



Informal document No. GRSG-125-14  
(125 GRSG, 27-31 March 2023  
Agenda item 10(a)).

**中国汽车技术研究中心有限公司**  
China Automotive Technology and Research Center Co., Ltd.

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# **The introduction of the EDR technology and regulation**

For the 125th meeting of WP.29/GRSG

Submitted by the experts from China

# EDR in China

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## ❖ GB 7258—2017 Technical specifications for safety of power-driven vehicles operating on roads”

- 8.6.6 The **passenger car** should be equipped with an event data recording system (**EDR**) that can record the vehicle speed, braking state and other data when a specific event such as a collision occurs; if it is equipped with an On-board driving video recording system (**DVR**) that meets the requirements of the standard, it shall be considered to meet the requirements.

## ❖ GB 39732-2020 Vehicle event data recorder system

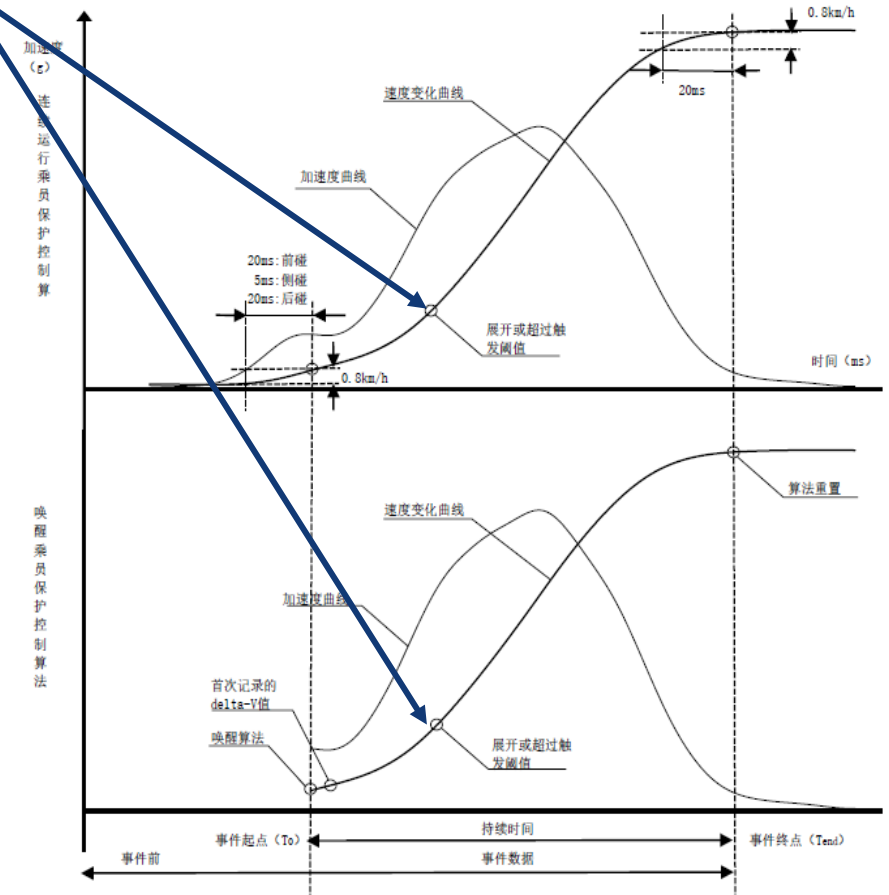
- Apply to vehicles of category M<sub>1</sub>
- 1 January, 2022, except for the B-level data elements and data retrieval;
- 1 January, 2024, all requirements.

# Technical Requirements

## Trigger Threshold

- For vehicles that record "delta-V, longitudinal" only, Trigger threshold means a change in vehicle velocity, which is **not less than 8km/h** within 150ms interval in the X-axis direction .
- For vehicles that record "delta-V, lateral" also, Trigger threshold means a change in vehicle velocity, which is **not less than 8km/h** within 150ms interval In either the X-axis or Y-axis direction .
- For both cases above, if the event duration is less than 150ms, then as a change in vehicle velocity is not less than 8km/h, that is, the trigger threshold is reached.
- When the manufacturer sets other trigger thresholds, the requirements of a) and b) shall also be met.

R160 more than 8 km/h  
CFR 563 equals or exceeds 8 km/h

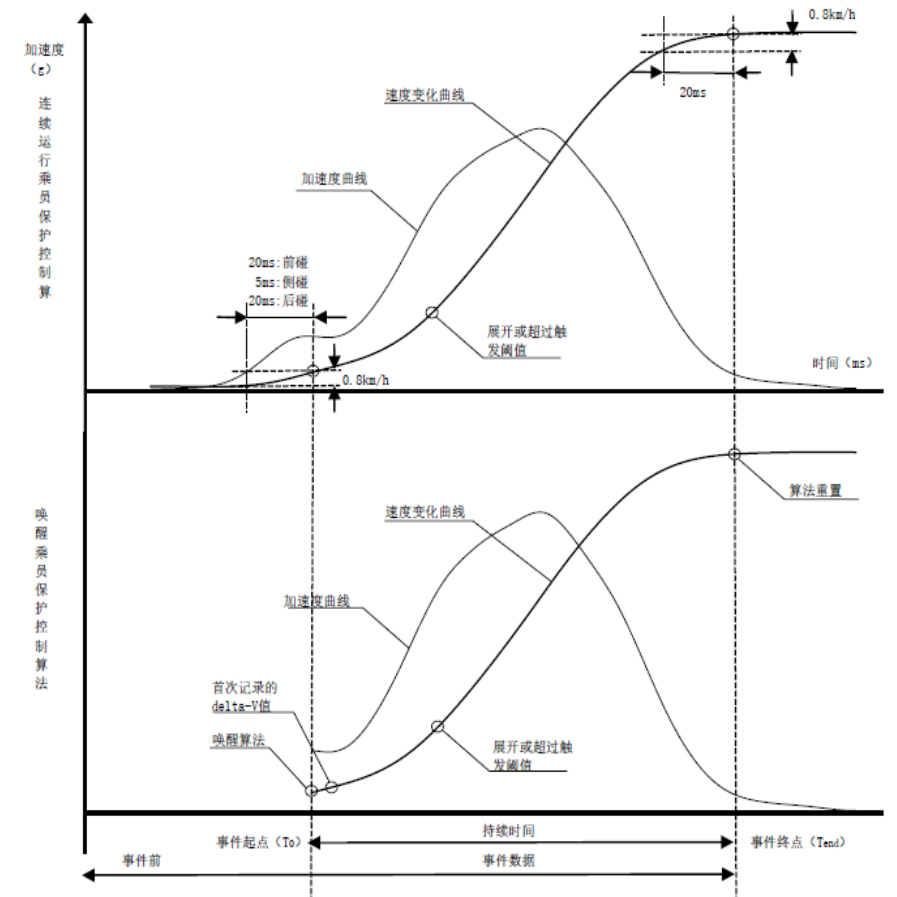


**Record as much as possible potential events.**

# Technical Requirements

## Locking Condition

- a) EDR shall choose either of the following as the locking condition:
- Non-reversible restraint deployment;
  - The vehicle velocity change in X-axis direction is not less than 25km/h within 150ms interval.
- b) In case of a rear-impact, it is permitted to adopt the control algorithm designed by the manufacturer as locking condition. In case of lateral impact, deployment of lateral non-reversible restraint shall be taken as locking condition. If the vehicle is not configured with lateral non-reversible restraint, vehicle manufacturers shall determine whether to lock.
- c) If the manufacturer sets other locking conditions, the requirements of a) and b) shall also be met.



# Technical Requirements

## ❖ Record function requirements

### Storage medium

Non-volatile storage medium

### Event number

At least three consecutive impact event data

### Overwriting mechanism

first-in first-out  
Locked event data shall not be overwritten

### Power-off storage

(150+10) ms after power-off

## ❖ Retrieval requirements

### Unified data retrieval connector

GB/T 34589-2017  
Road Vehicles diagnostic connector”

### Unified data retrieval protocol

ISO 14229  
Road Vehicles unified diagnostic service

### Unified data retrieval ID

0xFA13 the most recent  
0xFA14 the second  
0xFA15 the third

### Unified Data arrangement

data range  
Accuracy  
Resolution  
data arrangement order

## ❖ Protective performance requirements

Engine compartment

**IP5K6**

Dust protection  
ultra-high velocity  
water injection.

Interior of the vehicle  
Luggage compartment

**IP5K1**

Dust protection,  
vertically dripping  
water.

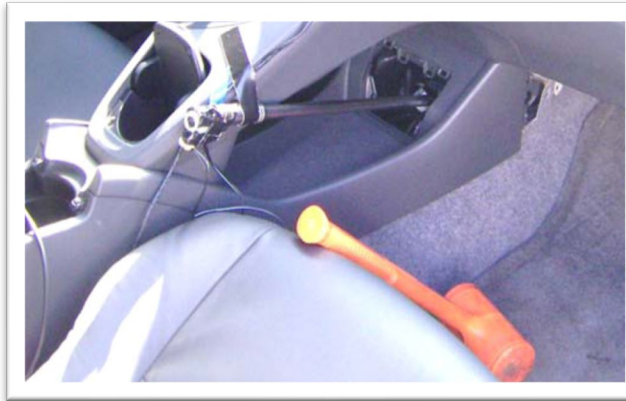
# Test Methods



## Impact test

- Frontal collision
- lateral collision

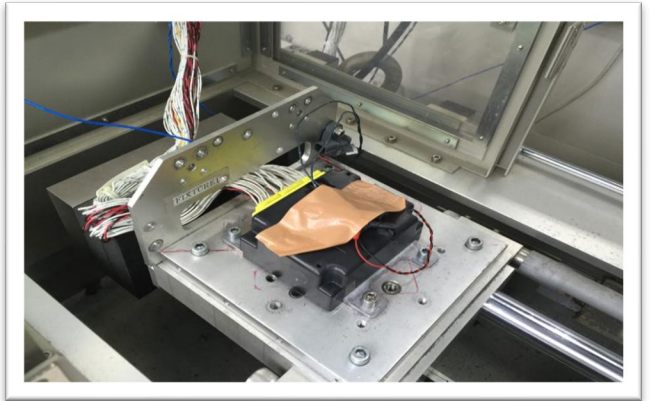
- The EDR shall **completely record** all data
- The data **can be read**
- The acquired delta-V or acceleration data shall meet the **delta-V conformity** requirements and there is **no delta-V clipping**, or the acceleration data **shall not exceed the range** of acceleration sensor



## Driving Operation Data Test

- Hit the vehicle
- Fix the vehicle with the pallet
- Physically trigger the EDR
- Input trigger signal to the EDR

- The EDR system shall be **triggered**.
- The records of relevant data shall be **identical with the settings**

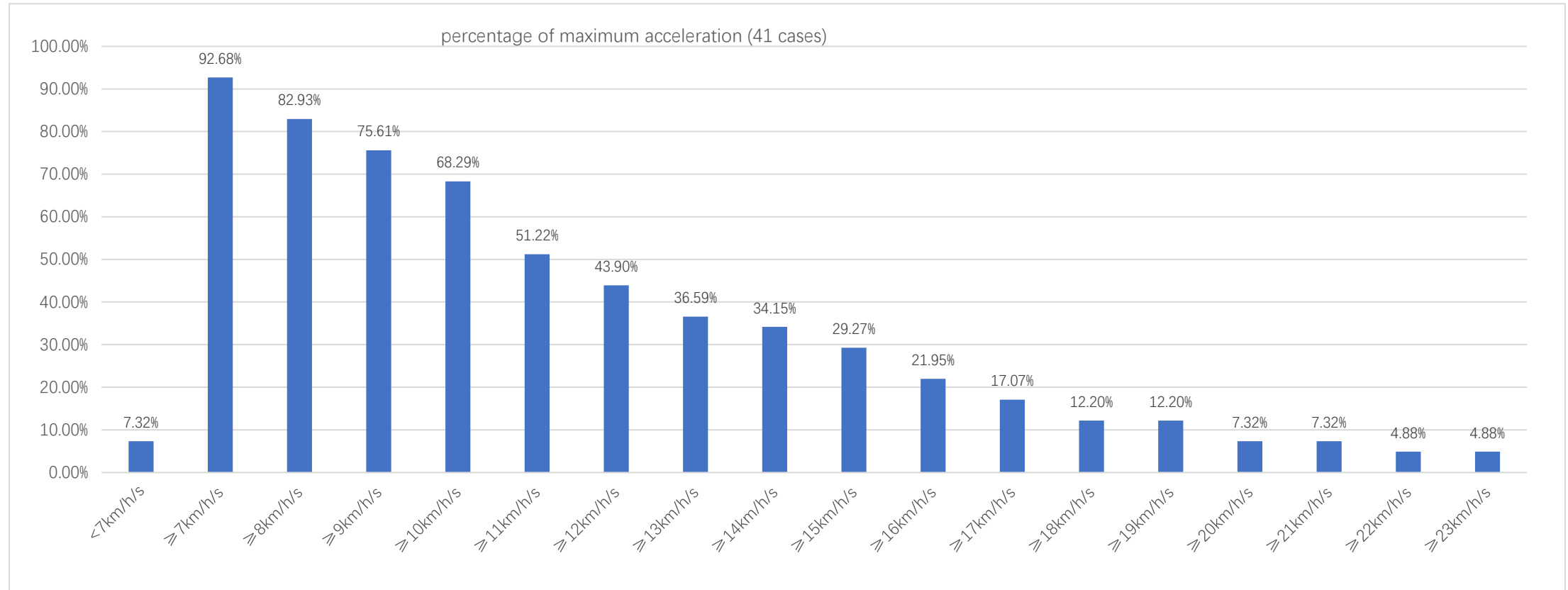


## Bench test

- Trigger test
- Event number test
- Storage overwrite mechanism test
- Power-off storage test

- The EDR shall be **triggered to work**
- The **latest consecutive 3 events** shall be recorded
- The **unlocked** event shall be overwritten and the **locked** event shall not be overwritten
- **The (150+10) ms** data after power-off shall be recorded

# Data survey for Heavy duty vehicle



Source: The traffic accident investigation

- Learning from statistics, 80% of the HD vehicles accidents will be covered when the maximum of acceleration  $\geq 8\text{km/h/s}$ .

# Data survey for Heavy duty vehicle

## ❖ Heavy Duty Vehicles idle conditions

Quantile	Bus	Coach	Dumper	Truck (GVW≤5500 kg)	Truck (GVW>5500 kg)	Tractor	Average
80%	18.92	37.74	46.21	33.89	41.91	57.06	39.29
90%	33.14	56.55	79.84	59.67	68.84	85.41	63.91
95%	52.69	74.49	111.46	90.60	100.48	114.48	90.70

Source: China Automotive Test Cycle(CATC,HD vehicles)

- The average interval when the Heavy duty vehicle speed is reported as 0 is more than 30 seconds if 80% is covered)



# Thinking on EDR

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- ❖ **More trigger conditions may be considered in order to record different kinds of vehicle accidents(e.g. lost control, fire).**
- ❖ **More kinds of data can be recorded for In-depth accident analysis(e.g. ADAS/ADS, High-voltage component)**
- ❖ **Protective performance requirements shall be considered for the severe vehicle accident(e.g. water resistance, impact resistance, fire resistance)**
- ❖ **More test methods may be considered to validate different requirements of EDR(e.g. bench test, driving operation test)**

**Thank you for your attention!**