

Global EDR

AAPC

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- UN R160 and 1998 Agreement Guidelines: M₁ passenger and N₁ commercial vehicles
 - Starting point based on US EDR standard (49 CFR Part 563)
 - Interest in mandating EDR outside North America while updating from current EDR standard
 - N₁ limited to maximum of 3.5 tonnes
- HD-EDR: M₂, M₃, N₂, N₃
 - N₂ medium-duty category from 3.5 up to 12 tonnes
- HD-EDR and 98 Agreement Guidelines motivation was to address vehicles that could not be covered by UN R160
 - Address heavy vehicles with different architectures, crash dynamics, and occupant safety designs (e.g., no airbags)
- Gray area arose for N₂ vehicles derived from N₁ designs
 - These vehicles have airbags and related safety systems consistent with UN R160.

- North American vehicle classifications differ from 1958 Agreement categories
 - Class 2-6 medium-duty trucks fall within N₂ mass range
- North American market has medium-duty trucks within the 8-12 tonne range
 - These vehicles meet the US EDR standard (49 CFR Part 563)
 - Intention to update EDR capabilities in line with UN R160 and global guidelines developed under WP.29
- Discussions recognized medium-duty truck gray area
 - In other UN Regulations, such vehicles may be approved under either the light vehicle or the heavy vehicle versions of a given regulation.
- However, current UN R EDR texts proposes to only permit choice for vehicles up to 8 tonnes.
 - US update to Part 563 would cover medium-duty trucks
 - UN R160 would limit application up to 8 tonnes
 - Blocks harmonization without clear reason for divergence

For Global Harmonization purposes:

- UN R160 Scope covers M1 and N1 vehicles
 - N1 vehicle are defined as vehicles not exceeding 3.5 tonnes
- R-HD-EDR Scope covers M2, M3, N2, and N3
 - N2 vehicles are defined as vehicles within $3.5 \text{ tonnes} < \text{GVWR} < 12 \text{ tonnes}$

Global Harmonization of HD-EDRs

Current text:

[1.2. In case of a vehicle type equipped with deployable restraint system and with GVW up to a maximum of 12t, Contracting Parties applying both UN Regulation No. 160 and this Regulation [may/shall] recognize approvals to either Regulation as equally valid.]

[1.3. Notwithstanding paragraph 1.2., in case of a vehicle type equipped with deployable restraint system and with GVW up to 8t, Contracting Parties shall recognize approvals to either regulation as equally valid.]

- 4.1 If the vehicle type submitted for approval pursuant to this Regulation meets the requirements of paragraph 5. below approval of that vehicle type shall be granted. [Alternatively, approval shall be granted, at the request of the manufacturer and in case of a vehicle type equipped with deployable restraint system with GVW up to 12t, if that this vehicle type meets the technical requirements of paragraph 5.1 to 5.5 and in line with the transitional provisions of paragraph 11 of the 01 or later series of amendments to UN Regulation No. 160 [and for only vehicle types with GVW between 8-12t the manufacturer demonstrates, to [the satisfaction of] the approval authority, that the triggering performance is equally effective to this Regulation.]]
- [4.1.1 Vehicles referred to in paragraph 4.1. which are not subject to national and regional regulations providing for crash tests requirements referred to in paragraphs 5.4.1 and 5.4.2. of UN Regulation No. 160 shall be subject to paragraph 5.4. of this regulation.]
- N2 includes full-size light & medium duty trucks
- Some medium duty trucks exceed 8 tonnes

Scope, purpose, and coverage

- R-HD-EDR started with tractor trailers, not light and medium duty vehicles.
 - Use cases for light/medium vehicles different than tractor trailers
 - Light/medium vehicles have different electrical architectures and systems
- Triggers and elements in the R-HD-EDR designed for tractor trailers, not light/medium vehicles
 - Sudden Deceleration / Last Stop
 - Propulsion System Activation Hours / Retarder Torque Mode / Propulsion System Power / ABS Trailer / Rollover Protection Control system status / Reversing Motion VRU Detection
- Regulation should cover vehicles available across world
 - Should not exclude vehicles simply because rare in some major markets

R-HD-EDR unnecessary for medium vehicles

- Medium duty vehicles with supplemental restraint system
 - Automakers voluntarily include EDR in these vehicles
 - Meet 49 CFR Part 563 and new programs will incorporate UN R160 functionality
 - An EDR will be locked if a non-reversible restraint system device is deployed OR a delta V of 5mph within a 150 millisecond time period is reached.
- No evidence provided that UN R160 not appropriate for medium duty vehicles or would degrade accident reconstruction.
- As vehicles become electrified, weights will increase, and more vehicles will fall in the M2 and N2 category.

- Medium Duty vehicles are already designed with EDR
 - Current Vehicles were designed to NHTSA Part 563
 - Future Vehicles are being designed to R160.01
- Challenges with R-HD-EDR for Medium Duty Vehicles:
 - **Additional Triggers:** Sudden Deceleration Trigger / Last Stop Trigger
 - **Some elements are not relevant** to Medium Duty Vehicles
 - Propulsion System Activation Hours / Retarder Torque Mode / Propulsion System Power / ABS Trailer / Rollover Protection Control system status / Reversing Motion VRU Detection
 - **Longer Recording Interval:** -20s to +10s
 - **More Buffers/Storage:** 5 events
 - **Vehicle weights** of Electrified Vehicles **increase** into the M2/N2 categories

- Medium duty 8-12t vehicles
 - Exclusion impacts vehicles compliant with current requirements
 - Additional requirements not intended for medium-duty vehicles
 - Lack of evidence or justification for change from current requirements
 - No data to support the exclusion of vehicles between 8-12t.
- Harmonization should not impose unnecessary burden on vehicles designed to be compliant with US EDR standard (49 CFR Part 563) de facto UN R 160
 - Impact of R-HD-EDR on vehicles outside intended scope needs to be minimized.

- Proposal

- Amend paragraph 1.2

- 1.2. In case of a vehicle type equipped with deployable restraint system and with GVW up to a maximum of 12t, Contracting Parties applying both UN Regulation No. 160 and this Regulation [~~may/shall~~] recognize approvals to either Regulation as equally valid.]

- Delete paragraph 1.3

~~1.3. Notwithstanding paragraph 1.2., in case of a vehicle type equipped with deployable restraint system and with GVW up to 12t, Contracting Parties shall recognize approvals to either regulation as equally valid.~~

- Delete the following text in paragraph 4.1

~~4.1 [...and for vehicle types with GVW between 8-12t, the manufacturer demonstrates to the approval authority that the triggering performance is equally effective to this Regulation.]~~

and

- Amend the scope of UN R 160 to recognize N2 vehicles derived from N1 vehicles may be approved to the regulation.

Thank You