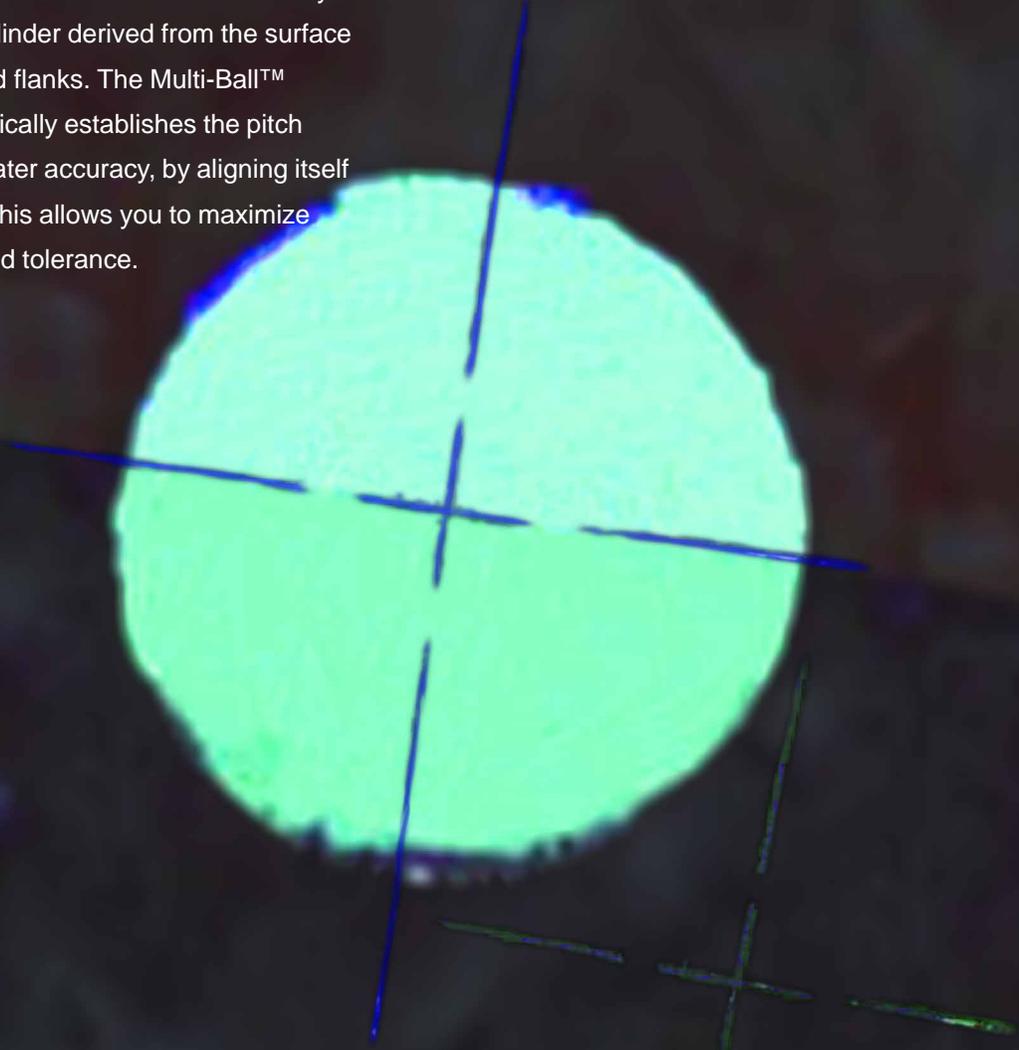


# Imaginary Accuracy.



## ESTABLISH THE IMAGINARY PITCH CYLINDER AXIS WITH GREATER ACCURACY.

An internal thread axis is defined and controlled by the imaginary pitch cylinder derived from the surface features of both thread flanks. The Multi-Ball™ location gage mechanically establishes the pitch cylinder axis, with greater accuracy, by aligning itself with the thread axis. This allows you to maximize greater use of specified tolerance.

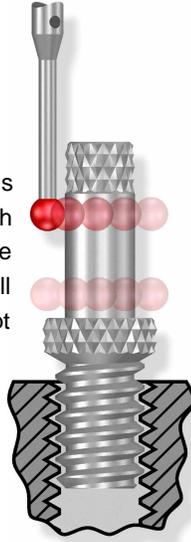
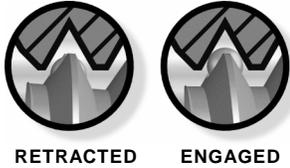


**MULTI-BALL™**  
Internal Thread Location Gage

# MAXIMIZE GREATER USE OF SPECIFIED TOLERANCE

## with the accuracy of the Multi-Ball Location Gage.

The patented Multi-Ball™ thread location gage uses hardened balls as flank contact elements to align itself with the thread pitch cylinder axis. Once locked in position, only the balls are in contact with the workpiece, making the Multi-Ball location gage totally independent of all workpiece features except for the thread pitch cylinder.



### Features of the Multi-Ball Location Gage

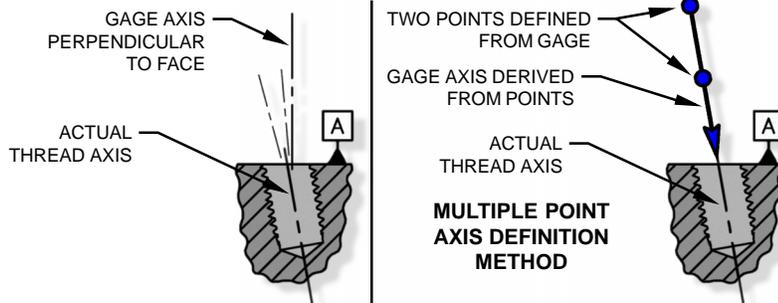
- Alignment accuracy is unaffected by an irregular or out-of-square workpiece face
- Only the balls contact the workpiece thread
- Does not distort the thread form
- Adjusts to holes regardless of feature size
- Designed to promote the use of "multiple point" (cylindrical) gage axis definition
- Easy installation/removal

### How It Works

The Multi-Ball location gage centers itself inside two patterns of three balls spaced 120 degrees apart. The patterns are located at each end of the threaded portion of the sleeve. The balls are free to move radially and are retracted or engaged by turning the pin counterclockwise or clockwise respectively. The turning of the pin rolls the balls into contact with the workpiece thread flanks, eliminating the possibility of wearing flats on the balls. When the balls are retracted, the gage can be easily inserted or removed from the workpiece without any resistance.

### Why Use Multi-Ball Location Gages?

Normally, part tolerance should be reduced by the total amount of gage and inspection process uncertainty. Since this reduction in tolerance can make manufacturing more difficult and costly, choosing gages that produce the least uncertainty can reduce overall manufacturing costs.

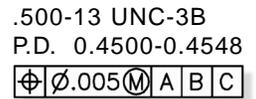


Location gages can induce errors if seated perpendicular to the workpiece face or by other alignment errors. If the CMM program assumes the gage axis is perpendicular to the face, additional errors are possible which further add to the total uncertainty.

Multi-Ball location gages are designed so that two points can establish the gage axis. When Multi-Ball location gages are used and the shank axis is defined by multiple point programming, the total inspection process uncertainty is reduced to the minimum.

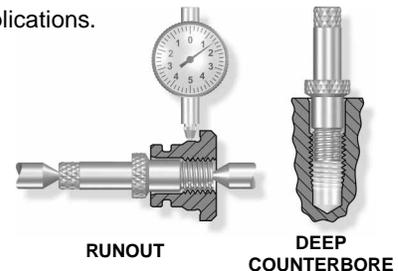
### Bonus Tolerance

When "Bonus" tolerance is specified on the drawing, you can gain significant additional tolerance under certain conditions. A Multi-Ball thread micrometer used with a Multi-Ball location gage can get you that extra tolerance. Ask us how.



### Special Configurations

The Multi-Ball internal thread location gage can be custom made for many unique and difficult applications.



If you have any special requirement, email, fax or call us to find out if Multi-Ball can be applied to your project.

Multi-Ball technology is also available on internal thread pitch diameter micrometers.

### Available From:

**TPC TRUE PRECISION CORPORATION**  
 831 South Post Road Tel: 317-899-0899  
 Indianapolis, IN 46239 Fax: 317-899-5374  
 Home Page: <http://www.TRUEPRECISIONCORP.com>  
 E-Mail: [Sales@TRUEPRECISIONCORP.com](mailto:Sales@TRUEPRECISIONCORP.com)



# MULTI-BALL™

## Internal Thread Location Gage