# 4N6XPRT StifCalcs<sup>®</sup> Manual

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# **INTRODUCTION:**

The purpose of our writing the 4N6XPRT StifCalcs<sup>®</sup> program is to provide users easier access to the NHTSA Crash Test data. Part of the "easier access" concept is to allow the typical user to:

- Rapidly determine if NHTSA has a test for a certain vehicle with a certain impact location
- Search the database for all tests across the year range the vehicle is the "same", based upon identifying the desired vehicle Year, Make, and Model
- Search the database for all tests of "Sister" vehicles across the year range the vehicle is the "same" based upon identifying the desired vehicle Year, Make, and Model
- Display all the selected matches from the database broken into their general impact "classes" - Frontal impact, Side impact, Rear impact, and Other impact
- Easily search the database for similar class vehicles when there is no test for a desired vehicle

As a secondary consideration, the program provides some "base" calculations for stiffness values based upon the test data, with the realization that no one set of stiffness values will handle all situations, at least not well. Therefore, for each test we provide multiple sets of A-B-G stiffness values and leave it to the user to pick the appropriate values for their given collision analysis.

We hope that you find the program as useful as we do, and welcome your questions and suggestions for possible improvements.

# **FREQUENTLY ASKED QUESTIONS:**

Why can't I find any tests when I use the BASIC VEHICLE SEARCH, yet the vehicle has been tested by NHTSA?? This is most likely due to an incompatibility in model name between the Sister/Clone list maintained by Greg Anderson and the model name used by NHTSA. Incompatibility can be ANYTHING which is different between the two names - spelling, characters, spacing, etc.

Why can't I find all of the available tests for a vehicle and its Sisters & Clones when I use the BASIC VEHICLE SEARCH?? This is most likely due to an incompatibility in model name(s) between the Sister/Clone list maintained by Greg Anderson and the model name(s) used by NHTSA. Incompatibility can be ANYTHING which is different between the two names - spelling, characters, spacing, etc.

Why can't I find the vehicle manufacturer or model when I use the BASIC VEHICLE SEARCH, yet the vehicle has been tested by NHTSA?? This is most likely due to the vehicle being outside of the year range covered by the Sister/Clone list maintained by Greg Anderson.

Why are there so many Stiffness Values for a given test? Several reasons. First, our presentation of stiffness values mirrors our belief that no one set of values will fit every situation. Second, our presentation allows you to quickly develop a range of damage speeds, in a manner that should be easily explainable to a judge and/or jury, based upon data from one test. Third, there are up to three different sets of crush depths and two crush widths from which to calculate stiffness values, as well as two different methods of calculating average crush. Depending upon which data set(s) you choose to use will determine how many calculated stiffness sheets you will end up with.

Which values do I use?? It depends upon the type of test, Front, Rear, or Side.

Front - The initial point to start at would be Vehicle Width, Trapezoidal Average Crush, 5 mph Rated No Damage Speed. Which set of crush measurements to use is determined by what NHTSA reported along with your preference.

- Rear The initial point to start at would be Vehicle Width, KE Equivalent Speed, Trapezoidal Average Crush, 5 mph Rated No Damage Speed. Which set of crush measurements to use is determined by what NHTSA reported along with your preference.
- Side The initial point to start at would be Indentation Length, KE Equivalent Speed, Trapezoidal Average Crush, 2 mph Rated No Damage Speed. Which set of crush measurements to use is determined by what NHTSA reported along with your preference.

Must I use the "Trapezoidal Average"? When dealing with equally spaced crush measurements, you CAN use a "Simple average", but it is still "more correct" to use a "Trapezoidal Average", and with the 4N6XPRT StifCalcs program determining the Trapezoidal Average is quite painless.

What <u>IS</u> a Trapezoidal Average? The trapezoidal average is determined by first calculating the area in each Crush Zone through the formula -

Area = (distance between measurements  $C_n \& C_{n+1}$ )\* ( $C_n + C_{n+1}$ )/2 next, add each of the areas, and then divide that by the total Crush Length (L) Trapezoidal Average Crush Depth = ( $\sum$ [Area]) / L

What **IS** a Simple Average? The "Simple Average" is determined/calculated by adding up all of the crush measurements and then dividing the total by the number of measurements.

What is the Tumbas method/Protocol? Nicholas Tumbas was a co-author of SAE # 880072 - Tumbas, Nicholas S. and Smith Russell A. - which set a number of "standards" for what and how crush is to be measured. CRASH3, together with SAE # 880072, defines three options for the crush measurements. Either two, four or six crush equally spaced measurements are taken which are labelled C1 through to C6 as appropriate. This gives either one, three or five crush zones which are designed to approximate the damage profile.

Which is better, EQUAL or NON-EQUAL spacing between Crush Measurements? Equally spaced crush measurements have the benefit of complying with the commonly accepted crush measurement techniques/protocols, along with fitting nicely into a set of predefined "short hand" equations for calculating Average Depth, Force, and Energy. Unfortunately, equally spaced crush depth measurements may not properly depict the crush profile, may require measurements to be taken in an area where they really don't need to be taken due to the crush profile being a "straight line" at that point, or more commonly .... both. For that reason, we prefer to use nonequally spaced measurements for most cases. What follows is a step-by-step walk through for this program. The user should also refer to the NHTSA Reference Manuals provided with this program. If they were loaded, they are accessible from the HELP menu. The NHTSA Reference Manuals discuss the various data points contained in the NHTSA database in detail.

# **ESSENTIAL FORMULAS:**

At the very end of ths manual (Starting around page 56) we detail a number of the formulas used to complete the various calculations in the 4N6XPRT StifCalcs<sup>®</sup> program.

# **BASIC SEARCH:**



To retrieve data through the basic search method, simply 1) pick the year, 2) pick the make, 3) pick the model, and 4) click on the **NHTSA TEST SELECTION** tab.

When "picking" the Year, Make, and Model, they can either be picked off the drop down list, typed in directly, or a combination of the two.

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As can be seen in the Year box, as you begin to type a entry, the "Pick List" box narrows appropriately. In this case, all of the 1900 years have "disappeared". This same approach can be used with the Make and Model entries.

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To change the Year, Make, and/or Model values you can begin typing in the new value, or click the appropriate **RESET** button.

As stated previously, when you have the appropriate Year, Make, and Model entered, click on the **NHTSA TEST SELECTION** tab to see which tests are available.

# **TEST SELECTION:**

	Calcs - Selected	Vehicle: 2008 CHI	EVROLET COBALT							
Print Reports	Settings Help Re	ion Advanced Vahida	Sanah Ganas Balan							
ac venicle search		Advanced vehicle	Search Porce balan							
Available Test	Test Information	Occupant Informa	ation Vehicle In	formation Stiffness	Calcs					
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				2005 2						
				2005 - 2	UIU CHEV	ROLET COE	ALI			
		S	ister Clone	Searched Year	Range (200	03 - 2010)				
Print					Frontal Te	est(s)				
est No.	🔺 Year	Make	Model	Impact Speed	Max Crush	Crush Factor	VDI	PDOF	Test Config	VIN
487	2003	SATURN	ION	34.8	22.2	21.8	12FDEW6	0	VEHICLE INTO BAR	1G8AF52F33Z141088
<u>784</u> 100	2004	SATURN	ION	24.9	24.0	16.9	12FDEW2		VEHICLE INTO BAR	1G8AF52F54Z155463
126	2004	CHEVROLET	COBALT	34.9	17.5	27.9	12EDEW3		VEHICLE INTO BAR	1G1AK52E757520801
084	2007	CHEVROLET	COBALT	24.7	16.2	15.1	12FDEW6	lŏ	VEHICLE INTO BAR	1G1AK55F677150701
)94	2007	CHEVROLET	COBALT	0.0	0.0	0.0		0	LOW RISK DEPLOY	1G1AK55F677150701
095	2007	CHEVROLET	COBALT	0.0	0.0	0.0		0	LOW RISK DEPLOY	1G1AK55F677150701
569	2009	CHEVROLET	COBALT	0.0	0.0	0.0		0	LOW RISK DEPLOY	1G1AK58H897127727
572	2009		COBALT	0.0	0.0	0.0			LOW RISK DEPLOY	1G14K58H897127727
573	2009	CHEVROLET	COBALT	0.0	0.0	0.0			LOW RISK DEPLOY	1G1AK58H897127727
/74	10000	CURUPOLET	CODALT	0.0	0.0	100	1	- Lă	LOW DICK DEDLOY	1C1AKE01007107707
827	2003	SATURN	ION	29.9	N/A	-0.1	9999999	180	IMPACTOR INTO V.	. 1G8AF52F032138200
Print					Side Tes	st(s)				
est No.	Year	Make	Model	Impact Speed	Max Crush	Crush Factor	VDI	PDOF	Test Config	VIN
502	2003	SATURN	ION	38.5	13.2	45.0	09LPEW2	270	IMPACTOR INTO V	1G8AF52F432145245
260	2004	SATURN	ION	38.6	10.6	50.4	U9LPEW2	297	IMPACTOR INTO V	1G0AM12F542126995
100	2005	SATURN	ION	20.4	14.0	11.5	09LPAN3	285	VEHICLE INTO BAD	1G8A154E557165701
160	2005	SATURN	ION	33.0	11.3	38.5	03LPAW2	297	IMPACTOR INTO V	1G8AJ54F35Z166135
61	2005	SATURN	ION	33.1	10.2	43.2	03LPAW2	297	IMPACTOR INTO V	1G8AJ54F65Z165741
72	2005	SATURN	ION	20.1	16.7	9.7	09LPAN3	285	VEHICLE INTO BAR	1G8AJ54F35Z170654
42	2005	SATURN	ION	19.3	15.4	9.6	09LPEW2	285	VEHICLE INTO BAR	1G8AL54F45Z167434
587	2005	SATURN	ION	32.9	10.7	40.5	09LPEW2	270	IMPACTOR INTO V	1G8AL54F95Z124482
2/2	2005		COBALT	38.5	12.7	46.7	10LDAW3	297		1G14K52F257669400
151	121861	CHERROLE	CODALI	30.3	14.1	10.7	TULFAWU	22/	IPPRACION INTO V	101-MOLE 207000000

Once you are on the NHTSA TEST SELECTION tab, you can select a test for review.

The available tests come from matching the selected Year/Make/Model to the Sister/Clone (Vehicle Interchange) list which is maintained by Greg Anderson, then searching the NHTSA Crash Test database for the tests that meet the Start & End year constraints of the Sister/Clone list and also meet the Make/Model and similar vehicle constraints of the Sister/Clone list.

To select a test, click on the test. Make sure that the little hour glass shows up after clicking on the test. If the hourglass does not show, click on the test again.

	ehicle: 2008 CHE	VROLET COBALT							
ettings Help Reg	To: 4N6XPRT SYSTEM	15							
NHTSA Test Selection	n Advanced Vehicle	Search   Force Balan	ce						
Test Information	Occupant Informa	ation Vehicle In	formation Stiffness	Calcs					
						6			
		AV	allable lest	s in the N	HISA datat	base for a			
			2005 - 2	010 CHEV	ROLET COB	ALT			
	S	ister Clone	Searched Year	Range (200	03 - 2010)				
				Frontal To	est(s)				
Year	Make	Model	Impact Speed	Max Crush	Crush Factor	VDI	PDOF	Test Config	VIN
2003	SATURN	ION	34.8	22.2	21.8	12FDEW6	0	VEHICLE INTO BAR	1G8AF52F33Z141088
2004	SATURN	ION	24.9	14.6	16.9	12FDEW2	0	VEHICLE INTO BAR	1G8AF52F54Z155463
2004		COBALT	29.6	17.5	27.9	12EDEW3	0	VEHICLE INTO BAR	1G0AF52F442137343
2007	CHEVROLET	COBALT	24.7	16.2	15.1	12FDEW6	0	VEHICLE INTO BAR	1G1AK55F677150701 =
2007	CHEVROLET	COBALT	0.0	0.0	0.0		0	LOW RISK DEPLOY	1G1AK55F677150701
2007	CHEVROLET	COBALT	0.0	0.0	0.0		0	LOW RISK DEPLOY	1G1AK55F677150701
2009	CHEVROLET	COBALT	0.0	0.0	0.0		0	LOW RISK DEPLOY	1G1AK58H897127727
2009		COBALT	0.0	0.0	0.0		0	LOW RISK DEPLOY	1G1AK50H89/12/727
2009	CHEVROLET	COBALT	0.0	0.0	0.0		0	LOW RISK DEPLOY	1G1AK58H897127727
2000	Laurupourt	CODALT	0.0	0.0	0.0		lä	LOW DICK DEDLOY	1_C1AKE0U007107707
Year 2003	Make SATURN	Model ION	Impact Speed 29.9	Max Crush	Crush Factor -0.1	VDI 9999999	PDOF 180	Test Config IMPACTOR INTO V	VIN . 1G8AF52F03Z138200
				Side Tes	at(s)				
Veer	Make	Model	Impact Speed	Max Crush	Crush Eactor	VDI	PDOE	Test Copfig	VIN
Looop		TON	Inpact Speed	12.2		LODIDEW2	1270	IMPACTOR INTO V	
2003	SATURN	ION	38.6	11.8	50.4	09LPEW2	297	IMPACTOR INTO V	1G8AM12E547126995
2005	SATURN	ION	38.4	10.6	55.5	over ente	297	IMPACTOR INTO V	1G8AF52F45Z123878
2005	SATURN	ION	20.1	14.0	11.5	09LPAN3	285	VEHICLE INTO BAR	1G8AJ54F55Z165701
2005	SATURN	ION	33.0	11.3	38.5	03LPAW2	297	IMPACTOR INTO V	1G8AJ54F35Z166135
2005	SATURN	ION	33.1	10.2	43.2	03LPAW2	297	IMPACTOR INTO V	1G8AJ54F65Z165741
2005	SATURN	ION	20.1	15.7	9.7	09LPAN3	285	VEHICLE INTO BAR	1G0AJ59F352170654
12000	CATURN	ION	32.9	10.7	40.5	109LPEW2	203	IMPACTOR INTO V	1G8AL54E957124482
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2005	CHEVROLET	COBALT	38.1	11.9	48.8		297	I IMPACTOR INTO V I	1G1AK52F257526599
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2010 CHEV           Sister Clone Searched Year Range (200 Frontal Te           Year         Make         Model         Impact Speed         Max Crush           2003         Saturn         ION         24.9         14.6           2004         Saturn         ION         24.9         14.6           2004         Saturn         ION         24.9         14.6           2005         CHEVROLET         COBALT         94.9         17.5           2007         CHEVROLET         COBALT         0.0         0.0           2009         CHEVROLET         COBALT	Test Information         Vehicle Information         Stitmess Calls           Available Tests in the NHTSA datab 2005 - 2010 CHEVROLET COB Sister Clone Searched Year Range (2003 - 2010) Frontal Test(s)           Year         Make         Model         Impact Speed         Max Crush         Crush Factor           2004         SATURN         ION         24.9         14.6         16.9           2005         CHEVROLET         COBALT         24.9         14.6         15.1           2007         CHEVROLET         COBALT         0.0         0.0         0.0           2007         CHEVROLET         COBALT         0.0         0.0         0.0           2009         CHEVROLET         COBALT         0.0         0.0         0.0           2009         CHEVROLET         COBALT         0.0         0.0         0.0           2009	Test Information         Vehicle Information         Stittness Cats           Available Tests in the NHTSA database for a 2005 - 2010 CHEVROLET COBALT           Sister Clone Searched Year Range (2003 - 2010) Frontal Test(s)           Year         Make         Model         Impact Speed         Max Crush         Crush Factor         VDI           2003         SATURN         ION         24.9         14.6         16.9         127DEW6           2004         SATURN         ION         24.9         14.6         16.9         127DEW6           2004         SATURN         ION         24.9         14.6         16.9         127DEW6           2004         SATURN         ION         24.9         14.6         16.9         127DEW6           2005         CHEVROLET         COBALT         24.9         16.6         15.1         127DEW6           2007         CHEVROLET         COBALT         0.0         0.0         0.0         10.0           2007         CHEVROLET         COBALT         0.0         0.0         0.0         10.0           2009         CHEVROLET         COBALT         0.0         0.0         0.0         10.0           2009         CHEVROLET         COBA	Vende Information         Stiffness Calls           Available Tests in the NHTSA database for a 2005 - 2010 CHEVROLET COBALT           Sister Clone Searched Year Range (2003 - 2010) Frontal Test(s)           Ver         Make         Model         Impact Speed         Max Crush         Crush Factor         VDI         PDOF           2003         SATURN         ION         34.8         22.2         21.8         12PDEW2         0           2004         SATURN         ION         24.9         14.6         16.9         12PDEW2         0           2007         CHEWOLT         COBALT         34.9         17.5         27.9         12PDEW2         0           2007         CHEWOLT         COBALT         0.0         0.0         0         0           2007         CHEWOLT         COBALT         0.0         0.0         0         0         0           2007         CHEWOLT         COBALT         0.0         0.0         0         0         0           2007         CHEWOLT         COBALT         0.0         0.0         0.0         0         0         0         0           2007         CHEWOLT         COBALT         0.0         0.0         0.0 <td>Verice information         Verice information         Verice information           Available Tests in the NHTSA database for a 2005 - 2010 CHEVROLET COBALT           Sister Clone Searched Year Range (2003 - 2010)           Frontal Test(s)           Year         Male         Model         Impact Speed         Max Crush         Crush Factor         YOI         POOF         Test Config           2003         SATURN         1004         34.8         22.2         21.8         1270EVW2         0         VEHICLE INTO BAR           2004         SATURN         1004         24.9         14.6         16.9         1270EVW2         0         VEHICLE INTO BAR           2005         CALUENT         100.41         25.6         12.0         12.6         12.0         0         0         12.0</td>	Verice information         Verice information         Verice information           Available Tests in the NHTSA database for a 2005 - 2010 CHEVROLET COBALT           Sister Clone Searched Year Range (2003 - 2010)           Frontal Test(s)           Year         Male         Model         Impact Speed         Max Crush         Crush Factor         YOI         POOF         Test Config           2003         SATURN         1004         34.8         22.2         21.8         1270EVW2         0         VEHICLE INTO BAR           2004         SATURN         1004         24.9         14.6         16.9         1270EVW2         0         VEHICLE INTO BAR           2005         CALUENT         100.41         25.6         12.0         12.6         12.0         0         0         12.0

When determining which test to select, items to be considered include:

Does the VDI (Vehicle Damage Indicator) clock position match the impact location? - 12 for front, 3 or 9 for side, and 6 for rear tests.

Does the PDOF (Principal Direction of Force) match the impact location? - 0 for front, 90 or 270 for side, an 180 for rear tests. Keep in mind that the Frontal tests can have a PDOF of 180 depending upon the reporting agency.

On frontal tests the test specific CF (Crush Factor) is close to 21, on side or rear tests the CF is close to 27.

The Year/Make/Model of the test vehicle matches the Year/Make/Model of

your subject vehicle.

There are no errors in the crush measurements. You may have to check the **VEHICLE** tab after selecting the test to verify this.

The impact speed of the test is a close match to the suspected impact speed of your subject collision.

These are IDEAL guidelines!!! Unfortunately, it is difficult to get a test that matches all of these guidelines. This is the first area where you can apply your expertise. Review the available tests and determine which test(s) best meet your criteria for this collision.

# **RESULTS:**

Once you have selected a test, you may examine the following tabs for selected information -

🖧 4N6XPRT StifCal	cs - Selected Vehicle: 20	008 CHEVROLET	T COBALT										
File Print Reports Set	tings Help Reg To: 4N6XPR	T SYSTEMS	Force Balance										
Austichte Test													1
		t Information	venicie Informai		Stirrness Calcs								
			Test	t Inf	orma	tion							
Test # 6084	NHTSA Test Reference G	iuide Version #	V5	Test Dat	e 2007-07-	12		Contract #	DTNH2	2-03-D-1100	12		
Contract/Study Title	FMVSS 208 FRONTAL IMPACT	- 2007 CHEVROLE	T COBALT										
Test Objective(s)	VEHICLE CRASHWORTHINES:	5 AND OCCUPANT I	RESTRAINT PERF	ORMANCE [	DATA								
Test Type	FMV55 208 OCCUPANT CRAS	H PROTEC			Conf	iguration	VEHICLE I	INTO BARRI	ER				
		Closing Speed	39.8	Km/Hr	24.73	MPH							
Impact Angle	0	Offset Distance	0	mm	0.0	inches	Side Impa	ct Point	0	mm 0	1.0	inches	
Test Performer	MGA RESEARCH					Test Rel	ference #	BT070712	:01				
Test Track Surface	CONCRETE		Condition D	RY			Ambier	nt Temperat	ure 21	C 6	9.8 F		
Data Recorder Type	OTHER		Data Lin	k OTHE	ર			Total Nu	mber of Curv	/es 44			
Test Commentary	DTS TDAS PRO				viterierieri								
		Fi	ixed Ba	arrie	r Info	orma	tion						
Barrier Type	RIGID	Barrier Sh	ape LOAD CELI	. BARRIER			Pole Barrier	Diameter	0 m	m 0.0	inches		
Barrier Commentary													
<		an		10 (12 (12 (12 (12 (12 (12 (12 (12 (12 (12		2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		10 21 21 21 21 21 21 21 21 21	وي وي دي وي وي وي وي وي وي		ar ar ar an air an		

TEST INFORMATION - look for the following items - Contract/Study Title, Test Objective(s), Test Type, Closing Speed, and Test Commentary - are these consistent with your collision? Is there anything in these areas which raise questions? Is there something here that makes you want to look at a different test, provided it/they are available?

🖧 4N6XPRT StifCalcs - S	Selected V	'ehicle: 2	008 CHEVROL	ET COBALT									
File Print Reports Settings	Help Reg	To: 4N6XPR	T SYSTEMS										
Basic Vehicle Search NHTSA	Test Selectio	n Advance	d Vehicle Search	Force Balance									
Available Test Test I	nformation	Occupa	nt Information	Vehicle Information	s	tiffness	Calcs						^
Select Occupant	Center Fro	n - Vehi nt Righ er Rigt	cle # 1 - 2 Front	2007 CHEVROL	.ET C	OBAI	LT Seat		Restraints		Head Chest		
Test # 6084 Vehic	:le # 1		Occupant Local	tion LEFT FRONT SE	AT	0	ccupant :	eat Position	CENTER POSITION				
Occupant Type HYBRI	D III DUMM	Se	× MALE	Age 0 Size	e Percen	tile 5	0 PERCEN	ITILE	Calibration Method	HYBRID III			
Occupant Height 0.0	mm	0.0 ir	iches			Weight	0.0	kg 0.0	pounds				
Occupant Manufacturer	FIRST TEC	-INOLOGY S/	N 312										
Occupant Modification					*********								
Occupant Description													
Occupant Commentary		ISOD											
Occupant Commontally	TIEAD TO I	IJOR											
Usedba						Head	1		Turn				
Head to - Windshielder Header	387 (	15.2	inches	Head to -	0.0		0.0	inches	Fide Heador	211 (	83	ochec	
	700.0	10.2	incries	Seaudack	0.0		0.0	inches	blue neduer	211.0 mm	0.0	neries	
WindShield	723.U mr	28.5	inches	Neck to Seatback	0.0	mm	0.0	inches	Side Window	321.0 mm	12.6 i	nches	
First Contact Region	(Head)	AIR BAG		Head Iniu	iry Crite	ria (HIC)	64			HC Time Interval	(ms)		
Second Contact Region	(Head)			_					Lower	90 U	pper 105		
												-	
<													~
<b>K</b> J			arararan dararan maranan da		araan galaalaan ah	91811F11				ayarayo iyar ara jara yara a		ana na ngananyogo	>_

OCCUPANT INFORMATION - depending upon the case, multiple fields may be of interest, such as: contact region(s), position with respect to the vehicle, HIC, G's, or force loadings on the dummy, and restraints in use for the test.

The above Screen shows the HEAD information for the LEFT FRONT occupant. When more than one occupant is in the vehicle, you can switch between occupants by clicking on the appropriate non-greyed out occupant location.

The following screens illustrate the CHEST, LEGS, and RESTRAINTS information, which you get to by clicking the appropriate button.

🖓 4N6XPRT StifC	alcs - Sel	ected Veh	ricle: 200	8 CHEVROLET C	OBALT								
File Print Reports S	ettings H	elp Reg To	: 4N6XPRT S	SYSTEMS									
Basic Vehicle Search	NHTSA Tes	t Selection	Advanced \	/ehicle Search For	e Balance								
	<u> </u>					. —							-
Available Test	Test Info	rmation	Occupant I	Information	ehicle Information	Stiffness	Calcs						
Select Occ	upant Lu Int Ca ar C	ocation -	Vehicl Right Fi	e # 1 - 200	7 CHEVROL	ET COBA	LT		Restr	raints		Head Chest Legs	
					L	eft Front	Seat						
Test # 6084	Vehicle #	<b>r</b> 1		Occupant Location	LEFT FRONT SEA	AT C	Occupant Se	at Position	CENT	TER POSITIO	N		
Occupant Type	HYBRID I	II DUMMY	Sex	MALE Age	0 Size	Percentile	50 PERCENT	TLE	Calibra	tion Method	HYBRID III		
Occupant Height	0.0	mm 0.	0 inch	es		Weigh	it 0.0	kg 0	).0 pc	ounds			
Occupant Manufact	urer FI	IRST TECHNO	DLOGY S/N 3	312									
Occupant Modificat	on												
Occupant Descript	ion 🗌												
Occupant Commen	ary HE	EAD TO VISC	R										
						<b>.</b>							
Chest to -	_					Chest							
Dash	563.0	mm 2	2.2 inche	es First Co	ntact Region (Ches	:/Abdomen)	AIR B	AG	Secon	d Contact Rei	gion (Chest/Abdomen)	NONE	
Steering Wheel	368.0	mm 1	4.5 inche	es	L	ap Belt Peak Lo	oad 0.0		Newtons	0.0	pound Force		
Seatback	0.0	mm 0	1.0 inche	95	Should	er Belt Peak Lo	oad 0.0		Newtons	0.0	pound Force		
Arm to Door	113.0	mm 4	.4 inche	85	Chest	Severity Index	0			Pelvic Peak L	ateral Acceleration (g	's) 0	
Hip to Door	122.0	mm 4	.8 inche	85	Thoracic	Trauma Index	0			Thoras	Peak Acceleration (g	's) 41	
													~
<		]											>

🖓 4N6XPRT StifCalcs - Selected Vehicle: 2008 CHEVROLET COBALT	
File Print Reports Settings Help Reg To: 4N6XPRT SYSTEMS	
Basic Vehicle Search NHTSA Test Selection Advanced Vehicle Search Force Balance	
Available Test         Test Information         Occupant Information         Yehicle Information         Stiffness Calcs	<b>^</b>
Select Occupant Location - Vehicle # 1 - 2007 CHEVROLET COBALT	=
Left Front       Right Front       Chest         Left Rear       Center Rear       Right Rear	
Left Front Seat	
Test # 6084 Vehicle # 1 Occupant Location LEFT FRONT SEAT Occupant Seat Position CENTER POSITION	
Occupant Type HYBRID III DUMMY Sex MALE Age 0 Size Percentile 50 PERCENTILE Calibration Method HYBRID III	
Occupant Height 0.0 mm 0.0 inches Weight 0.0 kg 0.0 pounds	
Occupant Manufacturer FIRST TECHNOLOGY 5/N 312	
Occupant Modification	
Occupant Description	
Occupant Commentary HEAD TO VISOR	
Legs	
Knees to Dash 211.0 mm 8.3 inches Knees to Seatback 0.0 mm 0.0 inches	
First Contact Region (Legs) DASHPANEL Second Contact Region (Legs)	
Left Femur Peak Load -5572.0 Newtons -1252.6 pounds Force Right Femur Peak Load -7315.0 Newtons -1644.5 pounds Force	
	~

🖧 4N6XPRT StifCale	s - Selected Ve	ehicle: 2008 CHEVE	OLET COBALT						
File Print Reports Setti	ings Help Reg	To: 4N6XPRT SYSTEMS							
Basic Vehicle Search NH	TSA Test Selection	Advanced Vehicle Se	rch Force Balance	•					
Available Test Te	est Information	Occupant Informatio	n Vehicle Info	ormation Stiffn	ess Calcs				^
Select Occup	oant Location	• Vehicle # 1	- 2007 CHE	VROLET COB	BALT	Technick		Head	
Left Rear	Center Rear	Right Rear				Restraints		Legs	
				Left Fro	nt Seat				
Test # 6084	Vehicle # 1	Occupant I	ocation LEFT F	RONT SEAT	Occupant Seat Position	CENTER POSITION			
Occupant Type	YBRID III DUMMY	Sex MALE	Age 0	Size Percentile	50 PERCENTILE	Calibration Method	HYBRID III		
Occupant Height	0.0 mm	0.0 inches		We	ight 0.0 kg 0.1	0 pounds			
Occupant Manufacture	r FIRST TECH	NOLOGY 5/N 312							
Occupant Modification									
Occupant Description									
Occupant Commentary	HEAD TO VI	50R							
				Res	traint				
	Restraint # 1 2	Type FRONTA NONE	L AIRBAG	Mount STEERING WHEE NOT APPLICABL	Deploymer IL DEPLOYED E NOT APPLI	it Coi PROPERLY PR CABLE SEC	mments IMARY CONDARY		
									<b>•</b>
S	in and the second second								

e 4Ni le Di	INT Reports	tifCalcs	- Sele	cted Vehi	cle: 200 4M6YPRT	08 CHEVRO	DLET CO	BALT							asessas			
asic V	ehicle Sear	ch NHT	SA Test	Selection 4	Advanced	Vehicle Searc	ch Force	Balance	•									
Av	ailable Test	Te	st Inforr	nation	Occupant	Information	Veh	icle Info	rmation	Stif	fness Cali	's						
						Vehic	le # 1	- 20	07 CH	IEVRO	DLET	COBALT						
													Sum	mary Pre/P	ost Measur	ements	Notes	
Test #	6084				NHT:	5A Test Vehic	:le Number		1				VIN 1G	LAK55F6771507	)1			
Year	2007	Make	CHEVE	ROLET		Mod	del 🔽	OBALT					Body	OUR DOOR SED	AN			
Engin	e 4 CYL	INDER TR	RANSVER	RSE FRONT			Displacer	nent	2.2	Liter		Transmission	AUTOMAT	IC - FRONT WH	EL DRIVE	<u></u>		
Vehick	e Modificati	ion Indica	ator	PRODUCT	ION VEHI	CLE			Vel	hicle Moc	lification(:	;) Description						
Post-t	est Steerin	ig Column	Shear (	Capsule Sepe	eration	UNKNOW	VN				Steerin	ng Column Collaps	e Mechanis	m UNKN	OWN			
Vehicl	2st-cest Steering Column Snear Capsule Seperation UNKNOWN Steering Column Collapse Mechanism UNKNOWN whicle Commentary																	
				_														
	١	Vehicle Le	ength	4548	mm	179.1	inches					Vehi	cle Test We	aight 1493	KG	3291	pounds	
	Vehic	cle Whee	lbase	2630	mm	103.5	inches						Vehicle W	idth 1821	mm	71.7	inches	
	CG behi	ind Front	Axle	1149	mm	45.2	inches					Total Length	of Indentat	ion 1284	mm	50.6	inches	
Cente	er of Dama	ge to CG	Axis	0	mm	0.0	inches					Maximum Static	: Crush Dep	th 412	mm	16.2	inches	
	Vehicle Da	amage In	dex	12		Principal Din	ection of F	orce	0			Pre	e-Impact Sp	eed 40	kph	24.7	mph	
	Dama	age F	Profil	e Dista	ince N	leasure	ement	ts			Cru	sh from F	Pre Po	st Test D	amac	ie Mea	asurements	
		(Me	asured	Left-to-Right	, Rear-to-	Front)						Pre-Test		Post-Test		Crush E	Depth	
		DPD 1	276	mm	10.9	inches			Left	Bumper	Corner	173.3	inches	162.4	inches	10.9	inches	
		DPD 2	365	mm	14.4	inches						4402	mm	4126	mm	276	mm	
		DPD 3	394	mm	15.5	inches				Сег	iterline	179.1	inches	162.9	inches	16.2	inches	
		DPD 4	412	mm	16.2	inches						4548	mm	4137	mm	411	mm	
	DPD 5 374 mm 14.7 inches Right Burger Corper 173.4 inches 162.0 inches 11.4 inches												inches	162.0	inches	11.4	inches	

VEHICLE INFO - For the purposes of calculating stiffness values, the following information is important:

Crush Depths - On front and rear tests, there is a possibility for three sets of crush depth measurements: Maximum Crush, Damage Profile Distances (DPD), and Pre test minus Post test measurements. These three sets of measurements can be seen on the top half of the vehicle printout, or on the Vehicle Summary page. Side impact tests may record the Pre test minus Post test measurements, but they are meaningless for the purposes of calculating stiffness values.

Damage Width - There are two possible damage width measurements, Vehicle Width and Total Length of Indentation. Both are applicable to front and rear tests, if present. For side tests, only the Total Length of Indentation is applicable.

Weight - A Vehicle Test Weight is required, and if this is a side or a rear

test, test weights are needed for both the impactor and the target.

Speed - A closing speed is needed.

All of the required information is shown on the Vehicle SUMMARY screen.

The detailed Pre-Test and Post-Test dimensions are shown on the Vehicle PRE/POST MEASUREMENTS screen.

🙀 4N6XPRT StifCalcs - Selected Vehicle: 2008 CHEVROLET COBALT	
File Print Reports Settings Help Reg To: 4N6XPRT SYSTEMS	
Basic Vehicle Search NHTSA Test Selection Advanced Vehicle Search Force Balance	
Available Test         Test Information         Occupant Information         Vehicle Information         Stiffness Calcs	Ê
Vehicle # 1 - 2007 CHEVROLET COBALT	
Summary Pre/Post Measurements Notes	
Test # 6084 NHTSA Test Vehicle Number 1 VIN 1G1AK55F677150701	
Year 2007 Make CHEVROLET Model COBALT Body FOUR DOOR SEDAN	
Engine 4 CYLINDER TRANSVERSE FRONT Displacement 2.2 Liter Transmission AUTOMATIC - FRONT WHEEL DRIVE	
Vehicle Modification Indicator PRODUCTION VEHICLE Vehicle Modification(s) Description	
Post-test Steering Column Shear Capsule Seperation UNKNOWN Steering Column Collapse Mechanism UNKNOWN	
Vehicle Commentary	
Pre & Post Test Damage Measurements	
(Measurements are taken in a longitudinal direction. 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 Post-Test Post-Test pre-Test Post-Test pre-Test Post-Test pre-Test Post-Test pre-Test pre-T	
Length of Vehicle at Centerline	
4548.0 179.1 4137.0 162.9	
Engine Block	
0.0 0.0 0.0	
4402.0 173.3 4126.0 162.4 Front Bumper Corner 4405.0 173.4 4116.0 162.0	
Front of Engine	
0.0 0.0 0.0	
Firewall	
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 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 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	
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 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	
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	
	>

🖗 4N6XPRT StifCalcs - Selected Vehicle: 2008	B CHEVROLET COBALT	
File Print Reports Settings Help Reg To: 4N6XPRT SY	YSTEMS	
Basic Vehicle Search NHTSA Test Selection Advanced Ve	ehicle Search Force Balance	
Available Test Test Information Occupant In	nformation Vehicle Information Stiffness Calcs	
	Vehicle # 1 - 2007 CHEVROLET COBALT Summary Pre/Post Measurements Notes	=
Test # 6084 NHTSA	A Test Vehicle Number 1 VIN 1G1AK55F677150701	
Year 2007 Make CHEVROLET	Model COBALT Body FOUR DOOR SEDAN	
Engine 4 CYLINDER TRANSVERSE FRONT	Displacement 2.2 Liter Transmission AUTOMATIC - FRONT WHEEL DRIVE	
Vehicle Modification Indicator PRODUCTION VEHICLE	LE Vehicle Modification(s) Description	
Post-test Steering Column Shear Capsule Seperation	UNKNOWN Steering Column Collapse Mechanism UNKNOWN	
Vehicle Commentary		
Bumper Engagement (Inline Impact Only) 0	Sill Engagement A-pillar Engagement (Side Impact Only) (Side Impact Only)	
Moving Test Cart Angle	Moving Test Cart/Vehicle Vehicle Orientation on Cart Crabbed Angle Moving Test Cart	
DIRECT ENGAGEMENT	0 NOT APPLICABLE	
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	Magnitude of the Crabbed Angle Magnitude of the Angle Measure Clockwise from Measured between the Vehicle Orientation Longitudinal Vector to Velocity Vector of Vehicle and Direction of Test Cart Motion	~
<		>

Any Test Notes are shown on the Vehicle NOTES screen.

4N6XPRT StifCalcs - Selected Vehicle: 2008 CHEVROLET	COBALT				
File Print Reports Settings Help Reg To: 4N6XPRT SYSTEMS					
Basic Vehicle Search NHTSA Test Selection Advanced Vehicle Search Fo	orce Balance				
Available Test Test Information Occupant Information	Vehicle Information	Stiffness Calcs			
Pre/Post Depth Damage Profile Distance Depths Maximum V	ehicle Depth				
Vehicle Width     Vehicle Indent     O     Closing Speed		<ul> <li>Trapezoidal Average</li> </ul>	◯ Simple Av	erage	
Modify Vehicle # 1	- 2007 CHI	EVROLET COBALT		A - B - G Average	Crush Factor (CF)
NHSTA Crash Test	6084 Front Imp	pact			
Given: Test Vehicle Weight = 3291 pounds Closi	ing Speed = 24.	7 mph			
Test Vehicle Width = 71.7 inches					
Pre/Pos	t Collision Crush	Depths (inches			
Left Side Crush	Centerline cru:	sh Right Side Crush			
(Driver Side) 10.9	16.2	11.4	(Pass. S	iide)	
	c	rash 3 Stiffness Coefficents		Smac Stiffnes	s
	Α	в	G	Ку	
Minimum Crush = 10.9 inches				189.4	
Using a Rated No Damage Speed of 2.5 mph	187.6	153.1	115.0		
Using a Rated No Damage Speed of 5.0 mph	333.0	120.6	460.0		
Using a Rated No Damage Speed of 7.5 mph	436.3	92.0	1034.9		
Using a Rated No Damage Speed of 10.0 mph	497.3	67.2	1839.9	a la de la company	
Average Crush = 13.7 inches				119.9	
Uking a Baked No Damage Speed of 2.5 mph	140.2	06.0	115.0	N 1997 - 19	
Using a Rated No Damage Speed of 5.0 mph	265.0	76.3	460.0		
Using a Rated No Damage Speed of 7.5 mph	347.1	58.2	1034.9		
Using a Rated No Damage Speed of 10.0 mph	395.7	42.5	1839.9		
				A Charles	
Maximum Crush = 16.2 inches				85.8	
Using a Rated No Damage Speed of 2.5 mph	126.2	69.3	115.0		
Using a Rated No Damage Speed of 5.0 mph	224.1	54.6	460.0		
Using a Rated No Damage Speed of 7.5 mph	293.5	41.6	1034.9		
Using a Rated No Damage Speed of 10.0 mph	334.6	30.4	1839.9		
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 Spe vehicles may, however, have a higher rating	A B G G K	<ul> <li>Maximum force per inch of damage with</li> <li>Crush resistance per inch of damage with</li> <li>Energy dissipated without permanent d</li> <li>Crush resistance per inch of damage with</li> </ul>	iout permanent dth (Crash), Ib/ii amage, Ib vidth (SMAC), Ib,	damage, Ib/in 1^2 /in^2	
	and the second second second second		1		3

STIFFNESS CALCS - From the damage depths and damage widths reported, we allow you to view stiffness values for each of the combinations. We also allow you to view the differences between the Trapezoidal and "Simple" methods of calculating the average crush depth when appropriate, by "toggling" between the two methods. Finally, we allow you to see the stiffness value change between using the closing speed and KE Equivalent Speed for side and rear tests.

In addition to calculating the CRASH 3 A-B-G values and the Test Specific Crush Factor (CF) value, beginning in 2010 the program calculates the SMAC Kv stiffness value for each crush value - Minimum, Average, and Maximum. When applying stiffness values to your collision, these are the values to use as your starting point depends upon the impact location:

- Front The initial starting point would be Vehicle Width, Trapezoidal Average Crush, 5 mph Rated No Damage Speed. Which set of crush measurements to use is determined by what NHTSA reported, along with your preference.
- Rear The initial starting point would be Vehicle Width, KE Equivalent Speed, Trapezoidal Average Crush, 5 mph Rated No Damage Speed. Which set of crush measurements to use is determined by what NHTSA reported, along with your preference.
- Side The initial starting point would be Indentation Length, KE Equivalent Speed, Trapezoidal Average Crush, 2 mph Rated No Damage Speed. Which set of crush measurements to use is determined by what NHTSA reported, along with your preference.

4 4 M	6XPRT StifCalcs - Selected Vehic	le: 2008	CHEVROLET	COBALT							
e P	Print Reports Settings Help Reg To: 4	N6XPRT SY	STEMS								
	Sister Clone Test Occupant Vehicle Max Depth Stiffness Damage Profile Distance Stiffness Pre and Post Measurement Stiffness Force Balance	vanced Vel cupant Inl e Depths	iormation ( Maximum V losing Speed	orce Balance	ation Stif	fness Calcs	Average	Simple A	verage		
C	Vehicle Selection Advanced Search	Vehi	icle # 1	- 2007	CHEVR	OLET CO	BALT		A - B - G Average	Crush Factor (CF)	
	Complete Report	INSTA	Grash rest	· 6064 Fr0	numpacu						
Gi	Custom Report	ounds	Clos	ing Speed =	24.7 mph						
	Current Page	thes									
	Printer Setup										
	(Driver Side)	DPD1 10.9	DPD2 14.4	DPD3 15.5	DPD4 16.2 Crash	DPD5 14.7 3 Stiffness	DPD6 11.4 Coefficents	(Pass. Side)	Smac Stiffnes	s	
	Minimum Crush = 10.9 in	thes	e en	_A_	~	<u>_B</u> _	×	<u> </u>	<u>Kv</u> 189.4		-
	Average Crush = 14.4 in	thes							108.5		$\sim$
	Using a Rated No Damage Speed of	2.5 r	nph	142.0		87.7		115.0		4	
	Using a Rated No Damage Speed of	5.0 r	nph	252.1		69.1		460.0			
	Using a Rated No Damage Speed of	7.5 r	nph	330.2		52.7		1034.9			
	Vets Autority of	a high		0.0.1		Silines 3 pr	Rafik – A latansagi	estalui (a 🦲 a I	b/ii -2		

## **PRINTING:**

To Print a report click on the PRINT REPORTS in the top Menu bar. Then, in order to get the pages you are concerned with, click on CUSTOM REPORT.

e Print Reports Settings Help Reg To: 4N6YPD	SYSTEMS	ROLLI CODALI		ana ana ana ang ang ang ang ang ang ang			
asic Vehicle Search NHTSA Test Selection Advance	d Vehicle S	earch Force Balance					
om Report Selection			×				
Custom F	Repo	rt Setup					
Available Reports		Selected Reports	Average	O Simple Av	verage		
Sister-Chone Test: Information Occupant: Information Peri/Bod (Vieble With) - Closing Speed - Trapez, Peri/Bod (Vieble With) - Closing Speed - Trapez, Peri/Bod, (Vieble Indert - Closing Speed - Trapez, Peri/Bod, (Vieble Indert - Closing Speed - Trapez, Peri/Bod, (Vieble Indert - KES - Simple Avg) DPD (Vieble With - Closing Speed - Trapez, DPD (Vieble Indert - Closing Speed - Trapez, DPD (Vieble Indert - Closing Speed - Trapez, DPD (Vieble Indert - Closing Speed) Max Crush (Vieble Indert - Closing Speed)			<b>BALT</b>	(Pass. Side)	A - B - G Average	Crush Factor (CF)	
			Coefficents	_6_	Smac Stiffnes	s	
Add Reports		Remove Reports		115.0 460.0			
Print Report		Close		1839.9	108.5		

Next, Highlight the pages you would like to print. Multiple pages can be highlighted by holding the CTRL key down while clicking on the desired pages.

4N6XPRT StifCalcs - Selected Vehicle: 2008 C	HEVROLET COBALT			
Basic Vehicle Search NHTSA Test Selection Advanced Vehic	le Search Force Balance			
Lustom Report Selection		X		<u>^</u>
Custom Rep	ort Setup			
Available Reports	Selected Reports	Average O Simple /	Average	
Pre/Post (Vehicle Width - Closing Speed - Simple Pre/Post (Vehicle Indent - Closing Speed - Simple Pre/Post (Vehicle Indent - KEES - Trapeziodal Avg) Pre/Post (Vehicle Indent - KEES - Simple Avg) DPD (Vehicle Width - Closing Speed - Simple Avg) DPD (Vehicle Indent - Closing Speed - Simple Avg) Max Crush (Vehicle Width - Closing Speed) Max Crush (Vehicle Indent - Closing Speed)	Sister-Clone Test Information Occupant Information Vehicle Information PrefPost (Vehicle Width - Closing Speed - Trapez., PrefPost (Vehicle Indent - Closing Speed - Trapez.) DPD (Vehicle Width - Closing Speed - Trapeziodal., DPD (Vehicle Indent - Closing Speed - Trapeziodal.)	BALT	A - B - G Average	Crush Factor (CF)
		<ul> <li>DPD6</li> <li>11.4</li> <li>(Pass, Side</li> </ul>	)	
		Coefficents	Smac Stiffnes	s 1
Add Highlighted Add All	Remove Highlighted Remove All	]	<u>Kv</u> 189.4	
		115.0		
Add Reports 🗆	LI Remove Reports	460.0		
		1034.9		
Print Report	Close	1039.9	100.5	
			108.5	
Using a Rated No Damage Speed of 2.5 mp	h 142.0 87.7	115.0		

Once the desired pages are highlighted, click the ADD HIGHLIGHTED button.

Finally, click the PRINT REPORT button.

To close the Custom Report box, click the CLOSE button or on the "X" in the upper right corner of the box.



## **TEST SUMMARY REPORT:**

When you are on the AVAILABLE TESTS page of the NHTSA TEST RESULTS tab, you also have the opportunity to print out a TEST SUMMARY report by clicking on the PRINT button above each grouping of tests.

						_				
vailable Test	Test Information	Occupant Information	on Vehicle Info	rmation Stiffness	Calcs		Advanced/Vehicle Sear	ch Printout		
Print		Sis	ter Clone S	2005 - 2 earched Year	010 CHEV Range (20 Frontal T	/ROLET C 03 - 2010) <b>est(s)</b>	P Frontal Tests	lease choose the para NOTE: Default settings are	already selected for you	eport.
t No.	🚓 Year	Make	Model	Impact Speed	Max Crush	Crush Factor	Constanting a speed (in	Crosin Departament	Crush children (inch)	O Chain
7	2003	SATURN	ION	34.8	22.2	21.8	02.5	<ul> <li>Average</li> </ul>	• width	Closin
8	2004	SATURN	ION	29.6	24.0	14.6	• 5.0	○ Max	O Indent	(● KE
6	2005	CHEVROLET	COBALT	34.9	17.5	27.9	07.5			
14	2007	CHEVROLET	COBALT	0.0	0.0	0.0	010.0			
5	2007	CHEVROLET	COBALT	0.0	0.0	0.0	0 1010			
9 10	2009	CHEVROLET	COBALT	0.0	0.0	0.0	Oother			
2	2009	CHEVROLET	COBALT	0.0	0.0	0.0				
3	2009	CHEVROLET	COBALT	0.0	0.0	0.0	Rear Tests			
							No Damage Speed (m	ph) Crush Depth (inch)	Crush Length (inch)	Speed Ty
Print					Rear Te	st(s)	02.5	Average	( Width	◯ Closir
t No.	Year	Make	Model	Impact Speed	Max Crush	Crush Facto	050	0.00	Order	OWE
7	2003	SATURN	ION	29.9	N/A	-0.1	05.0	Omax	Undent	O KE
							07.5			
							○10.0			
							Oother			
					ille cassesses	and the second				
Print					Side le	st(s)	Side Tests			
CINO.	Year	Make	Model	Impact Speed	Max Crush	Crush Factor	No Damage Speed (m	ph) Crush Depth (inch)	Speed Type (inch)	
0	2005	SATURN	ION	33.0	11.3	43.2	○1.0	O Average	Closing	
2	2005	SATURN	ION	20.1	16.7	9.7	0.2.0	C Marin	OVE	
2	2005	SATURN	ION	19.3	15.4	9.6	02.0	C Max	O KE	
5	2005	CHEVROLET	COBALT	38.1	11.9	48.8	◯3.0			
1	2005	CHEVROLET	COBALT	38.5	12.7	46.7	○5.0			
2	2006	CHEVROLET	COBALT	38.5	13.5	43.9	Oother			
9	2007	CHEVROLET	COBALT	38.4	13.3	44.4	Oddier			
2	2007	CHEVROLET	COBALT	38.7	14.4	41.5				
							Default Setting	gs Next	Cancel	
					Other Te	est(s)				
									Include Not C	alculated lests
				No Oth	er Tests:	2005 - 2	2010			

When one of the PRINT buttons is clicked, the REPORT PARAMETERS box where you set the parameters for the Test Summary Stiffness Calculations pops up.

NO DAMAGE SPEED - The default value for the Front and Rear tests is 5 mph. The default value for Side tests is 2 mph. The default can be changed by clicking the appropriate radio button, or by entering a speed in the OTHER box.

CRUSH DEPTH - The default value for all tests is AVERAGE, however this can be changed to MAXIMUM by clicking the radio button. Using the MAXIMUM crush depth will result in more conservative, i.e. - "softer", Stiffness values.

CRUSH LENGTH - The default value for the Front and Rear tests is WIDTH, that is, the vehicle width. This can be changed to INDENT, the reported Indentation length, by clicking the radio button. Using the WIDTH for the Crush Length will result in more conservative, i.e. - "softer", Stiffness values. The only possible Crush Length for Side tests is the reported Indentation Length, so no options are available for the Crush Length for Side tests.

SPEED TYPE - The default Speed Type is KE - Kinetic Energy Equivalent

Speed - for all test types. The user is probably more familiar with using the CLOSING speed in Frontal tests, however, in the instance where a moving barrier is impacting the front of the vehicle, the CLOSING speed will give erroneously high Stiffness values for the same reason that the CLOSING speed will give high values for the Rear and Side tests .... not all of the moving barrier's Kinetic Energy is consumed in crushing the target vehicle. Some of the energy is retained by the barrier and is exhibited in post impact barrier movement, some is "expended" in crushing the target vehicle (and possibly the barrier), and some is transferred to the target vehicle and is exhibited in post impact barrier movement.

In the case of a vehicle running into a immovable barrier, with no post impact movement in the original direction of travel of the vehicle, the CLOSING speed and the KE speed will be the same.

It is suggested that the user begin using KE speed for all test types to avoid potential errors. With that as a given, there ARE case specific reasons for the user to use CLOSING speed for a Side or Rear test summary.

For this example we clicked the PRINT button for the SIDE tests, and have changed the Crush Depth to MAX.

When you have the parameters set for the test types you are interested in, click the NEXT button.

🛱 4N6XPRT StifC	alcs - Se	lected	Vehicle: 2008	CHEVROLET COBALT						energi etterte grette					_ @ X
File Print Reports S	Settings H	Help Re	g To: 4N6XPRT S	/STEMS											
Basic Vehicle Search	NHTSA Te	st Selecti	on Advanced V	ehicle Search Force Balance	•										
	Display	Auto Ca	culated Tests												
Available Test	Eroptal	Tests 6	ear Tests Side	Tests Other (Not Calculate	зд.										
	Tect No.	Vear	Maka	Model	Body Style	No Damar	a Speed Cri	uch Dictance	VEES	Stiffners A	Shiffperc B	Stiffnerr G	Ky.	for the re	eport.
	5472	2005	SATURN	ION	FOUR DOOR SEE	DAN 2.0	16	.7	20.1	42.1	22.8	38.9	28.1		
	5325	2005	CHEVROLET	COBALT	FOUR DOOR SEE	DAN 2.0	11	.9	26.3	76.4	78.0	37.4	91.4	ected for you	
	5682	2006	CHEVROLET	COBALT	TWO DOOR COL	JPE 2.0	13	1.5	26.6	80.8	73.9	44.2	86.4		
Print	6587	2005	SATURN	ION	FOUR DOOR SEL	DAN 2.0	10	17	22.7	96.6	93.7	49.8	112		
	6082	2007	CHEVROLET	COBALT	TWO DOOR COL	JPE 2.0	14	.4	26.9	100.5	86.5	58.4	101	Length (inch)	Speed Type
Test No. 4	5614	2006	CHEVROLET	COBALT	TWO DOOR COL	JPE 2.0	13	.3	26.9	105.9	99.5	56.3	116	dth	Closing
4487	6049	2007	CHEVROLET	COBALT	FOUR DOOR SEE	DAN 2.0	13	1.3	26.5	110.2	101.6	59.7	118	ocn	Closing
5188	5260	2005	CHEVROLET	COBALT	FOUR DOOR SEL	DAN 2.0	11	.1	26.6	115.6	120.5	59.7	14/	dent	() KE
5326	4602	2003	SATURN	ION	FOUR DOOR SEE	DAN 2.0	13	.2	26.7	126.7	118.7	67.6	138		
6084	4856	2004	SATURN	ION	OTHER	2.0	11	.8	26.6	161.5	168.4	77.5	196		
6094	-														
6669	-	-								-	-				
6670	ingen i connecte	1 1								1	1	1			
6672	<		enterierierierierierieri			10							2		
6673	-				a service and service and			A		B G	i de la companya de l	Kv	CF		
Service States	To sele	ect mult	iple records ho	ld the ctrl key down and	click on the records y	ou wish to select								Length (inch)	Sneed Type
Duinh			1000 C				Average	e 101.	.5	94.2	56.6	110.8	20.0	Longer (many	
FIIIC				Remove	Send A/B Valu	es to Force Balance								idth	Closing
Test No.			_				Minimur	m 42.	.1	22.8	37.4	28.1	9.6	doot	OVE
4827														uenic	U KL
	-						Maximu	im 161.	.5	168.4	78.9	196.8	25.8		
2	-						ch d D			07.4	10.5	42.0	- 1		
		Print this	Page Prir	nt All Pages Cancel			Stabev	29.		37.4	13.5	43.0	5.1		
					_	Number of Test	= 12								
Print						Side Tes	+(e)								
						Side les	43)	Side Test	s						
Test No.	Year		Make	Model	Impact Speed	Max Crush	Crush Fact	tor No Dama	ige Spee	ed (mph)	Crush Dept	th (inch)	Speed	Type (inch)	
5460	2005		SATURN	ION	33.0	11.3	38.5	010					Ock	osina	
5472	2005		SATURN	ION	20.1	10.2	9.7				- Hirolaye		U Cit	g	
6442	2005		SATURN	ION	19.3	15.4	9.6	• 2.0			<ul> <li>Max</li> </ul>		<ul><li>● KE</li></ul>		
6587	2005		SATURN	ION	32.9	10.7	40.5	03.0							
5325	2005		CHEVROLE	T COBALT	38.1	11.9	48.8	0.0.0							
5451	2005			T COBALT	38.5	12.7	46./	- 05.0							
5682	2006		CHEVROLE	T COBALT	38.5	13.5	43.9	Oothe							
6049	2007		CHEVROLE	T COBALT	38.4	13.3	44.4								
6082	2007		CHEVROLE	T COBALT	38.7	14.4	41.5	_							
200									efault Se	ettinas	Ne	ext	ſ	Cancel	
						Other To	-+/->						Ľ		
						outer le	sus						Г	Include Not Ca	iculated Tests
					No Othe	er Tester	2005 -	2010							
					nuo otin	cocor									

The tab displayed will be determined by the PRINT button which is clicked. Since the SIDE PRINT button was clicked for this example, the side Test Summary is displayed.

For this example we have further sorted the tests on the "A" value and highlighted the COBALT 4 door tests.

At this point you have the option to:

PRINT THIS PAGE - This button will print the Test Summary only for the page displayed.

PRINT ALL PAGES - This button will print the Test Summary for each test type which has tests available to print.

SEND A/B VALUES TO FORCE BALANCE - This will send the Statistical Summary of the A-B values to the Force Balance module, and allow you the chance to print the Test Summary page if you have not already done so.

Printing the Test Summary page is important so that you document what data went into the Force Balance calculations.

CANCEL - Allows you to close the Test Summary without doing anything else.

# **ADVANCED SEARCH:**

🛱 4N6XPRT Stif	Calcs								
File Print Reports	Settings Help Reg To	: 4N6XPRT SYSTEMS							
Basic Vehicle Search	NHTSA Test Selection	Advanced Vehicle Sear	th Force Balance						
				Advanced Search		O Seconds Elapsed			<u>^</u>
		Enter as much ir	formation as you can	about the type of vehicle/test	you are looking for then click	"search".			
		Remeber	he more "restrictions"	you put o the search criteria, I Specialty Search (	the fewer tests that will retriv	ved.			
Test Number	to	Units			Incond				
Year Range	1965 🌲 to 2011 🤹	() Imp	rial (lbs, inches)	Test	Test Type		~		
Make	*	OMet	ic (kg, mm, Newtons)	Barrier	Test Configuration		*		
			Min M	1ax					
Model		Yneel Wheel	Base						
Body Style		Vehicle Li	ingth						
		Vehicle W	eight						
Impact Local	tion								
Front	Side								
Rear	Other		Search	Reset					
Test Number	Year	Маке		Model	Body Style	Wheel base	Impact Point	Comments	~
	00000000000000000000000000000000000000			55	125	121	-71	121	8
1. 222									
									<b>~</b>
< _		מי אנים אין איינא אינא אינא אינא אינא אינא איינא א איינא איינא איינ		ים העצר על העליד קראינה ויקראיני העירו אין אייני איין אייני איין אייני איין אייני איין אייני איין אייני איין אי איין אייניא אייני איי	n dan die notweise gebreite weten de terreter in d	ne novo ne novo je ložna pri ložna po to kon po ložna po	n na	n ya na na na kata na	>

If you do not find a test of the type you want/need (i.e. - side impact), you need to do a **ADVANCED VEHICLE SEARCH** in order to create a CLASS vehicle.

Any of the fields in the ADVANCED VEHICLE SEARCH page can be used singly, or in combination. One must remember, however, that the fields are combined as an AND search .... which means that all of the criteria input on the page must be met in order for the test to be retrieved. Therefore, it is suggested that the user starts with a BROAD search (though not TOO broad - start with two or three fields/field ranges, such as body style and a weight range), and then narrow the search down depending upon the number of tests retrieved.

One approach - duplicate your basic vehicle search by selecting the appropriate MODEL and then click the SEARCH button.

When you click the SEARCH button, the tests which meet your search criteria show up in the box along the bottom of the window. When you see a test which you want to look at more closely, note the test number, then click on that

test. This will then put you on the **NHTSA TEST SELECTION** tab, at which point you proceed as you would if you were conducting a BASIC SEARCH.

If NO tests come up for the model you are looking for, or the similar model(s) as identified in the Sister/Clone list, you have the capability to build your own "CLASS" of similar vehicle.

Class based on WEIGHT. The weights contained in the NHTSA Crash Test database are **loaded weights**, not curb. Generally, the additional load is comprised of dummies and test recording instrumentation. This load generally ranges from 500-800 pounds over the curb weight.

The best way to find a base test weight for your search is to look at the weight of the vehicle in some other test. If there are no tests for your desired vehicle in the database, use a curb weight from a published source, such as Expert AutoStats<sup>®</sup>, and add your guess of what the load weight desired is. One way of estimating the load weight is.... use your best estimate of the load weight in your collision.

When inputting the weight MIN and MAX values, where you start your range depends upon what type of test you are trying to retrieve.

- For FRONTAL Tests, it is suggested that you start your range as +/- 20 pounds, due to the large number of frontal tests in the database, then expand or contract the range as you find necessary to get a valid number of tests in your search results.
- For REAR Tests, it is suggested that you start your range as +/- 200 pounds, due to the small number of rear tests in the database, then expand or contract the range as you find necessary to get a valid number of tests in your search results.
- For SIDE Tests, it is suggested that you start your range as +/- 100 pounds, then expand or contract the range as you find necessary to get a valid number of tests in your search results.

Class based on WHEELBASE. Determine the wheelbase of your desired class vehicle based upon a test of your desired vehicle, or from a published

source, such as Expert AutoStats<sup>®</sup>.

Class based on LENGTH. Determine the wheelbase of your desired class vehicle based upon a test of your desired vehicle, or from a published source, such as Expert AutoStats<sup>®</sup>.

Class based on BODYSTYLE. Select the body style you want to search for within the database.

Class based on IMPACT LOCATION. Select the Impact location(s) you want to search for within the database.

The more criteria used for the "CLASS" the more similar the tests will be to your subject vehicle, but the less likely it will be that you find any tests.

You can also start with one, or two, criteria, search the database, then add criteria and re-search the database to narrow the number of tests to review.

When you click the SEARCH button, the tests which meet your search criteria show up in the box along the bottom of the window. When you see a test which you want to look at more closely, note the test number, then click on that test. This will then put you on the **NHTSA TEST SELECTION** tab, at which point you proceed as you would if you were conducting a BASIC SEARCH.

You also have the opportunity to print a TEST SUMMARY REPORT of the search results.

# **"CLASS" VEHICLE:**

You, the user, should create a CLASS report every time you do vehicle stiffness research. Why?? Several Reasons -

(1) - Practice, Practice, PRACTICE! The more often you create a CLASS vehicle advanced search, the more easily the process will come to you. As with many skills, if you don't use them, you lose them.

- (2) Confirmation of findings. As you gain experience in creating CLASS vehicles, you will:
  - (A) confirm in your own mind that this is a valid method, and
  - (B) build confidence in the method for when you only have the CLASS vehicle upon which to rely for stiffness values.
- (3) Comfort. With the points mentioned in 1 and 2 above, you don't have to be afraid that you will not be able to do your normal outstanding reconstruction due to the lack of stiffness values.

🖧 4N6XPRT Stif	fCalcs - Selected Veh	icle: 200	8 CHEVROLET	COBALT							
File Print Reports	Settings Help Reg To	: 4N6XPRT S	SYSTEMS								1. A.
Basic Vehicle Search	NHTSA Test Selection	Advanced V	Vehicle Search	orce Balanc	e						
					Ad	vanced Search		O Seconds Elaps	ed		^
		Ente	er as much informa	ition as you	can about	the type of vehicle/test	you are looking for then d	lick "search".			
			Remeber the mo	ore "restricti	ons" you p	ut o the search criteria, t	he fewer tests that will re	trived.			
Test Number	to		Units			speciality Search C	Interia				
Year Range	1965 🛟 to 2011 🍨		Imperial (I)	os, inches)		Test	Test Ty	pe		~	] –
Maka			O Metric (kg	. mm, Newb	ons)	Barrier	Test Configurati				1
Make				Min	Max		rest coningerati				
Model		*	Wheel Base	102.5	104.5						
Body Style		~	Vehicle Length								
			Vehicle Weight								
Impact Loca	4 DOOD BYCHUD		venicie weight								
Front	BUS										
Rear	C-10										
	CONVERTIBLE			Search	Re	set					
Test Number	FIVE DOOR HATCHBACK	lake		Model		Body Style	Wheel Base	Impact Point	Comments		
	FOUR DOOR SEDAN	-								A	
			-								
	MOTOR HOME									-	
22 <u>8 </u>	NOT APPLICABLE							5		_ 2	
		-					-			$\equiv$	
	SILVERADO									—	
	STATION WAGON	-					-				
	TRUCK		1								
	TWO DOOR COUPE							5		-	
<	TWO DOOR SEDAN							•		>	
<	VAN										>
	-			orden dig generation							

For this CLASS, we will be looking at a COBALT FOUR DOOR SEDAN impacted on the Side.

When we look at the available Body Types, we see there are three car body types which have 4 doors - FIVE DOOR HATCHBACK, FOUR DOOR SEDAN, and STATION WAGON. In order to get the widest exposure, and to create the "best" class vehicle, a Body Style will not be designated at this point, but will be sorted for in future steps.

Print Reports Se	ettings Help Reg To	1: 4N6XPRT S		T COBAL I						
Vehicle Search	NHTSA Test Selection	Advanced V	'ehicle Search	Force Balanc	e					
					Adv	anced Search		O Seconds Elap:	sed	
		Enter	Remeber the r	mation as you more "restricti	ons" you pu	t o the search criteria, t	you are looking for then cli the fewer tests that will rel	ck "search". rrived.		
Test Number	to		Units			Specialty Search C	Iriteria			
Year Range 19	965 🌲 to 2011 🌲		<ol> <li>Imperial</li> </ol>	(lbs, inches)		Test	Test Typ	be		*
Make	~		O Metric (k	kg, mm, Newb	ons)	Barrier	Test Configuratio			~
Model		~	Wheel Bas	Min e 102.5	Max 104.5					
Parks Chula			Ushiela Lanak							
			venicie Lengu							
Impact Location	n									
Impact Location	n V Side			Search	Res	et				
Impact Location Front Rear	n Vide Other Year	Make		Search	Res	et Body Style	Wheel Base	Impact Point	Comments	
Impact Locatio	n Side Other Year	Make		Search	Res	et Body Style	Wheel Base	Impact Point	Comments	
Impact Locatio	n Vide	Make		Model	Res	et   Body Style	Wheel Base	Impact Point	Comments	
Impact Locatio	n Side	Make		Model	Res	et	Wheel Base	Impact Point	Comments	
Impact Locatio	N Side ☐ Other Year — — — — — — — — — — — — —	Make		Model	Res	et Body Style	Wheel Base	Impact Point	Comments	
Impact Locatio	N Side	Make		Model	Res	et Body Style	Wheel Base	Impact Point	Comments	
Impact Locatio	N Side ○ Other Year 	Make		Search Model	Res	et Body Style	Wheel Base	Impact Point	Comments	
Impact Locatio	N Side Other Year 	Make		Search Model	Res	et Body Style	Wheel Base	Impact Point	Comments	

Therefore, our ADVANCED SEARCH example consists of looking for SIDE impact tests for vehicles which have a wheelbase range of 102.5 to 104.5 inches, which is +/- 1 inch of the wheelbase we found in test # 6084 (See page 14 of this manual).

Once the Search criteria is set, click the SEARCH button.

Print Reports Settings Heb (Pay 1440/ER 1975/EM5			lcs - Selected Vehi	cle: 2008 CHEVROLET	COBALT				
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Ver Pange         1965         to         2011         Imperiation         Test         Test         Test         Test Configuration           Male         V         Market         Vertice (lige, m, New-out)         Barrier         Test Configuration           Model         Vertice (lige, m, New-out)         Barrier         Test Configuration           Model         Vertice (lige, m, New-out)         Barrier         Test Configuration           Impact Out         Vertice Weight         Vertice Weight         Print           Impact Out         Vertice Weight         Print         Print           Impact Out         1961 Tests Frond         Barrier         New Print         Print           Test Number         Year         Model         Body Style         State         Print           1980         CreterRoaft         Total Toto         Flyte Doore HaTcrete, Mass         State         No convertis         State           1982         1982         Cother         Flyte Doore HaTcrete, Mass         State         No convertis         State           1984         1987         Cother         Cother         Flyte Doore HaTcrete, Mass         State         No convertis           1984         1989         132,02.0         Flyte Doore Ha	Ver Range         1965         to         2011         Omeral (bc, inches)         Test         Test Type           Male         Male         Male         Male         Test Configuration         Test Configuration           Model         Wheel Base         102.5         194.5         Test Configuration         Test Configuration           Impact Location         Wheel Base         102.5         194.5         Test         Price           Impact Location         Vehicle Weight         Wheel Base         Price         Price         Price           Test Number         Verice Weight         Itels Tests Found         Search         Reset         Price         Price           966         1880         CHEVROLET         CITATION         Price DOOR HATCHEW, 2654         STLE         NO COMMENTS           972         1880         CHEVROLET         CITATION         Price DOOR HATCHEW, 2654         STLE         NO COMMENTS           986         1880         CHEVROLET         CITATION         Price DOOR HATCHEW, 2654         STLE         NO COMMENTS           1784         1991         TOYOTA         FICULP PILCK         Stote         Stote         Stote         Stote         Stote         Stote         Stote         Stote	Test Number	to	Units		specialcy search or	iteria		
Meter         Ver         Mode         Mode         Test Configuration           Model         Vehicle Length               Model         Vehicle Length               Property Constant         Vehicle Length               Sec         1980         Cherrolder Constant              Sec         1980         Cherrolder Constant              Sec         1980         Cherrolder Constant               Sec         1980         Cherrolder Constant	Main         Main <th< td=""><td>Year Range 19</td><td>965 🔶 to 2011 🤶</td><td>💿 Imperial (</td><td>lbs, inches)</td><td>Test</td><td>Test Type</td><td></td><td></td></th<>	Year Range 19	965 🔶 to 2011 🤶	💿 Imperial (	lbs, inches)	Test	Test Type		
Wate         Win         Max         Local         Feet Configuration           Model         Wheel Base         102.5         104.5         Intervention         Intervention           Body Style         Wheel Base         102.5         104.5         Intervention         Intervention           Impact Location         Intervention         Intervention         Intervention         Intervention         Intervention           Text Number         Year         Noise         Intervention         Intervention         Intervention         Intervention           Sec         Other         168 Tests Found         Search         Reset         Intervention         Intervention         Intervention           1522         1080         Other         168 Tests Found         Search         Reset         Intervention         Intervent	Inset         Ins.         Common         Inset         Common         Inset           Model         Wheel Base         102-5         104-5 <td>883 S</td> <td></td> <td>🔿 Metric (ka</td> <td>ı, mm, Newtons)</td> <td>Barrier</td> <td></td> <td></td> <td></td>	883 S		🔿 Metric (ka	ı, mm, Newtons)	Barrier			
Model         Wheel Base         102.5         104.5           Body Style         Vehicle Length         Vehicle Length         Vehicle Length           Impact Location         Vehicle Vehicle         Vehicle Vehicle         Vehicle Vehicle           Impact Location         Vehicle Vehicle         Vehicle Vehicle         Vehicle Vehicle           Impact Location         Vehicle Vehicle         Vehicle Vehicle         Vehicle Vehicle           Sec.         100 Mark         Reset         Print           Test Number         Year         Mele         Model         Eddy Style         Wheel Base         Inpact Point         Comments           Sec.         1298         Other Toticit         Content State         Sec.         Note Comments         Sec.         Note Comments           Sec.         1299         Totoria         Criticit         Print Content State         Sec.         Not Comments         Sec.         Not Comments         Not Comments           1298         1299         Totoria         Plotup         Plotup Print Content State         Size         Not Comments         Not Comments           1294         1293         Totoria         Plotup Print Content State         Size         Not Comments         Not Comments           129	Model         Wheel Base         102.5         104.5           Body Style         Weinde Length         Image: Location         Image: Location           Image: Location         State         Print           Test Number         Year         Model         Body Style         Wheel Base         Image: Location           Test Number         Year         Model         Body Style         Wheel Base         Image: Location           Sec         1398         Chernological Content State         Print           Test Number         Year         Model         Body Style         Wheel Base         Impact Doritic         Comments           Sec         1398         Chernological Content         Essent         Print         State         No. Content/State           1322         1398         Introvint A         Procup Titutics         8243         State         No. Content/State           1323         1389         Introvint A         Procup Titutics         8243         State         No. Content/State           1324         1393         Introvint A         Procup Titutics         8243         State         No. Content/State           1323         1393         Introvint A         Procup Titutics         8263         State	Маке	*		Min Max	Contor	l est Conriguration	٠ 	
Body Style         Vehice Length           ungast Location	Body Syle         Vehicle Length           Impact Location         Vehicle Weight           Innext Location         Vehicle Weight           Control         Viside         Print           Test Number         Yeard         Model         Reset         Print           Test Number         Yeard         Model         Reset         Print           Sé         1380         Children Model         Reset         Print           Test Number         Yeard         Model         Reset         Print           Sé         1380         Children Kart         Reset         Print           Tiss:         1382         Children Kart         Print         State         Noticitititititititititititititititititit	Model		Vheel Base	102.5 104.5				
Verkice Weight           Insect Location           Proct         Sale         Prick           Proct         Other         168 Tests Fourt         Seach         Prick           Test Number         Year         Make         Model         Body Syle         Minel Base         Ingrat Print         Comments           966         1980         CretWoolET         CTATION         FVEX DOOR HATCHE         2654         SIDE         NO COMMENTS           987         1980         CretWoolET         CTATION         FVEX DOOR HATCHE         2654         SIDE         NO COMMENTS           1982         1993         TOYOTA         PICULP         PICULP TRUSK         2644         SIDE         NO COMMENTS           1984         1991         TOYOTA         PICULP TRUSK         2644         SIDE         NO COMMENTS           1983         CLOSMORELE         ACHIEVA         TWO DOOR COLLER         2625         SIDE         NO COMMENTS           1983         TOYOTA         PICULP         TWO DOOR COLLER         2625         SIDE         NO COMMENTS           1983         TOYOTA         PICULP         PICULP TRUCK         2616         SIDE         NO COMMENTS <tr< td=""><td>Impact Location         Print           Proof         © Side         Print           Proof         © Side         Print           Test Number         Year         Male         Nodel         Print           Test Number         Year         Male         Nodel         Print         Print           Test Number         Year         Male         Nodel         Print Dool Halt Test         Side         No comments           Size         1980         OFENDALT         CITATION         Print Dool Halt Test         Side         No comments           Size         1980         OFENDALT         CITATION         Print Dool Halt Test         Side         No comments           Size         1988         INSSAM         Pickup Prink         Side         No comments           1232         1983         FORDER         Pickup Prink         Side         No comments           1341         1991         ToroTA         Pickup Prink         Side         No comments           1342         1983         FORD         Pickup Prink         Side         No comments           1342         1983         Citation         Pickup Prink         Side         No comments           1344         &lt;</td><td>Body Style</td><td></td><td>Vehicle Length</td><td></td><td></td><td></td><td></td><td></td></tr<>	Impact Location         Print           Proof         © Side         Print           Proof         © Side         Print           Test Number         Year         Male         Nodel         Print           Test Number         Year         Male         Nodel         Print         Print           Test Number         Year         Male         Nodel         Print Dool Halt Test         Side         No comments           Size         1980         OFENDALT         CITATION         Print Dool Halt Test         Side         No comments           Size         1980         OFENDALT         CITATION         Print Dool Halt Test         Side         No comments           Size         1988         INSSAM         Pickup Prink         Side         No comments           1232         1983         FORDER         Pickup Prink         Side         No comments           1341         1991         ToroTA         Pickup Prink         Side         No comments           1342         1983         FORD         Pickup Prink         Side         No comments           1342         1983         Citation         Pickup Prink         Side         No comments           1344         <	Body Style		Vehicle Length					
Vehice Weight           Impact.coston           Print         State           Print         Iterat.coston           Print         Iterat.coston         Print           Test.Number         Year         Male         Model         Body Style         Wheel Base         Impact.coston           967         1980         CHEVROLET         CITATION         FIVE DOOR HATCH:::::::::::::::::::::::::::::::::::	Vehice Weight           Impact Location         Impact Point         Other                Print               Est Found         Search         Rest         Print                Test Number          Year         Make         Model         Body Style         Wheel Base         Impact Point         Comments           966         1980         CHEVROLET         CITATION         PIVE DOOR HATCHER:         2554         SIDE         NO COMMENTS           1522         1988         INSSAN         PICOLP TRUCK         2547         SIDE         NO COMMENTS           1522         1988         INSSAN         PICOLP TRUCK         2547         SIDE         NO COMMENTS           1522         1988         INSSAN         PICOLP TRUCK         2547         SIDE         NO COMMENTS           1524         1921         TOYOTA         PICUP         PICUP TRUCK         2541         SIDE         NO COMMENTS           1744         1921         TOYOTA         PICUP         PIVE DOOR HATCHER:         2541         SIDE         NO COMMENTS           1922         1993         OLDSMOBILE         ACHEVA         TWO DOOR COLFE         2523         SIDE         NO COMMENTS			- Vonicio zonga					
Line         Description         Description         Description         Prixt           Test Number         Year         Make         Model         Body Syle         Wheel Base         Inpact Point         Comments           966         1980         CHEVPOLET         CITATION         FIVE DOOR HATCH	Line Tork         Content         Content         Print           Test Number         Year         Make         Model         Body Style         Wheel Base         Impact Point         Comments           966         1980         CHEWROLET         CITATION         FIVE DOOR HATCHEL, 2644         SIDE         No COMMENTS           1972         1988         MISSAM         PICUP         PICUP TRUCK         2644         SIDE         No COMMENTS           1982         1983         MISSAM         PICUP         PICUP TRUCK         2644         SIDE         No COMMENTS           1988         1000TA         PICUP         PICUP TRUCK         2644         SIDE         No COMMENTS           1988         1000TA         PICUP         PICUP TRUCK         2644         SIDE         No COMMENTS           1981         TOYOTA         PICUP         PICUP TRUCK         2644         SIDE         No COMMENTS           1982         1993         OLOSMOBLE         ACHEVA         TWO DOOR COUPE         2620         SIDE         1993 OLOSMOBLE A/ SIDE         1993 OLOSMOBLE A/ SIDE <td></td> <td></td> <td>Vehicle Weight</td> <td></td> <td></td> <td></td> <td></td> <td></td>			Vehicle Weight					
Front         U Side           Rear         Other         168 Texts Found         Search         Rest         Print           Text Number         Year         Make         Model         Body Style         Wheel Base         Impact Paint         Comments           966         1980         CHEWROLET         CITATION         FIVE DOOR NATCHB.         2554         SIDE         NO COMMENTS         9           1522         1988         NISSAM         PICULP         PICULP TRUCK         2647         SIDE         NO COMMENTS         9           1536         1991         TOYOTA         PICULP         PICULP TRUCK         2647         SIDE         NO COMMENTS         1           1744         1991         TOYOTA         PICULP TRUCK         2644         SIDE         NO COMMENTS           1744         1991         TOYOTA         PICULP TRUCK         2644         SIDE         NO COMMENT           1744         1991         TOYOTA         PICULP TRUCK         2644         SIDE         NO COMMENT           1741         1993         TOYOTA         PICULP TRUCK         2646         SIDE         NO COMMENT           1742         1993         HONDA         CVILC         TWO DOOR	Front         Under         Coher         Print           1         168 Tests Found         Search         Reset         Print           1         1980         CFEWROLET         CTATION         FME DOOR HATCHS	Impact Location							
Rear         Other         L68 Tests Found         Reset         Print           Test Number         Year         Make         Model         Body Style         Wheel Base         Impact Point         Comments           966         1980         CHEVROLET         CITATION         FIVE DOOR HATCHB	Rear         Other         168 Tests Found         Reset         Print           Test Number         Year         Make         Model         Body Style         Wheel Base         Impact Point         Comments           966         1980         CHEVROLET         CITATION         FIVE DOOR HATCHS	Front	✓ Side						
Test Number         Year         Make         Model         Body Style         Wheel Base         Impact Point         Comments           966         1980         CHEVROLET         CITATION         FIVE DOOR HATCHE,         2654         SIDE         NO COMMENTS           967.         1980         CHEVROLET         CITATION         FIVE DOOR HATCHE,         2654         SIDE         NO COMMENTS           1522.         1988         NISSAN         PICAUP TRUCK         2641         SIDE         NO COMMENTS           1536.         1991         TOYOTA         PICAUP TRUCK         2641         SIDE         NO COMMENTS           1744         1991         TOYOTA         PICAUP TRUCK         2644         SIDE         NO COMMENTS           1744         1991         TOYOTA         PICAUP TRUCK         2644         SIDE         NO COMMENTS           1744         1993         CALDMOBILE         PICAUP TRUCK         2645         SIDE         NO COMMENTS           1743         1993         CALDMOBILE         ACHEVA         TWO DOOR SCOLE         2625         SIDE         1993 DONOCOMENTS           1942         1993         CADMOBILE         ACHEVA         TWO DOOR SCOLE         2616         SIDE         <	Test Number         Year         Male         Model         Body Style         Wheel Base         Impact Point         Comments           966         1980         CHEVROLET         CITATION         FIVE DOOR HATCH	Rear	Other	168 Tests Found	Search Res	set		Pi	rint
Test Number         Year         Male         Model         Body Style         Wheel Base         Impact Point         Comments           996.         1980         CHEVROLET         CITATION         FIVE DOOR HATCHS	Test Number         Year         Male         Model         Body Style         Wheel Base         Impact Point         Comments           996         1980         CHEWROLET         CTIATION         FIVE DOOR NATCHS.         S264         SIDE         NO COMMENTS           1982         1988         NISSAN         PICKUP         PICKUP TRUCK         2647         SIDE         NO COMMENTS           1982         1991         TOYOTA         PICKUP         PICKUP TRUCK         2646         SIDE         NO COMMENTS           1733         1987         DOOGE         COLT         FIVE DOOR NATCHS.         2522         SIDE         NO COMMENT           1744         1991         TOYOTA         PICKUP         PICKUP TRUCK         2624         SIDE         NO COMMENT           1743         1993         FORD         PROBE         THREPOOR HATCHS.         2524         SIDE         NO COMMENT           1922         1993         OLOSMOBILE         ACHIEVA         TWO DOOR COUPE         2620         SIDE         1993 OLOSMOBILE AL           1922         1993         HORAGA         CTUC         TWO DOOR COUPE         2620         SIDE         1993 OLOSMOBILE AL           1924         HORAGA         CTUC <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
yeb         I yeu         CHEWROLET         CITATION         FIVE DOOR HATCHE         2654         SIDE         NO COMMENTS           1522         1980         MESROLET         CITATION         FIVE DOOR HATCHE         2654         SIDE         NO COMMENTS           1522         1980         MISSAN         PICKUP         PICKUP         PICKUP         ENCOMMENTS           1535         1991         TOYOTA         PICKUP         PICKUP         PICKUP TRUCK         2616         SIDE         NO COMMENTS           1738         1987         DODGE         COLT         FIVE DOOR HATCHE         2624         SIDE         NO COMMENTS           1744         1991         TOYOTA         PICKUP         PICKUP TRUCK         2644         SIDE         NO COMMENTS           1749         1993         FORD         PROBE         THEE DOOR HATC         2624         SIDE         NO COMMENTS           1722         1973         OLDSMOBILE         ACHIEVA         TWO DOOR SCUPE         2625         SIDE         1932 OLDSMOBILE A           1982         1973         OLDSMOBILE A         TWO DOOR SCUPE         2620         SIDE         1932 OLDSMOBILE A           1984         HONDA         CTUT	yeb         Lysu         CHEWROLET         CLIATION         FIVE DOOR HATCHE         2554         SIDE         NO COMMENTS           567         1980         CHEWROLET         CITATION         FIVE DOOR HATCHE         2564         SIDE         NO COMMENTS           1522         1988         INISSAN         PICKUP         PICKUP TRUCK         2616         SIDE         NO COMMENTS           1536         1991         TOYOTA         PICKUP         PICKUP TRUCK         2616         SIDE         NO COMMENTS           1738         1997         DOOGE         COLT         FIVE DOOR HATCHE         2624         SIDE         NO COMMENT           1744         1993         FORD         PICKUP         PICKUP TRUCK         2644         SIDE         NO COMMENT           1742         1993         OLDSMOBILE         ACHIEVA         TWO DOOR COUPE         2620         SIDE         1933 OLDSMOBILE AL           1742         1993         OLDSMOBILE         ACHIEVA         TWO DOOR COUPE         2620         SIDE         1933 OLDSMOBILE AL           1742         1993         OLDSMOBILE         ACHIEVA         TWO DOOR COUPE         2620         SIDE         1934 MORA CUIC 2.           1742         1993	Test Number	Year	Make	Model	Body Style	Wheel Base	Impact Point	Comments
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1596         1991         TOYOTA         PICKUP TUCK         2516         SIDE         NO COMMENTS           1788         1997         DOOGE         COLT         FIVE DOOR HATCHER         2629         SIDE         COLT VISTA MAGON           1744         1991         TOYOTA         PICKUP TUCK         2604         SIDE         NO COMMENT           1749         1993         FORD         PROBE         FIVE DOOR HATCHER         2554         SIDE         NO COMMENT           1922         1993         OLDSMOBILE         ACHIEVA         TWO DOOR COUPE         2620         SIDE         1993 OLDSMOBILE A           1922         1993         OLDSMOBILE         ACHIEVA         TWO DOOR COUPE         2620         SIDE         1993 OLDSMOBILE A           1923         HONDA         CIVIC         TWO DOOR SEDAN         2616         SIDE         1993 OLDSMOBILE A           1981         1993         TOYOTA         PICKUP TUCK         2616         SIDE         NO COMMENTS           1984         NOYTA         PICKUP PUCK         2616         SIDE         NO COMMENTS           1984         TOYOTA         PICKUP TUCK         2616         SIDE         NO COMMENTS           1984         MI	1596         1991         TOYOTA         PICULP         PICULP NUCK         26.16         SDE         NO.COMMENTS           1738         1991         TOYOTA         PICULP         PICULP NUCK         26.04         SDE         NO.COMMENTS           1749         1991         TOYOTA         PICULP         PICULP NUCK         26.04         SDE         NO.COMMENT           1912         1993         FORD         PROBE         THREE DOOR HATCH.         26.24         SDE         NO.COMMENTS           1922         1993         OLDSMOBILE         ACHIEVA         THVD DOOR COUPE         26.25         SIDE         1993 OLDSMOBILE A.           1922         1993         HONDA         CIVIC         TWO DOOR COUPE         26.25         SIDE         1993 OLDSMOBILE A.           1931         HONDA         CIVIC         TWO DOOR COUPE         26.16         SIDE         1993 OLDSMOBILE A.           1941         10YOTA         PICUP PUCLP PICUR NUCK         26.16         SIDE         1993 OLDSMOBILE A.           1941         10YOTA         PICUP         PICUP PUCL         26.16         SIDE         10.00 A.           1942         10YOTA         PICUP         PICUP PUCL         26.16         SIDE         NO	1522	1988	NISSAN	PICKUP	PICKUP TRUCK	2647	SIDE	VEHICLE LOST LEFT
1738       1987       DODGE       COLT       FIVE DOOR HATCHE       2634       SIDE       COLT VISTA WAGON         1744       1991       TOYOTA       PICKUP       PICKUP TRUCK       2604       SIDE       NO COMMENT         1749       1989       ISUZU       TROOPER II       FIVE DOOR HATCHE       2634       SIDE       NO COMMENT         1912       1993       OLDSMOBILE       ACHIEVA       TWO DOOR COUPE       2630       SIDE       1993 OLDSMOBILE A         1923       1993       OLDSMOBILE       ACHIEVA       TWO DOOR COUPE       2636       SIDE       1993 OLDSMOBILE A         1934       HONDA       CIVIC       TWO DOOR COUPE       2636       SIDE       1993 OLDSMOBILE A         1982       1993       HONDA       CIVIC       TWO DOOR COUPE       2636       SIDE       NO COMMENTS         1982       1993       TOYOTA       PICKUP PILICK       2616       SIDE       NO COMMENTS         1984       NISSAN       ALTIMA       FOUR DOOR SEDAN       2604       SIDE       NO COMMENTS         2094       1994       NITSBAN       ALTIMA       FOUR DOOR SEDAN       2630       SIDE       NO COMMENTS         2198       SUBA	1738         1987         DODGE         COLT         FIVE DOOR HATCHE         2629         SIDE         COLT VISTA WAGON,           1744         1991         TOYOTA         PICKUP         PICKUP TRUCK         2604         SIDE         NO COMMENT           1749         1989         ISUZU         TROOPER II         FIVE DOOR HATCHE         2654         SIDE         NO COMMENTS           1922         1993         OLDSMOBILE         ACHIEVA         TWO DOOR COUPE         2620         SIDE         1993 OLDSMOBILE A           1923         LODSMOBILE         ACHIEVA         TWO DOOR COUPE         2620         SIDE         1993 OLDSMOBILE A           1931         HONDA         CIVIC         TWO DOOR COUPE         2616         SIDE         1993 HONDA CIVIC 2,           1962         1993         HONDA         CIVIC         TWO DOOR SEDAN         2616         SIDE         NO COMMENTS           1989         1993         TOYOTA         PICKUP TRUCK         2616         SIDE         NO COMMENTS           1989         1994         NISSAN         ALTIMA         FOUR DOOR SEDAN         2604         SIDE         NO COMMENTS           2096         1994         MISSAN         ALTIMA         FOUR DOOR SEDAN </td <td>1596</td> <td>1991</td> <td>ΤΟΥΟΤΑ</td> <td>PICKUP</td> <td>PICKUP TRUCK</td> <td>2616</td> <td>SIDE</td> <td>NO COMMENTS</td>	1596	1991	ΤΟΥΟΤΑ	PICKUP	PICKUP TRUCK	2616	SIDE	NO COMMENTS
1744         1931         TOYOTA         PICUP         PICUP         PICUP         2604         SIDE         NO COMMENT           1749         1993         FORD         PROBE         THRE DORN HATCH         2634         SIDE         NO COMMENT           1912         1993         OLDSMOBILE         ACHIEVA         TWO DOOR COUPE         2630         SIDE         1993 OLDSMOBILE A           1923         1993         OLDSMOBILE         ACHIEVA         TWO DOOR COUPE         2635         SIDE         1993 OLDSMOBILE A           1924         1993         HONDA         CIVIC         TWO DOOR SEDAN         2616         SIDE         1993 HONDA CIVIC 2           1942         1993         TOYOTA         PICKUP         PICKUP PIRUCK         2616         SIDE         NO COMMENTS           1958         1994         NITSSAN         ALTIMA         FOUR DOR SEDAN         2630         SIDE         NO COMMENTS           1959         MITSJAH         ALTIMA         FOUR DOR SEDAN         2636         SIDE         NO COMMENTS           2054         1994         TOYOTA         CARRY         FOUR DOR SEDAN         2636         SIDE         NO COMMENTS           2054         1994         MITSJAB	1744         1991         TOYOTA         PICKUP         PICKUP         2604         SDE         No_COMMENT           1749         1993         FORD         PROBE         THREDOR HATC         2634         SDE         No_COMMENT           1912         1993         OLDSMOBILE         ACHEVA         TWO DOOR COUPE         2630         SDE         1993.0LDSMOBILE A.           1922         1993         OLDSMOBILE         ACHEVA         TWO DOOR COUPE         2635         SDE         1993.0LDSMOBILE A.           1924         1993         HONDA         CIVIC         TWO DOOR SCOUPE         26316         SDE         1993.0HONDA CIVIC 2.           1961         1993         HONDA         CIVIC         TWO DOOR SCOUPE         26316         SDE         No COMMENTS           1988         1993         TOYOTA         PICKUP         PICKUP TRUCK         2616         SDE         No COMMENTS           2059         1994         NITSSAN         ALTMA         FOUR DOOR SEDAN         2636         SDE         No COMMENT           2051         1994         NITSUBISHI         GALANT         FOUR DOOR SEDAN         2637         SIDE         No COMMENT           2056         1994         MITSUBISHI	1738	1987	DODGE	COLT	FIVE DOOR HATCHB	2629	SIDE	COLT VISTA WAGON
1749         1989         JSUZU         TROOPER II         FIVE DOR HATCHE         2654         SDE         NO COMMENT           1912         1993         OLDSMOBILE         ACHIEVA         TWO DOOR COUPE         2620         SDE         1993 OLDSMOBILE A           1923         OLDSMOBILE         ACHIEVA         TWO DOOR COUPE         2620         SDE         1993 OLDSMOBILE A           1961         1993         HONDA         CIVIC         TWO DOOR SEDAN         2616         SDE         1993 HONDA CIVIC 2           1962         1993         HONDA         CIVIC         TWO DOOR SEDAN         2616         SDE         NO COMMENTS           1984         1993         TOYOTA         PICKUP TRUCK         2616         SDE         NO COMMENTS           1989         1993         TOYOTA         PICKUP TRUCK         2616         SDE         NO COMMENTS           2094         1994         NISSAN         ALTMA         FOUR DOOR SEDAN         2620         SDE         NO COMMENTS           2094         1994         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2620         SDE         NO COMMENT           2116         1994         AUDI         905         FOUR DOOR SEDAN <t< td=""><td>1749         1989         ISUZU         TROOPER II         FIVE DOOR HATCHE</td><td>1744</td><td>1991</td><td>ΤΟΥΟΤΑ</td><td>PICKUP</td><td>PICKUP TRUCK</td><td>2604</td><td>SIDE</td><td>NO COMMENT</td></t<>	1749         1989         ISUZU         TROOPER II         FIVE DOOR HATCHE	1744	1991	ΤΟΥΟΤΑ	PICKUP	PICKUP TRUCK	2604	SIDE	NO COMMENT
1912         1923         FORD         FMORE         THREE         DEC         NUCCHPTENTS           1922         1993         OLDSMOBILE         ACHEVA         TWO DOOR COUFE         2625         SDE         1993 OLDSMOBILE A           1923         1993         OLDSMOBILE         ACHEVA         TWO DOOR COUFE         2625         SDE         1993 OLDSMOBILE A           1924         1993         HONDA         CTVIC         TWO DOOR COUFE         2625         SDE         1993 HONDA CLEX           1986         1993         HONDA         CTVIC         TWO DOOR COUFE         2616         SDE         1993 HONDA CLEZ           1987         1993         TOYOTA         PICKUP         PICKUP TRUCK         2616         SDE         NO COMMENTS           2094         1994         NISSAN         ALTMA         FOUR DOOR SEDAN         2620         SDE         NO COMMENTS           2096         1994         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2624         SIDE         NO COMMENT           2116         1994         AUDI         905         FOUR DOOR SEDAN         2626         SIDE         NO COMMENT           2121         1995         MAZDA         323-POTEGE	1912         1993         FORD         PROBE         Intellight         202         1912         1912         1912         1912         1912         1912         1912         1912         1912         1912         1912         1912         1912         1912         1913         OLDSMOBILE         ACHIEVA         TWO DOOR COUPE         2625         SIDE         1933 OLDSMOBILE         1913         1914 <td>1749</td> <td>1989</td> <td>ISUZU</td> <td>TROOPER II</td> <td>FIVE DOOR HATCHB</td> <td>2654</td> <td>SIDE</td> <td></td>	1749	1989	ISUZU	TROOPER II	FIVE DOOR HATCHB	2654	SIDE	
122         1233         OLD SINCELLE         ALTIEVA         TWO DOOR COUPE         2620         Dite         1293 OLDS/NOBLE         ALTIEVA           1923         1993         OLDSMOBILE         ALTIEVA         TWO DOOR COUPE         2625         SIDE         1993 OLDS/NOBLE         ALTIEVA           1961         1993         HONDA         CTVIC         TWO DOOR COUPE         2616         SIDE         1993 OLDS/NOBLE         ALTIEVA           19962         1993         TOYOTA         PICKUP         PICKUP TRUCK         2616         SIDE         NO COMMENTS           19989         1993         TOYOTA         PICKUP         PICKUP TRUCK         2616         SIDE         NO COMMENTS           2099         1994         INSSAN         ALTIMA         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2094         1994         MIJDUEISHIT         GALANT         FOUR DOOR SEDAN         2636         SIDE         NO COMMENT           2116         1994         AUDI         905         FOUR DOOR SEDAN         2632         SIDE         NO COMMENT           2210         1995         SUBARU         LEGACY         STATION WAGON         2629         SIDE         NO COMMENT <tr< td=""><td>1322         1393         OLD SINCELL         ACTIEVA         INV DOOR COUPE         2620         JUL         1493 OLD MODILE           1931         OLDSMOBILE         ACTIEVA         TWO DOOR COUPE         2625         SIDE         1933 OLDSMOBILE A.           1941         1993         HONDA         CIVIC         TWO DOOR COUPE         2616         SIDE         1933 HONDA CIVIC 2.           1952         1993         HONDA         CIVIC         TWO DOOR COUPE         2616         SIDE         1933 HONDA CIVIC 2.           1978         1993         TOYOTA         PICKUP         PICKUP TRUCK         2616         SIDE         NO COMMENTS           2059         1994         INISSAN         ALTIMA         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2054         1994         MISUBISHI         GALANT         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2056         1994         AUDI         905         FOUR DOOR SEDAN         2624         SIDE         NO COMMENTS           2216         1995         MISUBISHI         GALANT         FOUR DOOR SEDAN         2624         SIDE         NO COMMENTS           2217         1995         MAZDA         &lt;</td><td>1912</td><td>1993</td><td></td><td>PROBE</td><td>THREE DOOR HATC</td><td>2624</td><td>SIDE</td><td></td></tr<>	1322         1393         OLD SINCELL         ACTIEVA         INV DOOR COUPE         2620         JUL         1493 OLD MODILE           1931         OLDSMOBILE         ACTIEVA         TWO DOOR COUPE         2625         SIDE         1933 OLDSMOBILE A.           1941         1993         HONDA         CIVIC         TWO DOOR COUPE         2616         SIDE         1933 HONDA CIVIC 2.           1952         1993         HONDA         CIVIC         TWO DOOR COUPE         2616         SIDE         1933 HONDA CIVIC 2.           1978         1993         TOYOTA         PICKUP         PICKUP TRUCK         2616         SIDE         NO COMMENTS           2059         1994         INISSAN         ALTIMA         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2054         1994         MISUBISHI         GALANT         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2056         1994         AUDI         905         FOUR DOOR SEDAN         2624         SIDE         NO COMMENTS           2216         1995         MISUBISHI         GALANT         FOUR DOOR SEDAN         2624         SIDE         NO COMMENTS           2217         1995         MAZDA         <	1912	1993		PROBE	THREE DOOR HATC	2624	SIDE	
1961         1993         HONDA         CTVIC         TWO DOOR SEDAN         2616         SIDE         1993 HONDA CTVIC 2           1952         1993         HONDA         CTVIC         TWO DOOR SEDAN         2616         SIDE         1993 HONDA CTVIC 2           1978         1993         TOYOTA         PICKUP IRUCK         2616         SIDE         NO COMMENTS           1989         1993         TOYOTA         PICKUP IRUCK         2616         SIDE         NO COMMENTS           2094         1994         NISSAN         ALITMA         FOUR DOOR SEDAN         2604         SIDE         NO COMMENTS           2095         1994         MITSUEISHI         GALANT         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2116         1994         AUDI         905         FOUR DOOR SEDAN         2624         SIDE         NO COMMENT           2110         1995         SUBARU         LEGACY         STATION WAGON         2629         SIDE         NO COMMENTS           2212         1995         MITSUEISHI         GALANT         FOUR DOOR SEDAN         2636         SIDE         NO COMMENTS           2213         1995         MAZDA         323+ROTEGE         FOUR DOOR SEDAN	1961         1993         HONDA         CTVIC         TWO DOOR SEDAN         2616         SIDE         1993 HONDA CTVIC 2.           1962         1993         HONDA         CTVIC         TWO DOOR SEDAN         2616         SIDE         1993 HONDA CTVIC 2.           1978         1993         TOYOTA         PICKUP IRUCK         2616         SIDE         NO COMMENTS           1989         1993         TOYOTA         PICKUP IRUCK         2616         SIDE         NO COMMENTS           2059         1994         NISSAN         ALTIMA         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2096         1994         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2639         SIDE         NO COMMENTS           2116         1994         AUDI         905         FOUR DOOR SEDAN         2640         SIDE         NO COMMENT           2110         1995         SUBARU         LEGACY         STATION WAGON         2629         SIDE         NO COMMENT           2117         1995         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           21217         1995         MAZDA         323-PROTEGE         FOUR DOOR SEDAN <td>1923</td> <td>1993</td> <td></td> <td>ACHIEVA</td> <td>TWO DOOR COUPE</td> <td>2625</td> <td>SIDE</td> <td>1993 OLDSMOBILE A</td>	1923	1993		ACHIEVA	TWO DOOR COUPE	2625	SIDE	1993 OLDSMOBILE A
1962         1993         HONDA         CIVIC         TWO DOOR COUPE         2616         SIDE         1993 HONDA CIVIC 2           1978         1993         TOYOTA         PICKUP         PICKUP TRUCK         2616         SIDE         NO COMMENTS           1989         1993         TOYOTA         PICKUP         PICKUP TRUCK         2616         SIDE         NO COMMENTS           2059         1994         NISSAN         ALTIMA         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2054         1994         TOYOTA         CAMRY         FOUR DOOR SEDAN         2634         SIDE         NO COMMENT           2056         1994         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2634         SIDE         NO COMMENT           2116         1995         SUBARU         LEGACY         STATION WAGON         2624         SIDE         NO COMMENT           2217         1995         MAZDA         323-PROTEGE         FOUR DOOR SEDAN         2636         SIDE         NO COMMENT           2433         1996         DODGE         AVENGER         TWO DOOR SEDAN         2630         SIDE         NO COMMENTS           2447         1997         HONDA         CI	1962         1993         HONDA         CIVIC         TWO DOOR COUPE         26.16         SIDE         1993 HONDA CIVIC 2.           1978         1993         TOYOTA         PICKUP         PICKUP TRUCK         26.16         SIDE         NO COMMENTS           1989         1993         TOYOTA         PICKUP         PICKUP TRUCK         26.16         SIDE         NO COMMENTS           2059         1994         NISSAN         ALTIMA         FOUR DOOR SEDAN         26.20         SIDE         NO COMMENTS           2054         1994         TOYOTA         CAMRY         FOUR DOOR SEDAN         26.39         SIDE         NO COMMENT           2056         1994         AUDI         905         FOUR DOOR SEDAN         26.34         SIDE         NO COMMENT           2116         1995         SUBARU         LEGACY         STATION WAGON         26.23         SIDE         NO COMMENT           2217         1995         MAZDA         323-PROTEGE         FOUR DOOR SEDAN         26.36         SIDE         NO COMMENT           2433         1996         DODGE         AVENDER         TWO DOOR SEDAN         26.40         SIDE         NO COMMENTS           2431         1997         CHEVROLET	1961	1993	HONDA	CIVIC	TWO DOOR SEDAN	2616	SIDE	1993 HONDA CIVIC 2
1978         1993         TOYOTA         PICKUP         PICKUP         RUCKUP RUCK         2616         SIDE         NO COMMENTS           2059         1994         NISSAN         ALTIMA         FOUR DOOR SEDAN         2630         SIDE         NO COMMENTS           2059         1994         TOYOTA         CAMRY         FOUR DOOR SEDAN         2630         SIDE         NO COMMENTS           2096         1994         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2639         SIDE         NO COMMENT           2116         1994         AUDI         905         FOUR DOOR SEDAN         2624         SIDE         NO COMMENT           2110         1995         SUBARU         LEGACY         STATION WAGON         2629         SIDE         NO COMMENT           2121         1995         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2636         SIDE         NO COMMENTS           2217         1995         MAZDA         323-PROTEGE         FOUR DOOR SEDAN         2630         SIDE         NO COMMENTS           2249         1995         MAZDA         CIVIC         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2494         1997         CHEWROL	1978         1993         TOYOTA         PICKUP         PICKUP TRUCK         2616         SIDE         NO COMMENTS           2059         1994         NISSAN         ALTIMA         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2059         1994         TOYOTA         CAMRY         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2096         1994         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2639         SIDE         NO COMMENT           2116         1994         AUDI         905         FOUR DOOR SEDAN         2624         SIDE         NO COMMENT           2210         1995         SUBARU         LEGACY         STATION WAGON         2629         SIDE         NO COMMENT           2217         1995         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2636         SIDE         NO COMMENT           2217         1995         MAZDA         323-PROTEGE         FOUR DOOR SEDAN         2604         SIDE         NO COMMENTS           2249         1997         CHEWROLET         CAVALIER         TWO DOOR COUPE         2640         SIDE         NO COMMENTS           2491         1997         CHEWROLET <t< td=""><td>1962</td><td>1993</td><td>HONDA</td><td>CIVIC</td><td>TWO DOOR COUPE</td><td>2616</td><td>SIDE</td><td>1993 HONDA CIVIC 2</td></t<>	1962	1993	HONDA	CIVIC	TWO DOOR COUPE	2616	SIDE	1993 HONDA CIVIC 2
1989         1993         TOYOTA         PICKUP         PICKUP TRUCK         2616         SIDE         DAMDST IS NEGATIVE.           2059         1994         NISSAN         ALTIMA         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2096         1994         TOYOTA         CAMRY         FOUR DOOR SEDAN         2604         SIDE         NO COMMENT           2116         1994         ALDI         905         FOUR DOOR SEDAN         2624         SIDE         NO COMMENT           2217         1995         SUBARU         LEGACY         STATION WAGON         2629         SIDE         NO COMMENT           2217         1995         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2636         SIDE         NO COMMENT           2217         1995         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2604         SIDE         NO COMMENTS           2433         1996         DODGE         AVENGER         TWO DOOR COUPE         2640         SIDE         NO COMMENTS           2431         1997         CHEWROLET         CAVALIER         TWO DOOR SEDAN         2620         SIDE         NO COMMENTS           2491         1997         SATURN <t< td=""><td>1989         1993         TOYOTA         PICKUP         PICKUP TRUCK         2616         SIDE         DAMDST IS NEGATIVE           2059         1994         NISSAN         ALTIMA         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2096         1994         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2639         SIDE         NO COMMENT           2096         1994         ALUDI         905         FOUR DOOR SEDAN         2623         SIDE         NO COMMENT           2210         1995         SUBARU         LEGACY         STATION WAGON         2624         SIDE         NO COMMENT           2217         1995         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2623         SIDE         NO COMMENT           2243         1996         DODGE         AVENGER         TWO DOOR SEDAN         2620         SIDE         NO COMMENTS           2433         1996         DODGE         AVENGER         TWO DOOR SEDAN         2620         SIDE         NO COMMENTS           2447         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2491         1997         CHEVROLET         C</td><td>1978</td><td>1993</td><td>ΤΟΥΟΤΑ</td><td>PICKUP</td><td>PICKUP TRUCK</td><td>2616</td><td>SIDE</td><td>NO COMMENTS</td></t<>	1989         1993         TOYOTA         PICKUP         PICKUP TRUCK         2616         SIDE         DAMDST IS NEGATIVE           2059         1994         NISSAN         ALTIMA         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2096         1994         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2639         SIDE         NO COMMENT           2096         1994         ALUDI         905         FOUR DOOR SEDAN         2623         SIDE         NO COMMENT           2210         1995         SUBARU         LEGACY         STATION WAGON         2624         SIDE         NO COMMENT           2217         1995         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2623         SIDE         NO COMMENT           2243         1996         DODGE         AVENGER         TWO DOOR SEDAN         2620         SIDE         NO COMMENTS           2433         1996         DODGE         AVENGER         TWO DOOR SEDAN         2620         SIDE         NO COMMENTS           2447         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2491         1997         CHEVROLET         C	1978	1993	ΤΟΥΟΤΑ	PICKUP	PICKUP TRUCK	2616	SIDE	NO COMMENTS
2429         1924         IND SAM         PALINIK         POUR DORK SEDAN         2620         SIDE         IND COMMENT           2094         1994         MTSUBISHI         GALANT         FOUR DOOR SEDAN         2604         SIDE         IND COMMENT           2096         1994         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2629         SIDE         IND COMMENT           2210         1995         SUBARU         LEGACY         STATION WAGON         2629         SIDE         IND COMMENT           2217         1995         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2624         SIDE         IND COMMENT           2217         1995         MAZDA         323-RPOTEGE         FOUR DOOR SEDAN         2636         SIDE         IND COMMENT           2249         1995         MAZDA         323-RPOTEGE         FOUR DOOR SEDAN         2604         SIDE         IND COMMENT           2433         1996         DODGE         AVAIGER         TWO DOOR SEDAN         2640         SIDE         NO COMMENTS           2447         1997         CHEVROLET         CAVALER         TWO DOOR SEDAN         2640         SIDE         NO COMMENTS           2491         1997         SATUR	2029         1924         INDEXN         PALIDIA         POUR DOUR SEDAN         2620         SIDE         INDEXDMENT           2094         1994         MTSUBISHI         GALANT         FOUR DOOR SEDAN         2639         SIDE         NO COMMENT           2016         1994         AUDI         905         FOUR DOOR SEDAN         2629         SIDE         NO COMMENT           2210         1995         SUBARU         LEGACY         STATION WAGON         2629         SIDE         NO COMMENT           2217         1995         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2636         SIDE         NO COMMENTS           2249         1995         MAZDA         323-PROTEGE         FOUR DOOR SEDAN         2604         SIDE         NO COMMENTS           2433         1996         DODGE         AVENGER         TWO DOOR SEDAN         2604         SIDE         NO COMMENTS           2437         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2604         SIDE         NO COMMENTS           2447         1997         CHEVROLET         CAVALIER         TWO DOOR SEDAN         2604         SIDE         NO COMMENTS           2491         1997         PONTIAC <td< td=""><td>1989</td><td>1993</td><td>TOYOTA</td><td>PICKUP</td><td>PICKUP TRUCK</td><td>2616</td><td>SIDE</td><td>DAMDST IS NEGATIVE</td></td<>	1989	1993	TOYOTA	PICKUP	PICKUP TRUCK	2616	SIDE	DAMDST IS NEGATIVE
Description         Description <thdescription< th=""> <thdescription< th=""></thdescription<></thdescription<>	Display         Display <t< td=""><td>2059</td><td>1994</td><td></td><td></td><td>FOUR DOOR SEDAN</td><td>2620</td><td>SIDE</td><td></td></t<>	2059	1994			FOUR DOOR SEDAN	2620	SIDE	
2116         1994         AUDI         905         FOUR DOOR SEDAN         2624         SIDE         NO.COMMENT           2210         1995         SUBARU         LEGACY         STATION WAGON         2629         SIDE         NO.COMMENT           2217         1995         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2636         SIDE         NO.COMMENTS           2249         1995         MAZDA         323-PROTEGE         FOUR DOOR SEDAN         2636         SIDE         NO.COMMENT           22433         1996         DODGE         AVENGER         TWO DOOR SEDAN         2640         SIDE         NO.COMMENTS           2477         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2640         SIDE         NO.COMMENTS           2491         1997         CHEVROLET         CAVALIER         TWO DOOR SEDAN         2640         SIDE         NO.COMMENTS           2491         1997         SATURN         SL1         FOUR DOOR SEDAN         2630         SIDE         NO.COMMENTS           2499         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2630         SIDE         NO.COMMENTS           2508         1997         SUBARU         LE	2116         1994         AUDI         905         FOUR DOOR SEDAN         2624         SIDE         NO COMMENT           2210         1995         SUBARU         LEGACY         STATION WAGON         2629         SIDE         NO COMMENT           2217         1995         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2629         SIDE         NO COMMENTS           2249         1995         MAZDA         323-PROTEGE         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2433         1996         DOOGE         AVENGER         TWO DOOR SEDAN         2620         SIDE         NO COMMENTS           2477         1997         HONDA         CTVIC         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2491         1997         CHEVROLET         CAVALIER         TWO DOOR SEDAN         2640         SIDE         NO COMMENTS           2499         1997         SATURN         SI.1         FOUR DOOR SEDAN         2604         SIDE         NO COMMENTS           2499         1997         SUBARU         LEGACY         FOUR DOOR SEDAN         2630         SIDE         NO COMMENTS           2508         1997         SUBARU         LEGA	2094	1994	MITSUBISHI	GALANT	FOUR DOOR SEDAN	2639	SIDE	
1995         SUBARU         LEGACY         STATION WAGON         2629         SIDE         NO COMMENT           2217         1995         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2636         SIDE         NO COMMENTS           22149         1995         MAZDA         323-PROTEGE         FOUR DOOR SEDAN         2604         SIDE         NO COMMENT           2433         1996         DODGE         AVENGER         TWO DOOR SEDAN         2604         SIDE         NO COMMENTS           2437         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2604         SIDE         NO COMMENTS           2447         1997         CHEVROLET         CAVALIER         TWO DOOR SEDAN         2640         SIDE         NO COMMENTS           2491         1997         SATURN         SLI         FOUR DOOR SEDAN         2604         SIDE         NO COMMENTS           2494         1997         SATURN         SLI         FOUR DOOR SEDAN         2604         SIDE         NO COMMENTS           2499         1997         SUBARU         LEGACY         FOUR DOOR SEDAN         2632         SIDE         NO COMMENTS           2508         1997         PONTIAC         GRAND AM         <	2210         1995         SUBARU         LEGACY         STATION WAGON         2629         SIDE         NO COMMENT           2217         1995         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2636         SIDE         NO COMMENTS           2249         1995         MAZDA         323-PROTEGE         FOUR DOOR SEDAN         2604         SIDE         NO COMMENTS           2433         1996         DODGE         AVENGER         TWO DOOR SEDAN         2604         SIDE         NO COMMENTS           2437         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2604         SIDE         NO COMMENTS           2447         1997         CHEVROLET         CAVALIER         TWO DOOR SEDAN         2640         SIDE         NO COMMENTS           2491         1997         CHEVROLET         CAVALIER         TWO DOOR SEDAN         2604         SIDE         NO COMMENTS           2491         1997         SATURN         SLI         FOUR DOOR SEDAN         2604         SIDE         NO COMMENTS           2493         1997         SUBARU         LEGACY         FOUR DOOR SEDAN         2630         SIDE         NO COMMENTS           2508         1997         PONTIAC	2116	1994	AUDI	905	FOUR DOOR SEDAN	2624	SIDE	NO COMMENT
2217         1995         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2636         SIDE         NO COMMENTS           2249         1995         MAZDA         323-PROTEGE         FOUR DOOR SEDAN         2604         SIDE         NO COMMENT           2433         1996         DODGE         AVENGER         TWO DOOR COUPE         2640         SIDE         NO COMMENTS           2477         1997         HONDA         CTVC         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2485         1997         CHEVROLET         CAVALIER         TWO DOOR SEDAN         2640         SIDE         NO COMMENTS           2491         1997         SATURN         SLI         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2494         1997         SATURN         SLI         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2508         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2632         SIDE         NO COMMENTS           2510         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2523         1997         PONTIAC	2217         1995         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2636         SIDE         NO COMMENTS           2249         1995         MAZDA         323-PROTEGE         FOUR DOOR SEDAN         2604         SIDE         NO COMMENTS           2433         1996         DODGE         AVENGER         TWO DOOR SEDAN         2640         SIDE         NO COMMENTS           2477         1997         HONDA         CTVC         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2471         1997         CHEVROLET         CAVALIER         TWO DOOR SEDAN         2640         SIDE         NO COMMENTS           2491         1997         CHEVROLET         CAVALIER         TWO DOOR SEDAN         2640         SIDE         NO COMMENTS           2499         1997         SATURN         SLI         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2508         1997         PONITAC         GRAND AM         FOUR DOOR SEDAN         2630         SIDE         NO COMMENTS           2510         1997         MAZDA         626         FOUR DOOR SEDAN         2632         SIDE         NO COMMENTS           2532         1997         MAZDA	2210	1995	SUBARU	LEGACY	STATION WAGON	2629	SIDE	NO COMMENT
2249         1995         MAZDA         323*ROTEGE         FOUR DOOR SEDAN         2604         SIDE         NO COMMENT           2433         1996         DOOGE         AVENGER         TWO DOOR COUR         2640         SIDE         NO COMMENTS           2477         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2485         1997         CHEVROLET         CAVALIER         TWO DOOR SEDAN         2640         SIDE         NO COMMENTS           2491         1997         CHEVROLET         CAVALIER         TWO DOOR SEDAN         2642         SIDE         NO COMMENTS           2499         1997         SATURN         SL1         FOUR DOOR SEDAN         2642         SIDE         NO COMMENTS           2499         1997         SATURN         SL1         FOUR DOOR SEDAN         2630         SIDE         NO COMMENTS           2508         1997         SUBARU         LEGACY         FOUR DOOR SEDAN         2632         SIDE         NO COMMENTS           2510         1997         MAZDA         626         FOUR DOOR SEDAN         2632         SIDE         NO COMMENTS           2532         1997         MAZDA         626 <td>2249         1995         MAZDA         323*ROTEGE         FOUR DOOR SEDAN         2604         SIDE         NO COMMENT           2433         1996         DOOGE         AVENGER         TWO DOOR COUPE         2640         SIDE         NO COMMENTS           2477         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2485         1997         CHEVROLET         CAVALIER         TWO DOOR SEDAN         2640         SIDE         NO COMMENTS           2491         1997         CHEVROLET         CAVALIER         TWO DOOR SEDAN         2640         SIDE         NO COMMENTS           2494         1997         SATURN         SLI         FOUR DOOR SEDAN         2642         SIDE         NO COMMENTS           2494         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2630         SIDE         NO COMMENTS           2508         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2632         SIDE         NO COMMENTS           2510         1997         MAZDA         626         FOUR DOOR SEDAN         2632         SIDE         NO COMMENTS           2532         1997         MAZDA         &lt;</td> <td>2217</td> <td>1995</td> <td>MITSUBISHI</td> <td>GALANT</td> <td>FOUR DOOR SEDAN</td> <td>2636</td> <td>SIDE</td> <td>NO COMMENTS</td>	2249         1995         MAZDA         323*ROTEGE         FOUR DOOR SEDAN         2604         SIDE         NO COMMENT           2433         1996         DOOGE         AVENGER         TWO DOOR COUPE         2640         SIDE         NO COMMENTS           2477         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2485         1997         CHEVROLET         CAVALIER         TWO DOOR SEDAN         2640         SIDE         NO COMMENTS           2491         1997         CHEVROLET         CAVALIER         TWO DOOR SEDAN         2640         SIDE         NO COMMENTS           2494         1997         SATURN         SLI         FOUR DOOR SEDAN         2642         SIDE         NO COMMENTS           2494         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2630         SIDE         NO COMMENTS           2508         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2632         SIDE         NO COMMENTS           2510         1997         MAZDA         626         FOUR DOOR SEDAN         2632         SIDE         NO COMMENTS           2532         1997         MAZDA         <	2217	1995	MITSUBISHI	GALANT	FOUR DOOR SEDAN	2636	SIDE	NO COMMENTS
2435         1990         DODGE         AVENUE         Two DOR Court         Data         International Court         Data	2433         1990         DODGE         PAUlater         Two DOR Confer         Date         Ino Comments           2477         1997         HONDA         CIVIC         FOUR DOR SEDAN         2640         SIDE         No COMMENTS           2485         1997         CHEVROLET         CAVALIER         TWO DORS SEDAN         2640         SIDE         No COMMENTS           2491         1997         CHEVROLET         CAVALIER         TWO DORS SEDAN         2640         SIDE         No COMMENTS           2494         1997         SATURN         SL1         FOUR DOOR SEDAN         2630         SIDE         No COMMENTS           2499         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2630         SIDE         No COMMENTS           2508         1997         SUBARU         LEGACY         FOUR DOOR SEDAN         2632         SIDE         NO COMMENTS           2510         1997         MAZDA         626         FOUR DOOR SEDAN         2623         SIDE         NO COMMENTS           2531         1997         MAZDA         626         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2533         1997         HONDA         CIVIC         FOUR	2249	1995	MAZDA DODGE	323-PROTEGE	TWO DOOR SEDAN	2604	SIDE	
1225         CHEVROLET         CAVALIER         TWO DOOR SEDAN         2620         BID         INCOMINIS           2495         1997         CHEVROLET         CAVALIER         TWO DOOR SEDAN         2640         SIDE         INO COMMENTS           2491         1997         CHEVROLET         CAVALIER         TWO DOOR SEDAN         2640         SIDE         INO COMMENTS           2494         1997         SATURN         SL1         FOUR DOOR SEDAN         2604         SIDE         INO COMMENTS           2499         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2630         SIDE         INO COMMENTS           2508         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2509         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2510         1997         MAZDA         626         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2532         1997         HODDA         CIVIC         FOUR DOOR SEDAN         2624         SIDE         NO COMMENTS           2538         1997         HODDA         CIVIC	1220         CHEWROLET         CAVALIER         TWO DOOR SEDAN         2620         Dit         INO COMMENTS           2491         1997         CHEWROLET         CAVALIER         TWO DOOR SEDAN         2640         SIDE         INO COMMENTS           2491         1997         CHEWROLET         CAVALIER         TWO DOOR SEDAN         2640         SIDE         INO COMMENTS           2494         1997         SATURN         SL1         FOUR DOOR SEDAN         2644         SIDE         INO COMMENTS           2499         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2630         SIDE         INO COMMENTS           2508         1997         SUBARU         LEGACY         FOUR DOOR SEDAN         2632         SIDE         INO COMMENTS           2510         1997         MAZDA         626         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2532         1997         MAZDA         626         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2532         1997         HONDA         CTIV         FOUR DOOR SEDAN         2624         SIDE         NO COMMENTS           2538         1997         HONDA         CTIVC	2477	1997	HONDA	CIVIC	FOLIR DOOR SEDAN	2620	SIDE	NO COMMENTS
2491         1997         CHEVROLET         CAVALIER         TWO DOOR COUPE         2642         SIDE         NO COMMENTS           2494         1997         SATURN         SLI         FOUR DOOR SEDAN         2604         SIDE         NO COMMENTS           2499         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2630         SIDE         NO COMMENTS           2508         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2632         SIDE         ENGINE TYPE HORIZ           2509         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2632         SIDE         NO COMMENTS           2510         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2636         SIDE         NO COMMENTS           2532         1997         MAZDA         626         FOUR DOOR SEDAN         2648         SIDE         NO COMMENTS           2537         1997         NISSAN         ALTIMA         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2538         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2547         1997         DODGE <td>2491         1997         CHEVROLET         CAVALIER         TWO DOOR COUPE         2642         SIDE         NO COMMENTS           2494         1997         SATURN         SLI         FOUR DOOR SEDAN         2604         SIDE         NO COMMENTS           2499         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2630         SIDE         NO COMMENTS           2508         1997         SUBARU         LEGACY         FOUR DOOR SEDAN         2632         SIDE         ENGINE TYPE HORIZ.           2509         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2632         SIDE         ENGINE TYPE HORIZ.           2510         1997         MAZDA         626         FOUR DOOR SEDAN         2636         SIDE         NO COMMENTS           2531         1997         MAZDA         626         FOUR DOOR SEDAN         2608         SIDE         NO COMMENTS           2532         1997         FORD         PROBE         THREE DOOR HATC         2611         SIDE         NO COMMENTS           2537         1997         NISSAN         ALTIMA         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2538         1997         DODGE</td> <td>2485</td> <td>1997</td> <td>CHEVROLET</td> <td>CAVALIER</td> <td>TWO DOOR SEDAN</td> <td>2640</td> <td>SIDE</td> <td></td>	2491         1997         CHEVROLET         CAVALIER         TWO DOOR COUPE         2642         SIDE         NO COMMENTS           2494         1997         SATURN         SLI         FOUR DOOR SEDAN         2604         SIDE         NO COMMENTS           2499         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2630         SIDE         NO COMMENTS           2508         1997         SUBARU         LEGACY         FOUR DOOR SEDAN         2632         SIDE         ENGINE TYPE HORIZ.           2509         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2632         SIDE         ENGINE TYPE HORIZ.           2510         1997         MAZDA         626         FOUR DOOR SEDAN         2636         SIDE         NO COMMENTS           2531         1997         MAZDA         626         FOUR DOOR SEDAN         2608         SIDE         NO COMMENTS           2532         1997         FORD         PROBE         THREE DOOR HATC         2611         SIDE         NO COMMENTS           2537         1997         NISSAN         ALTIMA         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2538         1997         DODGE	2485	1997	CHEVROLET	CAVALIER	TWO DOOR SEDAN	2640	SIDE	
2494         1997         SATURN         SL1         FOUR DOOR SEDAN         2604         SIDE         NO COMMENTS           2499         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2630         SIDE         NO COMMENTS           2508         1997         SUBARU         LEGACY         FOUR DOOR SEDAN         2632         SIDE         NO COMMENTS           2509         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2622         SIDE         NO COMMENTS           2509         1997         MAZDA         626         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2510         1997         MAZDA         626         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2532         1997         FORD         PROBE         THREE DOOR HATC         2611         SIDE         NO COMMENTS           2533         1997         HONDA         CTVIC         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2539         1997         DODGE         NEON         FOUR DOOR SEDAN         2633         SIDE         NO COMMENTS           2547         1997         MITSUBISHI         GALANT </td <td>2494         1997         SATURN         SL1         FOUR DOOR SEDAN         2604         SIDE         NO COMMENTS           2499         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2630         SIDE         NO COMMENTS           2508         1997         SUBARU         LEGACY         FOUR DOOR SEDAN         2632         SIDE         NO COMMENTS           2509         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2622         SIDE         NO COMMENTS           2509         1997         MAZDA         626         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2510         1997         MAZDA         626         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2532         1997         FORD         PROBE         THRE DOOR HATC         2611         SIDE         NO COMMENTS           2538         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2538         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2547         1997         MITSUBISHI         GALANT<!--</td--><td>2491</td><td>1997</td><td>CHEVROLET</td><td>CAVALIER</td><td>TWO DOOR COUPE</td><td>2642</td><td>SIDE</td><td>NO COMMENTS</td></td>	2494         1997         SATURN         SL1         FOUR DOOR SEDAN         2604         SIDE         NO COMMENTS           2499         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2630         SIDE         NO COMMENTS           2508         1997         SUBARU         LEGACY         FOUR DOOR SEDAN         2632         SIDE         NO COMMENTS           2509         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2622         SIDE         NO COMMENTS           2509         1997         MAZDA         626         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2510         1997         MAZDA         626         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2532         1997         FORD         PROBE         THRE DOOR HATC         2611         SIDE         NO COMMENTS           2538         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2538         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2547         1997         MITSUBISHI         GALANT </td <td>2491</td> <td>1997</td> <td>CHEVROLET</td> <td>CAVALIER</td> <td>TWO DOOR COUPE</td> <td>2642</td> <td>SIDE</td> <td>NO COMMENTS</td>	2491	1997	CHEVROLET	CAVALIER	TWO DOOR COUPE	2642	SIDE	NO COMMENTS
2499         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2630         SIDE         NO COMMENTS           2508         1997         SUBARU         LEGACY         FOUR DOOR SEDAN         2632         SIDE         NO COMMENTS           2509         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2632         SIDE         NO COMMENTS           2509         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2636         SIDE         NO COMMENTS           2510         1997         MAZDA         626         FOUR DOOR SEDAN         2638         SIDE         NO COMMENTS           2532         1997         FORD         PROBE         THRE DOOR HATC         2611         SIDE         NO COMMENTS           2533         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2624         SIDE         NO COMMENTS           2538         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2539         1997         MODA         GALANT         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2547         1997         MITSUBISHI	2499         1997         PONITIAC         GRAND AM         FOUR DOOR SEDAN         2630         SIDE         NO COMMENTS           2508         1997         SUBARU         LEGACY         FOUR DOOR SEDAN         2632         SIDE         INSTITUTION           2509         1997         PONITIAC         GRAND AM         FOUR DOOR SEDAN         2632         SIDE         INSTITUTION           2509         1997         PONITAC         GRAND AM         FOUR DOOR SEDAN         2626         SIDE         INO COMMENTS           2510         1997         MAZDA         626         FOUR DOOR SEDAN         2626         SIDE         INO COMMENTS           2532         1997         FORD         PROBE         THREE DOOR HATC 2611         SIDE         INO COMMENTS           2538         1997         HONDA         CTIVC         FOUR DOOR SEDAN         2624         SIDE         INO COMMENTS           2539         1997         HONDA         CTIVC         FOUR DOOR SEDAN         2620         SIDE         INO COMMENTS           2537         1997         DODGE         NEON         FOUR DOOR SEDAN         2630         SIDE         NO COMMENTS           2538         1997         DODGE         NEON	2494	1997	SATURN	SL1	FOUR DOOR SEDAN	2604	SIDE	NO COMMENTS
Case         1737         JOBARU         LEGART         FOUR DOOR SEDAN         2632         JDE         ENGINE TYPE HORIL           2509         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2632         SIDE         INO COMMENTS           2510         1997         MAZDA         626         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2532         1997         FORD         PROBE         THREE DOOR HATC         2611         SIDE         NO COMMENTS           2537         1997         HOSSAN         ALTIMA         FOUR DOOR SEDAN         2624         SIDE         NO COMMENTS           2538         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2624         SIDE         NO COMMENTS           2539         1997         DODGE         NEON         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2547         1997         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2638         SIDE         NO COMMENTS           2666         1998         SATURN         SC2         TWO DOOR COUPE         2605         SIDE         NO COMMENTS           2685         1998         CHEVROLET	Case         1737         DOBARO         LEGART         FOUR DOOR SEDAN         2632         SIDE         ENGINE TYPE HORIZ.           2509         1997         PONTIAC         GRAND AM         FOUR DOOR SEDAN         2632         SIDE         INO COMMENTS           2510         1997         MAZDA         626         FOUR DOOR SEDAN         2626         SIDE         INO COMMENTS           2532         1997         FORD         PROBE         THREE DOOR HATC         2611         SIDE         NO COMMENTS           2537         1997         INISSAN         ALTIMA         FOUR DOOR SEDAN         2624         SIDE         NO COMMENTS           2538         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2624         SIDE         NO COMMENTS           2539         1997         DODGE         NEON         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2539         1997         DODGE         NEON         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2547         1997         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2665         1998         SATURN         <	2499	1997	PONTIAC:	I GRAND AM	FOUR DOOR SEDAN	2630	SIDE	NO COMMENTS
Image: Construct of the image:	Image: Status         Image: S	<u>2500</u> 2509	1997	PONTIAC	GRAND AM	FOUR DOOR SEDAN	2626	SIDE	NO COMMENTS
2532         1997         FORD         PROBE         THREE DOOR HATC         2611         SIDE         NO COMMENTS           2537         1997         NISSAN         ALTIMA         FOUR DOOR SEDAN         2624         SIDE         NO COMMENTS           2538         1997         HONDA         CTVIC         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2539         1997         DODGE         NEON         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2539         1997         DODGE         NEON         FOUR DOOR SEDAN         2638         SIDE         NO COMMENTS           2547         1997         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2566         1998         SATURN         SC2         TWO DOOR COUFE         2605         SIDE         NO COMMENTS           2685         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2635         SIDE         NO COMMENTS           2692         1998         NISSAN         ALTIMA         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2693         1998         CHEVROLET         CA	2532         1997         FORD         PROBE         THREE DOOR HATC         2611         SIDE         NO COMMENTS           2537         1997         NISSAN         ALTIMA         FOUR DOOR SEDAN         2624         SIDE         NO COMMENTS           2538         1997         HONDA         CTVIC         FOUR DOOR SEDAN         2624         SIDE         NO COMMENTS           2539         1997         DODGE         NEON         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2539         1997         DODGE         NEON         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2537         1997         DODGE         NEON         FOUR DOOR SEDAN         2638         SIDE         NO COMMENTS           2537         1997         MITSJUBISHI         GALANT         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2666         1998         SATURN         SC2         TWO DOOR COUPE         2605         SIDE         NO COMMENTS           2692         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2693         1998         DODGE         NEON <td>2510</td> <td>1997</td> <td>MAZDA</td> <td>626</td> <td>FOUR DOOR SEDAN</td> <td>2608</td> <td>SIDE</td> <td>NO COMMENTS</td>	2510	1997	MAZDA	626	FOUR DOOR SEDAN	2608	SIDE	NO COMMENTS
2537         1997         NISSAN         ALTIMA         FOUR DOOR SEDAN         2624         SIDE         NO COMMENTS           2538         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2539         1997         DODGE         NEON         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2547         1997         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2666         1998         SATURN         SC2         TWO DOOR COUPE         2605         SIDE         NO COMMENTS           2685         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2635         SIDE         NO COMMENTS           2692         1998         NISSAN         ALTIMA         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2692         1998         NISSAN         ALTIMA         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2693         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2715         1998         DODGE <t< td=""><td>2537         1997         NISSAN         ALTIMA         FOUR DOOR SEDAN         2624         SIDE         NO COMMENTS           2538         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2539         1997         DODGE         NEON         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2539         1997         DODGE         NEON         FOUR DOOR SEDAN         2638         SIDE         NO COMMENTS           2547         1997         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2665         1998         SATURN         SC2         TWO DOOR SEDAN         2635         SIDE         MODEL - SC2           2685         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2635         SIDE         NO COMMENTS           2692         1998         NISSAN         ALTIMA         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2693         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2715         1998         DODGE         N</td><td>2532</td><td>1997</td><td>FORD</td><td>PROBE</td><td>THREE DOOR HATC</td><td>2611</td><td>SIDE</td><td>NO COMMENTS</td></t<>	2537         1997         NISSAN         ALTIMA         FOUR DOOR SEDAN         2624         SIDE         NO COMMENTS           2538         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2539         1997         DODGE         NEON         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2539         1997         DODGE         NEON         FOUR DOOR SEDAN         2638         SIDE         NO COMMENTS           2547         1997         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2665         1998         SATURN         SC2         TWO DOOR SEDAN         2635         SIDE         MODEL - SC2           2685         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2635         SIDE         NO COMMENTS           2692         1998         NISSAN         ALTIMA         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2693         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2715         1998         DODGE         N	2532	1997	FORD	PROBE	THREE DOOR HATC	2611	SIDE	NO COMMENTS
2538         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2539         1997         DODGE         NEON         FOUR DOOR SEDAN         2638         SIDE         NO COMMENTS           2547         1997         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2666         1998         SATURN         SC2         TWO DOOR COUPE         2605         SIDE         MOCOMMENTS           2685         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2692         1998         NISSAN         ALTIMA         FOUR DOOR SEDAN         2645         SIDE         NO COMMENTS           2693         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2693         1998         DODGE         NEON         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2715         1998         DODGE         NEON         FOUR DOOR SEDAN         2645         SIDE         NO COMMENTS           2720         1998         SUBARU         LEGA	2538         1997         HONDA         CIVIC         FOUR DOOR SEDAN         2620         SIDE         NO COMMENTS           2539         1997         DODGE         NEON         FOUR DOOR SEDAN         2638         SIDE         NO COMMENTS           2547         1997         MITSUBISHI         GALANT         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2666         1998         SATURN         SC2         TWO DOOR COUPE         2605         SIDE         MODEL - SC2           2685         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2692         1998         NISSAN         ALTIMA         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2693         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2693         1998         DODGE         NEON         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2715         1998         DODGE         NEON         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2720         1998         SUBARU         LEG	2537	1997	NISSAN	ALTIMA	FOUR DOOR SEDAN	2624	SIDE	NO COMMENTS
C5:39         1997         DODGE         INCOM         FOUR DOOR SEDAN         26:38         SIDE         INCOMMENTS           2547         1997         MITSUBISHI         GALANT         FOUR DOOR SEDAN         26:40         SIDE         NO COMMENTS           2666         1998         SATURN         SC2         TWO DOOR COUPE         26:05         SIDE         MO COMMENTS           2665         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         26:40         SIDE         NO COMMENTS           2692         1998         INISSAN         ALTIMA         FOUR DOOR SEDAN         26:26         SIDE         NO COMMENTS           2693         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         26:26         SIDE         NO COMMENTS           2693         1998         DODGE         NEON         FOUR DOOR SEDAN         26:40         SIDE         NO COMMENTS           2715         1998         DODGE         NEON         FOUR DOOR SEDAN         26:45         SIDE         NO COMMENTS           2720         1998         SUBARU         LEGACY         FOUR DOOR SEDAN         26:39         SIDE         98 SUBARU LEGACY	C3-39         1 99/         DODGE         NECON         FOUR DOOR \$EDAN         26:38         SIDE         NO COMMENTS           2547         1997         MITSUBISHI         GALANT         FOUR DOOR \$EDAN         26:40         SIDE         NO COMMENTS           2666         1998         SATURN         SC2         TWO DOOR COUPE         26:05         SIDE         MODEL - SC2           2685         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         26:40         SIDE         NO COMMENTS           2692         1998         INISSAN         ALTIMA         FOUR DOOR SEDAN         26:26         SIDE         NO COMMENTS           2693         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         26:26         SIDE         NO COMMENTS           2693         1998         DODGE         NEON         FOUR DOOR SEDAN         26:26         SIDE         NO COMMENTS           2715         1998         DODGE         NEON         FOUR DOOR SEDAN         26:39         SIDE         NO COMMENTS           2720         1998         SUBARU         LEGACY         FOUR DOOR SEDAN         26:39         SIDE         98 SUBARU LEGACY           1998         SUBARU         CUVE<	2538	1997	HONDA	CIVIC	FOUR DOOR SEDAN	2620	SIDE	NO COMMENTS
Control         Control <t< td=""><td>Carrier         1227         PRI DOLIFIL         GALANI         FOUR DOOR SEDAN         Corri         SDE         INO COMMENTS           2666         1998         SATURN         SC2         TWO DOOR COUPE         2605         SIDE         MODEL - SC2           2685         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2635         SIDE         NO COMMENTS           2693         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2693         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2715         1998         DOGE         NEON         FOUR DOOR SEDAN         2645         SIDE         NO COMMENTS           2720         1998         SUBARU         LEGACY         FOUR DOOR SEDAN         2635         SIDE         98 SUBARU         LEGACY           2720         1998         SUBARU         LEGACY         FOUR DOOR SEDAN         2645         SIDE         98 SUBARU LEGACY</td><td>2539</td><td>1997</td><td></td><td></td><td>FOUR DOOR SEDAN</td><td>2638</td><td></td><td>NO COMMENTS</td></t<>	Carrier         1227         PRI DOLIFIL         GALANI         FOUR DOOR SEDAN         Corri         SDE         INO COMMENTS           2666         1998         SATURN         SC2         TWO DOOR COUPE         2605         SIDE         MODEL - SC2           2685         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2635         SIDE         NO COMMENTS           2693         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2693         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2715         1998         DOGE         NEON         FOUR DOOR SEDAN         2645         SIDE         NO COMMENTS           2720         1998         SUBARU         LEGACY         FOUR DOOR SEDAN         2635         SIDE         98 SUBARU         LEGACY           2720         1998         SUBARU         LEGACY         FOUR DOOR SEDAN         2645         SIDE         98 SUBARU LEGACY	2539	1997			FOUR DOOR SEDAN	2638		NO COMMENTS
Construction         Construction<	Construction         Construction<	2017 2666	1997	SATURN	SC2	TWO DOOR SEDAN	2605	SIDE	MODEL - SC2
2692         1998         NISSAN         ALTIMA         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2693         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2715         1998         DODGE         NEON         FOUR DOOR SEDAN         2645         SIDE         NO COMMENTS           2720         1998         SUBARU         LEGACY         FOUR DOOR SEDAN         2639         SIDE         98 SUBARU LEGACY	2692         1998         NISSAN         ALTIMA         FOUR DOOR SEDAN         2626         SIDE         NO COMMENTS           2693         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2715         1998         DODGE         NEON         FOUR DOOR SEDAN         2645         SIDE         NO COMMENTS           2720         1998         SUBARU         LEGACY         FOUR DOOR SEDAN         2639         SIDE         98 SUBARU LEGACY           1999         LIDEN         CEUER         TOUR DOOR SEDAN         2639         SIDE         98 SUBARU LEGACY	2685	1998	CHEVROLET	CAVALIER	FOUR DOOR SEDAN	2635	SIDE	NO COMMENTS
2693         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2640         SIDE         NO.COMMENTS           2715         1998         DODGE         NEON         FOUR DOOR SEDAN         2645         SIDE         NO.COMMENTS           2720         1998         SUBARU         LEGACY         FOUR DOOR SEDAN         2649         SIDE         99 SUBARU LEGACY	2693         1998         CHEVROLET         CAVALIER         FOUR DOOR SEDAN         2640         SIDE         NO COMMENTS           2715         1998         DODGE         NEON         FOUR DOOR SEDAN         2645         SIDE         NO COMMENTS           2720         1998         SUBARU         LEGACY         FOUR DOOR SEDAN         2639         SIDE         98 SUBARU LEGACY           2720         1998         SUBARU         LEGACY         FOUR DOOR SEDAN         2639         SIDE         98 SUBARU LEGACY           2720         1998         SUBARU         LEGACY         FOUR DOOR SEDAN         2639         SIDE         98 SUBARU LEGACY	2692	1998	NISSAN	ALTIMA	FOUR DOOR SEDAN	2626	SIDE	NO COMMENTS
1998         DODGE         NEON         FOUR DOOR SEDAN         2645         STDE         NO COMMENTS           2720         1998         SUBARU         LEGACY         FOUR DOOR SEDAN         2639         STDE         98 SUBARU LEGACY	1998         DODGE         NEON         FOUR DOOR SEDAN         2645         SIDE         NO COMMENTS           2720         1998         SUBARU         LEGACY         FOUR DOOR SEDAN         2639         SIDE         98 SUBARU LEGACY           1999         LODOR         LEDAN         DOOR SEDAN         2639         SIDE         98 SUBARU LEGACY	2693	1998	CHEVROLET	CAVALIER	FOUR DOOR SEDAN	2640	SIDE	NO COMMENTS
2720 1998 SUBARU LEGACY FOUR DOOR SEDAN 2639 SIDE 98 SUBARU LEGACY	Z7Z0 1998 SUBARU LEGACY FOUR DOOR SEDAN 2639 SIDE 98 SUBARU LEGACY	2715	1998	DODGE	NEON	FOUR DOOR SEDAN	2645	SIDE	NO COMMENTS
11000 LICINE LICE LICE LICE LICE		2720	1998	SUBARU	LEGACY	FOUR DOOR SEDAN	2639	SIDE	198 SUBARU LEGACY

Our SEARCH found 168 tests which matched the search criteria of SIDE tests on a vehicle with a reported wheelbase between 102.5 and 104.5 inches.

Multiple Body Styles meet this criteria - 2 door, Pickup, 4 door, Utility, Station Wagon ...... we are looking for cars which have 4 doors - Click the PRINT button to get to a Test Summary Report where the extraneous (non-4 door car tests, in this case) tests can be removed.

🛱 4N6XPRT SI	tifCalcs - Selected Ve	hicle: 2008 CHEVROL	LET COBALT				_ 🗆 🗙
File Print Report:	s Settings Help Reg T	To: 4N6XPRT SYSTEMS					
Basic Vehicle Sean	ch NHTSA Test Selection	Advanced Vehicle Search	Force Balance				
		Adv	vanced/Vehicle Search Prin	tout	una seculua seculua seculua se		^
Test Number	to <b>see</b>	Enter as much in Remeber t Units	Please	e choose the pai NOTE: Default settings a	rameters for the re are already selected for you	eport.	
Year Range Make Model	1965 to 2011	Metr	Side Tests No Damage Speed (mph)	Crush Depth (inch)	Speed Type (inch)		~
Body Style		Vehicle Le Vehicle W	<ul> <li>● 2.0</li> <li>● 3.0</li> <li>● 5.0</li> </ul>	Max	⊙ KE	J	
Impact Locat	ion Side		O Other				
Rear	Other	168 Tests F	Default Settings	Next	Cancel		
Test Number 966 967	Year 1980	Make CHEVROLET			🗌 Include Not Ca	alculated Tests	_^
1522	1988	NISSAN	PICKUP	UP TRUCK 2647	SIDE	VEHICLE LOST LEFT	<u>.</u>
1596	1991	ΤΟΥΟΤΑ	PICKUP PICK	UP TRUCK 2616	SIDE	NO COMMENTS	
1738	1987	DODGE	COLT FIVE	DOOR HATCHB 2629	SIDE	COLT VISTA WAGON .	
1744	1991	TOYOTA	PICKUP PICK	UP TRUCK 2604	SIDE	NO COMMENT	
1749	1989	ISUZU	TROOPER II FIVE	DOOR HATCHB 2654	SIDE	NO COMMENT	
1912	1993	FORD	PROBE THR	EE DOOR HATC 2624	SIDE	NO COMMENTS	
1922	1993	OLDSMOBILE	ACHIEVA TWO	DOOR COUPE 2620	SIDE	1993 OLDSMOBILE A.	
1923	1993	OLDSMOBILE	ACHIEVA TWO	DOOR COUPE 2625	SIDE	1993 OLDSMOBILE A.	<u> </u>
<							

When the PRINT button is clicked, the Report Parameters screen pops up. Set the Test Summary Report Stiffness parameters. Since only SIDE tests have been retrieved, you are only setting for the Side Test parameters.

For this example, and in order to match the COBALT Side Test Sister/Clone Summary we previously looked at, the Crush Depth is set to MAX.

🛱 4N6XI	PRT S	tifCalcs - S	elected '	Vehicle: 2008 Cl	HEVROL	ET COBALT									
Display A	uto C	alculated Te	sts Side Tests	Other ( Not Calcula	ated									×	
Test No	Year	Make	1	Model		Body Style	No Damage Spe	ed Crush D	istance K	EES	Stiffness A	Stiffness B	Stiffness G	Kv	
6281	2008	NISSAN		350Z		CONVERTIBLE	2.0	5.9	2	5.5	282.4	564.7	70.6		
7191	2011	DODGE					2.0	9.1	2	6.5	153.7	232.2	50.0	-#	
966	1980	CHEVROLET				FIVE DOOR HATCHBACK	2.0	6.2	1	3.5	115.4	107.0	62.2		
967	1980	CHEVROLET	(	CITATION		FIVE DOOR HATCHBACK	2.0	20.5	2	6.8	43.3	26.1	35.8		
5162	2005	ΤΟΥΟΤΑ	1	MATRIX	1	FIVE DOOR HATCHBACK	2.0	11.1	2	7.0	112.4	125.9	50.1		
1738	1987	DODGE				FIVE DOOR HATCHBACK	2.0	13.1	2	2.4	95.7	74.6	61.4	<u>+</u> !	
1740	1090	DODGE				FIVE DOOR HATCHBACK	2.0	/.5	2	6.1	202.7	325.0	63.2	<u> </u>	
2059	1909	NISSAN					2.0	12.9		5.0	161.7	142.9	91.5		
2094	1994	TOYOTA		CAMRY	1	FOUR DOOR SEDAN	2.0	15.0	lõ	1.0	-8.0	0.5	60.0	Ti I	
2096	1994	MITSUBISHI	(	SALANT		FOUR DOOR SEDAN	2.0	15.2	0	1.0	-8.0	0.5	61.1		
2116	1994	AUDI	9	905		FOUR DOOR SEDAN	2.0	10.7	0	1.0	-9.2	0.9	49.0		
2217	1995	MITSUBISHI		GALANT		FOUR DOOR SEDAN	2.0	12.8	2	3.0	128.0	105.5	77.7		
2249	1995	MAZDA		323-PROTEGE		FOUR DOOR SEDAN	2.0	12.5	2	4.2	117.2	103.8	66.1		
2490	1997			SPAND AM	1	FOUR DOOR SEDAN	2.0	18.1	2	25	50.0	36.9	33.8	+;	
2508	1997	SUBARII		EGACY		FOUR DOOR SEDAN	2.0	16.4	2	6.1	122.3	89.9	83.2		
2509	1997	PONTIAC		SRAND AM	1	FOUR DOOR SEDAN	2.0	15.8	2	5.9	52.6	39.8	34.8	二	
2510	1997	MAZDA	6	526		FOUR DOOR SEDAN	2.0	18.3	2	6.6	42.4	28.5	31.6		
2537	1997	NISSAN	1	ALTIMA		FOUR DOOR SEDAN	2.0	16.2	2	3.0	41.2	26.7	31.8	i	
2538	1997	HONDA			1	FOUR DOOR SEDAN	2.0	14.3	2	3.7	100.7	76.6	66.3		
2539	1997	DODGE				FOUR DOOR SEDAN	2.0	10.8	2	3.1	62.7	61.2	32.1		
2685	1997			SALANT SAVALTER	1	FOUR DOOR SEDAN	2.0	18.1	2	0.2 6 1	40.9	32.3	36.6	-+; I	
2692	1998	NISSAN				FOUR DOOR SEDAN	2.0	15.4	2	2.5	43.9	29.3	32.9		
2693	1998	CHEVROLET		CAVALIER	1	FOUR DOOR SEDAN	2.0	14.9	2	2.8	50.6	35.3	36.2	<b>—</b>	
2715	1998	DODGE	1	NEON		FOUR DOOR SEDAN	2.0	13.3	2	6.9	62.0	58.1	33.1	Ξŧ	
2720	1998	SUBARU	L	EGACY		FOUR DOOR SEDAN	2.0	13.0	2	2.9	99.7	80.2	62.0	£	
2743	1998	NISSAN		ALTIMA		FOUR DOOR SEDAN	2.0	19.6	2	6.1	43.5	26.8	35.3	-H:	
2984	1999	MITSUBISHI				FOUR DOOR SEDAN	2.0	12.7	2	2.3	81.8	65.4	51.2	-+; I	
3290	2000	FORD			3	FOUR DOOR SEDAN	2.0	13.8	2	6.9	65.2	59.0	36.0		
3307	2000	SATURN		5L1		FOUR DOOR SEDAN	2.0	10.1	2	0.7	55.5	51.6	29.9	Ti I	
3463	2001	HONDA	: (	CIVIC	1	FOUR DOOR SEDAN	2.0	12.7	2	7.2	66.7	66.4	33.5		
3486	2001	HYUNDAI	E	ELANTRA		FOUR DOOR SEDAN	2.0	13.0	2	6.7	88.8	84.4	46.7		
3515	2001	MITSUBISHI	0	GALANT		FOUR DOOR SEDAN	2.0	13.7	2	6.2	76.3	67.6	43.0	_÷	
3523	1998	CHEVROLET			1	FOUR DOOR SEDAN	2.0	20.1	2	6.6	42.8	26.2	34.9	÷	
4002	2002			-OCUS		FOUR DOOR SEDAN	2.0	10.6	2	4.9	06.5	103.3	35.0	-+:	
4456	2002	FORD	- F		2	FOUR DOOR SEDAN	2.0	13.2	2	6.8	69.7	65.4	37.1		
4547	2001	FORD	F	FOCUS		FOUR DOOR SEDAN	2.0	11.5	2	2.8	67.5	61.4	37.1		
4562	2001	FORD	F	=OCUS		FOUR DOOR SEDAN	2.0	14.8	2	9.0	67.6	61.5	37.1		
4576	2001	FORD	F	FOCUS		FOUR DOOR SEDAN	2.0	14.8	2	6.7	56.8	47.3	34.1	<u></u> !	
4602	2003	SATURN	1	ION		FOUR DOOR SEDAN	2.0	13.2	2	6.7	126.7	118.7	67.6	_ <u>+</u> ;	
4600	2003	LEORD				FOUR DOOR SEDAN	2.0	11.0	2	2.0	169.6	182.3	78.9		
4934	2001	MAZDA		MA7DA3		FOUR DOOR SEDAN	2.0	12.3		6.7	150.2	166.7	67.7		
5046	2004	KIA		SPECTRA		FOUR DOOR SEDAN	2.0	13.7	2	6.6	89.2	79.7	49.9		
5051	2004	VOLVO	-	540		FOUR DOOR SEDAN	2.0	12.6	2	5.5	136.8	128.0	73.1		
5260	2005	SATURN	]	ION	1	FOUR DOOR SEDAN	2.0	11.1	2	6.7	113.6	126.5	51.0		
5325	12005	I CHEVROLET	l c	COBALT		FOUR DOOR SEDAN	12.0	111.9	12	6.3	176.4	178.0	1.37.4		
						III and a second se									
To selec	t mul:	tiple records	s hold the	e ctri key down an	d click o	n the records you wish	to select		A		B G		Kγ	CF	
			Remov	/e		Send A/B Values to Ford	e Balance	Average	123.7		183.4	61.2	217.8	21.8	
								Minimum	-9.2		0.5	28.7	0.0	0.0	
-								Maximum Std Dev	140.9	82	573 5	40.1	9030.3	170.3	
E	Print th	is Page	Print All P	ages Can		Num	per of Tests	54	140.9	,	<i>n</i> 3.3	01.1	007.1	15.1	
<				- III											>

154 of the 168 tests found in the database SEARCH had sufficient information to calculate some sort of A-B Stiffness values. As can be seen from the Minimum and Maximum values, some of the tests have rather extreme values.

The extreme values come from, for the most part, crush measurement data which is reported, and contained in the database, but is "in error".

4N6XF	PRT S	tifCalcs - Selecter	d Vehicle: 2008 CHEVRO	LET COBALT	ulun na sana						
<mark>isplay A</mark> Frontal T	uto C ests	alculated Tests Rear Tests Side Test	ts Other / Not Calculated								
Fest No	Year	Make	Model	Body Style	No Damage Spee	ed Crush Distanc	e KEES	Stiffness A	Stiffness B	Stiffness G	Κv
5824	2010	MITSUBISHI	LANCER	FOUR DOOR SEDAN	2.0	9.1	26.3	138.5	185.1	51.8	120
5863	2010	KIA	FORTE	FOUR DOOR SEDAN	2.0	14.2	19.3	54.9	33.6	44.9	
5867	2010	KIA	FORTE	FOUR DOOR SEDAN	2.0	10.3	26.5	140.5	167.1	59.0	
106	2011	MAZDA	MAZDA3	FOUR DOOR SEDAN	2.0	10.0	26.6	145.9	179.6	59.3	i
107	2011	MAZDA	MAZDA3	FOUR DOOR SEDAN	2.0	19.8	20.2	40.7	18.7	44.4	<u> </u>
202	2011	KIA	FORTE	FOUR DOOR SEDAN	2.0	15.5	20.1	51.1	29.9	43.8	+
204 856	2011	SATURN	TON	OTHER	2.0	10.6	26.7	161.5	168.4	77.5	ť
596	1991	TOYOTA	PICKLIP		2.0	6.2	23.5	200.6	348.8	57.7	
744	1991	ΤΟΥΟΤΑ	PICKUP	PICKUP TRUCK	2.0	11.2	23.4	95.0	90.7	49.7	
978	1993	ΤΟΥΟΤΑ	PICKUP	PICKUP TRUCK	2.0	12.6	24.5	134.7	120.3	75.4	
00	1994	ΤΟΥΟΤΑ	PICKUP	PICKUP TRUCK	2.0	17.7	18.5	105.0	48.9	112.6	
89	1993	ΤΟΥΟΤΑ	PICKUP	PICKUP TRUCK	2.0	12.0	24.5	141.2	132.3	75.4	
516	2003	SUBARU	BAJA	PICKUP TRUCK	2.0	8.2	21.4	138.4	163.6	58.5	
72	2000	SUBARU	LEGACY	STATION WAGON	2.0	10.5	25.7	167.0	188.1	74.2	<u> – É</u>
20	2002	SUBARU		I STATION WAGON	2.0	8.0	25.0	159.4	229.5	55.4	+
10	2000	500AKU 500D	FOCUS	THREE DOOD HATCHRACK	2.0	12.4	23.2	97.4	20.0	47.2	
41	2000	FORD	FOCUS	THREE DOOR HATCHBACK	2.0	11.5	20.0	81.3	75.5	43.8	
32	1997	FORD	PROBE	THREE DOOR HATCHBACK	2.0	14.9	23.4	49.7	35.8	34.5	
33	1996	DODGE	AVENGER	TWO DOOR COUPE	2.0	13.6	22.7	52.3	39.7	34.5	
91	1997	CHEVROLET	CAVALIER	TWO DOOR COUPE	2.0	13.5	23,2	117.3	92.0	74.8	
56	1998	SATURN	SC2	TWO DOOR COUPE	2.0	1.3	23.5	993.6	8229.7	60.0	
23	1998	HONDA	CIVIC	TWO DOOR COUPE	2.0	10.4	23.8	86.1	90.7	40.8	
30	1998	DODGE	NEON	TWO DOOR COUPE	2.0	11.1	23.2	118.8	113.6	62.1	
0	1998	HONDA	CIVIC	TWO DOOR COUPE	2.0	12.8	27.0	62.9	61.6	32.1	
8	1999	ΤΟΥΟΤΑ	CAMRY	TWO DOOR COUPE	2.0	10.0	22.0	105.2	105.6	52.3	
5	2001	HONDA	CIVIC	TWO DOOR COUPE	2.0	9.6	27.2	87.7	114.6	33.6	
6	2001	DODGE	STRATUS	TWO DOOR COUPE	2.0	11.7	25.9	88.0	89.5	43.2	
4	2006	CHEVROLET	COBALT	TWO DOOR COUPE	2.0	13.3	26.9	105.9	99.5	56.3	
2	2006	CHEVROLET	COBALT	TWO DOOR COUPE	2.0	13.5	26.6	80.8	73.9	44.2	
) <del>1</del>	1005	HONDA	CIVIC	TWO DOOR COUPE	2.0	8.7	26.9	153.6	220.9	53.4	
2	2007	CHEVROLET	COBALT	TWO DOOR COUPE	2.0	10.0	25.1	100.5	96.5	59.4	
15	2007	FORD	EOCUS	TWO DOOR COUPE	2.0	14.1	26.9	64.9	57.6	36.6	
70	2008	FORD	FOCUS	TWO DOOR COUPE	2.0	13.1	27.3	69.3	66.8	35.9	
35	1997	CHEVROLET	CAVALIER	TWO DOOR SEDAN	2.0	15.2	26.6	124.8	101.1	77.0	
52	2009	VOLKSWAGEN	TIGUAN	UTILITY VEHICLE	2.0	7.8	24.7	198.1	288.7	68.0	
2	1998	HONDA	CRV	UTILITY VEHICLE	2.0	12.0	25.6	105.1	103.0	53.6	
25	1999	KIA	SPORTAGE	UTILITY VEHICLE	2.0	11.9	22.2	69.8	59.6	40.9	
3	2011	FORD	ESCAPE	UTILITY VEHICLE	2.0	17.6	20.1	54.9	28.2	53.5	
7	2011	FORD	ESCAPE	UTILITY VEHICLE	2.0	10.8	25.4	104.4	112.7	48.3	
4	2011	HONDA	CRV	UTILITY VEHICLE	2.0	8.2	25.7	310.3	449.7	107.0	
5	2001	CHRYSLER	CDV CRUISER	UTICITY VEHICLE	2.0	9.3	25.6	140.9	1/9.5	55.3	
5	2011	HONDA SUBADU	EODESTED		2.0	16.3	20.1	57.1	31.7	51.4	
19	2011	SUBARU	FORESTER		2.0	10.0	20.2	109.7	128.5	46.8	
n –	2011	MAZDA	TRIBUTE	LITILITY VEHICLE	2.0	12.3	26.0	78.4	76.6	40.1	
0	2001	LEXUS	BX300		2.0	11.0	24.3	109.2	110.3	54.1	
n	2002	FORD	ESCAPE		2.0	11.9	26.0	86.8	87.7	43.0	
3	2002	JEEP	LIBERTY	UTILITY VEHICLE	2.0	11.7	23.8	134,9	126.0	72.2	
2	2002	HONDA	CRV	LITILITY VEHICLE	2.0	11.7	25.6	94.2	94.7	46.8	<b>X</b>
											>
selec	t mul	tiple records hold t	be ctrl key down and click	on the records you wish t	o select	Average	<b>A</b> 122.7	B G	61.2	<b>Κν</b> 214.8	CF 21.6
		Rem		Jenu Ayb values to Porce		Minimum	-9.2	0.5	28.7	0.0	0.0
[-	wint H-		Pages Concol			maximum Std Dev	1055.4	675.0	61.3	9830.3 805.9	170.3
Ŀ	nine en			Numb	er of Tests 1	53					

The CLASS we are looking to develop is for a 4 door "sedan" (4 door COBALT). Therefore, having already set the wheelbase, the next (two) critical criteria is that the vehicle be a <u>car</u> which has <u>4 doors</u> (so that the "B" pillar hard point is in the CLASS vehicle). Body Styles which meet this criteria are FIVE DOOR HATCHBACK, FOUR DOOR SEDAN, and STATION WAGON.

Therefore, we sort on Body Type, highlight the body types which do not meet the 4 door Car criteria, and click the REMOVE button. This step can be taken in several steps so that only the appropriate tests are removed.

🖹 4N6XI	PRT S	tifCalcs - Sele	cted Vehicle: 2008 CHEV	ROLET COBALT							
Display A	uto C	alculated Tests	<b>T</b>								×
Frontal T	Vear	Rear Tests   Side	Model	Body Style	No Damage Speed	Crush Distance	KEES	Stiffness A.	Stiffness B	Stiffness G	- Ky
2116	1004			FOUR DOOR SEDAN	2 0	10.7		-9 2	0.9	49.0	
2094	1994	TOYOTA	CAMRY	FOUR DOOR SEDAN	2.0	15.0	0.0	-8.0	0.5	60.0	
2096	1994	MITSUBISHI	GALANT	FOUR DOOR SEDAN	2.0	15.2	0.0	-8.0	0.5	61.1	
6442	2005	SATURN	ION	FOUR DOOR SEDAN	2.0	34.2	19.3	39.8	10.0	78.9	
7107	2011	MAZDA	MAZDA3	FOUR DOOR SEDAN	2.0	19.8	20.2	40.7	18.7	44.4	
2537	1997	NISSAN		FOUR DOOR SEDAN	2.0	16.2	23.0	41.2	26.7	31.8	
5472	2005	SATURN	ION	FOUR DOOR SEDAN	2.0	16.7	20.1	42.1	22.8	38.9	
2510	1997	MAZDA	626	FOUR DOOR SEDAN	2.0	18.3	26.6	42.4	28.5	31.6	+
3523	1008	CHEVROLET	CAVALIER	FOUR DOOR SEDAN	2.0	20.1	26.6	42.8	26.2	34.0	+
6741	2010	TOYOTA	COPOLIA	FOUR DOOR SEDAN	2.0	13.4	10.4	42.0	27.0	33.0	+
067	1090	CHEVPOLET	CUTATION	EIVE DOOD HATCHBACK	2.0	20.5	26.9	43.3	26.1	35.0	+
907	1009				2.0	10.6	20.0	43.3	20.1	35.0	+
2/43	1990	NISSAN		FOUR DOOR SEDAN	2.0	19.0	20.1	43.5	20.0	33.3	+
2092	1990			FOUR DOOR SEDAN	2.0	10.4	22.5	45.9	29.5	32.9	+
2477	1997			FOUR DOOR SEDAN	2.0	10.1	27.3	45.1	31.5	32.3	+
2547	1997		GALANT	FOUR DOOR SEDAN	2.0	10.5	20.2	40.9	34.5	32.0	
3986	1995			FOUR DOOR SEDAN	2.0	13.0	23.6	47.6	39.3	28.7	
2685	1998		CAVALIER	FOUR DOOR SEDAN	2.0	18.1	26.1	48.7	32,3	36.6	
2499	1997	PONHAC	GRAND AM	FOUR DOOR SEDAN	12.0	13.9	22.5	150.0	36.9	33.8	
2693	1998	CHEVROLET	CAVALIER	FOUR DOOR SEDAN	2.0	14.9	22.8	50.6	35.3	36.2	
7202	2011	KIA	FORTE	FOUR DOOR SEDAN	2.0	15.5	20.1	51.1	29.9	43.8	
6735	2010	KIA	FORTE	FOUR DOOR SEDAN	2.0	18.5	19.7	51.7	24.7	54.0	
2509	1997	PONTIAC	GRAND AM	FOUR DOOR SEDAN	2.0	15.8	25.9	52.6	39.8	34.8	
6657	2010	MAZDA	MAZDA3	FOUR DOOR SEDAN	2.0	18.2	19.7	53.5	25.9	55.1	
6863	2010	KIA	FORTE	FOUR DOOR SEDAN	2.0	14.2	19.3	54.9	33.6	44.9	-
3307	2000	SATURN	SL1	FOUR DOOR SEDAN	2.0	10.1	20.7	55.5	51.6	29.9	6
4576	2001	FORD	FOCUS	FOUR DOOR SEDAN	2.0	14.8	26.7	56.8	47.3	34.1	5
2715	1998	DODGE	NEON	FOUR DOOR SEDAN	2.0	13.3	26.9	62.0	58.1	33.1	ŧ
2539	1997	DODGE	NEON	FOUR DOOR SEDAN	2.0	10.8	23.1	62.7	61.2	32.1	
4609	2001	FORD	FOCUS	FOUR DOOR SEDAN	2.0	12.3	22.8	62.9	53.4	37.1	Te
6604	2008	FORD	FOCUS	FOUR DOOR SEDAN	2.0	15.0	17.6	63.5	33.1	61.0	
3290	2000	FORD	EOCUS	FOUR DOOR SEDAN	2.0	13.8	26.9	65.2	59.0	36.0	Tr I
3799	2001	FORD	FOCUS	FOUR DOOR SEDAN	2.0	13.7	27.7	66.5	62.2	35.6	
3463	2001	HONDA	CIVIC	FOUR DOOR SEDAN	2.0	12.7	27.2	66.7	66.4	33.5	
4547	2001	FORD	EOCUS	FOUR DOOR SEDAN	2.0	11.5	22.8	67.5	61.4	37.1	
4562	2001	FORD	FOCUS	FOUR DOOR SEDAN	2.0	14.9	20.0	67.6	61.5	97.1	-+:
4456	2001	FORD	FOCUS	FOUR DOOR SEDAN	2.0	12.2	25.0	60.7	45.4	27.1	+:
4430	2001		IMPDEZA	FOUR DOOR SEDAN	2.0	13.2	20.0	74.4	47.0	57.1	$\pm$
2515	2000	MITCHDICUT		FOUR DOOR SEDAN	2.0	12.7	26.2	74.4	47.5	42.0	-+:
3515	2001			FUE DOOR JOOK SEDAN	2.0	13.7	20.2	70.3	07.0	43.0	$\pm$
1749	1989	ISUZU CUTUDOLET		FIVE DOOR HATCHBACK	2.0	12.9	21.3	76.4	57.1	51.1	
5325	2005	CHEVROLET	COBALI	FOUR DOOR SEDAN	2.0	11.9	26.3	/6.4	/8.0	37.4	
2210	1995	SUBARU	LEGACY	STATION WAGON	2.0	11.6	23.2	79.1	12.3	43.3	
2984	1999	MITSUBISHI	GALANT	FOUR DOOR SEDAN	2.0	12.7	22.3	81.8	65.4	51.2	
7191	2011	DODGE	CALIBER	FIVE DOOR HATCHBACK	2.0	14.6	20.0	84.4	52.2	68.2	t
3486	2001	HYUNDAI	ELANTRA	FOUR DOOR SEDAN	2.0	13.0	26.7	88.8	84.4	46.7	
5046	2004	KIA	SPECTRA	FOUR DOOR SEDAN	2.0	13.7	26.6	89.2	79.7	49.9	
1738	1987	DODGE		FIVE DOOR HATCHBACK	2.0	13.1	22.4	95.7	74.6	61.4	E
4092	2002	AUDI	A4	FOUR DOOR SEDAN	12.0	10.6	24.8	96.5	103.3	45.1	
6587	2005	SATURN	ION	FOUR DOOR SEDAN	2.0	10.7	22.7	96.6	93.7	49.8	
2994	1999	MITSUBISHI	GALANT	FOUR DOOR SEDAN	2.0	14.0	26.1	97.2	83.6	56.5	
6246	2008	FORD	FOCUS	FOUR DOOR SEDAN	2.0	11.5	27.3	97.2	106.4	44.4	
2720	1998	SUBARU	LEGACY	FOUR DOOR SEDAN	2.0	13.0	22.9	99.7	80.2	62.0	
6744	2010	ΤΟΥΟΤΑ	COROLLA	FOUR DOOR SEDAN	2.0	9.6	27.2	100.1	131.8	138.0	
<				III.	CARGO CA						>
To selec	t mul	tiple records ho	old the ctrl key down and cl	ick on the records you wish	to select	А		B G		K¥ I	F
		-			Av	erage 1	118.2	127.2	64.9	150.6	19.8
		L	Remove	Send A/B Values to Ford	te Balance Min	nimum	-9.2	0.5	28.7	0.0	0.0
					Ма	iximum 10	055.4 1	.346.7 5	40.1	1571.6	82.7
F	Print th	is Page Pri	nt All Pages Cancel		Sto	d Dev 1	153.8	200.5	79.0	237.4	10.2
			III	Numt	per of Tests 89						

When the tests are reduced to cars with 4 door Body types, we now have 89 tests. However, there are still some tests with "extreme" stiffness values.

To find and eliminate the EXTREME outliers, we sort the "A" value column, and remove any negative values.

and the second second	uto Ca	alculated Tests									×
rontal 1	ests	Rear Tests Side Te	other / Not Calculate	1							
est No	Year	Make	Model	Body Style	No Damage Speed	Crush Distance	KEES	Stiffness A	Stiffness B	Stiffness G	Kv
21	2010	MAZDA	MAZDA3	FOUR DOOR SEDAN	2.0	9.4	26.7	156.9	206.2	59.7	1: ^
26	2002	SUBARU	OUTBACK	STATION WAGON	2.0	8.0	25.0	159.4	229.5	55.4	
159	1994	NISSAN	ALTIMA	FOUR DOOR SEDAN	2.0	18.7	35.0	161.7	142.9	91.5	
)79	2008	MITSUBISHI	LANCER	FOUR DOOR SEDAN	2.0	9.3	26.5	162.5	213.5	61.8	1
72	2000	SUBARU	LEGACY	STATION WAGON	2.0	10.5	25.7	167.0	188.1	74.2	1
603	2003	SUBARU	LEGACY	FOUR DOOR SEDAN	2.0	11.0	25.6	169.6	182.3	78.9	1
204	2011	KIA	FORTE	FOUR DOOR SEDAN	2.0	10.6	26.7	181.4	210.5	78.2	2
719	2007	DODGE	CALIBER	FIVE DOOR HATCHBACK	2.0	7.5	26.1	202.7	325.0	63.2	- 1
749	2010	KIA	FORTE	FOUR DOOR SEDAN	2.0	3.5	26.9	378.8	1346.7	53.3	
457	2005	SATURN	ION	FOUR DOOR SEDAN	2.0	14.0	20.1	461.0	297.1	357.5	
460	2005	SATURN	7/081	EQUID DOOD CED MU	<ul> <li>Market Market Science and Sci</li></ul>	111.0	and the second se	and the second	and the second se	E40.4	11 A A A A A A A A A A A A A A A A A A
100	2000	DATONN	ION	FOUR DOOR SEDAN	2.0	11.3	22.9	1001.0	927.6	540.1	
461	2005	SATURN	ION	FOUR DOOR SEDAN	2.0	10.2	22.9	1001.0 1055.4	927.6	540.1	~
61	2005	SATURN	ION	FOUR DOOR SEDAN	2.0	10.2	22.9 22.8	1001.0 1055.4	927.6	515.0	>
461	2005	SATURN	ION	FOUR DOOR SEDAN FOUR DOOR SEDAN	2.0	11.3 10.2	22.9	1001.0 1055.4 B G	927.6	540.1 515.0	> CF
461 Josele	2005 :t mult	SATURN	TON TON	FOUR DOOR SEDAN	2.0 2.0 to select	11.5 10.2	22.9	1001.0 1055.4 B G	927.6	540.1 515.0 Kv	CF
461 o selec	2005 :t mult	SATURN	ION ION	FOUR DOOR SEDAN	2.0 2.0 to select	10.2 A	22.9 22.8	B G	927.6 1081.5	540.1 515.0 <b>K</b> ♥	20.7
461 5 6 selec	2005 :t mult	SATURN	the ctrl key down and c	FOUR DOOR SEDAN FOUR DOOR SEDAN BILL DOOR SEDAN	2.0 2.0 to select Ave	11.3 10.2 A trage 1	22.9 22.8 23.6	1001.0 1055.4 B G 133.0	927.6 1081.5 65.0	540.1 515.0 <b>Ky</b> 157.5	20.7
461 To selec	2005 t mult	iple records hold	the ctrl key down and c	FOUR DOOR SEDAN FOUR DOOR SEDAN BILL Lick on the records you wish Send A/B Values to Ford	to select Ave te Balance	11.3 10.2 A trage 1 imum	22.9 22.8 23.6 40.7	1001.0 1055.4 B G 133.0 18.7	65.0 28.7	540.1 515.0 <b>K</b> ♥ 157.5 23.0	20.7 8.2
i461	2005	iple records hold	the ctrl key down and c	FOUR DOOR SEDAN FOUR DOOR SEDAN In the records you wish Send A/B Values to Force	to select Re Balance	rage 1 inum	22.9 22.8 23.6 40.7	1001.0 1055.4 B G 133.0 18.7	927.6 1081.5 65.0 28.7	540.1 515.0 K♥ 157.5 23.0	20.7 8.2
461	2005	tiple records hold	the ctrl key down and c	FOUR DOOR SEDAN FOUR DOOR SEDAN In the records you wish	to select :e Balance Man	rrage 1 imum cimum 10	22.9 22.8 23.6 40.7 55.4 1	1001.0 1055.4 B G 133.0 18.7 .346.7 5	927.6 1081.5 65.0 28.7 40.1	540.1 515.0 K♥ 157.5 23.0 1571.6	20.7 8.2 82.7
o selec	2005 Et mult	tiple records hold Re	the ctrl key down and c move	FOUR DOOR SEDAN FOUR DOOR SEDAN	to select re Balance Min Mai	in.3 in.2 A erage 1 imum kimum 10 Dev 1	22.9 22.8 23.6 40.7 55.4 1	1001.0 1055.4 B G 133.0 18.7 346.7 5 203.3	927.6 1081.5 65.0 28.7 40.1 80.9	540.1 515.0 K▼ 157.5 23.0 1571.6 240.7	20.7 8.2 82.7 9.5

Then we scroll to the bottom of the page and eliminate the values above 200. Alternatively, you could click on the "A" column again, which would change the sort order from "Low to High" to "High to Low" .... and then eliminate the "high" values.

The "A" value of 200 and above was picked due to experience of working with Side impact tests and familiarity of "normal" side stiffness "A" values. Your criteria may be different.

🛱 4N6XI	PRT StifCalcs - S	elected Vehicle: 2008 CHEVRO	DLET COBALT							
Display A	uto Calculated Te	ests								
Test No.	Vear Make	Model	Body Style	No Damage Spe	ed Crush Distance	KEES	Stiffness A	Stiffness B	Stiffness G	- Ky
2249	1995 MAZDA	323-PROTEGE	E DOOR SEDAN	2.0	12.5	24.2	117.2	103.8	66.1	
4092	2002 AUDI	AT	FOUR DOOR SEDAN	2.0	10.6	24.8	96.5	103.3	45.1	
2537	1997 NISSAN	ALTIMA	FOUR DOOR SEDAN	2.0	16.2	23.0	41.2	26.7	31.8	
2059	1994 NISSAN	ALTIMA	FOUR DOOR SEDAN	2.0	18.7	35.0	161.7	142.9	91.5	
2743	1998 NISSAN	ALTIMA	FOUR DOOR SEDAN	2.0	19.6	26.1	43.5	26.8	35.3	;
2692	1998 NISSAN	ALTIMA	FOUR DOOR SEDAN	2.0	15.4	22.5	43.9	29.3	32.9	
7191	2011 DODGE	CALIBER	FIVE DOOR HATCHBACK	2.0	14.6	20.0	84.4	52.2	68.2	t
7193	2011 DODGE	CALIBER	FIVE DOOR HATCHBACK	2.0	8.1	26.5	153.7	232.2	50.9	<u> </u>
2685	1998 CHEVROLET	CAVALIER	FOUR DOOR SEDAN	2.0	18.1	26.1	48.7	32.3	36.6	
2693	1998 CHEVROLET		FOUR DOOR SEDAN	2.0	14.9	22.8	50.6	35.3	36.2	—÷
3523	1990 CHEVROLET		FOUR DOOR SEDAN	2.0	20.1	20.0	42.0	26.2	34.9	-+;
907				2.0	6.2	13.5	115.4	107.0	62.2	-+:
2538	1997 HONDA		FOUR DOOR SEDAN	2.0	14.3	23.7	100.7	76.6	66.3	
3463	2001 HONDA	CIVIC	FOUR DOOR SEDAN	2.0	12.7	23.7	66.7	66.4	33.5	
2477	1997 HONDA		FOUR DOOR SEDAN	2.0	18.1	27.3	45.1	31.5	32.3	
5986	1995 HONDA	CIVIC	FOUR DOOR SEDAN	2.0	13.0	23.6	47.6	39.3	28.7	
6049	2007 CHEVROLET	COBALT	FOUR DOOR SEDAN	2.0	13.3	26.5	110.2	101.6	59.7	
5325	2005 CHEVROLET	COBALT	FOUR DOOR SEDAN	2.0	11.9	26,3	76.4	78.0	37.4	
5451	2005 CHEVROLET	COBALT	FOUR DOOR SEDAN	2.0	12.7	26.6	115.4	111.7	59.7	
1738	1987 DODGE	COLT	FIVE DOOR HATCHBACK	2.0	13.1	22.4	95.7	74.6	61.4	1
6744	2010 TOYOTA	COROLLA	FOUR DOOR SEDAN	2.0	9.6	27.2	100.1	131.8	38.0	
6741	2010 TOYOTA	COROLLA	FOUR DOOR SEDAN	2.0	13.4	19.4	42.9	27.9	33.0	
3486	2001 HYUNDAI	ELANTRA	FOUR DOOR SEDAN	2.0	13.0	26.7	88.8	84.4	46.7	<u> </u>
5885	2007 HYUNDAI	ELANTRA	FOUR DOOR SEDAN	2.0	10.6	26.5	151.0	175.2	65.1	í
4547	2001 FORD	FOCUS	FOUR DOOR SEDAN	2.0	11.5	22.8	67.5	61.4	37.1	;
4562	2001 FORD	FOCUS	FOUR DOOR SEDAN	2.0	14.8	29.0	67.6	61.5	37.1	;
4576	2001 FORD	FOCUS	FOUR DOOR SEDAN	2.0	14.8	26.7	56.8	47.3	34.1	_ <u>+</u> :
4609	2001 FORD	FOCUS	FOUR DOOR SEDAN	2.0	12.3	22.8	62.9	53.4	37.1	<u>!</u>
4455	2001 FORD	FOLUS	FOUR DOOR SEDAN	2.0	13.2	26.8	69.7	65.4	37.1	
6246	2008 FORD	FOCUS	FOUR DOOR SEDAN	2.0	15.0	27.2	07.2	106.4	44.4	- <u>+</u> :
3290	2000 FORD	FOCUS	FOUR DOOR SEDAN	2.0	11.5	27.3	65.2	59.0	36.0	; I
3799	2000 FORD	FOCUS	FOUR DOOR SEDAN	2.0	13.0	20.7	66.5	62.2	35.6	
6269	2008 FORD	EOCUS	FOUR DOOR SEDAN	2.0	11.3	26.8	115.1	125.8	52.6	-+:
5575	2005 SUZUKT	FORENZA	FOUR DOOR SEDAN	2.0	10.9	22.9	139.9	134.4	72.9	-+:
6739	2010 KTA	FORTE	FOUR DOOR SEDAN	2.0	12.6	26.9	112.2	110.4	57.0	- <b>F</b>
7202	2011 KIA	FORTE	FOUR DOOR SEDAN	2.0	15.5	20.1	51.1	29.9	43.8	
6735	2010 KIA	FORTE	FOUR DOOR SEDAN	2.0	18.5	19.7	51.7	24.7	54.0	
6863	2010 KIA	FORTE	FOUR DOOR SEDAN	2.0	14.2	19.3	54.9	33.6	44.9	<b>—</b> •
7204	2011 KIA	FORTE	FOUR DOOR SEDAN	2.0	10.6	26.7	181.4	210.5	78.2	
6785	2010 KIA	FORTE	FOUR DOOR SEDAN	2.0	8.3	26.6	121.0	180.0	40.7	1
6867	2010 KIA	FORTE	FOUR DOOR SEDAN	2.0	10.3	26.5	140.5	167.1	59.0	:
2547	1997 MITSUBISHI	GALANT	FOUR DOOR SEDAN	2.0	16.5	26.2	46.9	34.5	32.0	
2994	1999 MITSUBISHI	GALANT	FOUR DOOR SEDAN	2.0	14.0	26.1	97.2	83.6	56.5	
3515	2001 MITSUBISHI	GALANT	FOUR DOOR SEDAN	2.0	13.7	26.2	76.3	67.6	43.0	;
2984	1999   MITSUBISHI	GALANT	FOUR DOOR SEDAN	12.0	12.7	22.3	81.8	65.4	51.2	
2217	1995 MITSUBISHI	GALANT	FOUR DOOR SEDAN	2.0	12.8	23.0	128.0	105.5	77.7	; <b> </b>
2499	1997 PONITAC	GRAND AM	FOUR DOOR SEDAN	12.0	13.9	22.5	150.0	36.9	33.8	
<										>
To selec	t multiple record:	s hold the ctrl key down and click	on the records you wish t	o select		A	BG	i	Kv	CF
		Remove	Send A/B Values to Forc	e Balance	Average	92.6	91.6	50.0	108.2	19.9
					Maximum	181.4	232.2	91.5	271.7	34.7
(	Print this Page	Print All Pages Cancel			Std Dev	39.9	58.2	14.8	67.8	6.5
<			Numb	er of Tests 8	0					

There are still 80 "valid" tests which meet our CLASS requirements of 4 door Car with a wheelbase between 102.5-104.5 inches.

The physical constraints of the program is that 34 tests fit on one printed page. More than 34 tests cause the statistical summary to partially, or wholly, "spill over" to an additional page. 80 tests would require 3 printed pages.

Sorting the remaining tests on the MODEL name, we can see the three COBALT tests have an "A" stiffness value range of  $\sim$ 76 to  $\sim$ 115.

iplay A	PRT Stircales - seu	icteu venicte: 2006 cmct	IKULET CUDALT							
ontal T	Nuto Calculated Test	e Tests Other / Not Calculated				4.092				×
st No	Year Make	Model	Body Style	No Damage Speed	Crush Distance	KEES	Stiffness A	Stiffness b	Stiffness G	Kv
39	1997 DODGE	NEON	FOUR DOOR SEDAN	2.0	110.8	00.1	62.7	61.2	32.1	173.:
99	2001 FORD	FOCUS	FOUR DOOR SEDAN	2.0	13.7	27.7	66.5	62.2	35.6	72.
53	2001 HONDA	CIVIC	FOUR DOOR SEDAN	2.0	12.7	27.2	66.7	66.4	33.5	77.4
ŧ7	2001 FORD	FOCUS	FOUR DOOR SEDAN	2.0	11.5	22.8	67.5	61.4	37.1	73.8
62	2001 FORD	FOCUS	FOUR DOOR SEDAN	2.0	14.8	29.0	67.6	61.5	37.1	71.0
56	2001 FORD	FOCUS	FOUR DOOR SEDAN	2.0	13.2	26.8	69.7	65.4	37.1	76.4
15	2001 MITSUBISHI	GALANT	FOUR DOOR SEDAN	2.0	13.7	26.2	76.3	67.6	43.0	79.3
25 10	2005 CHEVROLET	LEGACY	STATION WAGON	2.0	11.9	25.3	76.4	78.0	42.2	91.9
10 84	1000 MITSURISHI		EOUR DOOR SEDAN	2.0	12.7	22.2	91.8	65.4	51.2	78 (
86		FLANTRA	EOUR DOOR SEDAN	2.0	13.0	26.7	88.8	84.4	46.7	98.0
46	2004   KTA	SPECTRA	FOUR DOOR SEDAN	2.0	13.7	26.6	89.2	79.7	49.9	93.
38	1987 DODGE	COLT	FIVE DOOR HATCHBACK	2.0	13.1	22.4	95.7	74.6	61.4	89.4
92	2002 AUDI	A4	FOUR DOOR SEDAN	2.0	10.6	24.8	96.5	103.3	45.1	122
37	2005 SATURN	ION	FOUR DOOR SEDAN	2.0	10.7	22.7	96.6	93.7	49.8	112
4	1999 MITSUBISHI	GALANT	FOUR DOOR SEDAN	2.0	14.0	26.1	97.2	83.6	56.5	98.0
6	2008 FORD	FOCUS	FOUR DOOR SEDAN	2.0	11.5	27.3	97.2	106.4	44.4	124
0	1998 SUBARU	LEGACY	FOUR DOOR SEDAN	2.0	13.0	22.9	99.7	80.2	62.0	96.3
)2	2007 KIA	SPECTRA	FOUR DOOR SEDAN	2.0	12.2	26.4	100.1	99.6	50.3	116
38	1997 HONDA		FOUR DOOR SEDAN	2.0	14.3	23.7	100.7	76.6	66.3	91.3
32	2008 SUBARU	IMPREZA	FOUR DOOR SEDAN	2.0	10.9	26.4	101.8	113.8	45.5	133
19	2007 CHEVROLET	COBALT	FOUR DOOR SEDAN	2.0	13.3	26.5	110.2	101.6	59.7	118
59			FUE DOOD HATCUDACK	12.0	112.0	120.9	112.2	110.4	157.0	128
02	2005 TOYOTA			2.0	11.1	26.7	112.4	125.9	50.1	146
0	2009 SATURN	EOCUS	EOUR DOOR SEDAN	2.0	11.1	20.7	115.0	120.5	51.0	147
	1980 CHEVPOLET			2.0	62	13.5	115.4	107.0	62.2	147
1	2005 CHEVROLET	COBALT	EOUR DOOR SEDAN	2.0	12.7	26.6	115.4	111.7	59.7	130
19	1995 MAZDA	323-PROTEGE	FOUR DOOR SEDAN	2.0	12.5	24.2	117.2	103.8	66.1	123
08	1997 SUBARU	LEGACY	FOUR DOOR SEDAN	2.0	16.4	26.1	122.3	89.9	83.2	105
02	2003 SATURN	ION	FOUR DOOR SEDAN	2.0	13.2	26.7	126.7	118.7	67.6	138
17	1995 MITSUBISHI	GALANT	FOUR DOOR SEDAN	2.0	12.8	23.0	128.0	105.5	77.7	126
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	ct multiple records h	old the ctrl key down and c	lick on the records you wish (	to select	A		5 6		KY L	
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9 8	Print this Page Pr 1997 1997	Remove int All Pages Cancel PONTIAC SUBARU	Send A/B Values to Forc	E Balance Ave Min Max Std Per of Tests 32 OUE DOOR SEDAN OUR DOOR SEDAN	erage 95 imum 62. simum 128. Dev 19.	.8 .7 .0 1 6 <u>SIDE</u> SIDE	90.1 61.2 26.5 21.4 1	51.6 32.1 83.2 12.7 <u>NO COMME</u> ENGINE TYF	106.8 71.0 147.8 25.7 <u>NTS</u> <u>HORIZ</u>	20.6 11.7 26.1 3.6
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F	Print this Page Pr 1997 1997 1997 1997 1997 1997	Remove Int All Pages Cancel SUBARU PONTIAC MAZDA FORD	Send A/B Values to Ford GRAND AM LEGACY GRAND AM F 626 PROBE	E Balance Min Min Max Std Der of Tests 32 OUD DOOR SEDAN OUR DOOR SEDAN OUR DOOR SEDAN OUR DOOR SEDAN HEEE DOOR HATC	erage 95 imum 62, simum 128, Dev 19, 2632 2631 2031 2	.8 .7 .0 1 6 SIDE SIDE SIDE SIDE SIDE	90.1 61.2 26.5 21.4	51.6 32.1 83.2 12.7 ENGINE TYF NO COMME NO COMME NO COMME	106.8 71.0 147.8 25.7 <u>XIS</u> <u>XIS</u> NIS	20.6 11.7 26.1 3.6
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Sorting on the "A" value again, and removing all tests with an "A" value less than 60 or above 130 (+/- 15 "points" of the Min/Max Cobalt values) reduces the number of tests to 32. Since this is a number of tests which will fit on a single page, it is a test selection which we can use without generating too much paper.

This grouping has the added advantage of being a "tight" grouping of tests which incorporate the three COBALT 4 door sedans tested by NHTSA and a "fair" +/- number of tests above and below those tests.

At this point, we can click one of the two PRINT buttons, or click the SEND A/B VALUES TO FORCE BALANCE button, which will, as previously stated, allow you to print out this Test Summary report.

10 Y M		deulated Tasts									
ntal T	ests I	Rear Tests Side Test	S Other / Not Calculated								
No	Year	Make	Model	Body Style	No Damage Speed	Crush Distance	KEES	Stiffness A	Stiffness B	Stiffness G	Kv
)	1997	DODGE	NEON	FOUR DOOR SEDAN	2.0	10.8	23.1	62.7	61.2	32.1	73.3
)	2001	FORD	FOCUS	FOUR DOOR SEDAN	2.0	13.7	27.7	66.5	62.2	35.6	72.3
8 Z	2001	HONDA	CIVIC	FOUR DOOR SEDAN	2.0	12.7	27.2	66.7	66.4	33.5	77.4
·	2001	FORD	FOCUS	FOUR DOOR SEDAN	2.0	11.5	22.8	67.5	61.4	37.1	73.8
2	2001	FORD	FOCUS	FOUR DOOR SEDAN	2.0	14.8	29.0	67.6	61.5	37.1	71.0
	2001	FORD	FOCUS	FOUR DOOR SEDAN	2.0	13.2	26.8	69.7	65.4	37.1	76.4
100000	2001	MITSUBISHI	GALANI	FOUR DOOR SEDAN	2.0	13.7	26.2	76.3	67.6	43.0	79.3
227672	2005	CHEVROLET		FOUR DOOR SEDAN	2.0	11.9	20.3	70.1	78.0	37.4	91.4
	1000	MITSURISHI	CALANT	FOUR DOOR SEDAN	2.0	12.7	22.3	81.8	65.4	51.2	78.0
1.7	2001	HYUNDAT	FLANTRA	EOUR DOOR SEDAN	2.0	13.0	26.7	88.8	84.4	46.7	98.6
	2004	KTA	SPECTRA	FOUR DOOR SEDAN	2.0	13.7	26.6	89.2	79.7	49.9	93.2
1	1987	DODGE	COLT	FIVE DOOR HATCHBACK	2.0	13.1	22.4	95.7	74.6	61.4	89.9
0.0	2002	AUDI	A4	FOUR DOOR SEDAN	2.0	10.6	24.8	96.5	103.3	45.1	122
ŝ.,	2005	SATURN	ION	FOUR DOOR SEDAN	2.0	10.7	22.7	96.6	93.7	49.8	112
	1999	MITSUBISHI	GALANT	FOUR DOOR SEDAN	2.0	14.0	26.1	97.2	83.6	56.5	98.0
1.1	2008	FORD	FOCUS	FOUR DOOR SEDAN	2.0	11.5	27.3	97.2	106.4	44.4	124
Б	1998	SUBARU	LEGACY	FOUR DOOR SEDAN	2.0	13.0	22.9	99.7	80.2	62.0	96.3
k = 2	2007	KIA	SPECTRA	FOUR DOOR SEDAN	2.0	12.2	26.4	100.1	99.6	50.3	116
÷	1997	HONDA	CIVIC	FOUR DOOR SEDAN	2.0	14.3	23.7	100.7	76.6	66.3	91.3
	2008	SUBARU	IMPREZA	FOUR DOOR SEDAN	2.0	10.9	26.4	101.8	113.8	45.5	133
	2007	CHEVROLET	COBALT	FOUR DOOR SEDAN	2.0	13.3	26.5	110.2	101.6	59.7	118
	2010	KIA TOVOTA	FORTE	FOUR DOOR SEDAN	2.0	12.6	26.9	112.2	110.4	57.0	128
	2005	CATUDN		FIVE DOOR HATCHBACK	2.0	11.1	27.0	112.4	125.9	50.1	140
an an An An	2005		FOCUS	FOUR DOOR SEDAN	2.0	11.1	20.7	113.6	120.5	52.6	147
2	1980	CHEVROLET	CITATION	ETV AN AVAILAND THE SAME	na Calastad Vahi	-I 2008 CUEVE		DALT		62.2	147
	2005	CHEVROLET	COBALT	EQ 4N6XPRT Stifta	ics - Selected vemi	CIE: 2008 CHEVE	OLETU	JBAL I		59.7	130
1.1	1995	MAZDA	323-PROTEGE	FO						66.1	123
6.0	1997	SUBARU	LEGACY	FO 7 This butto	in sends the A and B va	lues to the Force Bal	ance Modu	le and will close	the 'Auto	83.2	105
	2002	SATURN	1011	Calculater							
	2003		ION	FO	3 WINDOW					67.6	138
7	1995	MITSUBISHI	GALANT	FO If you de	a window	redo the process vo	u went thr	ouch to get to t	his point.	67.6 77.7	138
7	1995	MITSUBISHI	GALANT	FO If you de	a window Naprine you wiinho ta ba	redo the process yo	u went thr	ough to get to t	his point.	67.6 77.7	138 126
7	1995	MITSUBISHI	GALANT	FO If you de	b principolo winness the	redo the process yo	u went thr	ough to get to t	his point.	67.6 77.7	138
	1995	MITSUBISHI	GALANT	FO FO If youd Print Tes	ts Page Don't Pri	redo the process yo	u went thr n to 'Auto C	ough to get to t Calculated' windo	his point. ow	67.6 77.7	138
	1995	MITSUBISHI	ION GALANT	FO FO Print Tes	ts Page	redo the process yo	u went thr n to 'Auto C	ough to get to t Calculated' windo	his point. w	67.6 77.7	138 126
	1995	MITSUBISHI	GALANT	FO FO If you de Print Tes	ts Page	redo the process yo nt Any Return A	u went thr n to 'Auto C	ough to get to t Calculated' windo	his point.	67.6 77.7	138 126
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elec	1995 t mult	iple records hold th	GALANT	FO If you de FO Print Tes	to select	redo the process yo nt Any Return A erage S	u went thr n to 'Auto C 95.8	ough to get to t Calculated' windo B G 90.1 S	his point. JW 51.6	67.6 77.7 Kv C	138 126
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elec	t mult	s Page Print All 1997 1997 1997 1997 1997 1997 1997 19	Pages Cancel PONTIAC SUBARU PONTIAC MAZDA FORD NISSAN	FO FO FO FO Print Tes FO FO Print Tes Font A/B Values to For Send A/B Values to For UEGACY GRAND AM LEGACY GRAND AM EPODE ALTIMA	to select  to select  to select  Avy ce Balance  Mir  Ma  Std ber of Tests  32  FOUR DOOR SEDAN FOUR SEDAN FOU	redo the process yo nt Any Return A erage 9 simum 6 ximum 12 Dev 1 2630 2632 2636 2632 2626 2626 2628 2624	u went thr to 'Auto C 95.8 52.7 28.0 19.6 SIDE SIDE SIDE SIDE SIDE SIDE SIDE	ough to get to t Ealculated' windo B G 90.1 \$ 61.2 \$ 126.5 \$ 21.4 \$	his point. w 51.6 32.1 83.2 12.7 NO COMME NO COMME NO COMME NO COMME NO COMME	67.6 77.7 106.8 71.0 147.8 25.7 25.7 25.7 25.7 25.7 25.7 25.7 25.7	138 126 20.6 11.7 26.1 3.6
F	t mult	s Page Print All 1997 1997 1997 1997 1997 1997 1997 19	Pages Cancel PONTIAC SUBARU PONTIAC MAZDA FORD NISSAN HONDA	FO FO FO FO FO FO FO FO FO FO	to select to sel	redo the process yo nt Any Return A erage 5 simum 6 simum 12 Dev 1 2630 2632 2632 2632 2632 2626 2608 2611 2620	u went thr to 'Auto C 35.8 32.7 28.0 19.6 SIDE SIDE SIDE SIDE SIDE SIDE SIDE SIDE SIDE	ough to get to t Calculated' windo B G 90.1 5 61.2 5 126.5 8 21.4 5	his point. 	67.6 77.7 Ky C 106.8 71.0 147.8 25.7 NTS NTS NTS NTS NTS NTS	138 126 F 20.6 11.7 26.1 3.6
elec	t mult	s Page Print All 1997 1907 1 1 1 1 1 1 1 1 1 1 1 1 1	Pages Cancel Pontiac SUBARU PONTIAC NAZDA FORD NISSAN HONDA DODGE	FO FO FO If you de Print Tes c on the records you wish Send A/B Values to For Num GRAND AM LEGACY GRAND AM Send A/B Values to For NUM	to select  to select  to select  to select  to select  Ave ce Balance  Mir  Ma  Std ber of Tests 32 FOUR DOOR SEDAN	redo the process yo nt Any Return A erage 9 imum 6 ximum 12 Dev 3 2630 2632 2632 2626 2626 2626 2626 2624 2624 2628	u went thr to 'Auto C 95.8 52.7 28.0 19.6 SIDE SIDE SIDE SIDE SIDE SIDE SIDE SIDE	ough to get to t Calculated' windo B G 90.1 5 61.2 3 126.5 8 21.4 3	his point. 	67.6 77.7 106.8 71.0 147.8 25.7 ENTS	138 126 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
elec	t mult	s Page Print All 1997 1997 1997 1997 1997 1997 1997 19	Pages Cancel Pages Cancel PontiAc SUBARU PONTIAC MAZDA FORD NISSAN HONDA DODGE MITSUBISHI	FO FO FO FO FO FO FO FO FO Print Tes FO Print Tes FO FO FO FO FO FO FO FO FO FO FO FO FO	to select to sel	redo the process yo           nt Any         Return           A           erage         S           simum         6           simum         12           Dev         1           2630         2           2620         2           2620         2           2620         2           2640         2	u went thr to 'Auto C 95.8 52.7 28.0 19.6 SIDE SIDE SIDE SIDE SIDE SIDE SIDE SIDE	ough to get to t Calculated' windo B G 90.1 \$ 61.2 \$ 126.5 \$ 21.4 \$	his point.           bit           bit <td>67.6 77.7 106.8 71.0 147.8 25.7 147.8 25.7 147.8 25.7 147.8 25.7 147.8 25.7 147.8 25.7 147.8 25.7 147.8 25.7 147.8 25.7</td> <td>138 126 F 20.6 11.7 26.1 3.6</td>	67.6 77.7 106.8 71.0 147.8 25.7 147.8 25.7 147.8 25.7 147.8 25.7 147.8 25.7 147.8 25.7 147.8 25.7 147.8 25.7 147.8 25.7	138 126 F 20.6 11.7 26.1 3.6
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elec	t mult	s Page Print All 1997 1997 1997 1997 1997 1997 1997 19	Pages Cancel Pages Cancel PONTIAC SUBARU PONTIAC SUBARU PONTIAC MAZDA FORD NISSAN HONDA DOOGE MITSUBISHI SATURN CHEVROLET	FO FO FO FO FO FO FO FO FO FO FIT FIT FIT FIT FIT FIT FIT FIT FIT FIT	to select to select to select Avy ce Balance Mir Ma Std ber of Tests 32 FOUR DOOR SEDAN FOUR DOOR SEDAN	redo the process yo           nt Any         Return           A           erage         S           nimum         6           ximum         12           Dev         11           2630         2626           2608         2611           2624         2626           2608         2611           2624         2626           2635         2635	u went thr to 'Auto C 35.8 52.7 28.0 19.6 SIDE SIDE SIDE SIDE SIDE SIDE SIDE SIDE	ough to get to t Calculated' windo B G 90.1 9 61.2 3 126.5 8 21.4 3	his point.           ww           51.6           32.1           83.2           12.7           No COMME No COMME	67.6 77.7 106.8 71.0 147.8 25.7	138 126 20.6 11.7 26.1 3.6
elec	t mult	s Page Print All 1997 1998 1098 1098 1098 1098 1098 1098 1098 1098 1098 1098 1098 1098 1098 1098 1098 1098 100	Pages Cancel Pages Cancel PontlaC SUBARU PONTLAC MAZDA FORD NISSAN HONDA DODGE MITSUBISHI SATURN CHEVROLET NISSAN	FO FO FO FO FO FO FO FO FO FO	to select  to select  to select  to select  to select  to select  function  to select  trian  trian  to select  trian  trian trian  trian  trian  trian  trian  trian  trian trian  trian  trian trian  trian trian trian trian trian tr	redo the process yo           nt Any         Return           A           arage         S           nimum         C           ximum         12           Dev         12           2630         2632           2630         2632           2630         2632           2630         2632           2630         2632           2630         2632           2630         2632           2626         2638           2640         2605           2635         2636	u went thr to 'Auto C 95.8 52.7 28.0 19.6 SIDE SIDE SIDE SIDE SIDE SIDE SIDE SIDE	ough to get to t Calculated' windo B G 90.1 \$ 61.2 \$ 126.5 \$ 21.4 \$	his point.           W           51.6           32.1           83.2           12.7           NO COMME NO COMME NO COMME NO COMME NO COMME MODEL - SI NO COMME MODEL - SI NO COMME           NO COMME MODEL - SI           NO COMME MODEL - SI           NO COMME	67.6 77.7 106.8 71.0 147.8 25.7 NTS NTS NTS NTS NTS NTS NTS NTS	138 126 20.6 11.7 26.1 3.6
elec	t mult	s Page Print All 1997 1997 1997 1997 1997 1997 1997 19	Pages Cancel Pontiac NISSAN HONDA DOGE MITSUEISHI SATURN CHEVROLET NISSAN	FO FO FO FO FO FO FO FO FO FO	to select  to select  to select  to select  to select  to select  Mir  Ma  Std  ber of Tests  32  FOUR DOOR SEDAN  FOUR FOUR FOUR FOUR SEDAN  FOUR FOUR FOUR FOUR  FOUR FOUR FOUR FOUR FOUR FOUR  FOUR FOUR FOUR FOUR  FOUR FOUR FOUR F	redo the process yo           nt Any         Return           A           erage         9           nimum         6           ximum         12           IDev         13           2630         2626           2608         2611           2626         2628           2631         2626           2632         2626           2633         2640           2605         2635           2626         2626	u went thr to 'Auto C 95.8 52.7 28.0 19.6 SIDE	ough to get to t Calculated' windo B G 90.1 5 61.2 3 126.5 6 21.4 5	his point.           W           51.6           32.1           33.2           12.7           NO COMME NO COMME	67.6 77.7 106.8 71.0 147.8 25.7 NTS NTS NTS NTS NTS NTS NTS NTS	138 126 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7

If you have not already printed the Test Summary report for the CLASS vehicle you have created, do so at this point.

# **FORCE BALANCE:**

474	IN6XPRT StifCal	cs - Select	ed Vehicle	: 2008 CHE	VROLET C	OBALT	enenenenenen	icalestenestent 						-	
File	Print Reports Set	Vehicle 1	Den Tor 4Nr	SVERT SVSTEM	ς										
	Year of Vehicle	: 2008			En En	ter the Year o	f the desired	Force Re	-Calculations	Print					~
	Maka				ve Th	hicle. en Select the I	Manufacturer.		Select Vet	vicle 2 From		Vehicle 2 M	anual Innut	Clear Ve	bide 2 D
L	Make	CHEVROL	EI		Fo Th	lowed by the I en Press 'Selei	Model. :t Vehicle.'		Vak	viele 2	MJ LICE	Vehicle 2 M	andar mpac		
	Model	COBALT			Ad	d additional In	formation to		100						
	Number of Doors				- Na Bo	rrow the Sear ×.	ch in the Botto	m		Curb	Weight (poun	ds):	d d	PDOF	
	Bodystyle of Vehicle				L				Occupar	nt + Cargo	Weight (poun	ds):		Lev Vau Marri	rer Arm L
	• • •			<b>c</b> i. 1	Le Lu					Total V	Veight (pound	ls)): 0		Yaw Mome	ent or Ir
	Model COBALT		Body 4 DO	Style OR SEDAN	Curb V 3216	/eight	103		Angle Co	Force to N	Vormal (degre	es); 0			AUCO-C
	COBALT		2 DO0	OR COUPE	2991		103							Impact Locatio	on
	COLORADO COLORADO	40	2 DO( 2 DO( 4 DO(	OR 4X4 PICKUP	3623		111	her		No Dama	age Speed (m	ph):		🚫 Front	🔿 Sidi
	COLORADO CREW C	AB	4 DO	OR 4X2 PICKUP	4002		126		E	nergy Crus	h Depth (inch	es): N/A			
	COLORADO EXTICAB		4 DOC 4 DOC	OR 4X2 PICKU	9 3622 9 3802		126	E. Jane	and the con-	Auto-Calcu	ilate Energy C	rush Depth			
	CORVETTE		2 DO 2 DO	OR COUPE OR CONVERTIE	3179 BLE 3199		106 106								
	CORVETTE Z06 EQUINOX		2 DO 4 DO	OR COUPE OR 4X2 UTILIT	3132 Y 3660		106 113			Damage	e Length (inch	es):			
	EQUINOX EQUINOX FCV		4 DO( 4 DO(	OR 4X4 UTILIT OR 4X2 UTILIT	Y 3776 Y 4370		113 113			- Crush Profi	e Measureme	nts:			
ļ	EXPRESS 1500 EXPRESS 1500		3 DO( 3 DO(	OR CARGO VAI	N 4832		135 135		Crush Spa	acing					
I	EXPRESS 1500 AWD		3 DO	OR CARGO VAI	V 5110		135		⊙ Equal		🚫 Non-Equ	lai			
l	EXPRESS 2500		3 DO	OR CARGO VAI	V 5002		135						Zone Depth(x)	Area Depth(x)	Zo Dept
	EXPRESS 2500 EXPRESS 2500 AWD		3 DO0 3 DO0	OR PASSENGER OR CARGO VAI	V. 5864 V. 5280		135 135	~	C1 (in.)		Spacing	Zone Area	(inches)	(inches <sup>2</sup> )	(ind
	Obberer and Poter							1	C2 (in.)		j				
		Sei	ect COBALT 4	TOUCK SEDAN	I (CW: 3216)				C3 (in.)		j				
ŀ	4 (IN.)				1				C4 (in.)						
с	5 (in.)	1							C5 (in.)					<u> </u>	
С	6 (in.)	ī							C6 (in.)						
с	7 (in.)	ī							C7 (in.)						
С	8 (in.)	]						-	C8 (in.)		]				
C	9 (in.)	]	_			_		-	C9 (in.)		]				
c	10 (in.)	]							C10 (in.)		] [			]	
Aver	rage Crush (inches):	N/A							Average Crus	n (inches):	N/A	]			
			F	2ecult	'c							R	ecult	łc	
			1	Average	Damage			Closing					Average	Damage	
		A	в	Force (pounds)	Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Speed (mph)			А	в	Force (pounds)	Energy (ft*lbs)	KE Sp (mp
	Minimum	62.7	61.2	N/A	N/A	N/A	N/A	N/A		Minimum	N/A	N/A	N/A	N/A	N/A
Avç	g - 2 Std. Deviations	56.6	47.3	N/A	N/A	N/A	N/A	N/A	Avg - 2 Std.	Deviations	N/A	N/A	N/A	N/A	N/A
<.				1		1	۱ <b></b>		· · · · ·		····			· · · · ·	>

When you send the A/B values from a Test Summary to the Force Balance module, the first thing that comes up is AS (AutoStats) Lite for the vehicle identified by the basic search.

If you have not completed a Basic Search prior to the Force Balance module, the Year, Make, and Model fields will be blank.

Once you have that data input into the appropriate fields, click the SELECT button at the bottom of the form.

4N6XPRT St	tifCalcs	s - Selecte	d Vehicle	e: 2008 CH	EVROLET CO	BALT										
File Print Reports	s Settir	ngs Help	Reg To: 4N	6XPRT SYSTE	15											
Basic Vehicle Searc	ch NHT	TSA Test Sele	ection Adv	anced Vehicle	Search Ford	e Balance										
Load previously	saved c	comparison	Sav	e current con	parision		Clear All Data	Force Re	-Calculations Print							
Select Vehicle 1	From AS	5 Lite	Vehicle 1 M	anual Input	Clear Vel	nicle 1 Data			Select Vehicle 2 From	AS Lite	Vehicle 2 N	lanual Input	Clear Ve	ehicle 2 Data	)	
2008 CH	IEVR	OLET C	OBAL	Г					Vehicle 2							
	Curb W	eight (pound	is): \$216		PDOF Leve	r Arm Distan	ce (inches):	N/A	Curb	Weight (pour	ids):	(	PDOF Lev	ver Arm Distar	nce (inches):	N/A
Occupant + (	Cargo W	eight (pound	is):		Yaw Momer	nt of Inertia (	(lb-ft-sec2):	2106.48	Occupant + Cargo	Weight (pour	ids):		Yaw Mom	ent of Inertia	(lb-ft-sec2):	1.00
	Total W	eight (pound	<b>is):</b> 3216			Auto-Calcula	ate Yaw Mome	nt 🗹	Total V	Veight (poun	ds)): 0			Auto-Calcula	ate Yaw Mome	nt 🗹
Angle Coll For	ce to No	ormal (degree	es): 0		Impact Locatio				Angle Coll Force to M	Normal (degre	es): 0		Impact Locati	ion		
No	o Damag	je Speed (mp	ih): 2		O Front (	<ul> <li>Side</li> </ul>	Rear	Other	No Dama	age Speed (m	ph):		Front	◯ Side	ORear	Other
Energ	y Crush	Depth (inche	es): N/A				010/02		Energy Crus	h Depth (inch	ies): N/A					
Auto	-Calcula	ite Energy Cr	ush Depth		venicle 1 Crus	n measureme A	nts B		Auto-Calcu	late Energy (	Irush Depth	✓				
					Average	95.8	90.1									
n	)amage I	enath (inche			Minimum	62.7	61.2	-	Damage	e Lenath (incl	ies):					
Crust	h Profile I	Measuremen	nts:		Maximur	128.0	126.5	7	Crush Profi	e Measureme	nts:					
Crush Spacing	g				Std. Devation	19.6	21.4	1 4 3	Crush Spacing							
📀 Equal		O Non-Eq	ual					(parting) artic	📀 Equal	O Non-Eq	ual in the			7		
				Zone Depth(x	) Depth(x)	Depth(y	) Depth(y					Depth(x)	Depth(x)	Depth(y)	Depth(y)	
C1 (in.)		Spacing	Zone Are	a (incries,	(Inches*)	(inches)	(Inches*)		C1 (in.)	Spacing	Zone Area	(Inches)	(Inches*)	(inches)	(Inches*)	1
C2 (in.)									C2 (in.)	]						
C3 (in.)								-	C3 (in.)	]					_	
C4 (in.)									C4 (in.)							
C5 (in.)									C5 (in.)							
C6 (in.)								1000	C6 (in.)							1
C7 (in.)								1	C7 (in.)							1
C8 (in.)									C8 (in.)				1			
C9 (in.)									C9 (in.)		]					
C10 (in.)									C10 (in.)							- -
verage Crush (ind	ches):	N/A							Average Crush (inches):	N/A						
			F	Result	ts						F	Result	ts			
				Average	Damage			Closing				Average	Damage			
		A	В	Force (pounds)	Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Speed (mph)		A	В	Force (pounds)	Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bSub1
Mir	nimum 6	62.7	61.2	N/A	N/A	N/A	N/A	N/A	Minimum	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Avg - 2 Std. Devia	ations	56.6	47.3	N/A	N/A	0.0	N/A	N/A	Avg - 2 Std. Deviations	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Avg - 1 Std. Devia	ations	76.2	68.7	N/A	N/A	0.0	N/A	N/A	Avg - 1 Std. Deviations	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Avi	erage 9	95.8	90.1	N/A	N/A	N/A	N/A	N/A	Average	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Avg + 1 Std. Devia	ations	115.4	111.5	N/A	N/A	0.0	N/A	N/A	Avg + 1 Std. Deviations	N/A	N/A	N/A	N/A	N/A	N/A	N/A
C C C C C C C C C C C C C C C C C C C		195 0	122.0	11 61/6	1 6126	0.0	N/A	1.674	I ALL CORD DURING	L MIZA	1.674	1.612.6	U NIZA	1.61/6	U 51/A	16//6

This is what the Force Balance page looks like after entering the AS Lite information and A-B values for Vehicle 1 (your KNOWN vehicle with "Good" Stiffness values).

This can also be reached without any data imports by just clicking on the Force Balance tab and filling in all the fields manually.

🛱 4N6XPRT StifCal	cs - Select	ed Vehicle	: 2008 CHI	EVROLET C	OBALT		-					Renter and second				- a 🗙
🖓 AutoStats Lite 🕻	Vehicle 2															
Year of Vehicle:	2005			Ente	the Year of t	he desired			_							
Make:	FORD			Ther	Select the Ma	nufacturer.	Force Re	-Calculations Print								1
	TORD			Follo Ther	Ned by the Mo Press 'Select	del. Vehicle.'		Select Vehicle 2 From	AS Lite	Vehicle 2 N	1anual Input	Clear Ve	hicle 2 Data			
Model:	CROWNUT			~		n to		Vehicle 2								
Number of Doors:	CROWN VIO	TORIA 4 DO	MERCIAL LWB	4 DOOR SED	AN	Bottom										
Bodystyle of Vehicle:	E150 3 DOC	R CARGO VA	N					Curb	Weight (poun	ids):		PDOF	er Arm Distan	ce (inches):	N/A	
	E250 3 DOC	IR PASSENGE	IR VAIN N				06.48	Occupant + Cargo	Neight (poun	ids):		Vaw Mom	ent of Inertia	(b-ft-sec2)	1.00	
Model	E250 HD 3 D	OOR CARGO	VAN				50.10	Total V	/eight (pound	ds)): 0		1 div Mon	encormenta	(ID-10-560-), [	-1 17	
CROWN VICTORIA CROWN VICTORIA CO	E250 HD SU E250 SUPER	PER 3 DOOR L 3 DOOR CA	CARGO VAN RGO VAN					Angle Coll Force to N	iormal (degre	es): 0			Auto-Calcula	ice raw mume	nu 🕑	
E150 E150	E250 SUPER	3 DOOR PA	SSENGER VAN							- 6.2		Impact Locati	on			
E250 E250 HD	E350 3 DOC	)r cargo va )r passenge	in R van				Dther	No Dama	ige speed (m	pn):		Front	🚫 Side	🚫 Rear	Other	
E250 HD SUPER	E350 SUPER	3 DOOR CA	rgo van			2		Energy Crus	n Depth (inch	ies): IWA						
E250 SUPER	ESCAPE 4 D	0 3 DOOR PA	55ENGER VAN ILITY			1		Auto-Calcu	late Energy (	Irush Depth						
E350	ESCAPE 4 D	OOR 4X4 UT	ILITY			\$										
E350 SUPER E350 SUPER	ESCAPE HY	BRID 4 DOOR BRID 4 DOOR	4X2 UTILITY					Damage	Length (inch	er):						
ESCAPE	EXCURSION	4 DOOR 4X2	2 UTILITY					Cruck Dealed	- Main and Anna	ies).						
ESCAPE HYBRID	EXCURSION	4 DOOR 4X4	UTILITY				1.1	Crush Spacing	e measureme	ints:						
EXCURSION	EXPEDITION	4 DOOR 4X	4 UTILITY			ł	. Sund	<ul> <li>Equal</li> </ul>	O Non-Equ	ual						
EXPEDITION	EXPEDITION	MSP SPECIA	AL SERVICE PA	ACKAGE 4 DO	OR 4X2 UTILI	ry 🕻	1996		station († 1960 - 1969 - 1969)		Zone Depth(v)	Area	Zone Depth(y)	Area Depth(y)		
EXPEDITION	EXPLORER	1 DOOR 4X2	UTILITY			~		(1/0)	Spacing	Zone Area	(inches)	(inches <sup>2</sup> )	(inches)	(inches <sup>2</sup> )		
	EXPLORER I	MSP SPECIAL	SERVICE PAC	KAGE 4 DOO	R 4X2 UTILITY			C1 (iii.)								
	EXPLORER :	PURTIRAL	4 DUUR 4X2 F	PICKUP											1	
	=						4	C3 (in.)								
C4 (in.)							i	C4 (in.)							1	
C5 (in.)							i	C5 (in.)							1	
C6 (in.)							i	C6 (in.)								
C7 (in.)							i	C7 (in.)								
C8 (in.)							1	C8 (in.)								
C9 (in.)	]						1	C9 (in.)								
C10 (in.)							]	C10 (in.)	department (Martin							
Average Crush (inches):	N/A	7						Average Crush (inches):	N/A	٦						
		_' _	بار ۲	<b>L</b> _							ا ا	<b>-</b> -				
		F	kesun	LS						F	kesul	lS				
	A	в	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (mph)		A	в	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bSub1	
Minimum	62.7	61.2	N/A	N/A	N/A	N/A	N/A	Minimum	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Avg - 2 Std. Deviations	56.6	47.3	N/A	N/A	0.0	N/A	N/A	Avg - 2 Std. Deviations	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Avg - 1 Std. Deviations	76.2	68.7	N/A	N/A	0.0	N/A	N/A	Avg - 1 Std. Deviations	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Average	95.8	90.1	N/A	N/A	N/A	N/A	N/A	Average	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Avg + 1 Std. Deviations	115.4	111.5	N/A	N/A	0.0	N/A	N/A	Avg + 1 Std. Deviations	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
ALL LOCAL DURING	195.0	122.0	ALLA	M/A	0.0	NUA		ALL LOCA DURING	51/A	MIA	A1/A	N/A	NIA	N/A	MI/A	
<	[	1. States		and the second secon	and the second second second second	a transformation and a statistic	and the design of the d		and the second second second	and a second	يشاهدهم ماسي مشعره م	,			and a summer since and solar solar	>

Enter the vehicle data for Vehicle 2, either using AS LITE as shown, or via MANUAL INPUT.

AN6XPRT StifCa	ilcs - Seleci	ted Vehicl	e: 2008 CH	IEVROLET CO	DBALT										
File Print Reports Si	ettings Help	Reg To: 4N	I6XPRT SYSTE	MS											
Basic Vehicle Search	VHTSA Test Se	election Ad	vanced Vehicle	e Search Ford	e Balance		<u> </u>								
Load previously save	d comparison	Sa	ve current cor	nparision	J	Ilear All Data	Force Re	Calculations Print							
Select Vehicle 1 From	AS Lite	Vehicle 1 M	1anual Input	Clear Ve	nicle 1 Data	J		Select Vehicle 2 From	AS Lite	Vehicle 2 M	Manual Input	Clear Ve	ehicle 2 Data	J	
2008 CHEV	ROLET	COBAL	Т					2005 FOR	d expe	DITIO	N				
0.4	Waight (page	ada), 3216		PDOF				Curb	Height (nour	J-1 5342		PDOF			
Occupant + Caro	Weight (pour	nds); OETO		Leve	r Arm Distan	te (inches):	N/A	Occupant + Cargo	Weight (pour	vde):		Le	ver Arm Dista	nce (inches):	N/A
Tota	l Weight (pou	nus).		Yaw Mome	nt of Inertia (	lb-ft-sec²):	2106.48	Total S	/eight (poup	de)): 5342		Yaw Mom	ent of Inertia	a (lb-ft-sec²):	4296.26
		) 0			Auto-Calcula	ite Yaw Mome	ent 🗹	. Lata	- ICI				Auto-Calcul	ate Yaw Mome	nt 🗹
Angle Coll Force to	Normal (degr	ees): U		Impact Locatio	n			Angle Coll Force to I	lormal (degre	es): U		Impact Locat	ion		
No Dar	nage Speed (n	nph): 2		○ Front	<ol> <li>Side</li> </ol>	Rear	🔿 Other	No Dam	ige Speed (m	iph):		O Front	🚫 Side	🚫 Rear	🔘 Other
Energy Cru	ish Depth (incl	hes): N/A		Vehicle 1 Crus	n Measureme	nts		Energy Crus	h Depth (inch	nes): N/A					
Auto-Calo	ulate Energy	Crush Depth			A	В		Auto-Calcu	late Energy (	Crush Depth					
				Average	95.8	90.1									
Dama	ge Length (ind	hes):		Minimun	62.7	61.2		Damage	Length (inch	nes):					
Crush Pro	file Measurem	ents:		Maximun	128.0	126.5		Crush Profi	e Measureme	ents:					
Crush Spacing	0			Std. Devation	19.6	21.4		Crush Spacing	-		0				
(•) Equal	O Non-E	iqual	Zone	Area	Zone	Area		() Equal	O Non-Eq	ual	Zone	Area	Zone	Area	
	Spacing	Zone An	Depth(× ea (inches	<ul> <li>Depth(x)</li> <li>(inches<sup>2</sup>)</li> </ul>	Depth(y) (inches)	Depth(y (inches <sup>2</sup>	}		Spacing	Zone Area	Depth(x) (inches)	Depth(x) (inches <sup>2</sup> )	Depth(y) (inches)	Depth(y) (inches <sup>2</sup> )	
C1 (in.)					1		7	C1 (in.)		1					1 - 22
(2 (in.)								C2 (in.)							
C3 (in.)	-							C3 (in.)							
C4 (in.)								C4 (in.)							]
C5 (in.)								C5 (in.)							
(7 (in.)								C3 (in.)							
C8 (in.)	-							C8 (in.)							
C9 (in.)	-							(9 (in.)							
C10 (in.)								C10 (in.)							
Average Crush (inches)	: N/A	7						Average Crush (inches):	N/A	1					
			Resul	ts						F	Resul	ts			
	А	в	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (mph)		А	в	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bSub1
Minimur	n 62.7	61.2	N/A	N/A	N/A	N/A	N/A	Minimum	N/A	N/A	N/A	N/A	0.0	N/A	N/A
Avg - 2 Std. Deviation	s 56.6	47.3	N/A	N/A	0.0	N/A	N/A	Avg - 2 Std. Deviations	N/A	N/A	N/A	N/A	0.0	N/A	N/A
Avg - 1 Std. Deviation	s 76.2	68.7	N/A	N/A	0.0	N/A	N/A	Avg - 1 Std. Deviations	N/A	N/A	N/A	N/A	0.0	N/A	N/A
Averag	95.8	90.1	N/A	N/A	N/A	N/A	N/A	Average	N/A	N/A	N/A	N/A	0.0	N/A	N/A
Avg + 1 Std. Deviation	s 115.4	111.5	N/A	N/A	0.0	N/A	N/A	Avg + 1 Std. Deviations	N/A	N/A	N/A	N/A	0.0	N/A	N/A
	195.0	122.0	N/A	617.6	0.0	N/A	MIA		M/A	617.6	N//A	617.6	0.0	617.6	61/6

At this point, we have Vehicle Year, Make, Model information, Curb Weight, and Yaw Moment of Inertia values entered for both vehicles. We also have the No Damage Value and Impact surface indicated for Vehicle 1.

4N6XPR	RT StifCal	cs - Selecte	ed Vehicle:	2008 CH	EVROLET CO	BALT											- F 🛛
File Print Re	sports Set	tings Help	Reg To: 4N6>	PRT SYSTEM	15 Sauch Fors	a Ralance											
Basic Vehicle	Search N	115A Test Sele	ection    Adva	nced Vehicle	Search Ford		Class All Data		Coloulations Duint								~
Load previ	ousiy saved	comparison	J	current com	parision		Liear Ali Data	Force Re									
Select Vehi	icle 1 From A	AS Lite	Vehicle 1 Mar	nual Input	Clear Vel	nicle 1 Data			Select Vehicle 2 From	AS Lite	Vehicle 2 M	lanual Input	Clear Ve	hicle 2 Data	J		
2008	CHEVE	ROLET C	COBALT						2005 FOR	D EXPE	DITIO	N					
	Curb 1	Weight (pound	ds): 3216		PDOF	r Arm Dictan	ce (inchec):	N/A	Curb	Weight (pound	ds): 5342		PDOF	ver Arm Dicka	nce (inchec):	N/A	
Occupar	nt + Cargo '	Weight (pound	ds):		Van Mana	n Ann Discan	(Ih 6h anno).	2106.49	Occupant + Cargo	Weight (pound	ds):		Vaux Marris	ont of Teachin	/lb fb ana2);	4296.26	
	Total 1	∦eight (pound	<b>ds):</b> 3216		Taw Home	Auto-Calcula	ate Yaw Mome	nt 🔽	Total \	Veight (pound:	s)): 5342		Taw Plot	Auto-Calcul	ate Yaw Mome	nt 🔽	
Angle Co	I Force to N	lormal (degree	es): 0			21			Angle Coll Force to I	Normal (degree	es): 0		Tool of the second	to ton			
	No Dama	ige Speed (mp	oh): 2		Front (	<ul> <li>Side</li> </ul>	ORear (	Other	No Dam	age Speed (mp	oh): 5		Front	On Side	○ Rear	Other	
E	Energy Crus	h Depth (inche	es): 11.66						Energy Crus	h Depth (inche	es): 3.00						
	Auto-Calcui	late Energy Cr	rush Depth		Vehicle 1 Crust	n Measureme A	nts B		Auto-Calcu	llate Energy C	rush Depth	✓					
					Average	95.8	90.1	7									
	Damage	Length (inche	es): 86		Minimum	62.7	61.2	Ĩ	Damag	: Length (inche	es): 50						
	- Crush Profil	e Measuremer	nts: 7		Maximum	128.0	126.5	i	Crush Profi	e Measuremer	nts: 2						
Crush Sp	pacing				Std. Devation	19.6	21.4	1 800	Crush Spacing								
🔿 Equa	d <sub>and</sub> and	📀 Non-Eq	ual	7	· · · ·	7			📀 Equal	🔿 Non-Equ	al	7		7			
	ang. Manakanti			Depth(x)	Depth(x)	Depth(y)	) Depth(y) (inches2)			Caralas		Depth(x)	Depth(x) (inches2)	Depth(y) (inches)	Depth(y)		
C1 (in.)	0	2.00	1.00	0.33	0.33	1.33	1.33	1	C1 (in.) 5	Spacing	150.00	1.72	258.33	19.44	2916.67	1	
C2 (in.)	1	5.00	7.50	0.78	5.83	7.78	58.33	1	C2 (in.) 1					1			
C3 (in.)	2	5.00	22,50	2.48	55,83	12.96	291.67	122	C3 (in.)							120000	
C4 (in.)	7	59.00	796.50	7.27	5791.83	211.23	168248.3	1922	C4 (in.)								
C5 (in.)	20	10.00	150.00	7.78	1166.67	44.44	6666.67		C5 (in.)			 				1,226	
C6 (in.)	10	5	25.00	3.33	83.33	26.67	666.67		C6 (in.)								
C7 (in.)	0							7.72	C7 (in.)							12000	
C8 (in.)		]							C8 (in.)								
C9 (in.)		]							C9 (in.)	]							
C10 (in.)		]		1 		Constantion		a an an a	C10 (in.)			Conserver and			and group to em		
Average Crus	sh (inches):	11.66	] /						Average Crush (inches):	3.00	1.2						
			R	esul	ts				12500		F	Resul	ts				
			fal sent	Average	Damage			Closing	a second second		e de la	Average	Damage				
		A	В	Force (pounds)	Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Speed (mph)		A	В	Force (pounds)	Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bSub1	
	Minimum	62.7	61.2	33372.60	41697.79	19.7	N/A	N/A	Minimum	682.7	217.4	33372.60	17679.19	10.0	N/A	28.0	
Avg - 2 Std.	Deviations	56.6	47.3	26142.93	32972.10	17.5	N/A	N/A	Avg - 2 Std. Deviations	578.0	155.9	26142.93	15047.07	9.2	N/A	23.7	
Avg - 1 Std.	Deviations	76.2	68.7	37712.48	47338.18	21.0	N/A	N/A	Avg - 1 Std. Deviations	740.7	255.9	37712.48	19233.78	10.4	N/A	30.4	
	Average	95.8	90.1	49282.03	61706.24	24.0	N/A	N/A	Average	882.1	363.0	49282.03	23307.85	11.4	N/A	36.2	
Avg + 1 Std.	Deviations	115.4	111.5	60851.58	76075.14	26.6	N/A	N/A	Avg + 1 Std. Deviations	1009.0	475.0	60851.58	27304.35	12.4	N/A	41.4	al a thuis
<	Nedekier	1950	122.0	79491-19	00444 47	20.0	l niża	NIZA.	And a second because	1100 1	E00 4	70401 10	01006 AE	10.0	U NIZA	16.0	>

We now see that the No-Damage value and impact surface for Vehicle 2 have been input. Also input are the Crush Profile information for both Vehicle 1 and Vehicle 2.



There are two check boxes for each vehicle that may raise questions

AUTO-CALCULATE YAW MOMENT - When this box is checked, the Yaw Moment of Inertia is calculated based on the following formulas and the Total weight of Vehicle + Occupant(s) & Cargo.

If the Vehicle is a Van, SUV, Pickup, or has a curb weight greater than 8000 pounds, the Yaw Moment will be calculated as:

1.03 \* Total Weight - 1343Otherwise, the Yaw Moment will be calculated as:1.03 \* Total Weight - 1206

AUTO-CALCULATE ENERGY CRUSH DEPTH - When this box is checked, the "ENERGY CRUSH DEPTH" field equals the AVERAGE CRUSH field. When it is unchecked, you can enter some other value, allowing you to quickly complete a "rough check" on someone elses numbers without having to enter their crush profile.

**ENERGY CRUSH DEPTH** - This is the Crush Depth ( $C_{avg}$ ) data field used for the "RESULTS" calculations of  $b_1$  (bSub1) and  $F_{avg}$  (Average Force). When

the Auto-Calculate box is checked, it is equal to the calculated Average Crush from the crush profile you entered.

Note that in this example the Crush Profile CRUSH SPACING for vehicle 1 is based on NON-Equal spacing, where the CRUSH SPACING for Vehicle 2 is based on Equal spacing.

The advantage of NON-Equal spacing over Equal Crush spacing is that the measurements are better able to "describe" the crush profile of the vehicle by catching the "inflection points" in the crush profile.

Something else to note is that the Delta V and Closing Speed values are N/A ... in order to calculate these values, you MUST input values for the LEVER ARM for both vehicles, and have a value in place for ANGLE COL FORCE TO NORMAL (DEGREES) for both vehicles.

Both of these values can be found in a variety of ways, one of which is through the use of a CRASH 3 program.

N6XPRT StifCal	cs - Select	ed Vehicl	e: 2008 CHE	VROLET C	OBALT											
Print Reports Set	tings Help	Reg To: 4N	6XPRT SYSTEM	15	- Delegan											
Vehicle Search	HTSA Test Se	election Adv	vanced Vehicle	Search For												
ad previously saved	comparison	Sav	/e current comp	parision	J 19	Llear All Data	Force Re-Ca	alculations								
lect Vehicle 1 From #	AS Lite	Vehicle 1 M	lanual Input	Clear Ve	hicle 1 Data			Select Vehicle 2 From	AS Lite	Vehicle 2 M	lanual Input	Clear Ve	hicle 2 Data			
00 <mark>8 CHEVF</mark>	OLET	COBAL	Т					2005 FOR	d expe	EDITIO	N					
Save As							?	X				PDOF				
Sav	e in: [ 🔒 M	lv Document:	s		V 0	1 1 1	-	Curb	∦eight (pour	nds): 5342		Lev	er Arm Distar	nce (inches):	N/A	
Dcc	0	116-						Occupant + Cargo	Weight (pour	nds): 0		Yaw Mom	ent of Inertia	(lb-ft-sec2):	4296.26	
Ò		Priv						Total \	/eight (pound	ds)): 5342			Auto-Calcula	ate Yaw Mome	nt 🔽	
ngl My Recen	t 🖨 My	Archives						Angle Coll Force to 1	lormal (degre	ees): 0						
Document	s OHT	ML mantec						No Dama	iae Speed (m	nph); 5		Impact Locati	on O = 1	0-	0	
	My	Templates						Epergy Crus	h Denth (inch	nes): 3.00		• Front	() Side	ORear	Other	
Desktop	My Con My	Cad Zone	ic.					Auto-Calca	late Energy (	Crush Depth						
	- 0 We	eb Easy						The care	ato Enorg, t	al abit b op at						
	C Sc	anSoft PDF P	rofessional 4													
My Docume	nts	A Articles to I - Rear	Jan					Damage	Length (inch	nes): 50						
	20	07 vehicle da	ta					Crush Profi	e Measureme	ents: 2						
ru 🚽	La dv	ndRoverDefe 3-PDF	nder90					Crush Spacing								
E My Comput	er Cor	5151						<ul> <li>Equal</li> </ul>	O Non-Eq	ual	7000	Area	7000	Area		
	< .	J									Depth(x)	Depth(x)	Depth(y)	Depth(y)		
(in 🥞	File na	me:	05_FORD_EX	PEDITION_7	3752.forceba	lance 💉	Save	1 (in.) 5	Spacing	Zone Area	(Incrites)	(ITICITIES*)	(incries)	(Incries*)	1	
(in My Networ Places	k Save	as type:	ForceBalance	(*.forcebalar	ce)	~	Cancel	2 (in.) 1	50.00	130.00	1.72	230,33	12.11	2910.07		
(in.) 2	5.00	00.50	0.40	1 55 00	10.01	001.07	Constant and	.:: C3 (in.)								
(in.) 7	5.00	22.50	2.48	55.83	12.96	291.67		C4 (in.)						·		
(in.) 20	59.00	796.50	7.27	5791.83	211.23	168248.3		C5 (in.)								
(in.) 10	10.00	150.00	7.78	1166.67	44.44	6666.67		C6 (in.)								
(in.) 0	5.00	25.00	3.33	83.33	26.67	666.67		C7 (in.) 0								
(in.) 0	1							C8 (in.)								
(in.) 0	1							C9 (in.) 0								
0 (in.) 0								C10 (in.) 0								
									Courses.	4000						
ge Crush (inches):	11.66							Average Crush (inches):	3.00							
			Result	s						F	Result	ts				
			Average	Damage			Closing				Average	Damage				
	А	в	Force (pounds)	Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Speed (mph)		A	в	Force (pounds)	Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bSub1	
Minimum	62.7	61.2	33372.60	41697.79	19.7	N/A	N/A	Minimum	682.7	217.4	33372.60	17679.19	10.0	N/A	28.0	
- 2 Std. Deviations	56.6	47.3	26142.93	32972.10	17.5	N/A	N/A	Avg - 2 Std. Deviations	578.0	155.9	26142.93	15047.07	9.2	N/A	23.7	
- 1 Std. Deviations	76.2	68.7	37712 49	47338 19	21.0	N/A	N/A	Avg - 1 Std. Deviations	740.7	255.9	37712 49	19233 79	10.4	N/A	30.4	
- 1 Stur Deviations	1012	00.7	57712.70	17550.10	21.0	140	indu []	wyg - 1 blu, Deviations	, 10.7	200.9	3//12.40	17233.70	10.4	influe	50.4	

At this point, you have the A-B values necessary for a CRASH 3 analysis. Saying that you have enough Post Impact information to complete a CRASH 3 analysis, it is suggested that you SAVE CURRENT COMPARISON and complete your CRASH 3 analysis.

4N6XPRT StifCalcs - Selected Vehicle: 2008 CHEVROLET COBALT		×
File Print Reports Settings Help Reg To: 4N6XPRT SYSTEMS		
Basic Vehicle Search NHTSA Test Selection Advanced Vehicle Search Force Balance		
Load previously saved comparison Save current comparision Clear All Data Force Re-C	alculations 🐨 📔 Print	^
Select Vehicle 1 From AS Lite Vehicle 1 Manual Input Clear Vehicle 1 Data	Select Vehicle 2 From AS Lite Vehicle 2 Manual Input	
2008 CHEVROLET COBALT	2005 FORD EXPEDITION	
Curb Weight (pounds): 3216 4N6XPRT.StifCalcs - Selected Vehicle; 2008 CHEVROLE Occupant + Cargo Weight (pounds): 0 Total Weight (pounds): 3210 Angle Coll Force to Normal (degrees): 0	FC OBALT     Stance (inches):     N/A       PEDITION_73752.forcebalance) has been Saved to C:\Documents and Settings\Daniel     rtia (b-ft-sec.3):     4296.26       COK     CoK     Cok     Cok	
No Damage Speed (mph): 2 Front Side Rear Other	No Damage Speed (mph): 5 Energy Crush Depth (inches): 3.00	

As part of the SAVE you receive a confirmation that the data file has been saved.

N6XPRT StifC	alcs - Selecte Settings Help	ed Vehicle Reg To: 4M	2008 CHE	VROLET C	OBALT										
c Vehicle Search	NHTSA Test Sel	ection Adv	anced Vehicle	Search For	e Balance										
ad previously sa	ved comparison	Sav	e current comp	arision		ilear All Data	Force Re	-Calculations Print							
				~				Select Vehicle 2 From a	AS Lite	Vehicle 2 M	anual Input	Clear Ve	hicle 2 Data	1	
pen							? 🛛	Vehicle 2						)	
Look in:	📋 My Docum	ients		~	G 🖻 🛤	••		Venicie 2							
	2006_FORD	_MUSTANG_	V5_1987_CHE	VROLET_CA	RICE_58401.	forcebalance		Curb V	/eight (pound	is):	ſ	PDOF	er Arm Dictar	oce (inchec):	N/A
Mu Recent	2006_FORD	MUSTANG_	V5_1987_CHE IS 2003 BMW	VROLET_CAI X5.3.0 484	PRICE_66731. 61.forcebalan	forcebalance re		Occupant + Cargo V	/eight (pound	is):		Vau Moro	or write Distan	(b-ft-coc2)	1.00
Documents	2003_BMW_	_X5 3.0_V5_2	2004_FORD_F	350 SUPER D	UTY_50788.fc	orcebalance		Total W	eight (pound	s)): 0		T div MUIIR	auto Coloula	(ID-I (-SEC-):	-1.00
	2003_BMW_	_X5 3.0_V5_3	2004_FORD_F	350 SUPER E	UTY6-5-4-2	154044.for	cebalance	Angle Coll Force to N	ormal (degree	es): 0			Auto-Calculo	ace yaw morne	anu 💌
Desktop	22 2000_CHEM	KOLLI_COB	htt_v5_2005_	J OND_EAPE	5111014_00000.	. If of cooparation	-	No Dama	ne Sneed (mr	ь);		Impact Locatio	n		
								Epergy Cruck	Depth (inch	sc): N/A		Front	🔘 Side	🚫 Rear	Other (
								Auto-Calcul	ate Energy C	rush Denth					
My Documents								Hata-Calcal	Let chorgy c	all roopen					
								Damage	Length (inche	es):					
My Computer								Crush Profile	Measuremer	nts:					
(Com)		r						Crush Spacing	~						
	File name:	2008_C	HEVROLET_0	OBALT_VS	2005_FOR		Open	(•) Equal	O Non-Equ	al	Zone	Area	Zone	Area	
My Network	Files of type:	ForceBa	alance (*.force	balance)		•	Cancel		Spacing	Zone Area	Depth(x) (inches)	Depth(x) (inches <sup>2</sup> )	Depth(y) (inches)	Depth(y) (inches <sup>2</sup> )	
1 (m)								C1 (in.)	Spacing	2010 HIGG					1
2 (in.)							14	C2 (in.)					]		1
3 (in.)								C3 (in.)					1		1977
4 (in.)							1822	C4 (in.)					1		1. 224
5 (in.)								C5 (in.)							1224
6 (in.)		1					71/2/3	C6 (in.)					1		10000
7 (in.)								C7 (in.)							1622
8 (in.)		1					<b>1</b> 022	C8 (in.)							1800
9 (in.)							1	C9 (in.)							18/30
10 (in.)	(increased)	dit provinsi	ante la garan	an lan garan	and Sections	dida para		C10 (in.)	ding second se	Sector sectors	a and an parton	() (Largeneric)	Mir na svance og s	a en par esperant	
rage Crush (inche:	s): N/A	1204						Average Crush (inches):	N/A	19/27					
		- F	esult	·c						R	esul	ts			
		<u> Solar</u>	Average	Damage			Closing			780 ac	Average	Damage			
	A	в	Force (pounds)	Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Speed (mph)		A	В	Force (pounds)	Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bSub1
Minimu	um 📃 mu							Minimum							
J - 2 Std. Deviatio	ns							Avg - 2 Std. Deviations							
g - 1 Std. Deviatio	ns							Avg - 1 Std. Deviations							
Avera	ge							Average							
+ 1 Std. Deviatio	ns							Avg + 1 Std. Deviations							
LOCH DUILD								And the second second						1	1

Once you complete your CRASH 3 analysis, you can come back, LOAD PREVIOUSLY SAVED COMPARISON, and enter Values for the Lever Arm for both vehicles, and change the Angle Col Force to Normal from "0" to some other value if appropriate.

AN6XP	RT StifCal	cs - Select	ed Vehicle:	2008 CH	EVROLET CO	DBALT											
File Print R	Reports Set	tings Help	Reg To: 4N6	XPRT SYSTE	MS	e Ralance											
Basic venicie	e search   N	HISA Test Se	ection    Adva	anced vehicle	e Search 1 Ord		Class All Data		Colordations Drint								
Luau prev	VIUUSIY SAVEL	companson	Jave					- PUPCE RE									
Select Ver	hidle 1 From a	AS Lite	Vehicle 1 Mai	nual Input	Clear Vel	nicle 1 Data			Select Vehicle 2 From	ASLite	Vehicle 2 M	lanual Input	Clear Ve	ehicle 2 Data	J		
2008	CHEVE	OLET	COBALI						2005 FOR	D EXPE	DITIO	N					
	Curb	Weight (poun	ids): 3216		PDOF	r Arm Distan	ce (inches):	0	Curb	Weight (poun	ds): 5342		PDOF	/er Arm Dista	nce (inches):	0	
Occupa	ant + Cargo	Weight (poun	ids):		Vaw Mome	nt of Toertia i	(heft-cec2)	2106.48	Occupant + Cargo	Weight (poun	ds):		Vaw Mom	ent of Toertia	(lb-ft-sec2)	4296.26	
	Total	Weight (poun	ids): 3216		Tan Florida	Auto-Calcula	ate Yaw Mome	-t 🔽	Total \	Veight (pound	s)): 5342		Ton Hom	Auto-Calcul	ate Yaw Mome	ent 🔽	_
Angle C	oll Force to N	iormal (degre	es): 0						Angle Coll Force to I	Normal (degre	es): 0						
	No Dami	ige Speed (m	ph): 2	(	Eropt (	n Side	O Rear (	Other	No Dam	age Speed (mp	oh): 5		Impact Locati	on Side	Rear	Other	
	Energy Crus	h Depth (inch	ies): 11.66		U.1.	0 5.00	01100	<i>y</i> ounor	Energy Crus	h Depth (inch	es): 3.00		0.101	0 5100	0,100		
	Auto-Calcu	late Energy C	rush Depth		Vehicle 1 Crus	n Measureme A	nts		Auto-Calcu	llate Energy C	rush Depth	<b>V</b>					
					Average	95.8	90.1										
	D	1			Minimum	62.7	61.2	-	Damas		); E0						
	Cruch Profi	e Measureme	ies); 00		Maximur	128.0	126.5	1	Cruch Profi	e Measureme	es): 30						
Crush 9	Spacing	e measureme	nics; [7		Std. Devation	19.6	21.4	1.00	Crush Spacing	e measurenne	105: 2						
OEqu	al	📀 Non-Ei	qual					- China Chin	● Equal	🔿 Non-Equ	al	민준이한					
				Zone Depth(x	Area ) Depth(x)	Zone Depth(y)	Area ) Depth(y)					Zone Depth(x)	Area Depth(x)	Zone Depth(y)	Area Depth(y)		
C1 (in.)	0	Spacing	Zone Area	(Inches	) (inches*)	(inches)	(Inches*)		C1 (in.) 5	Spacing	Zone Area	(Incries)	(Inches*)	(Incries)	(Incnes*)	1	
C2 (in.)	1	5.00	7.50	0.78	5.83	7.78	58.33		C2 (in.) 1	]	100.00	1.72	200.00	12.11	2710.07		
C3 (in.)	2	5,00	22,50	2,48	55.83	12.96	291.67	The second	C3 (in.)							65	
C4 (in.)	7	59.00	796.50	7.27	5791.83	211.23	168248.3	1022	C4 (in.)								
C5 (in.)	20	10.00	150.00	7.78	1166.67	44.44	6666.67		C5 (in.)								
C6 (in.)	10	5.00	25.00	3.33	83.33	26.67	666.67	7	C6 (in.)							1778	
C7 (in.)	0							1000	C7 (in.)								
C8 (in.)								1/2/2	C8 (in.)							1. 1. 1.	
C9 (in.)								<b>1</b> 228	C9 (in.)								
C10 (in.)				Congar.		0 9999			C10 (in.)				P wyger		1.000	1,000 20	
Average Cru	ush (inches):	11.66	1900						Average Crush (inches):	3.00	] genere						
			R	lesul	ts						F	Resul	ts				
		-		Average Force	Damage Energy	KE Speed	Delta V	Closing Speed		199	and and	Average Force	Damage Energy	KE Speed	Delta V	bCub1	
	Mininger	A	B	(pounds)	(It*Ibs)	(mph)	(mph)	(mph)	Minimum	A	B 217.4	(pounds)	(rt*ibs)	(mph)	(mph)	28.0	
Avg - 2 Std	. Deviations	56.6	47.3	26142.93	32972.10	17.5	16.7	26.8	Avg - 2 Std. Deviations	578.0	155.9	26142.93	15047.07	9.2	10.1	23.7	
Avg - 1 Std	. Deviations	76.2	68.7	37712.48	47338.18	21.0	19.7	31.5	Avg - 1 Std. Deviations	740.7	255.9	37712.48	19233.78	10.4	11.8	30.4	
	Average	95.8	90.1	49282.03	61706.24	24.0	22.2	35.6	Average	882.1	363.0	49282.03	23307.85	11.4	13.4	36.2	
Avg + 1 Std	. Deviations	115.4	111.5	60851.58	76075.14	26.6	24.5	39.3	Avg + 1 Std. Deviations	1009.0	475.0	60851.58	27304.35	12.4	14.8	41.4	
		195.0	122.0	70401 10	00444 47	20.0	76 6	17 6		1105 1	E00 4	70401 10	01006 AE	10.0	14 0	16 7	
1	18								, , , , , , , , , , , , , , , , , , ,								>

This shows the Force Balance analysis with Lever Arm and Angle Col Force to Normal values of "0", which will give the most conservative numbers for the Delta V and Closing Speed values.

4N6XPRT StifCalcs® licensed by 4N6XPRT Systems (www.4N6XPRT.com) to: Registered Owner: 4N6XPRT SYSTEMS Serial Number: 11R-0302015C02301	4N6XPRT SUTCalcs® licensed by 4N6XPRT Systems (www.4N6XPRT.com) to: Serial Number: 11R-0302015C02301
Area of Damage (inches <sup>2</sup> ): 150.00	Area of Damage (inches <sup>2</sup> ): 1002.50
Damage Centroid Depth (y) (inches) 19.44 Eff. Mass Ratio (gamma) 1.00	Damage Centroid Depth (y) (inches) 175.49 Eff. Mass Ratio (gamma) 1.00
Damage Centroid Depth (x) (inches) 1.72 k <sup>2</sup> 3729.11	Damage Centroid Depth (x) (inches) 7.09 k <sup>2</sup> 3037.10
Maximum 1090.9 555.2 68912.13 30053.81 13.0 15.6 44.8	Maximum 128.0 126.5 68912.13 86043.68 28.3 26.0 41.6
Avg + 2 Std. Deviations 1125.1 590.6 72421.13 31243.22 13.2 16.0 46.2	Avg + 2 Std. Deviations 135.0 132.9 72421.13 90444.47 29.0 26.6 42.6
Avg + 1 Std. Deviations 1009.0 475.0 60851.58 27304.35 12.4 14.8 41.4	Avg + 1 Std. Deviations 115.4 111.5 60851.58 76075.14 26.6 24.5 39.3
Average 882.1 363.0 49282.03 23307.85 11.4 13.4 36.2	Average 95.8 90.1 49282.03 61706.24 24.0 22.2 35.6
Avg - 1 Std. Deviations 740.7 255.9 37712.48 19233.78 10.4 11.8 30.4	Avg - 1 Std. Deviations 76.2 68.7 37712.48 47338.18 21.0 19.7 31.5
Avg - 2 Std. Deviations 578.0 155.9 26142.93 15047.07 9.2 10.1 23.7	Avg - 2 Std. Deviations 56.6 47.3 26142.93 32972.10 17.5 16.7 26.8
Minimum 682.7 217.4 33372.60 17679.19 10.0 11.2 28.0	Minimum <u>62.7</u> <u>61.2</u> <u>33372.60</u> <u>41697.79</u> <u>19.7</u> <u>18.6</u> <u>29.8</u>
Results Average Damage KE Force Energy Speed Delta V A B (pounds) (ft*lbs) (mph) (mph) B Sub	Results         Average         Damage         KE         Closing           A         B         (pounds)         (ft*lbs)         (mph)         (MPH)
Average Crush (inches): 3.00	Average Crush (inches): 11.66
C10 (inches)	C10 (inches)
	C7 (inches) 0.00 25.00 3.33 83.33 26.67 666.67
	C5 (inches) 10.00 150.00 7.78 1165.67 44.44 6666.67
	C5 (inches) 20.00 59.00 796.50 7.27 5791.83 211.23 168248.33
	C4 (inches) 7.00 24.90 24.94 59.83 14.99 291.97
C3 (inches)	C3 (inches) 2.00
C2 (inches) (1.00 )	C2 (inches) $1.00$ $500$ $750$ $0.76$ $583$ $778$ $5833$
C1 (incres) 3.00 50.00 150.00 1.72 258.33 19.44 2916.67	C1 (incres) 0.000 2.00 1.00 0.33 0.33 1.33 1.33
Spacing Zone Area Depth(x) Depth(x) Depth(y) Depth(y) Depth(y) (inches) (inches) (inches) (inches) (inches) (inches)	Spacing Zone Area Depth(x) Depth(x) Depth(y) Depth(y) (inches <sup>2</sup> )
Crush Profile Measurements: 2	Crush Profile Neasurements: 7 Succession States
	CH Developm 10.6 31.4
Damage Length (inches): 50.0	Damage Length (inches): 86.0 Maximum 128.0 126.5
Energy Crush Depth (inches): 3.00	Energy Crush Depth (inches): 11.66 Minimum 62.7 61.2
No Damage Speed (mph): 5.0	No Damage Speed (mph): 2.0 Average 95.8 90.1
Angle Coll Force to Normal (degrees): 0.0	Angle Coll Force to Normal (degrees): 0.0 "Known" Stifness Values
Total Weight (pounds): 5342	Total Weight (pounds): 3216
Curb Weight (pounds): 5342 PDOF Lever Arm Distance (inches): 0.00 Occupant + Cargo Weight (pounds): 0 Yaw Moment of Inerlia (Ib-th-sec <sup>2</sup> ) 4296.26	Curb Weight (pounds):         3216         PDOF         Lever Arm Distance (inches):         0.00           Occupant + Cargo Weight (pounds):         0         Yaw Moment of Inertia (Ib-th-sec2)         2106.48
2005 FORD EXPEDITION - Front Impact	2008 CHEVROLET COBALT - Side Impact
4N6XPRT StifCalcs® Force Balance - Page 2 of 2	4N6XPRT StifCalcs <sup>®</sup> Force Balance - Page 1 of 2

The printed output appears as shown above.

🖧 4N6XPF	RT StifCal	cs - Select	ed Vehicle:	2008 CH	EVROLET CO	DBALT											
File Print Re	eports Set	tings Help	Reg To: 4N6>	XPRT SYSTEM	45												
Basic Vehicle	Search N	HTSA Test Se	lection Adva	inced Vehicle	Search Ford	e Balance				_							
Load previ	iously saved	comparison	Save	current com	parision		Ilear All Data	Force Re	-Calculations Print								-
Select Veh	icle 1 From #	AS Lite	Vehicle 1 Mar	nual Input	Clear Vel	hicle 1 Data	J		Select Vehicle 2 From	AS Lite	Vehicle 2 M	lanual Input	Clear Ve	hicle 2 Data	J		
2008	CHEVE	ROLET	COBALT						2005 FOR	D EXPE		N					
	Curb	Weight (poun	ids): 3216		PDOF	r Arm Distan	e (inches):	20	Curb	Weight (pour	nds): 5342		PDOF	ver Arm Dista	nce (inches):	0	
Occupa	nt + Cargo	Weight (poun	ids): 0		Yaw Momer	ot of Inertia (	h-ft-sec2):	2106.48	Occupant + Cargo	Weight (pour	nds): 0		Yaw Mom	ent of Inertia	(lb-ft-sec2):	4296.26	
	Total	Weight (poun	ids): 3216			Auto-Calcula	te Yaw Mome	nt 🗹	Total V	Veight (pound	ds)): 5342		1411110	Auto-Calcula	ate Yaw Mome	nt 🔽	_
Angle Co	oll Force to M	iormal (degre	es): 20		Tennach Locabia				Angle Coll Force to N	iormal (degre	es): 10		Tennach Locabi				
	No Dama	ige Speed (m	ph): 2		Front (		🔵 Rear 🛛 🤇	Other	No Dama	age Speed (m	ph): 5		<ul> <li>Front</li> </ul>	Side	🚫 Rear	Other	
E	Energy Crus	h Depth (inch	es): 11.66		University of Course				Energy Crus	h Depth (inch	nes): 3.00						
	Auto-Calcu	late Energy C	Irush Depth		vonicie i crusi	A	В		Auto-Calcu	late Energy (	Crush Depth	✓					
					Average	95.8	90.1										
	Damage	Length (inch	ies): 86		Minimum	62.7	61.2		Damage	: Length (inch	nes): 50						
	Crush Profil	e Measureme	nts: 7		Maximum	128	126.5		Crush Profil	e Measureme	ents: 2						
Crush S	pacing	<u> </u>			Std. Devation	19.6	21.4		Crush Spacing								
OEqua	al	( Non-E	qual	Zone	Area	Zone	Area		( Equal	O Non-Eq	ual	Zone	Area	Zone	Area		
(1/m)	0	Spacing	Zone Area	Depth(x) (inches)	) Depth(x) (inches <sup>2</sup> )	Depth(y) (inches)	Depth(y) (inches <sup>2</sup> )		C1 /m ) E	Spacing	Zone Area	Depth(x) (inches)	Depth(x) (inches <sup>2</sup> )	Depth(y) (inches)	Depth(y) (inches <sup>2</sup> )		
C2 (in.)	1	2.00	1.00	0.33	0.33	1.33	1.33		C2 (in.) 5	50.00	150.00	1.72	258.33	19.44	2916.67	]	
C3 (in.)	2	5.00	7.50	0.78	5.83	7.78	58.33		C3 (in.) 0								
C4 (in.)	7	5.00	22.50	2.48	55.83	12.96	291.67		C4 (in.) 0								
C5 (in.)	20	59.00	796.50	7.27	5791.83	211.23	168248.3	<u>.</u>	C5 (in.) 0								
C6 (in.)	10	10.00	150.00	7.78	1166.67	44.44	6666.67		C6 (in.) 0					_			
C7 (in.)	0	5.00	25.00	3.33	83.33	26.67	666.67		C7 (in.) 0								
C8 (in.)	0	1 <b></b>							C8 (in.) 0								
C9 (in.)	0	1	_						C9 (in.) 0								
C10 (in.)	0	]							C10 (in.)							J	
Average Cru:	sh (inches):	11.66	]						Average Crush (inches):	3.00							
			R	lesul	ts						F	Resul	ts				
				Average	Damage			Closing				Average	Damage				
		A	В	Force (pounds)	Energy (ft*lbs)	(mph)	(mph)	(mph)		A	В	(pounds)	(ft*lbs)	KE Speed (mph)	(mph)	bSub1	
	Minimum	62.7	61.2	35514.38	47221.68	21.0	18.8	32.6	Minimum	704.4	231.5	35514.38	18822.67	10.3	11.3	28.9	
Avg - 2 Std.	Deviations	56.6	47.3	27820.72	37340.05	18.7	16.9	29.3	Avg - 2 Std. Deviations	597.0	166.3	27820.72	15990.58	9.5	10.2	24.5	
Avg - 1 Std.	Deviations	76.2	68.7	40132.78	53609.27	22.4	19.9	34.6	Avg - 1 Std. Deviations	764.0	272.3	40132.78	20495.66	10.7	12.0	31.4	
	Average	95.8	90.1	52444.84	69880.73	25.5	22.6	39.1	Average	909.1	385.6	52444.84	24880.92	11.8	13.6	37.3	
Avg + 1 Std.	Deviations	115.4	111.5	04/56.89	06153.14	28.3	24.9	43.1	Avg + 1 Std. Deviations	1039.3	503.9	04/55.89	29183.83	12.8	16.0	42.7	
<	-11											. mee nit	77966 JL				>

An illustration of what happens to the Delta V and Closing Speeds when the Lever Arm and Angle Col Force are values other than "0" appear above. These values should be compared to the printout previously discussed.

In short, the speeds are higher.

# **CLASS vs SISTER/CLONE Summary Comparison:**

One of the purposes of going through building the CLASS vehicle, even though there were Sister/Clone tests for the Cobalt, was to compare the CLASS values to Sister/Clone values. Another purpose was to restrict the CLASS vehicle to a 4 door vehicle only, and thus incorporate the B-Pillar "hard point"

## Looking at the two Force Balance analysis results again, we have -

\_\_\_\_\_

Sister/Clone -

Results         Average Force         Damage Energy         KE Speed         Closing           A         B         (pounds)         (H*bs)         (mpl)         (mpl)         (MPH)           Minimum         41.1         11.8         11338.80         17292.95         11.7         11.6         20.2           Arg - 2 Skd. Deviations         72.2         56.8         3157.60         39985.38         19.3         19.3         29.2           Average         101.5         94.1         51582.25         64636.46         24.6         22.7         36.4           Arg + 1 Skd. Deviations         100.8         111.6         71588.90         39298.47         28.9         26.4         42.3           Arg + 2 Skd. Deviations         160.1         160.0         91595.55         113964.15         32.6         29.7         47.6           Maximum         161.5         168.4         91355.00         113737.44         32.6         29.7         47.5           Damage Centroid Depth (Y) (inches)         175.49         Eff. Mass Ratio (gamma)         1.00         1.00           Area of Damage (inches <sup>2</sup> ):         1002.50         1.00         1.00         1.00         1.00         1.00         1.00         1.00	Source Subsection       Source Subsection         Subsection       Subsection       Subsection       Subsection         Subsection       Subsection       Subsection       Subsection       Subsection         Supsection       Subsection       Subsection       Subsection       Subsection       Subsection         Supsection       Subsection       S	4N6XPRT StifCalcs® Force Balance - Page 1 of 2
Results         Average Force         Damage Energy         KE Speed         Delta V (If*Ibs)         Ke           Minimum         34.1         58.5         13238.80         10150.68         7.6         1.45           Avg - 2 Std. Deviations         319.7         47.7         11569.95         9488.33         7.3         7.2         1.31           Avg - 1 Std. Deviations         65.7.7         201.8         31575.60         17030.3.1         9.8         1.0.0         27.0           Avg + 1 Std. Deviations         1117.1         582.2         71588.90         30961.51         1.3.7         3.7.3           Avg + 2 Std. Deviations         1297.7         788.1         91595.55         37676.36         14.5         17.9         5.3.3           Damage Centroid Depth (x) (Inches)         1.72         k²         3729.11         5.3           Damage Centroid Depth (y) (Inches')         1.9.44         Eff. Mass Ratio (gamma)         1.00           Area of Damage (Inches'2):         150.00         3729.13         1.00         1.00           Area of Damage (Inches'2):         150.00         3729.14         1.00         1.00           Area of Damage (Inches'2):         150.00         1.00         1.00         1.00	Subsection       Subsection <td>4N6XPRT StifCalcs® Force Balance - Page 2 of 2</td>	4N6XPRT StifCalcs® Force Balance - Page 2 of 2

## and then we have

## CLASS -

Results         Average Force         Damage Force         KE Energy Force         Closing Force           Minimum         6.2.7         61.2         3337.2.60         41697.79         19.7         18.6         29.8           Arg - 2 Scl. Deviations         56.6         47.3         26142.03         33972.10         17.5         16.7         26.8           Arg - 1 Scl. Deviations         76.2         68.7         37711.46         47338.16         21.0         19.7         31.5           Arg + 1 Scl. Deviations         115.4         111.5         60851.58         76075.14         26.6         41.5         39.3           Arg + 2 Scl. Deviations         135.0         132.9         72421.13         90444.47         29.0         26.6         41.5           Damage Centroid Depth (x) (nches)         72.09         7421.13         90444.47         29.0         26.6         41.6           Damage Centroid Depth (x) (nches)         175.49         Eff. Mass Ratio (gamma)         1.00         1.00           Area of Damage (nches <sup>2</sup> ):         102.50         Eff. Mass Ratio (gamma)         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00	Suppose the property of the pro	4N6XPRT StifCalcs® Force Balance - Page 1 of 2
Results         Average Force         Damage Energy Force         KE Energy Force         Kerney Energy Force         Kerney Ene	Suppose For District for the second secon	4N6XPRT StifCalcs® Force Balance - Page 2 of 2

Close examination of these two reports shows that, because the CLASS vehicle was "tighter", we have a narrower Closing Speed range with the CLASS vehicle (26.8-42.6 mph) vs the Sister/Clone vehicle (19.3-47.6 mph). Yet the Closing Speed based on the AVERAGE A-B values are very close (Class = 35.6 mph vs. Sister/Clone = 36.4 mph)

You can, and will, achieve this agreement in data with practice. Further, the confidence and experience you will gain with the Force Balance Module, and input of the A-B values into your CRASH 3 program, will allow you to testify with confidence when you have to rely solely upon a CLASS vehicle for stiffness data.

# **ESSENTIAL FORMULAS:**

## **CRASH 3 Stiffness Value Calculations:**

1 mph	= 17.6 inch/sec
gravity = g	= acceleration due to gravity
$g = 32.3 \text{ feet/sec}^2$	= 386.4 inch/sec <sup>2</sup>
KEES	= Kinetic Energy Equivalent Speed (mph)
$\Delta v_{test}$	= Speed(mph) $*$ 17.6 = inch/second
Crush = C	= crush depth used for calculations, in 4N6XPRT
	StifCalcs <sup>®</sup> the Crush depth used could be the
	minimum, average, or maximum depth = inches
$Crush_{avg} = C_{avg}$	= calculated average crush = inches
Weight $=$ W	= vehicle weight = pounds
b <sub>0</sub>	= "No Damage Speed" - For FRONT and REAR Tests
	initial assumption is $5 \text{ mph} = 88 \text{ inch/second}$ , for
	SIDE Tests initial assumption is
	2  mph = 35.2  inch/sec.
L	= damage length (inch)

The KEES speed is calculated with the following formula:

KEES = ( [  $W_{Barrier} * SPEED_{Closing}^2$  ] / [  $W_{Barrier} + W_{Vehicle}$  ] )<sup>0.5</sup>

#### **b**<sub>1</sub> = slope = inches / [inch\*sec]

Note - depending upon the author the unit notation could also appear as [inch/second]/inch or 1/second.

 $\mathbf{b}_1 = (\Delta \mathbf{v}_{\text{test}} - \mathbf{b}_0) / \text{Crush}$ 

#### <u>"A" coefficient = pound/inch</u>

A = Maximum force per inch of damage without permanent damage A = ( W \*  $b_0 * b_1$  ) / ( g \*  $L_{test}$  )

#### <u>"B" coefficient = pound/inch</u><sup>2</sup>

B = Crush resistance per inch of damage width B = (W \*  $b_1 * b_1$ ) / (g \*  $L_{test}$ )

## <u>"G" coefficient = pound</u>

G = Energy dissipated without permanent damage G = (A \* A) / (2 \* B)

#### **SMAC Stiffness Value Calculation:**

## <u>"Kv" coefficient = pound/inch</u><sup>2</sup>

Kv = The linear spring constant for the increasing/decreasing loads of a collision

 $Kv = (W * b_1 * b_1) / (g * L_{test})$ 

## **Test Specific Crush Factor (CF) Stiffness Value Calculation:**

#### <u>"CF" = unitless</u>

$$CF = Crush Factor = Resistance to crush$$
$$CF = \Delta v_{test(mph)} * \Delta v_{test(mph)} / (30 * Crush/12)$$

## **Force Balance Calculations:**

To perform an accurate Force Balance crush analysis, four things are needed: 1) "good" stiffness coefficients for one of the vehicles, Crush profile measurements from which the 2) area of damage and 3) depth of the damage centroid from the damage face can be calculated, and 4) the angle the collision force makes with respect to the damage face.

Additionally, to calculate Closing Speed and Delta-V's, a PDOF Lever Arm distance for each vehicle is needed.

Variables to be used in the formula notation are:

	E	=	total damage energy (inch-pound)
	А	=	stiffness coefficient (pound/inch)
	В	=	stiffness coefficient (pound/inch <sup>2</sup> )
	G	=	stiffness coefficient (pound)
	<b>x</b>	=	depth of the damage centroid from the undamaged surface
	Ad	=	area of damage (inch <sup>2</sup> )
	L	=	damage length (inch)
	F	=	collision force (pounds)
	$F_{x}$	=	collision force normal (perpendicular) to the undamaged surface
			(pounds)
	α	=	angle the collision force makes with a line normal
			(perpendicular) to the collision surface face (degrees)
(1 + t)	$an^2\alpha$	=	magnification factor to adjust for a collision force that is not
			normal to the undamaged surface (unitless)
	$F_{avg}$	=	average collision force (pounds)
	$C_{\text{avg}}$	=	average crush depth (inches)
	$\mathbf{F}_1$	=	average collision force for Vehicle 1 (pounds) - This is the
			vehicle with the "best" set of A-B Stiffness values. It may be
			EITHER the bullet or the target vehicle
	$C_{2\text{avg}}$	=	average crush depth for Vehicle 2 (inches)
	$A_2$	=	stiffness coefficient for Vehicle 2 (pound/inch)- This is to be
			solved for by balancing against the calculated average collision
			Force exerted on Vehicle 1
	$B_2$	=	stiffness coefficient for Vehicle 2 (pound/inch <sup>2</sup> )- <i>This is to be</i>
			solved for by balancing against the calculated average collision
			Force exerted on Vehicle 1
	$L_2$	=	damage length for Vehicle 2 (inch)
	$\alpha_2$	=	angle the collision force makes with a line normal
			(perpendicular) to the collision surface face for Vehicle 2
			(degrees)
	Iz	=	Yaw Moment of Inertia (pound-foot-second <sup>2</sup> )
	k	=	Radius of Gyration (feet)
	h	=	PDOF Lever Arm Distance (inches)
	γ	=	Effective mass ratio - Gamma (unitless)
Delta	V	=	The change in velocity experienced by the vehicle in a Linear
			Direction based purely upon the damage sustained (mph)

Closing Speed = The speed at which the two "damage surfaces" approached each other just before impact in a Linear Direction based purely upon the damage sustained (mph)

The general equation for calculating damage energy is:

$$E = [(A + Bx)*A_{D} + (A^{2}*L)/(2*B)] * (1 + \tan^{2}\alpha)$$

One of the foundations of the Force Balance model is that collision forces adhere to Newton's Third Law which states: *For every force exerted on a body by another body, there is an equal but opposite force reacting on the first body by the second.* The **average** collision force can be calculated by:

$$F_{avg} = [(A + B*C_{avg}) * L] / 2$$

where C<sub>avg</sub> can be calculated by:

$$C_{avg} = A_D / L$$

Crush measurements and energy calculations are based on a normal collision force. When the collision force is not normal to the original undamaged surface, the angle between the collision force and the normal (perpendicular) component needs to be determined. To visualize this angle, refer to the diagram below.



The angle acts as a "magnification" factor on the calculated force, and is accounted for in the  $(1 + \tan^2 \alpha)$  portion of the damage energy calculation. The good thing about this angle is that use of a 0 degree angle (as in, no angle) results in the most conservative energy values and thus conservative resulting speeds.

$$F = F_x / \cos \alpha$$

In terms of our A-B Stiffness values, the Force can be calculated as:

$$F = [(A + B*C_{avg}) * L] / (2*cos α)$$

The  $b_0$  value for Vehicle 2 is assumed. The Force on Vehicle 1 has been calculated, and because of Newton's Third Law, is known to be the Force acting on Vehicle 2 as well. The weight, average crush, and Force angle  $\alpha$  for vehicle 2 are all known. Calculation of the  $b_1$  is all that remains to be done in order for the A and B stiffness values for Vehicle 2 to be calculated.

$$b_1 = -1^* (W_2^* b_0) \pm [(W_2^* b_0)^2 - 4^* (W_2^* C_{2avg})^* (-2^* g^* F_1^* \cos \alpha)]^{0.5} / [2^* (W_2^* C_{2avg})]$$

Once  $b_1$  for Vehicle 2 has been determined, the appropriate values are plugged in to the formulas displayed in the CRASH 3 section above to calculate the A-B-G stiffness values.



Zone	Area	=	Each Zone Area segment is calculated as $[(C_n + C_{n+1}) / 2]$ * Spacing
Zone	Depth(x)	$=$ $[(C_n)^2$	Each Zone Depth(x) segment is calculated as + $(C_n * C_{n+1}) + (C_{n+1})^2 ] / [3 * (C_n + C_{n+1})]$
Area	Depth(x)	=	Each Area Depth(x) segment is calculated as Zone Area * Zone Depth(x)
	Zone#	=	The number of the zone segment - i.e the segment between $C_1$ and $C_2$ would be 1, between $C_7$ and $C_8$ would be 7.
Zone Spac	Depth(y) cing * [(-1)*	= (C <sub>n+1</sub> )	Each Zone Depth(y) segment is calculated as + $(-2)^{*}(C_n) + 3^{*}Zone\#^{*}C_n + 3^{*}Zone\#^{*}(C_{n+1}) ] / [3^{*}(C_n + C_{n+1})]$
Area	Depth(y)	=	Each Area Depth(y) segment is calculated as Zone Area * Zone Depth(x)
Avera	age Crush <sub>Tr</sub>	apezoidal	$=$ $C_{avg}$ $=$ $\sum [Zone Area] / L$



For Each KNOWN A-B pair, the Following is calculated:

Average Force <sub>1</sub>	=	$F = [(A + B*C_{avg}) * L] / (2*\cos \alpha)$
$E_1$	=	$[(A_{1} + B_{1} \tilde{x}_{1})^{*}A_{D1} + (A_{1}^{2}*L_{1})/(2^{*}B_{1})] * (1 + \tan^{2}\alpha_{1})$
KE Speed	=	$[(30 * E_1) / w_1]^{0.5}$
$k_{1}^{2}$	=	$[([I_{z1} / (W_1 / g)]^{0.5})*12]^2$
$\mathbf{\gamma}_{1}$	=	$k_{1}^{2} / (k_{1}^{2} + h_{1}^{2})$

Average Force<sub>2</sub> = Average Force<sub>1</sub> Vehicle 2 b<sub>1</sub> =  $-1^{*}(W_{2}^{*}b_{0}) \pm [(W_{2}^{*}b_{0})^{2} - 4^{*}(W_{2}^{*}C_{2avg})^{*}(-2^{*}g^{*}F_{1}^{*}\cos\alpha)]^{0.5} / [2^{*}(W_{2}^{*}C_{2avg})]^{0.5}$ 

$$\begin{array}{rcl} A_2 & = & (W_2 * b_0 * b_1) / (g * L_{2_{test}}) \\ B_2 & = & (W_2 * b_1 * b_1) / (g * L_{2_{test}}) \end{array}$$

$$\begin{array}{rcl}G_{2} & = & (A_{2} * A_{2}) / (2 * B_{2}) \\E_{2} & = & [(A_{2} + B_{2} \tilde{x}_{2}) * A_{D2} + (A_{2} {}^{2} * L_{2}) / (2 * B_{2})] * (1 + \tan^{2} \alpha_{2}) \\KE \ Speed_{2} & = & [(30 * E_{2}) / w_{2}]^{0.5} \\k_{2} {}^{2} & = & [([L_{22} / (w_{2} / g)]^{0.5}) * 12]^{2} \\\gamma_{2} & = & k_{2} {}^{2} / (k_{2} {}^{2} + h_{2} {}^{2})\end{array}$$

If a PDOF Lever Arm distance and Angle between the Collision Force and Normal Force have been entered, the following speeds can be calculated:

Delta V<sub>1</sub> =  $[2*\gamma_1*(E_1 + E_2) / ((W_1/g)*(1+((\gamma_1*W_1/g) / (\gamma_2*W_2/g))))]^{0.5}*3600/5280$ Delta V<sub>2</sub> =  $[Delta V_1 * (W_1/g) / (W_2/g)]$ Closing Speed =  $[(Delta V_1 * (5280/3600) / \gamma_1) + (Delta V_2 * (5280/3600) / \gamma_2)]*3600/5280$ 



Damage Centroid depth(x) =  $\bar{x}$  =  $\sum_{x} [Area Depth(x)] / \sum_{z} [Zone Area]$ Damage Centroid depth(y) =  $\bar{y}$  =  $\sum_{z} [Area Depth(y)] / \sum_{z} [Zone Area]$ Area of Damage =  $L * C_{avg}$  For the formulas used to calculate the Yaw Moment of Inertia, we refer you to SAE # 881767, "Vehicle Inertial parameters - measured values and approximations" by W.R. Garrott, M. W. Monk, and J. P. Chrstos

For more information on the Force Balance process, we refer you to: **"Balancing Collision Forces in Crush / Energy Analysis**" by Nathan Shigemura and Andrew Rich available from the IPTM Webstore <u>http://www.iptm.org/webstore/</u> under Crash Investigation Publications.

Several SAE papers discuss the Force Balance method, among them - 970942 / 1999-01-0079 / 2005-01-1188 and 2005-01-1205.

For more information on Crush Energy calculations, as well as Accident Investigation and Reconstruction calculations in general, we refer you to: <u>Fundamentals of Traffic Crash Reconstruction Volume 2 of the Traffic</u> <u>Crash Reconstruction Series</u> by John Daily, Nathan Shigemura, and Jeremy Daily available from the IPTM Webstore <u>http://www.iptm.org/webstore/</u> under Crash Investigation Publications.