Transmitted by the expert from GTB

Informal document **GRE-70-44**
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agenda item 15 (b))

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GTB Mirror Working Group SAE

Status Update

Presented to GRE-70 – October 2013

Introduction

Dialogue between SAE Lighting Systems Group and NHTSA

Scope: "A forum for dialogue between NHTSA and the SAE Lighting Committee for discussion of vehicle lighting topics of mutual interest"

SAE *Regulatory Cooperation Task Force*

- Established – April 2012
- Chairman: Mike Larsen
- Vice-Chairman: Stephan Berlitz

GTB established *Mirror Group working with SAE*

- Established – May 2012
- Chairman: Stephan Berlitz
- Vice-Chairman: Gary King

Cooperation of global vehicle lighting experts

Activities

- September 2012: SAE response to NHTSA Request for comments on Performance-based FMVSS108
- 2 April 2013: SAE Lighting Systems Group meeting at NHTSA
  - 16 attendees from NHTSA
  - Reviewed Recent Trends in Lighting Technology
    - *Focus on headlighting*
  - From 2000, interpretations are used to provide direction for how FMVSS108 is applied to a new technology that was not considered when the standard was first written
  - As technologies keep evolving, it is becoming increasingly difficult to use interpretations
    - *Shaping beam patterns that temporarily do not meet requirements*
- SAE Regulatory Cooperation Task Force meetings
  - Savannah(04/13), Troy (08/13), Vancouver (09/13)
- GTB SAE Mirror Working Group meeting
  - Karlsruhe, Germany (07/13)

Main task: Support NHTSA in development of ADB test protocol

- NHTSA requests from April meeting:
  - Input from car companies on vehicle makes/models equipped with ADB, and the types of ADB systems installed
    - ✓ Only vehicles with type-approval to ECE R48 (i.e. no developmental vehicles/systems)
  - Lease vehicles for evaluation

- NHTSA Vehicle Research and Test Center (VRTC, East Liberty, Ohio) is developing a set of test requirements for ADB

- Taking current ECE R48 ADB test drive procedure into acccount

  - GTB input: VRTC reached out to GTB with questions on R48 test protocol
  - Aim: to form a basis for a test, that meets practice of US/FMVSS108 self certification
  - Time frame: end of the year

Main task: Support NHTSA in development of ADB test protocol

Status quo:

1. List of ADB equipped vehicles and systems was developed:
   - Make/Model
   - Option or package containing ADB
   - Headlamp Supplier/Vision Camera Supplier
   - ADB Technology Description
   - Other features part of ADB system
   - Parameters for Enabling and Disabling ADB

2. Establish contacts with vehicle makers for lease vehicles to be delivered in the US:
   - Initiated at the Special Meeting of the GTB WG FL (Darmstadt, 09/2013)
   - Vehicles with following ADB technology are being considered for leasing:
     - Moveable Horizontal Cutoff
     - Swiveling Vertical Cutoff
     - HID with Moving Shade
     - LED Matrix Beam

Main task: Support NHTSA in development of ADB test protocol

Status quo:

3. Providing videos showing the different ABD systems in operation
   - ➢ Intended to provide a better understanding of the way the camera is recording the scene and the way that the image is being processed to produce the control signals to the headlamp

4. Supporting NHTSA and VRTC where possible by answering questions etc.

SAE – NHTSA Dialogue

April meeting: Other Tasks

- Further technical information on adaptive rear lighting
- Comparison US beam pattern to ECE beam patterns in terms of points vs. zones
- Further analysis of the data presented by UMTRI (M.Flannagan) to identify the fraction of pedestrian fatalities that occur at vehicle speed, when ADB system would be activated

SAE Regulatory Cooperation Task Force Topics

1. Haze material: Changes to SAE J576

- SAE submitted a letter informing NHTSA that SAE updated SAE J576*: "Plastic Materials for Use in Optical Parts to incorporate requirements for intentionally hazed materials"* (Oct. 2013)

2. Toyota Petition for Rulemaking to allow AHS (form of ADB system) into FMVSS No.108

- Request for interpretation of FMVSS108 (Sept. 2011)
- Petition for rulemaking (April 2012)

SAE Regulatory Cooperation Task Force Topics

3. FMVSS-ECE incompatibility list

Major requirement differences that drive design differences between FMVSS and ECE

Topic	FMVSS	ECE	Issue for Harmonization	Comments
Intelligent Headlamps	Only a low beam pattern and high beam pattern allowed	Adaptive headlamps allowed under unique regulation (R123) and specific provisions in current regulations (R48)	Greatly limits the intellegent headlamp functionality in the FMVSS market	Discussion Topic for first meeting with NHTSA
Lens Materials	Intentionally diffused materials with good transmission not allowed	Intentionally diffused materials allowed	Intentionally diffused materials are ideal for creating uniform lit appearance in a signal lamp Executions with optical prescriptions using standard lens materials do not provide the same appearance	Did the requirements change in the December 1, 2012 version of FMVS
EPLLA vs unobstructed view of the apparent surface	50 cm^2 EPLLA for Stop & Rear Turn 29.03 cm^2 EPLLA for CHMSL	Unobstructed view of the apparent surface of 12.5 cm^2 for Rear Turn & Rear Position	Drives larger size of stop and rear turn for FMVSS than minimally required Creates minimum size for Rear Position	Other FMVSS lamps require EPLLA, but does not impact harmonization FMVSS = 22 cm2, DRL = 25 cm2 Other ECE lamps require Area, but not as significant an impact Front/R 25 cm2
Rear Turn Signal Color	Rear Turn Signals can be Red or Amber HVamber > 130 cd (design to comply) HVred > 80 cd EPLLA > 50 cm^2	Rear Turn Signals must be Amber HVamber > 50 cd (type approval) HVred > n/a No Area requirement	When amber rear turn signals are amber in FMVSS, it greatly reduce the ability to harmonize styling and components between a FMVSS and ECE lamp	FMVSS amber rear turn signal is 2.5x brighter and typically larger (EPL turn signal One execution used is to convert the ECE amber rear turn signal to an r the ECE red stop/tail to a red stop/tail/turn, and to use both for the FMV ECE stop and turn EPLLA to be added together for the FMVSS market. are used for FMVSS, this execution can not be used.

Next Steps

- Support VRTC
- Meeting GTB SAE Mirror Working Group (Vienna, 11/2013)
- SAE Regulatory Cooperation Task Force (Troy, MI, 12/2013)

Thank you for your attention

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