

OICA / CLEPA views on LKAS

LKAS Ad-hoc group Nov 19-20, 2013

Agenda item « views from industry »

Reminders from OICA/CLEPA documents

GRRF-75-04 and 75-12

1. LKAS is not mature enough to be regulated now: risks of over-regulating; blocking innovation; prohibiting systems limited to basic features but nevertheless providing safety improvements
2. There is no data available indicating any safety concern with LKAS currently on the market (accident data, complaints from end users or authorities; test reports etc.), thus no safety justification to regulate.
3. UN R79 includes necessary provisions to guarantee LKAS does not impair steering performance, e.g. through CEL Annex. Most of LKAS systems are approved to UN R79 as corrective steering.
4. To decrease lane departure accidents, the EU and GRRF recently decided to follow the LDWS way vs the LKAS one (e.g. based on an EC cost/benefits analysis of LDWS vs LKAS). It would hence be logical to firstly get feedback from the LDWS effects, before to assess LKAS benefits and to start an LKAS rule making process.

Reminders from OICA/CLEPA document GRRF-75-04

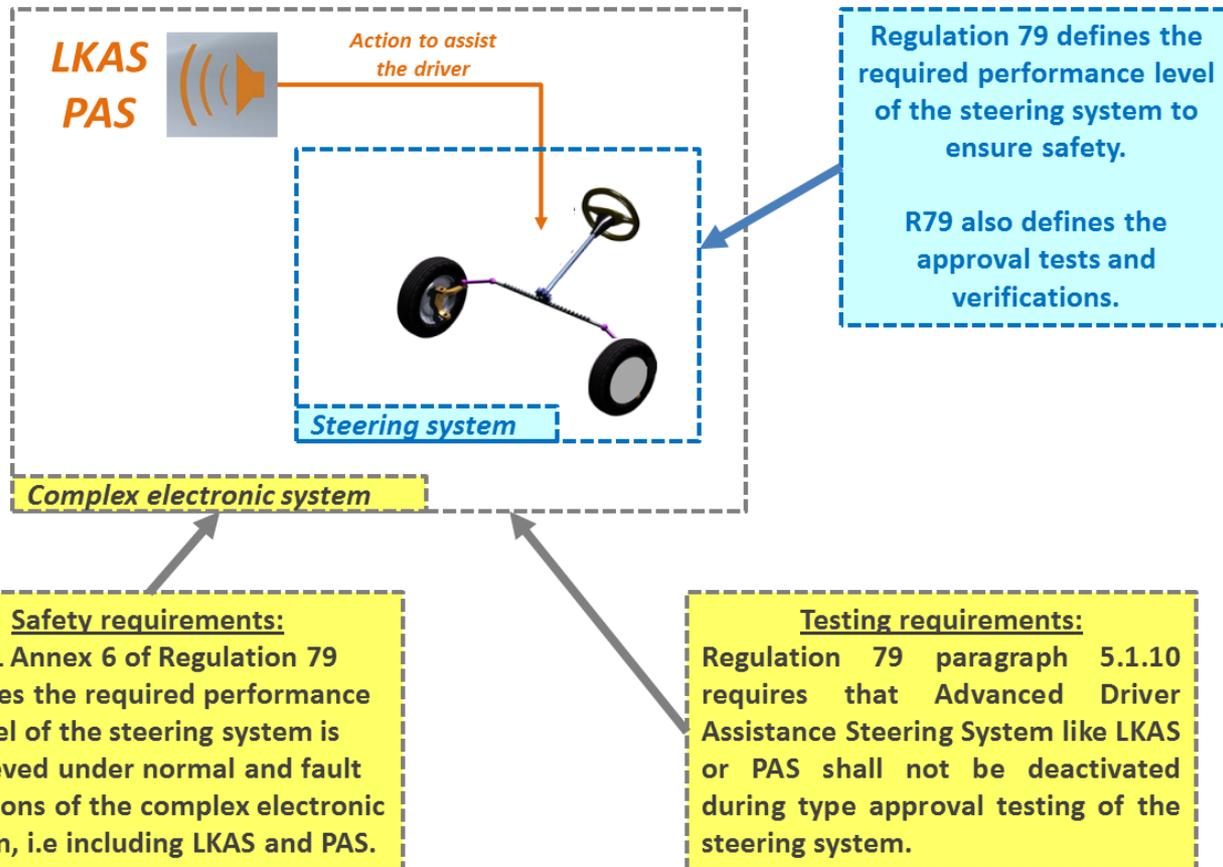
How does Regulation 79 cover LKAS and PAS to ensure safety?

Add-on to GRRF-75-04

5.1.6

Advanced driver assistance steering systems shall ... not cause any deterioration in the performance of the basic steering system.

...they shall be designed such that the driver may, at any time and by deliberate action, override the function."



Reminders from OICA/CLEPA document GRRF-75-04

How does Regulation 79 cover LKAS and PAS to ensure safety?

Definitions

- 2.3.4 **Advanced Driver Assistance Steering System** means a system, additional to 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...
- 2.3.4.1 **Automatically commanded steering function** means the function within a complex electronic control system where actuation of the steering system can result from automatic evaluation of signals initiated on-board the vehicle [...] to generate continuous control action in order to assist the driver in following a particular path, in low speed manoeuvring or parking operations.
- 2.3.4.2 **Corrective steering function** means the discontinuous control function within a complex 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 maintain the basic desired path of the vehicle or to influence the vehicle's dynamic behaviour.

When is CEL Annex 6 required?

- 5.1.10 [...] **Annex 6 shall be applied to** the safety aspects of electronic vehicle control systems [...] of **the steering function including advanced driver assistance steering systems** [...]. If such systems are provided, they shall not be deactivated during type approval testing of the steering system.

LKAS

PAS

Annex 6 – Complex Electronic

This annex defines the special requirements for documentation, fault strategy and verification with respect to the **safety aspects of Complex Electronic Vehicle Control Systems** [...].

This information shall show that "The System" respects, under normal and fault conditions, all the appropriate performance requirements specified elsewhere in this Regulation.

2.3. "Complex electronic vehicle control systems" are those electronic control systems which are subject to a hierarchy of control in which a controlled function may **be over-ridden by a higher level electronic control system/function**. A function which is over-ridden becomes part of the complex system.

LKAS
PAS



Action to assist
the driver



Steering system

Complex electronic system

Reminders from OICA/CLEPA document GRRF-75-04

Comments to proposal from Japan GRRF-74-40

- GRRF-74-40 is already design restrictive, and as a consequence may block innovation or prohibit systems limited to basic features but nevertheless providing safety improvements
 - Paragraph 2: “**activating condition**”: OICA questions the threshold of 250 m. An LKAS only functioning on straight roads would already improve safety.
 - Paragraph 2: “**activating speed**”: OICA questions the threshold of 60 km/h. An LKAS only functioning at higher speeds would already improve safety.
 - Paragraph 2: OICA challenges the fact that the LKAS would have to operate up to the **maximum speed of the vehicle**.
 - The skeleton document is unclear about the **links between LDWS and LKAS**. OICA questions the necessity to mandate LDWS on all vehicles equipped with LKAS.
 - The skeleton document is unclear about the **HMI requirements**. Paragraph 6: **OICA favours technical flexibility for warning display**
 - Paragraph 7: OICA challenges the idea of LKAS threshold activation blindly taken from LDWS specifications.
- Parts of the proposal are already covered by UN R79, especially the **CEL annex**:
 - Paragraph 3: “activation of the system shall not result in any critical situation”
 - Paragraph 5: “the system shall have the **override function** by the driver”.

Further considerations

1. An ISO standard is currently under development to cover LKAS (ISO 11270); may be published by mid of 2014
2. Further technical comments / Technical corner-stones
 - Current LKAS is “corrective steering”, since acting only when a drift in the lane is detected and driver does not react (discontinuous control); driver remains in primary control of the vehicle and can always over-ride LKAS; signals are generated on-board
 - LKAS is a more “intrusive” system than only LDWS: thus activation thresholds cannot be just copied from LDWS; it is too early at this stage to define them
 - LKAS requires earlier certainty about lane detection than LDWS
 - Default ON/OFF/Last memory at power-on and warning strategy shall be left to manufacturer’s choice; at present most of LKAS are default OFF or last memory

Conclusions & proposals

- OICA/CLEPA does not see any urgency to regulate LKAS at present, on the base that:
 - LKAS is not mature enough to be regulated now; developments and researches on-going; driver acceptance...
 - R79 covers corrective steering (i.e. LKAS) and guarantees the driver can always override LKAS with full steering performance
 - No data available showing any safety concern with LKAS
- OICA/CLEPA sees a lack of information to be able to decide at this stage → further inputs and actions are needed to “increase knowledge” and be able to make an informed decision on LKAS:
 - Closely monitor driver and social acceptance, to fine-tune / adapt technical solutions
 - Measure effects of LDWS on lane departure accidents (mandatory 2015 in EU)
 - Complete on-going standardization work?
 - Assess if the ISO standard / JPN guidelines are broadly followed by the industry and react accordingly in GRRF