Memorandum

U.S. Department
of Transportation

National Highway
Traffic Safety
Administration

Subject: PE04-052 Defect Investigation

Date: July 29, 2004

From: Kyle Bowker
Office of Defects Investigation

To: PE04-052 File

On July 23, 2004, personnel from NHTSA's Office of Defects Investigation (ODI) and National Center for Statistics and Analysis - Special Crash Investigations (SCI) met with General Motors Corp. (GM) personnel to conduct a field inspection of a motor vehicle and a crash scene. The vehicle was located at a salvage yard in Oloh, MS and the crash scene was located nearby in Ovett, MS. The vehicle, a MY 2003 Saturn Vue (VIN# 5GZCZ43DX3S805889), formerly belonged to a complainant (ODI# 10066157). The complainant alleges that, when recovering from a road edge departure, the left-rear wheel "bent underneath the vehicle," resulting in a rollover crash. SCI collected information from the vehicle's Event Data Recorder (EDR). The EDR information was shared with GM (see copy attached). Below is the list of attendees during the subject field inspection.

Attendance	Organization
Mr. Kyle Bowker	ODI, Vehicle Control Division
Mr. Tim Wildridge	NCSA, SCI
Mr. Vic Hakim	GM, Field Performance Assessment
Mr. Tony Gennusa	GM (ESIS, The Barnett Group)
Mr. Andrew Marquis	GM (ESIS, The Barnett Group)

Form Approved: OMB No. 2127-0004

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

DOT Auto Safety Hotline

Vehicle Owner's Questionnaire

To Report Vehicle Safety Defects
1-888-DASH-2-DOT
(1-888-327-4236)
INTERNET: www.nhtsa.dot.gov/hotline

FOR AGENCY USE ONLY 100148

Date Received	Repository ☐
14-APR-2004	Reference No. 10066157

OWNER INFORMATION (Type or Print)

Name

Address

City PETAL | State MS | Zip Code

Do you authorize NHTSA to provide a copy of this report to the manufacturer of your vehicle? ☒ *YES* ☐ *NO*
In the absence of an authorization, NHTSA WILL NOT provide your name or address to the vehicle manufacturer.
Signature of Owner _____ Date ___/___/___

VEHICLE INFORMATION

17 digit Vehicle Identification Number Located at bottom of windshield on driver's side	Make	Model	Model Year
5GZCZ43D03S	SATURN	VUE	2003

Date Purchased	Dealer's Name and Telephone Number	Engine:	Fuel Type:
23-SEP-02	SATURN OF FORT COLLINS 970-223-1234	No. Cylinders 4	Gas

Original Owner	Dealer's City	State	Zip Code
☐	FORT COLLINS	CO	80525

Transmission Type		Powertrain	Vehicle Component Code
AUTOMATIC	☒ Antilock Brakes ☒ Cruise Control	ALL WHEEL DRIVE	140000 AIR BAGS Multiple Failure: 2

FAILED COMPONENT(S)/PART(S) INFORMATION

Incident Date(s)	Failure Mileage	Failure Speed
04-APR-2004	23000	40

ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A TIRE FAILURE

Tire Make	Tire Model (Name or Number)	Tire Size (Example P215/65R15)
DOT No. (Example: DOTMA[9ABC]36)	☐ Original Equipment ☐ Prior Repair	Failure Location:
Tire Component Code		Tire Failure Type

ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A CHILD SEAT FAILURE

Make:	Date Manufactured:	Model No./Name:
Seat Type:	Installation System:	
Child Seat Component Code:	Failed Part:	

APPLICABLE INCIDENT INFORMATION
(Please describe in detail the incident(s), Failure(s), Crash(es), and Injury(ies).)

Crash	Fire	Number of Persons Injured	Number of Deaths	Reported to Police
☒ Yes ☐ No	☐ Yes ☒ No	1	0	Y

Narrative Description of Incident(S), Crash(es), and Injury(ies).
Please describe (1) events leading up to the failure, (2) failure and its consequences, and (3) what was done to correct the failure; i.e, parts repaired or replaced (and if old part is available).

AS I WAS DRIVING ON THE HIGHWAY, MY VEHICLE DRIFTED ONTO THE GRASSY SHOULDER. WITHOUT HITTING MY BRAKES, I STEERED BACK ONTO THE ROAD. THE REAR END OF MY VEHICLE FISH-TAILED SLIGHTLY. AS THIS WAS HAPPENING, THE DRIVER'S BACK WHEEL BENT UNDERNEATH THE VEHICLE CAUSING IT TO ROLL OVER, PASSENGER SIDE FIRST, ONTO THE SIDE OF THE HIGHWAY. DURING THE ROLL-OVER, NONE OF MY AIRBAGS DEPLOYED, BOTH DRIVER- SIDE TIRES BLEW, BOTH AXLES BENT, THE TOPS OF THE PASSENGER-SIDE DOORS CRUMPLED, THE PASSENGER-SIDE WINDOWS SHATTERED, AND THE ROOF CRUMPLED LIKE A CRUSHED ALUMINUM CAN. I RECEIVED NUMEROUS INJURIES, INCLUDING NECK/BACK/SHOULDER STRAINS, BROKEN RIBS AND DAMAGE TO MY RIGHT KNEE AND ANKLE.

Include, if available: Police/Fire Department Report, Photos, and Repair Invoice. ATTACH ADDITIONAL SHEETS IF NECESSARY

CDR File Information

Vehicle Identification Number	5GZCZ43DX35805889
Investigator	
Case Number	
Investigation Date	
Crash Date	
Filename	IN04022_03SATURN VUE.CDR
Saved on	Friday, July 23 2004 at 09:34:54 AM
Data check information	2C94079C
Collected with CDR version	Crash Data Retrieval Tool 2.24
Collecting program verification number	70CD63DD
Reported with CDR version	Crash Data Retrieval Tool 2.24
Reporting program verification number	70CD63DD
Interface used to collected data	Block number: 00 Interface version: 39 Date: 10-09-03 Checksum: 0300
Event(s) recovered	Non-Deployment

SDM Data Limitations

SDM Recorded Crash Events:

There are two types of SDM recorded crash events. The first is the Non-Deployment Event. A Non-Deployment Event is an event severe enough to "wake up" the sensing algorithm but not severe enough to deploy the air bag(s). It contains Pre-Crash and Crash data. The SDM can store up to one Non-Deployment Event. This event can be overwritten by an event that has a greater SDM recorded forward velocity change. This event will be cleared by the SDM after the ignition has been cycled 250 times.

The second type of SDM recorded crash event is the Deployment Event. It also contains Pre-Crash and Crash data. The SDM can store up to two different Deployment Events, if they occur within five seconds of one another. Deployment events can not be overwritten or cleared from the SDM. Once the SDM has deployed the air bag, the SDM must be replaced.

The data in the non-deployment file will be locked after a deployment, if the non-deployment occurred within 5 seconds before the deployment or a deployment level event occurs within 5 seconds after the deployment.

SDM Data Limitations:

-SDM Adjusted Algorithm Forward Velocity Change:

Once the crash data is downloaded, the CDR tool mathematically adjusts the recorded algorithm forward velocity data to generate an adjusted algorithm forward velocity change that may more closely approximate the forward velocity change the sensing system experienced during the recorded portion of the event. The adjustment takes place within the downloading tool and does not affect the crash data, which remains stored in the SDM. The SDM Adjusted Algorithm Forward Velocity Change may not closely approximate what the sensing system experienced in all types of events. For example, if a crash is preceded by other common events, such as rough road, struck objects, or off-road travel, the SDM Adjusted Algorithm Forward Velocity Change may be less than, and some times significantly less than the actual forward velocity change the sensing system experienced. This data should be examined in conjunction with other available physical evidence from the vehicle and scene when assessing occupant or vehicle forward velocity change. For deployments, the SDM will record 100 milliseconds of data after deployment criteria is met and up to 50 milliseconds before deployment criteria is met. For non-deployments and deployment level events, the SDM will record the first 150 milliseconds of data after algorithm enable. The maximum value that can be recorded for SDM Adjusted Algorithm Forward Velocity Change is about 112 MPH.

-Event Recording Complete will indicate if data from the recorded event has been fully written to the SDM memory or if it has been interrupted and not fully written.

-SDM Recorded Vehicle Speed accuracy can be affected if the vehicle has had the tire size or the final drive axle ratio changed from the factory build specifications.

-Brake Switch Circuit Status indicates the status of the brake switch circuit.

-Some of the Pre-Crash data, from the Deployment file, may be recorded after algorithm enable, if the Deployment event has a long crash pulse.

-Pre-Crash Electronic Data Validity Check Status indicates "Data Invalid" if the SDM does not receive a valid message.

-Driver's Belt Switch Circuit Status indicates the status of the driver's seat belt switch circuit.

-The Time Between Events is displayed in seconds. If the time between the two events is greater than five seconds, "N/A" is displayed in place of the time.

-If power to the SDM is lost during a crash event, all or part of the crash record may not be recorded.

SDM Data Source:

All SDM recorded data is measured, calculated, and stored internally, except for the following:

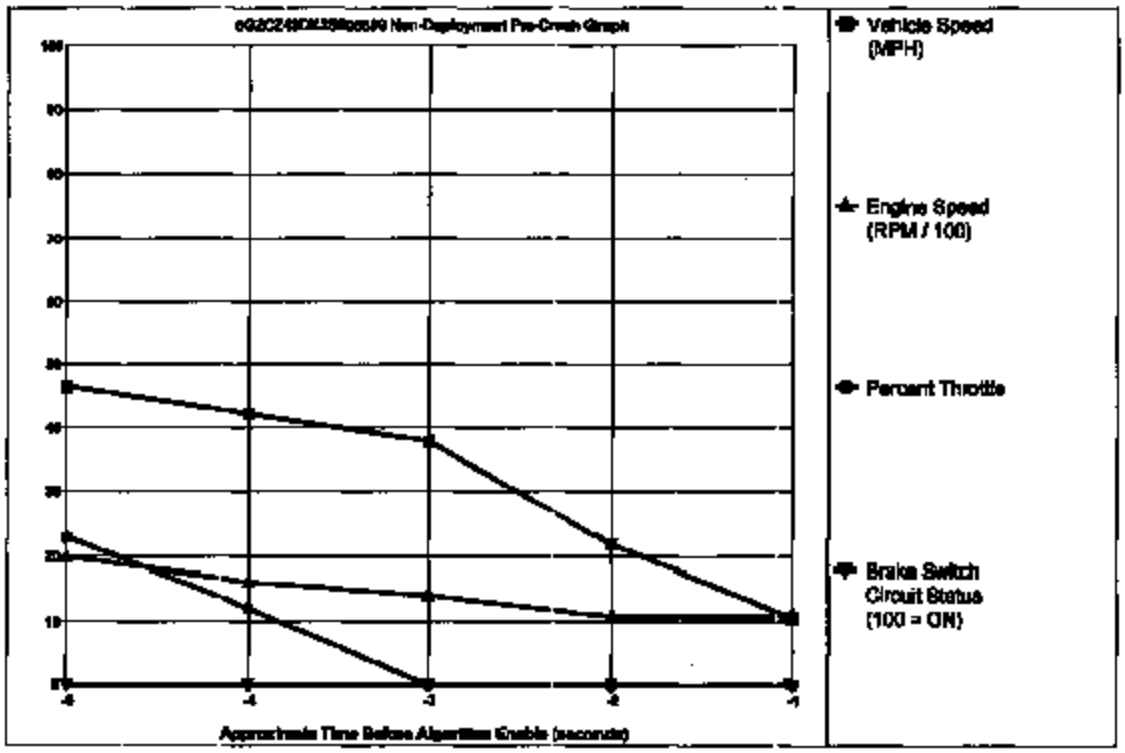
-Vehicle Speed, Engine Speed, and Percent Throttle data are transmitted once a second by the Powertrain Control Module (PCM), via the Class 2 data link, to the SDM.

-Brake Switch Circuit Status data is transmitted once a second by either the ABS module or the PCM, via the Class 2 data link,

to the SDM. Depending on vehicle option content, the Brake Switch Circuit Status data may not be available.
-In most vehicles, the Driver's Belt Switch Circuit is wired directly to the SDM. In some vehicles, the Driver's Belt Switch Circuit Status data is transmitted from the Body Control Module (BCM), via the Class 2 data link, to the SDM.

System Status At Non-Deployment

SIR Warning Lamp Status	OFF
Driver's Belt Switch Circuit Status	BUCKLED
Ignition Cycles At Non-Deployment	1763
Ignition Cycles At Investigation	1781
Maximum SDM Recorded Velocity Change (MPH)	0.00



Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle	Brake Switch Circuit Status
-5	47	1984	23	OFF
-4	42	1500	12	OFF
-3	35	1408	0	OFF
-2	22	1088	0	OFF
-1	11	1088	0	OFF

Hexadecimal Data

This page displays all the data retrieved from the air bag module.
It contains data that is not converted by this program.

$01	0C	04	00	00	00	00
$02	B8	BE	00	00	00	00
$03	41	53	32	31	37	39
$04	4B	31	41	35	45	31
$05	02	41	00	00	00	00
$06	22	68	71	96	00	00
$10	FF	21	E0	00	00	00
$11	BD	00	82	00	00	82
$12	00	00	00	00	00	00
$13	01	00	00	00	00	00
$14	03	04	EB	00	00	00
$18	82	82	83	47	FF	00
$1C	5A	FA	FA	FA	FA	FA
$1D	FA	5A	FA	FA	FA	FA
$1E	FA	FA	00	00	00	00
$1F	00	01	00	00	00	00
$20	40	00	00	7D	80	00
$21	FF	FF	FF	FF	FF	FF
$22	FF	FF	FF	FF	00	00
$23	00	00	00	00	00	00
$24	00	00	00	00	00	00
$25	00	00	00	01	00	00
$26	11	23	3D	44	4B	03
$27	00	00	00	1E	3A	00
$28	11	11	16	19	1F	00
$29	FF	24	FE	00	00	00
$2A	00	00	00	30	00	00
$2B	00	00	00	00	00	00
$2C	00	00	FF	00	00	00
$2D	00	00	00	00	00	00
$2E	00	00	00	00	00	00
$30	FF	FF	FF	FF	FF	00
$31	FF	FF	FF	FF	FF	FF
$32	FF	FF	FF	FF	00	00
$33	FF	FF	FF	FF	FF	FF
$34	FF	FF	FF	FF	FF	FF
$35	FF	FF	FF	FF	FF	FF
$36	FF	FF	FF	FF	FF	FF
$37	FF	FF	FF	FF	FF	FF
$38	FF	FF	FF	FF	FF	00
$39	FF	FF	FF	FF	FF	FF
$3A	FF	FF	FF	FF	FF	00
$3B	FF	FF	FF	FF	00	00
$3C	FF	FF	FF	FF	FF	FF
$3D	FF	FF	FF	FF	00	00
$3E	FF	FF	FF	00	00	00
$40	FF	FF	FF	FF	FF	00
$41	FF	FF	FF	FF	FF	FF
$42	FF	FF	FF	FF	00	00
$43	FF	FF	FF	00	00	00