Stiffness Values and Test Data

Derived from

NHTSA Crash Test # 2809

Provided By

4N6XPRT StifCalcs™

Registered to:

4N6XPRT SYSTEMS
8387 UNIVERSITY AVENUE
LAMESA CA 91941-384
S/N: 03R-030201SC01301

Sister/Clone database reader

You entered: 1998 Chevrolet C-1500

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

Year Range	Make	Model	Body Styles	Wheelbase
1988 - 1999 REMARKS :	Chevrolet	C-1500	Pickup	117.5,131.5"
1988 - 1999 REMARKS :	Chevrolet	C-2500	Pickup	117.5,131.5"
1988 - 1999 REMARKS :	Chevrolet	C-3500	Pickup	117.5,131.5"
1988 - 1999 REMARKS :	Chevrolet	K-1500	Pickup	117.5,131.5"
1988 - 1999 REMARKS :	Chevrolet	K-2500	Pickup	117.5,131.5"
1988 - 1999 REMARKS :	Chevrolet	K-3500	Pickup	117.5,131.5"

The data contained in the database has been provided free of charge as a courtesy to the traffic accident reconstruction community by Gregory C. Anderson of Scalia Safety Engineering. 4N6XPRT Systems has made no changes to this data, and has only provided for distribution of this data free of charge. 4N6XPRT Systems makes no warranties, either express or implied, with respect to this data, its quality, performance, merchantability, or fitness for any particular purpose. The entire risk as to its quality and performance is with the user. In no event will 4N6XPRT Systems be liable for direct, incidental, or consequential damages resulting from any data presented here, even if 4N6XPRT Systems has been advised of the possibility of such damages. The user must agree to assume full responsibility for any decisions which are based, in whole or in part, upon information obtained by using this data. As previously stated, the data has been provided free of charge as a courtesy to the traffic accident reconstruction community by Gregory C. Anderson of Scalia Safety Engineering. Mr. Anderson does not in any way guarantee the accuracy of the data. Some of the listed similarities are based on his own estimates or memory. Most of the data are pulled from specification tables which may contain inaccuracies of their own. Use common sense - if something seems wrong, check it (and if it is wrong, let him know!).

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 # 2809 NHTSA Version # V4 Test Date 1998-02 Contract # DTNH22-96-D-22010
Contract/Study Title 1998 CHEVROLET C/K FULL SIZE PICKUP INTO A FLAT FRONTAL BARRIER
Test Objective(s) OBTAIN 35 MPH NEW CAR ASSESSMENT AND RESEARCH DATA
Test Type
Closing Speed 56.1 Km/Hr 35 MPH
Impact Angle 0 Offset Distance 0 mm 0 inches Side Impact Point mm 0 inches
Test Performer TRC OF OHIO Test Reference # 96197-1020
Test Track Surface CONCRETE Condition DRY Ambient Temperature 20 C 68 F
Data Recorder Type OTHER Data Link OTHER Total Number of Curves 97
Test Commentary ONBOARD DIGITAL DATA A
Fixed Barrier Information
Barrier Type RIGID Barrier Shape FLAT BARRIER Pole Barrier Diameter 9999 mm inches
Barrier Commentary NO COMMENTS

LEFT FRONT SEAT OCCUPANT

Test # 2809 Vehicle #	1 Location LEFT FRONT SEAT Seat Position CENTER POSITION
Type HYBRID III DUMMY	Size Percentile 50 PERCENTILE Calibration Method HYBRID III
Sex M Age 99 Occ	supant Height 999 mm 0 inches Occupant Weight 999 kg 0 pounds
Occupant Manufactuer	MFG: ALDERSON RESEARCH LABS, S/N: 142
Occupant Modification	UNMODIFIED
Occupant Description	NO COMMENTS
Occupant Commentary	SECOND CONTACT POINT FOR HEAD IS HEAD RESTRAINT
Head To	Head Head To
Windshield Header 49	1 mm 19.3 inches Side Header 247 mm 9.7 inches
Windshield 656	6 mm 25.8 inches Side Window 350 mm 13.8 inches
Seatback 9999	
Neck to Seatback 9999	g mm 0 inches
First Contact Region (Head)	AIR BAG Second Contact Region (Head) OTHER
Head Injury Criteria (HIC)	726 HIC Lower Time interval (ms) 62.96 HIC Upper Time interval (ms) 97.04 Chest
Chest To	
Dash 556	mm 21.9 inches Arm to Door 111 mm 4.4 inches
Steering Wheel 311	mm 12.2 inches Hip to Door 138 mm 5.4 inches
Seatback 9999	mm 0 inches
First Contact Region (Chest/A	Abdomen) AIR BAG Second Contact Region (Chest/Abdomen) NONE
Lap Belt Peak Load 2994	Newtons 673.1 pounds Force Shoulder Belt Peak Load 8291 Newtons 1863.9 pounds Force
T. D. I.A. I (1)	Chest Severity Index 525
Thorax Peak Acceleration (g's	s) 46.20 Thoraic Trauma Index 0 Pelvic Peak Lateral Acceleration (g's) 0
	<u>Legs</u>
Knees to Dash 155 mm	6.1 inches Knees to Seatback 9999 mm 0 inches
First Contact Region (Legs)	DASHPANEL Second Contact Region (Legs) NONE
Left Femur Peak Load 5627	Newtons 1265 pounds Force Right Femur Peak Load 5783 Newtons 1300.1 pounds Force

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LEFT FRONT SEAT OCCUPANT

Test # 2809 Vehicle # 1 Location LEFT FRONT SEAT Seat Position CENTER POSITION						
Type HYBRID III DUMMY Size Percentile 50 PERCENTILE Calibration Method HYBRID III						
Sex M Age 99 Occupant Height 999 mm 0 inches Occupant Weight 999 kg 0 pounds						
Occupant Manufactuer MFG: ALDERSON RESEARCH LABS, S/N: 142						
Occupant Modification UNMODIFIED						
Occupant Description NO COMMENTS						
Occupant Commentary SECOND CONTACT POINT FOR HEAD IS HEAD RESTRAINT						
Restraints						
Restraint # 1 AIR BAG Mounted Deployment? DEPLOYED PROPERLY						
Restraint Commentary NO COMMENTS						
Restraint # 2 3 POINT BELT Mounted Deployment? NOT APPLICABLE Restraint Commentary NO COMMENTS						

RIGHT FRONT SEAT OCCUPANT

Test # 2809 Vehicle # 1 Location RIGHT FRONT SEAT Seat Position CENTER POSITION	
Type HYBRID III DUMMY Size Percentile 50 PERCENTILE Calibration Method HYBRID	III
Sex M Age 99 Occupant Height 999 mm 0 inches Occupant Weight 999 kg 0	pounds
Occupant Manufactuer MFG: ALDERSON RESEARCH LABS, S/N: 192	
Occupant Modification UNMODIFIED	
Occupant Description NO COMMENTS	
Occupant Commentary LBELT NO IS 10839 NEWTONS; SECOND CONTACT POINT FOR HEAD IS HEAD REST.	
Head To Head To	
Windshield Header 411 mm 16.2 inches Side Header 260 mm 10.2 inches	
Windshield 628 mm 24.7 inches Side Window 370 mm 14.6 inches	
Seatback 9999 mm 0 inches	
Neck to Seatback 9999 mm 0 inches	
First Contact Region (Head) AIR BAG Second Contact Region (Head) OTHER	
Head Injury Criteria (HIC) 693 HIC Lower Time interval (ms) 65.68 HIC Upper Time interval (ms) Chest	101.68
Chest To	
Dash 546 mm 21.5 inches Arm to Door 126 mm 5 in	iches
Steering Wheel 9999 mm 0 inches Hip to Door 128 mm 5 in	ches
Seatback 9999 mm 0 inches	
First Contact Region (Chest/Abdomen) AIR BAG Second Contact Region (Chest/Abdomen) NONE	
Lap Belt Peak Load 9999 Newtons 0 pounds Force Shoulder Belt Peak Load 7571 Newtons 1702 pour	nds Force
Chest Severity Index 567 Thorax Peak Acceleration (g's) 57.40 Thoraic Trauma Index 0 Pelvic Peak Lateral Acceleration (g's)	0
<u>Legs</u>	
Knees to Dash 183 mm 7.2 inches Knees to Seatback 9999 mm 0 inche	es
First Contact Region (Legs) DASHPANEL Second Contact Region (Legs) NONE	
Left Femur Peak Load 1778 Newtons 399,7 pounds Force Right Femur Peak Load 2937 Newtons 660,3 pou	nds Force

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4N6XPRT StifCalcs™

RIGHT FRONT SEAT OCCUPANT

Test # 2809 Vehicle #	1 Location RIGHT FRONT SEAT Seat Position CENTER POSITION			
Type HYBRID III DUMMY	Size Percentile 50 PERCENTILE Calibration Method HYBRID III			
Sex M Age 99 O	ccupant Height 999 mm 0 inches Occupant Weight 999 kg 0 pounds			
Occupant Manufactuer MFG: ALDERSON RESEARCH LABS, S/N: 192				
Occupant Modification	UNMODIFIED			
Occupant Description	NO COMMENTS			
Occupant Commentary	LBELT NO IS 10839 NEWTONS; SECOND CONTACT POINT FOR HEAD IS HEAD REST.			
	<u>Restraints</u>			
Restraint # 1 AIR I	BAG Mounted Deployment? DEPLOYED PROPERLY			
Restraint Commentary	NO COMMENTS			
Restraint # 2 3 PC	NOT APPLICABLE NOT APPLICABLE			
Restraint Commentary	NO COMMENTS			

the Test Cart Motion

4N6XPRT StifCalcs™ Vehicle 1 - 1998 CHEVROLET C-1500

Test #	2809	NHTSA Test \	/ehicle N	Number	MW01	04 VIN	2GCEC19M9	W1199846	
Year	1998 Make CHI	EVROLET	Model [C-1500		Body	EXTENDED CAB	PICKUP	
Vehicle	Modification Indicatior		Vehicle	Modification((s) Descriptio	n			
PRODU	JCTION VEHICLE		NO CC	OMMENTS					
Post-tes	st Steering Column Shea	ar Capsule Sepe	eration	Stee	ering Column	Collapse Med	hanism		
UNKNO	OWN			U	NKNOWN				
Vehicle	Commentary NO CC	OMMENTS							
	Vehicle Length	5785 mm	227	.8 inches	Ve	hicle Test Wo	eight 2328 KG	5132 pound	ls
	Vehicle Wheelbase	3590 mm	141.	.3 inches		Vehicle \	Width 1950 mm	76.8 inche	S
	CG behind front axle	1642 mm	64.	.6 inches					
Center	of Damage to CG Axis	0 mm	1	0 inches	Total Len	gth of Indent	ation 1524 mm	60 inche	:S
				1	Maximum S	Static Crush D	Pepth 750 mm	29.5 inche	s
Vehicle	Damage Index 12FD	EW Principa	l Direction	on of Force	0 1	Pre-Impact S	peed 56.10 kph	34.9 mph	
Dan	nage Profile Distar	nce Measure	ments	Crush	n from Pre	& Post Tes	st Damage Mea	surements	
	(Measured Left-to-Righ				Pre-Tes		Post-Test	Crush-Depth	
DPE	0 1 657 mm	25.9 inches	Left	Bumper Cor		inches	196.9 inches	25.9 inch	es
DPE	0 2 684 mm	26.9 inches			5045	mm	5000 mm	657 mm	
DPE) 3 745 mm	29.3 inches		Centerli	227.8	inches	198.2 inches	29.6 inch	es
DPE	0 4 750 mm	29.5 inches		Contorn	5785	mm	5034 mm	751 mm	
DPE	0 5 676 mm	26.6 inches	Right	Bumper Cori	ner 222.9	inches	198.2 inches	24.7 inch	es
DPE	0 6 628 mm	24.7 inches	J	·	5662	mm	5034 mm	628 mm	
	Bumper Engagement			Still Engage	ement		A-pillar Enga	gement	
	(Inline Impact Only)			(Side Impact	Only)	ī	(Side Impac	t Only)	
	NOT APPLICABLE			NOT APPLIC	ABLE		NOT APPLI	CABLE	
	Moving Test Cart		Мо	ving Test Cart	t / Vehicle		Moving Test	Cart	
	Angle			Crabbed A	ngle	1	Vehicle Orienta	ation on Cart	
	999			0			999		
	ude of the Tilt-Angle Measur n surface if a Rollover Test (e of the Crabbed from Logitudial			Magnitude of the Angle the vehicle Orientation		

Registerd Owner: 4N6XPRT SYSTEMS Serial Number # 03R-030201SC01301

and the Ground

Vector of Vehicle

Vehicle 1 - 1998 CHEVROLET C-1500

Test #	2809		NHTSA Te	est Vehicle N	Number		MW0104	VIN	2GCEC1	9M9W1199	9846
Year	1998	Make CHI	EVROLET	Model	C-1500			Body	EXTENDED (CAB PICKL	JP
Vehicle N	Modification I	Indicatior		Vehicle	Modification	on(s) De	scription				
PRODU	CTION VEHI	CLE		NO CC	OMMENTS						
Post-test	Steering Co	olumn Shea	ar Capsule S	Seperation	_ s		Column Colla	ose Mec	hanism		
UNKNO	WN					UNKNO	NWC				
Vehicle (Commentary	NO CO	OMMENTS								
	Vehi	cle Length	5785	mm 227	.8 inche	S	Vehicle	Test We	eight 2328	KG 513	2 pounds
	Vehicle W	/heelbase	3590	mm 141.	.3 inche	s	V	ehicle V	Vidth 1950	mm 76.	8 inches
	CG behind	front axle	1642	mm 64.	.6 inche	S					-
Center of	of Damage to	CG Axis	0	mm	0 inche	S Tot	al Length of	Indenta	1524	mm 6	inches
						Maxir	num Static	Crush D	epth 750	mm 29 .	.5 inches
Vehicle [amage Inde	x 12FD	EW Princ	cipal Direction	on of Force	e [0 Pre-Im	pact Sp	peed 56.10	kph 34.	.9 mph
	J			•			urments			'	
(N /	accurmente er	o takan in a l	agitudinal dirac					lean from t	ha Daar Vahiala	Curtoso forw	ord
(IV		Side	ogitualnal direc	зион. Ехсерин	Center		isuments are ta	ken irom i	he Rear Vehicle Righ	sunace forw it Side	aru
Pre-			T1	D., T.,					•		
110	1631	Post	:-Test	Pre-Tes	st	Pos	t-Test	Р	re-Test	Pos	t-Test
mm	inches	mm	inches		nches	Pos mm	t-Test inches	P mm	re-Test inches	Pos mm	t-Test inches
				mm i	nches	mm cle at Ce	inches nterline				
				mm i	nches gth of Vehic 227.8	mm cle at Ce 503	inches nterline				
				mm i	nches gth of Vehic 227.8	mm cle at Ce	inches nterline 4 198.2				
	inches			mm i Lenç 5785	gth of Vehic 227.8 Engine 22.8 Front Burn	mm cle at Ce 503 Block 58 apper Corr	inches Interline	mm			inches
mm	inches	mm	inches	mm i Lence 5785 580	gth of Vehic 227.8 Engine 22.8 Front Bum	mm cle at Ce 503 Block 58 sper Corr f Engine	inches nterline 14 198.2 22.8 ner	mm	inches	mm	inches
mm	inches 222.7	mm	inches	mm i Lenç 5785	gth of Vehic 227.8 Engine 22.8 Front Burn Front o	mm cle at Ce 503 Block 58 apper Corr	inches nterline 14 198.2 22.8 ner	mm 50	inches	mm	inches 198.2
mm 5657	inches 222.7	mm 5000	196.9	mm i Lence 5785 580	gth of Vehic 227.8 Engine 22.8 Front Burn Front o	mm cle at Ce 503 e Block 58 nper Corr f Engine 478	inches Interline Interlin	mm 50	inches 662 222.9	mm 5034	inches 198.2
mm 5657	222.7 178.6	mm 5000	196.9	mm i Leng 5785 580 5045	gth of Vehic 227.8 Engine 22.8 Front Burn Front of	mm cle at Ce 503 e Block 58 aper Corr f Engine 478 ewall 441	inches Interline Id 198.2 Id 22.8 Interline Id 198.5 Id 188.5 Id 174	mm 50	inches 662 222.9	mm 5034	198.2 174.8
mm 5657	222.7 178.6	mm 5000 4451	196.9 175.2	mm i Leng 5785 580 5045 Up	gth of Vehic 227.8 Engine 22.8 Front Bum Front of 198.6 Fire 188.5	mm cle at Ce 503 e Block 58 aper Corr f Engine 478 ewall 441 g Edge o	inches Interline Interlin	mm 50	inches 662 222.9 637 178.6	mm 5034 4440	198.2 174.8
5657 4537	178.6 169.3	5000 4451 4230	196.9 175.2	mm i Leng 5785 580 5045 Up	gth of Vehice 227.8 Engine 22.8 Front Burn Front o 198.6 Fire 188.5	mm cle at Ce 503 e Block 58 aper Corr f Engine 478 ewall 441 g Edge o	inches Interline Interlin	mm 50	inches 662 222.9 637 178.6 302 169.4	5034 4440 4236	198.2 174.8 166.8 165.7
5657 4537 4300 4242	178.6 169.3 167 168.5	5000 4451 4230 4192	196.9 175.2 166.5	mm i Leng 5785 580 5045 4535 Up Lov	gth of Vehice 227.8 Engine 22.8 Front Burn Front o 198.6 Fire 188.5 per Leading	mm cle at Ce 503 e Block 58 aper Corr f Engine 478 ewall 441 g Edge o g Edge o	inches Interline Id 198.2 Id 22.8 Inter Id 198.5 Id 188.5 Id 174 If Door If Door It Interline Interline Id 198.2 Id 198.	45 45 42 42	inches 662 222.9 637 178.6 302 169.4 253 167.4	5034 4440 4236 4210	198.2 174.8 166.8 165.7
5657 4537 4300 4242 4281	178.6 169.3 167 168.5 123.1	5000 4451 4230 4192 4205	196.9 175.2 166.5 165.6	mm i Leng 5785 580 5045 4535 Up Lov	gth of Vehice 227.8 Engine 22.8 Front Burn Front of 198.6 Fire 188.5 per Leading Wer Leading Bottom of	mm cle at Ce 503 Block 58 sper Corr f Engine 478 ewall 441 g Edge of g Edge of g Edge of g Edge of	inches Interline Id 198.2 Id 22.8 Id 22.8 Id 188.5 Id 174 If Door If Door If Door If Door If Door If Door	45 45 42 42 33	inches 662 222.9 537 178.6 302 169.4 253 167.4 281 168.5	5034 4440 4236 4210 4220	198.2 174.8 166.8 165.7 166.1
4537 4537 4300 4242 4281 3136	178.6 169.3 167 168.5 123.1	5000 4451 4230 4192 4205 3055	196.9 175.2 166.5 165.6 120.3	mm i Leng 5785 580 5045 Upp Lov	gth of Vehice 227.8 Engine 22.8 Front Burn Front of 198.6 Fire 188.5 per Leading Wer Leading Bottom of Upper Trailing Steering	mm cle at Ce 503 e Block 58 aper Corr f Engine 478 ewall 441 g Edge of	inches Interline Id 198.2 Id 22.8 Id 22.8 Id 188.5 Id 174 If Door If Door If Door If Door If Door If Door	45 45 42 42 33	inches 562 222.9 537 178.6 302 169.4 253 167.4 281 168.5 136 123.5	5034 4440 4236 4210 4220 3075	198.2 174.8 166.8 165.7 166.1
4537 4537 4300 4242 4281 3136	178.6 169.3 167 168.5 123.1	5000 4451 4230 4192 4205 3055	196.9 175.2 166.5 165.6 120.3 120.9	mm i Leng 5785 580 5045 4535 Up Lov Lov 3760	gth of Vehice 227.8 Engine 22.8 Front Burn Front of 198.6 Itself 188.5 Per Leading Wer Leading Bottom of Upper Trailing Steering 148	mm cle at Ce 503 e Block 58 aper Corr f Engine 478 ewall 441 g Edge of g Column 372	inches Interline Id 198.2 Id 22.8 Id 22.8 Id 188.5 Id 174 If Door	45 45 42 42 3°	inches 562 222.9 537 178.6 302 169.4 253 167.4 281 168.5 136 123.5	5034 4440 4236 4210 4220 3075	198.2 174.8 166.8 165.7 166.1
4537 4537 4300 4242 4281 3136	178.6 169.3 167 168.5 123.1	5000 4451 4230 4192 4205 3055	196.9 175.2 166.5 165.6 120.3 120.9	mm i Leng 5785 580 5045 4535 Up Low 200 3760 enter of Steee	gth of Vehice 227.8 Engine 22.8 Front Burn Front of 198.6 Itself 188.5 Per Leading Wer Leading Wer Leading Wer Trailing Steering 148 ring Colum 11.2	mm cle at Ce 503 e Block 58 aper Corr f Engine 478 ewall 441 g Edge of g Edge of g Edge of g Edge of g Column 372 n to 'A' P	inches Interline Id 198.2 Id 22.8 Id 22.8 Id 188.5 Id 174 If Door If D	45 45 42 42 3° 3°	inches 562 222.9 537 178.6 302 169.4 253 167.4 281 168.5 136 123.5	5034 4440 4236 4210 4220 3075	198.2 174.8 166.8 165.7 166.1

4N6XPRT StifCalcs™ 1998 CHEVROLET C-1500

NHTSA Crash Test - # 2809 - Front Impact

{ Pre/Post Crush Depths - Vehicle Width - Closing Speed - Trapezoidal Average }

Given:

Impactor Test Weight = 5132 pounds Vehicle Test Speed = 34.9 mph Test crush width = 76.8 inches

Pre/Post Collision Crush Depths (inches)

Centerline Left Bumper Corner Right Bumper Corner 25.9 29.6 24.7 (Driver Side)

(Pass. Side)

Calculated Stiffness Coefficients

Minimum Crush = 24.7 inches	
Using a Rated No Damage Speed of	2.5 mph
Using a Rated No Damage Speed of	5 mph
Using a Rated No Damage Speed of	7.5 mph
Using a Rated No Damage Speed of	10 mph
Average Crush = 27.5 inches	
Using a Rated No Damage Speed of	2.5 mph
Using a Rated No Damage Speed of	5 mph
Using a Rated No Damage Speed of	7.5 mph
Using a Rated No Damage Speed of	10 mph
Maximum Crush = 29.6 inches	
Using a Rated No Damage Speed of	2.5 mph
Using a Rated No Damage Speed of	5 mph
Using a Rated No Damage Speed of	7.5 mph

Using a Rated No Damage Speed of 10 mph

Rated No Damage Speed = Impact speed with a barrier

resulting in no permenant vehicle deformation

A	<u> </u>	<u> </u>
175.5	92	167.5
323.9	78.3	669.9
445.2	65.8	1507.2
539.4	54.3	2679.5
157.7	74.2	167.5
290.9	63.2	669.9
399.9	53	1507.2
484.4	43.8	2679.5
146.5	64	167.5
270.3	54.5	669.9
371.5	45.8	1507.2
450.1	37.8	2679.5

A = Maximum force per inch of damage without permenant damage, Ib/in

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some specific vehicles may have a higher rating

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) = SQR(30 * CF * max crush in feet)

Calculated Impact

Crush Factor	Maximum Crush (inches)	(mph)	Calculated Error (mph)	Calculated Error (%)
21	29.6	39.4	4.5	13%

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

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

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

4N6XPRT StifCalcs™ licensed by 4N6XPRT Systems (www.4N6XPRT.com) to:

B = Crush resistance per inch of damage width, lb/in^2

G = Energy dissipated without permenant damage, Ib

NHTSA Crash Test - # 2809 - Front Impact

{ Pre/Post Crush Depths - Vehicle Width - Closing Speed - Simple Average }

Given:

Impactor Test Weight = 5132 pounds

Vehicle Test Speed = 34.9 mph

Test crush width = 76.8 inches

Pre/Post Collision Crush Depths (inches)

Left Bumper Corner Centerline Right Bumper Corner (Driver Side) 25.9 29.6 24.7

(Pass. Side)

Calculated Stiffness Coefficients

Minimum Crush = 24.7 inches	
Using a Rated No Damage Speed of	2.5 mph
Using a Rated No Damage Speed of	5 mph
Using a Rated No Damage Speed of	7.5 mph
Using a Rated No Damage Speed of	10 mph
Average Crush = 26.7 inches	
Using a Rated No Damage Speed of	2.5 mph
Using a Rated No Damage Speed of	5 mph
Using a Rated No Damage Speed of	7.5 mph
Using a Rated No Damage Speed of	10 mph
Maximum Crush = 29.6 inches	
Using a Rated No Damage Speed of	2.5 mph
Using a Rated No Damage Speed of	5 mph
Using a Rated No Damage Speed of	7.5 mph

		3				- 3	- 1			-	•
Date	od M	o Do	mage Si	naad	_ r	nnac	t ene	od i	with	a hai	rrior
rau	eun	U Dai	maye Sp	Jeeu	= 11	прасі	ι δρε	eu	/VILI I	a Dai	Hei
	res	ulting	g in no p	erm	enai	nt vel	hicle	def	orm	ation	

Using a Rated No Damage Speed of 10 mph

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some specific vehicles may have a higher rating

	_	
A	<u> </u>	<u> </u>
175.5	92	167.5
323.9	78.3	669.9
445.2	65.8	1507.2
539.4	54.3	2679.5
162.4	78.7	167.5
299.7	67	669.9
411.9	56.3	1507.2
499	46.5	2679.5
146.5	64	167.5
270.3	54.5	669.9
371.5	45.8	1507.2
450.1	37.8	2679.5

A = Maximum force per inch of damage without permenant damage, Ib/in

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) = SQR(30 * CF * max crush in feet)

Calculated Impact

Crush Factor	Maximum Crush (inches)	(mph)	Calculated Error (mph)	Calculated Error (%)
21	29.6	39.4	4.5	13%

4N6XPRT Systems Specific Crush Factor (CF specific to this test) = 16.4

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

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

4N6XPRT StifCalcs™ licensed by 4N6XPRT Systems (www.4N6XPRT.com) to:

B = Crush resistance per inch of damage width, lb/in^2

G = Energy dissipated without permenant damage, Ib

NHTSA Crash Test - # 2809 - Front Impact

{ Pre/Post Crush Depths - Indentation Length - Closing Speed - Trapezoidal Average }

Given:

Impactor Test Weight = 5132 pounds

Vehicle Test Speed = 34.9 mph

Test crush width = 60 inches

Pre/Post Collision Crush Depths (inches)

Α

224.6

414.5

569.7

690.1

201.7

372.3

511.6

619.9

Left Bumper Corner Centerline Right Bumper Corner (Driver Side) 25.9 29.6 24.7

(Pass. Side)

G

214.3

857.1

1928.5

3428.5

214.3

857.1

1928.5

3428.5

Calculated Stiffness Coefficients

В

117.7

100.2

84.1

69.5

94.9

8.08

67.9

56

Minimum Crush = 24.7 inches	
Using a Rated No Damage Speed of	2.5 mph
Using a Rated No Damage Speed of	5 mph
Using a Rated No Damage Speed of	7.5 mph
Using a Rated No Damage Speed of	10 mph
Average Crush = 27.5 inches	
Using a Rated No Damage Speed of	2.5 mph
Using a Rated No Damage Speed of	5 mph
Using a Rated No Damage Speed of	7.5 mph
Using a Rated No Damage Speed of	10 mph
Maximum Crush = 29.6 inches	
Using a Rated No Damage Speed of	2.5 mph
Using a Rated No Damage Speed of	5 mph
Using a Rated No Damage Speed of	7.5 mph
Using a Rated No Damage Speed of	10 mph

187.4	82	214.3	
345.9	69.8	857.1	
475.4	58.6	1928.5	
575.9	48.4	3428.5	
	r inch of damage withou per inch of damage width	t permenant damage, lb/i n, lb/in^2	n

Rated No Damage Speed = Impact speed with a barrier resulting in no permenant vehicle deformation

G = Energy dissipated without permenant damage, Ib

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some specific vehicles may have a higher rating

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) = SQR(30 * CF * max crush in feet)

Calculated Impact

Crush Factor	Maximum Crush (inches)	(mph)	Calculated Error (mph)	Calculated Error (%)
21	29.6	39.4	4.5	13%

4N6XPRT Systems Specific Crush Factor (CF specific to this test) = 16.4

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

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

4N6XPRT StifCalcs™ licensed by 4N6XPRT Systems (www.4N6XPRT.com) to:

NHTSA Crash Test - # 2809 - Front Impact

{ Pre/Post Crush Depths - Indentation Length - Closing Speed - Simple Average }

Given:

Impactor Test Weight = 5132 pounds

Vehicle Test Speed = 34.9 mph

Test crush width = 60 inches

Pre/Post Collision Crush Depths (inches)

Left Bumper Corner Centerline Right Bumper Corner (Driver Side) 25.9 29.6 24.7

7 (Pass. Side)

Calculated Stiffness Coefficients

Minimum Crush = 24.7 inches	S
Using a Rated No Damage Spec	ed of 2.5 mph
Using a Rated No Damage Spee	ed of 5 mph
Using a Rated No Damage Spee	ed of 7.5 mph
Using a Rated No Damage Spec	ed of 10 mph
Average Crush = 26.7 inches	S
Using a Rated No Damage Spec	ed of 2.5 mph
Using a Rated No Damage Spee	ed of 5 mph
Using a Rated No Damage Spee	ed of 7.5 mph
Using a Rated No Damage Spec	ed of 10 mph
Maximum Crush = 29.6 inches	S
Using a Rated No Damage Spec	ed of 2.5 mph
Using a Rated No Damage Spee	ed of 5 mph
Using a Rated No Damage Spee	ed of 7.5 mph
Using a Rated No Damage Spec	ed of 10 mph
Rated No Damage Speed = Impact spee	ed with a barrier

A	<u> </u>	<u> </u>
224.6	117.7	214.3
414.5	100.2	857.1
569.7	84.1	1928.5
690.1	69.5	3428.5
207.8	100.7	214.3
383.4	85.8	857.1
527	72	1928.5
638.4	59.4	3428.5
187.4	82	214.3
345.9	69.8	857.1
475.4	58.6	1928.5
575.9	48.4	3428.5

A = Maximum force per inch of damage without permenant damage, Ib/in

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some specific vehicles may have a higher rating

resulting in no permenant vehicle deformation

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) = SQR(30 * CF * max crush in feet)

Calculated Impact

Crush Factor	Maximum Crush (inches)	(mph)	Calculated Error (mph)	Calculated Error (%)
21	29.6	39.4	4.5	13%

4N6XPRT Systems Specific Crush Factor (CF specific to this test) = 16.4

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

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

4N6XPRT StifCalcs™ licensed by 4N6XPRT Systems (www.4N6XPRT.com) to:

B = Crush resistance per inch of damage width, lb/in^2

G = Energy dissipated without permenant damage, Ib

NHTSA Crash Test - # 2809 - Front Impact

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

Given: Vehicle Test Weight = 5132 pounds

Vehicle Test Speed = 34.9 mph

Damage Width = 76.8 inches

Damage Profile Distance Crush Depths (inches)

DPD1 DPD2 DPD3 DPD4 DPD5 DPD6

(Driver Side) 25.9 26.9 29.3 29.5 26.6 24.7 (Pass. Side)

Calculated Stiffness Coefficients

Minimum Crush = 24.7 inches		A	<u> </u>	<u> </u>
Using a Rated No Damage Speed of	2.5 mph	175.5	92	167.5
Using a Rated No Damage Speed of	5 mph	323.9	78.3	669.9
Using a Rated No Damage Speed of	7.5 mph	445.2	65.8	1507.2
Using a Rated No Damage Speed of	10 mph	539.4	54.3	2679.5
Average Crush = 27.5 inches				
Using a Rated No Damage Speed of	2.5 mph	157.5	74.1	167.5
Using a Rated No Damage Speed of	5 mph	290.7	63.1	669.9
Using a Rated No Damage Speed of	7.5 mph	399.6	53	1507.2
Using a Rated No Damage Speed of	10 mph	484.1	43.7	2679.5
Maximum Crush = 29.5 inches				
Using a Rated No Damage Speed of	2.5 mph	147	64.5	167.5
Using a Rated No Damage Speed of	5 mph	271.2	54.9	669.9
Using a Rated No Damage Speed of	7.5 mph	372.8	46.1	1507.2
Using a Rated No Damage Speed of	10 mph	451.6	38.1	2679.5

Rated No Damage Speed = Impact speed with a barrier resulting in no permenant vehicle deformation

N

A = Maximum force per inch of damage width without permenant damage, Ib/ii

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some specific vehicles may have a higher rating

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) = SQR(30 * CF * max crush in feet)

Calculated Impact

Crush	Maximum Crush	Speed	Calculated Error	Calculated Error (%)
Factor	(inches)	(mph)	(mph)	
21	29.5	39.4	4.5	13%

4N6XPRT Systems Specific Crush Factor (CF specific to this test) = 16.5

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

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

4N6XPRT StifCalcs™ licensed by 4N6XPRT Systems (www.4N6XPRT.com) to:

B = Crush resistance per inch of damage width, lb/in^2

G = Energy dissipated without permenant damage, Ib

4N6XPRT StitCalcs™ 1998 CHEVROLET C-1500

NHTSA Crash Test - # 2809 - Front Impact

{ Damage Profile Distances - Vehicle Width - Closing Speed - Simple Average }

Given: Vehicle Test Weight = 5132 pounds

Vehicle Test Speed = 34.9 mph

Damage Width = 76.8 inches

Damage Profile Distance Crush Depths (inches)

DPD1 DPD2 DPD3 DPD4 DPD5 DPD6

(Driver Side) 25.9 26.9 29.3 29.5 26.6 24.7 (Pass. Side)

Calculated Stiffness Coefficients

Minimum Crush = 24.7 inches		A	<u> </u>	<u> </u>
Using a Rated No Damage Speed of	2.5 mph	175.5	92	167.5
Using a Rated No Damage Speed of	5 mph	323.9	78.3	669.9
Using a Rated No Damage Speed of	7.5 mph	445.2	65.8	1507.2
Using a Rated No Damage Speed of	10 mph	539.4	54.3	2679.5
Average Crush = 27.2 inches				
Using a Rated No Damage Speed of	2.5 mph	159.7	76.1	167.5
Using a Rated No Damage Speed of	5 mph	294.7	64.8	669.9
Using a Rated No Damage Speed of	7.5 mph	405	54.4	1507.2
Using a Rated No Damage Speed of	10 mph	490.7	44.9	2679.5
Maximum Crush = 29.5 inches				
Using a Rated No Damage Speed of	2.5 mph	147	64.5	167.5
Using a Rated No Damage Speed of	5 mph	271.2	54.9	669.9
Using a Rated No Damage Speed of	7.5 mph	372.8	46.1	1507.2
Using a Rated No Damage Speed of	10 mph	451.6	38.1	2679.5

Rated No Damage Speed = Impact speed with a barrier resulting in no permenant vehicle deformation

A = Maximum force per inch of damage width without permenant damage, Ib/ii

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some specific vehicles may have a higher rating

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) = SQR(30 * CF * max crush in feet)

Calculated Impact

Crush Factor	Maximum Crush (inches)	Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	29.5	39.4	4.5	13%

4N6XPRT Systems Specific Crush Factor (CF specific to this test) = 16.5

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

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

4N6XPRT StifCalcs™ licensed by 4N6XPRT Systems (www.4N6XPRT.com) to:

B = Crush resistance per inch of damage width, lb/in^2

G = Energy dissipated without permenant damage, Ib

NHTSA Crash Test - # 2809 - Front Impact

{ Damage Profile Distances - Indentation Length - Closing Speed - Trapezoidal Average }

Given: Vehicle Test Weight = 5132 pounds

Vehicle Test Speed = 34.9 mph

Damage Width = 60 inches

Damage Profile Distance Crush Depths (inches)

DPD1 DPD2 DPD3 DPD4 DPD5 DPD6

(Driver Side) 25.9 26.9 29.3 29.5 26.6 24.7 (Pass. Side)

Calculated Stiffness Coefficients

Minimum Crush = 24.7 inches		A	<u> </u>	<u> </u>
Using a Rated No Damage Speed of	2.5 mph	224.6	117.7	214.3
Using a Rated No Damage Speed of	5 mph	414.5	100.2	857.1
Using a Rated No Damage Speed of	7.5 mph	569.7	84.1	1928.5
Using a Rated No Damage Speed of	10 mph	690.1	69.5	3428.5
Average Crush = 27.5 inches				
Using a Rated No Damage Speed of	2.5 mph	201.6	94.8	214.3
Using a Rated No Damage Speed of	5 mph	372	80.7	857.1
Using a Rated No Damage Speed of	7.5 mph	511.3	67.8	1928.5
Using a Rated No Damage Speed of	10 mph	619.4	56	3428.5
Maximum Crush = 29.5 inches				
Using a Rated No Damage Speed of	2.5 mph	188	82.5	214.3
Using a Rated No Damage Speed of	5 mph	347	70.3	857.1
Using a Rated No Damage Speed of	7.5 mph	477	59	1928.5
Using a Rated No Damage Speed of	10 mph	577.8	48.7	3428.5

Rated No Damage Speed = Impact speed with a barrier resulting in no permenant vehicle deformation

A = Maximum force per inch of damage width without permenant damage, Ib/ii

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some specific vehicles may have a higher rating

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) = SQR(30 * CF * max crush in feet)

Calculated Impact

Crush	Maximum Crush	Speed	Calculated Error	Calculated Error (%)
Factor	(inches)	(mph)	(mph)	
21	29.5	39.4	4.5	13%

4N6XPRT Systems Specific Crush Factor (CF specific to this test) = 16.5

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

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

4N6XPRT StifCalcs™ licensed by 4N6XPRT Systems (www.4N6XPRT.com) to:

B = Crush resistance per inch of damage width, lb/in^2

G = Energy dissipated without permenant damage, Ib

NHTSA Crash Test - # 2809 - Front Impact

{ Damage Profile Distances - Indentation Length - Closing Speed - Simple Average }

Given: Vehicle Test Weight = 5132 pounds

Vehicle Test Speed = 34.9 mph

Damage Width = 60 inches

Damage Profile Distance Crush Depths (inches)

DPD1 DPD2 DPD3 DPD4 DPD5 DPD6

(Driver Side) 25.9 26.9 29.3 29.5 26.6 24.7 (Pass. Side)

Calculated Stiffness Coefficients

Minimum Crush = 24.7 inches		A	<u> </u>	<u> </u>
Using a Rated No Damage Speed of	2.5 mph	224.6	117.7	214.3
Using a Rated No Damage Speed of	5 mph	414.5	100.2	857.1
Using a Rated No Damage Speed of	7.5 mph	569.7	84.1	1928.5
Using a Rated No Damage Speed of	10 mph	690.1	69.5	3428.5
Average Crush = 27.2 inches				
Using a Rated No Damage Speed of	2.5 mph	204.3	97.4	214.3
Using a Rated No Damage Speed of	5 mph	377.1	82.9	857.1
Using a Rated No Damage Speed of	7.5 mph	518.2	69.6	1928.5
Using a Rated No Damage Speed of	10 mph	627.9	57.5	3428.5
Maximum Crush = 29.5 inches				
Using a Rated No Damage Speed of	2.5 mph	188	82.5	214.3
Using a Rated No Damage Speed of	5 mph	347	70.3	857.1
Using a Rated No Damage Speed of	7.5 mph	477	59	1928.5
Using a Rated No Damage Speed of	10 mph	577.8	48.7	3428.5

Rated No Damage Speed = Impact speed with a barrier resulting in no permenant vehicle deformation

A = Maximum force per inch of damage width without permenant damage, Ib/ii

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some specific vehicles may have a higher rating

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) = SQR(30 * CF * max crush in feet)

Calculated Impact

Crush	Maximum Crush	Speed	Calculated Error	Calculated Error (%)
Factor	(inches)	(mph)	(mph)	
21	29.5	39.4	4.5	13%

4N6XPRT Systems Specific Crush Factor (CF specific to this test) = 16.5

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

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

4N6XPRT StifCalcs™ licensed by 4N6XPRT Systems (www.4N6XPRT.com) to:

B = Crush resistance per inch of damage width, lb/in^2

G = Energy dissipated without permenant damage, Ib

NHTSA Crash Test - # 2809 - Front Impact

{ Maximum Crush - Vehicle Width - Closing Speed - }

Given:

Vehicle Test Weight = 5132 pounds Vehicle Test Speed = 34.9 mph Test Crush Length = 76.8 inches

Reported Maximum Crush Depth (inches)

(Driver Side)

29.5 (Pass. Side)

Minimum Crush = N/A inches

Using a Rated No Damage Speed of 2.5 mph Using a Rated No Damage Speed of 5 mph Using a Rated No Damage Speed of 7.5 mph Using a Rated No Damage Speed of 10 mph

Average Crush = N/A in

Using a Rated No Damage Speed of 2.5 mph Using a Rated No Damage Speed of 5 mph Using a Rated No Damage Speed of 7.5 mph Using a Rated No Damage Speed of 10 mph

Maximum Crush = 29.5 inches

Using a Rated No Damage Speed of 2.5 mph Using a Rated No Damage Speed of 5 mph Using a Rated No Damage Speed of 7.5 mph Using a Rated No Damage Speed of 10 mph

Rated No Damage Speed = Impact speed with a barrier resulting in no permenant vehicle deformation

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some specific vehicles may have a higher rating

Calculated Stiffness Coefficients

A	<u>B</u>	<u> </u>
4.47	04.5	407.5
147 271.2	64.5 54.9	167.5 669.9
372.8	46.1	1507.2
451.6	38.1	2679.5

A = Maximum force per inch of damage without permenant damage, Ib/in

B = Crush resistance per inch of damage width, lb/in^2

G = Energy dissipated without permenant damage, Ib

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats (version 4.1+)

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

Calculated Impact

 Crush
 Maximum Crush
 (mph)
 Calculated Error
 Calculated Error

 Factor
 (inches)
 (mph)
 (%)

 21
 29.5
 39.4
 4.5
 13%

4N6XPRT Systems Specific Crush Factor (CF specific to this test) = CF = (mph * mph) / (30 * max crush in feet), dimensionless

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

4N6XPRT StifCalcs™ licensed by 4N6XPRT Systems (www.4N6XPRT.com) to:

NHTSA Crash Test - # 2809 - Front Impact

{ Maximum Crush - Indentation Length - Closing Speed - }

Given:

Vehicle Test Weight = 5132 pounds

Vehicle Test Speed = 34.9 mph

Test Crush Length = 60 inches

Reported Maximum Crush Depth (inches)

(Driver Side) Maximum

29.5 (Pass. Side)

Minimum Crush = N/A inches

Using a Rated No Damage Speed of 2.5 mph Using a Rated No Damage Speed of 5 mph Using a Rated No Damage Speed of 7.5 mph Using a Rated No Damage Speed of 10 mph

Average Crush = N/A inc

Using a Rated No Damage Speed of 2.5 mph Using a Rated No Damage Speed of 5 mph Using a Rated No Damage Speed of 7.5 mph Using a Rated No Damage Speed of 10 mph

Maximum Crush = 29.5 inches

Using a Rated No Damage Speed of 2.5 mph Using a Rated No Damage Speed of 5 mph Using a Rated No Damage Speed of 7.5 mph Using a Rated No Damage Speed of 10 mph

Rated No Damage Speed = Impact speed with a barrier resulting in no permenant vehicle deformation

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some specific vehicles may have a higher rating

Calculated Stiffness Coefficients

A	<u>B</u>	<u> </u>
188	82.5	214.3
347	70.3	857.1
477 577.8	59 48.7	1928.5 3428.5

A = Maximum force per inch of damage without permenant damage, Ib/in

B = Crush resistance per inch of damage width, lb/in^2

G = Energy dissipated without permenant damage, Ib

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats (version 4.1+) Impact Speed (mph) = SQR(30 * CF * max crush in feet)

Calculated Impact

 Crush
 Maximum Crush
 (mph)
 Calculated Error
 Calculated Error

 Factor
 (inches)
 (mph)
 (%)

 21
 29.5
 39.4
 4.5
 13%

4N6XPRT Systems Specific Crush Factor (CF specific to this test) = CF = (mph * mph) / (30 * max crush in feet), dimensionless

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

4N6XPRT StifCalcs™ licensed by 4N6XPRT Systems (www.4N6XPRT.com) to:

Stiffness Values and Test Data

Derived from

NHTSA Crash Test # 2926

Provided By

4N6XPRT StifCalcs™

Registered to:

4N6XPRT SYSTEMS
8387 UNIVERSITY AVENUE
LA MESA CA 91941-384
S/N: 03R-030201SC01301

Sister/Clone database reader

You entered: 1999 Mazda Miata

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

Year RangeMakeModelBody StylesWheelbase1999 - 2003MazdaMiata2d89.2"

REMARKS:

The data contained in the database has been provided free of charge as a courtesy to the traffic accident reconstruction community by Gregory C. Anderson of Scalia Safety Engineering. 4N6XPRT Systems has made no changes to this data, and has only provided for distribution of this data free of charge. 4N6XPRT Systems makes no warranties, either express or implied, with respect to this data, its quality, performance, merchantability, or fitness for any particular purpose. The entire risk as to its quality and performance is with the user. In no event will 4N6XPRT Systems be liable for direct, incidental, or consequential damages resulting from any data presented here, even if 4N6XPRT Systems has been advised of the possibility of such damages. The user must agree to assume full responsibility for any decisions which are based, in whole or in part, upon information obtained by using this data. As previously stated, the data has been provided free of charge as a courtesy to the traffic accident reconstruction community by Gregory C. Anderson of Scalia Safety Engineering. Mr. Anderson does not in any way guarantee the accuracy of the data. Some of the listed similarities are based on his own estimates or memory. Most of the data are pulled from specification tables which may contain inaccuracies of their own. Use common sense - if something seems wrong, check it (and if it is wrong, let him know!).

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 # 2926 NHTSA Version # V4 Test Date 1998-07 Contract # DTRS57-95-C-00009
Contract/Study Title R & D TEST: 70% OVERLAP REAR MOVING DEFORMABLE BARRIER IMPACT
Test Objective(s) TO EVALUATE VEHICLE PERFORMANCE IN A MODIFIED FMVSS 301 TEST
Test Type RESEARCH Configuration IMPACTOR INTO VEHICLE
Closing Speed 82.4 Km/Hr 51 MPH
Impact Angle 180 Offset Distance mm 0 inches Side Impact Point mm 0 inches
Test Performer CALSPAN Test Reference # RUN1776
Test Track Surface CONCRETE Condition DRY Ambient Temperature 21 C 70 F
Data Recorder Type FM TAPE RECORDER Data Link UMBILICAL CABLE Total Number of Curves 53
Test Commentary 70% OF THE TARGET VEHI

No Fixed Barrier Data

LEFT FRONT SEAT OCCUPANT

Test # 2926 Vehicle #	2 Location LEFT FRONT S	EAT Seat Position CENTER POSITION
Type HYBRID III DUMMY	Size Percei	ntile 50 PERCENTILE Calibration Method HYBRID III
Sex M Age 99 Occ	supant Height 999 mm	0 inches Occupant Weight 999 kg 0 pounds
Occupant Manufactuer	MFG:VECTOR,S/N 064	
Occupant Modification	NO MODIFICATIONS	
Occupant Description	NO COMMENTS	
Occupant Commentary	CNTRH1: HEADREST; CNTRH2	2: ROOF RIBS; CNTRC1: SHOULDER/RETRACTOR
Head To		Head Head To
Windshield Header 37	7 mm 14.8 inches	Side Header 183 mm 7.2 inches
Windshield 49	3 mm 19.4 inches	Side Window 239 mm 9.4 inches
Seatback 999	g mm 0 inches	239 mm 3.4 mones
Neck to Seatback 9999	g mm 0 inches	
First Contact Region (Head)	OTHER	Second Contact Region (Head) OTHER
Head Injury Criteria (HIC)	1274 HIC Lower Time inter	val (ms) 51.50 HIC Upper Time interval (ms) 74.9
Chest To	-	=
Dash 486	mm 19.1 inches	Arm to Door 47 mm 1.9 inches
Steering Wheel 281	mm 11.1 inches	Hip to Door 98 mm 3.9 inches
Seatback 9999	mm 0 inches	
First Contact Region (Chest/A	Abdomen) OTHER	Second Contact Region (Chest/Abdomen) NONE
Lap Belt Peak Load 9999	Newtons 0 pounds Force	Shoulder Belt Peak Load 9999 Newtons 0 pounds For
Thorax Peak Acceleration (g's	. [111]	
Maran to D. J. Com		Legs
Knees to Dash 160 mm		Knees to Seatback 9999 mm 0 inches
First Contact Region (Legs)	NONE	Second Contact Region (Legs) NONE
Left Femur Peak Load 2219	Newtons 498.9 pounds Force	Right Femur Peak Load 3854 Newtons 866.4 pounds For

LEFT FRONT SEAT OCCUPANT

Test # 2926 Vehicle #	2 Location LEFT FRONT SEAT Seat Position CENTER POSITION			
Type HYBRID III DUMMY	Size Percentile 50 PERCENTILE Calibration Method HYBRID III			
Sex M Age 99 Occu	upant Height 999 mm 0 inches Occupant Weight 999 kg 0 pounds			
Occupant Manufactuer	MFG:VECTOR,S/N 064			
Occupant Modification	NO MODIFICATIONS			
Occupant Description	NO COMMENTS			
Occupant Commentary	CNTRH1: HEADREST; CNTRH2: ROOF RIBS; CNTRC1: SHOULDER/RETRACTOR			
<u>Restraints</u>				
Restraint # 1 3 POIN	T BELT Mounted Deployment? NOT APPLICABLE			
Restraint Commentary NO COMMENTS				
Restraint # 2 AIR BAIR Restraint Commentary NO	G Mounted Deployment? NOT APPLICABLE COMMENTS			
1 tootianit commontary	OOMINIETATO			

RIGHT FRONT SEAT OCCUPANT

Test # 2926 Vehicle #	2 Location RIGHT FRONT SEAT Seat Position CENTER POSITION
Type PART 572 DUMMY	Size Percentile 50 PERCENTILE Calibration Method PART 572
Sex N Age 99 Occ	cupant Height 999 mm 0 inches Occupant Weight 999 kg 0 pounds
Occupant Manufactuer	ARL,S/N 245
Occupant Modification	NO MODIFICATIONS
Occupant Description	NO COMMENTS
Occupant Commentary	CNTRH1: HEADREST; CNTRH2: ROOF RIBS; CNTRC1: SHOULDER/RETRACTOR
Head To	Head To
Windshield Header 34	1 mm 13.4 inches Side Header 197 mm 7.8 inches
Windshield 45	5 mm 17.9 inches Side Window 249 mm 9.8 inches
Seatback 999	¬
Neck to Seatback 999	g mm 0 inches
First Contact Region (Head)	OTHER Second Contact Region (Head) OTHER
Head Injury Criteria (HIC)	914 HIC Lower Time interval (ms) 62 HIC Upper Time interval (ms) 92.40 Chest
Chest To	
Dash 463	mm 18.2 inches Arm to Door 79 mm 3.1 inches
Steering Wheel 9999	mm 0 inches Hip to Door 97 mm 3.8 inches
Seatback 9999	mm 0 inches
First Contact Region (Chest/A	Abdomen) OTHER Second Contact Region (Chest/Abdomen) NONE
Lap Belt Peak Load 9999	Newtons 0 pounds Force Shoulder Belt Peak Load 9999 Newtons 0 pounds Force
Thorax Peak Acceleration (g's	Chest Severity Index 9999 s) 999.9 Thoraic Trauma Index 0 Pelvic Peak Lateral Acceleration (g's) 0
	<u>Legs</u>
Knees to Dash 136 mm	5.4 inches Knees to Seatback 9999 mm 0 inches
First Contact Region (Legs)	NONE Second Contact Region (Legs) NONE
Left Femur Peak Load 1174	Newtons 263.9 pounds Force Right Femur Peak Load 1333 Newtons 299.7 pounds Force

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4N6XPRT StifCalcs™

RIGHT FRONT SEAT OCCUPANT

Test # 2926 Vehicle #	2 Location RIGHT FRONT SEAT Seat Position CENTER POSITION
Type PART 572 DUMMY	Size Percentile 50 PERCENTILE Calibration Method PART 572
Sex N Age 99 Oc	cupant Height 999 mm 0 inches Occupant Weight 999 kg 0 pounds
Occupant Manufactuer	ARL,S/N 245
Occupant Modification	NO MODIFICATIONS
Occupant Description	NO COMMENTS
Occupant Commentary	CNTRH1: HEADREST; CNTRH2: ROOF RIBS; CNTRC1: SHOULDER/RETRACTOR
	Restraints
Restraint # 1 3 POI	NT BELT Mounted Deployment? NOT APPLICABLE
Restraint Commentary N	O COMMENTS
Restraint # 2 AIR B	AG Mounted Deployment? NOT APPLICABLE
Restraint Commentary N	O COMMENTS

the Test Cart Motion

4N6XPRT StifCalcs™ Vehicle 1 - 1999 NHTSA DEFORMABLE IMPACTOR

Test #	2926		NHTSA	Test Ve	hicle Num	nber		\	/IN			
Year	1999	Make NH	TSA	М	odel DE	FORMABL	E IMPACT	OR Bo	dy NOT	APPLICABL	E	
Vehicle	Modification	Indicatior		V	ehicle Mo	odification(s	s) Descripti	on				
RESEA	RCH VEHIC	LE			NO COM	MENTS						
Post-tes	st Steering C	olumn She	ar Capsul	e Sepera	ation	Stee	ring Columi	n Collapse N	/lechanisr	n		
UNKNO	OWN			<u> </u>		10	NKNOWN	<u> </u>				
Vehicle	Commentary	MOVI	NG DEFC	DRMABL	E BARRII	ER IMPACT	TOR EQUIF	PPED WITH	FIVE LO	AD CELLS		
	Veh	icle Length	410	2 mm	161.5	inches	V	ehicle Test	Weight	1358 KG	2994	pounds
	Vehicle V	Vheelbase	259	mm	102.3	inches		Vehic	le Width	mm	0	inches
	CG behind	front axle	96	7 mm	38.1	inches						
Center	of Damage to	o CG Axis		0 mm	0	inches	Total Lei	ngth of Ind	entation	99999 mm	0	inches
						N	Maximum	Static Crus	h Depth	mm	0	inches
Vehicle	Damage Inde	ex 9999	9999 P	rincipal [Direction of	of Force	0	Pre-Impac	t Speed	82.40 kph	51.2	mph
Dan	nage Profi	ile Dista	nce Mea	asuren	nents	Crush	from Pro	e & Post	Test Da	mage Mea	surem	ents
<u> </u>	(Measured				<u></u>	<u> </u>	Pre-Te			-Test	Crush-I	
DPD) 1	mm	0 inc	ches	Left Bu	mper Corr	ner (inches		0 inches	0	inches
DPE) 2	mm	0 inc	ches				mm		mm	0	mm
DPE	3	mm	0 inc	ches		Centerlii	ne (inches		0 inches	0	inches
DPE	04	mm	0 inc	ches				mm		mm	0	mm
DPE	5	mm	0 inc	ches	Right Rui	mper Corn	ner (inches		0 inches	0	inches
DPE	0 6	mm	0 inc	ches	Night Bui	inper com		mm		mm	0	mm
	Bumper En	gagement			S	till Engagei	ment			A-pillar Enga	gement	
	(Inline Imp					ide Impact				(Side Impac	-	
	DIRECT ENG	AGEMEN ⁻	Γ		NC	OT APPLICA	ABLE			NOT APPLI	CABLE	
	Moving To	est Cart			Moving	g Test Cart	/ Vehicle			Moving Test	Cart	
	Ang				7	Crabbed Ar			Ve	ehicle Orienta		Cart
	999	9				0				999		
	ude of the Tilt- <i>i</i> n surface if a R					the Crabbed m Logitudial	l Angle Meas Vector to Vel			de of the Angle cle Orientation		

Registerd Owner: 4N6XPRT SYSTEMS Serial Number # 03R-030201SC01301

Vector of Vehicle

and the Ground

Vehicle 1 - 1999 NHTSA DEFORMABLE IMPACTOR

Test #	2926		NHTSA Te	st Vehicle Nu	umber			VIN				
Year	1999 N	/lake NHT	SA	Model	DEFORMA	BLE IMPA	CTOR	Body	NOT A	PPLICAB	LE	
Vehicle	Modification Ir	ndicatior		Vehicle I	Modificatio	on(s) Descr	iption					
RESEA	ARCH VEHICL	E		NO COM	MMENTS							
	st Steering Col	umn Shear	Capsule S	eperation	Si	teering Colu		pse Mecl	nanism			
UNKN	OWN					UNKNOW	'N					
Vehicle	Commentary	MOVING	G DEFORM	MABLE BARF	RIER IMPA	ACTOR EQ	UIPPED	WITH FIV	E LOAD	CELLS		
	Vehic	le Length	4102	mm 161.5	inches	3	Vehicle	Test We	eight	1358 KG	299	4 pounds
	Vehicle W	heelbase	2598	mm 102.3	inches	5	١	/ehicle V	Vidth	mr	n 🗆	0 inches
	CG behind fi	ront axle	967	mm 38.1	inches							_
Center	of Damage to	CG Axis	0	mm 0	inches	Total	Length o	f Indenta	ation 9	19999 mr	n	0 inches
						Maximu	m Static	Crush Do	epth	mr	n	0 inches
\/ohiolo	Damage Index	99999	Dring	cipal Direction	of Force		Dro Ir	npact Sp	ood [22 40 kpl	b E 4	_ omph
venicie	Damage index	99999	199 11110	•		0	J	iipaci Sp	jeeu [{	32.40 kpl	11 51.	2 mph
				Pre & Po	ost Test	<u>Measur</u>	<u>ments</u>					
(Measurments are		gitudinal direc	tion. Except for	_		ments are to	aken from t	he Rear V			ard
Pre	Left S e-Test	Post-	Test	Pre-Test	Center	Post-T	est	P	re-Test	Right S		t-Test
mm	inches	mm	inches	mm in	ches	mm iı	nches	mm	inc	hes	mm	inches
				Lenat	h of Vehic	le at Cente	rline					
						ic at ocine						
					0		0					
					0 Engine 0		0					
	0		0		Engine 0 Front Bum	Block per Corner				0		0
	0		0		Engine 0 Front Bum Front of	Block per Corner	0			0		0
	0		0		Engine 0 Front Bum	Block per Corner Engine	0			0		0
					Engine 0 Front Bum Front of	Block per Corner Engine	0					
					Engine 0 Front Bum Front of 0 Fire	Block per Corner Engine						
			0	Uppe	Engine 0 Front Bum Front of 0 Fire 0	Block per Corner Engine wall Edge of D	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0		0
			0	Uppe	Engine 0 Front Bum Front of 0 Fire 0 er Leading	Block per Corner Engine wall Edge of D	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0		0
				Uppe	Engine 0 Front Bum Front of 0 Fire 0 er Leading er Leading Bottom of	Block per Corner Engine wall Edge of D Edge of D	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0 0		0
				Uppe Lowe	Engine 0 Front Bum Front of 0 Fire 0 er Leading er Leading Bottom o	Block per Corner Engine wall Edge of D Edge of D I Edge of D	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0 0 0		
				Uppe Lowe	Engine 0 Front Bum Front of 0 Fire 0 er Leading er Leading Bottom o	Block per Corner Engine wall Edge of D I Edge of D I Edge of I Edge of D Edge of I	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0 0 0		
				Upper Lower Upper	Engine 0 Front Bum Front of 0 Fire 0 er Leading er Leading Bottom of per Trailing steering 0	Block per Corner Engine wall Edge of D Edge of D I Edge of D Gedge of I Edge of D Column	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	tol)		0 0 0		
				Uppe Lowe	Engine 0 Front Bum Front of 0 Fire 0 er Leading er Leading Bottom of per Trailing steering 0	Block per Corner Engine wall Edge of D Edge of D I Edge of D Gedge of I Edge of D Column	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	tal)		0 0 0		
			0 0 0 0 0	Upper Lower Upper	Engine 0 Front Bum Front of 0 Fire 0 er Leading er Leading Bottom of pper Trailing er Trailing Steering 0 ng Column 0	Block per Corner Engine wall Edge of D Edge of D I Edge of D Column To 'A' Pos	0 0 0 0 0 0 0 0 0 0 0 t (Horizon 0	·		0 0 0		

the Test Cart Motion

4N6XPRT StifCalcs™ Vehicle 2-1999 MAZDA MIATA

Test # 2926	NHTSA Test Veh	nicle Number	\	/IN JM1NB353	5X0108953
Year 1999 Make MAZ	DA Mo	del MIATA	Во	dy CONVERTIBLE	
Vehicle Modification Indication	V	ehicle Modification(s) D	Description		
PRODUCTION VEHICLE	Ū	INMODIFIED			
Post-test Steering Column Shear	Capsule Sepera	tion Steering	Column Collapse N	/lechanism	
UNKNOWN	<u> </u>		NOWN		
Vehicle Commentary 1999 M.	AZDA MIATA 2-D	R CONVERTIBLE			
Vehicle Length	3947 mm	155.4 inches	Vehicle Test	Weight 1226 KG	2703 pounds
Vehicle Wheelbase	2265 mm	89.2 inches	Vehic	le Width 1678 mm	66.1 inches
CG behind front axle Center of Damage to CG Axis	1102 mm 9999 mm	43.4 inches 0 inches	otal Length of Inde	entation 99999 mm	0 inches
-		Max	ximum Static Crus	h Depth 579 mm	22.8 inches
Vehicle Damage Index 99999	99 Principal D	irection of Force	180 Pre-Impac	t Speed 0 kph	0 mph
Damage Profile Distance		ents Crush fr		Test Damage Mea	
(Measured Left-to-Right	, Rear-to-Front)		Pre-Test	Post-Test	Crush-Depth
DPD 1 mm	0 inches	Left Bumper Corner		0 inches	0 inches
DPD 2 mm	0 inches		mm	mm	0 mm
DPD 3 mm	0 inches	Centerline	0 inches	0 inches	0 inches
DPD 4 mm	0 inches		mm	mm	0 mm
DPD 5 mm	0 inches	Right Bumper Corner	0 inches	0 inches	0 inches
DPD 6 mm	0 inches	.	mm	mm	0 mm
Bumper Engagement		Still Engageme	nt	A-pillar Enga	agement
(Inline Impact Only)	<u></u>	(Side Impact On	ly)	(Side Impac	ot Only)
DIRECT ENGAGEMENT		NOT APPLICAB	LE	NOT APPLI	CABLE
Moving Test Cart		Moving Test Cart / V	ehicle/	Moving Tes	t Cart
Angle		Crabbed Angle	<u> </u>	Vehicle Orienta	ation on Cart
999		0		999	
Magnitude of the Tilt-Angle Measure between surface if a Rollover Test Ca		gnitude of the Crabbed An ckwise from Logitudial Ved		Magnitude of the Angle the vehicle Orientation	

Registerd Owner: 4N6XPRT SYSTEMS Serial Number # 03R-030201SC01301

Vector of Vehicle

and the Ground

Vehicle 2 - 1999 MAZDA MIATA

Γest #	2926	N	IHTSA Te	st Vehicle	Number			VIN	JM	1NB3535	X010895	3
Year	1999	Make MAZD	A	Model	MIATA			Body	CONVER ⁻	TIBLE		
/ehicle N	Modification I	ndicatior		Vehicle	e Modification	on(s) Descr	iption					
PRODU	CTION VEHI	CLE		UNMO	ODIFIED							
Post-test	Steering Co	lumn Shear C	Capsule S	eperation	s	teering Col	umn Collap	se Mech	anism			_
UNKNO	WN					UNKNOW	/N					
/ehicle (Commentary	1999 MA	ZDA MIAT	ΓA 2-DR C	ONVERTIBL	.E						
	Vehi	cle Length	3947	mm 155	5.4 inches	S	Vehicle 1	Test Wei	ght 12	26 KG	2703 P	ounds
	Vehicle W	/heelbase	2265	mm 89	9.2 inches	S	Ve	ehicle W	idth 16	78 mm	66 1 i	nches
	CG behind	front axle	1102	mm 43	3.4 inches	S			10	<u>70</u> [00.1	
Center of	of Damage to	CG Axis	9999	mm	0 inches	Total	Length of	Indentat	ion 999	99 mm	0 i	nches
						Maximu	ım Static C	Crush De	pth 5	79 mm	22.8 i	nches
/-l-:-l- [Duin -	-i Di	: / [] D	1 0				
venicie L	Damage Inde	x 999999	9 Princ	cipai Direct	ion of Force	180	Pre-im	pact Spe	eea	0 kph	0 r	nph
				Pre &	Post Tes	t Measur	<u>ments</u>					
(N		e taken in a logit	udinal direc	tion. Except	=		ments are tak	ken from the				
Pre-	Left Test	Side Post-Te	est	Pre-Te	Center	line Post-T	est	Pre	e-Test	ight Side	e Post-Te	est
mm	inches		nches				nches	mm	inche	es mn		ches
				Len	ngth of Vehic	cle at Cente	erline					
				Len	ngth of Vehic	cle at Cente	erline 0					
				Len	0 Engine	cle at Cente	0					
] [0]		0	Len	Engine					0		0
	0		0	Len	Engine O Front Bum Front of	Block	0			0		0
				Len	Engine O Front Bum Front of	Block per Corner f Engine	0					
	0		0	Len	Engine O Front Bum Front of	Block per Corner	0			0 _		0
			0		Engine O Front Bum Front of O Fire	Block per Corner f Engine ewall	0 0			0		0
			0	Uş	Engine O Front Bum Front of O Fire O O O O O O O O O O O O O O O O O O O	Block per Corner f Engine ewall g Edge of D	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0 [0
			0 0	Uş	Engine O Front Bum Front of O Fire O O O O O O O O O O O O O O O O O O O	e Block per Corner f Engine ewall g Edge of D	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0		0 0
			0 0 0	Uţ	Engine O Front Bum Front of Fire O O Fire O O Engine O Front of O Fire O O Engine O Fire O Engine O Fire O Engine O Fire O Engine Front of Fire O Engine Engine Engine O Engine Engine	Block per Corner f Engine ewall g Edge of D g Edge of D of 'A' Post	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0		0 0 0
			0 0 0 0	Up	Engine Engine Front Bum Front of Fire O O Engine O Front of O Fire O O Engine O Front of O Fire O O C C C C C C C C C C C	Block per Corner f Engine ewall g Edge of D g Edge of D of 'A' Post	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0		0 0 0
			0 0 0	Up	Engine O Engine Front Bum Front of O Fire O O Oper Leading Ower Leading Bottom o Upper Trailing	Block Block Per Corner Fengine Wall George Edge of D	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0		0 0 0
			0 0 0 0	Up	Engine O Engine O Front Bum Front of O Fire O O O O O O O O O O O O O O O O O O O	Block Block Engine Engine Ewall Gelde of Degrate of Ingered of Ingered of Degrate o	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0		0 0 0
			0 0 0 0	Up	Engine O Engine Front Bum Front of O Fire O O O O O O O O O O O O O O O O O O	Block Block Engine Engine Ewall Gelde of Degrate of Ingered of Ingered of Degrate o	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0		0 0 0
			0 0 0 0	Up Lo	Engine O Engine O Front Bum Front of O Fire O O O O O O O O O O O O O O O O O O O	Block Block Engine Engine Gewall Gedge of Degree Ge	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 t (Horizonta	•		0		0 0 0

4N6XPRT StitCalcs™ 1999 MAZDA MIATA

NHTSA Crash Test - # 2926 - Rear Impact

{ Maximum Crush - Vehicle Width - KE Equivalent Speed - }

Given:

Vehicle Test Weight = 2703 pounds Impactor Test Weight = 2994 pounds

KE Equivalent Speed = 37.1 mph Impactor Test Speed = 51.2 mph

Test Crush Length = 66.1 inches

Reported Maximum Crush Depth (inches)

(Driver Side) Maximum (Pass. Side)

__._

Calculated Stiffness Coefficients

A	<u>B</u>	<u> </u>
124.5	75.6	102.5
231	65.1	410
319.5	55.3	922.4
390.1	46.4	1639.8

A = Maximum force per inch of damage without permenant damage, lb/in

B = Crush resistance per inch of damage width, lb/in^2

G = Energy dissipated without permenant damage, Ib

Minimum Crush = N/A inches

Using a Rated No Damage Speed of 2.5 mph Using a Rated No Damage Speed of 5 mph Using a Rated No Damage Speed of 7.5 mph Using a Rated No Damage Speed of 10 mph

Average Crush = N/A

Using a Rated No Damage Speed of 2.5 mph Using a Rated No Damage Speed of 5 mph Using a Rated No Damage Speed of 7.5 mph Using a Rated No Damage Speed of 10 mph

Maximum Crush = 22.8 inches

Using a Rated No Damage Speed of 2.5 mph
Using a Rated No Damage Speed of 5 mph
Using a Rated No Damage Speed of 7.5 mph
Using a Rated No Damage Speed of 10 mph

Rated No Damage Speed = Impact speed with a barrier resulting in no permenant vehicle deformation

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some specific vehicles may have a higher rating

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats (version 4.1+) Impact Speed (mph) = SQR(30 * CF * max crush in feet)

Calculated KE Equivalent Speed

 Crush
 Maximum Crush
 (mph)
 Calculated Error
 Calculated Error

 Factor
 (inches)
 (mph)
 (%)

 21
 22.8
 34.6
 -2.5
 -6.8%

4N6XPRT Systems Specific Crush Factor (CF specific to this test) = 24.2 CF = (mph * mph) / (30 * max crush in feet), dimensionless

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

4N6XPRT StifCalcs™ licensed by 4N6XPRT Systems (www.4N6XPRT.com) to:

4N6XPRT StitCalcs™ 1999 MAZDA MIATA

NHTSA Crash Test - # 2926 - Rear Impact

{ Maximum Crush - Vehicle Width - Closing Speed - }

Given:

Vehicle Test Weight = 2703 pounds Impactor Test Speed = 51.2 mph Test Crush Length = 66.1 inches

Reported Maximum Crush Depth (inches)

(Driver Side) Maximum (Pass. Side)

22.8

Calculated Stiffness Coefficients

Minimum Crush =	N/A	inches

Using a Rated No Damage Speed of 2.5 mph Using a Rated No Damage Speed of 5 mph Using a Rated No Damage Speed of 7.5 mph Using a Rated No Damage Speed of 10 mph

Average Crush = N/A inc

Using a Rated No Damage Speed of 2.5 mph Using a Rated No Damage Speed of 5 mph Using a Rated No Damage Speed of 7.5 mph Using a Rated No Damage Speed of 10 mph

Maximum Crush = 22.8 inches

Using a Rated No Damage Speed of 2.5 mph
Using a Rated No Damage Speed of 5 mph
Using a Rated No Damage Speed of 7.5 mph
Using a Rated No Damage Speed of 10 mph

Rated No Damage Speed = Impact speed with a barrier resulting in no permenant vehicle deformation

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some specific vehicles may have a higher rating

A	<u>B</u>	G
175.1	149.6	102.5
332.3	134.7	410
471.5	120.5	922.4
592.7	107.1	1639.8

A = Maximum force per inch of damage without permenant damage, Ib/in

B = Crush resistance per inch of damage width, lb/in^2

G = Energy dissipated without permenant damage, Ib

Speed from Crush calculation using a generic CF of 27 as suggested in Expert AutoStats (version 4.1+)

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

Calculated Impact

 Crush
 Maximum Crush
 (mph)
 Calculated Error
 Calculated Error

 Factor
 (inches)
 (mph)
 (%)

 27
 22.8
 39.2
 -12
 -23.4%

4N6XPRT Systems Specific Crush Factor (CF specific to this test) = CF = (mph * mph) / (30 * max crush in feet), dimensionless

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

4N6XPRT StifCalcs™ licensed by 4N6XPRT Systems (www.4N6XPRT.com) to:

Stiffness Values and Test Data

Derived from

NHTSA Crash Test # 1272

Provided By

4N6XPRT StifCalcs™

Registered to:

4N6XPRT SYSTEMS
8387 UNIVERSITY AVENUE
LA MESA CA 91941-384
S/N: 03R-030201SC01301

Sister/Clone database reader

You entered: 1988 Volkswagen Golf

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

Year RangeMakeModelBody StylesWheelbase1985 - 1992VolkswagenGolf3d,5d97.3"

REMARKS:

The data contained in the database has been provided free of charge as a courtesy to the traffic accident reconstruction community by Gregory C. Anderson of Scalia Safety Engineering. 4N6XPRT Systems has made no changes to this data, and has only provided for distribution of this data free of charge. 4N6XPRT Systems makes no warranties, either express or implied, with respect to this data, its quality, performance, merchantability, or fitness for any particular purpose. The entire risk as to its quality and performance is with the user. In no event will 4N6XPRT Systems be liable for direct, incidental, or consequential damages resulting from any data presented here, even if 4N6XPRT Systems has been advised of the possibility of such damages. The user must agree to assume full responsibility for any decisions which are based, in whole or in part, upon information obtained by using this data. As previously stated, the data has been provided free of charge as a courtesy to the traffic accident reconstruction community by Gregory C. Anderson of Scalia Safety Engineering. Mr. Anderson does not in any way guarantee the accuracy of the data. Some of the listed similarities are based on his own estimates or memory. Most of the data are pulled from specification tables which may contain inaccuracies of their own. Use common sense - if something seems wrong, check it (and if it is wrong, let him know!).

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 # 1272 NHTSA Version # 2 Test Date 1988-12 Contract # DTRS57-87-C-00047
Contract/Study Title FY88 SIDE IMPACT PROTECTION PROGRAM
Test Objective(s) TO OBTAIN VEHICLE CRASHWORTHINESS AND OCCUPANT RESTRAINT PERFORMANCE
Test Type BASELINE TEST Configuration IMPACTOR INTO VEHICLE
Closing Speed 54.4 Km/Hr 34 MPH
Impact Angle 270 Offset Distance mm 0 inches Side Impact Point -112 mm -4 inches
Test Performer CALSPAN Test Reference # RUN 866
Test Track Surface CONCRETE Condition DRY Ambient Temperature 6 C 43 F
Data Recorder Type FM TAPE RECORDER Data Link UMBILICAL CABLE Total Number of Curves 63
Test Commentary NO COMMENTS

No Fixed Barrier Data

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4N6XPRT StifCalcs™

LEFT FRONT SEAT OCCUPANT

Test # 1272 Vehicle #	2 Location LEFT FRONT SEAT Seat Position CENTER POSITION
Type NHTSA SIDE IMPACT	DUMMY Size Percentile 50 PERCENTILE Calibration Method HSRI
Sex M Age Occu	upant Height mm 0 inches Occupant Weight kg 0 pounds
Occupant Manufactuer	HUMANOID S/N:905
Occupant Modification	NO COMMENTS
Occupant Description	SIDE IMPACT DUMMY
Occupant Commentary	CNTRH1=LT WINDOW SILL; CNTRH2=RT B PILLAR; CNTRC1 & CNTRL1=LEFT DOOR
_	<u>Head</u>
Head To	Head To
Windshield Header 422	mm 16.6 inches Side Header 140 mm 5.5 inches
Windshield 531	mm 20.9 inches Side Window 216 mm 8.5 inches
Seatback	mm 0 inches
Neck to Seatback	mm 0 inches
First Contact Region (Head)	OTHER Second Contact Region (Head) OTHER
Head Injury Criteria (HIC)	324 HIC Lower Time interval (ms) 46.95 HIC Upper Time interval (ms) 67.65 Chest
Chest To	
Dash 546	mm 21.5 inches Arm to Door 97 mm 3.8 inches
Steering Wheel 356	mm 14 inches Hip to Door 145 mm 5.7 inches
Seatback	mm 0 inches
First Contact Region (Chest/Ab	odomen) OTHER Second Contact Region (Chest/Abdomen) NONE
Lap Belt Peak Load N	lewtons 0 pounds Force Shoulder Belt Peak Load Newtons 0 pounds Force
	Chest Severity Index
Thorax Peak Acceleration (g's)	Thoraic Trauma Index Pelvic Peak Lateral Acceleration (g's)
	<u>Legs</u>
Knees to Dash 107 mm	4.2 inches Knees to Seatback mm 0 inches
First Contact Region (Legs)	OTHER Second Contact Region (Legs) NONE
Left Femur Peak Load	Newtons 0 pounds Force Right Femur Peak Load Newtons 0 pounds Force

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4N6XPRT StifCalcs™

LEFT FRONT SEAT OCCUPANT

Test # 1272 Vehicle #	2 Location LEFT FRONT SEAT Seat Position CENTER POSITION
Type NHTSA SIDE IMPACT	DUMMY Size Percentile 50 PERCENTILE Calibration Method HSRI
Sex M Age Occ	rupant Height mm 0 inches Occupant Weight kg 0 pounds
Occupant Manufactuer	HUMANOID S/N:905
Occupant Modification	NO COMMENTS
Occupant Description	SIDE IMPACT DUMMY
Occupant Commentary	CNTRH1=LT WINDOW SILL; CNTRH2=RT B PILLAR; CNTRC1 & CNTRL1=LEFT DOOR
	<u>Restraints</u>
Restraint # 1 NONE	Mounted Deployment? NOT APPLICABLE
Restraint Commentary DL	JMMY WAS UNRESTRAINED
Restraint # 2 NONE	Mounted Deployment? NOT APPLICABLE
Restraint Commentary DL	JMMY WAS UNRESTRAINED

4N6XPRT StifCalcs™

LEFT REAR SEAT OCCUPANT

Test # 1272 Vehicle #	2 Location LEFT REAR SEAT	Seat Position	NONADJUSTABLE SEAT
Type NHTSA SIDE IMPACT	DUMMY Size Percentile	50 PERCENTILE	Calibration Method HSRI
Sex M Age Occ	cupant Height mm	0 inches Occupa	nnt Weight kg 0 pounds
Occupant Manufactuer	HUMANOID S/N: 904		
Occupant Modification	NO COMMENTS		
Occupant Description	SIDE IMPACT DUMMY		
Occupant Commentary	CNTRH1 IS LEFT REAR ROOF RAIL	L; CNTRC1 IS LEFT	REAR SIDE PANEL.
	Hea		
Head To	_	Head To	
Windshield Header	mm 0 inches	Side Header	168 mm 6.6 inches
Windshield	mm 0 inches	Side Window	241 mm 9.5 inches
Seatback 57	7 mm 22.7 inches	_	
Neck to Seatback	mm 0 inches		
First Contact Region (Head)	OTHER	Second Contact Re	egion (Head) NONE
Head Injury Criteria (HIC)	350 HIC Lower Time interval (,	HIC Upper Time interval (ms) 62.92
Chest To			
Dash	mm 0 inches	Arm t	o Door 119 mm 4.7 inches
Steering Wheel	mm 0 inches	Hip to	Door 157 mm 6.2 inches
Seatback 450	mm 17.7 inches		
First Contact Region (Chest/A	Abdomen) OTHER Se	econd Contact Region	n (Chest/Abdomen) NONE
Lap Belt Peak Load	Newtons 0 pounds Force Sho	ulder Belt Peak Load	Newtons 0 pounds Force
	Chest Severity Index		
Thorax Peak Acceleration (g's	s) Thoraic Trauma Index	Pelvio	Peak Lateral Acceleration (g's)
	Leg	<u>qs</u>	
Knees to Dash mm	0 inches	Knees to Seatba	ck 127 mm 5 inches
First Contact Region (Legs)	NONE	cond Contact Region	(Legs) NONE
Left Femur Peak Load	Newtons 0 pounds Force F	Right Femur Peak Loa	ad Newtons 0 pounds Force

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4N6XPRT StifCalcs™

LEFT REAR SEAT OCCUPANT

Test # 1272 Vehicle #	2 Location LEFT REAR SEAT Seat Position NONADJUSTABLE SEAT						
Type NHTSA SIDE IMPACT	DUMMY Size Percentile 50 PERCENTILE Calibration Method HSRI						
Sex M Age Occ	cupant Height mm 0 inches Occupant Weight kg 0 pounds						
Occupant Manufactuer	HUMANOID S/N: 904						
Occupant Modification	NO COMMENTS						
Occupant Description	SIDE IMPACT DUMMY						
Occupant Commentary	CNTRH1 IS LEFT REAR ROOF RAIL; CNTRC1 IS LEFT REAR SIDE PANEL.						
	<u>Restraints</u>						
Restraint # 1 NONE	Mounted Deployment? NOT APPLICABLE						
Restraint Commentary TE	Restraint Commentary TEST DUMMY WAS UNRESTRAINED.						
Restraint # 2 NONE	Mounted Deployment? NOT APPLICABLE						
Restraint Commentary TE	ST DUMMY WAS UNRESTRAINED.						

the Test Cart Motion

4N6XPRT StifCalcs™ Vehicle 1 - NHTSA DEFORMABLE IMPACTOR

Test # 1272	NHTSA Test Ve	hicle Number		VIN		
Year Make NHT	SA M	odel DEFORMAB	LE IMPACTO	R Body	OTHER	
Vehicle Modification Indicatior	\	/ehicle Modification	(s) Description	1		
RESEARCH VEHICLE		UNMODIFIED				
Post-test Steering Column Shea	r Capsule Sepera	ation Ste	ering Column	Collapse Med	chanism	
NOT APPLICABLE		1	NOT APPLICA	BLE		
Vehicle Commentary NO CC	MMENTS					
Vehicle Length	4206 mm	165.6 inches	Vel	nicle Test W	eight 1315 KG	2899 pounds
Vehicle Wheelbase	2591 mm	102 inches		Vehicle	Width 1676 mm	66 inches
CG behind front axle	777 mm	30.6 inches			. —	
Center of Damage to CG Axis	mm	0 inches	Total Leng	th of Indeni	ation mm	0 inches
			Maximum S	tatic Crush [Depth mm	0 inches
Vehicle Damage Index 99999	999 Principal	Direction of Force	26 P	re-Impact S	peed 54.40 kph	33.8 mph
Damage Profile Distan	ce Measuren	nents Crus	h from Pre	& Post Te	st Damage Mea	surements
(Measured Left-to-Righ			Pre-Tes		Post-Test	Crush-Depth
DPD 1 38 mm	1.5 inches	Left Bumper Co	rner 0	inches	0 inches	0 inches
DPD 2 8 mm	0.3 inches			mm	mm	0 mm
DPD 3 8 mm	0.3 inches	Center	ine 0	inches	0 inches	0 inches
DPD 4 13 mm	0.5 inches			mm	mm	0 mm
DPD 5 38 mm	1.5 inches	Right Bumper Co	ner 0	inches	0 inches	0 inches
DPD 6 102 mm	4 inches			mm	mm	0 mm
Bumper Engagement		Still Engag	ement		A-pillar Enga	gement
(Inline Impact Only)		(Side Impac	t Only)		(Side Impac	t Only)
NOT APPLICABLE		DIRECT ENGA	GEMENT		DIRECT ENGA	GEMENT
Moving Test Cart		Moving Test Ca	rt / Vehicle		Moving Test	Cart
Angle		Crabbed A	Angle		Vehicle Orienta	ition on Cart
		26				
Magnitude of the Tilt-Angle Measure between surface if a Rollover Test C	ed M Cart CI	lagnitude of the Crabbe ockwise from Logitudia			Magnitude of the Angle the vehicle Orientation	

Registerd Owner: 4N6XPRT SYSTEMS Serial Number # 03R-030201SC01301

Vector of Vehicle

and the Ground

4N6XPRT StifCalcs™

Vehicle 1 - NHTSA DEFORMABLE IMPACTOR

Test #	1272]	NHTSA Te	est Vehicle Nu	mber		VIN			
Year		Make NHT	SA	Model D	EFORMABL	E IMPACTOR	Body	THER		
Vehicle	Modification I	ndicatior		Vehicle M	Modification(s	s) Description				
RESE	ARCH VEHIC	E		UNMOD	IFIED					
	st Steering Co	olumn Shear	Capsule S	Seperation	1	ring Column Colla	pse Mecha	nism		
NOT A	PPLICABLE				l NC	OT APPLICABLE				
Vehicle	Commentary	NO CO	MMENTS							
	Vehi	cle Length	4206	mm 165.6	inches	Vehicle	Test Weig	ht 1315	KG 28	99 pounds
	Vehicle W	/heelbase	2591	mm 102	inches	V	ehicle Wi	dth 1676	mm	66 inches
	CG behind	front axle	777	mm 30.6	inches	•		1070	'''''	<u>oo</u> ooo
Center	of Damage to	CG Axis		mm 0	inches	Total Length of	Indentati	on	mm	0 inches
					N	Maximum Static	Crush Dep	th [mm	0 inches
					F					
Vehicle	Damage Inde	x 99999	999 Prin	cipal Direction	of Force	26 Pre-Im	pact Spe	ed 54.40	<ph 33<="" td=""><td>3.8 mph</td></ph>	3.8 mph
				Pre & Po	st Test M	<u>easurments</u>				
(gitudinal dired	ction. Except for	Engine Block, a	II measurments are ta	ken from the	Rear Vehicle S	Surface for	ward
Dro	Left -Test	Side Post-	Toot	Pre-Test	Centerline	Post-Test	Dro	Righ [.] -Test	t Side	st-Test
mm	inches	mm	inches		ches mm		mm	inches	mm	inches
				Length	n of Vehicle a	at Centerline				
					0	0				
					Engine Blo	ock 0				
	0		0	F	ront Bumper	Corner		0		0
	_				_ , ,_			11 9		
					Front of En					
	0		0		0	0		-		7 0
	0		0			0				0
			0	Uppe	0 Firewall	0		-		0
			0		0 Firewall 0 er Leading Ed	0 I O				0
			0	Lowe	Firewall O Er Leading Eder Leading Eder	0 I O O O O O O O O O O O O O O O O O O				
				Lowe	Firewall O Er Leading Eder Leading Eder Leading Eder Bottom of 'A'	dge of Door				
				Lowe Up _l	Firewall O Er Leading Ed Pr Leading Ed Bottom of 'A' Per Trailing E	dge of Door Post				
				Lowe Up _l	Firewall o Firewall or Leading Ed Bottom of 'A' per Trailing Ed er Trailing Ed	dge of Door Post Edge of Door ge of Door				
				Lowe	Firewall O Firewall O Pr Leading Ed Bottom of 'A' per Trailing Ed Steering Col O	dge of Door Post dge of Door ge of Door Jumn 0				
				Lowe	Firewall or Leading Ed er Leading Ed Bottom of 'A' per Trailing Ed Steering Column to	dge of Door ' Post dge of Door ge of Door lumn 0 'A' Post (Horizont	tal)			
			0 0 0 0	Lowe Lowe	Firewall Firewall O Firewall or Leading Ed Bottom of 'A' per Trailing Ed Steering Col O Ig Column to O	dge of Door Post dge of Door ge of Door Jumn 0	·			

the Test Cart Motion

4N6XPRT StifCalcs™ Vehicle 2 - 1988 VOLKSWAGEN GOLF

Test #	1272	NHTSA Test Ve	ehicle Number		VI	N 1VWAA017	8JV019989
Year	1988 Make VO	LKSWAGEN M	odel GOLF		Boo	THREE DOOR H	ATCHBACK
Vehicle	Modification Indicatior	\	Vehicle Modification	on(s) Descriptio	n		
PRODU	JCTION VEHICLE		NO COMMENTS				
Post-tes	st Steering Column Shea	ar Capsule Sepera	ation Si	teering Column	Collapse M	echanism	
UNKNO	OWN			OTHER	•		
Vehicle	Commentary VEHIC	CLE MODEL IS A	GOLF. COLMEC	IS UNKNOWN			
	Vehicle Length	4011 mm	157.9 inches	s Ve	hicle Test	Weight 1207 KG	2661 pounds
	Vehicle Wheelbase	2479 mm	97.6 inches	5	Vehicle	e Width 1651 mm	65 inches
	CG behind front axle	1034 mm	40.7 inches				inabaa
Center	of Damage to CG Axis	-180 mm	-7.1 inches	iotai Len	gth of Inde	ntation 1676 mm	
				Maximum S	Static Crush	Depth 353 mm	13.9 inches
Vehicle	Damage Index 09LP	PEW Principal	Direction of Force	334	Pre-Impact	Speed 0 kph	0 mph
Dan	nage Profile Distar	nce Measuren	nents Cru	sh from Pre	& Post T	est Damage Mea	asurements
<u> Dan</u>	(Measured Left-to-Right		<u> </u>	Pre-Tes		Post-Test	Crush-Depth
DPE) 1 173 mm	6.8 inches	Left Bumper C	orner 0	inches	0 inches	0 inches
DPE) 2 353 mm	13.9 inches			mm	mm	0 mm
DPE	351 mm	13.8 inches	Cente	157.9	inches	157.9 inches	0 inches
DPE	0 4 351 mm	13.8 inches		4011	mm	4011 mm	0 mm
DPE) 5 353 mm	13.9 inches	Right Bumper C	orner 0	inches	0 inches	0 inches
DPE	0 6 221 mm	8.7 inches	riigiii Buiiipoi O		mm	mm	0 mm
	Bumper Engagement		Still Enga	gement		A-pillar Enga	agement
	(Inline Impact Only)		(Side Impa	act Only)		(Side Impa	ct Only)
	NOT APPLICABLE		NOT APPL	ICABLE		NOT APPLI	CABLE
	Moving Test Cart		Moving Test C	art / Vehicle		Moving Tes	t Cart
	Angle		Crabbed	l Angle	1	Vehicle Orient	ation on Cart
			26	3			
	ude of the Tilt-Angle Measu n surface if a Rollover Test (lagnitude of the Crab lockwise from Logitud			Magnitude of the Angle the vehicle Orientation	

Registerd Owner: 4N6XPRT SYSTEMS Serial Number # 03R-030201SC01301

Vector of Vehicle

and the Ground

4N6XPRT StifCalcs™

Vehicle 2 - 1988 VOLKSWAGEN GOLF

L	1272		NHISA IE	st Vehicle Nur	mber		VIN	1\	VWAA017	8JV0199	89
Year [1988	Make VOL	KSWAGEN	Model G	OLF		Body	THREE	DOOR H	ATCHBA	CK
/ehicle N	Modification I	ndicatior		Vehicle M	lodification(s)	Description					
PRODU	CTION VEHI	CLE		NO COM	IMENTS						
Post-test	Steering Co	lumn Shea	r Capsule S	Seperation	Steerin	ng Column Colla	apse Mech	nanism			
UNKNO	WN				OTH	IER					
/ehicle (Commentary	VEHIC	LE MODEL	IS A GOLF. C	COLMEC IS U	NKNOWN.					
	Vehic	cle Length	4011	mm 157.9	inches	Vehicle	e Test We	ight	1207 KG	2661	pounds
	Vehicle W	/heelbase	2479	mm 97.6	inches	,	Vehicle W	/idth	1651 mm	65	inches
	CG behind f	front axle	1034	mm 40.7	inches			_	1001		
Center of	of Damage to	CG Axis	-180	mm -7.1	inches	Total Length o	of Indenta	tion	1676 mm	66	inches
					Ма	ximum Static	Crush De	epth	353 mm	13.9	inches
/ehicle [Damage Inde	x 09LPI	EW Princ	cipal Direction	of Force	334 Pre-li	mpact Sp	eed	0 kph	0	mph
				Pre & Po	st Test Me	asurments					
(N	leasurments are	e taken in a k	ogitudinal direc	ction. Except for E	Engine Block, all r	measurments are	taken from tl	ne Rear V	ehicle Surfa	ace forwar	d
	Left	Side			Centerline				Right Si	de	
	Test	Post-		Pre-Test		Post-Test		e-Test		Post-1	
mm	inches	mm	inches	mm inc	ches mm	inches		inc	:hes n	nm	inches
							mm				
				Length	of Vehicle at	Centerline	1				
					157.9	Centerline 4011 157.9	1				
				Length	157.9 C	Centerline 4011 157.9		•			
	0		0	Length 4011	157.9	Centerline 4011 157.9 k 0			0		0
	0		0	Length 4011	157.9 Engine Bloc	Centerline 4011 157.9 k 0					0
	-			Length 4011	Engine Bloc O ront Bumper C Front of Engi	Centerline 4011 157.9 k 0			0		
	0		0	Length 4011	Engine Bloc 0 ront Bumper C Front of Engi 0 Firewall	Centerline 4011 157.9 k 0 corner ine 0					0
	-			Length 4011	Engine Bloc O ront Bumper C Front of Engi	Centerline 4011 157.9 k 0 Corner			0		
	-			Length 4011 Fr	Engine Bloc 0 ront Bumper C Front of Engi 0 Firewall	Centerline 4011 157.9 ck 0 Corner ine 0			0		
			0	Length 4011 Fr	Engine Bloc O ront Bumper C Front of Engi O Firewall O	Centerline 4011 157.9 k 0 Corner ine 0			0 0		0
			0	Length 4011 Fr Uppe	Engine Bloc O ront Bumper C Front of Engi O Firewall O r Leading Edg	Centerline 4011 157.9 sk 0 Corner ine 0 0 e of Door e of Door			0 0		0
			0 0	Length 4011 Fr Uppe Lowe	Engine Bloc O ront Bumper C Front of Engi O Firewall O r Leading Edg r Leading Edg	Centerline 4011 157.9 k 0 Corner ine 0 e of Door e of Door			0 0		0 0
				Length 4011 Fr Uppe Lowe	Engine Bloc O ront Bumper C Front of Engi O Firewall O r Leading Edg r Leading Edg Bottom of 'A' F	Centerline 4011 157.9 k 0 Corner ine 0 0 e of Door e of Door Post ge of Door			0 0 0 0		0 0 0
				Length 4011 Fr Uppe Lowe	Engine Bloc O ront Bumper C Front of Engi O Firewall O r Leading Edg r Leading Edg Bottom of 'A' F per Trailing Edg Steering Colu	Centerline 4011 157.9 ck 0 corner ne 0 0 e of Door e of Door ge of Door e of Door e of Door			0		0 0 0
				Length 4011 Fr Uppe Lowe	Engine Bloc O Tont Bumper C Front of Engi O Firewall O r Leading Edg r Leading Edg Bottom of 'A' F per Trailing Edg Steering Colu O	Centerline 4011 157.9 k 0 Corner ine 0 0 e of Door e of Door ge of Door e of Door e of Door n 0			0		0 0 0
				Length 4011 Fr Uppe Lowe	Engine Bloc O Tont Bumper C Front of Engi O Firewall O r Leading Edg r Leading Edg Bottom of 'A' F per Trailing Edg Steering Colu O	Centerline 4011 157.9 ck 0 corner ne 0 0 e of Door e of Door ge of Door e of Door e of Door			0		0 0 0
			0 0 0 0 0	Length 4011 Fr Uppe Lowe Upp Lowe Inter of Steering	Engine Bloc O ront Bumper C Front of Engi O Firewall O r Leading Edg r Leading Edg Bottom of 'A' F per Trailing Edge er Trailing Edge Steering Colu O g Column to 'A' O	Centerline 4011 157.9 k 0 Corner ine 0 0 e of Door e of Door ge of Door e of Door he of Door A' Post (Horizor	l		0		0 0 0 0

NHTSA Crash Test - # 1272 - Side Impact

{ Damage Profile Distances - Indentation Length - KE Equivalent Speed - Trapezoidal Average }

Given: Vehicle Test Weight = 2661 pounds Impactor Weight =

2899 pounds

KE Equivalent Speed = 24.4 mph

Impactor Test Speed =

33.8 mph

Damage Width = 66 inches

Damage Profile Distance Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	6.8	13.9	13.8	13.8	13.9	8.7	(Pass. Side)

Calculated Stiffness Coefficients

Minimum Crush = 6.8 inches		A	<u> </u>	<u> </u>
Using a Rated No Damage Speed of	1 mph	111.3	383.1	16.2
Using a Rated No Damage Speed of	2 mph	213.1	351.1	64.7
Using a Rated No Damage Speed of	3 mph	305.3	320.4	145.5
Using a Rated No Damage Speed of	5 mph	461.4	263.4	404.1
Average Crush = 12.6 inches				
Using a Rated No Damage Speed of	1 mph	59.9	111.1	16.2
Using a Rated No Damage Speed of	2 mph	114.7	101.8	64.7
Using a Rated No Damage Speed of	3 mph	164.4	92.9	145.5
Using a Rated No Damage Speed of	5 mph	248.4	76.3	404.1
Maximum Crush = 13.9 inches				
Using a Rated No Damage Speed of	1 mph	54.4	91.7	16.2
Using a Rated No Damage Speed of	2 mph	104.2	84	64.7
Using a Rated No Damage Speed of	3 mph	149.4	76.7	145.5
Using a Rated No Damage Speed of	5 mph	225.7	63	404.1

Rated No Damage Speed = Impact speed with a barrier resulting in no permenant vehicle deformation

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some specific vehicles may have a higher rating

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) = SQR(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Equivalent Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	13.9	27	2.6	10.6%

Calculated KE

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

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

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

4N6XPRT StifCalcs™ licensed by 4N6XPRT Systems (www.4N6XPRT.com) to:

A = Maximum force per inch of damage width without permenant damage, Ib/ii

B = Crush resistance per inch of damage width, lb/in^2

G = Energy dissipated without permenant damage, Ib

NHTSA Crash Test - # 1272 - Side Impact

{ Damage Profile Distances - Indentation Length - Closing Speed - Trapezoidal Average }

Given: Vehicle Test Weight = 2899 pounds

Impactor Test Speed = 33.8 mph

Damage Width = 66 inches

Damage Profile Distance Crush Depths (inches)

DPD1 DPD2 DPD3 DPD4 DPD5 DPD6

(Driver Side) 6.8 13.9 13.8 13.9 8.7 (Pass. Side)

Calculated Stiffness Coefficients

Minimum Crush = 6.8 inches		A	<u> </u>	<u> </u>
Using a Rated No Damage Speed of	1 mph	155.9	752.3	16.2
Using a Rated No Damage Speed of	2 mph	302.4	707.1	64.7
Using a Rated No Damage Speed of	3 mph	439.3	663.4	145.5
Using a Rated No Damage Speed of	5 mph	684.7	580	404.1
Average Crush = 12.6 inches				
Using a Rated No Damage Speed of	1 mph	84	218.1	16.2
Using a Rated No Damage Speed of	2 mph	162.8	205	64.7
Using a Rated No Damage Speed of	3 mph	236.5	192.3	145.5
Using a Rated No Damage Speed of	5 mph	368.6	168.1	404.1
Maximum Crush = 13.9 inches				
Using a Rated No Damage Speed of	1 mph	76.3	180	16.2
Using a Rated No Damage Speed of	2 mph	147.9	169.2	64.7
Using a Rated No Damage Speed of	3 mph	214.9	158.8	145.5
Using a Rated No Damage Speed of	5 mph	334.9	138.8	404.1

Rated No Damage Speed = Impact speed with a barrier resulting in no permenant vehicle deformation

A = Maximum force per inch of damage width without permenant damage, Ib/ii

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some specific vehicles may have a higher rating

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

Speed from Crush calculation using a generic CF of 27 as suggested in Expert AutoStats Impact Speed (mph) = SQR(30 * CF * max crush in feet)

Calculated Impact

Crush Factor			Calculated Error (mph)	Calculated Error (%)
27	13.9	30.6	-3.2	-9.5%

4N6XPRT Systems Specific Crush Factor (CF specific to this test) = 32.9

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

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

4N6XPRT StifCalcs™ licensed by 4N6XPRT Systems (www.4N6XPRT.com) to:

B = Crush resistance per inch of damage width, lb/in^2

G = Energy dissipated without permenant damage, Ib

NHTSA Crash Test - # 1272 - Side Impact

{ Damage Profile Distances - Indentation Length - KE Equivalent Speed - Simple Average }

Given: Vehicle Test Weight = 2661 pounds

Impactor Weight =

2899 pounds

KE Equivalent Speed = 24.4 mph

Impactor Test Speed =

33.8 mph

Damage Width = 66 inches

Damage Profile Distance Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	6.8	13.9	13.8	13.8	13.9	8.7	(Pass. Side)

Calculated Stiffness Coefficients

Minimum Crush = 6.8 inches		A	<u> </u>	<u> </u>
Using a Rated No Damage Speed of	1 mph	111.3	383.1	16.2
Using a Rated No Damage Speed of	2 mph	213.1	351.1	64.7
Using a Rated No Damage Speed of	3 mph	305.3	320.4	145.5
Using a Rated No Damage Speed of	5 mph	461.4	263.4	404.1
Average Crush = 11.8 inches				
Using a Rated No Damage Speed of	1 mph	64	126.9	16.2
Using a Rated No Damage Speed of	2 mph	122.6	116.3	64.7
Using a Rated No Damage Speed of	3 mph	175.7	106.1	145.5
Using a Rated No Damage Speed of	5 mph	265.5	87.2	404.1
Maximum Crush = 13.9 inches				
Using a Rated No Damage Speed of	1 mph	54.4	91.7	16.2
Using a Rated No Damage Speed of	2 mph	104.2	84	64.7
Using a Rated No Damage Speed of	3 mph	149.4	76.7	145.5
Using a Rated No Damage Speed of	5 mph	225.7	63	404.1

Rated No Damage Speed = Impact speed with a barrier resulting in no permenant vehicle deformation

A = Maximum force per inch of damage width without permenant damage, Ib/ii

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some specific vehicles may have a higher rating

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) = SQR(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Equivalent Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	13.9	27	2.6	10.6%

Calculated KE

4N6XPRT Systems Specific Crush Factor (CF specific to this test) = 17.1

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

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

4N6XPRT StifCalcs™ licensed by 4N6XPRT Systems (www.4N6XPRT.com) to:

B = Crush resistance per inch of damage width, lb/in^2

G = Energy dissipated without permenant damage, Ib

NHTSA Crash Test - # 1272 - Side Impact

{ Damage Profile Distances - Indentation Length - Closing Speed - Simple Average }

Given: Vehicle Test Weight = 2899 pounds

Impactor Test Speed = 33.8 mph

Damage Width = 66 inches

Damage Profile Distance Crush Depths (inches)

DPD1 DPD2 DPD3 DPD4 DPD5 DPD6

(Driver Side) 6.8 13.9 13.8 13.9 8.7 (Pass. Side)

Calculated Stiffness Coefficients

Minimum Crush = 6.8 inches		A	<u> </u>	G
Using a Rated No Damage Speed of	1 mph	155.9	752.3	16.2
Using a Rated No Damage Speed of	2 mph	302.4	707.1	64.7
Using a Rated No Damage Speed of	3 mph	439.3	663.4	145.5
Using a Rated No Damage Speed of	5 mph	684.7	580	404.1
Average Crush = 11.8 inches				
Using a Rated No Damage Speed of	1 mph	89.7	249.1	16.2
Using a Rated No Damage Speed of	2 mph	174	234.2	64.7
Using a Rated No Damage Speed of	3 mph	252.8	219.7	145.5
Using a Rated No Damage Speed of	5 mph	394	192.1	404.1
Maximum Crush = 13.9 inches				
Using a Rated No Damage Speed of	1 mph	76.3	180	16.2
Using a Rated No Damage Speed of	2 mph	147.9	169.2	64.7
Using a Rated No Damage Speed of	3 mph	214.9	158.8	145.5
Using a Rated No Damage Speed of	5 mph	334.9	138.8	404.1

Rated No Damage Speed = Impact speed with a barrier resulting in no permenant vehicle deformation

A = Maximum force per inch of damage width without permenant damage, Ib/ii

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some specific vehicles may have a higher rating

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

Speed from Crush calculation using a generic CF of 27 as suggested in Expert AutoStats Impact Speed (mph) = SQR(30 * CF * max crush in feet)

Calculated Impact

Crush Factor	Maximum Crush (inches)	Speed (mph)	Calculated Error (mph)	Calculated Error (%)
27	13.9	30.6	-3.2	-9.5%

4N6XPRT Systems Specific Crush Factor (CF specific to this test) = 32.9

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

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

4N6XPRT StifCalcs™ licensed by 4N6XPRT Systems (www.4N6XPRT.com) to:

B = Crush resistance per inch of damage width, lb/in^2

G = Energy dissipated without permenant damage, Ib

NHTSA Crash Test - # 1272 - Side Impact

{ Maximum Crush - Indentation Length - KE Equivalent Speed - }

Given:

Vehicle Test Weight = 2661 pounds Impactor Test Weight = 2899 pounds

KE Equivalent Speed = 24.4 mph Impactor Test Speed = 33.8 mph

Test Crush Length = 66 inches

Reported Maximum Crush Depth (inches)

(Driver Side) Maximum (Pass. Side)

Calculated Stiffness Coefficients

Minimum Crush = N/A	inches
Using a Rated No Damage Speed	of 1 mph
Using a Rated No Damage Speed Using a Rated No Damage Speed	
Using a Rated No Damage Speed	of 5 mph
Average Crush = N/A	inches

Using a Rated No Damage Speed of 1 mph Using a Rated No Damage Speed of 2 mph Using a Rated No Damage Speed of 3 mph Using a Rated No Damage Speed of 5 mph

Maximum Crush = 13.9 inches

Using a Rated No Damage Speed of 1 mph Using a Rated No Damage Speed of 2 mph Using a Rated No Damage Speed of 3 mph Using a Rated No Damage Speed of 5 mph

Rated No Damage Speed = Impact speed with a barrier resulting in no permenant vehicle deformation

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some specific vehicles may have a higher rating

A	B	G
76.3	180	16.2
147.9	169.2	64.7
214.9	158.8	145.5
334.9	138.8	404.1

A = Maximum force per inch of damage without permenant damage, Ib/in

B = Crush resistance per inch of damage width, lb/in^2

G = Energy dissipated without permenant damage, Ib

Speed from Crush calculation using a generic CF of 27 as suggested in Expert AutoStats (version 4.1+)

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

Calculated KE Equivalent Speed

 Crush
 Maximum Crush
 (mph)
 Calculated Error
 Calculated Error

 Factor
 (inches)
 (mph)
 (%)

 27
 13.9
 30.6
 -3.2
 -9.5%

4N6XPRT Systems Specific Crush Factor (CF specific to this test) = 32.9 CF = (mph * mph) / (30 * max crush in feet), dimensionless

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

4N6XPRT StifCalcs™ licensed by 4N6XPRT Systems (www.4N6XPRT.com) to:

NHTSA Crash Test - # 1272 - Side Impact

{ Maximum Crush - Indentation Length - Closing Speed - }

Given:

Vehicle Test Weight = 2661 pounds Impactor Test Speed = 33.8 mph Test Crush Length = 66 inches

Reported Maximum Crush Depth (inches)

(Driver Side) Maximum

13.9 (Pass. Side)

Minimum Crush = N/A inches

Using a Rated No Damage Speed of 1 mph Using a Rated No Damage Speed of 2 mph Using a Rated No Damage Speed of 3 mph Using a Rated No Damage Speed of 5 mph

Average Crush = N/A

Using a Rated No Damage Speed of 1 mph Using a Rated No Damage Speed of 2 mph Using a Rated No Damage Speed of 3 mph Using a Rated No Damage Speed of 5 mph

Maximum Crush = 13.9 inches

Using a Rated No Damage Speed of 1 mph Using a Rated No Damage Speed of 2 mph Using a Rated No Damage Speed of 3 mph Using a Rated No Damage Speed of 5 mph

Rated No Damage Speed = Impact speed with a barrier resulting in no permenant vehicle deformation

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some specific vehicles may have a higher rating

Calculated Stiffness Coefficients

A	<u> </u>	<u> </u>
76.3	180	16.2
147.9	169.2	64.7
214.9	158.8	145.5
334.9	138.8	404.1

A = Maximum force per inch of damage without permenant damage, Ib/in

B = Crush resistance per inch of damage width, lb/in^2

 $G = Energy \ dissipated \ without \ permenant \ damage, \ Ib$

Speed from Crush calculation using a generic CF of 27 as suggested in Expert AutoStats (version 4.1+)

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

Calculated Impact

 Crush
 Maximum Crush
 (mph)
 Calculated Error
 Calculated Error

 Factor
 (inches)
 (mph)
 (%)

 27
 13.9
 30.6
 -3.2
 -9.5%

4N6XPRT Systems Specific Crush Factor (CF specific to this test) = 32.9 CF = (mph * mph) / (30 * max crush in feet), dimensionless

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