*** * * A T T E N T I O N * * ***

Individual Vehicle dimensions were obtained through the use of the Expert AutoStats(R) program.

The Expert AutoStats(R) program contains a multitude of vehicle dimensions and specifications on over 45,000 different vehicles and 203 different manufacturers spanning more than 70 years.

While every attempt has been made to ensure accurate data, these dimensions are meant to be used as first approximations. Some measurements are dependant on such factors as tire and rim sizes, tire inflation pressure and wear, suspension system condition, bumper type and style, and other manufacturing variations from vehicle to vehicle.

Whenever feasible, the vehicle in question or an exemplar vehicle should be measured to verify data important to your case.

Individual Vehicle Data Search Service (R)

Provided by:
4N6XPRT SYSTEMS (R)
Forensic Expert Software
La Mesa, CA 91942

(619) 464-3478 / (800) 266-9778 / FAX: (619) 464-2206

Through the use of

E X P E R T A U T O S T A T S (R)

DEVELOPED BY:
Daniel W. Vomhof III & Daniel W. Vomhof, Ph.D.

VEHICLE DATA RESEARCH BY:
Sheryl Cozby, Marion Vomhof, Muriel Vomhof, & Cindy Christensen

Expert VIN DeCoder®

Version Number 3.4.0.2

DeCoded VIN: 1G1ND52F55M228271

Model:	2005 Chevrolet Malibu Classic 4 Door Sedan
Engine Size:	2.2L / 134cu.in.
Engine Description:	Inline 4 With Dual Overhead Camshaft
Horse Power:	145 @ 5600 rpm
Torque:	150 lb-ft at 4000 rpm
Injection System:	Sequential Fuel Injection (SFI)
PSI:	55-65 psi
Ignition:	Electronic
Manufacturer:	Saturn
Assembly Plant:	Lansing (A), MI
Drive Wheels:	This is a Front Wheel Drive vehicle w/ Manual Seatbelts + Driver & Passenger Air Bags

The First through Third characters (1G1) indicate a Chevrolet Car made in the U.S.A.

The Fourth through Fifth characters (ND) indicate a Malibu Classic

The Sixth character (5) indicates a 4 Door Sedan

The Seventh character (2) indicates Manual Seatbelts + Driver & Passenger Air Bags

The Eighth character (F) indicates the OEM engine: 2.2L / 134cu.in., L4 DOHC

The Ninth character (the check digit) is entered as 5.
The VIN appears Valid, the calculated value is 5.

The Tenth character (5) indicates the model year 2005

The Eleventh character (M) indicates the vehicle was made in the assembly plant in Lansing (A), MI

The Twelfth through Seventeenth characters (228271) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.5.1.0

PROVIDED BY:

4N6XPRT Systems

8387 University Avenue

La Mesa CA 91941

9/4/2015

2005 CHEVROLET MALIBU 4 DOOR SEDAN

Curb Weight:		3262	lbs.	1480	kg.
Curb Weight Distribution -	Front:	62	% Rear:	38	%
Gross Vehicle Weight Rating:		4267	lbs.	1935	kg.
Number of Tires on Vehicle:		4			
Drive Wheels:		FRONT			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	188	15.67	4.78
Wheelbase:	106	8.83	2.69
Front Bumper to Front Axle:	39	3.25	0.99
Front Bumper to Front of Front Well:	24	2.00	0.61
Front Bumper to Front of Hood:	6	0.50	0.15
Front Bumper to Base of Windshield:	49	4.08	1.24
Front Bumper to Top of Windshield:	79	6.58	2.01
Rear Bumper to Rear Axle:	43	3.58	1.09
Rear Bumper to Rear of Rear Well:	28	2.33	0.71
Rear Bumper to Rear of Trunk:	6	0.50	0.15
Rear Bumper to Base of Rear Window:	25	2.08	0.64
Width Dimensions			
Maximum Width:	70	5.83	1.78
Front Track:	60	5.00	1.52
Rear Track:	59	4.92	1.50
Vertical Dimensions			
Height:	58	4.83	1.47
Ground to -			
Front Bumper (Top)	21	1.75	0.53
Headlight - center	29	2.42	0.74
Hood - top front:	30	2.50	0.76
Base of Windshield	38	3.17	0.97
Rear Bumper - top:	25	2.08	0.64
Trunk - top rear:	42	3.50	1.07
Base of Rear Window:	43	3.58	1.09

2005 CHEVROLET MALIBU 4 DOOR SEDAN

Interior Dimensions

	Inches	Feet	Meters
Front Seat Shoulder Width	57	4.75	1.45
Front Seat to Headliner	40	3.33	1.02
Front Leg Room - seatback to floor (max)	42	3.50	1.07
Rear Seat Shoulder Width	56	4.67	1.42
Rear Seat to Headliner	38	3.17	0.97
Front Leg Room - seatback to floor (min)	39	3.25	0.99

Seatbelts: 3pt - front and rear

Airbags: FRONT SEAT AIRBAGS

Steering Data

Turning Circle (Diameter)	456	38.00	11.58
Steering Ratio: 15.90:1			
Wheel Radius:	12	1.00	0.30
Tire Size (OEM): P205/65R15			

Acceleration & Braking Information

Brake Type: ALL DISC

ABS System: ALL WHEEL ABS - OPTIONAL

Braking, 60 mph to 0 (Hard pedal, no skid, dry pavement):

d = 139.0 ft t = 3.2 sec a = -27.8 ft/sec² G-force = -0.86

Acceleration:

0 to 30mph	t =	2.7	sec	a =	16.3	ft/sec²	G-force = 0.51
0 to 60mph	t =	7.6	sec	a =	11.6	ft/sec²	G-force = 0.36
45 to 65mph	t =	4.2	sec	a =	7.0	ft/sec²	G-force = 0.22

Transmission Type: 4spd AUTOMATIC

Notes:

Federal Bumper Standard Requirements: 2.5 mph

This vehicles Rated Bumper Strength: 2.5 mph

N.S.D.C = 2004 - 2007

2005 CHEVROLET MALIBU 4 DOOR SEDAN

Other Information

Tip-Over Stability Ratio =	1.31	Stable
NHTSA Star Rating (calculated)		****

Center of Gravity (No Load):

Inches behind front axle	=	40.28
Inches in front of rear axle	=	65.72
Inches from side of vehicle	=	35.00
Inches from ground	=	22.77
Inches from front corner	=	86.66
Inches from rear corner	=	114.21
Inches from front bumper	=	79.28
Inches from rear bumper	=	108.72

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	2153.86	lb*ft*sec²
Pitch Moment of Inertia	=	2080.38	lb*ft*sec²
Roll Moment of Inertia	=	437.16	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	56.3	deg
Angle Front of Hood to Windshield Base	=	10.5	deg
Angle Front of Hood to Windshield Top	=	19.6	deg
Angle of Windshield	=	31.0	deg
Angle of Steering Tires at Max Turn	=	26.6	deg

First Approximation Crush Factors:

Speed Equivalent (mph) of Kinetic Energy (KE) used in causing crush of indentation may be evaluated using the following formula, the appropriated Crush Factor (CF), and Maximum Indentation Depth (MID), in feet:

$$V(mph) = \sqrt{(30 * CF * MID)}$$

KE Equivalent Speed (Front/Rear/Side)	=	21	CF
Bullet vehicle IMPACT SPEED estimation based on TARGET VEHICLE damage ONLY (Tested for Rear/Side Impact only)	=	27	CF

These CF values are based upon analysis of NHTSA Barrier Crash data, and from over 1000 vehicle accidents where independant evaluation of speed was possible. (These are NOT 'A', 'B', 'C', or 'G' values)

The rear Impact data with more then 2-3 inches of crush damage should be looked at carefully, since some vehicles have very weak trunk & fender strength. Therefore, on some cars, especially GM, you estimate from the rear crush data may be high by as much as 4-5 mph (on a crush of 18 inches).

Stiffness Values and Test Data

Derived from

NHTSA Crash Test

#4863

2004 CHEVROLET MALIBU

Provided By

4N6XPRT StifCalcs®

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4N6XPRT SYSTEMS
8387 UNIVERSITY AVENUE
LA MESA CA 91941-3842
15R-030201SC02301

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(800) 266-9778 | (619) 464-3478 | FAX: (619) 464-2206 | Email: 4n6@4n6xprt.com

Similar Vehicle database reader

You entered: **2005 CHEVROLET MALIBU**

The Similar Vehicle Year/Model list indicates the following are Similar Models

Year Range	Make	Model	Body Styles	Wheelbase
2003 - 2011	SAAB	9-3	4D, 5D, CONV	105.3
Remarks: CONV IS OLD BODY in 2003, new convertible body begins in 2004.				
2004 - 2007	CHEVROLET	MALIBU	2D, 4D, SW	106.3, 116
Remarks:				
2004 - 2007	CHEVROLET	MALIBU MAXX	5D	112.3
Remarks: Quasi-station wagon version of Malibu with extended WB				
2005 - 2009	PONTIAC	G6	2D, 4D, CONV	112.3
Remarks:				
2007 - 2010	SATURN	AURA	4D	112.3
Remarks:				
2008 - 2012	CHEVROLET	MALIBU	2D, 4D, SW	106.3, 116
Remarks:				

Test Information

Test #	**4863**	NHTSA Test Reference Guide Version #	**V5**			
Test Date	**2003-12-15**	Contract #	**DTNH22-01-D-32005**			
Contract/Study Title	**NEW CAR ASSESMENT PROGRAM FRONTAL BARRIER IMPACT TEST**					
Test Objective(s)	**TO OBTAIN VEHICLE CRASHWORTHINESS AND OCCUPANT RESTRAINT INFORMATION**					
Test Type	**NEW CAR ASSESSMENT TEST**	Configuration	**VEHICLE INTO BARRIER**			
Impact Angle	**0**	Side Impact Point	**9999**	mm	**0.0**	inches
		Offset Distance	**0**	mm	**0.0**	inches
		Closing Speed	**57.1**	Km/Hr	**35.50**	MPH
Test Performer	**CALSPAN**					
Test Reference #	**RUN2104**					
Test Track Surface	**CONCRETE**	Condition	**DRY**			
Ambient Temperature	**21** C **69.8** F	Total Number of Curves	**193**			
Data Recorder Type	**DIGITAL DATA ACQUISITION**	Data Link	**UMBILICAL CABLE**			
Test Commentary	**FY 04 NCAP - 2004 CHEVROLET MALIBU M40104**					

Fixed Barrier Information

Barrier Type	**RIGID**	Pole Barrier Diameter	**9999**	mm	**9999**	inches
Barrier Shape	**LOAD CELL BARRIER**					
Barrier Commentary	**FRONTAL FLAT BARRIER WITH 36 LOADCELLS**					

2004 CHEVROLET MALIBU LEFT FRONT SEAT OCCUPANT

Test #	4863		
Vehicle #	1	Sex	MALE
Location	LEFT FRONT SEAT	Age	99
Position	CENTER POSITION	Height	9999 mm / 0.0 inches
Type	HYBRID III DUMMY	Weight	999.0 kg / 2202 pounds
Size	50 PERCENTILE		
Calibration Method	HYBRID III		
Occupant Manufacturer	MFG: VECTOR S/N:061		
Occupant Modification	NO COMMENTS		
Occupant Description	NO COMMENTS		
Occupant Commentary	CNTRH2: HEAD RESTRAINT		

Head

Head to -

Windshielder Header	368	mm	14.5	inches	Head Injury Criteria (HIC)	447	
WindShield	673	mm	26.5	inches	HIC Lower Time Interval (ms)	63.3	
Seatback	9999	mm	0.0	inches	HIC Upper Time Interval (ms)	99.3	
Side Header	223	mm	8.8	inches			
Side Window	315	mm	12.4	inches			

Neck to Seatback 9999 mm 0.0 inches

First Contact Region (Head): AIR BAG

Second Contact Region (Head):

Chest

Chest to -

Dash	540	mm	21.3	inches	Arm to Door	108	mm	4.3	inches
Steering Wheel	326	mm	12.8	inches	Hip to Door	143	mm	5.6	inches
Seatback	9999	mm	0.0	inches					

Chest Severity Index	432	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	44.5

Lap Belt Peak Load	6934	Newtons	1558.8	pound Force
Shoulder Belt Peak Load	0	Newtons	0.0	pound Force

First Contact Region (Chest/Abdomen): AIR BAG

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash	170	mm	6.7	inches	Knees to Seatback	9999	mm	0.0	inches

Left Femur Peak Load	-2167	Newtons	-487.2	pounds Force
Right Femur Peak Load	-1937	Newtons	-435.5	pounds Force

First Contact Region (Legs): DASHPANEL

Second Contact Region (Legs):

2004 CHEVROLET MALIBU LEFT FRONT SEAT OCCUPANT

Test #	4863					
Vehicle #	1	Sex	MALE			
Location	LEFT FRONT SEAT	Age	99			
Position	CENTER POSITION	Height	9999	mm	0.0	inches
Type	HYBRID III DUMMY	Weight	999.0	kg	2202	pounds
Size	50 PERCENTILE					

Calibration Method	HYBRID III
Occupant Manufacturer	MFG: VECTOR S/N:061
Occupant Modification	NO COMMENTS
Occupant Description	NO COMMENTS
Occupant Commentary	CNTRH2: HEAD RESTRAINT

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	SHOULDER BELT PRETENSIONER AND FORCE LIMITER
Restraint # 2	FRONTAL AIRBAG
Mounted	STEERING WHEEL
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NONE

2004 CHEVROLET MALIBU RIGHT FRONT SEAT OCCUPANT

Test #	4863						
Vehicle #	1			Sex	MALE		
Location	RIGHT FRONT SEAT			Age	99		
Position	CENTER POSITION			Height	9999	mm	0.0 inches
Type	HYBRID III DUMMY			Weight	999.0	kg	2202 pounds
Size	50 PERCENTILE						

Calibration Method	HYBRID III
Occupant Manufacturer	MFG: VECTOR S/N:064
Occupant Modification	NO COMMENTS
Occupant Description	NO COMMENTS
Occupant Commentary	CNTRH2: HEAD RESTRAINT

Head

Head to -

Windshielder Header	361	mm	14.2	inches	Head Injury Criteria (HIC)	397			
WindShield	613	mm	24.1	inches	HIC Lower Time Interval (ms)	64.9			
Seatback	9999	mm	0.0	inches	HIC Upper Time Interval (ms)	100.9			
Side Header	221	mm	8.7	inches					
Side Window	320	mm	12.6	inches					

Neck to Seatback 9999 mm 0.0 inches

First Contact Region (Head)	AIR BAG
Second Contact Region (Head)	

Chest

Chest to -

Dash	539	mm	21.2	inches	Arm to Door	110	mm	4.3	inches
Steering Wheel	9999	mm	0.0	inches	Hip to Door	140	mm	5.5	inches
Seatback	9999	mm	0.0	inches					

Chest Severity Index	437	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	46.7

Lap Belt Peak Load	7041	Newtons	1582.9	pound Force
Shoulder Belt Peak Load	0	Newtons	0.0	pound Force

First Contact Region (Chest/Abdomen)	AIR BAG
Second Contact Region (Chest/Abdomen)	NONE

Legs

Knees to Dash	186	mm	7.3	inches	Knees to Seatback	9999	mm	0.0	inches

Left Femur Peak Load	-1251	Newtons	-281.2	pounds Force
Right Femur Peak Load	-1998	Newtons	-449.2	pounds Force

First Contact Region (Legs)	DASHPANEL
Second Contact Region (Legs)	

2004 CHEVROLET MALIBU RIGHT FRONT SEAT OCCUPANT

Test #	4863					
Vehicle #	1	Sex	MALE			
Location	RIGHT FRONT SEAT	Age	99			
Position	CENTER POSITION	Height	9999	mm	0.0	inches
Type	HYBRID III DUMMY	Weight	999.0	kg	2202	pounds
Size	50 PERCENTILE					

Calibration Method	HYBRID III
Occupant Manufacturer	MFG: VECTOR S/N:064
Occupant Modification	NO COMMENTS
Occupant Description	NO COMMENTS
Occupant Commentary	CNTRH2: HEAD RESTRAINT

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	SHOULDER BELT PRETENSIONER AND FORCE LIMITER
Restraint # 2	FRONTAL AIRBAG
Mounted	DASH PANEL - MID
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NONE

2004 CHEVROLET MALIBU RIGHT REAR SEAT OCCUPANT

Test #	4863						
Vehicle #	1		Sex	NOT APPLICABLE			
Location	RIGHT REAR SEAT		Age	1			
Position	NON-ADJUSTABLE SEAT		Height	9999	mm	0.0	inches
Type	HYBRID III DUMMY		Weight	999.0	kg	2202	pounds
Size	3 YEAR OLD CHILD						
Calibration Method	HYBRID III						
Occupant Manufacturer	MFG: DENTON S/N:044						
Occupant Modification	UNMODIFIED						
Occupant Description	SUBPART C THREE YEAR OLD CHILD						
Occupant Commentary	CONTACTS: CNTRH1: CHEST, CNTRH2: CRS						

Head

Head to -

Windshielder Header	9999	mm	0.0	inches	Head Injury Criteria (HIC)	1027			
WindShield	9999	mm	0.0	inches	HIC Lower Time Interval (ms)	68.7			
Seatback	580	mm	22.8	inches	HIC Upper Time Interval (ms)	104.7			
Side Header	9999	mm	0.0	inches					
Side Window	383	mm	15.1	inches					
Neck to Seatback	9999	mm	0.0	inches					
First Contact Region (Head)	OTHER								
Second Contact Region (Head)									

Chest

Chest to -

Dash	9999	mm	0.0	inches	Arm to Door	232	mm	9.1	inches
Steering Wheel	9999	mm	0.0	inches	Hip to Door	298	mm	11.7	inches
Seatback	582	mm	22.9	inches					
Chest Severity Index	574				Pelvic Peak Lateral Acceleration (g's)	0			
Thoracic Trauma Index	0				Thorax Peak Acceleration (g's)	53.2			
Lap Belt Peak Load	0	Newtons	0.0	pound Force					
Shoulder Belt Peak Load	0	Newtons	0.0	pound Force					
First Contact Region (Chest/Abdomen)	NONE								
Second Contact Region (Chest/Abdomen)	NONE								

Legs

Knees to Dash	9999	mm	0.0	inches	Knees to Seatback	417	mm	16.4	inches
Left Femur Peak Load	0	Newtons	0.0	pounds Force					
Right Femur Peak Load	0	Newtons	0.0	pounds Force					
First Contact Region (Legs)	NONE								
Second Contact Region (Legs)									

2004 CHEVROLET MALIBU RIGHT REAR SEAT OCCUPANT

Test #	4863					
Vehicle #	1	Sex	NOT APPLICABLE			
Location	RIGHT REAR SEAT	Age	1			
Position	NON-ADJUSTABLE SEAT	Height	9999	mm	0.0	inches
Type	HYBRID III DUMMY	Weight	999.0	kg	2202	pounds
Size	3 YEAR OLD CHILD					

Calibration Method	HYBRID III
Occupant Manufacturer	MFG: DENTON S/N:044
Occupant Modification	UNMODIFIED
Occupant Description	SUBPART C THREE YEAR OLD CHILD
Occupant Commentary	CONTACTS: CNTRH1: CHEST, CNTRH2: CRS

Restraints

Restraint # 1	CONVERTIBLE CHILD SAFETY SEAT, FRONT FACING
Mounted	LATCH - LOWER ANCHORAGES AND TOP TETHER
Deployment	NOT APPLICABLE
Restraint Commentary	EVENFLO VANGAURD V LATCH
Restraint # 2	5 POINT BELT
Mounted	CHILD SEAT
Deployment	NOT APPLICABLE
Restraint Commentary	EVENFLO VANGAURD V LATCH

2004 CHEVROLET MALIBU LEFT REAR SEAT OCCUPANT

Test #	4863						
Vehicle #	1		Sex	NOT APPLICABLE			
Location	LEFT REAR SEAT		Age	1			
Position	NON-ADJUSTABLE SEAT		Height	9999	mm	0.0	inches
Type	HYBRID III DUMMY		Weight	999.0	kg	2202	pounds
Size	3 YEAR OLD CHILD						
Calibration Method	HYBRID III						
Occupant Manufacturer	MFG: DENTON S/N:142						
Occupant Modification	UNMODIFIED						
Occupant Description	SUBPART C THREE YEAR OLD CHILD						
Occupant Commentary	CONTACTS: CNTRH1: CHEST, CNTRH2: CRS						

Head

Head to -

Windshielder Header	9999	mm	0.0	inches	Head Injury Criteria (HIC)	806			
WindShield	9999	mm	0.0	inches	HIC Lower Time Interval (ms)	66.6			
Seatback	563	mm	22.2	inches	HIC Upper Time Interval (ms)	102.6			
Side Header	9999	mm	0.0	inches					
Side Window	355	mm	14.0	inches					
Neck to Seatback	9999	mm	0.0	inches					
First Contact Region (Head)	OTHER								
Second Contact Region (Head)									

Chest

Chest to -

Dash	9999	mm	0.0	inches	Arm to Door	205	mm	8.1	inches
Steering Wheel	9999	mm	0.0	inches	Hip to Door	267	mm	10.5	inches
Seatback	538	mm	21.2	inches					
Chest Severity Index	578				Pelvic Peak Lateral Acceleration (g's)	0			
Thoracic Trauma Index	0				Thorax Peak Acceleration (g's)	51.7			
Lap Belt Peak Load	0	Newtons	0.0	pound Force					
Shoulder Belt Peak Load	0	Newtons	0.0	pound Force					
First Contact Region (Chest/Abdomen)	NONE								
Second Contact Region (Chest/Abdomen)	NONE								

Legs

Knees to Dash	9999	mm	0.0	inches	Knees to Seatback	380	mm	15.0	inches
Left Femur Peak Load	0	Newtons	0.0	pounds Force					
Right Femur Peak Load	0	Newtons	0.0	pounds Force					
First Contact Region (Legs)	NONE								
Second Contact Region (Legs)									

2004 CHEVROLET MALIBU LEFT REAR SEAT OCCUPANT

Test #	4863					
Vehicle #	1	Sex	NOT APPLICABLE			
Location	LEFT REAR SEAT	Age	1			
Position	NON-ADJUSTABLE SEAT	Height	9999	mm	0.0	inches
Type	HYBRID III DUMMY	Weight	999.0	kg	2202	pounds
Size	3 YEAR OLD CHILD					

Calibration Method	HYBRID III
Occupant Manufacturer	MFG: DENTON S/N:142
Occupant Modification	UNMODIFIED
Occupant Description	SUBPART C THREE YEAR OLD CHILD
Occupant Commentary	CONTACTS: CNTRH1: CHEST, CNTRH2: CRS

Restraints

Restraint # 1	CONVERTIBLE CHILD SAFETY SEAT, FRONT FACING
Mounted	LATCH - LOWER ANCHORAGES AND TOP TETHER
Deployment	NOT APPLICABLE
Restraint Commentary	BRITAX ROUNDABOUT LATCH
Restraint # 2	5 POINT BELT
Mounted	CHILD SEAT
Deployment	NOT APPLICABLE
Restraint Commentary	BRITAX ROUNDABOUT LATCH

Vehicle 1 2004 CHEVROLET MALIBU

Test #	4863		
VIN	1G1ZS52F24F129806	NHTSA Test Vehicle Number	1
Year	2004	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	CHEVROLET	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	MALIBU	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	2.2 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	NONE		
Vehicle Commentary	2004 CHEVROLET MALIBU M40104		

Vehicle Length	4779	mm	188.1	inches	CG behind Front Axle	1156	mm	45.5	inches
Vehicle Width	1775	mm	69.9	inches	Center of Damage to CG Axis	9999	mm	0.0	inches
Vehicle Wheelbase	2700	mm	106.3	inches	Total Length of Indentation	9999	mm	0.0	inches
Vehicle Test Weight	1635	KG	3604	pounds	Maximum Static Crush Depth	585	mm	23.0	inches
					Pre-Impact Speed	57	kph	35.5	mph

Vehicle Damage Index: 12FDEW3

Principal Direction of Force: 0

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	335	mm	13.2	inches
DPD 2	407	mm	16.0	inches
DPD 3	484	mm	19.1	inches
DPD 4	487	mm	19.2	inches
DPD 5	427	mm	16.8	inches
DPD 6	368	mm	14.5	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	185.5	inches	169.6	inches	15.8	inches
	4711	mm	4309	mm	402	mm
Centerline	188.1	inches	167.4	inches	20.7	inches
	4779	mm	4252	mm	527	mm
Right Bumper Corner	185.5	inches	168.7	inches	16.7	inches
	4711	mm	4286	mm	425	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
0.0	NOT APPLICABLE	0.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
DIRECT ENGAGEMENT	0.0	NOT APPLICABLE
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 1 2004 CHEVROLET MALIBU

Test #	4863		
VIN	1G1ZS52F24F129806	NHTSA Test Vehicle Number	1
Year	2004	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	CHEVROLET	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	MALIBU	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	2.2 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	NONE		
Vehicle Commentary	2004 CHEVROLET MALIBU M40104		

Vehicle Length	4779	mm	188.1	inches	CG behind Front Axle	1156	mm	45.5	inches
Vehicle Width	1775	mm	69.9	inches	Center of Damage to CG Axis	9999	mm	0.0	inches
Vehicle Wheelbase	2700	mm	106.3	inches	Total Length of Indentation	9999	mm	0.0	inches
Vehicle Test Weight	1635	KG	3604	pounds	Maximum Static Crush Depth	585	mm	23.0	inches
					Pre-Impact Speed	57	kph	35.5	mph

Vehicle Damage Index: 12FDEW3 — Principal Direction of Force: 0

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from the Rear Vehicle Surface forward.)

Left Side				Centerline				Right Side			
Pre-Test		Post-Test		Pre-Test		Post-Test		Pre-Test		Post-Test	
mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches
				Length of Vehicle at Centerline							
				4779	188.1	4252	167.4				
				Engine Block							
				384	15.1	384	15.1				
4711	185.5	4309	169.6	Front Bumper Corner				4711	185.5	4286	168.7
				Front of Engine							
				4250	167.3	3996	157.3				
3671	144.5	3599	141.7	Firewall				3662	144.2	3567	140.4
				3664	144.3	3584	141.1				
3307	130.2	3307	130.2	Upper Leading Edge of Door				3294	129.7	3297	129.8
3306	130.2	3321	130.7	Lower Leading Edge of Door				3300	129.9	3302	130.0
3335	131.3	3337	131.4	Bottom of 'A' Post				3325	130.9	3333	131.2
2210	87.0	2210	87.0	Upper Trailing Edge of Door				2195	86.4	2196	86.5
2239	88.1	2249	88.5	Lower Trailing Edge of Door				2224	87.6	2228	87.7
				Steering Column							
				2827	111.3	2836	111.7				
				Center of Seering Column to 'A' Post (Horizontal)							
				339	13.3	322	12.7				
				Center of Steering Column to Headliner (Vertical)							
				423	16.7	457	18.0				

2004 CHEVROLET MALIBU

NHTSA Crash Test - #4863 - Front Impact

Pre/Post Depths - Vehicle Width - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 3604 pounds
Vehicle Closing Speed = 35.5 mph
Test Crush Length = 69.9 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	15.8	20.7	16.7	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 15.8 inches					208.7
Using a Rated No Damage Speed of	2.5mph	215.9	180.3	129.2	
Using a Rated No Damage Speed of	5.0mph	399.0	154.0	516.8	
Using a Rated No Damage Speed of	7.5mph	549.5	129.8	1162.7	
Using a Rated No Damage Speed of	10.0mph	667.2	107.7	2067.1	
Average Crush = 18.5 inches					152.2
Using a Rated No Damage Speed of	2.5mph	184.4	131.5	129.2	
Using a Rated No Damage Speed of	5.0mph	340.8	112.4	516.8	
Using a Rated No Damage Speed of	7.5mph	469.3	94.7	1162.7	
Using a Rated No Damage Speed of	10.0mph	569.8	78.5	2067.1	
Maximum Crush = 20.7 inches					121.6
Using a Rated No Damage Speed of	2.5mph	164.8	105.1	129.2	
Using a Rated No Damage Speed of	5.0mph	304.6	89.7	516.8	
Using a Rated No Damage Speed of	7.5mph	419.4	75.6	1162.7	
Using a Rated No Damage Speed of	10.0mph	509.3	62.7	2067.1	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

****

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	20.7	33.0	-2.5	-7.7

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 24.4

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

2004 CHEVROLET MALIBU

NHTSA Crash Test - #4863 - Front Impact

Damage Profile Distances - Vehicle Width - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 3604 pounds
Vehicle Closing Speed = 35.5 MPH
Test Crush Length = 69.9 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	13.2	16.0	19.1	19.2	16.8	14.5	(Pass Side)

			CRASH 3 Stiffness Coefficents			SMAC Stiffness
			A	B	G	Kv
Minimum Crush =	13.2	inches				299.0
Using a Rated No Damage Speed of		2.5mph	258.4	258.4	129.2	
Using a Rated No Damage Speed of		5.0mph	477.6	220.7	516.8	
Using a Rated No Damage Speed of		7.5mph	657.7	186.0	1162.7	
Using a Rated No Damage Speed of		10.0mph	798.6	154.3	2067.1	
Average Crush =	17.0	inches				180.3
Using a Rated No Damage Speed of		2.5mph	200.6	155.8	129.2	
Using a Rated No Damage Speed of		5.0mph	370.8	133.1	516.8	
Using a Rated No Damage Speed of		7.5mph	510.7	112.1	1162.7	
Using a Rated No Damage Speed of		10.0mph	620.1	93.0	1444.9	
Maximum Crush =	19.2	inches				141.3
Using a Rated No Damage Speed of		2.5mph	177.6	122.1	129.2	
Using a Rated No Damage Speed of		5.0mph	328.4	104.3	516.8	
Using a Rated No Damage Speed of		7.5mph	452.2	87.9	1162.7	
Using a Rated No Damage Speed of		10.0mph	549.0	72.9	2067.1	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

****

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	19.2	31.7	-3.7	-11.8

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 26.3

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

4N6XPRT StifCalcs®

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2004 - 2007
Make: CHEVROLET
Model: MALIBU

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Width Values G	Width Values Kv	Crush Factor
5183	2004 SAAB 9-3 FOUR DOOR SEDAN	5.0	16.5	29.5	291.3	86.7	489.2	125.7	21.2
6056	2007 SAAB 9-3 FOUR DOOR SEDAN	5.0	19.4	34.7	334.5	102.4	546.6	139.8	24.8
5191	2004 CHEVROLET MALIBU FOUR DOOR SEDAN	5.0	16.4	29.7	341.3	102.7	567.0	148.5	21.5
6448	2008 CHEVROLET MALIBU FOUR DOOR SEDAN	5.0	11.9	24.7	360.3	119.2	544.3	187.3	20.5
6998	2011 CHEVROLET MALIBU FOUR DOOR SEDAN	5.0	18.6	35.1	360.9	117.1	556.0	159.3	26.6
5851	2006 SAAB 9-3 FOUR DOOR SEDAN	5.0	11.3	24.7	364.5	126.8	524.0	199.1	21.6
4863	2004 CHEVROLET MALIBU FOUR DOOR SEDAN	5.0	17.0	35.5	371.3	133.4	516.8	180.7	29.7
6268	2008 CHEVROLET MALIBU FOUR DOOR SEDAN	5.0	17.7	34.9	378.9	128.0	560.7	174.5	27.5
5271	2005 CHEVROLET MALIBU FOUR DOOR SEDAN	5.0	17.4	35.0	387.8	133.5	563.3	181.7	28.1
5250	2005 PONTIAC G6 FOUR DOOR SEDAN	5.0	17.0	35.3	393.2	139.8	552.9	189.7	29.2
5844	2007 SATURN AURA FOUR DOOR SEDAN	5.0	15.6	35.1	442.4	170.2	574.9	231.5	31.5
6997	2011 CHEVROLET MALIBU FOUR DOOR SEDAN	5.0	6.4	20.1	496.8	232.8	530.2	412.8	25.0
	Average (AVG)				**376.9**	**132.7**	**543.8**	**194.2**	**25.6**
	Minimum (MIN)				**291.3**	**86.7**	**489.2**	**125.7**	**20.5**
	Maximum (MAX)				**496.8**	**232.8**	**574.9**	**412.8**	**31.5**
	Standard Deviation (STDev-sample)				**52.4**	**38.0**	**24.7**	**74.5**	**3.8**
	Number of Tests (n)			**12**					

4N6XPRT StifCalcs®

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2004 - 2007
Make: CHEVROLET
Model: MALIBU

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Width Values G	Width Values Kv	Crush Factor
6997	2011 CHEVROLET MALIBU FOUR DOOR SEDAN	5.0	15.7	20.1	202.9	38.8	530.2	68.9	10.2
5183	2004 SAAB 9-3 FOUR DOOR SEDAN	5.0	18.2	29.5	263.7	71.1	489.2	103.0	19.2
4863	2004 CHEVROLET MALIBU FOUR DOOR SEDAN	5.0	23.0	35.5	273.7	72.5	516.8	98.2	21.9
5250	2005 PONTIAC G6 FOUR DOOR SEDAN	5.0	22.6	35.3	296.0	79.2	552.9	107.5	22.0
5191	2004 CHEVROLET MALIBU FOUR DOOR SEDAN	5.0	18.9	29.7	296.5	77.5	567.0	112.1	18.7
5851	2006 SAAB 9-3 FOUR DOOR SEDAN	5.0	13.6	24.7	303.6	87.9	524.0	138.2	18.0
6448	2008 CHEVROLET MALIBU FOUR DOOR SEDAN	5.0	14.1	24.7	304.8	85.3	544.3	134.1	17.4
6268	2008 CHEVROLET MALIBU FOUR DOOR SEDAN	5.0	21.8	34.9	307.2	84.1	560.7	114.7	22.3
6056	2007 SAAB 9-3 FOUR DOOR SEDAN	5.0	20.9	34.7	310.9	88.4	546.6	120.7	23.0
6998	2011 CHEVROLET MALIBU FOUR DOOR SEDAN	5.0	21.3	35.1	313.8	88.5	556.0	120.4	23.1
5271	2005 CHEVROLET MALIBU FOUR DOOR SEDAN	5.0	19.9	35.0	339.7	102.4	563.3	139.4	24.6
5844	2007 SATURN AURA FOUR DOOR SEDAN	5.0	18.7	35.1	369.3	118.7	574.9	161.3	26.3
	Average (AVG)				**298.5**	**82.9**	**543.8**	**118.2**	**20.6**
	Minimum (MIN)				**202.9**	**38.8**	**489.2**	**68.9**	**10.2**
	Maximum (MAX)				**369.3**	**118.7**	**574.9**	**161.3**	**26.3**
	Standard Deviation (STDev-sample)				**40.7**	**19.0**	**24.7**	**23.7**	**4.2**
	Number of Tests (n)			**12**					

Expert VIN DeCoder®

Version Number 3.4.0.2

DeCoded VIN: 1G1AK55F577203940

Model:	2007 Chevrolet Cobalt LEV 1 4 Door Sedan
Engine Size:	2.2L / 134cu.in.
Engine Description:	Inline 4 With Dual Overhead Camshaft
Horse Power:	145 @ 5600 rpm
Torque:	150 lb-ft at 4000 rpm
Injection System:	Sequential Fuel Injection (SFI)
PSI:	55-65 psi
Ignition:	Electronic
Manufacturer:	Saturn
Assembly Plant:	Lordstown, OH
Drive Wheels:	This is a Front Wheel Drive vehicle w/ Manual Belts W/Driver & Passenger and Side Air Bags

The First through Third characters (1G1) indicate a Chevrolet Car made in the U.S.A.

The Fourth through Fifth characters (AK) indicate a Cobalt

The Sixth character (5) indicates a 4 Door Sedan

The Seventh character (5) indicates Manual Belts W/Driver & Passenger and Side Air Bags

The Eighth character (F) indicates the OEM engine: 2.2L / 134cu.in., L4 DOHC

The Ninth character (the check digit) is entered as 5.
The VIN appears Valid, the calculated value is 5.

The Tenth character (7) indicates the model year 2007

The Eleventh character (7) indicates the vehicle was made in the assembly plant in Lordstown, OH

The Twelfth through Seventeenth characters (203940) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.5.1.0

PROVIDED BY:

4N6XPRT Systems

8387 University Avenue

La Mesa CA 91941

9/4/2015

2007 CHEVROLET COBALT 4 DOOR SEDAN

Curb Weight:		3216	lbs.	1459	kg.
Curb Weight Distribution -	Front:	59	% Rear:	41	%
Gross Vehicle Weight Rating:		3895	lbs.	1767	kg.
Number of Tires on Vehicle:		4			
Drive Wheels:		FRONT			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	180	15.00	4.57
Wheelbase:	103	8.58	2.62
Front Bumper to Front Axle:	38	3.17	0.97
Front Bumper to Front of Front Well:	23	1.92	0.58
Front Bumper to Front of Hood:	7	0.58	0.18
Front Bumper to Base of Windshield:	46	3.83	1.17
Front Bumper to Top of Windshield:	77	6.42	1.96
Rear Bumper to Rear Axle:	39	3.25	0.99
Rear Bumper to Rear of Rear Well:	24	2.00	0.61
Rear Bumper to Rear of Trunk:	6	0.50	0.15
Rear Bumper to Base of Rear Window:	21	1.75	0.53
Width Dimensions			
Maximum Width:	68	5.67	1.73
Front Track:	59	4.92	1.50
Rear Track:	58	4.83	1.47
Vertical Dimensions			
Height:	57	4.75	1.45
Ground to -			
Front Bumper (Top)	20	1.67	0.51
Headlight - center	26	2.17	0.66
Hood - top front:	29	2.42	0.74
Base of Windshield	37	3.08	0.94
Rear Bumper - top:	28	2.33	0.71
Trunk - top rear:	41	3.42	1.04
Base of Rear Window:	43	3.58	1.09

2007 CHEVROLET COBALT 4 DOOR SEDAN

Interior Dimensions

	Inches	Feet	Meters
Front Seat Shoulder Width	53	4.42	1.35
Front Seat to Headliner	39	3.25	0.99
Front Leg Room - seatback to floor (max)	42	3.50	1.07
Rear Seat Shoulder Width	51	4.25	1.30
Rear Seat to Headliner	38	3.17	0.97
Front Leg Room - seatback to floor (min)	34	2.83	0.86

Seatbelts: 3pt - front and rear

Airbags: FRONT SEAT AIRBAGS

Steering Data

Turning Circle (Diameter)	408	34.00	10.36
Steering Ratio: 16.60:1			
Wheel Radius:	12	1.00	0.30
Tire Size (OEM): 195/60R15			

Acceleration & Braking Information

Brake Type: FRONT DISC - REAR DRUM

ABS System: ALL WHEEL ABS - OPTIONAL

Braking, 60 mph to 0 (Hard pedal, no skid, dry pavement):

d = 138.0 ft t = 3.1 sec a = -28.0 ft/sec² G-force = -0.87

Acceleration:

0 to 30mph	t =	2.6	sec	a =	16.9	ft/sec²	G-force = 0.53
0 to 60mph	t =	6.1	sec	a =	14.4	ft/sec²	G-force = 0.45
45 to 65mph	t =	3.0	sec	a =	9.8	ft/sec²	G-force = 0.31

Transmission Type: 5spd MANUAL

Notes:

Federal Bumper Standard Requirements: 2.5 mph

This vehicles Rated Bumper Strength: 2.5 mph

N.S.D.C = 2005 - 2010

2007 CHEVROLET COBALT 4 DOOR SEDAN

Other Information

Tip-Over Stability Ratio =	1.31	Stable
NHTSA Star Rating (calculated)		****

Center of Gravity (No Load):

Inches behind front axle	=	42.23
Inches in front of rear axle	=	60.77
Inches from side of vehicle	=	34.00
Inches from ground	=	22.37
Inches from front corner	=	87.14
Inches from rear corner	=	105.40
Inches from front bumper	=	80.23
Inches from rear bumper	=	99.77

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	2106.48	lb*ft*sec²
Pitch Moment of Inertia	=	2034.84	lb*ft*sec²
Roll Moment of Inertia	=	428.88	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	52.1	deg
Angle Front of Hood to Windshield Base	=	11.6	deg
Angle Front of Hood to Windshield Top	=	20.4	deg
Angle of Windshield	=	30.1	deg
Angle of Steering Tires at Max Turn	=	28.9	deg

First Approximation Crush Factors:

Speed Equivalent (mph) of Kinetic Energy (KE) used in causing crush of indentation may be evaluated using the following formula, the appropriated Crush Factor (CF), and Maximum Indentation Depth (MID), in feet:

$$V(mph) = \sqrt{(30 * CF * MID)}$$

KE Equivalent Speed (Front/Rear/Side)	=	21	CF
Bullet vehicle IMPACT SPEED estimation based on TARGET VEHICLE damage ONLY (Tested for Rear/Side Impact only)	=	27	CF

These CF values are based upon analysis of NHTSA Barrier Crash data, and from over 1000 vehicle accidents where independant evaluation of speed was possible. (These are NOT 'A', 'B', 'C', or 'G' values)

The rear Impact data with more then 2-3 inches of crush damage should be looked at carefully, since some vehicles have very weak trunk & fender strength. Therefore, on some cars, especially GM, you estimate from the rear crush data may be high by as much as 4-5 mph (on a crush of 18 inches).

Stiffness Values and Test Data

Derived from

NHTSA Crash Test

#4827

2003 SATURN ION

Provided By

4N6XPRT StifCalcs®

Registered to:

4N6XPRT SYSTEMS
8387 UNIVERSITY AVENUE
LA MESA CA 91941-3842
15R-030201SC02301

4N6XPRT Systems | 8387 University Avenue | La Mesa, CA 91942 | USA
(800) 266-9778 | (619) 464-3478 | FAX: (619) 464-2206 | Email: 4n6@4n6xprt.com

Similar Vehicle database reader

You entered: **2007 CHEVROLET COBALT**

The Similar Vehicle Year/Model list indicates the following are Similar Models

Year Range	Make	Model	Body Styles	Wheelbase
2003 - 2007	SATURN	ION	2D, 4D	103.2
Remarks: Ion 1, Ion 2, Ion 3. Coupe has 4 doors. RED LINE is performance package.				
2005 - 2010	CHEVROLET	COBALT	2D, 4D	103.3, 133
Remarks:				
2007 - 2009	PONTIAC	G5	2D	103.3
Remarks:				

Test Information

Test #	**4827**	NHTSA Test Reference Guide Version #	**V5**			
Test Date	**2003-08-07**	Contract #	**DTNH22-01-C-01025**			
Contract/Study Title	**SAFETY COMPLIANCE TESTING FOR FMVSS 301 FUEL SYSTEM INTEGRITY**					
Test Objective(s)	**TO OBTAIN VEHICLE CRASHWORTHINESS AND OCCUPANT RESTRAINT PERFORMANCE**					
Test Type	**FMVSS 301 FUEL SYSTEM INTEGRITY**	Configuration	**IMPACTOR INTO VEHICLE**			
Impact Angle	**180**	Side Impact Point	**9999**	mm	**0.0**	inches
		Offset Distance	**9999**	mm	**0.0**	inches
		Closing Speed	**48.1**	Km/Hr	**29.89**	MPH
Test Performer	**CALSPAN**					
Test Reference #	**RUN2081**					
Test Track Surface	**CONCRETE**	Condition	**DRY**			
Ambient Temperature	**26** C **78.8** F	Total Number of Curves	**98**			
Data Recorder Type	**DIGITAL DATA ACQUISITION**	Data Link	**UMBILICAL CABLE**			
Test Commentary	**FY 2003 FMVSS 301R TEST - 2003 SATURN ION C30112**					

Fixed Barrier Information

Barrier Type		Pole Barrier Diameter		mm	inches
Barrier Shape					
Barrier Commentary					

2003 SATURN ION LEFT FRONT SEAT OCCUPANT

Test #	4827		
Vehicle #	2	Sex	MALE
Location	LEFT FRONT SEAT	Age	99
Position	CENTER POSITION	Height	9999 mm / 0.0 inches
Type	HYBRID III DUMMY	Weight	999.0 kg / 2202 pounds
Size	50 PERCENTILE		
Calibration Method	HYBRID III		
Occupant Manufacturer	MFG: FTSS S/N:206		
Occupant Modification	NO COMMENTS		
Occupant Description	NO COMMENTS		
Occupant Commentary	CNTRH2: HEAD RESTRAINT		

Head

Head to -

Windshielder Header	396	mm	15.6	inches	Head Injury Criteria (HIC)	49	
WindShield	778	mm	30.6	inches	HIC Lower Time Interval (ms)	119	
Seatback	9999	mm	0.0	inches	HIC Upper Time Interval (ms)	155	
Side Header	210	mm	8.3	inches			
Side Window	361	mm	14.2	inches			

Neck to Seatback 9999 mm 0.0 inches

First Contact Region (Head): OTHER

Second Contact Region (Head):

Chest

Chest to -

Dash	726	mm	28.6	inches	Arm to Door	109	mm	4.3	inches
Steering Wheel	320	mm	12.6	inches	Hip to Door	126	mm	5.0	inches
Seatback	9999	mm	0.0	inches					

Chest Severity Index	35	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	16.2

Lap Belt Peak Load	127	Newtons	28.6	pound Force
Shoulder Belt Peak Load	0	Newtons	0.0	pound Force

First Contact Region (Chest/Abdomen): NONE

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash	154	mm	6.1	inches	Knees to Seatback	9999	mm	0.0	inches

Left Femur Peak Load	-1530	Newtons	-344.0	pounds Force
Right Femur Peak Load	-717	Newtons	-161.2	pounds Force

First Contact Region (Legs): NONE

Second Contact Region (Legs):

2003 SATURN ION LEFT FRONT SEAT OCCUPANT

Test #	4827					
Vehicle #	2	Sex	MALE			
Location	LEFT FRONT SEAT	Age	99			
Position	CENTER POSITION	Height	9999	mm	0.0	inches
Type	HYBRID III DUMMY	Weight	999.0	kg	2202	pounds
Size	50 PERCENTILE					

Calibration Method	HYBRID III
Occupant Manufacturer	MFG: FTSS S/N:206
Occupant Modification	NO COMMENTS
Occupant Description	NO COMMENTS
Occupant Commentary	CNTRH2: HEAD RESTRAINT

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	NOT DEPLOYED
Restraint Commentary	EQUIPPED WITH BELT PRETENSIONER
Restraint # 2	FRONTAL AIRBAG
Mounted	STEERING WHEEL
Deployment	NOT DEPLOYED
Restraint Commentary	NONE
Restraint # 3	OTHER
Mounted	SEAT BACK
Deployment	NOT APPLICABLE
Restraint Commentary	HEAD RESTRAINT

2003 SATURN ION RIGHT FRONT SEAT OCCUPANT

Test #	4827		
Vehicle #	2	Sex	FEMALE
Location	RIGHT FRONT SEAT	Age	99
Position	CENTER POSITION	Height	9999 mm / 0.0 inches
Type	HYBRID III DUMMY	Weight	999.0 kg / 2202 pounds
Size	5 PERCENTILE		
Calibration Method	HYBRID III		
Occupant Manufacturer	MFG: FTSS S/N:505		
Occupant Modification	NO COMMENTS		
Occupant Description	NO COMMENTS		
Occupant Commentary	CNTRH2: HEAD RESTRAINT		

Head

Head to -

Windshielder Header	454	mm	17.9	inches	Head Injury Criteria (HIC)	115	
WindShield	925	mm	36.4	inches	HIC Lower Time Interval (ms)	79.9	
Seatback	9999	mm	0.0	inches	HIC Upper Time Interval (ms)	115.9	
Side Header	278	mm	10.9	inches			
Side Window	388	mm	15.3	inches			

Neck to Seatback: 9999 mm / 0.0 inches

First Contact Region (Head): OTHER

Second Contact Region (Head):

Chest

Chest to -

Dash	524	mm	20.6	inches	Arm to Door	155	mm	6.1	inches
Steering Wheel	9999	mm	0.0	inches	Hip to Door	152	mm	6.0	inches
Seatback	9999	mm	0.0	inches					

Chest Severity Index	58	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	18.1

Lap Belt Peak Load	457	Newtons	102.7	pound Force
Shoulder Belt Peak Load	0	Newtons	0.0	pound Force

First Contact Region (Chest/Abdomen): NONE

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash	216	mm	8.5	inches	Knees to Seatback	9999	mm	0.0	inches

Left Femur Peak Load	-145	Newtons	-32.6	pounds Force
Right Femur Peak Load	-236	Newtons	-53.1	pounds Force

First Contact Region (Legs): NONE

Second Contact Region (Legs):

2003 SATURN ION RIGHT FRONT SEAT OCCUPANT

Test #	4827					
Vehicle #	2	Sex	FEMALE			
Location	RIGHT FRONT SEAT	Age	99			
Position	CENTER POSITION	Height	9999	mm	0.0	inches
Type	HYBRID III DUMMY	Weight	999.0	kg	2202	pounds
Size	5 PERCENTILE					

Calibration Method	HYBRID III
Occupant Manufacturer	MFG: FTSS S/N:505
Occupant Modification	NO COMMENTS
Occupant Description	NO COMMENTS
Occupant Commentary	CNTRH2: HEAD RESTRAINT

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	NOT DEPLOYED
Restraint Commentary	EQUIPPED WITH BELT PRETENSIONER
Restraint # 2	FRONTAL AIRBAG
Mounted	DASH PANEL - MID
Deployment	NOT DEPLOYED
Restraint Commentary	NONE
Restraint # 3	OTHER
Mounted	SEAT BACK
Deployment	NOT APPLICABLE
Restraint Commentary	HEAD RESTRAINT

Vehicle 1 0 NHTSA FLAT IMPACTOR

Test #	4827		
VIN	9999	NHTSA Test Vehicle Number	1
Year	0	Vehicle Modification Indicator	RESEARCH VEHICLE
Make	NHTSA	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	FLAT IMPACTOR	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	NOT APPLICABLE		
Engine	NOT APPLICABLE		
Displacement	99.9 Liter	Transmission	NOT APPLICABLE
Vehicle Modification(s) Description	NONE		
Vehicle Commentary	MOVING BARRIER IMPACTOR		

Vehicle Length	99999	mm	0.0	inches	CG behind Front Axle	1344	mm	52.9	inches
Vehicle Width	1981	mm	78.0	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	3048	mm	120.0	inches	Total Length of Indentation	99999	mm	0.0	inches
Vehicle Test Weight	1797	KG	3961	pounds	Maximum Static Crush Depth	9999	mm	0.0	inches
					Pre-Impact Speed	48	kph	29.9	mph

Vehicle Damage Index: 9999999

Principal Direction of Force: 0

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	9999	mm	0.0	inches
DPD 2	9999	mm	0.0	inches
DPD 3	9999	mm	0.0	inches
DPD 4	9999	mm	0.0	inches
DPD 5	9999	mm	0.0	inches
DPD 6	9999	mm	0.0	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	0.0	inches	0.0	inches	N/A	inches
	9999	mm	99999	mm	-90000	mm
Centerline	0.0	inches	0.0	inches	N/A	inches
	9999	mm	99999	mm	-90000	mm
Right Bumper Corner	0.0	inches	0.0	inches	N/A	inches
	9999	mm	99999	mm	-90000	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
0.0	NOT APPLICABLE	0.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
DIRECT ENGAGEMENT	0.0	NOT APPLICABLE
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 1 0 NHTSA FLAT IMPACTOR

Test #	4827		
VIN	9999	NHTSA Test Vehicle Number	1
Year	0	Vehicle Modification Indicator	RESEARCH VEHICLE
Make	NHTSA	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	FLAT IMPACTOR	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	NOT APPLICABLE		
Engine	NOT APPLICABLE		
Displacement	99.9 Liter	Transmission	NOT APPLICABLE
Vehicle Modification(s) Description	NONE		
Vehicle Commentary	MOVING BARRIER IMPACTOR		

Vehicle Length	99999	mm	0.0	inches	CG behind Front Axle	1344	mm	52.9	inches
Vehicle Width	1981	mm	78.0	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	3048	mm	120.0	inches	Total Length of Indentation	99999	mm	0.0	inches
Vehicle Test Weight	1797	KG	3961	pounds	Maximum Static Crush Depth	9999	mm	0.0	inches
					Pre-Impact Speed	48	kph	29.9	mph

Vehicle Damage Index: 9999999 — Principal Direction of Force: 0

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from the Rear Vehicle Surface forward.)

Left Side				Centerline				Right Side			
Pre-Test		Post-Test		Pre-Test		Post-Test		Pre-Test		Post-Test	
mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches
				Length of Vehicle at Centerline							
				9999	0.0	99999	0.0				
				Engine Block							
				9999	0.0	99999	0.0				
9999	0.0	99999	0.0	Front Bumper Corner				9999	0.0	99999	0.0
				Front of Engine							
				9999	0.0	99999	0.0				
9999	0.0	99999	0.0	Firewall				9999	0.0	99999	0.0
				9999	0.0	99999	0.0				
9999	0.0	99999	0.0	Upper Leading Edge of Door				9999	0.0	99999	0.0
9999	0.0	99999	0.0	Lower Leading Edge of Door				9999	0.0	99999	0.0
9999	0.0	99999	0.0	Bottom of 'A' Post				9999	0.0	99999	0.0
9999	0.0	99999	0.0	Upper Trailing Edge of Door				9999	0.0	99999	0.0
9999	0.0	99999	0.0	Lower Trailing Edge of Door				9999	0.0	99999	0.0
				Steering Column							
				9999	0.0	99999	0.0				
				Center of Seering Column to 'A' Post (Horizontal)							
				9999	0.0	99999	0.0				
				Center of Steering Column to Headliner (Vertical)							
				9999	0.0	99999	0.0				

Vehicle 2 2003 SATURN ION

Test #	4827		
VIN	1G8AF52F03Z138200	NHTSA Test Vehicle Number	2
Year	2003	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	SATURN	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	ION	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	2.2 Liter	Transmission	MANUAL - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	NONE		
Vehicle Commentary	2003 SATURN ION C30112		

Vehicle Length	4683	mm	184.4	inches	CG behind Front Axle	1010	mm	39.8	inches
Vehicle Width	1707	mm	67.2	inches	Center of Damage to CG Axis	9999	mm	0.0	inches
Vehicle Wheelbase	2622	mm	103.2	inches	Total Length of Indentation	99999	mm	0.0	inches
Vehicle Test Weight	1431	KG	3154	pounds	Maximum Static Crush Depth	9999	mm	0.0	inches
					Pre-Impact Speed	0	kph	0.0	mph

Vehicle Damage Index: 9999999

Principal Direction of Force: 180

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	9999	mm	0.0	inches
DPD 2	9999	mm	0.0	inches
DPD 3	9999	mm	0.0	inches
DPD 4	9999	mm	0.0	inches
DPD 5	9999	mm	0.0	inches
DPD 6	9999	mm	0.0	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	0.0	inches	0.0	inches	N/A	inches
	9999	mm	99999	mm	-90000	mm
Centerline	0.0	inches	0.0	inches	N/A	inches
	9999	mm	99999	mm	-90000	mm
Right Bumper Corner	0.0	inches	0.0	inches	N/A	inches
	9999	mm	99999	mm	-90000	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
0.0	NOT APPLICABLE	0.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
DIRECT ENGAGEMENT	0.0	NOT APPLICABLE
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 2 2003 SATURN ION

Test #	4827		
VIN	1G8AF52F03Z138200	NHTSA Test Vehicle Number	2
Year	2003	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	SATURN	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	ION	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	2.2 Liter	Transmission	MANUAL - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	NONE		
Vehicle Commentary	2003 SATURN ION C30112		

Vehicle Length	4683	mm	184.4	inches	CG behind Front Axle	1010	mm	39.8	inches
Vehicle Width	1707	mm	67.2	inches	Center of Damage to CG Axis	9999	mm	0.0	inches
Vehicle Wheelbase	2622	mm	103.2	inches	Total Length of Indentation	99999	mm	0.0	inches
Vehicle Test Weight	1431	KG	3154	pounds	Maximum Static Crush Depth	9999	mm	0.0	inches
					Pre-Impact Speed	0	kph	0.0	mph

Vehicle Damage Index: 9999999 — Principal Direction of Force: 180

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from the Rear Vehicle Surface forward.)

Left Side Pre-Test mm	Left Side Pre-Test inches	Left Side Post-Test mm	Left Side Post-Test inches	Centerline	Centerline Pre-Test mm	Centerline Pre-Test inches	Centerline Post-Test mm	Centerline Post-Test inches	Right Side Pre-Test mm	Right Side Pre-Test inches	Right Side Post-Test mm	Right Side Post-Test inches
				Length of Vehicle at Centerline	9999	0.0	99999	0.0				
				Engine Block	9999	0.0	99999	0.0				
9999	0.0	99999	0.0	Front Bumper Corner					9999	0.0	99999	0.0
				Front of Engine	9999	0.0	99999	0.0				
9999	0.0	99999	0.0	Firewall					9999	0.0	99999	0.0
					9999	0.0	99999	0.0				
9999	0.0	99999	0.0	Upper Leading Edge of Door					9999	0.0	99999	0.0
9999	0.0	99999	0.0	Lower Leading Edge of Door					9999	0.0	99999	0.0
9999	0.0	99999	0.0	Bottom of 'A' Post					9999	0.0	99999	0.0
9999	0.0	99999	0.0	Upper Trailing Edge of Door					9999	0.0	99999	0.0
9999	0.0	99999	0.0	Lower Trailing Edge of Door					9999	0.0	99999	0.0
				Steering Column	9999	0.0	99999	0.0				
				Center of Seering Column to 'A' Post (Horizontal)	9999	0.0	99999	0.0				
				Center of Steering Column to Headliner (Vertical)	9999	0.0	99999	0.0				

MODIFIED - 2003 SATURN ION

NHTSA Crash Test # 4827 Rear Impact - MODIFIED

Pre/Post Depths - Vehicle Width - KE Equivalent Speed - Trapezoidal Average

Test Vehicle Weight =	3154 pounds	Impactor Weight =	3961
KE Equivalent Speed =	22.3 mph	Impactor Test Speed =	29.9
Test Crush Length =	67.2 inches		

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	16.2	18.5	12.9	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 12.9 inches					112.4
Using a Rated No Damage Speed of	2.5 mph	144.4	88.6	117.6	
Using a Rated No Damage Speed of	5.0 mph	252.3	67.7	470.3	
Using a Rated No Damage Speed of	7.5 mph	323.8	49.5	1058.2	
Using a Rated No Damage Speed of	10.0 mph	358.8	34.2	1881.3	
Average Crush = 16.5 inches					68.5
Using a Rated No Damage Speed of	2.5 mph	112.7	54.0	117.6	
Using a Rated No Damage Speed of	5.0 mph	196.9	41.2	470.3	
Using a Rated No Damage Speed of	7.5 mph	252.7	30.2	1058.2	
Using a Rated No Damage Speed of	10.0 mph	280.1	20.8	1881.3	
Maximum Crush = 18.5 inches					54.7
Using a Rated No Damage Speed of	2.5 mph	100.7	43.1	117.6	
Using a Rated No Damage Speed of	5.0 mph	175.9	32.9	470.3	
Using a Rated No Damage Speed of	7.5 mph	225.8	24.1	1058.2	
Using a Rated No Damage Speed of	10.0 mph	250.2	16.6	1881.3	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

****

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

Impact Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated Impact Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	18.5	31.2	8.9	28.4

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 10.8

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

REPORT NUMBER: 301-CAL-03-05

SAFETY COMPLIANCE TESTING FOR FMVSS 301
FUEL SYSTEM INTEGRITY

SATURN CORPORATION
2003 SATURN ION
4-DOOR SEDAN

NHTSA NUMBER: C30112

VERIDIAN TEST NUMBER: 8655-F301-14

August 7, 2003

VERIDIAN ENGINEERING
P.O. BOX 400
BUFFALO, NEW YORK 14225

FINAL REPORT

PREPARED FOR:

U. S. Department of Transportation
National Highway Traffic Safety Administration
Safety Assurance
Office of Vehicle Safety Compliance
400 Seventh Street, S. W.
Room No. 6115 (NVS-220)
Washington, DC 20590

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Transportation Sciences Center

Approval Date: _____

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: _____

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TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. 301-CAL-03-05	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle Final Report of FMVSS 301 Compliance Testing of a 2003 Saturn Ion 4-Door Sedan NHTSA No. C30112		5. Report Date August 7, 2003 6. Performing Organization Code CAL
7. Author(s) Lawrence Q. Valvo, Project Engineer David J. Travale, Program Manager		8. Performing Organization Report No. 8655-F301-14
9. Performing Organization Name and Address Veridian Engineering 4455 Genesee Street Buffalo, New York 14225		10. Work Unit No. 11. Contract or Grant No. DTNH22-01-C-01025
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance (NVS-220) 400 Seventh St , S.W., Rm. 6115, Washington, D.C. 20590		13. Type of Report and Period Covered Final Test Report 14. Sponsoring Agency Code NVS-220
15. Supplementary Notes		

16. Abstract

Compliance tests were conducted on the subject 2003 Saturn Ion 4-Door Sedan in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-301-03 for the determination of FMVSS 301 compliance. For the purpose of acquiring information for applied research, two instrumented Anthropomorphic Test Devices (ATDs) were placed in the front occupant seating positions and various instrumentation was added to the test vehicle. Test failures identified were as follows:

The test vehicle appeared to comply with all requirements of FMVSS 301 "Fuel System Integrity."

17. Key Words Compliance Testing Safety Engineering FMVSS 301	18. Distribution Statement Copies of this report are available from: NHTSA Technical Reference Division Room 5108 (NPO-230), 400 Seventh , S.W., Washington, D.C. 20590 Telephone No. (202) 366-4946

19. Security Classif. (of this report) UNCLASSIFIED	20. Security Classif. (of this page) UNCLASSIFIED	21. No. of Pages 40	22. Price

TABLE OF CONTENTS

SECTION 1

PURPOSE OF COMPLIANCE TEST

This 30 mph rear moving barrier impact test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 301 Compliance Test Program conducted for the National Highway Traffic Safety Administration (NHTSA) by Veridian Engineering under Contract No. DTNH22-01-C-01025. The purpose of this test was to determine if the subject vehicle, a 2003 Saturn Ion 4-Door Sedan, meets the performance requirements of FMVSS No. 301, "Fuel System Integrity." This compliance test was conducted using the requirements found in the OVSC Laboratory Test Procedure No. TP-301-03, dated February 28, 2003.

SECTION 2

COMPLIANCE TEST RESULTS SUMMARY

A 1431.5 kg 2003 Saturn Ion 4-Door Sedan was impacted from the rear by an 1797 pound moving barrier at a velocity of 48.1 kph (29.9 mph). The test was performed by Veridian Engineering on August 7, 2003.

The test vehicle was equipped with a 51.5 liter fuel tank which was filled to 92 percent capacity with stoddard fluid prior to impact. Additional ballast was not required to achieve vehicle test weight. For the purpose of acquiring information for applied research, one instrumented Part 572 E 50th percentile male Anthropomorphic Test Device (ATD) and one instrumented Part 572 O 5th percentile female ATD were placed in the front occupant seating positions and various instruments were added to the test vehicle. Research data is presented in a separate report.

The crash event was recorded by ten high-speed cameras and one real-time camera. Camera locations and other pertinent camera information are found on pages 3-9 and 3-10 of this report. Pre- and post-test photographs of the vehicle can be found in Appendix A.

There was no fuel system fluid spillage following the impact or during any portion of the static rollover test. The average vehicle longitudinal crush was 403 millimeters. The vehicle appeared to comply with all the requirements of FMVSS No. 301 "Fuel System Integrity."

SECTION 3

COMPLIANCE TEST DATA

DATA SHEET 1

TEST VEHICLE SPECIFICATIONS

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2003 Saturn Ion 4-Door Sedan

NHTSA No.: C30112 ; Color: Silver

Engine Data: 4 Cylinders; - CID; 2.2 Liters; - cc

Placement: - Longitudinal or In-Line; X Transverse or Lateral

Transmission Data: 5 Speeds; X Manual; - Automatic; - Overdrive

Final Drive: - Rear Wheel Drive; X Front Wheel Drive; - Four Wheel Drive

Major Options: - A/C; X Power Steering; X Power Brakes

- Power Windows; - Power Door Locks; X Tilt Wheel

Date Received: 04/10/03 ; Odometer Reading 187 km

Selling Dealer: Saturn of Orchard Park

& Address: 3559 Southwestern Blvd., Orchard Park, NY 14127

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Saturn Corporation

Date of Manufacture: 01/03

VIN: 1G8AF52F03Z138200

GVWR: 1644 kg; GAWR-FRONT: 833 kg; GAWR-REAR: 811 kg

DATA FROM VEHICLE'S TIRE LABEL:

Location of Placard on Vehicle: Glove compartment door

Recommended Tire Size: P185/70R14 S

* Recommended Cold Tire Pressure: FRONT: 210 kPa; REAR: 210 kPa

DATA FROM TIRE SIDEWALL:

Size of Tires on Test Vehicle: P185/70R14 87S Manufacturer:

Tire Pressure with Maximum Capacity Vehicle Load: FRONT: 300 kPa; REAR: 300 kPa

Type of Spare Tire: Temporary T115/70R14

VEHICLE CAPACITY DATA:

Type of Front Seats: - Bench; X Bucket; - Split Bench

Number of Occupants: 2 Front; 3 Rear; 5 Total

Vehicle Capacity Weight (VCW) = 408 kg

No. of Occupants x 68.04 kg = 340.2 kg

Rated Cargo/Luggage Weight (RCLW) = 67.8 kg

*Tire pressure used for test

DATA SHEET 2

PRE-TEST DATA

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (with maximum fluids)= UDW:

Right Front =	359.5	kg	Right Rear =	247.0	kg
Left Front =	364.5	kg.	Left Rear =	249.0	kg
TOTAL FRONT =	724.0	kg	TOTAL REAR =	496.0	kg

TOTAL DELIVERED WEIGHT = 1220.0 kg

% of Total Front of Vehicle Weight = 59.3% of Total Rear Weight = 40.7%

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight	=	1220.0	kg
Rated Cargo/Luggage Weight (RCLW)	=	67.8	kg
Weight of 2 p.572 Dummies, 74.4 kg	=	148.8	kg
TARGET TEST WEIGHT	=	1436.6	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 62.7 KG OF CARGO WEIGHT:

Right Front =	430.5	kg	Right Rear =	267.5	kg
Left Front =	449.5	kg	Left Rear =	284.0	kg
TOTAL FRONT =	880.0	kg	TOTAL REAR =	551.5	kg

TOTAL TEST WEIGHT = 1431.5 kg

% of Total Front of Vehicle Weight = 61.5% of Total Rear Weight = 38.5%

* Weight of Ballast Secured in Vehicle Trunk Area = 0 kg

Type of Ballast: None

Method of Securing Ballast: -

Vehicle Components Removed for Weight Reduction: Bumper cover, front door glass, rear door trim and glass, engine air intake ducts.

VEHICLE ATTITUDE (all dimension in millimeters):

AS DELIVERED:	RF	715	LF	714	RR	714	LR 711
AS TESTED:	RF	673	LF	663	RR	700	LR 698

Vehicle's Wheel Base: 2622 mm

Location of Vehicle's C.G.: 1010 millimeters rearward of front wheel center.

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 51.1 liters

Usable Capacity Figure Furnished by COTR = 51.5 liters

Test Volume Range (91 to 94% of Usable Capacity) = 46.87 to 48.41 liters

ACTUAL TEST VOLUME= 47.3 liters (with entire fuel system filled)

* Ballast weight includes the RCLW, the weight of drained vehicle fluids and the weight of any removed vehicle components less the weight of onboard instrumentation, cameras, and hardware.

DATA SHEET 2 (continued)

PRE-TEST DATA

FUEL SYSTEM DATA (continued):

Test Fluid Type: Stoddard Solution

Test Fluid Specific Gravity: 0.764

Test Fluid Kinematic Viscosity: 0.96 centistokes

Test Fluid Color: Orange ("red" is preferred)

Type of Vehicle Fuel Pump: Electric

Electric Fuel Pump Operation with Ignition Switch ON and Engine OFF -

When ignition is switched on without starting the engine, the fuel pump operates for several seconds then shuts off.

Details of Fuel System: Fuel filler is located on the left rear quarter panel aft of the rear axle; Fuel tank is located on the vehicle underbody beneath the rear seat and forward of the rear axle; Fuel lines are routed along the left side of the vehicle underbody.

Comments: None

DATA SHEET 3

MOVING BARRIER DATA

WEIGHT OF MOVING BARRIER:

Right Front	=	504.9 kg	Right Rear	=	393.7 kg.
Left Front	=	499.9 kg	Left Rear	=	398.3 kg
TOTAL FRONT	=	1004.8 kg	TOTAL REAR	=	792.0 kg

TOTAL BARRIER WEIGHT = 1796.8 kg

MOVING BARRIER DIMENSIONS:

Barrier Face Height: 1524 mm

Barrier Face Width: 1981 mm

Barrier Face Ground Clearance: 127 mm

Tread Width: 1511 mm

Wheel Base: 3048 mm

Location of C.G.: X: 1344 mm rearward of front wheel center.

Y: 0 mm from longitudinal-vertical plane of symmetry.

Z: 414 mm above ground.

MOVING BARRIER TIRES:

Manufacturer: Classic

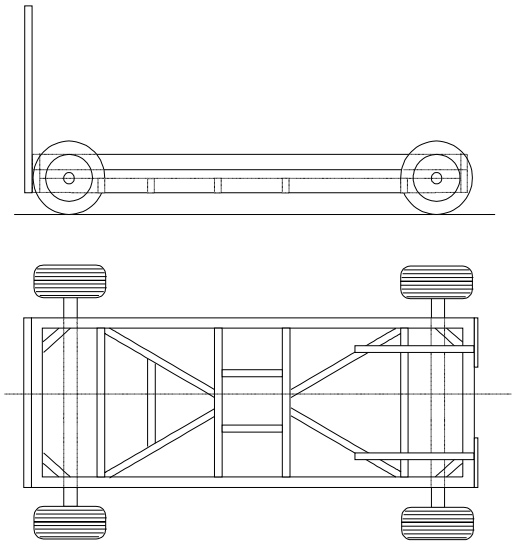
Model: Poly IV

Size: 215/75D15

Recommended Max Pressure: 240 kPa:

MOVING BARRIER ABORT SYSTEM:

Type: Trailing cable



DATA SHEET 4

POST TEST DATA

TYPE OF TEST:

Type of Test: Rear Barrier Impact Angle: 0º

Test Date: August 7, 2003 Time:: 11:58 Temperature: 26.1 ºC

Vehicle NHTSA No.: C30112 VIN: 1G8AF52F03Z138200

Required Impact Velocity Range: 46.51 to 48.12 kph

BARRIER IMPACT VELOCITY: (Speed traps within 5 feet of impact plane.)

Trap No. 1 = 48.1 kph; Trap No. 2 = 48.1 kph

Average Impact Speed = 48.1 kph

VEHICLE STATIC CRUSH:

Vehicle Length:

Pre-Test	Left =	4523	; C/L =	4683	Right =	4525
Post-Test	Left =	4112	; C/L =	4212	Right =	4198
Crush	Left =	411	; C/L =	471	Right =	327

AVERAGE = 403 millimeters

DATA SHEET 4 (continued)

POST TEST DATA

TEST VEHICLE NHTSA NO.: C30112 TEST DATE: August 7, 2003

Vehicle Mfgr./Make/Model: 2003 Saturn Ion 4-Door Sedan

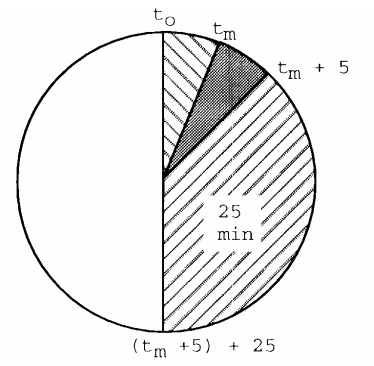
Test vehicle fuel tank filled to 91% to 94% of manufacturer's "usable" capacity and with electric fuel pump operating (if it will operate without engine operation). Part 572 test dummies located at each front designated seating position.

****

TEST VEHICLE IMPACT TYPE:

- Frontal (42.28 kph target velocity)
- Oblique (42.28 kph target velocity) with - ^{o} barrier face first contacting - (driver/passenger) side
- X Rear Moving Barrier (42.28 kph target velocity)
- Lateral Moving Barrier (32.19 kph target velocity)

FUEL SPILLAGE MEASUREMENT:



		ACTUAL	MAX ALLOWED
1.	From impact until vehicle motion ceases	0	28 g
2.	For five minute period after vehicle motion ceases	0	28 g.
3.	For next 25 minutes	0	28 g/min.

SOLVENT SPILLAGE DETAILS:

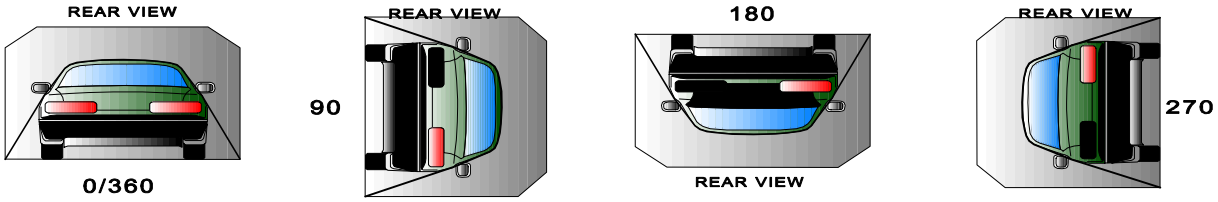
None

DATA SHEET 5

STATIC ROLLOVER TEST DATA

Table 7 FMVSS NO. 301 - STATIC ROLLOVER DATA SHEET

Vehicle: 2003 Saturn Ion 4-Door Sedan NHTSA No.: C30112



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Stage	Rotation Time (spec. 1 -3 min)				FMVSS 301 Hold Time		Total Time				Next Whole Minute Interval	
0º - 90º	1	minutes	14	seconds	5	minutes	6	minutes	14	seconds	7	minutes
90º - 180º	1	minutes	4	seconds	5	minutes	6	minutes	4	seconds	7	minutes
180º-270º	1	minutes	2	seconds	5	minutes	6	minutes	2	seconds	7	minutes
270º-360º	1	minutes	10	seconds	5	minutes	6	minutes	10	seconds	7	minutes

II. FMVSS 301 REQUIREMENTS: (Maximum allowable solvent spillage):

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
142 g	28 g	28 g	28 g

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0º - 90º	0	0	0	-
90º - 180º	0	0	0	-
180º-270º	0	0	0	-
270º-360º	0	0	0	-

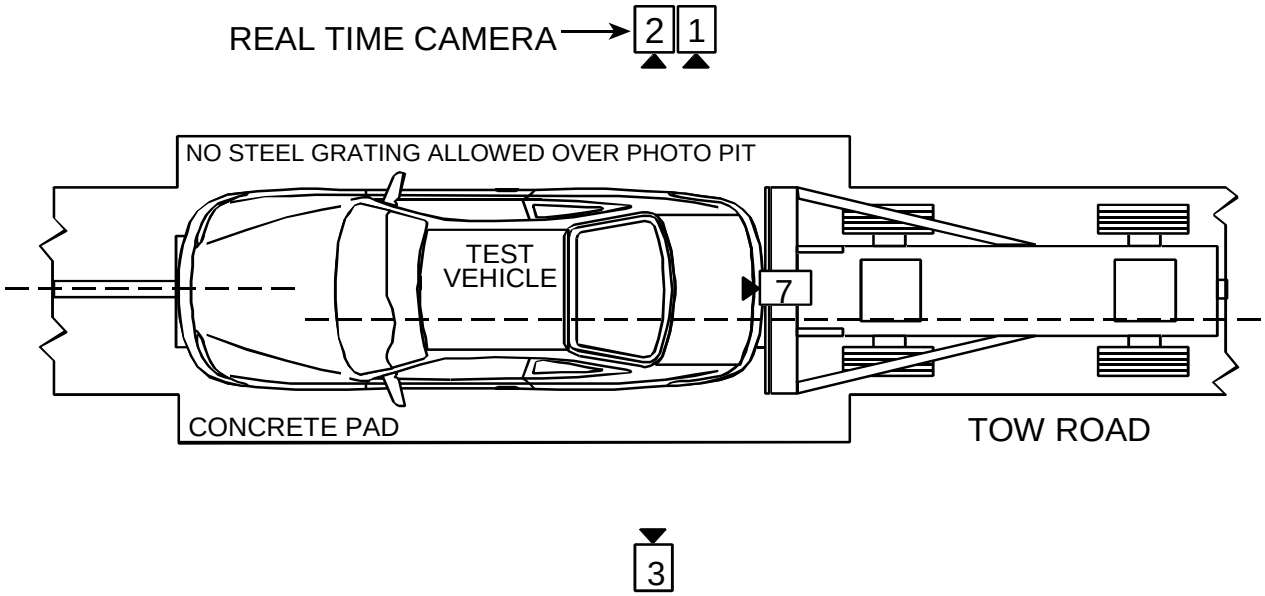
Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S):

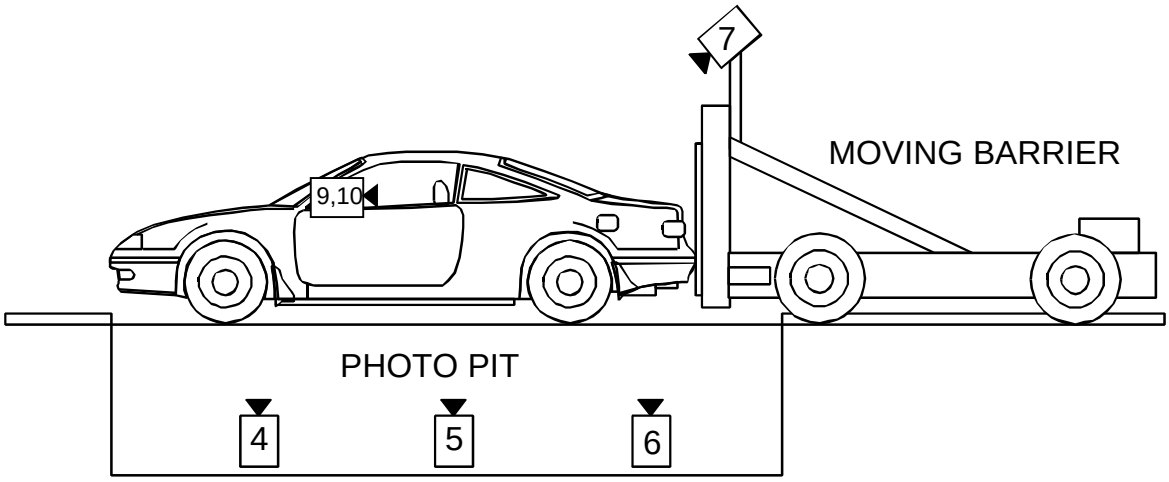
Rollover Stage	Spillage Location
0º - 90º	None
90º - 180º	None
180º-270º	None
270º-360º	None

DATA SHEET 6

HIGH SPEED CAMERA LOCATIONS



TOP VIEW



LEFT SIDE VIEW

DATA SHEET 6 (continued)

HIGH SPEED CAMERA LOCATIONS

NHTSA No. : C30112 Vehicle : 2003 Saturn Ion 4-Door Sedan

CAMERA NO.	VIEW	CAMERA POSITIONS (mm)*			ANGLE** (degrees)	LENS (mm)	SPEED (fps)
		X	Y	Z			
1	Real-Time Camera	-	-	-	-	-	24
2	Right Side View	15480	1690	1095	-1	35	1000
3	Left Side View	16512	2078	1000	1	35	1000
4	Vehicle Front Underbody View	0	3380	-1956	90	13	995
5	Vehicle Mid-Section Underbody View	0	1938	-1956	90	13	1005
6	Vehicle Rear Underbody View	0	992	-1956	90	13	1030
7	Moving Barrier View	0	0	2515	-105	13	1000
8	Overhead Overall View	-508	0	9804	-90	13	1000
9†	Onboard Driver View	855	2715	970	-6	8	1000
10†	Onboard Passenger View	855	2702	975	-5	8	1000

* X = film plant to monorail centerline (+ to left of rail)
Y = film plane to impact location (+ ahead of impact location)
Z = film plane to ground (+ above ground)
** = referenced to horizontal plane

† Research cameras.

Appendix A

PHOTOGRAPHS

LIST OF PHOTOGRAPHS

Figure A-1 PRE-TEST FRONT VIEW

Figure A-2 POST-TEST FRONT VIEW

Figure A-3 PRE-TEST LEFT SIDE VIEW

Figure A-4 POST-TEST LEFT SIDE VIEW

Figure A-5 PRE-TEST RIGHT SIDE VIEW

Figure A-6 POST-TEST RIGHT SIDE VIEW

Figure A-7 PRE-TEST REAR VIEW

Figure A-8 POST-TEST REAR VIEW

Figure A-9 PRE-TEST LEFT FRONT THREE-QUARTER VIEW

Figure A-10 POST-TEST LEFT FRONT THREE-QUARTER VIEW

Figure A-11 PRE-TEST RIGHT REAR THREE-QUARTER VIEW

Figure A-12 POST-TEST RIGHT REAR THREE-QUARTER VIEW

Figure A-13 PRE-TEST FRONT UNDERBODY VIEW

Figure A-14 POST-TEST FRONT UNDERBODY VIEW

Figure A-15 PRE-TEST REAR UNDERBODY VIEW

Figure A-16 POST-TEST REAR UNDERBODY VIEW

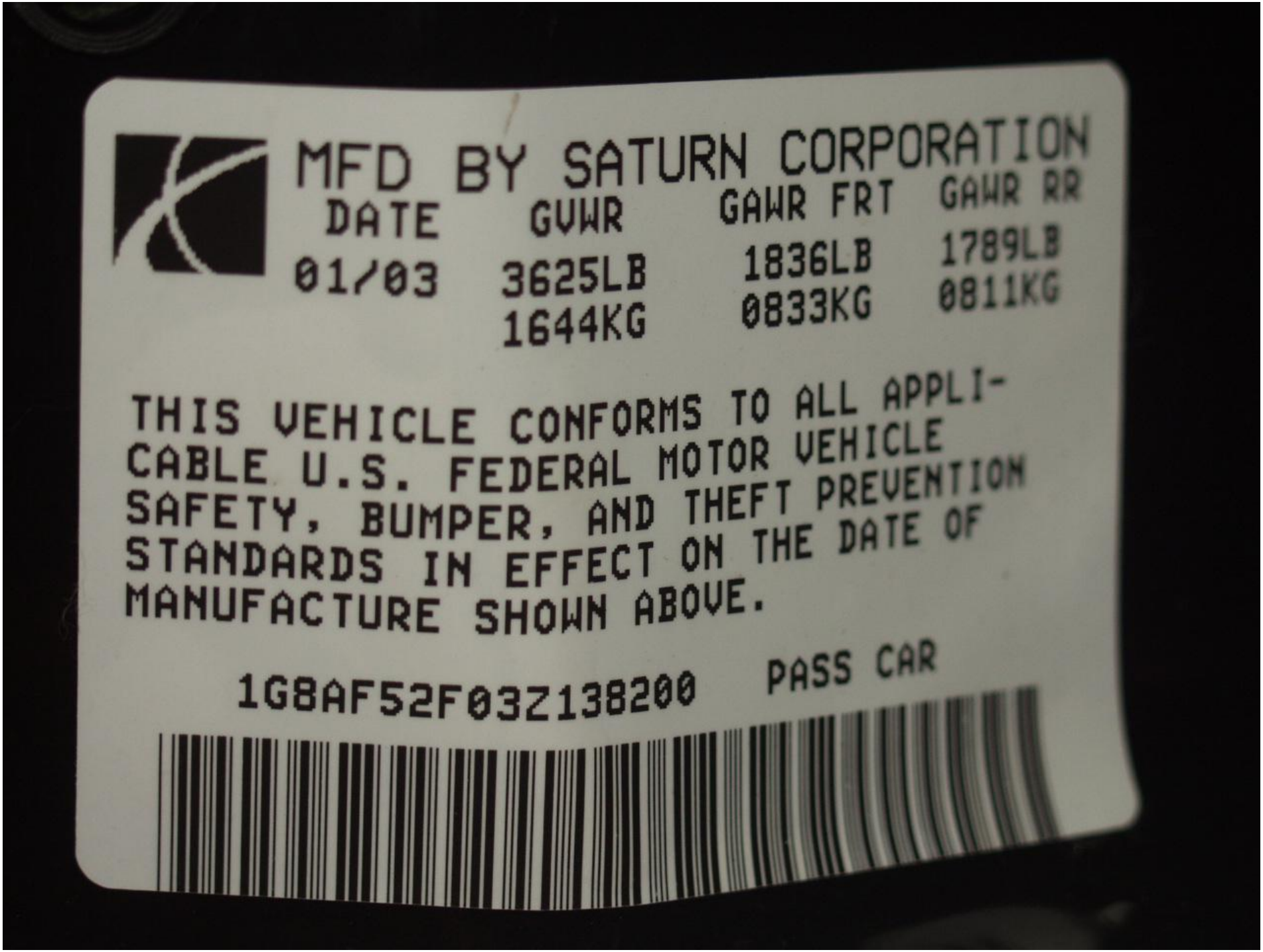


Figure A-17 CERTIFICATION PLACARD

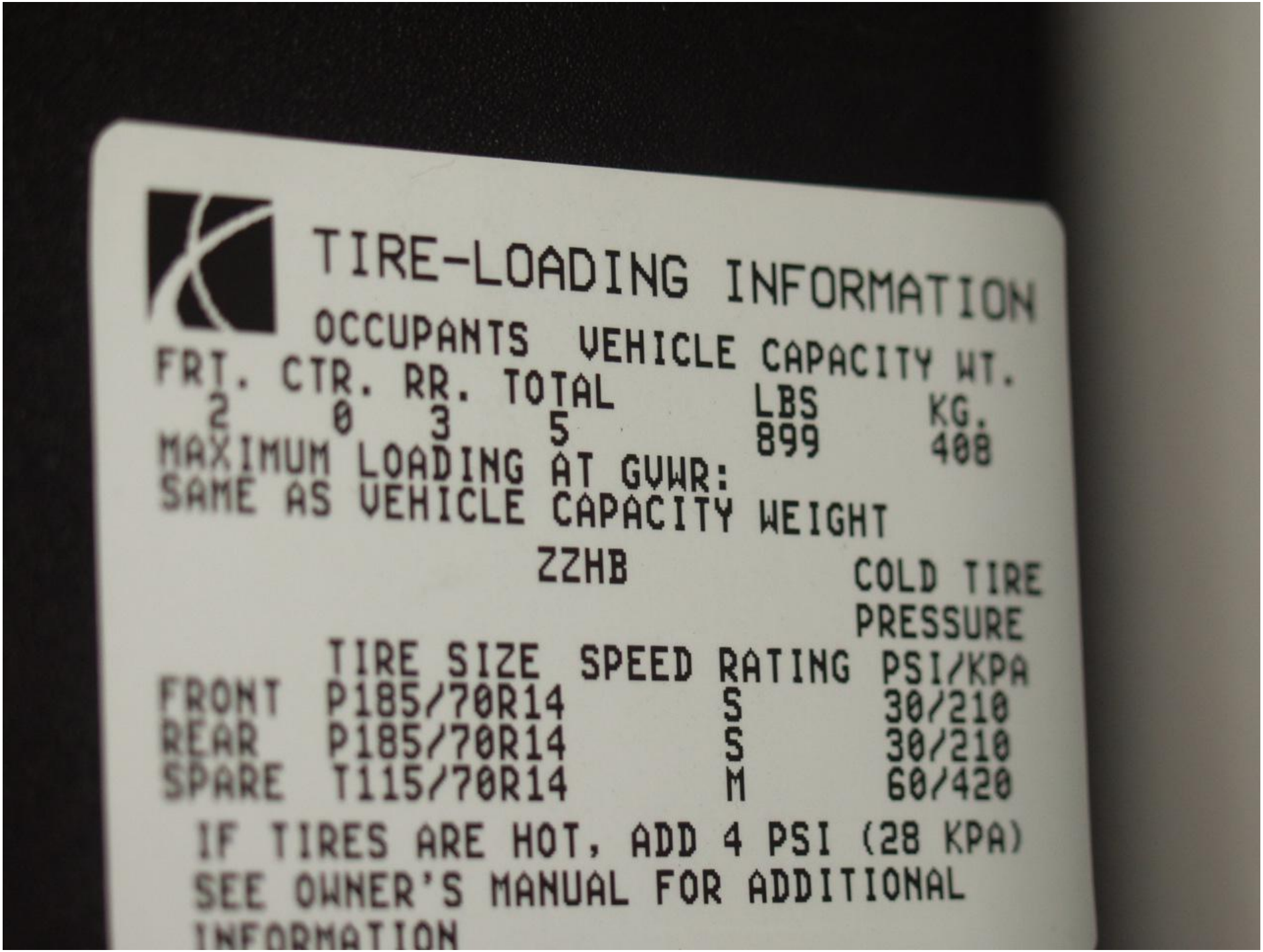


Figure A-18 TIRE PLACARD

Figure A-19 ROLLOVER 90º

Figure A-20 ROLLOVER 180º

Figure A-21 ROLLOVER 270º

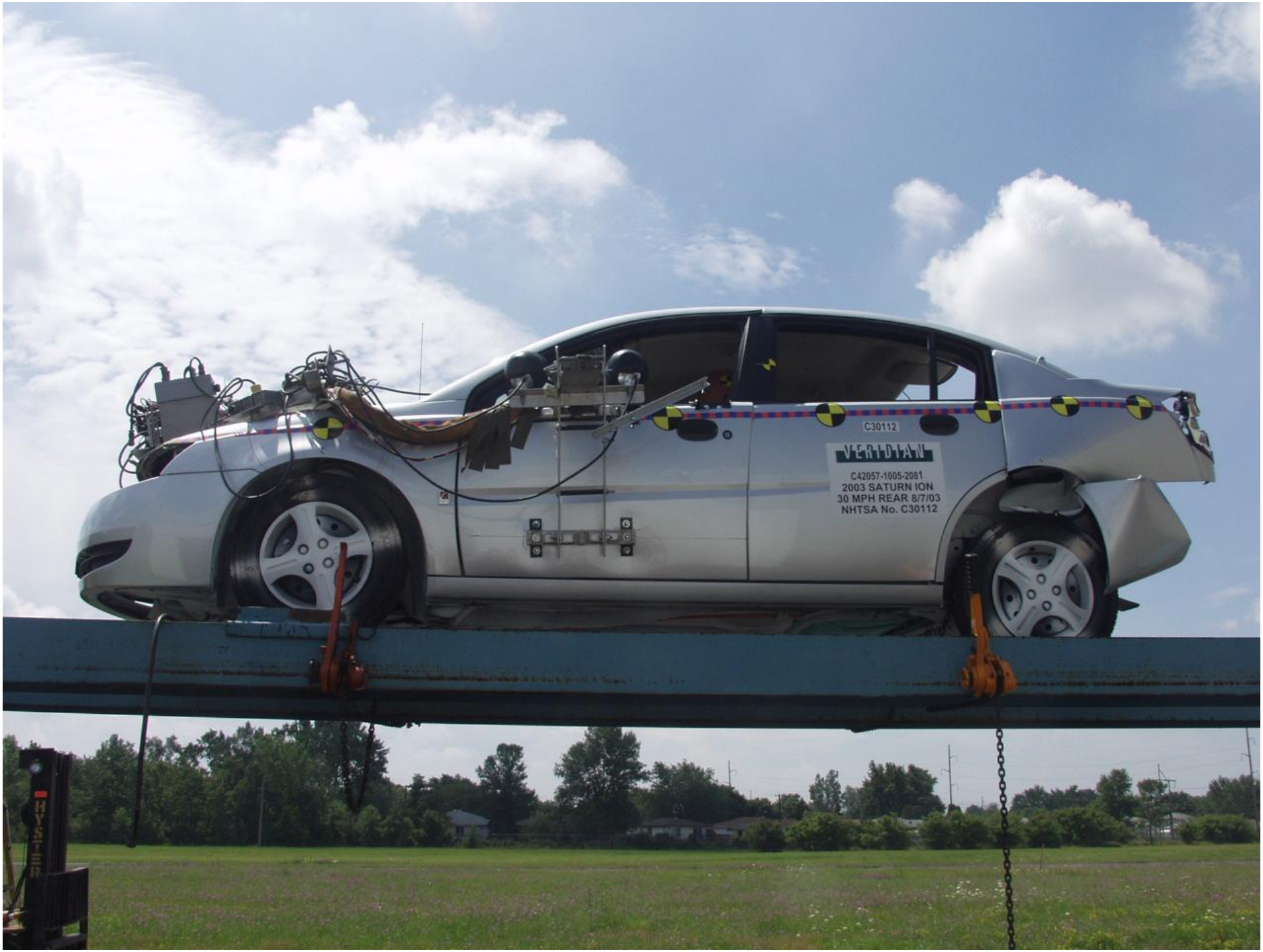


Figure A-22 ROLLOVER 360º

Stiffness Values and Test Data

Derived from

NHTSA Crash Test

#4984

2004 SATURN ION

Provided By

4N6XPRT StifCalcs®

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4N6XPRT SYSTEMS
8387 UNIVERSITY AVENUE
LA MESA CA 91941-3842
15R-030201SC02301

4N6XPRT Systems | 8387 University Avenue | La Mesa, CA 91942 | USA
(800) 266-9778 | (619) 464-3478 | FAX: (619) 464-2206 | Email: 4n6@4n6xprt.com

Similar Vehicle database reader

You entered: **2007 CHEVROLET COBALT**

The Similar Vehicle Year/Model list indicates the following are Similar Models

Year Range	Make	Model	Body Styles	Wheelbase
2003 - 2007	SATURN	ION	2D, 4D	103.2
Remarks: Ion 1, Ion 2, Ion 3. Coupe has 4 doors. RED LINE is performance package.				
2005 - 2010	CHEVROLET	COBALT	2D, 4D	103.3, 133
Remarks:				
2007 - 2009	PONTIAC	G5	2D	103.3
Remarks:				

Test Information

Test #	**4984**	NHTSA Test Reference Guide Version #	**V5**			
Test Date	**2004-03-18**	Contract #	**DTNH22-03-D-01002**			
Contract/Study Title	**VEHICLE SAFETY COMPLIANCE TESTING FOR OCCUPANT CRASH PROTECTION C40113**					
Test Objective(s)	**DETERMINE IF SUBJECT VEHICLE MEETS FMVSS 208 REQUREMENT IN CRASH TEST**					
Test Type	**FMVSS 208 OCCUPANT CRASH PROTECTION**	Configuration	**VEHICLE INTO BARRIER**			
Impact Angle	**0**	Side Impact Point	**0**	mm	**0.0**	inches
		Offset Distance	**0**	mm	**0.0**	inches
		Closing Speed	**40.0**	Km/Hr	**24.85**	MPH
Test Performer	**TRC OF OHIO**					
Test Reference #	**040318-1**					
Test Track Surface	**CONCRETE**	Condition	**DRY**			
Ambient Temperature	**22** C **71.6** F	Total Number of Curves	**74**			
Data Recorder Type	**DIGITAL DATA ACQUISITION**	Data Link	**UMBILICAL CABLE**			
Test Commentary	**NO COMMENTS**					

Fixed Barrier Information

Barrier Type	**RIGID**	Pole Barrier Diameter	**0**	mm	**0**	inches
Barrier Shape	**LOAD CELL BARRIER**					
Barrier Commentary	**36 LCB**					

2004 SATURN ION LEFT FRONT SEAT OCCUPANT

Test #	4984		
Vehicle #	1	Sex	MALE
Location	LEFT FRONT SEAT	Age	0
Position	CENTER POSITION	Height	0 mm 0.0 inches
Type	HYBRID III DUMMY	Weight	0.0 kg 0 pounds
Size	50 PERCENTILE		
Calibration Method	HYBRID III		
Occupant Manufacturer	HUMANOID, S/N: 229		
Occupant Modification	UNMODIFIED		
Occupant Description	NO COMMENTS		
Occupant Commentary			

Head

Head to -

Windshielder Header	390	mm	15.4	inches	Head Injury Criteria (HIC)	142	
WindShield	739	mm	29.1	inches	HIC Lower Time Interval (ms)	96.72	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	132.72	
Side Header	195	mm	7.7	inches			
Side Window	337	mm	13.3	inches			
Neck to Seatback	0	mm	0.0	inches			
First Contact Region (Head)	AIR BAG						
Second Contact Region (Head)							

Chest

Chest to -

Dash	710	mm	28.0	inches	Arm to Door	111	mm	4.4	inches
Steering Wheel	312	mm	12.3	inches	Hip to Door	105	mm	4.1	inches
Seatback	0	mm	0.0	inches					
Chest Severity Index	180				Pelvic Peak Lateral Acceleration (g's)	0			
Thoracic Trauma Index	0				Thorax Peak Acceleration (g's)	39.3			
Lap Belt Peak Load	0	Newtons	0.0	pound Force					
Shoulder Belt Peak Load	0	Newtons	0.0	pound Force					
First Contact Region (Chest/Abdomen)	AIR BAG								
Second Contact Region (Chest/Abdomen)	NONE								

Legs

Knees to Dash	143	mm	5.6	inches	Knees to Seatback	0	mm	0.0	inches
Left Femur Peak Load	-4157	Newtons	-934.5	pounds Force					
Right Femur Peak Load	-5248	Newtons	-1179.8	pounds Force					
First Contact Region (Legs)	DASHPANEL								
Second Contact Region (Legs)									

2004 SATURN ION LEFT FRONT SEAT OCCUPANT

Test #	4984					
Vehicle #	1	Sex	MALE			
Location	LEFT FRONT SEAT	Age	0			
Position	CENTER POSITION	Height	0	mm	0.0	inches
Type	HYBRID III DUMMY	Weight	0.0	kg	0	pounds
Size	50 PERCENTILE					

Calibration Method	HYBRID III
Occupant Manufacturer	HUMANOID, S/N: 229
Occupant Modification	UNMODIFIED
Occupant Description	NO COMMENTS
Occupant Commentary	

Restraints

Restraint # 1	FRONTAL AIRBAG
Mounted	STEERING WHEEL
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS

2004 SATURN ION RIGHT FRONT SEAT OCCUPANT

Test #	4984		
Vehicle #	1	Sex	MALE
Location	RIGHT FRONT SEAT	Age	0
Position	CENTER POSITION	Height	0 mm 0.0 inches
Type	HYBRID III DUMMY	Weight	0.0 kg 0 pounds
Size	50 PERCENTILE		
Calibration Method	HYBRID III		
Occupant Manufacturer	HUMANOID, S/N: 230		
Occupant Modification	UNMODIFIED		
Occupant Description	NO COMMENTS		
Occupant Commentary	CNTRH2=SUN VISOR, HEADER & A-PILLAR		

Head

Head to -

Windshielder Header	391	mm	15.4	inches	Head Injury Criteria (HIC)	259	
WindShield	720	mm	28.3	inches	HIC Lower Time Interval (ms)	106.96	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	142.96	
Side Header	200	mm	7.9	inches			
Side Window	333	mm	13.1	inches			
Neck to Seatback	0	mm	0.0	inches			
First Contact Region (Head)	AIR BAG						
Second Contact Region (Head)							

Chest

Chest to -

Dash	531	mm	20.9	inches	Arm to Door	94	mm	3.7	inches
Steering Wheel	0	mm	0.0	inches	Hip to Door	104	mm	4.1	inches
Seatback	0	mm	0.0	inches					
Chest Severity Index	191				Pelvic Peak Lateral Acceleration (g's)	0			
Thoracic Trauma Index	0				Thorax Peak Acceleration (g's)	34.6			
Lap Belt Peak Load	0	Newtons	0.0	pound Force					
Shoulder Belt Peak Load	0	Newtons	0.0	pound Force					
First Contact Region (Chest/Abdomen)	AIR BAG								
Second Contact Region (Chest/Abdomen)	NONE								

Legs

Knees to Dash	150	mm	5.9	inches	Knees to Seatback	0	mm	0.0	inches
Left Femur Peak Load	-6390	Newtons	-1436.5	pounds Force					
Right Femur Peak Load	-5789	Newtons	-1301.4	pounds Force					
First Contact Region (Legs)	DASHPANEL								
Second Contact Region (Legs)									

2004 SATURN ION RIGHT FRONT SEAT OCCUPANT

Test #	4984					
Vehicle #	1		Sex	MALE		
Location	RIGHT FRONT SEAT		Age	0		
Position	CENTER POSITION		Height	0	mm 0.0	inches
Type	HYBRID III DUMMY		Weight	0.0	kg 0	pounds
Size	50 PERCENTILE					

Calibration Method	HYBRID III
Occupant Manufacturer	HUMANOID, S/N: 230
Occupant Modification	UNMODIFIED
Occupant Description	NO COMMENTS
Occupant Commentary	CNTRH2=SUN VISOR, HEADER & A-PILLAR

Restraints

Restraint # 1	FRONTAL AIRBAG
Mounted	DASH PANEL - MID
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS

Vehicle 1 2004 SATURN ION

Test #	4984		
VIN	1G8AF52F54Z155463	NHTSA Test Vehicle Number	1
Year	2004	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	SATURN	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	ION	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	2.2 Liter	Transmission	MANUAL - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	UNMODIFIED		
Vehicle Commentary			

Vehicle Length	4648	mm	183.0	inches	CG behind Front Axle	1169	mm	46.0	inches
Vehicle Width	1695	mm	66.7	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2615	mm	103.0	inches	Total Length of Indentation	1505	mm	59.3	inches
Vehicle Test Weight	1444	KG	3183	pounds	Maximum Static Crush Depth	371	mm	14.6	inches
					Pre-Impact Speed	40	kph	24.9	mph

Vehicle Damage Index: 12FDEW2 — Principal Direction of Force: 0

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	253	mm	10.0	inches
DPD 2	323	mm	12.7	inches
DPD 3	371	mm	14.6	inches
DPD 4	358	mm	14.1	inches
DPD 5	314	mm	12.4	inches
DPD 6	235	mm	9.3	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	174.1	inches	164.2	inches	10.0	inches
	4423	mm	4170	mm	253	mm
Centerline	183.0	inches	167.3	inches	15.7	inches
	4648	mm	4250	mm	398	mm
Right Bumper Corner	174.3	inches	165.1	inches	9.3	inches
	4428	mm	4193	mm	235	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
0.0	NOT APPLICABLE	0.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
NOT APPLICABLE	0.0	NOT APPLICABLE
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 1 2004 SATURN ION

Test #	4984		
VIN	1G8AF52F54Z155463	NHTSA Test Vehicle Number	1
Year	2004	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	SATURN	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	ION	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	2.2 Liter	Transmission	MANUAL - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	UNMODIFIED		
Vehicle Commentary			

Vehicle Length	4648	mm	183.0	inches	CG behind Front Axle	1169	mm	46.0	inches
Vehicle Width	1695	mm	66.7	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2615	mm	103.0	inches	Total Length of Indentation	1505	mm	59.3	inches
Vehicle Test Weight	1444	KG	3183	pounds	Maximum Static Crush Depth	371	mm	14.6	inches
					Pre-Impact Speed	40	kph	24.9	mph

Vehicle Damage Index: 12FDEW2 — Principal Direction of Force: 0

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from the Rear Vehicle Surface forward.)

Left Side				Centerline				Right Side			
Pre-Test		Post-Test		Pre-Test		Post-Test		Pre-Test		Post-Test	
mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches
				Length of Vehicle at Centerline							
				4648	183.0	4250	167.3				
				Engine Block							
				484	19.1	484	19.1				
4423	174.1	4170	164.2	Front Bumper Corner				4428	174.3	4193	165.1
				Front of Engine							
				3888	153.1	3783	148.9				
3523	138.7	3532	139.1	Firewall				3548	139.7	3512	138.3
				3558	140.1	3571	140.6				
3148	123.9	3144	123.8	Upper Leading Edge of Door				3140	123.6	3143	123.7
3138	123.5	3120	122.8	Lower Leading Edge of Door				3134	123.4	3118	122.8
3138	123.5	3131	123.3	Bottom of 'A' Post				3134	123.4	3134	123.4
2152	84.7	2143	84.4	Upper Trailing Edge of Door				2149	84.6	2151	84.7
2198	86.5	2172	85.5	Lower Trailing Edge of Door				2185	86.0	2170	85.4
				Steering Column							
				2753	108.4	2770	109.1				
				Center of Seering Column to 'A' Post (Horizontal)							
				333	13.1	312	12.3				
				Center of Steering Column to Headliner (Vertical)							
				455	17.9	442	17.4				

2004 SATURN ION

NHTSA Crash Test - #4984 - Front Impact

Pre/Post Depths - Vehicle Width - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 3183 pounds
Vehicle Closing Speed = 24.9 mph
Test Crush Length = 66.7 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	10.0	15.7	9.3	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 9.3 inches					273.1
Using a Rated No Damage Speed of	2.5mph	229.8	220.9	119.5	
Using a Rated No Damage Speed of	5.0mph	408.1	174.3	477.9	
Using a Rated No Damage Speed of	7.5mph	535.1	133.1	1075.4	
Using a Rated No Damage Speed of	10.0mph	610.7	97.6	1911.8	
Average Crush = 12.6 inches					148.8
Using a Rated No Damage Speed of	2.5mph	169.6	120.4	119.5	
Using a Rated No Damage Speed of	5.0mph	301.3	94.9	477.9	
Using a Rated No Damage Speed of	7.5mph	395.0	72.5	1075.4	
Using a Rated No Damage Speed of	10.0mph	450.8	53.1	1911.8	
Maximum Crush = 15.7 inches					95.8
Using a Rated No Damage Speed of	2.5mph	136.1	77.5	119.5	
Using a Rated No Damage Speed of	5.0mph	241.8	61.2	477.9	
Using a Rated No Damage Speed of	7.5mph	317.0	46.7	1075.4	
Using a Rated No Damage Speed of	10.0mph	361.8	34.2	1911.8	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

****

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	15.7	28.7	3.9	13.4

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 15.7

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

2004 SATURN ION

NHTSA Crash Test - #4984 - Front Impact

Pre/Post Depths - Indention Length - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 3183 pounds
Vehicle Closing Speed = 24.9 mph
Test Crush Length = 59.3 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	10.0	15.7	9.3	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 9.3 inches					307.6
Using a Rated No Damage Speed of	2.5mph	258.8	248.8	134.6	
Using a Rated No Damage Speed of	5.0mph	459.7	196.3	538.3	
Using a Rated No Damage Speed of	7.5mph	602.7	150.0	1211.1	
Using a Rated No Damage Speed of	10.0mph	687.8	109.9	2153.1	
Average Crush = 12.6 inches					167.6
Using a Rated No Damage Speed of	2.5mph	191.0	135.5	134.6	
Using a Rated No Damage Speed of	5.0mph	339.3	106.9	538.3	
Using a Rated No Damage Speed of	7.5mph	444.8	81.7	1211.1	
Using a Rated No Damage Speed of	10.0mph	507.7	59.9	2153.1	
Maximum Crush = 15.7 inches					107.9
Using a Rated No Damage Speed of	2.5mph	153.3	87.3	134.6	
Using a Rated No Damage Speed of	5.0mph	272.3	68.9	538.3	
Using a Rated No Damage Speed of	7.5mph	357.0	52.6	1211.1	
Using a Rated No Damage Speed of	10.0mph	407.4	38.6	2153.1	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

****

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	15.7	28.7	3.9	13.4

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 15.7

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

2004 SATURN ION

NHTSA Crash Test - #4984 - Front Impact

Damage Profile Distances - Vehicle Width - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 3183 pounds
Vehicle Closing Speed = 24.9 MPH
Test Crush Length = 66.7 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	10.0	12.7	14.6	14.1	12.4	9.3	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 9.3 inches					273.1
Using a Rated No Damage Speed of	2.5mph	229.8	220.9	119.5	
Using a Rated No Damage Speed of	5.0mph	408.1	174.3	477.9	
Using a Rated No Damage Speed of	7.5mph	535.1	133.1	1075.4	
Using a Rated No Damage Speed of	10.0mph	610.7	97.6	1911.8	
Average Crush = 12.7 inches					146.4
Using a Rated No Damage Speed of	2.5mph	168.3	118.5	119.5	
Using a Rated No Damage Speed of	5.0mph	298.9	93.5	477.9	
Using a Rated No Damage Speed of	7.5mph	391.9	71.4	1075.4	
Using a Rated No Damage Speed of	10.0mph	447.2	52.3	1070.1	
Maximum Crush = 14.6 inches					110.8
Using a Rated No Damage Speed of	2.5mph	146.4	89.6	119.5	
Using a Rated No Damage Speed of	5.0mph	260.0	70.7	477.9	
Using a Rated No Damage Speed of	7.5mph	340.9	54.0	1075.4	
Using a Rated No Damage Speed of	10.0mph	389.0	39.6	1911.8	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

****

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	14.6	27.7	2.8	10.2

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 16.9

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

2004 SATURN ION

NHTSA Crash Test - #4984 - Front Impact

Damage Profile Distances - Indention Length - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 3183 pounds
Vehicle Closing Speed = 24.9 MPH
Test Crush Length = 59.3 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	10.0	12.7	14.6	14.1	12.4	9.3	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 9.3 inches					307.6
Using a Rated No Damage Speed of	2.5mph	258.8	248.8	134.6	
Using a Rated No Damage Speed of	5.0mph	459.7	196.3	538.3	
Using a Rated No Damage Speed of	7.5mph	602.7	150.0	1211.1	
Using a Rated No Damage Speed of	10.0mph	687.8	109.9	2153.1	
Average Crush = 12.7 inches					164.9
Using a Rated No Damage Speed of	2.5mph	189.5	133.4	134.6	
Using a Rated No Damage Speed of	5.0mph	336.6	105.3	538.3	
Using a Rated No Damage Speed of	7.5mph	441.3	80.4	1211.1	
Using a Rated No Damage Speed of	10.0mph	503.7	58.9	1205.2	
Maximum Crush = 14.6 inches					124.8
Using a Rated No Damage Speed of	2.5mph	164.8	101.0	134.6	
Using a Rated No Damage Speed of	5.0mph	292.8	79.6	538.3	
Using a Rated No Damage Speed of	7.5mph	383.9	60.8	1211.1	
Using a Rated No Damage Speed of	10.0mph	438.1	44.6	2153.1	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

****

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	14.6	27.7	2.8	10.2

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 16.9

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

4N6XPRT StifCalcs®

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2005 - 2010
Make: CHEVROLET
Model: COBALT

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
6084	2007 CHEVROLET COBALT FOUR DOOR SEDAN	5.0	14.4	24.7	252.3	69.2	460.0	108.7	17.0
6685	2009 CHEVROLET COBALT FOUR DOOR SEDAN	5.0	13.4	23.2	252.3	68.6	463.7	111.6	16.1
5188	2004 SATURN ION FOUR DOOR SEDAN	5.0	19.7	29.6	262.3	65.3	526.5	94.6	17.7
7443	2006 CHEVROLET COBALT TWO DOOR COUPE	5.0	5.6	14.9	282.8	99.6	401.5	225.4	15.8
4984	2004 SATURN ION FOUR DOOR SEDAN	5.0	12.7	24.9	299.4	93.8	477.9	147.0	19.5
5326	2005 CHEVROLET COBALT FOUR DOOR SEDAN	5.0	16.9	34.9	343.0	121.4	484.7	165.3	28.8
4487	2003 SATURN ION FOUR DOOR SEDAN	5.0	18.0	34.8	434.4	143.6	657.0	195.8	26.9
	Average (AVG)				**303.8**	**94.5**	**495.9**	**149.8**	**20.3**
	Minimum (MIN)				**252.3**	**65.3**	**401.5**	**94.6**	**15.8**
	Maximum (MAX)				**434.4**	**143.6**	**657.0**	**225.4**	**28.8**
	Standard Deviation (STDev-sample)				**65.9**	**29.8**	**80.2**	**48.8**	**5.4**
	Number of Tests (n)			**7**					

4N6XPRT StifCalcs®

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2005 - 2010
Make: CHEVROLET
Model: COBALT

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Width Values G	Width Values Kv	Crush Factor
5188	2004 SATURN ION FOUR DOOR SEDAN	5.0	24.5	29.6	211.0	42.3	526.5	61.2	14.3
6084	2007 CHEVROLET COBALT FOUR DOOR SEDAN	5.0	16.2	24.7	223.8	54.4	460.0	85.5	15.1
6685	2009 CHEVROLET COBALT FOUR DOOR SEDAN	5.0	15.0	23.2	224.7	54.5	463.7	88.6	14.3
4984	2004 SATURN ION FOUR DOOR SEDAN	5.0	15.7	24.9	242.2	61.4	477.9	96.2	15.8
7443	2006 CHEVROLET COBALT TWO DOOR COUPE	5.0	5.6	14.9	282.8	99.6	401.5	225.4	15.8
5326	2005 CHEVROLET COBALT FOUR DOOR SEDAN	5.0	17.5	34.9	331.6	113.5	484.7	154.6	27.9
4487	2003 SATURN ION FOUR DOOR SEDAN	5.0	22.2	34.8	352.5	94.6	657.0	128.9	21.8
	Average (AVG)				**267.0**	**74.3**	**495.9**	**120.1**	**17.8**
	Minimum (MIN)				**211.0**	**42.3**	**401.5**	**61.2**	**14.3**
	Maximum (MAX)				**352.5**	**113.5**	**657.0**	**225.4**	**27.9**
	Standard Deviation (STDev-sample)				**56.5**	**27.6**	**80.2**	**55.6**	**5.1**
	Number of Tests (n)			**7**					

Expert VIN DeCoder®

Version Number 3.0.2.4

DeCoded VIN: **2FTCF15YXGCA80524**

Model:	**1986 Ford F150 4x2 Regular Cab Pick-Up**
Engine Size:	**4.9 L/ 300 cu.in.**
Engine Description:	**In-line 6 cylinder with Overhead Cam**
Horse Power:	**150 @ 3400 rpm**
Torque:	**260 lb-ft at 2000 rpm**
Injection System:	**Electronic Fuel Injection (EFI)**
PSI:	**35-45 psi**
Ignition:	**electronic**
Manufacturer:	**Ford**
Assembly Plant:	**Oakville, Ontario (Canada)**
Drive Wheels:	**This is a Rear Wheel Drive vehicle**

The First through Third characters (2FT) indicate a Ford Truck made in Canada

The Fourth character (C) indicates a GVWR of 4001-5000 lbs.

The Fifth through Seventh characters (F15) indicate a F150 4x2 and a Regular Cab Pick-Up

The Eighth character (Y) indicates the OEM engine: 4.9 L/ 300 cu.in., L6, OHC

The Ninth character (the check digit) is entered as X.
The VIN appears Valid, the calculated value is 10. (The display Character should be X)

The Tenth character (G) indicates the model year 1986

The Eleventh character (C) indicates the vehicle was made in the assembly plant in Oakville, Ontario (Canada)

The Twelfth through Seventeenth characters (A80524) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.1.0.6

PROVIDED BY:
4N6XPRT Systems
8387 University Avenue
La Mesa CA 91941

9/17/2015

1986 FORD F150 LWB 2 DOOR 4X2 PICKUP

Curb Weight:	3507	lbs.	1591	kg.
Curb Weight Distribution - Front:	58	% Rear:	42	%
Gross Vehicle Weight Rating:	5450	lbs.	2472	kg.
Number of Tires on Vehicle:	4			
Drive Wheels:	REAR			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	208	17.33	5.28
Wheelbase:	133	11.08	3.38
Front Bumper to Front Axle:	29	2.42	0.74
Front Bumper to Front of Front Well:	10	0.83	0.25
Front Bumper to Front of Hood:	4	0.33	0.10
Front Bumper to Base of Windshield:	51	4.25	1.30
Front Bumper to Top of Windshield:	77	6.42	1.96
Rear Bumper to Rear Axle:	46	3.83	1.17
Rear Bumper to Rear of Rear Well:	32	2.67	0.81
Rear Bumper to Rear of Trunk:	6	0.50	0.15
Rear Bumper to Base of Rear Window:	101	8.42	2.57
Width Dimensions			
Maximum Width:	77	6.42	1.96
Front Track:	66	5.50	1.68
Rear Track:	66	5.50	1.68
Vertical Dimensions			
Height:	72	6.00	1.83
Ground to -			
Front Bumper (Top)	22	1.83	0.56
Headlight - center	34	2.83	0.86
Hood - top front:	42	3.50	1.07
Base of Windshield	49	4.08	1.24
Rear Bumper - top:	25	2.08	0.64
Trunk - top rear:	51	4.25	1.30
Base of Rear Window:	53	4.42	1.35

1986 FORD F150 LWB 2 DOOR 4X2 PICKUP

Interior Dimensions

	Inches	Feet	Meters
Front Seat Shoulder Width	65	5.42	1.65
Front Seat to Headliner	40	3.33	1.02
Front Leg Room - seatback to floor (max)	41	3.42	1.04
Rear Seat Shoulder Width			
Rear Seat to Headliner			
Front Leg Room - seatback to floor (min)			

Seatbelts: 3pt LAP & SHOULDER - front, None or Unknown - rear

Airbags: AIRBAGS UNKNOWN

Steering Data

Turning Circle (Diameter)	564	47.00	14.33
Steering Ratio:	24.00:1		
Wheel Radius:	12	1.00	0.30
Tire Size (OEM):	P235/75X15XL		

Acceleration & Braking Information

Brake Type: FRONT DISC - REAR DRUM

ABS System: ABS UNKNOWN

Braking, 60 mph to 0 (Hard pedal, no skid, dry pavement):

d = 180.0 ft t = 4.1 sec a = -21.5 ft/sec² G-force = -0.67

Acceleration:

0 to 30mph	t =	4.9	sec	a =	9.0	ft/sec²	G-force = 0.28
0 to 60mph	t =	14.2	sec	a =	6.2	ft/sec²	G-force = 0.19
45 to 65mph	t =	9.7	sec	a =	3.0	ft/sec²	G-force = 0.09

Transmission Type: 3spd MANUAL

Notes:

Federal Bumper Standard Requirements: No Requirement mph

This vehicles Rated Bumper Strength: 5 mph

N.S.D.C = 1980 - 1986

1986 FORD F150 LWB 2 DOOR 4X2 PICKUP

Other Information

Tip-Over Stability Ratio =	1.19	Reasonably Stable
NHTSA Star Rating (calculated)		***

Center of Gravity (No Load):

Inches behind front axle	=	55.86
Inches in front of rear axle	=	77.14
Inches from side of vehicle	=	38.50
Inches from ground	=	27.68
Inches from front corner	=	93.19
Inches from rear corner	=	129.02
Inches from front bumper	=	84.86
Inches from rear bumper	=	123.14

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	2269.21	lb*ft*sec²
Pitch Moment of Inertia	=	2270.84	lb*ft*sec²
Roll Moment of Inertia	=	536.54	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	78.7	deg
Angle Front of Hood to Windshield Base	=	8.5	deg
Angle Front of Hood to Windshield Top	=	21.0	deg
Angle of Windshield	=	38.9	deg
Angle of Steering Tires at Max Turn	=	27.0	deg

First Approximation Crush Factors:

Speed Equivalent (mph) of Kinetic Energy (KE) used in causing crush of indentation may be evaluated using the following formula, the appropriated Crush Factor (CF), and Maximum Indentation Depth (MID), in feet:

$$V(mph) = \sqrt{(30 * CF * MID)}$$

KE Equivalent Speed (Front/Rear/Side)	=	21 CF
Bullet vehicle IMPACT SPEED estimation based on TARGET VEHICLE damage ONLY (Tested for Rear/Side Impact only)	=	27 CF

These CF values are based upon analysis of NHTSA Barrier Crash data, and from over 1000 vehicle accidents where independant evaluation of speed was possible. (These are NOT 'A', 'B', 'C', or 'G' values)

The rear Impact data with more then 2-3 inches of crush damage should be looked at carefully, since some vehicles have very weak trunk & fender strength. Therefore, on some cars, especially GM, you estimate from the rear crush data may be high by as much as 4-5 mph (on a crush of 18 inches).

4N6XPRT Systems
Expert System Software for Litigation

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Toll Free: 1- 800-266-9778

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E-Mail: 4n6@4n6xprt.com

There are NO Full Size Pickup Rear Impact Tests in the NHTSA Crash Test database.

Therefore, NO vehicle specific nor "CLASS" vehicle Stiffness Values can be provided.

Expert VIN DeCoder®

Version Number 3.4.0.2

DeCoded VIN: 2G2WP552581120328

Model:	2008 Pontiac Grand Prix 4 Door Sedan
Engine Size:	3.8 L/ 231 cu.in.
Engine Description:	V6 Cylinder w/ Overhead Valves
Horse Power:	205 @ 5200 rpm
Torque:	230lb-ft at 4000 rpm
Injection System:	Multiport Fuel Injection (MFI)
PSI:	41-47 psi
Ignition:	Electronic
Manufacturer:	Pontiac, GM Canada
Assembly Plant:	Oshawa (T&B), ON
Drive Wheels:	This is a Front Wheel Drive vehicle w/ Manual Belts W/Driver & Passenger and Side Air Bags

The First through Third characters (2G2) indicate a Pontiac Car made in Canada

The Fourth through Fifth characters (WP) indicate a Grand Prix

The Sixth character (5) indicates a 4 Door Sedan

The Seventh character (5) indicates Manual Belts W/Driver & Passenger and Side Air Bags

The Eighth character (2) indicates the OEM engine: 3.8 L/ 231 cu.in., V6,OHV

The Ninth character (the check digit) is entered as 5.
The VIN appears Valid, the calculated value is 5.

The Tenth character (8) indicates the model year 2008

The Eleventh character (1) indicates the vehicle was made in the assembly plant in Oshawa (T&B), ON

The Twelfth through Seventeenth characters (120328) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.5.1.0

PROVIDED BY:

4N6XPRT Systems

8387 University Avenue

La Mesa CA 91941

9/4/2015

2008 PONTIAC GRAND PRIX 4 DOOR SEDAN

Curb Weight:		3515	lbs.	1594	kg.
Curb Weight Distribution -	Front:	63	% Rear:	37	%
Gross Vehicle Weight Rating:		4480	lbs.	2032	kg.
Number of Tires on Vehicle:		4			
Drive Wheels:		FRONT			

	Inches	Feet	Meters
Horizontal Dimensions			
Total Length	198	16.50	5.03
Wheelbase:	110	9.17	2.79
Front Bumper to Front Axle:	44	3.67	1.12
Front Bumper to Front of Front Well:	28	2.33	0.71
Front Bumper to Front of Hood:	5	0.42	0.13
Front Bumper to Base of Windshield:	52	4.33	1.32
Front Bumper to Top of Windshield:	87	7.25	2.21
Rear Bumper to Rear Axle:	44	3.67	1.12
Rear Bumper to Rear of Rear Well:	28	2.33	0.71
Rear Bumper to Rear of Trunk:	5	0.42	0.13
Rear Bumper to Base of Rear Window:	26	2.17	0.66
Width Dimensions			
Maximum Width:	72	6.00	1.83
Front Track:	62	5.17	1.57
Rear Track:	62	5.17	1.57
Vertical Dimensions			
Height:	56	4.67	1.42
Ground to -			
Front Bumper (Top)	22	1.83	0.56
Headlight - center	27	2.25	0.69
Hood - top front:	28	2.33	0.71
Base of Windshield	37	3.08	0.94
Rear Bumper - top:	24	2.00	0.61
Trunk - top rear:	41	3.42	1.04
Base of Rear Window:	43	3.58	1.09

2008 PONTIAC GRAND PRIX 4 DOOR SEDAN

Interior Dimensions

	Inches	Feet	Meters
Front Seat Shoulder Width	58	4.83	1.47
Front Seat to Headliner	39	3.25	0.99
Front Leg Room - seatback to floor (max)	42	3.50	1.07
Rear Seat Shoulder Width	58	4.83	1.47
Rear Seat to Headliner	37	3.08	0.94
Front Leg Room - seatback to floor (min)	37	3.08	0.94

Seatbelts: 3pt - front and rear

Airbags: FRONT SEAT AIRBAGS + OPTIONAL SIDE AIRBAGS

Steering Data

Turning Circle (Diameter)	444	37.00	11.28
Steering Ratio:	:1		
Wheel Radius:	13	1.08	0.33
Tire Size (OEM):	P225/60R16		

Acceleration & Braking Information

Brake Type: ALL DISC

ABS System: ALL WHEEL ABS - OPTIONAL

Braking, 60 mph to 0 (Hard pedal, no skid, dry pavement):

d = 126.0 ft t = 2.9 sec a = -30.7 ft/sec² G-force = -0.95

Acceleration:

0 to 30mph	t =	2.4	sec	a =	18.3	ft/sec²	G-force = 0.57
0 to 60mph	t =	6.6	sec	a =	13.3	ft/sec²	G-force = 0.41
45 to 65mph	t =	3.4	sec	a =	8.6	ft/sec²	G-force = 0.27

Transmission Type: 4spd AUTOMATIC

Notes:

Federal Bumper Standard Requirements: 2.5 mph

This vehicles Rated Bumper Strength: 2.5 mph

N.S.D.C = 2004 - 2008

2008 PONTIAC GRAND PRIX 4 DOOR SEDAN

Other Information

Tip-Over Stability Ratio =	1.41	Stable
NHTSA Star Rating (calculated)		****

Center of Gravity (No Load):

Inches behind front axle	=	40.70
Inches in front of rear axle	=	69.30
Inches from side of vehicle	=	36.00
Inches from ground	=	21.98
Inches from front corner	=	92.03
Inches from rear corner	=	118.88
Inches from front bumper	=	84.70
Inches from rear bumper	=	113.30

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	2414.45	lb*ft*sec²
Pitch Moment of Inertia	=	2330.85	lb*ft*sec²
Roll Moment of Inertia	=	482.70	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	50.2	deg
Angle Front of Hood to Windshield Base	=	10.8	deg
Angle Front of Hood to Windshield Top	=	17.6	deg
Angle of Windshield	=	25.9	deg
Angle of Steering Tires at Max Turn	=	28.4	deg

First Approximation Crush Factors:

Speed Equivalent (mph) of Kinetic Energy (KE) used in causing crush of indentation may be evaluated using the following formula, the appropriated Crush Factor (CF), and Maximum Indentation Depth (MID), in feet:

$$V(mph) = \sqrt{(30 * CF * MID)}$$

KE Equivalent Speed (Front/Rear/Side)	=	21 CF
Bullet vehicle IMPACT SPEED estimation based on TARGET VEHICLE damage ONLY (Tested for Rear/Side Impact only)	=	27 CF

These CF values are based upon analysis of NHTSA Barrier Crash data, and from over 1000 vehicle accidents where independant evaluation of speed was possible. (These are NOT 'A', 'B', 'C', or 'G' values)

The rear Impact data with more then 2-3 inches of crush damage should be looked at carefully, since some vehicles have very weak trunk & fender strength. Therefore, on some cars, especially GM, you estimate from the rear crush data may be high by as much as 4-5 mph (on a crush of 18 inches).

Stiffness Values and Test Data

Derived from

NHTSA Crash Test

#7488

2012 CHEVROLET IMPALA

Provided By

4N6XPRT StifCalcs®

Registered to:

4N6XPRT SYSTEMS
8387 UNIVERSITY AVENUE
LA MESA CA 91941-3842
15R-030201SC02301

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Similar Vehicle database reader

You entered: **2008 PONTIAC GRAND PRIX**

The Similar Vehicle Year/Model list indicates the following are Similar Models

Year Range	Make	Model	Body Styles	Wheelbase
2005 - 2009	BUICK	LACROSSE	4D	111.7
Remarks:				
2006 - 2008	PONTIAC	GRAND PRIX	2D, 4D	110.5
Remarks:				
2006 - 2007	CHEVROLET	MONTE CARLO	2D	108
Remarks:				
2006 - 2013	CHEVROLET	IMPALA	2D, 4D, SW	110.5, 125
Remarks:				

Test Information

Test #	**7488**	NHTSA Test Reference Guide Version #	**V5**			
Test Date	**2011-10-22**	Contract #	**DTNH22-06-D-00024**			
Contract/Study Title	**NEW CAR ASSESSMENT PROGRAM FRONTAL BARRIER IMPACT TEST**					
Test Objective(s)	**TO OBTAIN VEHICLE CRASHWORTHINESS AND OCCUPANT RESTRAINT INFORMATION**					
Test Type	**NEW CAR ASSESSMENT TEST**	Configuration	**VEHICLE INTO BARRIER**			
Impact Angle	**0**	Side Impact Point	**0**	mm	**0.0**	inches
		Offset Distance	**0**	mm	**0.0**	inches
		Closing Speed	**56.2**	Km/Hr	**34.89**	MPH
Test Performer	**CALSPAN**					
Test Reference #	**RUN2544**					
Test Track Surface	**CONCRETE**	Condition	**DRY**			
Ambient Temperature	**9** C **48.2** F	Total Number of Curves	**137**			
Data Recorder Type	**DIGITAL DATA ACQUISITION**	Data Link	**UMBILICAL CABLE**			
Test Commentary	**TR2544 - MC0100 - 2012 CHEVROLET IMPALA NCAP (FRONTAL) - TARGET 35.0**					

Fixed Barrier Information

Barrier Type	**RIGID**	Pole Barrier Diameter	**0**	mm	**0**	inches
Barrier Shape	**LOAD CELL BARRIER**					
Barrier Commentary	**FRONTAL FLAT BARRIER WITH 36 LOADCELLS**					

2012 CHEVROLET IMPALA LEFT FRONT SEAT OCCUPANT

Test #	7488		
Vehicle #	1	Sex	MALE
Location	LEFT FRONT SEAT	Age	0
Position	CENTER POSITION	Height	0 mm 0.0 inches
Type	HYBRID III DUMMY	Weight	0.0 kg 0 pounds
Size	50 PERCENTILE		
Calibration Method	HYBRID III		
Occupant Manufacturer	MFG: FIRST TECHNOLOGY SAFETY SYSTEMS: 064		
Occupant Modification	NO COMMENTS		
Occupant Description	NO COMMENTS		
Occupant Commentary	CNTRH2 =HEADREST		

Head

Head to -

Windshielder Header	358	mm	14.1	inches	Head Injury Criteria (HIC)	223	
WindShield	683	mm	26.9	inches	HIC Lower Time Interval (ms)	66.7	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	81.7	
Side Header	223	mm	8.8	inches			
Side Window	380	mm	15.0	inches			
Neck to Seatback	0	mm	0.0	inches			
First Contact Region (Head)	AIR BAG						
Second Contact Region (Head)							

Chest

Chest to -

Dash	558	mm	22.0	inches	Arm to Door	128	mm	5.0	inches
Steering Wheel	311	mm	12.2	inches	Hip to Door	149	mm	5.9	inches
Seatback	0	mm	0.0	inches					
Chest Severity Index	380				Pelvic Peak Lateral Acceleration (g's)	0			
Thoracic Trauma Index	0				Thorax Peak Acceleration (g's)	45.6			
Lap Belt Peak Load	7885	Newtons	1772.6	pound Force					
Shoulder Belt Peak Load	3563	Newtons	801.0	pound Force					
First Contact Region (Chest/Abdomen)	AIR BAG								
Second Contact Region (Chest/Abdomen)	NONE								

Legs

Knees to Dash	180	mm	7.1	inches	Knees to Seatback	0	mm	0.0	inches
Left Femur Peak Load	-208	Newtons	-46.8	pounds Force					
Right Femur Peak Load	-963	Newtons	-216.5	pounds Force					
First Contact Region (Legs)	DASHPANEL								
Second Contact Region (Legs)									

2012 CHEVROLET IMPALA LEFT FRONT SEAT OCCUPANT

Test #	7488					
Vehicle #	1		Sex	MALE		
Location	LEFT FRONT SEAT		Age	0		
Position	CENTER POSITION		Height	0	mm 0.0	inches
Type	HYBRID III DUMMY		Weight	0.0	kg 0	pounds
Size	50 PERCENTILE					

Calibration Method	HYBRID III
Occupant Manufacturer	MFG: FIRST TECHNOLOGY SAFETY SYSTEMS: 064
Occupant Modification	NO COMMENTS
Occupant Description	NO COMMENTS
Occupant Commentary	CNTRH2 =HEADREST

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	NOT APPLICABLE
Restraint Commentary	BELT PRETENSIONER & LOAD LIMITER
Restraint # 2	FRONTAL AIRBAG
Mounted	STEERING WHEEL
Deployment	DEPLOYED PROPERLY
Restraint Commentary	FRONTAL AIRBAG

2012 CHEVROLET IMPALA RIGHT FRONT SEAT OCCUPANT

Test #	7488		
Vehicle #	1	Sex	FEMALE
Location	RIGHT FRONT SEAT	Age	0
Position	FORWARD OF CENTER POSITION	Height	0 mm 0.0 inches
Type	HYBRID III DUMMY	Weight	0.0 kg 0 pounds
Size	5 PERCENTILE		
Calibration Method	HYBRID III		
Occupant Manufacturer	MFG: FIRST TECHNOLOGY SAFETY SYSTEMS S/N:273		
Occupant Modification	NO COMMENTS		
Occupant Description	NO COMMENTS		
Occupant Commentary	CNTRH2 =HEADREST		

Head

Head to -

Windshielder Header	290	mm	11.4	inches	Head Injury Criteria (HIC)	236	
WindShield	602	mm	23.7	inches	HIC Lower Time Interval (ms)	69	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	84	
Side Header	238	mm	9.4	inches			
Side Window	370	mm	14.6	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): AIR BAG

Second Contact Region (Head):

Chest

Chest to -

Dash	454	mm	17.9	inches	Arm to Door	73	mm	2.9	inches
Steering Wheel	0	mm	0.0	inches	Hip to Door	222	mm	8.7	inches
Seatback	0	mm	0.0	inches					

Chest Severity Index	287	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	36.5

Lap Belt Peak Load	3503	Newtons	787.5	pound Force
Shoulder Belt Peak Load	3469	Newtons	779.9	pound Force

First Contact Region (Chest/Abdomen): AIR BAG

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash	115	mm	4.5	inches	Knees to Seatback	0	mm	0.0	inches

Left Femur Peak Load	-3105	Newtons	-698.0	pounds Force
Right Femur Peak Load	-1406	Newtons	-316.1	pounds Force

First Contact Region (Legs): DASHPANEL

Second Contact Region (Legs):

2012 CHEVROLET IMPALA RIGHT FRONT SEAT OCCUPANT

Test #	7488					
Vehicle #	1	Sex	FEMALE			
Location	RIGHT FRONT SEAT	Age	0			
Position	FORWARD OF CENTER POSITION	Height	0	mm	0.0	inches
Type	HYBRID III DUMMY	Weight	0.0	kg	0	pounds
Size	5 PERCENTILE					

Calibration Method	HYBRID III
Occupant Manufacturer	MFG: FIRST TECHNOLOGY SAFETY SYSTEMS S/N:273
Occupant Modification	NO COMMENTS
Occupant Description	NO COMMENTS
Occupant Commentary	CNTRH2 =HEADREST

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	NOT APPLICABLE
Restraint Commentary	BELT PRETENSIONER & LOAD LIMITER
Restraint # 2	FRONTAL AIRBAG
Mounted	DASH PANEL - TOP
Deployment	DEPLOYED PROPERLY
Restraint Commentary	FRONTAL AIRBAG

Vehicle 1 2012 CHEVROLET IMPALA

Test #	7488		
VIN	2G1WA5E37C1117437	NHTSA Test Vehicle Number	1
Year	2012	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	CHEVROLET	Post-test Steering Column Shear Capsule Seperation	NO SEPARATION
Model	IMPALA	Steering Column Collapse Mechanism	NONE
Body	FOUR DOOR SEDAN		
Engine	V6 TRANSVERSE FRONT		
Displacement	3.6 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	NONE		
Vehicle Commentary	TR2544 - MC0100 - 2012 CHEVROLET IMPALA NCAP (FRONTAL) - TARGET 35.0		

Vehicle Length	5094	mm	200.6	inches	CG behind Front Axle	1195	mm	47.0	inches
Vehicle Width	1843	mm	72.6	inches	Center of Damage to CG Axis	153	mm	6.0	inches
Vehicle Wheelbase	2808	mm	110.6	inches	Total Length of Indentation	1399	mm	55.1	inches
Vehicle Test Weight	1851	KG	4080	pounds	Maximum Static Crush Depth	674	mm	26.5	inches
					Pre-Impact Speed	56	kph	34.9	mph

Vehicle Damage Index: 12FDEW3 — Principal Direction of Force: 0

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	479	mm	18.9	inches
DPD 2	629	mm	24.8	inches
DPD 3	666	mm	26.2	inches
DPD 4	651	mm	25.6	inches
DPD 5	599	mm	23.6	inches
DPD 6	492	mm	19.4	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	197.4	inches	173.0	inches	24.4	inches
	5014	mm	4394	mm	620	mm
Centerline	200.6	inches	174.1	inches	26.5	inches
	5094	mm	4421	mm	673	mm
Right Bumper Corner	197.6	inches	174.5	inches	23.0	inches
	5018	mm	4433	mm	585	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
0.0	NOT APPLICABLE	0.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
DIRECT ENGAGEMENT	0.0	NOT APPLICABLE
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 1 2012 CHEVROLET IMPALA

Test #	7488		
VIN	2G1WA5E37C1117437	NHTSA Test Vehicle Number	1
Year	2012	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	CHEVROLET	Post-test Steering Column Shear Capsule Seperation	NO SEPARATION
Model	IMPALA	Steering Column Collapse Mechanism	NONE
Body	FOUR DOOR SEDAN		
Engine	V6 TRANSVERSE FRONT		
Displacement	3.6 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	NONE		
Vehicle Commentary	TR2544 - MC0100 - 2012 CHEVROLET IMPALA NCAP (FRONTAL) - TARGET 35.0		

Vehicle Length	5094	mm	200.6	inches	CG behind Front Axle	1195	mm	47.0	inches
Vehicle Width	1843	mm	72.6	inches	Center of Damage to CG Axis	153	mm	6.0	inches
Vehicle Wheelbase	2808	mm	110.6	inches	Total Length of Indentation	1399	mm	55.1	inches
Vehicle Test Weight	1851	KG	4080	pounds	Maximum Static Crush Depth	674	mm	26.5	inches
					Pre-Impact Speed	56	kph	34.9	mph

Vehicle Damage Index	12FDEW3	Principal Direction of Force	0

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from the Rear Vehicle Surface forward.)

Left Side				Centerline				Right Side			
Pre-Test		Post-Test		Pre-Test		Post-Test		Pre-Test		Post-Test	
mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches
				Length of Vehicle at Centerline							
				5094	200.6	4421	174.1				
				Engine Block							
				401	15.8	392	15.4				
5014	197.4	4394	173.0	Front Bumper Corner				5018	197.6	4433	174.5
				Front of Engine							
				4430	174.4	4136	162.8				
3902	153.6	3844	151.3	Firewall				3876	152.6	3826	150.6
				3905	153.7	0	0.0				
3501	137.8	3503	137.9	Upper Leading Edge of Door				3504	138.0	3500	137.8
3492	137.5	3493	137.5	Lower Leading Edge of Door				3494	137.6	3488	137.3
3491	137.4	3489	137.4	Bottom of 'A' Post				3491	137.4	3488	137.3
2408	94.8	2407	94.8	Upper Trailing Edge of Door				2409	94.8	2406	94.7
2414	95.0	2415	95.1	Lower Trailing Edge of Door				2419	95.2	2411	94.9
				Steering Column							
				3000	118.1	2981	117.4				
				Center of Seering Column to 'A' Post (Horizontal)							
				281	11.1	249	9.8				
				Center of Steering Column to Headliner (Vertical)							
				437	17.2	401	15.8				

2012 CHEVROLET IMPALA

NHTSA Crash Test - #7488 - Front Impact

Pre/Post Depths - Vehicle Width - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 4080 pounds
Vehicle Closing Speed = 34.9 mph
Test Crush Length = 72.6 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	24.4	26.5	23.0	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 23.0 inches					103.7
Using a Rated No Damage Speed of	2.5mph	158.7	89.4	140.9	
Using a Rated No Damage Speed of	5.0mph	292.9	76.1	563.5	
Using a Rated No Damage Speed of	7.5mph	402.6	63.9	1267.8	
Using a Rated No Damage Speed of	10.0mph	487.8	52.8	2253.8	
Average Crush = 25.1 inches					87.1
Using a Rated No Damage Speed of	2.5mph	145.4	75.1	140.9	
Using a Rated No Damage Speed of	5.0mph	268.4	63.9	563.5	
Using a Rated No Damage Speed of	7.5mph	368.9	53.7	1267.8	
Using a Rated No Damage Speed of	10.0mph	447.0	44.3	2253.8	
Maximum Crush = 26.5 inches					78.1
Using a Rated No Damage Speed of	2.5mph	137.7	67.3	140.9	
Using a Rated No Damage Speed of	5.0mph	254.2	57.3	563.5	
Using a Rated No Damage Speed of	7.5mph	349.4	48.2	1267.8	
Using a Rated No Damage Speed of	10.0mph	423.4	39.8	2253.8	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

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4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	26.5	37.3	2.4	6.5

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 18.4

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

2012 CHEVROLET IMPALA

NHTSA Crash Test - #7488 - Front Impact

Pre/Post Depths - Indention Length - Closing Speed - Simple Average

Test Vehicle Weight = 4080 pounds
Vehicle Closing Speed = 34.9 mph
Test Crush Length = 55.1 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	24.4	26.5	23.0	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 23.0 inches					136.6
Using a Rated No Damage Speed of	2.5mph	209.1	117.8	185.6	
Using a Rated No Damage Speed of	5.0mph	385.9	100.3	742.3	
Using a Rated No Damage Speed of	7.5mph	530.4	84.2	1670.1	
Using a Rated No Damage Speed of	10.0mph	642.6	69.5	2969.1	
Average Crush = 24.6 inches					119.5
Using a Rated No Damage Speed of	2.5mph	195.5	102.9	185.6	
Using a Rated No Damage Speed of	5.0mph	360.8	87.7	742.3	
Using a Rated No Damage Speed of	7.5mph	495.9	73.6	1670.1	
Using a Rated No Damage Speed of	10.0mph	600.8	60.8	2969.1	
Maximum Crush = 26.5 inches					102.9
Using a Rated No Damage Speed of	2.5mph	181.5	88.7	185.6	
Using a Rated No Damage Speed of	5.0mph	334.9	75.5	742.3	
Using a Rated No Damage Speed of	7.5mph	460.3	63.4	1670.1	
Using a Rated No Damage Speed of	10.0mph	557.7	52.4	2969.1	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

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4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	26.5	37.3	2.4	6.5

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 18.4

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

2012 CHEVROLET IMPALA

NHTSA Crash Test - #7488 - Front Impact

Damage Profile Distances - Vehicle Width - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 4080 pounds
Vehicle Closing Speed = 34.9 MPH
Test Crush Length = 72.6 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	18.9	24.8	26.2	25.6	23.6	19.4	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 18.9 inches					153.6
Using a Rated No Damage Speed of	2.5mph	193.1	132.4	140.9	
Using a Rated No Damage Speed of	5.0mph	356.4	112.7	563.5	
Using a Rated No Damage Speed of	7.5mph	489.9	94.7	1267.8	
Using a Rated No Damage Speed of	10.0mph	593.6	78.2	2253.8	
Average Crush = 23.9 inches					96.1
Using a Rated No Damage Speed of	2.5mph	152.7	82.8	140.9	
Using a Rated No Damage Speed of	5.0mph	281.9	70.5	563.5	
Using a Rated No Damage Speed of	7.5mph	387.4	59.2	1267.8	
Using a Rated No Damage Speed of	10.0mph	469.4	48.9	1562.8	
Maximum Crush = 26.2 inches					79.9
Using a Rated No Damage Speed of	2.5mph	139.3	68.9	140.9	
Using a Rated No Damage Speed of	5.0mph	257.1	58.7	563.5	
Using a Rated No Damage Speed of	7.5mph	353.4	49.3	1267.8	
Using a Rated No Damage Speed of	10.0mph	428.2	40.7	2253.8	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

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4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	26.2	37.1	2.2	5.9

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 18.6

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

2012 CHEVROLET IMPALA

NHTSA Crash Test - #7488 - Front Impact

Damage Profile Distances - Indention Length - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 4080 pounds
Vehicle Closing Speed = 34.9 MPH
Test Crush Length = 55.1 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	18.9	24.8	26.2	25.6	23.6	19.4	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 18.9 inches					202.4
Using a Rated No Damage Speed of	2.5mph	254.4	174.4	185.6	
Using a Rated No Damage Speed of	5.0mph	469.6	148.5	742.3	
Using a Rated No Damage Speed of	7.5mph	645.4	124.7	1670.1	
Using a Rated No Damage Speed of	10.0mph	782.0	103.0	2969.1	
Average Crush = 23.9 inches					126.5
Using a Rated No Damage Speed of	2.5mph	201.2	109.1	185.6	
Using a Rated No Damage Speed of	5.0mph	371.3	92.9	742.3	
Using a Rated No Damage Speed of	7.5mph	510.4	78.0	1670.1	
Using a Rated No Damage Speed of	10.0mph	618.4	64.4	2058.8	
Maximum Crush = 26.2 inches					105.3
Using a Rated No Damage Speed of	2.5mph	183.5	90.8	185.6	
Using a Rated No Damage Speed of	5.0mph	338.7	77.3	742.3	
Using a Rated No Damage Speed of	7.5mph	465.6	64.9	1670.1	
Using a Rated No Damage Speed of	10.0mph	564.1	53.6	2969.1	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

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4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	26.2	37.1	2.2	5.9

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 18.6

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

4N6XPRT StifCalcs®

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2006 - 2008
Make: PONTIAC
Model: GRAND PRIX

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Width Values G	Width Values Kv	Crush Factor
5578	2006 CHEVROLET MONTE CARLO TWO DOOR C...	5.0	26.3	35.0	250.4	57.1	549.0	77.7	18.6
7488	2012 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	23.9	34.9	282.3	70.7	563.5	96.4	20.4
5468	2006 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	23.5	35.1	283.3	72.5	553.6	98.6	20.9
5547	2006 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	23.8	35.2	286.3	72.4	565.9	98.5	20.7
5274	2005 BUICK LACROSSE FOUR DOOR SEDAN	5.0	23.4	35.1	287.8	74.2	558.3	100.9	21.1
6052	2007 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	12.4	24.7	382.5	121.6	601.5	191.1	19.7
7496	2012 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	6.5	20.0	494.8	229.5	533.3	407.7	24.8
	Average (AVG)				**323.9**	**99.7**	**560.7**	**153.0**	**20.9**
	Minimum (MIN)				**250.4**	**57.1**	**533.3**	**77.7**	**18.6**
	Maximum (MAX)				**494.8**	**229.5**	**601.5**	**407.7**	**24.8**
	Standard Deviation (STDev-sample)				**85.8**	**60.7**	**21.0**	**118.2**	**1.9**
	Number of Tests (n)			**7**					

4N6XPRT StifCalcs®

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2006 - 2008
Make: PONTIAC
Model: GRAND PRIX

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
7496	2012 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	15.4	20.0	207.6	40.4	533.3	71.8	10.4
5578	2006 CHEVROLET MONTE CARLO TWO DOOR C...	5.0	28.0	35.0	235.7	50.6	549.0	68.9	17.5
5547	2006 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	28.3	35.2	240.8	51.2	565.9	69.6	17.4
5468	2006 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	26.7	35.1	249.3	56.1	553.6	76.3	18.4
7488	2012 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	26.5	34.9	253.9	57.2	563.5	77.9	18.4
5274	2005 BUICK LACROSSE FOUR DOOR SEDAN	5.0	24.9	35.1	269.7	65.2	558.3	88.6	19.8
6052	2007 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	13.9	24.7	340.6	96.4	601.5	151.5	17.6
	Average (AVG)				**256.8**	**59.6**	**560.7**	**86.4**	**17.1**
	Minimum (MIN)				**207.6**	**40.4**	**533.3**	**68.9**	**10.4**
	Maximum (MAX)				**340.6**	**96.4**	**601.5**	**151.5**	**19.8**
	Standard Deviation (STDev-sample)				**41.6**	**17.9**	**21.0**	**29.5**	**3.1**
	Number of Tests (n)			**7**					

Expert VIN DeCoder®

Version Number 3.4.0.2

DeCoded VIN: KL1TD56657B052417

Model:	2007 Chevrolet Aveo Base/LS 4 Door Sedan
Engine Size:	1.6L/ 97.5cu.in.
Engine Description:	Inline 4 with Dual Overhead Cam (DOHC)
Horse Power:	103 @ 6000rpm
Torque:	107lb-ft at 3600rpm
Injection System:	Multi-Port Fuel Injection (MPI)
PSI:	Not Available
Ignition:	Electronic
Manufacturer:	Geo/Chevrolet
Assembly Plant:	Bupyeong, South Korea
Drive Wheels:	This is a Front Wheel Drive vehicle w/ Manual Belts w/Driver & Passenger Air Bags (F/S)

The First through Third characters (KL1) indicate a Chevrolet Car made in South Korea

The Fourth through Fifth characters (TD) indicate an Aveo Base/LS

The Sixth character (5) indicates a 4 Door Sedan

The Seventh character (6) indicates Manual Belts w/Driver & Passenger Air Bags (F/S)

The Eighth character (6) indicates the OEM engine: 1.6L/ 97.5cu.in., L4 DOHC

The Ninth character (the check digit) is entered as 5.
The VIN appears Valid, the calculated value is 5.

The Tenth character (7) indicates the model year 2007

The Eleventh character (B) indicates the vehicle was made in the assembly plant in Bupyeong, South Korea

The Twelfth through Seventeenth characters (052417) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.5.1.0

PROVIDED BY:
4N6XPRT Systems
8387 University Avenue
La Mesa CA 91941

9/4/2015

2007 CHEVROLET AVEO 4 DOOR SEDAN

Curb Weight:		2535	lbs.	1150	kg.
Curb Weight Distribution -	Front:	61	% Rear:	39	%
Gross Vehicle Weight Rating:		3467	lbs.	1573	kg.
Number of Tires on Vehicle:		4			
Drive Wheels:		FRONT			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	170	14.17	4.32
Wheelbase:	98	8.17	2.49
Front Bumper to Front Axle:	32	2.67	0.81
Front Bumper to Front of Front Well:	18	1.50	0.46
Front Bumper to Front of Hood:	8	0.67	0.20
Front Bumper to Base of Windshield:	38	3.17	0.97
Front Bumper to Top of Windshield:	67	5.58	1.70
Rear Bumper to Rear Axle:	40	3.33	1.02
Rear Bumper to Rear of Rear Well:	27	2.25	0.69
Rear Bumper to Rear of Trunk:	5	0.42	0.13
Rear Bumper to Base of Rear Window:	18	1.50	0.46
Width Dimensions			
Maximum Width:	67	5.58	1.70
Front Track:	57	4.75	1.45
Rear Track:	56	4.67	1.42
Vertical Dimensions			
Height:	59	4.92	1.50
Ground to -			
Front Bumper (Top)	22	1.83	0.56
Headlight - center	30	2.50	0.76
Hood - top front:	33	2.75	0.84
Base of Windshield	40	3.33	1.02
Rear Bumper - top:	26	2.17	0.66
Trunk - top rear:	43	3.58	1.09
Base of Rear Window:	45	3.75	1.14

2007 CHEVROLET AVEO 4 DOOR SEDAN

Interior Dimensions

	Inches	Feet	Meters
Front Seat Shoulder Width	54	4.50	1.37
Front Seat to Headliner	39	3.25	0.99
Front Leg Room - seatback to floor (max)	41	3.42	1.04
Rear Seat Shoulder Width	53	4.42	1.35
Rear Seat to Headliner	37	3.08	0.94
Front Leg Room - seatback to floor (min)	35	2.92	0.89

Seatbelts: 3pt - front and rear

Airbags: FRONT SEAT AIRBAGS + SIDE AIRBAGS

Steering Data

Turning Circle (Diameter)	396	33.00	10.06
Steering Ratio:	:1		
Wheel Radius:	11	0.92	0.28
Tire Size (OEM):	P185/60R14		

Acceleration & Braking Information

Brake Type: FRONT DISC - REAR DRUM

ABS System: ALL WHEEL ABS - OPTIONAL

Braking, 60 mph to 0 (Hard pedal, no skid, dry pavement):

d = 172.0 ft t = 3.9 sec a = -22.5 ft/sec² G-force = -0.70

Acceleration:

0 to 30mph	t =	2.7	sec	a =	16.3	ft/sec²	G-force = 0.51
0 to 60mph	t =	10.8	sec	a =	8.1	ft/sec²	G-force = 0.25
45 to 65mph	t =	6.1	sec	a =	4.8	ft/sec²	G-force = 0.15

Transmission Type: 5spd MANUAL

Notes:

Federal Bumper Standard Requirements: 2.5 mph

This vehicles Rated Bumper Strength: 2.5 mph

N.S.D.C = 2007 - 2011

2007 CHEVROLET AVEO 4 DOOR SEDAN

Other Information

Tip-Over Stability Ratio =	1.22	Reasonably Stable
NHTSA Star Rating (calculated)		***

Center of Gravity (No Load):

Inches behind front axle	=	38.22
Inches in front of rear axle	=	59.78
Inches from side of vehicle	=	33.50
Inches from ground	=	23.16
Inches from front corner	=	77.80
Inches from rear corner	=	105.25
Inches from front bumper	=	70.22
Inches from rear bumper	=	99.78

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	1405.05	lb*ft*sec²
Pitch Moment of Inertia	=	1360.65	lb*ft*sec²
Roll Moment of Inertia	=	306.30	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	54.0	deg
Angle Front of Hood to Windshield Base	=	13.1	deg
Angle Front of Hood to Windshield Top	=	22.1	deg
Angle of Windshield	=	30.4	deg
Angle of Steering Tires at Max Turn	=	28.4	deg

First Approximation Crush Factors:

Speed Equivalent (mph) of Kinetic Energy (KE) used in causing crush of indentation may be evaluated using the following formula, the appropriated Crush Factor (CF), and Maximum Indentation Depth (MID), in feet:

$$V(mph) = \sqrt{(30 * CF * MID)}$$

KE Equivalent Speed (Front/Rear/Side)	=	21	CF
Bullet vehicle IMPACT SPEED estimation based on TARGET VEHICLE damage ONLY (Tested for Rear/Side Impact only)	=	27	CF

These CF values are based upon analysis of NHTSA Barrier Crash data, and from over 1000 vehicle accidents where independant evaluation of speed was possible. (These are NOT 'A', 'B', 'C', or 'G' values)

The rear Impact data with more then 2-3 inches of crush damage should be looked at carefully, since some vehicles have very weak trunk & fender strength. Therefore, on some cars, especially GM, you estimate from the rear crush data may be high by as much as 4-5 mph (on a crush of 18 inches).

Stiffness Values and Test Data

Derived from

NHTSA Crash Test

#6295

2008 CHEVROLET AVEO

Provided By

4N6XPRT StifCalcs®

Registered to:

4N6XPRT SYSTEMS
8387 UNIVERSITY AVENUE
LA MESA CA 91941-3842
15R-030201SC02301

4N6XPRT Systems | 8387 University Avenue | La Mesa, CA 91942 | USA
(800) 266-9778 | (619) 464-3478 | FAX: (619) 464-2206 | Email: 4n6@4n6xprt.com

Similar Vehicle database reader

You entered: **2007 CHEVROLET AVEO**

The Similar Vehicle Year/Model list indicates the following are Similar Models

Year Range	Make	Model	Body Styles	Wheelbase
2007 - 2011	CHEVROLET	AVEO	4D, 5D	97.6
Remarks:				
2009 - 2009	PONTIAC	G3	5D	97.6
Remarks:				

Test Information

Test #	**6295**	NHTSA Test Reference Guide Version #	**V5**			
Test Date	**2008-01-31**	Contract #	**DTRT57-05-D-30107**			
Contract/Study Title	**LEFT 40% OFFSET DEFORMABLE BARRIER - 2008 CHEVROLET AVEO LS 4-DOOR**					
Test Objective(s)	**IN SUPPORT OF NHTSA OFFSET FRONTAL PROGRAM**					
Test Type	**RESEARCH SAFETY VEHICLE TEST**	Configuration	**VEHICLE INTO BARRIER**			
Impact Angle	**0**	Side Impact Point	**0**	mm	**0.0**	inches
		Offset Distance	**669**	mm	**26.3**	inches
		Closing Speed	**56.0**	Km/Hr	**34.80**	MPH
Test Performer	**MGA RESEARCH**					
Test Reference #	**BT08013101**					
Test Track Surface	**CONCRETE**	Condition	**DRY**			
Ambient Temperature	**21** C **69.8** F	Total Number of Curves	**313**			
Data Recorder Type	**OTHER**	Data Link	**OTHER**			
Test Commentary	**DTS TDAS PRO ON BOARD DAS**					

Fixed Barrier Information

Barrier Type	**DEFORMABLE**	Pole Barrier Diameter	**0**	mm	**0**	inches
Barrier Shape	**EEVC OFFSET US LC BARRIER MOD3**					
Barrier Commentary						

2008 CHEVROLET AVEO LEFT FRONT SEAT OCCUPANT

Test #	6295		
Vehicle #	1	Sex	MALE
Location	LEFT FRONT SEAT	Age	0
Position	FORWARD OF CENTER POSITION	Height	0 mm 0.0 inches
Type	HYBRID III DUMMY WITH THOR LX LEGS	Weight	0.0 kg 0 pounds
Size	50 PERCENTILE		
Calibration Method	HYBRID III		
Occupant Manufacturer	FIRST TECHNOLOGY S/N 202		
Occupant Modification	THOR LX LEGS		
Occupant Description			
Occupant Commentary	DUMMY BASE SEATING V1		

Head

Head to -

Windshielder Header	434	mm	17.1	inches	Head Injury Criteria (HIC)	458	
WindShield	756	mm	29.8	inches	HIC Lower Time Interval (ms)	253.9	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	256.5	
Side Header	225	mm	8.9	inches			
Side Window	314	mm	12.4	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): AIR BAG

Second Contact Region (Head):

Chest

Chest to -

Dash	644	mm	25.4	inches	Arm to Door	145	mm	5.7	inches
Steering Wheel	421	mm	16.6	inches	Hip to Door	220	mm	8.7	inches
Seatback	0	mm	0.0	inches					

Chest Severity Index	0	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	32

Lap Belt Peak Load	5638	Newtons	1267.5	pound Force
Shoulder Belt Peak Load	3864	Newtons	868.7	pound Force

First Contact Region (Chest/Abdomen): AIR BAG

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash	211	mm	8.3	inches	Knees to Seatback	0	mm	0.0	inches

Left Femur Peak Load	-5052	Newtons	-1135.7	pounds Force
Right Femur Peak Load	-1343	Newtons	-301.9	pounds Force

First Contact Region (Legs): DASHPANEL

Second Contact Region (Legs):

2008 CHEVROLET AVEO LEFT FRONT SEAT OCCUPANT

Test #	6295					
Vehicle #	1	Sex	MALE			
Location	LEFT FRONT SEAT	Age	0			
Position	FORWARD OF CENTER POSITION	Height	0	mm	0.0	inches
Type	HYBRID III DUMMY WITH THOR LX LEGS	Weight	0.0	kg	0	pounds
Size	50 PERCENTILE					

Calibration Method	HYBRID III
Occupant Manufacturer	FIRST TECHNOLOGY S/N 202
Occupant Modification	THOR LX LEGS
Occupant Description	
Occupant Commentary	DUMMY BASE SEATING V1

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	PRIMARY
Restraint # 2	FRONTAL AIRBAG
Mounted	STEERING WHEEL
Deployment	DEPLOYED PROPERLY
Restraint Commentary	SECONDARY

2008 CHEVROLET AVEO RIGHT FRONT SEAT OCCUPANT

Test #	6295		
Vehicle #	1	Sex	MALE
Location	RIGHT FRONT SEAT	Age	0
Position	CENTER POSITION	Height	0 mm 0.0 inches
Type	HYBRID III DUMMY	Weight	0.0 kg 0 pounds
Size	50 PERCENTILE		
Calibration Method	HYBRID III		
Occupant Manufacturer	FIRST TECHNOLOGY S/N 206		
Occupant Modification	THOR LX LEGS		
Occupant Description			
Occupant Commentary	DUMMY BASE SEATING V1		

Head

Head to -

Windshielder Header	355	mm	14.0	inches	Head Injury Criteria (HIC)	201	
WindShield	661	mm	26.0	inches	HIC Lower Time Interval (ms)	104.1	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	140.1	
Side Header	228	mm	9.0	inches			
Side Window	307	mm	12.1	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): AIR BAG

Second Contact Region (Head):

Chest

Chest to -

Dash	536	mm	21.1	inches	Arm to Door	136	mm	5.4	inches
Steering Wheel	0	mm	0.0	inches	Hip to Door	210	mm	8.3	inches
Seatback	0	mm	0.0	inches					

Chest Severity Index	0	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	23

Lap Belt Peak Load	3639	Newtons	818.1	pound Force
Shoulder Belt Peak Load	3776	Newtons	848.9	pound Force

First Contact Region (Chest/Abdomen): AIR BAG

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash	126	mm	5.0	inches	Knees to Seatback	0	mm	0.0	inches

Left Femur Peak Load	-3627	Newtons	-815.4	pounds Force
Right Femur Peak Load	-1076	Newtons	-241.9	pounds Force

First Contact Region (Legs): DASHPANEL

Second Contact Region (Legs):

2008 CHEVROLET AVEO RIGHT FRONT SEAT OCCUPANT

Test #	6295					
Vehicle #	1	Sex	MALE			
Location	RIGHT FRONT SEAT	Age	0			
Position	CENTER POSITION	Height	0	mm	0.0	inches
Type	HYBRID III DUMMY	Weight	0.0	kg	0	pounds
Size	50 PERCENTILE					

Calibration Method	HYBRID III
Occupant Manufacturer	FIRST TECHNOLOGY S/N 206
Occupant Modification	THOR LX LEGS
Occupant Description	
Occupant Commentary	DUMMY BASE SEATING V1

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	PRIMARY
Restraint # 2	FRONTAL AIRBAG
Mounted	DASH PANEL - TOP
Deployment	DEPLOYED PROPERLY
Restraint Commentary	SECONDARY

2008 CHEVROLET AVEO LEFT REAR SEAT OCCUPANT

Test #	6295		
Vehicle #	1	Sex	NOT APPLICABLE
Location	LEFT REAR SEAT	Age	0
Position	NON-ADJUSTABLE SEAT	Height	0 mm 0.0 inches
Type	HYBRID III DUMMY	Weight	0.0 kg 0 pounds
Size	10 YEAR OLD CHILD		
Calibration Method	HYBRID III		
Occupant Manufacturer	FIRST TECHNOLOGY S/N D001		
Occupant Modification			
Occupant Description			
Occupant Commentary	DUMMY BASE SEATING V1		

Head

Head to -

Windshielder Header	0 mm	0.0 inches	Head Injury Criteria (HIC)	502
WindShield	0 mm	0.0 inches	HIC Lower Time Interval (ms)	90.3
Seatback	431 mm	17.0 inches	HIC Upper Time Interval (ms)	126.3
Side Header	0 mm	0.0 inches		
Side Window	281 mm	11.1 inches		

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): C PILLAR

Second Contact Region (Head):

Chest

Chest to -

Dash	0 mm	0.0 inches	Arm to Door	164 mm 6.5 inches
Steering Wheel	0 mm	0.0 inches	Hip to Door	221 mm 8.7 inches
Seatback	410 mm	16.1 inches		

Chest Severity Index	0	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	37

Lap Belt Peak Load: 3114 Newtons 700.1 pound Force

Shoulder Belt Peak Load: 5290 Newtons 1189.2 pound Force

First Contact Region (Chest/Abdomen): NONE

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash 0 mm 0.0 inches Knees to Seatback 152 mm 6.0 inches

Left Femur Peak Load 0 Newtons 0.0 pounds Force

Right Femur Peak Load 0 Newtons 0.0 pounds Force

First Contact Region (Legs): SEAT BACK

Second Contact Region (Legs):

2008 CHEVROLET AVEO LEFT REAR SEAT OCCUPANT

Test #	6295					
Vehicle #	1		Sex	NOT APPLICABLE		
Location	LEFT REAR SEAT		Age	0		
Position	NON-ADJUSTABLE SEAT		Height	0	mm 0.0	inches
Type	HYBRID III DUMMY		Weight	0.0	kg 0	pounds
Size	10 YEAR OLD CHILD					

Calibration Method	HYBRID III
Occupant Manufacturer	FIRST TECHNOLOGY S/N D001
Occupant Modification	
Occupant Description	
Occupant Commentary	DUMMY BASE SEATING V1

Restraints

Restraint # 1	BOOSTER SEAT
Mounted	LAP/SHOULDER BELT, NO TOP TETHER
Deployment	NOT APPLICABLE
Restraint Commentary	PRIMARY

Vehicle 1 2008 CHEVROLET AVEO

Test #	6295		
VIN	KL1TD56698B001262	NHTSA Test Vehicle Number	1
Year	2008	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	CHEVROLET	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	AVEO	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	1.6 Liter	Transmission	MANUAL - FRONT WHEEL DRIVE
Vehicle Modification(s) Description			
Vehicle Commentary			

Vehicle Length	4280	mm	168.5	inches	CG behind Front Axle	1159	mm	45.6	inches
Vehicle Width	1691	mm	66.6	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2480	mm	97.6	inches	Total Length of Indentation	1170	mm	46.1	inches
Vehicle Test Weight	1433	KG	3159	pounds	Maximum Static Crush Depth	591	mm	23.3	inches
					Pre-Impact Speed	56	kph	34.8	mph
Vehicle Damage Index					Principal Direction of Force	0			

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	591	mm	23.3	inches
DPD 2	541	mm	21.3	inches
DPD 3	519	mm	20.4	inches
DPD 4	290	mm	11.4	inches
DPD 5	152	mm	6.0	inches
DPD 6	20	mm	0.8	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	163.9	inches	140.6	inches	23.3	inches
	4162	mm	3571	mm	591	mm
Centerline	168.5	inches	152.3	inches	16.2	inches
	4280	mm	3869	mm	411	mm
Right Bumper Corner	163.8	inches	163.0	inches	0.8	inches
	4160	mm	4140	mm	20	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
0.0	NOT APPLICABLE	0.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
DIRECT ENGAGEMENT	0.0	NOT APPLICABLE
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 1 2008 CHEVROLET AVEO

Test #	6295		
VIN	KL1TD56698B001262	NHTSA Test Vehicle Number	1
Year	2008	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	CHEVROLET	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	AVEO	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	1.6 Liter	Transmission	MANUAL - FRONT WHEEL DRIVE
Vehicle Modification(s) Description			
Vehicle Commentary			

Vehicle Length	4280	mm	168.5	inches	CG behind Front Axle	1159	mm	45.6	inches
Vehicle Width	1691	mm	66.6	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2480	mm	97.6	inches	Total Length of Indentation	1170	mm	46.1	inches
Vehicle Test Weight	1433	KG	3159	pounds	Maximum Static Crush Depth	591	mm	23.3	inches
					Pre-Impact Speed	56	kph	34.8	mph

Vehicle Damage Index		Principal Direction of Force	0

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from the Rear Vehicle Surface forward.)

Left Side Pre-Test mm	Left Side Pre-Test inches	Left Side Post-Test mm	Left Side Post-Test inches	Centerline	Centerline Pre-Test mm	Centerline Pre-Test inches	Centerline Post-Test mm	Centerline Post-Test inches	Right Side Pre-Test mm	Right Side Pre-Test inches	Right Side Post-Test mm	Right Side Post-Test inches
				Length of Vehicle at Centerline	4280	168.5	3869	152.3				
				Engine Block	229	9.0	229	9.0				
4162	163.9	3571	140.6	Front Bumper Corner					4160	163.8	4140	163.0
				Front of Engine	3807	149.9	3633	143.0				
3372	132.8	3242	127.6	Firewall	3419	134.6	0	0.0	3380	133.1	3398	133.8
3031	119.3	2982	117.4	Upper Leading Edge of Door					3034	119.4	3042	119.8
2999	118.1	2962	116.6	Lower Leading Edge of Door					2999	118.1	2984	117.5
3000	118.1	2960	116.5	Bottom of 'A' Post					3001	118.1	2985	117.5
1913	75.3	1899	74.8	Upper Trailing Edge of Door					1921	75.6	1932	76.1
1962	77.2	1926	75.8	Lower Trailing Edge of Door					1969	77.5	1948	76.7
				Steering Column	2585	101.8	2519	99.2				
				Center of Seering Column to 'A' Post (Horizontal)	360	14.2	432	17.0				
				Center of Steering Column to Headliner (Vertical)	403	15.9	483	19.0				

2008 CHEVROLET AVEO

NHTSA Crash Test - #6295 - Front Impact

Pre/Post Depths - Vehicle Width - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 3159 pounds
Vehicle Closing Speed = 34.8 mph
Test Crush Length = 66.6 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	23.3	16.2	0.8	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 0.8 inches					71956.0
Using a Rated No Damage Speed of	2.5mph	3838.6	61988.0	118.9	
Using a Rated No Damage Speed of	5.0mph	7083.0	52762.8	475.4	
Using a Rated No Damage Speed of	7.5mph	9733.1	44280.4	1069.7	
Using a Rated No Damage Speed of	10.0mph	11788.9	36540.9	1901.7	
Average Crush = 14.1 inches					231.6
Using a Rated No Damage Speed of	2.5mph	217.8	199.5	118.9	
Using a Rated No Damage Speed of	5.0mph	401.9	169.9	475.4	
Using a Rated No Damage Speed of	7.5mph	552.2	142.5	1069.7	
Using a Rated No Damage Speed of	10.0mph	668.9	117.6	1901.7	
Maximum Crush = 23.3 inches					84.8
Using a Rated No Damage Speed of	2.5mph	131.8	73.1	118.9	
Using a Rated No Damage Speed of	5.0mph	243.2	62.2	475.4	
Using a Rated No Damage Speed of	7.5mph	334.2	52.2	1069.7	
Using a Rated No Damage Speed of	10.0mph	404.8	43.1	1901.7	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

****

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	23.3	35.0	0.2	0.5

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 20.8

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

2008 CHEVROLET AVEO

NHTSA Crash Test - #6295 - Front Impact

Pre/Post Depths - Indention Length - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 3159 pounds
Vehicle Closing Speed = 34.8 mph
Test Crush Length = 46.1 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	23.3	16.2	0.8	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 0.8 inches					103997.9
Using a Rated No Damage Speed of	2.5mph	5548.0	89591.1	171.8	
Using a Rated No Damage Speed of	5.0mph	10237.1	76258.0	687.1	
Using a Rated No Damage Speed of	7.5mph	14067.2	63998.4	1546.0	
Using a Rated No Damage Speed of	10.0mph	17038.5	52812.6	2748.5	
Average Crush = 14.1 inches					334.8
Using a Rated No Damage Speed of	2.5mph	314.8	288.4	171.8	
Using a Rated No Damage Speed of	5.0mph	580.8	245.5	687.1	
Using a Rated No Damage Speed of	7.5mph	798.1	206.0	1546.0	
Using a Rated No Damage Speed of	10.0mph	966.7	170.0	2748.5	
Maximum Crush = 23.3 inches					122.6
Using a Rated No Damage Speed of	2.5mph	190.5	105.6	171.8	
Using a Rated No Damage Speed of	5.0mph	351.5	89.9	687.1	
Using a Rated No Damage Speed of	7.5mph	483.0	75.4	1546.0	
Using a Rated No Damage Speed of	10.0mph	585.0	62.3	2748.5	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

****

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	23.3	35.0	0.2	0.5

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 20.8

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

2008 CHEVROLET AVEO

NHTSA Crash Test - #6295 - Front Impact

Damage Profile Distances - Vehicle Width - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 3159 pounds
Vehicle Closing Speed = 34.8 MPH
Test Crush Length = 66.6 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	23.3	21.3	20.4	11.4	6.0	0.8	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 0.8 inches					71956.0
Using a Rated No Damage Speed of	2.5mph	3838.6	61988.0	118.9	
Using a Rated No Damage Speed of	5.0mph	7083.0	52762.8	475.4	
Using a Rated No Damage Speed of	7.5mph	9733.1	44280.4	1069.7	
Using a Rated No Damage Speed of	10.0mph	11788.9	36540.9	1901.7	
Average Crush = 14.2 inches					228.4
Using a Rated No Damage Speed of	2.5mph	216.3	196.7	118.9	
Using a Rated No Damage Speed of	5.0mph	399.0	167.5	475.4	
Using a Rated No Damage Speed of	7.5mph	548.3	140.5	1069.7	
Using a Rated No Damage Speed of	10.0mph	664.2	116.0	1317.0	
Maximum Crush = 23.3 inches					84.8
Using a Rated No Damage Speed of	2.5mph	131.8	73.1	118.9	
Using a Rated No Damage Speed of	5.0mph	243.2	62.2	475.4	
Using a Rated No Damage Speed of	7.5mph	334.2	52.2	1069.7	
Using a Rated No Damage Speed of	10.0mph	404.8	43.1	1901.7	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

****

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	23.3	35.0	0.2	0.5

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 20.8

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

2008 CHEVROLET AVEO

NHTSA Crash Test - #6295 - Front Impact

Damage Profile Distances - Indention Length - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 3159 pounds
Vehicle Closing Speed = 34.8 MPH
Test Crush Length = 46.1 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	23.3	21.3	20.4	11.4	6.0	0.8	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 0.8 inches					103997.9
Using a Rated No Damage Speed of	2.5mph	5548.0	89591.1	171.8	
Using a Rated No Damage Speed of	5.0mph	10237.1	76258.0	687.1	
Using a Rated No Damage Speed of	7.5mph	14067.2	63998.4	1546.0	
Using a Rated No Damage Speed of	10.0mph	17038.5	52812.6	2748.5	
Average Crush = 14.2 inches					330.1
Using a Rated No Damage Speed of	2.5mph	312.6	284.4	171.8	
Using a Rated No Damage Speed of	5.0mph	576.7	242.0	687.1	
Using a Rated No Damage Speed of	7.5mph	792.5	203.1	1546.0	
Using a Rated No Damage Speed of	10.0mph	959.9	167.6	1903.5	
Maximum Crush = 23.3 inches					122.6
Using a Rated No Damage Speed of	2.5mph	190.5	105.6	171.8	
Using a Rated No Damage Speed of	5.0mph	351.5	89.9	687.1	
Using a Rated No Damage Speed of	7.5mph	483.0	75.4	1546.0	
Using a Rated No Damage Speed of	10.0mph	585.0	62.3	2748.5	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

****

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	23.3	35.0	0.2	0.5

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 20.8

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

4N6XPRT StifCalcs®

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2007 - 2011
Make: CHEVROLET
Model: AVEO

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Width Values G	Width Values Kv	Crush Factor
5873	2007 CHEVROLET AVEO FOUR DOOR SEDAN	5.0	18.6	35.0	293.0	94.7	453.5	128.9	26.4
6295	2008 CHEVROLET AVEO FOUR DOOR SEDAN	5.0	14.2	34.8	398.1	166.7	475.4	227.4	34.0
6296	2008 CHEVROLET AVEO FOUR DOOR SEDAN	5.0	14.7	37.3	417.5	183.3	475.4	244.5	37.8
	Average (AVG)				**369.5**	**148.2**	**468.1**	**200.2**	**32.7**
	Minimum (MIN)				**293.0**	**94.7**	**453.5**	**128.9**	**26.4**
	Maximum (MAX)				**417.5**	**183.3**	**475.4**	**244.5**	**37.8**
	Standard Deviation (STDev-sample)				**67.0**	**47.1**	**12.7**	**62.4**	**5.8**
	Number of Tests (n)			**3**					

4N6XPRT StifCalcs®

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2007 - 2011
Make: CHEVROLET
Model: AVEO

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Width Values G	Width Values Kv	Crush Factor
6296	2008 CHEVROLET AVEO FOUR DOOR SEDAN	5.0	26.8	37.3	229.0	55.1	475.4	73.5	20.7
6295	2008 CHEVROLET AVEO FOUR DOOR SEDAN	5.0	23.3	34.8	243.5	62.4	475.4	85.1	20.8
5873	2007 CHEVROLET AVEO FOUR DOOR SEDAN	5.0	20.0	35.0	272.5	81.9	453.5	111.4	24.5
	Average (AVG)				**248.3**	**66.5**	**468.1**	**90.0**	**22.0**
	Minimum (MIN)				**229.0**	**55.1**	**453.5**	**73.5**	**20.7**
	Maximum (MAX)				**272.5**	**81.9**	**475.4**	**111.4**	**24.5**
	Standard Deviation (STDev-sample)				**22.1**	**13.8**	**12.7**	**19.4**	**2.2**
	Number of Tests (n)			**3**					

Expert VIN DeCoder®

Version Number 3.4.0.2

DeCoded VIN: 5NPEC4AC1BH131182

Model:	2011 Hyundai Sonata GL 4-Door Sedan
Engine Size:	1.6 L/121 cu.in.
Engine Description:	In-Line 4 cylinder with Dual Overhead Cam
Horse Power:	110 @ 6000 rpm
Torque:	106 lb-ft at 4500 rpm
Injection System:	MultiPoint Fuel Injection (MPI)
PSI:	43 psi
Ignition:	electronic
Manufacturer:	Hyundai
Assembly Plant:	Montgomery,Alabama
Drive Wheels:	This is a Front Wheel Drive vehicle w/ Manual Belts and Air Bags

The First through Third characters (5NP) indicate a Hyundai Vehicle made in the United States

The Fourth character (E) indicates a Sonata

The Fifth character (C) indicates a GL series

The Sixth character (4) indicates a 4-Door Sedan

The Seventh character (A) indicates Manual Belts and Air Bags

The Eighth character (C) indicates the OEM engine: 1.6 L/121 cu.in., L4, DOHC

The Ninth character (the check digit) is entered as 1.
The VIN appears Valid, the calculated value is 1.

The Tenth character (B) indicates the model year 2011

The Eleventh character (H) indicates the vehicle was made in the assembly plant in Montgomery,Alabama

The Twelfth through Seventeenth characters (131182) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.5.1.0

PROVIDED BY:
4N6XPRT Systems
8387 University Avenue
La Mesa CA 91941

9/4/2015

2011 HYUNDAI SONATA 4 DOOR SEDAN

Curb Weight:		3225	lbs.	1463	kg.
Curb Weight Distribution -	Front:	60	% Rear:	40	%
Gross Vehicle Weight Rating:		4307	lbs.	1954	kg.
Number of Tires on Vehicle:		4			
Drive Wheels:		FRONT			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	190	15.83	4.83
Wheelbase:	110	9.17	2.79
Front Bumper to Front Axle:	37	3.08	0.94
Front Bumper to Front of Front Well:	22	1.83	0.56
Front Bumper to Front of Hood:	9	0.75	0.23
Front Bumper to Base of Windshield:	47	3.92	1.19
Front Bumper to Top of Windshield:	79	6.58	2.01
Rear Bumper to Rear Axle:	43	3.58	1.09
Rear Bumper to Rear of Rear Well:	29	2.42	0.74
Rear Bumper to Rear of Trunk:	5	0.42	0.13
Rear Bumper to Base of Rear Window:	22	1.83	0.56
Width Dimensions			
Maximum Width:	72	6.00	1.83
Front Track:	63	5.25	1.60
Rear Track:	63	5.25	1.60
Vertical Dimensions			
Height:	58	4.83	1.47
Ground to -			
Front Bumper (Top)	21	1.75	0.53
Headlight - center	28	2.33	0.71
Hood - top front:	32	2.67	0.81
Base of Windshield	40	3.33	1.02
Rear Bumper - top:	26	2.17	0.66
Trunk - top rear:	42	3.50	1.07
Base of Rear Window:	45	3.75	1.14

2011 HYUNDAI SONATA 4 DOOR SEDAN

Interior Dimensions

	Inches	Feet	Meters
Front Seat Shoulder Width	58	4.83	1.47
Front Seat to Headliner	40	3.33	1.02
Front Leg Room - seatback to floor (max)	45	3.75	1.14
Rear Seat Shoulder Width	57	4.75	1.45
Rear Seat to Headliner	38	3.17	0.97
Front Leg Room - seatback to floor (min)	35	2.92	0.89

Seatbelts: 3pt - front and rear

Airbags: FRONT SEAT AIRBAGS + SIDE AIRBAGS

Steering Data

Turning Circle (Diameter)	432	36.00	10.97
Steering Ratio:	:1		
Wheel Radius:			
Tire Size (OEM):	205/65R16		

Acceleration & Braking Information

Brake Type: ALL DISC

ABS System: ALL WHEEL ABS

Braking, 60 mph to 0 (Hard pedal, no skid, dry pavement):

d = 123.0 ft t = 2.8 sec a = -31.4 ft/sec² G-force = -0.98

Acceleration:

0 to 30mph	t =	2.9	sec	a =	15.2	ft/sec²	G-force = 0.47
0 to 60mph	t =	7.5	sec	a =	11.7	ft/sec²	G-force = 0.36
45 to 65mph	t =	4.1	sec	a =	7.2	ft/sec²	G-force = 0.22

Transmission Type: AUTOMATIC

Notes:

Federal Bumper Standard Requirements: 2.5 mph

This vehicles Rated Bumper Strength: 2.5 mph

N.S.D.C = 2011 - 2013

2011 HYUNDAI SONATA 4 DOOR SEDAN

Other Information

Tip-Over Stability Ratio =	1.38	Stable
NHTSA Star Rating (calculated)		****

Center of Gravity (No Load):

Inches behind front axle	=	44.00
Inches in front of rear axle	=	66.00
Inches from side of vehicle	=	36.00
Inches from ground	=	22.77
Inches from front corner	=	88.64
Inches from rear corner	=	114.79
Inches from front bumper	=	81.00
Inches from rear bumper	=	109.00

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	2115.75	lb*ft*sec²
Pitch Moment of Inertia	=	2043.75	lb*ft*sec²
Roll Moment of Inertia	=	430.50	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	50.7	deg
Angle Front of Hood to Windshield Base	=	11.9	deg
Angle Front of Hood to Windshield Top	=	18.9	deg
Angle of Windshield	=	26.6	deg
Angle of Steering Tires at Max Turn	=	29.2	deg

First Approximation Crush Factors:

Speed Equivalent (mph) of Kinetic Energy (KE) used in causing crush of indentation may be evaluated using the following formula, the appropriated Crush Factor (CF), and Maximum Indentation Depth (MID), in feet:

$$V(mph) = \sqrt{(30 * CF * MID)}$$

KE Equivalent Speed (Front/Rear/Side)	=	21 CF
Bullet vehicle IMPACT SPEED estimation based on TARGET VEHICLE damage ONLY (Tested for Rear/Side Impact only)	=	27 CF

These CF values are based upon analysis of NHTSA Barrier Crash data, and from over 1000 vehicle accidents where independant evaluation of speed was possible. (These are NOT 'A', 'B', 'C', or 'G' values)

The rear Impact data with more then 2-3 inches of crush damage should be looked at carefully, since some vehicles have very weak trunk & fender strength. Therefore, on some cars, especially GM, you estimate from the rear crush data may be high by as much as 4-5 mph (on a crush of 18 inches).

Stiffness Values and Test Data

Derived from

NHTSA Crash Test

#5453

2006 HYUNDAI SONATA

Provided By

4N6XPRT StifCalcs®

Registered to:

4N6XPRT SYSTEMS
8387 UNIVERSITY AVENUE
LA MESA CA 91941-3842
15R-030201SC02301

4N6XPRT Systems | 8387 University Avenue | La Mesa, CA 91942 | USA
(800) 266-9778 | (619) 464-3478 | FAX: (619) 464-2206 | Email: 4n6@4n6xprt.com

Similar Vehicle database reader

You entered: **2011 HYUNDAI SONATA**

The Similar Vehicle Year/Model list indicates the following are Similar Models

Year Range	Make	Model	Body Styles	Wheelbase
2006 - 2013	HYUNDAI	SONATA	4D	107.4

Remarks:

The Similar Vehicle List contained in 4N6XPRT StifCalcs is an extension of the free Vehicle Interchange List provided by Gregory C. Anderson of Scalia Safety Engineering through the 2012 model year. 4N6XPRT Systems® has taken over the maintenance of the Similar Vehicle List beginning with the 2013 version of the 4N6XPRT StifCalcs program. 4N6XPRT Systems® makes no warranties, either expressed or implied, with respect to this data, its quality, performance, merchantability, or fitness for any particular purpose. The entire risk as to its quality and performance is with the user. In no event will 4N6XPRT Systems® be liable for direct, indirect, incidental, or consequential damages resulting from any data presented here, even if 4N6XPRT Systems® has been advised of the possibility of such damages. The user must agree to assume full responsibility for any decisions which are based, in whole or in part, upon information obtained by using this data. Some of the listed similarities are based on estimates or memory. Most of the data are pulled from specification tables which may contain inaccuracies of their own. Use common sense - if something seems wrong, check it (and if it is wrong, let us know!).
If you have suggestions, corrections, etc., we request and urge you to contact us - 4n6@4n6xprt.com.

Test Information

Test #	**5453**	NHTSA Test Reference Guide Version #	**V5**			
Test Date	**2005-08-25**	Contract #	**DTNH22-01-D-32005**			
Contract/Study Title	**NEW CAR ASSESSMENT PROGRAM FRONTAL BARRIER IMPACT TEST**					
Test Objective(s)	**TO OBTAIN VEHICLE CRASHWORTHINESS AND OCCUPANT RESTRAINT INFORMATION**					
Test Type	**NEW CAR ASSESSMENT TEST**	Configuration	**VEHICLE INTO BARRIER**			
Impact Angle	**0**	Side Impact Point	**0**	mm	**0.0**	inches
		Offset Distance	**0**	mm	**0.0**	inches
		Closing Speed	**56.7**	Km/Hr	**35.20**	MPH
Test Performer	**CALSPAN**					
Test Reference #	**RUN2207**					
Test Track Surface	**CONCRETE**	Condition	**DRY**			
Ambient Temperature	**21** C **69.8** F	Total Number of Curves	**143**			
Data Recorder Type	**DIGITAL DATA ACQUISITION**	Data Link	**UMBILICAL CABLE**			
Test Commentary	**FY 06 NCAP - 2006 HYUNDAI SONATA - M60506**					

Fixed Barrier Information

Barrier Type	**RIGID**	Pole Barrier Diameter	**0**	mm	**0**	inches
Barrier Shape	**LOAD CELL BARRIER**					
Barrier Commentary	**FRONTAL FLAT BARRIER WITH 36 LOADCELLS**					

2006 HYUNDAI SONATA LEFT FRONT SEAT OCCUPANT

Test #	5453		
Vehicle #	1	Sex	MALE
Location	LEFT FRONT SEAT	Age	0
Position	CENTER POSITION	Height	0 mm 0.0 inches
Type	HYBRID III DUMMY	Weight	0.0 kg 0 pounds
Size	50 PERCENTILE		
Calibration Method	HYBRID III		
Occupant Manufacturer	MFG: FTSS S/N:143		
Occupant Modification	NO COMMENTS		
Occupant Description	NO COMMENTS		
Occupant Commentary	CNTRH2: HEAD RESTRAINT		

Head

Head to -

Windshielder Header	305	mm	12.0	inches	Head Injury Criteria (HIC)	268	
WindShield	532	mm	20.9	inches	HIC Lower Time Interval (ms)	50	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	86	
Side Header	185	mm	7.3	inches			
Side Window	308	mm	12.1	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): AIR BAG

Second Contact Region (Head):

Chest

Chest to -

Dash	518	mm	20.4	inches	Arm to Door	112	mm	4.4	inches
Steering Wheel	297	mm	11.7	inches	Hip to Door	166	mm	6.5	inches
Seatback	0	mm	0.0	inches					

Chest Severity Index	378	Pelvic Peak Lateral Acceleration (g's)	
Thoracic Trauma Index		Thorax Peak Acceleration (g's)	42.5

Lap Belt Peak Load	9463	Newtons	2127.4	pound Force
Shoulder Belt Peak Load	5436	Newtons	1222.1	pound Force

First Contact Region (Chest/Abdomen): AIR BAG

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash	137	mm	5.4	inches	Knees to Seatback	0	mm	0.0	inches

Left Femur Peak Load	-3239	Newtons	-728.2	pounds Force
Right Femur Peak Load	-3414	Newtons	-767.5	pounds Force

First Contact Region (Legs): DASHPANEL

Second Contact Region (Legs):

2006 HYUNDAI SONATA LEFT FRONT SEAT OCCUPANT

Test #	5453					
Vehicle #	1	Sex	MALE			
Location	LEFT FRONT SEAT	Age	0			
Position	CENTER POSITION	Height	0	mm	0.0	inches
Type	HYBRID III DUMMY	Weight	0.0	kg	0	pounds
Size	50 PERCENTILE					

Calibration Method	HYBRID III
Occupant Manufacturer	MFG: FTSS S/N:143
Occupant Modification	NO COMMENTS
Occupant Description	NO COMMENTS
Occupant Commentary	CNTRH2: HEAD RESTRAINT

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	SHOULDER BELT PRETENSIONER AND FORCE LIMITER
Restraint # 2	FRONTAL AIRBAG
Mounted	STEERING WHEEL
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NONE

2006 HYUNDAI SONATA RIGHT FRONT SEAT OCCUPANT

Test #	5453		
Vehicle #	1	Sex	MALE
Location	RIGHT FRONT SEAT	Age	0
Position	CENTER POSITION	Height	0 mm 0.0 inches
Type	HYBRID III DUMMY	Weight	0.0 kg 0 pounds
Size	50 PERCENTILE		
Calibration Method	HYBRID III		
Occupant Manufacturer	MFG: FTSS S/N:150		
Occupant Modification	NO COMMENTS		
Occupant Description	NO COMMENTS		
Occupant Commentary	CNTRH2: SUN VISOR		

Head

Head to -

Windshielder Header	305	mm	12.0	inches	Head Injury Criteria (HIC)	278	
WindShield	516	mm	20.3	inches	HIC Lower Time Interval (ms)	61.9	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	97.8	
Side Header	170	mm	6.7	inches			
Side Window	308	mm	12.1	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): AIR BAG

Second Contact Region (Head):

Chest

Chest to -

Dash	545	mm	21.5	inches	Arm to Door	120	mm	4.7	inches
Steering Wheel	0	mm	0.0	inches	Hip to Door	160	mm	6.3	inches
Seatback	0	mm	0.0	inches					

Chest Severity Index	340	Pelvic Peak Lateral Acceleration (g's)	
Thoracic Trauma Index		Thorax Peak Acceleration (g's)	38.5

Lap Belt Peak Load	8739	Newtons	1964.6	pound Force
Shoulder Belt Peak Load	5733	Newtons	1288.8	pound Force

First Contact Region (Chest/Abdomen): AIR BAG

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash	124	mm	4.9	inches	Knees to Seatback	0	mm	0.0	inches

Left Femur Peak Load	-2033	Newtons	-457.0	pounds Force
Right Femur Peak Load	-1182	Newtons	-265.7	pounds Force

First Contact Region (Legs): DASHPANEL

Second Contact Region (Legs):

2006 HYUNDAI SONATA RIGHT FRONT SEAT OCCUPANT

Test #	5453					
Vehicle #	1	Sex	MALE			
Location	RIGHT FRONT SEAT	Age	0			
Position	CENTER POSITION	Height	0	mm	0.0	inches
Type	HYBRID III DUMMY	Weight	0.0	kg	0	pounds
Size	50 PERCENTILE					

Calibration Method	HYBRID III
Occupant Manufacturer	MFG: FTSS S/N:150
Occupant Modification	NO COMMENTS
Occupant Description	NO COMMENTS
Occupant Commentary	CNTRH2: SUN VISOR

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	SHOULDER BELT PRETENSIONER AND FORCE LIMITER
Restraint # 2	FRONTAL AIRBAG
Mounted	DASH PANEL - MID
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NONE

Vehicle 1 2006 HYUNDAI SONATA

Test #	5453		
VIN	KMHET46CX6A078130	NHTSA Test Vehicle Number	1
Year	2006	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	HYUNDAI	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	SONATA	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	2.4 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	NONE		
Vehicle Commentary	2006 HYUNDAI SONATA - M60506		

Vehicle Length	4801	mm	189.0	inches	CG behind Front Axle	1157	mm	45.6	inches
Vehicle Width	1832	mm	72.1	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2727	mm	107.4	inches	Total Length of Indentation	1452	mm	57.2	inches
Vehicle Test Weight	1710	KG	3769	pounds	Maximum Static Crush Depth	431	mm	17.0	inches
					Pre-Impact Speed	57	kph	35.2	mph

Vehicle Damage Index: 12FDEW2

Principal Direction of Force: 0

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	291	mm	11.5	inches
DPD 2	425	mm	16.7	inches
DPD 3	392	mm	15.4	inches
DPD 4	371	mm	14.6	inches
DPD 5	343	mm	13.5	inches
DPD 6	329	mm	13.0	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	186.0	inches	169.0	inches	17.0	inches
	4724	mm	4293	mm	431	mm
Centerline	189.0	inches	173.5	inches	15.5	inches
	4801	mm	4407	mm	394	mm
Right Bumper Corner	185.9	inches	172.6	inches	13.3	inches
	4722	mm	4383	mm	339	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
0.0	NOT APPLICABLE	0.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
DIRECT ENGAGEMENT	0.0	NOT APPLICABLE
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 1 2006 HYUNDAI SONATA

Test #	5453		
VIN	KMHET46CX6A078130	NHTSA Test Vehicle Number	1
Year	2006	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	HYUNDAI	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	SONATA	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	2.4 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	NONE		
Vehicle Commentary	2006 HYUNDAI SONATA - M60506		

Vehicle Length	4801	mm	189.0	inches	CG behind Front Axle	1157	mm	45.6	inches
Vehicle Width	1832	mm	72.1	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2727	mm	107.4	inches	Total Length of Indentation	1452	mm	57.2	inches
Vehicle Test Weight	1710	KG	3769	pounds	Maximum Static Crush Depth	431	mm	17.0	inches
					Pre-Impact Speed	57	kph	35.2	mph

Vehicle Damage Index	12FDEW2	Principal Direction of Force	0

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from the Rear Vehicle Surface forward.)

Left Side				Centerline				Right Side			
Pre-Test		Post-Test		Pre-Test		Post-Test		Pre-Test		Post-Test	
mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches
				Length of Vehicle at Centerline							
				4801	189.0	4407	173.5				
				Engine Block							
				434	17.1	434	17.1				
4724	186.0	4293	169.0	Front Bumper Corner				4722	185.9	4383	172.6
				Front of Engine							
				4326	170.3	4081	160.7				
3687	145.2	3676	144.7	Firewall				3682	145.0	3641	143.3
				3706	145.9	3684	145.0				
3272	128.8	3274	128.9	Upper Leading Edge of Door				3270	128.7	3271	128.8
3300	129.9	3300	129.9	Lower Leading Edge of Door				3298	129.8	3299	129.9
3300	129.9	3300	129.9	Bottom of 'A' Post				3297	129.8	3298	129.8
2225	87.6	2226	87.6	Upper Trailing Edge of Door				2223	87.5	2225	87.6
2253	88.7	2253	88.7	Lower Trailing Edge of Door				2250	88.6	2251	88.6
				Steering Column							
				2843	111.9	2872	113.1				
				Center of Seering Column to 'A' Post (Horizontal)							
				367	14.4	386	15.2				
				Center of Steering Column to Headliner (Vertical)							
				418	16.5	409	16.1				

2006 HYUNDAI SONATA

NHTSA Crash Test - #5453 - Front Impact

Pre/Post Depths - Vehicle Width - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 3769 pounds
Vehicle Closing Speed = 35.2 mph
Test Crush Length = 72.1 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	17.0	15.5	13.3	(Pass. Side)

			CRASH 3 Stiffness Coefficents			SMAC Stiffness
			A	B	G	Kv
Minimum Crush =	13.3	inches				293.5
Using a Rated No Damage Speed of		2.5mph	257.5	253.2	130.9	
Using a Rated No Damage Speed of		5.0mph	475.6	216.0	523.7	
Using a Rated No Damage Speed of		7.5mph	654.4	181.7	1178.2	
Using a Rated No Damage Speed of		10.0mph	793.8	150.4	2094.6	
Average Crush =	15.3	inches				221.7
Using a Rated No Damage Speed of		2.5mph	223.8	191.4	130.9	
Using a Rated No Damage Speed of		5.0mph	413.5	163.2	523.7	
Using a Rated No Damage Speed of		7.5mph	568.8	137.3	1178.2	
Using a Rated No Damage Speed of		10.0mph	690.0	113.7	2094.6	
Maximum Crush =	17.0	inches				179.6
Using a Rated No Damage Speed of		2.5mph	201.5	155.0	130.9	
Using a Rated No Damage Speed of		5.0mph	372.1	132.2	523.7	
Using a Rated No Damage Speed of		7.5mph	512.0	111.2	1178.2	
Using a Rated No Damage Speed of		10.0mph	621.0	92.1	2094.6	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

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4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	17.0	29.9	-5.3	-17.8

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 29.2

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

2006 HYUNDAI SONATA

NHTSA Crash Test - #5453 - Front Impact

Pre/Post Depths - Indention Length - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 3769 pounds
Vehicle Closing Speed = 35.2 mph
Test Crush Length = 57.2 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	17.0	15.5	13.3	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 13.3 inches					370.2
Using a Rated No Damage Speed of	2.5mph	324.9	319.5	165.2	
Using a Rated No Damage Speed of	5.0mph	600.1	272.5	660.7	
Using a Rated No Damage Speed of	7.5mph	825.6	229.3	1486.6	
Using a Rated No Damage Speed of	10.0mph	1001.5	189.8	2642.8	
Average Crush = 15.3 inches					279.8
Using a Rated No Damage Speed of	2.5mph	282.4	241.4	165.2	
Using a Rated No Damage Speed of	5.0mph	521.7	205.9	660.7	
Using a Rated No Damage Speed of	7.5mph	717.7	173.3	1486.6	
Using a Rated No Damage Speed of	10.0mph	870.6	143.4	2642.8	
Maximum Crush = 17.0 inches					226.6
Using a Rated No Damage Speed of	2.5mph	254.2	195.6	165.2	
Using a Rated No Damage Speed of	5.0mph	469.5	166.8	660.7	
Using a Rated No Damage Speed of	7.5mph	645.9	140.3	1486.6	
Using a Rated No Damage Speed of	10.0mph	783.5	116.2	2642.8	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

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4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	17.0	29.9	-5.3	-17.8

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 29.2

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

2006 HYUNDAI SONATA

NHTSA Crash Test - #5453 - Front Impact

Damage Profile Distances - Vehicle Width - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 3769 pounds
Vehicle Closing Speed = 35.2 MPH
Test Crush Length = 72.1 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	11.5	16.7	15.4	14.6	13.5	13.0	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 11.5 inches					392.5
Using a Rated No Damage Speed of	2.5mph	297.8	338.7	130.9	
Using a Rated No Damage Speed of	5.0mph	550.1	288.9	523.7	
Using a Rated No Damage Speed of	7.5mph	756.8	243.1	1178.2	
Using a Rated No Damage Speed of	10.0mph	918.0	201.2	2094.6	
Average Crush = 14.5 inches					246.9
Using a Rated No Damage Speed of	2.5mph	236.2	213.1	130.9	
Using a Rated No Damage Speed of	5.0mph	436.3	181.7	523.7	
Using a Rated No Damage Speed of	7.5mph	600.2	152.9	1178.2	
Using a Rated No Damage Speed of	10.0mph	728.1	126.5	1458.5	
Maximum Crush = 16.7 inches					186.1
Using a Rated No Damage Speed of	2.5mph	205.1	160.6	130.9	
Using a Rated No Damage Speed of	5.0mph	378.8	137.0	523.7	
Using a Rated No Damage Speed of	7.5mph	521.2	115.3	1178.2	
Using a Rated No Damage Speed of	10.0mph	632.2	95.4	2094.6	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

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4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	16.7	29.6	-5.6	-18.9

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 29.7

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

2006 HYUNDAI SONATA

NHTSA Crash Test - #5453 - Front Impact

Damage Profile Distances - Indention Length - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 3769 pounds
Vehicle Closing Speed = 35.2 MPH
Test Crush Length = 57.2 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	11.5	16.7	15.4	14.6	13.5	13.0	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 11.5 inches					495.2
Using a Rated No Damage Speed of	2.5mph	375.7	427.4	165.2	
Using a Rated No Damage Speed of	5.0mph	694.0	364.5	660.7	
Using a Rated No Damage Speed of	7.5mph	954.9	306.7	1486.6	
Using a Rated No Damage Speed of	10.0mph	1158.3	253.8	2642.8	
Average Crush = 14.5 inches					311.5
Using a Rated No Damage Speed of	2.5mph	298.0	268.8	165.2	
Using a Rated No Damage Speed of	5.0mph	550.4	229.3	660.7	
Using a Rated No Damage Speed of	7.5mph	757.3	192.9	1486.6	
Using a Rated No Damage Speed of	10.0mph	918.6	159.7	1840.2	
Maximum Crush = 16.7 inches					234.8
Using a Rated No Damage Speed of	2.5mph	258.7	202.7	165.2	
Using a Rated No Damage Speed of	5.0mph	477.9	172.9	660.7	
Using a Rated No Damage Speed of	7.5mph	657.6	145.4	1486.6	
Using a Rated No Damage Speed of	10.0mph	797.6	120.4	2642.8	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

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4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	16.7	29.6	-5.6	-18.9

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 29.7

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

4N6XPRT StifCalcs®

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2006 - 2013
Make: HYUNDAI
Model: SONATA

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
5730	2006 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	13.6	24.7	296.9	86.2	511.4	135.4	18.0
6940	2011 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	17.5	35.0	353.3	121.4	514.2	165.3	28.0
7203	2011 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	17.1	35.1	363.4	128.3	514.5	174.5	28.9
6362	2009 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	17.1	35.0	374.6	131.7	532.7	179.3	28.7
5798	2006 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	16.6	35.4	404.8	148.5	551.8	201.4	30.2
5453	2006 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	14.5	35.2	436.4	181.8	523.7	247.0	34.2
5799	2006 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	14.4	35.1	460.6	192.1	552.1	261.3	34.1
6338	2009 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	13.3	34.8	476.9	214.8	529.6	292.8	36.6
7002	2011 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	12.5	35.0	496.4	237.9	517.9	323.9	39.1
6511	2009 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	12.1	35.0	524.0	259.3	529.4	352.9	40.4
5797	2006 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	8.1	25.0	546.9	271.2	551.5	423.5	31.0
7792	2011 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	7.7	24.7	577.0	296.7	561.0	466.2	31.9
	Average (AVG)				**442.6**	**189.2**	**532.5**	**268.6**	**31.8**
	Minimum (MIN)				**296.9**	**86.2**	**511.4**	**135.4**	**18.0**
	Maximum (MAX)				**577.0**	**296.7**	**561.0**	**466.2**	**40.4**
	Standard Deviation (STDev-sample)				**86.1**	**67.5**	**17.4**	**106.2**	**5.9**
	Number of Tests (n)			**12**					

4N6XPRT StifCalcs®

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2006 - 2013
Make: HYUNDAI
Model: SONATA

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
5730	2006 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	15.7	24.7	257.6	64.9	511.4	101.9	15.6
7203	2011 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	21.3	35.1	290.4	81.9	514.5	111.4	23.1
6940	2011 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	20.4	35.0	302.4	88.9	514.2	121.0	24.0
6362	2009 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	20.7	35.0	309.6	89.9	532.7	122.4	23.7
5798	2006 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	18.8	35.4	357.0	115.5	551.8	156.6	26.7
5453	2006 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	17.0	35.2	372.8	132.7	523.7	180.3	29.2
5797	2006 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	11.6	25.0	381.7	132.1	551.5	206.3	21.6
5799	2006 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	17.2	35.1	387.1	135.7	552.1	184.5	28.7
7002	2011 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	15.2	35.0	409.8	162.1	517.9	220.7	32.3
6338	2009 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	14.8	34.8	428.2	173.1	529.6	236.0	32.9
6511	2009 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	14.0	35.0	454.9	195.4	529.4	265.9	35.1
7792	2011 HYUNDAI SONATA FOUR DOOR SEDAN	5.0	9.4	24.7	470.6	197.3	561.0	310.0	26.0
	Average (AVG)				**368.5**	**130.8**	**532.5**	**184.8**	**26.6**
	Minimum (MIN)				**257.6**	**64.9**	**511.4**	**101.9**	**15.6**
	Maximum (MAX)				**470.6**	**197.3**	**561.0**	**310.0**	**35.1**
	Standard Deviation (STDev-sample)				**67.5**	**44.5**	**17.4**	**65.8**	**5.5**
	Number of Tests (n)			**12**					

Expert VIN DeCoder®

Version Number 3.4.0.2

DeCoded VIN:	JTDBT923371164780
Model:	2007 Toyota Yaris 4-Door Sedan
Engine Size:	1.5L / 91cu.in.
Engine Description:	In-line 4 Cylinder with Dual Overhead Cam
Horse Power:	108 @ 5999 rpm
Torque:	105 lb-ft @ 3999 rpm
Injection System:	Electronic Fuel Injection (EFI)
PSI:	44-50 psi
Ignition:	electronic
Manufacturer:	Toyota
Assembly Plant:	Toyota, Japan
Drive Wheels:	This is a Front Wheel Drive vehicle w/ Dual Front Air Bags

The First through Third characters (JTD) indicate a Toyota Car made in Japan

The Fourth character (B) indicates a 4-Door Sedan

The Fifth character (T) indicates the OEM engine: 1.5L / 91cu.in., L4,DOHC

The Sixth and Eighth characters (93) indicate a Yaris

The Seventh character (2) indicates Dual Front Air Bags

The Ninth character (the check digit) is entered as 3.
The VIN appears Valid, the calculated value is 3.

The Tenth character (7) indicates the model year 2007

The Eleventh character (1) indicates the vehicle was made in the assembly plant in Toyota, Japan

The Twelfth through Seventeenth characters (164780) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.5.1.0

PROVIDED BY:
4N6XPRT Systems
8387 University Avenue
La Mesa CA 91941

9/4/2015

2007 TOYOTA YARIS 4 DOOR SEDAN

Curb Weight:		2309	lbs.	1047	kg.
Curb Weight Distribution -	Front:	61	% Rear:	39	%
Gross Vehicle Weight Rating:		3300	lbs.	1497	kg.
Number of Tires on Vehicle:		4			
Drive Wheels:		FRONT			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	169	14.08	4.29
Wheelbase:	100	8.33	2.54
Front Bumper to Front Axle:	31	2.58	0.79
Front Bumper to Front of Front Well:	17	1.42	0.43
Front Bumper to Front of Hood:	7	0.58	0.18
Front Bumper to Base of Windshield:	36	3.00	0.91
Front Bumper to Top of Windshield:	66	5.50	1.68
Rear Bumper to Rear Axle:	38	3.17	0.97
Rear Bumper to Rear of Rear Well:	23	1.92	0.58
Rear Bumper to Rear of Trunk:	6	0.50	0.15
Rear Bumper to Base of Rear Window:	18	1.50	0.46
Width Dimensions			
Maximum Width:	67	5.58	1.70
Front Track:	58	4.83	1.47
Rear Track:	58	4.83	1.47
Vertical Dimensions			
Height:	57	4.75	1.45
Ground to -			
Front Bumper (Top)	22	1.83	0.56
Headlight - center	29	2.42	0.74
Hood - top front:	33	2.75	0.84
Base of Windshield	39	3.25	0.99
Rear Bumper - top:	24	2.00	0.61
Trunk - top rear:	42	3.50	1.07
Base of Rear Window:	44	3.67	1.12

2007 TOYOTA YARIS 4 DOOR SEDAN

Interior Dimensions

	Inches	Feet	Meters
Front Seat Shoulder Width	52	4.33	1.32
Front Seat to Headliner	39	3.25	0.99
Front Leg Room - seatback to floor (max)	42	3.50	1.07
Rear Seat Shoulder Width	50	4.17	1.27
Rear Seat to Headliner	37	3.08	0.94
Front Leg Room - seatback to floor (min)	36	3.00	0.91

Seatbelts: 3pt - front and rear

Airbags: FRONT SEAT AIRBAGS

Steering Data

	Inches	Feet	Meters
Turning Circle (Diameter)	396	33.00	10.06
Wheel Radius:			

Steering Ratio: 19.70:1

Tire Size (OEM): P175/65R14

Acceleration & Braking Information

Brake Type: FRONT DISC - REAR DRUM

ABS System: ALL WHEEL ABS - OPTIONAL

Braking, 60 mph to 0 (Hard pedal, no skid, dry pavement):

d = 125.0 ft t = 2.8 sec a = -30.9 ft/sec² G-force = -0.96

Acceleration:

0 to 30mph	t =	3.3	sec	a =	13.3	ft/sec²	G-force = 0.41
0 to 60mph	t =	10.4	sec	a =	8.5	ft/sec²	G-force = 0.26
45 to 65mph	t =	5.6	sec	a =	5.2	ft/sec²	G-force = 0.16

Transmission Type: 5spd MANUAL

Notes:

Federal Bumper Standard Requirements: 2.5 mph

This vehicles Rated Bumper Strength: 2.5 mph

N.S.D.C = 2007 - 2012

2007 TOYOTA YARIS 4 DOOR SEDAN

Other Information

Tip-Over Stability Ratio =	1.30	Stable
NHTSA Star Rating (calculated)		****

Center of Gravity (No Load):

Inches behind front axle	=	39.00
Inches in front of rear axle	=	61.00
Inches from side of vehicle	=	33.50
Inches from ground	=	22.37
Inches from front corner	=	77.60
Inches from rear corner	=	104.51
Inches from front bumper	=	70.00
Inches from rear bumper	=	99.00

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	1172.27	lb*ft*sec²
Pitch Moment of Inertia	=	1136.91	lb*ft*sec²
Roll Moment of Inertia	=	265.62	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	57.5	deg
Angle Front of Hood to Windshield Base	=	11.7	deg
Angle Front of Hood to Windshield Top	=	20.4	deg
Angle of Windshield	=	28.1	deg
Angle of Steering Tires at Max Turn	=	28.9	deg

First Approximation Crush Factors:

Speed Equivalent (mph) of Kinetic Energy (KE) used in causing crush of indentation may be evaluated using the following formula, the appropriated Crush Factor (CF), and Maximum Indentation Depth (MID), in feet:

$$V(mph) = \sqrt{(30 * CF * MID)}$$

KE Equivalent Speed (Front/Rear/Side)	=	21	CF
Bullet vehicle IMPACT SPEED estimation based on TARGET VEHICLE damage ONLY (Tested for Rear/Side Impact only)	=	27	CF

These CF values are based upon analysis of NHTSA Barrier Crash data, and from over 1000 vehicle accidents where independant evaluation of speed was possible. (These are NOT 'A', 'B', 'C', or 'G' values)

The rear Impact data with more then 2-3 inches of crush damage should be looked at carefully, since some vehicles have very weak trunk & fender strength. Therefore, on some cars, especially GM, you estimate from the rear crush data may be high by as much as 4-5 mph (on a crush of 18 inches).

Stiffness Values and Test Data

Derived from

NHTSA Crash Test

#6221

2008 TOYOTA YARIS

Provided By

4N6XPRT StifCalcs®

Registered to:

4N6XPRT SYSTEMS
8387 UNIVERSITY AVENUE
LA MESA CA 91941-3842
15R-030201SC02301

4N6XPRT Systems | 8387 University Avenue | La Mesa, CA 91942 | USA
(800) 266-9778 | (619) 464-3478 | FAX: (619) 464-2206 | Email: 4n6@4n6xprt.com

Similar Vehicle database reader

You entered: **2007 TOYOTA YARIS 4D**

The Similar Vehicle Year/Model list indicates the following are Similar Models

Year Range	Make	Model	Body Styles	Wheelbase
2006 - 2010	TOYOTA	YARIS 4D	4D	100.4

Remarks:

The Similar Vehicle List contained in 4N6XPRT StifCalcs is an extension of the free Vehicle Interchange List provided by Gregory C. Anderson of Scalia Safety Engineering through the 2012 model year. 4N6XPRT Systems® has taken over the maintenance of the Similar Vehicle List beginning with the 2013 version of the 4N6XPRT StifCalcs program. 4N6XPRT Systems® makes no warranties, either expressed or implied, with respect to this data, its quality, performance, merchantability, or fitness for any particular purpose. The entire risk as to its quality and performance is with the user. In no event will 4N6XPRT Systems® be liable for direct, indirect, incidental, or consequential damages resulting from any data presented here, even if 4N6XPRT Systems® has been advised of the possibility of such damages. The user must agree to assume full responsibility for any decisions which are based, in whole or in part, upon information obtained by using this data. Some of the listed similarities are based on estimates or memory. Most of the data are pulled from specification tables which may contain inaccuracies of their own. Use common sense - if something seems wrong, check it (and if it is wrong, let us know!).
If you have suggestions, corrections, etc., we request and urge you to contact us - 4n6@4n6xprt.com.

Test Information

Test #	**6221**	NHTSA Test Reference Guide Version #	**V5**			
Test Date	**2007-10-10**	Contract #	**DTNH22-06-D-00028**			
Contract/Study Title	**NCAP - 2008 TOYOTA YARIS 3-DOOR LIFTBACK**					
Test Objective(s)	**VEHICLE CRASHWORTHINESS AND OCCUPANT RESTRAINT PERFORMANCE DATA**					
Test Type	**NEW CAR ASSESSMENT TEST**	Configuration	**VEHICLE INTO BARRIER**			
Impact Angle	**0**	Side Impact Point	**0**	mm	**0.0**	inches
		Offset Distance	**0**	mm	**0.0**	inches
		Closing Speed	**56.2**	Km/Hr	**34.92**	MPH
Test Performer	**MGA RESEARCH**					
Test Reference #	**BT07101001**					
Test Track Surface	**CONCRETE**	Condition	**DRY**			
Ambient Temperature	**21** C **69.8** F	Total Number of Curves	**132**			
Data Recorder Type	**OTHER**	Data Link	**OTHER**			
Test Commentary	**DTS TDAS PRO ON BOARD DAS**					

Fixed Barrier Information

Barrier Type	**RIGID**	Pole Barrier Diameter	**0**	mm	**0**	inches
Barrier Shape	**LOAD CELL BARRIER**					
Barrier Commentary						

2008 TOYOTA YARIS LEFT FRONT SEAT OCCUPANT

Test #	6221		
Vehicle #	1	Sex	MALE
Location	LEFT FRONT SEAT	Age	0
Position	FORWARD OF CENTER POSITION	Height	0 mm 0.0 inches
Type	HYBRID III DUMMY	Weight	0.0 kg 0 pounds
Size	50 PERCENTILE		
Calibration Method	HYBRID III		
Occupant Manufacturer	FIRST TECHNOLOGY S/N 065		
Occupant Modification			
Occupant Description			
Occupant Commentary	HEAD TO HEADREST		

Head

Head to -

Windshielder Header	355	mm	14.0	inches	Head Injury Criteria (HIC)	390	
WindShield	641	mm	25.2	inches	HIC Lower Time Interval (ms)	60.4	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	96.4	
Side Header	214	mm	8.4	inches			
Side Window	321	mm	12.6	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): AIR BAG

Second Contact Region (Head):

Chest

Chest to -

Dash	644	mm	25.4	inches	Arm to Door	96	mm	3.8	inches
Steering Wheel	317	mm	12.5	inches	Hip to Door	138	mm	5.4	inches
Seatback	0	mm	0.0	inches					

Chest Severity Index	0	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	43

Lap Belt Peak Load	6545	Newtons	1471.4	pound Force
Shoulder Belt Peak Load	4588	Newtons	1031.4	pound Force

First Contact Region (Chest/Abdomen): AIR BAG

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash	151	mm	5.9	inches	Knees to Seatback	0	mm	0.0	inches

Left Femur Peak Load	-6035	Newtons	-1356.7	pounds Force
Right Femur Peak Load	-5327	Newtons	-1197.6	pounds Force

First Contact Region (Legs): DASHPANEL

Second Contact Region (Legs):

2008 TOYOTA YARIS LEFT FRONT SEAT OCCUPANT

Test #	6221					
Vehicle #	1		Sex	MALE		
Location	LEFT FRONT SEAT		Age	0		
Position	FORWARD OF CENTER POSITION		Height	0	mm 0.0	inches
Type	HYBRID III DUMMY		Weight	0.0	kg 0	pounds
Size	50 PERCENTILE					

Calibration Method	HYBRID III
Occupant Manufacturer	FIRST TECHNOLOGY S/N 065
Occupant Modification	
Occupant Description	
Occupant Commentary	HEAD TO HEADREST

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	PRIMARY
Restraint # 2	FRONTAL AIRBAG
Mounted	STEERING WHEEL
Deployment	DEPLOYED PROPERLY
Restraint Commentary	SECONDARY

2008 TOYOTA YARIS RIGHT FRONT SEAT OCCUPANT

Test #	6221						
Vehicle #	1			Sex	MALE		
Location	RIGHT FRONT SEAT			Age	0		
Position	FORWARD OF CENTER POSITION			Height	0	mm	0.0 inches
Type	HYBRID III DUMMY			Weight	0.0	kg	0 pounds
Size	50 PERCENTILE						

Calibration Method	HYBRID III
Occupant Manufacturer	FIRST TECHNOLOGY S/N 066
Occupant Modification	
Occupant Description	
Occupant Commentary	HEAD TO HEADREST; KNEES TO GLOVEBOX

Head

Head to -

Windshielder Header	377	mm	14.8	inches	Head Injury Criteria (HIC)	559			
WindShield	651	mm	25.6	inches	HIC Lower Time Interval (ms)	61.6			
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	86.3			
Side Header	211	mm	8.3	inches					
Side Window	322	mm	12.7	inches					

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head)	AIR BAG
Second Contact Region (Head)	

Chest

Chest to -

Dash	527	mm	20.7	inches	Arm to Door	136	mm	5.4	inches
Steering Wheel	0	mm	0.0	inches	Hip to Door	139	mm	5.5	inches
Seatback	0	mm	0.0	inches					

Chest Severity Index	0	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	42

Lap Belt Peak Load	8111	Newtons	1823.4	pound Force
Shoulder Belt Peak Load	4525	Newtons	1017.3	pound Force

First Contact Region (Chest/Abdomen)	AIR BAG
Second Contact Region (Chest/Abdomen)	NONE

Legs

Knees to Dash	151	mm	5.9	inches	Knees to Seatback	0	mm	0.0	inches

Left Femur Peak Load	-5222	Newtons	-1174.0	pounds Force
Right Femur Peak Load	-599	Newtons	-134.7	pounds Force

First Contact Region (Legs)	OTHER
Second Contact Region (Legs)	

2008 TOYOTA YARIS RIGHT FRONT SEAT OCCUPANT

Test #	6221					
Vehicle #	1	Sex	MALE			
Location	RIGHT FRONT SEAT	Age	0			
Position	FORWARD OF CENTER POSITION	Height	0	mm	0.0	inches
Type	HYBRID III DUMMY	Weight	0.0	kg	0	pounds
Size	50 PERCENTILE					

Calibration Method	HYBRID III
Occupant Manufacturer	FIRST TECHNOLOGY S/N 066
Occupant Modification	
Occupant Description	
Occupant Commentary	HEAD TO HEADREST; KNEES TO GLOVEBOX

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	PRIMARY
Restraint # 2	FRONTAL AIRBAG
Mounted	DASH PANEL - TOP
Deployment	DEPLOYED PROPERLY
Restraint Commentary	SECONDARY

2008 TOYOTA YARIS RIGHT REAR SEAT OCCUPANT

Test #	6221		
Vehicle #	1	Sex	NOT APPLICABLE
Location	RIGHT REAR SEAT	Age	0
Position	NON-ADJUSTABLE SEAT	Height	0 mm 0.0 inches
Type	CRABI	Weight	0.0 kg 0 pounds
Size	12 MONTH OLD CHILD		
Calibration Method	PART 572		
Occupant Manufacturer	FIRST TECHNOLOGY S/N 093		
Occupant Modification			
Occupant Description			
Occupant Commentary	HEAD TO HEADREST		

Head

Head to -

Windshielder Header	0 mm	0.0 inches	Head Injury Criteria (HIC)	1391
WindShield	0 mm	0.0 inches	HIC Lower Time Interval (ms)	54.3
Seatback	507 mm	20.0 inches	HIC Upper Time Interval (ms)	90.3
Side Header	0 mm	0.0 inches		
Side Window	357 mm	14.1 inches		

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): OTHER

Second Contact Region (Head):

Chest

Chest to -

Dash	0 mm	0.0 inches	Arm to Door	242 mm 9.5 inches
Steering Wheel	0 mm	0.0 inches	Hip to Door	281 mm 11.1 inches
Seatback	402 mm	15.8 inches		

Chest Severity Index	0	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	61

Lap Belt Peak Load: 0 Newtons 0.0 pound Force

Shoulder Belt Peak Load: 0 Newtons 0.0 pound Force

First Contact Region (Chest/Abdomen): NONE

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash 0 mm 0.0 inches Knees to Seatback 172 mm 6.8 inches

Left Femur Peak Load 0 Newtons 0.0 pounds Force

Right Femur Peak Load 0 Newtons 0.0 pounds Force

First Contact Region (Legs): SEAT BACK

Second Contact Region (Legs):

2008 TOYOTA YARIS RIGHT REAR SEAT OCCUPANT

Test #	6221					
Vehicle #	1	Sex	NOT APPLICABLE			
Location	RIGHT REAR SEAT	Age	0			
Position	NON-ADJUSTABLE SEAT	Height	0	mm	0.0	inches
Type	CRABI	Weight	0.0	kg	0	pounds
Size	12 MONTH OLD CHILD					

Calibration Method	PART 572
Occupant Manufacturer	FIRST TECHNOLOGY S/N 093
Occupant Modification	
Occupant Description	
Occupant Commentary	HEAD TO HEADREST

Restraints

Restraint # 1	INFANT SAFETY SEAT
Mounted	LATCH - LOWER ANCHORAGES NO TOP TETHER
Deployment	NOT APPLICABLE
Restraint Commentary	PRIMARY - GRACO SNUGRIDE
Restraint # 2	5 POINT BELT
Mounted	CHILD SEAT
Deployment	NOT APPLICABLE
Restraint Commentary	SECONDARY - GRACO SNUGRIDE

2008 TOYOTA YARIS LEFT REAR SEAT OCCUPANT

Test #	6221		
Vehicle #	1	Sex	NOT APPLICABLE
Location	LEFT REAR SEAT	Age	0
Position	NON-ADJUSTABLE SEAT	Height	0 mm 0.0 inches
Type	CRABI	Weight	0.0 kg 0 pounds
Size	12 MONTH OLD CHILD		
Calibration Method	PART 572		
Occupant Manufacturer	FIRST TECHNOLOGY S/N 090		
Occupant Modification			
Occupant Description			
Occupant Commentary			

Head

Head to -							
Windshielder Header	0	mm	0.0	inches	Head Injury Criteria (HIC)	1487	
WindShield	0	mm	0.0	inches	HIC Lower Time Interval (ms)	49.9	
Seatback	451	mm	17.8	inches	HIC Upper Time Interval (ms)	85.9	
Side Header	0	mm	0.0	inches			
Side Window	333	mm	13.1	inches			
Neck to Seatback	0	mm	0.0	inches			
First Contact Region (Head)	NONE						
Second Contact Region (Head)							

Chest

Chest to -									
Dash	0	mm	0.0	inches	Arm to Door	233	mm	9.2	inches
Steering Wheel	0	mm	0.0	inches	Hip to Door	287	mm	11.3	inches
Seatback	352	mm	13.9	inches					
Chest Severity Index	0				Pelvic Peak Lateral Acceleration (g's)	0			
Thoracic Trauma Index	0				Thorax Peak Acceleration (g's)	59			
Lap Belt Peak Load	0	Newtons	0.0	pound Force					
Shoulder Belt Peak Load	0	Newtons	0.0	pound Force					
First Contact Region (Chest/Abdomen)	NONE								
Second Contact Region (Chest/Abdomen)	NONE								

Legs

Knees to Dash	0	mm	0.0	inches	Knees to Seatback	163	mm	6.4	inches
Left Femur Peak Load	0	Newtons	0.0	pounds Force					
Right Femur Peak Load	0	Newtons	0.0	pounds Force					
First Contact Region (Legs)	SEAT BACK								
Second Contact Region (Legs)									

2008 TOYOTA YARIS LEFT REAR SEAT OCCUPANT

Test #	6221					
Vehicle #	1	Sex	NOT APPLICABLE			
Location	LEFT REAR SEAT	Age	0			
Position	NON-ADJUSTABLE SEAT	Height	0	mm	0.0	inches
Type	CRABI	Weight	0.0	kg	0	pounds
Size	12 MONTH OLD CHILD					

Calibration Method	PART 572
Occupant Manufacturer	FIRST TECHNOLOGY S/N 090
Occupant Modification	
Occupant Description	
Occupant Commentary	

Restraints

Restraint # 1	INFANT SAFETY SEAT
Mounted	LATCH - LOWER ANCHORAGES NO TOP TETHER
Deployment	NOT APPLICABLE
Restraint Commentary	PRIMARY - EVENFLO EMBRACE
Restraint # 2	5 POINT BELT
Mounted	CHILD SEAT
Deployment	NOT APPLICABLE
Restraint Commentary	SECONDARY - EVENFLO EMBRACE

Vehicle 1 2008 TOYOTA YARIS

Test #	6221		
VIN	JTDJT923285140508	NHTSA Test Vehicle Number	1
Year	2008	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	TOYOTA	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	YARIS	Steering Column Collapse Mechanism	UNKNOWN
Body	THREE DOOR HATCHBACK		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	1.5 Liter	Transmission	MANUAL - FRONT WHEEL DRIVE
Vehicle Modification(s) Description			
Vehicle Commentary	VEHICLE MODEL: YARIS		

Vehicle Length	3641	mm	143.3	inches	CG behind Front Axle	1009	mm	39.7	inches
Vehicle Width	1690	mm	66.5	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2463	mm	97.0	inches	Total Length of Indentation	1164	mm	45.8	inches
Vehicle Test Weight	1245	KG	2744	pounds	Maximum Static Crush Depth	517	mm	20.4	inches
					Pre-Impact Speed	56	kph	34.9	mph

Vehicle Damage Index: 12FDEW6

Principal Direction of Force: 0

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	431	mm	17.0	inches
DPD 2	491	mm	19.3	inches
DPD 3	517	mm	20.4	inches
DPD 4	507	mm	20.0	inches
DPD 5	497	mm	19.6	inches
DPD 6	421	mm	16.6	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	139.3	inches	122.3	inches	17.0	inches
	3538	mm	3107	mm	431	mm
Centerline	143.3	inches	123.1	inches	20.2	inches
	3641	mm	3128	mm	513	mm
Right Bumper Corner	138.9	inches	122.3	inches	16.6	inches
	3528	mm	3106	mm	422	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
0.0	NOT APPLICABLE	0.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
DIRECT ENGAGEMENT	0.0	NOT APPLICABLE
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 1 2008 TOYOTA YARIS

Test #	6221		
VIN	JTDJT923285140508	NHTSA Test Vehicle Number	1
Year	2008	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	TOYOTA	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	YARIS	Steering Column Collapse Mechanism	UNKNOWN
Body	THREE DOOR HATCHBACK		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	1.5 Liter	Transmission	MANUAL - FRONT WHEEL DRIVE
Vehicle Modification(s) Description			
Vehicle Commentary	VEHICLE MODEL: YARIS		

Vehicle Length	3641	mm	143.3	inches	CG behind Front Axle	1009	mm	39.7	inches
Vehicle Width	1690	mm	66.5	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2463	mm	97.0	inches	Total Length of Indentation	1164	mm	45.8	inches
Vehicle Test Weight	1245	KG	2744	pounds	Maximum Static Crush Depth	517	mm	20.4	inches
					Pre-Impact Speed	56	kph	34.9	mph

Vehicle Damage Index: 12FDEW6 — Principal Direction of Force: 0

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from the Rear Vehicle Surface forward.)

Left Side Pre-Test mm	Left Side Pre-Test inches	Left Side Post-Test mm	Left Side Post-Test inches	Centerline	Centerline Pre-Test mm	Centerline Pre-Test inches	Centerline Post-Test mm	Centerline Post-Test inches	Right Side Pre-Test mm	Right Side Pre-Test inches	Right Side Post-Test mm	Right Side Post-Test inches
				Length of Vehicle at Centerline	3641	143.3	3128	123.1				
				Engine Block	458	18.0	459	18.1				
3538	139.3	3107	122.3	Front Bumper Corner					3528	138.9	3106	122.3
				Front of Engine	3252	128.0	2980	117.3				
2926	115.2	2827	111.3	Firewall					2923	115.1	2854	112.4
					2847	112.1	0	0.0				
2488	98.0	2495	98.2	Upper Leading Edge of Door					2485	97.8	2474	97.4
2450	96.5	2443	96.2	Lower Leading Edge of Door					2453	96.6	2443	96.2
2449	96.4	2434	95.8	Bottom of 'A' Post					2446	96.3	2432	95.7
1252	49.3	1276	50.2	Upper Trailing Edge of Door					1249	49.2	1259	49.6
1314	51.7	1312	51.7	Lower Trailing Edge of Door					1304	51.3	1294	50.9
				Steering Column	2068	81.4	2161	85.1				
				Center of Seering Column to 'A' Post (Horizontal)	400	15.7	380	15.0				
				Center of Steering Column to Headliner (Vertical)	450	17.7	462	18.2				

2008 TOYOTA YARIS

NHTSA Crash Test - #6221 - Front Impact

Pre/Post Depths - Vehicle Width - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 2744 pounds
Vehicle Closing Speed = 34.9 mph
Test Crush Length = 66.5 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	17.0	20.2	16.6	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 16.6 inches					146.3
Using a Rated No Damage Speed of	2.5mph	161.4	126.1	103.3	
Using a Rated No Damage Speed of	5.0mph	298.0	107.4	413.3	
Using a Rated No Damage Speed of	7.5mph	409.6	90.2	929.9	
Using a Rated No Damage Speed of	10.0mph	496.4	74.5	1653.2	
Average Crush = 18.5 inches					117.8
Using a Rated No Damage Speed of	2.5mph	144.9	101.5	103.3	
Using a Rated No Damage Speed of	5.0mph	267.4	86.5	413.3	
Using a Rated No Damage Speed of	7.5mph	367.6	72.6	929.9	
Using a Rated No Damage Speed of	10.0mph	445.4	60.0	1653.2	
Maximum Crush = 20.2 inches					98.8
Using a Rated No Damage Speed of	2.5mph	132.7	85.2	103.3	
Using a Rated No Damage Speed of	5.0mph	244.9	72.5	413.3	
Using a Rated No Damage Speed of	7.5mph	336.6	60.9	929.9	
Using a Rated No Damage Speed of	10.0mph	407.9	50.3	1653.2	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

****

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	20.2	32.6	-2.4	-7.2

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 24.1

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

2008 TOYOTA YARIS

NHTSA Crash Test - #6221 - Front Impact

Pre/Post Depths - Indention Length - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 2744 pounds
Vehicle Closing Speed = 34.9 mph
Test Crush Length = 45.8 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	17.0	20.2	16.6	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 16.6 inches					212.4
Using a Rated No Damage Speed of	2.5mph	234.4	183.1	150.0	
Using a Rated No Damage Speed of	5.0mph	432.6	156.0	600.1	
Using a Rated No Damage Speed of	7.5mph	594.7	131.0	1350.1	
Using a Rated No Damage Speed of	10.0mph	720.7	108.2	2400.2	
Average Crush = 18.5 inches					171.0
Using a Rated No Damage Speed of	2.5mph	210.3	147.4	150.0	
Using a Rated No Damage Speed of	5.0mph	388.2	125.6	600.1	
Using a Rated No Damage Speed of	7.5mph	533.6	105.5	1350.1	
Using a Rated No Damage Speed of	10.0mph	646.7	87.1	2400.2	
Maximum Crush = 20.2 inches					143.5
Using a Rated No Damage Speed of	2.5mph	192.6	123.7	150.0	
Using a Rated No Damage Speed of	5.0mph	355.5	105.3	600.1	
Using a Rated No Damage Speed of	7.5mph	488.7	88.5	1350.1	
Using a Rated No Damage Speed of	10.0mph	592.2	73.1	2400.2	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

****

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	20.2	32.6	-2.4	-7.2

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 24.1

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

2008 TOYOTA YARIS

NHTSA Crash Test - #6221 - Front Impact

Damage Profile Distances - Vehicle Width - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 2744 pounds
Vehicle Closing Speed = 34.9 MPH
Test Crush Length = 66.5 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	17.0	19.3	20.4	20.0	19.6	16.6	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 16.6 inches					146.3
Using a Rated No Damage Speed of	2.5mph	161.4	126.1	103.3	
Using a Rated No Damage Speed of	5.0mph	298.0	107.4	413.3	
Using a Rated No Damage Speed of	7.5mph	409.6	90.2	929.9	
Using a Rated No Damage Speed of	10.0mph	496.4	74.5	1653.2	
Average Crush = 19.2 inches					109.4
Using a Rated No Damage Speed of	2.5mph	139.6	94.3	103.3	
Using a Rated No Damage Speed of	5.0mph	257.6	80.3	413.3	
Using a Rated No Damage Speed of	7.5mph	354.2	67.4	929.9	
Using a Rated No Damage Speed of	10.0mph	429.2	55.7	1146.8	
Maximum Crush = 20.4 inches					96.9
Using a Rated No Damage Speed of	2.5mph	131.4	83.5	103.3	
Using a Rated No Damage Speed of	5.0mph	242.5	71.1	413.3	
Using a Rated No Damage Speed of	7.5mph	333.3	59.7	929.9	
Using a Rated No Damage Speed of	10.0mph	403.9	49.3	1653.2	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

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4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	20.4	32.7	-2.2	-6.7

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 23.9

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

2008 TOYOTA YARIS

NHTSA Crash Test - #6221 - Front Impact

Damage Profile Distances - Indention Length - Closing Speed - Trapezoidal Average

Test Vehicle Weight = 2744 pounds
Vehicle Closing Speed = 34.9 MPH
Test Crush Length = 45.8 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	17.0	19.3	20.4	20.0	19.6	16.6	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 16.6 inches					212.4
Using a Rated No Damage Speed of	2.5mph	234.4	183.1	150.0	
Using a Rated No Damage Speed of	5.0mph	432.6	156.0	600.1	
Using a Rated No Damage Speed of	7.5mph	594.7	131.0	1350.1	
Using a Rated No Damage Speed of	10.0mph	720.7	108.2	2400.2	
Average Crush = 19.2 inches					158.8
Using a Rated No Damage Speed of	2.5mph	202.7	136.9	150.0	
Using a Rated No Damage Speed of	5.0mph	374.0	116.6	600.1	
Using a Rated No Damage Speed of	7.5mph	514.2	97.9	1350.1	
Using a Rated No Damage Speed of	10.0mph	623.1	80.9	1665.1	
Maximum Crush = 20.4 inches					140.7
Using a Rated No Damage Speed of	2.5mph	190.7	121.2	150.0	
Using a Rated No Damage Speed of	5.0mph	352.0	103.3	600.1	
Using a Rated No Damage Speed of	7.5mph	483.9	86.7	1350.1	
Using a Rated No Damage Speed of	10.0mph	586.4	71.6	2400.2	

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation
Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, lb/in
B = Crush resistance per inch of damage width (Crash), lb/in^2
G = Energy dissipated without permanent damage, lb
Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

****

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	20.4	32.7	-2.2	-6.7

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 23.9

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

4N6XPRT StifCalcs®

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2006 - 2010
Make: TOYOTA
Model: YARIS 4D

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	KEES (mph)	Vehicle Width Values: Stiffness A	B	G	Kv	Crush Factor
6069	2007 TOYOTA YARIS FOUR DOOR SEDAN	5.0	11.7	24.7	255.4	86.4	377.3	135.8	21.0
6221	2008 TOYOTA YARIS THREE DOOR HATCHBACK	5.0	19.2	34.9	257.7	80.3	413.3	109.4	25.4
5677	2007 TOYOTA YARIS FOUR DOOR SEDAN	5.0	15.3	35.0	330.3	129.7	420.7	176.5	32.0
7433	2010 TOYOTA YARIS FOUR DOOR SEDAN	5.0	15.4	43.7	443.4	222.9	441.2	284.1	49.6
	Average (AVG)				**321.7**	**129.8**	**413.1**	**176.5**	**32.0**
	Minimum (MIN)				**255.4**	**80.3**	**377.3**	**109.4**	**21.0**
	Maximum (MAX)				**443.4**	**222.9**	**441.2**	**284.1**	**49.6**
	Standard Deviation (STDev-sample)				**88.3**	**65.8**	**26.6**	**76.9**	**12.6**
	Number of Tests (n)			**4**					

4N6XPRT StifCalcs®

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2006 - 2010
Make: TOYOTA
Model: YARIS 4D

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	KEES (mph)	Vehicle Width Values A	B	G	Kv	Crush Factor
7444	2010 TOYOTA YARIS FOUR DOOR SEDAN	5.0	34.5	45.1	204.8	47.6	440.4	60.2	23.6
6069	2007 TOYOTA YARIS FOUR DOOR SEDAN	5.0	13.4	24.7	221.8	65.2	377.3	102.4	18.2
5677	2007 TOYOTA YARIS FOUR DOOR SEDAN	5.0	21.5	35.0	234.7	65.5	420.7	89.1	22.8
6221	2008 TOYOTA YARIS THREE DOOR HATCHBACK	5.0	20.4	34.9	243.0	71.4	413.3	97.3	24.0
7433	2010 TOYOTA YARIS FOUR DOOR SEDAN	5.0	24.9	43.7	274.6	85.4	441.2	108.9	30.7
7434	2010 TOYOTA YARIS FOUR DOOR SEDAN	5.0	17.0	43.7	405.3	184.7	444.6	235.5	44.9
	Average (AVG)				**264.0**	**86.6**	**422.9**	**115.6**	**27.4**
	Minimum (MIN)				**204.8**	**47.6**	**377.3**	**60.2**	**18.2**
	Maximum (MAX)				**405.3**	**184.7**	**444.6**	**235.5**	**44.9**
	Standard Deviation (STDev-sample)				**73.0**	**49.5**	**25.6**	**61.2**	**9.5**
	Number of Tests (n)			**6**					

4N6XPRT Systems
Expert System Software for Litigation

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La Mesa, CA 91941-3842

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Fax: (619) 464-2206

Toll Free: 1- 800-266-9778

Web Site: http://www.4n6xprt.com

E-Mail: 4n6@4n6xprt.com

NHTSA conducted three (3) “Oblique Impact” tests on the Yaris.

The Stiffness Test Summary for the AVERAGE and MAXIMUM Crush depths in those tests follow.

4N6XPRT StifCalcs®

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2006 - 2010
Make: TOYOTA
Model: YARIS 4D

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	KEES (mph)	Vehicle Width Values: Stiffness A	B	G	Kv	Crush Factor
7433	2010 TOYOTA YARIS FOUR DOOR SEDAN	5.0	15.4	43.7	443.4	222.9	441.2	284.1	49.6
7434	2010 TOYOTA YARIS FOUR DOOR SEDAN	5.0	7.5	43.7	916.9	945.3	444.6	1205.6	101.7
7444	2010 TOYOTA YARIS FOUR DOOR SEDAN	5.0	6.4	45.1	1099.9	1373.6	440.4	1737.1	126.8
	Average (AVG)				**820.1**	**847.3**	**442.1**	**1075....**	**92.7**
	Minimum (MIN)				**443.4**	**222.9**	**440.4**	**284.1**	**49.6**
	Maximum (MAX)				**1099.9**	**1373.6**	**444.6**	**1737....**	**126.8**
	Standard Deviation (STDev-sample)				**338.8**	**581.6**	**2.3**	**735.1**	**39.4**
	Number of Tests (n)			**3**					

4N6XPRT StifCalcs®

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2006 - 2010
Make: TOYOTA
Model: YARIS 4D

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	KEES (mph)	Vehicle Width Values: Stiffness A	B	G	Kv	Crush Factor
7444	2010 TOYOTA YARIS FOUR DOOR SEDAN	5.0	34.5	45.1	204.8	47.6	440.4	60.2	23.6
7433	2010 TOYOTA YARIS FOUR DOOR SEDAN	5.0	24.9	43.7	274.6	85.4	441.2	108.9	30.7
7434	2010 TOYOTA YARIS FOUR DOOR SEDAN	5.0	17.0	43.7	405.3	184.7	444.6	235.5	44.9
	Average (AVG)				**294.9**	**105.9**	**442.1**	**134.9**	**33.1**
	Minimum (MIN)				**204.8**	**47.6**	**440.4**	**60.2**	**23.6**
	Maximum (MAX)				**405.3**	**184.7**	**444.6**	**235.5**	**44.9**
	Standard Deviation (STDev-sample)				**101.8**	**70.8**	**2.3**	**90.5**	**10.9**
	Number of Tests (n)			**3**					

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E-Mail: 4n6@4n6xprt.com

Dear Conference Attendee,

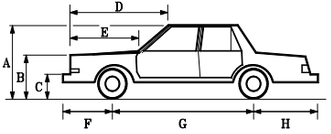
We at 4N6XPRT Systems were pleased to be able to provide you with the preceding data for the crash test vehicles.

Information regarding the Services available to you through our company, as well as the Programs used to create the data report follows this page.

We look forward to providing you similar information in the near future.

Sincerely,

Daniel W. Vomhof III
Daniel W. Vomhof, Ph.D.



Expert AutoStats®

Expert AutoStats® is a program that has over 42,000 cars, pick-ups, vans, and utility vehicles that range in years from the 1940's to the present. Expert AutoStats® has specifications that can assist in reconstructing accidents when the data for the vehicle is unavailable or the vehicle is too severely damaged to get correct measurements.

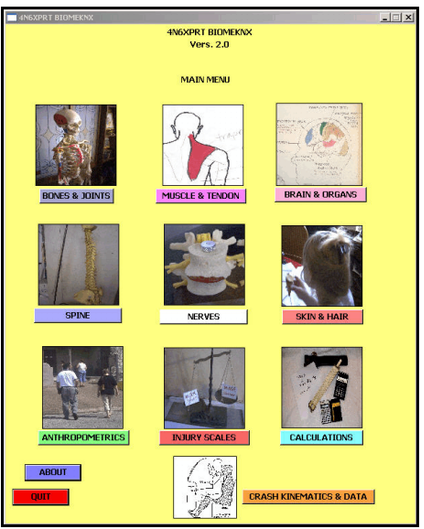
For many vehicles mid-1960's to present, data such as bumper height, front and rear overhang, hood height, etc., are also included.

Model | Data Page 1 | Data Page 2 | Data Page 3 | Printer | File Output | DXF Output

2011 FORD POLICE INTERCEPTOR (3.27) MSP POLICE PKG 4 DOOR SEDAN

Horizontal Dimensions			Vertical Dimensions		
Length	212	in.	Height	58	in.
Wheelbase	115	in.	Ground to:		
Front Bumper to Front Axle	43	in.	Front Bumper (Top)	23	in.
Front Bumper to Front of Hood	8	in.	Headlight - Center	27	in.
Front Bumper to Base of Windshield	65	in.	Hood - Top Front	31	in.
Front Bumper to Top of Windshield	91	in.	Base of Windshield	39	in.
Front Bumper to Front Wheel Well	26	in.	Rear Bumper (Top)	25	in.
Rear Bumper to Rear of Trunk	8	in.	Trunk - Top Rear	39	in.
Rear Bumper to Base of Rear Window	38	in.	Base of Rear Window	40	in.
Rear Bumper to Rear Well	38	in.	**Weight Dimensions**		
Rear Bumper to Rear Axle	54	in.	Curb Weight	4184	lbs.
Depth Dimensions			Curb Weight Distribution:		
Width	78	in.	Front =	56	%
Front Track	63	in.	Rear =	44	%
Rear Track	66	in.	Gross Vehicle Weight Rating	5500	lbs.

4N6XPRT BioMeknx®



Collecting the Biomechanical data of importance to the Accident Investigator into one easily accessible reference location

Biomechanics is the application of physics to describe, evaluate, or model living tissue and biological materials. Originally it was the application of the part of physics known as Mechanics to living systems. This is the same portion of physics which is used as the basis for much of accident reconstruction.

Biomechanics is important in many aspects of forensic work from vehicle accident reconstruction to slip-trip-stumble-fall cases. This particular program contains modules containing information on a variety of biomechanics and injury modalities, physical data found in the literature for failure of bone and tissue, calculation modules to evaluate individual specific parameters, and definitions and terminology used in the literature and found in medical reports.

4N6XPRT BioMeknx® is a program designed for the accident investigator. The BioMeknx program incorporates information from a number of different sources, as well as over 30 years of reconstruction experience. 4N6XPRT BioMeknx™ compiles into one source a number of items of information to assist in reconstructing accidents by tying in the human component more tightly without the need to be a BioMechanics expert. Identification of body location, body part illustrations, failure threshold limits, definitions of terms, calculation modules for body link lengths, weights, stride lengths, and formulas for other types of calculations are only some of the material included in the program.

To gather into your library the material included in the 4N6XPRT BioMeknx™, you would need a minimum of 10-15 Anatomy and Physiology, Human Factors, and Biomechanics books, as well as conduct over 50 hours of internet research.

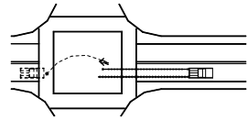
3FAPP1280MR117253

Expert VIN DeCoder®

Expert VIN DeCoder® is a program that "DeCodes" the 17 character VIN number for Cars, Vans, Pickups, and Utility vehicles manufactured from 1981 to the present.

Cars/Vans/Utility/Lt. Trucks Modules: 1981 to Present

Ford	Chevrolet/Geo
Mercury/Lincoln	Pontiac / Buick / Oldsmobile
Chrysler/AMC/Jeep	Cadillac/Saturn
European Import	Asian Import



4N6XPRT Ped & Bike Calcs®

The **4N6XPRT Ped & Bike Calcs®)** program is a program that provides FIRST ESTIMATE calculations to evaluate the speed of a vehicle involved in striking a pedestrian or bicyclist, IF Vehicle, scene, and pedestrian {or pedestrian and bicycle in a vehicle-bike accident} measurements are available. This program may also be used when skateboards or roller skates are involved.

>>>Calculate Time given D & V<<<
Enter Distance (in feet) : 45
Enter Velocity (in mph) : 6

Expert Qwic Calcs®

Expert Qwic Calcs® quickly provides answers to questions important in vehicle collision litigation. The user inputs data in response to relevant questions, Expert Qwic Clacs® performs the mathematical calculations required. Both the input data and the calculated result are then displayed, and may be "dumped" to a printer.

When the law enforcement accident report gives insufficient information to do a full - blown accident reconstruction, Expert Qwic Calcs® may be used to "scope out"the parameters of speeds, times, and distances to determine these relationships in a vehicle accident.

Expert TireStuf®

The Expert TireStuf® program is a Menu Driven program which has 19 modules explaining the various tire size designation systems, the information which MAY be in the DOT tire number, the DOT mandated Tire Grading system, Lug Nut Tightening and Tire Rotation schemes, Mix and Match precautions, a glossary of Tire Terms, and Addresses of a few of the sources of additional information on tires and rims.

Also included is a calculation of the number of revolutions in one mile given the tire dimensions.

4N6XPRT StifCalcs®

4N6XPRT StifCalcs®. Is a program which puts the NHTSA Crash Test database at your fingertips with no need to access the internet in order to obtain Stiffness Values!

In addition to the NHTSA Crash Test data, the program includes a "Similar Vehicle List Reader" which allows quick retrieval of the data for the desired and "similar" vehicle(s). This will drive the initial selection of the available tests. Alternatively, we have an ADVANCED SEARCH module which allows the creation of "Class" vehicles.

WITHOUT THE INTERNET the user can:

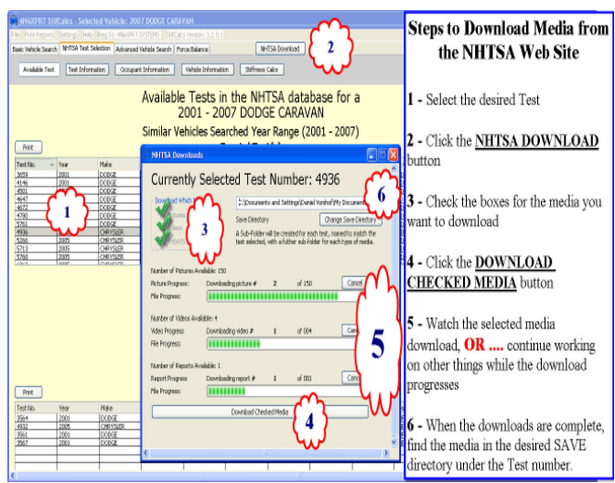
★ Lookup individual tests and get basic front, side, and rear **STIFFNESS VALUES** from these tests. The values are based on the reported crush depths and lengths within each test.
★ Obtain Similar Vehicle group summary STIFFNESS data with Statistical measures.
★ Create "CLASS" vehicles and get summary STIFFNESS data with Statistical measures.

FRONTAL STATISTICAL MEASURES EXAMPLE:

		Vehicle Width			
		Stiffness Values			
		A	B	G	Kv
Average (AVG)		305.7	93.5	523.6	143.1
Minimum (MIN)		115.0	13.2	465.2	23.5
Maximum (MAX)		461.6	200.0	614.1	387.3
Standard Deviation (STDev-sample)		73.4	38.4	36.2	72.8
Number of Tests (n)	53				

WITH THE INTERNET the user can:

★ **RESEARCH** and **easily download** the **PICTURES**, **VIDEOS**, and **REPORTS** available for individual tests



Steps to Download Media from the NHTSA Web Site

1 - Select the desired Test

2 - Click the NHTSA DOWNLOAD button

3 - Check the boxes for the media you want to download

4 - Click the DOWNLOAD CHECKED MEDIA button

5 - Watch the selected media download, **OR ....** continue working on other things while the download progresses

6 - When the downloads are complete, find the media in the desired SAVE directory under the Test number.

Please use this order form when ordering. Due to conditions and rising costs beyond our control, Shipping & Handling for program orders must be paid per the included schedule.

Contact Name:_____

Title:_____

Company/Organization:_____

Street:_____

City: _____ State: _____ Zip: _____

Phone: (_____)_____ FAX: (_____)_____

E-Mail: _____

PAYMENT BY: Check____ Money Order____ Govt. Purchase Order____

for Credit Card Orders, **please circle Credit Card type: Am. Express / Visa / MasterCard**, then complete the following:

Card Number: _____Expiration Date (MM/YY):____/____

Security code (card ID) on **back of** Visa/MasterCard card or **front of** American Express Card:

←Visa/MasterCard | Security | American Express →

Address for where the **credit card bill is sent**: _____

(This is the address that the credit card bill would go to, not where we would send the data or product to)

Zip for where the **credit card bill is sent**:_____

(This is the zip code that the credit card bill would go to, not where we would send the data or product to)

PROGRAM ORDER FORM:

(Pricing effective as of 8/30/12 - prices subject to change without notice)

Expert AutoStats®:	$ 625.00 *	$_____
4N6XPRT BioMeknx®:	$ 495.00 *	$_____
4N6XPRT Ped & Bike Calcs®:	$ 375.00 *	$_____
Expert Qwic Calcs®:	$ 275.00 *	$_____
Expert TireStuf®:	$ 85.00 *	$_____
4N6XPRT StifCalcs®:	$ 650.00 *	$_____
Expert VIN DeCoder®:	$ 550.00 *	$_____
		======
	SUB-TOTAL	$_____
Handling **:		$_____

(Cash or Check with order = $5.00, Credit Card = $10.00 , Govt. Purchase Order = $15.00)

Notarized Affidavit Filing Requirement $_____

($25.00 per required Notarized Signature)

Normal delivery is via electronic download

☐ - Deliver via electronic download link (e-mail address required) $ 0.00

☐ - Deliver on USB - **additional cost of $35.00 / disk / program** $_____

======

SUB-TOTAL $_____

California shipping addresses add **8.50%** sales tax $_____

(*California orders delivered electronically **DO NOT** owe sales tax*)

TOTAL $_____

Individual Vehicle Data FAX/Order Form

☐ **Expert VIN Decoder & Expert AutoStats**
☐ **NHTSA Crash Test Results**
☐ **BOTH**
Please circle ALL OPTIONS that apply

YEAR & MAKE:_____

MODEL:_____

If you are requesting **VIN DeCoder & AutoStats** please also provide:

Vehicle Type:Car - Pickup - Utility - Van
No. of Doors:2/3/4/5
Car Body Style:Coupe/Conv./Sedan/Wagon
DRIVE WHEELS: 4x2 / 4x4
PICKUPS:Dual Rear Wheel - Std. / Extra / Super / Crew Cab - Short Bed / Long Bed
VANS:Cargo / Passenger - Short / Long Wheelbase

VIN Information

___ ___ ___ ___ ___ ___ ___ ___ ___
1 2 3 4 5 6 7 8 9

___ ___ ___ ___ ___ ___ ___ ___
10 11 12 13 14 15 16 17

NHTSA Crash Test Information
Impact location - Front / Side / Rear
Impact Speed - Lower / Higher

Case Reference/Number:_____

Authorized signature: _____

Individual Vehicle Data Search Service®

Charges & Services

Individual Vehicle Specifications
$40.00-First vehicle*, $35.00/Additional Vehicles*,
$20.00/Additional Similar Model*

Medium/Heavy Truck Specifications
$40.00-First vehicle*, $35.00/Additional Vehicles*,
$20.00/Additional Similar Model*

Motorcycle Specifications (1970+)
$40.00-First cycle*, $35.00/Additional cycles*,
$20.00/Additional Similar Model*

NHTSA Crash Test Results
$40.00 per test - Includes A, B, & G values
Calculations are based on the test results

Individual Vehicle Specifications

Now you can get the Expert AutoStats® data for the vehicles in your case ***QUICKLY, EASILY***, and ***ECONOMICALLY***, instead of guessing, or begging a printout from a friend.

Our vehicle database includes dimensions on over 42,000 Cars, Vans, Lt. Pickups, and Utility Vehicles covering 1945 to the present.

Minimum Vehicle specifications include:

Overall Length	Curb Weight
Overall Width	Weight Distribution
Overall Height	Front/Rear Track
Wheelbase	CG Location

Model years with **N**o **S**ignificant **D**imensional **C**hanges VIN DeCoding when VIN is provided Information available

Mid-60's to present **also includes** (*when available*)

Front/Rear Overhang	Bumper Heights
Hood height	Turning Circle
Bumper-to-hood	Ground-to-hood

Dimensions are given in both Imperial and metric (SI) units. Motorcycle specifications will be similar to the Vehicle specifications with appropriate changes where applicable.

NHTSA Crash Test Results

Test results include: General Test information, Barrier Data when provided, Vehicle Data as reported by the testing organization, Occupant (Dummy) data when provided, and A-B-G Stiffness calculations based on the test results.

4N6XPRT Systems®

Providing Vehicle dimensional data, VIN DeCoding, and NHTSA Crash Test Results as a service to the Litigation community, in the form of:

Expert Systems Software Programs for Litigation

Expert AutoStats®
4N6XPRT StifCalcs®
4N6XPRT BioMeknx®
4N6XPRT Ped & Bike Calcs®
Expert Qwic Calcs®
Expert TireStuf®
Expert VIN DeCoder®

Vehicle Data Service

Individual Vehicle Data Search Service®

8387 University Avenue, Suite P
La Mesa, CA 91942-9342

Phone: 1-800-266-9778
Fax: **(619) 464-2206**
E-Mail: **4n6@4n6xprt.com**

Web: **http://www.4n6xprt.com**

Expert VIN DeCoder®

Expert VIN DeCoder® is a program that "DeCodes" the 17 character VIN number for vehicles manufactured from 1981 to the present.

Modules: 1981 to Present
Control Module - One Required per Set

Ford Cars (includes Festiva & Merkur)
Mercury/Lincoln Cars
Ford vans/Utility/Lt. Trucks

Chevrolet/Geo Cars
Pontiac/GM of Canada Cars
Oldsmobile Cars
Buick Cars
Cadillac/Saturn Cars
General Motors Vans/Utility/Lt. Trucks

Chrysler/AMC/Jeep Cars
Chrysler/Jeep Vans/Utility/Lt. Trucks

European Import Cars/Vans/Utility/Lt. Trucks
Asian Import Cars/Vans/Utility/Lt. Trucks

SYSTEM REQUIREMENTS

Expert VIN DeCoder® has been tested on a wide variety of IBM laptop and desktop clones ranging from 8088 through Pentium® chips. A math co-processor chip is NOT required. Expert VIN DeCoder® has also been tested under the various versions of MS-DOS 3.0 thru 7.0, DrDOS 6.0, and PC DOS 7.0. It also works as a DOS program under Windows 3.x, Windows, 95, Windows 98, Windows NT, OS/2 2.x, OS/2 Warp, and various versions of LINUX.

A variety of dot matrix printers emulating the EPSON series have been used with no difficulty. The output is also compatible with the Hewlett-Packard II, IIP, III and IIIP Laser printers. Expert VIN DeCoder® works with monochrome and color monitors.

As of April 1995 the 4N6XPRT Systems® programs Expert AutoStats®, Expert Qwic Calcs®, Expert TireStuf®, 4N6XPRT Ped & Bike Calcs®, and Expert VIN DeCoder® are accessible from within RECTEC.

PLEASE PRINT

Contact Name:_____
Company/Dept:_____
Mailing Address:_____
City:_____State:____Zip:_____
Phone: _____
Fax: _____
E-Mail:_____

Expert VIN DeCoder®
_____ (copies) x $550.00 . . . . . = $_____
Handling **: $_____
(Check with order = $5.00, Credit Card = $10.00 , Govt. P.O.r = $15.00)
Notarized Affidavit Filing Requirement $_____
($25.00 per required Notarized Signature)

Normal delivery is via electronic download
☐ - Deliver via electronic download link (e-mail address required) $ 0.00
☐ Please deliver on USB at an
additional cost of $35.00 per disk $_____
SUB-TOTAL = $_____
CA Addresses add 8.75% sales tax . . . . = $_____
(*California orders delivered by e-mail attachment **DO NOT** owe sales tax*)
TOTAL = $_____

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Check*/Money Order:___ Credit Card:___ P.O.:___
Please make check*/M.O./P.O. payable to:
4N6XPRT Systems®
Credit Card Orders:
MasterCard:___ Visa:___ Am.Ex.:___
Card #:_____
Expires: _____
Name on Card: _____
Signature: _____
Billing Add. #: _____
Billing Zip: _____

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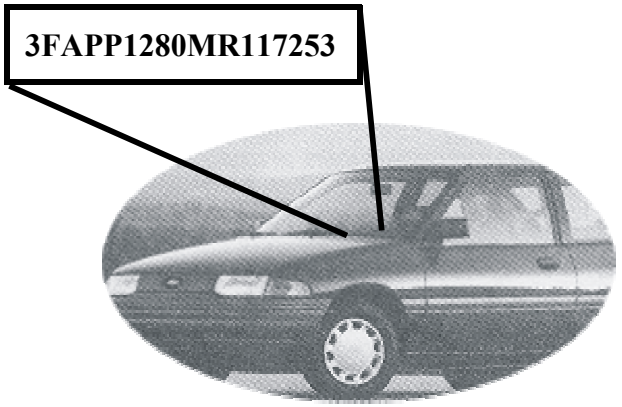
8387 University Avenue
La Mesa, CA 91942-9342
Telephone Orders:
Monday-Friday - 9:30am-5:00pm PST
Phone: (619) 464-3478 Fax: (619) 464-2206

Orders will be shipped Priority Mail within 10 working days of receipt of order.
Prices subject to change WITHOUT NOTICE.
** Checks MUST be drawn from a bank in the U.S.A.*

Expert VIN DeCoder®



User Friendly Software to provide interpretation of the 17 character VIN Number on Cars, Lt. Pickups, Utility Vehicles, and Vans.

4N6XPRT Systems®
Forensic Expert Software
8387 University Avenue
La Mesa, CA 91942-9342

Web: http://www.4n6xprt.com
E-Mail: VIN@4n6xprt.com

1-800-266-9778

Expert VIN DeCoder® example

INPUT:

1) Enter VIN Numbers to be DeCoded: 3FAPP1280MR117253

3FA PP128 0 MR 117253

2) Is this the VIN Number to be DeCoded (Y/N)? **Y**

OUTPUT:

EXPERT VIN DeCoder

The VIN Number is 3FA PP128 0 MR 117253

The vehicle should be a 1991 Ford
The model: Escort 2/3-door Hatchback GT
The assembly plant: Hermosillo, Mexico
The 4 passenger vehicle had : Passive (Automatic) Front Belts

The OEM engine was: In-line 4 cylinder with Double Overhead Cam
Engine Displacement/Type = 1.8 L/ 112 cu.in. L4, DOHC
Brake Horsepower (SAE) = 127 @ 6500 rpm
Torque (SAE) = 114 lb-ft at 4500 rpm
Engine manufacturer = Mazda

The fuel distribution system: Electronic Fuel Injection (EFI)
Fuel pump/line pressure = 35-45 psi
The ignition system = electronic

This is a Front Wheel Drive vehicle.

The first three characters {3, F, A} indicates that the vehicle
was a Ford made in Mexico

The fourth character {P} indicates the vehicle had
Passive (Automatic) Front Belts

The fifth character {P} indicates it was a Passenger Car

The sixth with the seventh character {12} indicates a
Escort 2/3-door Hatchback GT

The eighth character {8} indicates the OEM engine :
1.8 L/ 112 cu.in. L4, DOHC

The 9th Character { the Check Digit } is 0
The calculated Check Digit value is 0

The tenth character {M} indicates the Model Year was 1991

The eleventh character {R} indicates it was made
at the assembly plant in Hermosillo, Mexico

The twelveth through the seventeenth characters { 117253 } is
the Serial Number unique to this vehicle.

01-01-2001 S/N:930114VD01201 Reg. User: 4N6XPRT SYSTEMS

Expert AutoStats®

The Expert AutoStats® program contains data on more than 42,000 cars, pick-ups, vans, and utility vehicles that range in years from the 1940's to the present. The Expert AutoStats® base information can assist in reconstructing accidents when the data for the vehicle is unavailable or the vehicle is too severely damaged to get correct measurements. The program is currently relied upon by over 700 private and 300 Government entities within the United States for this very purpose. Additionally, for many vehicles mid-1960's to present, data such as bumper height, front and rear overhang, hood height, etc., are also included.

As of April 1995 the 4N6XPRT Systems® programs Expert AutoStats®, Expert Qwic Calcs®, Expert TireStuf®, and Expert VIN DeCoder® are accessible from within RECTEC.

SYSTEM REQUIREMENTS

Expert AutoStats® has been tested on a wide variety of IBM laptop and desktop clones ranging from 8088 through Pentium® chips. A math co-processor chip is NOT required. Expert AutoStats® has also been tested under the various versions of MS-DOS 3.0 thru 7.0, DrDOS 6.0, and PC DOS 7.0. It also works as a DOS program under Windows 3.x, Windows, 95, Windows 98, Windows NT, Windows Me, Windows 2000, Windows XP, Windows Vista, OS/2 2.x, OS/2 Warp, and various versions of LINUX.

A variety of dot matrix printers emulating the EPSON series have been used with no difficulty. The output is also compatible with the Hewlett-Packard II, IIP, III and IIIP Laser printers and Hewlett-Packard Desk Jet inkjet printers. Expert AutoStats® works with monochrome and color monitors.

PLEASE PRINT

Contact Name: _____
Company/Dept: _____
Mailing Address: _____
City:State:Zip: _____
Phone: _____
Fax: _____
E-Mail: _____

AutoStats® _____ (copies) x $625.00 . . = $_____
Handling **: $_____
(Check with order = $5.00, Credit Card = $10.00 , Govt. P.O.r = $15.00)
Notarized Affidavit Filing Requirement $_____
($25.00 per required Notarized Signature)

Normal delivery is via electronic download
☐ - Deliver via electronic download link (e-mail address required) $ 0.00
☐ Please deliver on USB at an
additional cost of $35.00 per disk $_____
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TOTAL = $_____

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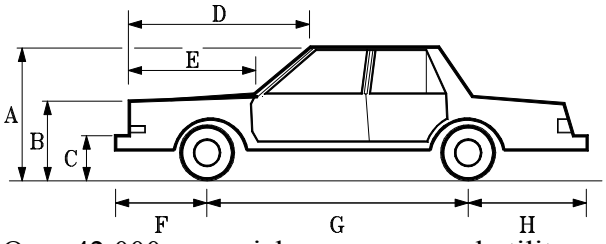
Please make check*/M.O./P.O. payable to:
4N6XPRT Systems®
Credit Card Orders:
MasterCard:___ Visa:___ Am.Ex.:___
Card #: _____
Expires: _____Sec.Code:_____
Name on Card: _____
Signature: _____
Billing Add. : _____
Billing Zip: _____

Mail to: 4N6XPRT Systems®
8387 University Avenue
La Mesa, CA 91942-9342
Telephone Orders:
Monday-Friday - 9:30am-5:00pm PST
Phone: (619) 464-3478 Fax: (619) 464-2206

Orders will be shipped Priority Mail within 10 working days of receipt of order.
Prices subject to change WITHOUT NOTICE.
** Checks MUST be drawn from a bank in the U.S.A.*

Expert AutoStats®



Over 42,000 cars, pick-ups, vans, and utility vehicles 1940's to the present are represented.

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Forensic Expert Software
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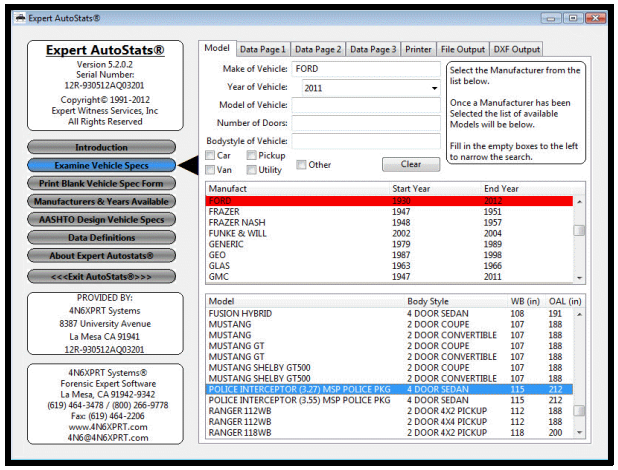
La Mesa, CA 91942-9342

Web: http://www.4n6xprt.com
E-Mail: autostats@4n6xprt.com

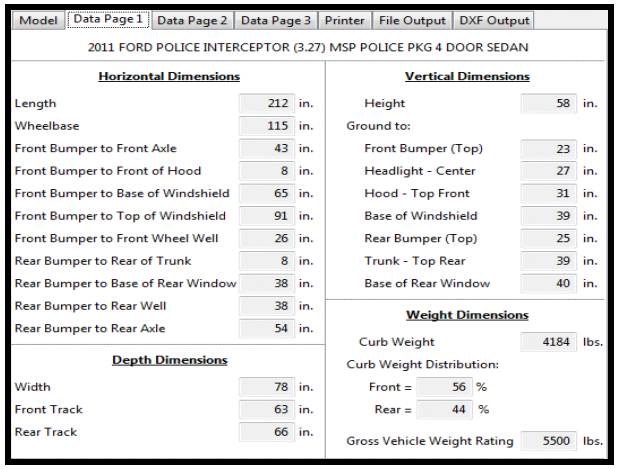
1-800-266-9778

Select Your Vehicle



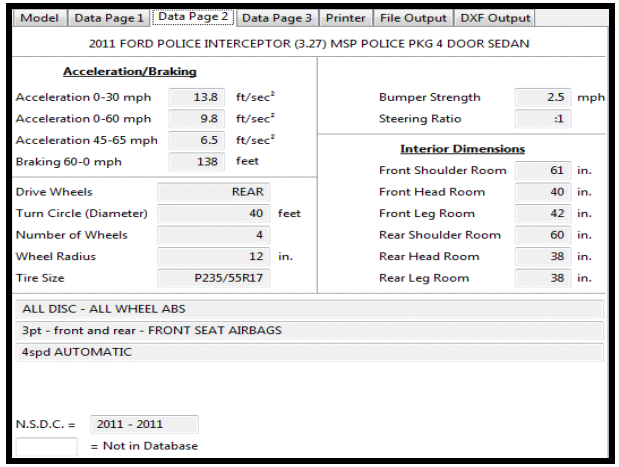
After typing in the Make, Year, and Type of vehicle, you are presented with the vehicles which are available for that year.

Screen 1



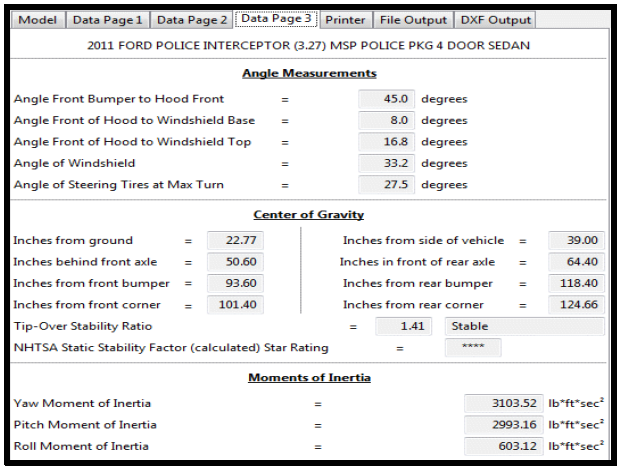
The first screen of data contains exterior dimensions and weight data. Length, Height, Wheelbase, Width, and Weight Distribution are published dimensions. Curb Weight is an average of published curb weights for the given vehicle. Detail dimensions such as the bumper heights and Front Bumper to Front of Hood are measurements obtained by our staff from actual vehicles.

Screen 2



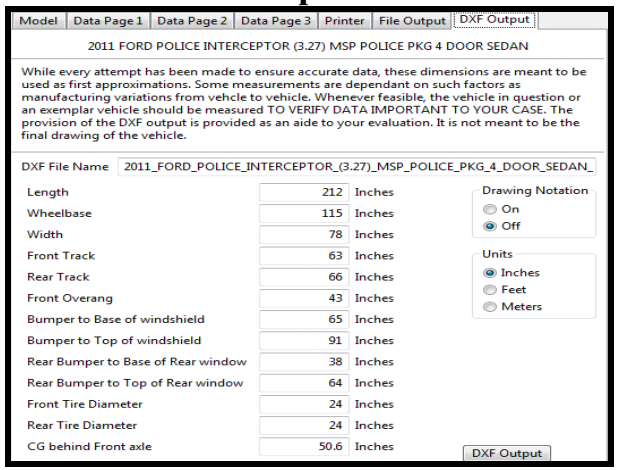
The second screen of data contains interior dimensions and various performance data. The data contained in the second screen comes from various published sources.

Screen 3



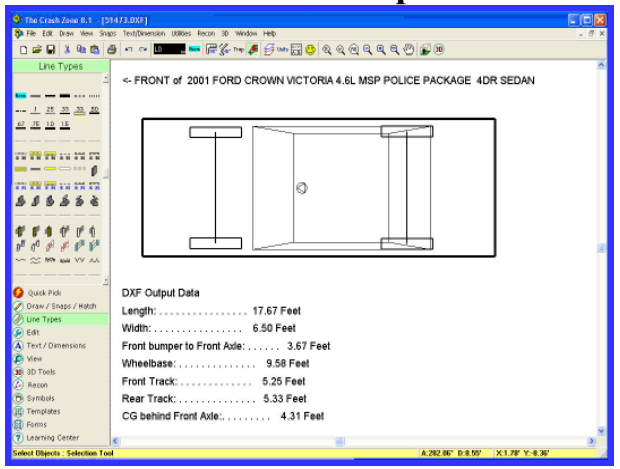
The third and last screen contains a number of calculated items of information which may be of use depending upon the type of case, the other software that you use, and the questions which need to be answered.

DXF Output Screen



From within the Expert AutoStats program you have the ability to output the data to a 2-D DXF file for importation into your CAD Scene Drawings. The screen below shows an import of the DXF file with Text into the CAD Zone program.

CADZONE Import



4N6XPRT StifCalcs®

Introducing ..... 4N6XPRT StifCalcs®. A program which puts the NHTSA Crash Test database at your fingertips with no need to access the internet in order to obtain Stiffness Values!

In addition to the NHTSA Crash Test data, the program includes a "Similar Vehicle Reader". Initially developed in cooperation with Greg Anderson and maintained by 4N6XPRT Systems starting with the 2013 version, the reader allows quick retrieval of vehicles similar to the desired vehicle. The Reader drives the initial selection of the available tests. Alternatively, we have an ADVANCED SEARCH module which allows the creation of "CLASS" vehicles.

STIFFNESS DATA, based on the selected test or test grouping is automatically calculated based on the reported crush depths and widths for front, side, and rear tests.

The User can - **WITHOUT the need for the internet:**

★ Lookup individual tests and get basic front, side, or rear (as appropriate to the test) **STIFFNESS VALUES** from the selected test. The values are based on the reported crush depths and lengths within each test.

SYSTEM REQUIREMENTS

4N6XPRT StifCalcs® is a MS-Windows program designed to work under a 32 **or** 64-bit (2000/XP/Vista/7) Windows System.

★ Obtain Similar Vehicle group summary **STIFFNESS VALUES** with Statistical measures.

★ Create "CLASS" vehicles and get summary **STIFFNESS VALUES** with Statistical measures.

FRONTAL STATISTICAL MEASURES EXAMPLE:

		Vehicle Width	Stiffness Values		
			A	B	G	Kv
Average (AVG)			305.7	93.5	523.6	143.1
Minimum (MIN)			115.0	13.2	465.2	23.5
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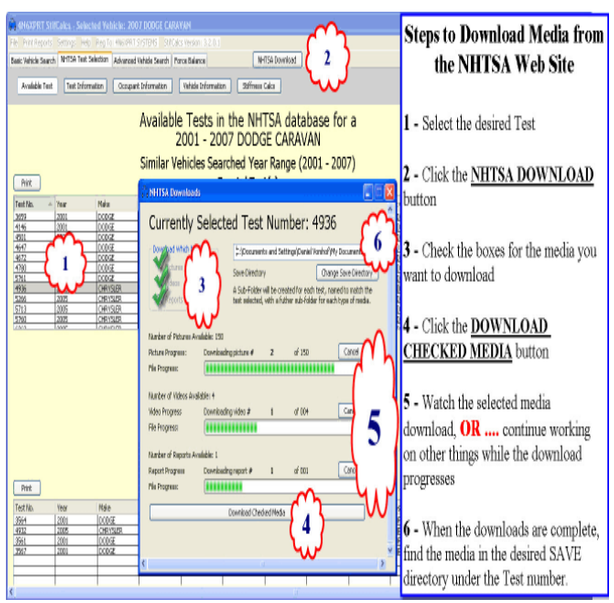
Number of Tests (n)	53					

WITH an internet connection the User will also be able to -

★ **RESEARCH** and **easily download** the

PICTURES,
VIDEOS,
and
REPORTS

that are available for the individual tests



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Contact Name: _____
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Phone: _____
Fax: _____
E-Mail: _____
(E-mail address required for electronic delivery)

StifCalcs®_____ (copies) x $650.00 . . = $_____
Handling **: $_____
(Check with order = $5.00, Credit Card = $10.00 , Govt. P.O. = $15.00)
Notarized Affidavit Filing Requirement $_____
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☐ Please deliver on USB at an
additional cost of $35.00 per disk $_____
SUB-TOTAL = $_____
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(*California orders delivered by e-mail attachment **DO NOT** owe sales tax*)

TOTAL = $_____

Enclosed is:
Check/M. O. :___ Credit Card:___ P.O.:___

Please make check/M.O./P.O. payable to:
4N6XPRT Systems®

Credit Card Orders:
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Card #: _____
Expires: _____
Name on Card: _____
Signature: _____
Billing Add. #: _____
Billing Zip: _____

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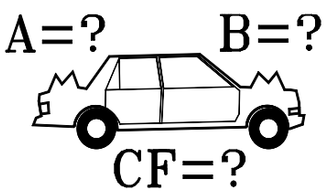
Phone: (619) 464-3478 Fax: (619) 464-2206

Orders within the U.S. will be shipped Priority Mail or via E-mail attachment within 10 working days of receipt of order.
*All prices are in U.S. Dollars, and subject to change **WITHOUT NOTICE.***
*Orders outside of U.S.A. shipped via E-Mail attachment **ONLY**.*

4N6XPRT StifCalcs®



Quick, Convenient, Easy access to the NHTSA Crash Test data on your own MS-Windows computer without the need for an internet connection.

4N6XPRT Systems®
Forensic Expert Software
8387 University Avenue
La Mesa, CA 91942-9342

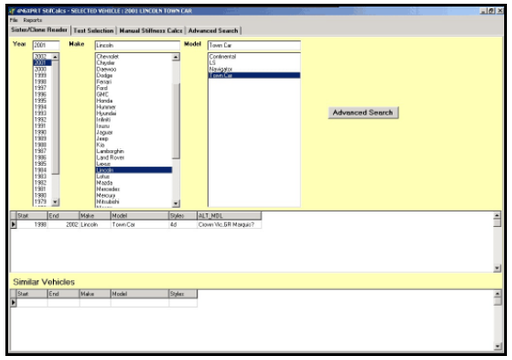
Web: http://www.4n6xprt.com
E-Mail: stifcalcs@4n6xprt.com

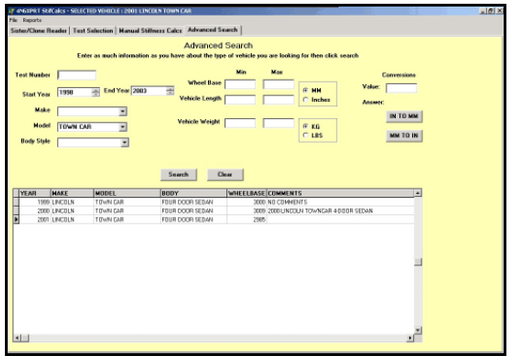
1-800-266-9778

BASIC VEHICLE CRASH TEST SEARCH

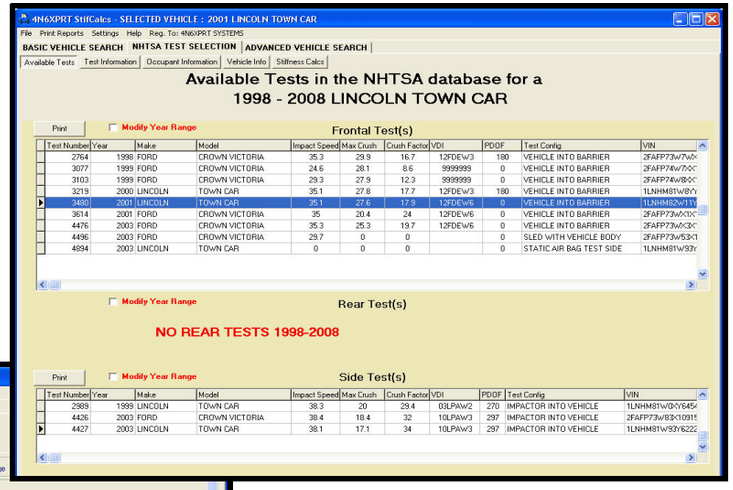
Select the desired vehicle through our **SIMILAR VEHICLE READER**

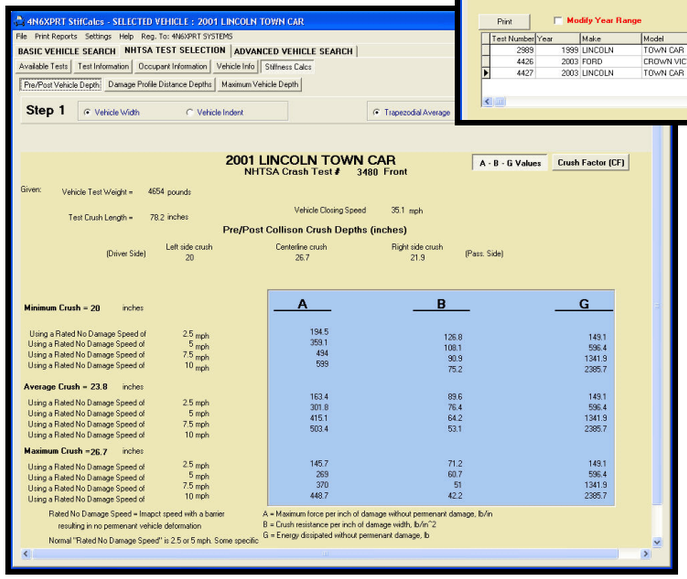
.





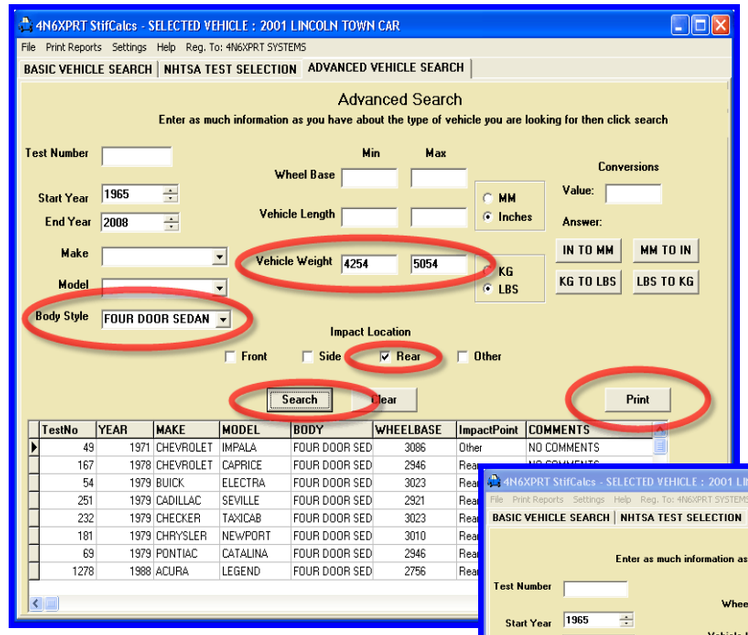
Once the desired vehicle is found/selected, click on the Test Selection tab. From here, select the test to be viewed



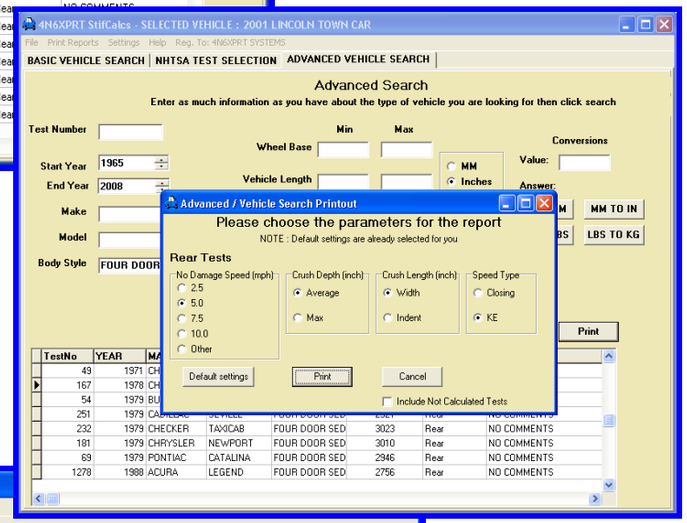


Once a test is selected, the available data for the Test, Occupant(s), Vehicle(s), and Stiffness data can be viewed. The stiffness values are automatically generated from the available test data.

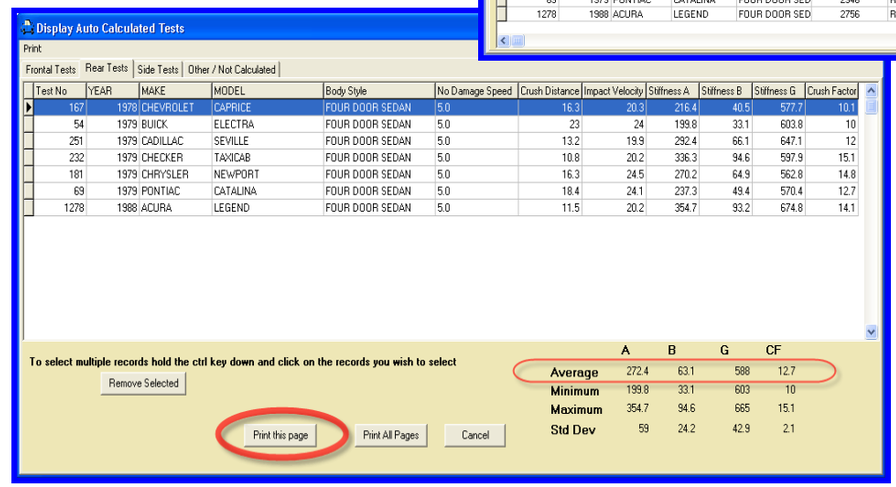
"CLASS" VEHICLE CRASH TEST SEARCH



Using the **ADVANCED SEARCH** tab, you can also create a **CLASS** of vehicle for when there are no tests available for the specific vehicle and test type. To create a class of REAR IMPACT stiffness values for the Lincoln, first set the **weight range**, **body style**, and **test type**, then **search** the database, when you have a sufficient number of tests (that is, more than one or two) that have been found, click the PRINT button:



Now Set your calculation parameters - **No Damage Speed - Crush Depth - Indentation (Crush) Length** - and **Speed**, then view your results, and if desired, print them to hard copy



The program will calculate the **AVERAGE, MINIMUM, MAXIMUM,** and **Standard Deviation** of the Stiffness Values calculated based upon the parameters you set in the preceding step.

4N6XPRT Systems

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8387 University Avenue
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FED Tax ID No.: 95-3121248

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Fax: (619) 464-2206

Web Site: ***http://www.4n6xprt.com***

E-Mail: ***4n6@4n6xprt.com***

2014 ORDER FORM

Expert AutoStats® - Expert VIN DeCoder® - 4N6XPRT StifCalcs® - 4N6XPRT BioMeknx™
Expert Qwic Calcs® - Expert TireStuf® - 4N6XPRT Ped & Bike Calcs®

Please use this order form when ordering your programs. Due to conditions and rising costs beyond our control, Shipping & Handling must be paid per the included schedule.

Contact Name: _____
Title: _____
Company/Organization: _____
Street: _____
City: _____ State: _____ Zip: _____
Phone: (_____)_____ FAX: (_____)_____
E-Mail: _____

Expert AutoStats®:	$ 625.00 *	$_____
4N6XPRT BioMeknx™:	$ 495.00 *	$_____
4N6XPRT Ped & Bike Calcs®:	$ 375.00 *	$_____
Expert Qwic Calcs®:	$ 275.00 *	$_____
Expert TireStuf®:	$ 85.00 *	$_____
4N6XPRT StifCalcs®**:**	$ 650.00 *	$_____
Expert VIN DeCoder®:	$ 550.00 *	$_____
		======
	SUB-TOTAL	$_____

Handling **: *(Cash or Check with order = **$5.00**, Credit Card = **$10.00** , Govt. Purchase Order = **$15.00**)* $_____
Notarized Affidavit filing requirement - **$25.00 per required notarized signature**: $_____

Normal delivery will be via email of a download link to a self extracting zip file

☐ - Deliver via electronic download link (e-mail address required) $ 0.00
☐ - Please deliver on USB at an **additional cost of $35.00 per program** $_____

	======
SUB-TOTAL	$_____
California shipping addresses add **8.75%** sales tax	$_____
(*California orders delivered by e-mail attachment **DO NOT** owe sales tax*)	
	======
TOTAL	$_____

Enclosed is:
Check____ Money Order____ Purchase Order____ Credit Card: Visa_____ Master Card_____ American Express_____

Card #_____ Expires_____ SecCode _____
Billing Add. :_____ Billing Zip: _____
Name on Card:_____ Signature: _____

PLEASE NOTE

-- Orders cannot be shipped without correct Shipping & Handling included.
-- California orders cannot be shipped without sales tax included.
-- Written Purchase Orders must be received in office before shipping.

* *Prices are subject to change without notice. Call for Multi-program and package purchase discounts.*
** *Orders will be shipped within 10 working days. Other shipping methods may cost extra. The Handling charge listed is for the first program,* ***add $5.00 per additional program*** *ordered at the same time and shipped to the same address.*

Please make checks, money orders or Purchase Orders Payable to: **4N6XPRT Systems®**
You may call or fax your order to us if paying by credit card.

4N6XPRT Systems

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8387 University Avenue
La Mesa, CA 91942-9342

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Phone: 1- 800-266-9778
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E-Mail: 4n6@4n6xprt.com

Dear Customer,

Due to the governments desire (both U.S. & California) to "protect us" we will need the following information from you in order to process your credit card(s). Please complete this form and return it with your order.

Card type: Am. Express / Visa / MasterCard
Card Number: _____
Expiration Date (MM/YY): ____/____

←Visa/MasterCard American Express →

Security code (card ID) on back of Visa/MasterCard card or front of American Express Card:

Address for where the **credit card bill is sent**:

_____

*(This is the address number - for instance, ours would be **8387 University Avenue** - that the credit card bill would go to, not where we would send the data or product to)*

City/State/Zip for where the **credit card bill is sent**:

_____

*(- for instance, ours would be **La Mesa, CA 91941** - that the credit card bill would go to, not where we would send the data or product to)*

Authorized signature: _____

We appreciate your cooperation in supplying us with this information and understanding that it is being required of us to obtain the information.

Sincerely,

Daniel W. Vomhof III
General Manager/Technical Support

SERVICE

You may make your request by phone or fax. Our fax machine is on 24 hours, 7 days a week, and can be reached at (619) 464-2206. A request may also be made by e-mail, which reaches us when we are "on the road" as well as in the office..

Upon receiving your request, we will research you request and **fax the information to you at NO ADDITIONAL CHARGE!** Normal response time is one working day or less. Your hard copy will follow in the mail.

Please include the vehicle information on the sample order form when requesting your Individual Vehicle Data Search. Please also be sure to provide a Visa, MasterCard, or American Express number, name as it appears on the card, Expiration date, and the billing address # and Zip.

*Pricing is for multiple vehicles on same Order/Request. Similar Vehicles may be required when it is not possible to determine the exact model of vehicle requested, based upon the information provided.

VIN DeCoding Information

FAX/Order Form

☐ **Expert VIN Decoder & Expert AutoStats**
☐ **NHTSA Crash Test Results**
☐ **BOTH**

Please circle ALL OPTIONS that apply

YEAR & MAKE:

_____

MODEL:_____

If you are requesting
VIN DeCoder & AutoStats
please also provide the following information:

No. of Doors:	2/3/4/5
Body Style:	Coupe/Conv./Sedan/Wagon
SUV & P/U:	4x2 / 4x4 / Dual Rear Wheel
PICKUPS:	Std. / Extra / Super / Crew Cab
	Short Bed / Long Bed
VANS:	Cargo / Passenger
	Short / Long Wheelbase

VIN Information

___	___	___		___	___	___	___	___		___						
1	2	3		4	5	6	7	8		9						
											___	___		___	___	___	___	___	___
											10	11		12	13	14	15	16	17

NHTSA Crash Test Information
Impact location - Front / Side / Rear
Impact Speed - Lower / Higher

PAYMENT INFORMATION
Visa/MasterCard / American Express:

_____

Expires: _____ / _____

Name & Address:

_____

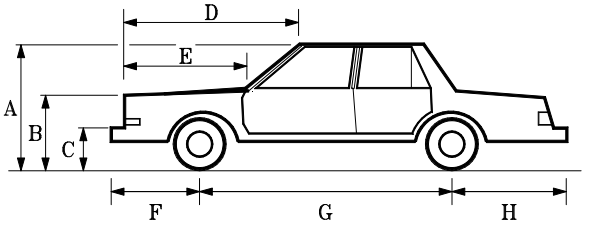
_____

_____

_____

Case Reference Name/Number:_____

Individual Vehicle Data Search Service®



Providing Vehicle dimensional data, VIN DeCoding, and NHTSA Crash Test Results as a service to the Litigation community.

E-Mail: **ivdss@4n6xprt.com**

FAX: (619) 464-2206
Phone: (619) 464-3478 / 1-800-266-9778

4N6XPRT Systems®
Forensic Expert Software
8387 University Avenue, Suite P
La Mesa, CA 91942-9342

Web: http://www.4n6xprt.com

How often have you been confronted with the

following on a Traffic Collision Report - "87 Ford, 4 door, Blue"? We have the answer to the problem of determining WHICH Ford 4 door model this was!

We will DeCode the VIN number and provide you with the information contained within that VIN number

Information generally includes:

Year	OEM Engine
Make	Displacement/Type
Model	Rated Horsepower
Drive Wheels	Rated Torque
Rated Pass. Load	Iginition System
Plant of Manufacture	Fuel Line Pressure

Also (*when provided by VIN*)

Gross Vehicle Weight	Safety Equipment
Transmission	

A DMV search for a vehicle identification from the registration will typically cost less than $10.00 and will give the VIN number, Make, and Year of vehicle. However, to also obtain the vehicle Model requires a "Manual Search" which will typically cost $30.00/vehicle/year searched.

With our service, you will be able to find out the model of vehicle as well as all of the other information mentioned above. This information will be faxed to you, typically in less than one working day, and the hard copy will follow in the mail.

Allow us to help you have all the information you require in your next Accident, Personal Injury, Criminal, Domestic, or Product Liability case.

Individual Vehicle Specifications

Now you can get the Expert AutoStats® data for the vehicles in your case ***QUICKLY, EASILY***, and ***ECONOMICALLY***, instead of guessing, or begging a printout from a friend.

Our vehicle database includes dimensions on over 35,000 Cars, Vans, Lt. Pickups, and Utility Vehicles covering 1945 to the present.

Minimum Vehicle specifications include:

Overall Length	Curb Weight
Overall Width	Weight Distribution
Overall Height	Front/Rear Track
Wheelbase	CG Location

Model yeasr with **N**o **S**ignificant **D**imensional **C**hanges
VIN DeCoding when VIN is provided Information available

Mid-60's to present **also includes** (*when available*)

Fron/Reart Overhang	Bumper Heights
Hood height	Turning Circle
Bumper-to-hood	Ground-to-hood

Dimensions are given in both Imperial and metric (SI) units. Motorcycle specifications will be similar to the Vehicle specifications with appropriate changes where applicable.

While the VIN number contains much information, it does not contain everything needed to identify a particular vehicle in every situation. Therefore, we would appreciate you providing as much of the information on the order form as possible.

If you are not sure of the specific model, we will provide dimensions on the similar model vehicles matching the provided data for a small additional cost per model*.

Individual Vehicle Data Search Service® Charges & Services

Individual Vehicle Specifications

$40.00-First vehicle*, $35.00/Additional Vehicles*,
$20.00/Additional Similar Model*

Medium/Heavy Truck Specifications

$40.00-First vehicle*, $35.00/Additional Vehicles*,
$20.00/Additional Similar Model*

Motorcycle Specifications (1970+)

$40.00-First cycle*, $35.00/Additional cycles*,
$20.00/Additional Similar Model*

NHTSA Crash Test Results

$40.00 per test - Includes A, B, & G values
Calculations are based on the test results

NHTSA Crash Test Results

Test results include: General Test information, Barrier Data when provided, Vehicle Data as reported by the testing organization, Occupant (Dummy) data when provided, and A-B-G Stiffness calculations based on the test results.

You may make your request by phone or fax. Our fax machine is on 24 hours/day and can be reached at:

(619) 464-2206

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Individual Vehicle Specifications

$40.00-First vehicle*, $35.00/Additional Vehicles*, $20.00/Additional Similar Model*

Medium/Heavy Truck Specifications

$40.00-First vehicle*, $35.00/Additional Vehicles*, $20.00/Additional Similar Model*

Motorcycle Specifications (1970+)

$40.00-First cycle*, $35.00/Additional cycles*, $20.00/Additional Similar Model*

NHTSA Crash Test Results

$40.00 per test - Includes A, B, & G values
Calculations are based on the test results

Contact Name & Address:

_____
_____
_____
_____

Phone: (_____) _____
Fax: (_____) _____

PAYMENT INFORMATION
Visa/MasterCard / American Express:

_____
Expires: _____ / _____
Credit Card billing address and Zip:
Address:_____
Zip: _____
Security Code # _____

FAX/Order Form

☐ **Expert VIN Decoder & Expert AutoStats**
☐ **NHTSA Crash Test Results**
☐ **BOTH**

Please circle <u>ALL OPTIONS</u> that apply

YEAR & MAKE:
_____
MODEL: _____

If you are requesting
VIN DeCoder & AutoStats
please also provide:

No. of Doors:	2/3/4/5
Body Style:	Coupe/Conv./Sedan/Wagon
SUV - P/U:	4x2 / 4x4 / Dual Rear Wheel
PICKUPS:	Std. / Extra / Super / Crew Cab
	Short Bed / Long Bed
VANS:	Cargo / Passenger
	Short / Long Wheelbase

VIN Information

__ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

NHTSA Crash Test Information

YEAR & MAKE:
_____
MODEL: _____

Impact location - Front / Side / Rear
Impact Speed - Lower / Higher

Case Reference/Number:_____

FAX/Order Form

☐ **Expert VIN Decoder & Expert AutoStats**
☐ **NHTSA Crash Test Results**
☐ **BOTH**

Please circle <u>ALL OPTIONS</u> that apply

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VANS:	Cargo / Passenger
	Short / Long Wheelbase

VIN Information

__ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __
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YEAR & MAKE:
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MODEL: _____

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Card type: Am. Express / Visa / MasterCard
Card Number: _____
Expiration Date (MM/YY): ____/____

←Visa/MasterCard American Express →

Security code (card ID) on back of Visa/MasterCard card or front of American Express Card:

Address for where the **credit card bill is sent**:

_____

*(This is the address number - for instance, ours would be **8387 University Avenue** - that the credit card bill would go to, not where we would send the data or product to)*

City/State/Zip for where the **credit card bill is sent**:

_____

*(- for instance, ours would be **La Mesa, CA 91941** - that the credit card bill would go to, not where we would send the data or product to)*

Authorized signature: _____

We appreciate your cooperation in supplying us with this information and understanding that it is being required of us to obtain the information.

Sincerely,

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