DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 563

[Docket No. NHTSA-2012-0099]

RIN 2127-AL14

Event Data Recorders

AGENCY: National Highway Traffic Safety Administration (NHTSA), Department of

Transportation (DOT).

ACTION: Final rule; response to petitions for reconsideration.

SUMMARY: On August 5, 2011, the agency published a final rule amending the requirements

for voluntarily installed event data recorders (EDRs) established in August 2006. In response to

the August 2011 final rule, the agency received three petitions for reconsideration from the

Alliance of Automobile Manufacturers, the Automotive Safety Council, and Honda Motor Co.,

LTD. The Association of Global Automakers, Inc. Technical Affairs Committee, and Nissan

North America, Inc. both submitted comments in support of the petitioners' requests. After

careful consideration, the agency is granting some aspects of the petitions, and denying others.

This document amends the final rule accordingly.

DATES: *Effective Date*: The amendments in this rule are effective *[Insert date 60 days after*

date of publication in the FEDERAL REGISTER].

    Compliance Dates: Except as provided below, light vehicles manufactured on or after

September 1, 2012 that are equipped with an EDR and manufacturers of those vehicles must

comply with this rule. However, vehicles that are manufactured in two or more stages or that are

altered are not required to comply with the rule until September 1, 2013. Voluntary compliance is permitted before that date.

Petitions: If you wish to submit a petition for reconsideration of this rule, your petition must be received by ***[Insert date 45 days after date of publication in the FEDERAL REGISTER]***.

ADDRESSES: Petitions for reconsideration should refer to the docket number and be submitted to: Administrator, National Highway Traffic Safety Administration, 1200 New Jersey Avenue, S.E., West Building, 4th Floor, Washington, DC 20590. Please see the Privacy Act heading under Rulemaking Analyses and Notices.

FOR FURTHER INFORMATION CONTACT: For technical and policy issues, contact:

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Both persons may be reached by mail at the following address:

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I. **Background**

In August 2006, NHTSA issued a final rule[1] amending 49 CFR Part 563 (Part 563) to establish uniform performance requirements for the accuracy, collection, storage, survivability, and retrievability of onboard motor vehicle crash EDRs voluntarily installed in light passenger vehicles. Specifically, the regulation applies to passenger cars, multipurpose passenger vehicles, trucks, and buses with a gross vehicle weight rating (GVWR) of 3,855 kg (8,500 pounds) or less and an unloaded vehicle weight of 2,495 kg (5,500 pounds) or less,[2] that are voluntarily equipped with an EDR. The 2006 final rule aimed to standardize the data obtained through EDRs so that such data would provide information to enhance the agency's understanding of crash events and safety system performance, thereby potentially contributing to safer vehicle designs and more effective safety regulations. The 2006 final rule was intended to be technology-neutral, so as to permit compliance with any available EDR technology that meets the specified performance requirements.

On January 14, 2008,[3] the agency responded to petitions for reconsideration on the August 2006 final rule, and made the following amendments to Part 563:

- Clarified the event storage definitions to alleviate any uncertainties in multiple event crashes;

- Revised certain sensor ranges and accuracies to reflect current state of the art technologies;

- Clarified the recorded data reporting format;

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[1] 71 FR 50998.
[2] Walk-in van-type trucks or vehicles designed to be sold exclusively to the U.S. Postal Service are excluded.
[3] 73 FR 2168.

- Specified vehicle storage conditions during compliance testing;

- Clarified the required data elements and scope of covered sensors; and

- Revised the effective date to provide sufficient time for manufacturers and suppliers to comply with the rule.

The agency made these changes to encourage a broad application of EDR technologies in motor vehicles and maximize the usefulness of EDR data for vehicle designers, researchers, and the medical community, without imposing unnecessary burdens or deterring future improvements to EDRs that have been voluntarily installed. The 2008 final rule also provided two additional years of lead time to provide manufacturers more time to implement the necessary changes to EDR architectures within their normal product development cycles.[4]

On August 5, 2011,[5] the agency published a final rule responding to three petitions for reconsideration and made the following clarifications and amendments to Part 563:

- Removed the required standardization of the reporting requirements for all acceleration data requirements to address certification issues with data clipping, filtering and phase-shifting;

- Clarified the application of sensor tolerances to within the range of the applicable sensor;

- Clarified our position regarding exclusion of peripheral sensors from the reporting requirements for EDRs;

- Clarified the event storage definition to alleviate uncertainties in multiple event crashes;

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[4] NHTSA issued a Federal Register notice on February 8, 2008 (73 FR 8408) to correct the placement of decimal points for data in Table II of the final rule.
[5] 76 FR 47478.

- Revised requirements for the capture of event data in crashes that:

  o Involve side or side curtain/tube air bags such that EDR data would only need to be locked if the vehicle also captures lateral delta-V data, and

  o Involve non-reversible deployable restraints other than frontal, side or side/curtain tube air bags such that EDR data would not need to be locked at the option of the manufacturer,

- Clarified that any non-reversible deployable restraint may serve as an event trigger;

- Revised the minimum range requirement for the "Steering input" data element from an angular basis to a percentage basis; and

- Made other minor technical and editorial corrections.

In response to the 2011 final rule, the agency received three petitions for reconsideration[6] from the Alliance of Automobile Manufacturers (Alliance), the Automotive Safety Council[7] (ASC), and Honda Motor Co., LTD (Honda). The Association of Global Automakers, Inc. Technical Affairs Committee (GAM), and Nissan North America, Inc. (Nissan) both submitted comments in support of the petitioners' requests. After careful consideration, the agency is granting some aspects of the petitions, and denying others. This document amends the final rule accordingly.

II. Petitions for Reconsideration

A. *Steering Input:*

Based on a petition for reconsideration from Bosch, the 2011 final rule modified the format and range of the steering input data element in Table III from a range of -250 degrees clockwise (CW) to 250 degrees counterclockwise (CCW) with a resolution specification of 1

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[6] See Docket number: NHTSA-2011-0106.
[7] Formerly the ASC was known as the Automotive Occupant Restraints Council.

percent to a percentage of the lock-to-lock steering wheel angle of ± 100 percent with a 1 percent range. The Alliance and Honda petitioned the agency to revert the range specification to the original range of -250 degrees clockwise (CW) to 250 degrees counterclockwise (CCW) with a resolution specification of 5 degrees. In its petition the Alliance stated that steering wheel angle sensors report the actual steering wheel angle in degrees. In order for the EDR to report the steering input in percent, the EDR module would need to have information about the vehicle's total lock-to-lock steering wheel angle capability. However, the total lock-to-lock steering wheel angle may vary not only from one vehicle model to another, but also within a vehicle trim line.

The Alliance added that the same vehicle trim line with a different suspension package or gear box also might have a different total lock-to-lock angle and each vehicle line would need to be specifically calibrated in order for the EDR to report steering input as a percentage based on that vehicle's steering wheel rotation capability. The Alliance went on to state that implementing the new EDR requirement to report steering input in percent would impose an unnecessary complex proliferation of EDR calibrations to match vehicle builds.

Honda noted that in addition to the variability both between and within vehicle trim lines, steering angle sensors simply detect and display the actual rotation angle of the steering wheel and do not detect if the steering wheel is in the locked position. Honda stated that it could not report steering input as a percentage value without drastic changes to vehicle steering system design and incorporation of new steering angle sensors. Both Nissan and GAM submitted comments in support of the Alliance and Honda petitions to reinstate the original input range to -250 degrees CW to 250 degrees CCW with a resolution specification of 5 degrees.

Bosch has submitted a letter in support of the Honda and Alliance petitions for reconsideration expressing its agreement with the petitioners' arguments.[8] In its letter and in an ex-parte meeting with the agency, Bosch reiterated the other petitioners' concerns that the data element change may require additional calibration and software changes. It noted that the majority of electronic stability control (ESC) systems utilize steering input information in degrees, not percentages. It stated that manufacturers may not have enough time to implement this change, and as a result may have to remove the steering wheel angle data from the EDR log.

SAE International (SAE) submitted to the 2011 final rule docket what they described as a technical amendment to the steering input parameter. Its submission supports a return to the reporting of a ± 250 degrees steering wheel angle. However, it indicated that the sign convention for the direction of rotation should be reversed such that it should be reported as 250 degrees CW to - 250 degrees CCW. It indicated that a CW positive sign is consistent with a Z axis down (into the steering wheel) philosophy explained in SAE Recommended Practice J670, "Vehicle Dynamics Terminology," and well as the philosophy being used to update the EDR parameter definitions in SAE Recommended Practice J1698-1, "Event Data Recorder - Output Data Definition."

Finally, SAE additionally requested that the accuracy of this data element be modified from ± 5 percent to the larger of ± 5 degrees or ± 5 percent of the reading. SAE stated that this change would add clarity to the accuracy specification while assuring that it is not too small for small steering angles.

B.   *Data Clipping Flag:*

All three petitioners requested that the agency consider delaying the requirement that an EDR must flag the first occurrence of input that saturates or clips the sensor. The Alliance and

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[8] See Docket No. NHTSA-2011-0106.

Honda agreed with the agency's intention to record the timing of when the design range of a sensor is exceeded. However, each petitioner commented that it would be too difficult to complete the necessary system programming within the 12-month interval between the August 5, 2011 final rule and the September 1, 2012 effective date of Part 563. Honda requested the agency delay this requirement for 1 year, while the Alliance and GAM requested a 2-year delay.

Honda stated that given the extensive ramifications of a software modification, they investigated the feasibility of detecting the time of a data clipping occurrence through the data retrieval tool. They stated that the result of this investigation indicated that it is not feasible to accurately capture the time of data clipping due to the low frequency in which the EDR records the data that is available for imaging by the tool (100 Hz).

C.   *End of Event Time:*

The Alliance commented that the revisions to the "End of event time" definition to be based on the resultant vehicle delta-V will affect both the data reporting requirements and the capture and storage requirements for EDRs. The ASC noted that this change could require a real-time calculation to determine when the resultant has been met under all conditions. Both the Alliance and the ASC noted that this may result in changes to the EDR software and require evaluation prior to implementation. Honda noted that certain strategies would determine the end of event when both the lateral and the longitudinal delta-V fall below the 0.8 km/h (0.5 mph) limit. In this case, the end of event determined by the EDR algorithm may be marginally earlier than specified in Part 563. The Alliance and Honda proposed that the agency consider revising the end of event definition as follows:

> End of event time means the moment at which (1) the cumulative longitudinal delta-V within a 20 ms time period becomes 0.8 km/h (0.5 mph) or less, and (2) for vehicles that record "delta-V lateral", the cumulative lateral delta-V within a 20 ms time

period becomes 0.8 km/h (0.5 mph) or less, or (3) the crash detection algorithm of the air bag control unit resets.

The GAM supported both the Alliance and Honda petitions to make this change to the end of event time definition.

D.   *Occupant Size Classification:*

Both the Alliance and Honda requested clarification on the revisions to the occupant size classifications definition. They stated that the current definition is misleading in that it may now include the 5th percentile female (as defined in 49 CFR Part 572, subpart O) in the same category as an adult, particularly in the driver's designated seating position. The GAM supported the Alliance and Honda petitions. The petitioners requested that the agency clarify if, in fact, it intended to include 5th percentile females in the larger occupant category.

E.   *Non-Reversible Deployable Restraints:*

The Alliance and ASC petitioned the agency to clarify the requirements for data capture by EDRs in events utilizing non-reversible deployable restraints other than air bags. They stated their belief that the agency intended to allow capture and recording of deployments of devices such as pretensioners at the option of the manufacturer, but that the current regulatory text in 49 CFR 563.9(b) does not specify this optional nature. The ASC asked for clarification on whether or not such non-reversible restraint deployments would be required to be locked. The GAM supported the Alliance petition, and recommended that the agency adopt the Alliance proposal to codify the optional nature of non-air bag, non-reversible restraint deployments.

F.   *Multi Event Storage:*

The ASC requested clarification on the locking of events involving side impact air bags. It commented that the regulatory text[9] could be interpreted to mean that if a side impact

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[9] See 49 CFR 563.9, Data capture.

deployment occurs first, it would be locked and a subsequent secondary frontal air bag deployment would not be recorded. It further suggested that this would not be in keeping with the agency's intent to record frontal air bag deployments. The GAM supported the ASC request for clarification.

G.   *Technical Workshop:*

Honda and GAM requested that the agency consider holding a technical workshop to ensure that all stakeholders are properly prepared to comply with Part 563 given the myriad complex issues and iterations of the regulation. GAM added that such an exchange would aid in resolving any additional technical issues in the most expeditious manner possible.

H.   *Compliance Test Procedures:*

Honda, ASC, and GAM urged the agency to publish a compliance test procedure for Part 563 as soon as possible. Without a test procedure, they noted that it will be very difficult to maintain consistent and reliable compliance across the industry. The ASC added that NHTSA should harmonize the test procedure for Part 563 with the appropriate test procedures for the Society of Automotive Engineers (SAE) recommended practices.

III. Analysis and Agency Decision

A.   *Steering Input:*

Steering input with respect to Part 563 is an optional data element used to determine the driver's intent prior to a crash. In its petition for reconsideration of the 2008 final rule, Bosch commented that the Table III accuracy and resolution requirements for the steering input data element are inconsistent with other data elements. It recommended that the agency revise the range definition for this data element to ± 100 percent. In response, the agency revised the minimum range requirement for the "Steering input" data element from -250 degrees CW to 250

degrees CCW to a value of ± 100 percent in Table III in the 2011 final rule. We stated we agreed with Bosch that this change would be more consistent with the accuracy and resolution requirements being expressed as percentages. We also believed the change would better address state-of-the-art active steering systems where the steering wheel angle and tire position may not correlate.

In consideration of the Alliance and Honda petitions for reconsideration of the 2011 final rule on the issue of steering input and the supporting information subsequently provided by Bosch, we are now reverting back to the steering input data element range of -250 degrees CW to 250 degrees CCW that was in the 2008 final rule. The change to the range made in the 2011 final rule was not intended to add unnecessary complexity to the vehicle's EDR. At the time of our earlier decision, we agreed with the need for desired consistency with other data elements (such as throttle and accelerator pedal position) and Bosch's petition for this change did not speak to the vehicle trim line implications and the complexities that would result.

We are not making this change in response to comments suggesting that the rule would require drastic changes in steering design. We believe that the reporting of angle as a percentage of full lock to the tolerance required could be implemented by a software change in the download tool and knowledge of the full lock angle for the vehicle make/model.

At the time of our analysis for the 2011 final rule, the majority of EDR data collected did not include steering input in the vehicle pre-crash data set. As a result, the agency had little practical experience with manufacturer plans for use of the voluntary steering input data element. However, after reviewing more recent EDR crash data where the pre-crash steering input was captured, we believe the original steering input range measured in degrees may be a more practical indicator. While the same information could be obtained from a percentage value, this

would require knowledge of the number of degrees to fully lock in each direction. Rather, we believe it would be more convenient to crash investigators to have the degree information without having to seek out the addition information about the full lock angle from the vehicle manufacturer or other means. If an investigator wishes to know the angle as percentage of full lock, they can take the extra step to get the full lock angle and do the conversion.

We note that no change was made based upon SAE's comments. We have considered their comments and suggested "technical amendments." However, we do not believe the changes suggested by SAE could be considered technical amendments. In addition, the submission was received outside of the 45-day period for filing a petition for reconsideration. As such, we will treat it as a petition for rulemaking and will consider it under our plans for publishing an advance notice of proposed rulemaking in the near future to explore the potential for, and future utility of, capturing additional EDR data in light vehicles.

B.   *Data Clipping Flag:*

We agree with Honda, the Alliance, ASC, and GAM that the data clipping flag requirement should be delayed by one year.

In the 2011 final rule, the agency addressed the issue of data clipping that may occur during extreme crash events, or even for brief periods of time during crash testing, by revising footnote 1 of Table III to require manufacturers to report when sensors first exceed their design range. The 2011 final rule, however, left the manner by which the clipping is indicated up to the vehicle manufacturer and did not limit the potential methods for achieving this requirement. Instead, we provided the examples of a flag on the data trace, or an additional reported field indicating the timing of the clipping.

The Alliance, ASC, and GAM both asserted that, although they were supportive of the data clipping flag requirement, that modifications, including new software, will be necessary in order to meet this requirement. The Alliance and GAM stated that an additional year is necessary to make these modifications. ASC requested that the data clipping requirement be delayed or eliminated until it can be properly studied. Honda indicated that the data retrieval tool cannot simply be reprogrammed to detect data clipping and report it. It further explained that the restraint control systems developed to properly operate the occupant restraint systems were not designed to capture the time at which the sensor inputs exceed their design range. It also stated that it is not feasible to accurately capture the saturation timing via a data retrieval tool because of the low sampling rate of the EDR.

We agree with Honda, the Alliance, ASC, and GAM that modifications may be necessary to existing EDRs in order to meet the data clipping flag. In particular, Honda provided a reasoned explanation of the software modifications that would be necessary to comply with the data clipping flag requirement and why an additional year is necessary. Although we believe that it may be feasible to use the data retrieval tool to detect data clipping to a level of accuracy that would allow manufacturers to report delta-V with the required accuracy, we understand that the use of the data retrieval tool to flag the clipping may provide some short-term technical challenges. Therefore, we are providing one extra year of lead time for this particular requirement to give manufacturers additional flexibility.

C.   *End of Event Time:*

We are denying the Alliance, ASC, and Honda petitions to reconsider amendments to the definition for an end of event. The petitioners state that the addition of "resultant" to the definition may marginally affect the determination of the end of an event. The Alliance and

GAM noted that not all EDRs capture lateral delta-V and that those vehicles that do capture lateral delta-V may not currently calculate the resultant. They stated that calculating the resultant delta-V could necessitate additional software changes, delaying the ability of the manufacturers to comply with Part 563.

The agency agrees that not all EDRs capture lateral delta-V. However, we note that in these cases, the resultant delta-V would simply be the longitudinal delta-V. For all other cases, we believe there is sufficient latitude in the definition for end of event for vehicle manufactures to institute an EDR strategy that meets the definition without undue burden. We note that manufacturers ultimately determine how the crash detection algorithm resets. Therefore, in cases where both lateral and longitudinal delta-V data are collected, manufacturers may opt to determine when the end of the event has occurred via the resultant cumulative delta-V, or via any method by which they choose to reset the crash detection algorithm. In the worst case, the vehicle will need to capture the full 300 ms of delta-V data, which has been required by Part 563 since the 2006 final rule.

D.   *Occupant Size Classification:*

We are denying the Honda and Alliance petitions to reconsider the occupant size classifications. Since the proposed rulemaking[10] stage of Part 563, the agency has intended for the occupant size classification to be inclusive of the 5th percentile female as defined in 49 CFR Part 572, subpart O. The revisions enacted in the 2011 final rule were simple clarifications to the original agency intent. We do not believe that there is a conflict with the resolution for this data element in Table III. Therefore, this data element will be used to report if the occupant in a designated seating position would meet the criteria of the 5th percentile female or larger.

E.   *Non-Reversible Deployment of Restraints:*

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[10] In the 2004 Part 563 NPRM, the data element was "Occupant size driver occupant 5th female size y/n."

We are denying the Alliance and ASC petitions to clarify how the deployment of non-reversible restraints other than air bags are recorded. We believe that section 563.9(b) is clear that when a memory buffer is available, EDRs must capture and record current event data that does not involve deployment of an air bag. If the memory buffers are full, manufacturers may either overwrite any previous data that does not involve deployment of an air bag, or not record the current event data if it does not involve deployment of an air bag. In this manner, manufacturers may prioritize the capture of events that do not involve deployments of air bags, but do deploy other non-reversible restraints regardless of type.

F.   *Multi Event Storage:*

In response to the ASC request for clarification on the locking of events involving side impact air bags, we agree that if a side impact deployment occurs first and the EDR records lateral delta-V, this event would need to be locked; however, a subsequent event (including the deployment of a frontal air bag) would not need to be recorded, but it could be allowed at the option of the manufacturer. We refer to the preambles of the previous rulemakings on the subject. Specifically, we stated the following in the preamble to the 2011 final rule.[11]

> "…'In a side or side curtain/tube air bag deployment crash, where lateral delta-V is recorded by the EDR, capture and record the current deployment data. The memory for the air bag deployment event must be locked to prevent any future overwriting of the data.' Thus, any frontal air bag deployment, or any side, or side curtain/tube air bag deployment where lateral delta-V is recorded by the EDR, would not require the EDR to record a second, subsequent event, although it would allow such recording. We note that the phrase 'up to two events' remains in § 563.9(b) and so there continues to be an obligation to record multiple non-air bag deployment events."

G.   *Technical Workshop:*

In response to the Honda and GAM request that the agency consider holding a technical workshop to ensure that all stakeholders are properly prepared to comply with Part 563, we do

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[11] See 76 FR 47482.

not believe that a technical workshop is needed at this time. We remain open to this possibility if the need presents itself in the future.

H.   *Compliance Test Procedures:*

The agency is working with the SAE EDR committee to ensure that any compliance test procedure we produce would consider the SAE J1698 Vehicle Event Data Interface recommended industry practices, as appropriate. The test procedure and accompanying documents will be provided in the docket[12] for the 2011 final rule.

IV. Rulemaking Analyses and Notices

We have considered the impact of this rulemaking action under Executive Order 12866, "Regulatory Planning and Review," Executive Order 13563, "Improving Regulation and Regulatory Review," and the Department of Transportation's regulatory policies and procedures. This rulemaking document was not reviewed by the Office of Management and Budget under those two Executive Orders. It has been determined not to be "nonsignificant" under Executive Order 12866 and the Department of Transportation's regulatory policies and procedures. This rule makes several technical changes to the regulatory text of 49 CFR Part 563, and does not increase the regulatory burden of manufacturers. A complete statement of the costs and benefits of the introduction of Part 563 are available in the August 2006 final rule and the accompanying Final Regulatory Evaluation.[13]

The agency has discussed the relevant requirements of the Vehicle Safety Act, the Regulatory Flexibility Act, Executive Order 13132 (Federalism), Executive Order 12988 (Civil Justice Reform), Executive Order 13045 (Protection of Children from Health and Safety Risks), the Paperwork Reduction Act, the National Technology Transfer and Advancement Act,

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[12] See Docket No. NHTSA-2011-0106 at www.regulations.gov.
[13] See 71 FR 51041; Docket No. NHTSA-2006-25666-0002.

Unfunded Mandates Reform Act, and the National Environmental Policy Act in the August 2006

final rule cited above. Those discussions are not affected by these technical changes.

Privacy Act

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into any of our dockets by the name of the individual submitting the document (or signing the

document, if submitted on behalf of an association, business, labor union, etc.). You may review

DOT's complete Privacy Act Statement in the Federal Register published on April 11, 2000

(Volume 65, Number 70; Pages 19477–78), or you may visit http://www.dot.gov/privacy.html.

List of Subjects in 49 CFR Part 563

Motor vehicle safety, Motor vehicles, Reporting and record keeping requirements.

Regulatory Text

In consideration of the foregoing, 49 CFR Part 563 is amended as follows:

PART 563 – EVENT DATA RECORDERS

1. The authority citation for Part 563 continues to read as follows:

Authority: 49 U.S.C. 322, 30101, 30111, 30115, 30117, 30166, 30168; delegation of

authority at 49 CFR 1.50.

2. In § 563.8, revise Table III in paragraph (a) to read as follows:

§ 563.8 Data format.

(a) *   *   *

TABLE III – REPORTED DATA ELEMENT FORMAT

Data Element	Minimum Range	Accuracy[1]	Resolution
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	- 250 deg CW to + 250 deg CCW	+/- 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,	0 to 250 ms	+/- 2 ms	1 ms.

time to deploy/first stage, driver			
Frontal air bag deployment, time to deploy/first stage, right front passenger	0 to 250 ms	+/- 2 ms	1 ms.
Frontal air bag deployment, time to n^{th} stage, driver	0 to 250 ms	+/- 2 ms	1 ms.
Frontal air bag deployment, time to n^{th} stage, right front passenger	0 to 250 ms	+/- 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	+/- 2 ms	1 ms.
Side air bag deployment, time to deploy, right front passenger	0 to 250 ms	+/- 2 ms	1 ms.
Side curtain/tube air bag deployment, time to deploy, driver side	0 to 250 ms	+/- 2 ms	1 ms.
Side curtain/tube air bag deployment, time to deploy, right side	0 to 250 ms	+/- 2 ms	1 ms.
Pretensioner deployment, time to fire, driver	0 to 250 ms	+/- 2 ms	1 ms.
Pretensioner deployment, time to fire, right front passenger	0 to 250 ms	+/- 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.

[1]Accuracy requirement only applies within the range of the physical sensor. For vehicles manufactured after September 1, 2014, 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.

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Issued on: July 19, 2012

David L. Strickland

Administrator

BILLING CODE 4910-59-P