

News Release from Vacu-Blast International

Vacu-Blast Installs Gearbox Peening System at Rover Torque rating increased by over 10%

Vacu-Blast has installed a special shot peening facility at the Rover Group plant in Longbridge, to process gearbox components for the Rover 600 and 800 Series. The facility has enabled Rover to uprate the torque handling capacity of these gearboxes by more than 10 percent by significantly enhancing the fatigue resistance of critical components – in line with Rover's "Total Quality" policy.

Installation of the facility reflects the growing importance in automotive transmission manufacture of precision shot peening techniques – hitherto the application of these has been largely confined to the aerospace industry. Vacu-Blast is already a major force in aerospace peening and numbers most of the world's aerospace manufactures and operators amongst its customers. Rover joins four other major European automotive companies who have recently installed Vacu-Blast programmable peening systems.

The design of the Rover facility represents the state-of-the-art in automotive peening technology. It processes two shaft and two gear components with high-grade steel shot.

Components are retained on special jigs on a six-station, precision indexing, powered turntable. Peening is carried out by an array of pressure-fed nozzles attached to a signal axis manipulator. The system checks automatically whether components have been loaded in the correct position on the right station and

selects the appropriate individual single or dual peening program. It does not operate if the wrong part has been loaded.

The peening programs govern all processing parameters, such as nozzle path and speed and shot flow rate, which are monitored constantly to ensure that quality assurance tolerances are met. The system also reclaims used shot, this passes through a stringent reclassification procedure to separate out reusable media for recycling.

One shaft component is dual or "duplex" peened with two difference sizes of shot (S230 and S110). This operation achieves the most effective improvement in fatigue resistance in hardened steels, by ensuring that the maximum residual compressive stress is as near to the surface as possible. The carburized components are first peened at a high intensity with large steel shot, then processed again at a low intensity with smaller steel shot. Dual peening effectively increases the depth of the compressive residual stress in the component, improving the load-carrying capacity of each gear tooth by between 20% and 30%. Additionally, the slight "dimpling" of the surface produced by the process assists gear lubrication.

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