

Introduction to Automotive Service

Precision Measuring

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Introduction to Automotive Service

Precision Measuring Tools

- Machinists ruler
- Micrometers
 - inside and outside
- Vernier dial caliper
- Dial indicators
- Depth gauges
- Feeler gauges



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Linear Measure

- American system
 - Fractions - 1/2" through 1/64" increments are common
 - Decimals - tolerances of .001" or less are common
- Metric system
 - Tolerances of .01 mm are common

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Conversions

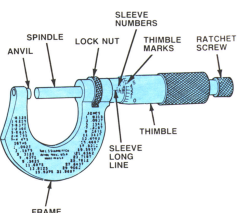
<ul style="list-style-type: none"> • Linear measure <ul style="list-style-type: none"> • 25.4 millimeters = 1 inch • Pressure <ul style="list-style-type: none"> • 6.89 kilopascals = 1 pound per square inch • Power <ul style="list-style-type: none"> • .746 kilowatts = 1 horsepower • Torque <ul style="list-style-type: none"> • 1.36 Newton meters = 1 foot pound 	<ul style="list-style-type: none"> • Volume <ul style="list-style-type: none"> • .016 liter = 1 cubic inch • Mass/Weight <ul style="list-style-type: none"> • .45 kilogram = 1 pound • Temperature <ul style="list-style-type: none"> • Celsius = (F - 32) X 5/9 • Fahrenheit = (C X 9/5) + 32
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Micrometer Parts

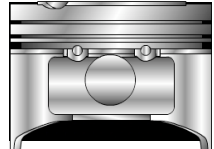
- Anvil
- Spindle
- Frame
- Thimble
- Sleeve or barrel
- Datum line or long sleeve line



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Using Outside Micrometers

- Used to measure diameter and thickness
- May be used with hole gauges or telescoping gauges to measure inside diameters
- Accurate to 0.001"
 - 0.0001" with a vernier scale
- Watch video



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Reading a Micrometer

- Read the highest number (tenths of an inch) visible on the sleeve
 - each increment = .100
- Read the number of lines visible on the sleeve beyond the highest figure
 - each increment = .025
- Read the line on the thimble aligning with the datum line
 - each increment = .001
- Total all of the readings

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Using a Dial Indicator

- Used to measure run-out or travel
- Available with rigid or flexible brackets
- Available a variety mounting base styles
 - fixed
 - magnetic
 - Visegrip
- Watch video



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Using a Feeler Gauge

- Used to measure clearances
- May be used with a precision straight edge to check for warped components
- Watch video

