



12 MEASURING SYSTEMS AND TOOLS

? FREQUENTLY ASKED QUESTION

What Weighs a Gram?

To better understand the metric system measurements, it is often helpful to visualize a certain object and relate it to a metric unit of measure. For example, the following objects weigh about 1 gram.

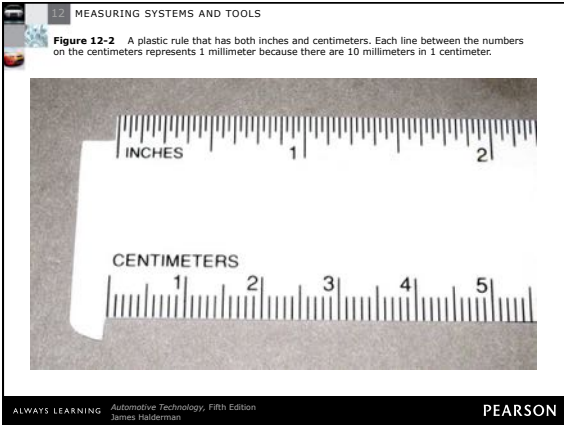
- A dollar bill
- A small paper clip

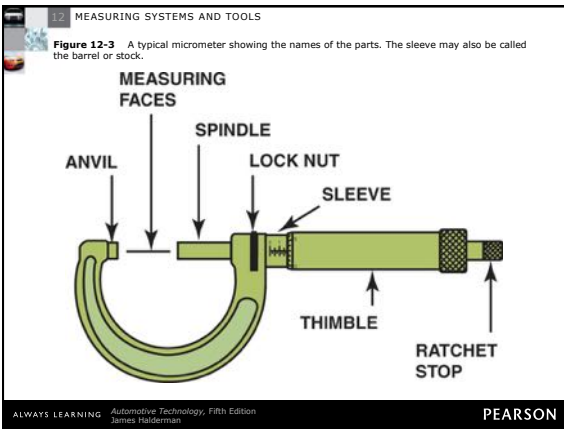
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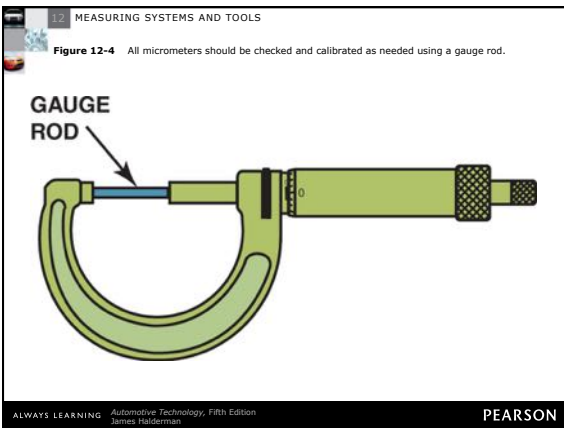
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Figure 12-1 A rule showing that the larger the division, the longer the line.

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Figure 12-5 The three micrometer readings are (a) 0.0212 in.; (b) 0.0775 in.; (c) 0.5280 in. These measurements used the vernier scale on the sleeve to arrive at the ten-thousandth measurement. The number that is aligned represents the digit in the ten-thousandth place.

0.0212 INCH (a) 0.0775 INCH (b) 0.5280 INCH (c)

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Figure 12-6 Metric micrometer readings that use the vernier scale on the sleeve to read to the nearest 0.001 millimeter. The arrows point to the final reading for each of the three examples.

0.187 MM (a) 3.601 MM (b) 5.530 MM (c)

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Figure 12-7 Using a micrometer to measure the connecting rod journal for out-of-round and taper.

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Figure 12-8 Crankshaft journal measurements. Each journal should be measured in at least six locations, but also in position A and position B and at 120-degree intervals around the journal.

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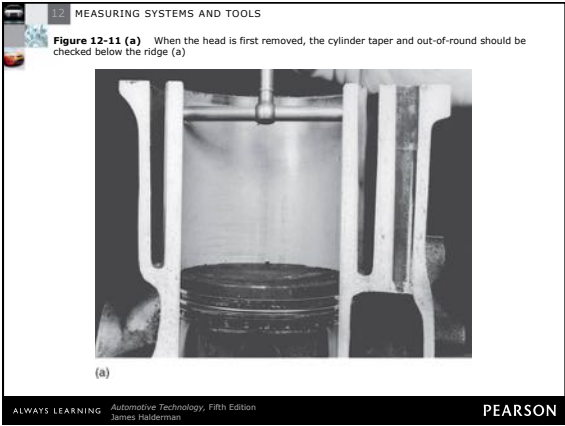
Figure 12-9 Camshaft journals should be measured in three locations, 120 degrees apart, to check for out-of-round.

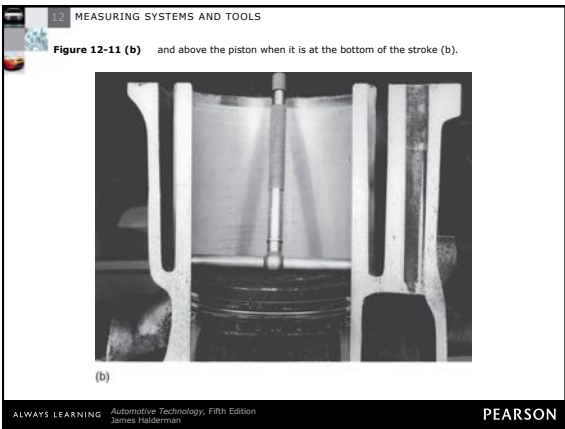
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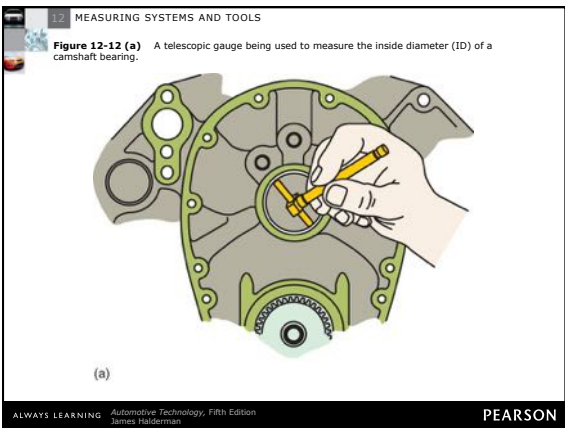
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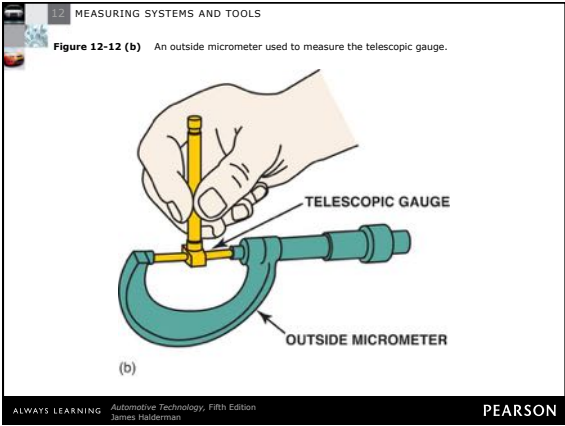
Figure 12-10 Checking a camshaft for wear by measuring the lobe height with a micrometer.

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1.2 MEASURING SYSTEMS AND TOOLS

FREQUENTLY ASKED QUESTION

What Is the Difference Between the Word Gage and Gauge?

The word gage means "measurement or dimension to a standard of reference." The word gauge can also be spelled gage. Therefore, in most cases, the words mean the same.

INTERESTING NOTE: One vehicle manufacturing representative told me that gage was used rather than gauge because even though it is the second acceptable spelling of the word, it is correct and it saved the company a lot of money in printing costs because the word gage has one less letter! One letter multiplied by millions of vehicles with gauges on the dash and the word gauge used in service manuals adds up to a big savings to the manufacturer.

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