U.S. Department of Transportation

National Highway Traffic Safety Administration

ODI RESUME

OFFICE OF DEFECTS INVESTIGATION

NHTSA

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Investigation:	EA 08-026		
Prompted by:	PE08-051		
Date Opened:	12/22/2008	**Date Closed:**	06/04/2010
Principal Investigator:	Kyle Bowker		
Subject:	Front Suspension Coil Spring Fracture		

MANUFACTURER & PRODUCT INFORMATION

Manufacturer:	GENERAL MOTORS CORP., SAAB CARS USA, INC.
Products:	MY2003-2006 SAAB 9-3 in Salt Belt States
Population:	61,800 (Estimated)
Problem Description:	Alleged front suspension coil spring fracture, which may result in tire puncture, loss of inflation pressure and subsequent loss of vehicle control.

FAILURE REPORT SUMMARY

	ODI	Manufacturer	Total
Complaints:	46	104	142**
Crashes/Fires:	0	0	0
Injury Incidents:	0	0	0
Fatality Incidents:	0	0	0
Other*:	0	2626	2626

***Description of Other:** Subject vehicles with one or more warranty claims related to the alleged defect.

** Count indicates duplicate reports received by ODI and manufacturer.

ACTION / SUMMARY INFORMATION

Action: This Engineering Analysis has been closed.

Summary:

To date, ODI is aware of 142 non-duplicative complaints related to the alleged defect. In addition, ODI is aware of 2,626 subject vehicles with one or more warranty claims related to the alleged defect. In total, ODI is aware of 2,714 unique subject vehicles that have experienced one or more front suspension coil spring fractures. ODI is not aware of any crashes or injuries related to the alleged defect.

The engineering design and testing data supplied by GM, along with the frequency of consumer complaints and warranty claims related to the alleged defect, tends to support the position that, in general, the coil springs that fractured on many subject vehicles did not achieve the expected service life. However, in regard to the subject vehicles, a front suspension coil spring fracture itself has little safety consequence, as evidenced by the minimal impact on vehicle ride and handling and by the number of drivers who were unaware of the failure condition for some time until alerted by service personnel. The ratio of tire punctures to coil spring fractures appears low and there are no reports of crashes, deaths or injuries related to the alleged defect. A safety-related defect has not been identified at this time and further use of agency resources does not appear to be warranted. Accordingly, this investigation is closed. The closing of this investigation does not constitute a finding by NHTSA that a safety-related defect does not exist. The agency will continue to monitor this issue and will take further action if warranted by the circumstances.

See the EA08-026 Engineering Analysis Closing Report for more details.

SUBJECT: Alleged front suspension coil spring fracture.

INVESTIGATION: EA08-026

DATE OPENED: 22-Dec-2008 **DATE CLOSED:** 4-Jun-2010

SUBJECT VEHICLES: Model year (MY) 2003 through 2006 Saab 9-3 vehicles manufactured by General Motors Corporation (GM) sold or registered in "salt belt" states. (Note: for purposes of this investigation, the "salt belt" includes Connecticut, Delaware, the District of Columbia, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia and Wisconsin).

BASIS: The National Highway Traffic Safety Administration's (NHTSA) investigation of alleged front suspension coil spring fracture in certain MY 2003-2004 Saab 9-3 vehicles began with Preliminary Evaluation PE08-051 on August 28, 2008. NHTSA's Office of Defects Investigation (ODI) sent a letter to the manufacturer on September 26, 2008, to request certain information about the eight complaints ODI had received. ODI also requested certain information about additional Saab 9-3 vehicles that use the same or substantially similar subject components. As a result of information obtained during the Preliminary Evaluation, the range of vehicles under investigation was expanded to include all the subject vehicles when the investigation was upgraded to an Engineering Analysis (EA08-026) on December 22, 2008.

DESCRIPTION OF COMPONENT OR VEHICLE SYSTEM: The subject vehicles are equipped with a McPherson strut front suspension system with conventional hydraulic telescoping dampers and cylindrical coil springs made of a proprietary steel alloy. The wheel and tire assembly is attached to the vehicle via the wheel hub mounted to the lower portion of the McPherson strut assembly. Several different OEM wheel and tire fitments were available in 16 – 18 in. wheel rim diameters as well as different suspension calibrations depending on trim level, body configuration, and optional equipment. The same coil spring supplier was used regardless of which wheel and tire assembly or suspension calibration the vehicle was originally equipped with.

VEHICLE POPULATION: The manufacturer provided Vehicle Identification Number (VIN) level detail for each of the subject vehicles, as defined by ODI, including the date of production, the date the warranty coverage period commenced, and the U.S. State where the vehicle was first sold. Using this data along with information compiled from complaint, warranty, field report, and claim data ODI estimates the subject vehicle population to be approximately 61,800 vehicles.

THE ALLEGED DEFECT: The alleged defect is any front suspension coil spring fracture, which may result in tire puncture, loss of inflation pressure, and subsequent loss of vehicle control.

FAILURE MECHANISM: Moisture and road debris may collect in the front suspension McPherson strut lower spring seat area. Contact at the coil spring/lower spring seat interface results in abrasion of the coil spring's protective paint coating and exposes the spring steel to the environment. Subsequent corrosion results in fatigue cracking on the underside of the coil spring, which may ultimately lead to complete coil spring fracture.

FREQUENCY OF THE ALLEGED DEFECT: Table 1 provides a count of consumer complaints and field reports that allege one or more front suspension coil spring fractures reported to ODI and/or the manufacturer. To date, ODI is aware of 142 non-duplicative complaints related to the alleged defect. In addition, ODI is aware of 2,626 subject vehicles with one or more warranty claims related to the alleged defect. In total, ODI is aware of 2,714 unique subject vehicles that have experienced one or more front suspension coil spring fractures.

	ODI	Manufacturer	Total
Complaints:	46	104	142
Crashes:	0	0	0
Injury Incidents:	0	0	0
# Injuries:	0	0	0
Fatality Incidents:	0	0	0
# Fatalities:	0	0	0

Table 1: Count of Subject Vehicles with Front Suspension Coil Spring Fracture

CONSEQUENCES OF THE ALLEGED DEFECT: ODI is not aware of any crashes or injuries related to the alleged defect. ODI has received two reports of non-crash loss of vehicle control incidents where the vehicle allegedly left the intended travel lane momentarily and crossed either a yellow center line pavement marking or a white lane line pavement marking. When questioned, the complainants describe being startled by the alleged coil spring fracture and subsequent tire puncture. It is uncertain whether the reported loss of vehicle control was vehicle induced or the result of an improper driver response.

MANUFACTURER'S ASSESSMENT: GM does not believe the alleged defect presents an unreasonable risk to motor vehicle safety for the following reasons: The rate for tire air loss related to coil spring fracture remains low; GM test results under a variety of conditions demonstrate that test drivers can maintain control of subject vehicles during rapid tire air loss events; all subject vehicles are equipped with electronic yaw stability control; and, to date, GM is not aware of any crashes or injuries related to the alleged defect.

ODI ANALYSIS: In evaluating this issue, ODI studied the risk of a front suspension coil spring fracture resulting in puncture of the adjacent tire. Examination of subject vehicle complaint and warranty claim data indicates that tire/spring contact occurs approximately every 1 in 10 times there is a front suspension coil spring fracture and for each incident in which there is tire/spring contact, approximately 55% of those experienced a tire puncture. The incident rate of front suspension coil spring fracture is 4,392 per 100,000 subject vehicles produced. The incident rate of front suspension coil spring fracture resulting in a tire puncture is 243 per 100,000 subject vehicles produced.

Symptoms of tire/spring contact may include increased noise, vibration and harshness (NVH) and may be accompanied by visible smoke and the smell of burning rubber. Some complainants report that the coil spring fracture was followed instantaneously by a tire puncture, while others report driving for some distance after symptoms became apparent before the tire was disabled. ODI did evaluate incident speed; however, in many cases incident speed was not reported or was unknown by the complainant, such as when the vehicle was serviced for unrelated repairs and the coil spring fracture was identified by service personnel. Although warranty claim data did contain verbatim details, incident speed was not widely reported and ODI was unable to gather additional incident details as warranty claims paid by Saab Cars USA under the 4-year/ 50,000 mile bumper-to-bumper new vehicle limited warranty, which comprised the vast majority of subject warranty claims, did not contain any customer contact information. Accordingly, analysis of incident speed relied primarily on consumer complaint data.

REASON FOR CLOSING: The engineering design and testing data supplied by GM, along with the frequency of consumer complaints and warranty claims related to the alleged defect, tends to support the position that, in general, the coil springs that fractured on many subject vehicles did not achieve the expected service life. However, in regard to the subject vehicles, a front suspension coil spring fracture itself has little safety consequence, as evidenced by the minimal impact on vehicle ride and handling and by the number of drivers who were unaware of the failure condition for some time until alerted by service personnel. The ratio of tire punctures to coil spring fractures appears low and there are no reports of crashes, deaths or injuries related to the alleged defect. A safety-related defect has not been identified at this time and further use of agency resources does not appear to be warranted. Accordingly, this investigation is closed. The closing of this investigation does not constitute a finding by NHTSA that a safety-related defect does not exist. The agency will continue to monitor this issue and will take further action if warranted by the circumstances.

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