

Gauge blocks

Sets of gauge blocks :They are available in different sets for different units Metric and English:

<b>Metric 56 pieces</b>	
	Increment
1 piece (1.0005) mm	
9 pieces (1.001-1.009) mm	0.001 mm
9 pieces (1.01- 1.09) mm	0.010 mm
9 pieces (1.0 -1.9) mm	0.100 mm
25 pieces (1-25) mm	1.000 mm
3 pieces (25-75) mm	25 mm

Sets of gauge blocks :They are available in different sets for different units Metric and English:

<b>Metric 103 pieces</b>	
	Increment
1 piece (1.005) mm	
49 pieces (1.01-1.49) mm	0.01 mm
49 pieces (0.5- 24.5) mm	0.5 mm
4 pieces (25-100) mm	25 mm

Sets of gauge blocks :They are available in different sets for different units Metric and English:

English 81 pieces	
	Increment
9 pieces (0.1001-0.1009)''	0.0001''
49 pieces (0.1010-0.1490)''	0.001''
19 pieces (0.0500-0.9500)''	0.050''
4 pieces (1.0-4.0)''	1.0''

## 88 piece set of metric gauge blocks

0.001 mm series 9 blocks

1.001	1.002	1.003	1.004	1.005	1.006	1.007	1.008	1.009
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0.01 series 49 blocks

1.01	1.02	1.03	1.04	1.05	1.06	1.07	1.08	1.09
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1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.18
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1.19	1.20	1.21	1.22	1.23	1.24	1.25	1.26	1.27
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1.28	1.29	1.30	1.31	1.32	1.33	1.34	1.35	1.36
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1.37	1.38	1.39	1.40	1.41	1.42	1.43	1.44	1.45
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1.46	1.47	1.48	1.49
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0.5 mm series 1 block

0.5 mm series -18 blocks

1	1.5	2	2.5	3	3.5	4	4.5	5
5.5	6	6.5	7	7.5	8	8.5	9	9.5

10 mm series (9 blocks)

10	20	30	40	50	60	70	80	90
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Two (2mm ) wear blocks

- Protecting Gauge Blocks: Another two gauges are added which are made extra wear resistant to reduce wear during inspection. They are called “**Protector Gauge Blocks**”. Usually have dimensions of 1mm, 1.5mm, 2mm or 2.5mm. They are marked with letter “P” on its measuring faces.

# Selecting and building up of blocks

To build up the blocks to the required length follow these steps :

- (1) Note down the required dimension,
- (2) Deduct from it the size of two protecting blocks,
- (3) Add blocks that eliminates the **least** digit of the number,
- (4) Continue till you reach zero.



Accuracy is affected by :

- (1) Dimensional instability of material,
- (2) Wear during operation or use,
- (3) Damage during storage and handling,
- (4) Change in parallelism.

To reduce errors and improve accuracy :

- (1) Repeated and periodical inspection and calibration,
- (2) Select the least number of gauge blocks for a given or required size (this helps reducing accumulative errors).

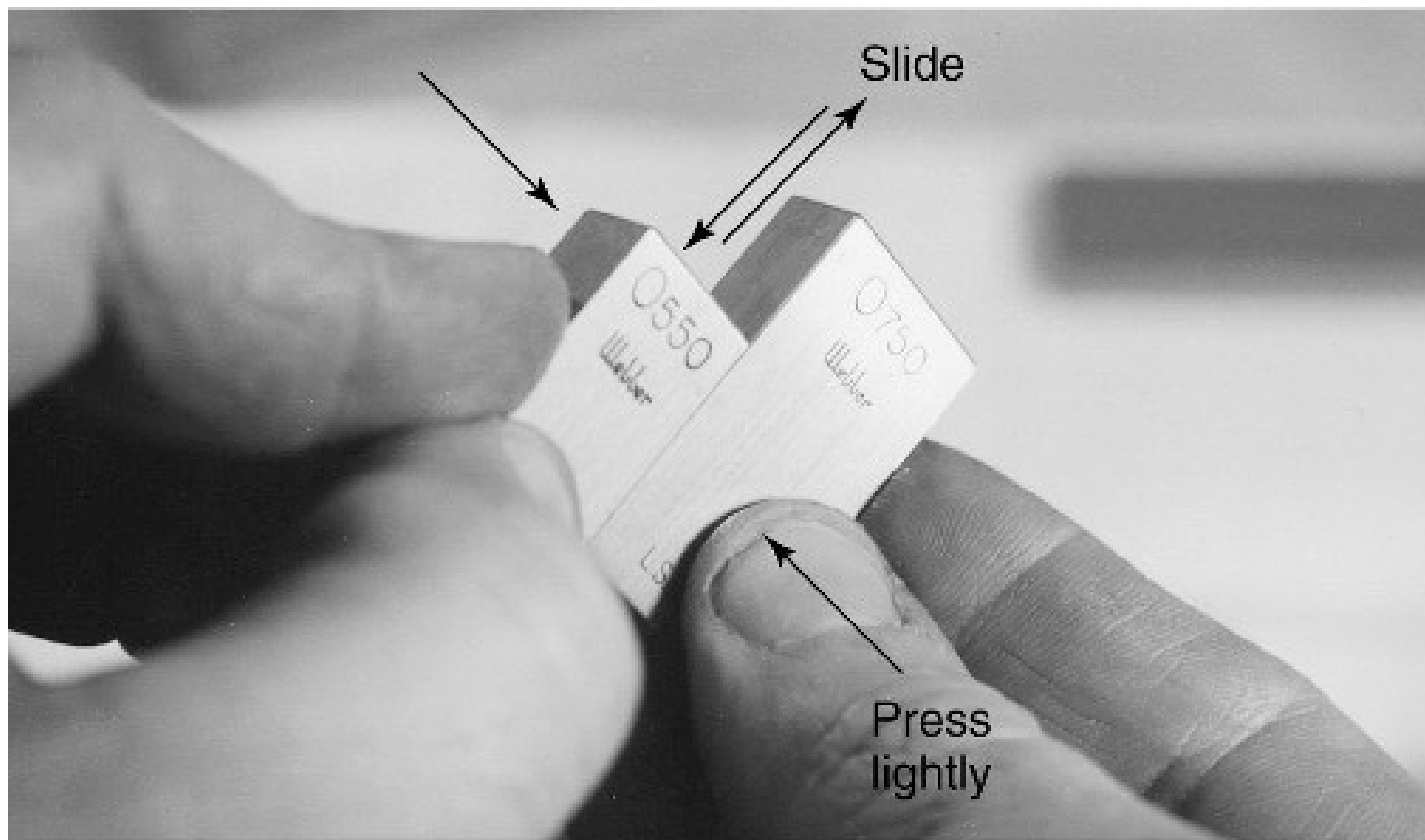
- **Example:** List the slips to be wrung together to produce an overall dimension of 92.357mm using two protective gauge blocks of ( )mm size.
- **Solution:**

# How to wring Blocks together

- When wringing blocks together, take care not to damage them. The correct sequence of movement to wring blocks together, illustrated as follows :
- 1. Clean the blocks with a clean, soft cloth.
- 2. Wipe each of the contacting surfaces on the clean palm of the hand or on the wrist. This procedure removes any dust particles left by the cloth and also applies a light film of oil.

- 3. Place the end of one block over the end of another block.
- 4. While applying pressure on the two blocks, slide one block over the other.

NOTE: If the blocks do not adhere to each other, it is generally because the blocks have not been thoroughly cleaned









# Block gauge set



Pratt & Whitney Cutting Tool and Gage Div., Colt Industries

Fig. 4-4. Large gage block set in a case with individual marked compartments for each block.



Pratt & Whitney Cutting Tool and Gage Div., Colt Industries

Fig. 4-5. When gage blocks in perfect condition are wrung together the resulting clinging power is capable of resisting the action of gravitational force upon a long stack.



CEJ Gage Company

Fig. 4-6. The sequential steps in wringing together rectangular gage blocks.

(Left) Holding the blocks crosswise and exerting some pressure, while carrying out a slight swiveling motion will cause the blocks to adhere to each other.

(Center) The adhering blocks are then slipped into parallel position with a slight pressure.

(Right) The wrung blocks form a single unit for the purpose of instrument setting and measurement.

**TABLE 4-5. THE COMPOSITION OF TYPICAL GAGE BLOCK SETS**

These are the recommended sets, but gage block sets in many other compositions are also available

The individual blocks contained in the sets are listed in series

RECOMMENDED SET DESIGNATION	PIECES IN THE SET	NUMBER OF BLOCKS PER SET	SIZE RANGE, inches	SERIES INCREMENTS (STEPS), inch
Standard 81 block set	81	9	0.1001–0.1009	0.0001
		49	0.101 –0.149	0.0010
		19	0.050 –0.950	0.050
		4	1.000 –4.000	1.000
Limited 36 block set	36	9	0.1001–0.0009	0.0001
		9	0.101 –0.109	0.001
		9	0.110 –0.190	0.010
		1	0.050	0.050
		5	0.100 –0.500	0.100
		2	1.000 –2.000	1.000
		1	4.000	4.000
Thin 28 block set	28	1	0.02005	0.00005
		9	0.0201 –0.0209	0.0001
		9	0.021 –0.029	0.001
		9	0.010 –0.090	0.010
Thin 21 block set	21	1	0.01005	0.00005
		9	0.0101 –0.0109	0.0001
		11	0.010 –0.020	0.001

EXAMPLE: For the combination of gage blocks into a specific total length. Available set of 81 blocks. Desired dimension: 1.7865 inch.

FOR A SINGLE COMBINATION		FOR TWO COMBINATIONS OF EQUAL LENGTHS			
		COMBINATION "A"		COMBINATION "B"	
DIMENSION TO COVER	GAGE BLOCKS SELECTED	DIMENSION TO COVER	GAGE BLOCKS SELECTED	DIMENSION TO COVER	GAGE BLOCKS SELECTED
1.7865		1.7865		1.7865	
– .1005	0.1005	– .1005	0.1005	– .1003	0.1003
<u>1.686</u>		<u>1.686</u>		<u>1.6862</u>	
– .136	0.136	– .146	0.146	– .1002	0.1002
<u>1.550</u>		<u>1.540</u>		<u>1.586</u>	
– .550	0.550	– .240	0.240	– .136	0.136
<u>1.000</u>		<u>1.300</u>		<u>1.450</u>	
– 1.000	1.000	– .300	0.300	– 0.650	0.650
<u>0.000</u>		<u>1.000</u>		<u>0.800</u>	
		– 1.000	1.000	– .800	0.800
		<u>0.000</u>		<u>0.000</u>	

The basic uses of the 0.5 and 1 block gauges are: a primary standard, as a reference standard for calibrating other blocks and a working standard for calibrating sensitive measuring tools

The basic applications for II block gauges is in the setting of adjustable limit gauges  
And for comparative length measurement

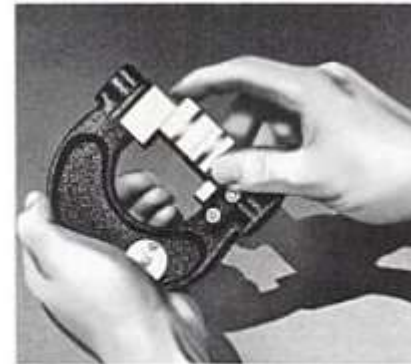


Fig. 4-10. (Left) Setting a comparator gage with the aid of gage blocks.



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Fig. 4-11. (Right) Setting a special gage—the CEJ Sine Protractor—to the desired angle with the aid of appropriate gage blocks.



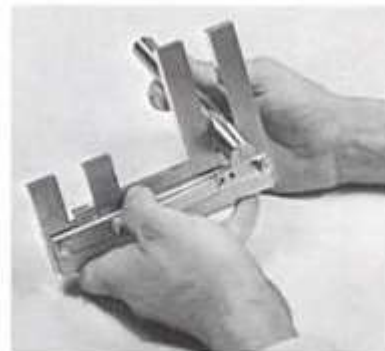
Pratt & Whitney Cutting Tool and Gage Div., Colt Industries

Fig. 4-9. Adjustable snap gage is set to the exact jaw opening with gage blocks.

The basic use of the III block gauges is in the actual measurement and  
For calibrating measuring instruments



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Do ALL Compa

Fig. 4-12. Gage blocks assembled with jaws into a limit gage with GO and NOT GO spans.

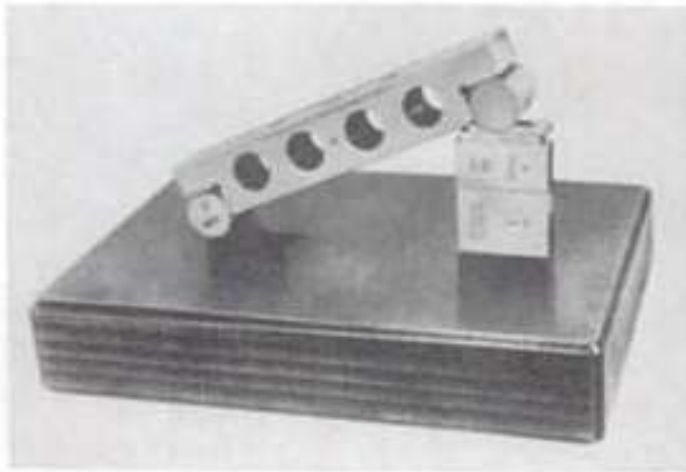


Fig. 4-14. (Left) Gage blocks assembled with foot plate and scriber jaw for surface plate layout work.



(Left) The L. S. Starrett Co.  
(Right) Do ALL Company

Fig. 4-15. (Right) Rapidly assembled comparator gage consisting of a gage block stack combined with a dial indicator.



*Brown & Sharpe Mfg. Co.*

Fig. 4-16. Sine bar supported by a gage block stack produces an accurately controlled incline.

Usually the surfaces of the gauge blocks are subject to damages the following figure Shows how to remove such minute damages



*Giddings & Lewis Measurement Systems*

Fig. 4-17. The use of a dressing stone to remove minute burrs from the wringing surface of gage blocks.