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EUROPEAN NEW CAR ASSESSMENT PROGRAMME (Euro NCAP)

ASSESSMENT PROTOCOL – SAFETY ASSIST

Version 6.1
June 2015

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1 INTRODUCTION

Euro NCAP's original assessment protocol was developed jointly by TRL and Vehicle Safety Consultants Ltd. under contract to the UK Department of the Environment Transport and the Regions and International Testing, respectively. Subsequent versions of the protocol have been developed and released by the Euro NCAP Secretariat. Beginning Version 5 important changes have been included that have been brought about by the introduction of the overall rating scheme. Individual documents are released for the four main areas of assessment:

- Assessment Protocol – Adult Occupant Protection;
- Assessment Protocol – Child Occupant Protection;
- Assessment Protocol – Pedestrian Occupant Protection;
- Assessment Protocol – Safety Assist;

In addition to these four assessment protocols, a separate document is provided describing the method and criteria by which the overall safety rating is calculated on the basis of the car performance in each of the above areas of assessment.

The following protocol deals with the assessments made in the area of Safety Assist, in particular for the Seat Belt Reminder, Speed Assist Systems, Electronic Stability Control Systems, Lane Support Systems and Autonomous Emergency Braking Systems.

DISCLAIMER: Euro NCAP has taken all reasonable care to ensure that the information published in this protocol is accurate and reflects the technical decisions taken by the organisation. In the unlikely event that this protocol contains a typographical error or any other inaccuracy, Euro NCAP reserves the right to make corrections and determine the assessment and subsequent result of the affected requirement(s).

2 METHOD OF ASSESSMENT

Unlike the assessment of protection offered in the event of a crash, the assessment of Safety Assist functions does not require destructive testing of the vehicle. Assessment of the Safety Assist functions can be based both on fitment requirement and performance requirements verified by Euro NCAP (as is the case for Seat Belt Reminder, Speed Assist Systems and Autonomous Emergency Braking systems) or fitment requirements alone, where functionality is demonstrated by the manufacturer (Electronic Stability Control and Lane Support systems). The intention is to promote standard fitment across the car volume sold in the European Community in combination with good functionality for these systems, where this is possible.

It is important to note that Euro NCAP only considers assessment of safety assist systems that meet the fitment requirements for base safety equipment (as defined in the Vehicle Specification, Selection, Testing and Re-testing protocol). For the performance assessment of seat belt reminder and speed assistance systems, the car is subjected to a number of trial sequences designed to highlight the effectiveness of the systems. The car performance is scored using the observations made by the inspector during driving. In addition to the basic Euro NCAP assessment, additional information may be recorded that may be added to the Euro NCAP assessment in the future.

3 SEAT BELT REMINDER ASSESSMENT

3.1 Introduction

3.1.1 It is well recognised that the correct wearing of seat belts is the most effective way of providing protection for vehicle occupants in a crash. Currently, wearing rates vary greatly across the European Union and research has shown that many of the non-wearers would use their seat belt with some encouragement. A small proportion of non-wearers will not be persuaded to use their belts.

3.1.2 Seat Belt Reminder (SBR) systems are intended to encourage the first of these groups to use their seat belt, whilst at the same time not be so annoying that the second group would take undesirable action to disable the system. Such action could include, tampering with or cutting electrical connections which might have undesirable consequences.

3.1.3 It is intended that habitual users who always put their seat belt on, before starting their journey, would hardly notice the existence of the system and would not be annoyed by it.

3.1.4 To avoid the danger that dedicated non-users would try to tamper with the system, Euro NCAP recommends that SBR systems are capable of being deactivated. Deactivation could be long term and/or short term for individual journeys.

3.1.5 Although, simple seat belt reminder systems have been available for some time, the technology behind the more sophisticated systems is new. Euro NCAP has set some minimum requirements but wishes to allow the development of increasingly improved systems.

3.1.6 Some recommendations are made for how improvements may occur and these may eventually become Euro NCAP requirements. The expectation is that the requirements will develop in the light of further knowledge.

3.1.7 The terms used in this protocol are defined in Appendix I.

3.2 Information Required from Manufacturers

3.2.1 Before the SBR system can be evaluated by Euro NCAP, it is necessary for the manufacturer to explain which seating positions are covered by the system and how the system is intended to work. See Appendix II. This information should be supplied to Euro NCAP prior to the assessment.

3.2.2 Only those seating positions, requested by the manufacturer, will be assessed by Euro NCAP, even if the system extends to other seats. However, where reminders are fitted to seats which have not been nominated for assessment, they should not adversely affect the seat being assessed.

3.3 Seat Occupancy Requirement

3.3.1 In the case of the driver's seat, occupancy can be assumed so the system does not have to be capable of detecting whether or not the seat is in use.

3.3.2 For the front seat passengers, seat use must be detected. Euro NCAP defines occupancy as use by an occupant larger, taller or heavier than a small female (5 percentile).

3.3.3 Rear seat occupant detection is not required but it is recommended.

3.4 Seat Belt Use

3.4.1 For all seats offered for assessment, seat belt use must be monitored. Their use needs to be identified at the start of the journey and any change of use must be detected throughout the period of use of the vehicle.

3.4.2 Monitoring of rear seat belt secondary buckles that require a key to unlock them, is not required.

Note: In some cases, systems are unable to reliably meet the requirements of Section 3.8.1. For example, if the seat belt is used to retain a child restraint, the belt may be unbuckled but sufficient webbing has been drawn off the reel for the system to interpret the belt as being buckled, resulting in false indication of belt use. This potentially hazardous situation could also occur with CRS lock-offs and where the belt is left over the occupants shoulder.

3.5 Removable Seats

3.5.1 Where seats, covered by the reminder system, are removable as part of the cars normal usage, Euro NCAP has minimum requirements for any electrical connections used by the reminder system.

3.5.2 It is recommended that such electrical connections are made automatically when the seat is installed in the vehicle.

3.5.3 Alternatively, a manual connection can be made by the installer. Where this is the case, all of the following requirements must be complied with:

- Connectors must be conspicuous and easily visible to the installer, during the installation process.
- Clear markings must indicate the purpose of the connection and show how the connection is made.
- The markings must be permanently attached to the vehicle.
- The markings must be conspicuous using contrasting colours.
- The markings must be easily visible to the installer during the installation process**.**

3.5.4 The presence or absence of the seat must not adversely affect the operation of other parts of the reminder system.

3.5.5 The SBR system must not give any false indication of belt use, whether the seats are installed in the vehicle or not. For example, when a seat is installed in the vehicle, but the electrical system is not connected, the seat belt reminder system should not indicate that the seat belt is being worn, when it is not being worn.

3.5.6 If the removable seat is optional, the assessment will be based on a car equipped with the optional removable seat.

3.6 Start and Duration of Signal

3.6.1 **Front seating positions**

3.6.1.1 The reminder system should "start" at the commencement of each "journey" that the vehicle makes. Short breaks in the journey are allowed, where the reminder system is not required to start again. Such short breaks, of up to 30 seconds, are to allow for events such as stalling of the engine.

3.6.1.1.1 Initial Signal

It is recommended that an audio and/or visual signal is started, shortly after the ignition is switched on or shortly after the vehicle starts to move, where one or more seat belts are not in use.

3.6.1.1.2 Intermediate Signal

Optionally, an intermediate signal may be given, at some time before the "Final Signal" is required, where one or more seat belts are not in use.

If this "Intermediate Signal" is more sophisticated than a simple audiovisual signal, the start of the Final Signal may be delayed. Such an Intermediate Signal might be a clear, easily visible text message or a loud and clear voice message.

3.6.1.1.3 Final Signal

The audiovisual Final Signal is the only signal which is a Euro NCAP requirement, where one or more seat belts are not in use.

The start and duration requirements are defined as follows:

(1) *Start*

The Final Signal must start before at least one of the following:

- The engine has been running for 60 seconds, or
- The car has been in "Forward Motion" for 60 seconds, or
- The car has been in "Forward Motion" for 500 meters, or
- The car has reached a forward speed of 25 km/h.

(2) Where an Initial Signal is employed, the start of the Final Signal may be delayed provided that the Initial Signal meets one of the requirements detailed below. In this circumstance, the Final Signal must start within 30 seconds of the car having reached a forward speed of 25 km/h.

- A constant, flashing or intermittent visual signal for at least 30 seconds
- A text message for at least 5 seconds
- A clear voice message

The duration of the Initial Signal may be reduced provided the Final Signal commences immediately after the Initial Signal stops.

For systems which have Initial, Intermediate and Final Signals, the start of the Intermediate and/or Final Signals may be delayed provided that the Initial Signal meets one of the requirements detailed above. In this circumstance, the Intermediate Signal must start within 30 seconds of the car having reached a forward speed of 25 km/h and lead into the Final Signal after an additional 30 seconds.

The duration of the Initial Signal may be reduced provided that either the Intermediate or Final Signal commences immediately after the Initial Signal stops.

(3) Where a "more sophisticated Intermediate Signal" is employed, the start of the Final Signal may be delayed. However, the Final Signal must start before at least one of the following:

- The engine has been running for 90 seconds, or
- The car has been in "Forward Motion" for 90 seconds, or
- The car has been in "Forward Motion" for 1000 meters, or
- The car has reached a forward speed of 40 km/h.

(4) For the purpose of defining the start of the Final Signal, forward motion at less than 10 km/h, or rearward motion, is not deemed to be motion.

(5) *Duration*

The duration of the Final Signal must be at least 90 seconds.

If the audiovisual Final Signal is not continuous:

- The signal must start with a positive audiovisual signal, for at least 5 seconds.
- Gaps of more than 1 second in the signal must not occur more frequently than every 5 seconds.
- Gaps of less than 1 second, which allow for visual signals which flash and audio signals which "beep," are ignored.
- If gaps in the signal exceed 3 seconds, that time is not included in the "Duration" time.
- No gap must last for more than 25 seconds.

(6) Once the Final Signal has started, it must only stop under one of the following circumstances.

- The signal has operated for the Duration specified.
- The related seat belts are put into use.
- The engine has stopped.
- Reverse gear has been selected.

  Note: When forward gear is re-selected and forward motion commences (>10 km/h), the Final Signal must resume again.
- The occupant leaves the car, unless the signal is required to indicate the belt use status of others.

3.6.1.2 The signal requirements when there is a change of belt status are described in Section 3.8.

3.6.2 **Rear seating positions**

3.6.2.1 The reminder system should "start" at the commencement of each "journey" that the vehicle makes. Short breaks in the journey are allowed, where the reminder system is not required to start again. Such short breaks, of not more than 30 minutes, are to allow for events such as stalling of the engine or re-fuelling, where passengers may remain in the vehicle.

3.6.2.1.1 For the rear seat belt reminder, it is acceptable for a journey to be considered as having been completed when 30 minutes have elapsed, after the engine has stopped.

3.6.2.1.2 In the absence of seat occupancy information, only a visual signal is required by Euro NCAP, unless there is a change of status. See Section 3.8 for further requirements.

3.6.2.1.3 The start and duration requirements of the signal are defined as follows:

(1) *Start*

The signal must start within five seconds of at least one of the following:

- Engine start, or
- The start of forward motion (>10 km/h).

(2) Where seat occupancy is monitored, the start of the signal may be delayed by 10 seconds. With good justification, longer delays may be acceptable.

(3) For the purpose of defining the start of the signal, forward motion at less than 10 km/h, or rearward motion, is not deemed to be motion.

(4) *Duration*

The duration of the visual signal must be at least 30 seconds.

If the visual signal is not continuous:

- Gaps of more than 1 second in the signal must not occur more frequently than every 5 seconds.

- Gaps of less than 1 second, which allow for visual signals which flash are ignored.
- If gaps in the signal exceed 3 seconds, that time is not included in the "Duration" time.
- No gap must last for more than 25 seconds.

3.6.2.2 The system may allow the driver to acknowledge the signal, so switching it off.

3.6.2.3 No signal is required if the system is able to determine that there are no occupants in the rear seating positions.

3.6.2.4 The signal requirements when there is a change of belt status are described in Section 3.8.

3.7 Signal

3.7.1 Euro NCAP only requires the provision of simple audiovisual or visual signals. However, manufacturers are recommended to use the best possible means of communicating the reminder message to the driver and all the passengers. The provision of a visual signal for the user of each seat, the use of a loud and clear voice message or

the use of a prominent text message on satellite navigation or other LCD screen is recommended.

3.7.2 The signal should not annoy users, to the extent that they may be tempted to tamper with the restraint or the vehicle's electrical system.

3.7.3 A progressive or stepped audible signal is recommended. However, there is no requirement regarding the volume of any audible signal other than the Final Signal.

3.7.4 If for any reason, multiple audible signals are being generated at the time that the reminder signal is operating, they must not interfere with each other, to the extent that the message is less clear, unless a more critical safety warning is being made.

3.7.5 **Front seating positions**

3.7.5.1 The Final Signal used for the front seating positions must be both audio and visual.

3.7.5.2 The audible component of the Final Signal must be "Loud and Clear" for the driver and all relevant passengers.

3.7.5.3 The visual signal and its message must be clearly visible to driver, without the need for the head to be moved from the normal driving position.

3.7.5.4 There must be a clear and obvious link between the audible and visual signals. In the case of flashing or intermittent visual or audible signals, this may be achieved by having them in synchronisation.

3.7.5.5 It is recommended that all front seat passengers can see the visual signal relevant to their seating position.

3.7.5.6 It is recommended that the relevant visual signals are illuminated for the whole of the time that the seat is occupied without the seat belt being used.

3.7.5.7 Where text messages are used, they must be in at least one of the languages of each of the countries in which the car is offered for sale.

3.7.6 **Rear seating positions**

3.7.6.1 The start signal(s) for the rear seating positions (as defined in Section 3.6.2.1.3) need only be visual.

3.7.6.2 An immediate audible component for change of status is required; the signal must be "loud and clear" for the driver. A single audible signal, such as one chime or beep, when

each belt is unbuckled is acceptable. The requirements for change of status are detailed in Section 3.8.

3.7.6.3 The visual signals and their message must be clearly and easily visible to driver, without the need for the head to be moved from the normal driving position.

3.7.6.4 It is recommended that all rear seat passengers can see the visual signal relevant to their seating position. It is recommended that the relevant visual signals are illuminated for the whole of the time that the seat is occupied without the seat belt being used.

3.7.6.5 The visual signals must clearly indicate to the driver the number of seat belts in use or not in use. No signal is required if all of the rear occupants are belted.

3.7.6.6 No signal is required if the system is able to determine that there are no occupants in the rear seats.

3.7.6.7 Where text messages are used, they must be in at least one of the languages of each of the countries in which the car is offered for sale.

3.8 Change of Status

3.8.1 If during the journey, any seat belt experiences a "change of status," where a buckled belt is unbuckled, the reminder must indicate this immediately with an audiovisual signal.

3.8.2 A change of status signal for all seating positions is required at vehicle speeds above 25km/h.

3.8.3 **Front seating positions**

3.8.3.1 An audiovisual signal must commence immediately once any front row seat belt is unbuckled. This must be indicated with the use of an "Intermediate Signal" or the Final Signal.

3.8.3.1.1 Where the Final Signal is used the following requirement must be met:

- The signal must meet the requirements detailed in Section 3.7.5.
- The signal must meet the requirements detailed in Section 3.6.1.1.3 (5) & (6).
- The signal must start immediately with a positive audiovisual signal, for at least 5 seconds.

3.8.3.1.2 Where an "Intermediate Signal" is used the following requirement must be met:

- The signal must be audiovisual.
- The signal must start with a positive audiovisual signal, for at least 5 seconds.
- The must be no gaps greater than 10 seconds.
- The final signal must commence after a maximum duration of 30 seconds.

3.8.4 **Rear seating positions**

3.8.4.1 An audiovisual signal, meeting the requirements of 3.7.6 and 3.8.1, must commence immediately when any rear seat belt is unbuckled.

3.8.4.2 The visual signal must continue for its full duration of 30 seconds or until the rear belts are buckled for the seats in use.

3.8.4.3 The audible component must also commence immediately and be "loud and clear" to the driver. A single audible signal, such as one 'chime' or 'beep', when each belt is unbuckled is acceptable.

3.8.4.4 Where two or more belts are unbuckled within 5 seconds of each other, a single chime or beep is acceptable. Where more than 5 seconds elapses between belts being unbuckled, an audible signal for each unbuckled belt is required.

3.8.4.5 For the rear seats, the system may allow the driver to acknowledge the signal, so switching it off.

3.9 Test Conditions for Assessment of Loud and Clear Audible Signals

3.9.1 The sound level will be assessed by a user, having normal hearing acuity, sitting in the relevant seat.

3.9.1.1 The assessment will be made with the vehicle being driven at constant speed, of 25 km/h, in second gear. Vehicles with automatic transmission will have it locked in second gear, if this is possible. Note: Where a more sophisticated Intermediate Signal is employed, it may be necessary to travel at 40 km/h before returning to 25 km/h, to assess the audible signal.

3.9.1.2 The ventilation fan will be set to its maximum setting.

3.9.1.3 All ventilation vents will be fully opened, if this is possible.

3.9.1.4 The radio / audio system will be switched off.

Note: It is recommended, that reminder systems are designed so that, if they sound whilst the radio / audio system is playing, they interrupt the radio / audio sound. Alternatively, the radio/ audio system could be used to convey the reminder message.

3.9.1.5 The air conditioning will be switched off, if this is possible

3.9.1.6 With convertibles, the roof will be closed.

3.9.1.7 All windows will be closed.

Note: It is recommended that the reminder system is designed so that the audible signal can be easily heard under any normal usage conditions.

3.10 Deactivation

3.10.1 The reminder system may be designed to allow deactivation. Short term deactivation can cover a single journey. Long term deactivation may be used for dedicated non-users

of seat belts. It is intended that this would reduce the likelihood that users might tamper with the system.

3.10.2 The Seat Belt Reminder system must not be deactivated at the time that the car is offered for sale.

3.10.3 Short term single journey deactivation

3.10.3.1 Short term deactivation must be more difficult than putting the seat belt on and off once. Short term deactivation must only affect the seating position for which deactivation had been chosen.

3.10.3.2 The Reminder system must reactivate if ignition is switched off for more than 60 seconds.

3.10.4 Long Term

3.10.4.1 Long term deactivation must require a sequence of operations, which could not be guessed at or carried out accidentally.

3.10.4.2 Re-activation must be simple. It should not be more difficult to reactivate than it was to deactivate. No new components or special tools should be required.

3.10.4.3 It is recommended that seating positions can be deactivated individually.

3.10.4.4 Instructions for long term deactivation must not be supplied with the car. However, they can be supplied to the user on their request.

3.10.4.5 Included with the deactivation instructions must be the instructions on how to reactivate the system.

3.10.4.6 If deactivation has to be carried out by dealer, reactivation may also be carried out by the dealer.

3.10.4.7 In the case of low volume, special purpose vehicles, the Euro NCAP Secretariat can give ad hoc approval to remove the Euro NCAP requirement for the fitting of the SBR system to those vehicles.

3.10.5 Installing Child Restraint Systems

3.10.5.1 Where a vehicle can automatically detect the installation of a child restraint system, that doesn't use the adult belt system, the SBR for that individual seat position may be disabled. For example, using a switch on the ISOFIX anchorage which would be activated when the ISOFIX latches are attached to the anchorages.

3.10.5.2 The SBR must only be deactivated by the specific action of installing a CRS in that seating position.

3.10.5.3 The reminder system must reactivate immediately once the CRS had been removed regardless of whether the ignition is switched on or off at the time.

3.10.5.4 There must be no link between the front seat passenger airbag and the front seat passenger SBR signals. It is NOT acceptable to Euro NCAP for the passenger seat SBR to be disabled via the passenger airbag switch.

3.11 Scoring & Visualisation

3.11.1 For Seat Belt Reminder systems which fully comply with the Euro NCAP requirements, the following points will be awarded to the overall occupant score for that vehicle:

3.11.1.1 *Front row seats*

Where ALL front row seating positions meet the assessment criteria, 2 points will be awarded.

3.11.1.2 *Rear Passenger Seats*

Where 2 points have been awarded for all front seating positions AND ALL rear seating positions meet the assessment criteria an additional 1 point will be awarded.

3.11.1.3 If the third or more row of seats is optional, on any variant, the assessment will be based on a vehicle fitted with the optional seats.

3.11.1.4 In future, up to two additional points may become available to reward very sophisticated systems with enhanced capability. Such capability is not yet defined.

3.11.1.5 The result of the Seat Belt Reminder assessment is not visualised.

3.12 Future Developments

3.12.1 It is expected that the protocol will continue to develop, in the light of experience with these new systems. Consideration will also be given to converting some of the current recommendations to requirements.

4 ASSESSMENT OF SPEED ASSIST SYSTEMS

4.1 Introduction

Excessive speed is a factor in the causation and severity of many road accidents. Speed restrictions are intended to promote safe operation of the road network by keeping traffic speeds below the maximum that is appropriate for a given traffic environment, thereby protecting vehicle occupants and other road users, both motorised and non-motorised. These maximum speeds are intended to control energy levels in typical crashes and to allow sufficient time for drivers to react to traffic situations. Properly selected speed limits should facilitate efficient traffic flow, reduce violations and promote safe driving conditions. Greater adherence to speed limits would avert many accidents and mitigate the effects of those that occur.

Voluntary speed limitation devices are a means to assist drivers to adhere to speed limits. Euro NCAP hopes to encourage manufacturers to promote such speed-limitation devices, to fit them as standard equipment. This, it is hoped, will lead to greater demand by consumers and an increased introduction of speed limitation systems.

The margins for alarm activation set out in this document are based on prevailing speedometer accuracy, which is specified by regulation and typically overstates the vehicle speed by several km/h.

This version of the protocol contains technical requirements for both Manual Speed Assist (MSA) systems where the driver needs to set the limited speed and Intelligent Speed Assist (ISA) systems where the car 'knows' the current legal speed limit to be used in the warning or speed limitation function. To be able to score full points for the speed limitation function the system (both MSA and ISA) need to fulfil the warning function and speed setting requirements.

4.2 Definitions

Throughout this protocol the following terms are used:

- **Vindicated** – The speed the car travels as displayed to the driver by the speedometer as in ECE R39.
- **Speed Limit** – Maximum allowed legal speed for the vehicle at the location, time and in the circumstance the vehicle is driving.
- **Vadj** – Adjustable speed Vadj means the voluntarily set speed for the MSA/ISA, which is based on **Vindicated** and includes the offset set by the driver.
- **MSA** – **Manual Speed Assistance**. MSA means a system which allows the driver to set a vehicle speed Vadj, to which he wishes the speed of his car to be limited and/or above which he wishes to be warned.

- **SLIF - Speed Limit Information Function**. SLIF means a function with which the vehicle knows and communicates the speed limit.
- **ISA – Intelligent Speed Assistance**. ISA is a MSA combined with SLIF, where the Vadj is set by the SLIF with or without driver confirmation.

The following terms are used for the assessment of the Speed Limitation function:

- **Vstab** – Stabilised speed Vstab means the mean actual vehicle speed when operating. Vstab is calculated as the average actual vehicle speed over a time interval of 20 seconds beginning 10 seconds after first reaching Vadj – 10 km/h.

4.3 Requirements for SLIF, MSA and ISA

4.3.1 The Speed Assist Systems is developed in such a way that it allows different types of Speed Assist Systems to be assessed. Four types of possible Speed Assist Systems are foreseen:

- SLIF Speed Limit Information Function
- MSA Manual Speed Assistance
  - Warning function only
  - Speed Limitation function only
  - Warning function & Speed Limitation function
- SLIF + MSA Both SLIF and MSA but not coupled
- ISA Intelligent Speed Assistance, SLIF and MSA coupled

4.3.2 The table below details which sections are applicable for the different types of SA systems:

Type	**Sections**
SLIF	4.4
MSA	4.5.1, 4.6, 4.7
ISA	0, 4.5.1, 4.5.2, 4.6, 4.7

4.4 Speed Limit Information Function

The Speed Limit Information Function can be a standalone function or an integrated part of ISA. Any SLIF, camera or map based or a combination of both, need to fulfil the requirements of this section. The speed limit information could either be provided by vehicle-integrated devices or by mobile devices connected to the vehicle network. A list of compatible devices needs to be mentioned in the vehicle handbook.

Manufacturers need to supply Euro NCAP with background information of the SLIF to be eligible for scoring (if applicable to the technology).

4.4.1 General Requirements

4.4.1.1 The speed limit shall be shown using a traffic sign and shall be in the direct field of view of the driver, without the need for the head to be moved from the normal driving position, i.e. instrument cluster, rear view mirror and centre console.

4.4.1.2 The speed limit information must be shown or accessible at any time with a simple operation and needs to be shown at the start of the next journey (excluding the initialization period).

4.4.1.3 The indicated speed limit information may indicate the level of reliability of the speed limit.

4.4.1.4 In the presence of conditional speed limits (see Appendix I) the system needs to either properly identify and show (for example when raining) the applicable speed limit or alternatively, needs to indicate the presence of a conditional speed limit which the system is not able to compute.

4.5 Setting the Speed

Both MSA and ISA systems must comply with section 4.5.1. ISA systems meeting the requirements of section 4.4 are eligible for a higher score when also meeting the requirements in section 4.5.2.

4.5.1 Manually setting the speed (MSA and MSA function of ISA)

4.5.1.1 Activation / de-activation of the system

- The system must be capable of being activated/de-activated at any time.
- At the start of a new journey, the vehicle should not limit the speed without confirmation from the driver

4.5.1.2 Setting of Vadj

- It shall be possible to set Vadj, by a control device operated directly by the driver, by steps not greater than 10km/h between 30km/h and 130km/h or by steps not greater than 5mph between 20mph and 80mph when imperial units are used.
- It shall be possible to set Vadj independently of the vehicle speed.
- If Vadj is set to a speed lower than the current vehicle speed, the system shall limit the vehicle speed to the new Vadj within 30s or shall initiate the supplementary warning (section 4.6.2) no later than 30s after Vadj has been set.

4.5.1.3 The Vadj value shall be permanently indicated to the driver and visible from the driver's seat. This does not preclude temporary interruption of the indication for safety reasons or driver's demand.

4.5.2 Automatic setting the speed (ISA)

An automatic setting is using the speed limit information from the SLIF to advise (requiring driver confirmation) or directly set the Vadj. Systems fulfilling the requirements from section 0 and section 4.5.1 are eligible for scoring when meeting the following additional requirements:

4.5.2.1 Activation / de-activation of the system

- The system must be capable of switching between MSA and ISA mode at any time with a simple operation.
- At the start of a new journey, the vehicle shall not limit the speed without confirmation from the driver

4.5.2.2 Setting of Vadj

- The system should adopt, or offer the driver to adopt, an adjusted Vadj within 5s after a change in the speed limit.
- If Vadj is set to a speed lower than the current vehicle speed, the system starts to limit the vehicle speed to the new Vadj or shall initiate the supplementary warning (section 4.6.2) no later than 30s after Vadj has been set.
- A negative and/or positive offset with respect to the known speed limit is allowed but may not be larger than 10 km/h (5 mph). This offset is included in Vadj.

- The Vadj in the automatic mode of an ISA system may be retained at the end of a journey.

4.5.2.3 Where Vadj is set to the speed limit advised by the SLIF, the indication of Vadj may be suppressed.

4.6 Warning Function

All MSA and ISA systems need to meet the warning requirements of section 4.6.1 to indicate the driver that Vadj is exceeded. In addition a supplementary warning is required, e.g. audible, haptic and head-up display meeting the requirements in section 4.6.2. A head-up display warning meeting the requirements of both 4.6.1 and 4.6.2 will be accepted.

Vehicles with Speed Limiter function activated do not need a warning function when active braking is applied to limit the vehicle speed.

It shall still be possible to exceed Vadj by applying a positive action, e.g. kickdown. After exceeding Vadj by applying a positive action, the speed limitation function shall be reactivated when Vindicated drops to a speed less than Vadj.

4.6.1 Visual warning requirements

4.6.1.1 The visual signal must be in the direct field of view of the driver, without the need for the head to be moved from the normal driving position, i.e. instrument cluster, rear view mirror and centre console.

4.6.1.2 The driver is informed when Vindicated of the vehicle is exceeding Vadj by more than 5 km/h.

4.6.1.3 The driver continues to be informed for the duration of the time that Vadj is exceeded by more than 5 km/h.

4.6.1.4 The warning signal does not preclude temporary interruption of the indication for safety reasons.

4.6.2 Supplementary warning requirements

4.6.2.1 The warning shall be clear to the driver.

4.6.2.2 No supplementary warning needs to be given when Vadj is exceeded as a result of a positive action.

4.6.2.3 The warning commences when the Vindicated of the vehicle is exceeding Vadj by more than 5km/h.

4.6.2.4 The total duration of the warning must be at least 10 seconds and must start with a positive signal for at least 2 seconds. Gaps of less than 1 second, which allow for signals which flash and audio signals that “beep”, are ignored. If the signal is not continuous for the first 10 seconds, it needs to be repeated every 30 seconds or less, resulting in a minimum total duration of at least 10 seconds.

4.6.2.5 The warning sequence does not need to be reinitiated for each exceedence of Vadj until Vindicated has reduced to more than 5km/h below Vadj.

4.7 Speed Limitation Function

Scoring is only eligible when the warning signal requirements from section 4.6 are met or when active braking is applied to limit the vehicle speed.

4.7.1 Speed Limitation

4.7.1.1 The vehicle speed shall be limited to Vadj, also see sections 4.5.1.2 and 4.5.2.2.

4.7.1.2 It shall still be possible to exceed Vadj by applying a positive action, e.g. kickdown.

4.7.1.2.1 After exceeding Vadj by applying a positive action, the speed limitation function shall be reactivated when the vehicle speed drops to a speed less than Vadj.

4.7.1.2.2 The speed limitation function shall permit a normal use of the accelerator control for gear selection.

4.7.1.3 The speed limitation function shall meet the following requirements (see test protocol):

When stable speed control has been achieved, Vstab shall be within -10/+0 km/h of Vadj and within -5/+0 km/h of Vadj for full points.

4.8 Scoring and Visualisation

The following points are awarded for systems that meet the requirements. These points will contribute to the Safety Assist Score.

	SLIF	**MSA**	**ISA**
Communicating speed limit (Section 4.4)	**1.00**		**1.00**
Camera based			
- without subsign recognition	0.25		0.25
- with subsign recognition	0.50		0.50
Digital Map based			
- without subsign recognition	0.25		0.25
- with subsign recognition	0.50		0.50
Camera and Digital Map combined			
- without subsign recognition	0.75		0.75
- with subsign recognition	1.00		1.00
Warning Function (Section 4.5 and 4.6)		**0.50**	**1.00**
Speed Limitation Function (Section 4.7)			
- Vstab within -10/+0 km/h of Vadj		**0.75**	**0.75**
- Vstab within -5/+0 km/h of Vadj		**1.00**	**1.00**

5 ASSESSMENT OF AEB INTER-URBAN SYSTEMS

5.1 Introduction

AEB Inter-Urban systems are AEB systems that are designed to work at speeds typical for driving outside of the city environment, for example on urban roads or highways. For the assessment of AEB Inter-Urban systems, three areas of assessment are considered: the Autonomous Emergency Braking function, Forward Collision Warning function and the Human Machine Interface (HMI). The AEB function is assessed in two different types of scenarios, while the FCW function is scored separately and assessed in three different types of scenarios. The FCW function is only considered when the system provides dynamic brake support.

At this stage the HMI operation is verified in a general way as scientific evidence regarding quality of warning is lacking. The current emphasis in the assessment of AEB Inter-Urban lies on the AEB function. It is expected that the requirements will be updated in the future when more real-life evidence is available.

5.2 Definitions

Throughout this protocol the following terms are used:

Autonomous emergency braking (AEB) – braking that is applied automatically by the vehicle in response to the detection of a likely collision to reduce the vehicle speed and potentially avoid the collision.

Forward Collision Warning (FCW) – an audiovisual warning that is provided automatically by the vehicle in response the detection of a likely collision to alert the driver.

Dynamic Brake Support (DBS) – a system that further amplifies the driver braking demand in response to the detection of a likely collision to achieve a greater deceleration than would otherwise be achieved for the braking demand in normal driving conditions.

Car-to-Car Rear Stationary (CCRs) – a collision in which a vehicle travels forwards towards another stationary vehicle and the frontal structure of the vehicle strikes the rear structure of the other.

Car-to-Car Rear Moving (CCRm) – a collision in which a vehicle travels forwards towards another vehicle that is travelling at constant speed and the frontal structure of the vehicle strikes the rear structure of the other.

Car-to-Car Rear Braking (CCRb) – a collision in which a vehicle travels forwards towards another vehicle that is travelling at constant speed and then decelerates, and the frontal structure of the vehicle strikes the rear structure of the other.

Vrel_test – means the relative speed between the VUT and the EVT by subtracting the velocity of the EVT from that of the VUT at the start of test

Vimpact – means the speed at which the VUT hits the EVT

Vrel_impact – means the relative speed at which the VUT hits the EVT by subtracting the velocity of the EVT from Vimpact at the time of collision

5.3 Criteria and Scoring

5.3.1 To be eligible for scoring points in AEB Inter-Urban, the AEB and/or FCW system must operate up to speeds of at least 80 km/h.

5.3.2 Human Machine Interface (HMI)

5.3.2.1 To be eligible for scoring points for HMI, the AEB and/or FCW function needs to be default ON at the start of every journey and the warning of the FCW system (if applicable) needs to be loud and clear.

5.3.2.2 When these prerequisites are met, HMI points can be achieved for the following:

- **Deactivating AEB and/or FCW system 2 points**

  De-activation of the AEB and/or FCW system should not be possible with a single push on a button.

- **Supplementary warning for the FCW system 1 point**

  In addition to the required audiovisual warning, a more sophisticated warning like head-up display, belt jerk, brake jerk or any other haptic feedback is awarded.

  NOTE: The supplementary warning point is not applicable to AEB only systems

- **Reversible pre-tensioning of the belt in the pre-crash phase 1 point**

  When the system detects a critical situation that can possibly lead to a crash, the belt can already be pre-tensioned to prepare for the oncoming impact.

5.3.2.3 The HMI score is calculated by dividing the points achieved by 4.

5.3.3 Autonomous Emergency Braking (AEB) / Forward Collision Warning (FCW)

5.3.3.1 For both AEB and FCW system tests, the assessment criteria used is the relative impact speed Vrel_impact. The available points per test speed are awarded based on the relative speed reduction achieved at every test speed. Where there is no full avoidance a lineair interpolation is applied to calculate the score for every single test speed. For CCRb scenarios, the relative test speed is assumed equal to the initial test speed.

$$Score_{\ test\ speed} = ((Vrel\_test - Vrel\_impact)/Vrel\_test) \times points_{test\ speed}$$

The maximum points available for the different test speeds for CCRs, CCRm and CCRb are detailed in the table below:

Test speed	CCRs		CCRm		CCRb	
	AEB	**FCW**	**AEB**	**FCW**	**AEB**	**FCW**
30 km/h	-	2.000	1.000	-	-	-
35 km/h	-	2.000	1.000	-	-	-
40 km/h	-	2.000	1.000	-	-	-
45 km/h	-	2.000	1.000	-	-	-
50 km/h	-	3.000	1.000	1.000	4x 1.000	4x 1.000
55 km/h	-	2.000	1.000	1.000	-	-
60 km/h	-	1.000	1.000	1.000	-	-
65 km/h	-	1.000	2.000	2.000	-	-
70 km/h	-	1.000	2.000	2.000	-	-
75 km/h	-	1.000	-	2.000	-	-
80 km/h	-	1.000	-	2.000	-	-
Total	**-**	**18.000**	**11.000**	**11.000**	**4.000**	**4.000**

5.3.3.2 The scoring is based on normalized scores of the AEB and FCW functions. For combined systems, AEB only and FCW only respectively, the score calculation is detailed in separate sections below.

- AEB + FCW (combined)

  For each scenario (CCRs, CCRm and CCRb) normalised scores are calculated for AEB and FCW separately where available. The total AEB and FCW scores are calculated by averaging the scenario scores. This results in two separate percentages for AEB and FCW.

- AEB only

  For systems that only offer the AEB function, the results of tests at all speeds (covering AEB and FCW) are used to calculate separate normalised AEB and FCW scores for each scenario. Where AEB and FCW test speeds are overlapping, the test result of AEB is duplicated for FCW. The total AEB and FCW scores are calculated by averaging the scenario scores. This results in two separate percentages for AEB and FCW.

- FCW only

  For systems that only offer the FCW (with brake support) function, the test results are used to calculate a normalised score for each FCW scenario. The total FCW score is calculated by averaging the scenario scores. This results in a single percentage for FCW, where the AEB score is set to 0%.

5.3.4 Total AEB Inter-Urban Score

The total score in points is the weighted sum of the AEB score, FCW score and HMI score as shown below.

$$AEB\ Inter\ Urban\ total\ score = (AEB\ score\ x\ 1.5) + (FCW\ score\ x\ 1.0) + (HMI\ score\ x\ 0.5)$$

☞ Example of a combined AEB + FCW system

a) AEB function test results in CCRm scenario.

Vtest	Vrel_test	$points_{test\ speed}$	Vimpact	Vrel_impact	$Score_{test\ speed}$
30 km/h	10 km/h	1.000	0 km/h	0 km/h	1.000
35 km/h	15 km/h	1.000	0 km/h	0 km/h	1.000
40 km/h	20 km/h	1.000	0 km/h	0 km/h	1.000
45 km/h	25 km/h	1.000	0 km/h	0 km/h	1.000
50 km/h	30 km/h	1.000	30 km/h	10 km/h	0.667
55 km/h	35 km/h	1.000	45 km/h	25 km/h	0.286
60 km/h	40 km/h	1.000	55 km/h	35 km/h	0.125
65 km/h	45 km/h	2.000	-	-	0.000
70 km/h	50 km/h	2.000	-	-	0.000
Total		**11.000**			**5.078**
Normalised score (AEB)					**46.2%**

AEB function test results in CCRb scenario.

Test	$points_{test\ speed}$	Vimpact	Vrel_impact	$Score_{test\ speed}$
50 km/h, 12m, 2m/s^2	1.000	0 km/h	0 km/h	1.000
50 km/h, 12m, 6m/s^2	1.000	20 km/h	20 km/h	0.600
50 km/h, 40m, 2m/s^2	1.000	25 km/h	25 km/h	0.500
50 km/h, 40m, 6m/s^2	1.000	20 km/h	20 km/h	0.600
Total	**4.000**			**2.700**
Normalised score (AEB)				**67.5%**

b) FCW function (assumed normalized scores for this example).

- Normalized score in CCRs scenario: **84.7%**
- Normalized score in CCRm scenario: **76.4%**
- Normalized score in CCRb scenario: **100.0%**

The FCW score is 87.0% (average).

c) HMI operation. Prerequisites are not met: the system can be switched OFF with a single button. HMI score is 0%.

d) AEB Inter-Urban total score. Applying the above formula renders: 1.5x56.9% + 1.0x87.0% + 0.5x0% = **1.724 points** (out of 3 points)

☞ Example of AEB only system

a) AEB function (normalized AEB scores as in above example).

- Normalized score in CCRm scenario: **46.2%**
- Normalized score in CCRb scenario: **67.5%**

The AEB score is 56.9% (average).

b) AEB test results for FCW function assessment in CCRs scenario.

Test speed	**points**$_{\text{test speed}}$	**Vimpact**	**Vrel_impact**	**Score**$_{\text{test speed}}$
30 km/h	2.000	0 km/h	0 km/h	2.000
35 km/h	2.000	0 km/h	0 km/h	2.000
40 km/h	2.000	0 km/h	0 km/h	2.000
45 km/h	2.000	0 km/h	0 km/h	2.000
50 km/h	3.000	10 km/h	10 km/h	2.400
55 km/h	2.000	25 km/h	25 km/h	1.091
60 km/h	1.000	35 km/h	35 km/h	0.417
65 km/h	1.000	-	-	0.000
70 km/h	1.000	-	-	0.000
75 km/h	1.000	-	-	0.000
80 km/h	1.000	-	-	0.000
Total	**18.000**			**11.908**
Normalised score				**66.2%**

AEB test results for FCW function assessment in CCRm scenario.

Test speed	**points**$_{\text{test speed}}$	**Vimpact**	**Vrel_impact**	**Score**$_{\text{test speed}}$
50 km/h	1.000	30 km/h	10 km/h	0.667
55 km/h	1.000	45 km/h	25 km/h	0.286
60 km/h	1.000	55 km/h	35 km/h	0.125
65 km/h	2.000	-	-	0.000
70 km/h	2.000	-	-	0.000
75 km/h	2.000	-	-	0.000
80 km/h	2.000	-	-	0.000
Total	**11.000**			**1.078**

Test speed	$points_{test\ speed}$	Vimpact	Vrel_impact	$Score_{test\ speed}$
Normalised score				**9.8%**

AEB test results for FCW function assessment in CCRb scenario.

Test	$points_{test\ speed}$	Vimpact	Vrel_impact	$Score_{test\ speed}$
50 km/h, 12m, $2m/s^2$	1.000	0 km/h	0 km/h	1.000
50 km/h, 12m, $6m/s^2$	1.000	20 km/h	20 km/h	0.600
50 km/h, 40m, $2m/s^2$	1.000	25 km/h	25 km/h	0.500
50 km/h, 40m, $6m/s^2$	1.000	20 km/h	20 km/h	0.600
Total	**4.000**			**2.700**
Normalised score				**67.5%**

Combining the results of all scenarios, the FCW score is 47.8% (average).

c) HMI operation. Prerequisites are not met: the system can be switched OFF with a single button. HMI score is 0%.

d) AEB Inter-Urban total score. Applying the above formula renders: 1.5x56.9% + 1.0x47.8% + 0.5x0% = **1.332 points** (out of 3 points).

6 ASSESSMENT OF ELECTRONIC STABILITY CONTROL

6.1 Introduction

Electronic Stability Control (ESC) systems have a demonstrable safety benefit: cars fitted with ESC systems are involved in fewer loss-of-control crashes than those which are not and the accidents they have are less severe. Euro NCAP has promoted standard fitment of ESC since 2009.

As of 2011, Euro NCAP has checked ESC performance at the test track on the basis of its own version of the ECE R13H test procedure. In November 2011, ESC became mandatory for new types of vehicles and, from November 2014, it will become mandatory for all types. Accordingly, as Euro NCAP's test is no more demanding than legislation, it will in general not be required to test ESC systems from 2014 onwards. However, for consistency of Euro NCAP's scoring system, points will continue to be awarded, based on type approval tests.

If, for whatever reason, proof of type approval cannot be produced, Euro NCAP will conduct its own tests, based on the R13H requirements.

6.2 Requirements for ESC

6.2.1 The manufacturer must provide a certificate showing ECE Regulation 13H approval of the vehicle type being assessed.

6.2.2 A technical report from a laboratory or technical service is not acceptable as, at the time the vehicle is assessed by Euro NCAP, all homologation should be complete and a certificate should have been obtained.

6.2.3 The variant tested by the Technical Service during type-approval does not need to be the same as the Euro NCAP test variant. However, if it is not, it should be clear that the certificate of approval covers all variants, including the Euro NCAP test variant.

6.2.4 If the manufacturer is unable or unwilling to demonstrate ECE R13H approval of the ESC system, Euro NCAP will test the system based on the Euro NCAP ESC Test and will apply the requirements of Annex IV of this protocol.

6.3 Scoring

6.3.1 Vehicles whose ESC systems meet the ECE R13H requirements, as defined in paragraph 6.2, are rewarded with 3 points added to the Safety Assist score.

6.3.2 Vehicles whose ESC systems do not meet the above requirements or are not eligible for ESC assessment receive no points.

7 ASSESSMENT OF LANE SUPPORT SYSTEMS

7.1 Introduction

Lane support systems are becoming increasingly widespread and Euro NCAP has acknowledged their safety potential via the Euro NCAP Advanced award process. From 2014, these systems are included in the Safety Assist score.

Euro NCAP intends to develop tests which complement any legislative requirements, to be able to rate lane support systems in more detail in the future. In the meantime, to try to encourage manufacturers to fit these systems more broadly, Euro NCAP rewards LDW and LKA based on installation rates where the NHTSA test procedure is used to demonstrate the system functionality.

Until such time that it becomes clear that one type of system is more beneficial than the other, equal credit is given to LDW and LKA systems.

7.2 Definitions

Lane Departure Warning (LDW) is a system designed to warn a driver when the vehicle begins to move unintentionally out of its lane (unless a turn signal is on in that direction) on highways and urban roads

Lane Keep Assist (LKA) is designed to support a driver when the vehicle begins to move unintentionally out of its lane (unless a turn signal is on in that direction). LKA systems support the driver with a haptic vehicle cue (eg steering nudge) which may help to keep the vehicle in lane.

7.3 Methodology

Euro NCAP will consider LDW/LKA for assessment only if it meets the fitment requirements for basic safety equipment (as defined in the Vehicle Specification, Selection, Testing and Retesting protocol).

7.3.1 Both LDW and LKA systems are eligible for scoring. For both types of system, the functionality assessment is solely based on whether the system produces an appropriate alert during a lane departure manoeuvre (true positive performance). For LKA the steering torque itself is considered an appropriate alert. Other aspects such as HMI are currently not assessed.

7.3.2 The manufacturer is required to demonstrate that the system meets the technical requirements of the U.S. DOT/NHTSA - NCAP Lane Departure Warning Test Procedure (February 2013). The manufacturer shall demonstrate this by using the procedure as written or the procedure with the following amendments:

- Tests with Botts' Dots may be included but are not required;

- Dashed lines may be coloured white instead of yellow to be in line with the common European lane markings as specified in the UN-ECE Regulation on Lane Departure Warning System.

7.3.3 Acceptable documents for proof of compliance are the NHTSA Final Test Report (along with a company declaration letter confirming that the system as tested is functionally identical to that offered in Europe), or a Test Report issued by one of Euro NCAP's accredited test laboratories.

7.3.4 Test track based lane support evaluation tests must be performed on the vehicle model for which the rating is required, however not necessarily on the test variant. Test data from other vehicle categories with a similar LDW/LKA system or in-house development data are not accepted.

7.4 Scoring

Based on the information provided by the manufacturer, 1 point is awarded in the Safety Assist score.

8 REFERENCES

1 ECE Regulation 89 – Uniform Provisions concerning the Approval of I .Vehicles with regard to Limitation of their Maximum Speed; II. Vehicles with regard to the Installation of a Speed Limitation Device (SLD) of an approved type; III Speed Limitation Devices. Date of entry into force 1 October 1992.

2 Vehicle Specification, Sponsorship, Testing and Retesting Protocol.

3 ECE Regulation 13H – Uniform provisions concerning the approval of passenger cars with regard to braking, Date of entry into force: 17 March 2010

APPENDIX I

SEAT BELT REMINDER DEFINITIONS

Change of Status
The change in use of the seat belt, where a buckled belt is unbuckled.

Deactivation
Short Term deactivation for a single journey or Long Term deactivation for a longer period.

Final Signal
The only signal required by Euro NCAP.

Forward Motion
Forward motion of more than 10 km/h.

Initial Signal
A signal, for the front seating positions, which commences at the start of the journey. It is desirable but is not required by Euro NCAP. No specifications are given for the signal, leaving manufacturers the freedom to use the signal they believe is most effective.

Intermediate Signal
A signal, for the front seating positions, which does not commence at the start of the journey but which commences before the Final Signal. It is desirable but is not required by Euro NCAP. No specifications are given for the signal, leaving manufacturers the freedom to use the signal they believe is most effective.

Journey
Movement of the vehicle under its own power.

Monitored
The continuous checking of the use, non-use or change in use of the seat belt or seat occupancy.

More Sophisticated Intermediate Signal
An intermediate signal, with a clear, easily visible text message or a loud and clear voice message. No specifications are given for the signal, leaving manufacturers the freedom to use the signal they believe is most effective.

Occupancy
Use by an occupant larger, taller or heavier than a small female (5 percentile).

Recommendation
A feature which is desirable but which is not required for the Euro NCAP assessment.

Requirement
A feature that is necessary to be awarded points in the Euro NCAP assessment.

Short Break
A short period of time during which the vehicle is stopped, where it would be un-necessary to start the reminder signal again when the journey re-commences.

Start of Reminder System
The commencement of the Seat Belt Reminder sequence.

APPENDIX II

SEAT BELT REMINDER INFORMATION FORM

The following details should be provided by the vehicle manufacturer prior to the assessment:

1. Details of the vehicle to be assessed

Make	
Model	
VIN (if known)	

2. Which seats are protected by the SBR system? (Tick as appropriate)

Driver	
Passenger	
2nd row	
3rd row or more	

3. System description

	Driver		Passenger		2nd Row		3rd Row/ Others	
Does the system have multiple stages?	yes	no	yes	no	yes	no	yes	no
Initial signal								
Intermediate signal								
Final signal								

4. Description of the system trigger for driver

	Applicable	Ignition ON	Speed (km/h)	Distance (m)	Time (s)
Initial signal					
Intermediate signal					
Final signal					

5. Description of the system trigger for passenger (if different)

	Applicable	Ignition ON	Speed (km/h)	Distance (m)	Time (s)
Initial signal					
Intermediate signal					
Final signal					

6. Description of the system trigger for 2ns row (if different)

	Applicable	Ignition ON	Speed (km/h)	Distance (m)	Time (s)
Initial signal					
Intermediate signal					
Final signal					

7. Description of the signal(s) for driver

Audible:

	Applicable	Frequency	Total duration (s)	Gap(s) in signal?
Initial signal				
Intermediate signal				
Final signal				

Visual:

	Applicable	Frequency	Total duration (s)	Gap(s) in signal?
Initial signal				
Intermediate signal				
Final signal				

a. Does the system have a progressive audible signal? For example, a change in volume/frequency?

☐ If yes, give details of the various amplitude/frequencies.

b. Does the system time out?

☐ Yes, the system times out after: ……. (seconds)

8. Description of the signal(s) for passenger, if different

Audible:

	Applicable	Frequency	Total duration (s)	Gap(s) in signal?
Initial signal				
Intermediate signal				
Final signal				

Visual:

	Applicable	Frequency	Total duration (s)	Gap(s) in signal?
Initial signal				
Intermediate signal				
Final signal				

a. Does the system have a progressive audible signal? For example, a change in volume/frequency?

☐ If yes, give details of the various amplitude/frequencies.

b. Does the system time out?

☐ Yes, the system times out after: ……. (seconds)

9. Can the system be deactivated? If so how, short/long term?

System can be deactivated?	Yes		No
How is the system deactivated?	Short term	Long term	

10. How is the passenger seat(s) occupancy detection triggered?

Provide details: ……...

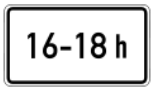
11. How is the rear seat reminder triggered?

Provide details: ……...

APPENDIX III

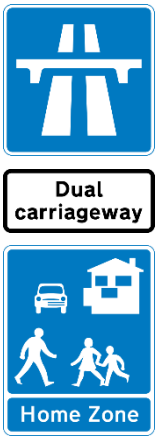
SPEED ASSIST SYSTEMS: MANUFACTURER'S INFORMATION

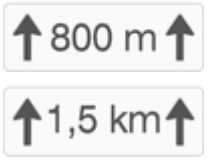
SPEED ASSIST SYSTEMS: CONDITIONAL SPEED LIMITS

Time condition				
France	**Germany**	**Netherlands**	**Sweden**	**United Kingdom**
				

Weather condition				
France	**Germany**	**Netherlands**	**Sweden**	**United Kingdom**
				

Vehicle category				
France	**Germany**	**Netherlands**	**Sweden**	**United Kingdom**
				

Implicit speed limit signs (under consideration for 2018)				
France	**Germany**	**Netherlands**	**Sweden**	**United Kingdom**
				

Distance condition (for 2018)				
France	**Germany**	**Netherlands**	**Sweden**	**United Kingdom**
				

APPENDIX IV

REQUIREMENTS FOR ELECTRONIC STABILITY CONTROL

1. Definitions

Throughout this chapter the following terms are used:

- BOS – Beginning of Steer
- COS – Completion of Steer

2. Methodology

In order to be eligible for ESC assessment, the requirements for basic safety equipment (as defined in the Vehicle Specification, Selection, Testing and Retesting protocol) must be met.

3. Scoring

Based on the dynamic tests according to the "Dynamic test of car electronic stability control (ESC) systems" protocol, points are awarded as follows:

Vehicles which ESC system meets the ECE R13H requirements [3] are rewarded with 3 points, added to the Safety Assist score. The pass/fail requirements are:

- Vehicle yaw rate @ COS + 1.00s < 35% of peak yaw velocity
- Vehicle yaw rate @ COS + 1.75s < 20% of peak yaw velocity
- Lateral displacement @ BOS + 1.07s > 1.83 m

Vehicles which ESC systems do not meet the above requirements receive no points.