



VDA Lane Change Maneuver

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. Testing the rollover resistance of passenger cars.

1.2 Applicability. This standard applies to all motor vehicles of M1 classes according to 70/156/EEC.

1.3 Remarks. Not applicable”

2 References

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

2.1 External Standards/Specifications.

70/156/EEC ISO 3888-2

2.2 GM Standards/Specifications.

GMW14264

2.3 Additional References. None.

3 Resources

3.1 Facilities. The test requires a uniform paved surface that is wide enough to provide two (2) lanes and appropriate runoff to safely perform the maneuver. The road surface gradient shall not exceed 2.5%. The peak coefficient of friction of the road surface shall be ≥ 0.8 and ≤ 1.0 .

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.

3.2 Equipment.

3.2.1 Measuring tape, oil based chalk, 30 cones.

3.2.2 Speed measuring system.

3.2.3 Safety package:

- Helmet
- Protective clothing
- Outriggers may be considered for high center of gravity, early development vehicles.
- Accompanying vehicle with radio and extinguishing equipment including accompanying person.

3.3 Test Vehicle/Test Piece.

3.3.1 Vehicle or chassis equipment shall be selected to the most recent release status, product range or **special work** order.

3.3.2 Tires. Test requires basic and optional tires according to product range or special work instructions.

3.3.3 Disk Wheel. Steel or aluminum rims according to product range or special work order.

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Documents

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3.3.4 Tire Pressure. The requirement is according to release or the special work instructions.

3.4 Test Time.

Calendar time: 0.3 days

Test time: 2 to 3 hours

Coordination time: 2 to 3 hours

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Experienced and trained personnel who have been given Safe Driving training.

4 Procedure

4.1 Preparation.

4.1.1 Vehicle Preparation. The following tests shall be performed according to release or special work instructions.

4.1.1.1 Test Vehicle Description See an example in Appendix A, Data Sheet A1.

4.1.1.1.1 Check that weights and trim heights comply with the relevant release or special work instructions, see example in Appendix B, Data Sheets B1 and B2.

4.1.1.2 Front and Rear Axle Geometry. Nominal values shall be set if necessary.

4.1.1.2.1 Safety precautions shall be taken, see 3.2.3 and Section 6.

4.1.2 Test Track Preparation. See Appendix C, Figure C1.

4.1.2.1 All cones shall be placed so that they are flush with the left or right side of the lane, see ISO 3888-2. The locations of the cones shall be marked with oil-based chalk.

4.1.2.1.1 Lane 1 (Entrance). The width of the lane is defined dependent on the width of the vehicle:

$1.1 \times \text{width (in meters (m)) of vehicle (width of body without mirrors) + 0.25 m}$, see ISO 3888-2.

4.1.2.1.2 Lane 2 (Alternate). The width of the lane is also defined dependent on the width of the vehicle:

$\text{Width (in meters (m)) of vehicle + 1.0 m}$.

4.1.2.1.3 Lane 3 (Exit). The width of the lane is 3.0 m regardless of the width of the vehicle.

4.1.2.1.4 Constant offset area 1 m wide between Lane 1 and Lane 2 (erection of the cones on the left side), see Appendix C, Figure C1.

4.2 Conditions.

4.2.1 Environmental Conditions. The test shall be performed on dry roadway only. The maximum wind speed must be $< 3 \text{ m/s}$.

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.

4.2.2.1 Loading.

- One (1) person
- Gross Vehicle Rating (GVR): Number of persons in accordance with the number of seats authorized, remaining loading up to GVR allocated giving priority to permitted Rear Axle (RA) load or as per **special work** instructions
- Weights and trim heights as to the most recent release status or to special work instructions

4.2.2.2 Roof Load. The load (roof load) released for the product range or submitted for release according to 4.2.2.1 shall be checked.

4.3 Instructions. Refer to Appendix C, Figure C1 for a visual representation of the following:

4.3.1 The measurement of the speed of entry shall be performed 8 m before the 1st cone of Lane 1 and ends 2 m after the 1st cone of Lane 1 (measuring section 10 m).

4.3.2 The test shall be performed in throttle off position. Accelerator shall be released 10 m before the last cone in the Lane 1 (at the 2nd cone of Lane 1).

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4.3.3 Entry into the Lane 1 track should be in highest gear or with an engine speed of ≥ 2000 rpm, in a vehicle with automatic transmission in driving position "D". If this speed is not reached in top gear, one (1) gear lower shall be selected.

4.3.4 The speed at which the vehicle passed through shall be noted in the table, see Appendix D, Datasheet D1.

4.3.5 Number and position of the cones knocked over shall be noted.

4.3.6 Any lifting of the wheels shall be described in detail and the height in centimeters (cm) (estimated values) shall be noted.

4.3.7 After the test it shall be checked to see if the front rims have any visual damage and also that no drops in tire pressure occurred.

4.3.8 The subjective evaluation of vehicle handling according to GMW14264 (e.g., the rear sideslip during driving in Lane 2 or Lane 3) shall be noted.

5 Data

5.1 Calculations. Not applicable.

5.2 Interpretation of Results. The purpose of the test is to determine the maximum possible entry speed at which no cones are touched, no rim touches the ground and there is still no lifting of the wheels simultaneously on both axles.

5.3 Test Documentation. With reference to this Test Procedure, the results shall be represented in a test report, see Appendix D, Data Sheet D1.

6 Safety

This standard may involve hazardous materials, operations, and equipment. This standard does not propose to address all the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

In general, a risk assessment needs to be performed for every driving instruction prior to executing this standard. (**Note:** National law needs to be considered while performing a risk assessment.) The required rating of risk by exposure probability and possible violation will be done in a separate document. Every identified risk must be named inside the risk assessment for the relevant driving instruction in order to announce that risk to employees. Within the risk assessment, the vehicle equipment and different vehicle build stages have to be considered. After performing a risk assessment, non-acceptable risk needs to be mitigated by appropriate countermeasures. Here technical measures are preferred because these are independent from attendant circumstances. In case technical measures are not appropriate, organizational and/or personal measures will apply. This includes training, wearing of Personal Protection Equipment, or arrangement of idle time.

6.1 Safety Precautions.

6.1.1 Instrumentation and other test equipment must be securely mounted in accordance with proving grounds traffic safety guidelines for mounting and usage of in-vehicle instrumentation.

6.1.2 All running lights and vehicle safety features must be operational according to proving grounds rules for running lights and power windows. Exterior lights must not be obscured by styling add-ons, covers or camouflage packages. The horn may be disabled because of steer angle transducer installation.

6.1.3 A helmet is required in accordance with the regulations of the test facility. The vehicle should never be operated in a manner where the vehicle leaves the roadway or goes onto the shoulder for any reason.

6.1.4 Check for proper attachment of the steering wheel to the gear via the intermediate shaft. If it feels loose or abnormal, do not run the test until the parts are properly assembled according to the intended design.

6.1.5 Check to be certain that all wheel lugs are present and have the specified torque. Loose or missing wheel fasteners are to be replaced, installed or tightened before the test may begin.

6.1.6 The driver's seatbelt must be worn at all times during the test. Passengers accompanying the test operator must also be safely belted in the vehicle, preferably in the right rear seat.

Note: Passengers are allowed for observation or training purposes.

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