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**Economic Commission for Europe**

Inland Transport Committee

**World Forum for Harmonization of Vehicle Regulations**

**186th session**

Geneva, 8-11 March 2022

Item 4.8.5 of the provisional agenda

**1958 Agreement:
Consideration of draft amendments to existing
UN Regulations submitted by GRSG**

 Proposal for Supplement 1 to the original version of UN Regulation No. 160 (Event Data Recorder (EDR))

 Submitted by the Working Party on General Safety Provisions [[1]](#footnote-2)\*

The text reproduced below was adopted by the Working Party on General Safety Provisions (GRSG) at its 122nd session (ECE/TRANS/WP.29/GRSG/101, para. 109). It is based on ECE/TRANS/WP.29/GRSG/2021/33. It is submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) and to the Administrative Committee (AC.1) for consideration at their March 2022 sessions.

*Paragraph 1.3.,* amend to read:

"1.3. The following data elements are excluded from the scope: VIN, associated vehicle details, location/positioning data, information of the driver, date, and time of an event."

*Paragraphs 2.1, 2.14, 2.15, 2.29. and 2.52.,* amend to read:

"2.1. "Anti-lock braking *activity*" means the anti-lock brake system is actively controlling the vehicle's brakes.

2.14. "*Ignition cycle, crash*" means the number (count) of power mode cycles as determined by the EDR ECU at the time when the crash event occurred since the first use of the EDR.

2.15. "*Ignition cycle download*" means the number (count) power mode cycles as determined by the EDR ECU at the time when the data was downloaded since the first use of the EDR.

2.29. *“Rollover”* means any vehicle rotation of 90 degrees or more about any true longitudinal or lateral axis.

2.52. "*X-direction*" means in the direction of the vehicle’s X-axis, which is parallel to the vehicle's longitudinal centreline. The X-direction is positive in the direction of forward vehicle travel."

*Paragraph 5.3.2.*, amend to read:

"5.3.2. Conditions for triggering locking of data

 In the circumstances provided below, the memory for the event shall be locked to prevent any future overwriting of the data by subsequent events."

*Annex 4. Table1, amend to read:*

Data elements and format *[[2]](#footnote-3)*

"Table 1

| *Data element* | *Condition for requirement[[3]](#footnote-4)* | *Recording interval/time[[4]](#footnote-5) (relative to time zero)* | *Data sample rate (samples per second)* | *Minimum range****[[5]](#footnote-6)*** | *Accuracy****[[6]](#footnote-7)*** | *Resolution4* | *Event(s) recorded for****[[7]](#footnote-8)*** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Delta-V, longitudinal | Mandatory - not required if longitudinal acceleration recorded at ≥500 Hz with sufficient range and resolution to calculate delta-v with required accuracy | 0 to 250 ms or 0 to End of Event Time plus 30 ms, whichever is shorter. | 100 | -100 km/h to + 100 km/h. | ±10% | 1 km/h. | Planar |
| Maximum delta-V, longitudinal | Mandatory - not required if longitudinal acceleration recorded at ≥500 Hz | 0–300 ms or 0 to End of Event Time plus 30 ms, whichever is shorter. | N/A | -100 km/h to + 100 km/h. | ±10% | 1 km/h. | Planar |
| Time, maximum delta-V, longitudinal | Mandatory - not required if longitudinal acceleration recorded at ≥500 Hz | 0–300 ms or 0 to End of Event Time plus 30 ms, whichever is shorter. | N/A | 0–300 ms, or 0-End of Event Time plus 30 ms, whichever is shorter. | ±3 ms | 2.5 ms. | Planar |
| Speed, vehicle indicated | Mandatory | -5.0 to 0 sec | 2 | 0 km/h to 250 km/h | ±1 km/h | 1 km/h. | PlanarVRURollover |
| Engine throttle, % full (or accelerator pedal, % full) | Mandatory | -5.0 to 0 sec | 2 | 0 to 100% | ±5% | 1% | PlanarRolloverVRU |
| Service brake, on/off | Mandatory | -5.0 to 0 sec | 2 | On or Off | N/A | On or Off. | PlanarVRURollover |
| Ignition cycle, crash | Mandatory | -1.0 sec | N/A | 0 to 60,000 | ±1 cycle | 1 cycle. | PlanarVRURollover |
| Ignition cycle, download | Mandatory | At time of download[[8]](#footnote-9) | N/A | 0 to 60,000 | ±1 cycle | 1 cycle. | PlanarVRURollover |
| Safety belt status, driver  | Mandatory | -1.0 sec | N/A | Fastened, not fastened | N/A | Fastened, not fastened | PlanarRollover  |
| Air bag warning lamp[[9]](#footnote-10) | Mandatory | -1.0 sec | N/A | On or Off | N/A | On or Off. | PlanarRollover |
| Frontal air bag deployment, time to deploy, in the case of a single stage air bag, or time to first stage deployment, in the case of a multi-stage air bag, driver.  | Mandatory | Event | N/A | 0 to 250 ms | ±2ms | 1 ms. | Planar |
| Frontal air bag deployment, time to deploy, in the case of a single stage air bag, or time to first stage deployment, in the case of a multi-stage air bag, front passenger[[10]](#footnote-11). | Mandatory | Event | N/A | 0 to 250 ms | ±2 ms | 1 ms. | Planar |
| Multi-event crash, number of events | If Recorded[[11]](#footnote-12) | Event | N/A | 1 or more | N/A | 1 or more. | PlanarVRURollover |
| Time from event 1 to 2 | Mandatory | As needed | N/A | 0 to 5.0 sec | ±0.1 sec | 0.1 sec. | PlanarRollover |
| Complete file recorded | Mandatory | Following other data | N/A | Yes or No | N/A | Yes or No. | PlanarVRURollover |
| Lateral acceleration(post-crash) | If Recorded | 0–250 ms or 0 to End of Event Time plus 30 ms, whichever is shorter.11 | 500 | -50 to +50g | +/- 10% | 1 g | PlanarRollover  |
| Longitudinal acceleration(post-crash) | If Recorded | 0–250 ms or 0 to End of Event Time plus 30 ms, whichever is shorter. | 500 | -50 to +50g | +/- 10% | 1 g | Planar |
| Normal acceleration(post-crash) | If recorded |  0 to at least 250 ms[[12]](#footnote-13)  | 10  | -5 g to +5 g | ± 10% | 0.5 g | Rollover |
| Delta-V, lateral | Mandatory - not required if lateral acceleration recorded at ≥500 Hz and with sufficient range and resolution to calculate delta-v with required accuracy | 0–250 ms or 0 to End of Event Time plus 30 ms, whichever is shorter. | 100 | -100 km/h to + 100 km/h. | ±10% | 1 km/h. | Planar |
| Maximum delta-V, lateral | Mandatory - not required if lateral acceleration recorded at ≥500 Hz | 0–300 ms or 0 to End of Event Time plus 30 ms, whichever is shorter. | N/A | -100 km/h to + 100 km/h. | ±10% | 1 km/h. | Planar |
| Time maximum delta-V, lateral | Mandatory - not required if lateral acceleration recorded at ≥500 Hz | 0–300 ms or 0 to End of Event Time plus 30 ms, whichever is shorter. | N/A | 0–300 ms, or 0-End of Event Time plus 30 ms, whichever is shorter. | ±3 ms | 2.5 ms. | Planar |
| Time for maximum delta-V, resultant. | Mandatory - not required if relevant acceleration recorded at ≥500 Hz | 0–300 ms or 0 to End of Event Time plus 30 ms, whichever is shorter. | N/A | 0–300 ms, or 0-End of Event Time plus 30 ms, whichever is shorter. | ±3 ms | 2.5 ms. | Planar |
| Engine rpm | Mandatory | -5.0 to 0 sec | 2 | 0 to 10,000 rpm | ±100 rpm[[13]](#footnote-14) | 100 rpm. | PlanarRollover |
| Vehicle roll angle | If recorded | 0 to at least 250 ms11 | 10 | -1080 deg to + 1080 deg. | ±10% | 10 deg. | Rollover |
| Anti-lock braking system activity  | Mandatory | -5.0 to 0 sec | 2 | Faulted, Non-Engaged, Engaged  | N/A | Faulted, Non-Engaged, Engaged  | PlanarVRURollover |
| Stability control  | Mandatory | -5.0 to 0 sec | 2 | Faulted, On, Off, Engaged | N/A | Faulted, On, Off, Engaged | PlanarVRURollover |
| Steering input | Mandatory | -5.0 to 0 sec | 2 | -250 deg CW to + 250 deg CCW. | ±5% | ±1%. | PlanarRollover VRU |
| Safety belt status, front passenger 9 | Mandatory | -1.0 sec | N/A | Fastened, not fastened | N/A | Fastened, not fastened | PlanarRollover  |
| Passenger air bag suppression status, front 9 | Mandatory | -1.0 sec | N/A | suppressed or not suppressed | N/A | suppressed or not suppressed | PlanarRollover |
| Frontal air bag deployment, time to nth stage, driver13. | Mandatory if fitted with a driver’s frontal air bag with a multi-stage inflator. | Event  | N/A | 0 to 250 ms | ±2 ms | 1 ms. | Planar |
| Frontal air bag deployment, time to nth stage, front passenger13, 9. | Mandatory if fitted with a front passenger’s frontal air bag with a multi-stage inflator. | Event | N/A | 0 to 250 ms | ±2 ms | 1 ms. | Planar |
| Side air bag deployment, time to deploy, driver. | Mandatory  | Event | N/A | 0 to 250 ms | ±2 ms | 1 ms. | Planar |
| Side air bag deployment, time to deploy, front passenger. | Mandatory  | Event | N/A | 0 to 250 ms | ±2 ms | 1 ms. | Planar |
| Side curtain/tube air bag deployment, time to deploy, driver side. | Mandatory  | Event | N/A | 0 to 250 ms | ±2 ms | 1 ms. | PlanarRollover |
| Side curtain/tube air bag deployment, time to deploy, passenger side. | Mandatory  | Event | N/A | 0 to 250 ms | ±2 ms | 1 ms. | PlanarRollover |
| Pretensioner deployment, time to fire, driver. | Mandatory  | Event | N/A | 0 to 250 ms | ±2 ms | 1 ms. | PlanarRollover |
| Pretensioner deployment, time to fire, front passenger9. | Mandatory  | Event | N/A | 0 to 250 ms | ±2 ms | 1 ms. | PlanarRollover |
| Seat track position switch, foremost, status, driver. | Mandatory if fitted and used for deployment decision | -1.0 sec | N/A | Yes or No | N/A | Yes or No. | PlanarRollover |
| Seat track position switch, foremost, status, front passenger9. | Mandatory if fitted and used for deployment decision | -1.0 sec | N/A | Yes or No | N/A | Yes or No. | PlanarRollover |
| Occupant size classification, driver  | If recorded | -1.0 sec | N/A | 5th percentile female or larger. | N/A | Yes or No. | PlanarRollover |
| Occupant size classification, front passenger9. | If recorded | -1.0 sec | N/A | 6yr old HIII US ATD or Q6 ATD or smaller | N/A | Yes or No. | PlanarRollover |

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1. \* In accordance with the programme of work of the Inland Transport Committee for 2022 as outlined in proposed programme budget for 2022 (A/76/6 (part V sect. 20) para 20.76), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate. [↑](#footnote-ref-2)
2. Format requirements specified below are minimum requirements and manufacturers can exceed them. [↑](#footnote-ref-3)
3. "Mandatory" is subject to the conditions detailed in Section 1. [↑](#footnote-ref-4)
4. Pre-crash data and crash data are asynchronous. The sample time accuracy requirement for pre-crash time is -0.1 to 1.0 sec (e.g., T = -1 would need to occur between -1.1 and 0 seconds.) [↑](#footnote-ref-5)
5. For data elements with system states, the term “engaged” also means “actively controlling” or “actively intervening” and “non-engaged” also means “on but not controlling”. Likewise, “*off”* also means “*deactivated*”. [↑](#footnote-ref-6)
6. Accuracy requirement only applies within the range of the physical sensor. If measurements captured by a sensor exceed the design range of the sensor, the reported element shall indicate when the measurement first exceeded the design range of the sensor. [↑](#footnote-ref-7)
7. "Planar" includes triggered events in sections 5.3.1.1, 5.3.1.2, and 5.3.1.3 and “VRU” includes triggered events in section 5.3.1.4. [↑](#footnote-ref-8)
8. The ignition cycle at the time of download is not required to be recorded at the time of the crash but shall be reported during the download process. [↑](#footnote-ref-9)
9. The air bag warning lamp is the readiness indicator specified in national air bag requirements and may also illuminate to indicate a malfunction in another part of the deployable restraint system. [↑](#footnote-ref-10)
10. List this element n times, once for each device. [↑](#footnote-ref-11)
11. "If recorded" means if the data is recorded in non-volatile memory for the purpose of subsequent downloading. [↑](#footnote-ref-12)
12. For rollover events the time at which the event is determined to have started as defined by the manufacturer. [↑](#footnote-ref-13)
13. These elements do not need to meet the accuracy and resolution requirements in specified crash tests [↑](#footnote-ref-14)