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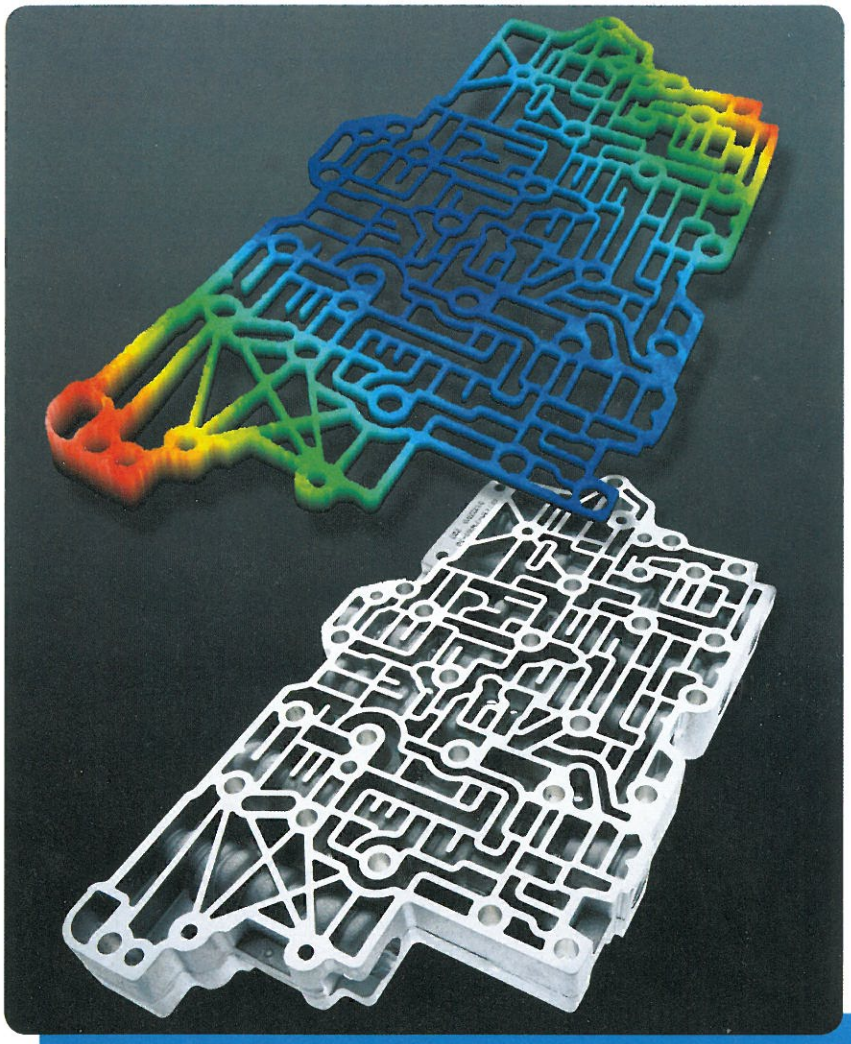
TECHNOLOGY AIDS VISUALIZATION OF PART PROBLEMS

Dwight Carlson and his team at Perceptron revolutionized automotive vehicle production back in the 1980s when they brought the gauging systems used to measure bodies-in-white on line in assembly plants. While this technology, based on cameras and laser systems, was not immediately embraced, Carlson recalls, suggesting that there is a technology curve that potential users must climb over a multiple-year period, nowadays, people in factories often refer to "the Perceptron" almost as though the system is to measurement what Kleenex is to tissues.

So what does a serial technology entrepreneur like Carlson do now? Well, he and his current team at another company, Coherix (www.coherix.com; Ann Arbor) are working with a development that came out of The University of Michigan: Digital Holography. This time, the issue is not looking at the relationship of say, body sides to doors, but analyzing, with considerable accuracy (i.e., microns), the surfaces of things like transmission valve bodies, and brake rotors. While the ShaPix unit is not an on-line unit (at least not yet, although it is sufficiently hardened to operate within a factory), what it does do is collect more than a million data points in a 300 x 300-mm field of view, using laser light. Essentially, the laser light is directed onto the part that's on a granite base within an enclosure, then a digital camera captures the image data. (The more technical description is: "Non-contact, three-dimensional surface measurement using frequency modulated and optical phase-shifting interferometry." This is comparatively tricky, given that the surfaces are machined and consequently reflective, which is not the best thing vis-à-vis imaging.)

While the collection of all of that information about the surface is certainly impressive, that's not the most important part of the process, at least not so far as improving production output goes. That is, the ShaPix software, which runs under Windows XP Pro, processes the information then provides an image on a 19-in. display that shows both color-coded 3D images and 2D profile plots of the part. Simply, it is exceedingly evident where there are variations (i.e., there is a scale that shows the degree of departure from the norm—as in red being bad, green good, and yellow in the middle—but with data connected to these variations). This, Carlson explains, helps engineers make a determination of whether adjustments (to the tooling, say) are necessary, and how much.

Compared with conventional measurement techniques, the word "revolutionize" comes up again.—GSV



The upper image shows the way that the valve body would appear on the screen of the ShaPix unit, with the colors indicating where there are surface variations on the part surface. This information can then be used to make necessary production adjustments to achieve better part quality.

ERRATUM

We made a silly mistake in the designation of the size of the 3.5-liter engine in the Lexus IS 350 in the October issue. It is not a 3.0-liter engine.

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