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REPORT NUMBER: 214-CAL-98-03

**SAFETY COMPLIANCE TESTING FOR FMVSS 214
SIDE IMPACT PROTECTION - PASSENGER CARS**

Toyota Motor Manufacturing
1998 Toyota Camry
4-Door Sedan

NHTSA NUMBER: CW5101

CALSPAN SRL CORPORATION
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October 22, 1997

FINAL REPORT

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Compliance
400 Seventh Street, SW
Room 6115 (NSA-30)
Washington, DC 20590

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16. Abstract A 48/24 kph 90° Impact (Moving Deformable Barrier) Compliance Test was conducted on the subject 1998 Toyota Camry 4-Door Sedan in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-214D-04 to determine FMVSS 214 Side Impact Protection compliance. This test was conducted at the Calspan SRL Corporation Crash Test Facility in Buffalo, New York ,on October 22,1997. The impact velocity of the Moving Deformable Barrier (MDB) was 53.4 kph, and the ambient temperature at the struck side (driver's) of the target vehicle at the time of impact was 21.5°C. The target vehicle post-test maximum crush was 273 mm at level 2. The test or target vehicle's performance is given below: <table border="0"> <thead> <tr> <th></th> <th align="center"><u>Front SID</u></th> <th></th> <th align="center"><u>Rear SID</u></th> <th></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib Acceleration:</td> <td align="center"><u>54</u></td> <td>g's</td> <td align="center"><u>41</u></td> <td>g's</td> </tr> <tr> <td>Left Lower Rib Acceleration:</td> <td align="center"><u>49</u></td> <td>g's*</td> <td align="center"><u>42</u></td> <td>g's</td> </tr> <tr> <td>Lower Spine Acceleration:</td> <td align="center"><u>45</u></td> <td>g's</td> <td align="center"><u>60</u></td> <td>g's</td> </tr> <tr> <td>Thoracic Trauma Index (TTI):</td> <td align="center"><u>49</u></td> <td>g's</td> <td align="center"><u>51</u></td> <td>g's</td> </tr> <tr> <td>Pelvis Acceleration (PEV):</td> <td align="center"><u>77</u></td> <td>g's</td> <td align="center"><u>57</u></td> <td>g's</td> </tr> </tbody> </table> The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event. *Primary left lower rib accelerometer was cut at approximately 30 msec, redundant accelerometer value is shown.					<u>Front SID</u>		<u>Rear SID</u>		Left Upper Rib Acceleration:	<u>54</u>	g's	<u>41</u>	g's	Left Lower Rib Acceleration:	<u>49</u>	g's*	<u>42</u>	g's	Lower Spine Acceleration:	<u>45</u>	g's	<u>60</u>	g's	Thoracic Trauma Index (TTI):	<u>49</u>	g's	<u>51</u>	g's	Pelvis Acceleration (PEV):	<u>77</u>	g's	<u>57</u>	g's
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SECTION 1

PURPOSE AND TEST PROCEDURE

This side impact test is part of the FMVSS 214 Side Impact Protection Compliance Test Program sponsored by the National Highway Safety Administration (NHTSA) under Contract No. DTNH22-97-C-01033. The purpose of this test was to evaluate side impact protection in a 1998 Toyota Camry 4-Door Sedan. The test was conducted in accordance with the Office of Vehicle Safety Compliance's Laboratory Test Procedure (TP-214D-04, dated September 1, 1995).

SECTION 2

SUMMARY OF SIDE IMPACT TEST

A 1998 Toyota Camry 4-Door Sedan was impacted on the left or driver's side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the monorail at a velocity of 53.4 kph (33.2 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Calspan SRL Corporation Transportation Sciences Center in Buffalo, New York on October 22, 1997. Pre- and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the side impact dummies (SIDs) are included in appendix A.

Two restrained Side Impact Dummies (SIDs) were placed in the driver (Pos. #1) and left rear (Pos. #4) designated seating positions according to the instructions specified in the OVSC Side Impact Laboratory Test Procedure (TP-214D-04, dated September 1, 1995). Both SIDs were certified prior to this test. The side impact test was documented by one real-time camera and 9 high-speed cameras. Camera locations and other pertinent camera information are included in this report.

The SIDs were instrumented with the following accelerometers:

1. Left Upper Rib (LUR) uniaxial and redundant accelerometer (Y-direction)
2. Left Lower Rib (LLR) uniaxial and redundant accelerometer (Y-direction)
3. Lower Thoracic Spine (T₁₂) uniaxial and redundant accelerometer (Y-direction)
4. Pelvic (PEV) section uniaxial and redundant accelerometer (Y-direction)

A summary of the side impact dummy (SID) configuration and verification test data can be found in Appendix C. A total of 45 channels of data were recorded. Appendix B contains the vehicle and dummy response data traces. Primary left lower rib accelerometer was cut at approximately 20 msec.

The following table summarizes the results of the test.

Injury Criteria	Front SID	Rear SID
TTI (g)	49	51
PEV (g)	77	57

FMVSS 214D requires that the TTI not exceed 85 g's for 4 door vehicles and not exceed 90 g's for 2 door vehicles. The peak lateral pelvis acceleration shall not exceed 130 g's.

SECTION 3

SUMMARY OF TEST RESULTS

DATA SHEET 1

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1998 Toyota Camry 4-Door Sedan
 Vehicle Body Color: Tan VIN: 4T1BG28K8WU198135
 Vehicle NHTSA No.: CW5101 Month & Year of Manufacture: 8/97
 Engine Data: 4 Cylinders; - CID; 2.2 Liters; - cc
 Engine Placement: - Longitudinal; or x Lateral
 Transmission: 4 Speed; - Manual; x Automatic; x Overdrive
 Final Drive: - Rear Wheel Drive; x Front Wheel Drive; - Four Wheel
 Odometer Reading 35 km
 Options: x A/C; x Power Steering; x Pwr.Brakes; x Pwr. Windows

DATA FROM TIRE PLACARD

Tire Pressure* (at capacity); 210 kPa FRONT
210 kPa REAR

Recommended Tire Size: P195/70R14
 Tires on Test Vehicle: P195/70R14 ; Manufacturer: General

Vehicle Capacity Data:

Number of Occupants: 2 Front; 3 Rear; - 3rd Seat; 5 Total
 Type of Front Seats: x Bucket; - Bench; - Split Bench
 Type of Front Seat Back: - Fixed; x Adjustable with x Lever or - Knob
 Vehicle Max Capacity Loading = 410 kg (A)
 No. of Occupants x 68.04 kg. = 340.2 kg (B)
 Vehicle Cargo Capacity = 69.8 kg (A-B)

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

Left Front	=	<u>440.5</u> kg	Left Rear	=	<u>277.5</u> kg
Right Front	=	<u>430.5</u> kg	Right Rear	=	<u>282</u> kg
TOTAL FRONT	=	<u>871.0</u> kg	TOTAL REAR	=	<u>559.5</u> kg
% of Total Weight	=	<u>60.9</u> %	% of Total Weight	=	<u>39.1</u> %
TOTAL WEIGHT	=	<u>1,430.5</u> kg			

* Tire pressure used in test.

DATA SHEET 1 (continued)

GENERAL TEST VEHICLE PARAMETER DATA

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Max. Fluids	=	<u>1430.5</u>	kg (A)
Maximum Cargo Carrying Capacity of Test Vehicle	=	<u>69.8</u>	kg (B)
Weight of instrumented Side Impact Dummies (1 or 2 X <u>81.2</u> kg)	=	<u>162.4</u>	kg (C)
TEST VEHICLE TARGET WEIGHT:	=	<u>1,662.7</u>	kg (A+B+C)

FULLY LOADED TEST VEHICLE (UDVW + 1 or 2 SID(s) + CARGO):

Left Front	=	<u>485</u>	kg	Left Rear	=	<u>390</u>	kg
Right Front	=	<u>426</u>	kg	Right Rear	=	<u>362</u>	kg
TOTAL FRONT	=	<u>911.0</u>	kg	TOTAL REAR	=	<u>752.0</u>	kg
% of Total Weight	=	<u>54.8</u>	%	% of Total Weight	=	<u>45.2</u>	%
TOTAL TEST WEIGHT	=	<u>1,663.0</u>	kg				

AS TESTED WEIGHT OF TEST VEHICLE (1 OR 2 SID(s) + CARGO + EQUIPMENT & INSTRUMENTATION):

Left Front	=	<u>444</u>	kg	Left Rear	=	<u>350.5</u>	kg
Right Front	=	<u>494</u>	kg	Right Rear	=	<u>366.5</u>	kg
TOTAL FRONT	=	<u>938.0</u>	kg	TOTAL REAR	=	<u>717.0</u>	kg
% of Total Weight	=	<u>56.7</u>	%	% of Total Weight	=	<u>43.3</u>	%
TOTAL TEST WEIGHT	=	<u>1,655.0</u>	kg				

TEST VEHICLE ATTITUDE (all dimensions in millimeters):

AS DELIVERED:

Left Front	<u>696</u>	Right Front	<u>695</u>	Left Rear	<u>687</u>	Right Rear	<u>689</u>
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FULLY LOADED:

Left Front	<u>676</u>	Right Front	<u>690</u>	Left Rear	<u>622</u>	Right Rear	<u>639</u>
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READY FOR TEST:

Left Front	<u>678</u>	Right Front	<u>694</u>	Left Rear	<u>633</u>	Right Rear	<u>645</u>
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Test Vehicle Wheelbase: 2664 millimeters

C.G. = 1,154 millimeters rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side	=	<u>4670</u>	millimeters
Left Side	=	<u>4670</u>	millimeters
Centerline	=	<u>4790</u>	millimeters

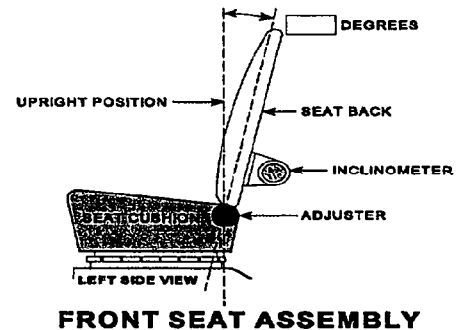
DATA SHEET 1 (continued)

GENERAL TEST VEHICLE PARAMETER DATA

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101

Nominal Design Riding Position for adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable.



FRONT SEAT CUSHION PLACEMENT: Position in detent #9, where the forward most position is detent #1

Total Length of Adjustment Travel: 225 millimeters

Total Number of Adjustment Positions or Detents: 16 detents

FRONT SEAT BACK ADJUSTMENT POSITION: Measured from headrest post

Seat Back Torso Angle: -20 degrees

SECOND POSITION SEAT:

Total Length of Fore/Aft Adjustment Travel: Fixed millimeters

Seat Back Adjustment Position: Fixed

ADJUSTABLE STEERING COLUMN POSITION: Placed in mid-position

WINDOW POSITIONS: Left Front: Closed Left Rear: Closed

Right Front: Open Right Rear: Open

Note: Windows will be in closed position on struck side of test vehicle and in open position on opposite side.

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

70 liters (Fuel Tank Usable Capacity)

65.1 Liters used in test (92% - 94% of Fuel Tank Usable Capacity)

LOCATION OF IMPACT POINT ON TEST VEHICLE SIDE TO BE IMPACTED:

Wheelbase = 2664 millimeters

Impact Point is 392 millimeters rearward of front axle centerline
(which is 940 millimeters forward of the wheelbase midpoint)

Actual Impact Point is 391 millimeters rearward of front axle centerline

DATA SHEET 2

TEST VEHICLE SUMMARY OF RESULTS

VEHICLE IDENTIFICATION:

Vehicle Year/Make/Model: 1998 Toyota Camry

Body Style: 4-Door Sedan

VIN: 4T1BG28K8WU198135

NHTSA No.: CW5101

Test Date: October 22, 1997

Overall Length = 4790 millimeters; Overall Width = 1792 millimeters

VEHICLE TEST WEIGHT (Pre-Test):

Left Front = 444 kg Left Rear = 350.5 kg

Right Front = 494 kg Right Rear = 366.5 kg

TOTAL FRONT = 938.0 kg TOTAL REAR = 717.0 kg

TOTAL VEHICLE WEIGHT 1,655.0 kg

Wheelbase = 2664 millimeters

Longitudinal C.G. from Center of Front Axle = 1,154 millimeters

Impact Angle with Respect to Impactor = 90 degrees

ACTUAL IMPACT POINT

Actual Impact Point is 1 mm fwd of nominal impact ref. line (Lateral)

Actual Impact Point is 3 mm abv nominal impact point (Vertical)

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (240 mm above ground) = 108 millimeters

2. LEVEL 2 (439 mm above ground) = 273 millimeters

3. LEVEL 3 (590 mm above ground) = 258 millimeters

4. LEVEL 4 (836 mm above ground) = 213 millimeters

5. LEVEL 5 (1307 mm above ground) = 130 millimeters

Maximum Post-Test Intrusion = 273 millimeters

OCCUPANTS:

Front Passenger:

Rear Passenger:

Dummy Identification 015

016

Restraints Used 3-point active seat belt

3-point active seat belt

INSTRUMENTATION:

Number of Vehicle Data Channels: = 20

Number of Cameras: Onboard = 3

Offboard = 6

TOTAL = 9

DATA SHEET 3

MOVING DEFORMABLE BARRIER (MDB) SUMMARY

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101

MDB FACE MANUFACTURER AND SERIAL NUMBER:

Plascore Inc. 026B0797-3 064A0697 6566-02

POSITION OF IMPACT (MDB) ON MONORAIL:

Crabbed 27° to left

MDB DETAILS:

Overall Width of Framework Carriage	=	<u>1250</u>	millimeters
Overall Length of MDB (incl. honeycomb impact face)	=	<u>4120</u>	millimeters
Wheelbase of Framework Carriage	=	<u>2590</u>	millimeters
Tread of Framework Carriage (Front & Rear)	=	<u>1875</u>	millimeters
C.G. Location Rearward of Front Axle	=	<u>1104</u>	millimeters

MDB WEIGHT:

Left Front	=	<u>409.5</u>	kg	Left Rear	=	<u>281.5</u>	kg
Right Front	=	<u>372.5</u>	kg	Right Rear	=	<u>299.0</u>	kg
TOTAL FRONT =		<u>782.0</u>	kg	TOTAL REAR =		<u>580.5</u>	kg
TOTAL MDB WEIGHT =		<u>1,362.5</u>	kg				
Impact Angle (MDB C/L to Target Vehicle C/L)	=	<u>90</u>	degrees				
Impact Speed	=	<u>53.4</u>	kph				

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

1. Row A at Center of Bumper Level	=	<u>123</u>	millimeters
2. Row B at Top of Bumper Level	=	<u>43</u>	millimeters
3. Row C at Mid Level	=	<u>104</u>	millimeters
4. Row D at Top of Stack Level	=	<u>121</u>	millimeters

INSTRUMENTATION:

Number of MDB Data Channels	=	<u>5</u>
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DATA SHEET 4

POST-TEST OBSERVATIONS

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101

VISIBLE DUMMY CONTACT POINTS:

LEFT FRONT SID

Head: Back of head to headrest
Upper Torso: Shoulder to upper rear portion of door trim panel above arm rest
Lower Torso: Left side of pelvis to rear portion of door located on the lower door trim panel
Left Knee: Knee into door panel forward of arm rest
Right Knee: Left Knee

LEFT REAR SID

Side of head to C-pillar
Shoulder to upper rear portion of door trim panel above arm rest
Left side of pelvis to left seat bolster
Knee into door panel forward of arm rest
Left Knee

DOOR OPENING:

LEFT DOOR

Front: Closed/Inoperable
Rear: Closed/Inoperable

RIGHT DOOR

Closed/Operable
Closed/Operable

MDB DISTANCE FROM TARGET IMPACT POINT:

Vertical: 1 mm forward
Horizontal: 3 mm up

ARM REST LOCATIONS:

Front: 243 mm below bottom of window
Rear: 248 mm below bottom of window

SEAT MOVEMENT:

Front: Driver seat was pushed inboard against center console
Rear: Left seat bolster was pushed inboard

GLAZING DAMAGE:

Windshield: Windshield cracked in front of driver position
Window: Left side front and rear door windows shattered at impact

PILLAR PERFORMANCE:

No visible tears

SILL SEPARATION:

No visible sill separation

OTHER NOTABLE IMPACT EFFECTS:

Driver left side airbag deployed
Front driver and passenger airbags did not deploy

SECTION 4

OCCUPANT AND VEHICLE INFORMATION

DATA SHEET 5

SID INSTRUMENTATION DATA

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101

	Front Dummy ID# 015				Rear Dummy ID# 016			
	Pos. Direction		Neg. Direction		Pos. Direction		Neg. Direction	
	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
RIB ACCELERATIONS:								
Upper Rib Lateral . . Y	53.6	38.1	-6.0	95.0	41.4	43.1	-4.5	162.5
Upper Rib Lateral . . Y(R)	53.7	38.1	-5.4	96.2	43.9	43.1	-5.63	78.1
Lower Rib Lateral . . Y	*	*	*	*	42.2	43.7	-7.3	79.4
Lower Rib Lateral . . Y(R)	48.8	37.5	-8.5	92.5	45.7	43.1	-9.6	78.7
SPINE ACCELERATIONS:								
Lower Lateral Y	44.5	41.2	-6.1	83.7	60.2	51.9	-12.3	71.9
Lower Lateral Y(R)	46.1	41.2	-5.4	83.7	58.9	51.9	-13.5	71.9
PELVIC ACCELERATIONS:								
Lateral Y	77.0	30.6	-15.4	53.7	57.3	41.2	-4.7	76.9
Lateral Y(R)	76.2	30.6	-15.6	53.7	57.0	41.2	-5.2	121.2

REFERENCE: Positive Direction - Longitudinal (X) = forward
 Lateral (Y) = to right
 Vertical (Z) = up
 Negative Direction - Longitudinal (X) = rearward
 Lateral (Y) = to left
 Vertical (Z) = down

Note: Above data has been FIR filtered, Y(R) denotes redundant Y direction accelerometer.

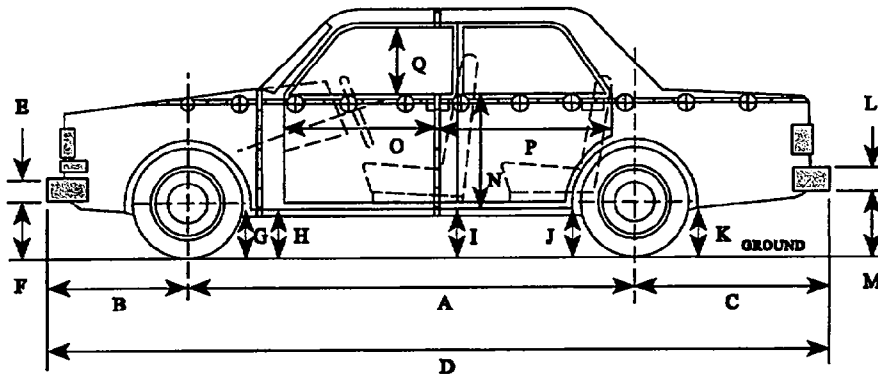
* Front dummy Lower Rib accelerometer wiring was damaged during impact.

DATA SHEET 6

VEHICLE SIDE MEASUREMENTS

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101



LEFT SIDE VIEW

NOTE: all dimensions are in millimeters with tolerance of ± 3 mm

	PRE-TEST (as delivered)	PRE-TEST (as tested)	POST-TEST (as tested)	Δ CHANGE
A	2664	-	2630	-34
B	980	-	970	-10
C	1150	-	1160	10
D	4790	-	4780	-10
E	580	-	590	10
F	280	255	285	30
G	190	170	210	40
H	190	170	210	40
I	205	165	210	45
J1	205	160	200	40
J2	295	265	285	20
K	310	260	305	45
L	630	-	615	-15
M	340	280	325	45
N	617	-	540	-77
O	717	-	705	-12
P	1377	-	1325	-52
Q	467	-	460	-7
R	4670	-	4695	25
S	4670	-	4675	5
T	1792	-	1620	-172

D = Length at Centerline
T = Width at B-Pillar

E&L = Bumper Thickness
J1 = To Pinch Weld

R = Right Side Length
J2 = To Sill

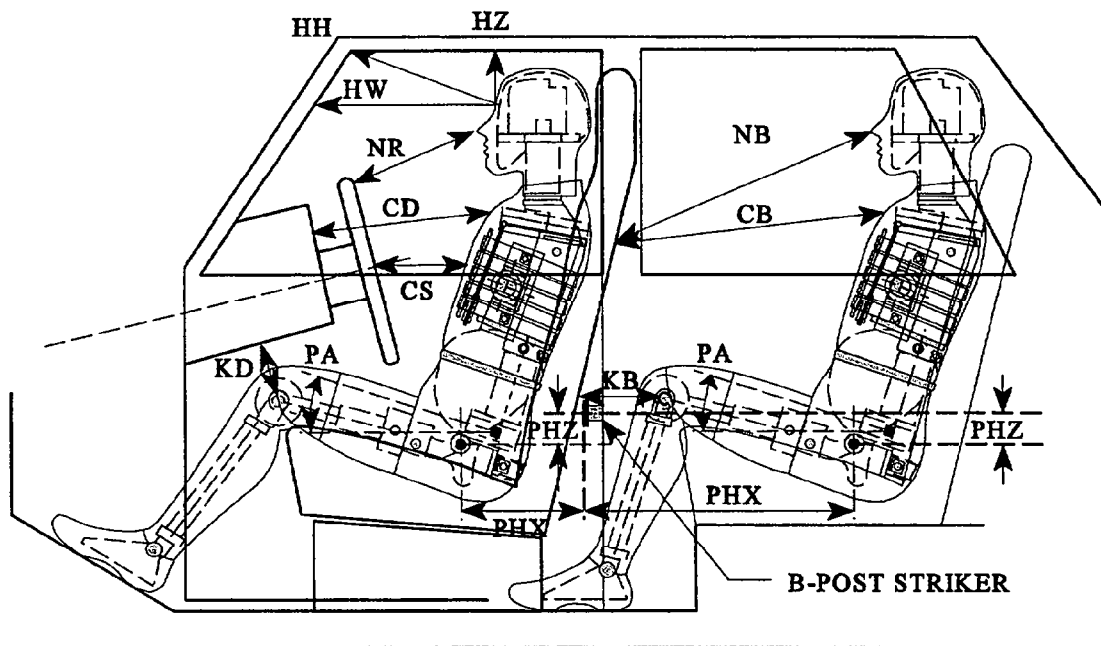
S = Left Side Length

DATA SHEET 7

SID LONGITUDINAL CLEARANCE DIMENSIONS

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101



LEFT SIDE VIEW

NOTE: 2-DOOR VEHICLE SHOWN.
REAR DUMMY PHX & PHZ
MEASUREMENTS FOR A 4-DOOR
VEHICLE WOULD USE THE C-POST
STRIKER AS A REFERENCE POINT

NOTE: All dimensions are in millimeters with tolerance of ± 3 mm

	DRIVER ID# 015	LEFT REAR PASS. ID# 016
HH	409	N/A
HW	646	N/A
HZ	181	148
NR/NB	467	656
CD/CB	584	555
CS	308	N/A
KDL(KDA°)/KBL(KDA°)	184 / (56 °)	237 / (20 °)
KDR(KBA°)/KBR(KBA°)	121 / (21 °)	232 / (20 °)
PA°	25 °	25 °
PHX	190	732
PHZ	136	316

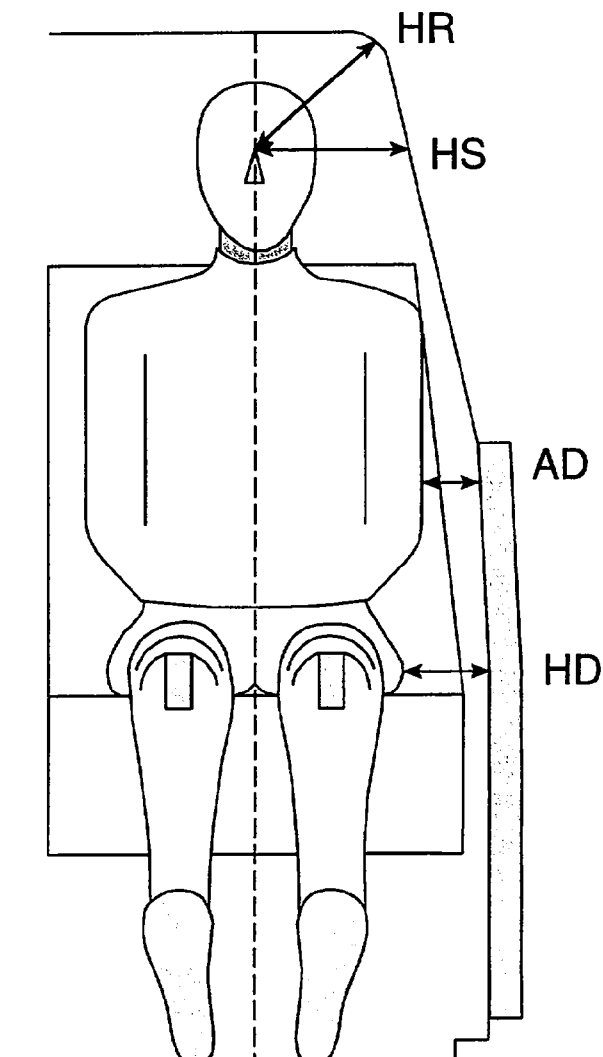
Note: 2-door vehicle shown. Rear dummy PHX & PHZ measurements for 4-door vehicle would use the C-post striker as a reference point.

DATA SHEET 8

SID LATERAL CLEARANCE DIMENSIONS

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101



NOTE: All dimensions are in millimeters with tolerance of ± 3 mm

	DRIVER ID # 015		LEFT REAR PASS. ID # 016	
HR	253		187	
HS	303		214	
AD*	LOWER: 114	UPPER: 127	LOWER: 104	UPPER: 112
HD	159		168	

* Lower measurement is taken laterally at center of the lower rib accelerometer height from the SID arm segment to the closet part of the vehicle side.

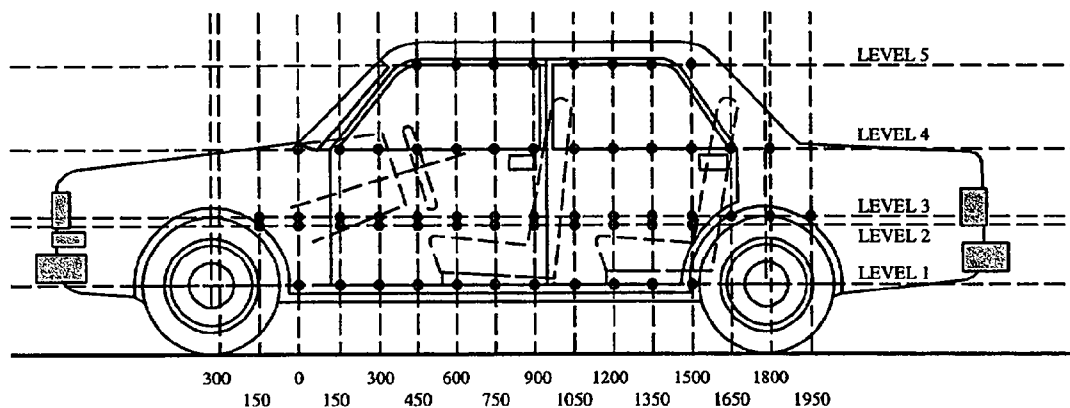
Upper measurement is taken laterally at center of the upper rib accelerometer height from the SID arm segment to the closet part of the vehicle side.

DATA SHEET 9

VEHICLE SIDE MEASUREMENTS

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101



LEFT SIDE VIEW

NOTE: All measurements are in millimeters (mm)

- LEVEL 5 - WINDOW TOP
- LEVEL 4 - WINDOW SILL
- LEVEL 3 - MID-DOOR
- LEVEL 2 - OCCUPANT H-POINT
- LEVEL 1 - AXLE CENTERLINE HEIGHT OR SILL TOP HEIGHT

MEASUREMENTS ARE TAKEN WHEN THE VEHICLE IS IN THE "AS TESTED" CONFIGURATION.
Measurements Along the Vertical 750 mm Line Shown Above:

Level 5 @ Window Top	=	<u>1307</u>	millimeters
Level 4 @ Window Sill	=	<u>836</u>	millimeters
Level 3 @ Mid Door	=	<u>590</u>	millimeters
Level 2 @ Occupant H-Point	=	<u>439</u>	millimeters
Level 1 @ Axle Centerline Height (or Sill Top Height)	=	<u>240</u>	millimeters

DATA SHEET 10

VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101

NOTE: All dimensions are in millimeters with a tolerance of ± 3 mm

		DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT																											
LEVEL	HEIGHT T (mm)	-900	-750	-600	-450	-300	-150	0	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700	2850	3000	
LEVEL 1 SIDE SILL	240	PRE	-	-	-	-	-	-	199	197	195	193	192	194	193	193	190	190	192	188	-	-	-	-	-	-	-	-	
		POST	-	-	-	-	-	-	271	271	279	287	292	294	298	301	289	257	238	201	-	-	-	-	-	-	-		
		CRUSH	N/A	N/A	N/A	N/A	N/A	N/A	72	74	85	93	101	100	104	108	99	67	46	14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
LEVEL 2 H POINT	439	PRE	178	155	-	-	-	148	143	142	138	138	136	137	140	136	134	133	137	133	-	-	-	-	-	152	175	190	
		POST	137	120	-	-	-	-	172	342	372	378	387	396	405	413	407	396	367	338	270	-	-	-	-	167	179	199	
		CRUSH	41	35	N/A	N/A	N/A	N/A	25	199	230	239	249	261	267	273	271	262	234	201	138	N/A	N/A	N/A	N/A	N/A	15	5	9
LEVEL 3 MID DOOR	590	PRE	-	177	-	-	-	137	130	128	129	127	128	126	124	124	127	123	124	126	128	124	-	-	143	160	177	201	
		POST	-	141	-	-	-	-	180	294	317	342	350	362	364	372	370	367	363	381	323	210	152	-	154	167	190	210	
		CRUSH	N/A	36	N/A	N/A	N/A	N/A	44	163	189	213	223	234	238	248	245	240	239	258	197	81	28	N/A	N/A	11	7	12	9
LEVEL 4 WINDOW SILL	836	PRE	-	-	-	-	232	213	204	191	188	181	179	176	172	171	172	167	165	164	164	166	170	180	188	207	227	255	
		POST	-	-	-	-	217	200	185	228	277	305	322	326	342	351	362	364	367	377	326	246	188	196	203	221	237	262	
		CRUSH	N/A	N/A	N/A	N/A	-15	-13	37	89	124	143	150	170	179	190	197	200	213	162	82	22	18	16	16	14	10	7	
LEVEL 5 WINDOW TOP	1307	PRE	-	-	-	-	-	-	-	-	-	-	-	423	422	420	419	422	426	429	473	-	-	-	-	-	-	-	
		POST	-	-	-	-	-	-	-	-	-	-	-	-	292	305	323	413	393	374	357	476	-	-	-	-	-	-	
		CRUSH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-130	-117	-97	-6	-29	-52	-72	3	N/A	N/A	N/A	N/A	N/A	N/A

DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

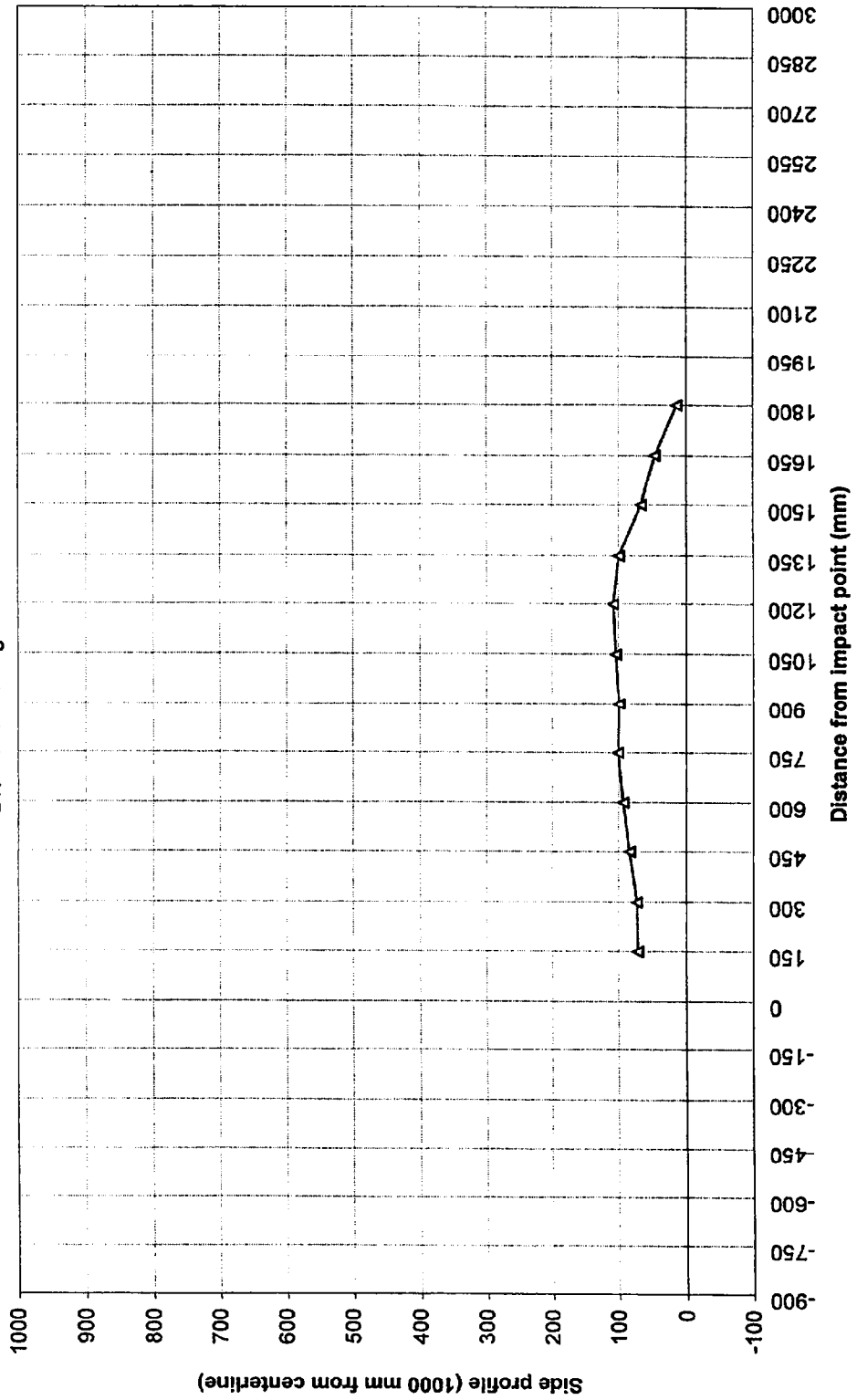
Vehicle: 1998 Toyota Camry

NHTSA No. CW5101

SIDE PROFILE LEVEL 1

240 mm above ground

—△— CRUSH



DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

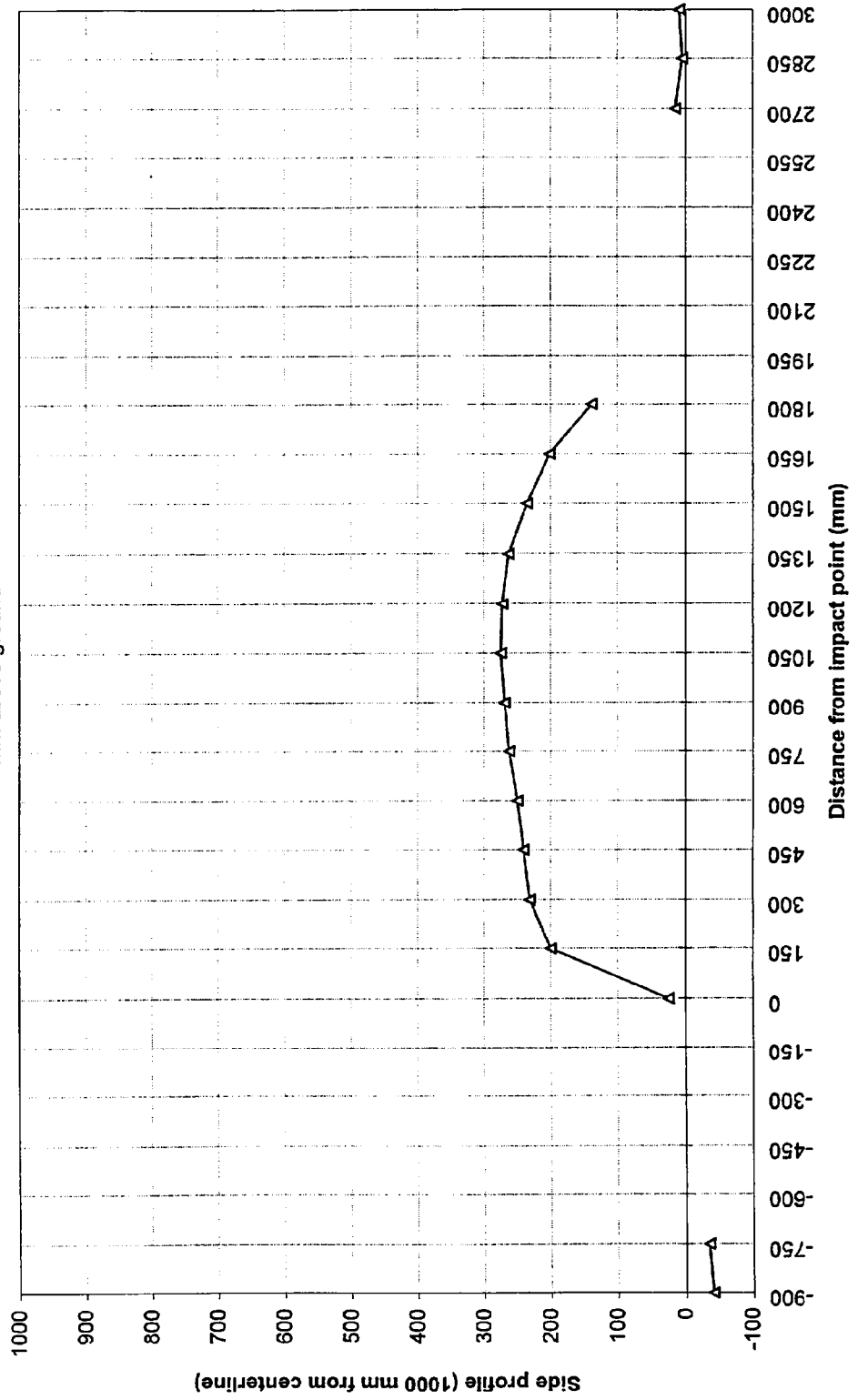
Vehicle: 1998 Toyota Camry

NHTSA No. CW5101

SIDE PROFILE LEVEL 2

439 mm above ground

—△— CRUSH



DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

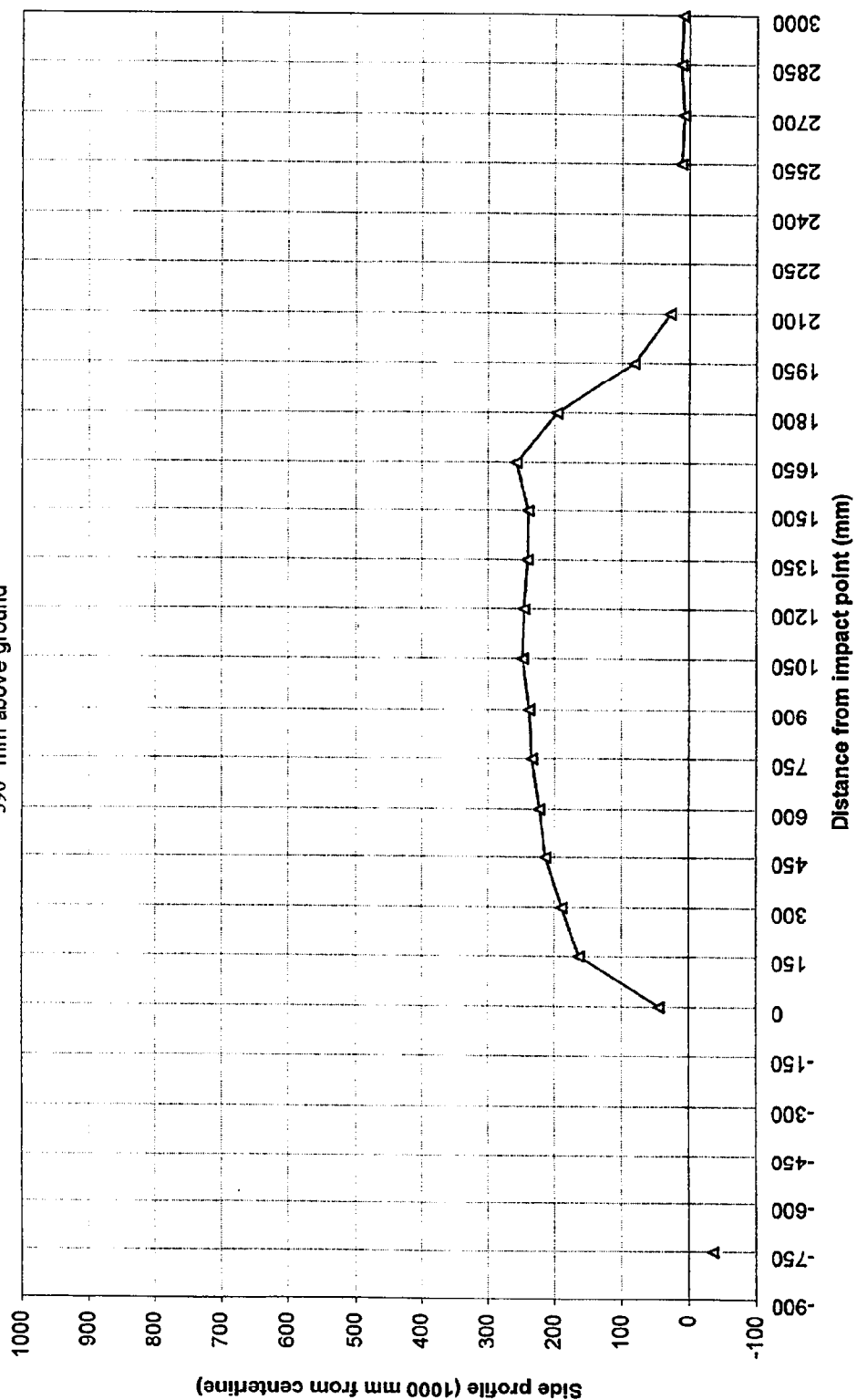
Vehicle: 1998 Toyota Camry

NHTSA No. CW5101

SIDE PROFILE LEVEL 3

590 mm above ground

—△— CRUSH



DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

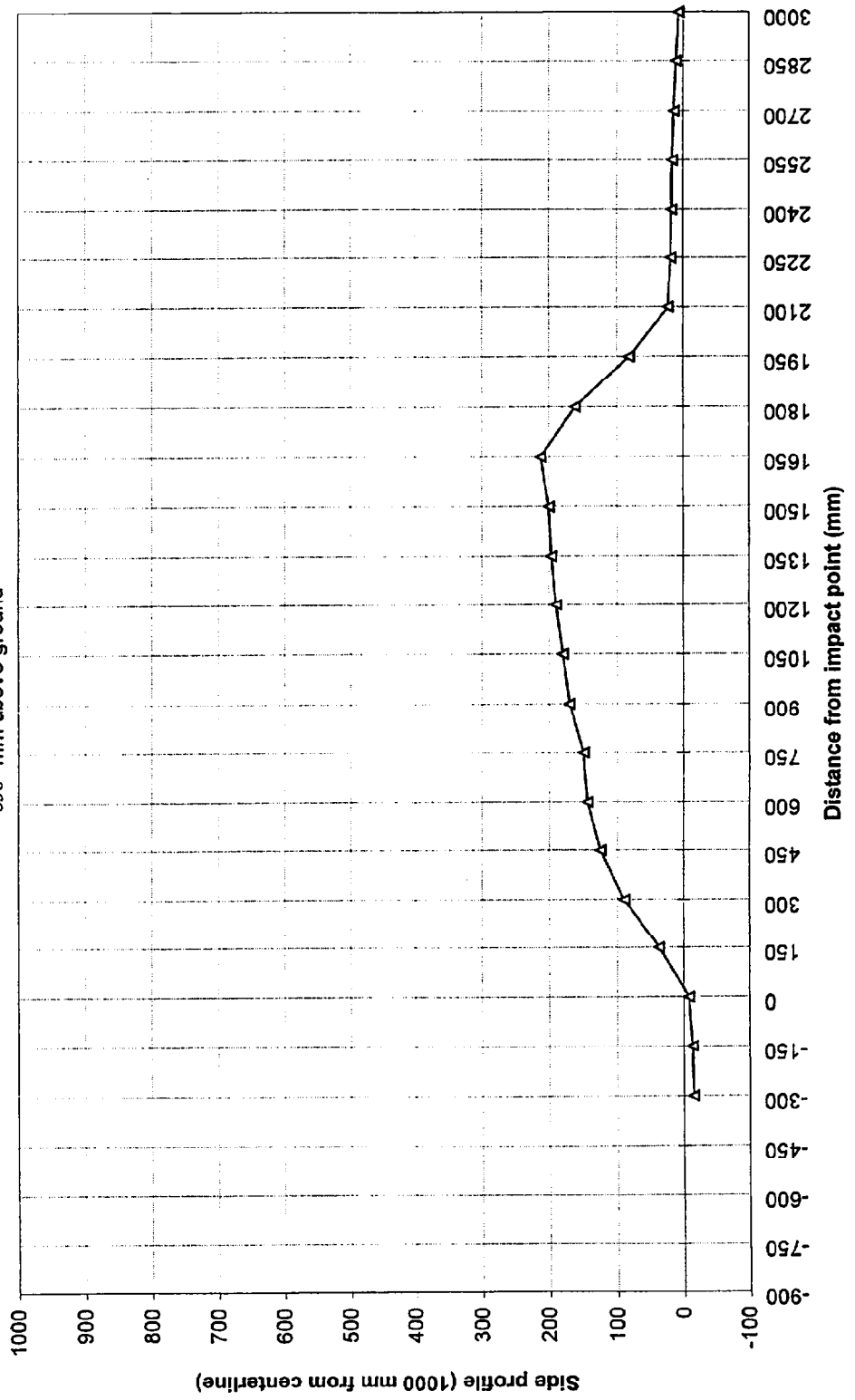
Vehicle: 1998 Toyota Camry

NHTSA No. CW5101

SIDE PROFILE LEVEL 4

836 mm above ground

—▲— CRUSH



DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

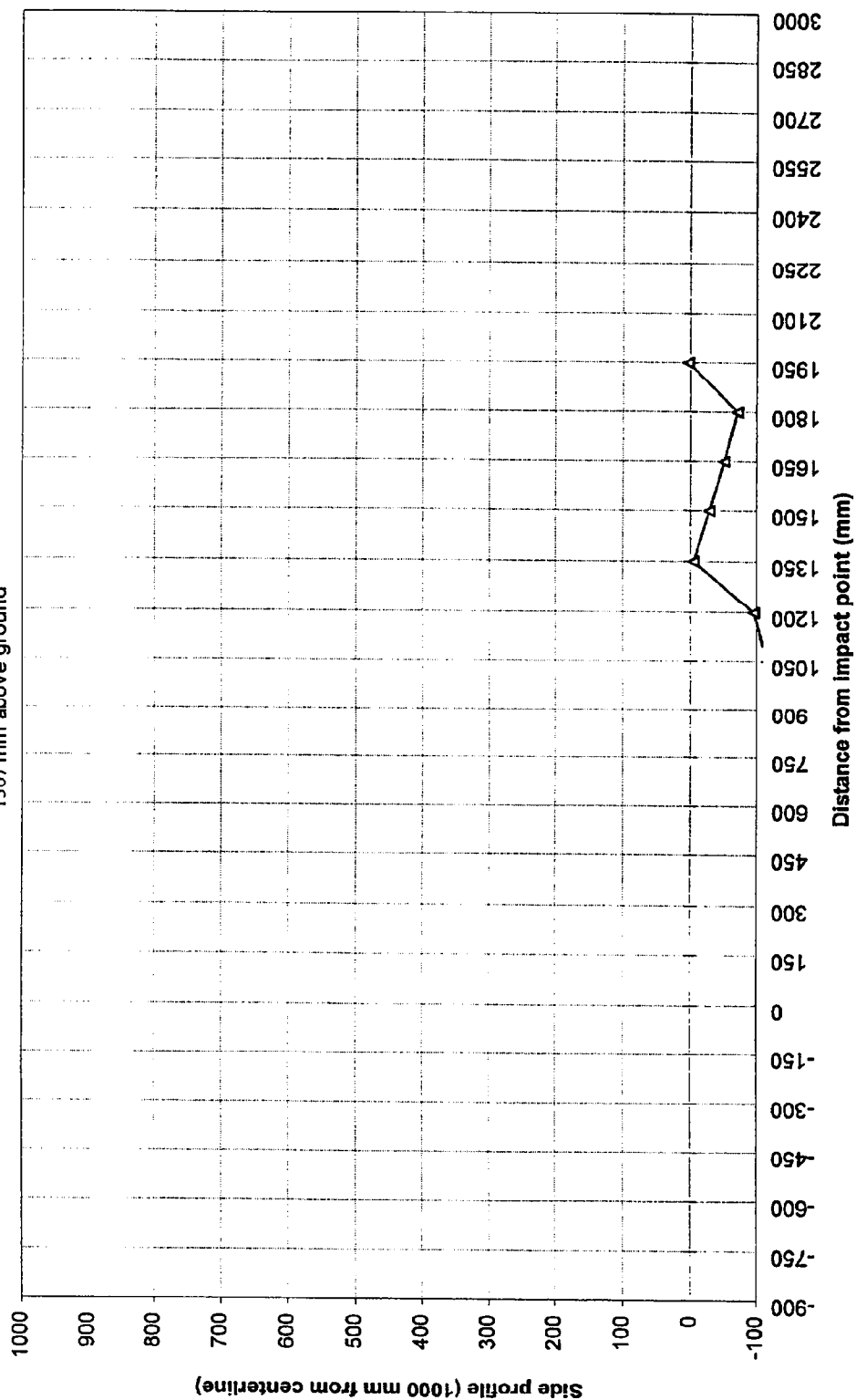
Vehicle: 1998 Toyota Camry

NHTSA No. CW5101

SIDE PROFILE LEVEL 5

—A— CRUSH

1307 mm above ground

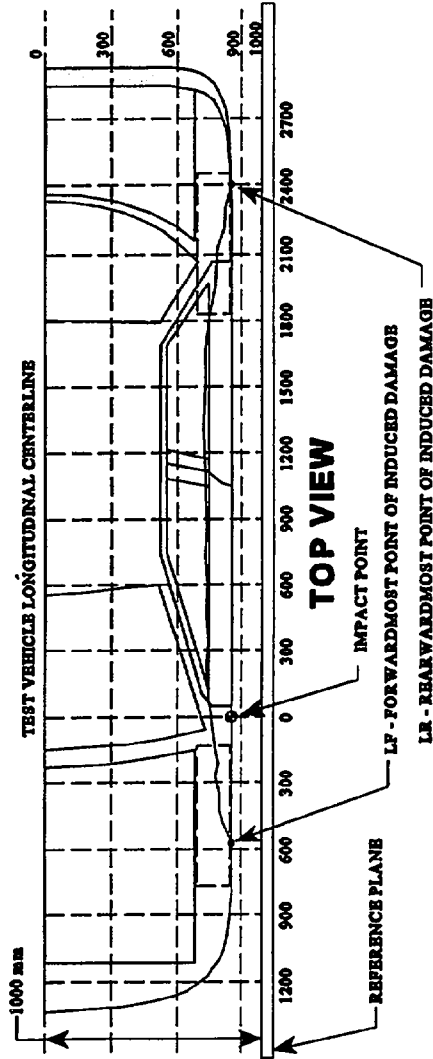


DATA SHEET 11

VEHICLE DAMAGE PROFILE DISTANCES

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101



MEASUREMENT CONVENTIONS:
 Forward of the impact point (toward front of vehicle) is considered negative (-).
 Rearward of the impact point (toward rear of vehicle) is considered positive (+).

NOTE: All dimensions are in millimeters with tolerance of ± 3 mm.

DPD MEASUREMENTS		POST TEST (mm)	PRETEST (mm)	STATIC CRUSH (mm)
1	(LF = 0 mm)	172	148	24
2	570	385	138	247
3	1140	409	137	272
4	1710	311	135	176
5	2280	190	172	18
6	(LR = 2850 mm)	179	175	4

DATA SHEET 12

EXTERIOR STATIC CRUSH FOR IMPACTOR FACE (Grid as looking at MDB from front)

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101

NOTE: All dimensions are in millimeters with a tolerance of ± 3 mm

		TOTAL BALL CENTER IS AT 0.000 INCHES WITH A TOLERANCE OF ± 0.001 INCH																
		DISTANCE RIGHT OF CENTER (mm)								DISTANCE LEFT OF CENTER (mm)								
LEVEL	HEIGHT AT CL (mm)*	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
LEVEL 4	PRE	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619
TOP	POST	637	608	608	611	612	612	613	614	617	618	619	622	628	646	672	697	739
STACK	CRUSH	19	-10	-11	-8	-6	-7	-5	-4	-1	-1	0	3	9	28	54	78	121
LEVEL 3	PRE	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619
MID	POST	623	609	611	611	612	617	616	613	615	619	618	623	623	629	642	685	722
LEVEL	CRUSH	5	-9	-7	-8	-6	-1	-3	-5	-3	0	-1	4	4	10	24	66	104
LEVEL 2	PRE	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619
TOP	POST	646	634	623	615	613	614	615	620	621	622	627	627	628	636	639	651	682
BUMPER	CRUSH	27	16	5	-4	-6	-4	-3	1	3	3	8	8	10	18	21	33	43
LEVEL 1	PRE	535	519	518	518	518	518	518	518	518	518	518	518	518	518	518	519	535
MID	POST	658	603	580	564	565	561	556	556	556	556	556	559	561	566	570	588	606
BUMPER	CRUSH	123	84	62	46	47	43	38	38	38	37	38	41	43	48	52	68	72

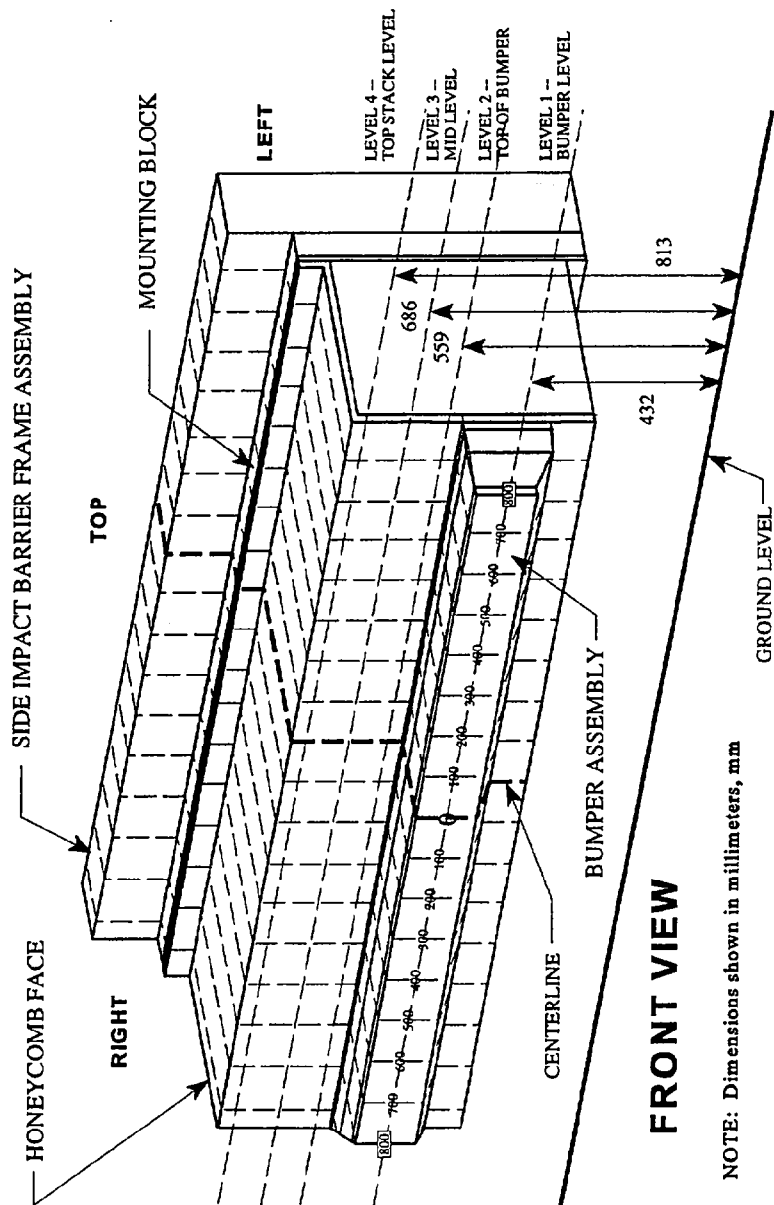
*Heights measured above ground level.

DATA SHEET 12 (continued)

EXTERIOR STATIC CRUSH FOR IMPACTOR FACE

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101

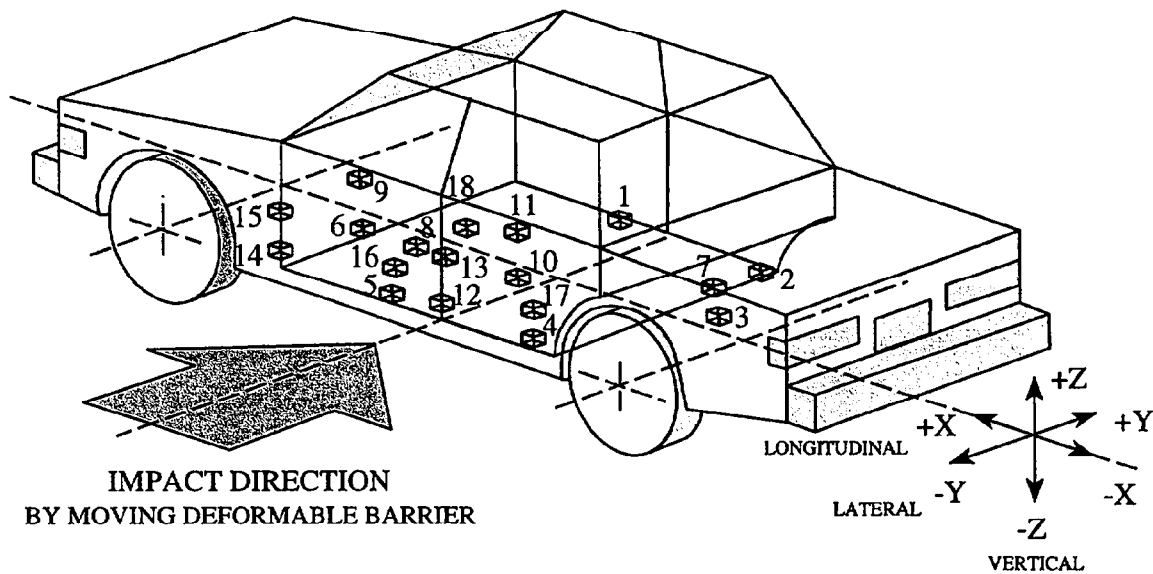


DATA SHEET 13

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101



- 1-Right Side Sill @ Front Seat
- 2-Right Side Sill @ Rear Seat
- 3-Rear Floorpan Above Axle
- 4-Left Side Sill @ Rear Seat
- 5-Left Side Sill @ Front Seat
- 6-Left Front Door on Centerline
- 7-Right Rear Occupant Compartment
- 8-Midrear of Left Front Door
- 9-Left Front Door Upper Centerline

- 10-Midrear of Left Rear Door
- 11-Left Rear Door Upper Centerline
- 12-Left Lower B-Pillar
- 13-Left Middle B-Pillar
- 14-Left Lower A-Pillar
- 15-Left Middle A-Pillar
- 16-Front Seat Track
- 17-Rear Seat Track
- 18-Vehicle CG

DATA SHEET 13 (continued)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101

Accel. No.	Location	Coordinates (mm)±3			Long. (x)		Lat. (y)		Vert. (z)		Resultant	
		mm			Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
		X*	Y*	Z*								
1	Right Side Sill at Front Seat	2746	825	309	pos. neg.	39.0 19.8	28.7 -2.4	5.2 133.2	4.5 -8.9	38.3 5.9	30.2	5.3
2	Right Side Sill at Rear Seat	1881	822	309	pos. neg.	64.2 10.3	28.5 -2.8	5.8 106.0	4.2 -9.2	33.7 16.6	30.3	5.8
3	Rear Floorpan Above Axle	1182	0	469	pos. neg.	37.4 22.7	21.4 -3.1	6.1 104.1	8.5 -12.6	11.9 32.6	22.3	6.2
4	Left Side Sill at Rear Seat	2068	-706	331	pos. neg.	-	59.1 -12.2	4.1 17.8	-	-	-	-
5	Left Side Sill at Front Seat	2858	-696	357	pos. neg.	-	77.6 -28.4	11.0 18.9	-	-	-	-
6	Left Front Door on Centerline	-	-	-	pos. neg.	-	-	-	-	-	-	-
7	Right Rear Occupant Compartment	2871	381	210	pos. neg.	-	30.5 -2.9	5.5 112.2	-	-	-	-
8	Midrear of Left Front Door	-	-	-	pos. neg.	-	-	-	-	-	-	-
9	Left Front Door Upper Centerline	-	-	-	pos. neg.	-	-	-	-	-	-	-
10	Midrear of Left Rear Door	-	-	-	pos. neg.	-	-	-	-	-	-	-
11	Left Rear Door Upper Centerline	-	-	-	pos. neg.	-	-	-	-	-	-	-

*Reference: X - Rear Bumper (+ Forward) Y - Vehicle Centerline (+ To Right) Z - Ground Level (+ Up)

DATA SHEET 13 (continued)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101

Accel. No.	Location	Coordinates (mm)±3			Long. (x)		Lat. (y)		Vert. (z)		Resultant	
		mm			Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
		X*	Y*	Z*								
12	Left Lower B-Pillar	2201	-737	534	-	-	158.7 -38.9	3.4 17.6	-	-	-	-
13	Left Middle B-Pillar	2225	-729	691	-	-	133.3 -23.5	3.3 41.5	-	-	-	-
14	Left Lower A-Pillar	3364	-709	373	-	-	93.4 -85.9	12.7 20.6	-	-	-	-
15	Left Middle A-Pillar	-	-	-	-	-	-	-	-	-	-	-
16	Front Seat Track	2300	-587	357	-	-	88.8 -50.8	21.6 27.4	-	-	-	-
17	Rear Seat Track	-	-	-	-	-	-	-	-	-	-	-
18	Vehicle CG	2711	0	391	2.3 -54.4	46.4 23.3	23.0 -2.3	4.8 59.8	6.8 -9.7	24.5 6.6	56.7	23.3

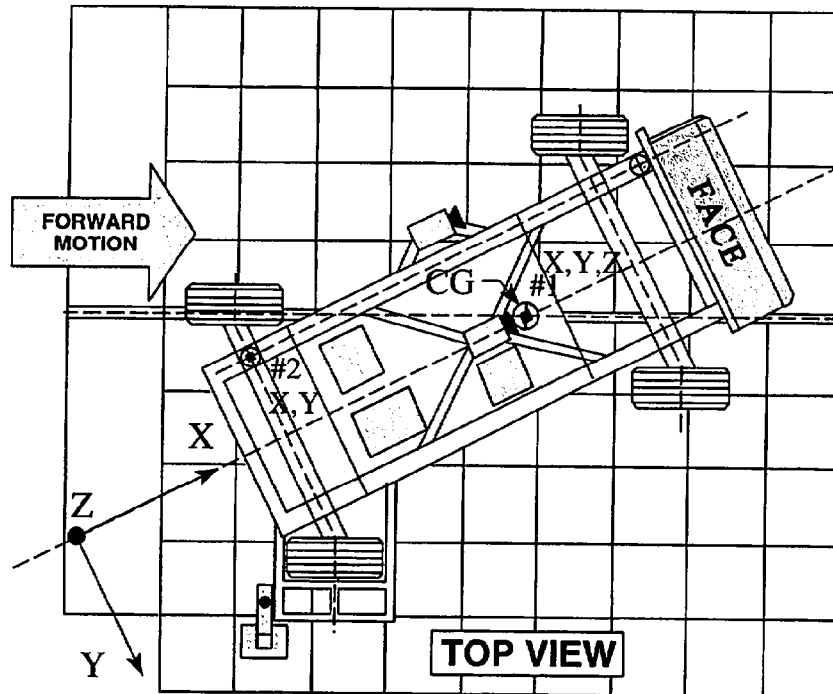
*Reference: X - Rear Bumper (+ Forward) Y - Vehicle Centerline (+ To Right) Z - Ground Level (+ Up)

DATA SHEET 14

MDB ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101



Accel. No.	Location	Coordinates (millimeters)			Pos. Direct.		Neg. Direct.	
		X*	Y*	Z*	Max (g)	Time (msec)	Max (g)	Time (msec)
1	MDB Center of Gravity							
	Longitudinal... X				1.1	116.7	-16.8	43.2
	Lateral..... Y	1859	0	330	1.4	53.9	-7.2	25.8
	Vertical..... Z				8.9	59.9	-6.8	16.2
	Resultant..... R				17.8	32.4	-	-
2	Rear Frame Member							
	Longitudinal... X	386	-660	660	1.3	185.2	-21.3	32.4
	Lateral..... Y				4.4	27.8	-2.1	61.6

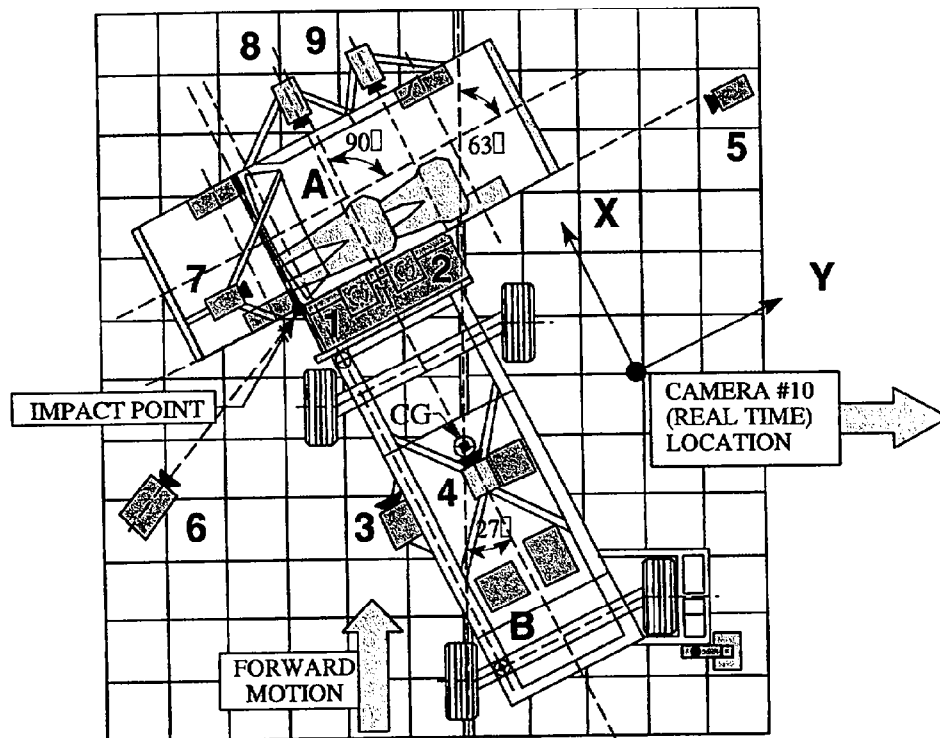
*Reference: X = Rear Bumper (+ Forward)
Y = Vehicle Centerline (+ To Right)
Z = Ground Level (+ Up)
All measurements accurate to within ± 3 mm.

DATA SHEET 15

HIGH SPEED CAMERA LOCATIONS AND DATA SUMMARY

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101



Camera No.	View	Coordinates (millimeters)			Angle (deg.)	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
1	Overhead view of test vehicle	0	780	4880	-85	8	1000
2	Overhead closeup view of impact plane	340	975	4880	-90	12.5	1000
3	MDB onboard closeup view of impact point	1470	0	847	0	13	1000
4	MDB onboard view of driver dummy	1140	838	1586	-17	7.5	950
5	Right side ground level overall view	424	9123	1586	-4	25	1000
6	Left side ground level overall view	-2233	-2941	1085	-7	13	1000
7	Test vehicle onboard driver front view	667	-813	1234	-13	13	1000
8	Test vehicle onboard driver side view	1717	830	975	-12	8	1000
9	Test vehicle onboard passenger side view	1719	1692	985	-7	8	n.t.
10	Real time film coverage of test	-	-	-	-	-	24

* Reference (from point of impact); all measurements accurate to within ± 6 mm.

+X = Forward

+Y = To Right

+Z = Upward

SECTION 5

FUEL SYSTEM INTEGRITY

DATA SHEET 16

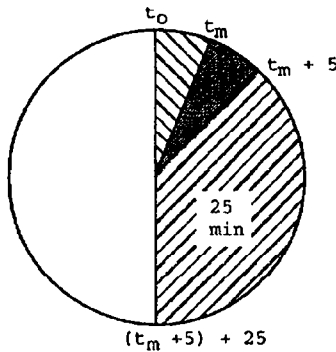
FMVSS 301 FUEL SYSTEM INTEGRITY DATA

NHTSA No.: CW5101 TEST DATE: October 22, 1997
 Vehicle Mfr./Make/Model : 1998 Toyota Camry 4-Door Sedan

TEST VEHICLE IMPACT TYPE :

- Frontal (48.28 kph)
- Oblique (48.28 kph) with ° barrier face first
 contacting the side
 (driver/passenger)
- Rear Moving Barrier (48.28 kph)
- Lateral Moving Barrier (32.19 kph)
- X Side Impact Moving Deformable Barrier (53.91 kph)
 contacting the driver side side
 (driver/passenger)

FUEL SPILLAGE MEASUREMENT:



1. From impact until vehicle motion ceases
2. For five minute period after vehicle motion ceases
3. For next 25 minutes

ACTUAL	MAX ALLOWED
0 g	28 g
0 g	142 g
0 g	28 g/1 min.

SOLVENT SPILLAGE DETAILS :

None

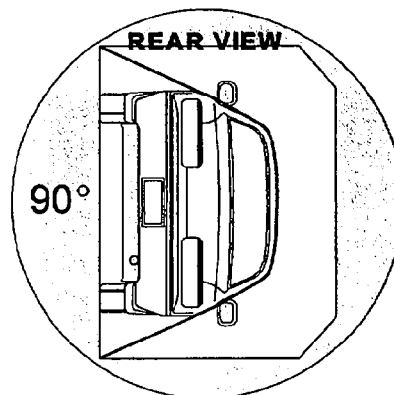
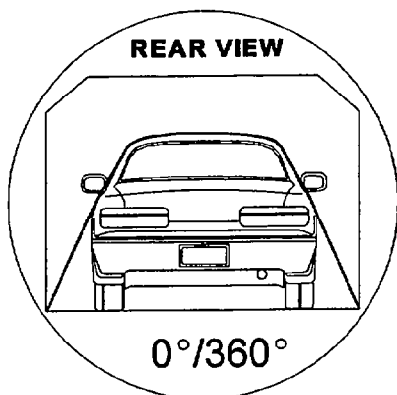
DATA SHEET 17

ROLLOVER DATA

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101

0 - 90 Degrees



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

Rollover Fixture 90° Rotation Time	<u>1</u> minutes <u>10</u> seconds
(Spec. Range = 1 to 3 minutes)	
FMVSS 301 Position Hold Time +	<u>5</u> minutes <u>0</u> seconds
TOTAL	<u>6</u> minutes <u>10</u> seconds
Next whole minute interval	<u>7</u> minutes

II. FMVSS 301 REQUIREMENTS :

(1) Time Period

First 5 minutes FROM onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

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

IV. SOLVENT SPILLAGE LOCATION(S) :

None

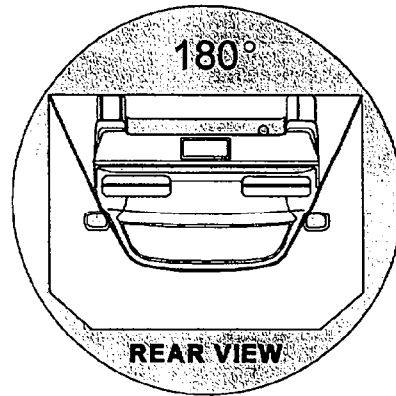
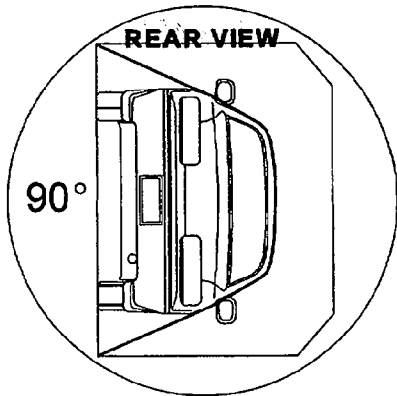
DATA SHEET 17 (continued)

ROLLOVER DATA

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101

90 - 180 Degrees



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

Rollover Fixture 90° Rotation Time	<u>1</u> minutes <u>8</u> seconds
(Spec. Range = 1 to 3 minutes)	
FMVSS 301 Position Hold Time +	<u>5</u> minutes <u>0</u> seconds
TOTAL	<u>6</u> minutes <u>8</u> seconds
Next whole minute interval	<u>7</u> minutes

II. FMVSS 301 REQUIREMENTS :

(1) Time Period

First 5 minutes FROM onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

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

IV. SOLVENT SPILLAGE LOCATION(S) :

None

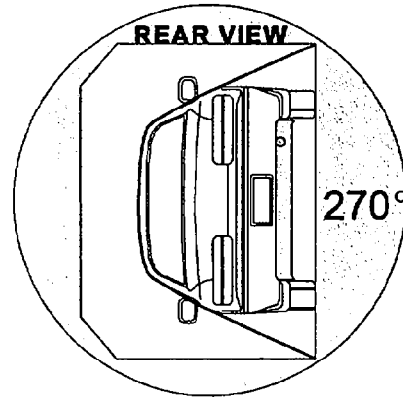
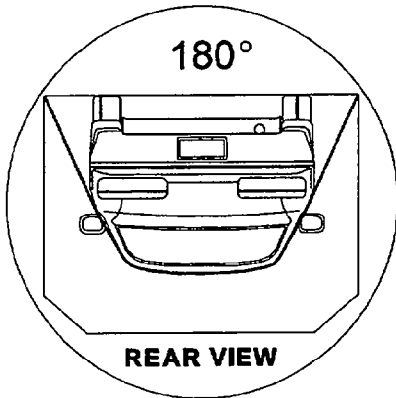
DATA SHEET 17 (continued)

ROLLOVER DATA

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101

180 - 270 Degrees



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

Rollover Fixture 90° Rotation Time
(Spec. Range = 1 to 3 minutes)
FMVSS 301 Position Hold Time +

TOTAL

Next whole minute interval

<u>1</u>	minutes	<u>10</u>	seconds
<u>5</u>	minutes	<u>0</u>	seconds
<u>6</u>	minutes	<u>10</u>	seconds
<u>7</u>	minutes		

II. FMVSS 301 REQUIREMENTS :

(1) Time Period

First 5 minutes FROM onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

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

IV. SOLVENT SPILLAGE LOCATION(S) :

None

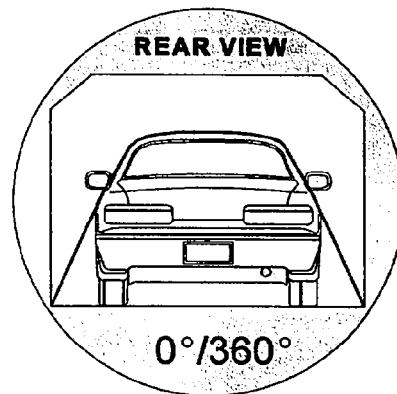
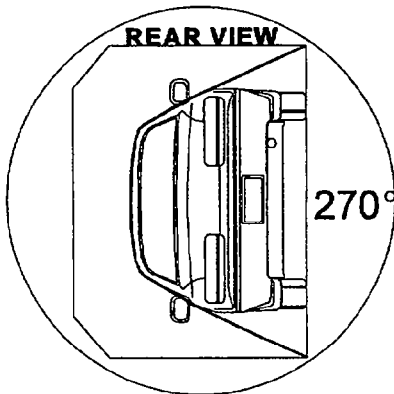
DATA SHEET 17 (continued)

ROLLOVER DATA

Vehicle: 1998 Toyota Camry

NHTSA No. CW5101

270 - 360 Degrees



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

Rollover Fixture 90° Rotation Time	<u>1</u> minutes <u>7</u> seconds
(Spec. Range = 1 to 3 minutes)	
FMVSS 301 Position Hold Time +	<u>5</u> minutes <u>0</u> seconds
TOTAL	<u>6</u> minutes <u>7</u> seconds
Next whole minute interval	<u>7</u> minutes

II. FMVSS 301 REQUIREMENTS :

(1) Time Period

First 5 minutes FROM onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

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

IV. SOLVENT SPILLAGE LOCATION(S) :

None

APPENDIX A
PHOTOGRAPHS

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Figure A- 23	PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID	A- 25
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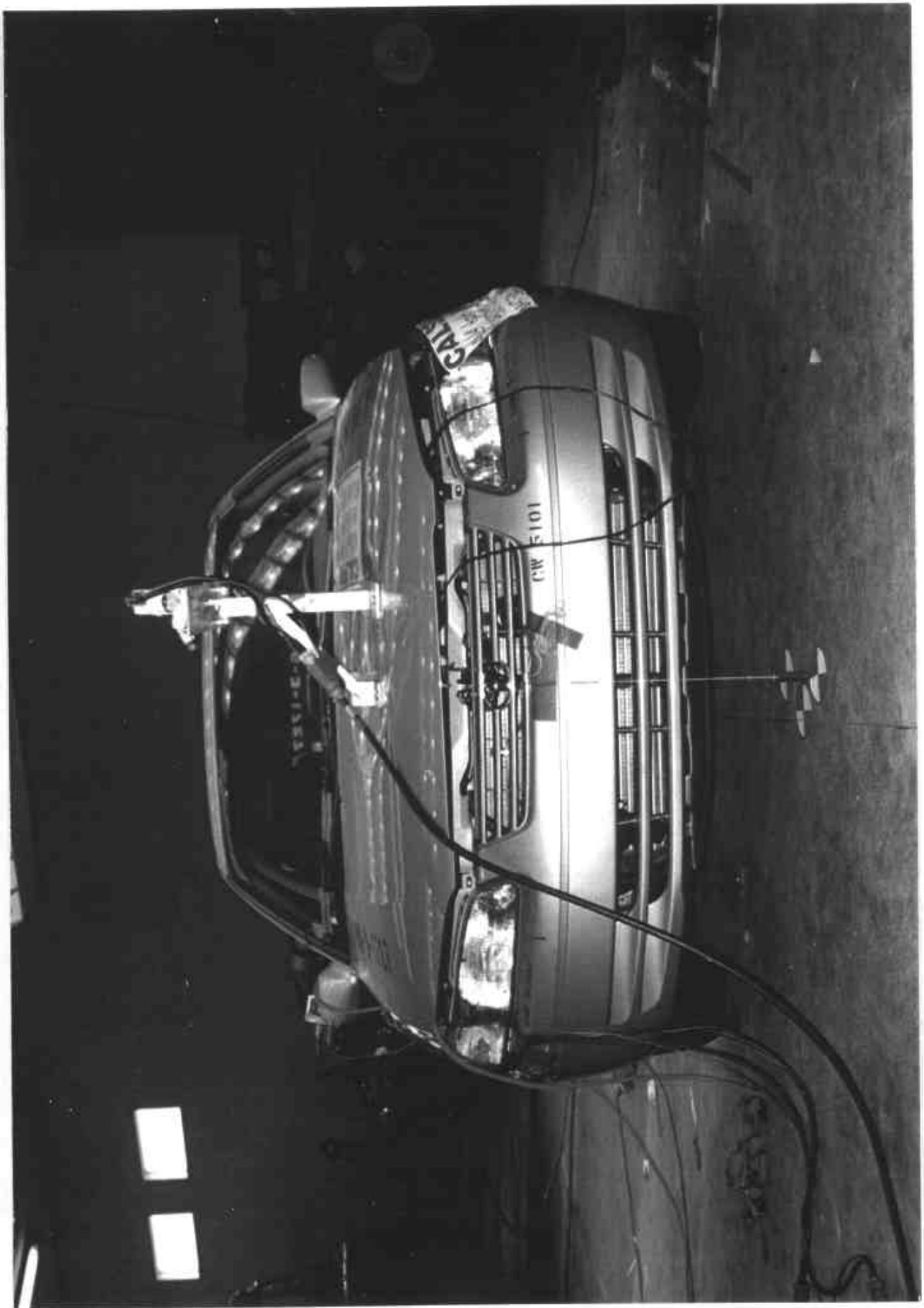


Figure A-1 PRE-TEST FRONTAL VIEW OF TEST VEHICLE

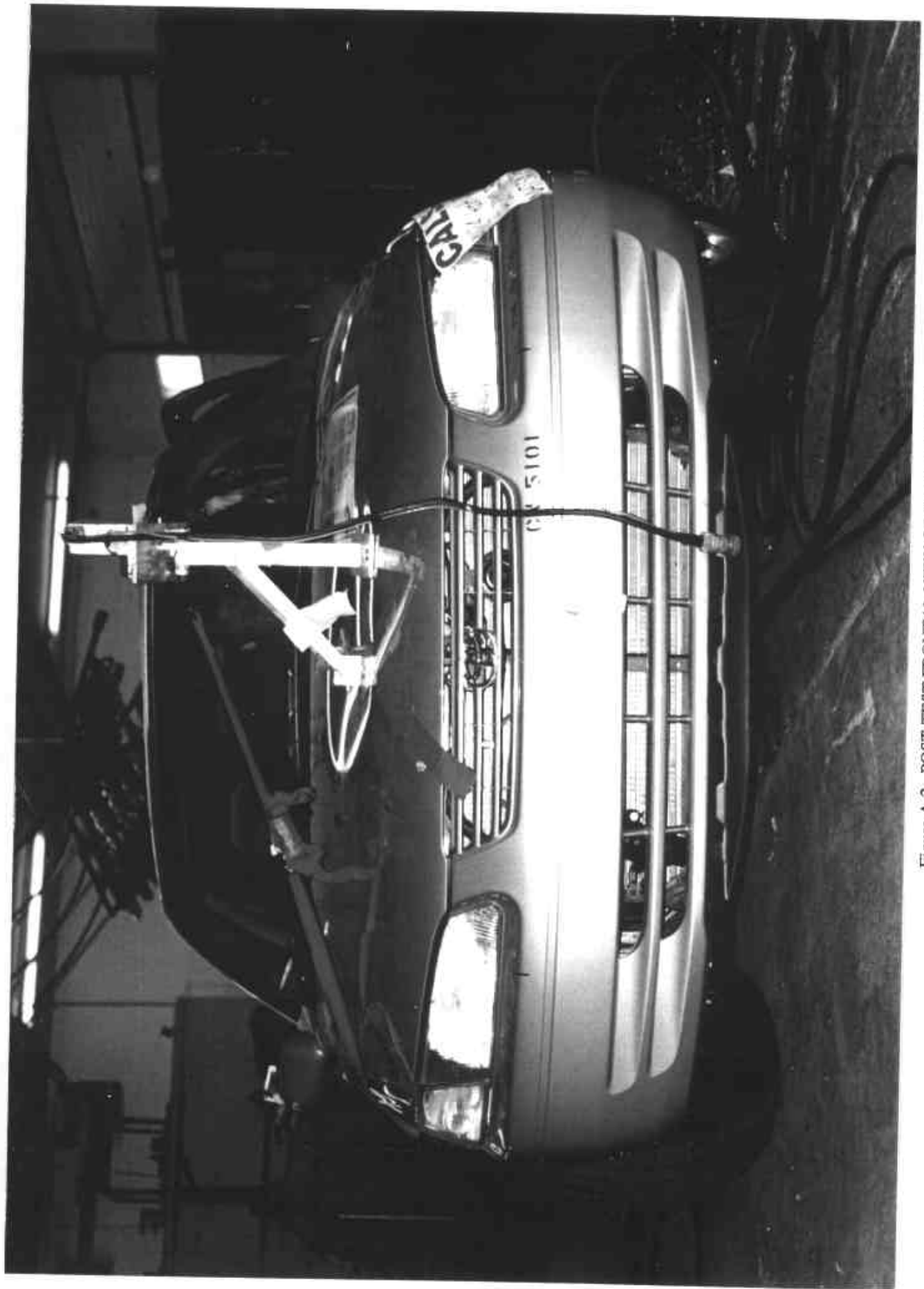


Figure A-2 POST-TEST FRONTAL VIEW OF TEST VEHICLE

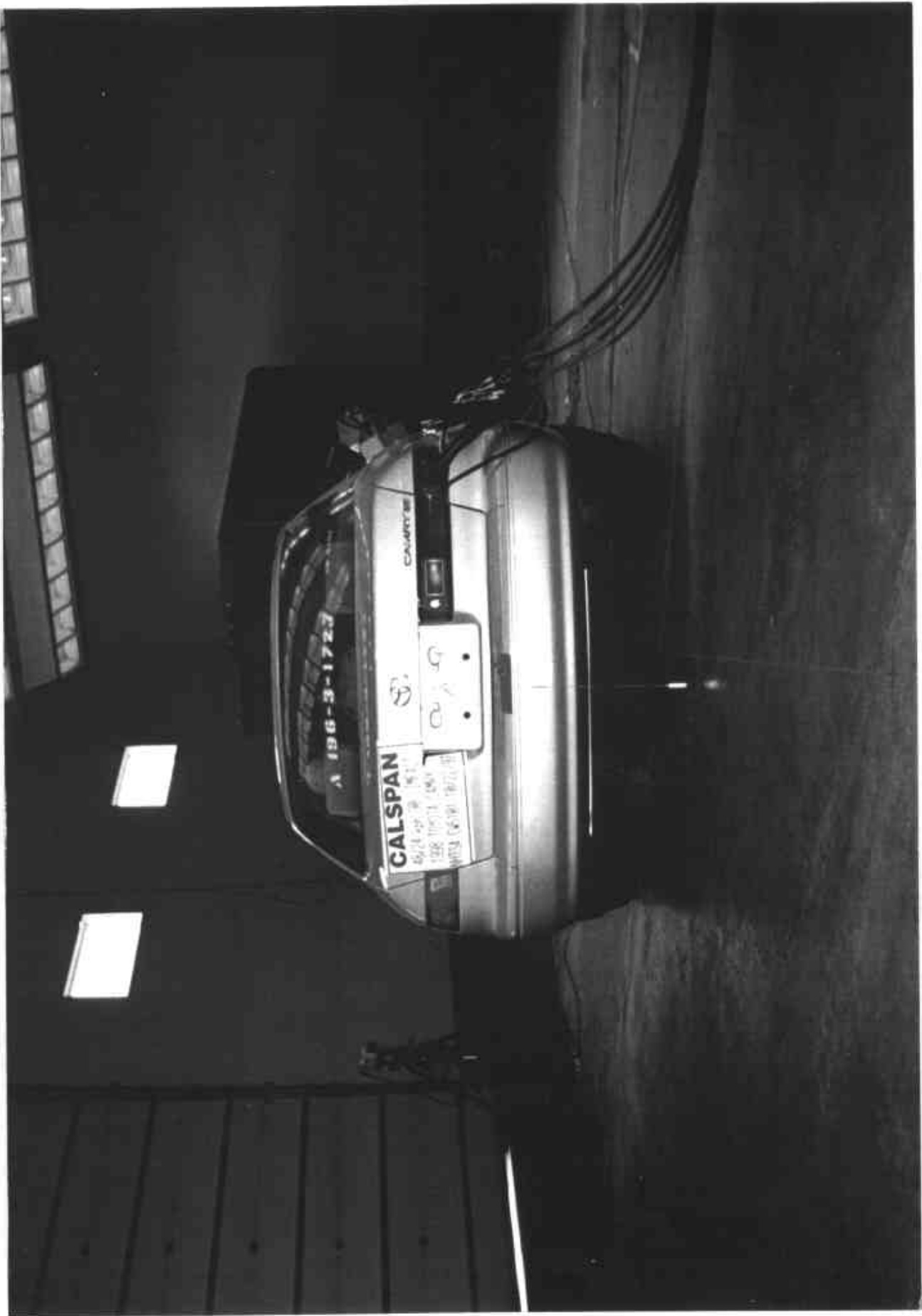


Figure A-3 PRE-TEST REAR VIEW OF TEST VEHICLE

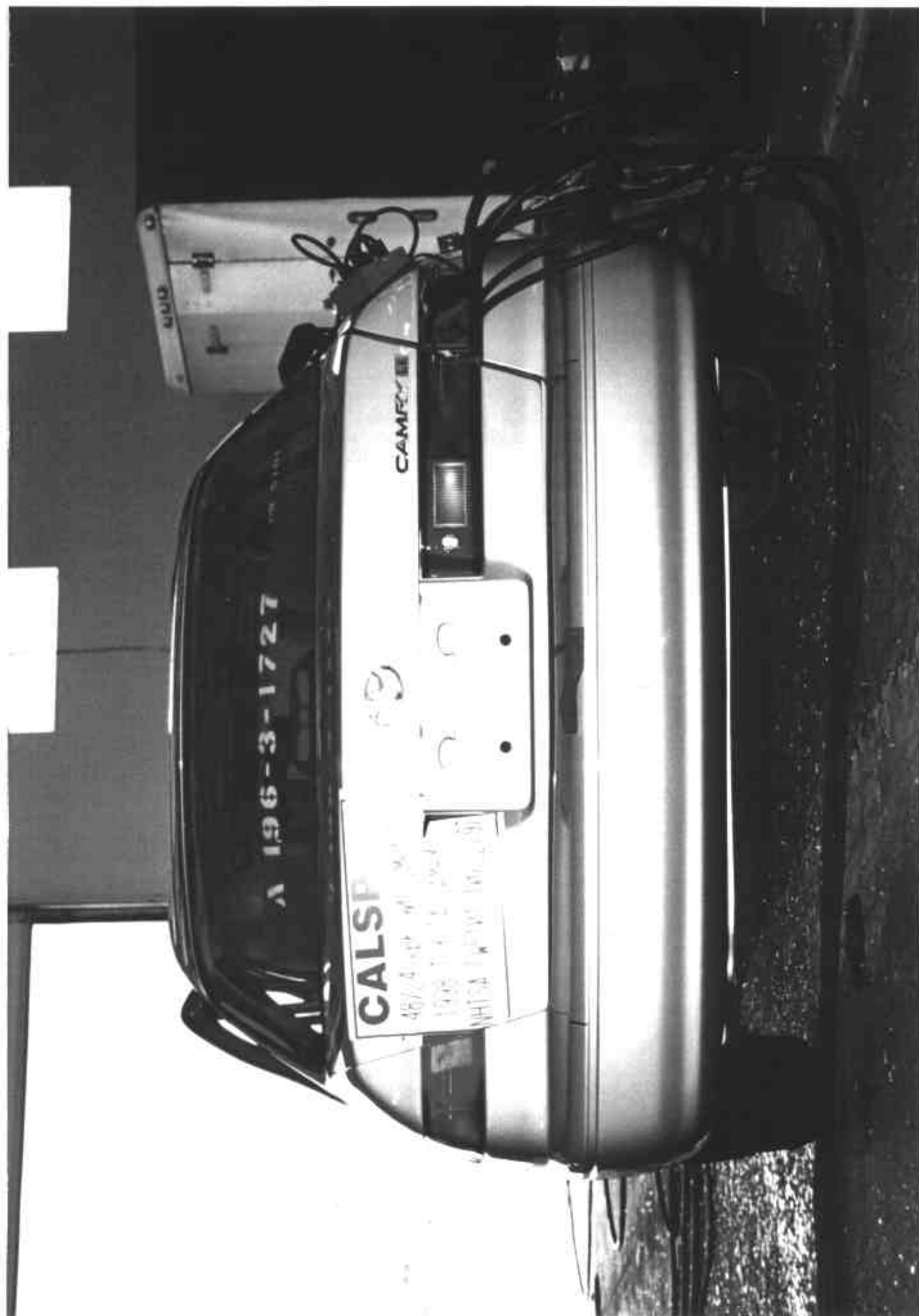


Figure A-4 POST-TEST REAR VIEW OF TEST VEHICLE

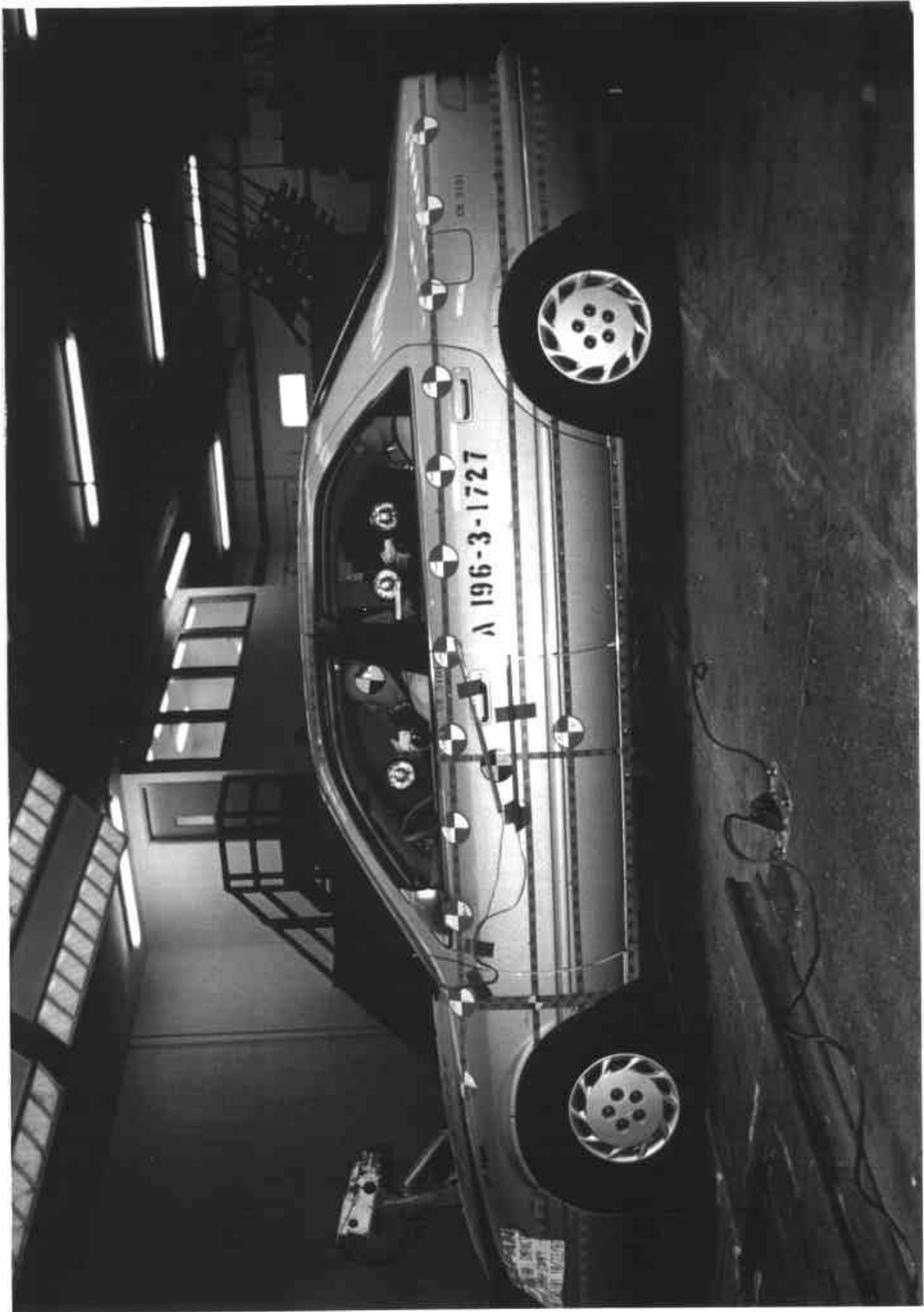


Figure A-5 PRE-TEST IMPACTED SIDE VIEW OF TEST VEHICLE

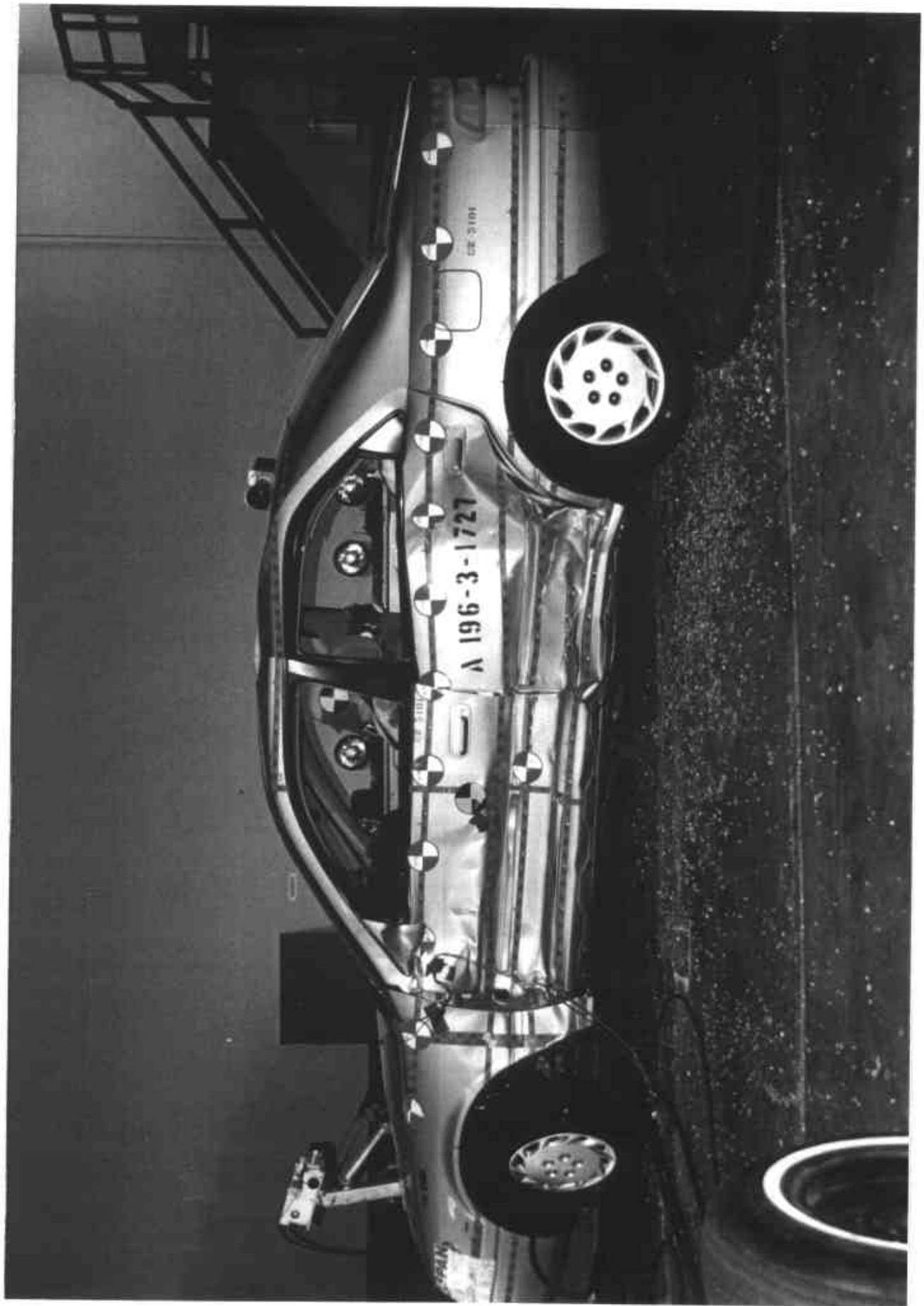


Figure A-6 POST-TEST IMPACTED SIDE VIEW OF TEST VEHICLE

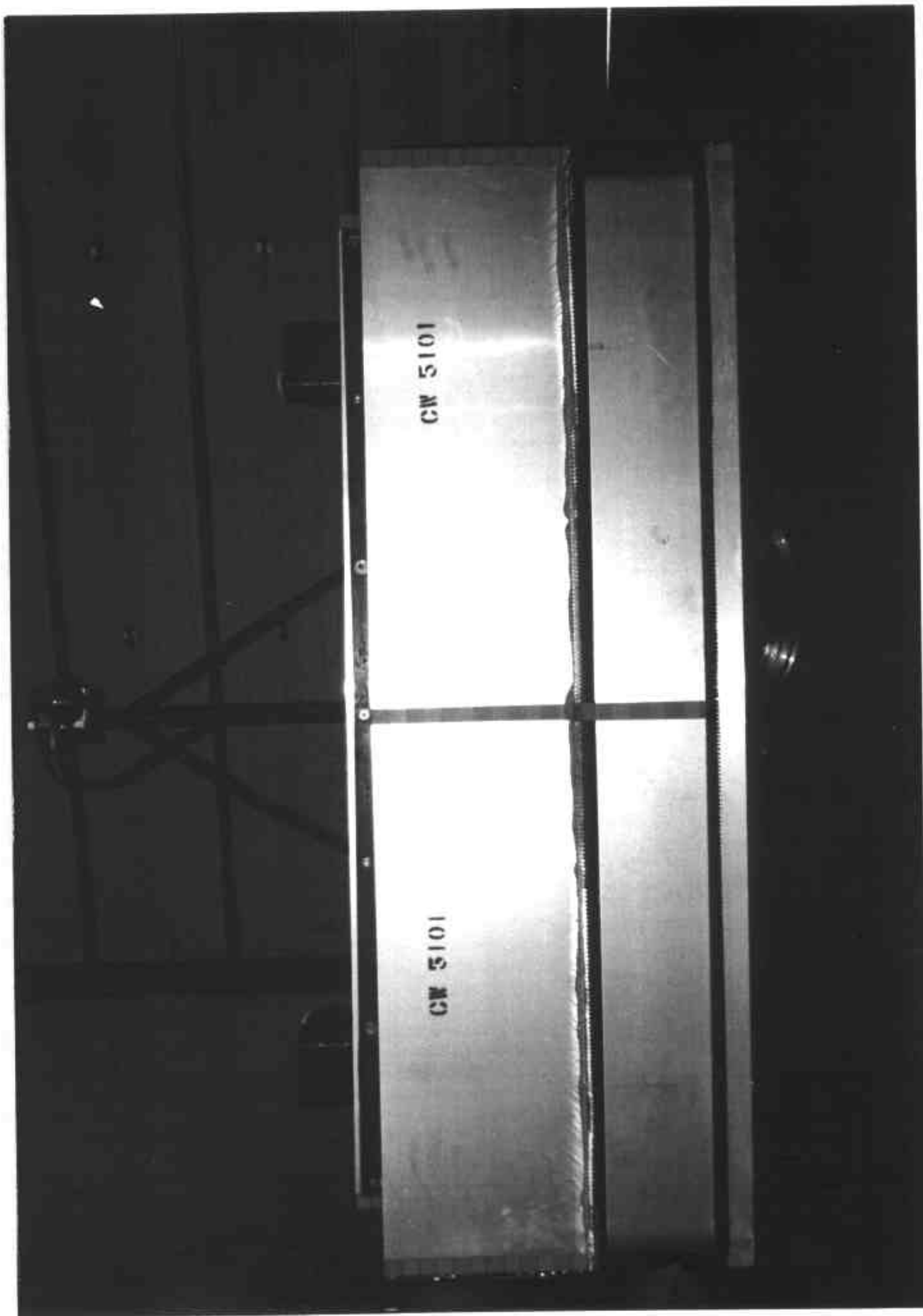


Figure A-7 PRE-TEST FRONTAL VIEW OF IMPACTOR FACE

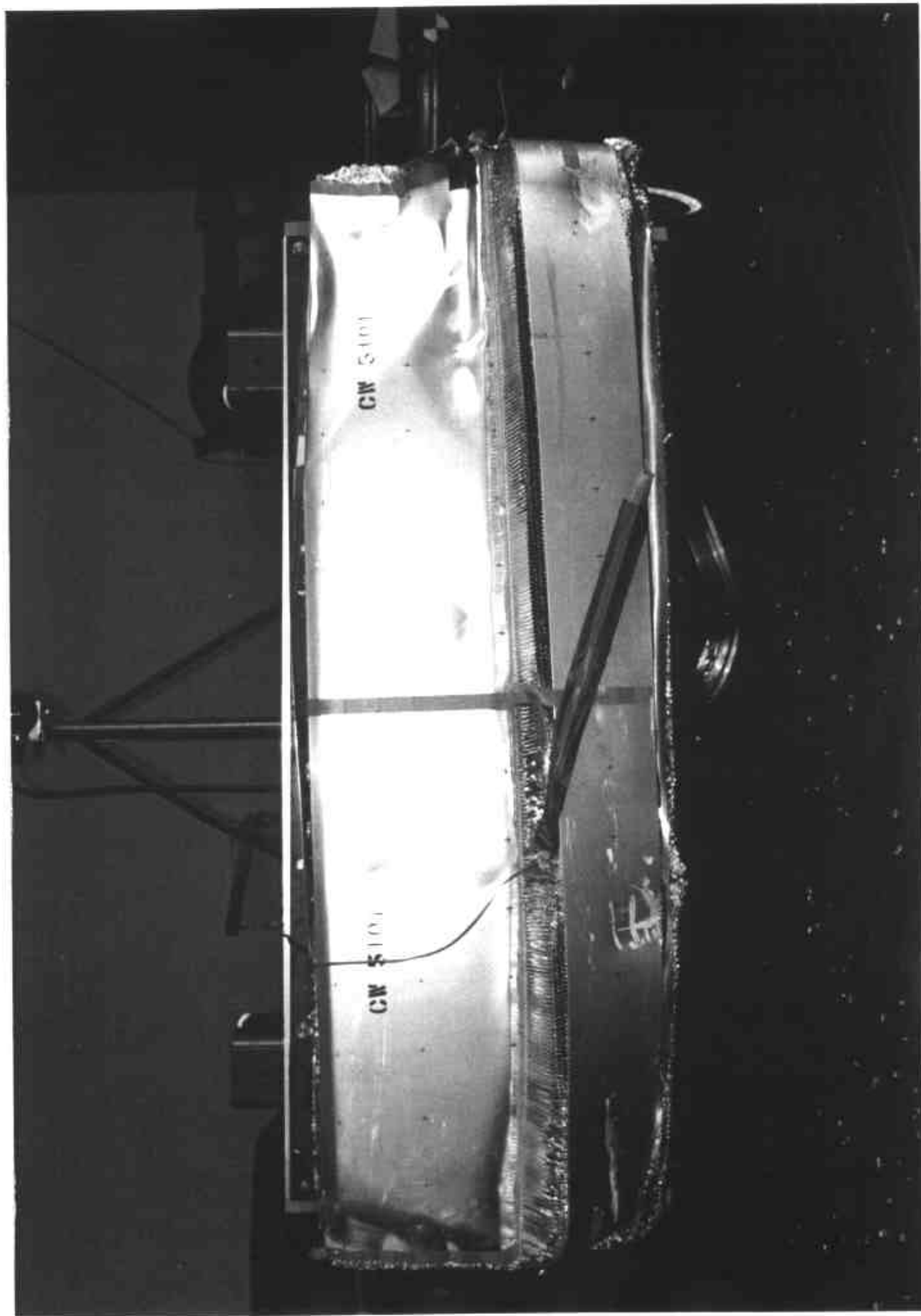
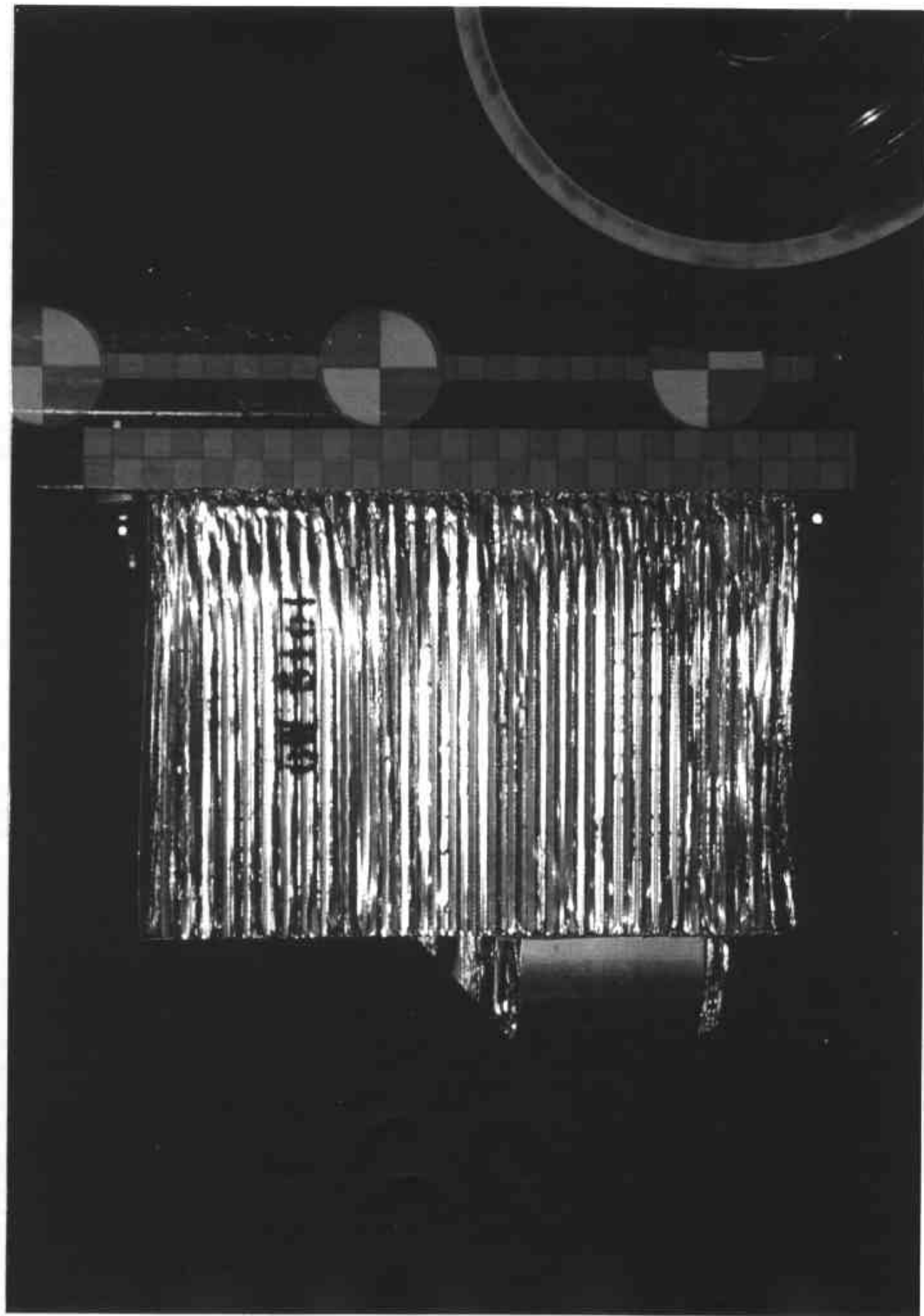


Figure A-8 POST-TEST FRONTAL VIEW OF IMPACTOR FACE

Figure A-9 PRE-TEST LEFT SIDE VIEW OF IMPACTOR FACE



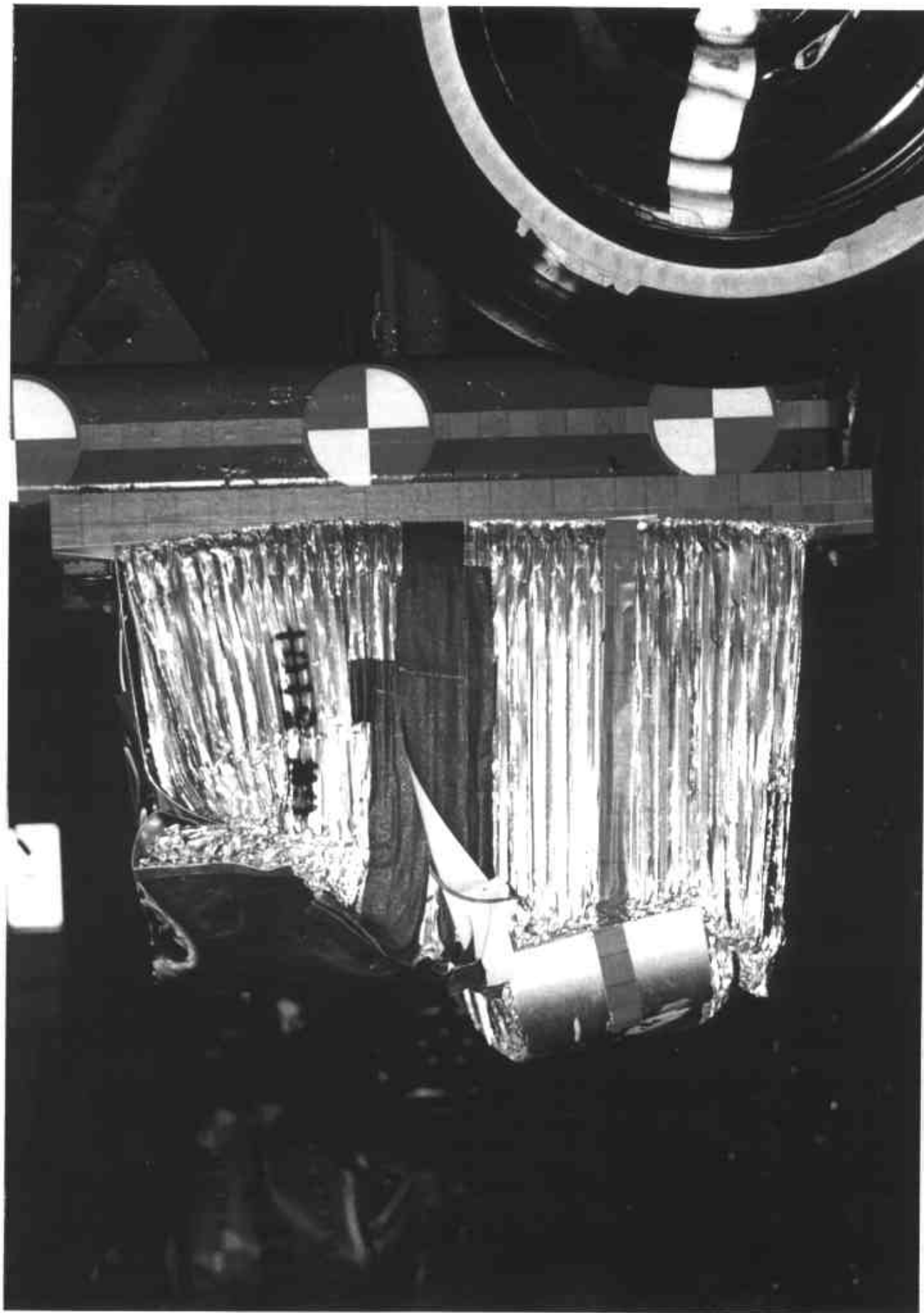


Figure A-10 POST-TEST LEFT SIDE VIEW OF IMPACTOR FACE



Figure A-11 PRE-TEST RIGHT SIDE VIEW OF IMPACTOR FACE



Figure A-12 POST-TEST RIGHT SIDE VIEW OF IMPACTOR FACE

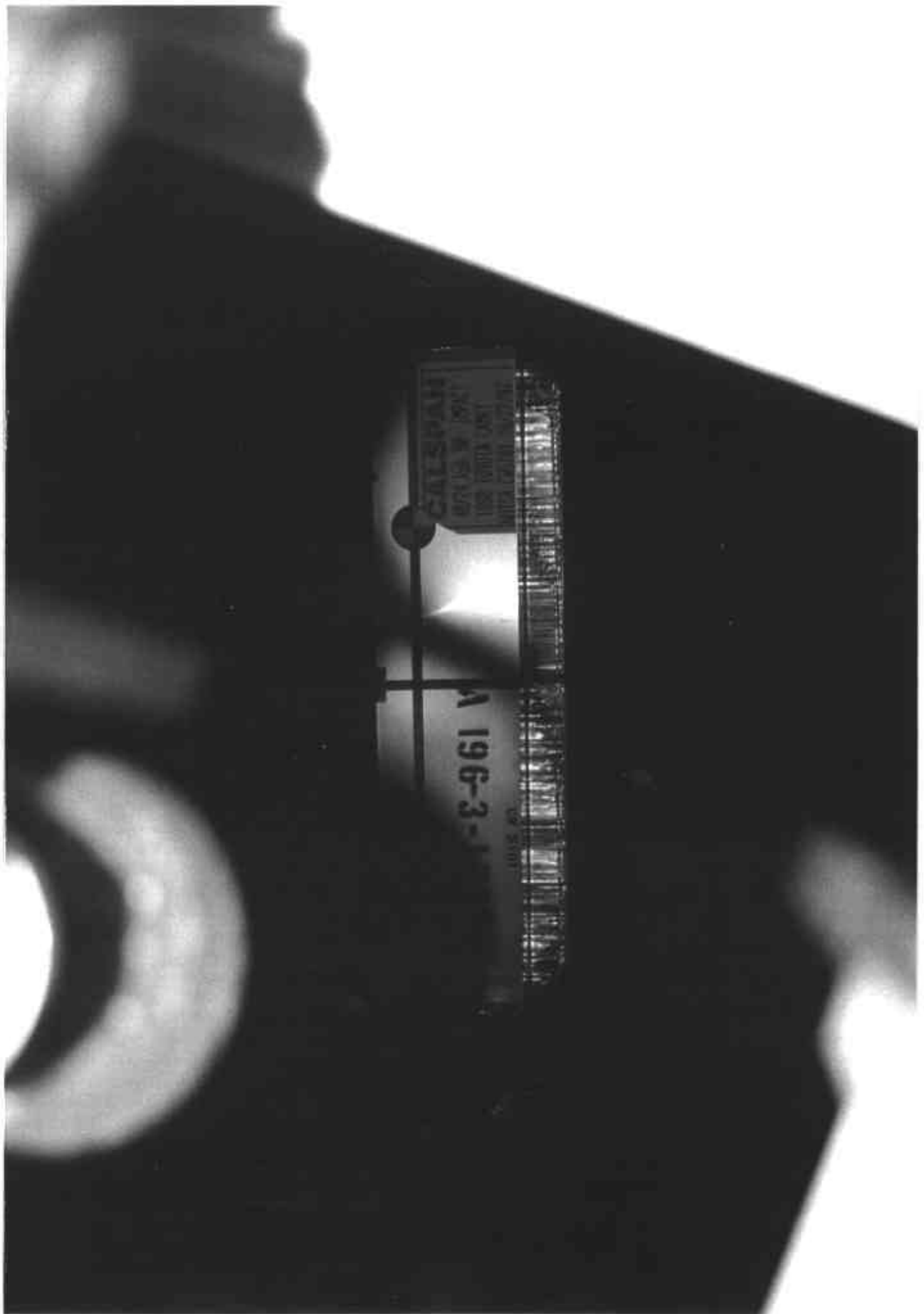


Figure A-13 PRE-TEST TOP VIEW OF IMPACTOR FACE



Figure A-14 POST-TEST TOP VIEW OF IMPACTOR FACE



Figure A-15 PRE-TEST OVERHEAD VIEW OF ALIGNED MDB AND VEHICLE

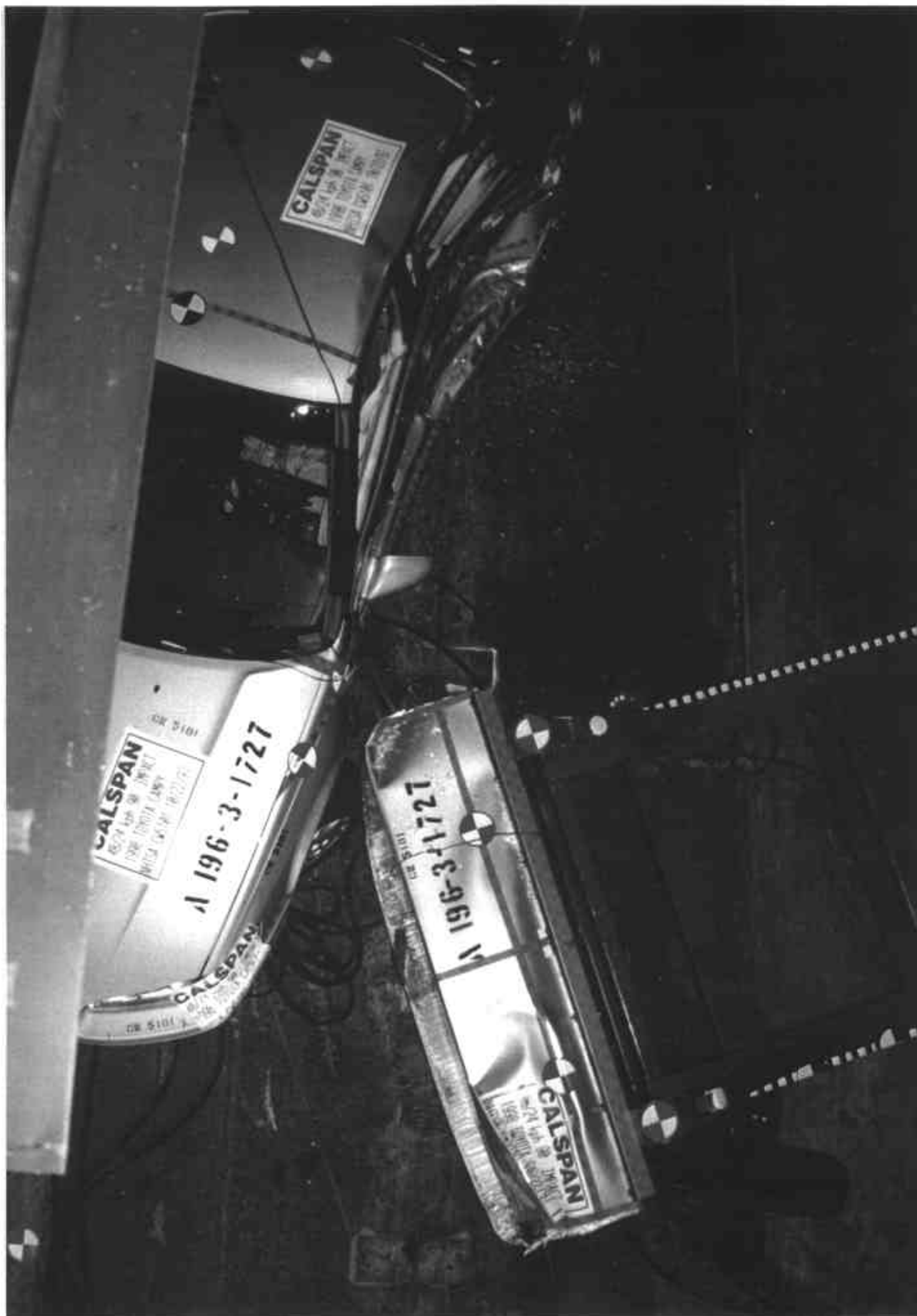


Figure A-16 POST-TEST OVERHEAD VIEW OF MDB AND VEHICLE



Figure A-17 PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID



Figure A-18 POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID

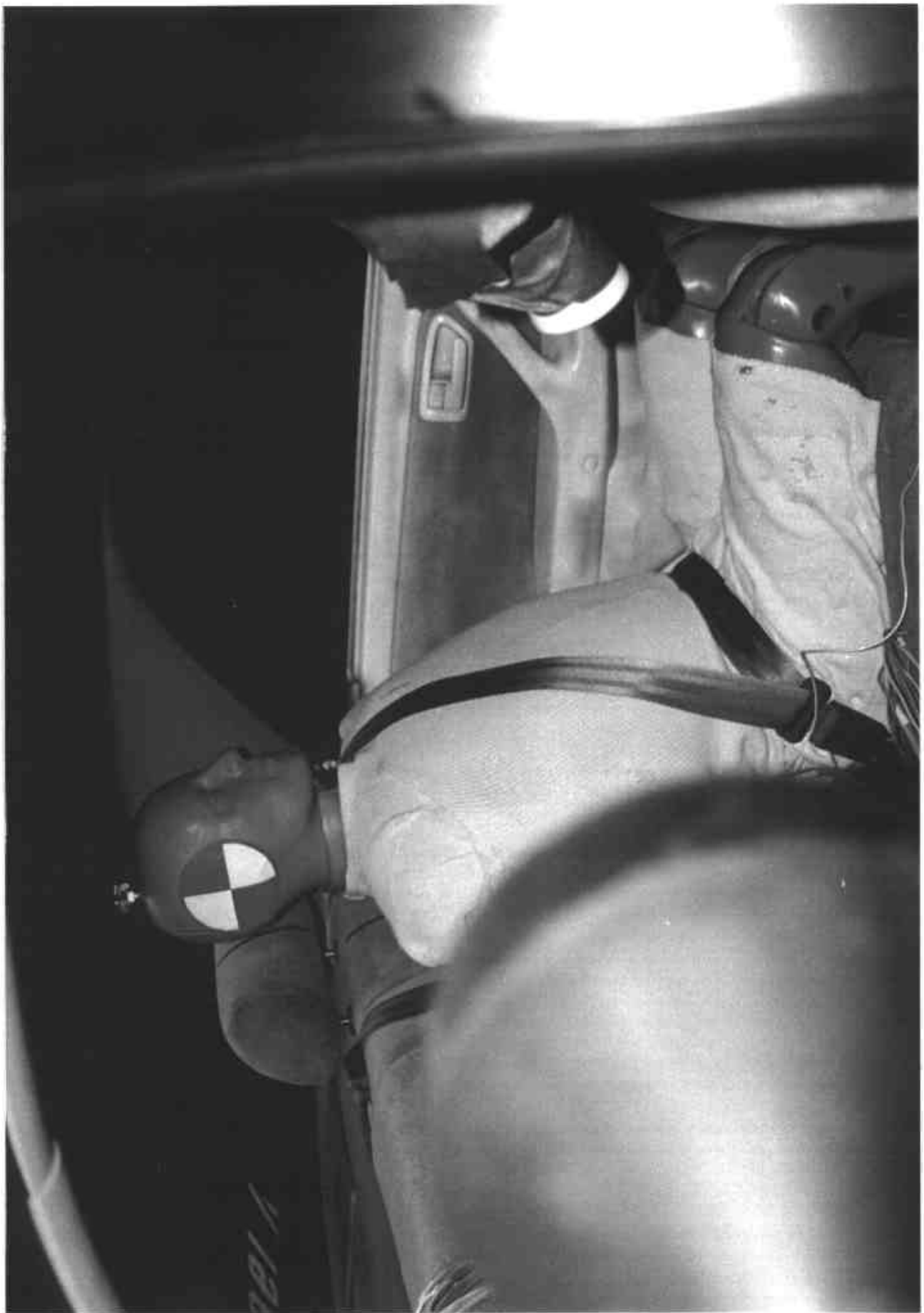


Figure A-19 PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID



Figure A-20 POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID

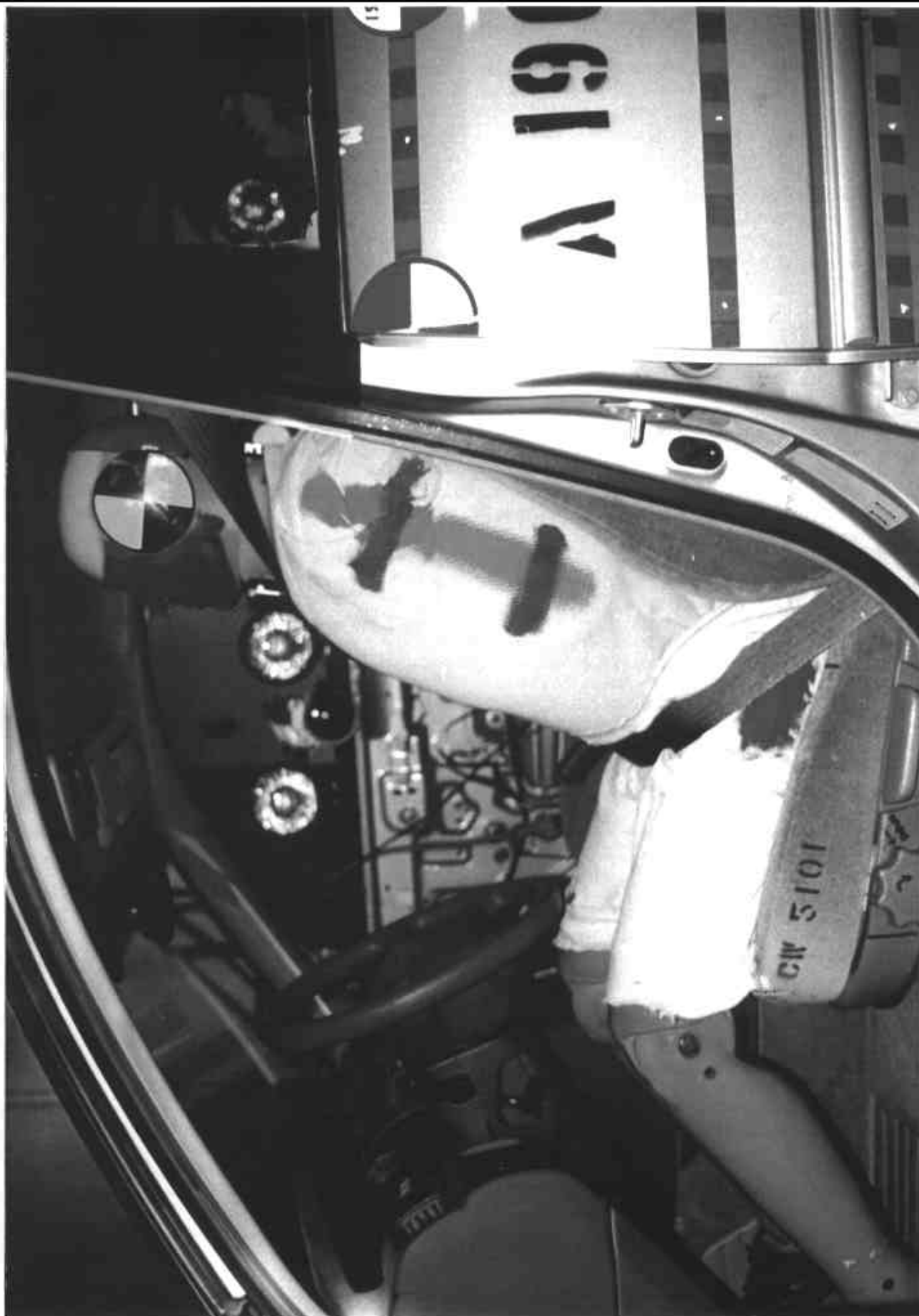


Figure A-21 PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID

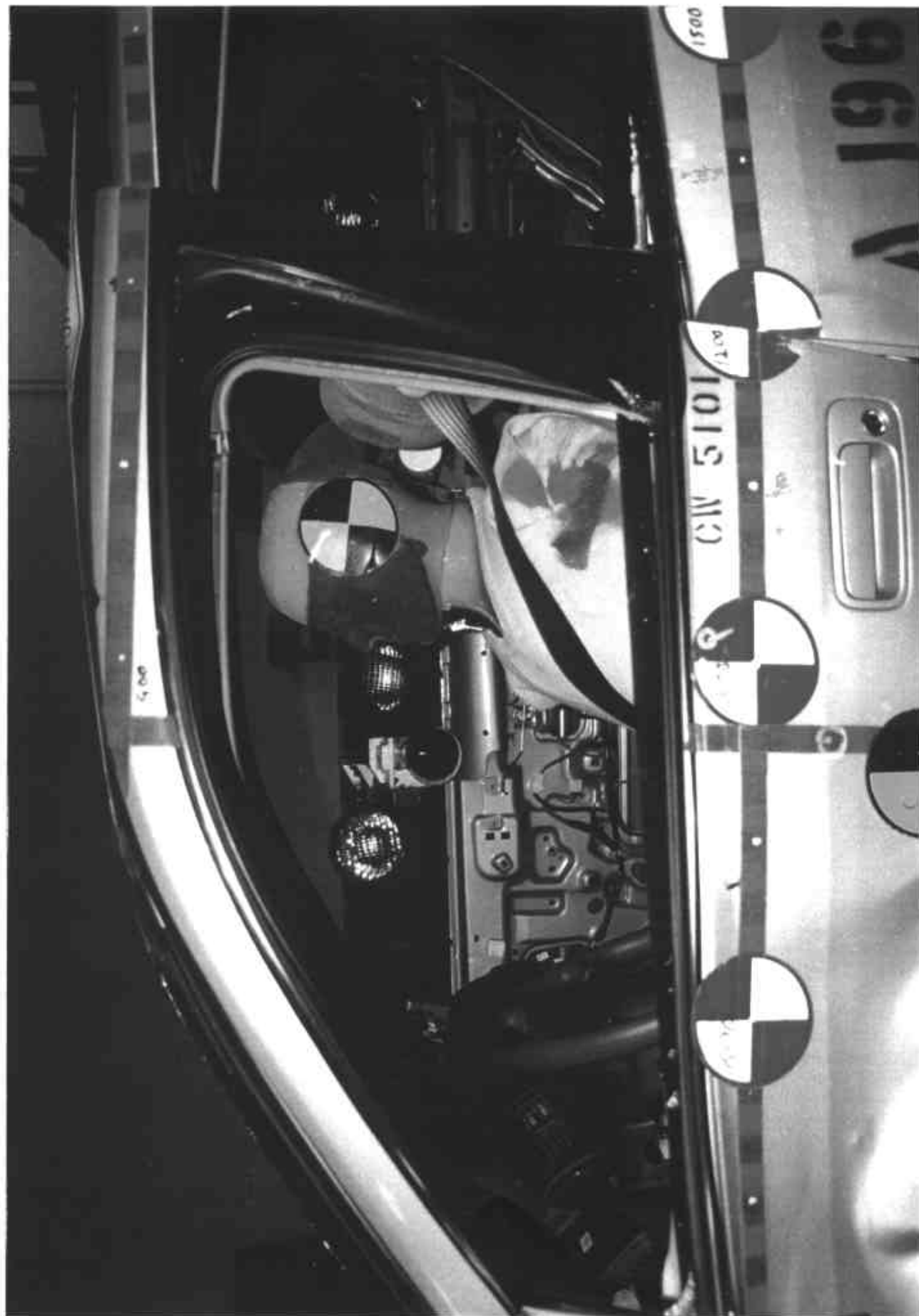


Figure A-22 POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID



Figure A-23 PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID



Figure A-24 POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID

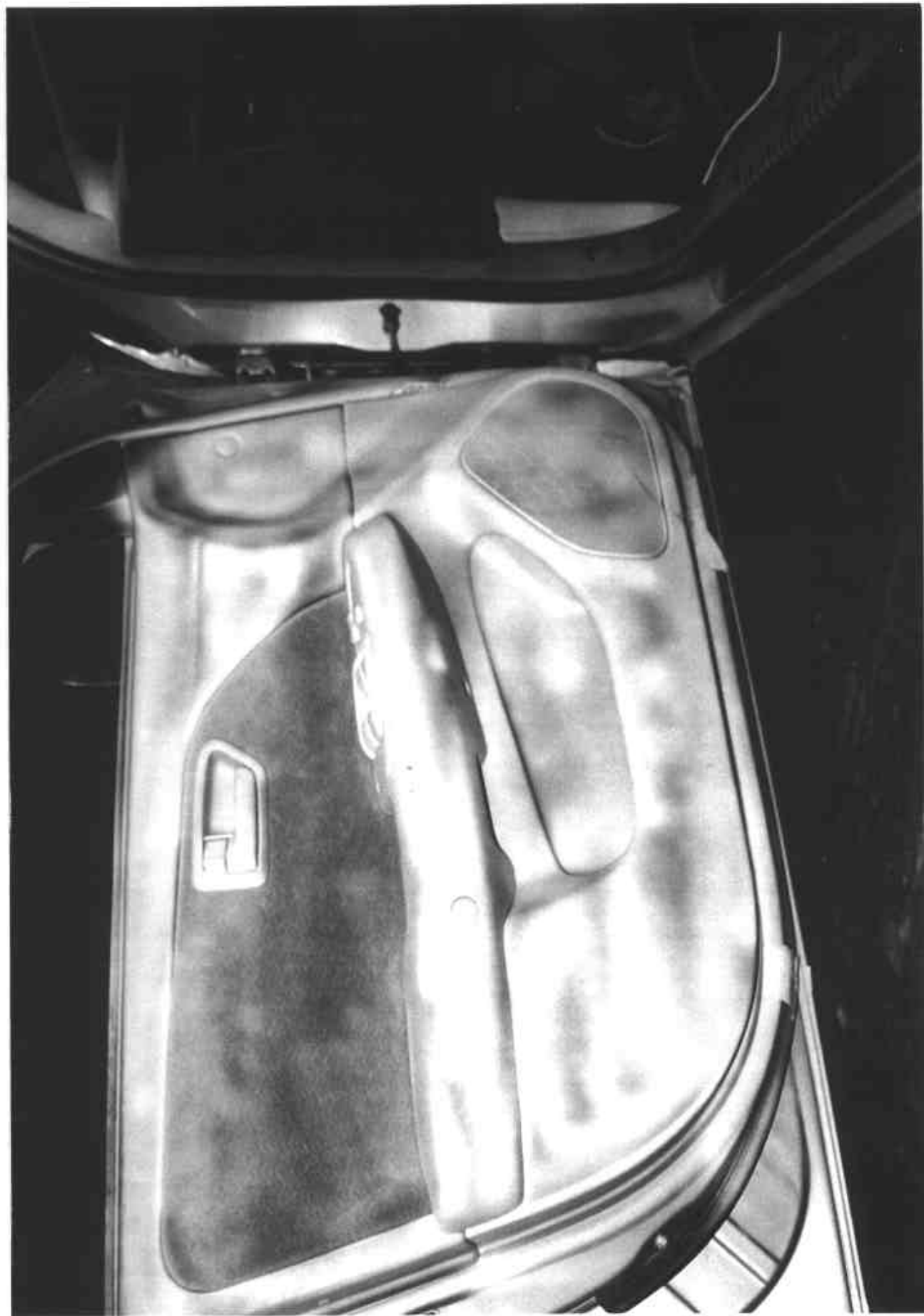


Figure A-25 PRE-TEST INTERIOR OF FRONT DOOR



Figure A-26 POST-TEST INTERIOR OF FRONT DOOR SHOWING SID IMPACT LOCATIONS



Figure A-27 PRE-TEST INTERIOR OF REAR DOOR



Figure A-28 POST-TEST INTERIOR OF REAR DOOR SHOWING SID IMPACT LOCATIONS

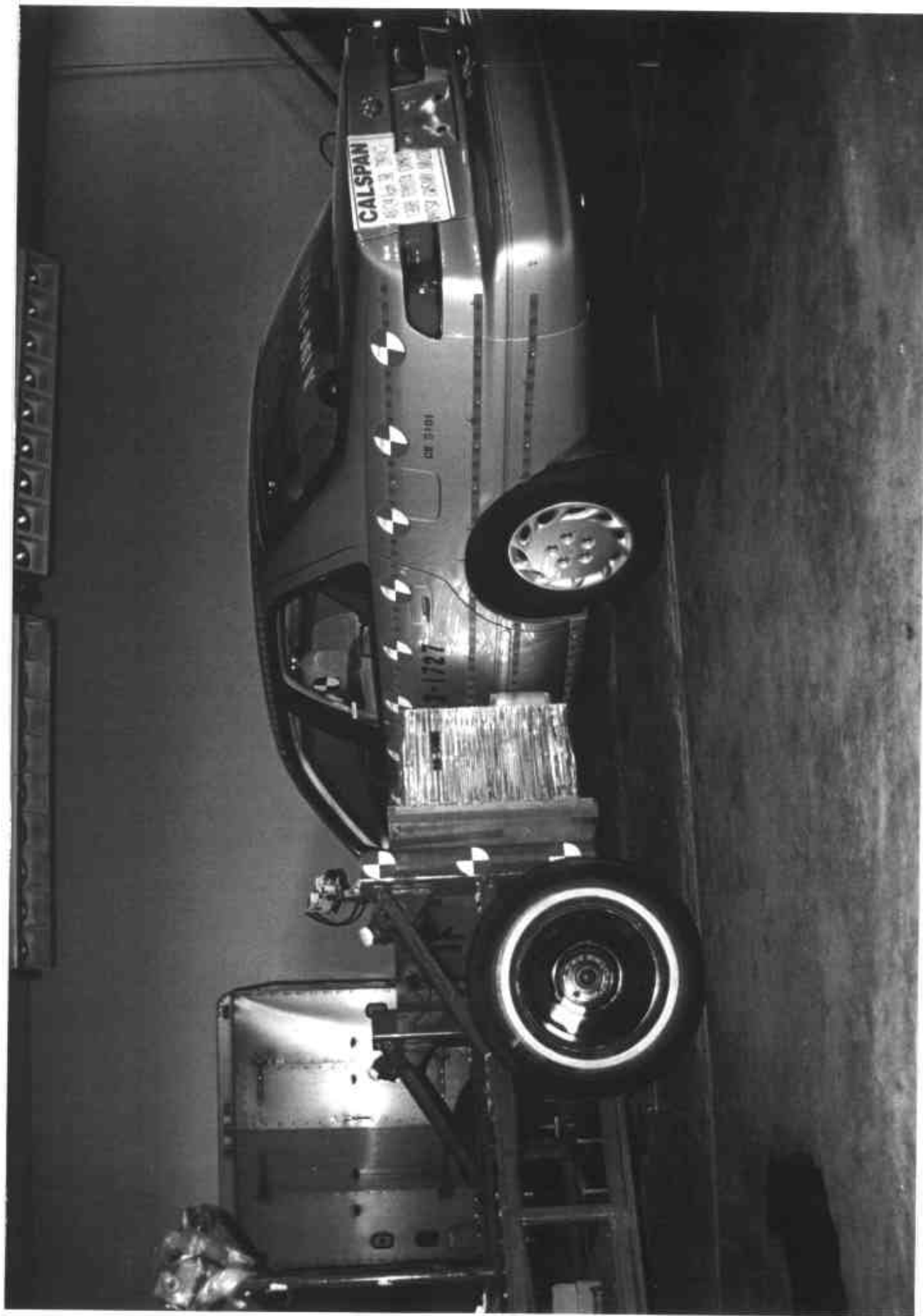


Figure A-29 PRE-TEST LEFT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION



Figure A-30 PRE-TEST RIGHT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION

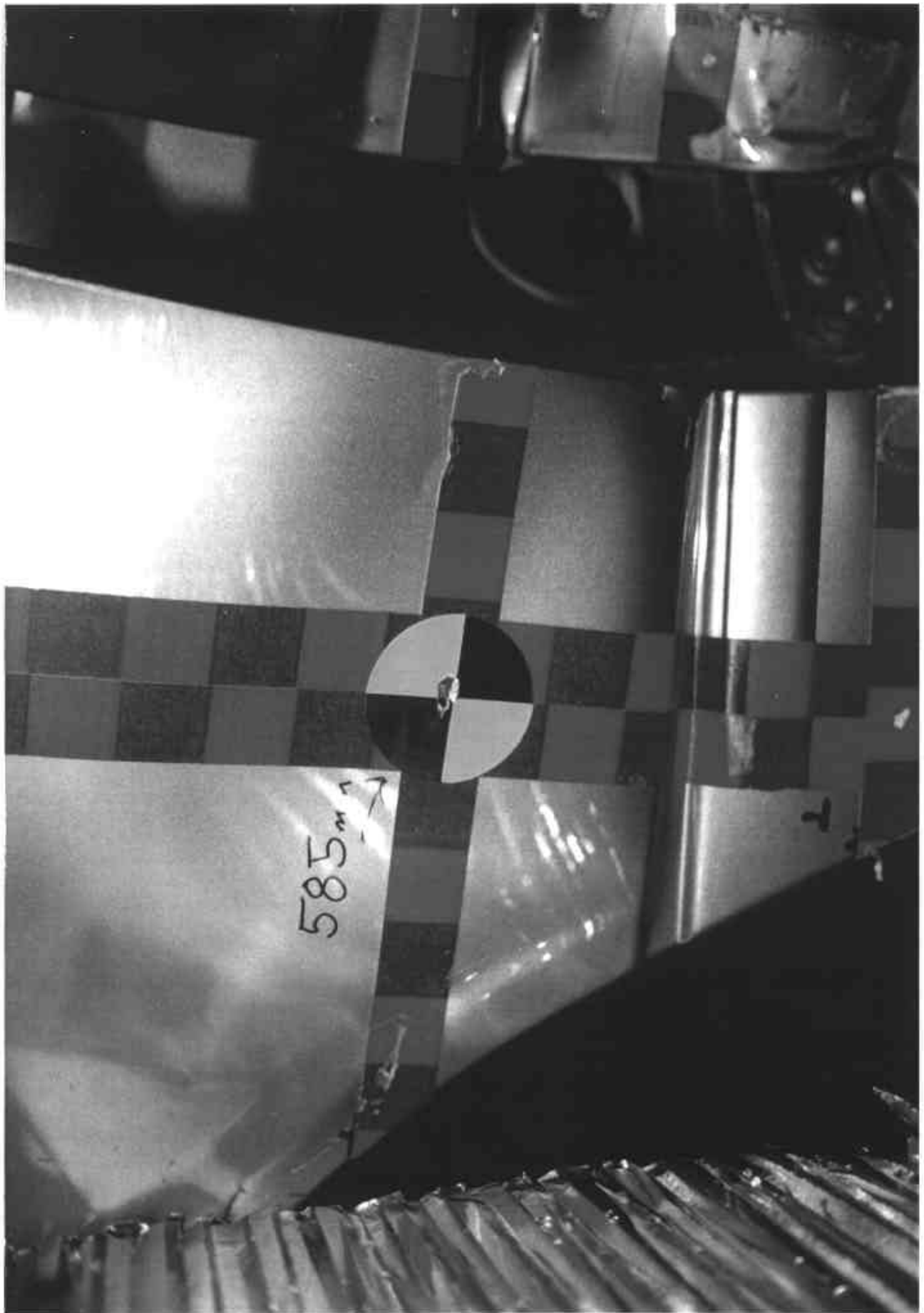


Figure A-31 POST-TEST CLOSE-UP VIEW OF IMPACT POINT TARGET

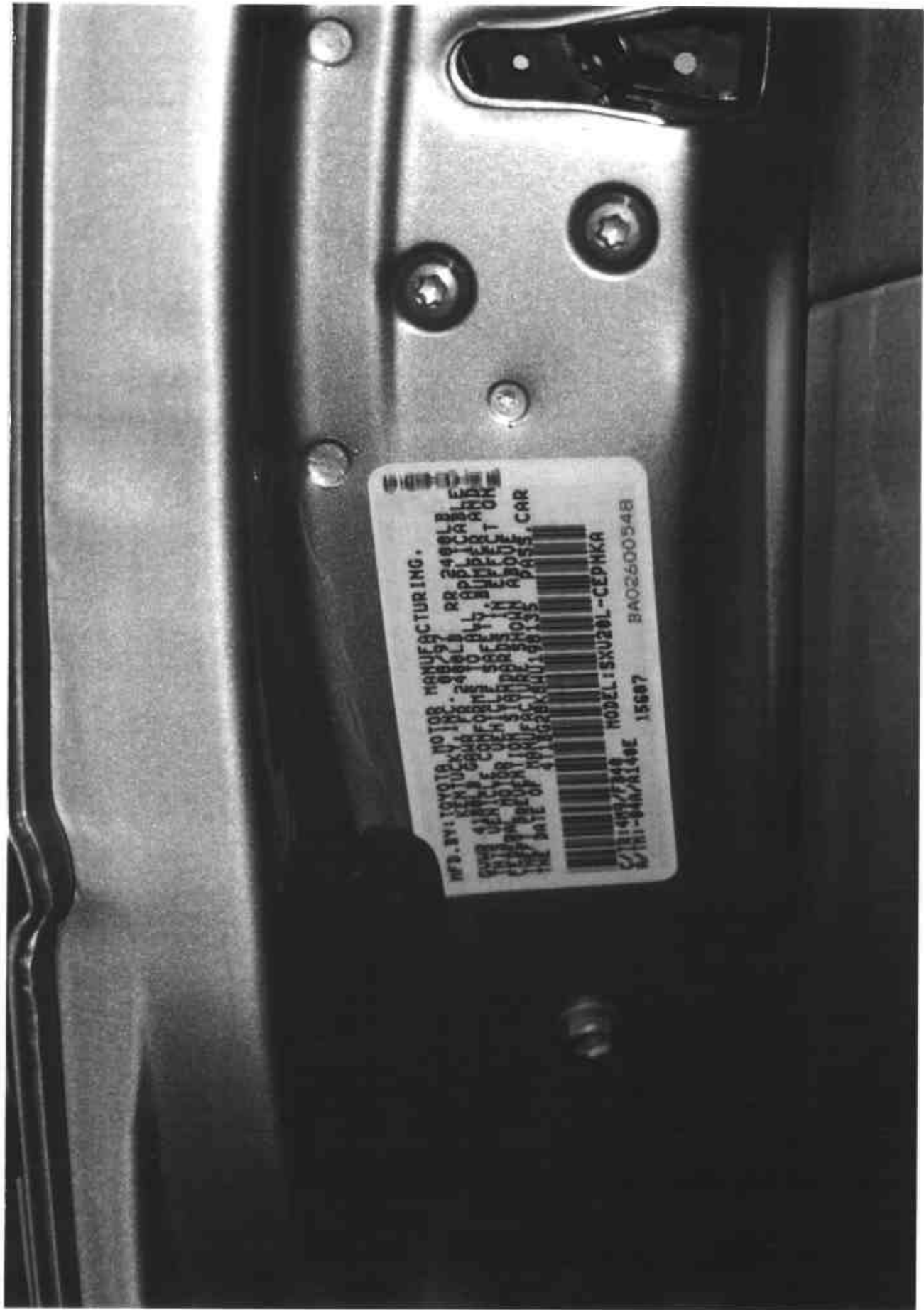


Figure A-32 CLOSE-UP VIEW OF VEHICLE'S CERTIFICATION LABEL

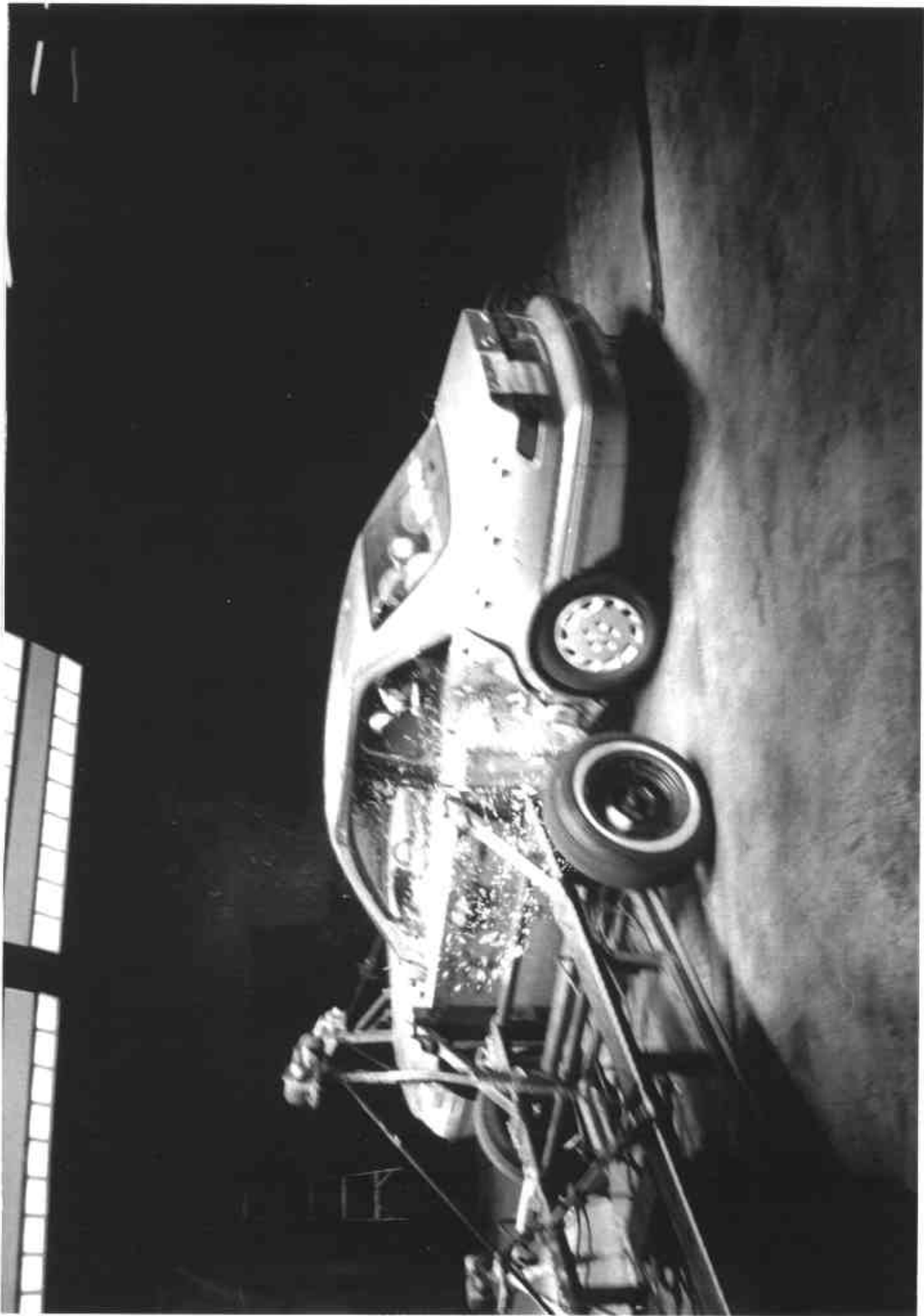


Figure A-34 IMPACT PHOTO

APPENDIX B

VEHICLE, MDB AND SID RESPONSE DATA

TABLE OF DATA PLOTS

DRIVER AND PASSENGER DUMMY INSTRUMENTATION PLOTS

ACCELERATION DATA - FILTER CLASS 180

INTEGRATION DATA - FILTER CLASS 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
1	DRIVER UPPER RIB (Y) ACCELERATION VS TIME	B- 6
2	DRIVER UPPER RIB (Y) VELOCITY VS TIME	B- 7
3	DRIVER LOWER RIB (Y) ACCELERATION VS TIME	B- 8
4	DRIVER LOWER RIB (Y) VELOCITY VS TIME	B- 9
5	DRIVER LOWER SPINE (Y) ACCELERATION VS TIME	B- 10
6	DRIVER LOWER SPINE (Y) VELOCITY VS TIME	B- 11
7	DRIVER PELVIC (Y) ACCELERATION VS TIME	B- 12
8	DRIVER PELVIC (Y) VELOCITY VS TIME	B- 13
9	PASSENGER UPPER RIB (Y) ACCELERATION VS TIME	B- 14
10	PASSENGER UPPER RIB (Y) VELOCITY VS TIME	B- 15
11	PASSENGER LOWER RIB (Y) ACCELERATION VS TIME	B- 16
12	PASSENGER LOWER RIB (Y) VELOCITY VS TIME	B- 17
13	PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME	B- 18
14	PASSENGER LOWER SPINE (Y) VELOCITY VS TIME	B- 19
15	PASSENGER PELVIC (Y) ACCELERATION VS TIME	B- 20
16	PASSENGER PELVIC (Y) VELOCITY VS TIME	B- 21

TEST VEHICLE INSTRUMENTATION PLOTS

ACCELERATION DATA - FILTER CLASS 60

INTEGRATION DATA - FILTER CLASS 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
17	RIGHT SIDE SILL AT FRONT SEAT (X) ACCELERATION VS TIME	B- 23
18	RIGHT SIDE SILL AT FRONT SEAT (X) VELOCITY VS TIME	B- 24
19	RIGHT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME	B- 25
20	RIGHT SIDE SILL AT FRONT SEAT (Y) VELOCITY VS TIME	B- 26
21	RIGHT SIDE SILL AT FRONT SEAT (Z) ACCELERATION VS TIME	B- 27
22	RIGHT SIDE SILL AT FRONT SEAT (Z) VELOCITY VS TIME	B- 28
23	RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION VS TIME	B- 29
24	RIGHT SIDE SILL AT REAR SEAT (X) ACCELERATION VS TIME	B- 30
25	RIGHT SIDE SILL AT REAR SEAT (X) VELOCITY VS TIME	B- 31
26	RIGHT SIDE SILL AT REAR SEAT (Y) ACCELERATION VS TIME	B- 32
27	RIGHT SIDE SILL AT REAR SEAT (Y) VELOCITY VS TIME	B- 33
28	RIGHT SIDE SILL AT REAR SEAT (Z) ACCELERATION VS TIME	B- 34
29	RIGHT SIDE SILL AT REAR SEAT (Z) VELOCITY VS TIME	B- 35
30	RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION VS TIME	B- 36
31	REAR FLOORPAN ABOVE AXLE (X) ACCELERATION VS TIME	B- 37
32	REAR FLOORPAN ABOVE AXLE (X) VELOCITY VS TIME	B- 38
33	REAR FLOORPAN ABOVE AXLE (Y) ACCELERATION VS TIME	B- 39
34	REAR FLOORPAN ABOVE AXLE (Y) VELOCITY VS TIME	B- 40

35	REAR FLOORPAN ABOVE AXLE (Z) ACCELERATION VS TIME	B- 41
36	REAR FLOORPAN ABOVE AXLE (Z) VELOCITY VS TIME	B- 42
37	REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION VS TIME	B- 43
38	LEFT SIDE SILL AT REAR SEAT (Y) ACCELERATION VS TIME	B- 44
39	LEFT SIDE SILL AT REAR SEAT (Y) VELOCITY VS TIME	B- 45
40	LEFT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME	B- 46
41	LEFT SIDE SILL AT FRONT SEAT (Y) VELOCITY VS TIME	B- 47
42	RIGHT REAR OCCUPANT COMPARTMENT (Y) ACCELERATION VS TIME	B- 48
43	RIGHT REAR OCCUPANT COMPARTMENT (Y) VELOCITY VS TIME	B- 49
44	LOWER B-POST (Y) ACCELERATION VS TIME	B- 50
45	LOWER B-POST (Y) VELOCITY VS TIME	B- 51
46	UPPER B-POST (Y) ACCELERATION VS TIME	B- 52
47	UPPER B-POST (Y) VELOCITY VS TIME	B- 53
48	LOWER A-POST (Y) ACCELERATION VS TIME	B- 54
49	LOWER A-POST (Y) VELOCITY VS TIME	B- 55
50	UPPER A-POST (Y) ACCELERATION VS TIME	B- 56
51	UPPER A-POST (Y) VELOCITY VS TIME	B- 57
52	FRONT SEAT TRACK (Y) ACCELERATION VS TIME	B- 58
53	FRONT SEAT TRACK (Y) VELOCITY VS TIME	B- 59
54	REAR SEAT TRACK (Y) ACCELERATION VS TIME	B- 60
55	REAR SEAT TRACK (Y) VELOCITY VS TIME	B- 61
56	VEHICLE CENTER OF GRAVITY (X) ACCELERATION VS TIME	B- 62
57	VEHICLE CENTER OF GRAVITY (X) VELOCITY VS TIME	B- 63
58	VEHICLE CENTER OF GRAVITY (Y) ACCELERATION VS TIME	B- 64
59	VEHICLE CENTER OF GRAVITY (Y) VELOCITY ACCELERATION VS TIME	B- 65
60	VEHICLE CENTER OF GRAVITY (Z) ACCELERATION VS TIME	B- 66
61	VEHICLE CENTER OF GRAVITY (Z) VELOCITY VS TIME	B- 67
62	VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION VS TIME	B- 68

MDB INSTRUMENTATION PLOTS
ACCELERATION DATA - FILTER CLASS 60
INTEGRATION DATA - FILTER CLASS 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
63	MDB CENTER OF GRAVITY (X) ACCELERATION VS TIME	B- 70
64	MDB CENTER OF GRAVITY (X) VELOCITY VS TIME	B- 71
65	MDB CENTER OF GRAVITY (Y) ACCELERATION VS TIME	B- 72
66	MDB CENTER OF GRAVITY (Y) VELOCITY VS TIME	B- 73
67	MDB CENTER OF GRAVITY (Z) ACCELERATION VS TIME	B- 74
68	MDB CENTER OF GRAVITY (Z) VELOCITY VS TIME	B- 75
69	MDB CENTER OF GRAVITY RESULTANT ACCELERATION VS TIME	B- 76
70	MDB REAR (X) ACCELERATION VS TIME	B- 77
71	MDB REAR (X) VELOCITY VS TIME	B- 78
72	MDB REAR (Y) ACCELERATION VS TIME	B- 79
73	MDB REAR (Y) VELOCITY VS TIME	B- 80

DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS (Redundant)
ACCELERATION DATA - FILTER CLASS 180
INTEGRATION DATA - FILTER CLASS 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
74	DRIVER UPPER RIB (Y) ACCELERATION VS TIME	B- 82
75	DRIVER UPPER RIB (Y) VELOCITY VS TIME	B- 83
76	DRIVER LOWER RIB (Y) ACCELERATION VS TIME	B- 84
77	DRIVER LOWER RIB (Y) VELOCITY VS TIME	B- 85
78	DRIVER LOWER SPINE (Y) ACCELERATION VS TIME	B- 86
79	DRIVER LOWER SPINE (Y) VELOCITY VS TIME	B- 87
80	DRIVER PELVIC (Y) ACCELERATION VS TIME	B- 88
81	DRIVER PELVIC (Y) VELOCITY VS TIME	B- 89
82	PASSENGER UPPER RIB (Y) ACCELERATION VS TIME	B- 90
83	PASSENGER UPPER RIB (Y) VELOCITY VS TIME	B- 91
84	PASSENGER LOWER RIB (Y) ACCELERATION VS TIME	B- 92
85	PASSENGER LOWER RIB (Y) VELOCITY VS TIME	B- 93
86	PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME	B- 94
87	PASSENGER LOWER SPINE (Y) VELOCITY VS TIME	B- 95
88	PASSENGER PELVIC (Y) ACCELERATION VS TIME	B- 96
89	PASSENGER PELVIC (Y) VELOCITY VS TIME	B- 97

DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS
ACCELERATION DATA - FIR FILTERED

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
90	DRIVER UPPER RIB (Y) ACCELERATION VS TIME	B- 99
91	DRIVER LOWER RIB (Y) ACCELERATION VS TIME	B- 100
92	DRIVER LOWER SPINE (Y) ACCELERATION VS TIME	B- 101
93	DRIVER PELVIC (Y) ACCELERATION VS TIME	B- 102
94	PASSENGER UPPER RIB (Y) ACCELERATION VS TIME	B- 103
95	PASSENGER LOWER RIB (Y) ACCELERATION VS TIME	B- 104
96	PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME	B- 105
97	PASSENGER PELVIC (Y) ACCELERATION VS TIME	B- 106

DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS (redundant)
ACCELERATION DATA - FIR FILTERED

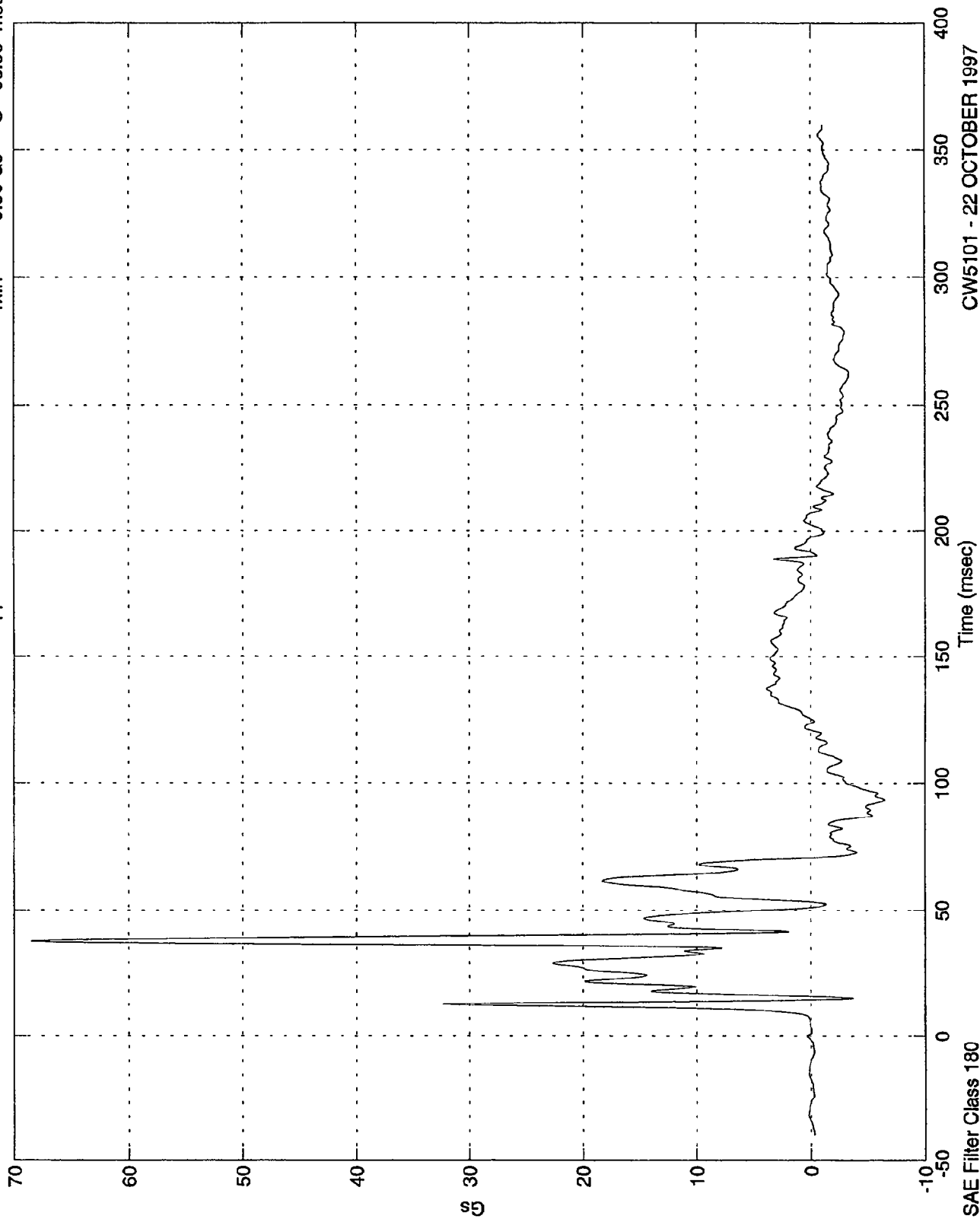
<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
98	DRIVER UPPER RIB (Y) ACCELERATION VS TIME	B- 108
99	DRIVER LOWER RIB (Y) ACCELERATION VS TIME	B- 109
100	DRIVER LOWER SPINE (Y) ACCELERATION VS TIME	B- 110
101	DRIVER PELVIC (Y) ACCELERATION VS TIME	B- 111
102	PASSENGER UPPER RIB (Y) ACCELERATION VS TIME	B- 112
103	PASSENGER LOWER RIB (Y) ACCELERATION VS TIME	B- 113
104	PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME	B- 114
105	PASSENGER PELVIC (Y) ACCELERATION VS TIME	B- 115

DRIVER AND PASSENGER DUMMY INSTRUMENTATION PLOTS
ACCELERATION DATA - FILTER CLASS 180
INTEGRATION DATA - FILTER CLASS 180

NHTSA Side Impact - 1998 Toyota Camry

Max = 68.49 Gs @ 37.59 msec
 Min = -6.50 Gs @ 93.59 msec

P1 Upper Rib Y



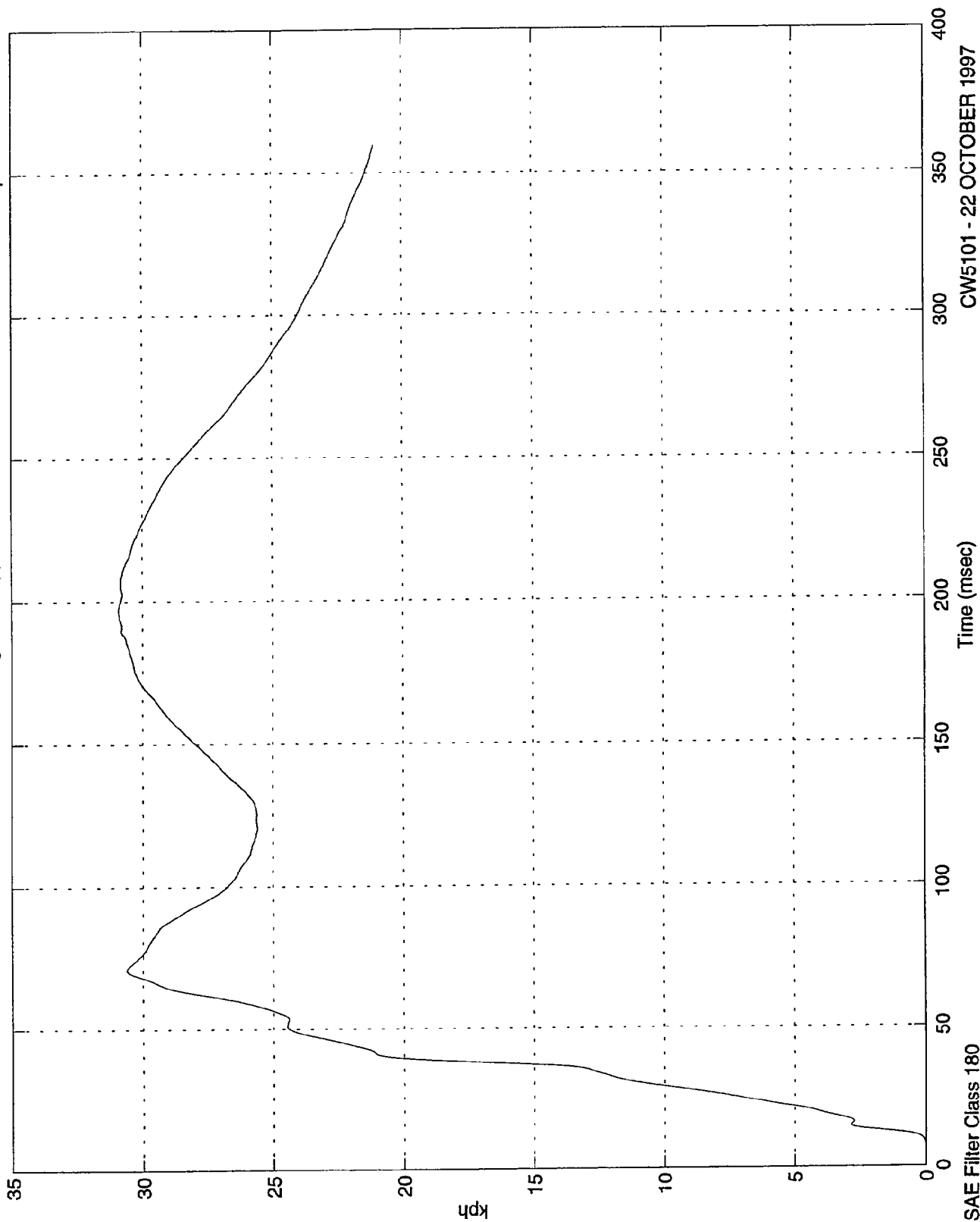
SAE Filter Class 180

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 30.91 kph @ 197.20 msec
Min = .00 kph @ 0.00 msec

1st Integral P1 Upper Rib Y



CW5101 - 22 OCTOBER 1997

SAE Filter Class 180

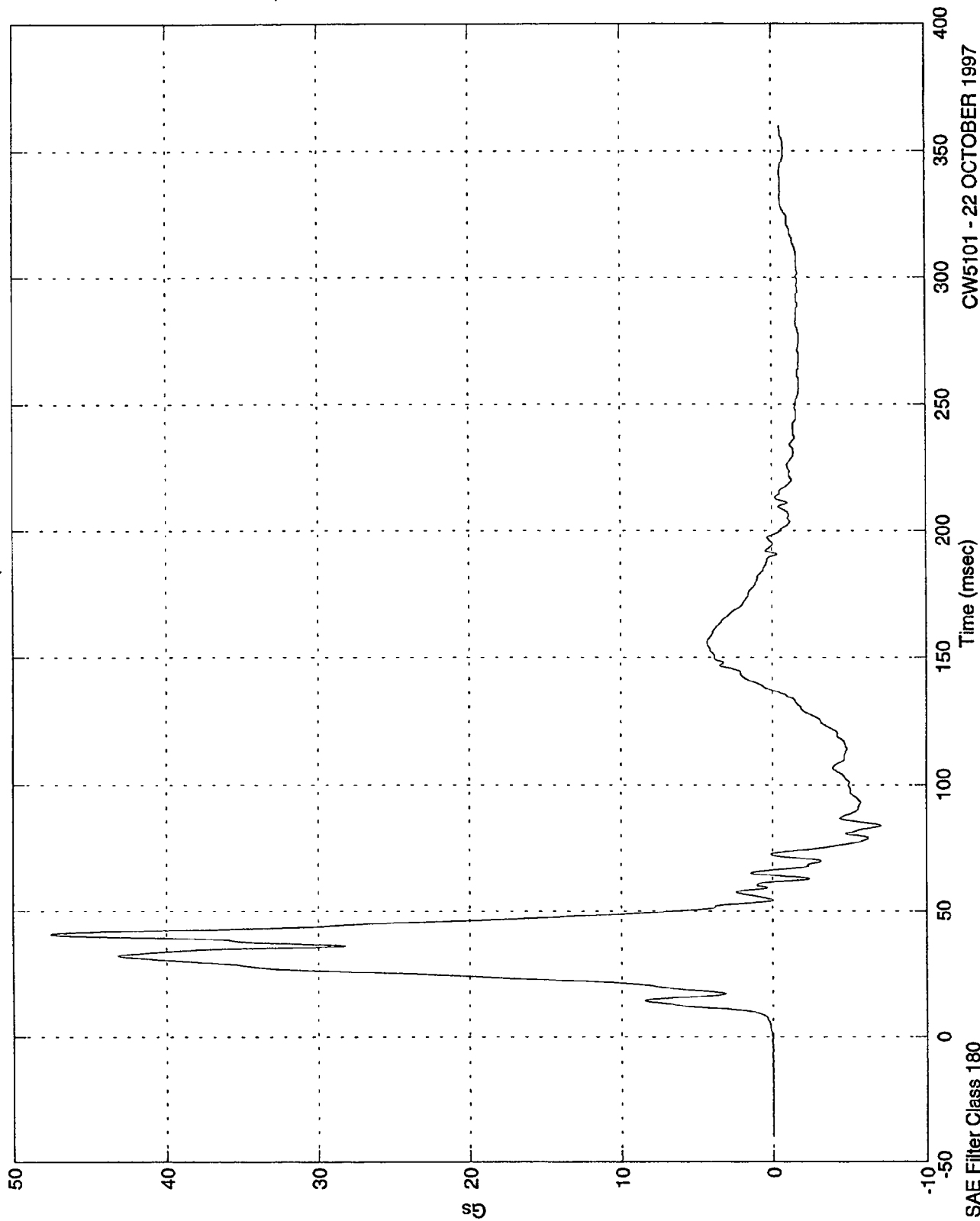
DRIVER LOWER RIB Y ACCELEROMETER WAS DAMAGED AT IMPACT

DRIVER LOWER RIB Y ACCELEROMETER WAS DAMAGED AT IMPACT

Max = 47.57 Gs @ 40.70 msec
Min = -7.03 Gs @ 83.70 msec

P1 Lower Spine Y

NHTSA Side Impact - 1998 Toyota Camry



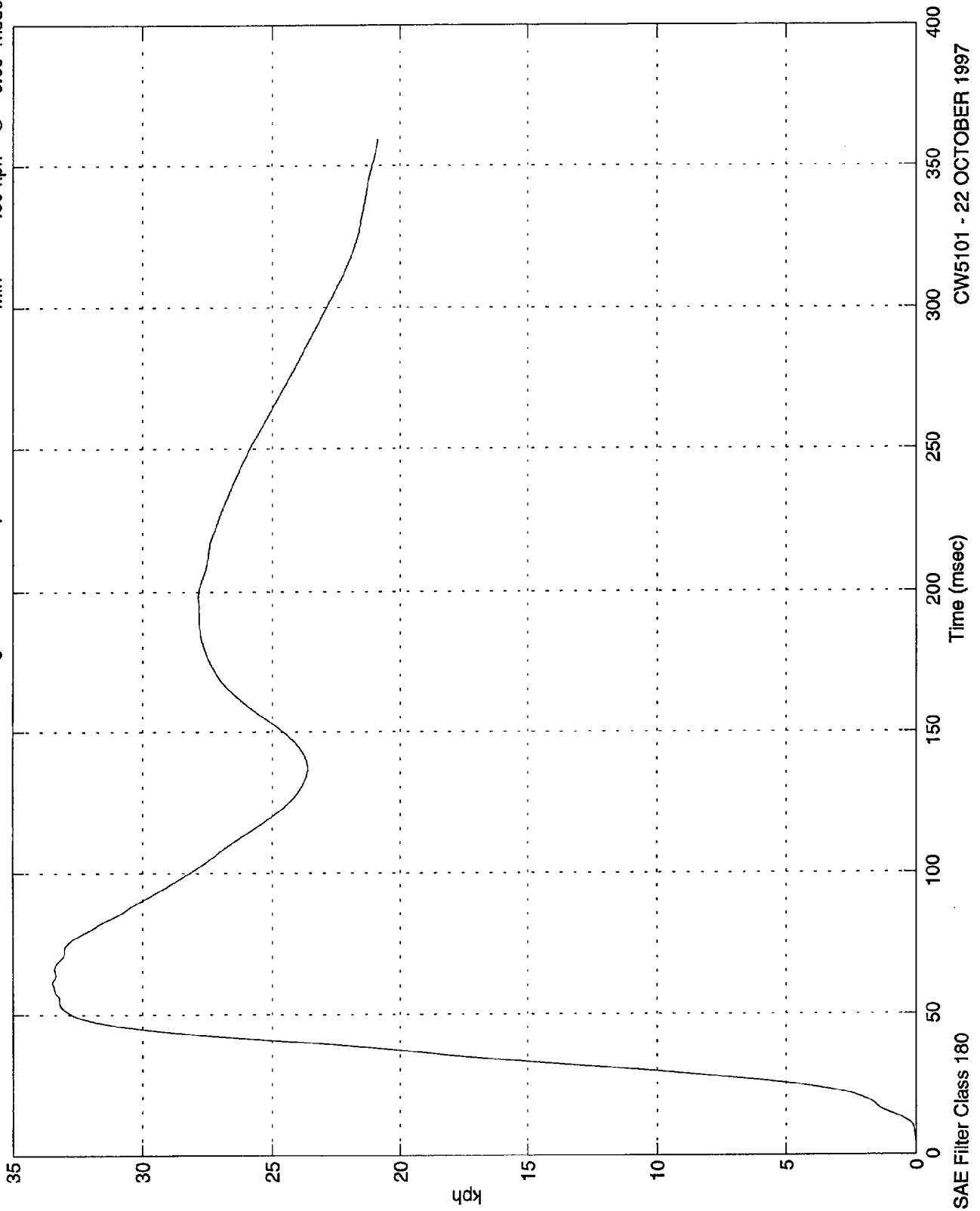
CW5101 - 22 OCTOBER 1997

SAE Filter Class 180

NHTSA Side Impact - 1998 Toyota Camry

Max = 33.46 kph @ 61.59 msec
Min = .00 kph @ 0.00 msec

1st Integral P1 Lower Spine Y

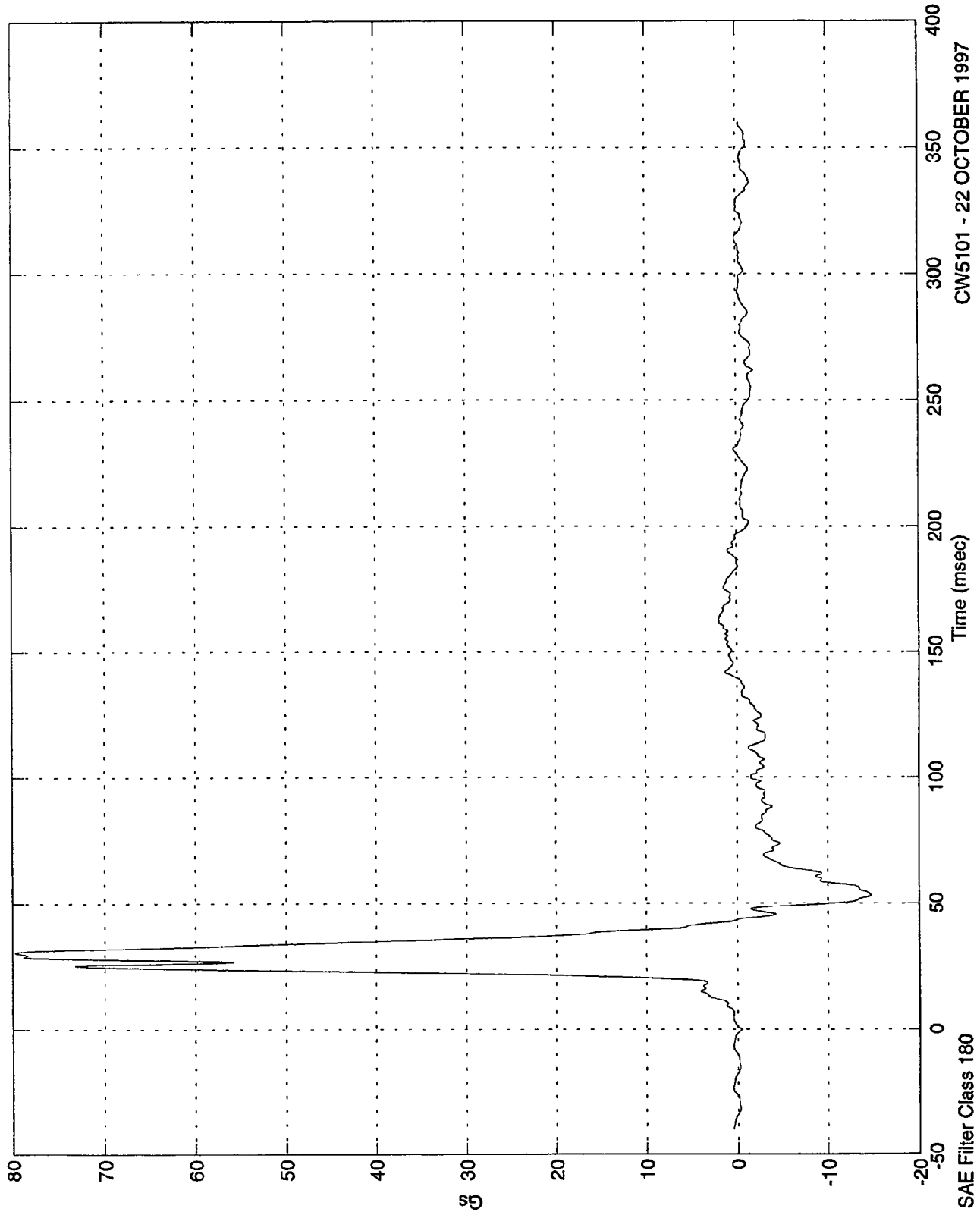


CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

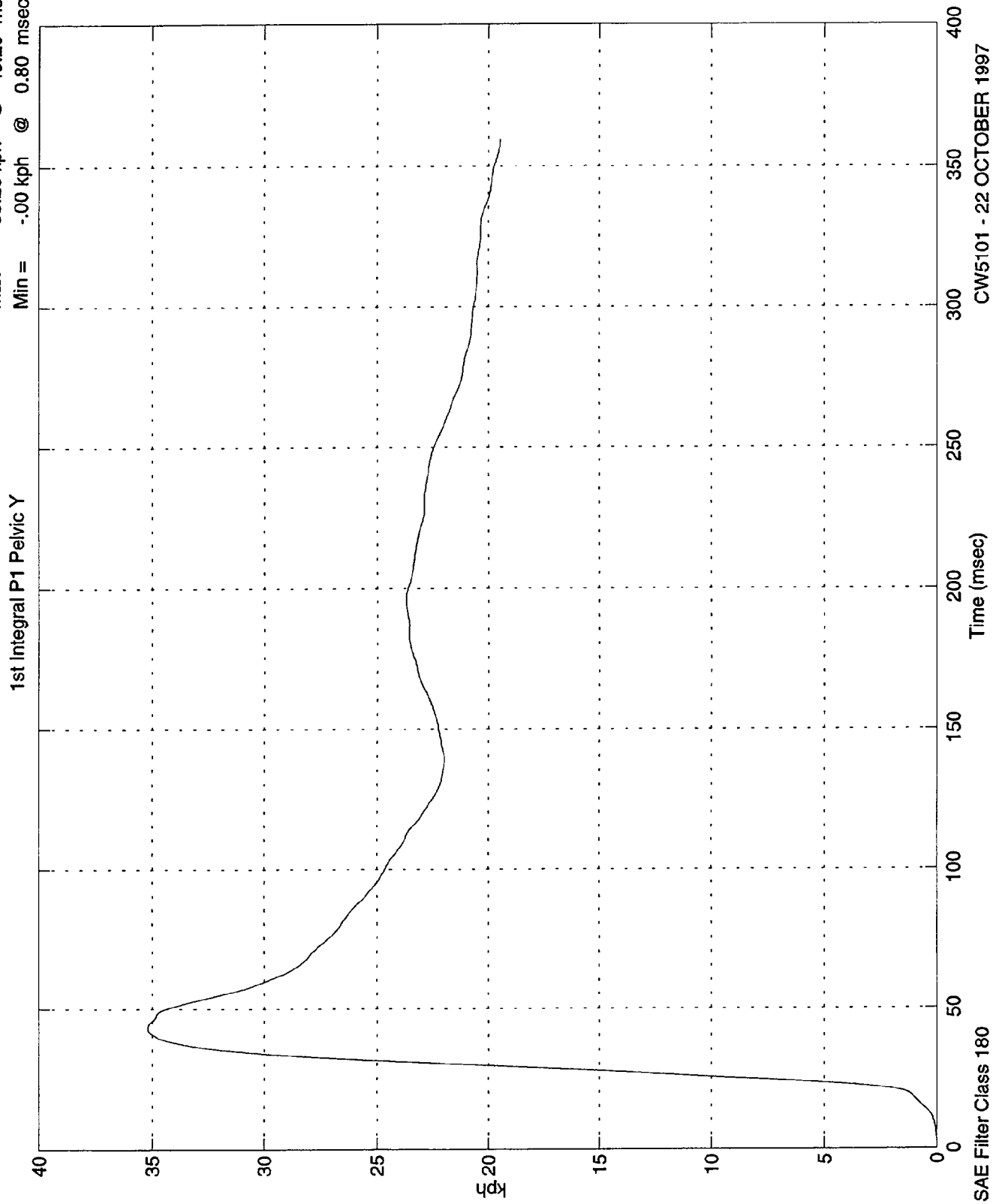
P1 Pelvic Y

Max = 79.73 Gs @ 30.39 msec
Min = -14.74 Gs @ 53.00 msec



NHTSA Side Impact - 1998 Toyota Camry

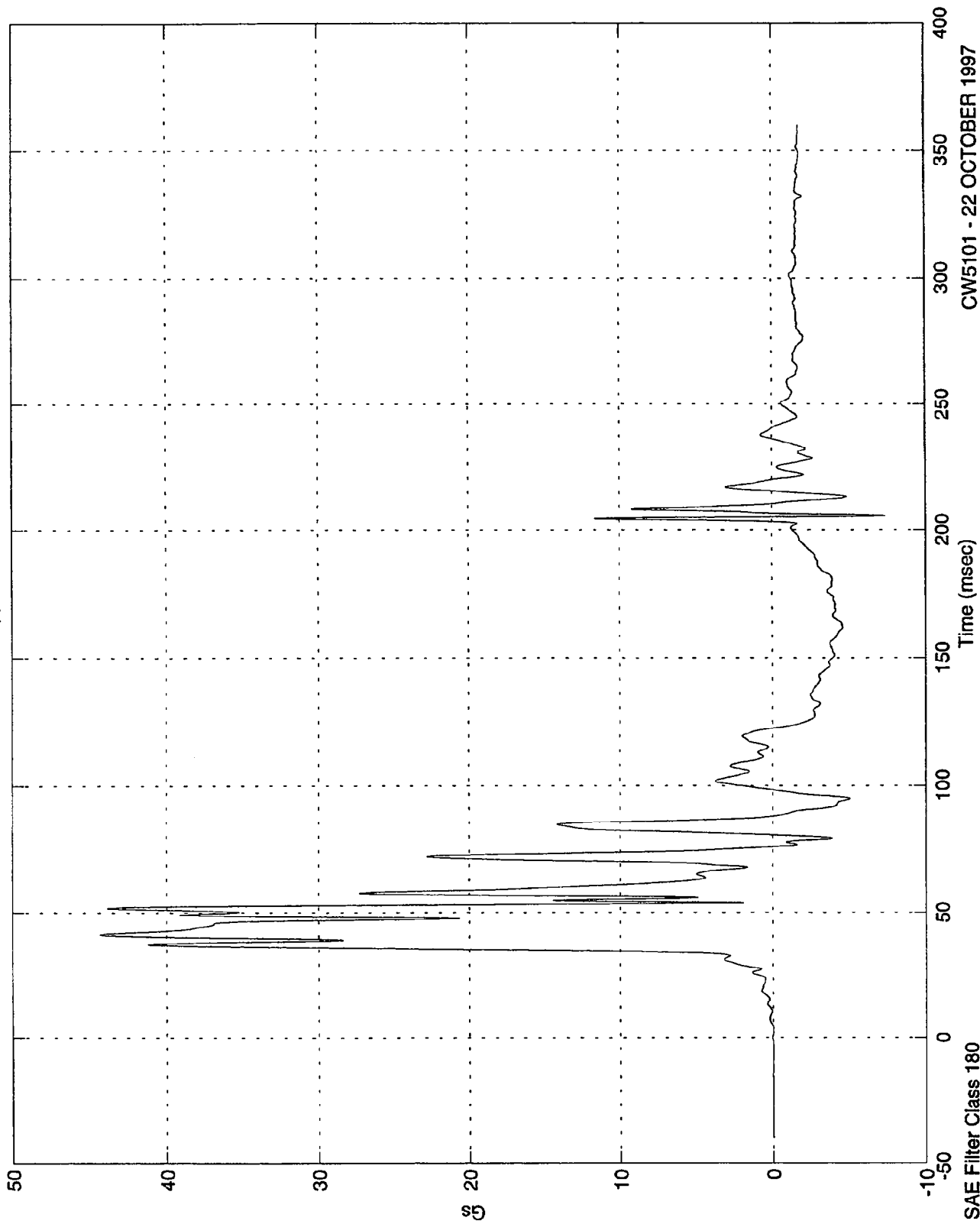
Max = 35.20 kph @ 43.20 msec
Min = -0.00 kph @ 0.80 msec



Max = 44.31 Gs @ 41.19 msec
Min = -7.34 Gs @ 205.59 msec

NHTSA Side Impact - 1998 Toyota Camry

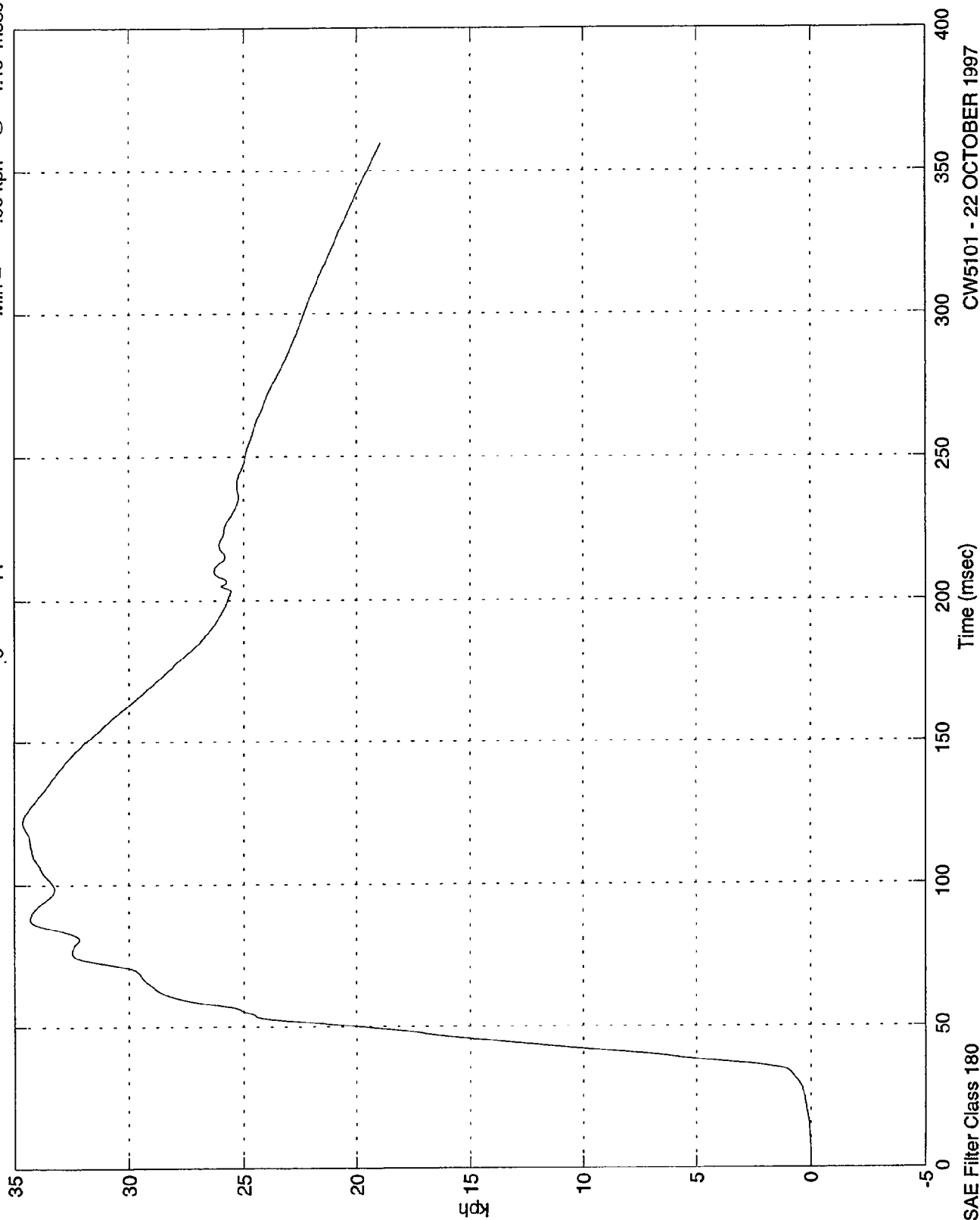
P4 Upper Rib Y



NHTSA Side Impact - 1998 Toyota Camry

Max = 34.63 kph @ 122.19 msec
Min = -.00 kph @ 4.40 msec

1st Integral P4 Upper Rib Y



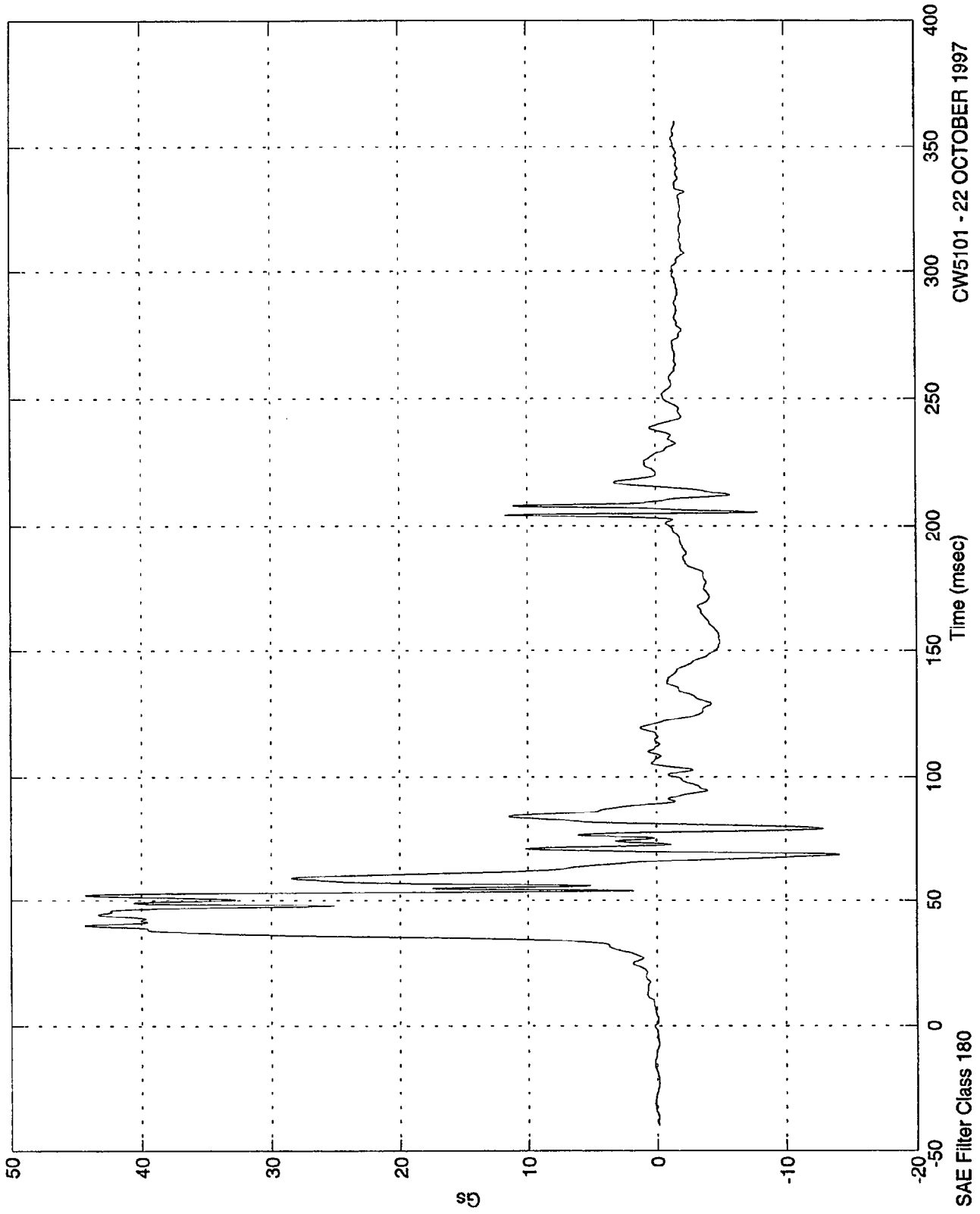
SAE Filter Class 180

CW5101 - 22 OCTOBER 1997

Max = 44.34 Gs @ 39.59 msec
Min = -14.13 Gs @ 68.50 msec

NHTSA Side Impact - 1998 Toyota Camry

P4 Lower Rib Y

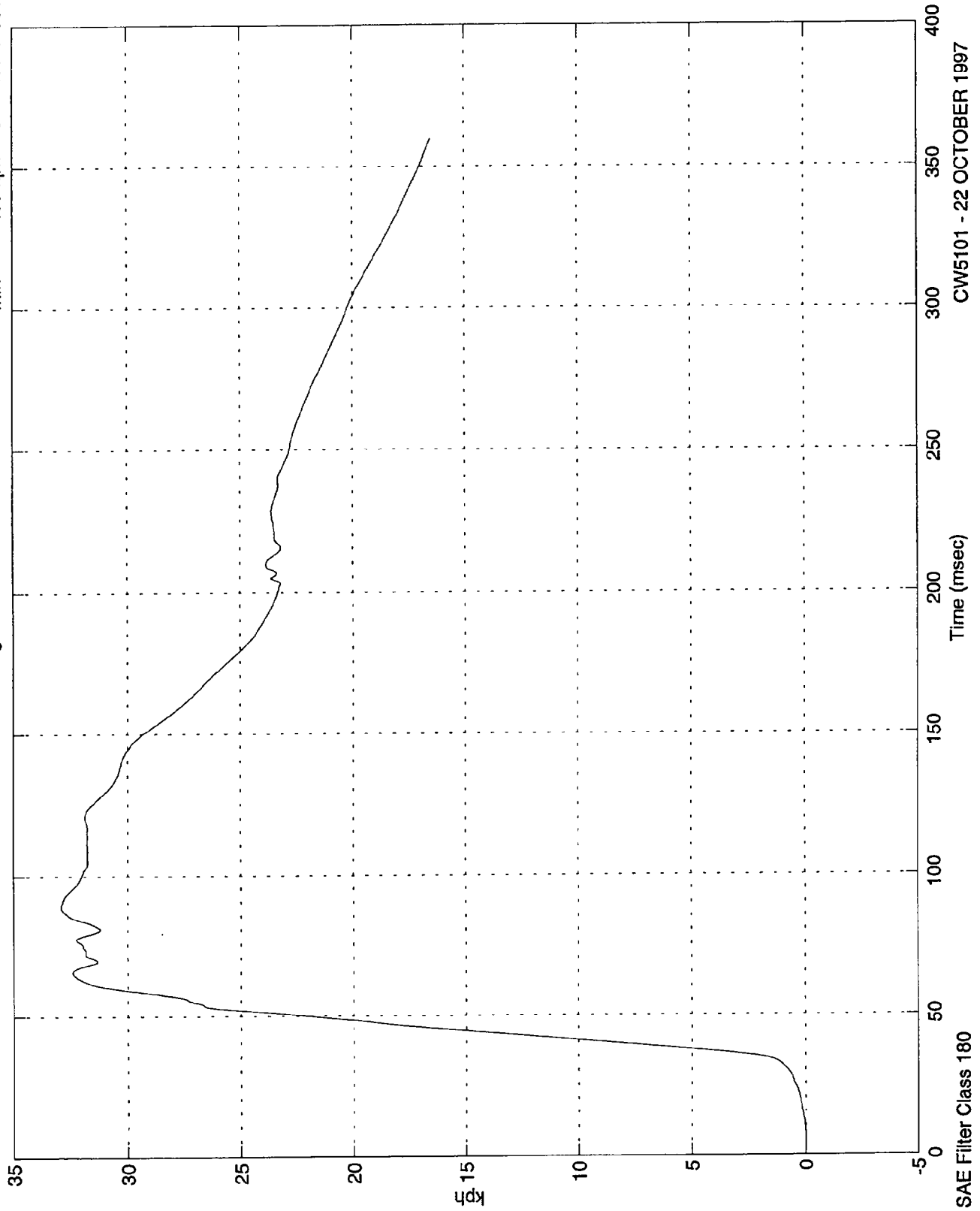


CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 32.89 kph @ 89.00 msec
Min = -.00 kph @ 4.00 msec

1st Integral P4 Lower Rib Y



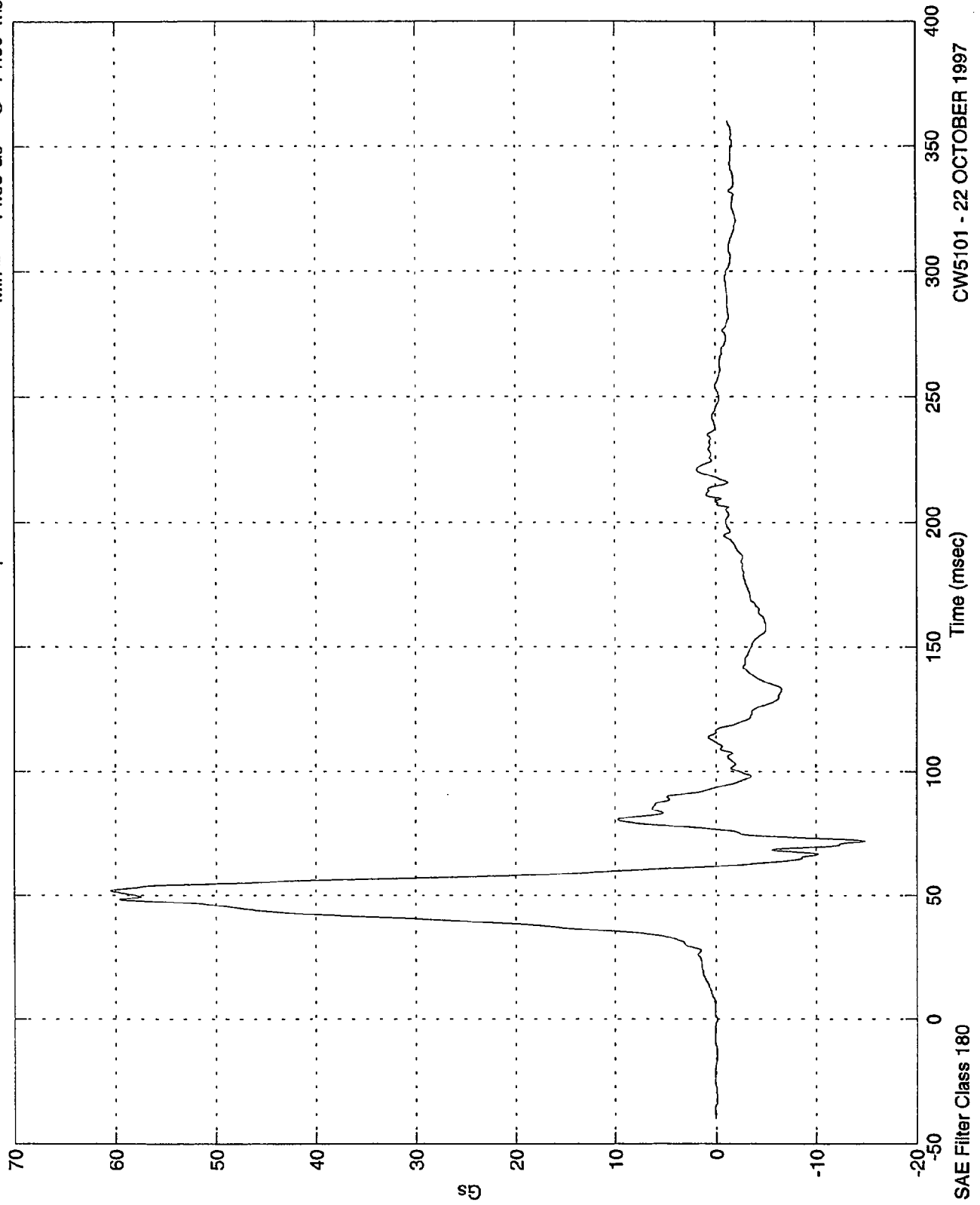
CW5101 - 22 OCTOBER 1997

SAE Filter Class 180

NHTSA Side Impact - 1998 Toyota Camry

P4 Lower Spine Y

Max = 60.48 Gs @ 51.79 msec
Min = -14.83 Gs @ 71.89 msec



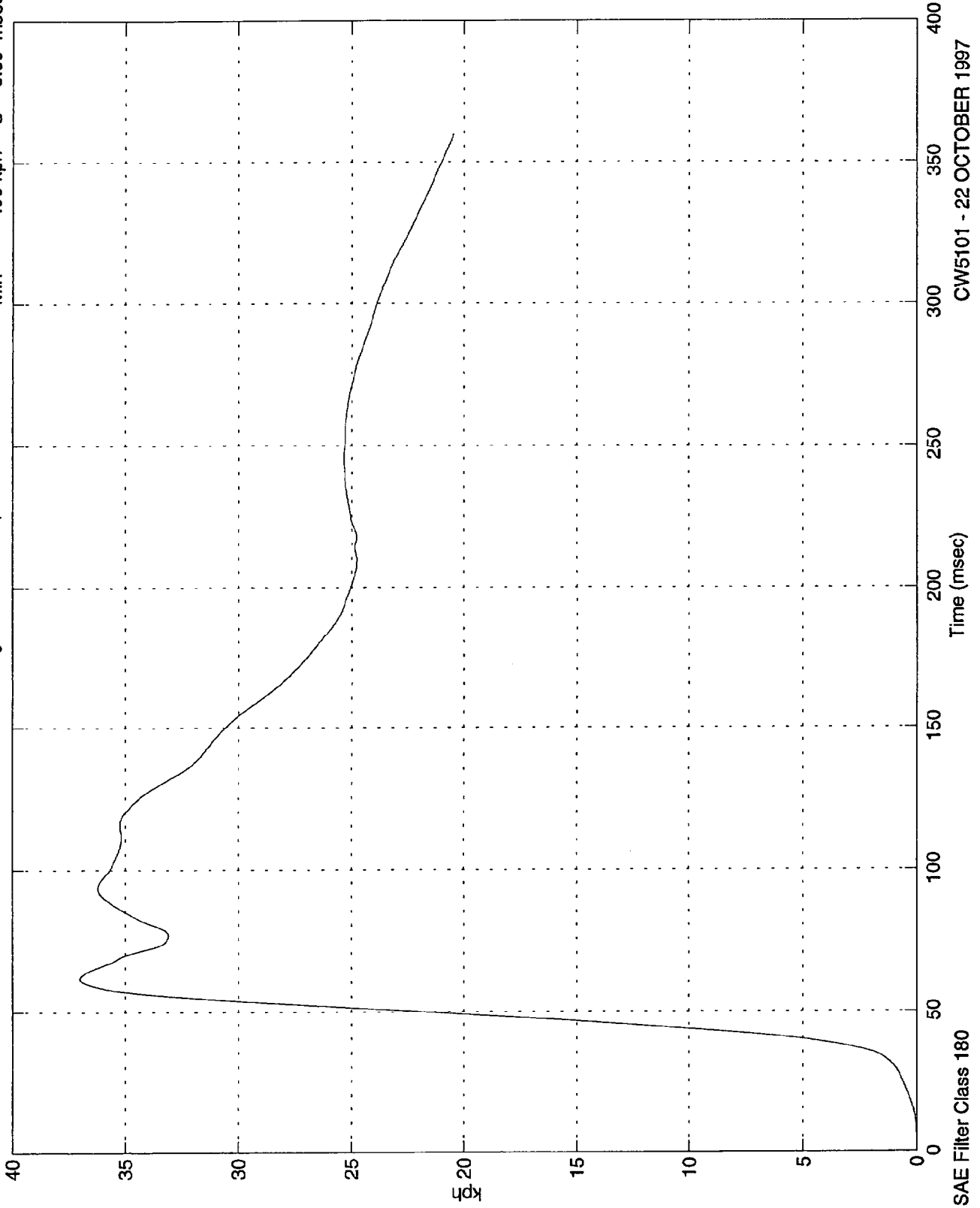
SAE Filter Class 180

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 37.00 kph @ 61.70 msec
 Min = -.00 kph @ 0.80 msec

1st Integral P4 Lower Spine Y



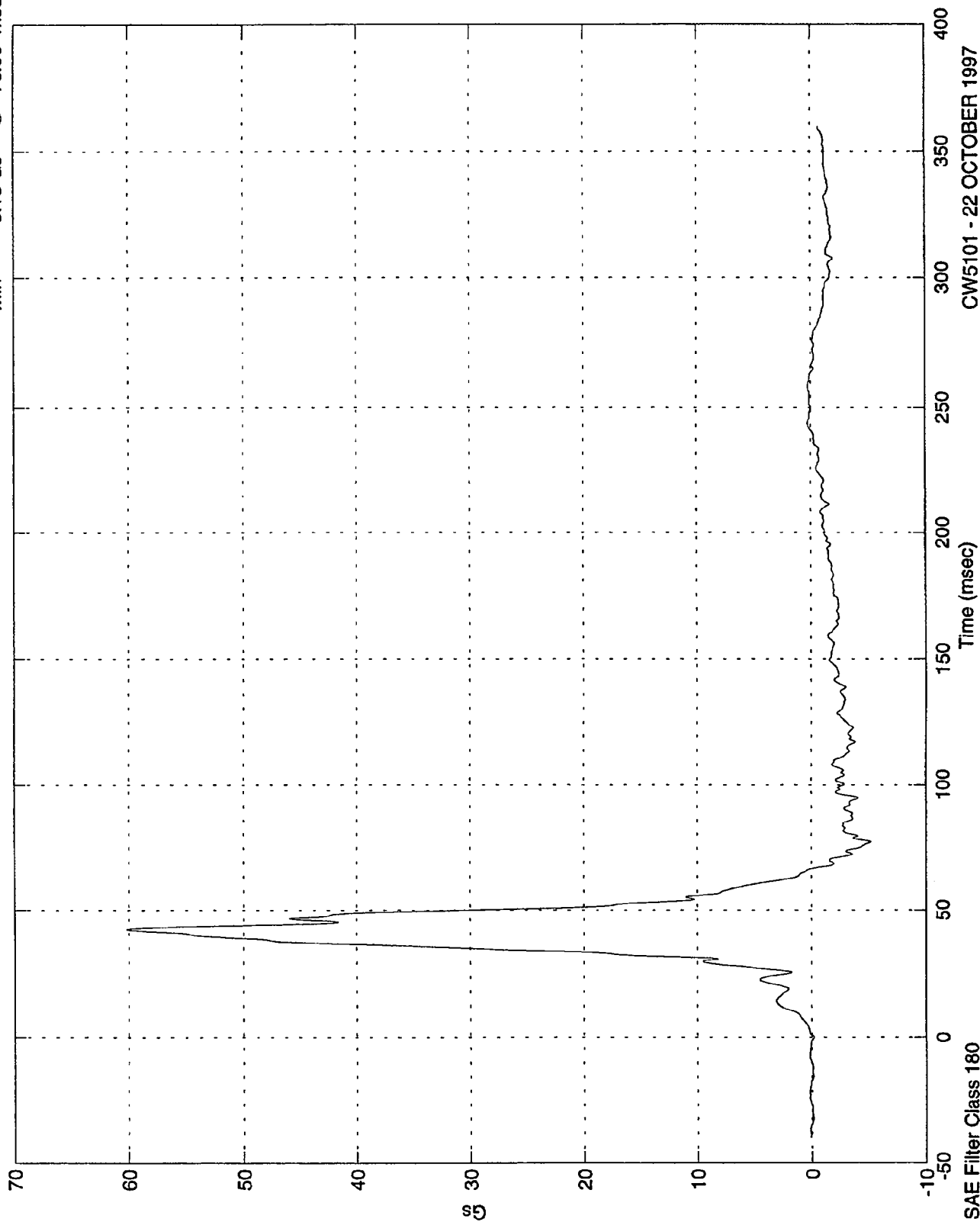
CW5101 - 22 OCTOBER 1997

SAE Filter Class 180

Max = 60.15 Gs @ 42.20 msec
Min = -5.18 Gs @ 76.90 msec

P4 Pelvic Y

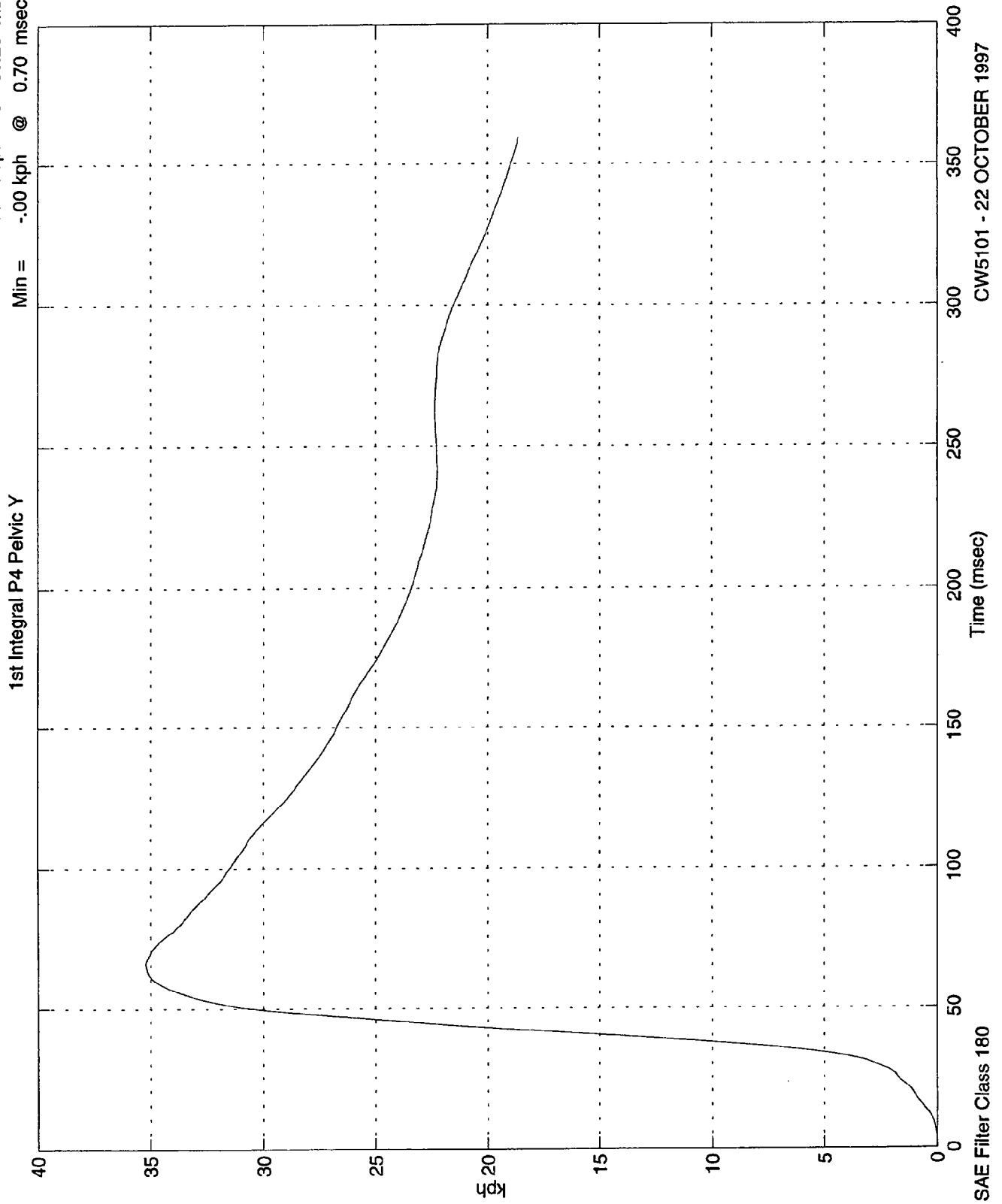
NHTSA Side Impact - 1998 Toyota Camry



SAE Filter Class 180

NHTSA Side Impact - 1998 Toyota Camry

Max = 35.20 kph @ 66.20 msec
 Min = -0.00 kph @ 0.70 msec



SAE Filter Class 180

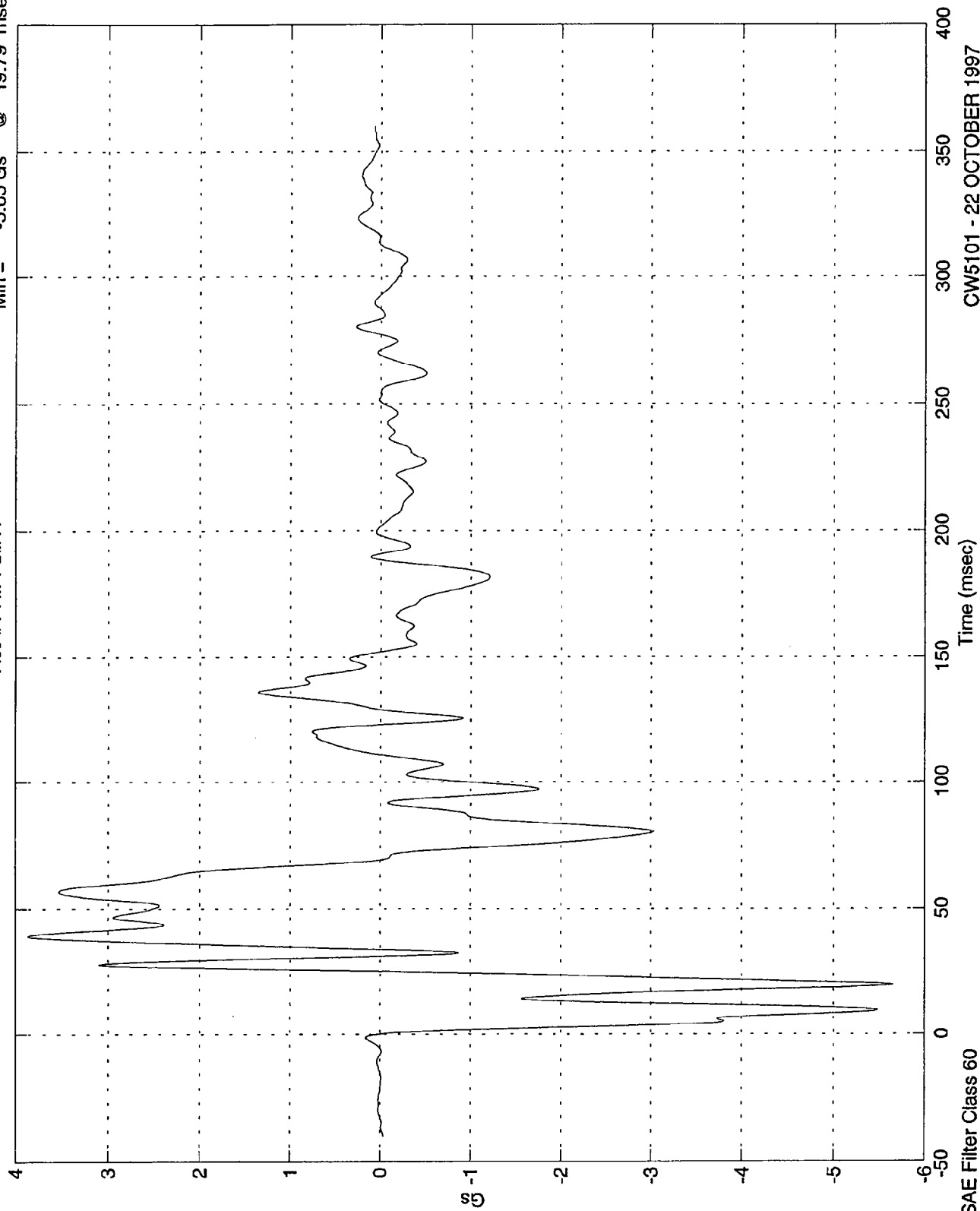
CW5101 - 22 OCTOBER 1997

TEST VEHICLE INSTRUMENTATION PLOTS
ACCELERATION DATA - FILTER CLASS 60
INTEGRATION DATA - FILTER CLASS 180

NHTSA Side Impact - 1998 Toyota Camry

Max = 3.86 Gs @ 38.99 msec
Min = -5.65 Gs @ 19.79 msec

Acc #1 R.F. Sill X

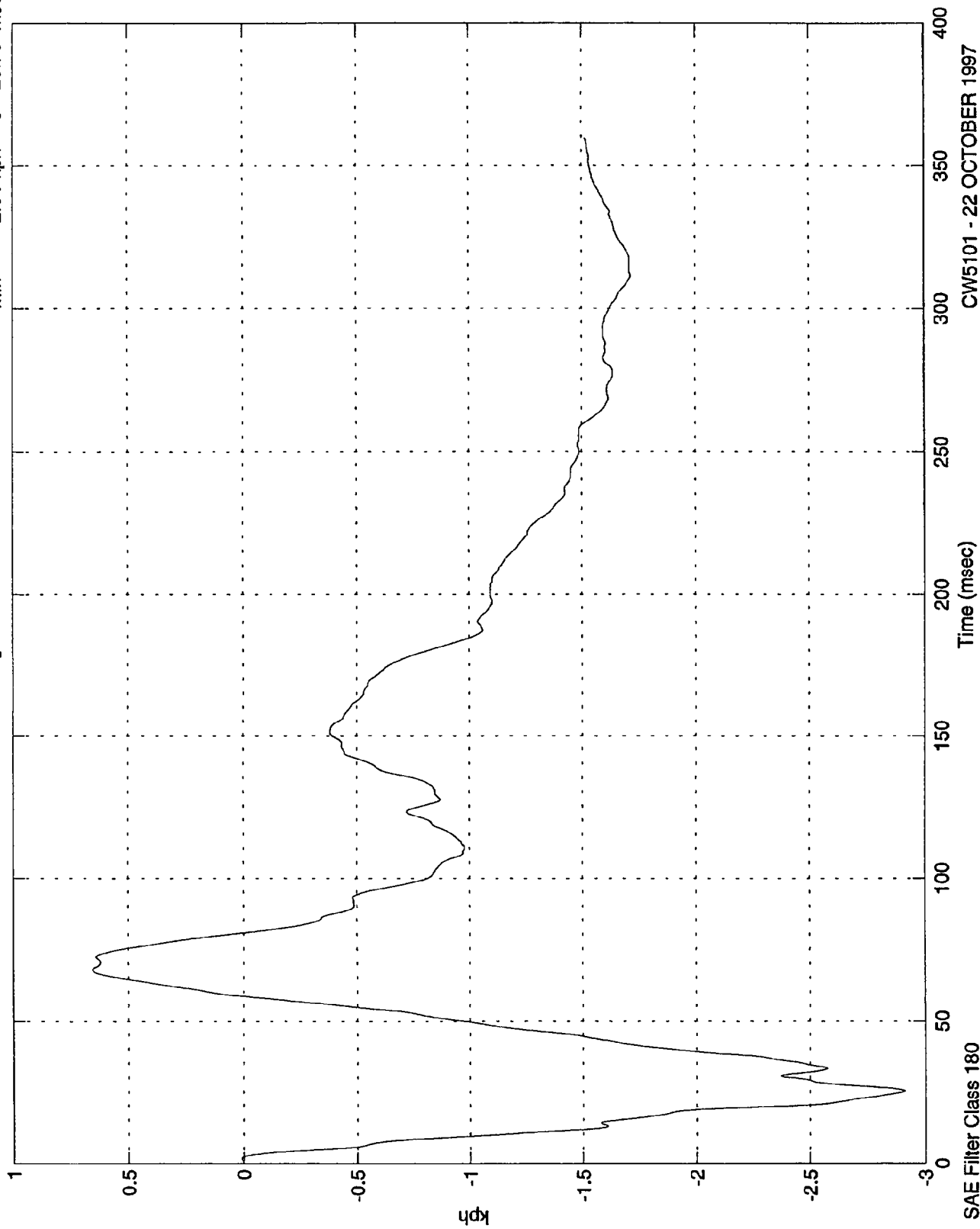


CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

1st Integral Acc #1 R.F. Sill X

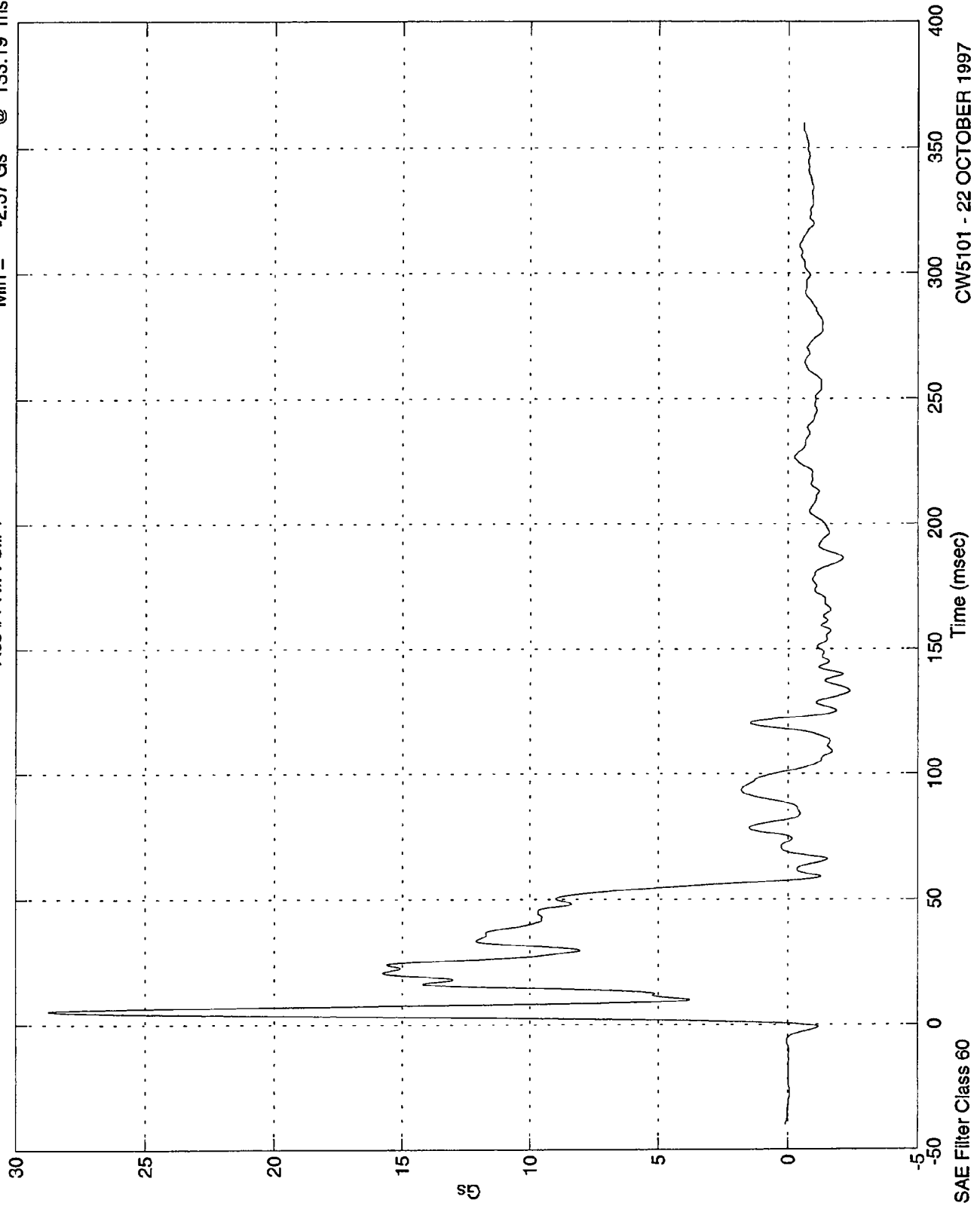
Max = .65 kph @ 68.19 msec
Min = -2.91 kph @ 25.70 msec



NHTSA Side Impact - 1998 Toyota Camry

Max = 28.71 Gs @ 5.19 msec
Min = -2.37 Gs @ 133.19 msec

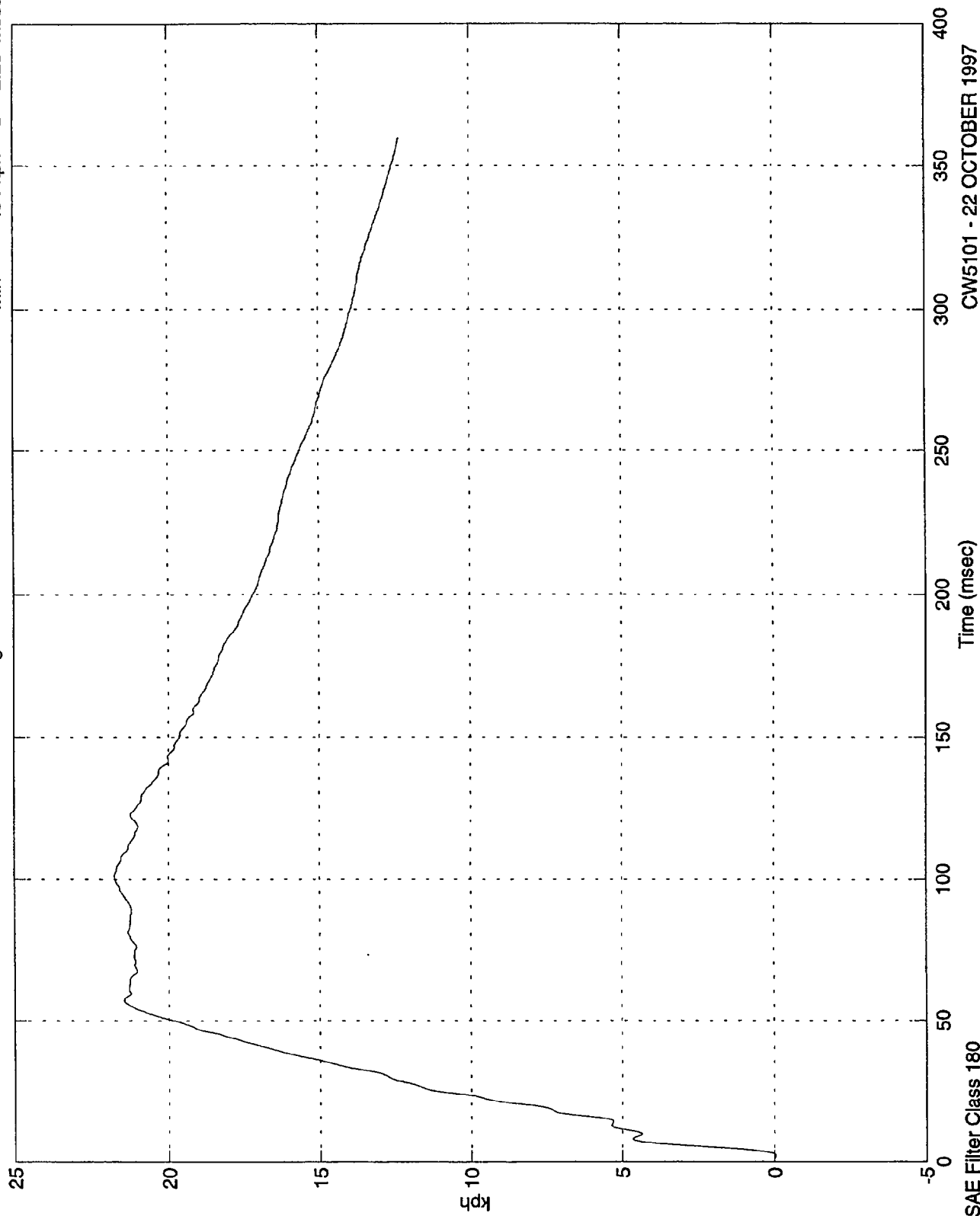
Acc #1 R.F. Sill Y



NHTSA Side Impact - 1998 Toyota Camry

1st Integral Acc #1 R.F. Sill Y

Max = 21.74 kph @ 101.19 msec
Min = -.04 kph @ 2.20 msec



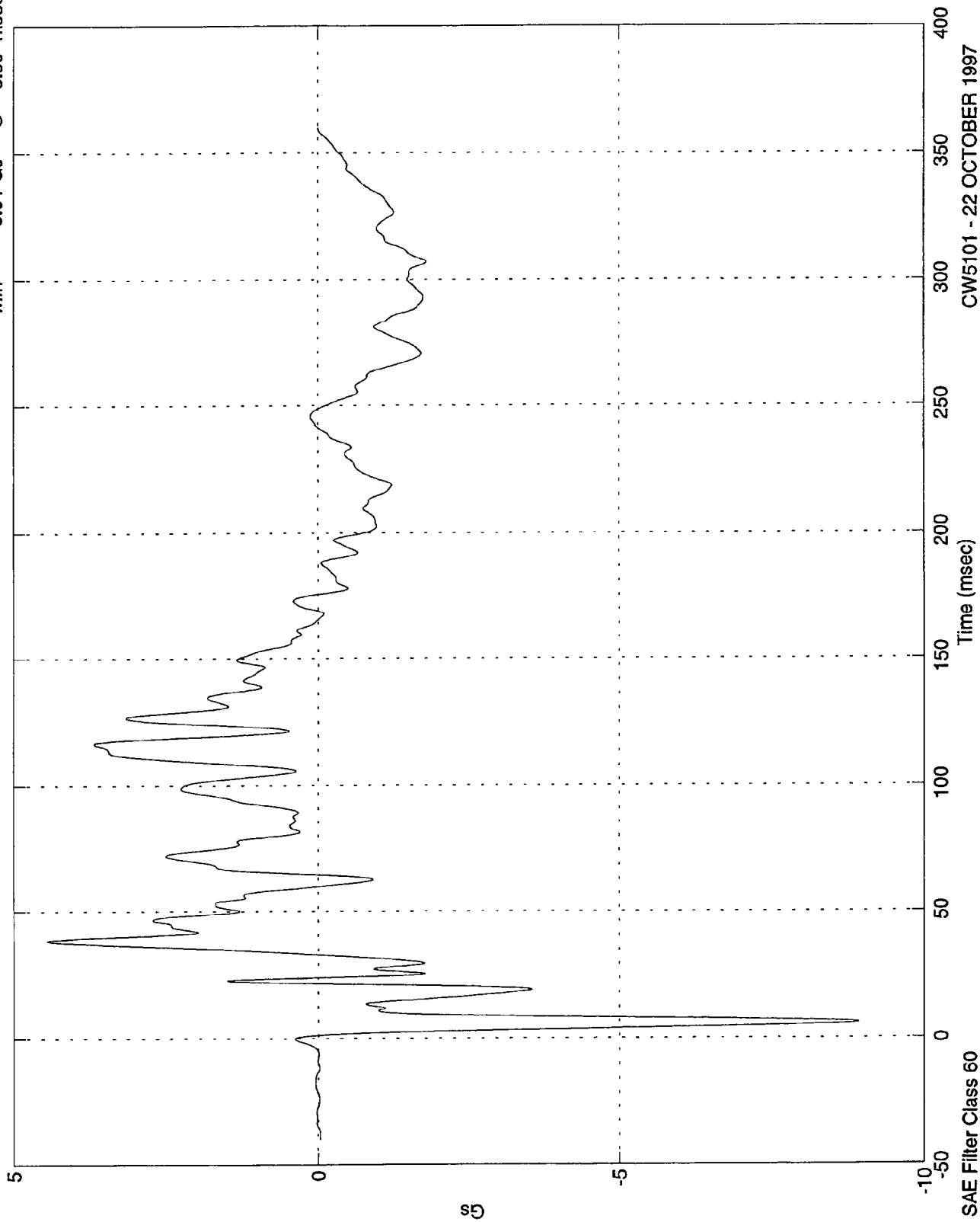
SAE Filter Class 180

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 4.45 Gs @ 38.29 msec
 Min = -8.91 Gs @ 5.89 msec

Acc #1 R.F. Still Z

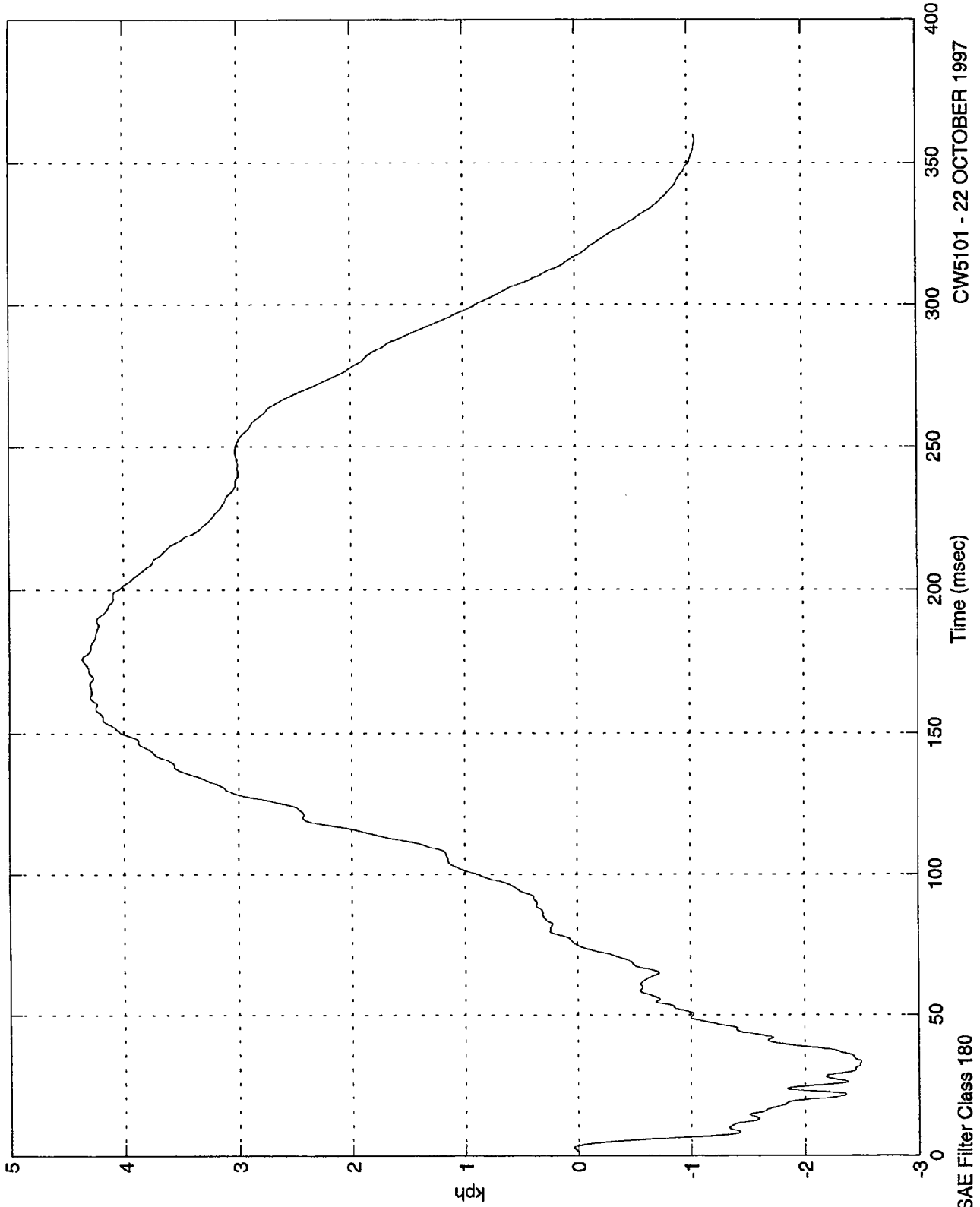


CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 4.35 kph @ 175.79 msec
Min = -2.49 kph @ 33.19 msec

1st Integral Acc #1 R.F. Sill Z



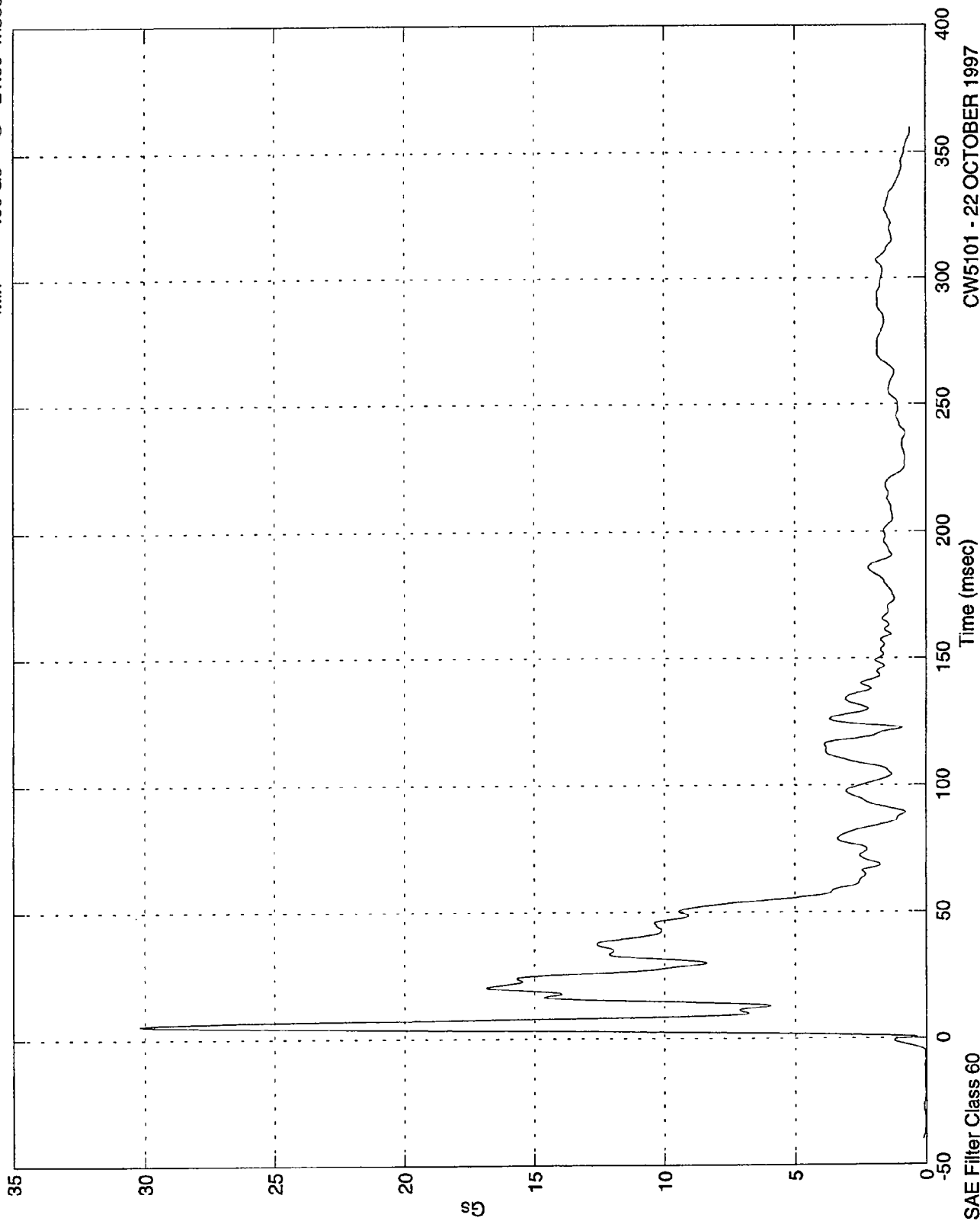
SAE Filter Class 180

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 30.18 Gs @ 5.29 msec
Min = .00 Gs @ -21.39 msec

Acc #1 R.F. Sill Res

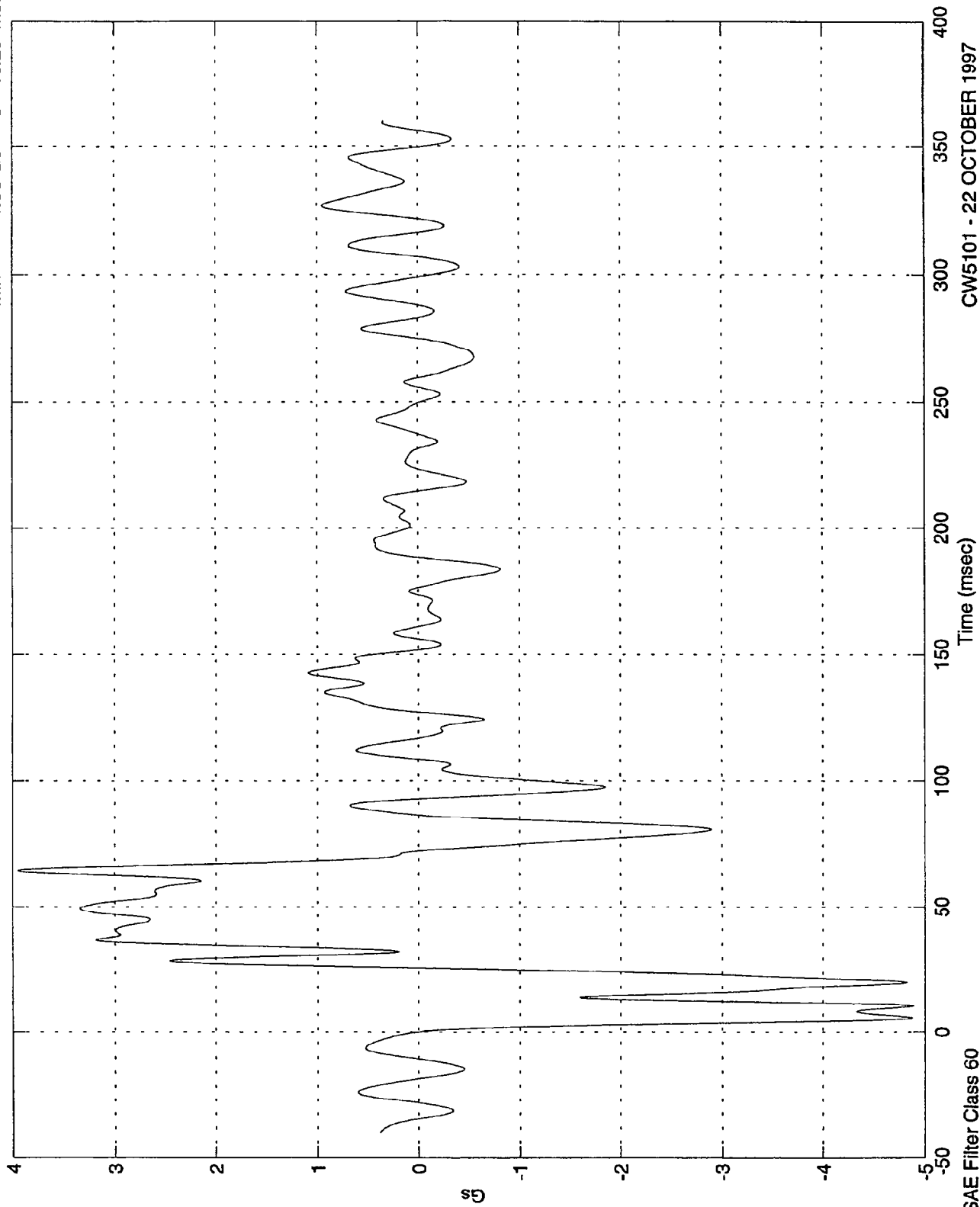


CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 3.94 Gs @ 64.19 msec
Min = -4.88 Gs @ 10.29 msec

Acc #2 R.R. Sill X

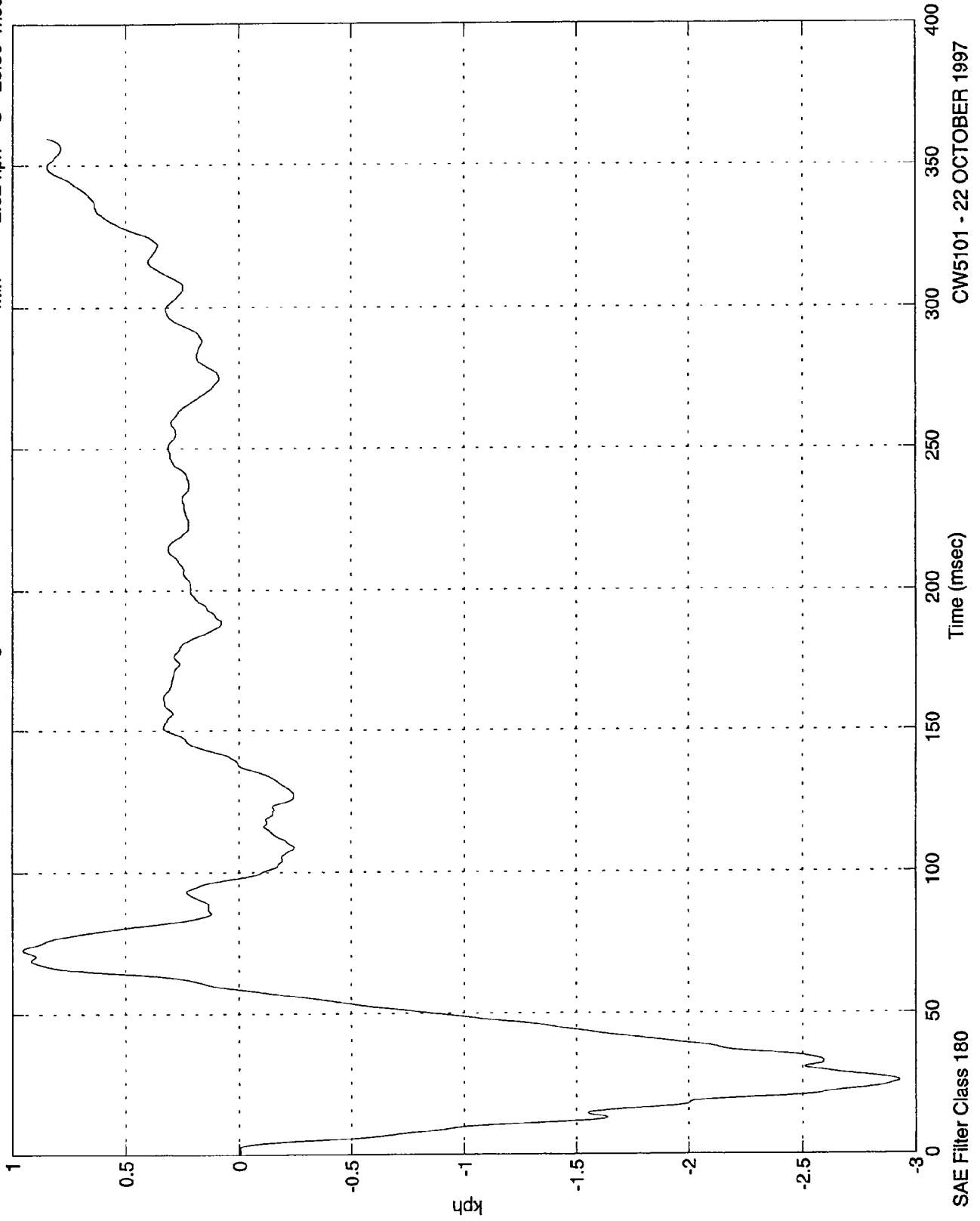


CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = .95 kph @ 72.70 msec
Min = -2.92 kph @ 25.80 msec

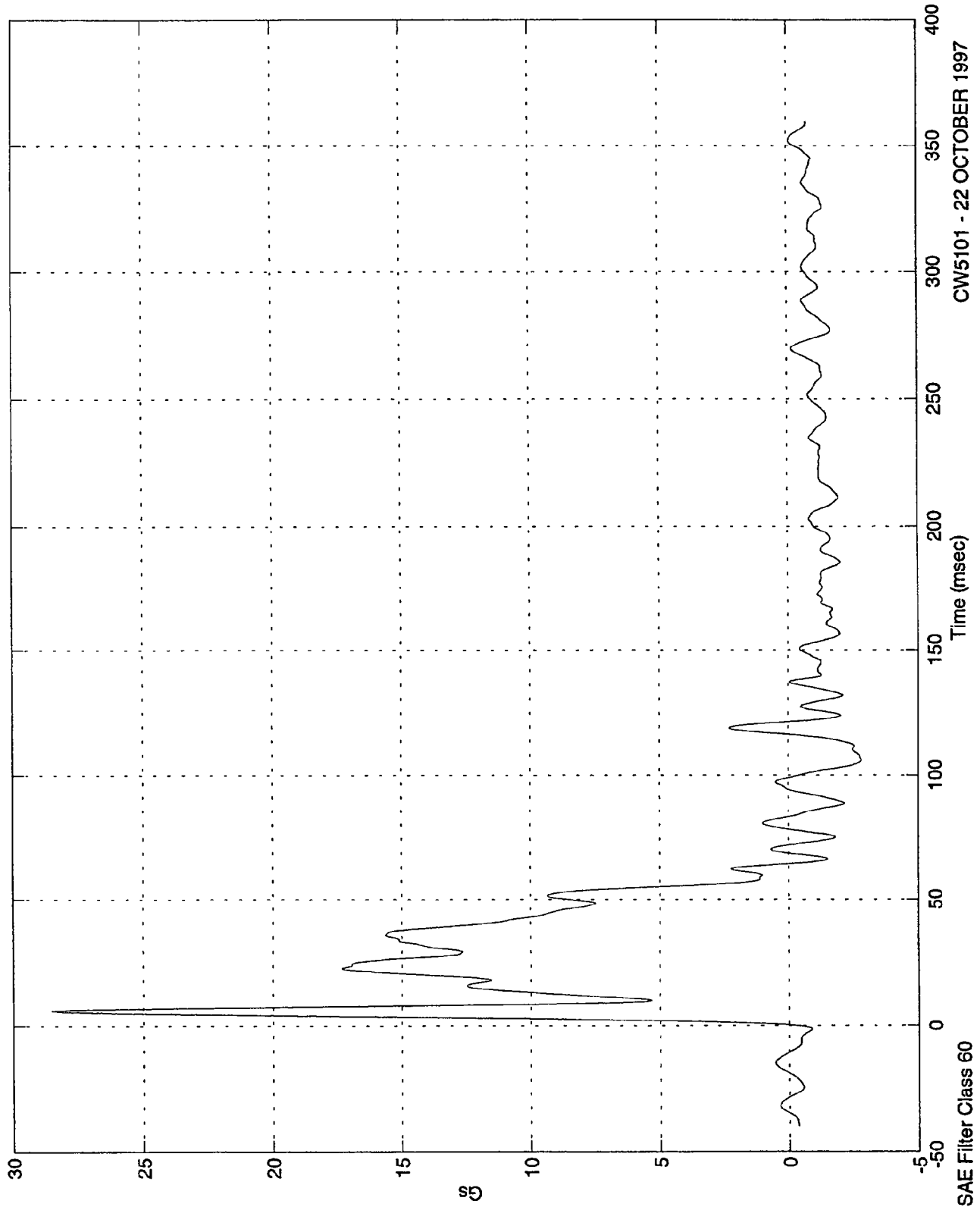
1st Integral Acc #2 R.R. Sill X



NHTSA Side Impact - 1998 Toyota Camry

Max = 28.51 Gs @ 5.79 msec
 Min = -2.79 Gs @ 106.00 msec

Acc #2 R.R. Sill Y



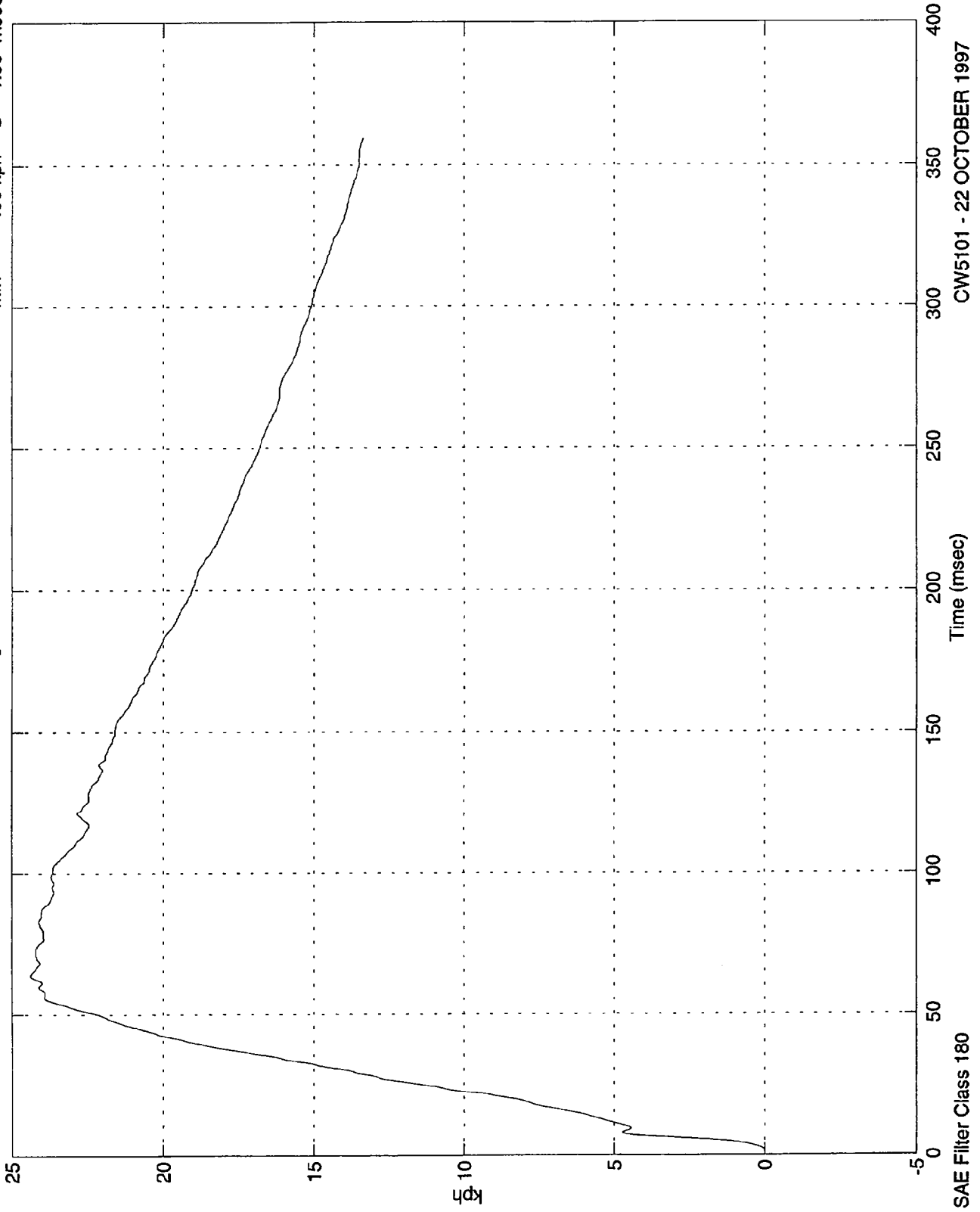
SAE Filter Class 60

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 24.39 kph @ 63.79 msec
Min = -.00 kph @ 1.30 msec

1st Integral Acc #2 R.R. Sill Y



SAE Filter Class 180

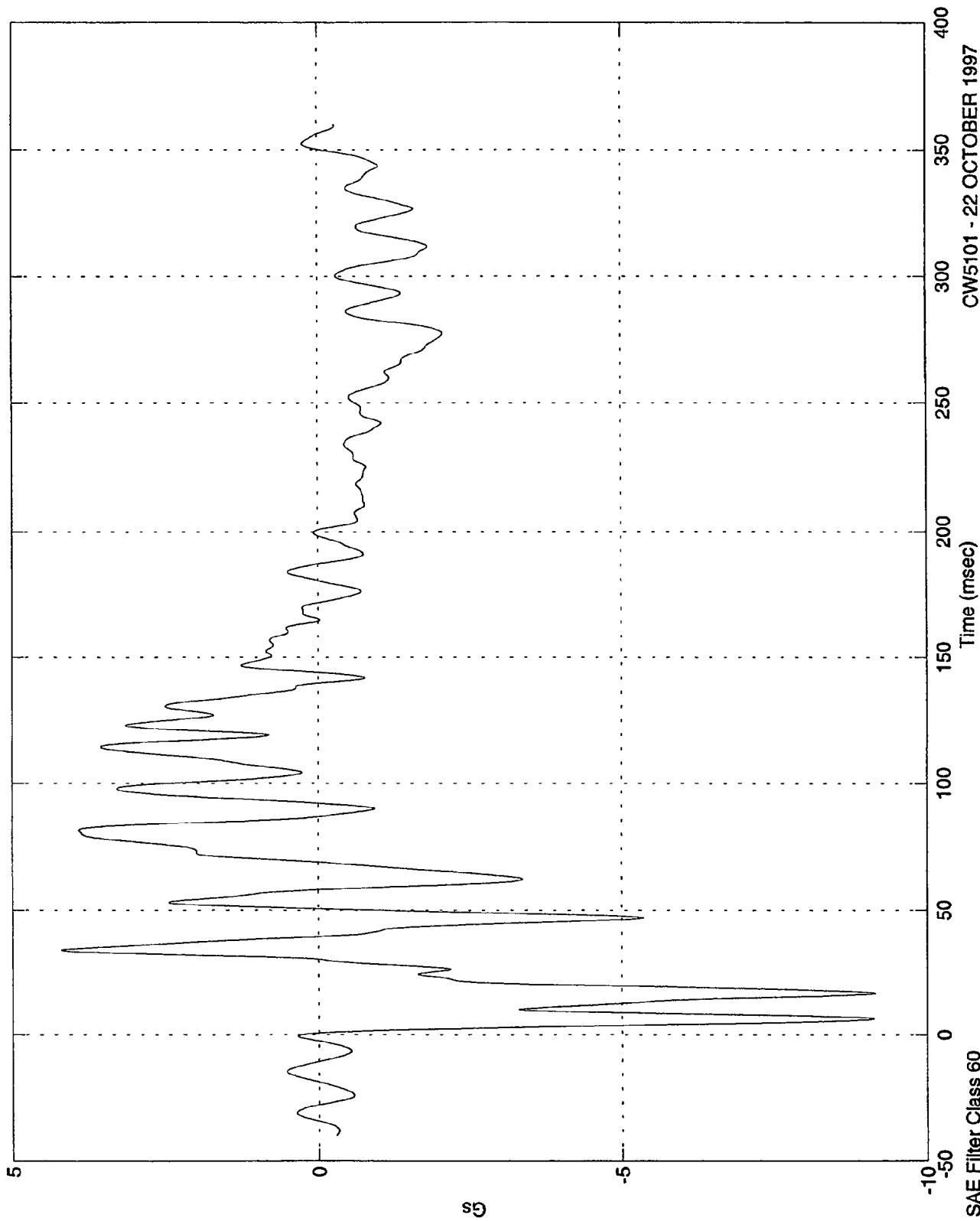
Time (msec)

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 4.21 Gs @ 33.70 msec
Min = -9.15 Gs @ 16.60 msec

Acc #2 R.R. Sill Z

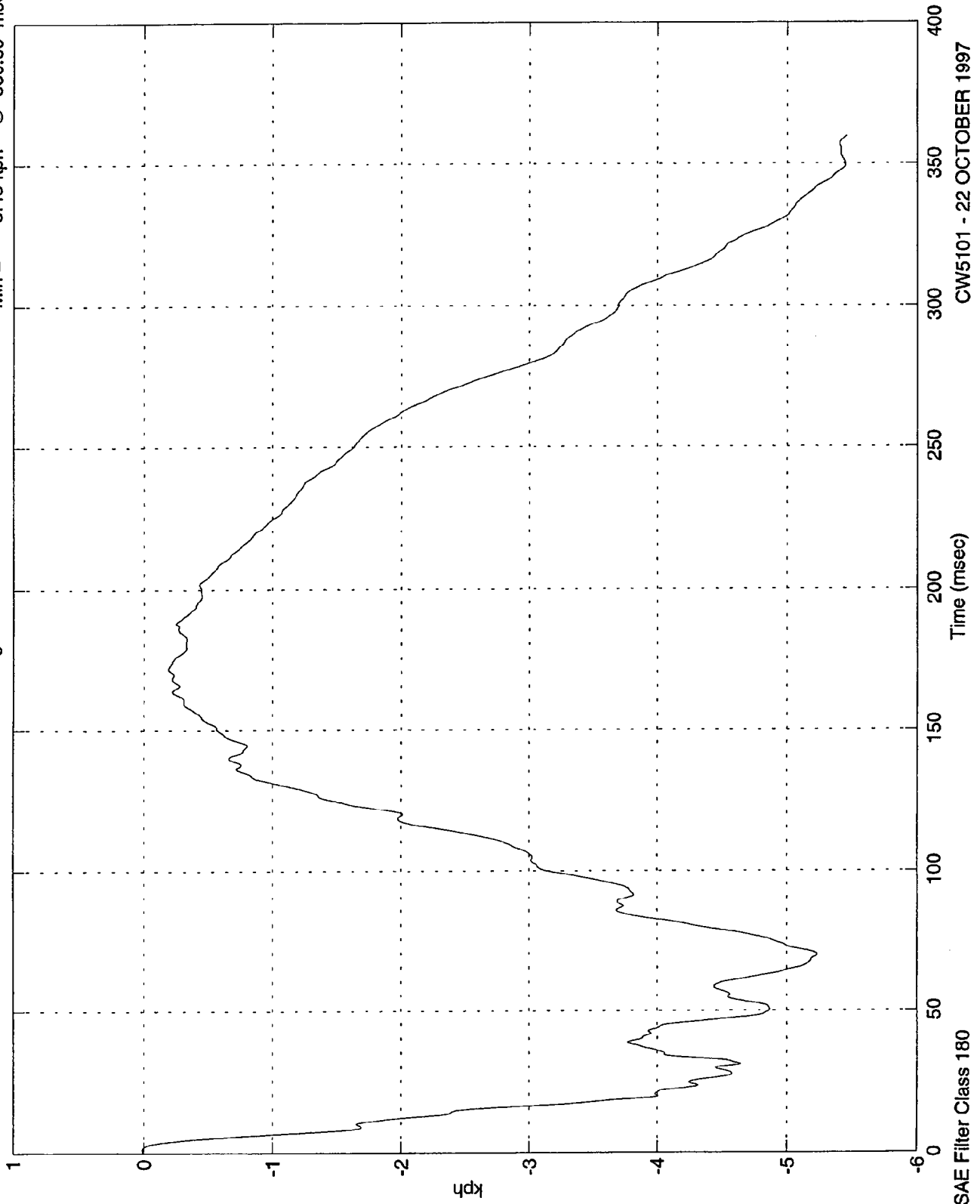


CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = .01 kph @ 1.10 msec
Min = -5.45 kph @ 359.89 msec

1st Integral Acc #2 R.R. Sill Z



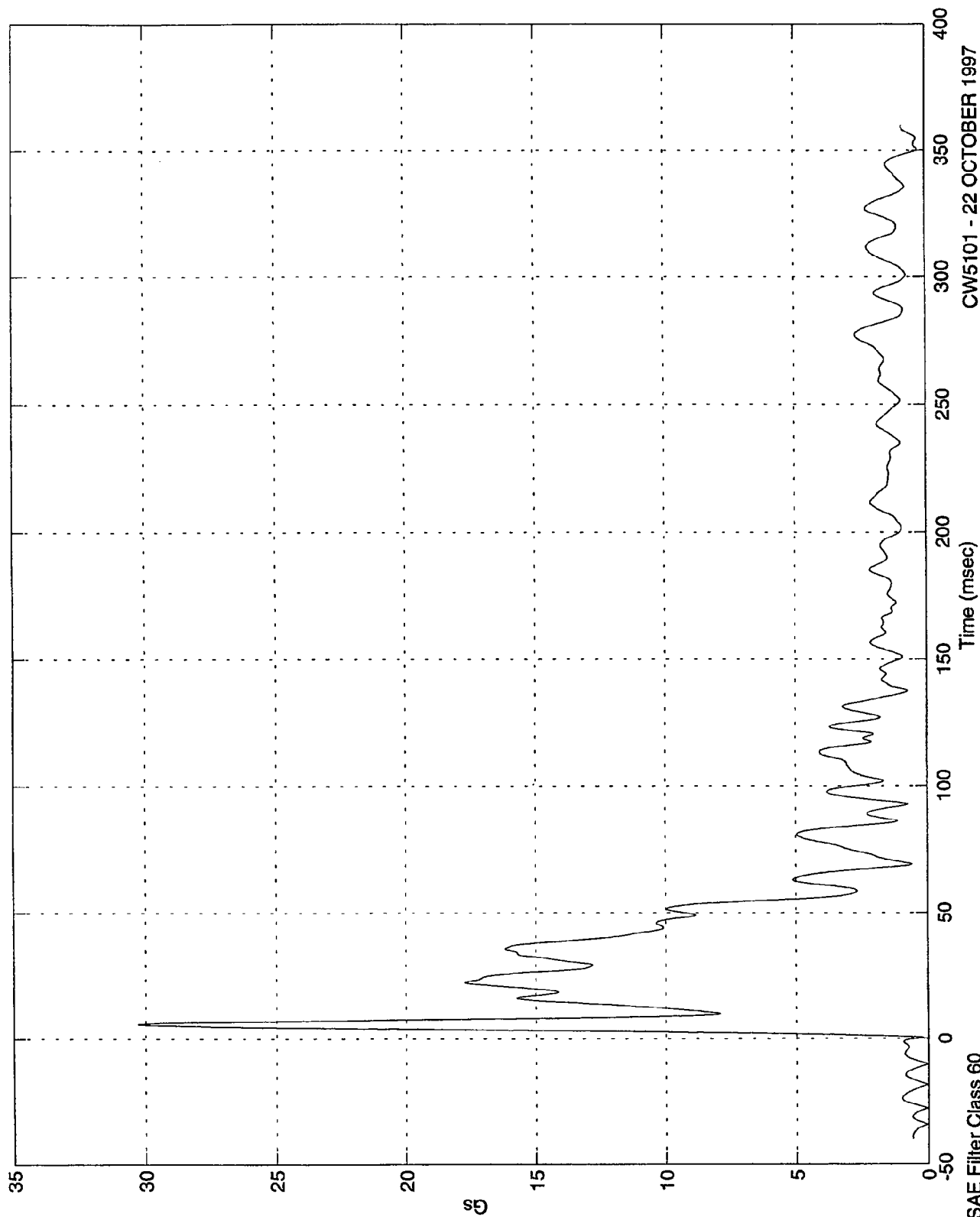
CW5101 - 22 OCTOBER 1997

SAE Filter Class 180

NHTSA Side Impact - 1998 Toyota Camry

Max = 30.28 Gs @ 5.79 msec
 Min = .02 Gs @ -10.69 msec

Acc #2 R.R. Sill Res



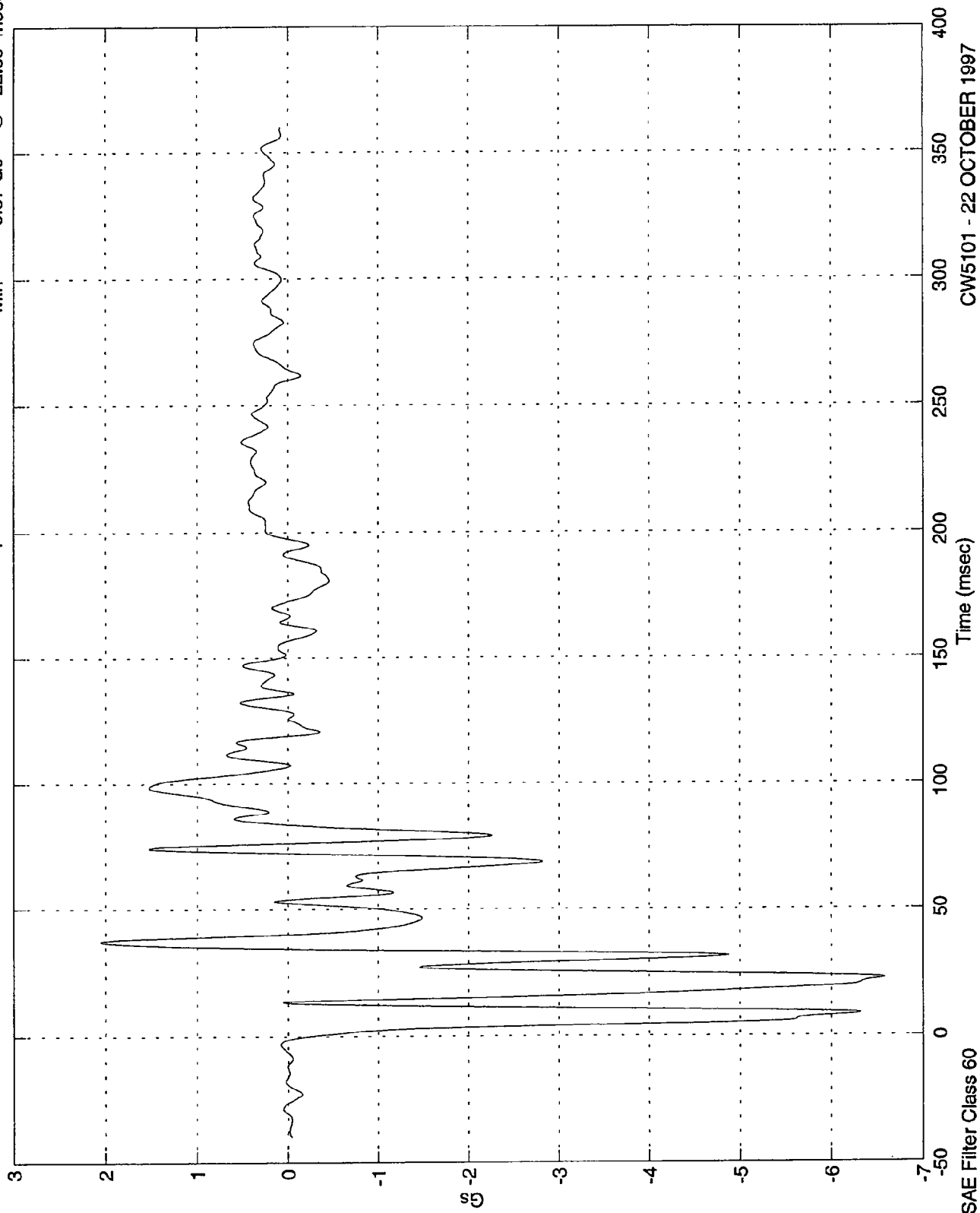
SAE Filter Class 60

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 2.06 Gs @ 37.40 msec
Min = -6.57 Gs @ 22.69 msec

Acc #3 Rear Floorpan X

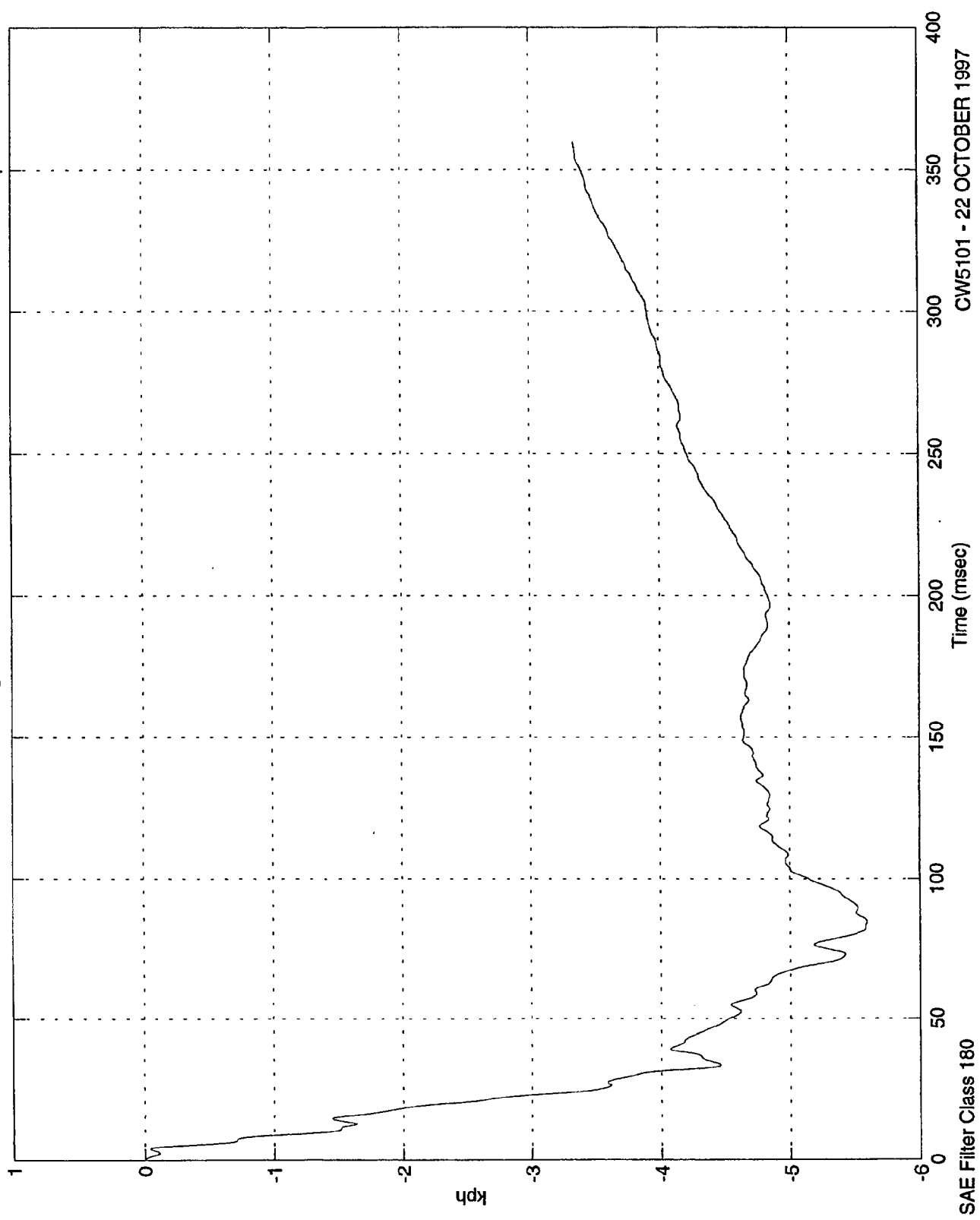


CW5101 - 22 OCTOBER 1997

Max = .00 kph @ 0.00 msec
Min = -5.59 kph @ 84.30 msec

1st Integral Acc #3 Rear Floorpan X

NHTSA Side Impact - 1998 Toyota Camry



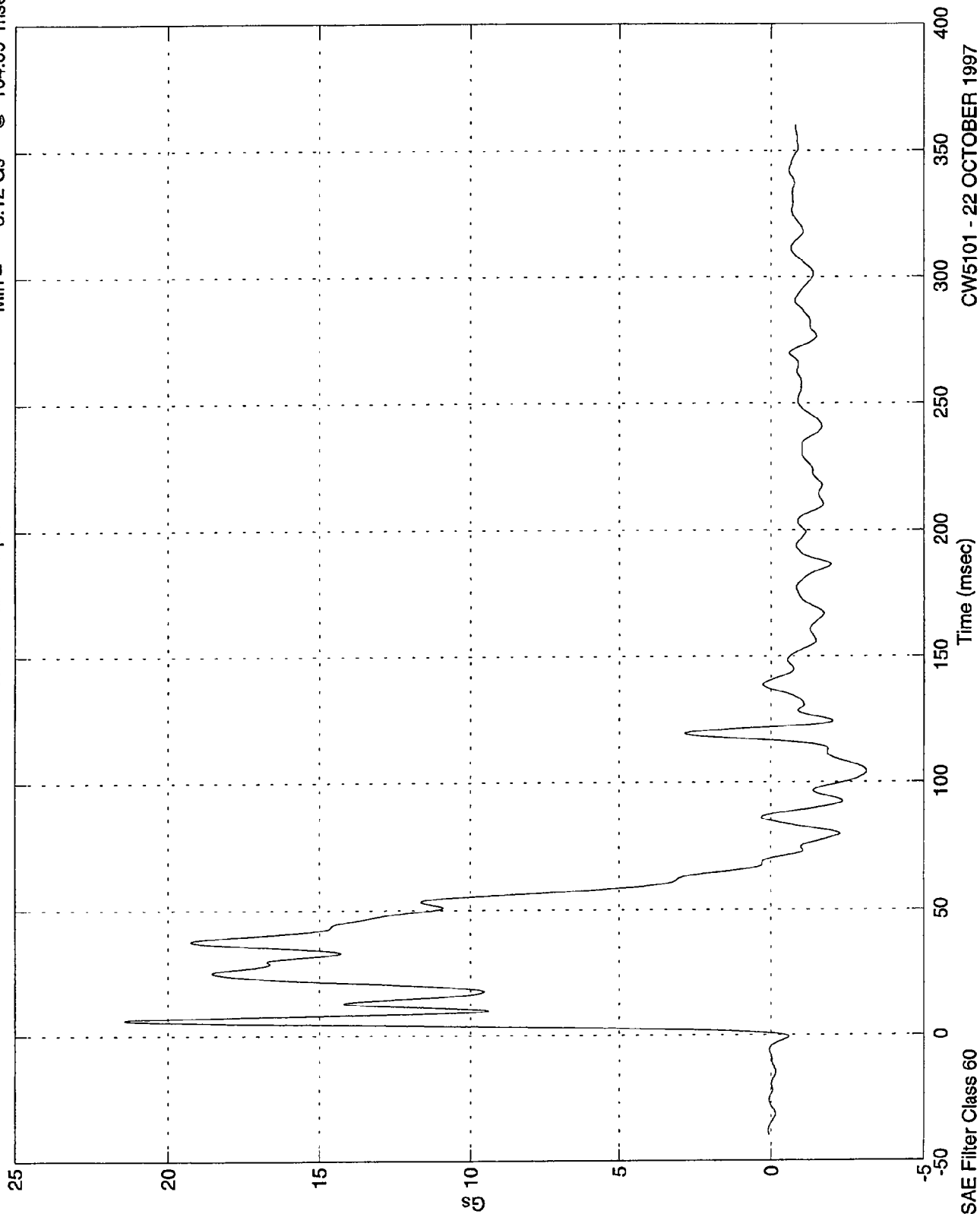
SAE Filter Class 180

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 21.43 Gs @ 6.09 msec
Min = -3.12 Gs @ 104.09 msec

Acc #3 Rear Floorpan Y



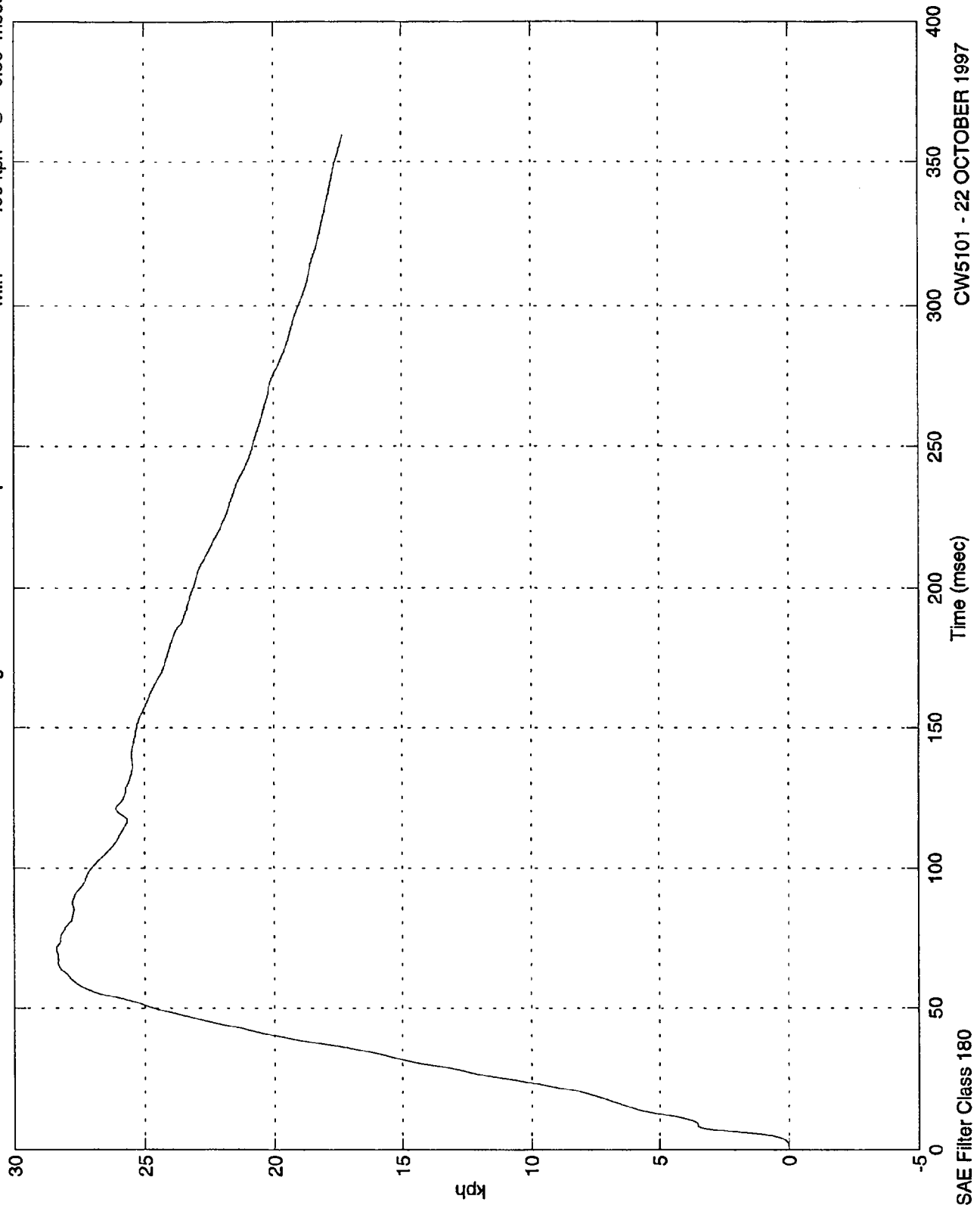
CW5101 - 22 OCTOBER 1997

SAE Filter Class 60

Max = 28.37 kph @ 70.90 msec
Min = -0.00 kph @ 0.30 msec

1st Integral Acc #3 Rear Floorpan Y

NHTSA Side Impact - 1998 Toyota Camry



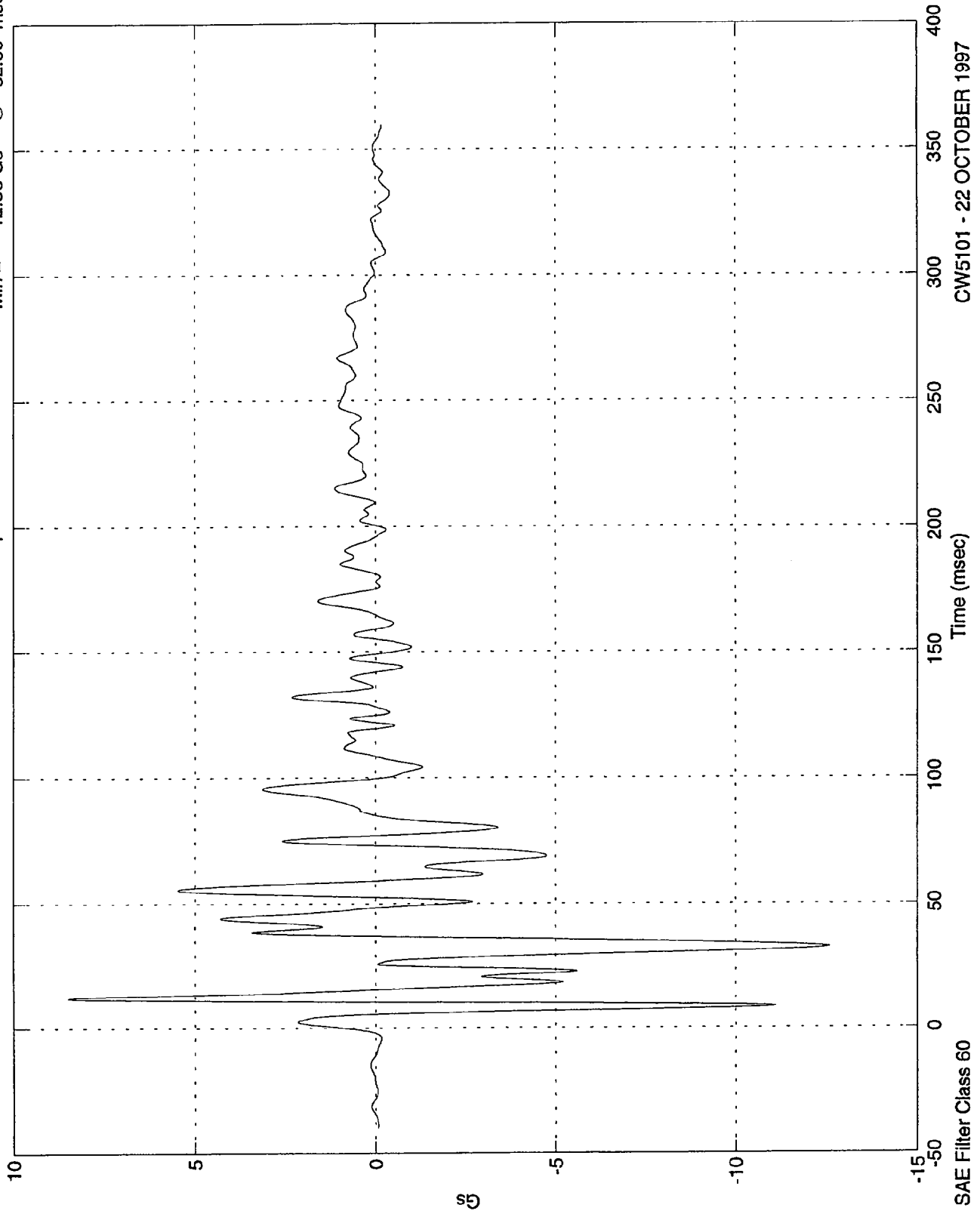
SAE Filter Class 180

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 8.49 Gs @ 11.89 msec
Min = -12.58 Gs @ 32.60 msec

Acc #3 Rear Floorpan Z

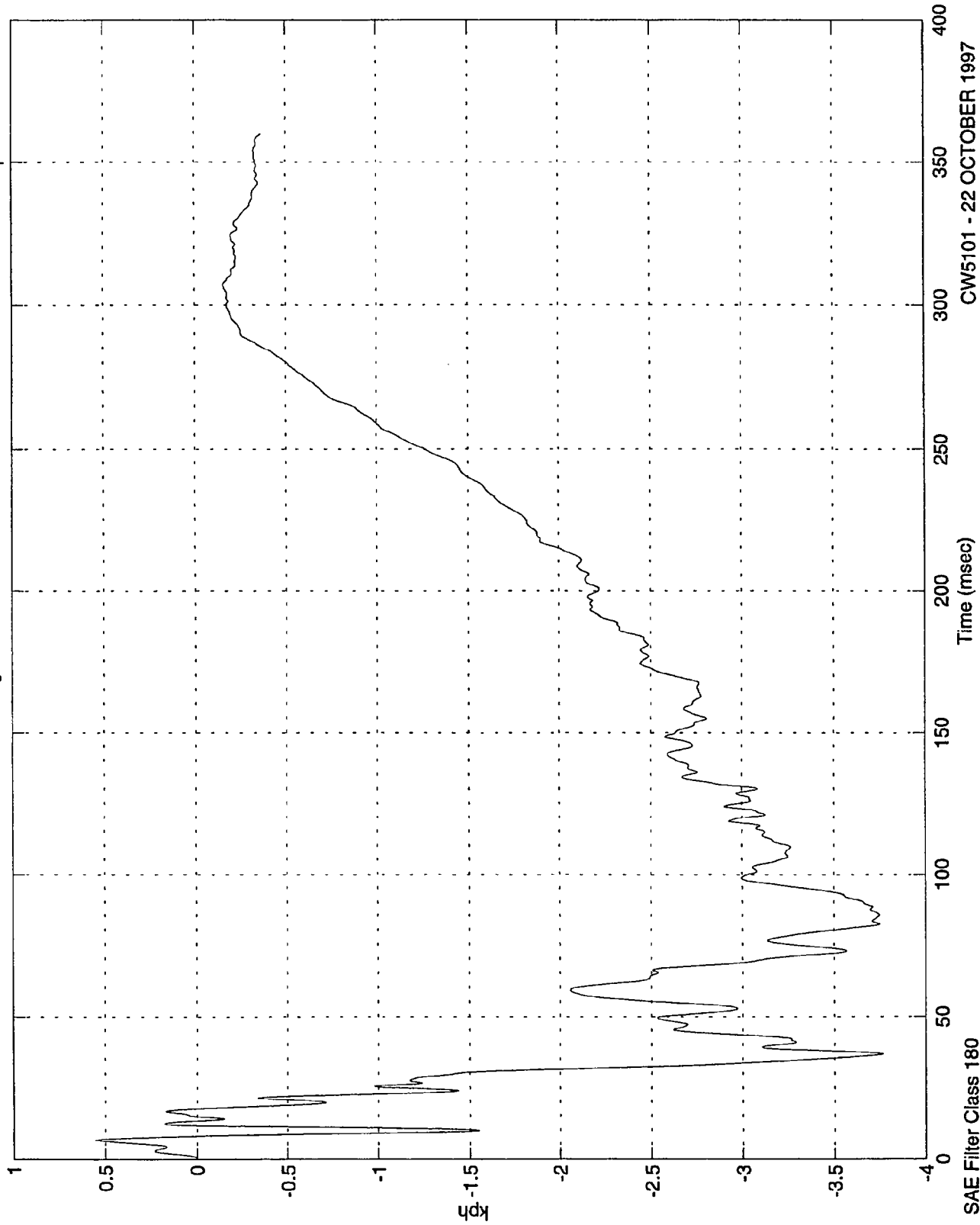


CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = .55 kph @ 6.80 msec
 Min = -3.76 kph @ 37.00 msec

1st Integral Acc #3 Rear Floorpan Z

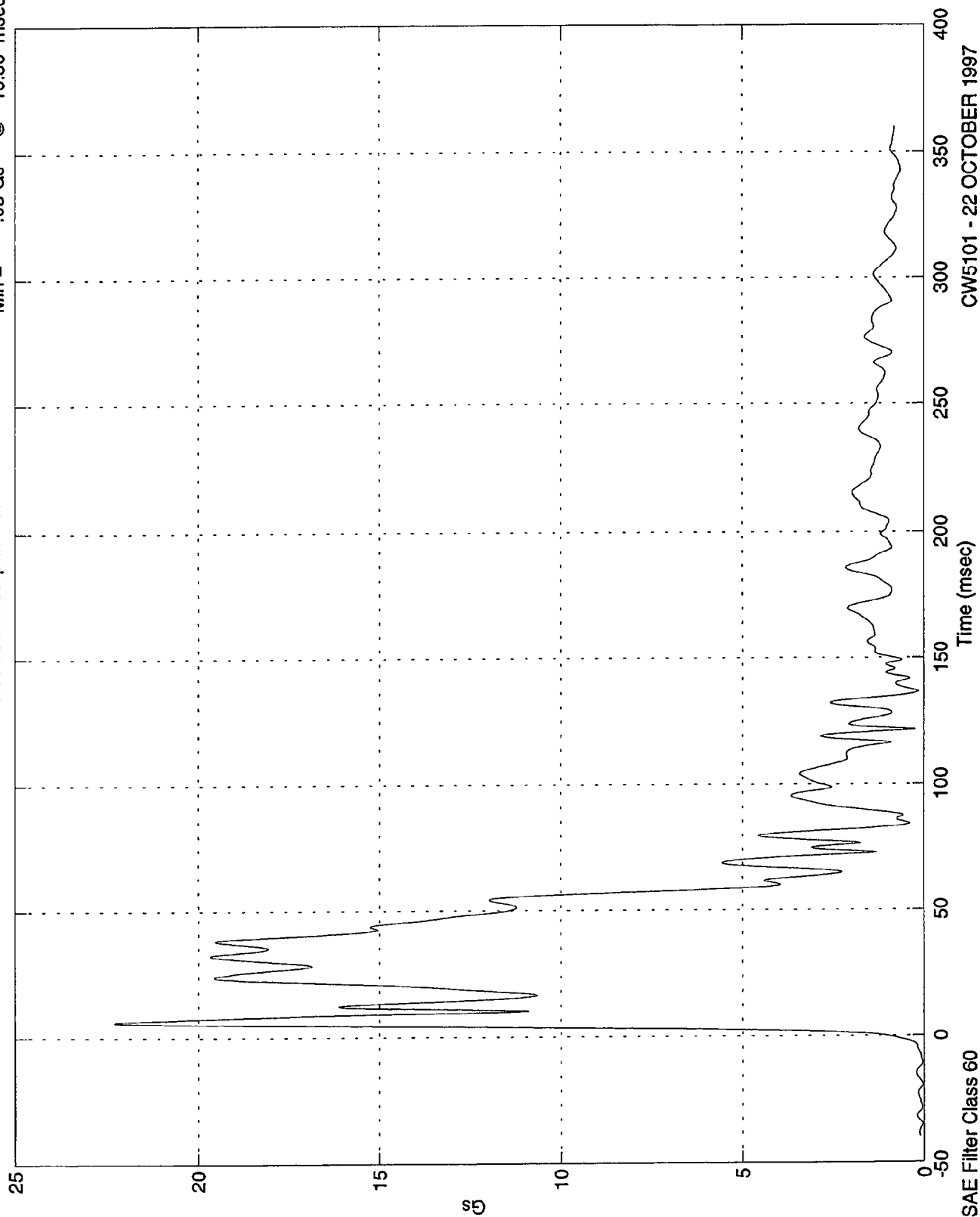


CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 22.29 Gs @ 6.19 msec
Min = .03 Gs @ -19.50 msec

Acc #3 R Floorpan Res

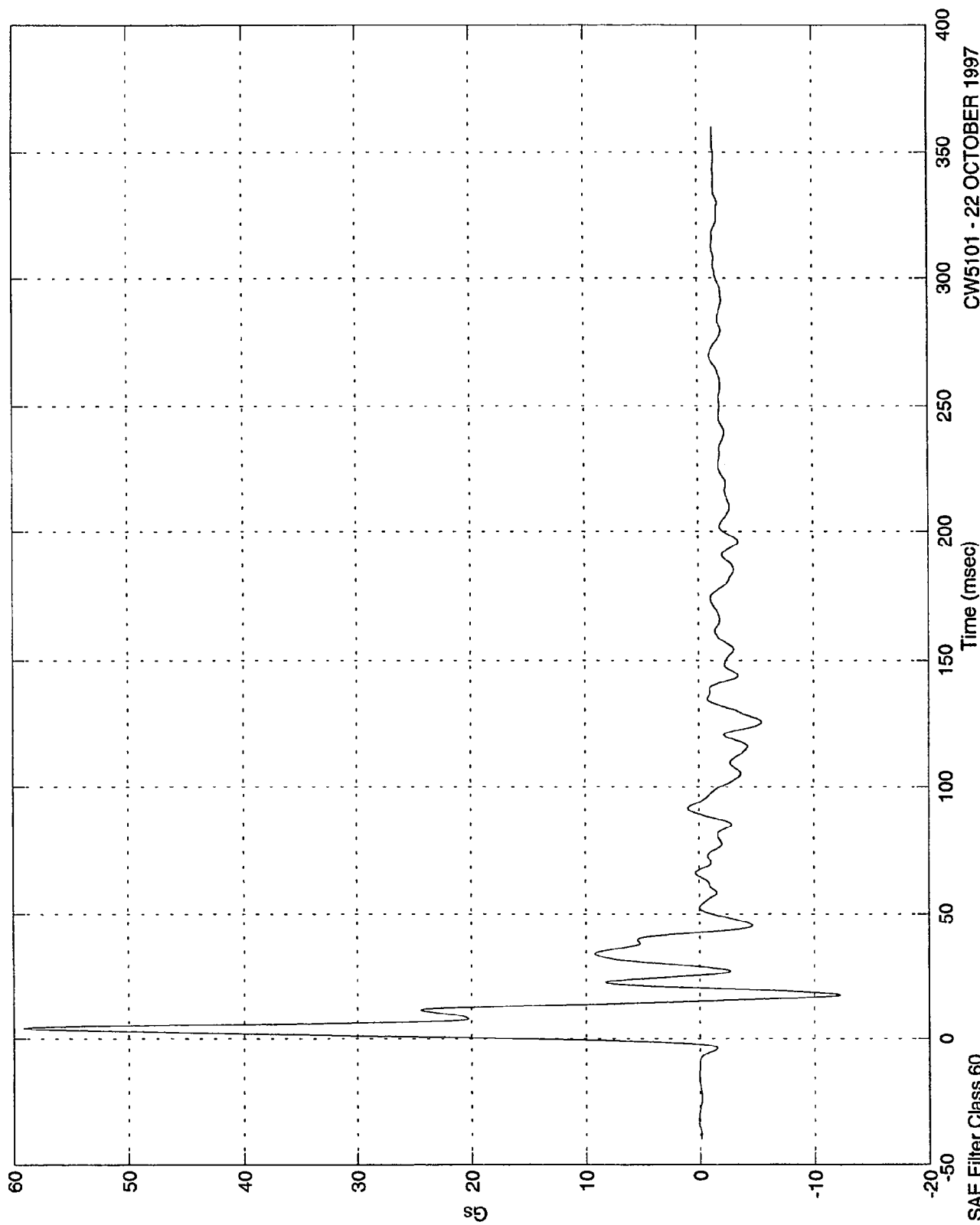


CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 59.13 Gs @ 4.09 msec
Min = -12.24 Gs @ 17.79 msec

Acc #4 L.R. Sill Y



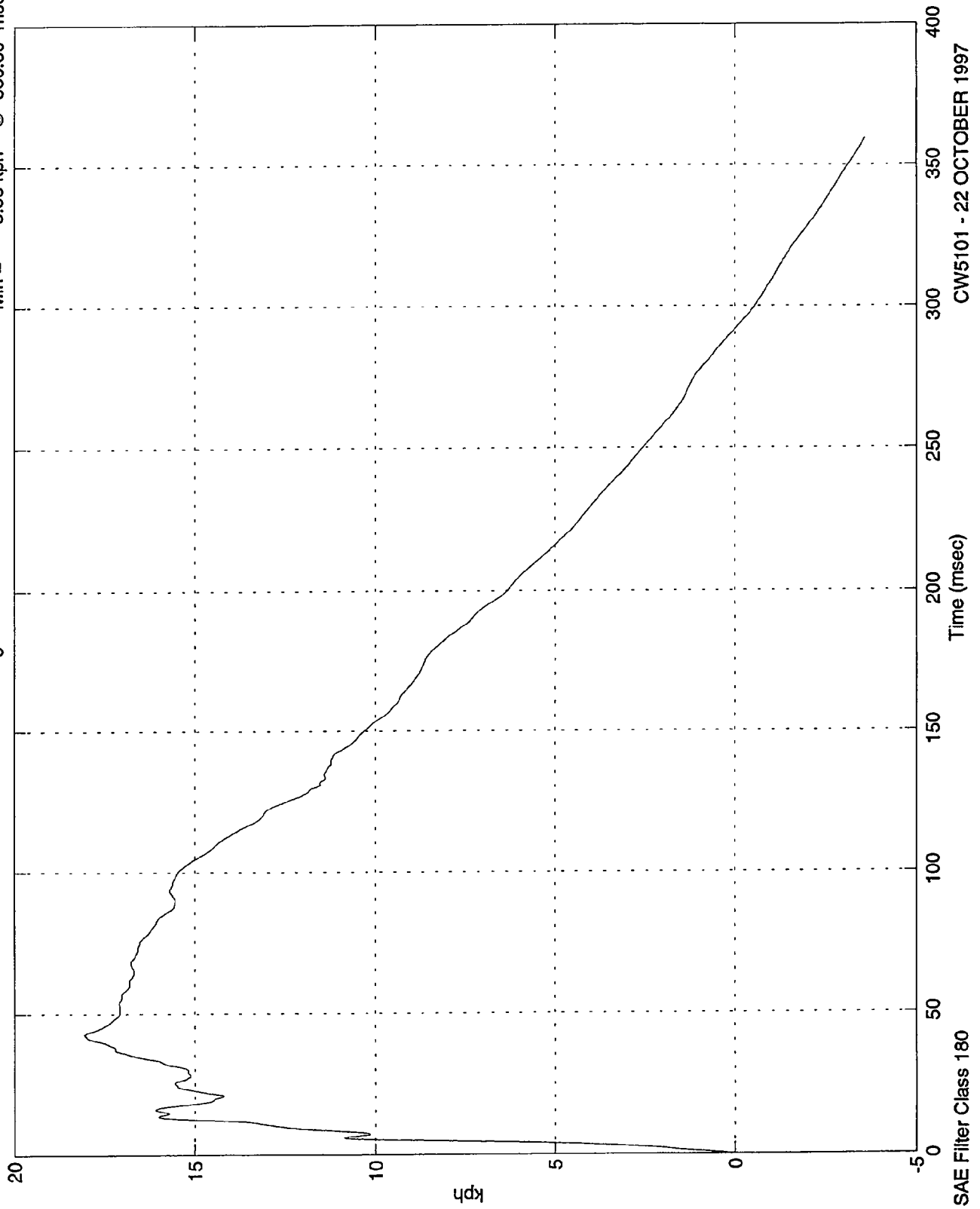
CW5101 - 22 OCTOBER 1997

SAE Filter Class 60

NHTSA Side Impact - 1998 Toyota Camry

Max = 18.05 kph @ 42.70 msec
Min = -3.58 kph @ 359.89 msec

1st Integral Acc #4 L.R. Sill Y



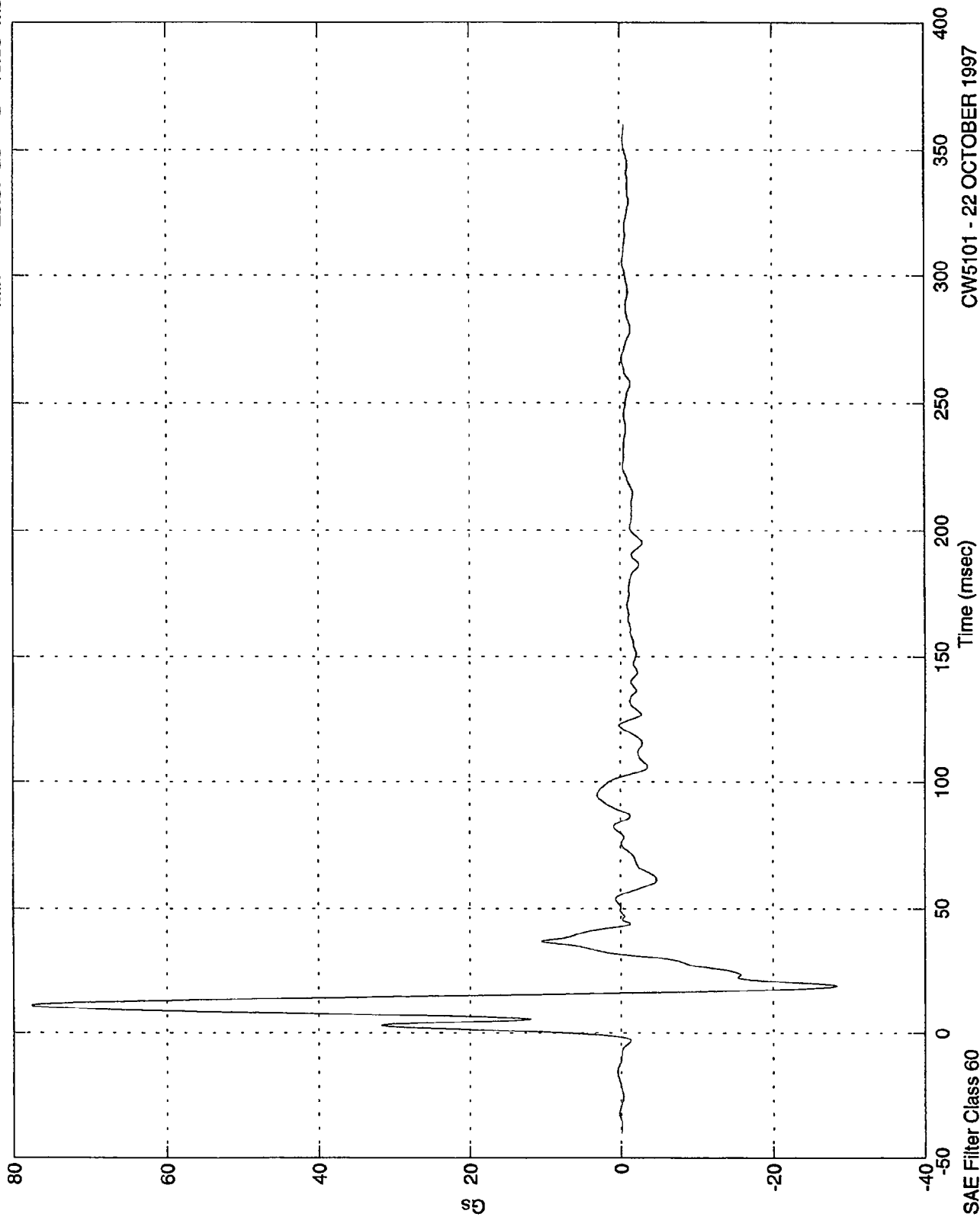
SAE Filter Class 180

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 77.64 Gs @ 11.00 msec
 Min = -28.37 Gs @ 18.89 msec

Acc #5 L.F. Sill Y

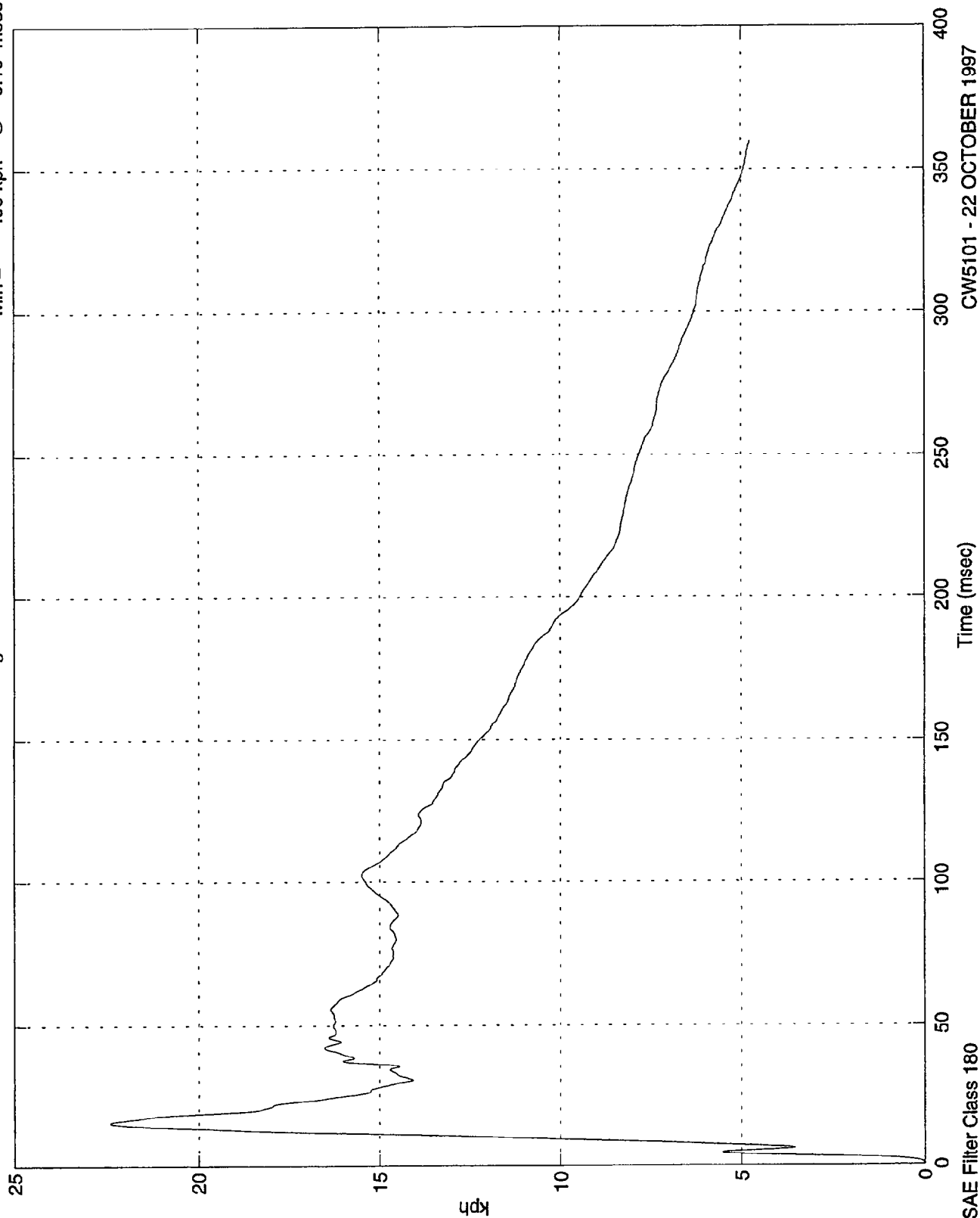


CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 22.41 kph @ 15.50 msec
Min = -.00 kph @ 0.10 msec

1st Integral Acc #5 L.F. Sill Y



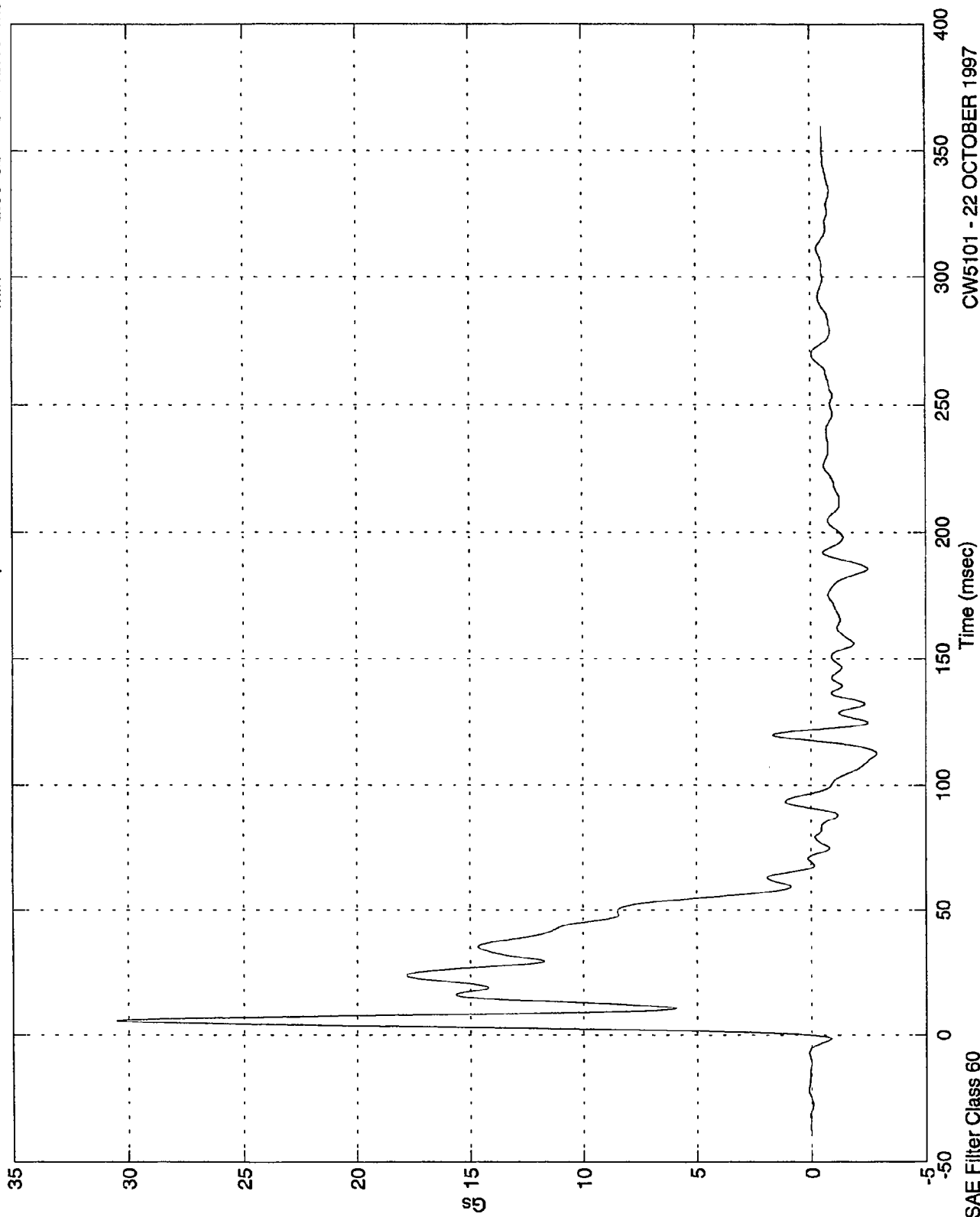
SAE Filter Class 180

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Acc #7 R.R Compartment Y

Max = 30.50 Gs @ 5.50 msec
Min = -2.85 Gs @ 112.19 msec



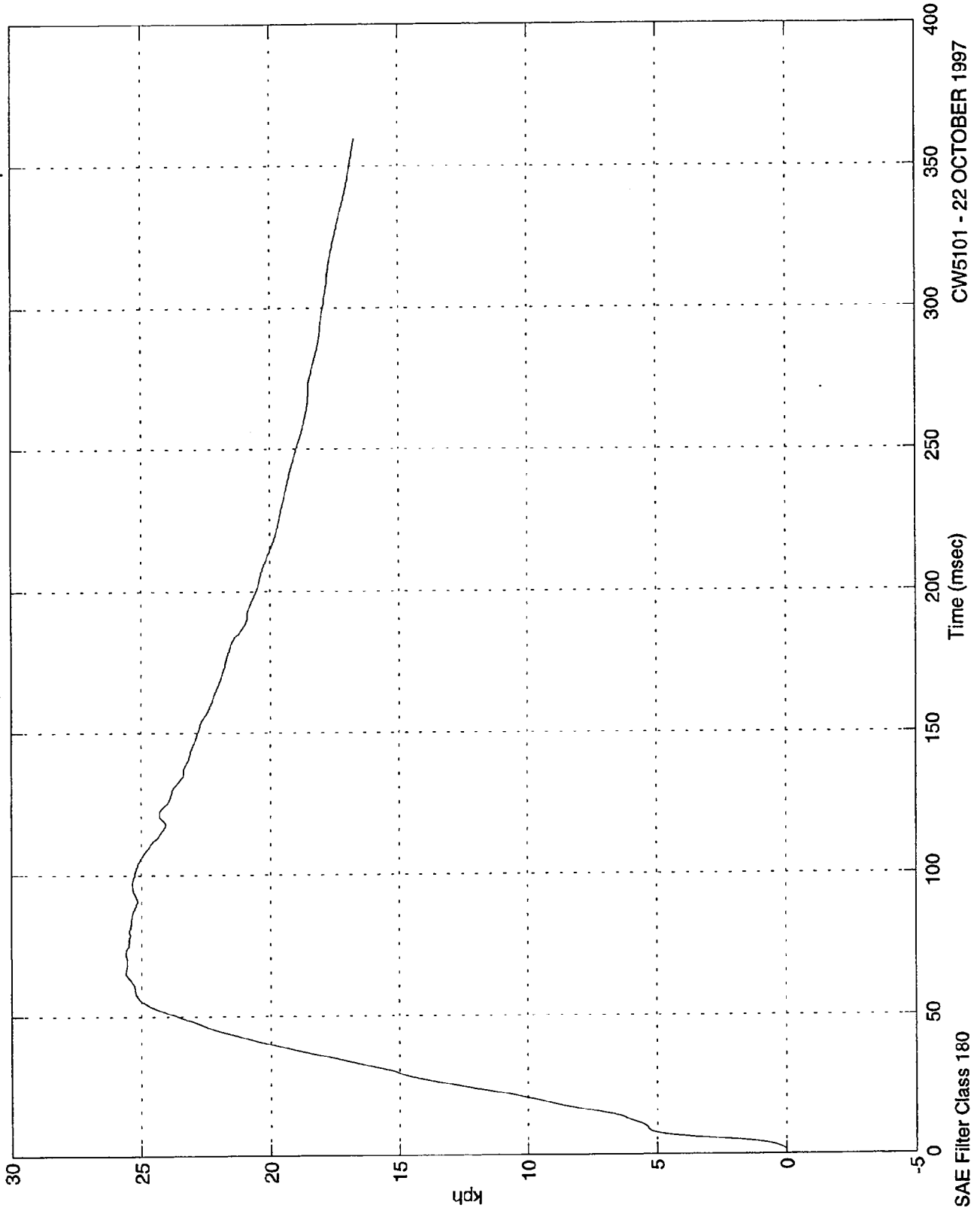
SAE Filter Class 60

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 25.58 kph @ 65.60 msec
Min = -.00 kph @ 0.40 msec

1st Integral Acc #7 R.R Compartment Y



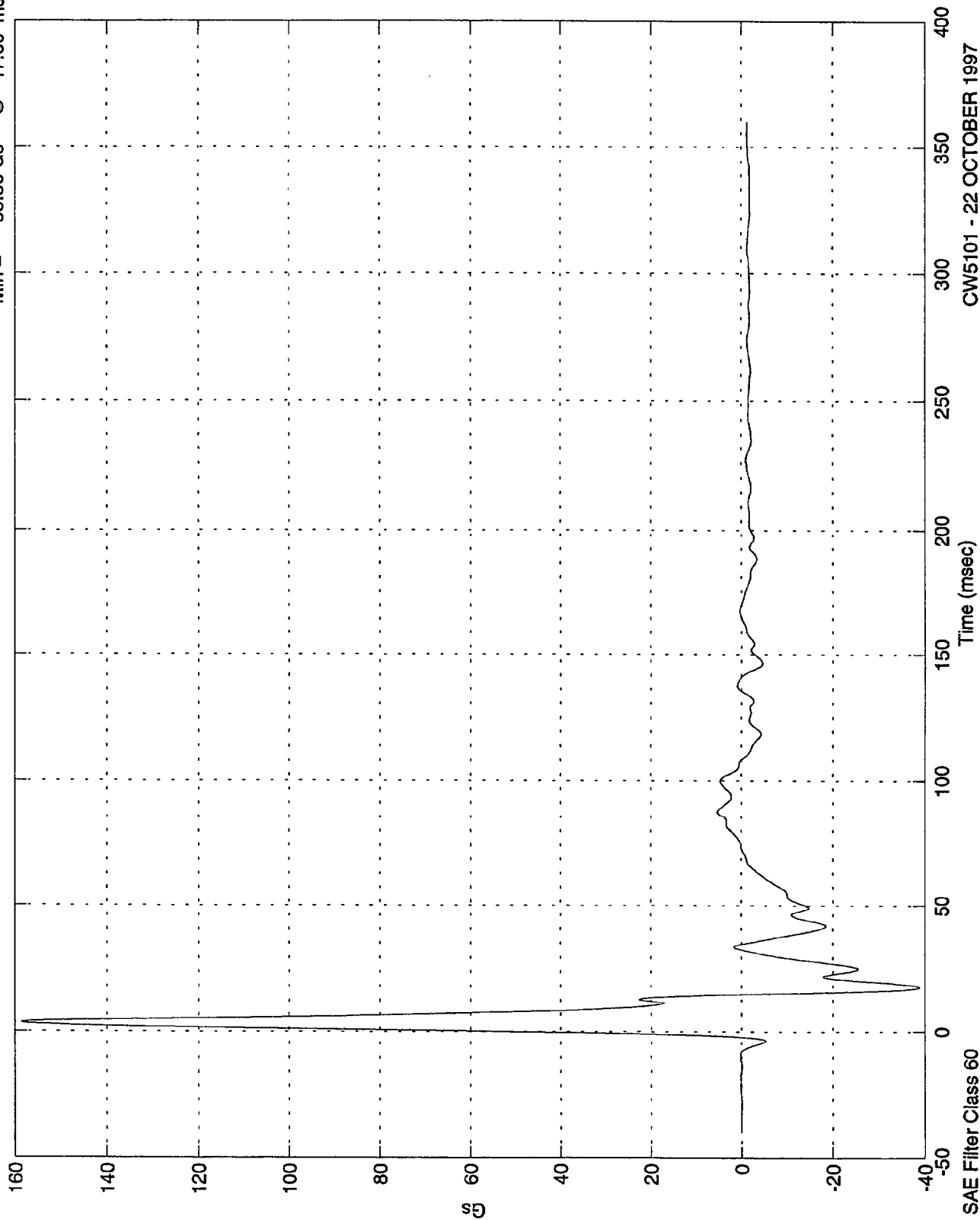
CW5101 - 22 OCTOBER 1997

SAE Filter Class 180

Max = 158.65 Gs @ 3.39 msec
Min = -38.86 Gs @ 17.60 msec

Acc #12 L.L. B-Pillar Y

NHTSA Side Impact - 1998 Toyota Camry



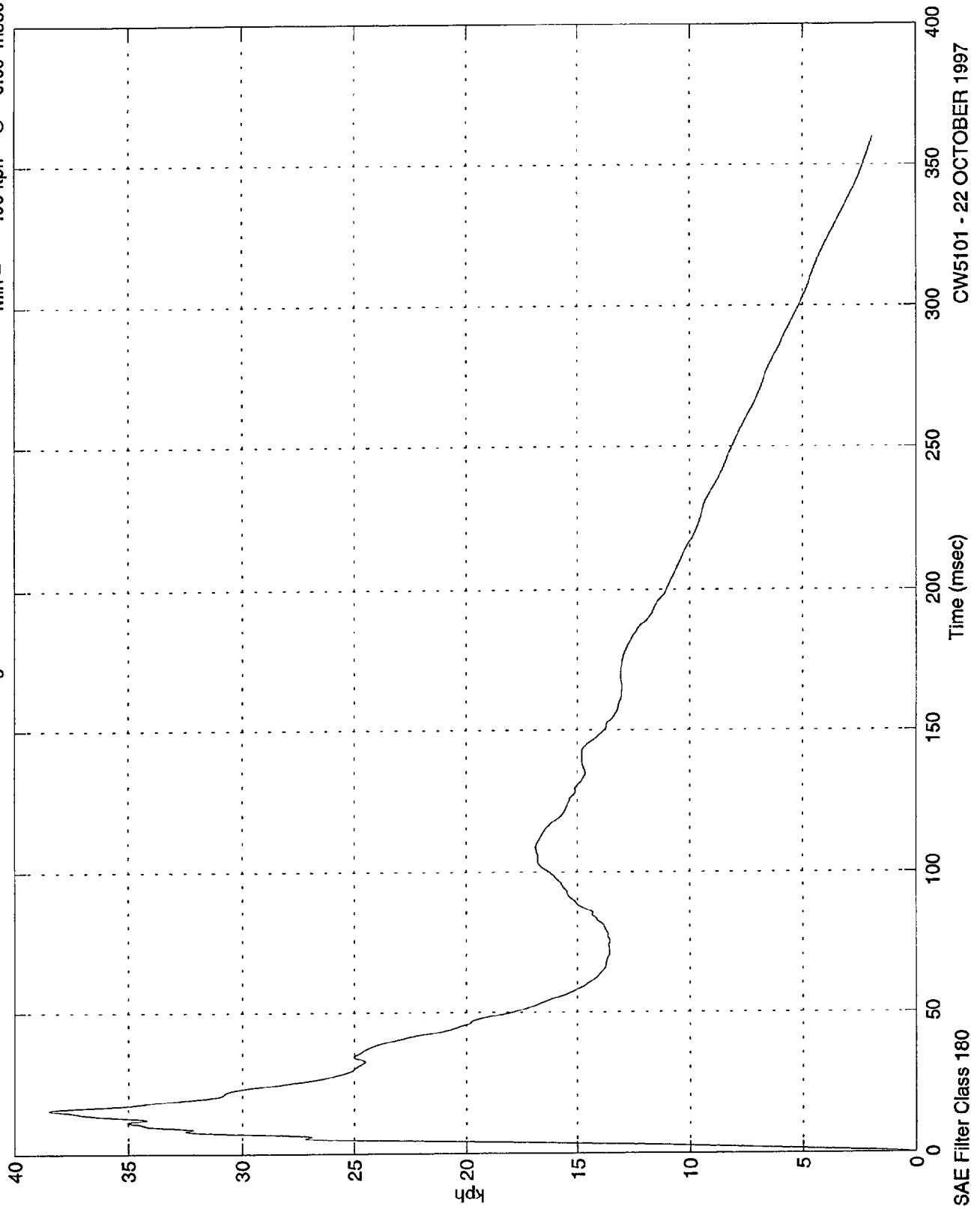
CW5101 - 22 OCTOBER 1997

SAE Filter Class 60

NHTSA Side Impact - 1998 Toyota Camry

Max = 38.52 kph @ 15.30 msec
Min = .00 kph @ 0.00 msec

1st Integral Acc #12 L.L. B-Pillar Y



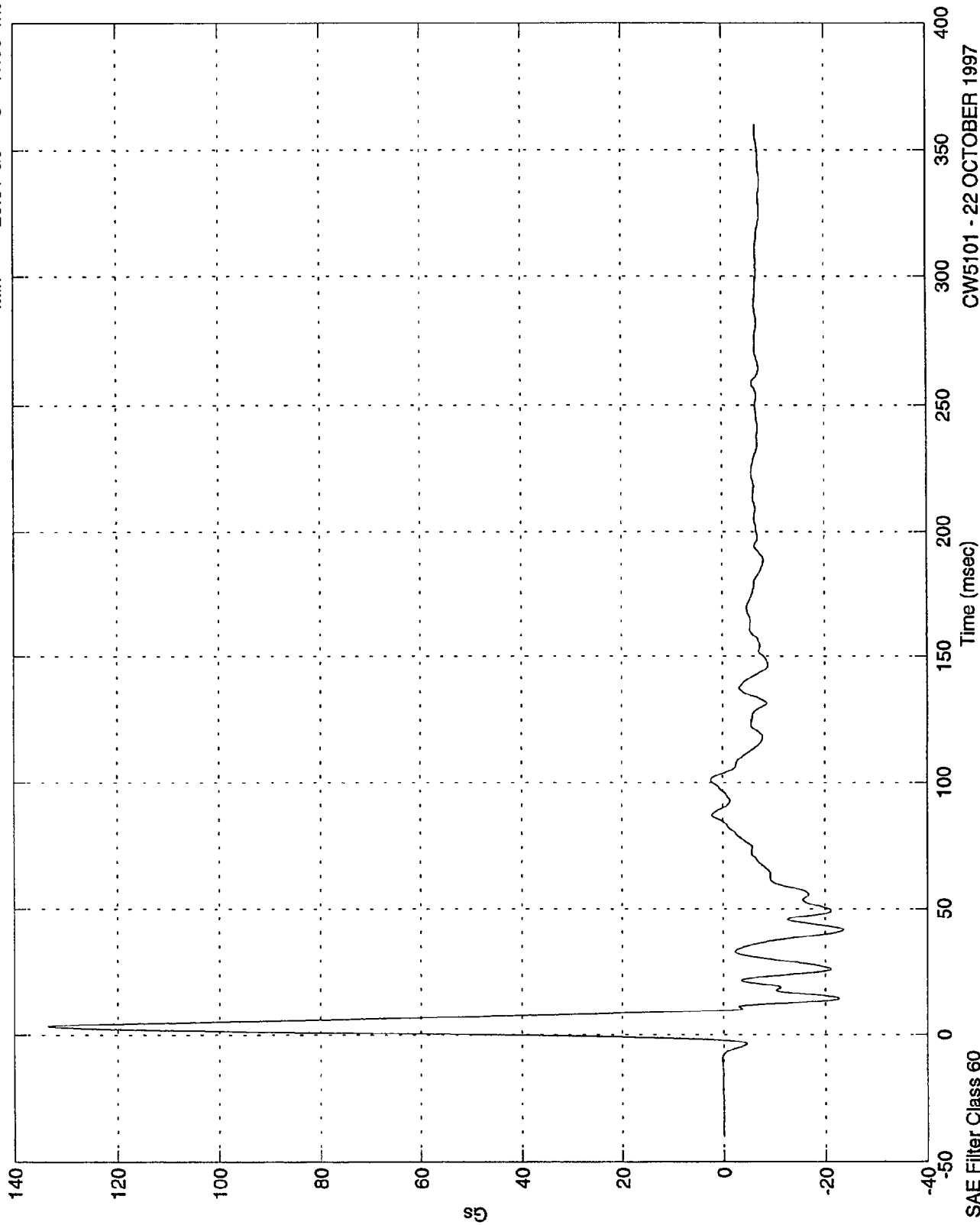
CW5101 - 22 OCTOBER 1997

SAE Filter Class 180

NHTSA Side Impact - 1998 Toyota Camry

Acc #13 L.M. B-Pillar Y

Max = 133.34 Gs @ 3.29 msec
Min = -23.51 Gs @ 41.50 msec



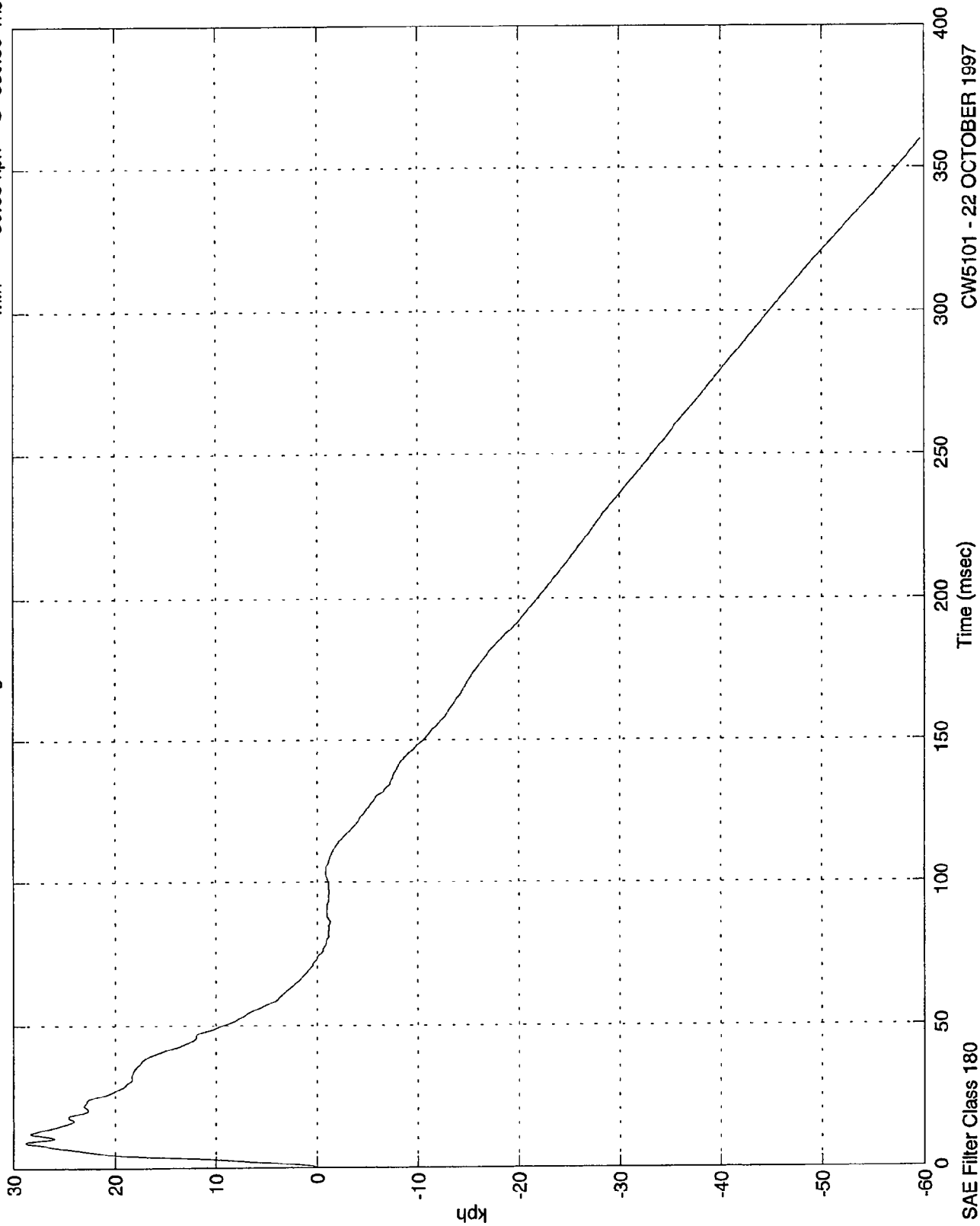
CW5101 - 22 OCTOBER 1997

SAE Filter Class 60

NHTSA Side Impact - 1998 Toyota Camry

1st Integral Acc #13 L.M. B-Pillar Y

Max = 28.86 kph @ 9.10 msec
Min = -59.68 kph @ 359.89 msec



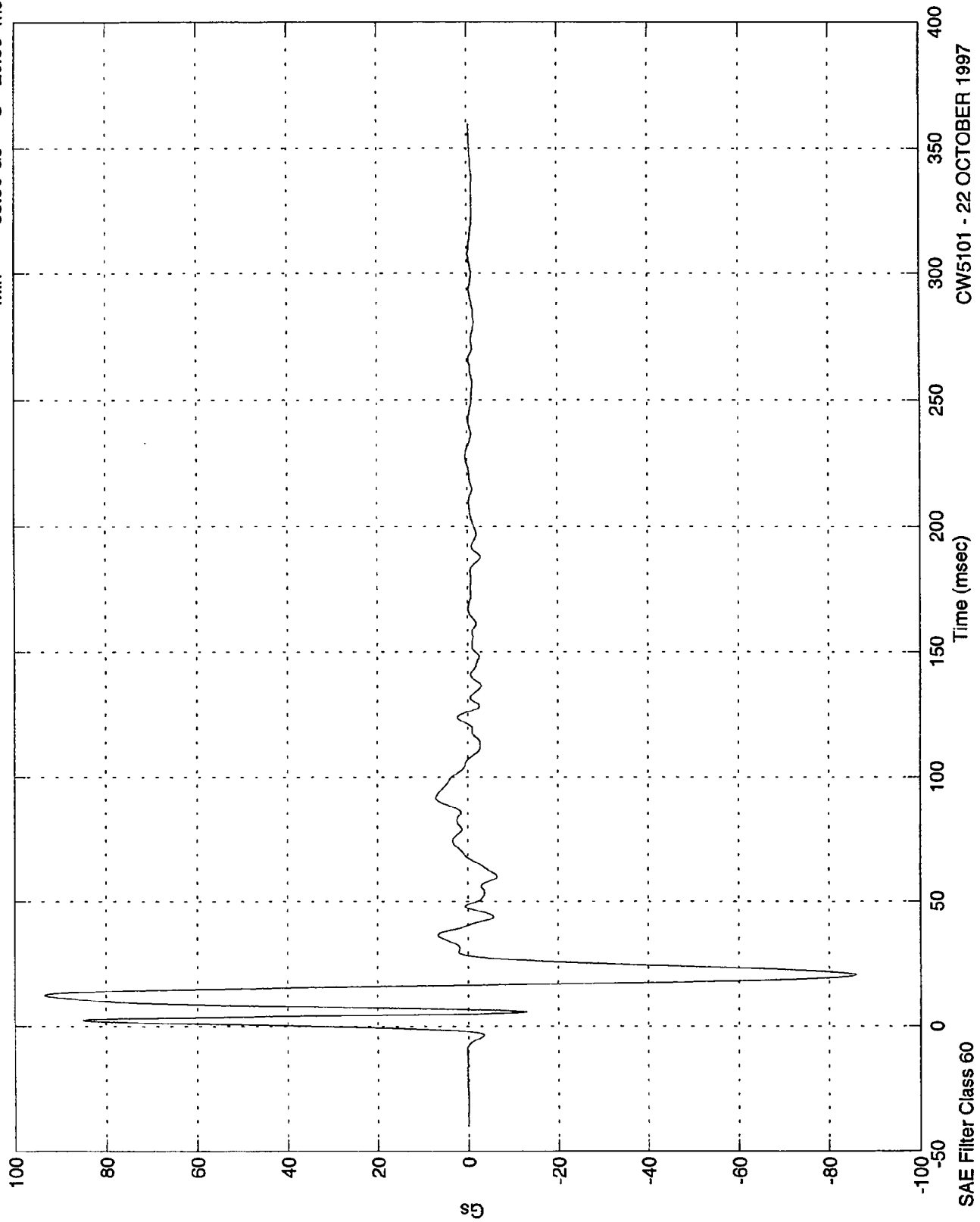
SAE Filter Class 180

CW5101 - 22 OCTOBER 1997

Max = 93.39 Gs @ 12.69 msec
Min = -85.90 Gs @ 20.59 msec

Acc #14 L.L. A-Pillar Y

NHTSA Side Impact - 1998 Toyota Camry



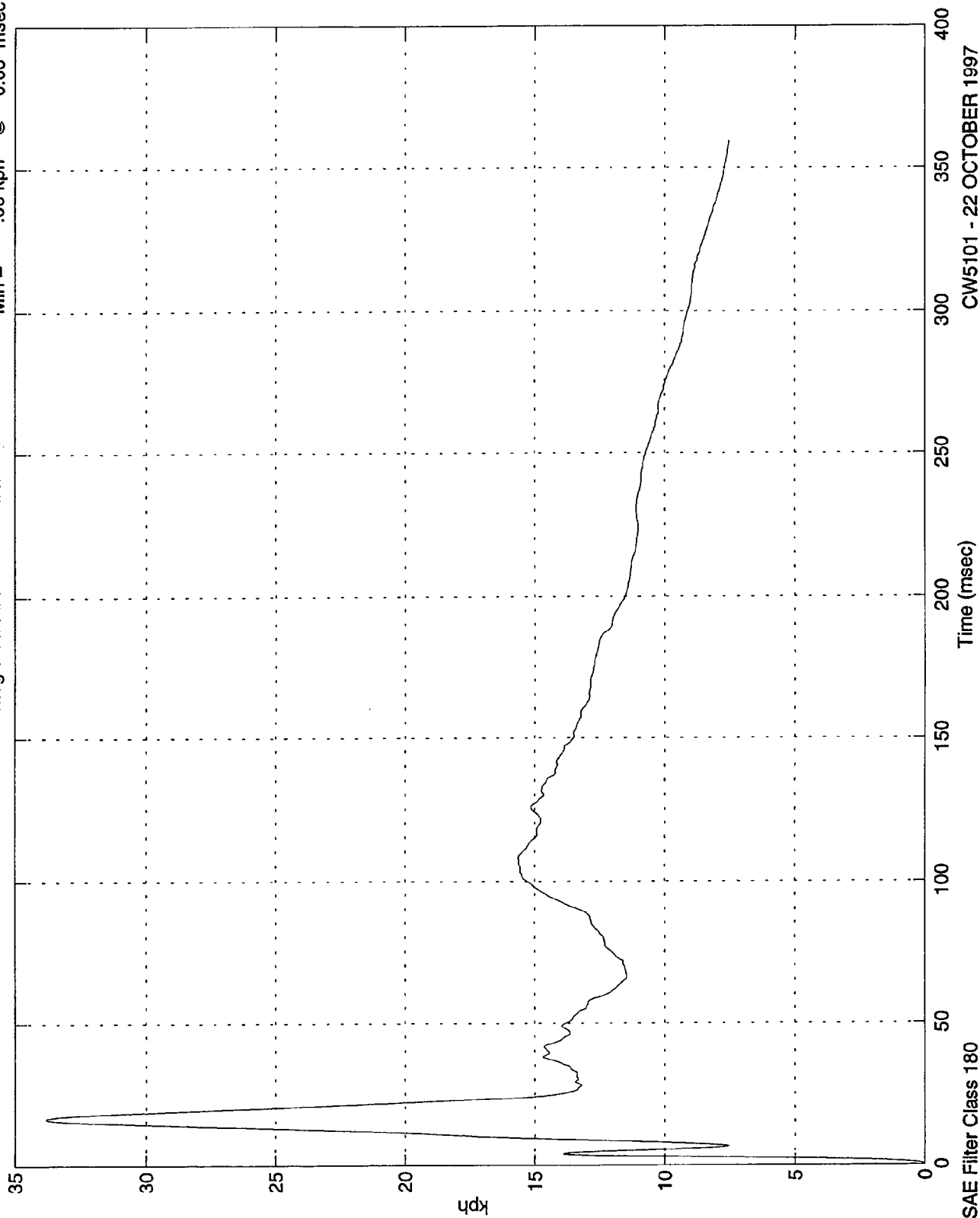
CW5101 - 22 OCTOBER 1997

SAE Filter Class 60

NHTSA Side Impact - 1998 Toyota Camry

Max = 33.81 kph @ 16.50 msec
Min = .00 kph @ 0.00 msec

1st Integral Acc #14 L.L. A-Pillar Y



SAE Filter Class 180

Time (msec)

CW5101 - 22 OCTOBER 1997

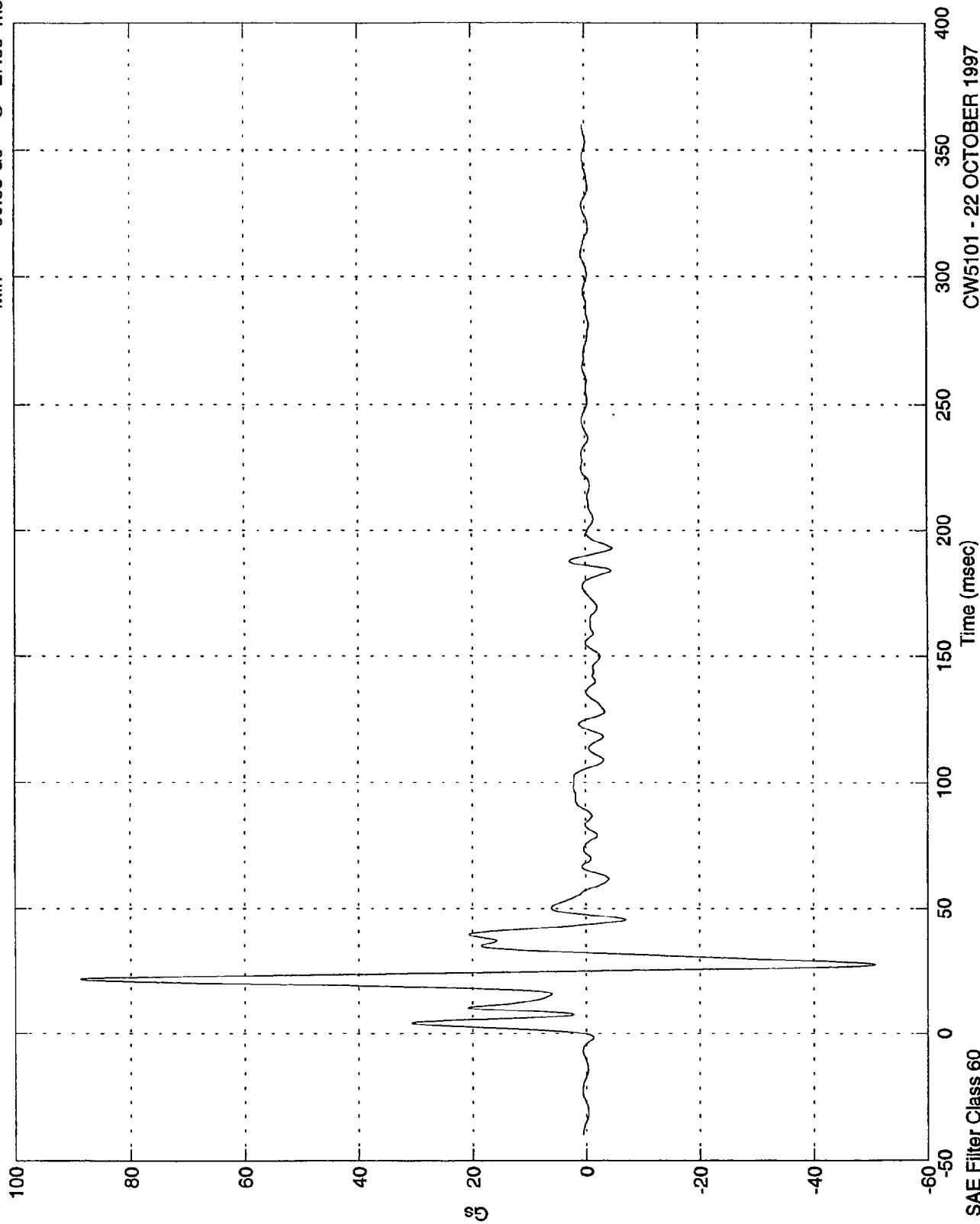
UPPER A-POST ACCELEROMETER #15 WAS NOT INSTALLED
(NO ACCESSIBLE MOUNTING LOCATION)

UPPER A-POST ACCELEROMETER #15 WAS NOT INSTALLED
(NO ACCESSIBLE MOUNTING LOCATION)

Max = 88.75 Gs @ 21.59 msec
Min = -50.83 Gs @ 27.39 msec

Acc #16 Ft Seat Track Y

NHTSA Side Impact - 1998 Toyota Camry

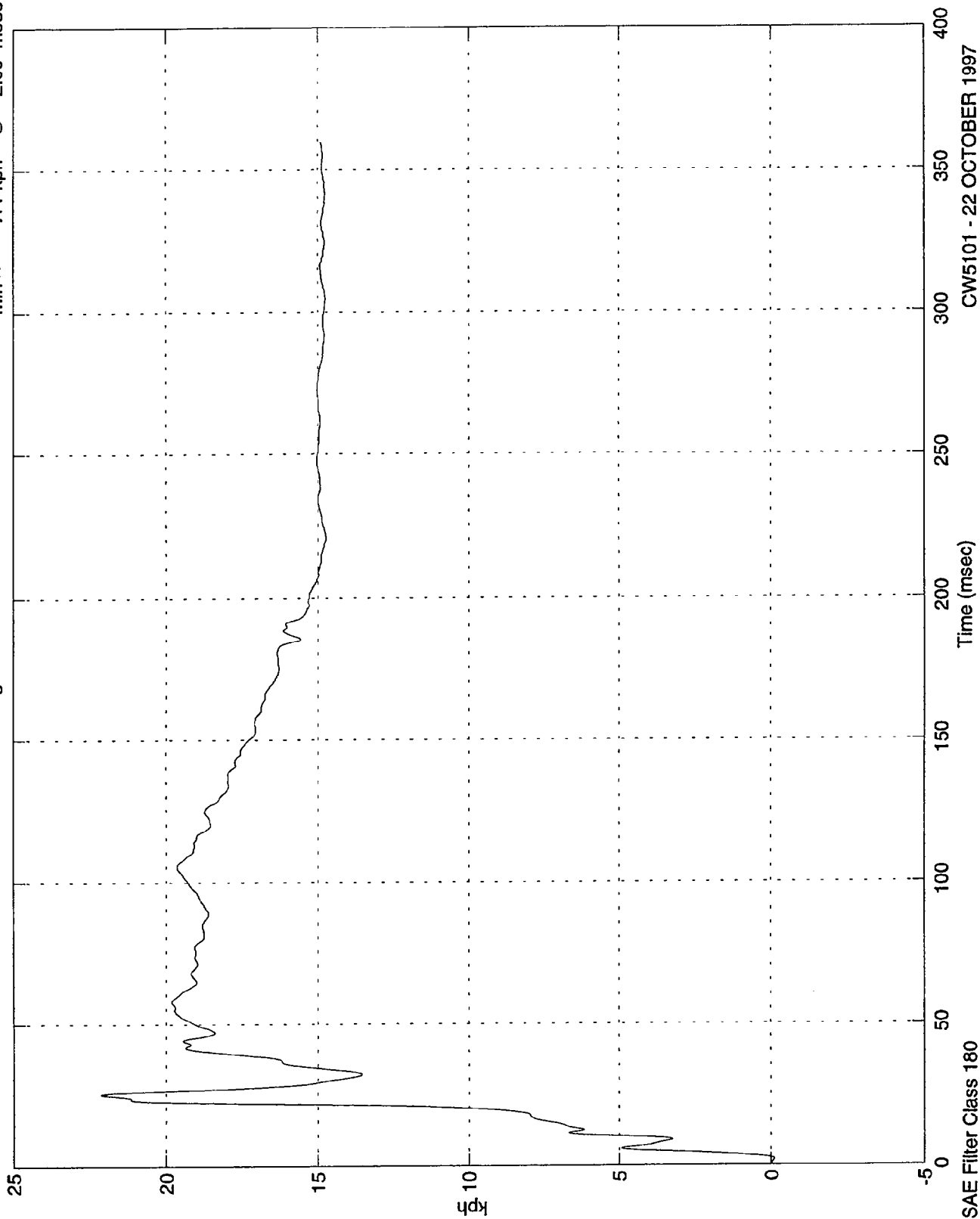


CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 22.16 kph @ 25.40 msec
Min = -.11 kph @ 2.00 msec

1st Integral Acc #16 Ft Seat Track Y



CW5101 - 22 OCTOBER 1997

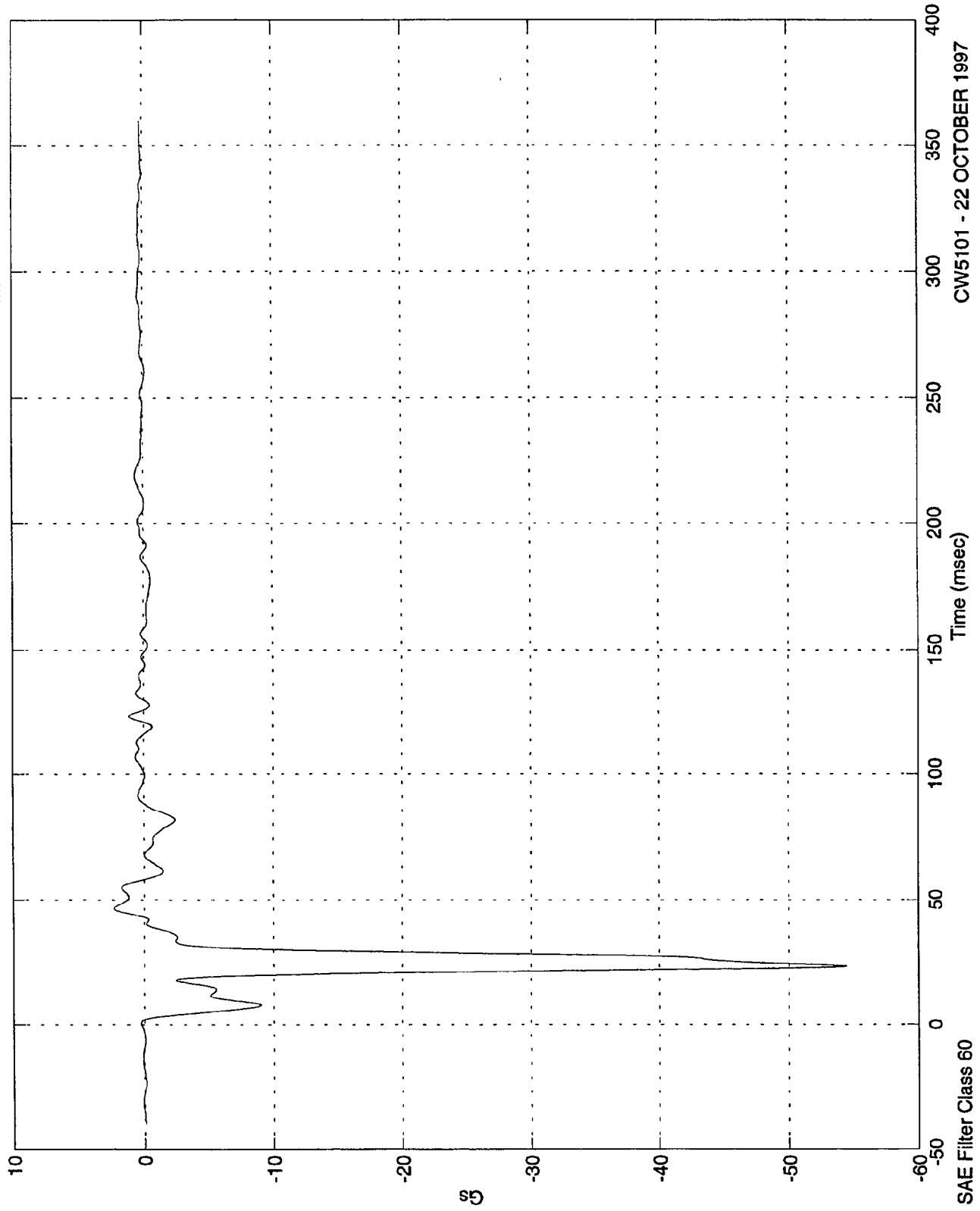
REAR SEAT TRACK ACCELEROMETER #17 WAS NOT INSTALLED
(NO ACCESSIBLE MOUNTING LOCATION)

REAR SEAT TRACK ACCELEROMETER #17 WAS NOT INSTALLED
(NO ACCESSIBLE MOUNTING LOCATION)

NHTSA Side Impact - 1998 Toyota Camry

Acc #18 Vehicle C.G. X

Max = 2.30 Gs @ 46.39 msec
Min = -54.44 Gs @ 23.29 msec



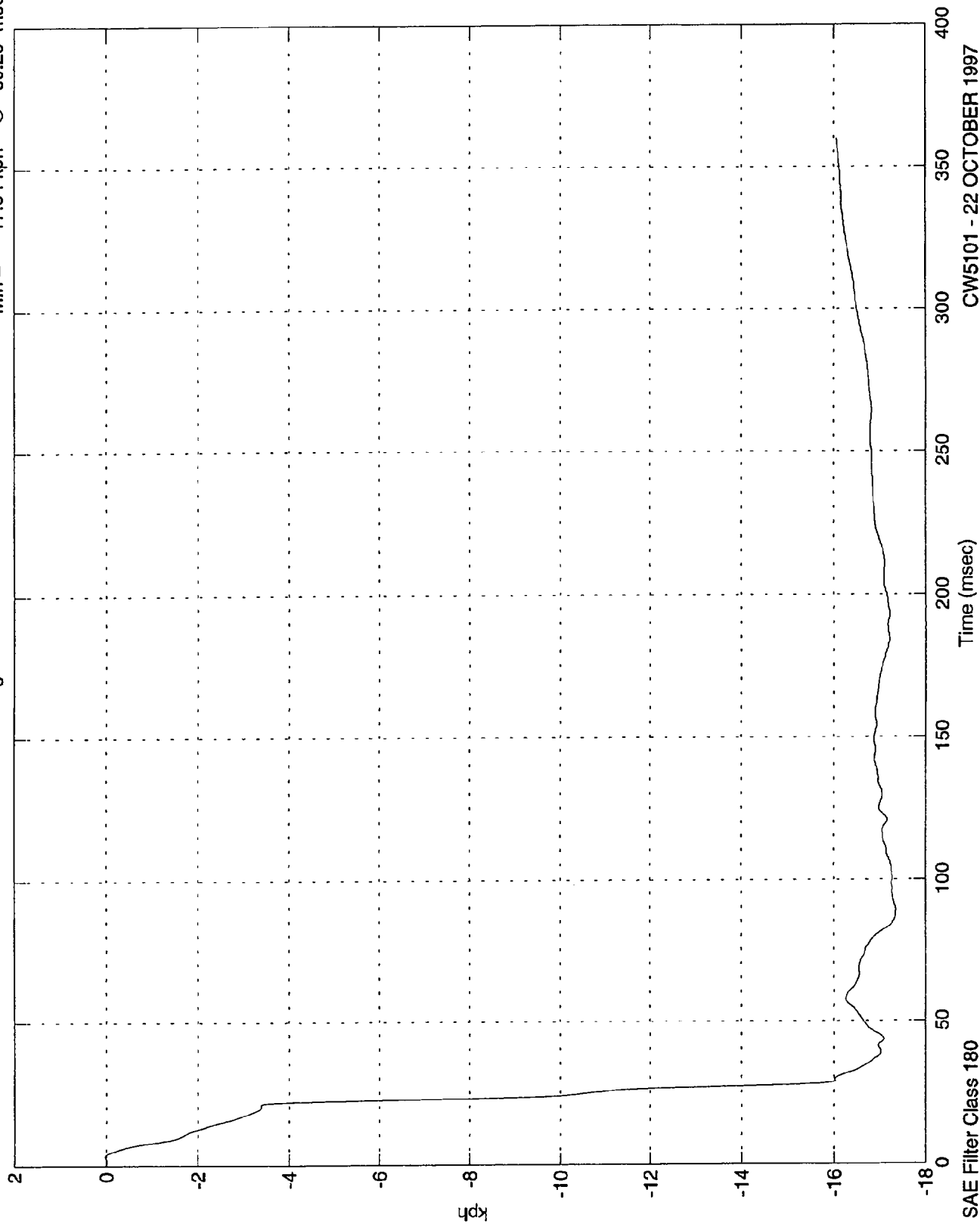
SAE Filter Class 60

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = .03 kph @ 3.20 msec
Min = -17.34 kph @ 89.29 msec

1st Integral Acc #18 Vehicle C.G X



SAE Filter Class 180

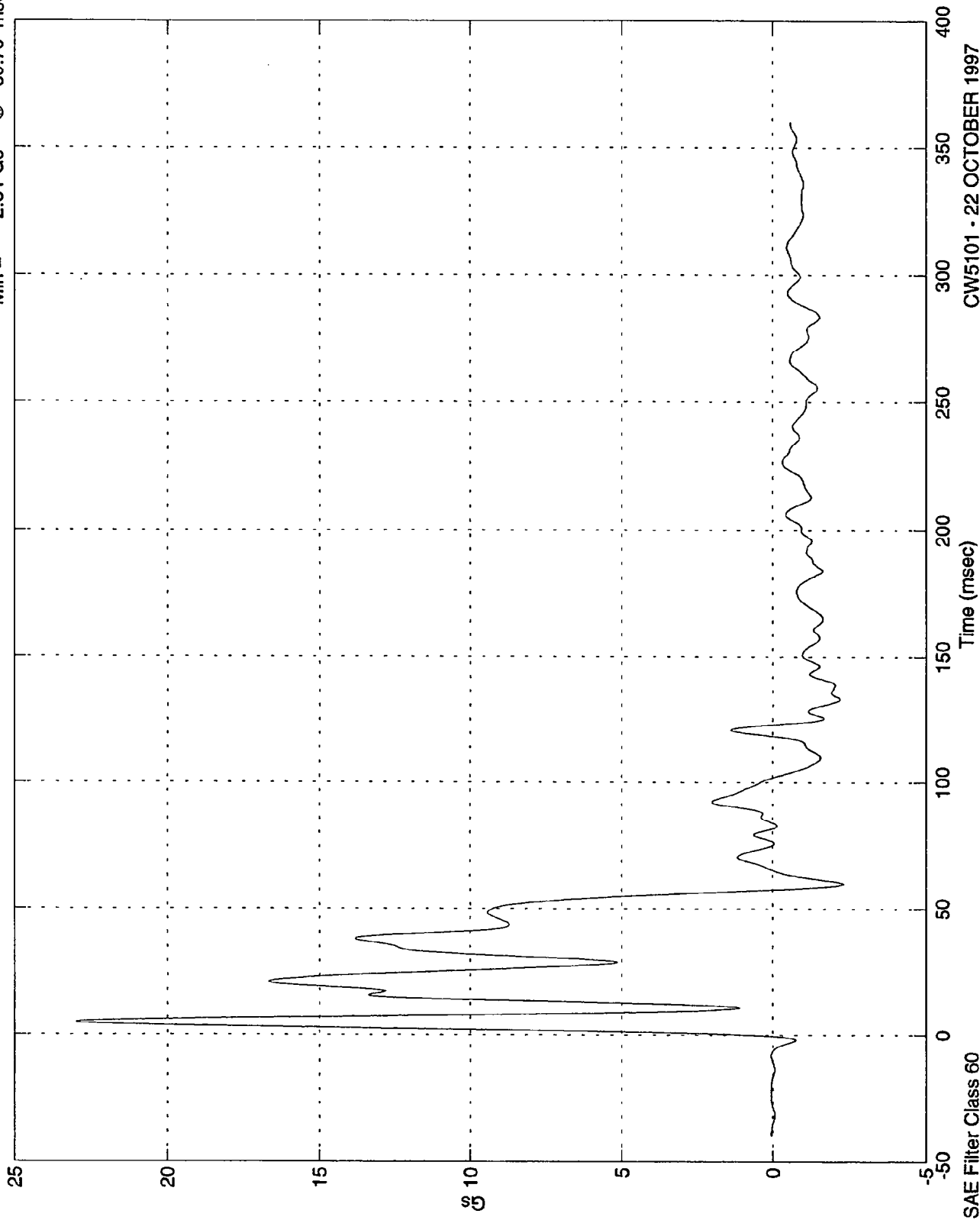
Time (msec)

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Acc #18 Vehicle C.G. Y

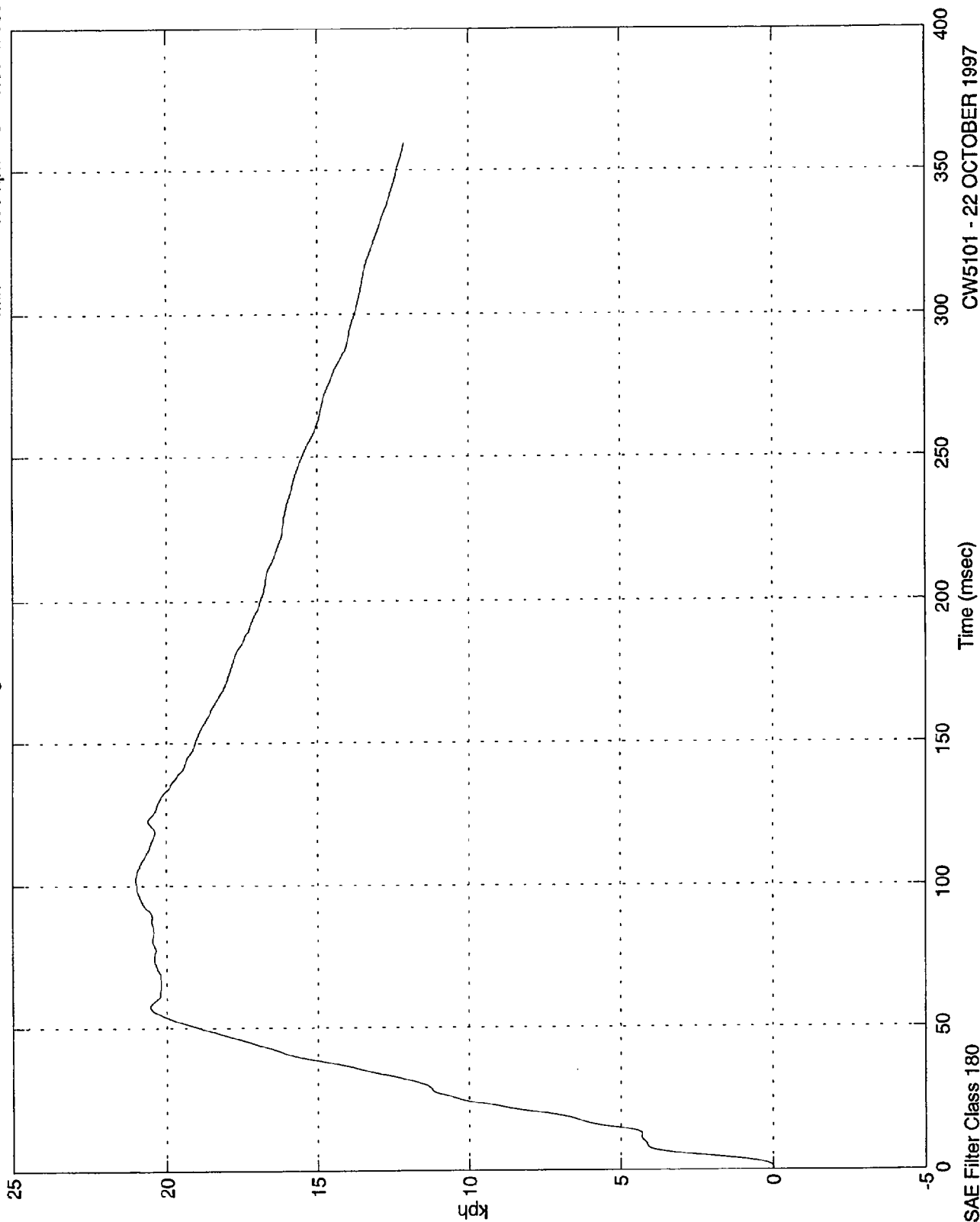
Max = 22.95 Gs @ 4.79 msec
Min = -2.31 Gs @ 59.79 msec



NHTSA Side Impact - 1998 Toyota Camry

Max = 21.01 kph @ 101.80 msec
Min = -.00 kph @ 0.60 msec

1st Integral Acc #18 Vehicle C.G. Y



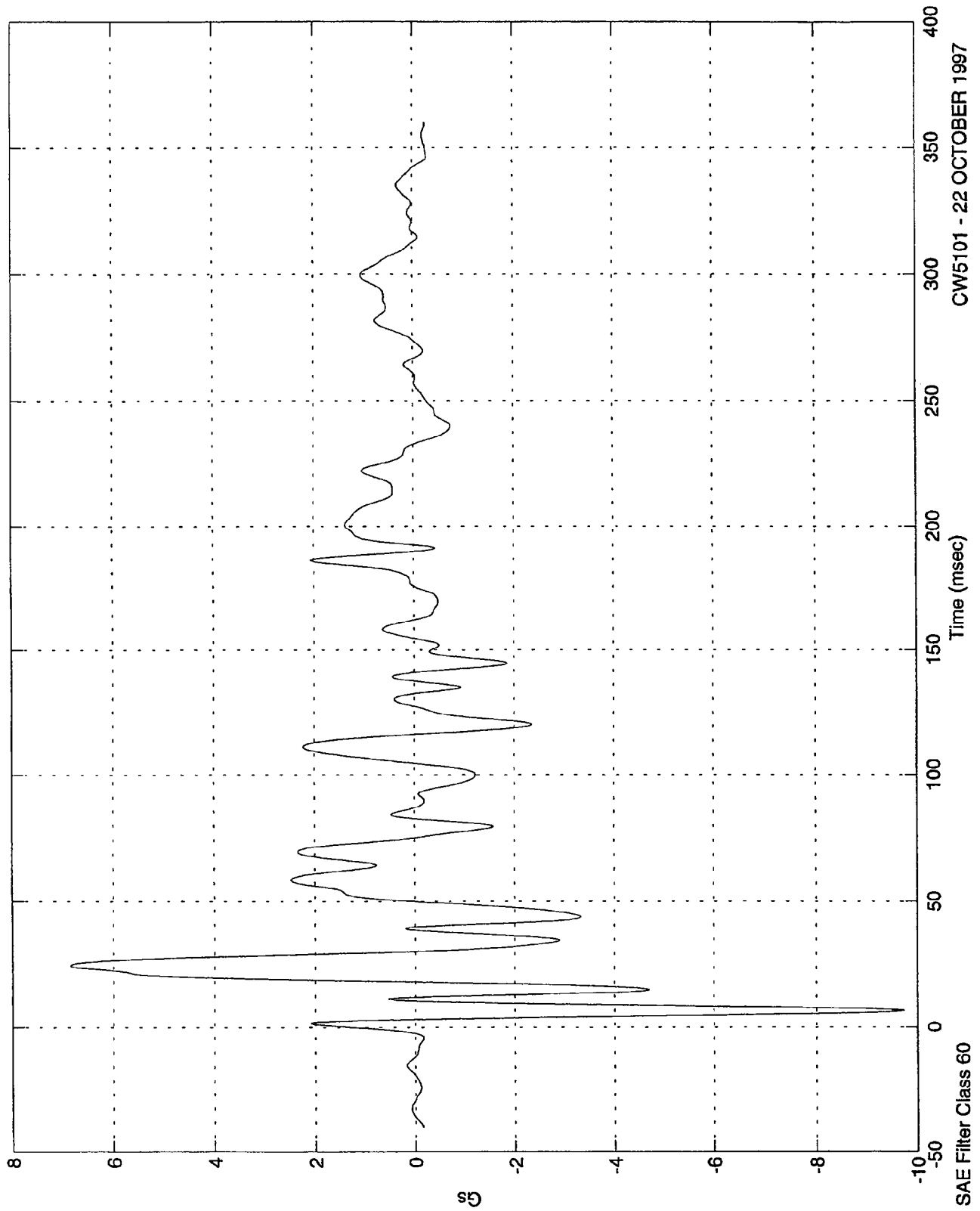
SAE Filter Class 180

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Acc #18 Vehicle C.G Z

Max = 6.83 Gs @ 24.50 msec
Min = -9.73 Gs @ 6.59 msec



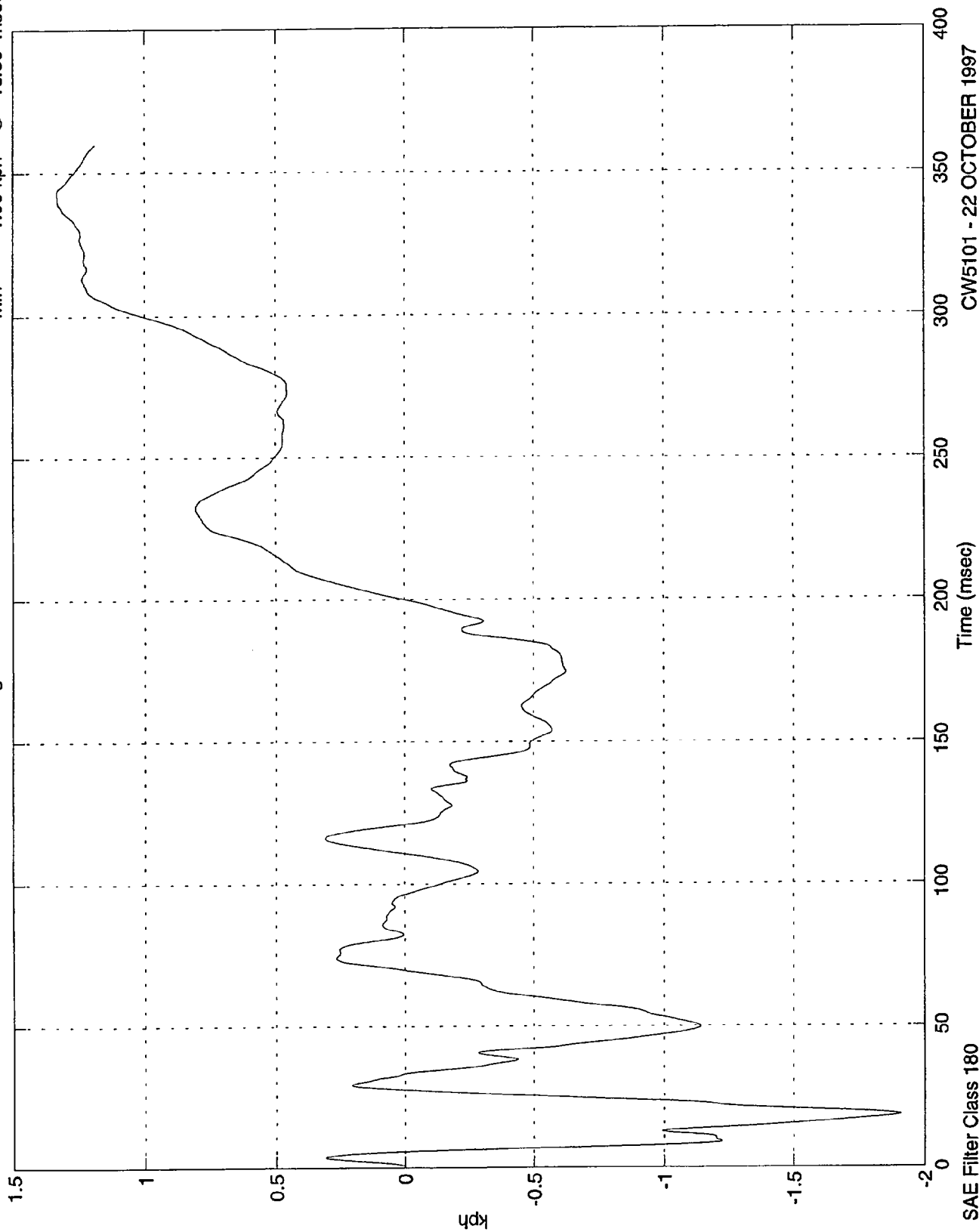
SAE Filter Class 60

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 1.33 kph @ 342.50 msec
Min = -1.90 kph @ 18.30 msec

1st Integral Acc #18 Vehicle C.G Z

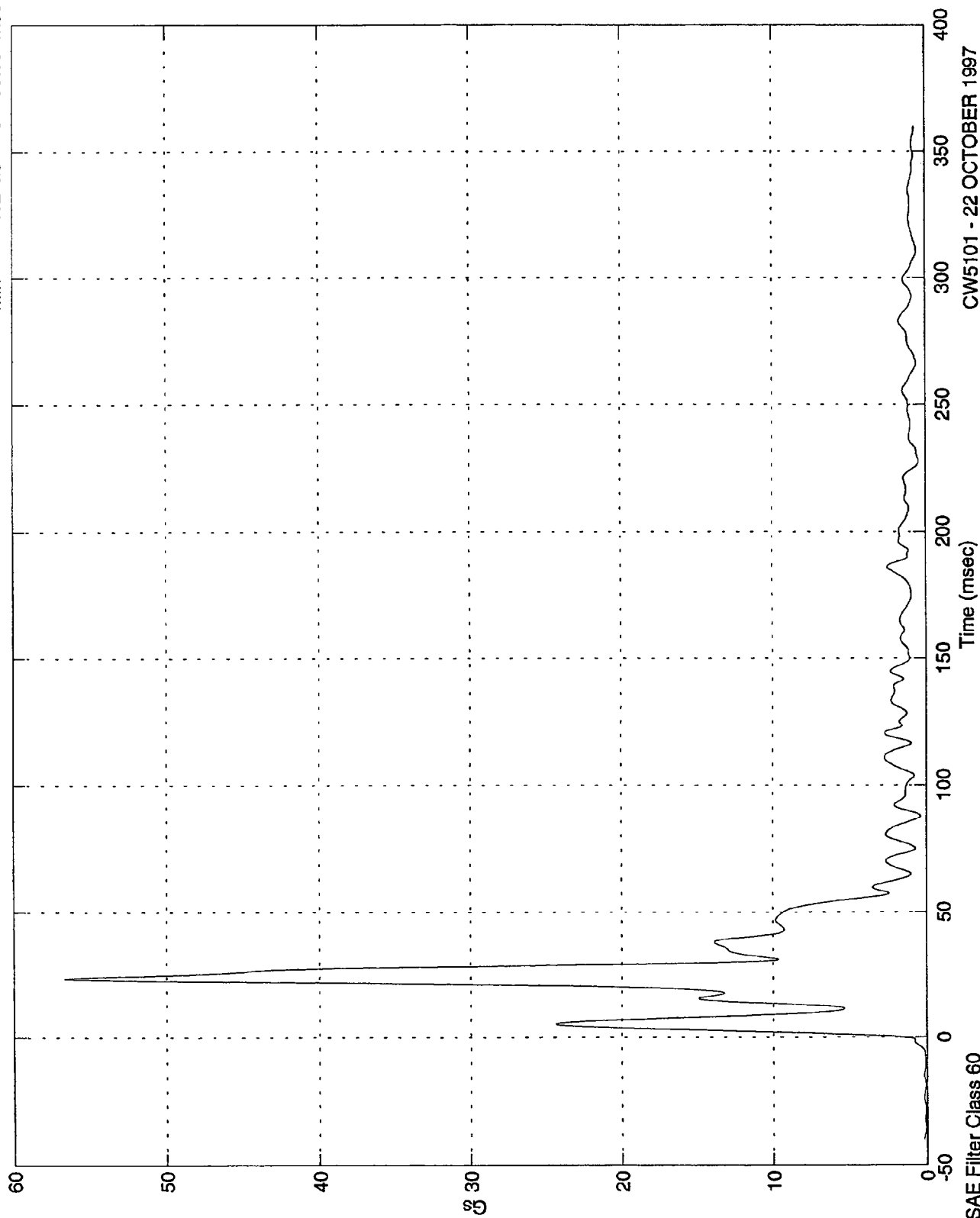


CW5101 - 22 OCTOBER 1997

Max = 56.72 Gs @ 23.29 msec
Min = .02 Gs @ -35.59 msec

Acc #18 Vehicle C.G.Res

NHTSA Side Impact - 1998 Toyota Camry



CW5101 - 22 OCTOBER 1997

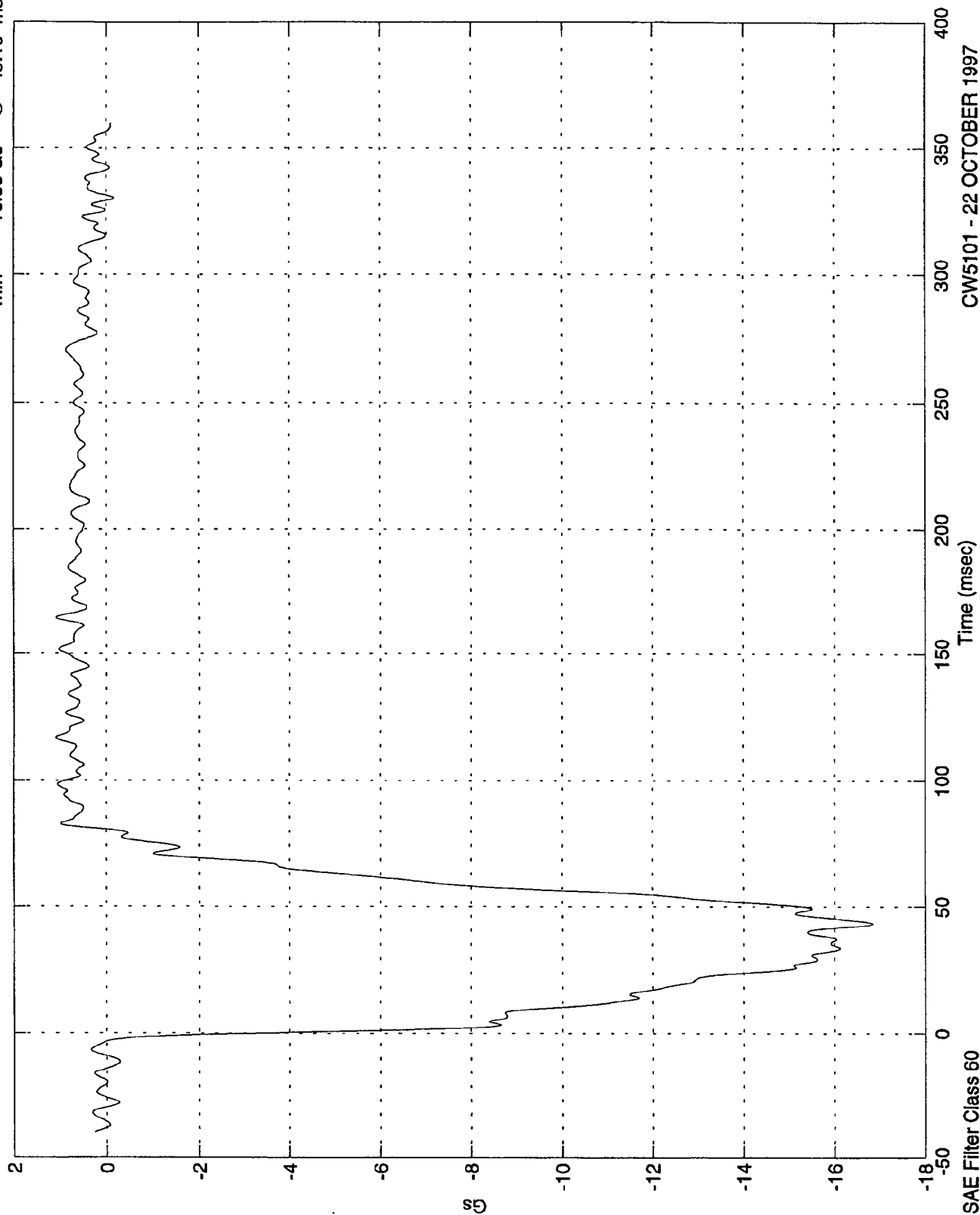
SAE Filter Class 60

MDB INSTRUMENTATION PLOTS
ACCELERATION DATA - FILTER CLASS 60
INTEGRATION DATA - FILTER CLASS 180

NHTSA Side Impact - 1998 Toyota Camry

Max = 1.09 Gs @ 116.69 msec
 Min = -16.83 Gs @ 43.19 msec

MDB C.G. X



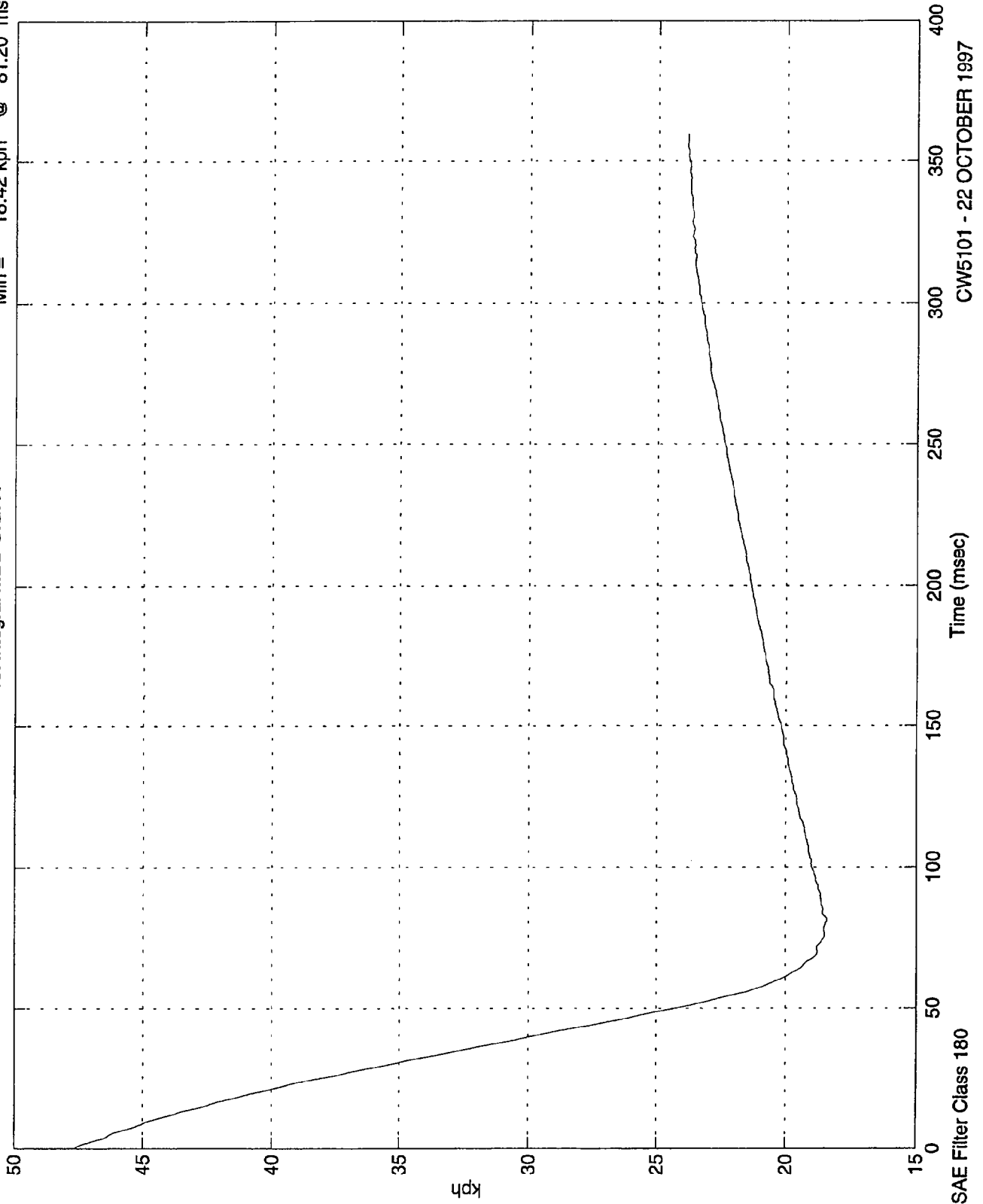
SAE Filter Class 60

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 47.60 kph @ 0.00 msec
Min = 18.42 kph @ 81.20 msec

1st Integral MDB C.G. X



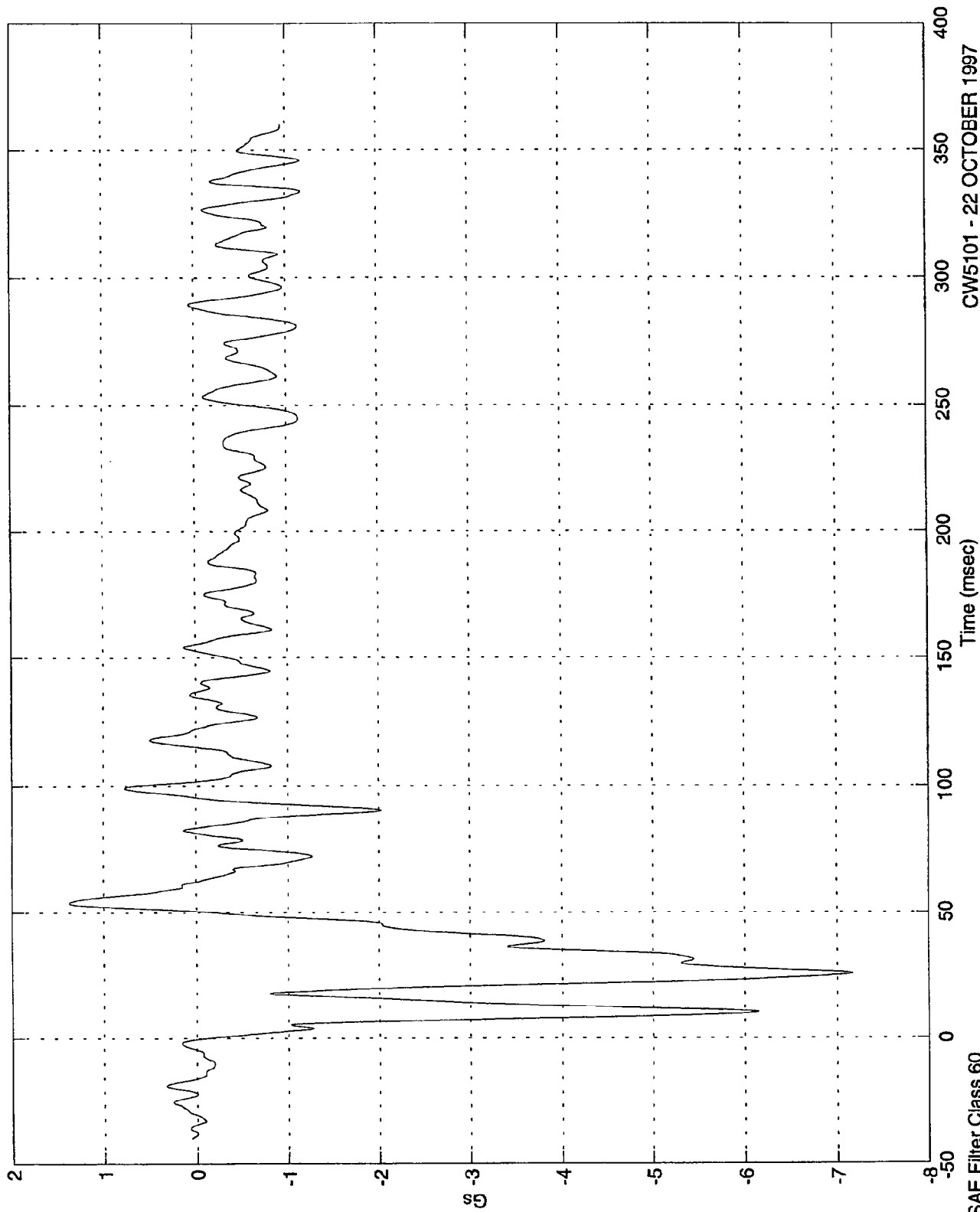
CW5101 - 22 OCTOBER 1997

SAE Filter Class 180

NHTSA Side Impact - 1998 Toyota Camry

Max = 1.37 Gs @ 53.90 msec
 Min = -7.17 Gs @ 25.79 msec

MDB C.G. Y



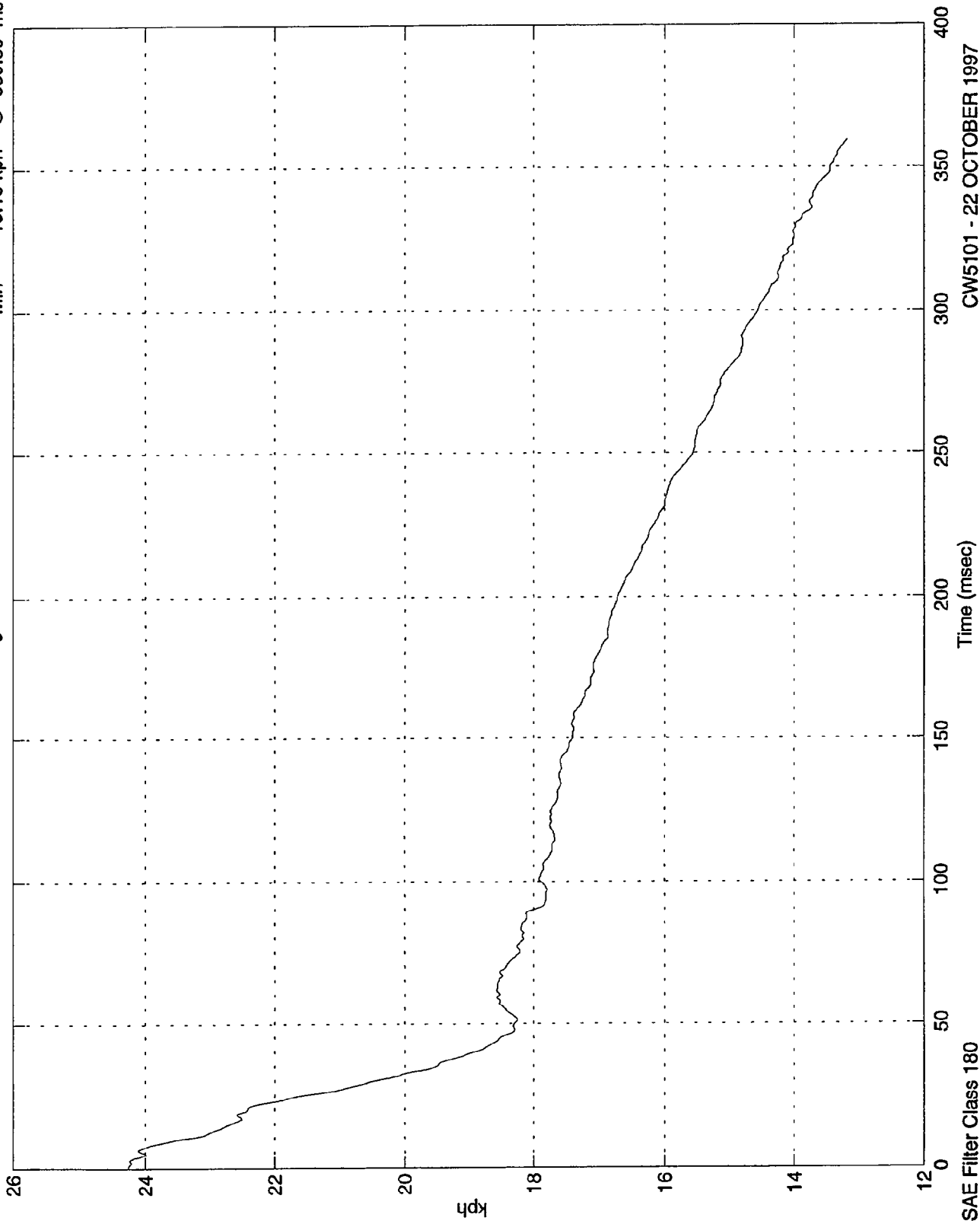
SAE Filter Class 60

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 24.25 kph @ 0.00 msec
Min = 13.18 kph @ 359.89 msec

1st Integral MDB C.G. Y



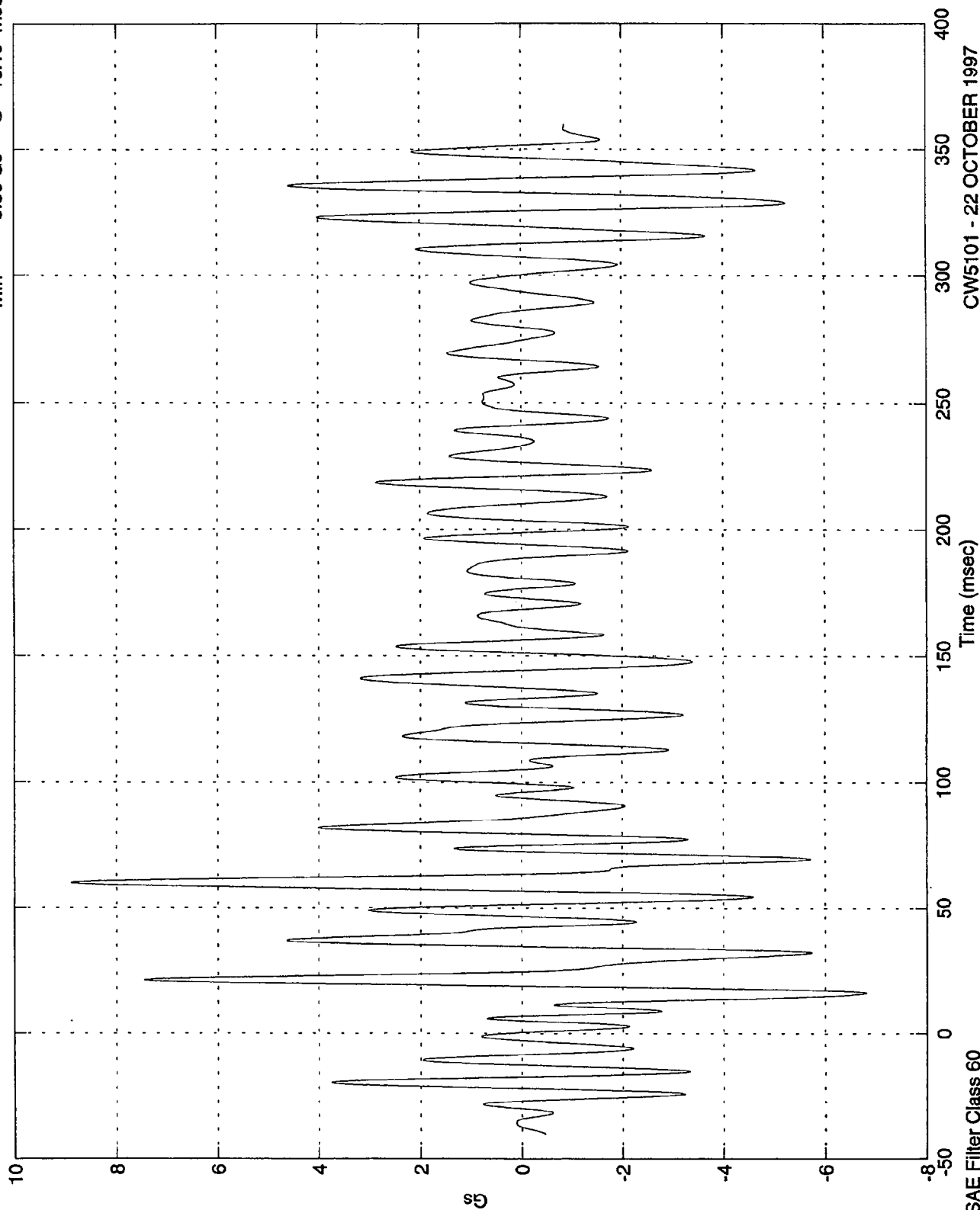
CW5101 - 22 OCTOBER 1997

SAE Filter Class 180

NHTSA Side Impact - 1998 Toyota Camry

Max = 8.87 Gs @ 59.89 msec
 Min = -6.80 Gs @ 16.19 msec

MDB C.G. Z



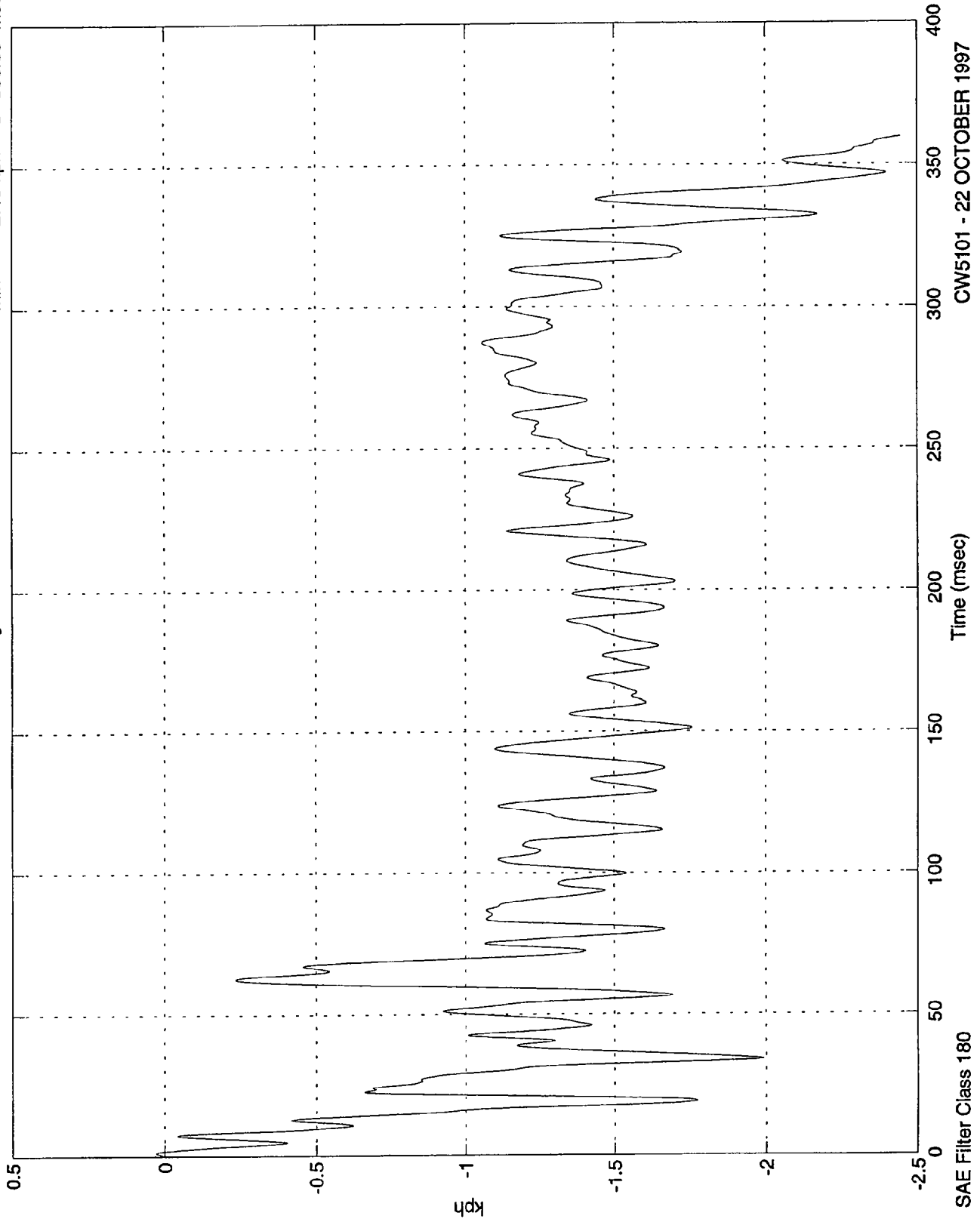
SAE Filter Class 60

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = .02 kph @ 1.10 msec
Min = -2.45 kph @ 359.89 msec

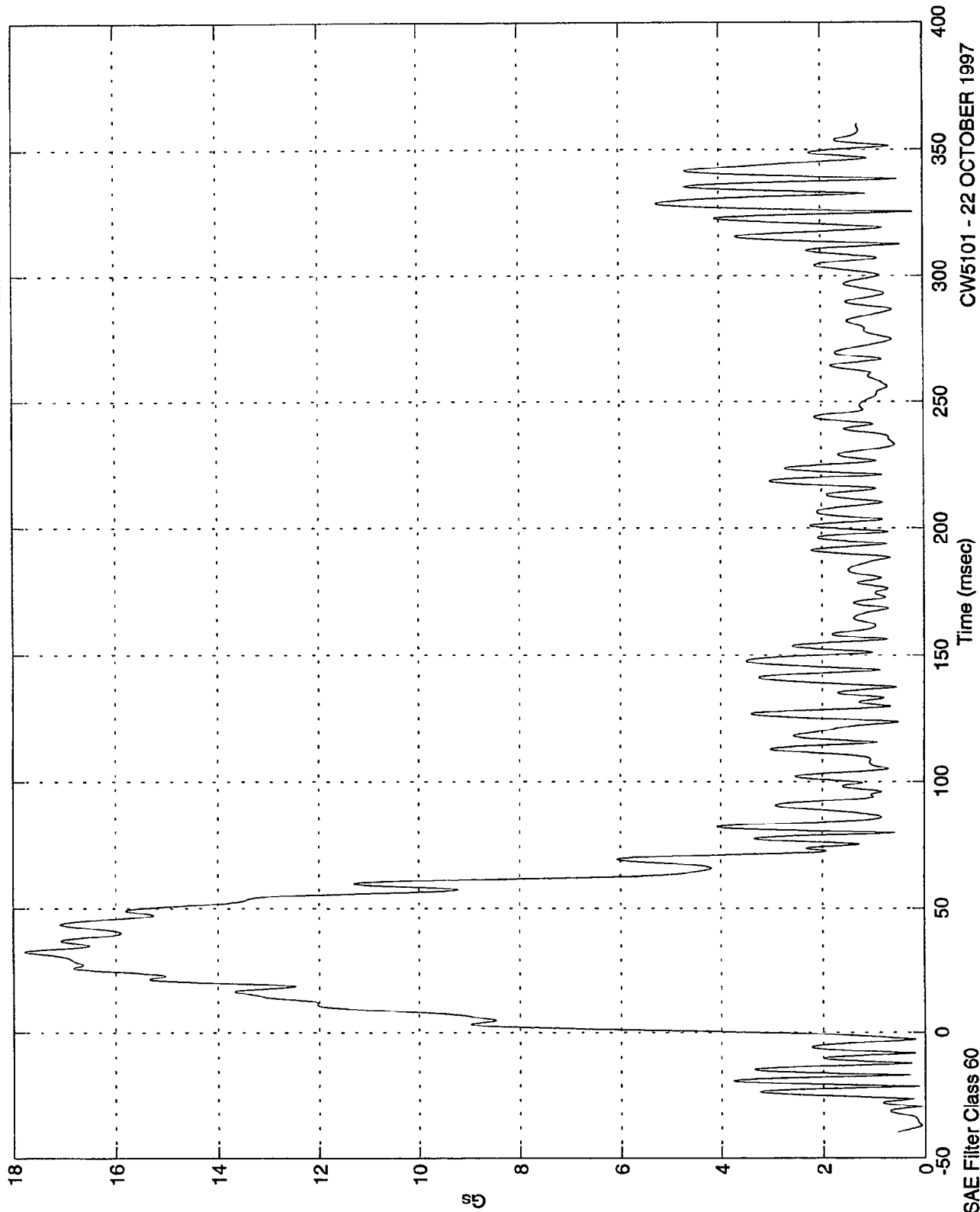
1st Integral MDB C.G. Z



NHTSA Side Impact - 1998 Toyota Camry

Max = 17.78 Gs @ 32.40 msec
Min = .06 Gs @ -29.89 msec

MDB C.G. Res



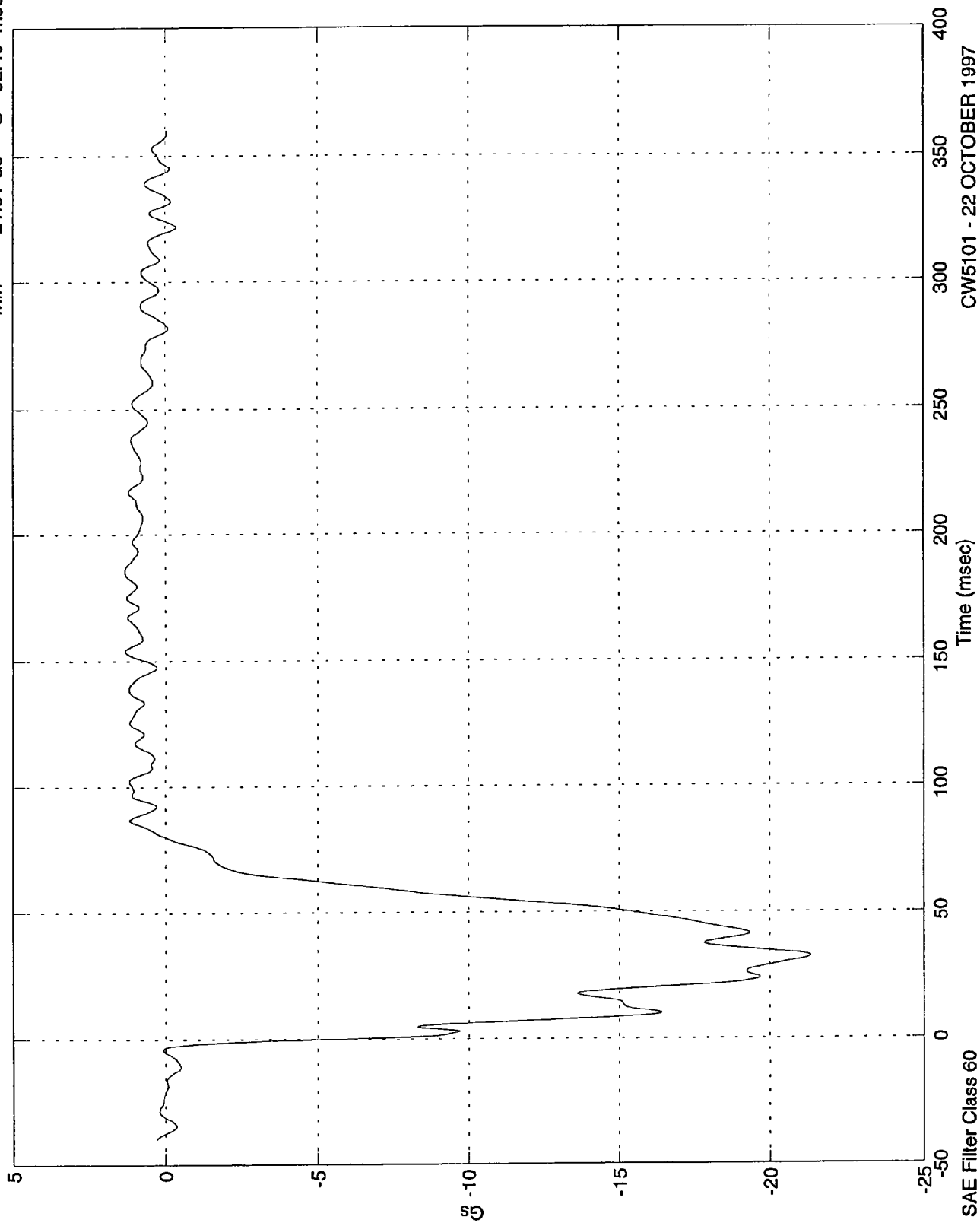
SAE Filter Class 60

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 1.34 Gs @ 185.19 msec
Min = -21.31 Gs @ 32.40 msec

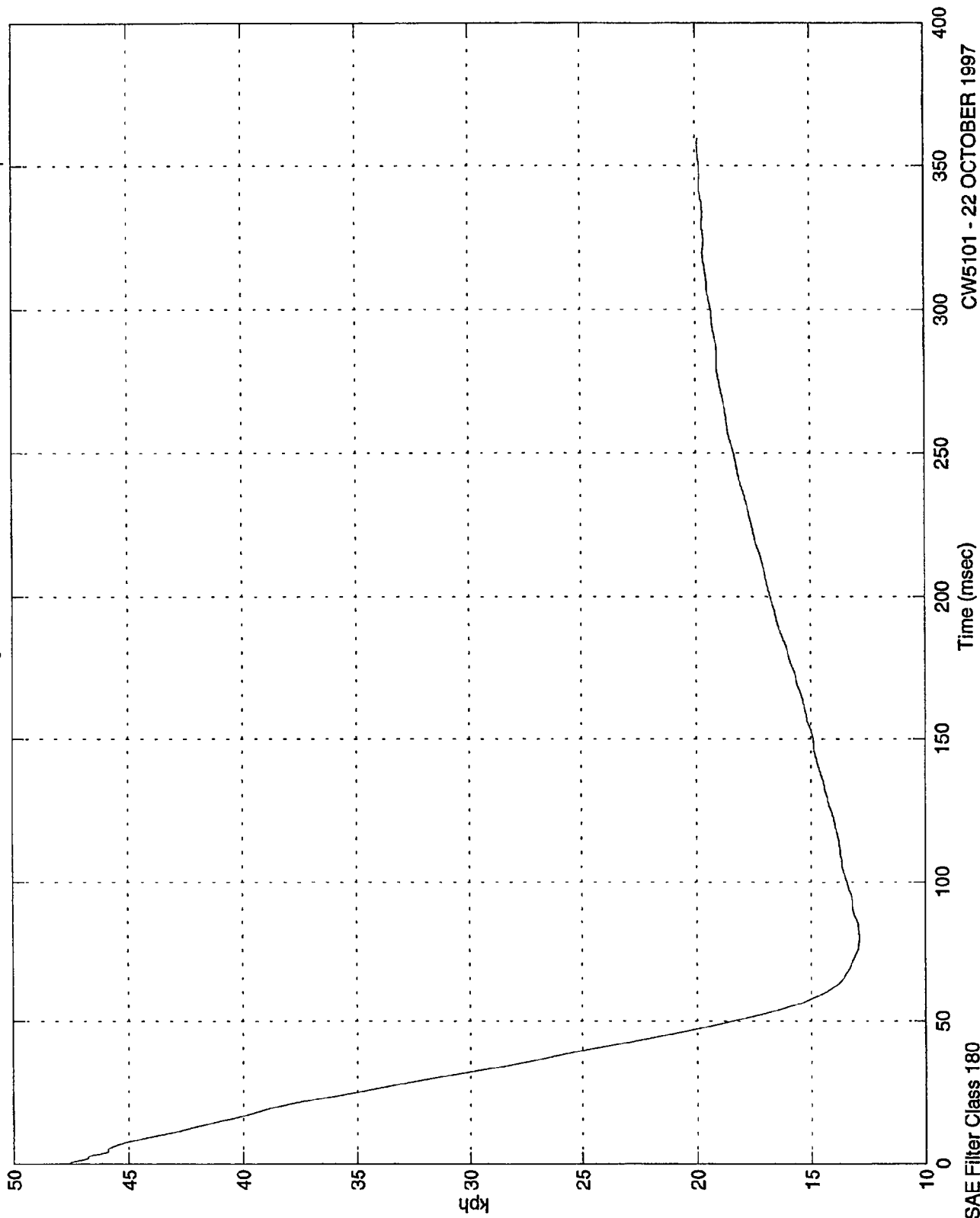
MDB Left Rear X



NHTSA Side Impact - 1998 Toyota Camry

1st Integral MDB Left Rear X

Max = 47.60 kph @ 0.00 msec
Min = 12.88 kph @ 80.09 msec



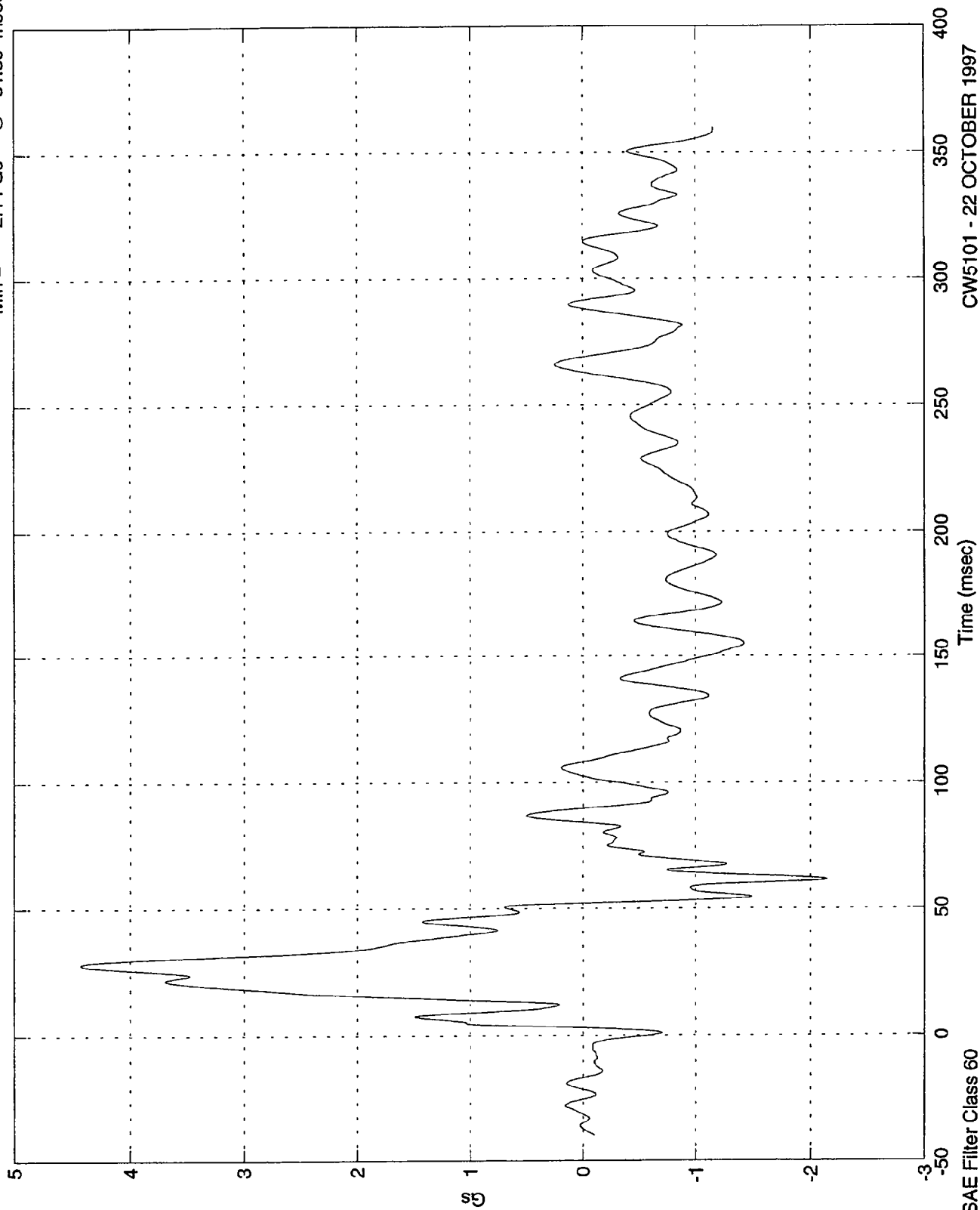
SAE Filter Class 180

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 4.42 Gs @ 27.79 msec
Min = -2.14 Gs @ 61.59 msec

MDB Left Rear Y

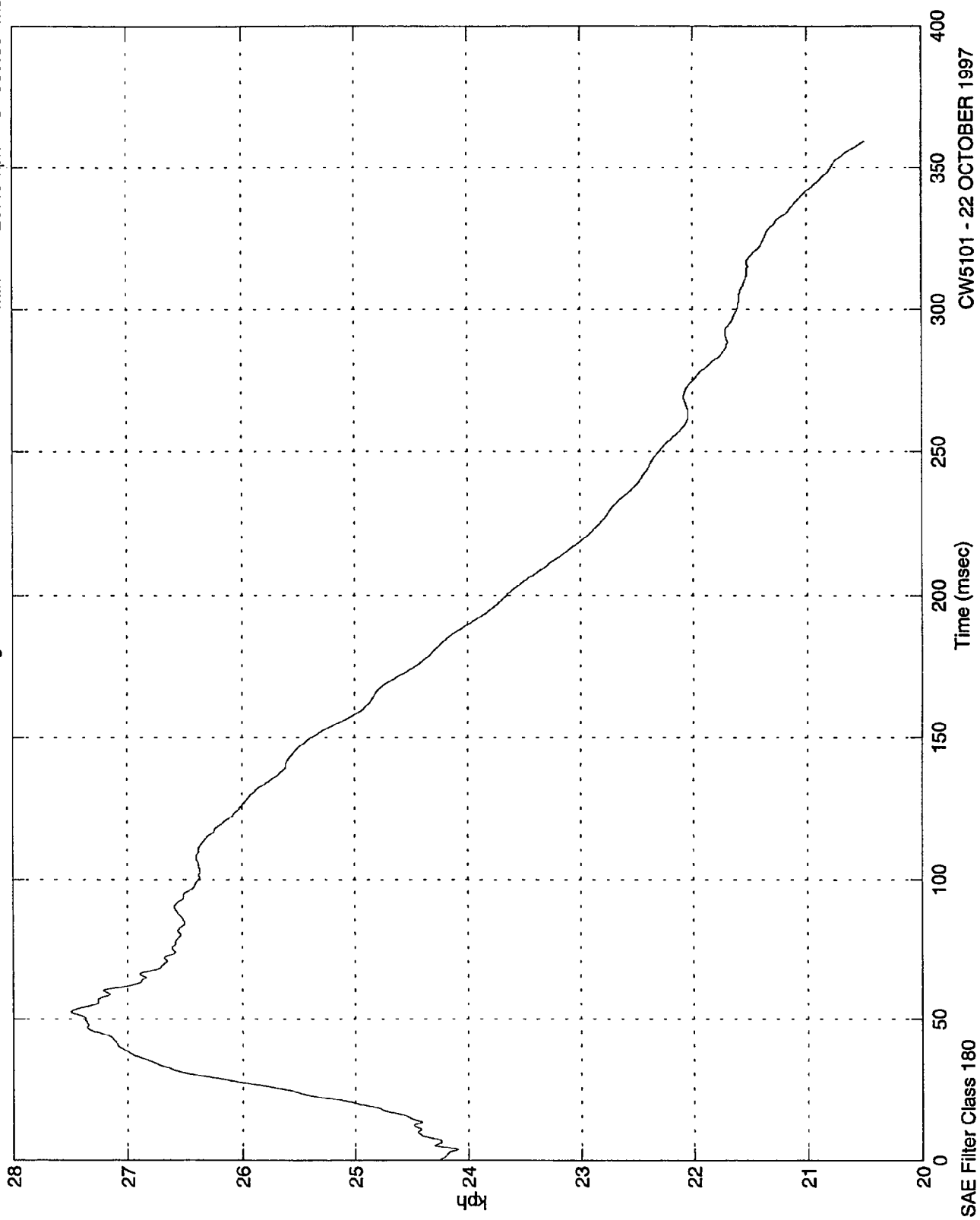


CW5101 - 22 OCTOBER 1997

Max = 27.49 kph @ 52.50 msec
Min = 20.49 kph @ 359.89 msec

1st Integral MDB Left Rear Y

NHTSA Side Impact - 1998 Toyota Camry



SAE Filter Class 180

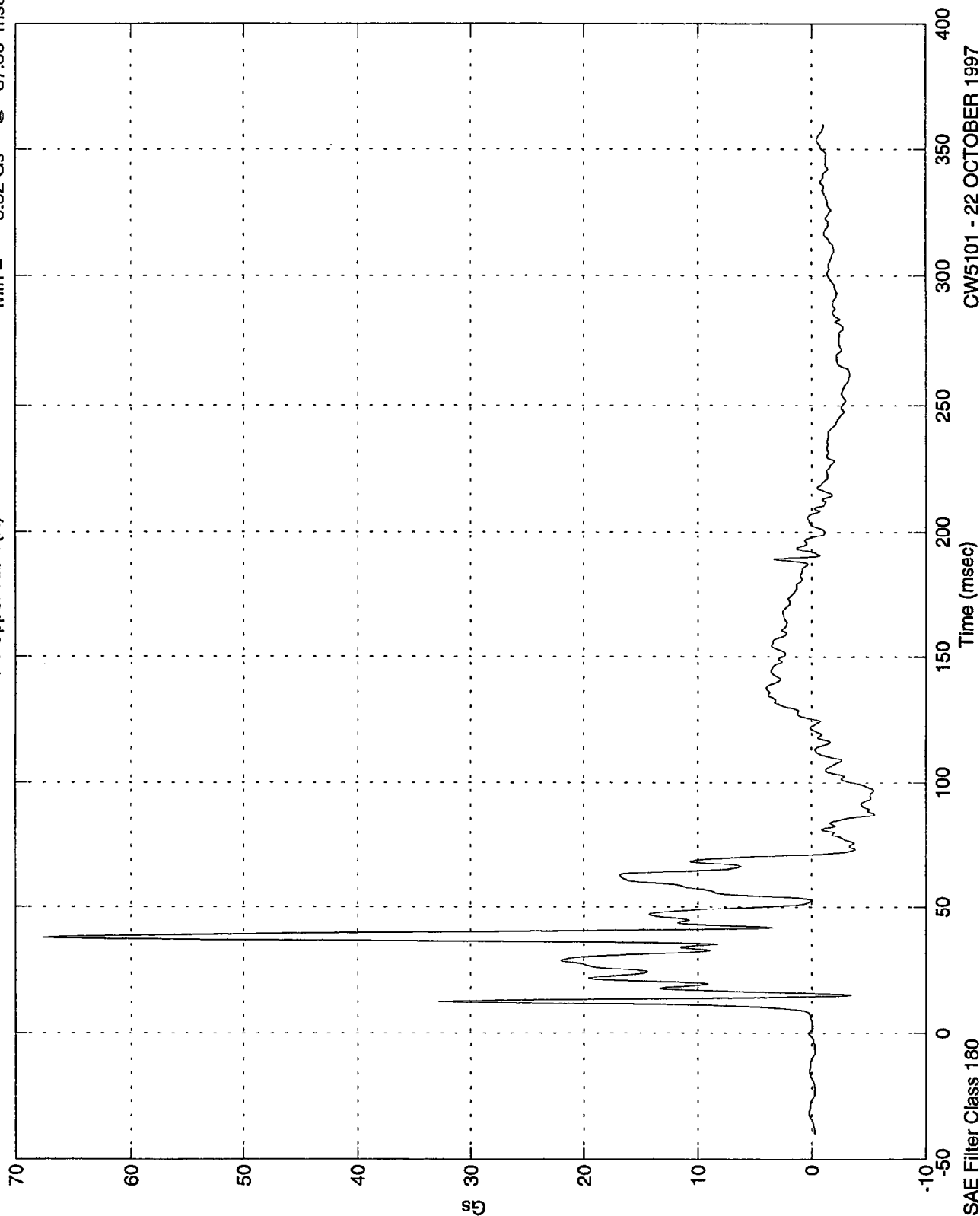
CW5101 - 22 OCTOBER 1997

DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS (Redundant)
ACCELERATION DATA - FILTER CLASS 180
INTEGRATION DATA - FILTER CLASS 180

NHTSA Side Impact - 1998 Toyota Camry

Max = 67.60 Gs @ 37.59 msec
 Min = -5.52 Gs @ 87.50 msec

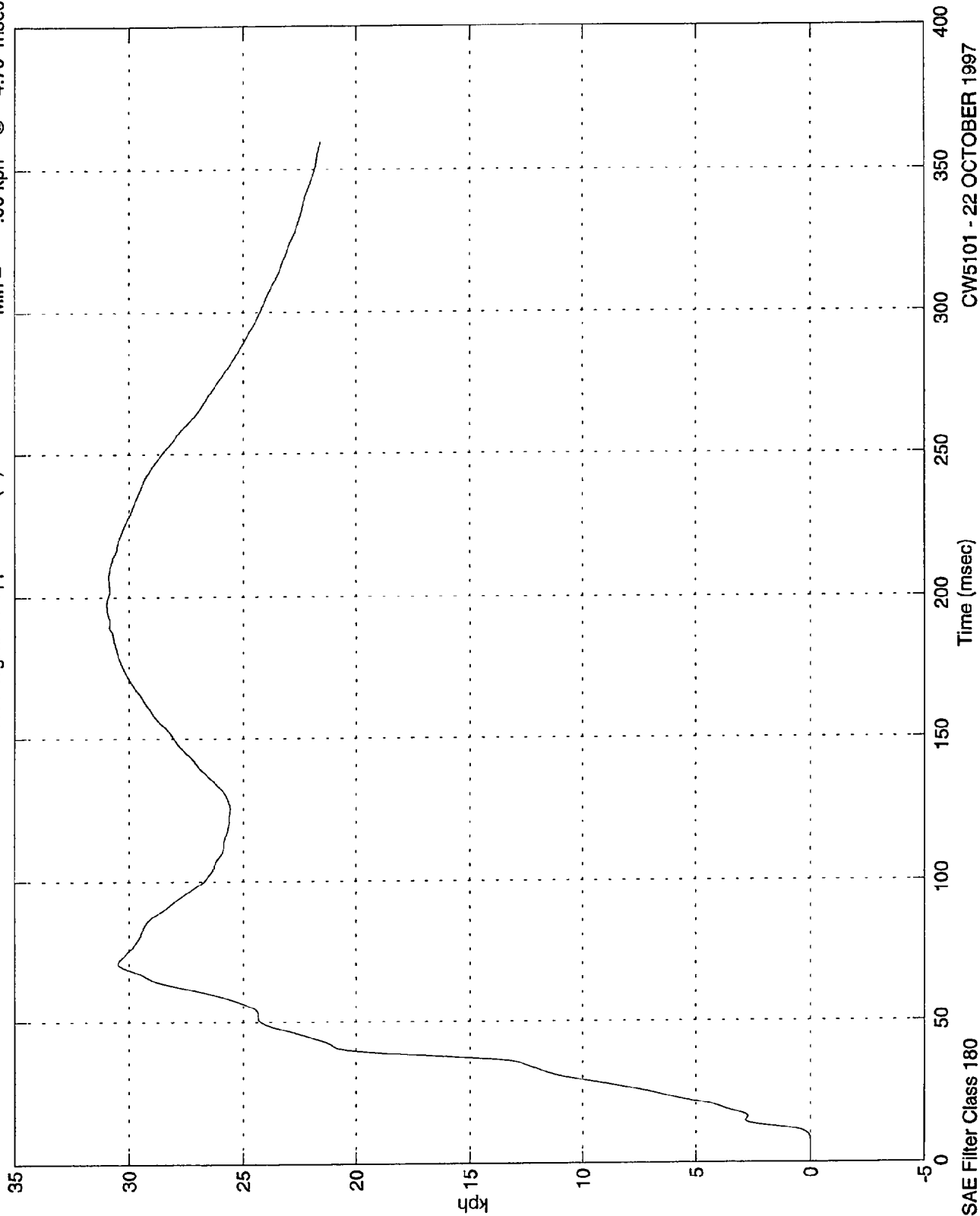
P1 Upper Rib Y(R)



NHTSA Side Impact - 1998 Toyota Camry

Max = 30.99 kph @ 197.60 msec
 Min = -0.00 kph @ 4.70 msec

1st Integral P1 Upper Rib Y(R)



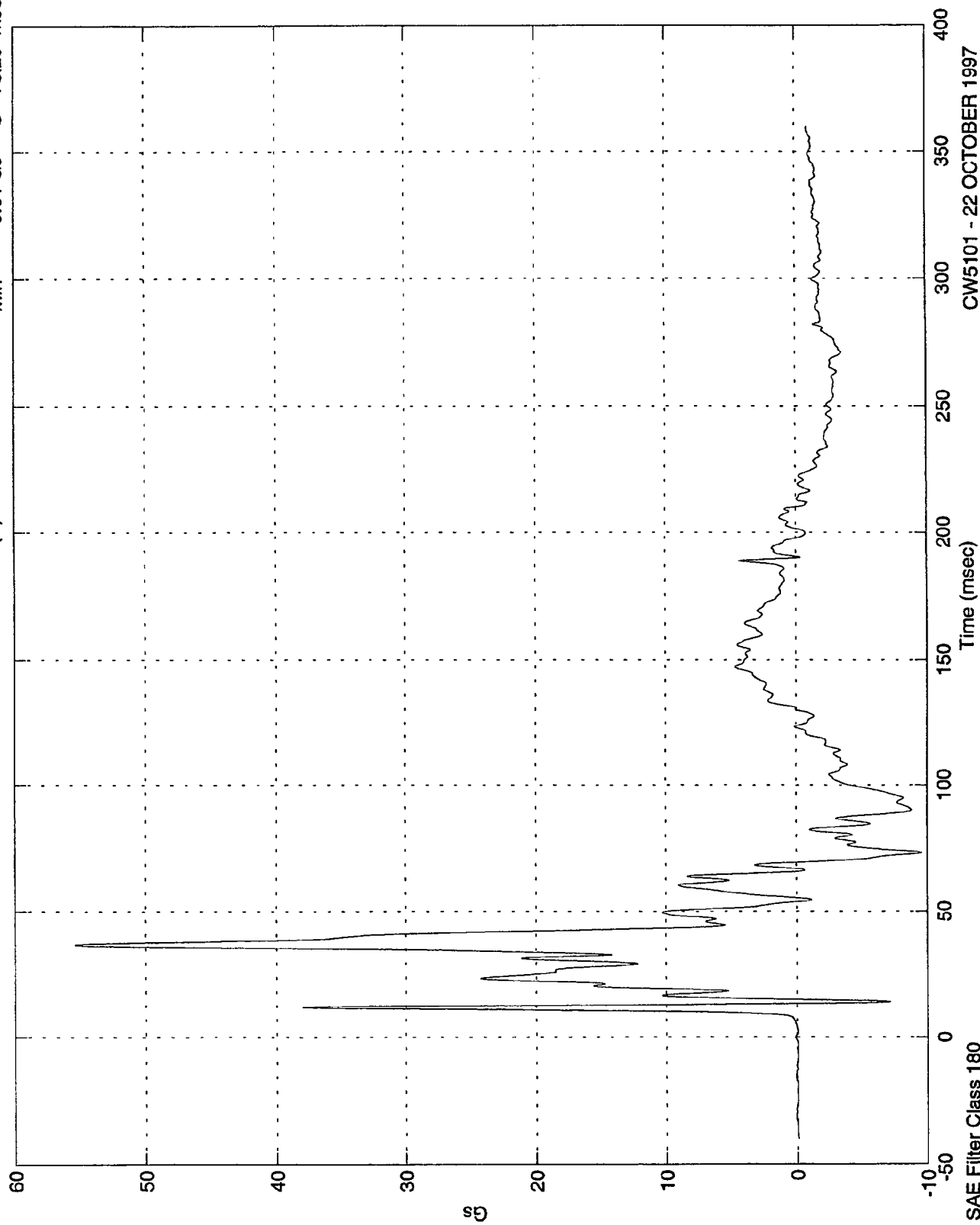
SAE Filter Class 180

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

P1 Lower Rib Y(R)

Max = 55.34 Gs @ 36.70 msec
Min = -9.61 Gs @ 73.29 msec

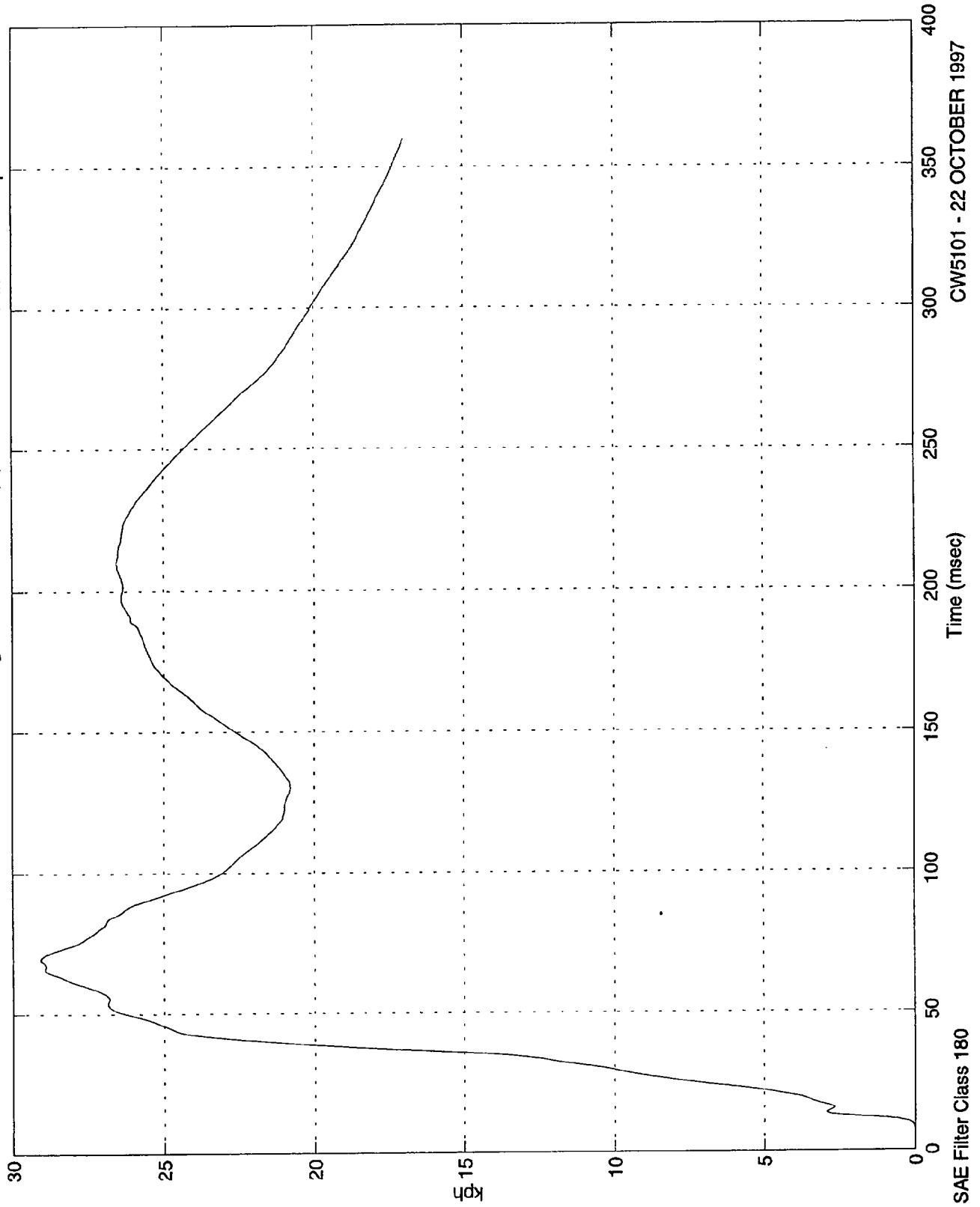


CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 29.07 kph @ 69.49 msec
Min = .00 kph @ 0.00 msec

1st Integral P1 Lower Rib Y(R)



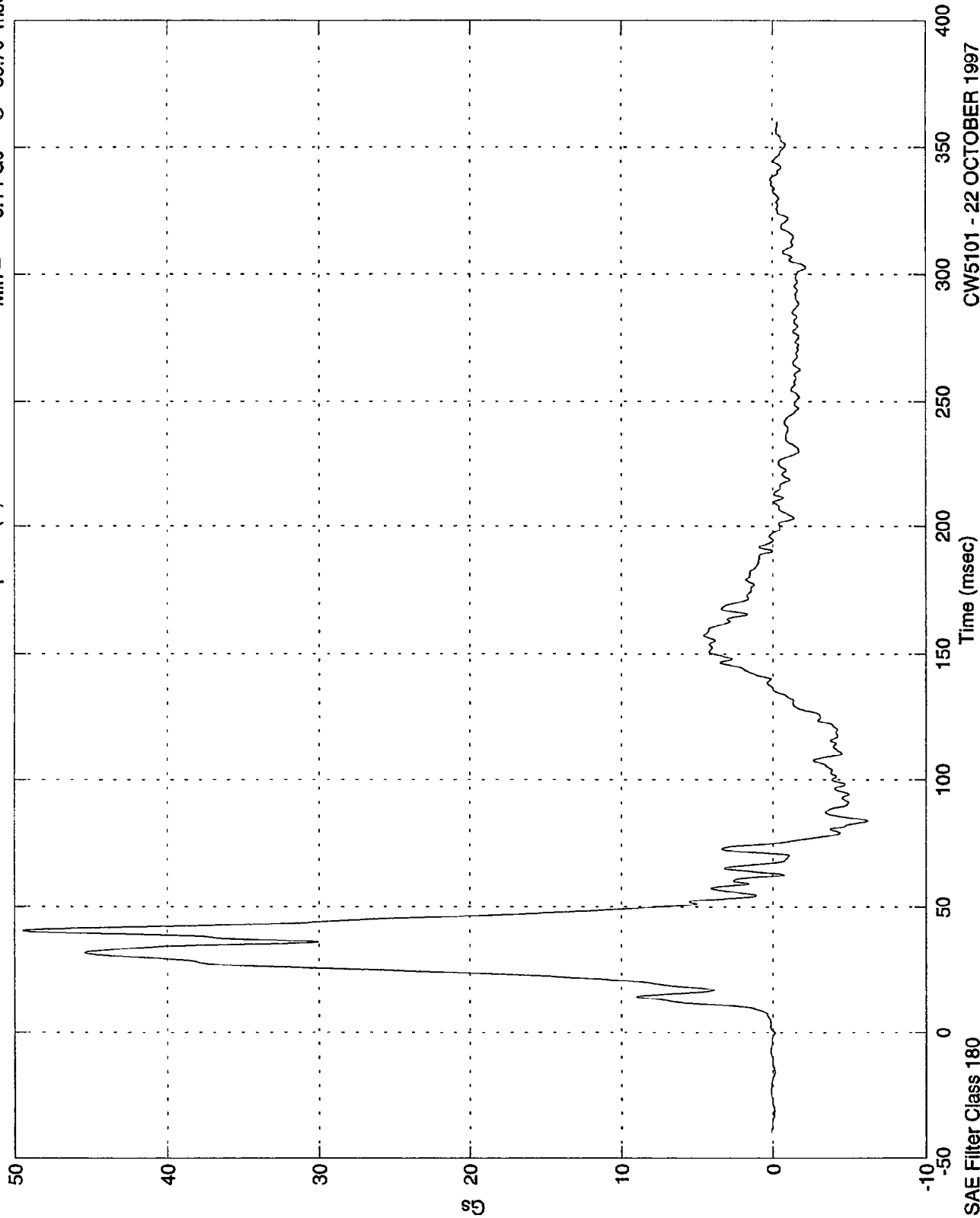
CW5101 - 22 OCTOBER 1997

SAE Filter Class 180

NHTSA Side Impact - 1998 Toyota Camry

Max = 49.42 Gs @ 40.70 msec
 Min = -6.14 Gs @ 83.70 msec

P1 Lower Spine Y(R)



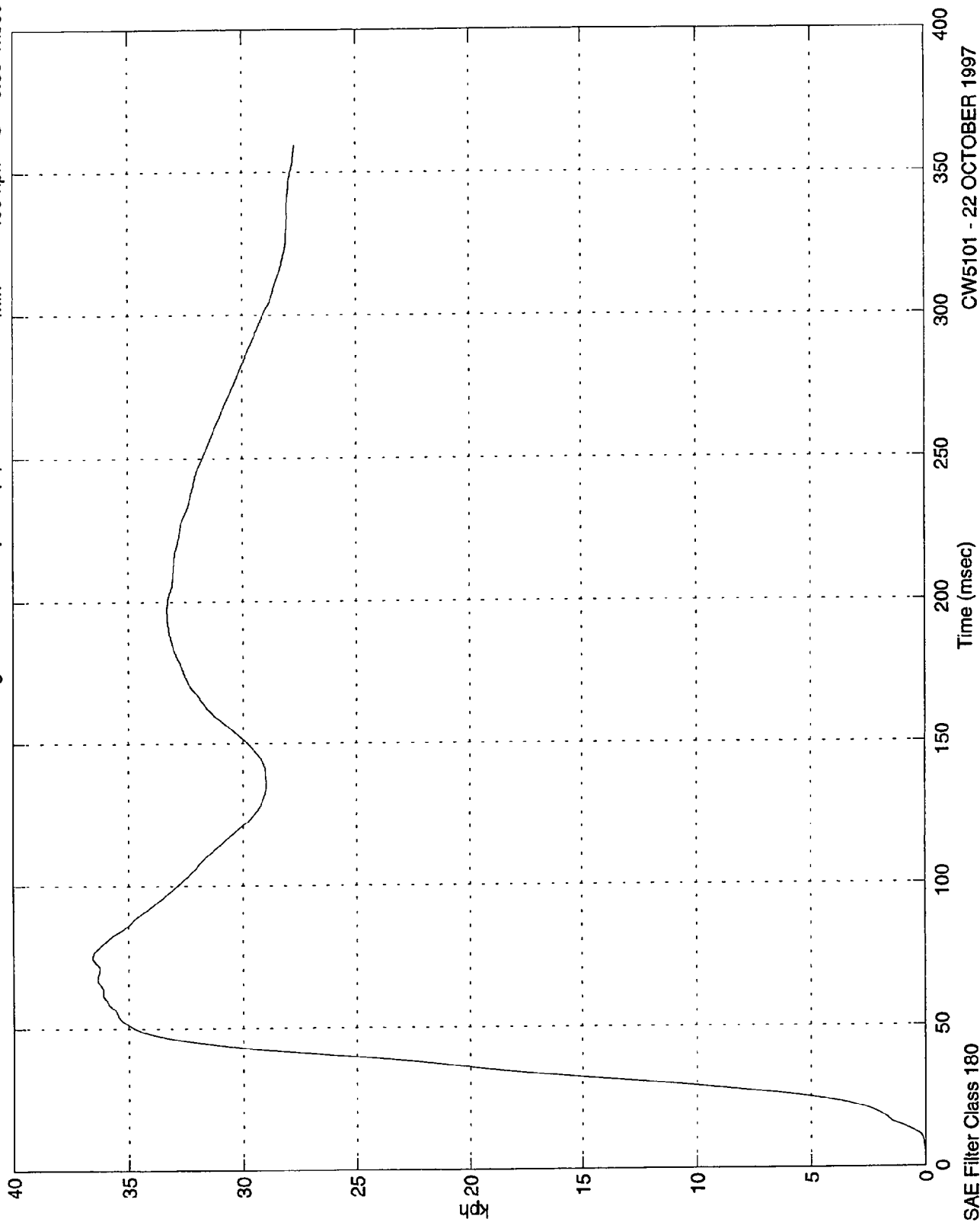
SAE Filter Class 180

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 36.54 kph @ 74.79 msec
Min = -.00 kph @ 0.50 msec

1st Integral P1 Lower Spine Y(R)



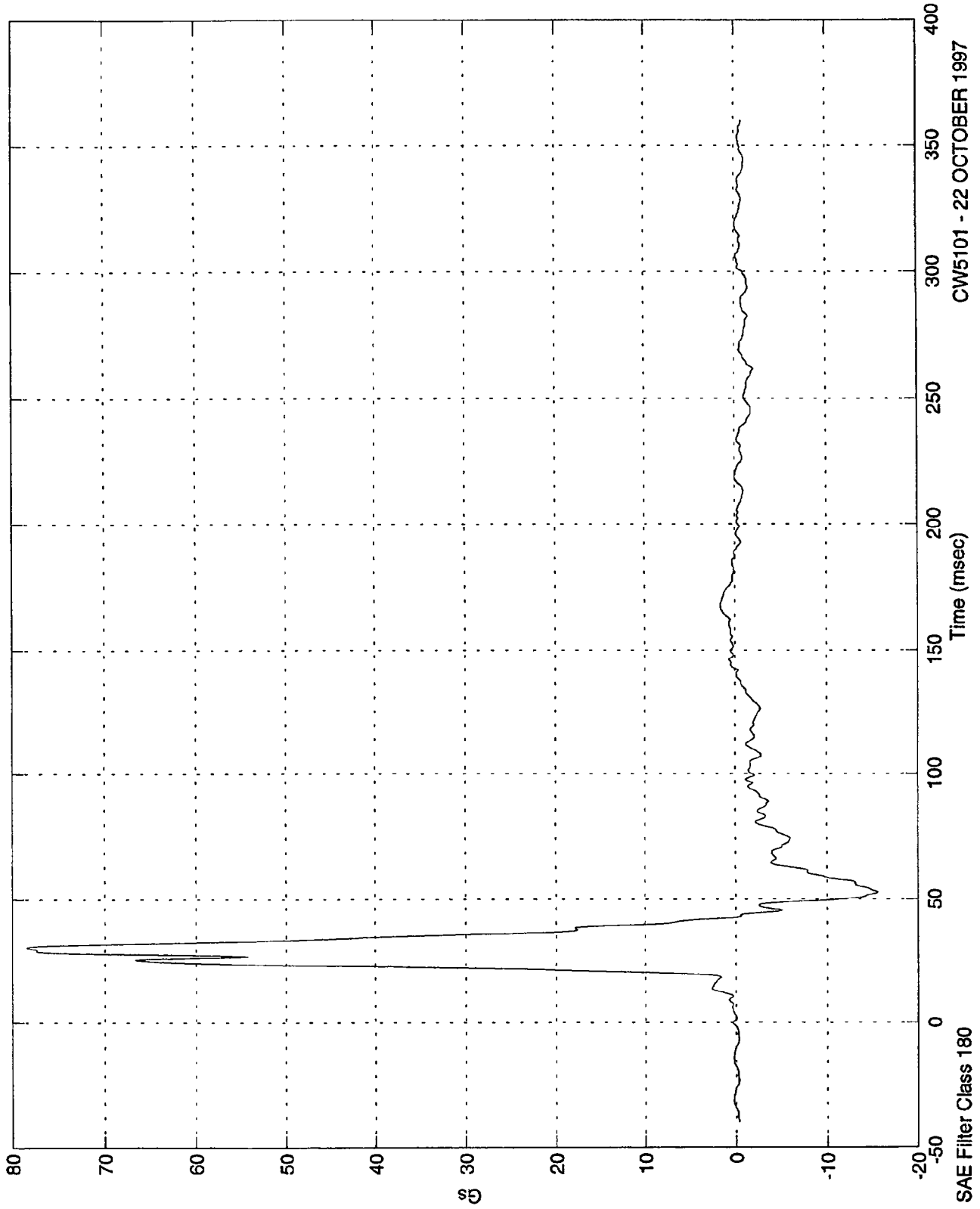
SAE Filter Class 180

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 78.41 Gs @ 30.39 msec
 Min = -15.61 Gs @ 52.89 msec

P1 Pelvic Y(R)



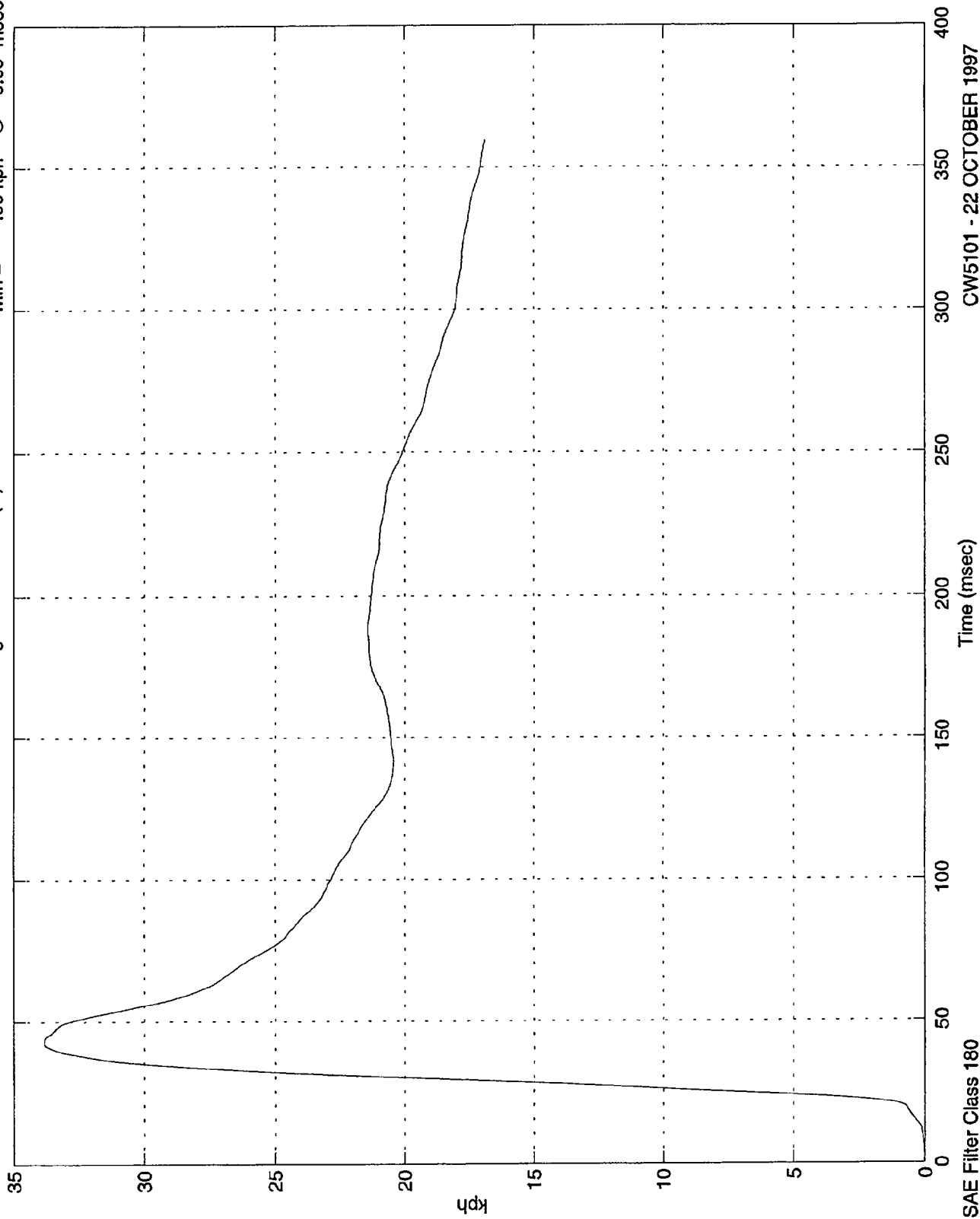
SAE Filter Class 180

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 33.84 kph @ 42.60 msec
Min = .00 kph @ 0.00 msec

1st Integral P1 Pelvic Y(R)



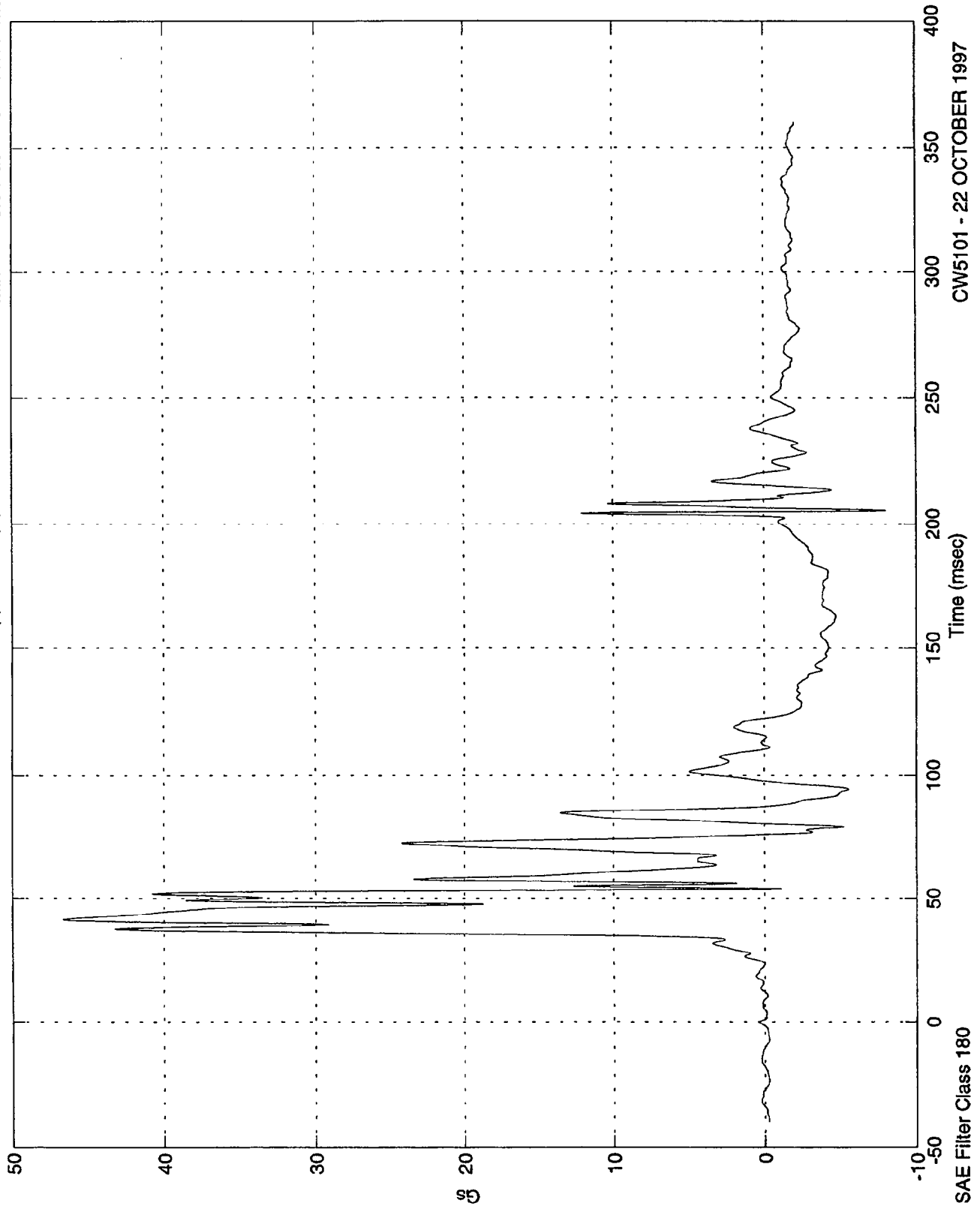
SAE Filter Class 180

CW5101 - 22 OCTOBER 1997

Max = 46.64 Gs @ 41.09 msec
Min = -8.04 Gs @ 205.59 msec

P4 Upper Rib Y(R)

NHTSA Side Impact - 1998 Toyota Camry



NHTSA Side Impact - 1998 Toyota Camry

Max = 34.14 kph @ 122.40 msec
Min = -.00 kph @ 4.80 msec

1st Integral P4 Upper Rib Y(R)



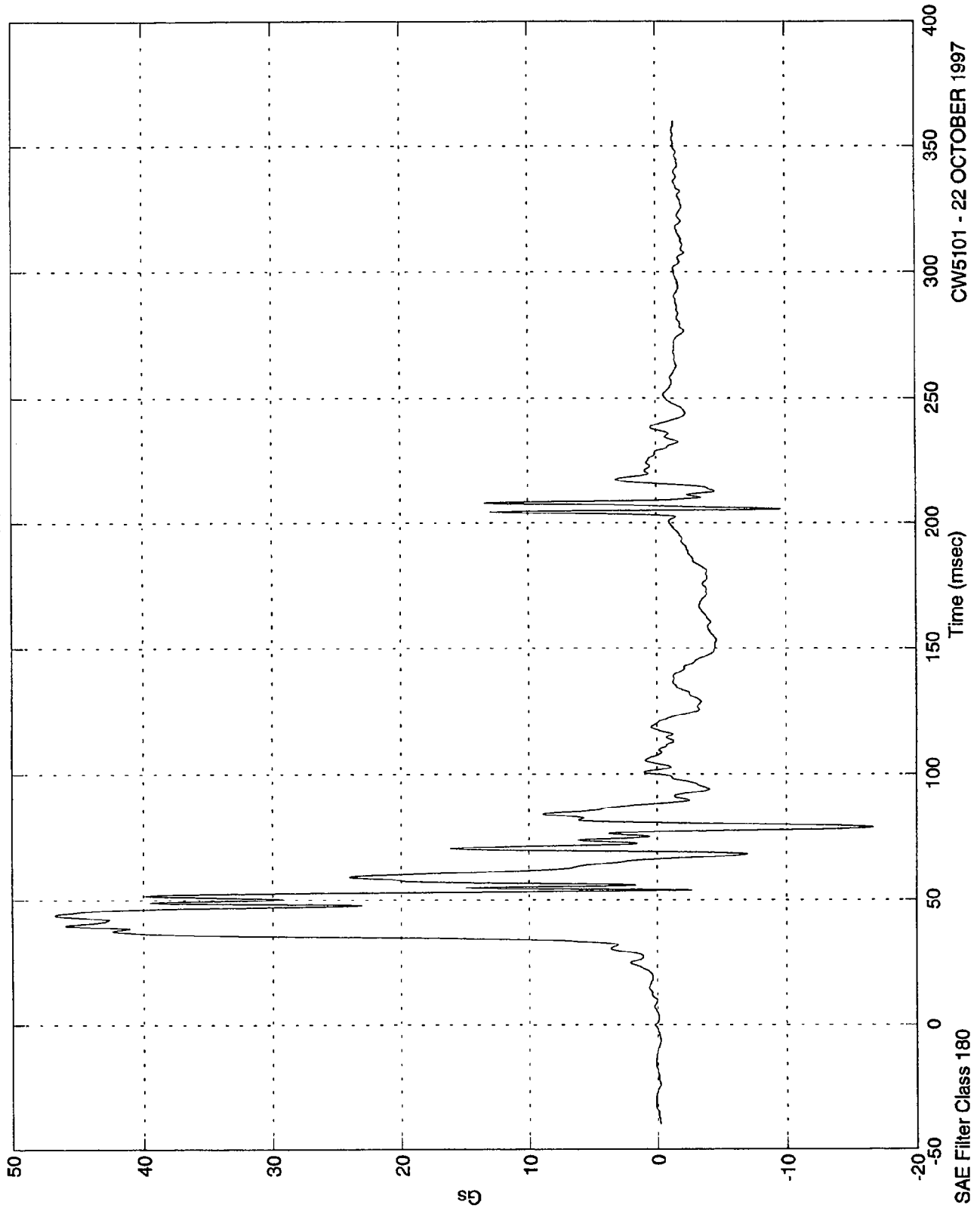
SAE Filter Class 180

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

P4 Lower Rib Y(R)

Max = 46.70 Gs @ 43.79 msec
Min = -16.64 Gs @ 78.69 msec



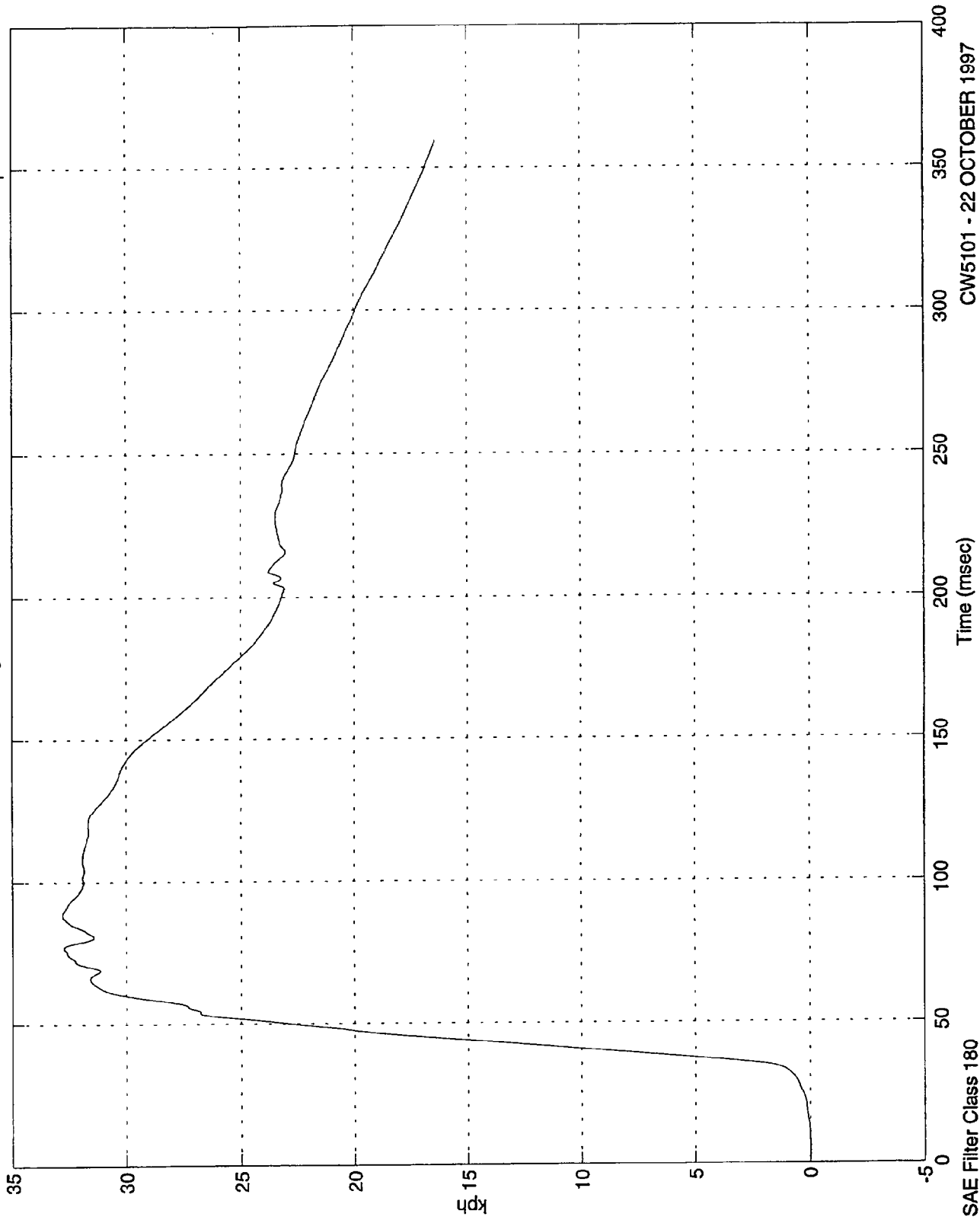
SAE Filter Class 180

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 32.78 kph @ 88.30 msec
Min = -.01 kph @ 5.00 msec

1st Integral P4 Lower Rib Y(R)



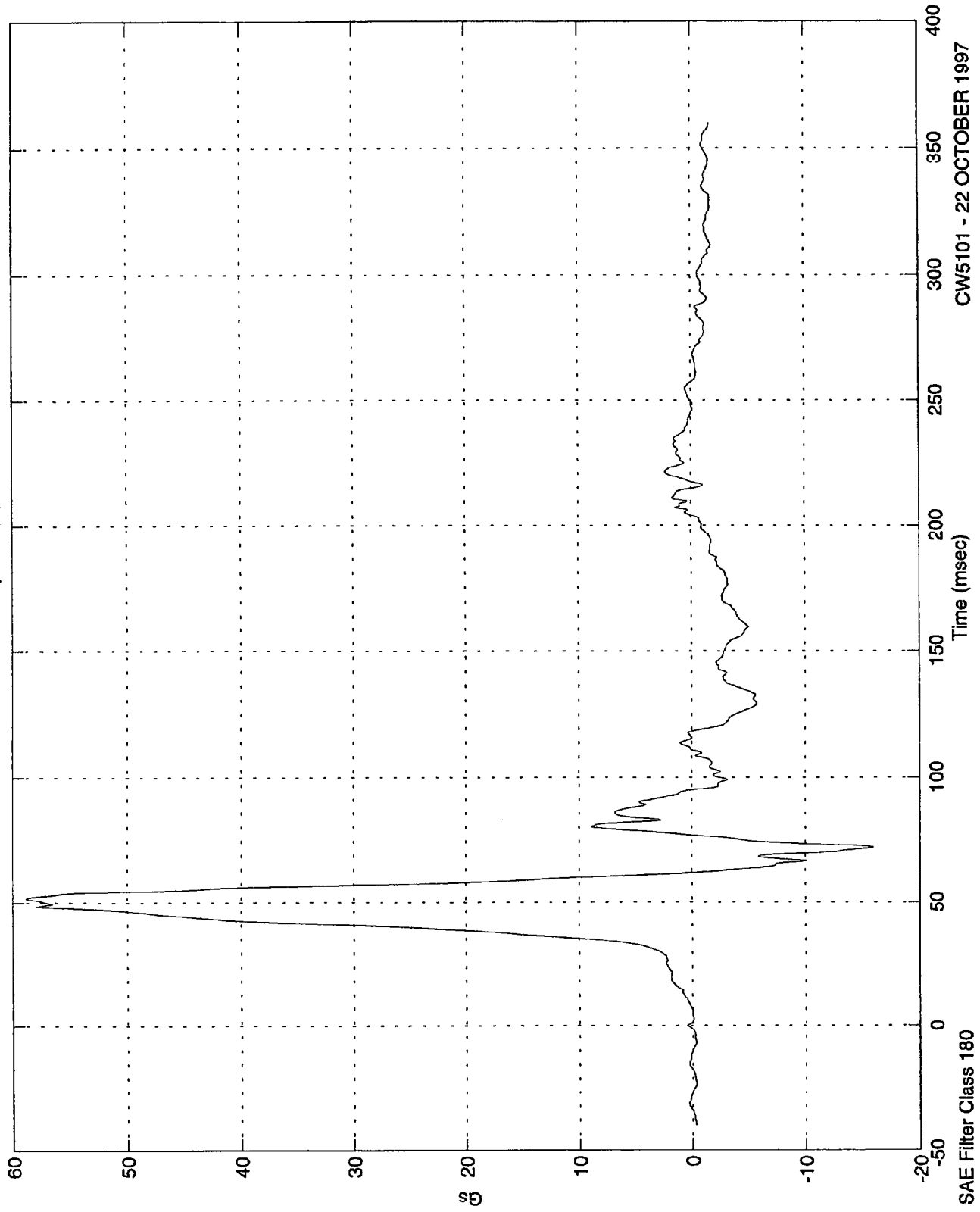
CW5101 - 22 OCTOBER 1997

SAE Filter Class 180

NHTSA Side Impact - 1998 Toyota Camry

P4 Lower Spine Y(R)

Max = 58.87 Gs @ 51.70 msec
Min = -15.93 Gs @ 71.89 msec

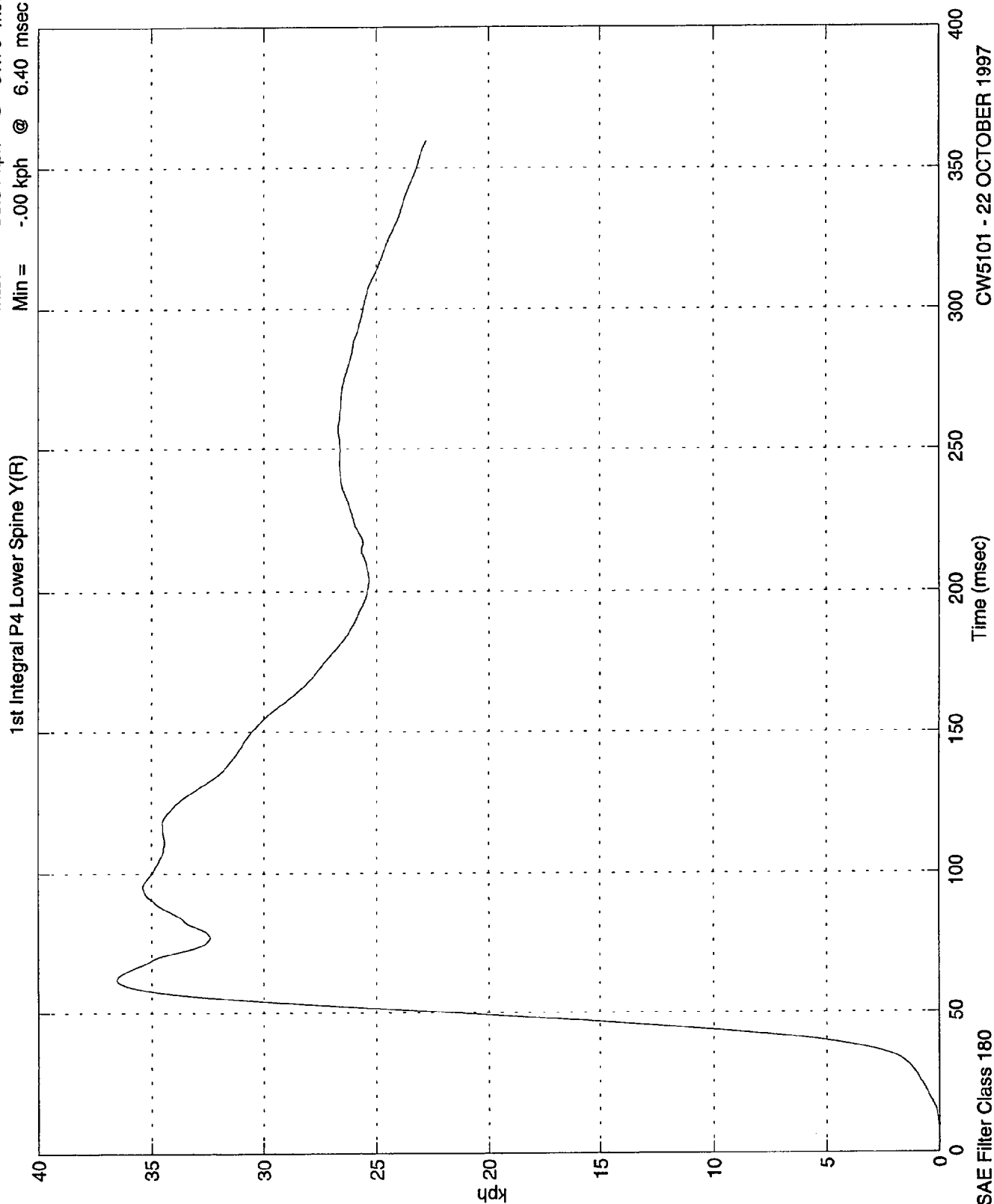


SAE Filter Class 180

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

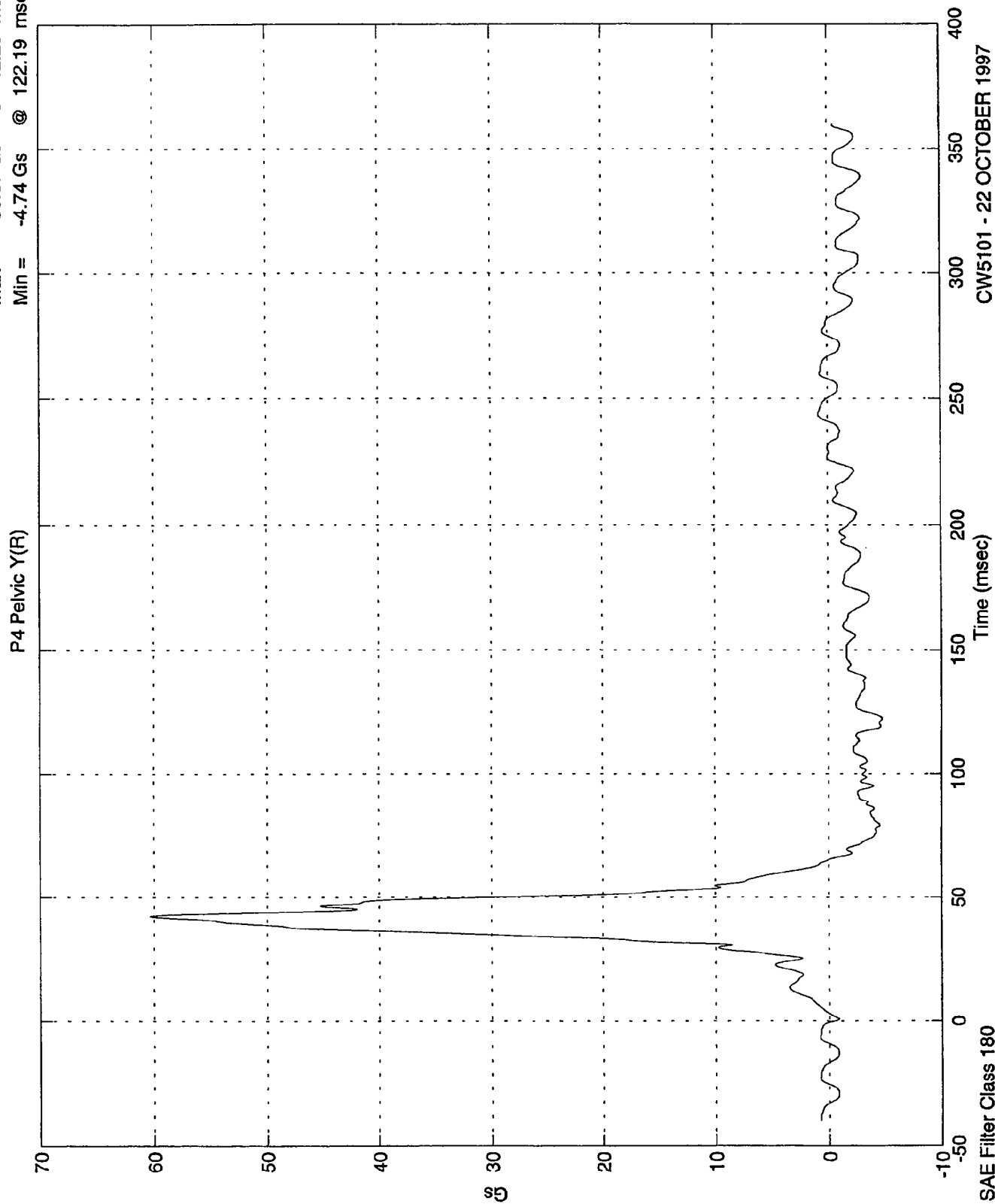
Max = 36.51 kph @ 61.79 msec
Min = -.00 kph @ 6.40 msec



CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

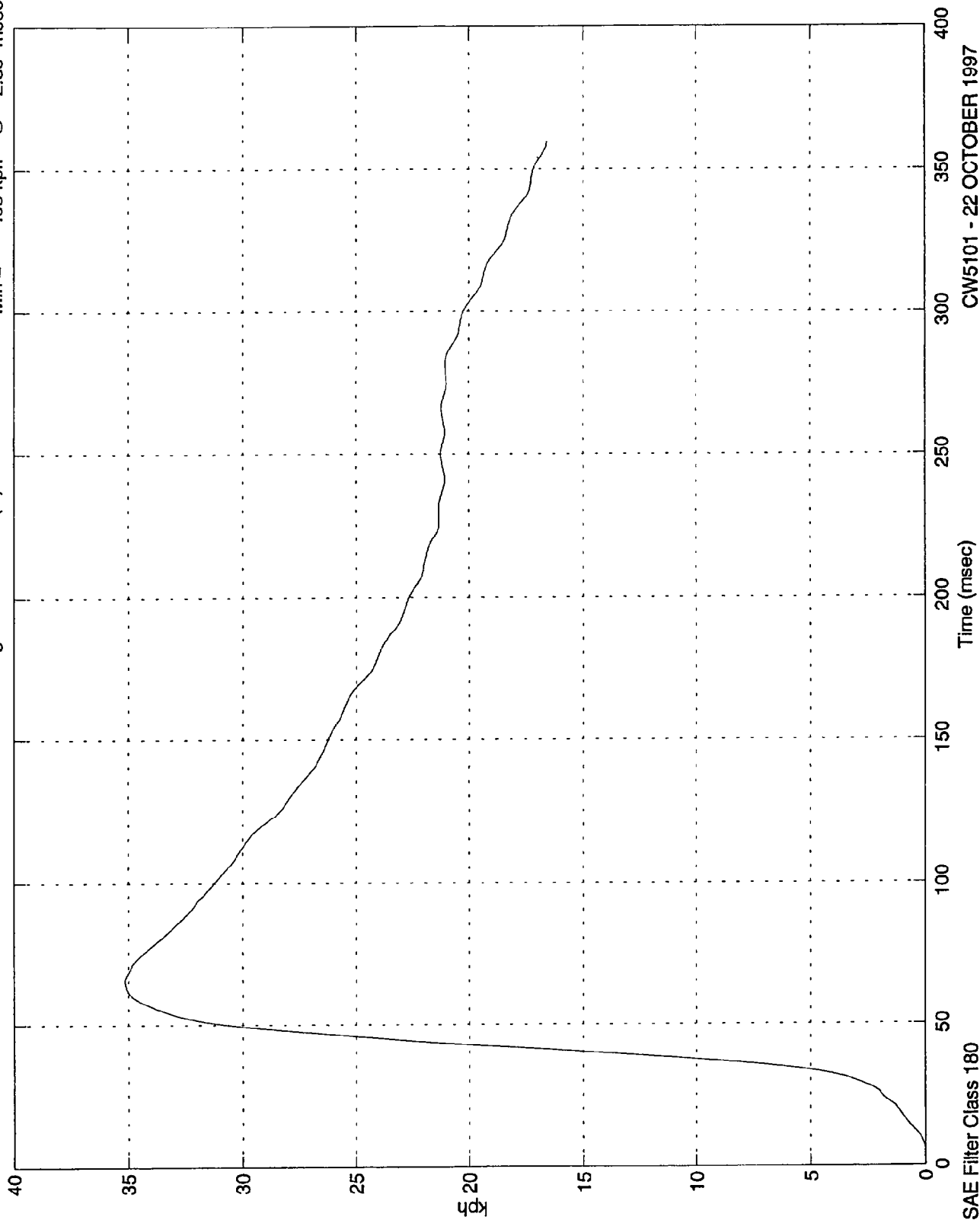
Max = 60.37 Gs @ 42.29 msec
Min = -4.74 Gs @ 122.19 msec



NHTSA Side Impact - 1998 Toyota Camry

Max = 35.13 kph @ 65.49 msec
Min = -.05 kph @ 2.80 msec

1st Integral P4 Pelvic Y(R)



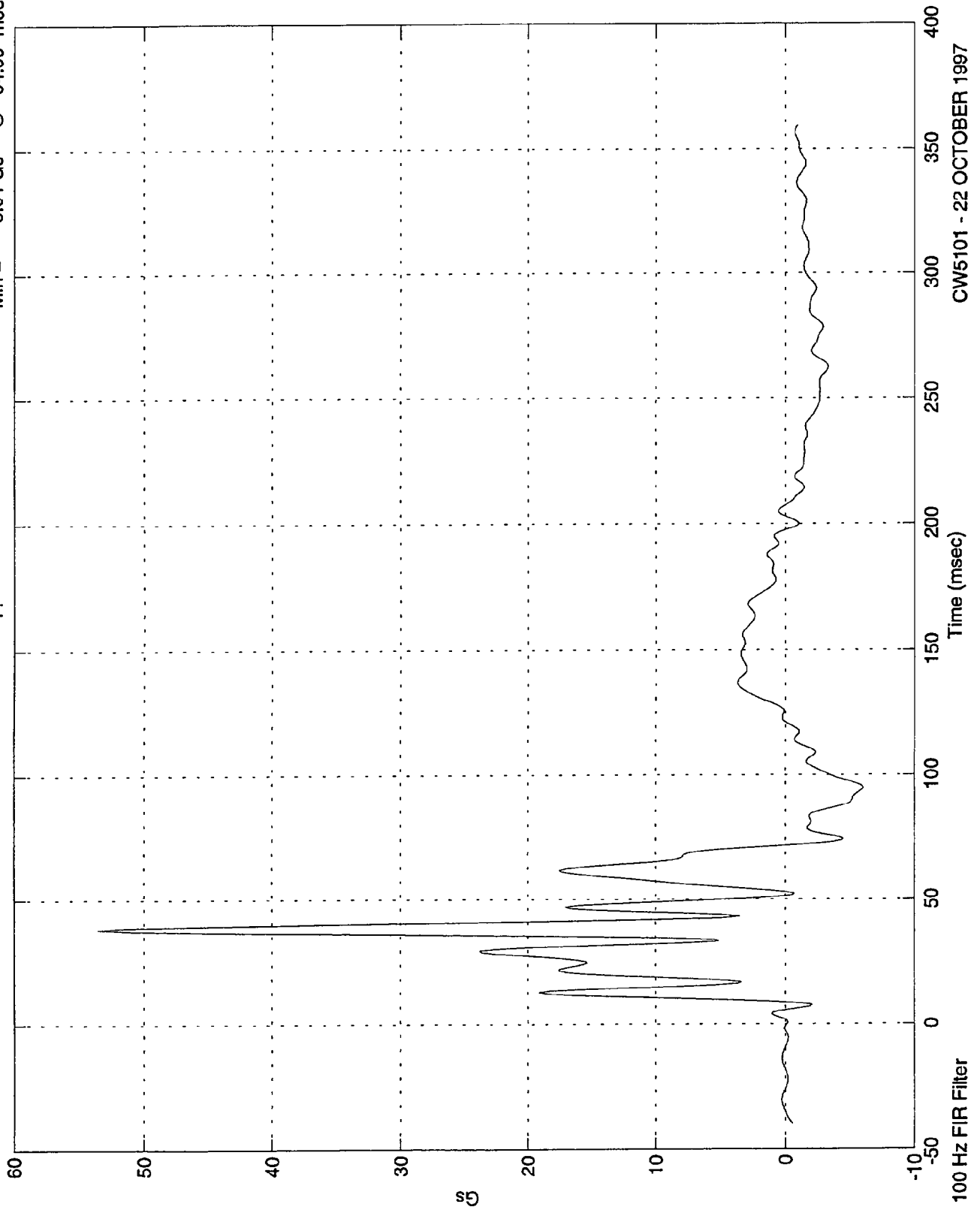
CW5101 - 22 OCTOBER 1997

DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS
ACCELERATION DATA - FIR FILTERED

NHTSA Side Impact - 1998 Toyota Camry

P1 Upper Rib Y

Max = 53.58 Gs @ 38.124 msec
Min = -6.04 Gs @ 94.99 msec



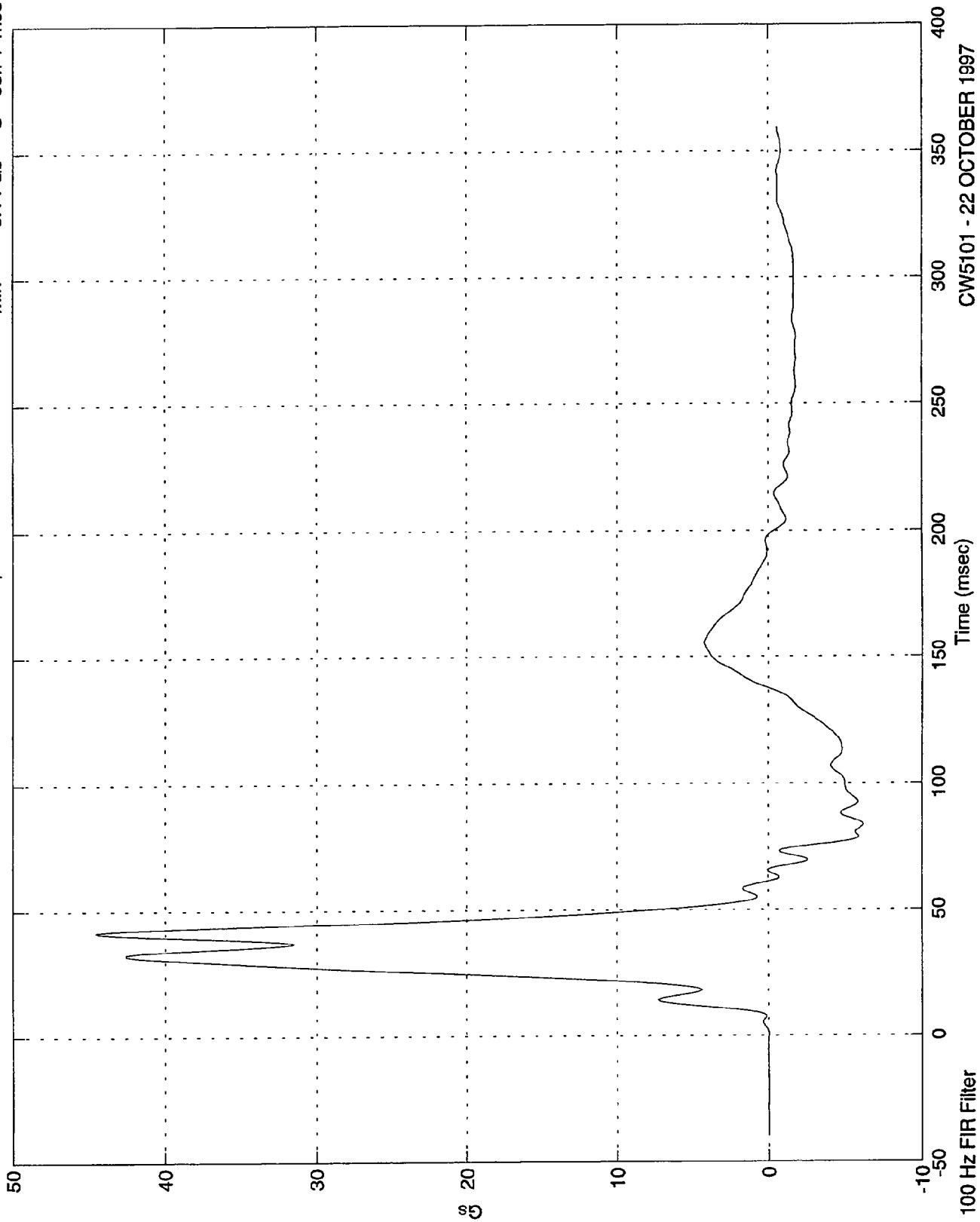
CW5101 - 22 OCTOBER 1997

DRIVER LOWER RIB Y ACCELEROMETER WAS DAMAGED AT IMPACT

NHTSA Side Impact - 1998 Toyota Camry

Max = 44.52 Gs @ 41.249 msec
Min = -6.14 Gs @ 83.74 msec

P1 Lower Spine Y

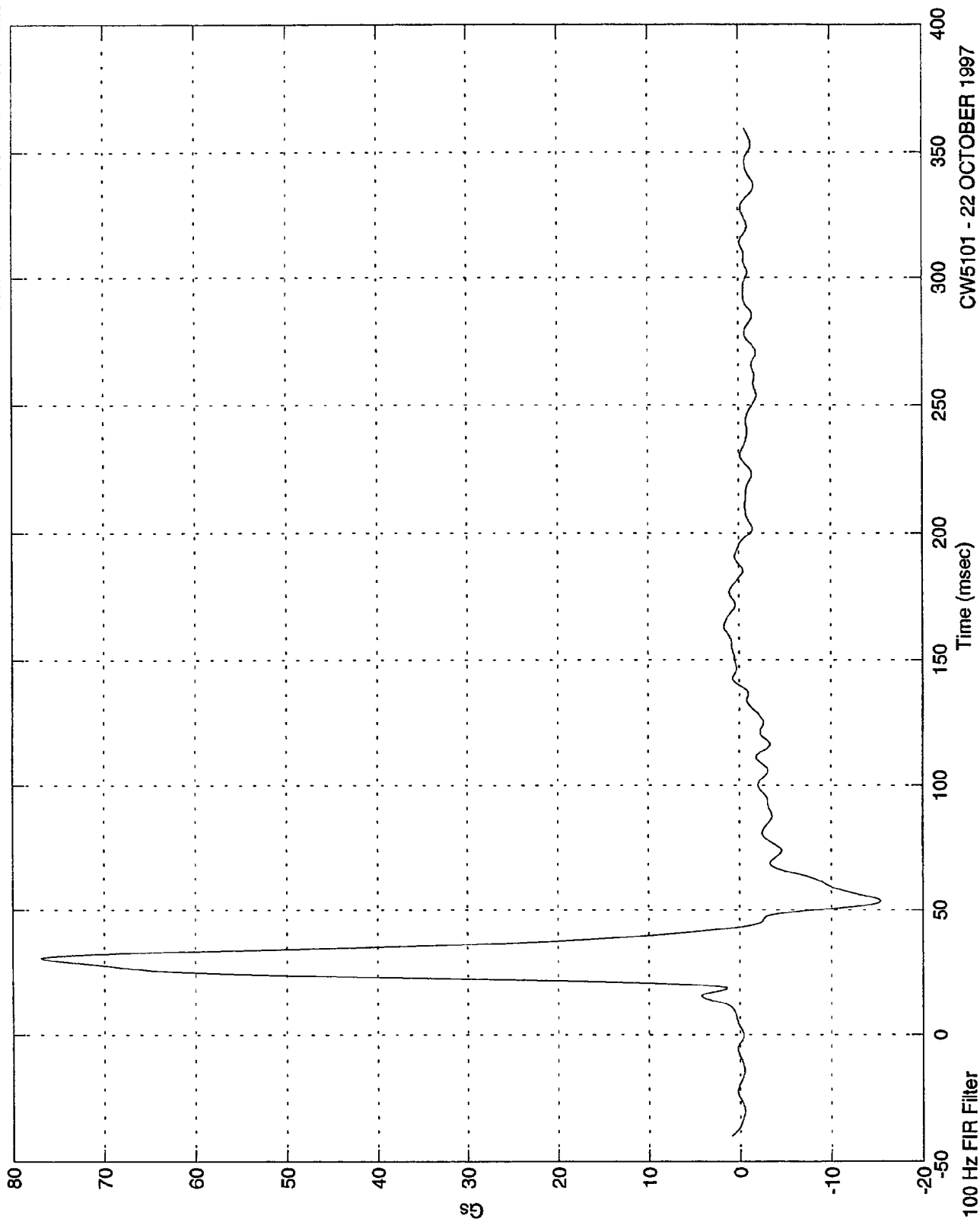


CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 76.95 Gs @ 30.624 msec
Min = -15.42 Gs @ 53.74 msec

P1 Pelvic Y

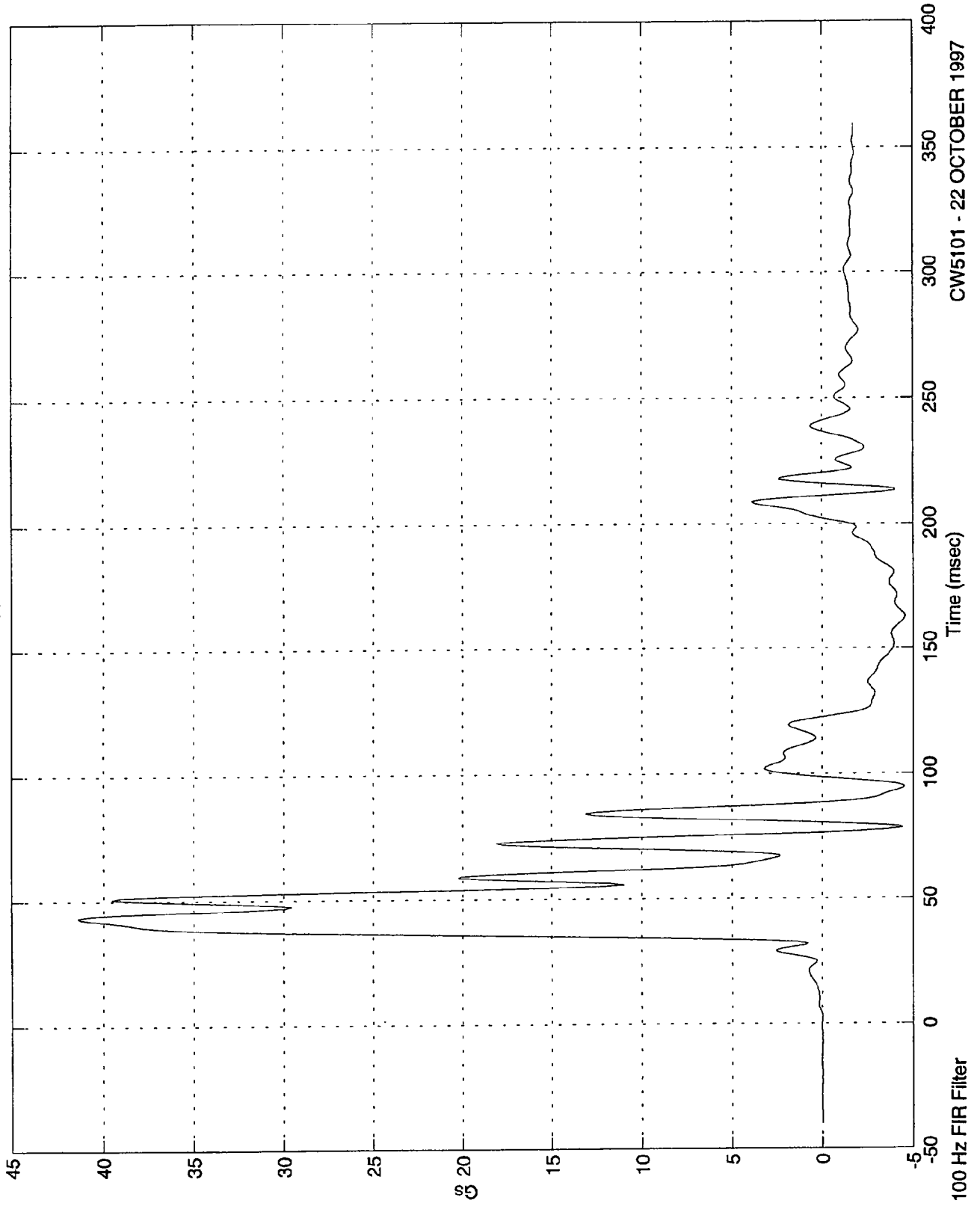


CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 41.37 Gs @ 43.124 msec
 Min = -4.54 Gs @ 162.49 msec

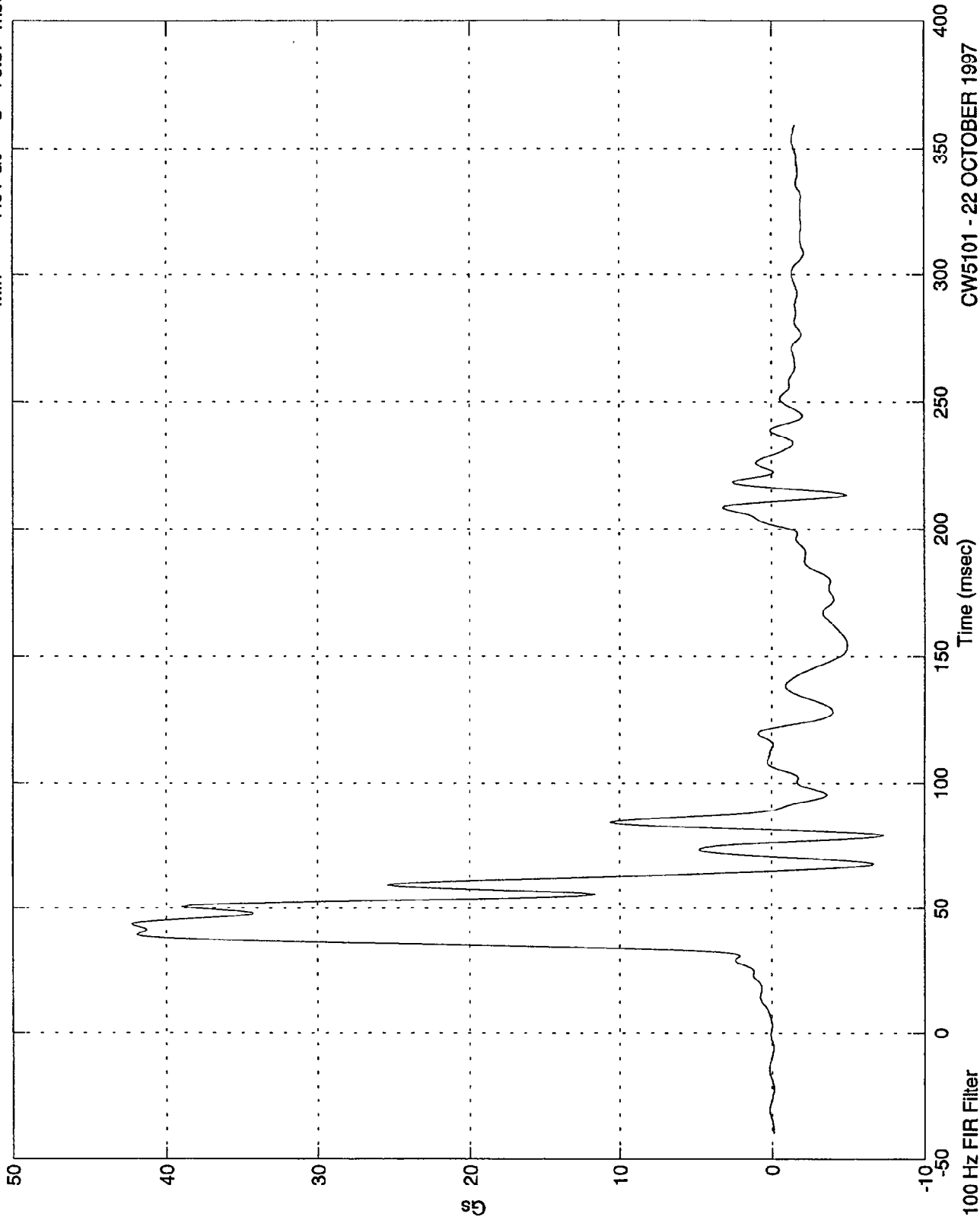
P4 Upper Rib Y



Max = 42.24 Gs @ 43.749 msec
Min = -7.31 Gs @ 79.37 msec

P4 Lower Rib Y

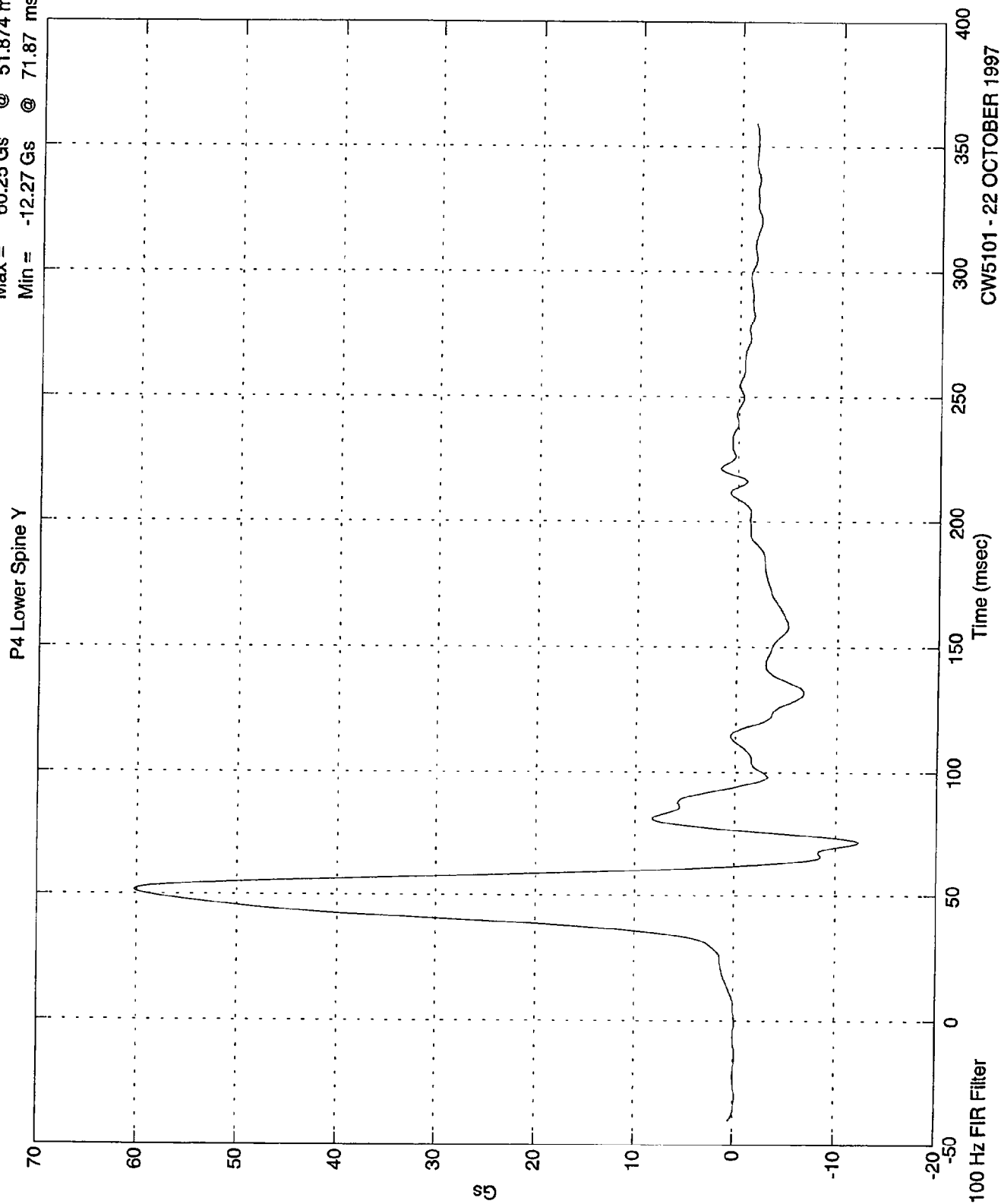
NHTSA Side Impact - 1998 Toyota Camry



CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

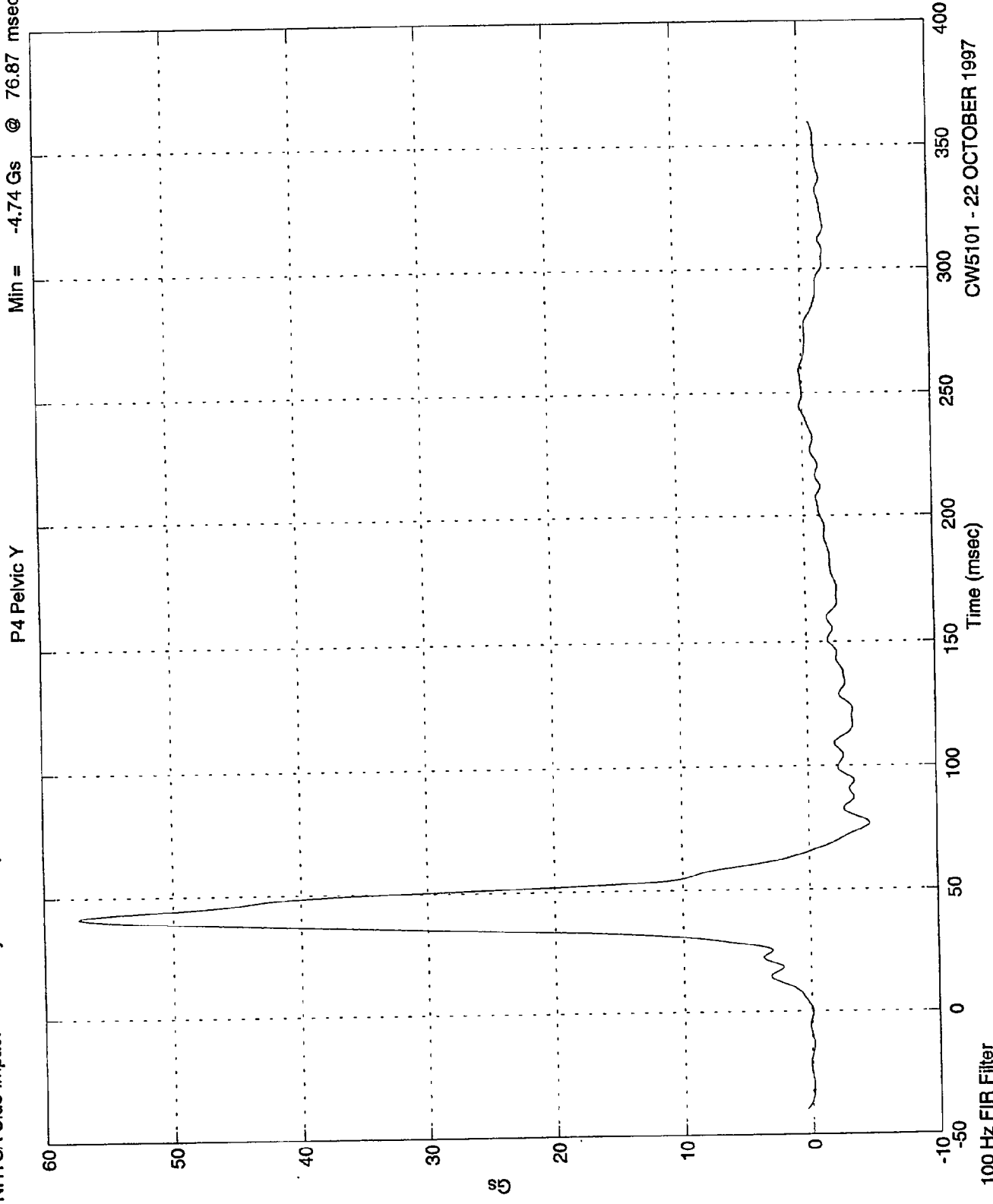
Max = 60.25 Gs @ 51.874 msec
Min = -12.27 Gs @ 71.87 msec



CW5101 - 22 OCTOBER 1997

Max = 57.28 Gs @ 41.249 msec
Min = -4.74 Gs @ 76.87 msec

NHTSA Side Impact - 1998 Toyota Camry



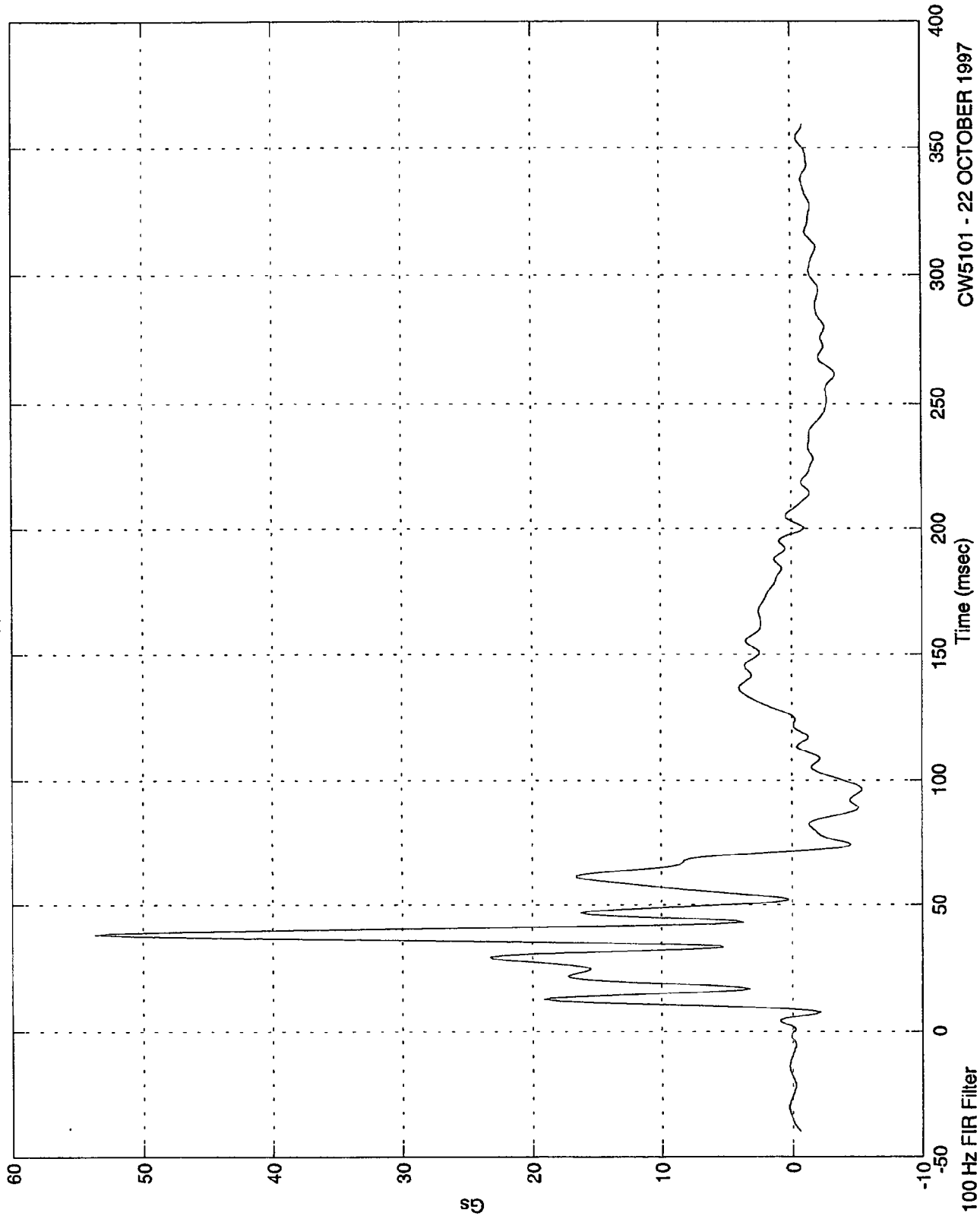
CW5101 - 22 OCTOBER 1997

DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS (redundant)
ACCELERATION DATA - FIR FILTERED

NHTSA Side Impact - 1998 Toyota Camry

P1 Upper Rib Y(R)

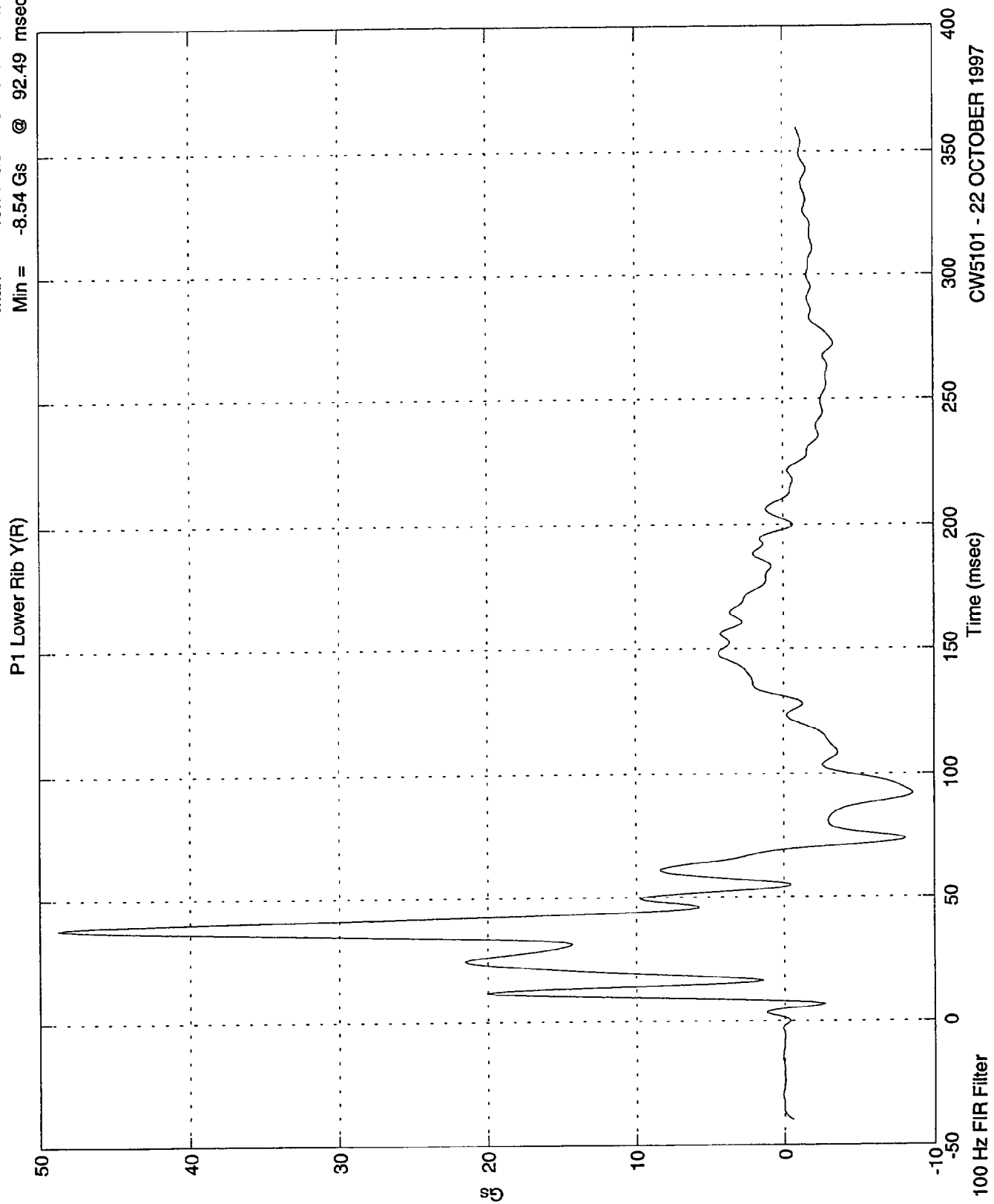
Max = 53.67 Gs @ 38.124 msec
Min = -5.37 Gs @ 96.24 msec



CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

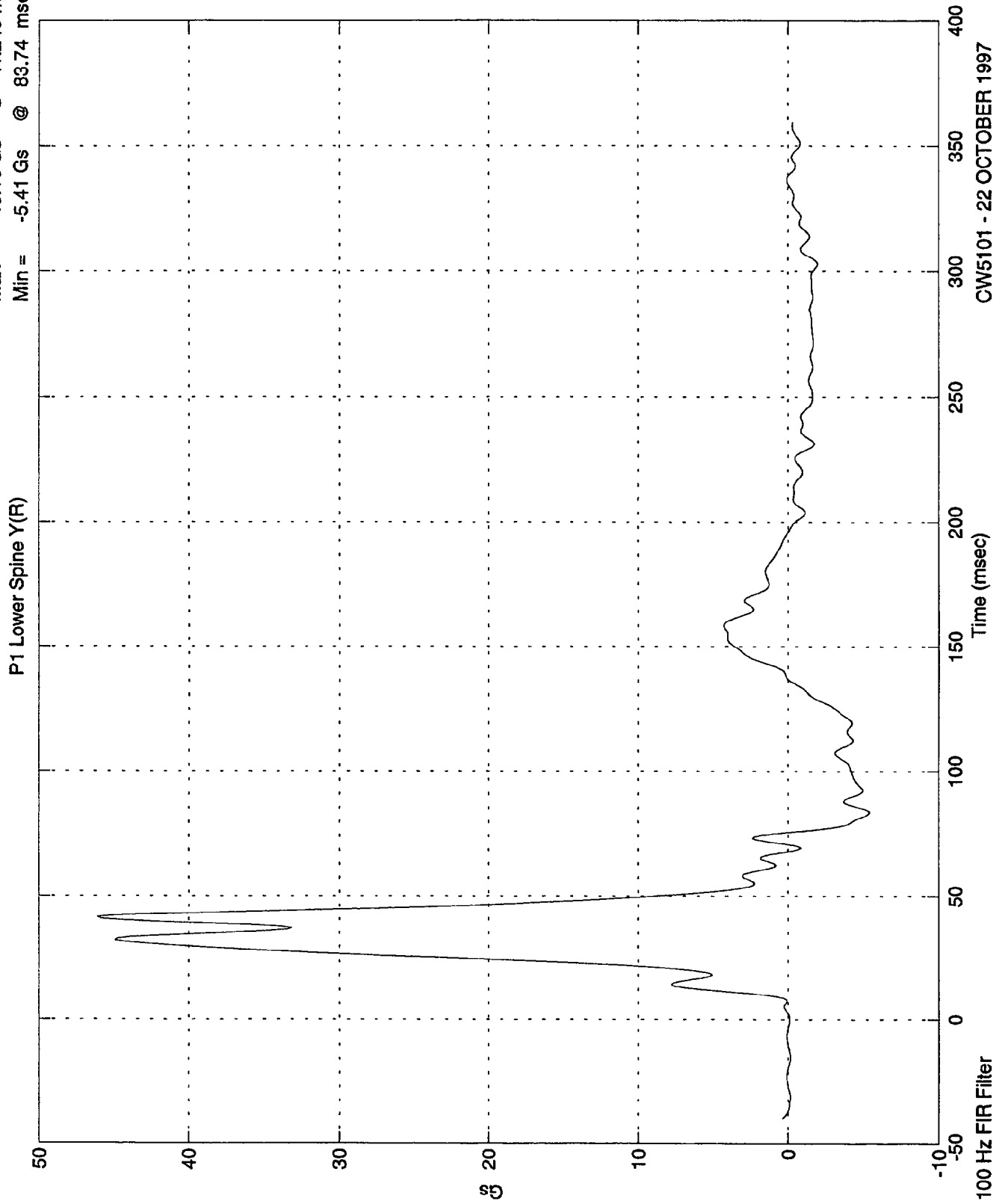
Max = 48.77 Gs @ 37.499 msec
Min = -8.54 Gs @ 92.49 msec



CW5101 - 22 OCTOBER 1997

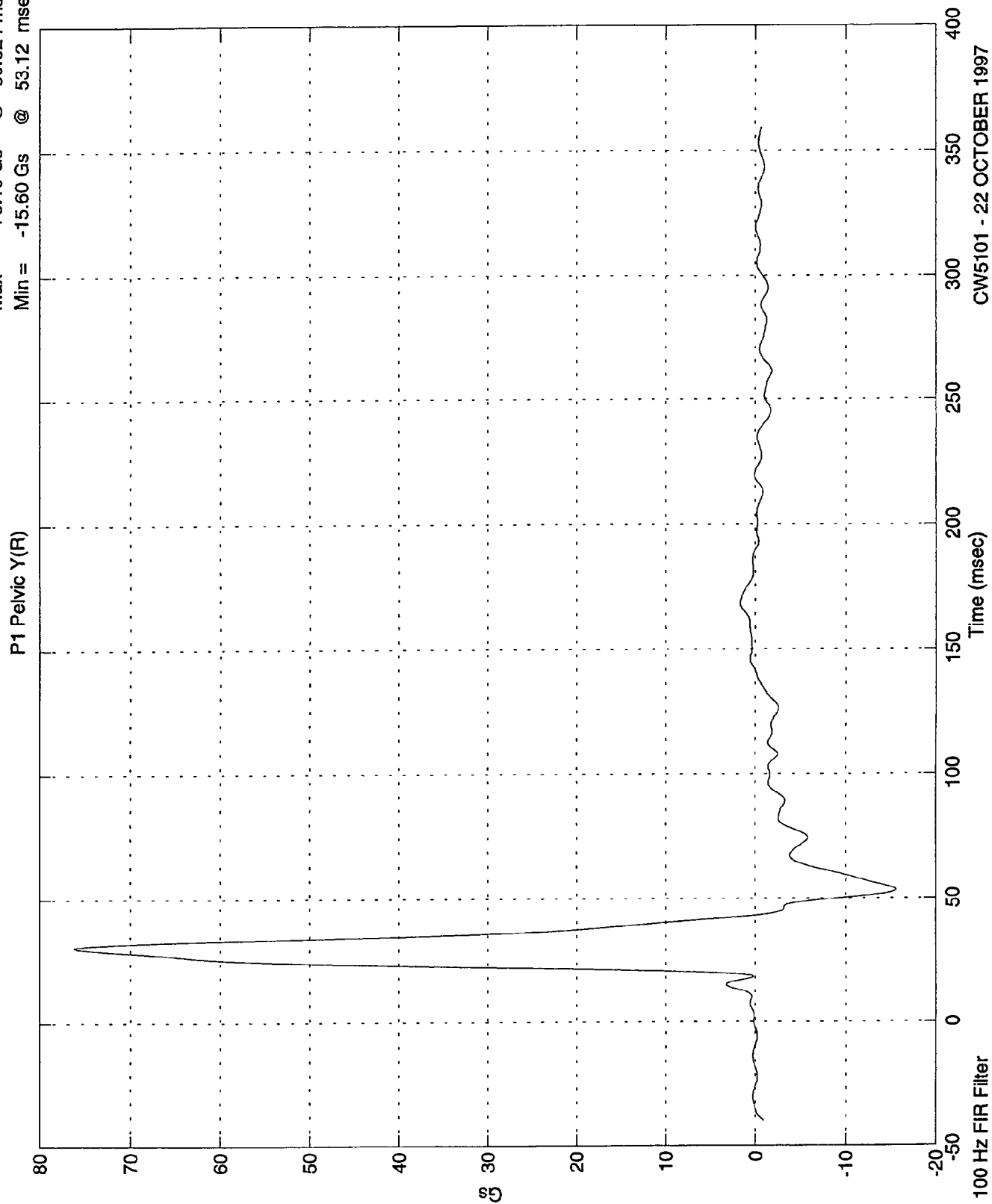
NHTSA Side Impact - 1998 Toyota Camry

Max = 46.10 Gs @ 41.249 msec
Min = -5.41 Gs @ 83.74 msec



NHTSA Side Impact - 1998 Toyota Camry

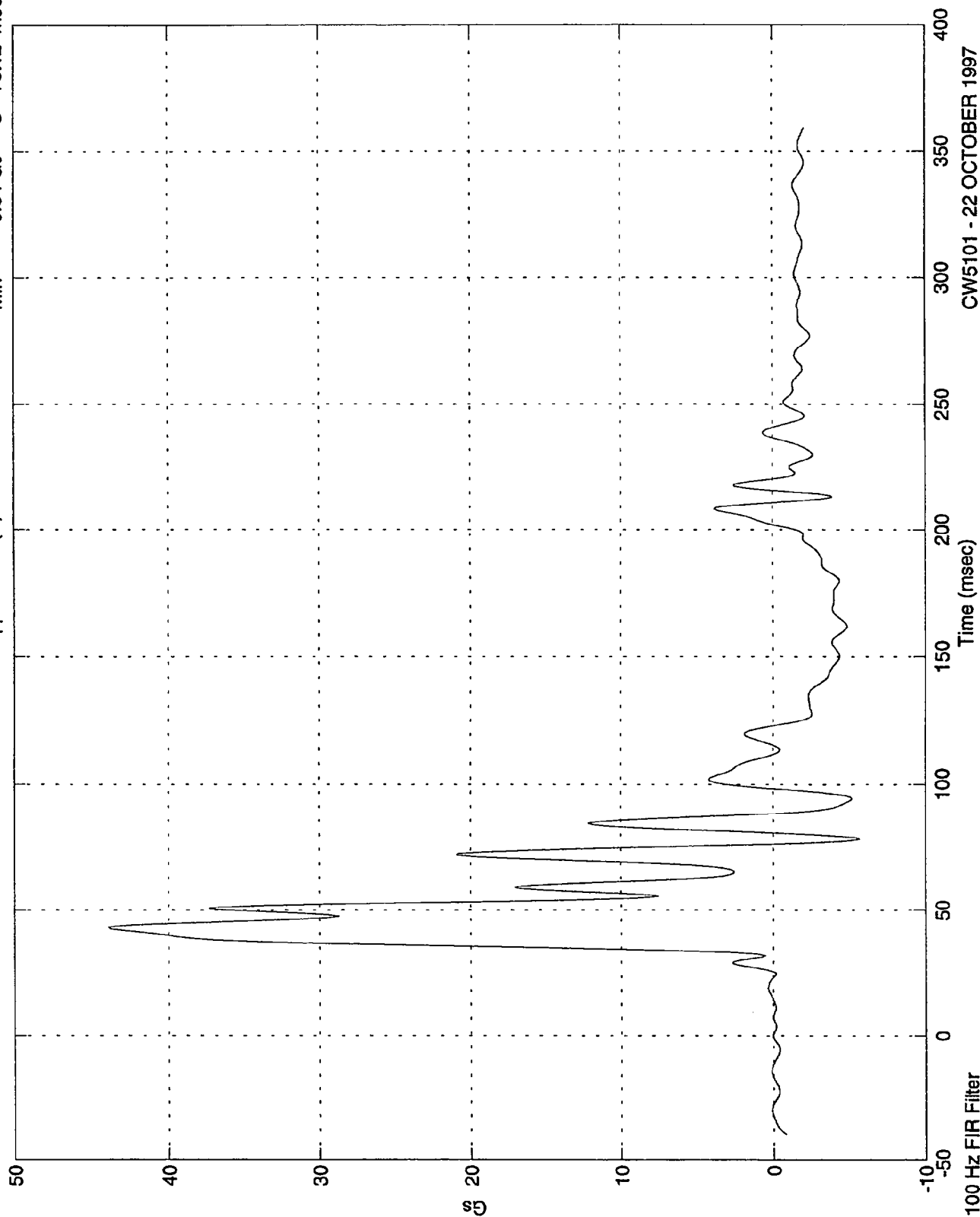
Max = 76.19 Gs @ 30.624 msec
Min = -15.60 Gs @ 53.12 msec



Max = 43.90 Gs @ 43.124 msec
Min = -5.64 Gs @ 78.12 msec

P4 Upper Rib Y(R)

NHTSA Side Impact - 1998 Toyota Camry

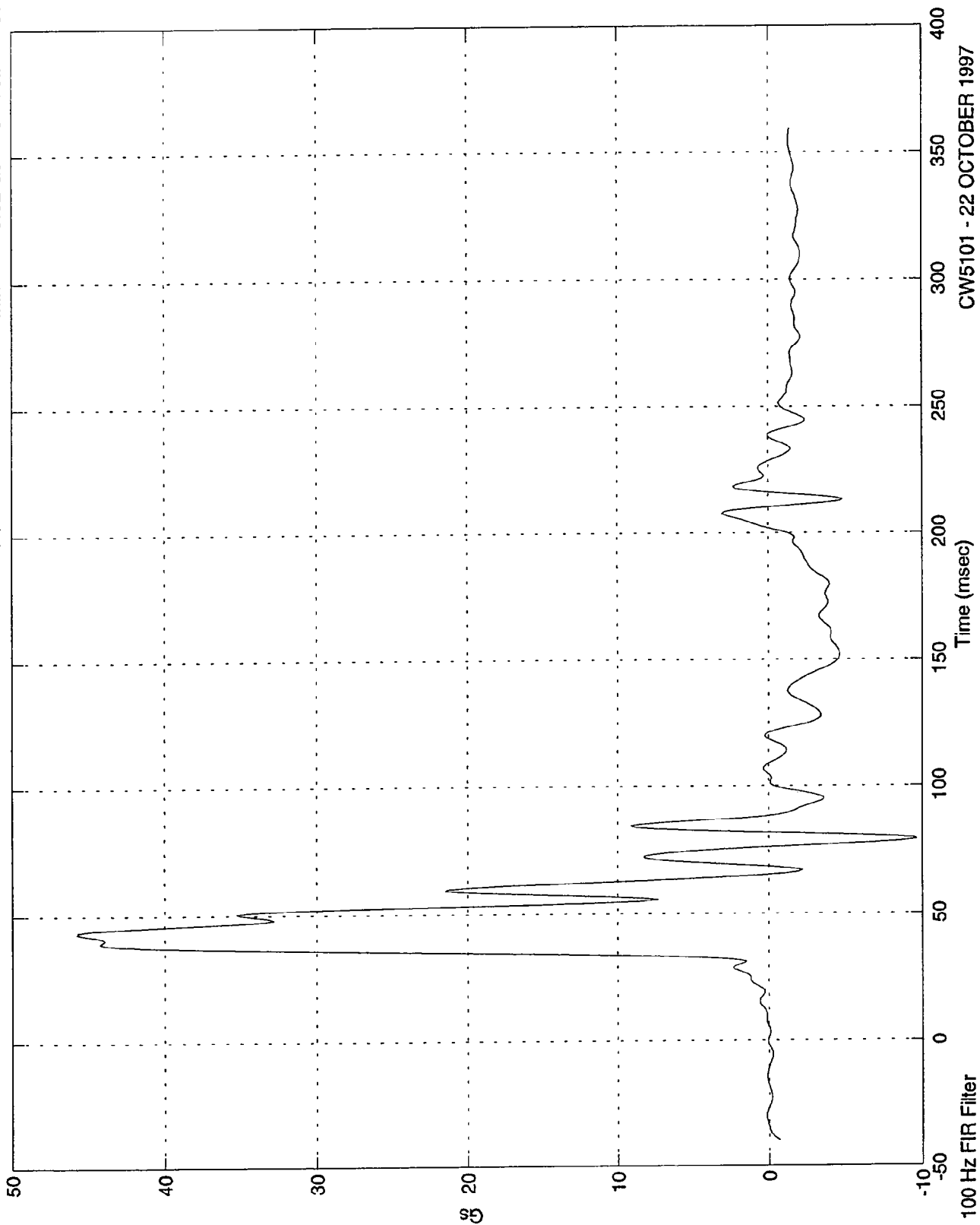


CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 45.74 Gs @ 43.124 msec
Min = -9.62 Gs @ 78.74 msec

P4 Lower Rib Y(R)

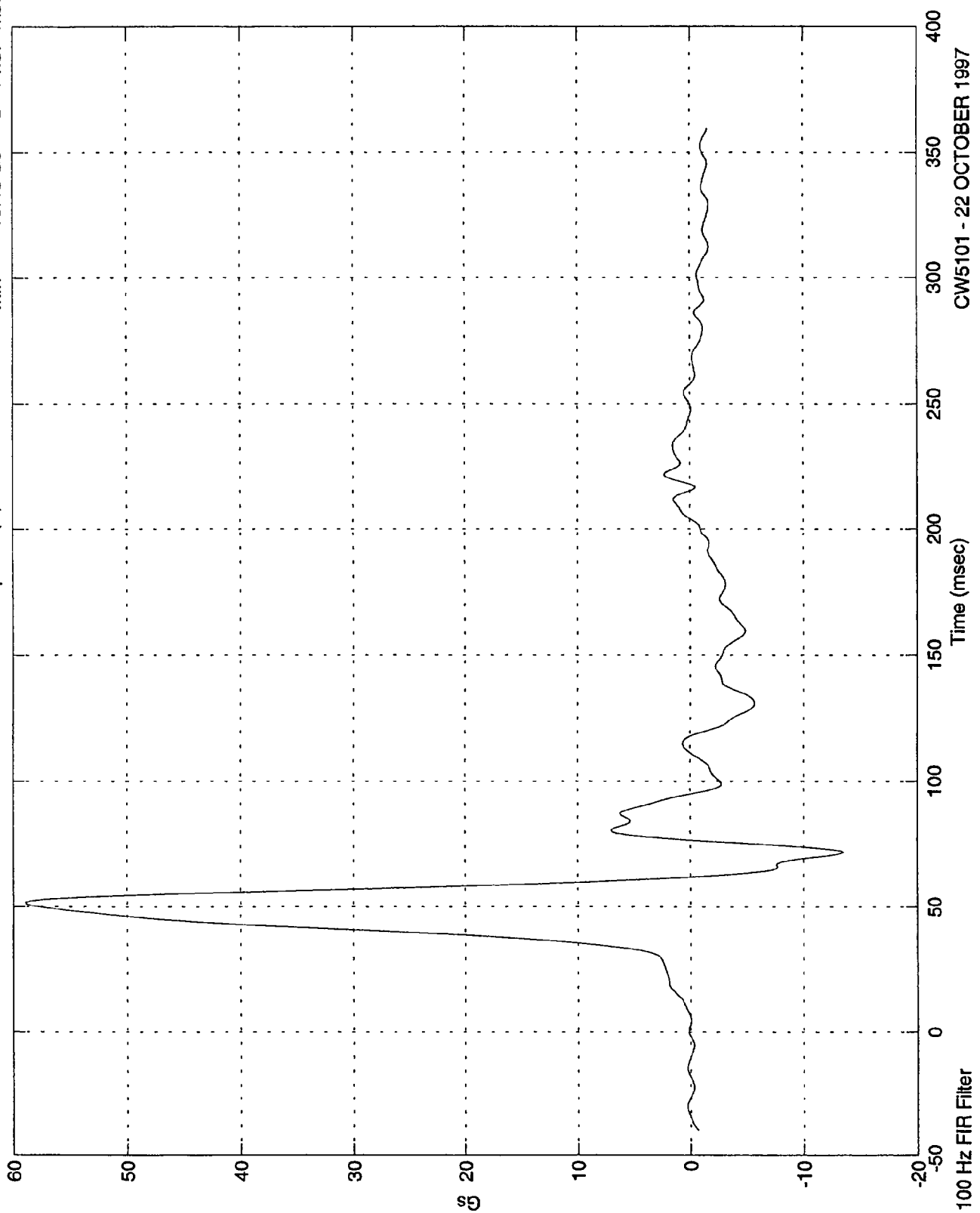


CW5101 - 22 OCTOBER 1997

Max = 58.92 Gs @ 51.874 msec
Min = -13.46 Gs @ 71.87 msec

NHTSA Side Impact - 1998 Toyota Camry

P4 Lower Spine Y(R)

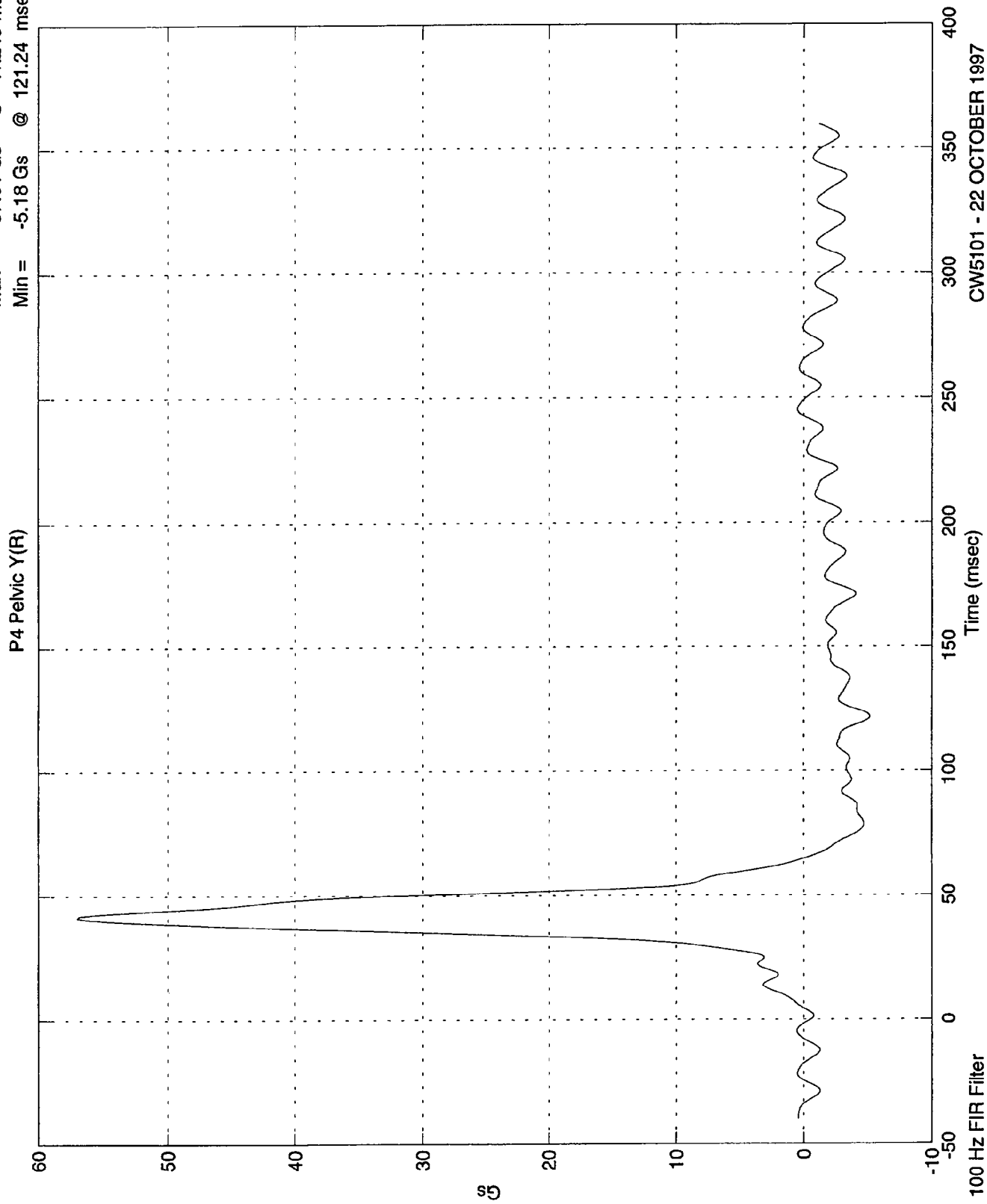


100 Hz FIR Filter

CW5101 - 22 OCTOBER 1997

NHTSA Side Impact - 1998 Toyota Camry

Max = 57.01 Gs @ 41.249 msec
Min = -5.18 Gs @ 121.24 msec





APPENDIX C

SID CONFIGURATION AND PERFORMANCE VERIFICATION DATA

SUMMARY
SID PRE & POST TEST CALIBRATION

CONFIGURED FOR LEFT SIDE IMPACT

Date: 10/15/97 10/23/97

Calspan Sequential Test Number: 1 and 2

Laboratory Technician: B. Swiecicki, G. Serbinowski

TEST PARAMETER	SPECIFICATION	SID NO.: 015		SID NO.: 016	
		PRE TEST	POST TEST	PRE TEST	POST TEST
SH- Seated Height (mm)	889 - 909	904	904	902	902
RH- Rib Height (mm)	501 - 521	509	509	513	513
HP- Hip Pivot Height (mm)	99 ref.	99	99	99	99
RD- Rib from Back Line (mm)	229 - 241	236	236	240	240
KV- Knee Pivot from Back Line (mm)	511 - 526	521	521	525	525
SW- Knee Pivot to Floor (mm)	490 - 505	493	493	494	494
HW- Hip Width (mm)	356 - 391	367	367	361	361
THORAX IMPACTS					
TEMPERATURE (°C)	18.9 - 25.5	22.0	21.7	22.0	21.7
RELATIVE HUMIDITY (%)	10 - 70	37	34	37	34
PROBE SPEED (m/s)	4.27 - 4.33	4.31	4.27	4.31	4.27
UPPER RIB (g's)	37 - 46	41.3	44.0	39.6	42.6
LOWER RIB (g's)	37 - 46	40.9	44.8	39.3	41.9
LOWER SPINE (g's)	15 - 22	21.8	21.9	20.6	21.3
PELVIS IMPACT					
TEMPERATURE (°C)	18.9 - 25.5	22.0	21.7	22.0	21.7
RELATIVE HUMIDITY (%)	10 - 70	37	34	37	34
PROBE SPEED (m/s)	4.27 - 4.33	4.30	4.28	4.30	4.32
PELVIS (g's)	40 - 60	42.4	45.9	46.0	48.7

REMARKS: None

**CALIBRATION TEST RESULTS
PRE-TEST**

SID NO.: 015

CONFIGURED FOR LEFT SIDE IMPACT

CALIBRATION TEST RESULTS SUMMARY

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 015 Calspan Sequential Test Number: 1
Date: 10/15/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

TEST	COMMENTS
EXTERNAL DIMENSIONS	Passed all requirements.
THORACIC SHOCK ABSORBER TEST	Passed all requirements.
LATERAL THORAX IMPACT TEST	Passed all requirements.
LATERAL PELVIS IMPACT TEST	Passed all requirements.
ABDOMINAL COMPRESSION TEST*	Passed all requirements.
LUMBAR FLEXION TEST*	Passed all requirements.

* Test not required for SID certification.

REMARKS: None

EXTERNAL DIMENSIONS

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 015 Calspan Sequential Test Number: 1
Date: 10/15/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	904
RH- Rib Height (mm)	502 - 520	509
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 - 241	236
KH- Knee Pivot from Back Line (mm)	511 - 526	521
KV- Knee Pivot to Floor (mm)	490 - 505	493
HW- Hip Width (mm)	356 - 391	367

REMARKS: None

THORACIC SHOCK ABSORBER TESTS

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 015 Calspan Sequential Test Number: 1
 Date: 10/15/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

DAMPER IDENTIFICATION: 015

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)		18.9 - 25.5	22.0
RELATIVE HUMIDITY (%)		10 - 70	37
VELOCITY 3.05 m/s	FORCE (N)	836 - 1125	1086.8
	DISPLACEMENT (mm)	30 - 35	32.8
VELOCITY 4.27 m/s	FORCE (N)	1730 - 2099	1883.1
	DISPLACEMENT (mm)	32 - 37	34.3
VELOCITY 6.10 m/s	FORCE (N)	3741 - 4448	3988.9
	DISPLACEMENT (mm)	33 - 40	36.1

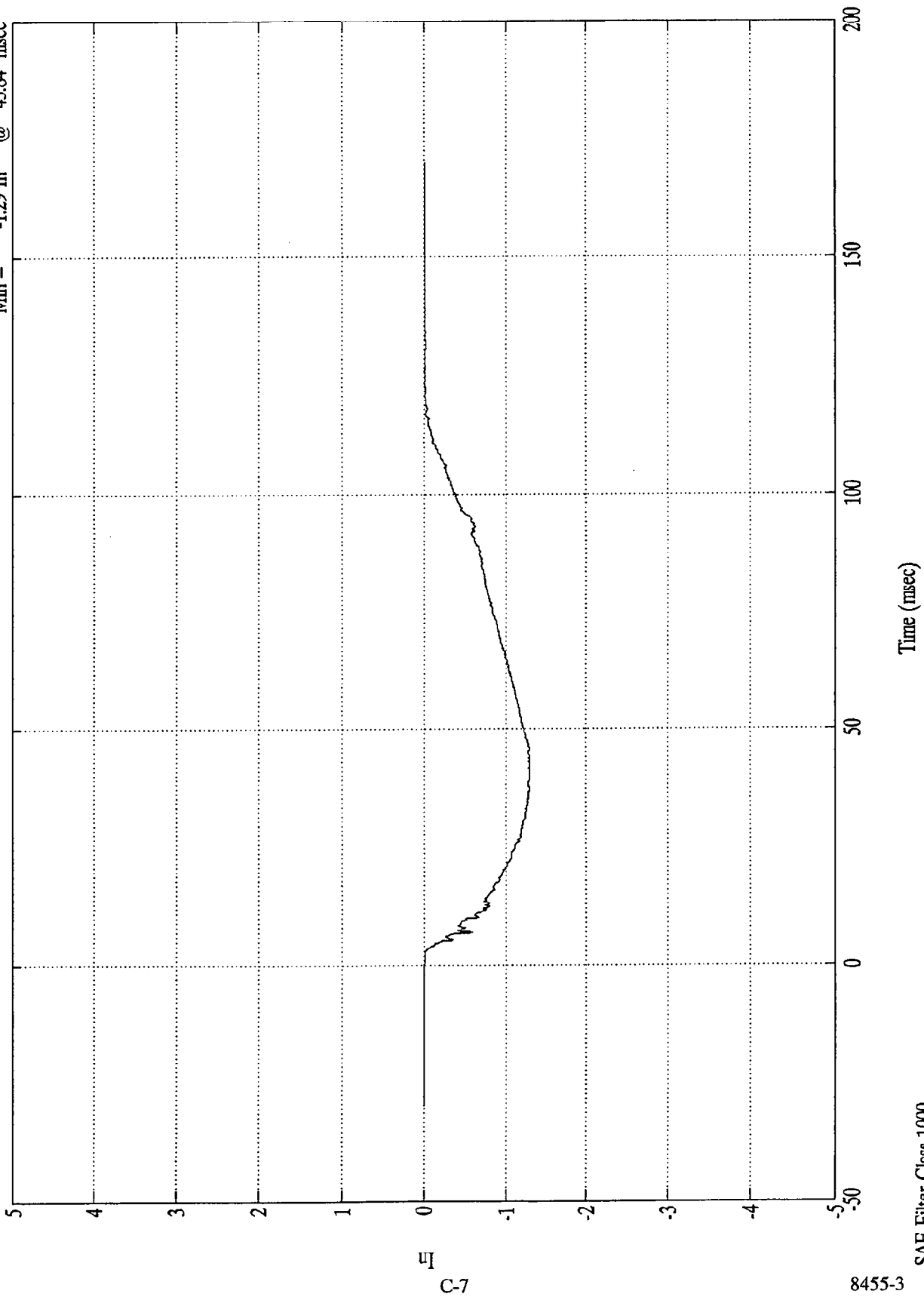
DAMPER SETTING: 5

REMARKS: None

SID Shock Absorber Impact Test 015 @ 9.9 fps

Max = .00 In @ -11.39 msec
Min = -1.29 In @ 45.84 msec

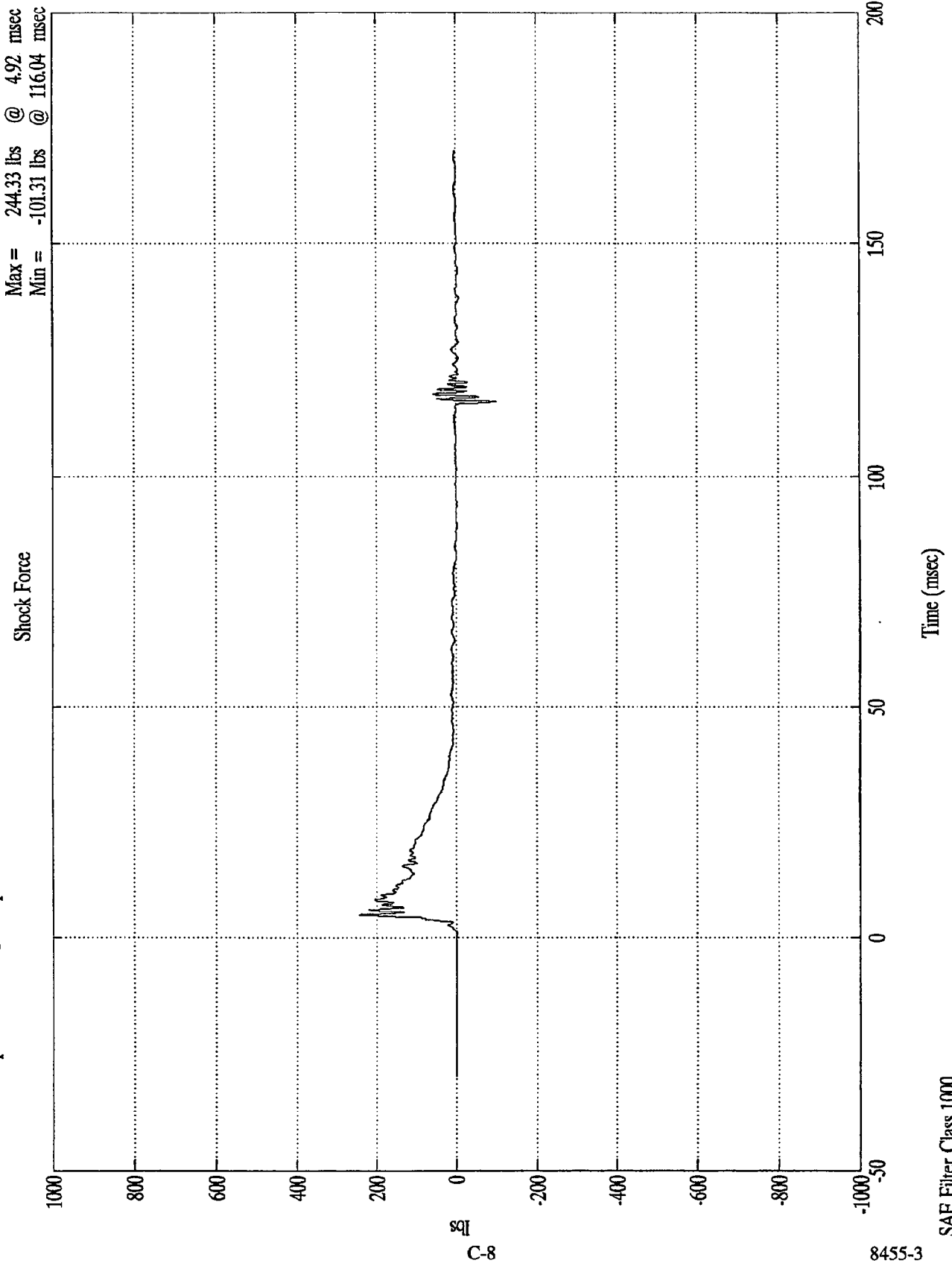
Displacement



SAE Filter Class 1000

8455-3

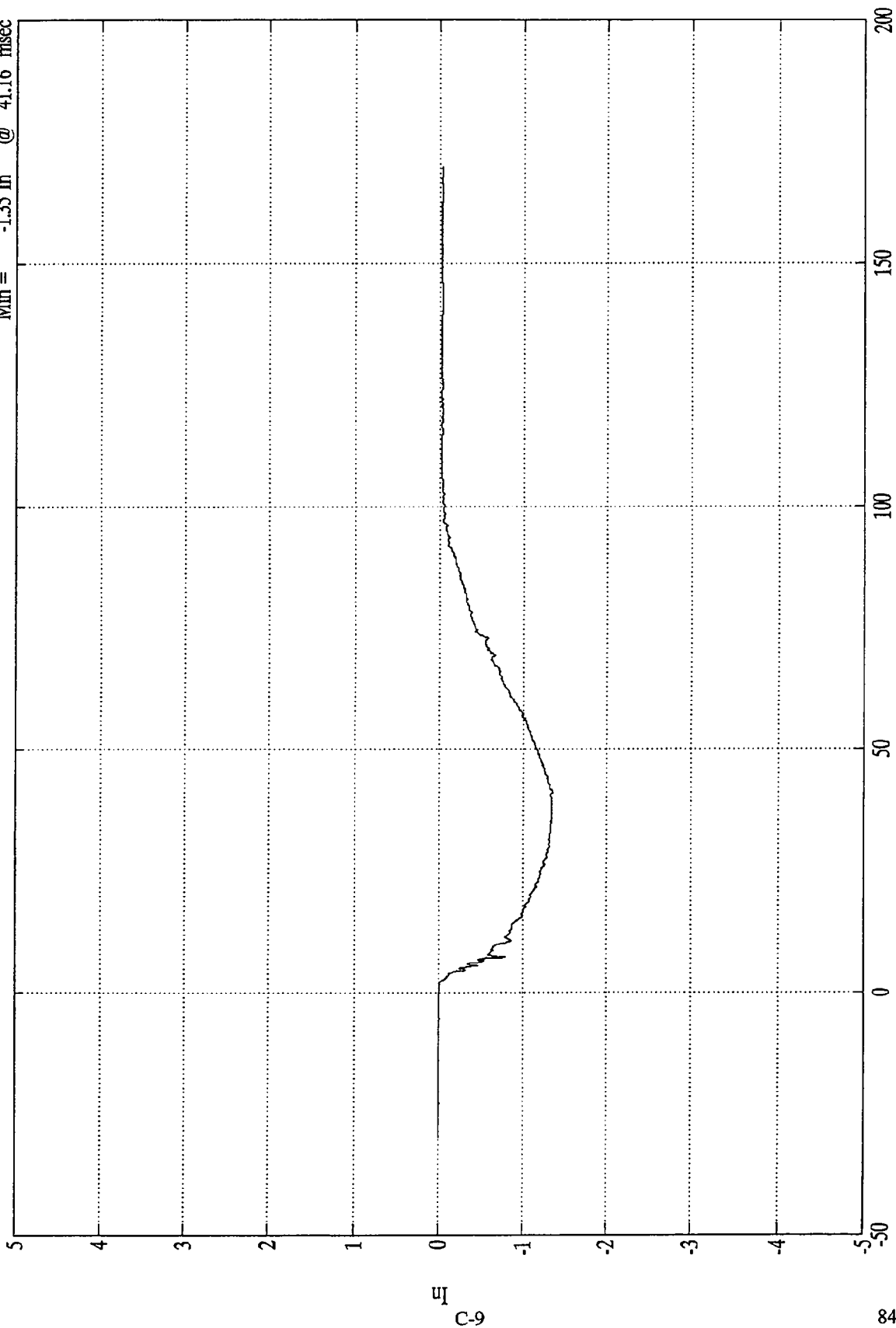
SID Shock Absorber Impact Test 015 @ 9.9 fps



SID Shock Absorber Impact Test 015 @ 13.8 fps

Max = .00 In @ -13.68 msec
Min = -1.35 In @ 41.16 msec

Displacement



C-9

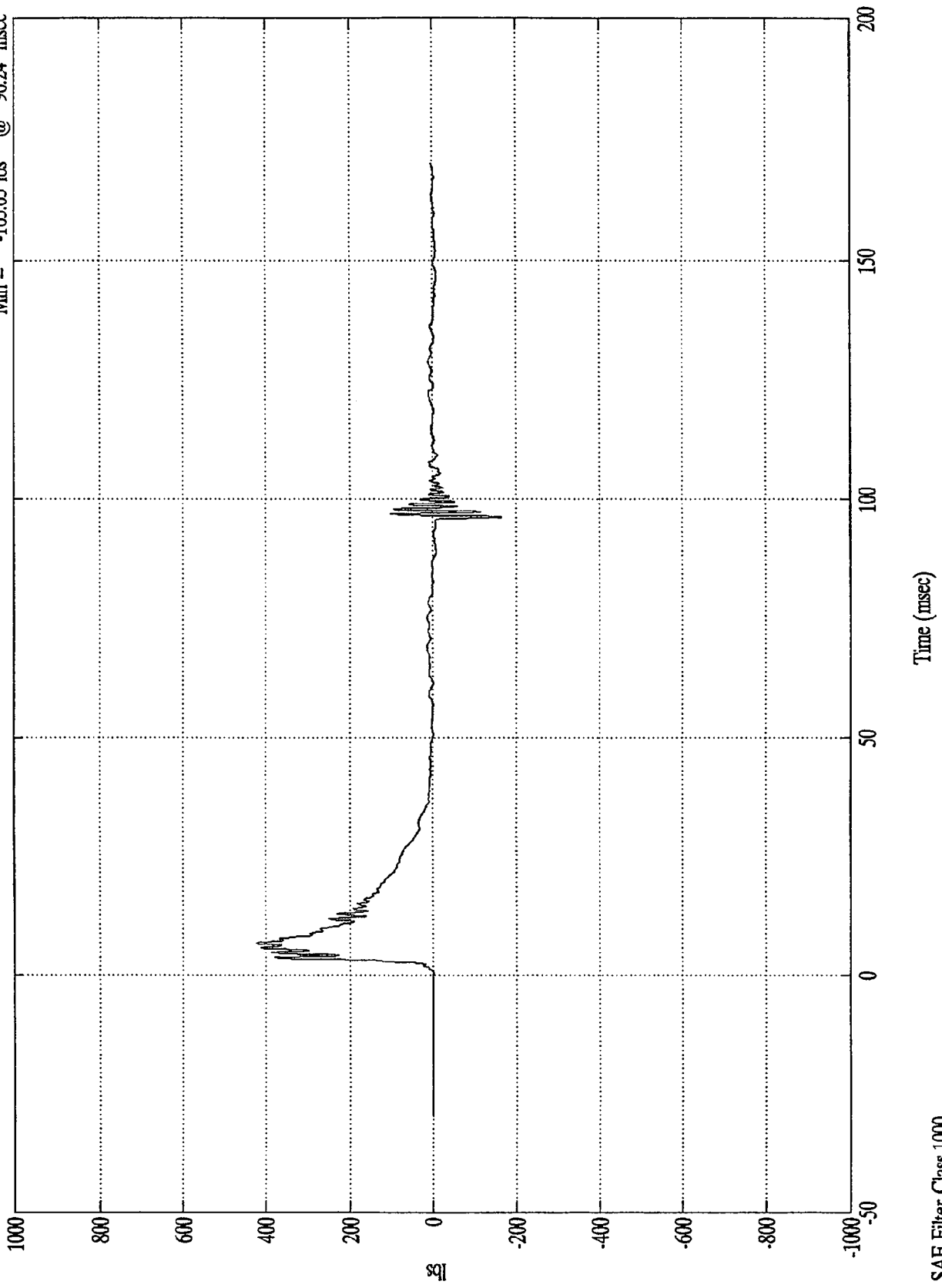
8455-3

SAE Filter Class 1000

STD Shock Absorber Impact Test 015 @ 13.8 fps

Max = 423.34 lbs @ 6.84 msec
Min = -165.65 lbs @ 96.24 msec

Shock Force

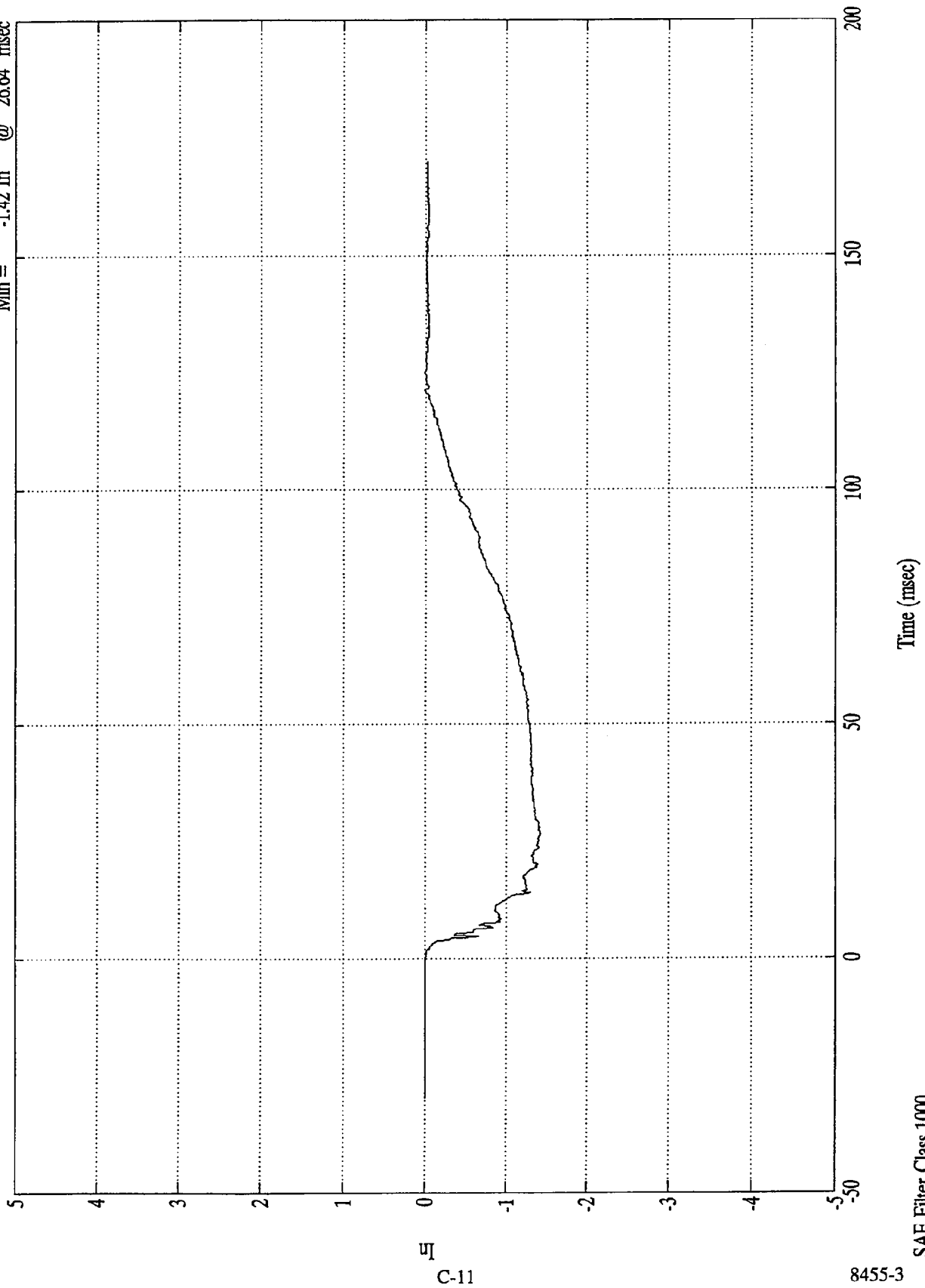


SAE Filter Class 1000

SID Shock Absorber Impact Test 015 @ 20.0 fps

Max = .01 In @ 124.92 msec
Min = -1.42 In @ 26.64 msec

Displacement



C-11

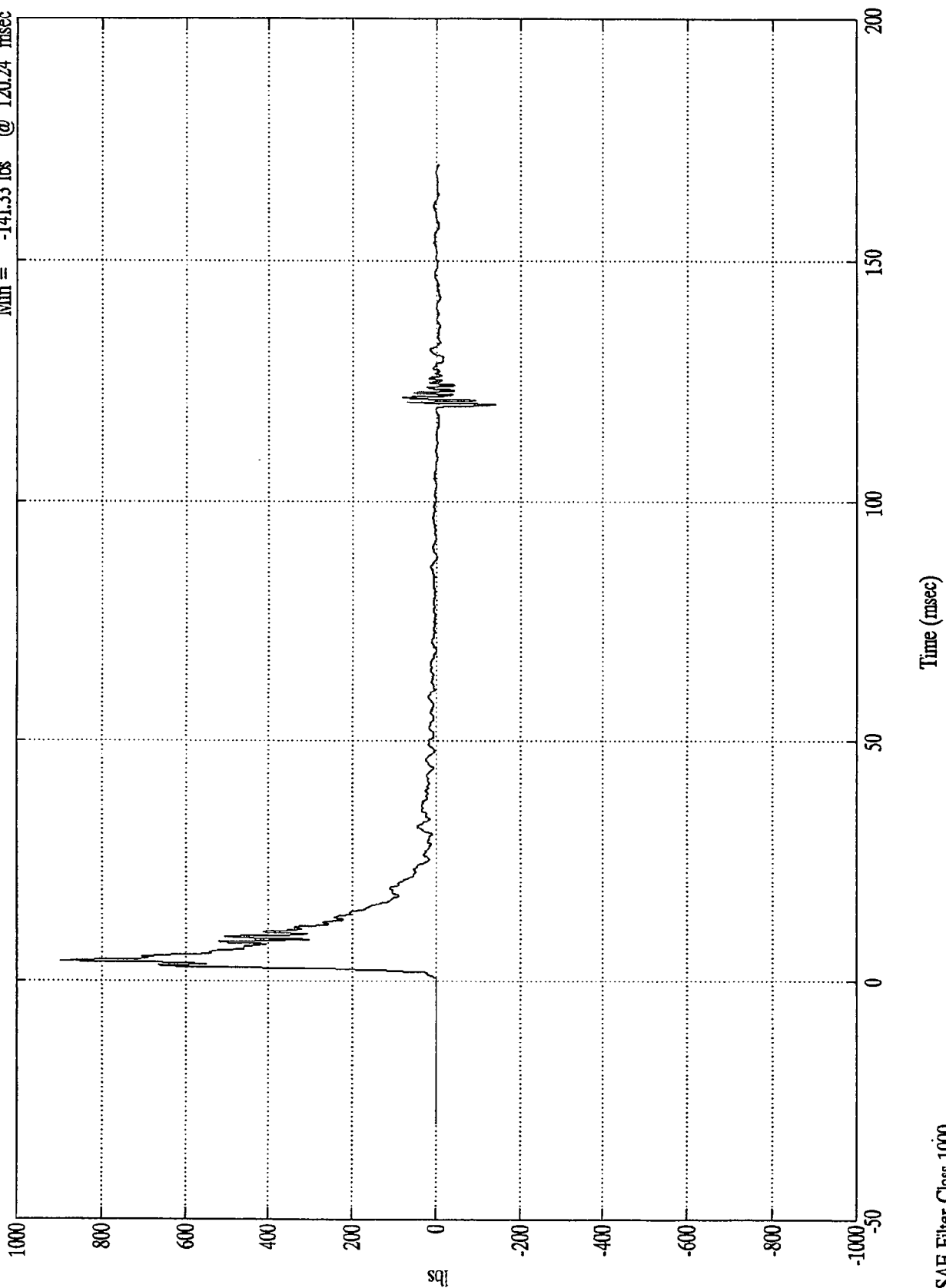
8455-3

SAE Filter Class 1000

SID Shock Absorber Impact Test 015 @ 20.0 fps

Max = 896.74 lbs @ 4.20 msec
Min = -141.33 lbs @ 120.24 msec

Shock Force



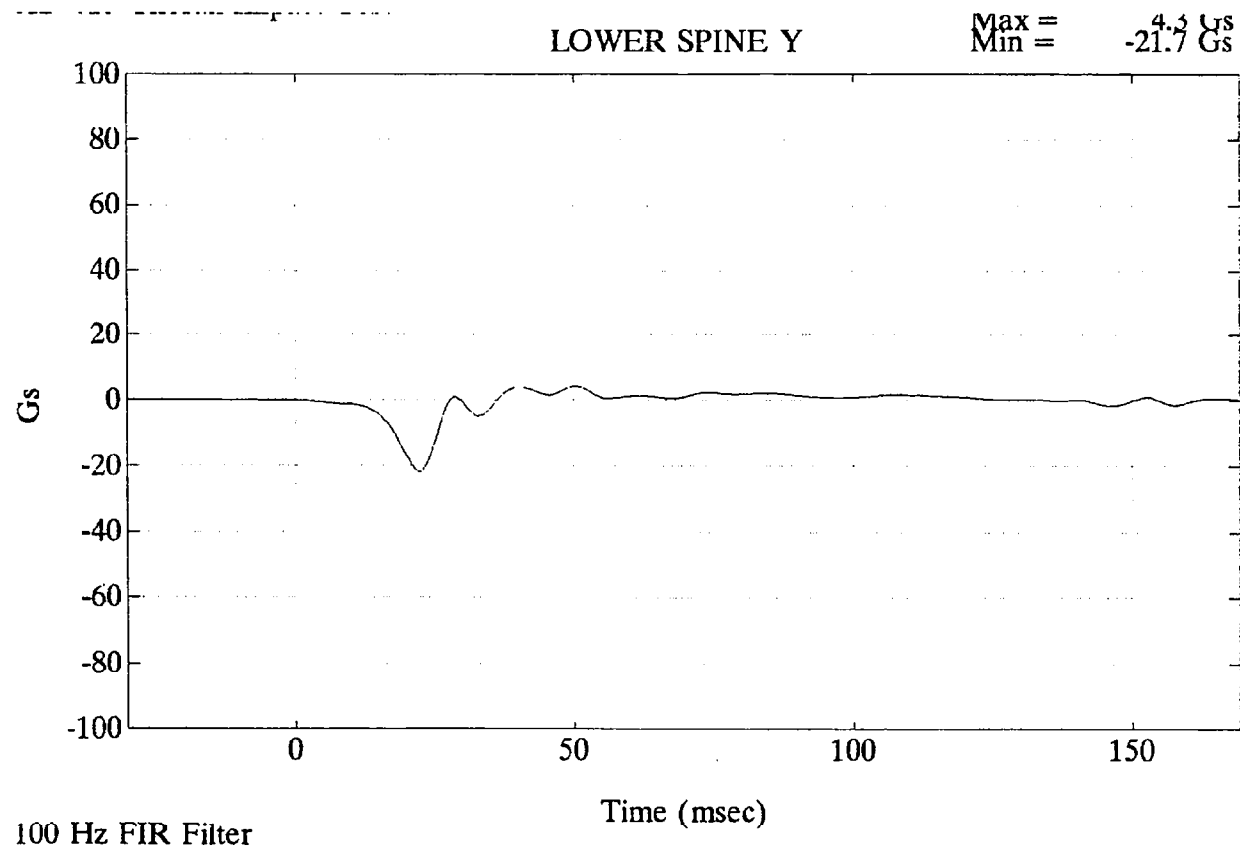
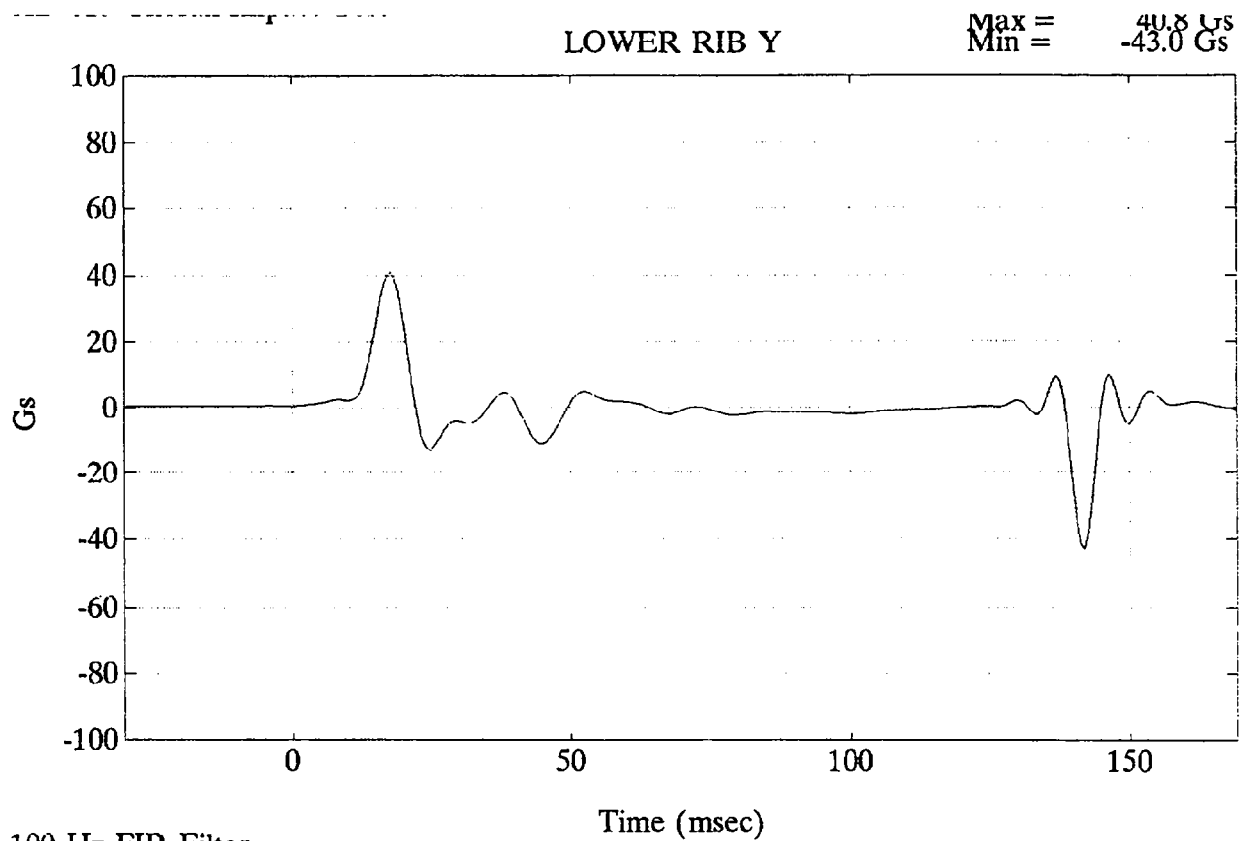
SAE Filter Class 1000

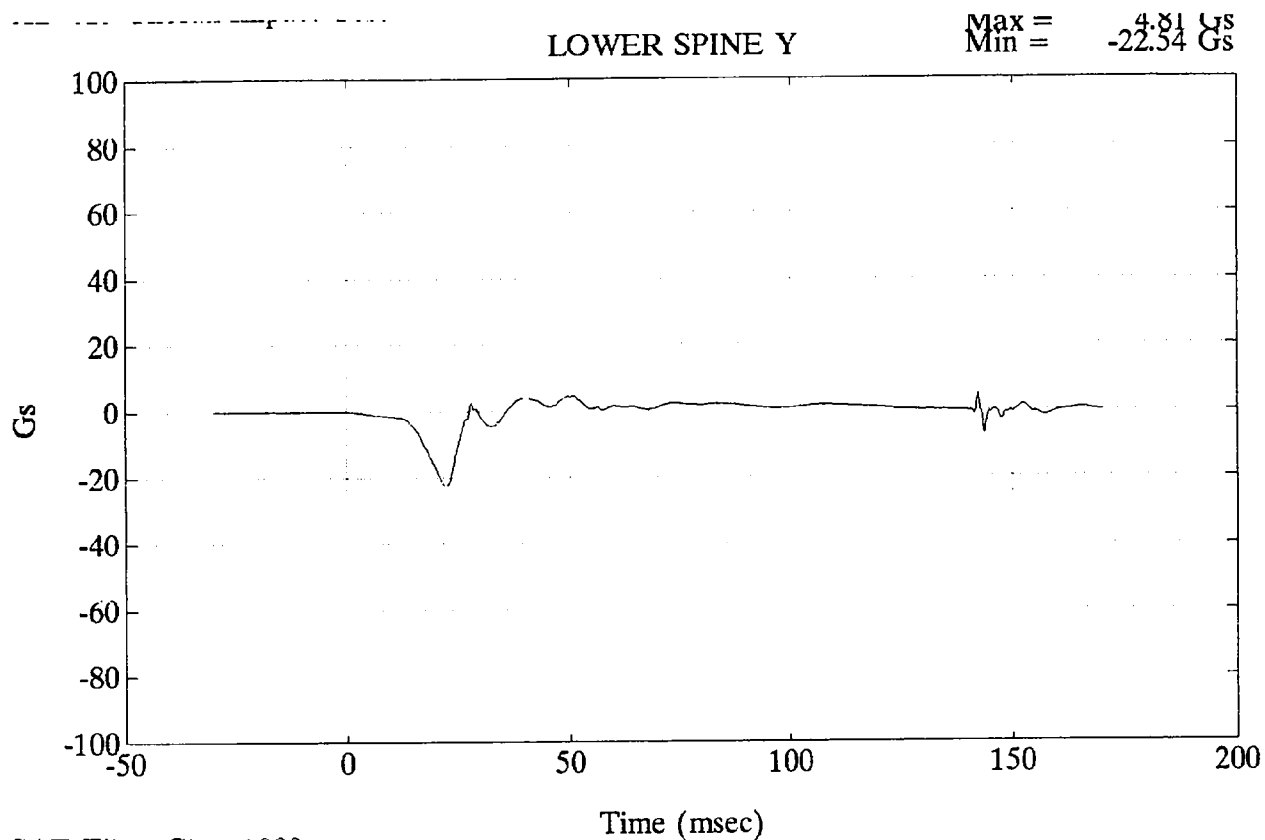
LATERAL THORAX IMPACT TEST
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 015 Calspan Sequential Test Number: 1
Date: 10/15/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

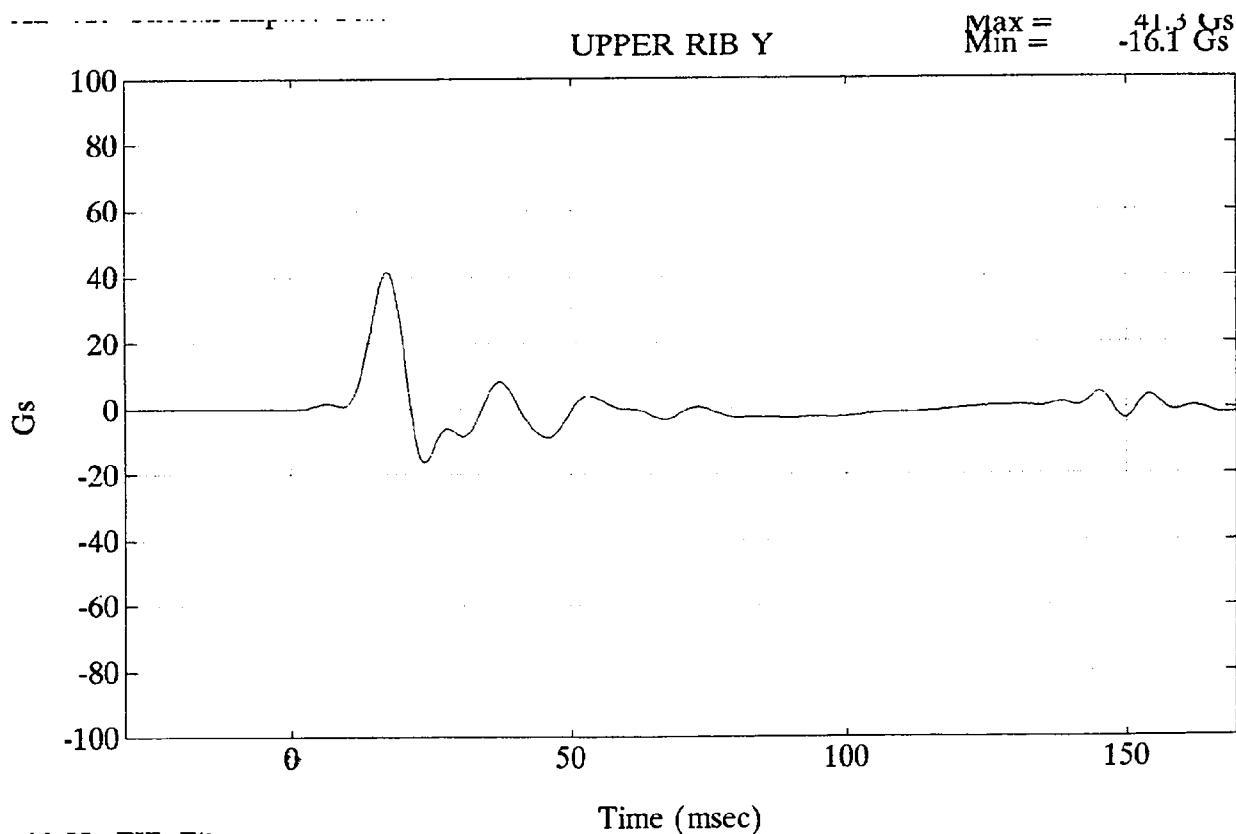
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	22.0
RELATIVE HUMIDITY (%)	10 - 70	37
PROBE SPEED (m/s)	4.27 - 4.33	4.31
UPPER RIB (g's)	37 - 46	41.3
LOWER RIB (g's)	37 - 46	40.9
LOWER SPINE (g's)	15 - 22	21.8

REMARKS: None

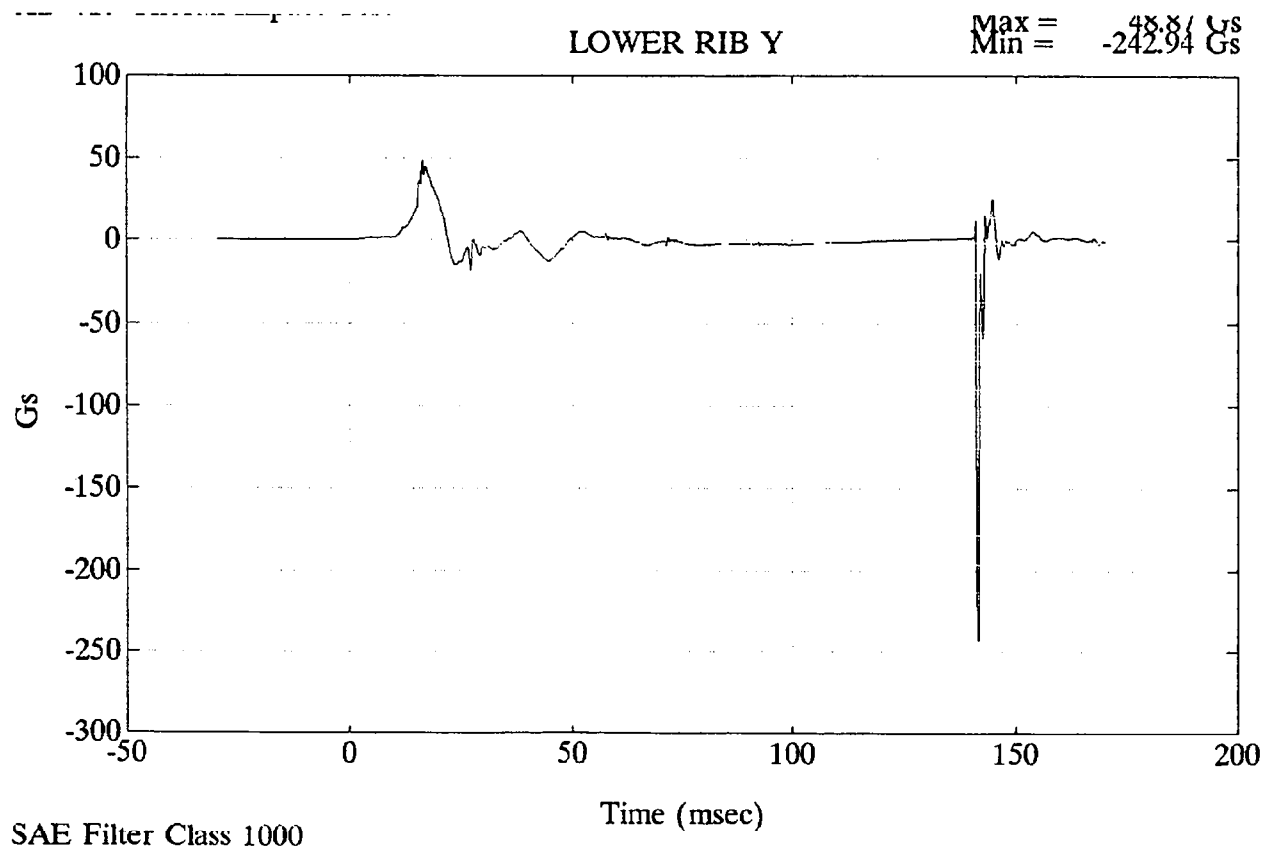
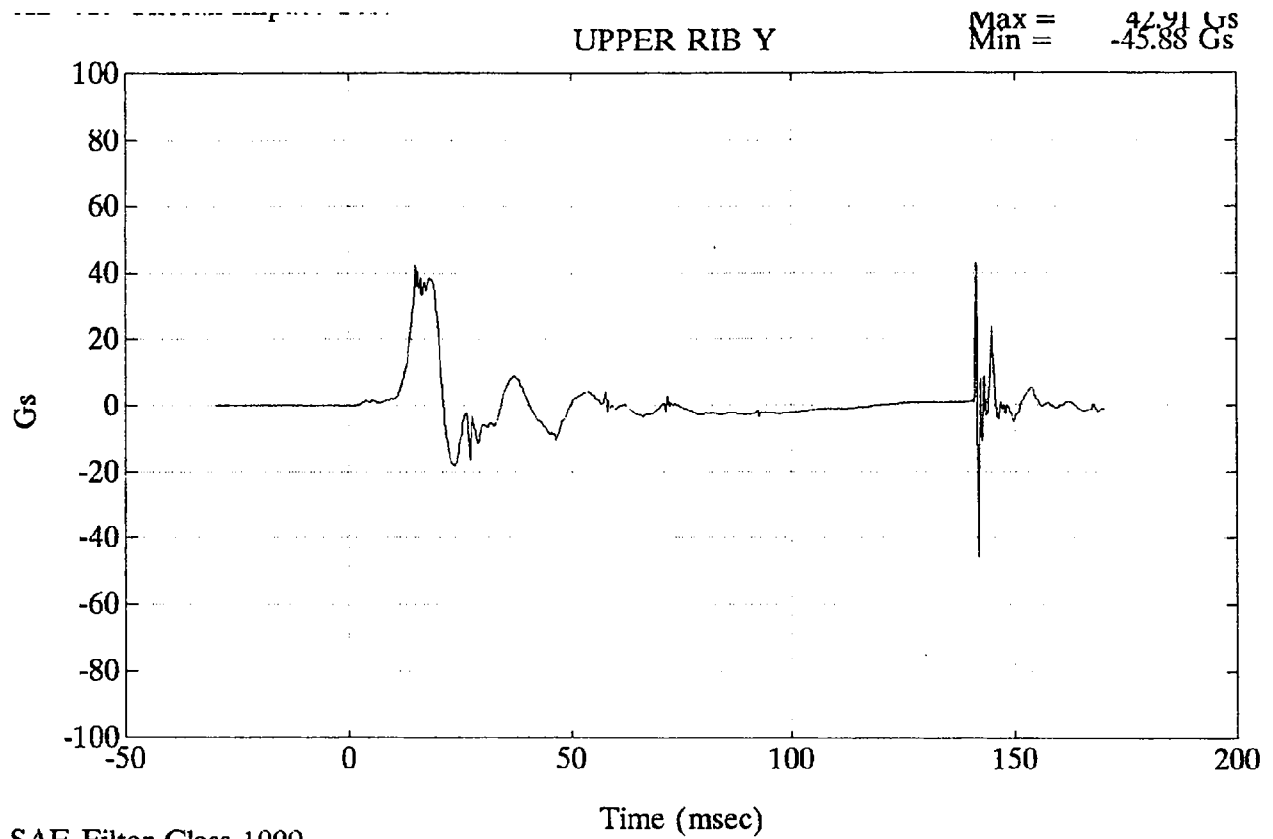




SAE Filter Class 1000



100 Hz FIR Filter



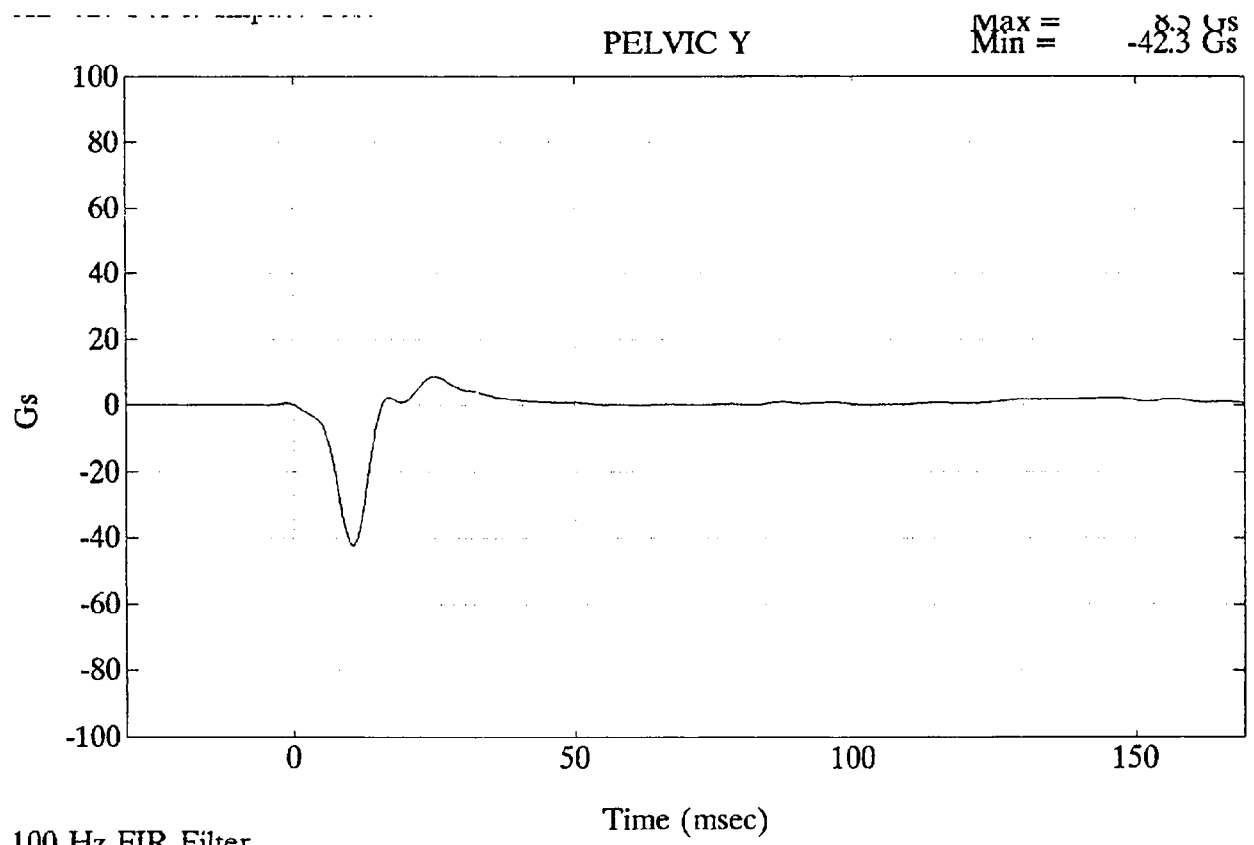
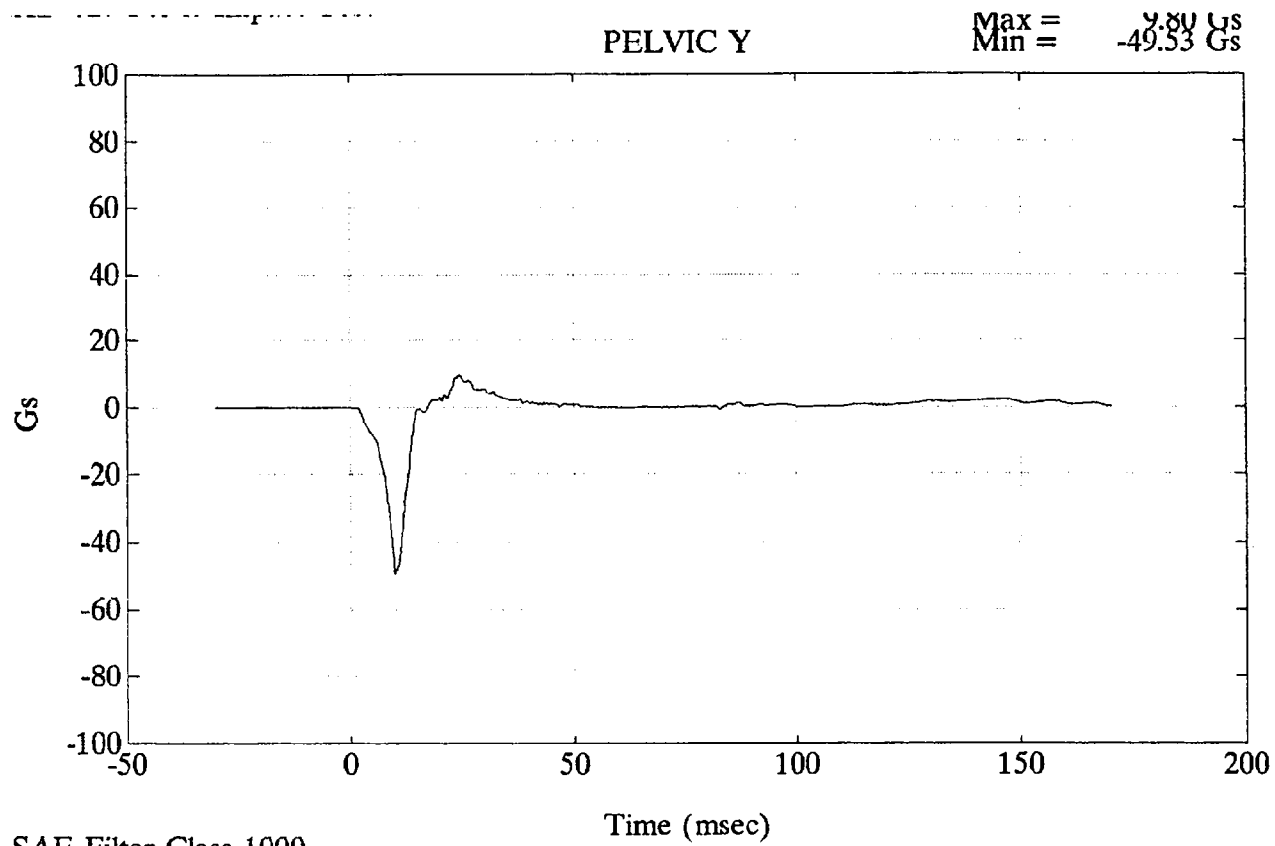
LATERAL PELVIS IMPACT TEST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 015 Calspan Sequential Test Number: 1
Date: 10/15/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	22.0
RELATIVE HUMIDITY (%)	10 - 70	37
PROBE SPEED (m/s)	4.27 - 4.33	4.3
PELVIS ACCELERATION (g's)	40 - 60	42.4

REMARKS: None



ABDOMINAL COMPRESSION TEST

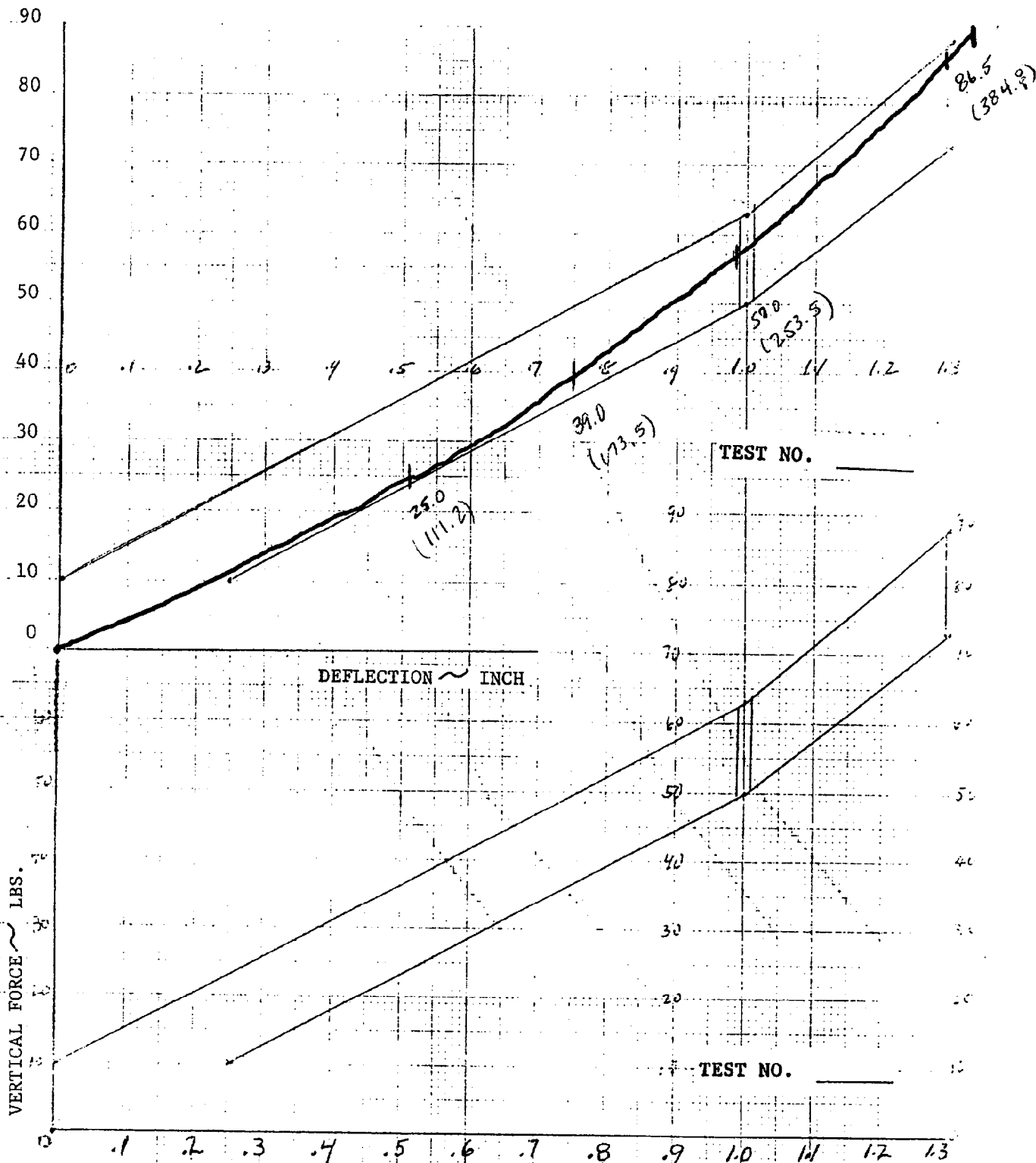
(Test not required for SID certification)

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 015 Calspan Sequential Test Number: 1
Date: 10/17/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	31
FORCE @ 13 mm (N)	104 - 162	111.2
FORCE @ 19 mm (N)	163 - 221	173.5
FORCE @ 25 mm (N)	222 - 280	253.5
FORCE @ 33 mm (N)	325 - 391	384.8

REMARKS: None



DUMMY S/N 015
 DATE 11-17-93
 CONTRACT AUTHORIZATION _____
 TEMP. 70 HUMIDITY 31
 PERFORMED BY [Signature]

PART 572
 ABDOMEN STATIC PRESS
 DOT - 13 DEC. '77
 C-20

8455-3

LUMBAR FLEXION TEST
(Test not required for SID certification)

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 015 Calspan Sequential Test Number: 1
Date: 10/17/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	31
FORCE @ 0° (N)	0 - 26.7	0
FORCE @ 20° (N)	97.8 - 151.2	133.4
FORCE @ 30° (N)	151.2 - 204.6	177.9
FORCE @ 40° (N)	204.6 - 258	242.4
RETURN ANGLE	12° max.	4

REMARKS: None

DUNNY 015

W/A

DATE 10-17-97

PERFORMED BY

TEST NO.

TEMP.

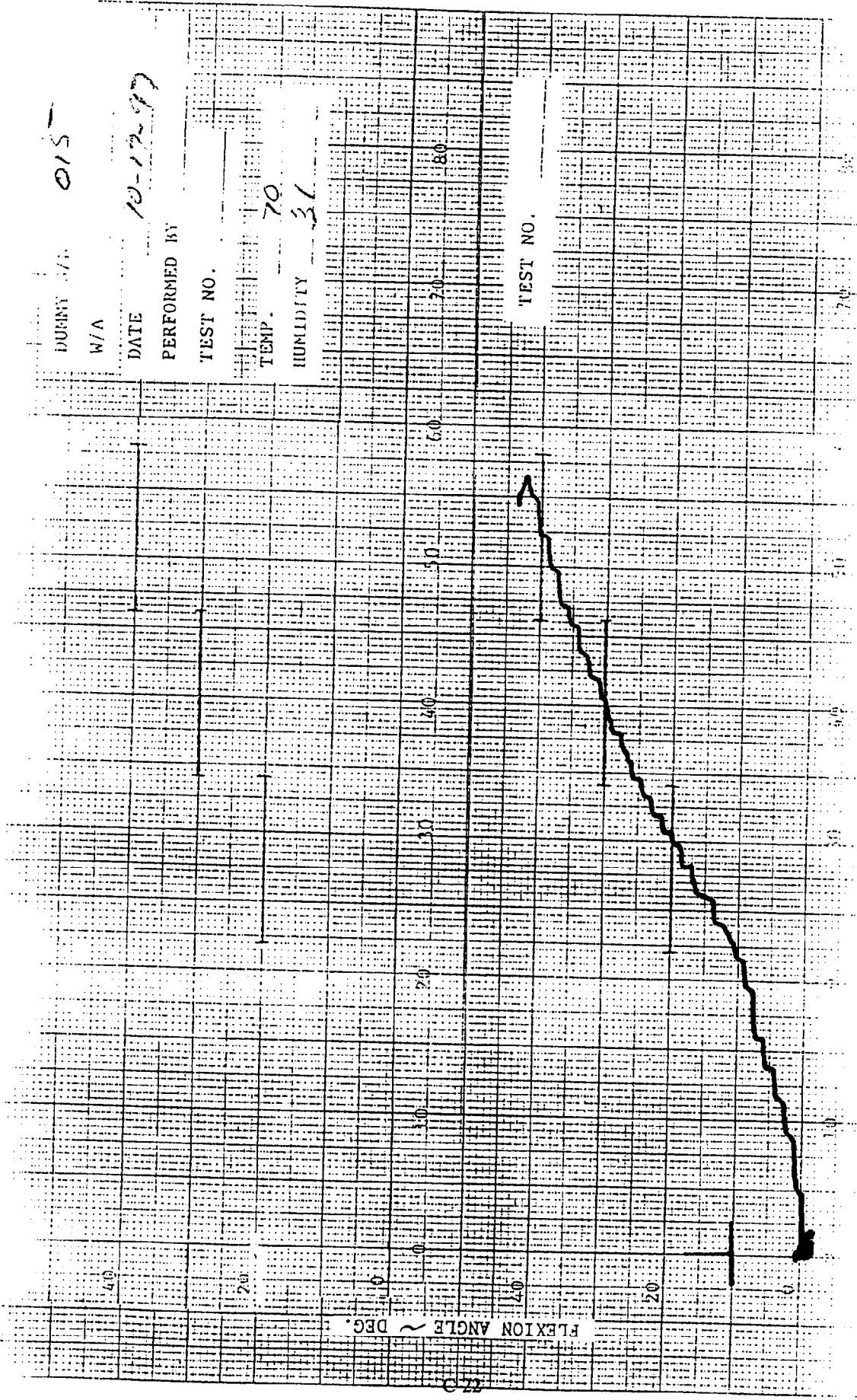
70

HUMIDITY

31

TEST NO.

FLEXION ANGLE ~ DEG.



PRE-TEST DUMMY INSPECTION LIST
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 015 Calspan Sequential Test Number: 1
Date: 10/15/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

PART	ITEMS CHECKED	COMMENTS
SKIN	VISUAL INSPECTION	OK
HEAD	VISUAL, BALLAST, ACCELEROMETER MOUNT	OK
NECK	VISUAL, CABLE TORQUE	OK
SPINE BOX	VISUAL, BALLAST, WELDMENT, ACCELEROMETER MOUNT	OK
RIB CAGE	VISUAL, MEASURE, STIFFENERS	OK
STERNUM	VISUAL	OK
LUMBAR SPINE	VISUAL	OK
ABDOMEN	VISUAL	OK
PELVIS	VISUAL, PALPATE, ACCELEROMETER MOUNT	OK
UPPER LEGS	VISUAL	OK
KNEES	VISUAL, STOPS, INSERTS	OK
LOWER LEGS	VISUAL, RANGE OF MOTION	OK
ANKLES	VISUAL, RANGE OF MOTION	OK
FEET	VISUAL, RANGE OF MOTION	OK
JOINTS	1 TO 2 g RANGE	OK
OTHER	NONE	-

REMARKS: None

CALIBRATION TEST RESULTS
PRE-TEST

SID NO.: 016

CONFIGURED FOR LEFT SIDE IMPACT

CALIBRATION TEST RESULTS SUMMARY

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 016
Date: 10/15/97

Calspan Sequential Test Number: 1
Laboratory Technician: B. Swiecicki, G. Serbinowski

TEST	COMMENTS
EXTERNAL DIMENSIONS	Passed all requirements.
THORACIC SHOCK ABSORBER TEST	Passed all requirements.
LATERAL THORAX IMPACT TEST	Passed all requirements.
LATERAL PELVIS IMPACT TEST	Passed all requirements.
ABDOMINAL COMPRESSION TEST*	Passed all requirements.
LUMBAR FLEXION TEST*	Passed all requirements.

* Test not required for SID certification.

REMARKS: None

EXTERNAL DIMENSIONS

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 016
Date: 10/15/97

Calspan Sequential Test Number: 1
Laboratory Technician: B. Swiecicki, G. Serbinowski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	902
RH- Rib Height (mm)	502 - 520	513
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 - 241	240
KH- Knee Pivot from Back Line (mm)	511 - 526	525
KV- Knee Pivot to Floor (mm)	490 - 505	494
HW- Hip Width (mm)	356 - 391	361

REMARKS: None

THORACIC SHOCK ABSORBER TESTS

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 016 Calspan Sequential Test Number: 1
Date: 10/15/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

DAMPER IDENTIFICATION: 016

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)		18.9 - 25.5	22.0
RELATIVE HUMIDITY (%)		10 - 70	37
VELOCITY 3.05 m/s	FORCE (N)	836 - 1125	1014.2
	DISPLACEMENT (mm)	30 - 35	34.8
VELOCITY 4.27 m/s	FORCE (N)	1730 - 2099	1878.3
	DISPLACEMENT (mm)	32 - 37	34.8
VELOCITY 6.10 m/s	FORCE (N)	3741 - 4448	4111.6
	DISPLACEMENT (mm)	33 - 40	36.3

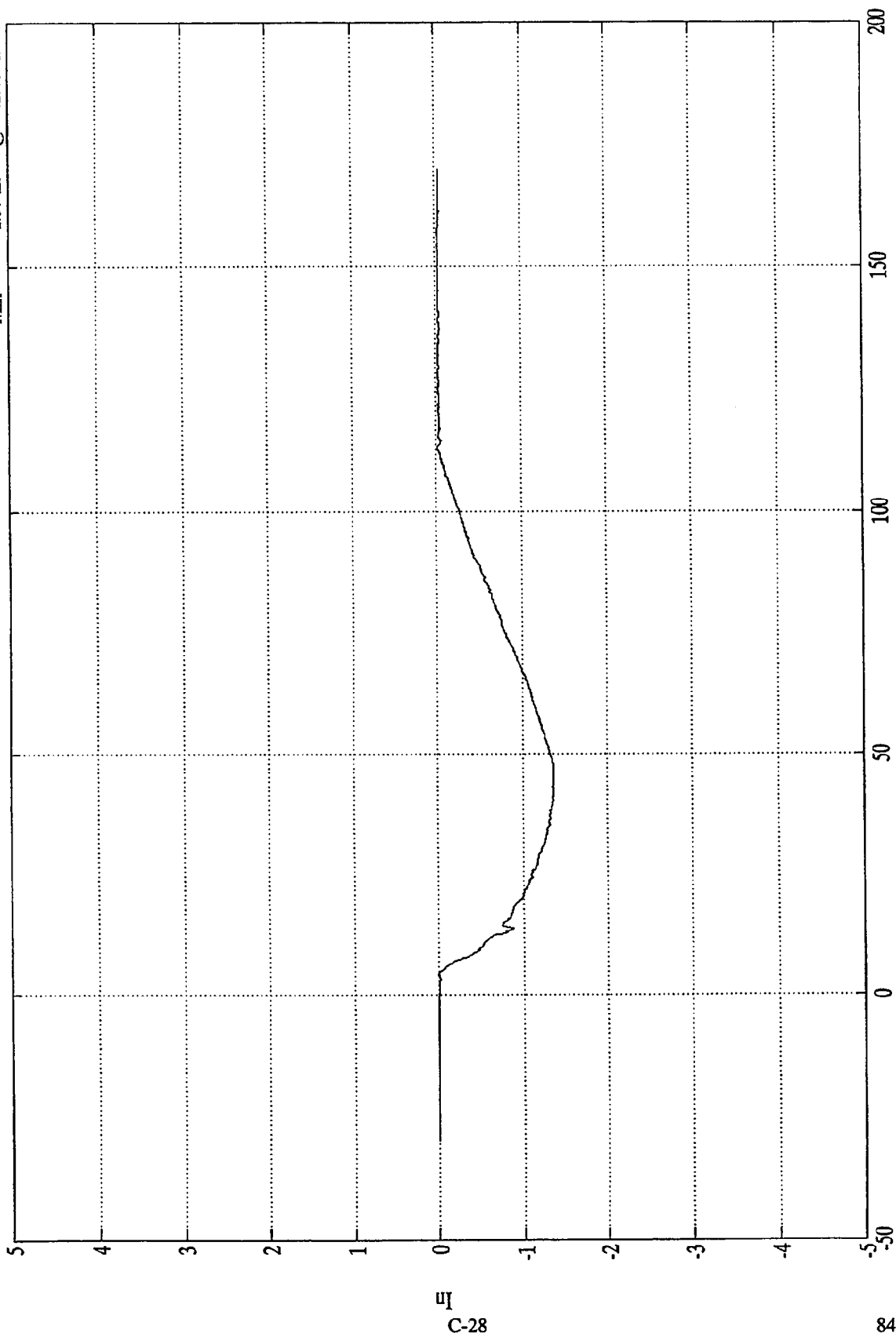
DAMPER SETTING: 5

REMARKS: None

SID Shock Absorber Impact Test 016 @ 10.1 fps

Max = .00 In @ -17.63 msec
Min = -1.37 In @ 42.48 msec

Displacement



Time (msec)

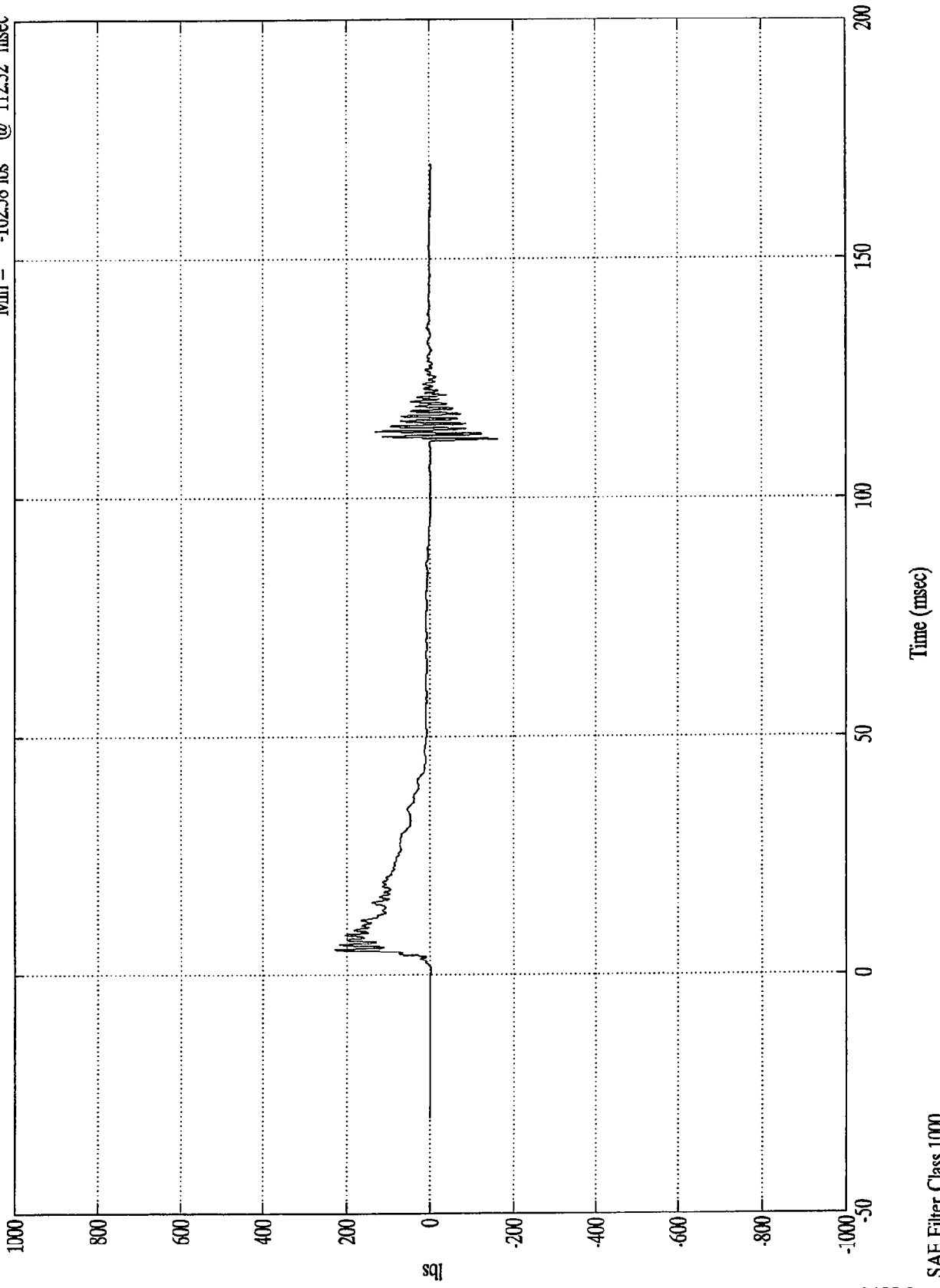
SAE Filter Class 1000

8455-3

C-28

SID Shock Absorber Impact Test 016 @ 10.1 fps

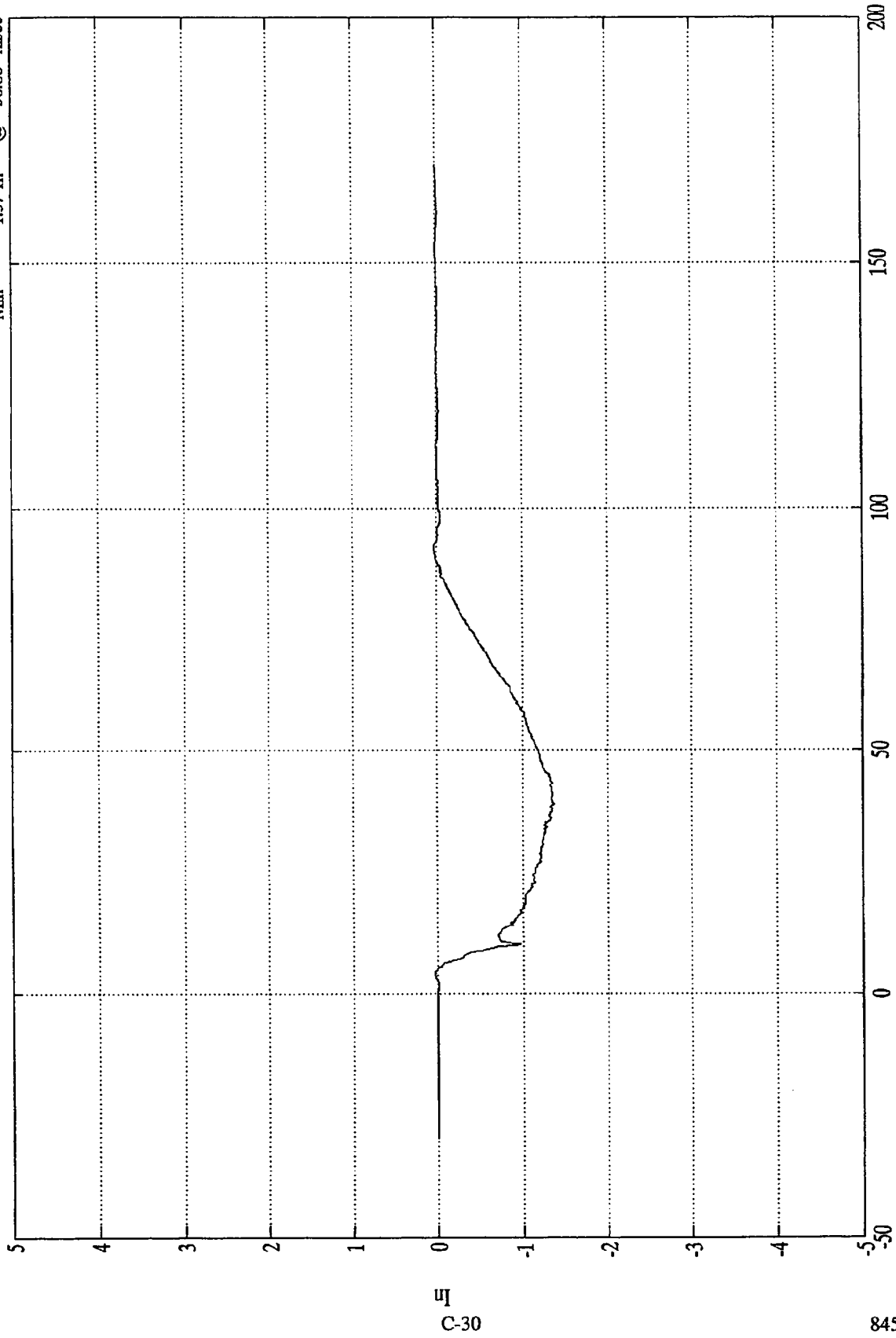
Shock Force
Max = 228.02 lbs @ 5.40 msec
Min = -162.58 lbs @ 112.32 msec



SID Shock Absorber Impact Test 016 @ 14.0 fps

Max = .03 In @ 92.27 msec
Min = -1.37 In @ 38.88 msec

Displacement



Time (msec)

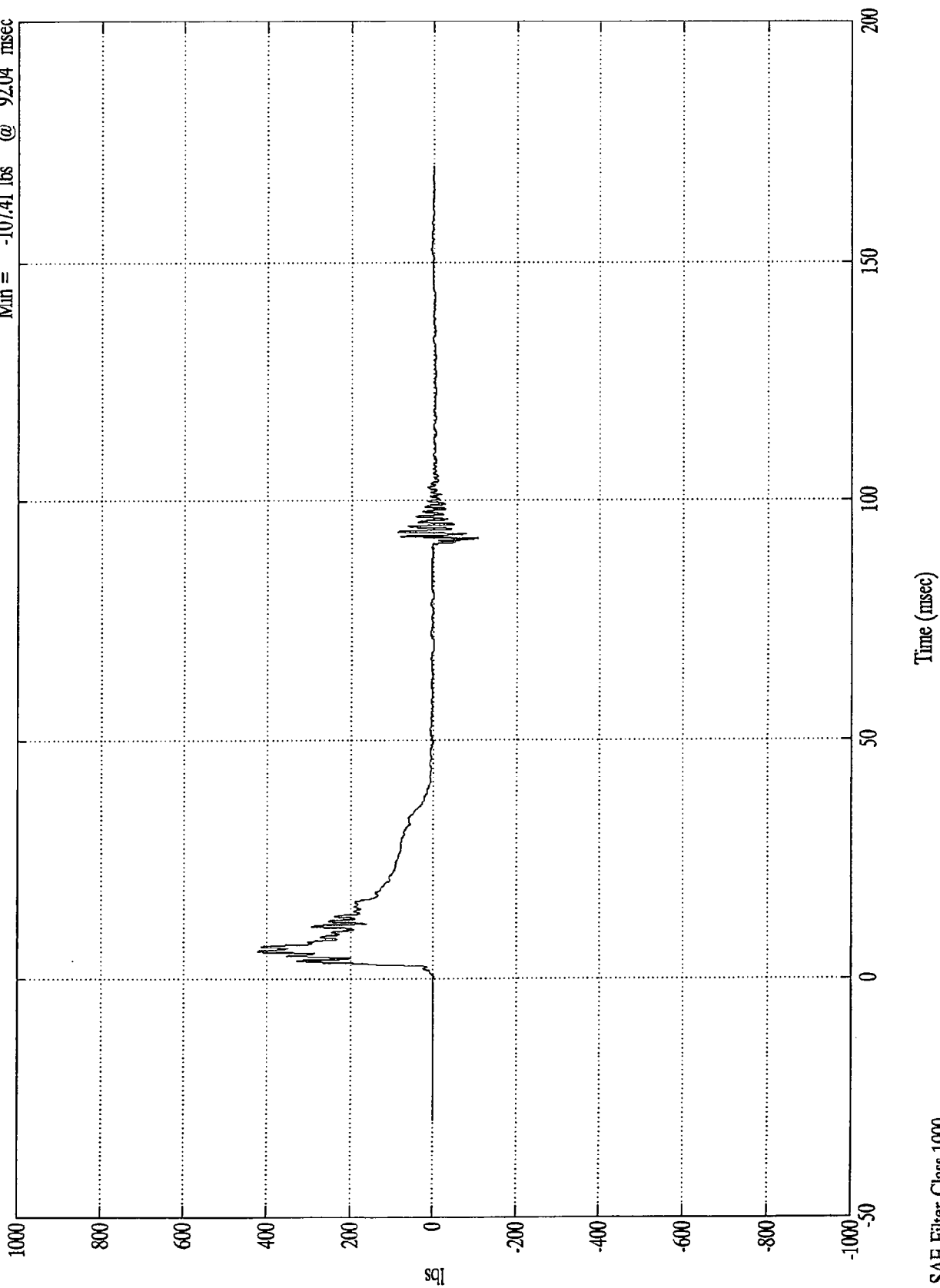
SAE Filter Class 1000

8455-3

C-30

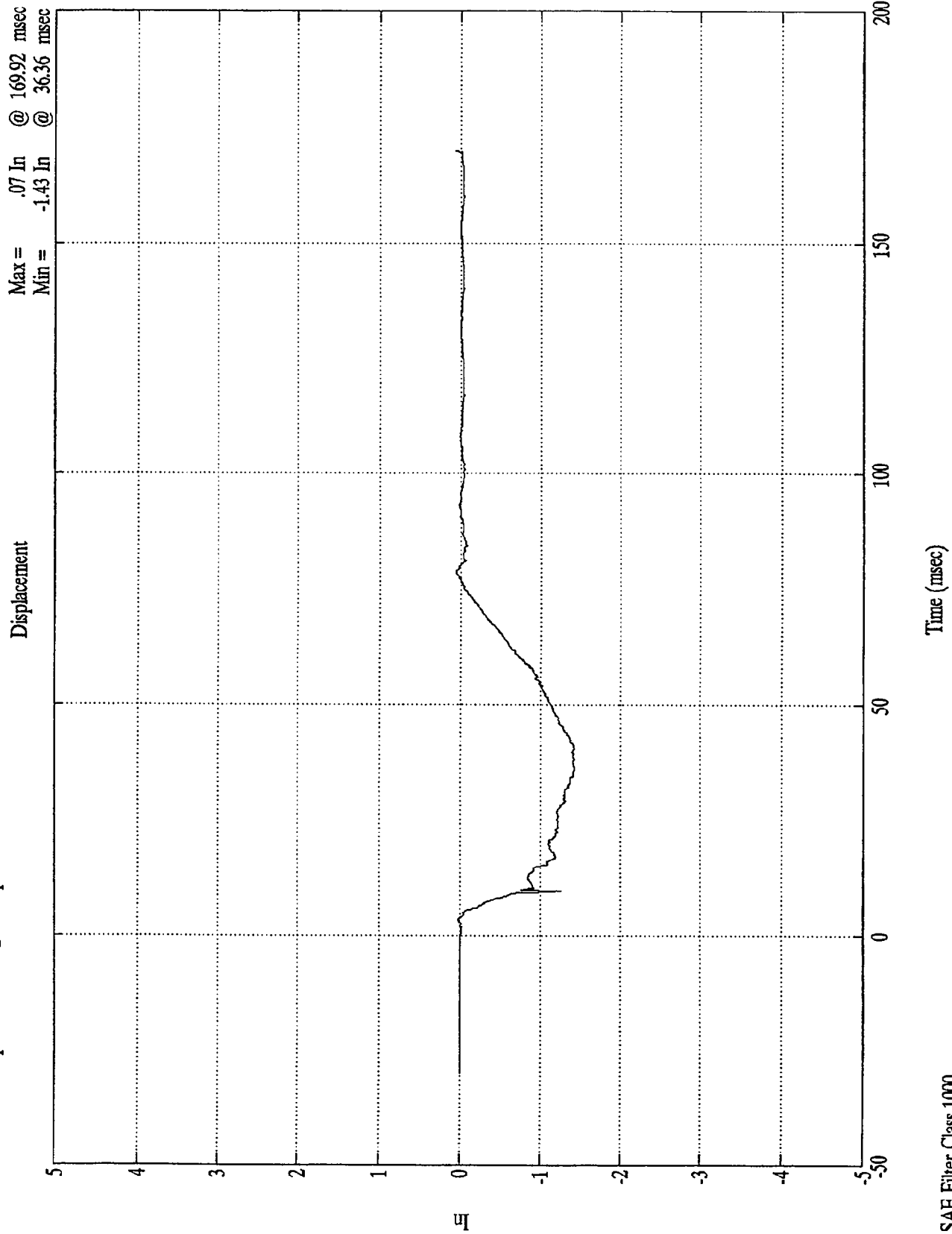
SID Shock Absorber Impact Test 016 @ 14.0 fps

Shock Force
Max = 422.25 lbs @ 5.88 msec
Min = -107.41 lbs @ 92.04 msec



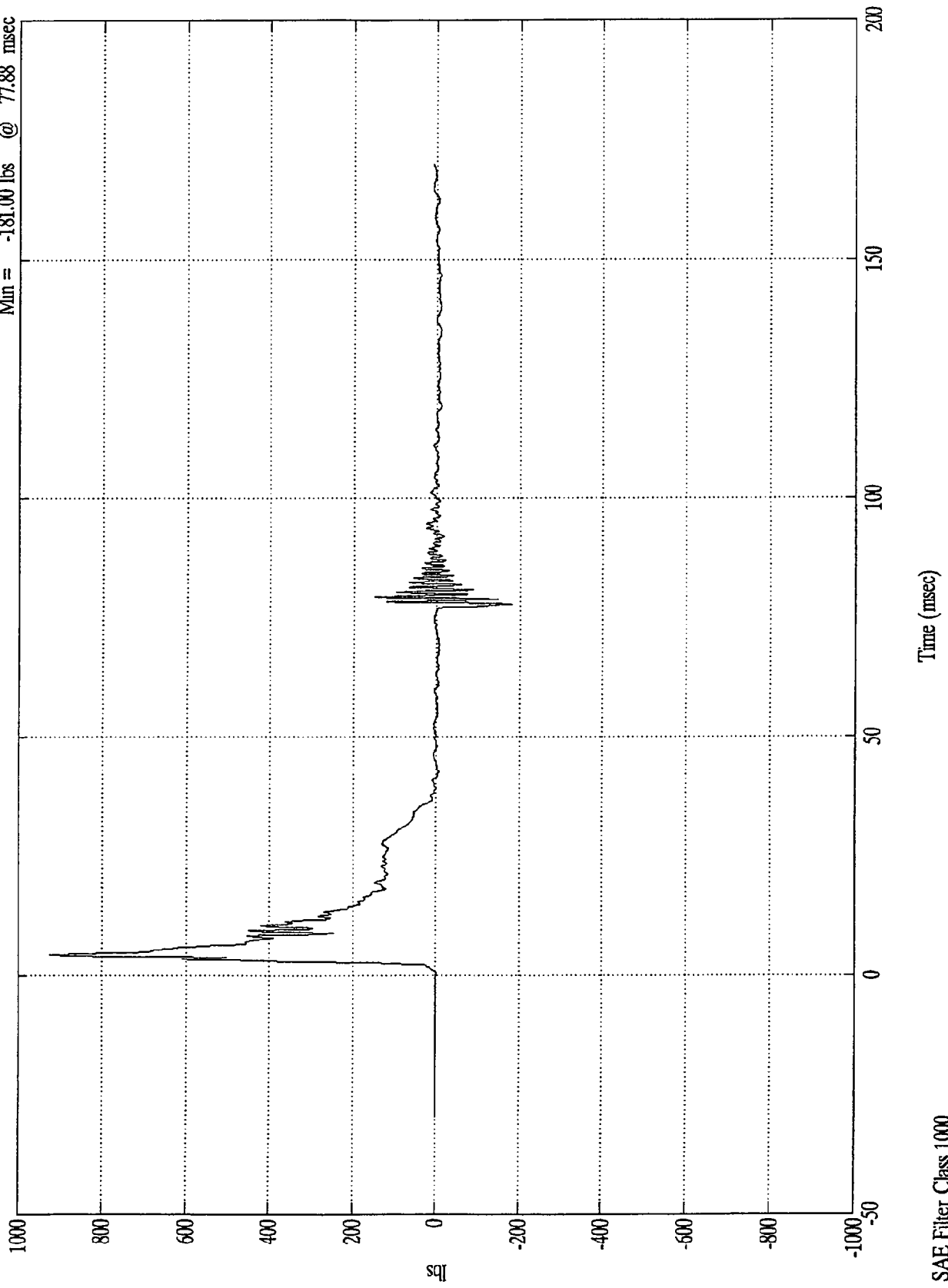
SAE Filter Class 1000

SID Shock Absorber Impact Test 016 @ 20.0 fps



SID Shock Absorber Impact Test 016 @ 20.0 fps

Shock Force
Max = 924.32 lbs @ 4.44 msec
Min = -181.00 lbs @ 77.88 msec



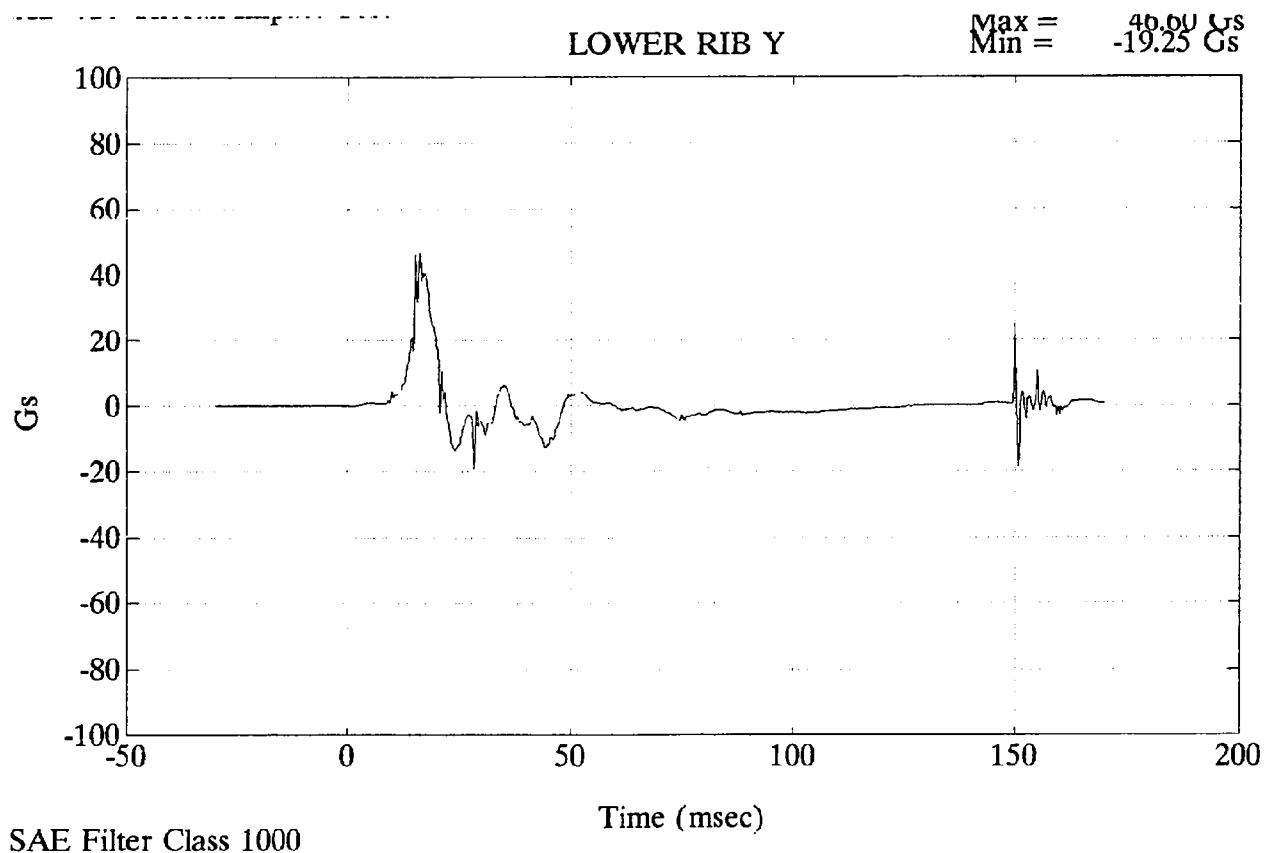
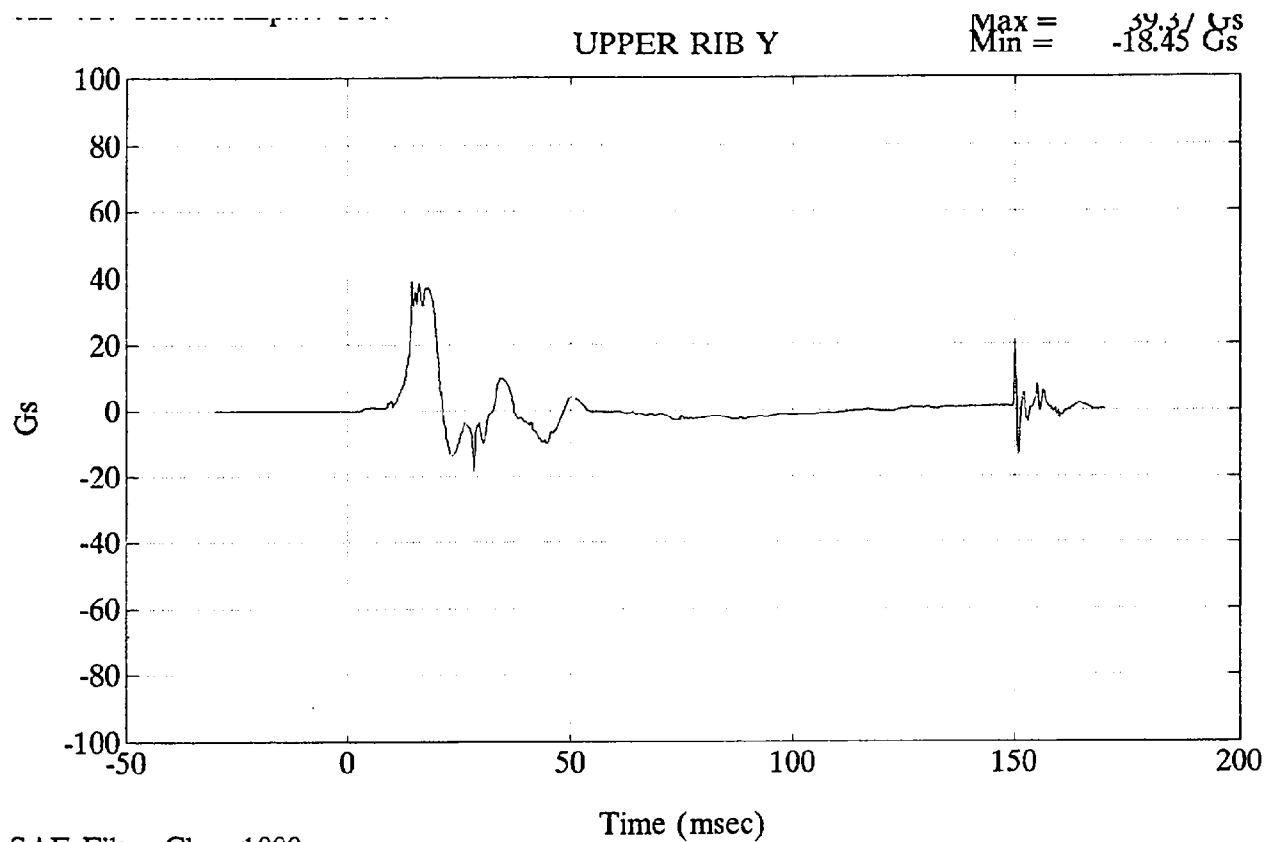
LATERAL THORAX IMPACT TEST

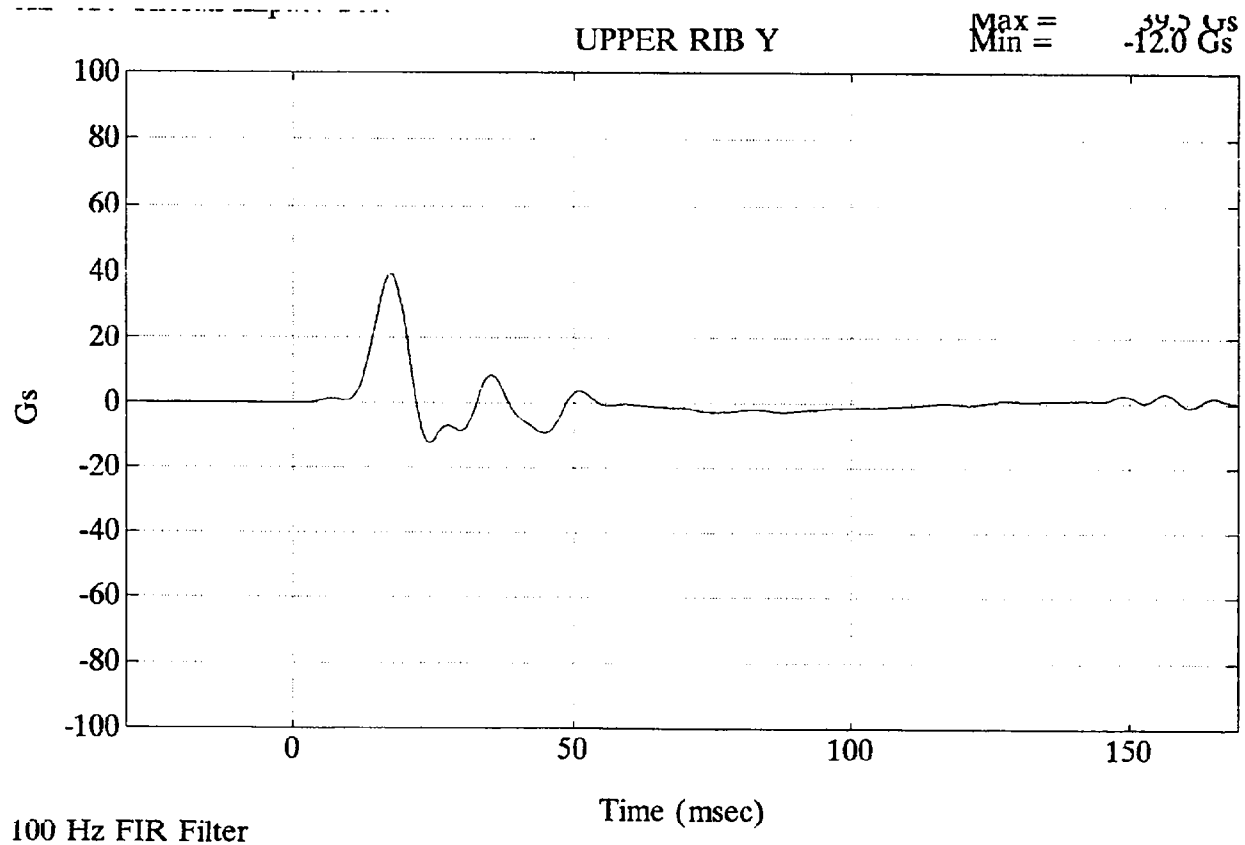
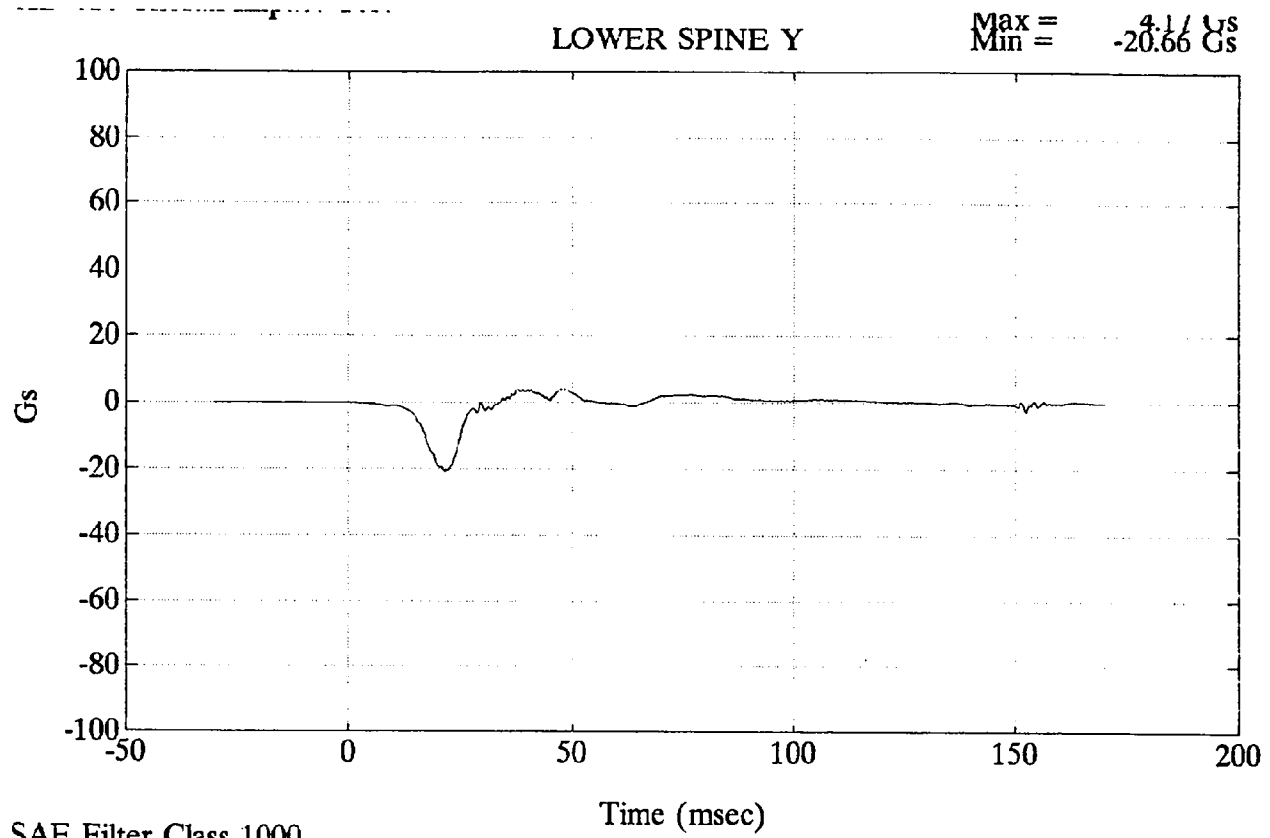
CONFIGURED FOR LEFT SIDE IMPACT

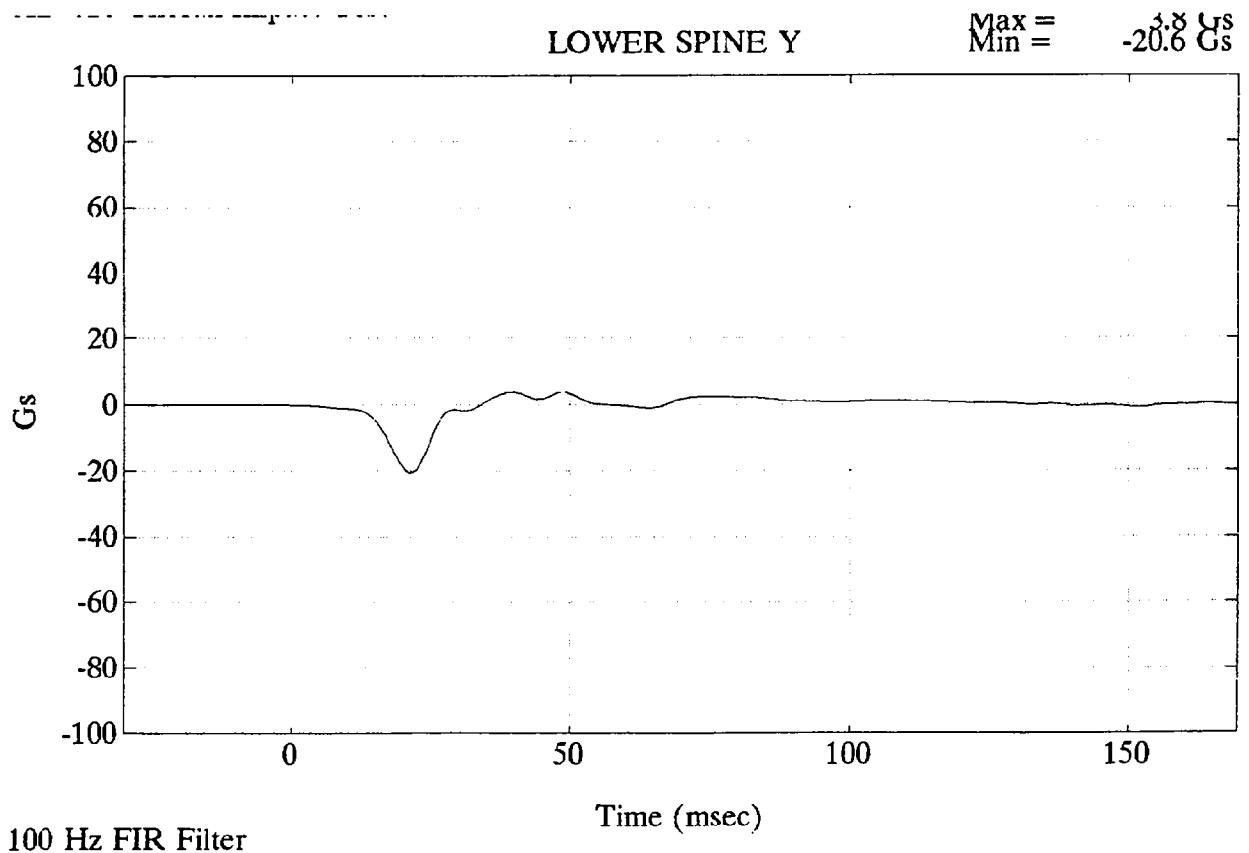
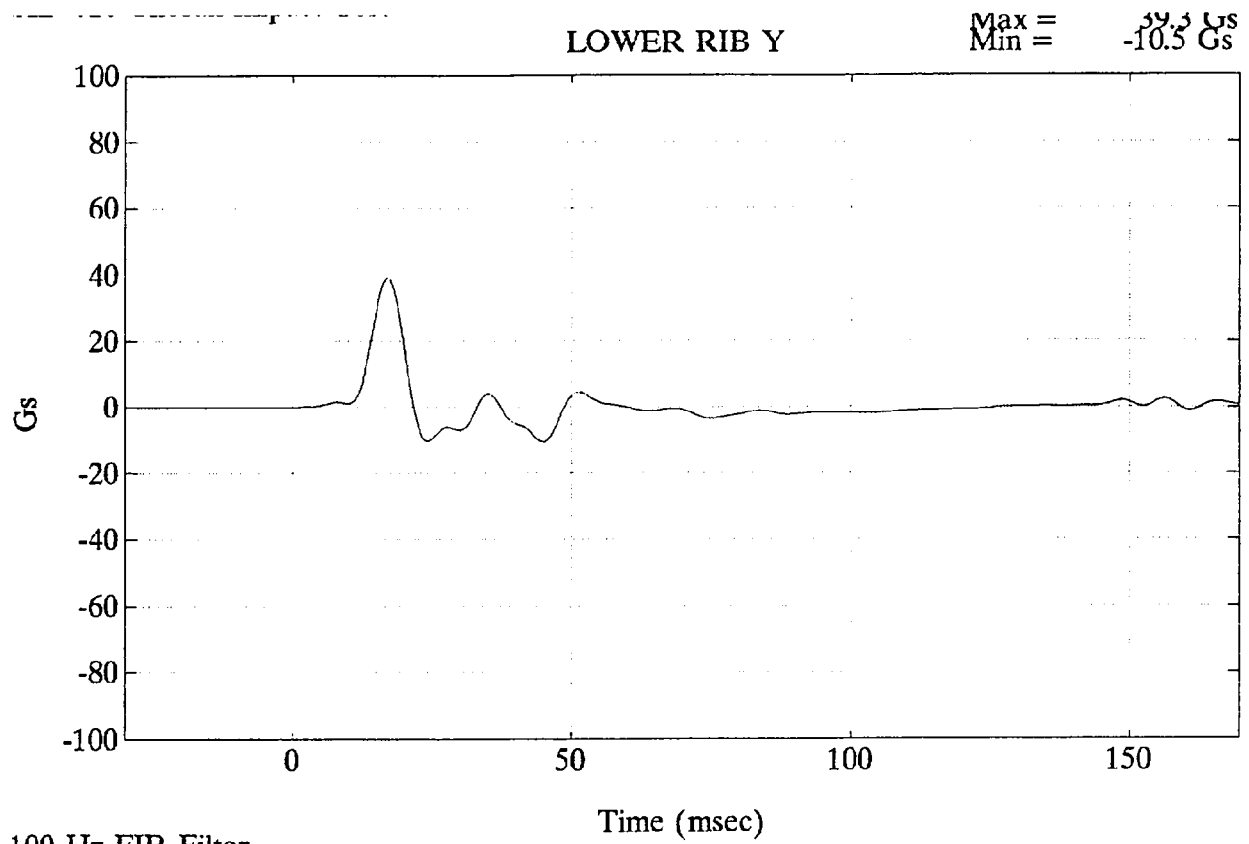
SID Serial No.: 016 Calspan Sequential Test Number: 1
Date: 10/15/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	22.0
RELATIVE HUMIDITY (%)	10 - 70	37
PROBE SPEED (m/s)	4.27 - 4.33	4.31
UPPER RIB (g's)	37 - 46	39.6
LOWER RIB (g's)	37 - 46	39.3
LOWER SPINE (g's)	15 - 22	20.6

REMARKS: None





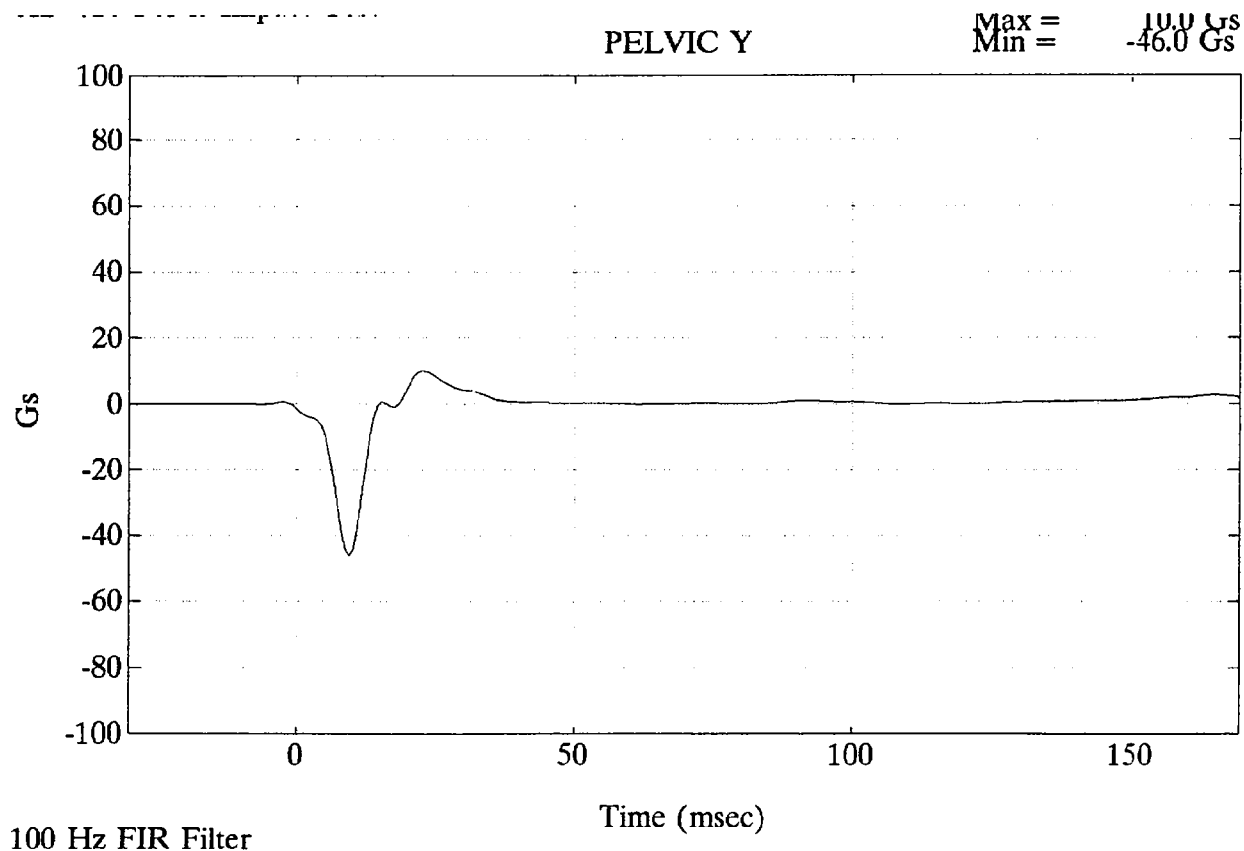
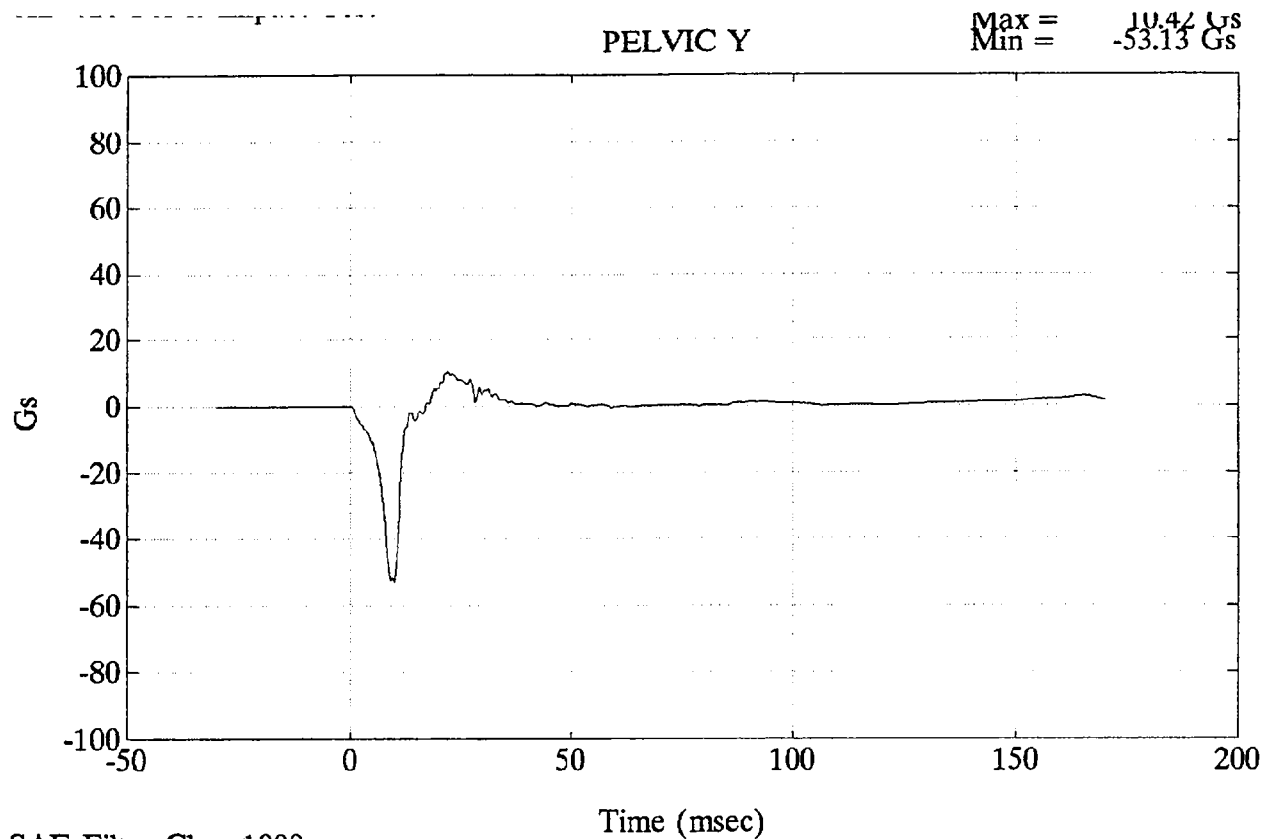


LATERAL PELVIS IMPACT TEST
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 016 Calspan Sequential Test Number: 1
Date: 10/15/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	22.0
RELATIVE HUMIDITY (%)	10 - 70	37
PROBE SPEED (m/s)	4.27 - 4.33	4.3
PELVIS ACCELERATION (g's)	40 - 60	46.0

REMARKS: None



ABDOMINAL COMPRESSION TEST

(Test not required for SID certification)

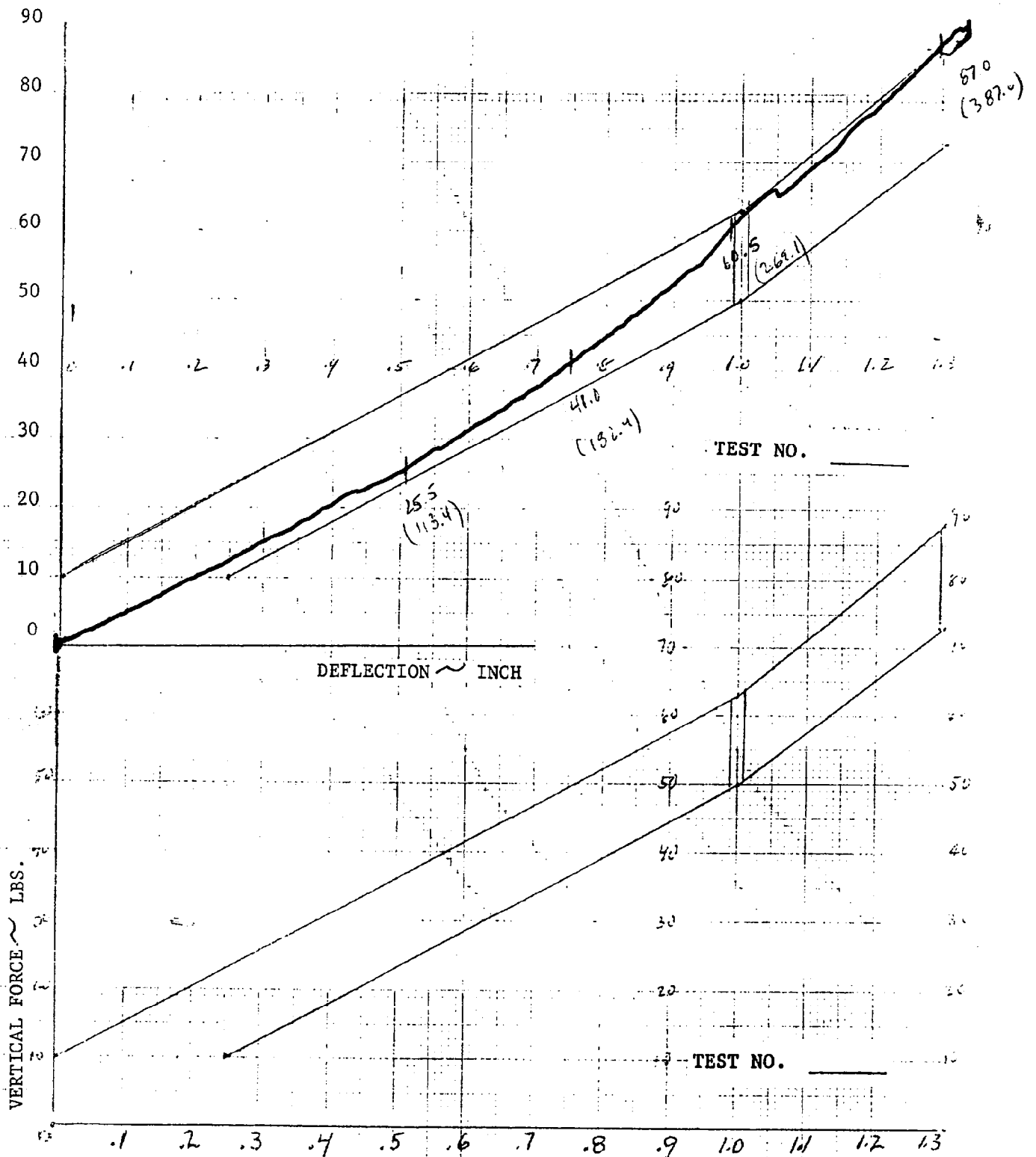
CONFIGURED FOR LEFT SIDE IMPACTSID Serial No.: 016Calspan Sequential Test Number: 1Date: 10/17/97

Laboratory Technician:

B. Swiecicki, G. Serbinowski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	31
FORCE @ 13 mm (N)	104 - 162	113.4
FORCE @ 19 mm (N)	163 - 221	182.4
FORCE @ 25 mm (N)	222 - 280	269.1
FORCE @ 33 mm (N)	325 - 391	387.0

REMARKS: None



DUMMY S/N 016

DATE 10-17-97

CONTRACT AUTHORIZATION _____

TEMP. 70 HUMIDITY 31

PERFORMED BY J.R.

PART 572
ABDOMEN STATIC PRESS
DOT - 13 DEC. '77
C-41

8455-3

LUMBAR FLEXION TEST
(Test not required for SID certification)

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 016 Calspan Sequential Test Number: 1
Date: 10/17/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	31
FORCE @ 0° (N)	0 - 26.7	0
FORCE @ 20° (N)	97.8 - 151.2	129.0
FORCE @ 30° (N)	151.2 - 204.6	177.9
FORCE @ 40° (N)	204.6 - 258	257
RETURN ANGLE	12° max.	3

REMARKS: None

016

DATE

W/A

PERFORMED BY

TEST NO.

TEMP.

HUMIDITY

70

31

TEST NO.

FLEXION ANGLE ~ DEG.

PRE-TEST DUMMY INSPECTION LIST
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 016 Calspan Sequential Test Number: 1
Date: 10/15/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

PART	ITEMS CHECKED	COMMENTS
SKIN	VISUAL INSPECTION	OK
HEAD	VISUAL, BALLAST, ACCELEROMETER MOUNT	OK
NECK	VISUAL, CABLE TORQUE	OK
SPINE BOX	VISUAL, BALLAST, WELDMENT, ACCELEROMETER MOUNT	OK
RIB CAGE	VISUAL, MEASURE, STIFFENERS	OK
STERNUM	VISUAL	OK
LUMBAR SPINE	VISUAL	OK
ABDOMEN	VISUAL	OK
PELVIS	VISUAL, PALPATE, ACCELEROMETER MOUNT	OK
UPPER LEGS	VISUAL	OK
KNEES	VISUAL, STOPS, INSERTS	OK
LOWER LEGS	VISUAL, RANGE OF MOTION	OK
ANKLES	VISUAL, RANGE OF MOTION	OK
FEET	VISUAL, RANGE OF MOTION	OK
JOINTS	1 TO 2 g RANGE	OK
OTHER	NONE	-

REMARKS: None

**CALIBRATION TEST RESULTS
POST TEST**

SID NO.: 015

CONFIGURED FOR LEFT SIDE IMPACT

CALIBRATION TEST RESULTS SUMMARY

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 015 Calspan Sequential Test Number: 2
Date: 10/23/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

TEST	COMMENTS
EXTERNAL DIMENSIONS	Passed all requirements.
LATERAL THORAX IMPACT TEST	Passed all requirements.
LATERAL PELVIS IMPACT TEST	Passed all requirements.
ABDOMINAL COMPRESSION TEST*	Not Requested By COTR
LUMBAR FLEXION TEST*	Not Requested By COTR

* Test not required for SID certification.

REMARKS: None

EXTERNAL DIMENSIONS

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 015
Date: 10/23/97

Calspan Sequential Test Number: 2
Laboratory Technician: B. Swiecicki, G. Serbinowski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	904
RH- Rib Height (mm)	502 - 520	509
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 - 241	236
KH- Knee Pivot from Back Line (mm)	511 - 526	521
KV- Knee Pivot to Floor (mm)	490 - 505	493
HW- Hip Width (mm)	356 - 391	367

REMARKS: None

LATERAL THORAX IMPACT TEST

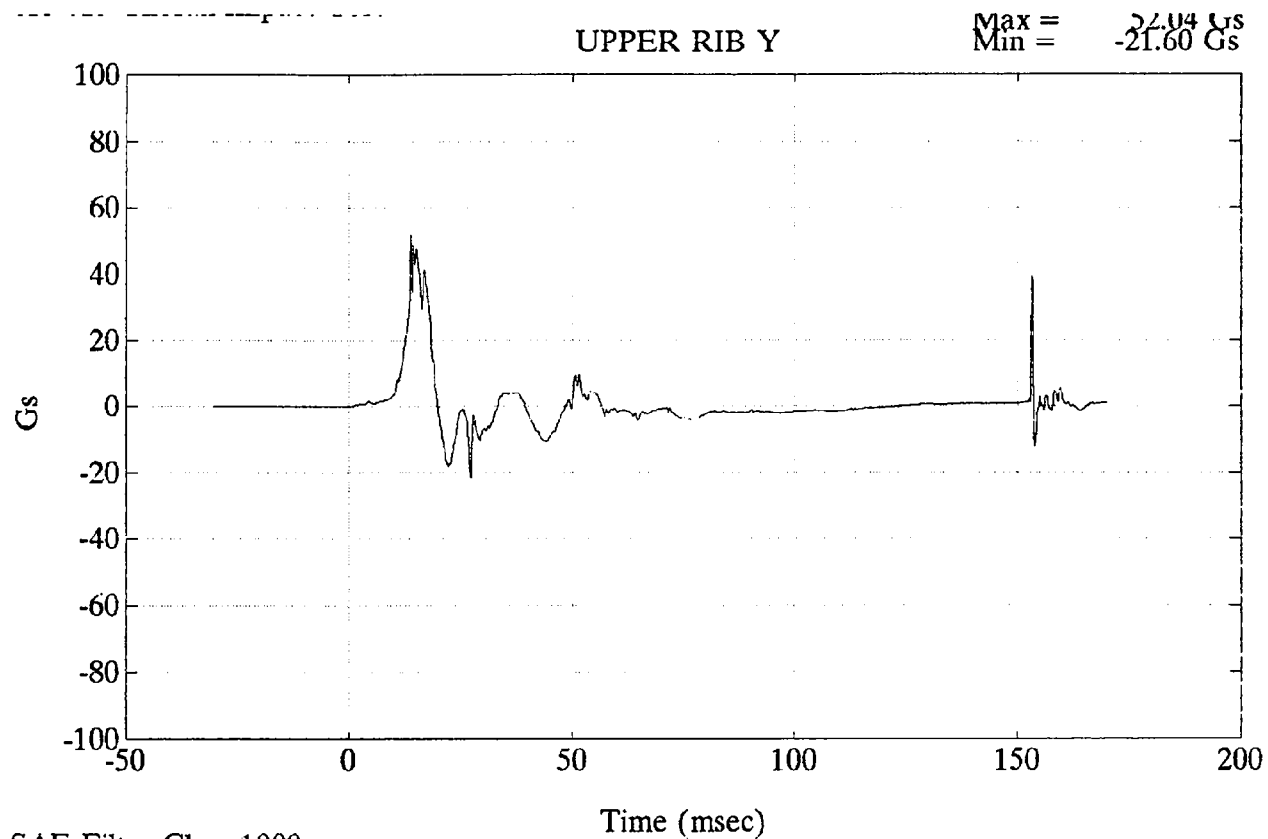
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 015
Date: 10/23/97

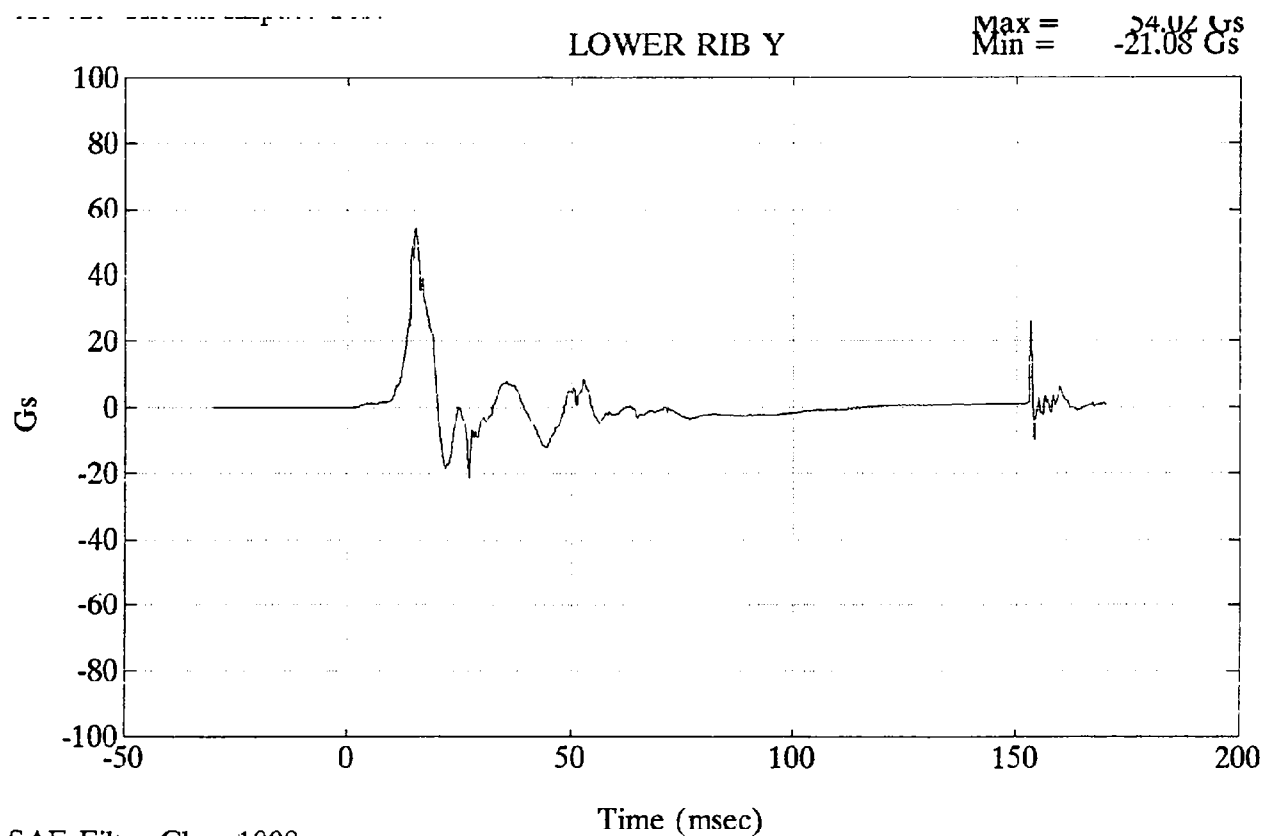
Calspan Sequential Test Number: 2
Laboratory Technician: B. Swiecicki, G. Serbinowski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.7
RELATIVE HUMIDITY (%)	10 - 70	34
PROBE SPEED (m/s)	4.27 - 4.33	4.27
UPPER RIB (g's)	37 - 46	44.0
LOWER RIB (g's)	37 - 46	44.8
LOWER SPINE (g's)	15 - 22	21.9

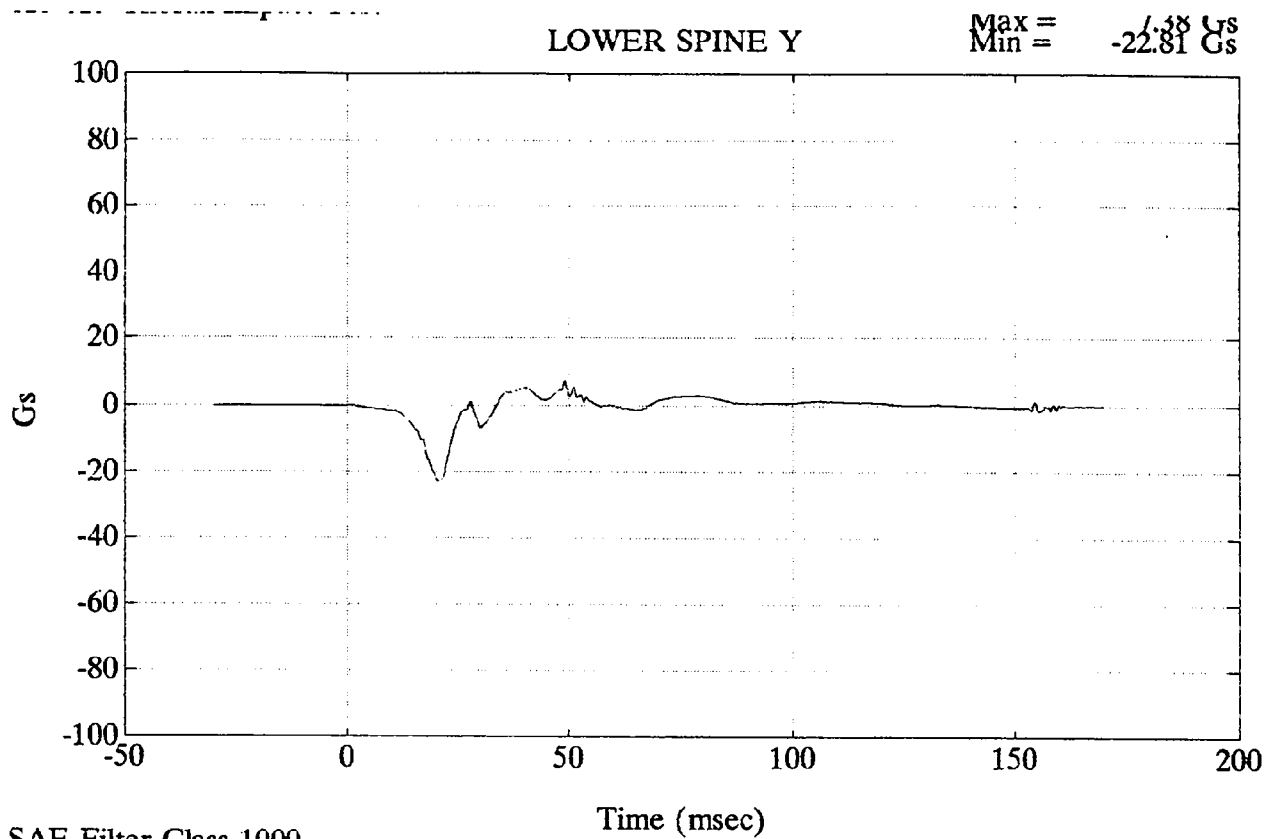
REMARKS: None



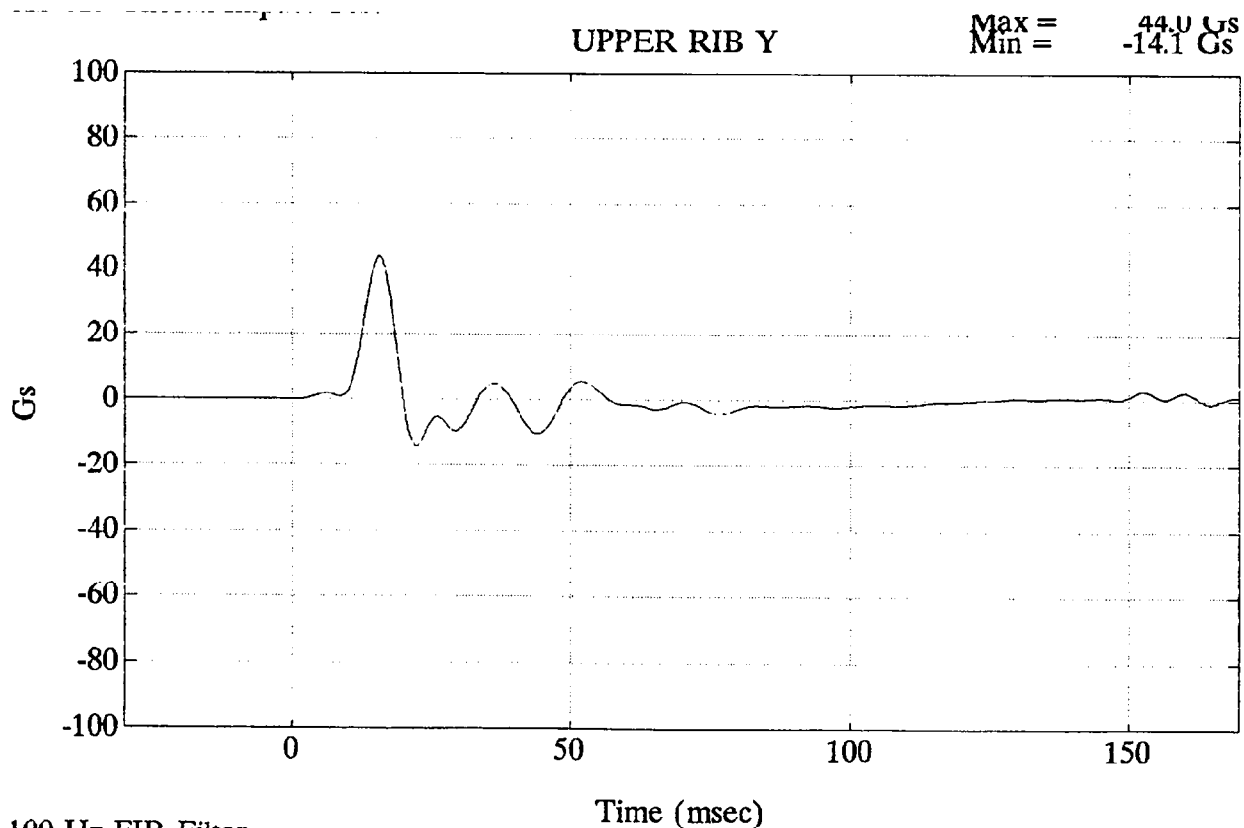
SAE Filter Class 1000



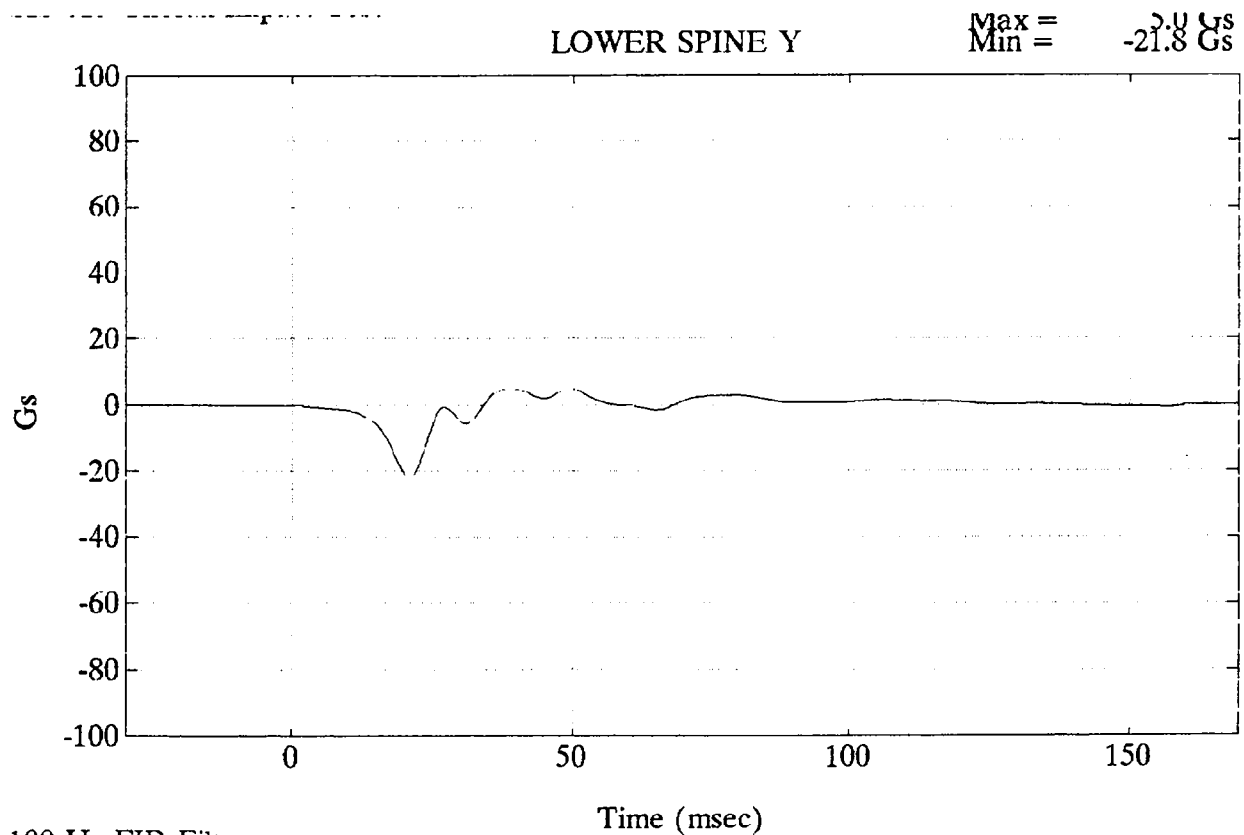
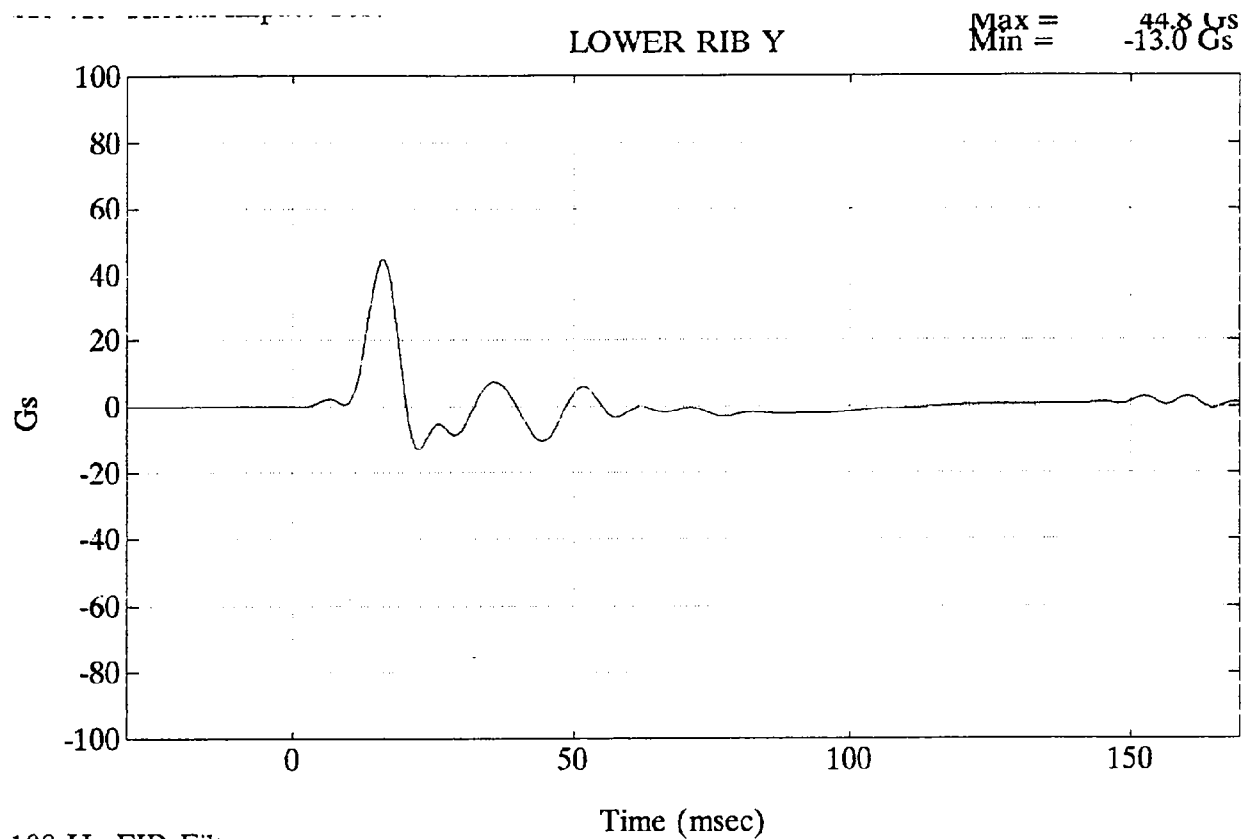
SAE Filter Class 1000



SAE Filter Class 1000



100 Hz FIR Filter



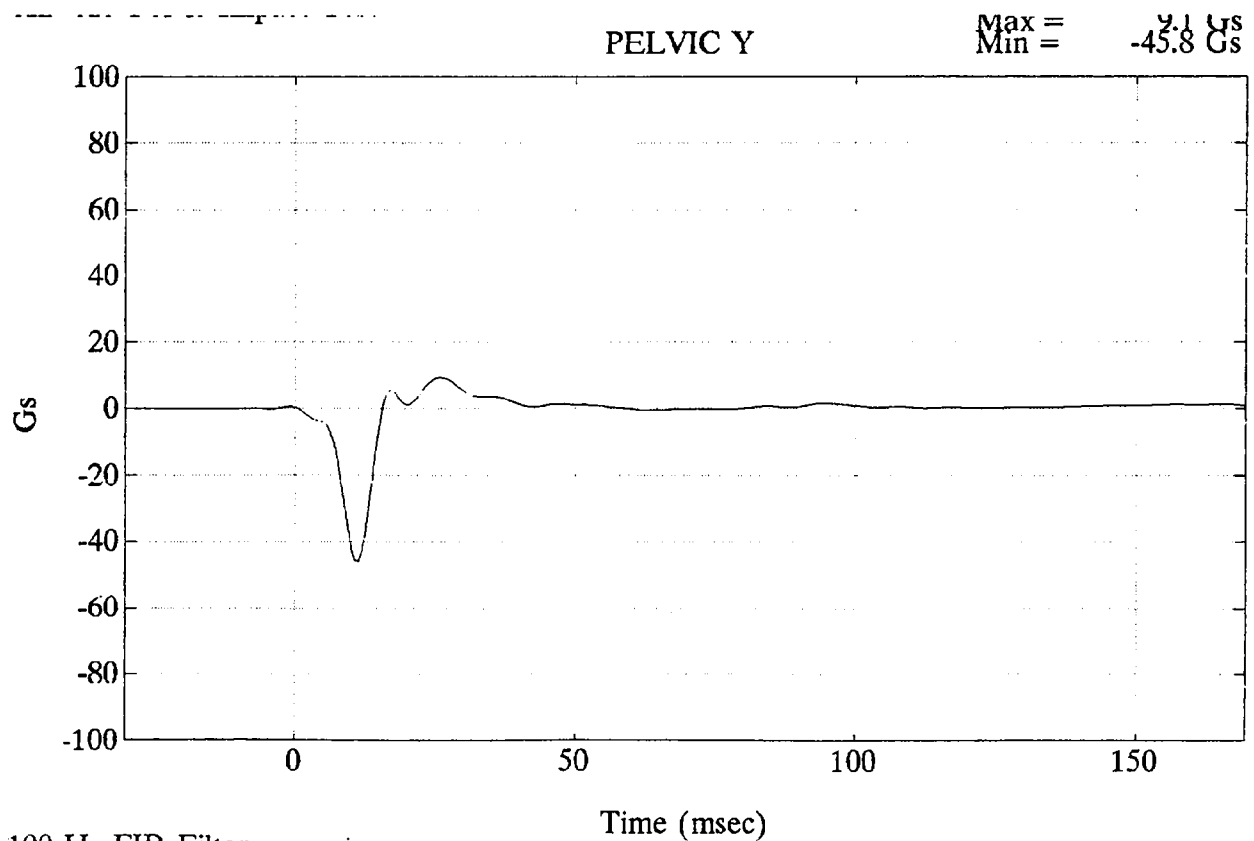
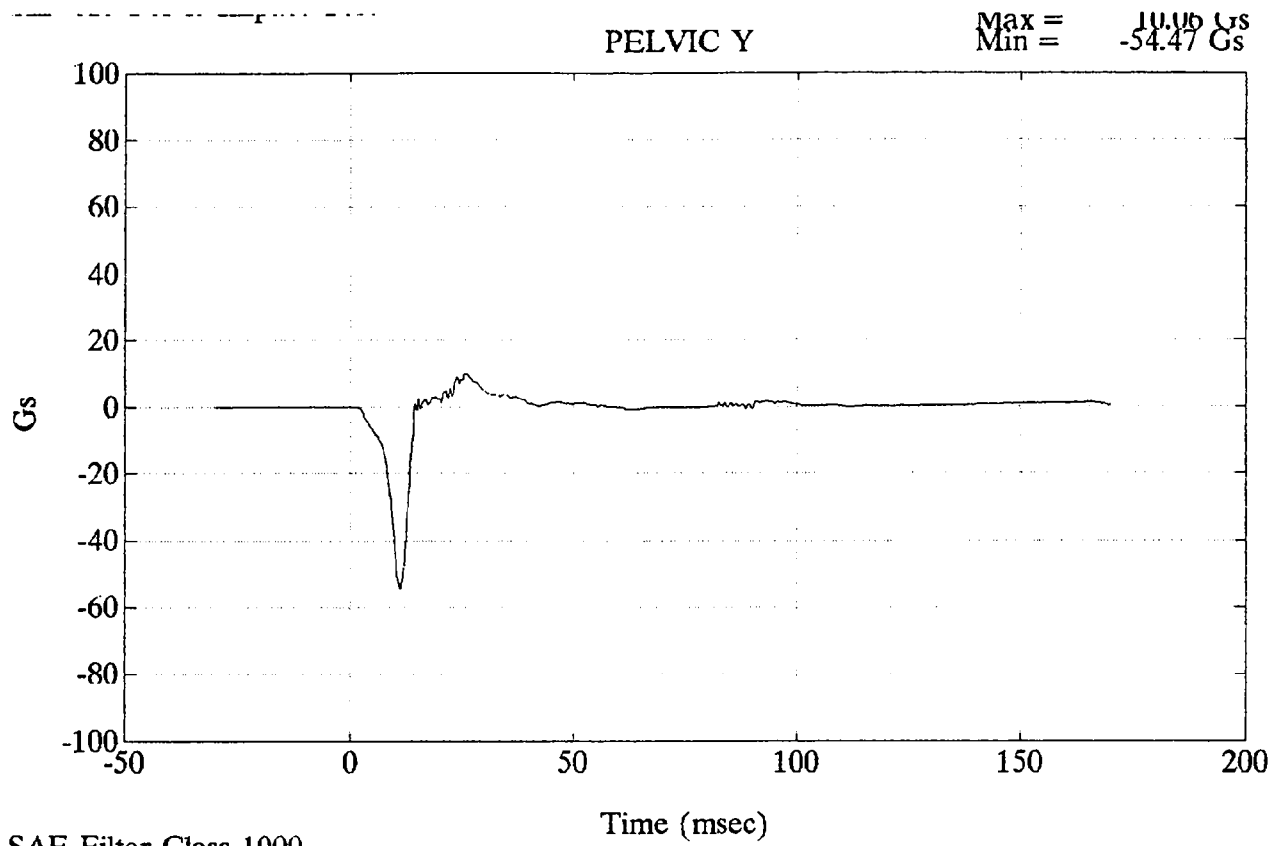
LATERAL PELVIS IMPACT TEST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 015 Calspan Sequential Test Number: 2
Date: 10/23/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.7
RELATIVE HUMIDITY (%)	10 - 70	34
PROBE SPEED (m/s)	4.27 - 4.33	4.28
PELVIS ACCELERATION (g's)	40 - 60	45.9

REMARKS: None



POST TEST DUMMY INSPECTION LIST
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 015 Calspan Sequential Test Number: 2
Date: 10/23/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

PART	ITEMS CHECKED	COMMENTS
SKIN	VISUAL INSPECTION	OK
HEAD	VISUAL, BALLAST, ACCELEROMETER MOUNT	OK
NECK	VISUAL, CABLE TORQUE	OK
SPINE BOX	VISUAL, BALLAST, WELDMENT, ACCELEROMETER MOUNT	OK
RIB CAGE	VISUAL, MEASURE, STIFFENERS	OK
STERNUM	VISUAL	OK
LUMBAR SPINE	VISUAL	OK
ABDOMEN	VISUAL	OK
PELVIS	VISUAL, PALPATE, ACCELEROMETER MOUNT	OK
UPPER LEGS	VISUAL	OK
KNEES	VISUAL, STOPS, INSERTS	OK
LOWER LEGS	VISUAL, RANGE OF MOTION	OK
ANKLES	VISUAL, RANGE OF MOTION	OK
FEET	VISUAL, RANGE OF MOTION	OK
JOINTS	1 TO 2 g RANGE	OK
OTHER	NONE	-

REMARKS: None

**CALIBRATION TEST RESULTS
POST TEST**

SID NO.: 016

CONFIGURED FOR LEFT SIDE IMPACT

CALIBRATION TEST RESULTS SUMMARY

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 016 Calspan Sequential Test Number: 2
Date: 10/23/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

TEST	COMMENTS
EXTERNAL DIMENSIONS	Passed all requirements.
LATERAL THORAX IMPACT TEST	Passed all requirements.
LATERAL PELVIS IMPACT TEST	Passed all requirements.
ABDOMINAL COMPRESSION TEST*	Not Requested By COTR
LUMBAR FLEXION TEST*	Not Requested By COTR

* Test not required for SID certification.

REMARKS: None

EXTERNAL DIMENSIONS

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 016 Calspan Sequential Test Number: 2
Date: 10/23/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	902
RH- Rib Height (mm)	502 - 520	513
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 - 241	240
KH- Knee Pivot from Back Line (mm)	511 - 526	525
KV- Knee Pivot to Floor (mm)	490 - 505	494
HW- Hip Width (mm)	356 - 391	361

REMARKS: None

LATERAL THORAX IMPACT TEST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 016

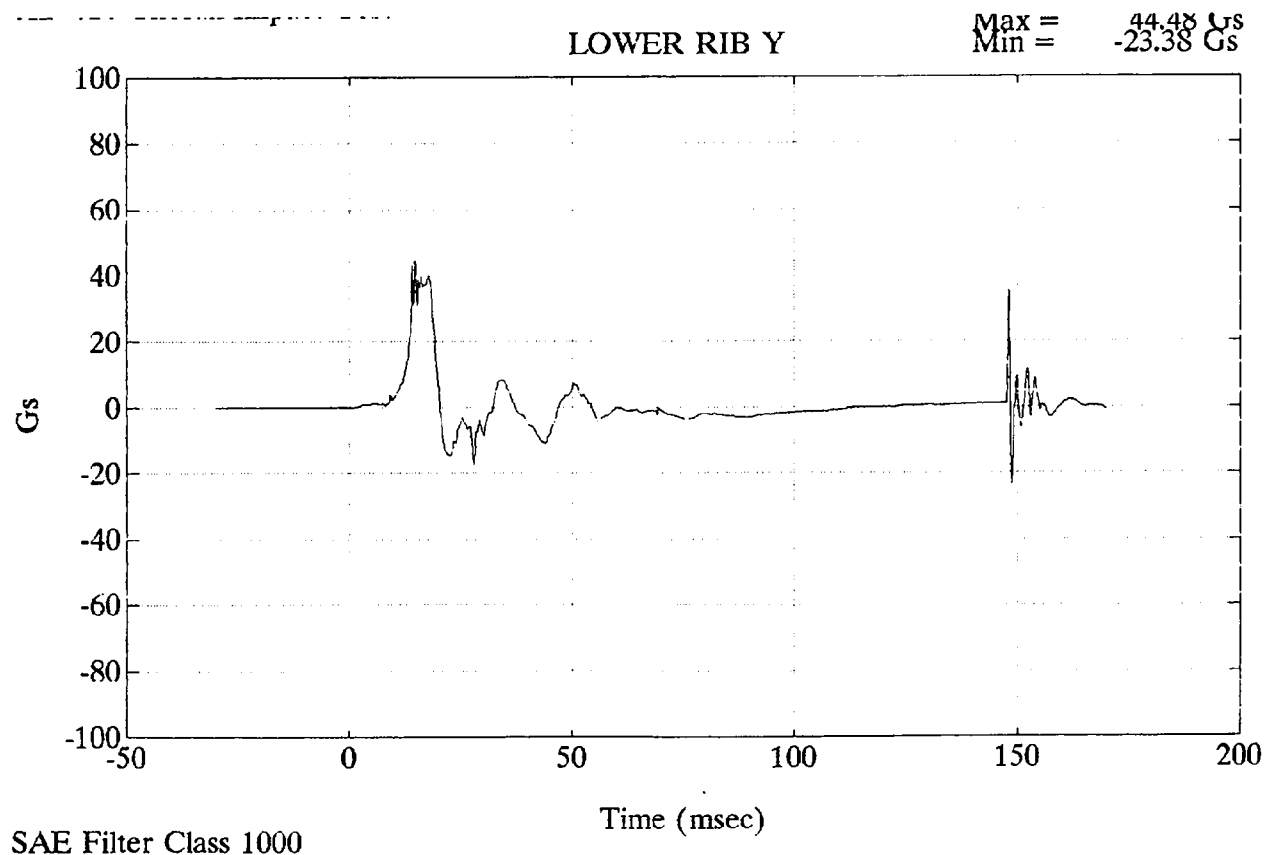
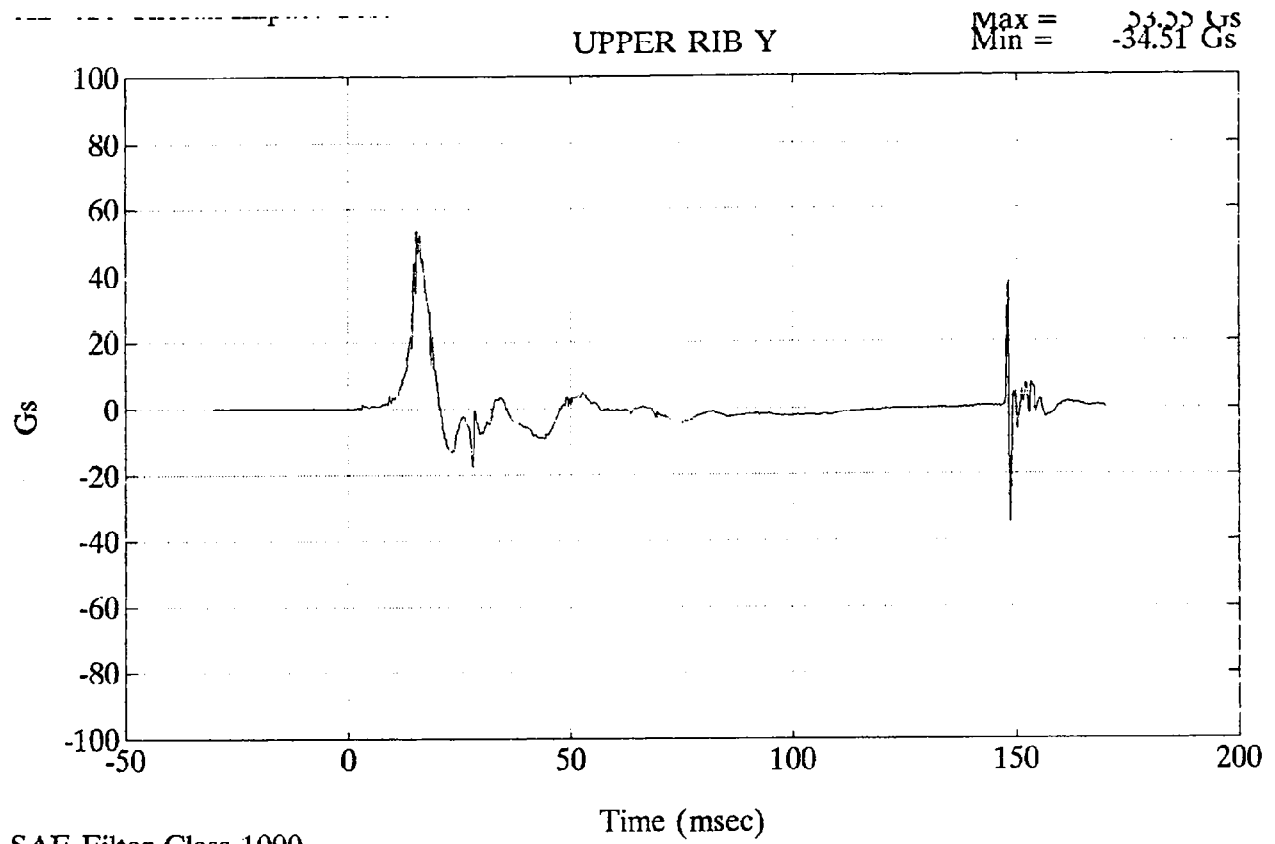
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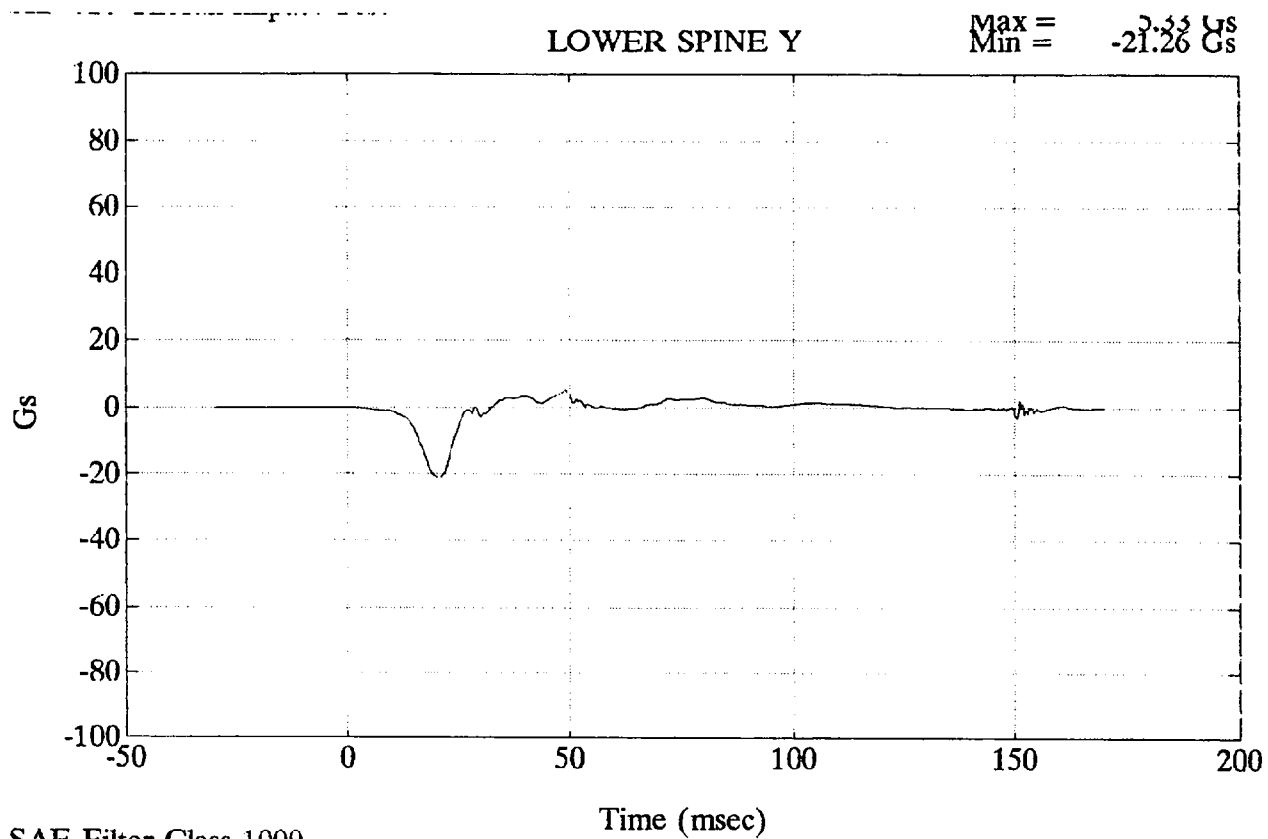
Date: 10/23/97

Laboratory Technician: B. Swiecicki, G. Serbinowski

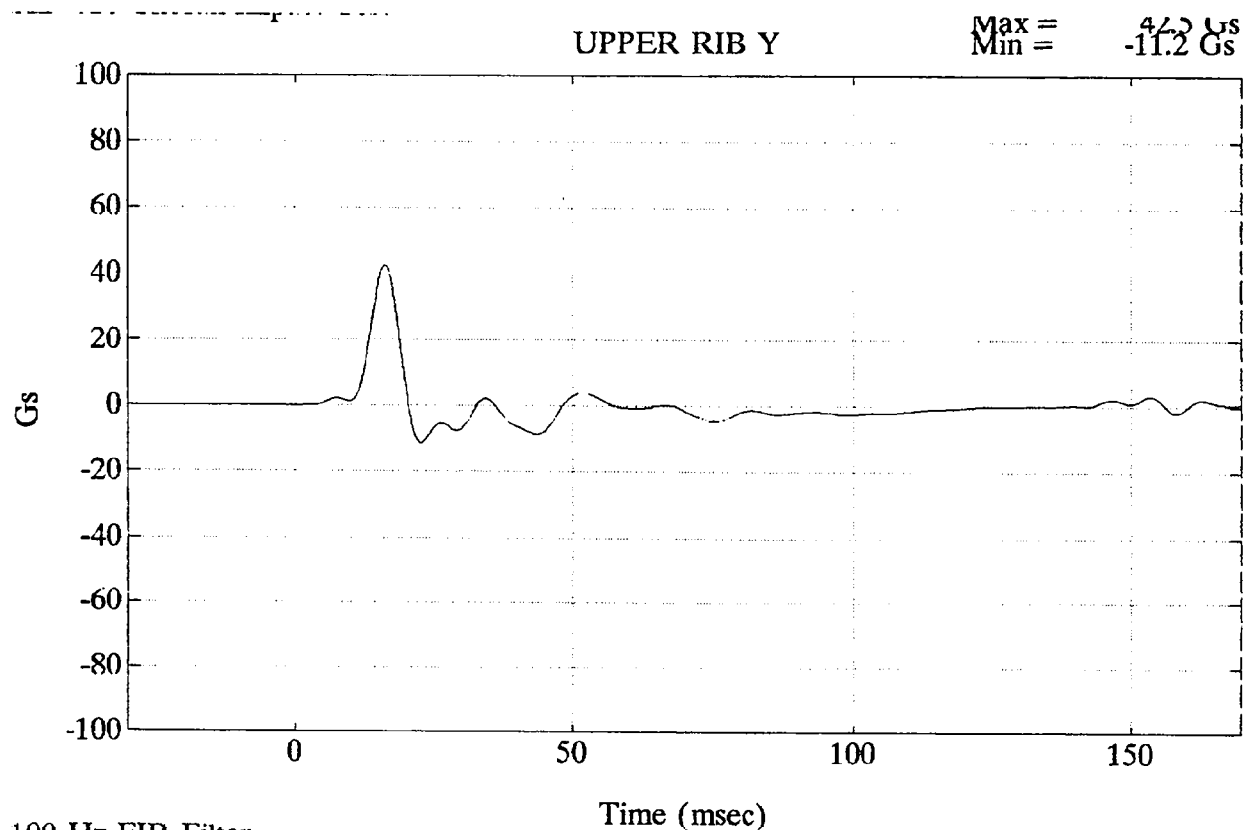
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.7
RELATIVE HUMIDITY (%)	10 - 70	34
PROBE SPEED (m/s)	4.27 - 4.33	4.27
UPPER RIB (g's)	37 - 46	42.6
LOWER RIB (g's)	37 - 46	41.9
LOWER SPINE (g's)	15 - 22	21.3

REMARKS: None

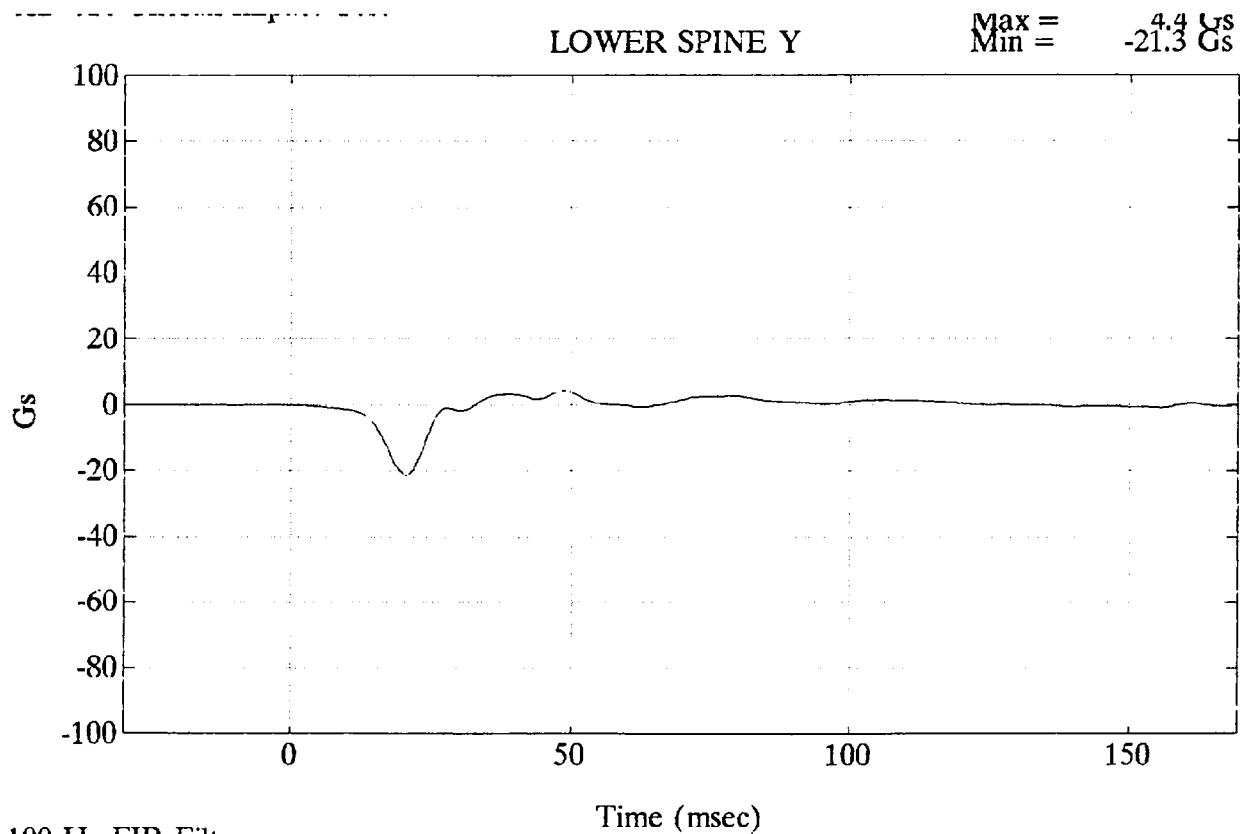
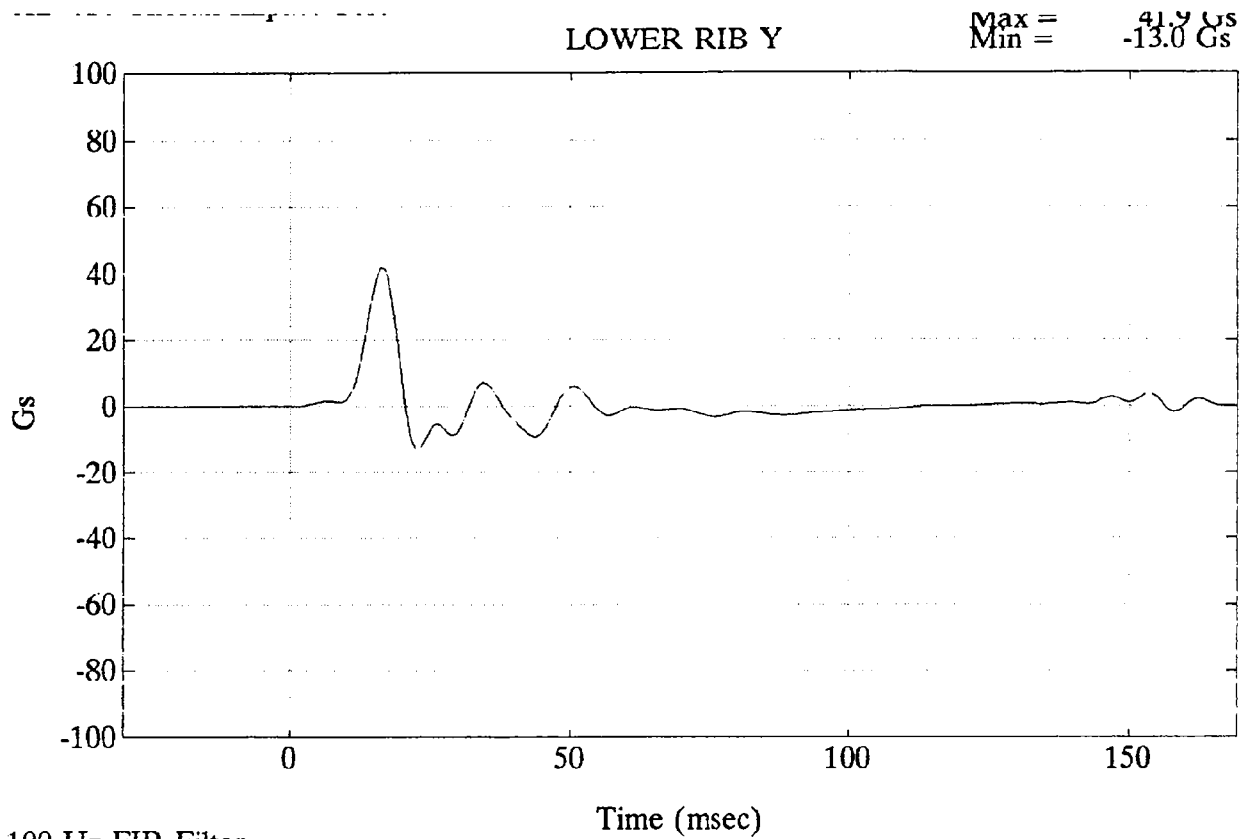




SAE Filter Class 1000



100 Hz FIR Filter



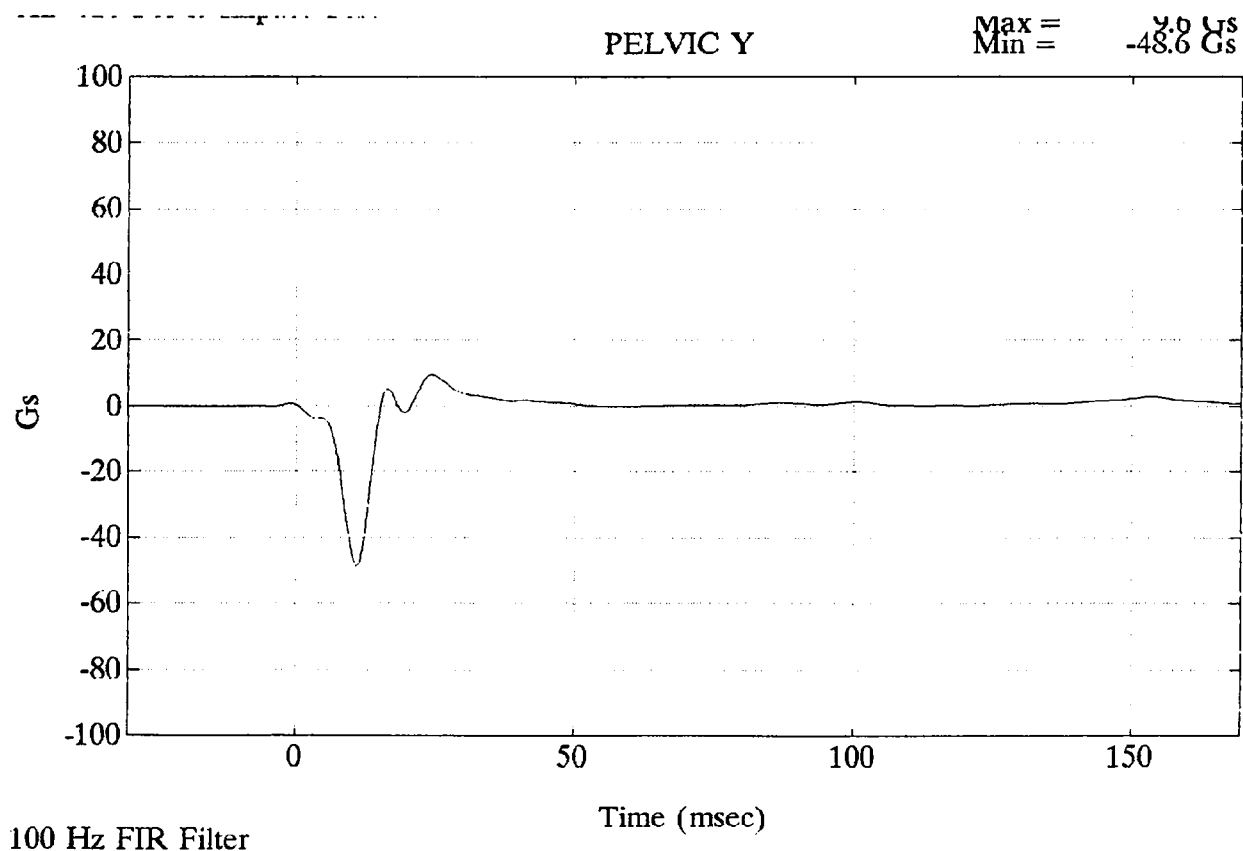
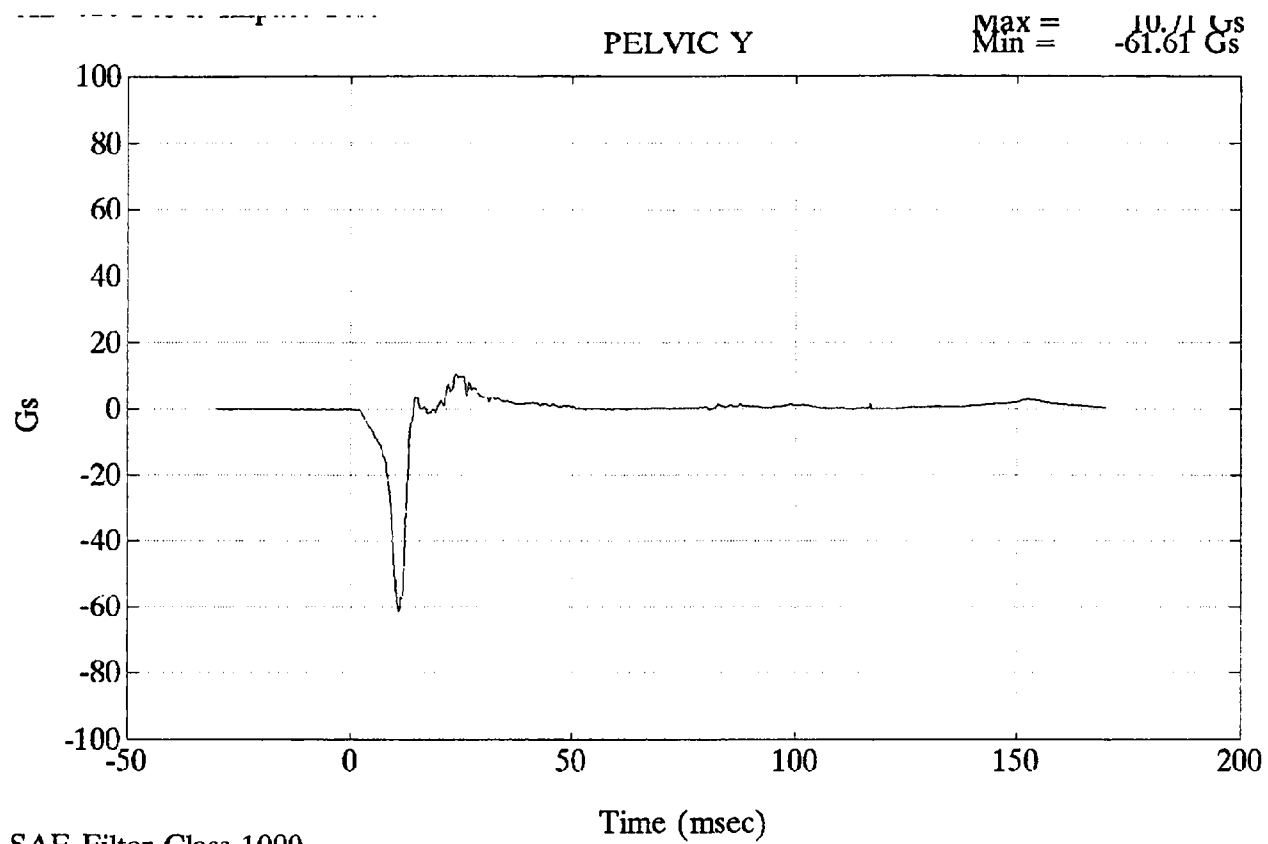
LATERAL PELVIS IMPACT TEST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 016 Calspan Sequential Test Number: 2
Date: 10/23/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.7
RELATIVE HUMIDITY (%)	10 - 70	34
PROBE SPEED (m/s)	4.27 - 4.33	4.32
PELVIS ACCELERATION (g's)	40 - 60	48.7

REMARKS: None



POST TEST DUMMY INSPECTION LIST
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 016 Calspan Sequential Test Number: 2
Date: 10/23/97 Laboratory Technician: B. Swiecicki, G. Serbinowski

PART	ITEMS CHECKED	COMMENTS
SKIN	VISUAL INSPECTION	OK
HEAD	VISUAL, BALLAST, ACCELEROMETER MOUNT	OK
NECK	VISUAL, CABLE TORQUE	OK
SPINE BOX	VISUAL, BALLAST, WELDMENT, ACCELEROMETER MOUNT	OK
RIB CAGE	VISUAL, MEASURE, STIFFENERS	OK
STERNUM	VISUAL	OK
LUMBAR SPINE	VISUAL	OK
ABDOMEN	VISUAL	OK
PELVIS	VISUAL, PALPATE, ACCELEROMETER MOUNT	OK
UPPER LEGS	VISUAL	OK
KNEES	VISUAL, STOPS, INSERTS	OK
LOWER LEGS	VISUAL, RANGE OF MOTION	OK
ANKLES	VISUAL, RANGE OF MOTION	OK
FEET	VISUAL, RANGE OF MOTION	OK
JOINTS	1 TO 2 g RANGE	OK
OTHER	NONE	-

REMARKS: None

APPENDIX D

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

SID INSTRUMENTATION

	FRONT SID NO.: 015		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
UPPER RIB	J18570	ENDEVCO	9/97
LOWER RIB	A14151	ENDEVCO	9/97
LOWER SPINE	B10827	ENDEVCO	6/97
PELVIS	AP1A2	ENDEVCO	5/97
UPPER RIB REDUNDANT	J18622	ENDEVCO	9/97
LOWER RIB REDUNDANT	A14151	ENDEVCO	10/97
LOWER SPINE REDUNDANT	AA4P6	ENDEVCO	10/97
PELVIS REDUNDANT	J18577	ENDEVCO	10/97

	REAR SID NO.: 016		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
UPPER RIB	B10955	ENDEVCO	6/97
LOWER RIB	A14172	ENDEVCO	9/97
LOWER SPINE	A13926	ENDEVCO	9/97
PELVIS	A13858	ENDEVCO	9/97
UPPER RIB REDUNDANT	J18439	ENDEVCO	8/97
LOWER RIB REDUNDANT	A13902	ENDEVCO	10/97
LOWER SPINE REDUNDANT	AN943	ENDEVCO	10/97
PELVIS REDUNDANT	B10481	ENDEVCO	10/97

REMARKS: None

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

VEHICLE AND MDB INSTRUMENTATION

	VEHICLE AND MDB INSTRUMENTS		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
RIGHT FRONT SILL (X)	MB19	ENTRAN	10/97
RIGHT FRONT SILL (Y)	MB08	ENTRAN	10/97
RIGHT FRONT SILL (Z)	MB10	ENTRAN	10/97
RIGHT REAR SILL (X)	AP065	ENDEVCO	10/97
RIGHT REAR SILL (Y)	APA29	ENDEVCO	10/97
RIGHT REAR SILL (Z)	AP1B6	ENDEVCO	10/97
REAR FLOORPAN ABOVE AXLE (X)	MB12	ENTRAN	10/97
REAR FLOORPAN ABOVE AXLE (Y)	D12	ENTRAN	10/97
REAR FLOORPAN ABOVE AXLE (Z)	D03	ENTRAN	10/97
LEFT REAR SILL (Y)	BA65	ENDEVCO	10/97
LEFT FRONT SILL (Y)	BA95	ENDEVCO	10/97
RIGHT REAR SEAT OCCUPANT COMP. (Y)	D72	ENTRAN	10/97
LOWER LEFT B- PILLAR (Y)	Z08	ENDEVCO	10/97
MIDDLE LEFT B-PILLAR (Y)	AC827	ENDEVCO	10/97
LOWER LEFT A-PILLAR (Y)	Z02	ENDEVCO	10/97
UPPER LEFT A-PILLAR (Y)	-	-	-
FRONT SEAT TRACK (Y)	BB14	ENDEVCO	10/97
REAR SEAT TRACK (Y)	-	-	-
VEHICLE CG (X)	A13941	ENDEVCO	10/97
VEHICLE CG (Y)	A13517	ENDEVCO	10/97
VEHICLE CG (Z)	A13937	ENDEVCO	10/97
MDB CG (X)	CL60	ENDEVCO	9/97
MDB CG (Y)	CJ54	ENDEVCO	9/97
MDB CG (Z)	CH35	ENDEVCO	9/97
MDB REAR FRAME MEMBER (X)	FL04	ENDEVCO	9/97
MDB REAR FRAME MEMBER (Y)	GL77	ENDEVCO	9/97

REMARKS: None