



DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

[Docket No. NHTSA-2018-0020]

Denial of Motor Vehicle Defect Petition, DP13-001

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

ACTION: Denial of petition for a defect investigation.

SUMMARY: This notice sets forth NHTSA's decision and reasons for denying a petition, Defect Petition (DP) (DP 13-001), submitted by Mr. William Rosenbluth (petitioner) in a January 23, 2013 letter to the Administrator of NHTSA (the "Agency"). The petitioner requested that the Agency open an investigation into the decoupling of the steering intermediate shaft assembly No. 2 from the steering column assembly on model year (MY) 2004-2009 Toyota Prius vehicles (the "Subject Vehicles"). After reviewing materials furnished by the petitioner, the manufacturer, and those already in its possession, NHTSA has concluded that the evidence does not warrant further investigation of the issue raised in the petition. The Agency accordingly has denied the petition.

FOR FURTHER INFORMATION CONTACT: Mr. Gregory Magno, Office of Defects Investigation (ODI), NHTSA; 1200 New Jersey Avenue, SE, Washington, DC 20590. Telephone: (202) 366-5226. E-mail: gregory.magno@dot.gov.

SUPPLEMENTARY INFORMATION:

I. Introduction:

Interested persons may petition NHTSA requesting that the Agency begin a proceeding to decide whether to issue an order determining that a vehicle or item of motor vehicle equipment

contains a defect that relates to motor vehicle safety. 49 U.S.C. 30162; 49 CFR part 552. Upon receipt of a properly filed petition, the Agency conducts a review of the petition, material submitted with the petition, and any additional information. 49 U.S.C. 30162; 49 CFR 552.8. The review may consist solely of a review of information already in the possession of the Agency, or it may include the collection of information from the motor vehicle manufacturer and/or other sources. After considering the review and taking into account appropriate factors, which may include, among others, allocation of Agency resources, Agency priorities, the likelihood of uncovering sufficient evidence to establish a safety-related defect, and the likelihood of success in any necessary enforcement litigation, the Agency will grant or deny the petition. *See* 49 U.S.C. 30162; 49 CFR 552.8.

II. Petition Background Information:

On January 30, 2013, NHTSA received a petition requesting that the Agency open a defect investigation submitted by Mr. William Rosenbluth of Automotive Systems Analysis, Inc., located in Reston, Virginia. The petition requested that the Agency investigate decoupling of the steering intermediate shaft assembly No. 2¹ from the steering column assembly in the Subject Vehicles. Mr. Rosenbluth's petition asserted that his client's MY 2005 Toyota Prius (the "Petition Vehicle") steering column linkage was improperly assembled at the time the vehicle was manufactured by Toyota. Included with the letter were a narrative from the Petitioner's client, Mr. Rosenbluth's documentation relating to the Petition Vehicle, and a comparison to an exemplar vehicle.

The Petition Vehicle - 2011 Complaint to NHTSA

¹ Toyota Motor Engineering & Manufacturing North America, Inc. (Toyota) used the terms "intermediate shaft," "steering intermediate shaft," "steering intermediate shaft assembly," "steering intermediate shaft No.2," "steering intermediate shaft assembly No. 2," and "intermediate shaft No. 2 (upper)" to refer to the same part. The petitioner used the terms "upper steering intermediate shaft," "steering upper intermediate shaft #2", "steering intermediate shaft No. 2", "upper steering column intermediate shaft #2" and "upper steering intermediate shaft assembly No. 2" to refer to the same part. For consistency, the Agency refers to the subject part as the "steering intermediate shaft assembly No. 2."

The owner of the Petition Vehicle previously filed a complaint in a Vehicle Owner's Questionnaire (VOQ) submitted to NHTSA (ODI Complaint No. 10437229) on November 25, 2011, that was subsequently amended by a December 7, 2011 e-mail with attachments from the complainant. The complainant stated that he heard a snapping sound coming from the steering wheel while attempting to park at 5 mph on November 23, 2011. The steering wheel then became loose and he could not steer the vehicle, and the driver's airbag and all of the steering wheel mounted controls were disabled.

On October 19, 2012, an ODI investigator contacted the Petition Vehicle owner by e-mail regarding the VOQ he had filed and requested a status update. The Agency has no record of receiving a response.

III. Summary of the Petition:

The narrative of events relied upon by the petitioner was reported by the Petition Vehicle owner as follows:

I had just turned left, and was straightening the wheels (turning the wheel back right) [to enter a parking spot] when I heard, and felt, a loud 'snap' in the steering wheel, immediately upon which I knew the steering wheel was disconnected and I could no longer steer the car. Very, very fortunately, and only because I was already nearly stopped, I was able to stop the vehicle without incident. However, I immediately recognized that, had this happened in almost any other scenario than being nearly parked, the outcome would have been markedly different. The steering wheel is completely loose, not controlling anything, and all the many steering wheel controls are equally disconnected, including the driver's air bag (SRS), something that I would have needed, but wouldn't have worked, had I crashed into oncoming traffic or an Interstate median.

Had I not decided to run a frivolous and unnecessary errand, I would have otherwise been on the Interstate, rushing home for Thanksgiving like many others, but now am merely stranded, in a motel, far from home in Jacksonville, FL, wondering what to do next. My low mileage (just 27,773 mi), seven year old Prius is still parked, undriveable.

On January 4, 2013, at the request of the vehicle owner, the petitioner inspected the Petition Vehicle and observed that the steering wheel could rotate multiple turns, in both directions, without resistance or any change in the angle of the front wheels. Further inspection revealed that the steering intermediate shaft assembly No. 2 was decoupled from the steering column assembly. The petitioner concluded that the steering intermediate shaft assembly No. 2 “had not been properly installed on the spline output of the steering column assembly,” leading to wear on the internal splines of the steering intermediate shaft assembly No. 2. According to the petition, the spline wear, evidenced by shards of spline material, allowed the shaft to decouple from the steering column assembly.

Subject Power Steering System

The subject power steering system is assisted by an electric motor linked to the steering column assembly. Steering torque is transmitted to a manual steering rack via a pair of intermediate shafts and a sliding yoke assembly. Image 1 below illustrates the Toyota Prius steering system and the components subjected to the two recalls.

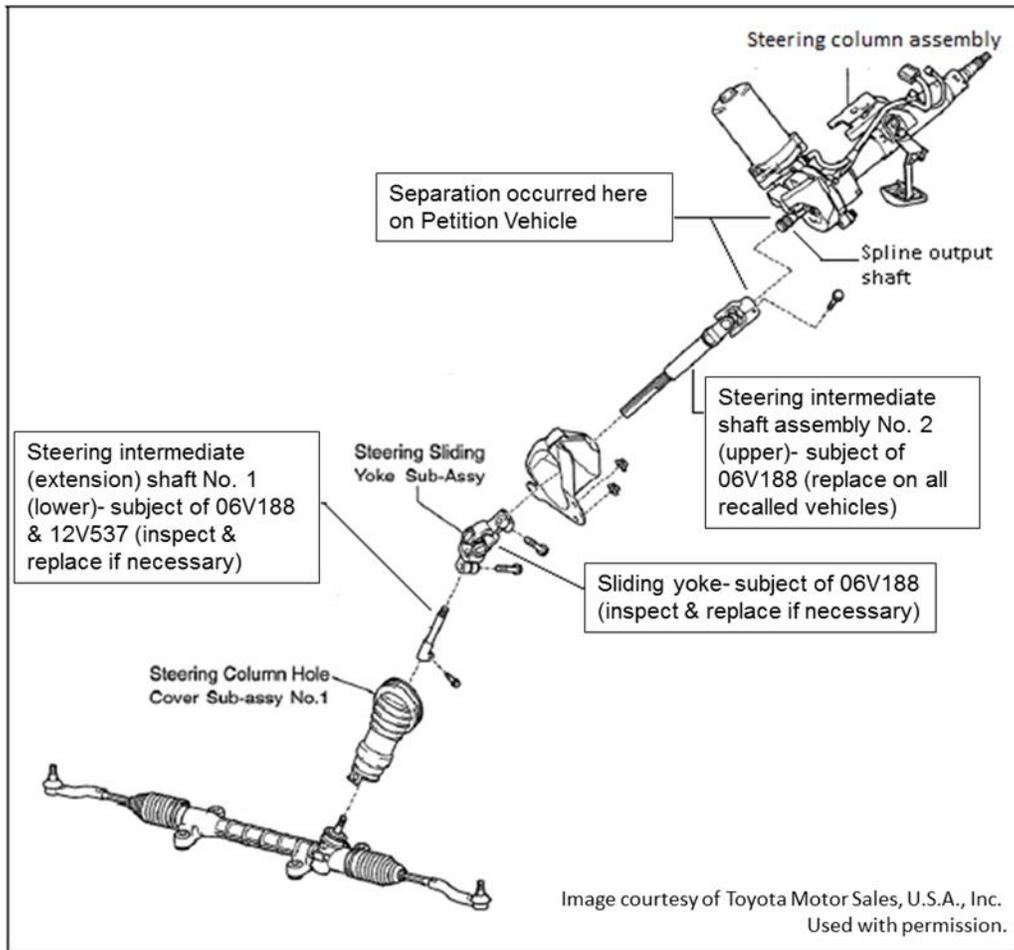


Image 1

Toyota's First Related Recall (06V188- Intermediate Shaft No. 2)

On May 30, 2006, Toyota submitted a Defect Information Report to notify NHTSA of Special Service Campaign (SSC) 60C (NHTSA Recall 06V188) to recall 170,856 MY 2004-2006 Toyota Prius vehicles produced between August 5, 2003, and November 10, 2005. The "Description of Problem" contained in the report stated as follows:

In the subject Prius vehicles equipped with an electric power steering system, due to insufficient strength at the steering intermediate shaft assembly No. 2 and sliding yoke which connects the steering wheel to the steering gear box, there is a possibility that the connection at the steering intermediate shaft assembly No. 2 or the intermediate extension shaft may become loose or the steering intermediate shaft assembly No. 2 sleeve may develop a crack under certain operating conditions where a large force is repeatedly applied to the connection (such as when the wheel is turned forcefully to the locked position at low speed or the tire contacts roadside curbs while driving). In the worst case, if the vehicle continues to be operated in this condition, the connection may separate or the shaft sleeve may fracture, which could result in the loss of steering control.

Vehicle owners were notified to return their vehicles to any Toyota dealer for replacement of the steering intermediate shaft assembly No. 2. The repair under SSC 60C (NHTSA Recall 06V188) required the old shaft to be decoupled from the steering column assembly so that the new replacement shaft could be connected to the steering column assembly. As of Toyota's submission of its sixth and final required quarterly report in 2007, the completion rate for this recall stood at 90%.

Toyota's Second Related Recall (12V537- Intermediate Shaft No. 1)

On November 14, 2012, Toyota submitted a Defect Information Report to notify NHTSA of Safety Recall C0T (NHTSA Recall 12V537), to recall 669,705 MY 2004-2009 Toyota Prius vehicles produced from August 5, 2003, through March 30, 2009. This recall included vehicles within the scope of NHTSA Recall 06V188, but also expanded the scope. The Description of Problem contained in Toyota's submission is as follows:

The steering shaft system of the subject vehicles consists of a steering intermediate shaft assembly No. 2, steering sliding yoke sub-assembly, and steering intermediate (extension) shaft No. 1. Due to insufficient hardness of the extension shaft supplied by JTEKT, the splines which connect the extension shaft to the steering gear box may deform if the steering wheel is frequently and forcefully turned to the full-lock position while driving at a slow speed. This may create an increased backlash, and splines may eventually wear out over time, which could result in loss of steering ability.

Vehicle owners were notified by first-class mail to return their vehicles to any Toyota dealer, which would “inspect the extension shaft, and, if the vehicle is equipped with an extension shaft produced by JTEKT, the dealer will replace it with an improved one.”

According to the Defect Information Report, only the steering intermediate extension shaft No. 1 was affected by Safety Recall C0T. The steering intermediate shaft assembly No. 2 was not affected and no repairs to or removal of the steering intermediate shaft assembly No. 2 were specified in the recall procedure. As of Toyota's submission of its sixth and final required quarterly report in 2014, the completion rate for this recall was 78%. The vehicle service history provided by Toyota to ODI indicates that this corrective action was not completed on the Petition Vehicle.

IV. Toyota Response to ODI's Information Request:

To further assess the scope of the subject problem and to review the recall remedy procedures for both safety recalls, ODI requested information from Toyota. On June 4, 2013, ODI sent an Information Request (IR) letter to Toyota concerning decoupling or separation of the steering intermediate shaft assembly No. 2 from the steering column assembly in the Subject Vehicles. The petition and twelve potentially related VOQs were enclosed. Twelve additional VOQs were received during the Agency's review of the petition.

With the exception of the vehicles referenced in the twelve ODI VOQs enclosed with the IR letter and this petition, Toyota's IR response indicated that it had not located any other information that indicates a decoupling or separation of the steering intermediate shaft assembly No. 2 from the steering column assembly in the Subject Vehicles.

V. ODI's Analysis:

To assess whether the Subject Vehicles demonstrate a risk of steering detachment, ODI's review and analysis of this petition included the following:

- Review of the petition and its enclosures;
- Review of the subject steering system layout;
- Analysis of the Petition Vehicle's history, including its repair history;
- Review and follow-up of potentially related VOQs;
- Review and analysis of NHTSA Recalls 06V188 and 12V537; and,
- Requests for and analysis of complaint, claim, field report, service history, and warranty information from Toyota.

ODI's analysis of these factors is outlined below.

Petition Vehicle History

Oct 2004

Vehicle built (from Petition)

Nov 2004	7 mi	Shipped to dealer, titled (from Vehicle History Report)
Dec 2006	10,623 mi	Recall 06V188 conducted, unrelated brake inspection (from Petition)
Feb 2009	20,666 mi	“Body elec- minor” repairs (from Petition)
Nov 2010	22,698 mi	Floor mat recall, multiple repairs (from Petition)
Nov 2011	27,773 mi	Steering incident, complaint to NHTSA (from VOQ)

Potentially Related VOQs

Excluding the petition (which duplicates the original complaint), ODI identified twenty-five potentially related VOQs received from 2011 to date (averaging three annually with three received in 2019). Eighteen of the complaints cited a complete decoupling between the steering wheel and steering system. The seven additional complaints cited precursor symptoms (clanking noises and play in the steering) without the separation. Four of the seven received dealer diagnoses that a portion of the steering shaft needed replacement. Two additional complaints advised that they had experienced the symptom but were uninterested in seeking repairs. Fourteen of the complaints (all of which involved separations) were reported during parking maneuvers (at or below 5 mph) with the remaining separation complaints taking place at speeds between 10 and 25 mph. The complaints with the precursor symptoms did not cite a specific vehicle speed. Seven of the most recent nine complaints (CY16-19) involved vehicles with over 150,000 miles of service or prior collisions or salvage titles.²

In addition to the petition vehicle, four complaints (three separations and one precursor) were attributed to Steering Shaft # 2 separation and all took place an average of five years after receiving the remedy for the 06V188 recall. Three of these occurred between recall remedies,

² Specifically, these vehicles had the following mileage / history: 161,000; 193,000; 217,029; 120,000; 146,000; mileage unknown (salvage title); 101,000 (previous frontal collision damage); 140,400 (previous rear collision damage); 186,600 (salvage title).

with the fourth occurring after both recall remedies. All related incidents were compared (Table 1) to recall remedy dates for the related safety recalls with no apparent pattern emerging to point to a particular procedure or set of circumstances.

06V188 performed?	Incident Timing	Symptom		Total
		Precursor (Noise/Play)	Steering Wheel Free-Spin	
No	After 12V537 remedy (no 06V188)	1	3	4
	Prior to any remedy		4	4
Yes	Between 06V188 & 12V537 remedies	2	4	6
	After both remedies	4	7	11
	Total	7	18	25

Table 1: Incident Timing Relative to Recall Remedy Procedures

Three potentially related crashes were considered and excluded from these figures. The first incident involved a 2007 Prius losing control on a curve while driving. It occurred in late 2013 not long after receiving the 12V537 remedy. Multiple ODI follow-ups with the complainant produced no further information. Circumstances and damage descriptions of the vehicle indicate that a steering shaft was unlikely to have caused the incident. The second collision occurred in late 2016 and the driver reported hearing a warning chime while driving followed by the steering “seizing to the right,” leading to frontal impact of a roadside pole. The subject vehicle was a 2007 Prius and the incident took place over three years after receiving the 12V537 remedy. A follow-up interview uncovered no further information. In the third, a 2009

Prius drove off the road in icy conditions in January 2017. Neither the complaint description nor follow-up information gathered from the complainant point to a steering shaft separation.

Safety Recall Procedures

Recalls 06V188 and 12V537 were also reviewed to assess whether the remedy procedures could have contributed to the condition experienced and to assess the impact of any revisions. No discernible impact to steering shaft integrity was identified in any of the procedures.

Additional data from Toyota

In addition to the VOQs, ODI asked Toyota in an IR letter to identify any additional incidents of steering intermediate shaft assembly No. 2 having decoupled or separated from the steering column assembly on MY 2004-2009 Toyota Prius vehicles that were contained in Toyota's complaint, claim, field report and warranty data. No additional incidents were identified.

Discussion

A review of the petition indicates that the Petition Vehicle's coupler for steering intermediate shaft assembly No. 2 was partially engaged to the steering column output shaft. The connection between the output shaft and intermediate shaft No. 2 lacked integrity because the output shaft was not fully engaged in the coupler and did not capture the coupler pinch bolt. The petitioner stated that he had no knowledge of any ". . . intervening repair to the steering intermediate shaft assembly No. 2 between the time of vehicle manufacture and my inspection. The recall procedure [for the lower intermediate steering shaft No. 1] specifically instructs technicians to avoid any operations on the steering intermediate shaft assembly No. 2." The petitioner also stated, "the steering column intermediate shaft assembly No. 2 separation is not

part of the Toyota steering recall 12V537 or any of its predecessor versions.” The petitioner concluded, in his opinion, that “the Petition Vehicle steering column linkage was improperly assembled at its original manufacturing point and thus contained a latent manufacturing defect.”

Toyota’s vehicle service history for the Petition Vehicle shows that NHTSA Recall 06V188 (SSC 60C) for steering intermediate shaft assembly No. 2 replacement was completed on December 12, 2006. Evidence from the petition indicates that the coupler joining intermediate shaft assembly No. 2 and the steering column output shaft may have been improperly installed so the coupler pinch bolt was not engaged in the corresponding notch in column output shaft when the recall remedy was performed. This improper installation would lead to the kind of abnormal and excessive wear shown in photographs attached to the petition. When this wear reached a certain point, it would allow the intermediate shaft coupler to separate from the steering column output shaft. Since this occurred in the Petition Vehicle after performance of the recall remedy for NHTSA Recall 06V188 and not before, the incident is likely the result of a poorly performed recall repair and not the assembly failure asserted by the petitioner.

NHTSA also observes that the rate of related consumer complaints (twenty-five over an eight-year period from a population of over 600,000 vehicles) is relatively low and does not appear to be attributable to either recall action. ODI’s review of consumer complaints did not indicate any apparent trend regarding the alleged failures occurring, relative to when the two recalls were performed, or the circumstances under which the failures occurred. Post-Recall 12V537, the subject vehicle population has not exhibited a safety defect trend relating to its steering shaft, with the few complaints received involving high-mileage or damaged vehicles, suggesting isolated vehicle repair errors. Given these conditions, the safety recalls appear to

have adequately addressed the safety defects within the subject vehicles related to the steering shaft assembly, and further investigation of the issue is not warranted at this time.

VI. Conclusion

NHTSA is authorized to issue an order requiring notification and remedy of a defect if the Agency's investigation shows a defect in design, construction, or performance of a motor vehicle that presents an unreasonable risk to safety. 49 U.S.C. §§ 30102(a)(9), 30118. Given the absence of a defect trend in the complaint data and a thorough assessment of the potential risks to safety presented in the petition, it is unlikely that an order concerning the notification and remedy of a safety-related defect would be issued due to any investigation opened as a result of granting this petition. Therefore, and upon full consideration of the information presented in the petition and the potential risks to safety, the petition is denied.

The Agency retains the authority to revisit these issues if warranted in the future if conditions change or new evidence arises.

(Authority: 49 U.S.C. 30162; 49 CFR part 552; delegations of authority at 49 CFR 1.95 and 501.8)

Jeffrey Mark Giuseppe,

Associate Administrator for Enforcement.

Billing Code 4910-59-P

[FR Doc. 2020-07400 Filed: 4/8/2020 8:45 am; Publication Date: 4/9/2020]