



U.S. Department
of Transportation
**National Highway
Traffic Safety
Administration**

ODI RESUME

Investigation: PE06-006
Date Opened: 01/24/2006 Date Closed: 06/06/2006
Principal Investigator: Chris Lash
Subject: timing chain failure

Manufacturer: General Motors Corp.
Products: 2000-03 Saturn L-Series and 2003 Saturn Ion with 2.2L engine
Population: 412,149

Problem Description: the timing chain may break, possibly resulting in engine stall while driving with no restart.

FAILURE REPORT SUMMARY

	ODI	Manufacturer	Total
Complaints:	34	1,020	1,054
Crashes/Fires:	0	0	0
Injury Incidents:	0	0	0
# Injuries:	0	0	0
Fatality Incidents:	0	0	0
# Fatalities:	0	0	0
Other*:	0	1,902	1,902

*Description of Other: warranty claims for timing chain repairs

Action: this Preliminary Evaluation has been upgraded to an Engineering Analysis (EA06-009).

Engineer: Christopher Lash *Chris Lash*

Date: 06/06/2006

Div. Chief: Jeffrey L. Quandt

Date: 06/06/2006

Office Dir.: Kathleen C. DeMeter

Date: 06/06/2006

Summary: On December 12, 2005, ODI received a Defect Petition (DP05-008) requesting the investigation of timing chain failures that could cause stalling in Saturn vehicles equipped with the 2.2L (L61) engine. ODI opened PE06-006 on January 24, 2006, with 24 vehicle owner complaints that alleged a broken timing chain caused the vehicle to stop operating. On April 12, 2006, ODI received information from General Motors (GM) concerning timing chain failures in approximately 412,000 Model Year (MY) 2000 through 2003 Saturn L-series and Ion vehicles with 2.2L engines.

GM's response included 1,020 owner complaints and field reports concerning timing chain failure, including 228 that alleged the failure caused the vehicle to stall while driving. GM also provided warranty claim data that showed 1,902 subject vehicles receiving timing chain repairs, including 261 which indicated that a stall while driving resulted from the failure. The GM complaints, field reports and warranty claims that did not contain sufficient information to determine that a stall while driving occurred were provided in the category "other." GM stated that the majority of these incidents probably occurred while the vehicles were parked "since the timing chain is more likely to break during high chain load situations, such as engine startup." GM's data showed elevated failure rates in approximately 20,500 MY 2001 L-series vehicles produced during a four month period from November 2000 through February 2001. Over one-third of GM's total complaints and field reports (34.3%) and warranty claims (38.2%) involved L-series vehicles built during the 4-month period, which are only about 5% of subject vehicle production. The timing chain failure rate in the vehicles built during this range is over 10 times greater than the remaining subject vehicle population. For the MY 2001 L-series vehicles built during the 4-month period, the 36-month failure rate for repairs involving stall while driving is slightly under one percent. However, if the incidents coded as "other" are added, the 36-month failure rate rises to nearly five percent for those vehicles.

ODI and GM are continuing to assess the number of complaints and warranty claims coded by GM as "other" that involve incidents of stall while driving. GM's statistical modeling of the failure data initially concluded that the failure rates were declining with age and mileage for any set of warranty data analyzed (e.g., stall while driving, other or combined). However, subsequent analysis showed that the failure rates are increasing. Based on the high complaint and warranty rates for timing chain failure in the 4-month production period for the MY 2001 L-series vehicles, this investigation has been upgraded to an Engineering Analysis to further assess the frequency of stall incidents due to timing chain failures in those vehicles (EA06-009).

CM 6-8-06