

REPORT NUMBER: TO2-MGA-2001-001

35 MPH FRONTAL BARRIER IMPACT TEST

**1998 Audi A8 4 Door Sedan
NHTSA NUMBER: RW0511**

**PREPARED BY:
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March 8, 2001

FINAL REPORT

**PREPARED FOR:
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This final test report was prepared for the John A Volpe National Transportation Systems Center, in response to Contract Number DTRS57-98-C-00041, Task Order #2

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Date 6-7-01

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Date 6-7-01

FINAL REPORT ACCEPTED BY

Manager, TTD #2 Test program

Date of Acceptance

COTR, TTD#2 Frontal Impact Test

Date of Acceptance

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SECTION 1
PURPOSE AND TEST PROCEDURE

1.1 PURPOSE

This 35 mph (56.3 km/h) frontal barrier impact test is part of Contract Number DTRS57-98-C-00041 Task Order #2 - Crash test for the Audi A8. The purpose of this test is to obtain vehicle crash pulse data for the development of vehicle models in frontal barrier impacts.

1.2 TEST PROCEDURE

This 56.3 km/h frontal barrier impact test was conducted in accordance with a modified Office of Crashworthiness Standards (OCS) New Car Assessment Program (NCAP) Laboratory Test Procedure, dated December 1999 and the corresponding MGA Research Corporation Test Procedure NHTSA3, dated January 5, 2001. Procedures for receiving, inspection, and reporting of test results are described in the test procedures and are not repeated in this report.

The test was conducted at MGA Research Corporation on March 8, 2001 at a speed of 56.2 km/h. The test vehicle was instrumented with thirty-four (34) accelerometers to measure longitudinal, lateral and vertical axis accelerations. The specified impact velocity range was 54.5 to 57.5 km/h. The frontal barrier impact event was documented by one (1) real-time panning motion picture camera and ten (10) high-speed motion picture cameras. Camera locations and pertinent camera information is documented in the data sheets. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The data was digitally sampled at 10,000 samples per second and processed per section IP11 of the Laboratory Test Procedure.

1.3 SUMMARY OF FRONTAL IMPACT TEST

A rigid load cell barrier was impacted by a 1998 Audi A8 4 Door sedan at a velocity of 56.2 km/h. The test vehicle weight was 2058.4 kilograms. Six (6) load cell barrier data channels were obtained in conducting the TTD#2 Test. The test vehicle is equipped with a longitudinally mounted 8-cylinder engine and an automatic transmission.

The test vehicle sustained a maximum static crush of 675 mm located to the right of the vehicle centerline. Both the driver and passenger side doors opened without the aid of tools.

1.4 GENERAL COMMENTS

The vehicle had the hood, fenders, all interior components, front bumper, and trunk interior removed.

The vehicle, camera, and measurement data are presented in Section 2. Appendix A contains the still photograph prints. Appendix B contains the vehicle response data traces. Appendix C contains the instrumentation calibration data.

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

Test Vehicle: 1998/Audi/A8/4 Door sedan

NHTSA No.: RW0511

Test Program: TO #2

Test Date: March 8, 2001

CONVERSION FACTORS USED IN THIS REPORT*

Quantity	Typical Application	Old Units	Metric Unit	Multiply By
Mass	Vehicle Weight	lb	kg	0.4536
Linear Velocity	Impact Velocity	mile/h	km/h	1.609
Length or Distance	Measurements	in	mm	25.4
Volume	Fuel Systems	gal	liter	3.785
Volume	Small Fluids	oz	mL	29.573
Pressure	Tire Pressure	lbf/in ²	kPa	7.0
Volume	Liquid	gal	liter	3.785
Temperature	General Use	°F	°C	$=(tf - 32)/1.8$
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf/ft	Nm	1.355

*Based on the Recommended Practice in SAE J916, May 85

DATA SHEET NO. 1

CRASH TEST SUMMARY

Test Vehicle: 1998/Audi/A8/4 Door sedan

NHTSA No.: RW0511

Test Program: TO #2

Test Date: March 8, 2001

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/h	56.2
Test Weight	kg	2058.4
Impact Angle	degrees	0
Average Rebound	mm	651
Maximum Static Crush	mm	675

DOOR OPENING

Description	Driver	Passenger
Front Door Opening	YES	YES
Rear Door Opening	YES	YES

16mm MOVIE COVERAGE

High Speed	10
Real Time	1
Total	11

INSTRUMENTATION

Vehicle Structure Accelerometers	34
Rigid Barrier Load Cells	6
Total	40

DATA SHEET NO. 4...(continued)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 1998/Audi/A8/4 Door sedan

NHTSA No.: RW0511

Test Program: TO #2

Test Date: March 8, 2001

VEHICLE X-AXIS ACCELEROMETER PEAK DATA AND PRE-TEST LOCATIONS

No	Accelerometer Location	Measurements (mm)			Peak Values				
		X	Y	Z	Units	Max	Time	Min	Time
11	Right Front Frame Rail @ Bumper X ⁴	4613	480	528	G's	217.2	19	219.4	15
	Right Front Frame Rail @ Bumper Y ⁴				G's	656.7	19	210.3	12
	Right Front Frame Rail @ Bumper Z ⁴				G's	201.8	16	67.4	12
12	Left Front Frame Rail @ Shock Brace X	4040	-480	550	G's	23.0	45	115.4	30
	Left Front Frame Rail @ Shock Brace Z				G's	58.5	22	47.4	26
13	Right Front Frame Rail @ Shock Brace X	4040	480	550	G's	24.4	13	210.9	27
	Right Front Frame Rail @ Shock Brace Z				G's	32.6	40	39.2	28
14	Left Front Frame Rail Behind Shock Brace X	3760	-400	540	G's	49.0	35	267.7	21
	Left Front Frame Rail Behind Shock Brace Z				G's	59.7	37	106.6	21
15	Right Front Frame Rail Behind Shock Brace X ⁵	3760	400	540	G's	252.8	27	30.7	13
	Right Front Frame Rail Behind Shock Brace Z ⁵				G's	49.4	21	65.3	40
16	Rear Compartment Center X	1290	0	610	G's	1.0	193	28.6	41
	Rear Compartment Center Y				G's	5.3	47	4.9	79
	Rear Compartment Center Z				G's	28.9	80	39.7	73
17	Right Upper B-Pillar X	2285	570	1345	G's	39.9	40	66.0	29
18	Left Upper B-pillar X	2285	-570	1345	G's	12.6	40	61.1	29

Reference Points: X - From Rear Surface of Vehicle (+ forward)

Y - Vehicle Centerline (+ to right)

Z - Ground Plane (+ up)

⁴ Questionable Data After 20 msec.

⁵ Questionable Data After 53 msec.

DATA SHEET NO. 2...(continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 1998/Audi/A8/4 Door sedan

NHTSA No.: RW0511

Test Program: TO #2

Test Date: March 8, 2001

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	430.9	195.5		509.8	551.6	
Right	kg	392.8	166.0		552.9	444.1	
Ratio	%	69	31		52	48	
Totals	kg	823.7	361.5	1185.2	1062.7	995.7	2058.4

Vehicle Wheelbase (mm): 2884

Weight of Ballast secured in cargo area (kg): 881

Vehicle Components Removed: Vehicle was received stripped, from Oak Ridge Laboratories ballast weight was added to replace vehicle components that were not attached to the vehicle.

Ballast weight does not include cameras, instrumentation.

**DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 1998/Audi/A8/4 Door sedan

NHTSA No.: RW0511

Test Program: TO #2

Test Date: March 8, 2001

TEST VEHICLE INFORMATION

Manufacturer	AUDI AG
Model	A8
Body Style	4 DOOR SEDAN
NHTSA No.	RW0511
VIN	WAUAF74D5WN00206
Color	DK GREEN
Delivery Date	10/26/00
Odometer Reading (mile)	Not Applicable
Dealer	Not Applicable
Transmission	5 SPEED AUTOMATIC
Final Drive	FRONT
Number of Cylinders	8
Engine Placement	LONGITUDINAL

TEST VEHICLE OPTIONS

Driver Airbag	YES
Passenger Airbag	N/A
Power Windows	YES
Power Steering	YES
Power Door Locks	YES
Tilt Wheel	YES
Air Conditioning	YES
Power Brakes	YES
Disc Brakes, Front	YES
Disc Brakes, Rear	NO
Anti-lock Brakes	YES
AM/FM/Cassette	N/A
Anti-theft System	N/A
Cruise Control	YES

DATA FROM CERTIFICATION LABEL

Manufactured By	AUDI AG	GVWR (kg)	2199
Date of Manufacture	9-97	GAWR Front (kg)	1220
		GAWR Rear (kg)	1150

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	308	308
Cold Pressure (kPa)	294	294
Recommended Tire Size	P225/55R17	P225/55R17
Tire Size on Vehicle	P225/55R17	P225/55R17
Tire Manufacturer	GOODYEAR	GOODYEAR

DATA SHEET NO. 4

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 1998/Audi/A8/4 Door sedan

NHTSA No.: RW0511

Test Program: TO #2

Test Date: March 8, 2001

VEHICLE X-AXIS ACCELEROMETER PEAK DATA AND PRE-TEST LOCATIONS

No	Accelerometer Location	Measurements (mm)			Peak Values				
		X	Y	Z	Units	Max	Time	Min	Time
1	Left Rear X-Member (Primary)	2030	-530	398	G's	1.0	195	46.3	39
2	Right Rear X-Member (Primary)	2030	530	398	G's	0.8	199	31.1	42
3	Vehicle CG X	3335	0	570	G's	25.6	129	116.4	37
	Vehicle CG Y				G's	66.9	40	69.1	46
	Vehicle CG Z				G's	57.7	27	68.4	34
4	Left Shock Tower X	4010	-420	890	G's	17.4	92	78.5	27
	Left Shock Tower Y				G's	52.5	40	64.8	45
5	Right Shock Tower X	4010	420	890	G's	35.5	48	168.5	39
	Right Shock Tower Y				G's	57.3	42	66.5	47
6	Engine Front Top X	4563	0	868	G's	67.6	28	228.4	19
	Engine Front Top Z				G's	44.3	30	40.4	37
7	Engine Rear Top X ¹	4288	0	868	G's	74.5	28	234.2	19
	Engine Rear Top Z ¹				G's	30.3	19	23.9	37
8	Engine Bottom X ²	4500	0	205	G's	NVD	NVD	NVD	NVD
9	Firewall / Shock Support X	4010	0	815	G's	122.7	30	145.6	19
10	Left Front Frame Rail @ Bumper X ³	4613	-480	528	G's	1.5	4	81.0	16
	Left Front Frame Rail @ Bumper Y ³				G's	84.5	11	117.7	8
	Left Front Frame Rail @ Bumper Z ³				G's	255.4	16	99.6	11

Reference Points: X - From Rear Surface of Vehicle (+ forward)

Y - Vehicle Centerline (+ to right)

Z - Ground Plane (+ up)

¹ Questionable Data After 58 msec.

² No Valid Data Collected

³ Questionable Data After 16 msec.

DATA SHEET NO. 3**POST IMPACT DATA**Test Vehicle: 1998/Audi/A8/4 Door sedanNHTSA No.: RW0511Test Program: TO #2Test Date: March 8, 2001

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	54.5 -57.5	56.2
Trap No. 1 Entry Distance	mm	<1524	1300
Trap No. 1 Exit Distance	mm	<1524	300
Trap No. 2 Velocity (Redundant)	km/h	54.5-57.5	56.3
Trap No. 2 Entry Distance	mm	<1524	1425
Trap No. 2 Exit Distance	mm	<1524	425

VEHICLE STATIC CRUSH

Measured Parameter	Units	Pre-Test	Post-Test	Difference
Left Side	mm	4845	4254	591
Center	mm	4974	4305	669
Right Side	mm	4845	4177	668

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	664
Center	mm	648
Right Side	mm	641
Average	mm	651

DATA SHEET NO. 5

VEHICLE MEASUREMENTS

Test Vehicle: 1998/Audi/A8/4 Door sedan

NHTSA No.: RW0511

Test Program: TO #2

Test Date: March 8, 2001

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total length of vehicle at centerline	mm	4974	4305	669
2	RSOV to front of engine	mm	4539	3959	580
3	RSOV to firewall centerline	mm	4036	3535	501
4	RSOV to leading edge of right door	mm	3409	3408	1
5	RSOV to leading edge of left door	mm	3408	3395	13
6	RSOV to lower leading edge of right door	mm	3474	3450	24
7	RSOV to lower leading edge of left door	mm	3483	3450	33
8	RSOV to upper leading edge of right door	mm	2352	2354	-2
9	RSOV to upper leading edge of left door	mm	2344	2345	-1
10	RSOV to lower trailing edge of right door	mm	2364	2336	28
11	RSOV to lower trailing edge of left door	mm	2368	2343	25
12	RSOV to bottom of right 'A' pillar	mm	3503	3478	25
13	RSOV to bottom of left 'A' pillar	mm	3502	3490	12
14	RSOV to firewall on right side	mm	3537	3453	84
15	RSOV to firewall on left side	mm	3531	3443	88
16	RSOV to steering column	mm	2970	2812	158
17	Center of steering column to left 'A' pillar	mm	505	873	-368
18	Center of steering column to headlining	mm	533	927	-394
19	RSOV to right side of front bumper	mm	4845	4254	591
20	RSOV to left side of front bumper	mm	4845	4177	668
21	Length of engine block	mm	460	460	0

RSOV = Rear Surface of Vehicle

DATA SHEET NO. 5...(continued)

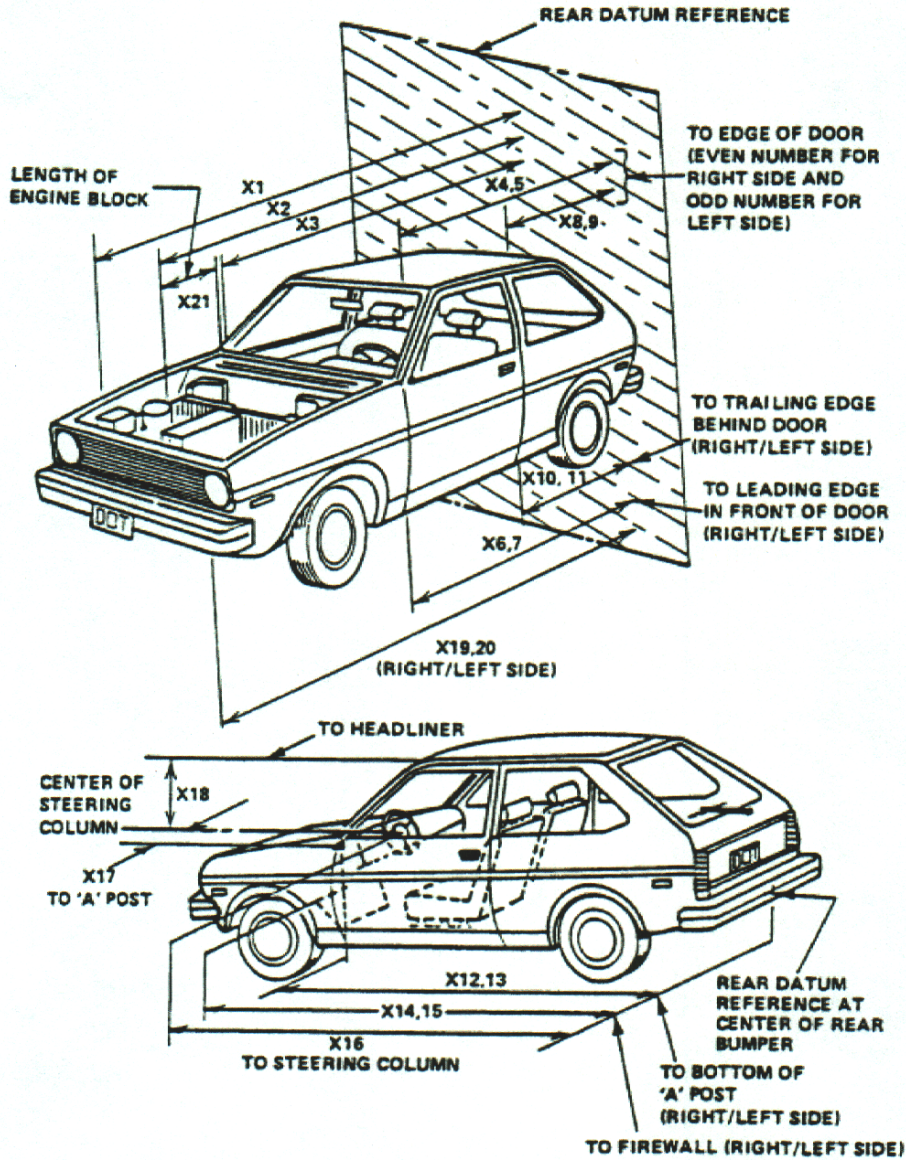
VEHICLE MEASUREMENTS

Test Vehicle: 1998/Audi/A8/4 Door sedan

NHTSA No.: RW0511

Test Program: TO #2

Test Date: March 8, 2001



DATA SHEET NO. 6
CAMERA LOCATIONS

Test Vehicle: 1998/Audi/A8/4 Door sedan

NHTSA No.: RW0511

Test Program: TO #2

Test Date: March 8, 2001

No.	Camera View	Location (mm) *			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Side View				18	32
2	Left Overall	2000	7870	1670	13	1000
3	Left Front Half	1000	8190	1570	25	714
4	Left Wheel Well	90	390	2080	25	1070
5	Right Overall	2100	7280	1650	13	1010
6	Right Front Half	1260	8140	1570	25	1058
7	Right Wheel Well	370	3680	1640	25	1026
8	Top Engine Compartment				25	1020
9	Pit Front #1	1020	0	-3210	13	1053
10	Pit Front #2	1450	0	-3150	13	1020
11	Pit Rear	3090	0	-3150	13	1000

***COORDINATES:**

+X = film plane rearward of barrier

+Y = film plane to right of monorail centerline

+Z = film plane to above ground level

ORIGIN: For X and Y it is the Impact Point. For Z it is the Floor.

CAMERA LOCATIONS

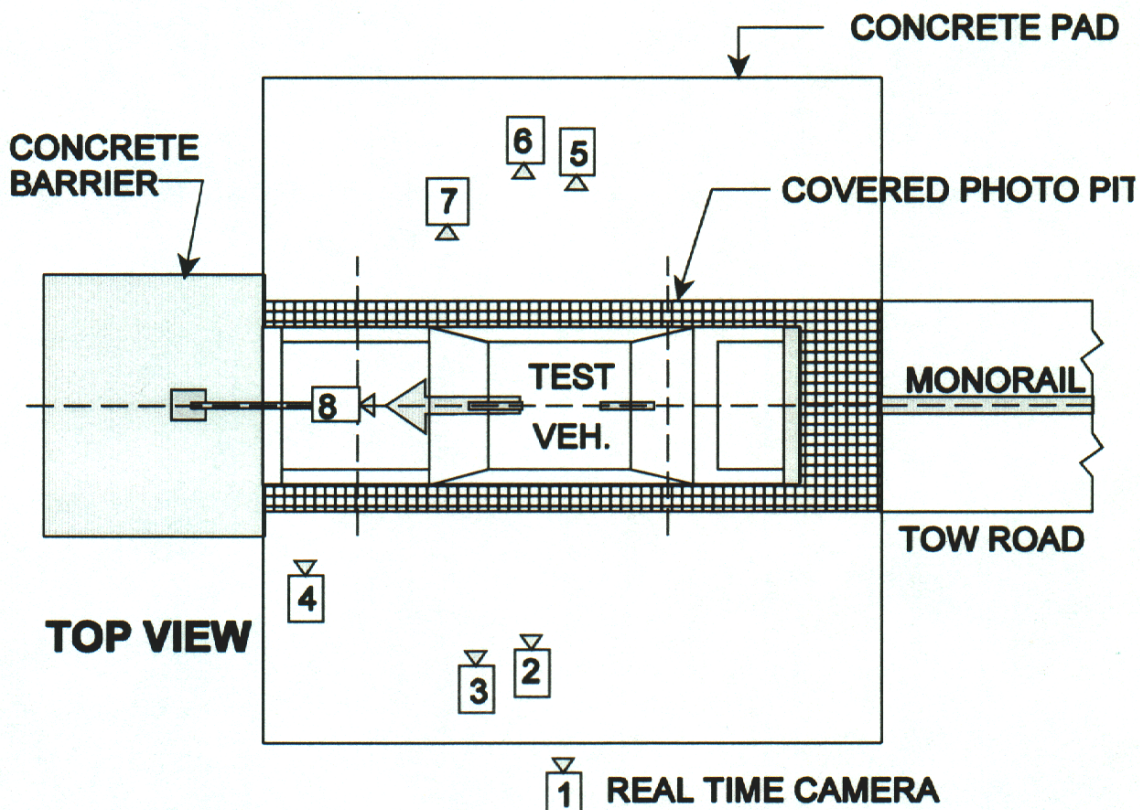
Test Vehicle: 1998/Audi/A8/4 Door sedan

NHTSA No.: RW0511

Test Program: TO #2

Test Date: March 8, 2001

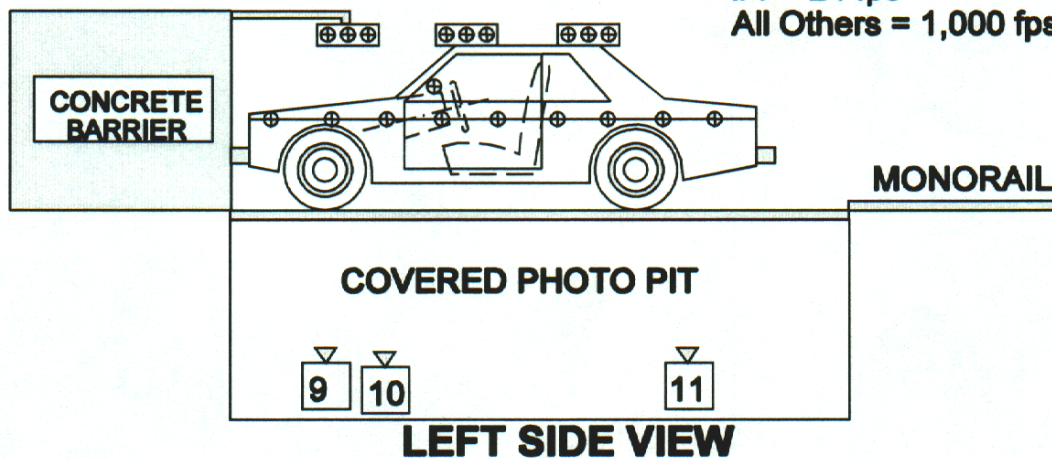
CAMERA POSITIONS FOR FRONTAL IMPACTS



CAMERA FRAME RATES:

#1 = 24 fps

All Others = 1,000 fps



DATA SHEET NO. 7

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 1998/Audi/A8/4 Door sedan

NHTSA No.: RW0511

Test Program: TO #2

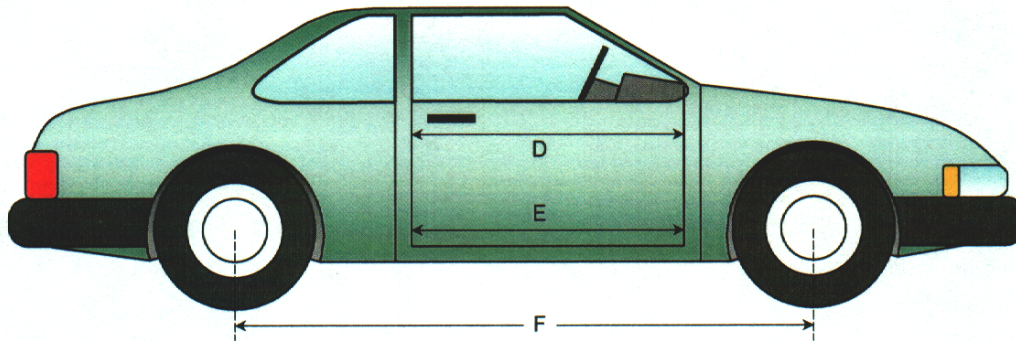
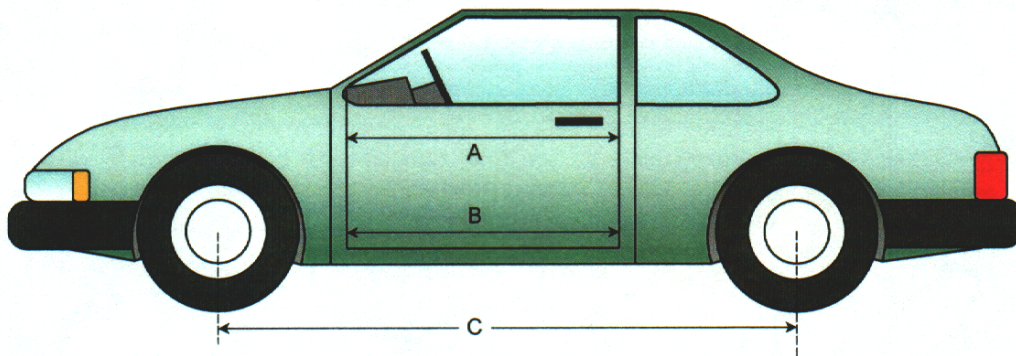
Test Date: March 8, 2001

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	958	913	45
B	Left Side Lower	mm	902	888	14
D	Right Side Upper	mm	947	934	13
E	Right Side Lower	mm	890	889	1

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2884	2755	129
F	Right Side Wheelbase	mm	2884	2764	120



DATA SHEET NO. 7...(continued)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 1998/Audi/A8/4 Door sedan

NHTSA No.: RW0511

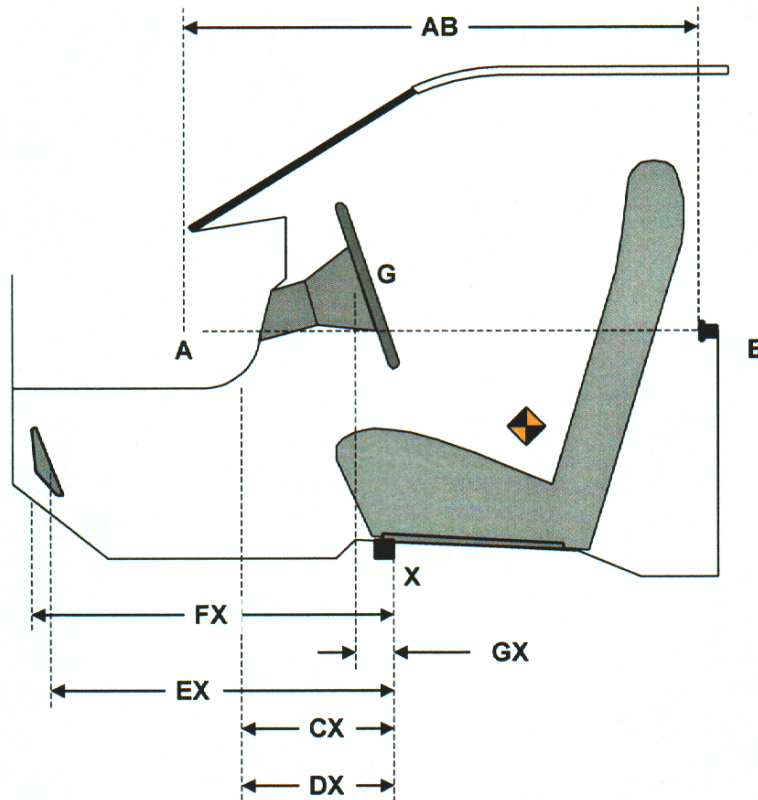
Test Program: TO #2

Test Date: March 8, 2001

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	958	913	45
CX	Left Knee Bolster to X	mm			
DX	Right Knee Bolster to X	mm			
EX	Brake Pedal to X	mm	594	440	154
FX	Foot Rest to X	mm			
GX	Center of Steering Column Wheel Hub to X	mm	31	-92	123

X = Left Front Seat Front Outboard Anchor Bolt Head



DRIVER COMPARTMENT

DATA SHEET NO. 7...(continued)

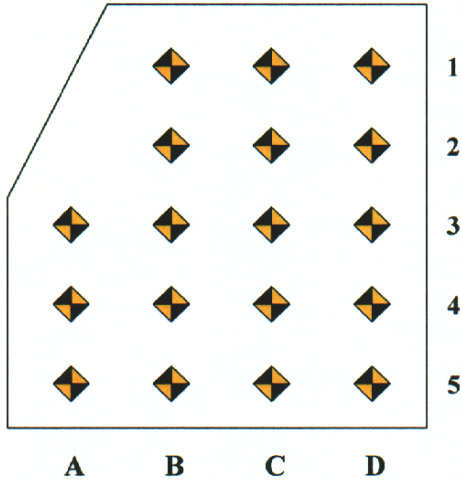
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 1998/Audi/A8/4 Door sedan

NHTSA No.: RW0511

Test Program: TO #2

Test Date: March 8, 2001



Measurement reference point for X and Z axis is the forward outboard seat mounting bolt.

Columns A through D are evenly spaced.

Rows 1 and 2 are on the toe kick portion of the floor pan. Rows 3, 4, and 5 are located on the most level portion of the floor pan.

Row 3 will be at the intersection of the toe kick and the level sections of the floor pan.

DRIVER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1			820	798			680	356			140	442
2			739	720			657	344			82	376
3	588	592	626	620	564	554	539	438	24	38	87	182
4	438	431	427	428	414	421	420	266	24	10	7	162
5	240	240	239	235	234	231	233	193	6	9	6	42

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1			+35	+20			+121	+196			-86	-176
2			-33	-45			-4	+148			-29	-193
3	-121	-119	-81	-87	-127	-112	-61	+132	6	-7	-20	-209
4	-121	-120	-91	-79	-121	-171	-121	+121	0	51	30	-200
5	-136	-133	-80	-76	-126	-153	-110	-15	-10	20	30	-61

DATA SHEET NO. 7...(continued)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 1998/Audi/A8/4 Door sedan

NHTSA No.: RW0511

Test Program: TO #2

Test Date: March 8, 2001

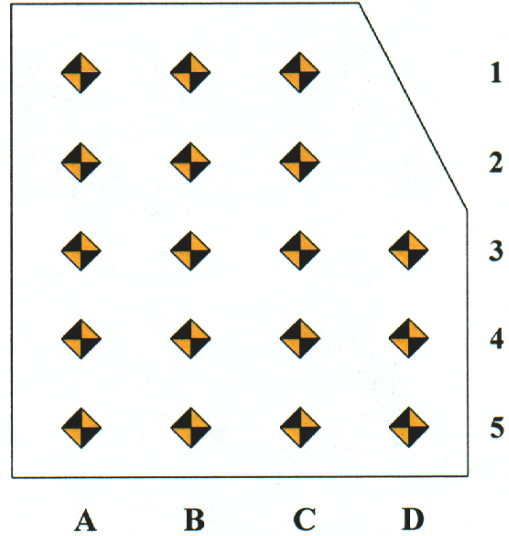
Measurement reference point for X and Z axis is the forward outboard seat mounting bolt.

Columns A through D are evenly spaced.

Rows 1 and 2 are on the toe kick portion of the floor pan.

Rows 3, 4, and 5 are located on the most level portion of the floor pan.

Row 3 will be at the intersection of the toe kick and the level sections of the floor pan.



PASSENGER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	846	845			538	648			308	197		
2	760	765			476	640			284	125		
3	642	638	620	580	369	522	556	574	273	116	64	6
4	441	437	442	444	210	432	433	429	231	5	9	15
5	233	228	235	240	170	228	230	232	63	0	5	8

PASSENGER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	+74	+73			+169	+141			-95	-68		
2	-13	-21			+120	-4			-133	-17		
3	-81	-122	-126	-123	+99	-30	-100	-118	-180	-92	-26	-5
4	-85	-90	-113	-122	+79	-134	-162	-130	-164	44	49	8
5	-80	-78	-134	-133	-59	-115	-164	-134	-21	37	30	1

DATA SHEET NO. 7...(continued)

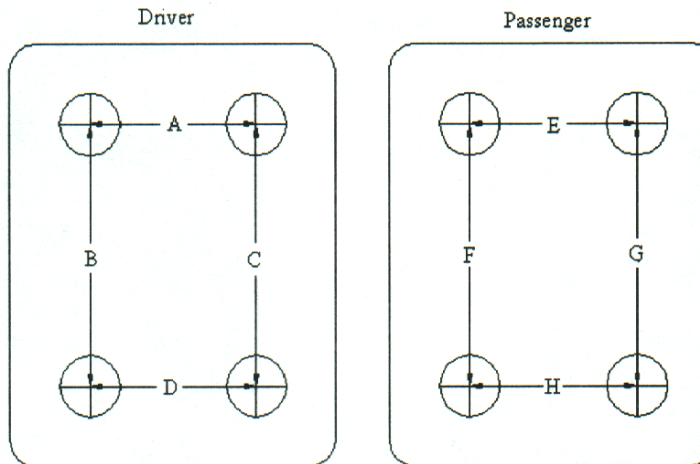
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 1998/Audi/A8/4 Door sedan

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UNDERBODY FLOORBOARD DEFORMATION

MEASUREMENT	PRE TEST	POST TEST	DIFFERENCE
A	292	300	-8
B	244	244	0
C	222	230	-8
D	217	191	26
E	288	292	-4
F	252	250	2
G	254	251	3
H	215	212	3

DATA SHEET NO. 4... (continued)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

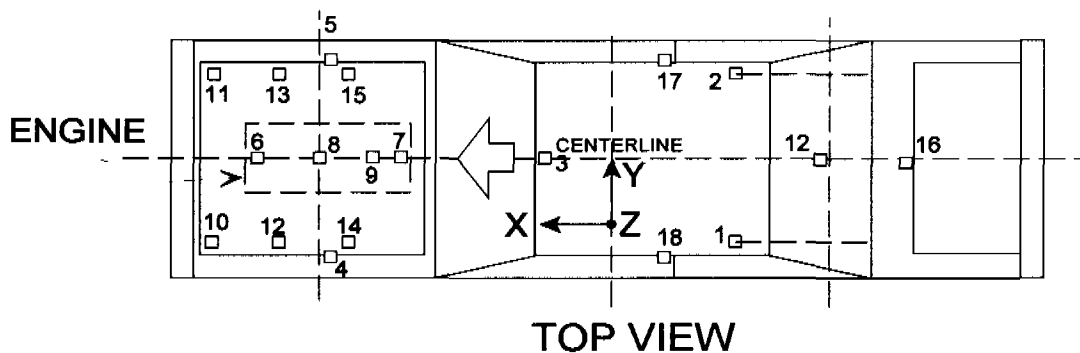
Test Vehicle 1998/Audi/A8/4 Door sedan

NHTSA No RW0511

Test Program TO #2

Test Date March 8, 2001

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



DATA SHEET NO. 8

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle 1998/Audi/A8/4 Door sedan

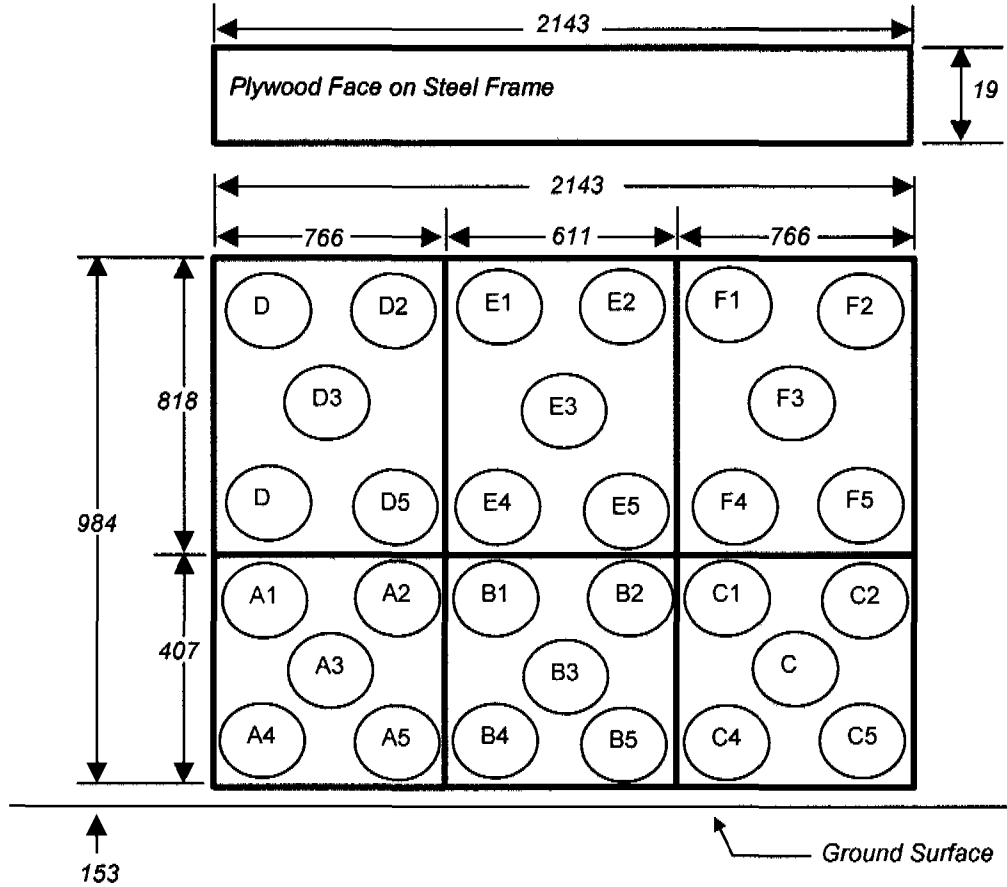
NHTSA No. RW0511

Test Program TO #2

Test Date March 8, 2001

30 Load Cell Rigid Barrier

Load Cell Locations on Fixed Barrier



Group 4 D1-D5	Group 5 E1-E5	Group 6 F1-F5
Group 1 A1-A5	Group 2 B1-B5	Group 3 C1-C5

6 Groups of 5 Load Cells Each

The Data is presented in Appendix B with the following requirements

- 1 Data from 30 individual load cells
- 2 Sum data from 6 groupings shown above (5 cells/group)
- 3 Total or sum of all 30 individual load cells

DATA SHEET NO. 9

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 1998/Audi/A8/4 Door sedan

NHTSA No.: RW0511

Test Program: TO #2

Test Date: March 8, 2001

VEHICLE INFORMATION

VIN: WAVAFZ4D5WN002067

Wheelbase (mm): 2884

Vehicle Size Category: 4 DR SEDAN

Test Weight (kg): 2058

ACCELEROMETER DATA

Cal. Procedure/Interval: MGA procedure / 6 month

Integration Algorithm: Trapezoidal

Linearity: >99.9%

Impact Velocity (km/h): 56.2

Velocity Change (km/h): 66.4

CRUSH PROFILE

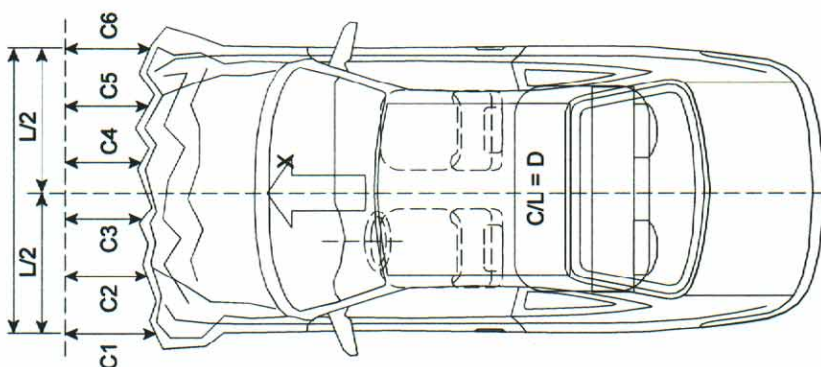
Collision Deformation Classification: FRONTAL

Midpoint of Damage: Centerline

Damage Region Length (mm): 1200

Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4845	4253	592
C2	Crush zone 2 at left side	mm	4945	4312	633
C3	Crush zone 3 at left side	mm	4977	4332	645
C4	Crush zone 4 at right side	mm	4975	4300	675
C5	Crush zone 5 at right side	mm	4944	4272	672
C6	Crush zone 6 at right side	mm	4845	4268	577



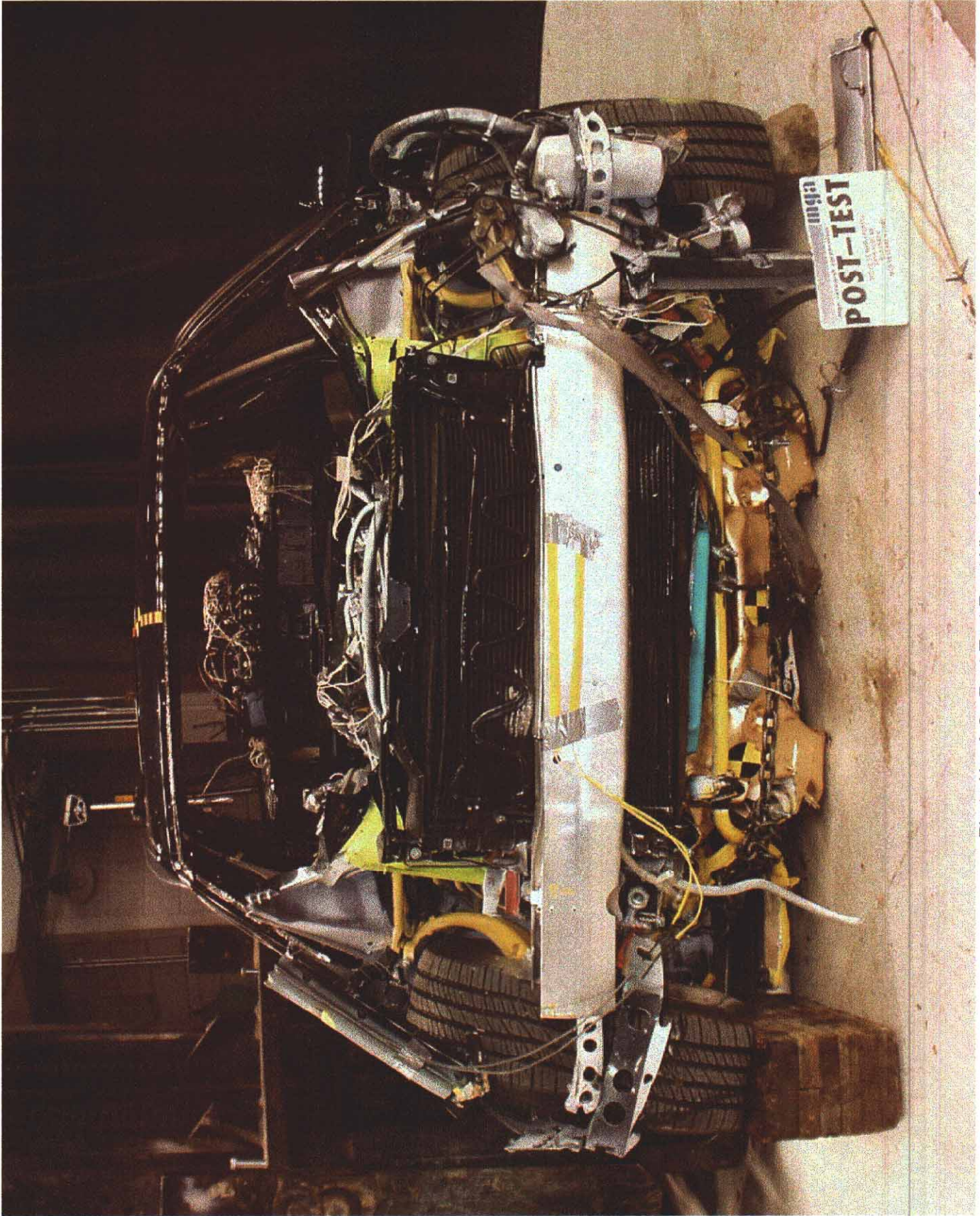


Photo No. A-2 - Post-Test Front View of Test Vehicle



Photo No. A-3 - Pre-Test Rear View of Test Vehicle



Photo No. A-4 - Post-Test Rear View of Test Vehicle



Photo No. A-5 - Pre-Test Left Side View of Test Vehicle

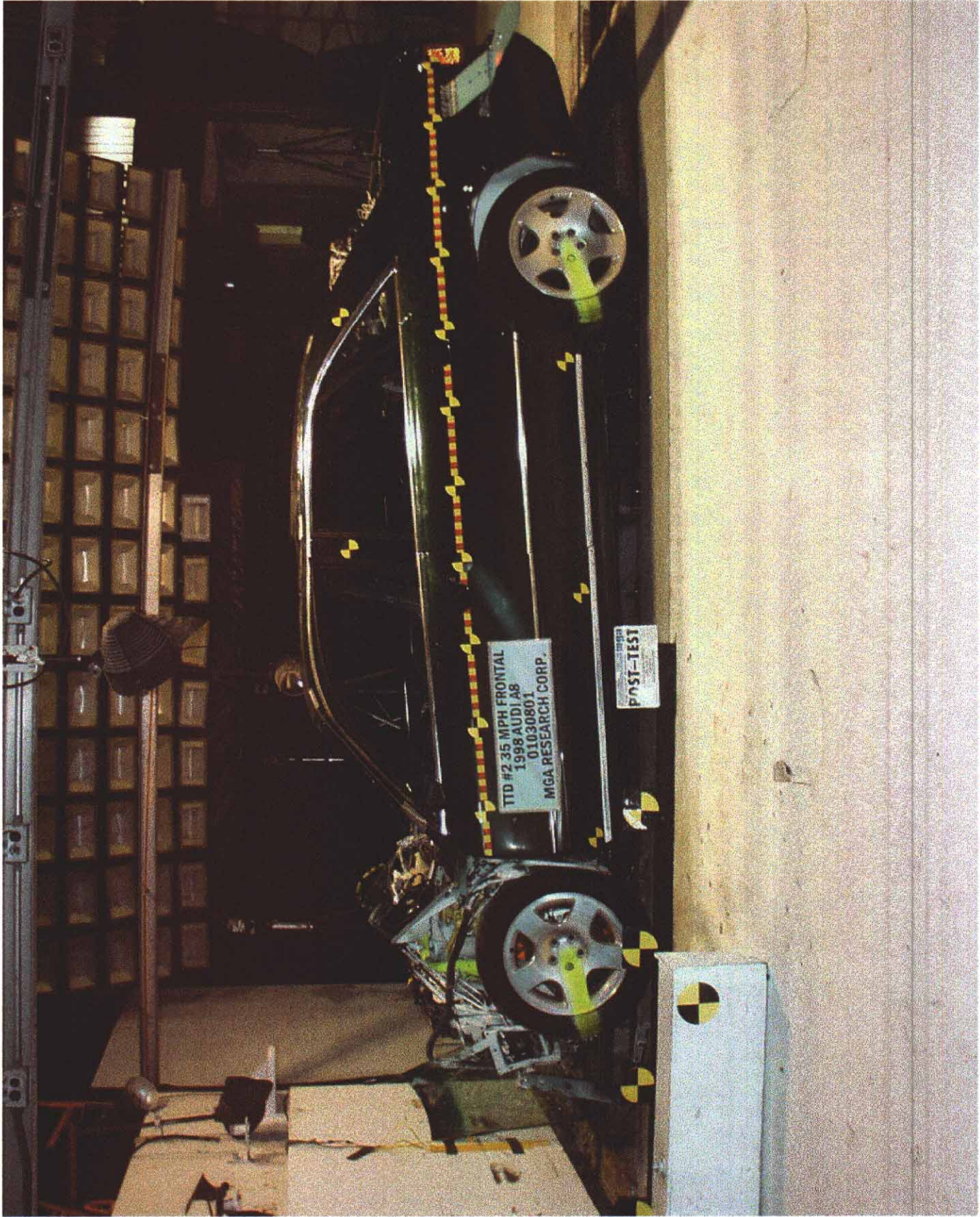


Photo No. A-6 - Post-Test Left Side View of Test Vehicle

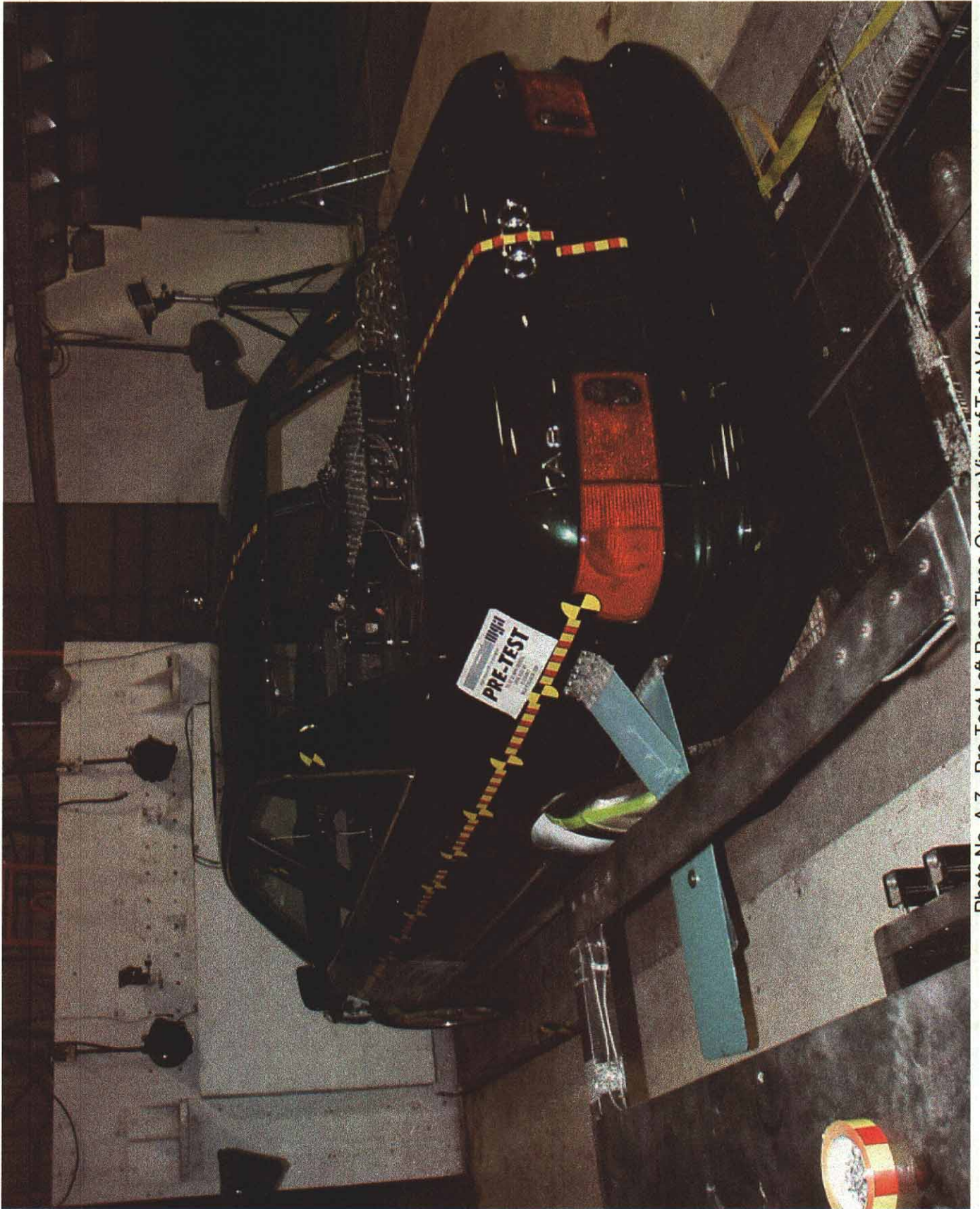


Photo No. A-7 - Pre-Test Left Rear Three-Quarter View of Test Vehicle

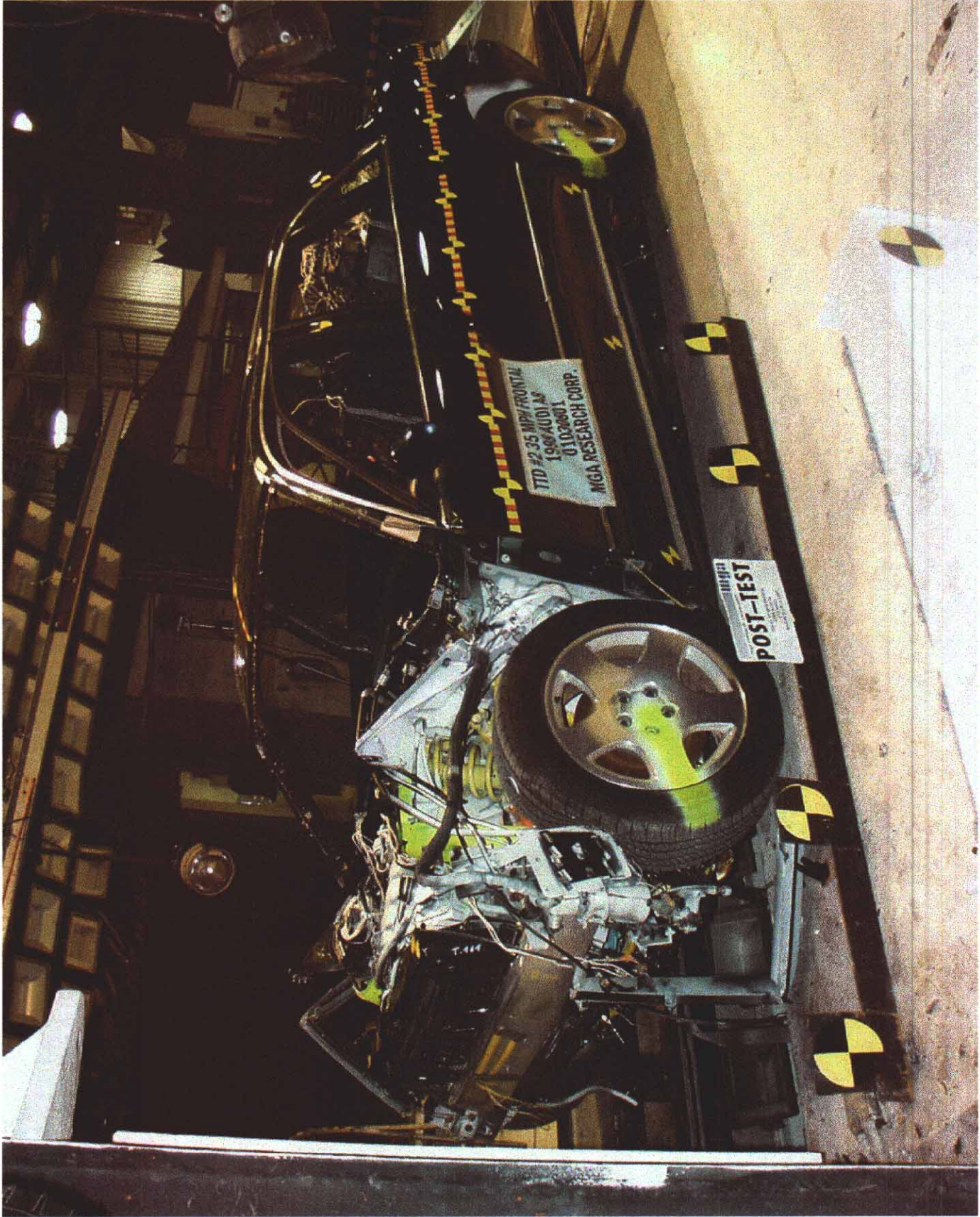


Photo No. A-8 - Post-Test Left Front Three-Quarter View of Test Vehicle



Photo No. A-9 - Pre-Test Right Side View of Test Vehicle

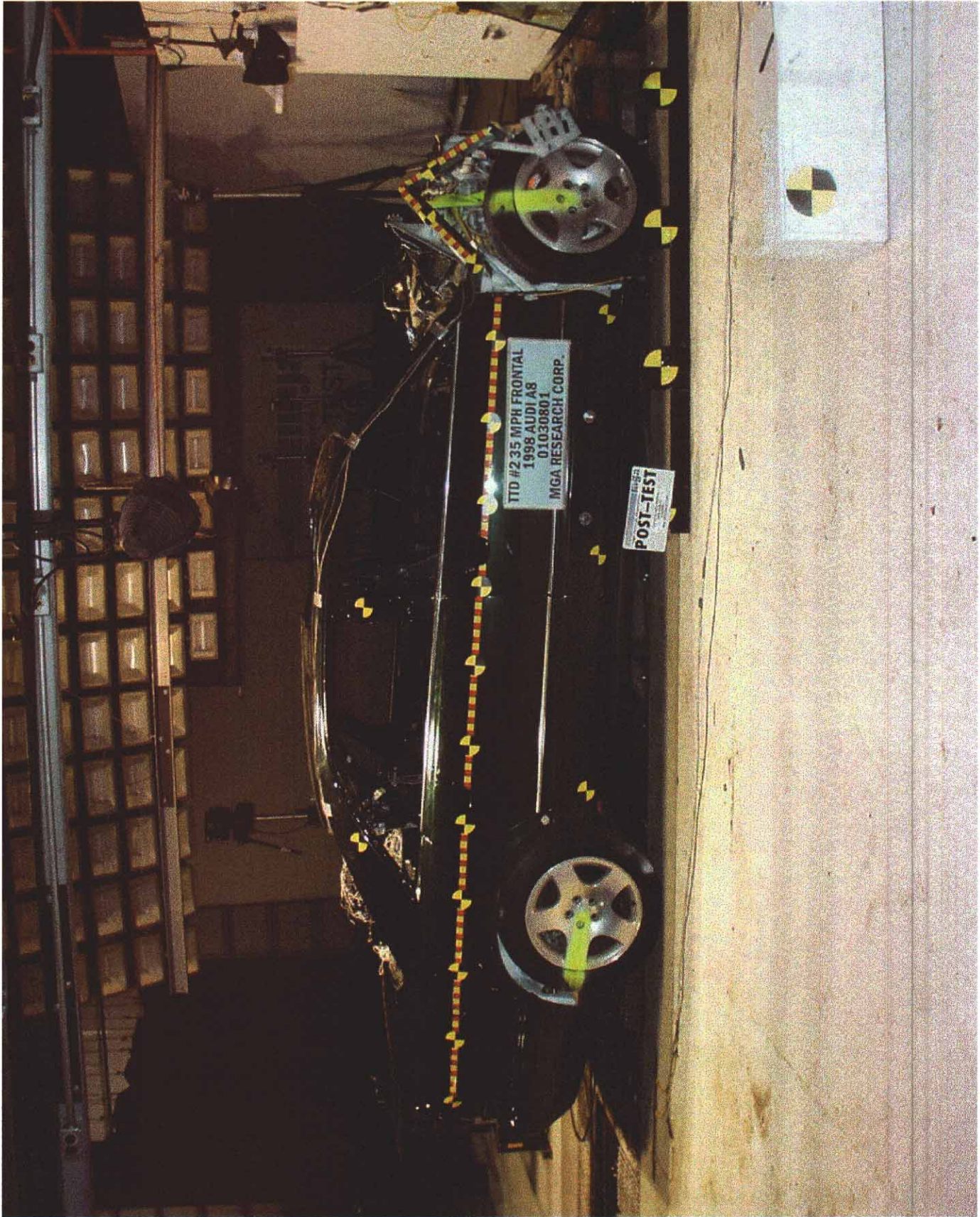


Photo No. A-10 - Post-Test Right Side View of Test Vehicle



Photo No. A-11 - Pre-Test Right Front Three-Quarter View of Test Vehicle

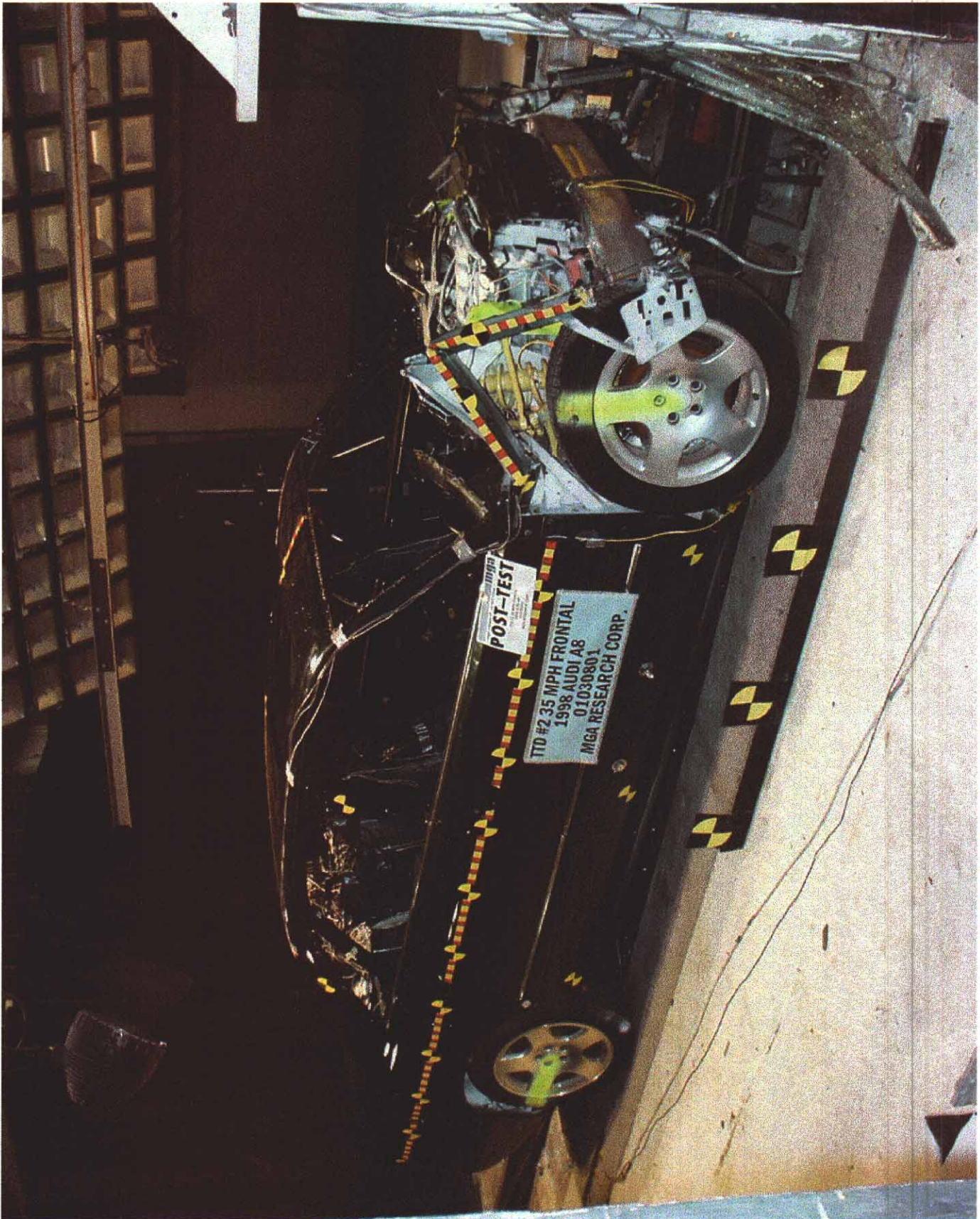


Photo No. A-12 - Post-Test Right Front Three-Quarter View of Test Vehicle

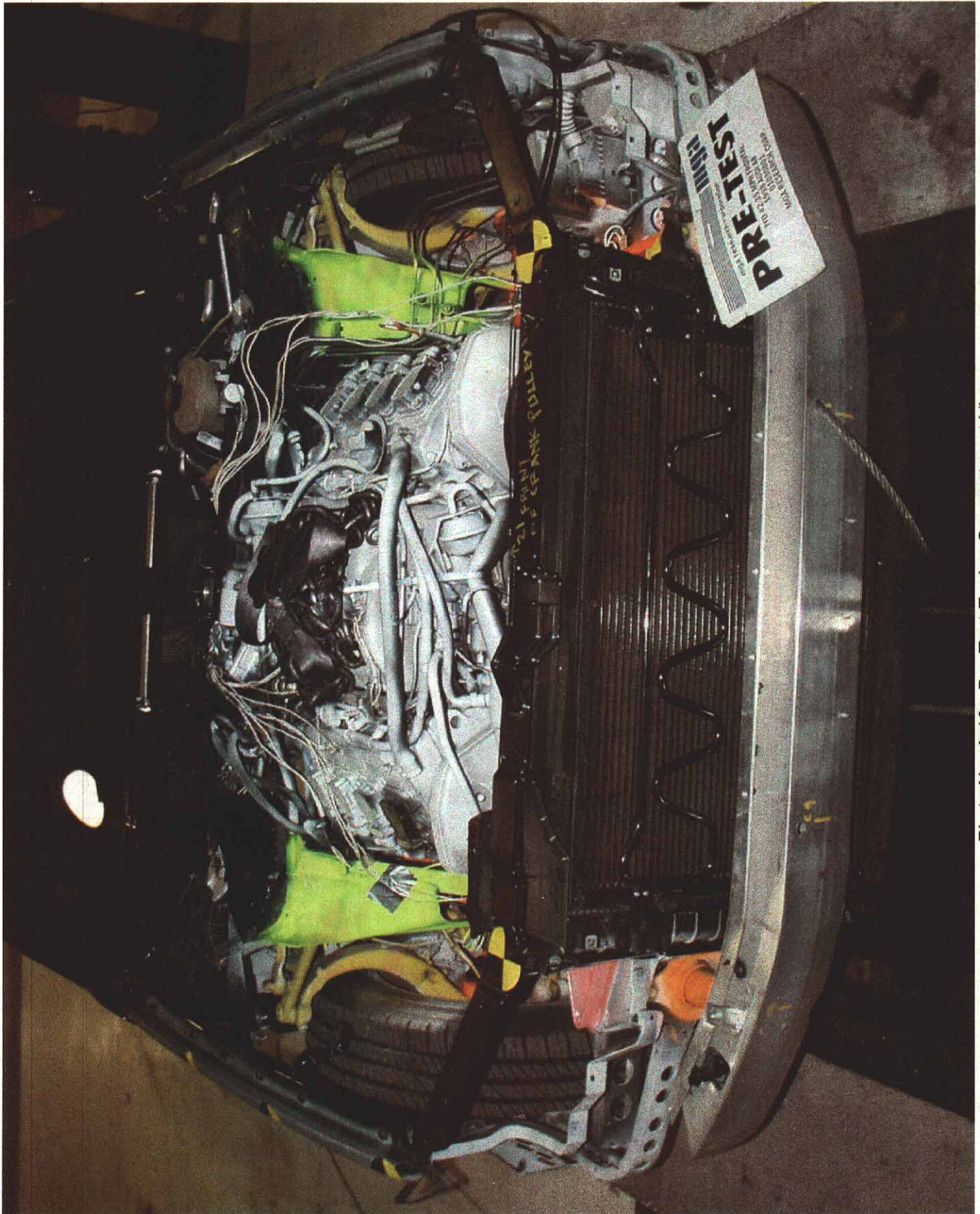


Photo No. A-13 - Pre-Test Engine Compartment View

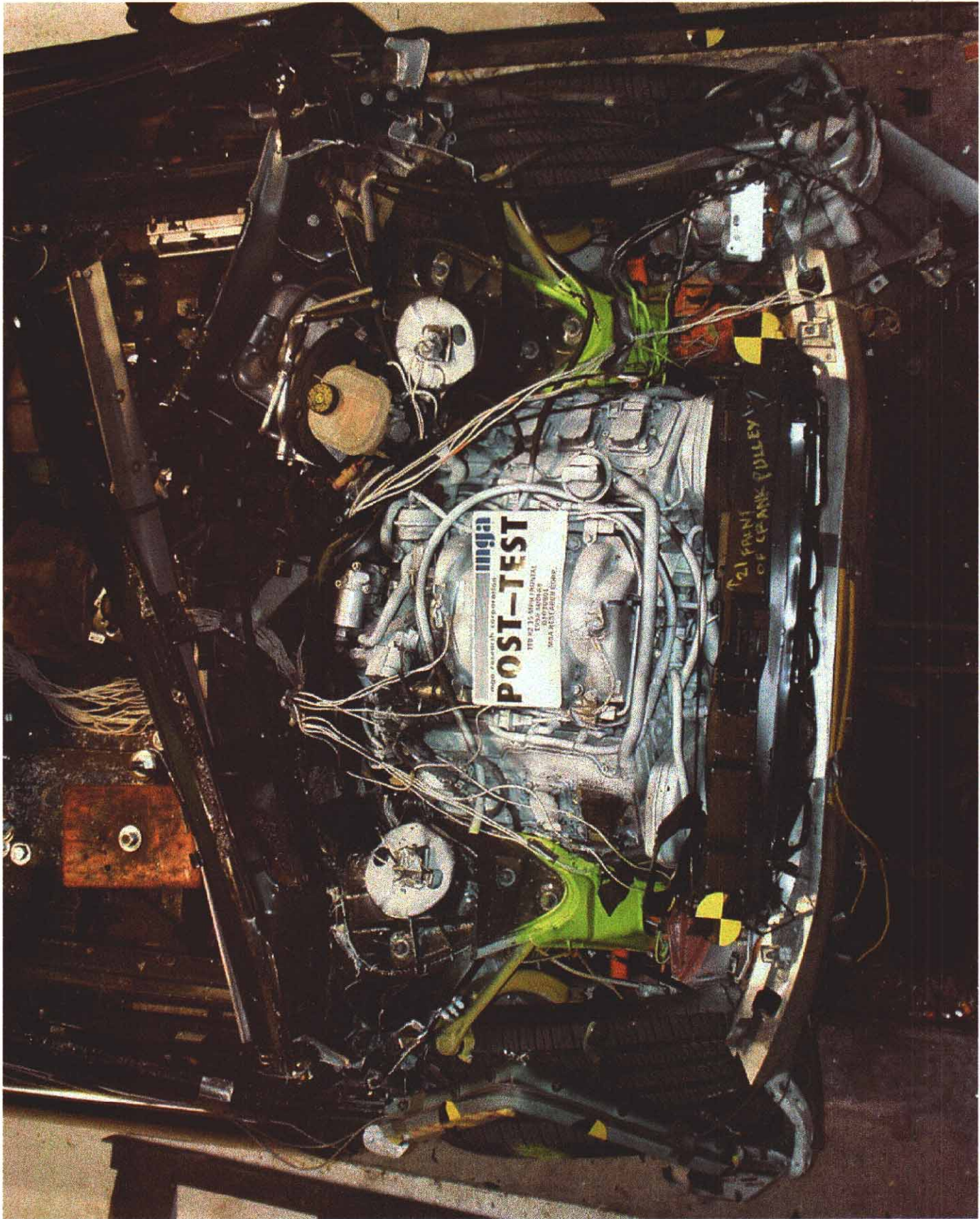


Photo No. A-14 - Post-Test Engine Compartment View

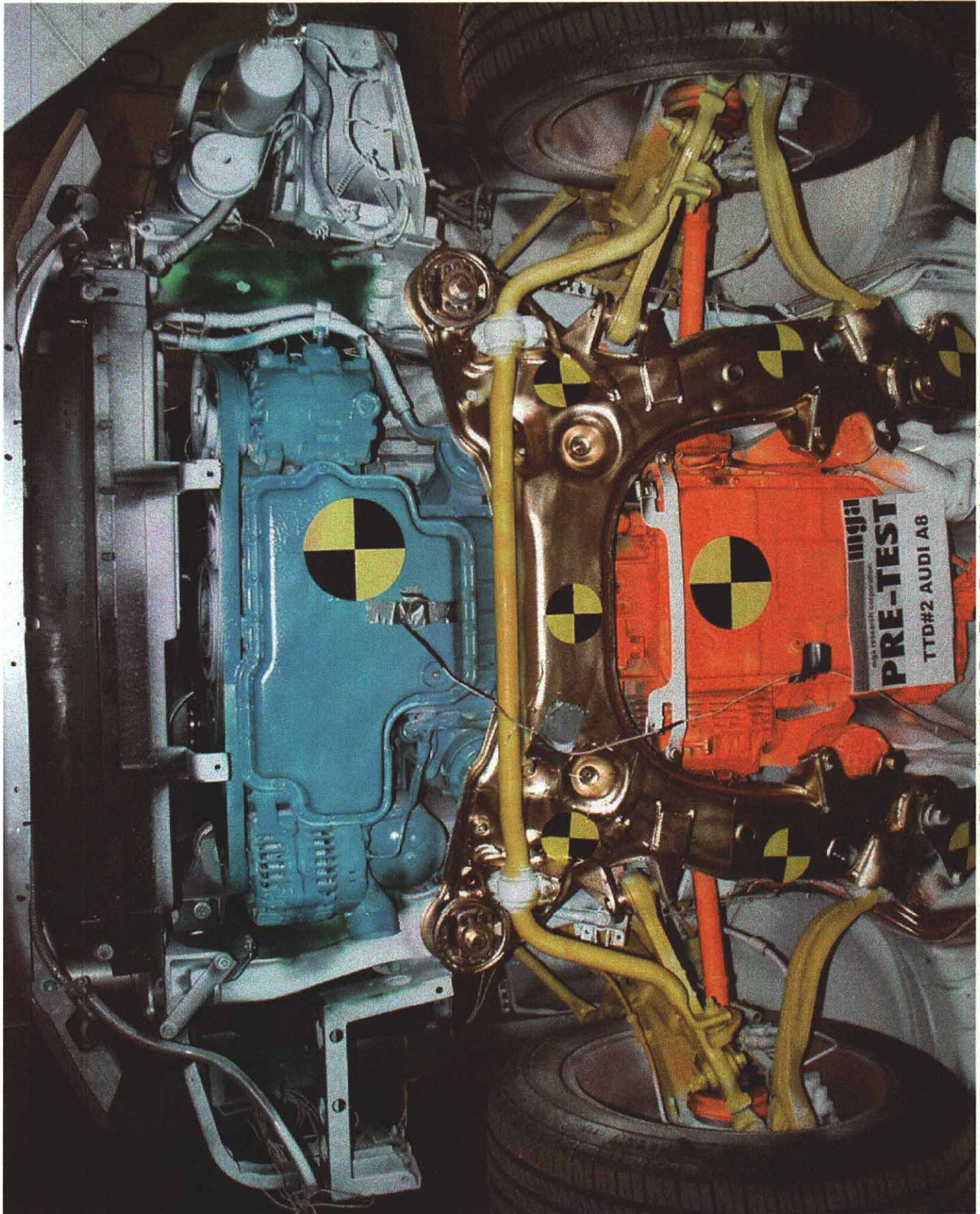


Photo No. A-15 - Pre-Test Front Underbody View

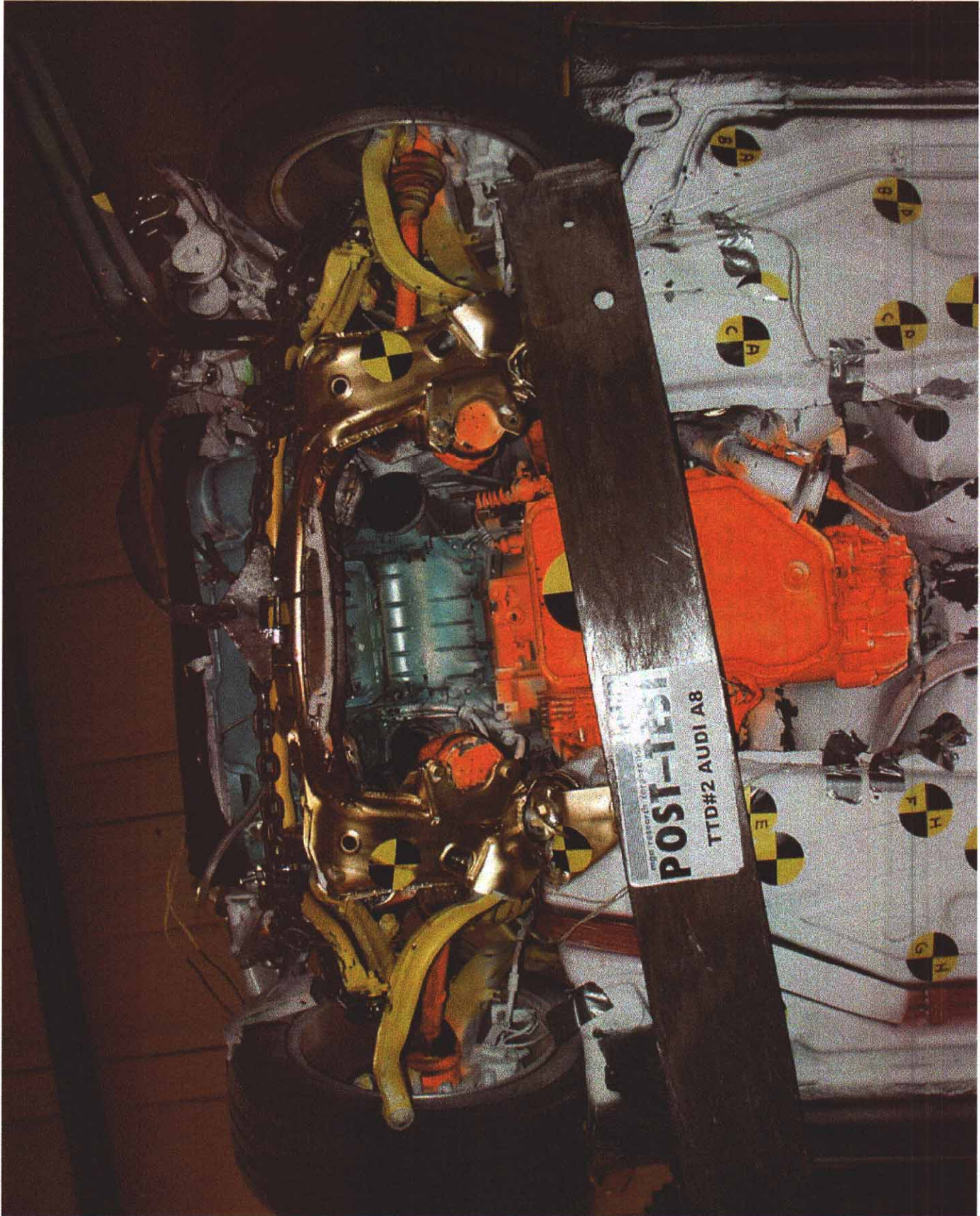


Photo No. A-16 - Post-Test Front Underbody View



Photo No. A-17 - Pre-Test Mid-Front Underbody View

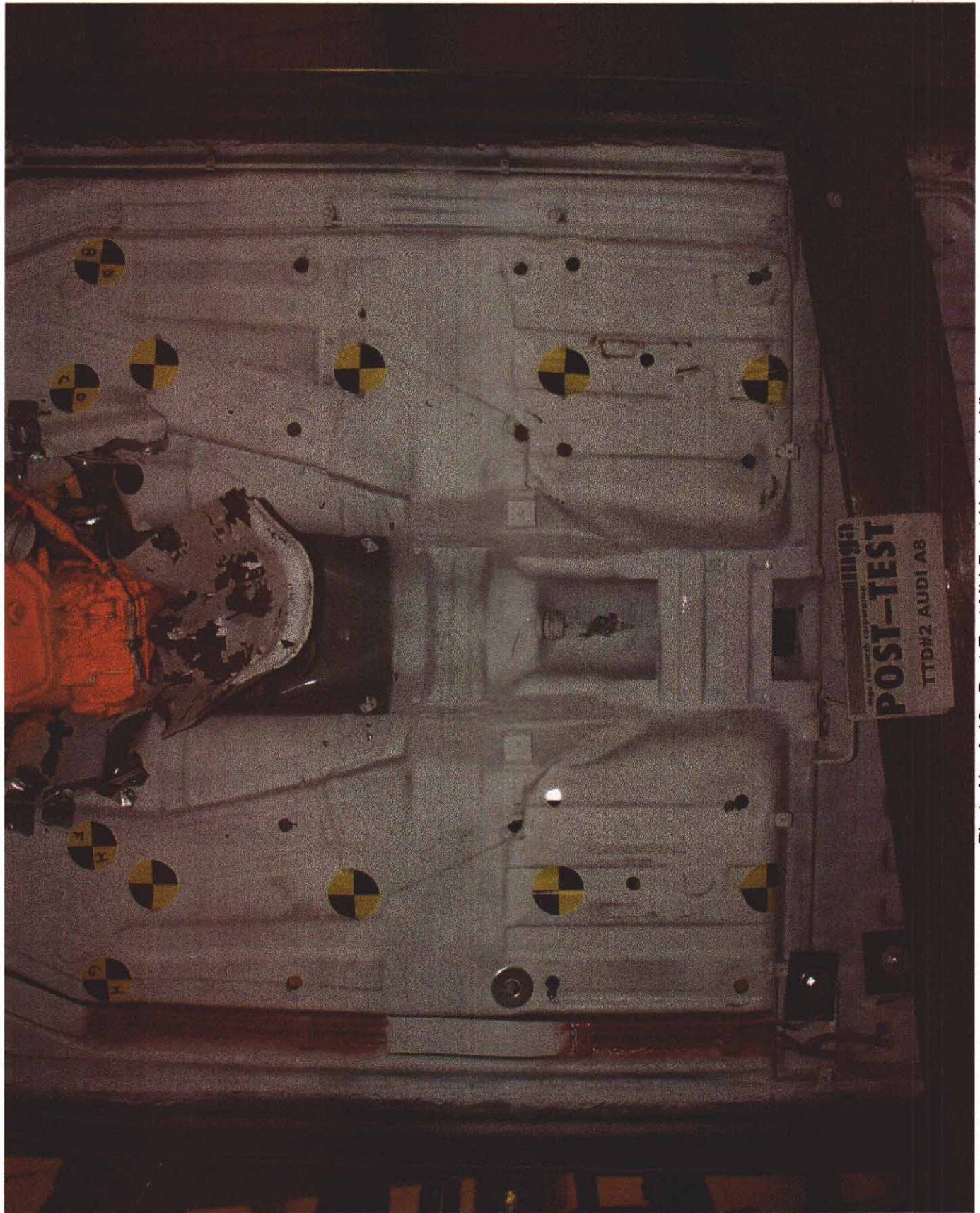


Photo No. A-18 - Post-Test Mid-Front Underbody View

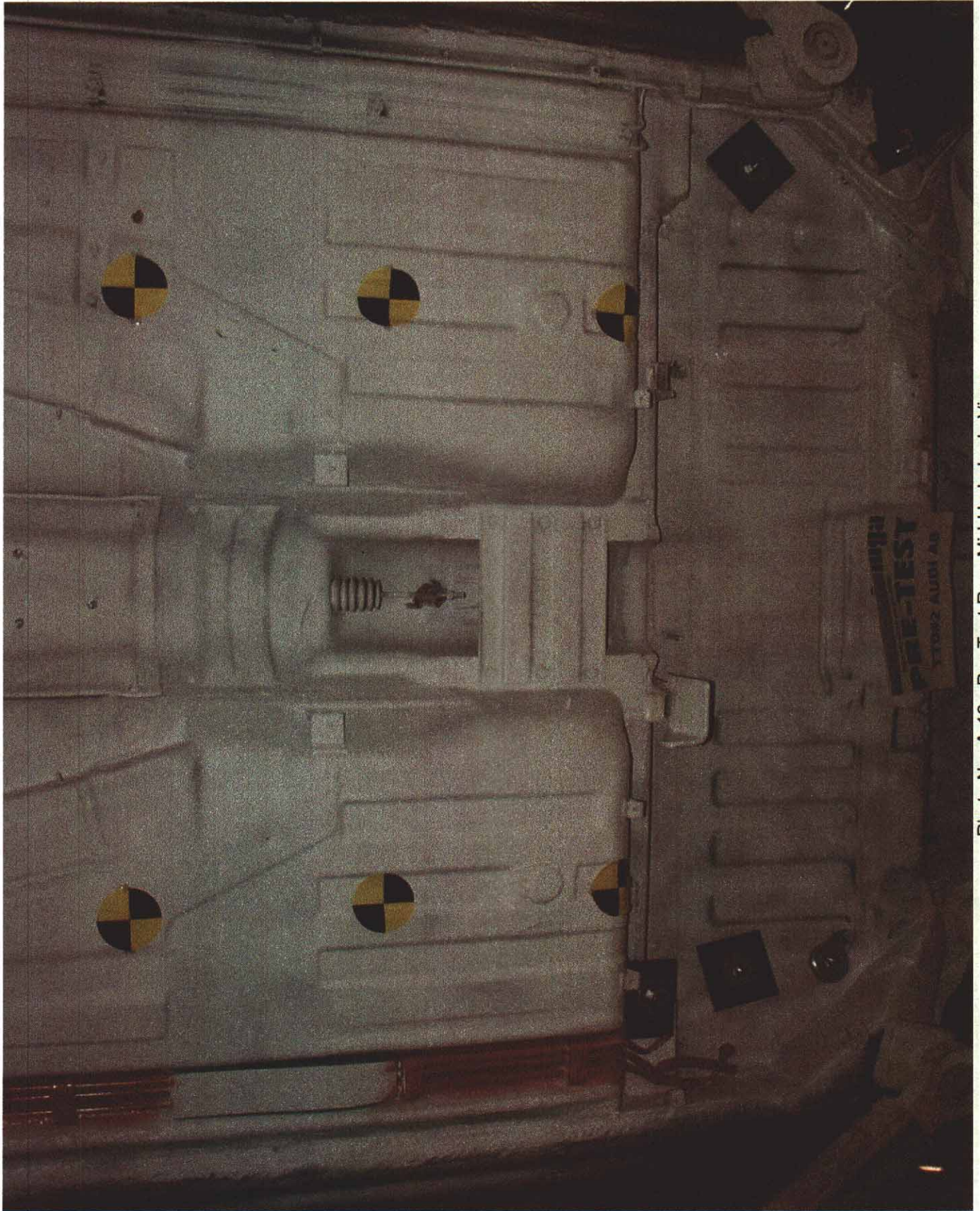


Photo No. A-19 - Pre-Test Rear Mid-Underbody View

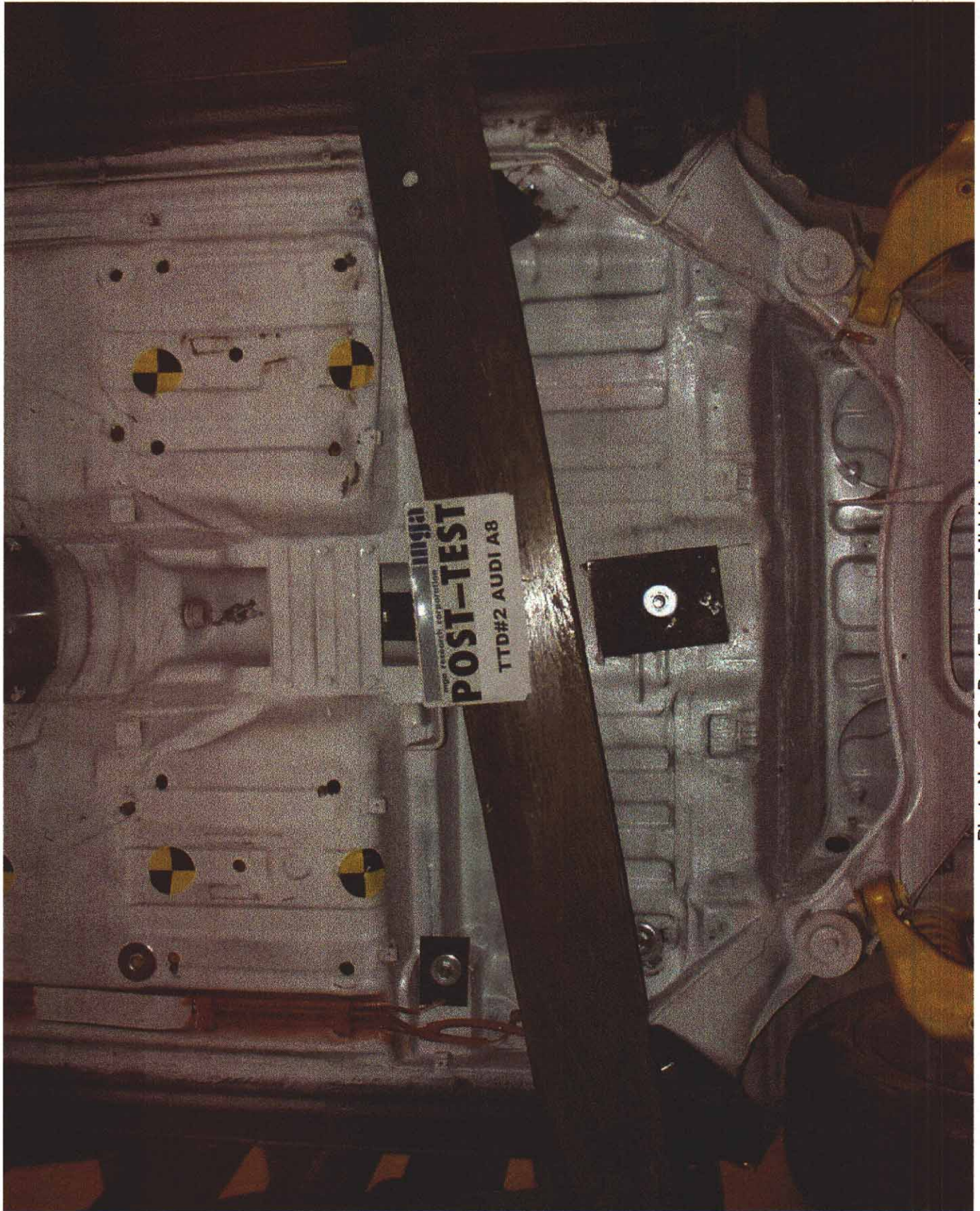


Photo No. A-20 - Post-Test Rear Mid-Underbody View



Photo No. A-21 - Pre-Test Rear Underbody View

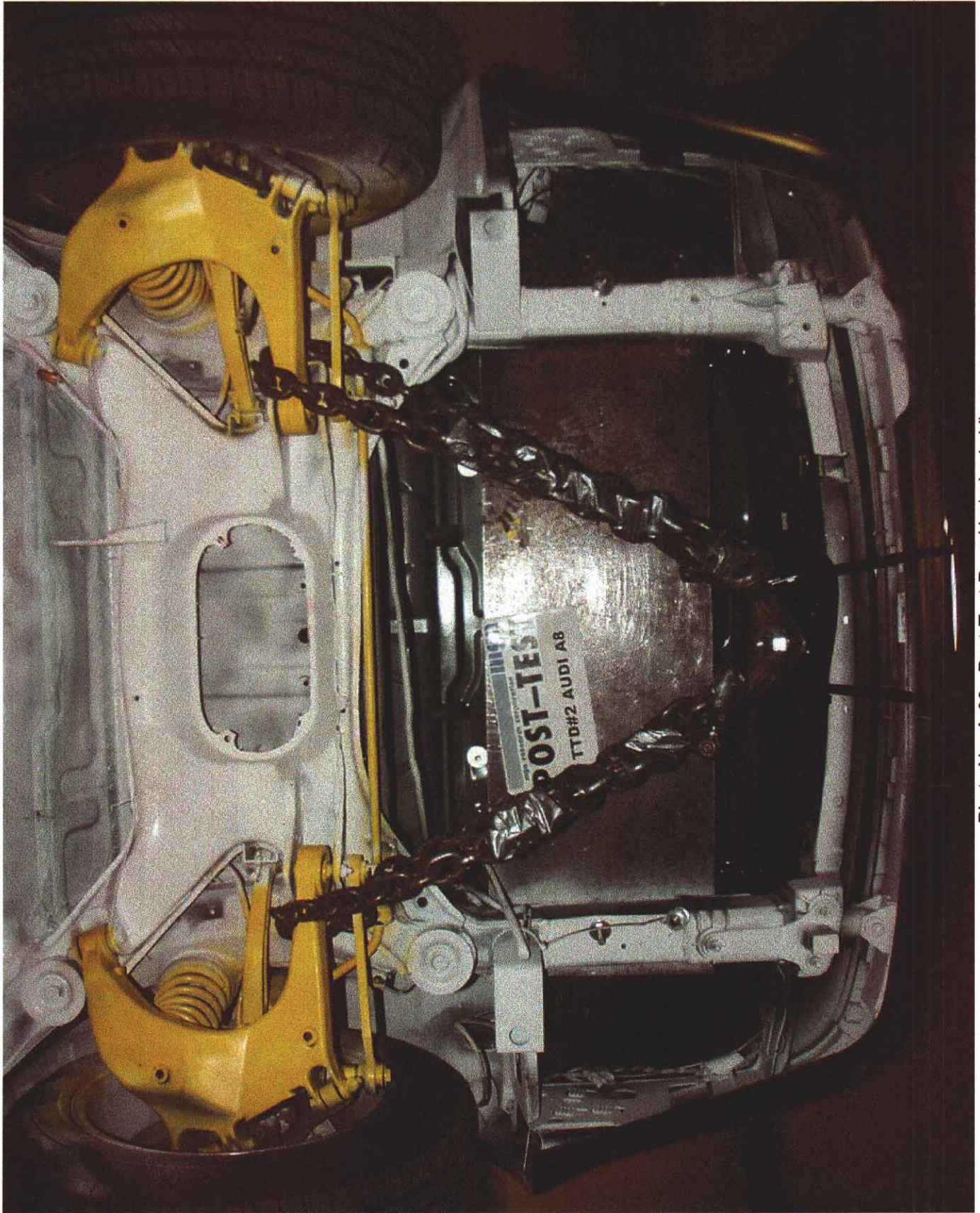


Photo No. A-22 - Post-Test Rear Underbody View

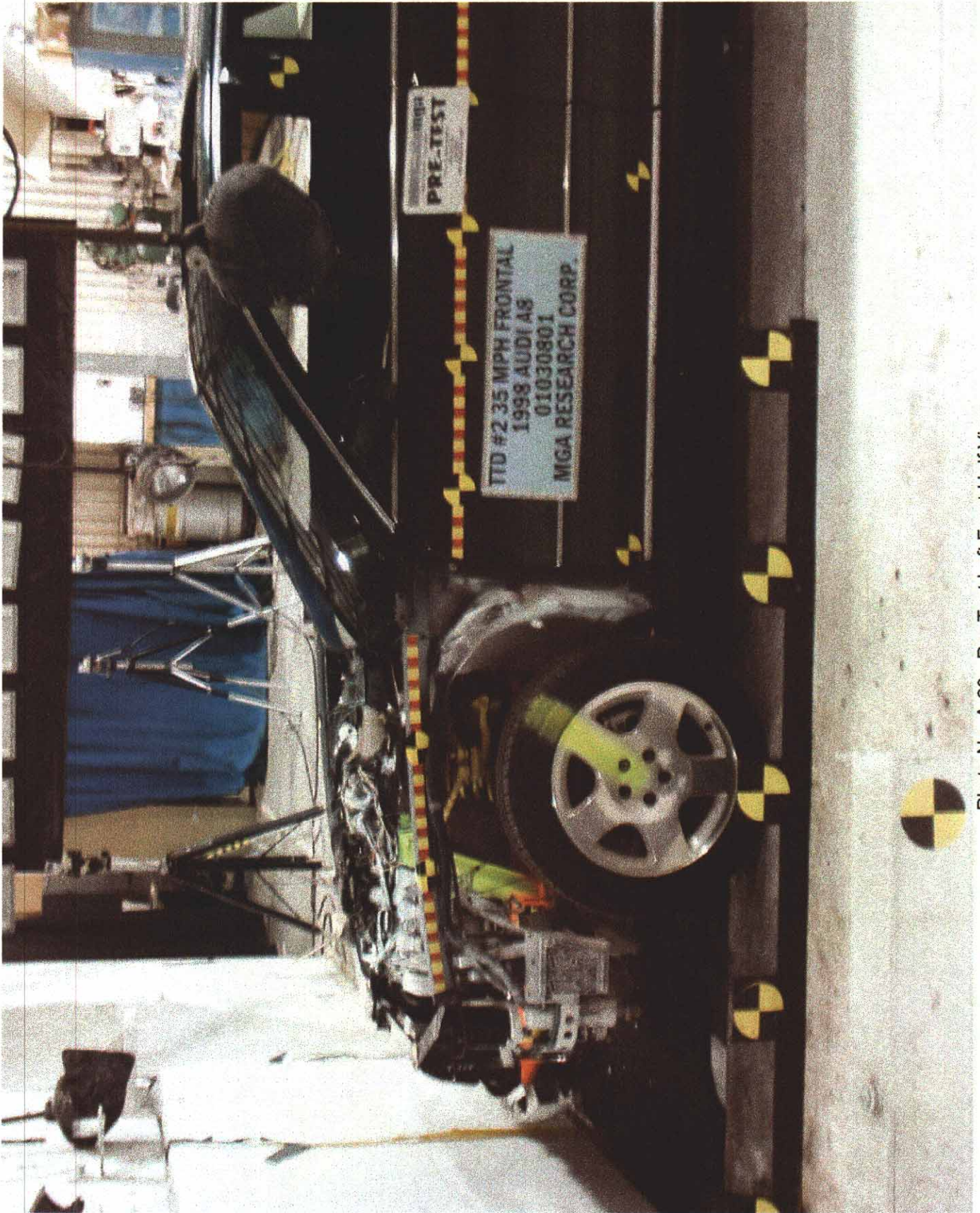


Photo No. A-23 - Pre-Test Left Front Half View



Photo No. A-24 - Post-Test Left Front Half View

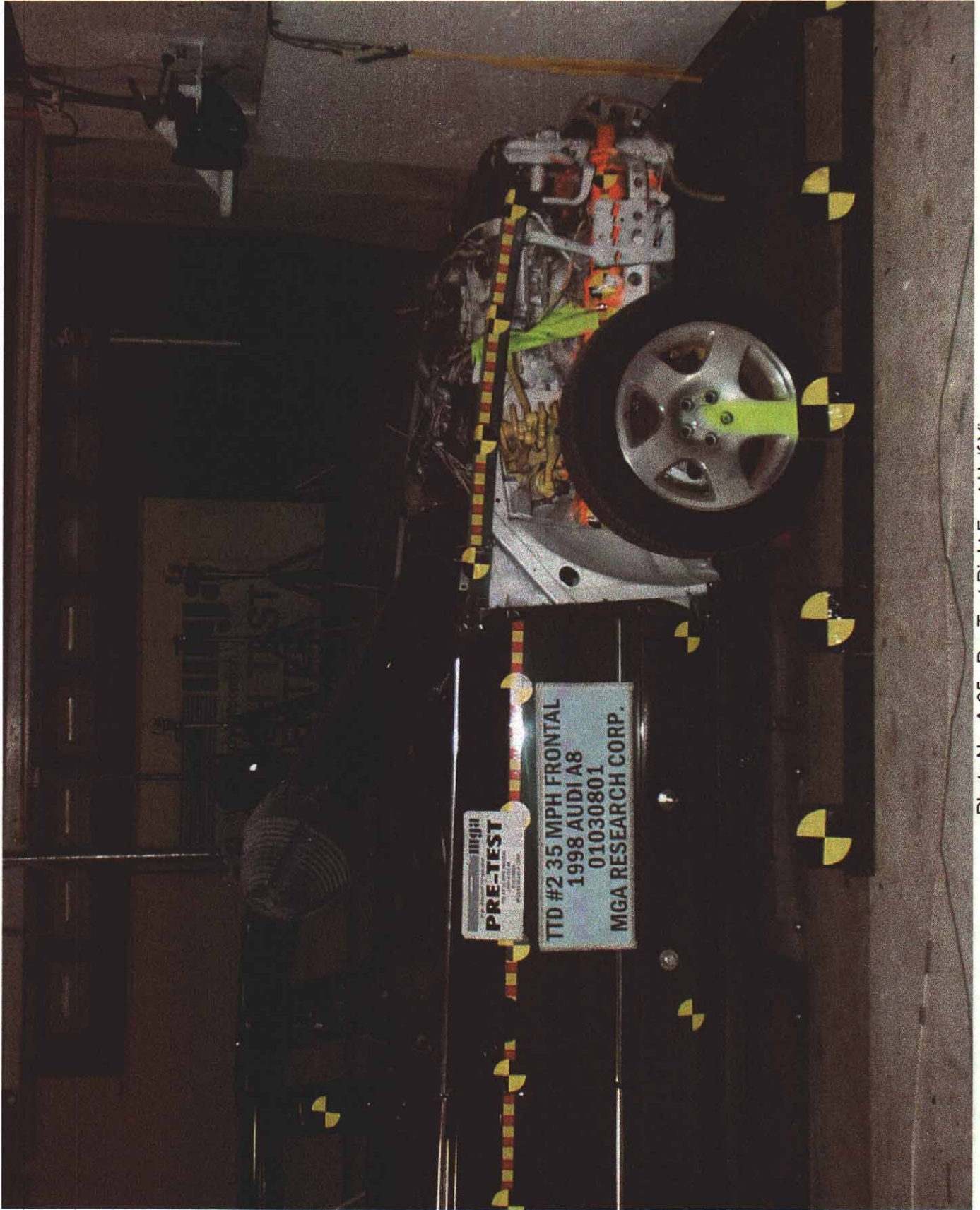


Photo No. A-25 - Pre-Test Right Front Half View

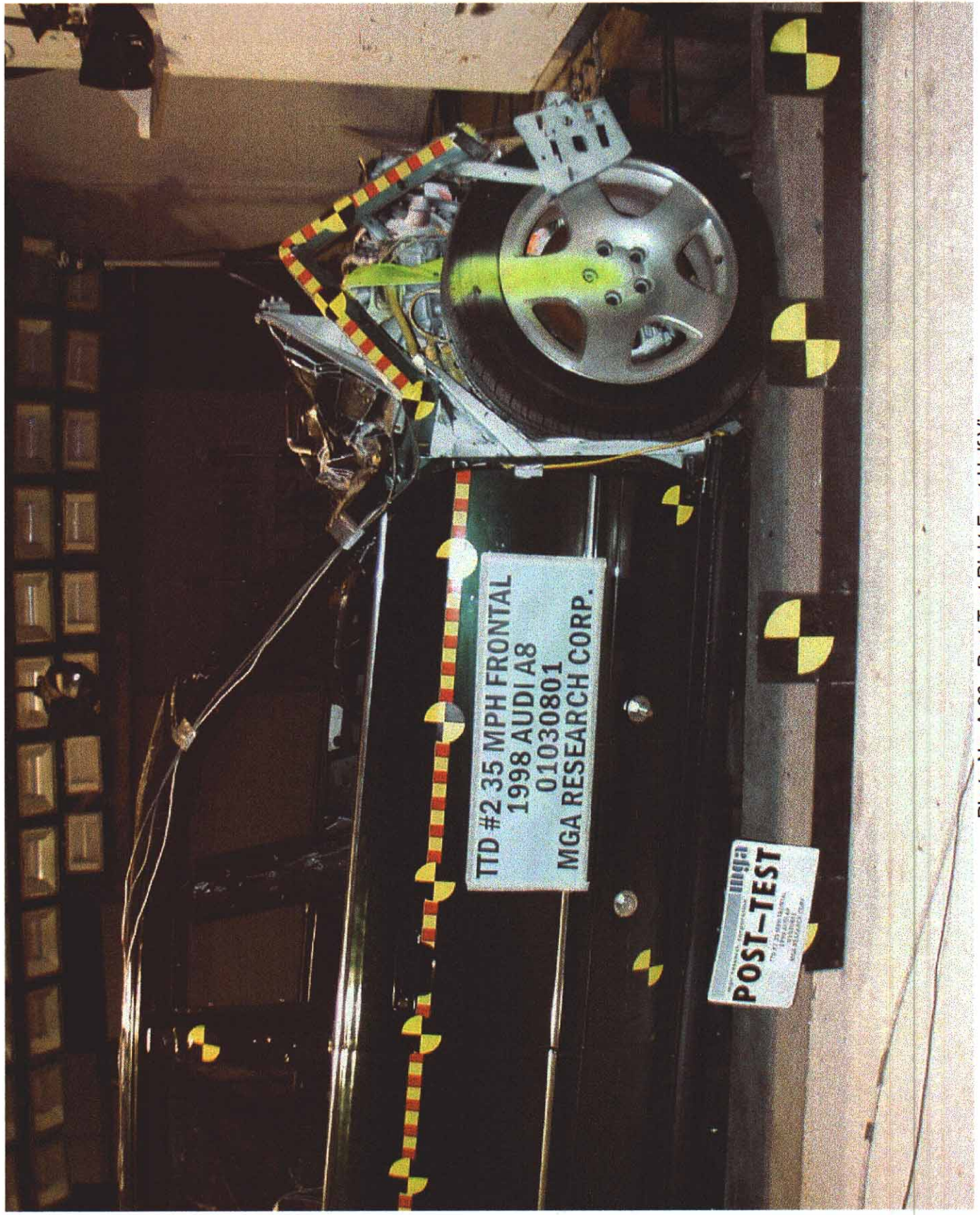


Photo No. A-26 - Post-Test Right Front Half View

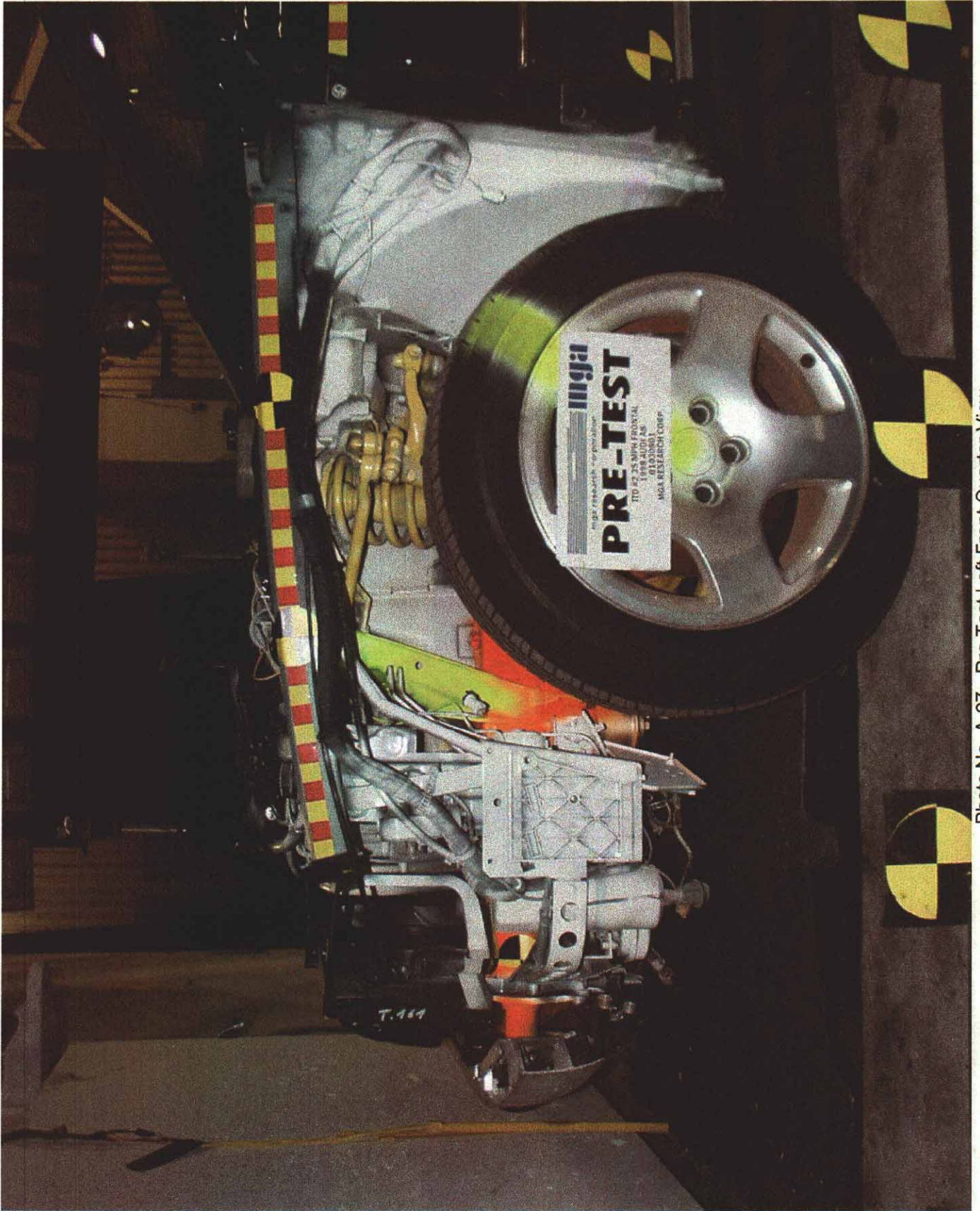


Photo No. A-27 - Pre-Test Left Front Quarter View



Photo No. A-28 - Post-Test Left Front Quarter View



Photo No. A-29 - Pre-Test Right Front Quarter View

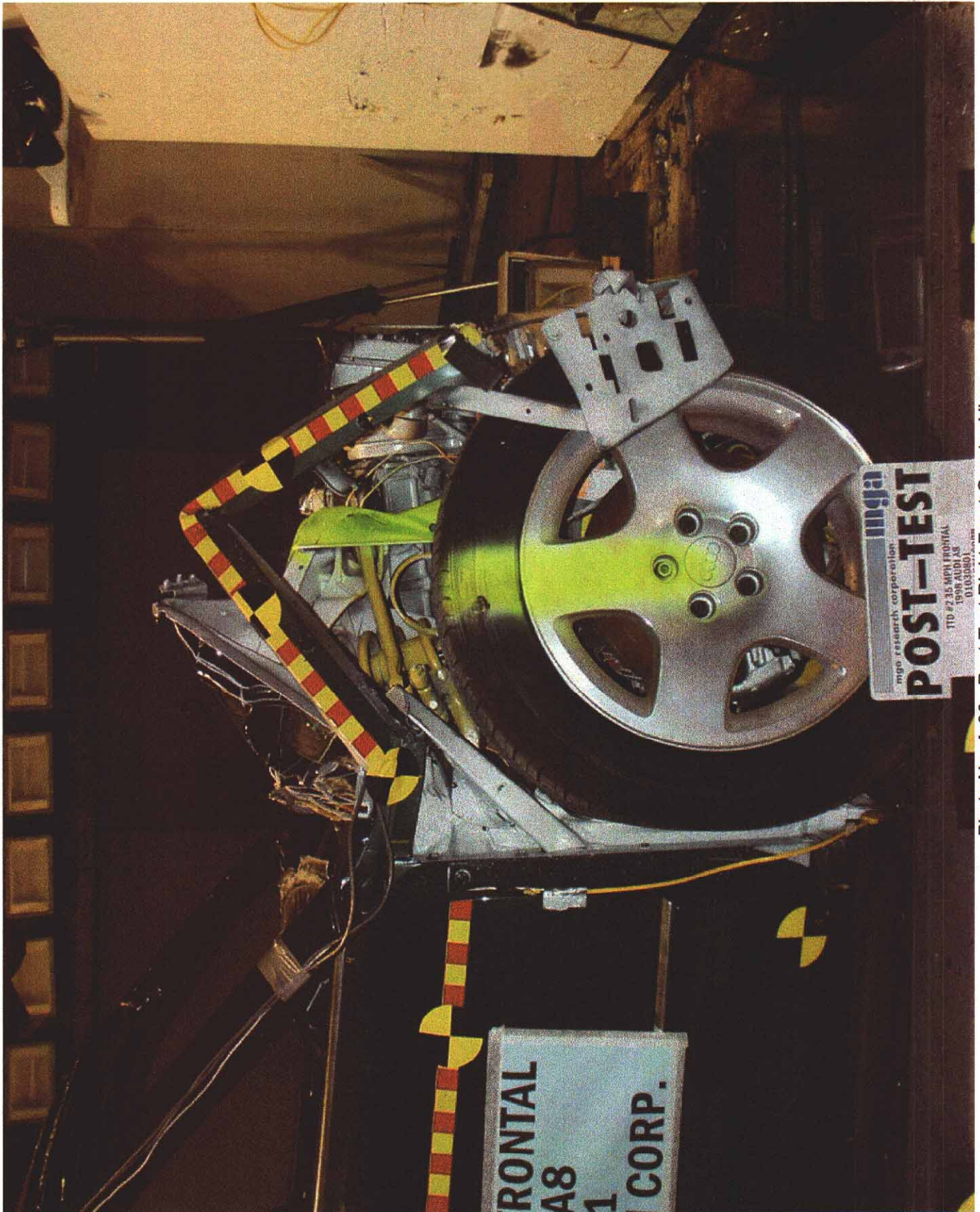


Photo No. A-30 - Post-Test Right Front Quarter View

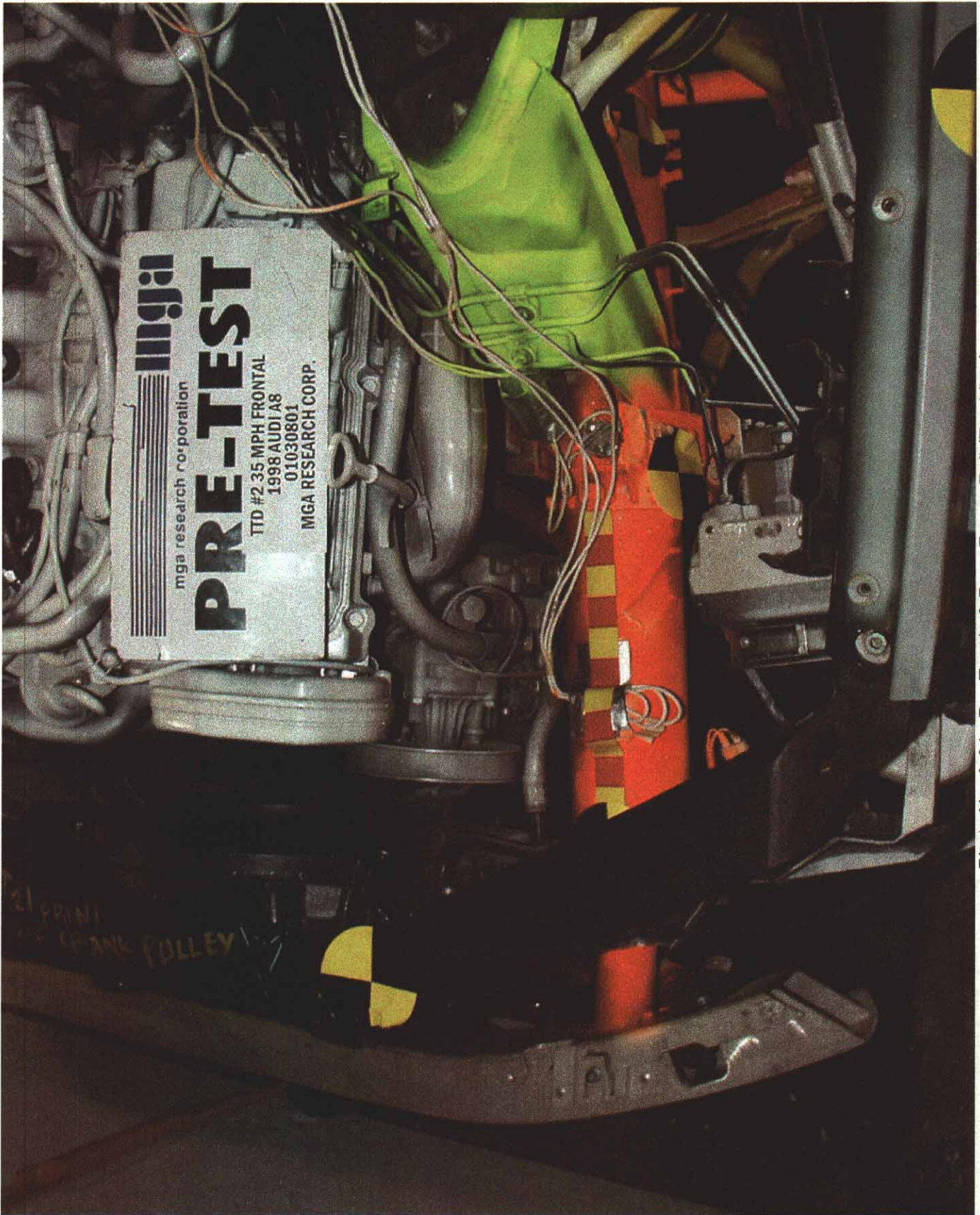


Photo No. A-31 - Pre-Test Left Front Frame Rail (Top View)

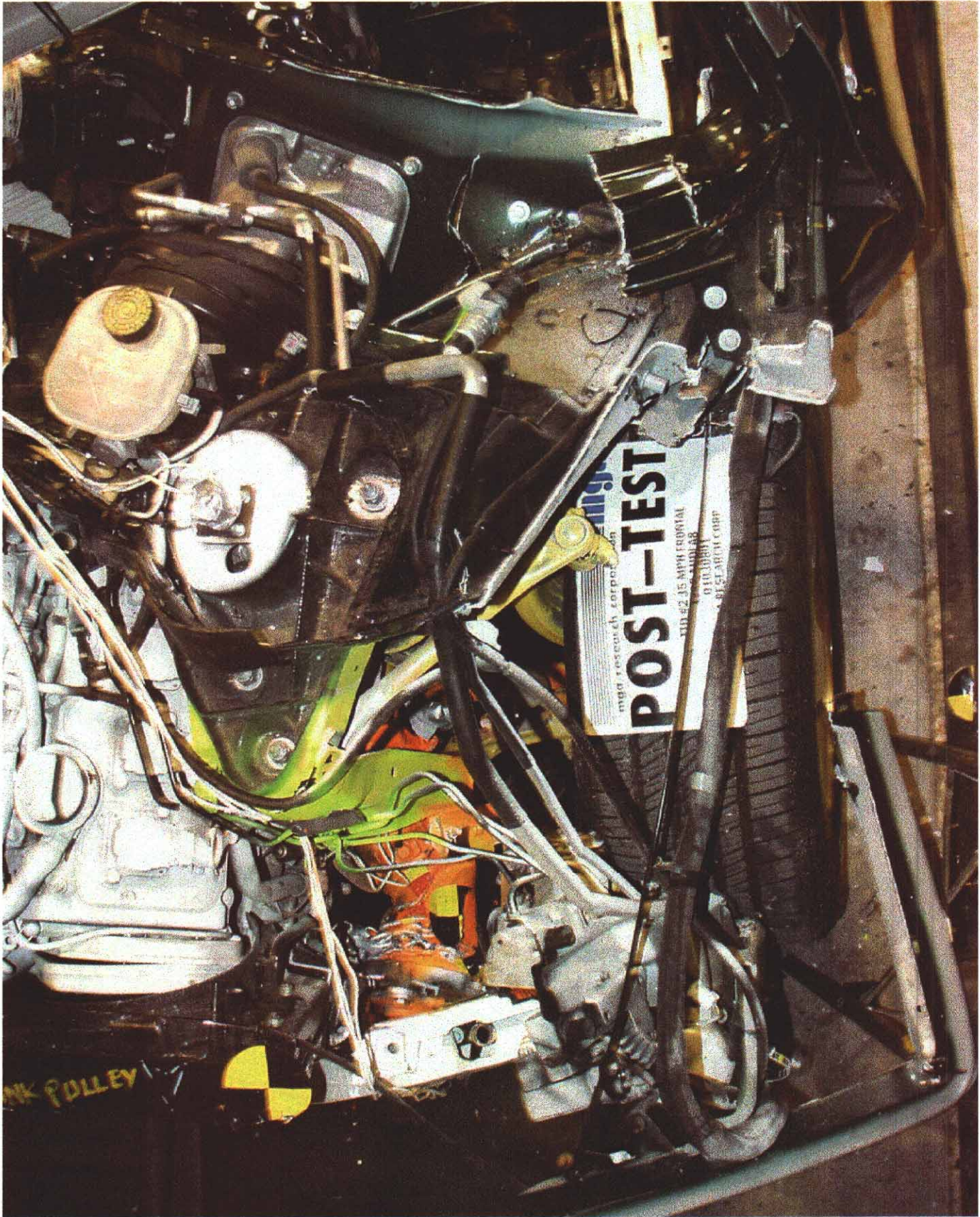


Photo No. A-32 - Post-Test Left Front Frame Rail (Top View)



Photo No. A-33 - Pre-Test Engine (Overhead View)

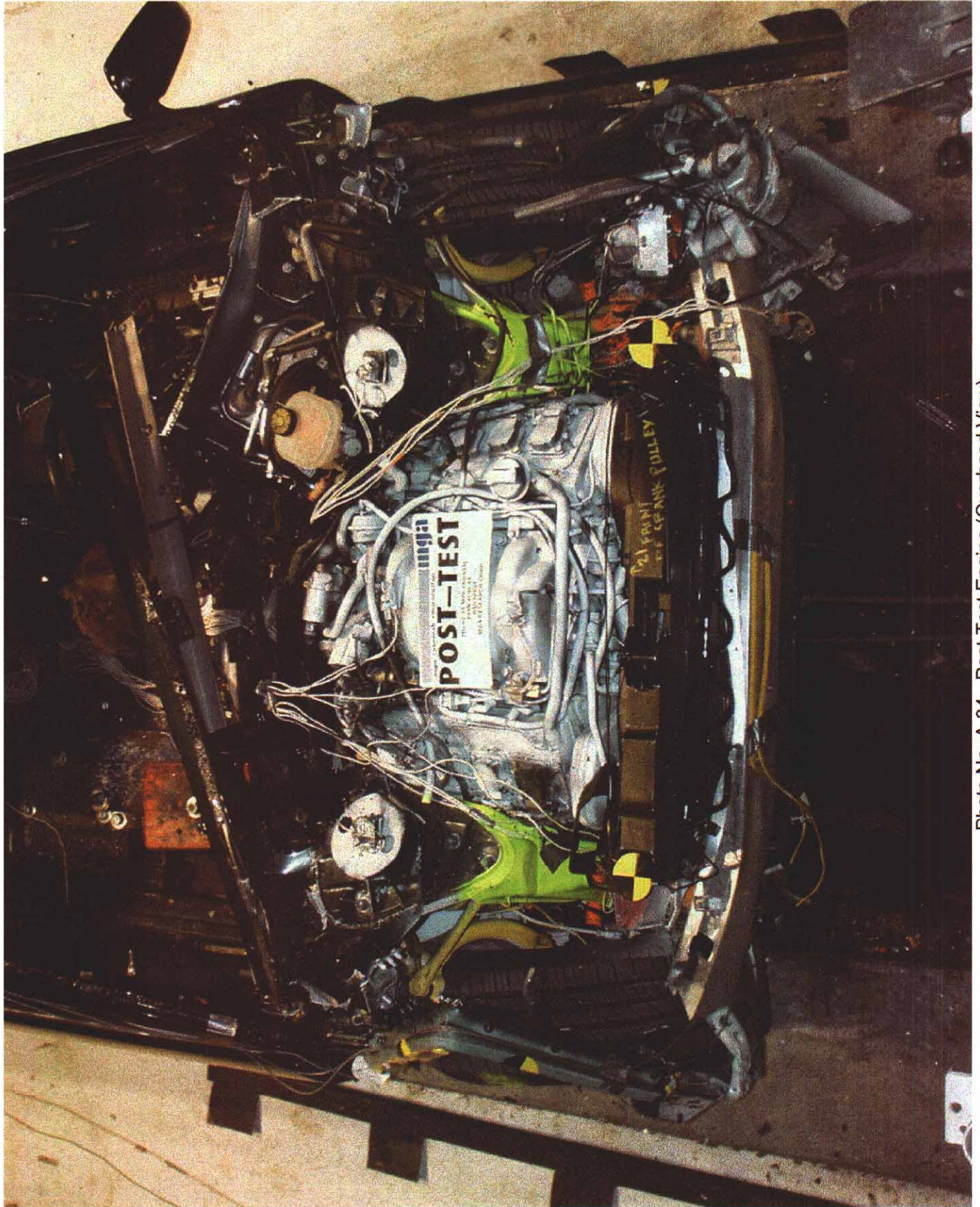


Photo No. A-34 - Post-Test Engine (Overhead View)

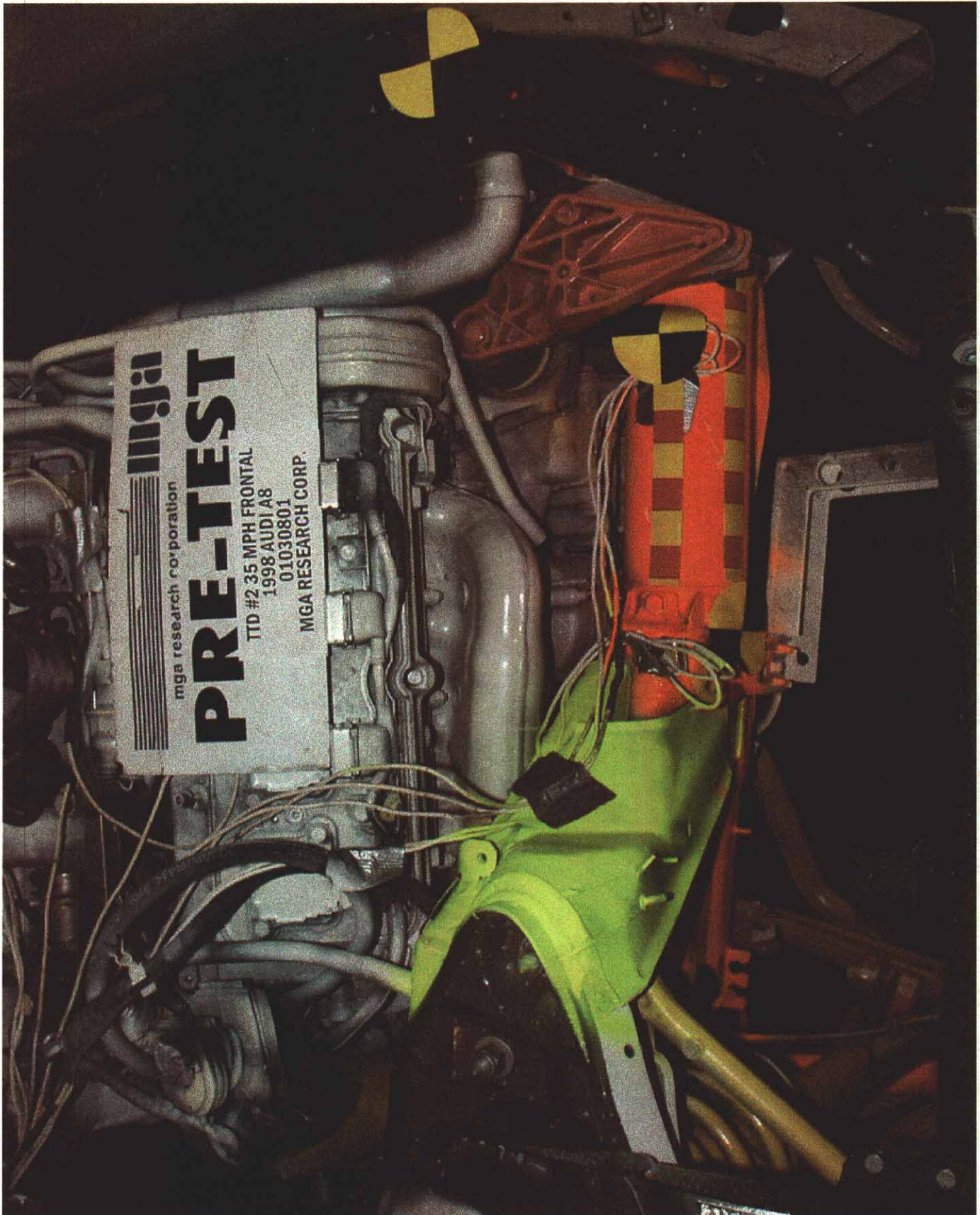


Photo No. A-35 - Pre-Test Right Front Frame Rail (Top View)



Photo No. A-36 - Pre-Test Right Front Frame Rail (Overhead View)



Photo No. A-37 - Post-Test Left Front Frame Rail Shock Brace



Photo No. A-38 - Post-Test Left Front Frame Rail (Bottom View)

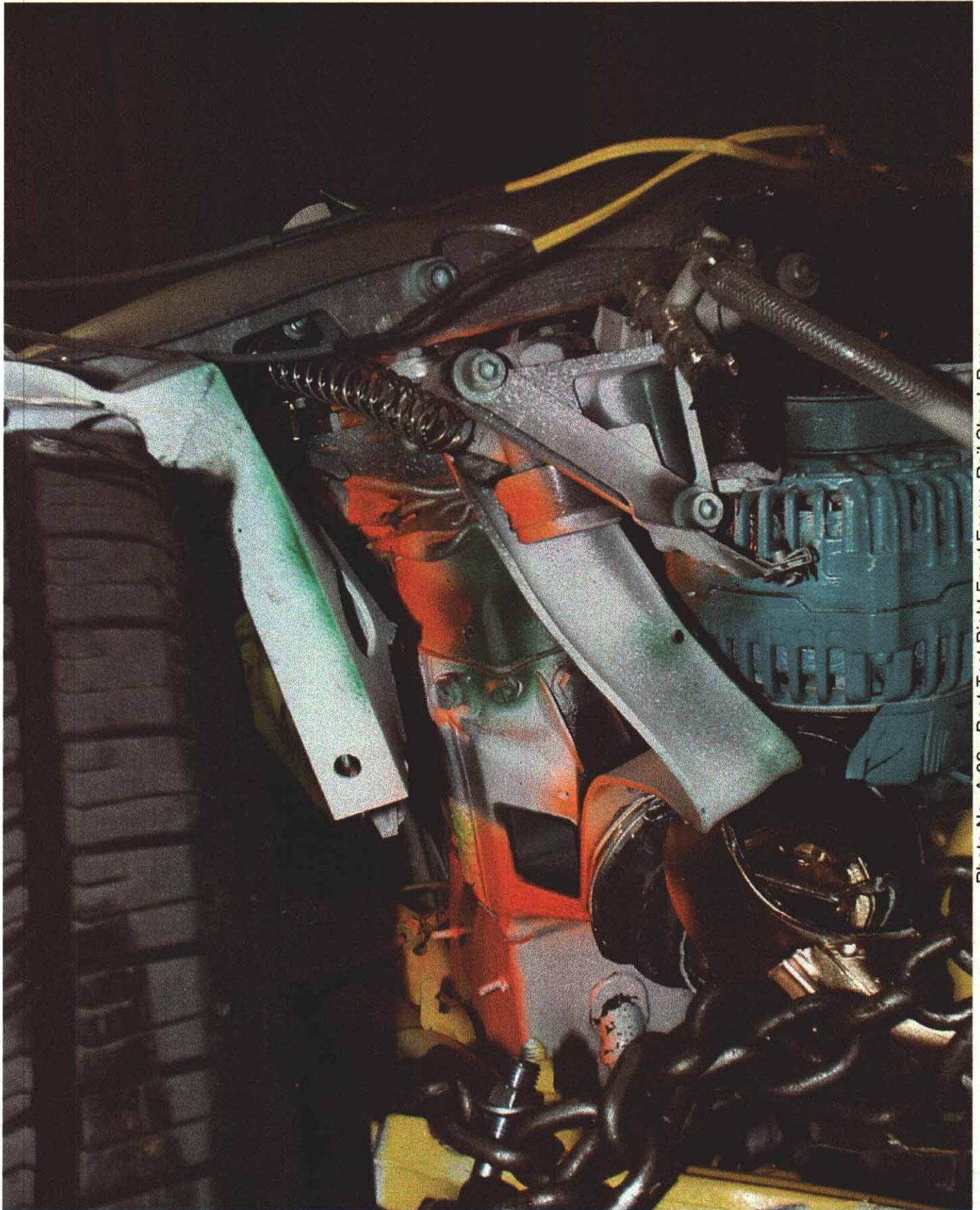


Photo No. A-39 - Post-Test Right Front Frame Rail Shock Brace

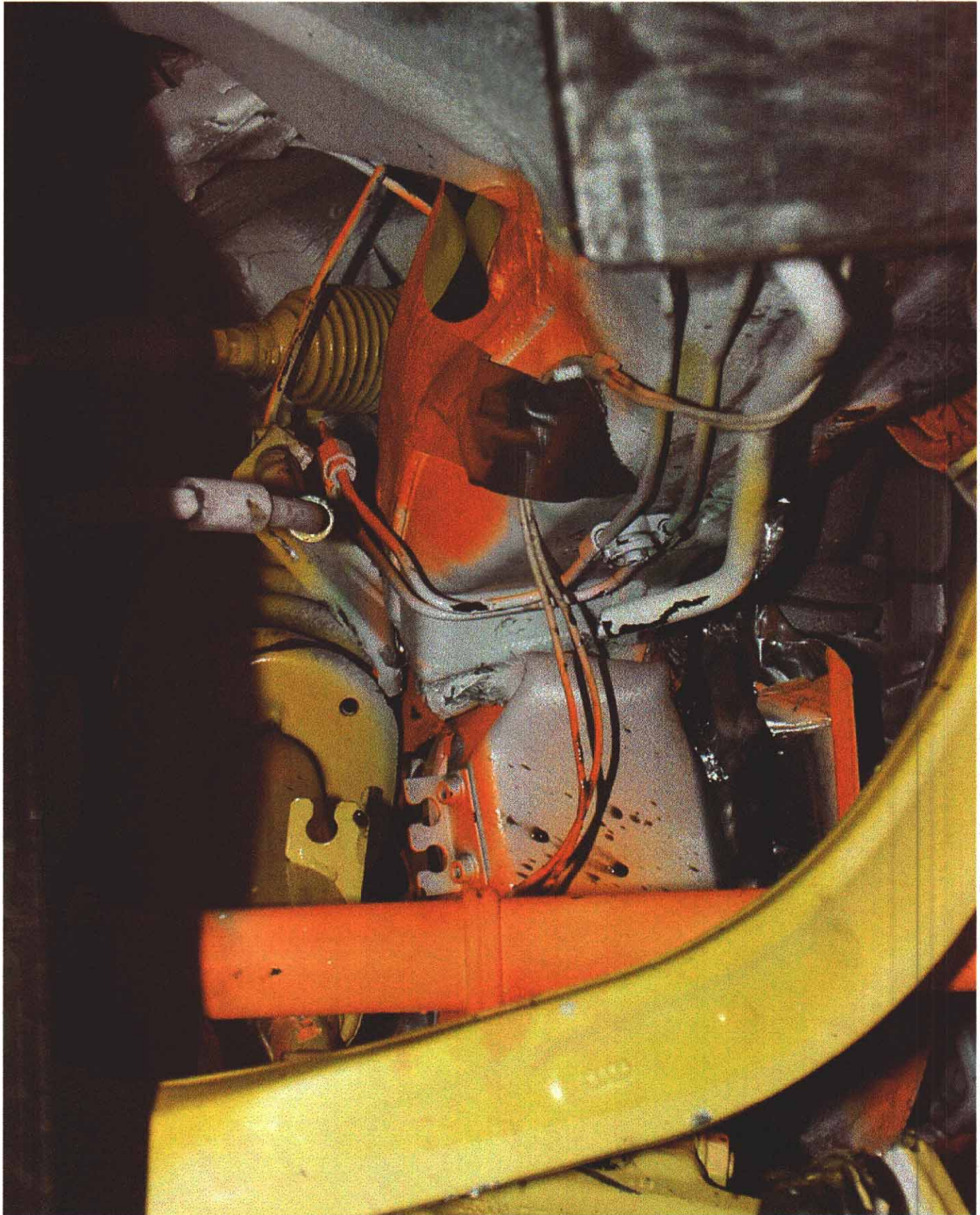


Photo No. A-40 - Post-Test Right Front Frame Rail (Bottom View)

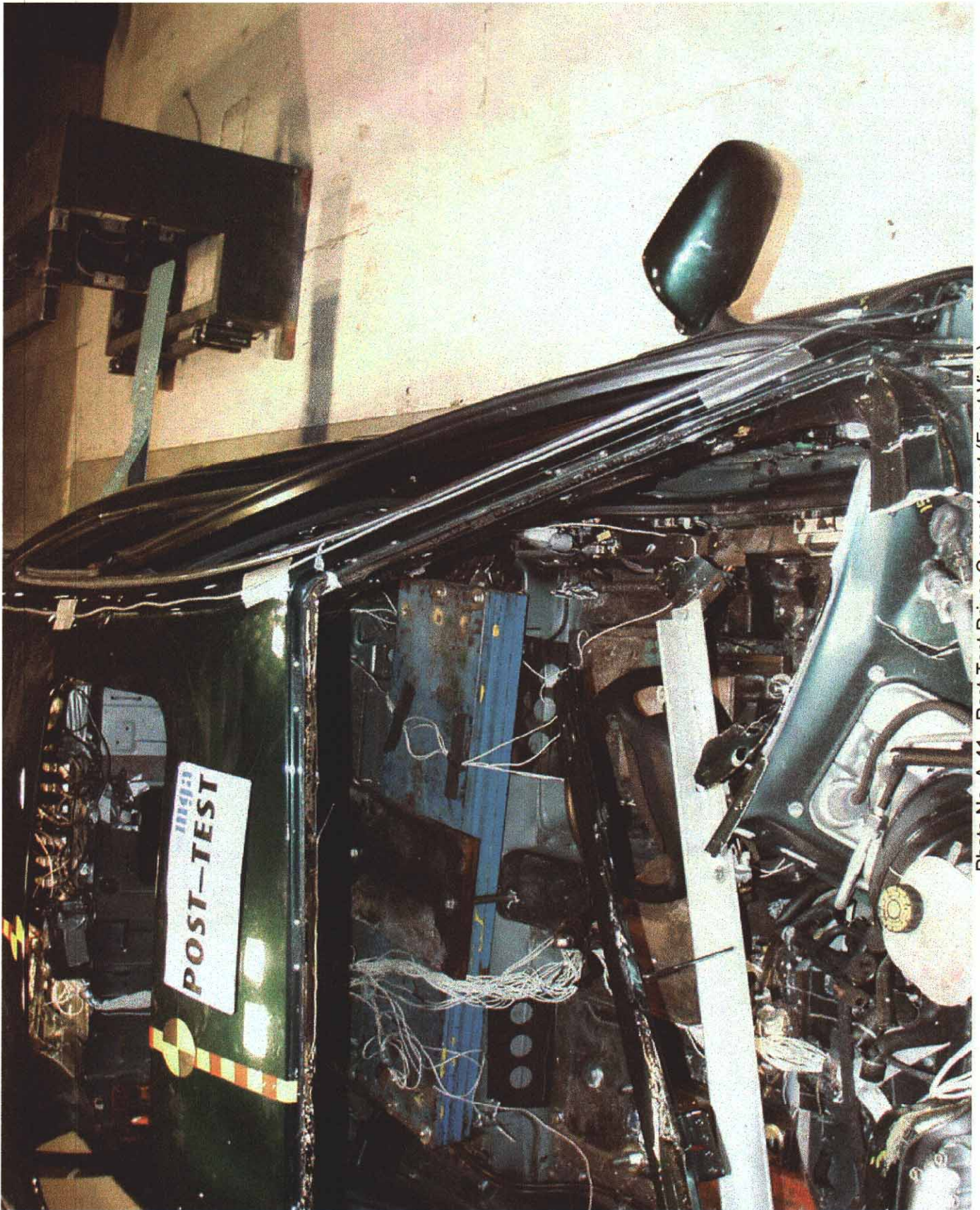


Photo No. A-41 - Post-Test Driver Compartment (Front View)

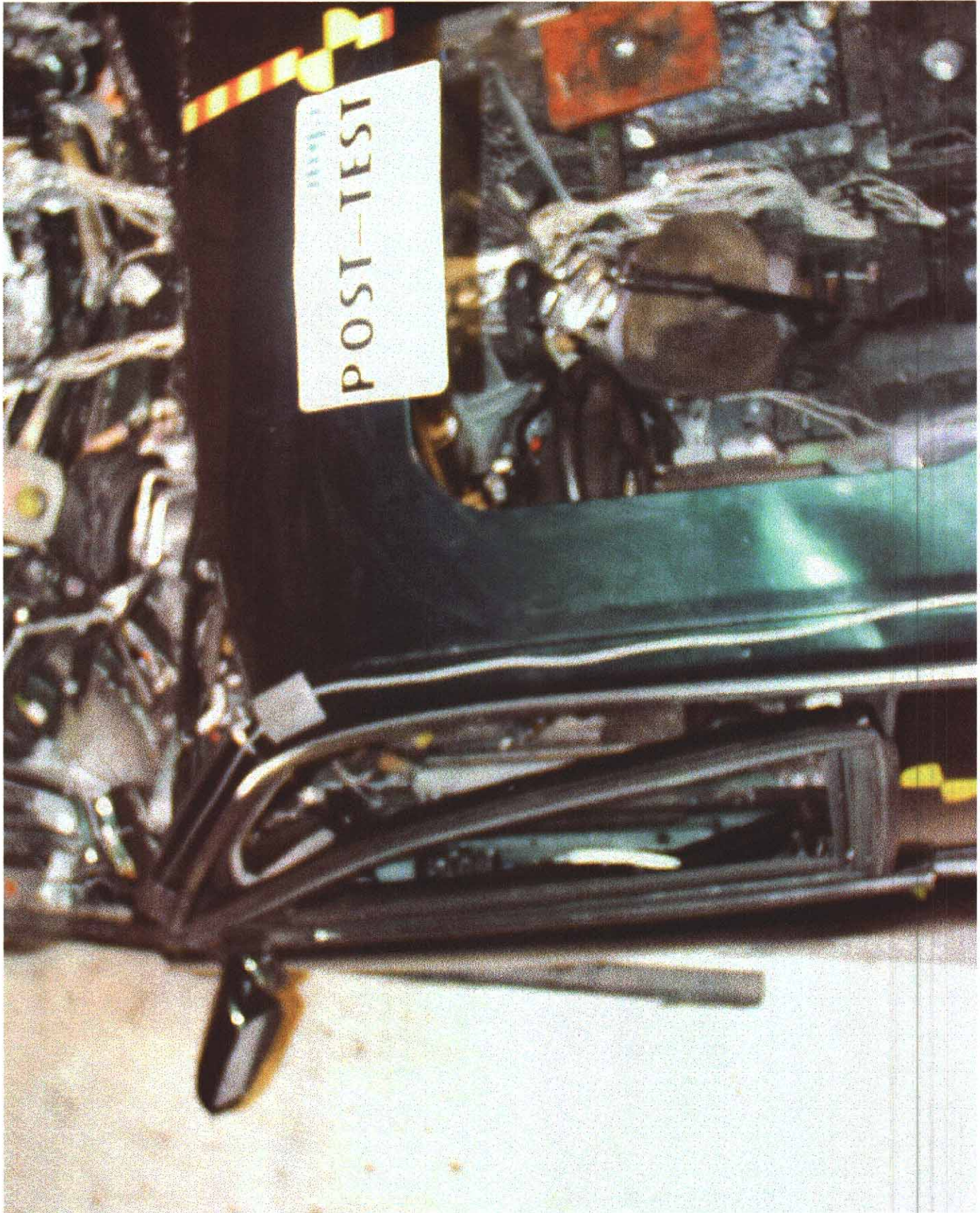


Photo No. A-42 - Post-Test Driver Compartment (Overhead View)

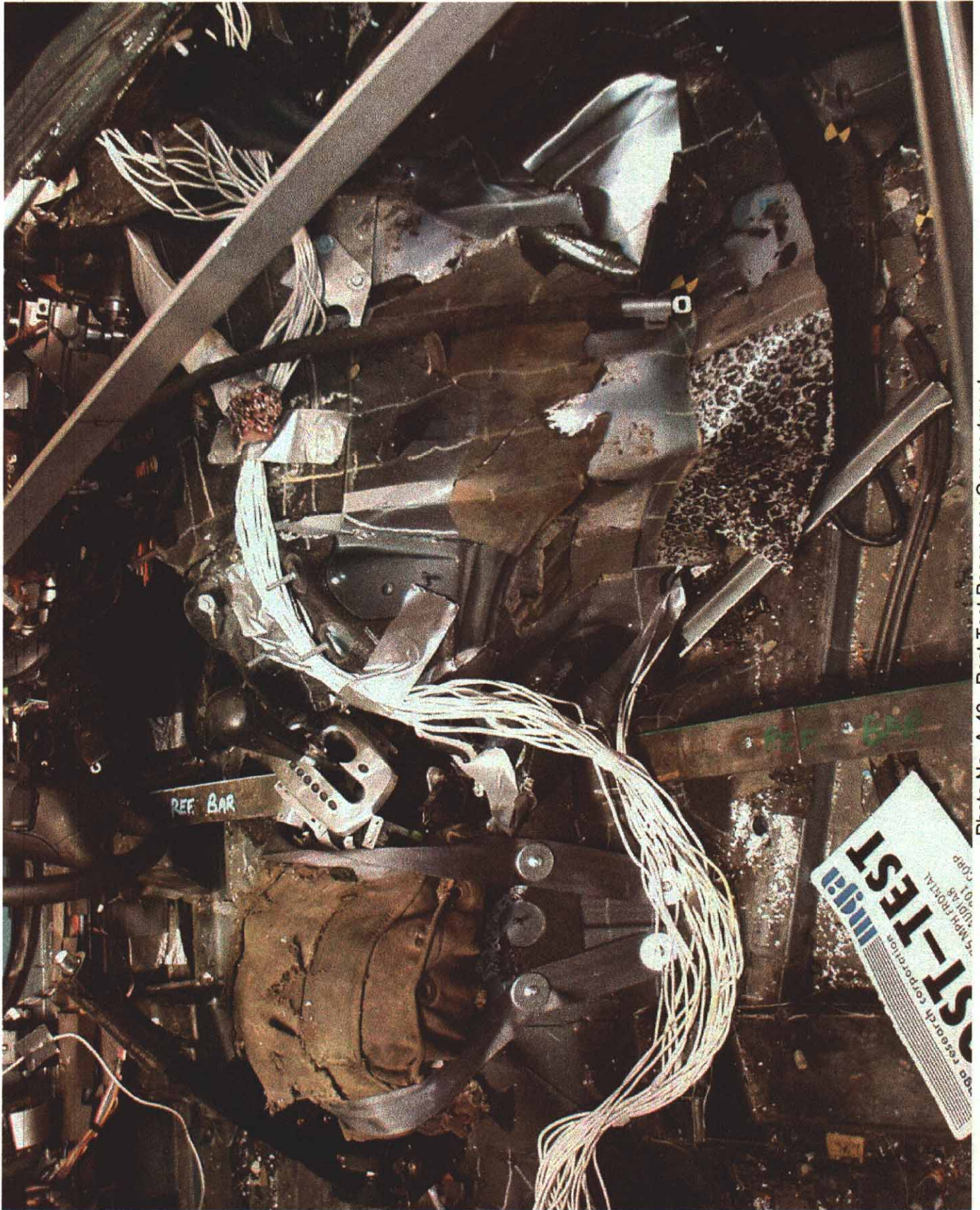


Photo No. A-43 - Post-Test Passenger Compartment



Photo No. A-44 - Post-Test Driver Compartment

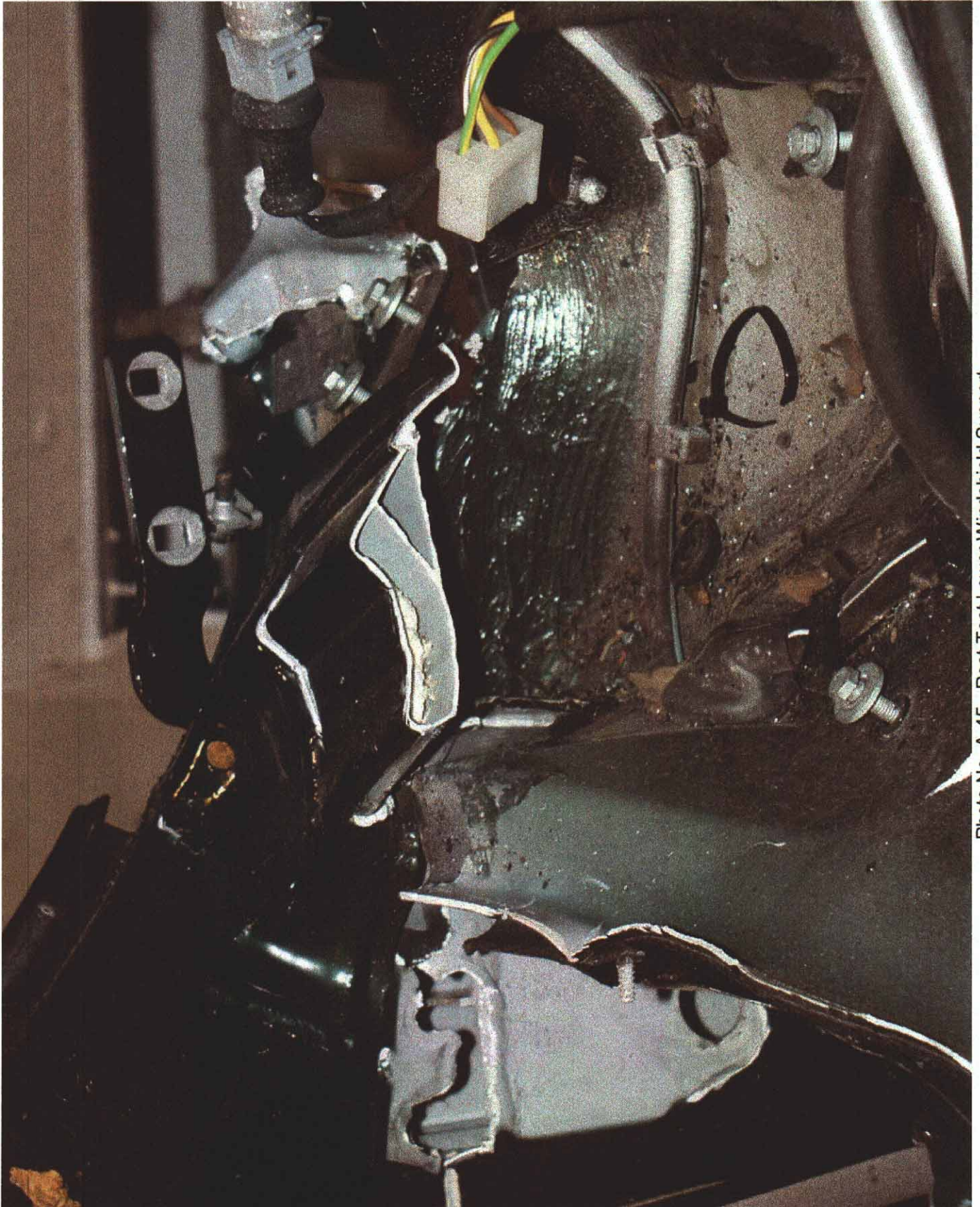


Photo No. A-45 - Post-Test Lower Windshield Support

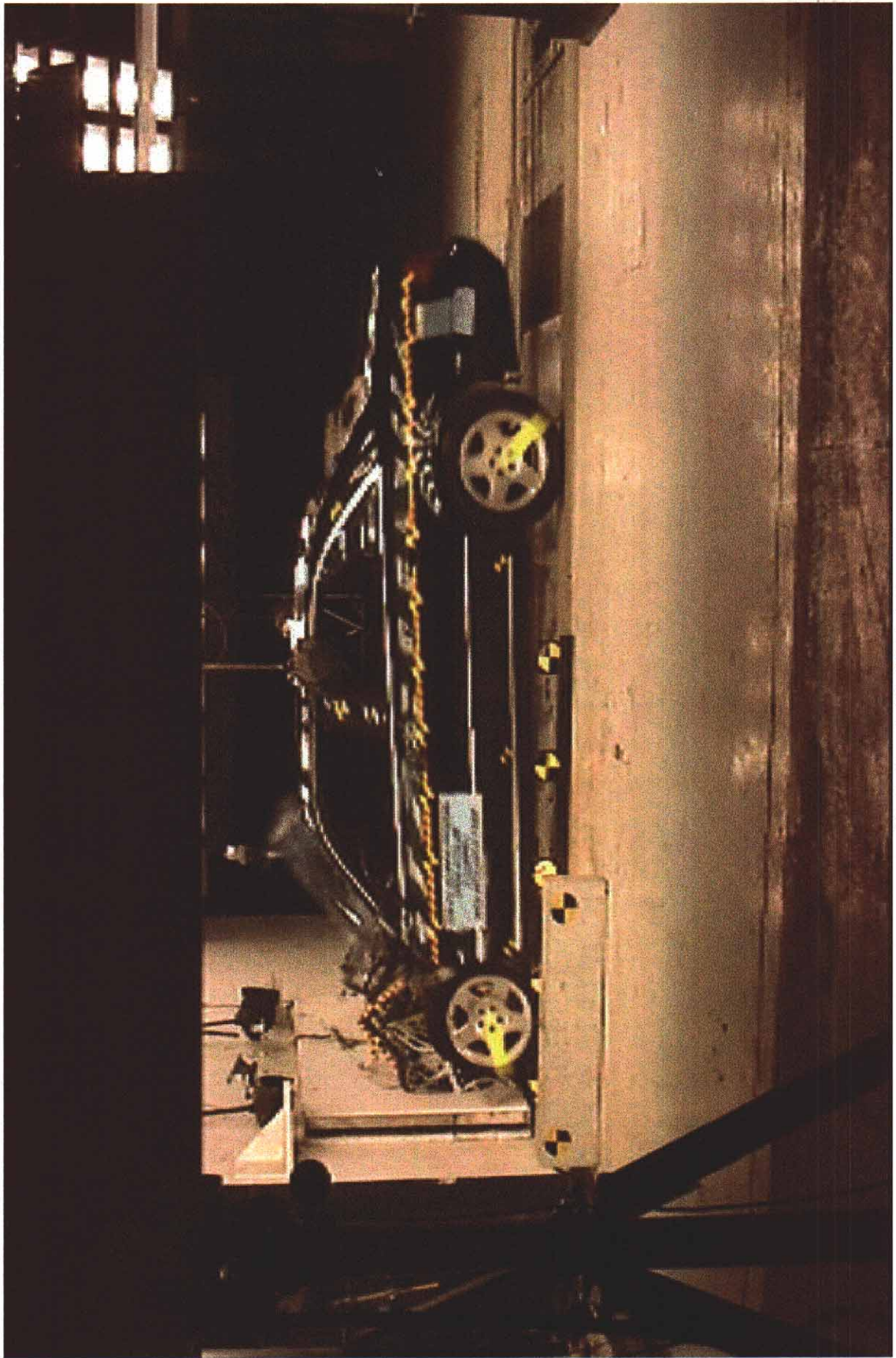


Photo No. A-46 - Vehicle Impact

A-46

APPENDIX B

DUMMY AND VEHICLE RESPONSE DATA TRACES

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VEHICLE DATA FILTER CHANNEL CLASS

Vehicle Accelerations 60 (100 Hz)

Barrier Load Cells 60 (100 Hz)

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* No valid data after 58 msec

** No valid data after 16 msec

*** No valid data after 20 msec

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* No valid data after 53 msec

** No valid data after 40 msec

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LEFT REAR SEAT CROSSMEMBER X ACCELERATION

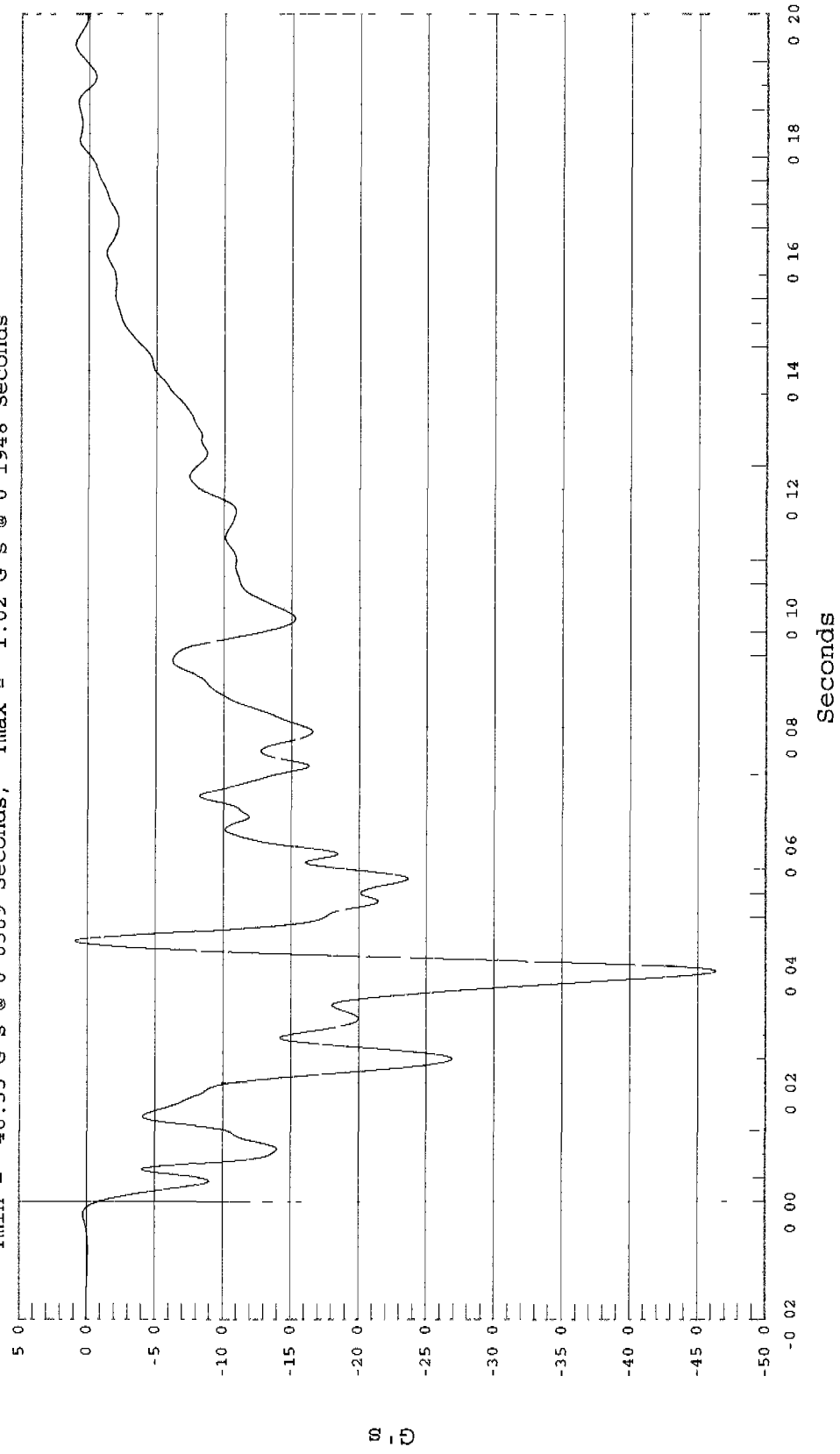
Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60

Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 LEFT REAR SEAT CROSSMEMBER X, B01028AF.A01



Ymin = -46.33 G's @ 0.0389 Seconds, Ymax = 1.02 G's @ 0.1948 Seconds



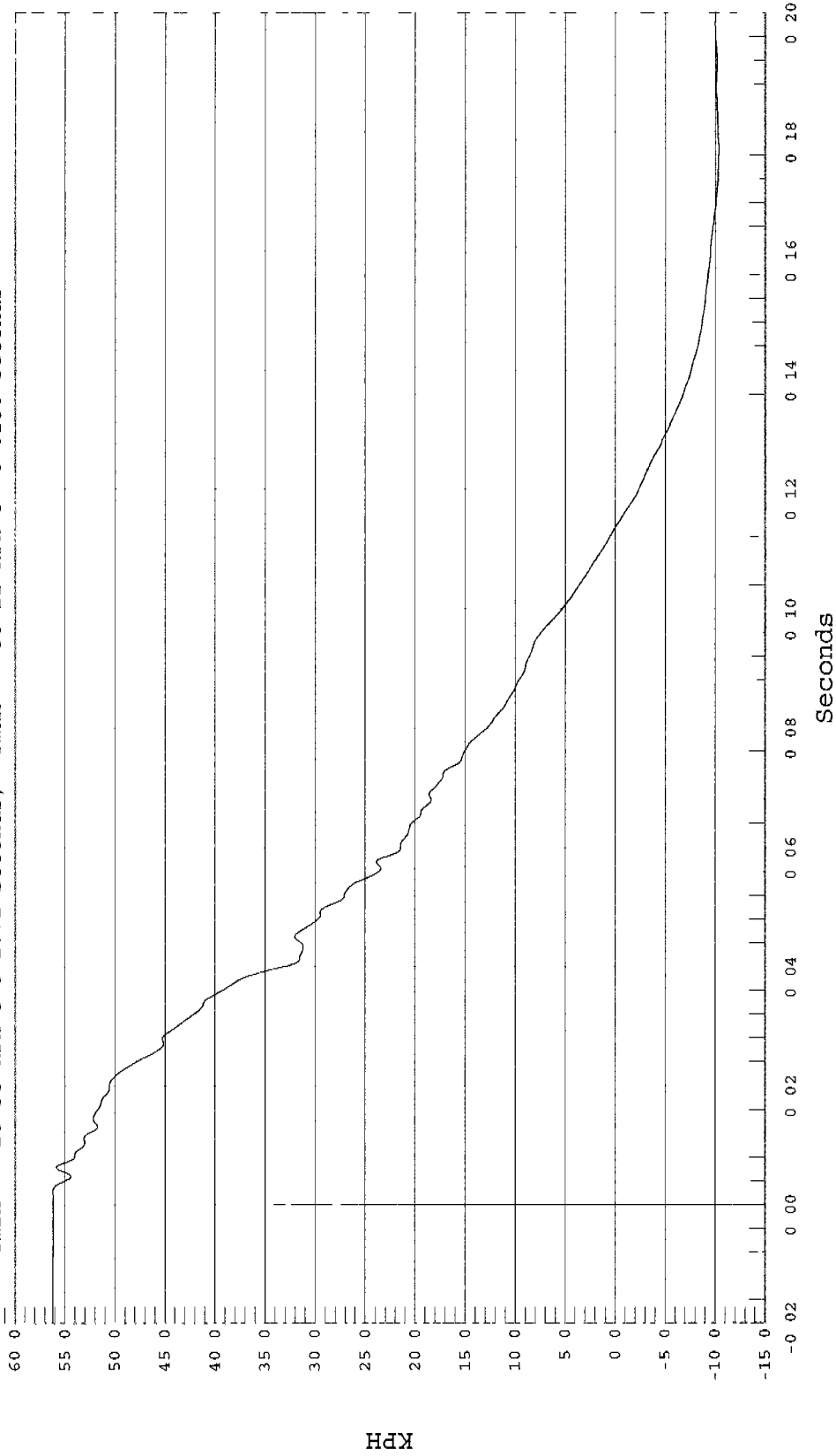
LEFT REAR SEAT CROSSMEMBER X VELOCITY

Test Desc . 35 MPH FRONTAL BARRIER IMPACT
Component . 1998 AUDI A8 4 DOOR SEDAN TTD#2
Filter Class: 180

Other Info:
1 LEFT REAR SEAT CROSSMEMBER X VELOCITY, B01028AI V01



Ymin = -10 35 KPH @ 0 1771 Seconds, Ymax = 56 21 KPH @ -0 0136 Seconds



LEFT REAR SEAT CROSSMEMBER X DISPLACEMENT

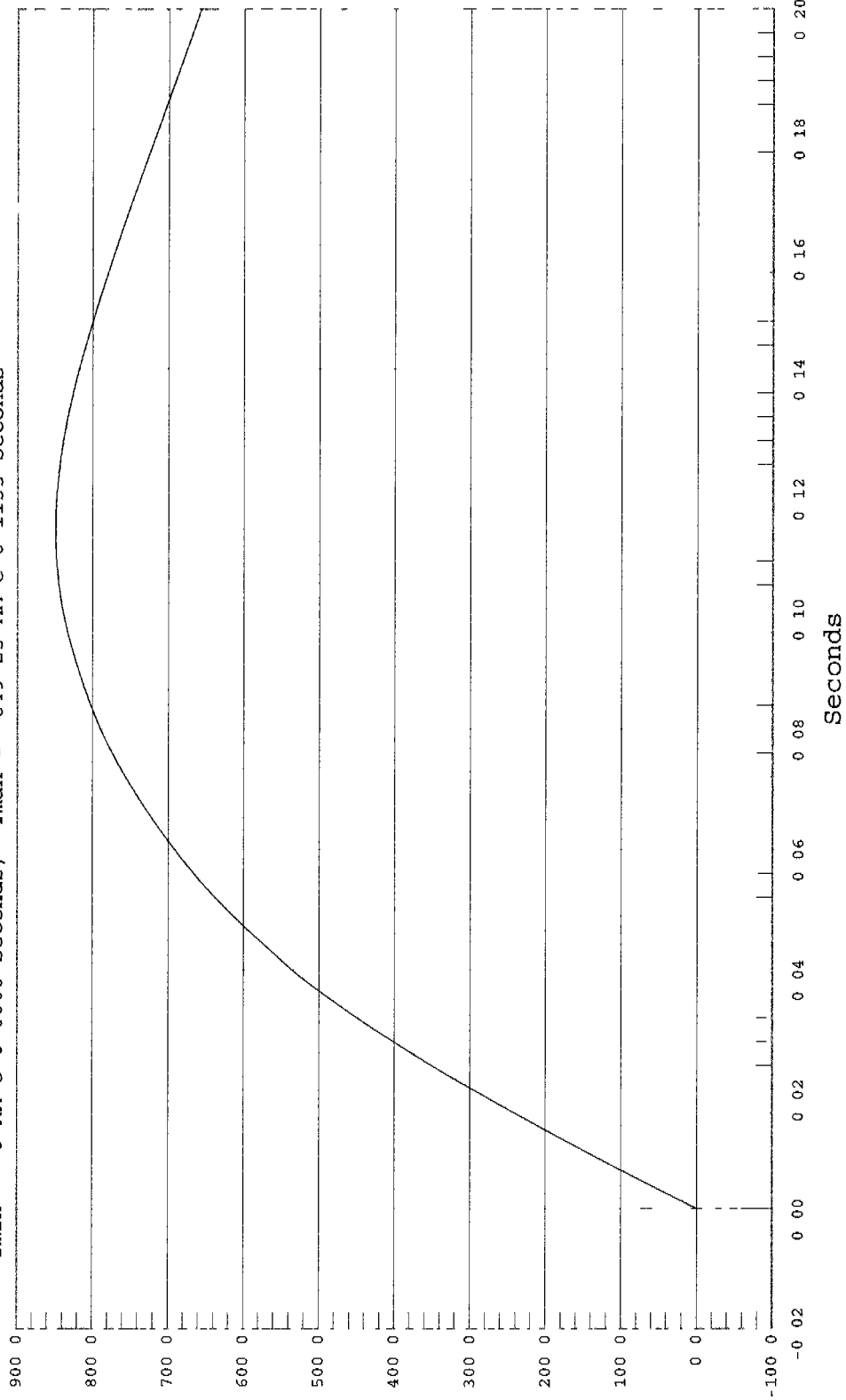
Test Date: 03-08-01
Speed: 34.9 MPH, 56 2 KPH
Filter Class: 180

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTID#2
Other Info:

1 LEFT REAR SEAT CROSSMEMBER X DISPLACEMENT, B01028AI D01



Ymin = 0 MM @ 0 0000 Seconds, Ymax = 849 23 MM @ 0 1133 Seconds



RIGHT REAR SEAT CROSSMEMBER X ACCELERATION

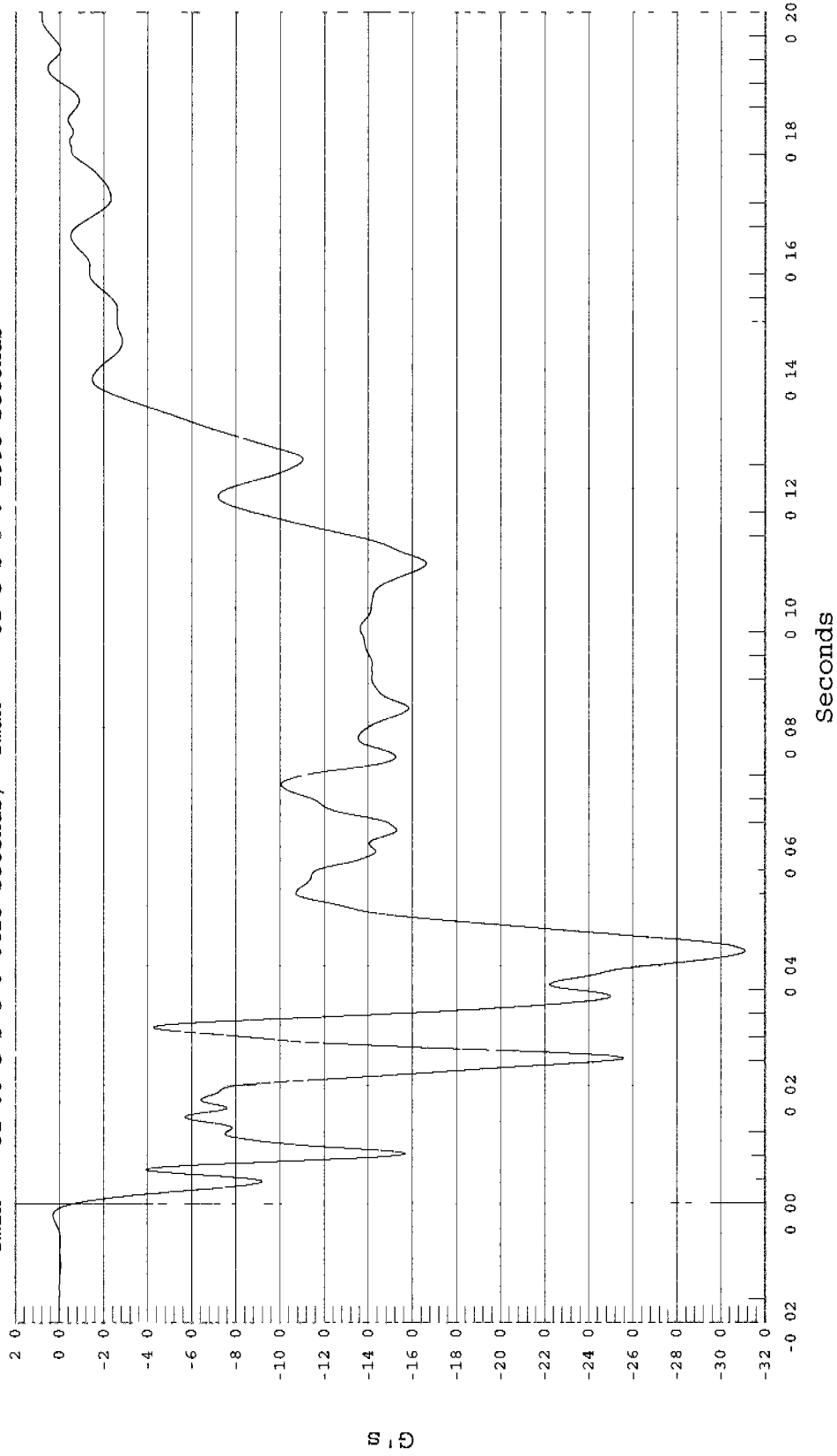
Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH



1 RIGHT REAR SEAT CROSSMEMBER X, B01028AF A02

Ymin = -31.08 G's @ 0.0423 Seconds, Ymax = 8.1 G's @ 0.1993 Seconds



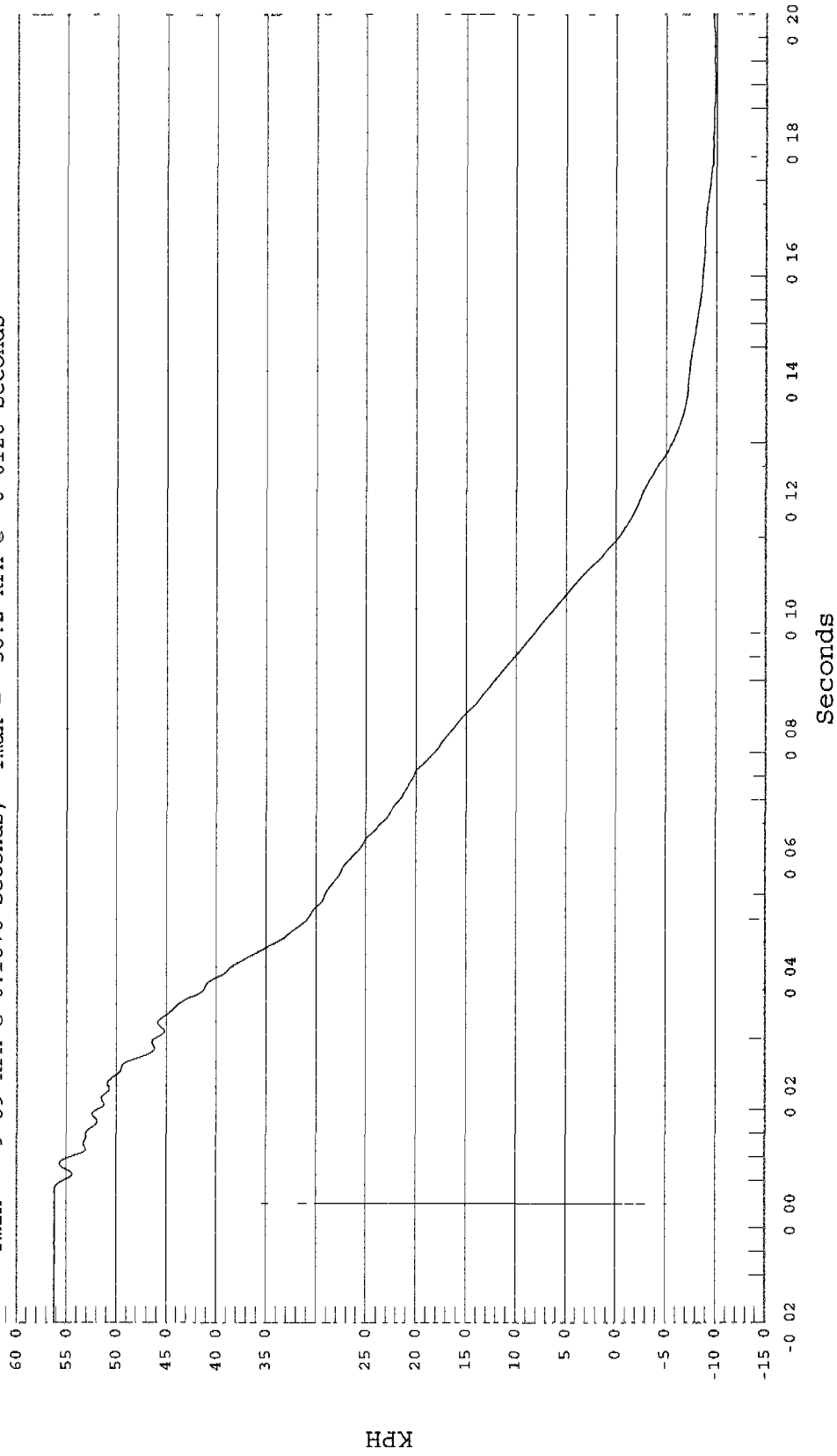
RIGHT REAR SEAT CROSSMEMBER X VELOCITY

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56 2 KPH
Filter Class: 180



1 RIGHT REAR SEAT CROSSMEMBER X VELOCITY, B01028AI.V02

Ymin = -9 89 KPH @ 0.1876 Seconds, Ymax = 56.2 KPH @ -0 0120 Seconds

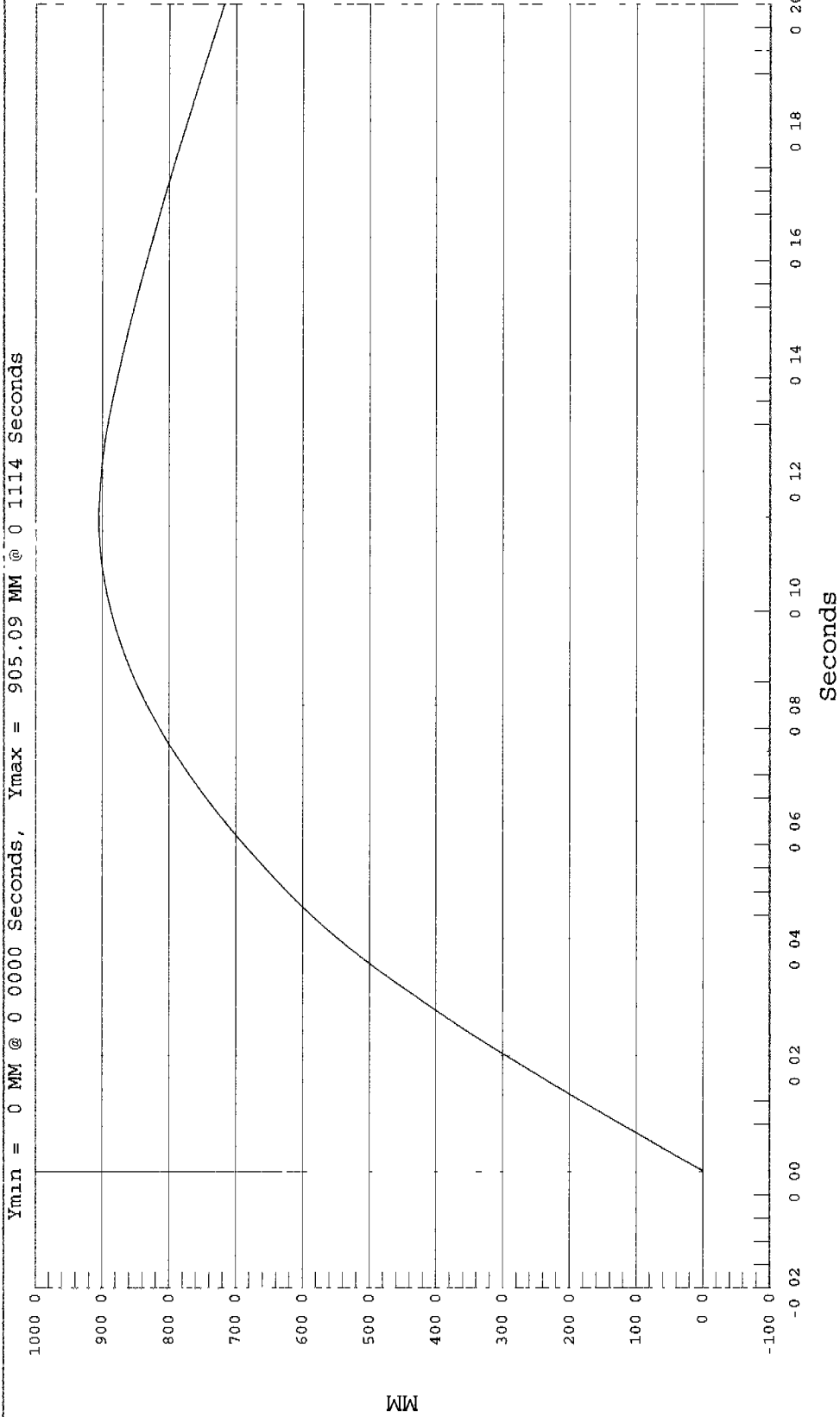


RIGHT REAR SEAT CROSSMEMBER X DISPLACEMENT

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Filter Class: 180
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH

1 RIGHT REAR SEAT CROSSMEMBER X DISPLACEMENT, B01028AI D02

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 905.09 MM @ 0.1114 Seconds



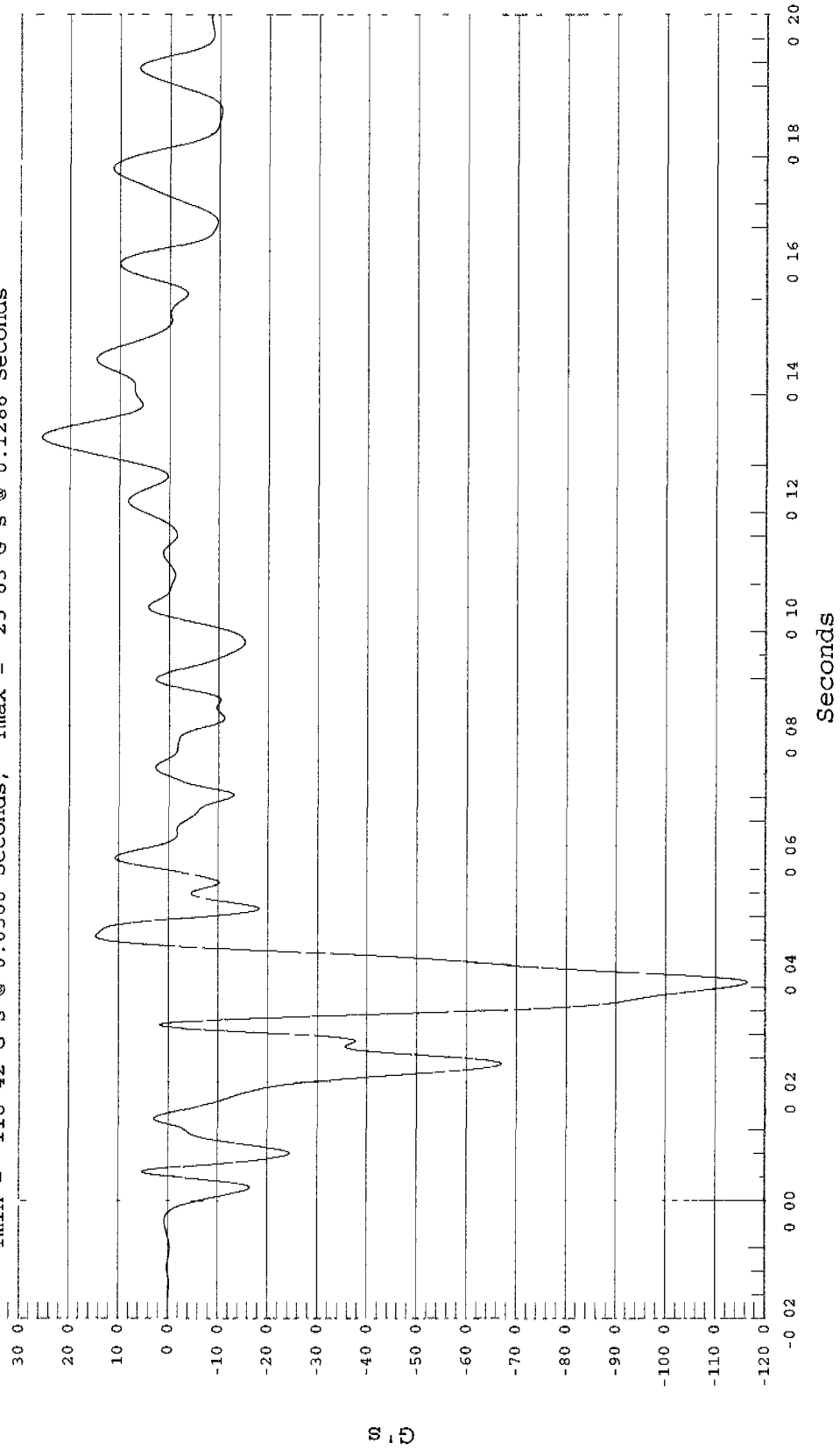
VEHICLE CG X ACCELERATION

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60



1 VEHICLE CG X, B01028AF A03

Ymin = -116.42 G's @ 0.0368 Seconds, Ymax = 25.63 G's @ 0.1286 Seconds



VEHICLE CG X VELOCITY

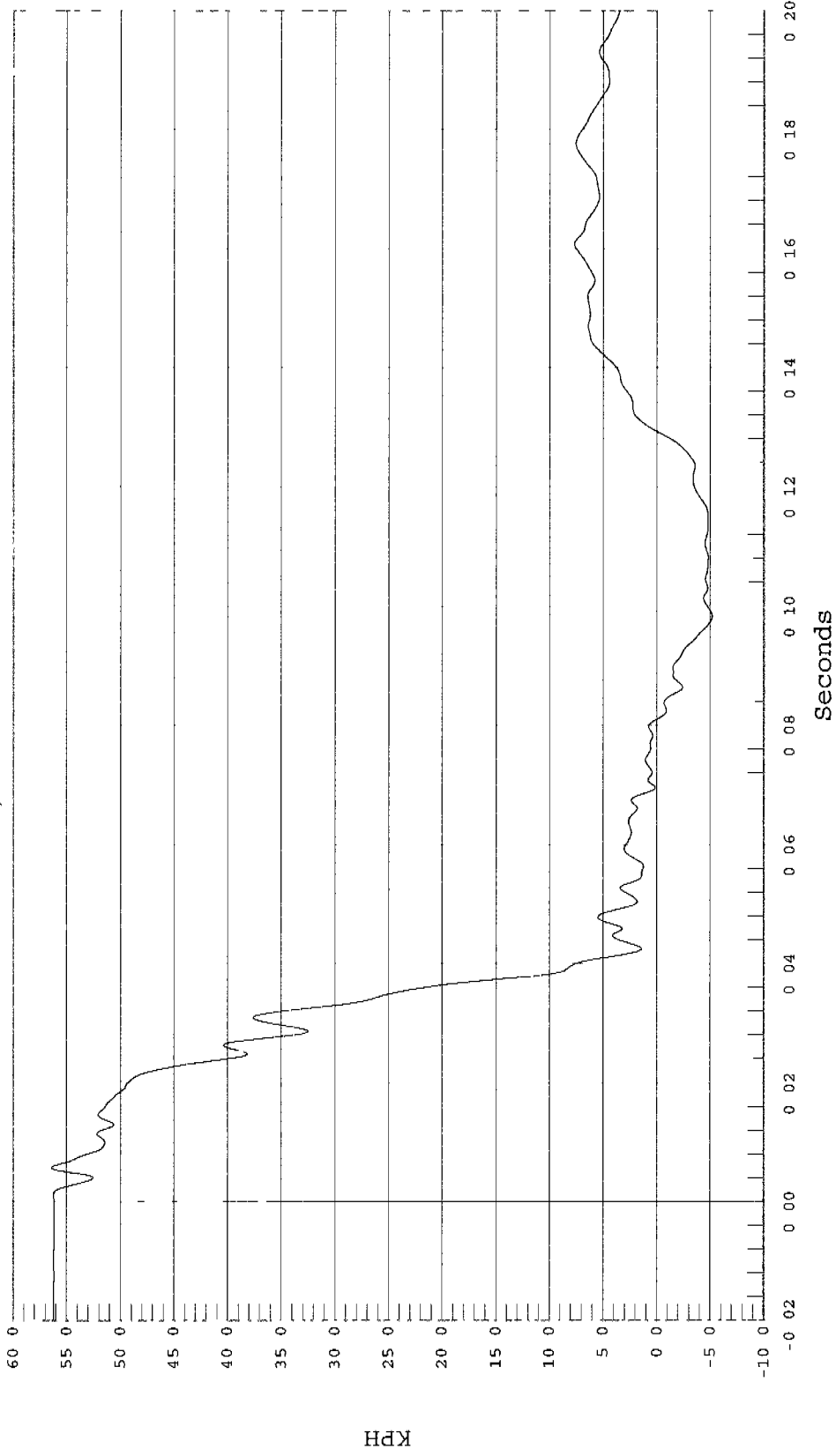
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:



1 VEHICLE CG X VELOCITY, B01028AI V03

Ymin = -5.19 KPH @ 0.0982 Seconds, Ymax = 56.4 KPH @ 0.0057 Seconds



VEHICLE CG X DISPLACEMENT

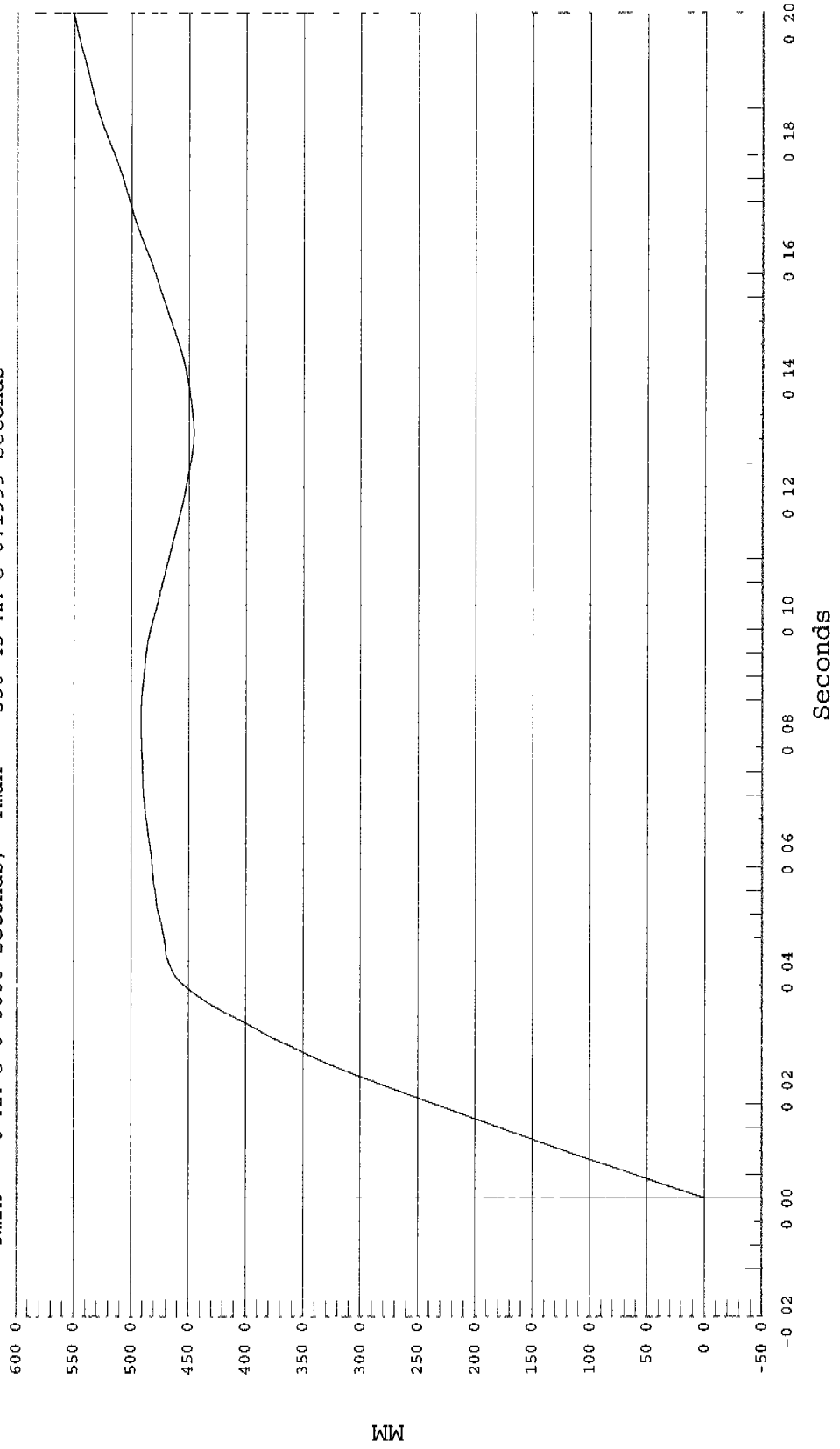
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 VEHICLE CG X DISPLACEMENT, B01028AI D03



Ymin = 0 MM @ 0.0000 Seconds, Ymax = 550.43 MM @ 0.1999 Seconds



VEHICLE CG Y ACCELERATION

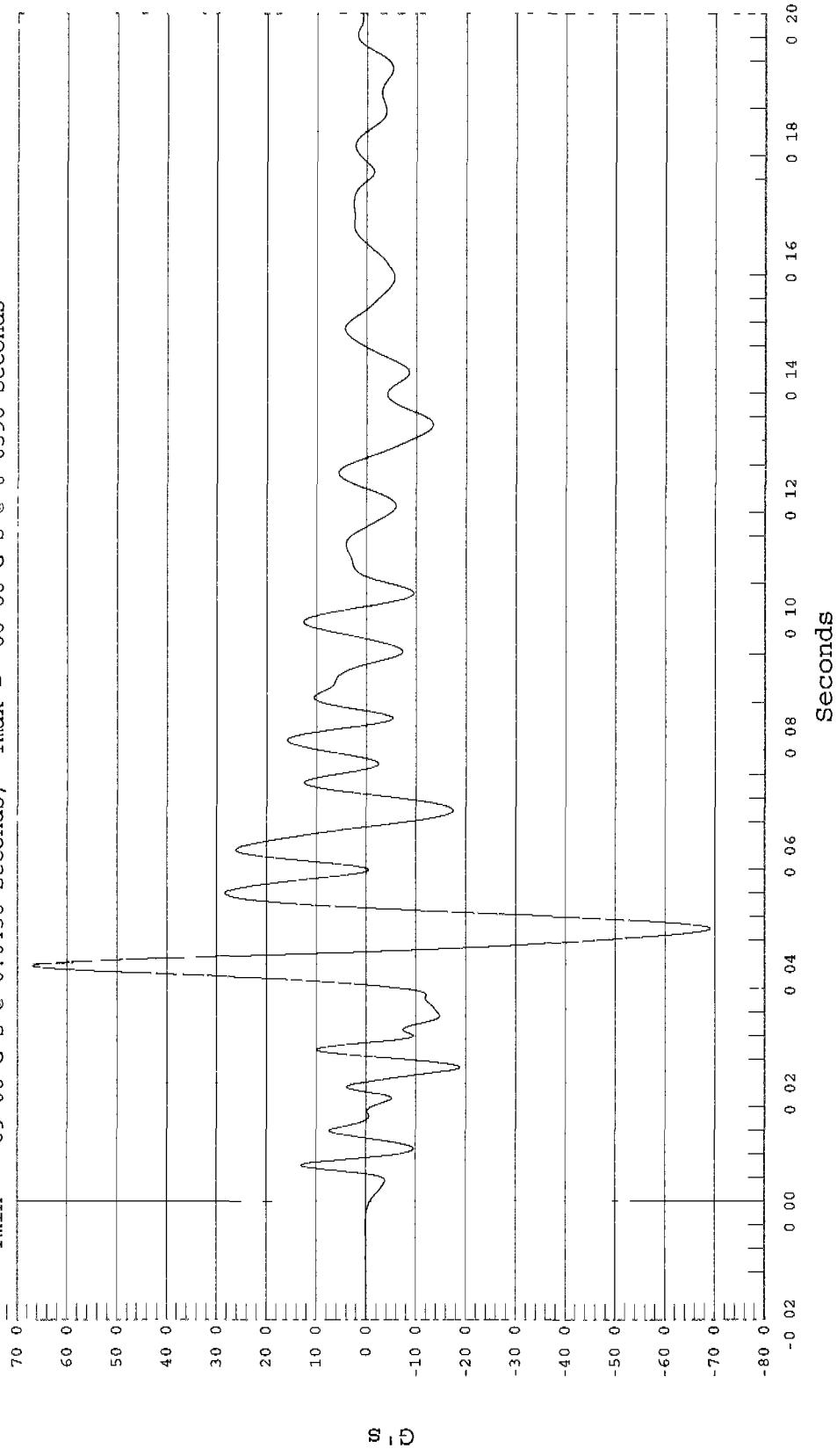
Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component : 1998 AUDI A8 4 DOOR SEDAN TTD#2

Test Date : 03-08-01
Speed : 34.9 MPH, 56.2 KPH



1 VEHICLE CG Y, B01028AF.A04

Ymin = -69.06 G's @ 0.0458 Seconds, Ymax = 66.88 G's @ 0.0396 Seconds



VEHICLE CG Y VELOCITY

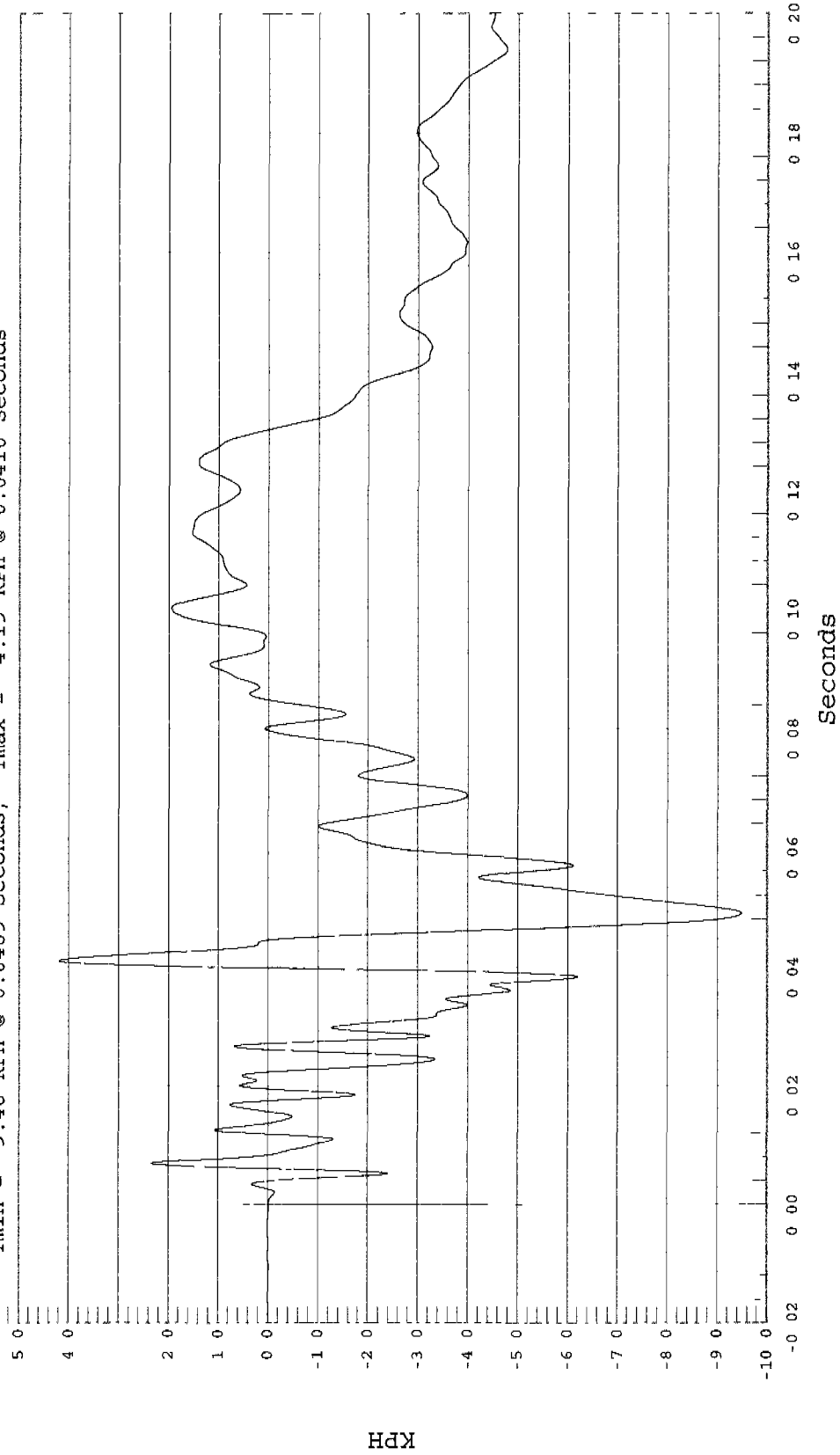
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 VEHICLE CG Y VELOCITY, B01028AI V04



Ymin = -9.48 KPH @ 0.0489 Seconds, Ymax = 4.19 KPH @ 0.0410 Seconds



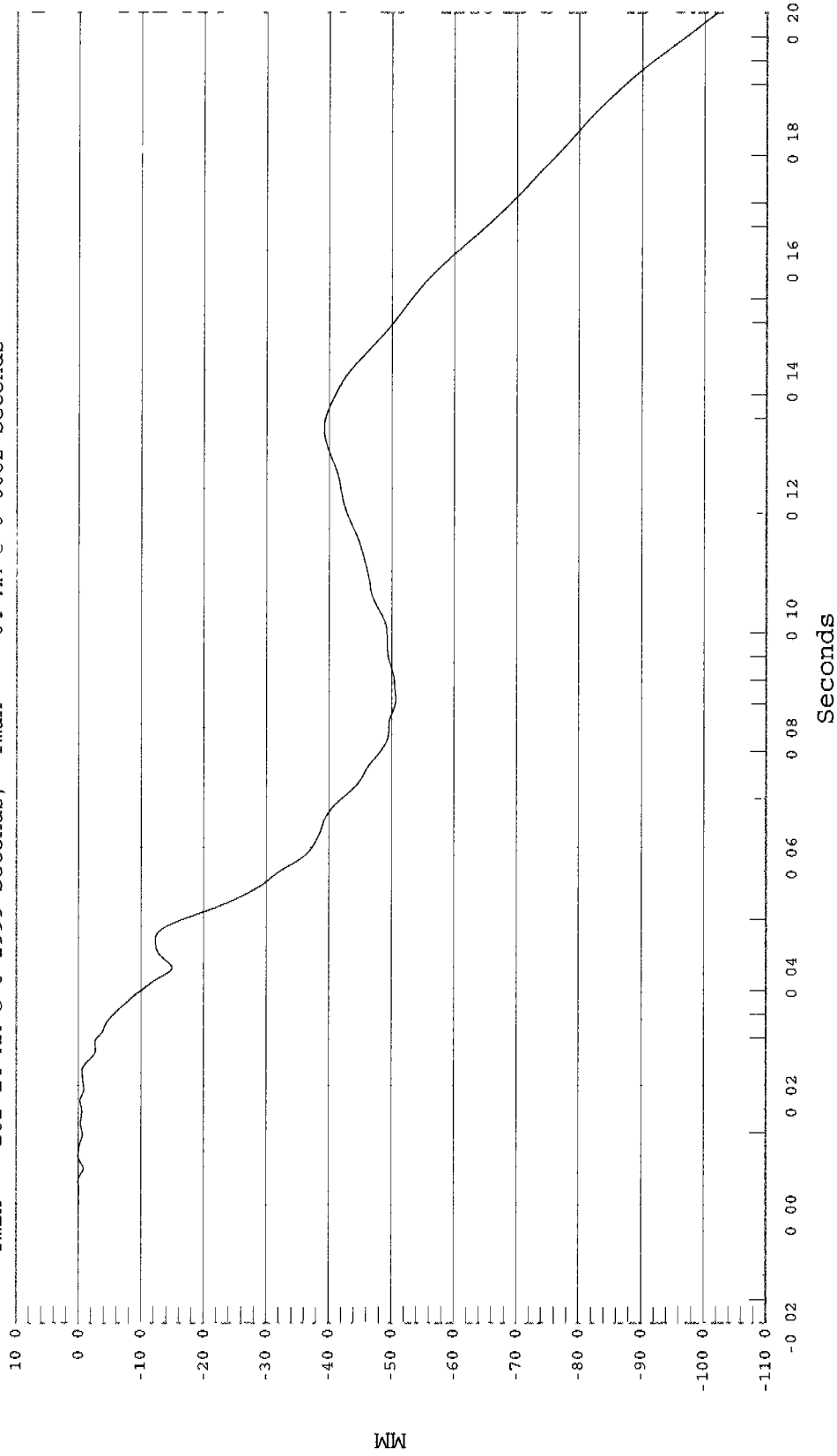


VEHICLE CG Y DISPLACEMENT

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed 34.9 MPH, 56.2 KPH
Filter Class: 180

1 VEHICLE CG Y DISPLACEMENT, B01028AI D04

Ymin = -102.14 MM @ 0.1999 Seconds, Ymax = 04. MM @ 0.0082 Seconds



VEHICLE CG Z ACCELERATION

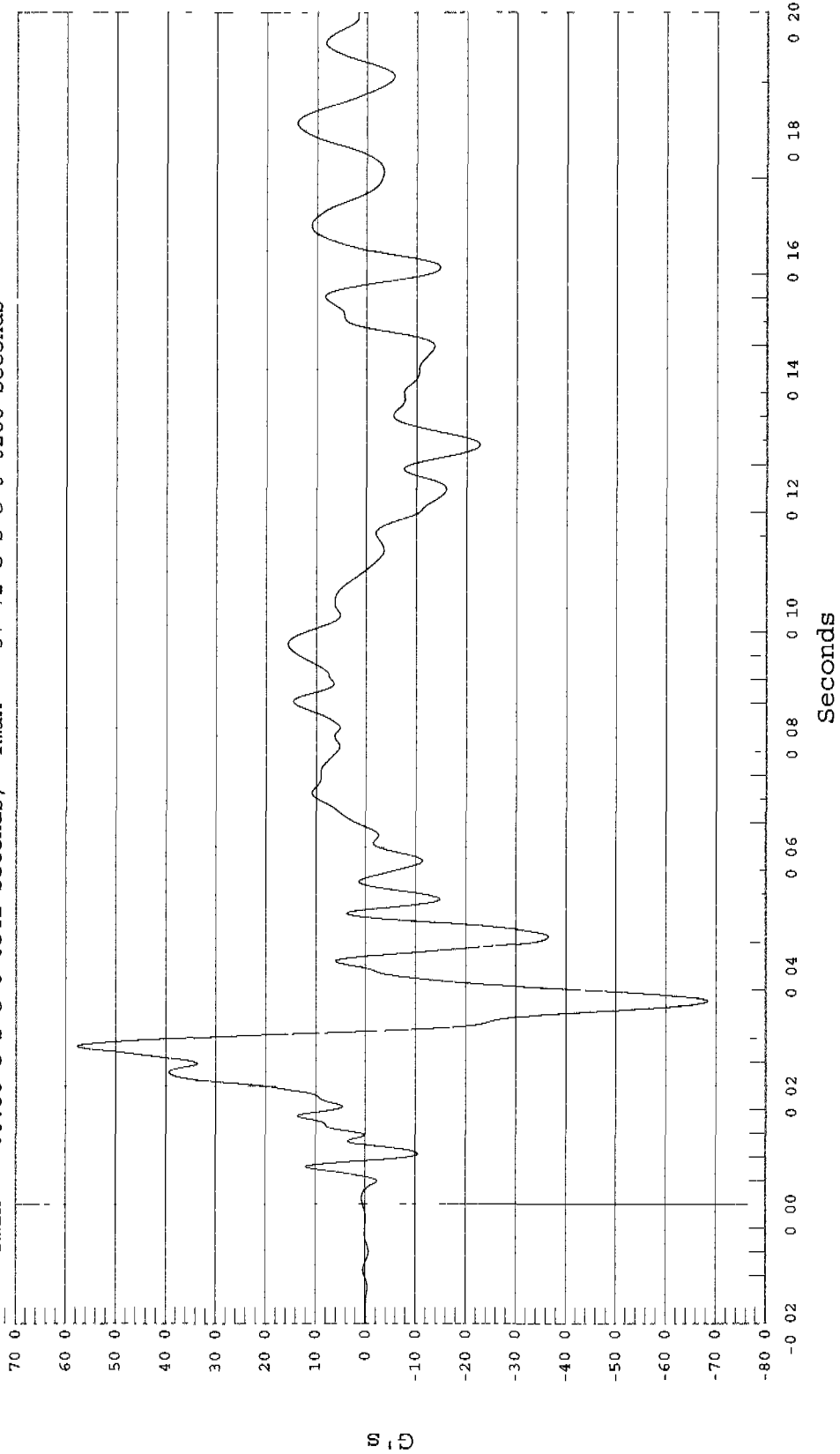
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 VEHICLE CG Z, B01028AF.A05



Ymin = -68.38 G's @ 0.0341 Seconds, Ymax = 57.72 G's @ 0.0266 Seconds



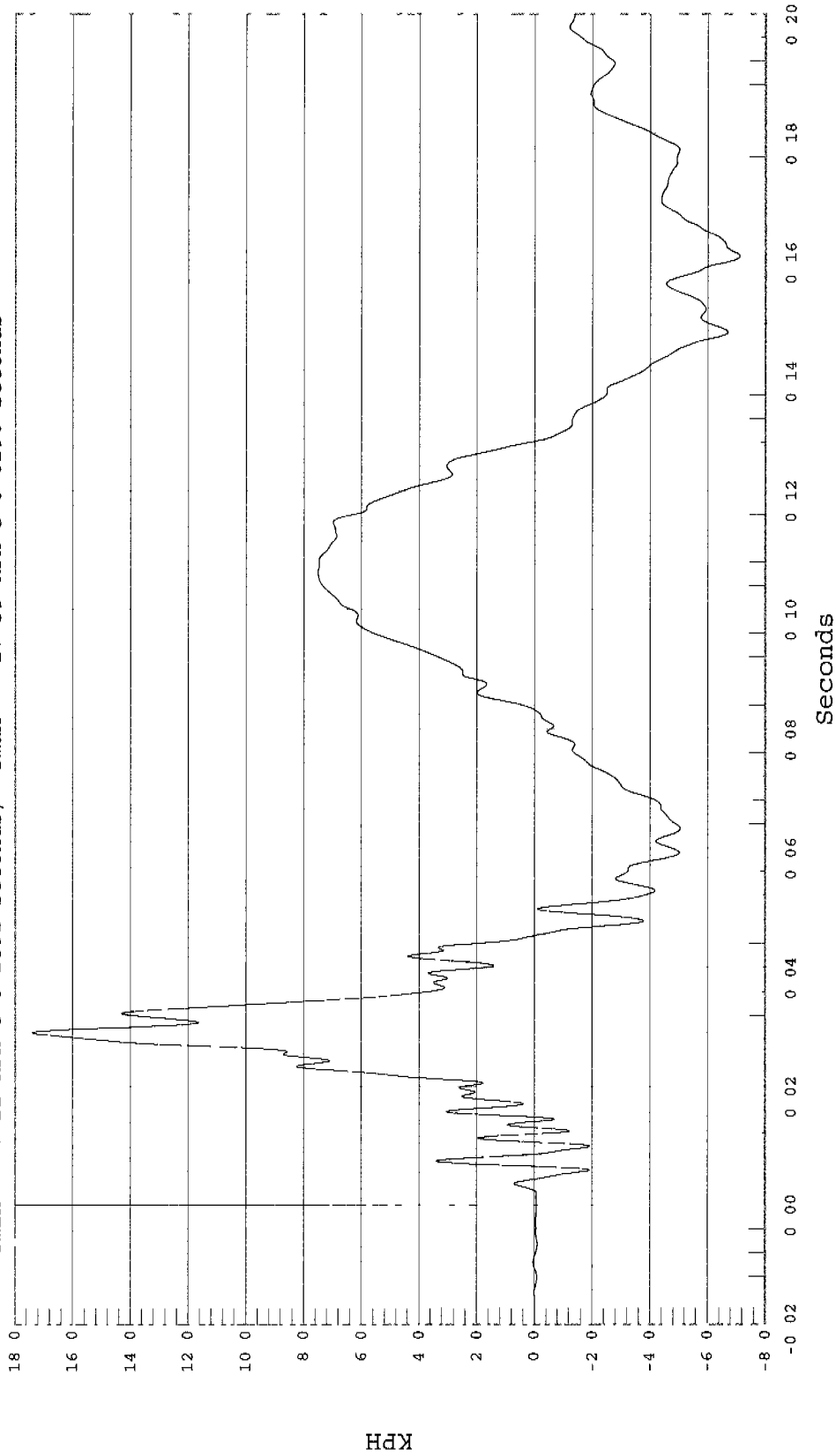
VEHICLE CG Z VELOCITY

Test Date: 03-08-01
Speed. 34.9 MPH, 56 2 KPH
Filter Class: 180

Test Desc 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 VEHICLE CG Z VELOCITY, B01028AI V05

Ymin = -7 11 KPH @ 0 1592 Seconds, Ymax = 17 39 KPH @ 0 0290 Seconds



VEHICLE CG Z DISPLACEMENT

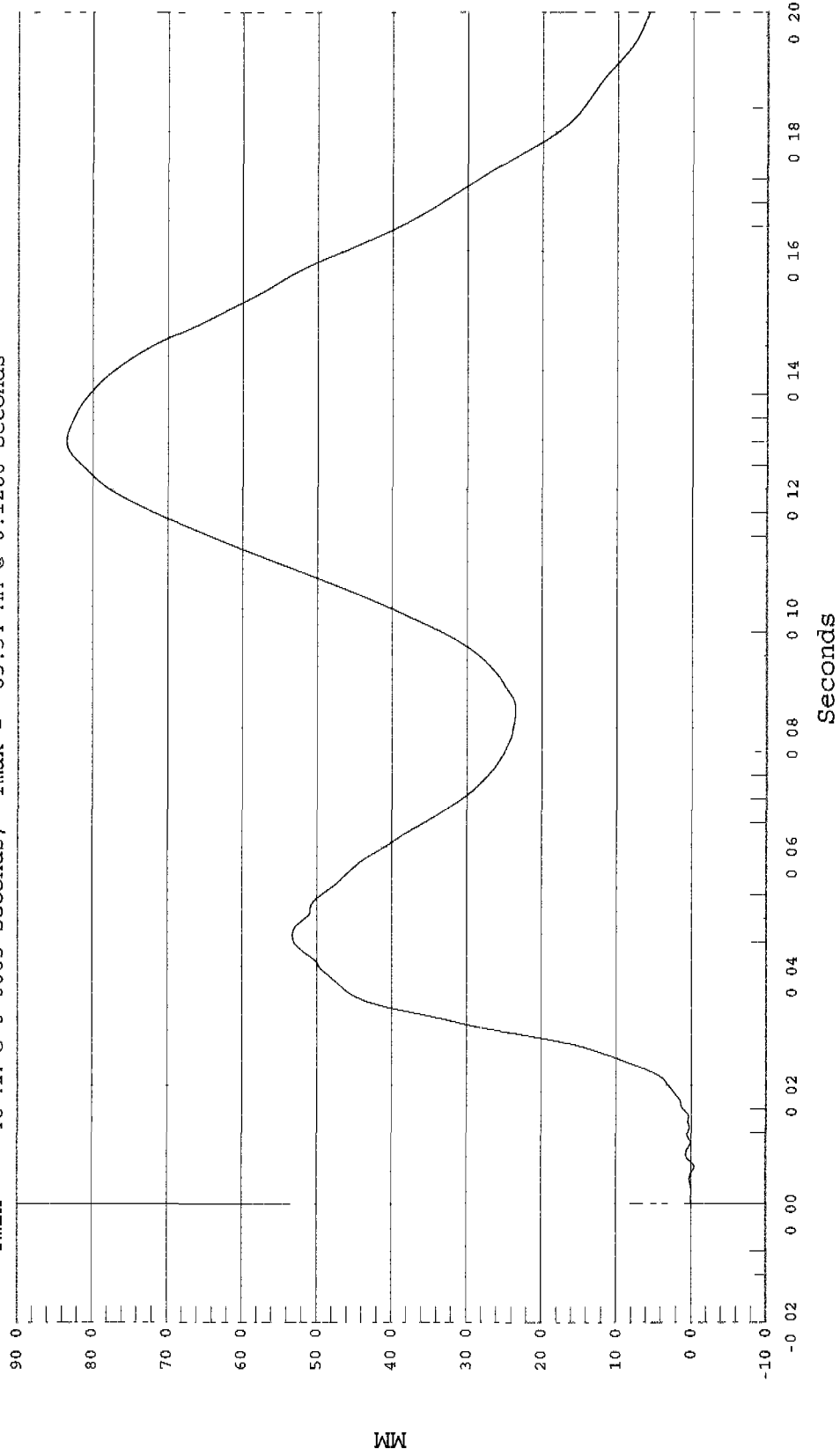
Test Desc . 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Filter Class: 180

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Other Info:

1 VEHICLE CG Z DISPLACEMENT, B01028AI.D05



Ymin = - 46 MM @ 0.0063 Seconds, Ymax = 83.54 MM @ 0.1280 Seconds



LEFT SHOCK TOWER X ACCELERATION

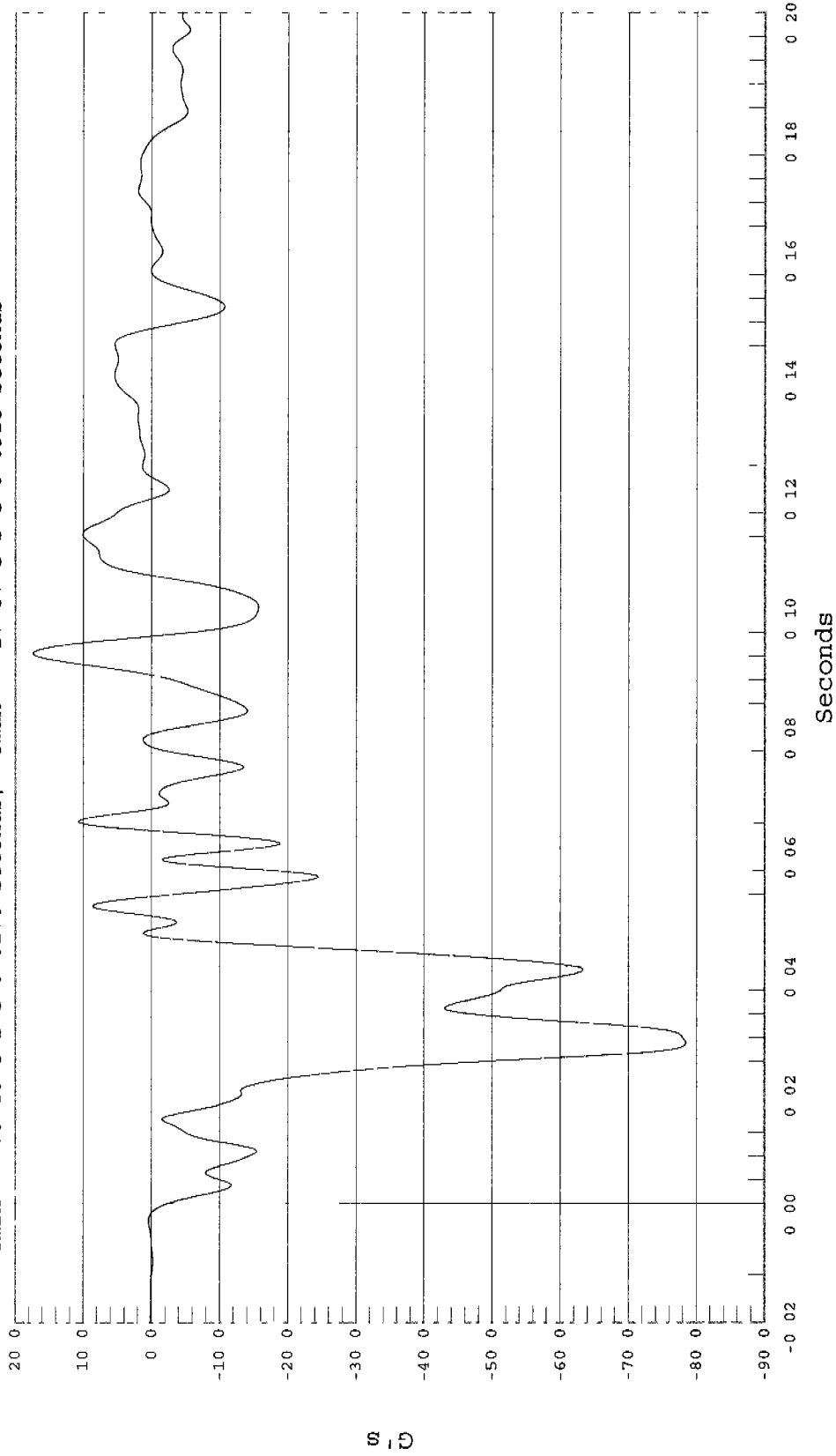
Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60



1 LEFT SHOCK TOWER X, B01028AF.A06

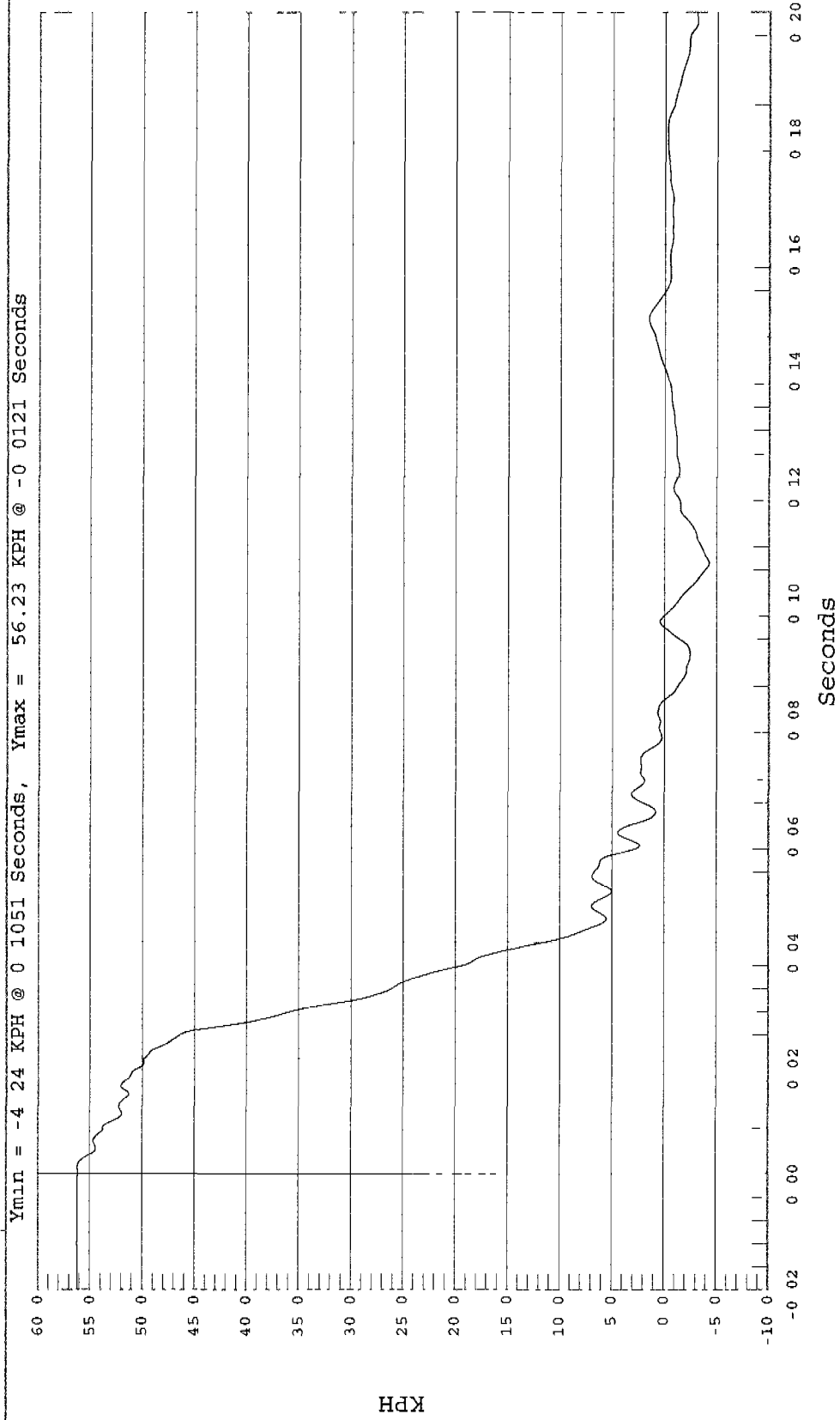
Ymin = -78.46 G's @ 0.0270 Seconds, Ymax = 17.37 G's @ 0.0923 Seconds



LEFT SHOCK TOWER X VELOCITY

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component : 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

1 LEFT SHOCK TOWER X VELOCITY, B01028AI.V06



LEFT SHOCK TOWER X DISPLACEMENT

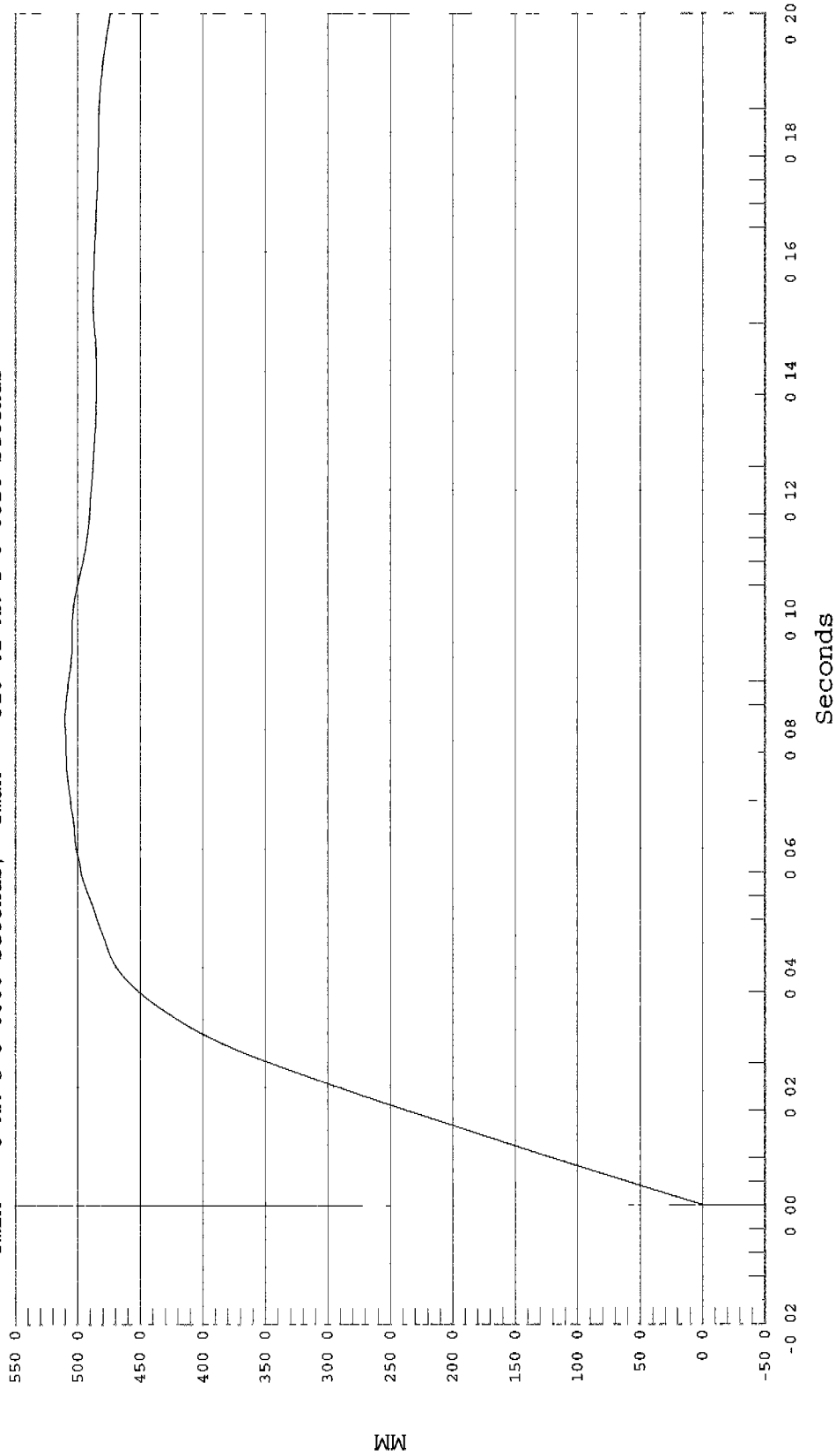
Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180



1 LEFT SHOCK TOWER X DISPLACEMENT, B01028AI D06

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 510.02 MM @ 0.0816 Seconds



LEFT SHOCK TOWER Y ACCELERATION

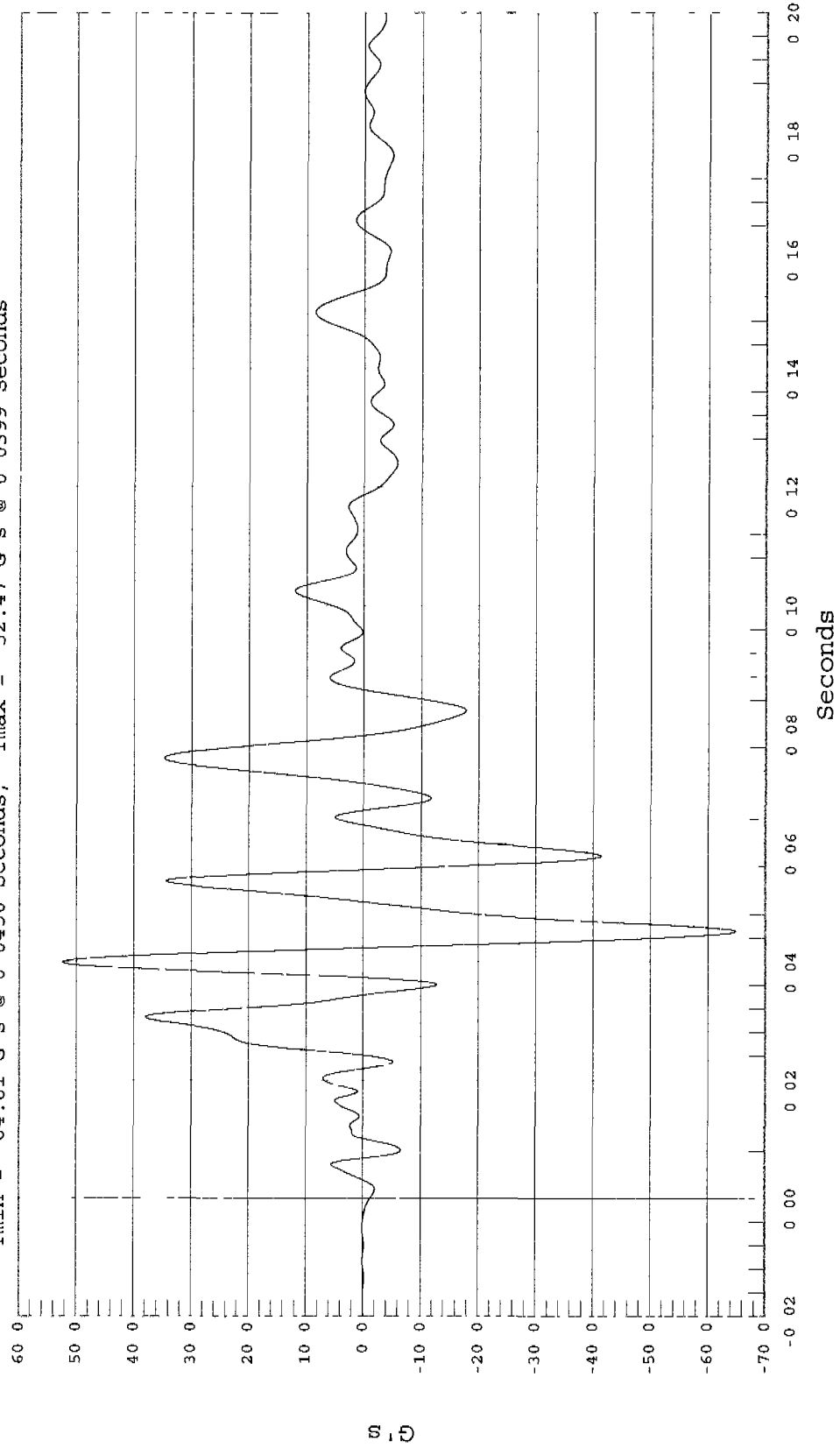
Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component : 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60

1 LEFT SHOCK TOWER Y, B01028AF A07



Ymin = -64.81 G's @ 0.0450 Seconds, Ymax = 52.47 G's @ 0.0399 Seconds





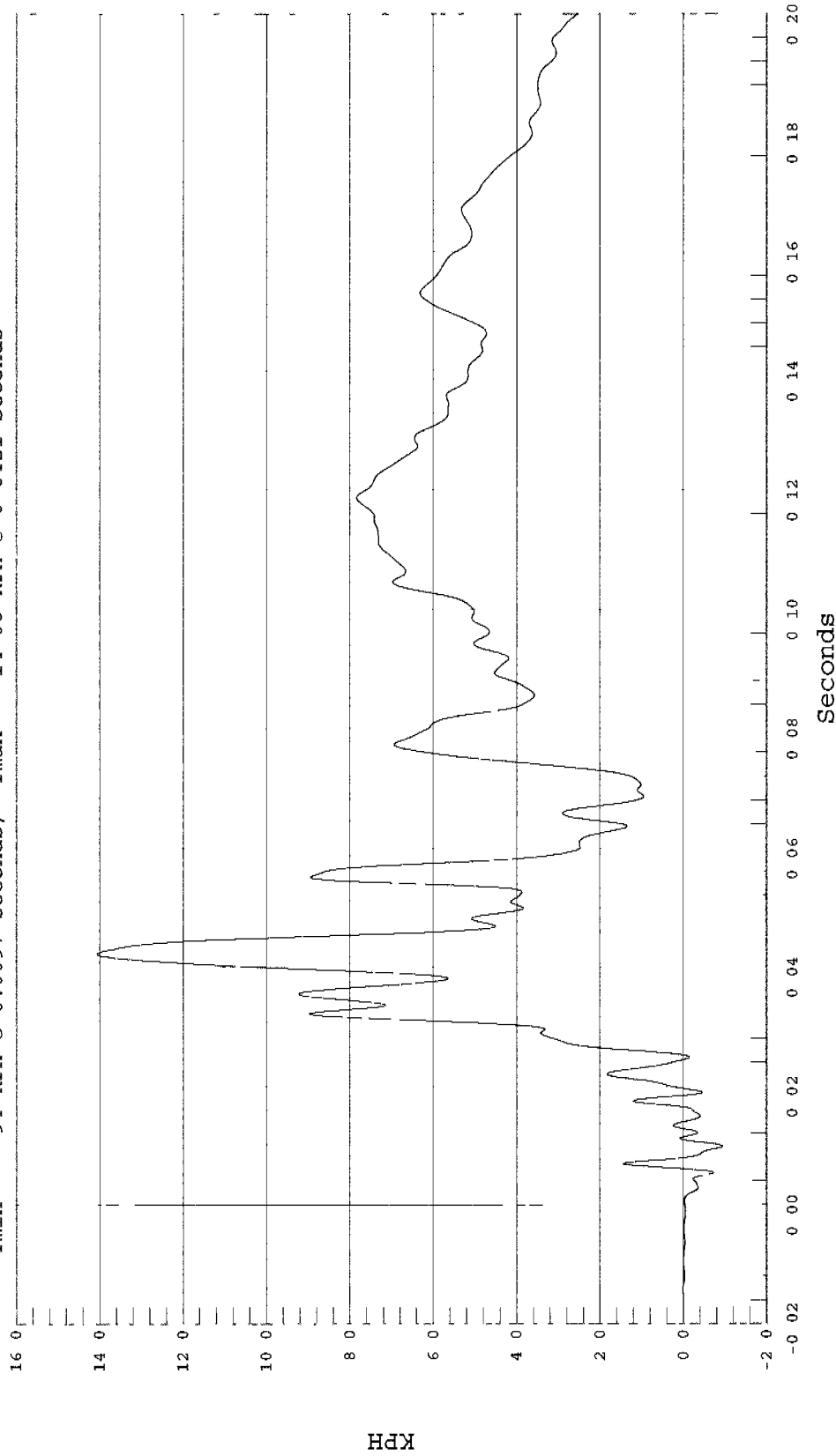
LEFT SHOCK TOWER Y VELOCITY

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

Test Desc: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 LEFT SHOCK TOWER Y VELOCITY, B01028AI V07

Ymin = -94 KPH @ 0.0097 Seconds, Ymax = 14.06 KPH @ 0.0421 Seconds



LEFT SHOCK TOWER Y DISPLACEMENT

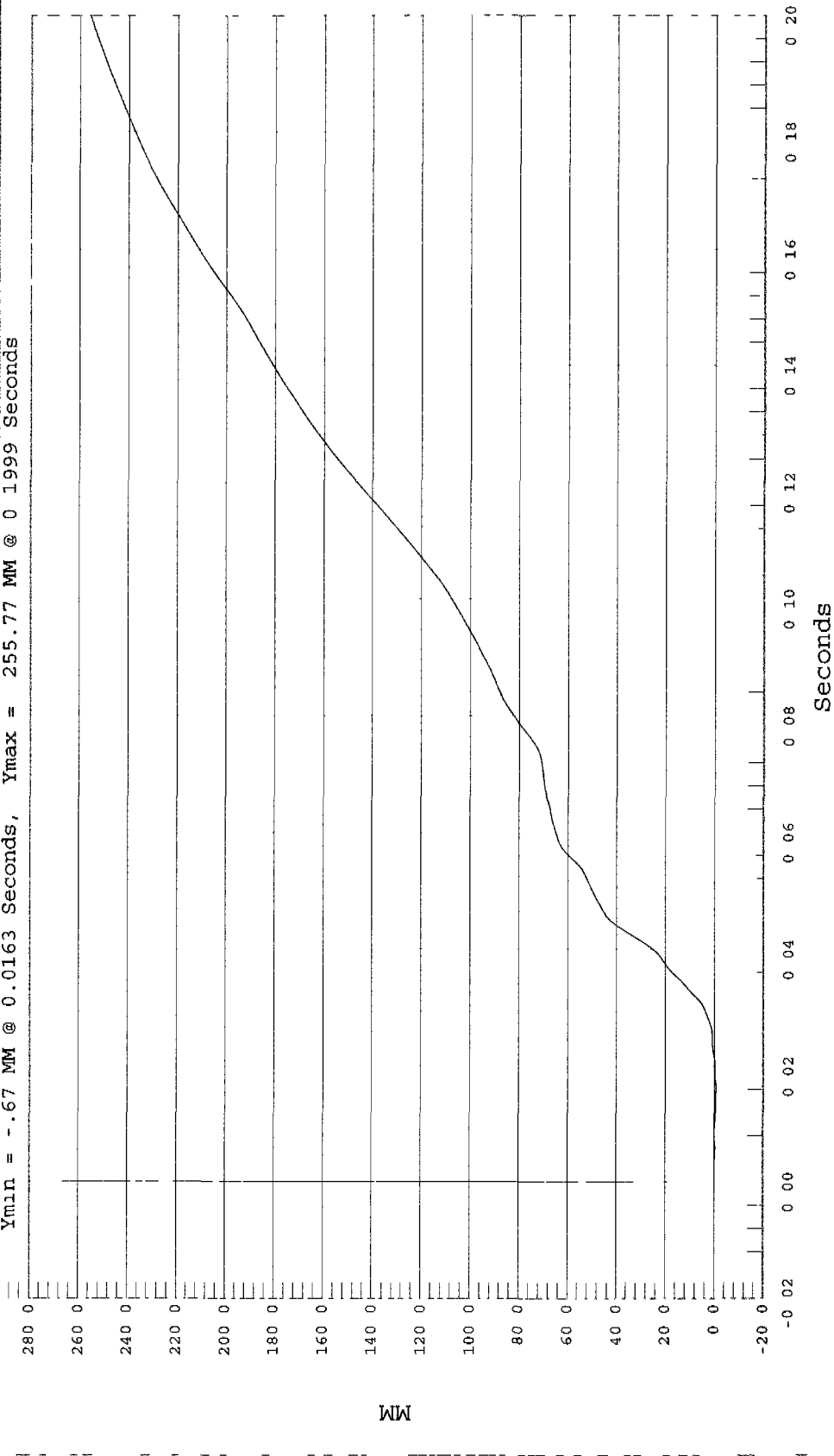
Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180



1 LEFT SHOCK TOWER Y DISPLACEMENT, B01028A1.D07

Ymin = -.67 MM @ 0.0163 Seconds, Ymax = 255.77 MM @ 0.1999 Seconds



RIGHT SHOCK TOWER X ACCELERATION

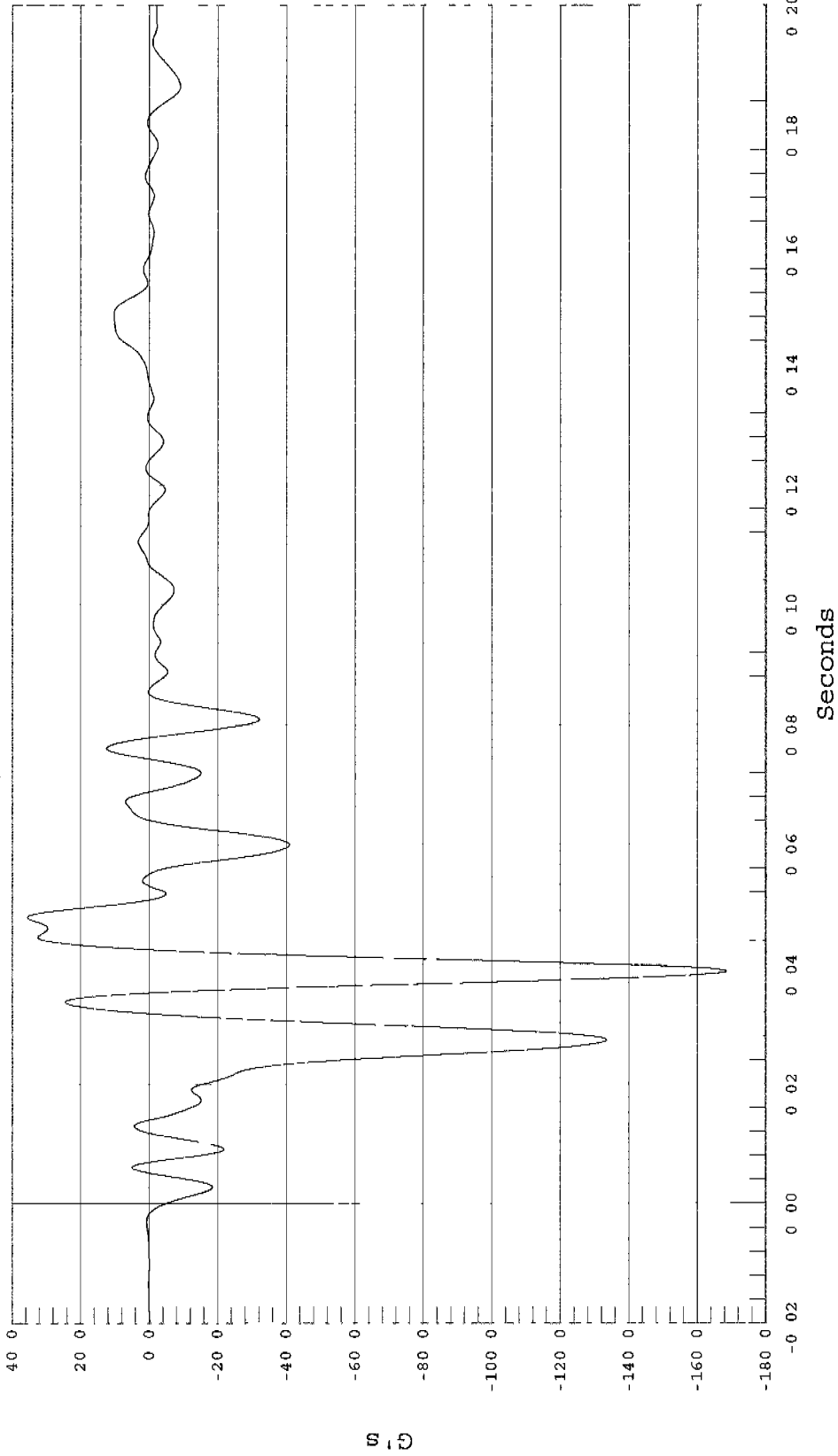
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class 60

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 RIGHT SHOCK TOWER X, B01028AF A08



Ymin = -168.52 G's @ 0.0388 Seconds, Ymax = 35.51 G's @ 0.0477 Seconds



RIGHT SHOCK TOWER X VELOCITY

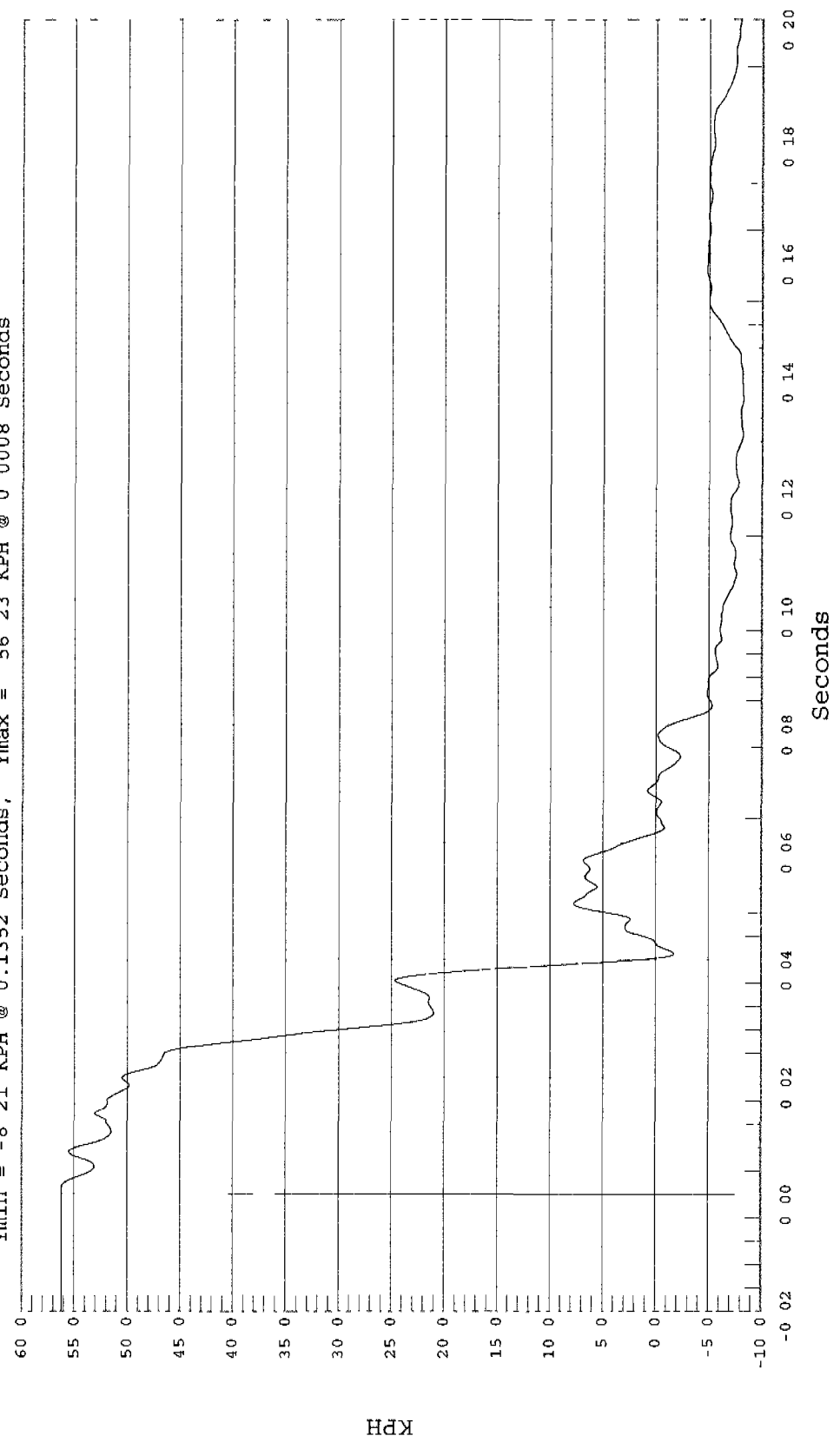
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 RIGHT SHOCK TOWER X VELOCITY, B01028AI.V08



Ymin = -8.21 KPH @ 0.1352 Seconds, Ymax = 56.23 KPH @ 0.0008 Seconds



RIGHT SHOCK TOWER X DISPLACEMENT

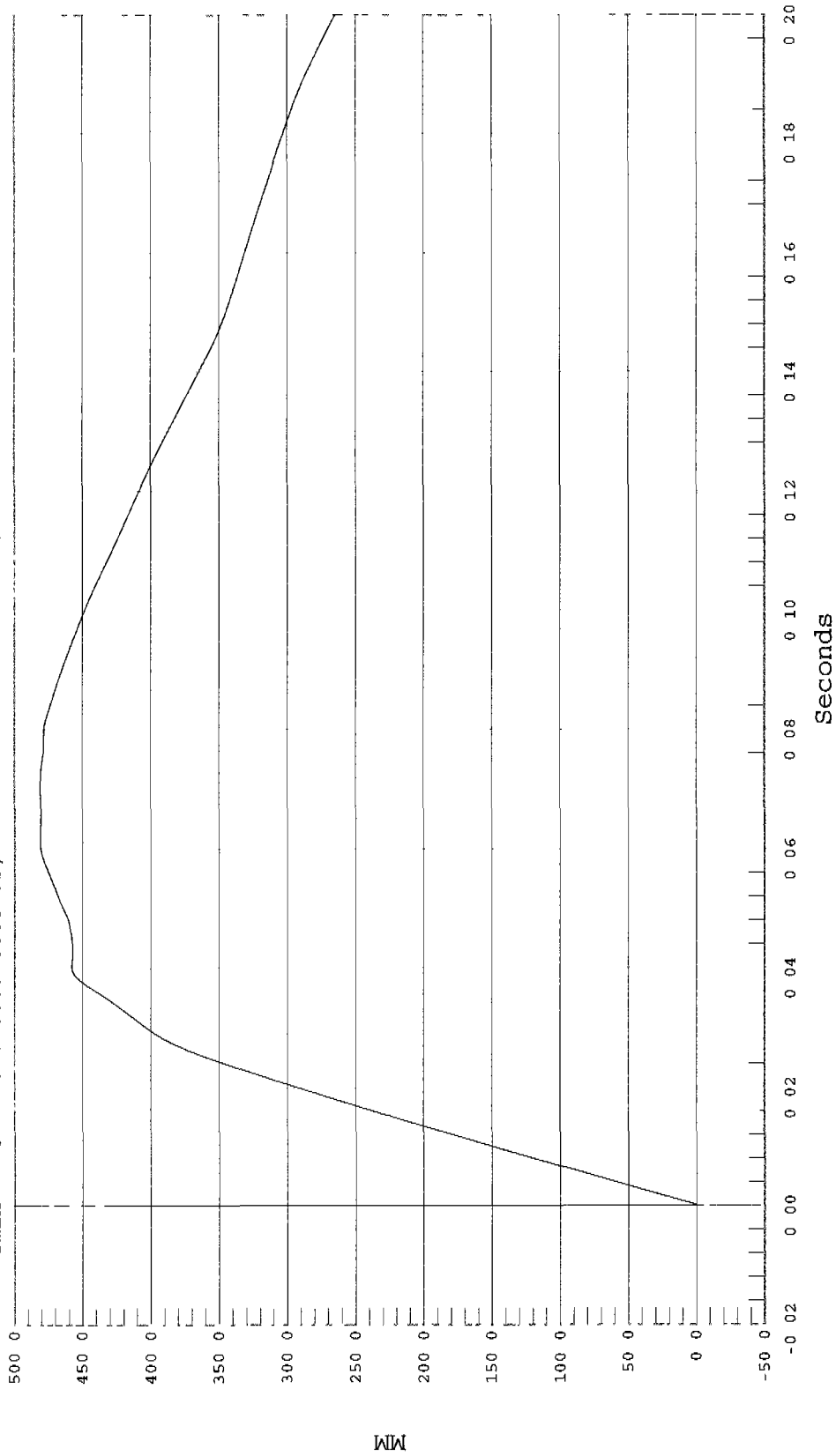
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 RIGHT SHOCK TOWER X DISPLACEMENT, B01028AI D08



Ymin = 0 MM @ 0.0000 Seconds, Ymax = 481.2 MM @ 0.0614 Seconds



RIGHT SHOCK TOWER Y ACCELERATION

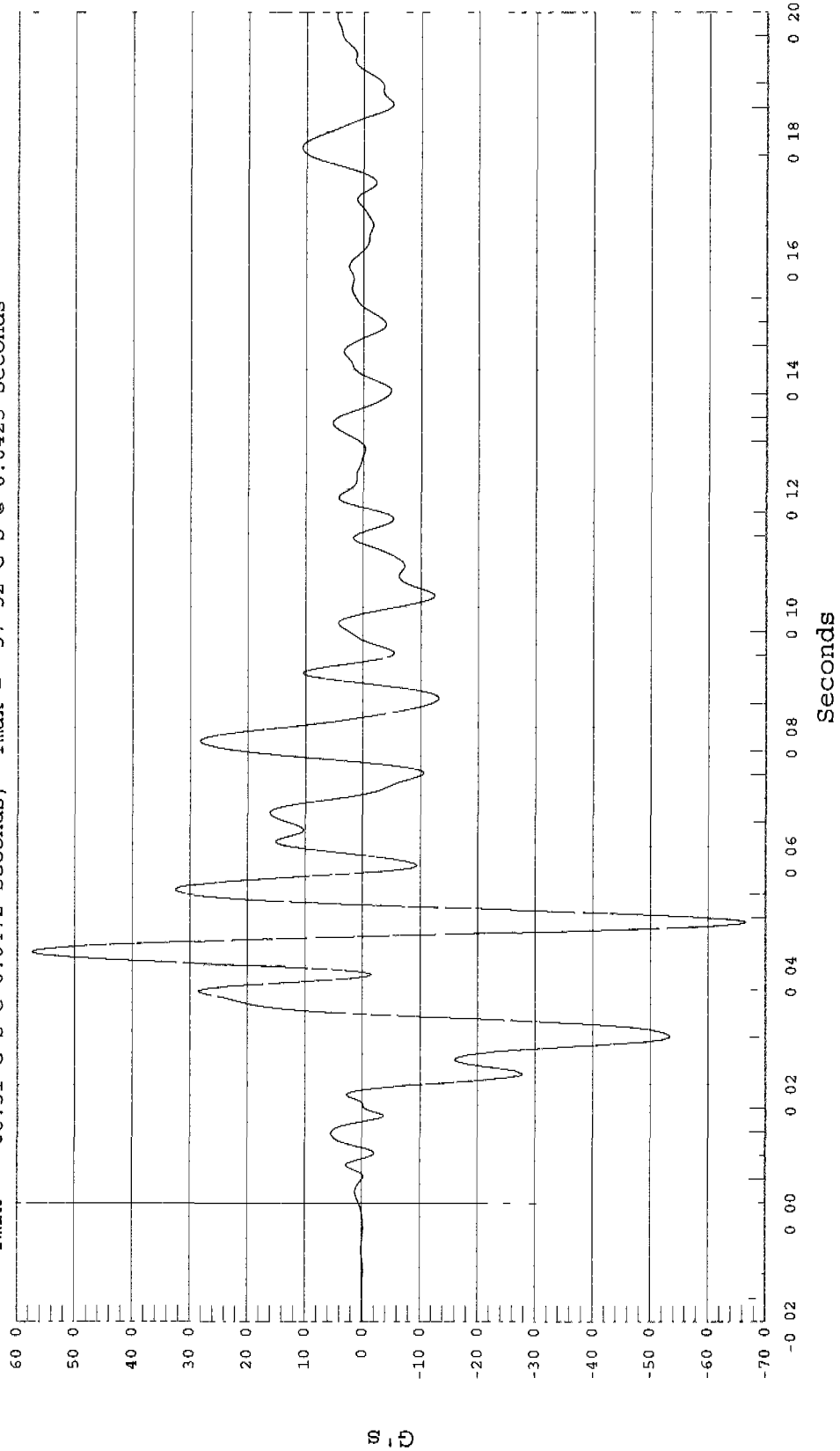
Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class. 60

1 RIGHT SHOCK TOWER Y, B01028AF.A09



Ymin = -66.51 G's @ 0.0472 Seconds, Ymax = 57.32 G's @ 0.0423 Seconds



RIGHT SHOCK TOWER Y VELOCITY

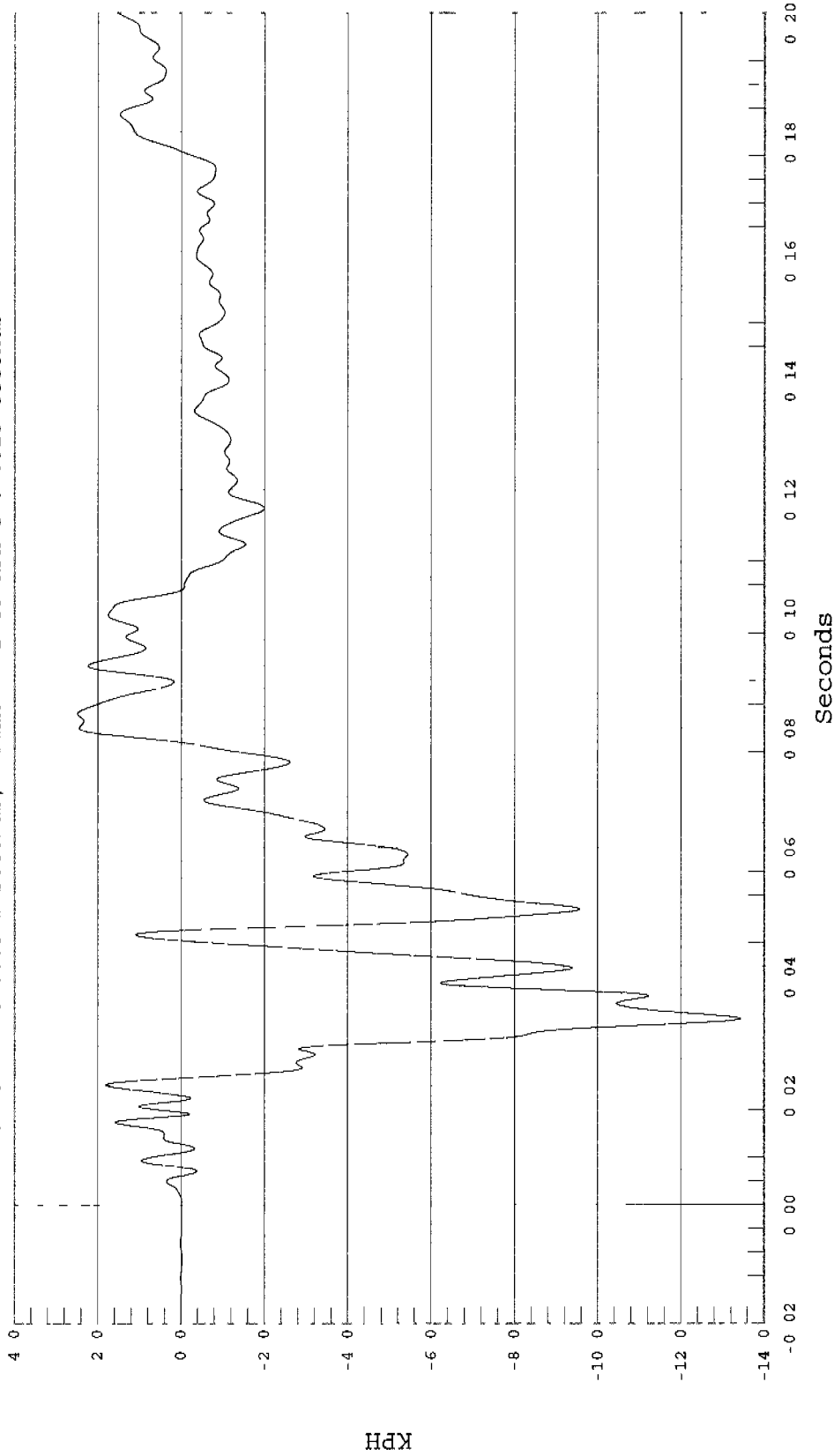
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

Test Desc: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 RIGHT SHOCK TOWER Y VELOCITY, B01028AI V09



Ymin = -13.43 KPH @ 0.0312 Seconds, Ymax = 2.48 KPH @ 0.0823 Seconds



RIGHT SHOCK TOWER Y DISPLACEMENT

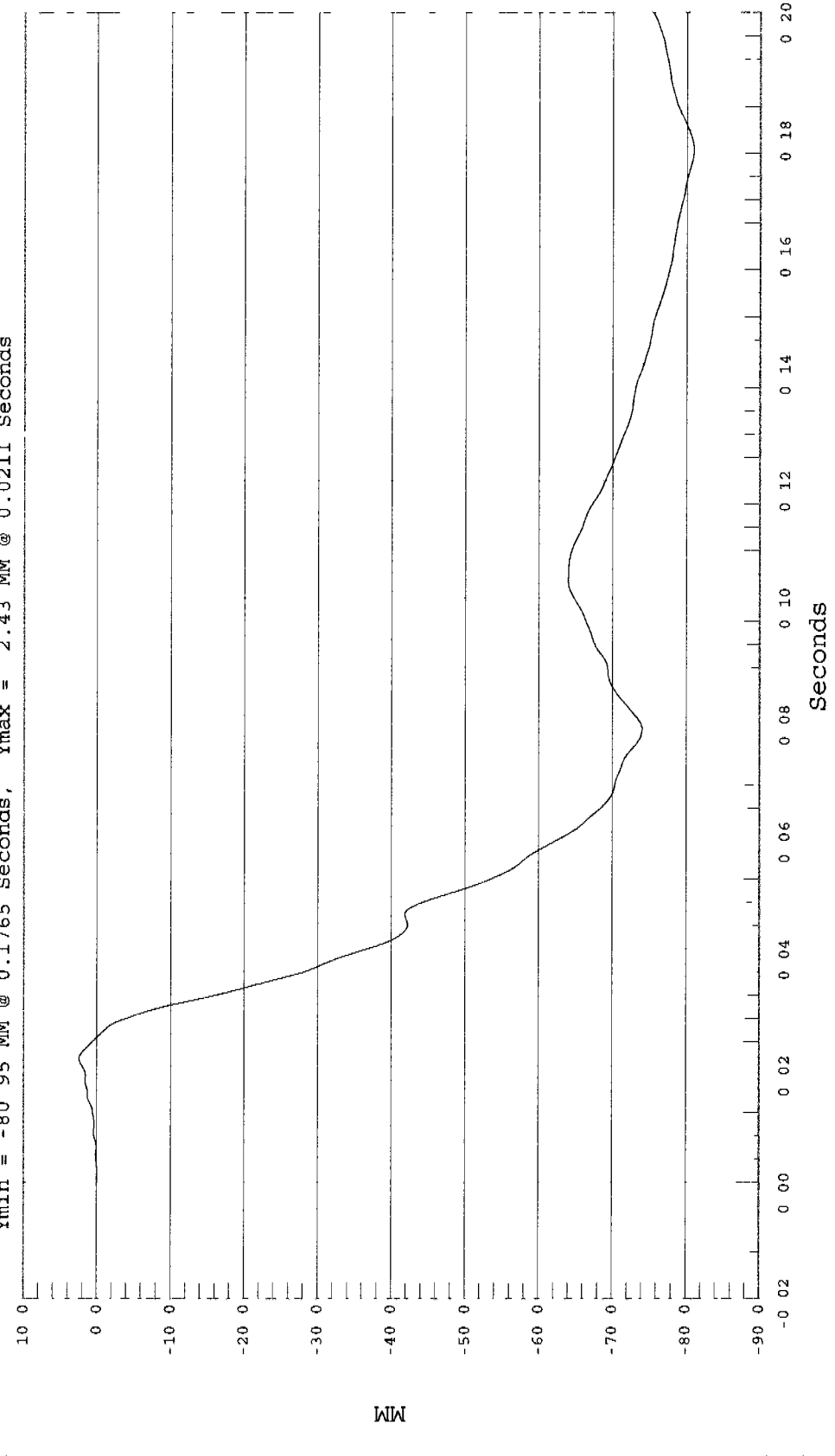
Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

1 RIGHT SHOCK TOWER Y DISPLACEMENT, B01028AI D09



Ymin = -80.95 MM @ 0.1765 Seconds, Ymax = 2.43 MM @ 0.0211 Seconds



FRONT TOP OF ENGINE X ACCELERATION

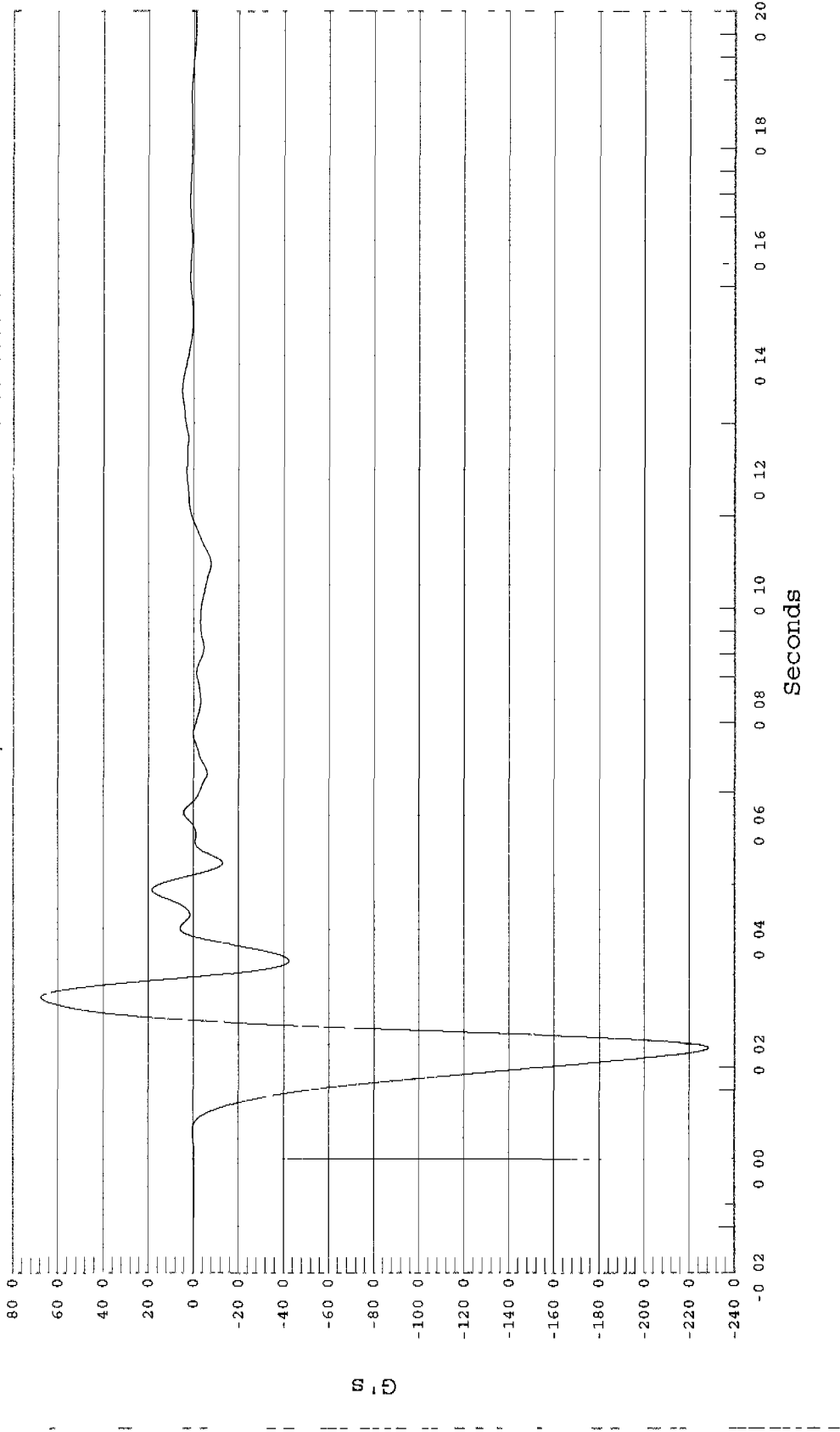
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 FRONT TOP OF ENGINE X, B01028AF A10



Ymin = -228.41 G's @ 0.0193 Seconds, Ymax = 67.58 G's @ 0.0280 Seconds



FRONT TOP OF ENGINE X VELOCITY

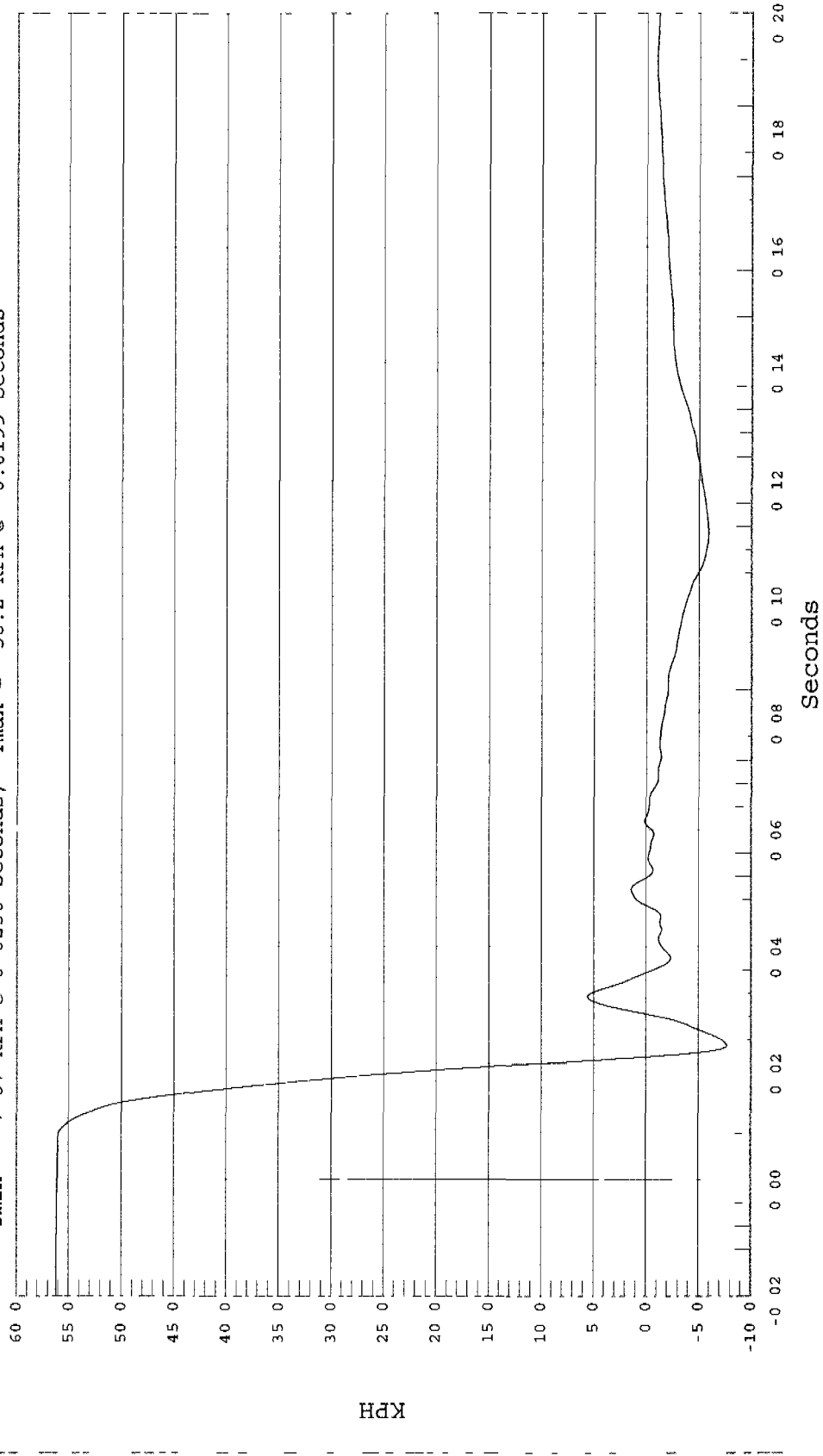
Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 FRONT TOP OF ENGINE X VELOCITY, B01028AI.V10



Ymin = -7.67 KPH @ 0.0230 Seconds, Ymax = 56.2 KPH @ -0.0199 Seconds



FRONT TOP OF ENGINE X DISPLACEMENT

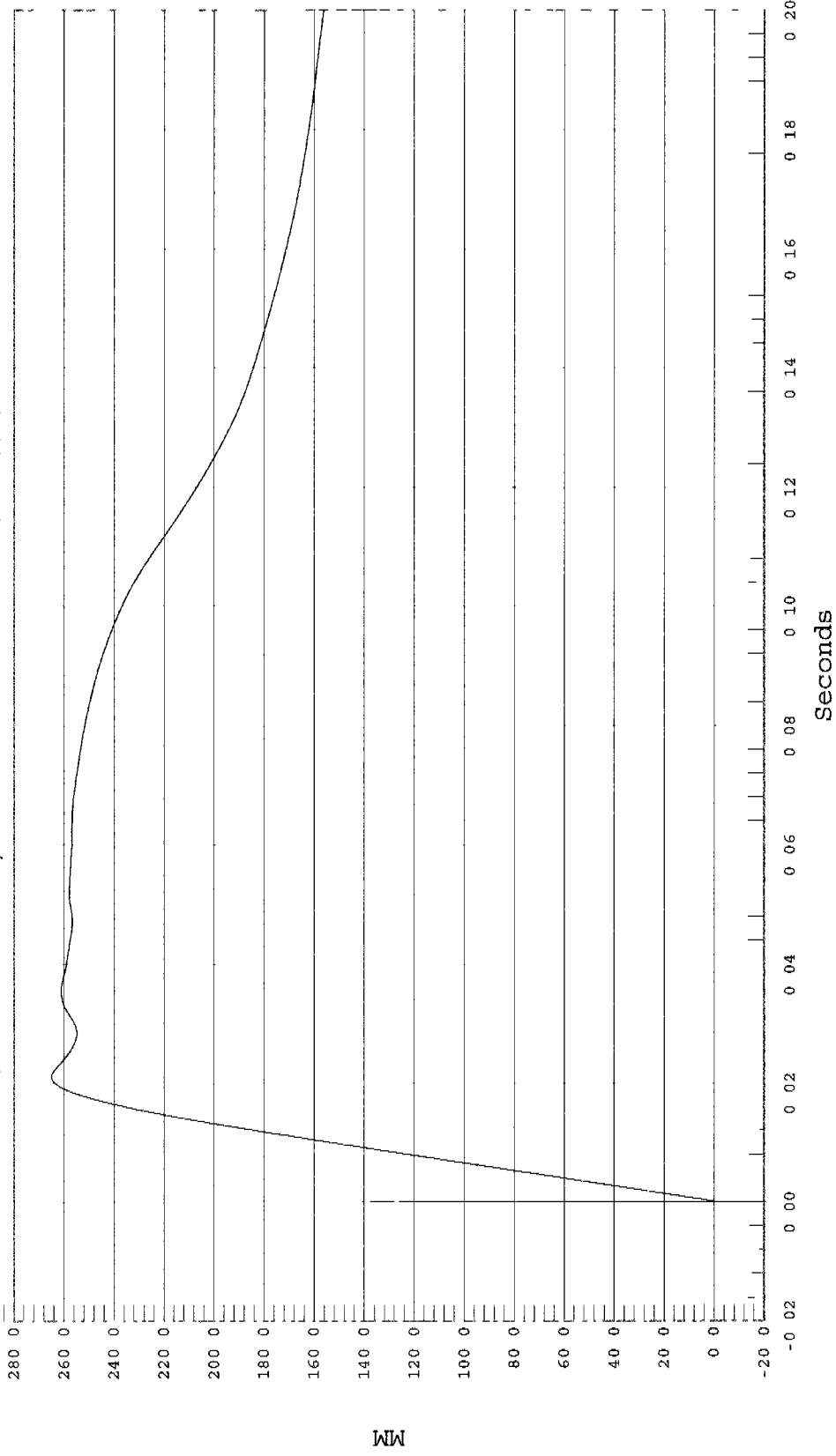
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 FRONT TOP OF ENGINE X DISPLACEMENT, B01028AI D10



Ymin = 0 MM @ 0.0000 Seconds, Ymax = 264.92 MM @ 0.0210 Seconds



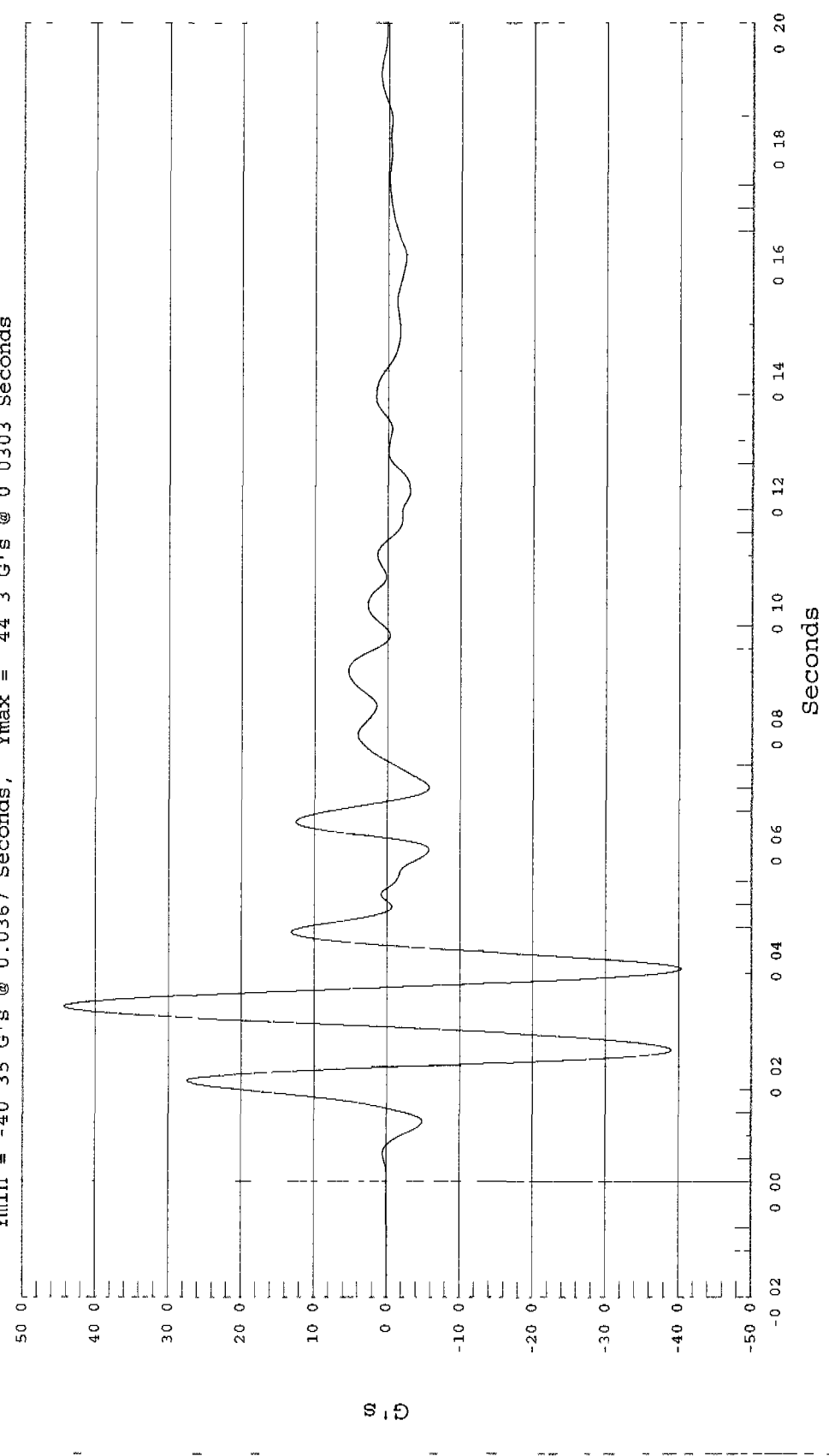
FRONT TOP OF ENGINE Z ACCELERATION

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Filter Class: 60
Speed: 34.9 MPH, 56 2 KPH
Test Date: 03-08-01



1 FRONT TOP OF ENGINE Z, B01028AF A11

Ymin = -40 35 G's @ 0.0367 Seconds, Ymax = 44 3 G's @ 0 0303 Seconds



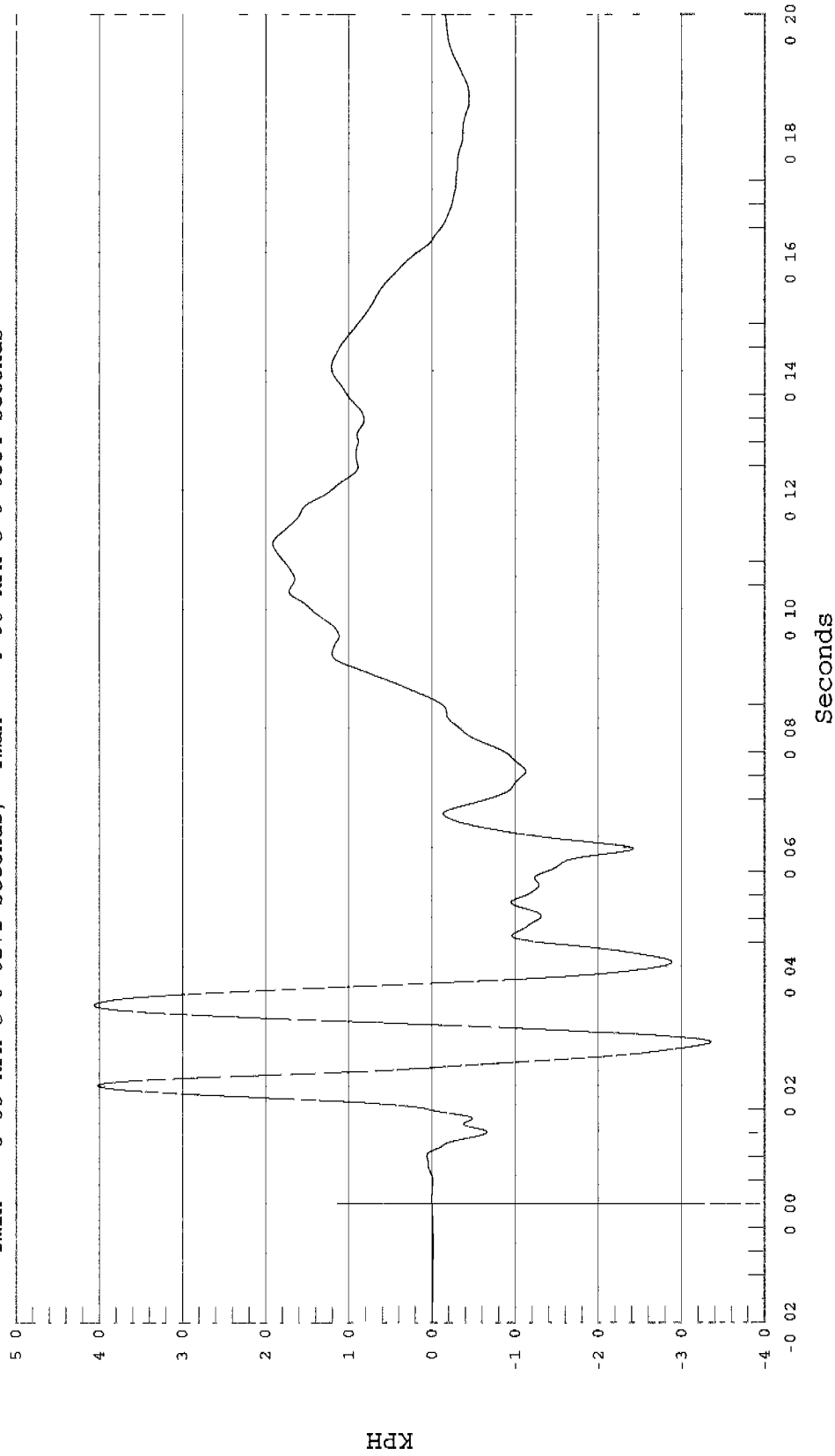
FRONT TOP OF ENGINE Z VELOCITY

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 FRONT TOP OF ENGINE Z VELOCITY, B01028AI V11

Ymin = -3.35 KPH @ 0.0271 Seconds, Ymax = 4.06 KPH @ 0.0334 Seconds



FRONT TOP OF ENGINE Z DISPLACEMENT

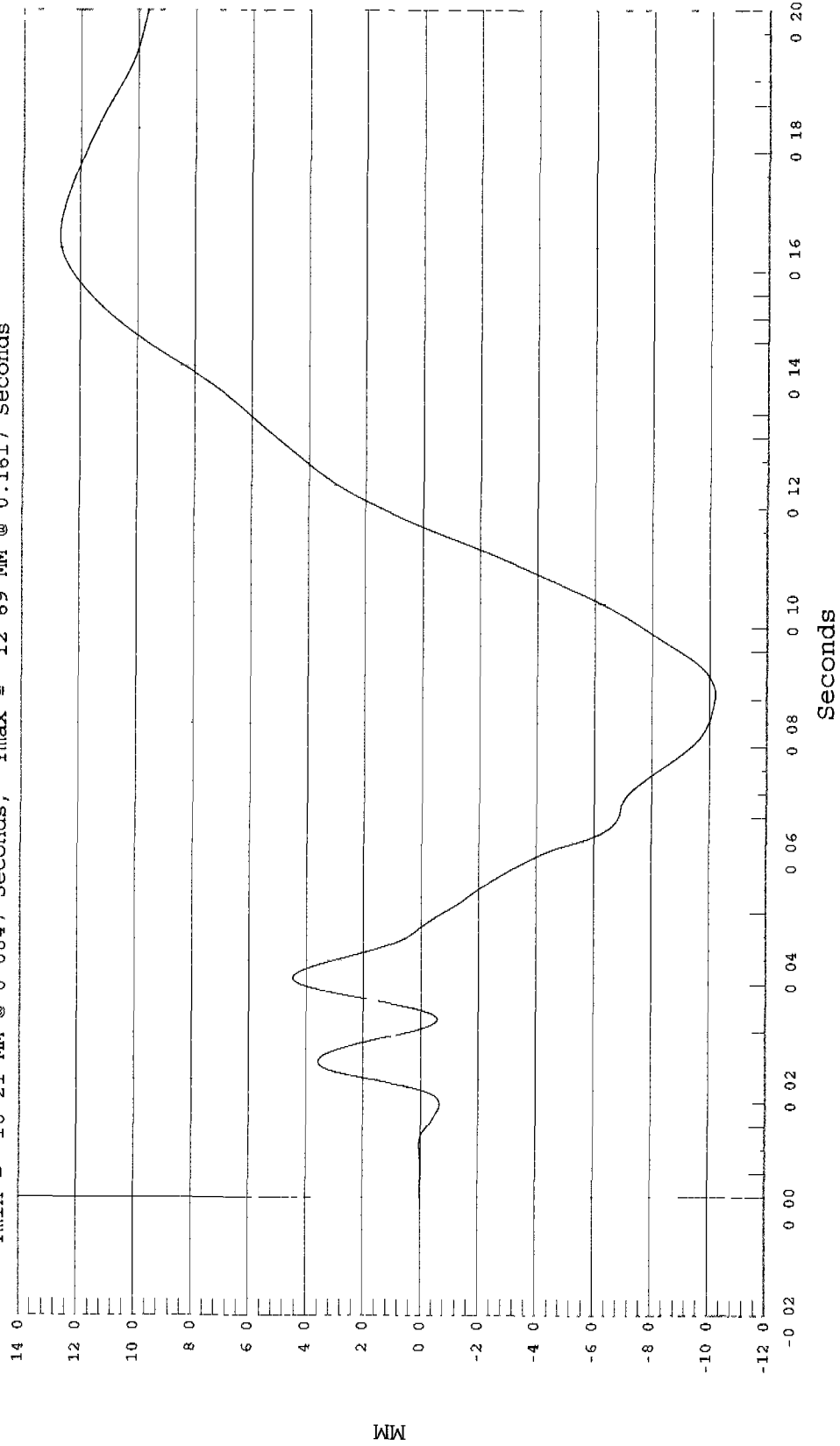
Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component. 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56 2 KPH
Filter Class: 180

1 FRONT TOP OF ENGINE Z DISPLACEMENT, B01028AI D11



Ymin = -10 21 MM @ 0 0847 Seconds, Ymax = 12 69 MM @ 0.1617 Seconds



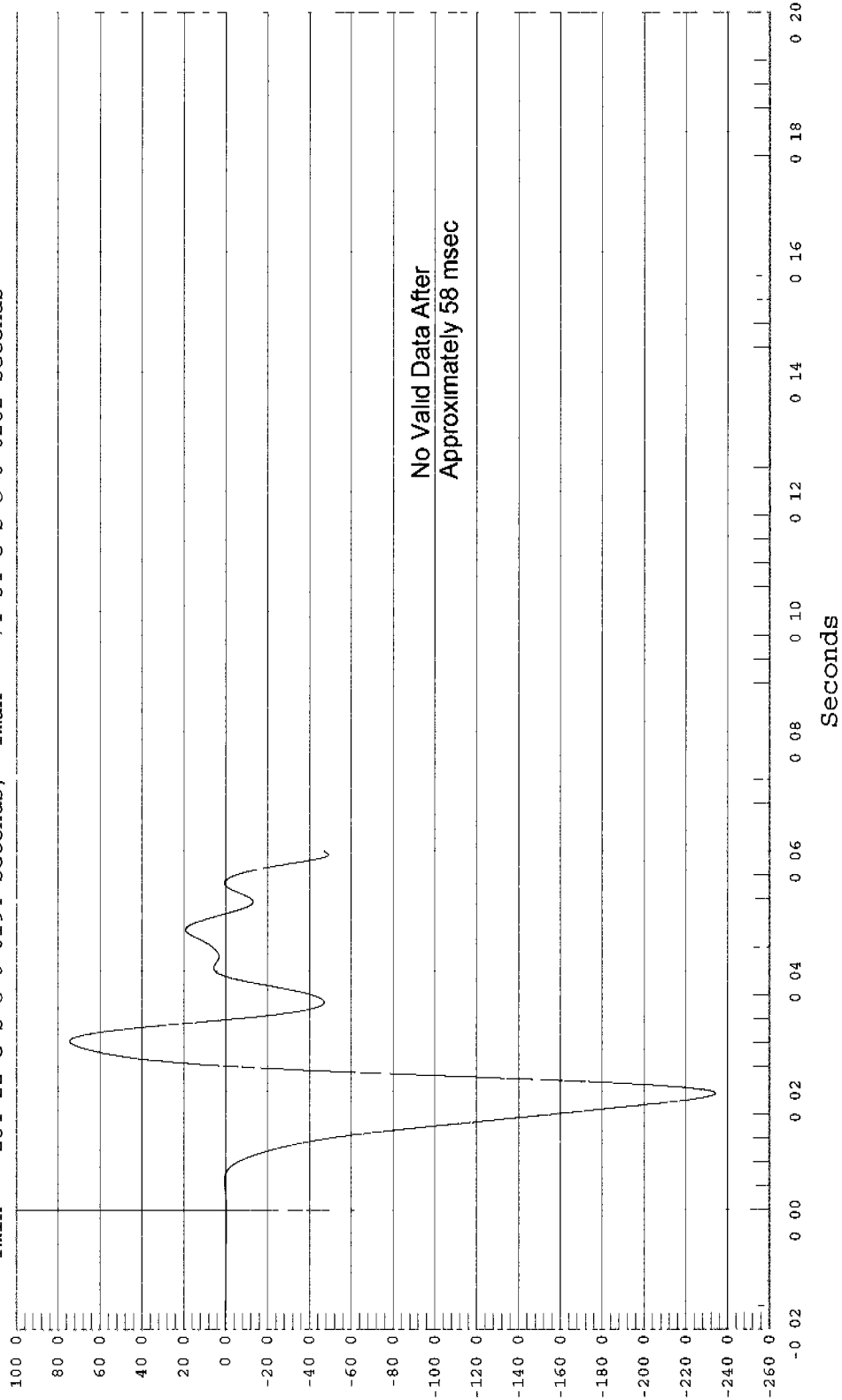
REAR TOP OF ENGINE X ACCELERATION

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed 34.9 MPH, 56 2 KPH
Filter Class: 60

1 REAR TOP OF ENGINE X, B01028AF.A12



Ymin = -234.22 G's @ 0.0194 Seconds, Ymax = 74.54 G's @ 0.0282 Seconds



REAR TOP OF ENGINE X VELOCITY

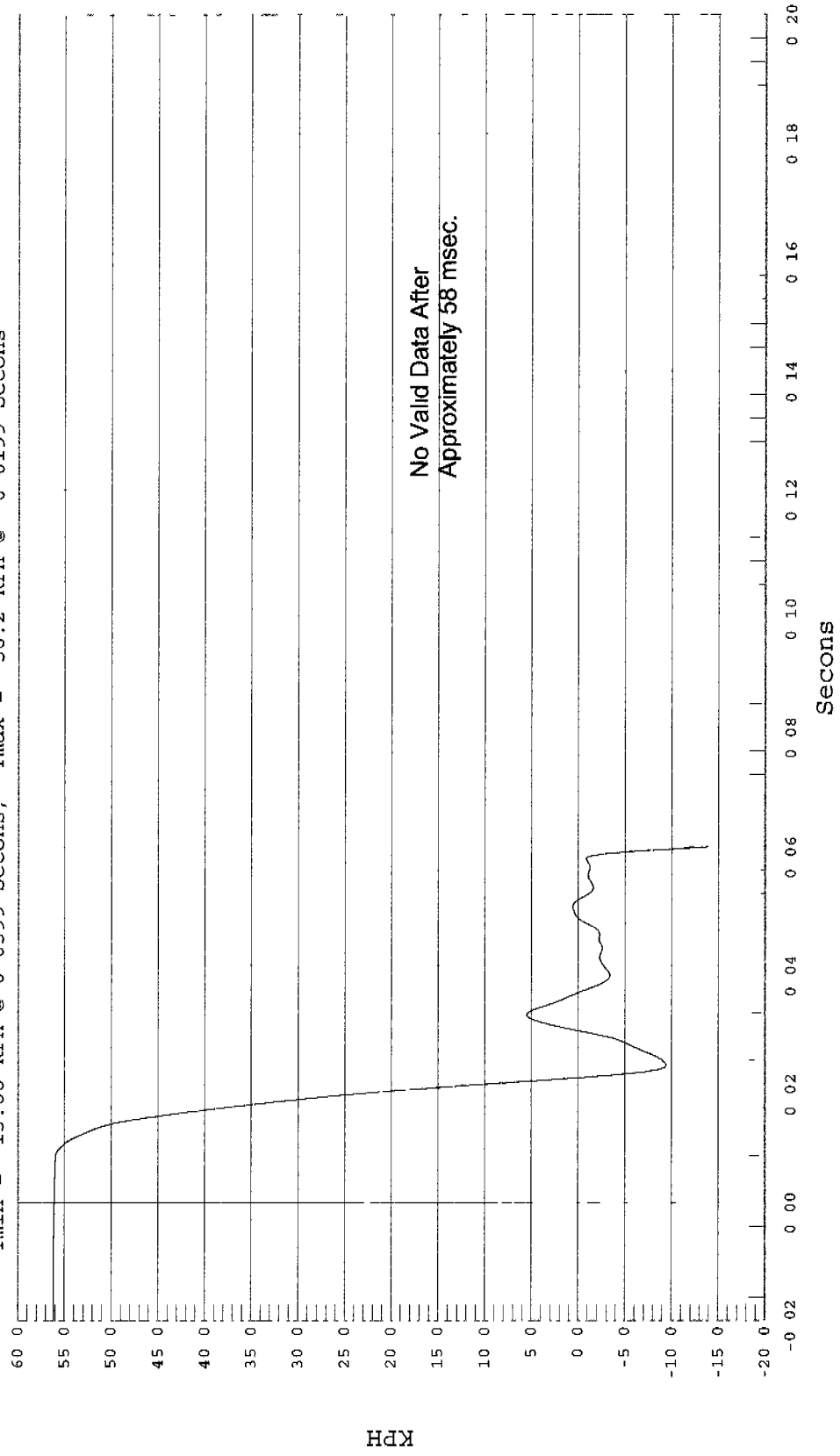
Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Filter Class: 180

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Other Info:

1 REAR TOP OF ENGINE X VELOCITY, B01028AI V12



Ymin = -13.88 KPH @ 0.0599 Seconds, Ymax = 56.2 KPH @ -0.0199 Seconds

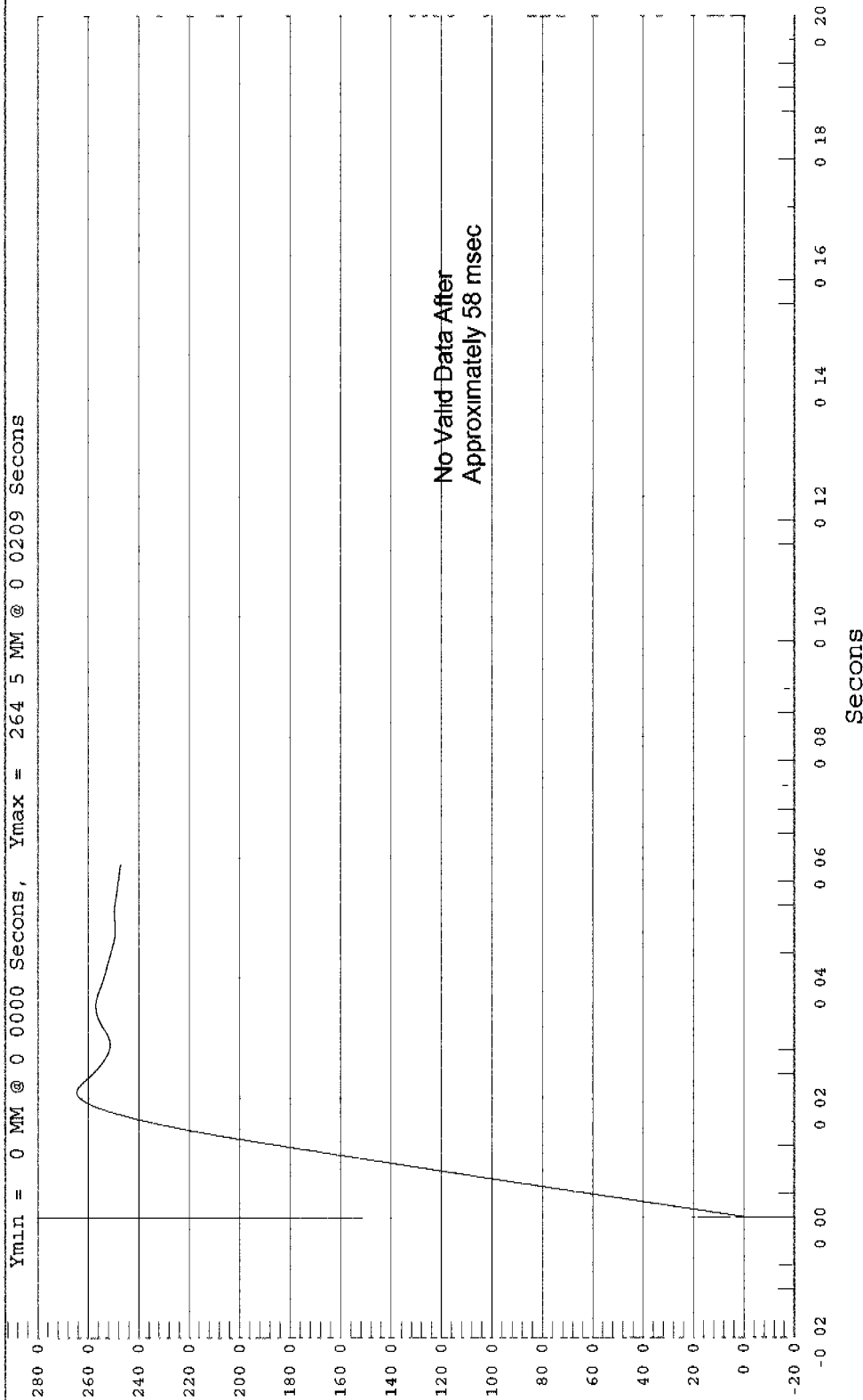


REAR TOP OF ENGINE X DISPLACEMENT

Test Date. 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class. 180

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 REAR TOP OF ENGINE X DISPLACEMENT, B01028AJ D12



No Valid Data After
Approximately 58 msec

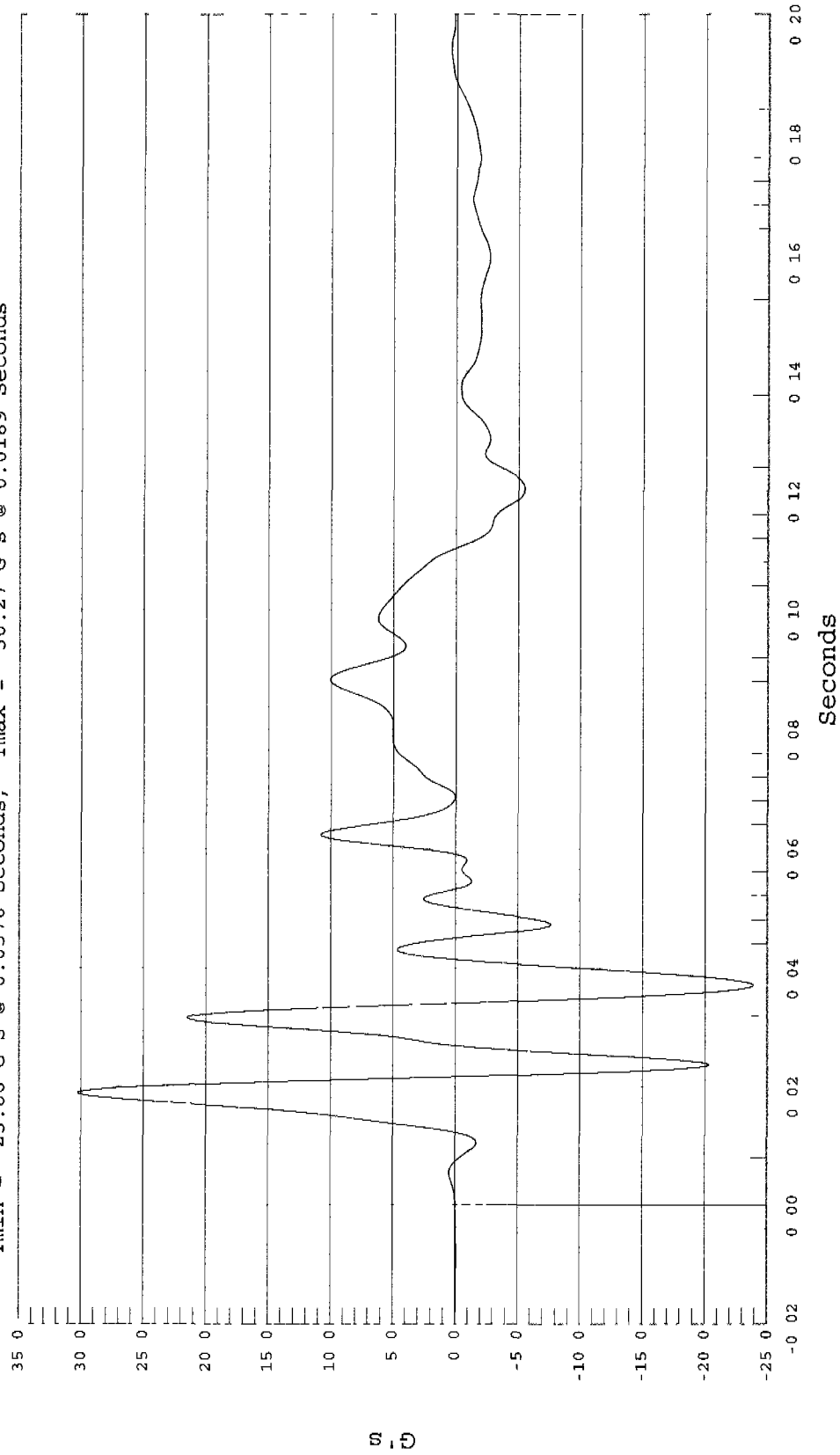
REAR TOP OF ENGINE Z ACCELERATION

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60

1 REAR TOP OF ENGINE Z, B01028AF.A13

Ymin = -23.86 G's @ 0.0370 Seconds, Ymax = 30.27 G's @ 0.0189 Seconds



REAR TOP OF ENGINE Z VELOCITY

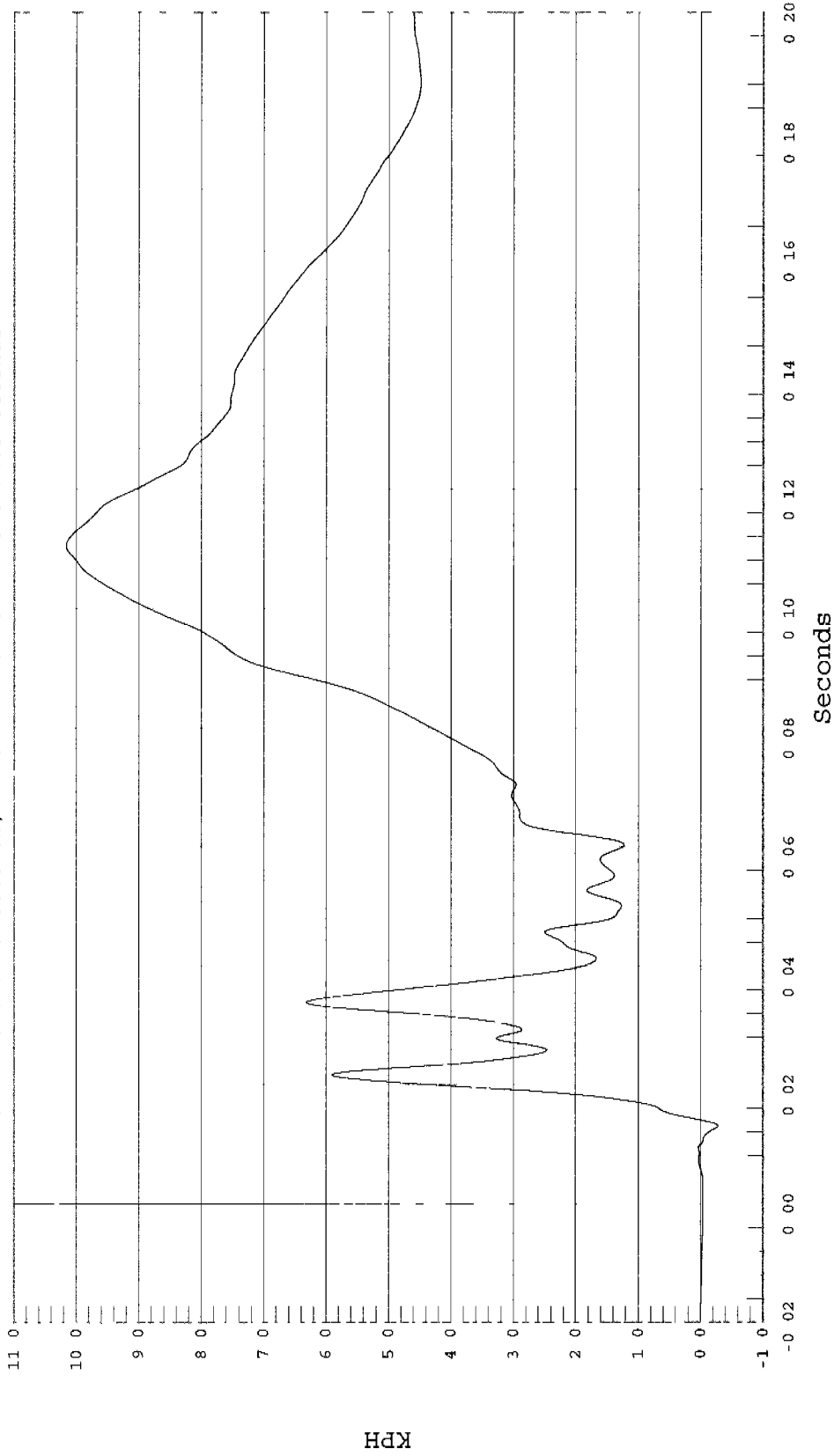
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info

1 REAR TOP OF ENGINE Z VELOCITY, B01028AI V13



Ymin = - 28 KPH @ 0.0129 Seconds, Ymax = 10.16 KPH @ 0.1103 Seconds



REAR TOP OF ENGINE Z DISPLACEMENT

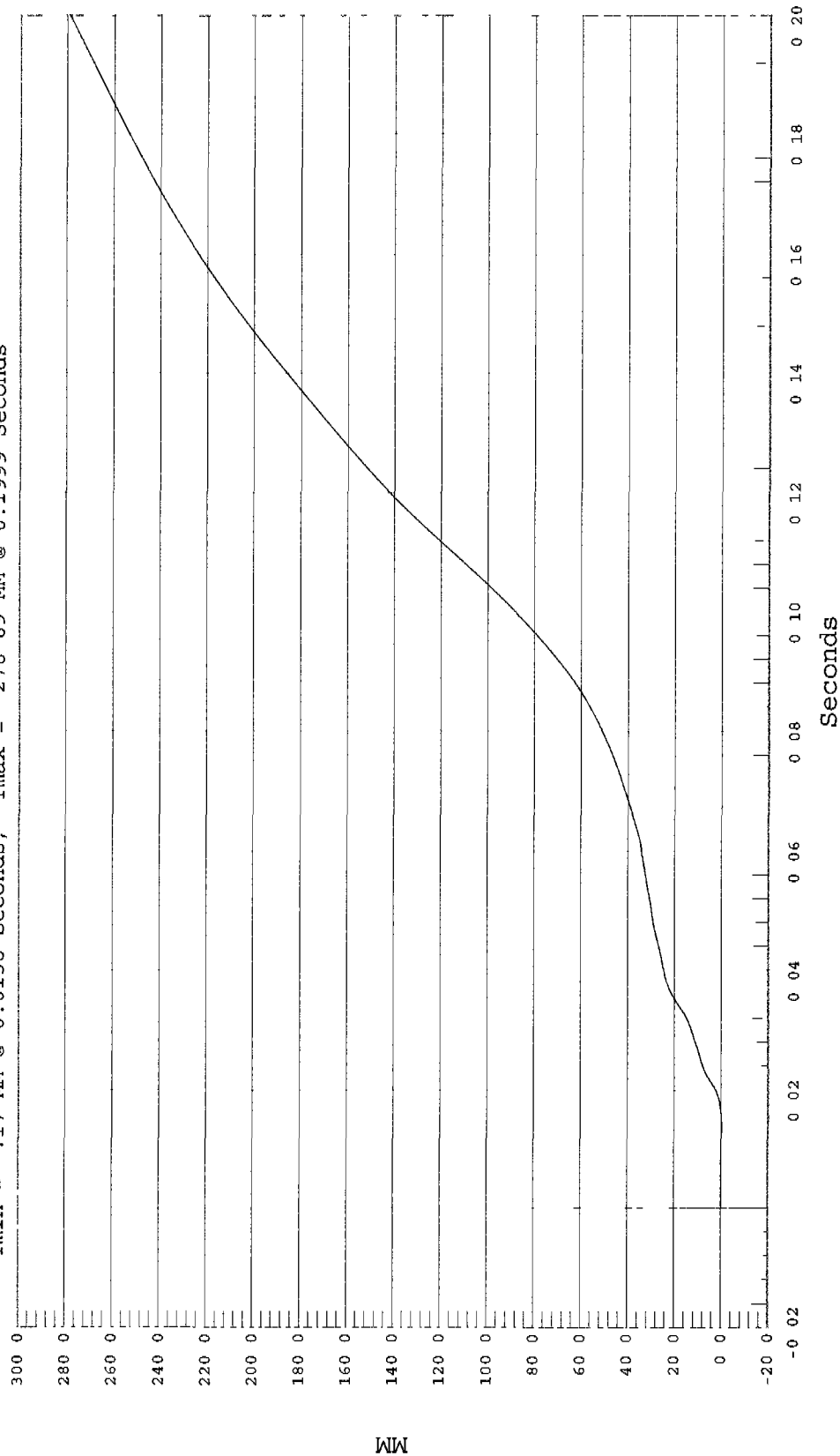
Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component. 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

1 REAR TOP OF ENGINE Z DISPLACEMENT, B01028AI.D13



Ymin = -.17 MM @ 0.0138 Seconds, Ymax = 278.89 MM @ 0.1999 Seconds



FIREWALL SHOCK TOWER BRACE X ACCELERATION

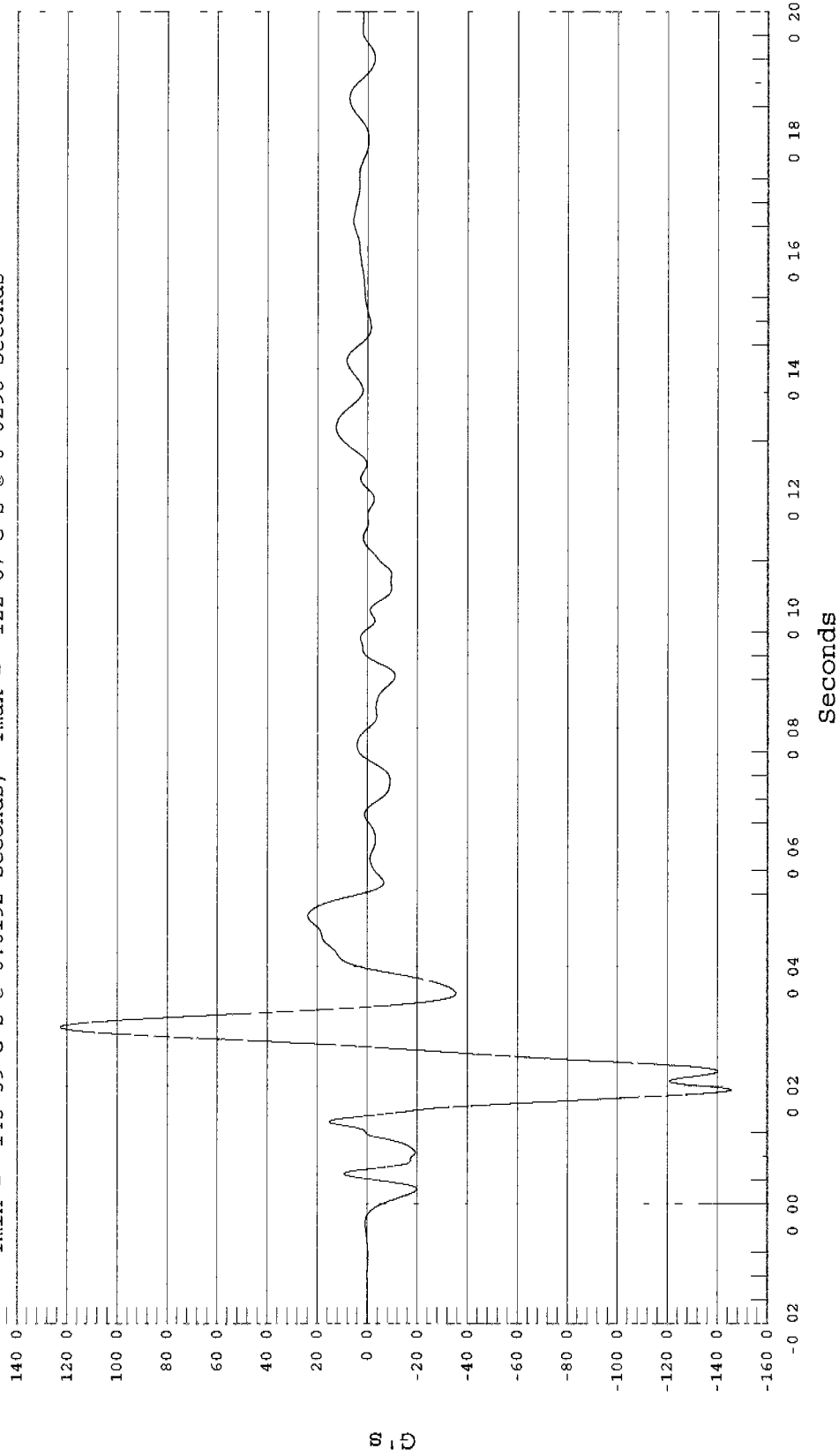
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 FIREWALL/SHOCK TOWER SUPPORT X, B01028AF A15



Ymin = -145.59 G's @ 0.0192 Seconds, Ymax = 122.67 G's @ 0.0298 Seconds



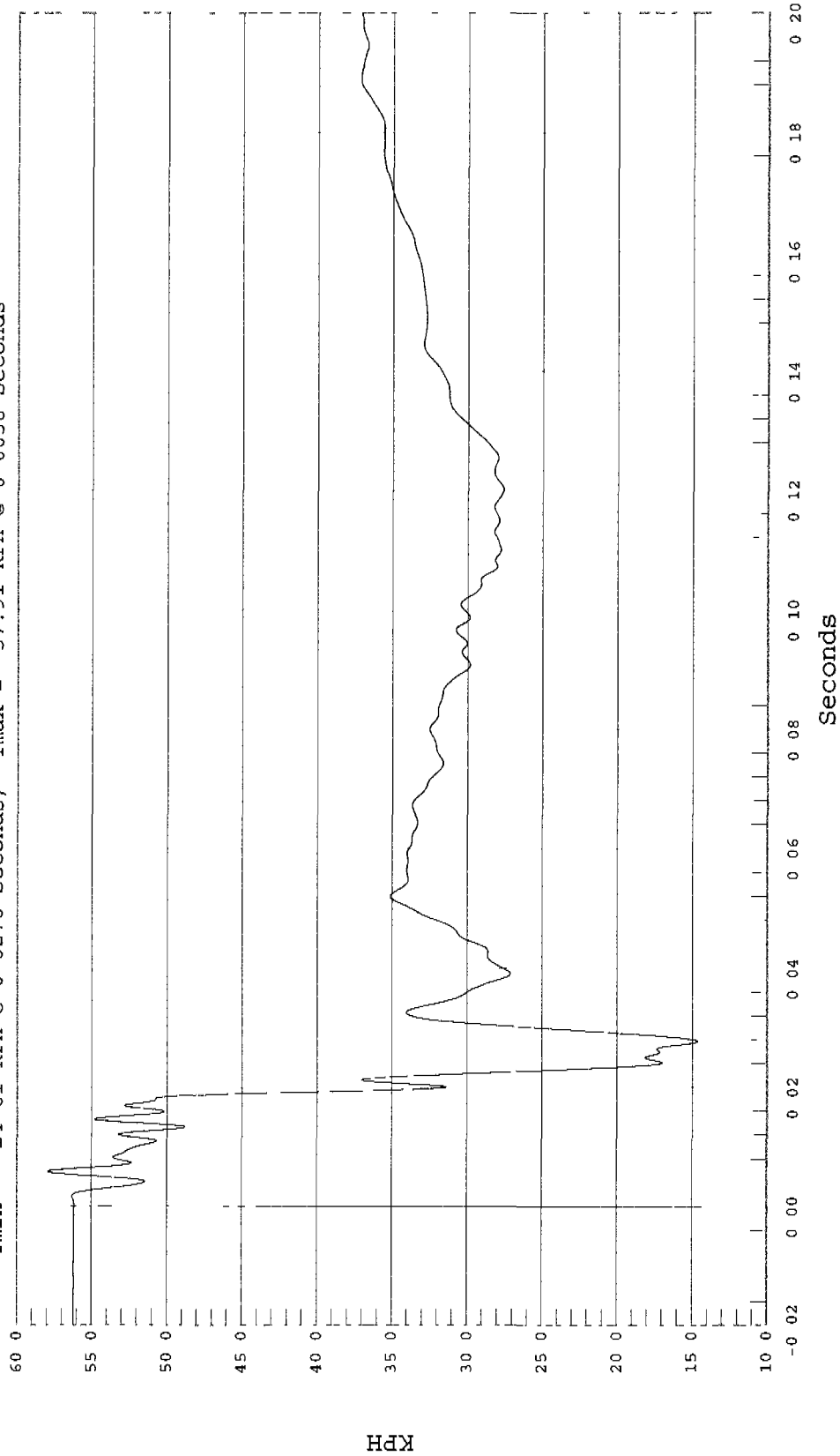
FIREWALL SHOCK TOWER BRACE X VELOCITY

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180



1 FIRE WALL SHOCK TOWER SUPPORT X VELOCITY, B01028AI.V15

Ymin = 14.61 KPH @ 0.0276 Seconds, Ymax = 57.91 KPH @ 0.0058 Seconds



FIREWALL SHOCK TOWER BRACE X DISPLACEMENT

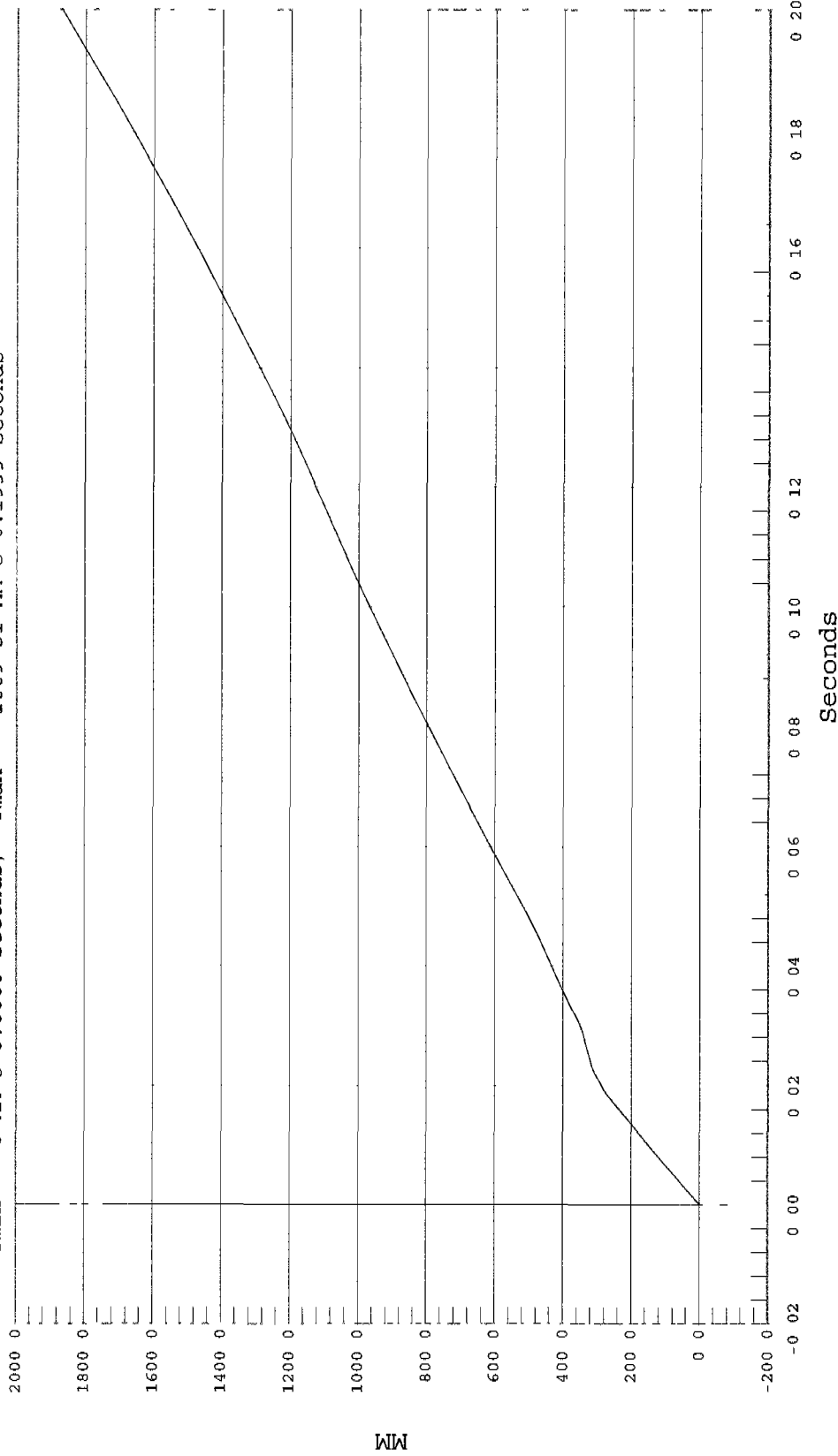
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

Test Desc: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 FIRE WALL SHOCK TOWER SUPPORT X DISPLACEMENT, B01028AI D15



Ymin = 0 MM @ 0.0000 Seconds, Ymax = 1869.31 MM @ 0.1999 Seconds



LEFT FRONT FRAME RAIL @ BUMPER X ACCELERATION

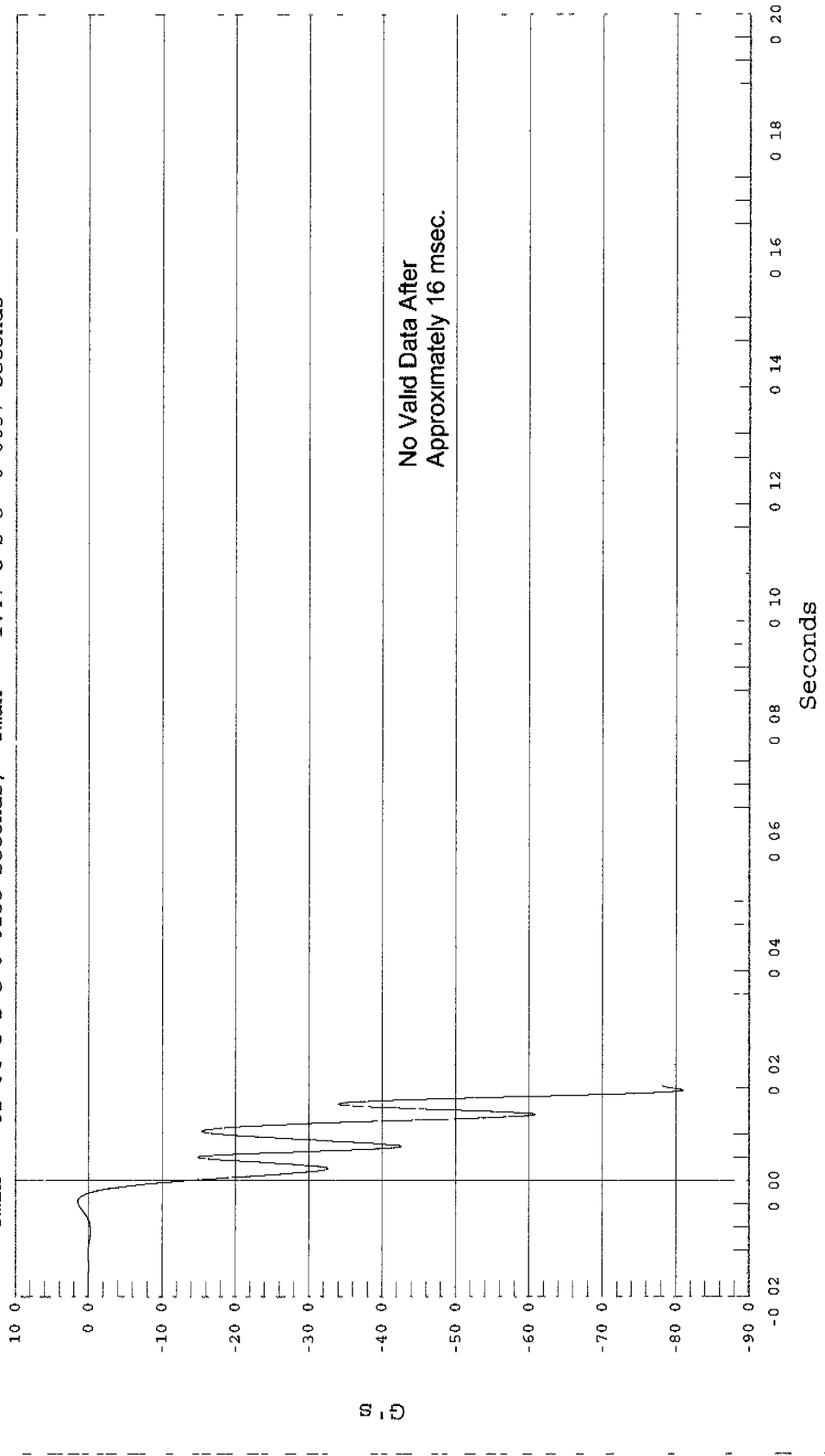
Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60

1 LEFT FRONT FRAME RAIL @ BUMPER X, B01028AF.A16



Ymin = -81.04 G's @ 0.0155 Seconds, Ymax = 1.47 G's @ -0.0037 Seconds



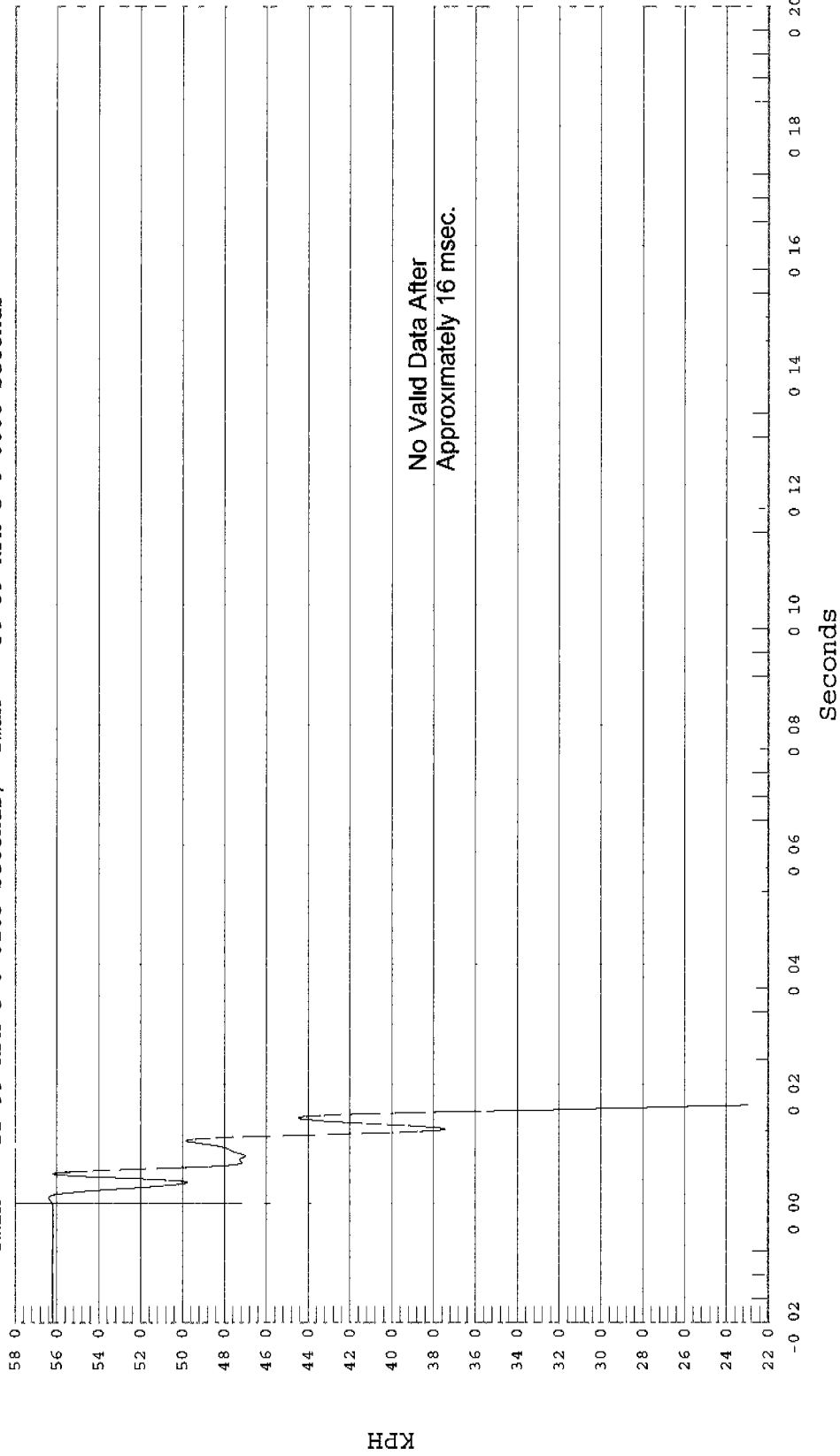
LEFT FRONT FRAME RAIL @ BUMPER X VELOCITY

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTTD#2
Other Info:
Filter Class: 180

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH

1 LEFT FRONT FRAME RAIL @ BUMPER X VELOCITY, B01028AI.V16

Ymin = 22.99 KPH @ 0.0163 Seconds, Ymax = 56.39 KPH @ 0.0008 Seconds



LEFT FRONT FRAME RAIL @ BUMPER X DISPLACEMENT

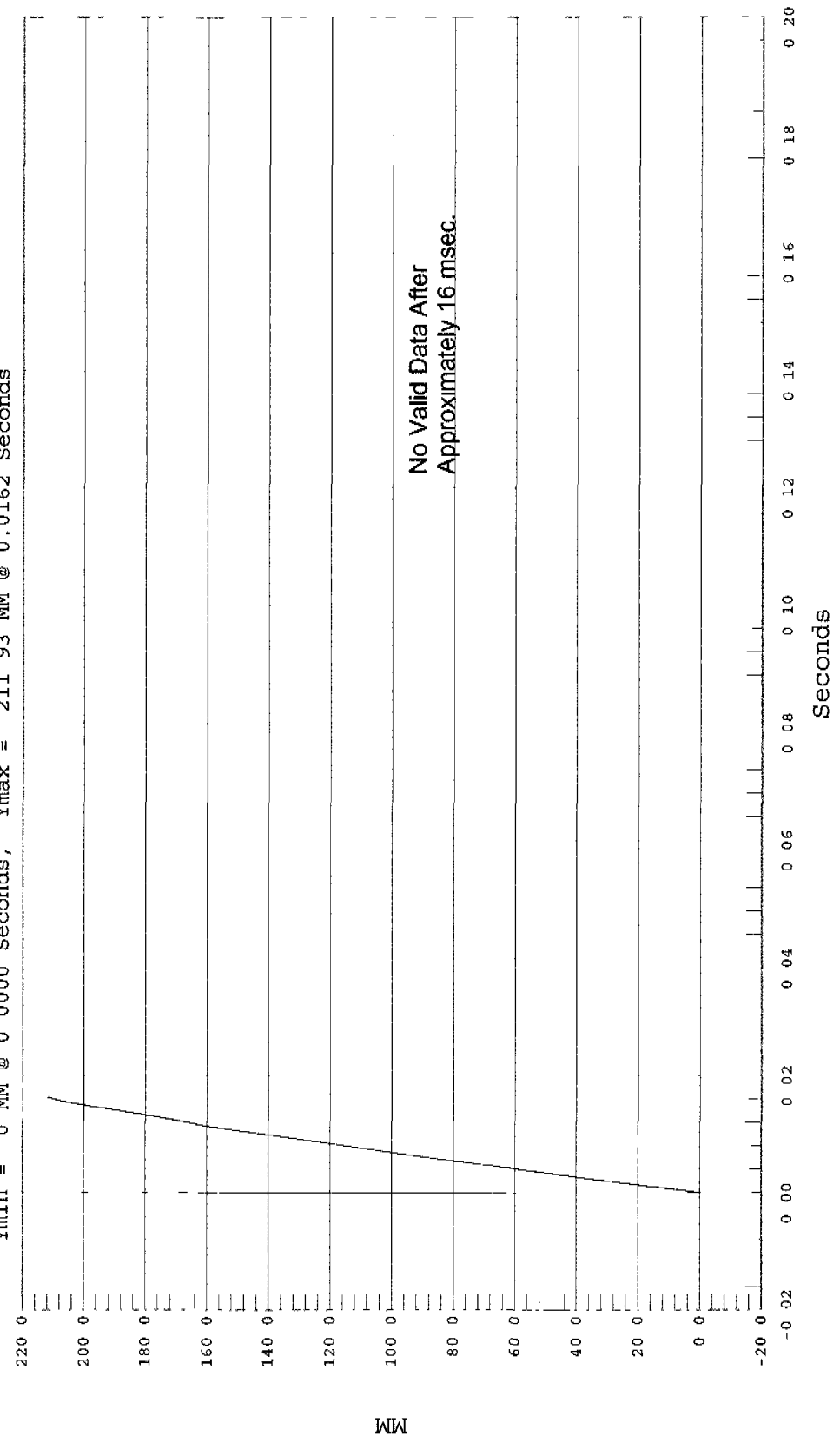
Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info.

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

1 LEFT FRONT FRAME RAIL @ BUMPER X DISPLACEMENT, B01028AI.D16



Ymin = 0 MM @ 0.0000 Seconds, Ymax = 211.93 MM @ 0.0162 Seconds



LEFT FRONT FRAME RAIL @ BUMPER Y ACCELERATION

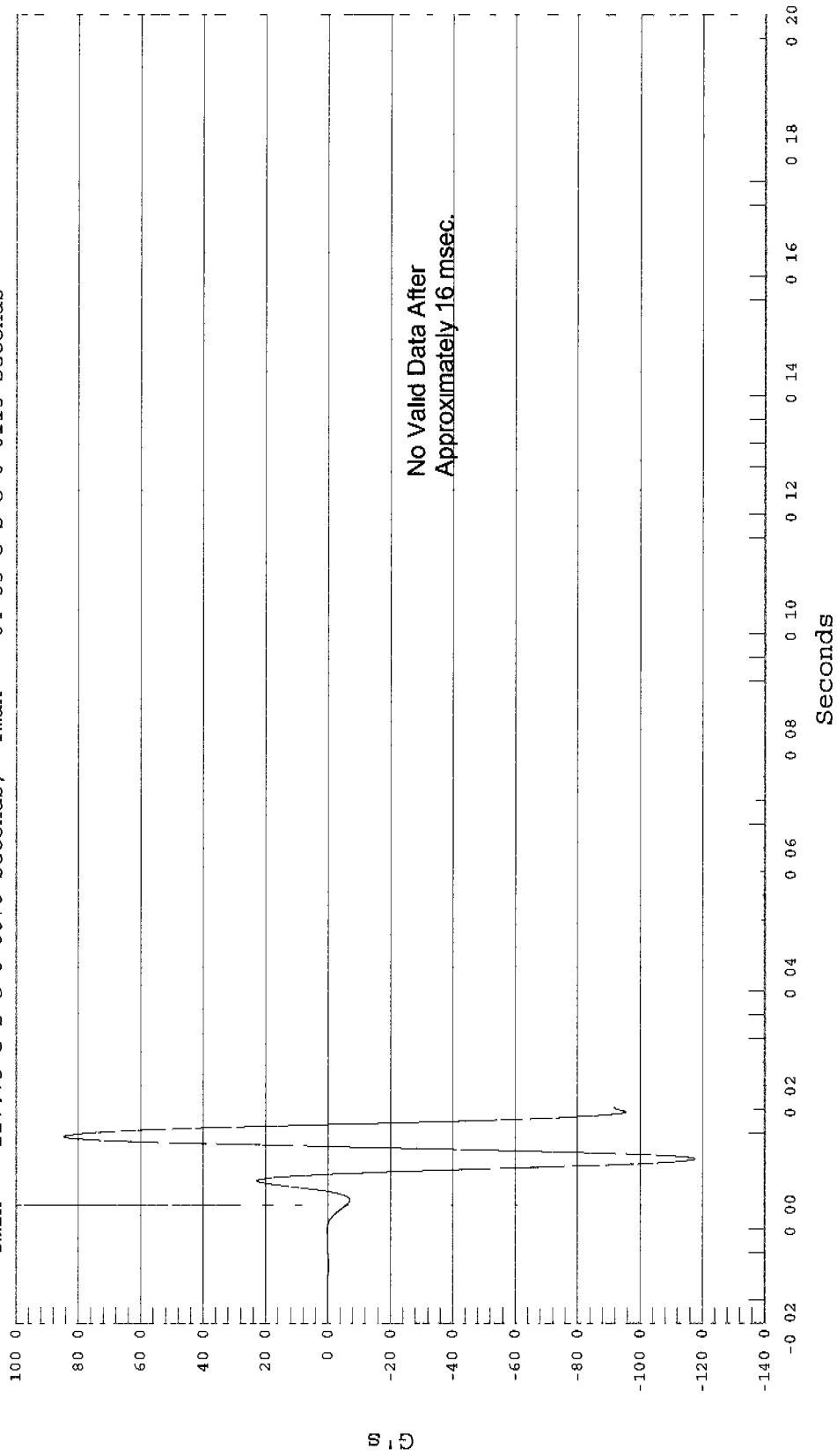
Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60



1 LEFT FRONT FRAME RAIL @ BUMPER Y, B01028AF A17

Ymin = -117.73 G's @ 0.0076 Seconds, Ymax = 84.53 G's @ 0.0113 Seconds



LEFT FRONT FRAME RAIL @ BUMPER Y VELOCITY

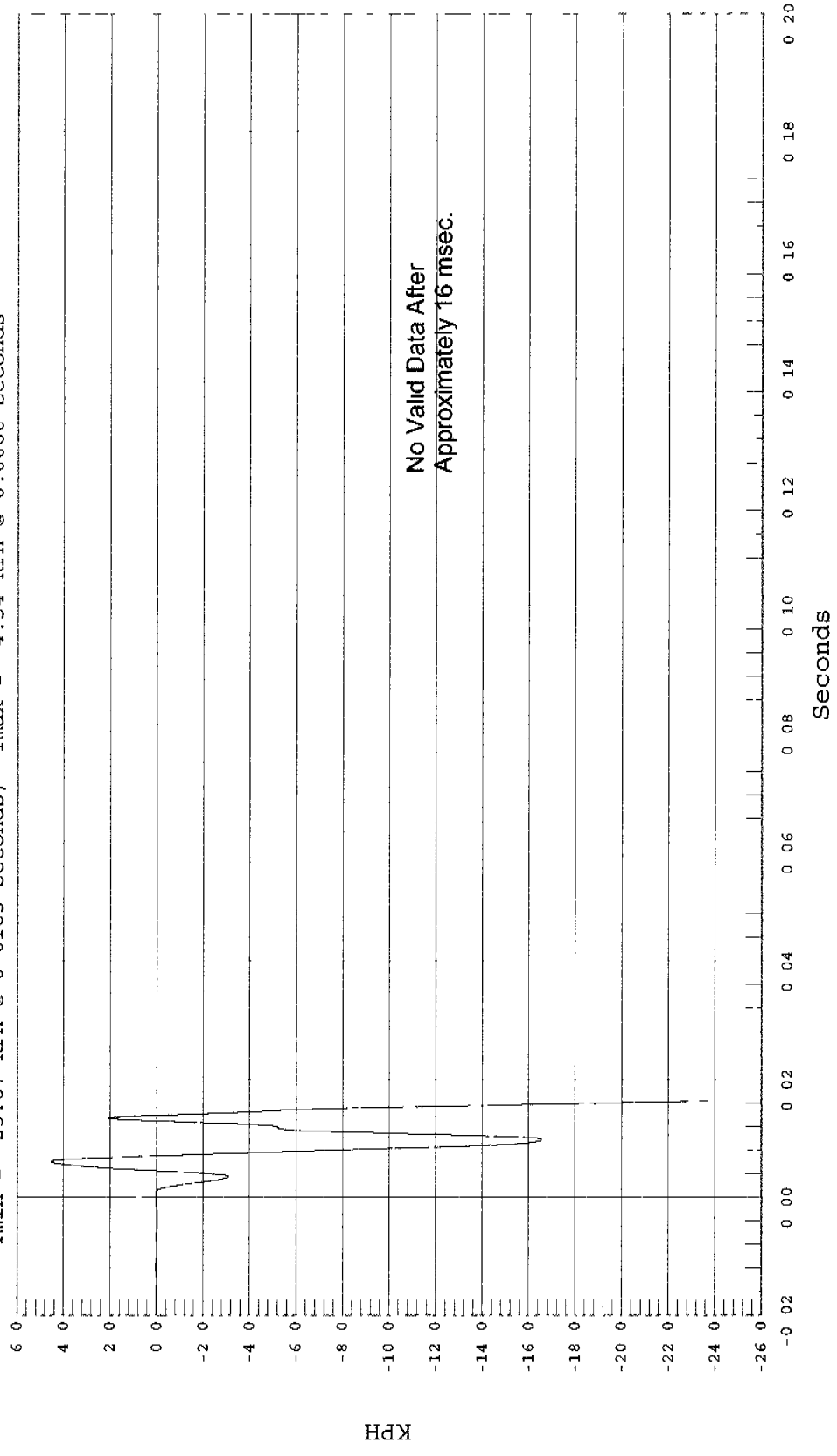
Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component : 1998 AUDI A8 4 DOOR SEDAN TTD#2
Filter Class : 180

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH



1 LEFT FRONT FRAME RAIL @ BUMPER Y VELOCITY, B01028AI V17

Ymin = -23.67 KPH @ 0.0163 Seconds, Ymax = 4.54 KPH @ 0.0060 Seconds



LEFT FRONT FRAME RAIL @ BUMPER Y DISPLACEMENT

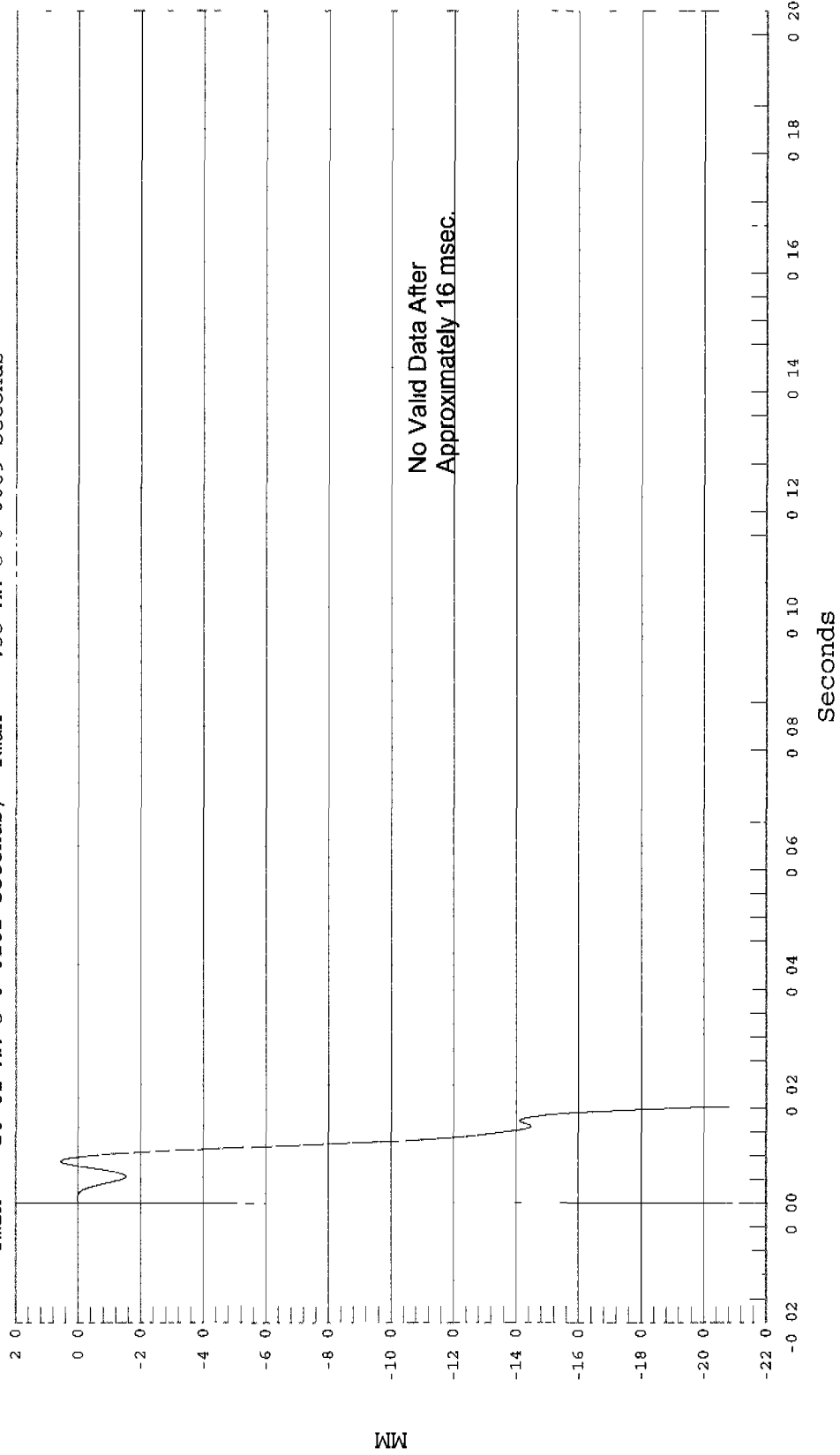
Test Desc . 35 MPH FRONTAL BARRIER IMPACT
Component. 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class. 180

1 LEFT FRONT FRAME RAIL @ BUMPER Y DISPLACEMENT, B01028AI.D17



Ymin = -20.81 MM @ 0.0162 Seconds, Ymax = .55 MM @ 0.0069 Seconds



LEFT FRONT FRAME RAIL @ BUMPER Z ACCELERATION

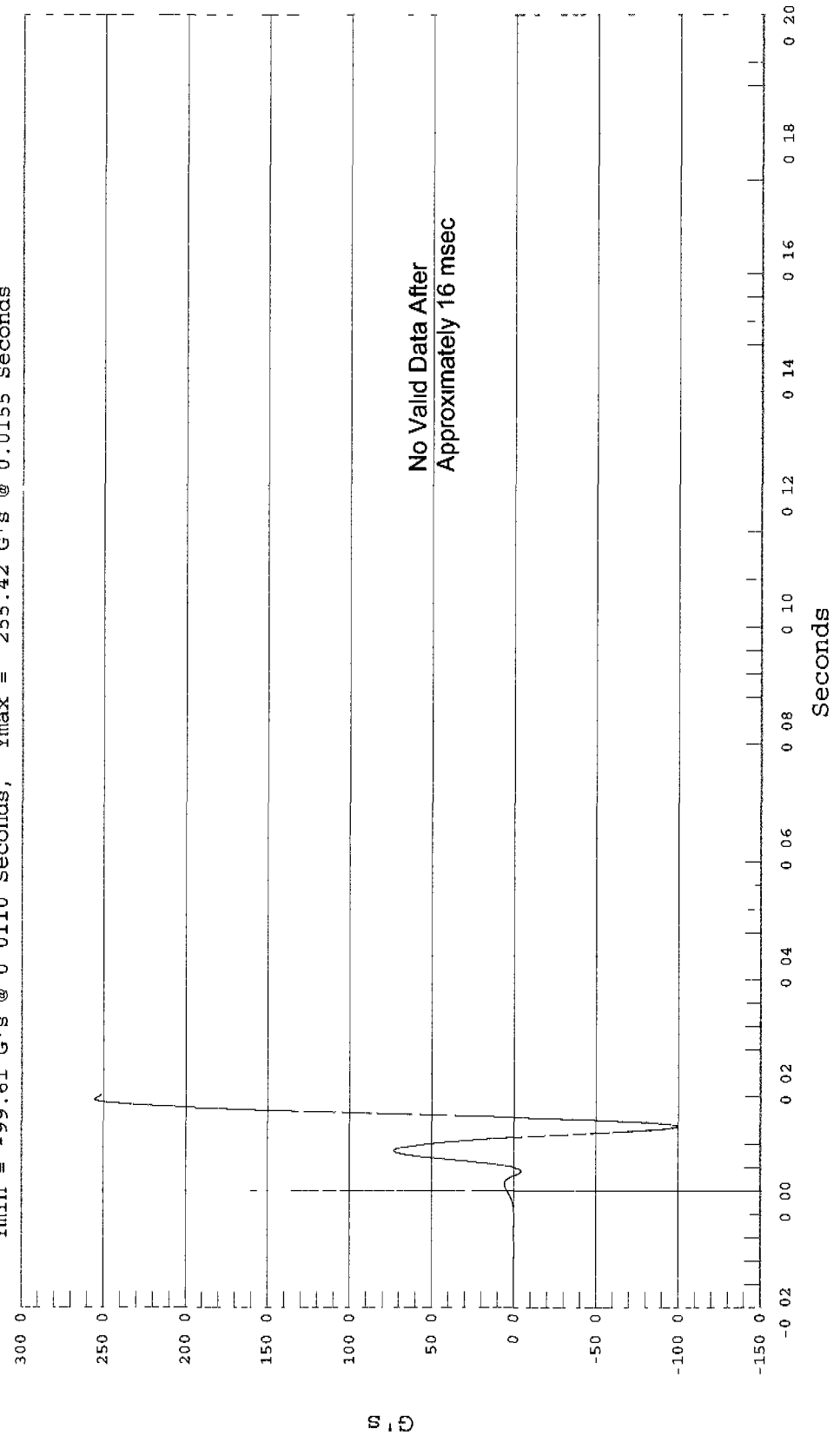
Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60

1 LEFT FRONT FRAME RAIL @ BUMPER Z, B01028AF A18



Ymin = -99.61 G's @ 0.0110 Seconds, Ymax = 255.42 G's @ 0.0155 Seconds



LEFT FRONT FRAME RAIL @ BUMPER Z VELOCITY

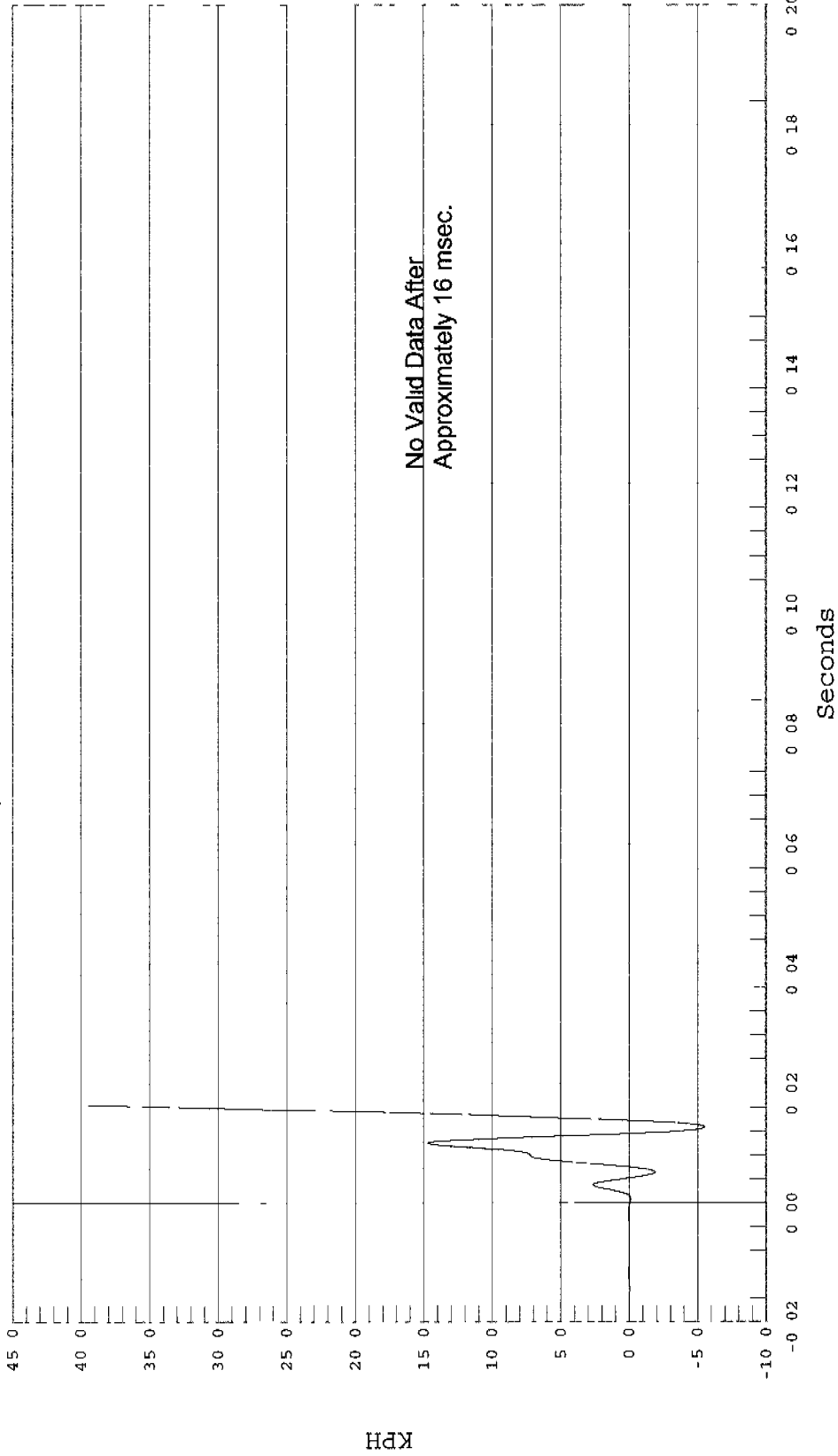
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

Test Desc: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 LEFT FRONT FRAME RAIL @ BUMPER Z VELOCITY, B01028AI V18



Ymin = -5.51 KPH @ 0.0126 Seconds, Ymax = 39.45 KPH @ 0.0163 Seconds



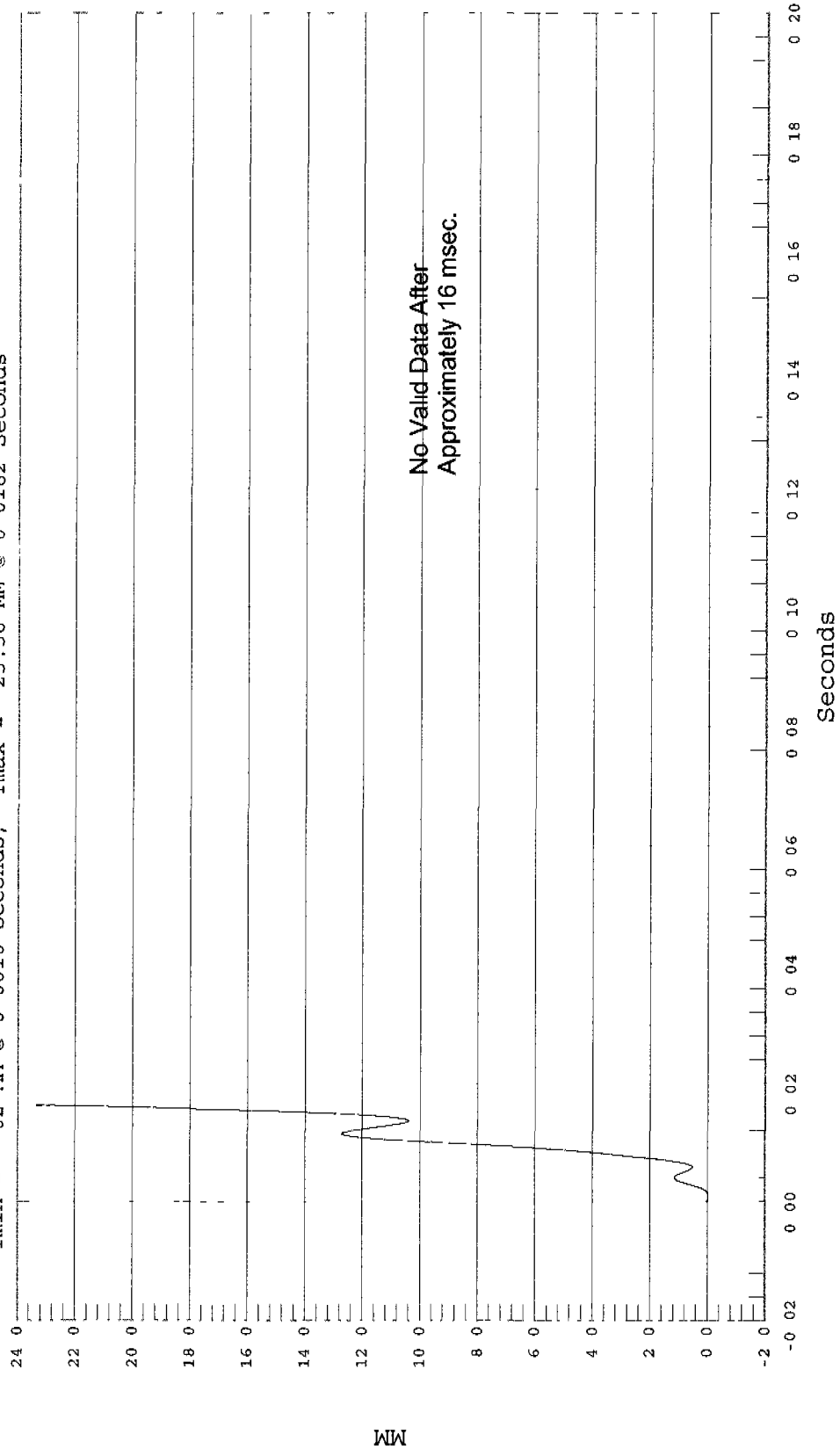
LEFT FRONT FRAME RAIL @ BUMPER Z DISPLACEMENT

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180



1 LEFT FRONT FRAME RAIL @ BUMPER Z DISPLACEMENT, B01028AI.D18

Ymin = - 02 MM @ 0 0010 Seconds, Ymax = 23.36 MM @ 0 0162 Seconds

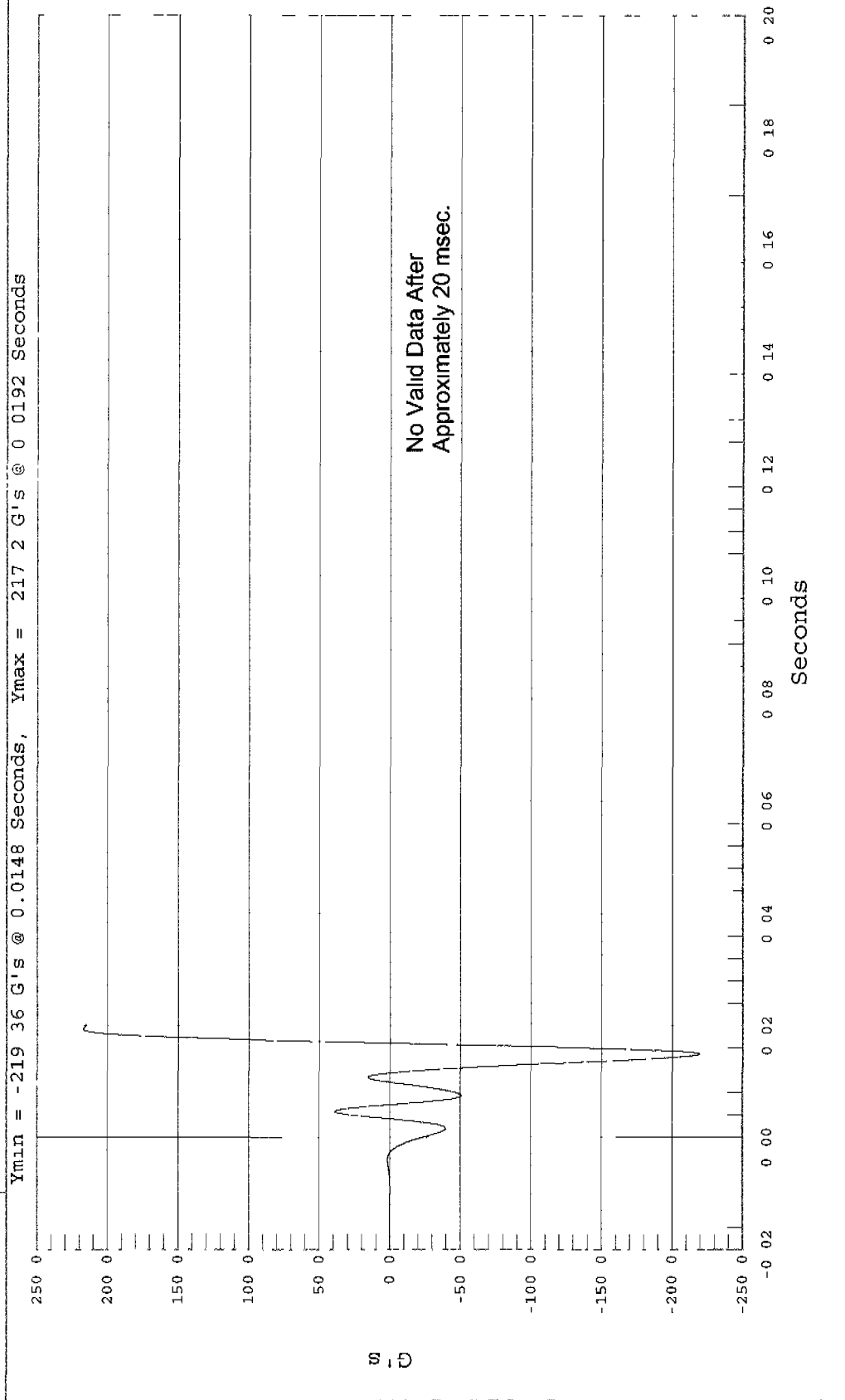


RIGHT FRONT FRAME RAIL @ BUMPER X ACCELERATION

Test Desc . 35 MPH FRONTAL BARRIER IMPACT
Component. 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info: Filter Class: 60

1 RIGHT FRONT FRAME RAIL @ BUMPER X, B01028AF A19

Ymin = -219.36 G's @ 0.0148 Seconds, Ymax = 217.2 G's @ 0.0192 Seconds



RIGHT FRONT FRAME RAIL @ BUMPER X VELOCITY

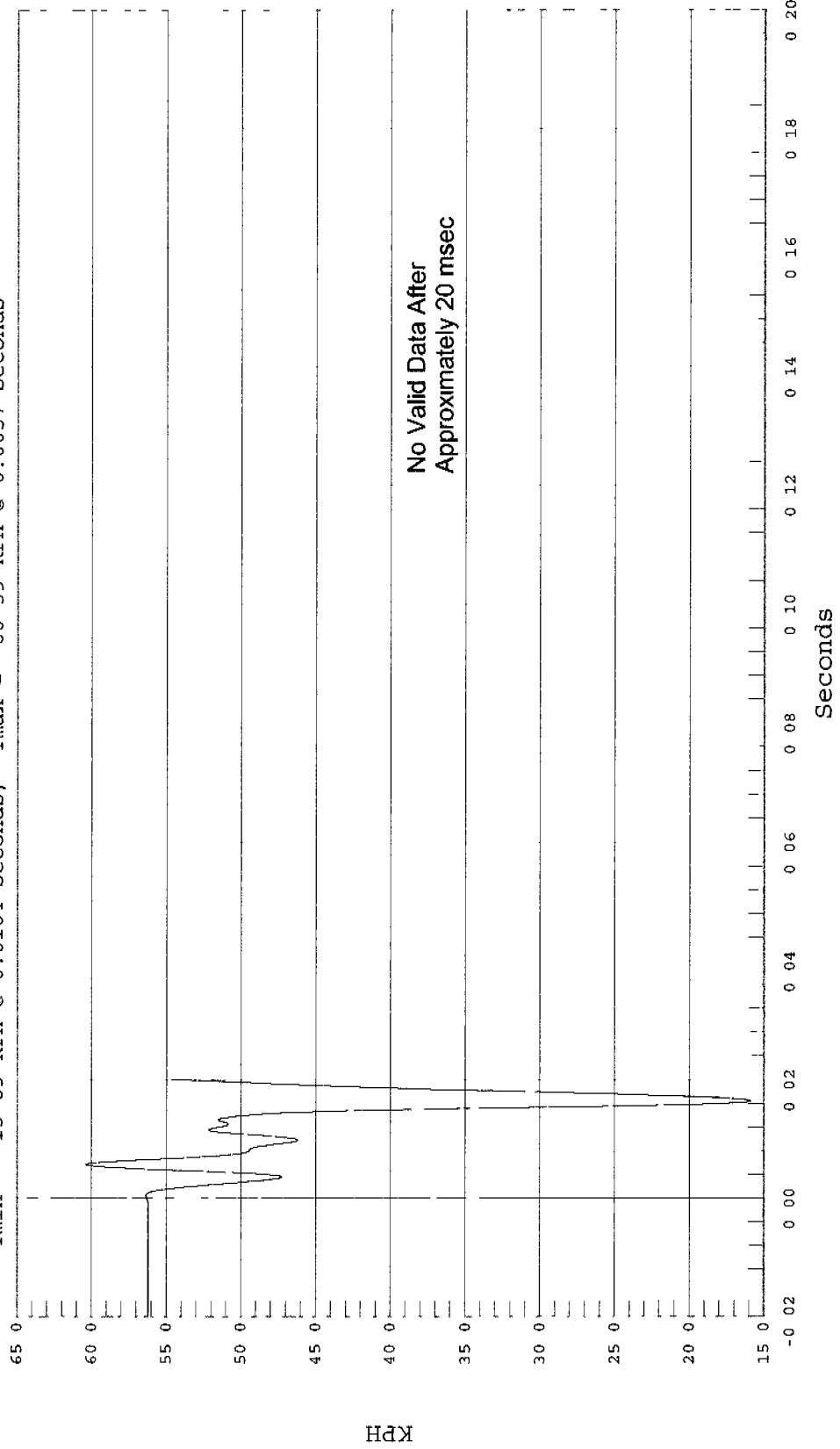
Test Desc . 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info.

Test Date: 03-08-01
Speed. 34.9 MPH, 56.2 KPH
Filter Class: 180

1 RIGHT FRONT FRAME RAIL @ BUMPER X VELOCITY, B01028AI.V19



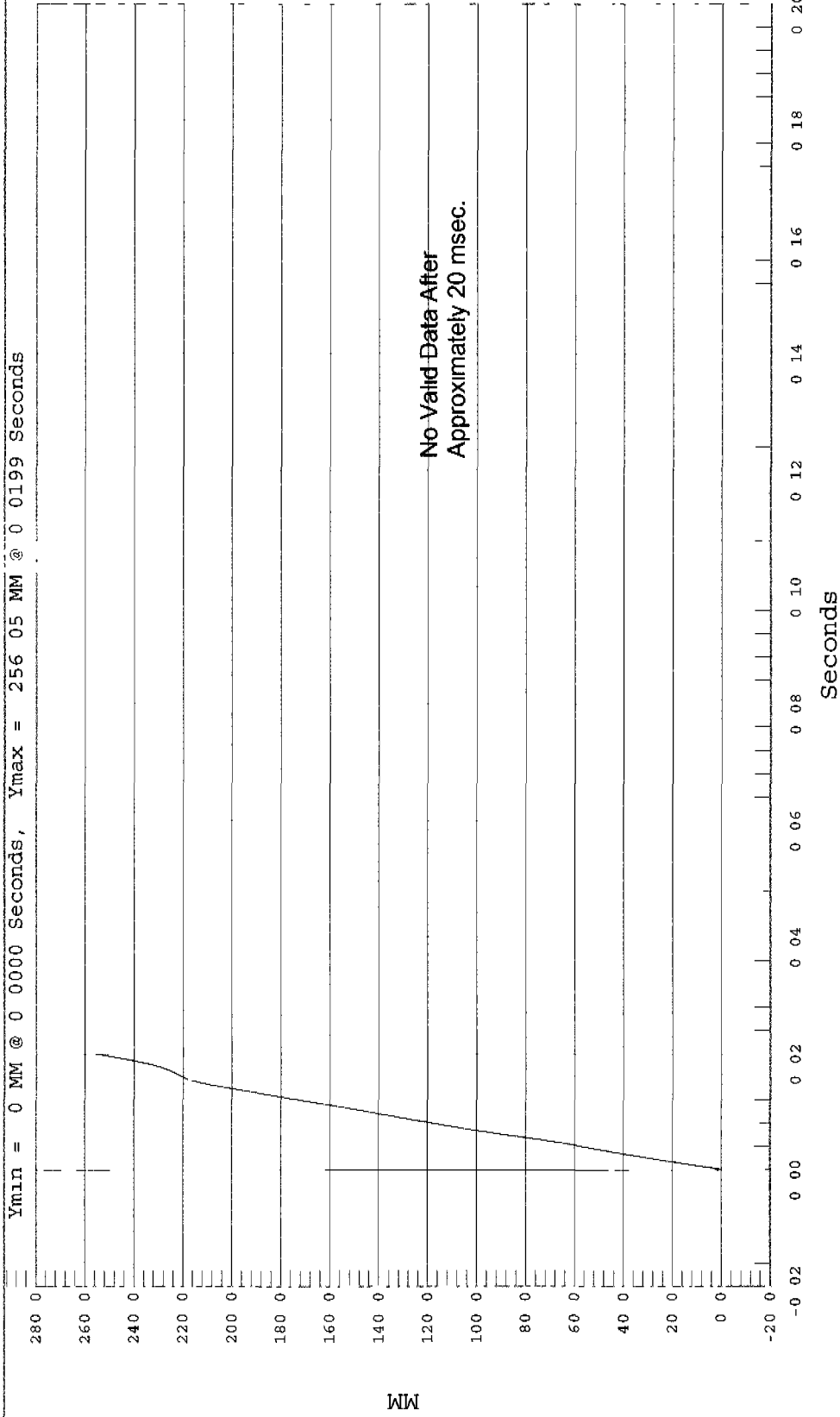
Ymin = 15 89 KPH @ 0.0164 Seconds, Ymax = 60 39 KPH @ 0.0057 Seconds



RIGHT FRONT FRAME RAIL @ BUMPER X DISPLACEMENT

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

1 RIGHT FRONT FRAME RAIL @ BUMPER X DISPLACEMENT, B01028AI D19



RIGHT FRONT FRAME RAIL @ BUMPER Y ACCELERATION

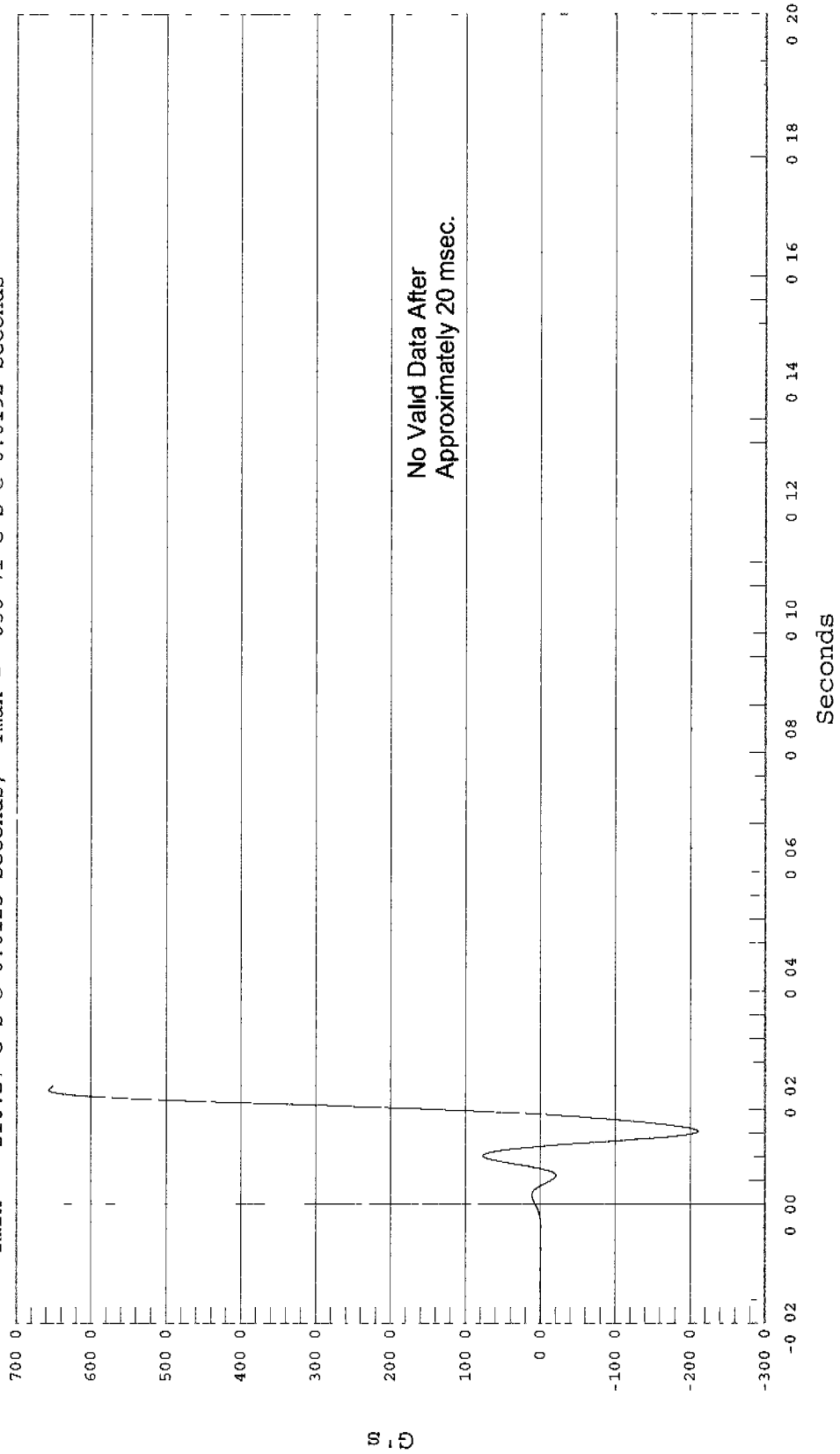
Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info.

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60



1 RIGHT FRONT FRAME RAIL @ BUMPER Y, B01028AF A20

Ymin = -210.27 G's @ 0.0123 Seconds, Ymax = 656.71 G's @ 0.0192 Seconds



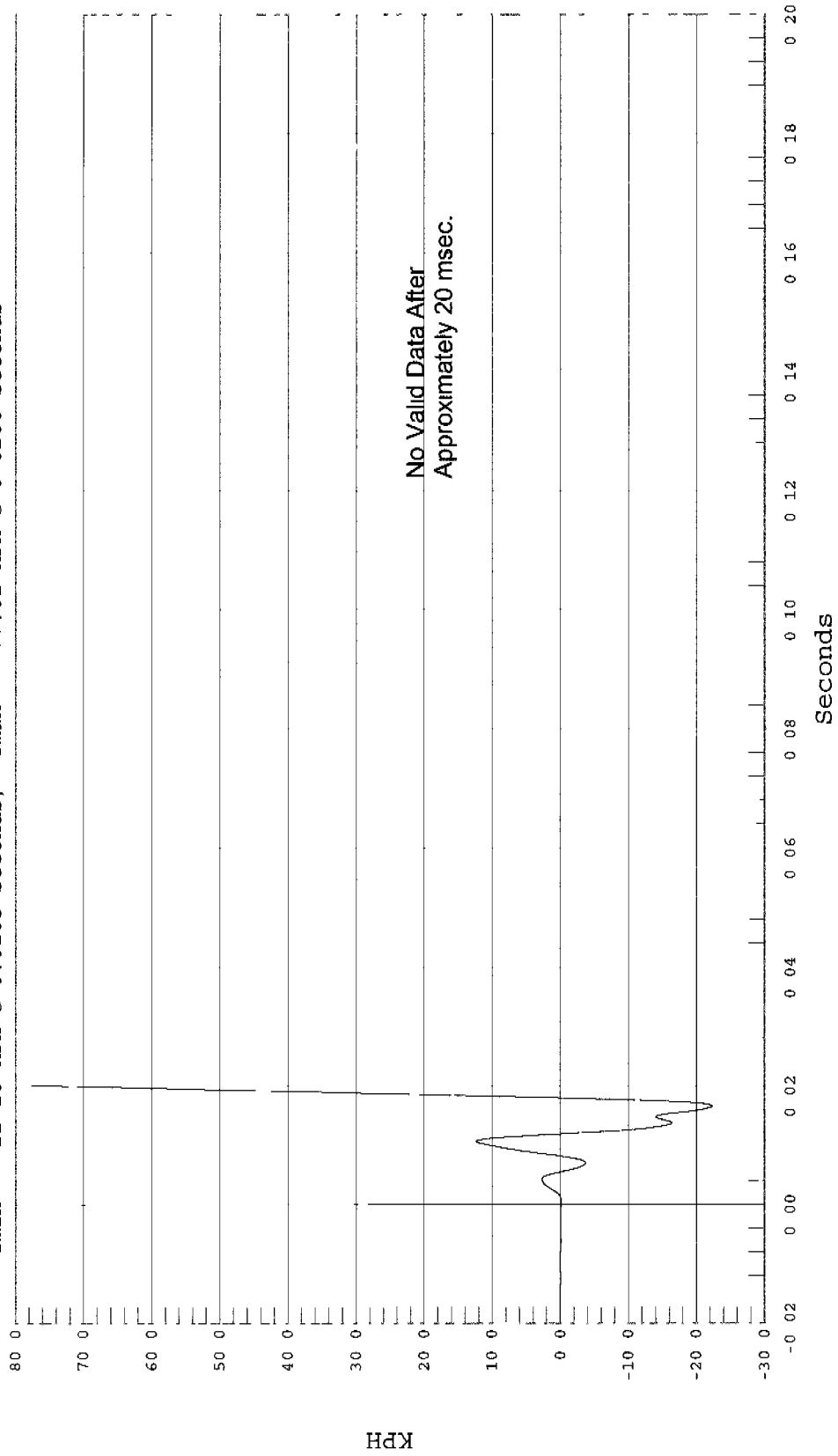
RIGHT FRONT FRAME RAIL @ BUMPER Y VELOCITY

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

1 RIGHT FRONT FRAME RAIL @ BUMPER Y VELOCITY, B01028AI.V20

Ymin = -22.28 KPH @ 0.0165 Seconds, Ymax = 77.61 KPH @ 0.0200 Seconds



RIGHT FRONT FRAME RAIL @ BUMPER Y DISPLACEMENT

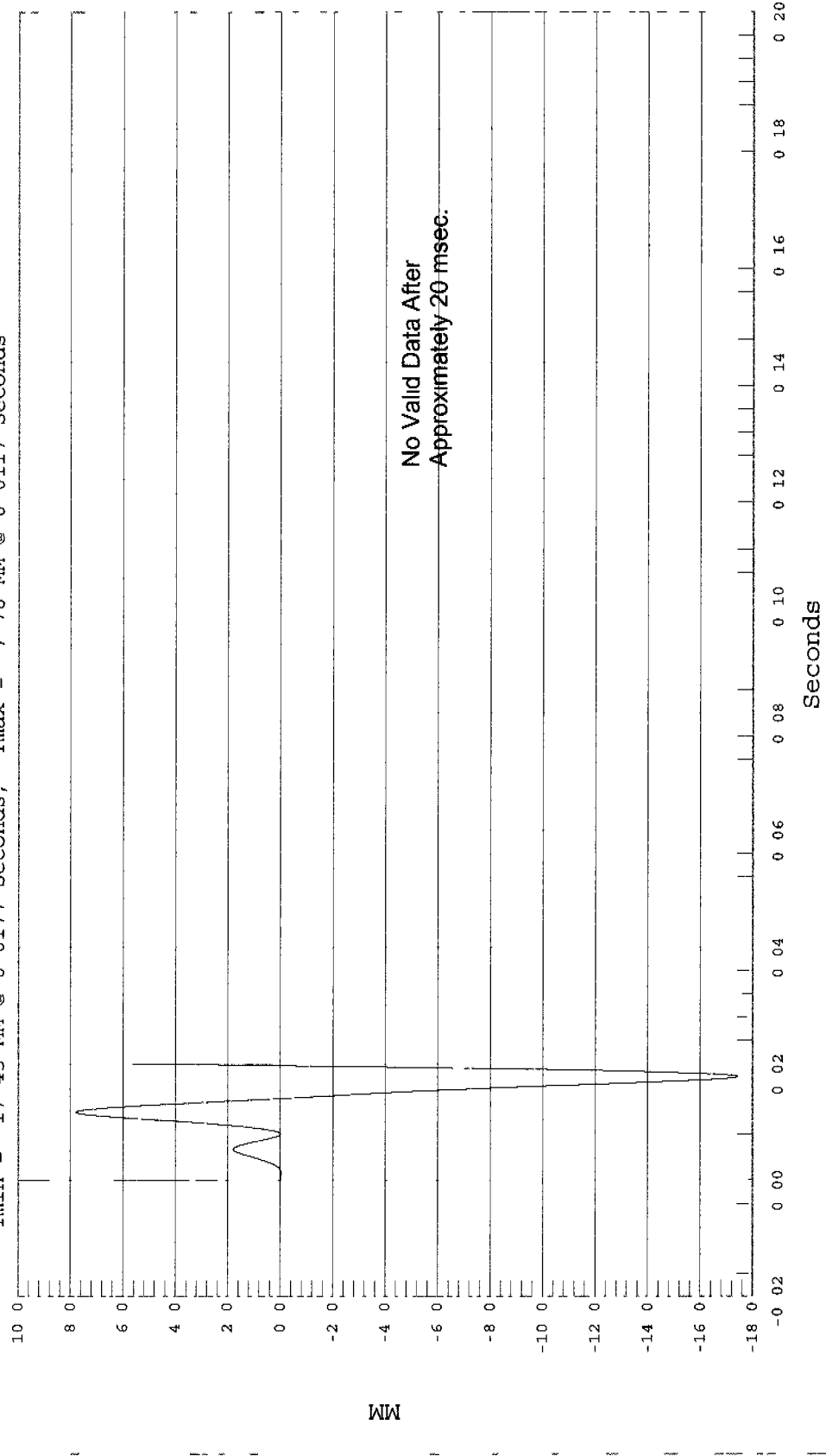
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

Test Desc: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:



1 RIGHT FRONT FRAME RAIL @ BUMPER Y DISPLACEMENT, B01028AI D20

Ymin = -17.43 MM @ 0.0177 Seconds, Ymax = 7.78 MM @ 0.0117 Seconds



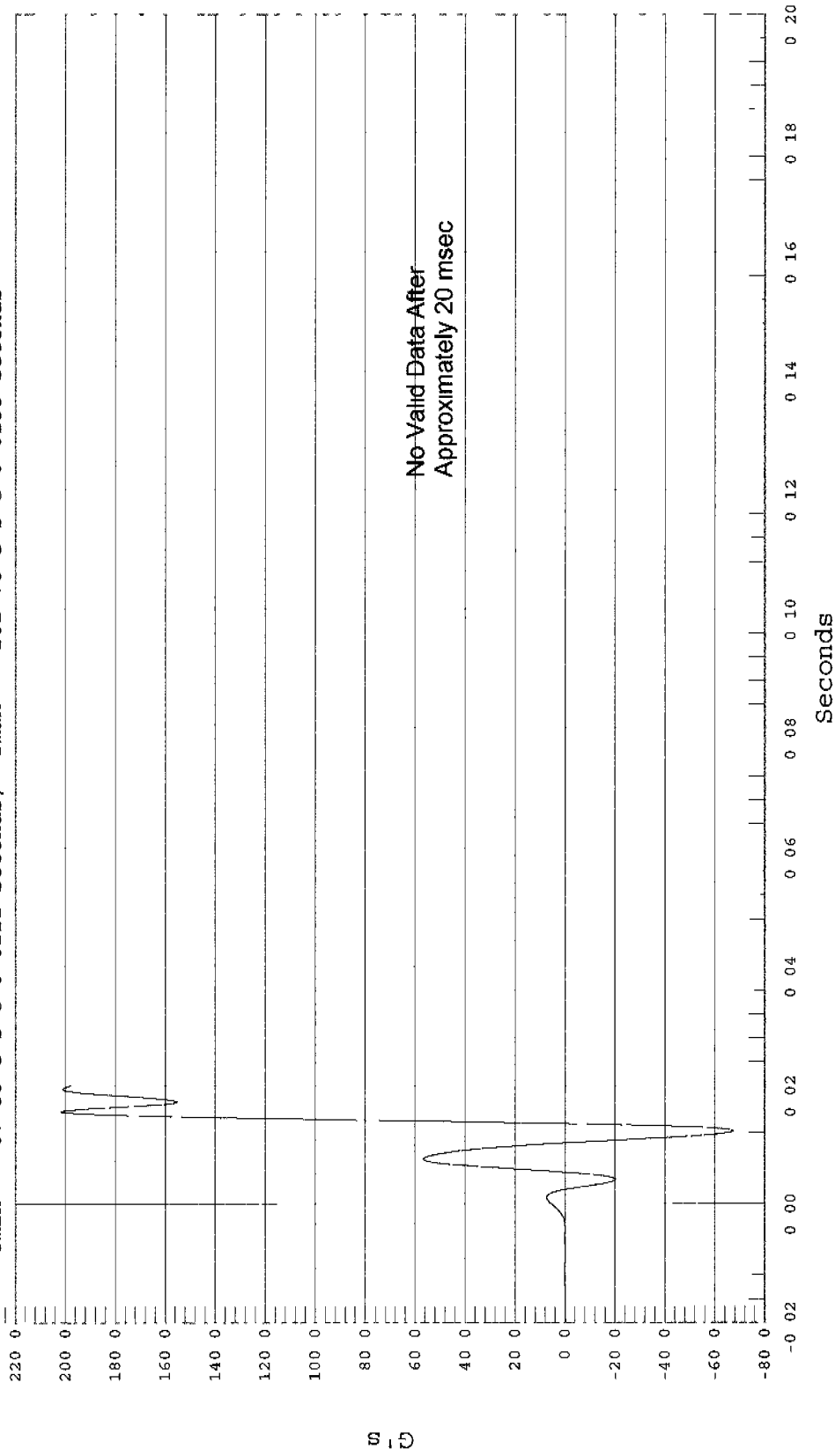
No Valid Data After
Approximately 20 msec.

RIGHT FRONT FRAME RAIL @ BUMPER Z ACCELERATION

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60

1 RIGHT FRONT FRAME RAIL @ BUMPER Z, B01028AF.A21

Ymin = -67.35 G's @ 0.0122 Seconds, Ymax = 201.78 G's @ 0.0155 Seconds



RIGHT FRONT FRAME RAIL @ BUMPER Z VELOCITY

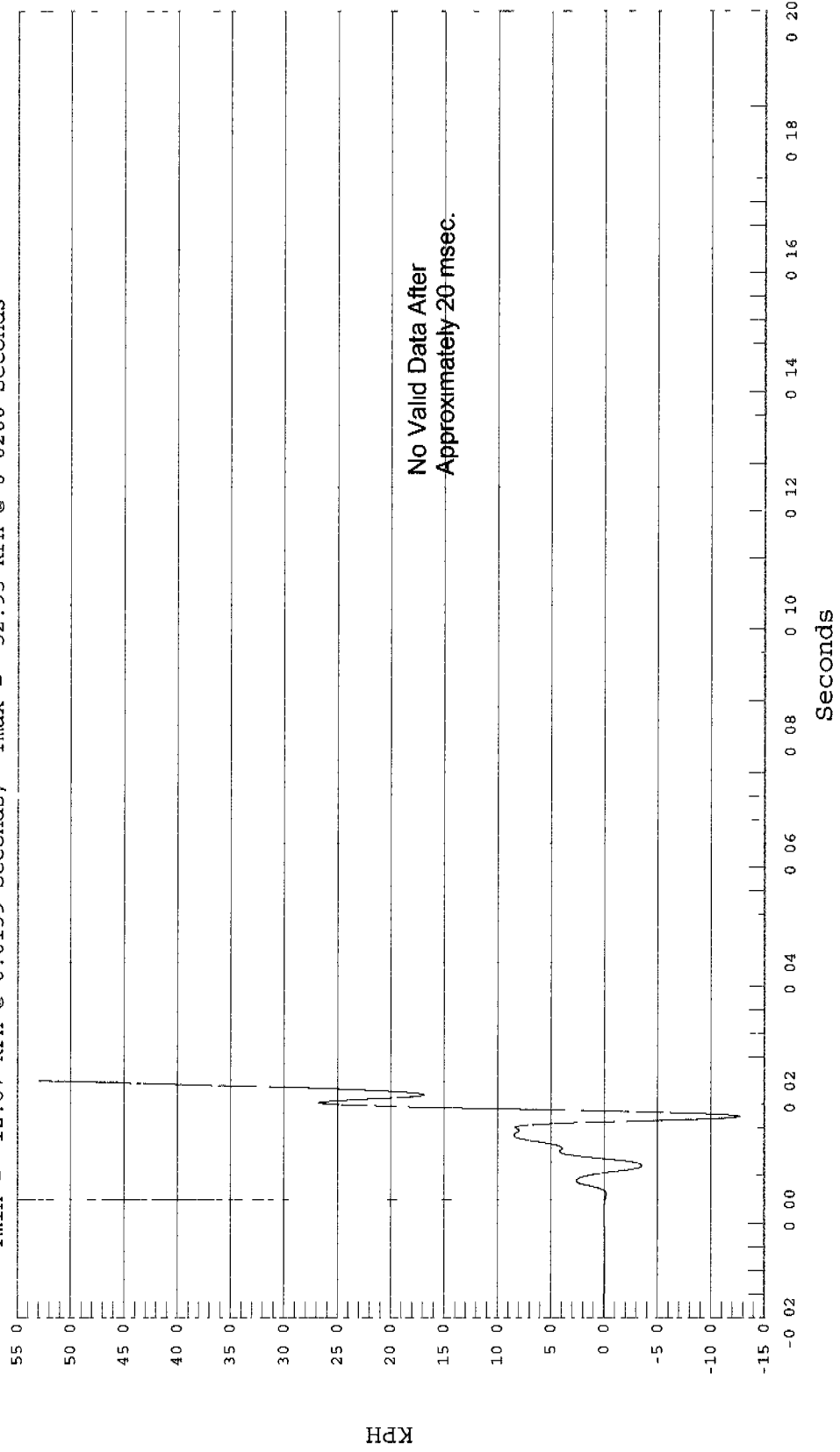
Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component : 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class. 180



1 RIGHT FRONT FRAME RAIL @ BUMPER Z VELOCITY, B01028AI V21

Ymin = -12.67 KPH @ 0.0139 Seconds, Ymax = 52.95 KPH @ 0 0200 Seconds



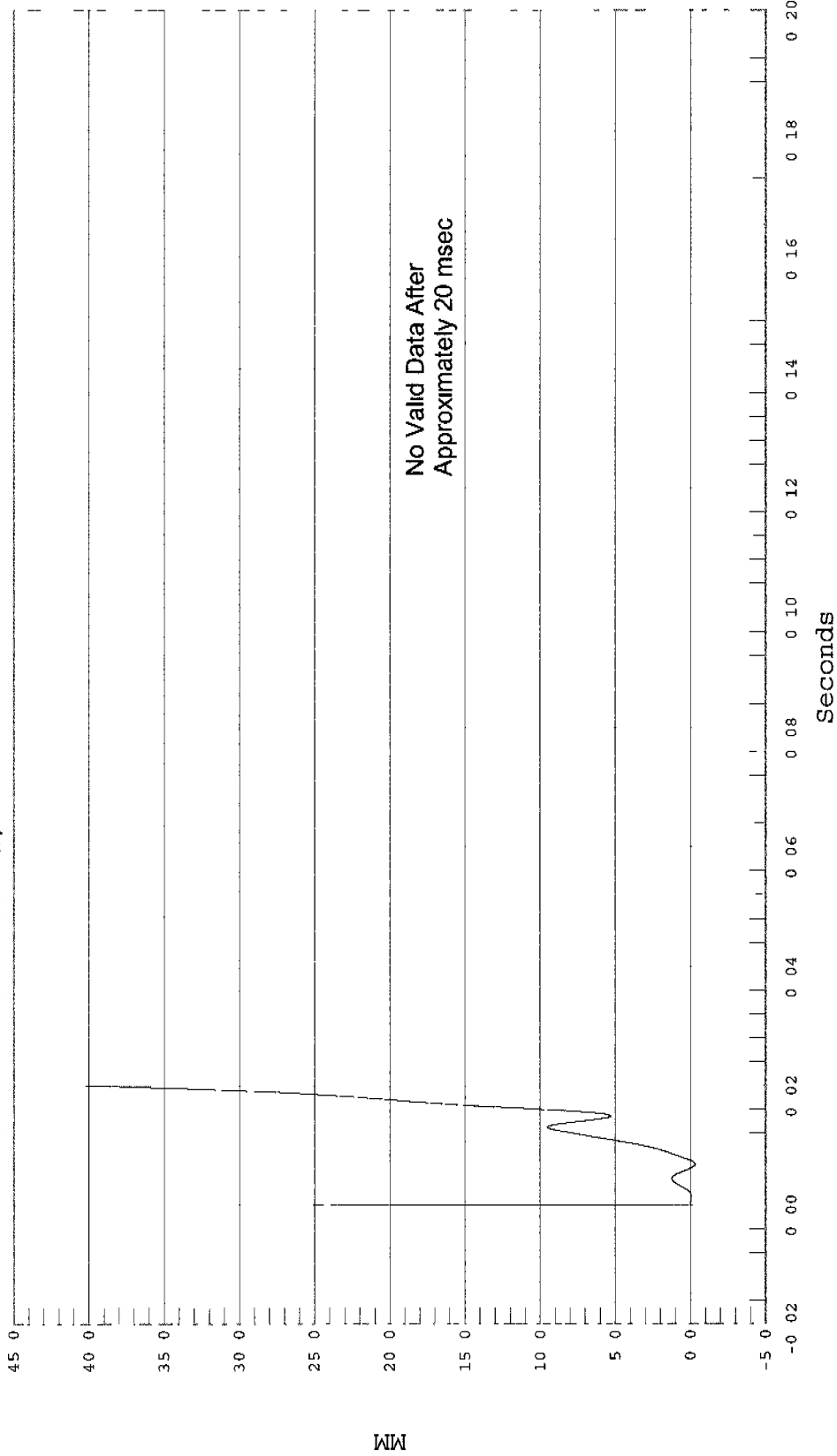
No Valid Data After
Approximately 20 msec.

RIGHT FRONT FRAME RAIL @ BUMPER Z DISPLACEMENT

Test Desc. 35 MPH FRONTAL BARRIER IMPACT
Component 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

1 RIGHT FRONT FRAME RAIL @ BUMPER Z DISPLACEMENT, B01028AI D21

Ymin = -31 MM @ 0.0067 Seconds, Ymax = 40.18 MM @ 0.0199 Seconds

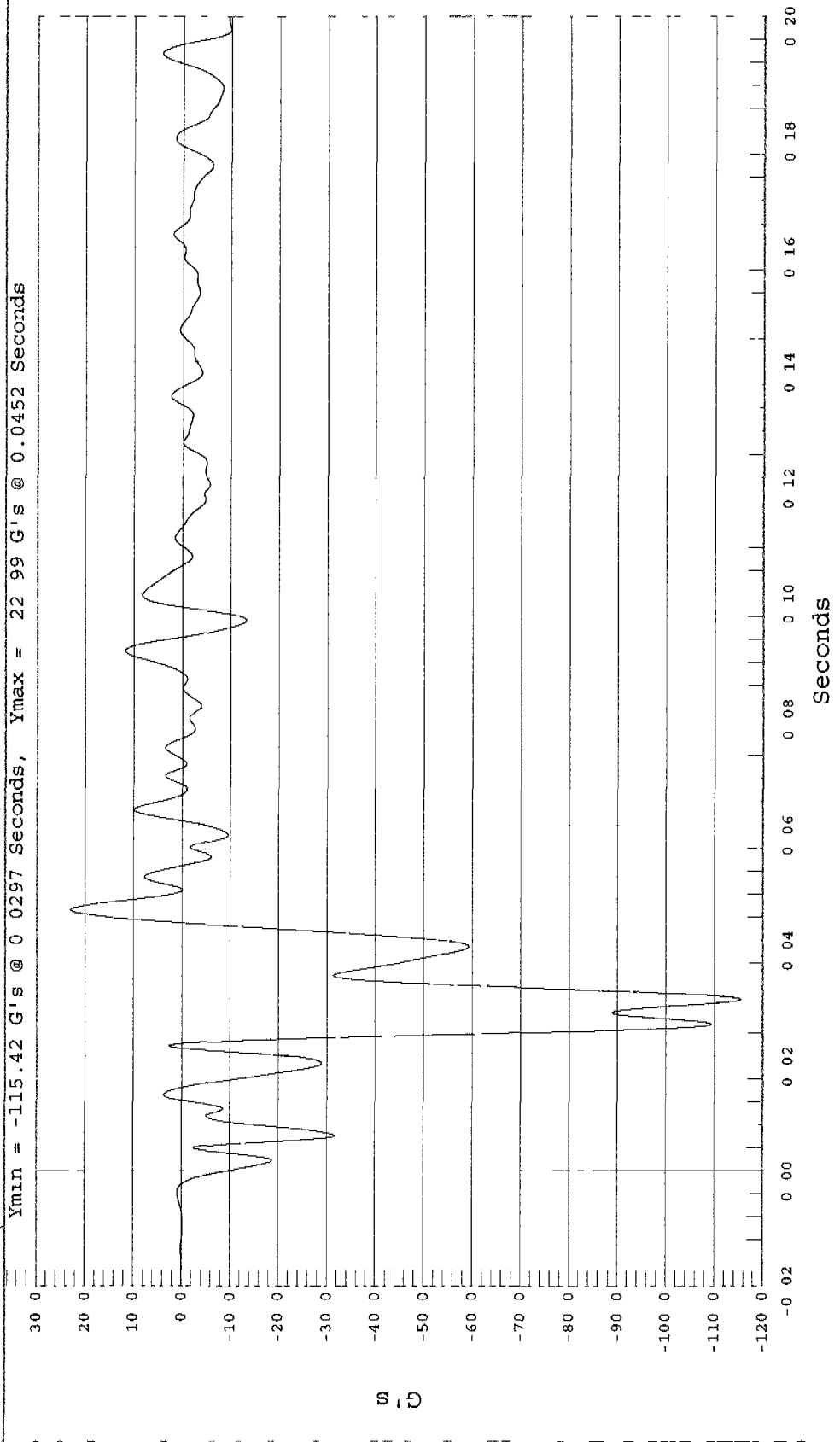


LEFT FRONT FRAME RAIL @ SHOCK BRACE X ACCELERATION

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Filter Class: 60

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH

1 LEFT FRONT FRAME RAIL @ SHOCK BRAC, B01028AF.A22



LEFT FRONT FRAME RAIL @ SHOCK BRACE X VELOCITY

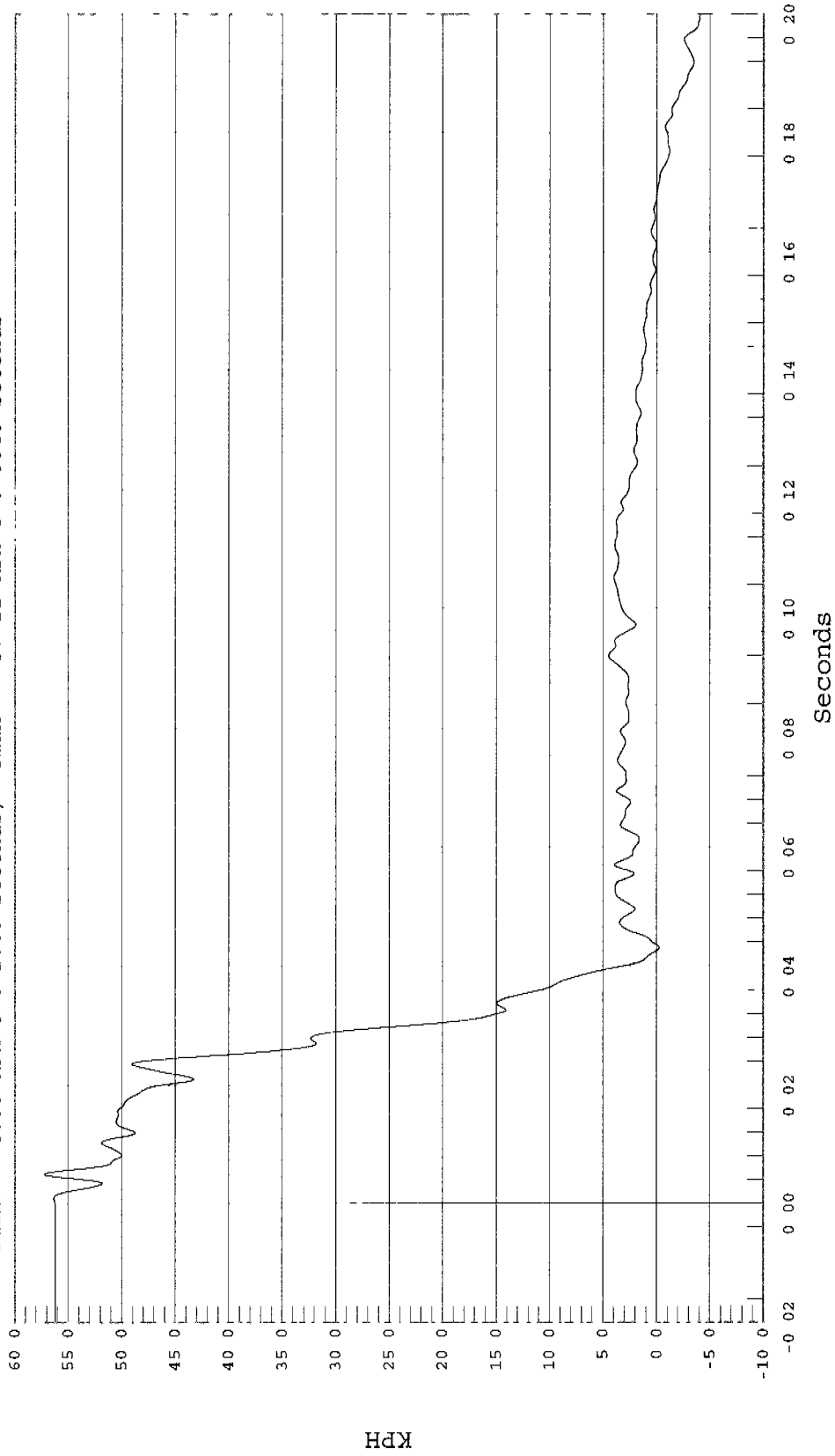
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

Test Desc: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 LEFT FRONT FRAME RAIL @ SHOCK BRACE X VELOCITY, B01028AI V22



Ymin = -4.08 KPH @ 0.2000 Seconds, Ymax = 57.22 KPH @ 0.0048 Seconds



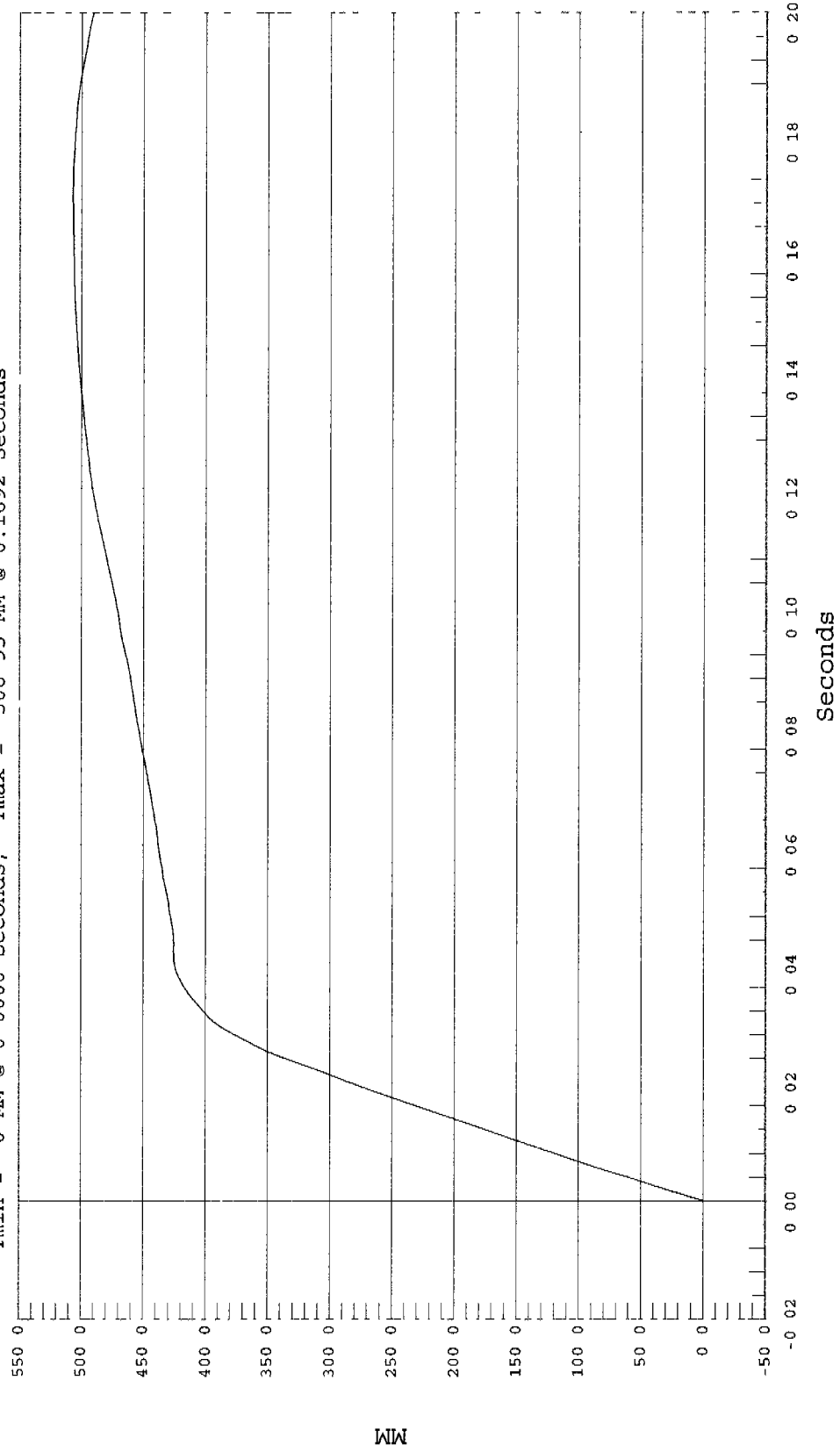
LEFT FRONT FRAME RAIL @ SHOCK BRACE X DISPLACEMENT

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info.
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180



1 LEFT FRONT FRAME RAIL @ SHOCK BRACE X DISPLACEMENT, B01028AI.D22

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 506.95 MM @ 0.1692 Seconds



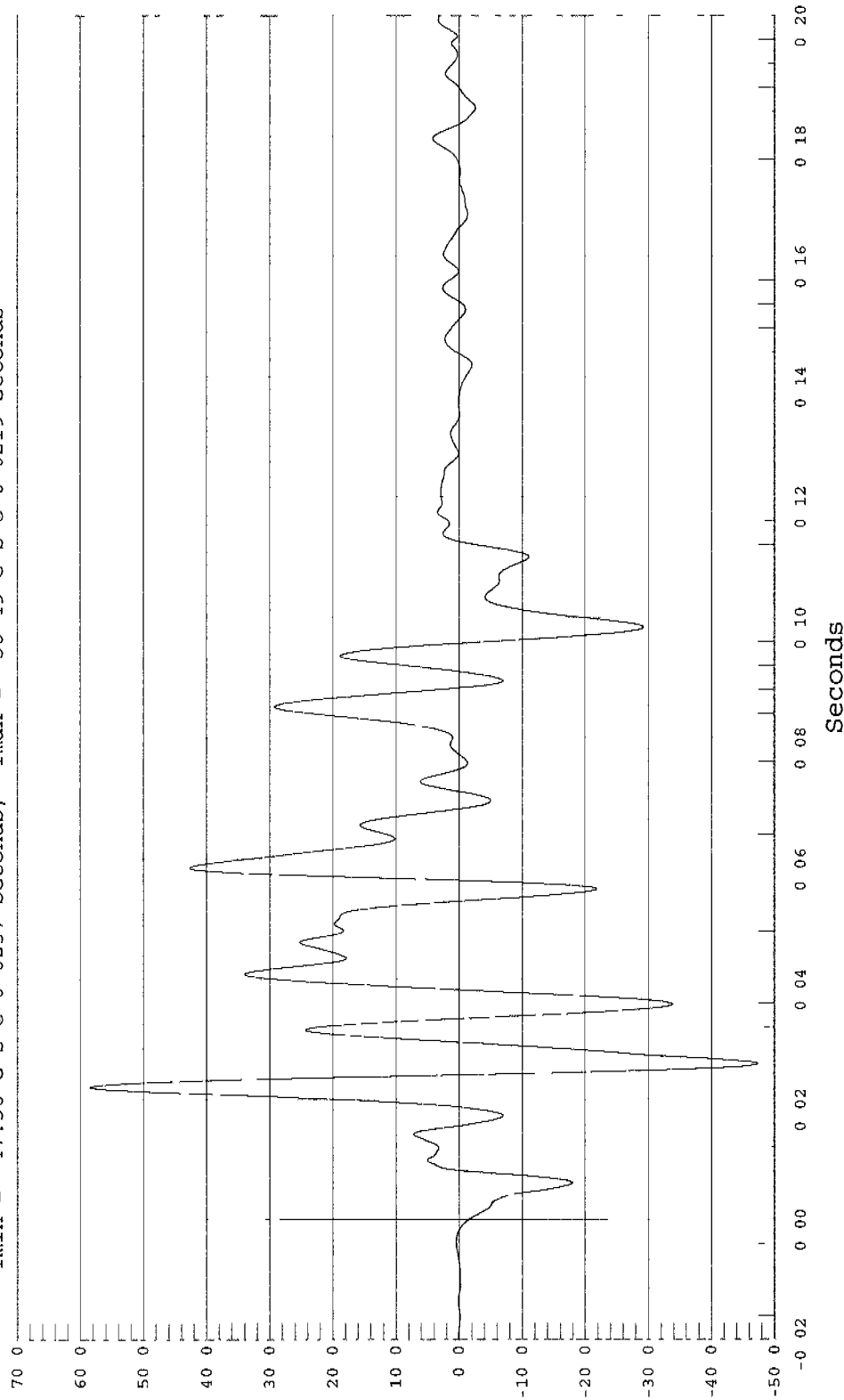
LEFT FRONT FRAME RAIL @ SHOCK BRACE Z ACCELERATION

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60

Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 LEFT FRONT FRAME RAIL @ SHOCK BRAC, B01028AF A23

Ymin = -47.36 G's @ 0.0257 Seconds, Ymax = 58.49 G's @ 0.0219 Seconds



G . G

LEFT FRONT FRAME RAIL @ SHOCK BRACE Z VELOCITY

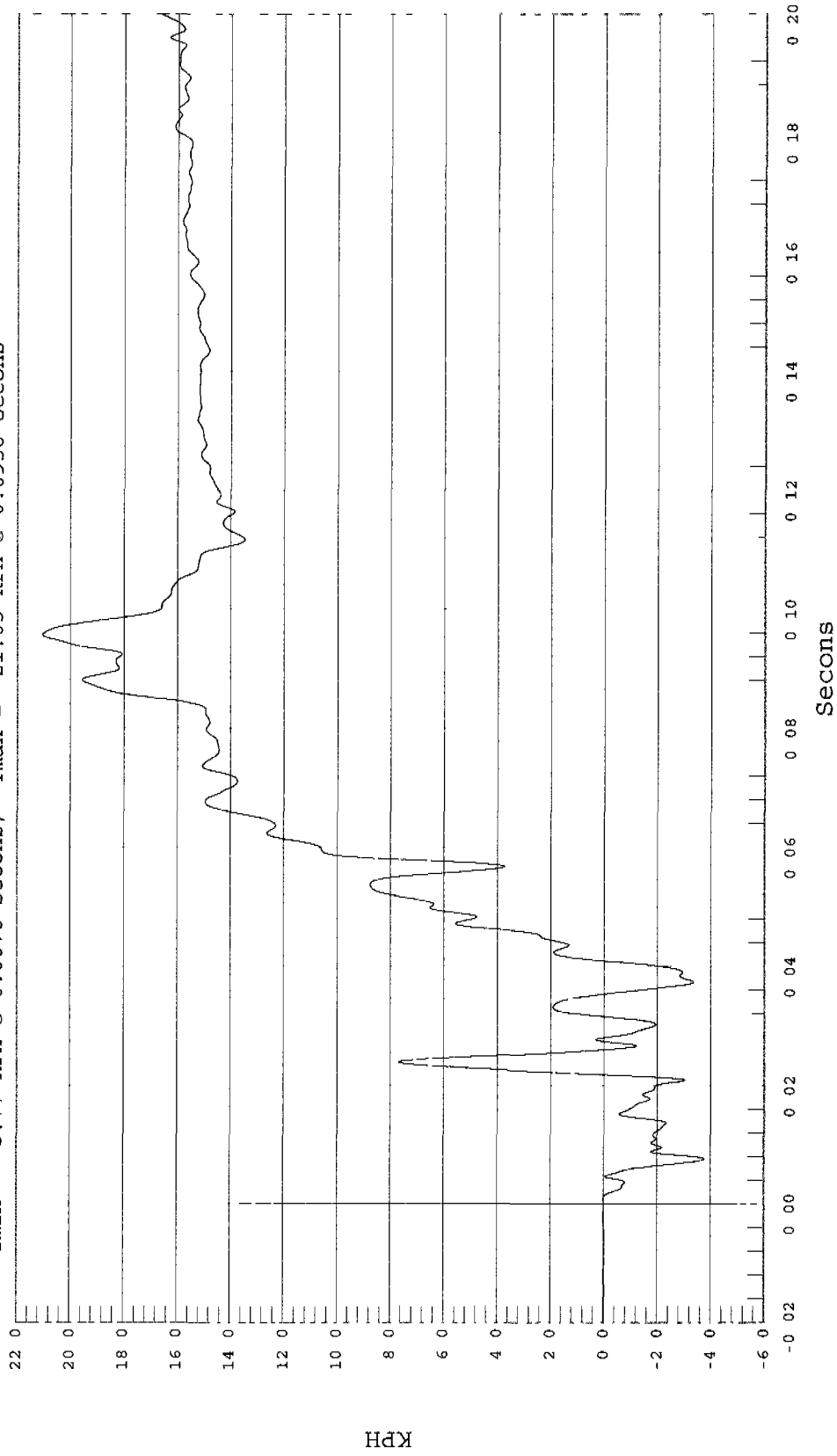
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 LEFT FRONT FRAME RAIL @ SHOCK BRACE Z VELOCITY, B01028AI.V23



Ymin = -3.77 KPH @ 0.0076 Seconds, Ymax = 21.05 KPH @ 0.0956 Seconds



LEFT FRONT FRAME RAIL @ SHOCK BRACE Z DISPLACEMENT

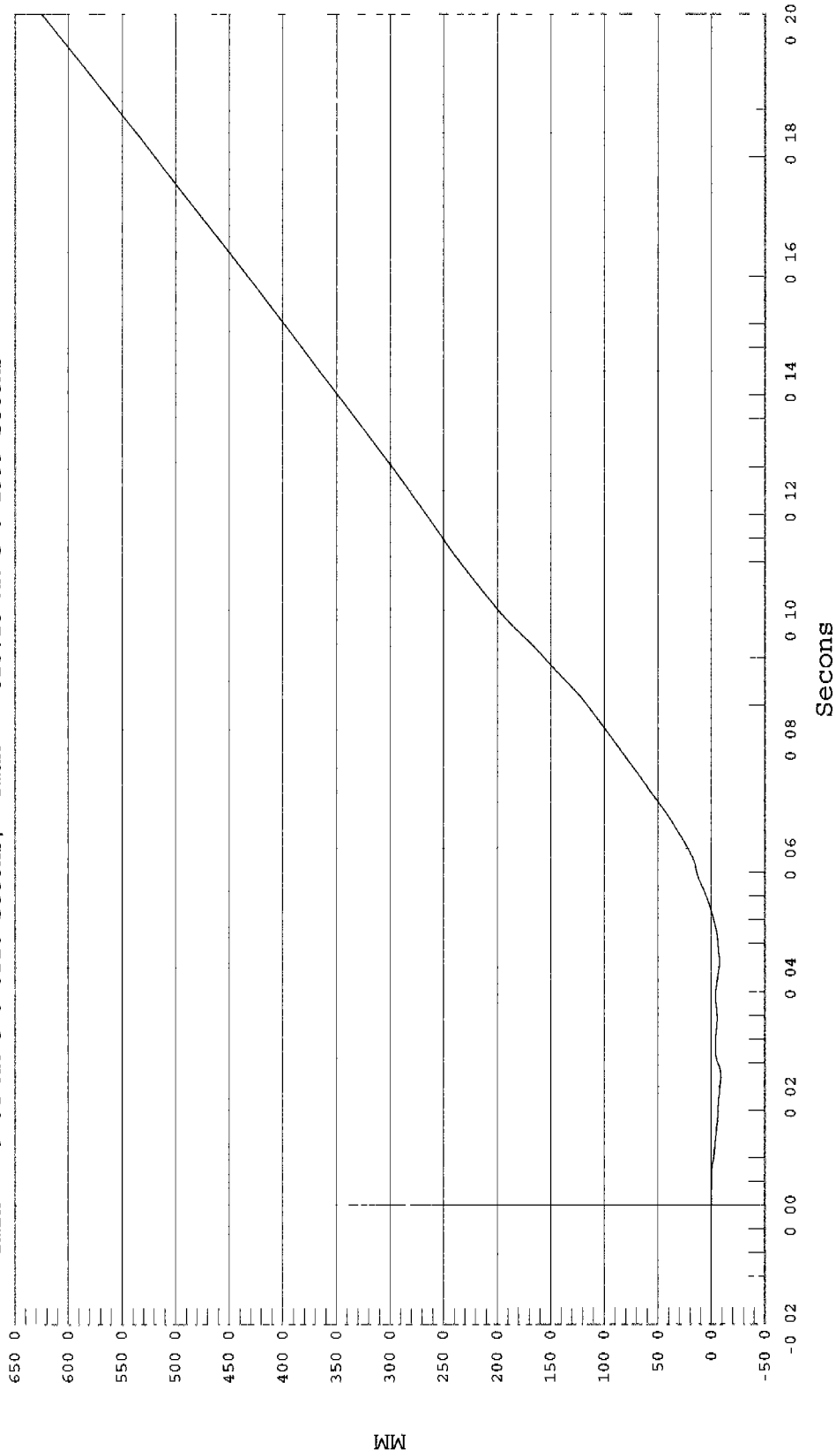
Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component : 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info :

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180



1 LEFT FRONT FRAME RAIL @ SHOCK BRACE Z DISPLACEMENT, B01028AI.D23

Ymin = -9.04 MM @ 0.0216 Seconds, Ymax = 625.18 MM @ 0.1999 Seconds



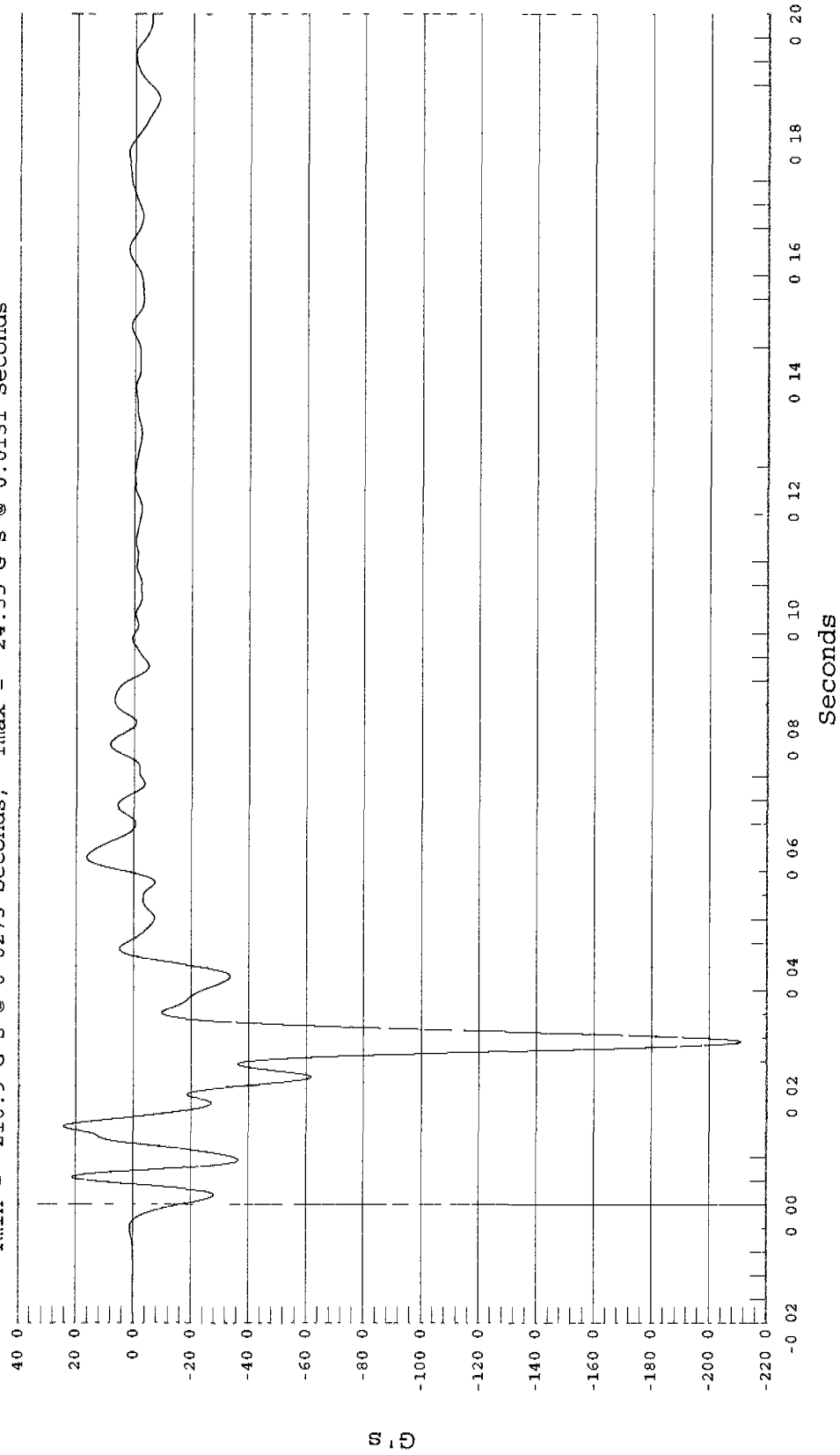
RIGHT FRONT FRAME RAIL @ SHOCK BRACE X ACCELERATION

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60

1 RIGHT FRONT FRAME RAIL @ SHOCK BRA, B01028AF A24



Ymin = -210.9 G's @ 0.0273 Seconds, Ymax = 24.35 G's @ 0.0131 Seconds

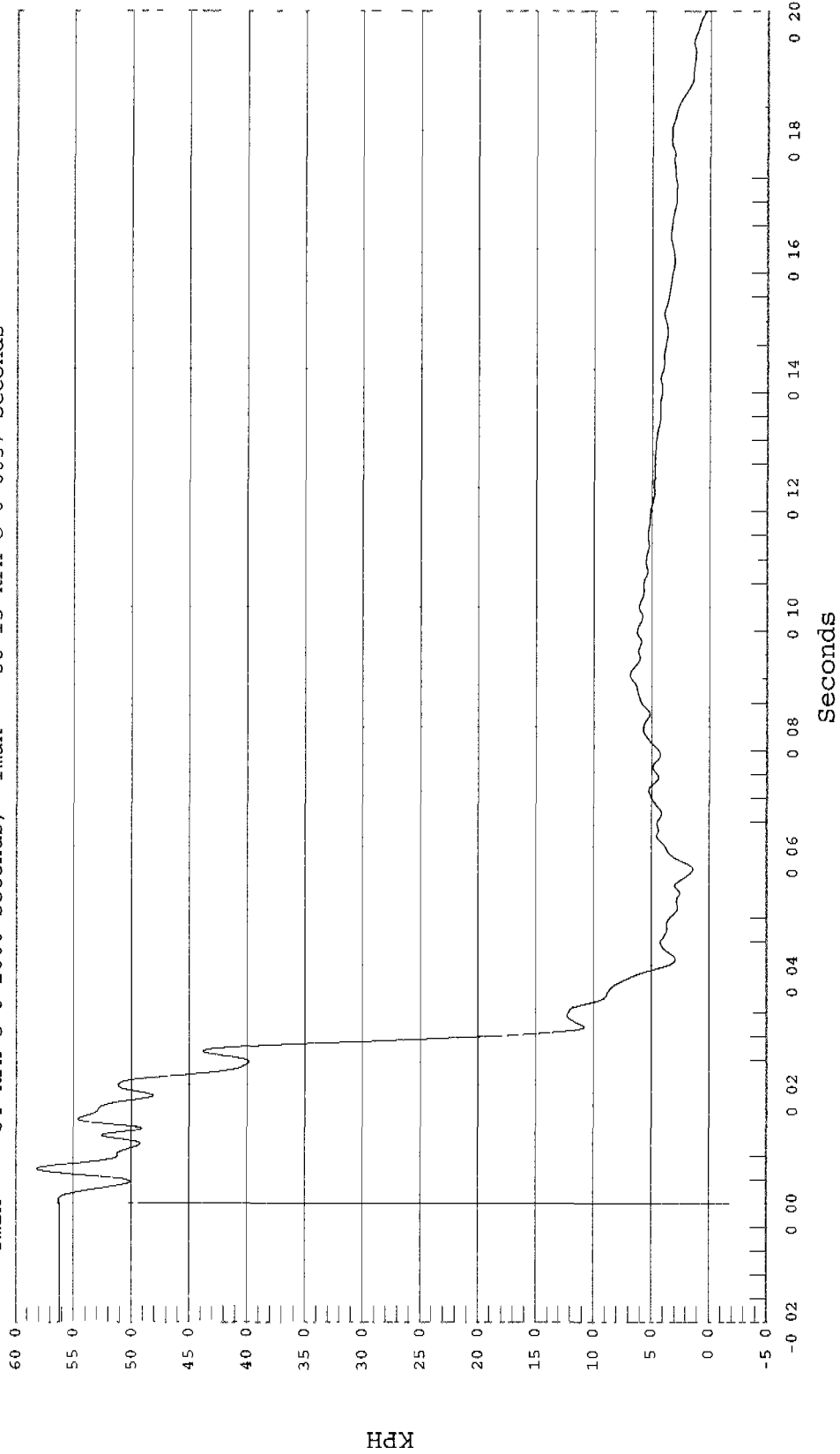


RIGHT FRONT FRAME RAIL @ SHOCK BRACE X VELOCITY

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

1 RIGHT FRONT FRAME RAIL @ SHOCK BRACE X VELOCITY, B01028AI V24

Ymin = 34 KPH @ 0.2000 Seconds, Ymax = 58.15 KPH @ 0.0057 Seconds



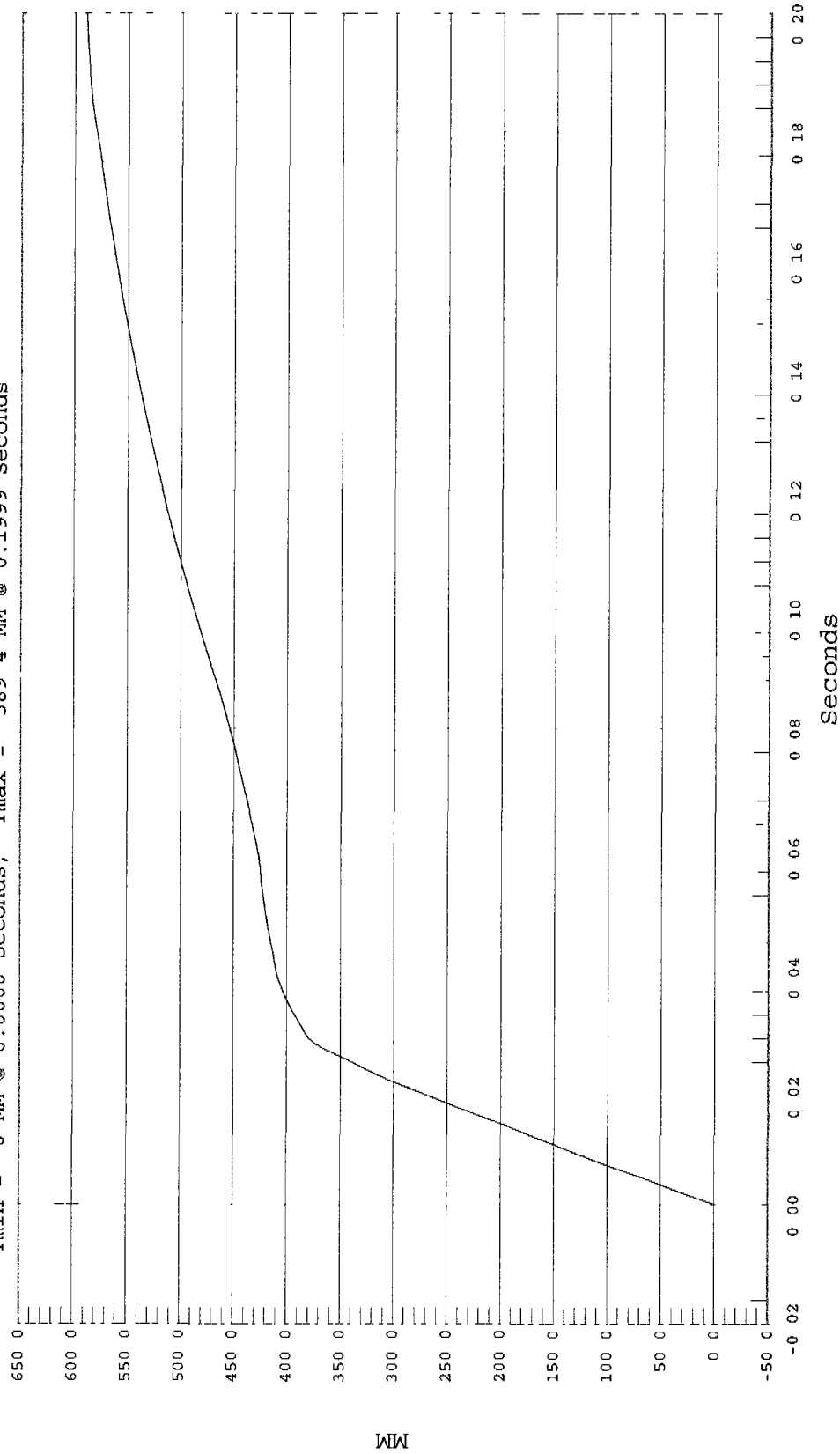
RIGHT FRONT FRAME RAIL @ SHOCK BRACE X DISPLACEMENT

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN ITD#2
Other Info.
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180



1 RIGHT FRONT FRAME RAIL @ SHOCK BRACE X DISPLACEMENT, B01028AI D24

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 589.4 MM @ 0.1999 Seconds



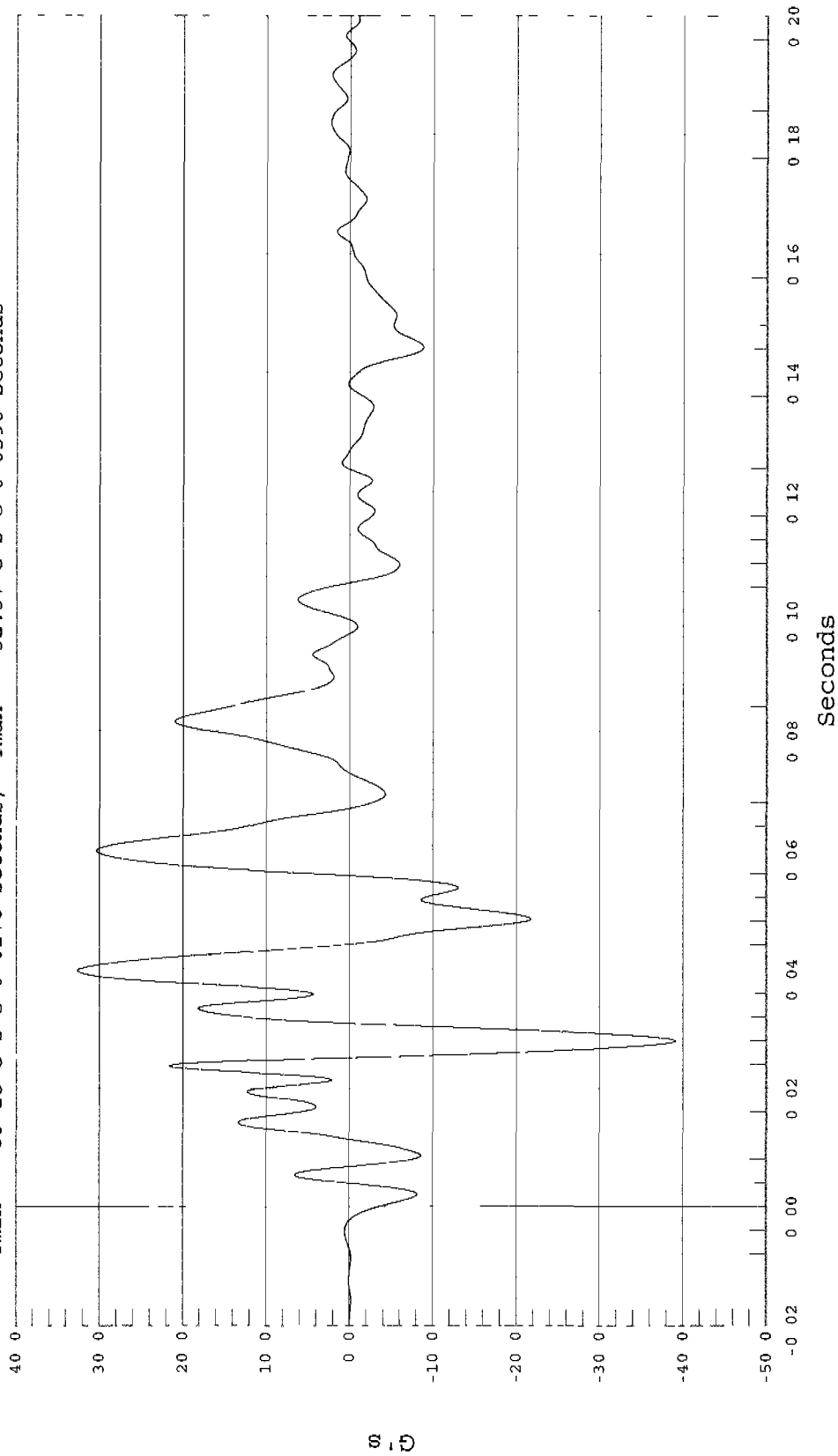
RIGHT FRONT FRAME RAIL @ SHOCK BRACE Z ACCELERATION

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60

1 RIGHT FRONT FRAME RAIL @ SHOCK BRA, B01028AF A25



Ymin = -39.15 G's @ 0.0278 Seconds, Ymax = 32.57 G's @ 0.0396 Seconds



RIGHT FRONT FRAME RAIL @ SHOCK BRACE Z VELOCITY

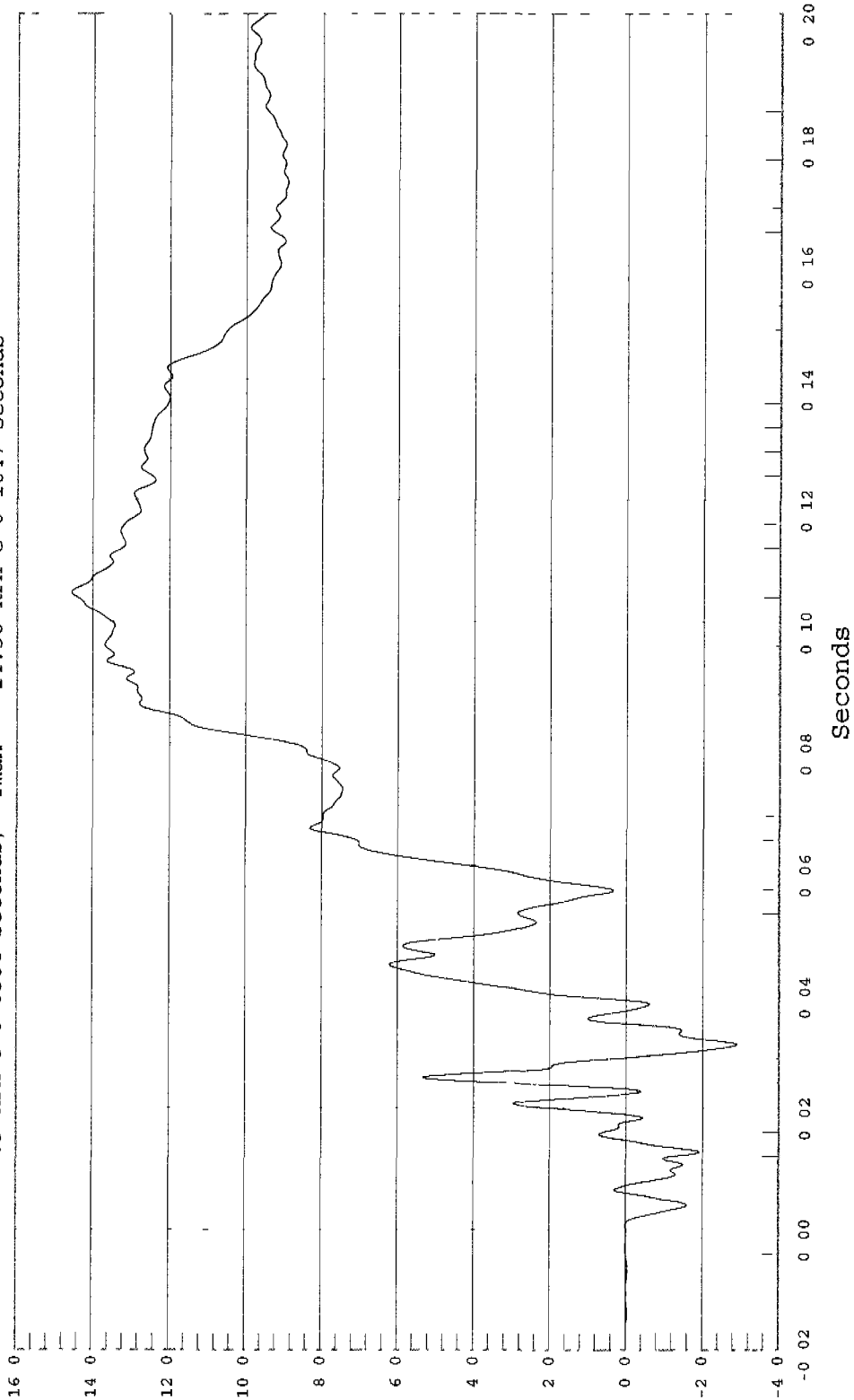
Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

1 RIGHT FRONT FRAME RAIL @ SHOCK BRACE Z VELOCITY, B01028AI.V25



Ymin = -2.9 KPH @ 0.0304 Seconds, Ymax = 14.56 KPH @ 0.1047 Seconds



KPH

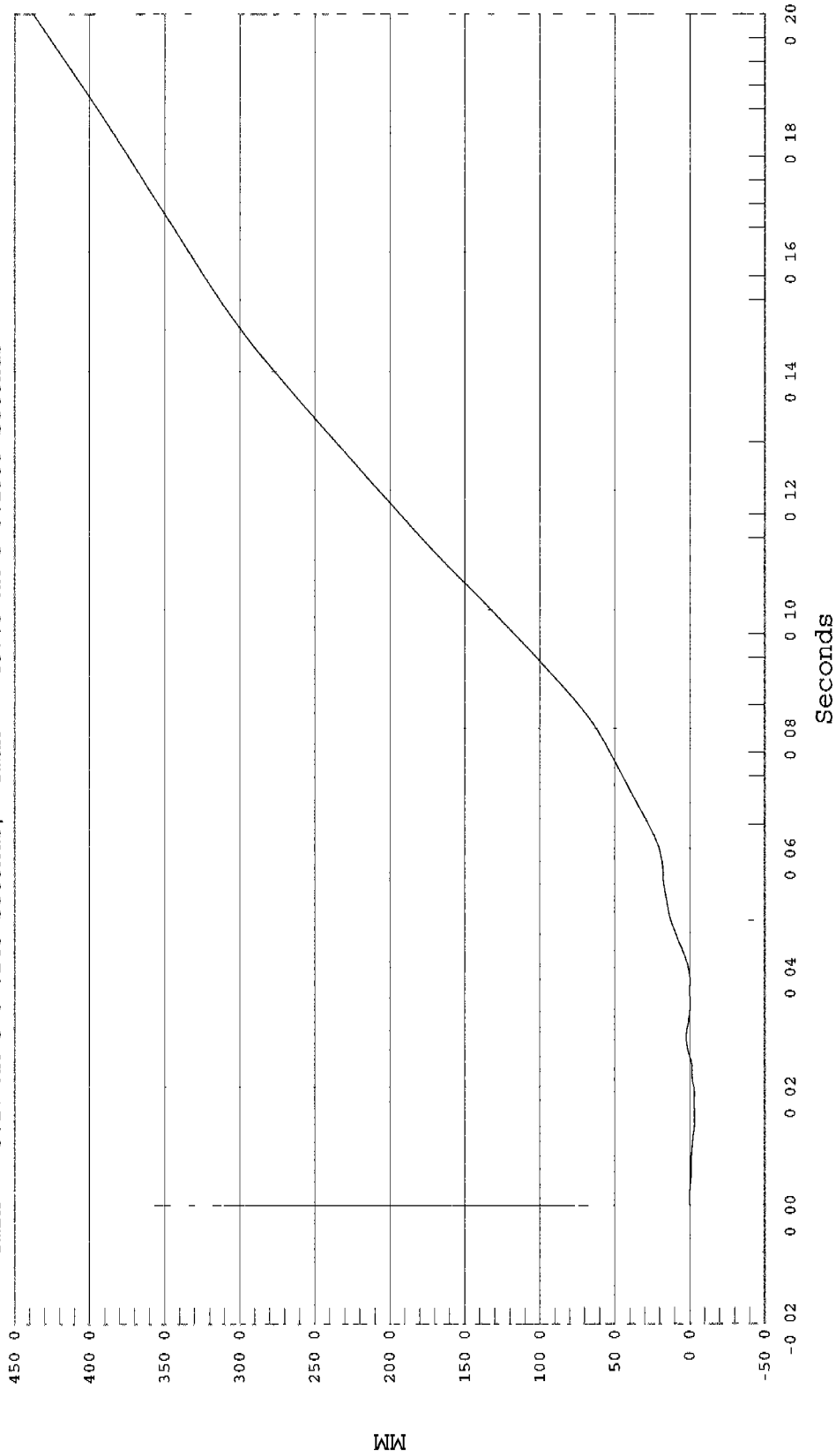
Seconds

RIGHT FRONT FRAME RAIL @ SHOCK BRACE Z DISPLACEMENT

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component : 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

1 RIGHT FRONT FRAME RAIL @ SHOCK BRACE Z DISPLACEMENT, B01028AI D25

Ymin = -3.27 MM @ 0.0145 Seconds, Ymax = 437.5 MM @ 0.1999 Seconds

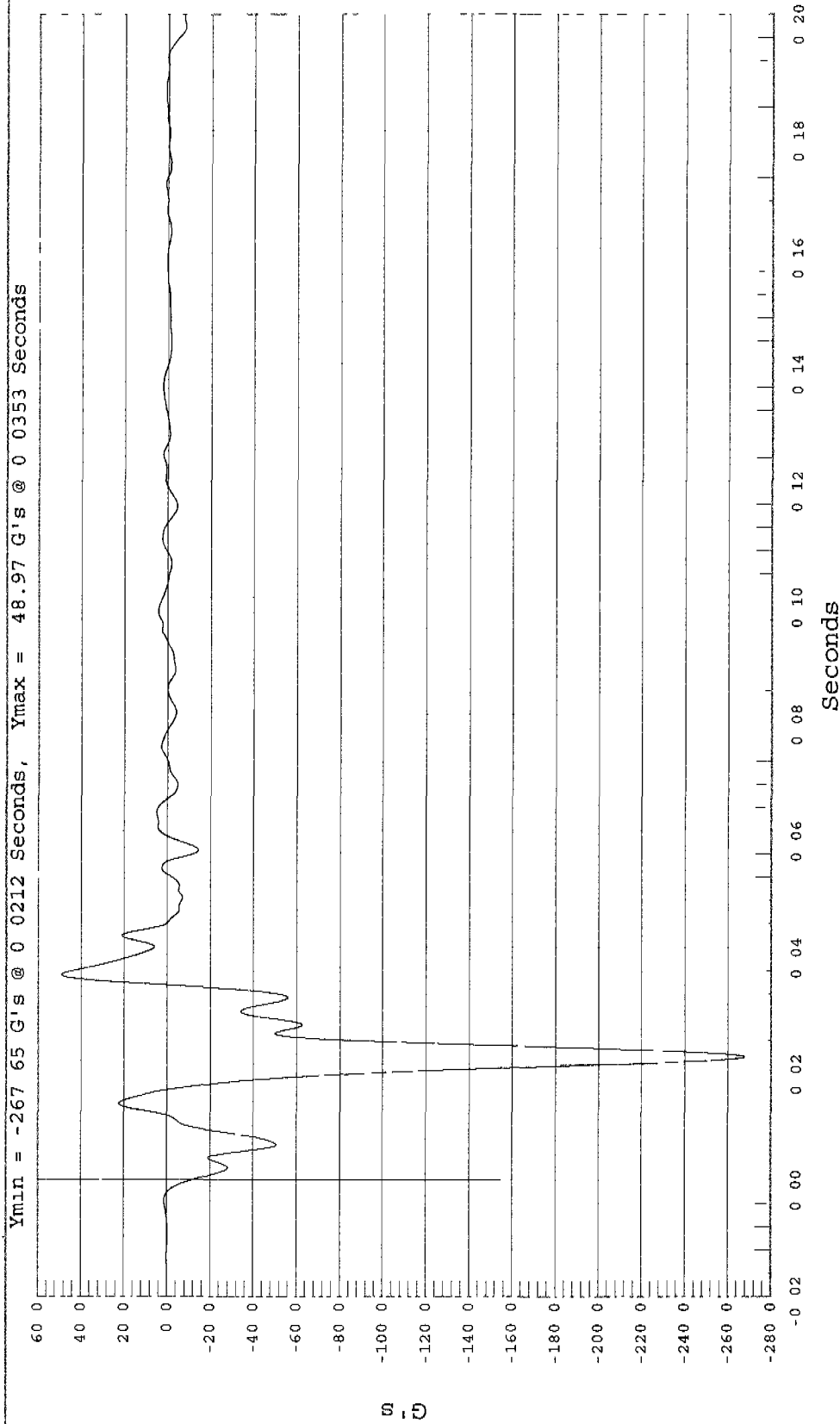


LEFT FRONT FRAME RAIL BEHIND SHOCK BRACE X ACCELERATION

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56 2 KPH
Filter Class: 60

1 LEFT FRONT FRAME RAIL BEHIND SHOCK, B01028AF A26

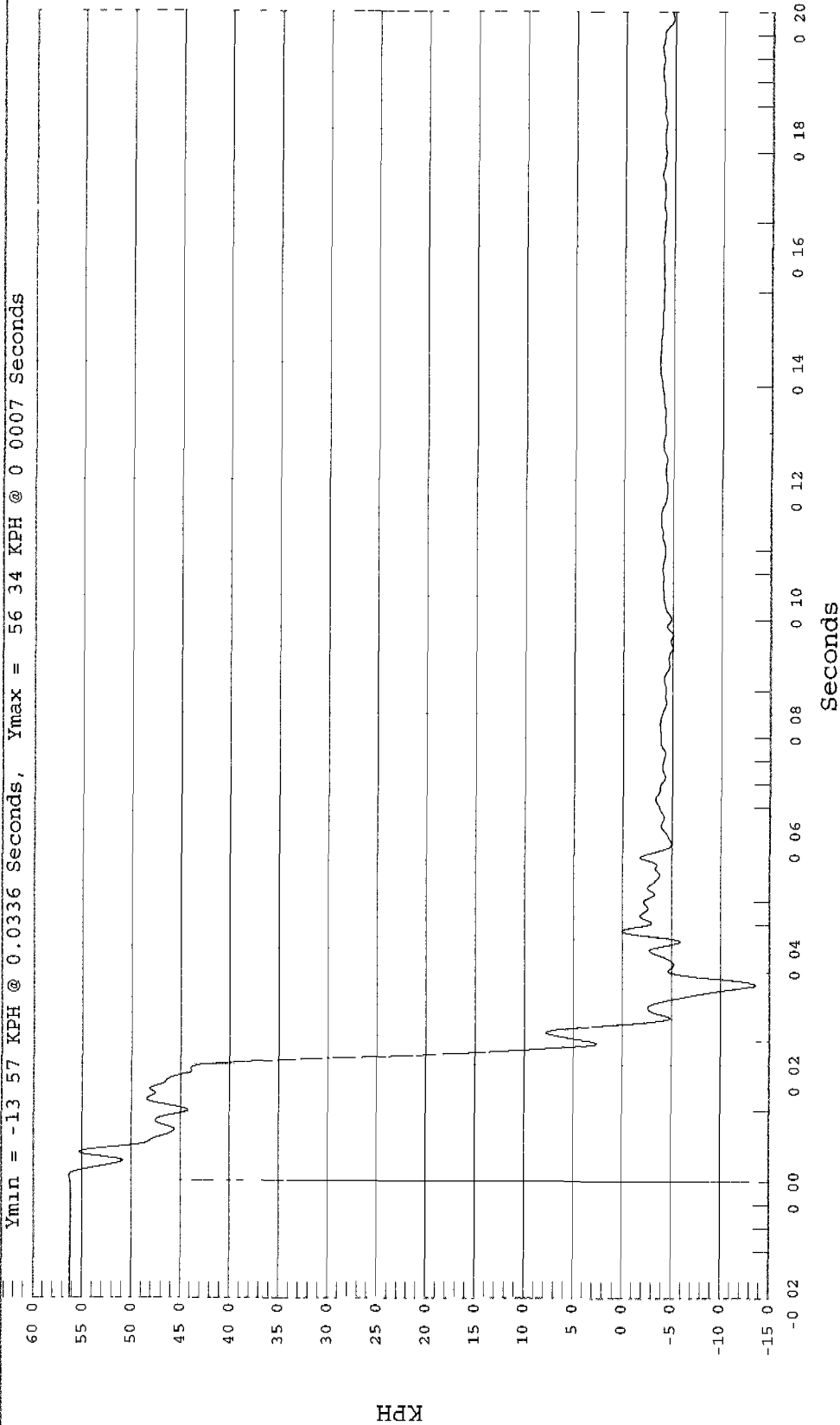


LEFT FRONT FRAME RAIL BEHIND SHOCK BRACE X VELOCITY

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Filter Class: 180

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH

1 LEFT FRAME RAIL BEHIND SHOCK BRACE X VELOCITY, B01028AI.V26

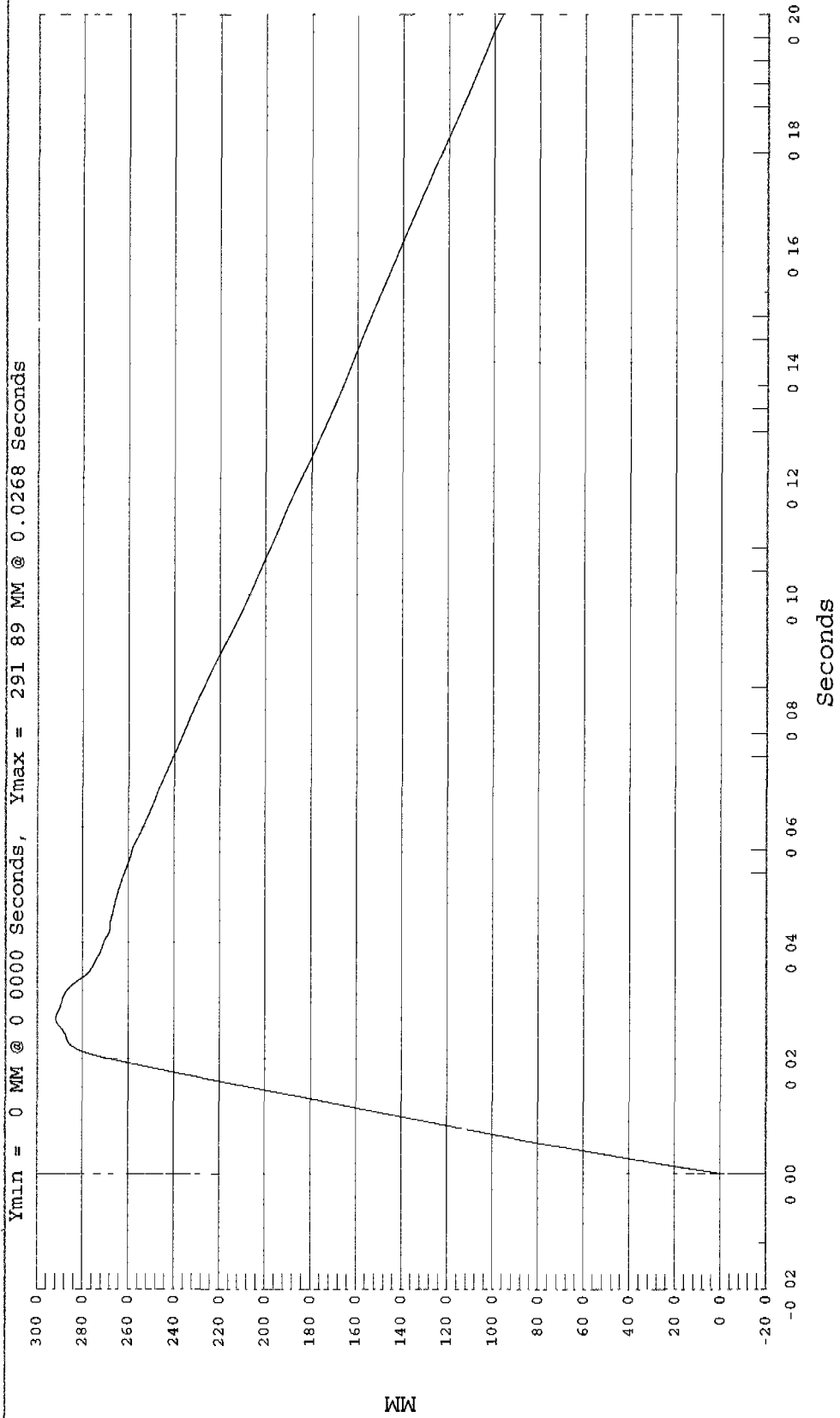


LEFT FRONT FRAME RAIL BEHIND SHOCK BRACE X DISPLACEMENT

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 LEFT FRAME RAIL BEHIND SHOCK BRACE X DISPLACEMENT, B01028AI.D26



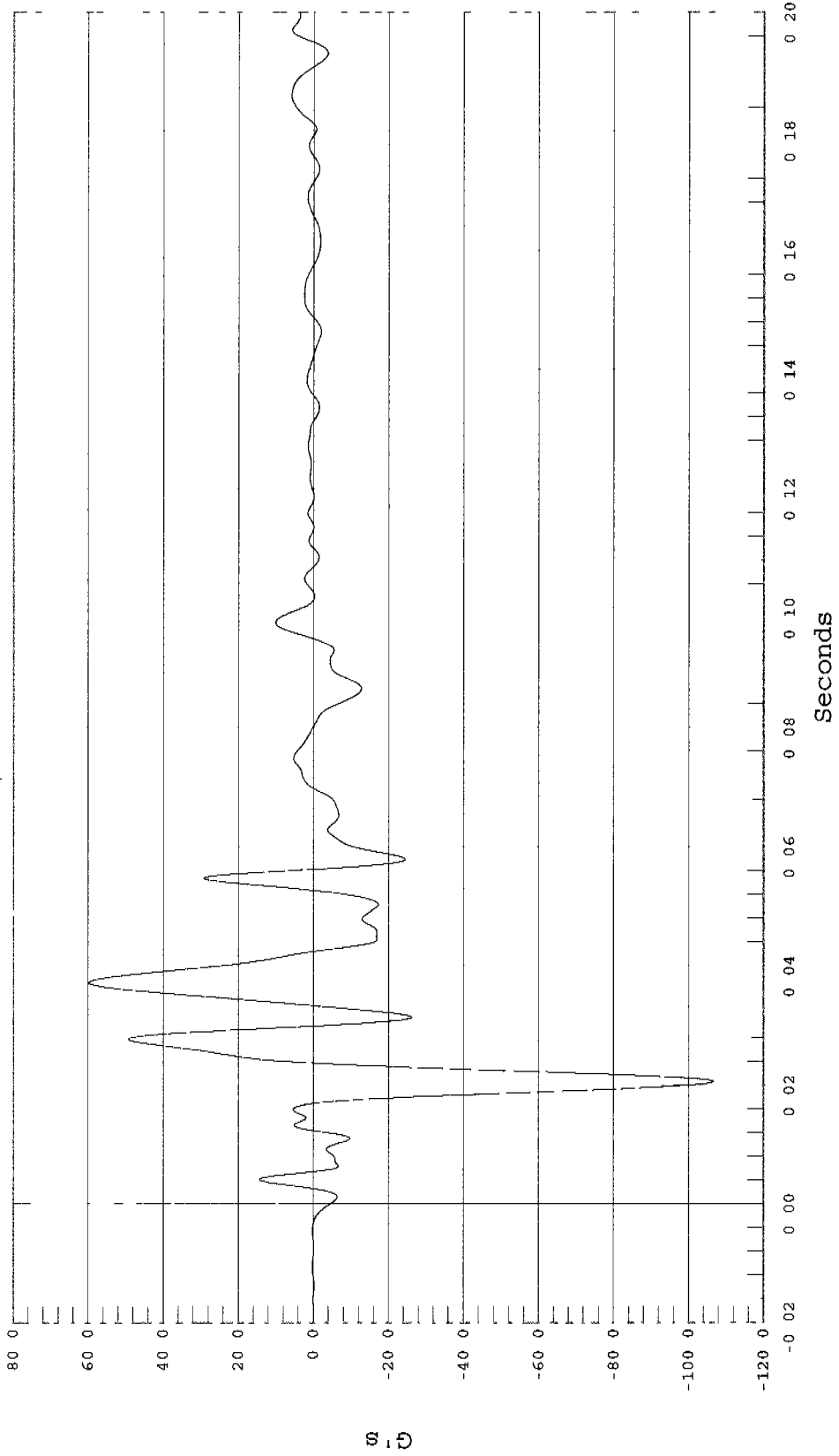


LEFT FRONT FRAME RAIL BEHIND SHOCK BRACE Z ACCELERATION

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info.
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60

1 LEFT FRONT FRAME RAIL BEHIND SHOCK, B01028AF.A27

Ymin = -106.64 G's @ 0.0205 Seconds, Ymax = 59.74 G's @ 0.0371 Seconds



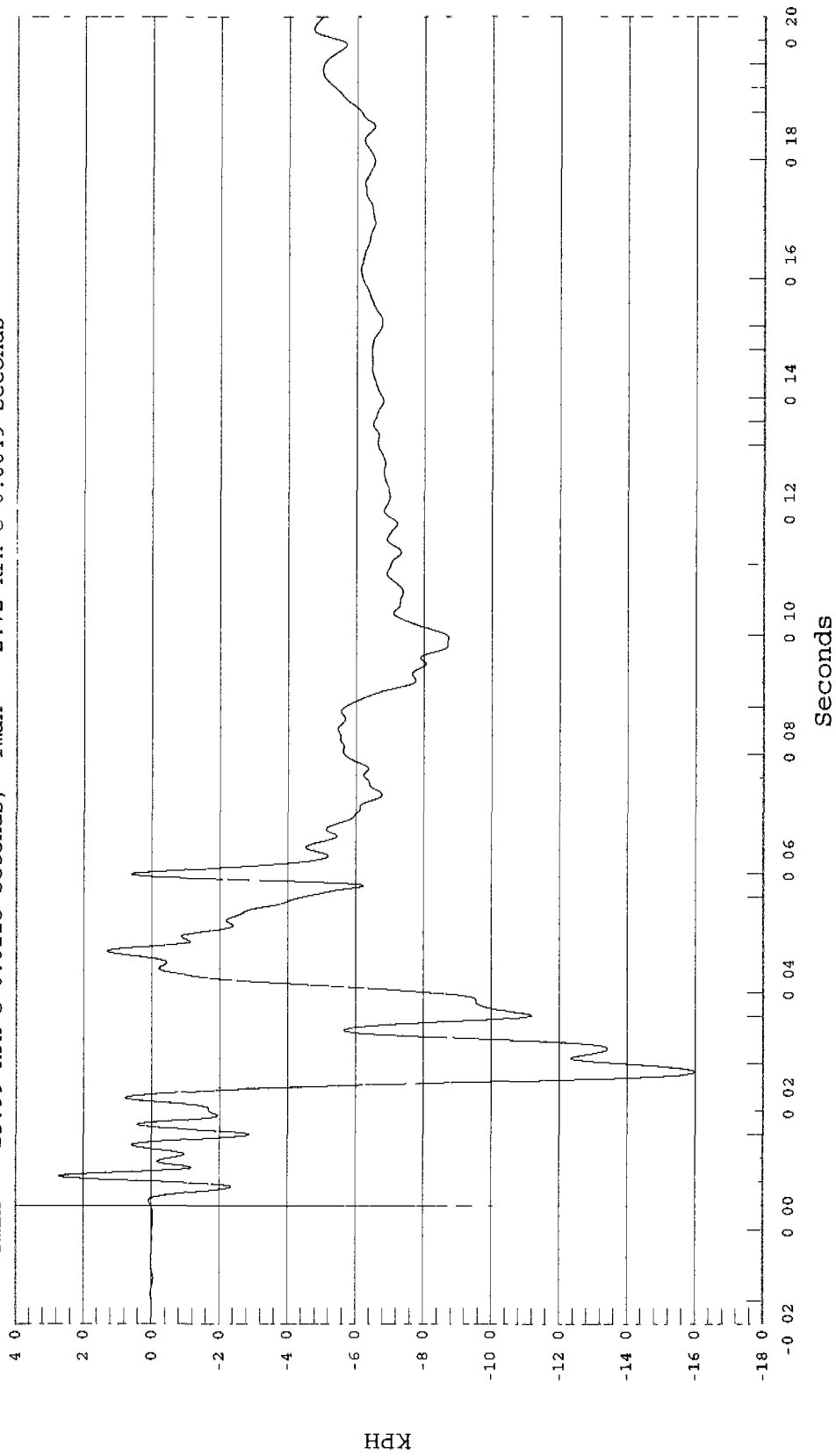
LEFT FRONT FRAME RAIL BEHIND SHOCK BRACE Z VELOCITY

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56 2 KPH
Filter Class: 180



1 LEFT FRONT FRAME RAIL BEHIND SHOCK BRACE Z VELOCITY, B01028AI.V27

Ymin = -15.99 KPH @ 0.0225 Seconds, Ymax = 2.72 KPH @ 0.0049 Seconds



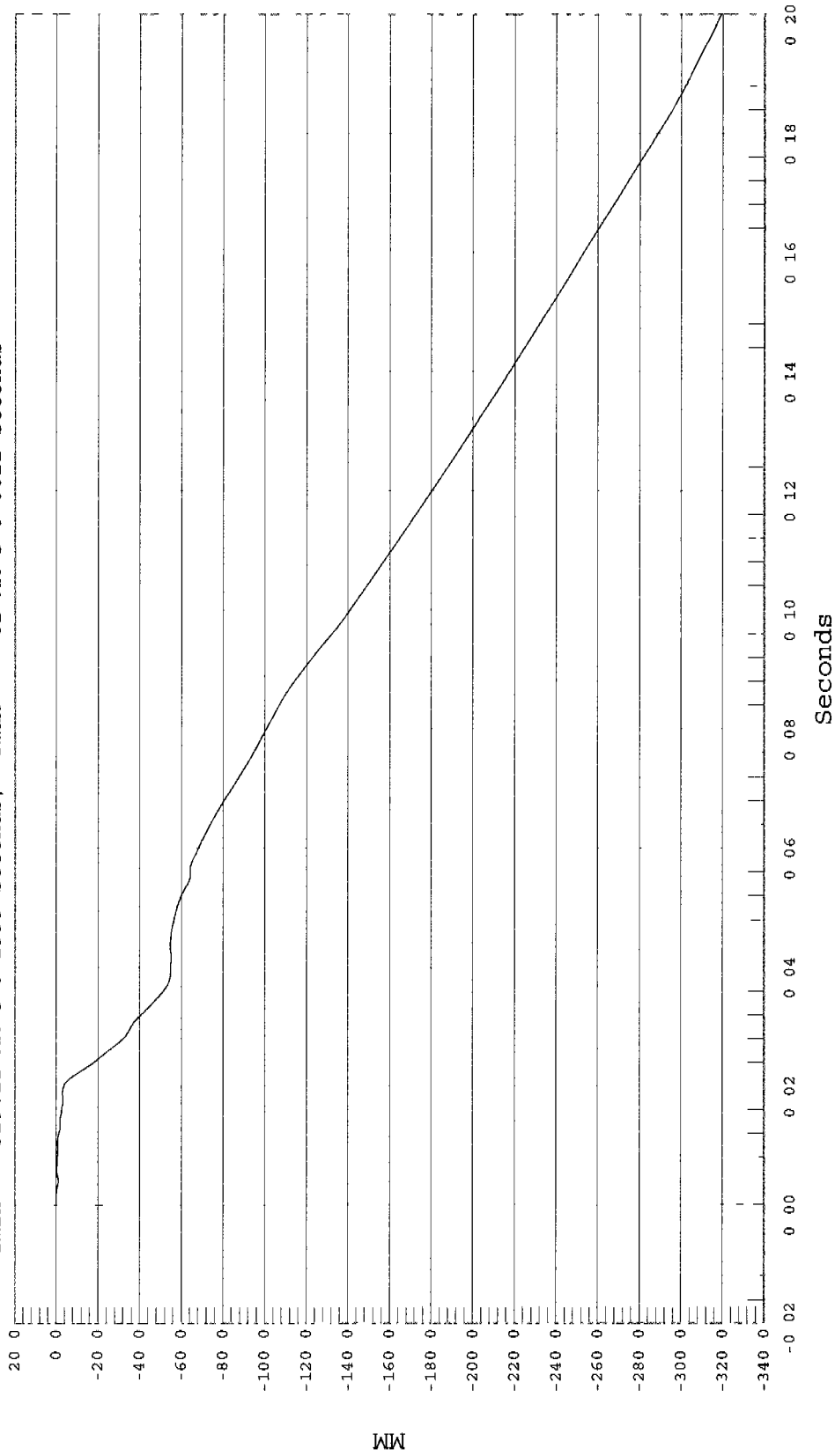
LEFT FRONT FRAME RAIL BEHIND SHOCK BRACE Z DISPLACEMENT

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

1 LEFT FRONT FRAME RAIL BEHIND SHOCK BRACE Z DISPLACEMENT, B01028AI D27



Ymin = -319.21 MM @ 0.1999 Seconds, Ymax = 02 MM @ 0.0012 Seconds



RIGHT FRONT FRAME RAIL BEHIND SHOCK BRACE X ACCELERATION

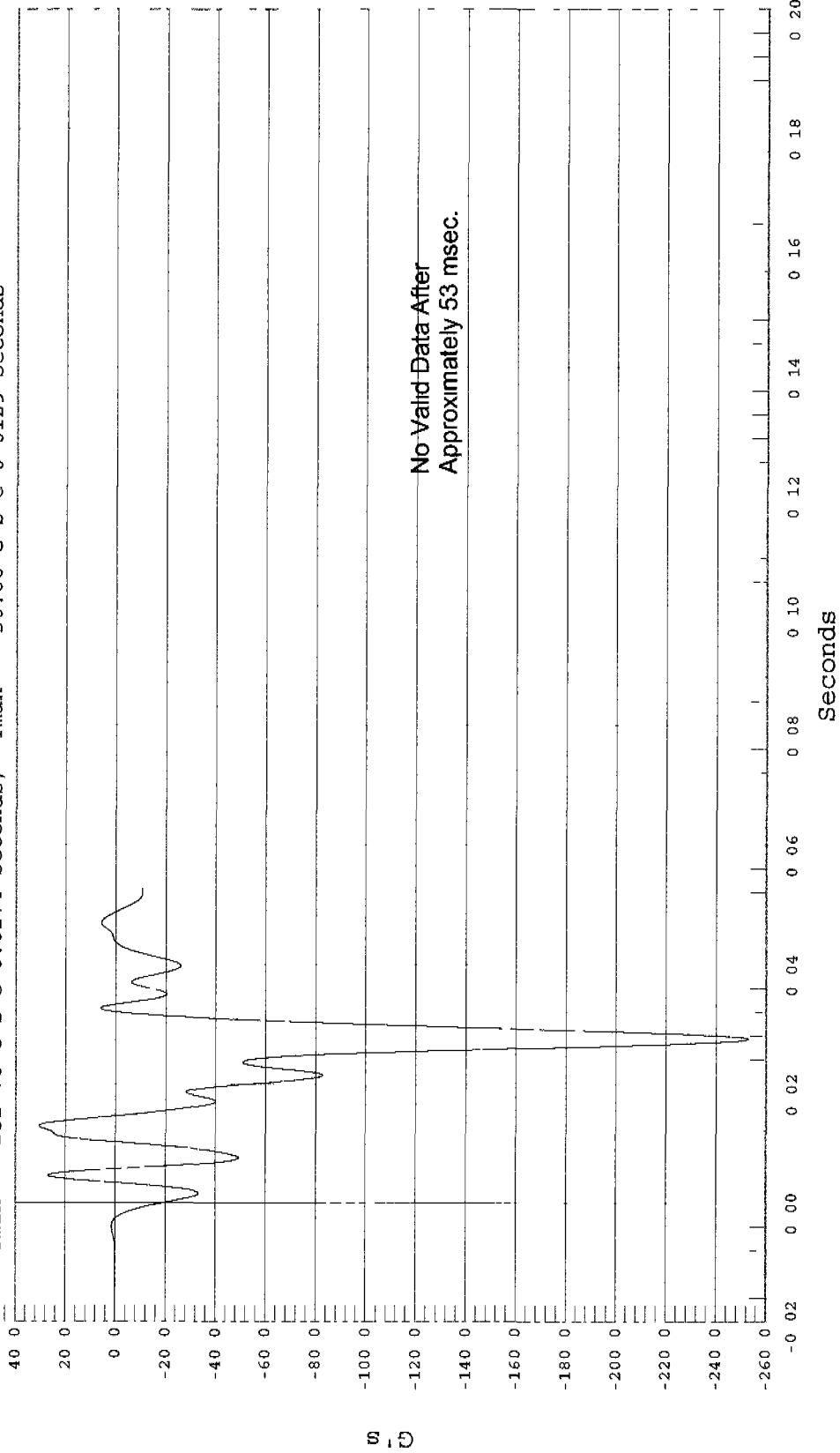
Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60



1 RIGHT FRONT FRAME RAIL BEHIND SHOC, B01028AF.A28

Ymin = -252 78 G's @ 0.0274 Seconds, Ymax = 30.66 G's @ 0 0129 Seconds

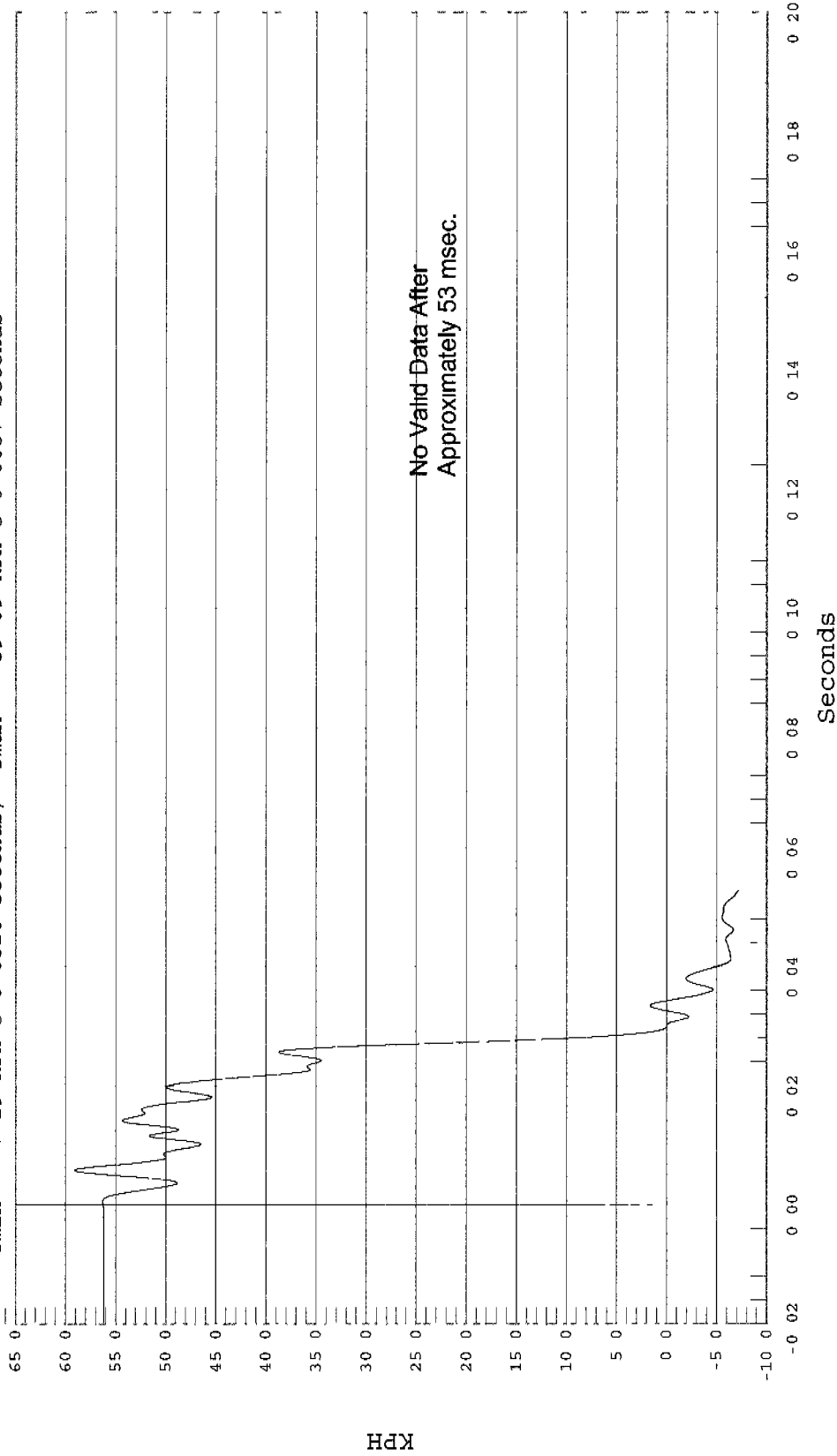


RIGHT FRONT FRAME RAIL BEHIND SHOCK BRACE X VELOCITY

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

1 RIGHT FRAME RAIL BEHIND SHOCK BRACE X VELOCITY, B01028AI V28

Ymin = -7.19 KPH @ 0.0526 Seconds, Ymax = 59.09 KPH @ 0.0057 Seconds



RIGHT FRONT FRAME RAIL BEHIND SHOCK BRACE X DISPLACEMENT

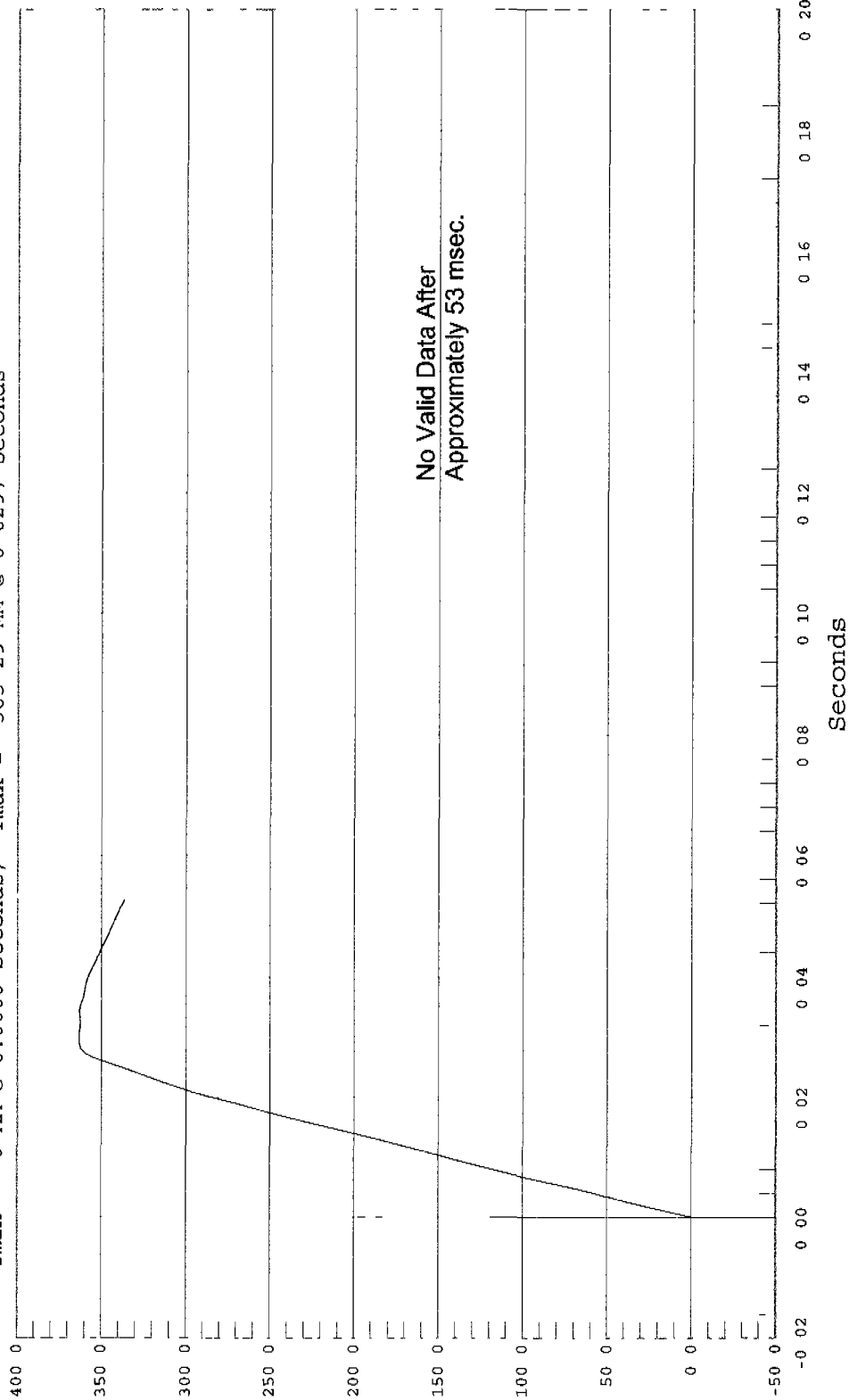
Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

1 RIGHT FRAME RAIL BEHIND SHOCK BRACE X DISPLACEMENT, B01028AI D28



Ymin = 0 MM @ 0.0000 Seconds, Ymax = 363.29 MM @ 0.0297 Seconds



MM

Seconds

RIGHT FRONT FRAME RAIL BEHIND SHOCK BRACE Z ACCELERATION

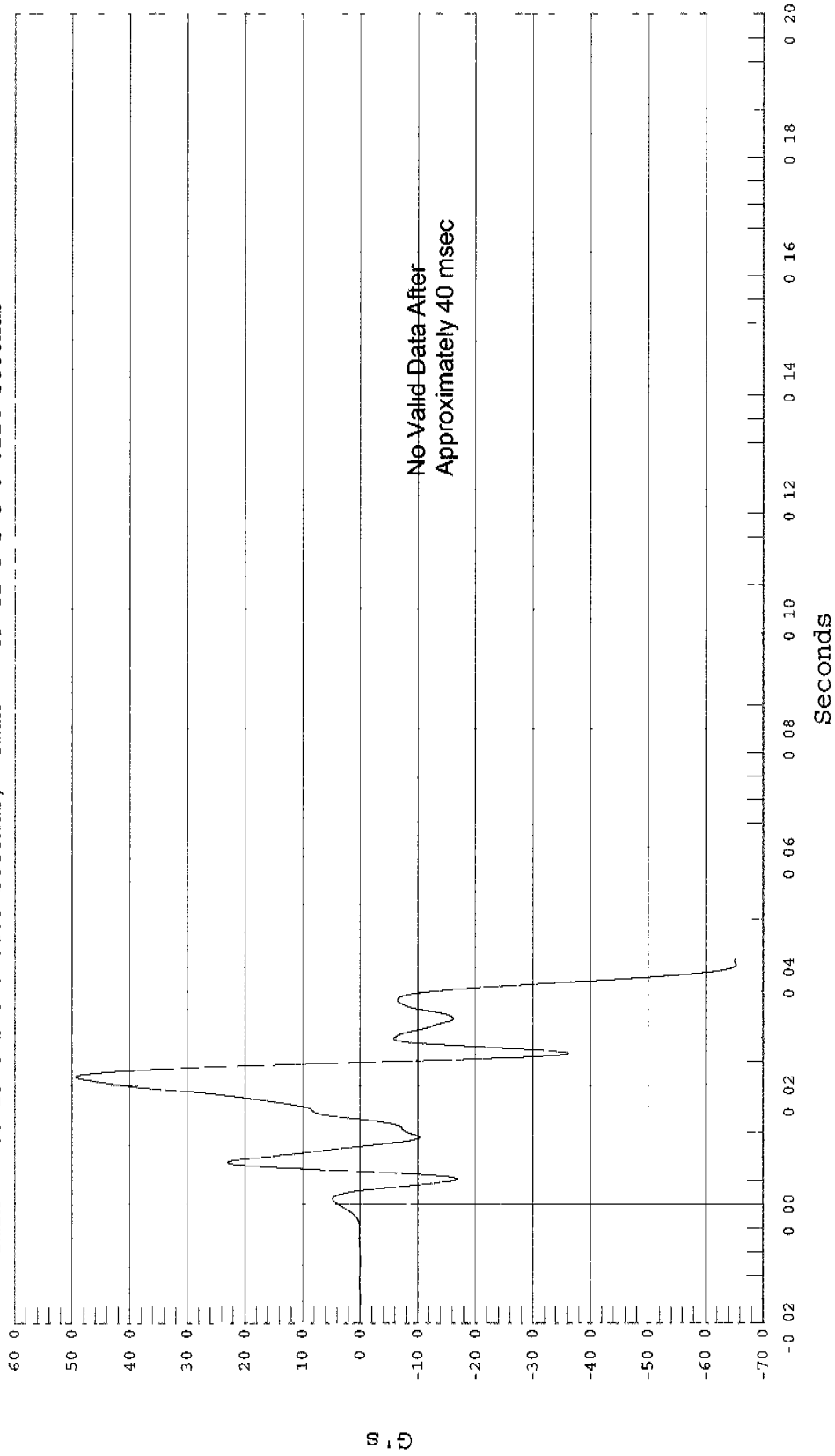
Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed 34.9 MPH, 56.2 KPH
Filter Class: 60

1 RIGHT FRONT FRAME RAIL BEHIND SHOC, B01028AF A29



Ymin = -65.29 G's @ 0.0403 Seconds, Ymax = 49.41 G's @ 0.0214 Seconds



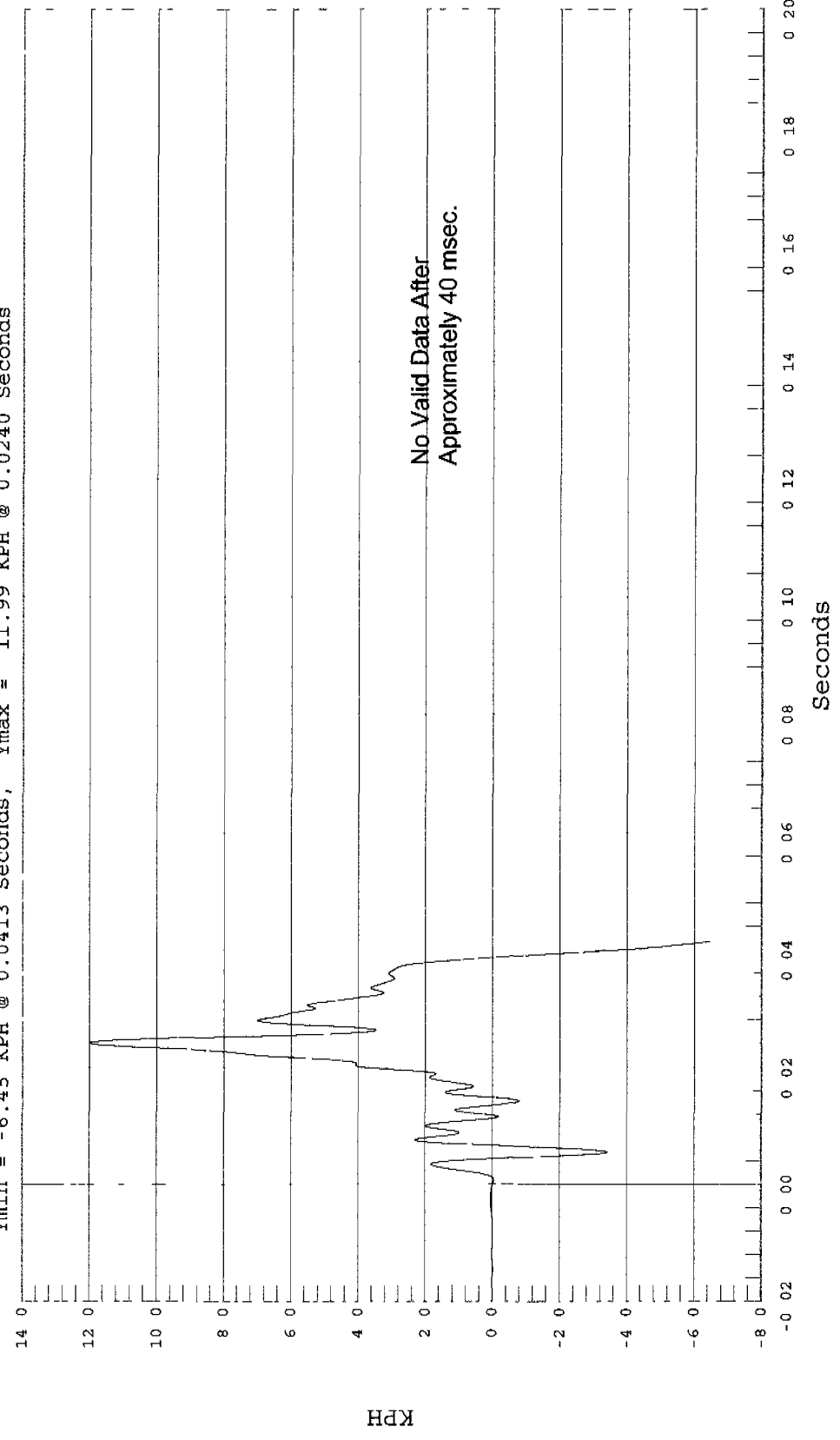
RIGHT FRONT FRAME RAIL BEHIND SHOCK BRACE Z VELOCITY

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Filter Class: 180
Speed: 34.9 MPH, 56.2 KPH
Test Date: 03-08-01



1 RIGHT FRAME RAIL BEHIND SHOCK BRACE Z VELOCITY, B01028AI.V29

Ymin = -6.45 KPH @ 0.0413 Seconds, Ymax = 11.99 KPH @ 0.0240 Seconds



RIGHT FRONT FRAME RAIL BEHIND SHOCK BRACE Z DISPLACEMENT

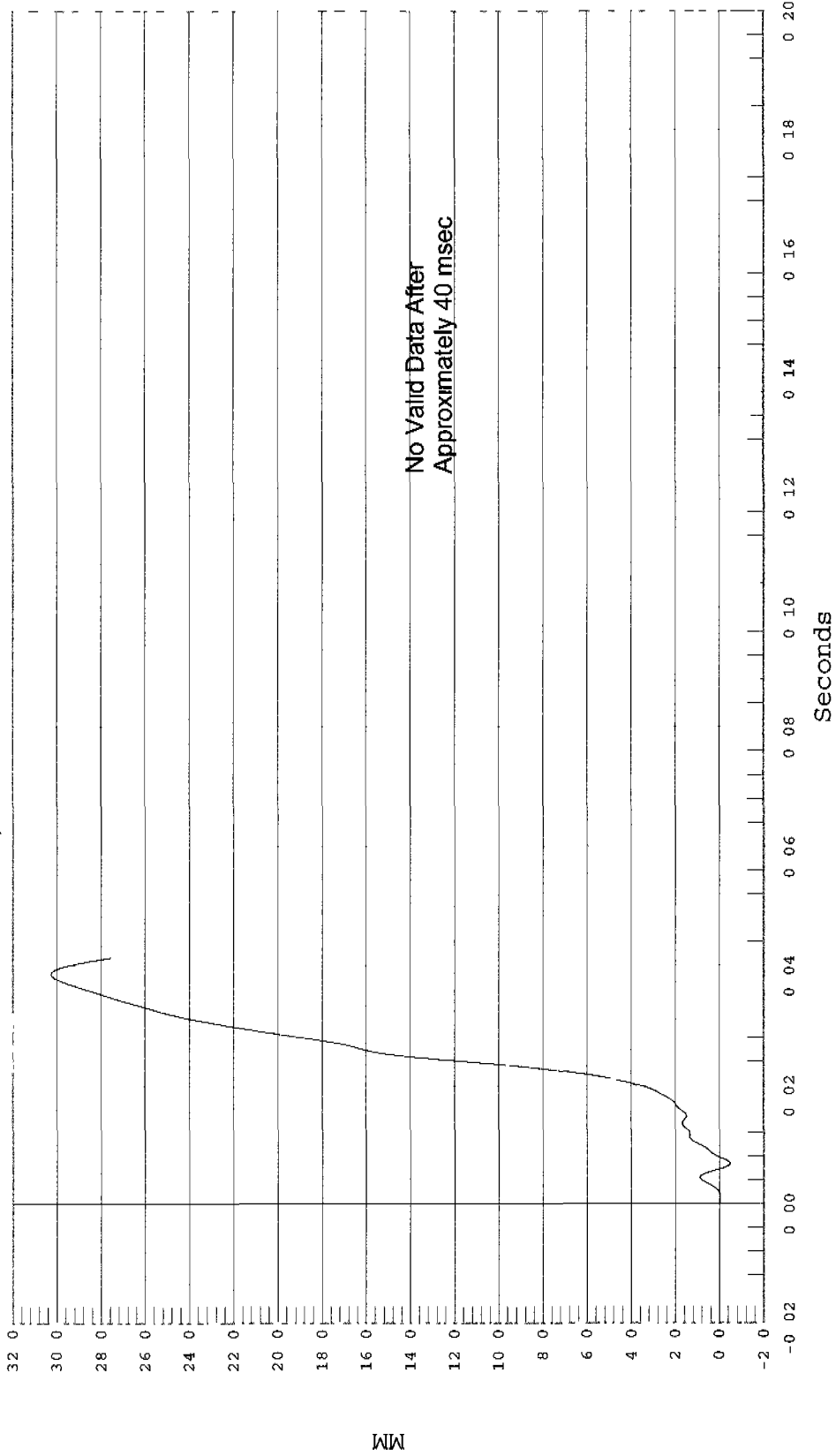
Test Desc . 35 MPH FRONTAL BARRIER IMEACT
Component. 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info.

Test Date 03-08-01
Speed. 34 9 MPH, 56 2 KPH
Filter Class. 180

1 RIGHT FRAME RAIL BEHIND SHOCK BRACE Z DISPLACEMENT, B01028AI D29



Ymin = - 47 MM @ 0 0066 Seconds, Ymax = 30 26 MM @ 0 0385 Seconds



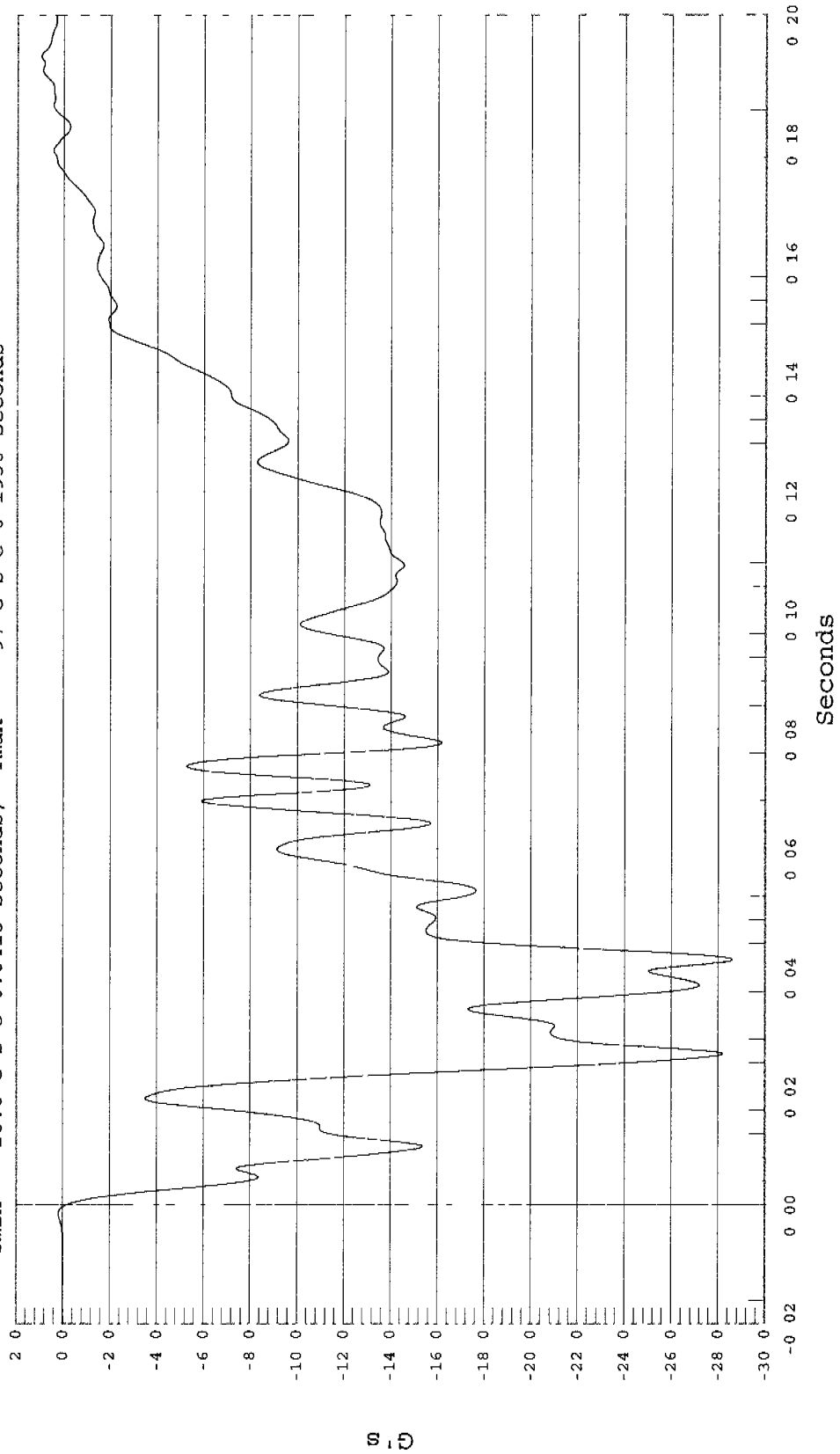
REAR COMPARTMENT CENTER X ACCELERATION

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60



1 REAR COMPARTMENT CENTER X, B01028AF A33

Ymin = -28.6 G's @ 0.0413 Seconds, Ymax = 97 G's @ 0.1930 Seconds

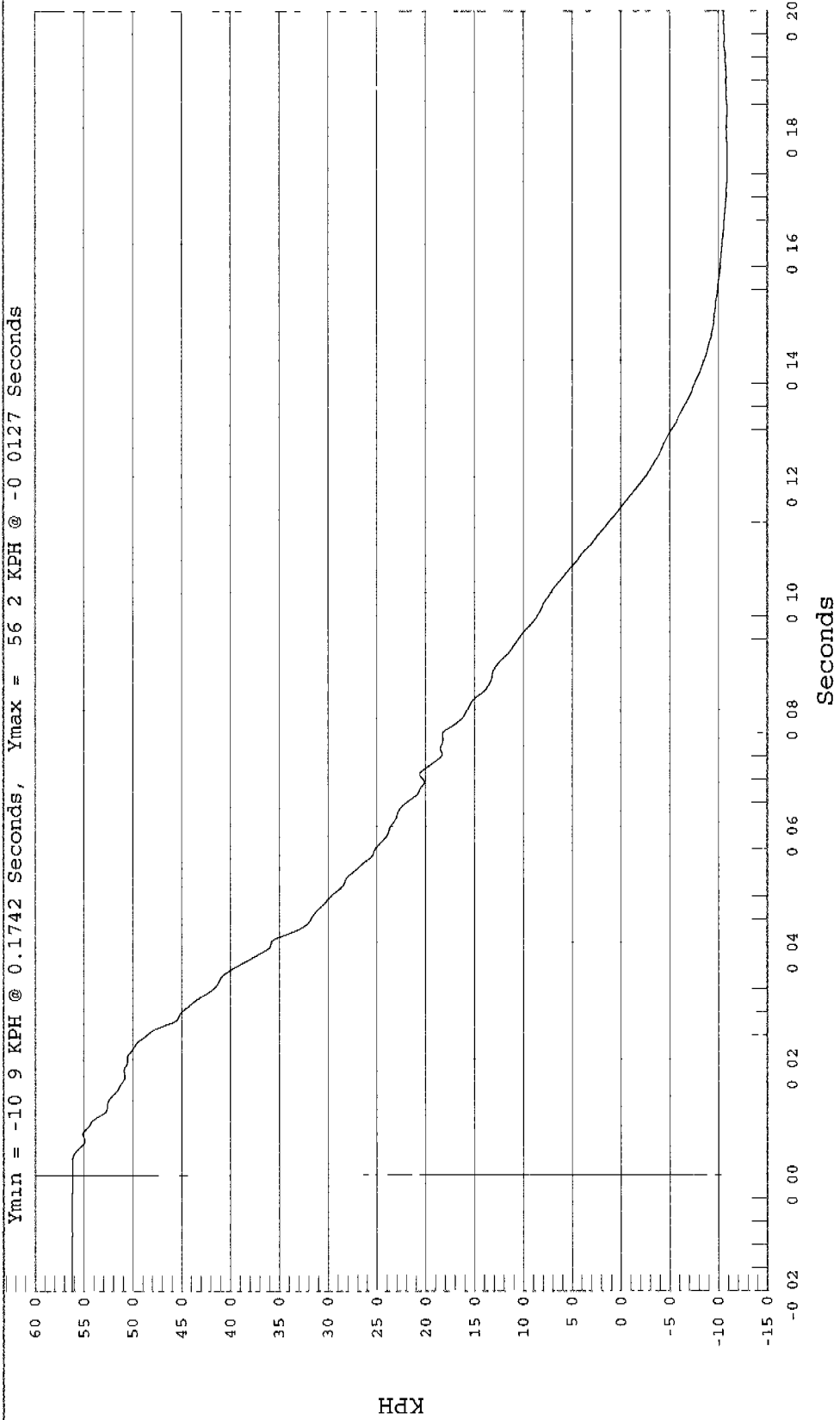


REAR COMPARTMENT CENTER X VELOCITY

Test Desc 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Filter Class: 180

Test Date: 03-08-01
Speed 34.9 MPH, 56.2 KPH

1 REAR COMPARTMENT X VELOCITY, B01028AI V33

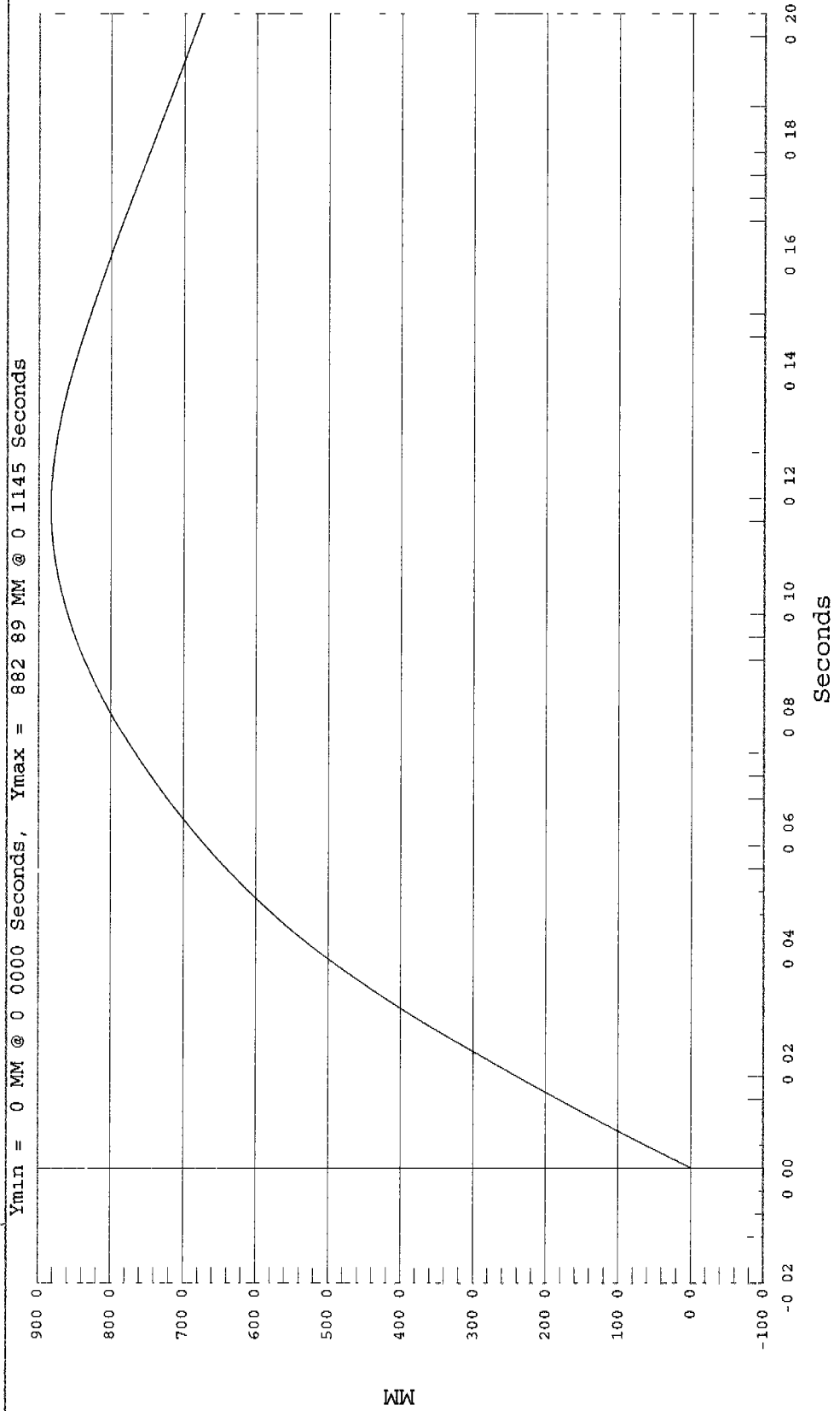


REAR COMPARTMENT CENTER X DISPLACEMENT

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56 2 KPH
Filter Class: 180



1 REAR COMPARTMENT X DISPLACEMENT, B01028AI.D33



REAR COMPARTMENT CENTER Y ACCELERATION

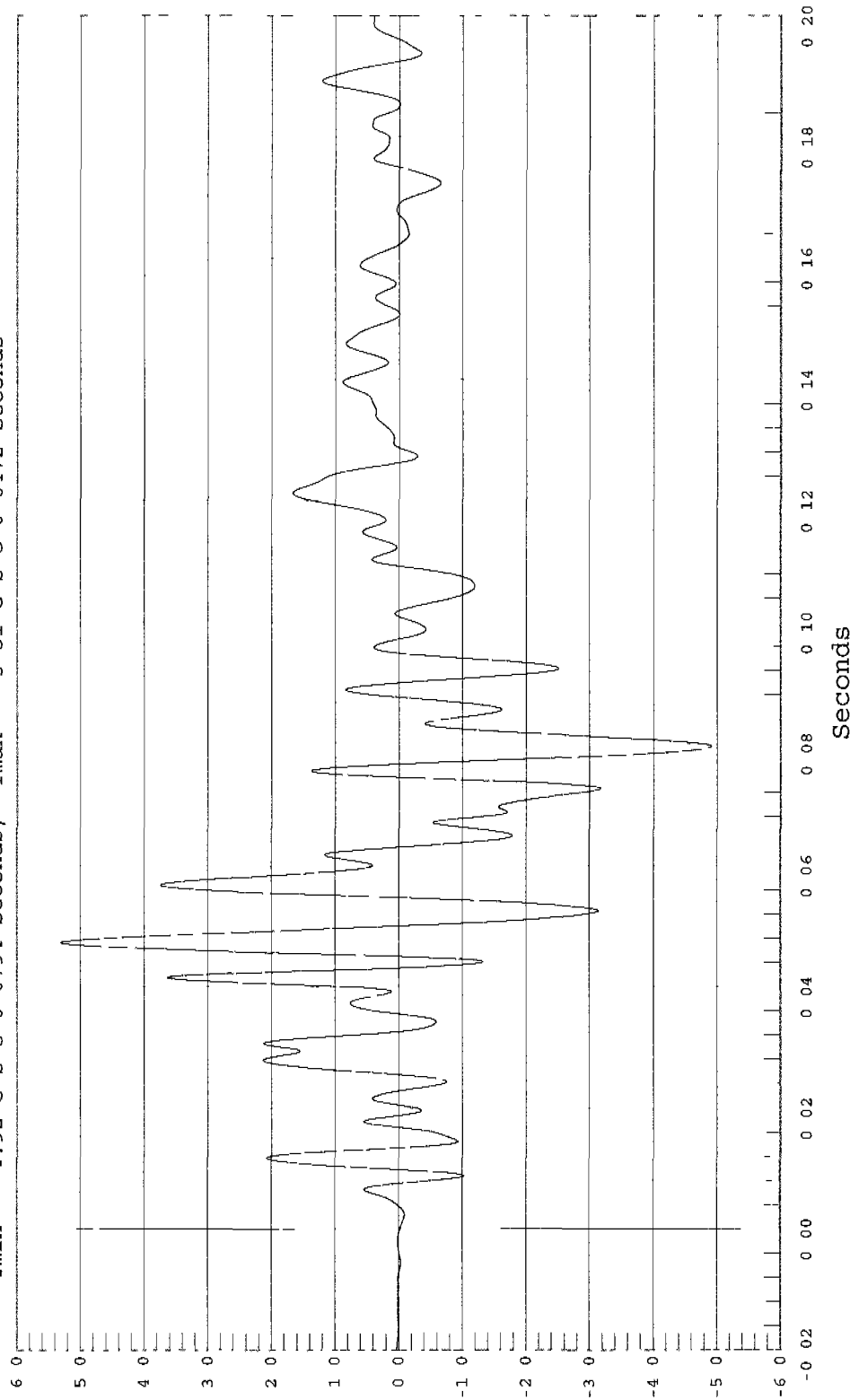
Test Desc . 35 MPH FRONTAL BARRIER IMPACT
Component 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60



1 REAR COMPARTMENT CENTER Y, B01028AF A34

Ymin = -4.92 G's @ 0.0794 Seconds, Ymax = 5.31 G's @ 0.0472 Seconds



REAR COMPARTMENT CENTER Y VELOCITY

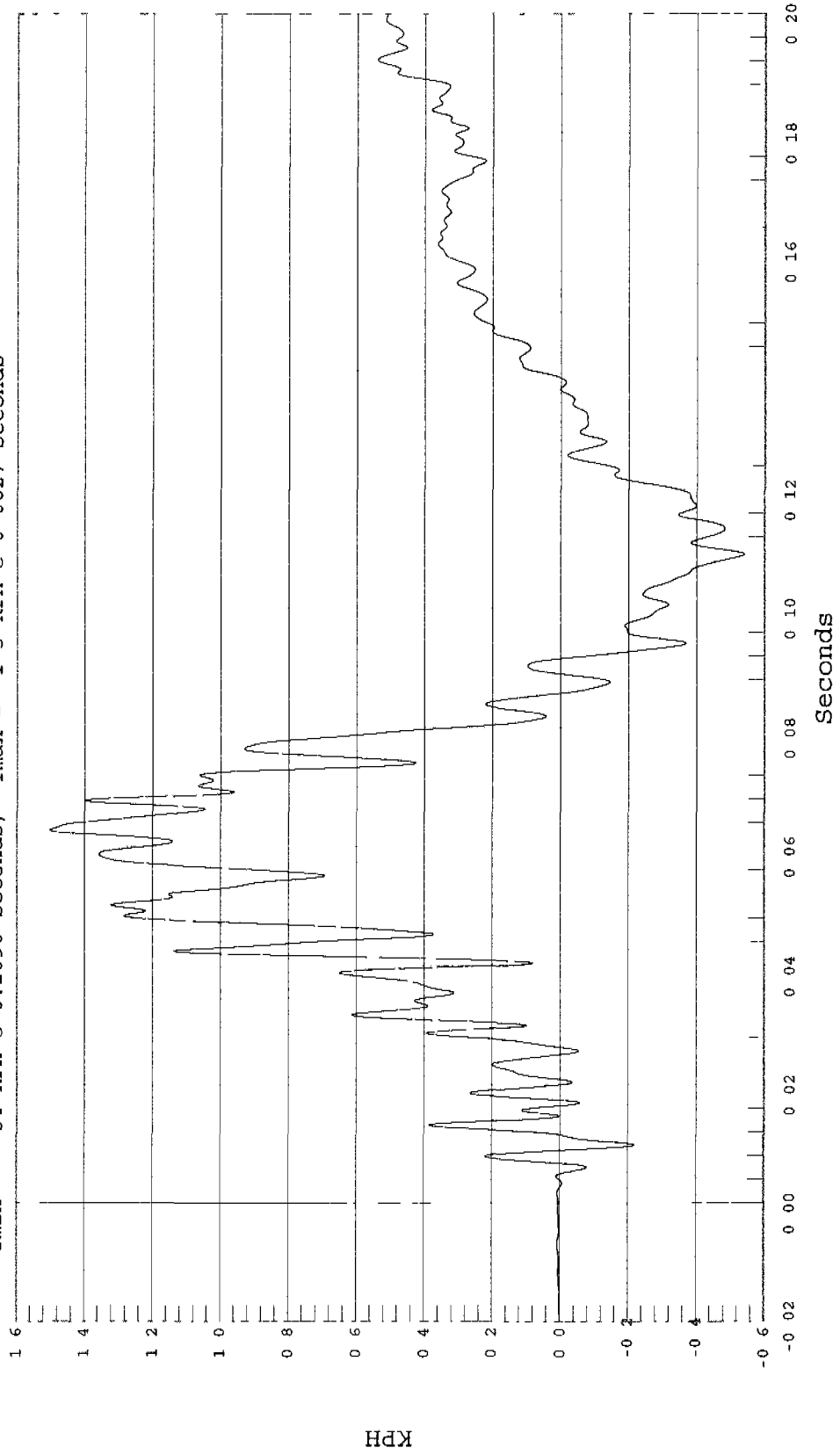
Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

1 REAR COMPARTMENT Y VELOCITY, B01028AI V34



Ymin = - 54 KPH @ 0.1090 Seconds, Ymax = 1.5 KPH @ 0.0627 Seconds



REAR COMPARTMENT CENTER Y DISPLACEMENT

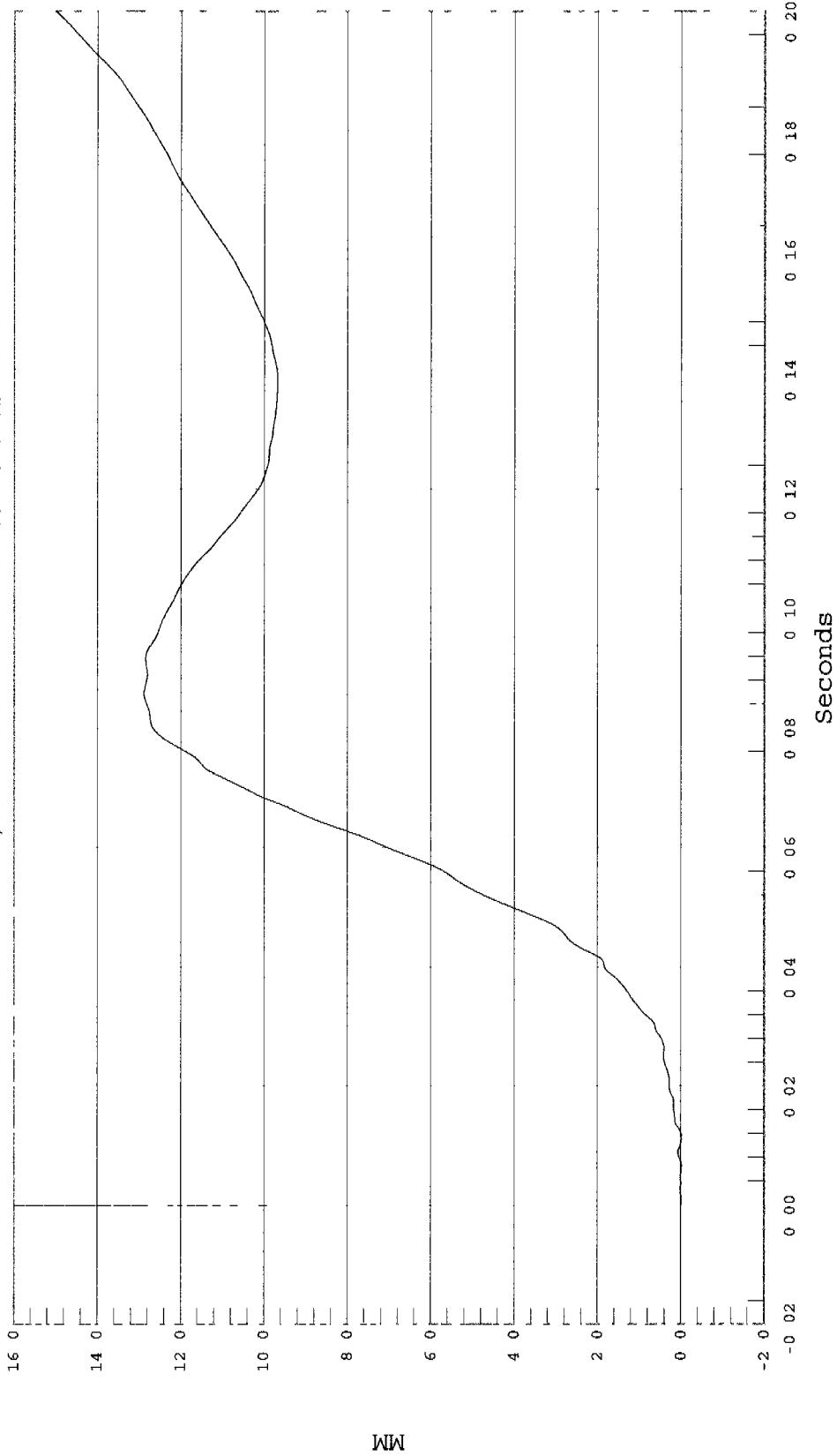
Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Filter Class: 180

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH

Other Info:
1 REAR COMPARTMENT Y DISPLACEMENT, B01028AI.D34



Ymin = -02 MM @ 0.0065 Seconds, Ymax = 15 MM @ 0.1999 Seconds



REAR COMPARTMENT CENTER Z ACCELERATION

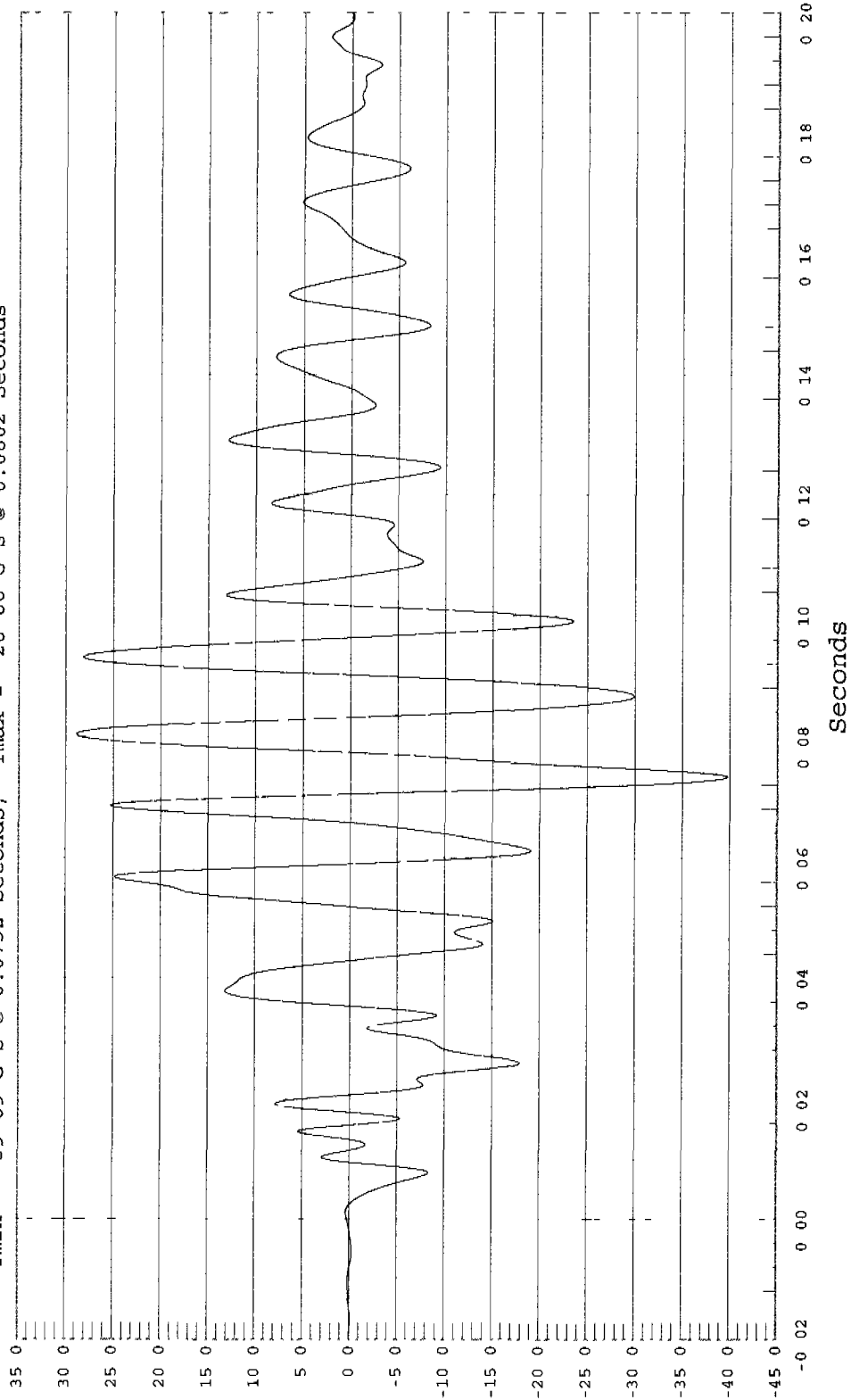
Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Filter Class: 60

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH

Other Info: 1 REAR COMPARTMENT CENTER Z, B01028AF A35



Ymin = -39.69 G's @ 0.0732 Seconds, Ymax = 28.86 G's @ 0.0802 Seconds



G's

Seconds

REAR COMPARTMENT CENTER Z VELOCITY

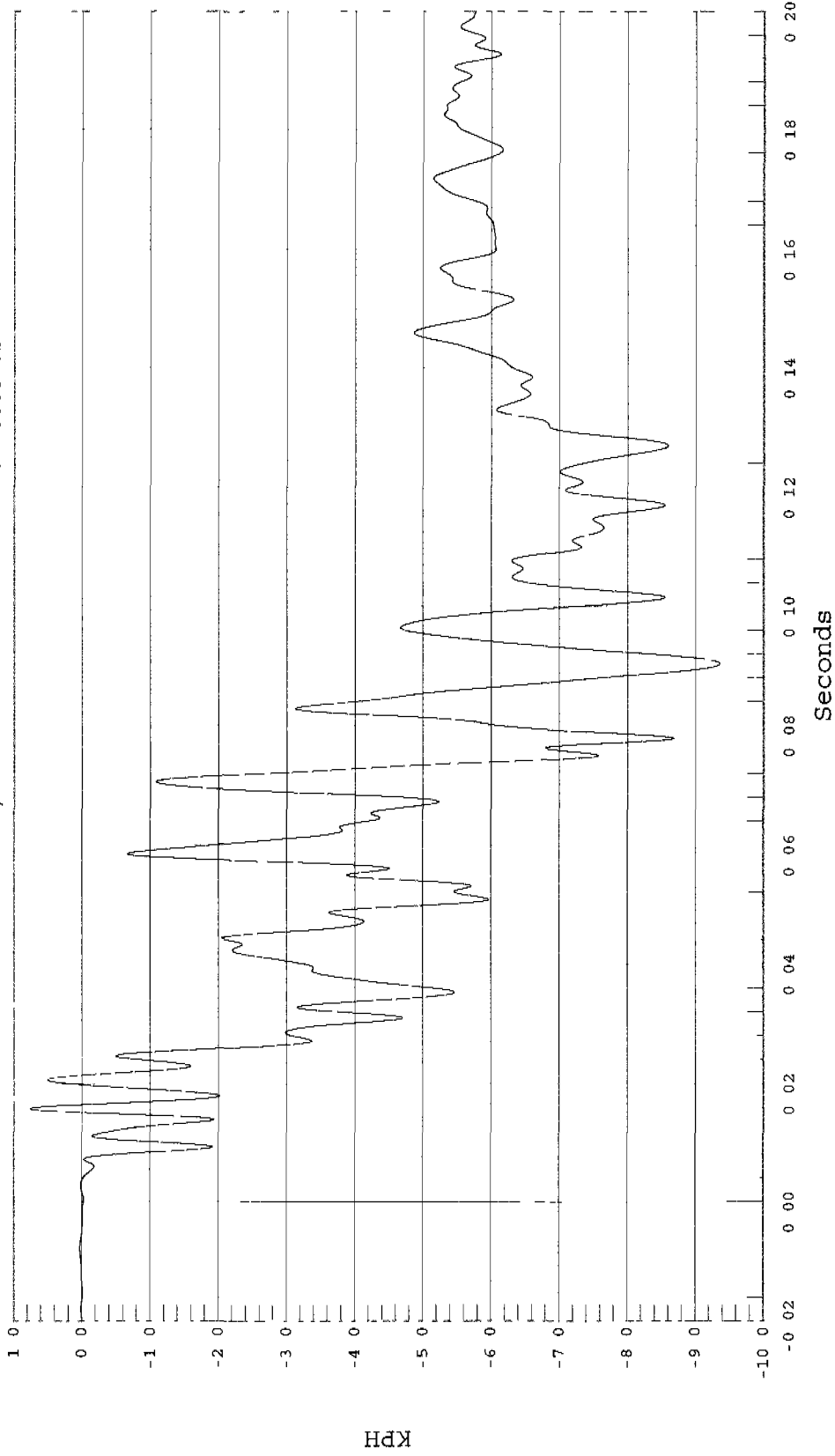
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180

Test Desc: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:



1 REAR COMPARTMENT Z VELOCITY, B01028AI V35

Ymin = -9.36 KPH @ 0.0902 Seconds, Ymax = .76 KPH @ 0.0157 Seconds



REAR COMPARTMENT CENTER Z DISPLACEMENT

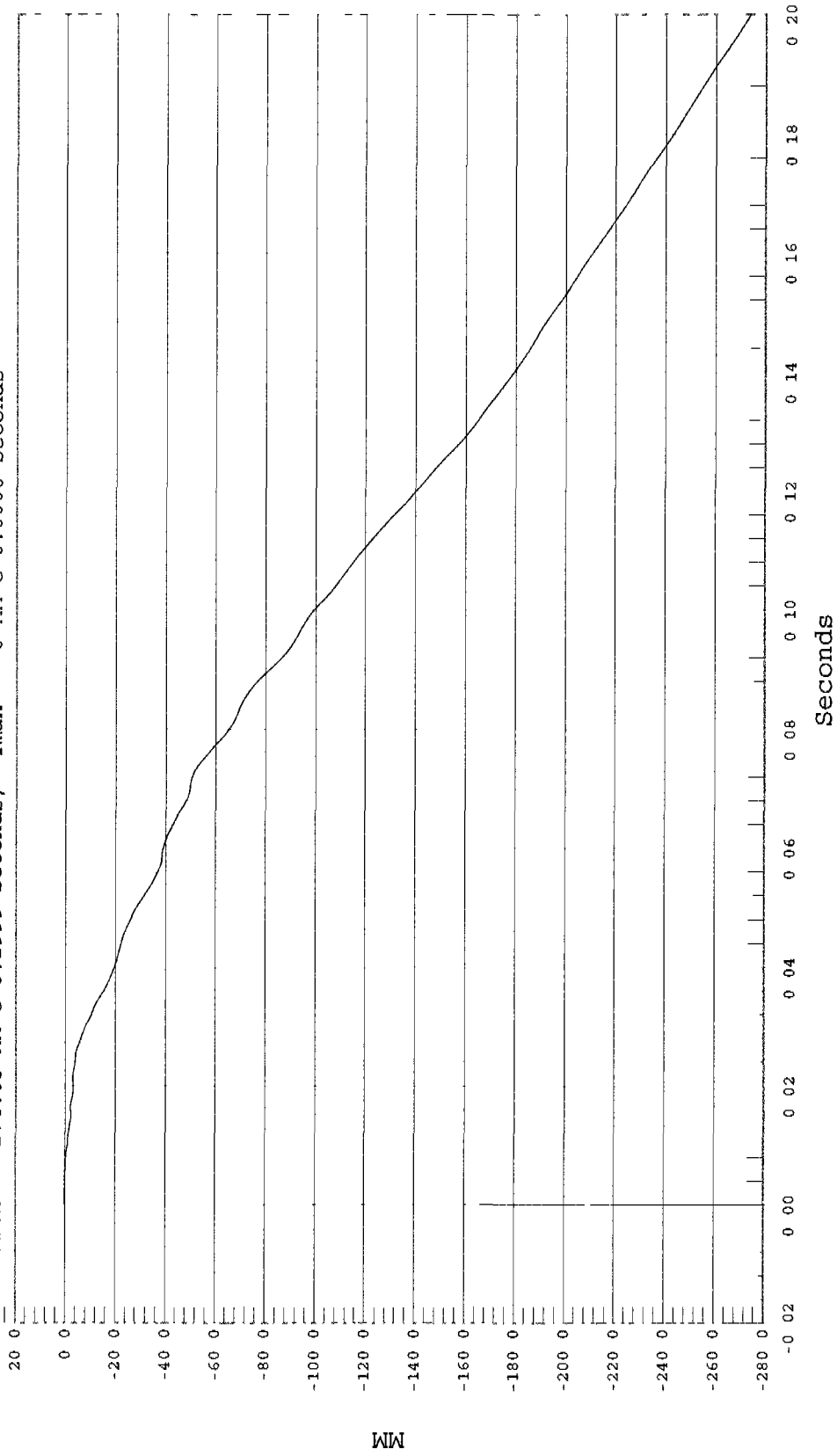
Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180



1 REAR COMPARTMENT Z DISPLACEMENT, B01028AI D35

Ymin = -274.05 MM @ 0.1999 Seconds, Ymax = 0 MM @ 0.0000 Seconds



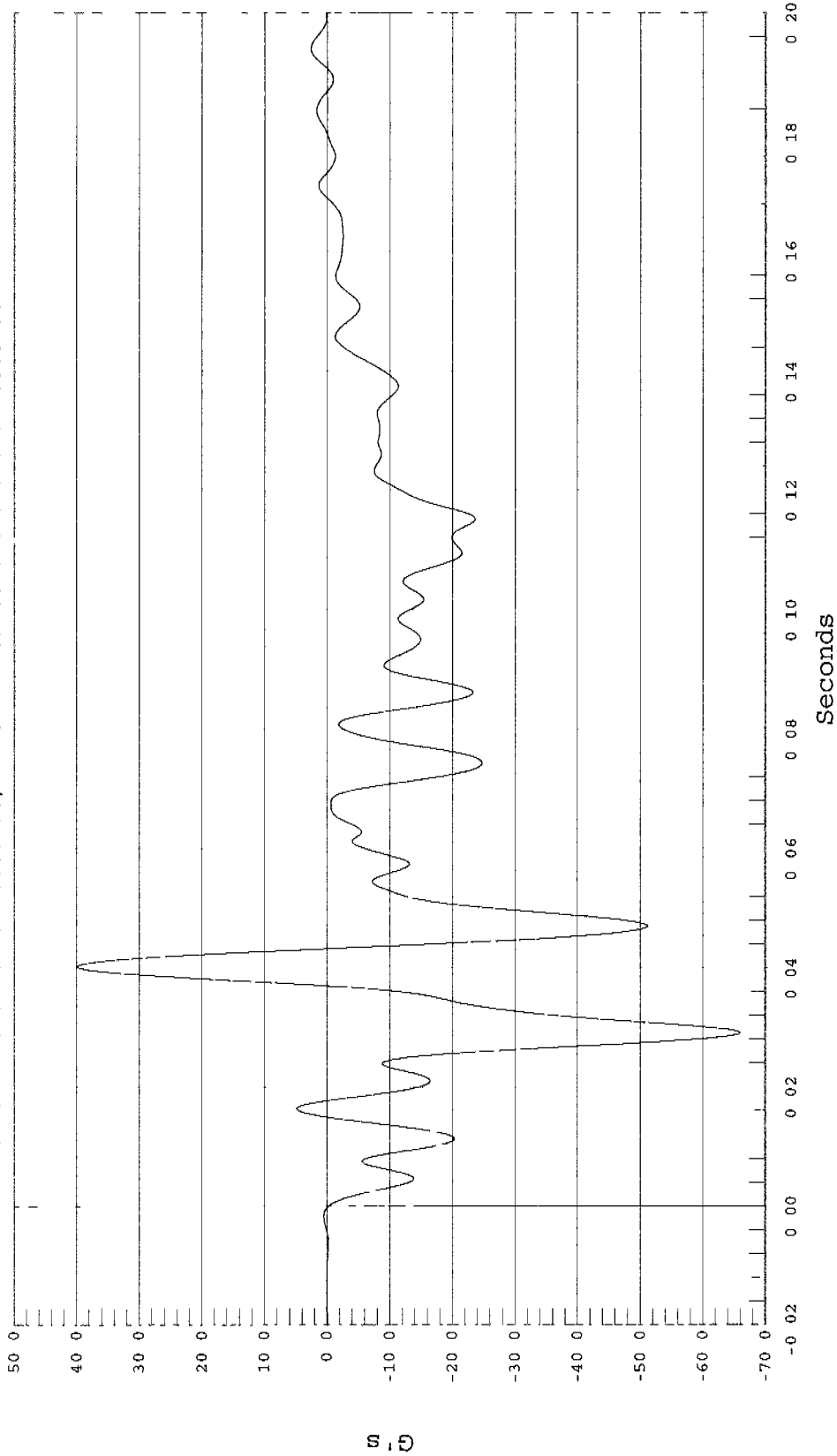


RIGHT UPPER B-PILLAR X ACCELERATION

Test Desc. 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60

1 RIGHT UPPER B-PILLAR X, B01028AF A36

Ymin = -65.97 G's @ 0.0290 Seconds, Ymax = 39.85 G's @ 0.0401 Seconds



RIGHT UPPER B-PILLAR X VELOCITY

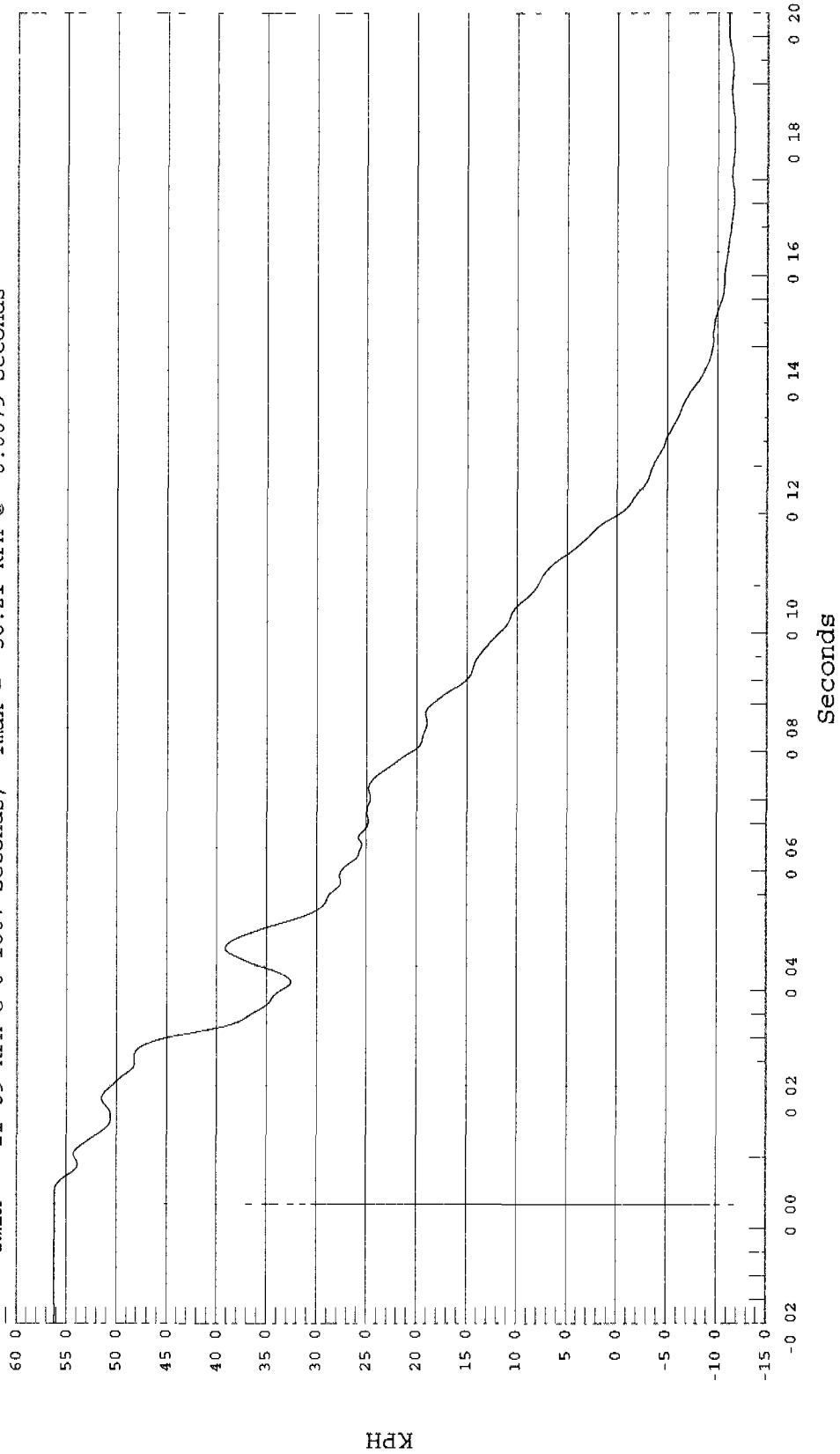
Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Filter Class: 180

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH

Other Info:
1 RIGHT UPPER B-PILLAR X VELOCITY, B01028AI V36



Ymin = -11.69 KPH @ 0.1807 Seconds, Ymax = 56.21 KPH @ -0.0079 Seconds



RIGHT UPPER B-PILLAR X DISPLACEMENT

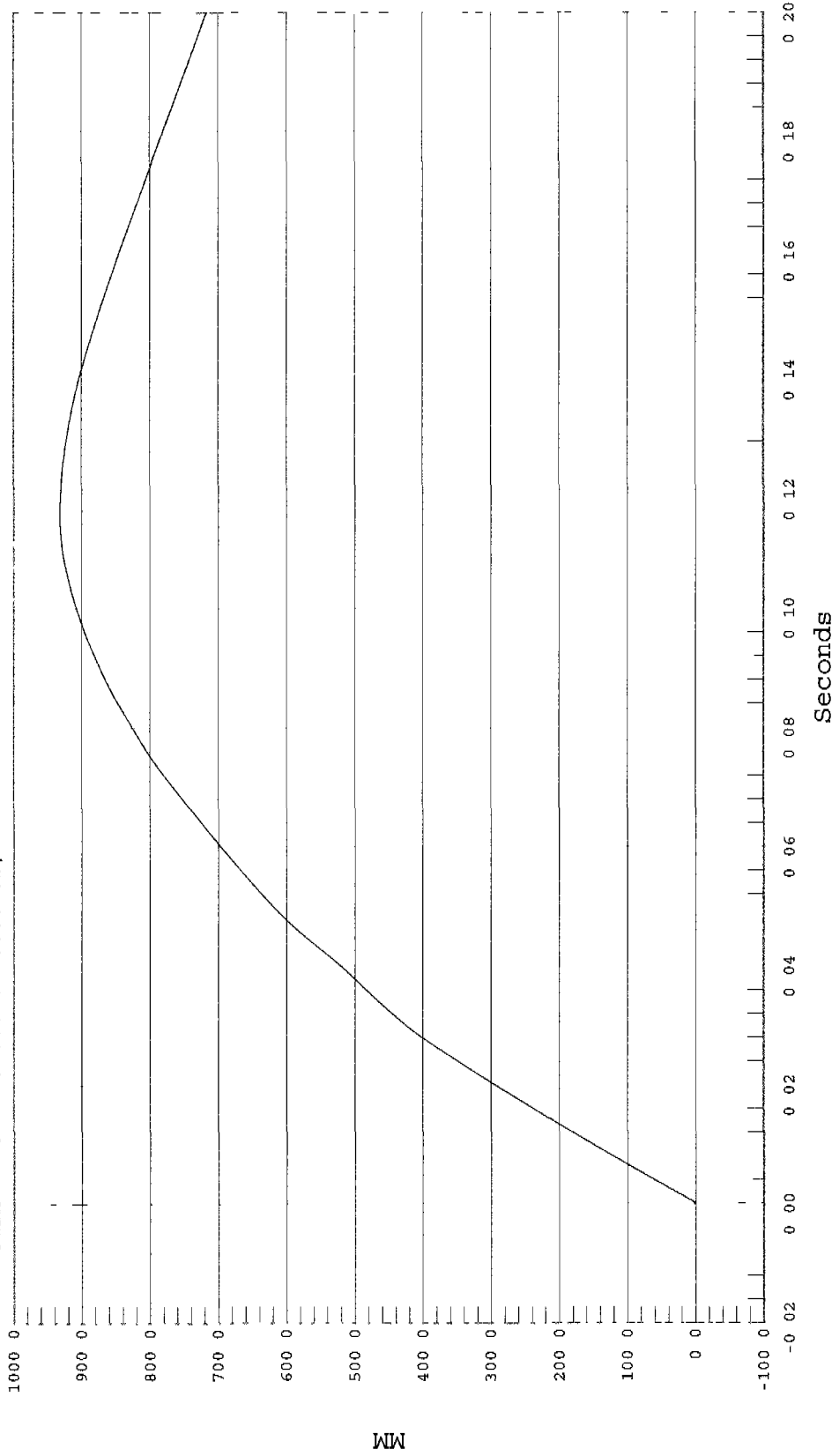
Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180



1 RIGHT UPPER B-PILLAR X DISPLACEMENT, B01028AI D36

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 932.23 MM @ 0.1156 Seconds



LEFT UPPER B-PILLAR X ACCELERATION

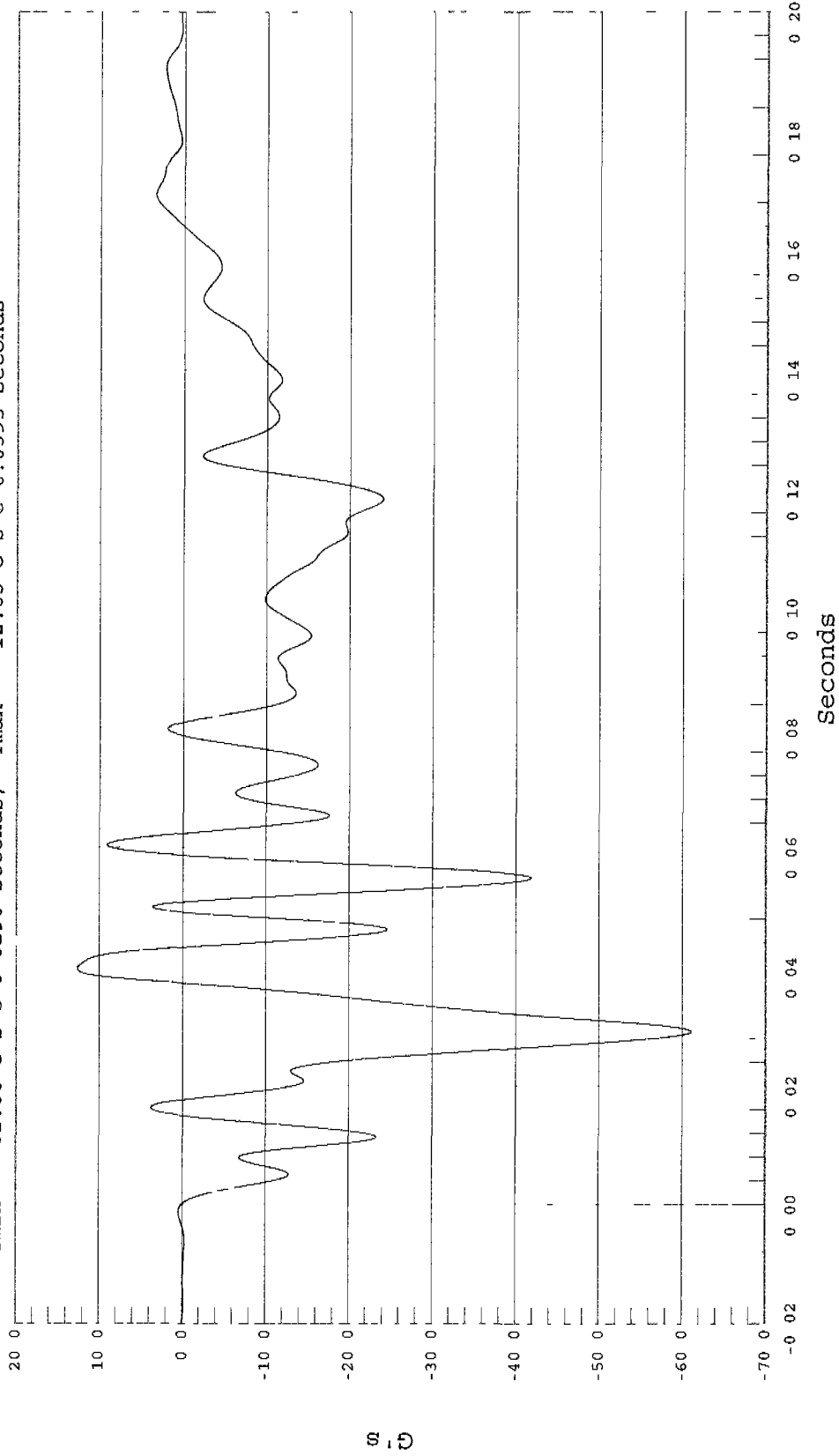
Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date: 03-08-01
Speed: 34.9 MPH, 56 2 KPH
Filter Class: 60

1 LEFT UPPER B-PILLAR X, B01028AF.A37



Ymin = -61.06 G's @ 0.0290 Seconds, Ymax = 12.63 G's @ 0.0395 Seconds

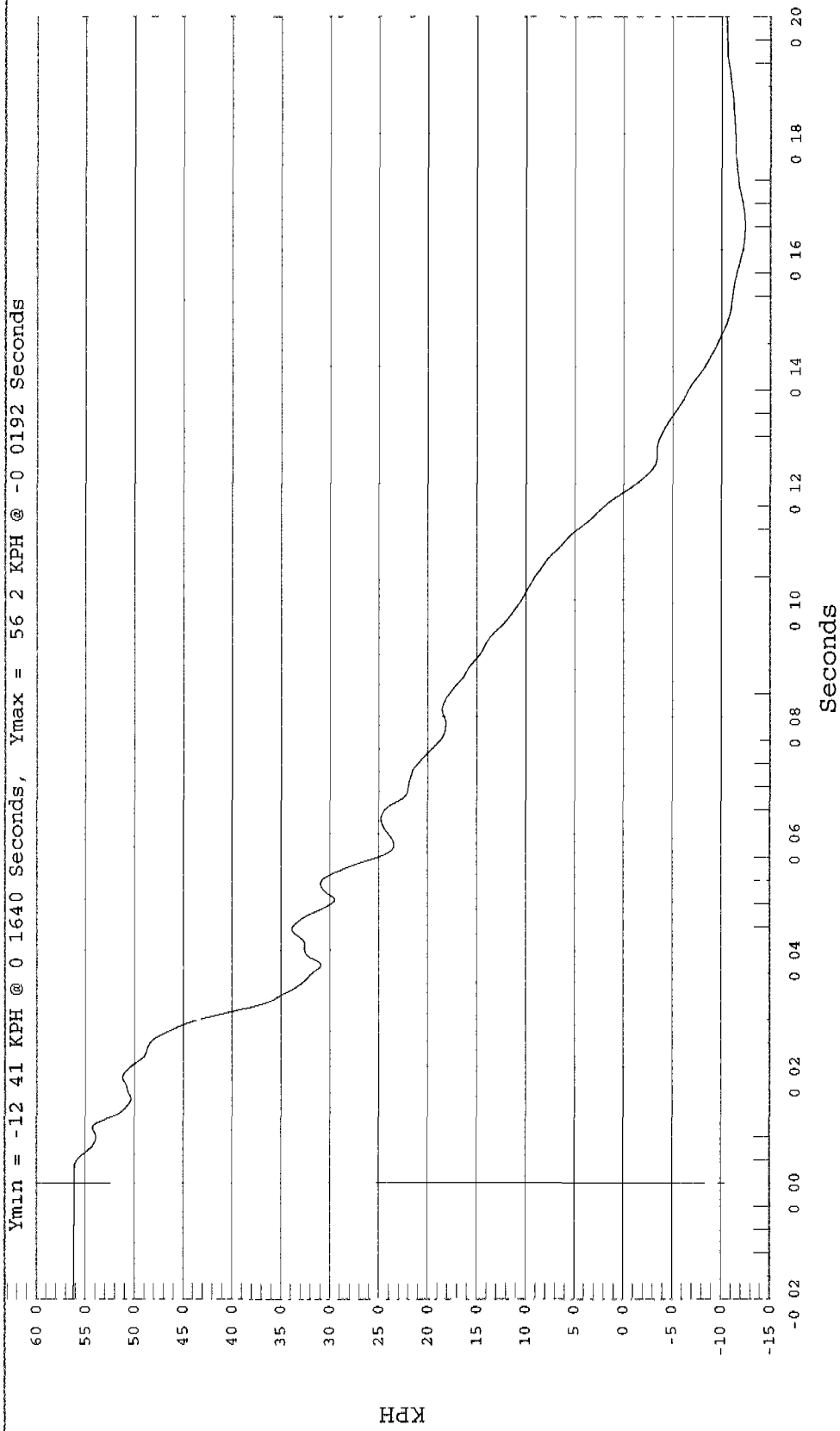


LEFT UPPER B-PILLAR X ACCELERATION

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class. 180

1 LEFT UPPER B-PILLAR X VELOCITY, B01028AI.V37



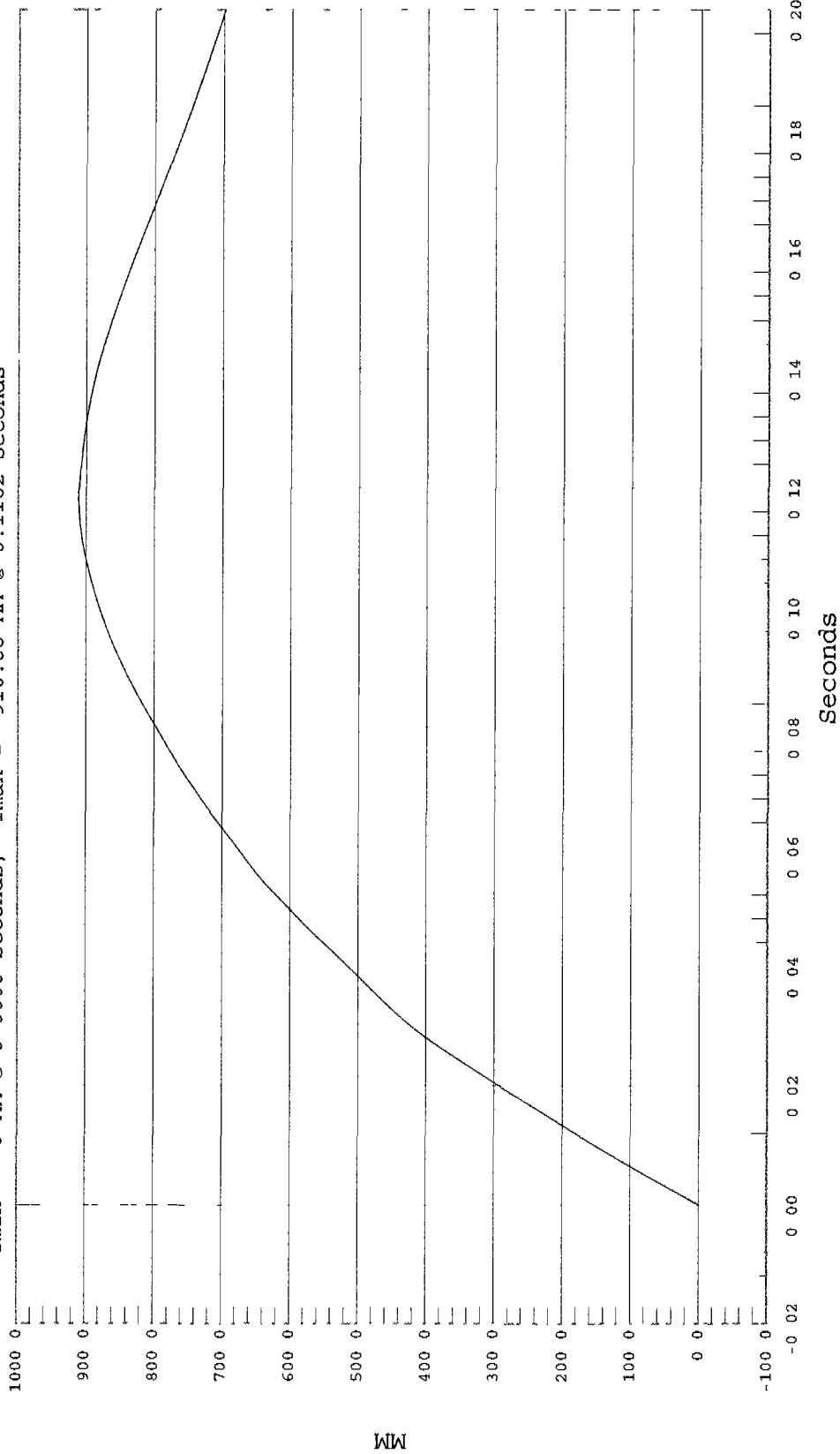
LEFT UPPER B-PILLAR X ACCELERATION

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 180



1 LEFT UPPER B-PILLAR X DISPLACEMENT, B01028AI D37

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 910.88 MM @ 0.1182 Seconds



RIGHT WHEEL WELL CONTACT

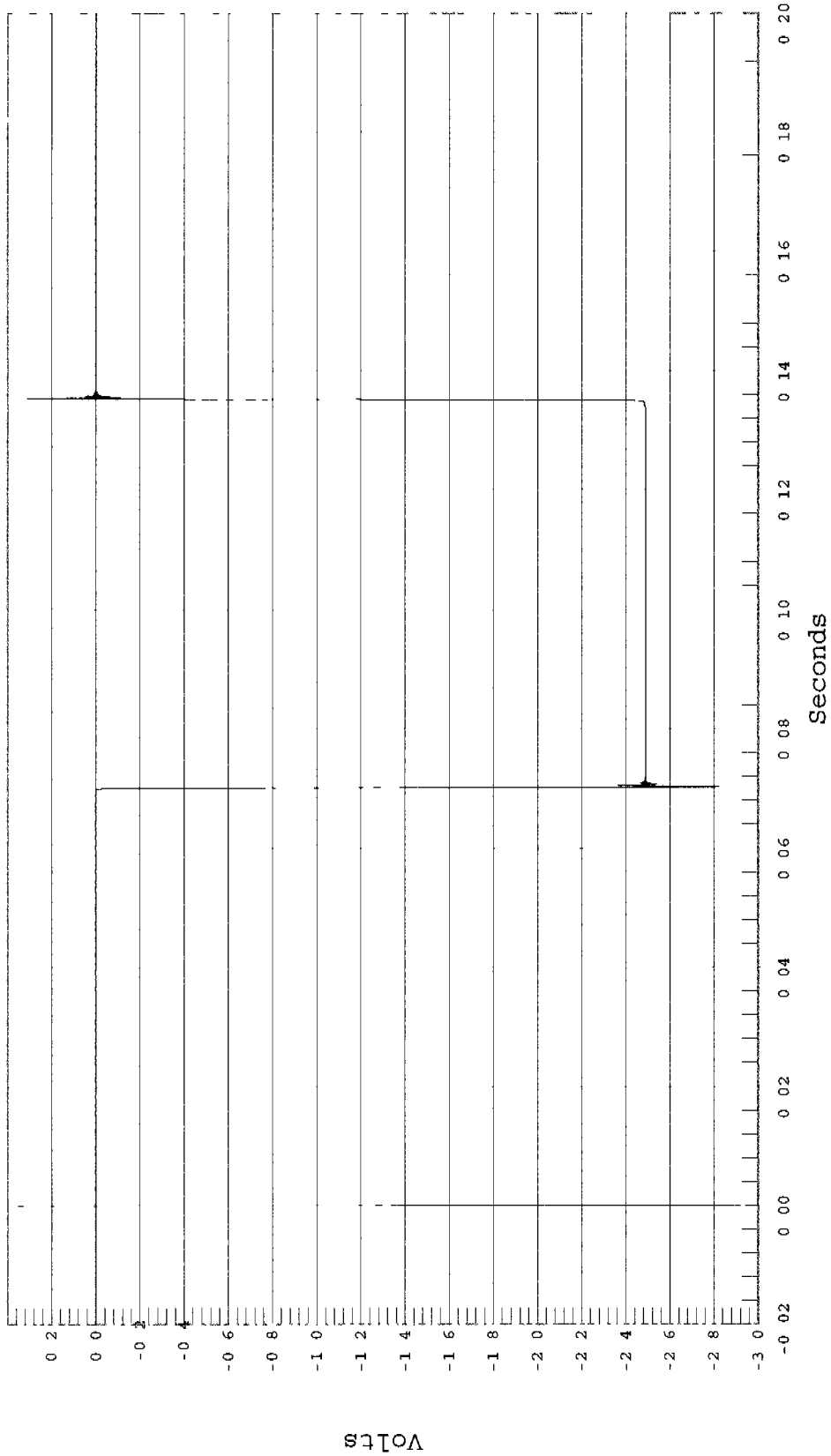
Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

Test Date. 03-08-01
Speed. 34.9 MPH, 56.2 KPH
Filter Class. 1000



1 RIGHT WHEEL WELL CONTACT, B010280T O41

Ymin = -2.82 Volts @ 0.0701 Seconds, Ymax = 31 Volts @ 0.1352 Seconds



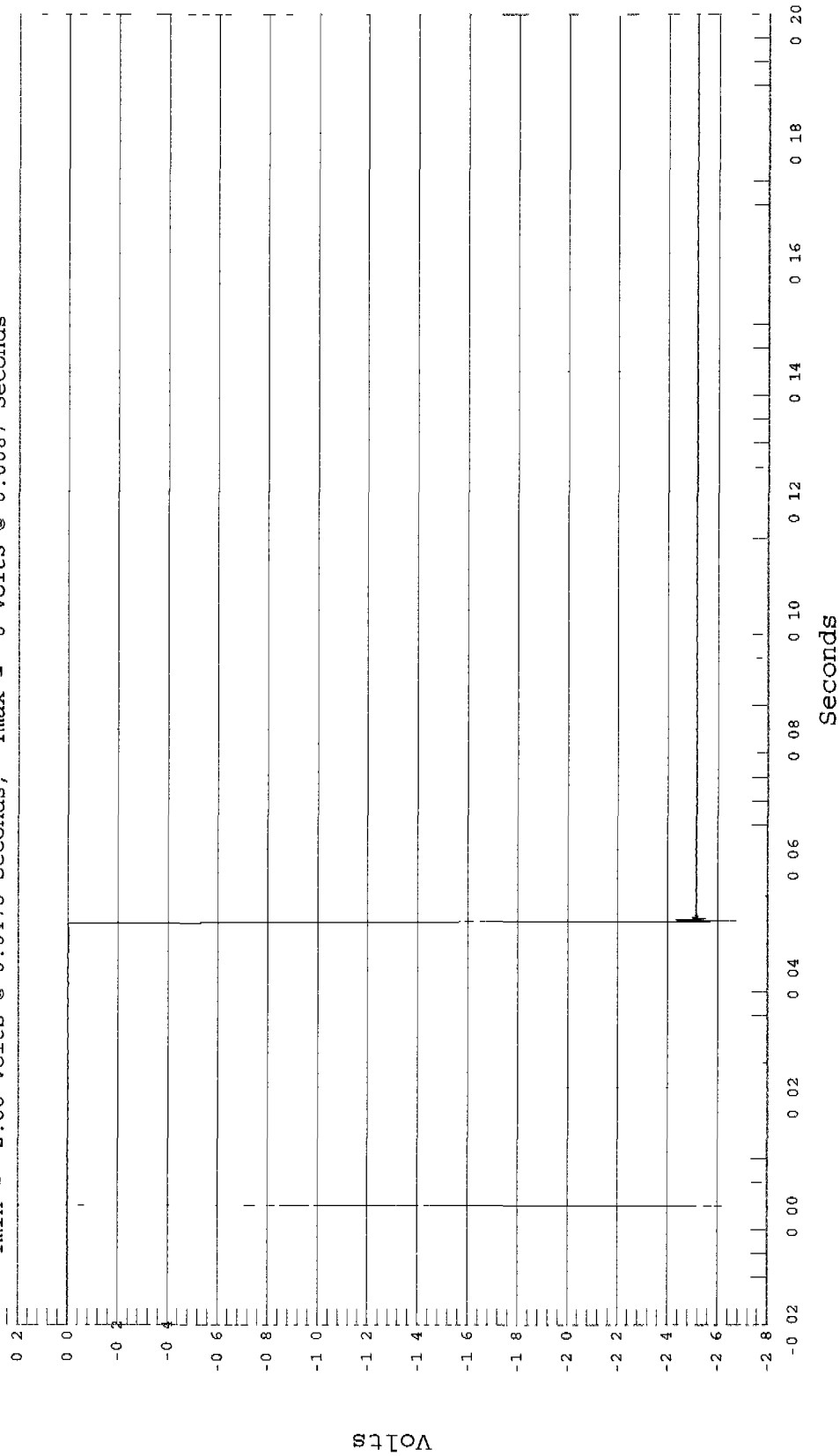
LEFT WHEEL WELL CONTACT

Test Desc . 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class. 1000



1 LEFT WHEEL WELL CONTACT, B010280T.042

Ymin = -2.68 Volts @ 0.0478 Seconds, Ymax = 0 Volts @ 0.0087 Seconds



UPPER LEFT BARRIER FORCE

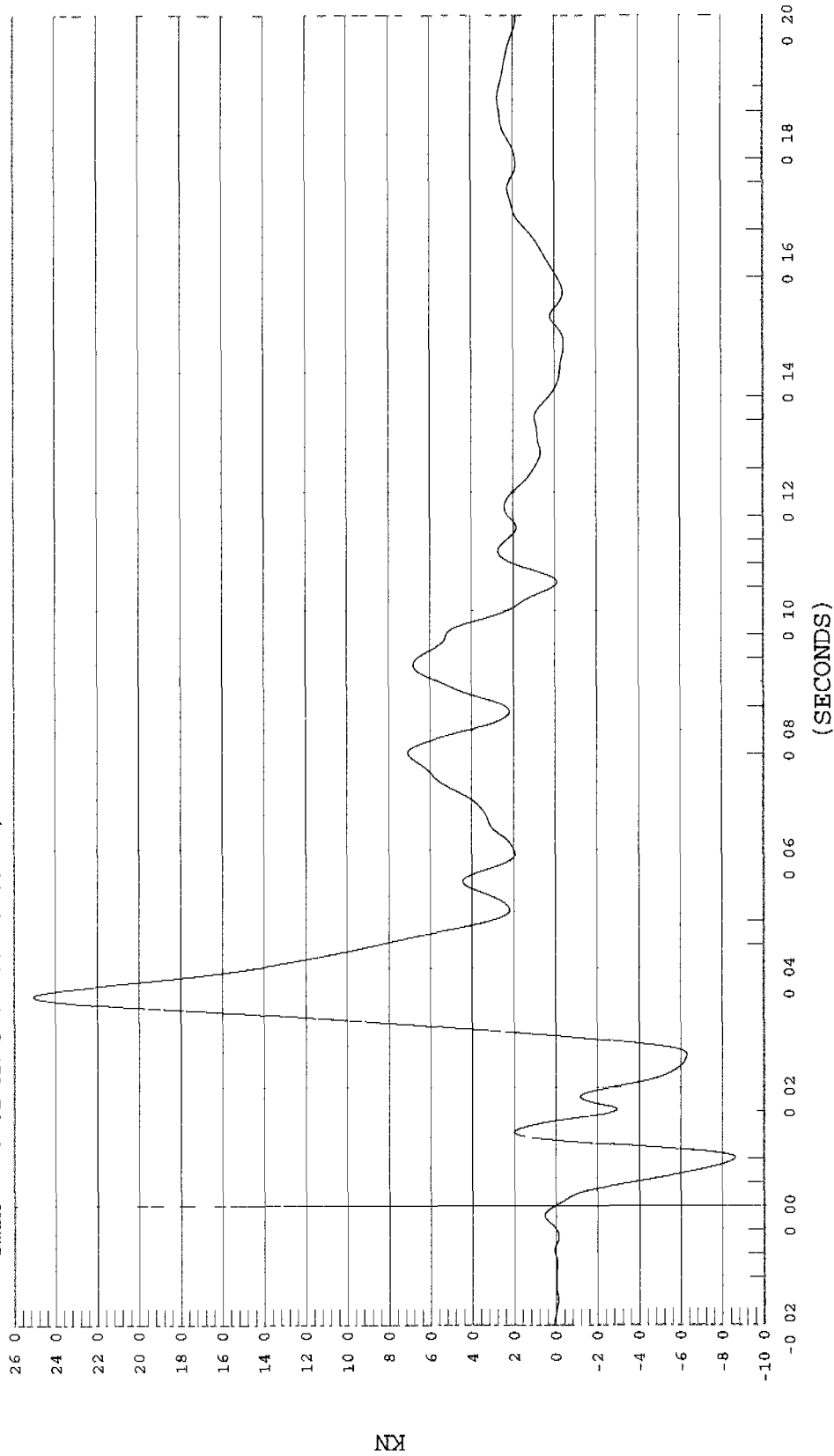
Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info.

Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60

1 BARRIER UPPER LEFT, B01028FF F02



Ymin = -8.62 KN @ 0.0080 SECONDS, Ymax = 25.05 KN @ 0.0352 SECONDS



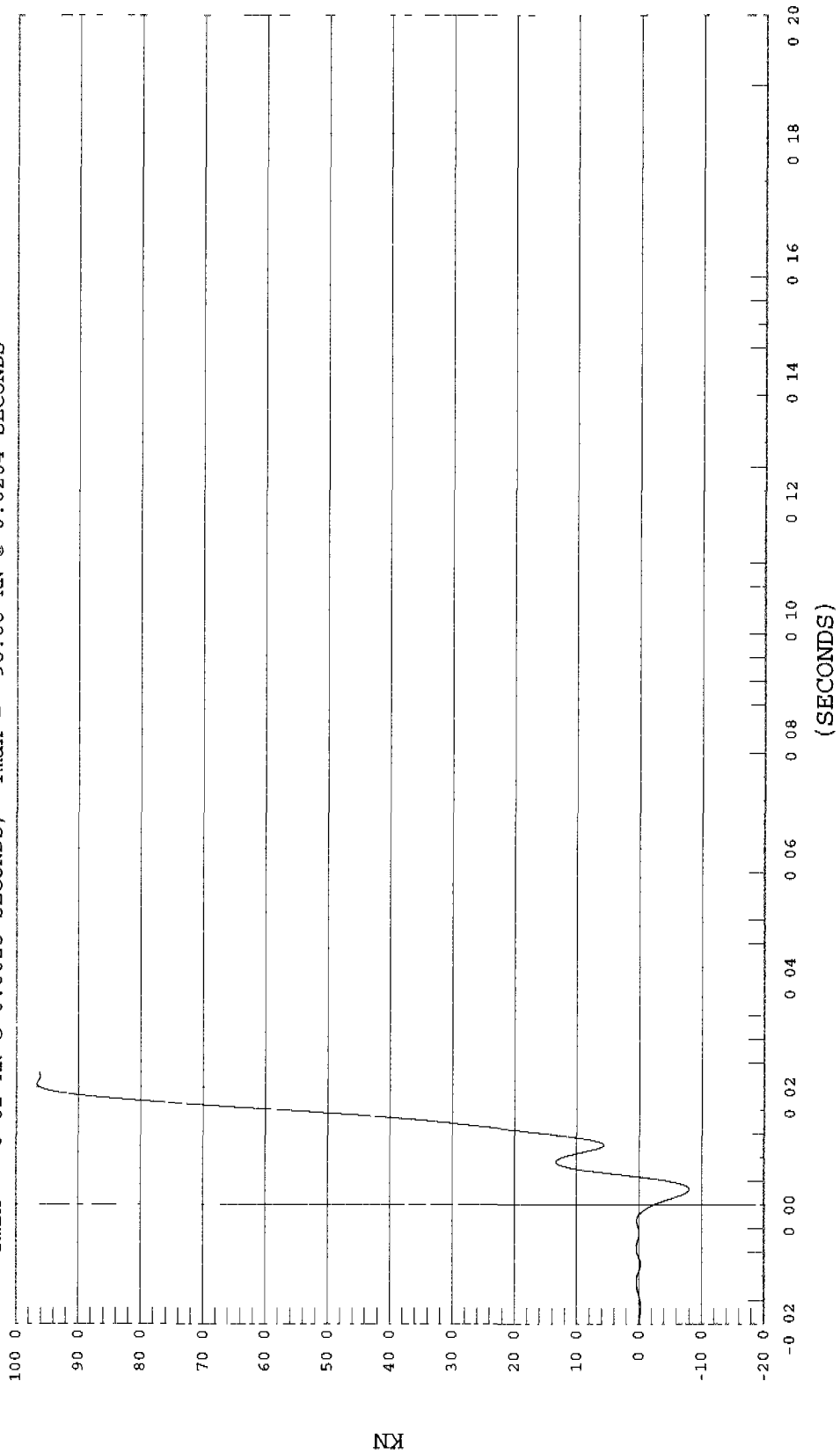
UPPER CENTER BARRIER FORCE

Test Desc : 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60



1 BARRIER UPPER CENTER, B01028FF F03

Ymin = -8.02 KN @ 0.0025 SECONDS, Ymax = 96.68 KN @ 0.0204 SECONDS



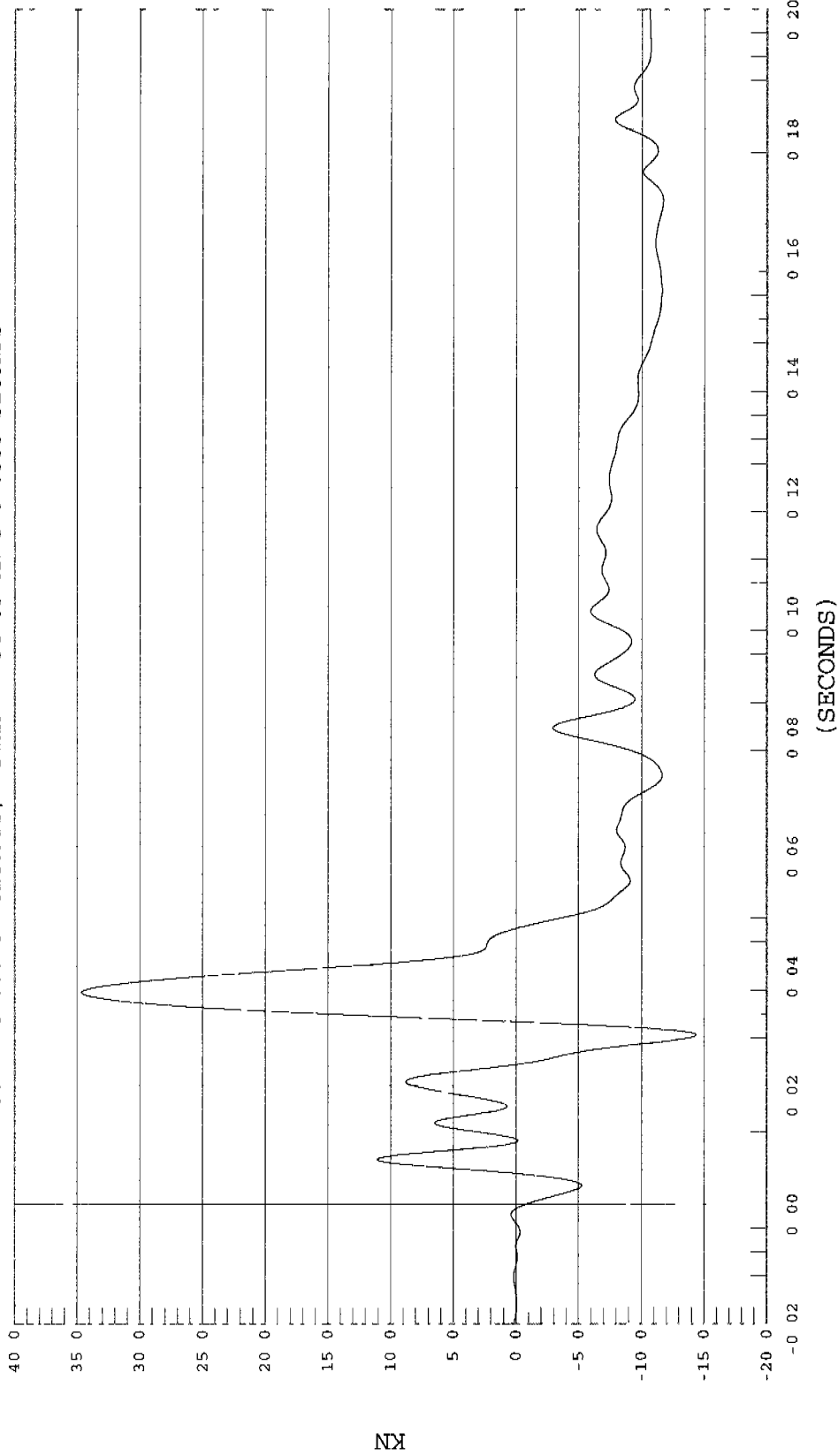
UPPER RIGHT BARRIER FORCE

Test Desc 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:
Test Date 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60



1 BARRIER UPPER RIGHT, B01028FF F04

Ymin = -14.38 KN @ 0.0284 SECONDS, Ymax = 34.65 KN @ 0.0355 SECONDS



LOWER LEFT BARRIER FORCE

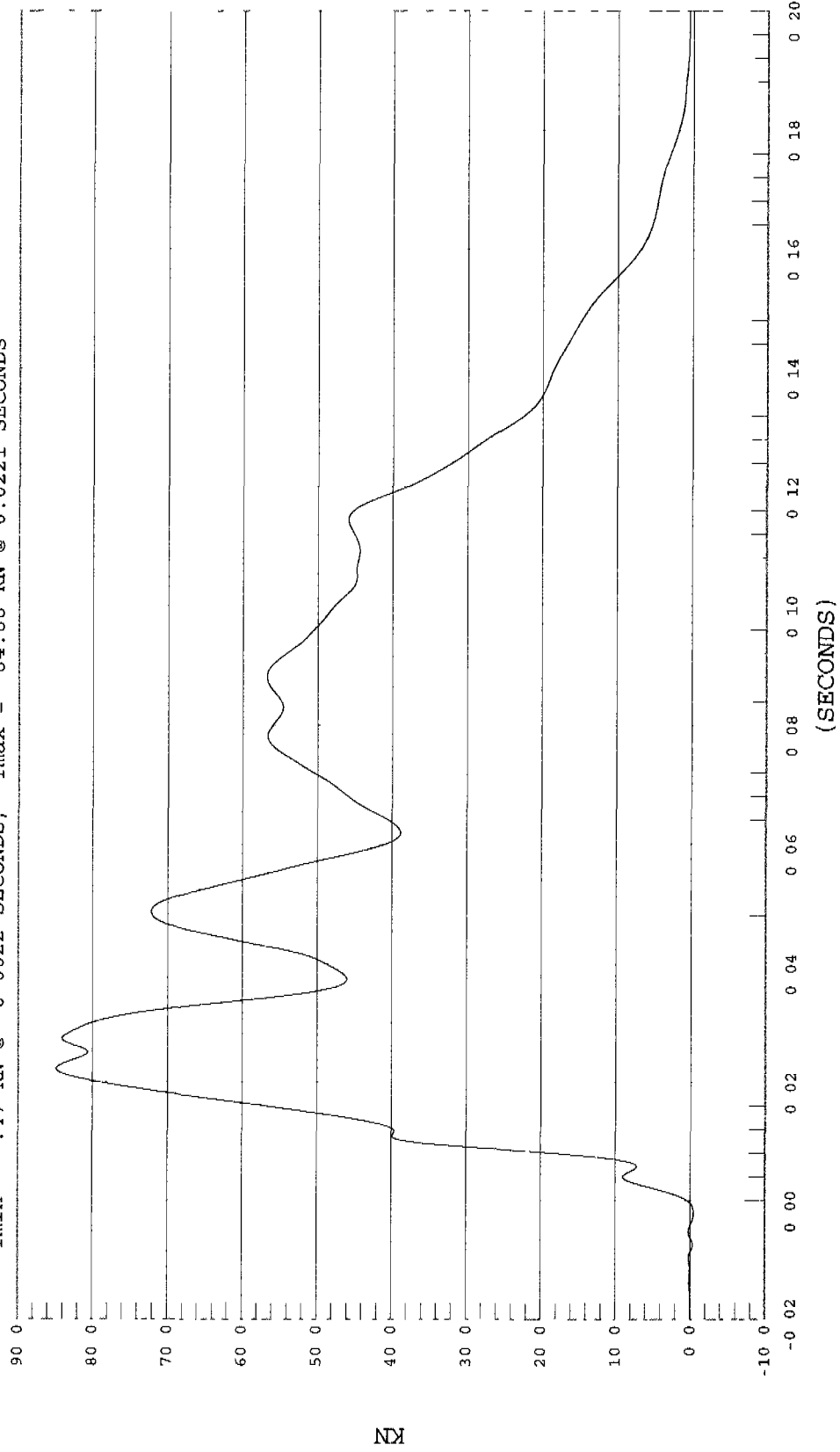
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info.

1 BARRIER LOWER LEFT, B01028FF.F05



Ymin = -.47 KN @ -0.0022 SECONDS, Ymax = 84.88 KN @ 0.0221 SECONDS



LOWER CENTER BARRIER FORCE

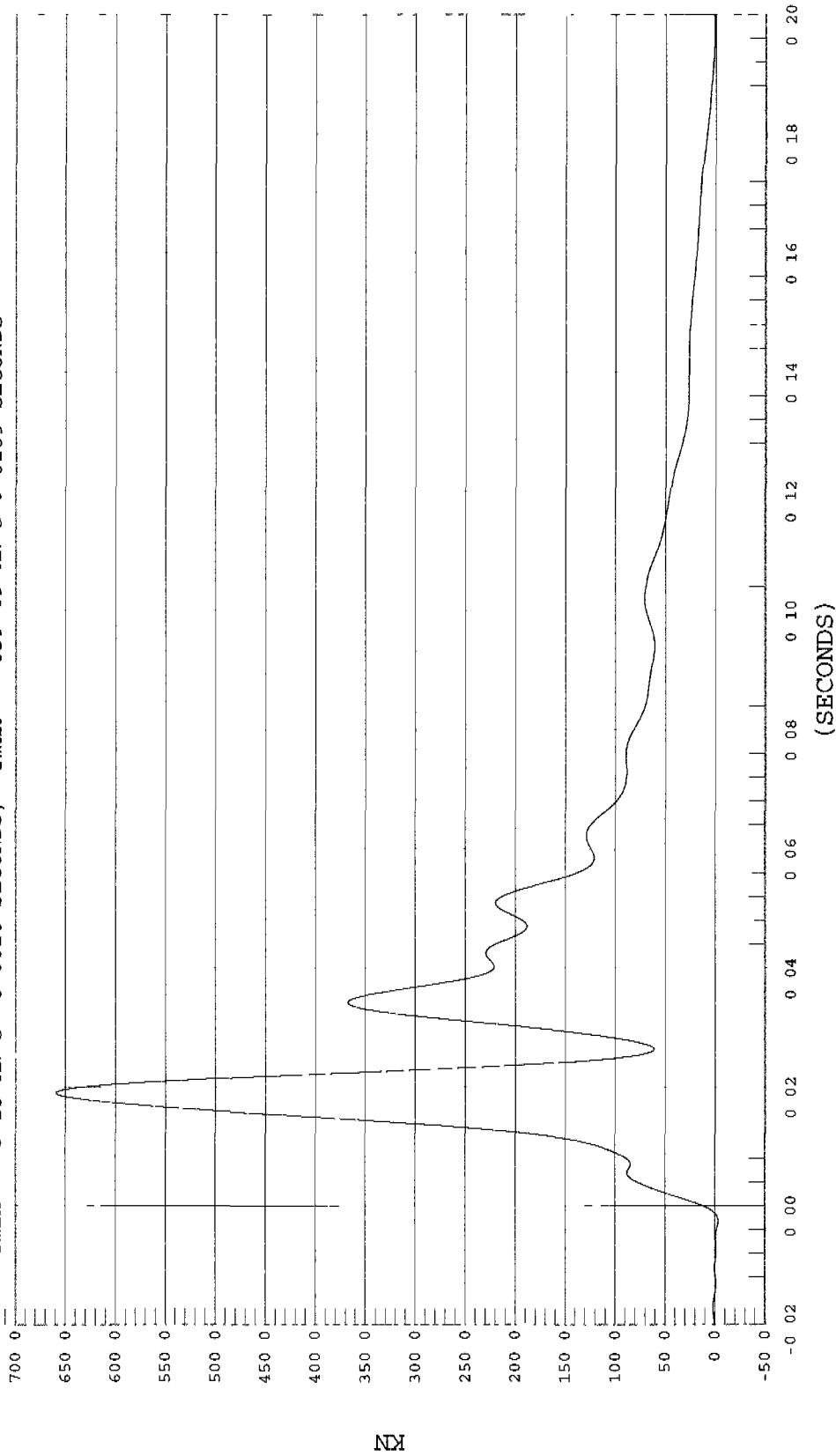
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 BARRIER LOWER CENTER, B01028FF.F06



Ymin = -3.15 KN @ -0.0026 SECONDS, Ymax = 659.49 KN @ 0.0189 SECONDS



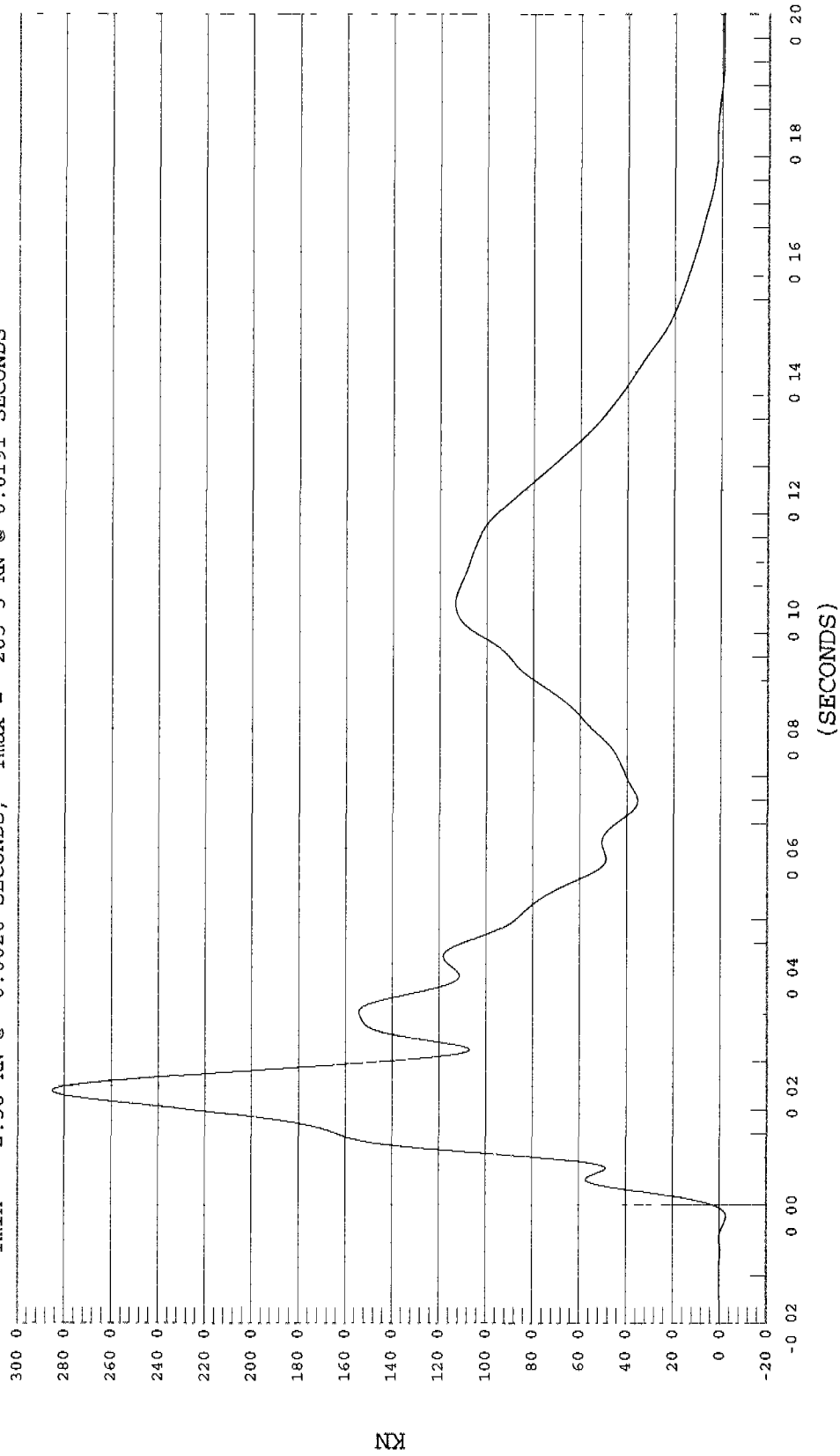
LOWER RIGHT BARRIER FORCE

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60

1 BARRIER LOWER RIGHT, B01028FF.F07



Ymin = -2.58 KN @ -0.0020 SECONDS, Ymax = 285.3 KN @ 0.0191 SECONDS



SUM OF LEFT BARRIER FORCES

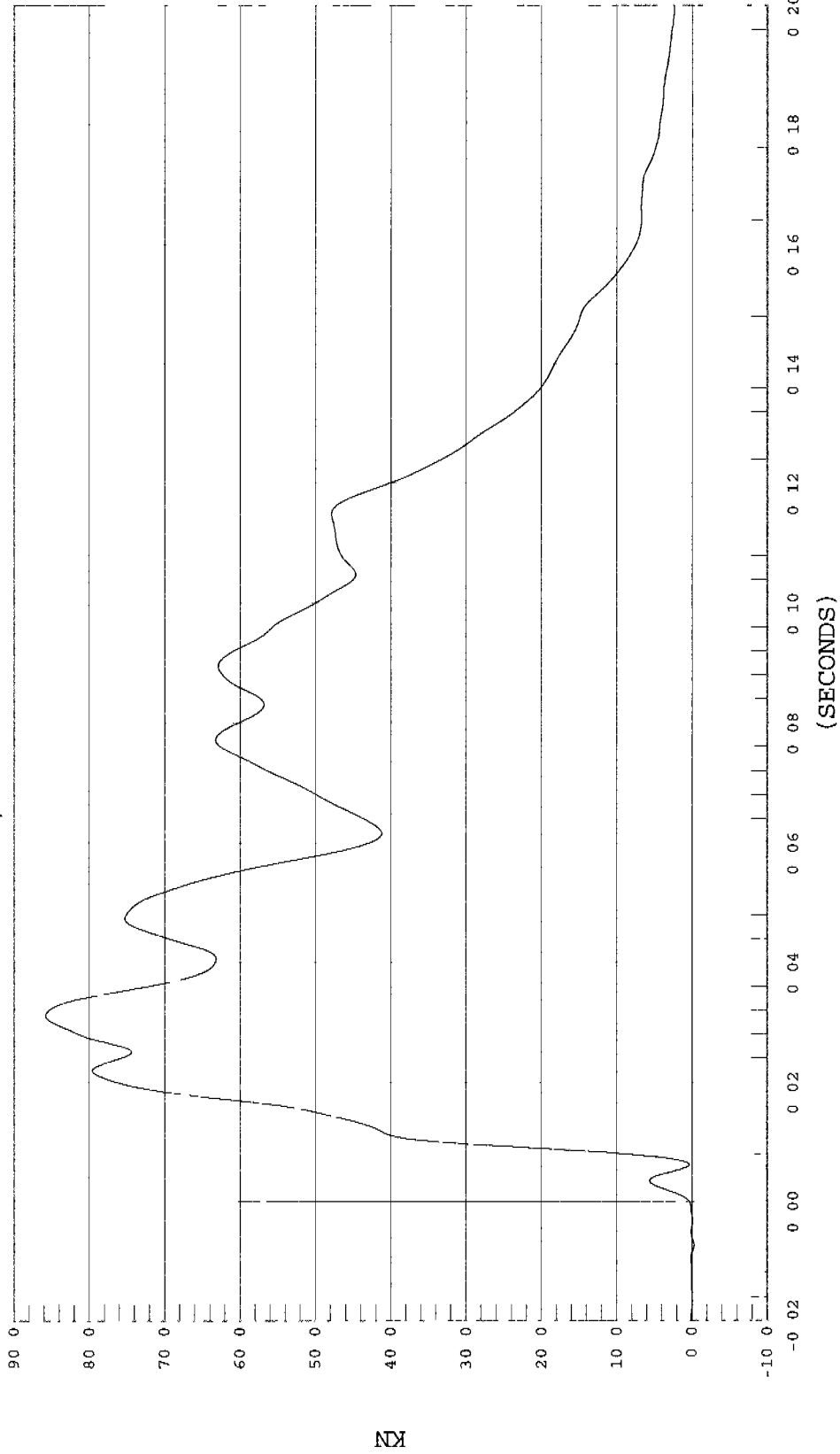
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info:

1 SUM OF LEFT BARRIER FORCES, B01028FU F02



Ymin = -.29 KN @ -0.0075 SECONDS, Ymax = 85.82 KN @ 0.0310 SECONDS



SUM OF RIGHT BARRIER FORCES

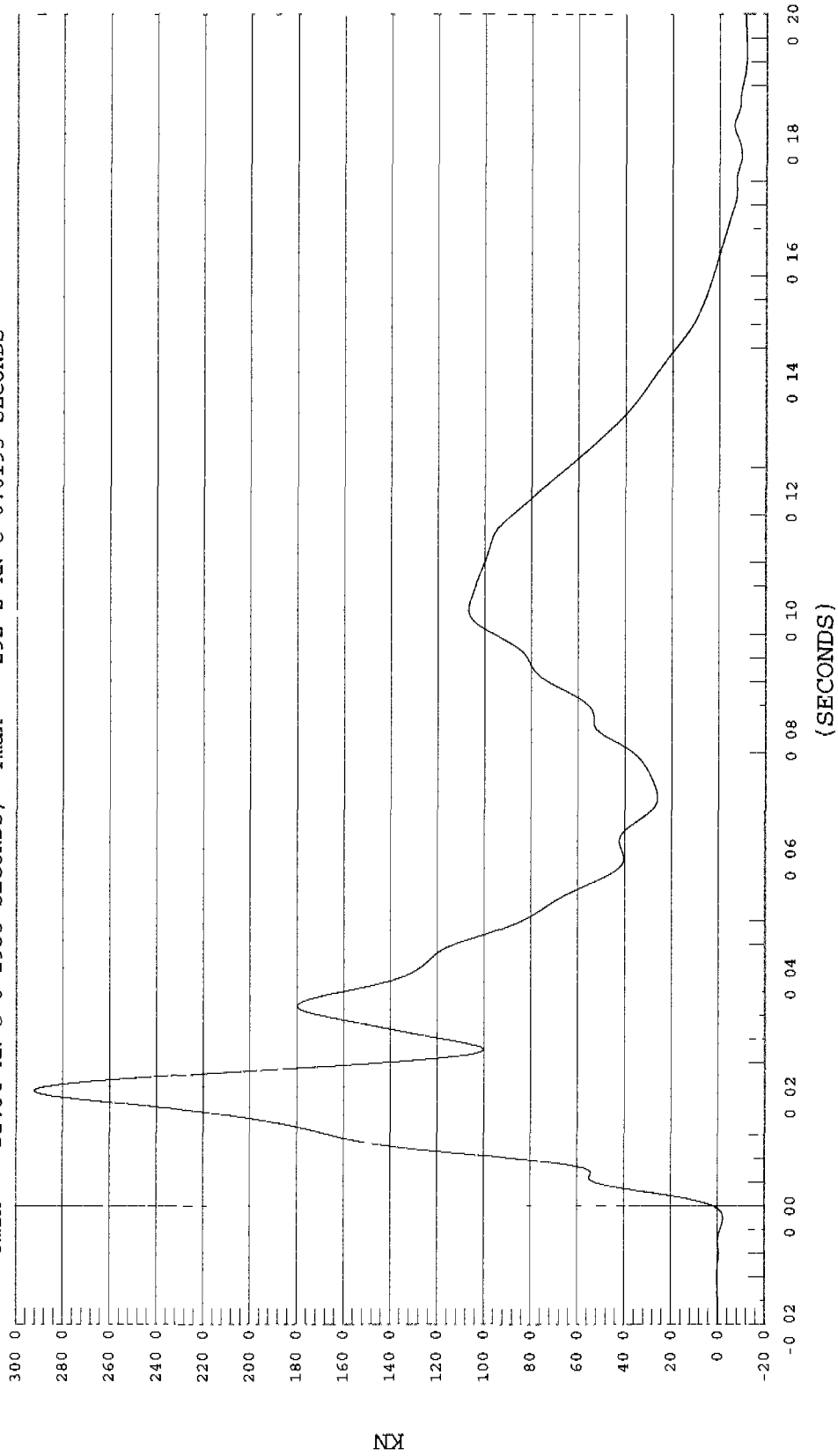
Test Date: 03-08-01
Speed: 34.9 MPH, 56.2 KPH
Filter Class: 60

Test Desc.: 35 MPH FRONTAL BARRIER IMPACT
Component: 1998 AUDI A8 4 DOOR SEDAN TTD#2
Other Info.

1 SUM OF RIGHT BARRIER FORCES, B01028FU F04



Ymin = -11.34 KN @ 0.1933 SECONDS, Ymax = 292.2 KN @ 0.0193 SECONDS



APPENDIX C

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO	MANUFACTURER	CALIBRATION DATE
Left Rear Seat Crossmember X	I14-D18	Entran	11/17/00
Right Rear Seat Crossmember X	H07-A04	Entran	12/14/00
Vehicle CG X	I25-F05	Entran	1/15/00
Vehicle CG Y	F11-G09	Entran	9/14/00
Vehicle CG Z	F20-G11	Entran	9/14/00
Left Shock Tower X	K19-A15	Entran	1/11/01
Left Shock Tower Y	I26-D11	Entran	2/7/01
Right Shock Tower X	MGA045	Entran	9/14/00
Right Shock Tower Y	I18-E05	Entran	12/13/00
Front Top of Engine X	I25-J08	Entran	11/17/00
Front Top of Engine Z	C25-A17	Entran	11/17/00
Rear Top of Engine X	I25-F12	Entran	11/15/00
Rear Top of Engine Z	E13-D06	Entran	2/15/01
Engine Bottom X	MGA095	Entran	2/15/01
Firewall/Shock Tower Support X	F07-A20	Entran	9/14/00
Left Front Frame Rail @ Bumper X	G13-F15	Entran	2/7/01
Left Front Frame Rail @ Bumper Y	G13-F02	Entran	2/7/01
Left Front Frame Rail @ Bumper Z	G13-F12	Entran	2/7/01
Right Front Frame Rail @ Shock Brace X	G13-F04	Entran	2/7/01
Right Front Frame Rail @ Shock Brace Y	G13-F06	Entran	2/7/01
Right Front Frame Rail @ Shock Brace Z	K11-J08	Entran	2/7/01
Left Front Frame Rail @ Shock Brace X	I18-E18	Entran	12/13/00
Left Front Frame Rail @ Shock Brace Z	G01-J15	Entran	10/2/00
Right Front Frame Rail @ Shock Brace X	G01-J04	Entran	12/14/00
Right Front Frame Rail @ Shock Brace Z	J10-E03	Entran	12/14/00

VEHICLE INSTRUMENT CALIBRATION (CONTINUED)

	VEHICLE ACCELEROMETERS		
	SERIAL NO	MANUFACTURER	CALIBRATION DATE
Left Front Frame Rail Behind Shock X	F18-G13	Entran	10/4/00
Left Front Frame Rail Behind Shock Z	F20-G10	Entran	9/14/00
Right Front Frame Rail Behind Shock X	G13-F07	Entran	2/15/01
Right Front Frame Rail Behind Shock Z	A08-A11	Entran	2/8/01
Rear Compartment Center X	G13-F09	Entran	2/7/01
Rear Compartment Center Y	E23-R11	Entran	2/7/01
Rear Compartment Center Z	G13-F01	Entran	2/7/01
Right Upper B-Pillar X	D05-R25	Entran	2/7/01
Left Upper B-Pillar X	I25-J18	Entran	2/7/01