

Issue Number: **N172404**

PDF Date Submitted 01/07/2005



Part - Location: **Ignition Key Cylinder Assembly - Column - Steering**

Complaint: **vehicle can be keyed off with knee while driving**

Issue Type: **Current Prod**

Vehicle/Product Line: **3Acar**

Region: **GMNA**

Severity: **3**

Primary Metric/Score: **LaunchX / 0.025**

7. Business case unacceptable

Vehicle / Product Description

Primary Project No:	Cobalt	Model Year:	2005
Other Project No(s):	05X001	Model Year Qtr:	
Vehicle/Prop. #:		Model Code:	
Marketing Division:	Chevrolet, Pontiac	Hardware Stage:	
Marketing Region(s):		(VIN) Vehicle ID #:	
Engine(s):		Transmission(s):	
Engine Serial #:		Transmission Serial #:	
Drive Type(s):		Option(s):	
Steering:		PIMREP No:	

Odometer Reading or Range in Miles from to

Part / Supplier Information

1st Level (VPPS):	2nd Level (VPPS):	3rd Level (VPPS):	4th Level (VPPS):
20 Chassis	1 Steering	4 Steering Column	
UPC:	FNA:	Part Name:	Part Number:
-	-	key cylinder	-
Supplier(s) Name:	DUNS Code(s):	Part Year:	Drawing Revision Date:
-	-	-	01/01/1900
Suspect Part(s) available?	Location of Suspect Part(s)	PIM (EPS/PAD)	EPN
<input type="radio"/> Yes <input checked="" type="radio"/> No			

Incident Description

Date first reported:	10/29/2004	Complaint Category:	Loose
Incident Discovered by:	Gary Altman	Discoverer's Dept:	
Discoverer's Phone:	[REDACTED]	Plants w/ same Problem:	

Source Level 1:	Source Level 2:	Source Level 3:
Physical Test - Field Test	Other Loc	Chassis/Powertrain

Incident Description: (Give detailed description of incident)

While driving the vehicle the drivers knee bumped the key in such a manner as to turn off the ignition

Preliminary Root Cause: (Give preliminary Root Cause if known, do not speculate!)

low key cylinder torque/effort

Potential Root Cause Champion: (Select potential Root Cause Champion.)	
Re-Assign	Potential Champion
Department :	Chassis & Powertrain *** Suspension - Steering - Structures & Mounts (Warren)
or:	Gannon, Kevin G.
Name :	Phone: [REDACTED]
	Fax: [REDACTED]

Evaluation Information (Test)			
Procedure: (Test Schedule)	% Complete (Test Schedule):	Driving Conditions:	Environmental Conditions:
Odometer:	Vehicle Test:	Part Durability:	Part Test:

Containment			
Plant Information			
Description of Plant Containment:			

Plant:	VIN:	Breakpoint Date:	Contact Person:	Tel. No:

Field Information			
Description of Field Containment:			

Breakpoint Date:	Contact Person:	Tel. No:


Involved Components	
Component:	Plant:

Originator Information	
-------------------------------	--

Document Originator:	ALAN G STORCK/US/GM/GMC	11/19/2004 11:42:31 AM
Location:	Milford Proving Ground Building 104	Phone: [REDACTED]
Dept.:	GM *** GMNA *** Engineering *** Vehicle Integration *** Vehicle Performance *** Vehicle Dynamics & Control Systems *** Vehicle Dynamics Ride & Handling Small & Midsize Cars	

Document Information	
-----------------------------	--

Last Modified by	Dennis L. Korinek/US/GM/GMC	03/01/2005 08:00:31 AM
History	Dennis L. Korinek/US/GM/GMC - 03/01/2005 07:00:31 AM Blendi Sullaj/US/GM/GMC - 02/04/2005 10:14:21 AM Blendi Sullaj/US/GM/GMC - 02/04/2005 10:03:55 AM Blendi Sullaj/US/GM/GMC - 02/04/2005 09:02:33 AM Blendi Sullaj/US/GM/GMC - 02/01/2005 02:00:56 PM Scott Sherman/US/GM/GMC - 01/12/2005 02:26:25 PM Scott Sherman/US/GM/GMC - 01/10/2005 09:02:07 AM Kevin G. Gannon/US/GM/GMC - 01/10/2005 07:53:38 AM Nancy Burder/US/GM/GMC - 01/07/2005 11:32:14 AM Nancy Burder/US/GM/GMC - 01/07/2005 11:32:05 AM	

Issue Number:	N172404	 Impact
Part - Location:	Ignition Key Cylinder Assembly -Column - Steering	

Complaint: **vehicle can be keyed off with knee while driving**

Vehicle Line:	Prioritization Ranking by:	Priority Val.:	Bypass:	Link:
3Acar	LaunchX	0.025	n	

Other Vehicle/Product Line(s) involved:

Assessment of Customer Satisfaction Impact						
Customer Survey:		Customer Survey Category:		Customer Survey:		Customer Survey Category:
Marketing Division / Vehicle Line	PPH	MY	Wave	PPH	MY	Wave
3A Total						
Not Applicable.						
Not Applicable..						
Not Applicable...						
Not Applicable....						
Not Applicable.....						
Not Applicable.....						
Not Applicable.....						
Not Applicable.....						
Not Applicable.....						
Not Applicable.....						
Powertrain 1						
Powertrain 2						
Powertrain 3						
Powertrain 4						
Report Date:	Customer Survey Specialist:					
Customer Survey Comments:						

Assessment of impact on warranty								
Sales Region:				Currency: \$US				
Labor Codes:								
Primary:								
2nd Labor Code:								
3rd Labor Code:								
4th Labor Code:								
5th Labor Code:								
Measure	Marketing Division / Vehicle Line	Months in service						Model Year
		0	2	6	12	24	36	
IPTV	3A Total	0	0	0	0	0	0	
IPTV	Not Applicable.	0	0	0	0	0	0	
IPTV	Not Applicable..	0	0	0	0	0	0	
IPTV	Not Applicable...	0	0	0	0	0	0	

IPTV	Not Applicable....	0	0	0	0	0	0	
IPTV	Not Applicable....	0	0	0	0	0	0	
IPTV	Not Applicable.....	0	0	0	0	0	0	
IPTV	Not Applicable.....	0	0	0	0	0	0	
IPTV	Not Applicable.....	0	0	0	0	0	0	
IPTV	Not Applicable.....	0	0	0	0	0	0	
IPTV	Not Applicable.....	0	0	0	0	0	0	
IPTV	Powertrain 1	0	0	0	0	0	0	
IPTV	Powertrain 2	0	0	0	0	0	0	
IPTV	Powertrain 3	0	0	0	0	0	0	
IPTV	Powertrain 4	0	0	0	0	0	0	
Cost / Vehicle	3A Total	0	0	0	0	0	0	
Cost / Vehicle	Not Applicable.	0	0	0	0	0	0	
Cost / Vehicle	Not Applicable..	0	0	0	0	0	0	
Cost / Vehicle	Not Applicable...	0	0	0	0	0	0	
Cost / Vehicle	Not Applicable....	0	0	0	0	0	0	
Cost / Vehicle	Not Applicable.....	0	0	0	0	0	0	
Cost / Vehicle	Not Applicable.....	0	0	0	0	0	0	
Cost / Vehicle	Not Applicable.....	0	0	0	0	0	0	
Cost / Vehicle	Not Applicable.....	0	0	0	0	0	0	
Cost / Vehicle	Not Applicable.....	0	0	0	0	0	0	
Cost / Vehicle	Powertrain 1	0	0	0	0	0	0	
Cost / Vehicle	Powertrain 2	0	0	0	0	0	0	
Cost / Vehicle	Powertrain 3	0	0	0	0	0	0	
Cost / Vehicle	Powertrain 4	0	0	0	0	0	0	

Solution Effectiveness (%):

Report Date: _____ Warranty Specialist: _____

Warranty Comments: _____

Assessment of internal measurements					
Plant	% Direct Run Improvement (< 100)	GCA Value	GM Rating	Ergonomics	Productivity

Report Date: _____
 Owner of Information: _____

Assessment of Aftersales Impact		
FPR No.:		
Metric:	No of Cases:	Comments:
TAC:		
CAC:		
Buybacks:		
FPR:		

Cost Reduction			
Type of Cost Reduction:		Tracking Number:	
Marketing Division / Vehicle Line	Amount of Reduction (\$US):		
3A Total	0		
Not Applicable.	0		
Not Applicable..	0		
Not Applicable...	0		
Not Applicable....	0		
Not Applicable.....	0		
Not Applicable.....	0		
Not Applicable.....	0		
Not Applicable.....	0		
Not Applicable.....	0		
Powertrain 1	0		
Powertrain 2	0		
Powertrain 3	0		
Powertrain 4	0		
Report Date:			
Cost Reduction Comments:			

Risk Assessment Number / FMEA			
Marketing Division / Vehicle Line	FMEA Severity:	FMEA Occurrence:	FMEA Detection:
3A Total			
Not Applicable.			
Not Applicable..			
Not Applicable...			
Not Applicable....			
Not Applicable.....			
Not Applicable.....			
Not Applicable.....			
Not Applicable.....			
Not Applicable.....			
Powertrain 1			
Powertrain 2			
Powertrain 3			
Powertrain 4			

Regional Information

Description	Value	Description	Value
Physical Test		Issue Resolution Team Approval Date	
GMM ICE PPH		4	
5		CTF Repeat Occurrences	
ZDW Plant&Value		8	
Direct Run Loss		PDT	
Highlight Number		12	
13		Build Sequence	
15		16	
Sequence Number		18	
Local		Feedback Owner	

Document Information

Document created by: Nancy Burder/US/GM/GMC 01/07/2005 11:31:15 AM

Last Modified by

Issue Number: **N172404**

Part - Location: **Ignition Key Cylinder Assembly -Column - Steering**



RC

Complaint: **vehicle can be keyed off with knee while driving**

Assign Root Cause Champion

Department: Suspension - Steering - Structures & Mounts (Warren) *** Frame-Body Integral Steering
 Champion: Sherman, Scott - Phone: [REDACTED] Fax: [REDACTED]

Nomination Comments:

Champion History:

Assign Root Cause Champion Designee

Department: Suspension - Steering - Structures & Mounts (Warren) *** Frame-Body Integral Steering
 Champion: Sullaj, Blendi - Phone: [REDACTED]

Champion Designee History:

Assign Root Cause External Designee

Assignment Date: Department : External Designee:
 Name :

External Designee History:

Root Cause Analysis

Target Date: 02/06/2005 Actual Date: 02/04/2005 Actual date reported by champion:

Description of Root Cause Investigation Progress and Verification:

Author: Blendi Sullaj/US/GM/GMC on 01-Feb-2005 14:00

There are two main reasons that we believe can cause a lower effort in turning the key:

1. A low torque detent in the ignition switch
2. A low position of the lock module in the column.

Looking at the first reason, one would immediately think that changing/increasing the ignition switch torque effort would be a good solution. After talking to Ray DeGiorgio, I found out that it is close to impossible to modify the present ignition switch. The switch itself is very fragile and doing any further changes will lead to mechanical and /or electrical problems.

There are two other ways we can approach towards possible solutions:

- a. Modifying/adding detent to lock module cam shaft
- b. Adding detent to the lock cylinder-lock housing interface at RUN position (Similar to T257).

We discussed with our supplier regarding a possible torque increase from the cam shaft. Even though this is possible, it involves changes in tooling for almost all components that constitute the lock housing.

It seems that adding a detent to the key cylinder-lock housing interface at RUN position will be the most viable solution.

<input checked="" type="checkbox"/> Problem Solving Methodology: <i>Document the Solving Process seen as appropriate</i>	
Other Statistical Methods	
<input checked="" type="checkbox"/> Potential Solution Champion / Department:	
Department: or Name:	Potential Champion: Suspension - Steering - Structures & Mounts (Warren) *** Frame-Body Integral Steering Sherman, Scott Phone: [REDACTED] Fax: [REDACTED]
<input checked="" type="checkbox"/> Problem mainly caused by:	<input checked="" type="checkbox"/> Field Remedy Requested?
Engineering	No
<input checked="" type="checkbox"/> Root Cause Summary:	
The low key effort from RUN to ACC seems to occur because of a combination of two main reasons:	
1. Not enough detent in the ignition switch	
2. The lock module is a low mounted one.	
The possibility of adding a detent in the lock cylinder to lock housing interface is being investigated.	
Document Information	
Document created by:	Nancy Burder/US/GM/GMC 01/07/2005 11:31:15 AM
Last Modified by:	Blendi Sullaj/US/GM/GMC 02/04/2005 10:14:21 AM
Issue Number:	N172404
Part - Location:	Ignition Key Cylinder Assembly -Column - Steering
Complaint:	vehicle can be keyed off with knee while driving
Assign Solution Champion	
Department:	Champion:
Suspension - Steering - Structures & Mounts (Warren) *** Frame-Body Integral Steering	Sherman, Scott - Phone: [REDACTED] Fax: [REDACTED]



Nomination Comments:

Champion History:

Assign Solution Champion Designee

Department: Suspension - Steering - Structures & Mounts (Warren) *** Frame-Body Integral Steering	Champion: Sullaj, Blendi - Phone: [REDACTED]
--	---

Champion Designee History:

Assign Solution External Designee

Assignment Date:	Department: Name:	Champion Designee:
------------------	----------------------	--------------------

External Designee History:

Develop Solution / Make Decision on Solution

Target Date: 03/06/2005	Actual Date: 03/09/2005	Actual date reported by champion:
<input checked="" type="checkbox"/> Description of Solution Investigation Progress and Verification:		

Author: Blendi Sullaj/US/GM/GMC on 01-Mar-2005 16:07

Several possible solutions were presented to CPIT on 02/18/2005 See the following file for a better understanding of the solutions presented.



GMX001 Lock Module Detent in RUN 20050216.ppt

We were advised to look at the key slot change as a containment. This is in order to reduce the lever arm and as a result the pulling load.

We discussed the above solutions with Ray DeGiorgio (ignition switch DE) and Dave Trush (Lead Engineer, Closures) on 02/28/2005. After a thorough discussion, the following file was generated:



VAPIR GMX001 Lock Module Detent in RUN 20050301.ppt

This file was presented in VAPIR on 01/03/2005. The advised was the same as CPIT; to look into the key slot change as a containment (i.e., look into pricing and timing for the change).

Next step is to provide the required information (key slot change) to CPIT on 03/04/2005

Cost estimate to modify vehicle key for Cobalt



Cost estimate to change the vehicle key for the Cobalt only
per David Trush 3/04/05

Author: Blendi Sullaj/US/GM/GMC on 09-Mar-2005 9:36

Per GMX001 PEM's directive we are closing this PRTS with no action. The main reasons are as following:

1. All possible solutions were presented in CPIT and VAPIR:

- a. The lead-time for all the solutions is too long.
- b. The tooling cost and piece price are too high.
- c. None of the solutions seems to fully countermeasure the possibility of the key being turned (ignition turn off) during driving.

Thus none of the solutions represents an acceptable business case.

03/09/2005 - Blendi Sullaj

Aftersales Field Fix:	N/A
-----------------------	-----

EWO			
EWO #:	Approval / Release Date (i.e. CAB, etc):	Validation Part Availability Date:	TID (Target Implementation Date) of EWO:
EWO Comment:			

EWO Part Actions			
New Part Number Required?	New Part Number		
<input type="radio"/> Yes <input type="radio"/> No			
Stock Disposition Domestic	Stock Disposition Export	Service Disposition (Retailer)	Service Interchange
Exchange Aftersales Warehouse Parts according to Engineering/VLDM decision?			
Department:	Potential Champion:		
or	Suspension - Steering - Structures & Mounts (Warren) *** Frame-Body Integral Steering		
Name:	Sherman, Scott		
	Phone: [REDACTED]		
	Fax: [REDACTED]		

Summary
Solution Type
Solution Summary:
Per GMX001 PEM's directive we are closing this PRTS with no action. The main reasons are as following:
1. All possible solutions were presented in CPIT and VAPIR:
a. The lead-time for all the solutions is too long.
b. The tooling cost and piece price are too high.
c. None of the solutions seems to fully countermeasure the possibility of the key being turned (ignition turn off) during driving.
Thus none of the solutions represents an acceptable business case.

Document Information

Document created by: Blendi Sullaj/US/GM/GMC 02/04/2005 10:14:08 AM
Last Modified by: Blendi Sullaj/US/GM/GMC 03/09/2005 09:36:27 AM

Issue Number: **N172404**
 Part - **Ignition Key Cylinder Assembly -Column - Steering**
Location:
 Complaint: **vehicle can be keyed off with knee while driving**



Assign Implementation Champion

Department: Champion:

Assign Implementation Champion Designee

Department: Champion:

Assign Implementation Champion Designee

Company: External Designee:

Implement Solution

Target Date: Actual Date: Actual date reported by champion:

Description of Implementation:

Breakpoint(s)

Plant: Date: VIN / Val Vehicle #:

Breakpoint(s) Involved Components

Plant*Component / Supplier*Part:		Serial - No:	Date Breakpoint:
Component/Part:	Plant / Supplier:	Serial - No:	Breakpoint:

Department : Potential Champion:
or
Name :

Service Bulletin

Service Bulletin Requested:	Service Bulletin #:	Bulletin Release Date:	Applicable Region/Country:
Service Bulletin Name/Desc.:			

Summary

Implementation Summary:

Document Information

Document created by:
Last Modified by:

Issue Number: **N172404**
 Part - **Ignition Key Cylinder Assembly -Column - Steering**
Location:
 Complaint: **vehicle can be keyed off with knee while driving**



Assign Feedback Champion

Department:	Champion:
-------------	-----------

Assign Feedback Champion Designee

Department:	Champion:
-------------	-----------

Assign Feedback External Designee

Company:	External Designee:
----------	--------------------

Feedback

Target Date:	Actual Date:	Actual date reported by champion:
--------------	--------------	-----------------------------------

Did the Solution fix the problem?

Yes No

Copy of the data analysis to support the above conclusion:

Feedback Summary:

Document Information

Document created by:

Last Modified by:

Issue Number: **N172404**

Part - Ignition Key Cylinder Assembly -Column - Steering
Location:



Field
Remedy

Complaint: **vehicle can be keyed off with knee while driving**

Assign Field Remedy Champion

Department:	Champion:
-------------	-----------

Field Remedy

Field Remedy Comment:


Last Break Point

Date	VIN / Part Number	Measure

Document Information

Document created by:

Last Modified by:

Issue Number:	N172404	
Part -	Ignition Key Cylinder Assembly -Column - Steering	
Location:		
Complaint:	vehicle can be keyed off with knee while driving	

Solution for new Design / Project

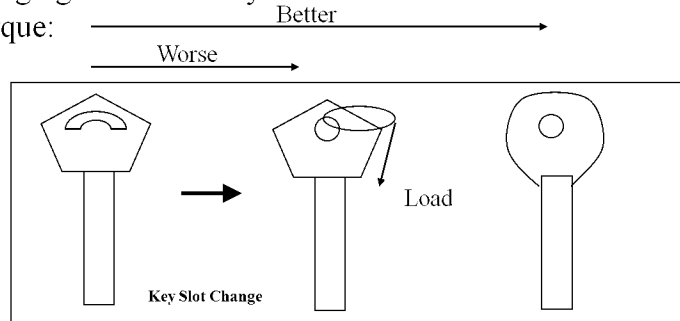
Shall a Lessons Learned Request be sent?	<input type="radio"/> Yes <input type="radio"/> No
Step when issue was flagged as Lessons Learned:	
Flagged by:	
Standard Work Element:	
Lesson Learned Number:	
Has the issue been entered in the Lessons Learned database?	<input type="radio"/> Yes <input checked="" type="radio"/> No

Document Information	
Document created by:	
Last Modified by	

GMX001 Lock Module Detent in RUN

Containment Solution

➤ Changing slot in the key in order to reduce lever arm and thus the torque:



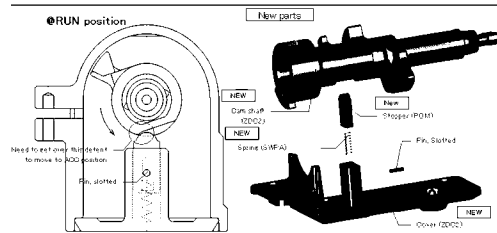
✓ It was determined that the lever arm is still present due to fob ring. This may even cause a higher pulling load if fob ring is wedged between the slot and the sharp corner of key.

✓ Can be considered as a containment if the shape of key is changed to round corners

GMX001 Lock Module Detent in RUN

Partial Solution Design Concept

➤ Detent between lock cover and cam shaft:



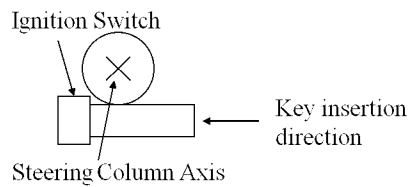
- ✓ Partial solution based on engineering judgment. No experimental verification that detent is sufficient.
- ✓ If chosen, will drive changes and tuning efforts in ignition switch in order to avoid double detent feel.
- ✓ Design has to become common between Delta, Theta and Kappa
- ✓ Can be combined with the new ignition switch presently sourced for GMT191/2/3 for better detent

GMX001 Lock Module Detent in RUN

Sure Solution Description

- Change from a low mount to a high mount lock module.
 - ✓ It will considerably reduce the possibility of the key/key fob being pulled by driver
 - ✓ Can be combined with gear driven ignition switch design (Additive internal friction → more detent)

Low Mount Lock Housing



High Mount Lock Housing

