

FROM THE PUBLISHER

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A different take on Surface Finish

This issue of *Engine Professional* (EP) is going to treat a familiar subject but in a way that helps give meaning to what we are trying to accomplish when we measure things. It sounds odd to say we may not know what we are measuring when we pick up an instrument because after all, the purpose of a measuring device is, well, to measure something. But often we haven't qualified the instrument itself for accuracy and even more importantly, haven't qualified that instrument against all others in the shop.

We will first discuss surface finish but in different terms from the normal. Generally, when surface finish is covered, the subject quickly moves to cylinder wall or deck surfaces for blocks and heads. But surface finish is much more than meeting print specification through a machining process and it extends to every engine component that is called upon to bear load. It should also involve a basic understanding of what the machining process is doing to underlying metal. All machining generates surface defects. Grinding creates unique defects from turning, honing or milling. Even though each machining process could potentially measure the same surface number, surface topographies created through differing machining processes could be vastly different and possibly cause component failure if not controlled. How often

have you qualified measurements, both dimensionally and for surface and still had a failure? A real head scratcher for sure but the cause of failure may be more subtle than you think.

What will be attempted is a more thorough explanation of surface, the types of topography produced and possibly a more accurate surface measurement parameter to use when describing surface quality. It is our hope that after reading the various articles, you will better understand what surface measurements represent and how you can change them to your satisfaction.

Coupled with surface treatment are the tools that create them. Some tools are responsible for very specific surface structure change yet few fully understand when to use these tools optimally. To that end, we will have tool manufacturers address the discrete nature of these tools.

Additionally, we will cover some simple ways to routinely monitor instrument calibration and keep your gages agreeing with one another. An average shop will astound you with the number of micrometers, bore gauges, calipers, setting fixtures, in-process gauges and other measuring devices specific to machines used in the shop. Can you imagine what problems face a shop if all or part of these measuring devices do not agree.

These days, shops face a greater and wider range of problems, many outside their control. Dave Metchkoff's article points to a classic difference in approach for creating cylinder wall finishes depending upon application. What is required (federally mandated) of an OEM cylinder surface is not necessarily the same for performance or some other application. For this reason, shops should be aware of engine use and the fuel it is going to consume.

When problems fall within the boundaries of control, AERA wants to be there with solutions. EP strives to supply those solutions. This is a natural extension of what AERA does for its members on a daily basis.

I hope you find articles in this issue helpful and educational. ■



Prior to becoming president of AERA, John Goodman was director of the Advanced Technology Center (ATC) for Micromatic-Extron. The ATC focused on manufacturing honing solutions and studies for OEM engine manufacturers. Testing of traditional and unique honing abrasive systems, coolants, fixtures, tools and software were primary responsibilities of the ATC lab.