

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 began an investigation into claims involving left rear wheel bearing hub locking bolts in March, 2015. The investigation found that, following a production re-start, certain temporary workers were responsible for a small number of rear wheel bearing hub locking bolts found to have been insufficiently torqued at the time of production. The production facility had provided additional torque bolt training in 2012 and the production facility had instituted use of an electric wrench in lieu of the oil pulse wrench in March, 2014.

Isuzu investigated the potential frequency and implications of such failures. Isuzu conducted vehicle testing, with the torque at the lowest setting within the allowable range, to confirm the absence of any design issue. Induced failure analysis monitored both the "steering degree" and the "yaw rate," finding that drivers could drive the vehicles off the roadway safely. Cycle testing found that, if the bolt had not been fully torqued, the bolt would begin to loosen early in the vehicle life-cycle; however, the length of time or amount of mileage to failure varied in the vehicles in question. A Weibull analysis showed a low potential for future failures. As of October, 2015 Isuzu had received ten reports involving loosening left rear wheel bearing hub locking bolts in vehicles built between November, 2010 and December, 2013. Isuzu concluded that any failures associated with improper torquing of the bolt were likely to have already manifested in the field and that drivers were able control the vehicles and to drive off the road safely.

Isuzu continued to take steps to improve the ease and consistency of the bolt-torquing process. Isuzu decided to add 2 mm to the length of the bolt in October, 2015 and implemented a process to de-burr the lock washers in December, 2015. The production plant also implemented a process in April, 2016 utilizing both the electric wrench and a torque wrench.

Isuzu received five reports between December, 2016 and February, 2017 involving vehicles built between the time Isuzu implemented the electric wrench (March, 2014) and the time Isuzu added utilization of a torque wrench along with the electric wrench (April, 2016). Isuzu also identified four reports received between March and November, 2016 regarding vehicles built prior to March, 2014. Isuzu has received no reports with regard to vehicles built after the plant began utilizing both the electric wrench and a torque wrench.

Isuzu has accordingly reconsidered the issue and on March 14, 2017 decided to conduct a safety recall. Although Isuzu believes that earlier built vehicles with insufficiently torqued bolts would already have experienced the issue, Isuzu decided to include in the safety recall all vehicles built since the production start date of the model year of the first failure. Isuzu dealers will inspect and, as necessary, tighten the left rear wheel bearing hub locking bolts in the subject N-Series vehicles.