



SURFACE VEHICLE RECOMMENDED PRACTICE

J2986™

JAN2019

Issued

2019-01

Brake Pads, Lining, Disc, and Drum Wear Measurements

RATIONALE

Measuring mass and thickness loss of friction materials (brake pad assemblies and brake-lined shoes) and their mating parts (brake discs or brake drums) is a common practice during most inertia dynamometer and vehicle tests. Mass and thickness loss are some of the main criteria to assess the performance and behavior of the wearable brake components. This makes repeatable and reproducible wear measurements a must. This Recommended Practice presents the default measurement methods for the parts in the friction couple. SAE J2986 can be considered as a companion document to supplement laboratory or vehicle test and measurement programs.

The measurement methods presented in this Recommended Practice are useful to determine and report the mass and thickness properties (initial, intermediate, and final) of the friction couple or individual components. These measurements apply to brake parts preparation for mechanical testing, or other testing inducing wear or dimensional changes on the friction materials or their mating components.

TABLE OF CONTENTS

1.	SCOPE.....	2
1.1	Purpose.....	2
2.	REFERENCES.....	2
2.1	Related Publications	2
2.1.1	ISO Publications.....	2
3.	MEASUREMENT CAPABILITIES.....	2
4.	MEASUREMENT POSITIONS	3
4.1	Brake Pad Assemblies	3
4.2	Brake Shoe Assemblies	3
4.3	Brake Discs	4
4.4	Brake Drums	5
5.	MINIMUM MEASUREMENT PROCEDURE.....	6
6.	NOTES.....	7
6.1	Revision Indicator.....	7
Figure 1	Measurement positions for brake pad assemblies	3
Figure 2	Measurement positions for brake shoe assemblies.....	4
Figure 3	Measurement positions for brake discs (example for left-hand side)	5
Figure 4	Measurement positions for brake drums (example for left-hand side)	6

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be revised, reaffirmed, stabilized, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2019 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
http://www.sae.org

SAE WEB ADDRESS:

Full document details: SAE J2986_201901

SAE values your input. To provide feedback on this Technical Report, please visit http://standards.sae.org/J2986_201901

Documents
Document Sharing Hub

1. SCOPE

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

2. REFERENCES

2.1 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.1.1 ISO Publications

Copies of these documents are available online at <http://webstore.ansi.org/>.

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 Resolution of 0.01 mm or better.

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

3.1.3 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 Weighting 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 insitu at the test equipment, or when the measurements are taken in the field (e.g., during vehicle testing).

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 except for noise testing.
- 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.

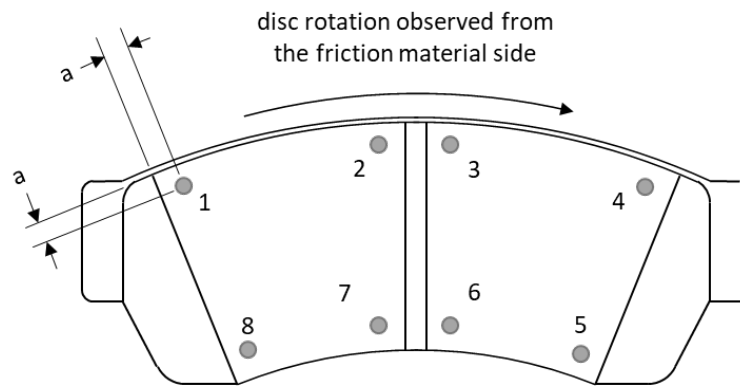


Figure 1 - Measurement positions for brake pad assemblies

4.2 Brake Shoe Assemblies

- 4.2.1 Mark (or determine using XYZ coordinates) eight positions equally spaced, marked one through eight.
- 4.2.2 Position 1 is on the inner side of the brake shoe (on the mounting side of the drum), on the short edge closest to the wheel cylinder, when looking at the friction side.
- 4.2.3 Continue labeling in the clockwise direction, so Position 8 is on the outer edge of the brake shoe, on the short edge closest to the wheel cylinder.
- 4.2.4 Locate the measurement positions (dimension “a”) at the midpoint between the lining edge and the nearest edge of the shoe web.
- 4.2.5 Keep at least 10 mm or 20% of the total lining width from the long edge of the friction material surface (outer or inner surfaces).
- 4.2.6 Keep dimension “b” at least 10 mm from chamfers, or edges on the long side of the friction material. See Figure 2.