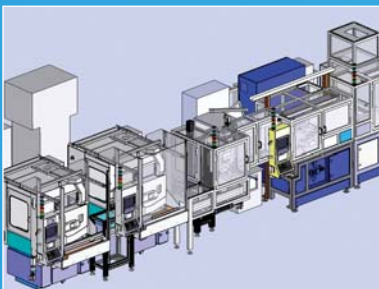
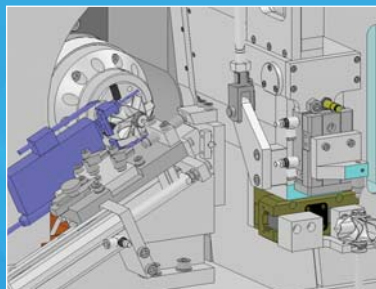


In this issue... Vector grinds from solid



Germany orders
manufacturing cells for
turbo charger shafts



Gauging system for turbo
shaft vane grinding



Curtis Machine Tools Ltd,
then and now

also...

- Groove grinding with
plated CBN wheels
- New projects
underway

Vector grinds from solid

With components destined for fuel injection and similar applications within the automotive industry becoming ever smaller, the traditional production route of turn, heat treat and grind is no longer a cost-effective option.

Presented with components in the 1 to 2 mm diameter range, which are difficult to handle and locate reliably using conventional methods, CMT has developed the Vector GFS cylindrical grinding machine. This new machine is capable of producing a wide range of parts from hardened bar in one cycle using a multi-form grinding wheel.

The key elements of the design are the stock feed unit, which feeds bar into the work spindle from a magazine

located at the rear of the machine, and a puller unit, wherein a servo-driven gripper pulls bar material a precisely programmable distance through the work spindle chuck.



Optional features available on the Vector GFS include the following:

- Servo-feed slitting saw that permits part cut-off with square pip-free faces, regardless of the wheel approach angle
- Radially retractable tailstock that swings clear to admit the puller gripper
- Slimline in-process diameter gauging using the Marposs 'Nano Unimar' gauge, with a retraction system built into the tailstock body
- Two-point steady that can be programmed for fixed support with retraction for stock advance, or linked to the grinding in-feed in follow-down mode
- C axis for non-round features
- Work handling systems based on the standard Vector robot, giving the possibility to execute further operations such as deburring, washing and palletisation.

A brief history...

...and a brief update

Douglas Curtis Machine Tools Ltd was founded in 1973 as a rebuilder of all types of machine tool by the late Douglas Curtis and son, Rick. It is the parent company of Curtis Machine Tools Ltd, which manufactures specialist cylindrical grinding machines and is one of four discrete businesses within the Douglas Curtis Group.

Doug could relate tales dating back to the time he hand cut teeth in big cast iron gears with the aid of a tooth form template. By the time Rick began working as a development engineer with Colchester Lathe, computers were making their presence felt in the world of machine tools, although Rick recalls the technology at that time as being horrendously unreliable.

Despite Doug's misgivings, the company extended its machine tool rebuilding activities in 1983 to include CNC retrofits, making use of 8-bit minicomputers with the operating system on a huge one-inch paper

tape. Eventually even the drawing boards at CMT were discarded in favour of CAD, although it took Doug a long time to acknowledge that anyone sitting at a computer all day was actually doing a proper job.

The experience gained in the 'good old days' has stood CMT and Curtis Assemble & Test Ltd in good stead. It bequeathed a conservative management policy and an insistence on sound engineering principles that did not stifle the enthusiasm for innovation.



Over the years growth has been dictated by a preference for internal finance for development projects, a policy that has proved its worth in difficult times. CMT is working through this latest recession without the need for redundancies or short-time working. This is in marked contrast to many volume production companies that have been forced to make substantial reductions in their workforce.

Mick Stowe, Machine Shop Manager (left), has been with CMT for 26 years, while Alan Wilkinson, Managing Director, is a 'new boy' with just 17 years service.



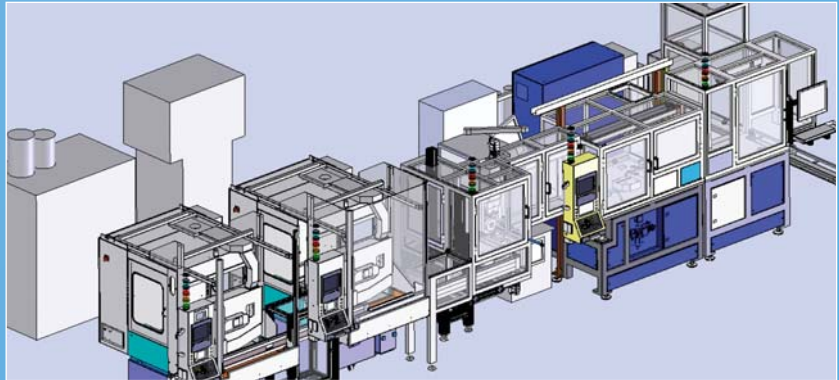
As they were 20 years ago: From left – Rick Curtis, Rick Baker (Managing Director of Curtis Assemble & Test Ltd and Chief Executive Officer, Douglas Curtis Group), Doug Curtis (Deceased 1999) and Melvyn Boley, (Technical/ Sales Director, Curtis Machine Tools Ltd).

German order puts CMT in pole position

Curtis Machine Tools has received a substantial order from Germany for two cells to manufacture turbo charger shafts.

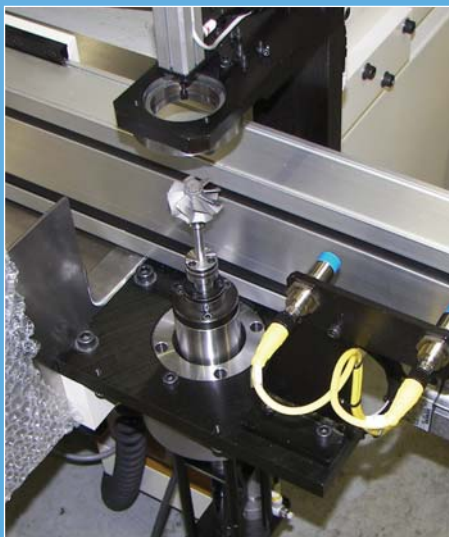
The new cells will each include two CMT Vector twin-spindle cylindrical grinding machines, a burnisher, and units for deburring, superfinishing and washing, as well as incorporating a laser-based final inspection system.

CMT has continued the development of its innovative Vector range and is confident of being in a strong position to meet future customer demands.



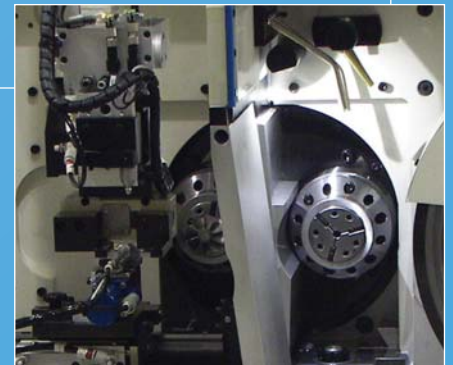
Schematic of one of two new cells for the manufacture of turbo charger shafts now under construction in CMT's Colchester facility.

Vane and groove grinding benefits from bespoke gauging system



Anticipating an increase in demand for its twin-spindle vane and groove grinding package, CMT has been working with gauge manufacturers on a system capable of the post-process measurement of the effective diameter and length of the blade profile.

While one workpiece is being ground, the part awaiting removal at the off-load station is rotated at a reduced speed. A measurement caliper is advanced and in one and a half revolutions the mean diameter of the profile plus the blade-to-blade variation are captured. The part is



then offloaded to a carriage that transports it to a length gauge with a ring at the gauge plane that checks the axial dimension. Feedback is provided for drift cancellation. Parts falling outside tolerance (due to insufficient stock or damaged seating faces, for example) are flagged as rejects.

Groove grinding with plated CBN grinding wheels

Grooves in turbo charger shafts have traditionally been ground from solid using conventional grit wheels dressed with a diamond roll. However, plated CBN wheels have been

developed that can grind an unhardened shaft – achieving the required groove tolerances and giving a very long wheel life. An additional advantage is that the plated CBN

wheel does not need dressing, assuring consistency of groove width and significantly increased productivity.

