

REPORT

14th meeting of GRRF Informal Working Group on Automatically Commanded Steering Function

Venue: TÜV-Rheinland in Köln, Germany
Chairman: Mr. Hiroshi Morimoto (J) and Mr. Christian Theis (D)
Secretariat: Mr. Jochen Schaefer (CLEPA)
Dates: 30. August – 1. September 2017
Website: [ACSF 14th session](#)

1. Participants:

see special attachment

2. Welcome and Introduction

The new chairmen Hiroshi Morimoto welcomed the delegates to the 14th session of the IWG ACSF. He is the successor of Hidenobu Kubota who has now a new responsibility within MLIT.

3. Approval of the report of the 13th Session

The report of the 13th Session was approved by the delegates
[ACSF-13-18-Rev.1 - \(Secretary\) Report of 13th session.pdf](#)

4. Approval of the agenda

The agenda was adopted and confirmed by the delegates without amendments.
[ACSF-14-03-Rev.1 - \(Chair\) Agenda 14th session.pdf](#)

Abbreviations used in this document :

LC: Lane Change
DI: Direction Indicator
TS: Technical Service
VM: Vehicle manufacturer
IWG: Informal Working Group

5. List of Documents:

ACSF-14-01 - (Germany and Secretary) Information to the 14th session of ACSF	Doku
ACSF-14-02 - (Germany) Rear and side view in assistance systems	Doku
ACSF-14-03 - (Chair) Provisional Agenda 14th session	Doku
ACSF-14-04 - (OICA-CLEPA) - ACSF-C - homework	Doku
ACSF-14-05 - (OICA) - Proposal for ACSF C2	Doku
ACSF-14-06 - (OICA-CLEPA) - Presentation of ACSF C Tests	Doku
ACSF-14-07 - (OICA-CLEPA) - ESF - homework	Doku
ACSF-14-08 - (OICA-CLEPA) - Bench Study - Overriding Force of 50N	Doku
ACSF-14-09 - (The Netherlands) - Comments to ACSF-C	Doku
ACSF-14-10 - (OICA) Scenarios for hands-off detection	Doku
ACSF-14-11 - (Secretary) - ACSF-C - Consolidated document for CAT C1	Doku

6. Target of the meeting

Target of the meeting was to finalize the ACSF Category C1 and ACSF-ESF. This target could not be finally reached, as there are still a lot of issues in [...]. It was concluded, that D will invite industry and interested CPs to a telecon before the GRRF84 session in September in Geneva, another meeting of the IWG ACSF is planned for end of November 2017. A special GRRF85 is planned for beginning of December 2017, dedicated only on the ACSF issues. Details see 9.

7. Amendments to the consolidated documents ACSF-13-16

(EC): he sees the following priorities:

Prio 1: CAT C1
Prio 2: ESF
further – if time avail.: CAT C2

The delegates agreed to this.

Due to the delay of Chair-D (in the following C-D), Chair-J (in the following C-J) proposes to start with ESF.

7.1. **Emergency Steering Function (ESF)**

Document: [ACSF-14-07](#)

5.1.6.2.3 ('warning of the driver')

(NL): Is it necessary to define the strength of the acoustic warning signal?

(SE): As it is an emergency system, the warning should be "special"

(OICA): Proposes that it is possible to use warnings, which are maybe already available, provided they are directionally and functionally appropriate. We have to consider, that we have a optical and an acoustic/haptic warning.

(UK): Is supporting to limit the different signals which can be issued to the driver. Is it helpful here, if the optical signal is placed in the door mirror?

(EC): At least, we should have a clear information for the driver. Maybe we can combine it with CAT C1.

(D): Supports EC. Maybe we can use the ESC warning signal for ESF as well.

Conclusion: Item was not finally concluded.

5.1.6.2.6 ('30N vs. 50N oversteering force')

(Secr.) Presented document ACSF-14-08

(UK): It is not convinced, that a study of 5 engineers is a valid one.

(Secr.) The proposed 50N is the max. value, not a typical one. We have to consider, that the max. value for a intact steering system is 150N. Is it possible to define the max. value for oversteering with a delta (e.g. 20N) to the intact steering force, which is installed in the vehicle?

(UK): The steering system of a M1 and N3 vehicle is very different. So we need different values.

(OICA): Proposes to wait with fixing this value until the first vehicles are on the market.

Conclusion: Not finalized, wait for the definition in CAT C1

3.3 ('ESF Tests')

3.3.1

(C-D): Is it assured, that the parameters of the system are known at the TS?

(OICA): Yes, this is part of paragraph 5.1.6.2.8 – 'System information data' and in the paragraph 3.3.

3.3.2. – no comment

3.3.3. – no comment

3.3.4. ('Tests for systems able to operate in the absence of lane markings')

(UK): How can we handle the test "d" ('...the vehicle has not left the road due to the ESF intervention..') under type approval conditions?

(OICA): This is the "road edge detection". If this is not installed in the vehicle, the vehicle manufacturer will not provide such a function.

(UK): Nevertheless, we need here clear requirements and a clear definition of the test.

(OICA): This is in detail not possible, as the requirements are not defined.

3.3.5. ('False reaction test...')

(F): This is not enough for the TS to perform the test. Proposes to take a look on tests which are used by Euro NCAP.

(SE): The user shall be informed about the system performance.

(EC): We can make it easier, as we have no requirements in the text. The TS should check, that the input of the VM is correct, but currently it is not clear what we expect to be checked.

(D): We have to check the values, which are declared by the VM.

Conclusion: no real conclusion...

7.2. ACSF Category C1

(Secr.): Presented the results of the the CP-meeting the day before

Informal Working Group on ACSF
CP – Meeting ACSF14

Requirements for rear monitoring for CAT C1 systems:

Proposal:

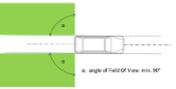
Min. detection range: 55m / 6m (rear/side acc. sketch below)

Manoeuvre to start: earliest after 3.0s

Manoeuvre to start: latest after 4.0s

Hands on detection (filter): less than 3.0s

Min. activation speed: 80 km/h



Picture 1

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CP – Meeting ACSF14

Enable a LC-manoevrre if dV between Ego- and Target vehicle is low:

If vehicles have a small speed difference, the following values are valid:

- A vehicle is detected in the detection range
- The vehicle speed of ego and target vehicle is available
- The distance between the vehicles is available

If the dV is < [x] km/h and the distance is > [y] m a lane change manoeuvre may be carried out

Picture 2

(BAST): Showed a calculation sheet for the safety distance

- Base:
- Reaction time is 1,2 s
 - Deceleration of the target vehicle: 3 m/s²
 - Remaining gap: 1 s

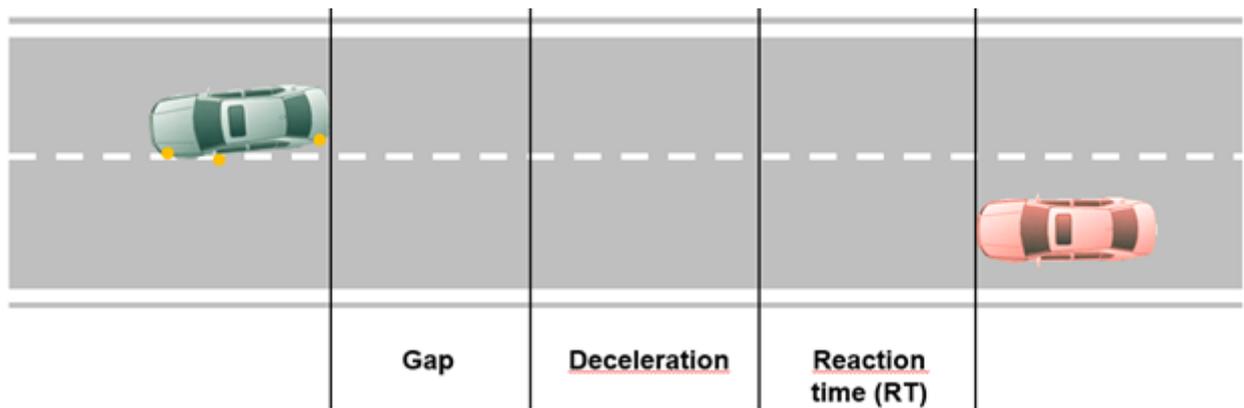
V_RO	0	10	20	30	40	50	60	70	80	90	100	110	120	130 V_VUT
130	260,7	228,0	197,8	170,3	145,3	122,9	103,0	85,7	71,0	58,9	49,4	42,4	38,0	36,1
120	225,2	195,1	167,5	142,5	120,1	100,2	83,0	68,3	56,1	46,6	39,6	35,2	33,3	34,1
110	192,3	164,7	139,7	117,3	97,5	80,2	65,5	53,4	43,8	36,8	32,4	30,6	31,3	34,6
100	161,9	136,9	114,5	94,7	77,4	62,7	50,6	41,0	34,0	29,6	27,8	28,5	31,8	37,7
90	134,2	111,7	91,9	74,6	59,9	47,8	38,2	31,3	26,8	25,0	25,7	29,0	34,9	43,4
80	109,0	89,1	71,9	57,2	45,0	35,5	28,5	24,1	22,2	23,0	26,3	32,1	40,6	51,6
70	86,3	69,1	54,4	42,2	32,7	25,7	21,3	19,4	20,2	23,5	29,4	37,8	48,8	62,4
60	66,3	51,6	39,5	29,9	22,9	18,5	16,7	17,4	20,7	26,6	35,0	46,0	59,6	75,8
50	48,8	36,7	27,1	20,1	15,7	13,9	14,6	17,9	23,8	32,2	43,3	56,9	73,0	91,7
40	33,9	24,4	17,4	13,0	11,1	11,8	15,1	21,0	29,5	40,5	54,1	70,2	89,0	110,3
30	21,6	14,6	10,2	8,3	9,1	12,4	18,2	26,7	37,7	51,3	67,5	86,2	107,5	131,4
20	11,8	7,4	5,6	6,3	9,6	15,5	23,9	34,9	48,5	64,7	83,4	104,7	128,6	155,1
10	4,6	2,8	3,5	6,8	12,7	21,1	32,2	45,7	61,9	80,6	101,9	125,8	152,3	181,3
0	0,0	0,7	4,0	9,9	18,4	29,4	43,0	59,1	77,9	99,2	123,0	149,5	178,5	210,1

Table 1

It started a lengthy discussion with regard to the values for

- reaction time/distance,
- deceleration distance and
- remaining distance (gap) between the vehicles.

the graph should show these parameters:



	Gap	Deceleration	Reaction time (RT)	
some CPs:	1 s	3 m/s ²	1,2 s	Only low dV others min. 55m
OICA:	1 s	3 m/s ²	0 s	Reaction time of 1,2 s is covered in flashing time (3 s)
UK	1 s (to increase with high dV)	3 m/s ²	tbd.	values tbd.

Table 2

(C-D): Proposal:

Define a fixed safety distance value of >30m,
if Vego < 100 km/h and dV < 20 km/h

Proposals from Japan:

dV	60 km/h	70 km/h	80 km/h	90 km/h	100 km/h	110 km/h	120 km/h	ego vehicle speed
50 km/h	55m	55m	55m	55m	55m	55m	55m	
40 km/h	55m	55m	55m	55m	55m	55m	55m	
30 km/h	55m	55m	55m	55m	55m	55m	55m	
20 km/h	20m	23m	25m	28m	30m	33m	X	
10 km/h	18m	20m	23m	25m	28m	30m	33m	

Table 3

Alternative Japan:

dV	60 km/h	70 km/h	80 km/h	90 km/h	100 km/h	110 km/h	120 km/h	ego vehicle speed
50 km/h	55m	55m	55m	55m	55m	55m	55m	
40 km/h	55m	55m	55m	55m	55m	55m	55m	
30 km/h	38m	41m	44m	47m	49m	55m	55m	
20 km/h	29m	31m	34m	37m	40m	42m	55m	
10 km/h	21m	24m	27m	30m	32m	35m	38m	

Table 4

It followed a long discussion, whether it is better to use a linear calculation vs. a fixed value.

(NL): Does not support, that in case the calculated safety distance is too low, a second action can enable the LC-Manoeuvre. (100% or nothing)

(UK): Is not sure, whether a value of 1 s for the gap at high dV is reasonable

(OICA): The reaction time in the OICA proposal (see **Table 2**) is not zero, but is considered to be within the 3 s flashing time of the direction indicator lamps. OICA believes, that the driver of the rear coming vehicle is already alerted by the flashing and the movement of the vehicle towards the marking, so that he can react immediately if the vehicle starts the LC-manoeuvre.

OICA is proposing a compromise, to take 0,4 s of the reaction time in the distance calculation after LC manoeuvre has started:

dV	ego vehicle speed						
	60 km/h	70 km/h	80 km/h	90 km/h	100 km/h	110 km/h	120 km/h
70 km/h	87.5	x	X	X	X	X	X
60 km/h	69.6	72.4	x	X	X	X	X
50 km/h	54.3	57.1	59.9	x	X	X	X
40 km/h	41.7	44.4	47.2	50.0	x	X	X
30 km/h	31.6	34.3	37.1	39.9	42.7	x	X
20 km/h	24.0	26.8	29.6	32.4	35.1	37.9	x
10 km/h	19.1	21.8	24.6	27.4	30.2	32.9	35.7

Table 5

(OICA): In the case, the vehicle has a better sensor performance also a higher dV should be possible.

(D): The 1,2 s reaction time proposed by D are already a compromise.

(NL): supports the 1,2 s reaction time. This is also used at AEBS.

(Secr.): We cannot compare the reaction on the LC manoeuvre with AEBS. AEBS is a sudden event, where the driver is really surprised. This is not the case here.

(UK): We have to be careful, that we do not end up in a discussion, where we discuss the pressure built up time/rate.

(NL): But this is only for M1 vehicles – or?

(EC): Now we have three versions for the reaction time:

0 s, 0,4 s and 1,2 s. EC can live with 0 s!

(C-D): This is ok, but the EC has no behaviour law!

Opinion of the CPs after the discussion:

Linear calculation from dV=0 up to dV=50 km/h with a reaction time of 0 up to 1,2 s

YES: J, D, NL, EC

Tbd.: SE, F, UK, ROK

(Secr.): If we use the linear calculation, do we still limit the distance in the table to the value, which was defined by the CPs (min. 55m) (see **Picture 1**)?

(EC): no, if we calculate it linear, then it is linear!

Conclusion: Values for the calculation of the safety distance remains open.

[ACSF-14-04](#)5.6.5.2.3. ('*highway detection*')

(UK): Thinks, that „road section“ is not clear enough.

„And/or“, proposed by OICA to use different provisions to detect the correct road is not possible, as OICA has explained, that road sign recognition is not reliable. „Or“ must be deleted.

(D): new wording is not acceptable. D understands, that 100% detection is not possible. 99% is ok. D assumes, that this is covered with the new wording.

(UK): It should be clear, that in case the decision to be on a „highway“ is based on a map, the system is not responsible in case the map has a failure – it is the driver who activates the system.

Prefers to have two means of detection.

UK and D agreed to the new wording (see [consolidated document ACSF-14-11](#)). Nobody disagreed.

Conclusion: Wording is marked in **green** in the [consolidated document](#).

5.6.5.6.4 (was 5.6.5.6.5)

(‘...*The system may delay initiation of the lane change manoeuvre for a period not exceeding [10] seconds...*’)

The CPs propose to have only 4 s (see **Picture 1**)

(OICA): Could not understand, how the mind change happened to come from 10 s to 4 s?

(Secr.): Explained the background of this decision of the CPs, took at the pre-meeting.

(NL): With 10 s the systems could be treated as a CAT E system...

(UK): This system is not a CAT D or CAT E system.

(OICA): The time when going from the center lane to the lane marking must also be considered.

(Secr.): We expect that the lane change manoeuvre for a M1 vehicle is over after latest 5 s. If we take a “normal” M1 vehicle with a width of 2 m, the lateral movement is 40 cm per second. When the vehicle drives in the middle of a “typical highway lane” of 3,50 m there is a space of 0,75 cm to the left and to the right. Considering the 40 cm per second, mentioning before, the vehicle needs

~2 s if the lateral movement starts immediately after the 3 s => recommended to increase the value to 5 s.

Conclusion: Based on this calculation, all CPs agree to the 5 s.

5.6.5.5.6. ('*hands on detection “filter” time*')

The CPs propose to have only 3 s (see **Picture 1**)

(OICA): That creates problems for some VMs, as with the current design for hands-on detection used in some vehicles, which fulfils the requirements for CAT B1, this is not possible to use.

(Secr.): As this is a design restrictive proposal we should think about transitional provisions, if we stick to the 3 s requirement.

Conclusion: No final decision – no new wording proposal in the document.

5.6.5.6.8. (*'The lane change procedure shall be aborted at least when one of the following situation occurs...'*)

The delegates discussed a long time about this paragraph.

(OICA): presented ACSF-14-10 and tried to bring clarity in the discussion.

The outcome is marked in **green** in the [consolidated document](#). Not the complete paragraph could be finalized, therefore there was defined Homework, which is also mentioned in the [consolidated document ACSF-14-11](#). Still a lot of open issues, marked with [...] and/or **yellow** highlighted are in the document.

(C-D): Asked D to coordinate a working group, which should review the entire document until GRRF84.

The working group includes:

- D (coordinator); UK, NL, SE, J, OICA, CLEPA, Secretary

Tests for CAT C1:

Due to time reasons, the group was not able to review the proposals for Annex 8.

This remains highlighted with **yellow** in the [consolidated document](#).

8. Extension of the mandate / Adaption of the TOR

The mandate for the group ends currently in September 2017.

The Secretary asked Bernie Frost, the delegate of UK and Chairman of the GRRF about his opinion.

(Bernie Frost): He expects, that the further development will depend on ATS-AD, therefore an extension of one year seems to be sufficient. It is up to WP.29 to decide, whether the next steps in defining CATs B2, D and E will be done in this IWG, or whether a new IWG with new mandate will be nominated.

(C-D): Asked the Secretary to prepare for GRRF84 a document with an extension of the TOR for this IWG for one more year.

9. Next meetings

GRRF84, Geneva (CH)	19 th - 22 th September 2017
ACSF15, Bonn (D)	22 nd - 24 th November 2017
GRRF85, Geneva (CH)	11. December 2017 (special GRRF for ACSF)