



DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

[Docket No. NHTSA-2016-0129; Notice 2]

**Toyota Motor Engineering & Manufacturing North America, Inc.,
Grant of Petition for Decision of Inconsequential Noncompliance**

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

ACTION: Grant of petition.

SUMMARY: Toyota Motor Engineering & Manufacturing North America, Inc., on behalf of Toyota Motor Corporation and certain other specified Toyota manufacturing entities (collectively referred to as "Toyota"), has determined that certain model year (MY) 2016-2017 Lexus RX350 and Lexus RX450H motor vehicles do not fully comply with Federal Motor Vehicle Safety Standard (FMVSS) No. 202a, *Head Restraints*. Toyota filed a noncompliance information report dated November 29, 2016. Toyota also petitioned NHTSA on December 21, 2016, for a decision that the subject noncompliance is inconsequential as it relates to motor vehicle safety.

FOR FURTHER INFORMATION CONTACT: Ed Chan, Office of Vehicle Safety Compliance, NHTSA, telephone (202) 493-0335, facsimile (202) 366-3081.

SUPPLEMENTARY INFORMATION:

I. Overview: Toyota, has determined that certain MY 2016-2017 Lexus RX350 and RX450H motor vehicles do not fully comply with paragraph S4.5 of FMVSS No. 202a, *Head Restraints* (49 CFR 571.202a). Toyota filed a noncompliance information report dated November 29, 2016, pursuant to 49 CFR part 573, *Defect and Noncompliance Responsibility and Reports*. Toyota also petitioned NHTSA on December 21, 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.

Notice of receipt of the petition was published with a 30-day public comment period, on April 7, 2017, in the **Federal Register** (82 FR 17079). One comment was received. To view the petition and all supporting documents log onto the Federal Docket Management System (FDMS) website at: <https://www.regulations.gov/>. Then follow the online search instructions to locate docket number "NHTSA-2016-0129."

II. Vehicles Involved: Approximately 120,748 MY 2016-2017 Lexus RX350 and Lexus RX450H motor vehicles manufactured between September 28, 2016, and November 23, 2016, are potentially involved.

III. Noncompliance: Toyota explains that the rear seat outboard head restraints are removable by utilizing the same action

(i.e., depressing the lock release button while the headrest is being pulled upward) that is used to adjust the head restraints from the first adjustment position to the second. Therefore, the requirements of paragraph S4.5 of FMVSS No. 202a are not met.

IV. Rule Requirements: Paragraph S4.5 of FMVSS No. 202a, titled "Removability of Head Restraints" includes the requirements relevant to this petition:

- The head restraint must not be removable without a deliberate action distinct from any act necessary for upward adjustment.

V. Summary of Toyota's Petition: Toyota 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, Toyota submitted the following reasoning:

1. The rear outboard head restraints continue to meet the underlying purpose of S4.5 of the standard:

- a. *Background of S4.5:* Toyota referenced a notice of proposed rulemaking (NPRM) that NHTSA issued in 2001¹ to upgrade FMVSS No. 202 and stated that its principal focus was to improve performance of front and rear outboard head restraints to mitigate "whiplash" injuries, particularly in rear crashes. Toyota stated that the agency recognized that

¹ 66 Fed. Reg. 968 (January 4, 2001)

existing adjustable head restraints could be manually removed solely by hand, and not be replaced, thereby creating a greater risk of injury. As a result, the proposed rule stated that removable front seat head restraints would not be permitted, but that due to concerns with rear visibility, removable restraints in the rear would not be prohibited. Toyota stated that the draft rule did not contain any requirement comparable to the one set forth in paragraph S4.5 of FMVSS No. 202a.

Toyota further explained that when NHTSA issued the FMVSS No. 202 Final Rule in 2004,² it made a variety of changes from the requirements proposed in the NPRM. One of those was to not require rear seat outboard head restraints, but to impose certain requirements on head restraints that were voluntarily installed. Toyota noted that most of the comments submitted on the NPRM favored removability of both front and rear seat head restraints solely by hand, although some supported a prohibition on removability at all positions, because a removed restraint might not be replaced or correctly reinstalled. Toyota stated that NHTSA ultimately decided to allow head

² 69 Fed. Reg. 74848 (December 14, 2004)

restraint removability for both front and rear restraints, but for both front and rear optional head restraints, specified that removal must be by means of a deliberate action that is distinct from any act necessary for adjustment to ensure that head restraints are not accidentally removed when being adjusted, thereby reducing the likelihood of inadvertent head restraint removal and increasing the chances that vehicle occupants will receive the benefits of properly positioned head restraints. To implement this requirement, the agency added the text in paragraph S4.5. In 2007, the agency amended the standard by adding the word "upward" before "adjustment" to clarify the upward adjustment and removability aspects of the requirement.

- b. *The noncompliance is inconsequential because the rear outboard head restraints meet the underlying purpose of S4.5:* Toyota stated that the rear seat head restraints in the subject vehicles allow manual adjustment by sliding the head restraint in and out of the seat back on stays attached to the head restraint. Position locking is achieved by two notches in one of the stays, allowing for a detent mechanism. Toyota stated that the posts go through

plates on top of the seat back, one of which contains a button which is pressed to allow the restraint to be removed. To adjust the height of the head restraint from the fully stowed position on top of the seatback to the first notch on the stay, the restraint is simply pulled upward. To reach the second notch, the button must first be pressed to allow the restraint to be lifted; it then will lock in position. To remove the restraint, the button must again be pressed before lifting it out of the seatback. Because the button must be pressed to adjust the restraint from the first notch position to the second, and the same action is required to start the removal process, the restraint does not conform to paragraph S4.5 of FMVSS No. 202a.

Toyota stated that there are three factors, when considered together, that make this noncompliance inconsequential to motor vehicles safety:

- i. With the subject head restraints, the necessity to press the release button to move from the first notch to the second, in addition to the need to press it to release the restraint from the second notch to remove it, lessens the ease of removal, thereby reducing

the likelihood of inadvertent removal and increasing the chances that the occupant will receive the benefits of a properly positioned head restraint.

- ii. The subject vehicle model can be generally described as a mid-sized sports-utility vehicle (SUV). The roofline tends to slope downward toward the rear of the vehicle, and the distance between the top of the head restraint and the headliner is less than in other mid-sized SUV's with a less sloped roofline. The rear seat can be manually adjusted forward and rearward on the seat track for a distance of 120mm from the front position to the rear position. The nominal design seat back position is approximately 27 degrees rearward to the vertical line, and the seat back can be reclined an additional 10 degrees. The seat back folds forward from the nominal design position. (See figure 6 of Toyota's petition).

Given the rear seat design, there are a variety of combinations of seat track and seat back positions that can be attained. Typically, the seat would most likely be placed in the

mid-track position or rearward for occupant comfort and convenience. From the mid-track position (60mm) rearward there are 30 combinations of seat track/seat back angle combinations for the manually reclining seat back.³ Of these combinations there are 25 where there would be some degree of interference between the top of the head restraint and the vehicle headliner if someone intended to remove it. To completely remove the restraint from the top of the seat in these 25 combinations, there must be a deliberate action to compress the soft material of the restraint, because it cannot be pulled directly out of the seatback. In some cases, the seat back angle would have to be adjusted or the seat moved forward on the seat track before the restraint can be removed without headliner interference. (See figure 7 of Toyota's petition)

Together with the need to press the release button to move the head restraint when in either the first or second notches, such

³ Some models are equipped with a power reclining seat back with the same adjustment range as the manual reclining seat back, but which can be placed in positions between the 2 degree increments of the manual seat back.

further deliberate actions in many seat adjustment positions of either compressing the restraint material, adjusting the seat slide position, or adjusting the seat back angle lessen the ease with which the restraint can be removed, reduce the chance of accidental removal, and increase the chances that the occupant will receive the benefits of a properly positioned head restraint.

iii. Finally, in addition to the two previously noted factors, it is unlikely that the head restraint will be inadvertently removed as there is 97.7mm of travel distance from the second notch until the head restraint is fully removed from the seat; this length is much greater than the travel distance between the fully stowed position and second notch (37.5mm). The difference is easily recognized by anyone attempting to adjust the head restraint. (See figure 8 of Toyota's petition) Therefore, the overall design and operation of the rear head restraints in the subject vehicles fulfill the purpose and policy behind the S4.5 requirement.

2. The Design and performance of the rear seat head restraints provide safety benefits to a broad range of occupants and pose no risk of exacerbating whiplash injuries, making the noncompliance inconsequential:
 - a. Toyota stated that NHTSA elected not to mandate rear seat head restraints in vehicles; however, certain requirements for voluntarily installed rear head restraints were adopted. Toyota stated that the requirements for rear outboard head restraints are common in some respects with those of front seat restraints, but that the rear seat environment and usage resulted in several differences. Toyota stated that NHTSA analyzed the usage of rear seats and studied the various types of occupants who typically occupy rear seating positions. Toyota stated that NHTSA found that 10 percent of all occupants sit in rear outboard seats, and that only 5.1 percent of those are people who are 13 years or older. Toyota stated that this justified a difference in the minimum height requirement for front and rear head restraints. The standard requires front integral head restraints to have a height of at least 800mm

above the H-point⁴ to the top of the restraint; the top of an adjustable restraint must reach at least 800mm and cannot be adjustable below 750mm. Rear outboard head restraints must have a height not less than 750mm in any position of adjustment. Toyota quoted the agency as stating: "The agency has estimated that a 750mm head restraint height would offer whiplash protection to nearly the entire population of rear seat occupants."

Toyota stated that the rear outboard restraints in the subject vehicles meet or surpass all the requirements in the completely stowed position and in the first notch position. Toyota stated that there is nothing about the performance of these restraints that poses a risk of exacerbating whiplash injuries and that the noncompliance does not create such a risk.

- b. Rear head restraint height well surpasses the requirements of the standard: Toyota stated that when NHTSA established height requirements for mandatory front head restraints, an adjustment range was adopted that was estimated to ensure that the

⁴ The H-point is defined by a test machine placed in the vehicle seat. From the side, the H-point represents the pivot point between the torso and upper leg portions of the test machine, or roughly like the hip joint of a 50th percentile male occupant viewed laterally.

top of the head restraint exceeded the head center of gravity for an estimated 93 percent of all adults. Toyota stated that research conducted since the implementation of the previous height requirements has shown that head restraints should be at least as high as the center of gravity of the occupant's head to adequately control motion of the head and neck relative to the torso.

Toyota stated that the rear head restraints in the subject vehicles not only surpass the 750mm requirement for voluntarily installed rear seat restraints, but also can be adjusted to surpass the 800mm requirement applicable to mandatory front seat head restraints. In the fully stowed position, the rear outboard head restraints measure 780mm above the H-point. In the first notch position they are 797mm above the H-point, and in the second notch position they are 816mm above the H-point. (See figure 9 of Toyota's petition)

Toyota stated that it evaluated the height of the rear outboard head restraints in the subject vehicles against the center of gravity of various size occupants. In the first notch position, which can be attained by simply pulling upward on the head

restraint in a manner compliant with S4.5, the center of gravity of the head of an occupant the size of a 95th percentile adult male (AM95) is below the top of the head restraint.⁵ (See figure 10 of Toyota's petition) Therefore, for virtually 100 percent of the female adult population of the United States⁶ and over 95 percent of the U.S. male adult population, the rear outboard head restraints can help "adequately control motion of the head and neck relative to the torso" in a position that can be adjusted in compliance with the standard. It can also protect occupants larger than AM95 occupants when adjusted to the second notch position.

- c. Toyota stated that the rear outboard head restraints in the subject vehicles meet and surpass all other performance requirements of the standard not only in the fully stowed position, but also in both the first and second notch positions. These include energy absorption (S4.2.5 and S5.2.5), backset retention (S4.2.7 and S5.2.7), and height retention (S4.2.6 and S5.2.6). Toyota summarized the

⁵ NHTSA assumed during the rulemaking that the center of gravity of the head of the AM95 was 105mm from the top of the head. See FRIA at page 44. See also 66 Fed. Reg. at page 975. Figure 10, below, uses this value. The center of gravity of the head of the BIORID III ATD is 110.5mm below the top of the head.

⁶ "The center of gravity height of a99th percentile female reclined at 25 degrees is about 19mm below a 750mm (29.5 inches) high head restraint at a 50mm (2 inch) backset."

performance in tables that can be found in its petition. It contended that there is nothing about the performance of the rear outboard head restraints in the subject vehicles that in relation to the additional criteria set forth in these tables that poses a risk of exacerbating whiplash injuries.

3. The occupancy rates and usage of the Lexus RX model further supports the conclusion that the noncompliance with S4.5 is inconsequential to safety: The rear seat vehicle environment has unique aspects in terms of occupancy rates and usage. This is why the agency decided to specify different requirements for front and rear seat head restraints. As noted above, the agency found that, in the general vehicle population studied for the purpose of adopting FMVSS 202a requirements, the occupancy rate for the rear outboard seating positions was about 10 percent. Toyota undertook an analysis of the National Automotive Sampling System (NASS) General Estimates System (GES) data to better understand the outboard rear seat occupancy rate in the subject vehicles. The subject vehicles are the fourth generation of the Lexus RX model series, which was introduced for MY2016. Because the exposure of this model year in the fleet is somewhat limited, and NASS GES does not yet contain MY2016 data,

the three previous generations of the RX model going back to MY 1999 were used for the analysis. While there are design differences in each generation, all are mid-size SUV's, and it is expected that the user demographics and rear seat usage would be representative of the subject vehicles.

Based on the analysis, the occupancy rate for rear outboard seat occupants in all types of crashes for the RX models analyzed was 10 percent --meaning that 10 percent of the RX vehicles involved in crashes have a rear outboard passenger. This is the same as what NHTSA found to be the occupancy rate in the general vehicle population when it undertook the FMVSS 202a rulemaking. In a smaller subset of only rear crashes, the occupancy rate in the RX models is slightly higher, but still small---only 13 percent.

The data analyzed were insufficient to provide an understanding of the size of the occupants who ride in the rear outboard positions in the subject vehicles. However, considering that the occupancy rate is consistent with NHTSA's previous analyses, there is no reason to believe that occupant sizes would be significantly different from the general vehicle population. In the Final Regulatory Impact Analysis, the

agency found that, of the small percentage of occupants that ride in the rear of vehicles generally, 83 percent of all rear outboard occupants were 5'9" or less and 17 percent were 5'10" and above. The latter is the height of the average U.S. male. As outlined in Section II, above, the rear outboard head restraints in the subject vehicles are designed so that the center of gravity of the head of the small percentage of large occupants who may occasionally ride in the rear seats of the subject vehicles is below the top of the head restraint. Therefore, the number of occupants who may actually seek to adjust the rear outboard head restraints in the subject vehicles is insignificant, further justifying a finding that the paragraph S4.5 noncompliance is inconsequential to vehicle safety.

Toyota stated that it is unaware of any consumer complaints, field reports, accidents, or injuries that have occurred as a result of this noncompliance as of December 15, 2016.

Toyota 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.

PUBLIC COMMENTS: One comment was received by an anonymous source and they recommended that Toyota's petition be denied. They indicated that this law was important because it works to reduce whiplash injuries and that if someone were trying to adjust their head restraint, and accidentally removed it, they would be at a greater risk of injury if they were involved in a crash trying to take it to a mechanic.

NHTSA'S DECISION:

NHTSA has reviewed the petition and the anonymous comment and has made its decision to grant the petition based on the reasons described below.

NHTSA's Analysis: In promulgating the requirements related to head restraint removability, it was the agency's desire to take reasonable steps to increase the likelihood that a head restraint is available when needed. We stated the following in the 2004 final rule:

"If head restraints were too easily removable, chances are greater that they will be removed. That, in turn, increases the chances that the restraints might not be reinstalled correctly, if at all. By prohibiting removability without the use of deliberate action distinct from any act necessary for adjustment, the likelihood of inadvertent

head restraint removal will be reduced, thus increasing the chances that vehicle occupants will receive the benefits of properly positioned head restraints.”⁷

We believe the rationale and justification for this provision remains sound. NHTSA’s decision in this matter, in no way changes the agency’s position about the general need for the removability requirements specified in S4.5 of FMVSS No. 202a.

We find merit in the argument presented by Toyota that when the head restraint is in the stowed (full down), first notch, and second notch position, the head restraint “meet[s] and surpass all other performance requirements of the standard” Thus, when the head restraint is not removed, all benefits of the standard have been preserved.

Toyota provided information indicating that when the rear seat is adjusted to a mid-track position, most seat adjustment positions (25 of 30) are such that there would be interference during head restraint removal necessitating compression of the head restraint foam or readjustment of the seat back to complete the removal. However, Toyota did not provide similar data for more forward seat track positions. Based on the data presented, it seems likely that the interference during removal would be lessened or eliminated in these more forward positions.

⁷ 69 FR 74863

Nonetheless, NHTSA finds some merit in the argument that this mitigates to some degree the possibility of inadvertent head restraint removal, when the seat is at mid-track or more rearward.

We do not agree with Toyota's contention that "the overall design and operation of the rear head restraints in the subject vehicles fulfills the purpose and policy behind the S4.5 requirement." However, we find merit in the argument that the required 97mm of travel beyond the second adjustment position to remove the head restraint may mitigate potential unintended removal. This distance is greater than the travel from the fully stowed to the second adjustment position (37mm), and this additional distance (without a detent) may indicate to the operator that the head restraint is being removed rather than being adjusted to a higher position.

Finally, although not required by FMVSS No. 202a, NHTSA notes that the head restraints, if removed, can be reinstalled by the operator without the assistance of a mechanic and without any tools.

NHTSA's Decision: In consideration of the foregoing, NHTSA finds that Toyota has met its burden of persuasion that the FMVSS No. 202a noncompliance is inconsequential as it relates to motor vehicle safety. Accordingly, Toyota's petition is hereby granted and Toyota is consequently exempted from the obligation to

provide notification of, and remedy for, the subject noncompliance in the affected vehicles under 49 U.S.C. 30118 and 30120.

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, this decision only applies to the subject vehicles that Toyota no longer controlled at the time it determined that the noncompliance existed. However, the granting of 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 Toyota 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)

Claudia Covell,

Acting Director, Office of Vehicle Safety Compliance.

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