REPORT NO. 118-KAR-10-002

SAFETY COMPLIANCE TESTING FOR FMVSS 118

Power-Operated Window, Partition, And Roof Panel Systems

2010 CHEVROLET CAMARO
2-DOOR COUPE

NHTSA NO. CA0106

PREPARED BY:
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May 28, 2010

Final Report

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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16. *Abstract* Compliance tests were conducted on the subject 2010 Chevrolet Camaro 2-Door Coupe in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-118-06 for the determination of FMVSS 118 compliance. Test failures identified were as follows: None			
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TABLE OF CONTENTS

SECTION 1
PURPOSE OF COMPLIANCE TEST

Tests were conducted on a 2010 Chevrolet Camaro 2-Door Coupe, manufactured by Chevrolet AG to determine compliance with FMVSS 118 "Power-Operated Window, Partition, and Roof Panel Systems". FMVSS 118 specifies requirements for power operated window, partition and roof panel systems to minimize the likelihood of death or injury from their accidental operation.

All tests were conducted based on the current National Highway Traffic Safety Administration (NHTSA), Office of Vehicle Safety Compliance (OVSC) Laboratory Procedures, TP-118-06, dated April 12, 2006, and corresponding KARCO Engineering test procedure KTP-118, dated March 23, 2009. Detailed procedures for receiving, inspecting, testing and reporting of test results are described in the test procedures and are not repeated in this report.

SECTION 2
TEST PROCEDURE AND DATA SUMMARY

A 2010 Chevrolet Camaro 2-Door Coupe was subjected to FMVSS 118 compliance testing. The tests were conducted at KARCO Engineering in Adelanto, California on May 27th, 2010 through May 28th, 2010. FMVSS 118 Compliance testing was performed in the following sequence:

- Vehicle Receiving Photographs
- Test Vehicle Check-in
- Power Window, Partitions and Roof Panel Identification/Documentation
- Interior, Exterior and Remote Control Switch Identification/Documentation
- Pre-Test Operation of all Power Windows, Partitions and Roof Panels
- Photograph Vehicle Ignition Switch and Master and Individual Power Window, Partition and Roof Panel Switches
- Perform Ignition Switch off Test
- Perform Ignition Key Removed Test
- Perform Exterior Key Locking System Test
- Perform Remote Control System Test
- Perform Reversal System Test
- Perform Sphere Test

DATA SUMMARY

TEST VEHICLE INFORMATION			
YEAR	**2010**	MAKE	**Chevrolet**
MODEL	**Camaro**	BODY STYLE	**2-Door Coupe**
NHTSA NO.	**CA0106**	VIN	**2G1FA1EV1A9178422**
TEST DATE:	**05/27/10 - 05/28/10**		

SWITCH ACTUATION

WINDOWS, PARTITIONS, ROOF PANEL SWITCHES (WPRP)	**INTERIOR KEY LOCKING SYSTEM***			EXTERIOR LOCKING SYSTEM (PASS / FAIL)
	IGNITION KEY OFF (PASS/FAIL)	IGNITION KEY REMOVED (PASS/FAIL)	IGNITION KEY REMOVED DOOR OPENED (PASS/FAIL)	
MASTER SWITCH PANEL				
Left Front (LF)	PASS	PASS	PASS	N/A
Right Front (RF)	PASS	PASS	PASS	N/A
Left Rear (LR)	N/A	N/A	N/A	N/A
Right Rear (RR)	N/A	N/A	N/A	N/A
Tail Gate (TG)	N/A	N/A	N/A	N/A
Partition	N/A	N/A	N/A	N/A
Roof Panel (RP)	N/A	N/A	N/A	N/A
INDIVIDUAL SWITCHES				
Left Front (LF)	PASS	PASS	PASS	N/A
Right Front (RF)	PASS	PASS	PASS	N/A
Left Rear (LR)	N/A	N/A	N/A	N/A
Right Rear(RR)	N/A	N/A	N/A	N/A
Tail Gate (TG)	N/A	N/A	N/A	N/A
Partition (P)	N/A	N/A	N/A	N/A
Roof Panel (RP)	N/A	N/A	N/A	N/A

REMARKS: The master switch control panel is located on the driver's side door panel and includes the individual left front window switch. Vehicle passed as soon as ignition key "off" test was performed.

***PASS =** After ignition key cycled from ON,ACC, or START to OFF position, or removed WPRP does not close, or closes until either front door is opened

REMOTE ACTUATION DEVICE

VEHICLE ORIENTATION REMOTE ACTUATION DEVICE	NON-LINE OF SIGHT REMOTE (METERS)	LINE OF SIGHT REMOTE (METERS)
FRONT	N/A	N/A
DRIVER SIDE	N/A	N/A
PASSENGER SIDE	N/A	N/A
REAR	N/A	N/A

WPRP OBSTRUCTION FORCE REVERSAL

WINDOW, PARTITION, ROOF PANEL	FORCE TO REVERSE (NEWTONS)	DISTANCE WINDOW, PARTITION, OR ROOF PANEL OPENED ON REVERSAL (mm)
LEFT FRONT (LF)	See Data Sheet 8	See Data Sheet 8
RIGHT FRONT (RF)	See Data Sheet 8	See Data Sheet 8
LEFT REAR (LR)	N/A	N/A
RIGHT REAR (RR)	N/A	N/A
PARTITION (P)	N/A	N/A
ROOF PANEL (RP)	N/A	N/A
TAIL GATE (TG)	N/A	N/A

SPHERE TEST

WINDOW, PARTITION, ROOF PANEL	MASTER SWITCH	INDIVIDUAL SWITCH	PASS / FAIL
LEFT FRONT (LF)	See Data Sheet 9	See Data Sheet 9	PASS
RIGHT FRONT (RF)	See Data Sheet 9	See Data Sheet 9	PASS
LEFT REAR (LR)	N/A	N/A	N/A
RIGHT REAR (RR)	N/A	N/A	N/A
PARTITION (P)	N/A	N/A	N/A
ROOF PANEL (RP)	N/A	N/A	N/A
TAIL GATE (TG)	N/A	N/A	N/A

REMARKS: None.

The subject 2010 Chevrolet Camaro 2-Door Coupe appeared to meet the requirements of FMVSS 118.

SECTION 3
TEST DATA

DATA SHEET NO. 1
VEHICLE IDENTIFICATION

TEST VEHICLE INFORMATION			
YEAR	**2010**	MAKE	**Chevrolet**
MODEL	**Camaro**	BODY STYLE	**2-Door Coupe**
NHTSA NO.	**CA0106**	VIN	**2G1FA1EV1A9178422**
TEST DATE:	**05/27/10 - 05/28/10**		

Identify Vehicle equipped WPRP and WPRP controls

	LEFT FRONT	LEFT REAR	RIGHT FRONT	RIGHT REAR	TAIL GATE	PARTITION	ROOF PANEL
Power Windows	X	N/A	X	N/A	N/A	N/A	N/A
Interior Switches	X	N/A	X	N/A	N/A	N/A	N/A
Master Control Panel	X	N/A	X	N/A	N/A	N/A	N/A
Exterior Switches	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Remote Controller	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Auto-Reverse	X	N/A	X	N/A	N/A	N/A	N/A

Master Control Panel Location: **Driver Side Door Panel**

Remote Control: **None**

Window Switch Design: **Master Control Switches – Flush Mounted Rocker Switch push down to open, pull up to close.**
Individual Window Switches – Flush Mounted Rocker Switch push down to open, pull up to close.

Exterior Control Switch: **N/A**

Sunroof: **N/A**

REMARKS: Master control panel switch is located in the driver side door panel. Individual switches are located on the door panel for each door. On this vehicle the reversal feature is not required because the windows appear to meet the operational requirements of FMVSS 118 paragraph S.4.

RECORDED BY: **MATTHEW S. HUBBARD** DATE: **05/27/10 - 05/28/10**

APPROVED BY: **MICHAEL L. DUNLAP** DATE: **07/06/10**

DATA SHEET NO. 2
IGNITION KEY OFF TEST

TEST VEHICLE INFORMATION			
YEAR	**2010**	MAKE	**Chevrolet**
MODEL	**Camaro**	BODY STYLE	**2-Door Coupe**
NHTSA NO.	**CA0106**	VIN	**2G1FA1EV1A9178422**
TEST DATE:	**05/27/10 - 05/28/10**		

Pre-Test Check: Window, Partition, Roof Panel Systems operate with Ignition Switch in "ON" Position	YES	X	NO	N/A
Pre-Test Check: Window, Partition, Roof Panel Systems operate with Ignition Switch in "ACCESSORY" Position	YES	X	NO	N/A

WINDOW SWITCHES	DOORS CLOSED		LEFT DOOR OPEN		RIGHT DOOR OPEN		PASS/ FAIL
	INOP.	OPER.	INOP.	OPER.	INOP.	OPER.	
MASTER							
Left Front (LF)	N/A	X	X	N/A	X	N/A	PASS
Right Front (RF)	N/A	X	X	N/A	X	N/A	PASS
Left Rear (LR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Right Rear (RR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tail Gate (TG)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Partition (P)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roof Panel (RP)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
INDIVIDUAL							
Left Front (LF)	N/A	X	X	N/A	X	N/A	PASS
Right Front (RF)	N/A	X	X	N/A	X	N/A	PASS
Left Rear (LR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Right Rear (RR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tail Gate (TG)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Partition (P)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roof Panel (RP)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

REMARKS: The master left front switch is the same as the individual left front switch. Test was performed with key in the “Lock” position. For the pre-test check in the “Accessory” position the key was moved from the “Lock” position to the “Accessory” position without cycling through the “On” position or starting the engine. Vehicle passed as soon as ignition “off” test was performed.

RECORDED BY: **MATTHEW S. HUBBARD** DATE: **05/27/10 - 05/28/10**

APPROVED BY: **MICHAEL L. DUNLAP** DATE: **07/06/10**

DATA SHEET NO. 3
IGNITION KEY REMOVED TEST

TEST VEHICLE INFORMATION			
YEAR	**2010**	MAKE	**Chevrolet**
MODEL	**Camaro**	BODY STYLE	**2-Door Coupe**
NHTSA NO.	**CA0106**	VIN	**2G1FA1EV1A9178422**
TEST DATE:	**05/27/10 - 05/28/10**		

WINDOW SWITCHES	DOORS CLOSED		LEFT DOOR OPEN		RIGHT DOOR OPEN		PASS/ FAIL
	INOP.	OPER.	INOP.	OPER.	INOP.	OPER.	
MASTER							
Left Front (LF)	N/A	X	X	N/A	X	N/A	PASS
Right Front (RF)	N/A	X	X	N/A	X	N/A	PASS
Left Rear (LR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Right Rear (RR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tail Gate (TG)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Partition (P)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roof Panel (RP)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
INDIVIDUAL							
Left Front (LF)	N/A	X	X	N/A	X	N/A	PASS
Right Front (RF)	N/A	X	X	N/A	X	N/A	PASS
Left Rear (LR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Right Rear (RR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tail Gate (TG)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Partition (P)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roof Panel (RP)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

REMARKS: The master left front switch is the same as the individual left front switch. Vehicle passed as soon as ignition key “off” test was performed.

RECORDED BY: **MATTHEW S. HUBBARD** DATE: **05/27/10 - 05/28/10**

APPROVED BY: **MICHAEL L. DUNLAP** DATE: **07/06/10**

DATA SHEET NO. 4
EXTERIOR KEY LOCKING SYSTEM

TEST VEHICLE INFORMATION			
YEAR	**2010**	MAKE	**Chevrolet**
MODEL	**Camaro**	BODY STYLE	**2-Door Coupe**
NHTSA NO.	**CA0106**	VIN	**2G1FA1EV1A9178422**
TEST DATE:	**05/27/10 - 05/28/10**		

EXTERIOR LOCKING CONTROL SWITCH TEST				
Can Any WPRP Be Operated by Directly Using A Key in an Exterior Locking Control Switch?	Yes	N/A	No	X
If Yes: Is Continuous Activation of the Switch Required	Yes	N/A	No	X

IDENTIFY WINDOW, PARTITION AND ROOF PANEL POSITIONS WHICH ARE OPERABLE WITH EXTERIOR KEY.

LOCATION	OPERABLE W/KEY		CONTINUOUS ACTION		PASS / FAIL
	YES	NO	YES	NO	
LEFT FRONT (LF)	N/A	X	N/A	N/A	N/A
RIGHT FRONT (RF)	N/A	X	N/A	N/A	N/A
LEFT REAR (LR)	N/A	N/A	N/A	N/A	N/A
RIGHT REAR (RR)	N/A	N/A	N/A	N/A	N/A
PARTITION (P)	N/A	N/A	N/A	N/A	N/A
ROOF PANEL (RP)	N/A	N/A	N/A	N/A	N/A
TAIL GATE (TG)	N/A	N/A	N/A	N/A	N/A

REMARKS:

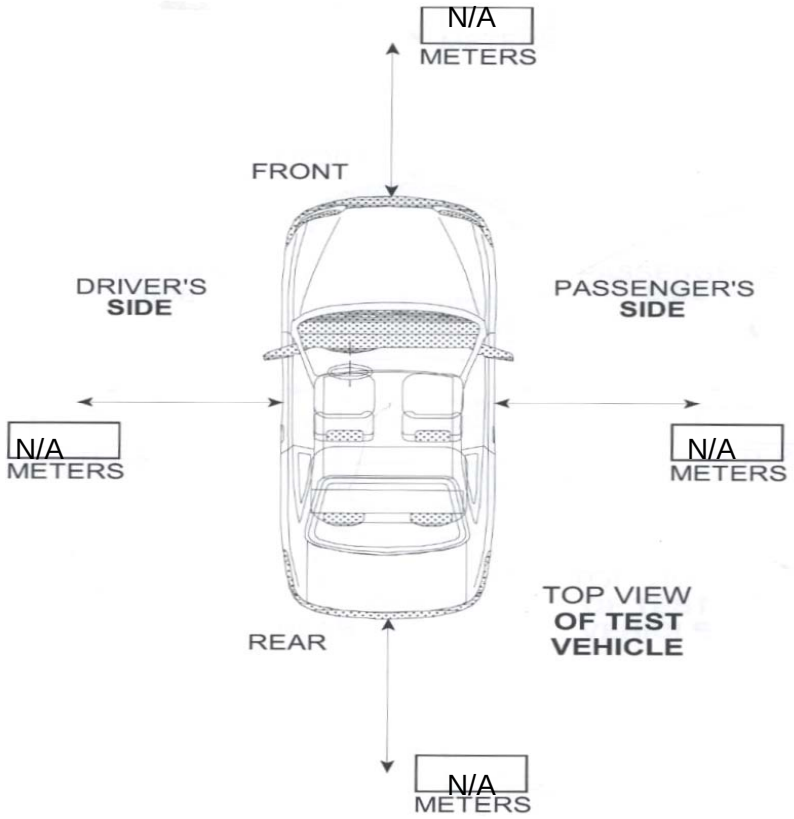
RECORDED BY: **MATTHEW S. HUBBARD** DATE: **05/27/10 - 05/28/10**

APPROVED BY: **MICHAEL L. DUNLAP** DATE: **07/06/10**

DATA SHEET NO. 5
MAXIMUM OPERATING RANGE FOR LINE-OF-SIGHT REMOTE

TEST VEHICLE INFORMATION			
YEAR	**2010**	MAKE	**Chevrolet**
MODEL	**Camaro**	BODY STYLE	**2-Door Coupe**
NHTSA NO.	**CA0106**	VIN	**2G1FA1EV1A9178422**
TEST DATE:	**05/27/10 - 05/28/10**		

If range of operation exceeds 11 meters in any of the below measured directions, the window, partition, and roof panel must meet the reversing requirements of FMVSS 118. Continuous activation of remote device is required to close windows, partition and roof panel YES ( ) NO (X).



REMARKS: The vehicle is not equipped with a remote actuation device that allows the windows to be opened.

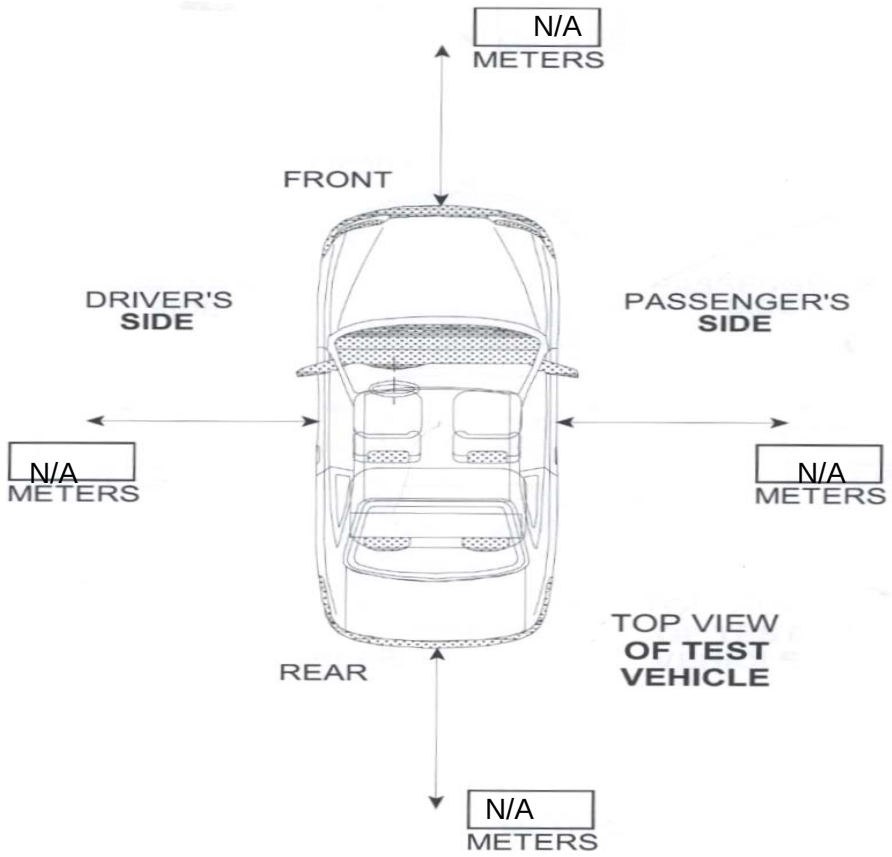
RECORDED BY: **MATTHEW S. HUBBARD** DATE: **05/27/10 - 05/28/10**

APPROVED BY: **MICHAEL L. DUNLAP** DATE: **07/06/10**

DATA SHEET NO. 6
MAXIMUM OPERATING RANGE FOR NON-LINE-OF-SIGHT REMOTE

TEST VEHICLE INFORMATION			
YEAR	**2010**	MAKE	**Chevrolet**
MODEL	**Camaro**	BODY STYLE	**2-Door Coupe**
NHTSA NO.	**CA0106**	VIN	**2G1FA1EV1A9178422**
TEST DATE:	**05/27/10 - 05/28/10**		

If range of operation exceeds 6 meters in any of the below measured directions, the window, partition, and roof panel must meet the reversing requirements of FMVSS 118. Continuous activation of remote device is required to close windows, partition and roof panel YES ( ) NO (X).



REMARKS: The vehicle is not equipped with a remote actuation device that allows the windows to be opened.

RECORDED BY: **MATTHEW S. HUBBARD** DATE: **05/27/10 - 05/28/10**

APPROVED BY: **MICHAEL L. DUNLAP** DATE: **07/06/10**

DATA SHEET NO. 7
AUTO REVERSAL

TEST VEHICLE INFORMATION			
YEAR	**2010**	MAKE	**Chevrolet**
MODEL	**Camaro**	BODY STYLE	**2-Door Coupe**
NHTSA NO.	**CA0106**	VIN	**2G1FA1EV1A9178422**
TEST DATE:	**05/27/10 - 05/28/10**		

IDENTIFY WINDOW, PARTITION AND ROOF PANEL POSITIONS WHICH ARE EQUIPPED WITH AUTO REVERSAL.

Is vehicle equipped with Auto Reversal	YES	X	NO	N/A

SWITCHES EQUIPPED WITH AUTO REVERSAL	MASTER	INDIVIDUAL
LEFT FRONT (LF)	X	X
RIGHT FRONT (RF)	X	X
LEFT REAR (LR)	N/A	N/A
RIGHT REAR (RR)	N/A	N/A
PARTITION (P)	N/A	N/A
ROOF PANEL (RP)	N/A	N/A
TAIL GATE (TG)	N/A	N/A

REMARKS: The master switch is the same as the individual switch for the left front window. The vehicle passed as soon as ignition key “off” was performed. All windows and sunroof are equipped with one touch auto express feature. The reversal feature is not required because the window appears to meet the operational requirements of FMVSS 118 paragraph S.4.

RECORDED BY: **MATTHEW S. HUBBARD** DATE: **05/27/10 - 05/28/10**

APPROVED BY: **MICHAEL L. DUNLAP** DATE: **07/06/10**

DATA SHEET NO. 8
AUTO REVERSAL

TEST VEHICLE INFORMATION			
YEAR	**2010**	MAKE	**Chevrolet**
MODEL	**Camaro**	BODY STYLE	**2-Door Coupe**
NHTSA NO.	**CA0106**	VIN	**2G1FA1EV1A9178422**
TEST DATE:	**05/27/10 - 05/28/10**		

Distance window is open from top seam to start position. 235

WPRP OBSTRUCTION FORCE REVERSAL

LEADING EDGE LEFT FRONT WINDOW	FORCE TO REVERSE (NEWTONS)	DISTANCE WINDOW, PARTITION, OR ROOF PANEL OPENED ON REVERSAL (mm)
5mm semi rigid rod	43.9	151.5
25mm semi rigid rod	73.6	151.2
50mm semi rigid rod	59.7	149.4
100mm semi rigid rod	112.6	153.3
200mm semi rigid rod	160.6	65.9

Distance window is open from top seam to start position. 235

WPRP OBSTRUCTION FORCE REVERSAL

REAR EDGE LEFT FRONT WINDOW	FORCE TO REVERSE (NEWTONS)	DISTANCE WINDOW, PARTITION, OR ROOF PANEL OPENED ON REVERSAL (mm)
5mm semi rigid rod	31.8	149.8
25mm semi rigid rod	67.7	149.7
50mm semi rigid rod	77.5	147.0
100mm semi rigid rod	115.2	152.6
200mm semi rigid rod	173.3	84.8

REMARKS: The master switch is the same as the individual switch for the left front window. The vehicle passed as soon as ignition key “off” was performed. The reversal feature is not required because the window appears to meet the operational requirements of FMVSS 118 paragraph S.4.

RECORDED BY: **MATTHEW S. HUBBARD** DATE: **05/27/10 - 05/28/10**

APPROVED BY: **MICHAEL L. DUNLAP** DATE: **07/06/10**

DATA SHEET NO. 8 (Continued)
AUTO REVERSAL

TEST VEHICLE INFORMATION			
YEAR	**2010**	MAKE	**Chevrolet**
MODEL	**Camaro**	BODY STYLE	**2-Door Coupe**
NHTSA NO.	**CA0106**	VIN	**2G1FA1EV1A9178422**
TEST DATE:	**05/27/10 - 05/28/10**		

Distance window is open from top seam to start position. 235

WPRP OBSTRUCTION FORCE REVERSAL

LEADING EDGE RIGHT FRONT WINDOW	FORCE TO REVERSE (NEWTONS)	DISTANCE WINDOW, PARTITION, OR ROOF PANEL OPENED ON REVERSAL (mm)
5mm semi rigid rod	36.4	153.7
25mm semi rigid rod	64.3	157.8
50mm semi rigid rod	54.6	153.4
100mm semi rigid rod	78.4	152.7
200mm semi rigid rod	176.4	71.9

Distance window is open from top seam to start position. 235

WPRP OBSTRUCTION FORCE REVERSAL

REAR EDGE RIGHT FRONT WINDOW	FORCE TO REVERSE (NEWTONS)	DISTANCE WINDOW, PARTITION, OR ROOF PANEL OPENED ON REVERSAL (mm)
5mm semi rigid rod	39.9	150.8
25mm semi rigid rod	61.3	156.9
50mm semi rigid rod	66.9	145.2
100mm semi rigid rod	116.0	150.8
200mm semi rigid rod	204.3	82.4

REMARKS: The master switch is the same as the individual switch for the left front window. The vehicle passed as soon as ignition key “off” was performed. The reversal feature is not required because the window appears to meet the operational requirements of FMVSS 118 paragraph S.4.

RECORDED BY: **MATTHEW S. HUBBARD** DATE: **05/27/10 - 05/28/10**

APPROVED BY: **MICHAEL L. DUNLAP** DATE: **07/06/10**

DATA SHEET NO. 9
SPHERE TEST

TEST VEHICLE INFORMATION			
YEAR	**2010**	MAKE	**Chevrolet**
MODEL	**Camaro**	BODY STYLE	**2-Door Coupe**
NHTSA NO.	**CA0106**	VIN	**2G1FA1EV1A9178422**
TEST DATE:	**05/27/10 - 05/28/10**		

SPHERE TEST CONDUCTED ON MASTER SWITCH CONTROL PANEL

WINDOW	FORCE APPLIED TO ACTIVATE SWITCH (NEWTONS)	SWITCH ACTIVATED (YES / NO)	PASS / FAIL
LEFT FRONT (LF)	172.3	NO	PASS
RIGHT FRONT (RF)	155.5	NO	PASS
LEFT REAR (LR)	N/A	N/A	N/A
RIGHT REAR (RR)	N/A	N/A	N/A
PARTITION (P)	N/A	N/A	N/A
ROOF PANEL (RP)	N/A	N/A	N/A
TAIL GATE (TG)	N/A	N/A	N/A

SPHERE TEST CONDUCTED ON INDIVIDUAL SWITCH

WINDOW	FORCE APPLIED TO ACTIVATE SWITCH (NEWTONS)	SWITCH ACTIVATED (YES / NO)	PASS / FAIL
LEFT FRONT (LF)	172.3	NO	PASS
RIGHT FRONT (RF)	141.5	NO	PASS
LEFT REAR (LR)	N/A	N/A	N/A
RIGHT REAR (RR)	N/A	N/A	N/A
PARTITION (P)	N/A	N/A	N/A
ROOF PANEL (RP)	N/A	N/A	N/A
TAIL GATE (TG)	N/A	N/A	N/A

REMARKS: The master switch is the same as the individual switch for the left front window.

RECORDED BY: **MATTHEW S. HUBBARD** DATE: **05/27/10 - 05/28/10**

APPROVED BY: **MICHAEL L. DUNLAP** DATE: **07/06/10**

SECTION 4

PHOTOGRAPHS

Figure 1: Frontal ¾ View From Right Side of Vehicle

2010 Chevrolet Camaro
NHTSA NO. CA0106
FMVSS NO. 118

Figure 2: Rear ¾ View From Left Side of Vehicle

Figure 3: Vehicle Certification Label

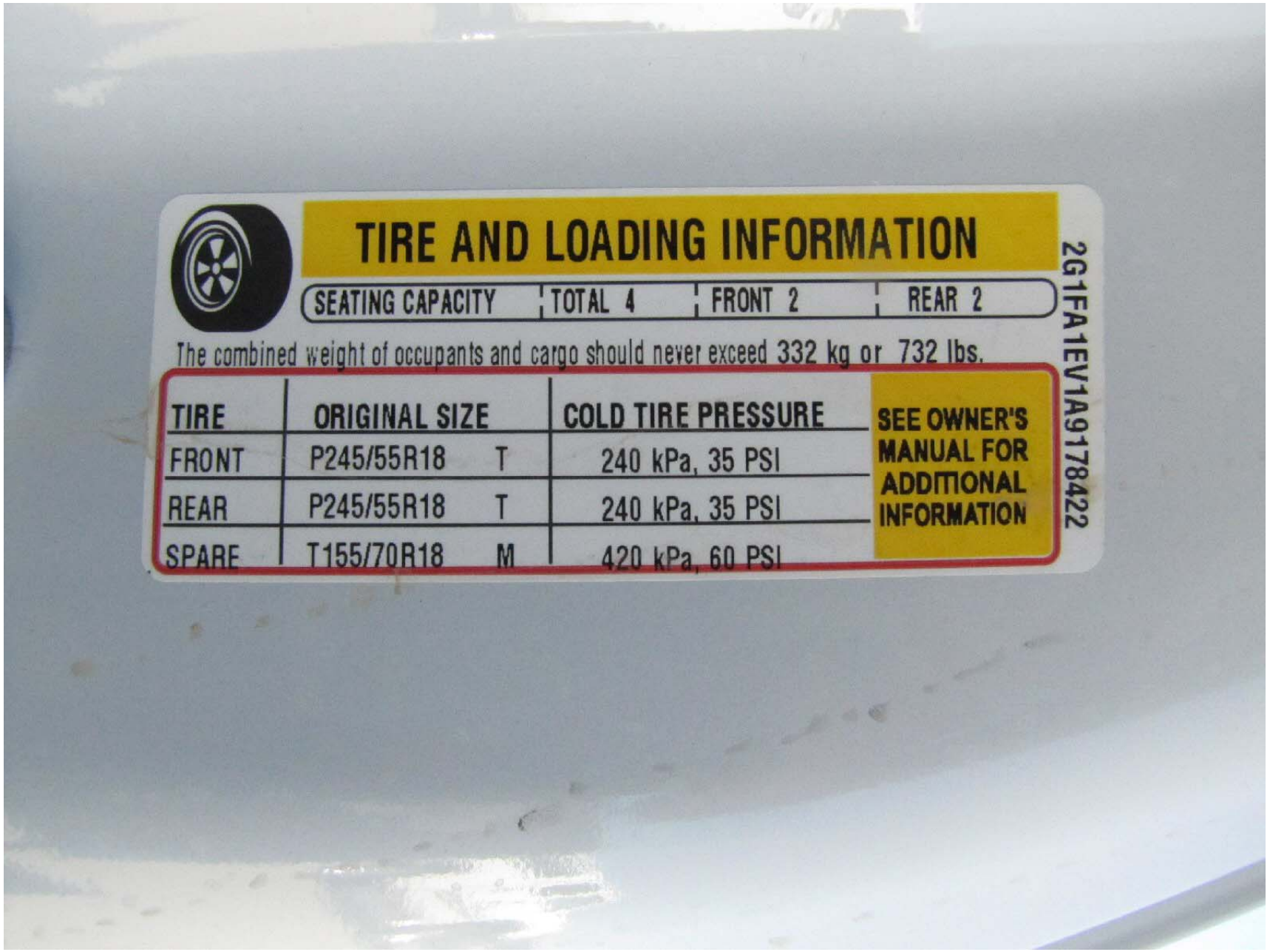


Figure 4: Tire Information Placard

Figure 5: Ignition Switch

2010 Chevrolet Camaro
NHTSA NO. CA0106
FMVSS NO. 118

Figure 6: Left Front Master Power Window Switch

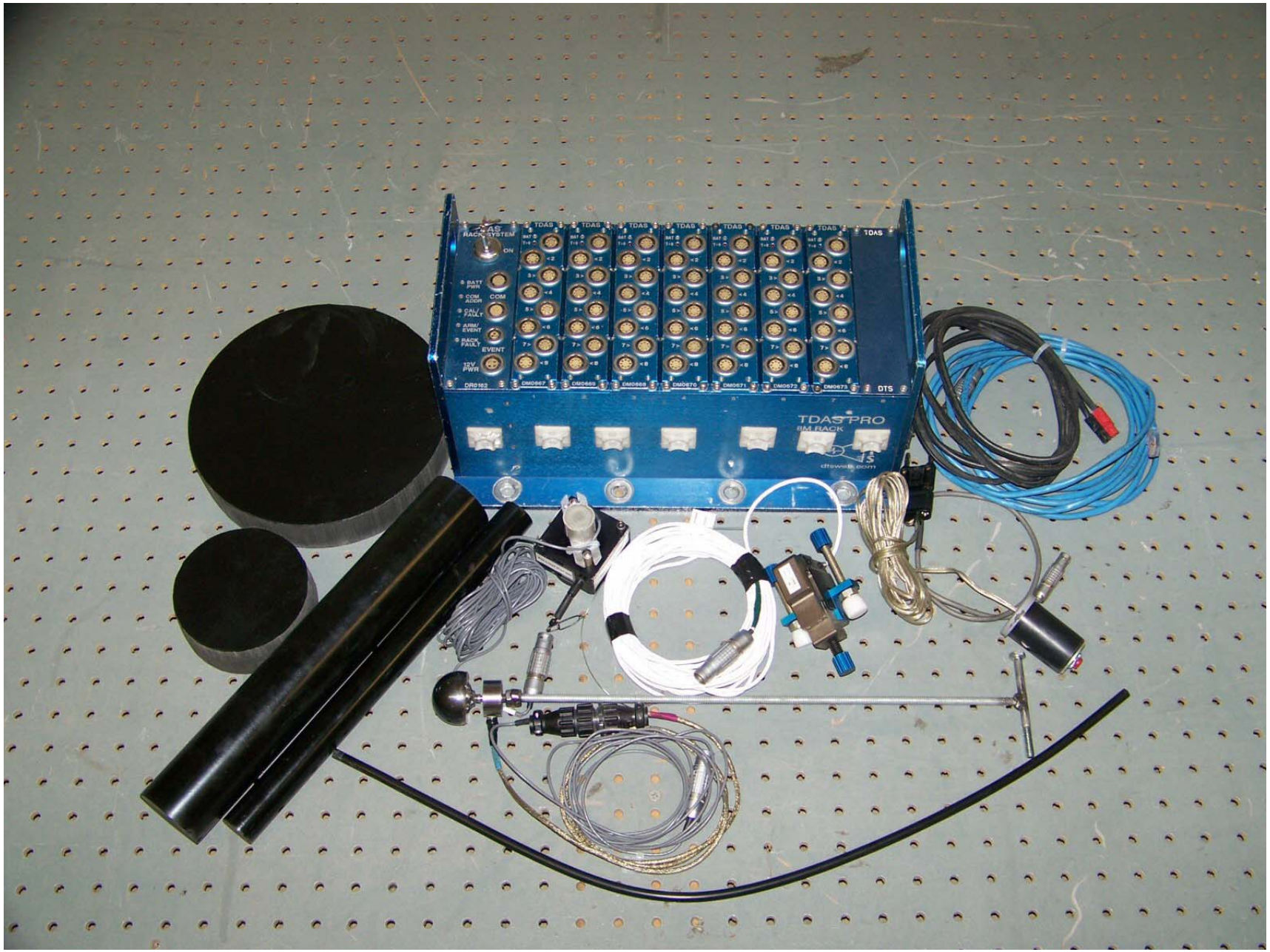
Figure 7: Right Front Power Window Switch

2010 Chevrolet Camaro
NHTSA NO. CA0106
FMVSS NO. 118

Figure 8: Exterior Locking System (Driver Door)

Figure 9: Exterior Locking System (Key)

Figure 10: Overall Test Set-Up



2010 Chevrolet Camaro
NHTSA NO. CA0106
FMVSS NO. 118

Figure 11: Instrumentation

2010 Chevrolet Camaro
NHTSA NO. CA0106
FMVSS NO. 118

Figure 12: Left Front Window

Figure 13: Left Front Window Test Set-Up Leading Edge

Figure 14: Left Front Window Test Set-Up Rear Edge

2010 Chevrolet Camaro
NHTSA NO. CA0106
FMVSS NO. 118

Figure 15: Right Front Window

2010 Chevrolet Camaro
NHTSA NO. CA0106
FMVSS NO. 118

Figure 16: Right Front Window Test Set-Up Leading Edge

Figure 17: Right Front Window Test Set-Up Rear Edge

2010 Chevrolet Camaro
NHTSA NO. CA0106
FMVSS NO. 118

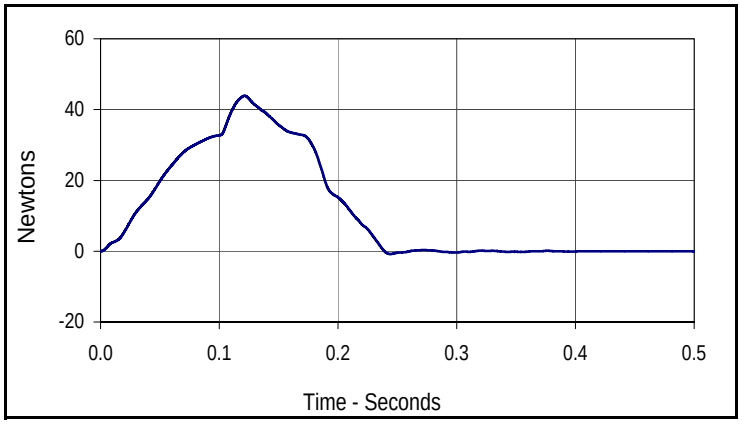
Figure 18: Sphere Test Master Control Panel

Figure 19: Sphere Test Right Front Window Switch

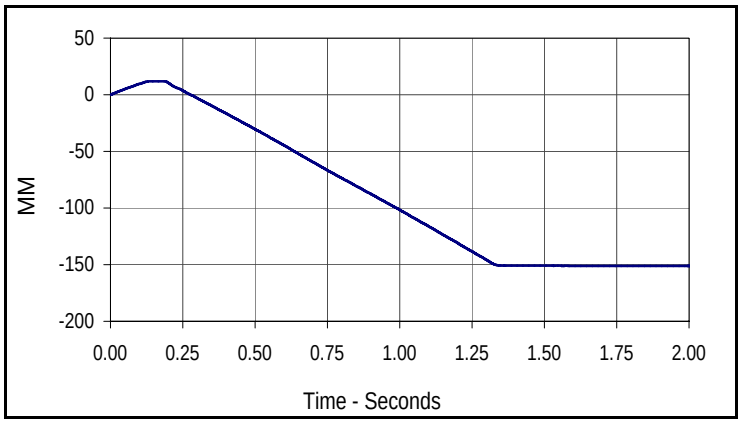
2010 Chevrolet Camaro
NHTSA NO. CA0106
FMVSS NO. 118

SECTION 5

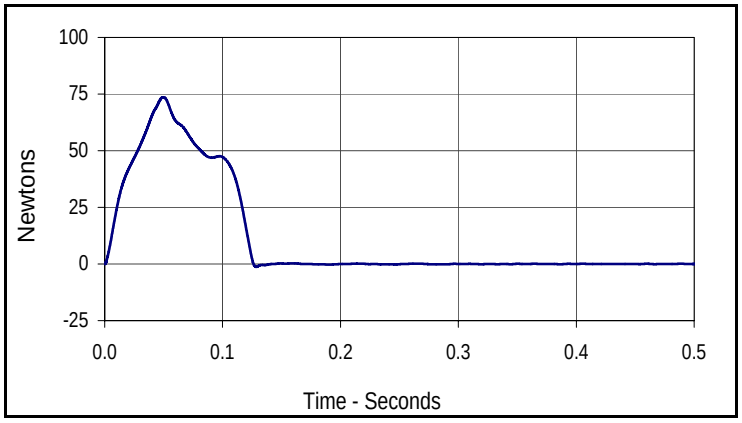
DATA PLOTS



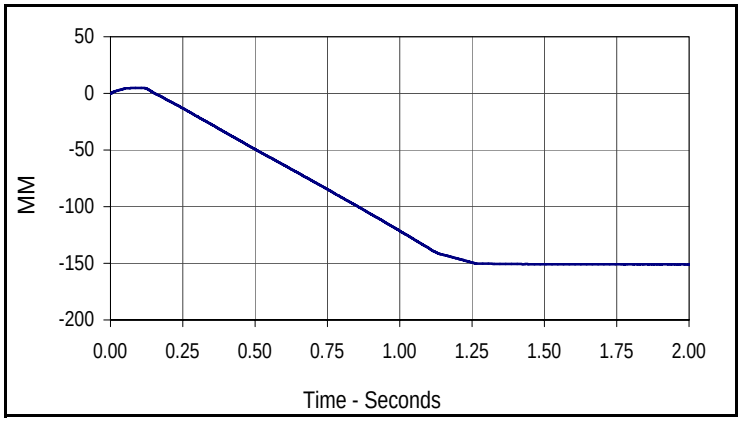
Curve Description			
Left Front Window			
Window Force 5MM Leading Edge			
CURNO	Type	SAE Class	Units
001	FIL	60	Newtons
Max	Time	Min	Time
43.9	0.1	-0.8	0.2



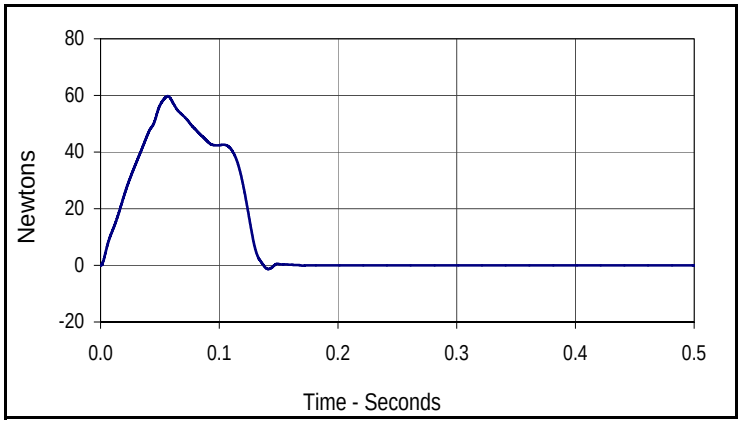
Curve Description			
Left Front Window			
Window Travel 5MM Leading Edge			
CURNO	Type	SAE Class	Units
002	FIL	60	MM
Max	Time	Min	Time
11.9	0.2	-151.5	2.9



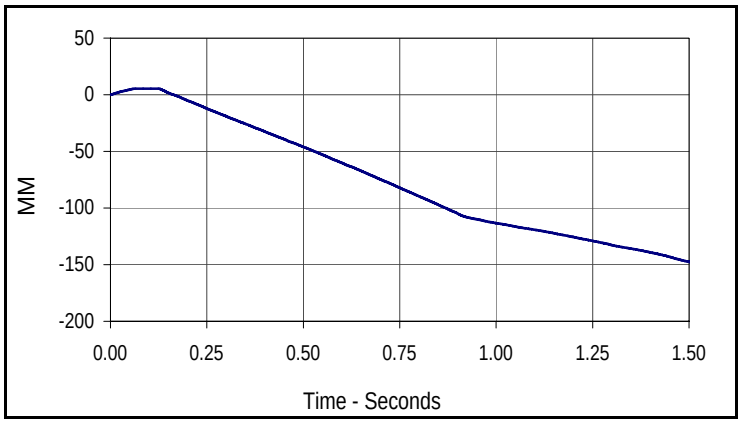
Curve Description			
Left Front Window			
Window Force 25MM Leading Edge			
CURNO	Type	SAE Class	Units
003	FIL	60	Newtons
Max	Time	Min	Time
73.6	0.0	-1.3	0.1



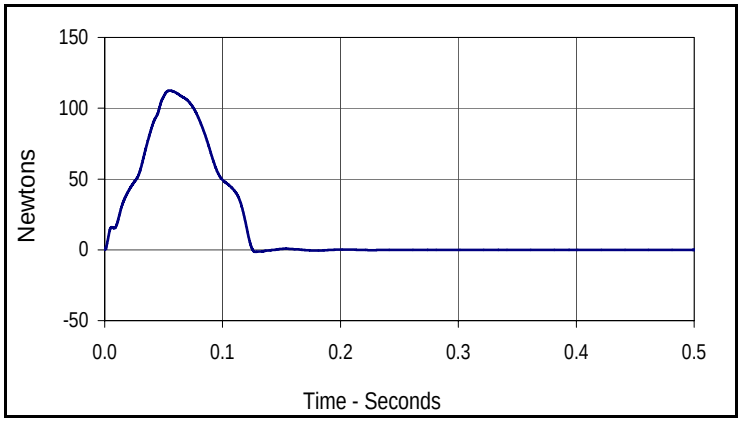
Curve Description			
Left Front Window			
Window Travel 25MM Leading Edge			
CURNO	Type	SAE Class	Units
004	FIL	60	MM
Max	Time	Min	Time
4.8	0.1	-151.2	3.0



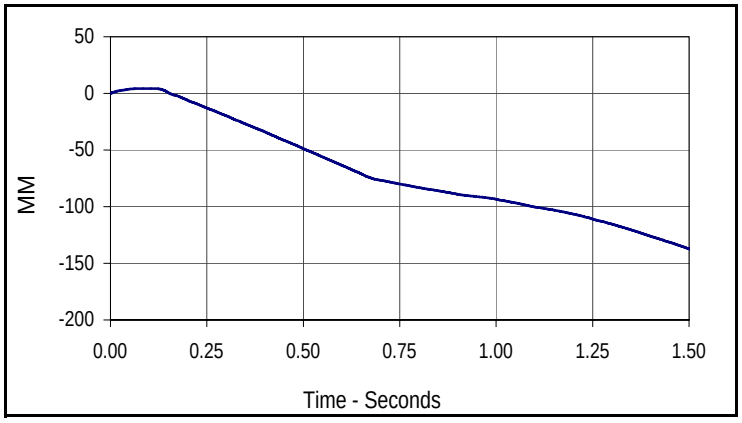
Curve Description			
Left Front Window			
Window Force 50MM Leading Edge			
CURNO	Type	SAE Class	Units
005	FIL	60	Newtons
Max	Time	Min	Time
59.7	0.1	-1.3	0.1



Curve Description			
Left Front Window			
Window Travel 50MM Leading Edge			
CURNO	Type	SAE Class	Units
006	FIL	60	MM
Max	Time	Min	Time
5.5	0.1	-149.4	3.0

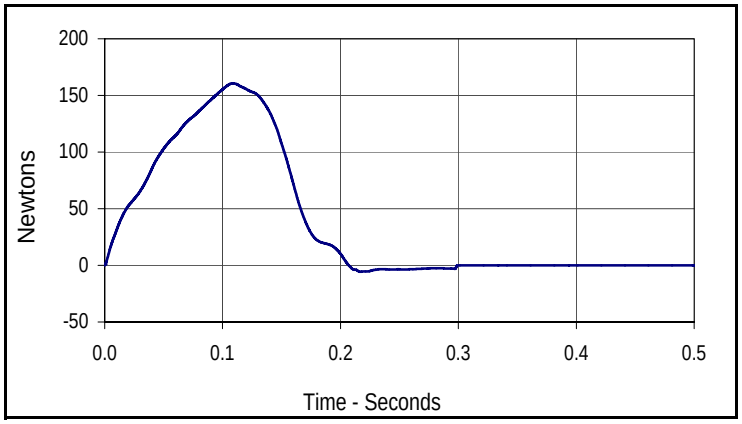


Curve Description			
Left Front Window			
Window Force 100MM Leading Edge			
CURNO	Type	SAE Class	Units
007	FIL	60	Newtons
Max	Time	Min	Time
112.6	0.1	-1.5	0.1

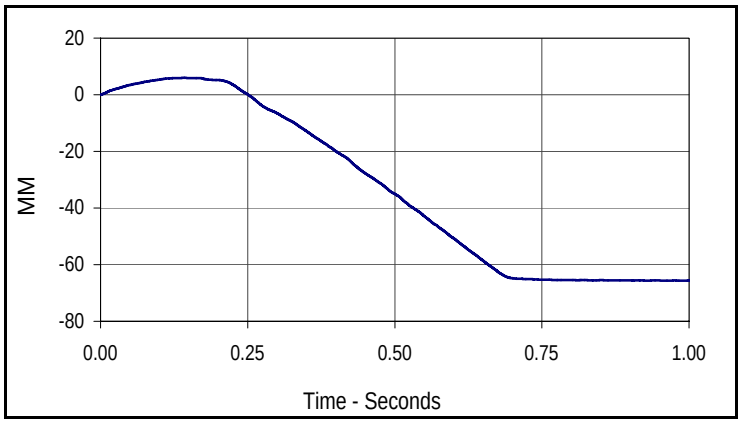


Curve Description			
Left Front Window			
Window Travel 100MM Leading Edge			
CURNO	Type	SAE Class	Units
008	FIL	60	MM
Max	Time	Min	Time
4.2	0.1	-153.3	3.0

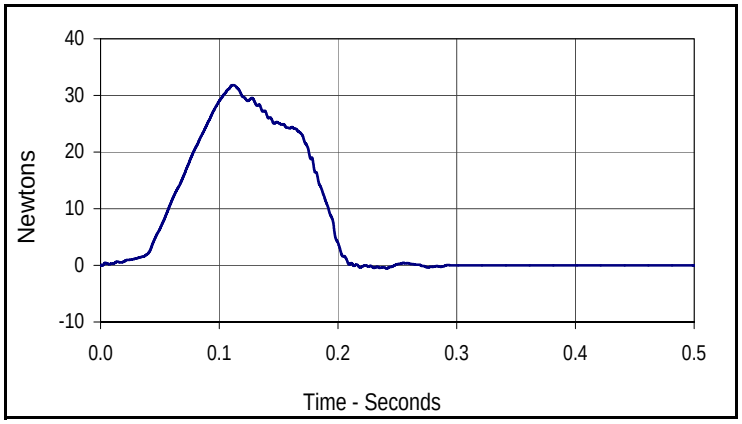
Test Vehicle:	2010 Chevrolet Camaro 2-Door Coupe	Test Date:	5/26/10 - 5/28/10
Test Program:	FMVSS 118	NHTSA No.:	CA0106



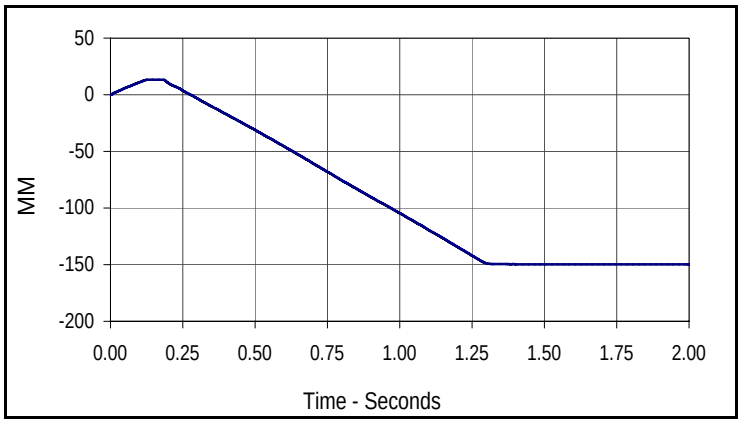
Curve Description			
Left Front Window			
Window Force 200MM Leading Edge			
CURNO	Type	SAE Class	Units
009	FIL	60	Newtons
Max	Time	Min	Time
160.6	0.1	-5.7	0.2



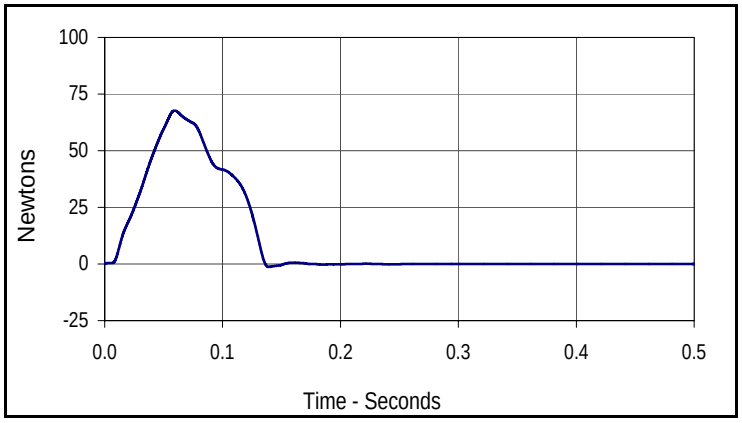
Curve Description			
Left Front Window			
Window Travel 200MM Leading Edge			
CURNO	Type	SAE Class	Units
010	FIL	60	MM
Max	Time	Min	Time
6.0	0.1	-65.9	1.8



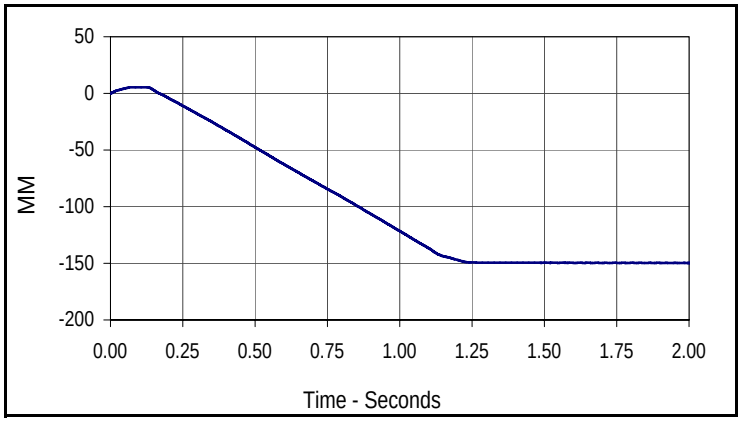
Curve Description			
Left Front Window			
Window Force 5MM Rear Edge			
CURNO	Type	SAE Class	Units
011	FIL	60	Newtons
Max	Time	Min	Time
31.8	0.1	-0.6	0.2



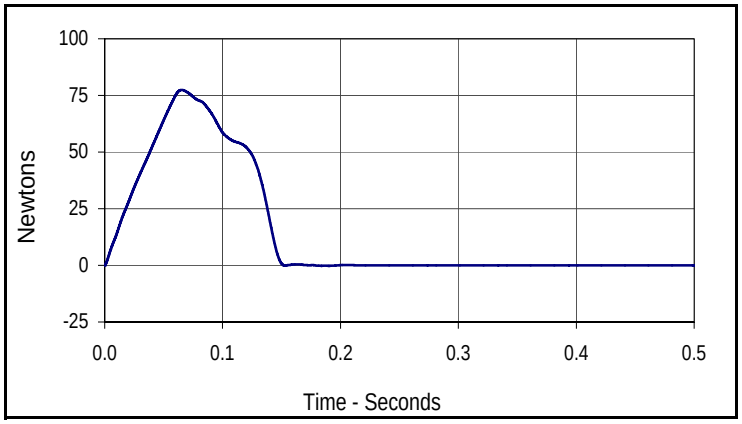
Curve Description			
Left Front Window			
Window Travel 5MM Rear Edge			
CURNO	Type	SAE Class	Units
012	FIL	60	MM
Max	Time	Min	Time
13.3	0.2	-149.8	2.6



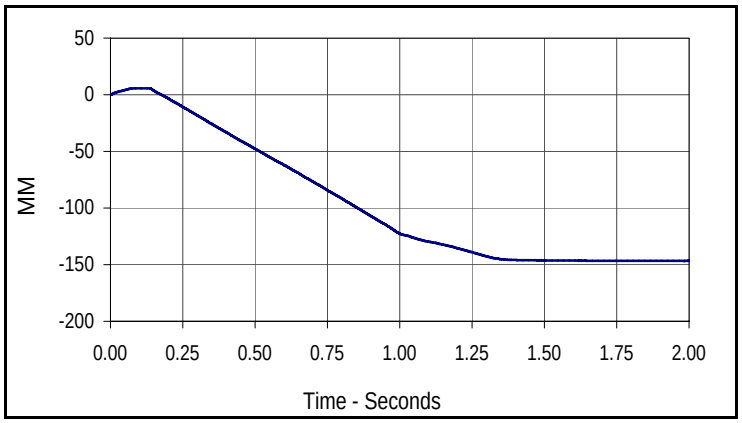
Curve Description			
Left Front Window			
Window Force 25MM Rear Edge			
CURNO	Type	SAE Class	Units
013	FIL	60	Newtons
Max	Time	Min	Time
67.7	0.1	-1.3	0.1



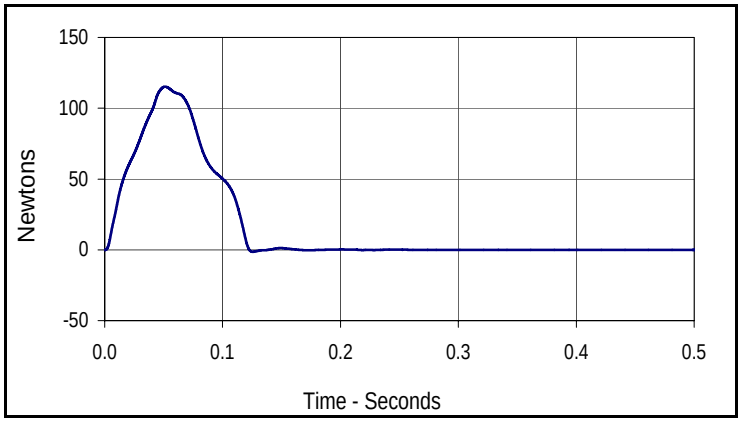
Curve Description			
Left Front Window			
Window Travel 25MM Rear Edge			
CURNO	Type	SAE Class	Units
014	FIL	60	MM
Max	Time	Min	Time
5.4	0.1	-149.7	3.0



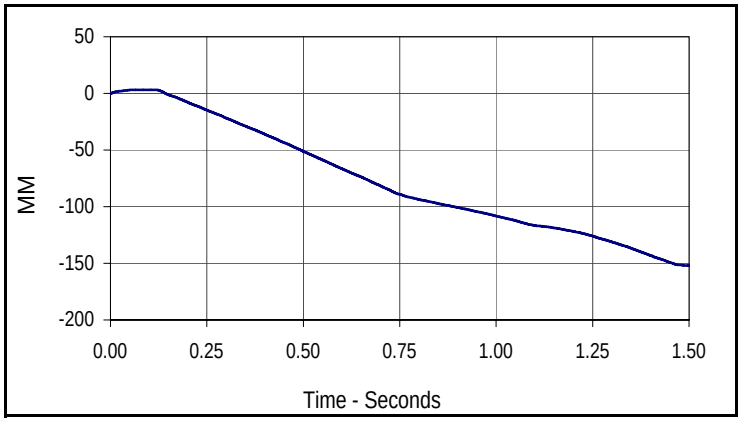
Curve Description			
Left Front Window			
Window Force 50MM Rear Edge			
CURNO	Type	SAE Class	Units
015	FIL	60	Newtons
Max	Time	Min	Time
77.5	0.1	-0.2	0.2



Curve Description			
Left Front Window			
Window Travel 50MM Rear Edge			
CURNO	Type	SAE Class	Units
016	FIL	60	MM
Max	Time	Min	Time
5.6	0.1	-147.0	3.0

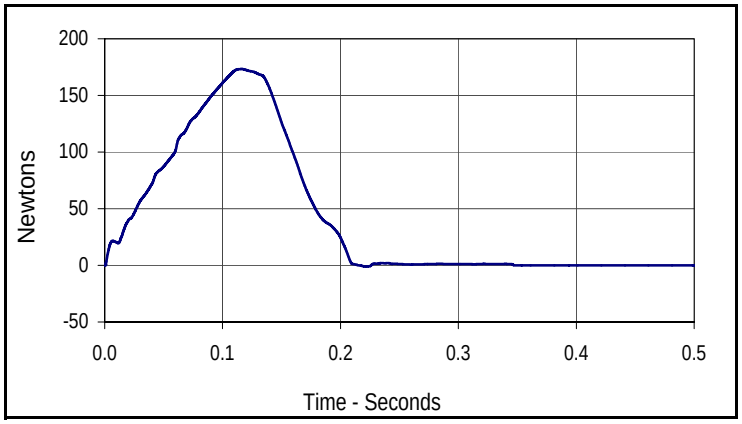


Curve Description			
Left Front Window			
Window Force 100MM Rear Edge			
CURNO	Type	SAE Class	Units
017	FIL	60	Newtons
Max	Time	Min	Time
115.2	0.1	-1.4	0.1

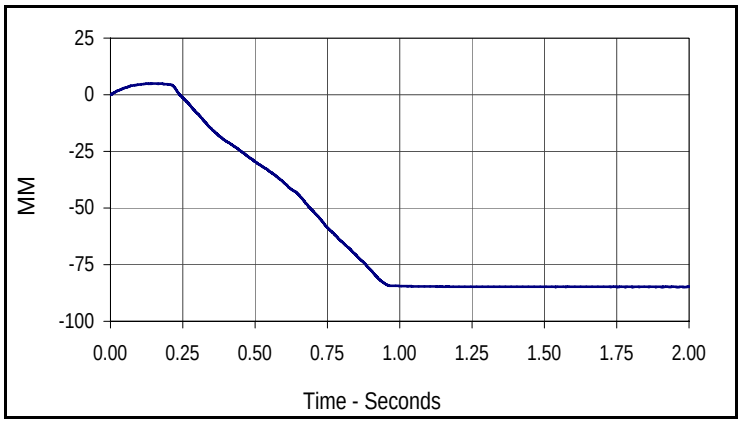


Curve Description			
Left Front Window			
Window Travel 100MM Rear Edge			
CURNO	Type	SAE Class	Units
018	FIL	60	MM
Max	Time	Min	Time
3.2	0.1	-152.6	2.9

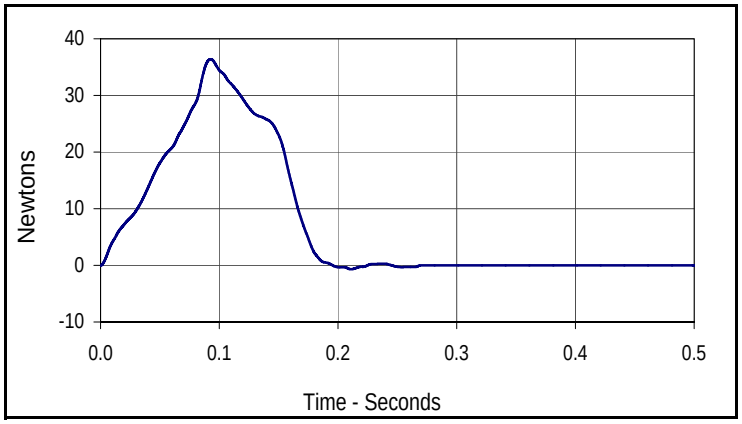
Test Vehicle:	2010 Chevrolet Camaro 2-Door Coupe	Test Date:	5/26/10 - 5/28/10
Test Program:	FMVSS 118	NHTSA No.:	CA0106



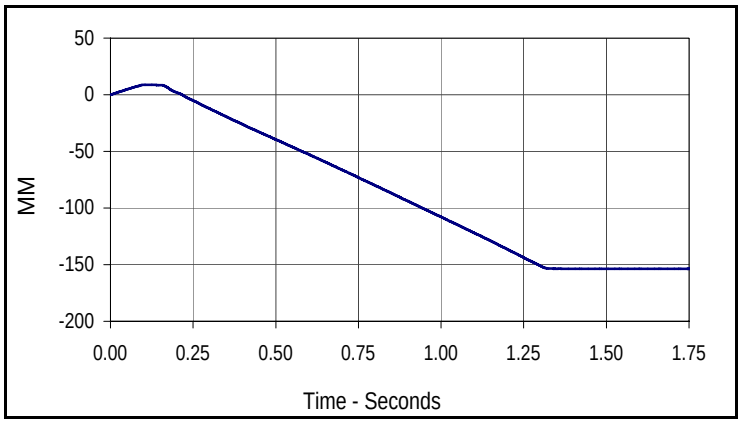
Curve Description			
Left Front Window			
Window Force 200MM Rear Edge			
CURNO	Type	SAE Class	Units
019	FIL	60	Newtons
Max	Time	Min	Time
173.3	0.1	-1.0	0.2



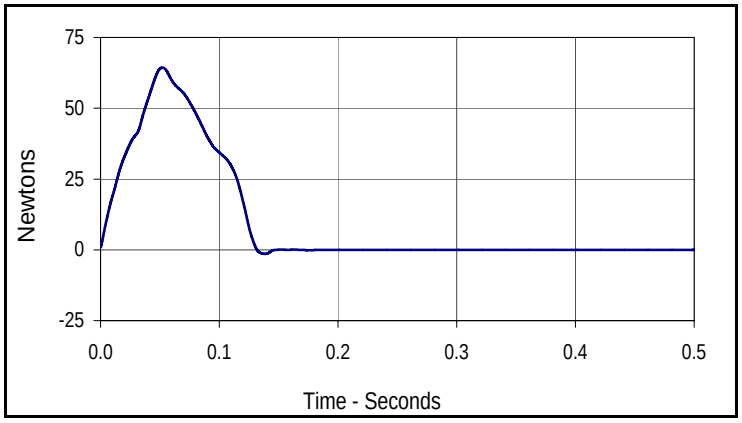
Curve Description			
Left Front Window			
Window Travel 200MM Rear Edge			
CURNO	Type	SAE Class	Units
020	FIL	60	MM
Max	Time	Min	Time
4.9	0.2	-84.8	2.0



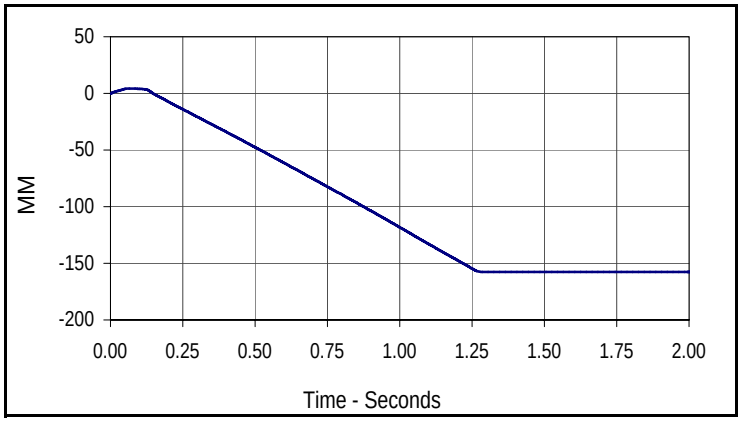
Curve Description			
Right Front Window			
Window Force 5MM Leading Edge			
CURNO	Type	SAE Class	Units
021	FIL	60	Newtons
Max	Time	Min	Time
36.4	0.1	-0.7	0.2



Curve Description			
Right Front Window			
Window Travel 5MM Leading Edge			
CURNO	Type	SAE Class	Units
022	FIL	60	MM
Max	Time	Min	Time
8.7	0.1	-153.7	3.0

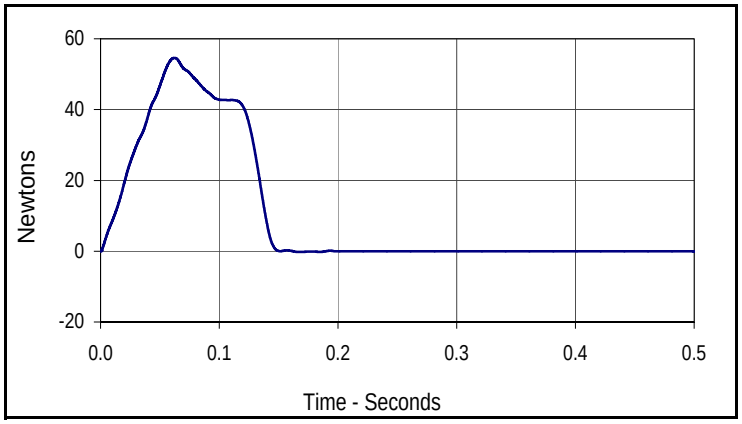


Curve Description			
Right Front Window			
Window Force 25MM Leading Edge			
CURNO	Type	SAE Class	Units
023	FIL	60	Newtons
Max	Time	Min	Time
64.3	0.1	-1.4	0.1

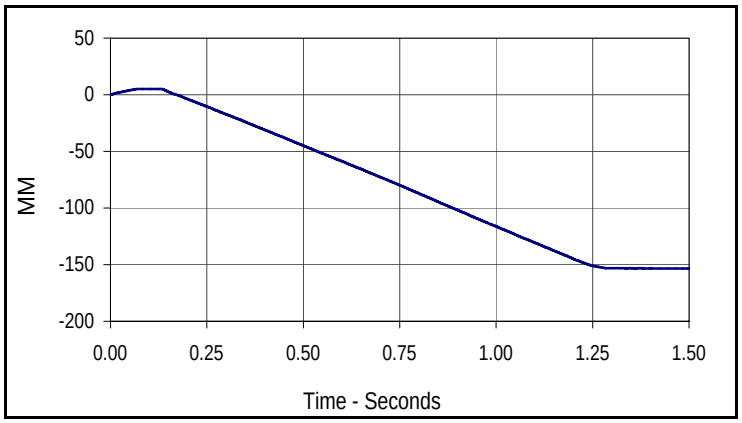


Curve Description			
Right Front Window			
Window Travel 25MM Leading Edge			
CURNO	Type	SAE Class	Units
024	FIL	60	MM
Max	Time	Min	Time
4.3	0.1	-157.8	2.4

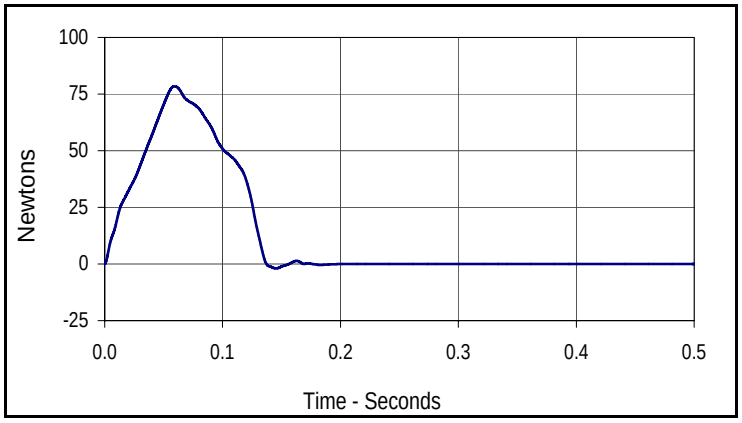
Test Vehicle:	2010 Chevrolet Camaro 2-Door Coupe	Test Date:	5/26/10 - 5/28/10
Test Program:	FMVSS 118	NHTSA No.:	CA0106



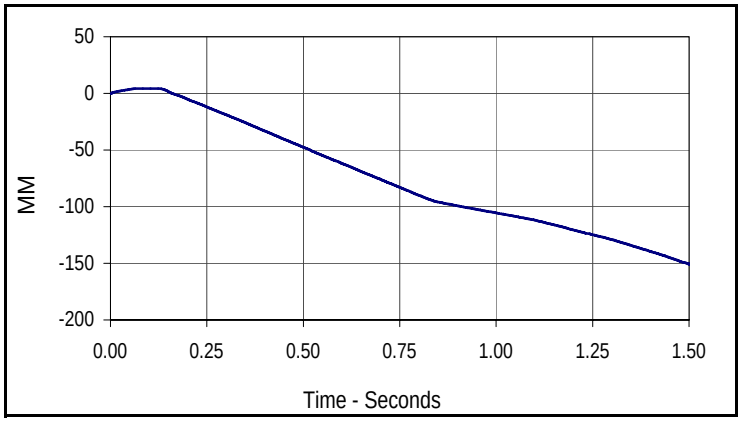
Curve Description			
Right Front Window			
Window Force 50MM Leading Edge			
CURNO	Type	SAE Class	Units
025	FIL	60	Newtons
Max	Time	Min	Time
54.6	0.1	-0.2	0.2



Curve Description			
Right Front Window			
Window Travel 50MM Leading Edge			
CURNO	Type	SAE Class	Units
026	FIL	60	MM
Max	Time	Min	Time
5.1	0.1	-153.4	2.7

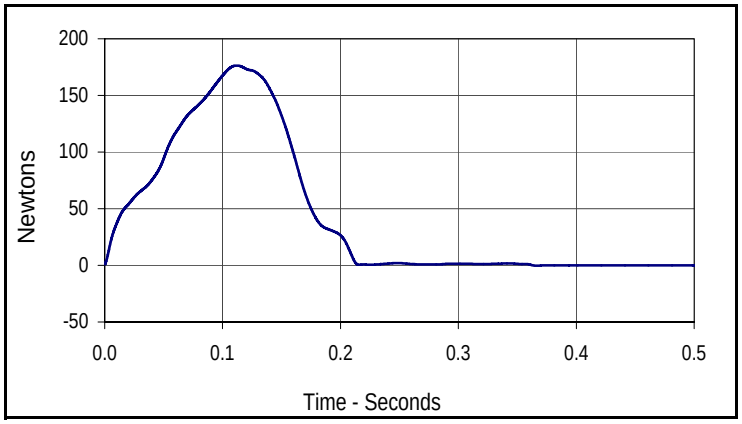


Curve Description			
Right Front Window			
Window Force 100MM Leading Edge			
CURNO	Type	SAE Class	Units
027	FIL	60	Newtons
Max	Time	Min	Time
78.4	0.1	-1.9	0.1

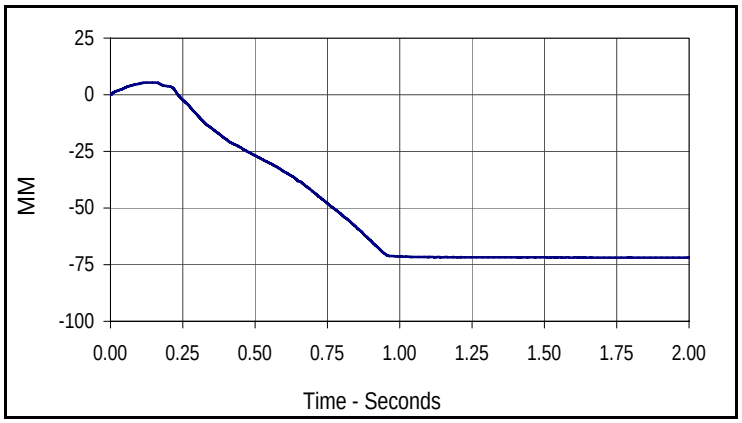


Curve Description			
Right Front Window			
Window Travel 100MM Leading Edge			
CURNO	Type	SAE Class	Units
028	FIL	60	MM
Max	Time	Min	Time
4.3	0.1	-152.7	2.9

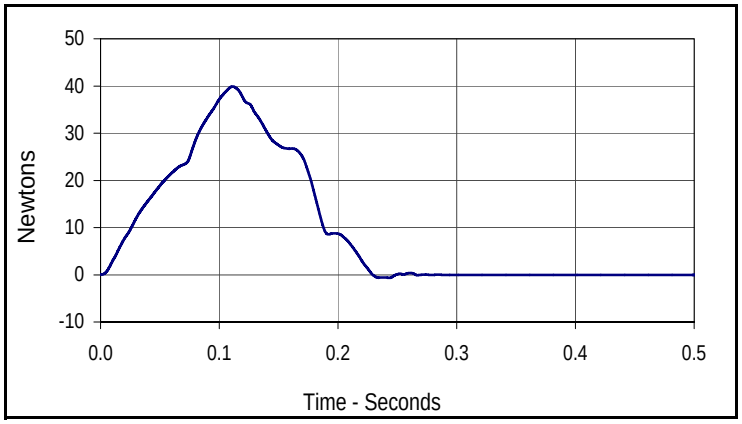
Test Vehicle:	2010 Chevrolet Camaro 2-Door Coupe	Test Date:	5/26/10 - 5/28/10
Test Program:	FMVSS 118	NHTSA No.:	CA0106



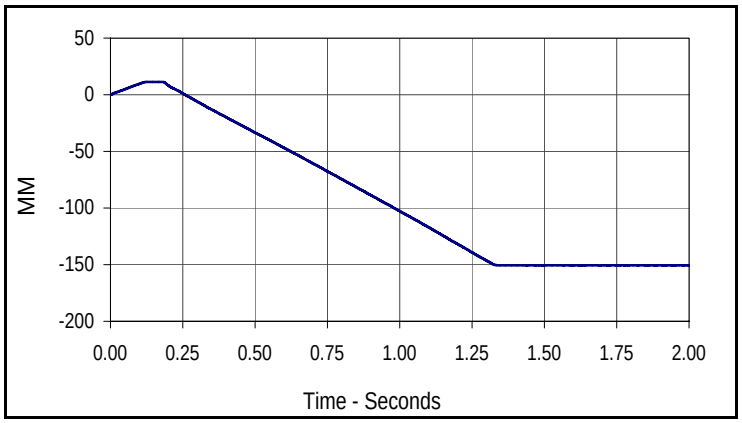
Curve Description			
Right Front Window			
Window Force 200MM Leading Edge			
CURNO	Type	SAE Class	Units
029	FIL	60	Newtons
Max	Time	Min	Time
176.4	0.1	-0.3	0.4



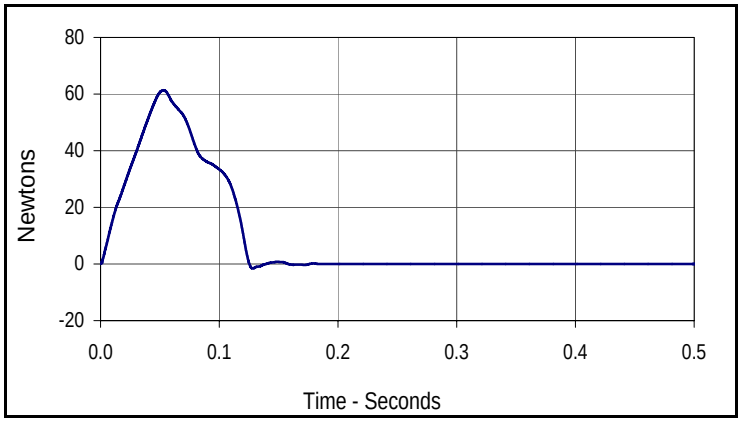
Curve Description			
Right Front Window			
Window Travel 200MM Leading Edge			
CURNO	Type	SAE Class	Units
030	FIL	60	MM
Max	Time	Min	Time
5.4	0.1	-71.9	2.0



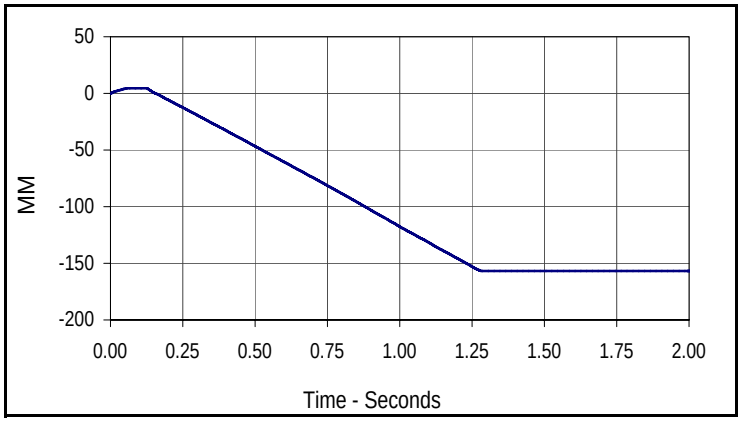
Curve Description			
Right Front Window			
Window Force 5MM Rear Edge			
CURNO	Type	SAE Class	Units
031	FIL	60	Newtons
Max	Time	Min	Time
39.9	0.1	-0.7	0.2



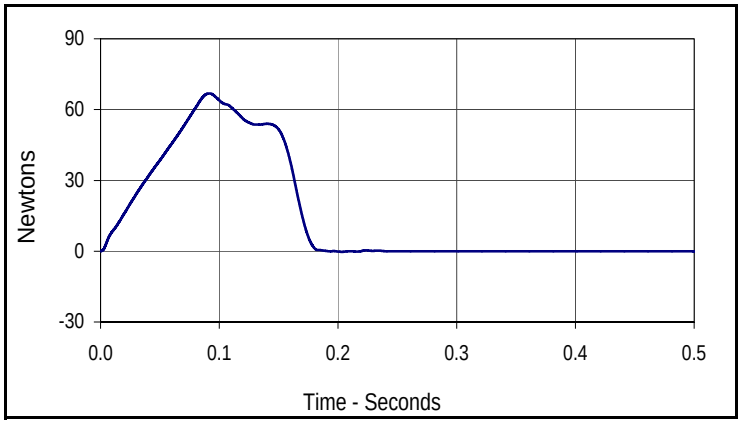
Curve Description			
Right Front Window			
Window Travel 5MM Rear Edge			
CURNO	Type	SAE Class	Units
032	FIL	60	MM
Max	Time	Min	Time
11.4	0.2	-150.8	2.0



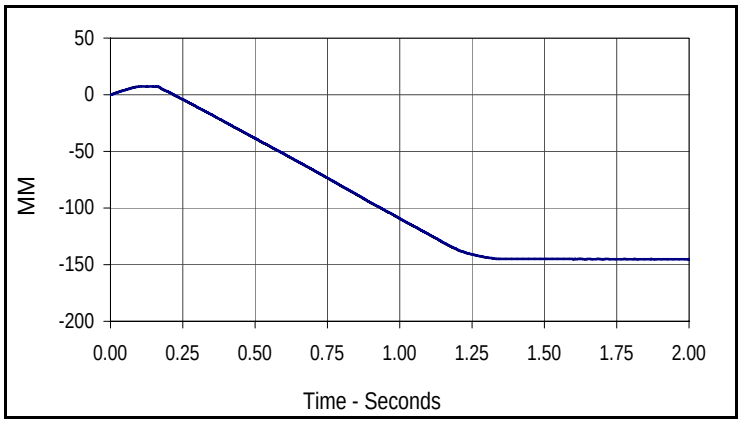
Curve Description			
Right Front Window			
Window Force 25MM Rear Edge			
CURNO	Type	SAE Class	Units
033	FIL	60	Newtons
Max	Time	Min	Time
61.3	0.1	-1.6	0.1



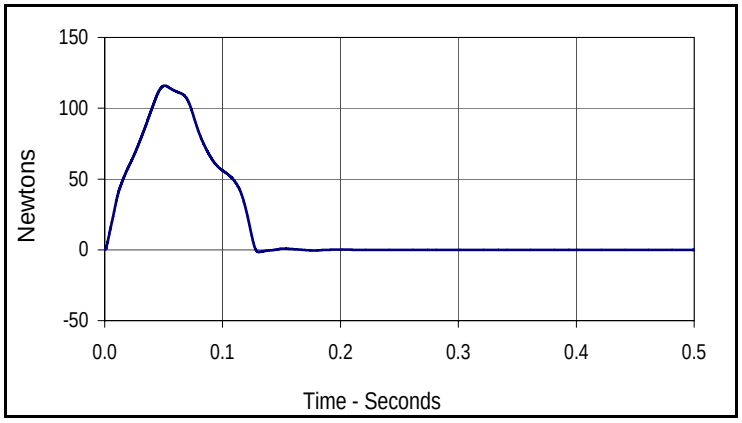
Curve Description			
Right Front Window			
Window Travel 25MM Rear Edge			
CURNO	Type	SAE Class	Units
034	FIL	60	MM
Max	Time	Min	Time
4.6	0.1	-156.9	2.7



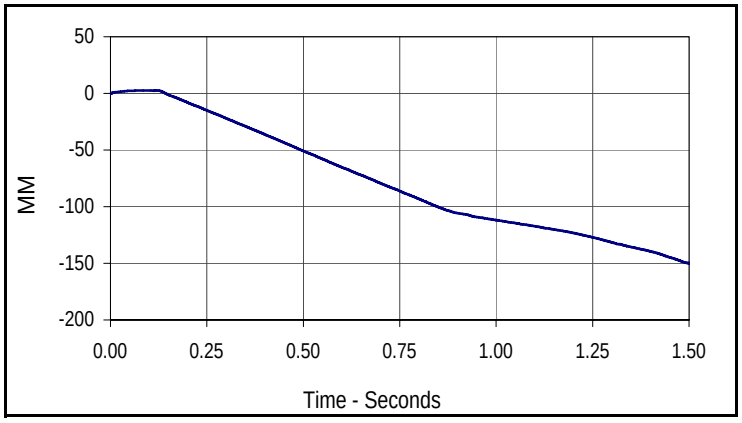
Curve Description			
Right Front Window			
Window Force 50MM Rear Edge			
CURNO	Type	SAE Class	Units
035	FIL	60	Newtons
Max	Time	Min	Time
66.9	0.1	-0.3	0.2



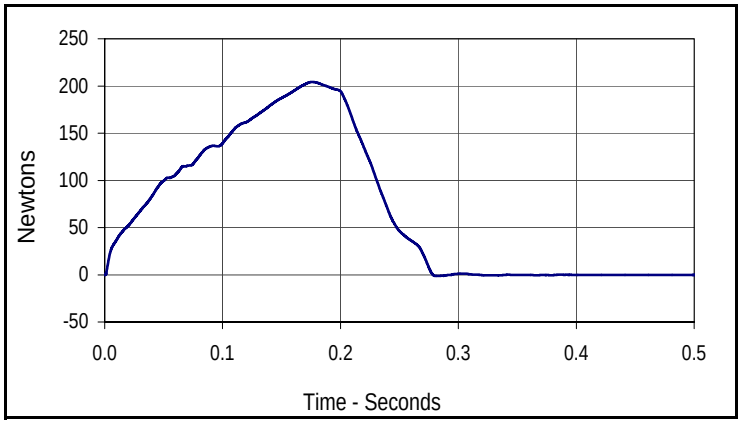
Curve Description			
Right Front Window			
Window Travel 50MM Rear Edge			
CURNO	Type	SAE Class	Units
036	FIL	60	MM
Max	Time	Min	Time
7.3	0.1	-145.2	2.6



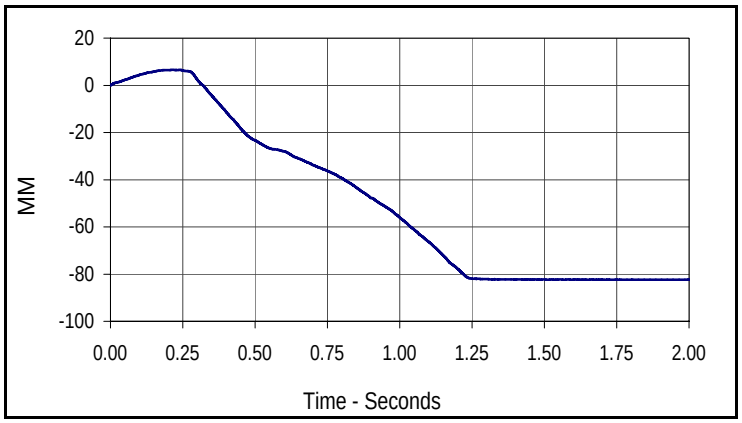
Curve Description			
Right Front Window			
Window Force 100MM Rear Edge			
CURNO	Type	SAE Class	Units
037	FIL	60	Newtons
Max	Time	Min	Time
116.0	0.1	-1.5	0.1



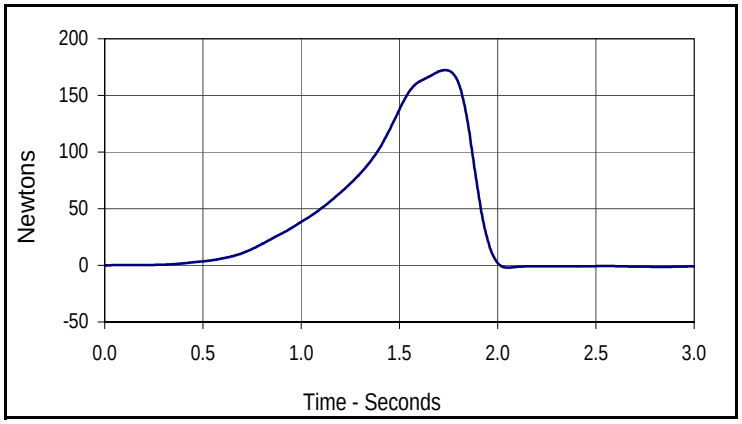
Curve Description			
Right Front Window			
Window Travel 100MM Rear Edge			
CURNO	Type	SAE Class	Units
038	FIL	60	MM
Max	Time	Min	Time
2.5	0.1	-150.8	3.0



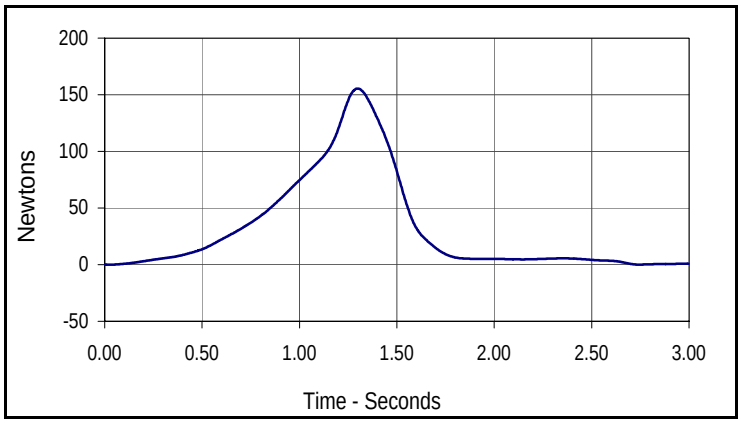
Curve Description			
Right Front Window			
Window Force 200MM Rear Edge			
CURNO	Type	SAE Class	Units
039	FIL	60	Newtons
Max	Time	Min	Time
204.3	0.2	-1.3	0.3



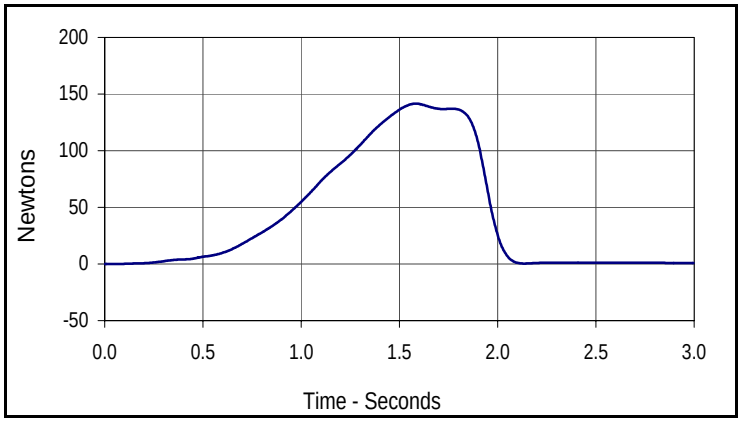
Curve Description			
Right Front Window			
Window Travel 200MM Leading Edge			
CURNO	Type	SAE Class	Units
040	FIL	60	MM
Max	Time	Min	Time
6.5	0.2	-82.4	1.9



Curve Description			
Master Switch Test			
Master Switch Left Front Window			
CURNO	Type	SAE Class	Units
041	FIL	60	Newtons
Max	Time	Min	Time
172.3	1.7	-2.0	2.1



Curve Description			
Master Switch Test			
Master Switch Right Front Window			
CURNO	Type	SAE Class	Units
042	FIL	60	Newtons
Max	Time	Min	Time
155.5	1.3	0.0	0.0



Curve Description			
Individual Switch Test			
Individual Switch Right Front Window			
CURNO	Type	SAE Class	Units
043	FIL	60	Newtons
Max	Time	Min	Time
141.5	1.6	0.0	0.0

FMVSS 118

Test Equipment List and Calibration Information

5/26/10 - 5/28/10

2010 Chevrolet Camaro 2-Door Coupe

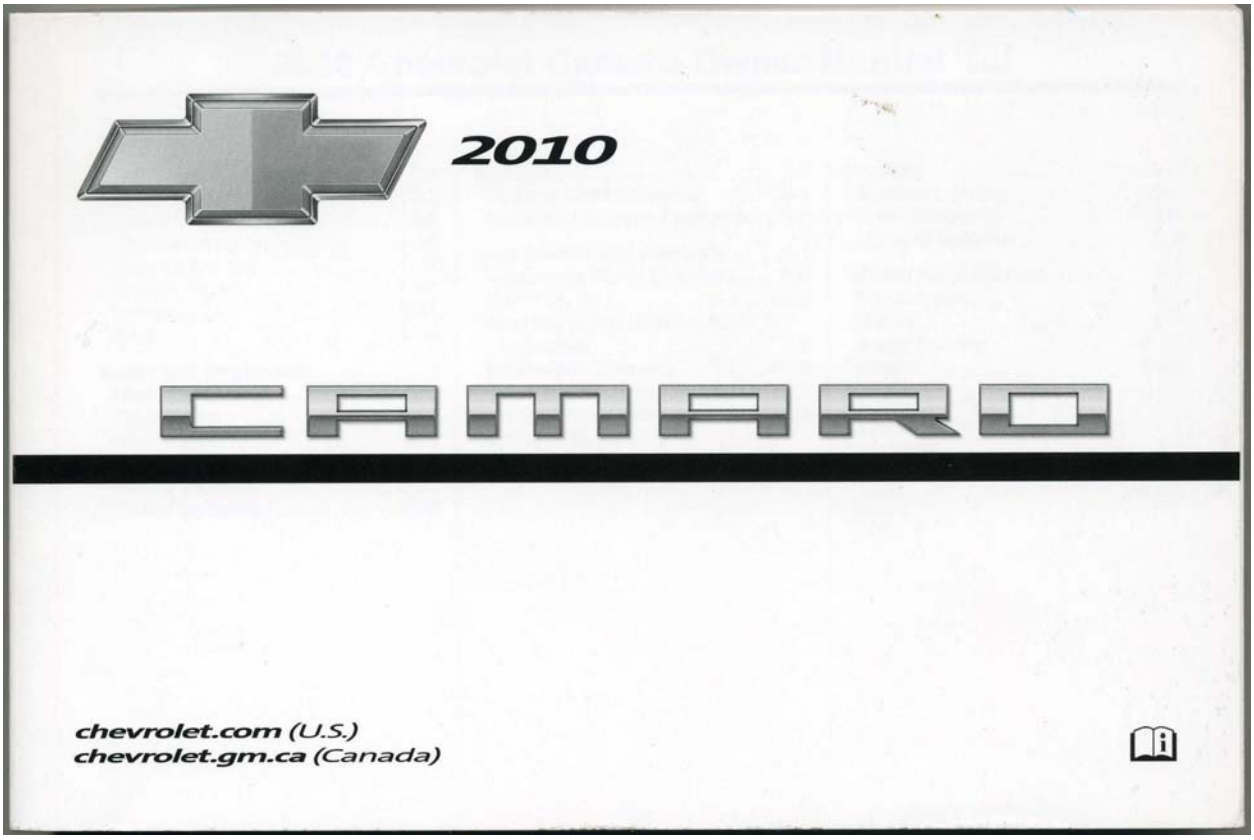
Description	Manufacturer	Model No.	Serial No.	Limit	Accuracy	Cal. Date	Due Cal.
DAS	DTS	TDAS Pro	DM0429	N/A	SAE J211	03/08/10	03/08/11
Laptop Computer	Toshiba	Satellite	LAP02	N/A	N/A	N/A	N/A
Load Cell	Denton	2409	85	445 Newtons	± 1.0%	03/22/10	03/22/11
Displacement Xdcr.	Celesco	PTX101-0030	J0654653	76 CM	± 1.0%	Each Use	
Load Cell	Lebow	261134	K118	300 Newtons	± 1.0%	05/25/10	05/25/11

SECTION 6

COPY OF OWNER'S MANUAL INSTRUCTION FOR USE OF POWER WINDOWS

COPY OF OWNER'S MANUAL INSTRUCTIONS FOR USE OF POWER WINDOWS

TEST VEHICLE INFORMATION			
YEAR	**2010**	MAKE	**Chevrolet**
MODEL	**Camaro**	BODY STYLE	**2-Door Coupe**
NHTSA NO.	**CA0106**	VIN	**2G1FA1EV1A9178422**
TEST DATE:	**05/27/10 - 05/28/10**		



COPY OF OWNER'S MANUAL INSTRUCTIONS FOR USE OF POWER WINDOWS

TEST VEHICLE INFORMATION			
YEAR	**2010**	MAKE	**Chevrolet**
MODEL	**Camaro**	BODY STYLE	**2-Door Coupe**
NHTSA NO.	**CA0106**	VIN	**2G1FA1EV1A9178422**
TEST DATE:	**05/27/10 - 05/28/10**		

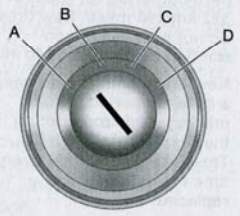
Starting and Operating

New Vehicle Break-In

Notice: **Follow these recommended guidelines during the first 2 414 km/1,500 miles of driving this vehicle. Parts have a break-in period and performance will be better in the long run.**

- **For the first 2 414 km/ 1,500 miles:**
- **Avoid full throttle starts and abrupt stops.**
- **Do not exceed 4,000 engine rpm.**
- **Avoid driving at any one constant speed, fast or slow.**
- **Do not drive above 160 km/h (100 mph).**
- **Avoid downshifting to brake or slow the vehicle when the engine speed will exceed 4000 RPM.**
- **Do not let the engine labor. Never lug the engine in high gear at low speeds. With a manual transmission, shift to the next lower gear. This rule applies at all times, not just during the break-in period.**
- **Do not participate in racing events, sport driving schools, or similar activities during this break-in period.**
- **Check engine oil with every refueling and add if necessary. Oil and fuel consumption may be higher than normal during the first 2 414 km/1,500 miles.**
- **To break in new tires, drive at moderate speeds and avoid hard cornering for the first 322 km/200 miles. New tires do not have maximum traction and may tend to slip.**
- **New brake linings also need a break-in period. Avoid making hard stops during the first 322 km/200 miles. This is recommended every time brake linings are replaced.**
- **Should the vehicle be used for racing or competitive driving (after break-in), the rear axle lubricant must be replaced before hand.**

Ignition Positions



The ignition switch has four different positions.

Notice: **Using a tool to force the key to turn in the ignition could cause damage to the switch or break the key. Use the correct key, make sure it is all the way in, and turn it only with your hand. If the key cannot be turned by hand, see your dealer/retailer.**

To shift out of P (Park), turn the ignition to ON/RUN and apply the brake pedal.

A (LOCK/OFF): This is the only position from which the key can be removed. This locks the steering wheel, ignition and automatic transmission.

On vehicles with an automatic transmission, the shift lever must be in P (Park) to turn the ignition switch to the LOCK/OFF position.

The ignition switch can bind in the LOCK/OFF position with the wheels turned off center. If this happens, move the steering wheel from right to left while turning the key to ACC/ ACCESSORY. If this does not work, then the vehicle needs service.

B (ACC/ACCESSORY) : This position provides power to some of the electrical accessories. It unlocks the steering wheel and ignition. The transmission is also unlocked in this position on automatic transmission vehicles. To move the key from ACC/ACCESSORY to LOCK/OFF, push in the key and then turn it to LOCK/OFF.

C (ON/RUN): The ignition switch stays in this position when the engine is running. This position can be used to operate the electrical accessories, including the ventilation fan and 12 volt power outlet, as well as to display some warning and indicator lights.

The battery could be drained if the key is left in the ACC/ACCESSORY or ON/RUN position with the engine off. The vehicle might not start if the battery is allowed to drain for an extended period of time.

D (START) : This position starts the engine. When the engine starts, release the key. The ignition switch will return to ON/RUN for normal driving.

A warning tone sounds when the driver door is opened if the ignition is still in ACC/ACCESSORY and the key is in the ignition.

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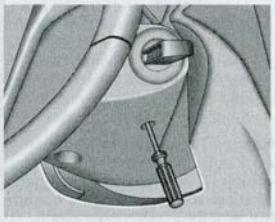
NHTSA NO.	**CA0106**	VIN	**2G1FA1EV1A9178422**
TEST DATE:	**05/27/10 - 05/28/10**		

Key Lock Release



This vehicle is equipped with an electronic key lock release system. The key lock release is designed to prevent ignition key removal unless the shift lever is in P (Park).

The key lock release is always functional except in the case of an uncharged or low voltage (less than 9 volt) battery. If the vehicle has an uncharged battery or a battery with low voltage, try charging or jump starting the battery. See *Jump Starting on page 9-83*.

If charging or jump starting the battery does not work, remove the plug covering the hole below the ignition lock. Insert a screwdriver into the opening as far as it will go and remove the key from the ignition.

Retained Accessory Power (RAP)

These vehicle accessories may be used for up to 10 minutes after the engine is turned off:

- Audio System
- Power Windows

The power windows will continue to work for up to 10 minutes or until any door is opened. The radio will work when the key is in ON/RUN or ACC/ACCESSORY. Once the key is turned from ON/RUN to LOCK/OFF, the radio will continue to work for 10 minutes, or until the driver door is opened or the key is removed from the ignition.

Starting the Engine

Place the transmission in the proper gear.

Automatic Transmission

Move the shift lever to P (Park) or N (Neutral). The engine will not start in any other position. To restart the vehicle when it is already moving, use N (Neutral) only.

Notice: **Do not try to shift to P (Park) if the vehicle is moving. If you do, you could damage the transmission. Shift to P (Park) only when the vehicle is stopped.**

Manual Transmission

The shift lever should be in N (Neutral) and the parking brake engaged. Hold the clutch pedal down to the floor and start the engine. The vehicle will not start if the clutch pedal is not all the way down.

Starting Procedure

1. With your foot off the accelerator pedal, turn the ignition key to START. When the engine starts, let go of the key. The idle speed will go down as the engine warms. Do not race the engine immediately after starting it. Allow the oil to warm up and lubricate all moving parts.

   The vehicle has a Computer-Controlled Cranking System. This feature assists in starting the engine and protects components. If the ignition key is turned to the START position, and then released when the engine begins cranking, the engine will continue cranking for a few seconds or until the vehicle starts. If the engine does not start and the key is held in START for many seconds, cranking stops after 15 seconds to prevent cranking motor damage. To prevent gear damage, this system also prevents cranking if the engine is already running. Engine cranking can be stopped by turning the ignition switch to ACC/ACCESSORY or LOCK/OFF.

   Notice: **Cranking the engine for long periods of time, by returning the key to the START position immediately after cranking has ended, can overheat and damage the cranking motor, and drain the battery. Wait at least 15 seconds between each try, to let the cranking motor cool down.**

2. If the engine does not start after 5-10 seconds, especially in very cold weather (below 0°F or −18°C), it could be flooded with too much gasoline. Push the accelerator pedal all the way to the floor and holding it there as you hold the key in START for a maximum of 15 seconds. Wait at least 15 seconds between each try, to allow the cranking motor to cool. When the engine starts, let go of the key and accelerator. If the vehicle starts briefly but then stops again, repeat the procedure. This clears the extra gasoline from the engine. Do not race the engine immediately after starting it. Operate the engine and transmission gently until the oil warms up and lubricates all moving parts.

Notice: **The engine is designed to work with the electronics in the vehicle. If you add electrical parts or accessories, you could change the way the engine operates. Before adding electrical equipment, check with your dealer/retailer. If you do not, the engine might not perform properly. Any resulting damage would not be covered by the vehicle warranty.**

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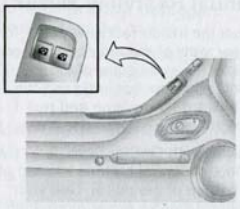
Windows

⚠ WARNING

Leaving children, helpless adults, or pets in a vehicle with the windows closed is dangerous. They can be overcome by the extreme heat and suffer permanent injuries or even death from heat stroke. Never leave a child, a helpless adult, or a pet alone in a vehicle, especially with the windows closed in warm or hot weather.

Power Windows



The power window switches located on the driver door control all windows. The window switches on the passenger door are only for that window. Push the front of the switch down to open the window. Pull the switch up to close it.

The switches work when the ignition is in ON/RUN, ACC/ACCESSORY, or in Retained Accessory Power (RAP). See *Retained Accessory Power (RAP) on page 8-19.*

Window Indexing

This automatically lowers the window a small amount when the door is opened. When the door is closed, the window will raise fully.

If the vehicle loses power or the window freezes, this feature may not work. From outside the vehicle, close the door and push the window inward so that the glass goes under the molding.

If the "Open, Then Close Driver Window" or "Open, Then Close Passenger Window" messages are displayed on the Driver Information Center (DIC), follow the procedure for Programming the Power Windows later in this section. See also *Driver Information Center (DIC) on page 4-28.*

Express Window Operation

The front window switches have an express-up or down feature that lowers or raises the window without holding the switch. Pull the switch up or press it down all the way and release it. Stop the window by pressing or pulling the switch.

Express Window Anti-Pinch Feature

When express-up is active, the window will auto-reverse if there is an obstruction or severe icing. The window returns to normal operation after the obstruction or condition is removed.

⚠ WARNING

If express override is activated, the window will not reverse automatically. You or others could be injured and the window could be damaged. Before you use express override, make sure that all people and obstructions are clear of the window path.

Express Window Anti-Pinch Override

The anti-pinch feature can be overridden by holding the window switch all the way down. The window will lower for as long as the switch is held. Once the switch is released, the express mode is re-activated. In this mode, the window can still close on an object in its path. Use care when using the override mode.

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Programming the Power Windows

If the battery on the vehicle has been recharged, disconnected, or is not working, you will need to reprogram each front power window for the express-up feature to work. Before reprogramming, replace or recharge the vehicle's battery.

To program each front window, follow these steps:

1. With the ignition in ACC/ ACCESSORY, ON/RUN, or when Retained Accessory Power (RAP) is active, close all doors.
2. Press and hold the power window switch until the window is fully open.
3. Pull the power window switch up until the window is fully closed.
4. Continue holding the switch up for approximately two seconds after the window is completely closed.

The window is now reprogrammed. Repeat the process for the other windows.

Sun Visors

Pull the sun visor toward you or move it to the side to reduce glare.

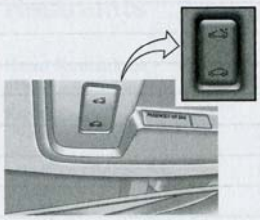
Roof

Sunroof

On vehicles with a sunroof, the switch is located on the overhead console.

The sunroof only operates when the ignition is in ON/RUN, ACC/ ACCESSORY, or if Retained Accessory Power (RAP) is active. See *Retained Accessory Power (RAP) on page 8-19.*

Express Sunroof Operation



The sunroof can be opened without holding the switch down. Push the switch in the open direction until the second pause. The sunroof will fully open.

To stop the sunroof from moving, press either the open or close sunroof switch.

Press and release the back of the switch to open the sunroof to the vent position. Press it again to express-open the sunroof. To stop the sunroof from opening, press the switch again.

A deflector automatically raises when the sunroof is opened and retracts while the sunroof closes.

If the sunshade is closed, it opens automatically when the sunroof opens past the vented position.

Notice: **Forcing the sunshade forward of the sliding glass panel may cause damage and the sunroof may not operate properly. Always close the glass panel before closing the sunshade.**

To close the sunroof, press the front of the switch and hold it until the sunroof is closed. The sunroof will stop if the switch is released. Close the sunshade by hand.

The sunroof glass panel cannot be opened or closed if the vehicle has an electrical failure.