Proposal for amendments to document EDR-DSSAD-01-03

The modifications to the existing text of the draft Regulation (see EDR-DSSAD-01-03) are marked in bold for new or strikethrough for deleted characters.

I. Proposal

6. Test Procedure

Item 6.1, amend to read:

6.1   Vehicles **subject to** the requirements of UN Regulation No. 94, **95, 137 or national or regional crash regulations or standards**

~~The retrieved data elements shall include all required data elements per Table 1 except for the "Engine throttle, percent full",~~ **"Accelerator pedal, percent full"**, **"Vehicle roll angle"**, **"ABS activity (on, off, engaged)"**, **"Stability control (on, off engaged)"**, **"Steering input"**, ~~"E~~engine RPM", and ~~"S~~service brake, on/off", ~~in the format specified in Table 1.~~

shall conduct the impact test. After the test, the following requirement shall be met:

-The complete data recorded element must read "yes" after the impact test.

-The acquired (or computed) longitudinal (or lateral) delta-V data shall be within the tolerance of [±10km/h] when compared with the laboratory reference longitudinal (or lateral) delta-V.

-Delta-V data shall not produce clipping, or acceleration data shall not exceed range of acceleration sensor.

Item 6.2, amend to read:

[6.2   Vehicles not **subject to** the requirements of UN Regulation No. 94 **, 95 or 137,** shall be approved in agreement between the manufacturer and the Technical Service.]

Item 6.3, amend to read:

6.3   Driving operation data test

6.3.1   The threshold can be triggered by adopting the following four methods or other methods during test:

-The vehicle is impacted to trigger the threshold;

-The vehicle is fixed on the trolley, then the trolley is impacted to trigger the threshold;

-The EDR system is triggered physically.

-The EDR system is triggered by inputting signal

6.3.2   The test method shall test the following data elements: "Engine throttle, percent full", "Accelerator pedal, percent full", "Vehicle roll angle", "ABS activity (on, off, engaged)", "Stability control (on, off engaged)", "Steering input", "Engine RPM", "Service brake, on/off", Safety belt buckle and other vehicle electronic/electric system can be set ON/OFF by the driver, etc.

6.3.3   After test, the data that EDR recorded shall be identical with the setting before test.

6.4   Bench test

6.4.1   EDR system trigger test

6.4.2   Test of number of storage events

6.4.3   Storage coverage mechanism test

6.4.3.1   Unlocked event overwrite test

6.4.3.2   Locked event overwrite test

6.4.4   Power-off storage test

II.   Justification

A.   Paragraph 6.1.

1. Although there will be both the longitudinal and lateral delta-V during the test set by UN Regulation No. 94, the EDR system will not always be triggered to record lateral delta-V data nor the side airbag or curtain will be deployed, hence the lateral delta-V data shall be verified separately in the tests set by UN Regulation No. 95. Furthermore, tests set by either UN Regulation No. 94 or 137 can be selected to verify the accuracy of longitudinal delta-V data.

2. Vehicle dynamic parameters acceleration and delta-V are important for accident recovery analysis assistance, medical assistance, collision safety research, etc. which requires the accuracy of EDR data. Verification of the accuracy of these data should be done after impact test.

3. The impact test set by the UN Regulation is the lowest requirement of the vehicle's passive safety, hence the Delta-V data or acceleration data shall not clip or outrange. To maximize the possibility of accurate recording of these date in real world accidents.

B.   Paragraph 6.3.

1.   "Engine throttle, percent full", "Accelerator pedal, percent full", "ABS activity (on, off)", "Stability control (on, off)", "Steering input", "Engine RPM", "Service brake, on/off" , "safety belt buckle (on, off)" , "steering signal" and the "on/off status of other vehicle electronic/electric system" can't be validated in the impact test set by UN Regulation No. 94, 95, 137. Because the systems which produce Driver operation data are not working during the impact test, or the related data can't be set for the test procedure. But these driver operation data elements are important for investigating the reason of the accident.

Furthermore, these data elements can't be validated in the bench test either. Because in the bench test, the simulation of the relevant data is not the driver's actual operation information. It can only ensure that the component functions meet the relevant requirements, but it does not represent the vehicle integration is OK.

There are some reports about EDR's wrong record of the event data in some accidents. The driving operation data test is used for investigation.

This test is to ensure (a) The vehicle sends the Driving operation data to EDR correctly (Vehicle level), (b) EDR can record this data correctly (System level), so that the EDR's accurate record of driving operation data can be validated.
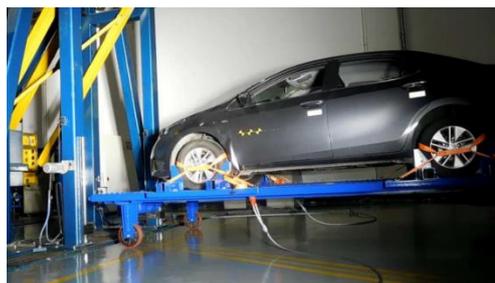
C.   Paragraph 6.4.

Bench test is important for verification of the EDR system's functional and performance requirement. Bench test is using a thruster to thrust the EDR controller with a controlled impact waveform. Bench test can conduct performance requirement test by using a controlled acceleration thrust and can do functional requirement test with much lower cost than impact test.

（1） functional requirement

req1. System storage capabilities --> 6.4.2 Test of number of storage events

req2. Erasing means --> 6.4.3.1   Unlocked event overwrite test / 6.4.3.2 Locked event overwrite test

（2） performance requirement

req3. Trigger to initiate the data storage --> 6.4.1 EDR   system   trigger   test （This can be tested by physically thrusting the EDR controller with a controlled impact waveform whose velocity at 150ms is 8kph）

req4. Battery restitution --> 6.4.4   Power-off storage test

（This can be tested by physically thrusting the EDR controller with a controlled impact waveform meanwhile cut off the power supply of the EDR controller） .