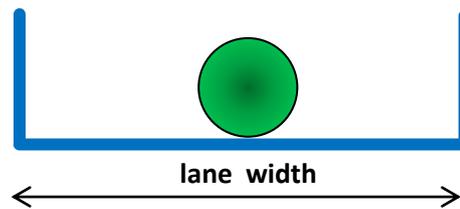


- Industry proposal for amendments to the doc ACSF-07-02 (New text proposal for the requirements of a CAT B1 system)
- Reminder: Industry prerequisite (expressed at ACSF-06) to accept moving LKAS into ACSF B1 was that the B1 requirements should be identical to those agreed in the LKAS adhoc group (see document GRRF-79-04).
- Another prerequisite was that ACSF B1 may be a discontinuous control.



5.6.5. Special Provisions for ACSF of Category B1

Any system of Category B1 ACSF shall fulfill the following requirements within the boundary conditions declared by the vehicle manufacturer in the System information data.

5.6.5.1. General

- 5.6.5.21.1 The activated system shall ~~at any time ensure that the vehicle does not cross any lane marking [continuously]~~ assists the driver in keeping the vehicle within the chosen lane, by intervention starting before crossing the lane marking.

Justification: use the words from the definition of ACSF B1.

- 5.6.5.1.2 The vehicle shall be equipped with a means for the driver to activate and deactivate the system. ~~The deactivation shall be possible at any time.~~
~~The activated system shall assist the driver in keeping the vehicle in the chosen lane~~

Justification:

- In the LKAS ad-hoc group, the requirement to have a means to activate / deactivate the system was optional. In the new proposal it is a must. We propose a trade-off: we accept a “shall” but delete the second sentence. The deactivation is not needed at any time since the driver shall always be able to override the function.
- The last sentence is redundant text with 5.6.5.1.1

5.6.5.1.3 The system shall be designed so that excessive intervention of steering control (e.g. an excessive steering torque) is suppressed to ensure the steering operability by the driver and to avoid unexpected vehicle behavior, during its operation.

The end of the intervention shall be such that the system reduces its directional control to zero in a progressive manner, to ensure easy and safe handling of the vehicle, as defined in paragraph 5.1.1. The directional control fade-out strategy shall be at the discretion of the vehicle manufacturer.

The steering control effort necessary to override the directional control provided by the system shall not exceed the value specified in paragraph 6.2.4.2. for an intact steering equipment.

5.6.5.2. Operation of ACSF

5.6.5.2.1 If the system is active a visual signal shall be provided to the driver.

5.6.5.2.2 When the system is temporarily not available, for example due to inclement weather conditions, the system shall clearly inform the driver about the system status by a visual signal, except if the system is in the OFF mode, e.g. switched off.

5.6.5.2.3 A system failure shall be signaled to the driver. The visual signal mentioned in 5.6.5.2.2 may be used for this purpose. However, when the system is switched off, the indication of failure mode may be suppressed.

Justification

- This requirement was not present in the LKAS ad-hoc group proposal, since already stipulated in the CEL Annex 6 paragraph 3.4.3.
- Now that this requirement is explicit, we need to add the sentence above.
- Reminder of annex 6: “In case of a failure, the driver shall be warned for example by warning signal or message display. When the system is not deactivated by the driver, e.g. by turning the ignition (run) switch to "off", or by switching off that particular function if a special switch is provided for that purpose, the warning shall be present as long as the fault condition persists.“

5.6.5.2.4 When the system is active (i.e. ready to intervene or intervening), it shall provide a means of detecting that the driver is holding the steering control. If the driver is not holding the steering control for a time span ~~not~~ exceeding a time t , a warning shall be immediately provided until this is no longer the case or until the system is deactivated, either manually or automatically.

$$t = 30 \times 130 / V \quad (\text{s})$$

where V is the speed of the vehicle in km/h at the time when the system has detected that the driver is no longer holding the steering control

Additionally t shall not be longer than 180s.

The requirements above do not apply for an actual vehicle speed below or equal to 10km/h.

Justification:

- Industry is ready to accept the principle of a “hands-off” detection, however the detection time span is not acceptable for all speed. Industry still favors proposal in document ACSF-06-20, slide 5, based on a fixed distance of 1500m, rather than on a fixed time span of 30s. As a compromise, industry proposes now a fixed distance equivalent to 30s at 130km/h, i.e. 1083m.
- Industry approach is less design restrictive, since qualifying systems based on monitoring of the steering wheel angle or torque (vs. hardware detection in the steering wheel), while keeping the same safety level (criticality is lower at lower speed).

This warning shall be provided by at least two means out of optical, acoustic and haptic given simultaneously or in a cascade.

If this warning continues for more than 30s the system shall be automatically deactivated. In this case the system shall clearly inform the driver about the system status by an emergency signal ~~for at least 5s~~ which is different from the warning signal. The emergency signal may be stopped when the system has detected that the driver is holding the steering control again.

5.6.5.3. System information data

5.6.5.3.1. Following data shall be provided together with the documentation package required in Annex 6 of this regulation to the Technical Service at the time of type approval

5.6.5.3.1.1. The ~~conditions under which the system can be activated and the system boundaries for operation~~ (e.g. V_{smax} , V_{smin} , ay_{smax}),

Justification: use the definition in 2.4.8.12.

5.6.5.3.1.2 Information about how the system detects that the driver is holding the steering control.

~~5.6.5.3.1.3 Documentation/information about the system software and version.~~

Justification:

- SW check at PTI should be limited to new technologies, i.e. B2 and not B1.
- This was not included in the LKAS Adhoc group proposal.

~~5.6.5.3.1.4 Information about how the failure warning signal status and the confirmation of the valid software version can be checked via the use of an electronic communication interface.~~

Justification:

- PTI via the electronic vehicle interface should be limited to new technologies, i.e. B2 and not B1.
- This was not included in the LKAS Adhoc group proposal.