SURFACE VEHICLE RECOMMENDED PRACTICE

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Brake Pads, Lining, Disc, and Drum Wear Measurements

RATIONALE

As the industry continues to move toward new rotor coatings with an objective of zero wear, it is becoming more and more relevant the revision of the methodology SAE recommends in terms of wear measurements on brake components. This revision will be focused on exploring improvements that can ensure a more consistent way to measure rotor and pad thickness as well as review the possibility of improving the required resolution of the equipment used.

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Full document details: SAE J2986-2026 Brake Pads, Lining, Disc, and Drum Wear Measurements

1. SCOPE

This SAE Recommended Practice provides a common method to measure wear of friction materials (brake pad assemblies and brake shoes) and their mating parts (brake disc or brake drum). These wear measurements apply to brakes fitted on passenger cars and light trucks up to 4536 kg of Gross Vehicle Weight Rating under the Federal Motor Vehicle Safety Standard (FMVSS), or vehicles category M1 (passenger cars up to nine occupants, including the driver) under the European Community's ECE Regulations.

1.1 Purpose

This SAE Recommended Practice provides a measurement method to quantify and report mass and thickness of friction materials, discs, and drums.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 ISO Publications

Copies of these documents are available online at www.iso.org/store.

ISO/PAS 22574 Road Vehicles - Brake Lining Friction Materials - Visual Inspections

ISO 7629 Road Vehicles - Brake Linings - Disc Brake Pads - Evaluation of Surface and Material Flaws After Testing

3. MEASUREMENT CAPABILITIES

Unless otherwise indicated or approved by the test requestor prior to conducting the measurement, ensure the minimum measurement capabilities indicated below.

3.1 Micrometer, or equivalent device (contact or noncontact), with:

3.1.1 If possible, use a spring-loaded micrometer to reduce user variability.

3.1.2 Resolution of 0.01 mm for brake pads and 0.001 mm for the rotor.

3.1.3 Flat surface(s) on the side(s) contacting the friction material or anti-noise shims.

3.1.4 Ratchet mechanism to limit the clamping force exerted during measurements.

3.2 Digital/Vernier caliper, or equivalent device (contact or noncontact), with an accuracy of 0.01 mm or better, for internal drum wear measurements.

3.3 Weighing scale with an accuracy of 0.1 g or better.

3.4 Digital camera with a resolution equivalent to 300 dpi or better.

3.5 Measuring devices, grids, templates, markers, etc., to ensure the proper location of the measurement position.

3.6 Records, forms, or data entry templates to assign the values measured to a specific test, part number, and section.

3.7 Measurement room with control of air temperature and humidity.

NOTE: These conditions may be waived when the measurement needs to happen in situ at the test equipment, or when the measurements are taken in the field (e.g., during vehicle testing).

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4. MEASUREMENT POSITIONS

4.1 Brake Pad Assemblies

4.1.1 Mark (or determine using XY coordinates) eight positions equally spaced, marked one through eight. Marking positions on brake pads are to be drill pointed approximately 1 mm deep except for noise testing. For noise testing, measure pads using a flat end micrometer without drill points to avoid damaging noise insulators.

4.1.2 Position 1 is on the outer diameter on the leading edge when looking at the friction side.

4.1.3 Continue labeling in the clockwise direction, so Position 8 is on the inner diameter on the leading edge.

4.1.4 Locate the measurement positions (dimension “a”) approximately 5 mm from any edge of the friction material surface (outer or inner diameters, chamfers, or slots). See Figure 1.

4.1.5 Ensure positions 1, 4, 5, and 8 are located on their respective edges of the friction material following dimension “a.”

4.1.6 To determine the location of positions 2, 3, 6, and 7, measure the distance (in the x-axis) of position 1 with 4 and 5 with 8 (dimension “b”). Divide this by 3 to determine the fixed distance between all points (dimension “c”), ensuring dimension a is respected by all 8 positions. Ensure to avoid special features like slots, chamfers, etc.

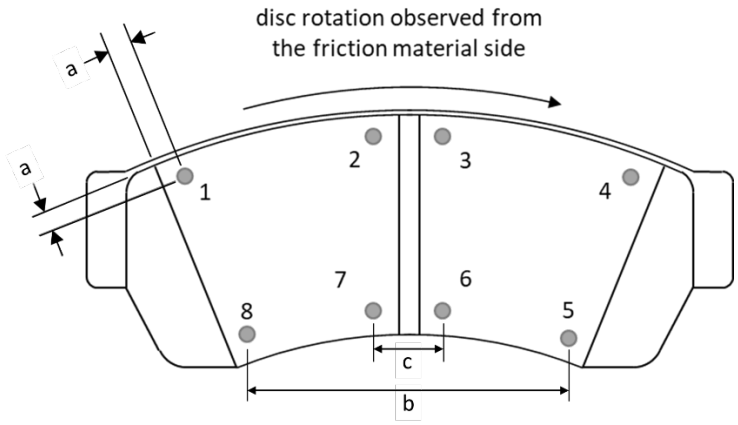


Figure 1 - Measurement positions for brake pad assemblies

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