



Give Your Mechanical Snap Gage a 50,000 Mile Checkup George Schuetz, Mahr Federal Inc.

Your snap gages have been out on the shop floor for years and have served you well. Normally, they are zeroed with a zero master, measurements are made, and all is well. However, just like your car, it is wise to give these gages a thorough once-over every now and then just to make sure they're performing up to snuff.

Start by giving the gage a good visual inspection. This includes taking the indicator off and inspecting it. Is it sticking, and has it been recently calibrated? Inspect the anvils that are the key wear points. Any sign of chipping or cracking at the leading edges? While a chip may not affect the actual measurement, it could scratch a part, making it unusable in the final product. Check out all the locking mechanisms and screws. Do they hold everything in place tightly and securely? Replace anything that looks worn or ready to break.

Next, test the linear calibration of the sensitive anvil and the readout, usually a dial indicator. Use a gage block stack that moves the indicator through its normal measuring range. With a gage block stack that checks the nominal capacity of the gage, bring the sensitive contact down so that the indicator can be zeroed at its mid range. All adjustment screws should be tightened and calibration testing can begin. To represent the full travel of the indicator along with a number of points along the way, bring a number of stacks to the sensitive anvil. This typically includes blocks that represent ± 0.005 ", ± 0.004 ", ± 0.003 ", ± 0.002 " and ± 0.001 ". The indicator should reproduce the increase or decrease of the gage block stack length with suitable plus or minus readings as called out by the performance specs of the indicator.

Checking for repeatability can be performed at the same time, while everything is locked into position. Using a cylindrical master the same size as the gage block used to set zero—and with the back stop set at the proper location to put the cylinder at the mid-point of the anvil—measure the master cylinder at least 20 times. The repetition error should typically be less than one-quarter of the dial indicator division.

Using this same cylinder, check the parallelism of the anvils. Move the cylinder front to back and side to side, and watch the indicator hand. Any out-of-parallel condition will be registered on the indicator hand. Watch for the Max and Min in both directions. The difference between these two values is the out-of-parallel reading.

The actual flatness of the anvils should also be inspected occasionally. The basic test for this is to slide a steel ball between the anvils in the same manner as the cylinder. The only difference here is that the ball should be moved front to back and side to side in a grid type pattern. This will find any bumps or valleys in the anvils. A better way of checking each anvil separately is to use an optical flat to inspect the anvils and measure the fringe pattern.



Most comparative snap gages use either chromed or tungsten carbide contacts. Often wear on the anvils will not be noticed until errors reach an extreme condition. In many manufacturing areas, these gages are used 24/7 for thousands of parts, and it takes years of service for errors to become noticeable. Those that are seen typically relate to the condition of the anvils. Since the snap gage was designed to measure cylindrical parts, it is natural for a side-to-side groove to be worn into the anvils. This condition is easily found with the ball or cylindrical test mentioned above.

Once this checkup is complete, the gage is ready to be calibrated and put back into service. It is ready for several more years measuring those same parts. How about the master that is used to set the gage: when was the last time you gave it a thorough check?