



Department of Transportation

National Highway Traffic Safety Administration

[Docket No. NHTSA-2016-0138; Notice 1]

**Jaguar Land Rover North America, LLC, Receipt of Petition for
Decision of Inconsequential Noncompliance**

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

ACTION: Receipt of petition.

SUMMARY: Jaguar Land Rover North America, LLC (JLR) on behalf of Jaguar Land Rover Limited, has determined that certain model year (MY) 2016-2017 Land Rover Range Rover and Range Rover Sport motor vehicles do not fully comply with Federal Motor Vehicle Safety Standard (FMVSS) No. 208, *Occupant Crash Protection*, and FMVSS No. 209, *Seat Belt Assemblies*. JLR filed a noncompliance report dated December 2, 2016. JLR also petitioned NHTSA on December 23, 2016, for a decision that the subject noncompliance is inconsequential as it relates to motor vehicle safety.

DATES: The closing date for comments on the petition is **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: Interested persons are invited to submit written data, views, and arguments on this petition. Comments must refer to the docket and notice number cited in the title of this notice and submitted by any of the following methods:

- Mail: Send comments by mail addressed to U.S.
Department of Transportation, Docket Operations, M-30,
West Building Ground Floor, Room W12-140, 1200 New
Jersey Avenue, SE, Washington, DC 20590.
- Hand Delivery: Deliver comments by hand to U.S.
Department of Transportation, Docket Operations, M-30,
West Building Ground Floor, Room W12-140, 1200 New
Jersey Avenue, SE, Washington, DC 20590. The Docket
Section is open on weekdays from 10 am to 5 pm except
Federal Holidays.
- Electronically: Submit comments electronically by
logging onto the Federal Docket Management System
(FDMS) website at <https://www.regulations.gov/>. Follow
the online instructions for submitting comments.
- Comments may also be faxed to (202) 493-2251.

Comments must be written in the English language, and be no greater than 15 pages in length, although there is no limit to the length of necessary attachments to the comments. If comments are submitted in hard copy form, please ensure that two copies are provided. If you wish to receive confirmation that comments you have submitted by mail were received, please enclose a stamped, self-addressed postcard with the comments. Note that all comments received will be posted without change to

<https://www.regulations.gov>, including any personal information provided.

All comments and supporting materials received before the close of business on the closing date indicated above will be filed in the docket and will be considered. All comments and supporting materials received after the closing date will also be filed and will be considered to the fullest extent possible.

When the petition is granted or denied, notice of the decision will also be published in the Federal Register pursuant to the authority indicated at the end of this notice.

All comments, background documentation, and supporting materials submitted to the docket may be viewed by anyone at the address and times given above. The documents may also be viewed on the Internet at <https://www.regulations.gov> by following the online instructions for accessing the dockets. The docket ID number for this petition is shown in the heading of this notice.

DOT's complete Privacy Act Statement is available for review in a Federal Register notice published on April 11, 2000, (65 FR 19477-78).

SUPPLEMENTARY INFORMATION:

I. Overview: Jaguar Land Rover North America, LLC (JLR), has determined that certain model year (MY) 2016-2017 Land Rover Range Rover and Range Rover Sport motor vehicles do not fully comply with Federal Motor Vehicle Safety Standard (FMVSS) No.

208, *Occupant Crash Protection*, and FMVSS No. 209, *Seat Belt Assemblies*. JLR filed a noncompliance report dated December 2, 2016, pursuant to 49 CFR part 573, *Defect and Noncompliance Responsibility and Reports*. JLR also petitioned NHTSA on December 23, 2016, pursuant to 49 U.S.C. 30118(d) and 30120(h) and 49 CFR part 556, for an exemption from the notification and remedy requirements of 49 U.S.C. Chapter 301 on the basis that this noncompliance is inconsequential as it relates to motor vehicle safety.

This notice of receipt of JLR's petition is published under 49 U.S.C. 30118 and 30120 and does not represent any agency decision or other exercise of judgment concerning the merits of the petition.

II. Vehicles Involved: Approximately 16,502 MY 2016-2017 Land Rover Range Rover and MY 2016-2017 Land Rover Range Rover Sport motor vehicles, manufactured between May 3, 2016, and October 14, 2016, are potentially involved.

III. Noncompliance: JLR explains that the noncompliance involves the Emergency Locking Retractor (ELR) in the safety belt assembly of the vehicle's front left seat. These ELR's are equipped with a vehicle-sensitive locking mechanism and a webbing-sensitive locking mechanism. The noncompliance specifically involves the vehicle-sensitive locking mechanism,

which does not lock as designed when subjected to the requirements of paragraph

IV. Rule Text: Paragraph S4.3 of FMVSS No. 209 states in pertinent part:

S4.3 Requirements for hardware...

(j) Emergency-locking retractor...

(2) For seat belt assemblies manufactured on or after February 22, 2007 and for manufacturers opting for early compliance. An emergency-locking retractor of a Type 1 or Type 2 seat belt assembly, when tested in accordance with the procedures specified in paragraph S5.2(j)(2)...

(ii) Shall lock before the webbing payout exceeds the maximum limit of 25 mm when the retractor is subjected to an acceleration of 0.7 g under the applicable test conditions of S5.2(j)(2)(iii)(A) or (B). The retractor is determined to be locked when the webbing belt load tension is at least 35 N.

Paragraph S7.1.1.3 of FMVSS No. 208 states in pertinent part:

S7.1.1.3 A Type 1 lap belt or the lap belt portion of any Type 2 seat belt assembly installed at any forward-facing outboard designated seating position of a vehicle with a gross vehicle weight rating of 10,000 pounds or less to comply with a requirement of this standard, except walk-in van-type vehicles and school buses, and except in rear seating positions in law enforcement vehicles, shall meet the requirements of S7.1 by means of an emergency locking retractor that conforms to stand No. 209 (49 CFR 571.209)...

V. Summary of JLR's Petition: JLR described the subject noncompliance and stated its belief that the noncompliance is inconsequential as it relates to motor vehicle safety.

In support of its petition, JLR submitted the following reasoning:

a) **ELR is Voluntarily Equipped with a Webbing Sensitive**

Locking Mechanism: The driver's ELR safety belt assembly also contains a voluntary webbing-sensitive locking mechanism which provides crash restraint performance comparable to the performance provided by an FMVSS No. 209 compliant vehicle sensitive mechanism. A description of the tests that were performed and the results that were obtained which support this petition are contained in the petition.

The webbing sensitive locking mechanism is designed to lock at approximately 1.4 - 2.0g. The webbing-sensitive locking mechanism was designed to meet the requirements of other non-U.S. markets.

b) **Testing and Analyses:** Tests and analyses were conducted to determine the effect of a non-compliant vehicle-sensitive locking mechanism ELR on safety belt restraint (retractor locking) performance and any commensurate increase in injury risk in a crash.

Even though the ELRs in affected vehicles contain a vehicle-sensitive locking mechanism which slightly exceeds the FMVSS No. 209 Section 4.3(j)(2)(ii) requirement, for purposes of evaluation, and to demonstrate a "worst-case

scenario", testing was conducted without reliance on vehicle-sensitive ELR operation.

1. Sled (Crash) Tests to Assess Safety Belt Restraint

(Retractor Locking) Performance: Sled (crash) tests were conducted with an ELR containing an FMVSS No. 209 compliant vehicle-sensitive locking mechanism and an ELR in which the vehicle-sensitive locking mechanism was disabled (to simulate a "worst-case scenario", but contained a webbing-sensitive locking mechanism.

The belt geometry is representative of the Land Rover Range Rover and Range Rover Sport Installation.

The testing focused upon low severity crashes, because as NHTSA had discussed in their ruling on the GM petition¹, "...a webbing-sensitive ELR mechanism will lock up more quickly in a severe frontal crash than in a low-to-moderate severity frontal crash." A low-severity crash represents a "worst-case scenario" for an ELR equipped with a non-compliant vehicle-sensitive locking mechanism. In addition, the testing was conducted using a Hybrid III 5th dummy in order to provide a slow increase in belt loads.

Three acceleration pulses with a low increase in deceleration and a low deceleration level were

¹ See 69 FR 1987@ 1900

selected from all pulses pertaining to the affected vehicles. The selected pulses have an impact velocity of 15 km/h, and 40 km/h respectively. The 15 km/h and 32 km/h pulses represent a full frontal crash, while the 40 km/h pulse represents an Offset Deformable Barrier (ODB) crash. The 15 km/h pulse is a "no fire" pulse to simulate a crash without safety belt pre-tensioning.

A total of six tests were conducted, with two tests being conducted at each pulse level. Webbing payout and dummy chest forward displacement were measured.

The results indicate that there is no significant difference in restraint performance (webbing payout, dummy chest forward displacement) between an ELR equipped with an FMVSS No. 209 compliant vehicle-sensitive locking mechanism and one that is not equipped with such a mechanism. The webbing-sensitive locking mechanism within the ELR provides comparable performance to that of an FMVSS No. 209 compliant ELR containing a vehicle sensitive locking mechanism.

Therefore, in a crash, the webbing-sensitive locking mechanism provides equivalent protection for the driver to that which would be provided by an FMVSS

No. 209-compliant vehicle sensitive locking mechanism. It should be emphasized that the vehicle-sensitive locking mechanism contained in the ELR of the affected vehicles slightly exceeds the FMVSS No. 209 Section 4.3(j)(2)(ii) requirement, whereas testing was conducted with a disabled vehicle-sensitive locking mechanism to simulate a "worst-case scenario".

It should also be noted that any performance differences, such as a slight decrease in dummy chest forward displacement from an ELR without a vehicle-sensitive locking mechanism, are within the normal test to test variation and are attributed to test tolerances.

2. Body-In White (BIW) Sled (Crash) Tests to Assess

Injury Risk: Body-In-White (BIW) sled (crash) tests were conducted with an ELR containing an FMVSS No. 209 Section 4.3(i)2(ii)-compliant vehicle-sensitive locking mechanism. Further testing was conducted without reliance on vehicle-sensitive ELR operation for comparative performance purposes (to simulate a "worst-case scenario"), but contained a webbing-sensitive locking mechanism.

Tests were conducted with a Hybrid III 50th% dummy and a 56 km/h pulse representing a full-frontal FMVSS

No. 208 requirement. The pulse was selected from an actual pulse of one of the affected vehicles.

3. **Sled (BIW Crash) Test Pulse (L405 - Range Rover):** The dummy was positioned to simulate pre-crash braking for both test conditions, i.e., the test using the compliant vehicle-sensitive locking mechanism ELR, and the test using the non-compliant vehicle-sensitive locking mechanism ELR. Pre-crash braking positioning was included to simulate critical real-world crash conditions, as pre-crash braking occurs in a significant percentage of crashes. Pre-crash braking would position the dummy (in both tests) closer to the steering wheel prior to impact. Additionally, pre-crash braking would assess any effect of additional forward movement resulting from an ELR in which the vehicle-sensitive locking mechanism was disabled (to simulate a "worst-case scenario").

For the test with the FMVSS No. 209-compliant vehicle-sensitive ELR, the dummy's H-point was 40mm more forward, and the dummy's Chest CG was 70mm more forward, than it otherwise would be in a test which did not simulate pre-crash braking. For the test with the FMVSS No. 209 non-compliant vehicle-sensitive ELR, the dummy's H-point was 60mm more forward, and the

dummy's Chest CG was 90mm more forward than it otherwise would be in a test which did not simulate pre-crash braking. Therefore, for the dummy in which the non-compliant vehicle-sensitive ELR was utilized, it was positioned approximately 20mm more forward as compared to the dummy in the test in which the compliant vehicle-sensitive ELR was utilized.

The value of 20mm was obtained from conducting simulations representing pre-crash braking involving a deceleration over 1.5s peaking at approximately 1.0g for 1.0sec duration. Simulations were conducted because the Hybrid III dummy does not have adequate biofidelity in low-severity acceleration conditions such as pre-crash braking. The simulations utilized the Active THUMS model which has been well-correlated to actual driving/braking tests involving human volunteers. The additional forward movement of 20mm for the dummy in which the non-functioning vehicle-sensitive ELR was utilized was consistent across all dummy body regions (i.e., head, chest, and pelvis).

The restraint system was equipped with a dual-stage driver airbag and safety belt pre-tensioners.

The results indicated that while there were only minor differences in recorded values between the two

tests, the calculated injury values were well within the Injury Assessment Reference Values IARVs for each test outcome for both an ELR equipped with an FMVSS No. 209-compliant vehicle-sensitive locking mechanism and an ELR equipped with a non-compliant vehicle-sensitive locking mechanism.

c) Rollover Tests to Assess Safety Belt Restraint (Retractor Locking) Performance:

1. Quasi-static Rollover Tests - FMVSS No. 209 Paragraph 4.3(j)(2)(i)(D) requires that the retractor lock at an angular rotation greater than 45-degrees. When tested, JLR has evidence of a part which did not perform to this standard.

Rollover tests were conducted with an ELR containing an FMVSS No. 209-compliant vehicle-sensitive locking mechanism and an ELR in which the vehicle-sensitive locking mechanism was disabled (to simulate a "worst-case scenario").

To simulate a rollover condition, quasi-static testing was conducted with an FMVSS No. 301 test device with a World-SID dummy being placed in the driver's seat of the vehicle mounted on the test device. Testing was conducted with an angular rotation range of ± 50 degrees around the vehicle's

longitudinal axis according to SAE 760. An angular range of ± 50 degrees was used based on analysis of the affected vehicles during different vehicle level roll-over events and two key observations: 1) the time at which the seat belt retractors were subject to $>1g$ lateral acceleration (an acceleration at which the affected ELRs had typically locked via the CS sensor, particularly with additional tilt angle applied) and, 2) the timing of the triggering of belt pretensioners in such a roll-over event, leading to locking of the seat belt ELR via the WS sensor (assuming the CS sensor had not locked earlier in the event). Test video of the D-loop (upper attachment point) and any dummy head movement was recorded.

For the tests in which the vehicle was rotated to the right, approximately 5mm additional webbing payout at the upper seat belt anchorage was observed between the vehicle-sensitive compliant and non-compliant ELRs up to a roll angle of 50 degrees. A difference in dummy head movement of approximately 10mm (in the lateral (y-direction)) was observed for the tests conducted with the vehicle-sensitive non-compliant ELR.

For the tests in which the vehicle was rotated to the left, the video did not depict any difference in dummy head movement between the vehicle-sensitive compliant and non-compliant ELRs. Also, no belt payout was visible at the D-loop.

2. **Dynamic Rollover Tests:** In addition to the quasi-static rollover tests, available data from actual dynamic rollover tests of the affected vehicles was analyzed to understand the dynamics in such scenarios and the effect of the vehicle-sensitive locking mechanism in the ELR.

The dynamic rollover tests were based upon real-world rollover conditions. An initial acceleration must occur to induce a rollover and tests were selected based on the minimum dynamic scenarios that would result in rollover. The lateral deceleration of the seat belt retractors in the rollover events was analyzed to determine the expected ELR vehicle-sensitive sensor locking time based on the evidence that a non-compliant ELR would lock by a lateral acceleration of approximately 1.0g and that the tilt lock function would lock at <0.7g with an additional tilt lock angle of 18 degrees. As the rollover sensing system fitted to the affected vehicles is configured

to trigger the seat belt retractor pretensioners, the rollover sensor trigger times were also established for the rollover scenarios analyzed to determine the point at which the seat belt retractor pretensioner would activate and thereby achieve ELR belt locking.

From tests conducted with vehicle-sensitive locking mechanism non-compliant ELRs, the locking mechanism locks at approximately 1.0g of lateral acceleration. Additional testing on the same non-compliant ELRs has confirmed that the vehicle-sensitive locking of such an ELR would lock below an applied acceleration of 0.7g in all directions when tilted to an angle of up to 18° around the vehicle's longitudinal axis. Therefore, the results of the dynamic rollover tests indicate that the impact-inducing rollovers result in lateral decelerations in which the ELR will lock before a rotation of 18 degrees is reached. Further analysis of rollover sensor trigger times has demonstrated that the pretensioners would trigger before a rollover angle of 45 degrees.

This analysis confirms that locking will occur before a rotation angle of 45 degrees is reached, as required by FMVSS 209.

3. **Cork-Screw Rollover Simulation Analysis:** For the "cork-screw" rollover event additional analysis of the occupant kinematics was made to establish whether a non-compliant vehicle-sensitive locking mechanism of the ELR would have affected any forward motion of an occupant prior to ELR lock as previously determined.

An LS-Dyna computer simulation was made to replicate the "cork-screw" rollover event previously analyzed such that the occupant positioning could be determined without the influence of a locking seat belt ELR. To simulate a "worst case scenario" locking of the seat belt ELR was completely removed from the CAE model. The analysis was made on the "far side" occupant (i.e. the occupant sat on the opposite side of the vehicle from that which impacts the test ramp) as any lateral motion of this occupant is assumed to be inboard, away from the seat belt upper anchorage. The model was set up with a normally extracting/retracting seat belt to measure any webbing pay-out due to dummy kinematics prior to seat belt ELR lock.

Like the physical test, the simulation showed a small level of initial occupant forward head motion on initial vehicle-to-ramp contact and the occupant

returned to a normal seating position prior to the vehicle leaving the ramp or the seat belt ELR locking during this dynamic event as previously determined. No webbing payout of the seat belt was observed in the simulation, leading to the conclusion that a seat belt with non-compliant vehicle-sensitive locking mechanism would not affect the occupant kinematics in such a rollover scenario.

- d) **Summary of Test Results:** The FMVSS 209 Section 4.3(j)(2)(i) & (ii) non-compliant vehicle-sensitive locking mechanism within the ELRs of affected vehicles shows no significant performance difference when compared to a compliant vehicle-sensitive locking mechanism. This finding is obtained from conducting a number of laboratory tests representing FMVSS 209 and 208 requirements, as well as other real-world crash conditions. The tests represent a variety of conditions such as crashes with, and without, pre-crash braking, and also other conditions, such as rollovers.

Notably, although all tests were conducted without reliance on a functioning ELR vehicle sensitive locking mechanism, affected vehicles do contain a functionally operable vehicle-sensitive locking mechanism which may slightly exceed the FMVSS 209 Paragraph 4.3(j)(2)(i) & (ii)

requirements. Therefore, as installed in vehicles, the seat belt would likely perform better than the non-functioning units utilized for testing and analysis that form the basis for this petition.

e) **Owner Contacts to Jaguar Land Rover Customer Relations:**

Jaguar Land Rover Customer Relations has not received any contacts from vehicle owners regarding this issue.

f) **Accidents/Injuries:** Jaguar Land Rover is not aware of any accidents or injuries that have occurred as a result of this issue.

g) **Prior NHTSA Rulings re Manufacturer Petitions:** NHTSA has previously granted a petition from General Motors (GM) on a very similar issue. [69 FR 19897, Docket No. NHTSA-2002-12366, Apr 14, 2004]. GM provided test results and analyses indicating that while there existed a non-functional vehicle sensitive locking mechanism within the safety belt assembly ELR, the webbing sensitive locking mechanism provided comparable restraint performance to that of a fully functional vehicle sensitive locking mechanism.

In Jaguar Land Rover's case, the vehicle-sensitive locking mechanism is functional, but may slightly exceed the FMVSS 209 Sections 4.3(j)(2)(i) & (ii) requirements, and, also contains a webbing sensitive locking mechanism

which provides comparable performance to that of a vehicle sensitive mechanism.

- h) **Vehicle Production:** Vehicle production has been corrected to fully conform to FMVSS 209 Sections 4.3(j)(2)(i) & (ii).

JLR concluded by expressing the belief that the subject noncompliance is inconsequential as it relates to motor vehicle safety, and that its petition to be exempted from providing notification of the noncompliance, as required by 49 U.S.C. 30118, and a remedy for the noncompliance, as required by 49 U.S.C. 30120, should be granted.

To view JLR's petition, test data and analyses in its entirety you can visit <https://www.regulations.gov> by following the online instructions for accessing the dockets and by using the docket ID number for this petition shown in the heading of this notice.

NHTSA notes that the statutory provisions (49 U.S.C. 30118(d) and 30120(h)) that permit manufacturers to file petitions for a determination of inconsequentiality allow NHTSA to exempt manufacturers only from the duties found in sections 30118 and 30120, respectively, to notify owners, purchasers, and dealers of a defect or noncompliance and to remedy the defect or noncompliance. Therefore, any decision on this petition only applies to the subject vehicles that JLR no longer controlled at the time it determined that the noncompliance existed. However,

any decision on this petition does not relieve vehicle distributors and dealers of the prohibitions on the sale, offer for sale, or introduction or delivery for introduction into interstate commerce of the noncompliant vehicles under their control after JLR notified them that the subject noncompliance existed.

Authority: (49 U.S.C. 30118, 30120: delegations of authority at 49 CFR 1.95 and 501.8)

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Office of Vehicle Safety Compliance.

Billing Code 4910-59-P

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