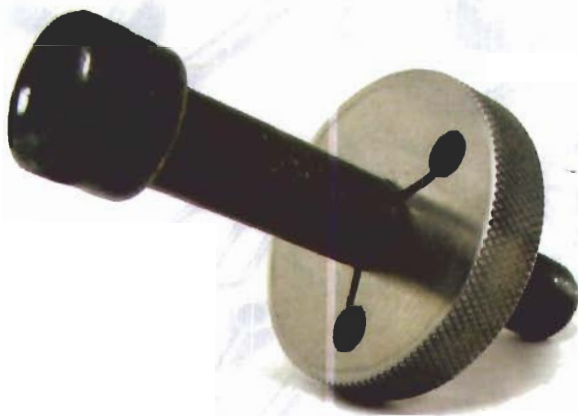


What is a Non-counterbore Ring Gage and Why Use One?

by Joe Greenslade



The American Society of Mechanical Engineers (ASME) B18.3 product standard for socket products and some of the other ASME standards refer to the use of a thread ring gage without any counterbore or countersink in measuring certain lengths on screws. Note 1 of Table 1C in ASME B18.3 states:

"The tabulated L_g values are the maximum and represent the minimum design grip length for the screw. They shall be measured from the bearing surface of the head to the face of GO thread ring gage, having the thread countersink

and/or counterbore removed, which has been assembled by hand as far as the thread will permit....."

Over the years I have been asked the following questions regarding this requirement:

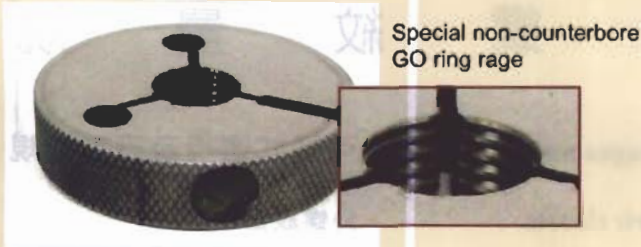
1. Exactly what is a non-countersink/non-counterbore GO ring gage?
2. Where can these gages be obtained?
3. What difference does it make if a standard ring gage is used instead of a non-countersink/non-counterbore GO ring gage?



Standard GO ring gage with counterbore



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Special non-counterbore
GO ring gage

Exactly what is a non-countersink/non-counterbore GO ring gage?

Standard thread ring gages have a small countersink or counterbore on both faces of the gage to make it easier to start screwing a bolt or screw into the ring when performing thread inspections. The depth of that countersink or counterbore is not specifically defined by the ring gage standards. This results in significant dimensional differences from ring to ring and from manufacturer to manufacturer. This dimensional difference is not important when inspecting for thread acceptability, but it is important if the location of this surface is used for a reference position when making a length measurement.

For purposes of measuring the Lg lengths, special ring gages having no countersink or counterbore must be used so that all parties

inspecting the same parts for this characteristic will obtain very similar measurement results.

Where can these gages be obtained?

Non-countersink/non-counterbore GO ring gages can be purchased as SPECIALS from most ring gage suppliers, or ring gage users who have grinding capabilities can modify standard GO ring gages for their use.

Since countersink and counterbore depths are not standardized one cannot simply decide, for example, to grind one face of all 1/4-20 GO ring gages .025 - .020 inches and expect to have them all be the same. To successfully modify a GO ring gage each one must be carefully ground and frequently visually inspect to determine at what point the countersink or counterbore on the face of the ring vanishes.

What difference does it make if a standard ring gage is used instead of a non-countersink/non-counterbore GO ring gage?

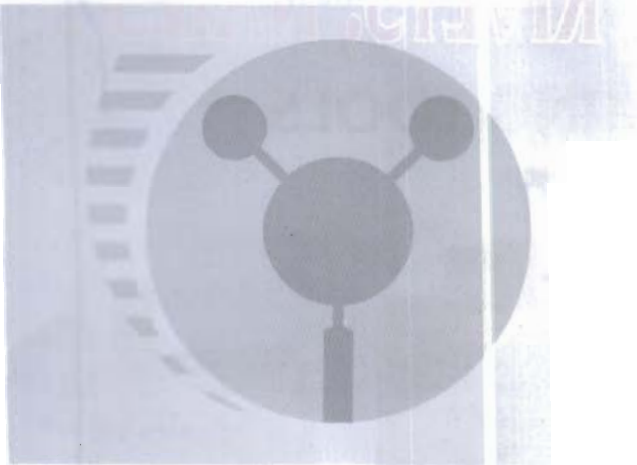
The measurement difference between using a standard GO ring gage and a SPECIAL non-



Lg measurement using
standard GO ring gage



Lg measurement using
SPECIAL non-counterbore GO ring gage



countersink/non-counterbore GO ring gage is illustrated by the photographs in this article. When measuring the Lg length of a 1/2-20 Socket Head Cap Screw with first a standard GO ring and then a SPECIAL non-countersink/non-counterbore ring the difference becomes very clear.

In the photo when the Lg length was inspected using a standard GO ring gage, the measurement was 1.378. When the same inspection was made using a SPECIAL non-countersink/non-counterbore GO ring, the measurement was 1.417. This amount of difference can obviously result in one party determining the parts are acceptable and another party determining the same parts are defective when the same style of GO ring gage is not used.

For more information on this or other fastener quality issues, contact the author at

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