

## Proposal for Requirements of ACSF of Category B2 – Related to the General System Classification / Human Driver Priority / Information to the Driver

*Note: The following text is taken from UN Regulation No. 79 Rev.3, Annex II of ECE/TRANS/WP.29/GRRF/85 and ACSF-06-28. Modifications are marked **red**. Comments are **blue**.*

- x.x.x. General System Classification  
*Please see ACSF-17-03-Rev.1 and ACSF-17-08-Rev.1 for the moment.*
- x.x.x. Human Driver Priority
- x.x.x.1. Advanced driver assistance steering systems shall only be approved in accordance with this Regulation where the function does not cause any deterioration in the performance of the basic steering system. In addition they shall be designed such that the driver may, at any time and by deliberate action, override the function.
- x.x.x.2. Activation/deactivation of the ACSF of Category **B2** system
- x.x.x.2.1. After each vehicle new engine start/run cycle (other than when performed automatically, e.g. the operation of a stop/start systems), the ACSF of Category **B2** function shall be prevented from **being in active mode** until the system has detected, at least once, [a moving object at a distance greater than the minimum distance  $S_{\text{rear}}$  declared by the manufacturer in paragraph **x.x.x.** above.]
- x.x.x.2.2. The vehicle shall be equipped with a means for the driver to activate (standby mode) and deactivate (off mode) the system. [The same means as for an ACSF of Category B1 may be used.]
- x.x.x.2.3. The system shall only be activated (standby mode) after a deliberate action by the driver.  
  
The activation of the system shall not be possible if the driver is not in the driver seat or if the seatbelt is not fastened.
- x.x.x.2.4. It shall be possible to deactivate the system (off mode) at any time by a single action of the driver. Following this action, the system shall only be able to be reactivated (standby mode) by a deliberate action of the driver.
- x.x.x.2.5. The ACSF of Category **B2** shall be able to detect blindness of the sensor (e.g. due to accumulation of dirt, ice or snow). The ACSF of Category **B2** shall be prevented, upon detection of blindness, from **being in active mode**. The status of the system shall be signalled to the driver no later than on the initiation of **activation**. The same warning as the one specified in paragraph **x.x.x.** (system failure warning) may be used.
- x.x.x.3. The system shall be designed so that excessive intervention of steering control is suppressed to ensure the steering operability by the driver and to avoid unexpected vehicle behaviour, during its operation. To ensure this, the following requirements shall be fulfilled:

- (a) The steering control effort necessary to override the directional control provided by the system shall not exceed 50 N;
- (b) The specified maximum lateral acceleration  $a_{ysmax}$  shall be within the limits as defined in the following [table]: *See UN-R 79 Table 1*
- (c) The moving average over half a second of the lateral jerk generated by the system shall not exceed 5 m/s<sup>3</sup>.

x.x.x.4. Overriding

A steering input by the driver shall override the steering action of the system. The steering control effort necessary to override the directional control provided by the system shall not exceed 50 N.

The system [may remain activated (standby mode)] provided that priority is given to the driver during the overriding period.

x.x.x.4.1. **Measures to manually override the system:**

- (a) **lateral control (steering)**
- (b) **longitudinal control (braking and accelerating)**

Steering by the driver shall override steering by the system. Braking or accelerating by the driver shall override speed selection by the system.

x.x.x.5. Suppression of **ACSF of Category B2 function**

x.x.x.5.1. The **ACSF of Category B2** shall be suppressed automatically by the system when at least one of the following situations occurs:

- (a) The system detects a critical **distance** (as defined in paragraph [x.x.]);
- (b) The system is overridden or switched off by the driver;
- (c) The system reaches its [boundaries] (e.g. lane markings are no longer detected);
- (d) **The system detects the driver is not available (e.g. seated, etc.).**

*Still missing (see ACSF17-03-Rev.1): “A logical and intuitive procedure to permit the driver to resume control from the automated system but including safeguards to ensure unintended driver inputs of the automated driving system is avoided.”*

x.x.x. Information to the driver

x.x.x.1. Required information at all times

If the system is active an [optical] signal shall be provided to the driver.

When the system is in standby mode, an [optical] signal shall be provided to the driver.

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

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

x.x.x.1.1. Any fault which impairs the steering function and is not mechanical in nature shall be signalled clearly to the driver of the vehicle.

A system failure shall be signalled immediately to the driver by an [optical] warning signal. However, when the system is manually deactivated by the driver, the indication of the failure may be suppressed.

If a system failure occurs **while the ACSF of Category B2 system is in active mode**, the failure shall be signalled to the driver by an optical, and an acoustic or haptic warning.

Despite the requirements of paragraph x.x.x. the deliberate application of [vibration in the steering system] may be used as an additional indication of a fault condition in this system.

[In the case of a motor vehicle, an increase in steering force is considered to be a warning indication; in the case of a trailer, a mechanical indicator is permitted.]

x.x.x.2. Design requirements Human Machine Interface (HMI)

x.x.x.2.1. Optical warning signals shall be visible, even by daylight and distinguishable from other alerts; the satisfactory condition of the signals shall be easily verifiable by the driver from the driver's seat; the failure of a component of the warning devices shall not entail any loss of the steering system's performance.

x.x.x.2.2. Acoustic warning signals shall be by continuous or intermittent sound signal or by vocal information. Where vocal information is employed, the manufacturer shall ensure that the alert uses the language(s) of the market into which the vehicle is sold.

Acoustic warning signals shall be easily recognized by the driver.

x.x.x.2.3. The system shall provide a means of detecting that the driver is holding the steering control **after the transition period** and shall warn the driver in accordance with the warning strategy below:

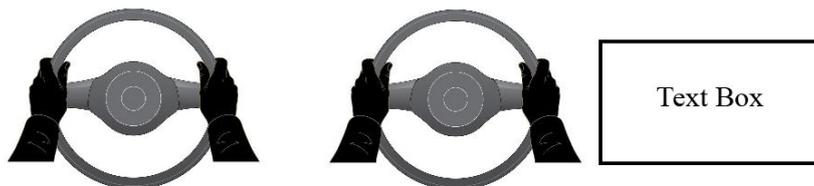
If, after a period of no longer than [3 seconds] after the initiation of the transition demand, the driver is not holding the steering control, an [optical] warning signal shall be provided. This signal shall be the same as the signal specified in paragraph x.x.x above.

The warning signal shall be active until the driver is holding the steering control, or until the system is deactivated, either manually or automatically.

x.x.x.2.4. [When the system is active and in the speed range between 10 km/h or  $V_{smin}$ , whichever is higher, and  $V_{smax}$ , it shall provide a means of detecting that the driver is holding the steering control.]

If, after a period of no longer than [15 seconds] the driver is not holding the steering control, an optical warning signal shall be provided. This signal may be the same as the signal specified below in this paragraph.

The optical warning signal shall indicate to the driver to place their hands on the steering control. It shall consist of pictorial information showing hands and the steering control and may be accompanied by additional explanatory text or warning symbols - see examples below:



Example 1.

Example 2.

If, after a period of no longer than [30 seconds] the driver is not holding the steering control, at least the hands or steering control in the pictorial information provided as optical warning signal shall be shown in red and an acoustic warning signal shall be provided.

The warning signals shall be active until the driver is holding the steering control, or until the system is deactivated, either manually or automatically.

The system shall be automatically deactivated at the latest [30 seconds] after the acoustic warning signal has started. After deactivation the system shall clearly inform the driver about the system status by an acoustic emergency signal which is different from the previous acoustic warning signal, for at least [five seconds] or until the driver holds the steering control again.

The above requirements shall be tested in accordance with the relevant vehicle test(s) specified in Annex 8 of this Regulation.

- x.x.x.2.5. Unless otherwise specified, the optical signals described in paragraph **x.x.x.** shall all be different from each other (e.g. different symbol, colour, blinking, text).