



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

ODI RESUME

Investigation: PE08-005
Date Opened: 01/28/2008 Date Closed: 06/03/2008
Principal Investigator: Kyle Bowker
Subject: Reduced Brake Power-Assist

Manufacturer: General Motors Corp.
Products: 2006-2008 Saab 9-3 Aero
Population: 12,317

Problem Description: Reduced brake power-assist due to an inoperative electric vacuum pump.

FAILURE REPORT SUMMARY

	ODI	Manufacturer	Total
Complaints:	10	68	72
Crashes/Fires:	1	2	3
Injury Incidents:	0	0	0
# Injuries:	0	0	0
Fatality Incidents:	0	0	0
# Fatalities:	0	0	0
Other*:	0	231	231

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

Action: This Preliminary Evaluation has been closed.

Engineer: Kyle M. Bowker KMB
Div. Chief: Jeffrey L. Quandt
Office Dir.: Kathleen C. DeMeter

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Summary: Saab Automobile AB, a subsidiary of General Motors Corp. (GM), manufactured 12,317 subject vehicles through February 15, 2008, equipped with the "High Feature" V6 turbocharged engine identified by Regular Production Option LP9. A tandem vacuum brake booster assembly provides brake power-assist. The engine is the primary vacuum source to the booster and its effect is amplified by a venturi. Under certain conditions, such as a cold engine start or at high altitudes, an electric vacuum pump (EVP) supplements engine vacuum. A pressure switch measures brake booster vacuum and commands the EVP when to turn on/off. Check valves are located at the intake manifold, venturi, and pressure switch.

GM identified two issues that affect EVP performance: corrosion of electrical components inside the pump caused by moisture ingress through the air outlet when the EVP shuts off and the vacuum in a section of piping between the EVP and the pressure switch is released to the atmosphere; and silicone contamination of the electrical contacts inside the pressure switch resulting in a noisy or impeded electrical signal. GM addressed EVP performance with two design changes. In November 2007, GM modified the rubber protective cap that covers the EVP air outlet to improve sealing and in February 2008, GM added a check valve to the section of piping between the EVP and the pressure switch as close as possible to the EVP in an effort to reduce the back flow of moisture through the pump.

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Summary continued from previous page:

In total, the Office of Defects Investigation (ODI) is aware of 240 subject vehicles affected by the alleged defect. Complainants report that symptoms occur immediately after a cold engine start and only for a short duration (30 to 60 seconds), during which period the amount of brake power-assist provided to the operator may be reduced due to an inoperative EVP. The symptoms may be more pronounced the longer the vehicle has been parked as there is a natural tendency for the brake booster to slowly release the vacuum over time if it is not replenished. Full brake power-assist capability resumes after this brief cold start period or immediately after a warm engine start. The three reported crashes all occurred at low speeds (< 5mph) while reversing from a garage or parking space and resulted in minimal to minor property damage.

The subject issue differs from a previous safety recall (05V-236) affecting certain model year (MY) 2003-2005 Saab 9-3 vehicles equipped with a defective check valve that could become brittle and fracture, resulting in a lasting and total loss of brake power-assist at any time. The defective check valve did not meet lifetime durability requirements and GM predicted a 100% failure rate at less than 4 years of service. In comparison, GM predicts an EVP failure rate of approximately 6.4% at 3 years in service for the subject vehicles resulting in reduced brake power-assist for a short duration. The subject issue also differs from a previous ODI influenced safety recall (03V-474) to address EVP moisture ingress in certain MY 2000 Volvo S40 and V40 vehicles. The recalled Volvo vehicles utilized a steel vacuum pipe between the EVP and the brake booster. Moisture ingress and subsequent corrosion could compromise the vacuum pipe resulting in a lasting and total loss of brake power-assist. Moisture does not appear to have a significant impact on the polyether-ester plastic vacuum pipe used in the subject vehicles.

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 take further action if warranted by the circumstances.