



INSTRUCTIONS FOR:
DIAL BORE GAUGE
 MODEL NO: **DBG5011**

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

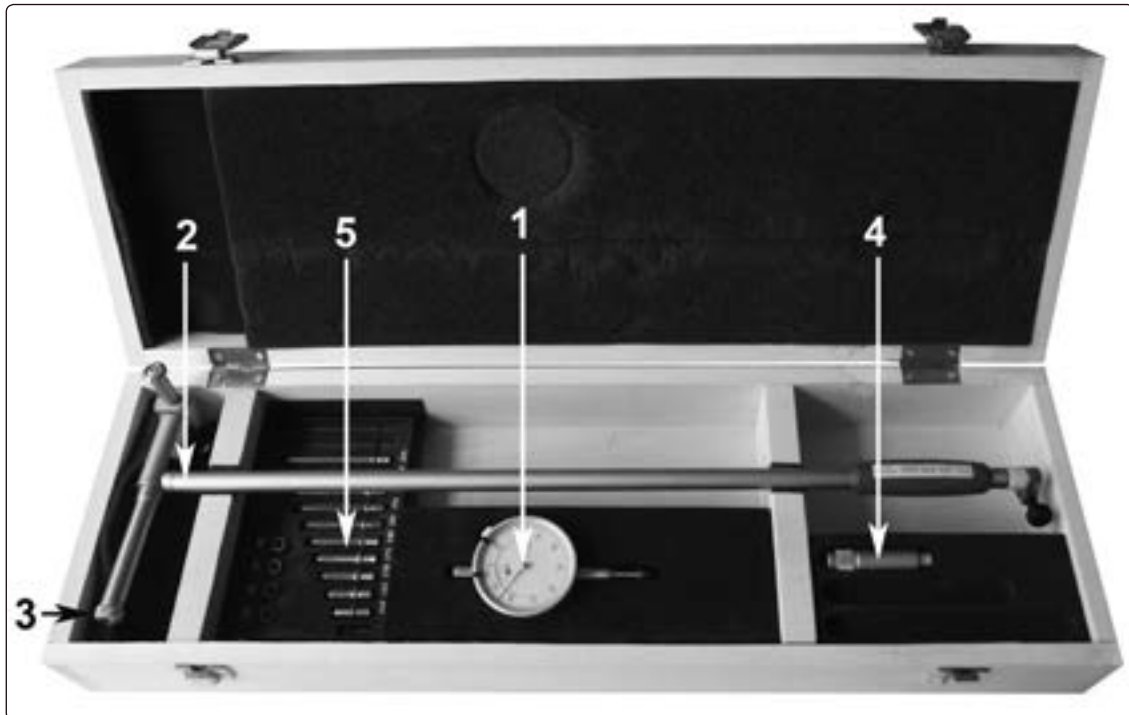
Precision mechanism with Ø55mm dial and locking rotating bezel, offering an accurate method of measuring a bore or detecting a taper or ovality. Will indicate the deviation from set size by up to 1mm with an accuracy of 0.01mm. Included with the bore gauge are; probe body, dial indicator, anvils, spacer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

3. SPECIFICATION

Model No: **DBG5011**
 Measuring Range: 160-250mm
 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 5 main components:-

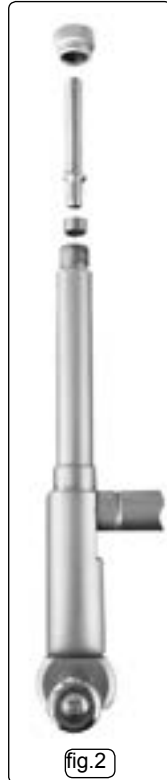
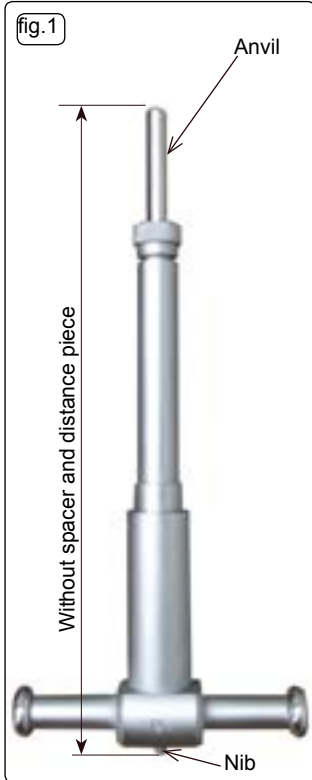


Item	Description	Qty
1	Dial gauge indicator	1
2	Probe body	1
3	Clamp Screw	1
4	Distance piece (50mm)	1
5	Anvils and spacer rings	1-set

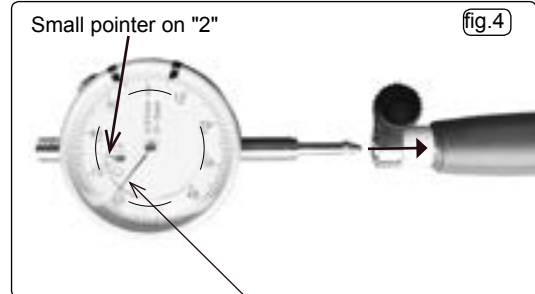
5. OPERATION

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

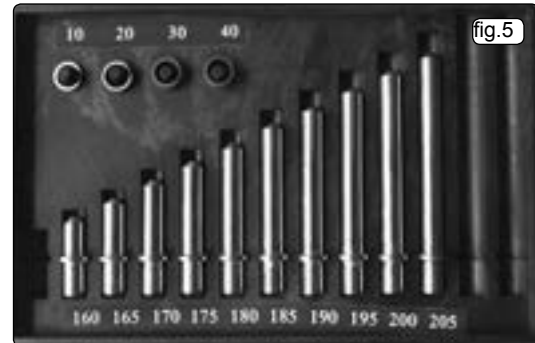
- 5.1.1. Measure the bore diameter or gap to be measured to the nearest millimetre with a rule or vernier callipers. The bore or gap must range between 160mm and 250mm nominally with this tool. (Up to 255.5 with spacers)
- 5.1.2. Select the range of parts required, anvils, spacers and 50mm distance piece using the table on the last page.
- 5.1.3. Assemble the dial bore gauge with selected parts as shown in fig.1, fig.2 and fig.3. Ensure all components are clean and when assembled are finger and thumb tight; no tools are to be used.
- 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. Two complete cycles 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 "2" [two].
- 5.1.5. Clamp the dial stem with the thumb screw. **DO NOT** overtighten.



With 50mm distance piece



Insert the stylus for 2 full large pointer CW revolutions



Use the spacer rings to achieve "x" = 161,162,163,164,166 etc..
Use the distance piece to achieve "x" = 210 and up to 255 nominally

5.2. Calibration

- 5.2.1. Depending upon accuracy requirement, calibration can be achieved with slip gauges, micrometer or vernier callipers. In our instructions example the micrometer is suggested, which has similar accuracy to the dial gauge.
- 5.2.2. Set the micrometer (150mm-175mm) to the target size "x", for example $\varnothing 163.50$ and lock. In our example the tolerance required is H9 from BS 4500:1969 (+0.100/-0).
- 5.2.3. From instruction 5.1.2 and the tables on the back page; parts required are the anvil 160 plus spacer ring 30 or 40, from item 5 in fig.1. Assemble as shown above in fig.2.
- 5.2.4. Manoeuvre the gauge anvil and nib inside the measuring gap of the micrometer (fig.8). This activity could be eased by assistance or carefully clamping the dial bore gauge in a retort stand for example.
- 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 two full cycles.
- 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 $\varnothing 163.00$ to $\varnothing 164.00$ bore ie ± 0.5 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 +0.100 to -0. Set one marker opposite and in line with "0" [zero] (fig.6) and the other +10 (fig.7) divisions apart. Note! the larger the deflection the smaller the bore.

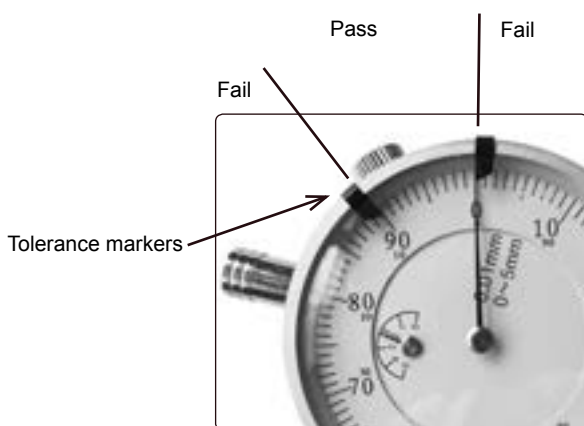


fig.6

Example for reference only

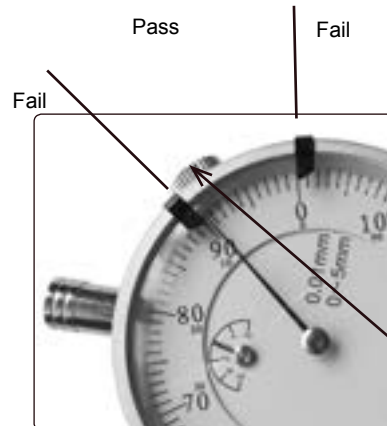
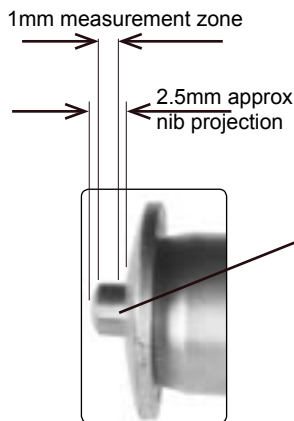
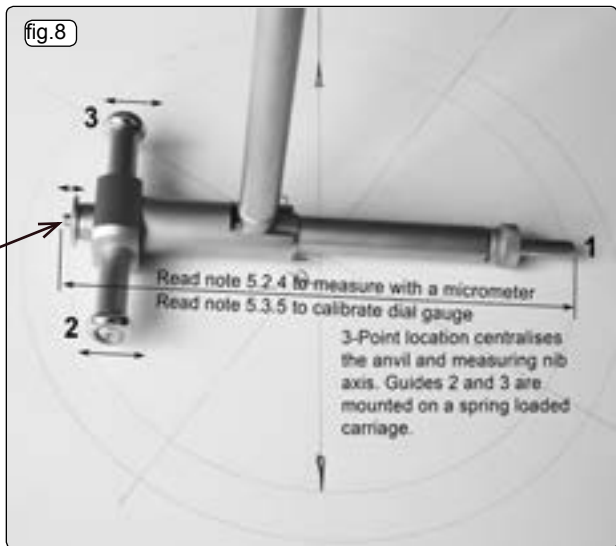


fig.7

Bezel clamping screw. Please note the tolerance markers will not pass the screw when clamped.



Be aware, nib projection is 2.5mm. Aim for 0.75mm to 2.25mm as the measurement zone.



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 $3.2\mu\text{m}$ to $6.4\mu\text{m}$ or better than, for fiducial indication.
- 5.3.3. Offer the anvil end into the bore slightly tilted (fig.8 and example fig.10) with the sprung loaded carriage entering just ahead of the anvil tip. Rock the dial gauge tube to the upright position (example fig.11) and beyond, observing the pointer sweep. The three point location offered by the two guides on the spring loaded carriage and the anvil tip will centralise the head (fig.8).
- 5.3.4. Rotate the bezel such that the "0" [zero] aligns with the largest sweep position of the pointer (fig.9). 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 two full cycles. 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.8), 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.

fig.10 generic



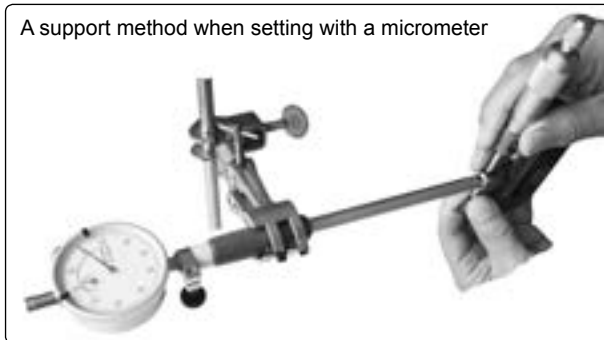
fig.11 generic



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

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

A support method when setting with 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
159.5-160.5	160	No
160.5-161.5	160	1x1mm(10)
161.5-162.5	160	1x2mm(20)
162.5-163.5	160	1x3mm(30)
163.5-164.5	160	1x4mm(40)
164.5-165.5	165	No
165.5-166.5	165	1x1mm
166.5-167.5	165	1x2mm
167.5-168.5	165	1x3mm
168.5-169.5	165	1x4mm
169.5-170.5	170	No
170.5-171.5	170	1x1mm
171.5-172.5	170	1x2mm
172.5-173.5	170	1x3mm
173.5-174.5	170	1x4mm
174.5-175.5	175	No
175.5-176.5	175	1x1mm
176.5-177.5	175	1x2mm
177.5-178.5	175	1x3mm
178.5-179.5	175	1x4mm

"x"	Anvil size	Spacer ring
179.5-180.5	180	No
180.5-181.5	180	1x1mm
181.5-182.5	180	1x2mm
182.5-183.5	180	1x3mm
183.5-184.5	180	1x4mm
184.5-185.5	185	No
185.5-186.5	185	1x1mm
186.5-187.5	185	1x2mm
187.5-188.5	185	1x3mm
188.5-189.5	185	1x4mm
189.5-190.5	190	No
190.5-191.5	190	1x1mm
191.5-192.5	190	1x2mm
192.5-193.5	190	1x3mm
193.5-194.5	190	1x4mm
194.5-195.5	195	No
195.5-196.5	195	1x1mm
196.5-197.5	195	1x2mm
197.5-198.5	195	1x3mm
198.5-199.5	195	1x4mm

"x"	Anvil size	Spacer ring
199.5 - 200.5	200	No
200.5-201.5	200	1x1mm
201.5-202.5	200	1x2mm
202.5-203.5	200	1x3mm
203.5-204.5	200	1x4mm
204.5-205.5	205	No
205.5-206.5	205	1x1mm
206.5-207.5	205	1x2mm
207.5-208.5	205	1x3mm
208.5-209.5	205	1x4mm

"x"	Anvil size	Spacer ring	Distance piece
209.5-210.5	160	No	Yes
210.5-211.5	160	1x1mm	Yes
211.5-212.5	160	1x2mm	Yes
212.5-213.5	160	1x3mm	Yes
213.5-214.5	160	1x4mm	Yes
214.5-215.5	165	No	Yes
215.5-216.5	165	1x1mm	Yes
216.5-217.5	165	1x2mm	Yes
217.5-218.5	165	1x3mm	Yes
218.5-219.5	165	1x4mm	Yes
219.5-220.5	170	No	Yes
220.5-221.5	170	1x1mm	Yes
221.5-222.5	170	1x2mm	Yes
222.5-223.5	170	1x3mm	Yes
223.5-224.5	170	1x4mm	Yes
224.5-225.5	175	No	Yes
225.5-226.5	175	1x1mm	Yes
226.5-227.5	175	1x2mm	Yes
227.5-228.5	175	1x3mm	Yes
228.5-229.5	175	1x4mm	Yes
229.5-230.5	180	No	Yes
230.5-231.5	180	1x1mm	Yes
231.5-232.5	180	1x2mm	Yes
232.5-233.5	180	1x3mm	Yes
233.5-234.5	180	1x4mm	Yes

"x"	Anvil size	Spacer ring	Distance piece
234.5-235.5	185	No	Yes
235.5-236.5	185	1x1mm	Yes
236.5-237.5	185	1x2mm	Yes
237.5-238.5	185	1x3mm	Yes
238.5-239.5	185	1x4mm	Yes
239.5-240.5	190	No	Yes
240.5-241.5	190	1x1mm	Yes
241.5-242.5	190	1x2mm	Yes
242.5-243.5	190	1x3mm	Yes
243.5-244.5	190	1x4mm	Yes
244.5-245.5	195	No	Yes
245.5-246.5	195	1x1mm	Yes
246.5-247.5	195	1x2mm	Yes
247.5-248.5	195	1x3mm	Yes
248.5-249.5	195	1x4mm	Yes
249.5-250.5	200	No	Yes
250.5-251.5	200	1x1mm	Yes
251.5-252.5	200	1x2mm	Yes
252.5-253.5	200	1x3mm	Yes
253.5-254.5	200	1x4mm	Yes
254.5-255.5	205	No	Yes
255.5-256.5	205	1x1mm	Yes
256.5-257.5	205	1x2mm	Yes
257.5-258.5	205	1x3mm	Yes
258.5-259.5	205	1x4mm	Yes



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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