



INSTRUCTIONS FOR:
DIAL BORE GAUGE
 MODEL NO: **DBG509**

Thank you for purchasing a Sealey product. Manufactured to a high standard, this product will, if used according to these instructions, and properly maintained, give you years of trouble free performance.



IMPORTANT: PLEASE READ THESE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS & CAUTIONS. USE THE PRODUCT CORRECTLY AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY. KEEP THESE INSTRUCTIONS SAFE FOR FUTURE USE.

1. SAFETY

- WARNING! Ensure Health and Safety, local authority and general workshop practice regulations are adhered to when using tools and equipment.**
- × **DO NOT** use the dial bore gauge if damaged.
- × **DO NOT** drop.
- ✓ This is a precision instrument, always return gauge components to the internally lined storage case.
- ✓ Maintain the gauge in good and clean condition for best and safest performance.
- ✓ Keep the work area clean, uncluttered and ensure there is adequate lighting.
- ✓ Ensure the work area floor is not slippery; wear non slip shoes.
- ✓ Components to be measured and the dial bore gauge to be stored at room temperature (21°C).

2. INTRODUCTION

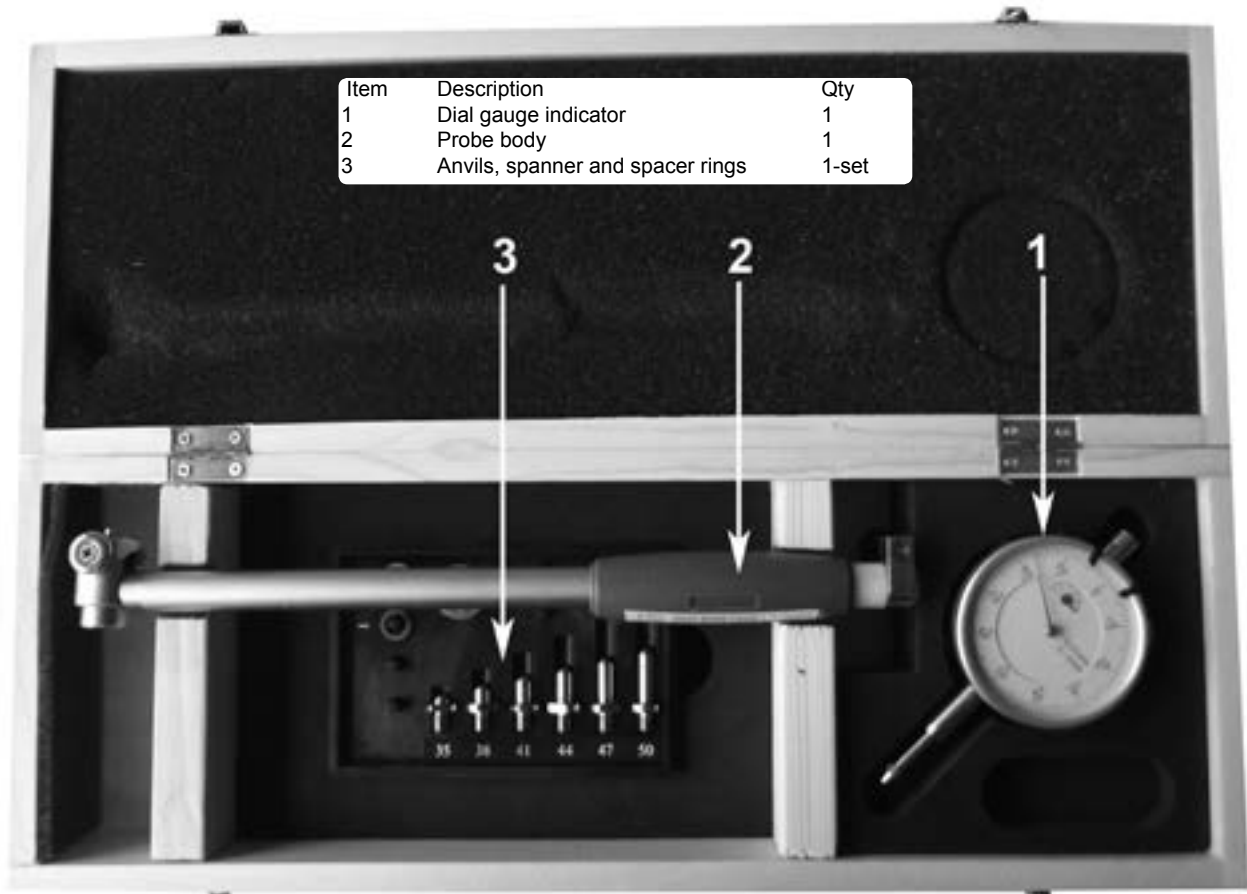
Precision mechanism with Ø55mm dial and locking rotating bezel, offering an accurate method of measuring a bore or detecting a taper or ovality. Will indicate the deviation from set size by up to 1mm with an accuracy of 0.01mm. Included with the bore gauge are; probe body, dial indicator, anvils, spacer rings. Supplied in wooden storage case. .

3. SPECIFICATION

Model No:**DBG509**
 Measuring Range:35-50mm
 Maximum Deviation Measurement (dial bore gauge):1mm
 Maximum Deviation Measurement (dial gauge separate):5mm
 Dial Bezel Diameter:.....Ø55mm
 Resolution:.....0.01mm (0.0004")

4. CONTENTS

4.1. There are 3 main components:-

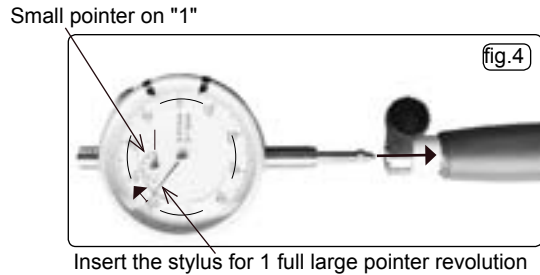
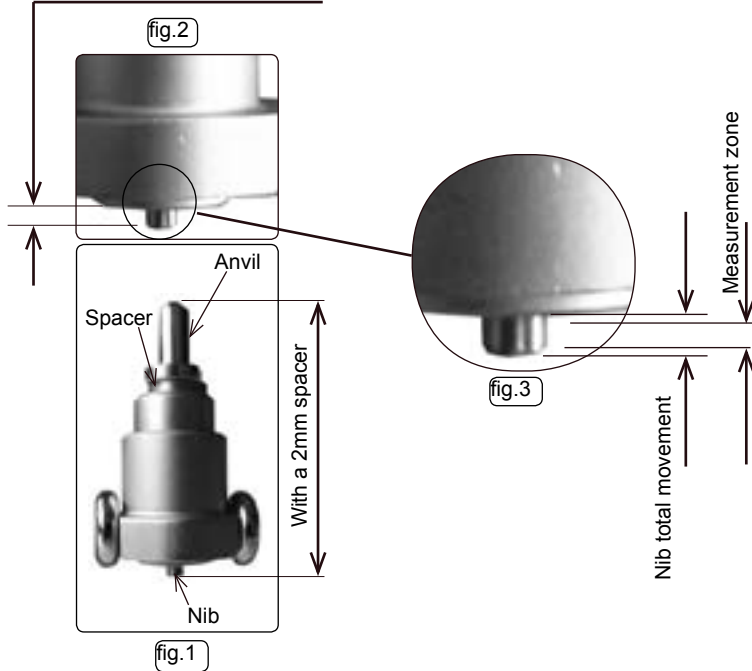


5. OPERATION

5.1. Setting up (The dial ball gauge is a comparator not a measuring tool)

- 5.1.1. Measure the bore diameter or gap to be measured to the nearest millimetre with a rule or vernier callipers. The bore or gap must range between 35mm and 50mm nominally with this tool. (Up to 52.5 with spacers)
- 5.1.2. Select the range of parts required, anvils and spacers using the table on the last page as a guide.
- 5.1.3. Assemble the dial bore gauge with selected parts as shown in fig.1. Ensure all components are clean when assembled, use the supplied spanner. **DO NOT** overtighten
- 5.1.4. Insert the dial stylus into the probe body as shown in fig.4. The stylus will meet with resistance internally and the dial pointer will begin to rotate clockwise. One complete cycle of the pointer is recommended for registration and will be indicated by the secondary dial indicator annotated 1-5. The small pointer should now be indicating "1" [one].
- 5.1.5. Clamp the dial stem with the thumb screw. **DO NOT** overtighten.

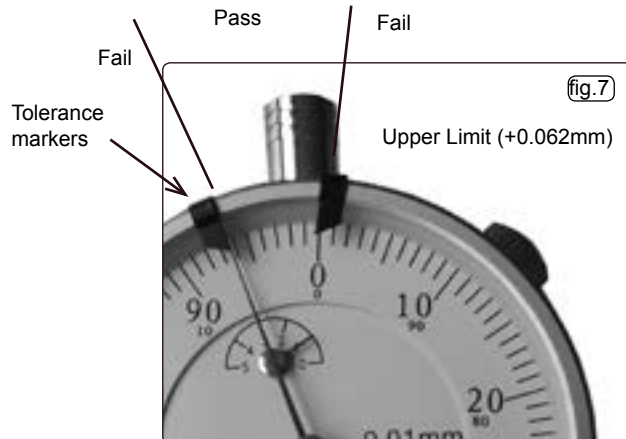
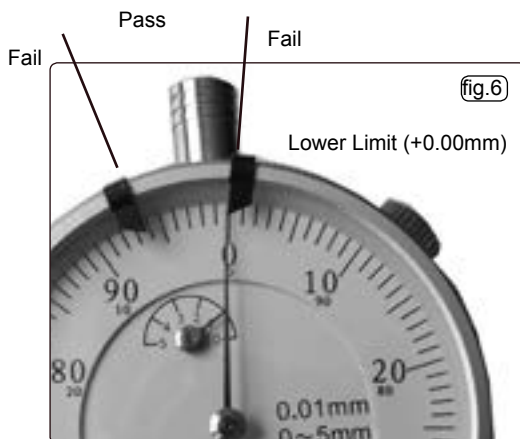
Be aware, nib projection is 2mm.
Aim for 0.5mm to 1.5mm as the measurement zone.



Use the spacer rings to achieve "x" = 36, 37, 39, 40, 42 etc..

5.2. Calibration

- 5.2.1. Depending upon accuracy requirement, calibration can be achieved with slip gauges, micrometer or vernier calipers. In our instructions example the micrometer is suggested, which has similar accuracy to the dial gauge.
- 5.2.2. Set the micrometer (25mm-50mm) to the target size "x", for example $\text{Ø}45.75$ and lock. In our example the tolerance required is H9 from BS 4500:1969 (+.062/-0).
- 5.2.3. From instruction 5.1.2 and the tables on the back page; parts required are the anvil 44 plus spacer ring 2, from item 1 in fig.5. Assemble as shown above in fig.1.
- 5.2.4. Manoeuvre the gauge anvil and nib inside the measuring gap of the micrometer (fig.11). This activity could be eased by assistance or carefully clamping the probe in a retort stand or similar.
- 5.2.5. Observe the large dial pointer movement. It is essential that the axis of the gauge anvil and spring loaded nib are centralised in the micrometer measuring faces. It is essential to observe the total sweep of the dial pointer using the small dial. Remember from the initial setting the pointer had rotated one full cycle.
- 5.2.6. When satisfied with alignment, hold the position and rotate the dial bezel until the "0" [zero] aligns with the pointer. Lock the bezel with the thumb screw. Your dial bore gauge has now been calibrated for use in a $\text{Ø}45.25$ to $\text{Ø}46.25$ bore ie $\pm 0.5\text{mm}$ of target.
- 5.2.7. The tolerance band can now be set using the two "markers" on the bezel. Our example states the tolerance band to be $+0.062$ to -0 . Set one marker opposite and in line with "0" [zero] (fig.6) and the other $+6.2$ (fig.7) divisions apart. Note! the larger the deflection the smaller the bore.



Example only; taken from Calibration text 5.2.

5.3. Accurate Measurement

5.3.1. Follow procedure 5.1.1 through 5.1.4.

5.3.2. The bore or gap machined finish must be clean with surface texture 3.2µm to 6.4µm or better than for fiducial indication.

5.3.3. Offer the anvil end into the bore slightly tilted (fig.8) with the sprung loaded carriage entering just ahead of the anvil tip. Rock the dial gauge tube to the upright position (fig.9) and beyond, observing the pointer sweep. The three point location offered by the two skirts on the spring loaded carriage and the anvil tip will centralise the head.

5.3.4. Rotate the bezel such that the "0" [zero] aligns with the largest sweep position of the pointer (fig.10).It is essential to observe the total sweep of the dial pointer using the small dial. Remember from the initial setting the pointer had rotated one full cycle. Mark the position on the component of where the measurement was taken, if required.

5.3.5. With a micrometer, measure across the anvil and the nib (fig.11), rotate the barrel of the micrometer until the dial pointer aligns with the same "0" [zero] as the measured bore. Take the reading from the micrometer and record.

5.3.6. With the bore dial gauge now set, the bore can now be measured for taper and ovality by reference back to the initial datum "0" [zero] reading and counting the 0.01mm divisions between datum and new. Note! the larger the deflection the smaller the bore.

"Rock the dial gauge tube to the upright position....."

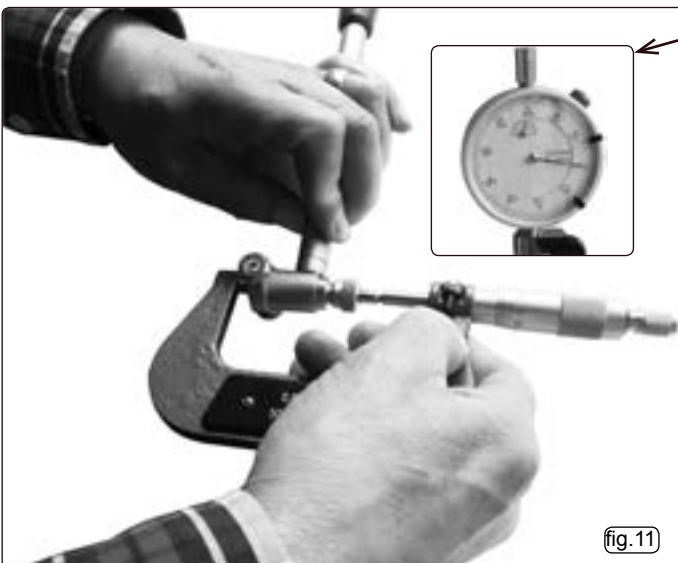
"Offer the anvil end into the bore slightly tilted...."



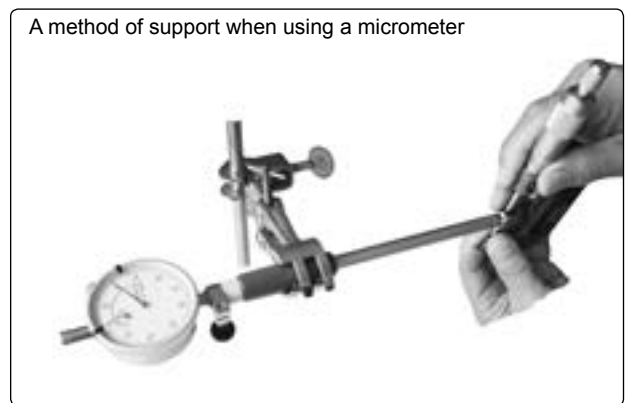
"Rotate the bezel such that the "0" [zero] aligns....."



"With a micrometer, measure across the anvil and the nib....."



A method of support when using a micrometer



6. MAINTENANCE

6.1. Keep all components dry and clean with a soft micro fibre cloth.

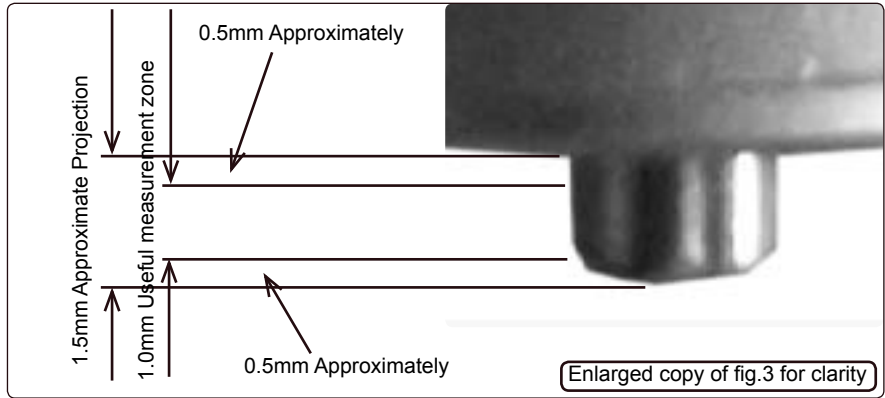
6.2. Return all items to the presentation case after use.

6.3. Store indoors in a temperature controlled dry environment, circa 21°C.

6.4. This is a precision instrument intended for use by engineers and engineering inspectors, keep out of reach of children.

Guide to Parts required versus measured size. (1mm graduations)

"x"	Anvil size	Spacer ring
34.5-35.5	35	No
35.5-36.5	35	1x1mm
36.5-37.5	35	1x2mm
37.5-38.5	38	No
38.5-39.5	38	1x1mm
39.5-40.5	38	1x2mm
40.5-41.5	41	No
41.5-42.5	41	1x1mm
42.5-43.5	41	1x2mm
43.5-44.5	44	No
44.5-45.5	44	1x1mm
45.5-46.5	44	1x2mm
46.5-47.5	47	No
47.5-48.5	47	1x1mm
48.5-49.5	47	1x2mm
49.5-50.5	50	No
50.5-51.5	50	1x1mm
51.5-52.5	50	1x2mm



Environmental Protection

Recycle unwanted materials instead of disposing of them as waste. All tools, accessories and packaging should be sorted, taken to a recycling centre and disposed of in a manner which is compatible with the environment.

Parts support is available for this product. To obtain a parts listing and/or diagram, please log on to www.sealey.co.uk, email sales@sealey.co.uk or telephone 01284 757500.

NOTE: It is our policy to continually improve products and as such we reserve the right to alter data, specifications and component parts without prior notice.

IMPORTANT: No liability is accepted for incorrect use of this product.

WARRANTY: Guarantee is 12 months from purchase date, proof of which will be required for any claim.



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