

Frank



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

OFFICE OF DEFECTS INVESTIGATION RESUME

INVESTIGATION: PE01-031
SUBJECT: Wiring Harness Failure
PROMPTED BY: IE01-022
PRINCIPAL ENGINEER: F. Borris

DATE OPENED: 30-Aug-01
DATE CLOSED: JAN 31 2002

MANUFACTURER: Porsche
MODEL(S): 911
MODEL YEAR(S): 1995-1996
VEHICLE POPULATION: 14579 [Model Year 1995 7,487]
[Model Year 1996 7,092]

PROBLEM DESCRIPTION: The engine compartment wiring harness insulation can decompose, exposing conductive wires to shorting and potentially resulting in an engine compartment fire.

FAILURE REPORT SUMMARY

	ODI	MANUFACTURER	TOTAL
COMPLAINTS:	6	12	18
FIRES:	1	1	2
# INJURIES:	0	0	0
# FATALS	0	0	0
WARRANTY	NA	389	389
OTHER*	NA	5	5

*Description of Other: Porsche submitted summaries of five incidents of engine wiring harness failure from high temperature/high humidity climates from August 1996 to March 1998. Three of the reports described "smoldering" wires and the remaining two reports involved the starter motor continuing to run with the key in the "OFF" position.

ACTION: The Preliminary Evaluation has been closed.

ENGINEER: *J. Scott* DIV CH: *Thomas Zoppa* OFC DIR: *[Signature]*
DATE: 1/31/02 DATE: 1/31/02 DATE: 1-31-02

Background: The Office of Defects Investigation opened this Preliminary Evaluation after receiving 4 complaints of engine compartment wiring harness failure in certain 1995 Porsche 911 vehicles. Owners allege that the wiring insulation decomposes, resulting in bare wires that can short during normal use. In one of the four complaints, the owner alleges that a fire resulted from the alleged defect.

System Description: The subject vehicles are equipped with a rear mounted, air cooled engine and rear wheel drive. The engine wiring harness is an assembly of copper conductor wires bundled together with connectors corresponding to the various electrical components housed in the engine compartment (i.e., starter motor, alternator, fuel injectors, climate control devices, etc.) Similar to any multi-circuit wiring harness, each individual circuit is isolated from other circuits and the environment by insulating material encapsulating the conductor strands. Each branch of the wiring harness is encased in a sleeve to provide additional protection from abrasion and the relatively high temperature environment of the engine compartment. According to information submitted by Porsche, the subject vehicles were originally equipped with an engine wiring harness utilizing insulation made of a thermoplastic elastomer (TPE) marketed under the trade name Arnitel. The protective sleeves were originally made of rubber.

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Causal Factor: As early as November 1994, Porsche began receiving warranty data indicating engine wiring harness failure. During the first quarter of 1995, Porsche received a report from the harness supplier (Leonische Drahtwerke AG) indicating that Arnitel is incompatible with the rubber material of the sleeves under high temperature conditions. Soon thereafter, the supplier informed Porsche that Arnitel has unsatisfactory performance in hot and humid environments.

Modifications: On approximately May 10, 1995, Porsche changed the material composition of the wiring harness sleeves from rubber to PVC. Additional changes were undertaken early in the Model Year 1996 production run (January 5, 1996) when the wiring insulation was changed from Arnitel to polyvinyl chloride (PVC). The production wiring harnesses for the normally aspirated and turbocharged models can be identified by part numbers 993 607 016 05 and 993 607 016 10, respectively. The improved wiring harnesses, with PVC insulation and sleeves, can be identified by part numbers 993 607 016 15 for normally aspirated models and 993 607 016 12 for the turbocharged models.

Warranty: The subject vehicles are over-represented in warranty claims involving replacement of the wiring harness.

Note: Warranty claims through 10/17/01

Model Year	1995	1996	1997	1998
Claims	315	74	13	2
Rate/1000 veh-yrs	6.0	1.7	0.41	0.20

Complaint History: Of the 23 complaints identified during this investigation, four make reference to fire. However, further investigation into each of these four incidents reveals that two may not be related to the alleged defect. One of the two incidents (ODI No. 561221) involved a small fire in the engine compartment that left enough evidence for a technician to determine that the original harness was misrouted from the factory and was kinked against a metal member. Another alleged fire incident report includes a statement from the owner's wife stating that she saw the initial stages of the fire, and the flames were emitting from the front of the vehicle and not the rear as would be expected in the case of an engine wiring harness fire.

In the majority of complaints (19 of 23) for which adequate information exists, the failure of the engine wiring harness was discovered after some electrical system malfunction including: illumination of engine warning light, starter motor self activation, run on or failure to crank, engine rough running, or a dead battery. In some cases, the harness deterioration is discovered during routine service. No new pertinent fire complaints have been received by ODI since November 1998 and no new non-fire complaints have been received since October 2001.

Reason for Closing: 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.

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