ACSF Category C
Industry proposal

Preliminary notes:
- **Purple text shows industry amendments to document ACSF-06-28.**
- **The necessary tests in Annex 8 are not included in this proposal. Further work is needed.**

2.4.13   **A 'lane change procedure' starts when the direction indicator lamps are activated and ends when the lane change is completed. It comprises two operations:**
- **Activation of direction indicator lamps**
- **Lane change manoeuver**

2.4.14   **A 'lane change manoeuver' is deemed**
- **to start when the vehicle movement towards the target lane starts or when the front wheel of the vehicle touches the lane marking.**
- **to end when the vehicle has reached the target lane and drives parallel to the lane markings, or when the rear wheels of the vehicle have crossed the lane marking**

5.6.3.   **Special Provisions for ACSF of Category B2**

  (Reserved)

5.6.3.   **Special Provisions for ACSF of Category C**

> **Kommentiert [TP1]:** Renumber all paragraphs if it is agreed to reserve 5.6.3 for ACSF B2

  Any ~~system of Category C ACSF~~ **vehicle fitted with an ACSF of category C complying with the definition in paragraph 2. of this regulation shall fulfill the following requirements.**

5.6.3.1.   **General**

5.6.3.1.1.   ~~The system shall be active (deliver automatic steering) only after a deliberate action of the driver and if the conditions for operation of the system are fulfilled (all associated functions — e.g. brakes, accelerator, steering, camera/radar/lidar etc. are working properly).~~

> **Kommentiert [TP2]:** Already covered in ACSF C paragraphs 5.6.3.1.2 and 5.6.3.2; and in ACSF B1 / B2 requirements.

5.6.3.1.1.   **The vehicle shall be equipped with [either] an ACSF of category B1 [or of category B2], in accordance with the applicable requirements of this regulation.**

> **Kommentiert [TP3]:** Should it be kept or added only when B2 will be defined?

5.6.3.1.2.   **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.**

> **Kommentiert [TP4]:** In this section, the „system" is ACSF C. However, this does not mean there must be a specific means to deactivate ACSF C (e.g. the means may be shared with ACSF B1 - or B2).

5.6.3.1.3.   **Steering by the driver shall override steering by the system.** ~~Braking or accelerating by the driver shall override speed selection by the system.~~ **The steering control effort necessary to override the directional control provided by the system shall not exceed 50 N.**

> **Kommentiert [TP5]:** Should this be added in ACSF B1? Or deleted from here, provided existing requirement in 5.1.6 is deemed clear enough?

> **Kommentiert [TP6]:** ACSF C is only performing the lane change. Speed selection is taken over from e.g. an ACC.

5.6.3.1.4. ~~The specified maximum lateral acceleration ay$_{smax}$ shall not have a value of more than 3 m/s² and of less than 1 m/s².~~ The lateral acceleration induced by the system during the lane change manoeuver shall not exceed [1 m/s²] in addition to the lateral acceleration generated by the lane curve.

However, the lateral acceleration of the vehicle shall not exceed the maximum values defined in the table of paragraph 5.6.2.1.3.

5.6.3.1.5. ~~The activated system shall at any time control the movement of the vehicle in such a way that the vehicle does not induce any safety critical situations and that the movements of the vehicle are clear to other road users.~~

5.6.3.1.6. ~~The system status shall be indicated to the driver by a visual signal.~~

~~The indication shall [at least] distinguish between the system status stand-by Mode, active Mode and failure Mode.~~

~~The indication shall be present as long as the relevant system status persists.~~

~~When the system is switched off by the driver, the indication of stand-by Mode and failure Mode may be suppressed.~~

~~Any change in system status shall be indicated by a visual and either an acoustic or haptic signal.~~

5.6.3.1.5. The vehicle shall fulfill the tests for Category ~~C~~ C, i.e. FU1 and FU3, as specified in Annex 7. The test FU3 shall only be carried out until a single lane change was completed. Returning into the initial lane is not required.

5.6.3.2. ACSF of category C operation ~~Operation of ACSF~~

5.6.3.2.1. ~~Any lane change manoeuvre shall be initiated only if commanded by a deliberate action of the driver (e.g. by using the direction indicator lever for at least 2 s).~~

5.6.3.2.2. ~~If a lane change manoeuvre is carried out, the correspondent direction indicator lamps shall be automatically activated minimum 3 s~~
~~a) prior to the start of the lane change manoeuvre or~~
~~b) prior the vehicle has touched the lane markings~~

5.6.3.2.3. ~~The lane change manoeuvre shall be completed, except the system detects an imminent critical situation or the system is overridden by the steering of the driver.~~

5.6.3.2.4. ~~The activated system shall prior and after a lane change manoeuvre ensure that the vehicle does not cross any lane marking.~~

5.6.3.2.1 The activation of an ACSF of category C shall only be possible if an ACSF of category B1 [or B2] is active.

5.6.3.2.2. Any lane change manoeuvre shall be initiated only if commanded by two subsequent deliberate actions of the driver, within an interval of [10s]. The lane change manoeuver shall start upon the second command.

Kommentiert [TP7]: Industry will check the value.

Kommentiert [TP8]: These subjective requirements are superseded by proposals in paragraph 5.6.3.1.4.

Kommentiert [TP9]: This text is relevant for an ACSF B1 or B2, not for an ACSF C. Necessary requirements for ACSF C have been added in 5.6.3.2.

Kommentiert [TP10]: To be modified after tests of Annex 8 are defined.

Kommentiert [TP11]: Completely reworked, see below.

Kommentiert [TP12]: This is a way to ensure the driver is attentive and cannot initiate a lane change unintentionaly / without checking if the target lane is free.

5.6.3.2.3   The system shall inform the driver on the status of the system during the lane change procedure.

5.6.3.2.4.   The lane change manoeuver shall not be initiated before 3 flashes of the direction indicator lamps.

5.6.3.2.5.   Any lane change manoeuvre shall be completed, unless the system detects an imminent critical situation, is overridden by the driver or does not detect the lane markings anymore.

5.6.3.2.6.   During the single lateral manoeuvre, ACSF of category B1 [or B2] shall be temporarily suppressed. Once the manoeuvre is completed, ACSF of category B1 [or B2] shall automatically resume.

5.6.3.3.   System information data

5.6.3.3.1.   The 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

5.6.3.3.1.1.   The values for V_{smax}, V_{smin} ~~and ay$_{smax}$~~.

> **Kommentiert [TP13]:** aysmax is relevant only for B1 and B2.

5.6.3.3.1.2.   The conditions under which the system can be activated, i. e. when the conditions for operation of the system are fulfilled.

~~**5.6.3.3.1.3.**   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.~~

~~**5.6.3.3.1.4.**   Documentation about which system software version is valid. This documentation shall be updated whenever a software version was amended.~~

> **Kommentiert [TP14]:** These requirements should be added to B2 instead, so that they are appliable to B2, B2+C, B2+D, B2+E. They are not applicable to B1.