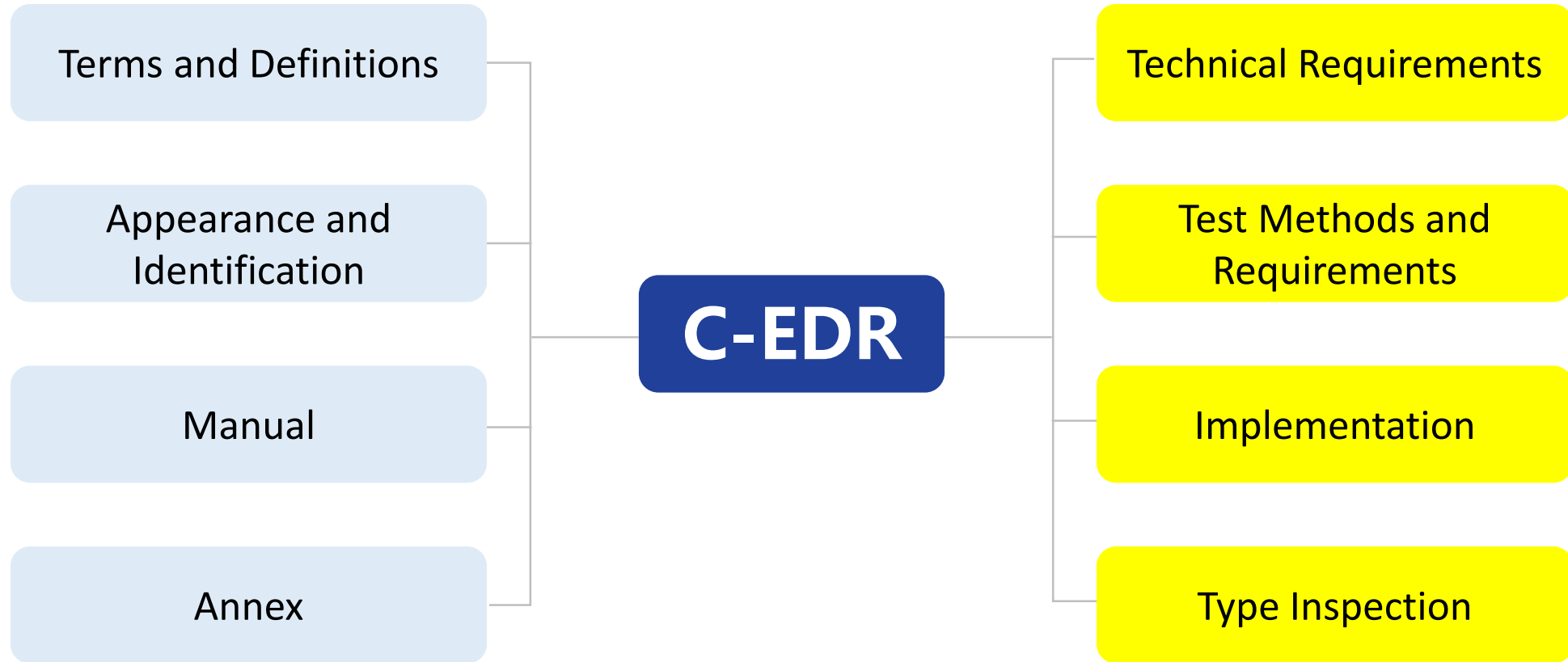
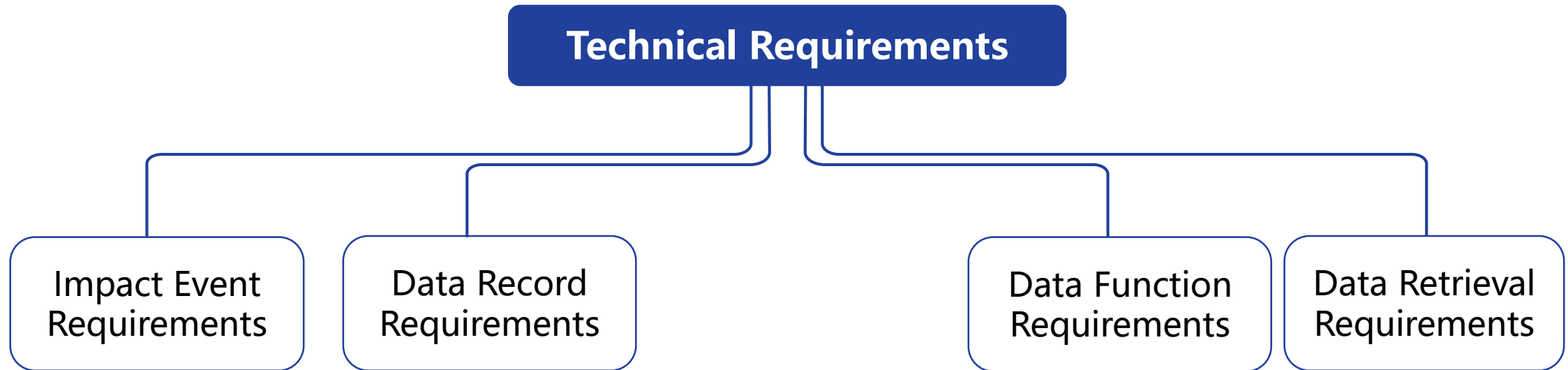


Chinese Mandatory National Standard

GB “Automobile Event Data Recorder system”







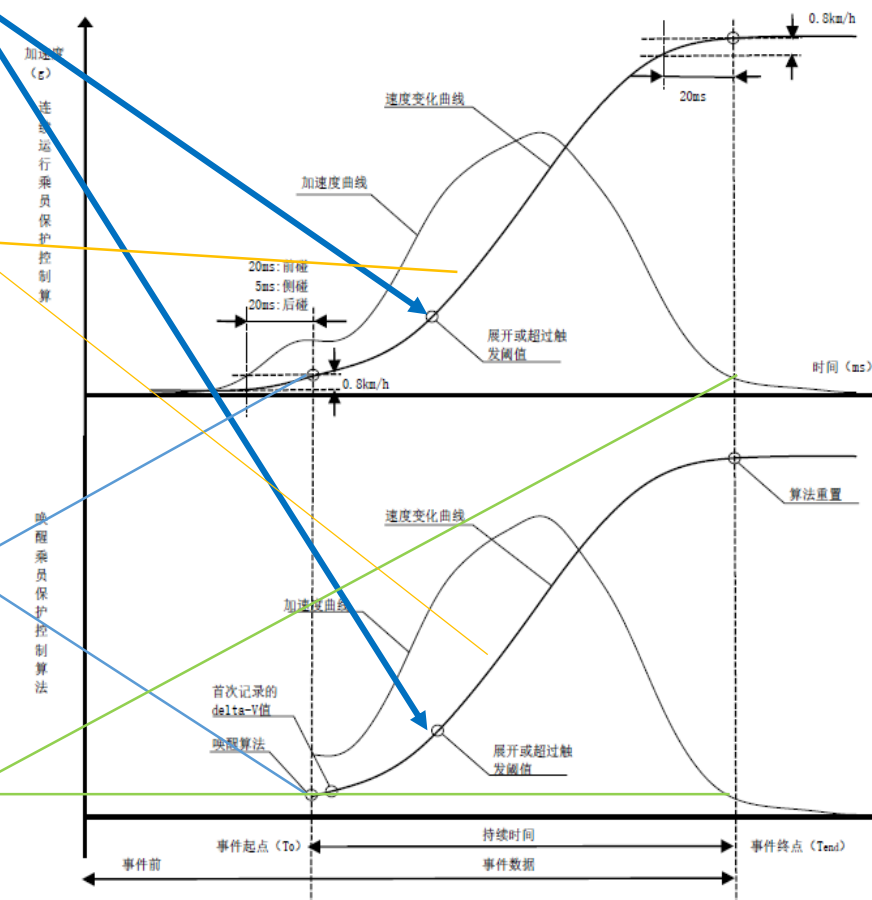
IMPACT EVENT REQUIREMENTS

Trigger Threshold

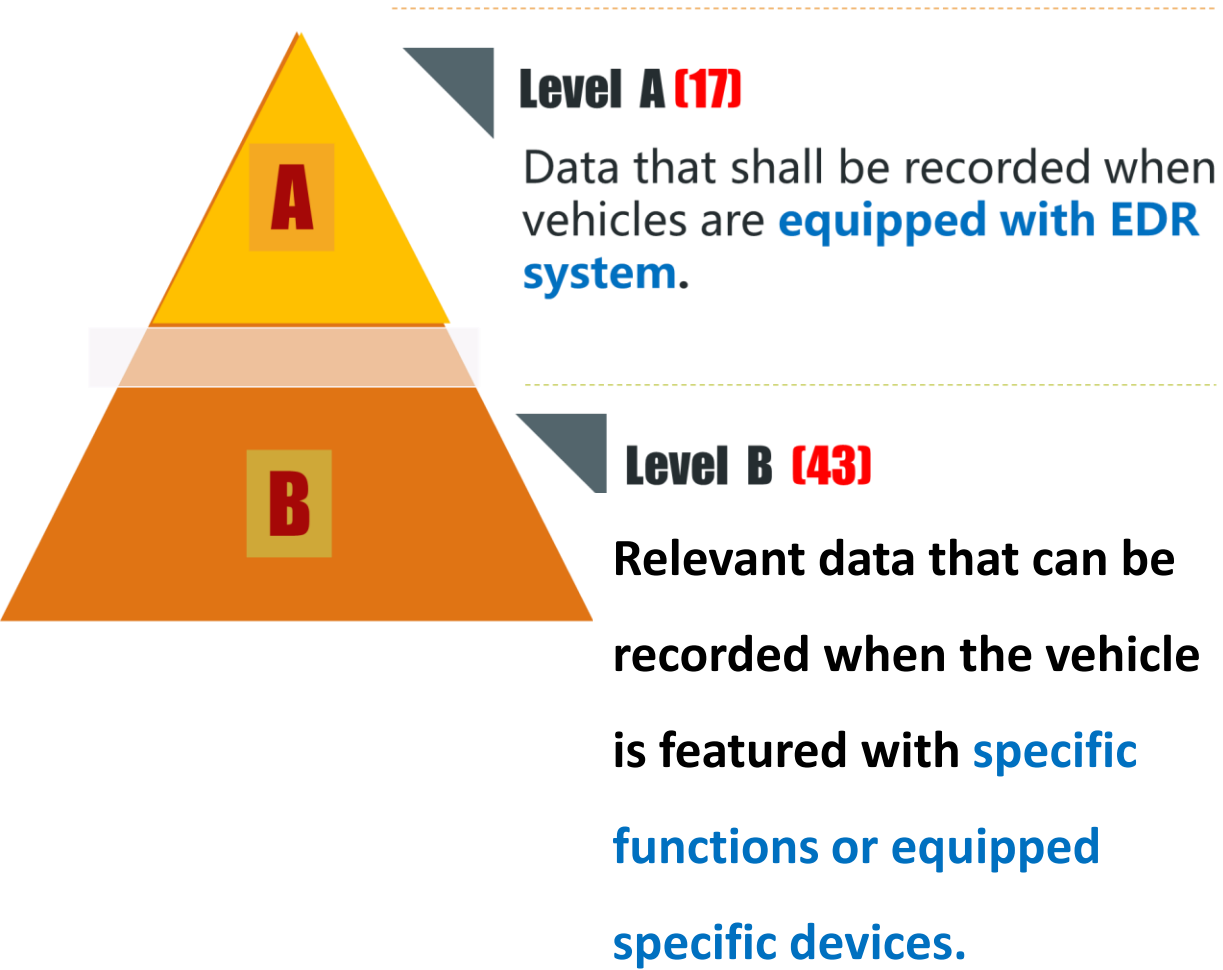
Locking Condition

Beginning of Event

End of Impact Event

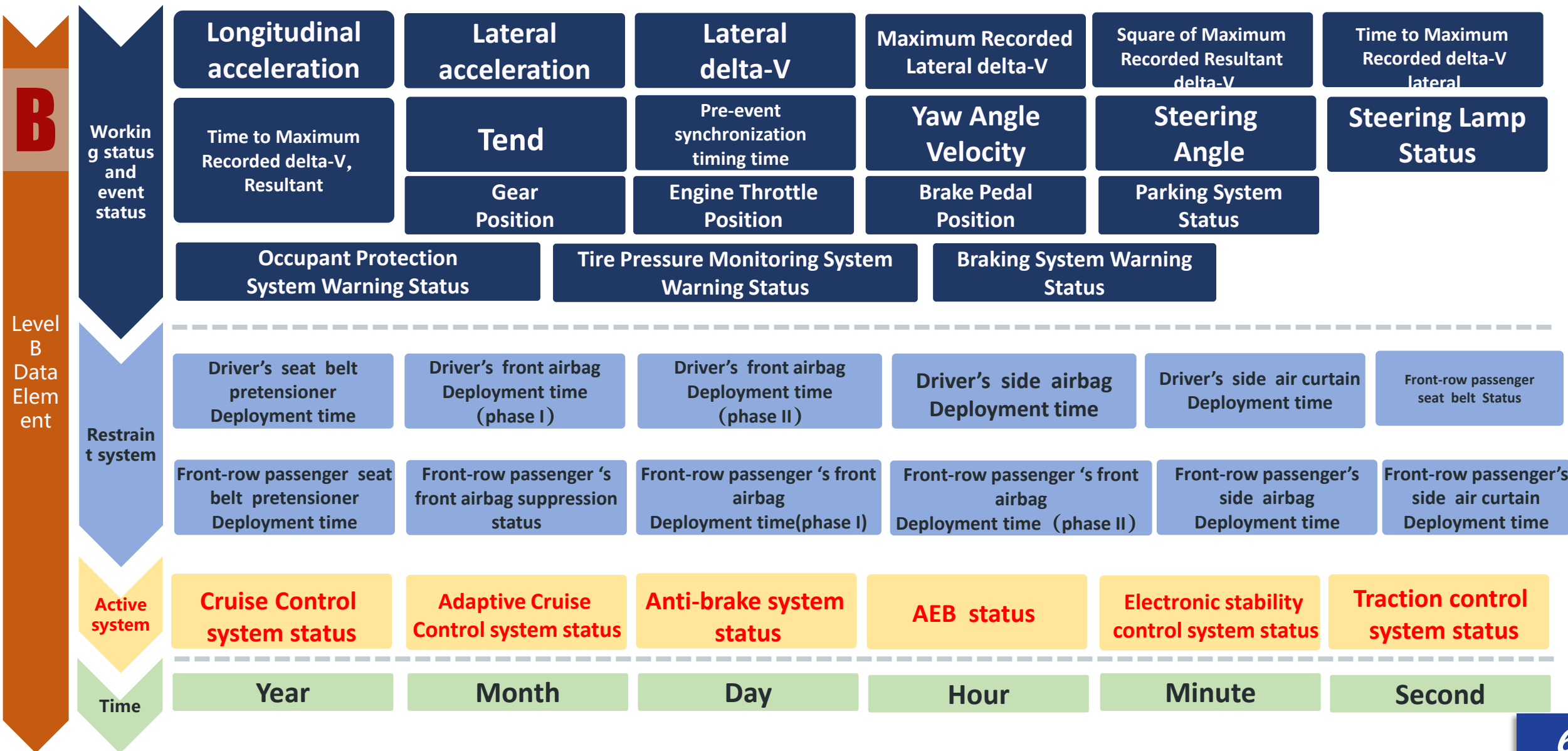


DATA RECORD REQUIREMENTS



Lateral delta-V	Maximum Recorded Lateral delta-V	Time to Maximum Recorded delta-V
Clipping Flag	Vehicle Velocity	Service brake , on or off
Acceleration pedal position%	Revolution per minute	Driver seatbelt status
Power-on cycle at event	Power-on cycle at retrieving	Complete status of event data record
Time interval from this event to the last event	VIN	
ECU hardware number that records EDR data	ECU software number that records EDR data	ECU serial number that records EDR data

DATA RECORD REQUIREMENTS



DATA RECORD FUNCTION REQUIREMENTS

Storage media and storage frequency 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.

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.

1 Unified data retrieval connector

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

Unified data retrieval protocol

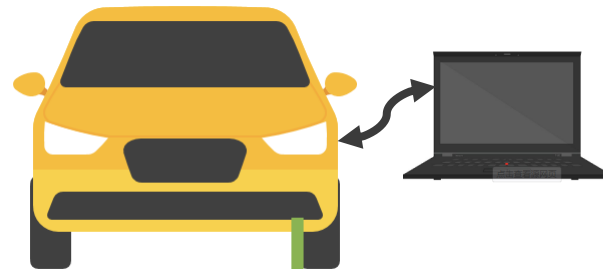
2

- ✓ 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

3 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 arrangement

4

Unified data range, accuracy, resolution and data arrangement order

ID (1)(2)(3)	Signal Name	Unit	Record Level	Length of Single Signal (bit)	Length of Single Signal (byte)	Number of Single Event Signals (#)	Length of Single Event Signal (Byte)	Serial Number of Byte	Conversion Formula	Unobtainable Value	Fault or Invalid Value
0xFA13	Longitudinal delta-V	km/h	A	8	1	26	26	0-25	E=N-150	FF ₁₆	FE ₁₆
	Maximum recorded longitudinal delta-V	km/h	A	8	1	1	26		E=N-150	FF ₁₆	FE ₁₆
	Time to maximum recorded delta-V, longitudinal	ms	A	7	1	1	1	27	E=N*2.5	FF ₁₆	FE ₁₆
0xFA14	Clipping flag	ms	A	16	2	1	2	28-29	E=N 1 st byte: longitudinal acceleration clipping flag; 2 nd byte: lateral acceleration	FFFF ₁₆	FFFE ₁₆
0xFA15											

TEST METHODS

Test Methods

IMPACT TEST

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.

DRIVER OPERATION DATA TEST

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*

BENCH TEST

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!