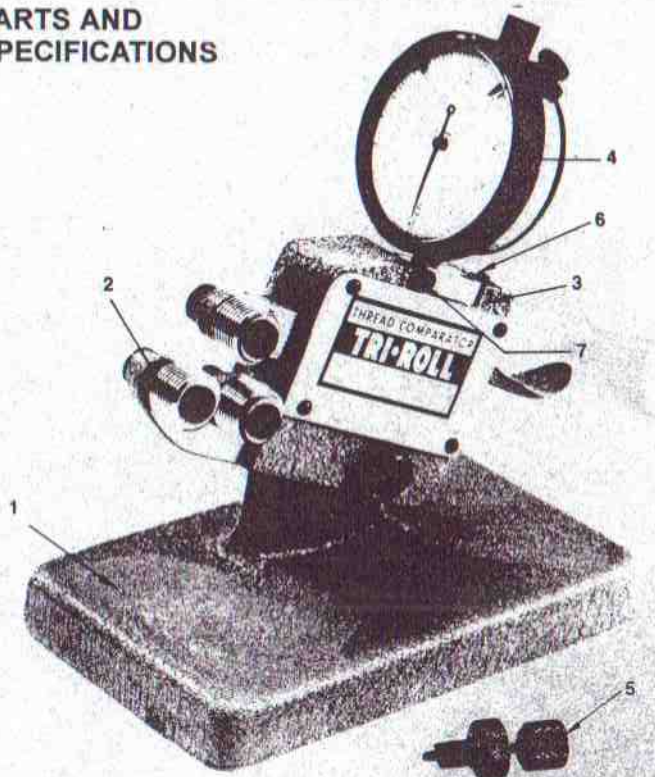
a Product of Southern Gage, Inc.

TRI-ROLL®
THREAD COMPARATORS

PARTS AND SPECIFICATIONS



1. **Base**—One rigid base applicable to all gage frames.

2. **Gaging Rolls**—Various type interchangeable rolls properly cradle the product thread to check the maximum and minimum limits of size, pitch diameter or single element gaging.

3. **Gage Frames**—Twelve gage frames, rigidly constructed to cover all nominal thread sizes from .060" to 3⅜" diameter.

4. **Dial Indicators**—Graduated .00025" or .0001" and equipped with adjustable tolerance hands. Properly mounted with positive locking binder adjustment.

5. **Stop Adjusting Tool**—Combination screwdriver, for adjusting the stop screw.

6. **Lever Stop Set Screw**

7. **Indicator Clamp Screw**

BASIC SPECIFICATIONS

GAGE No.	RANGE - NOMINAL SIZE				FOR THREADS PER INCH	ROLL LENGTH (Applies to type 3 +5 Rolls only)
	INCH		METRIC (mm)			
	ABOVE	TO & INCL.	ABOVE	TO & INCL.		
0	.059	.073	1.5	1.8	80 To 64	.223
1	.073	.099	1.8	2.5	64 To 48	.223
2	.099	.164	2.5	4.2	48 To 32	.223
3	.164	.3125	4.2	7.9	32 To 18	.424
4	.3125	.500	7.9	12.7	32 To 12	.424
5	.500	.750	12.7	19.0	28 To 10	.626
6	.750	1.125	19.0	28.5	28 To 6	.931
7	1.125	1.500	28.5	38.1	28 To 6	.931
8	1.500	1.875	38.1	47.6	28 To 4	.931
9	1.875	2.250	47.6	57.1	28 To 4	.931
10	2.250	2.625	57.1	66.7	28 To 4	.931
11	2.625	3.000	66.7	76.2	28 To 4	.931
12	3.000	3.375	76.2	85.7	28 To 4	.931

Sizes and pitches — and special forms — not listed are furnished on application.
When ordering a Tri-Roll, please specify thread diameter to be measured.

MOUNTING GAGE ROLLS

First, clean rolls, pins and setting plug thoroughly. Gage rolls are furnished in sets of three for each specific diameter-pitch combination and are interchangeable on the applicable frame size. The rolls should be placed on the pins with the marked faces out and the unmarked faces resting against the ground surfaces on the frame. The No. 2 roll is mounted on the movable upper arm. The No. 1 and No. 3 rolls are mounted on the fixed lower arm. For right hand threads the No. 1 roll is mounted on the outer end of fixed lower arm. The No. 3 roll is nearest the frame body. For left hand gaging simply reverse the No. 1 and No. 3 rolls.

With the rolls mounted correctly on the pins, the locking screws are turned clockwise to tighten. Types 3, 4 and 5 rolls should turn but not float longitudinally. They may be locked so they will not turn for ultra-critical inspection. Locked rolls, if required, should be repositioned periodically to avoid wearing flats on the gaging surfaces.

Multiple lead threads of less than 5 degrees helix angle may also be inspected with standard rolls. Information is available upon receipt of product thread specifications.

SETTING THE TRI•ROLL® THREAD COMPARATOR

The comparator is set with a single master plug gage, preferably of "W" tolerance. To engage the plug for setting, depress the operating lever at the back of the comparator and place the setting plug (entering from the front of the rolls) between the No. 1 and No. 3 rolls. Do not engage the setting plug by inserting from the side as to do so might nick or damage the rolls. Rotate the setting plug approximately ¼ turn to be sure it is seated properly.

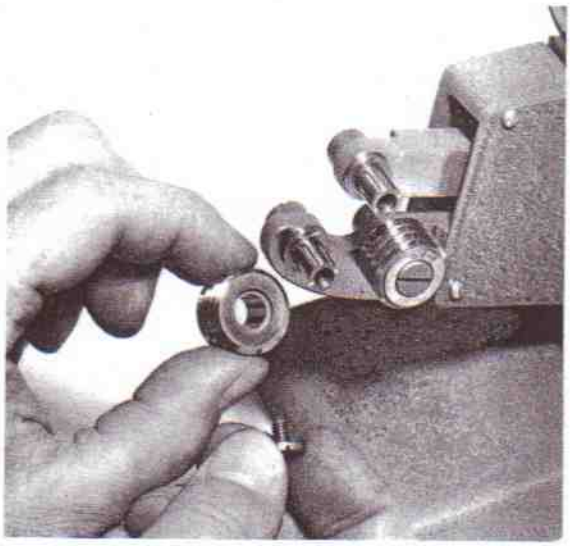
SETTING THE DIAL INDICATOR

The dial indicator is held in place by a positive clamp which encompasses the indicator stem. A standard socket wrench is used for the clamp screw. Preload the dial indicator by at least one full revolution to provide an adequate operating arc for the indicator pointer. To do this, place the setting plug in the rolls, loosen the clamp screw and adjust the indicator until the pointer has made one full revolution before coming to zero. With the indicator pointer on zero, tighten the clamp screw. The indicator bezel can be used for fine adjustment.

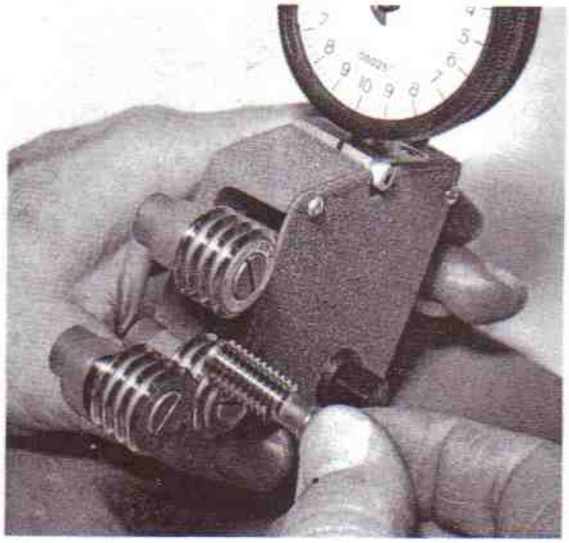
SETTING THE STOP SCREW

The stop screw, located on the top of the frame behind the indicator, is used to prevent damage to the rolls or the indicator by restricting the motion of the operating lever. With the setting plug in place, advance the stop screw until it contacts the operating lever (use special stop adjusting tool). Raise lever and remove setting plug. Lower lever until it again contacts the stop set screw. Retract stop set screw until pointer travels twice the part tolerance (part tol. .005—travel on indicator should be .010). Recheck indicator setting with setting plug.

The comparator is now set to inspect the part. Enter parts from the front as you did the setting plug. Rotate slightly to seat and read deviation from master on indicator.



Mounting gage rolls



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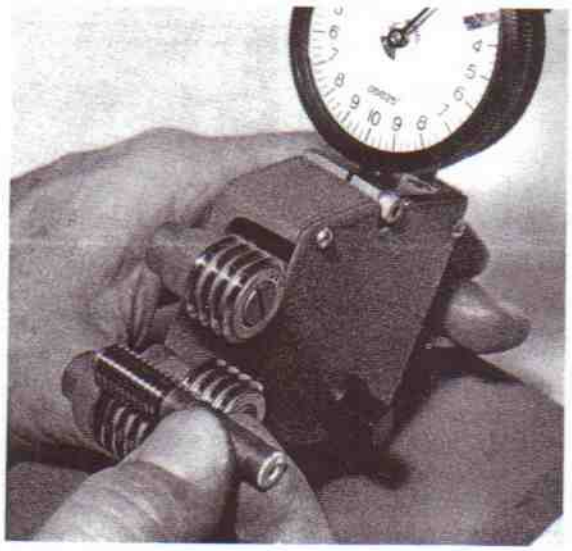


Do this.

OPERATING INSTRUCTIONS

Mounting Gage Rolls

Gage rolls are furnished in sets of three for each specific diameter-pitch combination, and are interchangeable on the applicable frame size. The rolls are hardened and precision ground, and are mounted on pins which are precisely aligned in the frame for perpendicularity and triangularity. They are threaded to receive the locking screws. The rolls should be placed on the pins with the marked faces out and the unmarked faces resting against the accurately ground surfaces on the frame. The No. 2 roll is mounted on the movable upper arm; the Nos. 1 and 3 rolls are mounted on the fixed lower arm.

With the rolls mounted correctly on the pins, the locking screws are turned — the amount of tightening depending upon the type of roll and the kind of inspection. Type 1 for instance, should turn and float longitudinally, using the screw as illustrated. Types 3, 4 and 5 rolls should turn but not float. Or, when used for ultra-critical inspection, they may be locked so they will not turn. The locking screws are slotted to permit secure locking. (Locked rolls may be repositioned as required to new gaging surfaces). Type 5 rolls are used to check 3-fluted taps at the first full thread in back of the chamfer at the cutting edge.

To check left-hand threads, the locations of the Nos. 1 and 3 rolls are reversed, with the No. 3 roll at the front and the No. 1 roll nearest the gage body. Multiple lead threads with a helix angle less than 10° are gaged in the same manner as single lead threads; further information is available on receipt of product thread specifications.

The Setting Plug

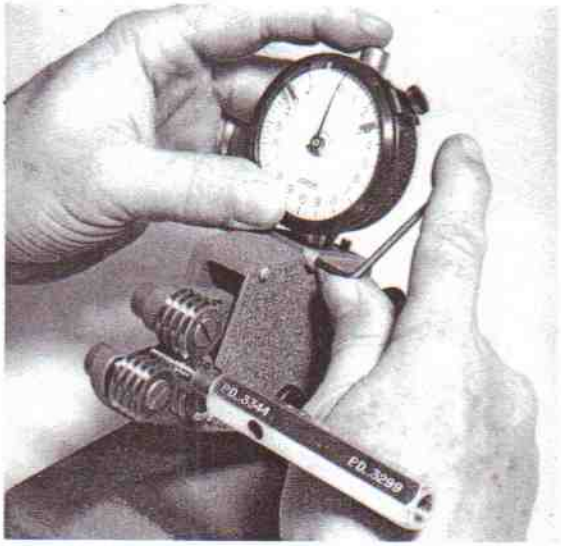
The Tri-Roll Thread Comparator is set by means of a single master plug gage, preferably of "W" tolerance. For exact setting, if required, the measured size of the setting plug — to the fourth decimal place — may be marked on the shank or handle.

Engaging The Setting Plug

To engage the plug for setting, depress the operating lever at the back of the comparator and pass the setting plug from the front between the Nos. 1 and 2 rolls. Release the lever to cradle the part in all three rolls. DO NOT try to engage the setting plug by inserting if from the side; to do so might nick the part or the rolls. Rotate the setting plug about 1/4 turn to be sure it is seated properly in the gage roll ribs. If the setting plug is equipped with a handle, hold it near the plug end. The setting plug and rolls must be clean to insure accurate setting. **Important Note:** Clean the setting plug thoroughly before setting the comparator.

Setting The Dial Indicator

The dial indicator is held in place in the gage body by a positive clamp, which engages the indicator stem. The clamp is operated by locking the indicator binding screw with a standard socket wrench. Before the comparator is ready for use, the dial indicator must be preloaded, at least one full turn, to provide an adequate operating arc for the indicator pointer. To do this, place the setting plug in the rolls, loosen the indicator binding screw, and reset the indicator until the pointer has made a full revolution before coming to zero. Holding the indicator so the pointer is on zero, tighten the binding screw firmly.



Setting the dial indicator.

Setting The Stop Screw

The stop screw, which is located at the back of the frame, protects the indicator against shock by preventing full travel of the operating lever. After the dial indicator has been set to zero, the stop screw is set by removing the setting plug, and then turning the stop screw in with the combination screwdriver until the screw contacts the lever arm and moves the pointer. Now back off the setting screw until the pointer has traveled a half-revolution to the bottom of the dial. Hold the stop screw steady and tighten the fulcrum lock nut.

Setting the stop screw.

Final Adjustment

In setting the dial indicator, as described previously, the pointer was brought as near the zero point as possible with the indicator binding screw. The pointer can now be brought exactly to zero by loosening the bezel clamp screw, turning the bezel, and reclamping. This final adjustment can also be used to compensate for any difference between the nominal setting and the actual size of the setting plug. If, for example, the actual size of the setting plug is .0001" smaller than the desired nominal setting, the bezel should be adjusted to read — .0001" . . . with the setting plug in the rolls. Inspections will then be made with the nominal size represented by the zero point.

NOTE: The Tri-Roll Thread Comparator is a precision instrument, and must be set and used correctly, handled with reasonable care, and kept clean to deliver its maximum accuracy and long life.

Inspections

Work to be inspected should be passed from the front between the Nos. 1 and 2 rolls until it is cradled in all three rolls, exactly as was done with the setting plug. Inserting work from the side can nick the work or the ribs of the rolls. Work to be inspected, and the rolls, should be kept free of dirt and chips to insure accurate measurement. Standard gaging pressure is 2-1/2 pounds for frame sizes up to No. 4, and 3 pounds for frames No. 5 to 12 inclusive. These pressures can be increased or decreased by turning the pressure adjusting screw, but the standard pressures are recommended for practically all applications.