

COMEC Takes Engine Builders Inside the Technology Behind Precision Boring and Surfacing

On EPARTRADE's Race Industry Now, COMEC demonstrates automated bore location, programmable machining cycles and laser surface scanning while opening the doors to its Italian manufacturing operation.

Precision engine machining depends on more than the cutting tool contacting the workpiece. Machine construction, fixture alignment, bore location, machining parameters and inspection all influence the finished component—and how efficiently a shop can produce it.

Those connections took center stage during “The Machines That Make The Machines,” Episode 641 of EPARTRADE's Race Industry Now. Featuring Enrico Carniel, CEO of Comec Italy; Ben Boor, US Sales Manager for Comec US; and Anthony Usher, President of MEC CNC, the presentation combined a live Italian factory tour with equipment demonstrations in Ohio. Brad Gillie of SiriusXM, Channel 90's Late Shift, hosted the discussion.

The session examined how COMEC applies the manufacturing practices used to build its own equipment to machines designed for engine rebuilding and performance applications. Demonstrations highlighted automatic cylinder-bore location, programmable roughing and finishing cycles, rapid fixture changes and surface scanning before machining.

Precision Starts With the Machine's Own Components

Founded in 1961, COMEC remains a family business, now managed by its second generation. Carniel explained that the company designs its machines internally using 3D CAD and manufactures their components at its facility in northeastern Italy.

The factory tour showed horizontal machining centers with twin-pallet arrangements, allowing the next component to be fixtured outside the cutting area while another is being machined. This approach reduces the spindle downtime associated with loading and setup.

Elsewhere, robot-loaded machining equipment continued operating after the normal staffed shift. Carniel described a production process in which material is prepared for overnight operation, while remote monitoring allows the production manager to check machine status and alarms.

Inspection accompanies that automation. In-machine probes check dimensions during production, followed by additional checks of completed components.

COMEC also stores raw castings for several months before machining. Carniel described this aging period as part of the company's approach to dimensional stability and long-term machine performance.

Before shipment, completed machines undergo electrical checks, geometry inspections and machining tests appropriate to their function, including boring or resurfacing operations. Test information is retained for future reference.

Automatic Bore Location on the ACF 200 CNC

A central demonstration focused on the ACF 200 CNC boring and milling machine, which Carniel identified as COMEC's strongest-selling machine globally over the past several years.

Boor demonstrated how the machine establishes cylinder-bore locations. After manually positioning the machine at the first bore and entering approximate bore spacing, the operator initiates a cycle that locates the individual bore centers.

The system uses a mechanical probing arrangement with a replaceable steel pin. Boor emphasized the serviceability of that design: damage to the contact element can be addressed without replacing an expensive electronic probe.

For performance engine shops, the discussion also covered situations in which an existing bore cannot provide a usable reference. Boor cited a damaged racing block requiring a replacement sleeve as one example. The operator can manually establish the required location rather than depend entirely on the damaged bore.

That flexibility also supports blueprinting work, where the required machining position may need to be established independently of the existing cylinder location.

Once the locations and machining parameters are established, automatic movement from bore to bore reduces the amount of operator intervention required during the programmed sequence.

Carniel emphasized the value for small businesses: a machine completing its cycle allows the operator to prepare another engine, handle paperwork or manage other shop responsibilities.

Separate Roughing and Finishing Parameters

The ACF 200 CNC also allows operators to program different machining conditions for roughing and finishing during surfacing operations.

Boor described setting the depth of cut and cutting conditions for material removal, followed by a separate finishing pass. This gives shops a way to retain an established process and repeat it on subsequent jobs.

Changing between boring and milling requires a physical tooling change. Boor estimated approximately two minutes for the changeover, describing a support arm that helps handle the tooling while the operator removes and reinstalls the mounting bolts.

An optional V8 blueprinting fixture provides another opportunity to reduce setup time. The fixture allows the block to rotate between cylinder banks and lock back into position. Boor said

that change could be completed in under two minutes, with faster changes possible once the operator is familiar with the procedure.

The presentation also highlighted software development for existing equipment. Boor said COMEC had added drilling and reaming capabilities and could remotely update compatible machines through a shop's Wi-Fi connection.

Laser Scanning Before the First Surfacing Pass

The RP1000 CNC resurfacing demonstration addressed a familiar question in cylinder-head work: how much material needs to be removed to clean up the surface?

Boor showed a laser scanning system intended to assess the head before cutting. The scan provides information about surface variation, helping the operator establish the machining program before beginning material removal.

For a distorted head, that information can reduce the need for repeated trial passes and checks to determine whether the surface has fully cleaned up.

The RP1000 CNC supports factory programs as well as operator-defined settings for cutting depth, starting position and finishing conditions. Shops can save a machining recipe for a recurring application and recall it for subsequent components.

Boor specifically discussed applications with a defined Ra surface-roughness requirement. Saving the established cutting parameters supports process repeatability when the shop returns to the same type of work.

A cycle-time estimate adds another practical benefit. The operator can see when the programmed operation is expected to finish and plan other tasks around that interval.

Line Boring With Adjustable Cutter Position

The line-boring demonstration showed equipment configured with a 23 mm boring bar, with 18 mm and 30 mm alternatives also discussed.

Applications included overhead-cam cylinder-head repair, main-bearing bores and block cam tunnels. A cutter mounted in a movable collar can be repositioned along the bar, while a micrometer-based setting fixture establishes the cutter position.

Boor also demonstrated a sequence combining programmed cutting feeds with operator-controlled repositioning. After completing a cut, the machine stops so the operator can check clearances and move to the next programmed starting position.

The fixture arrangement allows supports to be repositioned while maintaining alignment, reducing the need to dismantle and rebuild the entire setup when adjustments are required.

Connecting Machining Data to Shop Costs

Carniel also presented a cloud-based Internet of Things project designed to collect machine operating data.

The system records working hours, job types and the time spent completing operations. That information can help shops review their production history and calculate machining costs using recorded operating time.

For a small engine shop, this extends the benefit of CNC beyond the cutting cycle: the machine can also provide information useful for quoting, scheduling and evaluating how shop time is being used.

COMEC continues to offer manual equipment alongside its CNC range. Boor noted that hands-on demonstrations often help experienced manual machinists become comfortable with automation. For the CNC resurfacer demonstrated, he said typical operator training could take approximately a day and a half to two days.

With machine inventory, demonstrations and service support based in Ohio, COMEC's presentation connected its Italian manufacturing operation with the daily requirements of American engine shops.

Throughout the session, the emphasis remained on practical gains: locating bores efficiently, preserving proven machining settings, shortening changeovers and allowing skilled machinists to accomplish more while a programmed cycle runs.

For more information, [watch the full webinar here.](#)