

# **U.S. DEPARTMENT OF TRANSPORTATION**

## **NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**

### **LABORATORY TEST PROCEDURE**

### **FOR**

### **Part 563, EVENT DATA RECORDERS**



**ENFORCEMENT**  
**Office of Vehicle Safety Compliance**

**1200 New Jersey Ave., SE, NVS-220**  
**Washington, DC 20590**

**REVISION CONTROL LOG  
FOR OVSC LABORATORY  
TEST PROCEDURES**

**TP-563  
EVENT DATA RECORDERS**

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01				
02				
03				
04				
05				
06				
07				
08				

**OVSC LABORATORY TEST PROCEDURE NO. 563  
TABLE OF CONTENTS**

	PAGE
1. PURPOSE AND APPLICATION.....	1
2. GENERAL REQUIREMENTS .....	1
3. SECURITY.....	3
4. GOOD HOUSEKEEPING.....	3
5. TEST SCHEDULING AND MONITORING.....	3
6. TEST DATA DISPOSITION.....	4
7. GOVERNMENT FURNISHED PROPERTY.....	5
8. CALIBRATION OF TEST INSTRUMENTS .....	6
9. TEST EQUIPMENT .....	7
10. PHOTOGRAPHIC COVERAGE.....	7
11. DEFINITIONS.....	8
12. PRETEST REQUIREMENTS .....	12
13. COMPLIANCE TEST EXECUTION .....	12
14. POSTTEST REQUIREMENTS.....	13
15. REPORTS .....	13
16. DATA SHEETS.....	26
APPENDIX 1 - TABLES FOR PART 563.....	34

## 1. PURPOSE AND APPLICATION

This document is provided by the National Highway Traffic Safety Administration (NHTSA), Office of Vehicle Safety Compliance (OVSC) for the purpose of presenting procedures for uniform testing and providing suggestions for the use of specific equipment for contracted testing laboratories. It contains requirements based on the test procedures specified in the Federal Motor Vehicle Safety Standard(s) (FMVSS) and applicable safety Regulations. The OVSC test procedures include requirements that are general in scope to provide flexibility for contracted laboratories to perform compliance testing and are not intended to limit or restrain a contractor from developing or utilizing any testing techniques or equipment which will assist in procuring the required compliance test data. These test procedures do not constitute an endorsement or recommendation for use of any particular product or testing method.

The purpose of Part 563, EVENT DATA RECORDERS (EDR) is to help ensure that ERDs record, in a readily usable manner, data valuable for effective crash investigations and for analysis of safety equipment performance (e.g., advanced restraint systems). These data will help provide a better understanding of the circumstances in which crashes and injuries occur and will lead to safer vehicle designs.

Prior to conducting compliance testing, contracted laboratories are required to submit a detailed test procedure to the Contracting Officer's Technical Representative (COTR) to demonstrate concurrence with the OVSC laboratory test procedure and the applicable FMVSS or regulation. If any contractor views any part of an OVSC laboratory test procedure to be in conflict with a FMVSS or observes deficiencies in a laboratory test procedure, the contractor is required to advise the COTR and resolve the discrepancy prior to the start of compliance testing or as soon as practicable. The contractor's test procedure must include a step-by-step description of the methodology and detailed check-off sheets. Detailed check-off sheets shall also be provided for the testing instrumentation including a complete listing of the test equipment with make and model numbers. The list of test equipment shall include instrument accuracy and calibration dates. All equipment shall be calibrated in accordance with the manufacturer's instructions. There shall be no contradictions between the laboratory test procedure and the contractor's in-house test procedure. Written approval of the in-house test procedures shall be obtained from the COTR before initiating the compliance test program.

**NOTE:** The OVSC Laboratory Test Procedures, prepared for the limited purpose of use by independent laboratories under contract to conduct compliance tests for the OVSC, are not rules, regulations or NHTSA interpretations regarding the meaning of a FMVSS or regulation. The Laboratory Test Procedures are not intended to limit the requirements of the applicable FMVSS or regulations. In some cases, the OVSC Laboratory Test Procedures do not include all of the various minimum performance requirements. Recognizing applicable test tolerances, the Laboratory Test Procedures may specify test conditions that are less severe than the minimum requirements of FMVSS or regulation. In addition, the Laboratory Test Procedures may be modified by the OVSC at any time without notice, and the COTR may direct or authorize contractors to deviate from these procedures, as long as the tests are performed in a manner consistent with the regulation itself and within the scope of the contract. Laboratory Test Procedures may not be relied upon to create any right or benefit in any person. Therefore, compliance of a vehicle or item of motor vehicle equipment is not necessarily guaranteed if the manufacturer limits its certification tests to those described in the OVSC Laboratory Test Procedures.

## 2. GENERAL REQUIREMENTS

49 CFR Part 563 specifies uniform, national requirements for vehicles equipped with EDRs concerning the collection, storage, and retrievability of onboard motor vehicle crash event data. It also specifies requirements for vehicle manufacturers to make tools and/or methods commercially available so that crash investigators and researchers are able to retrieve data from EDRs.

**APPLICABILITY**

49 CFR Part 563 applies to the following vehicles manufactured on or after September 1, 2012, if they are equipped with an event data recorder: passenger cars, multipurpose passenger vehicles, trucks, and buses with a GVWR of 3,855 kg (8,500 pounds) or less and an unloaded vehicle weight of 2,495 kg (5,500 pounds) or less, except for walk-in van-type trucks or vehicles designed to be sold exclusively to the U.S. Postal Service. This part also applies to manufacturers of those vehicles. However, vehicles manufactured before September 1, 2013 that are manufactured in two or more stages or that are altered (within the meaning of 49 CFR 567.7) after having been previously certified to the Federal motor vehicle safety standards in accordance with part 567 of this chapter need not meet the requirements of this part.

**STANDARD REQUIREMENTS**

When tested to the procedures contained herein, each vehicle equipped with an Event Data Recorder (EDR) to which the standard applies:

- shall record and allow retrieval of all Table I and any stored Table II data elements specified in the regulation. (Part 563.7)
- shall report all recorded stored data elements in the format specified by Table III of the regulation. (Part 563.8)
- shall meet the accuracy requirements for all recorded data elements as specified in Table III of the regulation. (Part 563.8)
- shall allow retrieval after the test for the time frame required by the regulation when the tested vehicle is stored in accordance with the requirements of the regulation, (Part 563.10 (c))
- shall include the required statements in the Owner’s Manual if one is provided by the vehicle manufacturer. (Part 563.11)

**APPLICABLE BARRIER TESTS**

Vehicles will be tested to the requirements of 49 CFR Part 563 in conjunction with testing to either FMVSS 208 or 214 MDB.. (563.10 (a) and (b))

Table 1 indicates the barrier tests that are utilized to determine the performance of a vehicle with respect to the requirements of 49 CFR 563.

**TABLE 1**

Type of Test	Applicable FMVSS	Description	Requirement
Frontal Rigid Barrier	208	Rigid barrier crash at any speed up to and including 56 km/h, in a line of travel perpendicular to the barrier face and up to and including 48 km/h at any angle between +/- 30 degrees from the line of travel perpendicular to the barrier face	Part 563 S563.10 a, b
Frontal Offset	208	40% offset deformable barrier crash at any speed up to and including 40 km/h, in a line of travel perpendicular to the barrier face	
Side Deformable Barrier	214 MDB	Any single moving deformable barrier crash at any speed up to and including 54km/h, side impact (passenger car)	

## FINAL TEST REPORT

All Part 563 test data required by this test procedure shall be incorporated within the final test report of the specific barrier test performed.

## METRIC SYSTEM OF MEASUREMENT

Section 5164 of the Omnibus Trade and Competitiveness Act (Pub. L. 100-418) establishes that the metric system of measurement is the preferred system of weights and measures for trade and commerce in the United States. Executive order 12770 directs Federal agencies to comply with the Act by converting regulatory standards to the metric system after September 30, 1992. In a final rule published on March 15, 1990 (60 FR 13639), NHTSA completed the first phase of metrication, converting English measurements in several regulatory standards to the metric system. Since then, metrication has been applied to other regulatory standards (63 FR 28912).

Accordingly, the OVSC laboratory test procedures include revisions to comply with governmental directives in using the metric system. Regulatory standards converted to the metric units are required to use metric units in the test procedures, whereas standards using English are allowed to use English measurements or to use English measurements in combination with metric equivalents in parentheses.

All final compliance test reports are required to include metric measurements for standards using metrication.

Note: The methodology for rounding measurements in the test reports shall be made in accordance with ASTM E29-06b, "Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications."

## 3. SECURITY

The Contractor shall provide appropriate security measures to protect the OVSC test vehicles and other Government Furnished Property (GFP) from unauthorized personnel during the entire compliance test program. The Contractor is financially responsible for any acts of theft and/or vandalism, which occur during the storage of test vehicles and GFP. Any security problems, which arise, shall be reported by telephone to the Industrial Property Manager (IPM), Office of Acquisition Management, within two working days after the incident. A letter containing specific details of the security problem will be sent to the IPM (with copy to the COTR) within 48 hours. The Contractor shall protect and segregate all information from compliance testing before and after each vehicle test. No information concerning the vehicle safety compliance test program shall be released to anyone except the COTR, unless specifically authorized by the COTR or the COTR's Division Chief.

**NOTE:** No individuals, other than contractor personnel directly involved in the compliance testing program, shall be allowed to witness any vehicle compliance test unless specifically authorized by the COTR.

## 4. GOOD HOUSEKEEPING

Contractors shall maintain the entire vehicle compliance testing area, dummy calibration laboratory, test fixtures and instrumentation in a neat, clean and painted condition with test instruments arranged in an orderly manner consistent with good test laboratory housekeeping practices.

## 5. TEST SCHEDULING AND MONITORING

The contractor shall submit a test schedule to the COTR prior to conducting the first compliance test. Tests shall be completed at intervals as required in the contract. If not specified, the first test

shall be conducted within 6 weeks after receiving the first delivered unit. Subsequent tests shall be completed in no longer than 1 week intervals unless otherwise specified by the COTR. Scheduling of tests shall be adjusted to permit vehicles (or equipment, whichever applies) to be tested to other FMVSSs as may be required by the OVSC. All compliance testing shall be coordinated with the COTR in order to allow monitoring by the COTR and/or other personnel if desired. The contractor shall submit a monthly test status report and a vehicle status report (if applicable) to the COTR. The vehicle status report shall be submitted until disposal of all vehicles is complete. The status report form is provided in the forms section.

## **6. TEST DATA DISPOSITION**

The Contractor shall make all preliminary compliance test data available to the COTR on location within 30 minutes after the test. Final test data, including digital printouts and computer generated plots, shall be available to the COTR in accordance with the contract schedule or if not specified within two working days. Additionally, the Contractor shall analyze the preliminary test results as directed by the COTR.

All backup data sheets, strip charts, recordings, plots, technicians' notes, etc., shall be either sent to the COTR or destroyed at the conclusion of each delivery order, purchase order, etc.

The contractor shall protect and segregate the data that evolves from compliance testing before and after each test.

### **TEST DATA LOSS**

#### **A. INVALID TEST DESCRIPTION**

An invalid compliance test is one, which does not conform precisely to all requirements/specifications of the OVSC Laboratory Test Procedure and Statement of Work applicable to the test.

#### **B. INVALID TEST NOTIFICATION**

The Contractor shall notify NHTSA of any test not meeting all requirements/specifications of the OVSC Laboratory Test Procedure and Statement of Work applicable to the test, by telephone, within 24 hours of the test and send written notice to the COTR within 48 hours of the test completion.

#### **C. RETEST NOTIFICATION**

The Contracting Officer of NHTSA is the only NHTSA official authorized to notify the Contractor that a retest is required. The retest shall be completed within 2 weeks after receipt of notification by the Contracting Officer that a retest is required.

#### **D. WAIVER OF RETEST**

NHTSA, in its sole discretion, reserves the right to waive the retest requirement. This provision shall not constitute a basis for dispute over the NHTSA's waiving or not waiving any requirement.

#### **E. TEST VEHICLE**

NHTSA shall furnish only one vehicle for each test ordered. The Contractor shall furnish the test vehicle required for the retest. The retest vehicle shall be equipped as the original vehicle. The original vehicle used in the invalid test shall remain the property of NHTSA, and the retest vehicle shall remain the property of the Contractor. The Contractor shall retain the retest vehicle for a period not exceeding 180 days if it fails the test. If the retest vehicle passes the test, the Contractor may dispose of it upon notification from the COTR that the test report has been accepted.

#### **F. TEST REPORT**

No test report is required for any test that is determined to be invalid unless NHTSA specifically decides, in writing, to require the Contractor to submit such report. The test data from the invalid test must be safeguarded until the data from the retest has been accepted by the COTR. The report and other required deliverables for the retest vehicle are required to be submitted to the COTR within 3 weeks after completion of the retest.

#### G. DEFAULT

The Contractor is subject to the default and subsequent re-procurement costs for non-delivery of valid or conforming tests (pursuant to the Termination for Default clause in the contract).

#### H. NHTSA'S RIGHTS

None of the requirements herein stated shall diminish or modify the rights of NHTSA to determine that any test submitted by the Contractor does not conform precisely to all requirements/specifications of the OVSC Laboratory Test Procedure and Statement of Work applicable to the test.

### 7. GOVERNMENT FURNISHED PROPERTY

GFP consists of test vehicles. The handling and disposition of GFP is governed by contractual agreement. The contractor is responsible for the following.

#### A. ACCEPTANCE OF TEST VEHICLES

The contractor has the responsibility of accepting each GFP test vehicle whether delivered by a new vehicle dealership or another vehicle transporter. In both instances, the Contractor acts on behalf of the OVSC when signing an acceptance of the GFP test vehicle delivery order. When a GFP vehicle is delivered, the contractor must verify:

1. All options listed on the "window sticker" are present on the test vehicle.
2. Tires and wheel rims are new and the same as listed.
3. There are no dents or other interior or exterior flaws in the vehicle body.
4. The vehicle has been properly prepared and is in running condition.
5. The glove box contains an owner's manual, warranty document, consumer information, and extra set of keys.
6. Proper fuel filler cap is supplied on the test vehicle.
7. Spare tire, jack, lug wrench and tool kit (if applicable) is located in the vehicle cargo area.
8. The VIN (vehicle identification number) on the vehicle condition report matches the VIN on the vehicle.
9. The vehicle is equipped as specified by the COTR.

A Vehicle Condition form will be supplied to the Contractor by the COTR when the test vehicle is transferred from a new vehicle dealership or between test contracts. The upper half of the form is used to describe the vehicle as initially accepted. The lower half of the Vehicle Condition form provides space for a detailed description of the post-test condition. The contractor must complete a Vehicle Condition form for each vehicle and deliver it to the COTR with the Final Test Report or the report will NOT be accepted for payment. If the test vehicle is delivered by a government contracted transporter, the contractor should check for damage which may have occurred during transit. GFP vehicle(s) shall not be driven by the contractor on public roadways unless authorized by the COTR.

#### B. NOTIFICATION OF COTR

The COTR must be notified within 24 hours after a vehicle (and/or equipment item) has been delivered. In addition, if any discrepancy or damage is found at the time of delivery, a copy of the Vehicle Condition form shall be sent to the COTR immediately.



## 8. CALIBRATION OF TEST INSTRUMENTS

Before the Contractor initiates the vehicle safety compliance test program, a test instrumentation calibration system must be implemented and maintained in accordance with established calibration practices. The calibration system shall include the following as a minimum:

A. Standards for calibrating the measuring and test equipment shall be stored and used under appropriate environmental conditions to assure their accuracy and stability.

B. All measuring instruments and standards shall be calibrated by the Contractor, or a commercial facility, against a higher order standard at periodic intervals not exceeding 12 months for instruments and 12 months for the calibration standards except for static types of measuring devices such as rulers, weights, etc., which shall be calibrated at periodic intervals not to exceed two years. Records, showing the calibration traceability to the National Institute of Standards and Technology (NIST), shall be maintained for all measuring and test equipment.

Accelerometers and other transducers shall be calibrated every twelve months or after a vehicle fails to meet the PART 563 performance requirements or after any indication from calibration checks that there may be a problem with the accelerometer or transducer whichever occurs sooner.

C. All measuring and test equipment and measuring standards shall be labeled with the following information:

1. Date of calibration
2. Date of next scheduled calibration
3. Name of the technician who calibrated the equipment

D. A written calibration procedure shall be provided by the Contractor, which includes as a minimum the following information for all measurement and test equipment:

1. Type of equipment, manufacturer, model number, etc.
2. Measurement range
3. Accuracy
4. Calibration interval
5. Type of standard used to calibrate the equipment (calibration traceability of the standard must be evident)
6. The actual procedures and forms used to perform the calibrations.

E. Records of calibration for all test instrumentation shall be kept by the Contractor in a manner that assures the maintenance of established calibration schedules.

F. All such records shall be readily available for inspection when requested by the COTR. The calibration system shall need the acceptance of the COTR before vehicle safety compliance testing commences.

G. Test equipment shall receive a system functional check out using a known test input immediately before and after the test. This check shall be recorded by the test technician(s) and submitted with the final report.

H. The contractor may be directed by NHTSA to evaluate its data acquisition system. Further guidance is provided in the International Standard ISO 10012-1, "Quality Assurance Requirements for Measuring Equipment" and American National Standard ANSI/NCSL Z540-1, "Calibration Laboratories and Measuring and Test Equipment General Requirements."

NOTE: In the event of a failure to meet the standard's minimum performance requirements additional calibration checks of some critically sensitive test equipment and instrumentation may be required for verification of accuracy. The necessity for the calibration will be at the COTR's discretion and shall be performed without additional cost.

## 9. TEST EQUIPMENT

### 9.1 EDR Instrumentation Measurement

#### A. Onboard Data Acquisition

The onboard data acquisition system utilized for crash test data collection will be used to collect the data from the reference accelerometers co-located with EDR crash sensor(s), time of impact sensors, and inductive current sensors for detecting deployment of restraint system components.

### 9.2 OTHER INSTRUMENTATION

The Contractor shall provide the necessary equipment to permanently record and display data. The data shall be included in the final test report and on the electronic data media.

## 10. PHOTOGRAPHIC DOCUMENTATION

### 10.1 CAMERA COVERAGE

#### 10.1.1 High-speed photographic coverage:

All High-speed photographic coverage required by the barrier test procedure may be included in this test.

#### 10.1.2 Real-time photographic coverage:

All Real-time photographic coverage required by the barrier test procedure shall be included in the final film submission.

### 10.2 STILL PHOTOGRAPHS

Provide color digital still photographs of pretest and post-test condition of entire vehicle deformation and details that pertain to the tested standards. Photographs of all areas of the test vehicle that may be of importance to the governing barrier test, or Part 563 test, should be taken in excess and included in the test report only if the need arises.

The following still photographic documentation shall be recorded and included in the final test report:

- A. EDR module(s) location.
- B. Installation of reference accelerometer(s) collocated with the EDR primary accelerometer(s).
- C. Installation of the inductive current sensors on the air bag and seat belt pretensioner squib wires.
- D. EDR data download tool.
- E. EDR data download tool connected to the vehicle.
- F. Post-test EDR condition (some vehicle disassembly may be required)
- G. Post-test condition of the reference accelerometers and inductive current sensors
- H. Additional photographs requested by the COTR.

## 11. DEFINITIONS

- 11.1 ABS activity - The anti-lock brake system (ABS) is actively controlling the vehicle's brakes. (563.5 (b))
- 11.2 Air bag warning lamp status - The warning lamp required by FMVSS No. 208 is on or off. (563.5 (b))
- 11.3 Capture - The process of buffering EDR data in a temporary, volatile storage medium, where it is continuously updated at regular time intervals. (563.5 (b))
- 11.4 Delta-V, lateral - The cumulative change in velocity, as recorded by the EDR of the vehicle, along the lateral axis, starting from crash time zero and ending at 0.25 seconds, recorded every 0.01 seconds. (563.5 (b))
- 11.5 Delta-V, longitudinal - The cumulative change in velocity, as recorded by the EDR of the vehicle, along the longitudinal axis, starting from crash time zero and ending at 0.25 seconds, recorded every 0.01 seconds. (563.5 (b))
- 11.6 Deployment time, frontal air bag - The elapsed time from crash time zero to the deployment command, or for multi-staged air bag systems, the deployment command for the first stage. (for both driver and right front passenger) (563.5 (b))
- 11.7 Disposal - The deployment command of the second (or higher, if present) stage of a frontal air bag for the purpose of disposing the propellant from the air bag device. (563.5 (b))
- 11.8 End of event time - The moment at which the resultant cumulative delta-V within a 20 ms time period becomes 0.8 km/h (0.5 mph) or less, or the moment at which the crash detection algorithm of the air bag control unit resets. (563.5 (b))
- 11.9 Engine RPM -
- (1) For vehicles powered by internal combustion engines, the number of revolutions per minute of the main crankshaft of the vehicle's engine; and
  - (2) For vehicles not entirely powered by internal combustion engines, the number of revolutions per minute of the motor shaft at the point at which it enters the vehicle transmission gearbox. (563.5 (b))
- 11.10 Engine throttle, percent full - The driver-requested acceleration as measured by the throttle position sensor on the accelerator pedal compared to the fully-depressed position. (563.5 (b))
- 11.11 Event - A crash or other physical occurrence that causes the trigger threshold to be met or exceeded, or any non-reversible deployable restraint to be deployed, whichever occurs first. (563.5 (b))
- 11.12 Event data recorder (EDR) - A device or function in a vehicle that records the vehicle's dynamic time-series data during the time period just prior to a crash event (e.g., vehicle speed vs. time) or during a crash event (e.g., delta-V vs. time), intended for retrieval after the crash event. For the purposes of this definition, the event data do not include audio and video data. (563.5 (b))
- 11.13 Frontal air bag - An inflatable restraint system that requires no action by vehicle occupants and is used to meet the applicable frontal crash protection requirements of FMVSS No. 208. (563.5 (b))
- 11.14 Gross Vehicle Weight Rating or GVWR - The value specified by the manufacturer as the loaded weight of a single vehicle. (571.3)

- 11.15 Ignition cycle, crash - The number (count) of power cycles applied to the recording device at the time when the crash event occurred since the first use of the EDR. (563.5 (b))
- 11.16 Ignition cycle download - The number (count) of power cycles applied to the recording device at the time when the data was downloaded since the first use of the EDR. (563.5 (b))
- 11.17 Lateral acceleration means the component of the vector acceleration of a point in the vehicle in the y-direction. The lateral acceleration is positive from left to right, from the perspective of the driver when seated in the vehicle facing the direction of forward vehicle travel. (563.5 (b))
- 11.18 Longitudinal or Longitudinally - Parallel to the longitudinal centerline of the vehicle. (571.3)
- 11.19 Longitudinal acceleration means the component of the vector acceleration of a point in the vehicle in the x-direction. The longitudinal acceleration is positive in the direction of forward vehicle travel. (563.5 (b))
- 11.20 Maximum delta-V, lateral - The maximum value of the cumulative change in velocity, as recorded by the EDR, of the vehicle along the lateral axis, starting from crash time zero and ending at 0.3 seconds. (563.5 (b))
- 11.21 Maximum delta-V, longitudinal - The maximum value of the cumulative change in velocity, as recorded by the EDR, of the vehicle along the longitudinal axis, starting from crash time zero and ending at 0.3 seconds. (563.5 (b))
- 11.22 Maximum delta-V, resultant - The time-correlated maximum value of the cumulative change in velocity, as recorded by the EDR or processed during data download, along the vector-added longitudinal and lateral axes. (563.5 (b))
- 11.23 Multi-event crash  
The occurrence of 2 events, the first and last of which begin not more than 5 seconds apart. (563.5 (b))
- 11.24 Non-volatile memory -The memory reserved for maintaining recorded EDR data in a semi-permanent fashion. Data recorded in non-volatile memory is retained after loss of power and can be retrieved with EDR data extraction tools and methods. (563.5 (b))
- 11.25 Normal acceleration - The component of the vector acceleration of a point in the vehicle in the z-direction. The normal acceleration is positive in a downward direction and is zero when the accelerometer is at rest. (563.5 (b))
- 11.26 Occupant position classification - The classification indicating that the seating posture of a front outboard occupant (both driver and right front passenger) is determined as being out-of-position. (563.5 (b))
- 11.27 Occupant size classification - For the right front passenger, the classification of the occupant as a child (as defined in 49 CFR part 572, subpart N or smaller) or not as an adult (as defined in 49 CFR part 572, subpart O), and for the driver, the classification of the driver as being a 5th percentile female (as defined in 49 CFR Part 572, subpart O) or larger. (563.5 (b))
- 11.28 Outboard Designated Seating Position - A designated seating position where a longitudinal vertical plane tangent to the outboard side of the seat cushion is less than 12 inches from the innermost point on the inside surface of the vehicle at a height between the design H-point and the shoulder reference point (as shown in fig. 1 of Federal Motor

- Vehicle Safety Standard No. 210) and longitudinally between the front and rear edges of the seat cushion. (571.3)
- 11.29 Pretensioner - A device that is activated by a vehicle's crash sensing system and removes slack from a vehicle safety belt system. (563.5 (b))
- 11.30 Rated Cargo and Luggage Capacity Weight (RCLW) - RCLW = vehicle capacity weight – (68 kg x designated seating capacity). Maximum RCLW used in testing a truck, MPV, or bus is 136 kg. RCLW for school buses will follow the calculation contained within the governing barrier test procedure.
- 11.31 Record - The process of saving captured EDR data into a non-volatile device for subsequent retrieval. (563.5 (b))
- 11.32 Safety belt status - The feedback from the safety system that is used to determine that an occupant's safety belt (for both driver and right front passenger) is fastened or unfastened. (563.5 (b))
- 11.33 Seat track position switch, foremost, status - The status of the switch that is installed to detect whether the seat is moved to a forward position. (563.5 (b))
- 11.34 Service brake, on and off - The status of the device that is installed in or connected to the brake pedal system to detect whether the pedal was pressed. The device can include the brake pedal switch or other driver-operated service brake control. (563.5 (b))
- 11.35 Side air bag - Any inflatable occupant restraint device that is mounted to the seat or side structure of the vehicle interior, and that is designed to deploy in a side impact crash to help mitigate occupant injury and/or ejection. (563.5 (b))
- 11.36 Side curtain/tube air bag - Any inflatable occupant restraint device that is mounted to the side structure of the vehicle interior, and that is designed to deploy in a side impact crash or rollover and to help mitigate occupant injury and/or ejection. (563.5 (b))
- 11.37 Speed, vehicle indicated - The vehicle speed indicated by a manufacturer-designated subsystem designed to indicate the vehicle's ground travel speed during vehicle operation. (563.5 (b))
- 11.38 Stability control - Any device that complies with FMVSS No. 126, "Electronic stability control systems." (563.5 (b))
- 11.39 Steering input - The angular displacement of the steering wheel measured from the straight-ahead position (position corresponding to zero average steer angle of a pair of steered wheels). (563.5 (b))
- 11.40 Suppression switch status - The status of the switch indicating whether an air bag suppression system is on or off. (563.5 (b))
- 11.41 Time from event 1 to 2 - The elapsed time from time zero of the first event to time zero of the second event. (563.5 (b))
- 11.42 Time, maximum delta-V, lateral - The time from crash time zero to the point where the maximum value of the cumulative change in velocity is found, as recorded by the EDR, along the lateral axis. (563.5 (b))
- 11.43 Time, maximum delta-V, longitudinal - The time from crash time zero to the point where the maximum value of the cumulative change in velocity is found, as recorded by the EDR, along the longitudinal axis. (563.5 (b))

- 11.44 Time, maximum delta-V, resultant -The time from crash time zero to the point where the maximum delta-V resultant occurs, as recorded by the EDR or processed during data download. (563.5 (b))
- 11.45 Time to deploy, pretensioner -The elapsed time from crash time zero to the deployment command for the safety belt pretensioner (for both driver and right front passenger). (563.5 (b))
- 11.46 Time to deploy, side air bag/curtain -The elapsed time from crash time zero to the deployment command for a side air bag or a side curtain/tube air bag (for both driver and right front passenger). (563.5 (b))
- 11.47 Time to first stage -The elapsed time between time zero and the time when the first stage of a frontal air bag is commanded to fire. (563.5 (b))
- 11.48 Time to n<sup>th</sup> stage -The elapsed time from crash time zero to the deployment command for the nth stage of a frontal air bag (for both driver and right front passenger). (563.5 (b))
- 11.49 Time zero -  
Whichever of the following occurs first:
- (1) For systems with “wake-up” air bag control systems, the time at which the occupant restraint control algorithm is activated; or
  - (2) For continuously running algorithms,
    - (i) The first point in the interval where a longitudinal cumulative delta-V of over 0.8 km/h (0.5 mph) is reached within a 20 ms time period; or
    - (ii) For vehicles that record “delta-V, lateral,” the first point in the interval where a lateral cumulative delta-V of over 0.8 km/h (0.5 mph) is reached within a 5 ms time period; or
  - (3) Deployment of a non-reversible deployable restraint. (563.5 (b))
- 11.50 Trigger threshold - A change in vehicle velocity, in the longitudinal direction, that equals or exceeds 8 km/h within a 150 ms interval. For vehicles that record “delta-V, lateral,” trigger threshold means a change in vehicle velocity in either the longitudinal or lateral direction that equals or exceeds 8 km/h within a 150 ms interval. (563.5 (b))
- 11.51 Unloaded Vehicle Weight (UVW) - The weight of a vehicle with maximum capacity of all fluids necessary for operation of the vehicle, but without cargo, occupants, or accessories that are ordinarily removed from the vehicle when they are not in use. (571.3)
- 11.52 Vehicle Capacity Weight (VCW) - The rated cargo and luggage load plus 68 kilograms times the vehicle’s designated seating capacity (571.110, S3).  
VCW for school buses will follow the calculation contained within the governing barrier test procedure. (571.110, S3)
- 11.53 Vehicle roll angle - The angle between the vehicle's y-axis and the ground plane. (563.5 (b))
- 11.54 Volatile memory - The memory reserved for buffering of captured EDR data. The memory is not capable of retaining data in a semi-permanent fashion. Data captured in volatile memory is continuously overwritten and is not retained in the event of a power loss or retrievable with EDR data extraction tools. (563.5 (b))
- 11.55 X-direction - The direction of the vehicle's X-axis, which is parallel to the vehicle's longitudinal centerline. The X-direction is positive in the direction of forward vehicle travel. (563.5 (b))
- 11.56 Y-direction - The direction of the vehicle's Y-axis, which is perpendicular to its X-axis and in the same horizontal plane as that axis. The Y-direction is positive from left to right,

from the perspective of the driver when seated in the vehicle facing the direction of forward vehicle travel. (563.5 (b))

- 11.57 Z-direction - The direction of the vehicle's Z-axis, which is perpendicular to the X- and Y-axes. The Z-direction is positive in a downward direction. (563.5 (b))

## 12. PRE-TEST REQUIREMENTS

### 12.1 TEST VEHICLE PREPARATION

- a. Obtain the following information from the COTR.
  1. Disassembly procedures to access the EDR component which contains the sensors which measure longitudinal acceleration and/or delta-v.
  2. Wiring diagrams and procedures to access the harness location for measuring firing of the frontal air bags, knee air bags if equipped, and the seat belt pretensioners if equipped.
  3. Suggested locations for the reference accelerometer locations if provided by the manufacturer.
  4. Procedures for attaching and using the download tool to retrieve the recorded event data from the EDR.
  5. The full scale range of the longitudinal accelerometer in g's.
- b. Install the following instrumentation on the vehicle.
  1. Install 2 triaxial accelerometers near the vehicle's central body longitudinal acceleration/delta-v sensor(s). The first accelerometer shall be mounted on rigid vehicle structure on the longitudinal centerline passing through the vehicle's longitudinal crash sensor. The second triaxial accelerometer shall be on the vertical centerline passing through the vehicle's longitudinal crash sensor, either on the outer cover of the module containing the vehicle crash sensor or a nearby rigid structure. . The accelerometer axes should be aligned with the vehicles primary axes within +/- 2 degrees
  2. Install the inductive sensors for the restraint system active components at the location recommended by the manufacture. Take care to secure the sensors to prevent strain on the restraint system wiring during the crash event.
  3. Photograph the instrumentation installation per section 10.2.
  4. Inspect vehicle to verify that all interior trim is in place and all fastening hardware is installed after instrumentation installation.

### 12.2 PRE-TEST DATA COLLECTION

- a. Connect the EDR data download tool and perform a pre-crash data download.
- b. Review the downloaded data and save to a permanent storage location.
- c. Complete the pre-test section of Data Sheet One

## 13. COMPLIANCE TEST EXECUTION

- 13.1 BARRIER TEST – Perform barrier test ordered by the COTR

## 14. POST-TEST REQUIREMENTS

### 14.1 POST-CRASH DATA COLLECTION

- a. Connect the EDR data download tool and perform a post-test data download.
- b. Save the download data file to a permanent storage location.
- c. Photograph the EDR, instrumentation, and download operations per section 10.2.
- d. Before placing vehicle into storage, protect the vehicle from inclement weather for 10 days following the crash test.
- e. After 10 days perform steps "a" and "b" again.

### 14.2 POST CRASH DATA ANALYSIS

- a. Save the collected accelerometer and restraint system deployment data in unfiltered form. Default system filtering shall be set to 4 kHz or higher.
- b. Filter x-axis accelerometer data to SAE J211 Class 180 and plot versus time.
- c. Add error corridor of +/- TBD g's for entire data set. (Error corridor based on +/- 10% of sensor full scale range.)
- d. Check data clip status for acceleration or delta -v in downloaded data
- e. Compare recorded acceleration and delta-v against the manufacturer supplied full scale range of sensor(s).
- f. Truncate longitudinal acceleration at the time where the sensor full scale range is exceeded in the raw laboratory data or the time recorded by the EDR for clipping of the longitudinal signal. Use the shortest time for the truncation
- g. Integrate the accelerometer data to obtain velocity data and plot versus time.
- h. Apply an error corridor of +/- 10 km/hr to the entire data set.
- i. Plot the EDR reported longitudinal acceleration and/or delta-v on the respective plots.
- j. Align the EDR data time with the Laboratory data time using the time of the first air bag stage deployment as the alignment mark based on the firing current recorded for the air bags.
- k. Save and include the overlaid acceleration and delta-v plots in the report.
- l. Complete the post-test section of Data Sheet 2

## 15. REPORTS

### 15.1 MONTHLY STATUS REPORTS

The Contractor shall submit a monthly Test Status Report and a Vehicle or Equipment Status Report to the COTR (both reports shown in this section). The Vehicle Status Report shall be submitted until all vehicles or items of equipment are disposed of.



**15. REPORTS....Continued**

MONTHLY TEST STATUS REPORT

PART 563

DATE OF REPORT:

NO.	VEHICLE NHTSA NO., MAKE & MODEL	TEST DATE	PASS/ FAIL	DATE REPORT SUBMITTED	DATE INVOICE SUBMITTED	INVOICE PAYMENT DATE
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						

**15. REPORTS....Continued**

MONTHLY VEHICLE STATUS REPORT

PART 563

DATE OF REPORT:

NO .	VEH. NHTSA NO., MAKE & MODEL	DATE OF DELIVERY	ODOMETER READING	TEST COMPLETE DATE	VEHICLE SHIPMENT DATE	ODOMETER READING
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						

**15. REPORTS....Continued**

## 15.2 APPARENT TEST FAILURE

Any indication of an apparent test failure shall be communicated by telephone to the COTR within 24 hours with written notification mailed within 48 hours (Saturdays and Sundays excluded). A Notice of Apparent Test Failure, shown in this section, with a copy of the particular compliance test data sheet(s) and preliminary data plot(s) shall be included.

In the event of an apparent test failure, a posttest calibration check of some critically sensitive test equipment and instrumentation may be required for verification of accuracy. The necessity for the calibration shall be at the COTR's discretion and shall be performed without additional costs to the OVSC.

**15. REPORTS....Continued**

LABORATORY NOTICE OF APPARENT TEST FAILURE TO OVSC

PART 563 TEST DATE: \_\_\_\_\_

LABORATORY: \_\_\_\_\_

CONTRACT NO.: \_\_\_\_\_ DELV. ORDER NO.: \_\_\_\_\_

LABORATORY PROJECT ENGINEER'S NAME: \_\_\_\_\_

TEST SPECIMEN DESCRIPTION: \_\_\_\_\_

\_\_\_\_\_

VEHICLE NHTSA NO.: \_\_\_\_\_ VIN: \_\_\_\_\_

MFR: \_\_\_\_\_

APPARENT TEST FAILURE DESCRIPTION: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

PART 573 REQUIREMENT, PARAGRAPH S:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

NOTIFICATION TO NHTSA (COTR): \_\_\_\_\_

DATE: \_\_\_\_\_ BY: \_\_\_\_\_

REMARKS:

**15. REPORTS....Continued**

## 15.3 FINAL TEST REPORT

## 15.3.1 COPIES

Provide a compact disk or sets of disks, depending on the amount of data, with a draft of the final report, high speed video, real time video, and dummy calibration report. Once the draft has been approved provide 4 compact disks of the final report

The Final Test Report format to be used by all Contractors can be found in this section.

Payment of Contractor's invoices for completed compliance tests may be withheld until the Final Test Report is accepted by the COTR. Do NOT submit invoices before the COTR is provided copies of all the report deliverables.

Contractors are required to submit the first draft test report within two weeks after the compliance test is conducted. The Contractor and the COTR will then be able to discuss the details of both test conduct and report content early in the compliance test program.

High speed video, real time video, dummy calibrations and contractor test check sheets must be provided with the draft test report. The electronic test data shall be provided by e-mail to the COTR within 5 days of any test that requires injury measures to be calculated.

Contractors are required to PROOF READ all Final Test Reports before submittal to the COTR. The OVSC will not act as a report quality control office for Contractors. Reports containing a significant number of errors will be returned to the Contractor for correction, and a "hold" will be placed on invoice payment for the particular test.

### 15.3.2 REQUIREMENTS

The Final Test Report with the associated documentation (including photographs) is relied upon as the chronicle of the compliance test. The Final Test Report will be released to the public domain after review and acceptance by the COTR. For these reasons, each final report must be a complete document capable of standing by itself.

The Contractor should use **detailed** descriptions of all compliance test events. Any events that are not directly associated with the standard but are of technical interest should also be included. The Contractor should include as much detail as possible in the report.

Instructions for the preparation of the first three pages of the final test report are provided below for the purpose of standardization.

**15. REPORTS....Continued**

15.3.3 FIRST THREE PAGES

FRONT COVER

The information required on the cover page is as follows:

(A) Final Report Number such as 563-ABC-XX-001, where —

563 is the regulation tested  
 ABC are the initials for the laboratory  
 XX is the last two numbers of the Fiscal Year of the test program  
 001 is the Group Number (001 for the 1st test, 002 for the 2nd test, 003 for the 3rd test, etc.)

(B) Final Report Title and Subtitle such as

SAFETY COMPLIANCE TESTING FOR PART 563  
 Event Data Recorders  
 \*\*\*\*\*  
 World Motors Corporation  
 20XX XYZ 4-door sedan  
 NHTSA No. CX0401

(C) Contractor's Name and Address such as

COMPLIANCE TESTING LABORATORIES, INC.  
 4335 West Dearborn Street  
 Detroit, Michigan 48090

**NOTE:** DOT SYMBOL SHALL BE PLACED BETWEEN ITEMS (C) AND (D)

(D) Date of Final Report completion

(E) The words "FINAL REPORT"

(F) The sponsoring agency's name and address as follows

U. S. DEPARTMENT OF TRANSPORTATION  
 National Highway Traffic Safety Administration  
 Enforcement  
 Office of Vehicle Safety Compliance  
 Mail Code: NVS-220  
 1200 New Jersey Ave., SE  
 Washington, DC 20590

**15. REPORTS....Continued**

FIRST PAGE AFTER COVER PAGE

When a contract test laboratory is reporting, a disclaimer statement and an acceptance signature block for the COTR shall be provided as follows:

This publication is distributed by the National Highway Traffic Safety Administration in the interest of information exchange. Opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof.

If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement.

Prepared By: \_\_\_\_\_

Approved By: \_\_\_\_\_ \*

Approval Date: \_\_\_\_\_ \*

FINAL REPORT ACCEPTANCE BY OVSC: \*

Accepted By: \_\_\_\_\_

Acceptance Date: \_\_\_\_\_

\* These lines not required when OVSC staff writes the Test Report



**15. REPORTS....Continued**

## SECOND PAGE AFTER COVER PAGE

A completed Technical Report Documentation Page (Form DOT F1700.7) shall be completed for those items that are applicable with the other spaces left blank. Sample data for the applicable block numbers of the title page follows.

## Block 1 — REPORT NUMBER

208-ABC-XX-001

## Block 2 — GOVERNMENT ACCESSION NUMBER

Leave blank

## Block 3 — RECIPIENT'S CATALOG NUMBER

Leave blank

## Block 4 — TITLE AND SUBTITLE

Final Report of PART 563 Compliance Testing  
of a 20XX World XYZ Deluxe 4-door sedan  
NHTSA No. CX0401

## Block 5 — REPORT DATE

Month Day, 20XX

## Block 6 — PERFORMING ORGANIZATION CODE

ABC

## Block 7 — AUTHOR(S)

John Smith, Project Manager  
Bill Doe, Project Engineer

## Block 8 — PERFORMING ORGANIZATION REPORT NUMBER

ABC-DOT-XXX-001

## Block 9 — PERFORMING ORGANIZATION NAME AND ADDRESS

ABC Laboratories  
405 Main Street  
Detroit, MI 48070

**15. REPORTS....Continued**

Block 10 — WORK UNIT NUMBER

Leave blank

Block 11 — CONTRACT OR GRANT NUMBER

DTNH22-XX-D-12345

Block 12 — SPONSORING AGENCY NAME AND ADDRESS

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National Highway Traffic Safety Administration  
Enforcement  
Office of Vehicle Safety Compliance  
Mail Code: NVS-220  
1200 New Jersey Ave., SE  
Washington, DC 20590

Block 13 — TYPE OF REPORT AND PERIOD COVERED

Final Test Report  
Month Day to Month Day, 20XX

Block 14 — SPONSORING AGENCY CODE

NVS-220

Block 15 — SUPPLEMENTARY NOTES

Leave blank

Block 16 — ABSTRACT

Compliance tests were conducted on the subject 20XX World XYZ 4-door sedan in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP563-XX for the determination of PART 563 compliance. Test failures identified were as follows:

None

**15. REPORTS....Continued**

Block 17 — KEY WORDS

Compliance Testing  
Safety Engineering  
PART 563  
Event Data Recorders

Block 18 — DISTRIBUTION STATEMENT

Copies of this report are available from the following:

National Highway Traffic Safety Administration  
Technical Information Services Division, NPO-411  
1200 New Jersey Avenue SE (Room E12-100)  
Washington DC 20590

e-mail: [tis@nhtsa.dot.gov](mailto:tis@nhtsa.dot.gov)  
FAX: 202-493-2833

Block 19 — SECURITY CLASSIFICATION OF REPORT

Unclassified

Block 20 — SECURITY CLASSIFICATION OF PAGE

Unclassified

Block 21 — NUMBER OF PAGES

Add appropriate number

Block 22 — PRICE

Leave blank

#### 15.3.4 TABLE OF CONTENTS

Final test report Table of Contents shall include the following:

Section 1 — Purpose of Compliance Test

Section 2 — Test Procedure and Discussion of Results

Section 3 — Test Data

Section 4 — Test Equipment List and Calibration Information

Section 5 — Photographs

Section 6 — Other Documentation

Section 7 — Notice of Test Failure (if applicable)

**16. DATA SHEETS**

Data Sheet No. 1  
 Test Vehicle Specifications

**TEST VEHICLE INFORMATION:**

Year/Make/Model/Body Style \_\_\_\_\_  
 NHTSA No.: \_\_\_\_\_; Color: \_\_\_\_\_; Date Received: \_\_\_\_\_  
 Odometer Reading: \_\_\_\_\_ miles  
 Selling Dealer: \_\_\_\_\_  
 & Address: \_\_\_\_\_

**DATA FROM VEHICLE'S CERTIFICATION LABEL:**

Vehicle Manufactured By: \_\_\_\_\_  
 Date of Manufacture: \_\_\_\_\_  
 VIN: \_\_\_\_\_  
 GVWR: \_\_\_\_\_ kg. ; GAWR-Front: \_\_\_\_\_ kg. ; GAWR-Rear: \_\_\_\_\_ kg.

**DATA FROM VEHICLE'S TIRE PLACARD & SIDEWALL:**

Location of Placard on Vehicle: \_\_\_\_\_  
 Recommended Tire Size: \_\_\_\_\_  
 Recommended Cold Tire Pressure: Front: \_\_\_\_\_ kPa; Rear: \_\_\_\_\_ kPa  
 Size of Tires on Test Vehicle: \_\_\_\_\_  
 Type of Spare Tire: \_\_\_\_\_

**VEHICLE CAPACITY DATA:**

Type of Front Seat(s): \_\_\_\_\_  
 Number of Occupants: Front = \_\_\_\_\_; Rear = \_\_\_\_\_; Total = \_\_\_\_\_  
 A. VEHICLE CAPACITY WEIGHT (VCW) = \_\_\_\_\_ kg.  
 B. Number of Occupants x 68 kg. = \_\_\_\_\_ kg.  
 RATED CARGO AND LUGGAGE WEIGHT (RCLW) [A-B]: \_\_\_\_\_ kg  
 Maximum RCLW used in testing a truck, MPV, or bus is 136 kg.  
 RCLW-School Bus (If Applicable)= \_\_\_\_\_ kg

RECORDED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 APPROVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

Data Sheet No. 2  
TEST DATA

NHTSA No. \_\_\_\_\_

Test Date: \_\_\_\_\_

Laboratory: \_\_\_\_\_

Test Technician(s): \_\_\_\_\_

**INSTALLATION OF PRE-TEST INSTRUMENTATION**

1.0 Longitudinal Sensor Location

- 1.1 Gain access to the vehicle module containing the longitudinal acceleration/velocity sensor
- 1.2 On the top surface of the module, place a marking target in the X-Y plane positioned over the sensor location as identified by the manufacturer.

2.0 Installation of Triaxial Accelerometers

- 2.1 Install a triaxial accelerometer to nearby rigid vehicle structure such that the x-axis of the accelerometer is located on the vertical longitudinal plane passing through the target placed in step 1.2 The accelerometer axes shall be aligned with the primary vehicle axes +/- 1 degree.
- 2.2 Install a triaxial accelerometer on the module or nearby rigid structure such that the z-axis of the accelerometer is located on the vertical line passing through the target placed in step 1.2 The accelerometer axes shall be aligned with the primary vehicle axes +/- 1 degree.
- 2.3 Photograph installation and reassemble vehicle

3.0 Restraint System Component Inductive Sensor Installation

- 3.1 Gain access to location specified in the manufacturer's submission and install inductive current pickup on the following electrical leads. Indicate N/A for non-installed components (DO NOT TAP DIRECTLY INTO RESTRAINT SYSTEM WIRING)
  - Driver's frontal air bag 1<sup>st</sup> stage
  - Driver's frontal air bag 2<sup>nd</sup> stage
  - Passenger's frontal air bag 1<sup>st</sup> stage
  - Passenger's frontal air bag 2<sup>nd</sup> stage
  - Driver's knee air bag
  - Passenger's knee air bag
  - Driver's seat belt pretensioner
  - Passenger's seat belt pretensioner
- 3.2 Photograph installation and reassemble vehicle

## 4.0 EDR DATA COLLECTION

### 4.1 Pretest Data Collection

- 1. Connect EDR tool to Vehicle per manufacturer's instructions and perform data download.
- 2. Save data file and review data.
- 3. Verify that communications with the EDR was established and that no crash data records are present in the EDR

### 4.2 Post Test Data Collection

- 1. Connect EDR Tool to vehicle per manufacturer's instructions and perform data download.
- 2. Save the data file and review data
- 3. Complete the post-test data portions of Data Sheet 2
- 4. After 10 days repeat steps 1 and 2 and compare the data with the original post-test data and verify data matches except ignition cycle at download.

**TABLE ONE: REQUIRED DATA ELEMENTS**

<b>Data element</b>	<b>Recording interval/time<sup>1</sup> (relative to time zero)</b>	<b>Data sample rate (samples per second)</b>	<b>Data Element Present in Post-Test Download (Y/N)</b>	<b>Recorded Value</b>	<b>Meets Requirements of PART 563 Table 3 (Y/N or N/A)</b>
Delta-V, longitudinal	0 to 250 ms or 0 to End of Event Time plus 30 ms, whichever is shorter	100		Attach Delta-V plot	
Maximum delta-V, longitudinal	0–300 ms or 0 to End of Event Time plus 30 ms, whichever is shorter	N/A			
Time, maximum delta-V	0–300 ms or 0 to End of Event Time plus 30 ms, whichever is shorter	N/A			
Speed, vehicle indicated	-5.0 to 0 sec	2			
Engine throttle, % full (or accelerator pedal, % full)	-5.0 to 0 sec	2			
Service brake, on/off	-5.0 to 0 sec	2			
Ignition cycle, crash	-1.0 sec	N/A			
Ignition cycle, download	At time of download <sup>3</sup>	N/A			
Safety belt status, driver	-1.0 sec	N/A			
Frontal air bag warning lamp, on/off <sup>2</sup>	-1.0 sec	N/A			



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	Event	N/A			
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	Event	N/A			
Multi-event, number of event	Event	N/A			
Time from event 1 to 2	As needed	N/A			
Complete file recorded (yes, no)	Following other data	N/A			

TABLE 2 DATA ELEMENTS

<b>Data element name</b>	<b>Recording interval/time<sup>1</sup> (relative to time zero)</b>	<b>Data sample rate (per second)</b>	<b>Data Element Present in Post-Test Download (Y/N)</b>	<b>Recorded Value</b>	<b>Meets Requirements of PART 563 Table 3 (Y/N or N/A)</b>
Lateral acceleration	N/A	N/A			
Longitudinal acceleration	N/A	N/A			
Normal acceleration	N/A	N/A			
Delta-V, lateral	0–250 ms or 0 to End of Event Time plus 30 ms, whichever is shorter	100			
Maximum delta-V, lateral	0–300 ms or 0 to End of Event Time plus 30 ms, whichever is shorter	N/A			
Time maximum delta-V, lateral	0–300 ms or 0 to End of Event Time plus 30 ms, whichever is shorter	N/A			
Time for maximum delta-V, resultant	0–300 ms or 0 to End of Event Time plus 30 ms, whichever is shorter	N/A			
Engine rpm	–5.0 to 0 sec	2			
Vehicle roll angle	–1.0 up to 5.0 sec <sup>3</sup>	10			
ABS activity (engaged, non-engaged)	–5.0 to 0 sec	2			
Stability control (on, off, or engaged)	–5.0 to 0 sec	2			
Steering input	–5.0 to 0 sec	2			

Safety belt status, right front passenger (buckled, not buckled)	-1.0 sec	N/A			
Frontal air bag suppression switch status, right front passenger (on, off, or auto)	-1.0 sec	N/A			
Frontal air bag deployment, time to nth stage, driver <sup>4</sup>	Event	N/A			
Frontal air bag deployment, time to nth stage, right front passenger <sup>4</sup>	Event	N/A			
Frontal air bag deployment, nth stage disposal, driver, Y/N (whether the nth stage deployment was for occupant restraint or propellant disposal purposes)	Event	N/A			
Frontal air bag deployment, nth stage disposal, right front passenger, Y/N (whether the nth stage deployment was for occupant restraint or propellant disposal purposes)	Event	N/A			
Side air bag deployment, time to deploy, driver	Event	N/A			
Side air bag deployment, time to deploy, right front passenger	Event	N/A			
Side curtain/tube air bag deployment, time to deploy, driver side	Event	N/A			

Side curtain/tube air bag deployment, time to deploy, right side	Event	N/A			
Pretensioner deployment, time to fire, driver	Event	N/A			
Pretensioner deployment, time to fire, right front passenger	Event	N/A			
Seat track position switch, foremost, status, driver	-1.0 sec	N/A			
Seat track position switch, foremost, status, right front passenger	-1.0 sec	N/A			
Occupant size classification, driver	-1.0 sec	N/A			
Occupant size classification, right front passenger	-1.0 sec	N/A			
Occupant position classification, driver	-1.0 sec	N/A			
Occupant position classification, right front passenger	-1.0 sec	N/A			

<sup>1</sup>Pre-crash data and crash data are asynchronous. The sample time accuracy requirement for pre-crash time is -0.1 to 1.0 sec (e.g. T = -1 would need to occur between -1.1 and 0 seconds.)

<sup>2</sup>"If recorded" means if the data is recorded in non-volatile memory for the purpose of subsequent downloading.

<sup>3</sup>"vehicle roll angle" may be recorded in any time duration; -1.0 sec to 5.0 sec is suggested.

<sup>4</sup>List this element n - 1 times, once for each stage of a multi-stage air bag system.

[73 FR 2181, Jan. 14, 2008, 73 FR 8408, Feb. 13, 2008, as amended at 76 FR 47486, Aug. 5, 2011]

RECORDED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 APPROVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

## APPENDIX 1

## TABLES FOR PART 563

Table I—Data Elements Required for All Vehicles Equipped With an EDR

Data element	Recording interval/time <sup>1</sup> (relative to time zero)	Data sample rate (samples per second)
Delta-V, longitudinal	0 to 250 ms or 0 to End of Event Time plus 30 ms, whichever is shorter	100
Maximum delta-V, longitudinal	0–300 ms or 0 to End of Event Time plus 30 ms, whichever is shorter	N/A
Time, maximum delta-V	0–300 ms or 0 to End of Event Time plus 30 ms, whichever is shorter	N/A
Speed, vehicle indicated	–5.0 to 0 sec	2
Engine throttle, % full (or accelerator pedal, % full)	–5.0 to 0 sec	2
Service brake, on/off	–5.0 to 0 sec	2
Ignition cycle, crash	–1.0 sec	N/A
Ignition cycle, download	At time of download <sup>3</sup>	N/A
Safety belt status, driver	–1.0 sec	N/A
Frontal air bag warning lamp, on/off <sup>2</sup>	–1.0 sec	N/A
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	Event	N/A
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	Event	N/A
Multi-event, number of event	Event	N/A
Time from event 1 to 2	As needed	N/A
Complete file recorded (yes, no)	Following other data	N/A

<sup>1</sup>Pre-crash data and crash data are asynchronous. The sample time accuracy requirement for pre-crash time is -0.1 to 1.0 sec (e.g., T = -1 would need to occur between -1.1 and 0 seconds.)

<sup>2</sup>The frontal air bag warning lamp is the readiness indicator specified in S4.5.2 of FMVSS No. 208, and may also illuminate to indicate a malfunction in another part of the deployable restraint system.

<sup>3</sup>The ignition cycle at the time of download is not required to be recorded at the time of the crash, but shall be reported during the download process.

(b) *Data elements required for vehicles under specified conditions* . Each vehicle equipped with an EDR must record each of the data elements listed in column 1 of Table II for which the vehicle meets the condition specified in column 2 of that table, during the interval/time and at the sample rate specified in that table.

**Table II—Data Elements Required for Vehicles Under Specified Minimum Conditions**

<b>Data element name</b>	<b>Condition for requirement</b>	<b>Recording interval/time<sup>1</sup> (relative to time zero)</b>	<b>Data sample rate (per second)</b>
Lateral acceleration	If recorded <sup>2</sup>	N/A	N/A
Longitudinal acceleration	If recorded	N/A	N/A
Normal acceleration	If recorded	N/A	N/A
Delta-V, lateral	If recorded	0–250 ms or 0 to End of Event Time plus 30 ms, whichever is shorter	100
Maximum delta-V, lateral	If recorded	0–300 ms or 0 to End of Event Time plus 30 ms, whichever is shorter	N/A
Time maximum delta-V, lateral	If recorded	0–300 ms or 0 to End of Event Time plus 30 ms, whichever is shorter	N/A
Time for maximum delta-V, resultant	If recorded	0–300 ms or 0 to End of Event Time plus 30 ms, whichever is shorter	N/A
Engine rpm	If recorded	–5.0 to 0 sec	2
Vehicle roll angle	If recorded	–1.0 up to 5.0 sec <sup>3</sup>	10
ABS activity (engaged, non-engaged)	If recorded	–5.0 to 0 sec	2
Stability control (on, off, or engaged)	If recorded	–5.0 to 0 sec	2

Steering input	If recorded	-5.0 to 0 sec	2
Safety belt status, right front passenger (buckled, not buckled)	If recorded	-1.0 sec	N/A
Frontal air bag suppression switch status, right front passenger (on, off, or auto)	If recorded	-1.0 sec	N/A
Frontal air bag deployment, time to nth stage, driver <sup>4</sup>	If equipped with a driver's frontal air bag with a multi-stage inflator	Event	N/A
Frontal air bag deployment, time to nth stage, right front passenger <sup>4</sup>	If equipped with a right front passenger's frontal air bag with a multi-stage inflator	Event	N/A
Frontal air bag deployment, nth stage disposal, driver, Y/N (whether the nth stage deployment was for occupant restraint or propellant disposal purposes)	If recorded	Event	N/A
Frontal air bag deployment, nth stage disposal, right front passenger, Y/N (whether the nth stage deployment was for occupant restraint or propellant disposal purposes)	If recorded	Event	N/A
Side air bag deployment, time to deploy, driver	If recorded	Event	N/A
Side air bag deployment, time to deploy, right front passenger	If recorded	Event	N/A
Side curtain/tube air bag deployment, time to deploy, driver side	If recorded	Event	N/A
Side curtain/tube air bag deployment, time to deploy, right side	If recorded	Event	N/A
Pretensioner deployment, time to fire, driver	If recorded	Event	N/A
Pretensioner deployment, time to fire, right front passenger	If recorded	Event	N/A

Seat track position switch, foremost, status, driver	If recorded	-1.0 sec	N/A
Seat track position switch, foremost, status, right front passenger	If recorded	-1.0 sec	N/A
Occupant size classification, driver	If recorded	-1.0 sec	N/A
Occupant size classification, right front passenger	If recorded	-1.0 sec	N/A
Occupant position classification, driver	If recorded	-1.0 sec	N/A
Occupant position classification, right front passenger	If recorded	-1.0 sec	N/A

<sup>1</sup>Pre-crash data and crash data are asynchronous. The sample time accuracy requirement for pre-crash time is -0.1 to 1.0 sec (e.g. T = -1 would need to occur between -1.1 and 0 seconds.)

<sup>2</sup>"If recorded" means if the data is recorded in non-volatile memory for the purpose of subsequent downloading.

<sup>3</sup>"vehicle roll angle" may be recorded in any time duration; -1.0 sec to 5.0 sec is suggested.

<sup>4</sup>List this element n - 1 times, once for each stage of a multi-stage air bag system.

[73 FR 2181, Jan. 14, 2008, 73 FR 8408, Feb. 13, 2008, as amended at 76 FR 47486, Aug. 5, 2011]



Table III—Reported Data Element Format

<b>Data element</b>	<b>Minimum range</b>	<b>Accuracy<sup>1</sup></b>	<b>Resolution</b>
Lateral acceleration	At option of manufacturer	At option of manufacturer	At option of manufacturer.
Longitudinal acceleration	At option of manufacturer	At option of manufacturer	At option of manufacturer.
Normal Acceleration	At option of manufacturer	At option of manufacturer	At option of manufacturer.
Longitudinal delta-V	-100 km/h to +100 km/h	±10%	1 km/h.
Lateral delta-V	-100 km/h to +100 km/h	±10%	1 km/h.
Maximum delta-V, longitudinal	-100 km/h to +100 km/h	±10%	1 km/h.
Maximum delta-V, lateral	-100 km/h to +100 km/h	±10%	1 km/h.
Time, maximum delta-V, longitudinal	0–300 ms, or 0–End of Event Time plus 30 ms, whichever is shorter	±3 ms	2.5 ms.
Time, maximum delta-V, lateral	0–300 ms, or 0–End of Event Time plus 30 ms, whichever is shorter	±3 ms	2.5 ms.
Time, maximum delta-V, resultant	0–300 ms, or 0–End of Event Time plus 30 ms, whichever is shorter	±3 ms	2.5 ms.
Vehicle Roll Angle	-1080 deg to +1080 deg	±10%	10 deg.
Speed, vehicle indicated	0 km/h to 200 km/h	±1 km/h	1 km/h.
Engine throttle, percent full (accelerator pedal percent full)	0 to 100%	±5%	1%.
Engine rpm	0 to 10,000 rpm	±100 rpm	100 rpm.
Service brake	On or Off	N/A	On or Off.
ABS activity	On or Off	N/A	On or Off.
Stability control	On, Off, or Engaged	N/A	On, Off, or Engaged.
Steering input	±100%	±5%	1%.
Ignition cycle, crash	0 to 60,000	±1 cycle	1 cycle.
Ignition cycle, download	0 to 60,000	±1 cycle	1 cycle.

Safety belt status, driver	On or Off	N/A	On or Off.
Safety belt status, right front passenger	On or Off	N/A	On or Off.
Frontal air bag warning lamp	On or Off	N/A	On or Off.
Frontal air bag suppression switch status, right front passenger	On, Off, or Auto	N/A	On, Off, or Auto.
Frontal air bag deployment, time to deploy/first stage, driver	0 to 250 ms	$\pm 2$ ms	1 ms.
Frontal air bag deployment, time to deploy/first stage, right front passenger	0 to 250 ms	$\pm 2$ ms	1 ms.
Frontal air bag deployment, time to nth stage, driver	0 to 250 ms	$\pm 2$ ms	1 ms.
Frontal air bag deployment, time to nth stage, right front passenger	0 to 250 ms	$\pm 2$ ms	1 ms.
Frontal air bag deployment, nth stage disposal, driver	Yes or No	N/A	Yes or No.
Frontal air bag deployment, nth stage disposal, right front passenger	Yes or No	N/A	Yes or No.
Side air bag deployment, time to deploy, driver	0 to 250 ms	$\pm 2$ ms	1 ms.
Side air bag deployment, time to deploy, right front passenger	0 to 250 ms	$\pm 2$ ms	1 ms.
Side curtain/tube air bag deployment, time to deploy, driver side	0 to 250 ms	$\pm 2$ ms	1 ms.
Side curtain/tube air bag deployment, time to deploy, right side	0 to 250 ms	$\pm 2$ ms	1 ms.
Pretensioner deployment, time to fire, driver	0 to 250 ms	$\pm 2$ ms	1 ms.
Pretensioner deployment, time to fire, right front passenger	0 to 250 ms	$\pm 2$ ms	1 ms.

Seat track position switch, foremost, status, driver	Yes or No	N/A	Yes or No.
Seat track position switch, foremost, status, right front passenger	Yes or No	N/A	Yes or No.
Occupant size classification, driver	5th percentile female or larger	N/A	Yes or No.
Occupant size classification, right front passenger	Child	N/A	Yes or No.
Occupant position classification, driver	Out of position	N/A	Yes or No.
Occupant position classification, right front passenger	Out of position	N/A	Yes or No.
Multi-event, number of event	1 or 2	N/A	1 or 2.
Time from event 1 to 2	0 to 5.0 sec	0.1 sec	0.1 sec.
Complete file recorded	Yes or No	N/A	Yes or No.

<sup>1</sup>Accuracy requirement only applies within the range of the physical sensor. If measurements captured by a sensor exceed the design range of the sensor, the reported element must indicate when the measurement first exceeded the design range of the sensor.