Chinese Mandatory National Standard

GB “Automobile Event Data Recorder system”
Framework

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C-EDR

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Technical Requirements

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IMPACT EVENT REQUIREMENTS

- Trigger Threshold
- Locking Condition
- Beginning of Event
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Content

DATA RECORD REQUIREMENTS

Level A [17]
Data that shall be recorded when vehicles are equipped with EDR system.

Level B [43]
Relevant data that can be recorded when the vehicle is featured with specific functions or equipped specific devices.
DATA RECORD FUNCTION REQUIREMENTS

- **Non-volatile** storage medium
- At least 3 times of impact event data.

- Learning from relevant research, 94% of the accidents will be covered when EDR records 3 events, while only 84% when EDR records 2 events.

- Depends on different forms or phases, an accident can be recorded as several events.
C-EDR

DATA RECORD FUNCTION REQUIREMENTS

**Storage coverage mechanism requirements**

- **Unlocked event data** should be **overwritten** by subsequent un-locked event data, in chronological order.

- Locked event data should **not** be overwritten by data from subsequent events.

- For unlocked events, the manufacturer is allowed to set **other** storage coverage mechanisms.

**Power-off storage requirements**

- Data **before T0 and after T0 to (150±10) ms** should be recorded.
Unified data retrieval connector

GB/T 34589-2017 "Road Vehicles diagnostic connector"

Unified data retrieval ID

0xFA13, 0xFA14 and 0xFA15
Where,
0xFA13 for the most recent event,
0xFA14 for the second event from the bottom,
0xFA15 for the third event from the bottom.

Unified data retrieval protocol

- Use diagnostic service 0x22 "ReadDatabyIdentifier “ in ISO 14229 "Road Vehicles unified diagnostic service " to retrieve EDR data.
- compatible with CAN bus and k-line.
- Compatible with functional addressing and physical addressing
- Compatible with 11-bit and 29-bit CANID

Unified data arrangement

Unified data range, accuracy, resolution and data arrangement order
After the existed mandatory impact test, following two requirements are checked:

1. **Requirement conformance of post crash time-series data** (EDR delta-V or acceleration data): the EDR output is compared with the reference accelerometer sensor data. And there is no delta-V data clipping, or acceleration data outrange.

2. **Survivability**: the EDR system shall completely record all data.

After the EDR is triggered, the requirement conformance of pre-crash driver operation data elements are checked:

- Pedal: certain stroke
- Steering wheel: certain angle
- Safe belt buckle: locked
- Lamp: ON
- Electronic/electric systems recorded by EDR shall be set and kept on

**Note:** the EDR can be triggered in any way, e.g.

- impact the vehicle
- fix the vehicle on the trolley, and impact the trolley
- physically trigger the EDR
- input trigger signal to the EDR

The following EDR requirements are checked:

- EDR trigger performance
- Event storage times
- Storage overwrite mechanism
- Power off storage performance by thrusting the EDR controller using a electromagnetic thruster to physically generating relevant impact waveform.

**Note:** A test box is required to simulate the real vehicle peripheral signals or loads except for the EDR delta-V or acceleration signal during bench test.
When we developed the C-EDR standard, the following factors were considered:

- International standards and regulations;
- Chinese traffic condition;
- Requirements of Traffic Accident Identification Agency and Ministry of Public Security;
- ......

A large number of vehicle manufacturers and component suppliers all over the world have been taken part in this standard's development.

We would like to share the experience of C-EDR standard development to WP.29.
Thank you for your attention!