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Mitutoyo 209-551

Mitutoyo 209-551 Digimatic Caliper Gauge Instruction Manual

Model: 209-551 | Brand: Mitutoyo

1. INTRODUCTION AND OVERVIEW

The Mitutoyo 209 series Digimatic internal tube thickness caliper gauge is designed for precise internal dimension (ID) measurements. It features a combination analog/digital LCD display and a large measuring depth, making it suitable for measuring hole diameters, groove thickness, tube thickness, and other hard-to-reach internal dimensions. This model, 209-551, has a measurement range of 0.20-0.59 inches, a resolution of 0.0002 inches, and an accuracy of +/-0.0008 inches. It meets IP67 specifications, indicating resistance to dust and temporary submersion in liquid.

Key features include Statistical Process Control (SPC) data output for transmitting results to a miniprocessor or computer, and an easy-to-read analog/digital LCD readout with selectable inch/metric units. The unit is powered by a single AA battery.

2. SAFETY INFORMATION

- Always handle the caliper gauge with care to prevent damage to its precision components.
- Avoid dropping the instrument or subjecting it to strong impacts.
- Do not attempt to disassemble the caliper gauge, as this may void the warranty and cause damage.
- Keep the instrument clean and free from dust, dirt, and corrosive substances.
- Store the caliper gauge in its protective case when not in use, in a dry environment away from direct sunlight or extreme temperatures.
- Ensure the battery compartment is securely closed to maintain IP67 rating.

3. PRODUCT COMPONENTS

The Mitutoyo 209-551 Caliper Gauge consists of the following main parts:

- **Pointed Jaws:** Designed for internal measurements of holes, grooves, and tubes.
- **Main Body:** Houses the electronic components and display.
- **LCD Display:** Shows measurement readings in both analog and digital formats.
- **Control Buttons:**
 - **ON/OFF:** Powers the unit on or off.
 - **MODE:** Switches between measurement modes or functions.
 - **SET:** Used for setting parameters or presetting values.
 - **DATA:** Activates data output for SPC.

- **Inch/Metric:** Toggles between inch and metric measurement units.
- **Battery Compartment:** Located on the back, for a single AA battery.



Figure 3.1: The Mitutoyo 209-551 Digimatic Caliper Gauge stored in its protective wooden case. The image displays the blue main body with its LCD screen and control buttons, along with the pointed measuring jaws.

4. SETUP

4.1 Battery Installation

1. Locate the battery compartment cover on the rear of the caliper gauge.
2. Carefully remove the cover.
3. Insert one AA battery, ensuring correct polarity (+/-) as indicated inside the compartment.
4. Replace the battery compartment cover securely to maintain the IP67 rating.

4.2 Initial Cleaning

Before first use, gently wipe the measuring surfaces and the main body with a clean, dry, lint-free cloth. Avoid using solvents or abrasive cleaners.

4.3 Power On and Zero Setting

1. Press the **ON/OFF** button to power on the caliper gauge.
2. Ensure the measuring jaws are fully closed and clean.
3. Press the **ZERO** button (often integrated with ON/OFF or a separate button) to set the display to zero. This establishes the reference point for all subsequent measurements.

5. OPERATING INSTRUCTIONS

5.1 Power On/Off

- To turn on, press the **ON/OFF** button.
- To turn off, press and hold the **ON/OFF** button for a few seconds, or the unit will automatically power off after a period of inactivity to conserve battery life.

5.2 Inch/Metric Conversion

Press the **Inch/Metric** button to switch between imperial (inches) and metric (millimeters) measurement units. The selected unit

will be displayed on the LCD.

5.3 Taking an Internal Measurement

1. Ensure the caliper is zeroed correctly.
2. Carefully insert the pointed jaws into the feature to be measured (e.g., a hole, groove, or tube).
3. Open the jaws until they make firm, but not excessive, contact with the internal surfaces.
4. Read the measurement directly from the LCD display. The analog scale provides a quick visual reference, while the digital display offers precise numerical values.
5. For consistent results, take multiple readings and average them, especially for critical dimensions.

5.4 Data Output (SPC)

The caliper gauge is equipped with a data output port. To transmit measurement data for Statistical Process Control (SPC), connect an appropriate interface cable (sold separately) to the port and to a Mitutoyo miniprocessor or computer. Press the **DATA** button to send the current reading.

6. MAINTENANCE

6.1 Cleaning

- After each use, wipe down the entire instrument, especially the measuring surfaces, with a clean, dry, lint-free cloth.
- Do not use harsh chemicals, solvents, or abrasive materials, as these can damage the finish or electronic components.
- For stubborn dirt, a cloth lightly dampened with isopropyl alcohol may be used, followed by a dry wipe.

6.2 Storage

- Always store the caliper gauge in its original protective case when not in use.
- Store in a clean, dry environment, away from direct sunlight, high humidity, and extreme temperature fluctuations.
- Ensure the jaws are slightly open (not fully closed) to prevent stress on the measuring surfaces during long-term storage.

6.3 Battery Replacement

When the battery indicator appears on the LCD, replace the AA battery as described in Section 4.1. Prompt replacement ensures continuous accurate operation.

6.4 Calibration

For maintaining optimal accuracy, periodic professional calibration by an authorized Mitutoyo service center or a certified calibration laboratory is recommended. The frequency of calibration depends on usage and environmental conditions.

7. TROUBLESHOOTING

Problem	Possible Cause	Solution
Display does not turn on.	Dead or incorrectly installed battery.	Replace the battery, ensuring correct polarity.

Problem	Possible Cause	Solution
Inaccurate or inconsistent readings.	Measuring surfaces are dirty. Caliper not zeroed correctly. Improper measurement technique. Instrument requires calibration.	Clean measuring surfaces thoroughly. Re-zero the caliper with jaws closed. Ensure firm, consistent contact with the workpiece. Consider professional calibration.
Display shows "Low Battery" indicator.	Battery is running low.	Replace the AA battery immediately.

8. SPECIFICATIONS

Feature	Detail
Model Number	209-551
Measurement Range	0.20 - 0.59 inches
Resolution	0.0002 inches
Measurement Accuracy	+/-0.0008 inches
Measurement System	Inch/Metric
IP Rating	IP67 (Dust and temporary submersion resistant)
Power Source	1 x AA Battery
Material	Stainless Steel
Special Features	Data Output (SPC)
Item Weight	454 g
Parcel Dimensions	20.32 x 17.02 x 8.13 cm

9. WARRANTY AND SUPPORT

For warranty information, technical support, or service inquiries regarding your Mitutoyo 209-551 Digimatic Caliper Gauge, please contact your authorized Mitutoyo dealer or visit the official Mitutoyo website. Please have your model number and purchase details available when seeking support.