



Hydroplaning, Lateral Direction

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 hydroplaning behavior for different brands and sizes of tires.

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 Dry asphalt skidpad (circle radius $r = (95 \text{ to } 120) \text{ m}$) with a wetted measuring sector (water depth b (4 to 8) mm constant).

3.2 Equipment.

3.2.1 DIGITALKER measuring system.

3.2.2 Evaluation computer for preparation of the Digitalker data.

3.2.3 Acceleration sensor.

3.2.4 Antenna for data acquisition on Digitalker system.

3.2.5 Load: driver + measuring instruments.

3.2.6 V-Box for speed measurement.

3.3 Test Vehicle/Test Piece.

3.3.1 The vehicle type (engine and chassis version) shall be selected in accordance to the tire size to be tested and corresponds to the production status of the current model year.

3.3.2 Test tires and reference tires.

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3.4 Test Time.

Calendar time: 1 day

Test hours: 3 h

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 tire shall be run in. The tires shall be adjusted to partial load pressure.

4.1.2 The watering device shall be switched on and adjusted to a constant water depth of 5 mm.

At wind speeds > 10 m/s, no measurements shall be performed.

4.1.3 The Digitalker measuring system shall be adjusted as specified.

4.1.4 The acceleration sensor shall be installed close to the vehicle center of gravity (seat rail).

4.1.5 The test tire set shall be installed.

4.1.6 The test series always starts with a reference tire, which is already known from previous tests.

4.2 Conditions.

4.2.1 Environmental Conditions. No measurement at wind speeds > 10 m/s.

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 The measurement vehicle shall be accelerated to $v = \text{const.}$ of 65 km/h and then increasing in 5 km/h (10 km/h) steps until maximum possible speed is reached (65 km/h; 75 km/h; 80 km/h; 85 km/h; 90 km/h; 95 km/h; 100 km/h).

Water basin shall be run through with constant steering angle (no acceleration, no braking).

The speed when driving in the water basin and the average of the transversal acceleration over a distance of 10 m in the middle of the basin shall be measured.

4.3.2 Vehicle response in the water basin shall be evaluated according to GMW14264 (if necessary).

4.3.3 One (1) run per tire set with 1 measurement per speed step each.

4.3.4 Digitalker measuring values are recorded by the evaluation computer. The residual transversal acceleration $b_q = f(v)$ shall be determined.

5 Data

5.1 Calculations. Not applicable.

5.2 Interpretation of Results.

5.2.1 The mean transversal acceleration shall be evaluated in a range of (65 to 100) km/h. The various tire sets shall be compared with the reference tire in a percentage rating.

5.2.2 If a test tire achieves a Rating < 5.5 according to GMW14264 (e.g. poor vehicle control characteristics), the tire has failed the test.

Ratings < 6 shall be regarded as critical and improvement is strongly recommended (if other test tires of the same size obtain Rating 7).

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

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Documents

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