



Submitted by the expert from OICA

Informal document GRVA-17-47
17th GRVA, 25-29 Sep. 2023
Provisional agenda item 8(a)

UN Regulation No. 140 modification proposal

GRVA-17, September, 2023



GRVA#16 Report

Documentation: ECE/TRANS/WP.29/GRVA/2023/9
Informal document GRVA-16-23/Rev.1

96. The expert from OICA introduced ECE/TRANS/WP.29/GRVA/2023/9 as amended by GRVA-16-23/Rev.1, aimed at modifying testing requirements on the final steering amplitude in case of front tyres saturation. The experts from Japan and UK supported the revised document, as it addressed their comments.

97. The experts from Canada and the United States of America inquired if there was enough evidence demonstrating that the modification proposed would not lead to a safety decrease. They asked for more data and documentation to support this proposal.

98. The expert from OICA responded that no negative impact on the safety of vehicles was expected, as shown in previous GRVA sessions, based on evidence. She clarified that the reason for this proposal was the introduction of new steering technologies with low steering ratio. She stated that there was no added value in continuing to increase the steering wheel amplitude during the test after the front tyre saturation.

99. GRVA agreed to resume the discussion at its next session.



Working document GRVA/2023/23

I. Proposal

Paragraph 9.9.4., amend to read:

“9.9.4. The steering amplitude of the final run in each series is the greater of 6.5 A or 270 degrees, provided the calculated magnitude of 6.5 A is less than or equal to 300 degrees. If any 0.5 A increment, up to 6.5 A, is greater than 300 degrees, the steering amplitude of the final run shall be 300 degrees.

If the above calculated steering amplitude of the final run is greater than the maximum operable steering wheel angle determined by design of the steering system, the final angle amplitude for the series test shall be greater than 98 per cent of the maximum operable angle.

If tyre saturation occurs before the above calculated magnitude angle, then the amplitude at which it occurs may be used as the final steering amplitude, but only if this angle is greater than or equal to 6.5 A.

Tyre saturation shall be considered to have occurred when all of the following parameters have reached their peak value (i.e. these parameters have not increased between two successive increments of 0.5 A):

- (a) **Peak lateral acceleration (see paragraph 9.11.3)**
- (b) **Second peak yaw rate (see paragraph 9.11.8)**
- (c) **Lateral displacement 1.07 seconds after BOS (see paragraph 9.11.9.)**

It is not required for the peak values to occur in the same test run.”

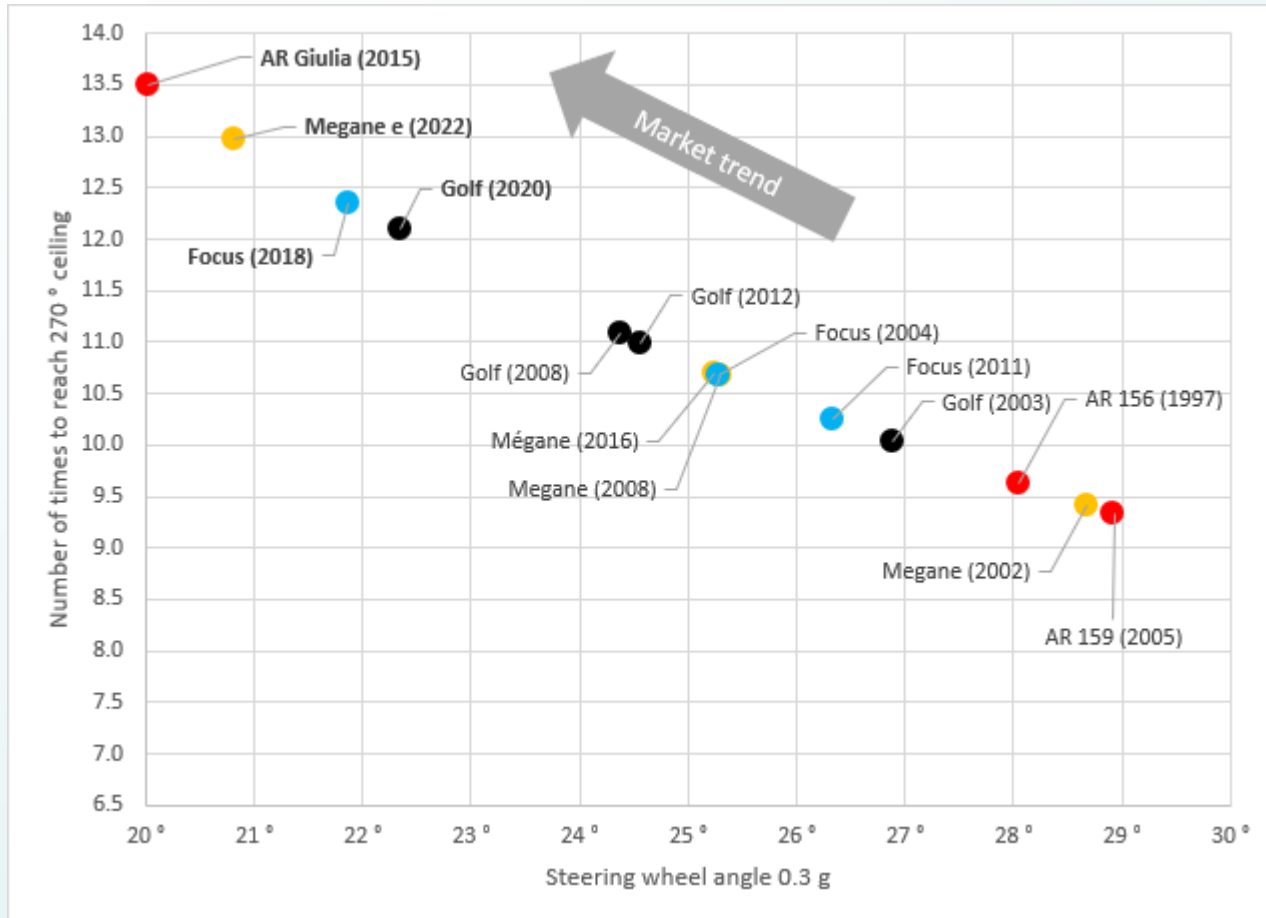


Clarification of the Aim of the Amendment

- Proposal for Amendment concerning Paragraph 9 (**Test Procedure**)
- Proposed amendment keeps technical requirement and safety level unchanged.
- Safety concept follows the requirements of :
 - Paragraph 6 on Functional Requirement
 - Paragraph 7 on Performance Requirement



EVOLUTION OF STEERING RATIO



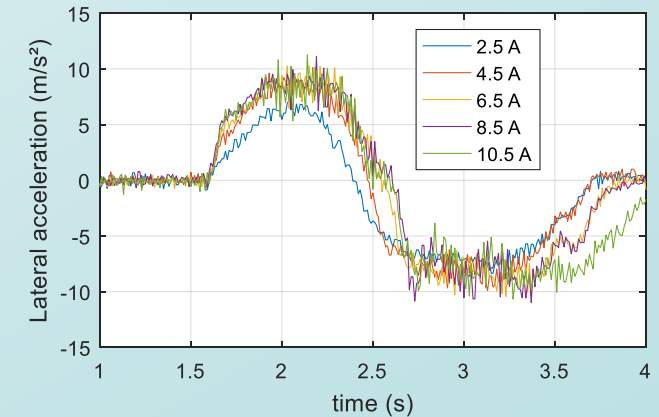
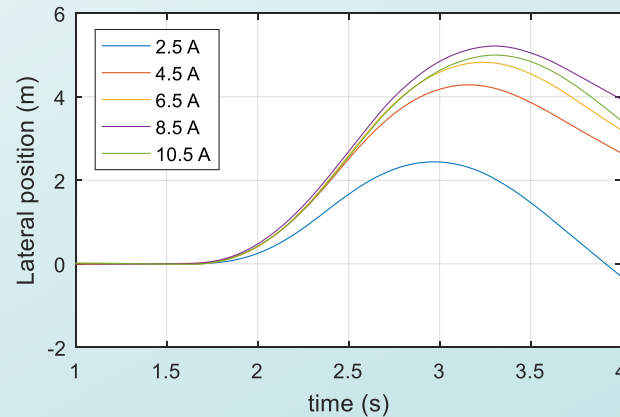
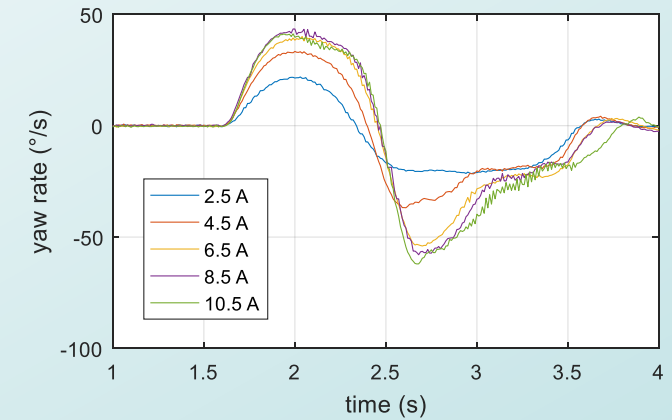
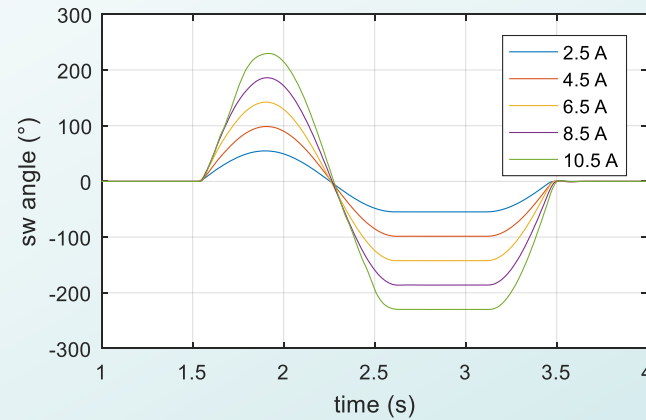
- ■ Alfa Romeo 156 – 159 – Giulia
- ■ Mégane 2 – 3 – 4 – 5 (électrique)
- ■ Golf 5 – 6 – 7 – 8
- ■ Focus 2 – 3 – 4

- Chassis characteristics, especially overall steering ratio, are moving continuously
- As a result, targetting fixed value of 270° steering wheel angle represents more and more severe input (now 12-13 times 0.3 g sollicitation; it was ~10 one decade before)



Does 270 ° amplitude give more information?

- On this example, above ~7 A, front tires are saturated so more steer don't give more force
- No benefit to go over ~7 A
- No modification of yaw rate and lateral acceleration after 7A run





Thank you