



Test Drive with Run Flat Tires: Tires with Flat-Running Properties

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.

1.1.1 Method A. Determination of maximum mileage of unpressurized run flat tires for European market road system.

1.1.2 Method B. To evaluate the endurance performance of unpressurized run flat tires for the North American market road system.

1.2 Applicability. For all run flat 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.

GMW16590

2.3 Additional References.

- Component Technical Specification (CTS)
- European Tyre and Rim Technical Organisation (ETRTO), Brussels, Belgium (www.etrto.org)

3 Resources

3.1 Facilities.

3.1.1 Method A. Dry surface, test course like country roads in area of Pferdsfeld Proving Ground (course: Pferdsfeld-Schweppenhausen-Pferdsfeld- Bad Sobernheim-Pferdsfeld; one lap of approximately 70 km). Other adequate test courses are also allowed.

3.1.2 Method B. A smooth road course with a minimum amount of lateral and longitudinal acceleration where the test can be completed without interruption. The MPG circle track is one example of an acceptable test track to achieve those requirements. The DPG circle track and any other GM approved test tracks are also allowed to be used for testing.

3.2 Equipment.

3.2.1 Measuring equipment for lateral acceleration.

3.2.2 Aluminum Jack.

3.2.3 Valve core remover.

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3.3 Test Vehicle/Test Piece.

3.3.1 Method A.

3.3.1.1 Run flat test tires.

3.3.1.2 Double hump (H2) wheels (according to European Tyre and Rim Technical Organisation (ETRTO)).

3.3.1.3 Test vehicle with Electronic Stability Program (ESP) enabled.

3.3.1.4 Assigned aluminum or steel wheel.

3.3.2 Method B.

3.3.2.1 A vehicle equipped to the extent necessary and ballasted to load conditions prescribed by the requesting test engineer, to perform the test.

3.3.2.2 Test vehicle with ESP disabled, if equipped.

3.3.2.3 Run Flat test tire and wheel as specified by the test requester.

3.4 Test Time. Total test time can vary depending on the test pieces, the vehicle and the tire performance requirements. The following estimates assume a test environment where the test pieces must be assembled from individual components.

Calendar time: 1 d

Test time: 4 h

Coordination time: 2 h

3.5 Test Required Information.

3.5.1. Tire Construction Number.

3.5.2. Wheel Rim Width and Diameter.

3.5.3. Vehicle Ballast Load (if applicable).

3.6 Personnel/Skills.

All Drivers must be certified to drive on the respective proving grounds.

4 Procedure

4.1 Preparation.

4.1.1 Method A.

4.1.1.1 Install measuring equipment for lateral acceleration in test car.

4.1.1.2 Mount test tire on H2 wheel according ETRTO.

4.1.1.3 Install the run flat tire-wheel assembly on the left rear position of test vehicle.

4.1.1.4 Perform a 10 km run-in of the tire.

4.1.1.5 Load the test vehicle to these conditions: according ETRTO (the tire pressure calculation) for three passengers, each 68 kg, plus 21 kg luggage, plus 100% options.

Depending on test tire position (front left or rear left (see section 4.3.1)), ensure to adjust maximum tire load percent accordingly to tested car model. The minimum tire load is 75%; Maximum tire load is 88%.

4.1.1.6 Weigh and record the gross-vehicle weight and its four (4) corner loads.

4.1.1.7 Remove the valve core to deflate tire test-tire and re-weigh the vehicle and its four (4) corner loads at deflated state.

4.1.1.8 Re-inflate the test tire and drive to the test road course to begin testing.

4.1.2 Method B.

4.1.2.1 Install the measuring equipment for lateral acceleration in the test vehicle.

4.1.2.2 Install the test tire and wheel assembly on the right rear of the test vehicle for square fitment. Split fitments must be tested separately: Right Front for front fitment; Right Rear for rear fitment. Front and rear tests must be carried out separately.

4.1.2.3 Ballast vehicle to front and rear axle loads as specified by the test requestor or program mass engineer.

4.1.2.4 Weigh and record the gross-vehicle weight and its four (4) corner loads.

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4.1.2.5 Remove the valve core to deflate tire test-tire and re-weigh the vehicle and its four (4) corner loads at deflated state.

4.1.2.6 Re-inflate the test tire and drive to the test road course to begin testing.

4.2 Conditions.

4.2.1 Environmental Conditions.

4.2.1.1 Method A.

4.2.1.1.1 Dry road surface.

4.2.1.1.2 Ambient temperature in the range of 12 °C through 27 °C.

4.2.1.2 Method B.

4.2.1.2.1 Dry road surface.

4.2.1.2.2 Ambient temperature ≥ 21 °C (70 °F).

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 Method A.

4.3.1.1 Drive vehicle with unpressurized run flat tire on test course until worn out.

The maximum test speed is 80 km/h. During cornering, the speed shall be adjusted that a maximum lateral acceleration of 3.43 m/s² will not be exceeded.

The maximum test distance is achieved when further driving would cause damage to the test vehicle, (e.g., strong impacts of loosening tire tread, etc.)

During the test drive the criteria are to be checked and described in relation to actual test distance:

- First indication of vibrations caused by test tire.
- First indication of visible noticeable tire degradation.
- Severe tire wear, which does not allow continuing driving test vehicle, is defined as documented maximum test distance.

The test driving can be stopped if no damage occurred after a test distance of 140 km.

4.3.1.2 The test has to be performed with these run flat tire positions:

- Rear left.
- Front left.

4.3.2 Method B.

4.3.2.1 Drive vehicle with unpressurized run flat tire on the test course. Refer to section 5.2 for minimum distance.

Drive the vehicle at 80 km/h (50 mph) under normal driving conditions. Set the vehicle cruise control to maintain constant speed throughout test.

The test can be stopped if there is a noticeable structural degradation within the tire, (e.g., sidewall degradation, a delamination, a thermal degradation, a severe vibration from the tire).

4.3.2.2 Repeat step 4.3.2.1 on second tire.

4.3.2.3 If a split fitment, test must be repeated for the other fitment.

5 Data

5.1 Calculations.

5.2 Interpretation of Results.

5.2.1 The tested run flat tires fulfill the requirements if the test distance meets or exceeds 80 km (50 mi).

5.3 Test Documentation. The test results documentation should include:

- Test results report.
- Test result data files (Extensible Markup Language (XML) format).

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