

Draft REPORT

11th meeting of GRRF Informal Working Group on Automatically Commanded Steering Function

Venue: Federal Ministry of Transport and Digital Infrastructure
Invalidenstr. 44 - 10115 Berlin - Germany
Chairman: Mr. Christian Theis (D) and Mr. Hidenobu Kubota (J)
Secretariat: Mr. Jochen Schaefer (CLEPA)
Dates: 28. – 30. March 2017
Website: <https://www2.unece.org/wiki/display/trans/ACSF+11th+session>

1. Participants:

see special attachment

2. Welcome and Introduction

The chairmen welcomed the delegates to the 11th session of the IWG ACSF

3. Approval of the report of the 10th Session

The report of the 10th Session was amended by the delegates
[ACSF-09-17-Rev1 - \(Secretary\) Report of 9th session](#)

4. Approval of the agenda

The agenda was amended by two additional items and adopted by the delegates.
[ACSF-11-02-Rev1 \(Secretary\) Agenda 11th session](#)

5. List of Documents:

ACSF-11-01 - (Germany) Information to the 11th session in Berlin	Doku
ACSF-11-02 - Provisional Agenda 11th session	Doku
ACSF-11-03 - (Germany+Japan) Proposal Category C	Doku
Consolidated Document : ACSF-11-03-Rev.2 - (IWG-Group) Proposal Category C-- PRELIMINARY	Doku
ACSF-11-04 - (Germany+Japan) Category C - Proposal for sensor range	Doku
ACSF-11-05 - (OICA-CLEPA) cat B1 _ default off_on	Doku
ACSF-11-06 (OICA) Proposal for ACSF roadmap	Doku
ACSF-11-07 (OICA-CLEPA) Process diagram lane change Category C with HMI	Rev.1
ACSF-11-08 - (EC) TRL study on the assessment and certification of automated vehicles	Doku
ACSF-11-09 - (EC) Commission study on vehicle certification	Doku
ACSF-11-10 - (D+J) Main Discussion Points of Category C	Doku
ACSF-11-11 - (OICA) Signalling of information and warnings	Doku
ACSF-11-12 - (Japan) Common understanding for CAT C	Doku

6. Remark from Bernie Frost (UK) to GRRF- and WP.29-session

He summarized the GRRF session in January and the WP.29 session in March. GRRF has confirmed the proposals for CAT A, CAT B1 and CSF. Open was, because we ran about of time, the transitional provisions. The date that the amendments mentioned above for new registrations will get into force is 2021 or 2024. The decision taken by WP.29 was 2021. The amendments should be in force by 1. April 2018 for new vehicle types.

7. Amendments to CAT B1

With document [ACSF-11-05](#), OICA proposes to review 5.6.2.1.2. that a misinterpretation is not possible.

After a short discussion the delegates from EC, UK and D proposed, that this item should be brought up in the next GRRF session in September.

(Chair J – in the following C-J):

- OICA to prepare a proposal for GRRF84
- EC to present their expectation to regulate LKAS

8. Roadmap for ACSF**Document ACSF-11-06**

OICA presented the document and explained their interest, to regulate in the next steps CAT B2/E based on level 2 and level 3.

(NL): is surprised about the level discussion. Sees level 3 as dangerous and proposes to skip level 3 and go directly to level 4.

(F): Appreciates the proposal from OICA. We should discuss this item in detail, as a CAT B2 system will completely different for level 2 and level 3.

(SE): Has at the moment no clear view, whether we should discuss here the levels. SE is discussion internally about the risk of the different levels. For him it is not clear how to combine CATs and levels.

(EC): The focus for this session is CAT C. The level discussion is important, but not in this group. When we have guidance from WP.29 we should work on this (mainly for CAT B2/E).

(UK): has two hats, one is that of the chairman of GRRF.

As the chairman of GRRF he must respect the TOR for this group – and in this TOR it is mentioned, that the mandate of this group will run out in September this year.

We should not debate about issues in the future, if we are not sure, whether this IWG will continue after September.

He sees the document as an indication what is in front of us, but maybe not in this group.

Industry should explain, what will be in production and when.

For him, the position of WP.1 is not completely clear, what is legal, and what should be legal in the future.

Also the opinion of the industry is sometimes different:

Level 2 -> Level 3 -> Level 4 ?

or Level 2 -----> Level 4 ?

The discussion should be taken outside of this group.

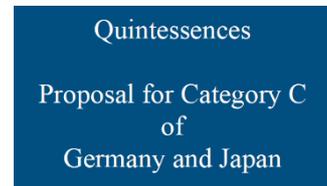
ACSF roadmap

Industry input to ACSF 11th meeting
March 2017, Berlin

(D): The mandate for this IWG will end in September 2017. The discussion is important, but not here. He proposes to extend the TOR.
 (C-J): Japan is interested in level 3, but it should be more clear, what this means in detail. WP.1 is not yet clear in the position of level 3 and level 4.
 (C-D): The situation is very clear. We have the current TOR.
 We define Lane Change systems on level 2.
 Whether we continue with level 3 this will be the decision of GRRF after we have discussed it there, and finally it must be decided in WP.29 to continue the work in this IWG, or in another, new IWG.
 At the moment, we have no mandate for CAT B2 and CAT E based on level 3. Do we have the CAT B2 and CAT E also for level 2?
 (OICA-Audi): CAT B2 and CAT E reflect parts of level 3. In his view, WP.1 has no problem with level 3 and level 4.
 (C-D): Thinks CAT B2 and CAT E are possible with level 2 and level 3.
 At level 2 the driver has to be able to take over immediately.
 (UK): We should now focus on our task, to deliver the work, which is expected by GRRF from the group.
 (J): Details in the definition of level 3 would be necessary prior the work on level 3 can be started.
 (EC): the “roadmap” is very challenging...
 (F): Why is CAT D not before CAT B2?
 (Secr.) A clear definition of level 2 and level 3 could be helpful in the further discussion.

9. Discussion about CAT C

9.1. D presented the document [ACSF-11-10](#)



Main topics:

- 2 Step Initiation (by 2 deliberate actions)
- Monitoring to the rear and to the side
- Restriction to a designated infrastructure
- Hands On during lane change manoeuvre

(Secr.): Presented a table, which was the result of the CP meeting (without UK and EC) the day before. This table was amended through the meeting. The “final-working” document is in [Annex 1](#).

CAT C (M1/N1)	Initiation		Max. time until LC	Rear monitoring		"Highway" detection	Hand on monitoring time	2-step w/o rear monitoring
	1. step	2. step		length	width			
All (not D,NL,ROK)	turn indicator	optional	<3s	>35m	8m	by system	<3s	no
D	turn indicator	optional	<3s	>60m	8m	by system	<3s	no
All (not NL,ROK)	turn indicator	yes, but design open	<10s	>10m	8m	by system	Cat B1	no
NL	turn indicator	yes, but design open	<10s	60-80m	8m	by system	Cat B1	no
ROK	turn indicator	yes, but design open	<5s	>46m	8m	by system	Cat B1	no

There was a break of 2hrs, where the Contracting Parties, with UK as chairman, discussed the issue about rear monitoring for CAT C with a representative of OICA and CLEPA.

(F): Prio for F is to have 2 initialisations for the lane change manoeuvre.

9.2. OICA presented the document [ACSF-11-07-Rev.1](#)

(OICA): For a double action system there is no need for rear monitoring

(EC): is the left column with active CAT B1?

(OICA): yes

(D): Positive is, that the drivers will use the turn indicator. If we have systems with different performance of the rear monitoring (10m, 50m or 80m) the drivers may be confused.

(F): There are not too many advantages given, beside the 3 time flashing of the turn indicator. Benefits of the system could be with a collision avoidance “active”. He sees the request of a rear monitoring.

(UK): If we look to an average driver, he will have different systems from “min to max” support. If you give to the driver more automation, he gets detached!

Is there an analysis of the driver behavior? We have to consider what might happen.

Proposes to have a high performance sensor.

But, if we provide systems with high performance sensors than this is a CAT D system.

Proposes to delete CAT C and focus on CAT D.

(C-D): This reflects the discussion of the CP-meeting just before.

(NL): A system without sensors may have problems with blind spot. Supports UK to have high performance sensors, because there is a foreseen misuse if drivers will rely on the sensors. This cannot be covered with low performance sensors.

(C-D): We should clarify with OICA, whether we can combine CAT C and CAT D

What is the opinion of the CPs?

(F): supports a 2-step approach with a sensor range of 10m.

(OICA): explained again the advantages presented in [ACSF-11-07-Rev.1](#)

(EC): sees the difference to “manual” (with CAT B1) as very little.

(OICA): The activation of the 2nd step with the steering wheel will assure, that the driver has the hand(s) on the steering wheel.

(C-D): What would be the proposal from OICA for the “hands-off” monitoring time?

(OICA): Use the CAT B1 monitoring.

(C-D): But a lane change manoeuvre is more critical as a lane keeping function.

(SE): Changes his opinion in the table (see [Annex 1](#))

(UK): filled his numbers in the table (see [Annex 1](#))

(OICA): If we would request a sensor, we have to consider “over-reliance”.

(C-D): Why, the lane change manoeuvre is only carried out, if the rear distance is free...

(OICA): This does not solve the problem about over-reliance.

(C-D): ...asked the OEMs which have the systems already on the market about their strategy...

(BMW): Has a 1-step approach (turn indicator) and uses the “lane change warning system” to check, whether the rear area is free. This is due to safety reasons, and as the monitoring system is already available in the vehicle.

(C-D): Why a 1-step activation?

(BMW): ...because this is the normal action of the driver...



(Daimler): Uses the same strategy as BMW.

(OICA): The difference is, that the described systems from BMW and Daimler are a 1-step approach and not a 2-step approach, which was discussed before.

Rem.: The table ([Annex 1](#)) was filled with the Daimler and BMW numbers

(UK): We should not define the limitations based on the performance of the current systems on the market.

(C-J): These values are seen as bottom line.

(UK): Raised the issue already 18 months ago. Target is a motorcycle with a speed of 130 km/h.

When approving the Daimler system according Article 20, it was mentioned, that the range is 60-80m. Now the numbers are less. OICA should explain the reason.

(EC): The long distance is more dedicated to CAT E. The driver is taken here the decision.

(D + C-D): For the initiation on a 2-step system, the driver is responsible.

(EC): A 1-step approach needs a longer monitoring range as the 2-step approach

(C-D): What should be the next step? 2-step or 1-step approach?

(UK): What are the limiting factors? Sensor range or detection range?

(OICA): refers to document [ACSF-06-18](#) and [ACSF-07-05](#)

(EC): proposes to start with the 2-step approach.

(C-D): It would be helpful to know the performance of the current systems

Discussion without final conclusion:

- What is the support for the driver?
- Which responsibility remains at the driver/system?
- What is the safety concept?

(UK): We have to define the systems to assist the drivers, as most of the accidents are caused by failures of the drivers. Requests also a 2-step approach with sensors first. A no-sensor-concept is frozen.

The CPs have decided to have another meeting in April for CPs and each participant from OICA and CLEPA. NL invited to a meeting by 26. April 2017 in NL, close to Schiphol Airport.

(C-D): Expects for this meeting an industry document about the sensor performance. How can the CPs define a regulation, when the boundary conditions for the sensors are not known.

(OICA): Details cannot be provided due to confidentiality reasons. We should come to a solution, that for 2-step systems a sensor is not necessary.

(NL): As we assist the driver and he may rely on it, we will not have the same safety of a system if we have no rear monitoring.

(C-D): Nevertheless we should consider, that the driver is still in full responsibility! For a 2-step system he thinks, that a "blind spot" detection system would be enough.

For a 1-step approach, the driver should "trust" that the system is supporting him.

(OICA): Is also thinking about such an approach. There may be a detection of vehicles which are outside the field of the mirrors.

(EC): Proposal of C-D can be accepted

(UK): Hesitant. Puts focus on a industry meeting mid of April. Maybe they find a solution to consider the wishes of some CPs. Expects more information when the small group meets again in NL.

9.3. J presented the document [ACSF-11-12](#)

(C-J): explained the slide

(OICA): Are the 2 actions to improve the safety?

(C-J): Yes, this system should be safer than manual steering.

(EC): Shall the system be really safer than manual steering?

He thinks, the safety should not been less.

(C-J): Yes, safety should be better...

Common understanding			
<ul style="list-style-type: none"> • Not taking into account the combination with B2 • Driver assistant system (not covering Lv.3) 			
	Detection range (ex.)	Target/Purpose	Warning strategy
2 actions	<ul style="list-style-type: none"> • in align with ISO for BSM (3-30m x 3-6m) or • D/J joint proposal (46m x 7m) 	<ul style="list-style-type: none"> • to avoid crucial/emergency situation 	<ul style="list-style-type: none"> • warning and/or • system have to avoid
1 action	<ul style="list-style-type: none"> • formula by D for Cat E or • >60m 	<ul style="list-style-type: none"> • to avoid accident by driver's fall/misuse 	<ul style="list-style-type: none"> • warning and/or • system have to avoid

9.4. D presented the document [ACSF-11-03](#)

The result of the discussion and consolidated document is [ACSF-11-03-Rev.2](#)

5.6.4.2.2. Unless otherwise specified, the optical signals described in 5.6.4.2. shall all be different from each other (e.g. different symbol, colour, blinking, text).

(UK): We have to be careful, that the lot of signals will be understood by all drivers. We should focus on this before we define it in the regulation.

5.6.4.2.7. During the lane change procedure 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.

(D): If the second action is the use of the steering wheel, the CAT B1 monitoring is sufficient.

The group decided, that the second deliberate action shall be always be “connected” with the steering wheel. (...but not necessarily “turning” the steering wheel).

(SE): Is it difficult to have the hands on the steering wheel, while the system is steering? When does the system detects, that the driver is overriding the system?

(BMW): This is difficult to define, as it depends on the driver.

Step back to 2.4.13 (Homework OICA):

New proposal from OICA to the definitions. (see [ACSF-11-03-Rev.1](#))

Discussion about the moment to switch off the turn indicator.

(NL): Believes, that the turn indicator lamps should stay on until CAT B1 has stabilized the vehicle in the lane (“5”).

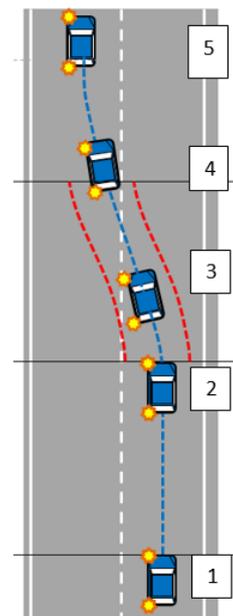
(D): Would like to have the sequence of the lane change manoeuvre in the definition of the regulation.

(UK): Personally, he would switch off the turn indicator lamps at point “4”, but he will clarify this UK-internally.

Homework: OICA to make a new proposal on the definitions

(UK): We have to avoid, that the vehicle moves to the lane edge after “1”, because then the lane change manoeuvre has started already.

Homework: OICA to draft a proposal to combine CAT B1 and CAT C requirements



5.6.4.1.4. It shall be ~~technically~~ ensured by the system that the activation of a system of Category C is only possible on a road section which is not dedicated to pedestrians or cyclists and which has a physical or constructional separation of traffic moving in opposite directions and which has at least two lanes for the direction the vehicle is driving.

Again it started the discussion about the definition of the “highway”

(OICA): proposes to amend the wording:

5.6.4.1.4. It shall be designed to ensure that the activation of a system of Category C is only possible on roads where pedestrians and cyclists are prohibited and which have a physical separation or solid marking of traffic moving in opposite directions and which have at least two lanes for the direction the vehicle is driving. This may be achieved with the use of e.g. digital map data or road sign recognition.

(D): Why do we discuss this again and again?

This wording is fixed, we are losing time!

(F): We are making it very complicated. We want to know, whether we are on the highway or in the center of Paris...

(UK): Understands OICA, because it may require, that the system must detect conditions, which are not “normal”.

(C-D): OICA should make a proposal for the next meeting.

Homework: OICA to draft a proposal for the “highway” definition, considering also “strange road conditions”.

(OICA): yes we try, but we need guidance from the group...

5.6.4.2.7. [During the lane change procedure 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.

While executing the lane change procedure/manoeuvre, the means of detecting that the driver is holding the steering control of the ACSF of category B1 described in 5.6.2.2.5. shall remain active. This includes also the warning signals.

If, at the start of the lane change manoeuvre the driver is not holding the steering control, the lane change shall be canceled.]

Homework: UK to rework

5.6.4.2.8. Any lane change manoeuvre shall be completed...

Any lane change manoeuvre shall be aborted...

The wording in the regulation should be reduced to one of the phrases (either-or!)

5.6.4.2.9. After the second deliberate action of driver according to 5.6.4.2.11.5., ACSF of category B1 lane keeping function shall be temporarily in stand by mode. Once the manoeuvre is completed, ACSF of category B1 shall automatically be activated again.

Homework: OICA to rework

5.6.4.2.10. The vehicle with ACSF category C shall be tested in accordance with relevant vehicle test(s) specified in Annex 8 of this Regulation. In addition, in order to comply Compliance with 5.6.4.1. and 5.6.4.2., for the driving situations not covered by the tests of Annex 8, the safe operation of the ACSF shall be demonstrated by the vehicle manufacturer on the base of Annex 6.

Homework: Proposal by EC to be checked by UK

5.6.4.2.11. HMI requirements

5.6.4.2.11.1. The system status shall be default off at the initiation of each new engine start/run cycle performed by the driver. At the time of the first system activation after a new engine start, a disclaimer shall be provided to inform the driver of their duty to monitor the traffic and road conditions prior to and throughout the lane change procedure.

A “memory function” is not acceptable for UK and NL.

Homework: J to make a new proposal for wording

5.6.4.2.11.2. *A lane change procedure shall not start if ACSF of category B1 has detected that the driver is hands-off the steering control.*

Homework: UK to rework considering also 5.6.4.2.7

OICA presented [ACSF-11-11](#)

5.6.4.2.11.4. *Any single lane change manoeuvre shall be initiated only if commanded by two subsequent deliberate actions of the driver, within an interval of maximum [10]s.*

(F): time should be max. 6s

(NL): On what are the 10s based on?

(J): 3s blinking and 7s safety margin

(D): is in favour of 10s.

(OICA): Traffic situations may require the 10s.

(UK): In the 2-step approach the driver shall consider the traffic situation before the 1st step.

(C-J): We also have to consider 5.6.4.2.11.6

Homework: F to check, whether they can support 10s

5.6.4.2.11.5. *The second deliberate action of the driver to start the lane change manoeuvre shall be a manual steering input in the direction of the deliberate lane change with a required steering input to the driver of more than the steering control effort necessary to override the directional control provided by the corresponding ACSF of category B1.*

Homework: UK with support of OICA to look which value is appropriate

Homework: OICA to check wording with regard to the value of the steering effort for the “mod.” CAT B1

5.6.4.2.11.6. *The lane change manoeuvre shall directly start upon the second deliberate action of the driver but shall not be initiated before 3 flashes of the direction indicator lamps.*

(UK): Recommends 3s instead of 3 flashes.

(C-J): then, if we have the fast flashes, the driver has to wait after the 3 flashes(best in 1,5s) another 1,5s to initiate the second action.

(NL): Supports 3s

(UK): This paragraph is open for interpretation. We have to avoid, that the two actions are not “one” action.

Homework: D to rework 5.6.4.2.11.6 mentioning, that 2nd action is only possible after 3 seconds

9.5. Sensor requirements

The discussion/decision about the sensor requirements will be delayed until the next meeting.

Inbetween will be the special meeting for CPs in NL the 26. April 2017.

9.6. Speed range for CAT C

(F): Do we need a min. speed?

(NL): Supports a min. and a max. speed.

(UK): Supports this, but has no value.

(D): We have to consider, that trucks in D are only allowed to drive 80 km/h.

9.7. System information data

5.6.4.3. System information data

5.6.4.3.1. 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.

5.6.4.3.1.1. The conditions under which the system can be activated and the boundaries for operation (boundary conditions). The vehicle manufacturer shall provide values for V_{smax} , V_{smin} and a_{ysmax} for every speed range as mentioned in the table of paragraph 5.6.2.1.3. of this Regulation;

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

(UK): Is 5.6.4.3.1.2 necessary, as the Technical Service will receive this information in any case.

(D): This is 1:1 taken from CAT B1, which is approved by WP.29.

10. Further steps

(C-D): Preparations for 12th session in Seoul: J + D to prepare proposals for the test requirements

Tasks for the 12th meeting 16. -18. May 2017 in Seoul (ROK):

- CAT C - finalizing 2-step approach
- discuss 1-step approach
- ESF

(OICA): Does not know, about the status of ESF at the moment. It is not regulated! So, it is then forbidden, or allowed?

(UK/Chairman GRRF): We should have a package for approval in GRRF84. This should be a formal document. Deadline for this is: 26. June 2017.

Priorities: (opinion of C-D and UK):

A: CAT C - 2-step approach

B: ESF

C: CAT C - 1-step approach (only if time available)

(D: CAT D or CAT B2)

Homeworks:

- D to prepare a document for CAT C
- OICA to prepare a document for ESF
- OICA to prepare a proposal for 1-step approach

11. Information about other working groups

(OICA): Jens Schenkenberger informed about the “Status report on the activities of TF-CS/OTA” ([ITS_AD-11-04](#))

12. Next meetings

IWG ACSF 12:

Date: 16.–18. May 2017 - see [ACSF-12-01](#)

Venue: Grand InterContinental Seoul COEX
(06164) 524, Bongeunsa-ro,
Gangnam-gu,
Seoul, Republic of Korea.

IWG ACSF 13:

Date: tbd. (most likely: 13.-15- June 2017)

Venue: tbd. (probably Paris, France)

Please provide the documents for the next meeting at least one week prior to the meeting start

13. Annex 1

CAT C (M1/N1)	Initiation		Max. time until LC	Rear monitoring		"Highway" *) detection	Hand **) on warning time	2-step w/o rear monitoring	Vmax
	1. step	2. step		length	width				
J + F + SE	turn indicator	optional	<3s	>35m	8m	by system	<3s	no	
D + SE	turn indicator	optional	<3s	>60m	8m	by system	<3s	no	
EC									
Daimler + BMW	turn indicator	-	<10s	60m	5m	by system	<15s		>130 km/h
J + D + F + SE	turn indicator	yes, but design open	<10s	>10m	8m	by system	Cat B1	no	
NL	turn indicator	yes, but design open	<10s	60-80m	8m	by system	Cat B1	no	
ROK	turn indicator	yes, but design open	<5s	>46m	8m	by system	Cat B1	no	
EC								maybe	
UK	turn indicator	yes, but design open	<10s	60-80m	8m	by system	less Cat B1	no	
<p>*) : "highway" means a road section which is not dedicated to pedestrians or cyclists and which has a physical or constructional separation of traffic moving in opposite directions and which has at least two lanes for the direction the vehicle is driving.</p>									
<p>**) : one hand should be enough</p>									