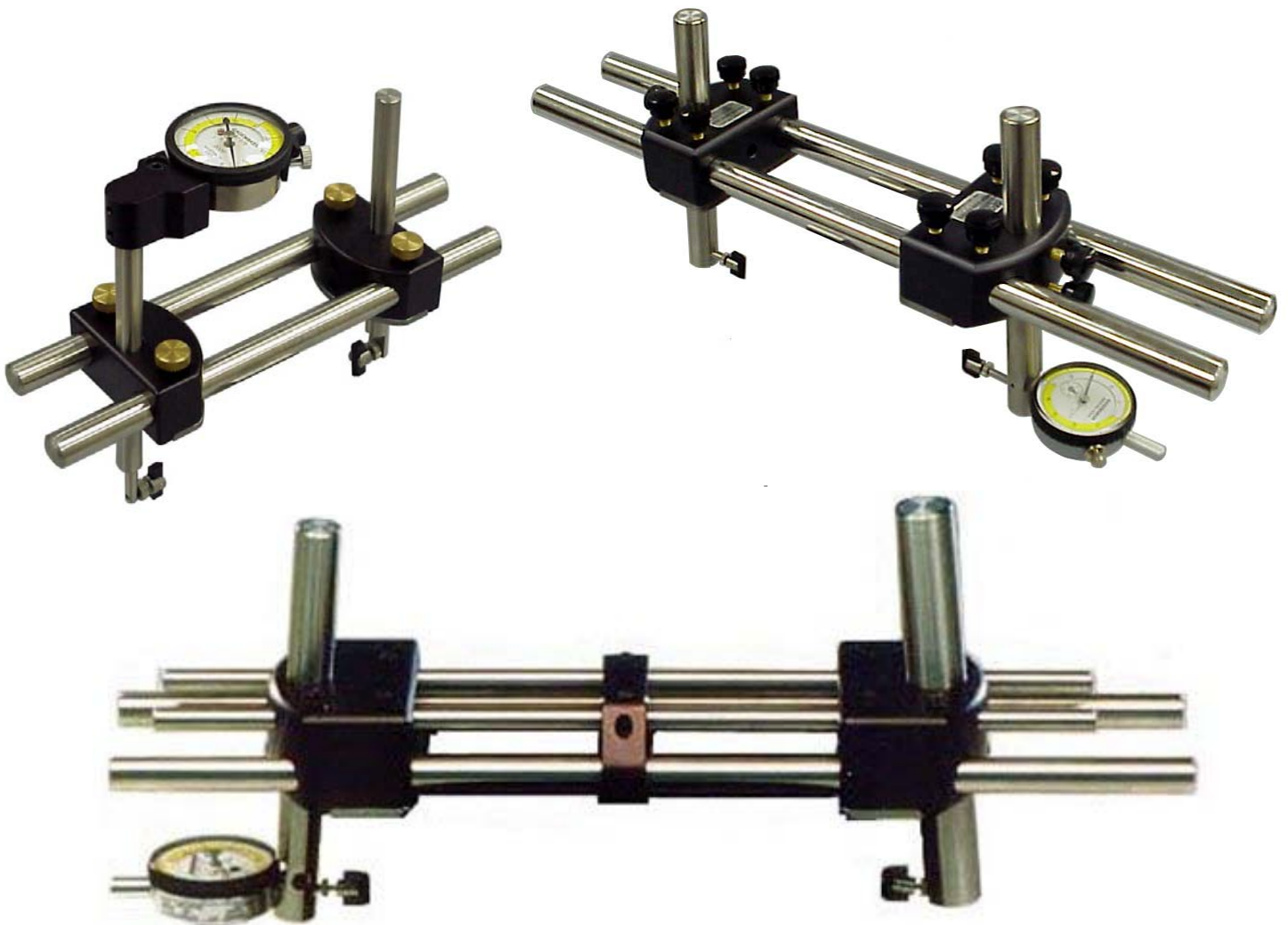


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***MRP Gage***  
***Models 1000/2000/3000***  
***OPERATION MANUAL***

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OMMRP10004-01

## Contents

### Introduction

Technical Support	4
Product Information and Updates	4

### System Components

MRP-1000 Component List (Internal and External Setup)	5
MRP-2000 Component List (Internal and External Setup)	6
MRP-3000 Component List (Internal and External Setup)	7

### Setup Procedures

MRP Dimensional Limits Chart	9
Setting Up the MRP Gage for External Measurements	10
Setting Up the MRP Gage for Internal Measurements	13
Zeroing the MRP Gage for External Measurements Using Rod Standards	17
Zeroing the MRP Gage for Internal Measurements Using Rod Standards	20
Zeroing the MRP Gage for External Measurements Using Frame Standards	23
Zeroing the MRP Gage for Internal Measurements Using Frame Standards	27
Zeroing the MRP Gage for External Measurements Using the MIC TRAC	31
Zeroing the MRP Gage for Internal Measurements Using the MIC TRAC	38

### Operating Procedures

Inspecting External Parts	45
Inspecting Internal Parts	47
Determining Diameter and Ovality Measurements with the MRP Gage	49
MRP Inspection Tolerance Guidelines	50

### MRP Accuracy Measurement Factors

Thread Shave Measurements	51
Standoff vs. Pitch Diameter Change	52

### Setting Standard Calculations

Rod Style Setting Standard Dimensions	53
Rod Style Setting Standard Correction Factors	55
MIC TRAC Setting Standard Dimensions	56

### MIC TRAC Setting Dimensions for the MRP Gage

API Line Pipe Connections - 1" to 20"	57
API NUE Connections - ¾" to 4½"	57
API EUE Connections - ¾" to 4½"	58
API STC Connections - 4½" to 20"	58
API LTC Connections - 4½" to 20"	59
API Buttress Connections - 4½" to 13⅜"	59
API Buttress Connections - 16" to 20"	59

### Care and Maintenance

Maintenance Tips	60
Warranty Information	60

Congratulations! Your decision to purchase a Gagemaker product above all others on the market demonstrates your confidence in our quality and workmanship.

To ensure the high performance and operation of our product, we urge you to use the included reference materials. They contain important information for proper setup and use of the equipment. Also, we recommend that you follow the care and maintenance tips in this manual to keep the equipment working in top condition.

If your questions have not been addressed in our reference materials, contact your local representative or a customer service representative at 713-472-7360.

## ***Introduction***

The MRP Gages inspect the pitch diameter and ovality of internal and external tapered threads ranging from 1 ½"-20". The MRP includes three models, which gives the gage its versatility. The different frame sizes allow each MRP model to measure a specific range of diameters. The MRP 1000 handles diameters from 1 ½" to 4 ½", the MRP 2000 fits diameters in the 2⅜" to 13⅜" range and the MRP 3000 tackles the 8⅝" to 20" diameter range.

The tubular rail and block construction allows the MRP gage to set securely on the face of the connector without any special adjustment. The gage uses two pivoting shoes that rest on the crests of the threads during inspection. Any variations in pitch diameter detected during inspection are shown on the gage's indicator.

Before inspecting parts, the MRP gages must be preset to a nominal predetermined dimension. For determining the gage's setting dimensions and gauging tolerances, this manual includes tabled setting values as well as formulas for calculating setting dimensions. The MRP gages can be preset using Rod or Frame Style setting standards or Gagemaker's MIC TRAC MIC TRAC measurement center.

To inspect parts, the pivot shoes are placed on the crest of the threads of the part and the gage is properly positioned by sweeping to obtain the largest indicator reading. It is also recommended that the gage be zeroed periodically during use to maintain accurate readings.

## **Technical Support**

Phone: 713-472-7360

Hours: Monday – Friday 8AM – 5PM (CST)

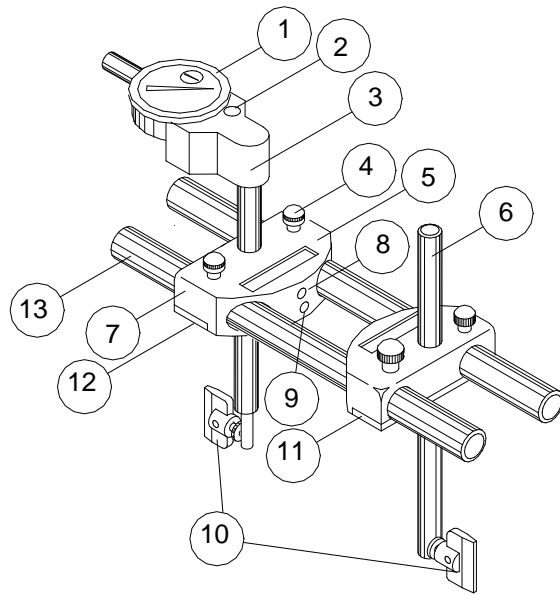
## **Product Information and Updates**

Visit our web site at: [www.gagemaker.com](http://www.gagemaker.com)

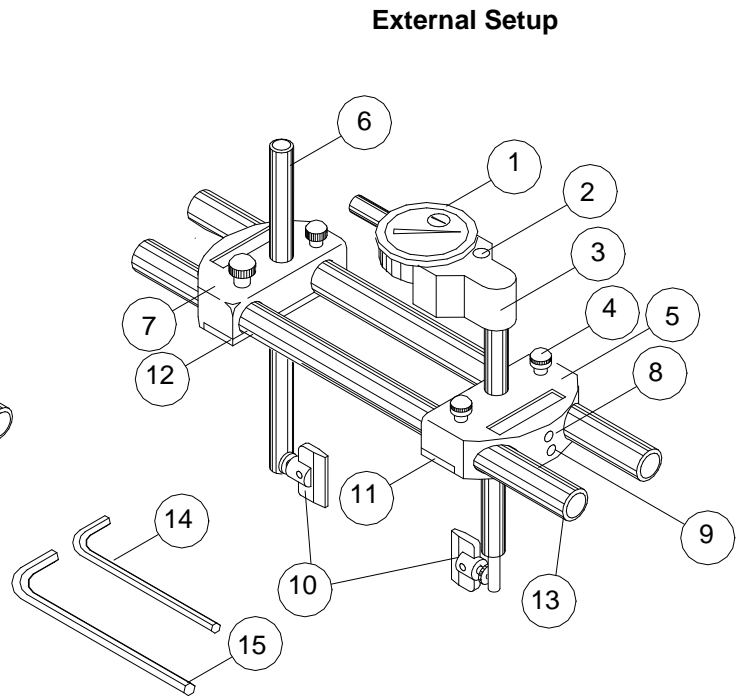
**System Components**

Take some time to become familiar with all the parts that make up the three models of the MRP gages by reviewing the labeled diagrams on the following pages. The part names are important for understanding the operating instructions.

**MRP-1000 Gage**



**Internal Setup**

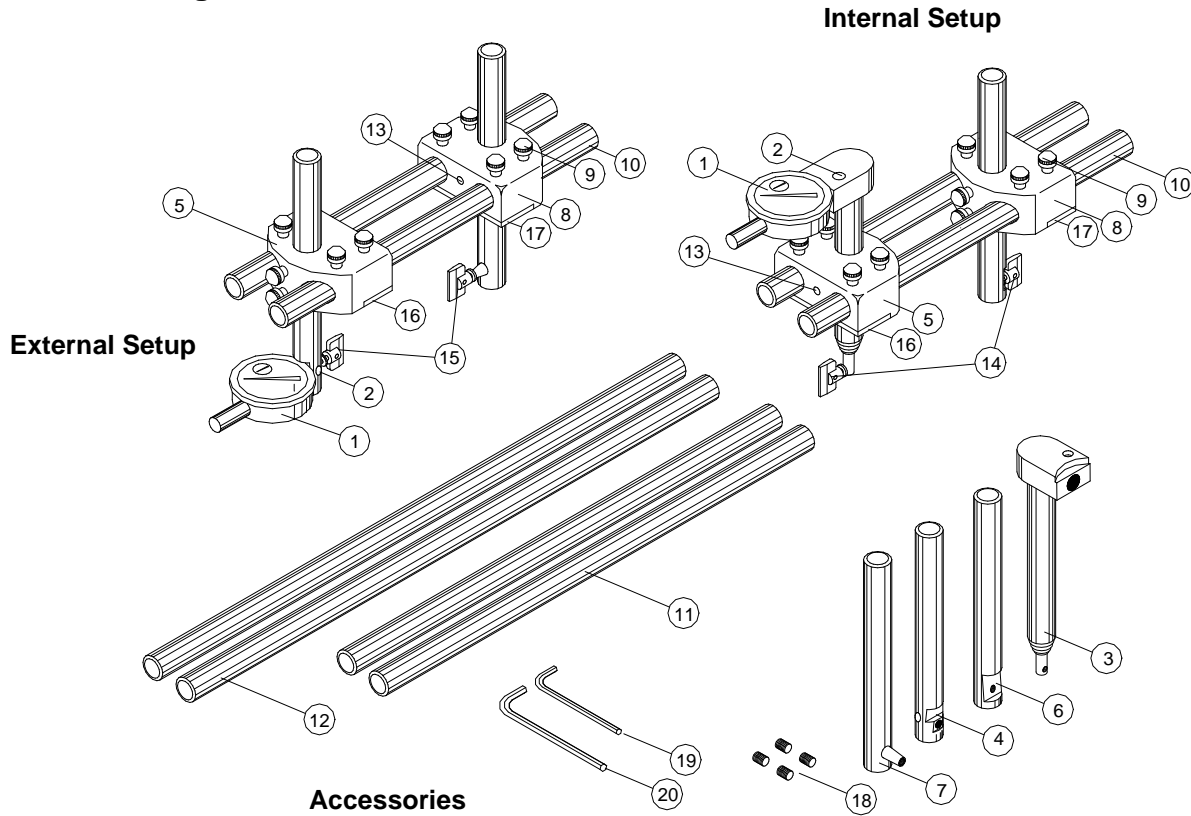


**External Setup**

**MRP-1000 Component List (Internal and External Setup)**

Item	Description	Qty	Item	Description	Qty
1	Indicator	1	9	Spring plunger	1
2	Binder nut/cap screw	1	10	Pivot shoe with binder nut	2
3	Upper arm assembly	1	11	Lower block wear pad	1
4	Locking knob	4	12	Upper block wear pad	1
5	Upper block	1	13	Rail	2
6	Lower arm	1	14	3/32" hex wrench	1
7	Lower block	1	15	7/64" hex wrench	1
8	1/4-20 Brass tipped set screw	1			

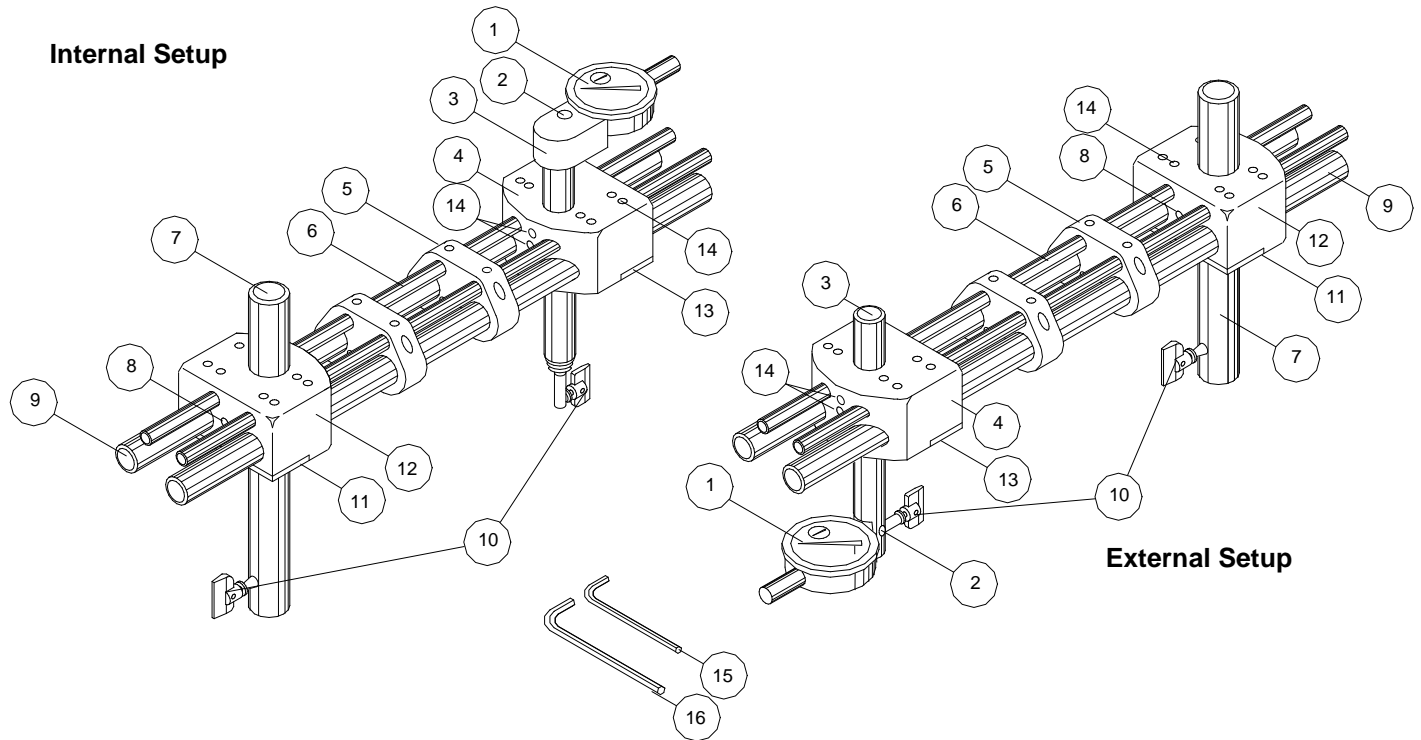
MRP-2000 Gage



MRP-2000 Component List (Internal and External Setup)

Item	Description	Qty	Item	Description	Qty
1	Indicator	1	11	Rail (18" set)	2
2	Binder nut/cap screw	1	12	Rail (24" set)	2
3	Upper arm assembly – MRP-2002	1	13	Spring plunger	1
4	Upper arm assembly – MRP-2001	1	14	Internal pivot shoe with binder nut	2
5	Upper block	1	15	External pivot shoe with binder nut	2
6	Lower arm – MRP-2002	1	16	Upper block wear pad	1
7	Lower arm – MRP-2001	1	17	Lower block wear pad	1
8	Lower block	1	18	¼-20 Brass tipped set screw	4
9	Locking knobs	12	19	7/64" hex wrench	1
10	Rail (12" set)	2	20	1/8" hex wrench	1

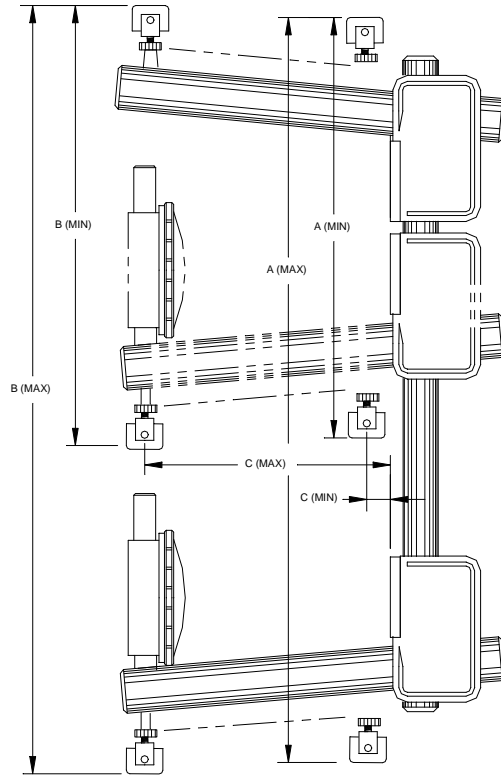
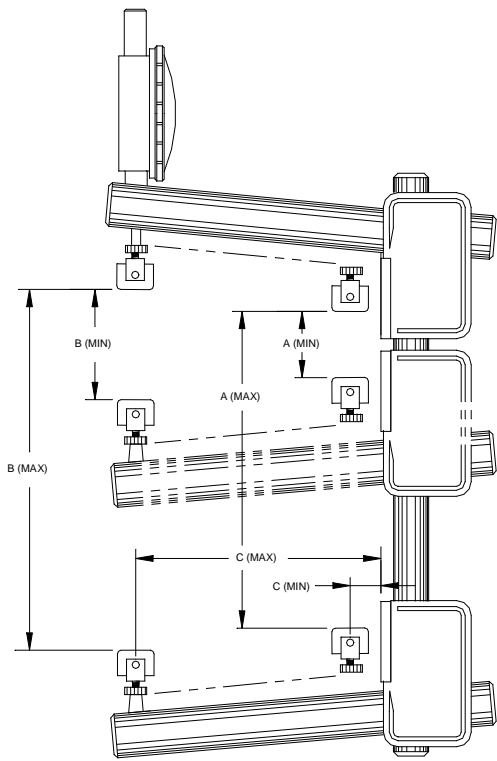
MRP-3000 Gage



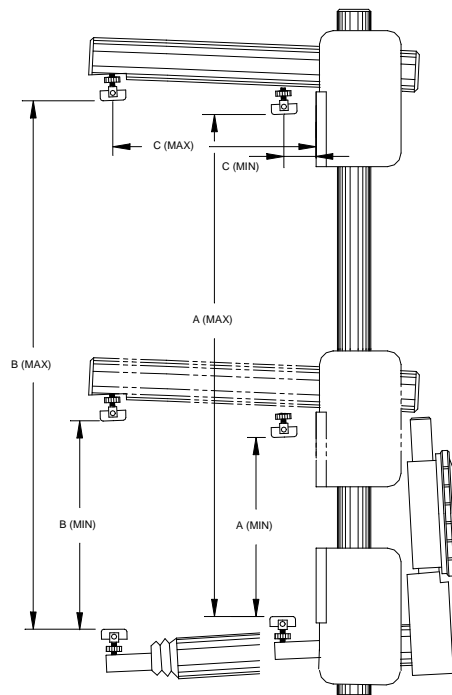
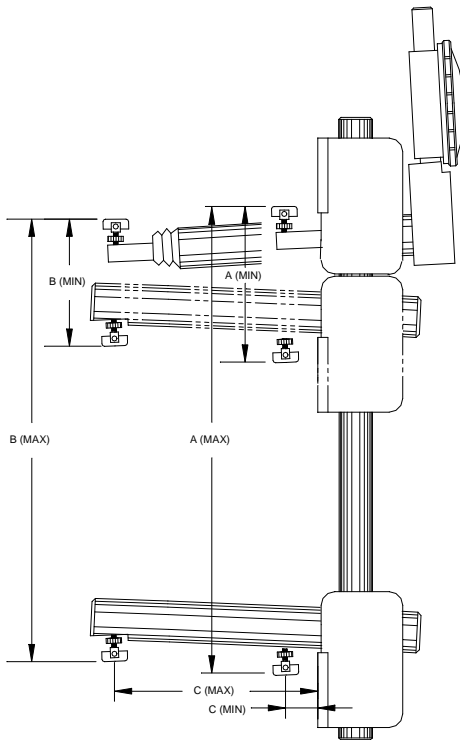
MRP-3000 Component List (Internal and External Setup)

Item	Description	Qty	Item	Description	Qty
1	Indicator	1	9	Lower rail assembly	2
2	Binder nut/cap screw	1	10	Pivot shoe with binder nut	2
3	Upper arm assembly	1	11	Lower block wear pad	1
4	Upper block	1	12	Upper block	1
5	Rail spacer	2	13	Upper block wear pad	2
6	Upper rail assembly	2	14	Locking set screw	20
7	Lower arm	1	15	7/64" hex wrench	1
8	Spring plunger	1	16	1/8" hex wrench	1

**MRP Gage Setup**



**MRP 2001 Internal and External Setup – Dimensional Limits**



**MRP 2002 Internal and External Setup – Dimensional Limits**



## Setup Procedures

### MRP Dimensional Limits Chart

The chart below shows the dimensional limits of each MRP Gage to assist in determining the correct gage model for the application. The MRP can be set up for taking internal and external measurements as shown in the diagrams on the previous page. All the diagrams are labeled with measurements that correspond to the MRP Dimensional Limits Chart below. Locate the measurement you need on the chart and determine if the MRP gage model falls within the measurement range.

<b>MRP Gage Model</b>	<b>Application</b>	<b>A Measurement</b> <i>MIN/MAX Diameter at Pivot Shoe with Arms Retracted</i>	<b>B Measurement</b> <i>MIN/MAX Diameter at Pivot Shoe with Arms Extended</i>	<b>C Measurement</b> <i>MIN/MAX Length from Wear Pad to Center of Pivot Shoe</i>
MRP-1000	Internal	1.50 / 7.625	1.375 / 7.375	.652 / 3.5
	External	.875 / 6.25	2.00 / 7.375	
MRP-2001	Internal	6.00 / 23.125	6.00 / 22.50	.625 / 4.875
	External	.875 / 20.25	1.50 / 21.00	
MRP-2001-7	Internal	6.00 / 23.125	6.375 / 22.875	.625 / 6.875
	External	.875 / 20.25	1.875 / 21.375	
MRP-2001-10	Internal	6.50 / 17.125	6.50 / 17.125	.625 / 9.375
	External	1.00 / 14.125	1.625 / 16.00	
MRP-2002	Internal	2.125 / 21.375	1.50 / 21.00	1.00/ 3.375
	External	3.875 / 22.125	4.25 / 22.625	
MRP-2002-7	Internal	2.125 / 21.375	1.50 / 20.625	1.00/ 5.375
	External	3.875 / 22.125	3.875 / 22.25	
MRP-2002-10	Internal	2.125 / 21.375	1.50 / 22.25	1.00/ 8.375
	External	3.875 / 22.125	3.50 / 21.875	
MRP-3001	External	6.50 / 20.25	6.875 / 21.00	1.00 / 3.375
MRP-3002	Internal	6.50 / 21.375	5.75 / 20.625	1.00 / 3.375

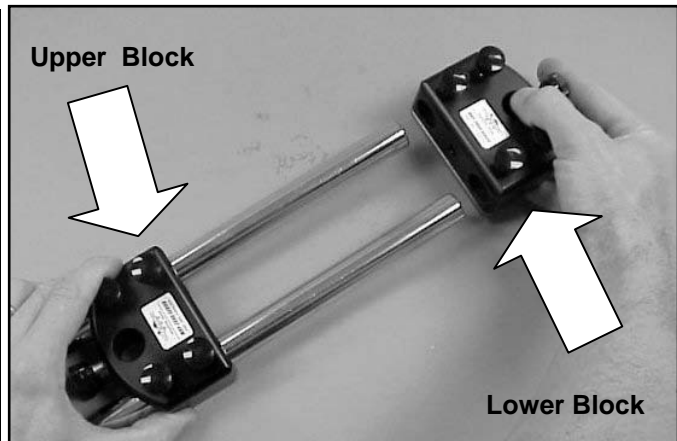
## Setting Up the MRP Gage for External Measurements

### Materials Needed:

- MRP gage
- 7/64" hex wrench (supplied with all MRP models)
- Pivot shoes
- 1/8" hex wrench (supplied with MRP-2000/3000 models)

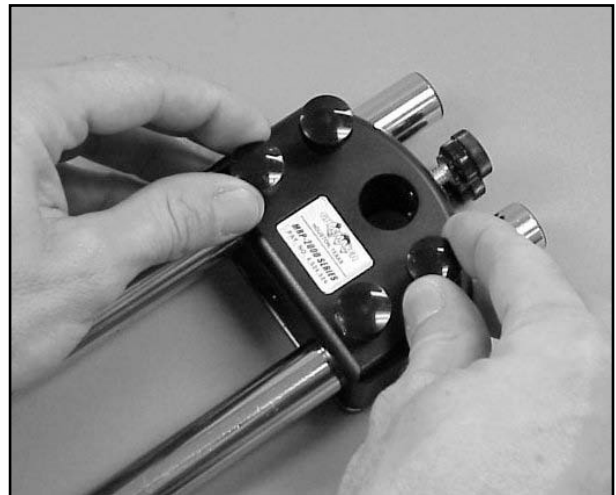
Setting up the MRP gage, involves assembling the gage, positioning the upper and lower block correctly, and installing the arms and pivot shoes.

1. To assemble the gage, slide the rails into the upper and lower blocks, as shown.



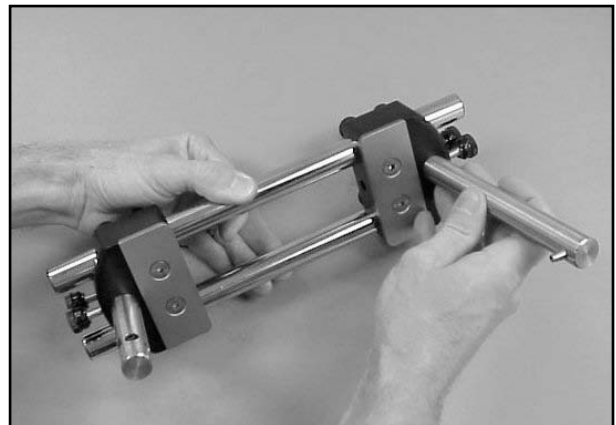
2. Tighten the locking knobs on both the upper and lower blocks to secure them to the rails.

**Note:** For the MRP-3000, use a 1/8" hex wrench to tighten the four locking set screws on the upper and lower blocks.



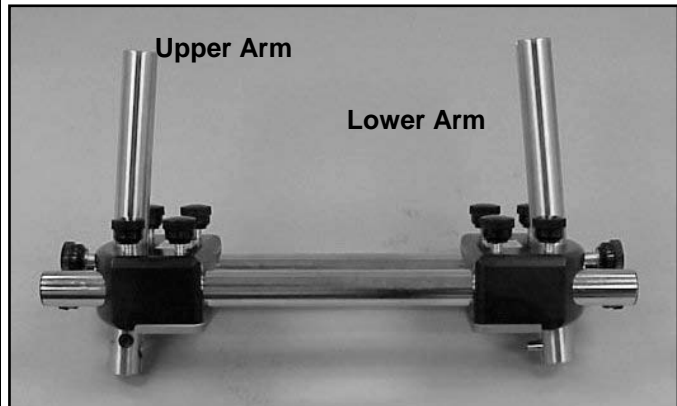
3. Insert the arms into the upper and lower blocks as shown.

**Note:** Be sure that the arms snap into position. The arms align with the ball on the inside of each block.



## Setting Up the MRP Gage for External Measurements (continued)

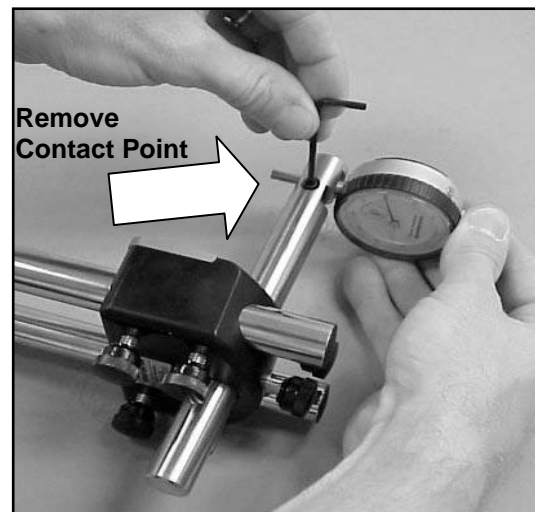
4. Be sure the upper and lower arms are positioned properly before continuing with the gage setup.



5. Insert the indicator into the upper arm.

**Note:** You'll need to remove the contact point from the indicator stem before inserting the indicator into the arm.

6. Using a  $7/64$ " hex wrench, tighten the set screw in the upper arm to secure the indicator.

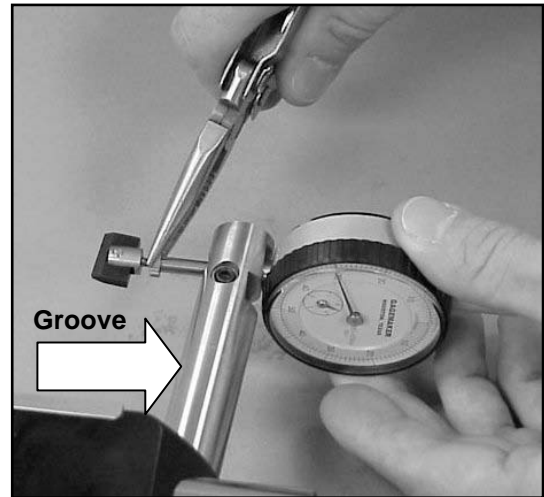


7. Thread one pivot shoe into the indicator stem in the upper arm.
8. Thread the other pivot shoe into the hole in the lower arm.



**Setting Up the MRP Gage for External Measurements (continued)**

- 9. Align each pivot shoe parallel with the groove on each arm.
- 10. Gently tighten the binder nut with pliers to secure. Be careful not to over-tighten the binder nut, which may cause damage to the indicator.



- 11. Move the pivot shoe back and forth to make sure it pivots freely.



**Setting Up the MRP Gage for Internal Measurements**

**Materials Needed:**

- MRP gage
- Pivot shoes
- 1/4-20 brass tipped set screws
- 3/32" hex wrench (supplied with MRP-1000 model only)
- 7/64" hex wrench (supplied with all MRP models)
- 1/8" hex wrench (supplied with MRP-2000/3000 models)

Setting up the MRP gage, involves assembling the gage, positioning the upper and lower block correctly, and installing the arms and pivot shoes.



**Perform this step for MRP-2000 only.**

1. Before assembling the gage, remove the two locking knobs on either end of the upper and lower blocks.



**Perform this step for MRP-2000 only.**

2. Insert a 1/4-20 brass tipped set screw in each hole of the upper and lower blocks and tighten using a 1/8" hex wrench.



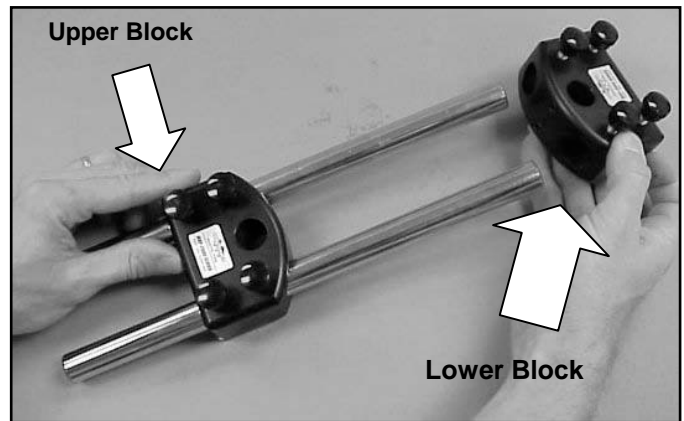
**Insert Set Screw**



**Tighten Set Screw**

3. To assemble the gage, slide the rails into the upper and lower blocks as shown. Tighten the locking knobs on both the upper and lower blocks to secure them to the rails.

**Note:** For the MRP-3000, use a 1/8" hex wrench to tighten the four locking set screws on the upper and lower blocks.



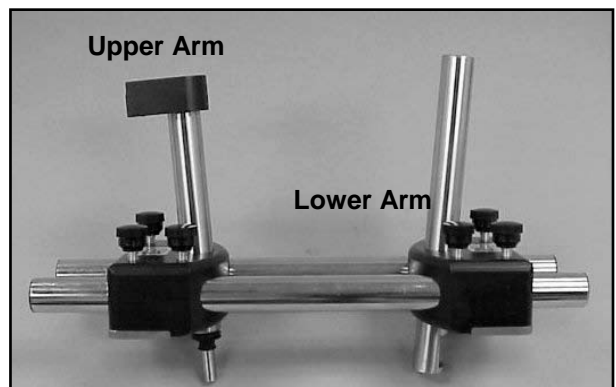
**Setting Up the MRP Gage for Internal Measurements (continued)**

- 4. Insert the arms into the upper and lower blocks, as shown.

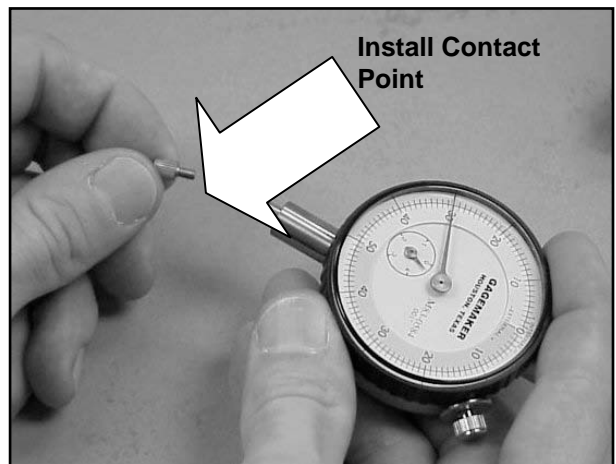
**Note:** Be sure that the arms snap into position. The arms align with the ball on the inside of each block.



- 5. Be sure the upper and lower arms are positioned properly before continuing with the gage setup.



- 6. Install the contact point on the indicator stem.
- 7. Insert the indicator into the upper arm.

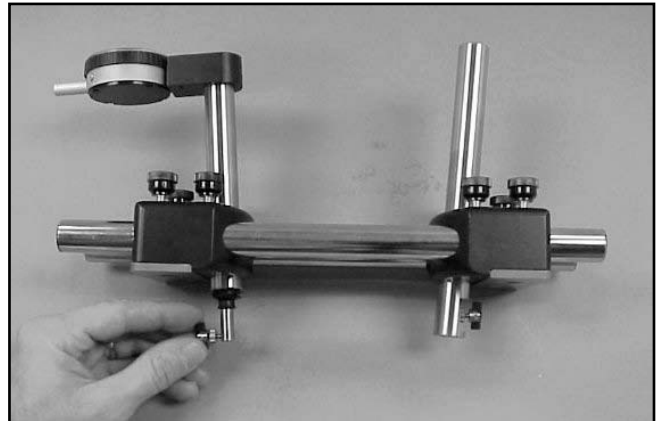


**Setting Up the MRP Gage for Internal Measurements (continued)**

- 8. Using a 7/64" hex wrench, tighten the set screw in the upper arm to secure the indicator.

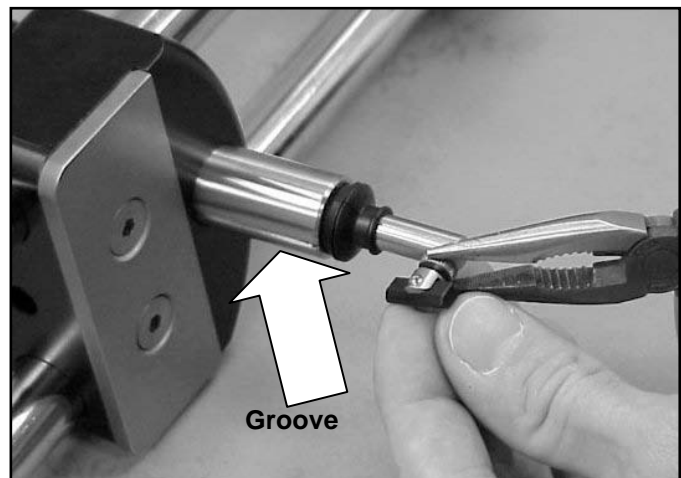


- 9. Thread each pivot shoe into the upper and lower arms of the MRP.



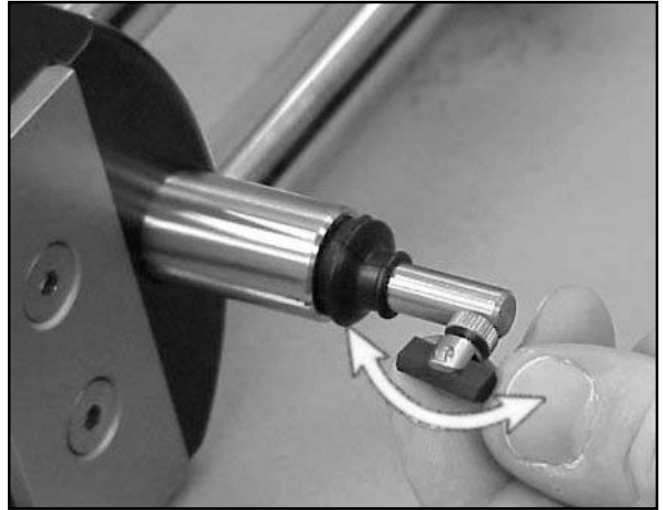
- 10. Align each pivot shoe parallel with the groove on each arm.

- 11. Gently tighten the binder nut with pliers to secure. Be careful not to over-tighten the binder nut.



**Setting Up the MRP Gage for Internal Measurements (continued)**

12. Move the pivot shoe back and forth to make sure it pivots freely.





## Zeroing the MRP Gage for External Measurements Using Rod Standards

### Materials Needed:

- MRP gage
- Rod standards
- 3/32" hex wrench (supplied with MRP-1000 model only)
- 1/8" hex wrench (supplied with MRP-2000/3000 models)



To ensure consistent and accurate readings, the MRP gage should be zeroed on a standard once during each shift, at a minimum.

1. Locate the appropriate MRP rod setting standard for the desired connector or dimension.

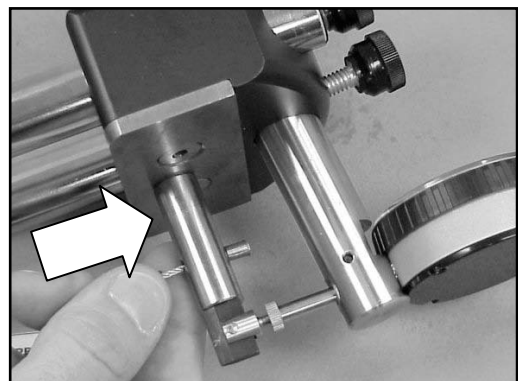
**Note:** MRP rod standards consist of an A rod and a B rod. A is used to set the proper distance between the MRP's pivot shoes. B is used to set the distance between the MRP's wear pad and each pivot shoe.

2. Loosen the two locking knobs on side of the upper block until the arm slides up and down freely. Repeat with the lower block.

**Note:** For the MRP-1000, use a 3/32" hex wrench to loosen the set screw on the side of the upper and lower blocks until the arms slide up and down freely.

**Note:** For the MRP-3000, use a 1/8" hex wrench to loosen the set screws on the side of the upper and lower blocks until the arms slide up and down freely.

3. Place the B standard on the MRP wear pad and move the upper arm until the end of the pivot shoe contacts the B standard.



## Zeroing the MRP Gage for External Measurements Using Rod Standards (continued)

4. Tighten the two locking knobs on the side of the upper block to secure the arm. Repeat with the lower arm.

**Note:** For the **MRP-1000**, use a 3/32" hex wrench to tighten the set screw on the side of the upper and lower blocks to secure the arms.

**Note:** For the **MRP-3000**, use a 1/8" hex wrench to tighten the set screws on the side of the upper and lower blocks to secure the arms.

5. Remove the standard.

6. Loosen the locking knobs on the lower block.

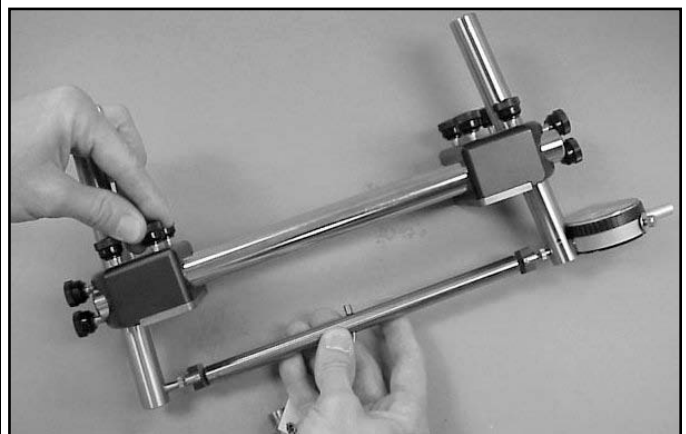
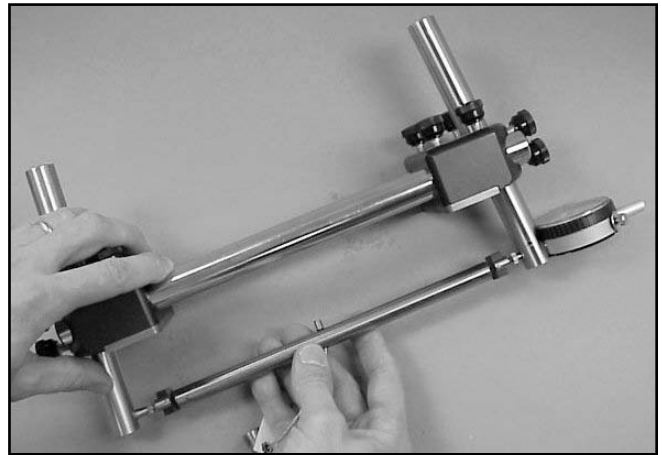
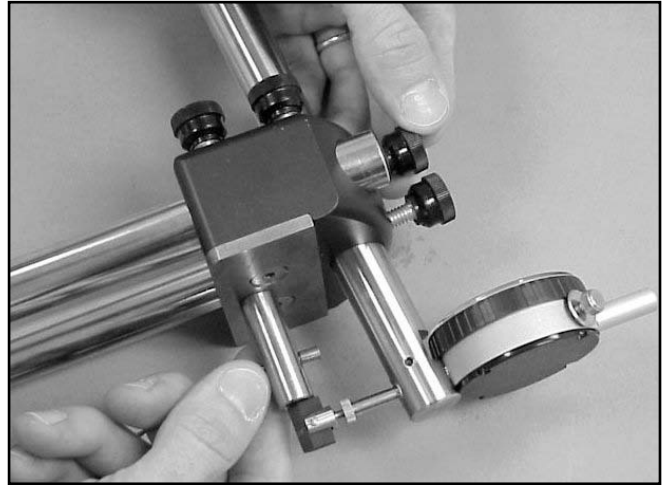
**Note:** For the **MRP-3000**, use a 1/8" hex wrench to loosen the four locking set screws on the lower block.

7. Place the A standard between the pivot shoes. Adjust the lower arm so the pivot shoes contact the A standard.

8. Slide the lower block approximately .050" closer to the upper block to give the MRP gage the proper preload.

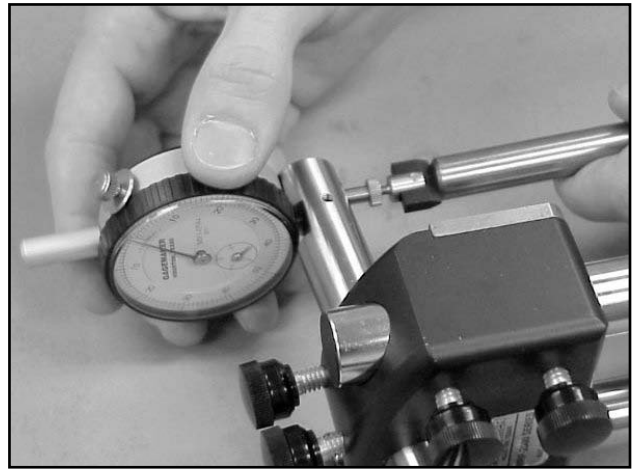
9. Tighten the locking knobs on the lower block.

**Note:** For the **MRP-3000**, use a 1/8" hex wrench to tighten the four locking set screws on the lower block.

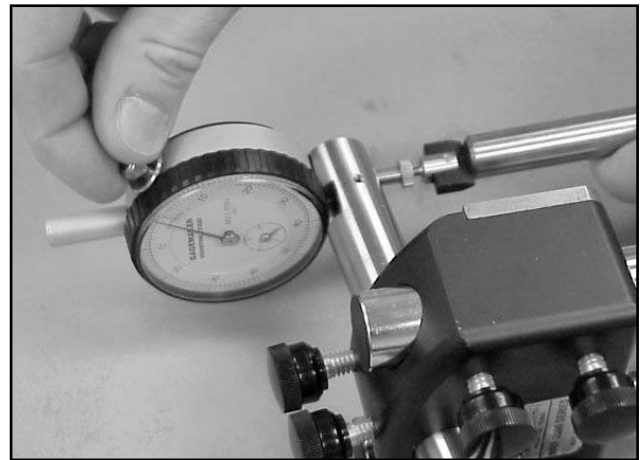


## Zeroing the MRP Gage for External Measurements Using Rod Standards (continued)

10. Turn the indicator dial on the MRP gage to align the needle with zero.



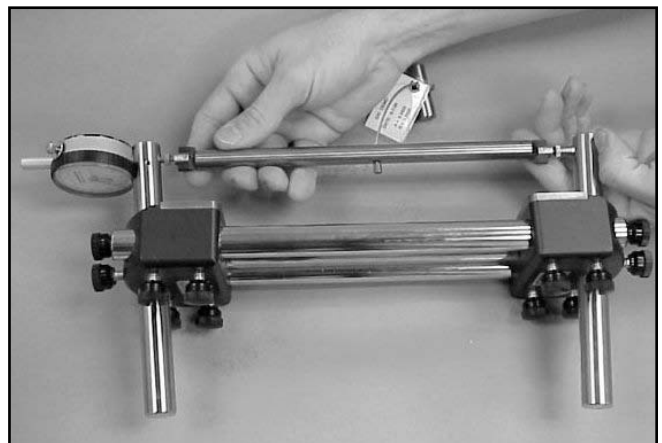
11. Tighten the indicator clamp.



12. Remove the A standard from the MRP gage. Reposition the standard on the gage to verify the zero setting.

**Note:** Note the position of the small revolution counter on the indicator before removing the gage. Place a piece of masking tape on the backside of the indicator and record the dial setting of the small revolution counter to eliminate incorrect indicator readings.

13. Remove the standard from the gage.
14. Set a frequency for verifying the zero setting of all gages. As a minimum, the MRP gage should be zeroed on a standard once during each shift to ensure accurate readings.



**Zeroing the MRP Gage for Internal Measurements Using Rod Standards**

**Materials Needed:**

- MRP gage
- Rod standards
- 3/32" hex wrench (supplied with MRP-1000 model only)
- 1/8" hex wrench (supplied with MRP-2000/3000 models)



To ensure consistent and accurate readings, the MRP gage should be zeroed on a standard once during each shift, at a minimum.

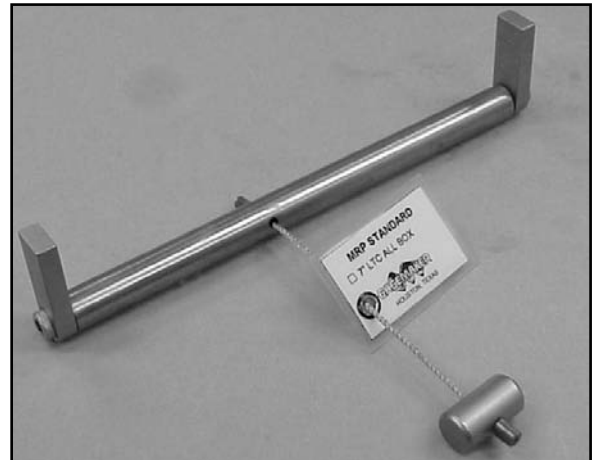
1. Locate the appropriate MRP rod setting standard for the desired connector or dimension.

**Note:** MRP rod standards consist of an A rod and a B rod. A is used to set the proper distance between the MRP's pivot shoes. B is used to set the distance between the MRP's wear pad and each pivot shoe.

2. Using a 1/8" hex wrench, loosen the two set screws on side of the upper block until the arm slides up and down freely. Repeat with the lower block.

**Note:** For the MRP-1000, use a 3/32" hex wrench to loosen the set screw on the side of the upper and lower blocks until the arms slide up and down freely.

3. Place the B standard on the MRP wear pad and move the upper arm until the end of the pivot shoe contacts the B standard.



## Zeroing the MRP Gage for Internal Measurements Using Rod Standards (continued)

- Using the 1/8" hex wrench, tighten the two set screws on the side of the upper block to secure the arm. Repeat with the lower arm.

**Note:** For the MRP-1000, use a 3/32" hex wrench to tighten the set screw on the side of the upper and lower blocks to secure the arms.

- Remove the standard.

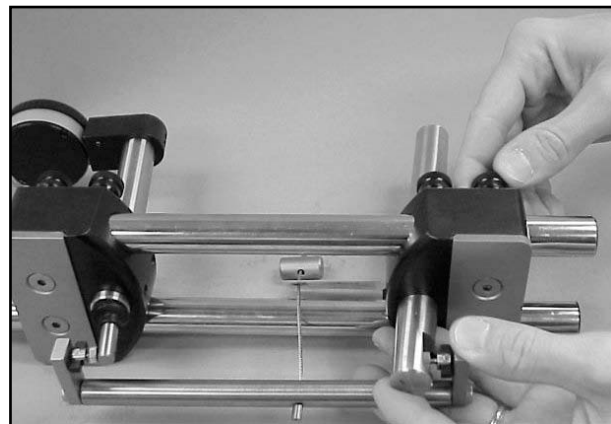
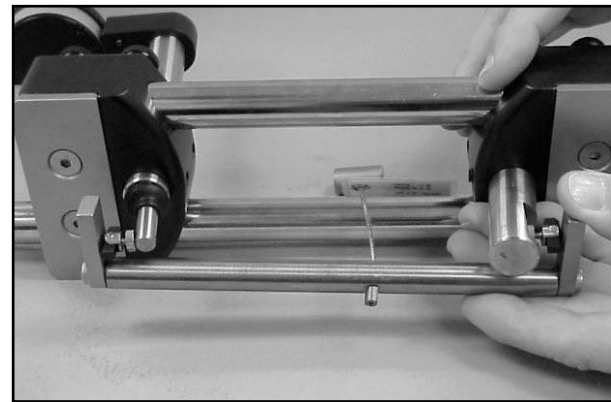
- Loosen the locking knobs on the lower block.

**Note:** For the MRP-3000, use a 1/8" hex wrench to loosen the four locking set screws on the lower block.

- Place the A standard on the outside of each pivot shoe. Adjust the lower arm so the pivot shoes contact the A standard.
- Slide the lower block approximately .050" away from the upper block to give the MRP gage the proper preload.

- Tighten the locking knobs on the lower block.

**Note:** For the MRP-3000, use a 1/8" hex wrench to tighten the four locking set screws on the lower block.



**Zeroing the MRP Gage for Internal Measurements Using Rod Standards (continued)**

10. Turn the indicator dial on the MRP gage to align the needle with zero.



11. Tighten the indicator clamp.

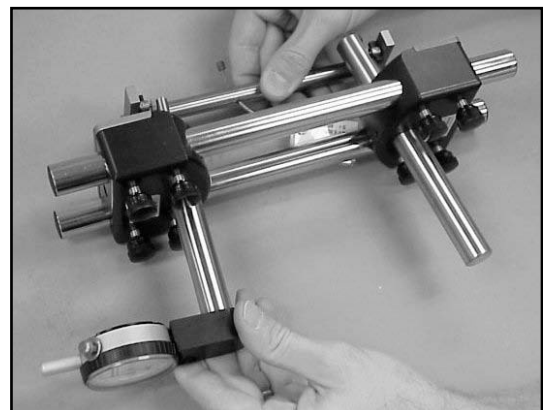


12. Remove the A standard from the MRP gage. Reposition the standard on the gage to verify the zero setting.

**Note:** Note the position of the small revolution counter on the indicator before removing the gage. Place a piece of masking tape on the backside of the indicator and record the dial setting of the small revolution counter to eliminate incorrect indicator readings.

13. Remove the standard from the gage.

14. Set a frequency for verifying the zero setting of all gages. As a minimum, the MRP gage should be zeroed on a standard once during each shift to ensure accurate readings.



## Zeroing the MRP Gage for External Measurements Using Frame Standards

### Materials Needed:

- MRP gage
- Frame standard
- 3/32" hex wrench (supplied with MRP-1000 model only)
- 1/8" hex wrench (supplied with MRP-2000/3000 models)



To ensure consistent and accurate readings, the MRP gage should be zeroed on a standard once during each shift, at a minimum.

1. Locate the appropriate frame setting standard for the desired connector or dimension.
2. Loosen the locking knobs on the upper block.

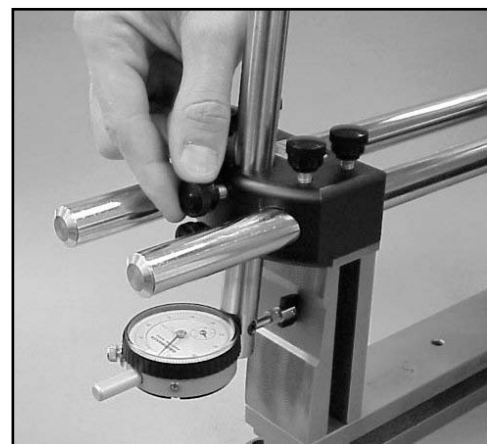
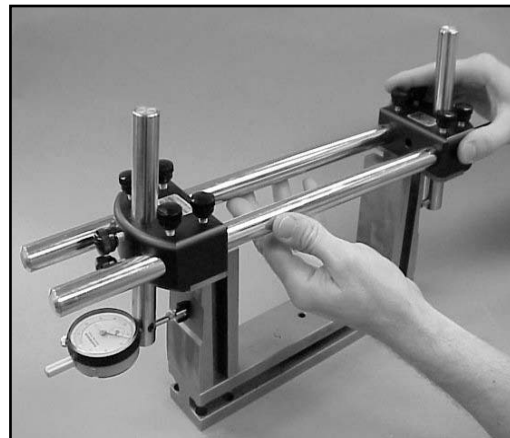
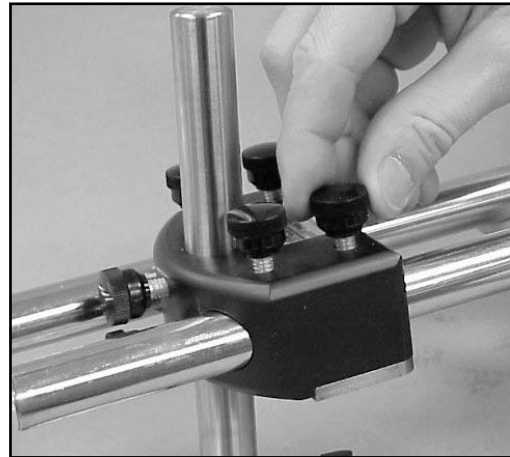
**Note:** For the **MRP-3000**, use a 1/8" hex wrench to loosen the set screws on the upper block.

3. Place the MRP gage on the frame setting standard so the pivot shoes are positioned on the outside of the setting standard.

4. Loosen the two locking knobs on the side of the upper block until the arm slides up and down freely. Repeat with the lower block.

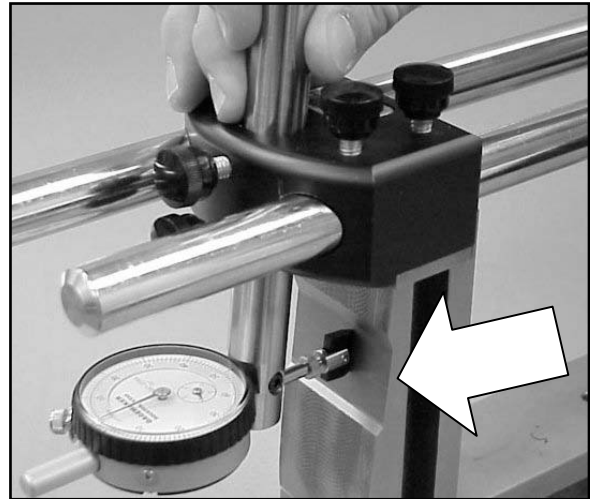
**Note:** For the **MRP-1000**, use a 3/32" hex wrench to loosen the set screw on the side of the upper and lower blocks until the arms slide up and down freely.

**Note:** For the **MRP-3000**, use a 1/8" hex wrench to loosen the set screws on the side of the upper and lower blocks until the arms slide up and down freely.



**Zeroing the MRP Gage for External Measurements Using Frame Standards (continued)**

5. Position both pivot shoes in the center of the smooth area of the frame setting standard.



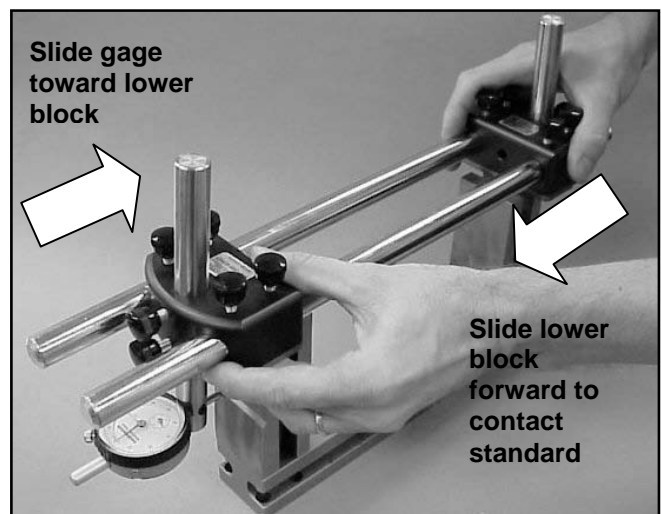
6. Tighten the two locking knobs on the side of the upper block to secure the arm. Repeat with the lower block.



**Note:** For the **MRP-1000**, use a 3/32" hex wrench to tighten the set screw on the side of the upper and lower blocks to secure the arms.

**Note:** For the **MRP-3000**, use a 1/8" hex wrench to tighten the set screws on the side of the upper and lower blocks to secure the arms.

7. With the pivot shoe of the upper arm contacting the standard, slide the entire MRP gage toward the lower block approximately .050". Then, slide the lower block until it contacts the frame setting standard, to give the MRP the proper preload.

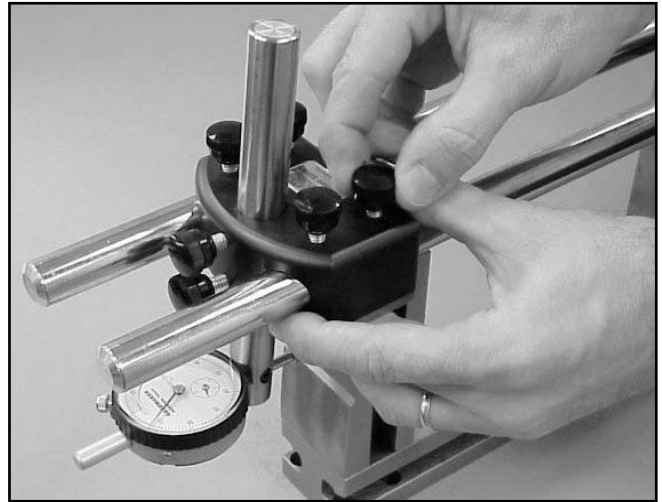




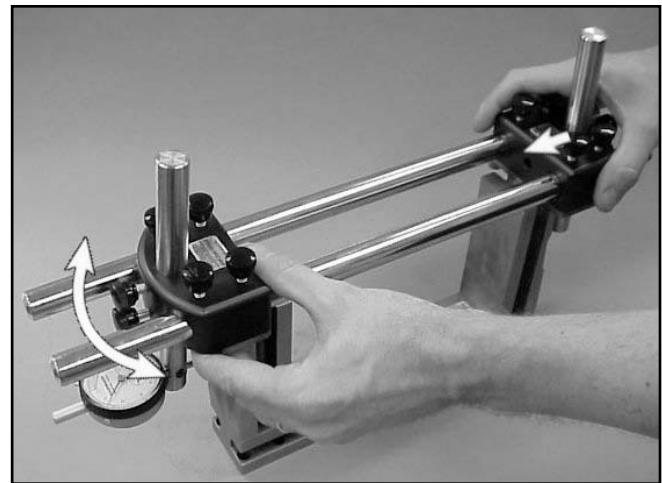
## Zeroing the MRP Gage for External Measurements Using Frame Standards (continued)

8. Once positioned with the proper preload, tighten the locking knobs to secure the upper block.

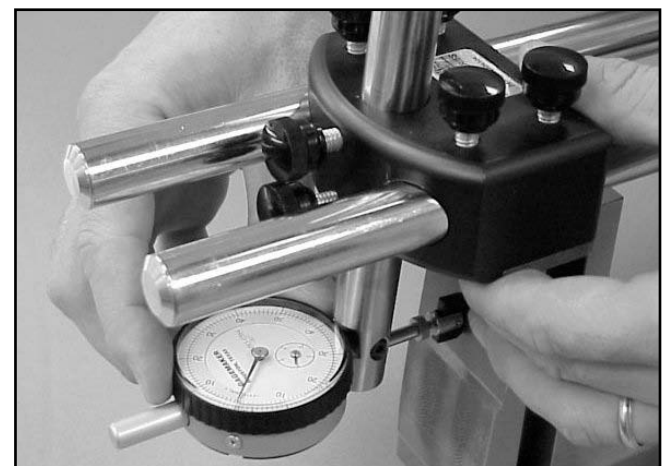
**Note:** For the MRP-3000, use a 1/8" hex wrench to tighten the four locking set screws on the upper block.



9. While holding the lower block securely against the right side of the standard, sweep the upper block back and forth to obtain the smallest indicator reading.



10. Turn the indicator dial on the MRP gage to align the needle with zero.



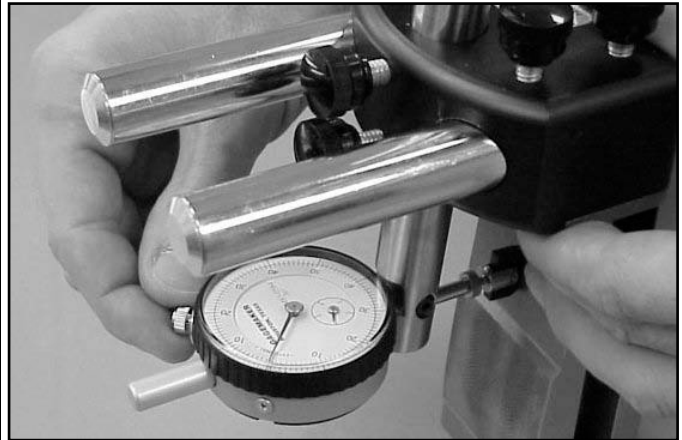
**Zeroing the MRP Gage for External Measurements Using Frame Standards (continued)**

11. Tighten the indicator clamp.

**Note:** Note the position of the small revolution counter on the indicator before removing the gage. Place a piece of masking tape on the backside of the indicator and record the dial setting of the small revolution counter to eliminate incorrect indicator readings.

12. Remove the gage from the frame setting standard.

13. Set a frequency for verifying the zero setting of all gages. As a minimum, the MRP gage should be zeroed on a standard once during each shift to ensure accurate readings.



## Zeroing the MRP Gage for Internal Measurements Using Frame Standards

### Materials Needed:

- MRP gage
- Frame standard
- 3/32" hex wrench (supplied with MRP-1000 model only)
- 1/8" hex wrench (supplied with MRP-2000/3000 models)



To ensure consistent and accurate readings, the MRP gage should be zeroed on a standard once during each shift, at a minimum.

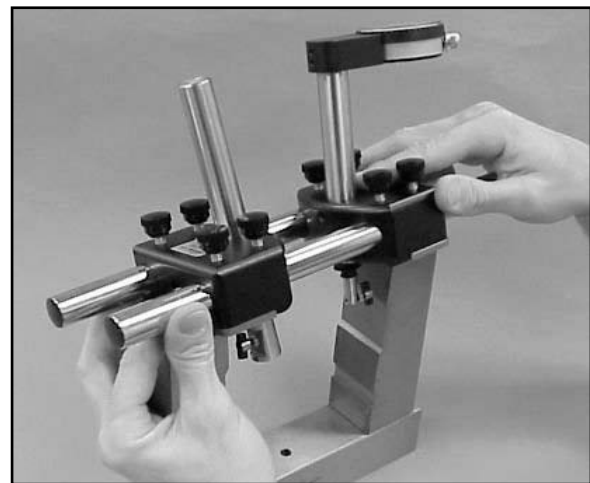
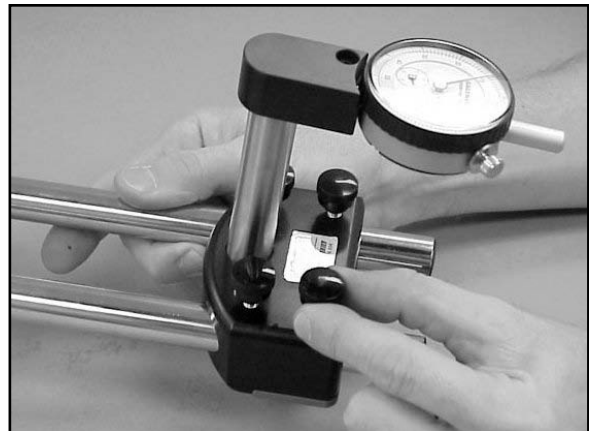
1. Locate the appropriate frame setting standard for the desired connector or dimension.
2. Loosen the locking knobs on the upper block.

**Note:** For the **MRP-3000**, use a 1/8" hex wrench to loosen the set screws on the upper block.

3. Place the MRP gage on the frame setting standard so the pivot shoes are positioned on the inside of the setting standard.

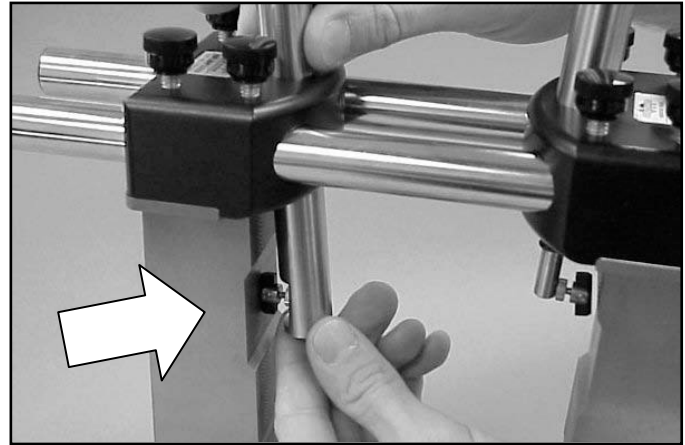
4. Using a 1/8" hex wrench, loosen the two set screws, on the side of the lower block, until the arm slides up and down freely. Repeat with the upper block.

**Note:** For the **MRP-1000**, use a 3/32" hex wrench to loosen the set screw on the side of the upper and lower blocks until the arms slide up and down freely.

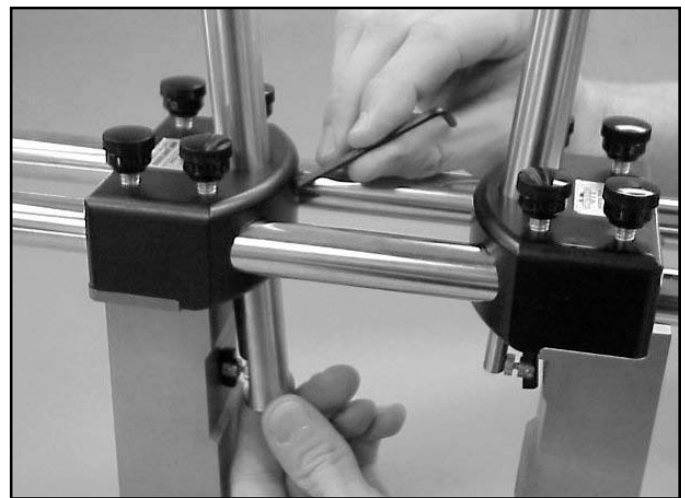


**Zeroing the MRP Gage for Internal Measurements Using Frame Standards (continued)**

5. Position both pivot shoes in the center of the smooth area of the frame setting standard.

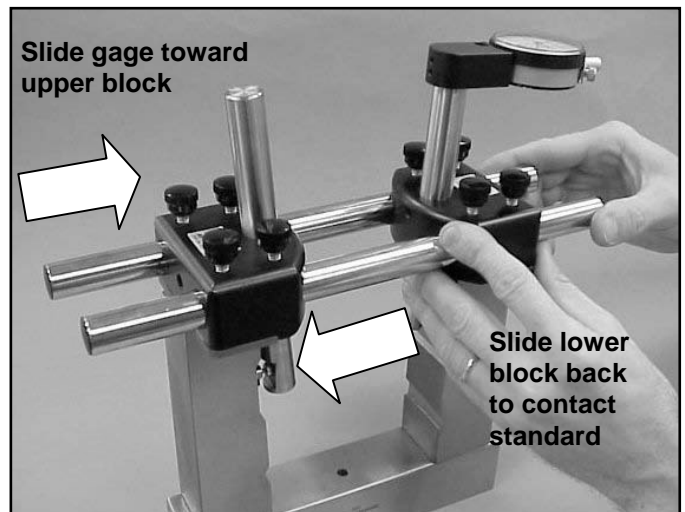


6. Using the 1/8" hex wrench, tighten the two set screws, on the side of the lower block, to secure the arm. Repeat with the upper block.



**Note:** For the MRP-1000, use a 3/32" hex wrench to tighten the set screw on the side of the upper and lower blocks to secure the arms.

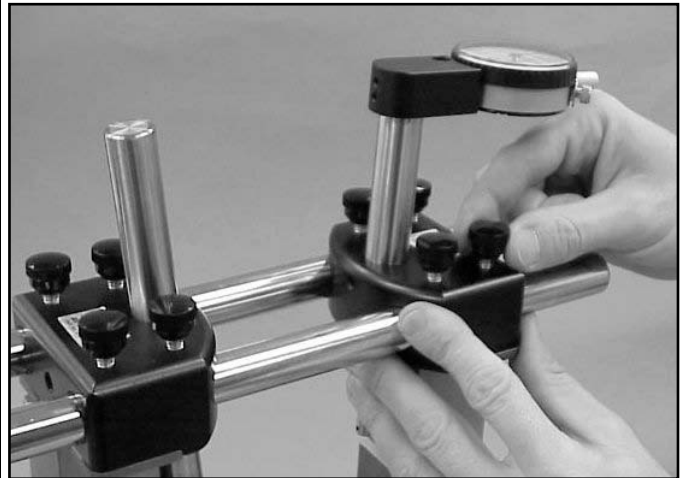
7. With the pivot shoe of the upper arm contacting the standard, slide the entire MRP gage toward the upper block approximately .050". Then, slide the lower block until it contacts the frame setting standard, to give the MRP the proper preload.



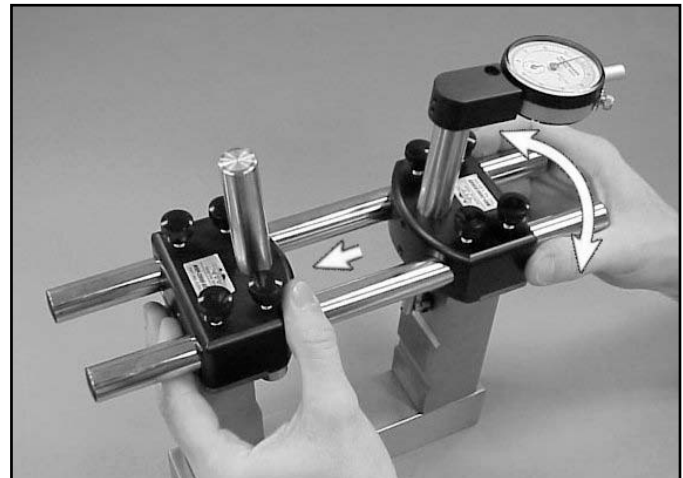
## Zeroing the MRP Gage for Internal Measurements Using Frame Standards (continued)

8. Once positioned with the proper preload, tighten the locking knobs to secure the upper block.

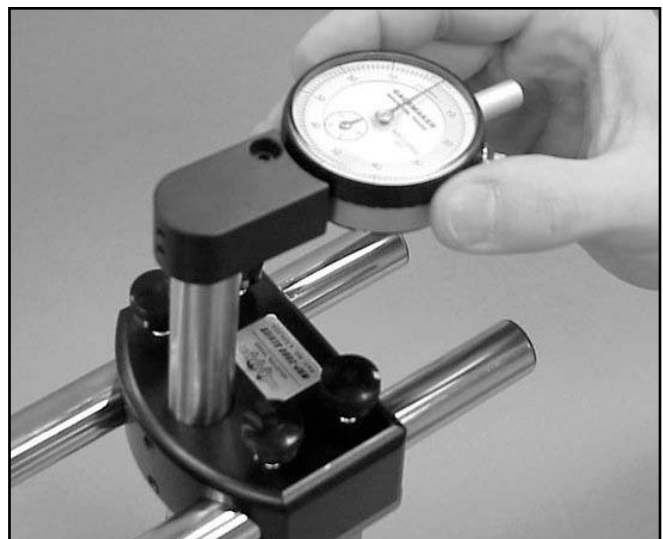
**Note:** For the MRP-3000, use a 1/8" hex wrench to tighten the set screws on the upper block.



9. While holding the lower block securely against the left side of the standard, sweep the upper block back and forth to obtain the smallest indicator reading.



10. Turn the indicator dial on the MRP gage to align the needle with zero.



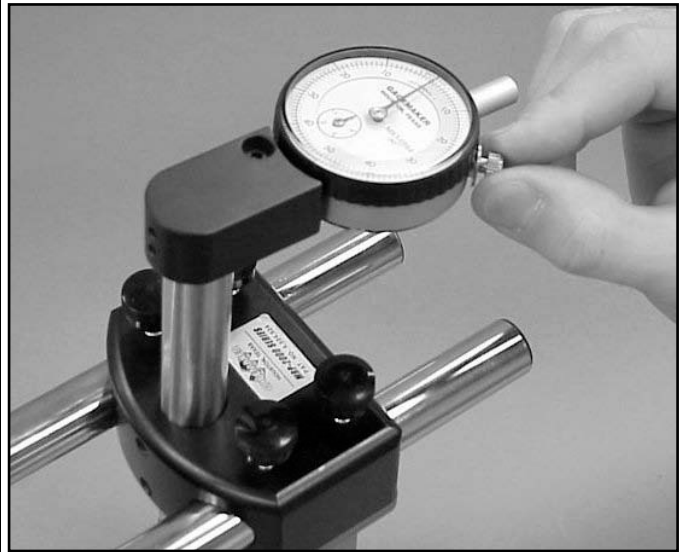
**Zeroing the MRP Gage for Internal Measurements Using Frame Standards (continued)**

11. Tighten the indicator clamp.

**Note:** Note the position of the small revolution counter on the indicator before removing the gage. Place a piece of masking tape on the backside of the indicator and record the dial setting of the small revolution counter to eliminate incorrect indicator readings.

12. Remove the gage from the frame setting standard.

13. Set a frequency for verifying the zero setting of all gages. As a minimum, the MRP gage should be zeroed on a standard once during each shift to ensure accurate readings.



## Zeroing the MRP Gage for External Measurements Using the MIC TRAC

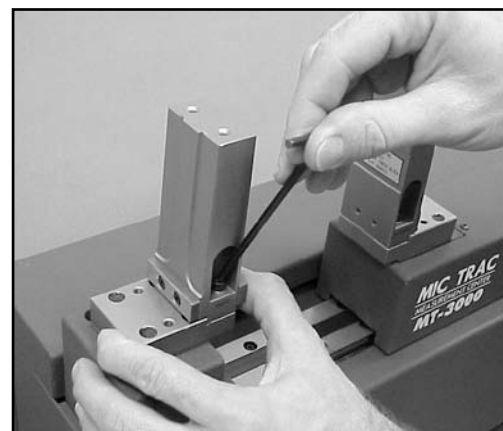
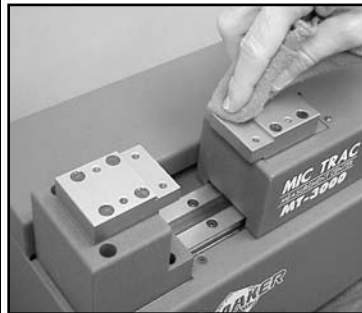
### Materials Needed:

- MRP gage
- 5/32" hex wrench
- Cloth
- MIC TRAC MIC TRAC, CPU, and taper blocks
- 3/32" hex wrench (supplied with MRP-1000 model only)
- 1/8" hex wrench (supplied with MRP-2000/3000 models)



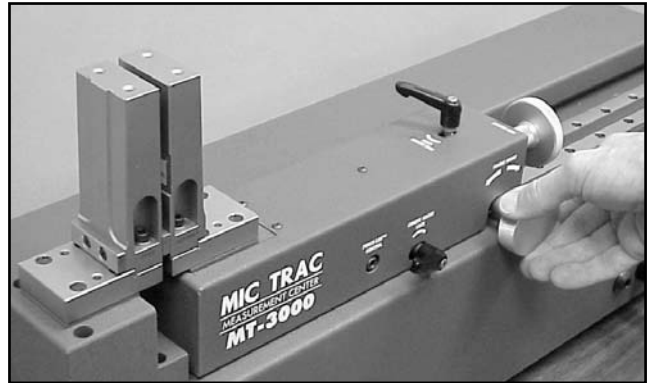
To ensure consistent and accurate readings, the MRP gage should be zeroed on the MIC TRAC once during each shift, at a minimum.

1. Turn on the MIC TRAC CPU.
2. Clean both of the receiver pads and the mounting surfaces of the taper blocks using a cloth.
3. Place the taper block against the receiver pad shoulder with the raised side of the block facing outward.
4. While holding the block against the receiver pad shoulder, insert the two cap screws with washers into the holes on either side of the block.
5. While applying pressure toward the receiver pad shoulder, use a 5/32" hex wrench to tighten the screws.
6. Repeat this process with other taper block.



**Zeroing the MRP Gage for External Measurements Using the MIC TRAC (continued)**

7. Turn the coarse adjust knob counterclockwise to bring the taper blocks together.
8. If necessary for documentation purposes, press the PRINT pad on the CPU to record the starting location of the blocks.



9. Press the EXT pad on the CPU to change to external measurement mode.



10. Press the ZERO pad on the CPU to zero the MIC TRAC.





## Zeroing the MRP Gage for External Measurements Using the MIC TRAC (continued)

11. Locate the proper gage setting dimensions on the MIC TRAC Setting Dimensions for the MRP Gage charts in this manual. Locate the chart for the type of connector being measured. Then, locate the pipe size and use the dimension in the Pin Dimensions External CPU Reading column.
12. Turn the coarse adjust knob on the MIC TRAC to display a measurement that is close to the desired setting dimension.
13. Secure the coarse adjust lock.

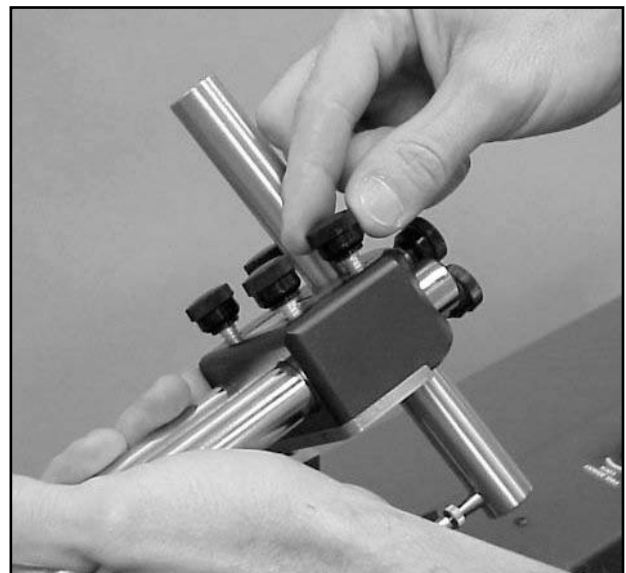


14. Turn the fine adjust knob until the CPU displays the exact setting dimension.
15. Secure the fine adjust lock.
16. If necessary for documentation purposes, press the PRINT pad on the CPU to record the actual setting dimension.



17. Loosen the locking knobs on the lower block.

**Note:** For the MRP-3000, use a 1/8" hex wrench to loosen the set screws on the lower block.



**Zeroing the MRP Gage for External Measurements Using the MIC TRAC (continued)**

18. Loosen the two locking knobs on the side of the lower block until the arm slides up and down freely. Repeat with the upper block.

**Note: For the MRP-1000**, use a 3/32" hex wrench to loosen the set screw on the side of the upper and lower blocks until the arms slide up and down freely.

**Note: For the MRP-3000**, use a 1/8" hex wrench to loosen the set screws on the side of the upper and lower blocks until the arms slide up and down freely.

19. Using a scale, adjust both arms to the proper MIC TRAC setting dimension (distance from the wear pad to the center of the pivot shoe) Refer to the MIC TRAC Setting Dimensions Charts in this manual. Then, tighten the two locking knobs on the side of the upper and lower blocks, to secure the arm.

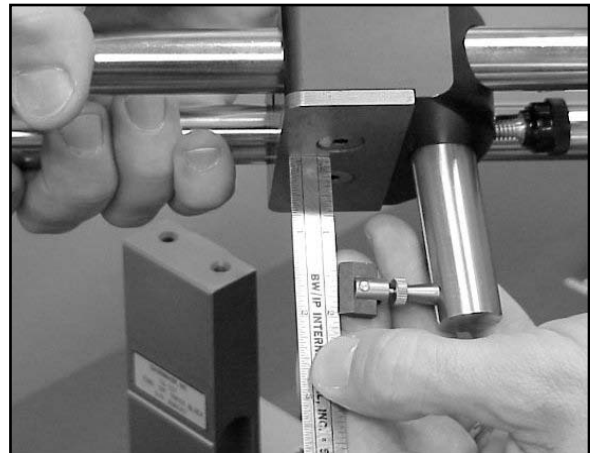
**Note: For the MRP-1000**, use a 3/32" hex wrench to tighten the set screw on the side of the upper and lower blocks to secure the arms.

**Note: For the MRP-3000**, use a 1/8" hex wrench to tighten the set screws on the side of the upper and lower blocks to secure the arms.



During inspection, the pivot shoes should rest on full form threads, not black crested threads. If necessary, re-adjust the location of the pivot shoe until the gage measures only full form threads.

20. Place the MRP gage on the MIC TRAC so the pivot shoes are positioned on the outside of the taper blocks.

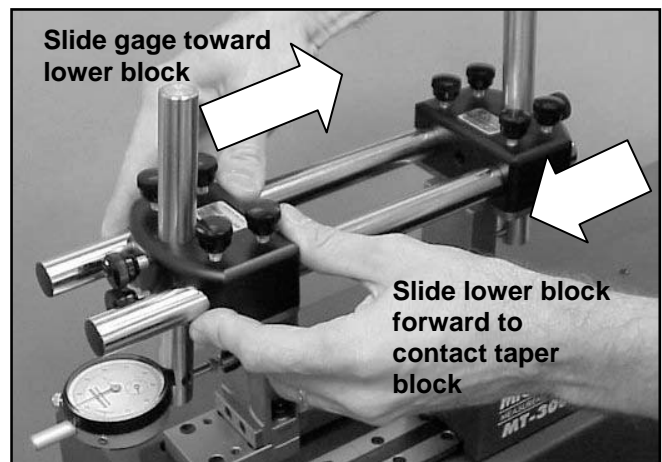


**Zeroing the MRP Gage for External Measurements Using the MIC TRAC (continued)**

21. Position both pivot shoes in the center of the taper blocks.

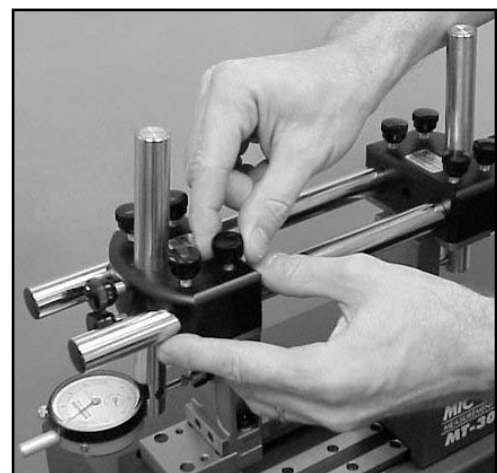


22. With the pivot shoe of the upper arm contacting the taper block, slide the entire MRP gage toward the lower block approximately .050". Then, slide the lower block until it contacts the right taper block, to give the MRP the proper preload.



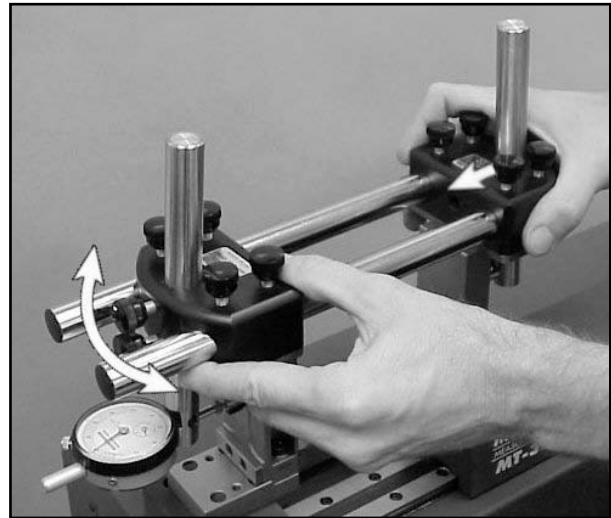
23. Once positioned with the proper preload, tighten the locking knobs to secure the upper block.

**Note:** For the MRP-3000, use a 1/8" hex wrench to tighten the set screws on the upper block.



**Zeroing the MRP Gage for External Measurements Using the MIC TRAC (continued)**

24. While holding the lower block securely against the right taper block, sweep the upper block back and forth to obtain the smallest indicator reading.

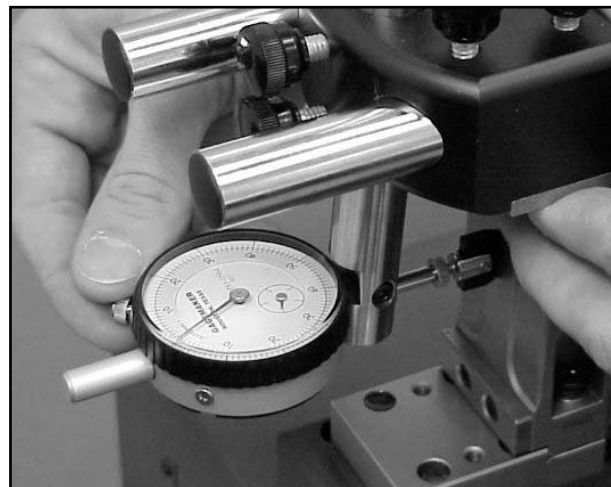


25. Turn the indicator dial on the MRP gage to align the needle with zero.



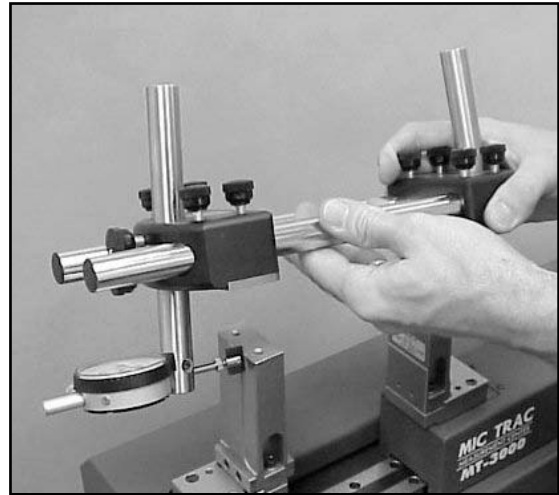
26. Tighten the indicator clamp.

**Note:** Note the position of the small revolution counter on the indicator before removing the gage. Place a piece of masking tape on the backside of the indicator and record the dial setting of the small revolution counter to eliminate incorrect indicator readings.



**Zeroing the MRP Gage for External Measurements Using the MIC TRAC (continued)**

27. Remove the gage from the taper blocks.
28. Set a frequency for verifying the zero setting of all gages. As a minimum, the MRP gage should be zeroed on a standard once during each shift to ensure accurate readings.



## Zeroing the MRP Gage for Internal Measurements Using the MIC TRAC

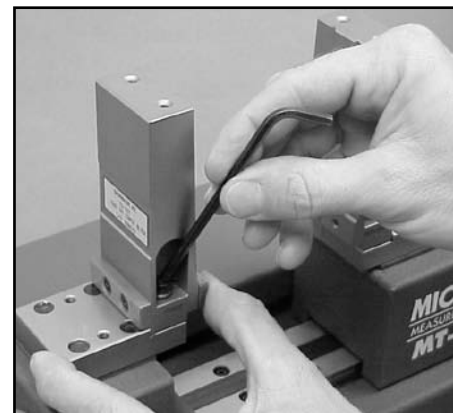
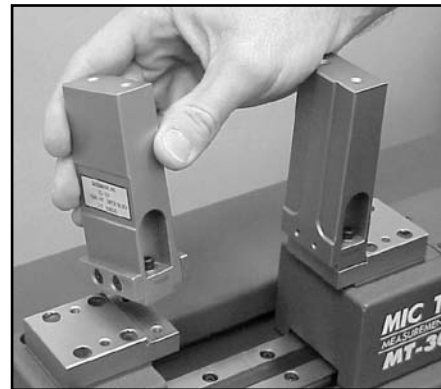
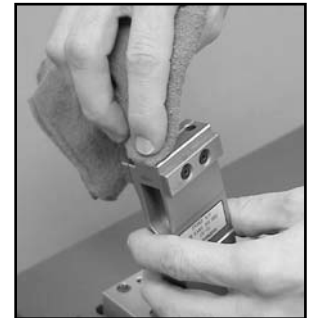
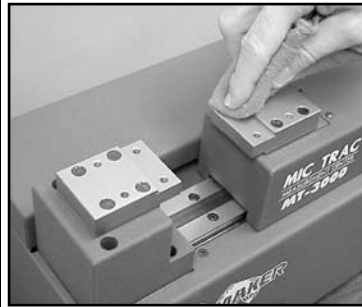
### Materials Needed:

- MRP gage
- 5/32" hex wrench
- Cloth
- MIC TRAC MIC TRAC, CPU, and taper blocks
- 3/32" hex wrench (supplied with MRP-1000 model only)
- 1/8" hex wrench (supplied with MRP-2000/3000 models)



To ensure consistent and accurate readings, the MRP gage should be zeroed on the MIC TRAC once during each shift, at a minimum.

1. Turn on the MIC TRAC CPU.
2. Clean both of the receiver pads and the mounting surfaces of the taper blocks using a cloth.
3. Place the taper block against the receiver pad shoulder with the recessed side of the block facing outward.
4. While holding the block against the receiver pad shoulder, insert the two cap screws with washers into the holes on either side of the block.
5. While applying pressure toward the receiver pad shoulder, use a 5/32" hex wrench to tighten the screws.
6. Repeat this process with other taper block.



**Zeroing the MRP Gage for Internal Measurements Using the MIC TRAC (continued)**

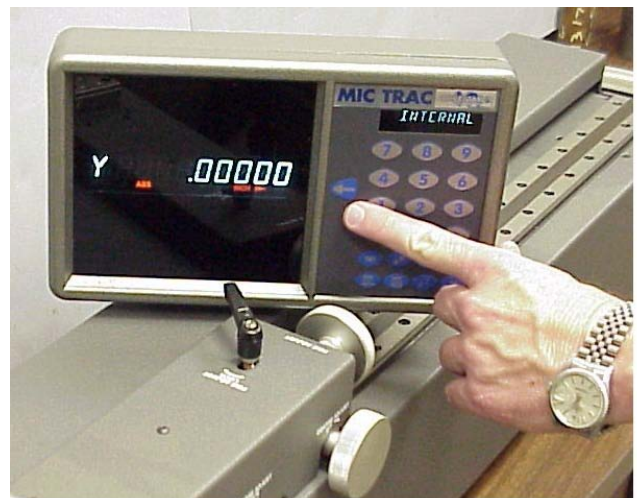
- 7. Turn the coarse adjust knob counterclockwise to bring the taper blocks together.
- 8. If necessary for documentation purposes, press the PRINT pad on the CPU to record the starting location of the blocks.



- 9. Press the INT pad on the CPU to change to internal measurement mode.



- 10. Press the ZERO pad on the CPU to zero the MIC TRAC.



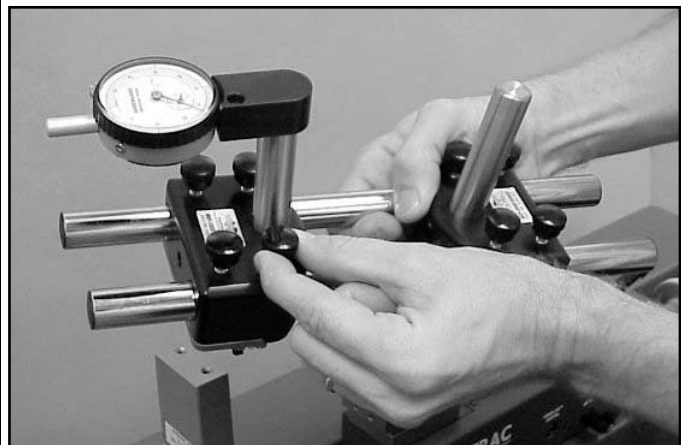
**Zeroing the MRP Gage for Internal Measurements Using the MIC TRAC (continued)**

11. Locate the proper gage setting dimensions on the MIC TRAC Setting Dimensions for the MRP Gage charts in this manual. Locate the chart for the type of connector being measured. Then, locate the pipe size and use the dimension in the Box Dimensions Internal CPU Reading column.
12. Turn the coarse adjust knob on the MIC TRAC to display a measurement that is close to the desired setting dimension.
13. Secure the coarse adjust lock.
14. Turn the fine adjust knob until the CPU displays the exact setting dimension.
15. Secure the fine adjust lock.
16. If necessary for documentation purposes, press the PRINT pad on the CPU to record the actual setting dimension.



17. Loosen the locking knobs on the lower block.

**Note:** For the MRP-3000, use a 1/8" hex wrench to loosen the set screws on the lower block.





## Zeroing the MRP Gage for Internal Measurements Using the MIC TRAC (continued)

18. Using a 1/8" hex wrench, loosen the two set screws on the side of the upper block until the arm slides up and down freely. Repeat with the lower block.

**Note:** For the MRP-1000, use a 3/32" hex wrench to loosen the set screw on the side of the upper and lower blocks until the arms slide up and down freely.

**Note:** For the MRP-3000, use a 1/8" hex wrench to loosen the set screws on the side of the upper and lower blocks until the arms slide up and down freely.

19. Using a scale, adjust both arms to the proper MIC TRAC setting dimension (distance from the wear pad to the center of the pivot shoe) Refer to the MIC TRAC Setting Dimensions Charts in this manual. Then, tighten the two locking knobs on the side of the upper and lower blocks, to secure the arm.

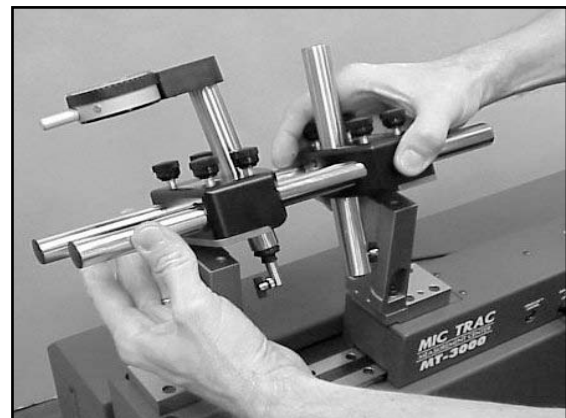
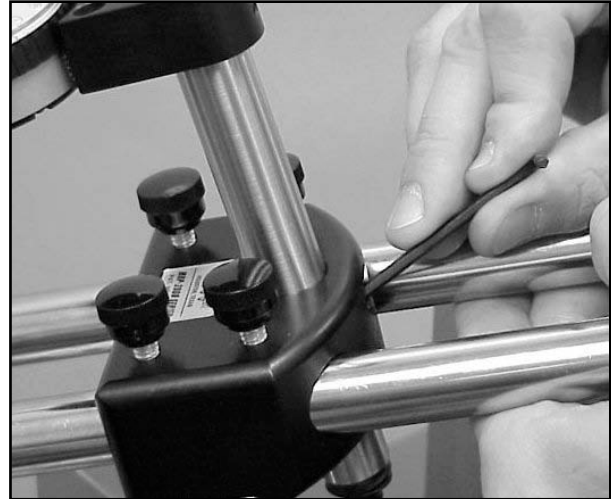
**Note:** For the MRP-1000, use a 3/32" hex wrench to tighten the set screw on the side of the upper and lower blocks to secure the arms.

**Note:** For the MRP-3000, use a 1/8" hex wrench to tighten the set screws on the side of the upper and lower blocks to secure the arms.



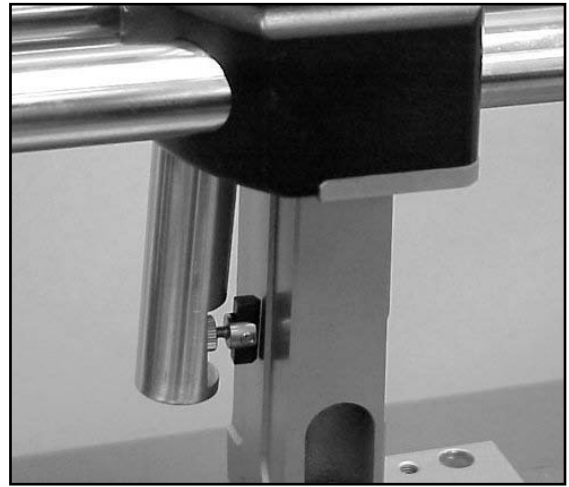
During inspection, ensure that the pivot shoe is not located on a thread pull-out area. If necessary, re-adjust the location of the pivot shoe until the gage measures only full form threads.

20. Place the MRP gage on the MIC TRAC so the pivot shoes are positioned on the inside of the taper blocks.

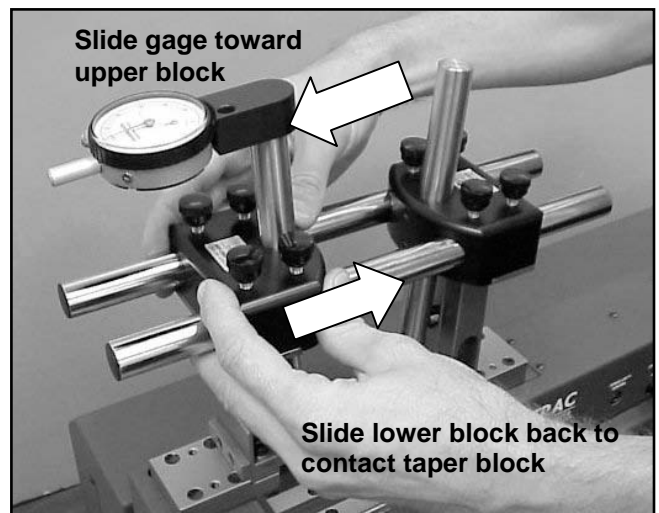


**Zeroing the MRP Gage for Internal Measurements Using the MIC TRAC (continued)**

21. Position both pivot shoes in the center of the smooth area of the frame setting standard.



22. With the pivot shoe of the upper arm contacting the taper block, slide the entire MRP gage toward the upper block approximately .050". Then, slide the lower block back until it contacts the right taper block, to give the MRP the proper preload.



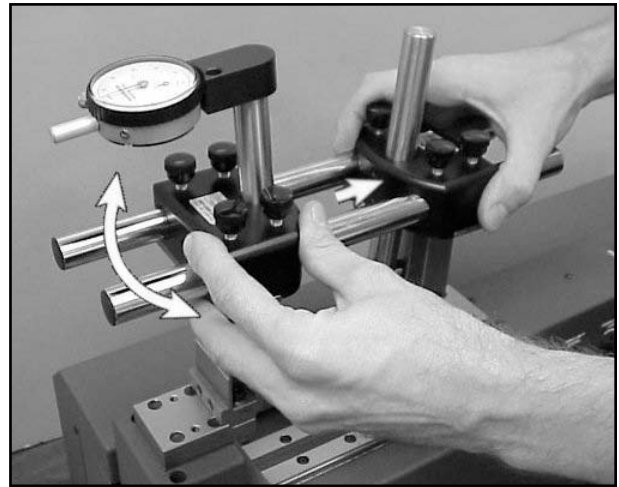
23. Once positioned with the proper preload, tighten the locking knobs to secure the upper block.

**Note:** For the MRP-3000, use a 1/8" hex wrench to tighten the set screws on the upper block.



## Zeroing the MRP Gage for Internal Measurements Using the MIC TRAC (continued)

24. While holding the lower block securely against the right taper block, sweep the upper block back and forth to obtain the smallest indicator reading.



25. Turn the indicator dial on the MRP gage to align the needle with zero.



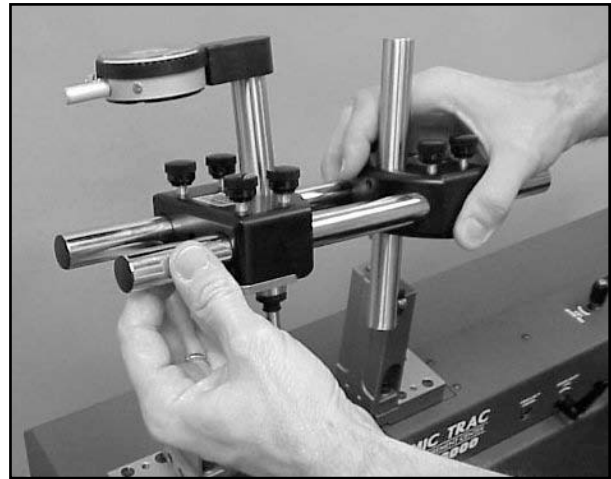
26. Tighten the indicator clamp.

**Note:** Note the position of the small revolution counter on the indicator before removing the gage. Place a piece of masking tape on the backside of the indicator and record the dial setting of the small revolution counter to eliminate incorrect indicator readings.



**Zeroing the MRP Gage for Internal Measurements Using the MIC TRAC (continued)**

27. Remove the gage from the taper blocks.
28. Set a frequency for verifying the zero setting of all gages. As a minimum, the MRP gage should be zeroed on a standard once during each shift to ensure accurate readings.



## Operating Procedures

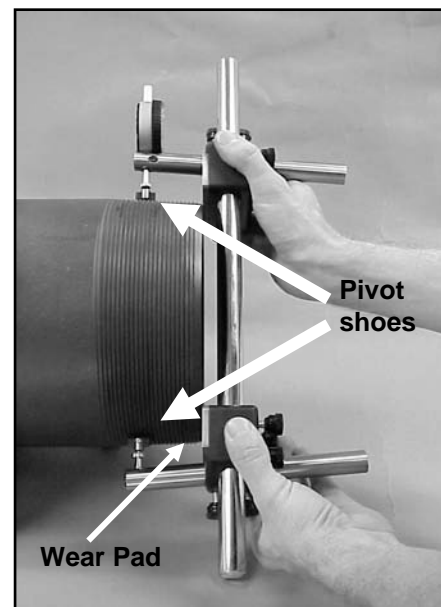
### Inspecting External Parts

#### Materials Needed:

- MRP gage
- Part
- Inspection report

Inspecting parts using the MRP involves placing the gage on a part in order to obtain a diameter reading and an ovality reading. Ovality is the out-of-roundness of a piece of pipe or coupling. The average of the largest and smallest readings, taken on the MRP, produces a “round” diameter reading. However, no pipe is exactly round. So, the smallest reading subtracted from the largest reading produces the ovality reading.

1. After zeroing the MRP gage on the standard, place the gage on a pin connector so the wear pads rest on the face of the connector and the pivot shoes ride on the crests of the threads.

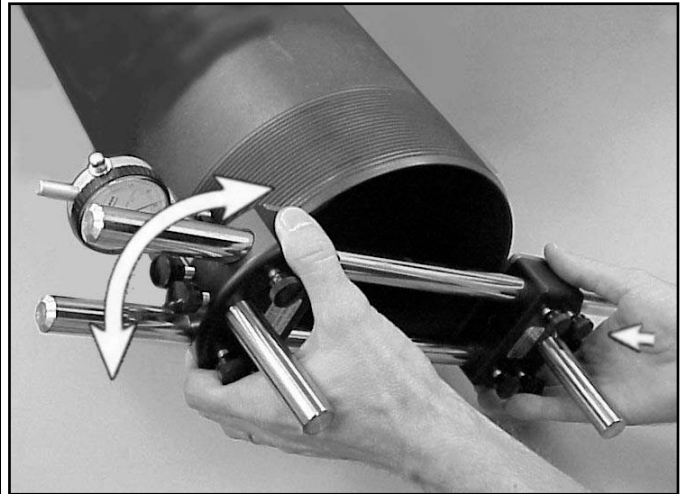


2. Ensure that the pivot shoes on the MRP gage are properly positioned on the threads of the part.



### Inspecting External Parts (continued)

- Using the lower shoe as a pivot, sweep the MRP gage back and forth to locate the largest indicator reading on the part. You may want to refer to the MRP Inspection Tolerance Guidelines in this manual to determine the accuracy of the diameter.



- Rotate the gage 90 degrees and sweep for the largest reading again. If your second reading is greater or less than the first, sweep 180° around the part to find the largest and smallest values.

**Note:** Be sure that the small revolution counter on the indicator is pointing to the same number as when the gage was zeroed. Refer to the number previously recorded on the back of the indicator.

- To calculate the part's diameter, add the largest diameter reading to the smallest diameter reading and divide the total by 2.
- To calculate the part's ovality, subtract the smallest indicator reading from the largest indicator reading.

**Note:** For more information about calculating diameter and ovality, refer to Calculating Diameter and Ovality Measurements with the MRP Gage in this manual.

- Record any deviations on an inspection or calibration report.
- Use the first part you inspected as a control piece to verify repeatability. Mark the part at a location where it was inspected and record the deviation from zero.
- During the inspection process, periodically place the MRP on the control piece to verify the gage's repeatability.



## Inspecting Internal Parts

### Materials Needed:

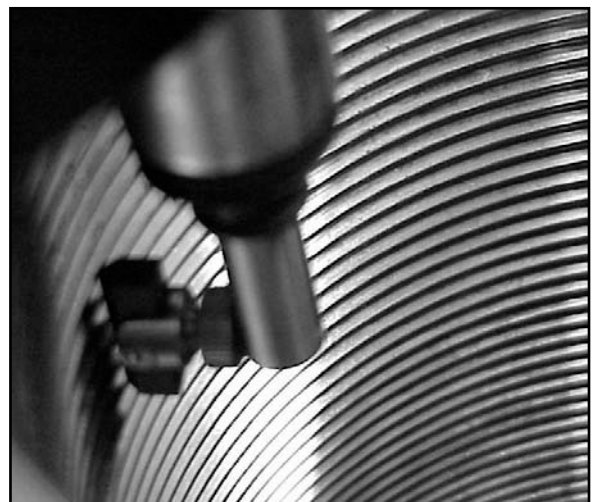
- MRP gage
- Part
- Inspection report

Inspecting parts using the MRP involves placing the gage on a part in order to obtain a diameter reading and an ovality reading. Ovality is the out-of-roundness of a piece of pipe or coupling. The average of the largest and smallest readings, taken on the MRP, produce a “round” diameter reading. However, no pipe is exactly round. So, the smallest reading subtracted from the largest reading produces the ovality reading.

1. After zeroing the MRP gage on the standard, place the gage on a box connector so the wear pad rests on the face of the connector and the pivot shoes ride on the crests of the threads.



2. Ensure that the pivot shoes on the MRP gage are properly positioned on the threads in the part.



**Inspecting Internal Parts (continued)**

3. Using the lower shoe as a pivot, sweep the MRP gage back and forth to locate the largest indicator reading on the part. You may want to refer to the MRP Inspection Tolerance Guidelines in this manual to determine the accuracy of the diameter.



4. Rotate the gage 90 degrees and sweep for the largest reading again. If your second reading is greater or less than the first, sweep 180° around the part to find the largest and smallest values.

**Note:** Be sure that the small revolution counter on the indicator is pointing to the same number as when the gage was zeroed. Refer to the number previously recorded on the back of the indicator.

5. To calculate the part's diameter, add the largest diameter reading to the smallest diameter reading and divide the total by 2.

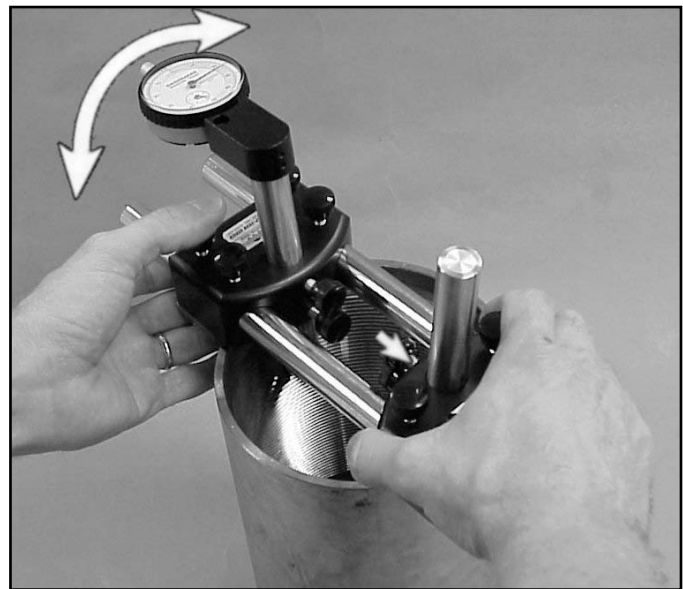
6. To calculate the part's ovality, subtract the smallest indicator reading from the largest indicator reading.

**Note:** For more information about calculating diameter and ovality, refer to Calculating Diameter and Ovality Measurements with the MRP Gage in this manual.

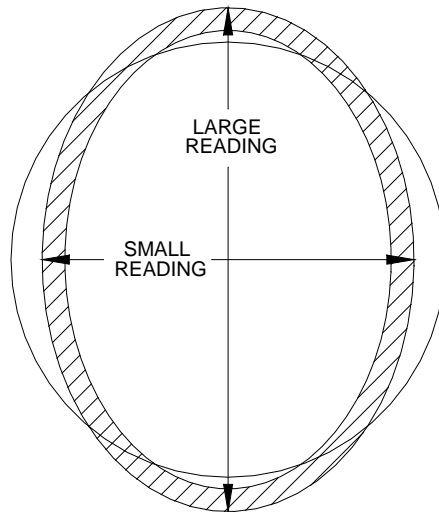
7. Record any deviations on an inspection or calibration report.

8. Use the first part you inspected as a control piece to verify repeatability. Mark the part at a location where it was inspected and record the deviation from zero.

9. During the inspection process, periodically place the MRP on the control piece to verify the gage's repeatability.







### Largest and Smallest Indicator Readings for Diameter and Ovality

#### Ovality

Ovality is the amount of out-of-roundness in a piece of pipe or a coupling. Determining ovality requires locating the largest and the smallest diameter readings on the part and subtracting the smallest reading from the largest reading, as shown in the following formula. Ovality readings are always positive (no sign attached).

$$\text{Largest Diameter} - \text{Smallest Diameter} = \text{Ovality}$$

#### Example:

Largest Diameter Reading	Smallest Diameter Reading	Ovality
+ .005	- .010	.015

**MRP Inspection Tolerance Guidelines**

The following tolerances are deviations from nominal indicator settings. These tolerances are guidelines **only** in that they allow for the cumulative effect of lead, taper, and thread form on ring or plug standoff. Ovality tolerances are based on unwritten standards accepted by much of the industry. Specific customers may have their own tolerances for rejection.

Connection	P.D Pin/Box Used (in.) Tolerance	P.D. Pin/Box New (in.) Tolerance	Ovality Pin/Box (in.)
<b>8-Round (LTC, STC, NUE, EUE)</b>			(.003"/in. dia.)
2 3/8	±.008	±.004	.007
2 7/8	±.008	±.004	.008
3 1/2	±.008	±.004	.011
4 1/2	±.008	±.004	.014
5	±.008	±.004	.015
5 1/2	±.008	±.004	.017
6 5/8	±.008	±.004	.020
7	±.008	±.004	.021
7 5/8	±.008	±.004	.023
8 5/8	±.008	±.004	.026
9 5/8	±.008	±.004	.029
10 3/4	±.008	±.004	.032
11 3/4	±.008	±.004	.035
13 3/8	±.008	±.004	.040
<b>Buttress (3/4" TPF)</b>			(.003"/in. dia.)
4 1/2	+ .006 / -.000	+ .004 / -.000	.014
5	+ .006 / -.000	+ .004 / -.000	.015
5 1/2	+ .006 / -.000	+ .004 / -.000	.017
6 5/8	+ .006 / -.000	+ .004 / -.000	.020
7	+ .006 / -.000	+ .004 / -.000	.021
7 5/8	+ .006 / -.000	+ .004 / -.000	.023
8 5/8	+ .006 / -.000	+ .004 / -.000	.026
9 5/8	+ .006 / -.000	+ .004 / -.000	.029
10 3/4	+ .006 / -.000	+ .004 / -.000	.032
11 3/4	+ .006 / -.000	+ .004 / -.000	.035
13 3/8	+ .006 / -.000	+ .004 / -.000	.040
<b>Buttress (1" TPF)</b>			(.004"/in. dia.)
16	+ .008 / -.000	+ .006 / -.000	.064
18 5/8	+ .008 / -.000	+ .006 / -.000	.075
20	+ .008 / -.000	+ .006 / -.000	.080

## MRP Accuracy Measurement Factors

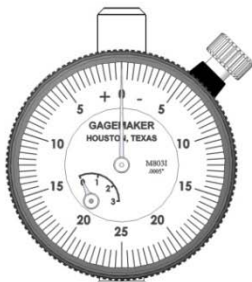
### Thread Shave Measurements

Accurate MRP measurements are based on positioning the pivot shoe on the crest cone of the thread at a prescribed distance from the face of the connector. If the distance from the pitch line to the crest cone is accurate, then readings taken from at the crest cone directly reflect the accuracy of the pitch diameter.

Problems occur when the threading process pushes a thread flank back, to decrease standoff of a ring or plug. When the flanks are relocated, the distance from the pitch line to the crest is changed. **Thread shave** is the change in the distance from the pitch line to the crest cone. Changes in thread shave affect the relationship of measurements taken with the MRP gage and measurements taken with ring and plug gages.

The diagrams below describe how plus and minus shave is detected and how to compensate for its effect on the readings of the MRP gage.

**Zero the indicator while the gage is on the standard**

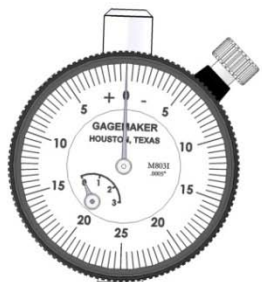


Seat the contact point into the standard's groove

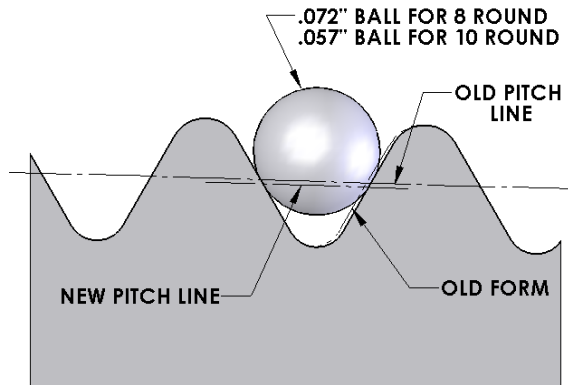
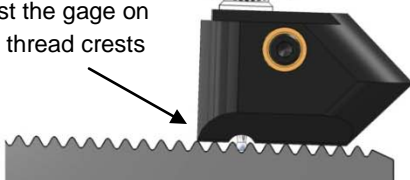


1014S

Setting Standard



Rest the gage on the thread crests



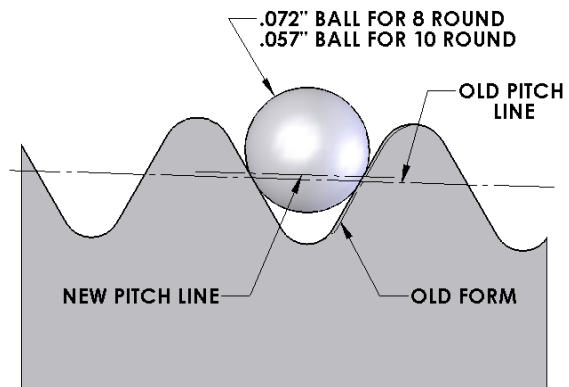
**Plus Shave – Wide Groove – Large Reading**

Mating part will have less standoff

**P.D. Correction for Plus Shave:**

Pin = Subtract 2 times deviation from P.D.

Box = Add 2 times deviation to P.D.



**Minus Shave – Narrow Groove – Small Reading**

Mating part will have more standoff

**P.D. Correction for Minus Shave:**

Pin = Add 2 times deviation to P.D.

Box = Subtract 2 times deviation from P.D.

**Standoff vs. Pitch Diameter Change**

The relationship between MRP diameter readings and ring and plug gage standoff readings are affected by many factors such as:

- Ovality (out-of-roundness)
- Thread shave (distance from crest to pitch line)
- Connection condition (newly machined or used thread form)
- Coatings (zinc or phosphate coated couplings)
- Incorrect thread elements (lead, taper, and thread height)

To determine the relationship between diameter change and ring or plug gage standoff for each type of connector, use the following formula (no consideration given to ovality):

$$\text{Standoff X Taper (in/in) = Diameter change (Dc)}$$

**8 Round**

Nominal Standoff	.125
Taper (in/in)	.062

**Standoff X Taper (in/in) = Diameter change (Dc)**

$$.125 \times .062 = +.008$$

**Buttress 4 1/2" – 13 3/8"**

Nominal Standoff	.100
Taper (in/in)	.062

**Standoff X Taper (in/in) = Diameter change (Dc)**

$$.100 \times .062 = +.006$$

**Buttress 16" – 20"**

Nominal Standoff	.100
Taper (in/in)	.083

**Standoff X Taper (in/in) = Diameter change (Dc)**

$$.100 \times .083 = +.008$$

**Example:**

To determine the MRP reading for a 7" LTC pin connector ring gage with a standoff of +.115:

$$\text{Standoff X Taper (in/in) = MRP Reading}$$

$$.115 \times .062 = +.007$$

## Setting Standard Calculations

### Rod Style Setting Standard Dimensions

Our rod style setting standards for the MRP gages are manufactured using dimensional information from API Specification 5B. The calculations below explain how we determine the critical dimensions for the rod style setting standards. The calculations that follow assume a pivot shoe length of .625".

#### Pin Connectors

##### STC, LTC, EUE, and NUE Pins (8 round thread)

A Standard (Diameter)	P.D. @ handtight plane + 2* (P.D. to crest) - shoe compensation factor $A = (E_1 + .068) - .0002$
B Standard (Shoe Location)	Length to handtight plane – (1/2 shoe length) $B = L_1 - .312$

**Note:** The shoe compensation factor compensates for the change in diameter of the pivot shoe between the setting and measuring positions.

##### Buttress Pins (4 1/2" – 13 3/8")

A Standard (Diameter)	P.D. @ handtight plane + 2* (P.D. to crest) - .500" shoe reposition factor - shoe compensation factor $A = (E_7 + .062) - (.500 * .062) - .0002$
B Standard (Shoe Location)	Length to handtight plane – (.500 + 1/2 shoe length) $B = L_7 - .812$

**Note:** The shoe reposition factor relocates the pivot shoe closer to the end of the pin to avoid measuring black crested threads. The shoe compensation factor compensates for the change in diameter of the pivot shoe between the setting and measuring positions. Refer to Rod Style Setting Standards' Correction Factor in this manual.

##### Buttress Pins (16" and larger)

A Standard (Diameter)	P.D. @ handtight plane + 2* (P.D. to crest) + total correction factor $A = (E_7 + .062) + .002$
B Standard (Shoe Location)	Length to handtight plane – 1/2 shoe length $B = L_7 - .312$

**Note:** The total correction factor is necessary for a step type thread form. Step threads have roots and crests parallel with the centerline of the pipe. The total correction factor compensates for both the change in diameter of the pivot shoe between the setting and measuring positions and the positioning of the shoe on the stab flank crest cone. Refer to Rod Style Setting Standards' Correction Factor in this manual.

**Rod Style Setting Standard Dimensions (continued)****Couplings****STC, LTC, EUE, and NUE Couplings (8 round thread)**

A Standard (Diameter)	P.D. @ handtight plane - 2* (P.D. to crest) + shoe reposition factor + shoe compensation factor $A = (E_1 - .06826) - (.500 * .062) + .0002$
B Standard (Shoe Location)	Length to handtight plane + (.500 - 1/2 shoe length) $B = M + (.500 - .312)$

**Note:** The shoe reposition factor relocates the pivot shoe deeper into the box to clear the counter bore. The shoe compensation factor compensates for the change in diameter of the pivot shoe between the setting and measuring positions.

**Buttress Couplings (3/4" TPF)**

A Standard (Diameter)	P.D. @ handtight plane - 2* (P.D. to crest) + shoe compensation factor $A = (E_7 - .062) + .0002$
B Standard (Shoe Location)	Length to handtight plane - (1/2 shoe length) $B = (g - A) - .312$

**Note:** The shoe compensation factor compensates for the change in diameter of the pivot shoe between the setting and measuring positions. Refer to Rod Style Setting Standards' Correction Factor in this manual.

**Buttress Couplings (1" TPF)**

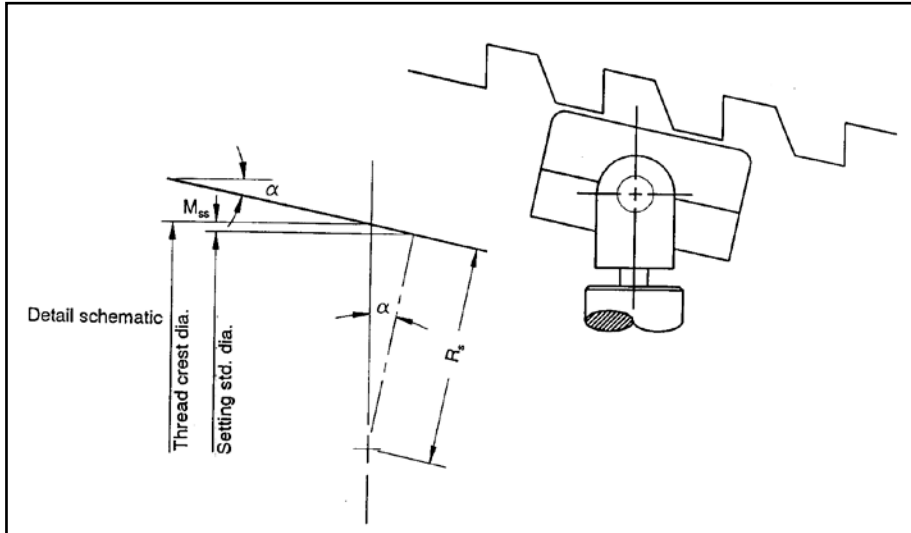
A Standard (Diameter)	P.D. @ handtight plane - 2* (P.D. to crest) - total correction factor $A = (E_7 - .062) - .002$
B Standard (Shoe Location)	Length to handtight plane - (1/2 shoe length + pivot relocation) $B = (g - A) - .342$

**Note:** The total correction factor is necessary for a step type thread form. Step threads have roots and crests parallel with the centerline of the pipe. The total correction factor compensates for both the change in diameter of the pivot shoe between the setting and measuring positions and the positioning of the shoe on the stab flank crest cone. Refer to Rod Style Setting Standards' Correction Factor in this manual.

## Rod Style Setting Standard Correction Factors

### Pivot Shoe Compensation Factor

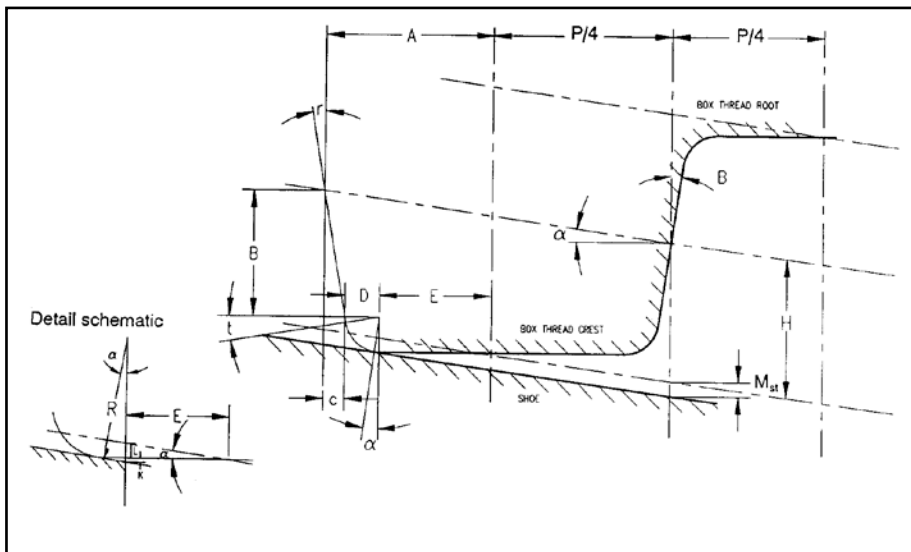
The shoe compensation factor compensates for the change in diameter of the pivot shoe between setting to a square standard and measuring to a tapered thread. The diagram below illustrates the change and how to adjust the setting standard to compensate for the change.



$\alpha$  Half thread taper  
 $R_s$  Center of shoe to contact surface  
 Shoe comp factor =  $R_s * ((1/\cos \alpha)-1)$

### Step Thread Compensation

Step type threads are threads that have roots and crests that are parallel to the center line of the pipe. When measuring connectors with step threads, a compensation must be made for positioning of the pivot shoe across the thread's stab flank crest radii. The diagram below illustrates how the step thread compensation factor is determined and how to adjust setting standards to compensate for the shoe contact.



$\alpha$  Half thread taper  
 $\beta$  Stab flank angle  
 $H$  P.D. to crest  
 $P$  Lead  
 $R$  Stab flank radius  
 $A$  tooth width ( $p/4$ )  
 $R_s$  Center of shoe to contact surface

$$B = H + A * \tan \alpha - R$$

$$C = B * \tan \beta$$

$$D = R / \cos \beta$$

$$E = A - C - D$$

$$K = R / \cos \alpha - R$$

$$L = E * \tan \alpha$$

$$\text{Comp factor} = 2 * (K + L)$$

### Total Correction Factor

The total correction factor is the combination of the shoe compensation factor and step thread compensation factors. This factor applies only to tapered thread connectors that have a step type thread form. Buttress connectors that are 16" and larger and many premium connectors require the total correction factor. The factor is added to pin calculations and subtracted from box calculations.

**MIC TRAC Setting Standard Dimensions**

**Taper Block Calculations**

Taper block gage point location – 1.709 from top of block

Taper block constant (in closed position):

Taper Block	Taper	Pin Taper Block Constant @ 1.709	Box Taper Block Constant @ 1.709
TF-.75T (¾" TPF)	.0625 in/in	2.0810 in	.2950 in
TF-10T (1.00" TPF)	.0833 in/in	2.0450 in	.3310 in
TF-112T (1 ⅛" TPF)	.0937 in/in	2.5040 in	.3560 in
TF-125T (1 ¼" TPF)	.1042 in/in	2.4820 in	.3778 in
TF-21T (2.1" TPF)	.1750 in/in	2.3610 in	.4990 in

The following calculations determine the CPU settings for the MIC TRAC for presetting the MRP gages.

**Calculation Variables and Factors:**

**GPr** - Change in setting diameter due to relocating the connection gage point to coincide with the taper block gage point

**PDc** - Connector pitch diameter at crest cone

**PDn** - New pitch diameter at crest cone at the relocated gage point

**Mtes** - MIC TRAC pin setting dimension

**MTis** - MIC TRAC box setting dimension

**Mtez** - MIC TRAC external preset zero = 1.5000

Pin Calculations	Box Calculations
$GPr = (1.709 - L_1) * Taper$	$GPr = (1.709 - M) * Taper$
$PDc = E_1 + 2 * (P.D. to crest)$	$PDc = E_1 - 2 * (P.D. to crest)$
$PDn = PDc + GPr$	$PDn = PDc - GPr$
$MTes = (PDn - block constant) + MTez$	$MTis = (PDn - block constant)$

**Note:** Reference API Specification Standard 5B, 13<sup>th</sup> edition, May 31, 1988 for L<sub>1</sub>, E<sub>1</sub>, M, and other diameters.

**Example:**

7" STC pin connector

E<sub>1</sub> = 6.90337

L<sub>1</sub> = 2.046

Taper = .0625 in/in

Block Constant = 2.0810

$$GPr = (1.7909 - 2.046) * .0625 = -.0210$$

$$PDc = 6.90337 + .06826 = 6.97163$$

$$PDn = (6.97163) + (-.0210) = 6.9506$$

$$MTes = (6.9506 - 2.0810) + 1.5000 = 6.3697 \text{ CPU reading}$$



**MIC TRAC Setting Dimensions for the MRP Gage**

Use these setting dimensions to set the MIC TRAC MT-3000 measurement center for presetting the MRP gages.

**Note: Use the TF-75T setting blocks on the MIC TRAC for all the following setting dimensions.**

**API Line Pipe Connections - 1" to 20"**

Nominal Pipe Size Line Pipe Only	Major Diameter	Threads Per Inch	Distance from MRP Wear pad to Center of Pivot Shoe	Pin Dimensions (External) CPU Reading	Box Dimensions (Internal) CPU Reading
1	1.315	11 ½	.375	N/A	.07945
1 ¼	1.660	11 ½	.375	N/A	1.1395
1 ½	1.900	11 ½	.375	N/A	1.3795
2	2.375	11 ½	.375	1.8573	1.8545
2 ½	2.875	8	.375	2.3351	2.3105
3	3.500	8	.375	2.9562	2.9355
3 ½	4.000	8	.500	3.4531	3.4355
4	4.500	8	.500	3.9500	3.9355
5	5.563	8	.500	5.0063	4.9985
6	6.625	8	.750	6.0617	6.0605
8	8.625	8	1.00	8.0492	8.0605
10	10.750	8	1.00	10.1609	10.1855
12	12.750	8	1.00	12.1484	12.1855
14D	14.000	8	1.25	13.3906	13.4355
16D	16.000	8	1.25	15.3781	15.4355
18D	18.000	8	1.75	17.3656	17.4355
20D	20.000	8	1.75	19.3531	19.4355

**API NUE Connections - ¾" to 4½"**

Nominal Pipe Size NUE Only	Distance from MRP Wear pad to Center of Pivot Shoe	Pin Dimensions (External) CPU Reading	Box Dimensions (Internal) CPU Reading
1.050	N/A	N/A	0.5619
1.315	N/A	N/A	0.8269
1.660	N/A	N/A	1.1719
1.900	N/A	N/A	1.4119
2¾	.50	1.8305	1.8867
2⅞	.75	2.3031	2.3867
3½	1.00	2.9125	3.0117
4	1.00	3.4064	3.4776
4½	1.00	3.8966	3.9776

**MIC TRAC Setting Dimensions for the MRP Gage (continued)**

API EUE Connections - 3/4" to 4 1/2"

Nominal Pipe Size EUE Only	Distance from MRP Wear pad to Center of Pivot Shoe	Pin Dimensions (External) CPU Reading	Box Dimensions (Internal) CPU Reading
1.050	N/A	N/A	0.8269
1.315	N/A	N/A	0.9807
1.660	N/A	N/A	1.3244
1.900	N/A	N/A	1.6057
2 3/8	.50	2.0298	2.0711
2 7/8	.75	2.5181	2.5711
3 1/2	1.00	3.1586	3.2273
4	1.00	3.6508	3.7273
4 1/2	1.00	4.1430	4.2273

API STC Connections - 4 1/2" to 20"

Nominal Pipe Size STC Only	Weight Per Foot	Grade	Distance from MRP Wear pad to Center of Pivot Shoe	Pin Dimensions (External) CPU Reading	Box Dimensions (Internal) CPU Reading
4 1/2	9.50	All	.50	3.9399	3.9774
4 1/2	Others	All	1.00	3.9009	3.9774
5	11.50	All	1.00	4.4087	4.4774
5	Others	All	1.00	4.3930	4.4774
5 1/2	All	All	1.25	4.8852	4.9774
6 5/8	All	All	1.25	5.9946	6.1024
7	17.00	All	1.00	6.4165	6.4774
7	Others	All	1.25	6.3696	6.4774
7 5/8	All	All	1.25	6.9868	7.0985
8 5/8	24.00	All	1.25	8.0024	8.0985
8 5/8	Others	All	1.75	7.9790	8.0985
9 5/8	All	<P-110	1.75	8.9790	9.0985
9 5/8	All	>P-110	1.75	8.9790	9.0945
10 3/4	32.75	<P-110	1.00	10.1430	10.2235
10 3/4	Others	<P-110	2.00	10.0962	10.2235
10 3/4	Others	>P-110	2.00	10.0962	10.2196
11 3/4	All	<P-110	2.00	11.0962	11.2235
11 3/4	All	>P-110	2.00	11.0962	11.2196
13 3/8	All	<P-110	2.00	12.7212	12.8485
13 3/8	All	>P-110	2.00	12.7212	12.8446
16	All	All	2.00	15.3149	15.4735
18 5/8	87.50	All	2.00	17.9399	18.0985
20	All	<J-55, K-55	2.00	19.3149	19.4735
20	All	>J-55, K-55	1.25	19.3149	19.4796

**MIC TRAC Setting Dimensions for the MRP Gage (continued)****API LTC Connections - 4½" to 20"**

Nominal Pipe Size LTC Only	Weight Per Foot	Grade	Distance from MRP Wear pad to Center of Pivot Shoe	Pin Dimensions (External) CPU Reading	Box Dimensions (Internal) CPU Reading
4½	All	All	1.25	3.8774	3.9774
5	All	All	1.75	4.3540	4.4774
5½	All	All	2.00	4.8462	4.9774
6⅝	All	All	2.25	5.9477	6.1024
7	All	All	2.25	6.3149	6.4774
7⅝	All	All	2.25	6.9321	7.0985
8⅝	All	All	3.00	7.9087	8.0985
9⅝	All	<P-110	3.00	8.8930	9.0985
9⅝	All	>P-110	3.00	8.8930	9.0945
20	All	<J-55, K-55	3.25	19.2368	19.4735
20	All	>J-55, K-55	3.25	19.2368	19.4796

**API Buttress Connections - 4½" to 13⅜"**

Nominal Pipe Size Buttress Only	Weight Per Foot	Grade	Distance from MRP Wear pad to Center of Pivot Shoe	Pin Dimensions (External) CPU Reading	Box Dimensions (Internal) CPU Reading
4½	All	All	.75	3.9385	4.1080
5	All	All	1.00	4.4307	4.6017
5½	All	All	1.00	4.9268	5.1017
6⅝	All	All	1.00	6.0401	6.2267
7	All	All	1.25	6.4033	6.6017
7⅝	All	All	1.25	7.0166	7.2267
8⅝	All	All	1.75	8.0088	8.2267
9⅝	All	All	1.75	9.0088	9.2267
10¾	All	All	1.75	10.1338	10.3517
11¾	All	All	1.75	11.1338	11.3517
13⅜	All	All	1.75	12.7588	12.9767

**API Buttress Connections – 16" to 20" (Use TG-10T Taper Blocks)**

Note: Use the TG-10T taper blocks on the MIC TRAC for all the following setting dimensions.

Nominal Pipe Size Buttress Only	Weight Per Foot	Grade	Distance from MRP Wear pad to Center of Pivot Shoe	Pin Dimensions (External) CPU Reading	Box Dimensions (Internal) CPU Reading
16	All	All	1.37	15.3387	15.5087
18⅝	All	All	1.37	17.9637	18.1337
20	All	All	1.37	19.3387	19.5087

## ***Care and Maintenance***

### **Maintenance Tips**

- Keep all unprotected metal surfaces coated with light oil.
- Avoid dropping the gage or subjecting it to any vibration or impact.
- Keep the gage dry and away from any machine coolant spray.
- Do not force the movement of any of the mechanical parts. The mechanics are designed to move freely.
- Keep the indicator face clean.

### **Warranty Information**

GAGEMAKER warrants its products to be free from defects in material and workmanship for one year from the date of shipment. At our option, we will repair or replace any defective product upon return, pre-paid, and properly packed to our factory in Pasadena, Texas. This warranty applies to all products when used in a normal industrial environment. Any unauthorized tampering, misuse or neglect will make this warranty null and void. Under no circumstances will GAGEMAKER or any affiliate have any liabilities for loss or for any indirect or consequential damages. The foregoing warranties are in lieu of all other warranties expressed or implied, including but not limited to, the implied warranties of merchantability and fitness for a particular purpose.



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