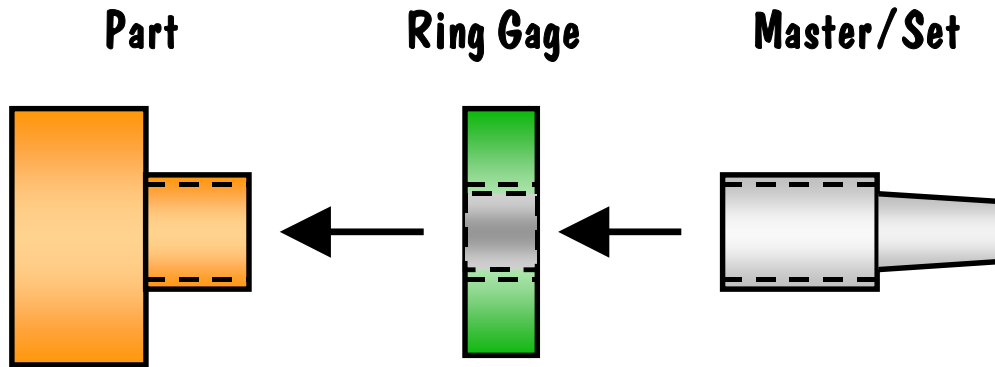
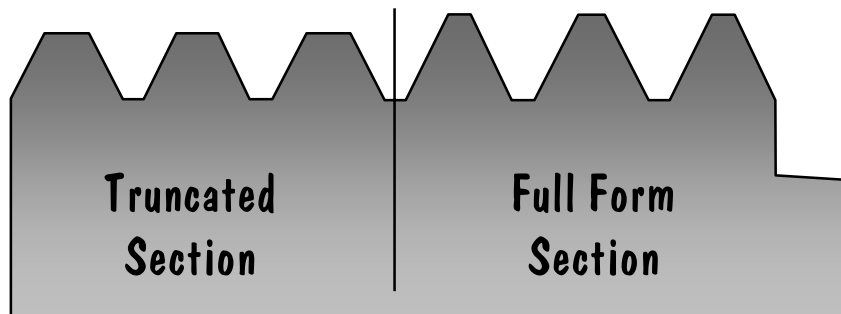


THREAD SET PLUG GAGES



The ring gage inspects the product, and the set plug / master plug / truncated plug inspects the ring gage. Maybe because it is commonly known as the 'set plug', many lab technicians think the set plug is only for the purpose of setting the ring to the proper size. It also has the function of inspecting the ring gage for wear.

TRUNCATED SET PLUG GAGES



The above picture is a cut-away view of the thread form of the truncated set plug. The thread pitch diameter is the same on both sections and requiring back taper. Back taper is when the measured size of the pitch diameter is less on the back, close to the shank, than on the front. The allowable taper is half of the tolerance of the pitch diameter. Set plugs with front taper should be replaced.

When using a set plug gage to check the ring, the ring should always be engaged across the full length of the plug to create consistent wear and retain the back taper condition. Set plugs become out-of-tolerance with a front taper condition because of the ring being engaged on the front portion only, many more times than on the back portion. So, contrary to normal logic, the set plug is actually given more life by more use.

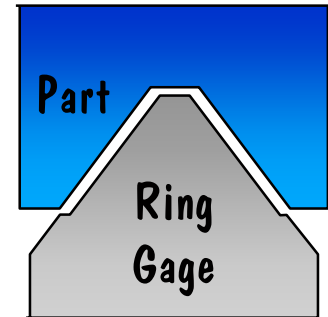
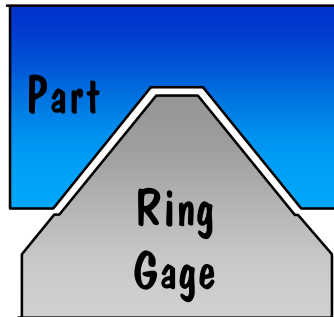
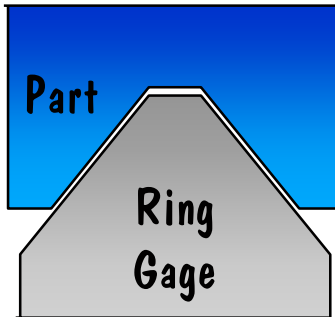
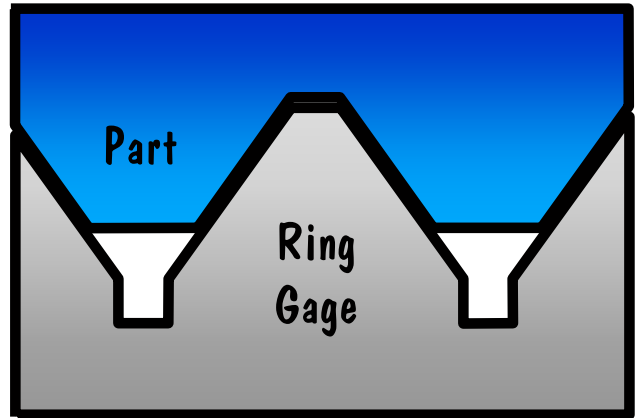


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RING GAGE WEAR PLANE

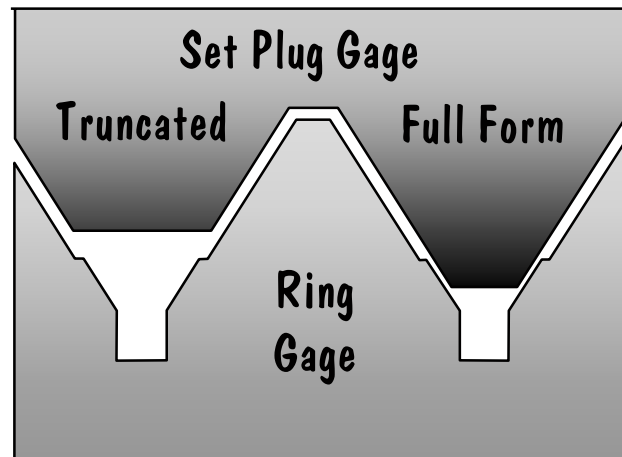
Product is produced in a manner that is designed to make the product as consistent as possible. This creates a scenario where the thread flank of the gages are contacted in the same general area consistently every time a part is inspected. This area we call the **wear plane**. As a gage is used it wears. Plug gages wear and are replaced when they wear outside of the tolerance limit. Ring gages are adjustable, and therefore present a problem we don't experience with plugs.



As a ring gage is used it wears, but it can be readjusted to be brought back into size. This means that the wear can continue until the flank is no longer a straight line. This is commonly referred to as the flank having a step wore in it.

The truncated set plug gage is designed to allow the truncated (front) section to contact the ring gage within the wear plane, While the full form (back) section is designed to contact beyond the wear plane.

When the flanks of a ring gage have a step wore in them the ring will feel much looser on the truncated section than on the full form section. This indicates the ring should be repaired or replaced.



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MASTER SETTING PLUG DESIGN

For Thread Ring Diagnostics & Setting

The Truncated Master Setting Plug Gage is designed for two functions; to set the adjustable thread ring gage, and to inspect the ring gage for wear. Two methods of using the setting plug are suggested to optimize the life of the setting plug. Pitch diameter taper on the setting plug is specified to always be in the minus direction, i.e. the PD on the front of the plug should always be larger than the PD on the back of the plug.

The first method addressed is used to inspect new ring gages, assuming your gages are not previously set by the manufacturer to your master plug. The ring should be set to the front or truncated portion, then continue onto the full form portion to inspect for root clearance, and consistent feel. The setting plug should be inserted a maximum of two threads into each end of ring for shake, inspecting for taper.

The second method addressed is used to re-inspect rings for wear after use on the

product. The ring should be set to the full form portion, then backed off to the truncated portion for feel. The setting plug should be inserted a maximum of two threads into each end of ring for shake, inspecting for taper.

The front or truncated portion of the setting plug is designed to contact the flanks of the ring in the wear plane, similar to a product. The full form portion is designed to contact the flanks of the ring beyond the wear plane. When a ring is run across the plug there will be a slight difference in the feel or tightness because there is more contact with the flanks on the full form portion of the setting plug, thus more resistance and a tighter feel.

If a significant difference in feel is noted, the ring has wear on the flank and should be repaired or replaced. Setting a ring with wear in the flanks will cause possible interference with the product major and does not properly inspect the product threads.

Tightness of Fit

There are no established torque values for degree of drag. Some judgment and common sense must be used. The resistance or drag for a small size gage should be less than for a larger size gage. A spin fit is obviously much too loose, and too tight a fit could damage or cause excessive wear on the ring or the setting plug. In-between is a fairly smooth drag. This tells you that the size of the ring is essentially the same as the setting plug.

On properly set gages with accurate lapped threads, a very little change to size

(adjustment of the ring gage) will effect a noticeable difference in drag. Two different setting plugs both within class W tolerance may feel entirely different in the same ring gage. One could be too tight and the other too loose. It must be realized that a ring gage set on one setting plug does not necessarily mean it will fit another setting plug. This is due to the allowable tolerance of the set plug.

In addition to pitch diameter variations, there may be a slight difference in the flank angle or lead of the ring versus the



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