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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"

# Sizing Things Up

We talk often in the engine building business of clearances. These radial and vertical clearance specifications are critical in the useful life and performance of a hot rod performance engine. There are many different clearance specification guidelines and they depend mainly on the use of the engine. Some builders believe in tighter clearances, some believe in using the mid-level clearances, and some use a looser clearance combination. All have their place in purpose built engines but using the correct combination in the right place will produce power, torque and engine life. Some of the things to consider when clearancing engine components are the engines desired use, engine RPM, bearing construction, journal size, and engine component material.

Most think of crankshaft bearing clearances as the only critical clearances in the engine, however it goes much deeper than that. Although crankshaft bearing clearances are very critical, the other critical clearances

include cam bearing clearance, piston to wall clearance, crankshaft thrust clearance, valve stem clearance, lifter bore clearance, wrist pin clearances, connecting rod side clearance, ring side clearance, ring end gap clearance, valve to piston clearance, all valve train clearances, piston dome clearance, deck clearance, valve head radial clearance, crankshaft and connecting rod radial clearance, and camshaft end play clearance. These are all things that require proper clearances, but the method of measuring these clearances to get an accurate and true reading is a science in itself.

Some clearance readings are recorded in thousands of an inch and some much tighter recorded readings are in ten thousands of an inch, or in other words a microinch. A microinch is a much smaller measurement and is a fraction of a human hair. To get proper and true measurements of this nature it is critical that the engine builder use high precision and accurately calibrated measuring

equipment. Tool and component temperature is a factor when taking measurements of the components, as well as tool centering and micrometer thimble pressure. Years of experience are required to ensure true and accurate results. Using the correct method and tooling of component measurement is also very important for accurate results. There are many different measuring and tooling methods. Some tooling available is inexpensive and the methods used with these are not very accurate. High-quality engine builders spare no expense when using proper equipment for accurate and precise clearance specifications. When it comes down to a microinch, high dollar accurate equipment is absolutely a necessity.

Here at Sehr Performance we have always used the best measuring equipment available and provide the experience to make sure all clearances are exactly where they need to be so our customer enjoys all they can out of their engine.



Confirming Actual Main Bearing Clearance

## What is a microinch?

Human Hair  
0.0035"

0.001"

100 microinch  
(0.0001")

One micron  
(40 microinch)

One microinch

Courtesy of Engine Professional®