Submitted by the expert of OICA

Informal document **GRPE-86-08**
86th GRPE, 30 May – 2 June 2022
agenda item 3.(a),

Proposal for harmonization of UN-R83, 101 and 154 with 08 series of UN-R48

GRPE, May 2022

Introduction

- The 185th session of WP.29 adopted GRE's proposal for a 08 series of amendments to UN-R48 (Installation of lighting and light-signalling devices).
- This requires inter alia that when the daytime running lamps (DRL) are switched ON, at least the rear position lamps (RPL) shall be switched ON. According to the 07 series of UN-R48 this was optional.
  - Exemption: RPLs may be switched OFF with DRLs switched ON, if ambient light conditions > 7000lux
  - Justification as of ECE/TRANS/WP.29/GRE/2021/4:

    "Above 7,000lux Annex 13 of UN Regulation No. 48 today requests that dipped beam headlamps have to be switched OFF. This means that above 7,000lux the ambient light conditions outside the vehicle are considered more than high enough to drive without dipped beam headlamps and rear position lamps ON. This is also requested to avoid unnecessary fuel consumption."

- Emission type-approval Regulations (UN-R83, 101 and 154) require the DRLs to be switched ON during testing.
- However the vehicle settings for the dynamometer operation shall be independent of the light conditions in the test laboratory (e.g. above/below 7000lux).
- Thus OICA drafted proposals to amend UN-R83, 101 and 154 in order to ensure consistent vehicle behavior independent from the ambient light conditions. Documents as presented during 85th GRPE:
  - UN-R83: GRPE-85-18-Rev.2
  - UN-R101: GRPE-85-19-Rev.2
  - UN-R154: GRPE-85-20-Rev.2

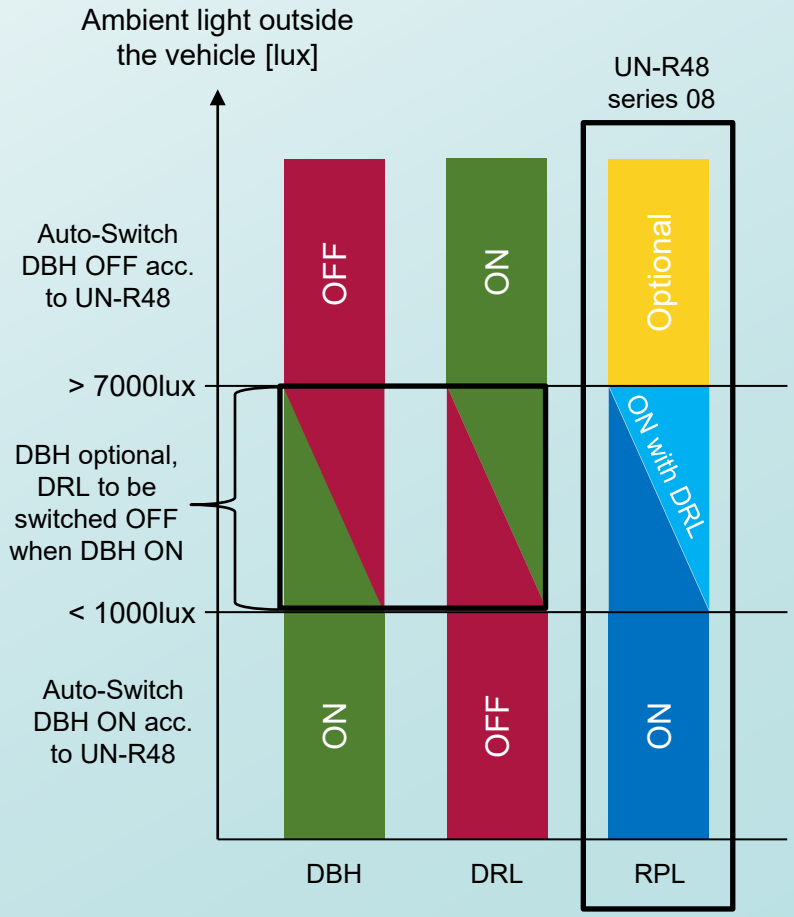
Explanation OICA Proposal

As presented in MVWG, 9th of Februray 2022

- OICA proposal to allow the inclusion of a function within the vehicle's dynamometer operation mode to simulate ambient light conditions exceeding 7000lux.
- The limit of 7000lux is already today included within 07 series of UN-R48 as the limit to automatically switch OFF the dipped-beam headlamps (DBH), because the ambient sufficiently bright.
- Other possible scenarios for type-approval testing:

Scenario	Vehicle's RPL implementation	Dyno A @ < 7000lux	Dyno B @ > 7000lux	Road @ > 7000lux	Conclusion
No regulatory changes	ON @ > 7000lux	ON	ON	ON	✓ RPL behaves as on road. × Possibly inconsistent testing for different dynos / labs.
	OFF @ > 7000lux	ON	OFF	OFF	
OICA proposal "Dyno mode"	ON @ > 7000lux	ON	ON	ON	✓ RPL behaves as on road. ✓ Consistent testing for different dynos / labs.
	OFF @ > 7000lux	OFF	OFF	OFF	
Always ON requirement	ON @ > 7000lux	ON	ON	ON	× RPL behaves possibly different to the road. ✓ Consistent testing for different dynos / labs.
	OFF @ > 7000lux	ON	ON	OFF	
Always OFF requirement	ON @ > 7000lux	OFF	OFF	ON	× RPL behaves possibly different to the road. ✓ Consistent testing for different dynos / labs.
	OFF @ > 7000lux	OFF	OFF	OFF	

Auto-Switch DBH acc. to Annex 13 of UN-R48[1)]



[1)]: Manual activation of DBH and special exemptions for DRL (e.g. when parking brake is enabled) not included.

Received Feedback

From the 85th GRPE:

The Chair agreed with the concern from OICA that a consistent approach was necessary for all laboratories performing the tests with regards to the upcoming change to the RPL switching logic introduced with the 08 series of amendments to UN-R48.

The following questions came up during the discussion of the informal documents:

I. Quantification of CO_2 emissions influence between RPL ON vs. OFF.

II. Information on the meaning of 7000lux and driving share

Agreed next steps are to address the open questions and introduce working documents to the next GRPE (May/June) with the two options (below/above 7000lux) in square brackets. Final option to be decided in GRPE.

From Japan:

III. OICA received feedback from Japan on its proposal regarding the UN-R154.

Item I: Quantification of CO_2 emissions influence between RPL ON vs. OFF

- The required power for a RPL is estimated to be 12W according to table 3 within the Annex to Commission Implementing Decision (EU) 2020/1339 (Eco-Innovation “Efficient LED Lights”).
  - ➢ ΔP = 12W: CO_2 influence within WLTC ~0,2 gCO_2/km
- This value represents the power consumption of the “baseline vehicle light”, meaning the value that the efficient technology has to meet is below the baseline.

Excerpt: Table 3

Vehicle light	Power consumption [W]
Low beam headlamp	137
High beam headlamp	150
[…]	[…]
Rear position lamp	**12**

Item II: Information on the meaning of 7000lux and driving share

- Commission Implementing Decision (EU) 2020/1339 (Eco-Innovation “Efficient LED Lights”) also offers usage factors for different lighting types to represent the usage share under real world conditions.
- The RPL have a usage factor of 36%, similar to the one used for the dipped-beam headlamps with 33%.
- Example values for different illuminances (table on the right) and from Jokkmokk/Sweden in February originating from informal document GRE-84-22 (next slide).
- “AM1.5 is useful to represent the overall yearly average for mid-latitudes”
  - Context: Assessment of solar panels
  - Source: Wikipedia

Excerpt: Table 4

Vehicle light	Usage factor (UF)
Low beam headlamp	0,33
High beam headlamp	0,03
License plate	0,36
Turn signal	0,15
[…]	[…]
Rear position lamp	**0,36**

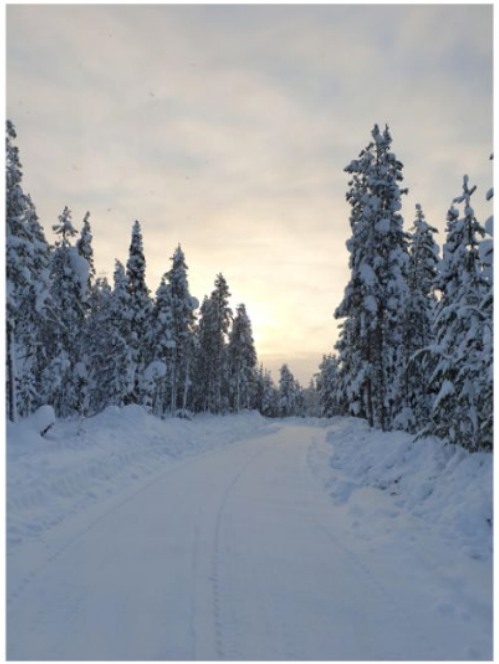
Excerpt: Example illuminance values

Illuminance	Example
111,000 lux	Bright sunlight
109,880 lux	AM 1.5 global solar spectrum sunlight
20,000 lux	Shade illuminated by entire clear blue sky, midday
1,000 – 2,000 lux	Typical overcast day, midday
400 lux	Sunrise or sunset on a clear day (ambient illumination)
<1 lux	Moonlight, clear night sky

Source: https://en.wikipedia.org/wiki/Daylight#cite_note-3

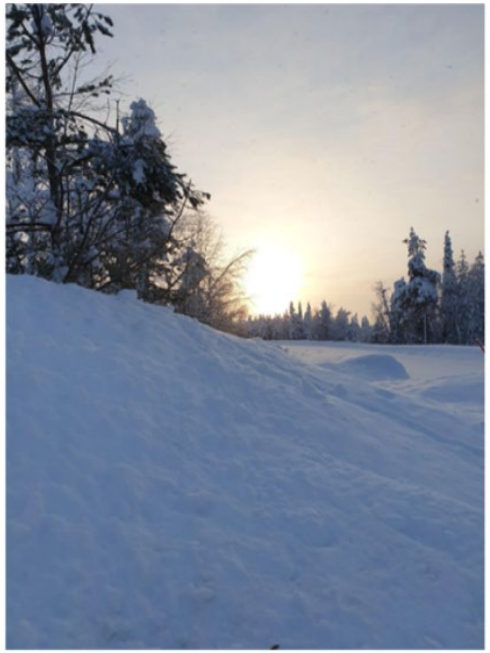
Item II: Information on the meaning of 7000lux and driving share

370 lux
(Dawn; Clouds)



Fourth of February at 08:20

1,600 lux
(Dusk)



Third of February 2021, 2:45pm

2,700 lux
(Daytime; clouds)

Fourth of February 2021, 12:30

Item III: Japan's Feedback from 12th of April on OICA Proposal for UN-R154/00 to 03 series

Paragraph (Annex B6)	Current Text	OICA Proposal	Japan Proposal 1	Japan Proposal 2
2.4.2.1. (No change)	Auxiliary devices shall be switched off or deactivated during dynamometer operation unless their operation is required by legislation (e.g. daylight running lamps).			
2.4.2.1.2. (Addition of paragraph for OICA proposal and Japan proposal 1)	Not applicable.	Where the rear position lamps and other lamps according to 5.11. of the 08 series of amendments of UN Regulation No. 48 are switched OFF when the ambient light conditions outside the vehicle exceed 7,000 lux (as defined in paragraph 6.19.7.5. of 08 series of amendments of UN Regulation No. 48), a function replicating the ambient light conditions outside the vehicle exceeding 7,000 lux **may** be incorporated into the vehicle's dynamometer operation mode.	During chassis dynamometer testing, the rear position lamps and other lamps according to 5.11. of the 08 series of amendments of UN Regulation No. 48 **shall** be same operation as when the ambient light conditions outside the vehicle exceed 7,000 lux. (e.g. by a switch or by the vehicle's dynamometer operation mode).	Not applicable.
Comments from Japan	-	The RPL shall be switched off by referring the 08 series of amendments of UN Regulation No. 48. Without this additional sentence, the RPL shall not be switched off.	Difference to OICA proposal: ▪ Any method is acceptable to switch off the RPL (e.g. dyno mode, flashlight or disconnected fuse). ▪ "Shall" instead of "may".	TAA in Japan (NTSEL): ▪ RPL shall be switched off as auxiliary devices on paragraph 2.4.2.1. This additional 2.4.2.1.2. is not necessary to switch RPL off. ▪ It may also be concerned that the interpolation family would be separated, if the lamp energy consumption is different.