

**DATA SHEET NO. 5 - HYBRID III ATD INJURY CRITERIA AND SENSOR DATA**

Test Vehicle: 1995 Hyundai Scoupe 2 Door Coupe

Project No.: P24076-01

Test Program: Acevedo vs. Hyundai

Test Date: 3/31/04

**HEAD PEAK ACCELERATIONS**

Location	Axis	Units	Driver				Left Rear Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	11.9	149.3	-257.4	61.6	2.4	238.1	-56.7	105.4
Head CG	Y	G's	41.4	64.9	-97.8	61.6	4.8	106.4	-7.5	91.5
Head CG	Z	G's	55.6	64.6	-36.2	62.1	65.7	77.3	-0.7	17.1
Head CG Resultant	N/A	G's	275.5	61.6			73.1	77.3		

**CHEST PEAK ACCELERATIONS**

Location	Axis	Units	Driver				Left Rear Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	4.1	116.6	-62.5	71.6	3.4	213.5	-55.7	76.8
Chest CG	Y	G's	12.2	68.0	-8.0	62.1	4.5	88.4	-14.9	75.9
Chest CG	Z	G's	11.3	67.6	-12.2	93.0	24.6	63.8	-0.7	165.7
Chest CG Resultant	N/A	G's	63.1	71.6			57.7	76.2		

**SEAT BELT SENSOR PEAK VALUES**

Location	Axis	Units	Driver				Left Rear Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Shoulder Belt Force Pri.	N/A	Newtons					6850.0	85.6	-62.9	192.0
Shoulder Belt Force Red.	N/A	Newtons					6902.9	86.9	-43.57	218.1
Lap Belt Force	N/A	Newtons					6328.3	64.8	-8.96	157.7
Shoulder Belt Pullout	N/A	Inches					9.0	101.3	-1.1	299.3

**HEAD INJURY CRITERIA (HIC36)**

Location	Driver				Left Rear Passenger			
	HIC	T <sup>1</sup>	T <sup>2</sup>	Avg G	HIC	T <sup>1</sup>	T <sup>2</sup>	Avg G
Head CG Primary	2133.9	60.7	72.8	125.0	1068.5	71.6	107.6	61.5

**CHEST CLIP (3MSEC)**

Location	Driver			Left Rear Passenger		
	CLIP	T <sup>1</sup>	T <sup>2</sup>	CLIP	T <sup>1</sup>	T <sup>2</sup>
Chest CG Primary	59.2	69.9	72.9	53.4	69.2	72.2

**DATA SHEET NO. 5...(continued)**

Test Vehicle: 1995 Hyundai Scoupe 2 Door Coupe

Project No.: P24076-01

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**UPPER NECK PEAK FORCES AND MOMENTS**

Location	Axis	Units	Driver				Left Rear Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	1323.8	70.0	-791.7	59.6	73.6	237.4	-1017.6	80.2
Neck Force	Y	Newtons	532.0	62.1	-632.3	69.3	101.6	128.2	-177.0	108.9
Neck Force	Z	Newtons	5101.6	63.4	-582.4	212.1	2387.3	94.3	-31.4	17.0
Neck Force Resultant	N/A	Newtons	5103.0	63.4			2491.9	94.3		
Neck Moment	X	Nm	50.6	71.6	-15.6	80.8	9.5	63.3	-20.1	100.0
Neck Moment	Y	Nm	121.2	70.1	-52.6	59.6	35.3	113.0	-60.3	80.4
Neck Moment	Z	Nm	11.8	193.5	-17.2	84.8	0.0	0.0	0.0	0.0
Neck Moment Resultant	N/A	Nm	131.0	70.1			61.2	80.4		

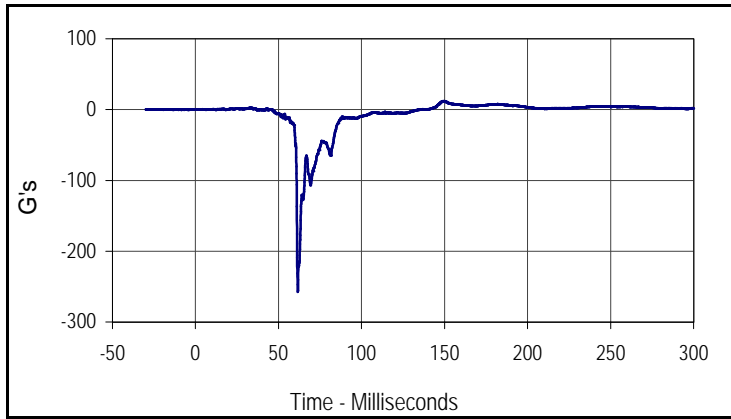
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**VEHICLE ACCELEROMETER PEAK ACCELERATIONS**

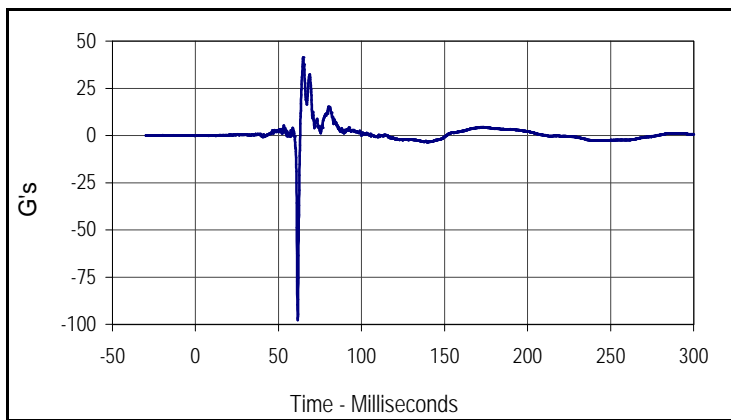
Location	Axis	Units	Vehicle			
			Max	Time	Min	Time
Vehicle Rear Seat	X	G's	3.1	151.2	-36.7	31.1
Vehicle Rear Seat	Y	G's	7.5	38.5	-9.7	33.5
Vehicle Rear Seat	Z	G's	22.5	75.1	-14.7	59.0
Vehicle Rear Seat Res.	N/A	G's	37.9	58.2		
Vehicle CG	X	G's	7.6	85.7	-51.8	42.9
Vehicle CG	Y	G's	10.7	61.2	-18.5	32.3
Vehicle CG	Z	G's	28.1	39.4	-35.8	47.6
Vehicle CG Resultant	N/A	G's	54.7	42.3		

Test Vehicle: 1995 Hyundai Scoupe 2 Door Coupe  
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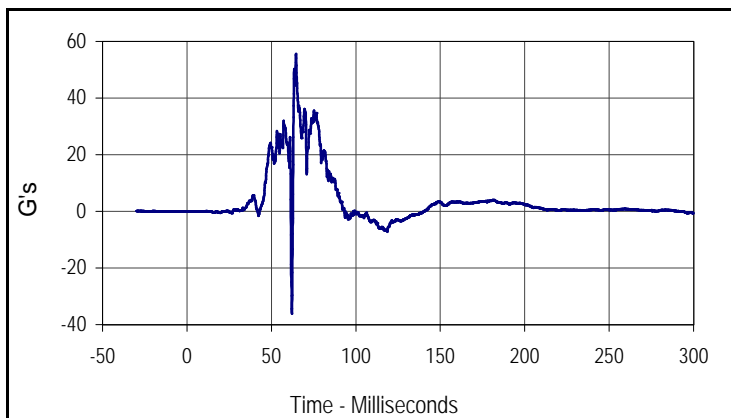
Test Date: 3/31/04  
 Project No.: P24076-01



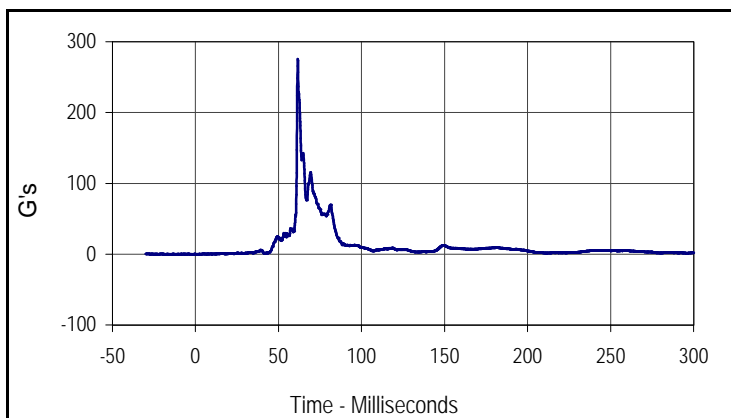
Curve Description			
Driver Head X			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
11.9	149.3	-257.4	61.6



Curve Description			
Driver Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
41.4	64.9	-97.8	61.6



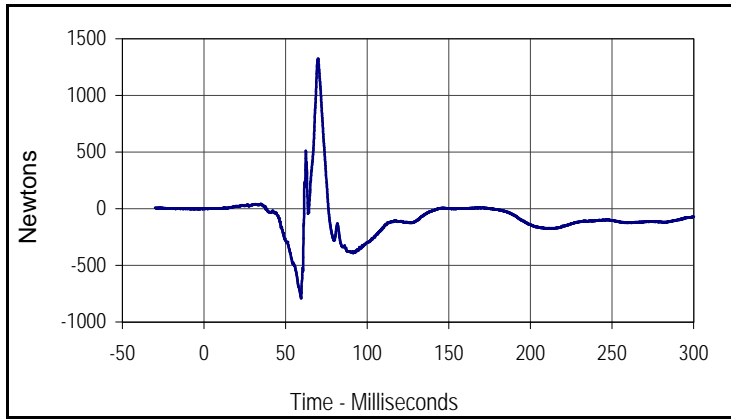
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Driver Head Z			
CURNO	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
55.6	64.6	-36.2	62.1



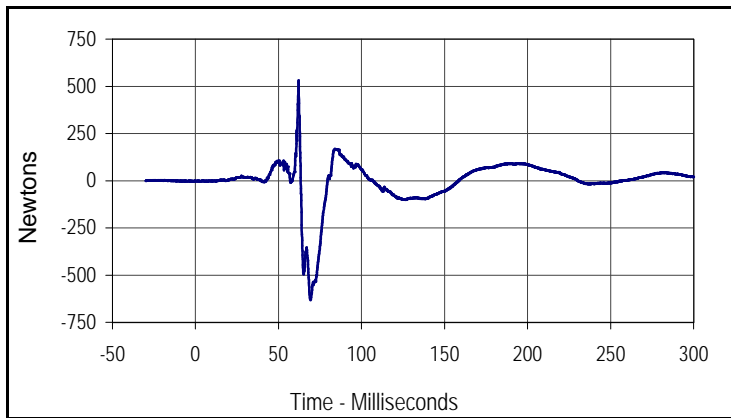
Curve Description			
Driver Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
275.5	61.6	0.0	0.1

Test Vehicle: 1995 Hyundai Scoupe 2 Door Coupe  
 Test Program: Acevedo vs. Hyundai

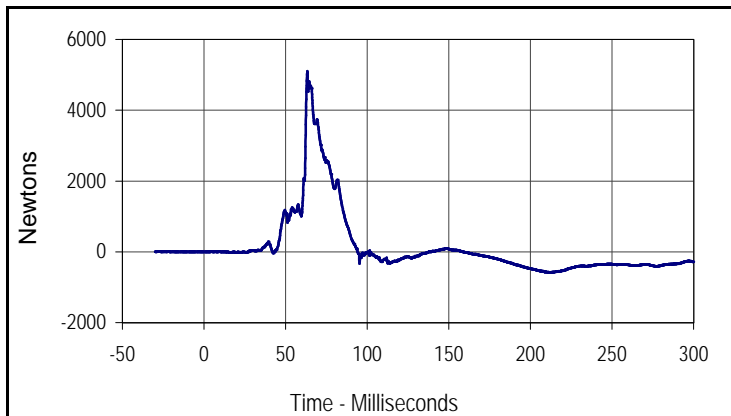
Test Date: 3/31/04  
 Project No.: P24076-01



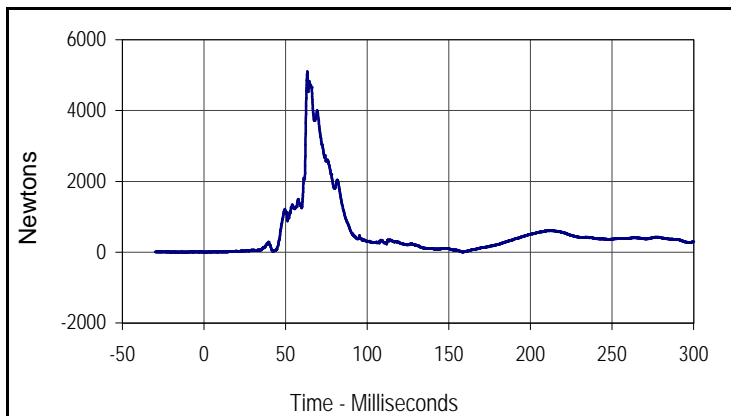
Curve Description			
Driver Upper Neck Force X			
CURNO	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
1323.8	70.0	-791.7	59.6



Curve Description			
Driver Upper Neck Force Y			
CURNO	Type	SAE Class	Units
005	FIL	1000	Newtons
Max	Time	Min	Time
532.0	62.1	-632.3	69.3



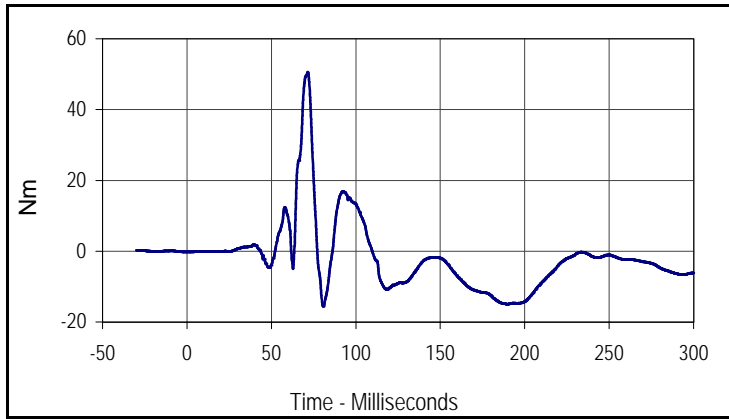
Curve Description			
Driver Upper Neck Force Z			
CURNO	Type	SAE Class	Units
006	FIL	1000	Newtons
Max	Time	Min	Time
5101.6	63.4	-582.4	212.1



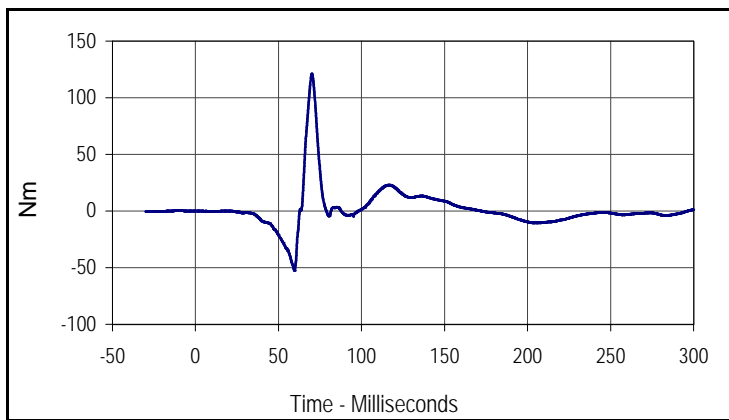
Curve Description			
Driver Upper Neck Force Resultant			
CURNO	Type	SAE Class	Units
004	RES	1000	Newtons
Max	Time	Min	Time
5103.0	63.4	1.1	1.4

Test Vehicle: 1995 Hyundai Scoupe 2 Door Coupe  
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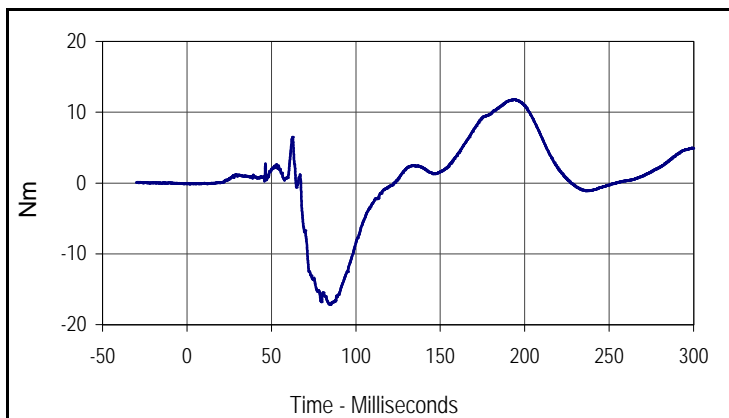
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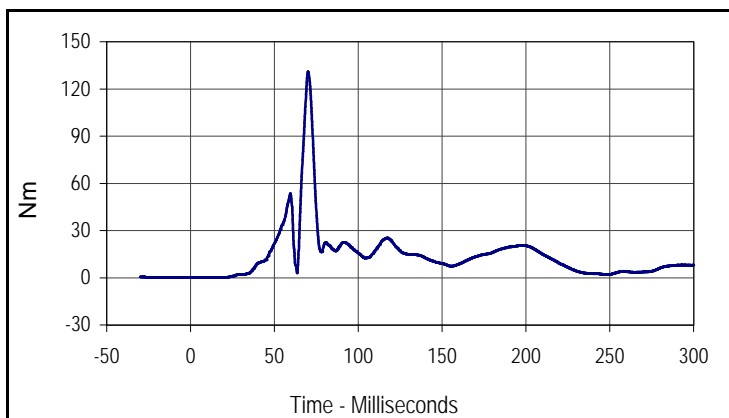
Curve Description			
Driver Upper Neck Moment X			
CURNO	Type	SAE Class	Units
007	FIL	600	Nm
Max	Time	Min	Time
50.6	71.6	-15.6	80.8



Curve Description			
Driver Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
008	FIL	600	Nm
Max	Time	Min	Time
121.2	70.1	-52.6	59.6



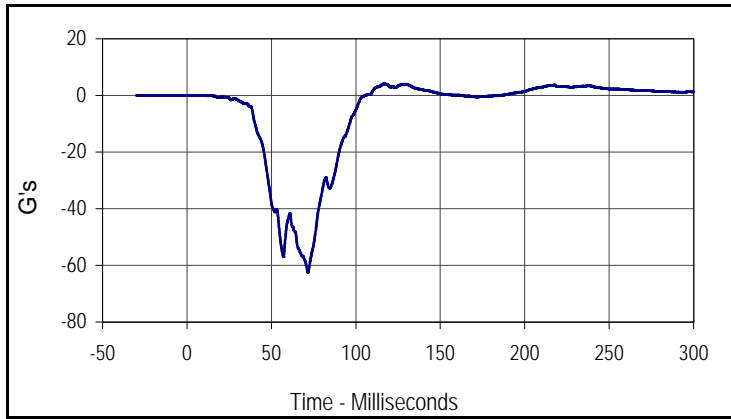
Curve Description			
Driver Upper Neck Moment Z			
CURNO	Type	SAE Class	Units
009	FIL	600	Nm
Max	Time	Min	Time
11.8	193.5	-17.2	84.8



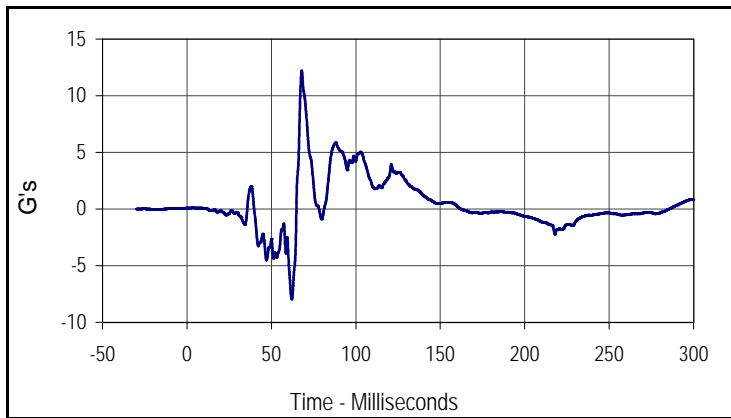
Curve Description			
Driver Upper Neck Moment Resultant			
CURNO	Type	SAE Class	Units
007	RES	600	Nm
Max	Time	Min	Time
131.0	70.1	0.1	19.6

Test Vehicle: 1995 Hyundai Scoupe 2 Door Coupe  
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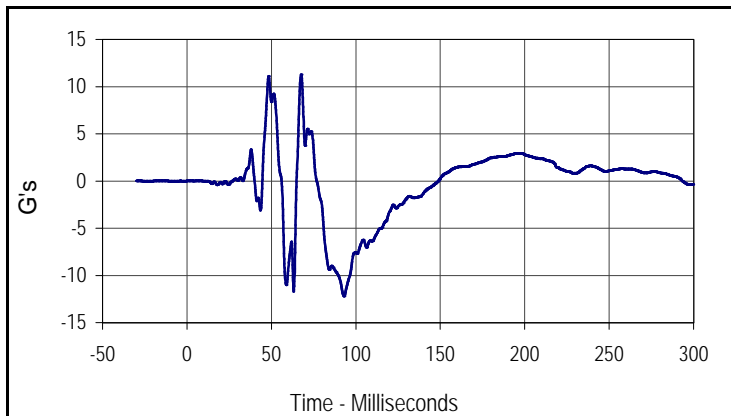
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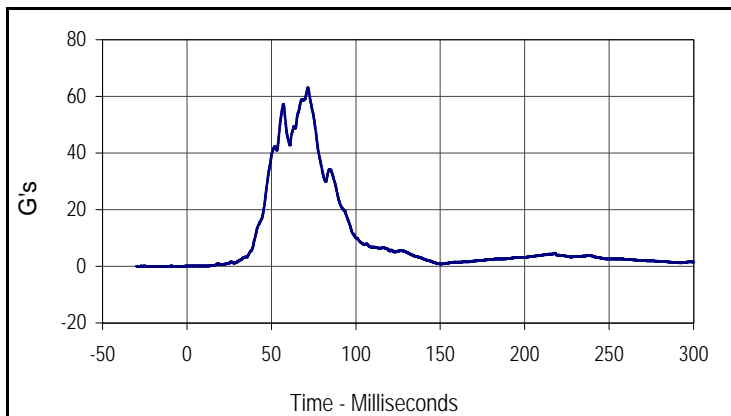
Curve Description			
Driver Chest X			
CURNO	Type	SAE Class	Units
010	FIL	180	G's
Max	Time	Min	Time
4.1	116.6	-62.5	71.6



Curve Description			
Driver Chest Y			
CURNO	Type	SAE Class	Units
011	FIL	180	G's
Max	Time	Min	Time
12.2	68.0	-8.0	62.1



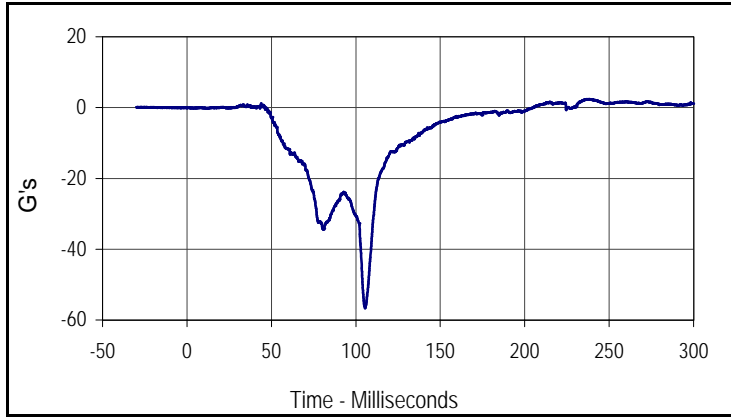
Curve Description			
Driver Chest Z			
CURNO	Type	SAE Class	Units
012	FIL	180	G's
Max	Time	Min	Time
11.3	67.6	-12.2	93.0



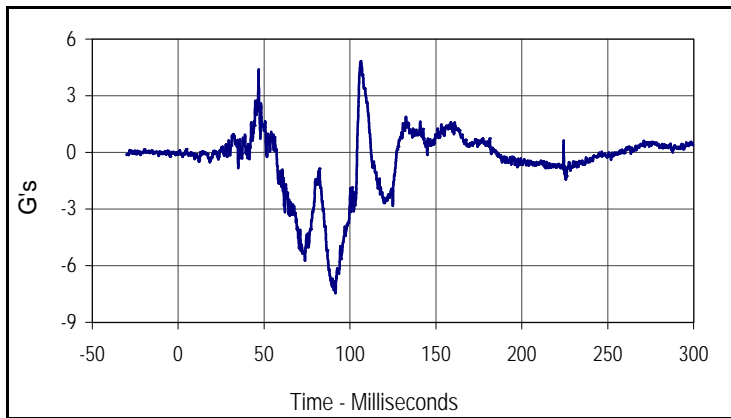
Curve Description			
Driver Chest Resultant			
CURNO	Type	SAE Class	Units
010	RES	180	G's
Max	Time	Min	Time
63.1	71.6	0.1	10.0

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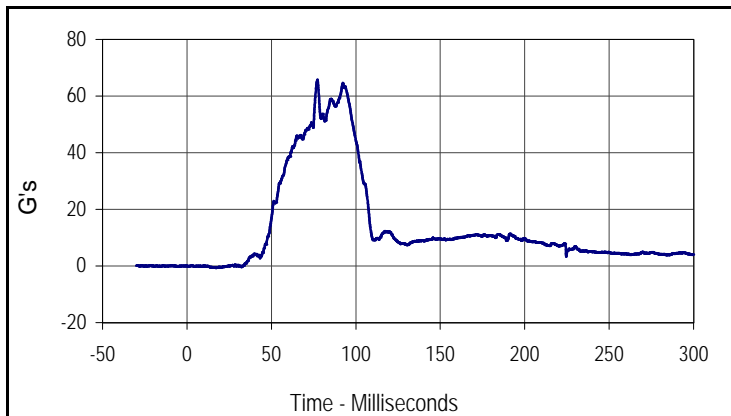
Test Date: 3/31/04  
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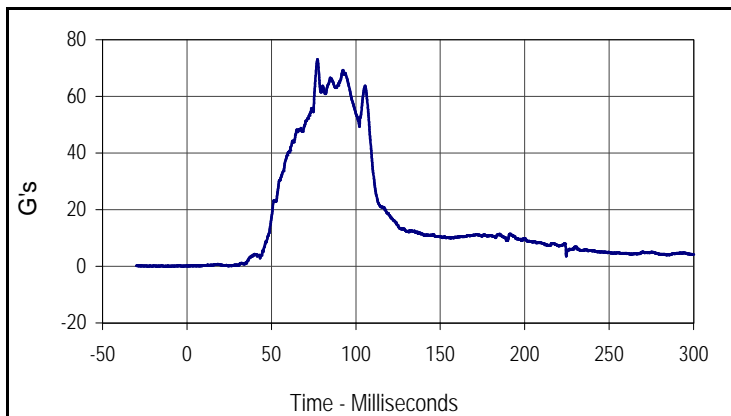
Curve Description			
Left Rear Pass. Head X			
CURNO	Type	SAE Class	Units
013	FIL	1000	G's
Max	Time	Min	Time
2.4	238.1	-56.7	105.4



Curve Description			
Left Rear Pass. Head Y			
CURNO	Type	SAE Class	Units
014	FIL	1000	G's
Max	Time	Min	Time
4.8	106.4	-7.5	91.5



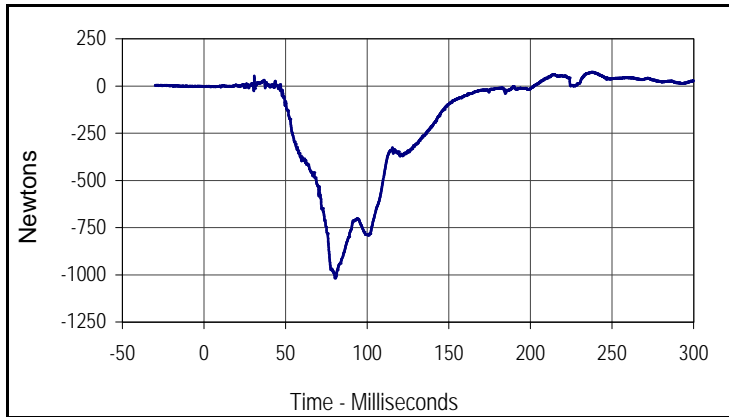
Curve Description			
Left Rear Pass. Head Z			
CURNO	Type	SAE Class	Units
015	FIL	1000	G's
Max	Time	Min	Time
65.7	77.3	-0.7	17.1



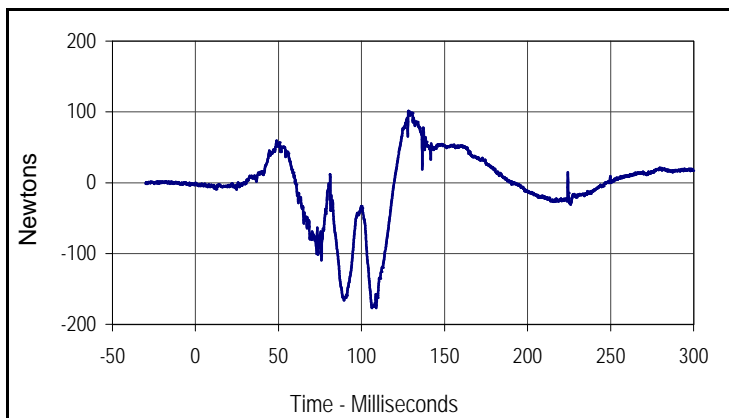
Curve Description			
Left Rear Pass. Head Resultant			
CURNO	Type	SAE Class	Units
013	RES	1000	G's
Max	Time	Min	Time
73.1	77.3	0.1	0.6

Test Vehicle: 1995 Hyundai Scoupe 2 Door Coupe  
 Test Program: Acevedo vs. Hyundai

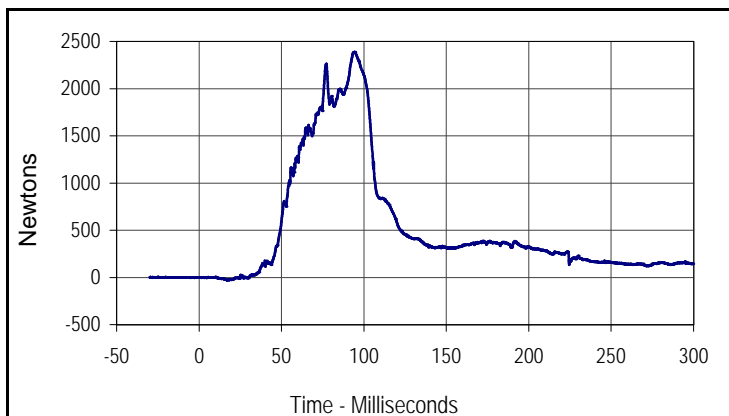
Test Date: 3/31/04  
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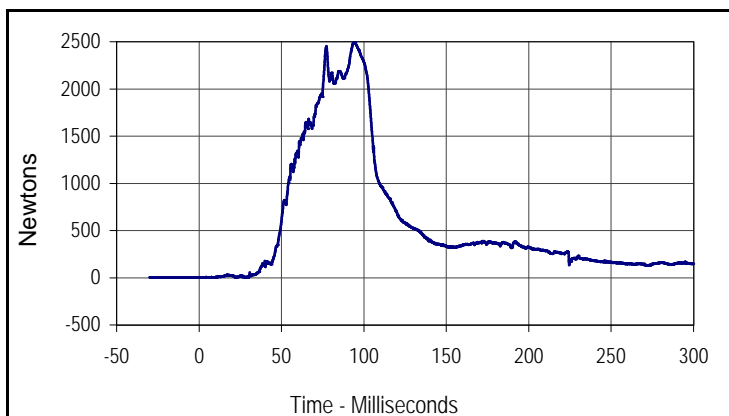
Curve Description			
Left Rear Pass. Upper Neck Force X			
CURNO	Type	SAE Class	Units
016	FIL	1000	Newtons
Max	Time	Min	Time
73.6	237.4	-1017.6	80.2



Curve Description			
Left Rear Pass. Upper Neck Force Y			
CURNO	Type	SAE Class	Units
017	FIL	1000	Newtons
Max	Time	Min	Time
101.6	128.2	-177.0	108.9



Curve Description			
Left Rear Pass. Upper Neck Force Z			
CURNO	Type	SAE Class	Units
018	FIL	1000	Newtons
Max	Time	Min	Time
2387.3	94.3	-31.4	17.0

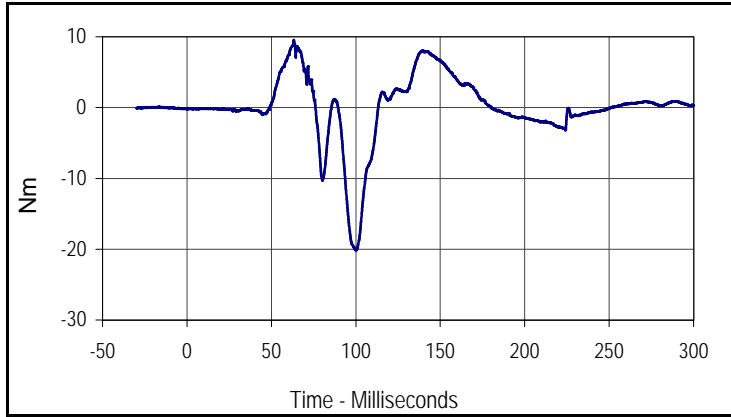


Curve Description			
Left Rear Pass. Upper Neck Force Resultant			
CURNO	Type	SAE Class	Units
016	RES	1000	Newtons
Max	Time	Min	Time
2491.9	94.3	1.7	30.1

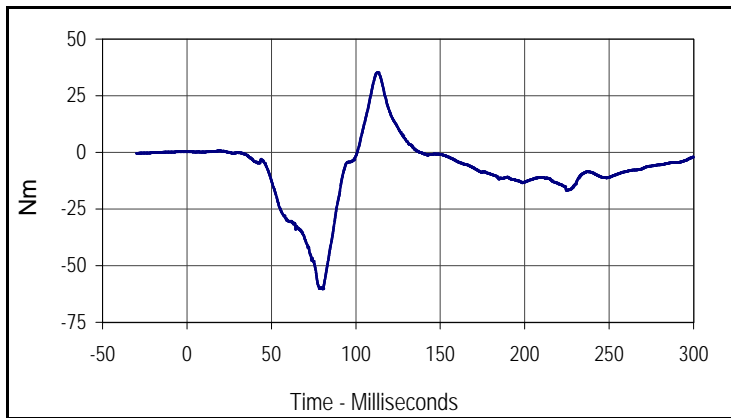


Test Vehicle: 1995 Hyundai Scoupe 2 Door Coupe  
 Test Program: Acevedo vs. Hyundai

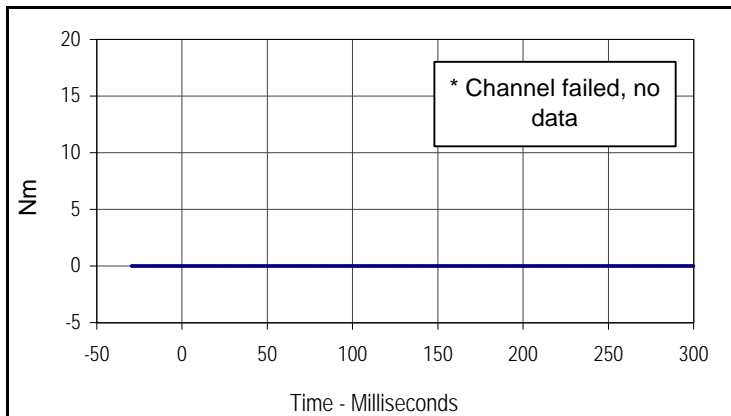
Test Date: 3/31/04  
 Project No.: P24076-01



Curve Description			
Left Rear Pass. Upper Neck Moment X			
CURNO	Type	SAE Class	Units
019	FIL	600	Nm
Max	Time	Min	Time
9.5	63.3	-20.1	100.0

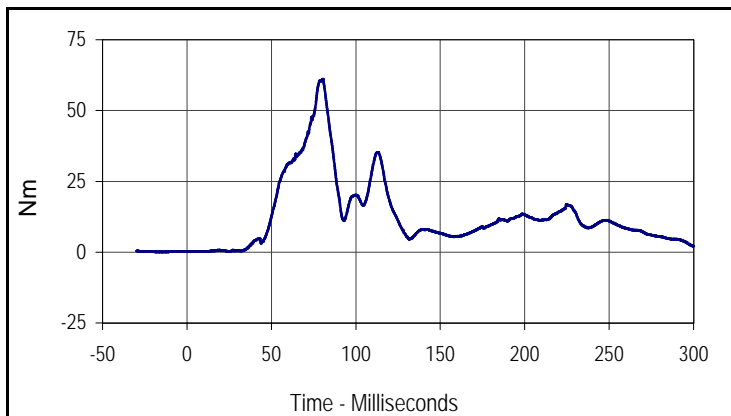


Curve Description			
Left Rear Pass. Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
020	FIL	600	Nm
Max	Time	Min	Time
35.3	113.0	-60.3	80.4



Curve Description			
Left Rear Pass. Upper Neck Moment Z			
CURNO	Type	SAE Class	Units
021	FIL	600	Nm
Max	Time	Min	Time
0.0	0.0	0.0	0.0

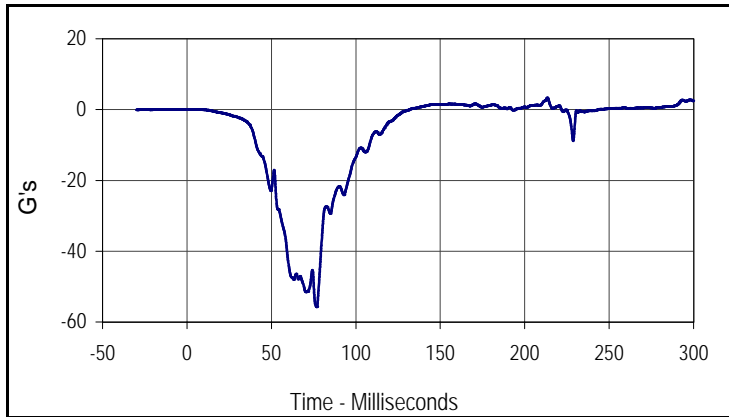
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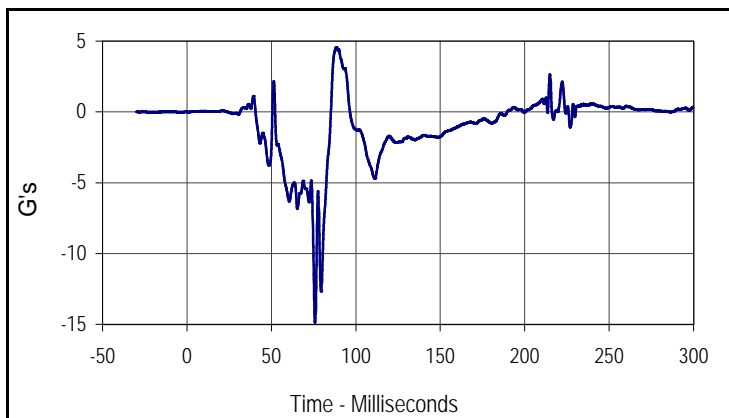
Curve Description			
Left Rear Pass. Upper Neck Moment Resultant			
CURNO	Type	SAE Class	Units
019	RES	600	Nm
Max	Time	Min	Time
61.2	80.4	0.2	10.7

Test Vehicle: 1995 Hyundai Scoupe 2 Door Coupe  
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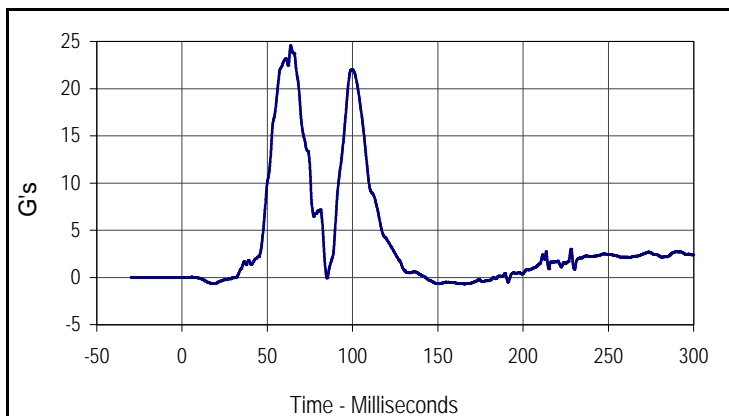
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 Project No.: P24076-01



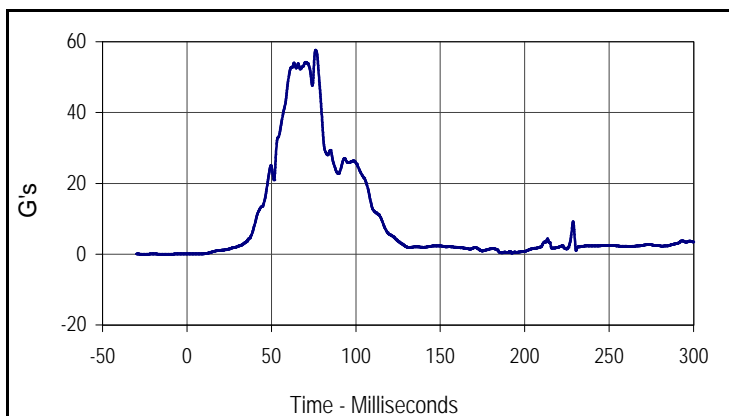
Curve Description			
Left Rear Pass. Chest X			
CURNO	Type	SAE Class	Units
022	FIL	180	G's
Max	Time	Min	Time
3.4	213.5	-55.7	76.8



Curve Description			
Left Rear Pass. Chest Y			
CURNO	Type	SAE Class	Units
023	FIL	180	G's
Max	Time	Min	Time
4.5	88.4	-14.9	75.9



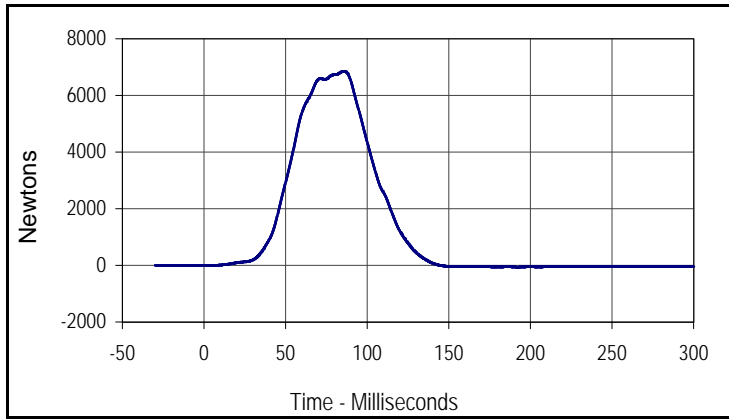
Curve Description			
Left Rear Pass. Chest Z			
CURNO	Type	SAE Class	Units
024	FIL	180	G's
Max	Time	Min	Time
24.6	63.8	-0.7	165.7



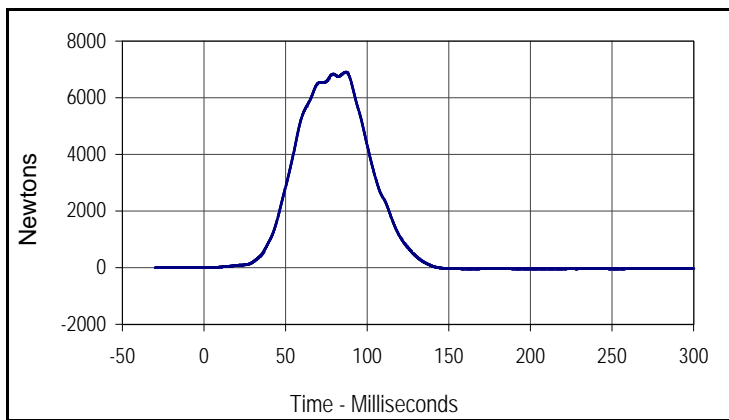
Curve Description			
Left Rear Pass. Chest Resultant			
CURNO	Type	SAE Class	Units
022	RES	180	G's
Max	Time	Min	Time
57.7	76.2	0.0	6.6

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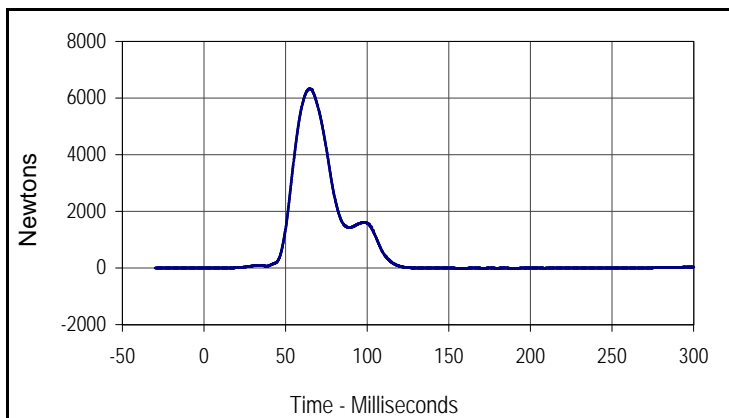
Test Date: 3/31/04  
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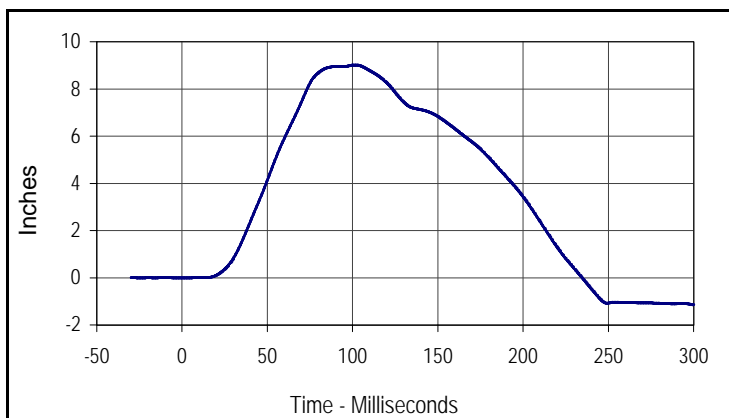
Curve Description			
Left Rear Pass. Shoulder Belt Force Primary			
CURNO	Type	SAE Class	Units
025	FIL	60	Newtons
Max	Time	Min	Time
6850.0	85.6	-62.9	192.0



Curve Description			
Left Rear Pass. Shoulder Belt Force Redundant			
CURNO	Type	SAE Class	Units
026	FIL	60	Newtons
Max	Time	Min	Time
6902.9	86.9	-43.6	218.1



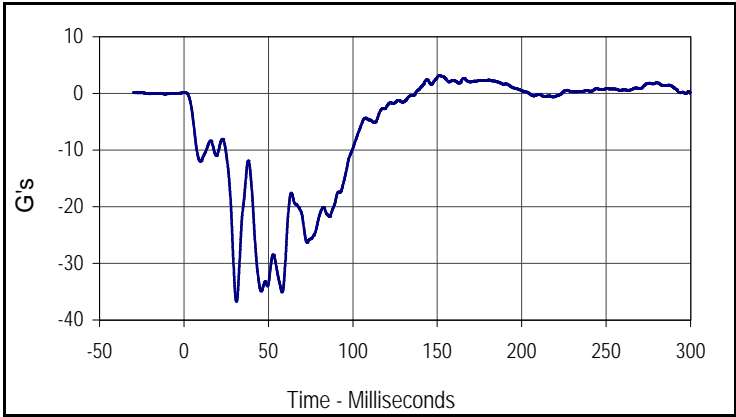
Curve Description			
Left Rear Pass. Lap Belt Force			
CURNO	Type	SAE Class	Units
027	FIL	60	Newtons
Max	Time	Min	Time
6328.3	64.8	-9.0	157.7



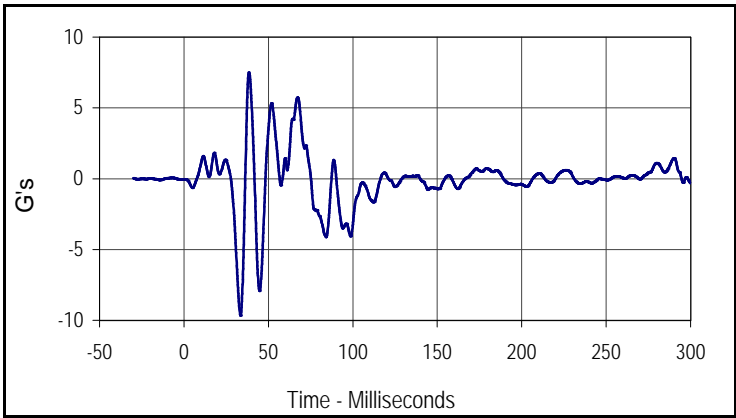
Curve Description			
Left Rear Pass. Shoulder Belt Pullout			
CURNO	Type	SAE Class	Units
028	FIL	60	Inches
Max	Time	Min	Time
9.0	101.3	-1.1	299.3

Test Vehicle: 1995 Hyundai Scoupe 2 Door Coupe  
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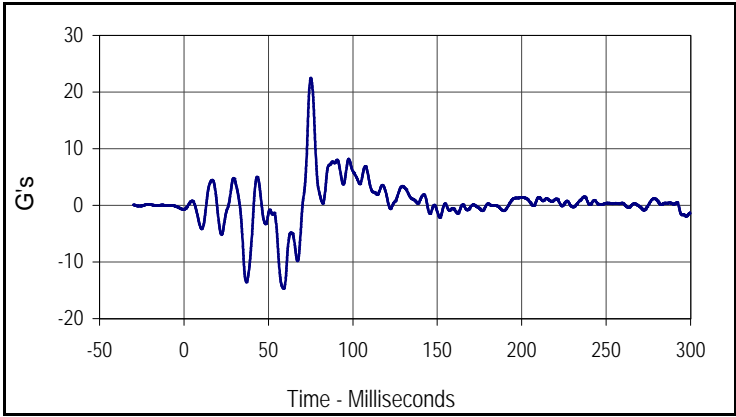
Test Date: 3/31/04  
 Project No.: P24076-01



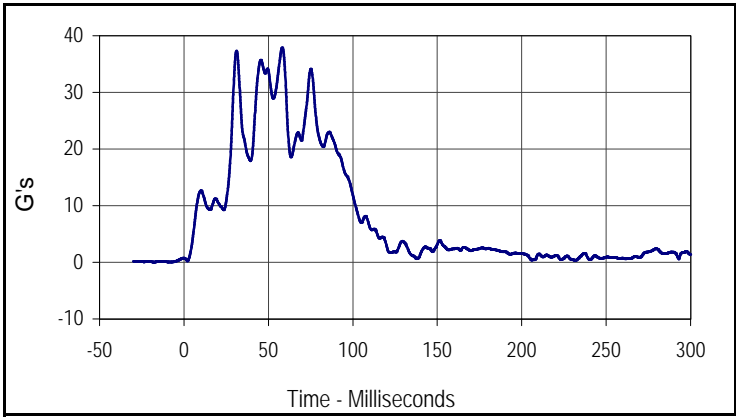
Curve Description			
Vehicle Rear Seat X			
CURNO	Type	SAE Class	Units
29	FIL	60	G's
Max	Time	Min	Time
3.1	151.2	-36.7	31.1



Curve Description			
Vehicle Rear Seat Y			
CURNO	Type	SAE Class	Units
30	FIL	60	G's
Max	Time	Min	Time
7.5	38.5	-9.7	33.5



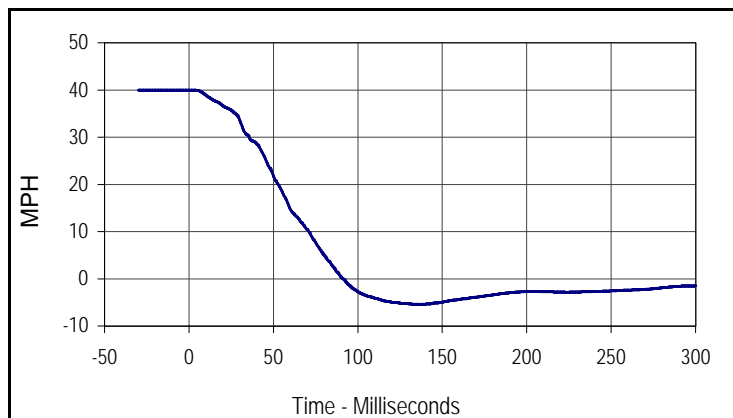
Curve Description			
Vehicle Rear Seat Z			
CURNO	Type	SAE Class	Units
31	FIL	60	G's
Max	Time	Min	Time
22.5	75.1	-14.7	59.0



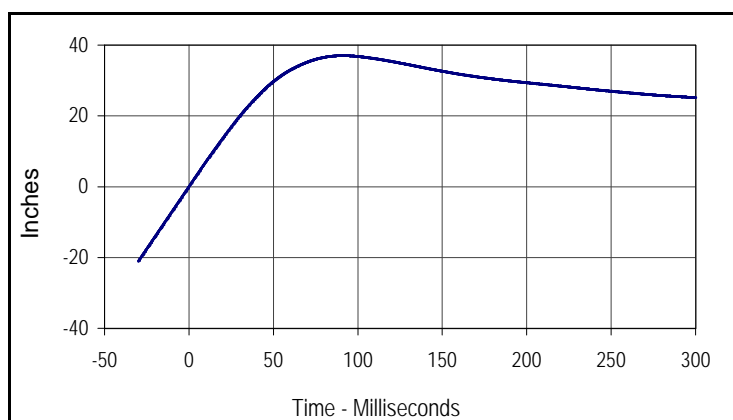
Curve Description			
Vehicle Rear Seat Resultant			
CURNO	Type	SAE Class	Units
29	RES	60	G's
Max	Time	Min	Time
37.9	58.2	0.2	2.1

Test Vehicle: 1995 Hyundai Scoupe 2 Door Coupe  
 Test Program: Acevedo vs. Hyundai

Test Date: 3/31/04  
 Project No.: P24076-01



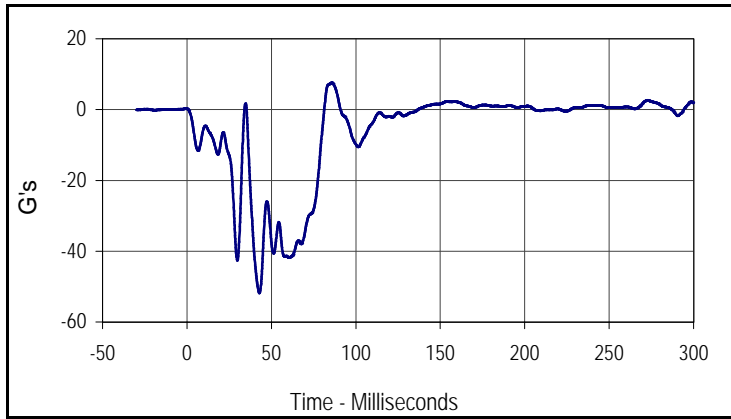
Curve Description			
Vehicle Rear Seat X Velocity			
CURNO	Type	SAE Class	Units
29	IN1	180	MPH
Max	Time	Min	Time
40.0	1.0	-5.4	137.0



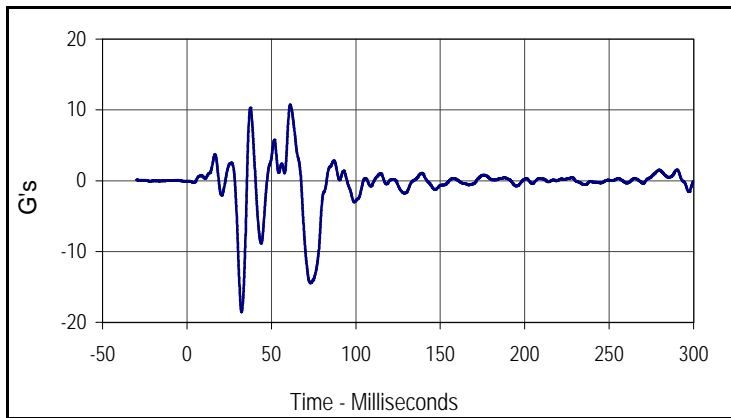
Curve Description			
Vehicle Rear Seat X Displacement			
CURNO	Type	SAE Class	Units
29	IN2	180	Inches
Max	Time	Min	Time
37.0	91.2	0.0	0.0

Test Vehicle: 1995 Hyundai Scoupe 2 Door Coupe  
 Test Program: Acevedo vs. Hyundai

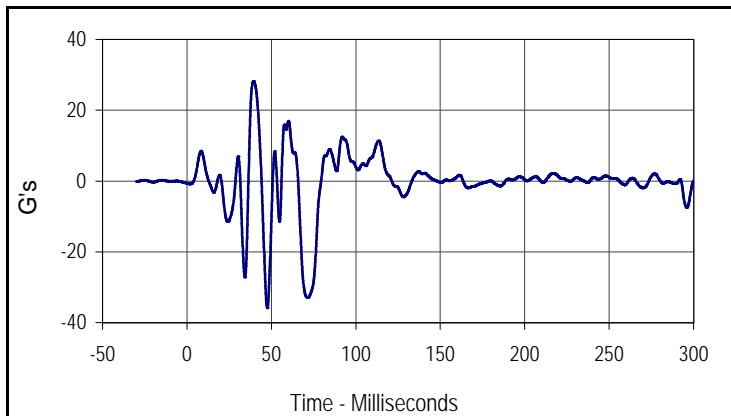
Test Date: 3/31/04  
 Project No.: P24076-01



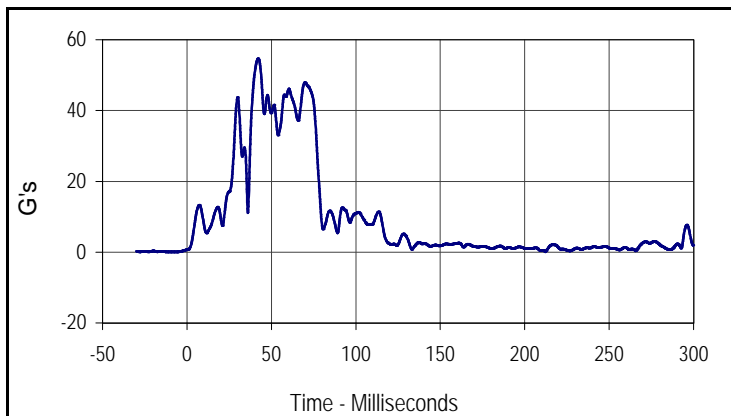
Curve Description			
Vehicle CG X			
CURNO	Type	SAE Class	Units
32	FIL	60	G's
Max	Time	Min	Time
7.6	85.7	-51.8	42.9



Curve Description			
Vehicle CG Y			
CURNO	Type	SAE Class	Units
33	FIL	60	G's
Max	Time	Min	Time
10.7	61.2	-18.5	32.3



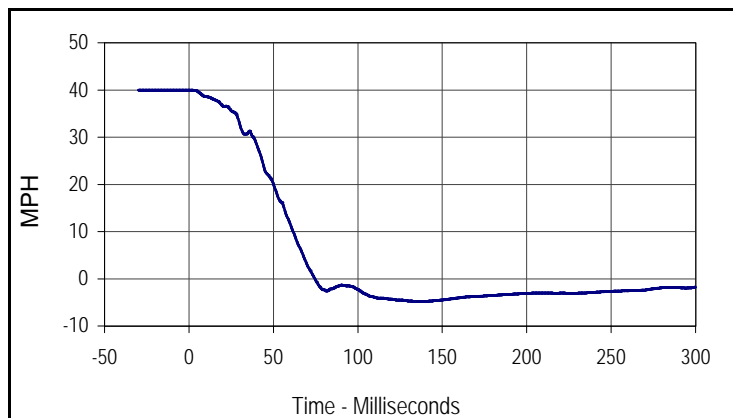
Curve Description			
Vehicle CG Z			
CURNO	Type	SAE Class	Units
34	FIL	60	G's
Max	Time	Min	Time
28.1	39.4	-35.8	47.6



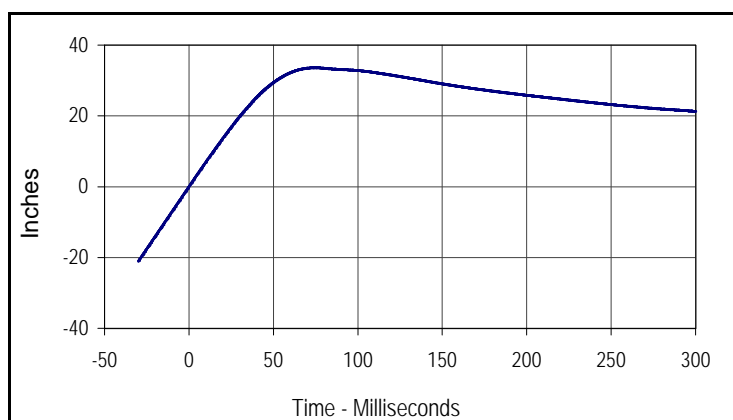
Curve Description			
Vehicle CG Resultant			
CURNO	Type	SAE Class	Units
032	RES	60	G's
Max	Time	Min	Time
54.7	42.3	0.1	212.2

Test Vehicle: 1995 Hyundai Scoupe 2 Door Coupe  
 Test Program: Acevedo vs. Hyundai

Test Date: 3/31/04  
 Project No.: P24076-01



Curve Description			
Vehicle CG X Velocity			
CURNO	Type	SAE Class	Units
32	IN1	180	MPH
Max	Time	Min	Time
39.9	0.0	-4.8	136.1



Curve Description			
Vehicle CG X Displacement			
CURNO	Type	SAE Class	Units
32	IN2	180	Inches
Max	Time	Min	Time
33.6	74.5	0.0	0.0

**Acevedo vs. Hyundai**  
**Instrumentation Data Channel Assignments**  
**Driver A.T.D. Serial Number 002**  
**3/31/04**  
**1995 Hyundai Scoupe 2 Door Coupe**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
1	HEAD, PRIMARY	X	KEAC086X	Accel., 1/2 bridge	Endevco	7264-2000	G
2	HEAD, PRIMARY	Y	KEAC087Y	Accel., 1/2 bridge	Endevco	7264-2000	G
3	HEAD, PRIMARY	Z	KEAC088Z	Accel., 1/2 bridge	Endevco	7264-2000	G
4	NECK FORCE	X	GPUN01FX	Load cell, six axis neck	R.A. Denton	1716A	N
5	NECK FORCE	Y	GPUN01FY	Load cell, six axis neck	R.A. Denton	1716A	N
6	NECK FORCE	Z	GPUN01FZ	Load cell, six axis neck	R.A. Denton	1716A	N
7	NECK MOMENT	X	GPUN01MX	Load cell, six axis neck	R.A. Denton	1716A	Nm
8	NECK MOMENT	Y	GPUN01MY	Load cell, six axis neck	R.A. Denton	1716A	Nm
9	NECK MOMENT	Z	GPUN01MZ	Load cell, six axis neck	R.A. Denton	1716A	Nm
10	CHEST, PRIMARY	X	GPAC035X	Accel., 1/2 bridge	Endevco	7264-2000	G
11	CHEST, PRIMARY	Y	KEAC013Y	Accel., 1/2 bridge	Endevco	7264-2000	G
12	CHEST, PRIMARY	Z	KEAC015Z	Accel., 1/2 bridge	Endevco	7264-2000	G

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**Acevedo vs. Hyundai**  
**Instrumentation Data Channel Assignments**  
**Passenger A.T.D. Serial Number 076**  
**3/31/04**  
**1995 Hyundai Scoupe 2 Door Coupe**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
13	HEAD, PRIMARY	X	KEAC069X	Accel., 1/2 bridge	Endevco	7264-2000	G
14	HEAD, PRIMARY	Y	KEAC080Y	Accel., 1/2 bridge	Endevco	7264-2000	G
15	HEAD, PRIMARY	Z	KEAC082Z	Accel., 1/2 bridge	Endevco	7264-2000	G
16	NECK FORCE	X	5THUNFX	Load cell, six axis neck	R. A. Denton	1716A	N
17	NECK FORCE	Y	5THUNFY	Load cell, six axis neck	R. A. Denton	1716A	N
18	NECK FORCE	Z	5THUNFZ	Load cell, six axis neck	R. A. Denton	1716A	N
19	NECK MOMENT	X	5THUNMX	Load cell, six axis neck	R. A. Denton	1716A	Nm
20	NECK MOMENT	Y	5THUNMY	Load cell, six axis neck	R. A. Denton	1716A	Nm
21	NECK MOMENT	Z	5THUNMZ	Load cell, six axis neck	R. A. Denton	1716A	Nm
22	CHEST, PRIMARY	X	KEAC002X	Accel., 1/2 bridge	Endevco	7264-2000	G
23	CHEST, PRIMARY	Y	KEAC007Y	Accel., 1/2 bridge	Endevco	7264-2000	G
24	CHEST, PRIMARY	Z	KEAC009Z	Accel., 1/2 bridge	Endevco	7264-2000	G
25	SHOULDER BELT FORCE	N/A	BL168	Load cell, Seat belt	FGP	FN4060	N
26	SHOULDER BELT FORCE	N/A	BL169	Load cell, Seat belt	FGP	FN4060	N
27	LAP BELT FORCE	N/A	BL112	Load cell, Seat belt	FGP	FN4060	N
28	SHOULDER BELT SPOOL	N/A	POT1	Pullout pot	Celesco	PTX101-0030	In

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**Acevedo vs. Hyundai  
Instrumentation Data Channel Assignments  
Vehicle Accelerometers  
3/31/04  
1995 Hyundai Scoupe 2 Door Coupe**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
29	REAR SEAT	X	KETX5A	Accel., Vehicle block	I.C. Sensor	3031-200	G
30	REAR SEAT	Y	KETX5B	Accel., Vehicle block	I.C. Sensor	3031-200	G
31	REAR SEAT	Z	KETX5C	Accel., Vehicle block	I.C. Sensor	3031-200	G
32	CG	X	KETX1A	Accel., Vehicle block	I.C. Sensor	3031-200	G
33	CG	Y	KETX1B	Accel., Vehicle block	I.C. Sensor	3031-200	G
34	CG	Z	KETX1C	Accel., Vehicle block	I.C. Sensor	3031-200	G