

DVN Munich - External Displays

Regulatory options and obstructions

UN Regulations and FMVSS-108

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Content

External Displays - Regulatory options and obstructions

UN Regulations

What should be possible?

What are the present obstacles?

FMVSS-108

What should be possible?

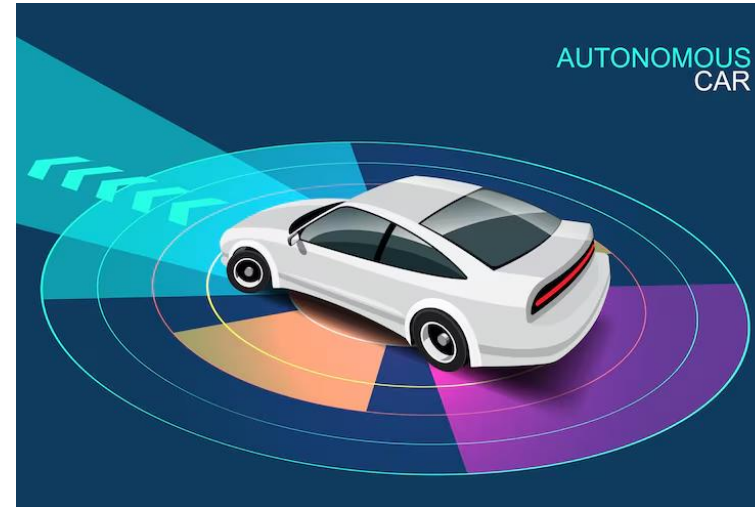
What are the present obstacles?

Some words about **other markets**

What **regulatory changes** would be necessary?

- Lamps that vary during driving
- Different levels of autonomous vehicles

Conclusion



From Freepik.com



UN Regulation 48 (Installation)

There are mandatory and optional lamps

The Regulation lists

- Mandatory lamps (like position, stop, direction indicator lamps etc.)
- Optional lamps (like side direction indicator and front fog lamp)

Only mandatory and optional lamps can be installed.

→ any other lamp is forbidden

Exceptions:

- National laws
- Innovations according the 1958 agreement

**What else?
Nothing!**

Still something!

Issues with UN Regulations

Symmetry and variable lamps



5.5.1. *fitted symmetrical*

...

Need for symmetry...

5.9. *..photometric characteristics shall not intentionally vary*

...

Some exceptions e.g. sequential direction indicator

Variability only for some exceptions

5.15. The colours ...

Which colours are explicitly mentioned

- 1) White
- 2) Selective yellow
- 3) Amber
- 4) Red
- 5) Yellow

No other colours...

Limited palette of colours



Challenges and To-do list

How to get external displays approved and installed?



A new *supplement* to the current UN Regulation No. 48 (for installation of lamps)

- 1) Define new colours in 2.11
- 2) Update 5.15 to add colours and directions of new optional lamps
- 3) Define conditions to vary at the end of Clause 5
- 4) Add the new optional lamps to Clause 6 (presence, number, arrangement, position, geometric visibility, orientation, electrical connections, tell-tale and perhaps other requirements)

To-do

A new supplement to the current UN Regulation No. 148 (for lamp approval)

- a) Type definition (2.2) ...the characteristics of the optical system ...
- b) New requirements for intensities and colour

FMVSS-108

Regulates lamps federally

- 1) Self-certification
- 2) Certain lamps not federally regulated
- 3) Certain states regulate lamps
- 4) Sometimes referring to certain SAE Standards
- 5) Prohibits additional lighting that impairs the effectiveness of required lights

S6.2 *Impairment.*

S6.2.1 No additional lamp, reflective device, or other motor vehicle equipment is permitted to be installed that impairs the effectiveness of lighting equipment required by this standard.

Impairment rule

Question: what is impairing the effectiveness?



Automated Driving System (ADS) Marker Lamp

SAE J3134 MAY2019 / DEC2025



- California and Nevada (and Alabama?)
- approved (granted exemption)
- to use these turquoise-colored lamps
- to indicate autonomous driving functionality.

State laws

Other markets

China, India, Taiwan



- China is advancing with their Regulations
- India (AIS) in principle would allow any lamps that have UN (ECE) approval
- Taiwan normally copies the updates in the UN Regulations but with delay

Based on UN Regulations

Conclusions

Summary



UN “1958” agreement

- What is not specifically allowed is forbidden
- Lamps shall be mounted symmetrically and not vary during driving
- Regulations shall be amended to allow the approval and installation

North America

- Lamps that are not federally regulated can be regulated at State level
- Impairment rule

Other markets are based on UN (ECE) but might be in advance or lagging behind



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Thank you for your attention