**OICA/CLEPA comments are marked with turquoise background**

**6. TEST PROVISIONS**

6.1. General provisions

 Testing according to the provisions of paragraph 6 is not required for any other paragraph than 6.2.1.2 whilst an ADS is active.

6.1.1. The test shall be conducted on a level surface affording good adhesion.

6.1.2. During the test(s), the vehicle shall be loaded to its technically permissible maximum mass and its technically permissible maximum load on the steered axle(s).

In the case of axles fitted with ASE, this test shall be repeated with the vehicle loaded to its technically permissible maximum mass and the axle equipped with ASE loaded to its maximum permissible mass.

6.1.3. Before the test begins, the tyre pressures shall be as prescribed by the manufacturer for the mass specified in paragraph 6.1.2. when the vehicle is stationary.

6.1.4. In the case of any systems that use electrical energy for part or all of the energy supply, all performance tests shall be carried out under conditions of actual or simulated electrical load of all essential systems or systems components which share the same energy supply. Essential systems shall comprise at least the following, where fitted: lighting systems, windscreen wipers, powertrain management systems, braking systems and automated driving systems.

The ADS and any related systems should be added to this list.

6.2. Provisions for motor vehicles

6.2.1. It shall be possible to leave a curve with a radius of 50 m at a tangent without unusual vibration in the steering equipment at the following speed:

Category M1 vehicles: 50 km/h

Category M2, M3, N1, N2 and N3 vehicles: 40 km/h

or the maximum design speed if this is below the speeds given above.

For vehicles of category X and Y the curve radius and corresponding speed shall be agreed upon between the manufacturer and the Type Approval Authority, however the resulting lateral acceleration of the test shall be at least 4 m/s2.

The appropriateness of this test should be discussed. Such a specific speed and bend radius may not be useful. If it is relevant, a test mode will need to be provided. There also may be a need for new/alternative tests.

ALTERNATIVE to 6.2.1. from OICA/CLEPA

6.2.1. Radius Driving

6.2.1.1. For categories M and N non ADS

 It shall be possible to leave a curve with a radius of 50 m at a tangent without unusual vibration in the steering equipment at the following speed:

Category M1 vehicles: 50 km/h

Category M2, M3, N1, N2 and N3 vehicles: 40 km/h

or the maximum design speed if this is below the speeds given above.

6.2.1.2. For ADS-categories X and Y

 it shall be possible to enter a curve with a radius of [50] meter from a tangent with a speed of **x** km/h. The speed **x** shall be agreed between the manufacturer and the Type Approval Authority, whereby the resulting lateral acceleration of the test shall be at least 4 m/s2.

6.2.2. When the vehicle is driven in a circle with its steered wheels at approximately half lock and a constant speed of at least 10 km/h, the turning circle shall remain the same or become larger if the steering control is released.

6.2.3. During the measurement of control effort, forces with a duration of less than 0.2 seconds shall not be taken into account.

6.2.4. The measurement of steering efforts on motor vehicles with intact steering equipment.

6.2.4.1. The vehicle shall be driven from straight ahead into a spiral at a speed of 10 km/h. The steering wheel control effort shall be measured at the nominal radius of the steering control until the position of the steering control corresponds to turning radius given in the table below for the particular category of vehicle with intact steering. One steering movement shall be made to the right and one to the left.

6.2.4.2. The maximum permitted steering time and the maximum permitted steering control effort with intact steering equipment are given in the table below for each category of vehicle.

6.2.5. The measurement of steering efforts on motor vehicles with a failure in the steering equipment.

6.2.5.1. The test described in paragraph 6.2.4. shall be repeated with a failure in the steering equipment. The steering effort shall be measured until the position of the steering control corresponds to the turning radius given in the table below for the particular category of vehicle with a failure in the steering equipment.

6.2.5.2. The maximum permitted steering time and the maximum permitted steering control effort with a failure in the steering equipment are given in the table below for each category of vehicle.

OICA/CLEPA: Sections 6.2.6. and 6.2.7. are not needed as their rationale is covered by the test suggested in 6.2.1.2. (see also the comment to 6.2.1.2.)

6.2.6. The measurement of steering time of vehicles of category X and Y with intact steering equipment.

6.2.6.1. The vehicle shall be driven from straight ahead into a spiral at a speed of 10 km/h. The time shall be measured until the position of the steered wheels corresponds to turning radius given in the table below for the particular category of vehicle with intact steering. One steering movement shall be made to the right and one to the left.

6.2.6.2. The maximum permitted steering time with intact steering equipment are given in the table below for each category of vehicle.

6.2.7. The measurement of steering time of vehicles of category X and Y with a failure in the steering equipment.

6.2.7.1. The test described in paragraph 6.2.6. shall be repeated with a failure in the steering equipment. The steering time shall be measured until the position of the steered wheels corresponds to the turning radius given in the table below for the particular category of vehicle with a failure in the steering equipment.

6.2.7.2. The maximum permitted steering time with a failure in the steering equipment are given in the table below for each category of vehicle.

Table – STEERING CONTROL EFFORT REQUIREMENTS

|  |  |  |
| --- | --- | --- |
| Vehicle Category | INTACT | WITH A FAILURE |
|  | Maximum effort (daN) | Time (s) | Turning radius (m) | Maximum effort (daN) | Time (s) | Turning radius (m) |
| M1 | 15 | 4 | 12 | 30 | 4 | 20 |
| M2 | 15 | 4 | 12 | 30 | 4 | 20 |
| M3 | 20 | 4 | 12\*\* | 45\* | 6 | 20 |
| N1 | 20 | 4 | 12 | 30 | 4 | 20 |
| N2 | 25 | 4 | 12 | 40 | 4 | 20 |
| N3 | 20 | 4 | 12\*\* | 45\* | 6 | 20 |
| X | N/A | 4 | 12 | N/A | 4 | 20 |
| Y | N/A | 4 | 12 | N/A | 4 | 20 |

\* 50 for rigid vehicles with 2 or more steered axles excluding self tracking equipment

\*\* or full lock if 12 m radius is not attainable.