

2005-7 Cobalt/G5 Frontal Airbags

Requests from 6/21/12 mtg to understand why only 2005-7

1. What changes were made to the ignition switch, key cylinder, steering column?
2. Are there complaints to NHTSA (VOQs) for stalling?
3. What reports are in GM system?
4. Do we have access to any non-deploy vehicles?

Electrical System Changes

- The only change between the Cobalt for (2005-2007) and Cobalt for (2008) is a pull-up resistor in the IBCM that interfaces to the ignition switch. It was changed from 5.11 kohms to 3 kohms in order to accommodate a change in the ignition switch.
 - This same change occurred for the HHR in 2008. Otherwise, the Cobalt and HHR have the same electrical architecture in this time frame.
 - Per the electrical group, no changes are believed to affect switch rotation
- The Saturn Ion is a totally different electrical architecture that is not comparable to the Cobalt/HHR.

Steering Column Changes

- There are no known changes that would affect the ignition lock housing (part of steering column) or ignition key rotational torque.

Lock / Ignition Cylinder Changes

EWO Number	Date Initiated	Date Released	Program	Effective Point	Description	Part Numbers		Source
						Key Assembly-Door Lock & Ignition Lock	Cylinder Assembly-Ignition Lock	
APVTD	100316	10/28/2003	3/18/2008	GM0001	2008 SOP	22720858	22720839	Ortech
ASQ24	146074	2/19/2008	3/21/2008	GM0001	2008 SOP	22720858	22720839	Ortech
APVTD	188188	4/1/2008	5/15/2008	GM0001	2008 SOP	22720858	22720839	Ortech
AWC02	182709	5/15/2008	6/18/2008	GM0001	2008 SOP	22720858	22720839	Ortech
AXGFW	199456	6/18/2008	1/23/2009	GM0001	2008 SOP	10849674	22720839	Ortech
BPUK (A)	394640	6/11/2004	1/21/2005	GM0001	2007 SOP	12451728 (C) 10849683 (P)	22720839	Ortech
CAHTZ	521108	6/9/2005	7/16/2008	GM0001	2008 URS 2007 SOP 2008 SOP	15839273 (C) 15839387 (P)	22720839	Ortech
BZWX	519286	6/9/2005	6/13/2005	GM0001	2008 ASAP	22720858 (C) 10849670 (P)	22720839	Ortech
BYXRB	499812	4/25/2005	6/14/2005	GM0001	2008 URS 2007 SOP	22720858 (C) 10849670 (P)	15825912	Ortech
CCTVP	520847				Change shape of ignition cylinder slider top from flat to crowned (- Profile and overall height of ignition cylinder slider to be changed in order to assist in preventing key pullout on certain keysets. Profile of slider to be domed as opposed to flat and overall height to be increased by 0.23mm			
Resource Lock Sets (Resourcing of Lock Sets to Strattec Security Corp. Components are carryover from other programs but the lockset unit is new.) PRTS N211324 (BP 8/6/2007)								
CCTVPA	631797	1/7/2006	4/7/2006	GM0001	2008 URS 2007 SOP	10849682 (C) 13481716 (P)	15872666	Ortech
CCTVPC	684287	5/24/2006	6/30/2006	GM0001	2007 URS 2008 SOP	13481716 (C) 10849682 (P)	15872666	Ortech
CPBMY	678288	6/27/2006	1/4/2007	GM0001	2008 URS 2007 SOP	10849682 (C) 10849682 (P)	25408809	Ortech
CVLFR	738063	12/5/2006	2/22/2007	GM0001	2007 URS 2008 URS 2008 SOP	15123456 (C) 25454392 (P)	25488835	Strattec
DVHDF	105593	11/5/2008	12/18/2008	GM0001	2008 URS 2010 URS	15123456 (C) 25454392 (P)	25488835	Strattec

Cobalt VOQ (Complaints to NHTSA) Search 8-7-12

	Model Year						
PI Assessment	2005	2006	2007	2008	2009	2010	Grand Total
Binding (ignition)	17	21	3	5	7	2	55
EPS		4					4
Ignition (function)	3	1		2	1		7
Knee Contact	11	2					13

TREAD Search July 2012 (TAC & CAC)
Stalling with No DTCs

2005-10 Cobalt TREAD Search - Elec, Eng, Strg Potential Knee-Key

Assessment	2005	2006	2007	2008	2009	2010	Grand Total
Yes	56	43	10	1	0	0	110

2003-7 Ion TREAD Search - Eng, Eng Cooling Potential Knee-Key

Assessment	2003	2004	2005	2006	2007	Grand Total
No (keys not excessive)	15	1		5	1	22
Yes	37	26	27	13		103

Non-deploy vehicles

- 3 potentially available
 - One received, one in process
 - [REDACTED] (723188) 2006 Cobalt [REDACTED], 12/31/10
 - Missed turn at a "T" intersection and went forward off the road. Hit a curb and vehicle launched in the air, coming down nose-first in a ditch and then rolling several times before coming to rest upside down. Driver received injuries but did not seek medical treatment. Front passenger did receive medical treatment for injuries.
 - Steering column and ignition switch available

Report to NHTSA
on 2006 Incident
Submitted 4/25/07
Revised 3/31/08



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ON-SITE AIR BAG NON-DEPLOYMENT INVESTIGATION

CASE NUMBER - IN-06-083
LOCATION - WISCONSIN
VEHICLE - 2006 CHEVROLET COBALT
CRASH DATE - October 2006

Submitted

April 25, 2007
Revised: March 31, 2008



Contract Number DTNH22-01-C-07002

Prepared for:

U.S. Department of Transportation
National Highway Traffic Safety Administration
National Center for Statistics and Analysis
Washington, D.C. 20590-0003

2005 Cobalt

October 2006

1. Travelling approx. 70 mph, vehicle left road
2. Went across driveway becoming airborne
3. Hit utility box
4. Hit clump of trees

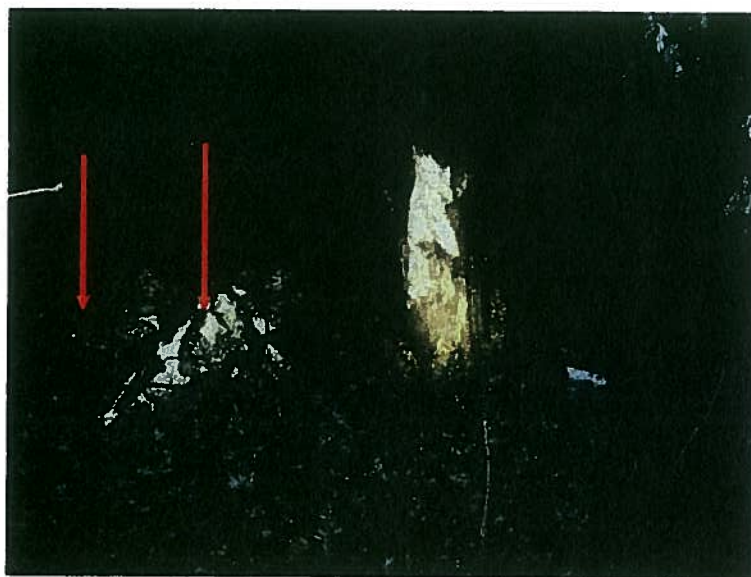
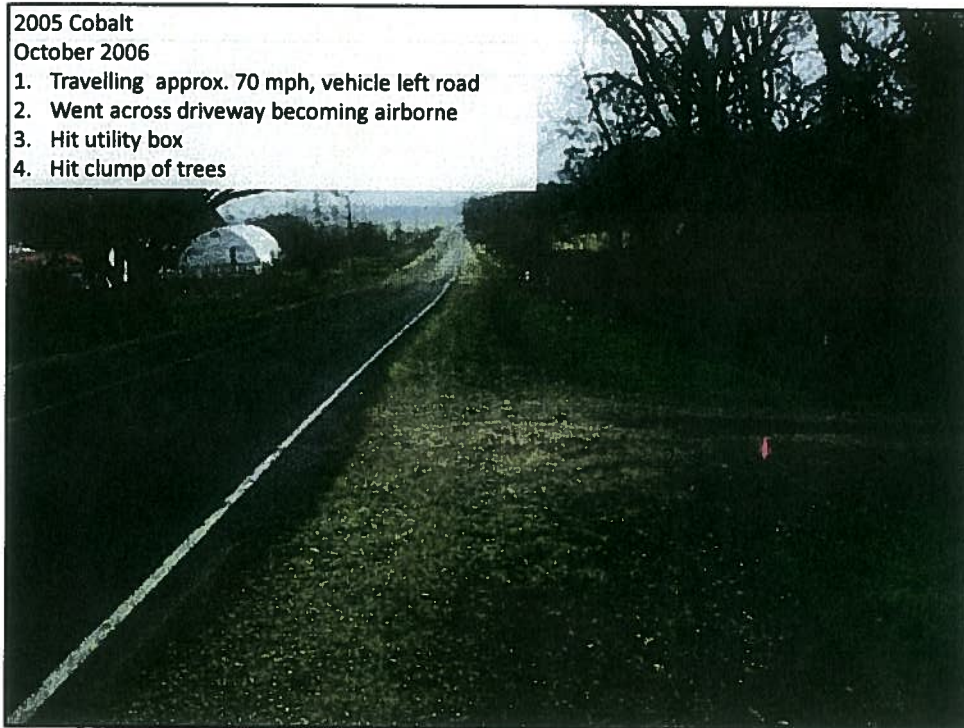


Figure 5: Police on-scene photo of impacted clump of trees, arrows shows broken/uprooted tree



Figure 7: Right side view of crush to front of case vehicle from impact with clump of trees



Figure 8: Top view of crush to front of case vehicle from impact with clump of trees, each increment on rods is 5 cm (2 in)

2005-7 Cobalt/G5

Potential countermeasures:

- Change switch to increase detent forces
- Change keys to only use centered hole
- Keep BCM / SDM powered after key - off

Backup

2005-7 Cobalt/G5

Team Members:

- Brian Stouffer PI - Team Leader
- Jeff Konchan, Bruce Jackson - Body
- Terry Connolly, John Zuzelski - Chassis
- Kristen Siemen, David Carey – Electrical Systems
- John Capp, Lisa Weber – Passive Safety Systems
- Dave Defrain, Brian Thompson – Electrical Controls
- Carmen Benavides, Doug Wachtel - PI
- Jim Federico – Global VLE, Small, Compact, Mini, Elec

Vehicle Population 2005-2007

Vehicles Sold in US & Canada

	2005	2006	2007
Cobalt/G5# Pursuit	172,044	284,958	314,090
Ion	83,681	110,197	110,511
HHR	N/A	120,645	104,516
Incidents*	7	6	5

*Except for 1 2007 G5, all reports are Cobalt. There is 1 incident reported on a 2008 vehicle (pop. 248,455). 2008 vehicle had frt sensor fault that disabled system prior to crash.
G5 was 2007 start.

2005-7 Cobalt/G5

Project Statement:

A review of selected GMX001 field events shows a voltage drop out to the SDM has occurred under certain conditions. The condition appears to be limited to 2005-07 MY vehicles. The noted field events involve vehicles going off the road and/or hitting smaller objects shortly before a significant impact.

Initial Questions:

- Why no incidents on Ion or HHR?
- Why no incidents on 2008/09/10 Cobalt?

Objectives:

- Determine:
 - the technical root cause of the issue
 - vehicle operating conditions that can cause voltage dropout

Develop countermeasure alternatives once the technical root cause has been developed

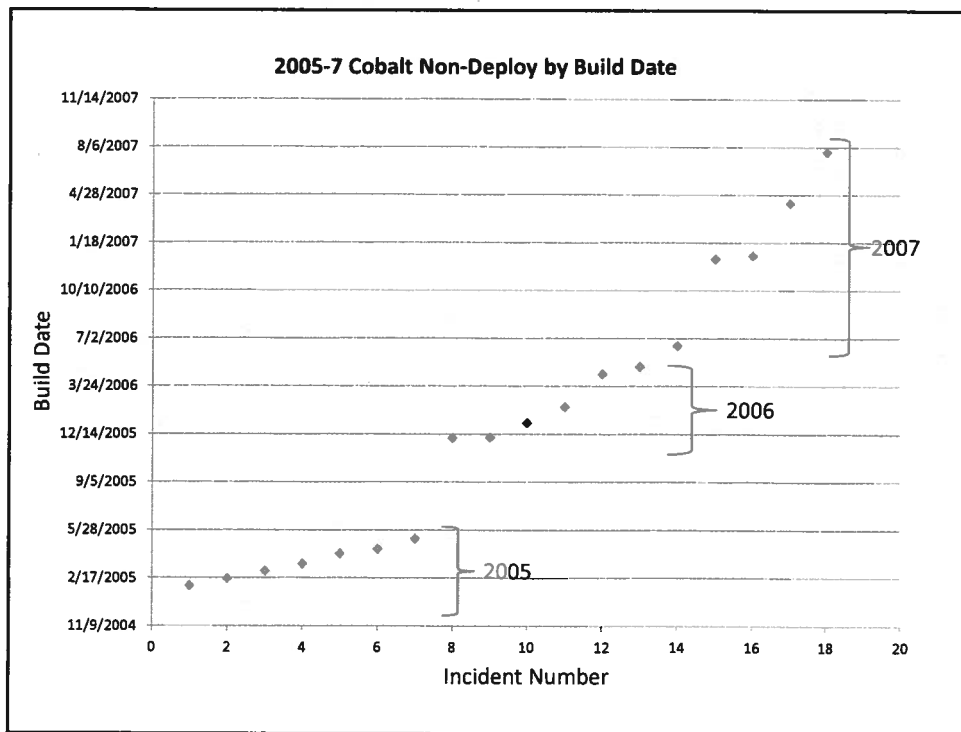
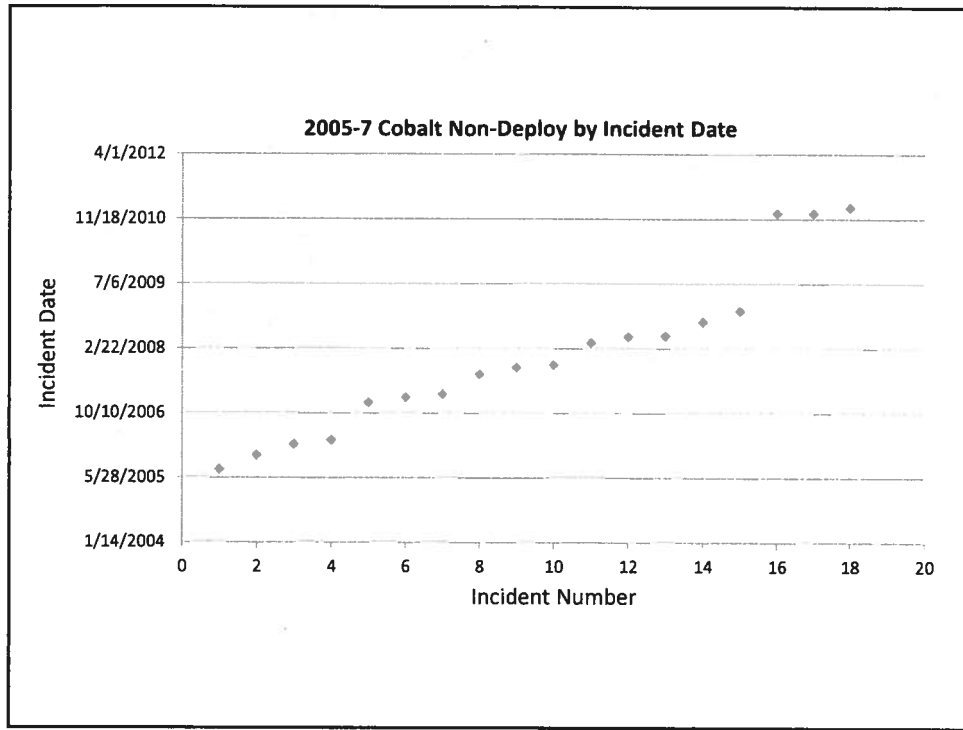
2005-7 Cobalt/G5

Refine the statements of fact:

- What additional clues are in EDR data?
- Generate clues from post crash inspections (is there any indication of key/ignition cylinder position after crash)
- What are switch detent requirements?
- When did key p/n change from a slot to a hole? (Aug 2009)
- List of changes in system (column, key, switch, SDM, sensing , architecture, etc.) between 2007 and 2008 Cobalt
 - Switch went from Passlock-3 to Passkey theft prevention
- What makes the 2005-7 Ion and 2006-7 HHR different than Cobalt?
 - Ion is Class 2 architecture vs GM LAN on Cobalt
 - Both disable SDM with key off, but Cobalt will store ignition state while Ion will not.
 - Ion has different SDM and supplier than Cobalt

Field Incident Summary from SDM Download

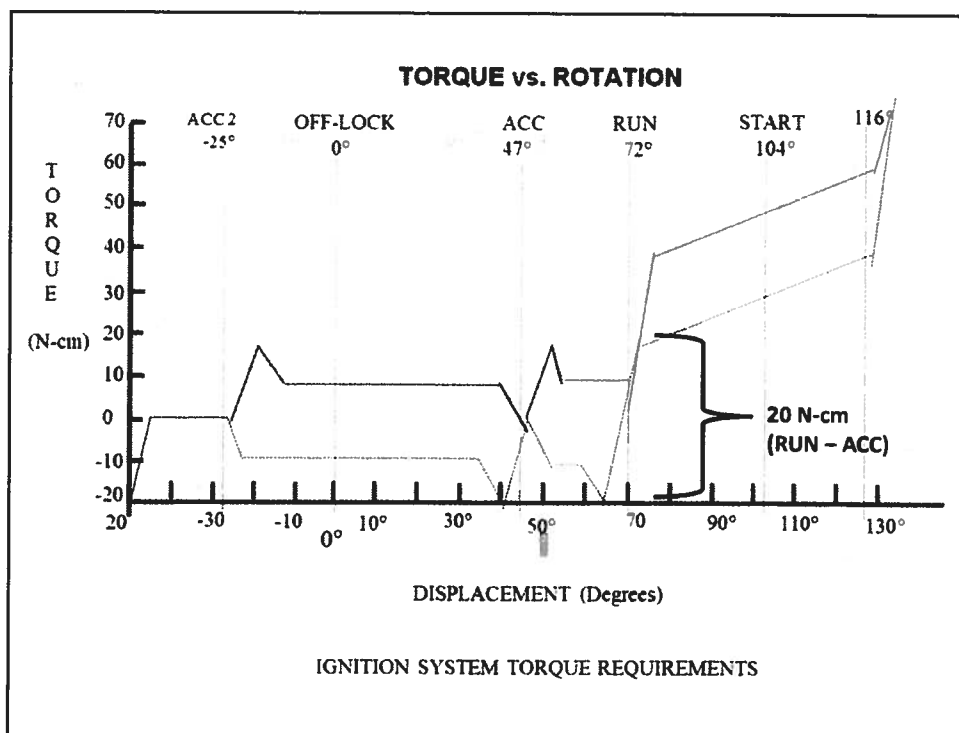
- 8 in Accessory
- 2 in "Run" showed that algorithm was disabled when Continental downloaded the EEPROM and looked at all of the data in the SDM.



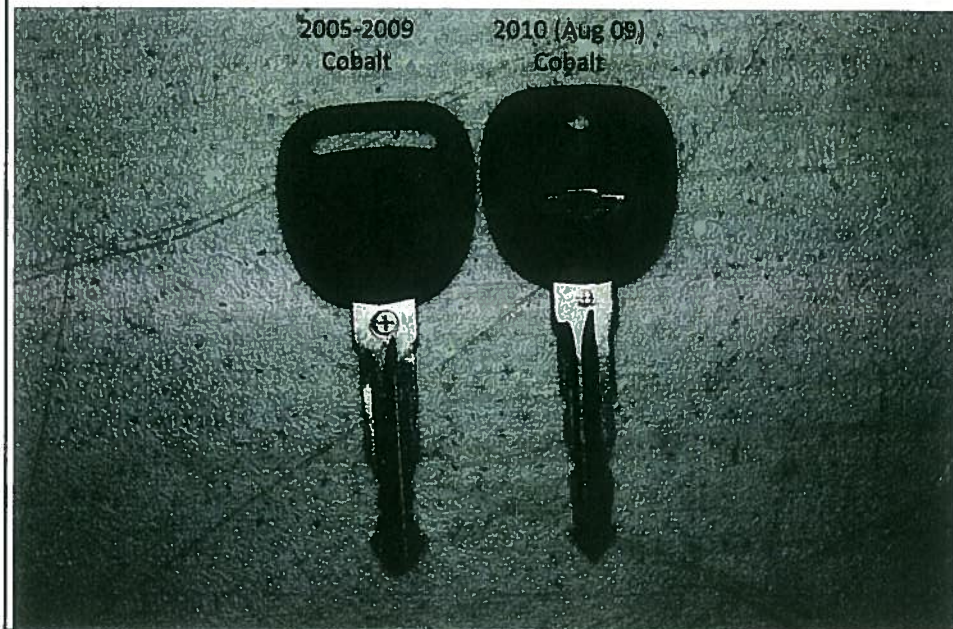
2005-7 Cobalt and Airbag Reports (TREAD)

Incident Date > 9/1/11

Source Natural Key	MY	VIN	Build Date	Odometer	Report Date	Incident Date	State	Verbatim
71-991144455	2005	[REDACTED]	11/19/2004	49000	9/26/2011	9/10/2011	PA	airbag non deploy ment with injuries injuries Claim [REDACTED] minor concussion, ribs fractured, back pain, no seat belt, physician, unknown, will be seen on 9/27/11 upper MD EMS/Renee/PAR/TX
71-1041075612	2006	[REDACTED]	12/12/2005	0	2/20/2012	1/22/2012	CA	Crs verified customer contact information. Cust. states: Cust. unable to correct veh. after experiencing cramps and lost control of veh., hit a pole. No airbags deployed . Impact was center of front bumper. Thermal event ensued post coll. Original owner? Yes Currently in a rental or loaner vehicle? Yes Who placed you in a rental or loaner vehicle? Self Cust. sustained injuries ? Yes Did the injured party seek medical attention? Yes Are cust/ injured party in the medical field? No Crs gathered prePAR and PAR Detail info. CRS advised customer of required verbiage as stated in d_1075534 Cust requested the file to be referred to the Central Claims dept. Crs advised cust someone from our Central Claims department will follow up with you within 7-10 business days. Crs provided contact information and the case number William Duffy/PAR/ATX
71-1033620153	2007	[REDACTED]	8/10/2006	23000	1/27/2012	1/24/2012	OH	Veh was in a collision, air bags did not deploy , driver sustained injuries and sought medical treatment [REDACTED] sprained right ankle, fracture breast bone, bruised head, Miami Valley Hospital/736978 Annette Rigdon [REDACTED]



Slot vs Hole Key Pictures



Cobalt Ignition System Changes

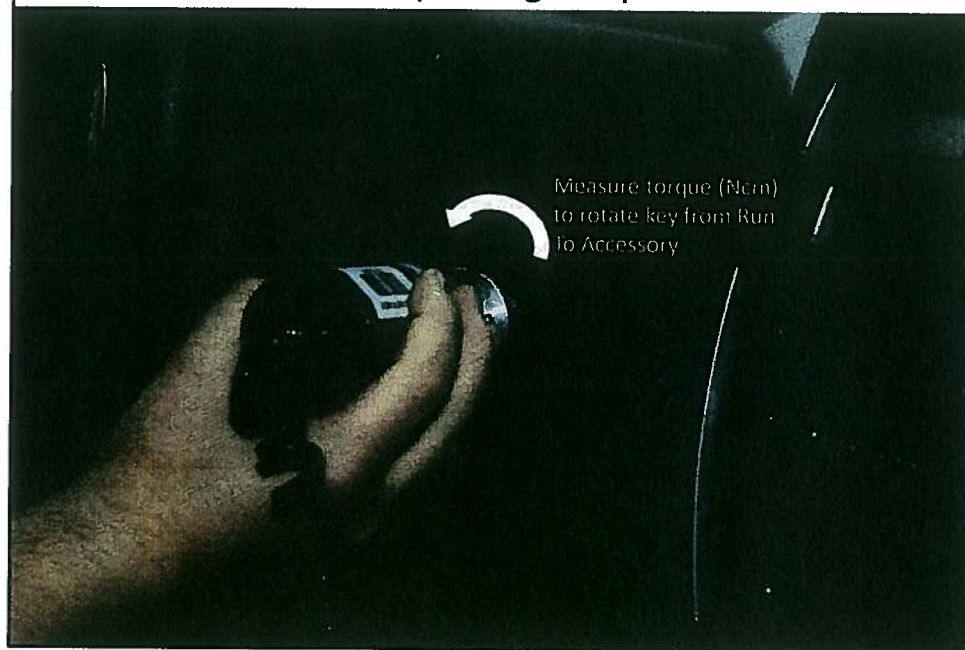
P/N	Initiated	EWOM	Work Order #	Effective Point	Title	Reason (from EWO)
	28-Feb-02		3284		GMD001 Program-DLS Ignition Switch	Tooling Capacity Increase (Cancelled since costs were captured in another EWO)
12450150	9-Jan-03	APVSR	12679	2005 SOP	GMD001 - DLS Ignition Switch	GMD001 - Beta Integration Vehicle Build (Release parts for production)
	23-May-03	AWZAL	188180		GMD001 - DLS Ignition Switch	Delete following parts from GMD001 BOM: Ignition Switch and Two Fasteners (12450150)
10392423	18-Feb-04	RGDMG	80272	2004/2005 Urgent	GMD057 - DLS Ignition Switch	Intermittent No Starts: Release modified ignition switch design P/N 10392423 for production to improve switch performance at cold temps. New grease/lower contact forces new PCB - FPM Board
						When the vehicle goes into "crank", the ignition switch sends a "signal" to the BCM and the ECM/PCM. Both modules must decode the signal within 10 ms of each other. When that happens, both modules agree that it's a "good signal" and will start the engine. In cold conditions, the grease inside the original ignition switch caused the "bounce time" to exceed 10 ms and prevent an engine start. A change to a new grease with a lower viscosity below -20C was implemented to address the issue of intermittent no starts.
	18-Feb-04	WFTLM	80272		GMD191 MY05 and GMD191/192 MY06 software release	Revised BCM software for GMD191/192 (Not directly related, appears to be a typo on Work Order 333314)
10392423	18-Apr-04	WRTJA	33331	2005 ASAP	GMD001-Steering Column Ignition Switch	Revised Ignition Switch (Refer to PWO 802725-BGDMG) Intermittent No Starts: Release modified ignition switch design P/N 10392423 for production to improve switch performance at cold temps. New grease/lower contact forces new PCB - FPM Board
10392423	12-Oct-04	WBLUD	41405	2005 ASAP	GMD001 Steering Column - Correct POA Content	Early Non-Chassis from OBMV release created some confusion, that led to mistakes in the OBMV POA content; this WO is to fix these mistakes
						The Cobalt went into production with an ignition switch that was based on the Saturn IIS switch. That switch used a Passlock-3 theft prevention system. For the 2008 MY the Cobalt changed to a "Passkey" system. The "Passkey" system used "rolling codes" for the anti-theft system. Changing to the Pass key system resulted in changing to a Road reader value for the ignition switch. As a result, ignition switch changed part numbers for 2008 MY.
15886190	12-Oct-05	CFAMG	57355	2008 SOP	GMD001/GMD003/G023 and GMDT001 - Release DLS Ignition Switch for 08 MY	Revised crank circuit resistor value to 1.3 ohms; 1% 1/4 Watt. Updated PCB artwork. (-Revise OFF/RUN/CRANK circuit to include 1-3 ohms; 1% Tolerance; 1/4 Watt - revise art work on PCB i.e. move VIMS, increase trace width.)
	20-Aug-06	CHCMA	70015	2008 SOP	GMD001 - OBMV Electric Power Steering Column Chassis	Covers 8 design changes: 1. 08 MY 09 MY GMD001 steering column use GMDT001 Inlet 2. Update GPDS for 2008, 2009 GMD001 Steering Column 3. Release ignition switch for initial production of 08MY GMD001 (see WO 573554)
	14-Sep-06	CH	70999	2008 SOP	GMD001 - Release DLS Ignition Switch for 08 MY	This work order is to release the ignition switch for initial production for 2008 GMD001 program. -Revise crank circuit resistor value to 1.3 ohms; 1% 1/4 watt. -Updated PCB art work
	18-Jan-07	CVITY	75178		GMD001 - HPVO Turbo EPS Column design changes	1. Carry over from 08MY base GMD001 steering column 2. Ignition switch carry over from 08 MY base GMD001 steering column (refer to original WOS73554)
P/N	EWO					
10392423	2005 MY					
10392423	2006 MY					
10392423	2007 MY					
15886190	2008 MY					
	2009 MY					
	2010 MY					

Cobalt, Ion & HHR Ignition Switch Measurement

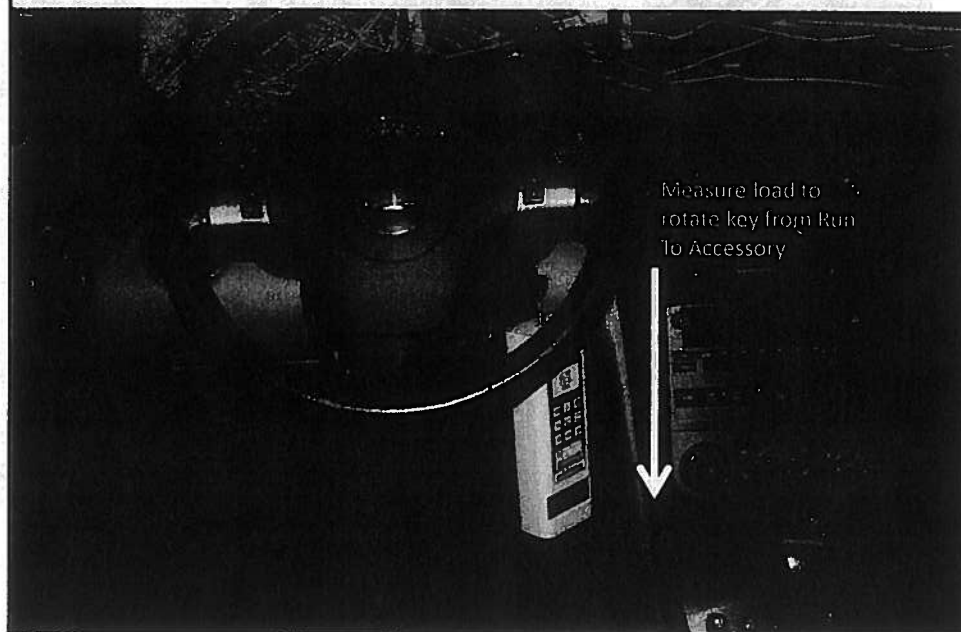
- 5/22/12 44 vehicles in Davison salvage yard
 - Measured torque (Ncm) and force (N) to turn the ignition switch from Run to Accessory.
 - Five of the vehicles had a replacement key, or a key with a hole vs slot (force not measured)

	Model Year									
Model	2003	2004	2005	2006	2007	2008	2009	2010	Grand Total	
Cobalt			1	5	5	3	3	1	18	
G5					1		1		2	
HHR				4	3	3	1		11	
Ion	2	5	3	1	2				13	
Grand Total	2	5	4	10	11	6	5	1	44	

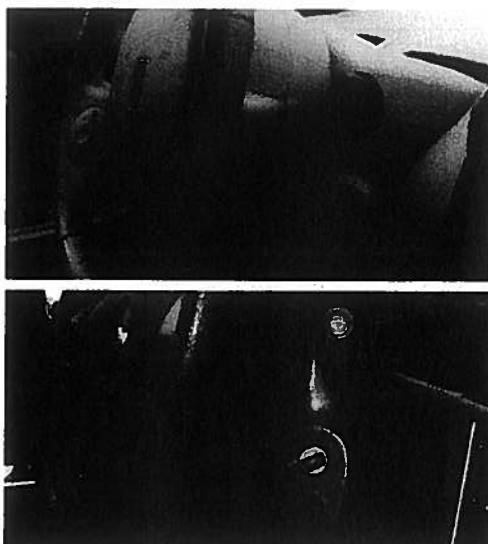
Test Set-up Using Torque Tool



Test Set-up Using Force Gauge



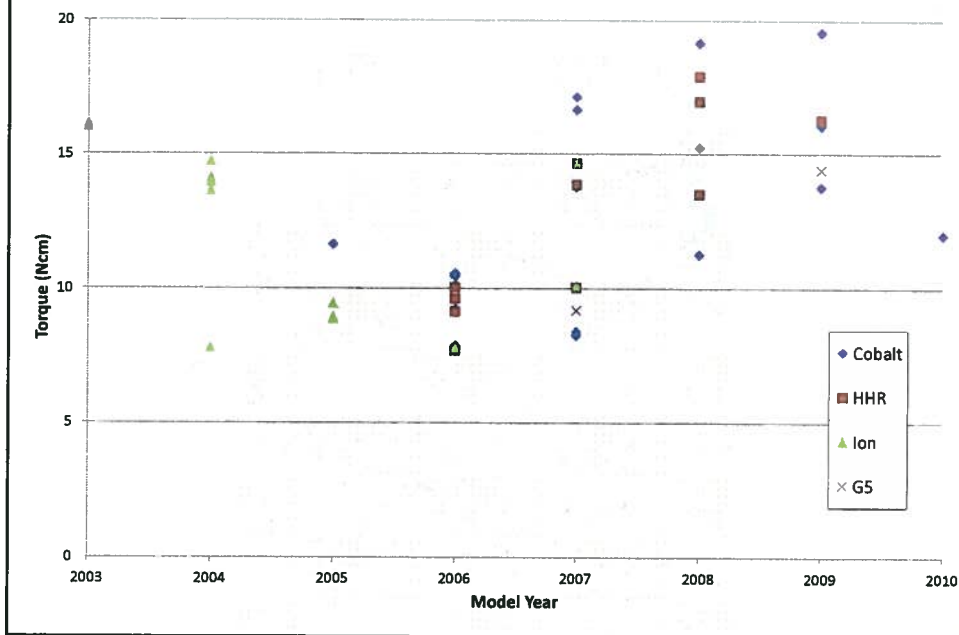
2003 Ion vs 2007 Cobalt

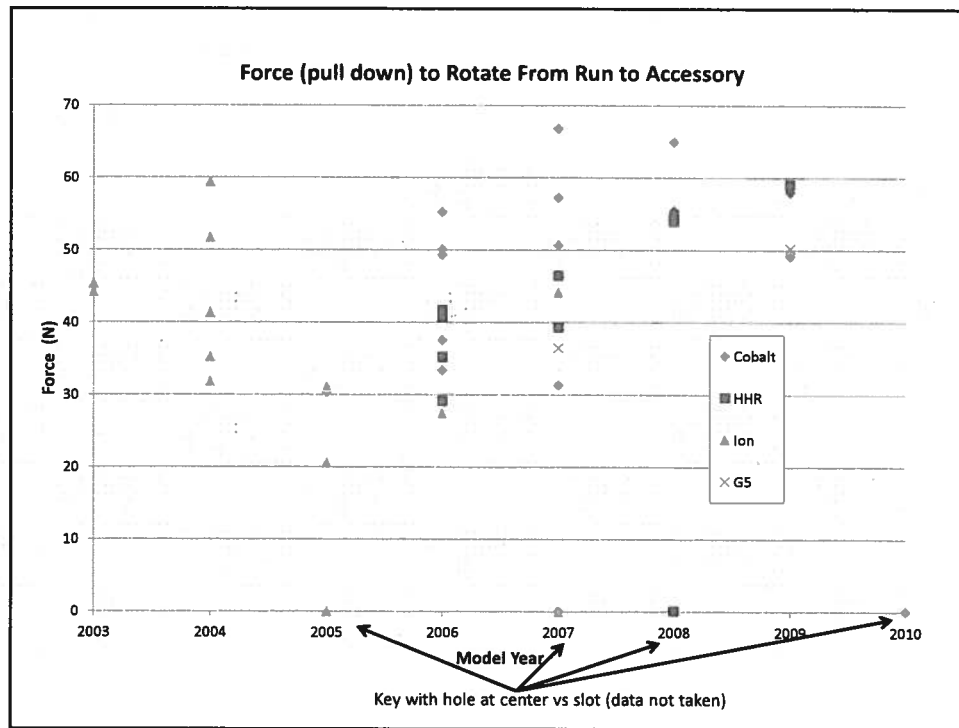


HHR Knee Clearance to Ignition (6'1" driver)



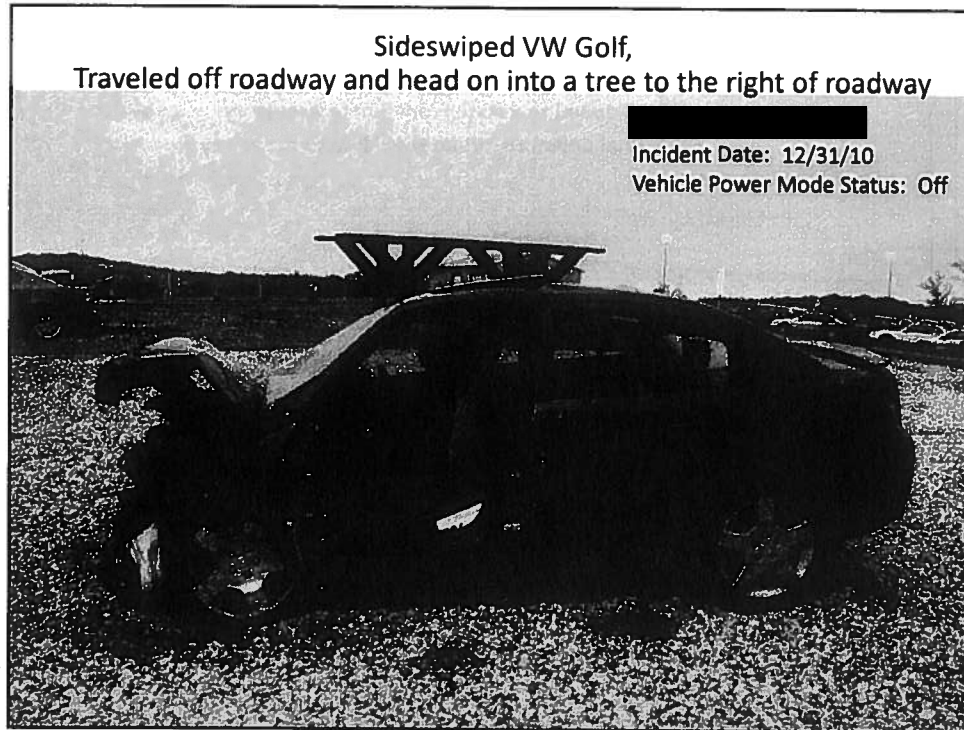
Torque to Rotate From Run to Accessory





Switch Background

- Ion switch original for 2003. For 2005 needed capacity tooling for Cobalt. However, same part number, so it is not known what cavity parts were used for Ion and then for Cobalt. HHR added in 2006



SDM Analysis

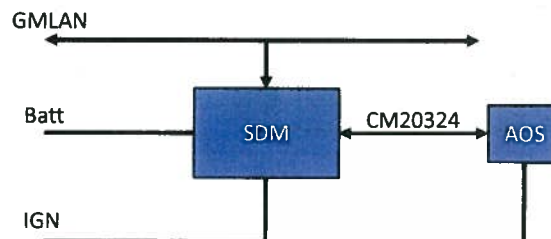
- **Background**
 - The SDM used on the Cobalt was originally designed in 1999 by Siemens Safety Electronics. In 2007 Siemens Safety Electronics was bought by Continental-Temic. The SDM is designed for the 11 bit GMLAN and the only SDM designed for that architecture.
 - This SDM is preprogrammed at the supplier and not field programmable – replacement is how this vintage SDM is serviced.
- Analysis of SDM involved in field incident indicate the SDM was working per design.
- Fishbone analysis indicates the only way the recorded EDR could have occurred is if the SDM received a change in power mode from RUN.
- The power mode behavior of this SDM is the same as all other SDMs in GM vehicles.

IGN Cylinder/Key

- IGN Switch Investigation
 - July 09 testing at the MPG demonstrated 1 of the 3 contacts lifting during rough road events. This occurred once during multiple tests. 2 contacts lifting (open) would be required to for the a power mode OFF to be generated with the key in the RUN position. Though this test did not duplicate the field conditions, it did show it may be possible to cause errant IGN switch behavior with rough road input.
 - During April 12 investigation at the Davison Salvage Yard, an IGN switch and BCM was removed from a vehicle that had this issue to determine if there was any evidence that the contacts had lifted. During the attempt to power up the BCM in a fault free environment to pull history DTCs, it was found that the donor vehicle IGN switch required low force to rotate the cylinder. The tangential force of the crashed vehicle with the issue could not be measured.
 - The force was measured by pulling on a ring attached to the key ring slot of the key (Fig 1)
 - Rotational force measured in 8 2005 - 2006 at the Davison Salvage Yard indicate some vehicle require low force to rotate the key (Table 1).
 - On one of the 8 Cobalts, the force required to rotate the key was greater than 25lbs (limit of the available force meter), this was the only vehicle that had a hole style key ring slot.
 - A salvage yard HHR, which has a similar key cylinder and a key with a hole was also beyond the limit of the available measurement tool

Assessment SDM Change

- Changing the SDM power down behavior is high risk. The power moding, fail safe operation, and diagnostics portion of the SW would need to be modified.
 - The start up behavior, i.e. driver seat belt reminder would still need to be compliant – even though there was no change to the “internal power mode” of the SDM on a quick IGN cycle.
 - Diagnostics of the IGN line and AOS module (perhaps other U-Codes) would need to be modified
 - Changes to the design of the SDM will need to be done by engineers who were not part of the original design team.
- Note that the AOS module is powered from IGN not battery – so it will power off when the key transitions from run. The FMVSS requirement is that the correct airbag state be displayed within 10 secs – so if the SDM shut off delay lasted longer than 10 seconds or if a transition of airbag state happened with 2-3 seconds of power mode change, there may be a violation of this requirement.



Document ID: 1869035

Page 1 of 2

Document ID: 1869035

#05-02-35-007A: Information on Inadvertent Turning of Key Cylinder, Loss of Electrical System and No DTCs - (Jul 1, 2011)

Subject: Information on Inadvertent Turning of Key Cylinder, Loss of Electrical System and No DTCs



Models: 2005-2007 Chevrolet Cobalt
 2006-2007 Chevrolet HHR
 2005-2006 Pontiac Pursuit (Canada Only)
 2007 Pontiac G5
 2006-2007 Pontiac Solstice
 2005-2007 Saturn ION
 2007 Saturn Sky

This bulletin is being revised to add a model year. Please discard Corporate Bulletin Number 05-02-35-007 (Section 02 - Steering).

There is potential for the driver to inadvertently turn off the ignition due to low ignition key cylinder torque/effort.

The concern is more likely to occur if the driver is short and has a large and/or heavy key chain. In these cases, this condition was documented and the driver's knee would contact the key chain while the vehicle was turning and the steering column was adjusted all the way down. This is more likely to happen to a person who is short, as they will have the seat positioned closer to the steering column.

In cases that fit this profile, question the customer thoroughly to determine if this may be the cause. The customer should be advised of this potential and should take steps to prevent it - such as removing unnecessary items from their key chain.

Engineering has come up with an insert for the key ring so that it goes from a "slot" design to a hole design. As a result, the key ring cannot move up and down in the slot any longer - it can only rotate on the hole. In addition, the previous key ring has been replaced with a smaller, 13 mm (0.5 in) design. This will result in the keys not hanging as low as in the past.

Parts Information

Part Number	Description
15842334	Cover, Dr Lk & Ign Lk Key

<http://psi.xm.com/mw/vehicleDoc.do?docSyskey=1869035&size=small&date=2011-07-01...> 5/14/2012

Cobalt & G5 Vehicles

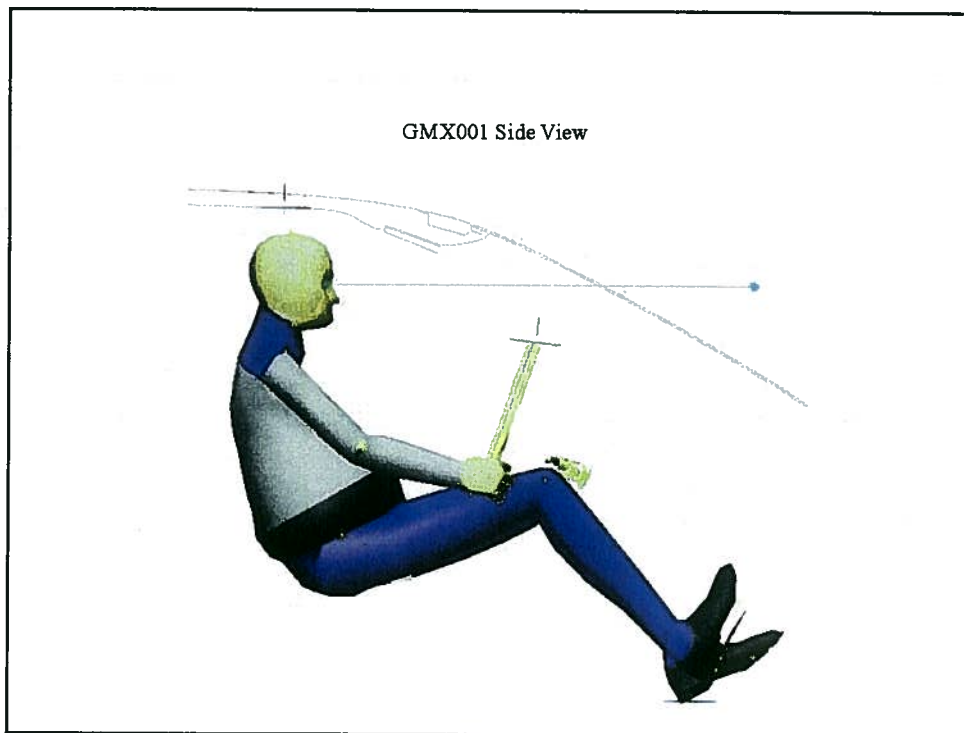
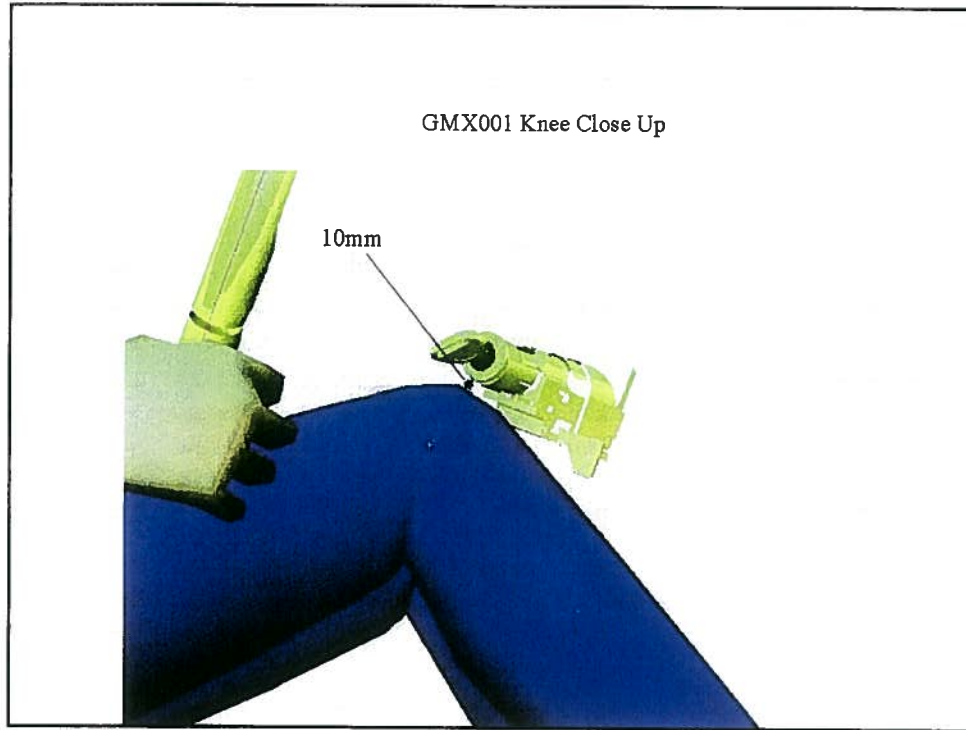
Complete VIN	Build Date	Warranty Start Date	Branded Title	Mileage @ ASA	Ignition Cycles (5/24/12)	Switch or Column Warranty	Model:	MY	Load (N)		Torque (Ncm)	
									Trimmed Avg		Trimmed Avg	
	9/5/2006	12/18/2006	Junk 5/1/12	65,060	11,953	N/A	Cobalt	2007	---		8.3	
	10/24/2005	11/15/2005	No	95,601	16,165	3/3/2010 E7680-Swg Col Replace @ 58,975 MI	Cobalt	2006	49.3		7.9	
	1/12/2007	1/13/2007	Junk 5/1/12	76,763	9,160	N/A	Cobalt	2007	66.8		13.8	
	10/4/2005	10/5/2005	No	162,096	No event	11/10/2008 E7680-Swg Col Replace @ 30,510 MI	Cobalt	2006	37.6		10.1	
	5/5/2008	5/6/2008	No	89,083	8,576	N/A	Cobalt	2008	54.3		11.3	
	7/11/2008	9/22/2008	No	55,113	3,034	N/A	Cobalt	2009	58.7		19.6	
	8/11/2008	5/15/2009	No	46,337		N/A	Cobalt	2009	58.1		13.8	
	9/13/2007	5/16/2008	Junk 4/1/12	59,445		N/A	Cobalt	2008	55.4		15.2	
	09/27/2005	09/28/2006	No	not on list		N/A	Cobalt	2006	50.1		10.6	
	08/25/2005	02/27/2006	No	146,499	12,996	N/A	Cobalt	2006	33.4		9.2	
	6/19/2006	8/29/2006	Junk 4/1/12	130,687		12/15/2008 E7200 - Cyl Ignition Lock @ 9,076 MI	Cobalt	2007	31.3		8.4	
	8/25/2005	3/23/2007	No	59,068		N/A	Cobalt	2007	50.7		16.7	
	3/14/2005	5/21/2005	No	112,397		N/A	Cobalt	2005	30.3		11.6	
	06/18/2007	9/28/2007	No	83,855		N/A	Cobalt	2007	57.2		17.1	
	3/14/2008	4/7/2008	No	not on list	9,472	N/A	Cobalt	2008	64.9		19.2	
	11/9/2005	11/30/2005	No	131,662		N/A	Cobalt	2006	55.2		10.5	
	10/1/2008	3/18/2009	No	13,004	4,209	N/A	Cobalt	2009	49.2		16.1	
	10/20/2009	11/5/2009	No	missing	5,941	N/A	Cobalt	2010	---		12.0	
	8/15/2008	6/30/2009	Salvaged 3/1/12	not on list	3,673	N/A	G5	2009	49.1		14.4	
	8/9/2006	9/15/2006	Salvaged 5/1/12	not on list	7,953	N/A	G5	2007	36.5		9.2	

HHR Vehicles

Complete VIN	Build Date	Warranty Start Date	Branded Title	Mileage @ ASA	Ignition Cycles (5/24/12)	Switch or Column Warranty	Model:	MY	Load (N)	Torque (Ncm)
									Trimmed Avg	Trimmed Avg
	9/2/2008	3/26/2009	Salvaged 4/1/12	66,543	6,731	N/A	HHR	2009	59.1	16.3
	5/18/2010	5/19/2010	No	35,309	4,472	N/A	HHR	2008	—	17.9
	12/22/2005	3/8/2006	No	30,935		09/29/2006 I7200 - Cyl. Ignition Lock @ 3,784 MI	HHR	2006	40.7	7.7
	3/12/2007	4/3/2007	No	96,830		N/A	HHR	2007	46.5	13.9
	12/11/2007	12/12/2007	Junk 5/1/12	104,343	8,586	N/A	HHR	2008	54.0	17.0
	11/7/2006	7/12/2007	Junk 5/1/12	140,265	No event	N/A	HHR	2007	83.1	14.7
	7/14/2005	7/15/2005	No	100,963		N/A	HHR	2006	29.1	9.6
	8/23/2005	9/13/2005	No	56,355		N/A	HHR	2006	35.2	10.0
	1/23/2006	3/10/2006	No	139,165	12,686	N/A	HHR	2006	41.7	9.1
	5/19/2008	6/24/2008	Salvaged 2/1/12	59,650		N/A	HHR	2008	54.5	13.5
	8/8/2006	8/9/2006	No	95,524	11,686	N/A	HHR	2007	39.3	10.0

Ion Vehicles

Complete VIN	Build Date	Warranty Start Date	Branded Title	Mileage @ ASA	Ignition Cycles (5/24/12)	Switch or Column Warranty	Model:	MY	Load (N)	Torque (Ncm)
									Trimmed Avg	Trimmed Avg
	12/1/2006	4/27/2007	No	44,367		N/A	Ion	2007	—	14.7
	3/2/2007	7/6/2007	Salvaged 5/1/12	51,000	7,394	N/A	Ion	2007	44.2	10.1
	9/13/2003	12/27/2003	No	128,621	15,452	1/4/2008 H2320 - Ign Switch Replace @ 76,162 MI	Ion	2004	51.8	14.1
	4/22/2004	7/28/2004	No	144,700		N/A	Ion	2004	59.4	14.8
	5/18/2004	6/9/2004	No	124,856		1/21/2009 H2320 - Ign Switch Replace @ 75,998 MI	Ion	2004	41.4	14.0
	9/27/2002	11/9/2002	No	73,487		12/4/2007 H2320 - Ign Switch Replace @ 54,430 MI	Ion	2003	44.2	16.0
	9/8/2004	10/8/2004	No	48,510		N/A	Ion	2005	20.6	9.0
	1/19/2005	3/29/2005	Flood 4/1/12	45,368	5,904	N/A	Ion	2005	—	8.9
	9/16/2004	1/12/2005	Flood 4/1/12	103,913	13,496	N/A	Ion	2005	31.1	9.5
	3/31/2004	4/29/2004	No	110,101		1/21/2005 H2320 - Ign Switch Replace @ 10,728 MI	Ion	2004	35.3	13.7
	2/24/2006	3/20/2006	No	99,993		N/A	Ion	2006	27.4	7.8
	10/10/2003	12/12/2003	No	26,629		N/A	Ion	2004	31.9	7.8
	11/27/2002	7/21/2003	No	135,974		12/27/2007 H2320 - Ign Switch Replace @ 55,725 MI	Ion	2003	45.4	16.2



Architecture Program Review Open Issues

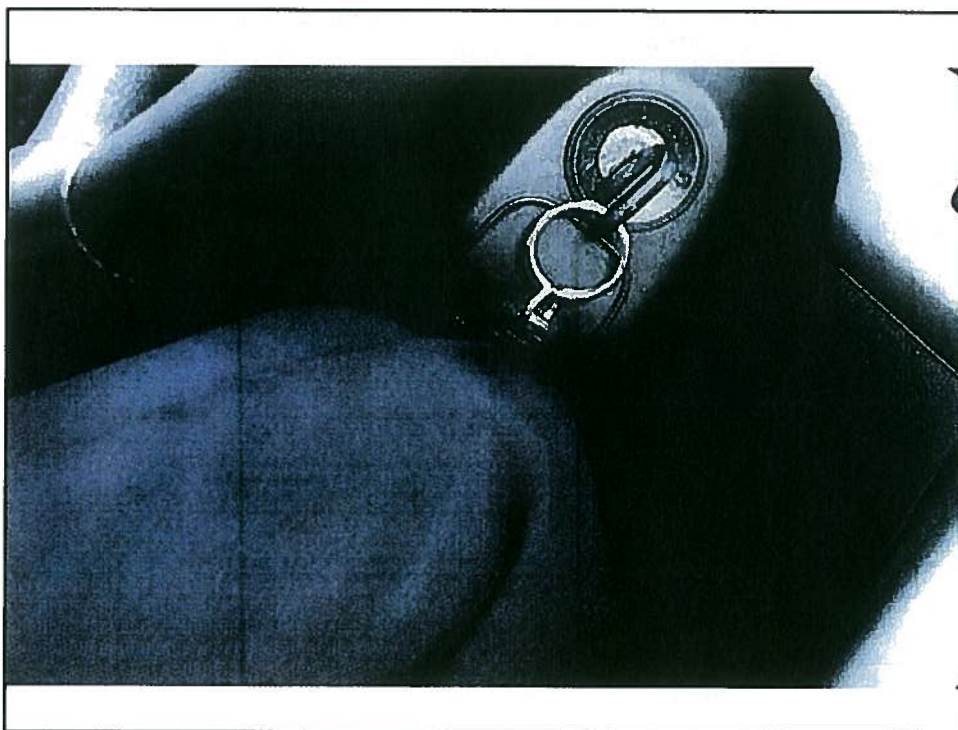
Cobalt SS – Driver Knee Hits Key During Heel/Toe

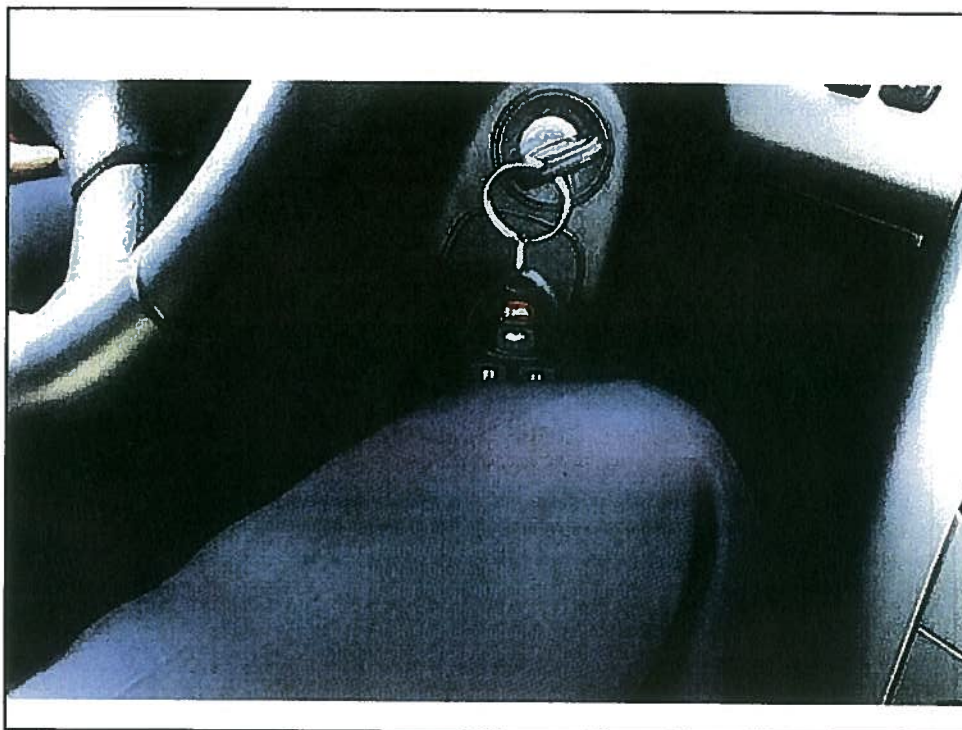
It has been reported that the driver's knee can hit the key and fob in the ignition switch and turn off the engine during heel/toe - brake/throttle actuation used for spirited driving maneuvers. This condition occurs on the Chevrolet Cobalt SS with manual transmission. It was also established that the turn off condition *did not* occur when the fob was removed from the key.

A request was brought forward to create criteria that would minimize the possibility of this condition occurring on future designs.

As no manual transmission Cobalts were available to test and evaluate, it was decided to attempt to duplicate the condition with RAMSIS, an available math tool.

Using RAMSIS on the Cobalt SS data, the operator was able to show a condition where the knee was within less than 10mm from the key in the ignition switch (without a fob).





Document ID: 1869035

#05-02-35-007A: Information on Inadvertent Turning of Key Cylinder, Loss of Electrical System and No DTCs - (Jul 1, 2011)

Subject: Information on Inadvertent Turning of Key Cylinder, Loss of Electrical System and No DTCs



Models: 2005-2007 Chevrolet Cobalt
 2006-2007 Chevrolet HHR
 2005-2006 Pontiac Pursuit (Canada Only)
 2007 Pontiac G5
 2006-2007 Pontiac Solstice
 2003-2007 Saturn ION
 2007 Saturn Sky

This bulletin is being revised to add a model year. Please discard Corporate Bulletin Number 05-02-35-007 (Section 02 - Steering).

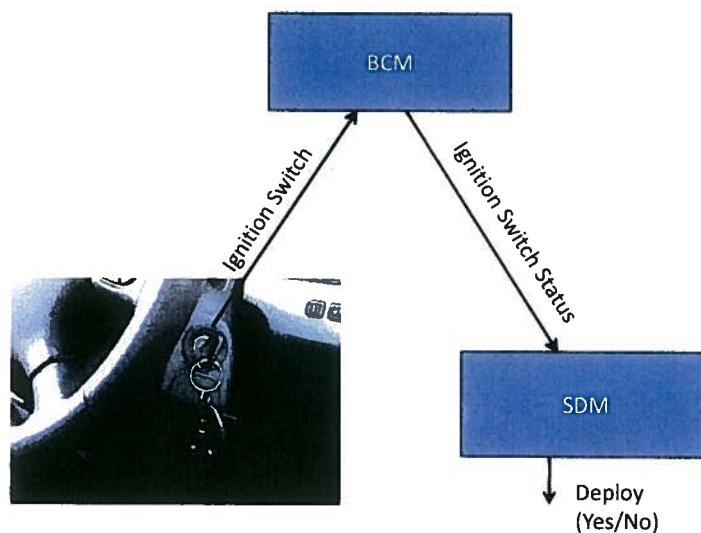
There is potential for the driver to inadvertently turn off the ignition due to low ignition key cylinder torque/effort.

The concern is more likely to occur if the driver is short and has a large and/or heavy key chain. In these cases, this condition was documented and the driver's knee would contact the key chain while the vehicle was turning and the steering column was adjusted all the way down. This is more likely to happen to a person who is short, as they will have the seat positioned closer to the steering column.

In cases that fit this profile, question the customer thoroughly to determine if this may be the cause. The customer should be advised of this potential and should take steps to prevent it - such as removing unessential items from their key chain.

Engineering has come up with an insert for the key ring so that it goes from a "slot" design to a hole design. As a result, the key ring cannot move up and down in the slot any longer - it can only rotate on the hole. In addition, the previous key ring has been replaced with a smaller, 13mm (0.5 in) design. This will result in the keys not hanging as low as in the past.

GMX001 Airbag Local Area Network (LAN)



2005-7 Cobalt/G5 Potential Non-Deployments (Ignition Switch)

US (Cobalt & G5)

18 incidents/6 yrs avg exposure or 3 incidents/year

18 incidents/617,832 vehicles/6 yrs avg exposure = 0.049 incidents/10,000 vehicles

2000 C/K rate is 3.2 times higher

TREAD Search as of 3/7/12: 57 alleged non-deploy cases (2 indicate fatality) do not have sufficient data to exclude them.

NOTE: FPA has one case for 2008 (sensor fault prior to crash)

2005	2006	2007	Total
140,464	229,231	248,137	617,832

US/Canada/Mexico Sales (Cobalt, G5 & Pursuit)

2005	2006	2007	Total
173,450	287,400	317,712	778,562