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Engine Building and Power Techniques

BY SCOTT SEHR



Absolutely, The Most Motor For Your Money! *Guaranteed*

Sehr Performance
going the
"EXTRA MILE"

Machining a Better Block: Dimensions

We all know that the cylinder block is the main foundation of the performance engine. After we determine that the integrity of the block is adequate for the engine build, the first thing that must be looked at is the main bore of the engine block. The main bore houses the main engine bearings for the crankshaft to spin in and provides an absolute center to measure and correctly machine all other aspects of the engine block. Many believe that if the crankshaft spun good in the block during disassembly and if the bearings looked good, that the main bore is good and doesn't need to be attended to but this belief is not true. The fact of the matter is that the main bore is very susceptible to becoming compromised by just the engine running under normal conditions, not to mention any abnormal conditions like heat, higher RPM, high engine loads, or lack of engine lubricant. The main bore housing must absolutely be round, perfect in size, and in perfect alignment with each other. The specification is within one half of one thousandth of an inch but this tolerance is not acceptable in a performance engine. Even though this is only a fraction of the thickness of a piece of paper, this tolerance is

not close enough for a properly built engine. A properly built performance engine must be within one or two ten thousandth of an inch and this is not easy to accomplish, which is why many builders may overlook this part of the engine build.

To correct the main bore, we start by shot peening the main caps to stress relieve them, then they are precisely cut on the block mating surface correcting any cup or twist on the main caps. This makes the main bore smaller in size and allows us to machine the main bore back out to size, correct the out of round condition and place the individual bores back into perfect alignment. Then the block cap registers are machined of the abnormalities so the new main cap will properly set against the engine block for maximum surface clamping area. Precise measurement is required since cutting too much will reduce the crankshaft to camshaft centerline and this will result in a loose timing chain. The main caps are installed in correct order and required fasteners are installed. The main caps are tightened into the cap register to prevent cap walk and the caps are precisely torqued in

the correct sequence. Then the main bore is carefully and slowly honed out to size and back into exacting alignment using years of tried and true experience.

The main bore size must be accurate so the bearing crush will be at its full potential to hold the bearing into place and to provide maximum contact surface area for correct heat distribution. The main bore must be perfectly round to provide adequate support for the main bearing to control crankshaft flex and the alignment of the main bores must be exact so there is minimal crankshaft scuffing or binding which will steal power from the engine. The main bore is corrected first because all the parts of the engine block are measured and machined off the main bore centerline. The main bore is very critical for a correctly machined performance engine block.

For the best deal on the block, Sehr Performance will always travel the "EXTRA MILE" to give our customers the best engine possible.

