

**Chronology of Defect / Noncompliance Determination****573.6 (c) (6) (7)**

Describe the chronology of events leading up to the defect decision or test data for the noncompliance decision: (2000)

Isuzu received an initial warranty claim of a loose steering stopper bolt in mid-January 2018. The claim reported difficulty in turning the steering wheel fully to the left. It was determined that the torque wrench being used at the axle production facility was not set up to record or track torque. Isuzu placed the issue in a “monitor” status and the supplier implemented procedures to record and to track torque.

Isuzu continued to receive reports of loose and/or missing stopper bolts on the left, all of which involved vehicles with axles built prior to the torque wrench process change. At this point, Isuzu believed the issue had been improper torquing at the production facility. Isuzu escalated the issue to “open” status in October 2018, and from October through December, Isuzu and the supplier were investigating to determine why the bolts appeared to be loosening in the field, as well as the consequences associated with missing or loose bolts. In December, 2018, the supplier implemented an additional manual torque check. Isuzu’s analysis determined that if a bolt breaks off or falls off completely, the missing bolt could allow a small amount of oversteer but the driver is able to control the vehicle throughout the turn and complete it without difficulty. The investigation further concluded that were a bolt to fall off, there would be no interference with suspension components or air brake lines.

Isuzu initiated a parts inspection and force measurement study and conducted cyclical load testing, which found in late February 2019 that the force exerted on the stopper bolt in normal operation is sufficient to cause the jam nut to loosen. Also at that time, Isuzu received the first report of a loose stopper bolt on a vehicle built after the countermeasures that had been implemented by the supplier. In response, Isuzu increased the torque specification. That increase was implemented at the supplier’s facility on April 2, 2019.

In May, Isuzu received test parts from the field for duplication and analysis, which was completed at the end of May. Isuzu has found that even at the higher torque specification the jam nut may loosen under forces consistent with normal steering loads. Isuzu has received a total of 67 reports of loose or missing steering bolts to date but is not aware of any crashes or injuries associated with this issue. On June 11, 2019, Isuzu made a determination to conduct a safety recall to address the issue.