



The Honing Business

Cylinder bore-specific procedures assure optimum performance from a rebuilt engine

BY DAVE EMANUEL

Back in the day, when an engine needed to be honed—you honed it. If you were a do-it-yourselfer, you broke out your trusty handheld drill, clamped the chuck down on a ball-type hone and proceeded to “break the glaze” or “refinish the cylinder bores”. If you were a true “high-tech” machinist, you had the block on an engine stand during the honing operation, which was required to knock off the rough edges left by a boring bar. But as likely as not, the engine hadn’t seen a boring bar since it left factory—it was being rebuilt while still in the car (or truck). Of course, if you were attempting to refinish the bores with a high degree of precision, you used an adjustable hone equipped with actual honing stones.

Then, someone had to go and ruin everything by spreading the word that cylinder shape is distorted by the stress created when head bolts or studs are torqued to the proper specification. That revelation led to the creation of torque plates, thereby allowing bores to be honed while under the same stress that exists when a cylinder head is installed.

Since engines don’t run for long, if at all, without a cylinder head in place, “torque plate honing” makes a lot of sense, and has proven itself by providing superior piston ring seal, oil control and durability. For a time, “torque plate honing” was as good as it got, but then automakers had to go and make things complicated by developing new cylinder bore and piston ring materials. Concurrently, more stringent emissions and fuel economy requirements, combined with changes in the composition of fuels and oils made an already complicated situation even more complex.

As you’ll see by reading through the accompanying articles, a variety of cylinder bore-specific honing procedures are required to assure optimum performance from a rebuilt engine.

As with most machining operations, individual opinions will vary as to the “best” procedure for a specific application, but there can be no argument that cylinder honing is no longer just a simple finishing touch that’s required to be ensure that the rings seat properly.

Although cylinder honing isn’t as simple a process as it has been in the past, it is not particularly complicated. The descriptions of OEM honing processes contained in the accompanying articles may seem to imply otherwise, but the complexity of those processes have more to do with mass production than with machining. Many automotive machine shops are currently machining aluminum and diesel engine cylinder bores to OEM quality specifications. As they have demonstrated, all it takes are the proper tools, abrasives and coolants (all of which are currently available).

Conventional wisdom would suggest that it’s not reasonable to produce OEM quality cylinder bores without the use of OEM machining equipment. As usual, conventional wisdom is wrong. An automotive machine shop can in fact deliver higher precision and more consistent quality because each engine is handled on an individual basis. While there certainly is a learning curve with some of the newer processes, it’s not particularly steep, and any competent machinist can get up to speed quickly. ■



With six technically oriented automotive books and over 1,500 magazine articles to his credit, Dave Emanuel is regarded as one of the nation’s most respected automotive journalists. During the past 20 years, his work has appeared in popular publications such as Motor Trend, Road & Track, Hot Rod, Corvette Fever and Popular Science to name only a few of the more than twenty magazines.

Dave’s technical expertise and extensive hands-on experience, combined with his personal relationships with many of the nation’s top high performance engine builders and Detroit engineers, allows him to provide readers with unique insights into the high performance and racing aspects of engines and drivelines. Dave is also involved with private enterprise and offers insight on yet another possible power source.

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