**Draft UN Regulation**

**Uniform provisions concerning the approval of motor vehicles with regard to their Advanced Driver Assistance Systems (ADAS)**

|  |  |
| --- | --- |
| **Legend:** Initial text, not agreed after the end of the actual TF on ADAS session;New text submitted to the actual TF on ADAS session;Agreed text.Additional amendments to the already agreed text. | **Note:**UN Regulation No. 157 (ALKS) was used as the base text. |

| **Draft regulatory text** | **Comments, Remarks, Justification** |
| --- | --- |
| **Uniform provisions concerning the approval of motor vehicles with regard to their Advanced Driver Assistance Systems (ADAS)** |  |
| Contents |  |
|  |  |
| **Introduction** |  |
|  | Advanced Driver Assistance Systems (ADAS)addressed in this UN Regulation can be defined as electronically controlled vehicle systems aimed at assisting a human driver in performing the dynamic driving task (DDT) through information support (e.g., warnings in safety-critical situations) and assisting in executing the lateral and/or longitudinal control of the vehicle temporarily or on a sustained basis, but which require the human driver to permanently monitor the environment and vehicle/system performance.Thus, ADAS may not be capable to perform the entire DDT as they are limited in Object and Event Detection and Response (OEDR) and Operational Design Domain (ODD), and may not be capable to recognize certain environmental conditions. ADAS is intended to assist the human driver, who remains responsible for the entire DDT as well as OEDR. ADAS provide assistance at the tactical and operational driving levels.SAE J3016 (2021): Level 1 (*driver* assistance) and Level 2 (partial automation) *features* are capable of performing only part of the *DDT*, and thus require a *driver* to perform the remainder of the *DDT*, as well as to supervise the *feature’s* performance while engaged. As such, these *features*, when engaged, support—but do not replace—a *driver* in performing the *DDT*.Implementation of ADAS requires appropriate understanding by the human driver of the performance capabilities of the ADAS in the vehicle. The appropriate information provision and interaction with the driver is required to ensure that the human driver is fully engaged in the DDT, and to avoid potential human driver’s misinterpretation, overestimation, or difficulty with ADAS/vehicle control. |
| **1. Scope** |  |
|  |  |
| **2. Definitions**For the purposes of this Regulation: |  |
|  | DDT, OEDR, system boundaries / ODD, human driver.The term “driver” always refers to a human driver. |
| **3. Application for approval** |  |
| 3.1. The application for approval of a vehicle type with regard to the ADAS shall be submitted by the vehicle manufacturer or by the manufacturer’s authorized representative.3.2. It shall be accompanied by the documents mentioned below in triplicate:3.2.1. A description of the vehicle type with regard to the items mentioned in paragraph 2.1.1., together with a documentation package as required in Annex 1 which gives access to the basic design of the ADAS and the means by which it is linked to other vehicle systems or by which it directly controls output variables. The numbers and/or symbols identifying the vehicle type shall be specified.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 to 9 below, approval of that vehicle shall be granted.4.2. An approval number shall be assigned to each type approved; its first two digits (at present 00 corresponding to the 00 series of amendments, its original version) 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 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 documentation 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 or electronic format.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;[[1]](#footnote-1)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. above 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. ADAS Functionality** |  |
|  The fulfilment of the provisions of this paragraph shall be demonstrated by the manufacturer to the technical service during the inspection of the safety approach as part of the assessment to Annex 3. |  |
| **5.1.1. General requirements** | System operational frameworks associated with the ADAS definition.Include description of ADAS functionality. |
|  |  |
| **5.1.2. Dynamic Driving Task (DDT)** | FRAV-13-03 – Description of DDT elements |
| **5.1.2.1. Longitudinal control** |  |
|  |  |
| **5.1.2.2. Lateral control** |  |
|  |  |
| **5.1.2.3. Object and Event Detection and Response (OEDR)** |  |
|  |  |
| **5.1.3. Operating scenarios** |  |
|  |  |
| **5.1.4. System boundaries** |  |
|  |  |
| **5.1.5. ADAS states, modes, transitions and actions** |  |
|  |  |
| **5.1.6. ADAS interactions with other vehicle systems** |  |
|  |  |
| **5.2. ADAS interaction with the human driver** | HMI moved to functional requirements. |
|  The fulfilment of the provisions of this paragraph shall be demonstrated by the manufacturer to the technical service during the inspection of the safety approach as part of the assessment to Annex 3. |  |
| **5.2.1. Measures addressing the human driver’s awareness of ADAS capabilities and performance** |  |
| **5.2.1.1. Estimation of change of the human driver’s behaviour due to ADAS operation** | This section should predict the change of the human driver’s workload and address ensuring that the driver is fully engaged in performing DDT, possible human driver’s expectations, misinterpretations, overestimations, difficulties with ADAS/vehicle control. |
|  |  |
| **5.2.1.2. Human driver education** | Description of the driver information, engagement and possibly educational approach. |
|  |  |
| **5.2.2. Measures ensuring the human driver’s ADAS mode awareness** |  |
|  |  |
| **5.3. Hazard analysis related to ADAS application** | Note: wording should be transferred from current UN R 79 CEL Annex and NATM. |
|  The fulfilment of the provisions of this paragraph shall be demonstrated by the manufacturer to the technical service during the inspection of the safety approach as part of the assessment to Annex 3. |  |
|  | The hazard analysis should include:1. Possible hazardous situations and sources of hazards:
	1. ADAS normal operation;
	2. When reaching and exceeding ADAS boundaries;
	3. ADAS failures;
2. Reasonably foreseeable ADAS misuse:
	1. Countermeasures to avoid ADAS misuse;
3. ADAS failures;
4. Risk assessment;
5. How the hazards are addressed.
 |
| **5.4. Functional requirements** |  |
| **5.4.1. OEDR sensor requirements** | General plus function-specific requirements, if appropriate. |
|  |  |
| **5.4.2. Driver Engagement Detection** |  |
|  |  |
| **5.4.3. Vehicle dynamic behaviour** |  |
|  |  |
| **5.4.4. Function-specific requirements** |  |
| **5.4.4.1. Lane keeping** |  |
|  |  |
| **5.4.4.2. Lane changing** |  |
|  |  |
| **5.4.4.3. Other transitions between lane-keeping phases** |  |
|  |  |
| **5.4.4.4. Low-speed manoeuvring** |  |
|  |  |
| **5.5. ADAS overriding by the human driver** |  |
|  |  |
| **5.6. Human-machine interface (HMI)** |  |
| **5.6.1. ADAS activation and deactivation** |  |
|  |  |
| **5.6.2. ADAS status indication**  |  |
|  |  |
| **5.6.3. ADAS messages to the human diver** | * Message classification
	+ Fault indication
	+ Information prompt
	+ Status prompt
* Warning messages
* Measures to avoid driver informational overload
 |
|  |  |
| **5.6.4. Special provisions for ADAS-initiated driving manoeuvres** |  |
|  |  |
| **5.6.5. ADAS fallback special cases** |  |
| **5.6.5.1. Reaching the ADAS boundaries** |  |
|  |  |
| **5.6.5.2. Exceeding the ADAS boundaries** |  |
|  |  |
| **5.6.5.3. ADAS failures** |  |
|  |  |
| **6. Modification of vehicle type and extension of approval** |  |
| 6.1. Every modification to an existing vehicle type shall be notified to the Type Approval Authority which approved the vehicle type. The Authority shall then either: (a) Decide, in consultation with the manufacturer, that a new type-approval is to be granted; or (b) Apply the procedure contained in paragraph 6.1.1. (Revision) and, if applicable, the procedure contained in paragraph 6.1.2. (Extension).6.1.1. Revision When particulars recorded in the information documents have changed and the Type Approval Authority considers that the modifications made are unlikely to have appreciable adverse effects and that in any case the foot controls still meet the requirements, the modification shall be designated a "revision". In such a case, the Type Approval Authority shall issue the revised pages of the information documents as necessary, marking each revised page to show clearly the nature of the modification and the date of re-issue.  A consolidated, updated version of the information documents, accompanied by a detailed description of the modification, shall be deemed to meet this requirement.6.1.2. Extension The modification shall be designated an "extension" if, in addition to the change of the particulars recorded in the information documents, (a) Further inspections or tests are required; or (b) Any information on the communication document (with the exception of its attachments) has changed; or (c) Approval to a later series of amendments is requested after its entry into force.6.2. Confirmation or refusal of approval, specifying the alteration, shall be communicated by the procedure specified in paragraph 4.3. above to the Contracting Parties to the Agreement applying this Regulation. In addition, the index to the information documents and to the test reports, attached to the communication document of Annex 1, shall be amended accordingly to show the date of the most recent revision or extension.6.3. The competent authority issuing the extension of approval shall assign a serial number to each communication form drawn up for such an extension. |  |
| **7. Conformity of production** |  |
| 7.1. Procedures concerning conformity of production shall comply with those set out in the 1958 Agreement, Schedule 1 (E/ECE/TRANS/505/Rev.3) and meet the following requirements: 7.2. A vehicle approved pursuant to this Regulation shall be so manufactured as to conform to the type approved by meeting the requirements of this regulation; 7.3. The Type Approval 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.  |  |
| **8. Penalties for non-conformity of production** |  |
| 8.1. 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.8.2. 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.  |  |
| **9. Production definitively discontinued** |  |
| 9.1. 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 Type Approval 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.9.2. The production is not considered definitely discontinued if the vehicle manufacturer intends to obtain further approvals for software updates for vehicles already registered in the market. |  |
| **10. Names and addresses of technical series responsible for conducting approval tests and of Type Approval Authorities** |  |
|  The Contracting Parties to the Agreement applying this Regulation shall communicate to the United Nations Secretariat[[2]](#footnote-2) the names and addresses of the Technical Services responsible for conducting approval tests and of the Type Approval Authorities which grant approval and to which forms certifying approval or extension or refusal or withdrawal of approval are to be sent. |  |

| **Draft regulatory text** | **Comments, Remarks, Justification** |
| --- | --- |
| **Annex 1** |  |
| **Communication**(Maximum format: A4 (210 x 297 mm)[[3]](#footnote-3)issued by: Name of administration:..................................................................................................................**4**Concerning:[[4]](#footnote-4) Approval grantedApproval extendedApproval refusedApproval withdrawnProduction definitively discontinuedof a vehicle type with regard to steering equipment pursuant to UN Regulation No. XXXApproval No. .................. Reason for extension or revision: 1. Trade name or mark of vehicle 2. Vehicle type 3. Manufacturer's name and address 4. If applicable, name and address of manufacturer's representative 5. General construction characteristics of the vehicle: 5.1. Photographs and/or drawings of a representative vehicle: 6. Description and/or drawing of the ADAS including:  |  |
|  |  |

| **Draft regulatory text** | **Comments, Remarks, Justification** |
| --- | --- |
| **Appendix** |  |
| **Addendum to Type Approval Communication No … concerning the type approval of a vehicle type with regard to ADAS pursuant to UN Regulation No. XXX** |  |
| Additional informationContracting Party regions where the vehiclemanufacturer has declared that the ADAS had been assessed to comply with local traffic rules: |  |

| *Country* | *Assessed* | *Comments on any restrictions* |
| --- | --- | --- |
|  |  |  |
| E 1 Germany | Yes/No |  |
| E 2 France |  |  |
| E 3 Italy |  |  |
| E 4 Netherlands |  |  |
| E 5 Sweden |  |  |
| E 6 Belgium |  |  |
| E 7 Hungary |  |  |
| E 8 Czech Republic |  |  |
| E 9 Spain |  |  |
| E 10 Serbia |  |  |
| E 11 United Kingdom |  |  |
| E 12 Austria |  |  |
| E 13 Luxembourg |  |  |
| E 14 Switzerland |  |  |
| E 16 Norway |  |  |
| E 17 Finland |  |  |
| E 18 Denmark |  |  |
| E 19 Romania |  |  |
| E 20 Poland |  |  |
| E 21 Portugal |  |  |
| E 22 Russian Federation |  |  |
| E 23 Greece |  |  |
| E 24 Ireland |  |  |
| E 25 Croatia |  |  |
| E 26 Slovenia |  |  |
| E 27 Slovakia |  |  |
| E 28 Belarus  |  |  |
| E 29 Estonia  |  |  |
| E 30 Republic of Moldova  |  |  |
| E 31 Bosnia and Herzegovina |  |  |
| E 32 Latvia  |  |  |
| E 34 Bulgaria  |  |  |
| E 35 Kazakhstan  |  |  |
| E 36 Lithuania  |  |  |
| E 37 Turkey  |  |  |
| E 39 Azerbaijan  |  |  |
| E 40 North Macedonia |  |  |
| E 43 Japan  |  |  |
| E 45 Australia  |  |  |
| E 46 Ukraine  |  |  |
| E 47 South Africa |  |  |
| E 48 New Zealand  |  |  |
| E 49 Cyprus |  |  |
| E 50 Malta |  |  |
| E 51 Republic of Korea |  |  |
| E 52 Malaysia |  |  |
| E 53 Thailand |  |  |
| E 54 Albania E 55 Armenia  |  |  |
| E 56 Montenegro |  |  |
| E 57 San Marino  |  |  |
| E 58 Tunisia  |  |  |
| E 60 Georgia  |  |  |
| E 62 Egypt  |  |  |
| E 63 Nigeria  |  |  |
| E 64 Pakistan |  |  |
| \* |  |  |

\* The list of Contracting Parties applying UN Regulation No. [15X] is available online: [https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg\_no=XI-B-16-15[X]&chapter=11&clang=\_en](https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XI-B-16-%5b15X%5d&chapter=11&clang=_en)

| **Draft regulatory text** | **Comments, Remarks, Justification** |
| --- | --- |
| **Annex 2** |  |
| **Arrangements of approval marks****Model A**(See paragraph 4.4. of this Regulation)**XXXR - 002439** a = 8 mm minThe above approval mark affixed to a vehicle shows that the vehicle type concerned has, with regard to ADAS, been approved in the Netherlands (E 4) pursuant to UN Regulation No. XXX under approval No. 002439. The approval number indicates that the approval was granted in accordance with the requirements of UN Regulation No. XXX in its original version.**Model B**(See paragraph 4.5. of this Regulation)

|  |  |
| --- | --- |
| **XXX** | **002439** |
| **31** | **021628** |

 a = 8 mm minThe above approval mark affixed to a vehicle shows that the vehicle type concerned has been approved in the Netherlands (E 4) pursuant to Regulations Nos. XXX and 31.[[5]](#footnote-5) The approval numbers indicate that, at the dates when the respective approvals were given, UN Regulation No. XXX was in its original version and UN Regulation No. 31 included the 02 series of amendments. |  |
| **Annex 3** |  |
| **Special requirements to be applied to the safety aspects of electronic control systems and audit** |  |
|  |  |

| **Draft regulatory text** | **Comments, Remarks, Justification** |
| --- | --- |
| **Annex 4** |  |
|  |  |
|  |  |

| **Draft regulatory text** | **Comments, Remarks, Justification** |
| --- | --- |
| **Annex 5** |  |
|  |  |
|  |  |

| **Draft regulatory text** | **Comments, Remarks, Justification** |
| --- | --- |
| **Annex 6** |  |
|  |  |
|  |  |

1. The distinguishing numbers of the Contracting Parties to the 1958 Agreement are reproduced in Annex 3 to the Consolidated Resolution on the Construction of Vehicles (R.E.3), documentECE/TRANS/WP.29/78/Rev. 6 - [www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html](http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html) [↑](#footnote-ref-1)
2. Through the online platform (“/343 Application”) provided by UNECE and dedicated to the exchange of such information: https://www.unece.org/trans/main/wp29/datasharing.html [↑](#footnote-ref-2)
3. Distinguishing number of the country which has granted/extended/refused/withdrawn approval (see approval provisions in UN Regulation No. [15X]). [↑](#footnote-ref-3)
4. Strike out what does not apply. [↑](#footnote-ref-4)
5. The second number is given merely as an example. [↑](#footnote-ref-5)