



Braking Distance in Wet Conditions

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. Determination of the wet-surface braking performance of various tire makes and sizes whilst braking with locked wheels or ABS. Measurements with locked wheels are only performed on vehicles not equipped with ABS as standard.

1.2 Applicability. For all tires.

1.3 Remarks. Not applicable.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW14264

3 Resources

3.1 Facilities.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.1.3 Wetted asphalt road, e.g. Conti Co. (Contidrom).

3.1.4 Test center Bridgestone / Firestone (Rome).

3.2 Equipment.

3.2.1 DIGITALKER measuring system (or equivalent) for stopping distance measurement.

3.2.2 Evaluation computer for preparation of the DIGITALKER data.

3.2.3 V-Box for speed and distance measuring.

3.2.6 Device for lateral guidance on the rail if possible, otherwise not guided driving also permitted.

3.2.7 Load: Driver + measuring instruments.

3.2.8 Four (4) test wheels and 4 reference tires.

3.3 Test Vehicle/Test Piece. Test vehicle equipped with tires according to paragraph 3.2.8.

3.4 Test Time.

Calendar time: 1 day

Test hours: 3 h

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November 2016

Page 1 of 4

Coordination hours: 2 h

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Not applicable.

4 Procedure

4.1 Preparation.

4.1.1 The test tires shall be run in appropriately. The tires shall be adjusted to partial load pressure, eventually ECO pressure.

4.1.2 The watering device shall be switched on. It shall be ensured that the water can drain away at the side of the road, constant watering is required.

4.1.3 Braking on the test track, i.e. $\approx 15 \times$ braking with old tires from $v = 90$ km/h to a standstill. Braking starts ≈ 5 m before the test braking point.

4.1.4 The DIGITALKER measuring system shall be set and calibrated as specified.

($v_{\text{start}} = 80$ km/h; $v_{\text{end}} = 20$ km/h)

4.2 Conditions.

4.2.1 Environmental Conditions. The road surface and the air temperature shall be noted every hour.

4.2.1.1 Temperatures.

Summer tires: (+10 to +30) °C

Winter tires: (+5 to +15) °C

ALS tires: (+10 to +30) °C

4.2.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.3 Instructions.

4.3.1 Braking with ABS.

4.3.1.1 The test series begins with a reference tire, which is already known from previous tests.

4.3.1.2 Sequence of tests in a series:

Reference tire $\rightarrow$ Test tire $\rightarrow$ Reference $\rightarrow$ 2 Test sets $\rightarrow$ Reference.

This is necessary for tendency compensation.

4.3.1.3 The vehicle shall be accelerated to $v = 90$ km/h on the measuring rail and kept at a constant speed (external display).

4.3.1.4 The gears shall be disengaged before the marked braking point. At braking point the full brake pressure shall be applied and kept until $v = 0$ km/h.

4.3.1.5 At least 7 measurements shall be performed per tire set, at least 5 results shall be within 1 m. Measurement is valid, if the control interventions of ABS are smooth and constant.

5 Data

5.1 Calculations. Not applicable.

5.2 Interpretation of Results.

5.2.1 Read out the DIGITALKER measured values. The evaluation program calculates the mean values for the stopping distances of each tire set as well as the tendency compensation based on the values for the reference tire.

5.2.2 Subjective rating according to GMW14264.

Results shall be compared with CTS targets.

5.3 Test Documentation. The test data shall be added to the Wet Braking Calculation Chart according to Appendix A and represented in a test report with reference to this Test Procedure.

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November 2016

Page 2 of 4