## UK: FANUC — IFR Partner

### Partnership helps keep Perkins' machining in-house and back in the UK

**Bringing efficient machining processes back in-house at diesel engine manufacturer Perkins has been helped by close partnerships with FANUC Robotics (UK) and Heller Machine Tools. Support and collaboration from OEM suppliers is seen by Perkins as a fundamental to success.**


Manufacturing coach is a job title that becomes very obvious after only a few minutes talking to Tony Green of Perkins Engines. Enthusiasm pours from Tony as he explains the shift in working practice that has benefited the company, and the UK, over the past three years. (…)

The cell produces 'ready for assembly' cylinder heads from un-machined castings. Operating a 3 shift system over 24 hours and 5 days a week the new system will produce 80,000 cylinder heads per year. Each team comprises three operators and a maintenance person.

Tony explains, "Skills and the right attitude are essential and I believe attitude is of paramount importance – we can provide skills – attitude is a little harder. Success relies on the team working together and sharing information and experiences with each other. If there's a breakdown the maintenance team member will attend but also the operator will be sufficiently capable and willing to provide support until operations are resumed.

The key focus has been to release the full potential of the teams- giving them what they need and making sure they have the right tools. Partnering with FANUC and Heller has been a core element in achieving this."

Initiatives at Perkins have included OEMs' support teams working on site with the Perkins' teams to completely rebuild older equipment, and in the case of FANUC Robotics, sending the Perkins apprentice of the year to work at FANUC's Coventry base for a six month period.

Pallets of cylinder head castings are delivered to the cell where a FANUC R2000iA/165 robot equipped with a FANUC V500iA/3DL vision system identifies the position of the heads and then picks them up using a magnetic gripper. After re-orientating the head, using a fixture, the robot then places the cylinder head into a marking machine and then places it onto the machine cell input conveyor.

The vision system allows Perkins to use standard pallets and eliminates the need for special jigs and costly containers. The robot is utilised further by loading finish machined heads into a leak testing machine and reloading them safely and neatly into the pallet.

The machining cell comprises six Heller machining centres – four for pre-machining and two for finish machining. Two washing machines ensure complete removal of metal cuttings. Servicing the machines and mounted on a 20 Metre linear slide are two further FANUC Robotics R2000iA/165 robots. Cylinder heads enter the machining area on a power and free conveyor and from that point are handled through the cell by the robots. The two FANUC robots are identical and, although programmed to work together servicing the machines, each one is capable of servicing the entire cell independently – therefore providing redundancy if needed.

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Using a single gripper design each robot is able to locate the cylinder heads in any of three positions dependent on the loading/unloading requirement. The long radial reach of the robots, 2.65Mtr allows the machines and processes to be accessed comfortably and still allow space around the machines for maintenance.

Before the finish machined cylinder head is leak tested, a further FANUC robot is used by the cell to load core plugs into the cylinder head at the core plug pressing station.
Tony Green concludes, "This success of this project is down to partnership – the result of a ground up development to ensure the cost effective machining of the 400D cylinder head. It has retained machining work in the UK, improved product quality and has further enhanced best working practice within Perkins Engines."

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