*** * * 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 41,000 different vehicles and 203 different manufacturers spanning more than 50 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 91941-3842

(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 3.0.2.5

DeCoded VIN: 2G1WS551869322489

Model:	2006 Chevrolet Impala Police Sedan 4 Door Sedan
Engine Size:	3.9L / 238 cu.in.
Engine Description:	V6 Cylinder with Overhead Valves (OHV)
Horse Power:	240 @ 6000 rpm
Torque:	241 lb-ft at 2800 rpm
Injection System:	Sequential Port Fuel Injection (SEFI)
PSI:	50-60 psi
Ignition:	Electronic
Manufacturer:	General Motors
Assembly Plant:	Oshawa #1, ON
Drive Wheels:	This is a Front Wheel Drive vehicle w/Manual Belts W/Driver & Passenger a

The First through Third characters (2G1) indicate a Chevrolet Car made in Canada

The Fourth and Fifth characters (WS) indicate an Impala Police Sedan

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 (1) indicates the OEM engine: 3.9L / 238 cu.in., V6 OHV

The Ninth character (the check digit) is entered as 8.
The VIN appears Valid, the calculated value is 8.

The Tenth character (6) indicates the model year 2006

The Eleventh character (9) indicates the vehicle was made in the assembly plant in Oshawa #1, ON

The Twelfth through Seventeenth characters (322489) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.1.1.11

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

7/21/2011

2006 CHEVROLET IMPALA MSP POLICE PACKAGE 4 DOOR SEDAN

Curb Weight:		3725	lbs.	1690	kg.
Curb Weight Distribution -	Front:	62	% Rear:	38	%
Gross Vehicle Weight Rating:		4678	lbs.	2122	kg.
Number of Tires on Vehicle:		4			
Drive Wheels:		FRONT			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	200	16.67	5.08
Wheelbase:	111	9.25	2.82
Front Bumper to Front Axle:	42	3.50	1.07
Front Bumper to Front of Front Well:	26	2.17	0.66
Front Bumper to Front of Hood:	7	0.58	0.18
Front Bumper to Base of Windshield:	50	4.17	1.27
Front Bumper to Top of Windshield:	83	6.92	2.11
Rear Bumper to Rear Axle:	47	3.92	1.19
Rear Bumper to Rear of Rear Well:	33	2.75	0.84
Rear Bumper to Rear of Trunk:	9	0.75	0.23
Rear Bumper to Base of Rear Window:	26	2.17	0.66
Width Dimensions			
Maximum Width:	73	6.08	1.85
Front Track:	61	5.08	1.55
Rear Track:	61	5.08	1.55
Vertical Dimensions			
Height:	59	4.92	1.50
Ground to -			
Front Bumper (Top)	23	1.92	0.58
Headlight - center	28	2.33	0.71
Hood - top front:	30	2.50	0.76
Base of Windshield	38	3.17	0.97
Rear Bumper - top:	28	2.33	0.71
Trunk - top rear:	44	3.67	1.12
Base of Rear Window:	45	3.75	1.14

2006 CHEVROLET IMPALA MSP POLICE PACKAGE 4 DOOR SEDAN

Interior Dimensions	Inches	Feet	Meters
Front Seat Shoulder Width	59	4.92	1.50
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	59	4.92	1.50
Rear Seat to Headliner	38	3.17	0.97
Front Leg Room - seatback to floor (min)	38	3.17	0.97

Seatbelts: 3pt - front and rear

Airbags: FRONT SEAT AIRBAGS

Steering Data

Turning Circle (Diameter)	456	38.00	11.58
Steering Ratio:	:1		
Wheel Radius:			
Tire Size (OEM):	P225/60R16		

Acceleration & Braking Information

Brake Type: ALL DISC

ABS System: ALL WHEEL ABS

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 =	3.3	sec	a =	13.3	ft/sec²	G-force = 0.41
0 to 60mph	t =	8.7	sec	a =	10.1	ft/sec²	G-force = 0.31
45 to 65mph	t =	4.7	sec	a =	6.2	ft/sec²	G-force = 0.20

Transmission Type: 4spd AUTOMATIC

Notes:

Federal Bumper Standard Requirements: 2.5 mph

This vehicles Rated Bumper Strength: 2.5 mph

N.S.D.C = 2006 - 2006

2006 CHEVROLET IMPALA MSP POLICE PACKAGE 4 DOOR SEDAN

Other Information

Tip-Over Stability Ratio =	1.32	Stable
NHTSA Star Rating (calculated)		****

Center of Gravity (No Load):

Inches behind front axle	=	42.18
Inches in front of rear axle	=	68.82
Inches from side of vehicle	=	36.50
Inches from ground	=	23.16
Inches from front corner	=	91.75
Inches from rear corner	=	121.44
Inches from front bumper	=	84.18
Inches from rear bumper	=	115.82

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	2630.75	lb*ft*sec²
Pitch Moment of Inertia	=	2538.75	lb*ft*sec²
Roll Moment of Inertia	=	520.50	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	45.0	deg
Angle Front of Hood to Windshield Base	=	10.5	deg
Angle Front of Hood to Windshield Top	=	19.6	deg
Angle of Windshield	=	29.9	deg
Angle of Steering Tires at Max Turn	=	27.9	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

#5547

2006 CHEVROLET IMPALA

Provided By

4N6XPRT StifCalcs®

Registered to:

4N6XPRT SYSTEMS
8387 UNIVERSITY AVENUE
LA MESA CA 91941-3842
11R-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

Sister/Clone database reader

You entered: **2006 CHEVROLET IMPALA**

The Sister/Clone Vehicle Year/Model Interchange 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 - 2011	CHEVROLET	IMPALA	2D, 4D, SW	110.5, 125
Remarks:				

If you have suggestions, corrections, etc., you should contact Greg Anderson at Scalia Safety Engineering,
521 East Washington Avenue, Suite 200, Madison, WI 53703-2914, (608) 256-0820, FAX (608) 256-0212, E-mail: greganderson@cs.com.

Test Information

Test #	5547	NHTSA Test Reference Guide Version #	V5			
Test Date	2005-10-19	Contract #	DTNH22-01-D-02005			
Contract/Study Title	35 MPH NCAP FRONTAL - 2006 CHEVROLET IMPALA 4-DOOR SEDAN					
Test Objective(s)	OBTAIN ATD AND VEHICLE DATA					
Test Type	NEW CAR ASSESSMENT TEST	Configuration	VEHICLE INTO BARRIER			
Impact Angle	0	Side Impact Point	0	mm	0.0	inches
			0	mm	0.0	inches
		Closing Speed	56.6	Km/Hr	35.15	MPH
Test Performer	KARCO ENGINEERING					
Test Reference #	M60110					
Test Track Surface	CONCRETE	Condition	DRY			
Ambient Temperature	22 C	71.6 F	Total Number of Curves	133		
Data Recorder Type	DIGITAL DATA ACQUISITION	Data Link	OTHER			
Test Commentary	DATALINK IS NONE, ON-BOARD DAS					

Fixed Barrier Information

Barrier Type	RIGID	Pole Barrier Diameter	0	mm	0 inches
Barrier Shape	LOAD CELL BARRIER				
Barrier Commentary	NO COMMENTS				

2006 CHEVROLET IMPALA LEFT FRONT SEAT OCCUPANT

Test #	5547		
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	VECTOR, S/N:034		
Occupant Modification	UNMODIFIED		
Occupant Description	N0 COMMENTS		
Occupant Commentary	NO COMMENTS		

Head

Head to -

Windshielder Header	340	mm	13.4	inches	Head Injury Criteria (HIC)	411	
WindShield	640	mm	25.2	inches	HIC Lower Time Interval (ms)	52.1	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	88.1	
Side Header	230	mm	9.1	inches			
Side Window	284	mm	11.2	inches			

Neck to Seatback 0 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	125	mm	4.9	inches
Steering Wheel	280	mm	11.0	inches	Hip to Door	165	mm	6.5	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)	32.7

Lap Belt Peak Load	5517	Newtons	1240.3	pound Force
Shoulder Belt Peak Load	5156	Newtons	1159.1	pound Force

First Contact Region (Chest/Abdomen): AIR BAG

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash	245	mm	9.6	inches	Knees to Seatback	0	mm	0.0	inches

Left Femur Peak Load	-4050	Newtons	-910.5	pounds Force
Right Femur Peak Load	-2740	Newtons	-616.0	pounds Force

First Contact Region (Legs): DASHPANEL

Second Contact Region (Legs):

2006 CHEVROLET IMPALA LEFT FRONT SEAT OCCUPANT

Test #	5547					
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	VECTOR, S/N:034
Occupant Modification	UNMODIFIED
Occupant Description	N0 COMMENTS
Occupant Commentary	NO COMMENTS

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS
Restraint # 2	FRONTAL AIRBAG
Mounted	STEERING WHEEL
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS

2006 CHEVROLET IMPALA RIGHT FRONT SEAT OCCUPANT

Test #	5547		
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	VECTOR, S/N:035		
Occupant Modification	UNMODIFIED		
Occupant Description	N0 COMMENTS		
Occupant Commentary	NO COMMENTS		

Head

Head to -

Windshielder Header	330	mm	13.0	inches	Head Injury Criteria (HIC)	276	
WindShield	645	mm	25.4	inches	HIC Lower Time Interval (ms)	62.6	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	98.6	
Side Header	290	mm	11.4	inches			
Side Window	260	mm	10.2	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): AIR BAG

Second Contact Region (Head):

Chest

Chest to -

Dash	565	mm	22.2	inches	Arm to Door	125	mm	4.9	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	0	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	37.6

Lap Belt Peak Load	6164	Newtons	1385.7	pound Force
Shoulder Belt Peak Load	4842	Newtons	1088.5	pound Force

First Contact Region (Chest/Abdomen): AIR BAG

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash	210	mm	8.3	inches	Knees to Seatback	0	mm	0.0	inches

Left Femur Peak Load	-2354	Newtons	-529.2	pounds Force
Right Femur Peak Load	-2072	Newtons	-465.8	pounds Force

First Contact Region (Legs): DASHPANEL

Second Contact Region (Legs):

2006 CHEVROLET IMPALA RIGHT FRONT SEAT OCCUPANT

Test #	5547					
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	VECTOR, S/N:035
Occupant Modification	UNMODIFIED
Occupant Description	N0 COMMENTS
Occupant Commentary	NO COMMENTS

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS
Restraint # 2	FRONTAL AIRBAG
Mounted	DASH PANEL - TOP
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS

Vehicle 1 2006 CHEVROLET IMPALA

Test #	5547		
VIN	2G1WB58K069119598	NHTSA Test Vehicle Number	1
Year	2006	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	CHEVROLET	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	IMPALA	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	V6 TRANSVERSE FRONT		
Displacement	3.5 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	UNMODIFIED		
Vehicle Commentary	NO COMMENTS		

Vehicle Length	5085	mm	200.2	inches	CG behind Front Axle	1172	mm	46.1	inches
Vehicle Width	1835	mm	72.2	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2805	mm	110.4	inches	Total Length of Indentation	1249	mm	49.2	inches
Vehicle Test Weight	1851	KG	4080	pounds	Maximum Static Crush Depth	720	mm	28.3	inches
					Pre-Impact Speed	57	kph	35.2	mph

Vehicle Damage Index 12FDEW6 — Principal Direction of Force 0

Damage Profile Distance Measurements

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

DPD 1	-524	mm	-20.6	inches
DPD 2	-650	mm	-25.6	inches
DPD 3	-699	mm	-27.5	inches
DPD 4	-679	mm	-26.7	inches
DPD 5	-661	mm	-26.0	inches
DPD 6	-574	mm	-22.6	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	194.1	inches	173.4	inches	20.6	inches
	4929	mm	4405	mm	524	mm
Centerline	200.2	inches	171.9	inches	28.3	inches
	5085	mm	4365	mm	720	mm
Right Bumper Corner	194.1	inches	171.5	inches	22.6	inches
	4929	mm	4355	mm	574	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 CHEVROLET IMPALA

Test #	5547		
VIN	2G1WB58K069119598	NHTSA Test Vehicle Number	1
Year	2006	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	CHEVROLET	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	IMPALA	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	V6 TRANSVERSE FRONT		
Displacement	3.5 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	UNMODIFIED		
Vehicle Commentary	NO COMMENTS		

Vehicle Length	5085	mm	200.2	inches	CG behind Front Axle	1172	mm	46.1	inches
Vehicle Width	1835	mm	72.2	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2805	mm	110.4	inches	Total Length of Indentation	1249	mm	49.2	inches
Vehicle Test Weight	1851	KG	4080	pounds	Maximum Static Crush Depth	720	mm	28.3	inches
					Pre-Impact Speed	57	kph	35.2	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				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							
				5085	200.2	4365	171.9				
				Engine Block							
				425	16.7	420	16.5				
4929	194.1	4405	173.4	Front Bumper Corner				4929	194.1	4355	171.5
				Front of Engine							
				4457	175.5	4121	162.2				
3858	151.9	3805	149.8	Firewall				3850	151.6	3803	149.7
				3902	153.6	3795	149.4				
3493	137.5	3494	137.6	Upper Leading Edge of Door				3490	137.4	3486	137.2
3485	137.2	3482	137.1	Lower Leading Edge of Door				3475	136.8	3480	137.0
3470	136.6	3471	136.7	Bottom of 'A' Post				3471	136.7	3462	136.3
2415	95.1	2411	94.9	Upper Trailing Edge of Door				2405	94.7	2402	94.6
2405	94.7	2410	94.9	Lower Trailing Edge of Door				2394	94.3	2406	94.7
				Steering Column							
				3042	119.8	3070	120.9				
				Center of Seering Column to 'A' Post (Horizontal)							
				405	15.9	425	16.7				
				Center of Steering Column to Headliner (Vertical)							
				435	17.1	375	14.8				

2006 CHEVROLET IMPALA

NHTSA Crash Test - #5547 - Front Impact

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

Test Vehicle Weight = 4080 pounds
Vehicle Closing Speed = 35.2 mph
Test Crush Length = 72.2 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	20.6	28.3	22.6	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 20.6 inches					131.8
Using a Rated No Damage Speed of	2.5 mph	179.4	113.7	141.5	
Using a Rated No Damage Speed of	5.0 mph	331.3	97.0	565.9	
Using a Rated No Damage Speed of	7.5 mph	455.8	81.6	1273.3	
Using a Rated No Damage Speed of	10.0 mph	552.7	67.5	2263.6	
Average Crush = 25.0 inches					89.5
Using a Rated No Damage Speed of	2.5 mph	147.8	77.2	141.5	
Using a Rated No Damage Speed of	5.0 mph	273.0	65.9	565.9	
Using a Rated No Damage Speed of	7.5 mph	375.6	55.4	1273.3	
Using a Rated No Damage Speed of	10.0 mph	455.5	45.8	2263.6	
Maximum Crush = 28.3 inches					69.8
Using a Rated No Damage Speed of	2.5 mph	130.6	60.3	141.5	
Using a Rated No Damage Speed of	5.0 mph	241.2	51.4	565.9	
Using a Rated No Damage Speed of	7.5 mph	331.8	43.2	1273.3	
Using a Rated No Damage Speed of	10.0 mph	402.4	35.8	2263.6	

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

****

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	28.3	38.5	3.4	8.8

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 17.5

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 CHEVROLET IMPALA

NHTSA Crash Test - #5547 - Front Impact

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

Test Vehicle Weight = 4080 pounds
Vehicle Closing Speed = 35.2 mph
Test Crush Length = 49.2 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	20.6	28.3	22.6	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 20.6 inches					193.7
Using a Rated No Damage Speed of	2.5 mph	263.6	167.1	207.9	
Using a Rated No Damage Speed of	5.0 mph	486.8	142.5	831.4	
Using a Rated No Damage Speed of	7.5 mph	669.6	119.8	1870.7	
Using a Rated No Damage Speed of	10.0 mph	812.1	99.1	3325.7	
Average Crush = 25.0 inches					131.5
Using a Rated No Damage Speed of	2.5 mph	217.2	113.5	207.9	
Using a Rated No Damage Speed of	5.0 mph	401.1	96.7	831.4	
Using a Rated No Damage Speed of	7.5 mph	551.7	81.4	1870.7	
Using a Rated No Damage Speed of	10.0 mph	669.2	67.3	3325.7	
Maximum Crush = 28.3 inches					102.6
Using a Rated No Damage Speed of	2.5 mph	191.8	88.5	207.9	
Using a Rated No Damage Speed of	5.0 mph	354.3	75.5	831.4	
Using a Rated No Damage Speed of	7.5 mph	487.4	63.5	1870.7	
Using a Rated No Damage Speed of	10.0 mph	591.1	52.5	3325.7	

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

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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

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	28.3	38.5	3.4	8.8

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 17.5

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 CHEVROLET IMPALA

NHTSA Crash Test - #5547 - Front Impact

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

Test Vehicle Weight = 4080 pounds
Vehicle Closing Speed = 35.2 MPH
Test Crush Length = 72.2 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	-20.6	-25.6	-27.5	-26.7	-26.0	-22.6	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 6.0 inches					1553.8
Using a Rated No Damage Speed of	2.5mph	615.9	1340.7	141.5	
Using a Rated No Damage Speed of	5.0mph	1137.5	1143.2	565.9	
Using a Rated No Damage Speed of	7.5mph	1564.8	961.5	1273.3	
Using a Rated No Damage Speed of	10.0mph	1897.8	795.5	2263.6	
Average Crush = 23.8 inches					98.8
Using a Rated No Damage Speed of	2.5mph	155.3	85.2	141.5	
Using a Rated No Damage Speed of	5.0mph	286.8	72.7	565.9	
Using a Rated No Damage Speed of	7.5mph	394.5	61.1	1273.3	
Using a Rated No Damage Speed of	10.0mph	478.4	50.6	1575.1	
Maximum Crush = 27.5 inches					74.0
Using a Rated No Damage Speed of	2.5mph	134.4	63.8	141.5	
Using a Rated No Damage Speed of	5.0mph	248.2	54.4	565.9	
Using a Rated No Damage Speed of	7.5mph	341.4	45.8	1273.3	
Using a Rated No Damage Speed of	10.0mph	414.1	37.9	2263.6	

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

****

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	27.5	38.0	2.8	7.5

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 18.0

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 CHEVROLET IMPALA

NHTSA Crash Test - #5547 - Front Impact

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

Test Vehicle Weight = 4080 pounds
Vehicle Closing Speed = 35.2 MPH
Test Crush Length = 49.2 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	-20.6	-25.6	-27.5	-26.7	-26.0	-22.6	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 6.0 inches					2282.9
Using a Rated No Damage Speed of	2.5mph	904.9	1969.7	207.9	
Using a Rated No Damage Speed of	5.0mph	1671.2	1679.6	831.4	
Using a Rated No Damage Speed of	7.5mph	2299.0	1412.6	1870.7	
Using a Rated No Damage Speed of	10.0mph	2788.1	1168.7	3325.7	
Average Crush = 23.8 inches					145.1
Using a Rated No Damage Speed of	2.5mph	228.1	125.2	207.9	
Using a Rated No Damage Speed of	5.0mph	421.3	106.7	831.4	
Using a Rated No Damage Speed of	7.5mph	579.6	89.8	1870.7	
Using a Rated No Damage Speed of	10.0mph	702.9	74.3	2314.1	
Maximum Crush = 27.5 inches					108.7
Using a Rated No Damage Speed of	2.5mph	197.4	93.8	207.9	
Using a Rated No Damage Speed of	5.0mph	364.6	80.0	831.4	
Using a Rated No Damage Speed of	7.5mph	501.6	67.2	1870.7	
Using a Rated No Damage Speed of	10.0mph	608.3	55.6	3325.7	

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

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	27.5	38.0	2.8	7.5

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 18.0

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

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2006 - 2011
Make: CHEVROLET
Model: IMPALA

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
5578	2006 CHEVROLET MONTE CARLO TWO DOOR C...	5.0	26.3	35.0	250.4	57.1	549.0	77.7	18.6
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
	Average (AVG)				**298.1**	**79.6**	**565.7**	**113.4**	**20.2**
	Minimum (MIN)				**250.4**	**57.1**	**549.0**	**77.7**	**18.6**
	Maximum (MAX)				**382.5**	**121.6**	**601.5**	**191.1**	**21.1**
	Standard Deviation (STDev-sample)				**49.7**	**24.5**	**21.0**	**44.5**	**1.0**
	Number of Tests (n)			**5**					

2006 CHEVROLET IMPALA MSP POLICE PACKAGE - Front Impact

Curb Weight (pounds):	3725
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3725
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	9.24
Damage Length (inches):	58.1
Crush Profile Measurements:	7

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	2630.75

"Known" Stifness Values

	A	B
Average	298.1	79.6
Minimum	250.4	57.1
Maximum	382.5	121.6
Std. Devation	49.7	24.5

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00						
C2 (inches)	5.95	4.06	12.07	1.98	23.92	2.71	32.67
C3 (inches)	8.59	11.99	87.14	3.67	320.13	18.35	1598.83
C4 (inches)	12.22	16.95	176.38	5.26	927.04	42.87	7561.18
C5 (inches)	11.23	11.99	140.61	5.87	825.01	41.88	5888.94
C6 (inches)	11.23	8.36	93.90	5.62	527.34	37.62	3532.50
C7 (inches)	0.00	4.79	26.90	3.74	100.72	25.55	687.22
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 9.24

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	250.4	57.1	22610.23	26827.97	14.7	11.3	35.9
Avg - 2 Std. Deviations	198.7	30.6	13992.18	18964.09	12.4	9.3	29.5
Avg - 1 Std. Deviations	248.4	55.1	22015.10	26337.14	14.6	11.2	35.5
Average	298.1	79.6	30038.03	34114.67	16.6	12.9	40.7
Avg + 1 Std. Deviations	347.8	104.1	38060.95	42011.11	18.4	14.3	45.4
Avg + 2 Std. Deviations	397.5	128.6	46083.87	49958.49	20.1	15.7	49.6
Maximum	382.5	121.6	43768.35	47636.40	19.6	15.3	48.4

Damage Centroid Depth (x) (inches)	5.07	k^2	3274.70
Damage Centroid Depth (y) (inches)	35.94	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	537.00		

1991 TOYOTA PREVIA DX - Side Impact

Curb Weight (pounds):	3479
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3479
Angle Coll Force to Normal (degrees):	20.0
No Damage Speed (mph):	2.0
Energy Crush Depth (inches):	8.33
Damage Length (inches):	77.5
Crush Profile Measurements:	8

PDOF

Lever Arm Distance (inches):	57.00
Yaw Moment of Inertia (lb-ft-sec^2)	2377.37

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00	12.57	22.25	1.18	26.25	8.38	186.45
C2 (inches)	3.54	13.06	89.33	3.69	329.21	20.64	1843.79
C3 (inches)	10.14	13.28	164.74	6.27	1033.14	33.60	5535.89
C4 (inches)	14.67	12.55	165.79	6.63	1099.47	43.69	7243.80
C5 (inches)	11.75	9.66	102.69	5.33	547.79	43.30	4446.33
C6 (inches)	9.51	8.56	72.03	4.23	304.79	46.89	3377.91
C7 (inches)	7.32	7.83	28.66	2.44	69.93	49.59	1421.14
C8 (inches)	0.00						
C9 (inches)							
C10 (inches)							

Average Crush (inches): 8.33

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	89.1	55.1	22610.23	23695.39	14.3	12.1	21.8
Avg - 2 Std. Deviations	68.4	32.5	13992.18	15160.74	11.4	10.0	16.7
Avg - 1 Std. Deviations	87.8	53.5	22015.10	23109.19	14.1	12.0	21.5
Average	103.9	75.0	30038.03	30984.35	16.3	13.8	25.4
Avg + 1 Std. Deviations	118.0	96.6	38060.95	38814.31	18.3	15.3	28.8
Avg + 2 Std. Deviations	130.6	118.5	46083.87	46612.78	20.0	16.8	31.9
Maximum	127.1	112.1	43768.35	44364.73	19.6	16.4	31.1

Damage Centroid Depth (x) (inches)	5.28	k^2	3168.55
Damage Centroid Depth (y) (inches)	37.27	Eff. Mass Ratio (gamma)	0.49
Area of Damage (inches^2):	645.48		

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2006 - 2011
Make: CHEVROLET
Model: IMPALA

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
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
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)				**267.2**	**63.9**	**565.7**	**91.0**	**18.1**
	Minimum (MIN)				**235.7**	**50.6**	**549.0**	**68.9**	**17.4**
	Maximum (MAX)				**340.6**	**96.4**	**601.5**	**151.5**	**19.8**
	Standard Deviation (STDev-sample)				**43.0**	**19.1**	**21.0**	**34.7**	**1.0**
	Number of Tests (n)			**5**					

2006 CHEVROLET IMPALA MSP POLICE PACKAGE - Front Impact

Curb Weight (pounds):	3725
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3725
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	9.24
Damage Length (inches):	58.1
Crush Profile Measurements:	7

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	2630.75

"Known" Stifness Values

	A	B
Average	267.2	63.9
Minimum	235.7	50.6
Maximum	340.6	96.4
Std. Devation	43.0	19.1

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00						
C2 (inches)	5.95	4.06	12.07	1.98	23.92	2.71	32.67
C3 (inches)	8.59	11.99	87.14	3.67	320.13	18.35	1598.83
C4 (inches)	12.22	16.95	176.38	5.26	927.04	42.87	7561.18
C5 (inches)	11.23	11.99	140.61	5.87	825.01	41.88	5888.94
C6 (inches)	11.23	8.36	93.90	5.62	527.34	37.62	3532.50
C7 (inches)	0.00	4.79	26.90	3.74	100.72	25.55	687.22
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 9.24

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	235.7	50.6	20437.68	24694.17	14.1	10.8	34.3
Avg - 2 Std. Deviations	181.2	25.7	12167.82	17037.87	11.7	8.8	27.8
Avg - 1 Std. Deviations	224.2	44.8	18546.10	22921.21	13.6	10.4	32.9
Average	267.2	63.9	24924.38	29170.04	15.3	11.8	37.5
Avg + 1 Std. Deviations	310.2	83.0	31302.66	35532.04	16.9	13.1	41.5
Avg + 2 Std. Deviations	353.2	102.1	37680.94	41943.69	18.4	14.3	45.2
Maximum	340.6	96.4	35784.23	40041.20	18.0	13.9	44.2

Damage Centroid Depth (x) (inches)	5.07	k^2	3274.70
Damage Centroid Depth (y) (inches)	35.94	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	537.00		

1991 TOYOTA PREVIA DX - Side Impact

Curb Weight (pounds):	3479
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3479
Angle Coll Force to Normal (degrees):	20.0
No Damage Speed (mph):	2.0
Energy Crush Depth (inches):	8.33
Damage Length (inches):	77.5
Crush Profile Measurements:	8

PDOF

Lever Arm Distance (inches):	57.00
Yaw Moment of Inertia (lb-ft-sec^2)	2377.37

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00	12.57	22.25	1.18	26.25	8.38	186.45
C2 (inches)	3.54	13.06	89.33	3.69	329.21	20.64	1843.79
C3 (inches)	10.14	13.28	164.74	6.27	1033.14	33.60	5535.89
C4 (inches)	14.67	12.55	165.79	6.63	1099.47	43.69	7243.80
C5 (inches)	11.75	9.66	102.69	5.33	547.79	43.30	4446.33
C6 (inches)	9.51	8.56	72.03	4.23	304.79	46.89	3377.91
C7 (inches)	7.32	7.83	28.66	2.44	69.93	49.59	1421.14
C8 (inches)	0.00						
C9 (inches)							
C10 (inches)							

Average Crush (inches): 8.33

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	84.3	49.4	20437.68	21553.54	13.6	11.6	20.6
Avg - 2 Std. Deviations	63.3	27.8	12167.82	13337.16	10.7	9.4	15.5
Avg - 1 Std. Deviations	80.0	44.4	18546.10	19684.02	13.0	11.1	19.5
Average	94.0	61.3	24924.38	25971.40	15.0	12.7	23.0
Avg + 1 Std. Deviations	106.3	78.4	31302.66	32221.12	16.7	14.0	26.0
Avg + 2 Std. Deviations	117.4	95.6	37680.94	38444.22	18.2	15.3	28.7
Maximum	114.2	90.5	35784.23	36595.99	17.8	14.9	27.9

Damage Centroid Depth (x) (inches)	5.28	k^2	3168.55
Damage Centroid Depth (y) (inches)	37.27	Eff. Mass Ratio (gamma)	0.49
Area of Damage (inches^2):	645.48		

Expert VIN DeCoder®

Version Number 3.0.2.5

DeCoded VIN: JT3AC22S2M0013395

Model:	1991 Toyota Previa Van 4 Door Wagon
Engine Size:	2.4 L/146 cu.in.
Engine Description:	In-Line 4 cylinder with Dual Overhead Cam
Horse Power:	138 @ 5000 rpm
Torque:	154 lb-ft @ 4000 rpm
Injection System:	Electronic Fuel Injection (EFI)
PSI:	38-44 psi
Ignition:	electronic
Manufacturer:	Toyota
Assembly Plant:	Toyota, Japan
Drive Wheels:	This is a 4 Wheel Drive vehicle w/Manual Belts

The First through Third characters (JT3) indicate a Toyota MPV made in Japan

The Fourth character (A) indicates the OEM engine: 2.4 L/146 cu.in., L4, DOHC

The Fifth and Sixth characters (C2) indicate a Previa Van

The Seventh character (2) indicates

The Eighth character (S) indicates a 4 Door Wagon

The Ninth character (the check digit) is entered as 2.
The VIN appears Valid, the calculated value is 2.

The Tenth character (M) indicates the model year 1991

The Eleventh character (0) indicates the vehicle was made in the assembly plant in Toyota, Japan

The Twelfth through Seventeenth characters (013395) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.1.1.11

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

7/21/2011

1991 TOYOTA PREVIA DX 3 DOOR MINI VAN

Curb Weight:	3479	lbs.	1578	kg.
Curb Weight Distribution - Front:	53	% Rear:	47	%
Gross Vehicle Weight Rating:	5300	lbs.	2404	kg.
Number of Tires on Vehicle:	4			
Drive Wheels:	REAR			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	187	15.58	4.75
Wheelbase:	113	9.42	2.87
Front Bumper to Front Axle:	36	3.00	0.91
Front Bumper to Front of Front Well:	16	1.33	0.41
Front Bumper to Front of Hood:	5	0.42	0.13
Front Bumper to Base of Windshield:	21	1.75	0.53
Front Bumper to Top of Windshield:	53	4.42	1.35
Rear Bumper to Rear Axle:	38	3.17	0.97
Rear Bumper to Rear of Rear Well:	24	2.00	0.61
Rear Bumper to Rear of Trunk:			
Rear Bumper to Base of Rear Window:			
Width Dimensions			
Maximum Width:	71	5.92	1.80
Front Track:	62	5.17	1.57
Rear Track:	62	5.17	1.57
Vertical Dimensions			
Height:	69	5.75	1.75
Ground to -			
Front Bumper (Top)	21	1.75	0.53
Headlight - center	28	2.33	0.71
Hood - top front:	30	2.50	0.76
Base of Windshield	44	3.67	1.12
Rear Bumper - top:	26	2.17	0.66
Trunk - top rear:			
Base of Rear Window:			

1991 TOYOTA PREVIA DX 3 DOOR MINI VAN

Interior Dimensions

	Inches	Feet	Meters
Front Seat Shoulder Width	61	5.08	1.55
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	61	5.08	1.55
Rear Seat to Headliner	39	3.25	0.99
Front Leg Room - seatback to floor (min)	35	2.92	0.89

Seatbelts: 3pt front, 2pt rear

Airbags: NO AIRBAGS

Steering Data

Turning Circle (Diameter)	444	37.00	11.28
Steering Ratio:	18.82:1		
Wheel Radius:	13	1.08	0.33
Tire Size (OEM):	215-65R15		

Acceleration & Braking Information

Brake Type: ALL DISC

ABS System: ABS UNKNOWN

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

d = 137.0 ft t = 3.1 sec a = -28.2 ft/sec² G-force = -0.88

Acceleration:

0 to 30mph	t =	4.6	sec	a =	9.6	ft/sec²	G-force = 0.30
0 to 60mph	t =	12.9	sec	a =	6.8	ft/sec²	G-force = 0.21
45 to 65mph	t =	7.7	sec	a =	3.8	ft/sec²	G-force = 0.12

Transmission Type: 5spd MANUAL

Notes:

Federal Bumper Standard Requirements: No Requirement mph

This vehicles Rated Bumper Strength: 5 mph

N.S.D.C = 1990 - 1993

1991 TOYOTA PREVIA DX 3 DOOR MINI VAN

Other Information

Tip-Over Stability Ratio =	1.15	Reasonably Stable
NHTSA Star Rating (calculated)		***

Center of Gravity (No Load):

Inches behind front axle	=	53.11
Inches in front of rear axle	=	59.89
Inches from side of vehicle	=	35.50
Inches from ground	=	27.01
Inches from front corner	=	95.92
Inches from rear corner	=	104.13
Inches from front bumper	=	89.11
Inches from rear bumper	=	97.89

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	2240.37	lb*ft*sec²
Pitch Moment of Inertia	=	2239.48	lb*ft*sec²
Roll Moment of Inertia	=	530.38	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	60.9	deg
Angle Front of Hood to Windshield Base	=	41.2	deg
Angle Front of Hood to Windshield Top	=	37.6	deg
Angle of Windshield	=	35.7	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).

4N6XPRT Systems
Expert System Software for Litigation

8387 University Avenue
La Mesa, CA 91942

Phone: (619) 464-3478
Fax: (619) 464-2206
Toll Free: 1- 800-266-9778

Web Site: http://www.4n6xprt.com

E-Mail: 4n6@4n6xprt.com

The NHTSA Crash Test database contains NO SIDE Impact tests for the Toyota Previa.

To create a SIMILAR class of vehicle, we first looked at the wheelbase of one of the frontal impact tests for the PREVIA, which was reported as 112.8 inches.

We then looked at the NHTSA database for VANS that have SIDE IMPACT TESTS and had a wheelbase of 109.8-115.8 inches (+/- 3 inches).

The Test Summary Reports based on the Average and Maximum crush depths follow.

4N6XPRT StifCalcs - Selected Vehicle: 1991 TOYOTA PREVIA

File Print Reports Settings Help Reg To: 4N6XPRT SYSTEMS

Basic Vehicle Search | NHTSA Test Selection | Advanced Vehicle Search | Force Balance

3.1.1.1

Available Test | Test Information | Occupant Information | Vehicle Information | Stiffness Calcs

Available Tests in the NHTSA database for a 1991 - 1996 TOYOTA PREVIA

Sister Clone Searched Year Range (1991 - 1996)

Print

Frontal Test(s)

Test No.	Year	Make	Model	Impact Speed	Max Crush	Crush Factor	VDI	PDOF	Test Config	VIN
1519	1991	TOYOTA	PREVIA	34.6	20.3	23.6	12FCAW9	0	VEHICLE INTO BA...	JT3AC11R4MOO20...
1853	1993	TOYOTA	PREVIA	35.1	15.3	32.2	12FDEW4	0	VEHICLE INTO BA...	JT3AC11R6P1065698
2058	1994	TOYOTA	PREVIA	35.3	19.6	25.4	9999999	0	VEHICLE INTO BA...	JT3AC11R6R1132058
2074	1994	TOYOTA	PREVIA	29.4	11.5	30.1	12FDEW5	0	VEHICLE INTO BA...	JT3AC11R5R1129989

Rear Test(s)

No Rear Tests: 1991 - 1996

Side Test(s)

No Side Tests: 1991 - 1996

Print

Other Test(s)

Available Test Results
Side Impact Test Summary

Report Filter Settings

Year Range: 1965 - 2011

Bodystyle: VAN

Wheelbase Range: 109.8-115.8

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	KEES (mph)	Indention Stiffness A	Indention Stiffness B	Length Values G	Length Values Kv	Crush Factor
1764	1989 MAZDA MPV VAN	2.0	12.0	20.9	92.4	72.4	59.0	88.6	14.5
3028	1999 DODGE CARAVAN VAN	2.0	9.4	21.2	114.3	116.8	56.0	142.4	19.2
3299	2000 MERCURY VILLAGER VAN	2.0	9.0	24.3	125.8	155.9	50.7	185.2	26.2
3011	1999 TOYOTA SIENNA VAN	2.0	6.1	24.5	161.4	297.4	43.8	352.7	39.3
6790	2010 FORD TRANSIT CONNECT VAN	2.0	6.0	25.2	194.8	378.0	50.2	446.0	42.5
3037	1999 TOYOTA SIENNA VAN	2.0	5.1	20.9	208.7	386.8	56.3	472.8	34.3
	Average (AVG)				**149.6**	**234.6**	**52.7**	**281.3**	**29.3**
	Minimum (MIN)				**92.4**	**72.4**	**43.8**	**88.6**	**14.5**
	Maximum (MAX)				**208.7**	**386.8**	**59.0**	**472.8**	**42.5**
	Standard Deviation (STDev-sample)				**46.4**	**137.2**	**5.5**	**164.0**	**11.2**
	Number of Tests (n)			**6**					

1991 TOYOTA PREVIA DX - Side Impact

Curb Weight (pounds):	3479
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3479
Angle Coll Force to Normal (degrees):	57.0
No Damage Speed (mph):	2.0
Energy Crush Depth (inches):	8.33
Damage Length (inches):	77.5
Crush Profile Measurements:	8

PDOF

Lever Arm Distance (inches):	20.00
Yaw Moment of Inertia (lb-ft-sec^2)	2377.37

"Known" Stifness Values

	A	B
Average	149.6	234.5
Minimum	92.4	72.4
Maximum	208.7	386.8
Std. Devation	46.4	137.2

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00						
C2 (inches)	3.54	12.57	22.25	1.18	26.25	8.38	186.45
C3 (inches)	10.14	13.06	89.33	3.69	329.21	20.64	1843.79
C4 (inches)	14.67	13.28	164.74	6.27	1033.14	33.60	5535.89
C5 (inches)	11.75	12.55	165.79	6.63	1099.47	43.69	7243.80
C6 (inches)	9.51	9.66	102.69	5.33	547.79	43.30	4446.33
C7 (inches)	7.32	8.56	72.03	4.23	304.79	46.89	3377.91
C8 (inches)	0.00	7.83	28.66	2.44	69.93	49.59	1421.14
C9 (inches)							
C10 (inches)							

Average Crush (inches): 8.33

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	92.4	72.4	49477.37	87408.97	27.5	24.3	50.0
Avg - 2 Std. Deviations	56.8	-39.9	N/A	N/A	N/A	N/A	N/A
Avg - 1 Std. Deviations	103.2	97.3	65000.99	113133.00	31.2	27.5	56.7
Average	149.6	234.5	149604.01	252851.71	46.7	40.8	84.0
Avg + 1 Std. Deviations	196.0	371.7	234207.03	392809.23	58.2	50.6	104.3
Avg + 2 Std. Deviations	242.4	508.9	318810.04	532812.41	67.8	58.8	121.2
Maximum	208.7	386.8	244058.61	409680.91	59.4	51.7	106.5

Damage Centroid Depth (x) (inches)	5.28	k^2	3168.55
Damage Centroid Depth (y) (inches)	37.27	Eff. Mass Ratio (gamma)	0.89
Area of Damage (inches^2):	645.48		

2006 CHEVROLET IMPALA MSP POLICE PACKAGE - Front Impact

Curb Weight (pounds):	3725
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3725
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	9.24
Damage Length (inches):	58.1
Crush Profile Measurements:	7

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	2630.75

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00	4.06	12.07	1.98	23.92	2.71	32.67
C2 (inches)	5.95	11.99	87.14	3.67	320.13	18.35	1598.83
C3 (inches)	8.59	16.95	176.38	5.26	927.04	42.87	7561.18
C4 (inches)	12.22	11.99	140.61	5.87	825.01	41.88	5888.94
C5 (inches)	11.23	8.36	93.90	5.62	527.34	37.62	3532.50
C6 (inches)	11.23	4.79	26.90	3.74	100.72	25.55	687.22
C7 (inches)	0.00						
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 9.24

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	422.0	138.5	49477.37	53445.79	20.7	22.7	28.9
Avg - 2 Std. Deviations	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Avg - 1 Std. Deviations	492.5	188.7	65000.99	67988.55	23.4	25.7	33.7
Average	779.4	472.6	149604.01	145281.35	34.2	38.1	53.4
Avg + 1 Std. Deviations	991.4	764.6	234207.03	221061.54	42.2	47.3	67.9
Avg + 2 Std. Deviations	1167.6	1060.5	318810.04	296119.16	48.8	55.0	79.9
Maximum	1013.4	798.9	244058.61	229831.39	43.0	48.3	69.4

Damage Centroid Depth (x) (inches)	5.07	k^2	3274.70
Damage Centroid Depth (y) (inches)	35.94	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	537.00		

Available Test Results
Side Impact Test Summary

Report Filter Settings

Year Range: 1965 - 2011

Bodystyle: VAN

Wheelbase Range: 109.8-115.8

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	KEES (mph)	Indention Stiffness A	Indention Stiffness B	Length Values G	Length Values Kv	Crush Factor
1764	1989 MAZDA MPV VAN	2.0	18.9	20.9	58.9	29.4	59.0	35.9	9.2
3299	2000 MERCURY VILLAGER VAN	2.0	15.8	24.3	71.6	50.5	50.7	60.0	14.9
3011	1999 TOYOTA SIENNA VAN	2.0	13.4	24.5	73.3	61.3	43.8	72.7	17.8
3028	1999 DODGE CARAVAN VAN	2.0	14.5	21.2	74.0	49.0	56.0	59.7	12.4
3037	1999 TOYOTA SIENNA VAN	2.0	9.8	20.9	108.8	105.1	56.3	128.5	17.9
6790	2010 FORD TRANSIT CONNECT VAN	2.0	10.0	25.2	116.4	135.0	50.2	159.3	25.4
	Average (AVG)				**83.8**	**71.7**	**52.7**	**86.0**	**16.3**
	Minimum (MIN)				**58.9**	**29.4**	**43.8**	**35.9**	**9.2**
	Maximum (MAX)				**116.4**	**135.0**	**59.0**	**159.3**	**25.4**
	Standard Deviation (STDev-sample)				**23.1**	**40.0**	**5.5**	**47.4**	**5.6**
	Number of Tests (n)			**6**					

1991 TOYOTA PREVIA DX - Side Impact

Curb Weight (pounds):	3479
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3479
Angle Coll Force to Normal (degrees):	57.0
No Damage Speed (mph):	2.0
Energy Crush Depth (inches):	8.33
Damage Length (inches):	77.5
Crush Profile Measurements:	8

PDOF

Lever Arm Distance (inches):	20.00
Yaw Moment of Inertia (lb-ft-sec^2)	2377.37

"Known" Stifness Values

	A	B
Average	83.8	71.7
Minimum	58.9	29.4
Maximum	116.4	135.0
Std. Devation	23.1	40.0

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00						
C2 (inches)	3.54	12.57	22.25	1.18	26.25	8.38	186.45
C3 (inches)	10.14	13.06	89.33	3.69	329.21	20.64	1843.79
C4 (inches)	14.67	13.28	164.74	6.27	1033.14	33.60	5535.89
C5 (inches)	11.75	12.55	165.79	6.63	1099.47	43.69	7243.80
C6 (inches)	9.51	9.66	102.69	5.33	547.79	43.30	4446.33
C7 (inches)	7.32	8.56	72.03	4.23	304.79	46.89	3377.91
C8 (inches)	0.00	7.83	28.66	2.44	69.93	49.59	1421.14
C9 (inches)							
C10 (inches)							

Average Crush (inches): 8.33

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	58.9	29.4	21612.87	40134.85	18.6	16.7	34.5
Avg - 2 Std. Deviations	37.6	-8.3	N/A	N/A	N/A	N/A	N/A
Avg - 1 Std. Deviations	60.7	31.7	23103.88	42645.71	19.2	17.2	35.5
Average	83.8	71.7	48450.62	84961.22	27.1	24.0	49.5
Avg + 1 Std. Deviations	106.9	111.7	73797.36	127523.35	33.2	29.3	60.3
Avg + 2 Std. Deviations	130.0	151.7	99144.10	170137.03	38.3	33.7	69.4
Maximum	116.4	135.0	88280.36	151549.64	36.2	31.8	65.6

Damage Centroid Depth (x) (inches)	5.28	k^2	3168.55
Damage Centroid Depth (y) (inches)	37.27	Eff. Mass Ratio (gamma)	0.89
Area of Damage (inches^2):	645.48		

2006 CHEVROLET IMPALA MSP POLICE PACKAGE - Front Impact

Curb Weight (pounds):	3725
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3725
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	9.03
Damage Length (inches):	58.1
Crush Profile Measurements:	7

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	2630.75

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00	4.06	12.07	1.98	23.92	2.71	32.67
C2 (inches)	5.95	11.99	87.14	3.67	320.13	18.35	1598.83
C3 (inches)	8.59	16.95	176.38	5.26	927.04	42.87	7561.18
C4 (inches)	12.22	11.99	140.61	5.87	825.01	41.88	5888.94
C5 (inches)	11.23	8.36	93.90	5.62	527.34	37.62	3532.50
C6 (inches)	11.23	4.79	26.90	3.74	100.72	25.55	687.22
C7 (inches)	0.00						
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 9.24

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	261.9	53.3	21612.87	26941.38	14.7	15.6	17.9
Avg - 2 Std. Deviations	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Avg - 1 Std. Deviations	272.6	57.8	23103.88	28442.50	15.1	16.1	18.7
Average	421.1	138.0	48450.62	53276.36	20.7	22.4	28.8
Avg + 1 Std. Deviations	534.2	222.0	73797.36	77416.62	25.0	27.3	36.6
Avg + 2 Std. Deviations	629.2	308.0	99144.10	101203.44	28.5	31.4	43.1
Maximum	590.2	271.0	88280.36	91041.13	27.1	29.7	40.4

Damage Centroid Depth (x) (inches)	5.07	k^2	3274.70
Damage Centroid Depth (y) (inches)	35.94	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	537.00		

Expert VIN DeCoder®

Version Number 3.0.2.5

DeCoded VIN:	2FAFP71W17X116231
Model:	2007 Ford Crown Victoria 4 door Sedan
Engine Size:	4.6 L/ 281 cu.in.
Engine Description:	V-8 cylinder with Overhead Cam
Horse Power:	220 @ 4750 rpm
Torque:	265 lb-ft @ 3250 rpm
Injection System:	Sequential Port Fuel Injection (SEFI)
PSI:	35-45 psi
Ignition:	electronic
Manufacturer:	Ford
Assembly Plant:	St. Thomas, Ontario
Drive Wheels:	This is a Rear Wheel Drive vehicle w/Manual Seatbelts + Driver/Passenger

The First through Third characters (2FA) indicate a Ford Passenger Car made in Canada

The Fourth character (F) indicates Manual Seatbelts + Driver/Passenger Front Air Bags

The Fifth through Seventh characters (P71) indicate a Crown Victoria and a 4 door Sedan

The Eighth character (W) indicates the OEM engine: 4.6 L/ 281 cu.in., V8, OHC

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

The Tenth character (7) indicates the model year 2007

The Eleventh character (X) indicates the vehicle was made in the assembly plant in St. Thomas, Ontario

The Twelfth through Seventeenth characters (116231) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.1.1.11

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

7/21/2011

2007 FORD POLICE INTERCEPTOR (3.27) MSP POLICE PKG 4 DOOR SEDAN

Curb Weight:		4157	lbs.	1886	kg.
Curb Weight Distribution -	Front:	56	%	Rear: 44	%
Gross Vehicle Weight Rating:		5500	lbs.	2495	kg.
Number of Tires on Vehicle:		4			
Drive Wheels:		REAR			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	212	17.67	5.38
Wheelbase:	115	9.58	2.92
Front Bumper to Front Axle:	43	3.58	1.09
Front Bumper to Front of Front Well:	26	2.17	0.66
Front Bumper to Front of Hood:	8	0.67	0.20
Front Bumper to Base of Windshield:	65	5.42	1.65
Front Bumper to Top of Windshield:	91	7.58	2.31
Rear Bumper to Rear Axle:	54	4.50	1.37
Rear Bumper to Rear of Rear Well:	38	3.17	0.97
Rear Bumper to Rear of Trunk:	8	0.67	0.20
Rear Bumper to Base of Rear Window:	38	3.17	0.97
Width Dimensions			
Maximum Width:	78	6.50	1.98
Front Track:	63	5.25	1.60
Rear Track:	66	5.50	1.68
Vertical Dimensions			
Height:	58	4.83	1.47
Ground to -			
Front Bumper (Top)	23	1.92	0.58
Headlight - center	27	2.25	0.69
Hood - top front:	31	2.58	0.79
Base of Windshield	39	3.25	0.99
Rear Bumper - top:	25	2.08	0.64
Trunk - top rear:	39	3.25	0.99
Base of Rear Window:	40	3.33	1.02

2007 FORD POLICE INTERCEPTOR (3.27) MSP POLICE PKG 4 DOOR SEDAN

Interior Dimensions	Inches	Feet	Meters
Front Seat Shoulder Width	61	5.08	1.55
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	60	5.00	1.52
Rear Seat to Headliner	38	3.17	0.97
Front Leg Room - seatback to floor (min)	38	3.17	0.97

Seatbelts: 3pt - front and rear
Airbags: FRONT SEAT AIRBAGS

Steering Data

Turning Circle (Diameter)	480	40.00	12.19
Steering Ratio:	:1		
Wheel Radius:	12	1.00	0.30
Tire Size (OEM):	P235/55R17		

Acceleration & Braking Information

Brake Type: ALL DISC
ABS System: ALL WHEEL ABS

Braking, 60 mph to 0 (Hard pedal, no skid, dry pavement):
d = 140.0 ft t = 3.2 sec a = -27.6 ft/sec² G-force = -0.86

Acceleration:

0 to 30mph	t =	3.1	sec	a =	14.2	ft/sec²	G-force = 0.44
0 to 60mph	t =	8.6	sec	a =	10.2	ft/sec²	G-force = 0.32
45 to 65mph	t =	4.5	sec	a =	6.5	ft/sec²	G-force = 0.20

Transmission Type: 4spd AUTOMATIC

Notes:
Federal Bumper Standard Requirements: 2.5 mph
This vehicles Rated Bumper Strength: 2.5 mph

N.S.D.C = 2007 - 2007

2007 FORD POLICE INTERCEPTOR (3.27) MSP POLICE PKG 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	=	50.60
Inches in front of rear axle	=	64.40
Inches from side of vehicle	=	39.00
Inches from ground	=	22.77
Inches from front corner	=	101.40
Inches from rear corner	=	124.66
Inches from front bumper	=	93.60
Inches from rear bumper	=	118.40

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	3075.71	lb*ft*sec²
Pitch Moment of Inertia	=	2966.43	lb*ft*sec²
Roll Moment of Inertia	=	598.26	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	45.0	deg
Angle Front of Hood to Windshield Base	=	8.0	deg
Angle Front of Hood to Windshield Top	=	16.8	deg
Angle of Windshield	=	33.2	deg
Angle of Steering Tires at Max Turn	=	27.5	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

#3480

2001 LINCOLN TOWN CAR

Provided By

4N6XPRT StifCalcs®

Registered to:

4N6XPRT SYSTEMS
8387 UNIVERSITY AVENUE
LA MESA CA 91941-3842
11R-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

Sister/Clone database reader

You entered: **2007 FORD CROWN VICTORIA**

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

Year Range	Make	Model	Body Styles	Wheelbase
1998 - 2011	LINCOLN	TOWN CAR	2D, 4D	117.4
Remarks: Could use Crown Victoria/Grand Marquis - same basic RWD Chassis, longer WB				
2003 - 2010	FORD	CROWN VICTORIA	4D	114.7, 133
Remarks: REVISED "STIFFER FRAME"				
2003 - 2010	MERCURY	GRAND MARQUIS	2D, 4D, SW	114.7
Remarks: ALSO MARAUDER				

If you have suggestions, corrections, etc., you should contact Greg Anderson at Scalia Safety Engineering,
521 East Washington Avenue, Suite 200, Madison, WI 53703-2914, (608) 256-0820, FAX (608) 256-0212, E-mail: greganderson@cs.com.

Test Information

Test #	3480	NHTSA Test Reference Guide Version #	V5				
Test Date	2000-11-09	Contract #					
Contract/Study Title	OPTIONAL NCAP - 2001 LINCOLN TOWNCAR 4 DOOR SEDAN						
Test Objective(s)	VEHICLE CRASHWORTHINESS AND OCCUPANT RESTRAINT PERFORMANCE DATA						
Test Type	OPTIONAL NEW CAR ASSESSMENT TEST	Configuration	VEHICLE INTO BARRIER				
Impact Angle	0	Side Impact Point	0	mm	0.0	inches	
			0	mm	0.0	inches	
		Closing Speed	56.5	Km/Hr	35.11	MPH	
Test Performer	MGA RESEARCH						
Test Reference #	BT00110901						
Test Track Surface	CONCRETE	Condition	WET				
Ambient Temperature	21 C	69.8 F	Total Number of Curves	97			
Data Recorder Type	OTHER	Data Link	OTHER				
Test Commentary	EME ON BOARD DAS 3200						

Fixed Barrier Information

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

2001 LINCOLN TOWN CAR LEFT FRONT SEAT OCCUPANT

Test #	3480		
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	FIRST TECHNOLOGY S/N 66		
Occupant Modification			
Occupant Description			
Occupant Commentary	HEAD TO HEADREST		

Head

Head to -

Windshielder Header	343	mm	13.5	inches	Head Injury Criteria (HIC)	425	
WindShield	568	mm	22.4	inches	HIC Lower Time Interval (ms)	75	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	111	
Side Header	246	mm	9.7	inches			
Side Window	350	mm	13.8	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): AIR BAG

Second Contact Region (Head):

Chest

Chest to -

Dash	532	mm	20.9	inches	Arm to Door	124	mm	4.9	inches
Steering Wheel	286	mm	11.3	inches	Hip to Door	156	mm	6.1	inches
Seatback	0	mm	0.0	inches					

Chest Severity Index	359	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	34.7

Lap Belt Peak Load	3302	Newtons	742.3	pound Force
Shoulder Belt Peak Load	4996	Newtons	1123.2	pound Force

First Contact Region (Chest/Abdomen): AIR BAG

Second Contact Region (Chest/Abdomen): AIR BAG

Legs

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

Left Femur Peak Load	-4319	Newtons	-971.0	pounds Force
Right Femur Peak Load	-2825	Newtons	-635.1	pounds Force

First Contact Region (Legs): DASHPANEL

Second Contact Region (Legs):

2001 LINCOLN TOWN CAR LEFT FRONT SEAT OCCUPANT

Test #	3480					
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	FIRST TECHNOLOGY S/N 66
Occupant Modification	
Occupant Description	
Occupant Commentary	HEAD TO HEADREST

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	NOT APPLICABLE
Restraint Commentary	PRIMARY
Restraint # 2	FRONTAL AIRBAG
Mounted	STEERING WHEEL
Deployment	DEPLOYED PROPERLY
Restraint Commentary	SECONDARY

2001 LINCOLN TOWN CAR RIGHT FRONT SEAT OCCUPANT

Test #	3480		
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 65		
Occupant Modification			
Occupant Description			
Occupant Commentary	HEAD TO HEADREST		

Head

Head to -

Windshielder Header	231	mm	9.1	inches	Head Injury Criteria (HIC)	472	
WindShield	551	mm	21.7	inches	HIC Lower Time Interval (ms)	72	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	108	
Side Header	206	mm	8.1	inches			
Side Window	350	mm	13.8	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): AIR BAG

Second Contact Region (Head):

Chest

Chest to -

Dash	538	mm	21.2	inches	Arm to Door	129	mm	5.1	inches
Steering Wheel	0	mm	0.0	inches	Hip to Door	132	mm	5.2	inches
Seatback	0	mm	0.0	inches					

Chest Severity Index	359	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	35.6

Lap Belt Peak Load	4483	Newtons	1007.8	pound Force
Shoulder Belt Peak Load	4914	Newtons	1104.7	pound Force

First Contact Region (Chest/Abdomen): AIR BAG

Second Contact Region (Chest/Abdomen): AIR BAG

Legs

Knees to Dash	117	mm	4.6	inches	Knees to Seatback	0	mm	0.0	inches

Left Femur Peak Load	-2107	Newtons	-473.7	pounds Force
Right Femur Peak Load	-1967	Newtons	-442.2	pounds Force

First Contact Region (Legs): DASHPANEL

Second Contact Region (Legs):

2001 LINCOLN TOWN CAR RIGHT FRONT SEAT OCCUPANT

Test #	3480					
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 65
Occupant Modification	
Occupant Description	
Occupant Commentary	HEAD TO HEADREST

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	NOT APPLICABLE
Restraint Commentary	PRIMARY
Restraint # 2	FRONTAL AIRBAG
Mounted	DASH PANEL - MID
Deployment	DEPLOYED PROPERLY
Restraint Commentary	SECONDARY

Vehicle 1 2001 LINCOLN TOWN CAR

Test #	3480		
VIN	1LNHM82W11Y633287	NHTSA Test Vehicle Number	1
Year	2001	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	LINCOLN	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	TOWN CAR	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	V8 INLINE FRONT		
Displacement	4.6 Liter	Transmission	AUTOMATIC - REAR WHEEL DRIVE
Vehicle Modification(s) Description			
Vehicle Commentary			

Vehicle Length	5389	mm	212.2	inches	CG behind Front Axle	1409	mm	55.5	inches
Vehicle Width	1986	mm	78.2	inches	Center of Damage to CG Axis	135	mm	5.3	inches
Vehicle Wheelbase	2985	mm	117.5	inches	Total Length of Indentation	1620	mm	63.8	inches
Vehicle Test Weight	2111	KG	4653	pounds	Maximum Static Crush Depth	700	mm	27.6	inches
					Pre-Impact Speed	57	kph	35.1	mph

Vehicle Damage Index: 12FDEW6

Principal Direction of Force: 0

Damage Profile Distance Measurements

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

DPD 1	447	mm	17.6	inches
DPD 2	599	mm	23.6	inches
DPD 3	642	mm	25.3	inches
DPD 4	700	mm	27.6	inches
DPD 5	699	mm	27.5	inches
DPD 6	557	mm	21.9	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	205.7	inches	185.7	inches	20.0	inches
	5225	mm	4718	mm	507	mm
Centerline	212.2	inches	185.4	inches	26.7	inches
	5389	mm	4710	mm	679	mm
Right Bumper Corner	205.3	inches	183.4	inches	21.9	inches
	5215	mm	4658	mm	557	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 2001 LINCOLN TOWN CAR

Test #	3480		
VIN	1LNHM82W11Y633287	NHTSA Test Vehicle Number	1
Year	2001	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	LINCOLN	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	TOWN CAR	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	V8 INLINE FRONT		
Displacement	4.6 Liter	Transmission	AUTOMATIC - REAR WHEEL DRIVE
Vehicle Modification(s) Description			
Vehicle Commentary			

Vehicle Length	5389	mm	212.2	inches	CG behind Front Axle	1409	mm	55.5	inches
Vehicle Width	1986	mm	78.2	inches	Center of Damage to CG Axis	135	mm	5.3	inches
Vehicle Wheelbase	2985	mm	117.5	inches	Total Length of Indentation	1620	mm	63.8	inches
Vehicle Test Weight	2111	KG	4653	pounds	Maximum Static Crush Depth	700	mm	27.6	inches
					Pre-Impact Speed	57	kph	35.1	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				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							
				5389	212.2	4710	185.4				
				Engine Block							
				530	20.9	530	20.9				
5225	205.7	4718	185.7	Front Bumper Corner				5215	205.3	4658	183.4
				Front of Engine							
				4539	178.7	4274	168.3				
3936	155.0	3886	153.0	Firewall				3909	153.9	3858	151.9
				4069	160.2	4066	160.1				
3612	142.2	3608	142.0	Upper Leading Edge of Door				3616	142.4	3600	141.7
3664	144.3	3658	144.0	Lower Leading Edge of Door				3657	144.0	3653	143.8
3582	141.0	3564	140.3	Bottom of 'A' Post				3587	141.2	3561	140.2
2554	100.6	2542	100.1	Upper Trailing Edge of Door				2553	100.5	2542	100.1
2575	101.4	2567	101.1	Lower Trailing Edge of Door				2571	101.2	2569	101.1
				Steering Column							
				3105	122.2	3154	124.2				
				Center of Seering Column to 'A' Post (Horizontal)							
				391	15.4	365	14.4				
				Center of Steering Column to Headliner (Vertical)							
				448	17.6	424	16.7				

2001 LINCOLN TOWN CAR

NHTSA Crash Test - #3480 - Front Impact

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

Test Vehicle Weight = 4653 pounds
Vehicle Closing Speed = 35.1 mph
Test Crush Length = 78.2 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	20.0	26.7	21.9	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 20.0 inches					147.0
Using a Rated No Damage Speed of	2.5 mph	194.4	126.8	149.1	
Using a Rated No Damage Speed of	5.0 mph	359.1	108.1	596.3	
Using a Rated No Damage Speed of	7.5 mph	493.9	90.9	1341.7	
Using a Rated No Damage Speed of	10.0 mph	598.9	75.2	2385.3	
Average Crush = 23.8 inches					103.8
Using a Rated No Damage Speed of	2.5 mph	163.4	89.5	149.1	
Using a Rated No Damage Speed of	5.0 mph	301.7	76.3	596.3	
Using a Rated No Damage Speed of	7.5 mph	415.0	64.2	1341.7	
Using a Rated No Damage Speed of	10.0 mph	503.3	53.1	2385.3	
Maximum Crush = 26.7 inches					82.5
Using a Rated No Damage Speed of	2.5 mph	145.7	71.2	149.1	
Using a Rated No Damage Speed of	5.0 mph	269.0	60.7	596.3	
Using a Rated No Damage Speed of	7.5 mph	370.0	51.0	1341.7	
Using a Rated No Damage Speed of	10.0 mph	448.6	42.2	2385.3	

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

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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

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	26.7	37.4	2.3	6.2

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 18.5

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

2001 LINCOLN TOWN CAR

NHTSA Crash Test - #3480 - Front Impact

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

Test Vehicle Weight = 4653 pounds
Vehicle Closing Speed = 35.1 mph
Test Crush Length = 63.8 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	20.0	26.7	21.9	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 20.0 inches					180.2
Using a Rated No Damage Speed of	2.5 mph	238.4	155.5	182.8	
Using a Rated No Damage Speed of	5.0 mph	440.2	132.5	731.1	
Using a Rated No Damage Speed of	7.5 mph	605.5	111.4	1644.9	
Using a Rated No Damage Speed of	10.0 mph	734.2	92.2	2924.2	
Average Crush = 23.8 inches					127.3
Using a Rated No Damage Speed of	2.5 mph	200.3	109.8	182.8	
Using a Rated No Damage Speed of	5.0 mph	369.9	93.6	731.1	
Using a Rated No Damage Speed of	7.5 mph	508.8	78.7	1644.9	
Using a Rated No Damage Speed of	10.0 mph	617.0	65.1	2924.2	
Maximum Crush = 26.7 inches					101.1
Using a Rated No Damage Speed of	2.5 mph	178.6	87.2	182.8	
Using a Rated No Damage Speed of	5.0 mph	329.7	74.4	731.1	
Using a Rated No Damage Speed of	7.5 mph	453.5	62.5	1644.9	
Using a Rated No Damage Speed of	10.0 mph	550.0	51.7	2924.2	

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

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	26.7	37.4	2.3	6.2

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 18.5

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

2001 LINCOLN TOWN CAR

NHTSA Crash Test - #3480 - Front Impact

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

Test Vehicle Weight = 4653 pounds
Vehicle Closing Speed = 35.1 MPH
Test Crush Length = 78.2 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	17.6	23.6	25.3	27.6	27.5	21.9	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 17.6 inches					189.8
Using a Rated No Damage Speed of	2.5mph	221.0	163.8	149.1	
Using a Rated No Damage Speed of	5.0mph	408.0	139.6	596.3	
Using a Rated No Damage Speed of	7.5mph	561.2	117.4	1341.7	
Using a Rated No Damage Speed of	10.0mph	680.6	97.1	2385.3	
Average Crush = 24.7 inches					96.4
Using a Rated No Damage Speed of	2.5mph	157.4	83.1	149.1	
Using a Rated No Damage Speed of	5.0mph	290.8	70.9	596.3	
Using a Rated No Damage Speed of	7.5mph	399.9	59.6	1341.7	
Using a Rated No Damage Speed of	10.0mph	484.9	49.3	1658.8	
Maximum Crush = 27.6 inches					77.2
Using a Rated No Damage Speed of	2.5mph	140.9	66.6	149.1	
Using a Rated No Damage Speed of	5.0mph	260.2	56.8	596.3	
Using a Rated No Damage Speed of	7.5mph	357.9	47.7	1341.7	
Using a Rated No Damage Speed of	10.0mph	434.0	39.5	2385.3	

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

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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

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	27.6	38.1	3.0	7.8

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 17.9

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

2001 LINCOLN TOWN CAR

NHTSA Crash Test - #3480 - Front Impact

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

Test Vehicle Weight = 4653 pounds
Vehicle Closing Speed = 35.1 MPH
Test Crush Length = 63.8 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	17.6	23.6	25.3	27.6	27.5	21.9	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 17.6 inches					232.7
Using a Rated No Damage Speed of	2.5mph	270.9	200.7	182.8	
Using a Rated No Damage Speed of	5.0mph	500.2	171.1	731.1	
Using a Rated No Damage Speed of	7.5mph	688.0	143.9	1644.9	
Using a Rated No Damage Speed of	10.0mph	834.3	119.0	2924.2	
Average Crush = 24.7 inches					118.2
Using a Rated No Damage Speed of	2.5mph	193.0	101.9	182.8	
Using a Rated No Damage Speed of	5.0mph	356.4	86.9	731.1	
Using a Rated No Damage Speed of	7.5mph	490.3	73.1	1644.9	
Using a Rated No Damage Speed of	10.0mph	594.5	60.4	2033.6	
Maximum Crush = 27.6 inches					94.6
Using a Rated No Damage Speed of	2.5mph	172.7	81.6	182.8	
Using a Rated No Damage Speed of	5.0mph	319.0	69.6	731.1	
Using a Rated No Damage Speed of	7.5mph	438.8	58.5	1644.9	
Using a Rated No Damage Speed of	10.0mph	532.0	48.4	2924.2	

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

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	27.6	38.1	3.0	7.8

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 17.9

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

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2003 - 2010
Make: FORD
Model: CROWN VICTORIA

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	Closing Speed (mph)	Vehicle Width Stiffness A	Vehicle Width Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
3219	2000 LINCOLN TOWN CAR FOUR DOOR SEDAN	5.0	26.8	35.1	263.7	59.2	587.0	80.5	18.4
3480	2001 LINCOLN TOWN CAR FOUR DOOR SEDAN	5.0	24.7	35.1	290.3	70.7	596.3	96.1	19.9
5803	2006 FORD OTHER FOUR DOOR SEDAN	5.0	21.5	35.2	300.6	84.5	535.0	114.7	23.1
4476	2003 FORD CROWN VICTORIA FOUR DOOR SEDAN	5.0	23.0	35.3	318.1	83.9	603.6	113.8	21.7
	Average (AVG)				**293.2**	**74.6**	**580.5**	**101.3**	**20.8**
	Minimum (MIN)				**263.7**	**59.2**	**535.0**	**80.5**	**18.4**
	Maximum (MAX)				**318.1**	**84.5**	**603.6**	**114.7**	**23.1**
	Standard Deviation (STDev-sample)				**22.8**	**12.1**	**31.1**	**16.3**	**2.1**
	Number of Tests (n)			**4**					

2007 FORD POLICE INTERCEPTOR (3.27) MSP POLICE PKG - Front Impact

Curb Weight (pounds):	4157
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	4157
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	11.56
Damage Length (inches):	44.1
Crush Profile Measurements:	6

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	3075.71

"Known" Stifness Values

	A	B
Average	293.2	74.6
Minimum	263.7	59.2
Maximum	318.1	84.5
Std. Devation	22.8	12.1

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00						
C2 (inches)	12.16	8.69	52.84	4.05	214.16	5.79	306.09
C3 (inches)	15.29	17.02	233.57	6.89	1609.66	25.85	6038.63
C4 (inches)	15.63	6.95	107.45	7.73	830.65	17.39	1868.35
C5 (inches)	10.77	6.95	91.75	6.68	612.52	24.11	2212.34
C6 (inches)	0.00	4.51	24.29	3.59	87.19	19.54	474.64
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 11.56

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	263.7	59.2	20908.66	29911.69	14.7	11.7	33.9
Avg - 2 Std. Deviations	247.6	50.4	18310.18	26844.61	13.9	11.0	32.1
Avg - 1 Std. Deviations	270.4	62.5	21897.71	31110.02	15.0	11.9	34.6
Average	293.2	74.6	25485.25	35428.80	16.0	12.7	36.8
Avg + 1 Std. Deviations	316.0	86.7	29072.79	39778.60	16.9	13.4	39.0
Avg + 2 Std. Deviations	338.8	98.8	32660.32	44148.02	17.8	14.1	41.0
Maximum	318.1	84.5	28558.28	39336.99	16.8	13.3	38.7

Damage Centroid Depth (x) (inches)	6.58	k^2	3430.71
Damage Centroid Depth (y) (inches)	21.38	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	509.90		

1998 OLDSMOBILE INTRIGUE - Front Impact

Curb Weight (pounds):	3455
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3455
Angle Coll Force to Normal (degrees):	11.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	8.25
Damage Length (inches):	47.6
Crush Profile Measurements:	6

PDOF

Lever Arm Distance (inches):	43.00
Yaw Moment of Inertia (lb-ft-sec^2)	2352.65

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00	8.36	28.22	2.25	63.52	5.57	157.30
C2 (inches)	6.75	9.97	88.15	4.50	396.99	15.35	1352.98
C3 (inches)	10.93	10.93	131.79	6.05	796.83	27.50	3623.53
C4 (inches)	13.18	8.04	93.07	5.83	542.11	27.95	2601.59
C5 (inches)	9.97	10.29	51.29	3.32	170.40	44.59	2286.81
C6 (inches)	0.00						
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 8.25

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	311.8	66.8	20908.66	24954.51	14.7	14.0	18.8
Avg - 2 Std. Deviations	287.4	56.7	18310.18	22416.61	14.0	13.3	17.4
Avg - 1 Std. Deviations	320.7	70.6	21897.71	25915.42	15.0	14.3	19.4
Average	351.5	84.8	25485.25	29380.81	16.0	15.2	21.2
Avg + 1 Std. Deviations	380.3	99.3	29072.79	32819.36	16.9	16.1	23.0
Avg + 2 Std. Deviations	407.4	113.9	32660.32	36235.75	17.7	17.0	24.6
Maximum	376.3	97.2	28558.28	32327.68	16.8	16.0	22.7

Damage Centroid Depth (x) (inches)	5.02	k^2	3157.39
Damage Centroid Depth (y) (inches)	25.53	Eff. Mass Ratio (gamma)	0.63
Area of Damage (inches^2):	392.52		

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2003 - 2010
Make: FORD
Model: CROWN VICTORIA

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
3219	2000 LINCOLN TOWN CAR FOUR DOOR SEDAN	5.0	27.8	35.1	254.0	54.9	587.0	74.7	17.7
3480	2001 LINCOLN TOWN CAR FOUR DOOR SEDAN	5.0	27.6	35.1	260.6	56.9	596.3	77.4	17.9
5803	2006 FORD OTHER FOUR DOOR SEDAN	5.0	24.4	35.2	265.4	65.8	535.0	89.4	20.4
4476	2003 FORD CROWN VICTORIA FOUR DOOR SEDAN	5.0	25.3	35.3	289.4	69.4	603.6	94.1	19.7
	Average (AVG)				**267.4**	**61.8**	**580.5**	**83.9**	**18.9**
	Minimum (MIN)				**254.0**	**54.9**	**535.0**	**74.7**	**17.7**
	Maximum (MAX)				**289.4**	**69.4**	**603.6**	**94.1**	**20.4**
	Standard Deviation (STDev-sample)				**15.4**	**7.0**	**31.1**	**9.3**	**1.3**
	Number of Tests (n)			**4**					

2007 FORD POLICE INTERCEPTOR (3.27) MSP POLICE PKG - Front Impact

Curb Weight (pounds):	4157
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	4157
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	11.56
Damage Length (inches):	44.1
Crush Profile Measurements:	6

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	3075.71

"Known" Stifness Values

	A	B
Average	267.4	61.8
Minimum	254.0	54.9
Maximum	289.4	69.4
Std. Devation	15.4	7.0

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00						
C2 (inches)	12.16	8.69	52.84	4.05	214.16	5.79	306.09
C3 (inches)	15.29	17.02	233.57	6.89	1609.66	25.85	6038.63
C4 (inches)	15.63	6.95	107.45	7.73	830.65	17.39	1868.35
C5 (inches)	10.77	6.95	91.75	6.68	612.52	24.11	2212.34
C6 (inches)	0.00	4.51	24.29	3.59	87.19	19.54	474.64
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 11.56

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	254.0	54.9	19598.51	28298.58	14.3	11.3	33.0
Avg - 2 Std. Deviations	236.6	47.8	17404.72	25567.25	13.6	10.8	31.4
Avg - 1 Std. Deviations	252.0	54.8	19528.90	28155.64	14.3	11.3	32.9
Average	267.4	61.8	21653.09	30763.25	14.9	11.8	34.4
Avg + 1 Std. Deviations	282.8	68.8	23777.27	33384.22	15.5	12.3	35.8
Avg + 2 Std. Deviations	298.2	75.8	25901.46	36014.85	16.1	12.8	37.1
Maximum	289.4	69.4	24075.82	33913.94	15.6	12.4	36.0

Damage Centroid Depth (x) (inches)	6.58	k^2	3430.71
Damage Centroid Depth (y) (inches)	21.38	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	509.90		

1998 OLDSMOBILE INTRIGUE - Front Impact

Curb Weight (pounds):	3455
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3455
Angle Coll Force to Normal (degrees):	11.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	8.25
Damage Length (inches):	47.6
Crush Profile Measurements:	6

PDOF

Lever Arm Distance (inches):	43.00
Yaw Moment of Inertia (lb-ft-sec^2)	2352.65

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00						
C2 (inches)	6.75	8.36	28.22	2.25	63.52	5.57	157.30
C3 (inches)	10.93	9.97	88.15	4.50	396.99	15.35	1352.98
C4 (inches)	13.18	10.93	131.79	6.05	796.83	27.50	3623.53
C5 (inches)	9.97	8.04	93.07	5.83	542.11	27.95	2601.59
C6 (inches)	0.00	10.29	51.29	3.32	170.40	44.59	2286.81
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 8.25

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	299.7	61.7	19598.51	23677.46	14.3	13.7	18.1
Avg - 2 Std. Deviations	278.5	53.3	17404.72	21527.20	13.7	13.0	16.8
Avg - 1 Std. Deviations	299.1	61.4	19528.90	23609.47	14.3	13.6	18.1
Average	318.5	69.7	21653.09	25678.00	14.9	14.2	19.2
Avg + 1 Std. Deviations	337.1	78.0	23777.27	27734.68	15.5	14.8	20.4
Avg + 2 Std. Deviations	354.9	86.5	25901.46	29781.00	16.1	15.4	21.4
Maximum	339.7	79.2	24075.82	28022.88	15.6	14.9	20.5

Damage Centroid Depth (x) (inches)	5.02	k^2	3157.39
Damage Centroid Depth (y) (inches)	25.53	Eff. Mass Ratio (gamma)	0.63
Area of Damage (inches^2):	392.52		

Expert VIN DeCoder®

Version Number 3.0.2.5

DeCoded VIN:	1G3WH52K7WF343053
Model:	1998 Oldsmobile Intrigue 4 Door Sedan
Engine Size:	3.8 L/ 231 cu.in.
Engine Description:	V-6 cylinder with Overhead Valves
Horse Power:	205 @ 5200 rpm
Torque:	230 lb-ft at 4000 rpm
Injection System:	Multiport Fuel Injection (MFI)
PSI:	41-47 psi
Ignition:	Electronic
Manufacturer:	Buick-Oldsmobile-Cadillac
Assembly Plant:	Fairfax II, KS
Drive Wheels:	This is a Front Wheel Drive vehicle w/Manual Seatbelts + Driver & Passenger Ai

The First through Third characters (1G3) indicate a Oldsmobile Car made in the U.S.A.

The Fourth and Fifth characters (WH) indicate a Intrigue

The Sixth character (5) indicates a 4 Door Sedan

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

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

The Ninth character (the check digit) is entered as 7.
The VIN appears Valid, the calculated value is 7.

The Tenth character (W) indicates the model year 1998

The Eleventh character (F) indicates the vehicle was made in the assembly plant in Fairfax II, KS

The Twelfth through Seventeenth characters (343053) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.1.1.11

PROVIDED BY:

4N6XPRT Systems

8387 University Avenue

La Mesa CA 91941

7/26/2011

1998 OLDSMOBILE INTRIGUE 4 DOOR SEDAN

Curb Weight:	3455	lbs.	1567	kg.
Curb Weight Distribution - Front:	64	% Rear:	36	%
Gross Vehicle Weight Rating:	4387	lbs.	1990	kg.
Number of Tires on Vehicle:	4			
Drive Wheels:	FRONT			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	196	16.33	4.98
Wheelbase:	109	9.08	2.77
Front Bumper to Front Axle:	45	3.75	1.14
Front Bumper to Front of Front Well:	29	2.42	0.74
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:	85	7.08	2.16
Rear Bumper to Rear Axle:	42	3.50	1.07
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:	27	2.25	0.69
Width Dimensions			
Maximum Width:	74	6.17	1.88
Front Track:	62	5.17	1.57
Rear Track:	61	5.08	1.55
Vertical Dimensions			
Height:	57	4.75	1.45
Ground to -			
Front Bumper (Top)	23	1.92	0.58
Headlight - center	25	2.08	0.64
Hood - top front:	26	2.17	0.66
Base of Windshield	61	5.08	1.55
Rear Bumper - top:	27	2.25	0.69
Trunk - top rear:	40	3.33	1.02
Base of Rear Window:	43	3.58	1.09

1998 OLDSMOBILE INTRIGUE 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	57	4.75	1.45
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

Steering Data

Turning Circle (Diameter)	480	40.00	12.19
Steering Ratio:	:1		
Wheel Radius:	12	1.00	0.30
Tire Size (OEM):	P225/60SR16		

Acceleration & Braking Information

Brake Type: ALL DISC
ABS System: ABS

Braking, 60 mph to 0 (Hard pedal, no skid, dry pavement):
d = 133.0 ft t = 3.0 sec a = -29.1 ft/sec² G-force = -0.90

Acceleration:

0 to 30mph	t =	2.7	sec	a =	16.3	ft/sec²	G-force = 0.51
0 to 60mph	t =	7.9	sec	a =	11.1	ft/sec²	G-force = 0.35
45 to 65mph	t =	4.4	sec	a =	6.7	ft/sec²	G-force = 0.21

Transmission Type: 4spd AUTOMATIC

Notes:
Federal Bumper Standard Requirements: 2.5 mph
This vehicles Rated Bumper Strength: 2.5 mph

N.S.D.C = 1998 - 2002

1998 OLDSMOBILE INTRIGUE 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	=	39.24
Inches in front of rear axle	=	69.76
Inches from side of vehicle	=	37.00
Inches from ground	=	22.37
Inches from front corner	=	92.01
Inches from rear corner	=	117.73
Inches from front bumper	=	84.24
Inches from rear bumper	=	111.76

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	2352.65	lb*ft*sec²
Pitch Moment of Inertia	=	2271.45	lb*ft*sec²
Roll Moment of Inertia	=	471.90	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	36.9	deg
Angle Front of Hood to Windshield Base	=	36.7	deg
Angle Front of Hood to Windshield Top	=	19.7	deg
Angle of Windshield	=	-10.0	deg
Angle of Steering Tires at Max Turn	=	26.0	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).

Stiffness Values and Test Data

Derived from

NHTSA Crash Test

#2821

1998 OLDSMOBILE INTRIGUE

Provided By

4N6XPRT StifCalcs®

Registered to:

4N6XPRT SYSTEMS
8387 UNIVERSITY AVENUE
LA MESA CA 91941-3842
11R-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

Sister/Clone database reader

You entered: **1998 OLDSMOBILE INTRIGUE**

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

Year Range	Make	Model	Body Styles	Wheelbase
2000 - 2005	CHEVROLET	IMPALA	2D, 4D, SW	110.5, 125
Remarks:				
1997 - 2004	BUICK	REGAL	2D, 4D, SW	107.5
Remarks: Regal now same as Century				
1997 - 2003	PONTIAC	GRAND PRIX	2D, 4D	110.5
Remarks:				
1998 - 2002	OLDSMOBILE	INTRIGUE	4D	109
Remarks:				
1997 - 2005	BUICK	CENTURY	2D, 4D, SW	109, 116
Remarks:				
2000 - 2005	CHEVROLET	MONTE CARLO	2D	108
Remarks:				
2004 - 2005	PONTIAC	GRAND PRIX	2D, 4D	110.5
Remarks:				

If you have suggestions, corrections, etc., you should contact Greg Anderson at Scalia Safety Engineering,
521 East Washington Avenue, Suite 200, Madison, WI 53703-2914, (608) 256-0820, FAX (608) 256-0212, E-mail: greganderson@cs.com.

Test Information

Test #	2821	NHTSA Test Reference Guide Version #	V4			
Test Date	1998-02-21	Contract #	DTNH22-96-D-22010			
Contract/Study Title	1998 OLDSMOBILE INTRIGUE INTO FLAT FRONTAL BARRIER					
Test Objective(s)	OBTAIN 35 MPH NEW CAR ASSESSMENT AND RESEARCH DATA					
Test Type	NEW CAR ASSESSMENT TEST	Configuration	VEHICLE INTO BARRIER			
Impact Angle	0	Side Impact Point	0	mm	0.0	inches
			0	mm	0.0	inches
		Closing Speed	56.1	Km/Hr	34.86	MPH
Test Performer	TRC OF OHIO					
Test Reference #	9802211030					
Test Track Surface	CONCRETE	Condition	DRY			
Ambient Temperature	20 C	68.0 F	Total Number of Curves	97		
Data Recorder Type	OTHER	Data Link	OTHER			
Test Commentary	ONBOARD DIGITAL DATA ACQUISITION					

Fixed Barrier Information

Barrier Type	RIGID	Pole Barrier Diameter	9999	mm	9999 inches
Barrier Shape	FLAT BARRIER				
Barrier Commentary	NO COMMENTS				

1998 OLDSMOBILE INTRIGUE LEFT FRONT SEAT OCCUPANT

Test #	2821						
Vehicle #	1			Sex	MALE		
Location	LEFT FRONT SEAT			Age	99		
Position	CENTER POSITION			Height	999	mm	39.3 inches
Type	HYBRID III DUMMY			Weight	999.0	kg	2202 pounds
Size	50 PERCENTILE						

Calibration Method	HYBRID III
Occupant Manufacturer	MFG: ALDERSON RESEARCH LABS, S/N: 192
Occupant Modification	UNMODIFIED
Occupant Description	NO COMMENTS
Occupant Commentary	SECOND CONTACT POINT FOR HEAD IS HEAD RESTRAINT

Head

Head to -

Windshielder Header	320	mm	12.6	inches	Head Injury Criteria (HIC)	589		
WindShield	581	mm	22.9	inches	HIC Lower Time Interval (ms)	60.16		
Seatback	9999	mm	0.0	inches	HIC Upper Time Interval (ms)	96.16		
Side Header	200	mm	7.9	inches				
Side Window	303	mm	11.9	inches				
Neck to Seatback	9999	mm	0.0	inches				

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

Chest

Chest to -

Dash	535	mm	21.1	inches	Arm to Door	130	mm	5.1	inches
Steering Wheel	307	mm	12.1	inches	Hip to Door	159	mm	6.3	inches
Seatback	9999	mm	0.0	inches					

Chest Severity Index	433	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	46.9

Lap Belt Peak Load	4532	Newtons	1018.8	pound Force
Shoulder Belt Peak Load	7009	Newtons	1575.7	pound Force

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

Legs

Knees to Dash	182	mm	7.2	inches	Knees to Seatback	9999	mm	0.0	inches

Left Femur Peak Load	-4207	Newtons	-945.8	pounds Force
Right Femur Peak Load	-2727	Newtons	-613.1	pounds Force

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

1998 OLDSMOBILE INTRIGUE LEFT FRONT SEAT OCCUPANT

Test #	2821					
Vehicle #	1	Sex	MALE			
Location	LEFT FRONT SEAT	Age	99			
Position	CENTER POSITION	Height	999	mm	39.3	inches
Type	HYBRID III DUMMY	Weight	999.0	kg	2202	pounds
Size	50 PERCENTILE					

Calibration Method	HYBRID III
Occupant Manufacturer	MFG: ALDERSON RESEARCH LABS, S/N: 192
Occupant Modification	UNMODIFIED
Occupant Description	NO COMMENTS
Occupant Commentary	SECOND CONTACT POINT FOR HEAD IS HEAD RESTRAINT

Restraints

Restraint # 1	FRONTAL AIRBAG
Mounted	
Deployment	DEPLOYED PROPERLY
Restraint Commentary	ADJUSTABLE D-RING LATCHED IN THE FIRST POSITION DOWN FROM THE TOP
Restraint # 2	3 POINT BELT
Mounted	
Deployment	NOT APPLICABLE
Restraint Commentary	ADJUSTABLE D-RING LATCHED IN THE FIRST POSITION DOWN FROM THE TOP

1998 OLDSMOBILE INTRIGUE RIGHT FRONT SEAT OCCUPANT

Test #	2821						
Vehicle #	1			Sex	MALE		
Location	RIGHT FRONT SEAT			Age	99		
Position	CENTER POSITION			Height	999	mm	39.3 inches
Type	HYBRID III DUMMY			Weight	999.0	kg	2202 pounds
Size	50 PERCENTILE						

Calibration Method	HYBRID III
Occupant Manufacturer	MFG: ALDERSON RESEARCH LABS, S/N: 142
Occupant Modification	UNMODIFIED
Occupant Description	NO COMMENTS
Occupant Commentary	SECOND CONTACT FOR HEAD IS HEAD RESTRAINT

Head

Head to -

Windshielder Header	295	mm	11.6	inches	Head Injury Criteria (HIC)	1139	
WindShield	545	mm	21.5	inches	HIC Lower Time Interval (ms)	69.92	
Seatback	9999	mm	0.0	inches	HIC Upper Time Interval (ms)	99.12	
Side Header	209	mm	8.2	inches			
Side Window	290	mm	11.4	inches			

Neck to Seatback 9999 mm 0.0 inches

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

Chest

Chest to -

Dash	478	mm	18.8	inches	Arm to Door	129	mm	5.1	inches
Steering Wheel	9999	mm	0.0	inches	Hip to Door	118	mm	4.6	inches
Seatback	9999	mm	0.0	inches					

Chest Severity Index	477	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	48.8

Lap Belt Peak Load	4265	Newtons	958.8	pound Force
Shoulder Belt Peak Load	3608	Newtons	811.1	pound Force

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

Legs

Knees to Dash	149	mm	5.9	inches	Knees to Seatback	9999	mm	0.0	inches

Left Femur Peak Load	-3348	Newtons	-752.7	pounds Force
Right Femur Peak Load	-3218	Newtons	-723.4	pounds Force

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

1998 OLDSMOBILE INTRIGUE RIGHT FRONT SEAT OCCUPANT

Test #	2821					
Vehicle #	1	Sex	MALE			
Location	RIGHT FRONT SEAT	Age	99			
Position	CENTER POSITION	Height	999	mm	39.3	inches
Type	HYBRID III DUMMY	Weight	999.0	kg	2202	pounds
Size	50 PERCENTILE					

Calibration Method	HYBRID III
Occupant Manufacturer	MFG: ALDERSON RESEARCH LABS, S/N: 142
Occupant Modification	UNMODIFIED
Occupant Description	NO COMMENTS
Occupant Commentary	SECOND CONTACT FOR HEAD IS HEAD RESTRAINT

Restraints

Restraint # 1	FRONTAL AIRBAG
Mounted	
Deployment	DEPLOYED PROPERLY
Restraint Commentary	ADJUSTABLE D-RING LATCHED IN THE FIRST POSITION DOWN FROM THE TOP
Restraint # 2	3 POINT BELT
Mounted	
Deployment	NOT APPLICABLE
Restraint Commentary	ADJUSTABLE D-RING LATCHED IN THE FIRST POSITION DOWN FROM THE TOP

Vehicle 1 1998 OLDSMOBILE INTRIGUE

Test #	2821		
VIN	1G3WH52K4WF350882	NHTSA Test Vehicle Number	1
Year	1998	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	OLDSMOBILE	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	INTRIGUE	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	V6 TRANSVERSE FRONT		
Displacement	3.8 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	NO COMMENTS		
Vehicle Commentary	MODEL IS INTRIGUE		

Vehicle Length	5012	mm	197.3	inches	CG behind Front Axle	1120	mm	44.1	inches
Vehicle Width	1860	mm	73.2	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2769	mm	109.0	inches	Total Length of Indentation	1524	mm	60.0	inches
Vehicle Test Weight	1762	KG	3884	pounds	Maximum Static Crush Depth	612	mm	24.1	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	500	mm	19.7	inches
DPD 2	571	mm	22.5	inches
DPD 3	595	mm	23.4	inches
DPD 4	567	mm	22.3	inches
DPD 5	495	mm	19.5	inches
DPD 6	378	mm	14.9	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	189.0	inches	169.3	inches	19.7	inches
	4800	mm	4300	mm	500	mm
Centerline	197.3	inches	173.2	inches	24.1	inches
	5012	mm	4400	mm	612	mm
Right Bumper Corner	189.4	inches	174.6	inches	14.9	inches
	4812	mm	4434	mm	378	mm

Bumper Engagement (Inline Impact Only): 999.0

Sill Engagement (Side Impact Only): NOT APPLICABLE

A-pillar Engagement (Side Impact Only): 999.0

Moving Test Cart Angle: NOT APPLICABLE

Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground

Moving Test Cart/Vehicle Crabbed Angle: 0.0

Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle

Vehicle Orientation on Cart Moving Test Cart: NOT APPLICABLE

Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion

Vehicle 1 1998 OLDSMOBILE INTRIGUE

Test #	2821		
VIN	1G3WH52K4WF350882	NHTSA Test Vehicle Number	1
Year	1998	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	OLDSMOBILE	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	INTRIGUE	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	V6 TRANSVERSE FRONT		
Displacement	3.8 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	NO COMMENTS		
Vehicle Commentary	MODEL IS INTRIGUE		

Vehicle Length	5012	mm	197.3	inches	CG behind Front Axle	1120	mm	44.1	inches
Vehicle Width	1860	mm	73.2	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2769	mm	109.0	inches	Total Length of Indentation	1524	mm	60.0	inches
Vehicle Test Weight	1762	KG	3884	pounds	Maximum Static Crush Depth	612	mm	24.1	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							
				5012	197.3	4400	173.2				
				Engine Block							
				440	17.3	440	17.3				
4800	189.0	4300	169.3	Front Bumper Corner				4812	189.4	4434	174.6
				Front of Engine							
				4377	172.3	4135	162.8				
3887	153.0	3796	149.4	Firewall				3860	152.0	3650	143.7
				3811	150.0	3795	149.4				
3362	132.4	3362	132.4	Upper Leading Edge of Door				3364	132.4	3362	132.4
3365	132.5	3364	132.4	Lower Leading Edge of Door				3370	132.7	3362	132.4
3351	131.9	3344	131.7	Bottom of 'A' Post				3354	132.0	3354	132.0
2357	92.8	2354	92.7	Upper Trailing Edge of Door				2364	93.1	2364	93.1
2367	93.2	2364	93.1	Lower Trailing Edge of Door				2374	93.5	2377	93.6
				Steering Column							
				2927	115.2	2942	115.8				
				Center of Seering Column to 'A' Post (Horizontal)							
				295	11.6	333	13.1				
				Center of Steering Column to Headliner (Vertical)							
				420	16.5	404	15.9				

1998 OLDSMOBILE INTRIGUE

NHTSA Crash Test - #2821 - Front Impact

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

Test Vehicle Weight = 3884 pounds
Vehicle Closing Speed = 34.9 mph
Test Crush Length = 73.2 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	19.7	24.1	14.9	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 14.9 inches					232.7
Using a Rated No Damage Speed of	2.5 mph	230.8	200.5	132.9	
Using a Rated No Damage Speed of	5.0 mph	426.0	170.7	531.5	
Using a Rated No Damage Speed of	7.5 mph	585.5	143.3	1195.8	
Using a Rated No Damage Speed of	10.0 mph	709.3	118.3	2125.8	
Average Crush = 20.7 inches					120.6
Using a Rated No Damage Speed of	2.5 mph	166.2	103.9	132.9	
Using a Rated No Damage Speed of	5.0 mph	306.6	88.5	531.5	
Using a Rated No Damage Speed of	7.5 mph	421.5	74.3	1195.8	
Using a Rated No Damage Speed of	10.0 mph	510.6	61.3	2125.8	
Maximum Crush = 24.1 inches					89.0
Using a Rated No Damage Speed of	2.5 mph	142.7	76.7	132.9	
Using a Rated No Damage Speed of	5.0 mph	263.4	65.3	531.5	
Using a Rated No Damage Speed of	7.5 mph	362.0	54.8	1195.8	
Using a Rated No Damage Speed of	10.0 mph	438.6	45.2	2125.8	

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

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	24.1	35.6	0.7	2.0

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 20.2

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

1998 OLDSMOBILE INTRIGUE

NHTSA Crash Test - #2821 - Front Impact

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

Test Vehicle Weight = 3884 pounds
Vehicle Closing Speed = 34.9 mph
Test Crush Length = 60.0 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	19.7	24.1	14.9	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 14.9 inches					284.0
Using a Rated No Damage Speed of	2.5 mph	281.7	244.7	162.2	
Using a Rated No Damage Speed of	5.0 mph	519.9	208.4	648.6	
Using a Rated No Damage Speed of	7.5 mph	714.6	174.9	1459.4	
Using a Rated No Damage Speed of	10.0 mph	865.7	144.4	2594.5	
Average Crush = 20.7 inches					147.2
Using a Rated No Damage Speed of	2.5 mph	202.8	126.8	162.2	
Using a Rated No Damage Speed of	5.0 mph	374.2	108.0	648.6	
Using a Rated No Damage Speed of	7.5 mph	514.4	90.6	1459.4	
Using a Rated No Damage Speed of	10.0 mph	623.2	74.8	2594.5	
Maximum Crush = 24.1 inches					108.6
Using a Rated No Damage Speed of	2.5 mph	174.2	93.5	162.2	
Using a Rated No Damage Speed of	5.0 mph	321.5	79.7	648.6	
Using a Rated No Damage Speed of	7.5 mph	441.8	66.9	1459.4	
Using a Rated No Damage Speed of	10.0 mph	535.2	55.2	2594.5	

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

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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

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	24.1	35.6	0.7	2.0

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 20.2

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

1998 OLDSMOBILE INTRIGUE

NHTSA Crash Test - #2821 - Front Impact

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

Test Vehicle Weight = 3884 pounds
Vehicle Closing Speed = 34.9 MPH
Test Crush Length = 73.2 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	19.7	22.5	23.4	22.3	19.5	14.9	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 14.9 inches					232.7
Using a Rated No Damage Speed of	2.5mph	230.8	200.5	132.9	
Using a Rated No Damage Speed of	5.0mph	426.0	170.7	531.5	
Using a Rated No Damage Speed of	7.5mph	585.5	143.3	1195.8	
Using a Rated No Damage Speed of	10.0mph	709.3	118.3	2125.8	
Average Crush = 21.0 inches					117.2
Using a Rated No Damage Speed of	2.5mph	163.8	101.0	132.9	
Using a Rated No Damage Speed of	5.0mph	302.3	86.0	531.5	
Using a Rated No Damage Speed of	7.5mph	415.4	72.2	1195.8	
Using a Rated No Damage Speed of	10.0mph	503.3	59.6	1473.5	
Maximum Crush = 23.4 inches					94.4
Using a Rated No Damage Speed of	2.5mph	147.0	81.3	132.9	
Using a Rated No Damage Speed of	5.0mph	271.3	69.2	531.5	
Using a Rated No Damage Speed of	7.5mph	372.8	58.1	1195.8	
Using a Rated No Damage Speed of	10.0mph	451.7	48.0	2125.8	

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

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	23.4	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

1998 OLDSMOBILE INTRIGUE

NHTSA Crash Test - #2821 - Front Impact

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

Test Vehicle Weight = 3884 pounds
Vehicle Closing Speed = 34.9 MPH
Test Crush Length = 60.0 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	19.7	22.5	23.4	22.3	19.5	14.9	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 14.9 inches					284.0
Using a Rated No Damage Speed of	2.5mph	281.7	244.7	162.2	
Using a Rated No Damage Speed of	5.0mph	519.9	208.4	648.6	
Using a Rated No Damage Speed of	7.5mph	714.6	174.9	1459.4	
Using a Rated No Damage Speed of	10.0mph	865.7	144.4	2594.5	
Average Crush = 21.0 inches					143.0
Using a Rated No Damage Speed of	2.5mph	199.9	123.2	162.2	
Using a Rated No Damage Speed of	5.0mph	368.9	104.9	648.6	
Using a Rated No Damage Speed of	7.5mph	507.0	88.1	1459.4	
Using a Rated No Damage Speed of	10.0mph	614.3	72.7	1798.3	
Maximum Crush = 23.4 inches					115.2
Using a Rated No Damage Speed of	2.5mph	179.4	99.2	162.2	
Using a Rated No Damage Speed of	5.0mph	331.1	84.5	648.6	
Using a Rated No Damage Speed of	7.5mph	455.0	70.9	1459.4	
Using a Rated No Damage Speed of	10.0mph	551.3	58.6	2594.5	

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

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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

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	23.4	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

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 1998 - 2002
Make: OLDSMOBILE
Model: INTRIGUE

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
4141	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	20.8	29.6	256.8	60.8	542.3	88.0	16.9
2831	1998 BUICK CENTURY FOUR DOOR SEDAN	5.0	19.7	29.9	268.6	67.9	531.3	97.9	18.1
3524	2001 CHEVROLET MONTE CARLO TWO DOOR C...	5.0	23.2	35.5	277.3	73.0	526.8	98.9	21.7
3471	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	23.2	34.9	279.0	71.9	541.0	98.0	21.0
3053	1999 BUICK CENTURY FOUR DOOR SEDAN	5.0	22.4	34.9	283.7	75.7	531.5	103.1	21.8
2821	1998 OLDSMOBILE INTRIGUE FOUR DOOR SEDAN	5.0	21.0	34.9	302.3	86.0	531.5	117.2	23.1
5204	2004 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	18.1	29.6	307.7	83.3	567.9	120.7	19.3
3843	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	16.9	29.8	321.5	94.3	548.3	136.2	21.0
4775	2004 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	20.4	34.7	325.6	95.1	557.6	129.7	23.7
4317	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	12.1	24.9	351.3	115.8	532.7	181.2	20.6
3637	2001 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	16.9	34.7	373.4	131.4	530.8	179.4	28.5
2855	1997 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	17.7	29.6	386.6	107.3	696.2	155.3	19.8
3786	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	12.9	30.0	413.5	160.1	534.0	230.8	27.8
2877	1997 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	9.2	25.2	465.2	205.0	527.9	318.8	27.7
3798	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	11.3	24.8	465.8	162.6	667.3	255.1	21.7
	Average (AVG)				**338.6**	**106.0**	**557.8**	**154.0**	**22.2**
	Minimum (MIN)				**256.8**	**60.8**	**526.8**	**88.0**	**16.9**
	Maximum (MAX)				**465.8**	**205.0**	**696.2**	**318.8**	**28.5**
	Standard Deviation (STDev-sample)				**68.7**	**41.8**	**51.9**	**67.8**	**3.5**
	Number of Tests (n)			**15**					

1998 OLDSMOBILE INTRIGUE - Front Impact

Curb Weight (pounds):	3455
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3455
Angle Coll Force to Normal (degrees):	11.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	8.25
Damage Length (inches):	47.6
Crush Profile Measurements:	6

PDOF

Lever Arm Distance (inches):	43.00
Yaw Moment of Inertia (lb-ft-sec^2)	2352.65

"Known" Stifness Values

	A	B
Average	338.6	106.0
Minimum	256.8	60.8
Maximum	465.8	205.0
Std. Devation	68.7	41.8

	Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches) 0.00	8.36	28.22	2.25	63.52	5.57	157.30
C2 (inches) 6.75	9.97	88.15	4.50	396.99	15.35	1352.98
C3 (inches) 10.93	10.93	131.79	6.05	796.83	27.50	3623.53
C4 (inches) 13.18	8.04	93.07	5.83	542.11	27.95	2601.59
C5 (inches) 9.97	10.29	51.29	3.32	170.40	44.59	2286.81
C6 (inches) 0.00						
C7 (inches)						
C8 (inches)						
C9 (inches)						
C10 (inches)						

Average Crush (inches): 8.25

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	256.8	60.8	18380.84	21307.00	13.6	13.4	32.5
Avg - 2 Std. Deviations	201.2	22.4	9355.66	14364.83	11.2	10.7	25.7
Avg - 1 Std. Deviations	269.9	64.2	19378.16	22433.86	14.0	13.8	33.2
Average	338.6	106.0	29400.66	31777.65	16.6	16.4	39.5
Avg + 1 Std. Deviations	407.3	147.8	39423.17	41314.64	18.9	18.6	45.0
Avg + 2 Std. Deviations	476.0	189.6	49445.67	50917.04	21.0	20.6	49.8
Maximum	465.8	205.0	52277.39	52913.12	21.4	21.1	50.9

Damage Centroid Depth (x) (inches)	5.02	k^2	3157.39
Damage Centroid Depth (y) (inches)	25.53	Eff. Mass Ratio (gamma)	0.63
Area of Damage (inches^2):	392.52		

2007 FORD POLICE INTERCEPTOR (3.27) MSP POLICE PKG - Front Impact

Curb Weight (pounds):	4157
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	4157
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	11.56
Damage Length (inches):	44.1
Crush Profile Measurements:	6

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	3075.71

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00	8.69	52.84	4.05	214.16	5.79	306.09
C2 (inches)	12.16	17.02	233.57	6.89	1609.66	25.85	6038.63
C3 (inches)	15.29	6.95	107.45	7.73	830.65	17.39	1868.35
C4 (inches)	15.63	6.95	91.75	6.68	612.52	24.11	2212.34
C5 (inches)	10.77	4.51	24.29	3.59	87.19	19.54	474.64
C6 (inches)	0.00						
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 11.56

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	296.3	46.4	18380.84	29047.73	14.5	11.2	13.8
Avg - 2 Std. Deviations	194.0	19.9	9355.66	17281.68	11.2	8.9	9.0
Avg - 1 Std. Deviations	306.0	49.5	19378.16	30317.65	14.8	11.4	14.2
Average	392.2	81.4	29400.66	42881.97	17.6	13.6	18.3
Avg + 1 Std. Deviations	465.0	114.4	39423.17	55200.31	20.0	15.5	21.6
Avg + 2 Std. Deviations	529.1	148.1	49445.67	67360.96	22.0	17.1	24.6
Maximum	546.1	157.8	52277.39	70775.03	22.6	17.5	25.4

Damage Centroid Depth (x) (inches)	6.58	k^2	3430.71
Damage Centroid Depth (y) (inches)	21.38	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	509.90		

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 1998 - 2002
Make: OLDSMOBILE
Model: INTRIGUE

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
2877	1997 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	19.9	25.2	214.4	43.5	527.9	67.7	12.8
4141	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	24.7	29.6	216.5	43.2	542.3	62.5	14.2
3524	2001 CHEVROLET MONTE CARLO TWO DOOR C...	5.0	28.5	35.5	225.8	48.4	526.8	65.6	17.7
2831	1998 BUICK CENTURY FOUR DOOR SEDAN	5.0	23.2	29.9	227.7	48.8	531.3	70.4	15.4
3053	1999 BUICK CENTURY FOUR DOOR SEDAN	5.0	27.4	34.9	232.5	50.8	531.5	69.3	17.8
3471	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	27.1	34.9	238.5	52.6	541.0	71.6	18.0
2821	1998 OLDSMOBILE INTRIGUE FOUR DOOR SEDAN	5.0	24.1	34.9	263.4	65.3	531.5	89.0	20.2
3843	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	20.6	29.8	264.3	63.7	548.3	92.0	17.2
5204	2004 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	20.7	29.6	269.6	64.0	567.9	92.7	16.9
2888	1998 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	15.2	24.7	272.9	70.8	525.7	111.4	16.1
4775	2004 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	23.1	34.7	286.9	73.8	557.6	100.7	20.9
4317	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	13.5	24.9	313.4	92.2	532.7	144.3	18.3
3798	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	16.7	24.8	317.3	75.4	667.3	118.3	14.8
3637	2001 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	19.1	34.7	330.0	102.6	530.8	140.0	25.2
2855	1997 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	19.5	29.6	351.4	88.7	696.2	128.3	18.0
3786	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	14.2	30.0	374.9	131.6	534.0	189.7	25.2
3648	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	17.6	35.0	452.2	154.1	663.6	209.8	27.8
	Average (AVG)				**285.4**	**74.7**	**562.1**	**107.3**	**18.6**
	Minimum (MIN)				**214.4**	**43.2**	**525.7**	**62.5**	**12.8**
	Maximum (MAX)				**452.2**	**154.1**	**696.2**	**209.8**	**27.8**
	Standard Deviation (STDev-sample)				**64.7**	**31.2**	**55.7**	**43.7**	**4.1**
	Number of Tests (n)			**17**					

1998 OLDSMOBILE INTRIGUE - Front Impact

Curb Weight (pounds):	3455
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3455
Angle Coll Force to Normal (degrees):	11.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	8.25
Damage Length (inches):	47.6
Crush Profile Measurements:	6

PDOF

Lever Arm Distance (inches):	43.00
Yaw Moment of Inertia (lb-ft-sec^2)	2352.65

"Known" Stifness Values

	A	B
Average	285.4	74.7
Minimum	214.4	43.2
Maximum	452.2	154.1
Std. Devation	64.7	31.2

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00						
C2 (inches)	6.75	8.36	28.22	2.25	63.52	5.57	157.30
C3 (inches)	10.93	9.97	88.15	4.50	396.99	15.35	1352.98
C4 (inches)	13.18	10.93	131.79	6.05	796.83	27.50	3623.53
C5 (inches)	9.97	8.04	93.07	5.83	542.11	27.95	2601.59
C6 (inches)	0.00	10.29	51.29	3.32	170.40	44.59	2286.81
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 8.25

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	214.4	43.2	13834.23	16827.06	12.1	12.0	28.9
Avg - 2 Std. Deviations	156.0	12.3	6240.67	11462.45	10.0	9.4	22.6
Avg - 1 Std. Deviations	220.7	43.5	14046.93	17206.60	12.2	12.1	29.2
Average	285.4	74.7	21853.18	24657.67	14.6	14.4	34.9
Avg + 1 Std. Deviations	350.1	105.9	29659.44	32307.00	16.7	16.5	39.8
Avg + 2 Std. Deviations	414.8	137.1	37465.69	40019.22	18.6	18.2	44.1
Maximum	452.2	154.1	41771.14	44332.97	19.6	19.2	46.3

Damage Centroid Depth (x) (inches)	5.02	k^2	3157.39
Damage Centroid Depth (y) (inches)	25.53	Eff. Mass Ratio (gamma)	0.63
Area of Damage (inches^2):	392.52		

2007 FORD POLICE INTERCEPTOR (3.27) MSP POLICE PKG - Front Impact

Curb Weight (pounds):	4157
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	4157
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	11.56
Damage Length (inches):	44.1
Crush Profile Measurements:	6

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	3075.71

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00	8.69	52.84	4.05	214.16	5.79	306.09
C2 (inches)	12.16	17.02	233.57	6.89	1609.66	25.85	6038.63
C3 (inches)	15.29	6.95	107.45	7.73	830.65	17.39	1868.35
C4 (inches)	15.63	6.95	91.75	6.68	612.52	24.11	2212.34
C5 (inches)	10.77	4.51	24.29	3.59	87.19	19.54	474.64
C6 (inches)	0.00						
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 11.56

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	248.7	32.7	13834.23	23193.31	12.9	10.0	11.6
Avg - 2 Std. Deviations	148.3	11.6	6240.67	13031.53	9.7	7.8	6.9
Avg - 1 Std. Deviations	251.1	33.4	14046.93	23469.96	13.0	10.0	11.7
Average	328.9	57.2	21853.18	33451.25	15.5	12.0	15.3
Avg + 1 Std. Deviations	394.2	82.2	29659.44	43202.58	17.7	13.7	18.4
Avg + 2 Std. Deviations	451.5	107.9	37465.69	52808.75	19.5	15.2	21.0
Maximum	480.7	122.2	41771.14	58061.22	20.5	15.9	22.4

Damage Centroid Depth (x) (inches)	6.58	k^2	3430.71
Damage Centroid Depth (y) (inches)	21.38	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	509.90		

Expert VIN DeCoder®

Version Number 3.0.2.5

DeCoded VIN: 2FAFP71VX8X133019

Model:	2008 Ford Crown Victoria 4 door Sedan
Engine Size:	4.6L / 281 cu.in.
Engine Description:	V8 Cylinder with Dual Overhead Cam
Horse Power:	275 @ 5750rpm
Torque:	275 lb-ft @ 4750rpm
Injection System:	Sequential Fuel Injection (SFI)
PSI:	N/A
Ignition:	electronic
Manufacturer:	Ford
Assembly Plant:	St. Thomas, Ontario
Drive Wheels:	This is a Rear Wheel Drive vehicle w/Manual Seatbelts + Driver/Passenger

The First through Third characters (2FA) indicate a Ford Passenger Car made in Canada

The Fourth character (F) indicates Manual Seatbelts + Driver/Passenger Front Air Bags

The Fifth through Seventh characters (P71) indicate a Crown Victoria and a 4 door Sedan

The Eighth character (V) indicates the OEM engine: 4.6L / 281 cu.in., V8, DOHC

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 (8) indicates the model year 2008

The Eleventh character (X) indicates the vehicle was made in the assembly plant in St. Thomas, Ontario

The Twelfth through Seventeenth characters (133019) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.1.1.11

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

7/21/2011

2008 FORD POLICE INTERCEPTOR (3.55) MSP POLICE PKG 4 DOOR SEDAN

Curb Weight:		4128	lbs.	1872	kg.
Curb Weight Distribution -	Front:	56	% Rear:	44	%
Gross Vehicle Weight Rating:		5500	lbs.	2495	kg.
Number of Tires on Vehicle:		4			
Drive Wheels:		REAR			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	212	17.67	5.38
Wheelbase:	115	9.58	2.92
Front Bumper to Front Axle:	43	3.58	1.09
Front Bumper to Front of Front Well:	26	2.17	0.66
Front Bumper to Front of Hood:	8	0.67	0.20
Front Bumper to Base of Windshield:	65	5.42	1.65
Front Bumper to Top of Windshield:	91	7.58	2.31
Rear Bumper to Rear Axle:	54	4.50	1.37
Rear Bumper to Rear of Rear Well:	38	3.17	0.97
Rear Bumper to Rear of Trunk:	8	0.67	0.20
Rear Bumper to Base of Rear Window:	38	3.17	0.97
Width Dimensions			
Maximum Width:	78	6.50	1.98
Front Track:	63	5.25	1.60
Rear Track:	66	5.50	1.68
Vertical Dimensions			
Height:	58	4.83	1.47
Ground to -			
Front Bumper (Top)	23	1.92	0.58
Headlight - center	27	2.25	0.69
Hood - top front:	31	2.58	0.79
Base of Windshield	39	3.25	0.99
Rear Bumper - top:	25	2.08	0.64
Trunk - top rear:	39	3.25	0.99
Base of Rear Window:	40	3.33	1.02

2008 FORD POLICE INTERCEPTOR (3.55) MSP POLICE PKG 4 DOOR SEDAN

Interior Dimensions	Inches	Feet	Meters
Front Seat Shoulder Width	61	5.08	1.55
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	60	5.00	1.52
Rear Seat to Headliner	38	3.17	0.97
Front Leg Room - seatback to floor (min)	38	3.17	0.97

Seatbelts: 3pt - front and rear
Airbags: FRONT SEAT AIRBAGS

Steering Data

Turning Circle (Diameter)	480	40.00	12.19
Steering Ratio:	:1		
Wheel Radius:	12	1.00	0.30
Tire Size (OEM):	P235/55R17		

Acceleration & Braking Information

Brake Type: ALL DISC
ABS System: ALL WHEEL ABS

Braking, 60 mph to 0 (Hard pedal, no skid, dry pavement):
d = 145.0 ft t = 3.3 sec a = -26.6 ft/sec² G-force = -0.83

Acceleration:

0 to 30mph	t =	2.9	sec	a =	15.2	ft/sec²	G-force = 0.47
0 to 60mph	t =	8.2	sec	a =	10.7	ft/sec²	G-force = 0.33
45 to 65mph	t =	4.1	sec	a =	7.2	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 = 2008 - 2008

2008 FORD POLICE INTERCEPTOR (3.55) MSP POLICE PKG 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	=	50.60
Inches in front of rear axle	=	64.40
Inches from side of vehicle	=	39.00
Inches from ground	=	22.77
Inches from front corner	=	101.40
Inches from rear corner	=	124.66
Inches from front bumper	=	93.60
Inches from rear bumper	=	118.40

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	3045.84	lb*ft*sec²
Pitch Moment of Inertia	=	2937.72	lb*ft*sec²
Roll Moment of Inertia	=	593.04	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	45.0	deg
Angle Front of Hood to Windshield Base	=	8.0	deg
Angle Front of Hood to Windshield Top	=	16.8	deg
Angle of Windshield	=	33.2	deg
Angle of Steering Tires at Max Turn	=	27.5	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

#5803

2006 FORD OTHER

Provided By

4N6XPRT StifCalcs®

Registered to:

4N6XPRT SYSTEMS
8387 UNIVERSITY AVENUE
LA MESA CA 91941-3842
11R-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

Sister/Clone database reader

You entered: **2008 FORD CROWN VICTORIA**

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

Year Range	Make	Model	Body Styles	Wheelbase
1998 - 2011	LINCOLN	TOWN CAR	2D, 4D	117.4
Remarks: Could use Crown Victoria/Grand Marquis - same basic RWD Chassis, longer WB				
2003 - 2010	FORD	CROWN VICTORIA	4D	114.7, 133
Remarks: REVISED "STIFFER FRAME"				
2003 - 2010	MERCURY	GRAND MARQUIS	2D, 4D, SW	114.7
Remarks: ALSO MARAUDER				

If you have suggestions, corrections, etc., you should contact Greg Anderson at Scalia Safety Engineering,
521 East Washington Avenue, Suite 200, Madison, WI 53703-2914, (608) 256-0820, FAX (608) 256-0212, E-mail: greganderson@cs.com.

Test Information

Test #	**5803**	NHTSA Test Reference Guide Version #	**V5**				
Test Date	**2005-12-14**	Contract #	**06-6008**				
Contract/Study Title	**RESEARCH COLLISION TEST**						
Test Objective(s)	**FRONTAL CRASH**						
Test Type	**RESEARCH SAFETY VEHICLE TEST**	Configuration	**VEHICLE INTO BARRIER**				
Impact Angle	**0**	Side Impact Point	**9999**	mm	**0.0**	inches	
			9999	mm	**0.0**	inches	
		Closing Speed	**56.7**	Km/Hr	**35.22**	MPH	
Test Performer	**TRANSPORT CANADA**						
Test Reference #	**TC06-207**						
Test Track Surface	**CONCRETE**	Condition	**DRY**				
Ambient Temperature	**21** C	**69.8** F	Total Number of Curves	**347**			
Data Recorder Type	**OTHER**	Data Link	**OTHER**				
Test Commentary	**NO COMMENTS**						

Fixed Barrier Information

Barrier Type	**RIGID**	Pole Barrier Diameter	**9999**	mm	**9999**	inches
Barrier Shape	**LOAD CELL BARRIER**					
Barrier Commentary	**NO COMMENTS**					

2006 FORD OTHER LEFT FRONT SEAT OCCUPANT

Test #	5803		
Vehicle #	1	Sex	FEMALE
Location	LEFT FRONT SEAT	Age	99
Position	FORWARD OF CENTER POSITION	Height	999 mm 39.3 inches
Type	HYBRID III DUMMY	Weight	999.0 kg 2202 pounds
Size	5 PERCENTILE		
Calibration Method	OTHER		
Occupant Manufacturer	FIRST TECHNOLOGY		
Occupant Modification	UNMODIFIED		
Occupant Description	S/N : 105		
Occupant Commentary	LAST CALIBRATION DATE : 31/OCT/05		

Head

Head to -

Windshielder Header	268	mm	10.6	inches	Head Injury Criteria (HIC)	330	
WindShield	652	mm	25.7	inches	HIC Lower Time Interval (ms)	51	
Seatback	9999	mm	0.0	inches	HIC Upper Time Interval (ms)	87	
Side Header	270	mm	10.6	inches			
Side Window	360	mm	14.2	inches			
Neck to Seatback	9999	mm	0.0	inches			
First Contact Region (Head)	AIR BAG						
Second Contact Region (Head)							

Chest

Chest to -

Dash	9999	mm	0.0	inches	Arm to Door	133	mm	5.2	inches
Steering Wheel	238	mm	9.4	inches	Hip to Door	174	mm	6.9	inches
Seatback	9999	mm	0.0	inches					
Chest Severity Index	9999				Pelvic Peak Lateral Acceleration (g's)	9			
Thoracic Trauma Index	9				Thorax Peak Acceleration (g's)	55.4			
Lap Belt Peak Load	5370	Newtons	1207.2	pound Force					
Shoulder Belt Peak Load	3981	Newtons	895.0	pound Force					
First Contact Region (Chest/Abdomen)	AIR BAG								
Second Contact Region (Chest/Abdomen)	NONE								

Legs

Knees to Dash	60	mm	2.4	inches	Knees to Seatback	9999	mm	0.0	inches
Left Femur Peak Load	-1257	Newtons	-282.6	pounds Force					
Right Femur Peak Load	-2124	Newtons	-477.5	pounds Force					
First Contact Region (Legs)	DASHPANEL								
Second Contact Region (Legs)									

2006 FORD OTHER LEFT FRONT SEAT OCCUPANT

Test #	5803					
Vehicle #	1	Sex	FEMALE			
Location	LEFT FRONT SEAT	Age	99			
Position	FORWARD OF CENTER POSITION	Height	999	mm	39.3	inches
Type	HYBRID III DUMMY	Weight	999.0	kg	2202	pounds
Size	5 PERCENTILE					

Calibration Method	OTHER
Occupant Manufacturer	FIRST TECHNOLOGY
Occupant Modification	UNMODIFIED
Occupant Description	S/N : 105
Occupant Commentary	LAST CALIBRATION DATE : 31/OCT/05

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS
Restraint # 2	AIR BAG
Mounted	STEERING WHEEL
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS

2006 FORD OTHER RIGHT FRONT SEAT OCCUPANT

Test #	5803		
Vehicle #	1	Sex	FEMALE
Location	RIGHT FRONT SEAT	Age	99
Position	FORWARD OF CENTER POSITION	Height	999 mm 39.3 inches
Type	HYBRID III DUMMY	Weight	999.0 kg 2202 pounds
Size	5 PERCENTILE		
Calibration Method	OTHER		
Occupant Manufacturer	FIRST TECHNOLOGY		
Occupant Modification	UNMODIFIED		
Occupant Description	S/N : 104		
Occupant Commentary	LAST CALIBRATION DATE : 21/NOV/05		

Head

Head to -

Windshielder Header	284	mm	11.2	inches	Head Injury Criteria (HIC)	427	
WindShield	663	mm	26.1	inches	HIC Lower Time Interval (ms)	52.1	
Seatback	9999	mm	0.0	inches	HIC Upper Time Interval (ms)	88.1	
Side Header	275	mm	10.8	inches			
Side Window	367	mm	14.4	inches			
Neck to Seatback	9999	mm	0.0	inches			
First Contact Region (Head)	AIR BAG						
Second Contact Region (Head)							

Chest

Chest to -

Dash	410	mm	16.1	inches	Arm to Door	184	mm	7.2	inches
Steering Wheel	9999	mm	0.0	inches	Hip to Door	177	mm	7.0	inches
Seatback	9999	mm	0.0	inches					
Chest Severity Index	9999				Pelvic Peak Lateral Acceleration (g's)	9			
Thoracic Trauma Index	9				Thorax Peak Acceleration (g's)	51.6			
Lap Belt Peak Load	5358	Newtons	1204.5	pound Force					
Shoulder Belt Peak Load	3706	Newtons	833.1	pound Force					
First Contact Region (Chest/Abdomen)	AIR BAG								
Second Contact Region (Chest/Abdomen)	NONE								

Legs

Knees to Dash	45	mm	1.8	inches	Knees to Seatback	9999	mm	0.0	inches
Left Femur Peak Load	-1582	Newtons	-355.6	pounds Force					
Right Femur Peak Load	-1986	Newtons	-446.5	pounds Force					
First Contact Region (Legs)	DASHPANEL								
Second Contact Region (Legs)									

2006 FORD OTHER RIGHT FRONT SEAT OCCUPANT

Test #	5803					
Vehicle #	1	Sex	FEMALE			
Location	RIGHT FRONT SEAT	Age	99			
Position	FORWARD OF CENTER POSITION	Height	999	mm	39.3	inches
Type	HYBRID III DUMMY	Weight	999.0	kg	2202	pounds
Size	5 PERCENTILE					

Calibration Method	OTHER
Occupant Manufacturer	FIRST TECHNOLOGY
Occupant Modification	UNMODIFIED
Occupant Description	S/N : 104
Occupant Commentary	LAST CALIBRATION DATE : 21/NOV/05

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS
Restraint # 2	AIR BAG
Mounted	DASH PANEL - TOP
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS

2006 FORD OTHER RIGHT REAR SEAT OCCUPANT

Test #	5803		
Vehicle #	1	Sex	FEMALE
Location	RIGHT REAR SEAT	Age	99
Position	NOT APPLICABLE	Height	999 mm 39.3 inches
Type	HYBRID III DUMMY	Weight	999.0 kg 2202 pounds
Size	5 PERCENTILE		
Calibration Method	OTHER		
Occupant Manufacturer	FIRST TECHNOLOGY		
Occupant Modification	UNMODIFIED		
Occupant Description	S/N : 103		
Occupant Commentary	LAST CALIBRATION DATE : 10/NOV/05		

Head

Head to -

Windshielder Header	9999 mm	0.0 inches	Head Injury Criteria (HIC)	919
WindShield	9999 mm	0.0 inches	HIC Lower Time Interval (ms)	65
Seatback	9999 mm	0.0 inches	HIC Upper Time Interval (ms)	101
Side Header	9999 mm	0.0 inches		
Side Window	9999 mm	0.0 inches		

Neck to Seatback 9999 mm 0.0 inches

First Contact Region (Head) NONE

Second Contact Region (Head)

Chest

Chest to -

Dash	9999 mm	0.0 inches	Arm to Door	9999 mm 0.0 inches
Steering Wheel	9999 mm	0.0 inches	Hip to Door	9999 mm 0.0 inches
Seatback	9999 mm	0.0 inches		

Chest Severity Index	9999	Pelvic Peak Lateral Acceleration (g's)	9
Thoracic Trauma Index	9	Thorax Peak Acceleration (g's)	62.1

Lap Belt Peak Load 8630 Newtons 1940.1 pound Force

Shoulder Belt Peak Load 6281 Newtons 1412.0 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	9999 mm 0.0 inches
Left Femur Peak Load	-1764 Newtons	-396.6 pounds Force	
Right Femur Peak Load	-2053 Newtons	-461.5 pounds Force	

First Contact Region (Legs) NONE

Second Contact Region (Legs)

2006 FORD OTHER RIGHT REAR SEAT OCCUPANT

Test #	5803					
Vehicle #	1	Sex	FEMALE			
Location	RIGHT REAR SEAT	Age	99			
Position	NOT APPLICABLE	Height	999	mm	39.3	inches
Type	HYBRID III DUMMY	Weight	999.0	kg	2202	pounds
Size	5 PERCENTILE					

Calibration Method	OTHER
Occupant Manufacturer	FIRST TECHNOLOGY
Occupant Modification	UNMODIFIED
Occupant Description	S/N : 103
Occupant Commentary	LAST CALIBRATION DATE : 10/NOV/05

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS
Restraint # 2	SEAT BACK
Mounted	OTHER
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS

2006 FORD OTHER LEFT REAR SEAT OCCUPANT

Test #	5803		
Vehicle #	1	Sex	FEMALE
Location	LEFT REAR SEAT	Age	99
Position	NOT APPLICABLE	Height	999 mm 39.3 inches
Type	HYBRID III DUMMY	Weight	999.0 kg 2202 pounds
Size	5 PERCENTILE		
Calibration Method	OTHER		
Occupant Manufacturer	FIRST TECHNOLOGY		
Occupant Modification	UNMODIFIED		
Occupant Description	S/N : 111		
Occupant Commentary	LAST CALIBRATION DATE : 10/NOV/05		

Head

Head to -

Windshielder Header	9999 mm	0.0 inches	Head Injury Criteria (HIC)	731
WindShield	9999 mm	0.0 inches	HIC Lower Time Interval (ms)	66.2
Seatback	9999 mm	0.0 inches	HIC Upper Time Interval (ms)	102.2
Side Header	9999 mm	0.0 inches		
Side Window	9999 mm	0.0 inches		

Neck to Seatback 9999 mm 0.0 inches

First Contact Region (Head) NONE

Second Contact Region (Head)

Chest

Chest to -

Dash	9999 mm	0.0 inches	Arm to Door	9999 mm 0.0 inches
Steering Wheel	9999 mm	0.0 inches	Hip to Door	9999 mm 0.0 inches
Seatback	9999 mm	0.0 inches		

Chest Severity Index	9999	Pelvic Peak Lateral Acceleration (g's)	9
Thoracic Trauma Index	9	Thorax Peak Acceleration (g's)	53.6

Lap Belt Peak Load 8503 Newtons 1911.6 pound Force

Shoulder Belt Peak Load 5747 Newtons 1292.0 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 9999 mm 0.0 inches

Left Femur Peak Load -2983 Newtons -670.6 pounds Force

Right Femur Peak Load -2958 Newtons -665.0 pounds Force

First Contact Region (Legs) NONE

Second Contact Region (Legs)

2006 FORD OTHER LEFT REAR SEAT OCCUPANT

Test #	5803					
Vehicle #	1	Sex	FEMALE			
Location	LEFT REAR SEAT	Age	99			
Position	NOT APPLICABLE	Height	999	mm	39.3	inches
Type	HYBRID III DUMMY	Weight	999.0	kg	2202	pounds
Size	5 PERCENTILE					

Calibration Method	OTHER
Occupant Manufacturer	FIRST TECHNOLOGY
Occupant Modification	UNMODIFIED
Occupant Description	S/N : 111
Occupant Commentary	LAST CALIBRATION DATE : 10/NOV/05

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS
Restraint # 2	SEAT BACK
Mounted	OTHER
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS

Vehicle 1 2006 FORD OTHER

Test #	5803		
VIN	3FAFP07ZX6R106402	NHTSA Test Vehicle Number	1
Year	2006	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	FORD	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	OTHER	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	2.3 Liter	Transmission	MANUAL - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	UNMODIFIED		
Vehicle Commentary	06-207 FORD FUSION		

Vehicle Length	4832	mm	190.2	inches	CG behind Front Axle	1277	mm	50.3	inches
Vehicle Width	1835	mm	72.2	inches	Center of Damage to CG Axis	9999	mm	0.0	inches
Vehicle Wheelbase	2727	mm	107.4	inches	Total Length of Indentation	1501	mm	59.1	inches
Vehicle Test Weight	1750	KG	3857	pounds	Maximum Static Crush Depth	9999	mm	0.0	inches
					Pre-Impact Speed	57	kph	35.2	mph

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

Damage Profile Distance Measurements

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

DPD 1	375	mm	14.8	inches
DPD 2	546	mm	21.5	inches
DPD 3	619	mm	24.4	inches
DPD 4	618	mm	24.3	inches
DPD 5	598	mm	23.5	inches
DPD 6	327	mm	12.9	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	186.5	inches	164.9	inches	21.7	inches
	4738	mm	4188	mm	550	mm
Centerline	190.2	inches	166.1	inches	24.1	inches
	4832	mm	4220	mm	612	mm
Right Bumper Corner	186.6	inches	164.3	inches	22.3	inches
	4739	mm	4173	mm	566	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	99.0	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 FORD OTHER

Test #	5803		
VIN	3FAFP07ZX6R106402	NHTSA Test Vehicle Number	1
Year	2006	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	FORD	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	OTHER	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	2.3 Liter	Transmission	MANUAL - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	UNMODIFIED		
Vehicle Commentary	06-207 FORD FUSION		

Vehicle Length	4832	mm	190.2	inches	CG behind Front Axle	1277	mm	50.3	inches
Vehicle Width	1835	mm	72.2	inches	Center of Damage to CG Axis	9999	mm	0.0	inches
Vehicle Wheelbase	2727	mm	107.4	inches	Total Length of Indentation	1501	mm	59.1	inches
Vehicle Test Weight	1750	KG	3857	pounds	Maximum Static Crush Depth	9999	mm	0.0	inches
					Pre-Impact Speed	57	kph	35.2	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 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	4832	190.2	4220	166.1				
				Engine Block	212	8.3	1106	43.5				
4738	186.5	4188	164.9	Front Bumper Corner					4739	186.6	4173	164.3
				Front of Engine	4146	163.2	3726	146.7				
3524	138.7	3473	136.7	Firewall					3527	138.9	3427	134.9
					3723	146.6	0	0.0				
3335	131.3	3336	131.3	Upper Leading Edge of Door					3337	131.4	3334	131.3
3316	130.6	3316	130.6	Lower Leading Edge of Door					3329	131.1	3326	130.9
3291	129.6	3292	129.6	Bottom of 'A' Post					3297	129.8	3293	129.6
2276	89.6	2276	89.6	Upper Trailing Edge of Door					2282	89.8	2277	89.6
2317	91.2	2318	91.3	Lower Trailing Edge of Door					2322	91.4	2319	91.3
				Steering Column	2857	112.5	2893	113.9				
				Center of Seering Column to 'A' Post (Horizontal)	415	16.3	411	16.2				
				Center of Steering Column to Headliner (Vertical)	450	17.7	459	18.1				

2006 FORD OTHER

NHTSA Crash Test - #5803 - Front Impact

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

Test Vehicle Weight = 3857 pounds
Vehicle Closing Speed = 35.2 mph
Test Crush Length = 72.2 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	21.7	24.1	22.3	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 21.7 inches					112.7
Using a Rated No Damage Speed of	2.5 mph	161.3	97.3	133.8	
Using a Rated No Damage Speed of	5.0 mph	298.0	83.0	535.0	
Using a Rated No Damage Speed of	7.5 mph	410.1	69.8	1203.8	
Using a Rated No Damage Speed of	10.0 mph	497.4	57.8	2140.1	
Average Crush = 23.0 inches					100.4
Using a Rated No Damage Speed of	2.5 mph	152.2	86.6	133.8	
Using a Rated No Damage Speed of	5.0 mph	281.2	73.9	535.0	
Using a Rated No Damage Speed of	7.5 mph	386.9	62.2	1203.8	
Using a Rated No Damage Speed of	10.0 mph	469.3	51.5	2140.1	
Maximum Crush = 24.1 inches					91.4
Using a Rated No Damage Speed of	2.5 mph	145.3	78.9	133.8	
Using a Rated No Damage Speed of	5.0 mph	268.4	67.3	535.0	
Using a Rated No Damage Speed of	7.5 mph	369.2	56.6	1203.8	
Using a Rated No Damage Speed of	10.0 mph	447.9	46.9	2140.1	

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

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	24.1	35.6	0.4	1.0

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 20.6

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

2006 FORD OTHER

NHTSA Crash Test - #5803 - Front Impact

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

Test Vehicle Weight = 3857 pounds
Vehicle Closing Speed = 35.2 mph
Test Crush Length = 59.1 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	21.7	24.1	22.3	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 21.7 inches					137.8
Using a Rated No Damage Speed of	2.5 mph	197.2	119.0	163.5	
Using a Rated No Damage Speed of	5.0 mph	364.3	101.5	654.1	
Using a Rated No Damage Speed of	7.5 mph	501.3	85.4	1471.7	
Using a Rated No Damage Speed of	10.0 mph	608.1	70.7	2616.3	
Average Crush = 23.0 inches					122.7
Using a Rated No Damage Speed of	2.5 mph	186.1	105.9	163.5	
Using a Rated No Damage Speed of	5.0 mph	343.8	90.3	654.1	
Using a Rated No Damage Speed of	7.5 mph	473.0	76.0	1471.7	
Using a Rated No Damage Speed of	10.0 mph	573.8	62.9	2616.3	
Maximum Crush = 24.1 inches					111.8
Using a Rated No Damage Speed of	2.5 mph	177.6	96.4	163.5	
Using a Rated No Damage Speed of	5.0 mph	328.1	82.3	654.1	
Using a Rated No Damage Speed of	7.5 mph	451.4	69.2	1471.7	
Using a Rated No Damage Speed of	10.0 mph	547.6	57.3	2616.3	

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

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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

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	24.1	35.6	0.4	1.0

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 20.6

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

2006 FORD OTHER

NHTSA Crash Test - #5803 - Front Impact

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

Test Vehicle Weight = 3857 pounds
Vehicle Closing Speed = 35.2 MPH
Test Crush Length = 72.2 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	14.8	21.5	24.4	24.3	23.5	12.9	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 12.9 inches					319.0
Using a Rated No Damage Speed of	2.5mph	271.4	275.4	133.8	
Using a Rated No Damage Speed of	5.0mph	501.3	234.9	535.0	
Using a Rated No Damage Speed of	7.5mph	689.8	197.6	1203.8	
Using a Rated No Damage Speed of	10.0mph	836.8	163.6	2140.1	
Average Crush = 21.5 inches					114.9
Using a Rated No Damage Speed of	2.5mph	162.8	99.1	133.8	
Using a Rated No Damage Speed of	5.0mph	300.8	84.6	535.0	
Using a Rated No Damage Speed of	7.5mph	413.9	71.1	1203.8	
Using a Rated No Damage Speed of	10.0mph	502.1	58.9	1490.5	
Maximum Crush = 24.4 inches					89.2
Using a Rated No Damage Speed of	2.5mph	143.5	77.0	133.8	
Using a Rated No Damage Speed of	5.0mph	265.1	65.7	535.0	
Using a Rated No Damage Speed of	7.5mph	364.7	55.2	1203.8	
Using a Rated No Damage Speed of	10.0mph	442.4	45.7	2140.1	

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

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	24.4	35.8	0.6	1.6

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 20.3

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

2006 FORD OTHER

NHTSA Crash Test - #5803 - Front Impact

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

Test Vehicle Weight = 3857 pounds
Vehicle Closing Speed = 35.2 MPH
Test Crush Length = 59.1 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	14.8	21.5	24.4	24.3	23.5	12.9	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 12.9 inches					390.0
Using a Rated No Damage Speed of	2.5mph	331.8	336.6	163.5	
Using a Rated No Damage Speed of	5.0mph	612.9	287.2	654.1	
Using a Rated No Damage Speed of	7.5mph	843.3	241.6	1471.7	
Using a Rated No Damage Speed of	10.0mph	1023.0	200.0	2616.3	
Average Crush = 21.5 inches					140.4
Using a Rated No Damage Speed of	2.5mph	199.1	121.2	163.5	
Using a Rated No Damage Speed of	5.0mph	367.7	103.4	654.1	
Using a Rated No Damage Speed of	7.5mph	506.0	87.0	1471.7	
Using a Rated No Damage Speed of	10.0mph	613.8	72.0	1822.2	
Maximum Crush = 24.4 inches					109.0
Using a Rated No Damage Speed of	2.5mph	175.4	94.1	163.5	
Using a Rated No Damage Speed of	5.0mph	324.0	80.3	654.1	
Using a Rated No Damage Speed of	7.5mph	445.8	67.5	1471.7	
Using a Rated No Damage Speed of	10.0mph	540.8	55.9	2616.3	

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

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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

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	24.4	35.8	0.6	1.6

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 20.3

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

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2003 - 2010
Make: FORD
Model: CROWN VICTORIA

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	Closing Speed (mph)	Vehicle Width Stiffness A	Vehicle Width Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
3219	2000 LINCOLN TOWN CAR FOUR DOOR SEDAN	5.0	26.8	35.1	263.7	59.2	587.0	80.5	18.4
3480	2001 LINCOLN TOWN CAR FOUR DOOR SEDAN	5.0	24.7	35.1	290.3	70.7	596.3	96.1	19.9
5803	2006 FORD OTHER FOUR DOOR SEDAN	5.0	21.5	35.2	300.6	84.5	535.0	114.7	23.1
4476	2003 FORD CROWN VICTORIA FOUR DOOR SEDAN	5.0	23.0	35.3	318.1	83.9	603.6	113.8	21.7
	Average (AVG)				**293.2**	**74.6**	**580.5**	**101.3**	**20.8**
	Minimum (MIN)				**263.7**	**59.2**	**535.0**	**80.5**	**18.4**
	Maximum (MAX)				**318.1**	**84.5**	**603.6**	**114.7**	**23.1**
	Standard Deviation (STDev-sample)				**22.8**	**12.1**	**31.1**	**16.3**	**2.1**
	Number of Tests (n)			**4**					

2008 FORD POLICE INTERCEPTOR (3.55) MSP POLICE PKG - Front Impact

Curb Weight (pounds):	4128
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	4128
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	1.00
Damage Length (inches):	78.0
Crush Profile Measurements:	2

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	3045.84

"Known" Stifness Values

	A	B
Average	293.2	74.6
Minimum	263.7	59.2
Maximum	318.1	84.5
Std. Devation	22.8	12.1

		Equal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	1.00	78.00	78.00	0.50	39.00	39.00	3042.00
C2 (inches)	1.00						
C3 (inches)							
C4 (inches)							
C5 (inches)							
C6 (inches)							
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 1.00

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	263.7	59.2	12593.10	5723.98	6.4	6.3	32.6
Avg - 2 Std. Deviations	247.6	50.4	11622.00	5726.45	6.5	6.1	31.7
Avg - 1 Std. Deviations	270.4	62.5	12983.10	5762.77	6.5	6.4	33.0
Average	293.2	74.6	14344.20	5893.43	6.5	6.6	34.4
Avg + 1 Std. Deviations	316.0	86.7	15705.30	6078.94	6.6	6.9	35.7
Avg + 2 Std. Deviations	338.8	98.8	17066.40	6299.14	6.8	7.2	37.0
Maximum	318.1	84.5	15701.40	6234.11	6.7	6.9	35.8

Damage Centroid Depth (x) (inches)	0.50	k^2	3421.26
Damage Centroid Depth (y) (inches)	39.00	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	78.00		

1985 MERCURY MARQUIS - Side Impact

Curb Weight (pounds):	3001
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3001
Angle Coll Force to Normal (degrees):	29.0
No Damage Speed (mph):	2.0
Energy Crush Depth (inches):	12.61
Damage Length (inches):	112.3
Crush Profile Measurements:	10

PDOF

Lever Arm Distance (inches):	77.00
Yaw Moment of Inertia (lb-ft-sec^2)	1885.03

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00						
C2 (inches)	9.46	17.56	83.06	3.15	261.91	11.71	972.34
C3 (inches)	16.07	17.56	224.15	6.53	1462.63	27.10	6074.05
C4 (inches)	19.41	9.84	174.56	8.90	1552.94	24.75	4321.17
C5 (inches)	24.22	5.18	113.00	10.95	1237.56	18.23	2059.48
C6 (inches)	24.03	16.96	409.16	12.06	4935.52	76.31	31222.54
C7 (inches)	14.61	5.33	102.98	9.85	1014.45	29.10	2996.43
C8 (inches)	14.61	3.35	48.94	7.31	357.53	21.78	1065.74
C9 (inches)	8.53	14.28	165.22	5.92	977.79	106.47	17591.70
C10 (inches)	0.00	22.22	94.77	2.84	269.46	185.17	17547.93

Average Crush (inches): 12.61

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	33.3	12.9	12593.10	22645.42	15.0	8.7	13.7
Avg - 2 Std. Deviations	31.9	11.8	11622.00	20996.41	14.5	8.4	13.1
Avg - 1 Std. Deviations	33.9	13.4	12983.10	23306.90	15.3	8.8	13.9
Average	35.7	14.9	14344.20	25612.35	16.0	9.1	14.7
Avg + 1 Std. Deviations	37.5	16.4	15705.30	27913.44	16.7	9.5	15.4
Avg + 2 Std. Deviations	39.3	18.0	17066.40	30210.74	17.4	9.8	16.1
Maximum	37.5	16.4	15701.40	27906.86	16.7	9.5	15.4

Damage Centroid Depth (x) (inches)	8.52	k^2	2912.53
Damage Centroid Depth (y) (inches)	59.22	Eff. Mass Ratio (gamma)	0.33
Area of Damage (inches^2):	1415.84		

2008 FORD POLICE INTERCEPTOR (3.55) MSP POLICE PKG - Front Impact

Curb Weight (pounds):	4128
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	4128
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	4.00
Damage Length (inches):	63.0
Crush Profile Measurements:	2

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	3045.84

"Known" Stifness Values

	A	B
Average	293.2	74.6
Minimum	263.7	59.2
Maximum	318.1	84.5
Std. Devation	22.8	12.1

		Equal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	4.00	63.00	252.00	2.00	504.00	31.50	7938.00
C2 (inches)	4.00						
C3 (inches)							
C4 (inches)							
C5 (inches)							
C6 (inches)							
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 4.00

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	263.7	59.2	15765.75	11107.49	9.0	7.4	38.3
Avg - 2 Std. Deviations	247.6	50.4	14149.80	10509.41	8.7	7.1	36.7
Avg - 1 Std. Deviations	270.4	62.5	16392.60	11374.28	9.1	7.5	39.0
Average	293.2	74.6	18635.40	12315.35	9.5	8.0	41.2
Avg + 1 Std. Deviations	316.0	86.7	20878.20	13300.72	9.8	8.4	43.3
Avg + 2 Std. Deviations	338.8	98.8	23121.00	14314.11	10.2	8.8	45.3
Maximum	318.1	84.5	20667.15	13372.50	9.9	8.3	43.2

Damage Centroid Depth (x) (inches)	2.00	k^2	3421.26
Damage Centroid Depth (y) (inches)	31.50	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	252.00		

1985 MERCURY MARQUIS - Side Impact

Curb Weight (pounds):	3001
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3001
Angle Coll Force to Normal (degrees):	29.0
No Damage Speed (mph):	2.0
Energy Crush Depth (inches):	12.61
Damage Length (inches):	112.3
Crush Profile Measurements:	10

PDOF

Lever Arm Distance (inches):	77.00
Yaw Moment of Inertia (lb-ft-sec^2)	1885.03

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00	17.56	83.06	3.15	261.91	11.71	972.34
C2 (inches)	9.46	17.56	224.15	6.53	1462.63	27.10	6074.05
C3 (inches)	16.07	9.84	174.56	8.90	1552.94	24.75	4321.17
C4 (inches)	19.41	5.18	113.00	10.95	1237.56	18.23	2059.48
C5 (inches)	24.22	16.96	409.16	12.06	4935.52	76.31	31222.54
C6 (inches)	24.03	5.33	102.98	9.85	1014.45	29.10	2996.43
C7 (inches)	14.61	3.35	48.94	7.31	357.53	21.78	1065.74
C8 (inches)	14.61	14.28	165.22	5.92	977.79	106.47	17591.70
C9 (inches)	8.53	22.22	94.77	2.84	269.46	185.17	17547.93
C10 (inches)	0.00						

Average Crush (inches): 12.61

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	37.6	16.5	15765.75	28015.55	16.7	10.2	15.4
Avg - 2 Std. Deviations	35.5	14.7	14149.80	25283.35	15.9	9.7	14.6
Avg - 1 Std. Deviations	38.4	17.2	16392.60	29073.93	17.0	10.4	15.8
Average	41.2	19.8	18635.40	32854.80	18.1	10.9	16.9
Avg + 1 Std. Deviations	43.8	22.3	20878.20	36627.67	19.1	11.5	18.0
Avg + 2 Std. Deviations	46.2	24.9	23121.00	40393.78	20.1	12.0	19.0
Maximum	43.5	22.1	20667.15	36272.94	19.0	11.5	17.9

Damage Centroid Depth (x) (inches)	8.52	k^2	2912.53
Damage Centroid Depth (y) (inches)	59.22	Eff. Mass Ratio (gamma)	0.33
Area of Damage (inches^2):	1415.84		

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2003 - 2010
Make: FORD
Model: CROWN VICTORIA

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
3219	2000 LINCOLN TOWN CAR FOUR DOOR SEDAN	5.0	27.8	35.1	254.0	54.9	587.0	74.7	17.7
3480	2001 LINCOLN TOWN CAR FOUR DOOR SEDAN	5.0	27.6	35.1	260.6	56.9	596.3	77.4	17.9
5803	2006 FORD OTHER FOUR DOOR SEDAN	5.0	24.4	35.2	265.4	65.8	535.0	89.4	20.4
4476	2003 FORD CROWN VICTORIA FOUR DOOR SEDAN	5.0	25.3	35.3	289.4	69.4	603.6	94.1	19.7
	Average (AVG)				**267.4**	**61.8**	**580.5**	**83.9**	**18.9**
	Minimum (MIN)				**254.0**	**54.9**	**535.0**	**74.7**	**17.7**
	Maximum (MAX)				**289.4**	**69.4**	**603.6**	**94.1**	**20.4**
	Standard Deviation (STDev-sample)				**15.4**	**7.0**	**31.1**	**9.3**	**1.3**
	Number of Tests (n)			**4**					

2008 FORD POLICE INTERCEPTOR (3.55) MSP POLICE PKG - Front Impact

Curb Weight (pounds):	4128
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	4128
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	1.00
Damage Length (inches):	78.0
Crush Profile Measurements:	2

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	3045.84

"Known" Stifness Values

	A	B
Average	267.4	61.8
Minimum	254.0	54.9
Maximum	289.4	69.4
Std. Devation	15.4	7.0

		Equal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	1.00	78.00	78.00	0.50	39.00	39.00	3042.00
C2 (inches)	1.00						
C3 (inches)							
C4 (inches)							
C5 (inches)							
C6 (inches)							
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 1.00

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	254.0	54.9	12047.10	5648.68	6.4	6.2	32.1
Avg - 2 Std. Deviations	236.6	47.8	11091.60	5499.39	6.3	6.0	31.0
Avg - 1 Std. Deviations	252.0	54.8	11965.20	5582.30	6.4	6.2	31.9
Average	267.4	61.8	12838.80	5699.21	6.4	6.3	32.9
Avg + 1 Std. Deviations	282.8	68.8	13712.40	5839.73	6.5	6.5	33.8
Avg + 2 Std. Deviations	298.2	75.8	14586.00	5997.32	6.6	6.7	34.7
Maximum	289.4	69.4	13993.20	6028.77	6.6	6.6	34.1

Damage Centroid Depth (x) (inches)	0.50	k^2	3421.26
Damage Centroid Depth (y) (inches)	39.00	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	78.00		

1985 MERCURY MARQUIS - Side Impact

Curb Weight (pounds):	3001
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3001
Angle Coll Force to Normal (degrees):	29.0
No Damage Speed (mph):	2.0
Energy Crush Depth (inches):	12.61
Damage Length (inches):	112.3
Crush Profile Measurements:	10

PDOF

Lever Arm Distance (inches):	77.00
Yaw Moment of Inertia (lb-ft-sec^2)	1885.03

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00	17.56	83.06	3.15	261.91	11.71	972.34
C2 (inches)	9.46	17.56	224.15	6.53	1462.63	27.10	6074.05
C3 (inches)	16.07	9.84	174.56	8.90	1552.94	24.75	4321.17
C4 (inches)	19.41	5.18	113.00	10.95	1237.56	18.23	2059.48
C5 (inches)	24.22	16.96	409.16	12.06	4935.52	76.31	31222.54
C6 (inches)	24.03	5.33	102.98	9.85	1014.45	29.10	2996.43
C7 (inches)	14.61	3.35	48.94	7.31	357.53	21.78	1065.74
C8 (inches)	14.61	14.28	165.22	5.92	977.79	106.47	17591.70
C9 (inches)	8.53	22.22	94.77	2.84	269.46	185.17	17547.93
C10 (inches)	0.00						

Average Crush (inches): 12.61

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	32.5	12.3	12047.10	21718.62	14.7	8.5	13.3
Avg - 2 Std. Deviations	31.1	11.2	11091.60	20094.50	14.2	8.2	12.7
Avg - 1 Std. Deviations	32.4	12.2	11965.20	21579.52	14.7	8.5	13.3
Average	33.6	13.2	12838.80	23062.21	15.2	8.7	13.8
Avg + 1 Std. Deviations	34.9	14.2	13712.40	24542.78	15.7	9.0	14.3
Avg + 2 Std. Deviations	36.1	15.2	14586.00	26021.44	16.1	9.2	14.8
Maximum	35.3	14.5	13993.20	25018.26	15.8	9.1	14.5

Damage Centroid Depth (x) (inches)	8.52	k^2	2912.53
Damage Centroid Depth (y) (inches)	59.22	Eff. Mass Ratio (gamma)	0.33
Area of Damage (inches^2):	1415.84		

2008 FORD POLICE INTERCEPTOR (3.55) MSP POLICE PKG - Front Impact

Curb Weight (pounds):	4128
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	4128
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	4.00
Damage Length (inches):	63.0
Crush Profile Measurements:	2

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	3045.84

"Known" Stifness Values

	A	B
Average	267.4	61.8
Minimum	254.0	54.9
Maximum	289.4	69.4
Std. Devation	15.4	7.0

		Equal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	4.00	63.00	252.00	2.00	504.00	31.50	7938.00
C2 (inches)	4.00						
C3 (inches)							
C4 (inches)							
C5 (inches)							
C6 (inches)							
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 4.00

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	254.0	54.9	14918.40	10724.58	8.8	7.2	37.4
Avg - 2 Std. Deviations	236.6	47.8	13475.70	10050.39	8.5	6.9	35.8
Avg - 1 Std. Deviations	252.0	54.8	14842.80	10635.53	8.8	7.2	37.3
Average	267.4	61.8	16209.90	11248.13	9.0	7.5	38.8
Avg + 1 Std. Deviations	282.8	68.8	17577.00	11879.80	9.3	7.8	40.2
Avg + 2 Std. Deviations	298.2	75.8	18944.10	12525.27	9.5	8.0	41.5
Maximum	289.4	69.4	17860.50	12160.07	9.4	7.8	40.5

Damage Centroid Depth (x) (inches)	2.00	k^2	3421.26
Damage Centroid Depth (y) (inches)	31.50	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	252.00		

1985 MERCURY MARQUIS - Side Impact

Curb Weight (pounds):	3001
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3001
Angle Coll Force to Normal (degrees):	29.0
No Damage Speed (mph):	2.0
Energy Crush Depth (inches):	12.61
Damage Length (inches):	112.3
Crush Profile Measurements:	10

PDOF

Lever Arm Distance (inches):	77.00
Yaw Moment of Inertia (lb-ft-sec^2)	1885.03

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00	17.56	83.06	3.15	261.91	11.71	972.34
C2 (inches)	9.46	17.56	224.15	6.53	1462.63	27.10	6074.05
C3 (inches)	16.07	9.84	174.56	8.90	1552.94	24.75	4321.17
C4 (inches)	19.41	5.18	113.00	10.95	1237.56	18.23	2059.48
C5 (inches)	24.22	16.96	409.16	12.06	4935.52	76.31	31222.54
C6 (inches)	24.03	5.33	102.98	9.85	1014.45	29.10	2996.43
C7 (inches)	14.61	3.35	48.94	7.31	357.53	21.78	1065.74
C8 (inches)	14.61	14.28	165.22	5.92	977.79	106.47	17591.70
C9 (inches)	8.53	22.22	94.77	2.84	269.46	185.17	17547.93
C10 (inches)	0.00						

Average Crush (inches): 12.61

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	36.5	15.5	14918.40	26583.60	16.3	9.9	15.0
Avg - 2 Std. Deviations	34.5	13.9	13475.70	24141.82	15.5	9.5	14.2
Avg - 1 Std. Deviations	36.4	15.5	14842.80	26455.76	16.3	9.9	14.9
Average	38.2	17.0	16209.90	28765.54	17.0	10.3	15.7
Avg + 1 Std. Deviations	39.9	18.6	17577.00	31071.66	17.6	10.7	16.4
Avg + 2 Std. Deviations	41.5	20.1	18944.10	33374.55	18.3	11.0	17.0
Maximum	40.2	18.9	17860.50	31549.47	17.8	10.8	16.5

Damage Centroid Depth (x) (inches)	8.52	k^2	2912.53
Damage Centroid Depth (y) (inches)	59.22	Eff. Mass Ratio (gamma)	0.33
Area of Damage (inches^2):	1415.84		

Expert VIN DeCoder®

Version Number 3.0.2.5

DeCoded VIN: 1MEBP8935FA601342

Model:	1985 Mercury Marquis 4 Door Sedan
Engine Size:	3.8 L/ 232 cu.in.
Engine Description:	V-6 cylinder with Overhead Valve
Horse Power:	120 @ 3600 rpm
Torque:	250 lb-ft at 1600 rpm
Injection System:	Central Fuel Injection (CFI)
PSI:	39 psi
Ignition:	electronic
Manufacturer:	Ford
Assembly Plant:	Atlanta, GA
Drive Wheels:	This is a Rear Wheel Drive vehicle w/Manual Seatbelts

The First through Third characters (1ME) indicate a Mercury Passenger car made in the U.S.A.

The Fourth character (B) indicates Manual Seatbelts

The Fifth through Seventh characters (P89) indicate a Marquis

The Eighth character (3) indicates the OEM engine: 3.8 L/ 232 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 (F) indicates the model year 1985

The Eleventh character (A) indicates the vehicle was made in the assembly plant in Atlanta, GA

The Twelfth through Seventeenth characters (601342) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.1.1.11

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

7/26/2011

1985 MERCURY MARQUIS 4 DOOR SEDAN

Curb Weight:	3001	lbs.	1361	kg.
Curb Weight Distribution - Front:	57	% Rear:	43	%
Gross Vehicle Weight Rating:		lbs.		kg.
Number of Tires on Vehicle:	4			
Drive Wheels:	REAR			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	196	16.33	4.98
Wheelbase:	106	8.83	2.69
Front Bumper to Front Axle:	40	3.33	1.02
Front Bumper to Front of Front Well:	26	2.17	0.66
Front Bumper to Front of Hood:	4	0.33	0.10
Front Bumper to Base of Windshield:	60	5.00	1.52
Front Bumper to Top of Windshield:	80	6.67	2.03
Rear Bumper to Rear Axle:	50	4.17	1.27
Rear Bumper to Rear of Rear Well:	37	3.08	0.94
Rear Bumper to Rear of Trunk:			
Rear Bumper to Base of Rear Window:			
Width Dimensions			
Maximum Width:	71	5.92	1.80
Front Track:	57	4.75	1.45
Rear Track:	57	4.75	1.45
Vertical Dimensions			
Height:	53	4.42	1.35
Ground to -			
Front Bumper (Top)	21	1.75	0.53
Headlight - center	27	2.25	0.69
Hood - top front:	30	2.50	0.76
Base of Windshield	38	3.17	0.97
Rear Bumper - top:	21	1.75	0.53
Trunk - top rear:			
Base of Rear Window:			

1985 MERCURY MARQUIS 4 DOOR SEDAN

Interior Dimensions	Inches	Feet	Meters
Front Seat Shoulder Width	56	4.67	1.42
Front Seat to Headliner	38	3.17	0.97
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)	36	3.00	0.91

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

Airbags: NO AIRBAGS

Steering Data

Turning Circle (Diameter)	504	42.00	12.80
Steering Ratio:	23.69:1		
Wheel Radius:	13	1.08	0.33
Tire Size (OEM):	195-75R14		

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 = 190.0 ft t = 4.3 sec a = -20.3 ft/sec² G-force = -0.63

Acceleration:

0 to 30mph	t =	4.7	sec	a =	9.4	ft/sec²	G-force = 0.29
0 to 60mph	t =	13.4	sec	a =	6.6	ft/sec²	G-force = 0.20
45 to 65mph	t =	8.0	sec	a =	3.7	ft/sec²	G-force = 0.11

Transmission Type: AUTOMATIC

Notes:

Federal Bumper Standard Requirements: 2.5 mph

This vehicles Rated Bumper Strength: 5 mph

N.S.D.C = 1983 - 1986

1985 MERCURY MARQUIS 4 DOOR SEDAN

Other Information

Tip-Over Stability Ratio =	1.37	Stable
NHTSA Star Rating (calculated)		****

Center of Gravity (No Load):

Inches behind front axle	=	45.58
Inches in front of rear axle	=	60.42
Inches from side of vehicle	=	35.50
Inches from ground	=	20.80
Inches from front corner	=	92.65
Inches from rear corner	=	115.99
Inches from front bumper	=	85.58
Inches from rear bumper	=	110.42

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	1885.03	lb*ft*sec²
Pitch Moment of Inertia	=	1821.99	lb*ft*sec²
Roll Moment of Inertia	=	390.18	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	66.0	deg
Angle Front of Hood to Windshield Base	=	8.1	deg
Angle Front of Hood to Windshield Top	=	15.4	deg
Angle of Windshield	=	33.0	deg
Angle of Steering Tires at Max Turn	=	24.1	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

#1136

1985 FORD LTD

Provided By

4N6XPRT StifCalcs®

Registered to:

4N6XPRT SYSTEMS
8387 UNIVERSITY AVENUE
LA MESA CA 91941-3842
11R-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

Sister/Clone database reader

You entered: **1985 MERCURY MARQUIS**

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

Year Range	Make	Model	Body Styles	Wheelbase
1983 - 1986	MERCURY	MARQUIS	2D, 4D, SW	105.5, 121
Remarks: ZEPHYR RESTYLE				
1983 - 1986	FORD	LTD	2D, 4D, SW	105.5
Remarks: NOT LTD CROWN VICTORIA				

If you have suggestions, corrections, etc., you should contact Greg Anderson at Scalia Safety Engineering,
521 East Washington Avenue, Suite 200, Madison, WI 53703-2914, (608) 256-0820, FAX (608) 256-0212, E-mail: greganderson@cs.com.

Test Information

Test #	1136	NHTSA Test Reference Guide Version #	2			
Test Date	1987-11-02	Contract #	087109-0300			
Contract/Study Title	MVMA SIDE IMPACT TESTING USING EUROPEAN PROCEDURE					
Test Objective(s)	BASELINE STRUCTURE, DUMMY FIVE INCHES AWAY FROM PADDED DOOR PANEL					
Test Type	MODIFIED VEHICLE TEST	Configuration	IMPACTOR INTO VEHICLE			
Impact Angle	90	Side Impact Point	107	mm	4.2	inches
			0	mm	0.0	inches
		Closing Speed	50.5	Km/Hr	31.38	MPH
Test Performer	TRC OF OHIO					
Test Reference #	871102					
Test Track Surface	CONCRETE	Condition	DRY			
Ambient Temperature	26 C	78.8 F	Total Number of Curves	37		
Data Recorder Type	FM MULTIPLEXOR TAPE RECORDER	Data Link	UMBILICAL CABLE			
Test Commentary	NO COMMENTS					

Fixed Barrier Information

Barrier Type		Pole Barrier Diameter		mm	inches
Barrier Shape					
Barrier Commentary					

1985 FORD LTD RIGHT FRONT SEAT OCCUPANT

Test #	1136		
Vehicle #	2	Sex	MALE
Location	RIGHT FRONT SEAT	Age	0
Position	CENTER POSITION	Height	0 mm 0.0 inches
Type	EURO-SID DUMMY	Weight	0.0 kg 0 pounds
Size	50 PERCENTILE		
Calibration Method	OTHER		
Occupant Manufacturer	MFG: EUROPEAN SIDE IMPACT DUMMY S/N 1-001		
Occupant Modification	UNMODIFIED		
Occupant Description	NO COMMENTS		
Occupant Commentary	RIGHT LEG CONTACTED DOOR PANEL, LEFT LEG CONTACTED RIGHT LEG		

Head

Head to -

Windshielder Header	358	mm	14.1	inches	Head Injury Criteria (HIC)	118	
WindShield	462	mm	18.2	inches	HIC Lower Time Interval (ms)	54.75	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	76.5	
Side Header	282	mm	11.1	inches			
Side Window	371	mm	14.6	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): NONE

Second Contact Region (Head):

Chest

Chest to -

Dash	478	mm	18.8	inches	Arm to Door	132	mm	5.2	inches
Steering Wheel	0	mm	0.0	inches	Hip to Door	183	mm	7.2	inches
Seatback	0	mm	0.0	inches					

Chest Severity Index: | Pelvic Peak Lateral Acceleration (g's):

Thoracic Trauma Index: | Thorax Peak Acceleration (g's): 33.27

Lap Belt Peak Load: Newtons 0.0 pound Force

Shoulder Belt Peak Load: Newtons 0.0 pound Force

First Contact Region (Chest/Abdomen): NONE

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash 99 mm 3.9 inches | Knees to Seatback 0 mm 0.0 inches

Left Femur Peak Load: Newtons 0.0 pounds Force

Right Femur Peak Load: Newtons 0.0 pounds Force

First Contact Region (Legs): OTHER

Second Contact Region (Legs):

1985 FORD LTD RIGHT FRONT SEAT OCCUPANT

Test #	1136					
Vehicle #	2	Sex	MALE			
Location	RIGHT FRONT SEAT	Age	0			
Position	CENTER POSITION	Height	0	mm	0.0	inches
Type	EURO-SID DUMMY	Weight	0.0	kg	0	pounds
Size	50 PERCENTILE					

Calibration Method	OTHER
Occupant Manufacturer	MFG: EUROPEAN SIDE IMPACT DUMMY S/N 1-001
Occupant Modification	UNMODIFIED
Occupant Description	NO COMMENTS
Occupant Commentary	RIGHT LEG CONTACTED DOOR PANEL, LEFT LEG CONTACTED RIGHT LEG

Restraints

Restraint # 1	NONE
Mounted	
Deployment	NOT APPLICABLE
Restraint Commentary	NO COMMENTS
Restraint # 2	NONE
Mounted	
Deployment	NOT APPLICABLE
Restraint Commentary	NO COMMENTS

Vehicle 1 0 EEVC DEFORMABLE IMPACTOR

Test #	1136		
VIN		NHTSA Test Vehicle Number	1
Year	0	Vehicle Modification Indicator	RESEARCH VEHICLE
Make	EEVC	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	DEFORMABLE IMPACTOR	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	NOT APPLICABLE		
Engine	NOT APPLICABLE		
Displacement	0 Liter	Transmission	NOT APPLICABLE
Vehicle Modification(s) Description	NO COMMENTS		
Vehicle Commentary	IMPACTOR WITH EEVC DEFORMABLE BARRIER FACE		

Vehicle Length	0	mm	0.0	inches	CG behind Front Axle	0 mm	0.0 inches
Vehicle Width	0	mm	0.0	inches	Center of Damage to CG Axis	0 mm	0.0 inches
Vehicle Wheelbase	0	mm	0.0	inches	Total Length of Indentation	0 mm	0.0 inches
Vehicle Test Weight	945	KG	2083	pounds	Maximum Static Crush Depth	0 mm	0.0 inches
					Pre-Impact Speed	51 kph	31.4 mph

Vehicle Damage Index: 9999999

Principal Direction of Force: 0

Damage Profile Distance Measurements

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

DPD 1	0	mm	0.0	inches
DPD 2	0	mm	0.0	inches
DPD 3	0	mm	0.0	inches
DPD 4	0	mm	0.0	inches
DPD 5	0	mm	0.0	inches
DPD 6	0	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	0.0	inches
	0	mm	0	mm	0	mm
Centerline	0.0	inches	0.0	inches	0.0	inches
	0	mm	0	mm	0	mm
Right Bumper Corner	0.0	inches	0.0	inches	0.0	inches
	0	mm	0	mm	0	mm

Bumper Engagement (Inline Impact Only): 0.0

Sill Engagement (Side Impact Only): NOT APPLICABLE

A-pillar Engagement (Side Impact Only): 0.0

Moving Test Cart Angle: NOT APPLICABLE

Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground

Moving Test Cart/Vehicle Crabbed Angle: 0.0

Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle

Vehicle Orientation on Cart Moving Test Cart: NOT APPLICABLE

Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion

Vehicle 1 0 EEVC DEFORMABLE IMPACTOR

Test #	1136		
VIN		NHTSA Test Vehicle Number	1
Year	0	Vehicle Modification Indicator	RESEARCH VEHICLE
Make	EEVC	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	DEFORMABLE IMPACTOR	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	NOT APPLICABLE		
Engine	NOT APPLICABLE		
Displacement	0 Liter	Transmission	NOT APPLICABLE
Vehicle Modification(s) Description	NO COMMENTS		
Vehicle Commentary	IMPACTOR WITH EEVC DEFORMABLE BARRIER FACE		

Vehicle Length	0	mm	0.0	inches	CG behind Front Axle	0	mm	0.0	inches
Vehicle Width	0	mm	0.0	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	0	mm	0.0	inches	Total Length of Indentation	0	mm	0.0	inches
Vehicle Test Weight	945	KG	2083	pounds	Maximum Static Crush Depth	0	mm	0.0	inches
					Pre-Impact Speed	51	kph	31.4	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							
				0	0.0	0	0.0				
				Engine Block							
				0	0.0	0	0.0				
0	0.0	0	0.0	Front Bumper Corner				0	0.0	0	0.0
				Front of Engine							
				0	0.0	0	0.0				
0	0.0	0	0.0	Firewall				0	0.0	0	0.0
				0	0.0	0	0.0				
0	0.0	0	0.0	Upper Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Bottom of 'A' Post				0	0.0	0	0.0
0	0.0	0	0.0	Upper Trailing Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Trailing Edge of Door				0	0.0	0	0.0
				Steering Column							
				0	0.0	0	0.0				
				Center of Seering Column to 'A' Post (Horizontal)							
				0	0.0	0	0.0				
				Center of Steering Column to Headliner (Vertical)							
				0	0.0	0	0.0				

Vehicle 2 1985 FORD LTD

Test #	1136		
VIN	1FABP3936FA136466	NHTSA Test Vehicle Number	2
Year	1985	Vehicle Modification Indicator	MODIFIED VEHICLE
Make	FORD	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	LTD	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	FOUR DOOR SEDAN		
Engine	V6 INLINE FRONT		
Displacement	3.8 Liter	Transmission	AUTOMATIC - REAR WHEEL DRIVE
Vehicle Modification(s) Description	PADDED DOOR PANEL		
Vehicle Commentary	NO COMMENTS		

Vehicle Length	4966	mm	195.5	inches	CG behind Front Axle	1275	mm	50.2	inches
Vehicle Width	1758	mm	69.2	inches	Center of Damage to CG Axis	-107	mm	-4.2	inches
Vehicle Wheelbase	2680	mm	105.5	inches	Total Length of Indentation	1499	mm	59.0	inches
Vehicle Test Weight	1479	KG	3260	pounds	Maximum Static Crush Depth	404	mm	15.9	inches
					Pre-Impact Speed	0	kph	0.0	mph

Vehicle Damage Index: 03RPEW3

Principal Direction of Force: 90

Damage Profile Distance Measurements

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

DPD 1	267	mm	10.5	inches
DPD 2	338	mm	13.3	inches
DPD 3	401	mm	15.8	inches
DPD 4	404	mm	15.9	inches
DPD 5	312	mm	12.3	inches
DPD 6	163	mm	6.4	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	0.0	inches	0.0	inches	0.0	inches
	0	mm	0	mm	0	mm
Centerline	0.0	inches	0.0	inches	0.0	inches
	0	mm	0	mm	0	mm
Right Bumper Corner	0.0	inches	0.0	inches	0.0	inches
	0	mm	0	mm	0	mm

Bumper Engagement (Inline Impact Only): 0.0

Sill Engagement (Side Impact Only): NOT APPLICABLE

A-pillar Engagement (Side Impact Only): 0.0

Moving Test Cart Angle: NOT APPLICABLE

Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground

Moving Test Cart/Vehicle Crabbed Angle: 0.0

Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle

Vehicle Orientation on Cart Moving Test Cart: NOT APPLICABLE

Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion

Vehicle 2 1985 FORD LTD

Test #	1136		
VIN	1FABP3936FA136466	NHTSA Test Vehicle Number	2
Year	1985	Vehicle Modification Indicator	MODIFIED VEHICLE
Make	FORD	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	LTD	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	FOUR DOOR SEDAN		
Engine	V6 INLINE FRONT		
Displacement	3.8 Liter	Transmission	AUTOMATIC - REAR WHEEL DRIVE
Vehicle Modification(s) Description	PADDED DOOR PANEL		
Vehicle Commentary	NO COMMENTS		

Vehicle Length	4966	mm	195.5	inches	CG behind Front Axle	1275	mm	50.2	inches
Vehicle Width	1758	mm	69.2	inches	Center of Damage to CG Axis	-107	mm	-4.2	inches
Vehicle Wheelbase	2680	mm	105.5	inches	Total Length of Indentation	1499	mm	59.0	inches
Vehicle Test Weight	1479	KG	3260	pounds	Maximum Static Crush Depth	404	mm	15.9	inches
					Pre-Impact Speed	0	kph	0.0	mph

Vehicle Damage Index	03RPEW3	Principal Direction of Force	90

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							
				0	0.0	0	0.0				
				Engine Block							
				0	0.0	0	0.0				
0	0.0	0	0.0	Front Bumper Corner				0	0.0	0	0.0
				Front of Engine							
				0	0.0	0	0.0				
0	0.0	0	0.0	Firewall				0	0.0	0	0.0
				0	0.0	0	0.0				
0	0.0	0	0.0	Upper Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Bottom of 'A' Post				0	0.0	0	0.0
0	0.0	0	0.0	Upper Trailing Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Trailing Edge of Door				0	0.0	0	0.0
				Steering Column							
				0	0.0	0	0.0				
				Center of Seering Column to 'A' Post (Horizontal)							
				0	0.0	0	0.0				
				Center of Steering Column to Headliner (Vertical)							
				0	0.0	0	0.0				

1985 FORD LTD

NHTSA Crash Test - #1136 - Side Impact

Damage Profile Distances - Indention Length - KE Equivalent Speed - Trapezoidal Average

Test Vehicle Weight =	3260 pounds	Impactor Weight =	2083
KE Equivalent Speed =	19.6 MPH	Impactor Test Speed =	31.4
Test Crush Length =	59.0 inches		

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Rear)	10.5	13.3	15.8	15.9	12.3	6.4	(Front)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 6.4 inches					415.0
Using a Rated No Damage Speed of	1.0mph	128.6	373.7	22.1	
Using a Rated No Damage Speed of	2.0mph	243.5	334.6	88.6	
Using a Rated No Damage Speed of	3.0mph	344.4	297.6	199.3	
Using a Rated No Damage Speed of	5.0mph	504.8	230.2	553.5	
Average Crush = 13.1 inches					99.1
Using a Rated No Damage Speed of	1.0mph	62.8	89.2	22.1	
Using a Rated No Damage Speed of	2.0mph	118.9	79.9	88.6	
Using a Rated No Damage Speed of	3.0mph	168.3	71.0	199.3	
Using a Rated No Damage Speed of	5.0mph	246.6	54.9	380.8	
Maximum Crush = 15.9 inches					67.2
Using a Rated No Damage Speed of	1.0mph	51.8	60.6	22.1	
Using a Rated No Damage Speed of	2.0mph	98.0	54.2	88.6	
Using a Rated No Damage Speed of	3.0mph	138.6	48.2	199.3	
Using a Rated No Damage Speed of	5.0mph	203.2	37.3	553.5	

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

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	15.9	28.9	9.3	32.2

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 9.7

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

Available Test Results
Side Impact Test Summary

Report Filter Settings

Year Range: 1983 - 1986
Make: MERCURY
Model: MARQUIS

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	KEES (mph)	Indention Stiffness A	Indention Stiffness B	Length Values G	Length Values Kv	Crush Factor
1096	1985 FORD LTD FOUR DOOR SEDAN	2.0	19.3	23.4	87.1	48.1	78.8	57.5	11.3
852	1985 FORD LTD FOUR DOOR SEDAN	2.0	17.2	23.2	88.9	54.8	72.0	65.7	12.5
851	1985 FORD LTD FOUR DOOR SEDAN	2.0	17.0	23.1	90.0	55.8	72.6	66.9	12.6
1098	1985 FORD LTD FOUR DOOR SEDAN	2.0	18.5	23.3	91.0	52.4	78.9	62.7	11.8
1095	1985 FORD LTD FOUR DOOR SEDAN	2.0	18.3	23.4	92.1	53.8	78.8	64.4	11.9
850	1985 FORD LTD FOUR DOOR SEDAN	2.0	16.4	23.1	92.6	59.4	72.1	71.2	13.0
853	1985 FORD LTD FOUR DOOR SEDAN	2.0	15.5	23.4	98.9	68.3	71.6	81.7	14.1
1094	1985 FORD LTD FOUR DOOR SEDAN	2.0	16.8	23.2	100.0	63.2	79.1	75.7	12.8
883	1985 FORD LTD FOUR DOOR SEDAN	2.0	13.6	23.2	112.5	87.8	72.1	105.1	15.9
849	1985 FORD LTD FOUR DOOR SEDAN	2.0	13.6	23.3	113.5	89.1	72.3	106.7	16.0
1093	1985 FORD LTD FOUR DOOR SEDAN	2.0	14.3	23.0	115.8	84.8	79.1	101.7	14.7
1136	1985 FORD LTD FOUR DOOR SEDAN	2.0	13.1	19.6	118.5	79.3	88.6	98.3	11.7
1135	1985 FORD LTD FOUR DOOR SEDAN	2.0	13.1	19.7	118.7	80.3	87.8	99.4	11.9
1138	1985 FORD LTD FOUR DOOR SEDAN	2.0	12.9	19.6	120.4	82.6	87.7	102.4	12.0
1075	1985 FORD LTD FOUR DOOR SEDAN	2.0	13.9	23.3	121.2	93.0	78.9	111.3	15.7
882	1985 FORD LTD FOUR DOOR SEDAN	2.0	12.6	23.2	121.7	102.5	72.2	122.8	17.1
1163	1985 FORD LTD FOUR DOOR SEDAN	2.0	15.3	23.3	121.9	84.9	87.5	101.7	14.2
1137	1985 FORD LTD FOUR DOOR SEDAN	2.0	12.7	19.7	122.6	85.4	88.1	105.7	12.2
1169	1985 FORD LTD FOUR DOOR SEDAN	2.0	15.1	23.3	123.2	86.8	87.5	103.9	14.3
884	1985 FORD LTD FOUR DOOR SEDAN	2.0	11.9	23.3	127.8	114.6	71.3	137.2	18.3
1171	1985 FORD LTD FOUR DOOR SEDAN	2.0	14.5	23.1	127.8	93.3	87.5	111.8	14.8
1165	1985 FORD LTD FOUR DOOR SEDAN	2.0	12.9	23.2	129.8	107.1	78.6	128.3	16.8
881	1985 FORD LTD FOUR DOOR SEDAN	2.0	11.6	23.2	131.9	120.0	72.4	143.8	18.5
1161	1985 FORD LTD FOUR DOOR SEDAN	2.0	13.6	23.2	137.7	107.5	88.2	128.8	15.9
870	1985 FORD LTD FOUR DOOR SEDAN	2.0	11.1	23.2	137.9	130.8	72.6	156.7	19.2
880	1985 FORD LTD FOUR DOOR SEDAN	2.0	11.0	23.3	139.8	135.0	72.3	161.6	19.7
1097	1985 FORD LTD FOUR DOOR SEDAN	2.0	11.7	23.3	144.0	131.4	78.9	157.2	18.6
1140	1985 FORD LTD FOUR DOOR SEDAN	2.0	10.5	19.7	149.3	125.7	88.7	155.8	14.7
1139	1985 FORD LTD FOUR DOOR SEDAN	2.0	10.2	19.7	153.4	133.2	88.3	165.1	15.2
886	1985 FORD LTD FOUR DOOR SEDAN	2.0	9.3	23.3	165.4	189.6	72.1	226.8	23.4
885	1985 FORD LTD FOUR DOOR SEDAN	2.0	9.3	23.2	166.2	190.1	72.6	227.6	23.3
1134	1985 FORD LTD FOUR DOOR SEDAN	2.0	9.2	19.7	170.6	164.7	88.3	204.1	16.9
1172	1985 FORD LTD FOUR DOOR SEDAN	2.0	9.9	23.1	185.8	197.5	87.4	236.7	21.5
	Average (AVG)				**124.8**	**101.6**	**79.5**	**122.6**	**15.5**
	Minimum (MIN)				**87.1**	**48.1**	**71.3**	**57.5**	**11.3**
	Maximum (MAX)				**185.8**	**197.5**	**88.7**	**236.7**	**23.4**
	Standard Deviation (STDev-sample)				**25.4**	**40.6**	**7.0**	**49.0**	**3.3**
	Number of Tests (n)			**33**					

1985 MERCURY MARQUIS - Side Impact

Curb Weight (pounds):	3001
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3001
Angle Coll Force to Normal (degrees):	29.0
No Damage Speed (mph):	2.0
Energy Crush Depth (inches):	12.61
Damage Length (inches):	112.3
Crush Profile Measurements:	10

PDOF

Lever Arm Distance (inches):	77.00
Yaw Moment of Inertia (lb-ft-sec^2)	1885.03

"Known" Stifness Values

	A	B
Average	124.8	101.6
Minimum	87.1	48.1
Maximum	185.8	197.5
Std. Devation	25.4	40.6

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00						
C2 (inches)	9.46	17.56	83.06	3.15	261.91	11.71	972.34
C3 (inches)	16.07	17.56	224.15	6.53	1462.63	27.10	6074.05
C4 (inches)	19.41	9.84	174.56	8.90	1552.94	24.75	4321.17
C5 (inches)	24.22	5.18	113.00	10.95	1237.56	18.23	2059.48
C6 (inches)	24.03	16.96	409.16	12.06	4935.52	76.31	31222.54
C7 (inches)	14.61	5.33	102.98	9.85	1014.45	29.10	2996.43
C8 (inches)	14.61	3.35	48.94	7.31	357.53	21.78	1065.74
C9 (inches)	8.53	14.28	165.22	5.92	977.79	106.47	17591.70
C10 (inches)	0.00	22.22	94.77	2.84	269.46	185.17	17547.93

Average Crush (inches): 12.61

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	87.1	48.1	44523.13	77643.64	27.9	15.2	57.2
Avg - 2 Std. Deviations	74.0	20.4	21261.76	39878.54	20.0	11.1	41.7
Avg - 1 Std. Deviations	99.4	61.0	55753.96	96528.48	31.1	16.9	63.5
Average	124.8	101.6	90246.16	153776.45	39.2	21.1	79.5
Avg + 1 Std. Deviations	150.2	142.2	124738.36	211110.20	45.9	24.7	92.8
Avg + 2 Std. Deviations	175.6	182.8	159230.56	268472.59	51.8	27.8	104.4
Maximum	185.8	197.5	171783.53	289411.64	53.8	28.8	108.3

Damage Centroid Depth (x) (inches)	8.52	k^2	2912.53
Damage Centroid Depth (y) (inches)	59.22	Eff. Mass Ratio (gamma)	0.33
Area of Damage (inches^2):	1415.84		

2008 FORD POLICE INTERCEPTOR (3.55) MSP POLICE PKG - Front Impact

Curb Weight (pounds):	4128
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	4128
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	1.00
Damage Length (inches):	78.0
Crush Profile Measurements:	2

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	3045.84

		Equal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	1.00	78.00	78.00	0.50	39.00	39.00	3042.00
C2 (inches)	1.00						
C3 (inches)							
C4 (inches)							
C5 (inches)							
C6 (inches)							
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 1.00

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	691.4	450.2	44523.13	9407.99	8.3	11.0	57.3
Avg - 2 Std. Deviations	396.8	148.3	21261.76	6512.26	6.9	8.1	32.9
Avg - 1 Std. Deviations	810.7	618.9	55753.96	10731.48	8.8	12.3	67.2
Average	1124.0	1190.0	90246.16	14624.32	10.3	15.4	93.2
Avg + 1 Std. Deviations	1386.9	1811.5	124738.36	18352.89	11.5	17.9	114.9
Avg + 2 Std. Deviations	1617.8	2465.0	159230.56	21977.74	12.6	20.2	134.1
Maximum	1695.9	2708.8	171783.53	23277.67	13.0	20.9	140.6

Damage Centroid Depth (x) (inches)	0.50	k^2	3421.26
Damage Centroid Depth (y) (inches)	39.00	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	78.00		

1985 MERCURY MARQUIS - Side Impact

Curb Weight (pounds):	3001
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3001
Angle Coll Force to Normal (degrees):	29.0
No Damage Speed (mph):	2.0
Energy Crush Depth (inches):	12.61
Damage Length (inches):	112.3
Crush Profile Measurements:	10

PDOF

Lever Arm Distance (inches):	77.00
Yaw Moment of Inertia (lb-ft-sec^2)	1885.03

"Known" Stifness Values

	A	B
Average	124.8	101.6
Minimum	87.1	48.1
Maximum	185.8	197.5
Std. Devation	25.4	40.6

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00						
C2 (inches)	9.46	17.56	83.06	3.15	261.91	11.71	972.34
C3 (inches)	16.07	17.56	224.15	6.53	1462.63	27.10	6074.05
C4 (inches)	19.41	9.84	174.56	8.90	1552.94	24.75	4321.17
C5 (inches)	24.22	5.18	113.00	10.95	1237.56	18.23	2059.48
C6 (inches)	24.03	16.96	409.16	12.06	4935.52	76.31	31222.54
C7 (inches)	14.61	5.33	102.98	9.85	1014.45	29.10	2996.43
C8 (inches)	14.61	3.35	48.94	7.31	357.53	21.78	1065.74
C9 (inches)	8.53	14.28	165.22	5.92	977.79	106.47	17591.70
C10 (inches)	0.00	22.22	94.77	2.84	269.46	185.17	17547.93

Average Crush (inches): 12.61

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	87.1	48.1	44523.13	77643.64	27.9	16.4	61.7
Avg - 2 Std. Deviations	74.0	20.4	21261.76	39878.54	20.0	12.0	45.0
Avg - 1 Std. Deviations	99.4	61.0	55753.96	96528.48	31.1	18.2	68.5
Average	124.8	101.6	90246.16	153776.45	39.2	22.8	85.8
Avg + 1 Std. Deviations	150.2	142.2	124738.36	211110.20	45.9	26.6	100.0
Avg + 2 Std. Deviations	175.6	182.8	159230.56	268472.59	51.8	29.9	112.5
Maximum	185.8	197.5	171783.53	289411.64	53.8	31.0	116.7

Damage Centroid Depth (x) (inches)	8.52	k^2	2912.53
Damage Centroid Depth (y) (inches)	59.22	Eff. Mass Ratio (gamma)	0.33
Area of Damage (inches^2):	1415.84		

2008 FORD POLICE INTERCEPTOR (3.55) MSP POLICE PKG - Front Impact

Curb Weight (pounds):	4128
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	4128
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	4.00
Damage Length (inches):	78.0
Crush Profile Measurements:	2

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	3045.84

		Equal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	4.00	78.00	312.00	2.00	624.00	39.00	12168.00
C2 (inches)	4.00						
C3 (inches)							
C4 (inches)							
C5 (inches)							
C6 (inches)							
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 4.00

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	433.5	177.0	44523.13	23927.69	13.2	11.9	35.9
Avg - 2 Std. Deviations	270.2	68.7	21261.76	14050.23	10.1	8.7	22.4
Avg - 1 Std. Deviations	497.4	233.0	55753.96	28501.87	14.4	13.2	41.2
Average	662.2	413.0	90246.16	42140.88	17.5	16.6	54.9
Avg + 1 Std. Deviations	798.2	600.1	124738.36	55406.65	20.1	19.3	66.2
Avg + 2 Std. Deviations	916.7	791.5	159230.56	68445.11	22.3	21.7	76.0
Maximum	956.7	862.0	171783.53	73148.71	23.1	22.5	79.3

Damage Centroid Depth (x) (inches)	2.00	k^2	3421.26
Damage Centroid Depth (y) (inches)	39.00	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	312.00		

Available Test Results
Side Impact Test Summary

Report Filter Settings

Year Range: 1983 - 1986
Make: MERCURY
Model: MARQUIS

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	KEES (mph)	Indention Stiffness A	Indention Stiffness B	Length Values G	Length Values Kv	Crush Factor
854	1985 FORD LTD FOUR DOOR SEDAN	2.0	21.3	23.3	71.5	35.7	71.6	42.7	10.2
1095	1985 FORD LTD FOUR DOOR SEDAN	2.0	23.5	23.4	71.6	32.5	78.8	38.9	9.3
1098	1985 FORD LTD FOUR DOOR SEDAN	2.0	23.5	23.3	71.7	32.6	78.9	39.0	9.3
1094	1985 FORD LTD FOUR DOOR SEDAN	2.0	22.6	23.2	74.2	34.8	79.1	41.7	9.5
852	1985 FORD LTD FOUR DOOR SEDAN	2.0	20.0	23.2	76.3	40.4	72.0	48.4	10.8
850	1985 FORD LTD FOUR DOOR SEDAN	2.0	19.9	23.1	76.4	40.5	72.1	48.6	10.7
851	1985 FORD LTD FOUR DOOR SEDAN	2.0	20.0	23.1	76.7	40.5	72.6	48.5	10.7
853	1985 FORD LTD FOUR DOOR SEDAN	2.0	17.7	23.4	86.3	52.1	71.6	62.3	12.3
1093	1985 FORD LTD FOUR DOOR SEDAN	2.0	18.6	23.0	89.3	50.4	79.1	60.5	11.4
1137	1985 FORD LTD FOUR DOOR SEDAN	2.0	16.7	19.7	93.4	49.5	88.1	61.4	9.3
1169	1985 FORD LTD FOUR DOOR SEDAN	2.0	19.8	23.3	93.9	50.4	87.5	60.4	10.9
849	1985 FORD LTD FOUR DOOR SEDAN	2.0	16.3	23.3	94.4	61.6	72.3	73.7	13.3
1135	1985 FORD LTD FOUR DOOR SEDAN	2.0	16.3	19.7	95.5	51.9	87.8	64.3	9.5
1163	1985 FORD LTD FOUR DOOR SEDAN	2.0	19.5	23.3	95.5	52.1	87.5	62.3	11.1
1138	1985 FORD LTD FOUR DOOR SEDAN	2.0	16.2	19.6	95.7	52.2	87.7	64.7	9.5
883	1985 FORD LTD FOUR DOOR SEDAN	2.0	15.9	23.2	96.1	64.1	72.1	76.7	13.5
1171	1985 FORD LTD FOUR DOOR SEDAN	2.0	18.9	23.1	97.8	54.7	87.5	65.5	11.3
1136	1985 FORD LTD FOUR DOOR SEDAN	2.0	15.9	19.6	98.0	54.2	88.6	67.2	9.7
1075	1985 FORD LTD FOUR DOOR SEDAN	2.0	16.5	23.3	102.1	66.0	78.9	79.0	13.2
1165	1985 FORD LTD FOUR DOOR SEDAN	2.0	16.3	23.2	102.4	66.6	78.6	79.8	13.2
882	1985 FORD LTD FOUR DOOR SEDAN	2.0	14.7	23.2	104.2	75.2	72.2	90.1	14.7
1161	1985 FORD LTD FOUR DOOR SEDAN	2.0	17.7	23.2	105.6	63.2	88.2	75.7	12.2
880	1985 FORD LTD FOUR DOOR SEDAN	2.0	14.4	23.3	106.8	78.8	72.3	94.4	15.0
870	1985 FORD LTD FOUR DOOR SEDAN	2.0	14.3	23.2	107.6	79.6	72.6	95.4	15.0
886	1985 FORD LTD FOUR DOOR SEDAN	2.0	14.0	23.3	109.6	83.2	72.1	99.6	15.5
884	1985 FORD LTD FOUR DOOR SEDAN	2.0	13.8	23.3	109.8	84.5	71.3	101.1	15.7
1140	1985 FORD LTD FOUR DOOR SEDAN	2.0	13.8	19.7	113.3	72.4	88.7	89.8	11.2
1139	1985 FORD LTD FOUR DOOR SEDAN	2.0	13.5	19.7	115.6	75.7	88.3	93.8	11.5
881	1985 FORD LTD FOUR DOOR SEDAN	2.0	13.2	23.2	116.3	93.4	72.4	111.9	16.3
1097	1985 FORD LTD FOUR DOOR SEDAN	2.0	14.2	23.3	118.6	89.1	78.9	106.5	15.3
885	1985 FORD LTD FOUR DOOR SEDAN	2.0	12.7	23.2	121.4	101.4	72.6	121.4	17.0
1172	1985 FORD LTD FOUR DOOR SEDAN	2.0	14.6	23.1	126.4	91.4	87.4	109.6	14.7
1134	1985 FORD LTD FOUR DOOR SEDAN	2.0	11.9	19.7	131.4	97.7	88.3	121.1	13.0
	Average (AVG)				**98.3**	**62.7**	**79.3**	**75.6**	**12.3**
	Minimum (MIN)				**71.5**	**32.5**	**71.3**	**38.9**	**9.3**
	Maximum (MAX)				**131.4**	**101.4**	**88.7**	**121.4**	**17.0**
	Standard Deviation (STDev-sample)				**16.5**	**20.1**	**7.1**	**24.3**	**2.3**
	Number of Tests (n)			**33**					

1985 MERCURY MARQUIS - Side Impact

Curb Weight (pounds):	3001
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3001
Angle Coll Force to Normal (degrees):	29.0
No Damage Speed (mph):	2.0
Energy Crush Depth (inches):	12.61
Damage Length (inches):	112.3
Crush Profile Measurements:	10

PDOF

Lever Arm Distance (inches):	77.00
Yaw Moment of Inertia (lb-ft-sec^2)	1885.03

"Known" Stifness Values

	A	B
Average	98.3	62.7
Minimum	71.5	32.5
Maximum	131.4	101.4
Std. Devation	16.5	20.1

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00						
C2 (inches)	9.46	17.56	83.06	3.15	261.91	11.71	972.34
C3 (inches)	16.07	17.56	224.15	6.53	1462.63	27.10	6074.05
C4 (inches)	19.41	9.84	174.56	8.90	1552.94	24.75	4321.17
C5 (inches)	24.22	5.18	113.00	10.95	1237.56	18.23	2059.48
C6 (inches)	24.03	16.96	409.16	12.06	4935.52	76.31	31222.54
C7 (inches)	14.61	5.33	102.98	9.85	1014.45	29.10	2996.43
C8 (inches)	14.61	3.35	48.94	7.31	357.53	21.78	1065.74
C9 (inches)	8.53	14.28	165.22	5.92	977.79	106.47	17591.70
C10 (inches)	0.00	22.22	94.77	2.84	269.46	185.17	17547.93

Average Crush (inches): 12.61

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	71.5	32.5	30895.09	54723.10	23.4	12.9	48.4
Avg - 2 Std. Deviations	65.3	22.5	22403.07	40815.23	20.2	11.2	42.2
Avg - 1 Std. Deviations	81.8	42.6	39731.21	69590.46	26.4	14.4	54.3
Average	98.3	62.7	57059.34	98546.01	31.4	17.0	64.1
Avg + 1 Std. Deviations	114.8	82.8	74387.47	127550.57	35.7	19.3	72.6
Avg + 2 Std. Deviations	131.3	102.9	91715.61	156575.42	39.6	21.3	80.2
Maximum	131.4	101.4	90507.92	154635.29	39.3	21.2	79.7

Damage Centroid Depth (x) (inches)	8.52	k^2	2912.53
Damage Centroid Depth (y) (inches)	59.22	Eff. Mass Ratio (gamma)	0.33
Area of Damage (inches^2):	1415.84		

2008 FORD POLICE INTERCEPTOR (3.55) MSP POLICE PKG - Front Impact

Curb Weight (pounds):	4128
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	4128
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	1.00
Damage Length (inches):	78.0
Crush Profile Measurements:	2

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	3045.84

		Equal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	1.00	78.00	78.00	0.50	39.00	39.00	3042.00
C2 (inches)	1.00						
C3 (inches)							
C4 (inches)							
C5 (inches)							
C6 (inches)							
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 1.00

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	528.8	263.4	30895.09	7743.91	7.5	9.4	43.8
Avg - 2 Std. Deviations	413.4	161.0	22403.07	6661.31	7.0	8.2	34.3
Avg - 1 Std. Deviations	636.8	381.9	39731.21	8831.26	8.0	10.5	52.8
Average	823.8	639.2	57059.34	10883.10	8.9	12.4	68.3
Avg + 1 Std. Deviations	988.0	919.4	74387.47	12860.65	9.7	14.0	81.9
Avg + 2 Std. Deviations	1136.1	1215.6	91715.61	14785.91	10.4	15.5	94.2
Maximum	1126.2	1194.5	90507.92	14653.13	10.3	15.4	93.3

Damage Centroid Depth (x) (inches)	0.50	k^2	3421.26
Damage Centroid Depth (y) (inches)	39.00	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	78.00		

1985 MERCURY MARQUIS - Side Impact

Curb Weight (pounds):	3001
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3001
Angle Coll Force to Normal (degrees):	29.0
No Damage Speed (mph):	2.0
Energy Crush Depth (inches):	12.61
Damage Length (inches):	112.3
Crush Profile Measurements:	10

PDOF

Lever Arm Distance (inches):	77.00
Yaw Moment of Inertia (lb-ft-sec^2)	1885.03

"Known" Stifness Values

	A	B
Average	98.3	62.7
Minimum	71.5	32.5
Maximum	131.4	101.4
Std. Devation	16.5	20.1

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	0.00						
C2 (inches)	9.46	17.56	83.06	3.15	261.91	11.71	972.34
C3 (inches)	16.07	17.56	224.15	6.53	1462.63	27.10	6074.05
C4 (inches)	19.41	9.84	174.56	8.90	1552.94	24.75	4321.17
C5 (inches)	24.22	5.18	113.00	10.95	1237.56	18.23	2059.48
C6 (inches)	24.03	16.96	409.16	12.06	4935.52	76.31	31222.54
C7 (inches)	14.61	5.33	102.98	9.85	1014.45	29.10	2996.43
C8 (inches)	14.61	3.35	48.94	7.31	357.53	21.78	1065.74
C9 (inches)	8.53	14.28	165.22	5.92	977.79	106.47	17591.70
C10 (inches)	0.00	22.22	94.77	2.84	269.46	185.17	17547.93

Average Crush (inches): 12.61

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	71.5	32.5	30895.09	54723.10	23.4	13.9	52.3
Avg - 2 Std. Deviations	65.3	22.5	22403.07	40815.23	20.2	12.1	45.6
Avg - 1 Std. Deviations	81.8	42.6	39731.21	69590.46	26.4	15.6	58.6
Average	98.3	62.7	57059.34	98546.01	31.4	18.4	69.2
Avg + 1 Std. Deviations	114.8	82.8	74387.47	127550.57	35.7	20.8	78.3
Avg + 2 Std. Deviations	131.3	102.9	91715.61	156575.42	39.6	23.0	86.5
Maximum	131.4	101.4	90507.92	154635.29	39.3	22.8	86.0

Damage Centroid Depth (x) (inches)	8.52	k^2	2912.53
Damage Centroid Depth (y) (inches)	59.22	Eff. Mass Ratio (gamma)	0.33
Area of Damage (inches^2):	1415.84		

2008 FORD POLICE INTERCEPTOR (3.55) MSP POLICE PKG - Front Impact

Curb Weight (pounds):	4128
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	4128
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	4.00
Damage Length (inches):	78.0
Crush Profile Measurements:	2

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	3045.84

		Equal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	4.00	78.00	312.00	2.00	624.00	39.00	12168.00
C2 (inches)	4.00						
C3 (inches)							
C4 (inches)							
C5 (inches)							
C6 (inches)							
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 4.00

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	344.7	111.9	30895.09	18229.62	11.5	10.1	28.6
Avg - 2 Std. Deviations	279.7	73.7	22403.07	14554.53	10.3	8.8	23.2
Avg - 1 Std. Deviations	404.0	153.7	39731.21	21945.97	12.6	11.3	33.5
Average	504.4	239.7	57059.34	29028.14	14.5	13.4	41.8
Avg + 1 Std. Deviations	591.1	329.1	74387.47	35930.72	16.2	15.1	49.0
Avg + 2 Std. Deviations	668.4	420.8	91715.61	42712.16	17.6	16.7	55.4
Maximum	663.3	414.4	90507.92	42242.69	17.5	16.6	55.0

Damage Centroid Depth (x) (inches)	2.00	k^2	3421.26
Damage Centroid Depth (y) (inches)	39.00	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	312.00		

4N6XPRT Systems
Expert System Software for Litigation

8387 University Avenue
La Mesa, CA 91942

Phone: (619) 464-3478
Fax: (619) 464-2206
Toll Free: 1- 800-266-9778

Web Site: http://www.4n6xprt.com

E-Mail: 4n6@4n6xprt.com

Dear Conference Attendee,

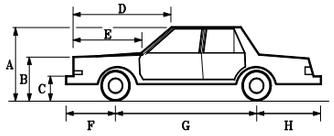
We at 4N6XPRT Systems were pleased to be able to provide you with the preceding data for the crash test vehicles.

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 40,000 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.

********** | PARTIAL OUTPUT | **********

2001 FORD CROWN VICTORIA 4DR SEDAN

[HORIZONTAL DIMENSIONS]

LENGTH	212 in.
WHEELBASE	115 in.
FRONT BUMPER TO FRONT AXLE	44 in.
FRONT BUMPER TO FRONT OF HOOD	8 in.
FRONT BUMPER TO BASE OF WINDSHIELD	66 in.
FRONT BUMPER TO TOP OF WINDSHIELD	91 in.
FRONT BUMPER TO FRONT WELL	27 in.
REAR BUMPER TO REAR OF TRUNK	8 in.
REAR BUMPER TO BASE OF REAR WINDOW	39 in.
REAR BUMPER TO REAR WELL	37 in.
REAR BUMPER TO REAR AXLE	53 in.

[VERTICAL DIMENSIONS]

HEIGHT	57 in.
GROUND TO:	
FRONT BUMPER (Top)	23 in.
HEADLIGHT - Center	27 in.
HOOD - Top Front	26 in.
BASE OF WINDSHIELD	38 in.
REAR BUMPER (Top)	26 in.
TRUNK - Top Rear	40 in.
BASE OF REAR WINDOW	40 in.

[DEPTH DIMENSIONS]

WIDTH	78 in.
FRONT TRACK	63 in.
REAR TRACK	64 in.

[WEIGHT DIMENSIONS]

CURB WEIGHT	3920 lbs.
Curb Weight Distribution:	
FRONT = 55%	REAR = 45%
GROSS VEHICLE WEIGHT	5170 lbs.

EXPERT AUTOSTATS(c) Reg.To:4N6XPRT Systems S/N:01R-930512AQ03201

2001 FORD CROWN VICTORIA 4DR SEDAN

[ACCELERATION/BRAKING]

ACCELERATION 0-30 mph	16.9 ft/sec/sec
ACCELERATION 0-60 mph	11.1 ft/sec/sec
ACCELERATION 45-65 mph	6.8 ft/sec/sec
BRAKING 60-0 mph	133 ft
DRIVE WHEELS	REAR
TURNING CIRCLE (DIAMETER)	41 ft.
NUMBER OF WHEELS	4
WHEEL RADIUS	13 in.
TIRE SIZE	P225/60SR16

BUMPER STRENGTH:	5 mph
STEERING RATIO	16.40:1

[INTERIOR DIMENSIONS]

FRONT SHOULDER ROOM	61 in.
FRONT HEAD ROOM	39 in.
FRONT LEG ROOM	43 in.
REAR SHOULDER ROOM	60 in.
REAR HEAD ROOM	38 in.
REAR LEG ROOM	40 in.

ALL DISC - REAR ABS - OPTIONAL
3pt - front and rear, FRONT SEAT AIRBAGS
4spd AUTOMATIC

N.S.D.C. = 1998 - 2001
---- = Value not in Database

EXPERT AUTOSTATS(c) Reg.To:4N6XPRT Systems S/N:01R-930512AQ03201

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.

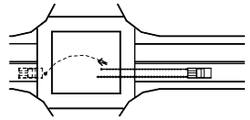
Expert VIN DeCoder®

3FAPP1280MR117253

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.

Expert Qwic Calcs®

>>>Calculate Time given D & V<<<
Enter Distance (in feet) : 45
Enter Velocity (in mph) : 6

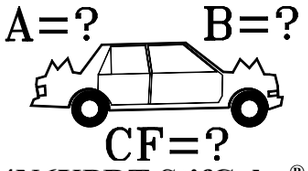
Expert Qwic Calcs® quickly provides answers to questions important in vehicle collision litigation. The user inputs data in response to relevant questions, Expert Qwic Clacs® performs the mathematical calculations required. Both the input data and the calculated result are then displayed, and may be "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 addition to the NHTSA Crash Test data, the program includes a "Sister/Clone List Reader" developed in cooperation with Greg Anderson. This allows quick retrieval of the "Sister/Clone" data for the desired vehicle. This will drive the initial selection of the available tests. Alternatively, we have an ADVANCED SEARCH module for the initial vehicle selection.

STIFFNESS DATA, based on the selected test, is automatically calculated based on the reported crush depths and widths for front, side, and rear tests.

To use the program, follow this "Yellow Brick Road":

1) Sister/Clone Reader -

(a) - Select YEAR (b) - Select Manufacturer
(c) - Select Model

▼

2) Click on TEST SELECTION Tab

▼

3) Select a test from the available tests which are displayed

▼

4) View TEST INFORMATION

▼

5) View OCCUPANT DATA

▼

6) View VEHICLE DATA

▼

7) View STIFFNESS CALCS

▼

8) Click on Reports - PRINT REPORT

IT'S THAT SIMPLE .... REALLY!!

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)

Authorized signature: _____

PROGRAM ORDER FORM:

(Pricing effective as of 5/20/11 - prices subject to change without notice)

Expert AutoStats®:	$ 595.00 *	$_____
4N6XPRT BioMeknx™:	$ 495.00 *	$_____
4N6XPRT Ped & Bike Calcs®:	$ 375.00 *	$_____
Expert Qwic Calcs®:	$ 275.00 *	$_____
Expert TireStuf®:	$ 85.00 *	$_____
4N6XPRT StifCalcs®:	$ 600.00 *	$_____
Expert VIN DeCoder®:	$ 525.00 *	$_____
	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 **9.50%** 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:_____

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 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 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 $525.00 . . . . . = $_____
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)

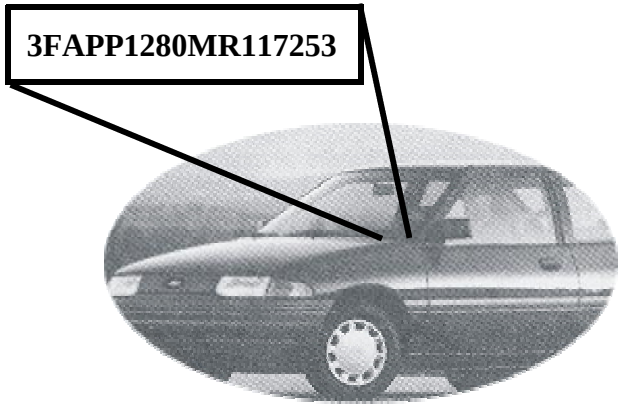
Normal delivery is via electronic download
☐ - Deliver via electronic download link (e-mail address required) $ 0.00
☐ Please deliver on USB at an
additional cost of $35.00 per disk $_____
SUB-TOTAL = $_____
CA Addresses add 9.50% sales tax . . . . = $_____
*(California orders delivered by e-mail attachment **DO NOT** owe sales tax)*
TOTAL = $_____

Enclosed is:
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: _____

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 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 40,000 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 600 private and 250 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.

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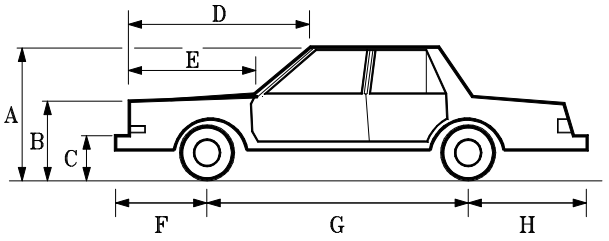
Expert AutoStats®



Over 40,000 cars, pick-ups, vans, and utility vehicles 1940's to the present are represented.

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1-800-266-9778

Select Your Vehicle

```
MAKE OF VEHICLE:      FORD
YEAR OF VEHICLE:      2001
BODYSTYLE OF VEHICLE: CAR

More than one model matches the make, year, and body style you specified.
Select the actual model from the list.  Use the arrow keys to highlight the
model, then press Enter.  Press Esc to return to the list of manufacturers.
(You can also begin typing the name of the model to jump directly to it.)

[ ** AVAILABLE MODELS - 2001 FORD ** ]   [ WB(in)  OAL(in) ]
CROWN VICTORIA                4DR SEDAN     115     212
CROWN VICTORIA (CNG) MSP PACKAG 4DR SEDAN   115     212
CROWN VICTORIA 4.6L MSP POLICE PACKAGE 4DR SEDAN 115 212
CROWN VICTORIA EXTENDED       4DR SEDAN     121     218
ESCORT                        4DR SEDAN      98     175
ESCORT ZX2                    2DR COUPE      98     175
FOCUS                         4DR SEDAN     103     175
FOCUS                         4DR WAGON     103     178
FOCUS ZX3                     2DR HATCHBACK 103     168
MUSTANG                       2DR CONVERTIBLE 101   183
MUSTANG                       2DR COUPE     101     183
MUSTANG COBRA                 2DR CONVERTIBLE 101   183
MUSTANG COBRA                 2DR COUPE     101     183
```

After typing in the Make, Year, and Type of vehicle, you are presented with the vehicles which are available for that year.

Screen 1

```
2001 FORD CROWN VICTORIA 4.6L MSP POLICE PACKAGE  4DR SEDAN

[ HORIZONTAL DIMENSIONS ]                [ VERTICAL DIMENSIONS ]
LENGTH                          212 in.  | HEIGHT                    57 in.
WHEELBASE                       115 in.  | GROUND TO:
FRONT BUMPER TO FRONT AXLE       44 in.  |  FRONT BUMPER (Top)       23 in.
FRONT BUMPER TO FRONT OF HOOD     8 in.  |  HEADLIGHT - Center       27 in.
FRONT BUMPER TO BASE OF WINDSHIELD 66 in. |  HOOD - Top Front         29 in.
FRONT BUMPER TO TOP OF WINDSHIELD 91 in. |  BASE OF WINDSHIELD       38 in.
FRONT BUMPER TO FRONT WELL       27 in.  |  REAR BUMPER (Top)        26 in.
REAR BUMPER TO REAR OF TRUNK      8 in.  |  TRUNK - Top Rear         40 in.
REAR BUMPER TO BASE OF REAR WINDOW 39 in. |  BASE OF REAR WINDOW      40 in.
REAR BUMPER TO REAR WELL         37 in.  |
REAR BUMPER TO REAR AXLE         53 in.  |----[ WEIGHT DIMENSIONS ]------
                                         | CURB WEIGHT             4020 lbs.
[ DEPTH DIMENSIONS ]-------------------- | Curb Weight Distribution:
WIDTH                            78 in.  |      FRONT = 55%   REAR = 45%
FRONT TRACK                      63 in.  |
REAR TRACK                       64 in.  | GROSS VEHICLE WEIGHT  5170 lbs.

          P)rint this screen,      ANY OTHER KEY = Continue
```

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

```
2001 FORD CROWN VICTORIA 4.6L MSP POLICE PACKAGE  4DR SEDAN

[ ACCELERATION/BRAKING ]---------  BUMPER STRENGTH:          5 mph
ACCELERATION 0-30 mph   13.8 ft/sec/sec  STEERING RATIO      16.40:1
ACCELERATION 0-60 mph   10.1 ft/sec/sec
ACCELERATION 45-65 mph   6.7 ft/sec/sec [ INTERIOR DIMENSIONS ]-----
BRAKING 60-0 mph       145   ft         FRONT SHOULDER ROOM     61 in.
                                        FRONT HEAD ROOM         39 in.
DRIVE WHEELS                REAR        FRONT LEG ROOM          43 in.
TURNING CIRCLE (DIAMETER)     41 ft.    REAR SHOULDER ROOM      60 in.
NUMBER OF WHEELS               4        REAR HEAD ROOM          38 in.
WHEEL RADIUS                  13 in.    REAR LEG ROOM           40 in.
TIRE SIZE              P225/60R16

ALL DISC - ALL WHEEL ABS
3pt - front and rear, FRONT SEAT AIRBAGS
4spd AUTOMATIC

N.S.D.C. = 2001 - 2001
___ = Value not in Database

   B)ack a screen,      P)rint this screen,      ANY OTHER KEY = Continue
```

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

```
2001 FORD CROWN VICTORIA 4.6L MSP POLICE PACKAGE  4DR SEDAN

[ ANGLE MEASUREMENTS ]
ANGLE FRONT BUMPER TO HOOD FRONT          =  36.9   deg
ANGLE FRONT OF HOOD TO WINDSHIELD BASE    =   8.8   deg
ANGLE FRONT OF HOOD TO WINDSHIELD TOP     =  17.4   deg
ANGLE OF WINDSHIELD                       =  34.2   deg
ANGLE OF STEERING TIRES AT MAX TURN       =  26.8   deg
[ CENTER OF GRAVITY ]
Inches from ground        =  22.37 | Inches from side of vehicle  =  39.00
Inches behind front axle  =  51.75 | Inches in front of rear axle =  63.25
Inches from front bumper  =  95.75 | Inches from rear bumper      = 116.25
Inches from front corner  = 103.39 | Inches from rear corner      = 122.62

TIP-OVER STABILITY RATIO                  =  1.42    STABLE
NHTSA Static Stability Factor (calculated) Star Rating:   ****
[ MOMENTS OF INERTIA ]
YAW MOMENT OF INERTIA                     =  2934.60  lb-ft-sec^2
PITCH MOMENT OF INERTIA                   =  2830.80  lb-ft-sec^2
ROLL MOMENT OF INERTIA                    =   573.60  lb-ft-sec^2

   B)ack a screen,      P)rint this screen,      ANY OTHER KEY = Continue
```

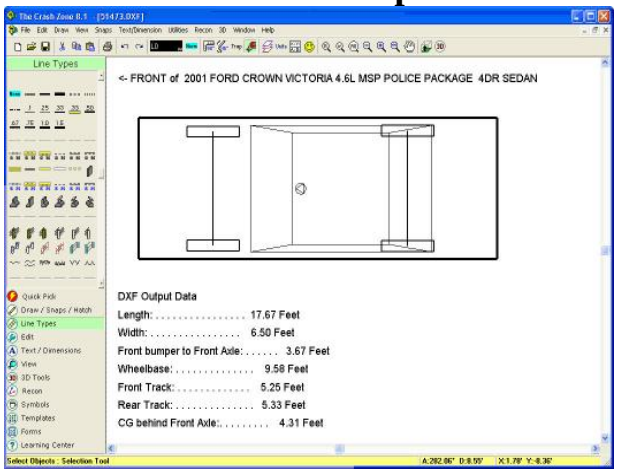
The third and last screen contains a number of calculated items of information which may be of use depending upon the type of case, the other software that you use, and the questions which need to be answered.

Screen 4

```
2001 FORD CROWN VICTORIA 4.6L MSP POLICE PACKAGE  4DR SEDAN

[ ANGLE MEASUREMENTS ]
ANGLE FRONT BUMPER TO HOOD FRONT          =  36.9   deg
ANGLE FRONT OF HOOD TO WINDSHIELD BASE    =   8.8   deg
ANGLE FRONT OF HOOD TO WINDSHIELD TOP     =  17.4   deg
ANGLE OF WINDSHIELD                       =  34.2   deg
ANGLE OF STEERING TIRES AT MAX TURN       =  26.8   deg
[ CENTER OF GRAVITY ]
Inches from ground        =  22.37 | Inches from side of vehicle  =  39.00
Inches behind front axle  =  51.75 | Inches in front of rear axle =  63.25
Inches from front bumper  =  95.75 | Inches from rear bumper      = 116.25
Inches from front corner  = 103.39 | Inches from rear corner      = 122.62

TIP-OVER STABILITY RATIO                  =  1.42    STABLE
NHTSA Static Stability Factor (calculated) Star Rating:   ****
[ MOMENTS OF INERTIA ]
YAW MOMENT OF INERTIA                     =  2934.60  lb-ft-sec^2
PITCH MOMENT OF INERTIA                   =  2830.80  lb-ft-sec^2
ROLL MOMENT OF INERTIA                    =   573.60  lb-ft-sec^2

N)ext Car, Print to - P)rinter or to File, E)xchange File, D)XF File, Q)uit
```

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®

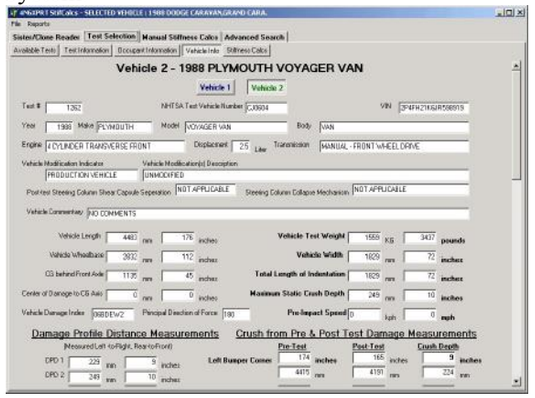
Introducing ..... 4N6XPRT StifCalcs®. A program which puts the NHTSA Crash Test database at your fingertips with no need to access the internet!

In addition to the NHTSA Crash Test data, the program includes a "Sister/Clone List Reader" developed in cooperation with Greg Anderson. This allows quick retrieval of the "Sister/Clone" data for the desired vehicle. This will drive the initial selection of the available tests. Alternatively, we have an ADVANCED SEARCH module for the initial vehicle selection.

STIFFNESS DATA, based on the selected test, is automatically calculated based on the reported crush depths and widths for front, side, and rear tests.

SYSTEM REQUIREMENTS

4N6XPRT StifCalcs® is a MS-Windows program designed to work under a 32 bit (95/98/Me/NT/ 2000/XP/Vista) Windows System.



To use the program, follow this "Yellow Brick Road":

1) Sister/Clone Reader -
(a) - Select YEAR
(b) - Select Manufacturer
(c) - Select Model

▼

2) Click on TEST SELECTION Tab

▼

3) Select a test from the available tests which are displayed

▼

4) View TEST INFORMATION

▼

5) View OCCUPANT DATA

▼

6) View VEHICLE DATA

▼

7) View STIFFNESS CALCS

▼

8) Click on Reports - PRINT REPORT

IT'S THAT SIMPLE .... <u>REALLY!!</u>

PLEASE PRINT

Contact Name: _____
Company/Dept: _____
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City:State:Zip: _____
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StifCalcs®_____ (copies) x $600.00 . . = $_____
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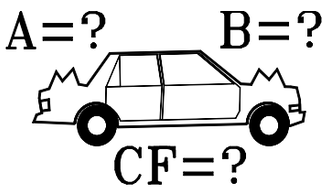

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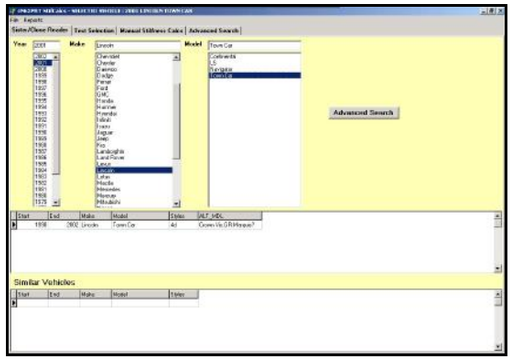
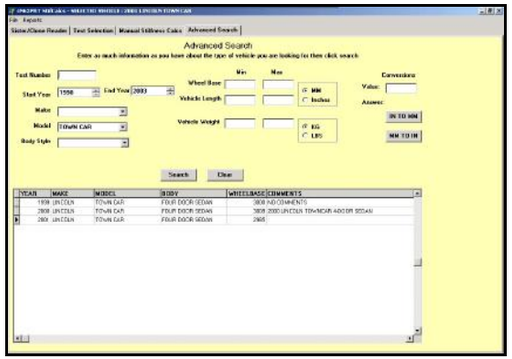
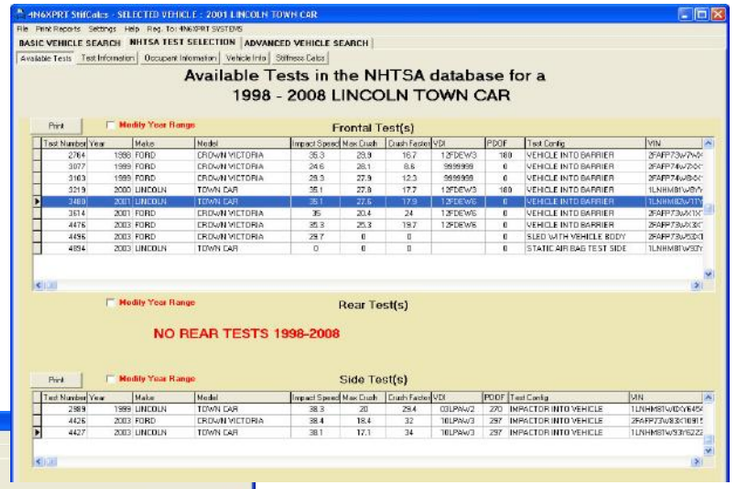
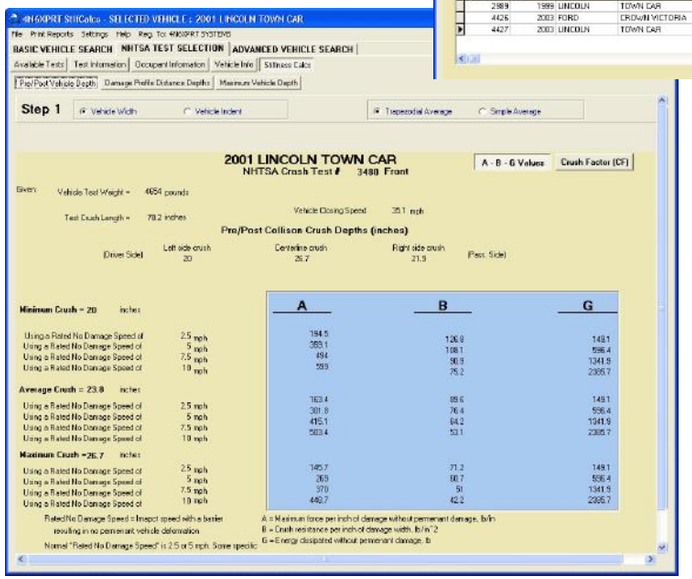
Select the desired vehicle through either our SISTER/CLONE READER or our ADVANCED SEARCH tab.



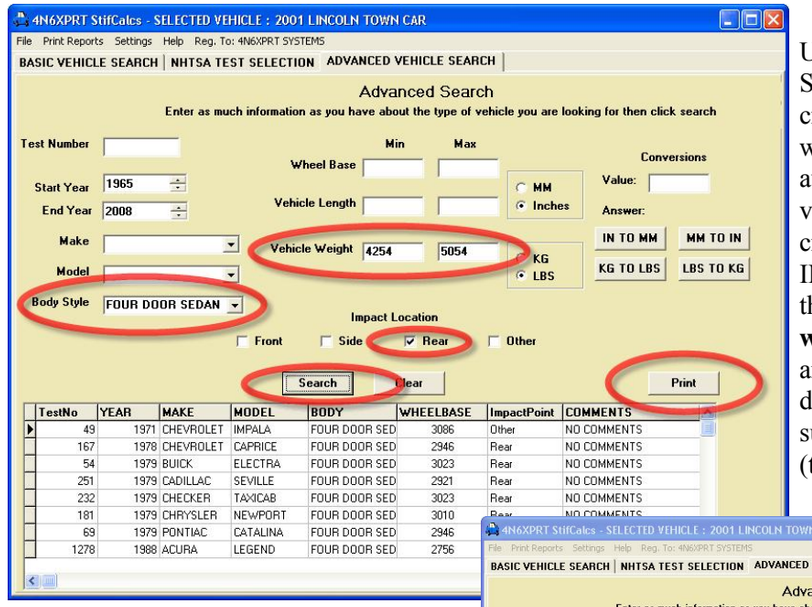


Once the desired vehicle is found/selected, click on the Test Selection tab. From here, select the test to be viewed



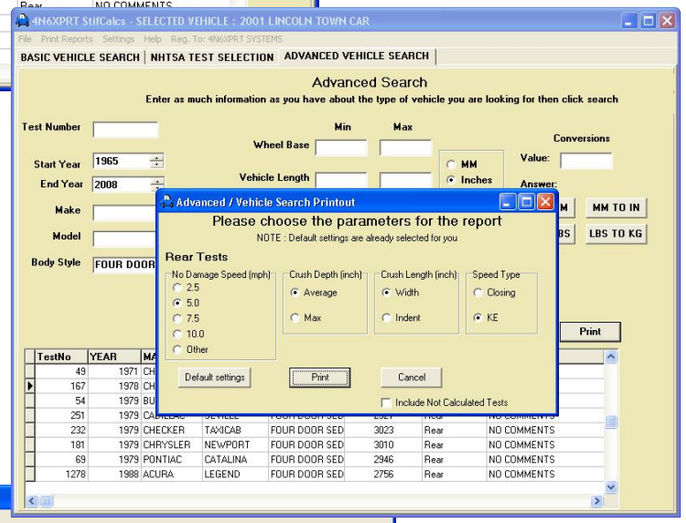


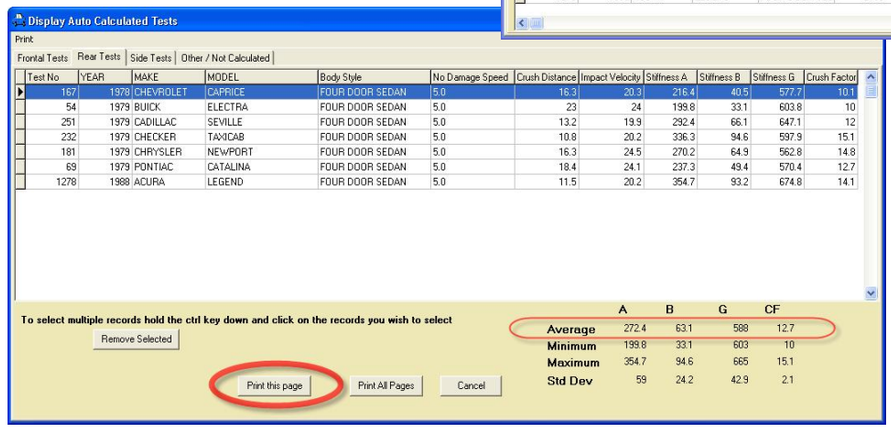
Once a test is selected, the available data for the Test, Occupant(s), Vehicle(s), and Stiffness data can be viewed. The stiffness values are automatically generated from the available test data.



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.

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

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4N6XPRT StifCalcs®**:**	$ 600.00 *	$_____
Expert VIN DeCoder®:	$ 525.00 *	$_____
		======
	SUB-TOTAL	$_____

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TOTAL $_____

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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:

_____

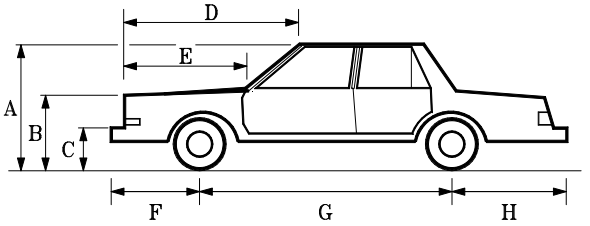
_____

_____

_____

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:

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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

YEAR & MAKE:
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4N6XPRT Systems

Expert System Software for Litigation

8387 University Avenue
La Mesa, CA 91942-9342

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Phone: 1- 800-266-9778
Fax: (619) 464-2206

Web Site: http://www.4n6xprt.com

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

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The 2011 version of 4N6XPRT StifCalcs® contains a Force Balance module -

The Force Balance approach to Stiffness values is based on the concept of "Equal and Opposite Forces" in combination with the assumption that one of the vehicles involved has a good set of Stiffness values based on testing.

There are essentially only TWO requirements in order to use a Force Balance approach, and they are:

- ❑ You must have A-B values for one of the vehicles for the surface that was hit
- ❑ Both vehicles must have SOME damage

Beyond these two requirements, the QUALITY of your calculation results will be impacted by :

- ❑ The quality of the information you have on each vehicle (weight, pass/cargo load, etc.)
- ❑ The quality/accuracy of your crush measurements
- ❑ The quality of your A-B stiffness values

while the Force Balance analysis CAN be run with degraded information in the above three areas, the quality of the results will also be degraded, sometimes significantly so.

As an extension of our **I**ndividual **V**ehicle **D**ata **S**earch **S**ervice, we have now added Force Balance Analysis runs to our services. An order form with pricing follows on the next page.

With respect to the Order Form -

A) Please be SPECIFIC on the vehicle make and model, including drive wheels, bed length, etc.
B) The Curb Weight used will come from Expert AutoStats unless you specify some other weight
C) The PDOF Lever Arm default length is 0 inches
D) The Angle of Collision Force to Normal Force default value is 0 degrees
E) If no Crush Spacing is indicated, equal spacing will be used.

If you have any specific questions, please be sure to call.

Sincerely,

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FORCE BALANCE ORDER FORM

$40 for the first "Run" / $20 for each additional crush variation with same vehicles

Vehicle 1 (KNOWN Stiffness) - Year/Make/Model

_____

Curb Weight (pounds) = _____
Occupant + Cargo Weight (pounds) = _____
Total Weight (pounds) = _____

Angle of Collision Force to Force Normal to
Collision Face (degrees) = _____
PDOF Lever Arm Distance (inches) = _____

Damage Length (inches) = _____

If Crush Depth measurements are equally spaced, you do not need to fill in the distance between Crush measurements.

Crush Depth	**Crush Spacing** EQUAL?? Yes / No
C1 (inches) = _____	
	Distance C1 to C2 (inches) = _____
C2 (inches) = _____	
	Distance C2 to C3 (inches) = _____
C3 (inches) = _____	
	Distance C3 to C4 (inches) = _____
C4 (inches) = _____	
	Distance C4 to C5 (inches) = _____
C5 (inches) = _____	
	Distance C5 to C6 (inches) = _____
C6 (inches) = _____	
	Distance C6 to C7 (inches) = _____
C7 (inches) = _____	
	Distance C7 to C8 (inches) = _____
C8 (inches) = _____	
	Distance C8 to C9 (inches) = _____
C9 (inches) = _____	
	Distance C9 to C10 (inches) = _____
C10 (inches) = _____	

Vehicle 2 - Year/Make/Model

_____

Curb Weight (pounds) = _____
Occupant + Cargo Weight (pounds) = _____
Total Weight (pounds) = _____

Angle of Collision Force to Force Normal to
Collision Face (degrees) = _____
PDOF Lever Arm Distance (inches) = _____

Damage Length (inches) = _____

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C3 (inches) = _____	
	Distance C3 to C4 (inches) = _____
C4 (inches) = _____	
	Distance C4 to C5 (inches) = _____
C5 (inches) = _____	
	Distance C5 to C6 (inches) = _____
C6 (inches) = _____	
	Distance C6 to C7 (inches) = _____
C7 (inches) = _____	
	Distance C7 to C8 (inches) = _____
C8 (inches) = _____	
	Distance C8 to C9 (inches) = _____
C9 (inches) = _____	
	Distance C9 to C10 (inches) = _____
C10 (inches) = _____	

Name_____
Company_____
Address_____
City/State/Zip_____
Phone_____
Case Reference _____

Visa/MasterCard/American Express
Card Number_____
Expiration _____/_____
Security Code_____
Card Billing Address_____
City/State/Zip_____

E-Mail_____

A Division of Expert Witness Services, Inc.

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