

Emergency Steering Function (ESF) Industry proposal

Background:

During the 8th meeting of ACSF informal group in Stockholm, it was decided that all functions to „assist the avoidance of a collision“ should be excluded from the scope of CSF. The agreement in the group was to create a new definition for „Emergency Steering Functions (ESF)“ and define new specific requirements. At GRRF-82 of September 2016, this work was agreed to be done within the frame of the second step of the ACSF informal group, targeting an adoption at GRRF 83rd session of January 2017.

Objectives:

- Define ESF.
- Specify requirements and tests, beyond Annex 6 to R79.
- Prevent ESF from being type approved as CSF or ACSF B1.
- Prevent ESF from being misused as an ACSF.

Basic principles:

- ESF is defined under ADASS umbrella, on the same level as CSF or ACSF.
- ESF assists the avoidance of a collision [in emergency situation]
- ESF can be implemented as a standalone function on the vehicle, or be coupled with other CSF and/or ACSF function(s).

Draft Proposal:

Paragraph 2.3.4., amend to read:

- 2.3.4. "Advanced Driver Assistance Steering System" means a system, additional to the main steering system, that provides assistance to the driver in steering the vehicle but in which the driver remains at all times in primary control of the vehicle. It comprises one or ~~both~~ **more** of the following functions:
- 2.3.4.1. "Automatically commanded steering function (ACSF)" means [...]
- 2.3.4.2. "Corrective steering function (CSF)" means [...]

Insert a new paragraph 2.3.4.3. to read:

- 2.3.4.3 "Emergency Steering Function (ESF)" means a control function within an electronic control system whereby, for a limited duration, changes to the steering angle of one or more wheels **[may] result from the automatic evaluation of signals initiated on-board the vehicle, in order to assist the driver in avoiding or mitigating a collision with:**
- another vehicle driving/* in an adjacent lane,
 - drifting towards the path of the subject vehicle and/or,
 - into which path the subject vehicle is drifting and/or,
 - into which lane the driver initiates a lane change manoeuvre.
 - an obstacle obstructing the path of the subject vehicle or when the obstruction of the subject vehicle's path is deemed imminent.
- ESF shall cover one or several use cases from the list above.

/* the vehicle may be driving in the same or the opposite direction as the subject vehicle.

Kommentiert [TP1]: Agreed at Webex #1 to review later if the "may" could be deleted...

Insert a new paragraph 5.1.6.3. to read:

5.1.6.3 Provisions for ESF
Any vehicle fitted with an ESF complying with the definition of paragraph 2. of this regulation shall meet the following requirements.

[5.1.6.3.1. ESF may only start an intervention in case a risk of a collision is detected as declared by the vehicle manufacturer.]

5.1.6.3.2. An automatic avoidance manoeuvre initiated by an ESF shall not lead the vehicle to cross a lane marking unless the target is to come back into the original lane for avoiding a collision.

5.1.6.3.3. In the case of an avoidance manoeuvre automatically initiated by the system, the intervention of ESF shall be indicated to the driver with an optical and an acoustic warning. In the case of an avoidance manoeuvre performed by the driver, the ESF intervention shall be indicated by at least one warning, either optical or acoustic.

[5.1.6.3.4. When a risk of collision has been detected by the system, an optical and an acoustic warning shall be provided at the latest when the intervention starts. The same warning(s) as in paragraph 5.1.6.3.3 may be used.]

5.1.6.3.5. A system failure shall be indicated to the driver with an optical signal. However, when the system is manually deactivated, the indication of failure mode may be suppressed.

5.1.6.3.6. The steering control effort necessary to override the directional control provided by the system shall not exceed 50 N.

5.1.6.3.7 The ESF shall be subject to the requirements of Annex 6.

5.1.6.3.8 The vehicle shall be tested in accordance with the relevant vehicle tests specified in Annex 8 of this Regulation.

5.1.6.3.9. System information data

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:

- Use case(s) where ESF is designed to operate (among the use cases i.a, i.b, i.c and ii. specified in the ESF definition);
- The conditions under which the system is active, e.g. the vehicle speed range V_{smax} , V_{smin} ;
- How ESF detects a risk of a collision.

Kommentiert [TP2]: The objective of this paragraph is to prevent ESF to be misused as a B1. Question: is this paragraph really needed at all, since the risk above is covered by the warning required at every intervention in paragraph 5.1.6.3.3.?