



U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

ODI RESUME

Investigation: PE 12-028
Date Opened: 10/09/2012
Investigator: Steve Mchenry
Approver: Frank Borris
Subject: Vehicle Stability Assist Malfunction
Date Closed: 03/15/2013
Reviewer: Jeff Quandt

MANUFACTURER & PRODUCT INFORMATION

Manufacturer: Honda (American Honda Motor Co.)
Products: 2005 Honda Pilot vehicles
Population: 87,803 (Estimated)
Problem Description: Unexpected vehicle deceleration and/or steering pull resulting from inappropriate electronic brake application with no brake light illumination.

FAILURE REPORT SUMMARY

	ODI	Manufacturer	Total
Complaints:	48	86	205**
Crashes/Fires:	0	0	0
Injury Incidents:	0	0	0
Fatality Incidents:	0	0	0
Other*:	22	18	24**

*Description of Other: Brake activations of short duration due to a yaw rate sensor malfunction.

** Total eliminates duplicates received by ODI and manufacturer.

ACTION / SUMMARY INFORMATION

Action: This Preliminary Evaluation has been upgraded to Engineering Analysis EA13-002.

Summary:

The Vehicle Stability Assist (VSA) system in the model year (MY) 2005 Honda Pilot vehicles integrates braking control strategies for anti-lock braking, traction control, electronic stability control and brake assist functions. The system consists of a VSA modulator (an electronic control unit and electronic/hydraulic actuator) that receives data from an integral brake pressure sensor and from wheel speed sensors (four wheels), the steering wheel angle sensor and a combination yaw rate and lateral acceleration sensor.

Allegations of unexpected braking appear to be related to inappropriate activation of the brake assist (BA) function. The BA system is designed to minimize stopping distances in emergency braking maneuvers by rapidly applying maximum braking force when a panic stop is detected. ODI's analysis of complaints and information provided by Honda in its response to DP12-002 and PE12-028 identified fault conditions that may result in false detection of a panic stop by the BA system, resulting in unexpected, severe brake application. The VSA control algorithm should detect inappropriate BA activation in less than 1 second and turn the system off. However, some complaints allege longer duration incidents of severe braking with no brake pedal application. Honda implemented countermeasures in the control and fault detection algorithm in the MY 2006 Pilot VSA modulators, which are not interchangeable with the MY 2005 parts.

Allegations of steering anomalies appear to be related to inappropriate activation of the VSA stability assist function. The VSA system uses information from the wheel speed, steering wheel angle, yaw rate and lateral acceleration sensors to calculate the rate of change in vehicle side slip with respect to time. If excessive side slip is calculated, the system modulates brake force pulses to individual or combinations of wheels to maintain stability. ODI has identified

22 VOQs and 18 Honda reports that appear to be incidents caused by a faulty yaw rate sensor. As judged by the complainants these incidents typically last two or less seconds.

Honda identified a problem with faulty yaw rate sensors sending an incorrect yaw rate signal to the VSA modulator. This may result in inappropriate VSA system activation, which is perceived by the driver as a momentary steering pull. The VSA control logic is designed to detect the yaw rate sensor faults in less than one second and place the system in fail-safe mode, disabling all VSA functions. This Preliminary Evaluation has been upgraded to Engineering Analysis (EA13-002) to further assess the scope, frequency, and safety-related consequences of the alleged defect.

The VOQs associated with the opening of this investigation are:

Brake Assist: 10158094, 10160741, 10213049, 10247329, 10248833, 10257672, 10257728, 10260943, 10270110, 10279468, 10282189, 10321302, 10334571, 10360371, 10366406, 10367757, 10381501, 10382911, 10399198, 10407070, 10410421, 10427031, 10443505, 10447413, 10448010, 10450564, 10451781, 10453607, 10459818, 10464695, 10466790, 10472620, 10472803, 10479999, 10480852, 10481312, 10481341, 10481372, 10483238, 10486558, 10487248, 10487492, 10487554, 10487784, 10489358, 10492006, 10493019, 10494637.

Yaw Rate Sensor: 10481310, 10492846, 10467571, 10368257, 10491748, 10307606, 10493497, 10194731, 10351927, 10492007, 10485841, 10462811, 10476925, 10482439, 10429988, 10487141, 10482567, 10359591, 10486281, 10486397, 10380979, 10486651.