

## 76 Speed limitation devices

Refer to: R89 00-S2

### 76.1 Effective Date and Scope:

- 76.1.1 Effective date from 2019/1/1, the new vehicle variants of category symbols M2, M3, N2 and N3 shall be equipped with a speed limitation function which shall comply with this regulation, with the exception of vehicles with highest speed is lower than paragraph 2.2 stipulation. If vehicle speed is under limitation and equipped with an adjustable speed limitation function (ASLF), it shall conform to this regulation.
- 76.1.2 Effective date from 2021/1/1, all vehicle variants of category symbols M2, M3, N2 and N3 shall be equipped with a speed limitation function which shall comply with this regulation, with the exception of vehicles with highest speed is lower than paragraph 2.2 stipulation. If vehicle speed is under limitation and equipped with an adjustable speed limitation function (ASLF), it shall conform to this regulation.
- 76.1.3 Effective date from 2018/1/1, the new vehicle variants of category symbols M1 and N1, and from 2020/1/1, the all vehicle variants of category symbols M1 and N1, if vehicle equipped with a speed limitation function, it shall conform to this regulation.
- 76.1.4 The same applicant applying for low volume safety approval and the amounts of vehicle variants of category symbols M1 and N1 not exceed 20 at same year and vehicle of same variant and specification, could exempt paragraph 76.5.5 test of endurance of this regulation.

### 76.2 Definitions

- 76.2.1 "Speed limitation function", means a function to control the fuel feed of the vehicle (including the output of traction motor(s) of electric vehicles) or engine(including traction motor(s) of electric vehicles) management in order to limit the vehicle speed to a fixed maximum value.
- 76.2.2 "Limitation speed V" means the maximum speed of the vehicle such that its design or equipment does not permit a response after a positive action on the accelerator control; the limitation speed V for vehicle category of N3 with a gross vehicle mass more than 20 tones shall not over 90 km/h, the limitation speed V for other vehicles shall not over 110 km/h.
- 76.2.3 "Set speed Vset" means the intended mean vehicle speed when operating in a stabilized condition;
- 76.2.4 "Stabilized speed Vstab" means the mean vehicle speed specified in paragraph 76 5.4.1.4.2.3.3 and in paragraph 76 6.4.1.5.4.1.2.3 of this Regulation;
- 76.2.5 "Maximum speed Vmax" is the maximum speed reached by the vehicle in the first half period of the response curve as defined in the figure 1.
- 76.2.6 "Adjustable speed limitation function ASLF", means a function which allows the driver to set a vehicle speed  $V_{adj}$ , and when activated limits the vehicle automatically to that speed.
- 76.2.7 "Adjustable limit speed  $V_{adj}$ " means the speed voluntarily set by the driver.

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76.3 The principles of applicable type and scope of speed limitation devices shall be as below:

76.3.1 If use completed vehicle for testing:

76.3.1.1 The same vehicle category.

76.3.1.2 The same brand and vehicle type series.

76.3.1.3 The same chassis brand.

76.3.1.4 The same chassis vehicle type series declared by chassis manufacturers.

76.3.2 If use chassis for testing,

76.3.2.1 The same chassis vehicle category.

76.3.2.2 The same chassis vehicle brand.

76.3.2.3 The same chassis vehicle type series declared by chassis manufacturers.

76.4 General specifications

76.4.1 For vehicles equipped with speed limitation device that shall at least conform to one of the following requirements:

76.4.1.1 Submitted a documentation to prove the speed limitation device is conform to paragraph 76.5. or/and 76.6. by accredited Technical Service. The speed limitation device shall follow the manual to install in the vehicle.

76.4.1.2 Speed limitation device shall conform to paragraph 76.5. or/and 76.6..

76.4.2 Applicant shall at least provide one represent vehicle and following documents to Technical Service, to confirm installation of vehicle is identical to paragraph 76.4.1 (the content of speed limitation device of documents).

76.4.2.1 Vehicle specification information and drawing and/or picture of a representative vehicle that conform to paragraph 76.3.

76.4.2.2 The documents for installation of unchangeable speed limitation device.

76.4.2.3 Illustration and drawing and/or picture of installation of representative vehicle.

76.4.2.4 Speed limitation device's brand and vehicle type series (it depend on demands, it could ask for providing paragraph 76.5.2 and/or 76.6.2 related documents).

76.4.2.5 The range of design speed.

76.4.2.6 Vehicle and/or chassis vehicle type series, all types (the maximum engine power (including rated power of traction motor(s) of electric vehicles)/ unladed mass) of ratio.

76.4.2.7 Vehicle and/or chassis vehicle type series, all types vehicle in the highest gear (the rotational speed of engine (including rotational speed of traction motor(s) of electric vehicles)/ vehicle speed) of ratio.

76.4.2.8 The method of check and calibration procedure for speed limitation function, It shall be possible to check the functioning of the speed limitation function whilst the vehicle is stationary.

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76.4.3 Declaration of design compliance: applicant shall ensure and declare to comply with following requirements.

76.4.3.1 The speed limitation function shall be so installed as to enable the vehicle in normal use, despite the vibrations to which it may be subjected, to comply with this Regulation.

76.4.3.2 Except for adjustable speed limitation function, in any situation, the set speed  $V_{set}$  must not, in any case, be capable of being increased or removed temporarily or permanently on vehicles in use. The information document shall indicate how inviolability of the speed limitation function is assured for Technical Service. The analysis level will be always to the first failure.

76.4.3.3 Except for adjustable speed limitation function (ASLF), the speed limitation function shall be obtained regardless of the accelerator control used if there is more than one such control which may be reached from the driver's seating position.

76.4.3.4 The applicant for approval shall provide documentation describing checking and calibration procedures. It shall be possible to check the functioning of the speed limitation function whilst the vehicle is stationary.

76.4.3.5 All components necessary for the full function of the speed limitation function shall be energized whenever the vehicle is being driven.

76.4.3.6 Except for vehicle categories of M1 and N1 that originally design could actuate the vehicle's service braking system of adjustable speed limitation function. The speed limitation function shall not actuate the vehicle's service braking system. A permanent brake (e.g. retarder) may be incorporated only if it operates after the speed limitation function has restricted the fuel (including the output of traction motor(s) of electric vehicles) feed to the minimum fuel position.

#### 76.5 Testing procedure and standard of speed limitation function

76.5.1 The testing sample which do not differ with respect to the essential characteristics of speed limitation function such as:

76.5.1.1 The same brand and speed limitation function type series.

76.5.1.2 The same range of design speed.

76.5.1.3 The same operate in coordination with speed of oil feeding engine (including the output of traction motor(s) of electric vehicles) of control method or engine (including traction motor(s) of electric vehicles) of management system.

76.5.1.4 The same applicable vehicle category.

76.5.1.5 The same applicable vehicle and/or chassis vehicle brand/ type series, and each type as follow:

76.5.1.5.1 The highest ratio of representative testing sample (the maximum engine power (including rated power of traction motor(s) of electric vehicles)/ unladed mass) in its series.

76.5.1.5.2 The highest ratio of representative testing sample in top gear (the rotational speed of engine (including rated power of traction motor(s) of electric vehicles)/ vehicle speed) in its series.

76.5.2 Five samples of speed limitation function shall be provided, the method of its installation shall base on the description

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documentation that shall cover as follow:

- 76.5.2.1 Brand and type series of device.
- 76.5.2.2 Description and/or drawing and/or picture (at least including speed limitation function characteristic of technical information, such as specification/dimension, the theory of function control, and all type of vehicle/or chassis vehicle brand/type series/ method of installation).
- 76.5.2.3 Range of limited design speed.
- 76.5.2.4 Operate in coordination with speed of oil feeding engine (including the output of traction motor(s) of electric vehicles) of control method or engine (including traction motor(s) of electric vehicles) of management system.
- 76.5.2.5 Applicable vehicle category.
- 76.5.2.6 The same applicable vehicle/or chassis vehicle brand/type series, and each type as follow:
  - 76.5.2.6.1 Ratio (including rated power of traction motor(s) of electric vehicles/ unladed mass).
  - 76.5.2.6.2 The highest ratio in top gear (including rated power of traction motor(s) of electric vehicles/ vehicle speed).
- 76.5.2.7 The set speed  $V_{set}$  must not, in any case, be capable of being increased or removed temporarily or permanently on vehicles in use. The inviolability shall be demonstrated to the technical service with documentation analysing the failure mode in which the system will be globally examined.
- 76.5.2.8 The installation of speed limitation function of the representative vehicle's brand/ type series.
- 76.5.3 Declaration of design compliance: applicant shall ensure and declare to comply with the following requirements.
  - 76.5.3.1 The speed limitation function shall be so designed, constructed and assembled as to enable the vehicle in normal use, fitted with the speed limitation function, to comply with this Regulation.
  - 76.5.3.2 In particular, the speed limitation function must be so deigned, constructed and assembled as to resist corrosion and ageing phenomena to which it may be exposed and to resist tampering in accordance with paragraph 76 5.3.6.
    - 76.5.3.2.1 The set speed  $V_{set}$  must not, in any case, be capable of being increased or removed temporarily or permanently on vehicles in use. The inviolability shall be demonstrated to the technical service with documentation analysing the failure mode in which the system will be globally examined (incorporate into the documents of 76 5.2). The analysis shall show, taking into account the different states taken by the system, the consequences of a modification of the input or output states on the functioning, the possibilities to obtain these modifications by failures or by voluntary violation and the possibility of their occurrence. The analysis level will be always to the first failure.
    - 76.5.3.2.2 The speed limitation function and the connections necessary for its operation, except those essential for the running of the vehicle, shall be capable of being protected from any unauthorized need to use special tools.

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- 76.5.3.3 The speed limitation function shall not actuate the vehicle's service braking system. A permanent brake (e.g. retarder) may be actuated only if it operates after the speed limitation device has restricted the fuel feed to the minimum fuel position (including the output of traction motor(s) of electric vehicles).
- 76.5.3.4 The speed limitation function must be such that it does not affect the vehicle's road speed if a positive action on the accelerator is applied when the vehicle is running at its set speed.
- 76.5.3.5 The speed limitation function may allow normal accelerator control for the purposes of gear changing.
- 76.5.3.6 No malfunction or unauthorized interference shall result in an increase in engine power (including the output of traction motor(s) of electric vehicles) above that demanded by the position of the driver's accelerator.
- 76.5.3.7 The speed limitation function shall operate satisfactorily in its electromagnetic environment without unacceptable electromagnetic disturbance for anything in this environment.

#### 76.5.4 Tests and performance requirements

At the request of the applicant for approval, tests shall be made in accordance with either paragraphs 76.5.4.1, 76.5.4.2 or 76.5.4.3 below.

##### 76.5.4.1 Measurement on the test track

###### 76.5.4.1.1 Preparation of the vehicle

- 76.5.4.1.1.1 A testing representative item shall conform to 76 5.1;
- 76.5.4.1.1.2 The settings of the engine of the test vehicle, particularly the fuel feed (carburettor or injection system) (including the output of traction motor(s) of electric vehicles), shall conform to the specifications of the vehicle applicant ;
- 76.5.4.1.1.3 The tyres shall be bedded and the pressure shall be as specified by the manufacturer for the vehicle;
- 76.5.4.1.1.4 The vehicle mass shall be the unladen mass as declared by the applicant.

###### 76.5.4.1.2 Characteristics of the test track

- 76.5.4.1.2.1 The test surface shall be suitable to enable stabilized speed to be maintained and shall be free from uneven patches. Gradients shall not exceed 2% and shall not vary by more than 1% excluding camber effects.
- 76.5.4.1.2.2 The test surface shall be free from standing water, snow or ice.

###### 76.5.4.1.3 Ambient weather conditions

- 76.5.4.1.3.1 The mean wind speed measured at a height at least 1 m above the ground shall be less than 6 m/s with gusts not exceeding 10 m/s.

###### 76.5.4.1.4 Acceleration test method: (see the figure 1below)

- 76.5.4.1.4.1 The vehicle running at a speed which is 10 km/h below the set speed shall be accelerated as much as possible

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using a fully positive action on the accelerator control. This action shall be maintained at least 30 seconds after the vehicle speed has been stabilized. The instantaneous vehicle speed shall be recorded during the test in order to establish the curve of the speed versus the time and during the operation of the speed limiting function or of the speed limitation function as appropriate. The accuracy of the speed measurement shall be  $\pm 1\%$ . The accuracy of the time measurement shall be less than 0.1 s

76.5.4.1.4.2 The test shall be considered satisfactory if the following conditions are met :

76.5.4.1.4.2.1 The stabilized speed reached by the vehicle shall not exceed the set speed ( $V_{stab} < V_{set}$ ). However, a tolerance of 5% of the  $V_{set}$  value, or 5 km/h, whichever is the greater, is acceptable;

76.5.4.1.4.2.2 After the stabilized speed is reached for the first time:

76.5.4.1.4.2.2.1  $V_{max}$  shall not exceed  $V_{stab}$  by more than 5%;

76.5.4.1.4.2.2.2 the rate of change of speed shall not exceed 0.5 m/s<sup>2</sup> when measured on a period greater than 0.1 s;

76.5.4.1.4.2.2.3 the stabilized speed conditions specified in paragraph 76 5.4.1.4.2.3 shall be attained within 10 s of first reaching  $V_{stab}$ ;

76.5.4.1.4.2.3 when stable speed control has been achieved:

76.5.4.1.4.2.3.1 speed shall not vary by more than 4% of  $V_{stab}$  or 2 km/h whichever is greater;

76.5.4.1.4.2.3.2 the rate of change of speed shall not exceed 0.2 m/s<sup>2</sup> when measured on a period greater than 0.1 s;

76.5.4.1.4.2.3.3  $V_{stab}$  is the average speed calculated for a minimum time interval of 20 seconds beginning 10 seconds after first reaching  $V_{stab}$ ;

76.5.4.1.4.2.4 Tests in acceleration shall be carried out and the acceptance criteria verified for each gear ratio allowing in theory the set speed to be exceeded.

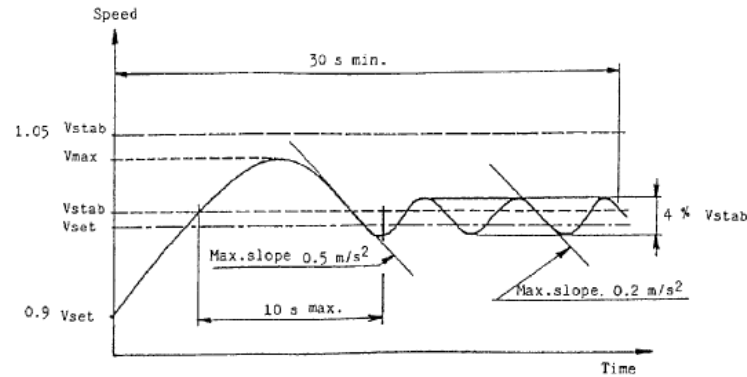


Figure 1

Note:  $V_{max}$  is the maximum speed reached by the vehicle in the first half period of the response curve.

#### 76.5.4.1.5 Test method at steady speed

76.5.4.1.5.1 The vehicle shall be driven at full acceleration up to the steady speed, then shall be maintained at this speed without any modification on the test basis of at least 400 metres. The vehicle's average speed shall be measured on this test basis. The average speed measurement shall then be repeated on the same test basis, but run in the opposite direction, and under the same procedures. The stabilization speed for the whole test previously considered is the mean of the two average speeds measured for both test runs. The whole test including the calculation of the stabilization speed shall be carried out five times. The speed measurements shall be carried out with an accuracy of  $\pm 1\%$ , the time measurements with an accuracy of 0.1 s.

76.5.4.1.5.2 The tests shall be considered satisfactory if the following conditions are met:

76.5.4.1.5.2.1 On each test run  $V_{stab}$  shall not exceed  $V_{set}$ . However, a tolerance of 5% of the  $V_{set}$  value, or 5 km/h, whichever is the greater, is acceptable;

76.5.4.1.5.2.2 The difference between the stabilization speeds obtained during each test run shall be equal to or less than 3 km/h;

76.5.4.1.5.2.3 Tests in steady speed shall be carried out and the acceptance criteria verified for each gear ratio allowing in theory the set speed to be exceeded.

#### 76.5.4.2 Test on chassis dynamometer

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A testing representative item shall conform to 76 5.1;

76.5.4.2.1 Characteristics of the chassis dynamometer: The equivalent inertia of the vehicle mass shall be reproduced on the chassis dynamometer with an accuracy of  $\pm 10\%$ . The speed of the vehicle shall be measured with an accuracy of  $\pm 1\%$ . The time shall be measured with an accuracy of 0.1s.

76.5.4.2.2 Acceleration test method

76.5.4.2.2.1 The power absorbed by the brake during the test shall be set to correspond with the vehicle's resistance to progress at the tested speed(s). This power may be established by calculation and shall be set to an accuracy of  $\pm 10\%$ . At the request of the applicant, and with the agreement of the competent authority, the power absorbed may alternatively be set at 0.4  $P_{max}$  ( $P_{max}$  is the maximum power of the engine). The vehicle running at a speed which is 10 km/h below the set speed  $V_{set}$  shall be accelerated at the maximum possibilities of the engine by using a fully positive action on the acceleration control. This action shall be maintained at least 20 seconds after the vehicle speed has been stabilized. The instantaneous vehicle speed shall be recorded during the test in order to draw the curve of the speed versus time during the operation of the speed limiting function or of the speed limitation function as appropriate.

76.5.4.2.2.2 The test shall be considered satisfactory if the provisions of the preceding paragraph 76.5.4.1.4.2 is satisfied.

76.5.4.2.3 Test method for steady speed test

76.5.4.2.3.1 The vehicle shall be installed on the chassis dynamometer. The following acceptance criteria should be met for power absorbed by the chassis dynamometer varying progressively from the maximum power  $P_{max}$  to a value equal to 0.2  $P_{max}$ . The speed of the vehicle shall be recorded in the full range of power defined above. The maximum speed of the vehicle shall be determined on this range. Test and record defined above should be made five times.

76.5.4.2.3.2 The tests shall be considered satisfactory if the provisions of the preceding paragraph 76.5.4.1.5.2 and its subparagraphs are satisfied.

76.5.4.3 Test on engine test bench

This test procedure can be used only when the applicant can demonstrate to the satisfaction of the technical services that this method is equivalent to the measurement on a test track.

76.5.5 Test of endurance

The speed limiting function or the speed limitation function, as appropriate, shall be submitted to the durability test prescribed below.

However, this may be omitted if the applicant demonstrates resistance to those effects.

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76.5.5.1 The device is cycled on a bench simulating the attitude and the movement which the speed limitation function would experience on the vehicle.

76.5.5.2 A functioning cycle is maintained by means of a control system supplied by the manufacturer. The diagram of the cycle given below (Figure 2):

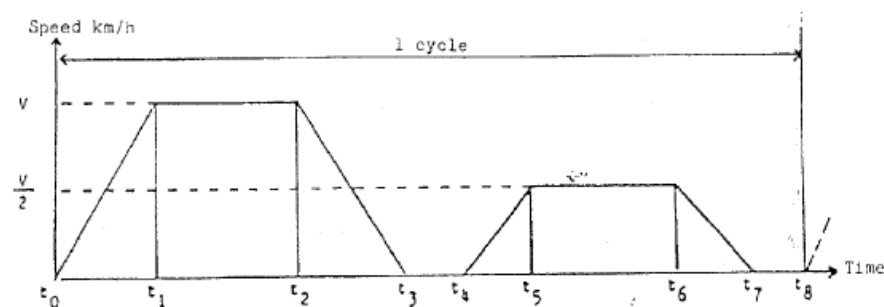


Figure 2

$t_0 - t_1$ ,  $t_2 - t_3$ ,  $t_4 - t_5$ ,  $t_6 - t_7$ : the time taken to do this operation

$t_1 - t_2 = 2$  seconds

$t_3 - t_4 = 1$  second

$t_5 - t_6 = 2$  seconds

$t_7 - t_8 = 1$  second

Five conditionings are defined hereafter. The speed limitation function samples of the type presented for approval shall be submitted to the conditionings according to the table below:

Table 1

	First SLD	Second SLD	Third SLD	Fourth SLD
Conditioning 1	x			
Conditioning 2		x		
Conditioning 3		x		
Conditioning 4			x	
Conditioning 5				x

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- 76.5.5.2.1     Conditioning 1 : tests at ambient temperature (20 degrees C +/- 2 degrees C)  
                    Number of cycles: 50,000
- 76.5.5.2.2     Conditioning 2 : tests at high temperatures
  - 76.5.5.2.2.1    Electronic components  
                    The components shall be cycled in a climatic chamber. A temperature of 65 degrees C +/- 5 degrees C is maintained during the whole functioning.  
                    Number of cycles: 12,500.
  - 76.5.5.2.2.2    Mechanical components  
                    The components shall be cycled in a climatic chamber. A temperature of 100 degrees C +/- 5 degrees C is maintained during the whole functioning.  
                    Number of cycles: 12,500.
- 76.5.5.2.3     Conditioning 3 : tests at low temperatures  
                    In the climatic chamber used for conditioning 2, a temperature of -20 degrees C +/- 5 degrees C is maintained during the whole functioning.  
                    Number of cycles: 12,500.
- 76.5.5.2.4     Conditioning 4 : tests in a salted atmosphere. (Only for components exposed to the ambient road environment.)  
                    The device shall be cycled in a salted atmosphere chamber. The concentration of sodium chloride is of 5% and internal temperature of the climatic chamber is of 35 degrees C +/- 2 degrees C.  
                    Number of cycles: 12,500.
- 76.5.5.2.5     Conditioning 5 : vibration test
  - 76.5.5.2.5.1    The speed limitation function is mounted in a similar way to its mounting on the vehicle.
  - 76.5.5.2.5.2    Sinusoidal vibrations shall be applied in all three planes. Logarithmic sweep shall be 1 octave per minute;
    - 76.5.5.2.5.2.1    First test : frequency range 10-24 Hz, amplitude +/- 2 mm;
    - 76.5.5.2.5.2.2    Second test: frequency range 24-1,000 Hz for chassis and cab-mounted components, input 2.5g. For engine-mounted components, input 5g.
- 76.5.5.3     Acceptance criteria of the endurance tests
  - 76.5.5.3.1     At the end of the endurance tests, no modification of the device's performances shall be observed regarding the set speed;
  - 76.5.5.3.2     However, if any breaking down of the device occurs during one of the endurance tests, a second device can be

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submitted to considered endurance tests at the manufacturer's request.

76.6 Testing procedure and standard of adjustable speed limitation function

76.6.1 The testing sample which do not differ with respect to the essential characteristics of adjustable speed limitation function such as:

76.6.1.1 The same brand and adjustable speed limitation function (ASLF) type series.

76.6.1.2 The same range of design speed.

76.6.1.3 The same operate in coordination with speed of oil feeding engine (including the output of traction motor(s) of electric vehicles) of control method or engine (including traction motor(s) of electric vehicles) of management system.

76.6.1.4 The same applicable vehicle category.

76.6.1.5 The same applicable vehicle and/or chassis vehicle brand/type series, and each type as follow:

76.6.1.5.1 The highest ratio of representative testing sample (the maximum engine power (including rated power of traction motor(s) of electric vehicles)/ unladed mass) in its series.

76.6.1.5.2 The highest ratio of representative testing sample in top gear (the rotational speed of engine (including rated power of traction motor(s) of electric vehicles)/ vehicle speed) in its series.

76.6.2 The method of test sample installation shall base on the description documentation which provided by applicant. Description documentation shall cover as follow:

76.6.2.1 Brand and type series of device.

76.6.2.2 Description and/or drawing and/or picture (at least including ASLF characteristic of technical information, such as specification/dimension, the theory of function control, and all type of vehicle/or chassis vehicle brand/type series/ method of installation).

76.6.2.3 Range of limited design speed.

76.6.2.4 Operate in coordination with speed of oil feeding engine (including the output of traction motor(s) of electric vehicles) of control method or engine (including traction motor(s) of electric vehicles) of management system.

76.6.2.5 Applicable vehicle category.

76.6.2.6 The same applicable vehicle/or chassis vehicle brand/type series, and each type as follow:

76.6.2.6.1 Ratio (including rated power of traction motor(s) of electric vehicles/ unladed mass).

76.6.2.6.2 The highest ratio in top gear (including rated power of traction motor(s) of electric vehicles/ vehicle speed).

76.6.2.7 The set speed  $V_{set}$  must not, in any case, be capable of being increased or removed temporarily or permanently on vehicles in use. The inviolability shall be demonstrated to the technical service with documentation analysing the failure mode in which the system will be globally examined.

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- 76.6.3 Declaration of design compliance: applicant shall ensure and declare to comply with the following requirements.
- 76.6.3.1 The adjustable speed limitation function (ASLF) must be such that the vehicle in normal use, despite the vibrations to which it may be subjected, complies with this Regulation.
- 76.6.3.1.1 In particular, the adjustable speed limitation function (ASLF) must be so designed, constructed and assembled as to resist corrosion and ageing phenomena to which it may be exposed.
- 76.6.3.2 The speed limitation function shall operate satisfactorily in its electromagnetic environment.
- 76.6.3.3 No malfunction or unauthorized interference shall result in an increase in engine power above that demanded by the position of the driver's accelerator.
- 76.6.3.4 The  $V_{adj}$  value shall be permanently indicated to the driver by a visual display. This does not preclude temporary interruption of the display for safety reasons
- 76.6.3.5 The adjustable speed limitation function (ASLF) must respect the following requirements:
- 76.6.3.5.1 The adjustable speed limitation device shall not actuate the vehicle's braking system except for vehicles of categories M1 and N1, where the vehicle's service braking system may be actuated.
- 76.6.3.5.2 The method used to limit speed when reaching  $V_{adj}$  must be possible whichever transmission type (automatic or manual) of the vehicle.
- 76.6.3.5.3 The vehicle speed shall be limited to  $V_{adj}$ .
- 76.6.3.5.4 It shall still be possible to exceed speed  $V_{adj}$ .
- 76.6.3.5.4.1 To exceed  $V_{adj}$  a positive action will be required.
- 76.6.3.5.4.2 Whenever the vehicle speed exceeds  $V_{adj}$  the driver must be informed by means of a suitable or warning signal other than the speedometer.
- 76.6.3.5.4.3 Compliance with paragraph 76 6.3.5.4.2 shall be demonstrated with paragraph 76 6.4.
- 76.6.3.5.5 The speed limitation function shall permit a normal use of the accelerator control for gear selection.
- 76.6.3.6 Setting of  $V_{adj}$
- 76.6.3.6.1 It shall be possible to set  $V_{adj}$  value by steps no greater than 10 km/h (5 mph) between 30 km/h (20 mph) and the maximum design max speed of the vehicle.
- 76.6.3.6.2 This shall be achieved by a control device operated by the driver.
- 76.6.3.7 Activation / de-activation
- 76.6.3.7.1 When  $V_{adj}$  is set by the driver it shall not capable of being modified by any means other than the designated control device.

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- 76.6.3.7.2 The adjustable speed limitation function (ASLF) must be capable to be activated / de-activated at any time.
- 76.6.3.7.3 The adjustable speed limitation function (ASLF) must be de-activated each time the engine is stopped by a deliberate action of the driver.
- 76.6.3.7.4 When the adjustable speed limitation function (ASLF) is activated the initial setting of  $V_{adj}$  shall not be less than the current vehicle speed.

#### 76.6.4 Tests and performance requirements

Technical Service shall choose 3 different vehicle speed to carry out test.

##### 76.6.4.1 Measurement on the test track

###### 76.6.4.1.1 Preparation of the vehicle

- 76.6.4.1.1.1 A testing representative item shall conform to 76 6.1.
- 76.6.4.1.1.2 The settings of the engine of the test vehicle, particularly the fuel feed (carburettor or injection system) (including the output of traction motor(s) of electric vehicles), shall conform to the specifications of the vehicle manufacturer;
- 76.6.4.1.1.3 The tyres shall be bedded and the pressure shall be as specified by the applicant for the vehicle;
- 76.6.4.1.1.4 The vehicle mass shall be the unladen mass as declared by the manufacturer.

###### 76.6.4.1.2 Characteristics of the test track

- 76.6.4.1.2.1 The test surface shall be suitable to enable stabilized speed to be maintained and shall be free from uneven patches. Gradients shall not exceed 2% and shall not vary by more than 1% excluding camber effects.
- 76.6.4.1.2.2 The test surface shall be free from standing water, snow or ice.

###### 76.6.4.1.3 Ambient weather conditions

- 76.6.4.1.3.1 The mean wind speed measured at a height of at least 1 m above the ground shall be less than 6 m/s with gusts not exceeding 10 m/s.

###### 76.6.4.1.4 Test 1 for the driver being informed that $V_{adj}$ is being exceeded, in addition speed meter, it shall adapt appropriate way to or warning signal to reminder driver.

- 76.6.4.1.4.1 The positive action (as referred to in paragraphs 76 6.3.5.4.1) required to enable  $V_{adj}$  to be exceeded shall be applied when the vehicle is running at a speed 10 km/h below  $V_{adj}$ .
- 76.6.4.1.4.2 The vehicle shall be accelerated up to a speed at least 10 km/h greater than  $V_{adj}$ .
- 76.6.4.1.4.3 This speed shall be maintained for at least 30 seconds.
- 76.6.4.1.4.4 Instantaneous vehicle speed shall be recorded during the test and measured with an accuracy of +/- 1 per cent.
- 76.6.4.1.4.5 The test shall be considered satisfactory if the following conditions are met:

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- 76.6.4.1.4.5.1 The driver is informed by a warning signal when the actual speed of the vehicle is exceeding  $V_{adj}$  by more than 3 km/h.
- 76.6.4.1.4.5.2 The driver continues to be informed for the duration of the time that  $V_{adj}$  is exceeded by more than 3 km/h.
- 76.6.4.1.5 Test 2 of the adjustable speed limitation function/device
  - 76.6.4.1.5.1 With the adjustable speed limitation function (ASLF) deactivated, for each gear ratio selected for the chosen test speed  $V_{adj}$ , the technical service shall measure the forces required on the accelerator control to maintain  $V_{adj}$  and a speed ( $V_{adj}$ ), which is 20 per cent or 20 km/h (whichever is the greater) faster than  $V_{adj}$ .
  - 76.6.4.1.5.2 With the adjustable speed limitation function (ASLF) activated and set at  $V_{adj}$ , the vehicle shall be run at a speed of 10 km/h below  $V_{adj}$ . The vehicle shall then be accelerated by increasing the force on the accelerator control over a period of 1 s  $\pm$  0.2 s to that required to attain  $V_{adj}$ . This force shall then be maintained for a period of at least 30 seconds, after the vehicle speed has stabilised.
  - 76.6.4.1.5.3 The instantaneous vehicle speed shall be recorded during the test in order to establish the curve of the speed versus the time and during the operation of the adjustable speed limitation function (ASLF) as appropriate. The accuracy of the speed measurement shall be  $\pm$  1 per cent. The accuracy of the time measurement shall be less than 0.1 s.
  - 76.6.4.1.5.4 The test shall be considered satisfactory if the following conditions are met:
    - 76.6.4.1.5.4.1 The stabilized speed ( $V_{stab}$ ) reached by the vehicle shall not exceed  $V_{adj}$  by more than 3 km/h.
      - 76.6.4.1.5.4.1.1 After  $V_{stab}$  is reached for the first time:
        - 76.6.4.1.5.4.1.1.1  $V_{max}$  shall not exceed  $V_{stab}$  by more than 5 per cent;
        - 76.6.4.1.5.4.1.1.2 the rate of change of speed shall not exceed 0.5 m/s<sup>2</sup> when measured over a period greater than 0.1 s;
        - 76.6.4.1.5.4.1.1.3 the stabilized speed conditions specified in paragraph 76 6.4.1.5.4.1.2. shall be attained within 10 s of first reaching  $V_{stab}$ ;
      - 76.6.4.1.5.4.1.2 When stable speed control has been achieved:
        - 76.6.4.1.5.4.1.2.1 speed shall not vary by more than 3 km/h of  $V_{stab}$ ;
        - 76.6.4.1.5.4.1.2.2 the rate of change of speed shall not exceed 0.2 m/s<sup>2</sup> when measured over a period greater than 0.1 s;
        - 76.6.4.1.5.4.1.2.3  $V_{stab}$  is the average speed calculated for a minimum time interval of 20 seconds beginning 10

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seconds after first reaching  $V_{stab}$ ;

76.6.4.1.5.4.1.3 Tests in acceleration shall be carried out and the acceptance criteria verified for each gear ratio allowing in theory  $V_{adj}$  to be achieved.