Draft Regulation on Driver Assist Systems to Avoid Blind Spot Accidents
Development of Test Procedure and Verification Tests
[updated]

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Test Results and Conclusions (GRSG 2016 01)

- Prototype information system implemented in HGV
- Test Scenarios carried out:
  - Case 1, 0/4 tests passed, bicycle movement starts late
  - Case 4, 4/4 tests passed
  - Case 6, 3/4 tests passed
  - Other test scenarios were not possible because of bug in dummy control software (to be fixed soon)
- Manual driving using cones is possible (driving robots not required)
- Manual speed control is possible
- Corridors for trajectory and speed will be defined
Updates for GRSG 2016 02

- Can all scenarios be performed?
- What is the influence of the vehicle configuration (e.g. single tractor, tractor+trailer, rigid vehicle)?
- Criteria for valid test execution
- Criteria for passing the test
### Recapitulation: Test Cases

<table>
<thead>
<tr>
<th>ID</th>
<th>$v_{\text{Truck}}$ [km/h]</th>
<th>$v_{\text{Cycle}}$ [km/h]</th>
<th>R [m]</th>
<th>Initial lateral separation [m]</th>
<th>Impact location with respect to front of truck [m]</th>
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<tbody>
<tr>
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<td>5</td>
<td>1,5</td>
<td>6</td>
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<tr>
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<td>20</td>
<td>10</td>
<td>25</td>
<td>4,5</td>
<td>0</td>
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<td>7</td>
<td>20</td>
<td>20</td>
<td>25</td>
<td>1,5</td>
<td>6</td>
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</table>
Influence of Vehicle Geometry (Example Case2)
Case 2: All positions of single tractor

Vehicle approximated as rectangular box; Box shown every 100 ms
Case 2: All positions of tractor (driven with trailer)
Case 2: All positions of bus
Case 2: Overview

- Different vehicle types show different cornering styles
- Corridors for test conduction need to be adjusted to take this into account
- → Corridors Type A and Type B
Test Case 1, 5 (5m Radius)

* M3 vehicles not in the scope yet but bus is representative for long rigid vehicle
Corridor – Type A
(for articulated combinations or long vehicles)

Vehicle Width + 1 m

$X$ m

15 m

10 m

$LPI$ line

$A + \text{Vehicle Width} + 1m + X$
Corridor – Type B 
(for short vehicles)
Other cases – overview

Case 1

Case 3

Case 5

Case 8

Case 7

Only Type B

Only Type B
# Test Overview

<table>
<thead>
<tr>
<th>Test No</th>
<th>LPI Line [m]</th>
<th>X [m]</th>
<th>LPI in turn?</th>
<th>Tractor</th>
<th>Short Vehicle</th>
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<tr>
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<td>Type B</td>
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<td>Type B</td>
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<td>Type B</td>
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<td>Type B</td>
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Speed Accuracy (manual driving)

20 km/h desired speed

10 km/h desired speed
Test Tools - Update

- Dummy propulsion system software bugs have been eliminated
- Synchronization between bicycle and truck is now working well
- Euro NCAP Bicycle Target has been used for most of the tests (pre-commercial version)
- Specifications will follow soon
Remaining issues

- Start of bicycle at 4s before „Last Point of Information“ (LPI) not sufficient
- Better: bicycle at speed at least 6 seconds before LPI
  - This means 33 m bicycle at full speed and 9 m acceleration length = 41 m belt length before impact point
  - Requires updates to current propulsion system control software
False Positive Tests

- System must not react to trees, cones and other road clutter
- Tests will always be carried out using cones
  - Information should only be given when approaching the bicycle
- Generic local road sign should be placed at entry of corridor
  - No information should be given when entering the corridor
Summary and next steps

- Can all scenarios be performed?
  - Yes

- What is the influence of the vehicle configuration (e.g. single tractor, tractor+trailer, rigid vehicle)?
  - Different corridors for valid execution proposed

- Criteria for valid test execution
  - Vehicle within corridor
  - Speed within an accuracy of ± 2 km/h

- Criteria for passing the test
  - Information has been given before the LPI line

- Next step: draft procedure will be provided