

## One-Stop Shop For UKAS Calibration & Service

Following UKAS 17025 accreditation of JFL Mecelec calibration test facilities in April 2004, we are now able to provide a comprehensive one-stop tender for your calibration and service requirements that includes onsite calibration, which significantly reduces machine downtime compared to remote calibration laboratories. Also, because we work on-site, we can offer a full system calibration - not just individual transducers. All our equipment is portable and fully traceable to national standards, and certificates can be issued at the time of calibration if required.

Our scope of accreditation currently allows us to perform calibration work for pressure, temperature, rotational speed and all electrical disciplines. More importantly, the one-stop shop means we can calibrate equipment that is not of our own manufacture, providing it adopts similar technology.

A daily rate charge also offers an important advantage, because we will calibrate as many instruments as possible in a day, rather than charging for individual items and because calibrations are carried out on the machines, there are no additional delivery or courier charges.

In addition to UKAS calibration, our expanding Service Division offers maintenance and support for bespoke equipment made by other machine builders as well as our own.

Our dedicated team of fully trained and qualified service engineers can provide flexible service contracts (including 24 x 7 cover), planned maintenance, machine modifications and spares packages.

We are also the UK service and support facility for a number of overseas companies selling machinery into the UK, but are unable to offer the response to breakdowns and service required by their customers.

We offer support across all engineering disciplines, i.e. PLC programming, electronic, electrical, mechanical, pneumatics, and hydraulics and we are willing to contact any companies on your behalf and offer support to them from a UK based company.

We also complete service and calibration work on a worldwide platform. This year alone, service engineers have completed work in Poland, Portugal, Singapore, Malaysia, Netherlands and the USA.

We are able to tailor any of the above services to suit your own particular requirements, so for further information, please call our service manager Mark Leighton.



Complete fuel rail assembly and test line, supplied to a major UK Automotive company, see page 3 for full story

Inside: Visteon Lean Assembly Cell · Denso Marston Intercooling Testing · Working with JFL Automotive · New Design Department & Team · New Website

# Beating Rivals For Visteon Lean Assembly Cell

**JFL** Mecelec has beaten a number of European rivals to deliver complete assembly and test facilities to Visteon UK's Belfast Plant, for the production of engine air inlet manifold assemblies.

The assemblies, which are shipped to Cologne, Germany are then assembled into engines for shipment to the USA, for use in the Ford Explorer sport utility vehicle.



The facility, which was developed jointly by JFL Mecelec and Visteon engineers, followed a competitive bid process involving potential suppliers from several European countries. Bidders were invited to propose solutions to achieve quality, cost and delivery targets against a functional specification.

The cell concept, which is based on lean manufacturing principles with minimum work in progress and maximum production volume flexibility, has enabled Visteon to respond rapidly to changing demand from Ford.

JFL Mecelec manufactured and delivered three assembly stations and one test station, which was arranged in a U-shaped layout for three operators. The stations use DC servo-driven screwdrivers to give precise control over screw insertion, and part present sensors are used to validate the correct installation of all component parts using 'Poka Yoke' techniques.

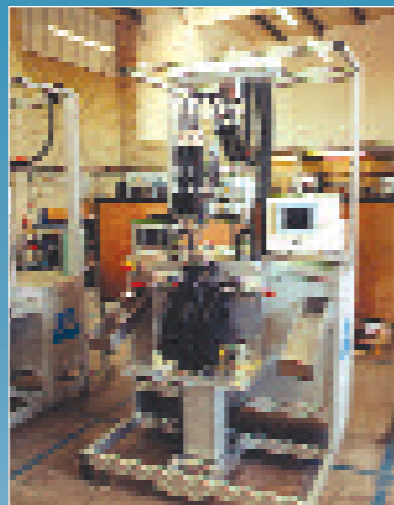
The completed manifold assemblies are finally checked for assembly integrity using a pressure decay leak test. A pre-existing test fixture was re-engineered to comply with current Health and Safety standards and to meet the new volume requirement.

Manifold assemblies that fulfil all quality pass-through characteristics are labelled and packed for shipment.

An important aspect of the ergonomic design is the facility to adjust the working height of each workstation to suit assembly operator preferences. Powered rise and fall devices are incorporated so that adjustments can be made in seconds, enabling operators to switch tasks frequently without any loss of production.

Before shipment, the complete cell was run at full production volume by Visteon's production and maintenance team at Mecelec's test facility in Gloucester, ensuring that all interested parties were fully engaged in the project and staff were fully familiarised with the operation and maintenance procedures prior to commissioning. It also meant that any minor issues could be exposed and dealt with before the equipment arrived on site in Belfast.

The facility was designed and manufactured in-house by the JFL Mecelec project team, which has built an enviable reputation for bespoke assembly and test automation in the automotive component sector.



# Finger On The Pulse For Pressure Testing

**C**urrently being built at our facility is a Pressure Pulse Test machine for accelerated life testing of large turbocharger intercoolers.



The machine is being purpose built for a leading heat exchanger manufacturer, Denso Marston and is required to meet the increasing demand for their expertise in this specialist market sector.

The machine stresses the intercoolers under test by repeatedly filling and venting the product with air at a controlled temperature and pressure. The facility incorporates a single air preparation system providing compressed air at up to 300°C, which is split to feed two identical circuits so that two charge air coolers can be tested simultaneously. Each test chamber operates with air at the same temperature but the pressure waveforms are separately controlled. (i.e. the test frequency could be different but the temperature and maximum pressure the same). It was decided to use air to test the intercooler as liquid test media at this temperature was too hazardous.

The machine is being designed to accept a single intercooler in each chamber with an internal volume of up to 30 litres. Alternatively, if just one test chamber is used, a single product may be tested with a maximum volume of 60 litres.

A compressor will provide compressed air at a controlled pressure, which will be circulated through a heated pressure vessel.

The controlled pressure will be slightly above the upper test pressure required. The temperature of the air in the vessel will be controlled to a little above the required test temperature to allow for losses.



In order to control the pressure waveform of the air delivered to the unit on test, JFL Mecelec has developed a special spool valve to operate at 300°C (max.) and 1.0Hz (min.). The test air passes through a further safety shut-off valve before admission to the test chamber.

Commenting for JFL Mecelec, David Peacock says: "Confidence in our ability to provide this special engineering solution is one of the main reasons why Denso Marston chose us as the supplier."

Two test chambers, integrated with the structure of the rig, will be provided to accommodate the components on test. The chambers, which are being designed to contain the effects of a catastrophic component failure, will be enclosed with access being provided by means of substantial interlocked doors.



A single electronic pressure transducer will be fitted to each test fixture, with their outputs displayed on a controlling PC to ensure compliance with the applied test specification. Two low thermal mass PRT's are positioned at the inlet to the unit on test, with the output from these also being displayed on the PC.

As the pressure pulse test occurs, the displacement of the pulsation actuator will be measured using an LVDT. If this displacement varies, it is an indication that there is a problem within the circuit

# Fuelling Up Our Sister Company

**W**e have recently completed a major contract to supply a range of semi and fully automated manufacturing lines to our sister company JFL Automotive.

Designed to produce fuel injection rails for two well known vehicle manufacturers, each line consists of two separate cells with all machinery contained within it, being controlled by dedicated PLC's. Each cell, which is capable of producing five variants of fuel rail, has a display panel to give quick and easy diagnostics and production management data and is designed with total control and monitoring of build type and component parts.

The lines use Poka Yoke concepts and are designed using 'Lean Manufacturing' principles.

The cells feature pressure decay leak testing, colour detection of component parts, insertion force monitoring, torque monitoring of bolted joints and component part detection, and to ensure process robustness, all rejects are segregated into bonded storage areas, with the machines being locked out of operation until this had been done.

"The rubber hose connecting the two banks of rails was a particularly complex component to deal with," explains Mecelec's senior engineering manager Adrian Whitehead. "It had to be supported across its whole

length to prevent it collapsing, which was a complex process.

"Working in partnership with one of our suppliers, a 3D Split Clamp was developed, which provided support for the hose and incorporated detection devices to check for closure of the clamps and presence of the hose."

The last piece of equipment in each cell was a 'final leak test validation', which proved the rail had been correctly assembled and was fit to be shipped to the customer. As a safety critical system, all data collected at this stage had to be stored against a unique serial number marked on each rail. The marking was achieved using an ink jet marker, supplied by Domino, with data collection and system monitoring via bespoke software running on an Industrial PC.



and an alarm will be triggered. This will detect gross leaks such as the failure of a connection hose or the catastrophic failure of an intercooler.

A Helium leak test will be used for the early detection of intercooler failure. Additionally, a port for a remote hand held sniffer will be provided in each chamber. This will be used initially to check the connection hoses for leaks before the test begins, and then to pinpoint the exact position of a leak

should one occur during the test.

The equipment will use Mecelec's well proven PulseLogic™ software running on a Labview platform. The PulseLogic™ software allows full access to interactive user utilities even while testing is in progress. This means that test schedules can be created or edited, test reports can be printed, new tests can be set up and incoming and outgoing signals can be examined, all without suspending current tests.

# Meet the team

To help you put a face to that all familiar name, we thought we would take this opportunity to introduce you to some of the team at JFL Mecelec.



JFL Mecelec's service manager Mark Leighton with service engineers Matt Darby, Gary Preen, Andrew Boulton-Briggs and Tony Morgan.

Dave Peacock is sales and marketing manager with responsibility for the South, South West and South Wales.



Area sales engineer Colin Cooper covers the North and South East, East Midlands and Ireland.

Colin Oliver recently joined the team as area sales engineer for the West Midlands, North Wales, North West and Scotland.



# Website Now Online

Our new website is now online and provides an introduction to the wide range of services JFL Mecelec offers, details of recent test and assembly machines we've built and news about the company.

You will also be able to send us your specifications for quotation.



# Design Capability Returns In-House

**JFL** Mecelec has re-established its own in-house design team staffed by a number of senior designers from Mecelec Design Ltd, a separate company that was set up several years ago, before JFL took over Mecelec Developments Ltd.

Mecelec Design Ltd, which previously operated within the Mecelec building, has now relocated and has no connection with what was Mecelec Developments Ltd or the newly formed JFL Mecelec Automation & Test Ltd.

