# CIECA Guidelines for the Conduction of Practical Tests in Vehicles Equipped with ADAS

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# Contents

Introduction	3
Classification of ADAS	4
Effects on the driver	6
Assessment principles	8
Systems	9
Level 0	9
Forward Collision Warning	9
Automatic Emergency Braking System	10
Emergency Stop Signal	10
Curve Speed Assistant	11
Intelligent Speed Assistant	12
Intersection Assistant	13
Drowsiness and Distraction Monitor	13
Road Sign Information Assistant	14
Lane Keeping Assistant (Lane Departure Warning)	15
Lane Keeping Assistant with Steering Intervention	16
Blind Spot Assistant	17
Lane Change Assistant	17
Lane Change Assistant with Steering Intervention	18
Park Assistant	19
Level 1	21
Cruise Control	21
Adaptive Cruise Control	22
Active Lane Keeping Assistant (Lane Centering)	23
Active Lane Change Assistant	24
Active Park Assistant (lateral control of the vehicle)	26
Level 2	28
Adaptive Cruise Control and Lane Centering at the same time	28
Adaptive Cruise Control and Active Lane Change Assistant at the same time	29
Active Park Assistant (lateral and longitudinal control of the vehicle)	30
Level 3 – Outlook	31

# Introduction

Modern vehicles are increasingly being equipped with Advances Driver Assistance System (ADAS). This will fundamentally change the driving task for the driver.

It therefore seems urgently necessary to further develop the current regulations in the education and examination of novice drivers with regard to the new requirements resulting from the use of ADAS.

One element of the EU strategy to halve the number of serious and fatal road accidents between 2020 and 2030 is to equip motor vehicles with ADAS. To this end, Regulation 2019/2144 of the European Parliament and of the Council (Regulation on general vehicle safety) lays down basic safety standards for motor vehicles and their trailers, which will apply to new vehicle types from July 2022 and to all new vehicles from July 2024. In addition, the new version of the EU Driving Licence Directive will require the adequate use of ADAS as part of the examination content.

This document is intended to provide CIECA members with suggestions for the development of future national guidelines for the testing of drivers in ADAS-equipped vehicles. This document is furthermore intended as a working paper, as any established guidelines will need to be regularly updated in line with the ongoing evolution and increasing adoption of technology.

The objectives of these guidelines are:

- 1. To provide a workable classification of ADAS that can be effectively applied in the context of the practical driving test.
- 2. To demonstrate the effects of ADAS on the execution of driving tasks, in particular with regard to the interaction between the driver and the technical system.
- 3. To derive general principles for assessment of the test performance.
- 4. To provide specific guidance to examiners on how certain ADAS can be integrated into the practical driving test, along with criteria for assessing their use.

#### Classification of ADAS

The categorisation of driver support features and automated driving features according to the Society of Automotive Engineers (SAE) is widely recognized as a standard in both the automotive industry and scientific literature.

This SAE categorisation, developed in collaboration with the International Organisation for Standardisation (ISO), can facilitate international and cross-disciplinary efforts in the education and assessment of novice drivers, provided all stakeholders adopt the established system.

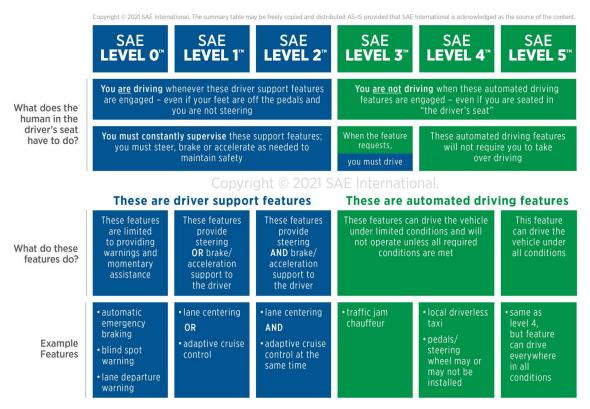


Figure: Levels of Driving Automation by SAE International, 2021

#### Level 0:

The driver performs the longitudinal and lateral guidance of the vehicle manually. ADAS in this category are limited to providing warnings in critical situations or intervening for a short period of time. The driver is solely responsible. Most ADAS are classified in this category.

#### Level 1:

The driver performs either the longitudinal <u>or</u> lateral guidance of the vehicle manually. The other task (longitudinal or lateral guidance) is actively and <u>continuously</u> taken over by the ADAS. The driver remains solely responsible. The driver must constantly monitor the longitudinal or lateral guidance of the vehicle by the system and, if necessary, override the ADAS immediately.

#### Level 2:

Both the longitudinal <u>and</u> lateral guidance of the vehicle are actively and <u>continuously</u> taken over by the ADAS in certain use cases. However, the driver remains solely responsible. The driver must constantly monitor the longitudinal and lateral guidance of the vehicle by the system and, if necessary, override the ADAS immediately.

#### Level 3:

Both the longitudinal and lateral guidance of the vehicle are actively and continuously taken over by the ADAS in certain use cases. Unlike Level 2, the driver is not required to constantly monitor the system. However, if the ADAS prompts the driver to do so, the driver must take over the driving task.

#### Level 4:

Both the longitudinal and lateral guidance of the vehicle are actively and continuously taken over by the ADAS in certain use cases. The difference to Level 3 is that the driver is not required in these situations.

#### Level 5:

The ADAS controls the vehicle completely in any situation. A driver is not required.

#### Effects on the driver

With the increasing integration of ADAS in modern vehicles, it is expected that road safety can be substantially improved.

This is based, among other things, on the assumption that the progressive elimination of the driver as an error-prone component in the human-machine system will inevitably lead to increased safety. However, there are numerous indications in the literature that this assumption is not necessarily correct in its generalised statement.

If the driver relies on warnings or technical fallback levels for manual driving (Level 0) or hands over lateral and/or longitudinal guidance to the system even though he is solely responsible (Levels 1 and 2), this can, for example, lead to the driver developing an inappropriate 'excessive trust' in the technical systems. As a result, dangerous situations can arise if the systems used do not function as expected.

With respect to the ADAS categorisation described before, Levels 1 to 3 should be emphasised. At these Levels, the interaction between the driver and the supporting systems changes. As a result, the systems of these Levels fundamentally change the driver's task.

Compared to conventional driving, Levels 1 to 3 have special features that need to be critically scrutinised from a human perspective:

Level 0 systems (warnings and momentary assistance) serve as a fallback level for driver errors. As a result, they have considerable safety potential. For instance, if the driver brakes too late in a critical situation, the system (Automatic Emergency Braking System) takes over the necessary braking.

This principle changes with the systems from Level 1 to 3, where the driver becomes the fallback level for the systems. For example, if the Adaptive Cruise Control falls below the required distance to the vehicle ahead, the driver must intervene and brake. Similarly, if the Active Lane Keeping Assistant (Lane Centering) crosses the lane markings, the driver must override the system. In this way, the driver essentially acts as a 'driving instructor' for the system.

In Level 1, the driver's task partially shifts from active regulation to monitoring the longitudinal or lateral guidance of the vehicle. In Level 2, there is then a shift to passive monitoring of the entire longitudinal and lateral guidance of the vehicle. This shift presents challenges, as passive monitoring is an incomplete activity with potential negative consequences. It can reduce vigilance, lead to monotony, diminish situational awareness, and result in undesirable (safety-critical) behavioural adaptations.

Finally, in Level 3, the driver is temporarily released from the full regulation of the driving task ("out of the loop situation"). However, in situations that the system cannot handle, the driver must be able to take over manual control quickly and safely. Numerous studies indicate that this task is far from easy. This mode of vehicle operation is considered more challenging for humans compared to active vehicle control.

Considerations for dealing with ADAS in the driving licence test can be derived from the above-mentioned facts.

What do drivers need to know and be able to do with regard to ADAS in addition to manual driving:

#### Level 0

- As these systems only support the driver during manual driving or are not under the driver's control (fallback level), knowledge and skills are limited to safe integration into conventional manual driving.
- The driver needs appropriate mental models of relevant systems. Correct knowledge of the intended use and the system limits is particularly important. This is particularly important to ensure that the driver does not rely on the system to warn them reliably in every situation.
- The driver must perform all manual driving actions properly (as without ADAS) and considers the systems merely as supplementary support. In doing so, the driver should react appropriately to warnings or brief interventions by the system, for example.

#### Level 1 and Level 2

- The driver needs appropriate mental models of the systems. Correct knowledge of the intended use and the system limits is particularly important. With certain systems, the driver must know in which situations the system is appropriate to use.
- The driver must know that he must monitor the systems in Levels 1 and 2 at all times and he is solely responsible. To do this, he must always be aware of whether the system is active or not.
- The driver must also be able to safely override the system if necessary. To do this, he
  must maintain his situational awareness at all times.
- It is also important that the driver is aware of the side effects of using the system. On the one hand, it is necessary to monitor the systems constantly. On the other hand, this passive monitoring reduces situational awareness. That cannot be avoided. However, if the driver is aware that constant monitoring impairs attention and situational awareness, they can mitigate these effects by being more mindful and reflective.

#### Level 3

- At this point, the demands on the driver change fundamentally. The driver can hand over the driving task completely to the system but must be able to take over the driving task with full situational awareness when the system requests it. These handover and takeover should follow a specific, trainable sequence of actions.
- The driver needs appropriate mental models of the system. Although the system can usually only be activated if the external circumstances allow the system to be used, the candidate must have correct knowledge of its intended use and the system limits.
- The driver also needs to understand what factors influence performance during takeover situations, such as the type of non-driving activity.

# **Assessment principles**

The focus of the exam should not be on whether certain ADAS are permitted or not, but on how the driver behaves when using the ADAS. The examiner's primary task is to assess the candidate's driving competence, not how the system works.

The competencies required to properly use of ADAS should be tested in both the theoretical and the practical exam to ensure that the candidate possesses both the knowledge and understanding, as well as the skills to use the ADAS correctly.

From the SAE classification of ADAS and the assignment of tasks between driver and vehicle described therein, assessment principles can be derived that can be applied across the board for testing up to Level 2 automation:

#### Level 0:

- In general, it is permitted to use all warning and momentary assistance systems, but the candidate performs all manual driving actions appropriately.
- The candidate should show proper responses to the technologies.
- If the candidate finds a system disruptive, they should be able to switch it off or adjust it if necessary.
- In the case of the intervention of systems that act beyond human control and as a fallback level for the driver (e.g. Automatic Emergency Braking System), the examiner decides whether the candidate has acted improperly.

The mere activation of such a system is not necessarily to be assessed as a mistake of the candidate, but serves as a reference point for evaluating the candidate's driving competence.

#### Level 1 and 2:

- It is permitted to use all Level 1 and 2 systems<sup>1</sup>, but the examiner may decide at any time during the driving test that the use is required or restricted.
- The candidate should be able to switch the system on and off or adjust it if necessary.
- The candidate must show that he or she uses the system in adequate situations and that he has understood the necessary monitoring and that he is prepared to override the system all the time. The candidate must recognise when the requirements of the respective driving task are not or cannot be fulfilled by the driver assistance system used. In this case, the candidate must override the system immediately.
- When assessing driving competence, the candidate's ability to perform the driving task in accordance with the requirements remains the decisive basis for assessment.

If misbehaviour that can also be detected during manual driving occurs while using the system (e.g. failure to maintain the required distances, exceeding the maximum permitted speed, inappropriate speed), this is taken into account when assessing the candidate's driving competence as if the incorrect behaviour had occurred during manual driving.

<sup>&</sup>lt;sup>1</sup> Except for 'Active Park Assistant' (see page 26 and 30).

# **Systems**

#### Level 0

Due to the variety of available systems of Level 0 and the rapid pace in technical developments, it does not make sense to list all currently available systems.

Furthermore, this is unnecessary, as the examiners assessment guidelines with respect to these systems are similar during the examination. Instead, the most common systems are briefly summarised below.

# **Forward Collision Warning**

#### Mode of action

The system should monitor the speeds of your vehicle and the vehicle in front, as well as the distance between the vehicles, so that the driver can be warned if the vehicles are getting too close and an accident can possibly be avoided. The system does not brake the vehicle by itself.

#### Requirements for the candidate

As this system is only a technical fallback level during manual driving, the driver must not rely on the effect of the system. The candidate performs all manual actions of speed adaption and vehicle positioning appropriately (as without ADAS) and considers the systems merely as additional support. Nevertheless, the candidate should react appropriately to warnings from the system if this is necessary.

#### Guidelines for Examiner

#### Recognisability of system usage

If it is not known before the test whether the vehicle is equipped with the system, this can only be determined during the test drive if the system is working (by issuing a warning).

#### **Evaluation of system usage**

- It is permitted to use the system.
- When the system warns, the candidate should brake appropriately if necessary.
- In the case of the intervention of the system, the examiner decides whether the candidate has acted improperly.

The mere activation of the system is not necessarily to be assessed as a mistake of the candidate, but serves as a reference point for evaluating the candidate's driving competence, e. g. the traffic observation, speed adaption or vehicle positioning.

# **Automatic Emergency Braking System**

#### Mode of action

The system should automatically detect a potential forward collision and activate the vehicle braking system to decelerate a vehicle with the purpose of avoiding or mitigating a collision.

#### Requirements for the candidate

As this system is only a technical fallback level during manual driving, the driver must not rely on the effect of the system. The driver performs all manual actions of speed adaption and vehicle positioning appropriately (as without ADAS) and considers the systems merely as additional support.

#### Guidelines for Examiner

# Recognisability of system usage

If it is not known before the test whether the vehicle is equipped with the system, this can only be determined during the test drive if the system is working. The system will be mandatory for new vehicle types from July 2022 and for all new vehicles from July 2024; Regulation (EU) 2019/2144.

#### **Evaluation of system usage**

- It is permitted to use the system.
- In the case of the intervention of the system, the examiner decides whether the candidate has acted improperly.

The mere activation of the system is not necessarily to be assessed as a mistake of the candidate, because the system may be able to react faster than a human if another vehicle or object suddenly appears in front of the candidate's vehicle without warning. But the operation of the system serves as a reference point for the driving competence of the candidate to be assessed, e. g. the traffic observation, speed adaption or vehicle positioning.

# **Emergency Stop Signal**

# Mode of action

The system is usually a more conspicuous second type of brake light for heavy braking in emergencies to inform the traffic behind. There are different types of adaptive brake lights or emergency brake signals (e. g. the brake lights flash several times per second, automatic switching on of the hazard warning lights, use of multiple brake lights).

#### Requirements for the candidate

There are no requirements for the candidate with regard to the installation of this system in the test vehicle. It is a warning system for the traffic behind.

In principle, it is helpful if the candidate is informed about such systems in order to be able to react appropriately if a vehicle in front signals an emergency stop.

#### **Guidelines for Examiner**

#### Recognisability of system usage

The system can be recognised by the vehicle in front. The system will be mandatory for new vehicle types from July 2022 and for all new vehicles from July 2024; Regulation (EU) 2019/2144.

#### **Evaluation of system usage**

If such a signal is given by a vehicle in front with a corresponding delay, the candidate must react adequately and decelerate appropriately to the traffic situation. The examiner regularly assesses the candidate's driving competence, e.g. traffic observation, speed adaptation or vehicle positioning.

# **Curve Speed Assistant**

#### Mode of action

The system should warn the driver if they are approaching a curve or an exit too quickly, using GPS data and route information. The system does not apply the brakes autonomously.

#### Requirements for the candidate

As this system is only a technical fallback level during manual driving, the driver must not rely on the effect of the system. The driver performs all manual actions of speed adaption and vehicle positioning appropriately (as without ADAS) and considers the systems merely as additional support. Many other factors must be considered when using this system, e.g. weather conditions, darkness, etc. Nevertheless, the candidate should react appropriately to warnings from the system if this is necessary.

#### Guidelines for Examiner

#### Recognisability of system usage

If it is not known before the test whether the vehicle is equipped with the system, this can only be determined during the test drive if the system is working (by issuing a warning).

- It is permitted to use the system.
- When the system warns, the candidate should reduce speed appropriately if necessary.
- In the case of the intervention of the system, the examiner decides whether the candidate has acted improperly.

The mere activation of the system is not necessarily to be assessed as a mistake of the candidate, but serves as a reference point for evaluating the candidate's driving competence, e. g. the traffic observation or speed adaption.

# Intelligent Speed Assistant

#### Mode of action

The system is designed to help the driver keep to the current speed limit. This can be done in different ways depending on the system:

Either the system warns the driver via a visual or acoustic signal, or the system makes it more difficult to operate the accelerator pedal, or it prevents the speed limit from being exceeded by taking appropriate technical measures. Irrespective of this, it is possible to override all systems.

#### Requirements for the candidate

As this system is only a technical fallback level during manual driving, the driver must not rely on the effect of the system. The driver performs all manual actions of traffic observation and speed adaption appropriately (as without ADAS) and considers the systems merely as additional support. Many other factors must be considered when using this system, e.g. weather conditions, darkness, etc. Nevertheless, the candidate should react appropriately to warnings from the system if this is necessary.

#### **Guidelines for Examiner**

#### Recognisability of system usage

If it is not known before the test whether the vehicle is equipped with the system, this can only be determined during the test drive if the system is working (warning). The system will be mandatory for new vehicle types from July 2022 and for all new vehicles from July 2024; Regulation (EU) 2019/2144.

- It is permitted to use the system.
- When the system warns, the candidate should reduce speed appropriately if necessary.
- In the case of the intervention of the system, the examiner decides whether the candidate has acted improperly.
  - The mere activation of the system is not necessarily to be assessed as a mistake of the candidate, but serves as a reference point for evaluating the candidate's driving competence, e. g. the traffic observation or speed adaption.

#### Intersection Assistant

#### Mode of action

The system should monitor cross traffic at a junction/road junction. If it detects crossing traffic, it should prompt the driver to brake by activating visual and audible warnings. Some systems also automatically initiate emergency braking.

#### Requirements for the candidate

As this system is only a technical fallback level during manual driving, the driver must not rely on the effect of the system. The driver performs all manual actions of traffic observation, speed adaption and vehicle positioning appropriately (as without ADAS) and considers the systems merely as additional support. Nevertheless, the candidate should react appropriately to warnings from the system if this is necessary.

# Guidelines for Examiner

#### Recognisability of system usage

If it is not known before the test whether the vehicle is equipped with the system, this can only be determined during the test drive if the system is working (warning).

#### **Evaluation of system usage**

- It is permitted to use the system.
- When the system warns, the candidate should brake appropriately if necessary.
- In the case of the intervention of the system, the examiner decides whether the candidate has acted improperly.

The mere activation of the system is not necessarily to be assessed as a mistake of the candidate, but serves as a reference point for evaluating the candidate's driving competence, e. g. the traffic observation, speed adaption or vehicle positioning.

#### **Drowsiness and Distraction Monitor**

#### Mode of action

This system should warn the driver if he is supposedly not focussed. The system then recommends interrupting the journey with a break. Depending on the system, different indicators are used: e.g. steering behaviour, positioning in the lane, gaze behaviour or physiological factors of the driver.

#### Requirements for the candidate

As this system is only a support for manual driving, the driver must not rely on the effect of the system. The driver performs all manual actions of traffic observation, speed adaption, vehicle positioning or vehicle handling appropriately (as without ADAS) and considers the systems merely as additional support. He must know that the system does not always correctly indicate the actual situation of drowsiness and distraction.

Nevertheless, the candidate should react appropriately to displayed traffic signs when necessary.

#### **Guidelines for Examiner**

#### Recognisability of system usage

If it is not known before the test whether the vehicle is equipped with the system, this can only be determined during the test drive if the system is working (warning). The system will be mandatory for new vehicle types from July 2022 and for all new vehicles from July 2024; Regulation (EU) 2019/2144.

#### **Evaluation of system usage**

- It is permitted to use the system.
- Due to the short duration of the practical test, a meaningful effect of the system is not to be expected. If the system does work, it could be due to other anomalies in the driving style rather than drowsiness.
- In the case of the intervention of the system, the examiner decides whether the candidate has acted improperly.
  - The mere activation of the system is not necessarily to be assessed as a mistake of the candidate, but serves as a reference point for evaluating the candidate's driving competence, e. g. the traffic observation, speed adaption, vehicle positioning or vehicle handling.

# **Road Sign Information Assistant**

#### Mode of action

The system should recognise traffic signs with a camera and display them to the driver via the instrument panel, the multimedia display or the head-up display.

#### Requirements for the candidate

As this system is only a support for manual driving, the driver must not rely on the effect of the system. The driver performs all manual actions of traffic observation, speed adaption and vehicle positioning appropriately (as without ADAS) and considers the systems merely as additional support. He must know that the system does not always display all traffic signs correctly. Nevertheless, the candidate should react appropriately to displayed traffic signs when necessary.

#### Guidelines for Examiner

#### Recognisability of system usage

The system can be recognised by the display registered traffic signs on the instrument panel, the multimedia display or, if applicable, the head-up display.

#### **Evaluation of system usage**

It is permitted to use the system.

- The examiner must ensure that the candidate does not rely solely on the information provided by the system.
- The examiner should assess the general ability to recognise traffic signs and remember the applicable rules for the required section of road.

# Lane Keeping Assistant (Lane Departure Warning)

# Mode of action

The system is designed to prevent unintentional lane departure within the system limits. To this end, the system signals when the vehicle unintentionally (no indicator activated) crosses the lane or carriageway markings.

The system warns the driver visually, acoustically or haptically (vibrations on the steering wheel or driver's seat) if there are signs of unintentional lane departure (without indicators). The system does not perform any active steering movements.

The limits of the system are unclear lane markings or irregular lane edges as well as tight bends and certain weather conditions (precipitation).

#### Requirements for the candidate

As this system is only a technical fallback level during manual driving, the driver must not rely on the effect of the system. The driver performs all manual actions of vehicle positioning appropriately (as without ADAS) and considers the systems merely as additional support. Nevertheless, the candidate should react appropriately to warnings from the system if this is necessary.

#### **Guidelines for Examiner**

#### Recognisability of system usage

If it is not known before the test whether the vehicle is equipped with the system, this can be determined during the test drive if applicable. The use of the system may be recognisable by a corresponding symbol on the instrument panel, the multimedia display or, if applicable, the head-up display. If the system emits acoustic warning signals, use by the candidate is obvious. The system will be mandatory for new vehicle types of the classes M2, M3, N2 and N3 from July 2022 and for all new vehicles of this classes from July 2024; Regulation (EU) 2019/2144.

#### **Evaluation of system usage**

- It is permitted to use the system.
- When the system warns, the candidate should steer appropriately if necessary.
- In the case of the intervention of the system, the examiner decides whether the candidate has acted improperly.

The mere activation of the system is not necessarily to be assessed as a mistake of the candidate, but serves as a reference point for evaluating the candidate's driving competence, e. g. the vehicle positioning.

# Lane Keeping Assistant with Steering Intervention

#### Mode of action

The system is a further development of the lane departure warning system. In addition to the visual, acoustic and possibly haptic warnings, the system is designed to correct the direction of travel by means of active steering intervention or lane-correcting braking intervention, thus preventing the driver from unintentionally leaving the lane. In this way, the system supports the driver when steering back into the lane. Depending on the manufacturer, the driver can set how early this intervention should take place. The system is intended to assist the driver with lateral guidance, but does not guarantee continuous independent lateral guidance.

#### Requirements for the candidate

As this system is only a technical fallback level during manual driving, the driver must not rely on the effect of the system. The driver performs all manual actions of vehicle positioning appropriately (as without ADAS) and considers the systems merely as additional support. Nevertheless, the candidate should react appropriately to warnings and actions from the system if this is necessary.

## Guidelines for Examiner

#### Recognisability of system usage

If it is not known before the test whether the vehicle is equipped with the system, this can be determined during the test drive if applicable. The use of the system may be recognisable by a corresponding symbol on the instrument panel, the multimedia display or, if applicable, the head-up display. If the system emits acoustic warning signals, use by the candidate is obvious. The system will be mandatory for new vehicle types of the classes M1 and N1 from July 2022 and for all new vehicles of this classes from July 2024; Regulation (EU) 2019/2144.

- It is permitted to use the system.
- When the system is active, the candidate must either allow appropriate steering correction or override the system if necessary.
- In the case of the intervention of the system, the examiner decides whether the candidate has acted improperly.
  - The mere activation of the system is not necessarily to be assessed as a mistake of the candidate, but serves as a reference point for evaluating the candidate's driving competence, e. g. the traffic observation or vehicle positioning.

# **Blind Spot Assistant**

#### Mode of action

The system is designed to recognise obstacles in the blind spot. If there are vehicles in the blind spot or approaching from behind, a symbol appears in the respective exterior mirror, even if the indicator is not actuated.

This system is often combined with a lane change assistant (see below).

#### Requirements for the candidate

As this system is only a support for manual driving, the driver must not rely on the effect of the system. The driver performs all manual actions of traffic observation appropriately (as without ADAS) and considers the systems merely as additional support. He must know that it is possible that the system does not always display all vehicles in the blind spot correctly. Nevertheless, the candidate should react appropriately to the displayed symbols if necessary.

# Guidelines for Examiner

#### Recognisability of system usage

If it is not known before the test whether the vehicle is equipped with the system, this can be determined during the test drive if applicable. The use of the system may be recognisable by a corresponding symbol in the exterior mirrors.

#### **Evaluation of system usage**

- It is permitted to use the system.
- When the system warns, the candidate should react appropriately if necessary. In this case, the candidate must first refrain from changing lanes or turning. He checks the area behind and to the side of the vehicle via the respective exterior mirror and, if necessary, by shoulder checks.
- The candidate should assess the general behaviour of the candidate when changing lanes. Simply checking the blind spot assistant by the candidate is not sufficient.

# Lane Change Assistant

#### Mode of action

The system is designed to warn the driver of impending collisions when changing lanes by monitoring the traffic situation in the neighbouring lane. The system is activated when the indicator is pressed (unlike the lane departure warning system, which is deactivated). The warning is given visually (usually in the exterior mirror), acoustically or haptically (by vibration of the steering wheel, driver's seat or indicator lever), depending on the system.

This system is often combined with a blind spot assistant, which also works without activated indicators (see above).

#### Requirements for the candidate

As this system is only a technical fallback level during manual driving, the driver must not rely on the effect of the system. The driver performs all manual actions of traffic observation, speed adaption and vehicle positioning appropriately (as without ADAS) and considers the systems merely as additional support. Especially the use of exterior mirrors, interior mirror and, depending on the situation, shoulder checks are still necessary. Nevertheless, the candidate should react appropriately to warnings from the system if this is necessary.

#### Guidelines for Examiner

#### Recognisability of system usage

If it is not known before the test whether the vehicle is equipped with the system, this can be determined during the test drive if applicable. The use of the system may be recognisable by a corresponding symbol in the exterior mirrors, on the instrument panel, the multimedia display or, if applicable, the head-up display. If the system emits acoustic warning signals, use by the candidate is obvious.

#### **Evaluation of system usage**

- It is permitted to use the system.
- When the system warns, the candidate should react appropriately if necessary. In this case, the candidate must cancel the initiated lane change. He checks the area behind and to the side of the vehicle via the respective exterior mirror and, if necessary, by shoulder checks.
- In the case of the intervention of the system, the examiner decides whether the candidate has acted improperly.
  - The mere activation of the system is not necessarily to be assessed as a mistake of the candidate, but serves as a reference point for evaluating the candidate's driving competence, e. g. the traffic observation.

# Lane Change Assistant with Steering Intervention

#### Mode of action

The Lane Change Assistant with steering intervention is a further development of the Lane Change Assistant. In addition to the warnings, the system is designed to carry out either corrective steering movements or targeted braking interventions in the event of an acute risk of collision in order to keep the vehicle in its original lane and avoid a collision. This should technically prevent a dangerous lane change. The system can be overridden by the driver at any time.

#### Requirements for the candidate

As this system is only a technical fallback level during manual driving, the driver must not rely on the effect of the system. The driver performs all manual actions of traffic observation, speed adaption and vehicle positioning appropriately (as without ADAS) and considers the systems merely as additional support. Especially the use of exterior mirrors, interior mirror and, depending on the situation, shoulder checks are still necessary. Nevertheless, the candidate should react appropriately to warnings from the system if this is necessary.

#### **Guidelines for Examiner**

#### Recognisability of system usage

If it is not known before the test whether the vehicle is equipped with the system, this can be determined during the test drive if applicable. The use of the system may be recognisable by a corresponding symbol in the exterior mirrors, on the instrument panel, the multimedia display or, if applicable, the head-up display. If the system emits acoustic warning signals, use by the candidate is obvious.

#### **Evaluation of system usage**

- It is permitted to use the system.
- When the system is active, the candidate must either allow appropriate steering correction or override the system if necessary. He checks the area behind and to the side of the vehicle via the respective exterior mirror and, if necessary, by shoulder checks.
- In the case of the intervention of the system, the examiner decides whether the candidate has acted improperly.
  - The mere activation of the system is not necessarily to be assessed as a mistake of the candidate, but serves as a reference point for evaluating the candidate's driving competence, e. g. the traffic observation or vehicle positioning.

#### Park Assistant

#### Mode of action

Parking Assistants are designed to support the driver when parking or manoeuvring at low speeds. At the lowest technical development stage, Parking Assistants offer environment and obstacle detection (so-called 'distance control') with acoustic or visual collision warning. This system will be mandatory for new vehicle types from July 2022 and for all new vehicles from July 2024; Regulation (EU) 2019/2144.

Some systems combine obstacle warning with Emergency Brake Assistant. If the driver does not react to a warning signal, the vehicle can independently prevent a collision by braking.

In the next stage of development, the driver is supported by camera systems. These are used either purely to map the vehicle's surroundings or to support the driver with the help of parking instructions: The system uses virtual orientation lines to support the driver in positioning the vehicle in the parking space (display of required steering movements). However, the driver performs the longitudinal and lateral guidance manually.

#### Requirements for the candidate

As this system is only a support for manual driving or a technical fallback level, the driver must not rely on the effect of the system. They must realise that the system may not always react to all obstacles.

For systems without camera systems, the driver performs all traffic observation and vehicle positioning actions appropriately (as without ADAS) and considers the system merely as additional support. The use of the system alone (without checking mirrors and shoulder check), is not sufficient to ensure safety.

Nevertheless, the candidate should respond appropriately to warnings from the system when necessary.

If the candidate uses camera systems for traffic observation, the examiner must assess whether the information shown on the display is sufficient to fulfil the requirements for traffic observation. Even when using a parking system with a camera system, traffic observation must be carried out in such a way that any danger or damage is excluded. The candidate must carry out a direct check before reversing. During the journey, direct observation of the rear traffic area (or the use of mirrors) may be necessary.

#### Guidelines for Examiner

#### Recognisability of system usage

If it is not known before the test whether the vehicle is equipped with the system, this can be determined during the test drive if necessary. The use of the system can be detected by corresponding acoustic warning signals. In the case of camera systems, the use can be recognised by the corresponding display.

- It is permitted to use the system.
- When the system warns, the candidate should react appropriately if necessary. The examiner must also consider the limitations of the warning system: Some systems may be too sensitive and react too early.
- The examiner should assess the candidate's general behaviour when parking. It is not sufficient if the candidate only relies on distance control (without traffic observation) or only checks the camera image. Instead, the candidate should demonstrate the ability to integrate the signals and camera images into the traffic observation process.

# Level 1

#### **Cruise Control**

#### Mode of action

Cruise Control is the oldest and simplest system of continuous longitudinal guidance. The system regulates the speed of a vehicle and, by controlling the engine management or the fuel supply, ensures that the vehicle travels at a speed previously set by the driver without the driver pressing the accelerator pedal. The system does not take other road users or structural conditions into account. It assists the driver with longitudinal guidance, mainly for his comfort when driving straight ahead for long periods and can be overridden by him at any time.

#### Requirements for the candidate

The candidate must know in which situations the use of the system is appropriate. Use may be inappropriate if speed adaptation is to be expected. For example, in slow traffic, on winding roads, at junctions, when turning off, at roundabouts or when crossing railway crossings. Use in such situations can lead to incorrect behaviour on the part of the candidate (e. g. lack of necessary speed adjustment).

The candidate carries out traffic observation and vehicle positioning as well as communication with other road users in the same way as when driving manually. As this system only maintains the set speed without paying attention to external traffic conditions, the candidate must make any necessary speed adjustments directly. The set speed must comply with the rules and be appropriate for the traffic situation.

#### **Guidelines for Examiner**

#### Recognisability of system usage

The use of the system can be recognised by the activation of the system by the candidate (switch usually on the steering wheel or on a steering column switch) or by a corresponding indicator light or symbol on the dashboard. In addition, the position of the candidate's right leg (foot off the accelerator pedal) can indicate that the system is being used.

- It is permitted to use the system, but the examiner may decide at any time during the driving test that the use is required or restricted.
- The candidate carries out traffic observation, speed adaption and vehicle positioning as well as communication with other road users in the same way as when driving manually.
- The candidate must show that he or she uses the system in adequate situations. They must recognise when the set speed of the vehicle is not appropriate for the traffic conditions. In this case, the candidate must override the system immediately (braking or accelerating).

When assessing driving competence, the candidate's ability to perform the driving task in accordance with the requirements remains the decisive basis for assessment. If misbehaviour occurs when using the system that can also be detected during manual driving (e.g. exceeding the maximum permitted speed, inappropriate speed), this is taken into account when assessing the candidate's driving competence as if the incorrect behaviour had occurred during manual driving.

# Adaptive Cruise Control

#### Mode of action

The Adaptive Cruise Control system (ACC) is a further development of the cruise control system. As with cruise control, the driver can use the ACC to set the speed of the vehicle to a specific desired speed. If possible, however, the ACC should then not only maintain the desired speed, but also a minimum distance from the vehicle in front set by the driver. This is intended to prevent collisions with the vehicle in front. To this end, the ACC uses environmental sensors (camera, radar, lidar and ultrasonic sensors) to monitor the traffic area in front of the vehicle.

If the ACC detects a slower vehicle in front, the speed of your own vehicle is reduced so that it follows at the set minimum distance. As soon as no vehicle in front is detected or the vehicle in front increases its speed, the system accelerates to the previously set desired speed. Depending on the manufacturer, the ACC can perform partial braking or, in combination with an Emergency Braking Assistant, braking to a standstill. In combination with road sign information system, some ACC systems adjust the speed to the recognised speed limit.

The driver can override the system at any time by accelerating or braking.

#### Requirements for the candidate

The candidate must know in which situations the use of the system is appropriate. Urban routes with many junctions are less suitable for the system. It is also not suitable on winding roads, when changing lanes, when turning or at roundabouts. Heavy rain or snow can impair the function of the radar sensors. Use in such situations can lead to incorrect behaviour on the part of the candidate (e. g. lack of necessary speed adjustment).

The candidate carries out traffic observation and vehicle positioning as well as communication with other road users in the same way as when driving manually.

The candidate must know that he must monitor the ACC at all times and he is solely responsible. To do this, he must always be aware of whether the system is active or not. The candidate must also be able to override the system safely if necessary.

#### **Guidelines for Examiner**

#### Recognisability of system usage

The use of the system can be recognised by the activation of the system by the candidate (switch usually on the steering wheel or on a steering column switch) or by a

corresponding indicator light or symbol on the dashboard. In addition, the position of the candidate's right leg (foot off the accelerator pedal and no operation of the brake pedal during deceleration) can indicate that the system is being used.

#### **Evaluation of system usage**

- It is permitted to use the system, but the examiner may decide at any time during the driving test that the use is required or restricted.
- The candidate carries out traffic observation and vehicle positioning as well as communication with other road users in the same way as when driving manually.
- The candidate must show that he or she uses the system in adequate situations. They must recognise when the set speed of the vehicle and the distance from the vehicle in front is not appropriate for the traffic conditions. In this case, the candidate must override the system immediately (braking or accelerating).
- When assessing driving competence, the candidate's ability to perform the driving task in accordance with the requirements remains the decisive basis for assessment. If misbehaviour occurs when using the system that can also be detected during manual driving (e.g. exceeding the maximum permitted speed, inappropriate speed, insufficient distance to the vehicle in front), this is taken into account when assessing the candidate's driving competence as if the incorrect behaviour had occurred during manual driving.

# Active Lane Keeping Assistant (Lane Centering)

# Mode of action

Active Lane Keeping Assistant (with continuous lateral guidance) is a further development of Lane Keeping Assistant with steering intervention and is designed to support the driver in certain situations by providing continuous lateral guidance (sometimes also referred to as 'Lane Centering', 'Steering Assist', 'Auto Steer' or similar). The system is designed to continuously position the vehicle in the centre of the lane. The system usually uses cameras to recognise lane boundaries, such as road markings. The driver can override the system at any time by steering.

#### Requirements for the candidate

Although the system can usually only be activated if the external circumstances allow the system to be used, the candidate must know the intended use and limits of the system. The system is not suitable for use on heavily soiled roads or in weather conditions that make it difficult to recognise lane markings or lane boundaries. Use in such situations can lead to incorrect behaviour on the part of the candidate (e. g. lack of necessary steering).

The candidate carries out traffic observation and speed adaption as well as communication with other road users in the same way as when driving manually. With regard to operating the vehicle, it should be noted that the driver must hold the steering wheel with both hands when using the system, analogous to manual driving.

The candidate must know that he must monitor the system at all times and he is solely responsible. To do this, he must always be aware of whether the system is active or not. The candidate must also be able to override the system safely if necessary.

#### Guidelines for Examiner

#### Recognisability of system usage

If it is not known before the test whether the vehicle is equipped with the system, this can be determined during the test drive if applicable. The use of the system may be recognisable by a corresponding symbol on the instrument panel, the multimedia display or, if applicable, the head-up display. In addition, the way in which the candidate holds the steering wheel (hands do not grip the steering wheel tightly) may indicate that the system is being used.

#### **Evaluation of system usage**

- It is permitted to use the system, but the examiner may decide at any time during the driving test that the use is required or restricted.
- The candidate carries out traffic observation and speed adaption as well as communication with other road users in the same way as when driving manually.
- The candidate must hold the steering wheel with both hands when using the system.
- The candidate must show that he or she knows the system limits. They must recognise when the requirements of vehicle positioning within the lane are not or cannot be fulfilled by the system. In this case, the candidate must override the system immediately (override the steering manually).
- When assessing driving competence, the candidate's ability to perform the driving task in accordance with the requirements remains the decisive basis for assessment. If misbehaviour occurs when using the system that can also be detected during manual driving (e.g. driving over lane markings, driving too far to the side of the road or in the lane of the oncoming traffic), this is taken into account when assessing the candidate's driving competence as if the incorrect behaviour had occurred during manual driving.

# Active Lane Change Assistant

#### Mode of action

The Active Lane Change Assistant is designed to take over the lateral guidance of the vehicle when changing lanes. The system actively steers the vehicle into the neighbouring lane if the traffic situation permits (road type, road markings, other road users). The system is activated by the driver pressing the indicator lever for a defined period of time to change lanes.

The system is used on multi-lane, motorway-like roads in the higher speed range. The driver can override the system at any time by steering.

#### Requirements for the candidate

Although the system can usually only be activated if the external circumstances allow the system to be used, the candidate must know the intended use and limits of the system. The system is not suitable for use on heavily soiled roads or in weather conditions that make it difficult to recognise lane markings or lane boundaries. Use in such situations can lead to incorrect behaviour on the part of the candidate (e. g. lack of necessary steering).

The candidate carries out traffic observation and speed adaption as well as communication with other road users in the same way as when driving manually. With regard to operating the vehicle, it should be noted that the driver must hold the steering wheel with both hands when using the system, analogous to manual driving. The candidate must know that he must monitor the system at all times and he is solely responsible. To do this, he must always be aware of whether the system is active or not. The candidate must also be able to override the system safely if necessary.

#### **Guidelines for Examiner**

#### Recognisability of system usage

If it is not known before the test whether the vehicle is equipped with the system, this can be determined during the test drive if applicable. The use of the system may be recognisable by the steering movements made by the system when changing lanes (steering wheel movement at the same time the hands of the candidate do not grip the steering wheel tightly).

- It is permitted to use the system, but the examiner may decide at any time during the driving test that the use is required or restricted.
- The candidate carries out traffic observation and speed adaption as well as communication with other road users in the same way as when driving manually.
- The candidate must hold the steering wheel with both hands when using the system.
- The candidate must show that he or she knows the system limits. They must recognise when the requirements of lane change are not or cannot be fulfilled by the system. In this case, the candidate must override the system immediately (override the steering manually).
- When assessing driving competence, the candidate's ability to perform the driving task in accordance with the requirements remains the decisive basis for assessment. If misbehaviour occurs when using the system that can also be detected during manual driving (e.g. initiating a lane change, although this is associated with endangering other road users, insufficient traffic observation), this is taken into account when assessing the candidate's driving competence as if the incorrect behaviour had occurred during manual driving.

# Active Park Assistant (lateral control of the vehicle)

# Mode of action

Active Park Assistant uses ultrasonic or radar sensors to search for a suitable parking space at a manufacturer-dependent speed as the vehicle drives past parking spaces. If the parking space is large enough for the vehicle, the driver is informed by a corresponding symbol and receives instructions on the correct starting position for entering the space. The driver engages reverse gear and carefully accelerates. The lateral guidance (steering movement) is taken over by the system when parking. To do this, the driver takes his hands off the steering wheel and only operates the vehicle's pedals (accelerates or brakes). The system parks vehicles in spaces along and across the carriageway. Some systems have the function of automatically braking if the parking speed is too high or an obstacle is detected. If the vehicle has been parked with the system, it can also park out with the support of the system.

The driver can override the system at any time by steering.

#### Requirements for the candidate

As the Active Park Assistant is supposed to find suitable parking spaces itself, situational suitability is largely determined by the system itself. However, the candidate must ensure that the parking space suggested by the system is actually suitable for parking. For example, they must observe signs or markings that prohibit parking or pay attention to other reasons that speak against parking.

The candidate carries out traffic observation and speed adaption as well as communication with other road users in the same way as when parking manually.

The candidate must know that he must monitor the system at all times and he is solely responsible. The candidate must also be able to override the system safely if necessary (e.g. pedestrians or obstacles in the parking space).

#### **Guidelines for Examiner**

#### Recognisability of system usage

If it is not known before the test whether the vehicle is equipped with the system, this can be determined during the parking. The use of the system can be recognisable by the steering movements made by the system when parking (steering wheel movement at the same time the hands of the candidate are not on the steering wheel).

- Parking should be done manually. In addition, the examiner may request the use of the system.
- The candidate carries out traffic observation and speed adaption as well as communication with other road users in the same way as when parking manually.
- The candidate must show that he or she uses the system in adequate situations. They must recognise when the requirements of parking are not or cannot be fulfilled by the system. In this case, the candidate must override the system immediately (override the steering manually) or stop parking by braking.

When assessing driving competence, the candidate's ability to perform the driving task in accordance with the requirements remains the decisive basis for assessment. If misbehaviour occurs when using the system that can also be detected during manual driving (e.g. insufficient traffic observation or the vehicle positioning within the parking space is not sufficient), this is taken into account when assessing the candidate's driving competence as if the incorrect behaviour had occurred during manual driving.

# Level 2

# Adaptive Cruise Control and Lane Centering at the same time

#### Mode of action

This system is a combination of individual assistance systems for lateral and longitudinal control of the vehicle. The system uses Adaptive Cruise Control and the Active Lane Keeping Assistant (Lane Centering), sometimes combined with Road Sign Information System and Automatic Emergency Braking System.

The system is intended to take over lateral and longitudinal control of the vehicle up to a manufacturer-specific speed. Depending on the manufacturer, the system also recognises speed limits or town entrances and exits and adjusts the vehicle's speed accordingly. If necessary, the system brakes the vehicle to a standstill. This is the case, for example, if the driver does not put his hands on the steering wheel regularly (after repeated prompts from the system).

The driver can override the system at any time by steering, breaking or accelerating. As this is a combination of independent assistance systems, you will find a more detailed description of how they work in the corresponding system-specific descriptions above.

#### Requirements for the candidate

The requirements for the candidate result from the requirements for the respective individual systems described above, i.e. with regard to the Adaptive Cruise Control and with regard to the Active Lane Keeping Assistant (Lane Centering). Here too, for example, the candidate must also be able to override the systems immediately and safely if necessary. To do this, the driver must maintain situational awareness at all times despite the combination of both systems.

#### Guidelines for Examiner

#### Recognisability of system usage

Instructions for recognising system use have been described in the respective individual systems (Adaptive Cruise Control and Active Lane Keeping Assistant) and also apply when the systems are used in combination.

- It is permitted to use the system, but the examiner may decide at any time during the driving test that the use is required or restricted.
- The candidate carries out traffic observation and communication with other road users in the same way as when driving manually.
- The candidate must hold the steering wheel with both hands when using the system.
- The candidate must show that he or she uses the system in adequate situations. They must recognise when the set speed of the vehicle and the distance from the vehicle in front is not appropriate for the traffic conditions. They must also recognise when the requirements of vehicle positioning within the lane are not or cannot be fulfilled

- by the system. In this case, the candidate must override the system immediately (braking or accelerating or override the steering manually).
- When assessing driving competence, the candidate's ability to perform the driving task in accordance with the requirements remains the decisive basis for assessment. If misbehaviour occurs when using the system that can also be detected during manual driving (e.g. exceeding the maximum permitted speed, inappropriate speed, insufficient distance to the vehicle in front, driving over lane markings, driving too far to the side of the road or in the lane of the oncoming traffic), this is taken into account when assessing the candidate's driving competence as if the incorrect behaviour had occurred during manual driving.

# Adaptive Cruise Control and Active Lane Change Assistant at the same time

#### Mode of action

This system is a combination of individual assistance systems for lateral and longitudinal control of the vehicle. The system uses Adaptive Cruise Control and the Active Lane Change Assistant.

The system is intended to take over lateral and longitudinal control of the vehicle when changing lanes.

The driver can override the system at any time by steering, breaking or accelerating. As this is a combination of independent assistance systems, you will find a more detailed description of how they work in the corresponding system-specific descriptions above.

#### Requirements for the candidate

The requirements for the candidate result from the requirements for the respective individual systems described above, i.e. with regard to the Adaptive Cruise Control and with regard to the Active Lane Change Assistant. Here too, for example, the candidate must also be able to override the systems immediately and safely if necessary. To do this, the driver must maintain situational awareness at all times despite the combination of both systems.

#### Guidelines for Examiner

#### Recognisability of system usage

Instructions for recognising system use have been described in the respective individual systems (Adaptive Cruise Control and Active Lane Change Assistant) and also apply when the systems are used in combination.

- It is permitted to use the system, but the examiner may decide at any time during the driving test that the use is required or restricted.
- The candidate carries out traffic observation as well as communication with other road users in the same way as when driving manually.
- The candidate must hold the steering wheel with both hands when using the system.

- The candidate must show that he or she uses the system in adequate situations. They must recognise when the requirements of lane change are not or cannot be fulfilled by the system. In this case, the candidate must override the system immediately (override the steering manually or braking respectively accelerating).
- When assessing driving competence, the candidate's ability to perform the driving task in accordance with the requirements remains the decisive basis for assessment. If misbehaviour occurs when using the system that can also be detected during manual driving (e.g. initiating a lane change, although this is associated with endangering other road users, insufficient traffic observation, exceeding the maximum permitted speed, inappropriate speed, insufficient distance to the vehicle in front), this is taken into account when assessing the candidate's driving competence as if the incorrect behaviour had occurred during manual driving.

# Active Park Assistant (lateral and longitudinal control of the vehicle)

#### Mode of action

Active Park Assistant (Level 2) is a further development of the Active Park Assistant (Level 1) and takes over both lateral and longitudinal control of the vehicle when parking. In addition to the described mode of operation of the Active Parking Assistant under Level 1 (see above), the speed of the vehicle is also controlled by the system. The driver can override the system at any time by braking, accelerating or steering.

#### Requirements for the candidate

The requirements for the candidate largely correspond to the descriptions under Active Parking Assistant (Level 1). The main difference to Level 1 is the additional active longitudinal guidance of the vehicle by the system.

The candidate carries out traffic observation and communication with other road users in the same way as when parking manually.

The candidate must know that he must monitor the system at all times and he is solely responsible. The candidate must also be able to override the system immediately and safely if necessary (e.g. pedestrians or obstacles in the parking space).

#### Guidelines for Examiner

#### Recognisability of system usage

Instructions for recognising system use have been described in the section of Active Park Assistant (Level 1). In addition, the position of the candidate's right leg (foot off the accelerator pedal and no operation of the brake pedal during deceleration) can indicate that the system is being used.

- Parking should be done manually. In addition, the examiner may request the use of the system.
- The candidate carries out traffic observation and communication with other road users in the same way as when parking manually.

- The candidate must show that he or she uses the system in adequate situations. They must recognise when the requirements of parking are not or cannot be fulfilled by the system. In this case, the candidate must override the system immediately (override the steering manually and/or braking).
- When assessing driving competence, the candidate's ability to perform the driving task in accordance with the requirements remains the decisive basis for assessment. If misbehaviour occurs when using the system that can also be detected during manual driving (e.g. insufficient traffic observation or the vehicle positioning within the parking space is not sufficient or the speed when parking is not appropriate), this is taken into account when assessing the candidate's driving competence as if the incorrect behaviour had occurred during manual driving.

#### Level 3 – Outlook

At present (2025), only very few vehicles are equipped with level 3 systems. These are mostly luxury class vehicles. System use is also (still) subject to relatively high situational requirements, which limits system use to comparatively few situations (certain road characteristics, certain speed range, certain traffic volume, certain weather, etc.).

However, the increasing spread of level 3 systems is to be expected. As permanent monitoring of the system is no longer necessary, the exam will then have to focus on how the driver safely hands over the execution of the driving task to the vehicle, which non-driving activities are possible, how he safely takes over the driving task from the vehicle again and how he reacts adequately to a request from the system to take over.

The guidelines will be updated by CIECA as the systems become more widespread.