

**Notes from the Secretariat :**

The Secretariat respected the following principles when drafting the document:

- TF02 recommendation adopted by IG03: text in normal characters.
- Wording newly appeared at IG03: text in bold characters
- In order to avoid creating confusion with some changes to the current cross-references , paragraphs will be re-numbered subsequently.

For ease of document management, the notes and action points are collected in tables below the relevant paragraphs.

E/ECE/324  
E/ECE/TRANS/505

Rev.2/Add.LDWS

5 November 20XX

## AGREEMENT

**AGREEMENT CONCERNING THE ADOPTION OF UNIFORM TECHNICAL PRESCRIPTIONS CONCERNING MOTOR VEHICLES, EQUIPMENT AND PARTS WHICH CAN BE FITTED TO MOTOR VEHICLES AND THE CONDITIONS FOR MUTUAL RECOGNITION OF APPROVALS GRANTED ON THE BASIS OF THESE PRESCRIPTIONS \*/**

(Revision 2, including the amendments which entered into force on 16 October 1995)

### **Addendum XXX: Regulation No. LDWS+1**

Date of entry into force: XXX

## **UNIFORM PROVISIONS CONCERNING THE APPROVAL OF MOTOR VEHICLES WITH REGARD TO THE LANE DEPARTURE WARNING SYSTEM**



**UNITED NATIONS**

\*/ Former title of the Agreement:

Agreement Concerning the Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts, done at Geneva on 20 March 1958.



AEBS/LDWS-02-03-Rev.2

Regulation No. LDWS

UNIFORM PROVISIONS CONCERNING THE APPROVAL OF MOTOR VEHICLES  
WITH REGARD TO THE LANE DEPARTURE WARNING SYSTEM

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1. SCOPE AND PURPOSE

- 1.1. This Regulation applies to the lane departure warning system of vehicles of category M<sub>2</sub>, N<sub>2</sub>, M<sub>3</sub> and N<sub>3</sub><sup>1/</sup>.
- 1.2. Vehicles of other categories may be approved at the request of the manufacturer.
- 1.3. **Contracting Parties may mandate fitment of LDWS to specific category among M2, M3, N2 and N3 in their territory. In this case, at the time of application of this Regulation, Contracting Parties shall notify to the Secretary-General of the United Nations that they intend to mandate the fitment of LDWS specified in this regulation in their territory for which vehicle.**

Notes from TF02	Notes from IG03
<p><i>Note of the Secretariat:</i>  Industry concern about how such new provision can function in the frame of the 1958 Agreement. In particular, concerns about the communication delays and quality between the different UN and national institutions. Industry indeed needs to get information well in time to adapt their production.</p>	<p>CLEPA repeated their concern about applicability of the proposed system. Chair: suggested to request guidance from GRRF.  Conclusion:  <ul style="list-style-type: none"> <li>•All parties to check applicability of the proposal</li> <li>•Request for advice to GRRF-67</li> <li>•Clarification of the wording might be necessary</li> </ul> </p>
<b>GRRF-67</b>	

2. DEFINITIONS

For the purposes of this Regulation:

- 2.1. "Approval of a vehicle type" means the full procedure whereby a Contracting Party to the Agreement certifies that a vehicle type meets the technical requirements of this Regulation;
- 2.2. "Vehicle type with regard to its Lane Departure Warning System" means a category of vehicles which do not differ in such essential respects as:

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<sup>1/</sup> As defined in Annex 7 to the Consolidated Resolution on the Construction of Vehicles (R.E.3) (document TRANS/WP.29/78/Rev.1/Amend.2, as last amended by Amend.4).

- (a) the manufacturer's trade name or mark,
- (b) vehicle features which significantly influence the performances of the Lane Departure Warning System,
- (c) the type and design of the Lane Departure Warning System.

2.3. "Lane Departure Warning System (LDWS)" means a system to warn the driver of an unintentional drift of the vehicle out of its travel lane.

2.4. "Lane" means the ~~area~~ **path** of roadway that a vehicle would be expected to travel along ~~in the absence of any obstruction and~~ without the ~~any~~ driver desire **steering input** to change the path of travel.

recommendation from TF02	Notes from IG03
<p>"<u>Lane</u>" means the <del>area</del> <b>path</b> of roadway that a vehicle would be expected to travel along <del>in the absence of any obstruction and</del> without the <del>any</del> driver desire <b>steering input</b> to change the path of travel.</p>	<p>OICA: raised the concern that the TF02 definition implies that the lane must be straight. However, the text means that some input from the driver is permitted, if it is not for changing the path of travel. Technically, the system does not need a definition for lane as it only refers to lane marking. Chair: considered logical to introduce a definition for "lane" in a regulation for LDWS.</p> <p>Two other proposals emerged from the discussions:</p> <ol style="list-style-type: none"> <li>1. "<u>Lane</u>" means the <del>area</del> <b>path</b> of roadway that a vehicle would be expected to travel along <del>in the absence of any obstruction and</del> without the <del>any</del> driver desire <b>steering input</b> to change the path of travel.</li> <li>2. <b>Lane means one of the longitudinal strips into which a roadway is divided.</b></li> </ol> <p>Conclusion:</p> <ul style="list-style-type: none"> <li>• 3 options remain: <ul style="list-style-type: none"> <li>- keep TF recommendation (see left column),</li> <li>- shorten TF proposal (see point 1 above),</li> <li>- CLEPA proposal based on Vienna Convention wording (see point 2 above)</li> </ul> </li> <li>• All parties to confirm their preference for conclusive discussion at TF03/IG04</li> </ul>
<b>TF03</b>	

2.5. "Visible lane marking" means delineators intentionally placed on the borderline of the lane that are directly visible by the driver while driving (e.g. not covered by snow, etc.).

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2.6. “Lane boundary” means the borderline of the lane that is determined by a visible lane marking.

Recommendation from TF02	Notes from IG03
<p>“Lane boundary” means the borderline of the lane that is determined by a visible lane marking <del>and in the absence of a visible lane marking by incidental visible road features or other means such as GPS, electromagnetic nails, etc. In the case of a visible lane marking, the boundary shall be at the centre thereof.</del></p>	<p>Adopted TF02 recommendation</p>

2.7. “Rate of departure” means the subject vehicle’s approach velocity at a right angle to the lane boundary at the warning issue point.

Recommendation from TF02	Notes from IG03
<p>2.8. <del>“Latest warning line” means the outermost limit of the warning threshold.</del></p>	<p>Adopted TF02 recommendation</p>
<p>2.9. <del>Explanatory schemes</del></p>	

3. APPLICATION FOR APPROVAL

3.1. The application for approval of a vehicle type with regard to the LDWS shall be submitted by the vehicle manufacturer or by his authorized representative.

3.2. It shall be accompanied by the documents mentioned below in triplicate and include the following particulars:

3.2.1. a description of the vehicle type with regard to the items mentioned in paragraph 5., together with dimensional drawings. The numbers and/or symbols identifying the vehicle type shall be specified; and

3.2.2. particulars of the primary reference marks in sufficient detail to enable them to be readily identified and the position of each in relation to the others and to the "R" point verified.

3.3. A vehicle representative of the vehicle type to be approved shall be submitted to the Technical Service conducting the approval tests.

4. APPROVAL

- 4.1. If the vehicle type submitted for approval pursuant to this Regulation meets the requirements of paragraph 5. below, approval of that vehicle shall be granted.
- 4.2. An approval number shall be assigned to each type approved; its first two digits (00 for the Regulation in its initial form) shall indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval. The same Contracting Party shall not assign the same number to the same vehicle type equipped with another type of field of vision, or to another vehicle type.
- 4.3. Notice of approval or of refusal or withdrawal of approval pursuant to this Regulation shall be communicated to the Parties to the Agreement which apply this Regulation by means of a form conforming to the model in Annex 1 and photographs and/or plans supplied by the applicant being in a format not exceeding A4 (210 x 297 mm), or folded to that format, and on an appropriate scale.
- 4.4. There shall be affixed, conspicuously and in a readily accessible place specified on the approval form, to every vehicle conforming to a vehicle type approved under this Regulation, an international approval mark conforming to the model described in Annex 2, consisting of:
- 4.4.1 a circle surrounding the letter "E" followed by the distinguishing number of the country which has granted approval 2/;

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2/ 1 for Germany, 2 for France, 3 for Italy, 4 for the Netherlands, 5 for Sweden, 6 for Belgium, 7 for Hungary, 8 for the Czech Republic, 9 for Spain, 10 for Serbia, 11 for the United Kingdom, 12 for Austria, 13 for Luxembourg, 14 for Switzerland, 15 (vacant), 16 for Norway, 17 for Finland, 18 for Denmark, 19 for Romania, 20 for Poland, 21 for Portugal, 22 for the Russian Federation, 23 for Greece, 24 for Ireland, 25 for Croatia, 26 for Slovenia, 27 for Slovakia, 28 for Belarus, 29 for Estonia, 30 (vacant), 31 for Bosnia and Herzegovina, 32 for Latvia, 33 (vacant), 34 for Bulgaria, 35 (vacant), 36 for Lithuania, 37 for Turkey, 38 (vacant), 39 for Azerbaijan, 40 for The former Yugoslav Republic of Macedonia, 41 (vacant), 42 for the European Community (Approvals are granted by its Member States using their respective ECE symbol), 43 for Japan, 44 (vacant), 45 for Australia, 46 for Ukraine, 47 for South Africa, 48 for New Zealand, 49 for Cyprus, 50 for Malta, 51 for the Republic of Korea, 52 for Malaysia, 53 for Thailand, 54 and 55 (vacant) and 56 for Montenegro. Subsequent numbers shall be assigned to other countries in the chronological order in which they ratify or accede to the Agreement Concerning the Adoption of Uniform Technical Prescriptions for Wheeled Vehicles, Equipment and Parts which can be Fitted and/or be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these Prescriptions, and the numbers thus assigned shall be communicated by the Secretary-General of the United Nations to the Contracting Parties to the Agreement.



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- 4.4.2. the number of this Regulation, followed by the letter "R", a dash and the approval number to the right of the circle prescribed in paragraph 4.4.1. above.
- 4.5. If the vehicle conforms to a vehicle type approved under one or more other Regulations, annexed to the Agreement, in the country which has granted approval under this Regulation, the symbol prescribed in paragraph 4.4.1. need not be repeated; in such a case, the Regulation and approval numbers and the additional symbols shall be placed in vertical columns to the right of the symbol prescribed in paragraph 4.4.1. above.
- 4.6. The approval mark shall be clearly legible and be indelible.
- 4.7. The approval mark shall be placed close to or on the vehicle data plate.

5. SPECIFICATIONS

5.1. General

- 5.1.1. Subject to the requirements of paragraph 12, any vehicle fitted with a LDWS complying with the definition of paragraph 2.3 shall meet the performance requirements contained in paragraphs 5.1 to 5.4 of this regulation.
- 5.1.2. [Any LDWS fitted on a vehicle shall comply with the requirements of Regulation No. 10 on electromagnetic interferences **in its latest series of Amendments.**]

Notes from TF02	Notes from IG03
<p>[Any LDWS fitted on a vehicle shall comply with the requirements of Regulation No. 10 on electromagnetic interferences <b>in its latest series of Amendments.</b>]</p> <p><i>Note of the Secretariat:</i>  CLEPA to provide written contribution for 3<sup>rd</sup> meeting of the informal group (3-4 December 09).</p>	<p>CLEPA: no common CLEPA position for the moment. Suggested to postpone to next meeting, possibly with an alignment on R13. All Electronic systems associated to the braking system are approved according to R13 wording  Conclusion: CLEPA will propose a wording at TF03/IG04, taking into account alignment on R13.</p>
<b>TF03</b>	

5.2. Performance requirements

Notes from TF02
<p><u>Note of the Secretariat:</u>  <i>OICA is requested</i></p> <ul style="list-style-type: none"> <li>• <i>to provide some wording for discriminating malfunction vs. failure.</i></li> <li>• <i>to assess the necessity of a warning in case of temporary incapacity of functioning. Any expert/delegation is welcomed to participate to the work.</i></li> </ul> <p><i>See notes under paragraph 6.1.1. (test conditions)</i></p> <ul style="list-style-type: none"> <li>• <i>addition of a general requirement in paragraph 5.2.1. about functionality in the highway conditions, and testing on straight roads only.</i></li> </ul> <p><i>See notes under paragraph 6.1.3. (visible lane markings)</i></p> <ul style="list-style-type: none"> <li>• <i>Addition of a general requirement in paragraph 5.2.1. about functionality with all kinds of markings, and testing with the defined markings only.</i></li> </ul>

5.2.1. When tested in the conditions of paragraphs 6.1. to ~~6.4~~ 6.3., the LDWS shall:

Notes from TF02	Notes from IG03
<p>TF02 only discussed editorial improvements</p>	<p>Revision of document AEBS/LDWS-03-04 (CLEPA):            “5.2.1. <del>When tested in the conditions of paragraphs 6.1. to 6.4</del> 6.3., the LDWS shall:  <b>Whenever the system is on, the LDWS shall provide the driver with a warning signal if the vehicle departs from its normal running lane, where this is marked with a clearly visible lane boundary marking<sup>1</sup>, when there has been no purposeful demand to do so. Specifically, it shall:”</b></p> <p>OICA: concern that the vehicles would have to comply with all the markings existing in the world.            Chair:</p> <ul style="list-style-type: none"> <li>• “whenever the system is on”: must be active. Hence suggest “active as mentioned in para. 5.2.2.”</li> <li>• “depart from its normal running lane”: should refer to the final definition of lane (paragraph 2.4. above)</li> <li>• “lane boundary marking”: same concern.</li> <li>• “when there has been no purposeful demand to do so”: same concern, need for consistency of the wording.</li> </ul> <p>Conclusion for paragraph 5.2.1.: CLEPA to propose an improved wording for TF03/IG04.</p>
<b>TF03</b>	

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5.2.1.1. provide the driver with the warning specified in paragraph 5.4.1. when tested in accordance with the provisions of paragraph 6.5. (departure warning test), and

Notes from TF02	Notes from IG03
<p>TF02 only discussed editorial improvements</p>	<p>Revision of document AEBS/LDWS-03-04:  “5.2.1.1. provide the driver with the warning specified in paragraph 5.4.1. when tested in accordance with the provisions of paragraph 6.5.<sup>2</sup> (departure warning test) <b>using a straight lane and a curved lane<sup>3</sup>, and”</b>  Footnote 2: <b>“The visible lane marking used in the tests shall be one of those identified in ISO 17361:2007 Annex A, with the actual markings being in good condition and of a material conforming to the National standard for visible road surface markings of the country in which the testing is being carried-out. The actual visible lane marking layout used for the testing shall be recorded.”</b></p> <p>NL: Footnote 2: concern that the worst case cannot be identified.  CLEPA: reference to curved lanes can be deleted if it is decided that the tests are performed on straight lanes only.  D, UK, PL, NL and J: can agree with testing on straight lanes only, but need for general requirement for curved road situations.  Conclusion:</p> <ul style="list-style-type: none"> <li>• Proposed footnote 2 of AEBS/LDWS-03-04 in [ ], CLEPA and NL to hold bilateral discussions.</li> <li>• Test on straight roads only, but general requirement for straight + curved roads.</li> </ul>
<b>TF03</b>	
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5.2.1.2. provide the driver with the warning specified in paragraph 5.4.2. when tested in accordance with the provisions of paragraph 6.6. (failure detection test).

Recommendation from TF02	Notes from IG03
<p>5.2.1.2. provide the driver with the warning specified in paragraph 5.4.2. when tested in accordance with the provisions of paragraph 6.6. (<del>malfunction</del> <b>failure</b> detection test).</p>	<p><u>Editorial amendment</u>: support from the IG</p> <p><u>Debate</u>:</p> <p>OICA: proposal in 3 parts:</p> <ul style="list-style-type: none"> <li>• text for failure warning + test.</li> <li>• Optional system disabling: if vehicle equipped with optional disabling capabilities, the driver shall be informed when the system is disabled.</li> <li>• When system is outside its capabilities: driver may be warned. All cases cannot be covered by a regulation. “Shall” when outside capabilities is in some cases impossible, in other cases burdening, sometimes possible. OICA favours a “may”.</li> </ul> <p>The driver should not adapt his driving behaviour to such warning: he should always be careful. In addition, there are technical limits.</p> <p>CLEPA: supported OICA. Possibility of achieving robust warning with some meaning for the driver is quite small. Should be left to the manufacturer.</p> <p>UK: UK position is that whenever the system is not able to work, then the driver must be warned.</p> <p>NL: supported UK. In addition, when the driver has disabled the system, warning must be mandatory.</p> <p>J: Ideally, all situations should be warned to the driver, but technically quite difficult. Attention to the “over-reliance”: the driver should always take the responsibility of his driving behaviour</p> <p>D: supported OICA/CLEPA.</p> <p>PL: concerned about the danger if the driver assumes the system is capable when it is not.</p> <p><u>Conclusion</u>:</p> <ul style="list-style-type: none"> <li>• All parties to reconsider their positions in view of the comments received</li> <li>• CP's in favour to make the “capability warning” mandatory, to propose draft wording (also about a possible test) for conclusive discussion at TF03/IG04.</li> </ul>
<b>TF03</b>	

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5.2.1.3. The warning mentioned in para 5.2.1.1. above may be suppressed when there is a driver action which indicates an intention to change lane.

Recommendation from TF02	Notes from IG03
Addition of the paragraph 5.2.1.3.: <b>5.2.1.3. The warning mentioned in paragraph 5.2.1.1. above may be suppressed when there is a driver action which indicates an intention to change lane.</b>	OICA: keen to improve the wording in order to make it cover all circumstances. Proposal: “5.2.1.3. The warning mentioned in paragraph 5.2.1.1. above may be suppressed when there is a [driver action] which indicates an intention to <del>change</del> <b>depart from</b> lane.” Some other conditions could be added, e.g. EVSC intervention, blind spot warning, etc. Conclusion: OICA to make relevant proposal at TF03/IG04.
<b>TF03</b>	

5.2.2. The LDWS shall be active at least at vehicle speeds above 60 km/h , unless manually de-activated as per paragraph 5.3. below.

Recommendation from TF02	Notes from IG03
The <del>AEBS</del> <b>LDWS</b> shall be active at least at vehicle speeds above <del>{60}</del> km/h, unless manually de-activated as per paragraph 5.3. below.	UK: can accept 60 km/h. Concern about false alerts on narrow roads for wide vehicles, but can accept 60 km/h. Conclusion: general agreement on activation speed of 60 km/h

5.3. When a vehicle is equipped with a means to disable the LDWS function, the following conditions shall apply as appropriate:

5.3.1. The LDWS function shall be automatically reinstated at the initiation of each new ignition “on” (run) cycle.

Recommendation from TF02	Notes from IG03
The LDWS function shall be automatically reinstated at the initiation of each new ignition “ <b>on</b> ” ( <b>run</b> ) cycle.	Proposal adopted

5.3.2. A [constant] optical warning signal shall inform the driver that the LDWS function has been disabled. The yellow warning signal specified in paragraph 5.4.2 below may be used for this purpose.

Recommendation from TF02	Notes from IG03
A constant optical warning signal shall inform the driver that the LDWS function has been disabled. The yellow warning signal specified in paragraph 5.4.2 below may be used for this purpose	Proposal adopted

5.4. Warning indication

Notes from TF02	Notes from IG03
<p><u>Note of the Secretariat:</u></p> <ul style="list-style-type: none"> <li>• OICA and UK to have a clear position about SAE J 2808 (referred to in document ITS-16-03) for 3<sup>rd</sup> plenary informal group meeting(December 09)</li> <li>• Adopted mean(s) to be taken from the three indicated means</li> <li>• Wording of paragraph 5.4.2. to be updated according to the outcomes of the discussions on warning strategy, “yellow” remains in [ ] for the time being.</li> <li>• Vocabulary: “optical”, “acoustic” and “haptic” are from the same linguistic origin. However, “acoustic” seems not implying the idea of a loudness level, which can be of some interest for the understanding of the text.</li> </ul>	<p><u>SAE J 2808:</u></p> <p>OICA: ITS guidelines are general but do not address specific cases, they refer to specific standards for specific systems. Contradiction between ITS-17-03 and the standard referenced for LDWS. For specific LDWS, we could face a need to adapt the HMI according to e.g. the category. SAE J2808 is not always in favour for 2 warnings. OICA proposes requirement for one mandatory warning, and additional means to be optional. In addition, OICA suggests to consult the manufacturers of the existing vehicles about the reasons of their choices.</p> <p>Experience of manufacturer N°1: on buses, acoustic warning and haptic braking would annoy the passengers. In trucks, only the driver is present in the vehicle, so the warning means can differ from the buses and coaches.</p> <p>Experience of manufacturer N°2: two warning means is to be avoided. LDWS (unlike AEBS) will provide hundreds of warnings per day, so the driver would directly switch off the LDWS if there are 2 means.</p> <p>CLEPA: supported OICA: the vehicle manufacturer should be allowed to choose</p> <p>D: supported OICA, plead for maximum flexibility for the beginning.</p> <p>UK: concern about too much flexibility because the driver could have difficulty in recognizing the situation when changing the vehicle. UK hence supports two mandatory warnings.</p> <p>NL: Optical seems not suitable, hence supports haptic or acoustic, 1 out of 3.</p> <p>J: suggested to wait for the outcomes of next ITS informal group</p> <p><u>Linguistic:</u> “audible” implies to specify a level.</p> <p><u>Conclusion:</u></p> <ul style="list-style-type: none"> <li>• text amended to reflect the positions.</li> <li>• Consensus that the means of the signal is at the choice</li> </ul>

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Notes from TF02	Notes from IG03
	<p>of the manufacturer.</p> <ul style="list-style-type: none"> <li>• IG04 to address the issue again.</li> <li>• IG to assess whether concrete feedback can be provided by the ITS group. If no concrete help can be received, then IG solve this issue internally.</li> <li>• Linguistic: “acoustic” / “optical” are terms to be used.</li> <li>• Paragraph to read:  <i>“5.4.1. The lane departure warning referred to in paragraph 6.5. shall be <b>provided</b> by means of <b>at least [one] / [two]</b> <del>an</del> easily perceivable <b>warning signal(s)</b> [<del>haptic and/or audible</del>] [<del>means among audible</del> <b>acoustic, haptic and optical</b>].</i></li> </ul>
<b>TF03</b>	

5.4.1. The lane departure warning referred to in paragraph 6.5. shall be provided by means of at least **[one] / [two]** an easily perceivable warning signal(s) [**means among acoustic, haptic and optical**].

**[5.4.1.1 When an optical signal is used for lane departure warning, the optical signal for lane departure warning may be the flashing of the malfunction warning signal specified in paragraph 5.4.2. below.]**

<b>Notes from IG03</b>
Proposal for an additional paragraph: particular provisions for the optical signal.
Conclusion: proposal to be discussed at TF03/IG04
<b>TF03</b>

5.4.2. The **failure** warning referred to in paragraph 6.6. shall be by means of a **yellow** optical warning signal.

<b>Notes from IG03</b>
All parties in favour of “failure” and “yellow”.

5.4.3. Any LDWS optical warning signal shall be activated either when the ignition (start) switch is turned to the "on" (run) position or when the ignition (start) switch is in a position between the “on” (run) and “start” that is designated by the manufacturer as a check position (bulb check).

**The warning signal(s) shall be automatically deactivated when the ignition (start) switch is moved to the “on” (run) position or after a period of time as identified by the vehicle manufacturer in the case where the signal activation occurs in the “on” (run) position.**

This requirement does not apply to ~~tell-tales~~ **warning signals** shown in a common space.

**Notes from IG03**

Proposal for an additional sub-paragraph in accordance with decision taken under paragraph 6.5. (see below: bulb check provisions moved from paragraph 6.5. to paragraph 5.4.3.). Editorial improvement.

Debate about necessity to specify similar qualitative requirements for the acoustic warning. CLEPA: bulb check was necessary at the time the bulbs were not reliable. Such provision is currently obsolete and not necessary for the acoustic warning.

Conclusion:

- Bulb check provisions moved from paragraph 6.5. to paragraph 5.4.3.
- Editorial change adopted.

5.4.4. The optical warning signals shall be visible even by daylight; the satisfactory condition of the signal must be easily verifiable by the driver from the driver's seat.

**[5.4.5. The failure warning signal specified in paragraph 5.4.2 may also be used to indicate that LDWS is temporarily not available.]**

**Notes from IG03**

OICA homework for system temporarily not available. OICA keen to ensure the possibility of using that tell-tale, for the sake of HMI simplification and reduction of number of dedicated tell-tales.

Conclusion: OICA to develop draft proposal for discussion at TF03/IG04

**TF03**

6. TEST PROCEDURE

6.1. Test conditions

6.1.1. The test shall be performed on a flat, dry asphalt or concrete surface.

**Notes from TF02**

- *J and F have no capability of testing on curved highway roads, UK will provide*

**Notes from IG03**

Conclusion: adopted: “6.1.1. The test shall be performed on a flat, **dry** asphalt or concrete



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Notes from TF02	Notes from IG03
<p><i>information at the 3<sup>rd</sup> plenary informal group meeting.</i></p> <ul style="list-style-type: none"> <li>• <i>TF recommends addition of a general requirement in paragraph 5.2.1. about functionality in the highway conditions, and testing on straight roads only</i></li> <li>• <i>Mr. Jennison (CLEPA) commits to provide and circulate a draft text before the 3<sup>rd</sup> meeting</i></li> </ul>	<p>surface.”</p>

6.1.2. The ambient temperature shall be between 0° C and 45° C.

[6.1.3. Visible lane markings

6.1.3.1. The markings of the test location shall be in a good condition.

6.1.3.2. The left edge road marking pattern shall be a continuous **0.2 m wide** line parallel to the axis of the road.

~~6.1.3.3. The left edge road marking width shall be at least 0,2 m.~~

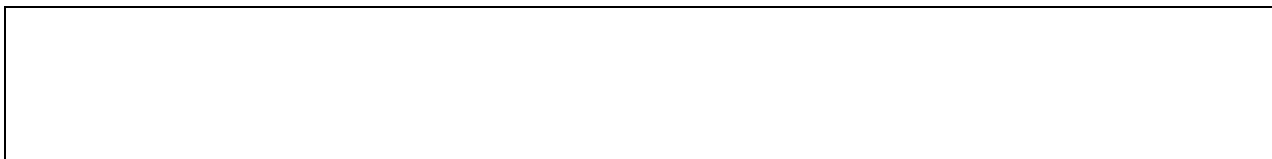
6.1.3.4. The centre line road marking pattern shall be 2.5 m length **and 0.15 m wide** segments separated by 10 m voids.

~~6.1.3.5. The centre line road marking width shall be at least 0,15 m.~~

6.1.3.6. The right edge road marking pattern shall be a continuous **0.2 m wide** line parallel to the axis of the road.]

~~6.1.3.7. The right edge road marking width shall be at least 0,2 m.~~

Notes from TF02	Notes from IG03
<p><u>Paragraph 6.1.3.:</u></p> <ul style="list-style-type: none"> <li>• <i>Simplification of the wording is proposed by the Secretariat</i></li> <li>• <i>UK to provide wording addressing continental vs. UK driving directions if necessary</i></li> <li>• <i>Addition of a general requirement in paragraph 5.2.1. about functionality with all kinds of markings, and testing with the defined markings only.</i></li> </ul> <p><u>Paragraph 6.1.3.1. (notes from IG01):</u> <i>USA to propose a draft description of “good condition” of the markings of the test location, and some relevant criteria for the definition of markings.</i></p>	<p>CLEPA proposal to entirely delete paragraph 6.1.3. because of new general provisions in paragraph 5.2. OICA: requested time to study CLEPA proposal for a deletion.  Conclusion: para. 6.1.3. to be discussed at TF03/IG04.</p>
<p><b>TF03</b></p>	



6.1.4. The test shall be performed under visibility conditions that allow safe driving at the required test speed.

Recommendation from TF02	Notes from IG03
<del>The horizontal visibility range shall be greater than 1 km</del> <b>The test shall be performed under visibility conditions that allow safe driving at the required test speed.</b>	Adopted TF02 recommendation

6.2. Accuracy of the measurements

6.2.1. Distances shall be measured with an accuracy of +/- **[5cm]**.

Notes from TF02	Notes from IG03
Distances shall be measured with an accuracy of +/- <b>[5%]</b> . <i>[5%] in [ ] following Japanese concerns. All parties to investigate proper value.</i>	OICA: favours +/- 5 cm J: study reservation Conclusion: inclusion of a tolerance expressed in absolute values to be discussed at TF03/IG04
<b>TF03</b>	

6.2.2. Speeds shall be measured with an accuracy of +/- 5%.

<b>Notes from IG03</b>
OICA: favours an absolute value: +/- 3 km/h. Attention to the vehicle longitudinal test speed: should be at a speed higher than 60 km/h by a value higher than the measuring instrument inaccuracy. Proposal: "6.2.2. Longitudinal vehicle speed shall be [measured] with an accuracy of +/- 3 km/h" Conclusion: see debate about accuracy of the test speed (para. 6.6.1.)
<b>TF03</b>

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**6.2.3. Rate of departure accuracy shall be measured with an accuracy of +/- 0.1 m/s**

<b>Notes from IG03</b>
Proposal for an additional paragraph: provisions for the accuracy in the measurement of the rate of departure, to read: "6.2.3. Rate of departure accuracy shall be measured with an accuracy of +/- 0.1 m/s." Conclusion: proposal was adopted

~~6.2.4. Time and delays shall be measured with an accuracy of +/- 1%.~~

<b>Notes from IG03</b>
IG03 recognized that time and delays are not measured in the test procedure Conclusion: Agreed to delete the paragraph.

~~6.3. Test course~~

~~The course shall be a segment of straight road of sufficient length in order to maintain a minimum vehicle speed of [60 km/h] to allow drifting out of the lane at a the rates of departure comprised between 0 m/s and 0,8 m/s mentioned in paragraph 6.5.2.~~

<b>Notes from TF02</b>	<b>Notes from IG03</b>
<ul style="list-style-type: none"> <li>• 60 km/h accepted subject to UK position and results of discussions about test speed</li> <li>• UK to provide wording about "drifting" rate at 3<sup>rd</sup> meeting (see paragraph 6.5.2. below)</li> </ul>	UK: supported a test speed of 65 km/h OICA: there is a need for some speed difference between test speed and activation speed to ensure the system is active when the test is performed Conclusion: agreed to delete the paragraph

6.4. Vehicle conditions

6.4.1. Test weight

The vehicle may be tested at any condition of load, the distribution of the mass among the axles being that stated by the vehicle manufacturer without exceeding any of the maximum permissible mass for each axle. No alteration shall be made once the test procedure has begun.

<b>Notes from IG03</b>
Adopted

~~6.4.2. The LDWS shall be installed and configured in accordance with the instructions provided by the vehicle manufacturer. In the case where the LDWS is equipped with a user-adjustable warning threshold, [each/the] test shall be performed twice: once~~

~~with the warning threshold set at its earliest setting, and once with the warning threshold set at its latest~~ **maximum departure** setting. No alteration shall be made once the test procedure has begun.

Notes from TF02	Notes from IG03
<ul style="list-style-type: none"> <li>• <i>Agreed to recommend deletion of 1<sup>st</sup> sentence.</i></li> <li>• <i>Discussion about necessity of such paragraph referring to adjustable systems is postponed to 3<sup>rd</sup> meeting of the informal group. Two questions must be answered:</i> <ol style="list-style-type: none"> <li>1. <i>Should the paragraph remain?</i></li> <li>2. <i>If yes, which test must be performed (earliest vs. latest warning)?</i></li> </ol> </li> <li>• <i>OICA to prepare a text proposal for the 3<sup>rd</sup> meeting.</i></li> </ul>	<p>OICA: requirement is necessary for flexibility for the manufacturer and the user. ISO recommends 2 tests, i.e. earliest and latest warning. In the regulation, there is only 1 test, hence only the latest warning is necessary.</p> <p>Conclusion:</p> <ul style="list-style-type: none"> <li>• New wording accepted</li> <li>• deletion of 1<sup>st</sup> part adopted</li> <li>• CLEPA to amend wording to ensure consistency with wording of § 6.6.2</li> </ul>
<b>TF03</b>	

6.5. ~~With the vehicle stationary and the ignition locking system in the "Lock" or "Off" position, activate the ignition locking system to the "On" or "Run" position. The LDWS shall perform a check of lamp function as specified in paragraph 5.4.3. of this Regulation.~~

~~With the vehicle stationary check that the optical warning signal(s) are activated when the ignition (start) switch is turned to the "on" (run) position or when the ignition (start) switch is in a position between the "on" (run) and "start" that is designated by the manufacturer as a check position.~~

~~The warning signal(s) shall then be automatically deactivated when ignition (start) switch is moved to the "on" (run) position or after a period of time as identified by the vehicle manufacturer in the case where the signal activation occurs in the "on" (run) position.~~

~~This test does not apply to tell-tales warning signals shown in a common space.~~

**Optical warning signal verification test**

**With the vehicle stationary check that the optical warning signal(s) comply with the requirements of paragraph 5.4.3.**

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Notes from TF02	Notes from IG03
<ul style="list-style-type: none"> <li><i>The informal group is requested to check possible conflict with the warning strategy: possible need to add an exemption to automatic de-activation when the system detects a failure.</i></li> <li><i>OICA to provide correct wording for the 3<sup>rd</sup> meeting of the informal group.</i></li> </ul>	<p>OICA proposal: “6.5.1. With the vehicle stationary and the ignition locking system in the "Lock" or "Off" position, activate the ignition locking system to the "On" or "Run" position. The LDWS shall perform a check of lamp function as specified in paragraph 5.4.3. of this Regulation. This requirement does not apply to tell-tales shown in a common space.”</p> <p>IG found appropriate to move the bulb check provisions to paragraph 5.4.3.</p>
<b>TF03</b>	

~~Drive the vehicle, enter the vehicle the course and smoothly track the lane so that the posture of the vehicle is stable. Gently drift off the vehicle inside and outside of the course while moving along the road at the speed of [60 km/h] +/- 5 km/h.~~

~~Steer the vehicle so as to gently depart from the lane at a rate of departure comprised between 0,1 m/s and 0,3 m/s for four tests to the left and four tests to the right.~~

~~Steer the vehicle so as to gently depart from the lane at a rate of departure comprised between 0,6 m/s and 0,8 m/s for four tests to the left and four tests to the right.~~

A total of 16 trials shall be performed as shown in the table 1 below:

Rate of departure	Departure to the left	Departure to the right
<b>0,1 m/s to 0,3 m/s</b>	Four trials	Four trials
<b>0,6 m/s to 0,8 m/s</b>	Four trials	Four trials

Table 1

6.6. Lane departure warning test

**6.6.1 Drive the vehicle at a speed of [65 km/h] +/- 5 km/h 65 km/h [+/- 2 km/h] into the centre of the test lane in a smooth manner so that the attitude of the vehicle is stable.**

Notes from IG03
<p>OICA reluctant to an additional tolerance in the vehicle test speed.  See also paragraph 6.2.2. above.  Conclusion:</p>

<b>Notes from IG03</b>	
<ul style="list-style-type: none"> <li>• Additional tolerance in test speed.</li> <li>• Addition of [ ] in para 6.2.2. (measured)</li> </ul>	
<b>TF03</b>	

Maintaining the prescribed speed, gently drift the vehicle, either to the left or the right, at a rate of departure of between 0.1 and 0.8 m/s so that the vehicle crosses the lane marking. ~~Repeat the test at a different rate of departure within the range 0.1 and 0.8 m/s.~~

Repeat the above tests drifting in the opposite direction.

<b>Notes from TF02</b>	<b>Notes from IG03</b>
<i>Repetition of test to be re-discussed at the 3<sup>rd</sup> meeting of the informal group. All Parties to verify feasibility of the wording.</i>	UK favours repetition of the test. For ensuring that it works at at least 2 values of drifting OICA: prefers no repetition, but can reluctantly agree with a repetition Conclusion: brackets removed

6.6.2. The LDWS shall provide the lane departure warning indication mentioned in paragraph 5.4.1. at the latest when the outside of the tyre of the vehicle's front wheel crosses a line 0,3 m ~~exterior to~~ **beyond** the outside of the visible lane marking.

<b>Notes from TF02</b>	<b>Notes from IG03</b>
<i>Value of 0.3 m adopted</i>	Editorial improvement adopted. Conclusion: CLEPA to amend paragraph. 6.4.2. (user-adjustable warning threshold ) accordingly as there is a need for a link between the two paragraphs
<b>TF03</b>	

<b>Recommendation from TF02</b>	<b>Notes from IG03</b>
<del>6.5.4.If the LDWS did not provide the lane departure warning indication as mentioned in paragraph 6.5.3. above, discontinue the test.</del>	Adopted TF02 recommendation

6.7. ~~Malfunction~~ **failure** detection

~~6.6.1. Simulate a LDWS malfunction, for example by disconnecting the power source to any LDWS component or disconnecting any electrical connection between LDWS~~

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~~components. When simulating a LDWS malfunction, the electrical connections for the telltale lamps shall not be disconnected.~~

~~6.6.2. With the vehicle stationary and the ignition locking system in the "Lock" or "Off" position, activate the ignition locking system to the "On" or "Run" position. The LDWS shall perform a check of lamp function as specified in paragraph 5.4.3. of this Regulation~~

~~6.6.3. Drive the vehicle for up to 60 minutes along any portion of the test course.~~

~~6.6.4. The sum of the total cumulative drive time under paragraph 6.6.3. shall be the lesser of 60 minutes or the time at which the LDWS malfunction telltale illuminates in accordance with paragraph 5.4.2.~~

~~6.6.5. If the LDWS malfunction indicator did not illuminate in accordance with paragraph 5.4.2. as required, discontinue the test.~~

~~6.7.1. Simulate an LDWS failure, for example by disconnecting the power source to any LDWS component or disconnecting any electrical connection between LDWS components. When simulating an LDWS failure, the electrical connections for the driver warning signal and optional manual off switch shall not be disconnected.~~

**Simulate an LDWS failure, [for example] by disconnecting the power source to any LDWS component or disconnecting any electrical connection between LDWS components. When simulating an LDWS failure, neither the electrical connections for the failure warning signal of paragraph 5.4.2 or the LDWS disable control of paragraph 5.3. shall be disconnected.**

~~6.7.2. The LDWS failure warning signal shall be activated without delay and remain activated while the vehicle is being driven and is re-activated after a subsequent ignition "off" ignition "on" cycle.~~

**The LDWS warning signal shall be activated without delay and remain activated while the ignition is "on". A subsequent "off" "on" ignition cycle shall result in the warning signal being reactivated.**

Notes from TF02	Notes from IG03
<ul style="list-style-type: none"> <li>• <i>"malfunction" replaced by "failure"</i></li> <li>• <i>New wording proposed by Task Force for consideration at 3<sup>rd</sup> meeting of the informal group.</i></li> </ul>	<ul style="list-style-type: none"> <li>• TF02 wording not accepted</li> <li>• New wording to be revised at TF03/IG04. In particular: <ul style="list-style-type: none"> <li>○ Simulations given as examples or as test procedures</li> <li>○ Necessity of a requirement to perform the test while driving the vehicle.</li> </ul> </li> <li>• ROK and CLEPA raised the concern of</li> </ul>

	the “repaired failure”.
<b>TF03</b>	

7. MODIFICATION OF VEHICLE TYPE AND EXTENSION OF APPROVAL

- 7.1. Every modification of the vehicle type as defined in paragraph XXXX above shall be notified to the Administrative Department which approved the vehicle type. The department may then either:
  - 7.1.1. consider that the modifications made do not have an adverse effect on the conditions of the granting of the approval and grant an extension of approval;
  - 7.1.2. consider that the modifications made affect the conditions of the granting of the approval and require further tests or additional checks before granting an extension of approval.
- 7.2. Confirmation or refusal of approval, specifying the alterations, shall be communicated by the procedure specified in paragraph 4.3. above to the Contracting Parties to the Agreement which apply this Regulation.
- 7.3. The Competent Authority shall inform the other Contracting Parties of the extension by means of the communication form which appears in Annex 2 to this Regulation. It shall assign a serial number to each extension, to be known as the extension number.

8. CONFORMITY OF PRODUCTION

- 8.1. Procedures concerning conformity of production shall conform to the general provisions defined in Appendix 2 to the Agreement (E/ECE/324-E/ECE/TRANS/505/Rev.2) and meet the following requirements:
- 8.2. A vehicle approved pursuant to this Regulation shall be so manufactured as to conform to the type approved by meeting the requirements of paragraph 5. above;
- 8.3. The Competent Authority which has granted approval may at any time verify the conformity of control methods applicable to each production unit. The normal frequency of such inspections shall be once every two years.

9. PENALTIES FOR NON-CONFORMITY OF PRODUCTION

- 9.1. The approval granted in respect of a vehicle type pursuant to this Regulation may be withdrawn if the requirements laid down in paragraph 8. above are not complied with.



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9.2. If a Contracting Party withdraws an approval it had previously granted, it shall forthwith so notify the other Contracting Parties applying this Regulation by sending them a communication form conforming to the model in Annex 1 to this Regulation.

10. PRODUCTION DEFINITELY DISCONTINUED

If the holder of the approval completely ceases to manufacture a type of vehicle approved in accordance with this Regulation, he shall so inform the authority which granted the approval, which in turn shall forthwith inform the other Contracting Parties to the Agreement applying this Regulation by means of a communication form conforming to the model in Annex 1 to this Regulation.

11. NAMES AND ADDRESSES OF THE TECHNICAL SERVICES RESPONSIBLE FOR CONDUCTING APPROVAL TESTS AND OF ADMINISTRATIVE DEPARTMENTS

The Contracting Parties to the Agreement applying this Regulation shall communicate to the United Nations Secretariat the names and addresses of the Technical Services responsible for conducting approval tests and of the Administrative Departments which grant approval and to which forms certifying approval or extension or refusal or withdrawal of approval are to be sent.

12. INTRODUCTORY PROVISIONS

12.1. As from the date of entry into force of this Regulation, Contracting Parties applying this Regulation shall not:

(a) Refuse to grant ECE approval for a type of vehicle under this Regulation; or

(b) Prohibit the sale or entry into service of a vehicle

if the vehicle falls within the scope of this Regulation and complies with the requirements of this Regulation.

Annex 1

COMMUNICATION

(Maximum format: A4 (210 x 297 mm))



issued by :

Name of administration:

.....  
.....  
.....

concerning: 2/

- APPROVAL GRANTED
- APPROVAL EXTENDED
- APPROVAL REFUSED
- APPROVAL WITHDRAWN
- PRODUCTION DEFINITELY DISCONTINUED

of a type of vehicle with regard to the lane departure warning system pursuant to Regulation No. LDWS

Approval No.: .....Extension No.: .....

1. Trademark: .....
2. Type and trade name(s): .....
3. Name and address of manufacturer: .....
4. If applicable, name and address of manufacturer's representative: .....  
.....
5. Brief description of vehicle: .....
6. Data to enable the identification of reference point "R" of the seating position designated for the driver in relation to the primary reference marks: .....  
.....
7. Identification, place and relative positions of the primary reference marks: .....
8. Date of submission of vehicle for approval: .....
9. Technical Service performing the approval tests: .....

10. Date of report issued by that service: .....
11. Number of report issued by that service: .....
12. Approval with regard to the LDWS is granted/refused: 2/ .....
13. Place: .....
14. Date: .....
15. Signature: .....
16. Annexed to this communication are the following documents, bearing the approval number indicated above:  
  
..... dimensional drawings  
  
..... exploded view or photograph of the passenger compartment
17. Any remarks: .....

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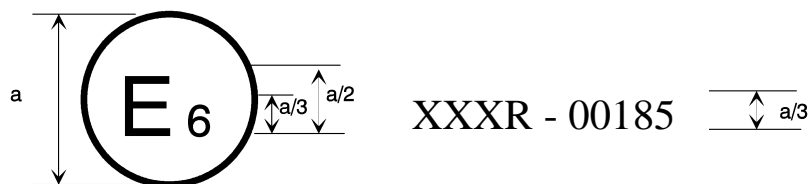
1/ Distinguishing number of the country which has granted/extended/refused/withdrawn an approval (see approval provisions in the Regulation).

2/ Delete what does not apply.

Annex 2

ARRANGEMENTS OF APPROVAL MARKS

(see paragraphs 4.4. to 4.4.2. of this Regulation)



$a = 8 \text{ mm min}$

The above approval mark affixed to a vehicle shows that the vehicle type concerned has been approved in Belgium (E6) with regard to the LDWS pursuant to Regulation No. LDWS. The first two digits of the approval number indicate that the approval was granted in accordance with the requirements of Regulation No. XXX in its original form.

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