

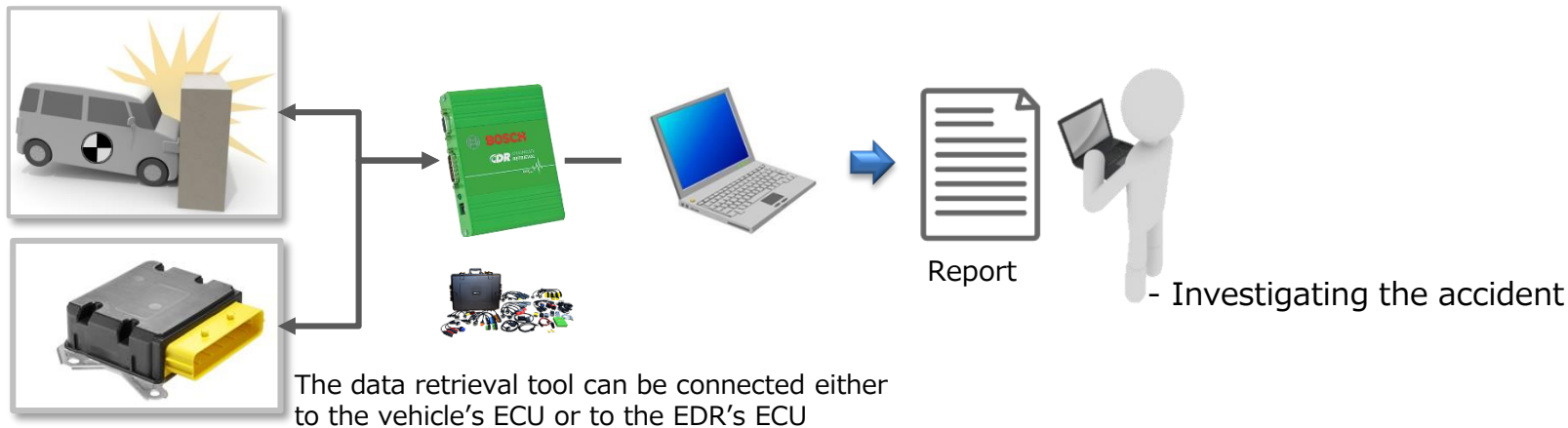
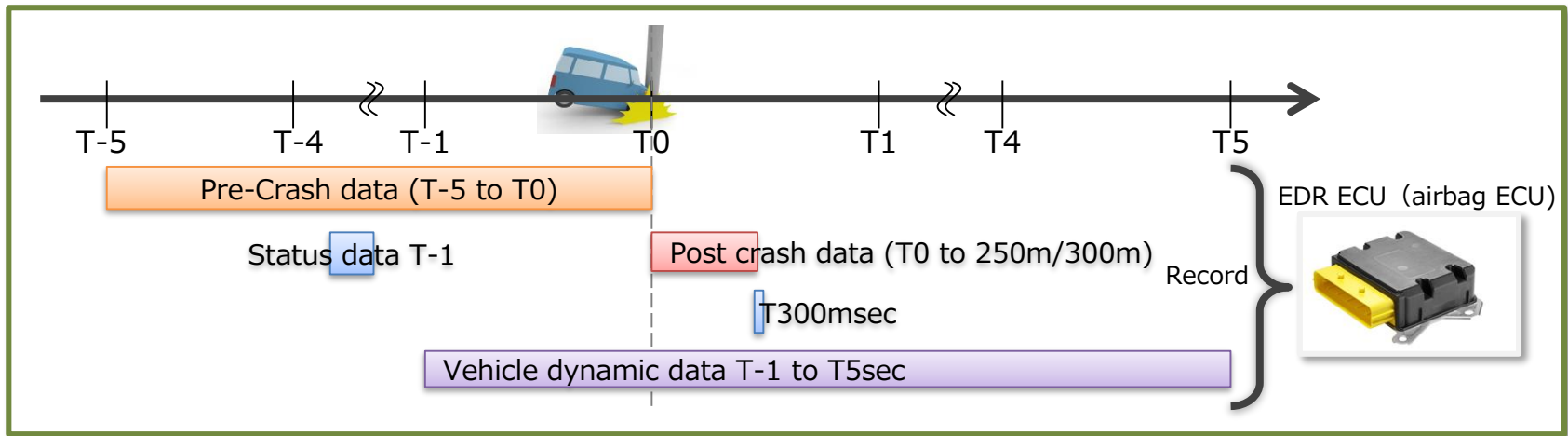
The overview of EDR

2019/07/08

Japan

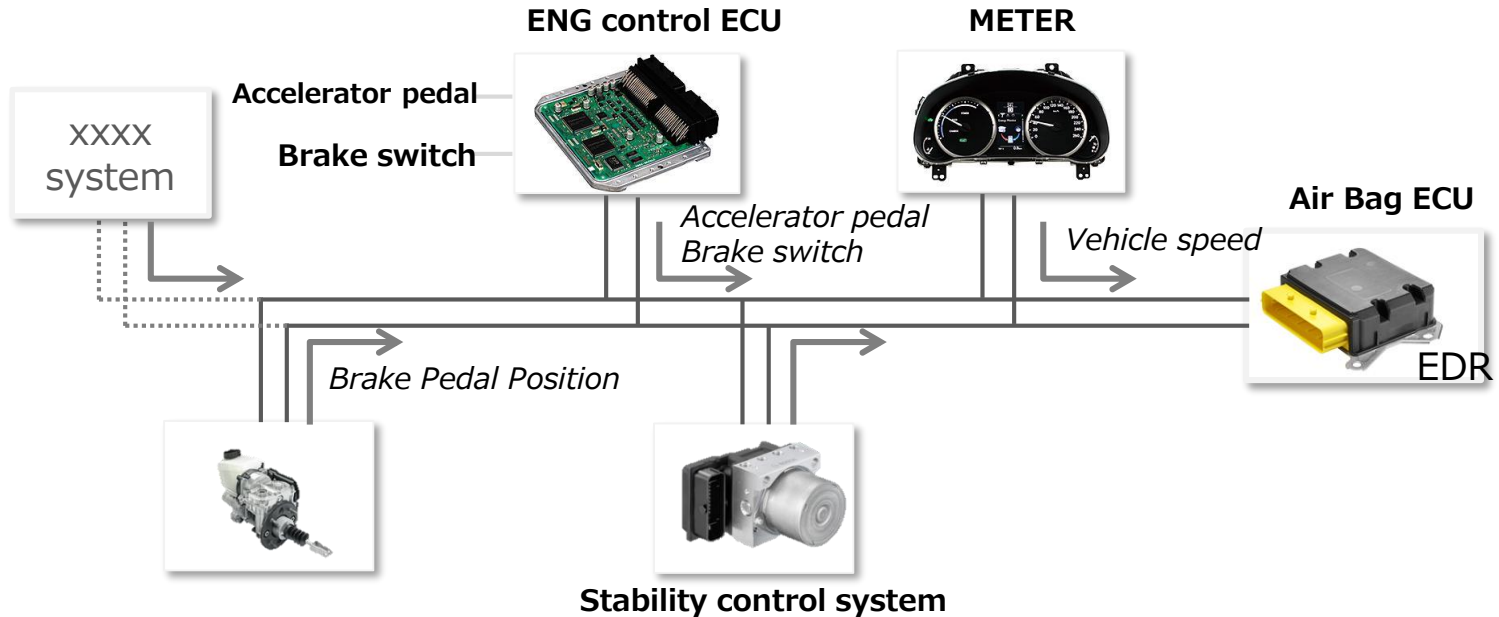
Overview of EDR

1. Overview of EDR (Event Data Recorder)



Overview of EDR

Network of EDR-compatible technologies (on the vehicle side)



For EDR to receive and record data of other systems, the ECU of each system must be connected to CAN and data transmitted.

Overview of EDR

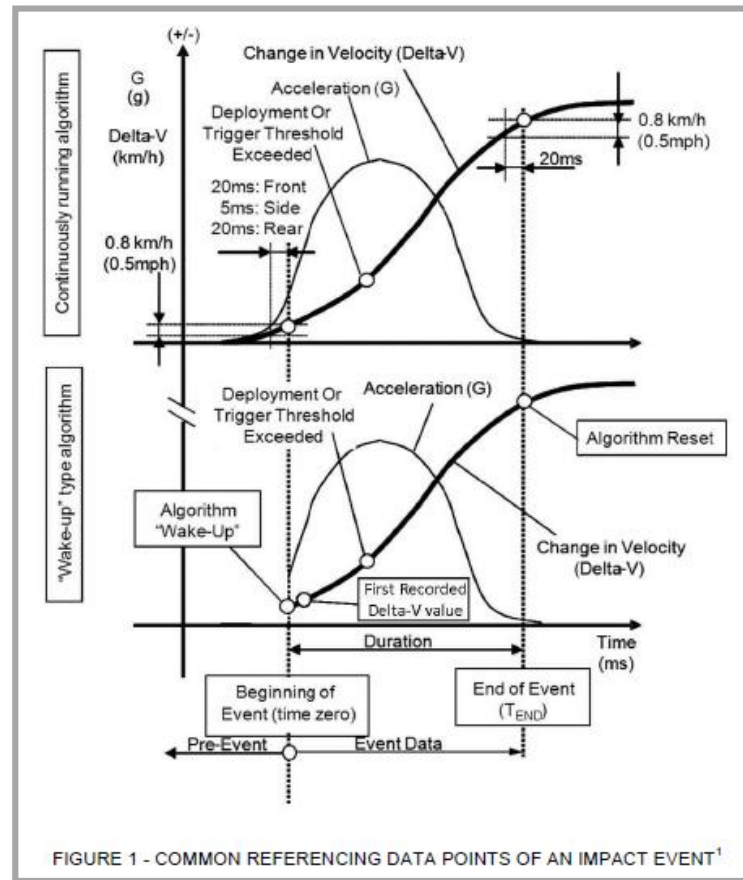
EDR-compatible technologies (on the ECU side)

How the airbag's ECU software records data (equivalent to Part 563)

Beginning of Impact Event

End of Impact Event

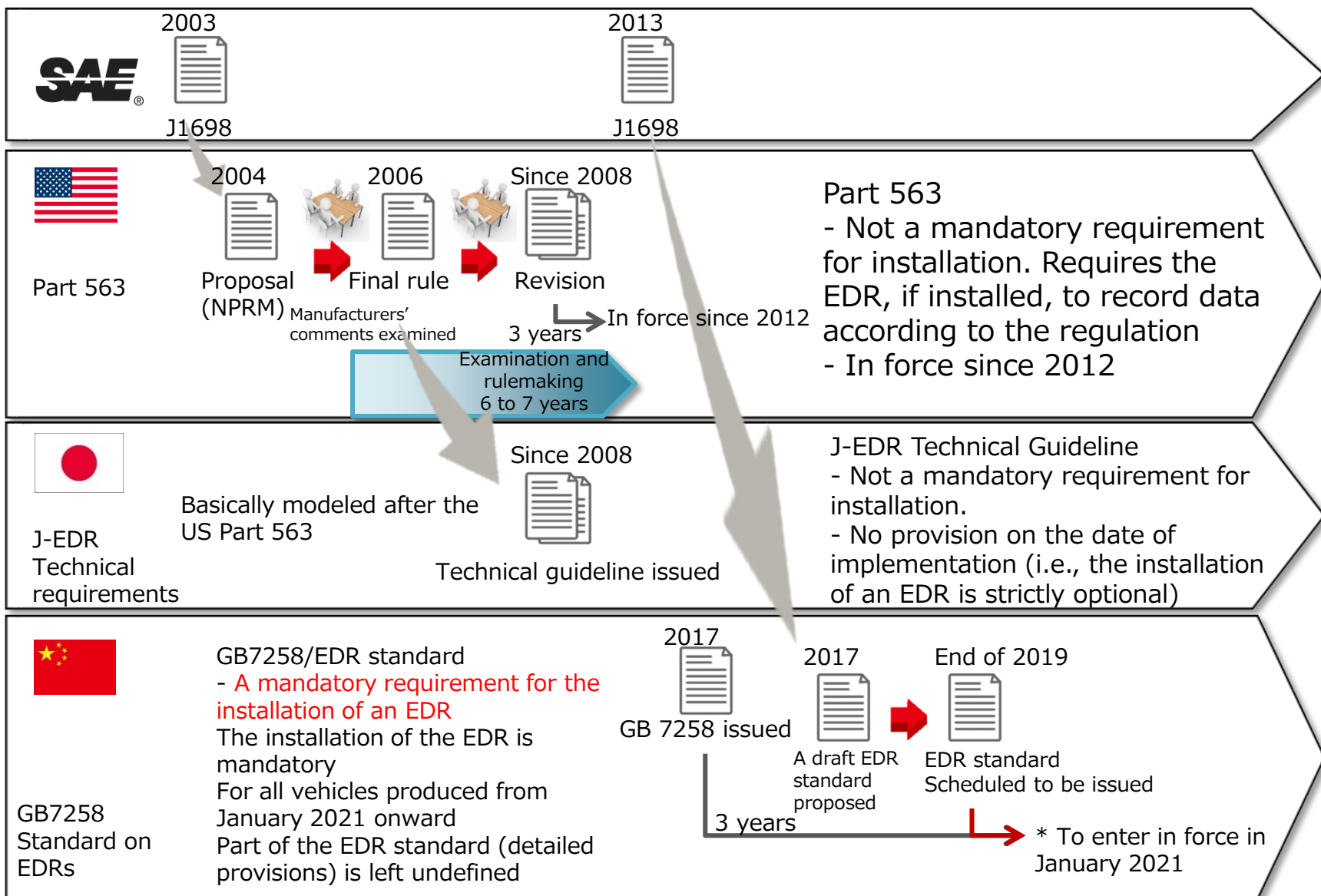
Impact Event



Upon detecting a specified force of impact, the airbag sensor starts recording data (but doesn't if the impact is below a specified value).

Overview of EDR

2. History of EDR-related standardization





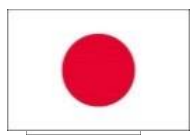
■ Purpose of J-EDR

To promote the spread and use of EDRs better suited for the analysis of traffic accidents, enhance accidents analysis by industry, government, and academia, and thus contribute to the improvement of vehicle safety measures by defining technical requirements for a device or function that records the measurements, in chronological order before, during, and after an event happens, such as collision involving the deployment of an air bag, of vehicle speed and other vehicle conditions (event data recorder or EDR).

■ Positioning of J-EDR technical requirements

Those of EDRs which are installed in motor vehicles exclusively used for carriage of passengers (excluding vehicles with a seating capacity of 10 or more including the driver, motorcycle, motorcycles with side cars, three-wheeled vehicles, mini-sized motor vehicles with caterpillars or threads, and towed vehicles) and freight motor vehicles of 3.5t or less in weight and which meet the following provisions will be called J-EDRs and their use will be promoted in the analysis of traffic accidents.

It is left to the discretion of manufacturers whether they equip their vehicles with EDRs or whether they bring such EDRs in compliance with the J-EDR technical requirements.



■ Items to Be Recorded

➤ Required items

1	Longitudinal delta V
2	Maximum longitudinal delta V
3	Time to maximum longitudinal delta V
4	Vehicle display speed
5	Engine throttle, fully open % (or accelerator pedal, fully open %)
6	Main brake, on/on
7	Ignition cycle, collision
8	Ignition cycle, download
9	Safety belt status, driver, buckled/not buckled
10	Frontal airbag warning lamp, on/on
11	Frontal airbag deployment - Time to deployment in case of a single-stage airbag or time to first stage deployment if it is a multiple-stage airbag, driver's seat
12	Frontal airbag deployment - Time to deployment in case of a single-stage airbag or time to first-stage deployment in case of a multiple-stage airbag, passenger seat



■ Items to Be Recorded

➤ Prescribed items, if recorded

1	Lateral acceleration
2	Longitudinal acceleration
3	Vertical acceleration
4	Delta V, lateral
5	Maximum delta V, lateral
6	Time to maximum delta V, lateral
7	Time to maximum Delta V, resultant
8	Engine RPM
9	Vehicle roll angle
10	ABS, engaged/non-engaged
11	Stability control system, on/off/engaged
12	Steering wheel angle
13	Safety belt status, passenger seat, buckled/not buckled
14	Airbag suppression switch status, passenger seat, on/off
15	Frontal airbag deployment, time to stage n, driver's seat *2

*2 If installed



■ Items to Be Recorded

➤ Prescribed items, if recorded (cont'd)

16	Frontal airbag deployment, time to stage n, passenger seat *2
17	Frontal airbag deployment, nth stage processing, driver's seat, yes/no (Whether the deployment in the nth stage is aimed at restraining the occupant or at possessing the propellant)
18	Frontal airbag deployment, nth stage processing, passenger seat, yes/no (Whether the deployment in the nth stage is aimed at restraining the occupant or at possessing the propellant)
19	Side airbag deployment, time to deployment, driver's seat
20	Side airbag deployment, time to deployment, passenger seat
21	Side curtain/tube airbag deployment, time to deployment, driver's seat
22	Side curtain/tube airbag deployment, time to deployment, passenger seat
23	Pretensioner deployment, time to first move, driver's seat
24	Pretensioner deployment, time to first move, passenger seat
25	Seat track position switch, foremost status, driver's seat
26	Seat track position switch, foremost status, passenger seat
27	Occupant's build classification, driver's seat, female 5 percentile size, yes/no
28	Occupant's build classification, passenger seat, child, yes/no
29	Occupant position classification, driver's seat, out of normal position, yes/no
30	Occupant's position classification, passenger seat, out of normal position, yes/no

*2 If installed



■ Items to Be Recorded

➤ Prescribed items, if recorded (cont'd)

31	Multiple accidents - Number of accidents, 1/2
32	Time from the accident 1 to the accident 2
33	Complete file recorded, yes/no
34	Pre-crash warning, on/off/engaged
35	AEBS, on/off/engaged

Note 1: "If recorded" means cases where data is recorded in non-volatile memory to be downloaded later.

Note 2: "Pre-crash warning" is a warning that is engaged when the system judges that the vehicle risks colliding with an obstacle.

Note 3: "AEBS" is a device that slows down the vehicle by automatically braking the vehicle when the system judges that the vehicle risks colliding with an obstacle.



■ Items to Be Recorded

➤ Required items

1	Delta-V, longitudinal
2	Maximum delta-V, longitudinal
3	Time, maximum delta-V
4	Speed, vehicle indicated
5	Engine throttle, % full (or accelerator pedal, % full)
6	Service brake, on/off
7	Ignition cycle, crash
8	Ignition cycle, download
9	Safety belt status, driver
10	Frontal air bag warning lamp, on/off 2
11	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.
12	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, right front passenger.
13	Multi-event, number of events
14	Time from event 1 to 2
15	Complete file recorded (yes, no)



■ Items to Be Recorded

➤ Prescribed items, if recorded

1	Lateral acceleration
2	Longitudinal acceleration
3	Normal acceleration
4	Delta-V, lateral
5	Maximum delta-V, lateral
6	Time, maximum delta-V, lateral
7	Time for maximum delta-V, resultant
8	Engine RPM
9	Vehicle roll angle
10	ABS activity (engaged, non-engaged)
11	Stability control (on, off, or engaged)
12	Steering input
13	Safety belt status, right front passenger (buckled, not buckled).
14	Frontal air bag suppression switch status, right front passenger (on, off, or auto).
15	Frontal air bag deployment, time to nth stage, driver 4.



■ Items to Be Recorded

➤ Prescribed items, if recorded (cont'd)

16	Frontal air bag deployment, time to nth stage, right front passenger 4.
17	Frontal air bag deployment, nth stage disposal, driver, Y/N.
18	Frontal air bag deployment, nth stage disposal, right front passenger, Y/N.
19	Side air bag deployment, time to deploy, right front passenger.
20	Side curtain/tube air bag deployment, time to deploy, driver side.
21	Side curtain/tube air bag deployment, time to deploy, right side.
22	Pretensioner deployment, time to fire, driver.
23	Pretensioner deployment, time to fire, right front passenger.
24	Seat track position switch, foremost, status, driver.
25	Seat track position switch, foremost, status, right front passenger.
26	Occupant size classification, driver
27	Occupant size classification, right front passenger.
28	Occupant position classification, driver
29	Occupant position classification, right front passenger.



- Classifies record items into rank A and rank B
- Divides required record items by the time the vehicle is newly type-approved (phase-in)

■ **For existing models, requires to record only 6 items**

New models	<p>From January 1, 2021 onward, vehicles applying for a new type approval will be required to meet the requirements other than B-class data elements and paragraph 4.5 (read-out requirements).</p> <p>From January 1, 2023 onward, vehicles applying for a new type approval will be required to meet all the requirements stipulated in this standard.</p>
Existing models	<p>All vehicles that are type-approved by the end of 2020 will be required to meet the following recording requirements from January 1, 2021 onward. The above must be proved by any of the high-speed collision test 5.1, driving operation data test 5.2, and bench test 5.3. There is no prescription as to data element formats, recording categories, and number of recordings.</p> <p><Required record items> Longitudinal Delta-V, Longitudinal maximum Delta-V, Time to Maximum longitudinal Delta-V, Vehicle speed, Brake pedal on/off, VIN</p>



■ Rank A Item

1	Longitudinal delta-V
2	Maximum recorded longitudinal delta-V
3	Time to maximum recorded longitudinal delta-V
4	Clipping flag
5	Vehicle speed
6	Traveling brake, on/off
7	Driver's seat belt status
8	Accelerator pedal position, percentage of full throttle position
9	Rotations per minute (RPM)
10	Energizing cycle during the event
11	Energizing cycle while loading
12	Complete status of recorded event data
13	Time interval between the previous event to the current event
14	Vehicle identification number
15	Hardware number of ECU recording EDR data
16	Serial number of ECU recording EDR data
17	Software number of ECU recording EDR data



■ Rank B Item

1	Longitudinal acceleration
2	Lateral acceleration
3	Delta-V, lateral
4	Maximum recorded I delta-V, lateral
5	Maximum recorded total delta-V squared
6	Time to maximum recorded delta-V, lateral
7	Time to maximum recorded total delta-V
8	Yaw angular velocity
9	Steering angle
10	T _{end}
11	Year
12	Month
13	Day
14	O'clock
15	Minutes
16	Seconds
17	Gear position
18	Engine throttle valve position, percentage of fully open position
19	Brake pedal position



■ Rank B Item

20	Parking system status
21	Brake priority display
22	Steering signal switch status
23	Time to deploy driver's seat belt pretensioner
24	Time to deploy driver's seat frontal airbag (First stage)
25	Time to deploy driver's seat frontal airbag (Second stage)
26	Time to deploy driver's seat side air bag
27	Time to deploy driver's seat side air curtain
28	Passenger seat belt status
29	Time to deploy passenger seat belt pretensioner
30	Passenger seat frontal airbag suppression status
31	Time to deploy passenger seat frontal airbag (First stage)
32	Time to deploy passenger seat frontal airbag (Second stage)
33	Time to deploy passenger seat side air bag
34	Time to deploy passenger seat side air curtain
35	Occupant protection system warning status
36	Tire pressure monitoring system warning status
37	Brake system warning status



■ Rank B Item

38	Constant speed cruise system status
39	Adaptive cruise system status
40	Antilock brake system status
41	AEBS status
42	Electronic stability control system status
43	Traction control system status
44	Pre-event synchronization timer time

Thank you for your attention !