V2219

REPORT NO.: MGA-95-214Ø8

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

VOLKWAGEN OF AMERICA
1995 VOLKSWAGEN CABRIO (CONVERTIBLE)
NHTSA NO: CS58ØØ

MGA PROVING GROUNDS
5ØØØ WARREN ROAD
BURLINGTON, WI 531Ø5

MGA Ref. No.: G93A-Ø2

Test Date: November 3Ø, 1994

Report Date: December 23, 1994

FINAL REPORT

Prepared For:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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15. Supplementary Notes

16. Abstract

Compliance tests were conducted on the subject 1995 Volkswagen Carbrio (Convertibel) 2 Door in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure for the determination of FMVSS 214 compliance. The test was conducted at the MGA Research Proving Grounds and crash Test Center in Burlington, Wisconsin on November 30, 1994.

The impact velocity of the Moving Barrier (MDB) was 32.8 mph (52.8 kph) and the ambient temperature of the struck side (driver's) of the target vehicle at the time of impact was 69°F. The maximum static crush of the impacted vehicle was 250 mm at the occupant H-Point of the struck vehicle.

The test or target vehicle's performance is given below:

	Driver's SID	Left Rear SID
Thoracic Trauma Index (TTI)	90 g's	55 g's
Pelvis Acceleration	62 g's	67 g's
Upper Rib Acceleration	82.9 g's	51.5 g's
Lower Rib	89.3 g's	56.3 g's
Lower Spine	90.3 g's	53.7 g's

17. Key Words	18. Distribution Statement
Side Impact Dummy (SID) Compliance Test FMVSS 214 Side Impact Protection	Copies of this report are available from: NHTSA Technical Reference Division, Room 5108 (NAD-52), 400 Seventh Street, S.W. Washington, D.C. 20590 Telephone No. (202) 366-4946 Attn: Robert Hornickle

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Approved by:

John Fleck

John Fleck, Project Engineer

Date: 12-28-94

FINAL REPORT ACCEPTED BY:

Contract Technical Manager

Date: 3-1-95

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SECTION 1

PURPOSE AND TEST PROCEDURE

This side impact test is part of the FY 94 FMVSS 214 "Dynamic" compliance test program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-93-C-02047. The purpose of this test was to evaluate side impact protection in a 1995 Volkswagen Cabrio (Convertible) 2 Door.

This test was conducted using the Office of Vehicle Safety Compliance's FMVSS 214 test procedure (TP-214D-03, dated May 17, 1993).

MGA does not endorse or certify products. The manufacturer's name appears solely for identification purposes only.

SECTION 2

SUMMARY OF SIDE IMPACT TEST

A stationary 1995 Volkswagen Cabrio (Convertible) 2 Door was impacted on the left or driver's side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the monorail at a velocity of 32.8 mph (52.8 kph) on November 30, 1994. The orientation angle of the striking vehicle was 90° counterclockwise with respect to the longitudinal axis of the struck vehicle. Pre- and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the side impact dummies (SIDs) are shown in Appendix A.

Two restrained Side Impact Dummies (SIDs) were placed in the driver (Pos. #1) and left rear (Pos. #4) designated seating positions. The SID in the driver (Pos. #1) and left rear (Pos. #4) were placed according to instructions specified in the Laboratory Test Procedure. The side impact event was documented by nine high speed cameras. Camera locations and other pertinent camera information can be found in this report. Appendix B contains the vehicle and dummy response data traces.

The SIDs were instrumented with the following accelerometers.

1. Left Upper Rib (LUR) uniaxial accelerometer (Y-direction)
2. Left Lower Rib (LLR) uniaxial accelerometer (Y-direction)
3. Lower Thoracic Spine (T_{12}) uniaxial accelerometer (Y-direction)
4. Pelvic (PEV) section uniaxial accelerometer (Y-direction)

The summary of the side impact dummy (SID) configuration and performance verification test data are shown in Appendix C. Dummy and vehicle calibration data can be found in Appendix D of this report.

The driver's Thoracic Trauma Index (TTI) was 90 g's. Maximum pelvic Y acceleration was 62 g's.

The left rear passenger's TTI was 55 g's. Maximum pelvic Y acceleration was 67 g's.

TEST NOTES

A negative acceleration data spike appears on the passenger lower spine data between 18 and 25 msec. following impact. This data problem was traced to a wiring problem in the lower spine accelerometer plug and does not appear on the redundant data. The maximum reported positive Y acceleration of the lower spine (53.7 g's) does not seem to be affected by this data problem.

SECTION 3
SUMMARY OF TEST DATA

TABLE 1

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

Vehicle NHTSA No.: CS5800 VIN: WVWBC81E9SK005598

Vehicle Body Color: White Month & Year of Manufacture: 9-94

Engine Data: 4 cylinders; __ CID; 2.0 Liter; __cc

Placement __ Longitudinal; or X Lateral

Transmission: 4 speed; __ Manual; X Automatic; __ Overdrive

Final Drive: __ Rear Wheel Drive; X Frt. Wheel Drive; __ Four Wheel Drive

Odometer Reading 71 miles

Options: X A/C; X Pwr. Steering.; X Pwr. Brakes; X Pwr. Windows

__Power Seats; X Tilt Wheel; X Power Door Locks; __Self Leveling System

DATA FROM TIRE PLACARD:

Tire Pressure (at capacity): 30 Psi FRONT (207 kpa)

30 Psi REAR (207 kpa)

Recommended Tire Size: P195/60R14

Tires on Test Vehicle: P195/60R14 Manufacturer: Goodyear

Vehicle Capacity Data:

Number of Occupants: 2 Front; 2 Rear; __ 3rd Seat 4 Total

Type of Front Seats: X Bucket; __ Bench; __ Split Bench

Type of Front Seat Back: __ Fixed; X Adjustable with X Knob

Vehicle Maximum Capacity Loading = 705 lbs (A) (319.8 kg)

No. of Occupants x 150 lbs. = 600 lbs (B) (272.2 kg)

Cargo Capacity (A-B) = 105 lbs (47.6 kg)

WEIGHT OF TEST VEHICLE WITH MAXIMUM FLUIDS:

Right Front = 861 lbs (390.5 kg)		Right Rear = 532 lbs (241.3 kg)	
Left Front = 890 lbs (403.7 kg)		Left Rear = 547 lbs (248.1 kg)	
TOTAL FRONT = 1751 lbs (794.2 kg)		TOTAL REAR = 1079 lbs (489.4 kg)	
% of Total Vehicle Weight = 61.9 %;		% of Total Weight = 38.1 %	

TOTAL WEIGHT = 2830 lbs (1283.6 kg)

TABLE 2

TEST VEHICLE DATA

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Maximum Fluids = 2830 lbs (1283.6 kg)

Cargo Carrying Capacity of Test Vehicle = 105 lbs (47.6 kg)

Weight of 2 Side Impact Dummies (2 x 178 lbs.) = 356 lbs (161.5 kg)

TEST VEHICLE TARGET WEIGHT: = 3291 lbs (1492.7 kg)

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front	= 951 lbs (431.4 kg)	Right Rear	= 634 lbs (287.6 kg)
Left Front	= 989 lbs (448.6 kg)	Left Rear	= 705 lbs (319.8 kg)
TOTAL FRONT	= 1940 lbs (880.0 kg)	TOTAL REAR	= 1339 lbs (607.4 kg)
% of Total Weight	= 59.1%	% of Total Weight	= 40.9%

TOTAL TEST WEIGHT = 3279 lbs (1487.4 kg)

TEST VEHICLE ATTITUDE (all dimensions in inches):

CURB WEIGHT ATTITUDE: in (mm)

Right Front 33.9 (861) Left Front 35.0 (890) Right Rear 20.9 (532) Left Rear 21.5 (547)

FULLY LOADED WEIGHT ATTITUDE: in (mm)

Right Front 26.4 (670) Left Front 25.9 (659) Right Rear 25.3 (643) Left Rear 24.7 (627)

TEST ATTITUDE: in (mm)

Right Front 25.8 (655) Left Front 26.0 (660) Right Rear 25.3 (642) Left Rear 25.0 (635)

Test Vehicle Wheelbase: 97.3 inches (2470 mm)

C.G. = 39.7 inches (1009 mm) rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 159.0 in (4040 mm)

Centerline = 160.4 in (4075 mm)

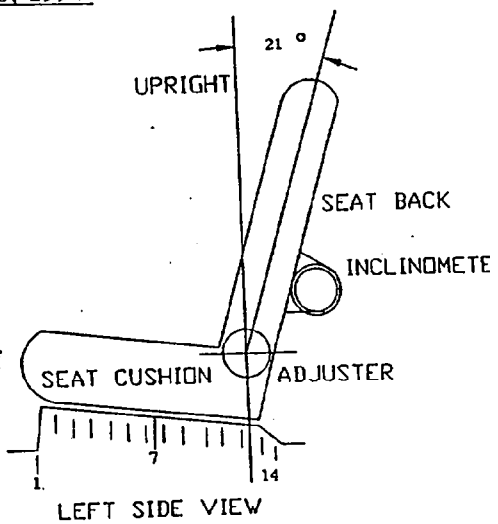
Left Side = 159.0 in (4040 mm)

FIGURE 1

PRE-TEST CONDITIONS

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994



FRONT SEAT CUSHION PLACEMENT:

Total Length of Adjustment Travel: 9.0 in (230 mm)

Total Number of Adjustment Positions or Detents: 14

Test Position: Mid Position (7th position from front)

FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Angle = 21° degrees as measured at the torso line of the SAE J826 H-Point Machine

SECOND POSITION SEAT:

Total Length of Fore/Aft Adjustment Travel: Non-Adjustable

Seat Back Adjustment Position: N/A

ADJUSTABLE STEERING COLUMN POSITION: Adjusted to mid position

WINDOW POSITIONS: Left Front closed Left Rear closed

Right Front open Right Rear open

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

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

Fuel system usable capacity = 14.5 gallons (55 liters)

Test Volume: 13.4 gallons (50.8 liters) 92% of capacity

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

Wheelbase: = 97.2 in (2470 mm)

Impact Point is 11.6 in (295 mm) rearward of front axle centerline

TABLE 3

CRASH TEST SUMMARY FOR TEST VEHICLE

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994

Overall Length = 160.4 in (4075 mm); Overall Width = 66.6 in (1693 mm)

TEST WEIGHT:

Right Front	= 861 lbs (390.5 kg)	Right Rear	= 532 lbs (241.3 kg)
Left Front	= 890 lbs (403.7 kg)	Left Rear	= 547 lbs (248.1 kg)
TOTAL FRONT	= 1751 lbs (794.2 kg)	TOTAL REAR	= 1079 lbs (489.4 kg)
% of Total Weight	= 59.1 %	% of Total Weight	= 40.9 %

TOTAL VEHICLE WEIGHT 2830 lbs (1283.6 kg)

Wheelbase = 97.2 in (2470 mm)

Longitudinal C.G. front Center of Front Axle = 39.7 in (1009 mm)

Impact Angle with Respect to Impactor = 90° degrees

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (265 mm above ground) = 88 mm
2. LEVEL 2 (470 mm above ground) = 250 mm
3. LEVEL 3 (625 mm above ground) = 223 mm
4. LEVEL 4 (885 mm above ground) = 193 mm
5. LEVEL 5 (1332 mm above ground) = 56 mm

Maximum Post-Test Intrusion = 250 mm

OCCUPANTS:	Left Front Passenger	Left Rear Passenger
Type of Dummy	SID	SID
Restraints Used	3 pt. lap & shoulder belt with airbag	3 pt. lap & shoulder belt

INSTRUMENTATION:

Number of Vehicle Data Channels:		= 15
Number of Cameras:	Onboard Vehicle	= 3
	Offboard Vehicle	= 4
	Deformable Barrier	= 2
	TOTAL	= 9

TABLE 4

CRASH TEST SUMMARY FOR SIDE IMPACTOR

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994

POSITION OF IMPACT (MDB) ON MONORAIL:

Crabbed 27° to left

MDB DETAILS:

Overall Width of Framework Carriage	= 49.3 in (1252.2 mm)
Overall Length of MDB (incl. honeycomb impact face)	= 162 in (4114.8 mm)
Wheelbase of Framework Carriage	= 102 in (259.1 mm)
Tread of Framework Carriage (Front & Rear)	= 74 in (1879.6 mm)
C.G. Location Rearward of Front Axle	= 43.4 in (1102.4 mm)
C.G. Location From Center Line	= -0.3 in (-7.62 mm)
C.G. Location Above Ground Level	= 19.2 in (487.7 mm)

MDB WEIGHT:

Left Front	= 1095 lbs (496.7 kg)	Left Rear	= 413 lbs (187.3 kg)
Right Front	= 624 lbs (283.0 kg)	Right Rear	= 858 lbs (389.2 kg)
TOTAL FRONT	= 1719 lbs (779.7 kg)	TOTAL REAR	= 1271 lbs (576.5 kg)

TOTAL MDB WEIGHT = 2990 lbs (1356.2 kg)

Impact Angle (MDB C/L to Target Vehicle C/L) = 90° degrees

Impact Speed = Primary: 32.78 mph (52.8 kph) Secondary: 32.80 mph (52.8 kph)

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

1.	Row A Top of Stack (33 in)	= 97 mm
2.	Row B Mid Stack (27 in)	= 94 mm
3.	Row C Top of Bumper (21 in)	= 81 mm
4.	Row D Center of Bumper (17 in)	= 119 mm

INSTRUMENTATION:

Number of MDB Data Channels = 7

TABLE 5

POST-TEST OBSERVATIONS

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door Coupe

Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994

VISIBLE DUMMY CONTACT POINTS:

	LEFT FRONT SID	LEFT REAR SID
Head	to side window & shoulder	to "C" Post
Arm	to door trim panel	to side trim panel
Pelvis	to armrest	to armrest
Left Knee	to armrest & door trim panel	to side trim panel
Right Knee	to left knee	to left knee

DOOR OPENING:

	LEFT SIDE	RIGHT SIDE
Front	remained closed	remained closed
Rear	N/A	N/A

MDB DISTANCE FROM TARGET IMPACT POINT:

Horizontal: .25 in (6.4 mm) forward Vertical: .25 in (6.4 mm) high

ARM REST LOCATIONS:

Front: 206 mm below window opening

Rear: 255 mm below window opening

SEAT CRUSH:

Driver Seat Back: 70 mm Driver Seat Cushion: 18 mm

Left Rear Seat Back: 6 mm Left Rear Seat Cushion: 52 mm

GLAZING DAMAGE:

Both left side windows broken & windshield cracked

PILLAR PERFORMANCE:

No separation noted

SILL SEPARATION:

No separation noted

OTHER NOTABLE IMPACT EFFECTS:

None

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

TABLE 6

SIDE IMPACT DUMMY (SID) TEST DATA SUMMARY

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994

	Front Dummy ID # 270					Rear Dummy ID # 272			
	Pos. Direct.		Neg. Direct			Pos. Direct.		Neg. Direct	
	Max (g)	Time (msec)	Max (g)	Time (msec)		Max (g)	Time (msec)	Max (g)	Time (msec)
RIB ACCELERATIONS:									
Upper Rib Lateral.....Y	82.9	31	16.4	74		51.5	42	4.2	66
Upper Rib Lateral....Y(R)	83.6	31	16.7	74		52.1	42	3.8	66
Lower Rib Lateral.....Y	89.3	33	21.4	73		56.3	41	3.8	108
Lower Rib Lateral.....Y(R)	88.4	33	20.5	73		55.6	41	4.7	108
SPINE ACCELERATIONS:									
Lower Lateral.....Y	90.3	36	23.1	65		53.7	55	59.9*	23*
Lower Lateral.....Y(R)	88.9	36	24.2	65		54.8	55	10.4	73
PELVIC ACCELERATIONS:									
Lateral.....Y	62.4	36	6.1	60		66.8	48	4.1	102
Lateral.....Y(R)	63.0	36	5.9	68		67.9	48	3.9	103

REFERENCE:

Positive Direction - Longitudinal (X) = forward

Lateral (Y) = to right

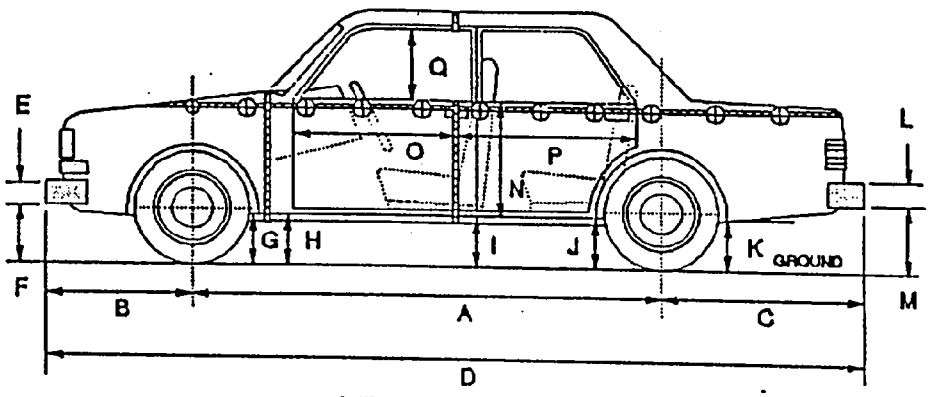
Vertical (Z) = up

Note: Y(R) denotes redundant Y direction accelerometer.

* Data spike between 18 and 25 msec. following impact.

FIGURE 2

PRE- AND POST-TEST MEASUREMENTS



LEFT SIDE VIEW

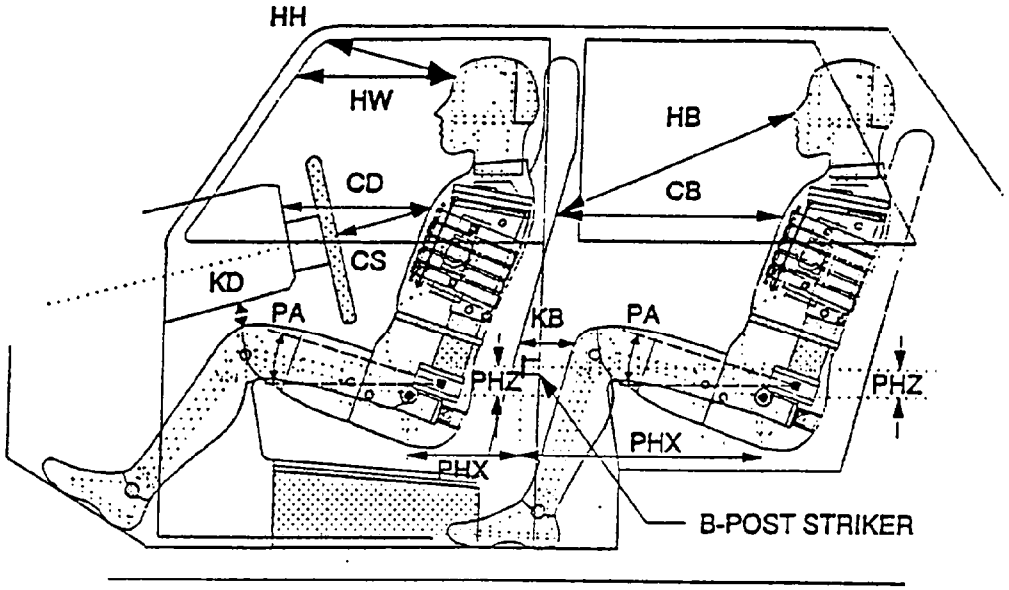
D = Length at Centerline
R = Right Side Length
S = Left Side Length
T = Width at B Post
E & L = Bumper Thickness
J1 = To Pinch Weld
J2 = To Sill

Units: mm

LOCATION	PRE-TEST	POST-TEST	Δ CHANGE
A	247Ø	247Ø	Ø
B	853	871	18
C	752	774	22
D	4Ø75	4115	4Ø
E	186	186	Ø
F	355	4Ø8	53
G	182	265	83
H	194	27Ø	76
I	196	26Ø	64
J1/J2	198/197	252/253	54/56
K	238	28Ø	42
L	25Ø	25Ø	Ø
M	436	425	11
N	612	572	4Ø
O	74Ø	735	5
P	N/A	N/A	N/A
Q	44Ø	453	13
R	4Ø4Ø	4Ø45	5
S	4Ø4Ø	4Ø38	2
T	1693	1609	84

FIGURE 3

SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONS



LEFT SIDE VIEW

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

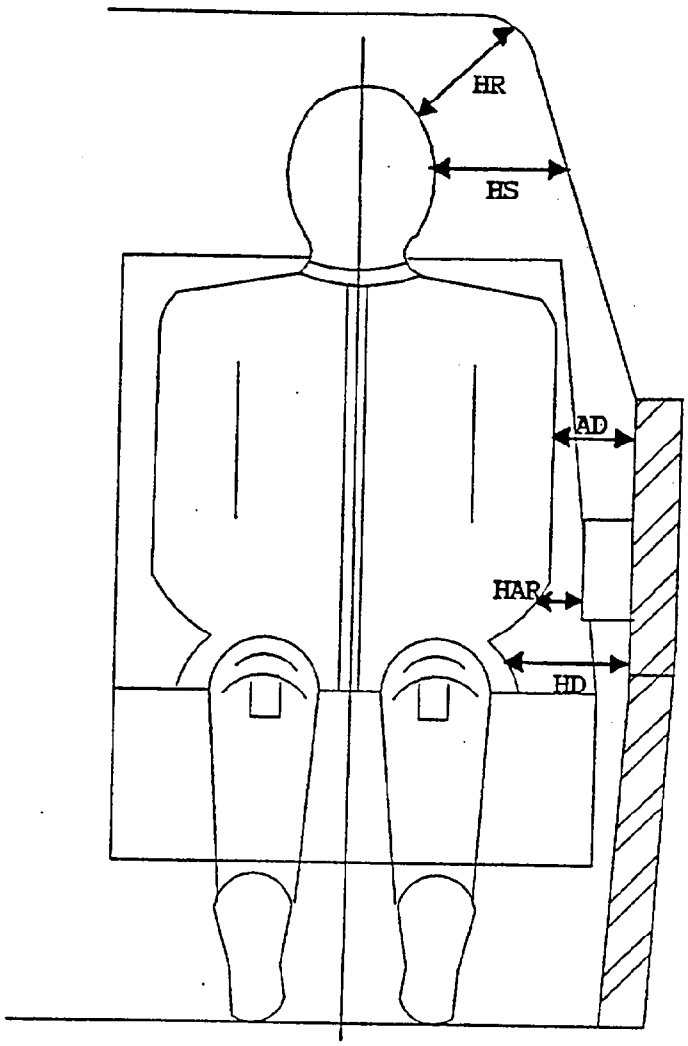
NOTE: All dimensions are in mm

	DRIVER ID #270	LEFT REAR PASSENGER ID #272	
HH	432	---	
HW	635	---	
HB	---	548	
CD	580	CB	391
CS	351	---	
KDL	126	KBL	68
KDR	120	KBR	70
PA°	23.2°	23.3°	
PHX	360	415	
PHZ	260	240	

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

FIGURE 4

SIDE IMPACT DUMMY (SID) LATERAL CLEARANCE DIMENSIONS



NOTE: All dimensions are in mm

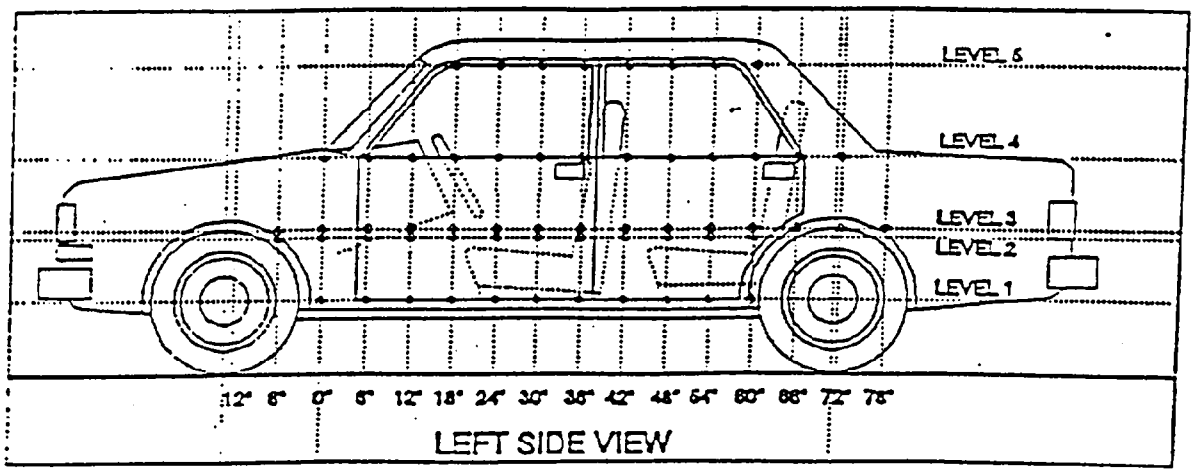
	DRIVER ID #270	LEFT REAR PASSENGER ID #272
HR	150	116
HS	250	200
AD	104	0
HD	204	75

FIGURE 5

VEHICLE SIDE MEASUREMENTS

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994



As tested height measurements are with respect to ground along the vertical 33" line shown above:

	33" Side Profile
Level 5 @ Window Top	= 1332 mm
Level 4 @ Window Sill	= 885 mm
Level 3 @ Mid Door	= 625 mm
Level 2 @ Occupant H-Point	= 470 mm
Level 1 @ Axle Centerline Height (or Sill Top Height)	= 265 mm

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH

LEVEL 1 AT AXLE CENTER LINE

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio/2 Door

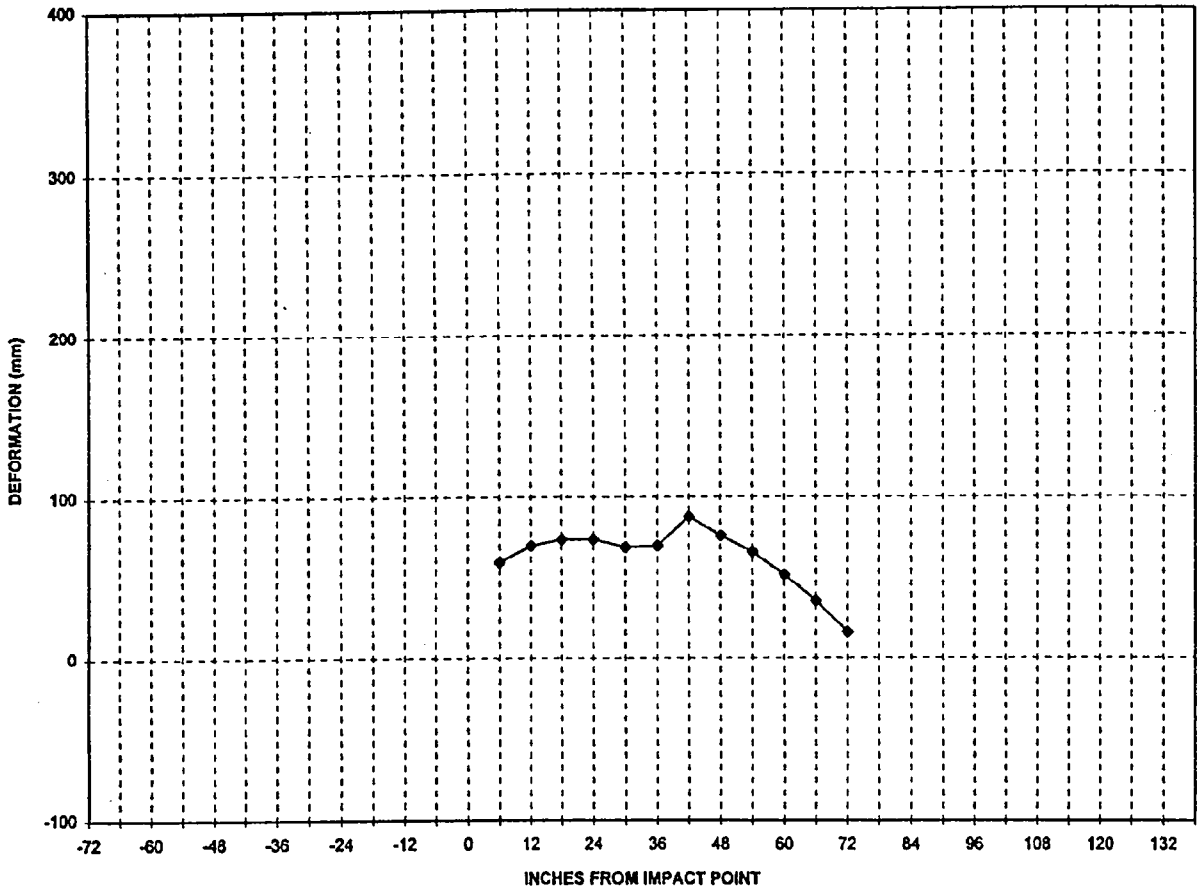
Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994

Longitudinal Distance (in)	PRE-TEST (mm)	POST-TEST (mm)	STATIC CRUSH (mm)	
-72	---	---	---	
-66	---	---	---	
-60	---	---	---	
-54	---	---	---	
-48	---	---	---	
-42	---	---	---	
-36	---	---	---	
-30	---	---	---	
-24	---	---	---	
-18	---	---	---	
-12	---	---	---	
-6	---	---	---	
0	---	---	---	(impact point)
6	875	935	60	
12	875	945	70	
18	874	948	74	
24	874	948	74	
30	874	943	69	
36	874	944	70	
42	869	952	88	
48	868	944	76	
54	870	936	66	
60	869	921	52	
66	869	904	35	
72	873	889	16	
78	---	---	---	
84	---	---	---	
90	---	---	---	
96	---	---	---	
102	---	---	---	
108	---	---	---	
114	---	---	---	
120	---	---	---	
126	---	---	---	
132	---	---	---	
138	---	---	---	

Reference plane is parallel to test vehicle longitudinal centerline
Given dimensions = reference plane to car body

FIGURE 6

VEHICLE EXTERIOR STATIC CRUSH



LEVEL 1 AT AXLE CENTER LINE

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH

LEVEL 2 AT OCCUPANT H-POINT

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

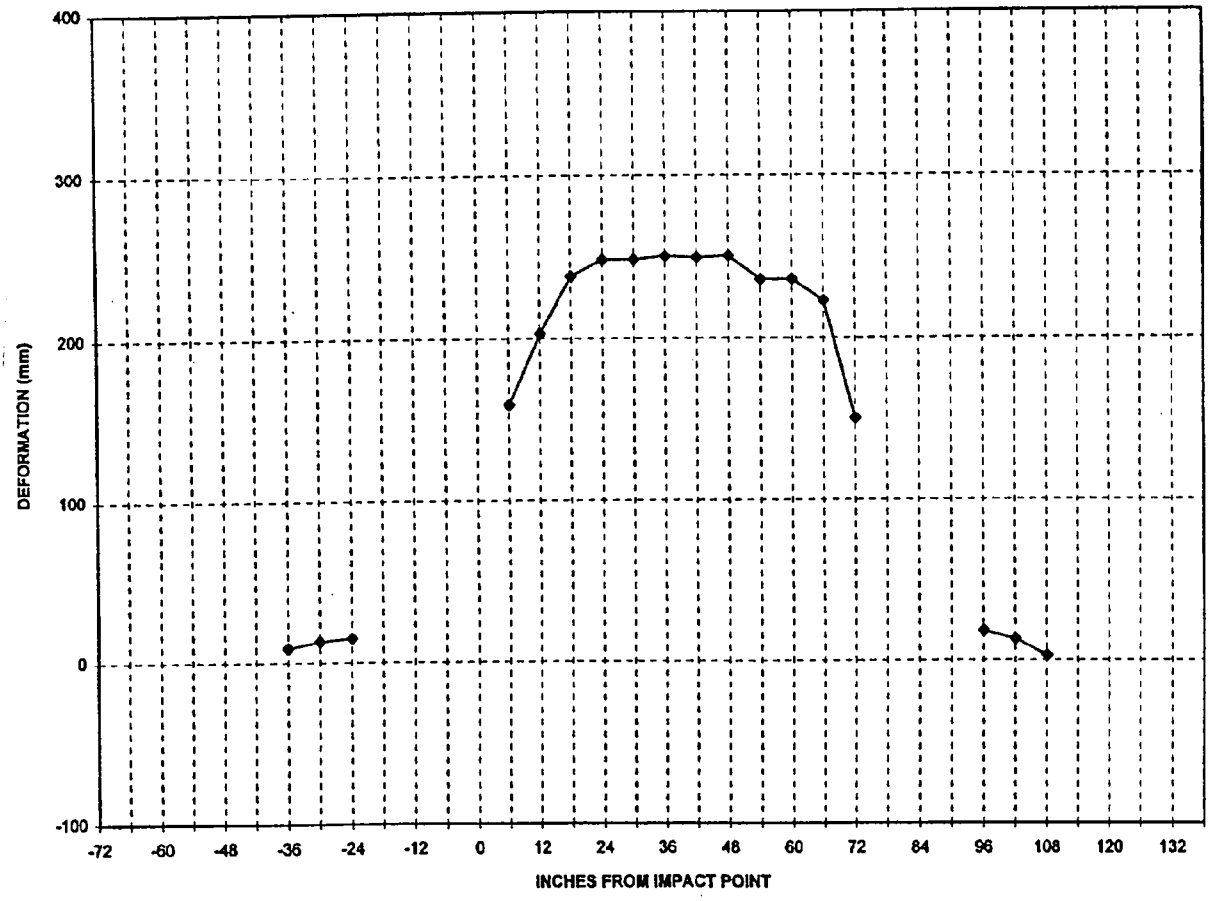
Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994

Longitudinal Distance (in)	PRE-TEST (mm)	POST-TEST (mm)	STATIC CRUSH (mm)	
-72	---	---	---	
-66	---	---	---	
-60	---	---	---	
-54	---	---	---	
-48	---	---	---	
-42	---	---	---	
-36	882	891	9	
-30	856	869	13	
-24	838	853	15	
-18	---	---	---	
-12	---	---	---	
-6	---	---	---	
0	---	---	---	(impact point)
6	825	985	160	
12	822	1025	203	
18	819	1057	238	
24	817	1065	248	
30	818	1066	248	
36	817	1067	250	
42	818	1067	249	
48	818	1068	250	
54	818	1054	236	
60	819	1055	236	
66	822	1045	223	
72	824	975	151	
78	---	---	---	
84	---	---	---	
90	---	---	---	
96	833	851	18	
102	857	870	13	
108	889	892	3	
114	---	---	---	
120	---	---	---	
126	---	---	---	
132	---	---	---	
138	---	---	---	
144	---	---	---	

Reference plane is parallel to test vehicle longitudinal centerline
Given dimensions = reference plane to car body

FIGURE 6 (Cont'd)

VEHICLE EXTERIOR STATIC CRUSH



LEVEL 2 AT OCCUPANT H-POINT

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH

LEVEL 3 AT MID-DOOR

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

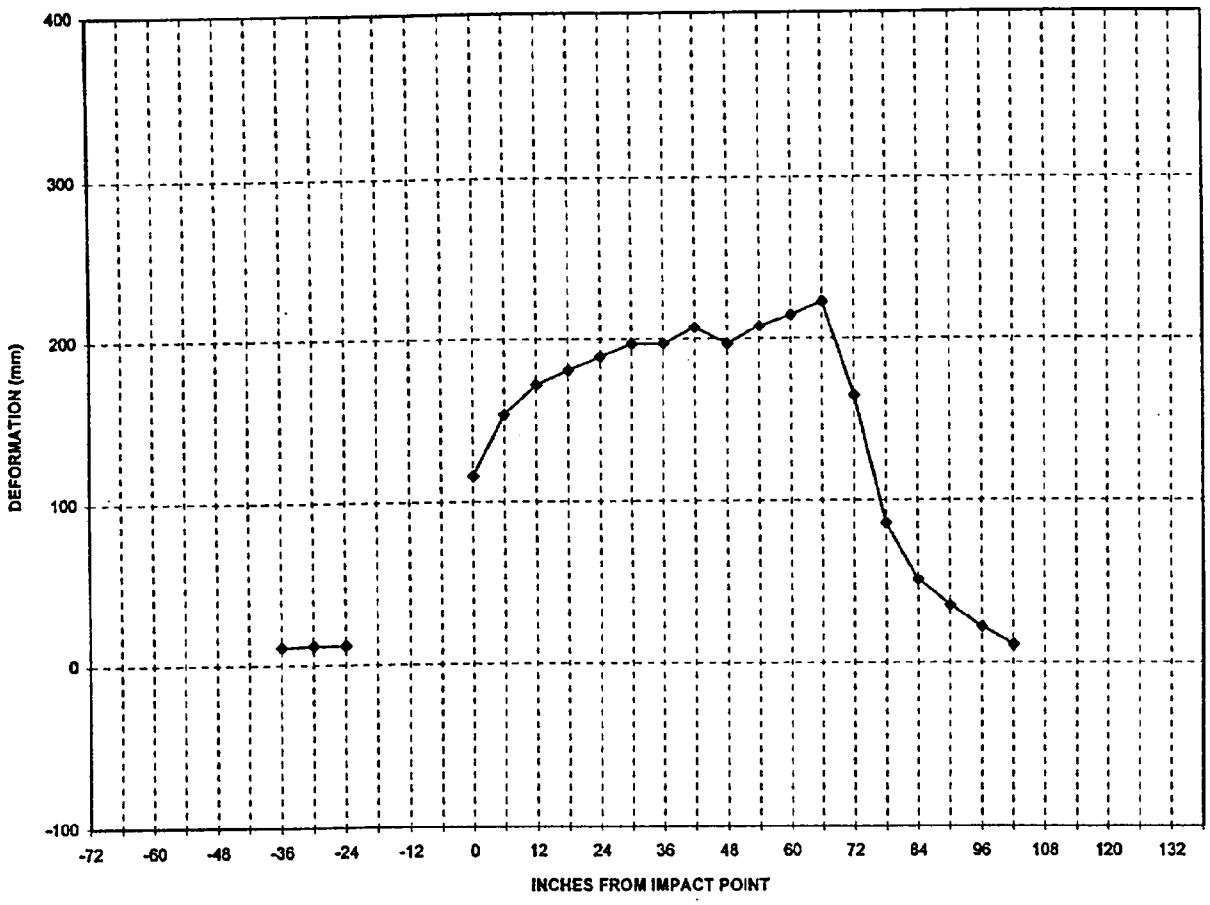
Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994

Longitudinal Distance (in)	PRE-TEST (mm)	POST-TEST (mm)	STATIC CRUSH (mm)	
-72	---	---	---	
-66	---	---	---	
-60	---	---	---	
-54	---	---	---	
-48	---	---	---	
-42	---	---	---	
-36	942	953	11	
-30	900	912	12	
-24	866	878	12	
-18	---	---	---	
-12	---	---	---	
-6	---	---	---	
0	824	940	116	(impact point)
6	824	978	154	
12	820	992	172	
18	818	999	181	
24	816	1005	189	
30	815	1012	197	
36	815	1012	197	
42	815	1022	207	
48	816	1013	197	
54	817	1025	208	
60	820	1035	215	
66	823	1046	223	
72	827	992	165	
78	823	909	86	
84	817	868	51	
90	830	865	35	
96	865	887	22	
102	897	908	11	
108	---	---	---	
114	---	---	---	
120	---	---	---	
126	---	---	---	
132	---	---	---	
138	---	---	---	

Reference plane is parallel to test vehicle longitudinal centerline
Given dimensions = reference plane to car body

FIGURE 6

VEHICLE EXTERIOR STATIC CRUSH



LEVEL 3 AT MID-DOOR

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH

LEVEL 4 AT WINDOW SILL

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

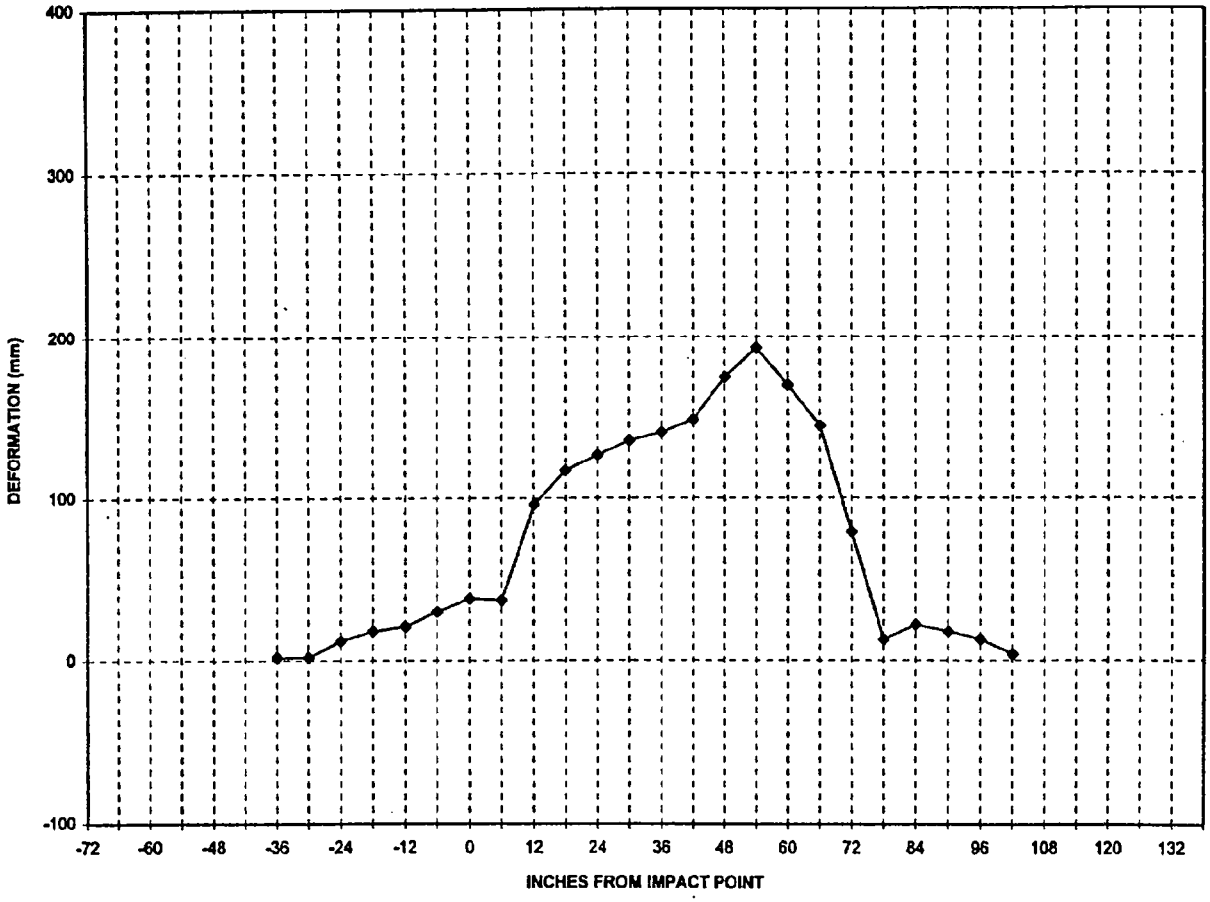
Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994

Longitudinal Distance (in)	PRE-TEST (mm)	POST-TEST (mm)	STATIC CRUSH (mm)	
-72	---	---	---	
-66	---	---	---	
-60	---	---	---	
-54	---	---	---	
-48	---	---	---	
-42	---	---	---	
-36	1008	1010	2	
-30	990	992	2	
-24	955	967	12	
-18	936	954	18	
-12	918	939	21	
-6	900	930	30	
0	899	937	38	(impact point)
6	899	966	37	
12	892	988	96	
18	891	1008	117	
24	887	1014	127	
30	886	1022	136	
36	887	1028	141	
42	887	1036	149	
48	888	1063	175	
54	888	1081	193	
60	891	1061	170	
66	896	1041	145	
72	902	981	79	
78	910	923	13	
84	918	940	22	
90	933	951	18	
96	951	964	13	
102	977	981	4	
108	---	---	---	
114	---	---	---	
120	---	---	---	
126	---	---	---	
132	---	---	---	
138	---	---	---	
144	---	---	---	

Reference plane is parallel to test vehicle longitudinal centerline
Given dimensions = reference plane to car body

FIGURE 6

VEHICLE EXTERIOR STATIC CRUSH



LEVEL 4 AT WINDOW SILL

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH

LEVEL 5 AT WINDOW TOP

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

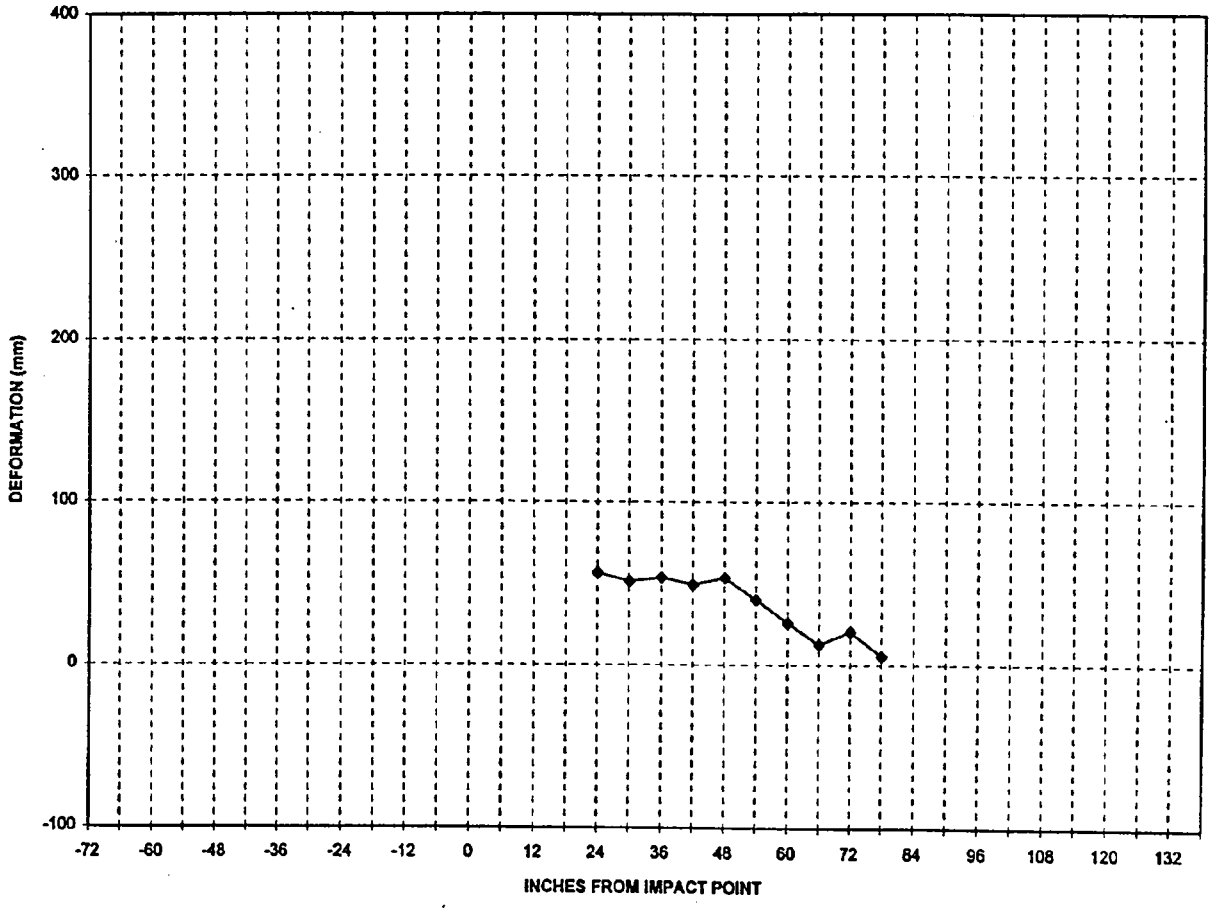
Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994

Longitudinal Distance (in)	PRE-TEST (mm)	POST-TEST (mm)	STATIC CRUSH (mm)	
-72	---	---	---	
-66	---	---	---	
-60	---	---	---	
-54	---	---	---	
-48	---	---	---	
-42	---	---	---	
-36	---	---	---	
-30	---	---	---	
-24	---	---	---	
-18	---	---	---	
-12	---	---	---	
-6	---	---	---	
0	---	---	---	(impact point)
6	---	---	---	
12	---	---	---	
18	---	---	---	
24	1099	1155	56	
30	1089	1140	51	
36	1087	1140	53	
42	1089	1138	49	
48	1089	1142	53	
54	1090	1130	40	
60	1097	1123	26	
66	1110	1123	13	
72	1127	1148	21	
78	1136	1142	6	
84	---	---	---	
90	---	---	---	
96	---	---	---	
102	---	---	---	
108	---	---	---	
114	---	---	---	
120	---	---	---	
126	---	---	---	
132	---	---	---	
138	---	---	---	

Reference plane is parallel to test vehicle longitudinal centerline
Given dimensions = reference plane to car body

FIGURE 6

VEHICLE EXTERIOR STATIC CRUSH



LEVEL 5 AT WINDOW TOP

FIGURE 7

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994

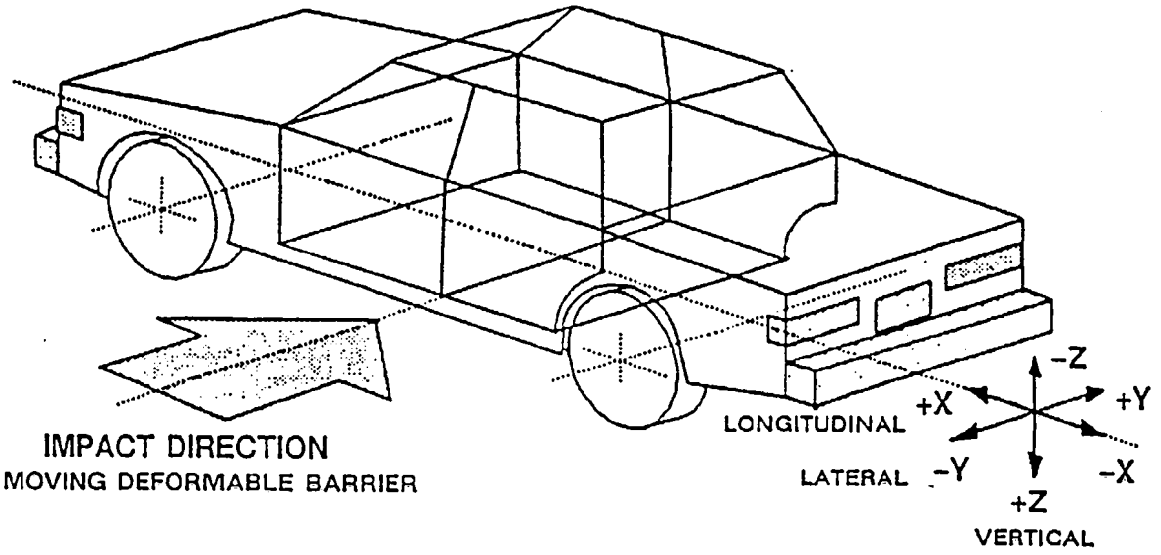


FIGURE 8

MDB FACE DIMENSIONS

Measurements in inches

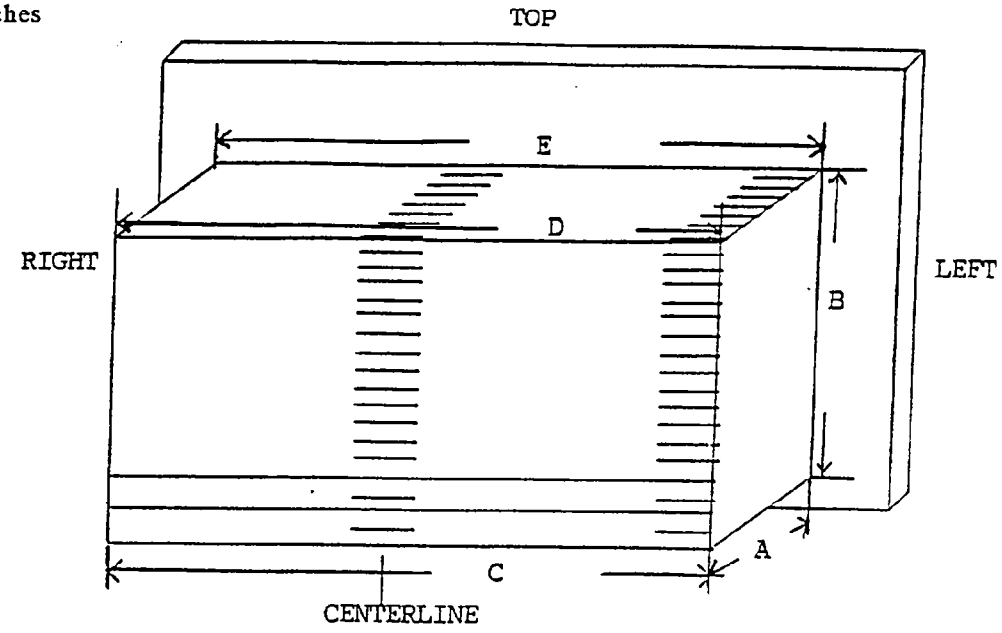
A = 15.Ø

B = 22.1

C = 66.Ø

D = 66.1

E = 66.1



Measurements in inches

	Right	Left
A =	11.1	1Ø.9
B =	13.1	12.9
C =	21.Ø	21.Ø
D =	33.Ø	33.Ø

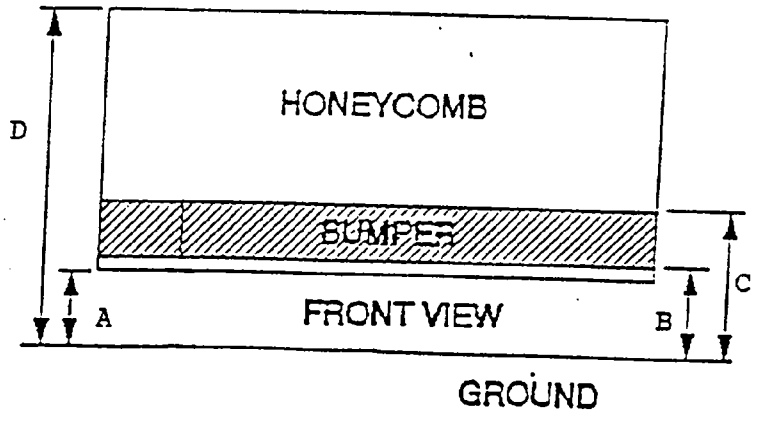


TABLE 8

EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994

Location	Top of Stack (33 inches)	Mid-Stack (27 inches)	Top of Bumper (21 inches)	Center of Bumper (17 inches)	
Horizontal Distance From Center	Crush inches (mm)	Crush inches (mm)	Crush inches (mm)	Crush inches (mm)	
32"	1.9 (49)	1.2 (30)	1.5 (39)	4.2 (106)	Right
28"	.6 (14)	0 (0)	1.2 (30)	3.9 (100)	
24"	.2 (5)	.1 (2)	1.2 (27)	3.6 (91)	
20"	.1 (2)	.1 (2)	.9 (24)	3.4 (87)	
16"	.1 (2)	.1 (2)	.9 (24)	3.4 (87)	
12"	.1 (2)	0 (0)	.7 (17)	3.1 (81)	
8"	.1 (2)	0 (0)	.6 (14)	2.8 (71)	
4"	.1 (2)	0 (0)	.6 (14)	2.7 (68)	
0"	.1 (3)	0 (0)	.6 (14)	2.7 (68)	
4"	.2 (5)	.1 (2)	.6 (14)	2.6 (65)	Left
8"	.2 (6)	.1 (2)	.7 (18)	2.7 (68)	
12"	.3 (8)	.1 (2)	.6 (14)	2.7 (68)	
16"	.4 (11)	.2 (5)	.6 (14)	2.7 (68)	
20"	1.1 (29)	.2 (6)	.8 (21)	3.0 (76)	
24"	2.0 (51)	.8 (20)	1.2 (30)	3.4 (87)	
28"	2.4 (60)	1.7 (43)	2.0 (52)	4.7 (119)	
32"	3.8 (97)	3.7 (94)	3.2 (81)	4.3 (109)	

TABLE 9

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994

Accel. No.	Description	Coordinates (mm)*			Long. (X) Maximums (g's)		Lat. (Y) Maximums (g's)		Vert. (Z) Maximums (g's)		Resultant (g's)
		X	Y	Z	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Max.
1	Rt. Side Sill @ Front Seat	2660	614	230	5.9	3.7	22.9	2.9	4.6	5.9	26.3
2	Rt. Side Sill @ Rear Seat	1652	588	200	6.3	4.5	26.8	4.0	4.6	9.6	27.9
3	Rr. Floorpan Above Axle	948	0	330	5.5	4.5	28.6	2.3	19.5	12.5	28.7
4	Left Side Sill @ Rr. Seat	1271	716	182	---	---	**	**	---	---	---
5	Left Side Sill @ Frt. Seat	2119	716	190	---	---	24.2	4.2	---	---	---
6	Left A-Post Lower	2711	698	357	---	---	43.0	10.6	---	---	---
7	Left Mid A-Post	2784	743	748	---	---	61.3	9.8	---	---	---
8	Left Mid B-Post	1597	678	704	---	---	126.8	***	---	---	---
9	Left B-Post Lower	1590	678	472	---	---	111.2	20.5	---	---	---
10	Right Rear Occupant Compartment	1544	274	280	---	---	28.3	.7	---	---	---

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

** Accelerometer came loose during impact

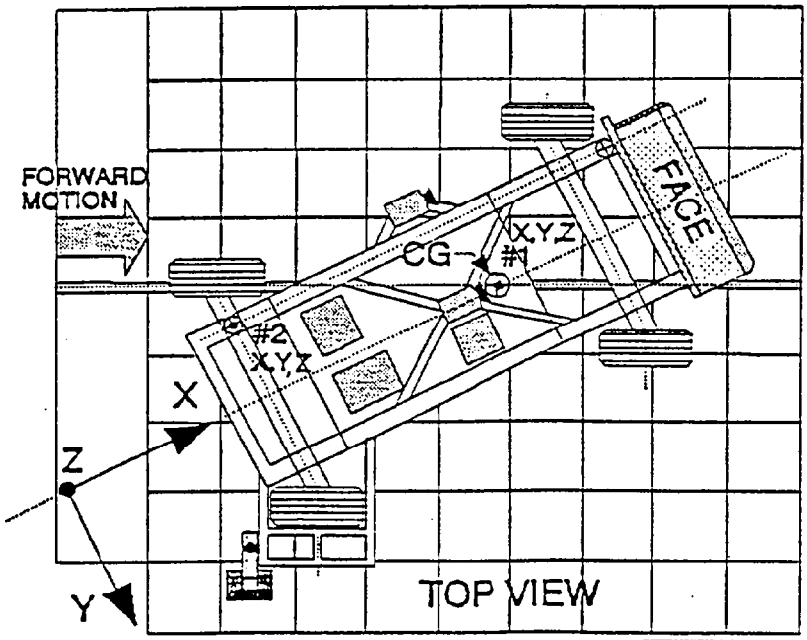
*** Data loss 30 msec. after impact

FIGURE 9

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994



Accel. No.	Location	Coordinates (mm)			Pos. Direct.		Neg. Direct.	
		X	Y	Z	Max (g)	Time (msec)	Max (g)	Time (msec)
1	MDB Center of Gravity Longitudinal ... X Lateral ..... Y Vertical ..... Z Resultant ..... R	-1092	0	483	0.6 2.7 12.3 22.2	188 -20 34 34	18.7 8.1 14.8 ---	40 38 21 ---
2	Rear Frame Member Longitudinal ... X Lateral ..... Y	-2591	-625	622	2.4 10.1	113 59	19.3 72.1	37 9.3

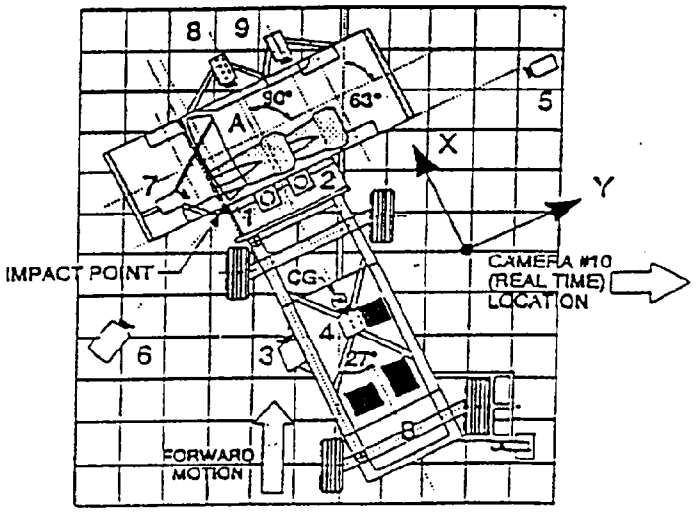
Reference: X = Front Axle (+Forward)
Y = Vehicle Centerline (+ To Right)
Z = Ground Level (+ Up)

FIGURE 10

HIGH SPEED CAMERA LOCATIONS AND DATA

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994



Camera No.	View	Coordinates (mm)			Angle	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
	Real Time					13	24
1	Top Impact	-350	850	5420		13	943
2	Top Wide	700	0	5130		8	1099
3	Cart Pointer					35	935
4	Cart					13	1005
5	Right Impact	3330	-7740	1015		25	885
6	Left Overall	-2620	2440	1665		13	975
7	Onboard Driver					8	930
8	Onboard Hood					13	1000
9	Onboard Passenger					8	1000

* Reference: (from point of impact)
+X = Forward
+Y = To Right
+Z = Upward

TABLE 1Ø

FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

FMVSS NO. 3Ø1

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

Vehicle NHTSA No.: CS58ØØ TEST DATE: November 3Ø, 1994

Test vehicle fuel tank filled to 92% to 94% of manufacturer's "useable" capacity and with electric fuel pump operating (if it will operate without engine operation). Part 572 test dummies located at each front designated seating position.

TEST VEHICLE IMPACT TYPE: X Side Impact MDB (32.8 kph)

FUEL SPILLAGE MEASUREMENT:

	ACTUAL	MAX ALLOWED
1. From impact until vehicle motion ceases	Ø	1 oz.
2. For 5 minute period after vehicle motion ceases	Ø	5 oz.
3. For next 25 minutes	Ø	1 oz./1 MIN

SOLVENT SPILLAGE DETAILS:

None

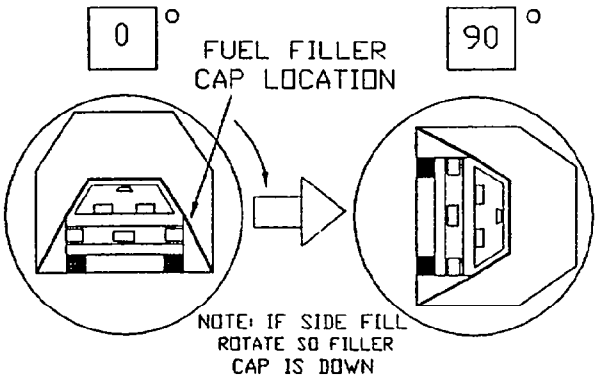
TABLE 11

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994

TEST PHASE: 0° - 90°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 43 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 43 seconds

Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min FROM onset of rotation	6th min.	7th min.	8th min. if reqd.

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0

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

IV. SOLVENT SPILLAGE LOCATIONS(S): None

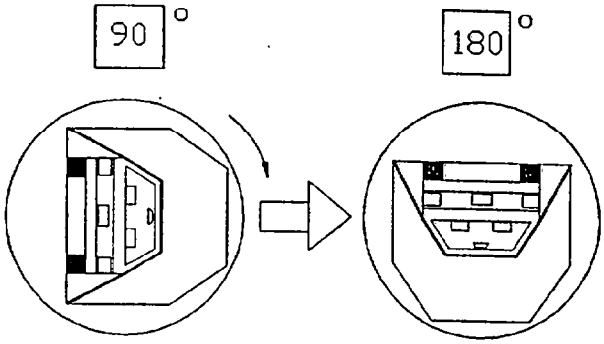
TABLE 11

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994

TEST PHASE: 90° - 180°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 30 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 30 seconds

Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min FROM onset of rotation	6th min.	7th min.	8th min. if reqd.

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0

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

IV. SOLVENT SPILLAGE LOCATIONS(S): None

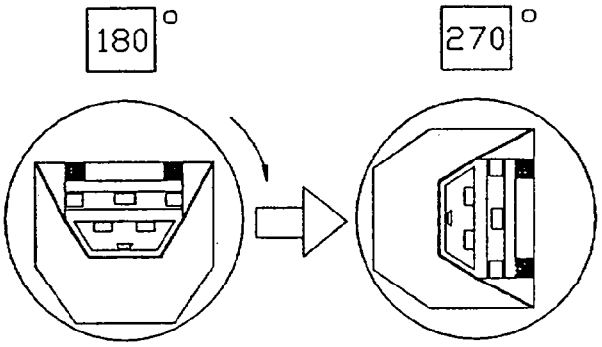
TABLE 11

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994

TEST PHASE: 180° - 270°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 18 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 18 seconds

Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min FROM onset of rotation	6th min.	7th min.	8th min. if reqd.

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0

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

IV. SOLVENT SPILLAGE LOCATIONS(S): None

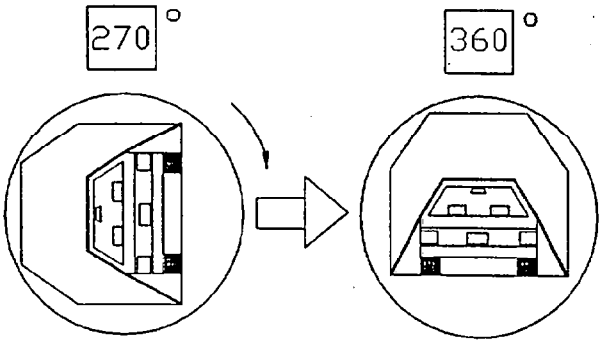
TABLE 11

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

Year/Make/Model/Body Style: 1995/Volkswagen/Cabrio (Convertible)/2 Door

Vehicle NHTSA No.: CS5800 TEST DATE: November 30, 1994

TEST PHASE: 270° - 360°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 50 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 50 seconds

Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min FROM onset of rotation	6th min.	7th min.	8th min. if reqd.

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0

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

IV. SOLVENT SPILLAGE LOCATIONS(S): None

APPENDIX A - PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

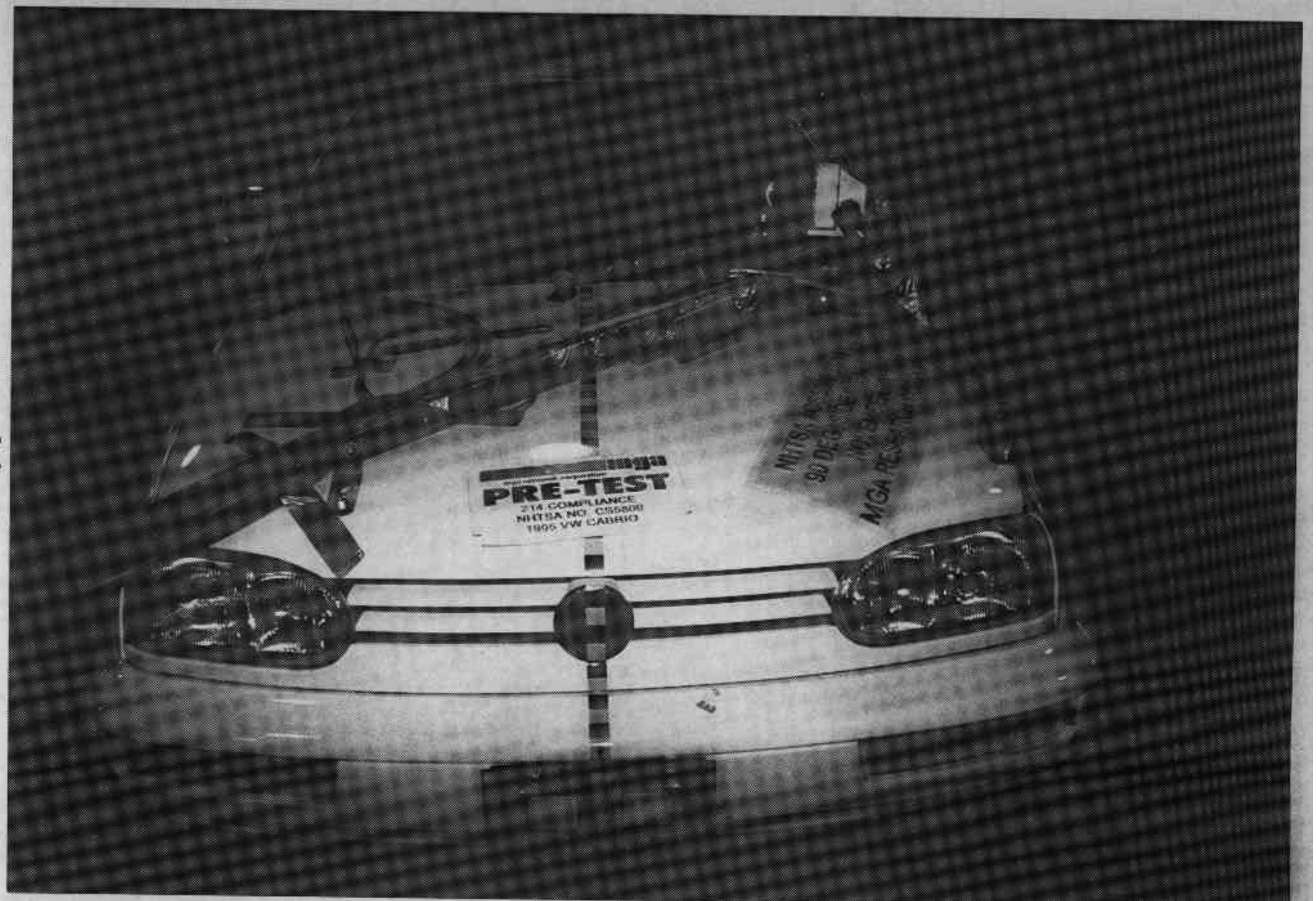


Photo No. A-1 - Pre-Test Front View of Test Vehicle

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

A-3

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 MDB Positioned Against Vehicle (left side)

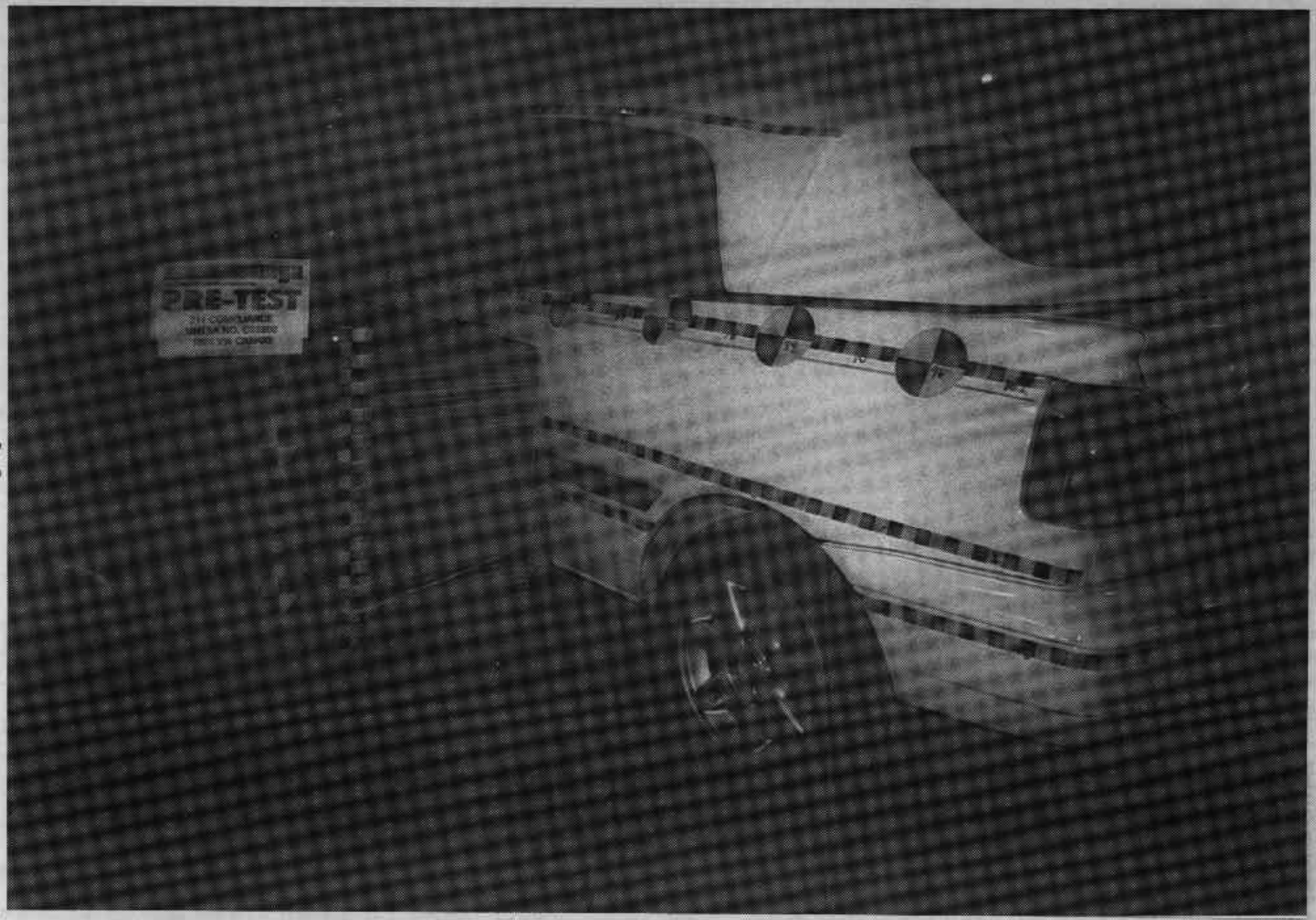


Photo No. A-8 - Pre-Test MDB Positioned Against Vehicle (right side)

Photo No. A-9 - Pre-Test MDB Position Against Vehicle Overhead View

Photo No. A-1Ø - Post-Test MDB and Vehicle Left Side Front View

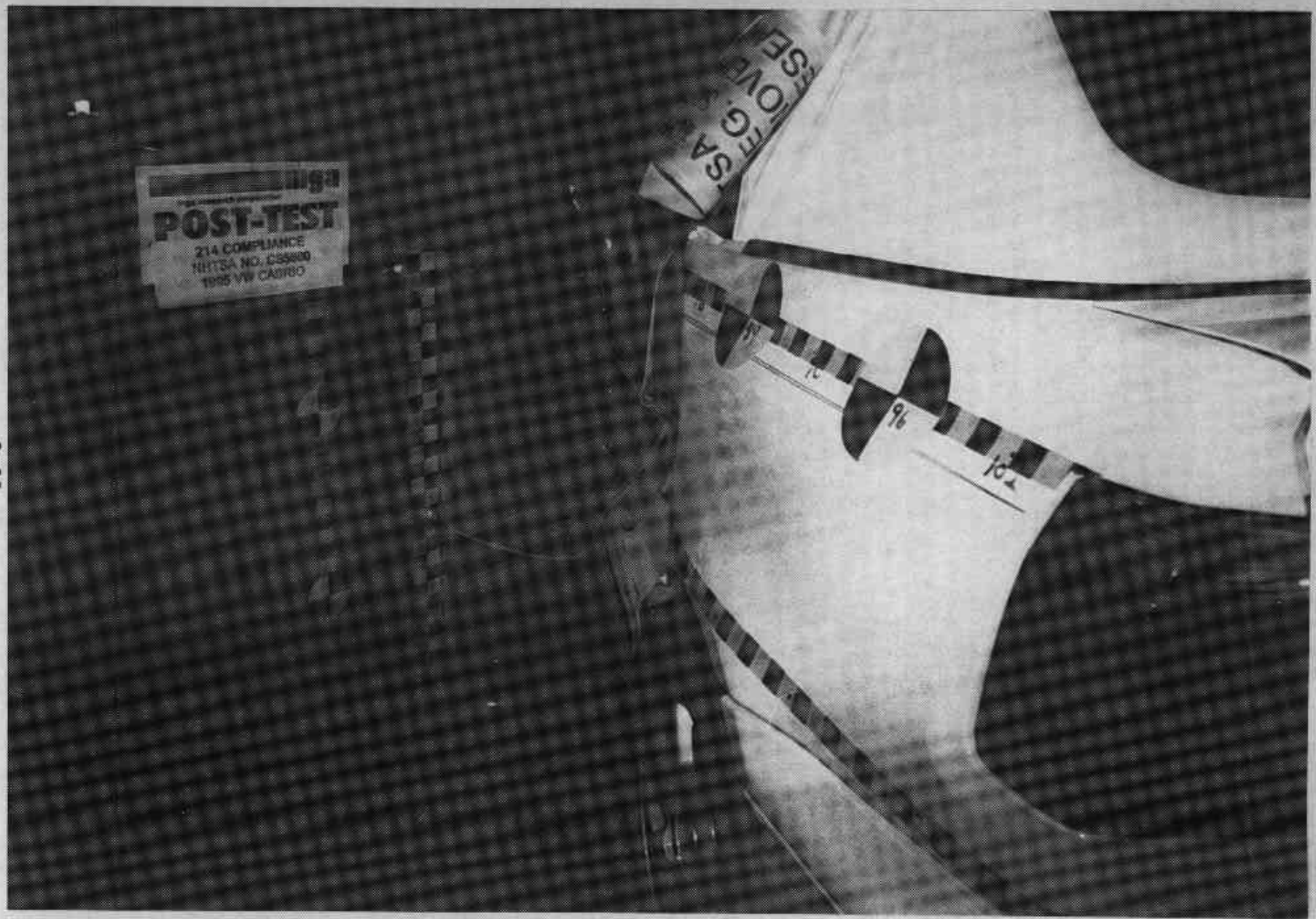


Photo No. A-11 - Post-Test MDB and Vehicle Right Side Rear View

Photo No. A-12 - Pre-Test MDB Top View

Photo No. A-13 - Post-Test MDB Top View

Photo No. A-14 - Pre-Test MDB Front View

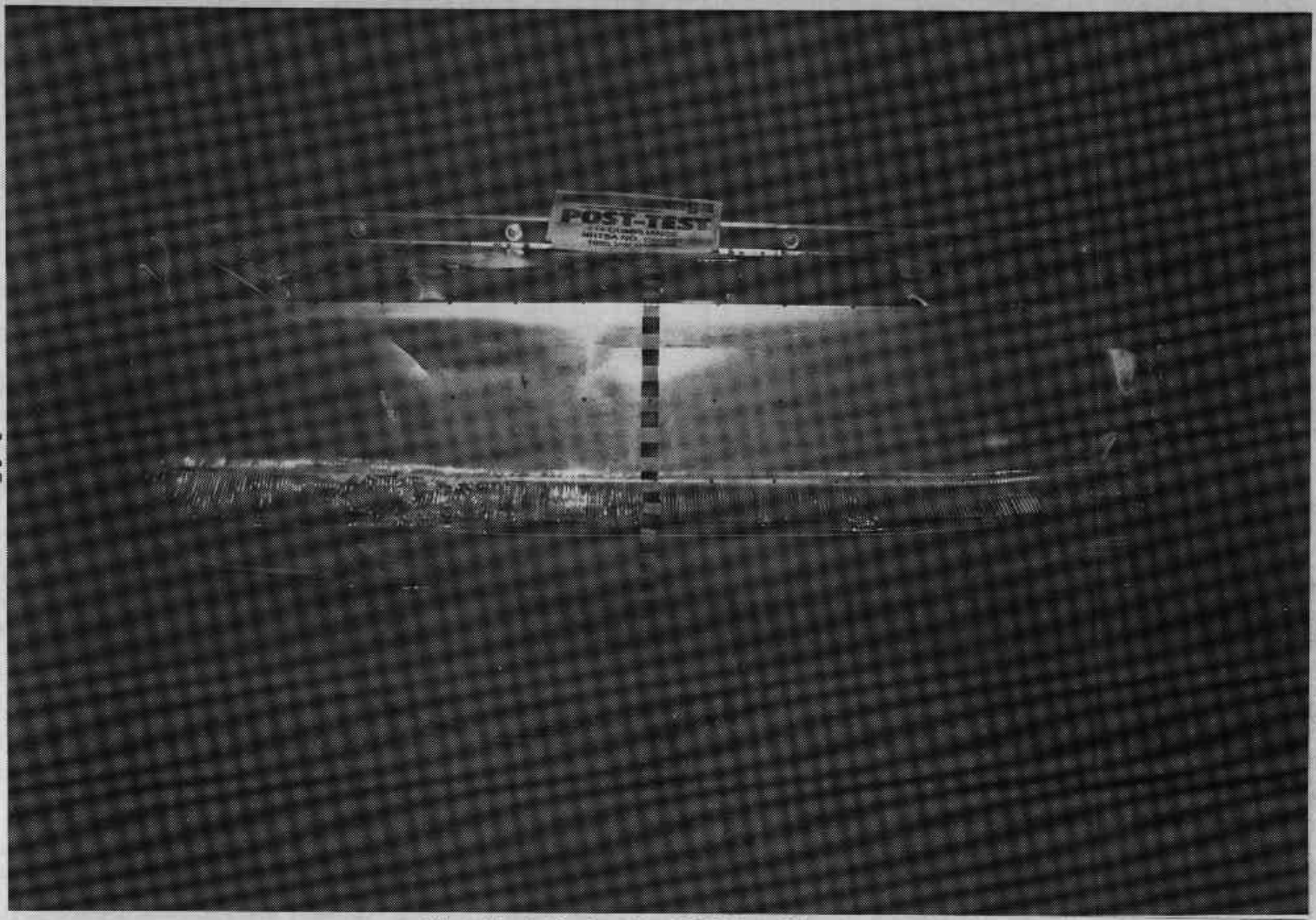


Photo No. A-15 - Post-Test MDB Front View

Photo No. A-16 - Pre-Test MDB Left Side View

Photo No. A-17 - Post-Test MDB Left Side View

Photo No. A-18 - Pre-Test MDB Right Side View

Photo No. A-19 - Post-Test MDB Right Side View

Photo No. A-20 - Post-Test MDB and Vehicle Overhead View

Photo No. A-21 - Pre-Test Driver Dummy Right Side View

Photo No. A-22 - Post-Test Driver Dummy Right Side View

Photo No. A-23 - Pre-Test Driver Dummy Left Side View

Photo No. A-24 - Post-Test Driver Dummy Left Side View

Photo No. A-25 - Pre-Test Driver Dummy Left Side View (Door Open)

Photo No. A-26 - Pre-Test Driver Dummy Shoulder and Door Top View

Photo No. A-27 - Post-Test Driver Dummy Shoulder and Door Top View

Photo No. A-28 - Post-Test Driver Dummy Contact

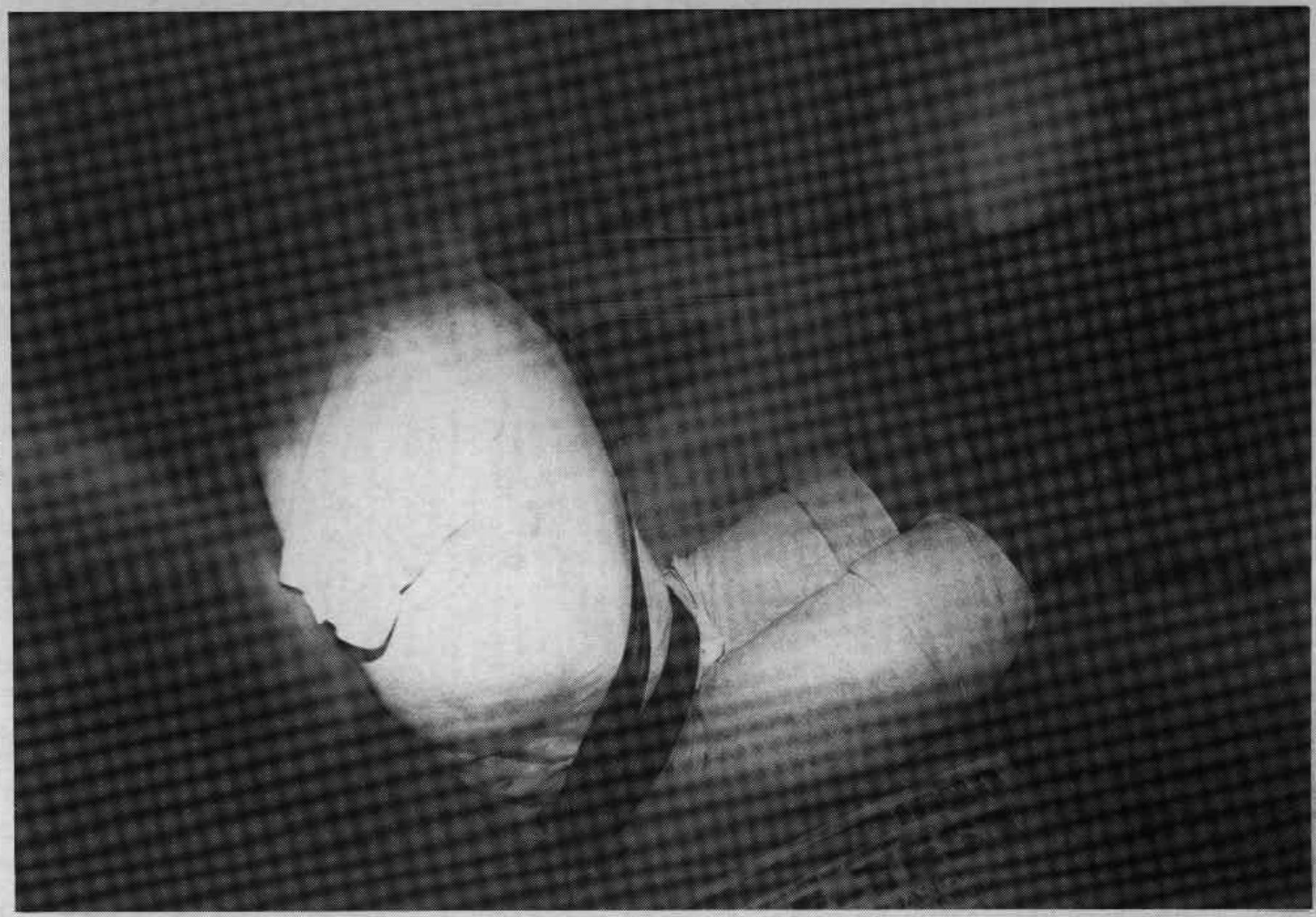


Photo No. A-29 - Pre-Test Passenger Dummy Right Side View

Photo No. A-38 - Post-Test Passenger Dummy Right Side View

Photo No. A-31 - Pre-Test Passenger Dummy Left Side View

Photo No. A-32 - Post-Test Passenger Dummy Left Side View

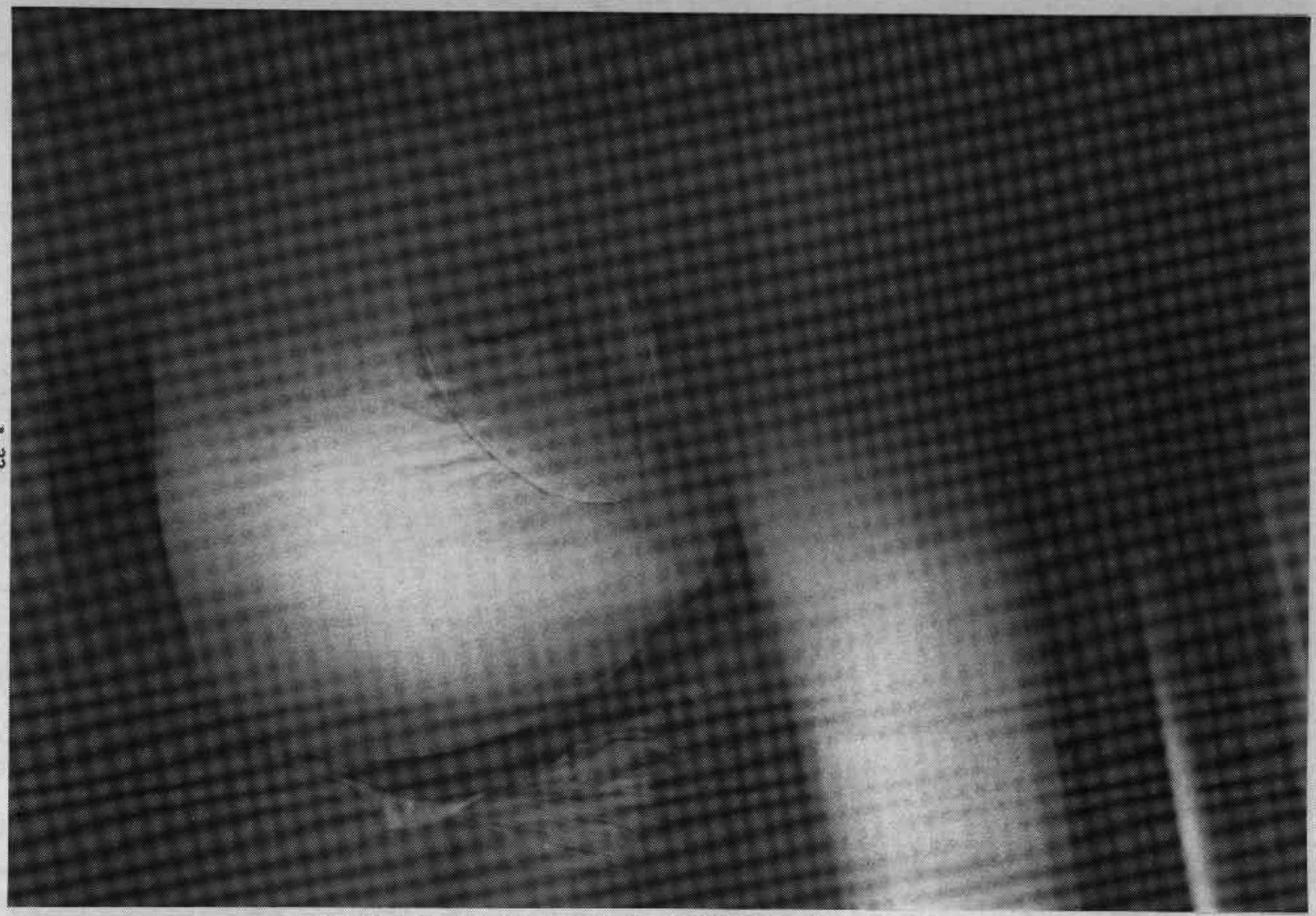


Photo No. A-33 - Pre-Test Passenger Dummy Shoulder and Door Top View

Photo No. A-34 - Post-Test Passenger Dummy Shoulder and Door Top View

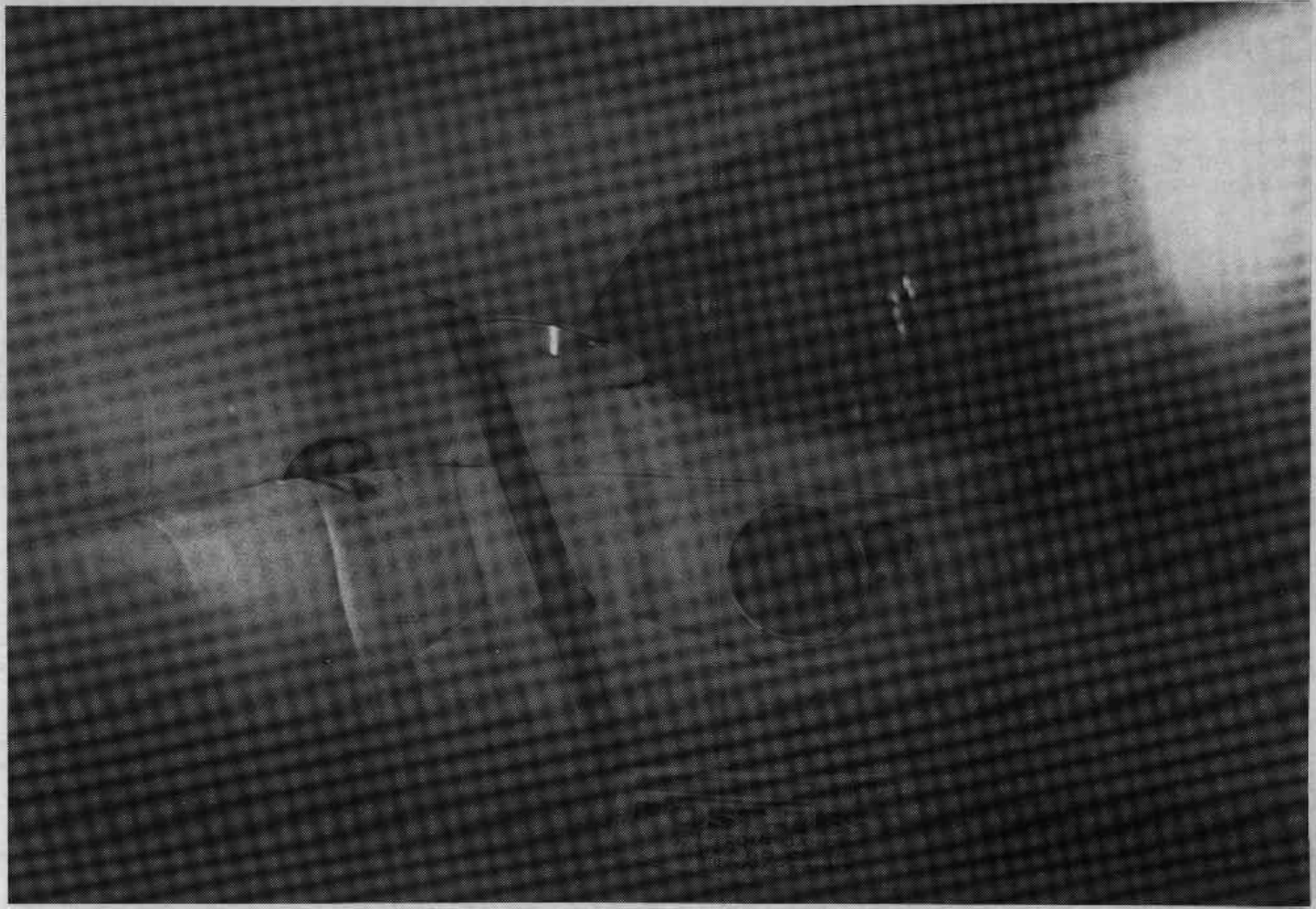


Photo No. A-35 - Post-Test Passenger Dummy Contact

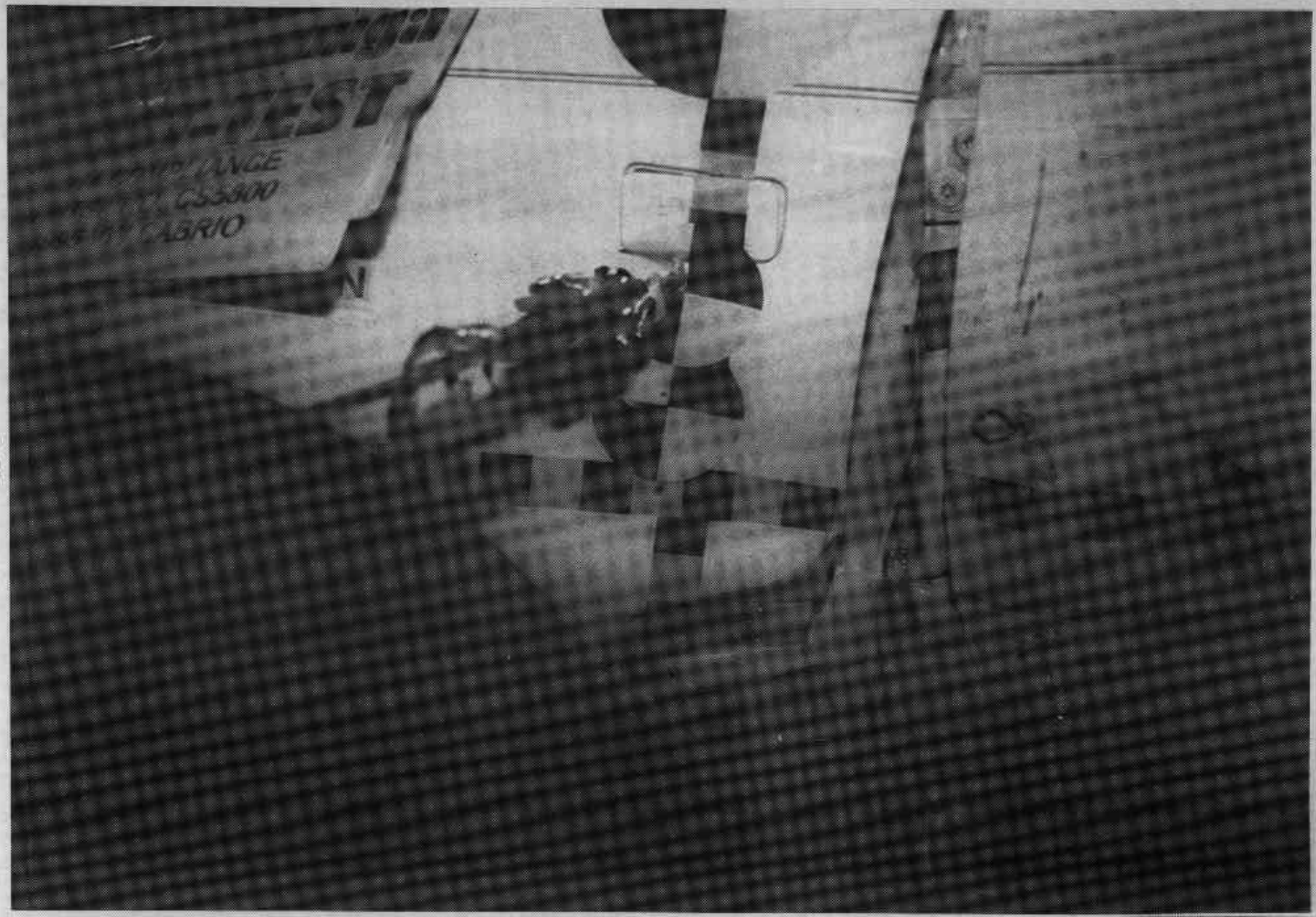


Photo No. A-36 - Left Front Impact Point on Vehicle

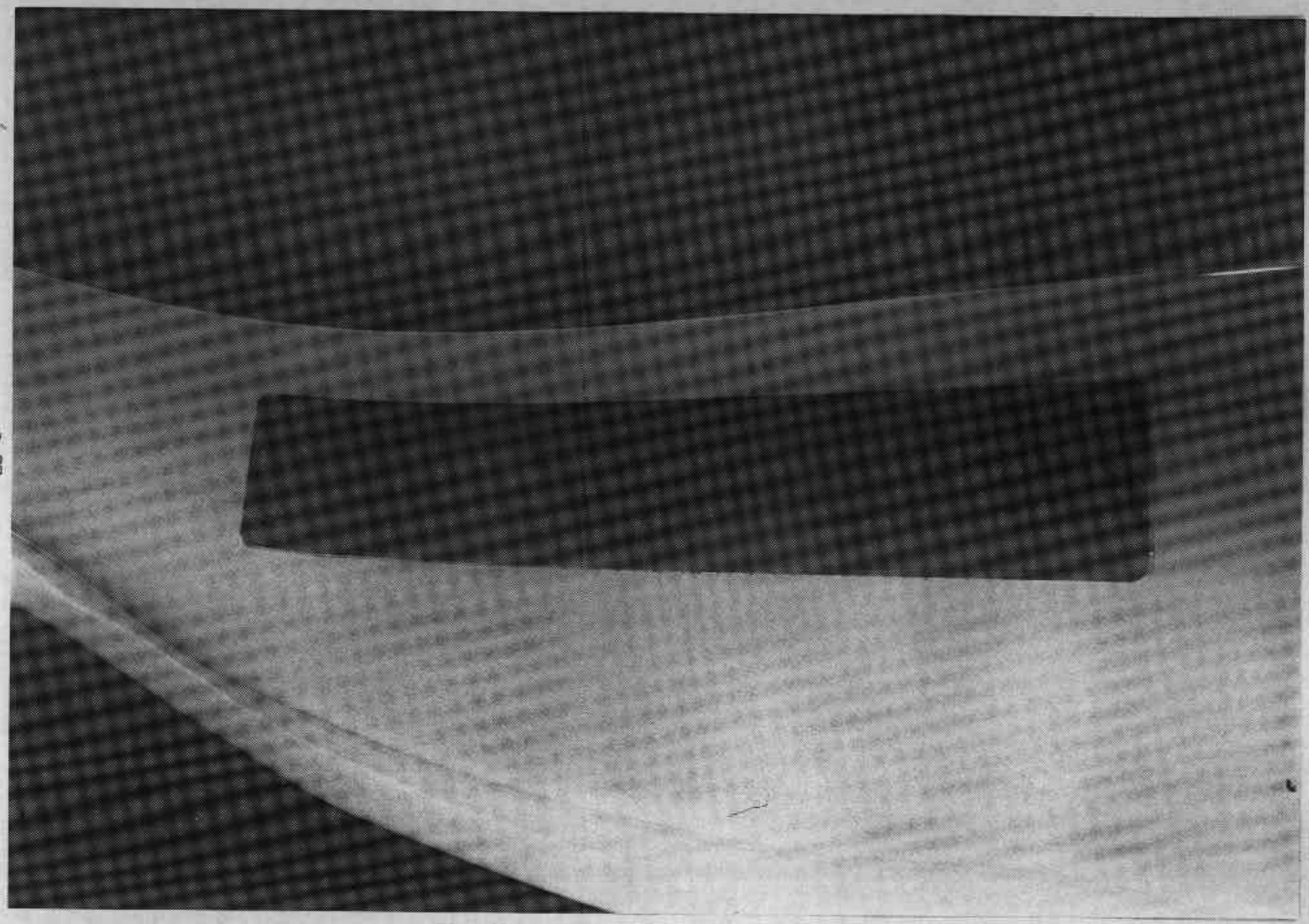


Photo No. A-37 - Vehicle Certification Label

Photo No. A-38 - Tire Placard

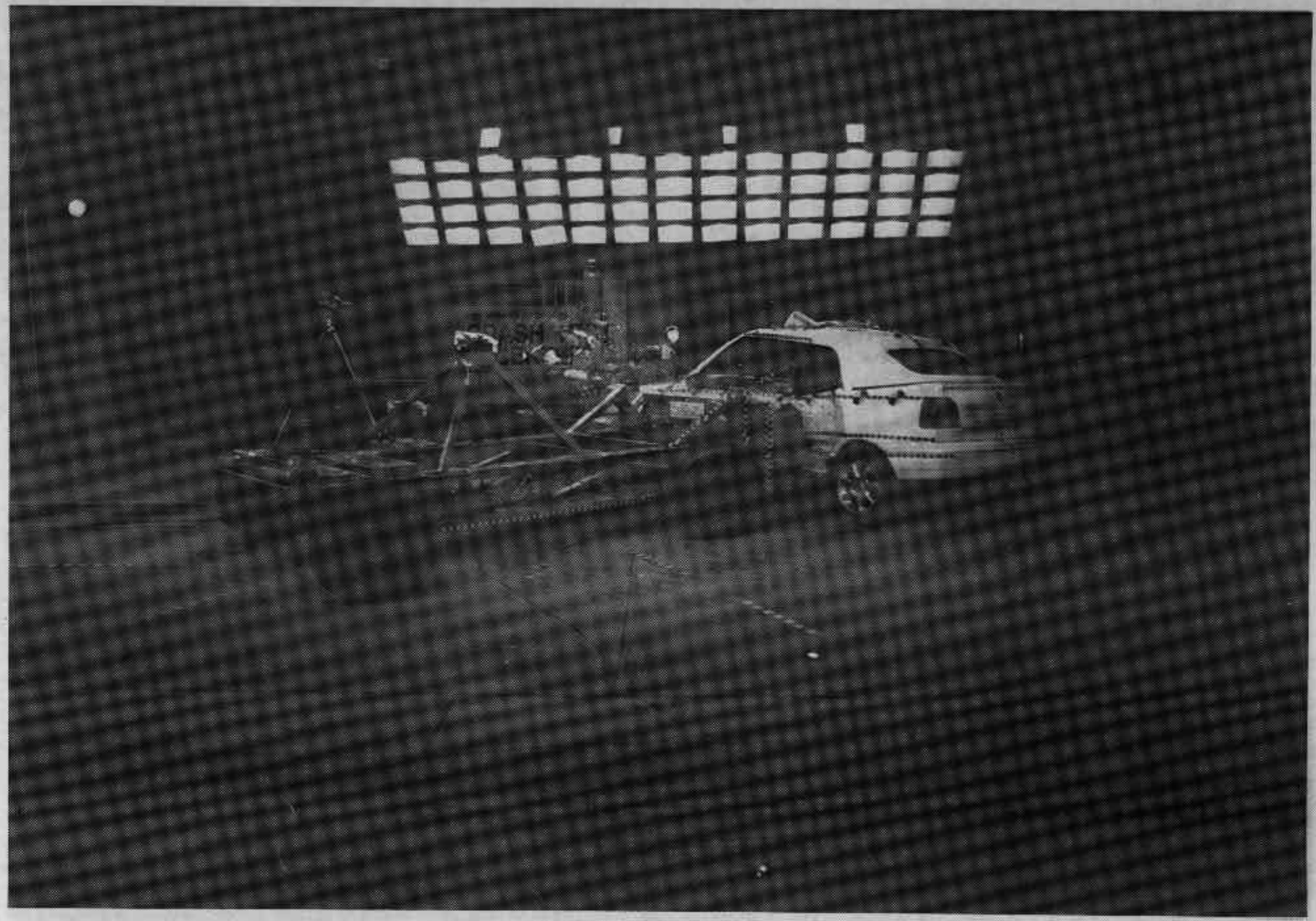


Photo No. A-39 - Impact

Photo No. A-40 - Rollover 90°

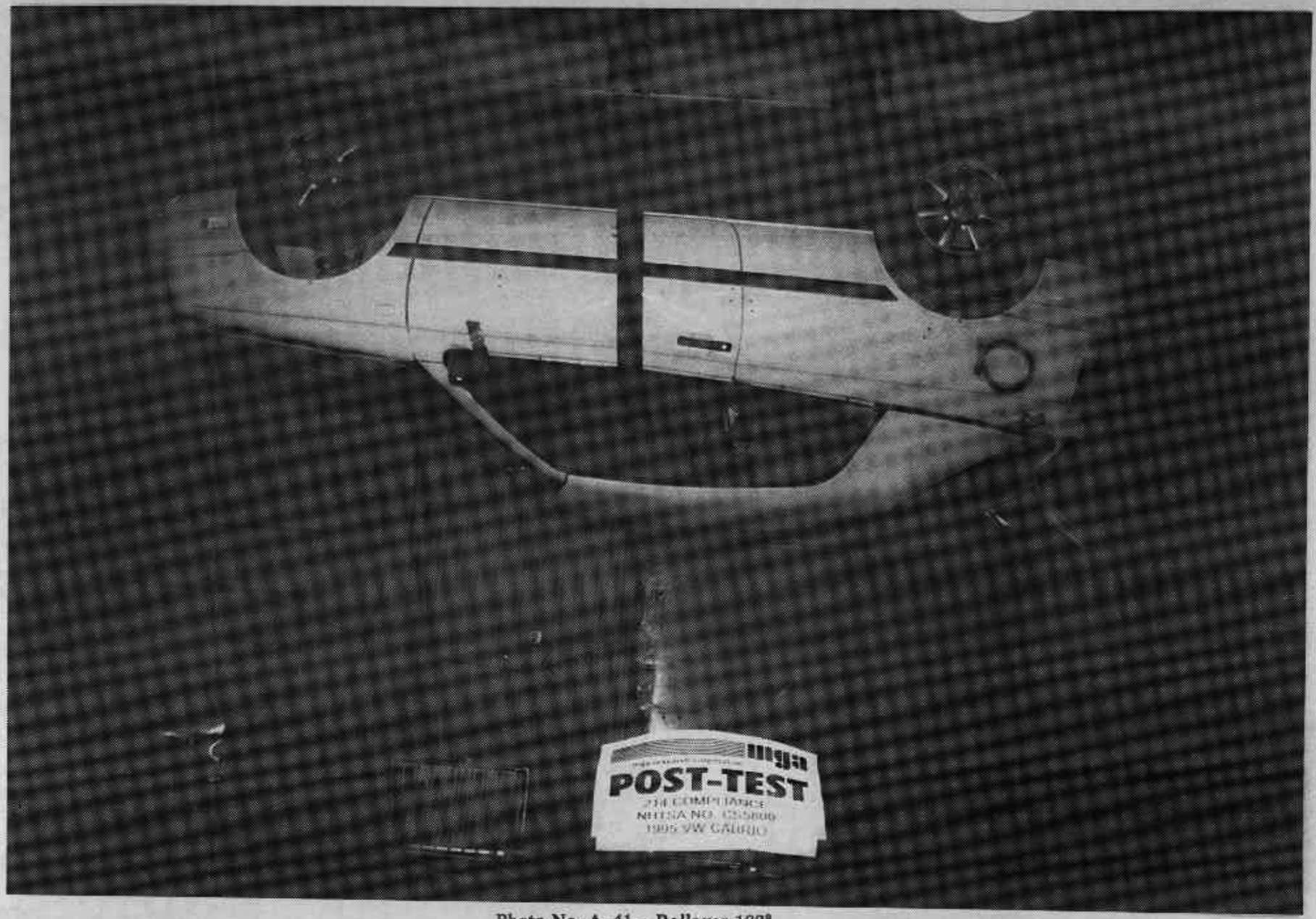


Photo No. A-41 - Rollover 180°

Photo No. A-42 - Rollover 270°

Photo No. A-43 - Rollover 360°

APPENDIX B - DATA PLOTS

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Table of Data Plots

Table of Data Plots

Filter: Class 1000 (1650 Hz)

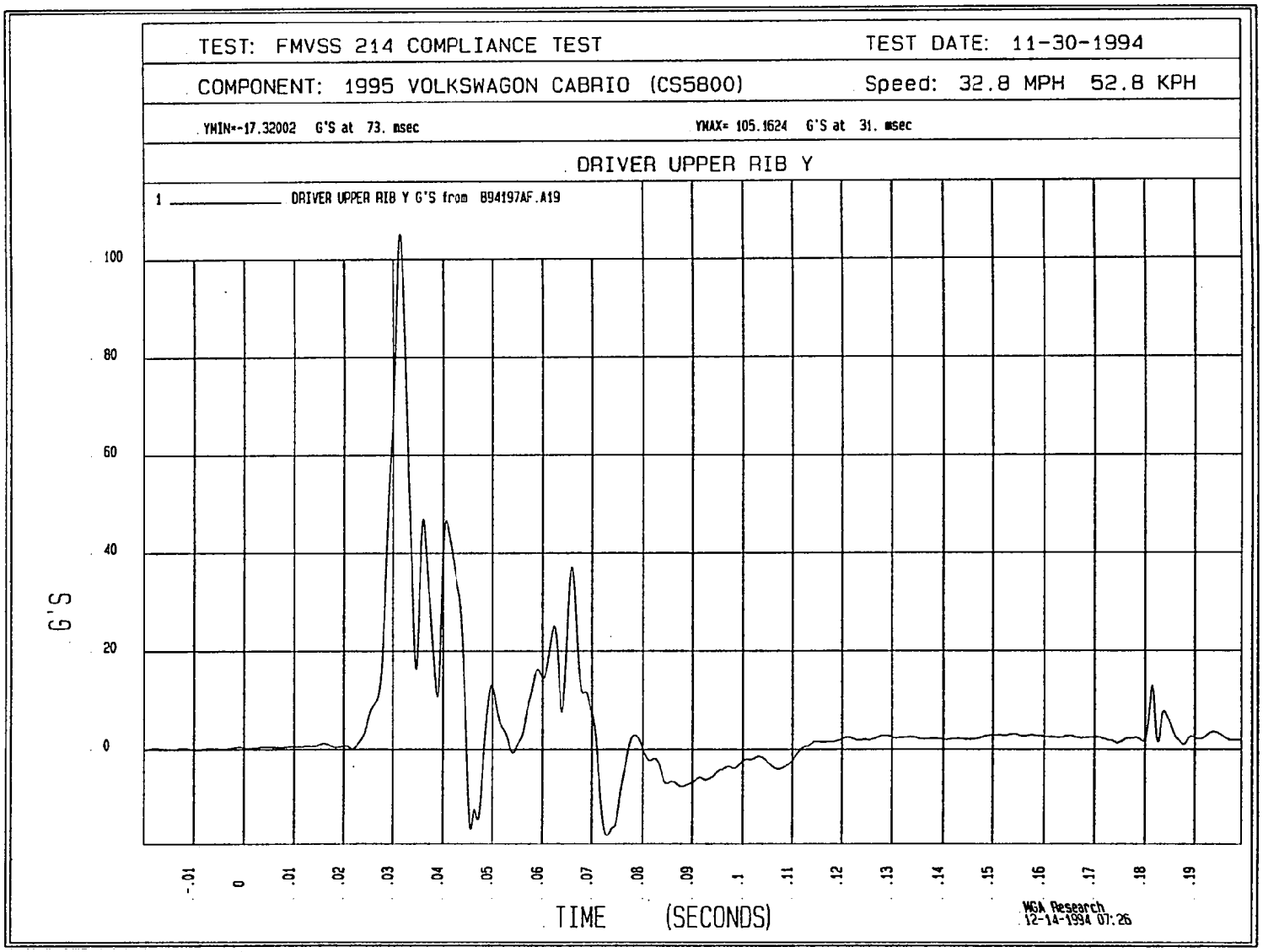


Figure B-1 - Driver Upper Rib Y Acceleration vs. Time

Filter: Class 1000 (1650 Hz)

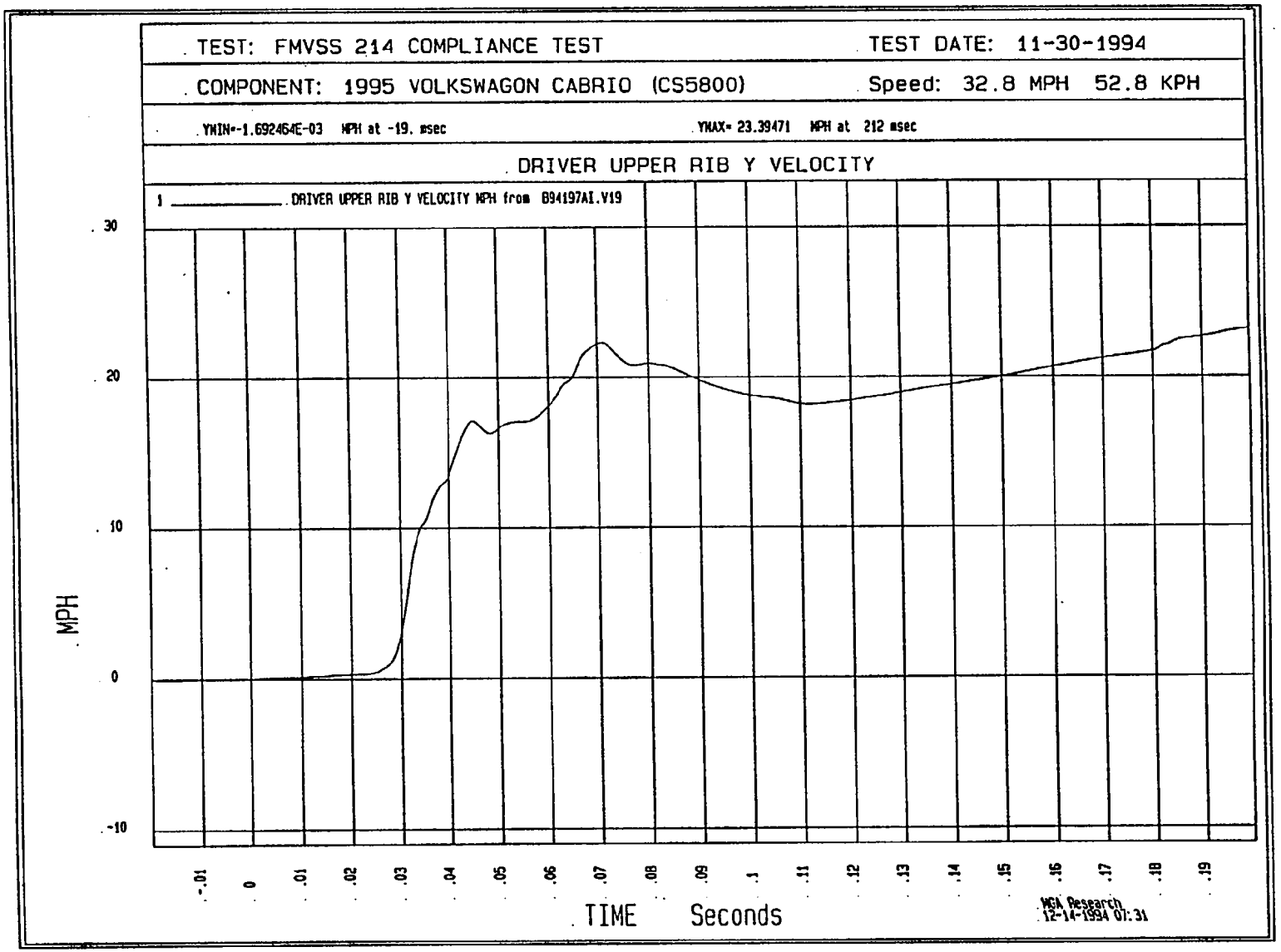


Figure B-2 - Driver Upper Rib Y Velocity vs. Time

Filter: Class 1000 (1650 Hz)

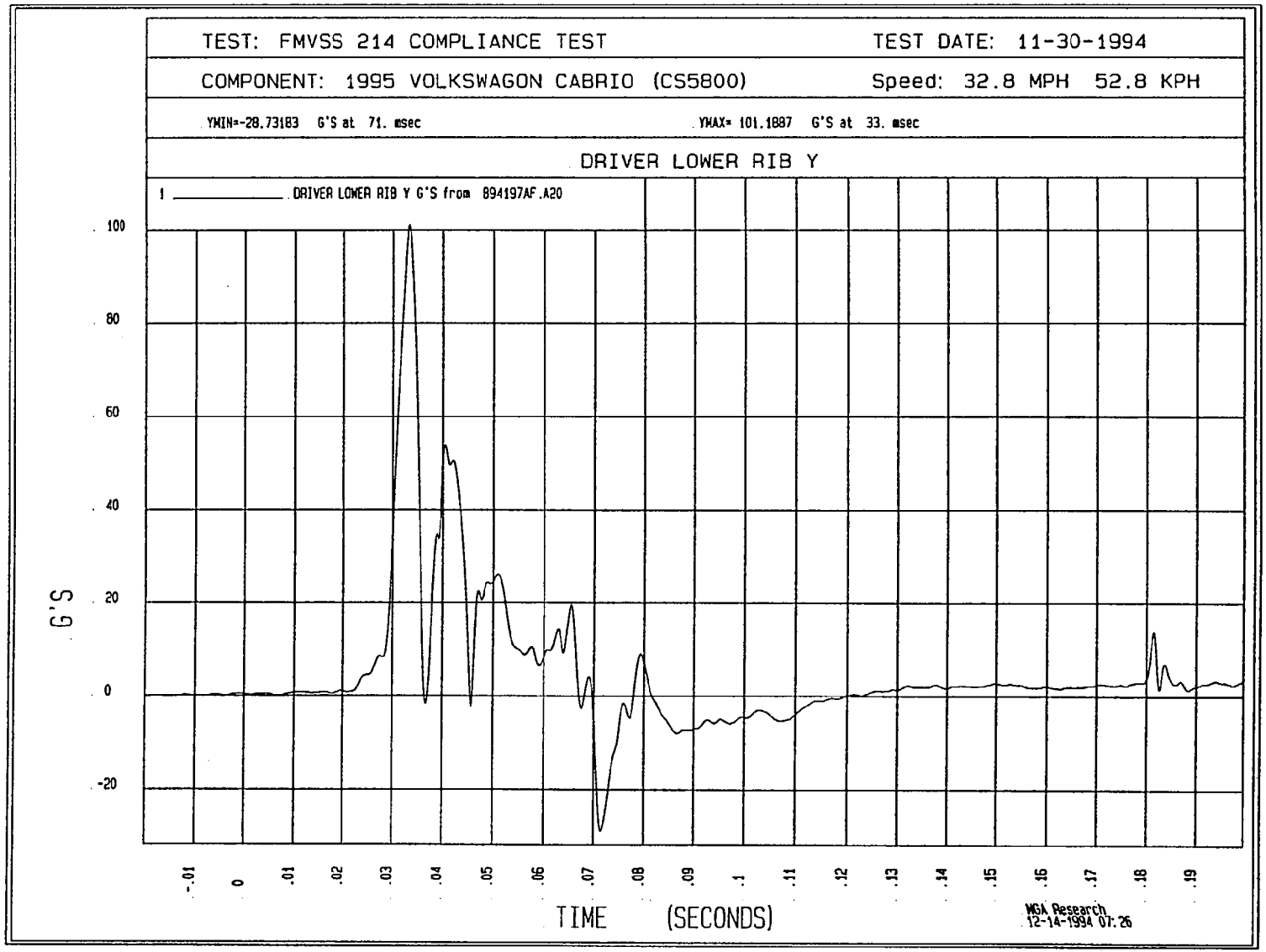


Figure B-3 - Driver Lower Rib Y Acceleration vs. Time

Filter: Class 1000 (1650 Hz)

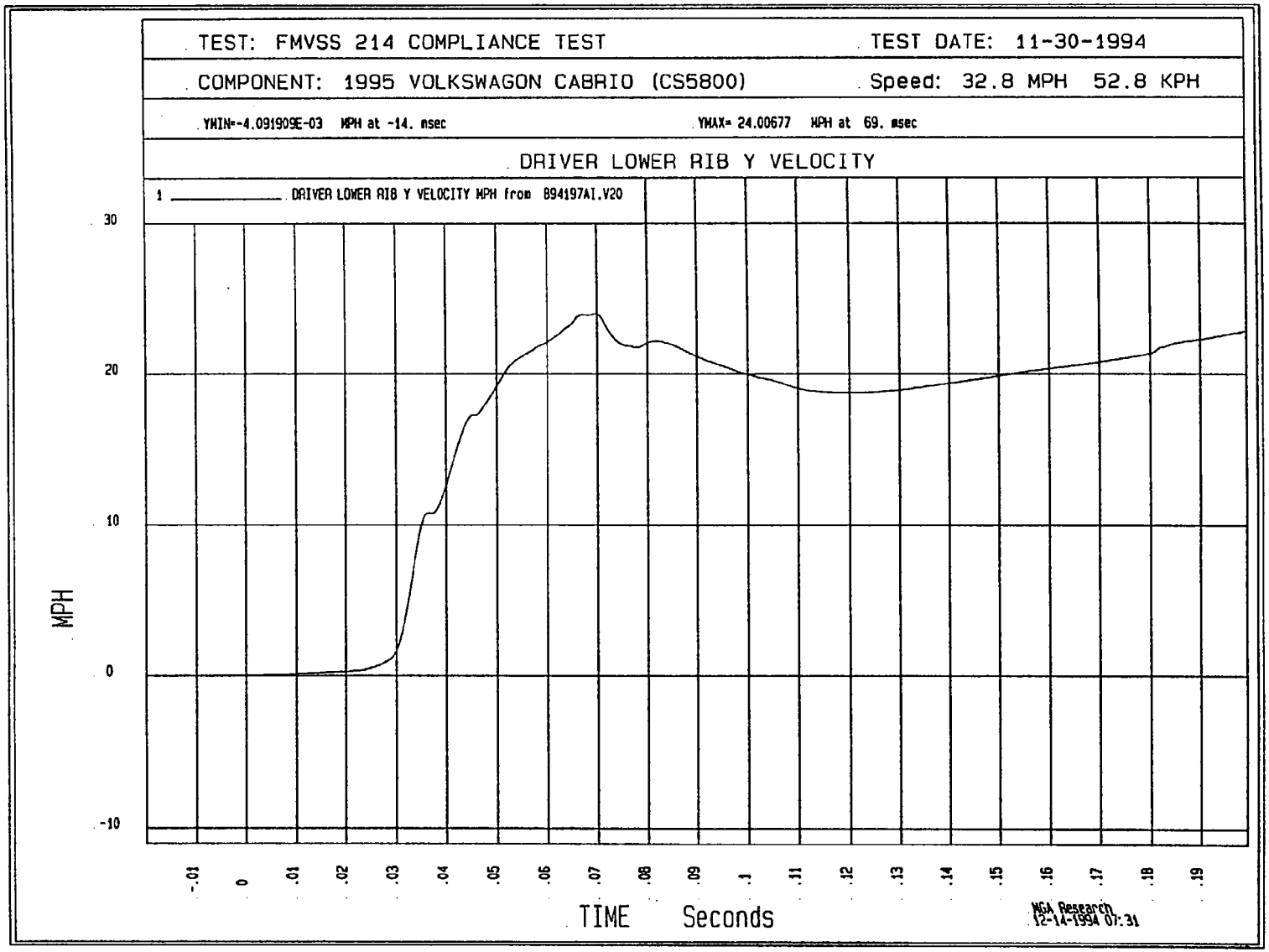


Figure B-4 - Driver Lower Rib Y Velocity vs. Time

Filter: Class 1000 (1650 Hz)

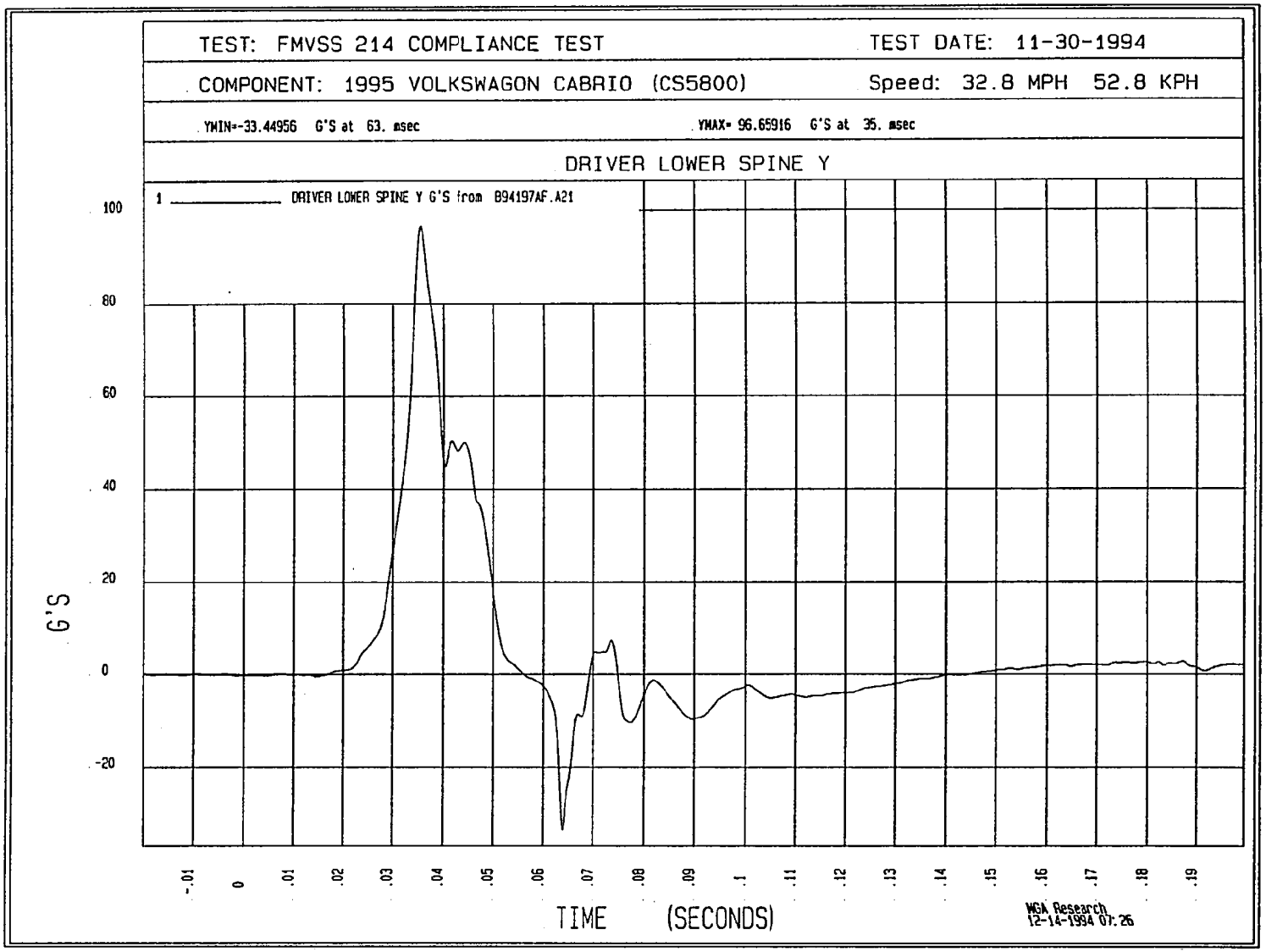


Figure B-5 - Driver Lower Spine Y Acceleration vs. Time

Filter: Class 1000 (1650 Hz)

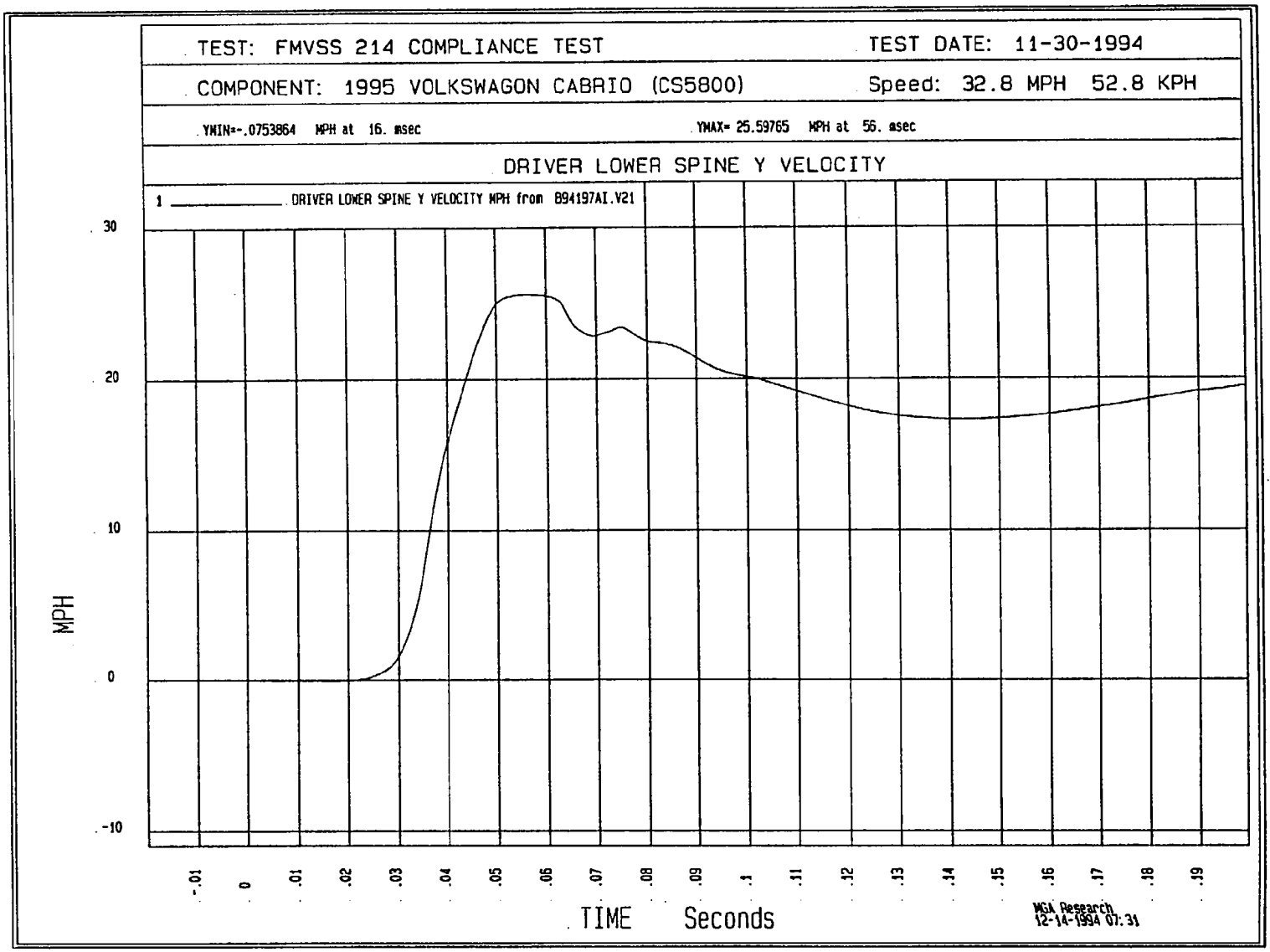


Figure B-6 - Driver Lower Spine Y Velocity vs. Time

Filter: Class 1000 (1650 Hz)

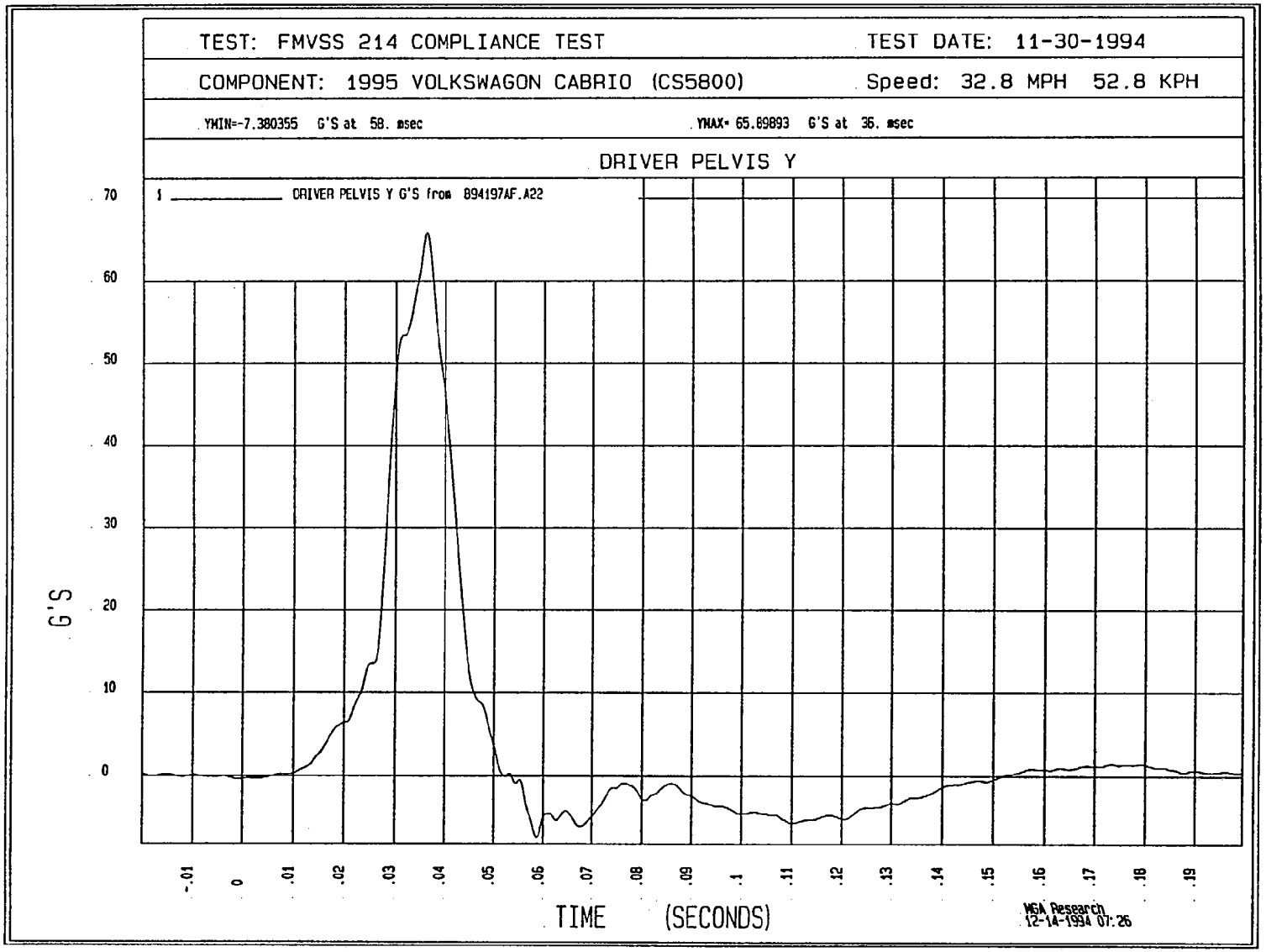


Figure B-7 - Driver Pelvis Y Acceleration vs. Time

Filter: Class 1000 (1650 Hz)

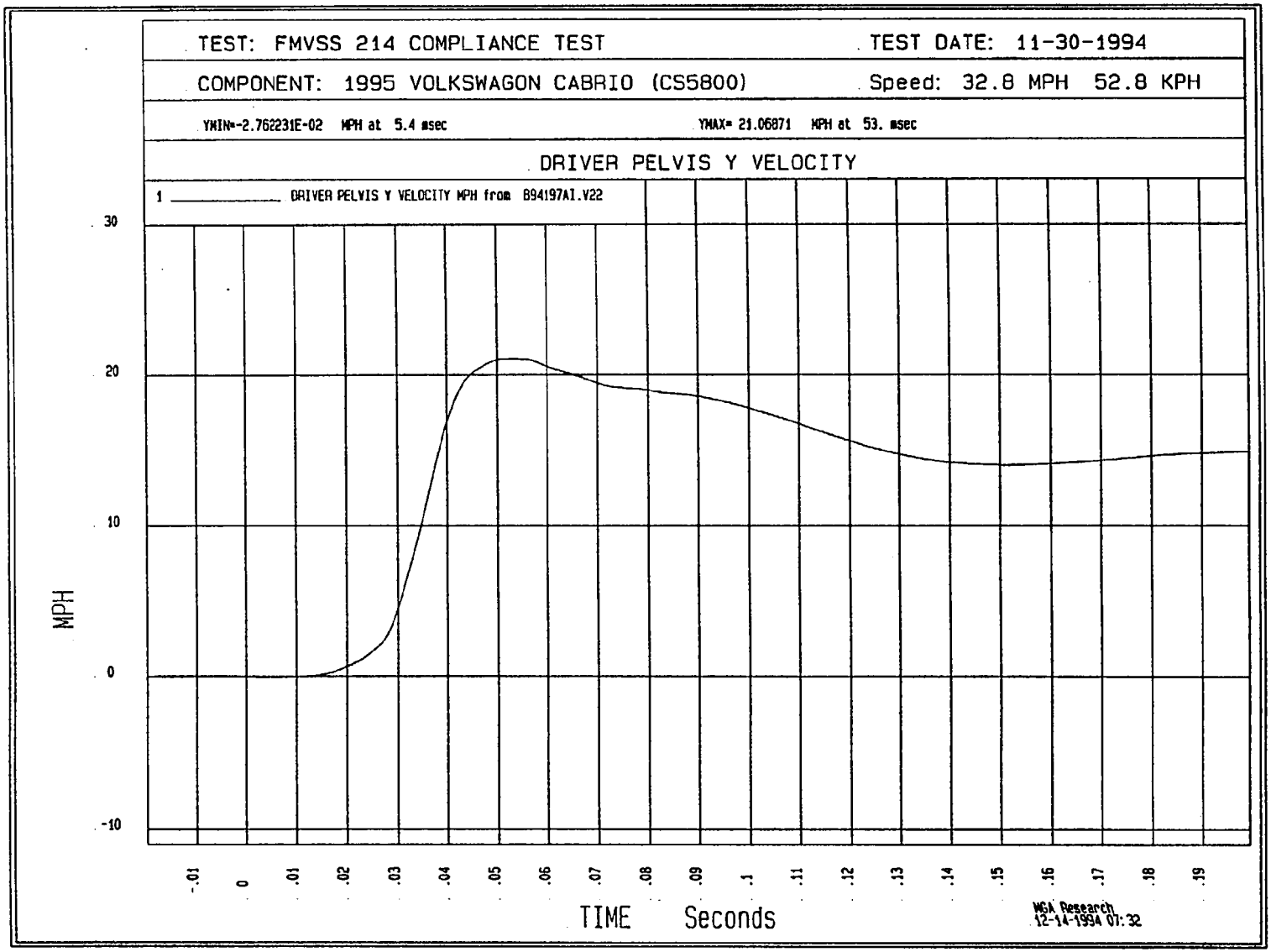


Figure B-8 - Driver Pelvis Y Velocity vs. Time

Filter: Class 1000 (1650 Hz)

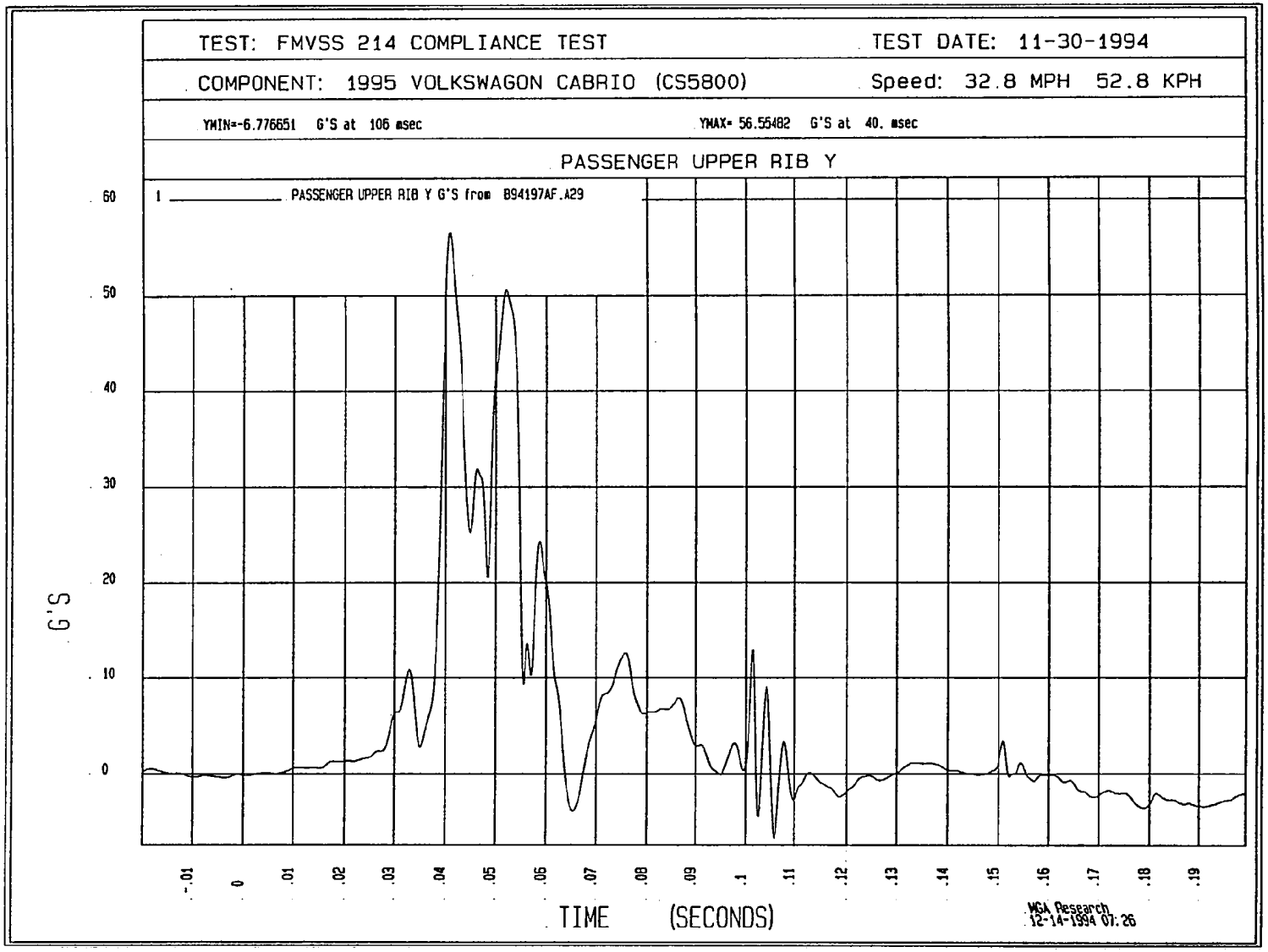


Figure B-9 - Passenger Upper Rib Y Acceleration vs. Time

Filter: Class 1000 (1650 Hz)

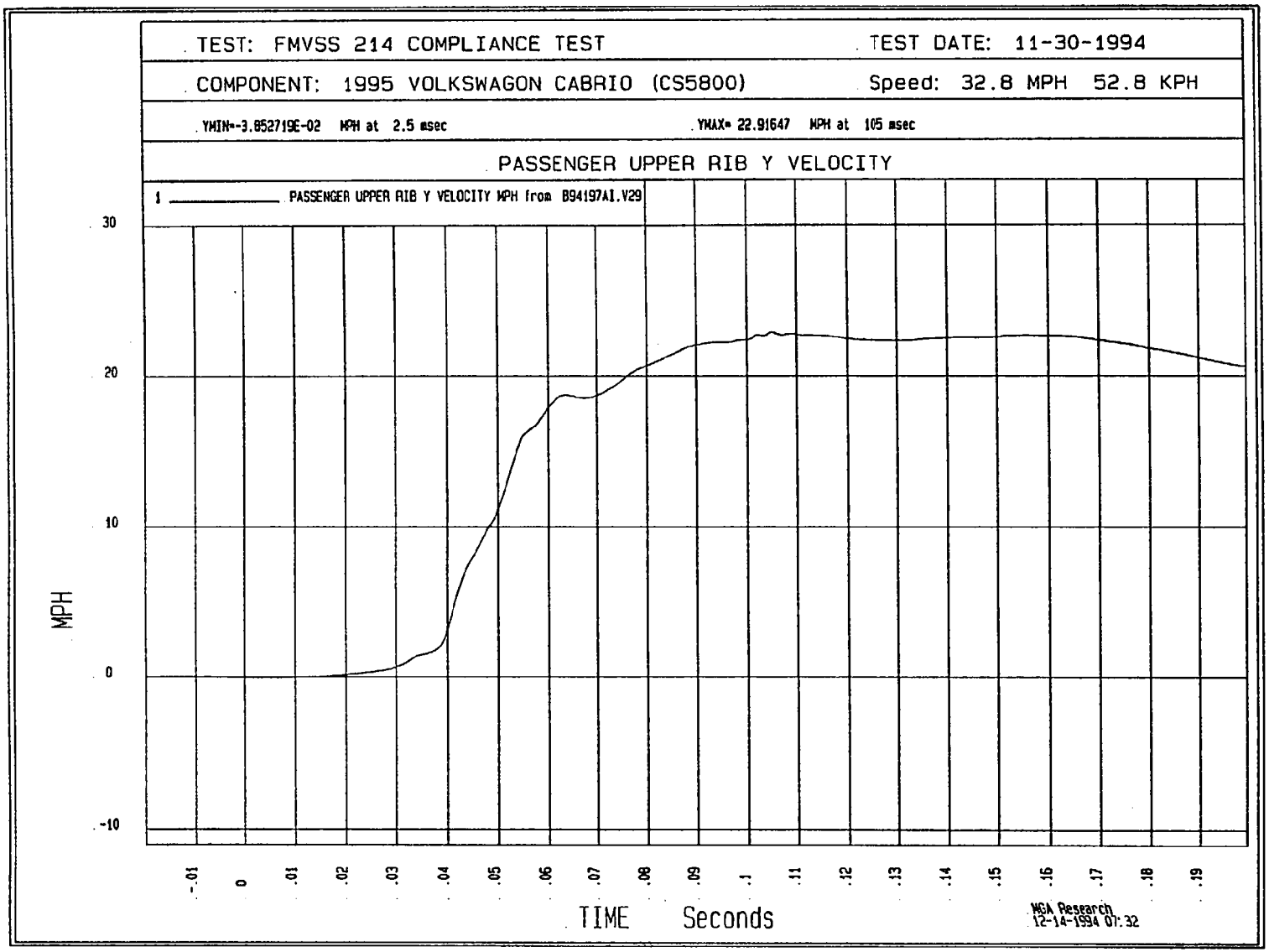


Figure B-10 - Passenger Upper Rib Y Velocity vs. Time

Filter: Class 1000 (1650 Hz)

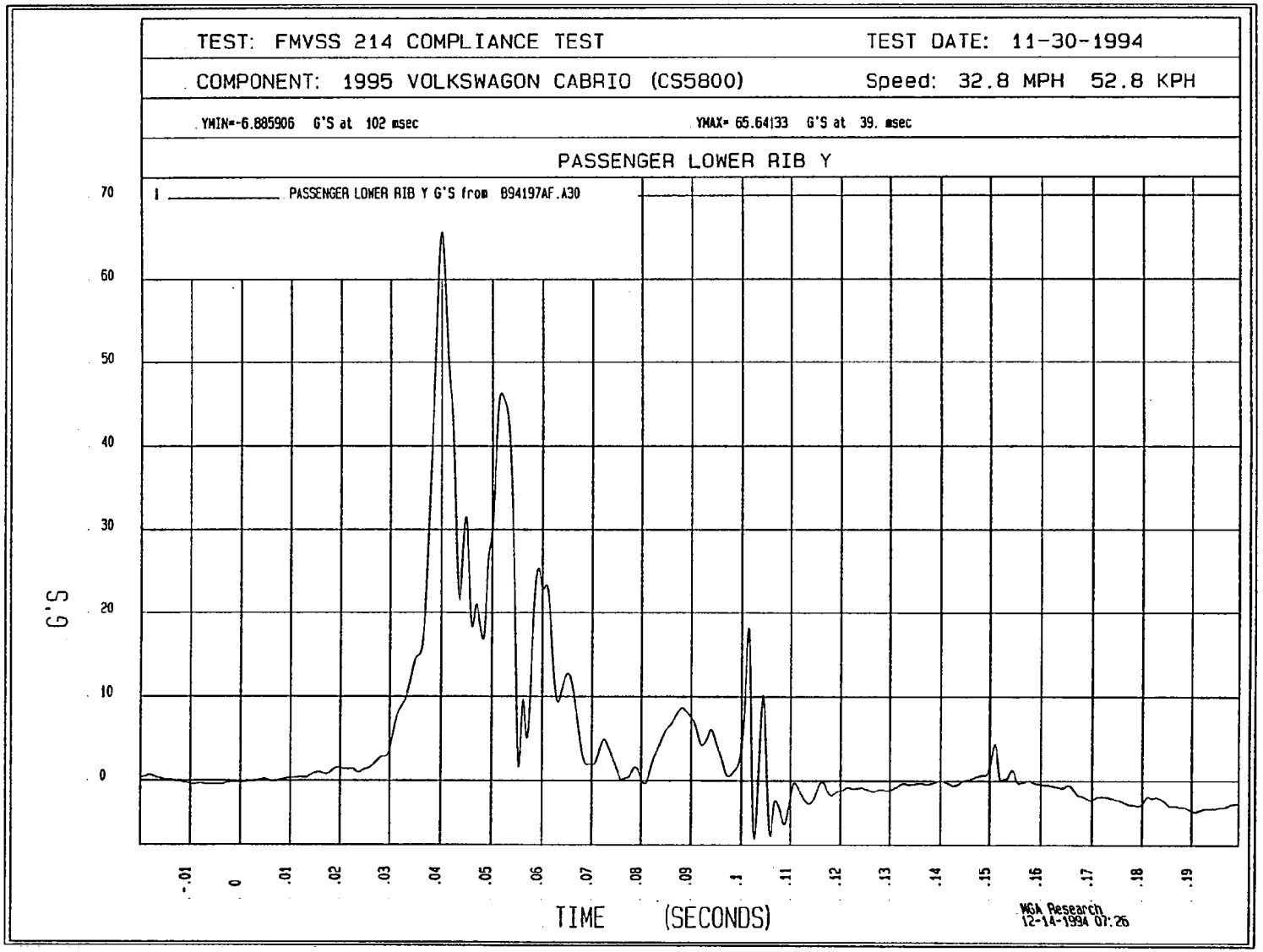


Figure B-11 - Passenger Lower Rib Y Acceleration vs. Time

Filter: Class 1000 (1650 Hz)

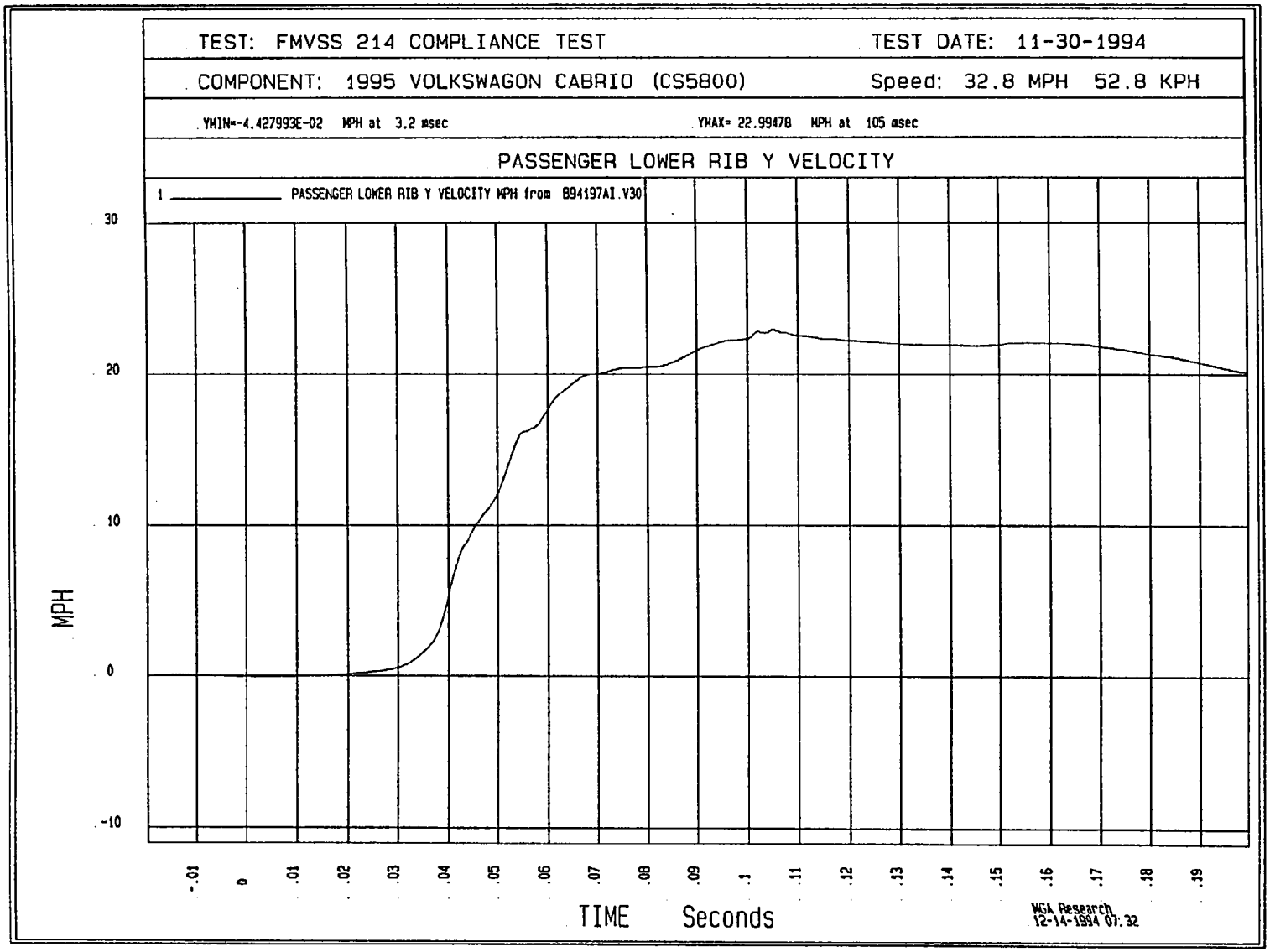


Figure B-12 - Passenger Lower Rib Y Velocity vs. Time

Filter: Class 1000 (1650 Hz)

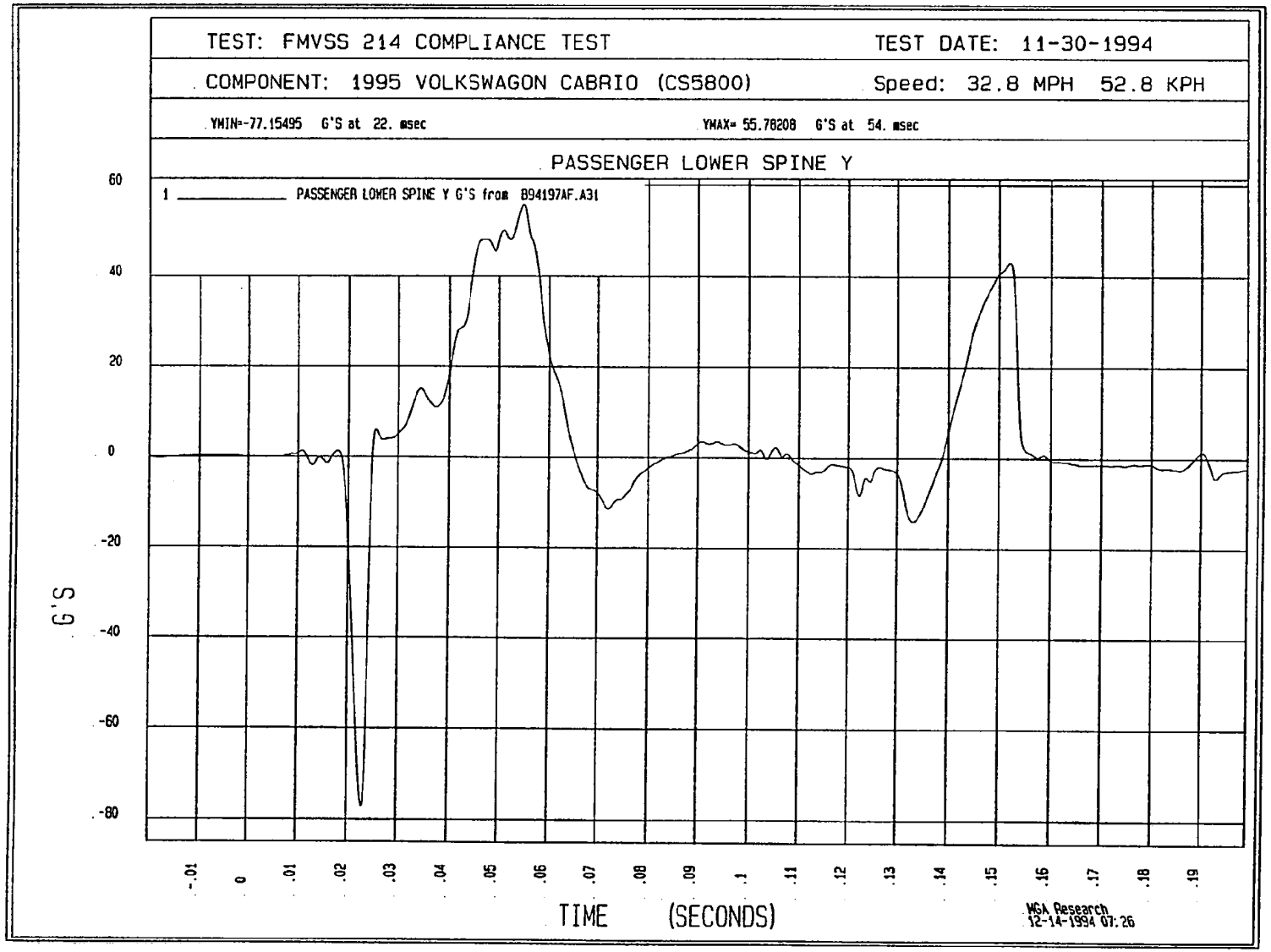


Figure B-13 - Passenger Lower Spine Y Acceleration vs. Time

Filter: Class 1000 (1650 Hz)

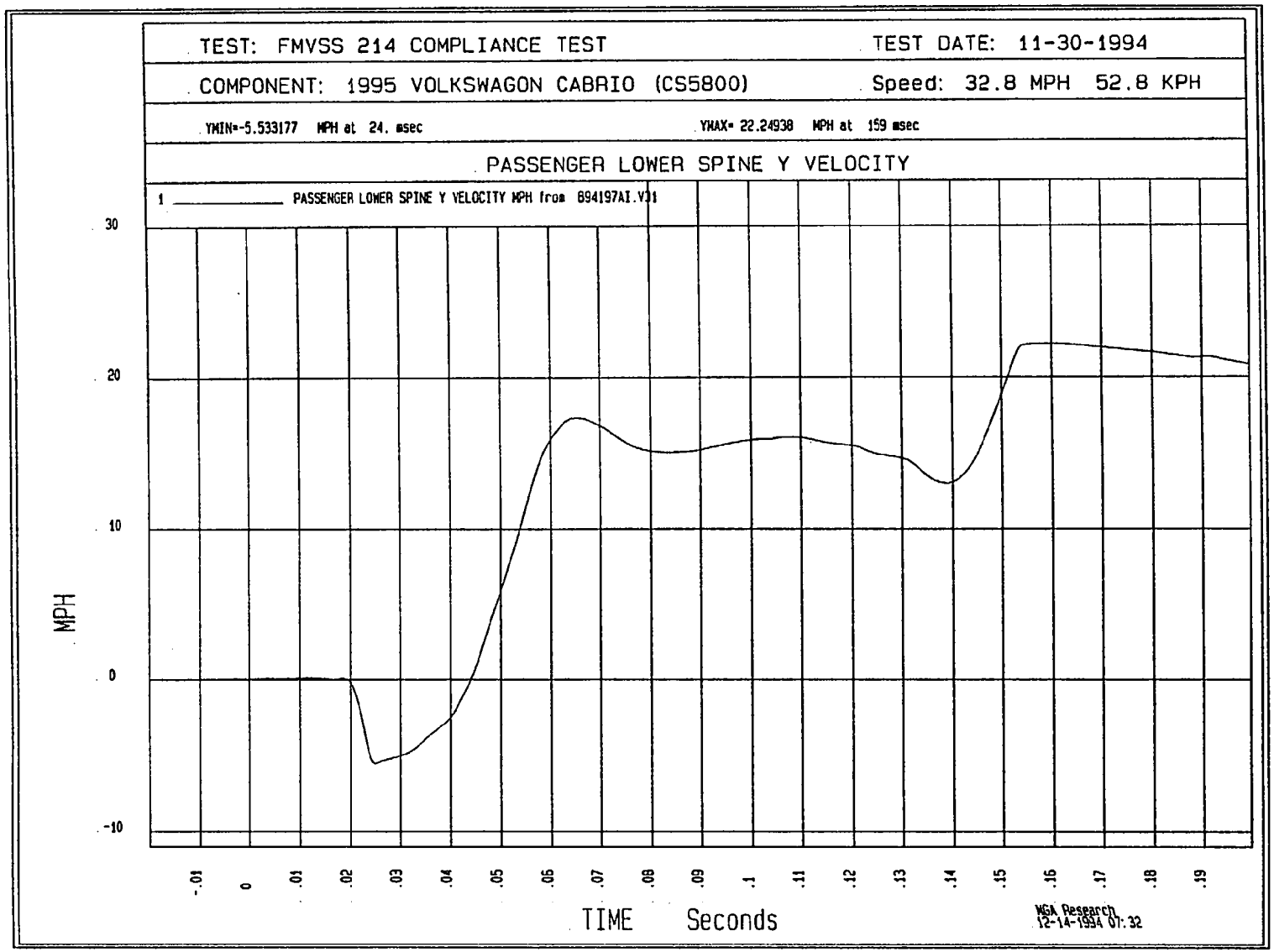


Figure B-14 - Passenger Lower Spine Y Velocity vs. Time

Filter: Class 1000 (1650 Hz)

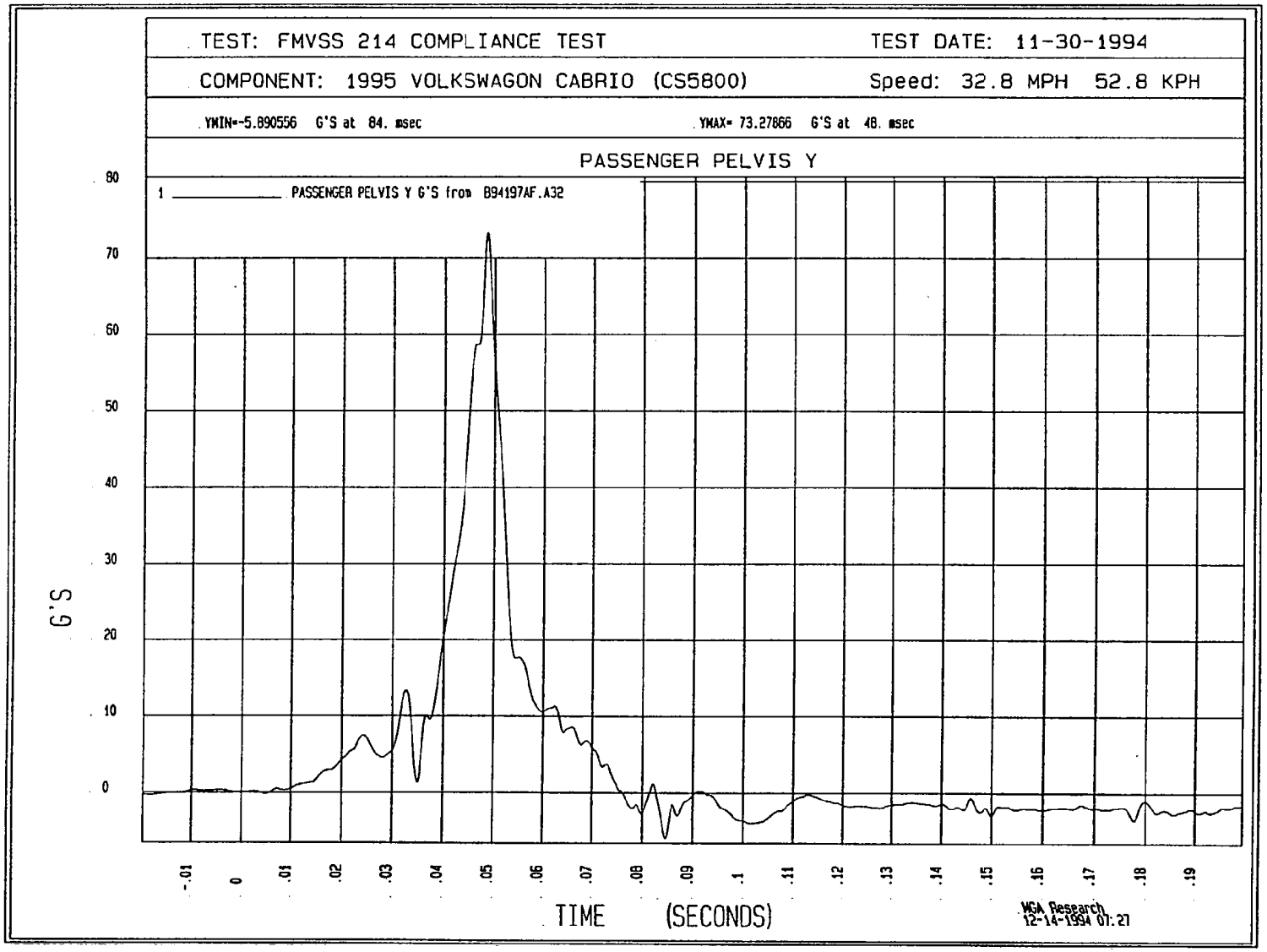


Figure B-15 - Passenger Pelvis Y Acceleration vs. Time

Filter: Class 1000 (1650 Hz)

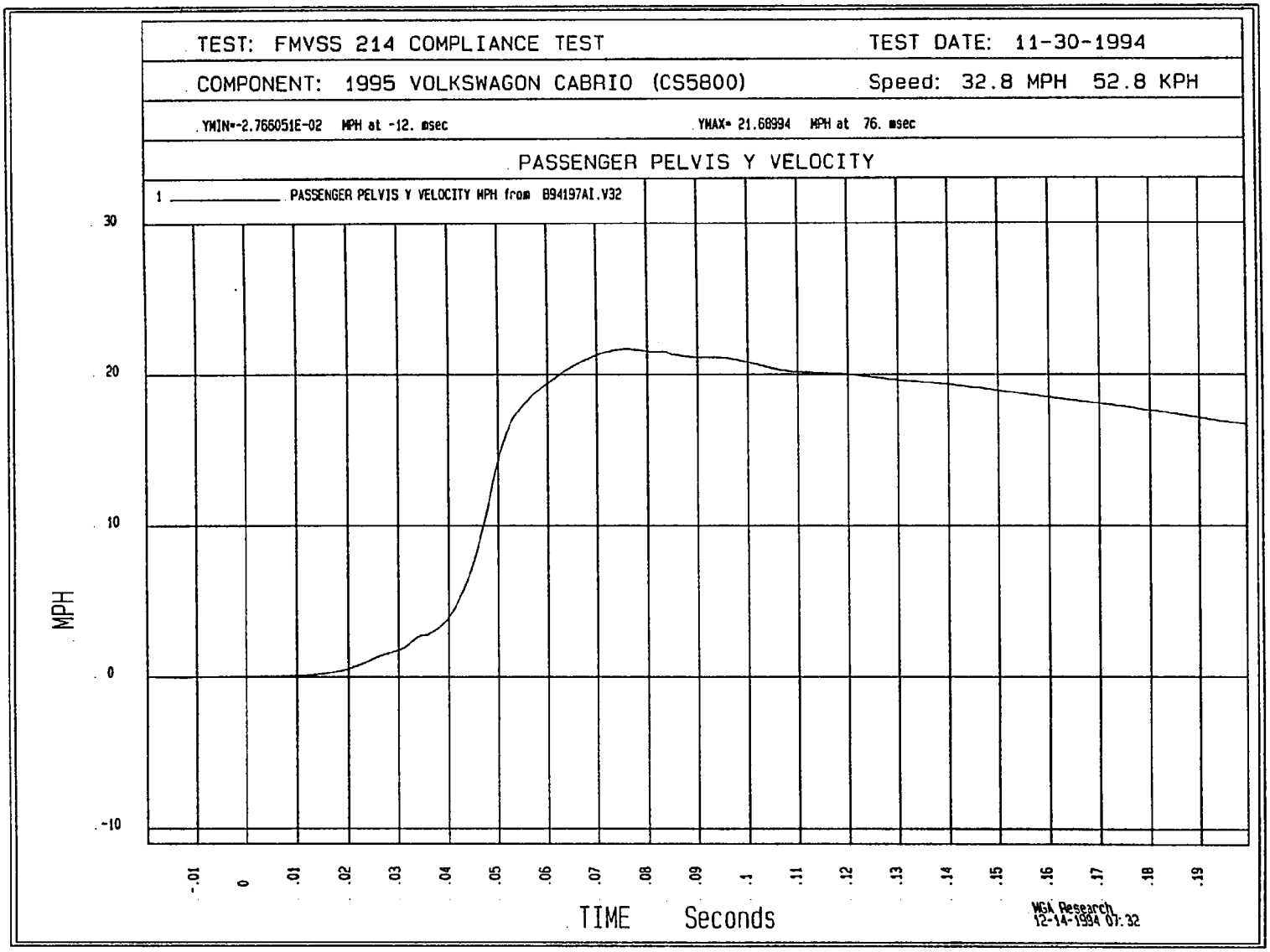


Figure B-16 - Passenger Pelvis Y Velocity vs. Time

Filter: Class 60 (100 Hz)

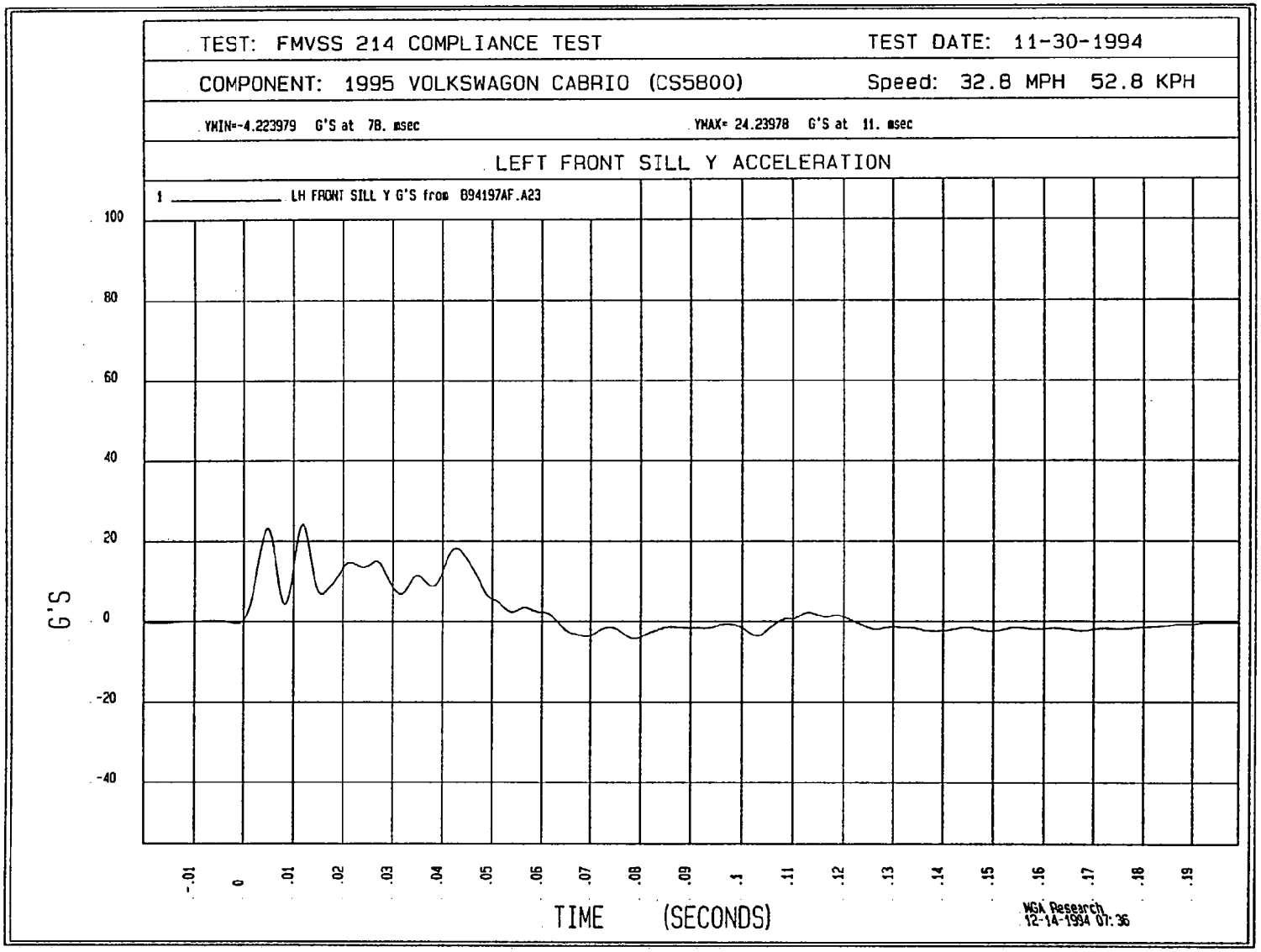


Figure B-17 - Left Front Sill Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

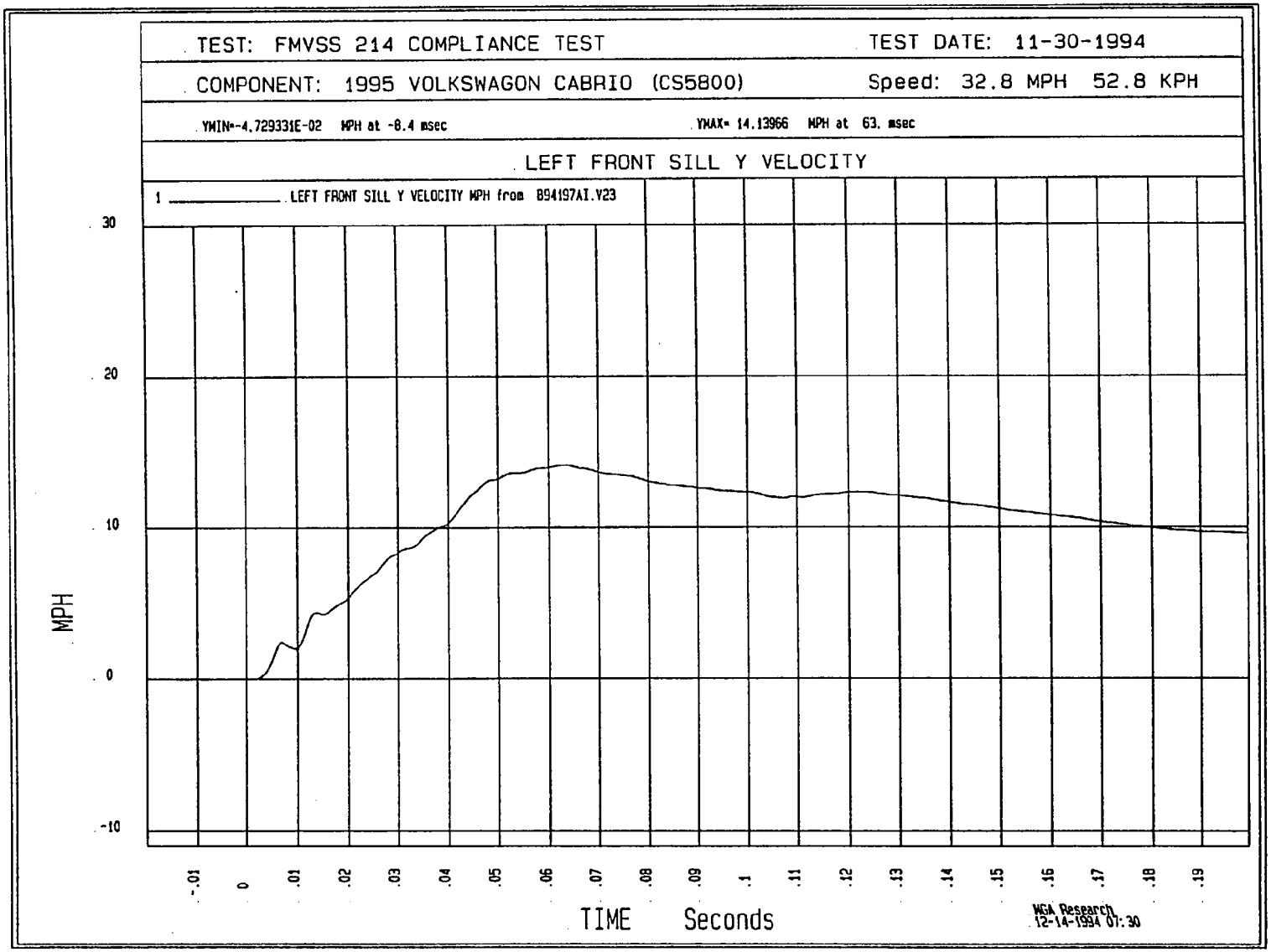


Figure B-18 - Left Front Sill Y Velocity vs. Time

Filter: Class 60 (100 Hz)

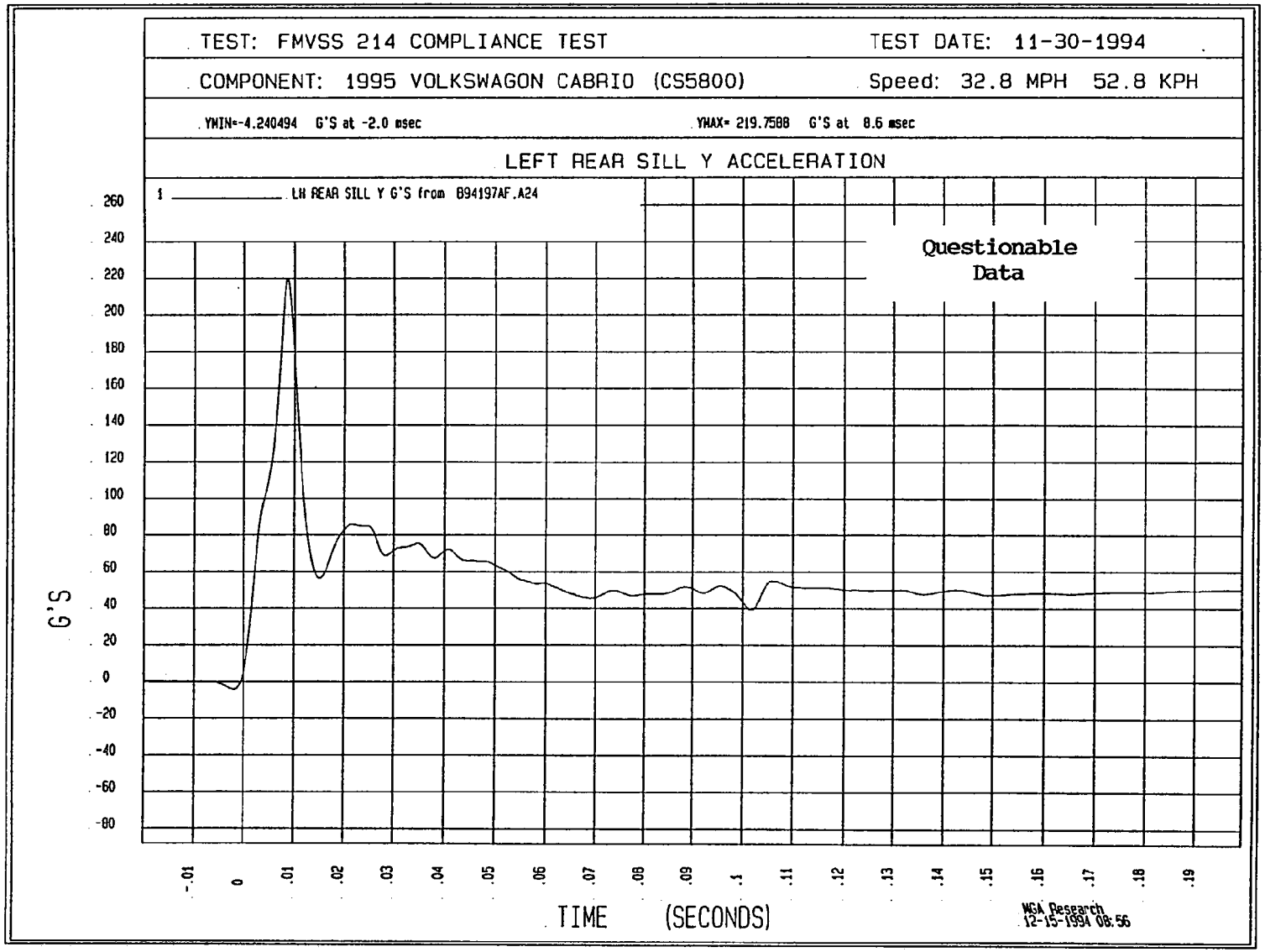


Figure B-19 - Left Rear Sill Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

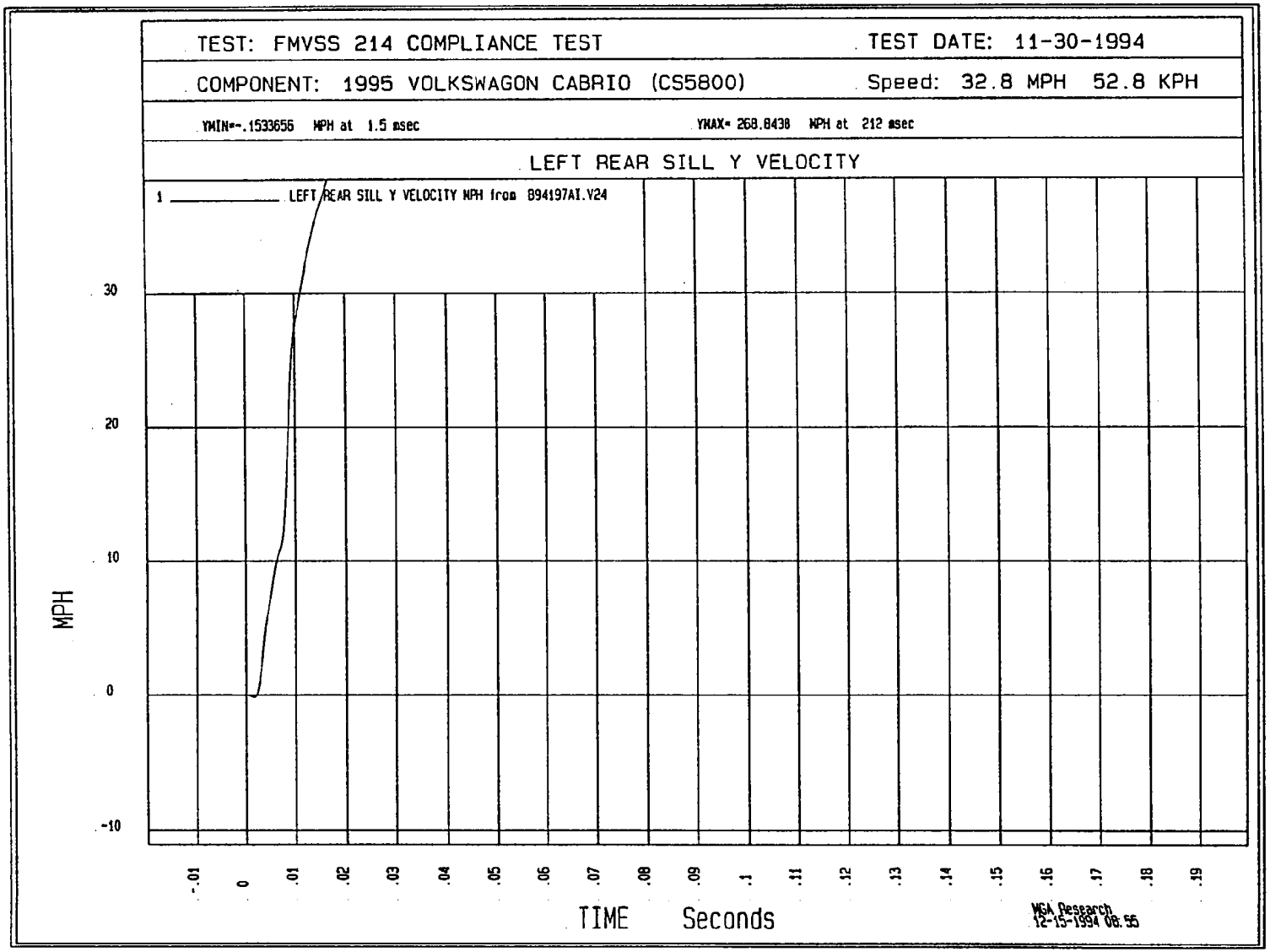


Figure B-20 - Left Rear Sill Y Velocity vs. Time

Filter: Class 60 (100 Hz)

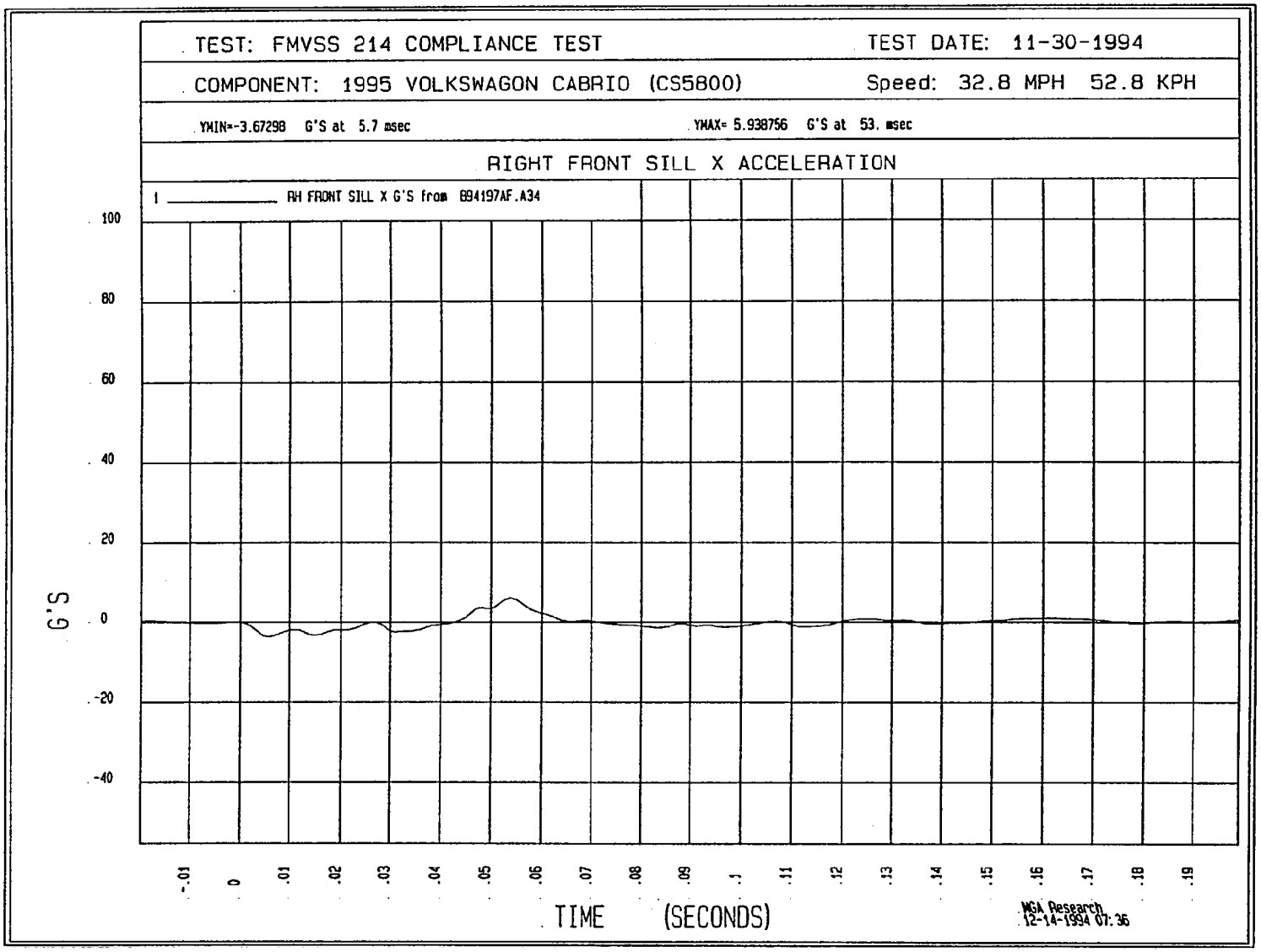


Figure B-21 - Right Front Sill X Acceleration vs. Time

Filter: Class 180 (300 Hz)

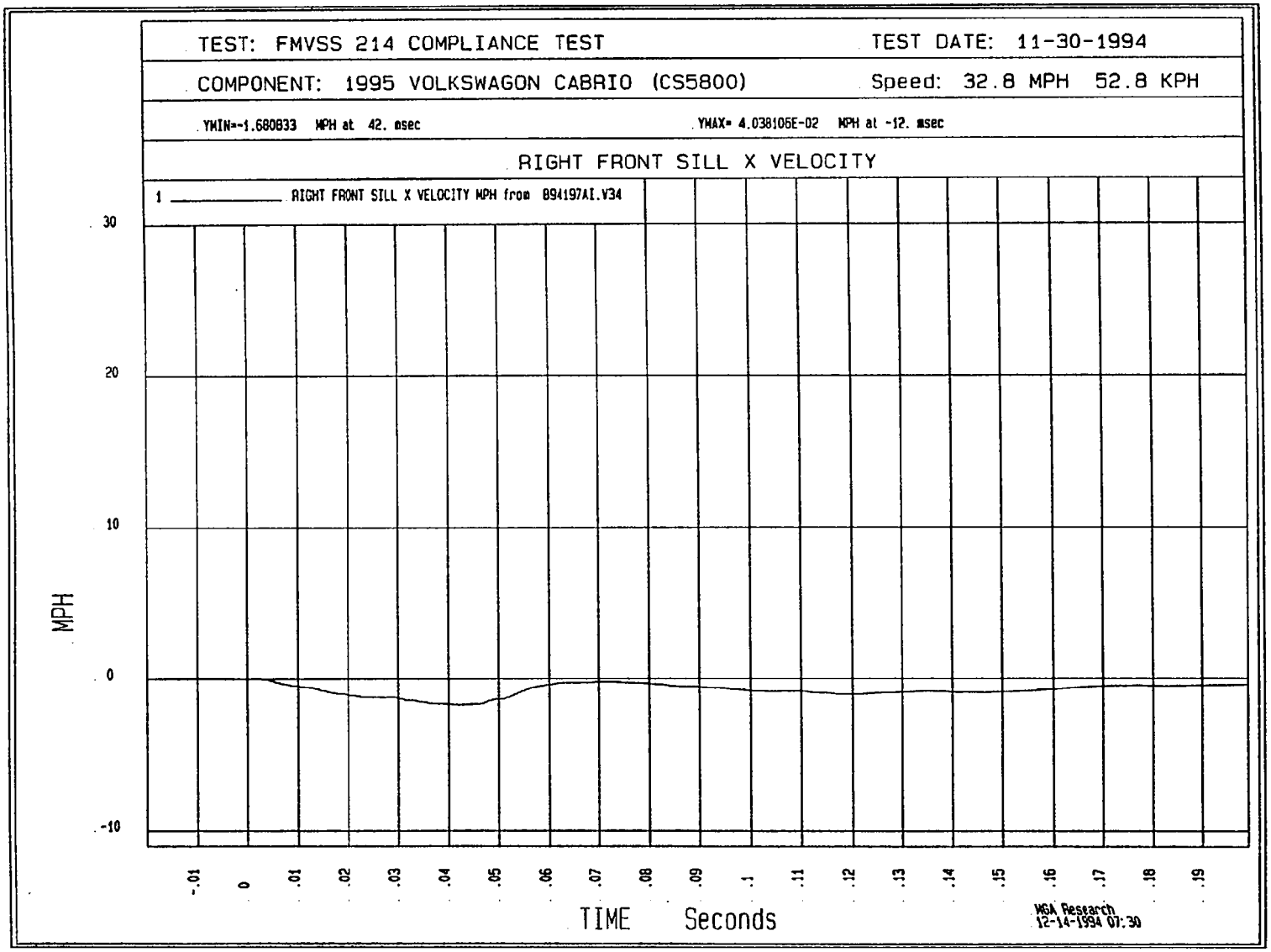


Figure B-22 - Right Front Sill X Velocity vs. Time

Filter: Class 60 (100 Hz)

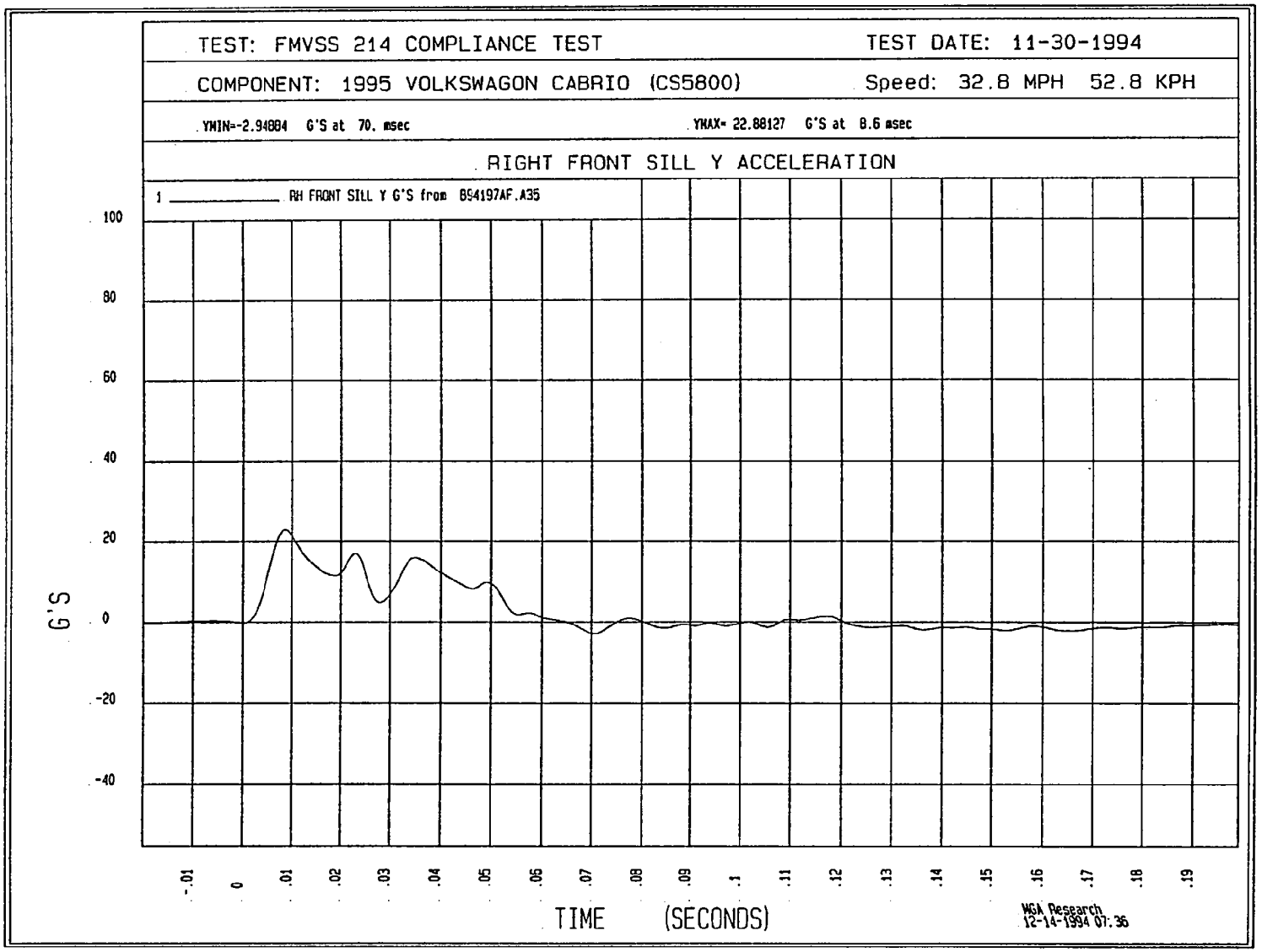


Figure B-23 - Right Front Sill Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

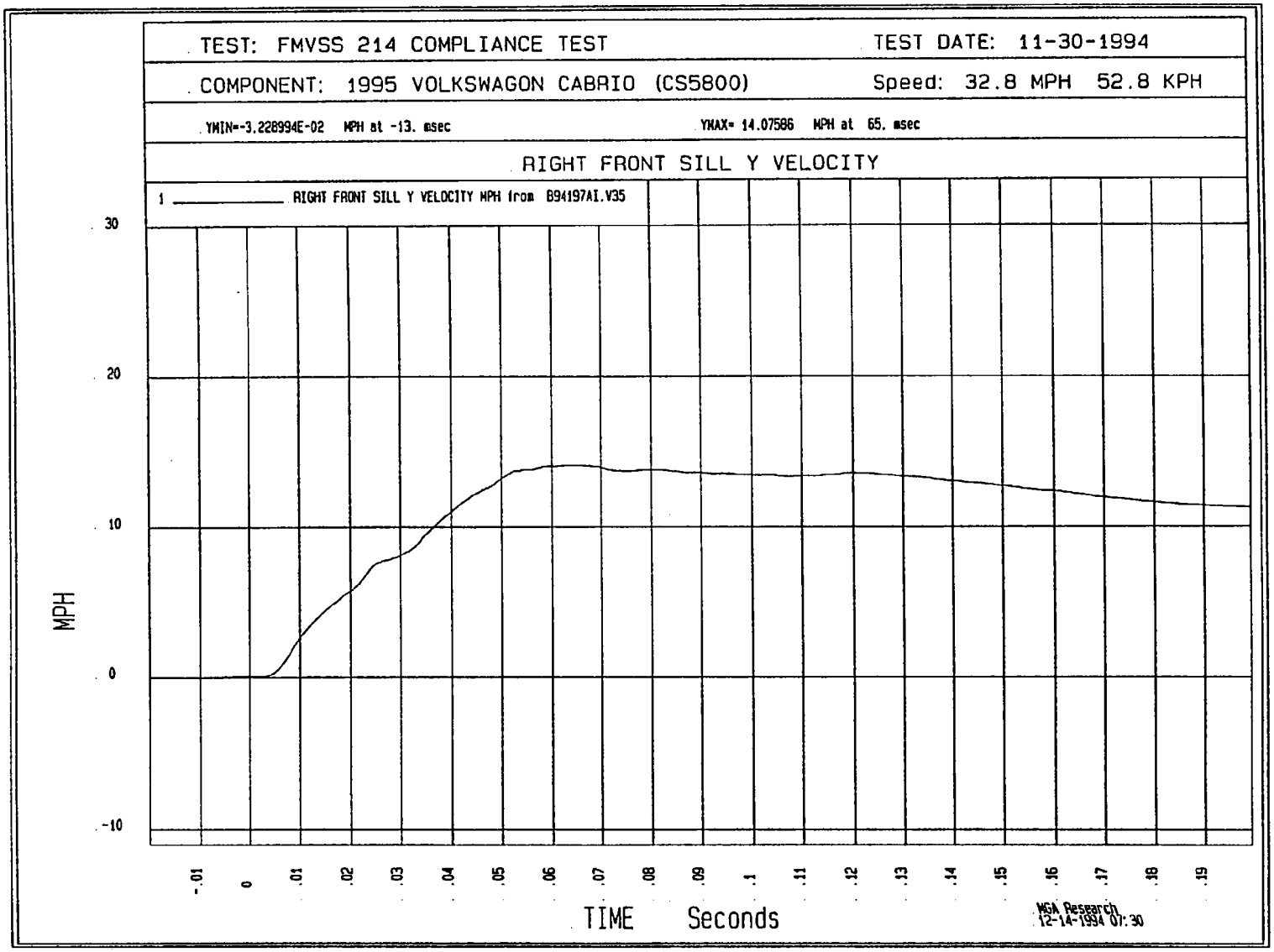


Figure B-24 - Right Front Sill Y Velocity vs. Time

Filter: Class 60 (100 Hz)

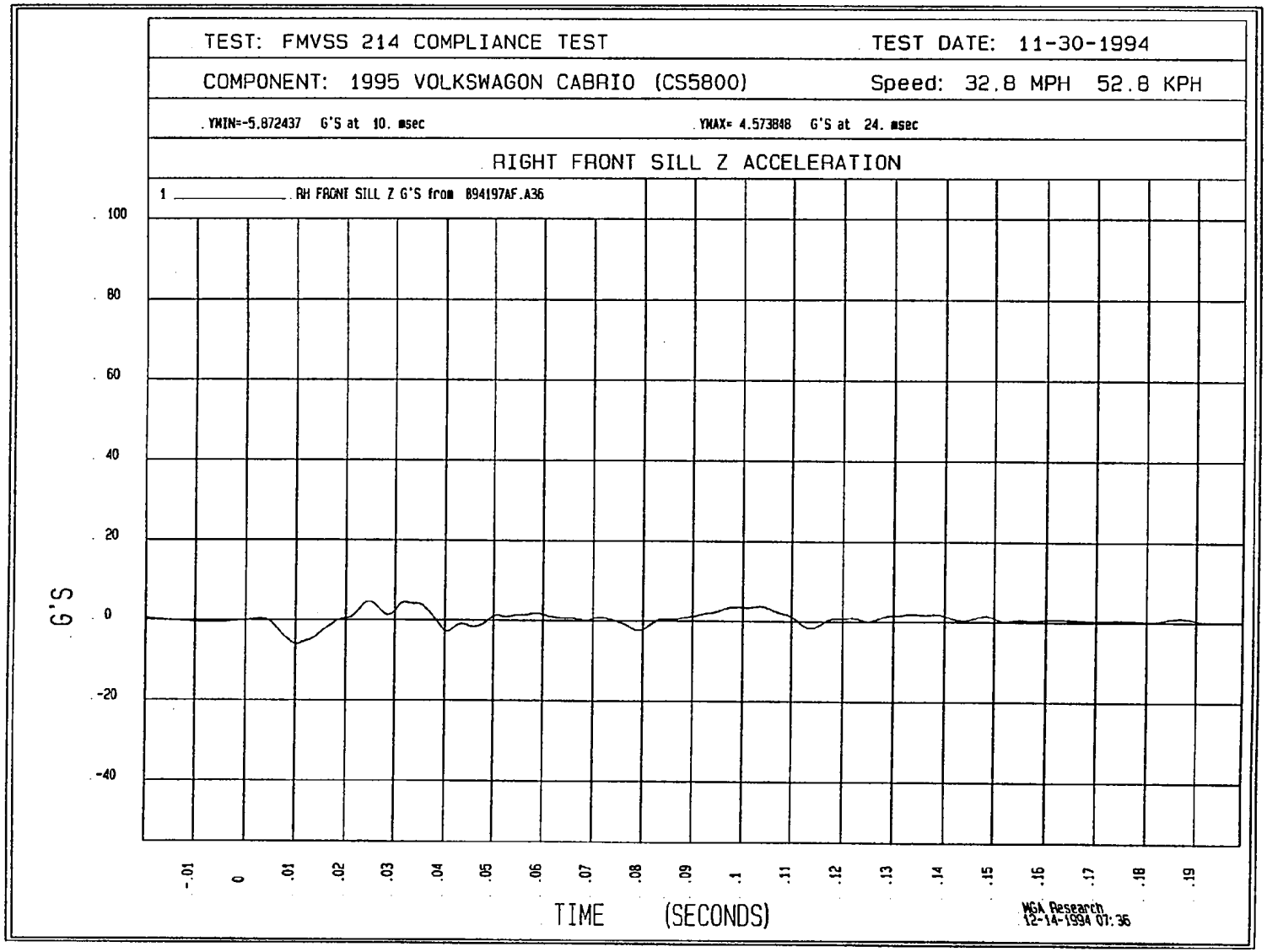


Figure B-25 - Right Front Sill Z Acceleration vs. Time

Filter: Class 180 (300 Hz)

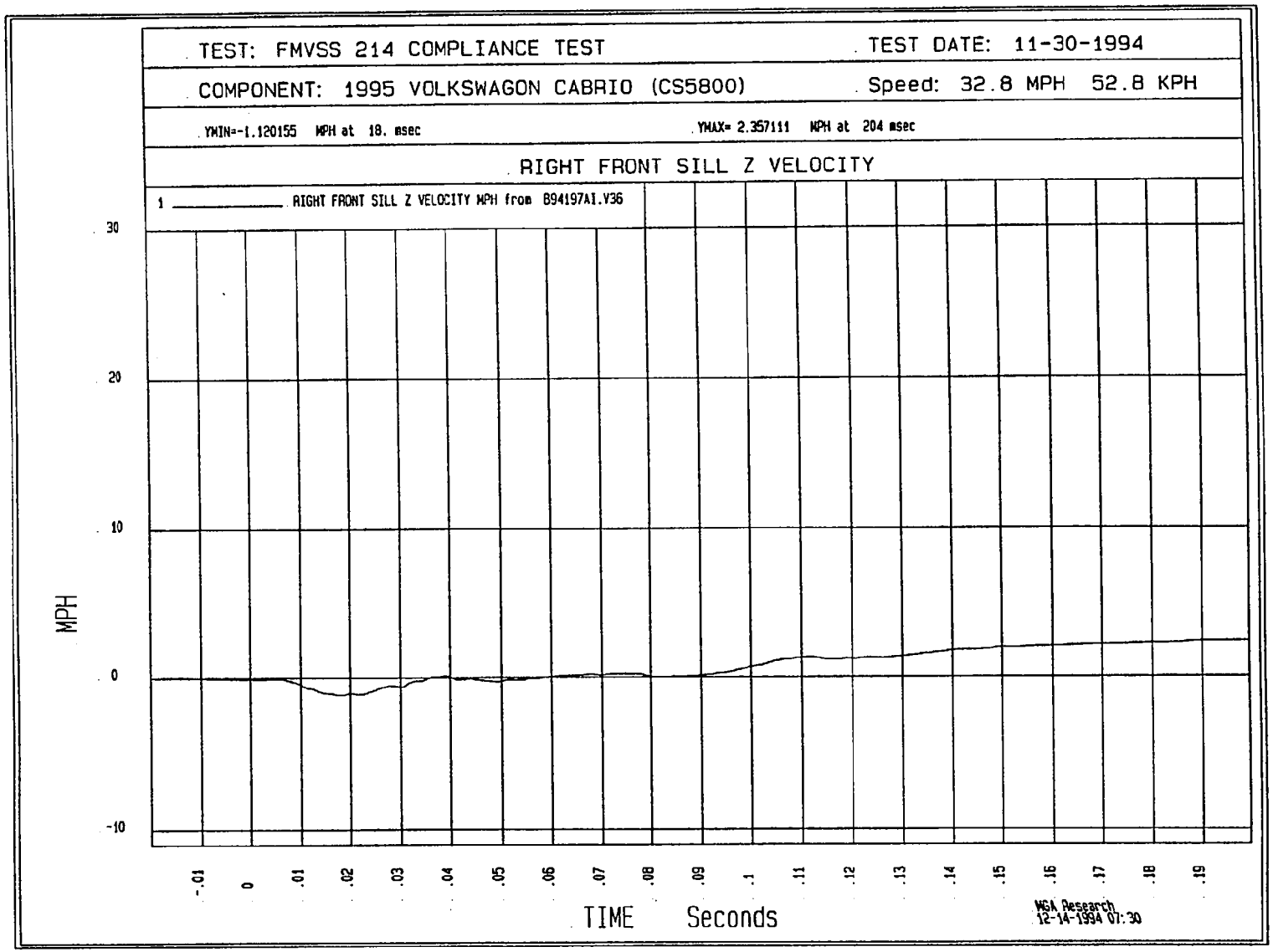


Figure B-26 - Right Front Sill Z Velocity vs. Time

Filter: Class 60 (100 Hz)

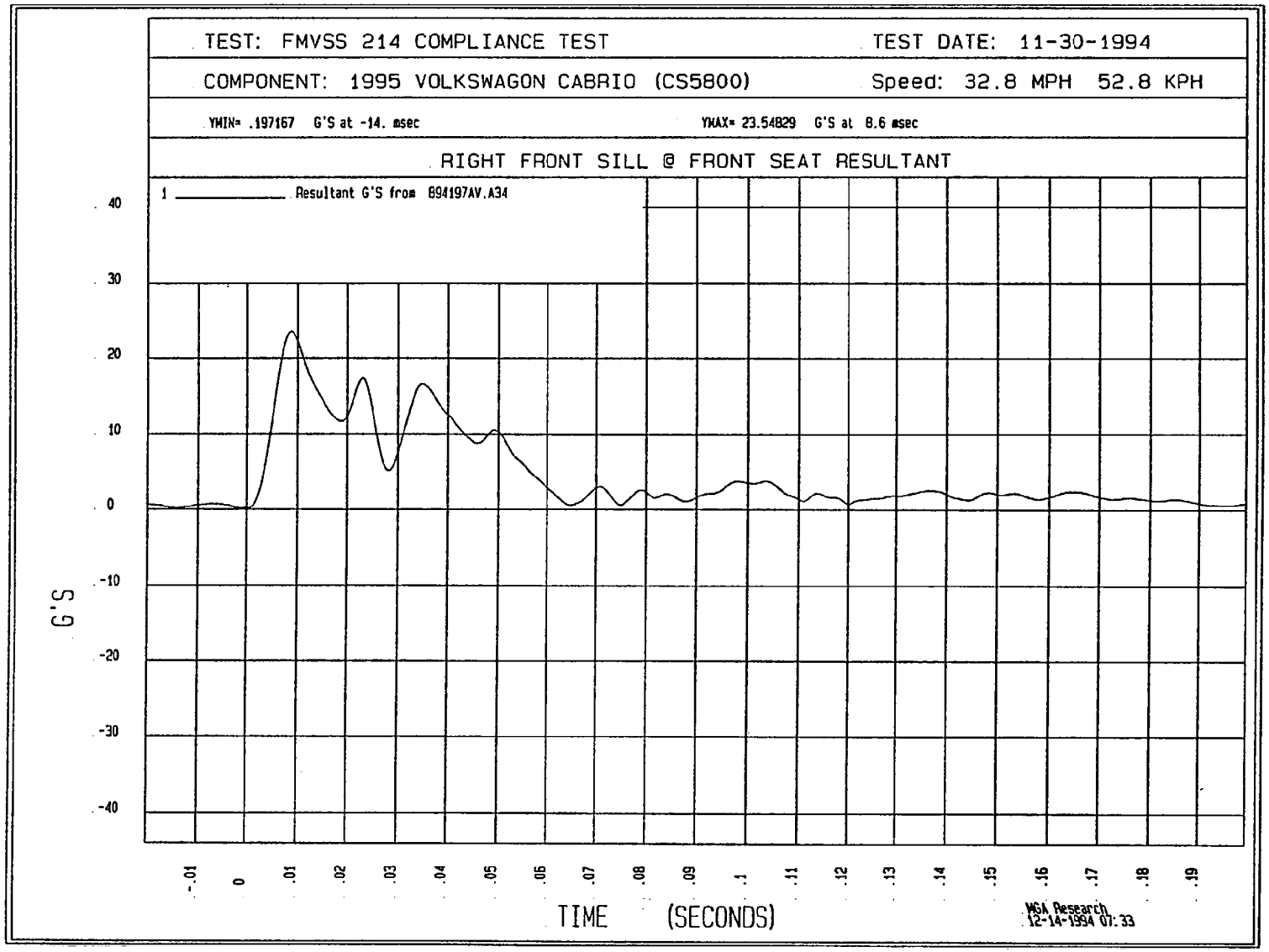


Figure B-27 - Right Front Sill at Front Seat Resultant vs. Time

Filter: Class 60 (100 Hz)

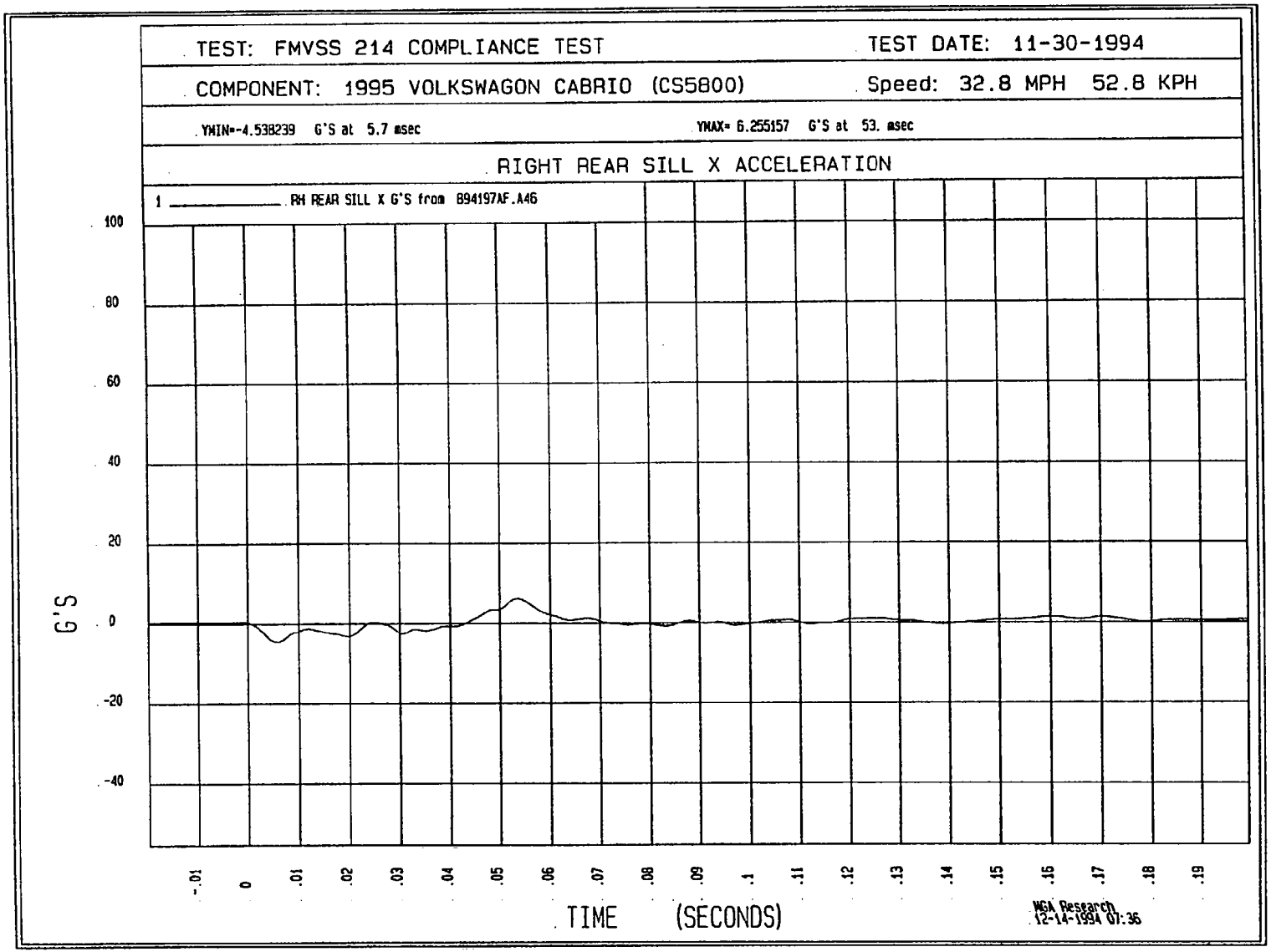


Figure B-28 - Right Rear Sill X Acceleration vs. Time

Filter: Class 180 (300 Hz)

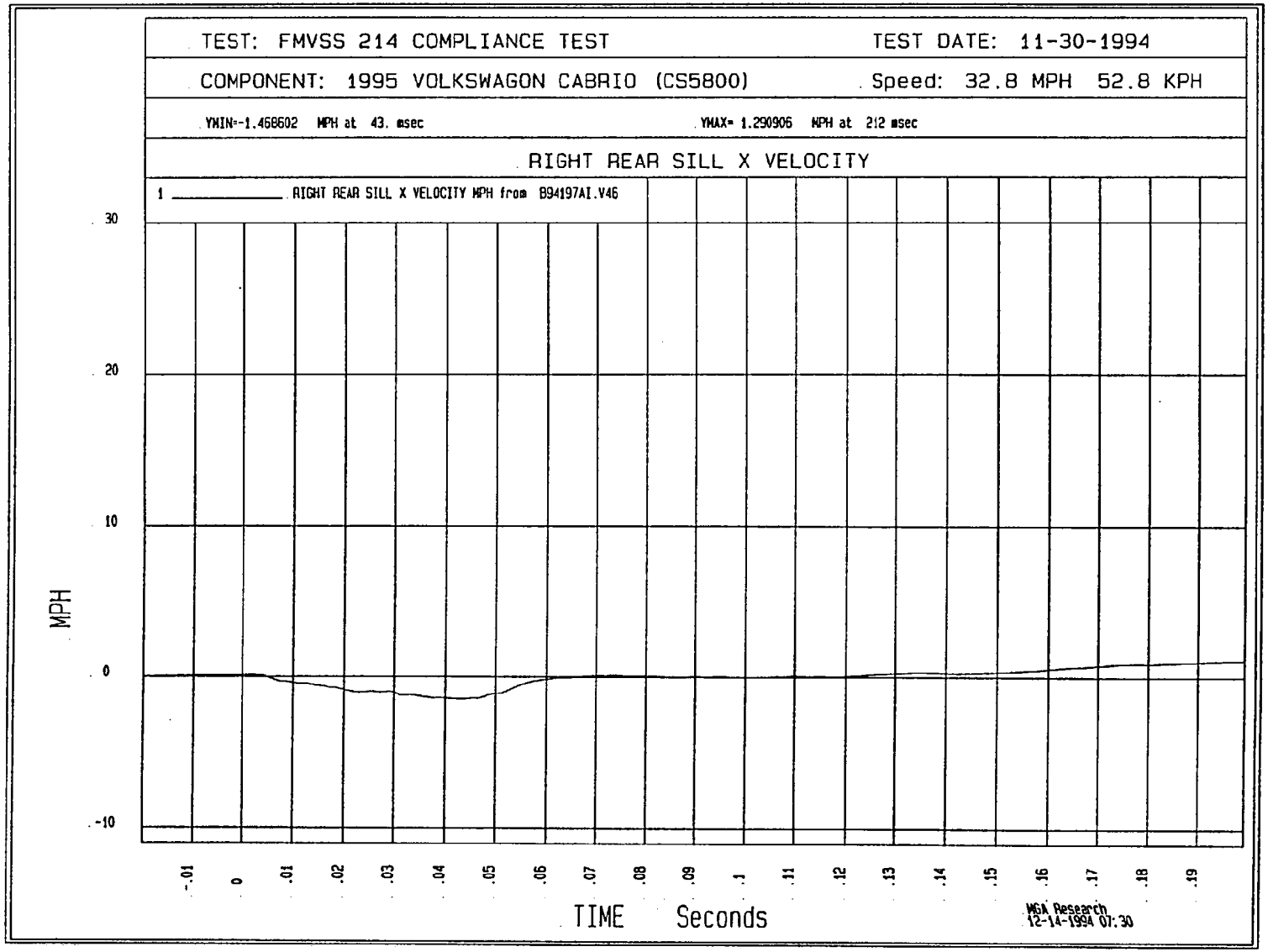


Figure B-29 - Right Rear Sill X Velocity vs. Time

Filter: Class 60 (100 Hz)

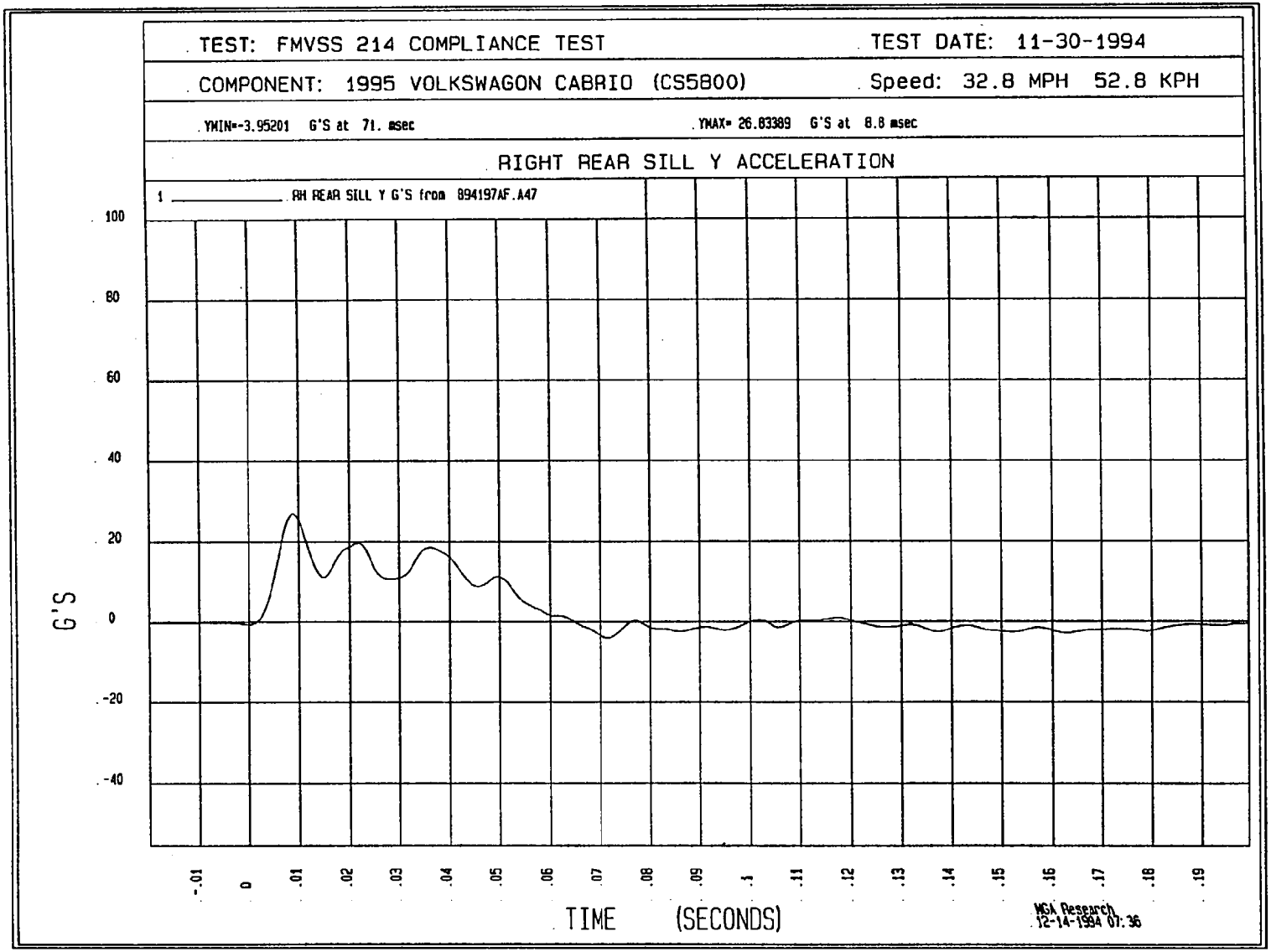


Figure B-3Ø - Right Rear Sill Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

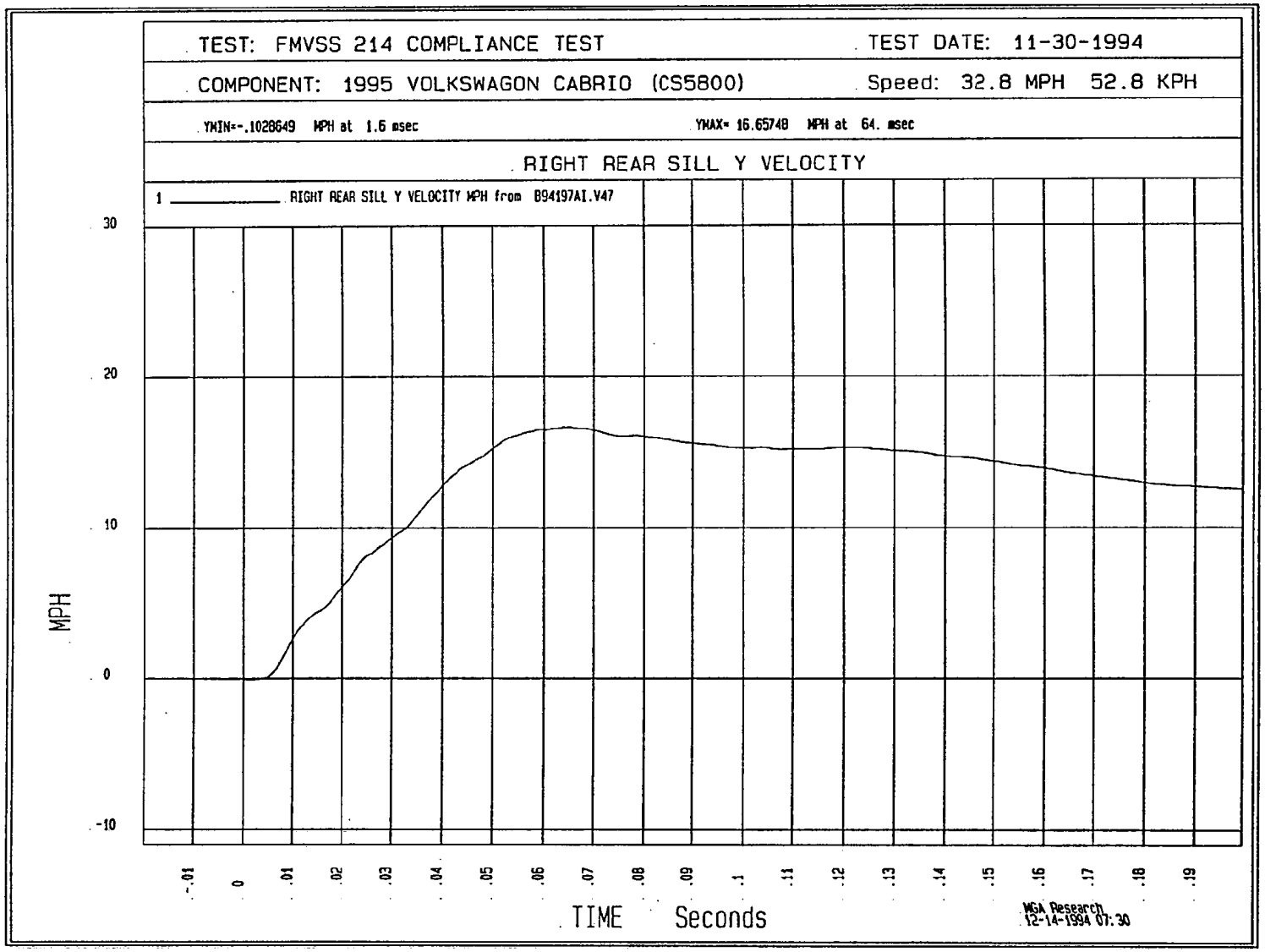


Figure B-31 - Right Rear Sill Y Velocity vs. Time

Filter: Class 60 (100 Hz)

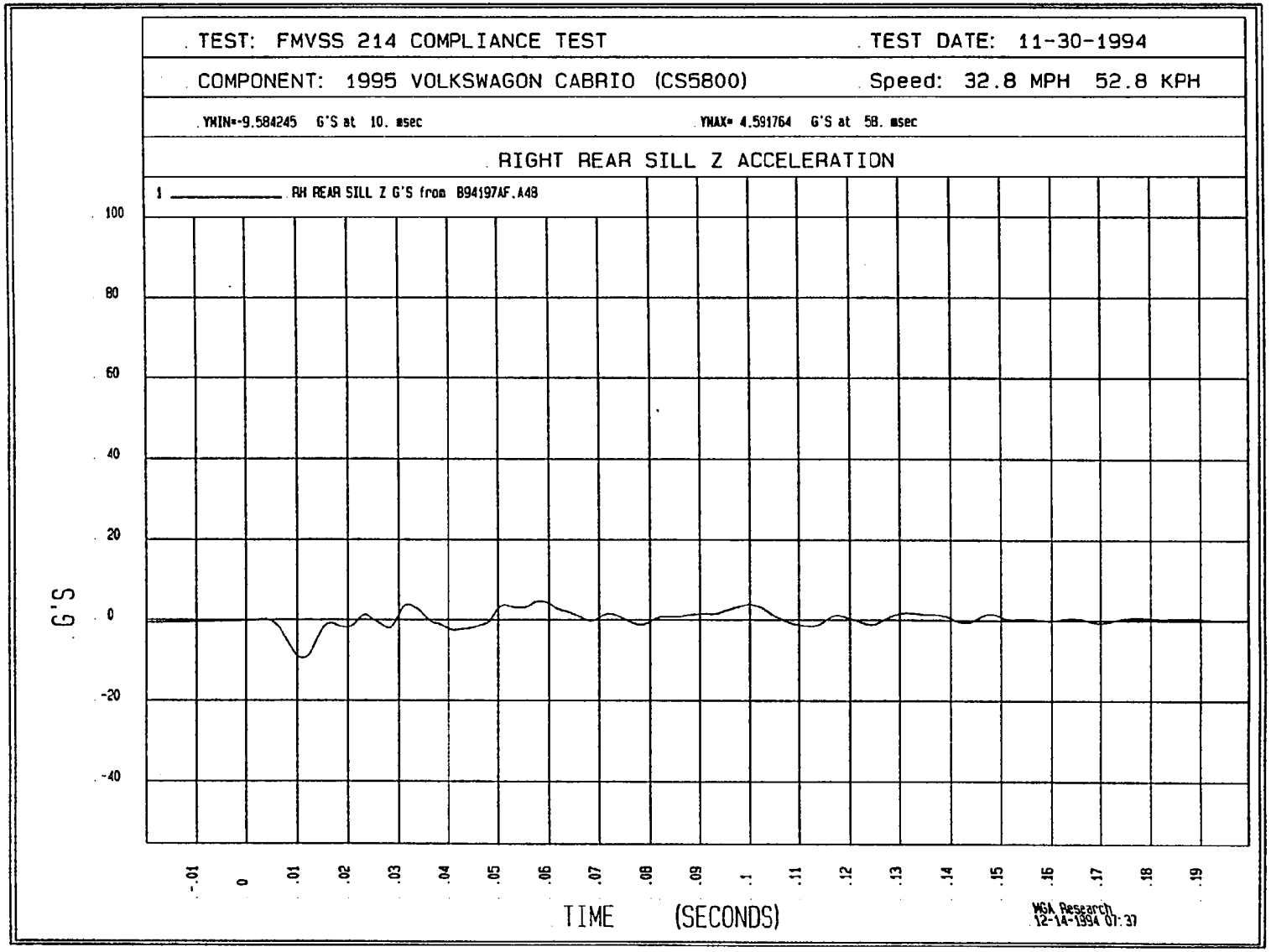


Figure B-32 - Right Rear Sill Z Acceleration vs. Time

Filter: Class 180 (300 Hz)

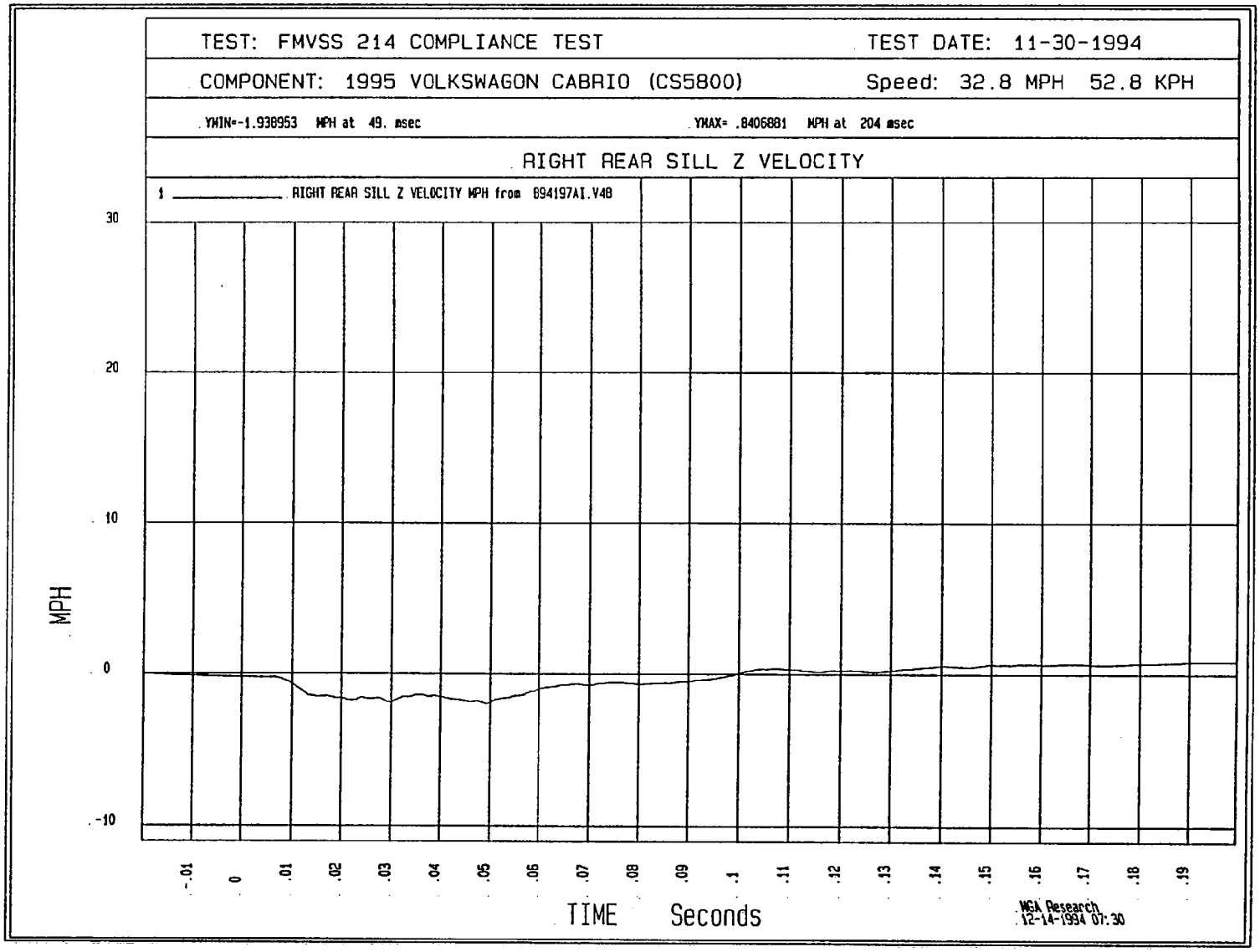


Figure B-33 - Right Rear Sill Z Velocity vs. Time

Filter: Class 60 (100 Hz)

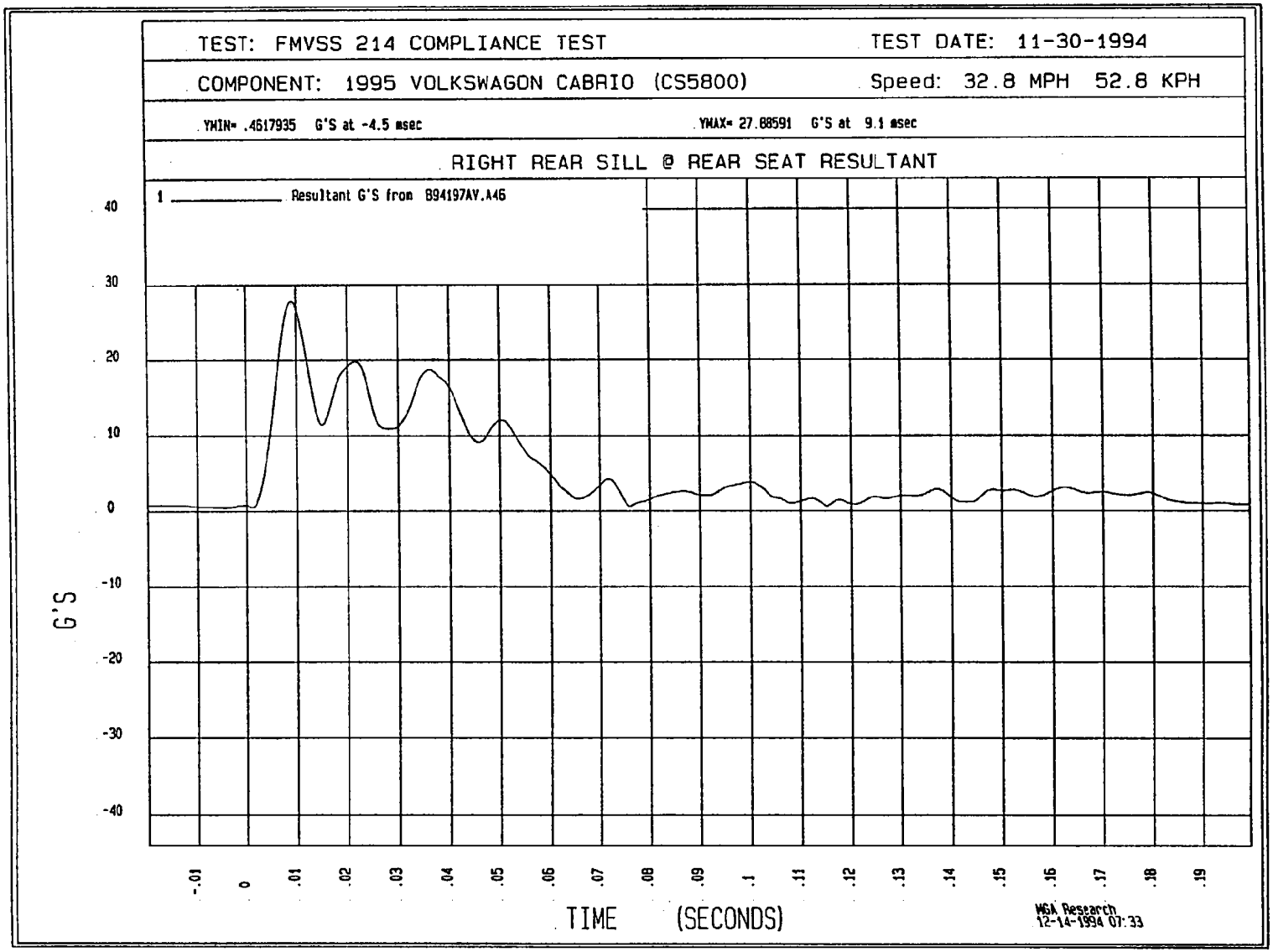


Figure B-34 - Right Rear Sill at Rear Seat Resultant vs. Time

Filter: Class 60 (100 Hz)

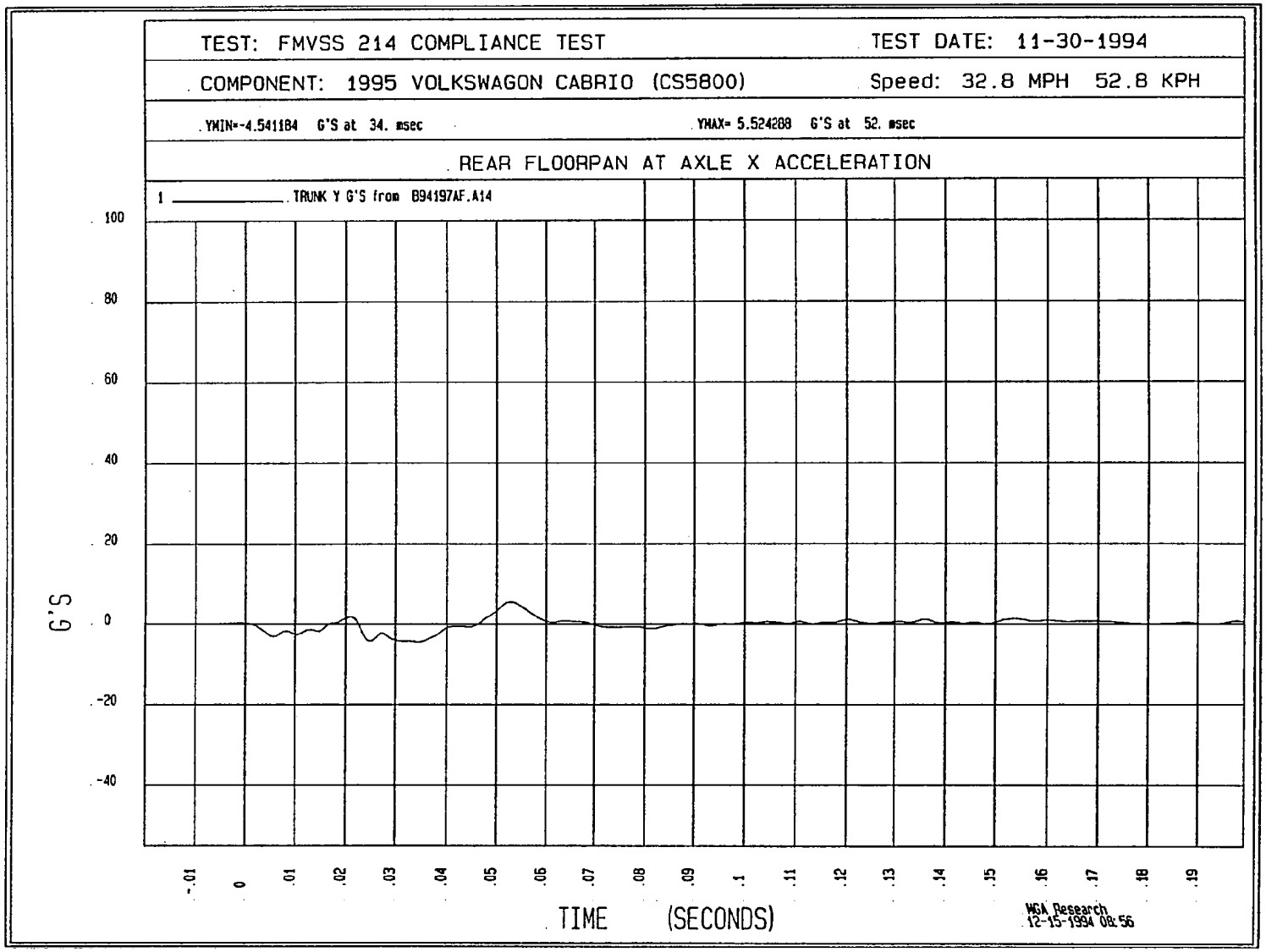


Figure B-35 - Rear Floorpan at Axle X Acceleration vs. Time

Filter: Class 180 (300 Hz)

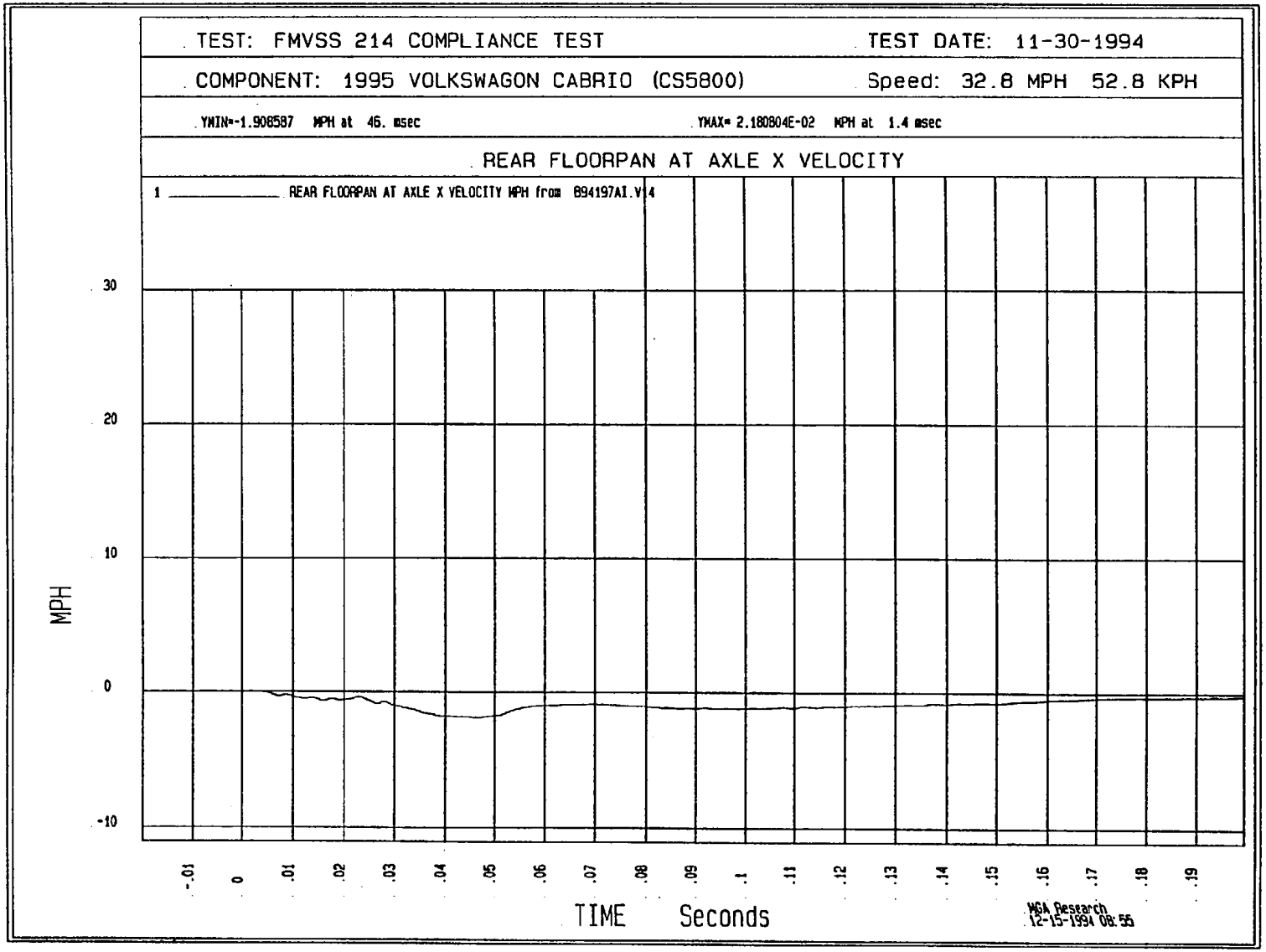


Figure B-36 - Rear Floorpan at Axle X Velocity vs. Time

Filter: Class 60 (100 Hz)

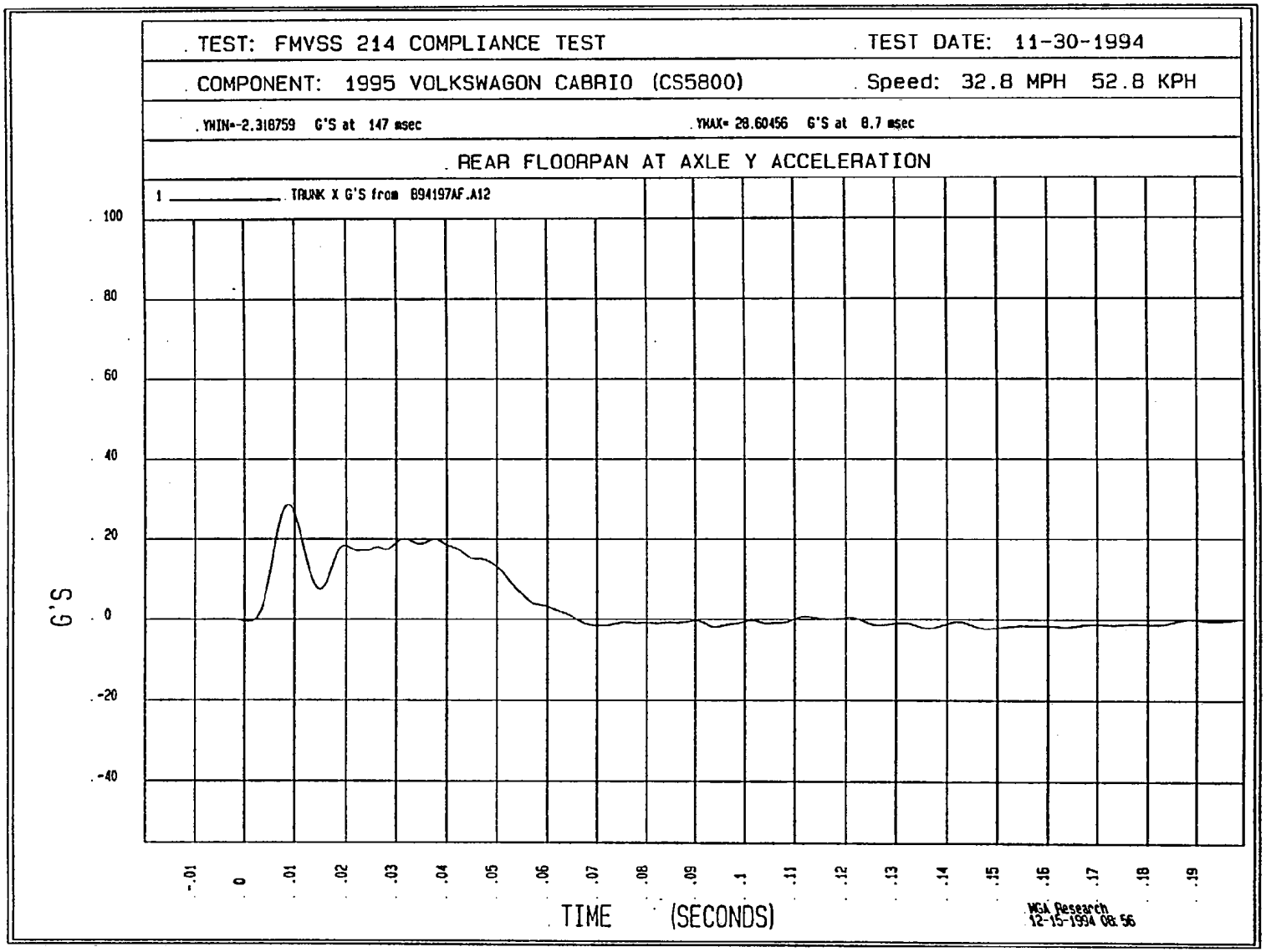


Figure B-37 - Rear Floorpan at Axle Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

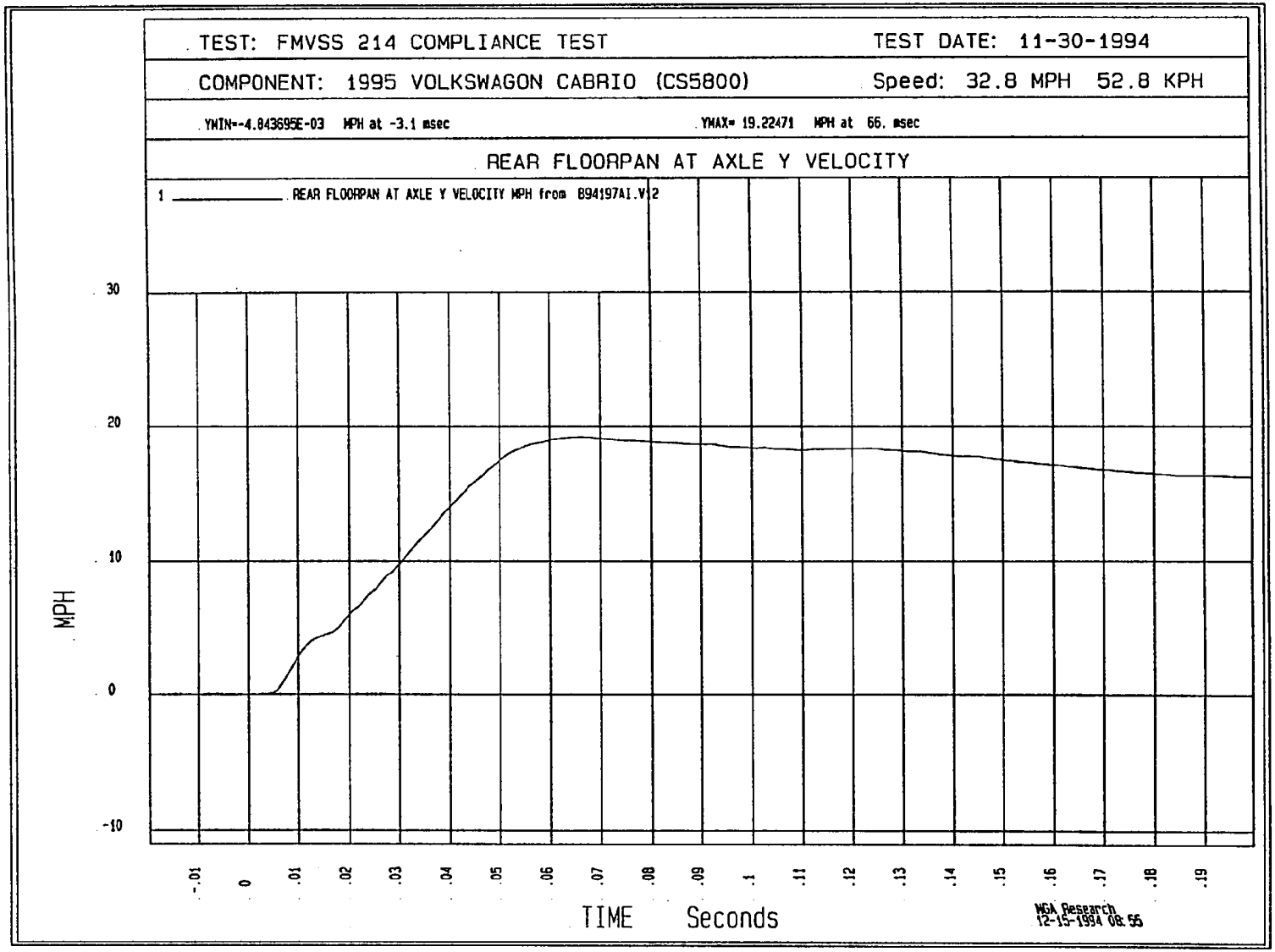


Figure B-38 - Rear Floorpan at Axle Y Velocity vs. Time

Filter: Class 60 (100 Hz)

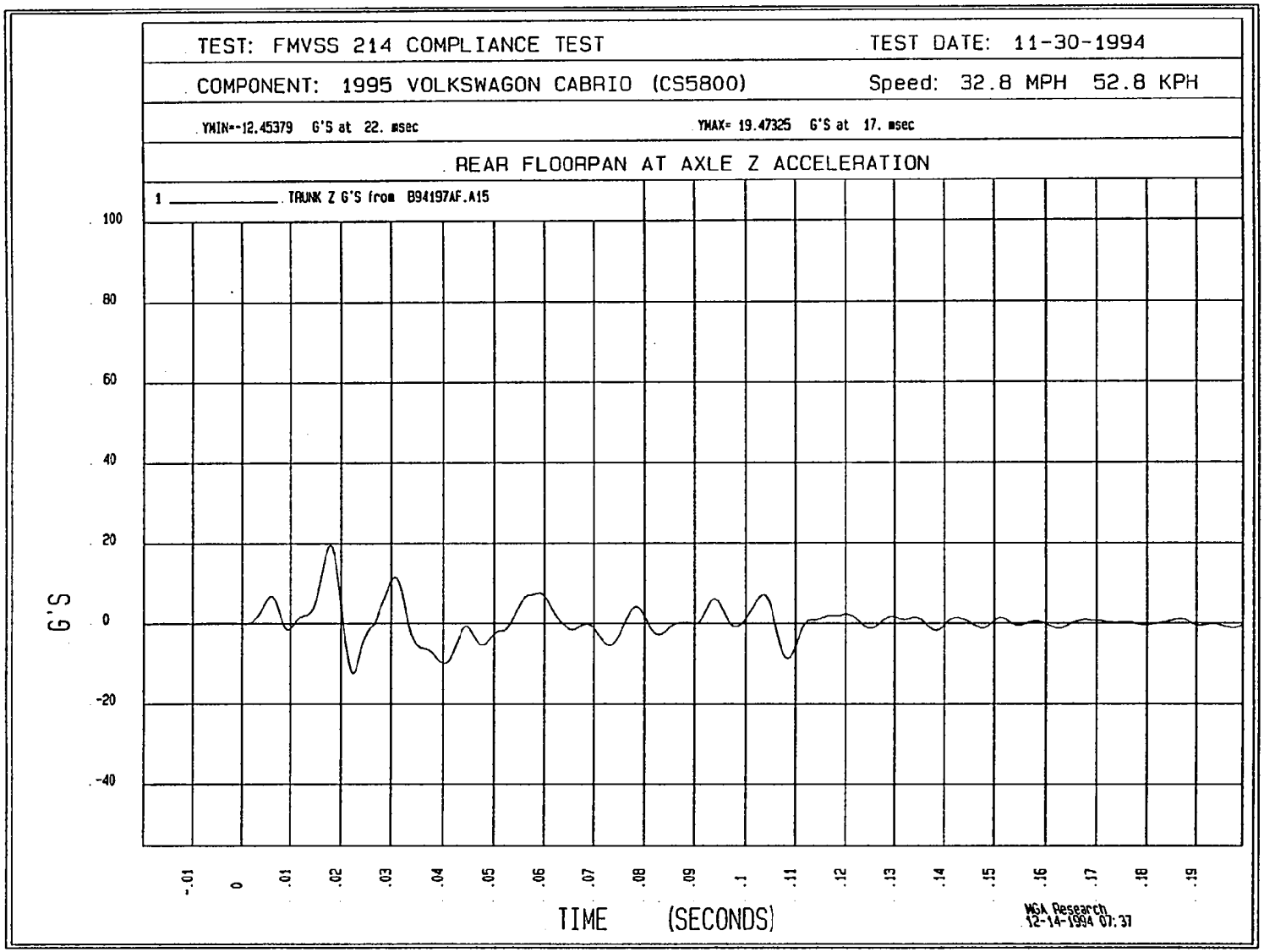


Figure B-39 - Rear Floorpan at Axle Z Acceleration vs. Time

Filter: Class 180 (300 Hz)

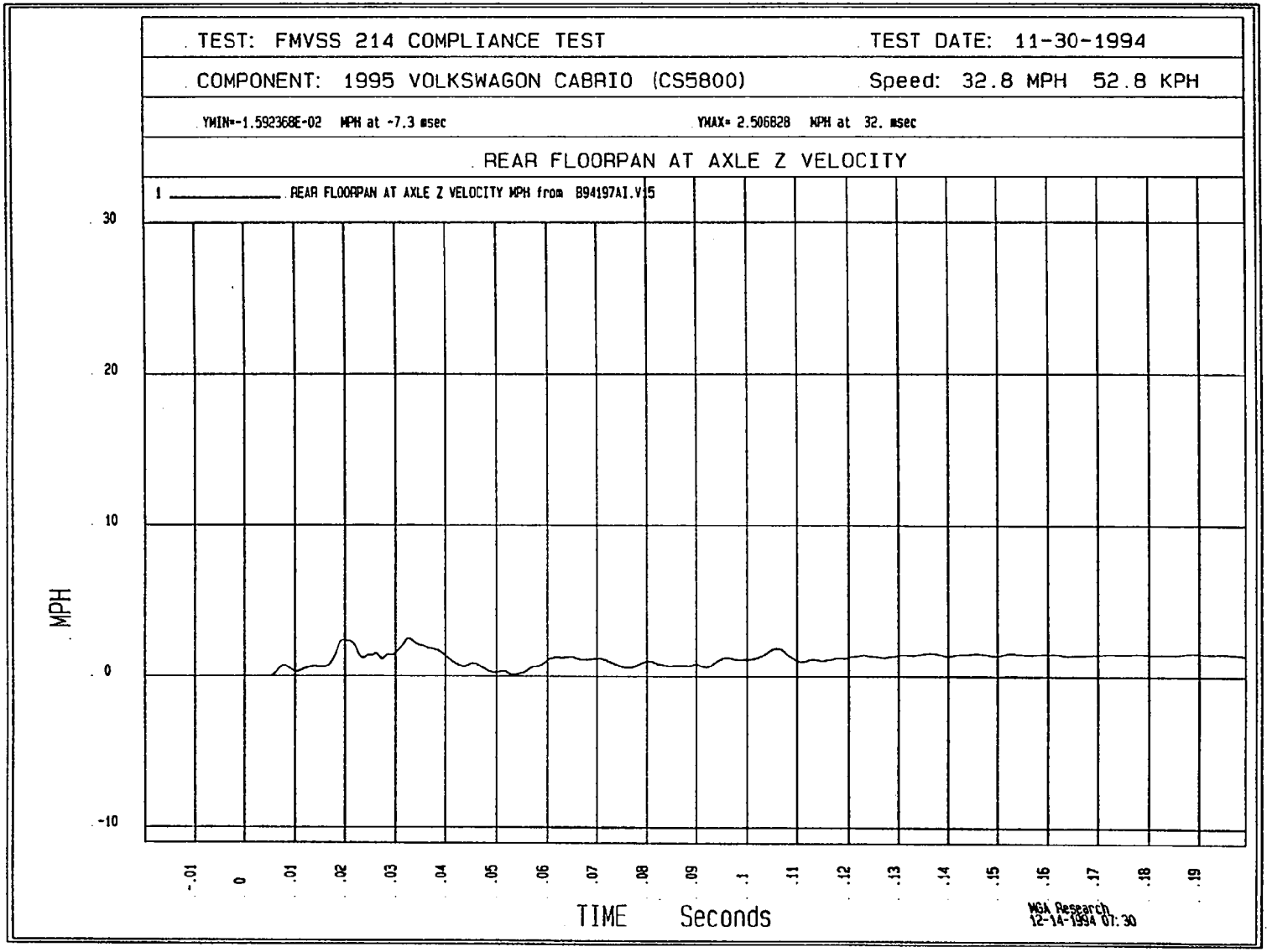


Figure B-4Ø - Rear Floorpan at Axle Z Velocity vs. Time

Filter: Class 60 (100 Hz)

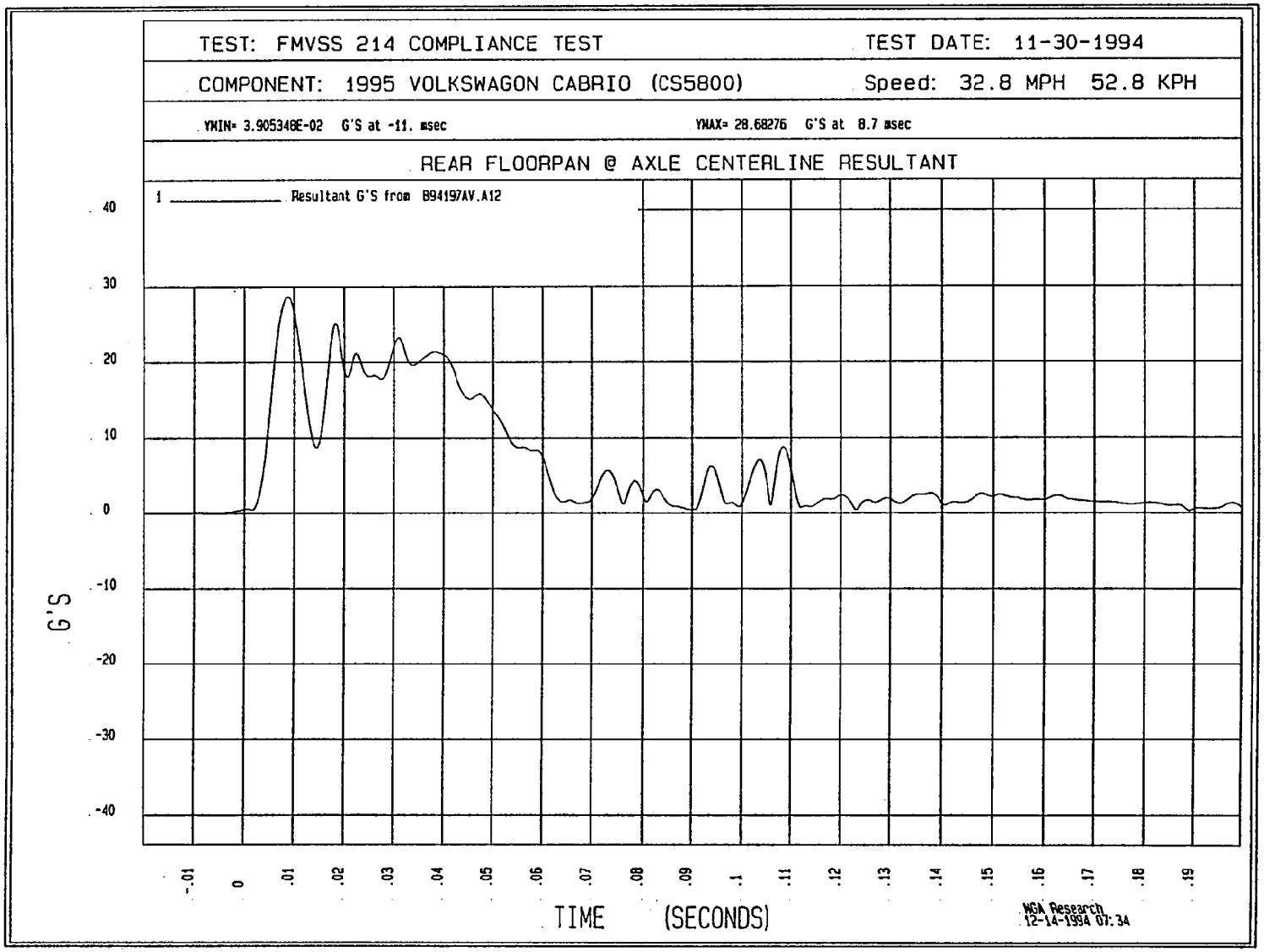


Figure B-41 - Rear Floorpan at Axle Centerline Resultant vs. Time

Filter: Class 60 (100 Hz)

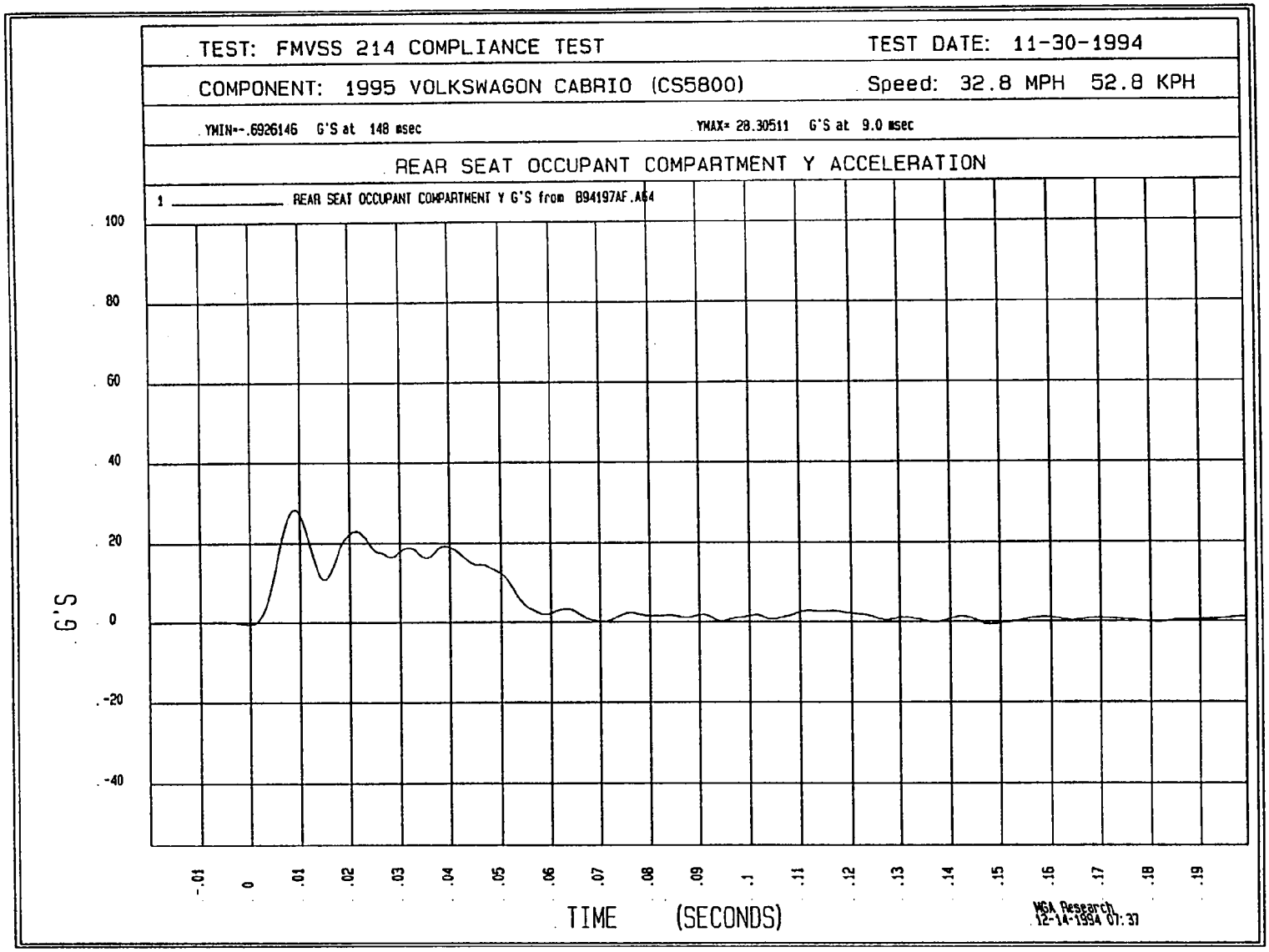


Figure B-42 - Rear Seat Occupant Compartment Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

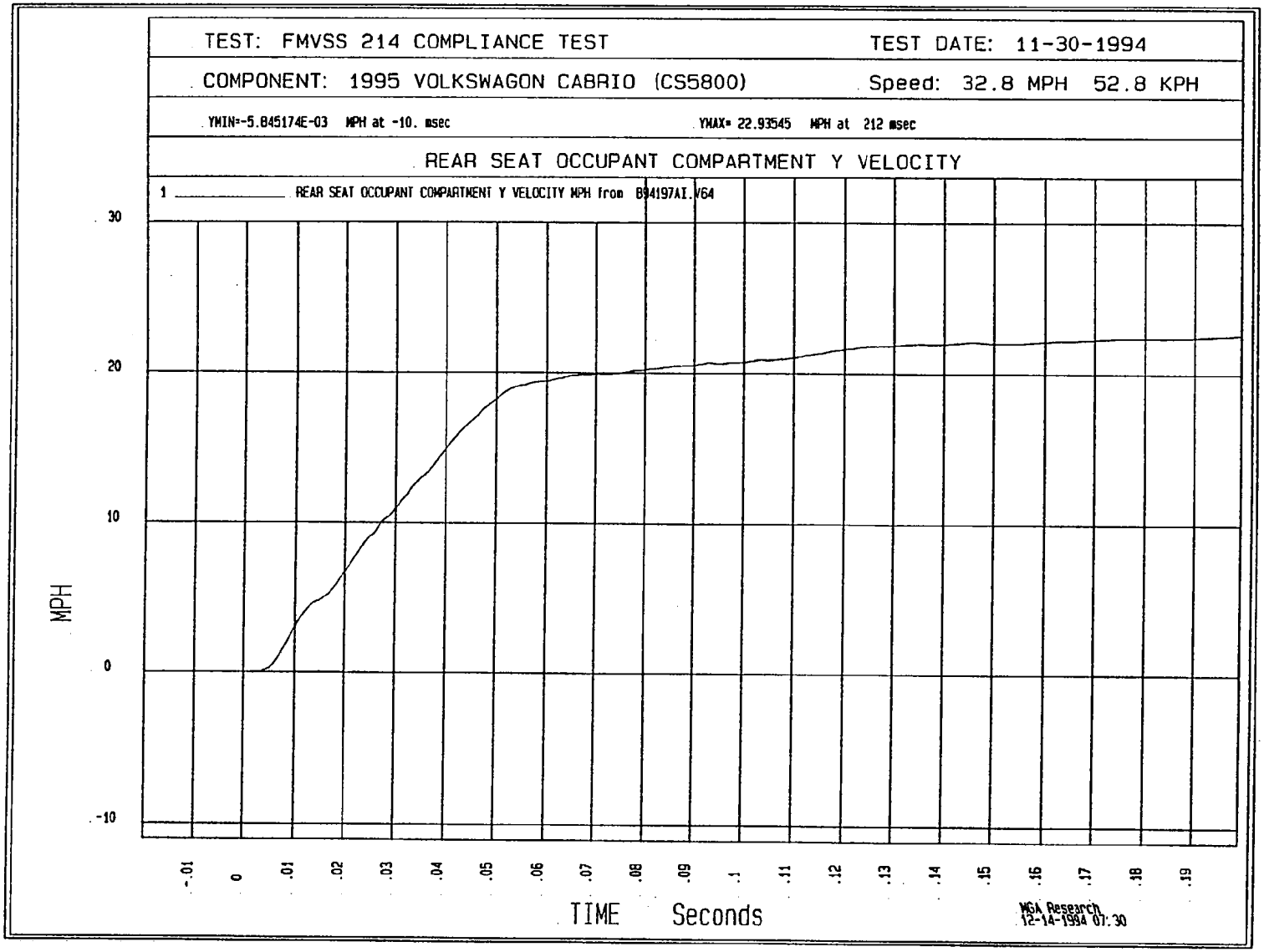


Figure B-43 - Rear Seat Occupant Compartment Y Velocity vs. Time

Filter: Class 60 (100 Hz)

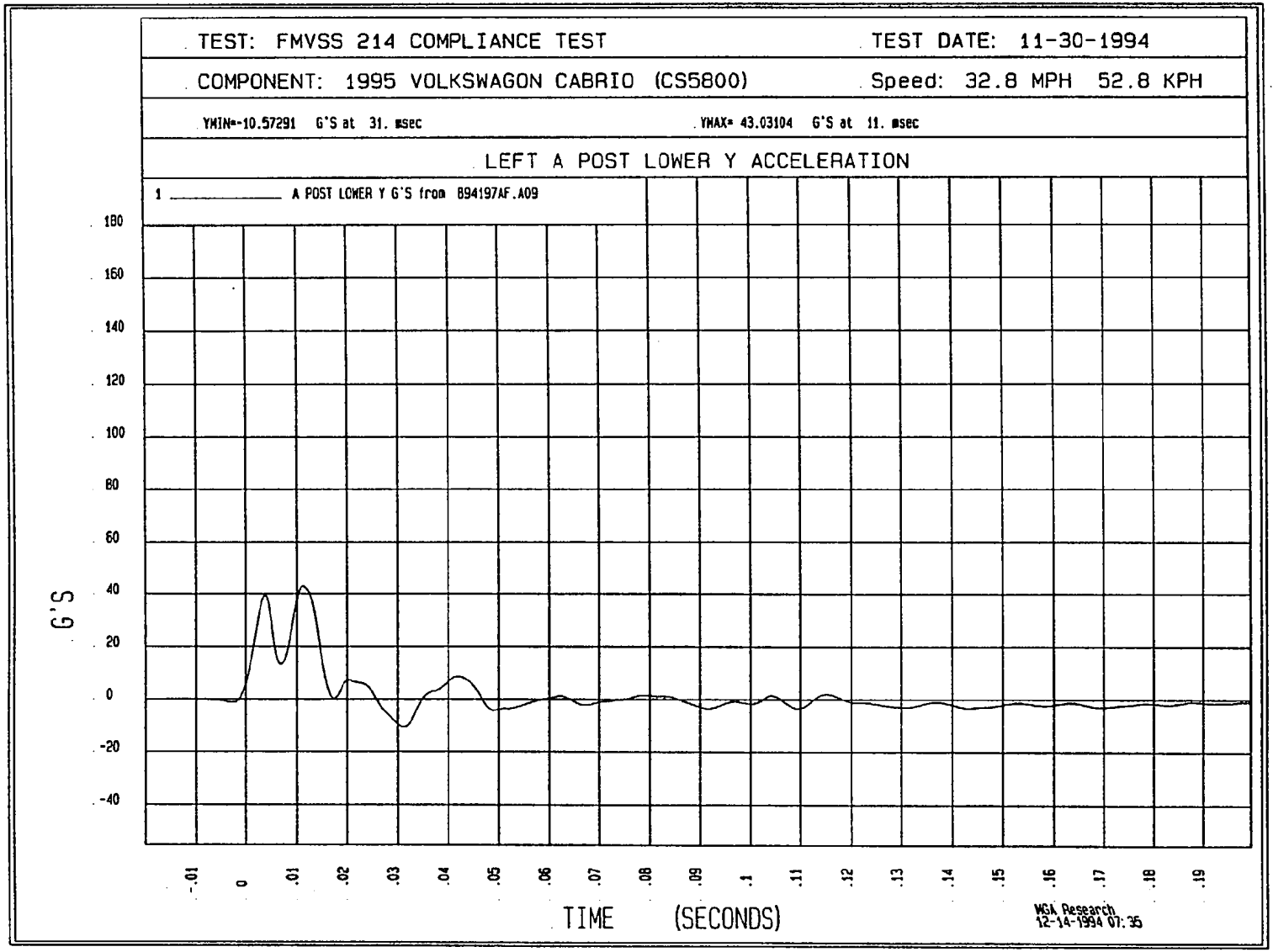


Figure B-44 - Left A Post Lower Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

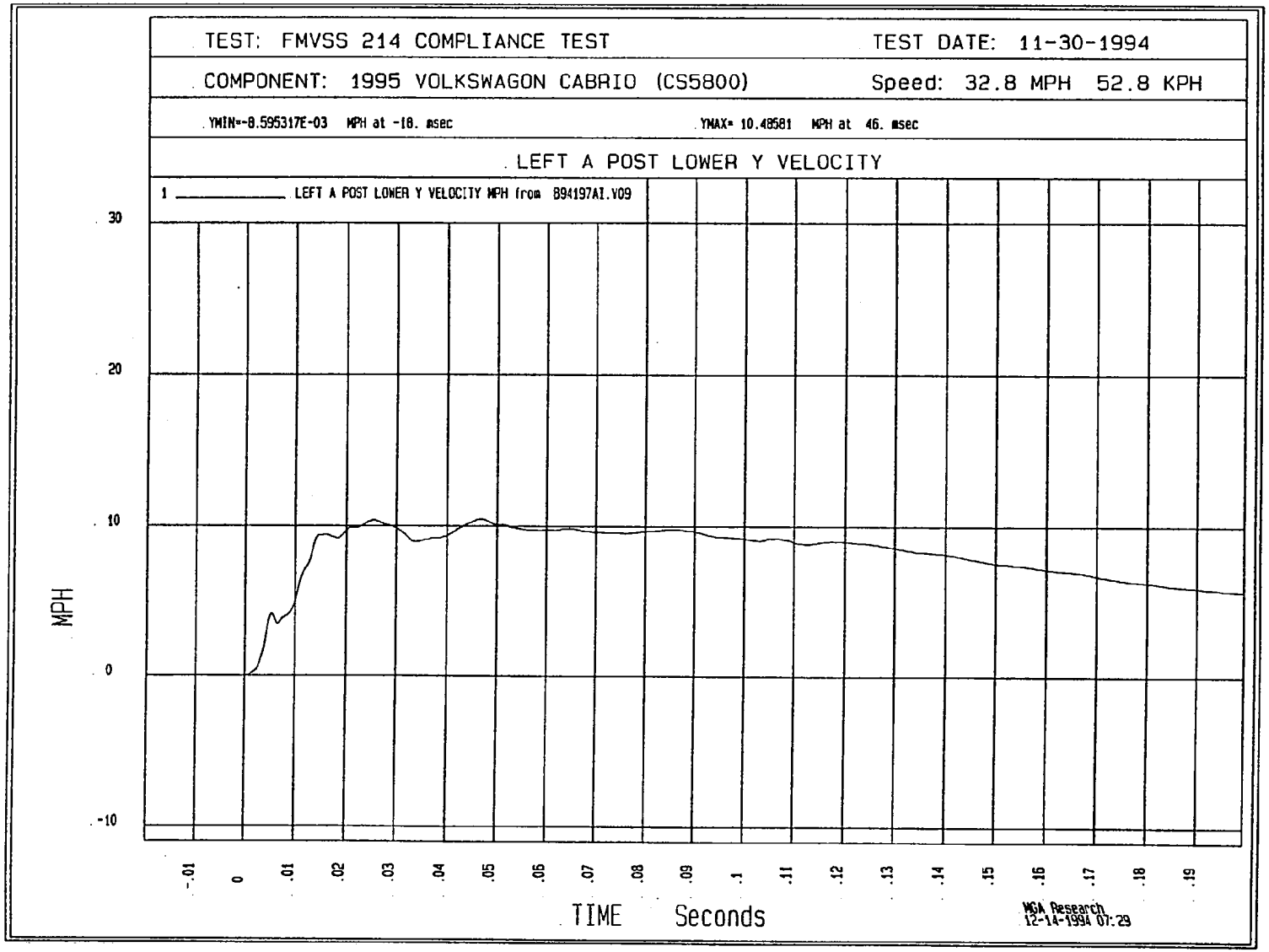


Figure B-45 - Left A Post Lower Y Velocity vs. Time

Filter; Class 60 (100 Hz)

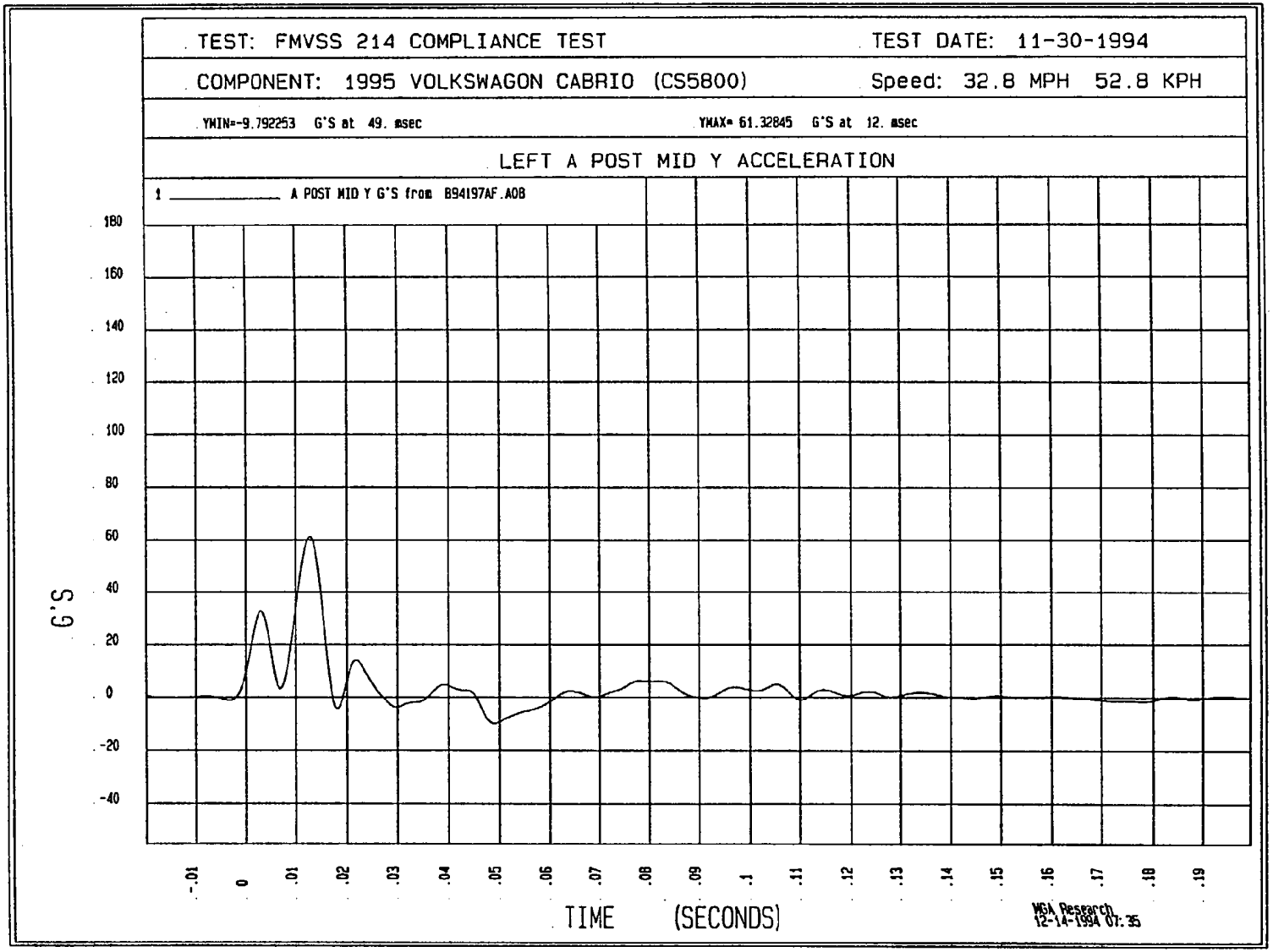


Figure B-46 - Left A Post Mid Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

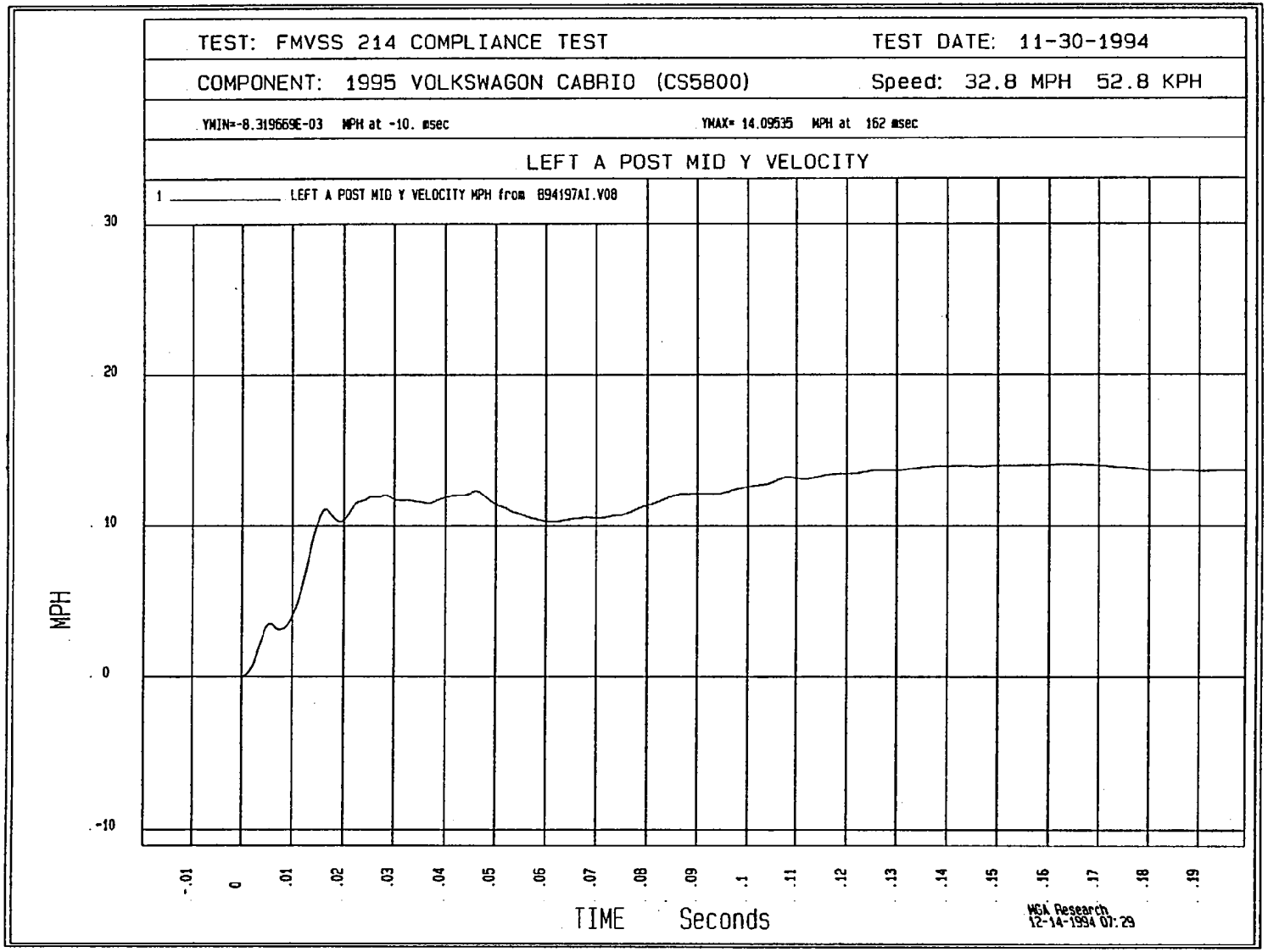


Figure B-47 - Left A Post Mid Y Velocity vs. Time

Filter: Class 60 (100 Hz)

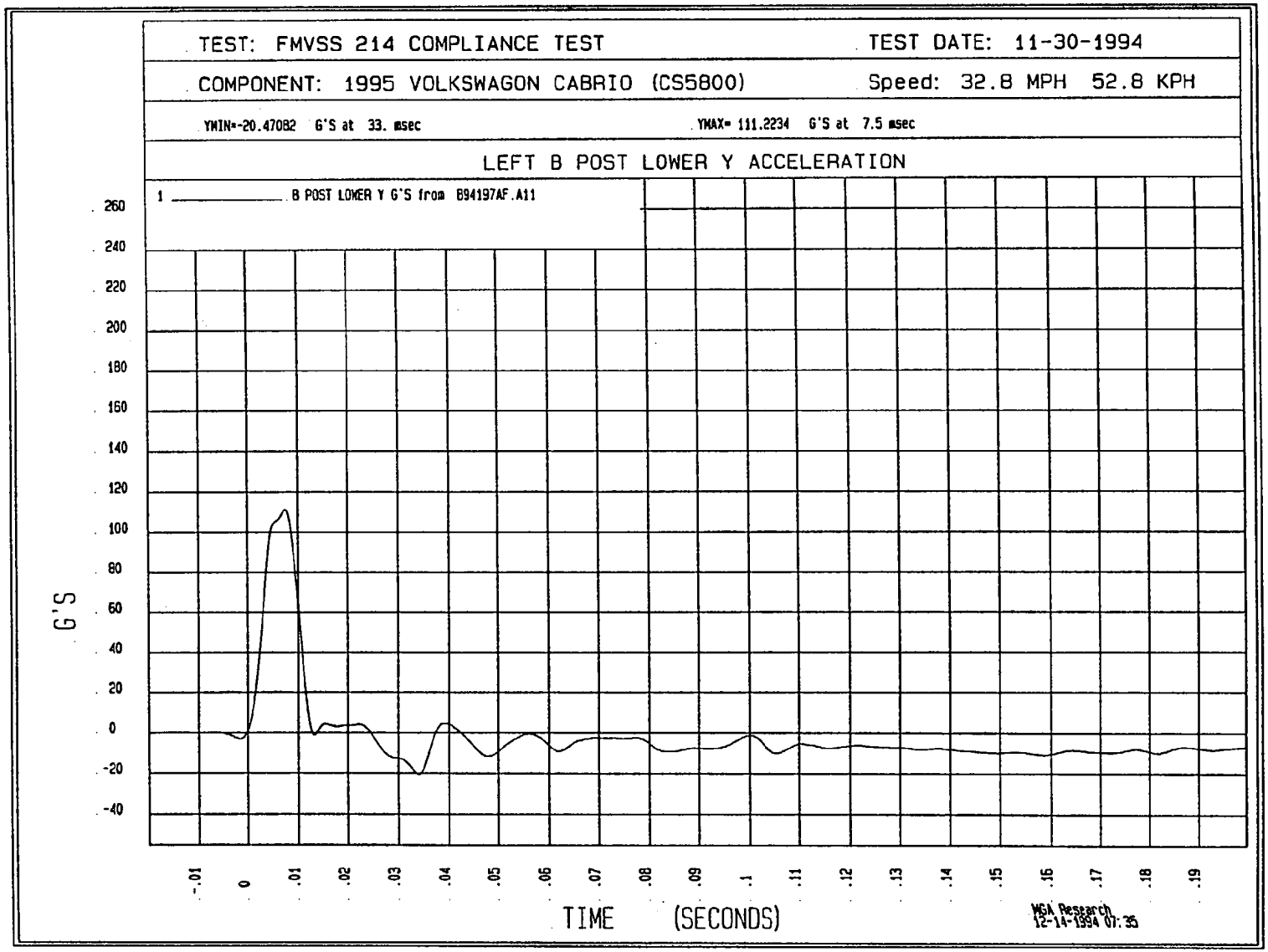


Figure B-48 - Left B Post Lower Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

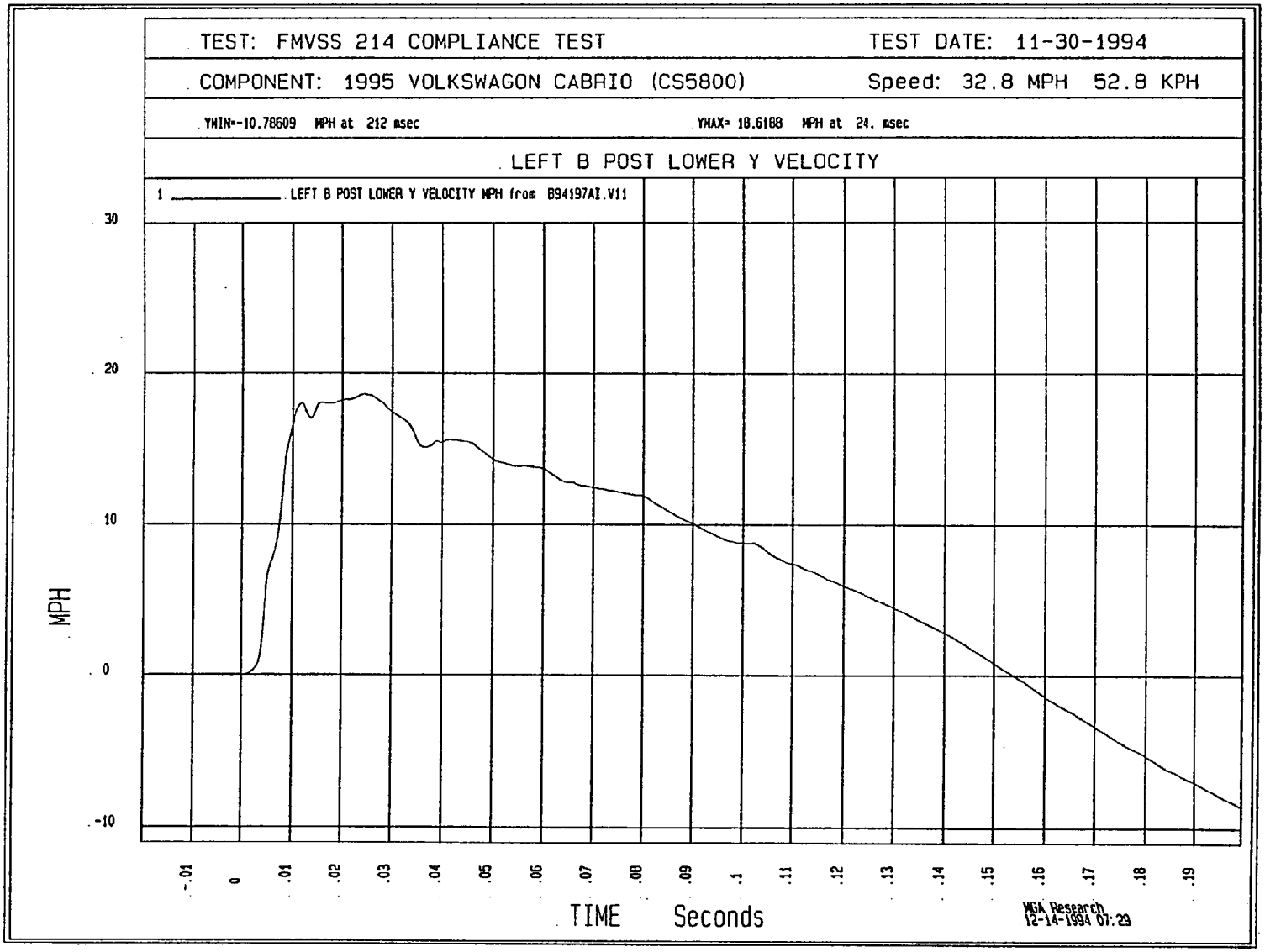


Figure B-49 - Left B Post Lower Y Velocity vs. Time

Filter: Class 60 (100 Hz)

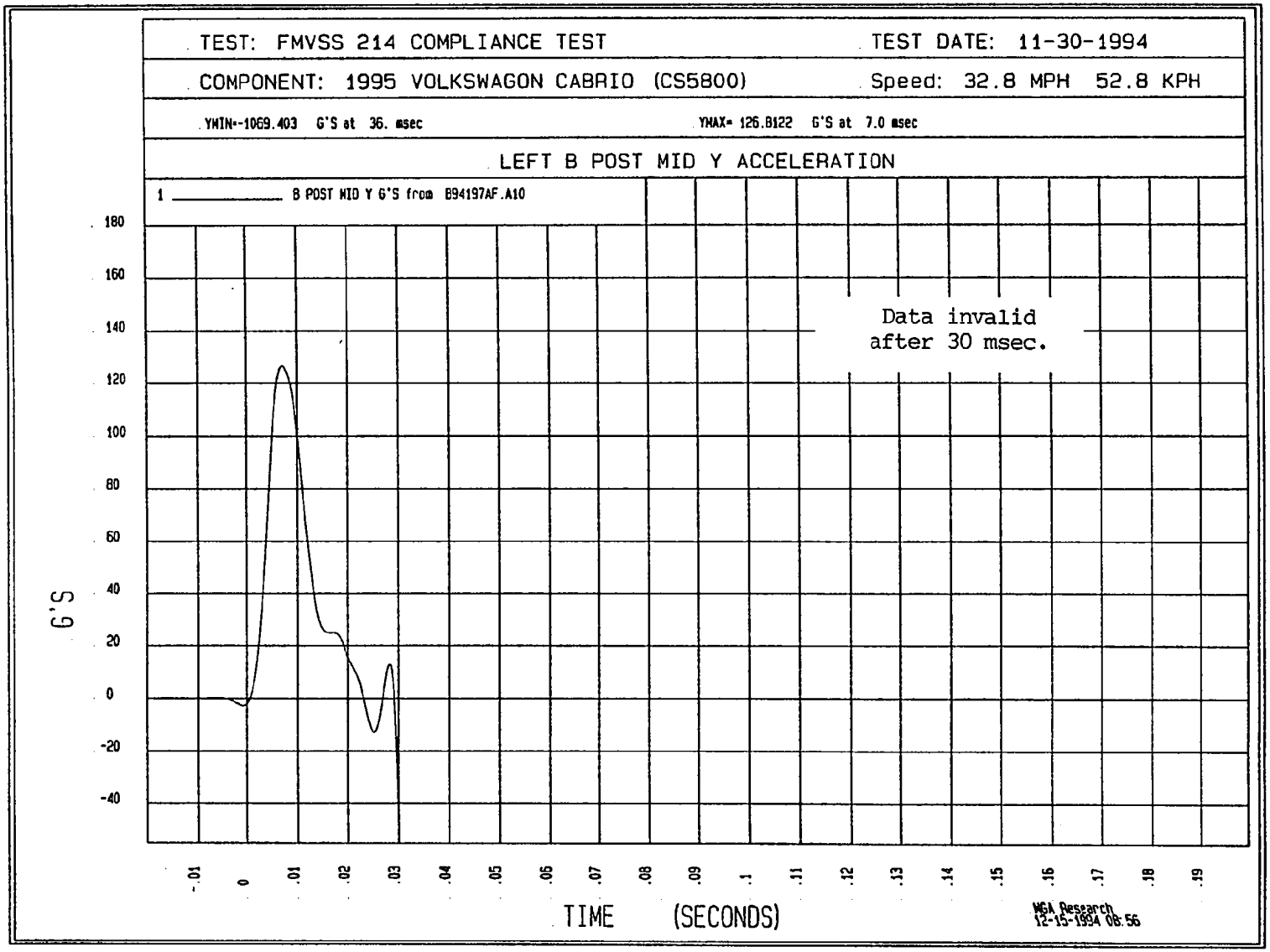


Figure B-5Ø - Left B Post Mid Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

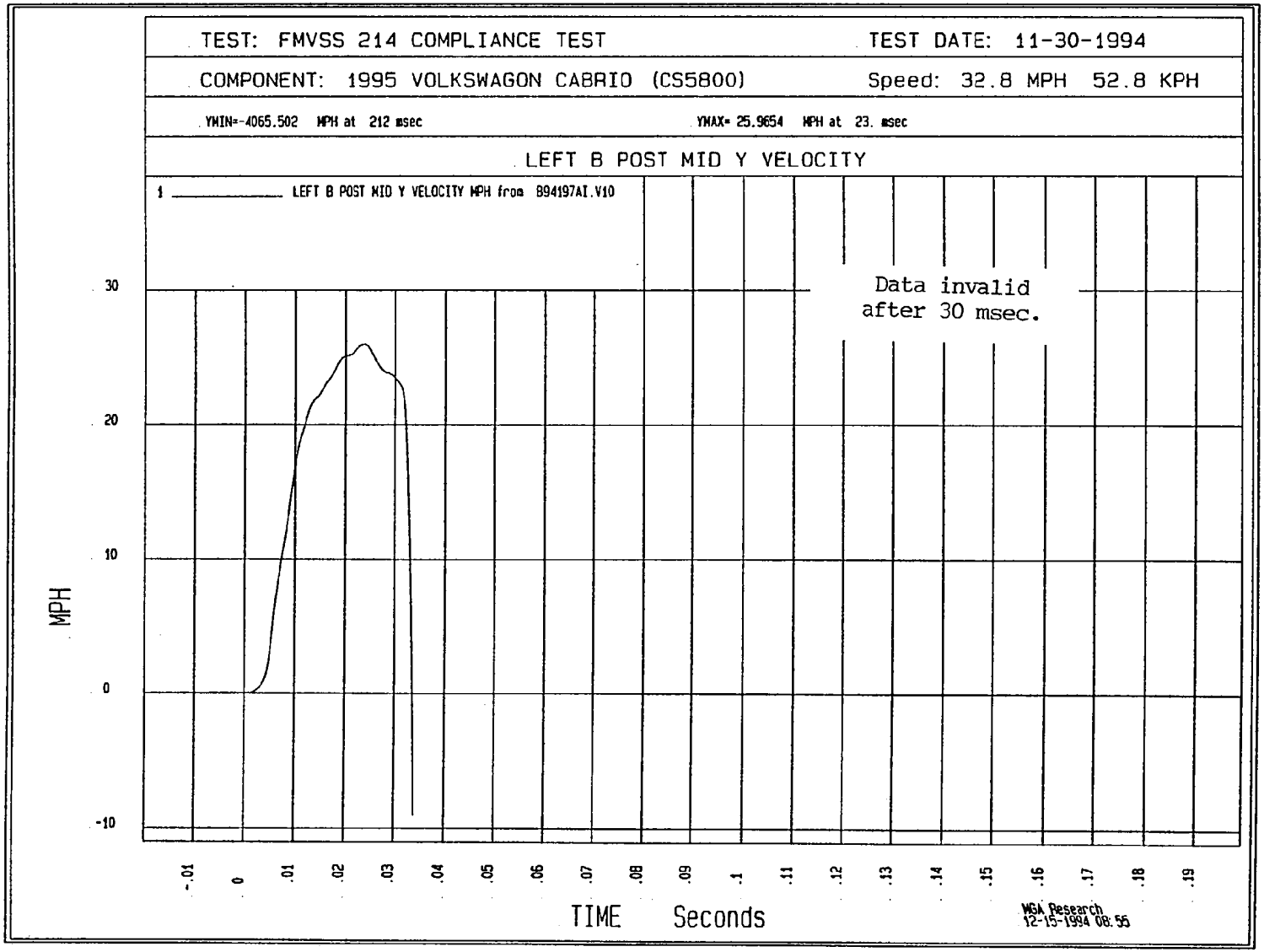


Figure B-51 - Left B Post Mid Y Velocity vs. Time

Filter: Class 60 (100 Hz)

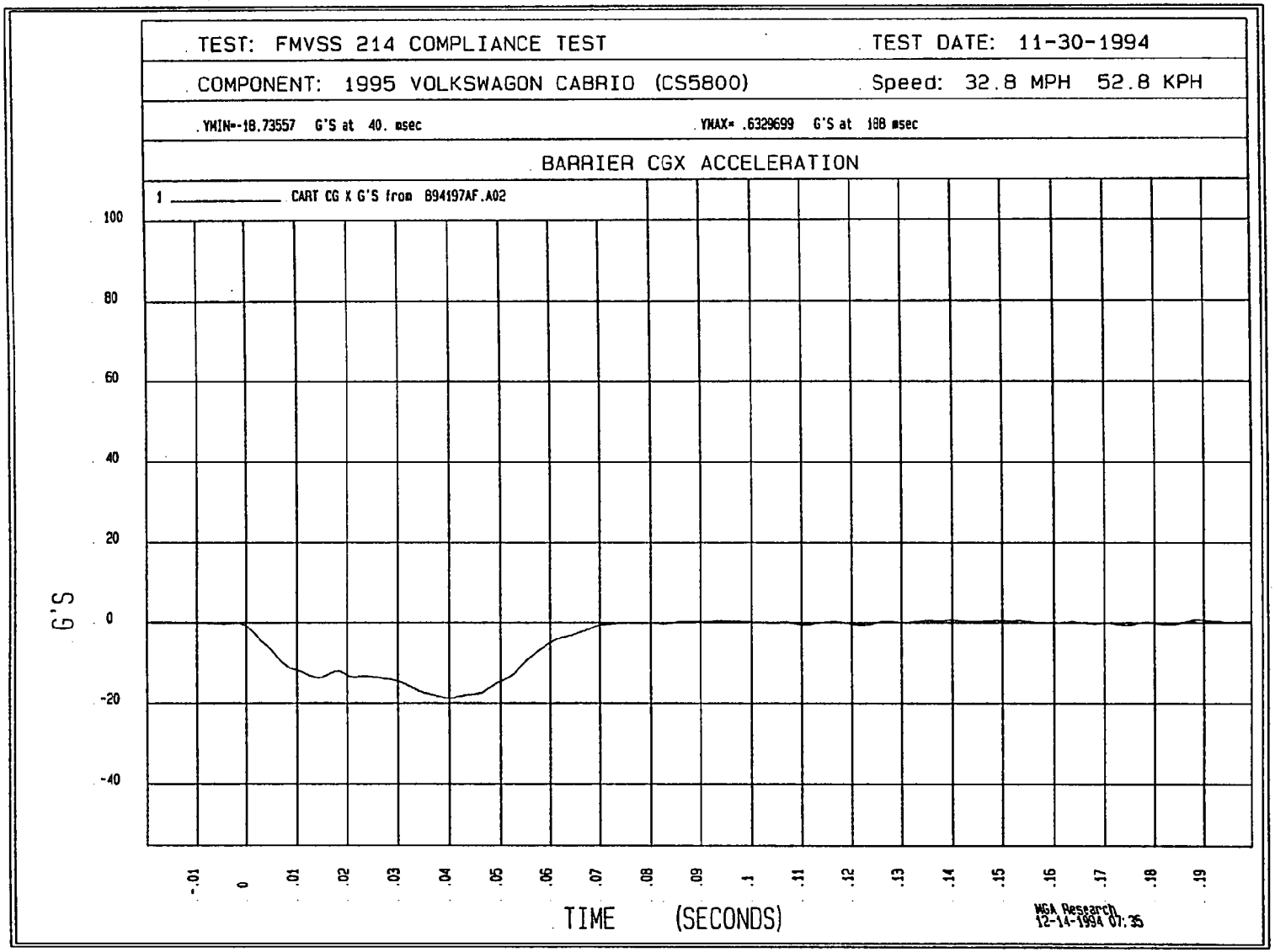


Figure B-52 - Moving Barrier Center of Gravity X Acceleration vs. Time

Filter: Class 180 (300 Hz)

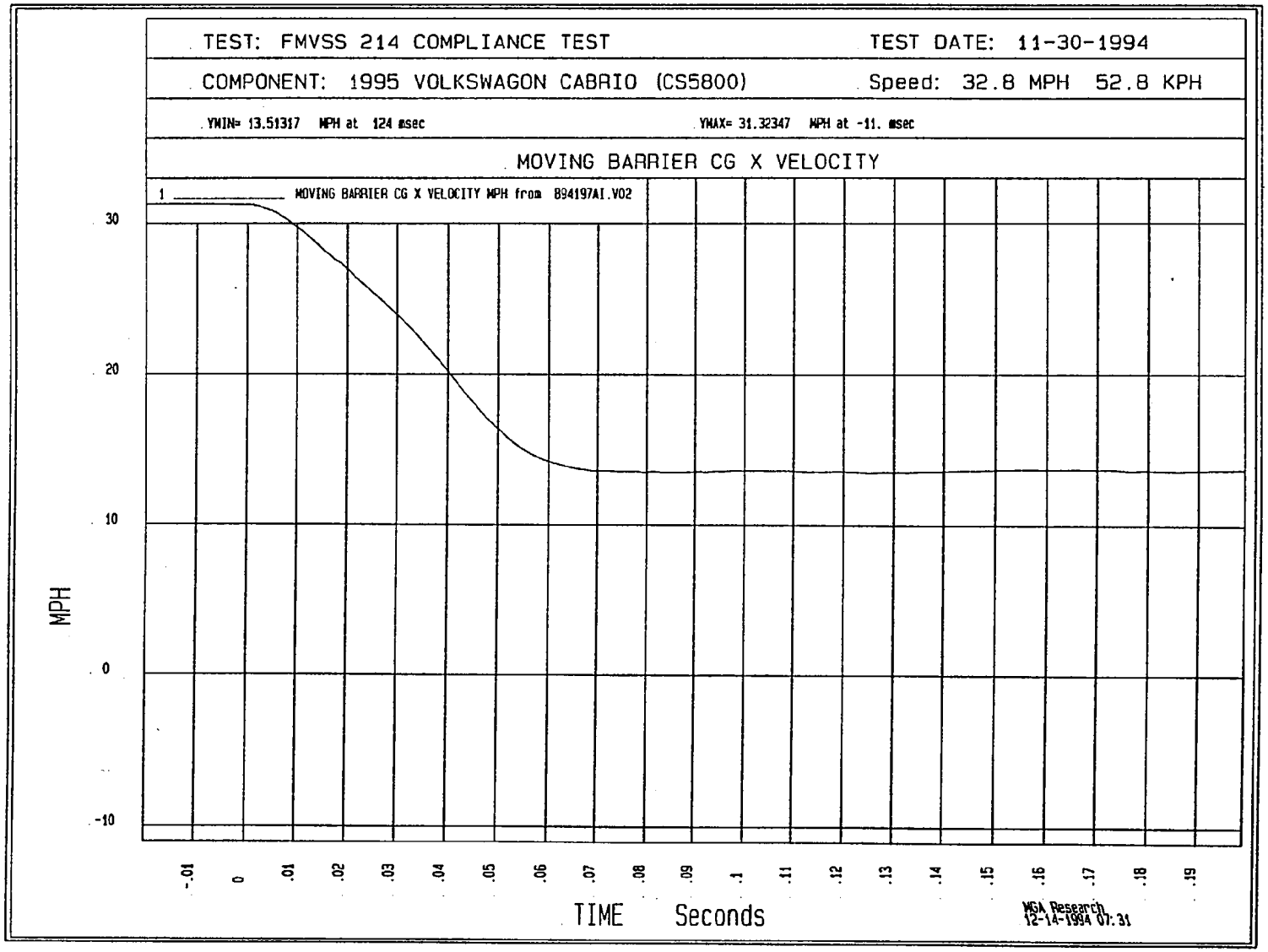


Figure B-53 - Moving Barrier Center of Gravity X Velocity vs. Time

Filter: Class 60 (100 Hz)

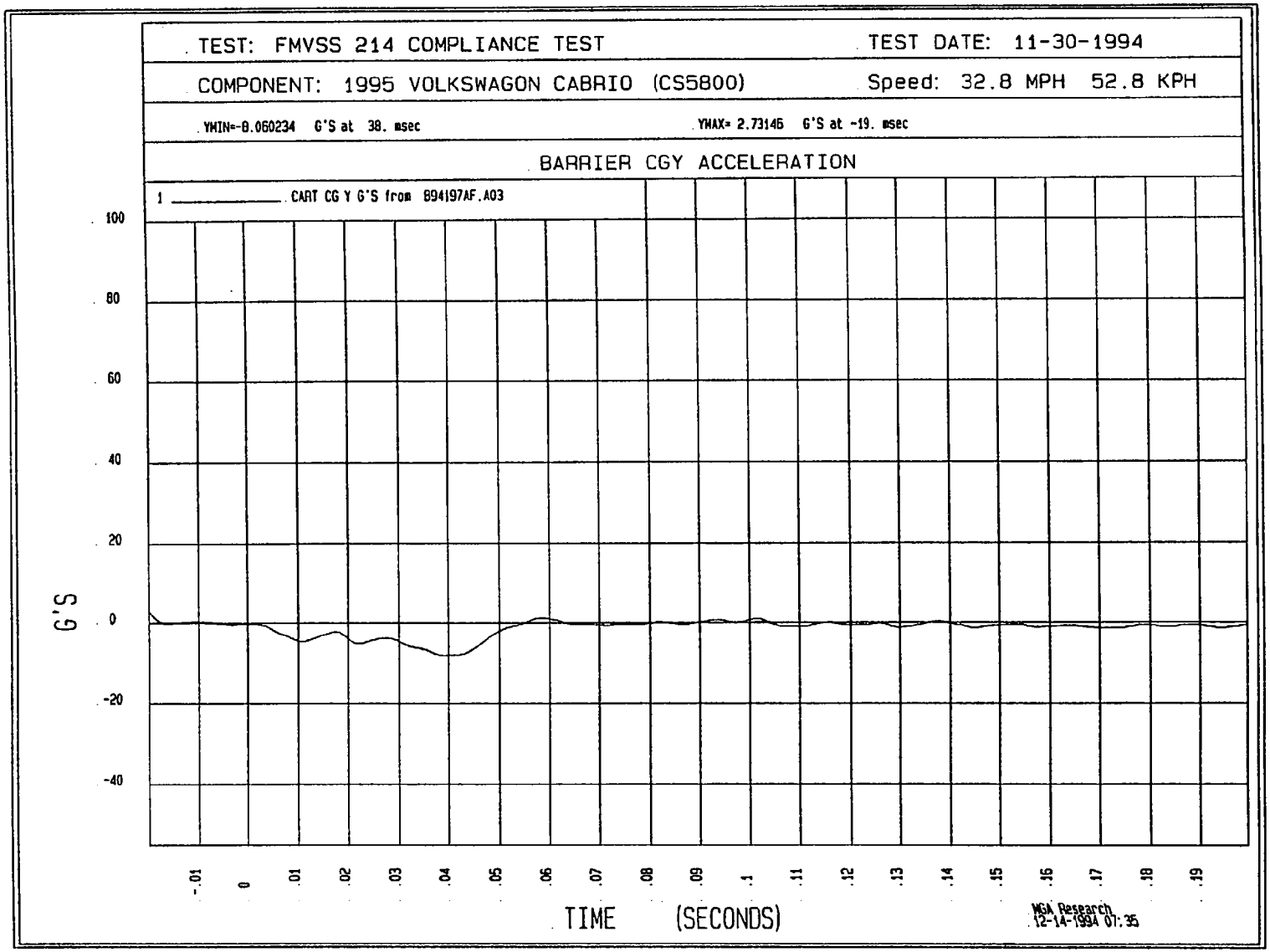


Figure B-54 - Moving Barrier Center of Gravity Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

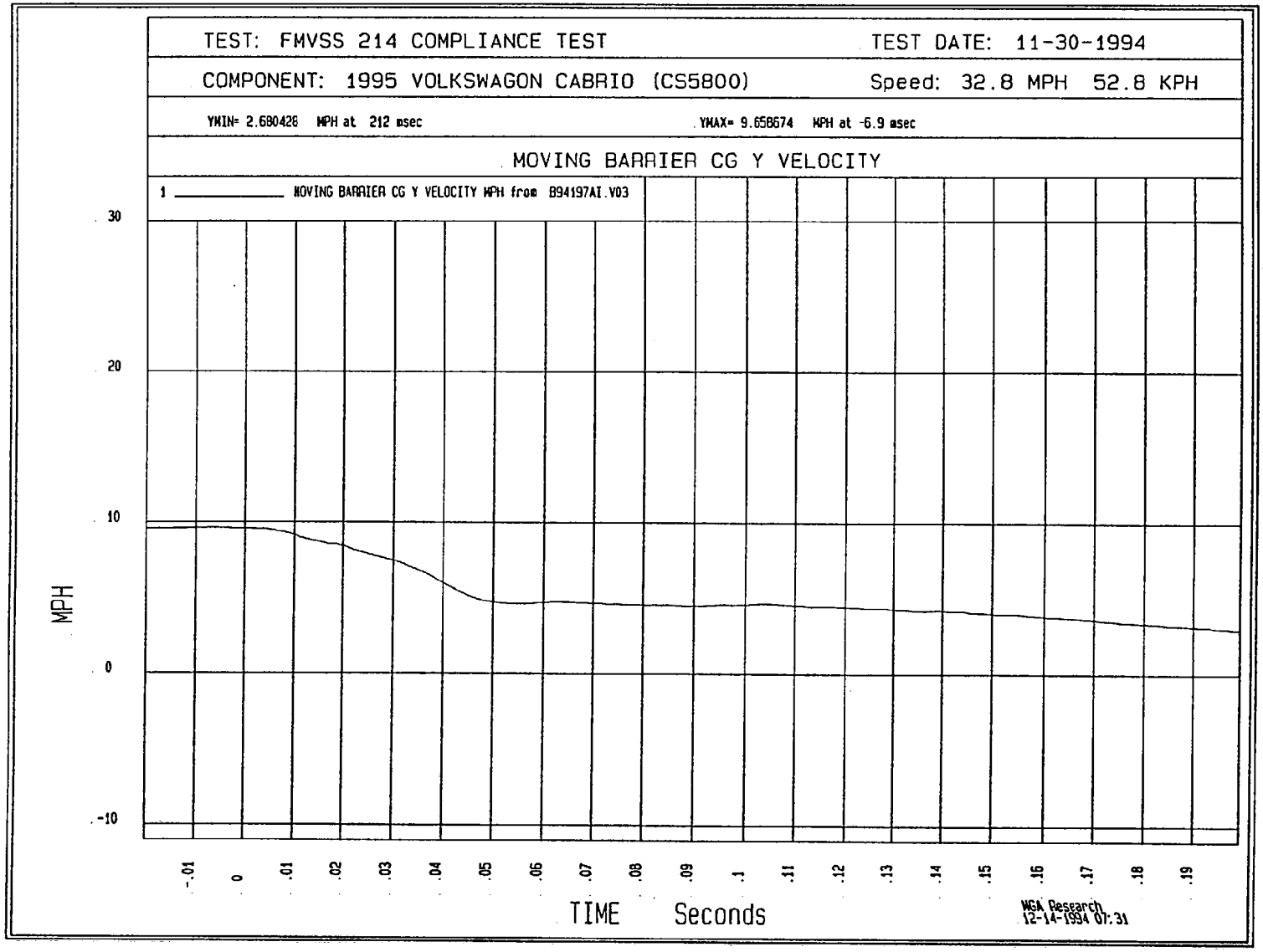


Figure B-55 - Moving Barrier Center of Gravity Y Velocity vs. Time

Filter: Class 60 (100 Hz)

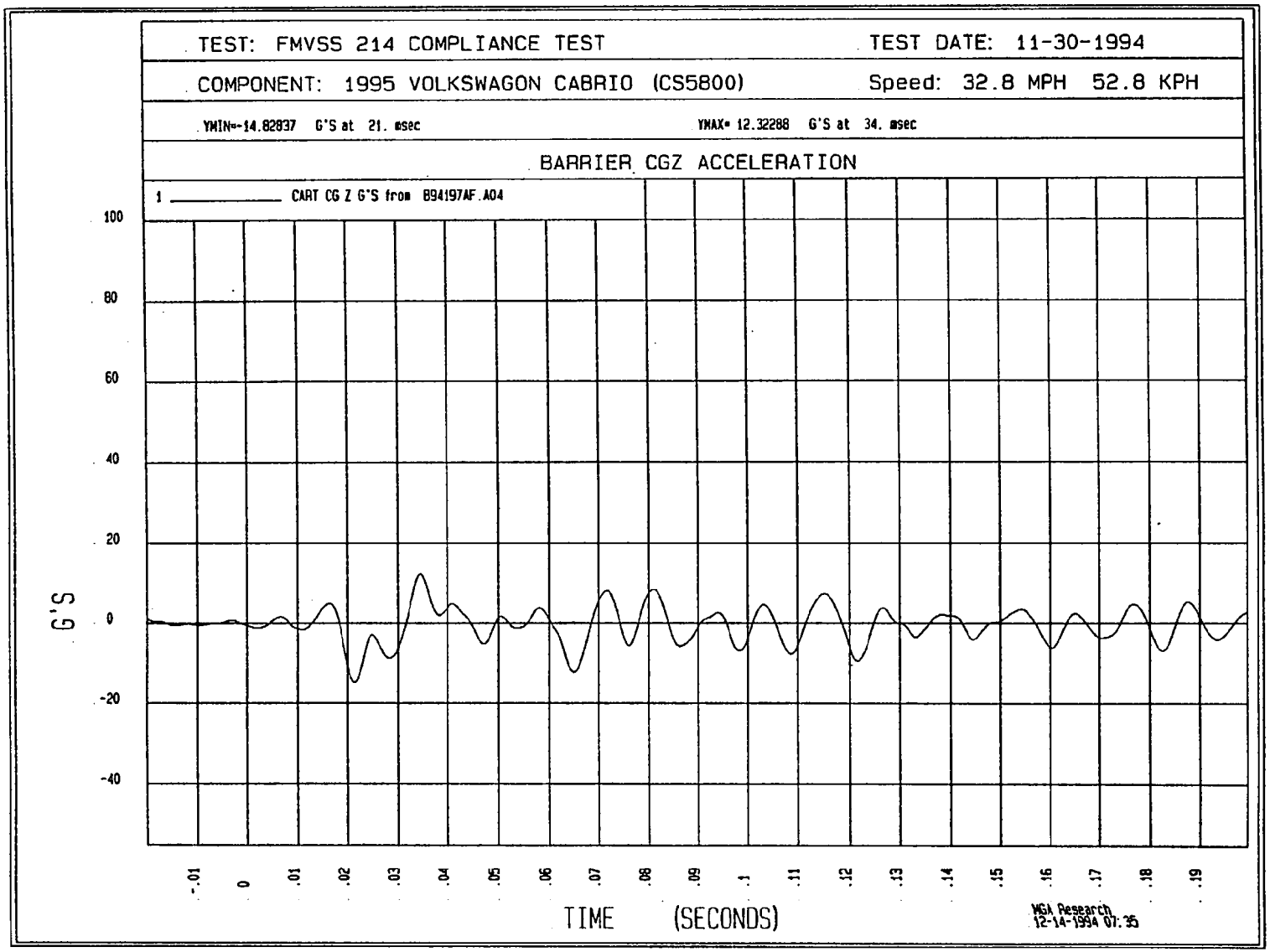


Figure B-56 - Moving Barrier Center of Gravity Z Acceleration vs. Time

Filter: Class 180 (300 Hz)

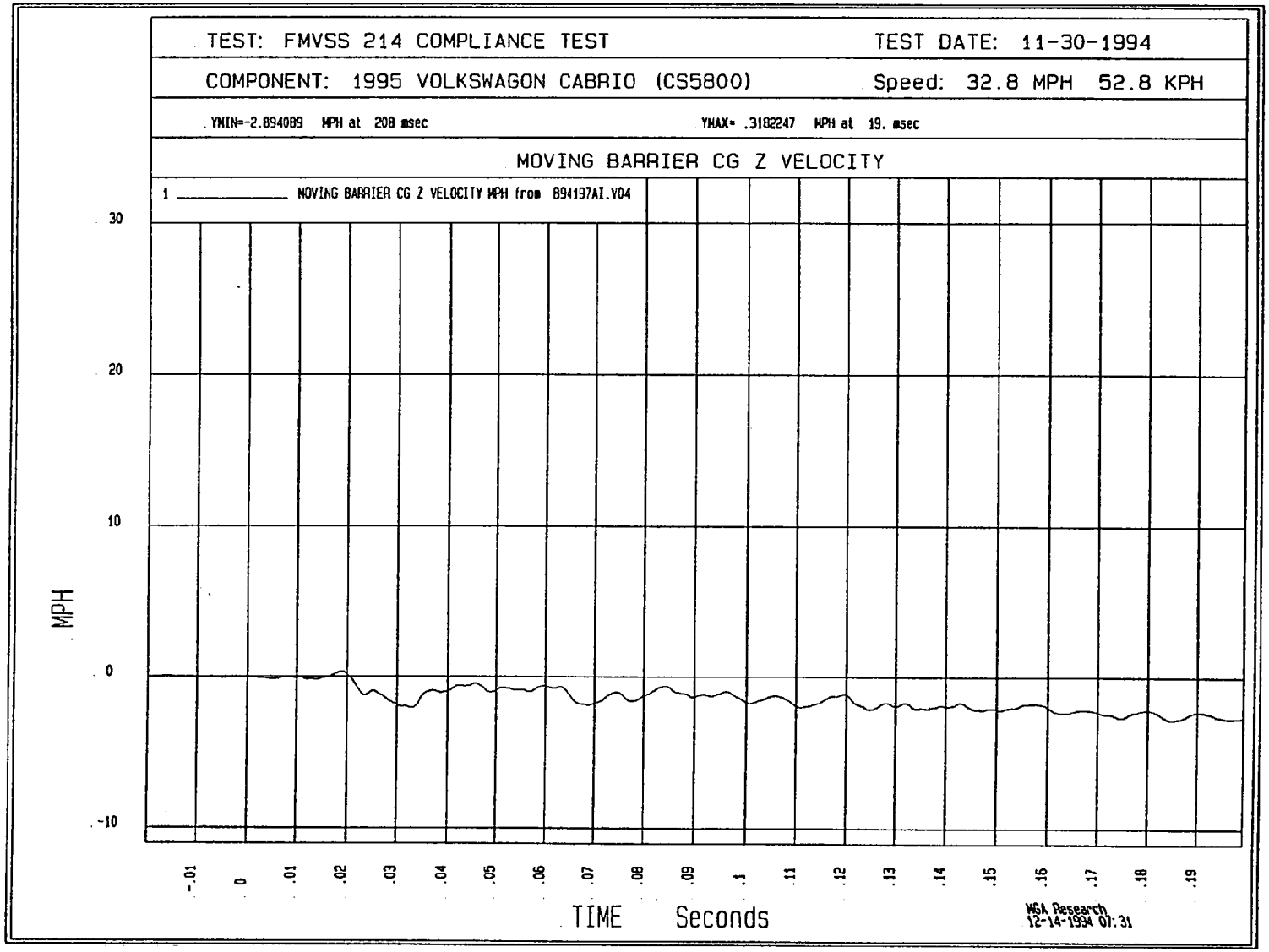


Figure B-57 - Moving Barrier Center of Gravity Z Velocity vs. Time

Filter: Class 60 (100 Hz)

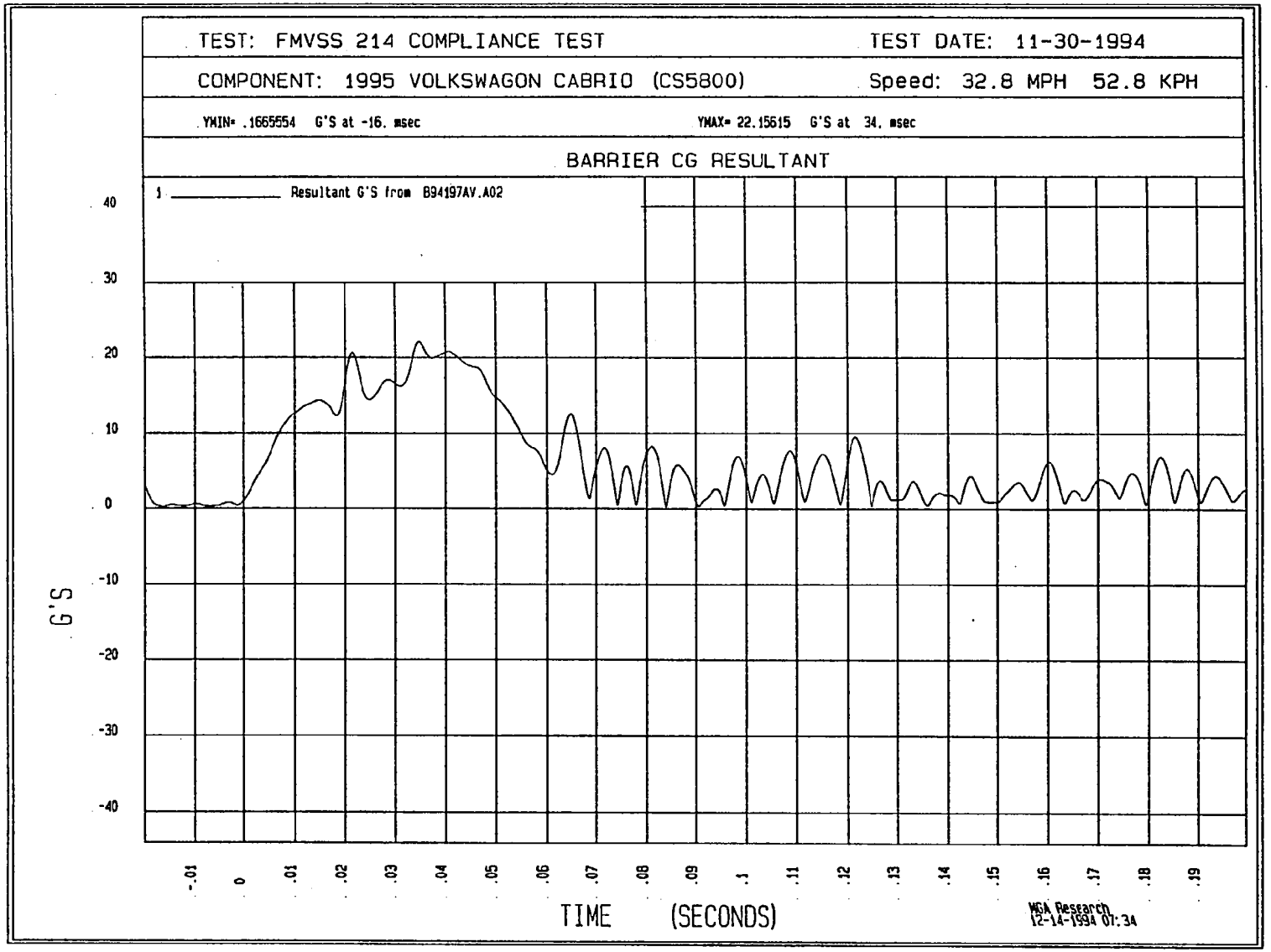


Figure B-58 - Moving Barrier Center of Gravity Resultant vs. Time

Filter: Class 60 (100 Hz)

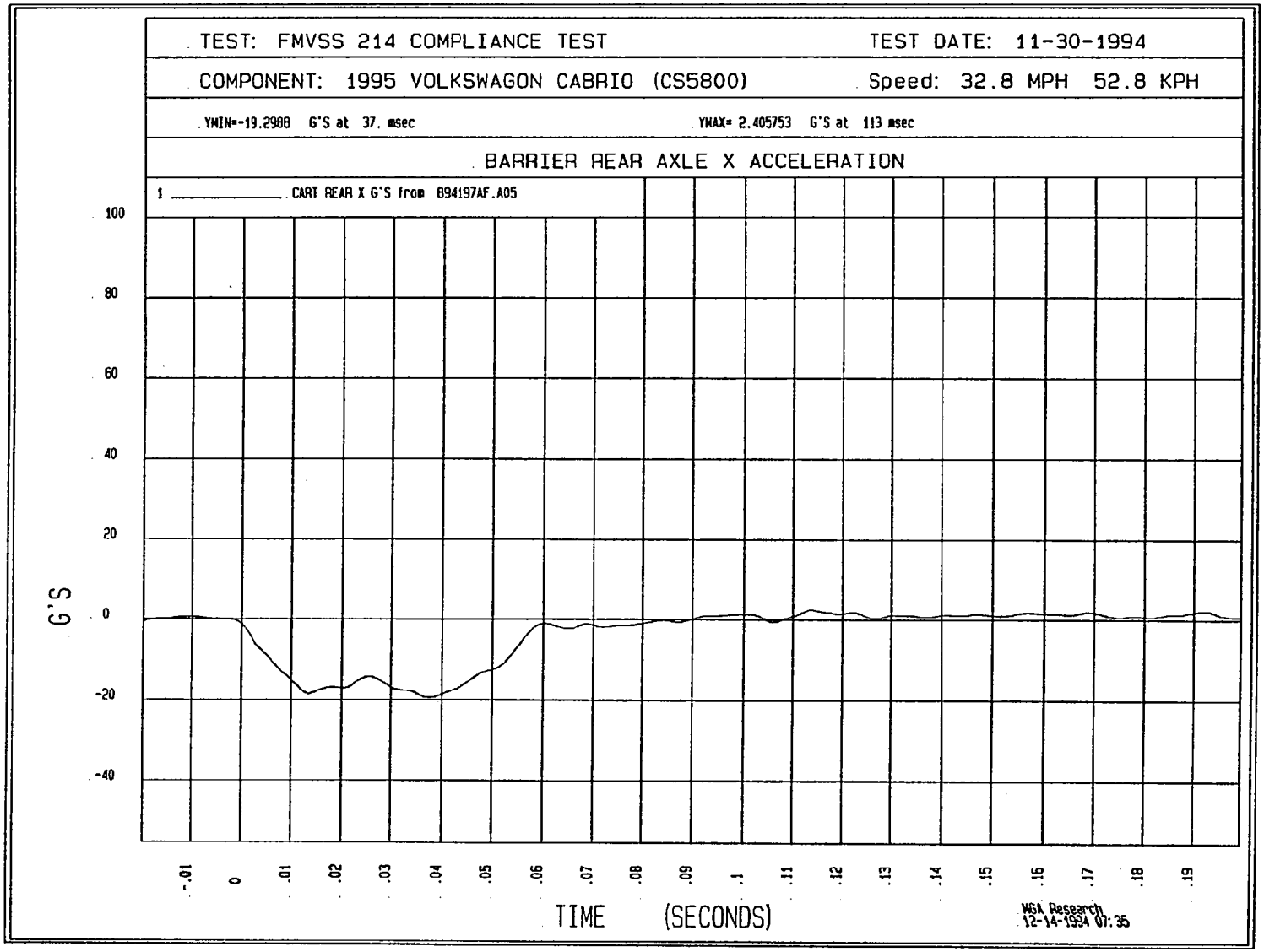
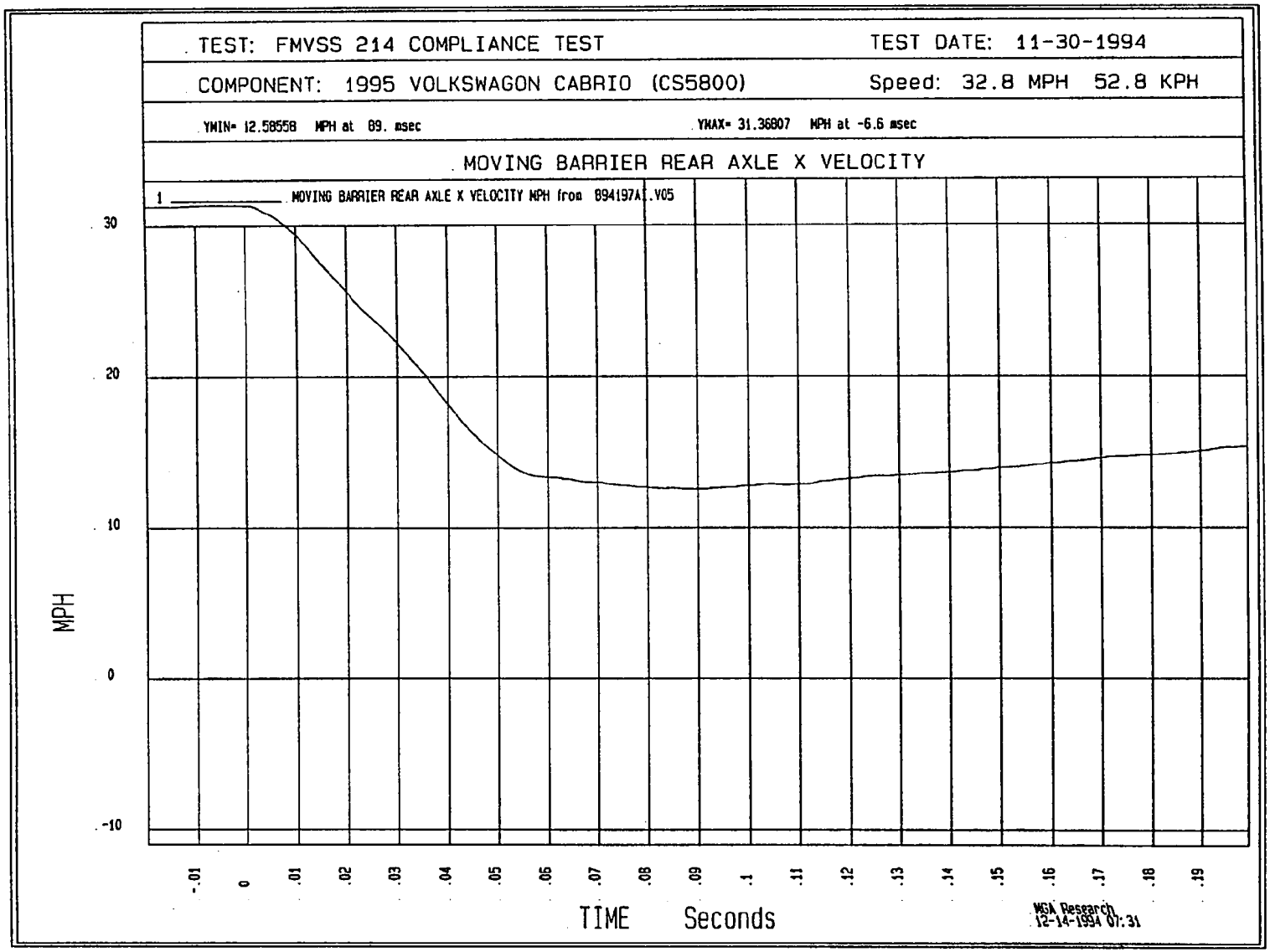


Figure B-59 - Moving Barrier Rear Axle X Acceleration vs. Time

Filter: Class 180 (300 Hz)



B-60

Figure B-60 - Moving Barrier Rear Axle X Velocity vs. Time

Filter: Class 60 (100 Hz)

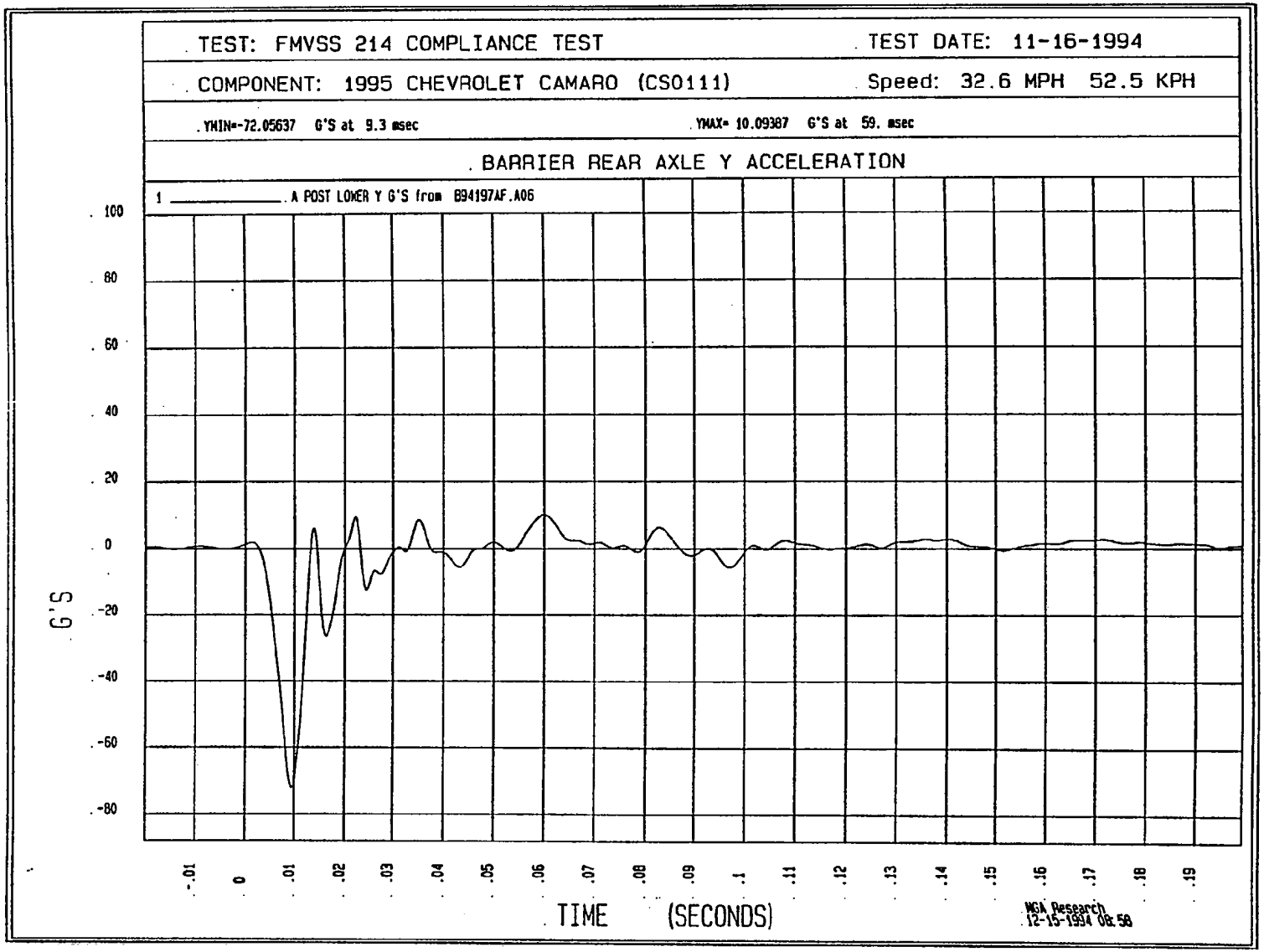


Figure B-61 - Moving Barrier Rear Axle Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

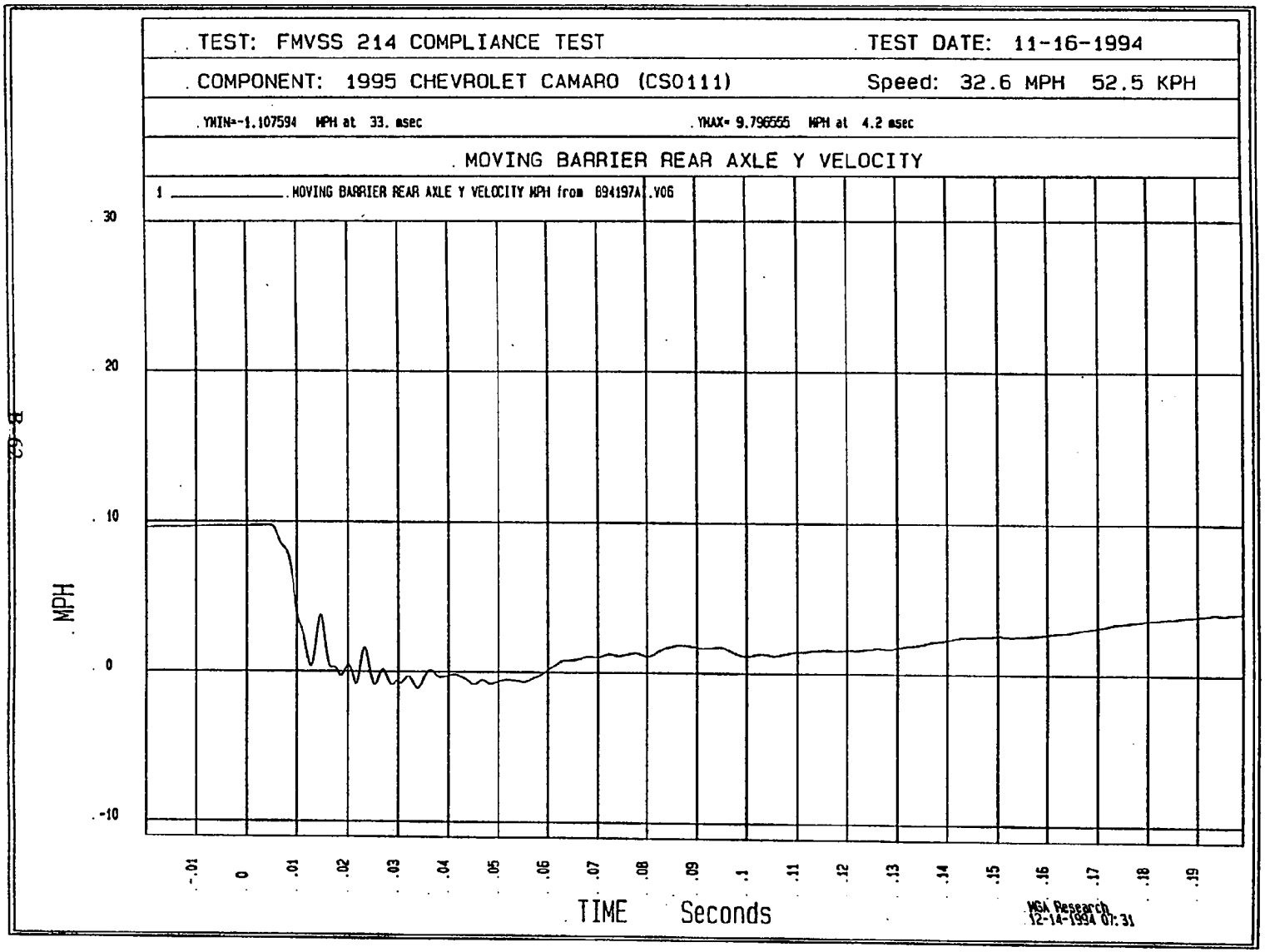


Figure B-62 - Moving Barrier Rear Axle Y Velocity vs. Time

Filter: Class 100 (1650 Hz)

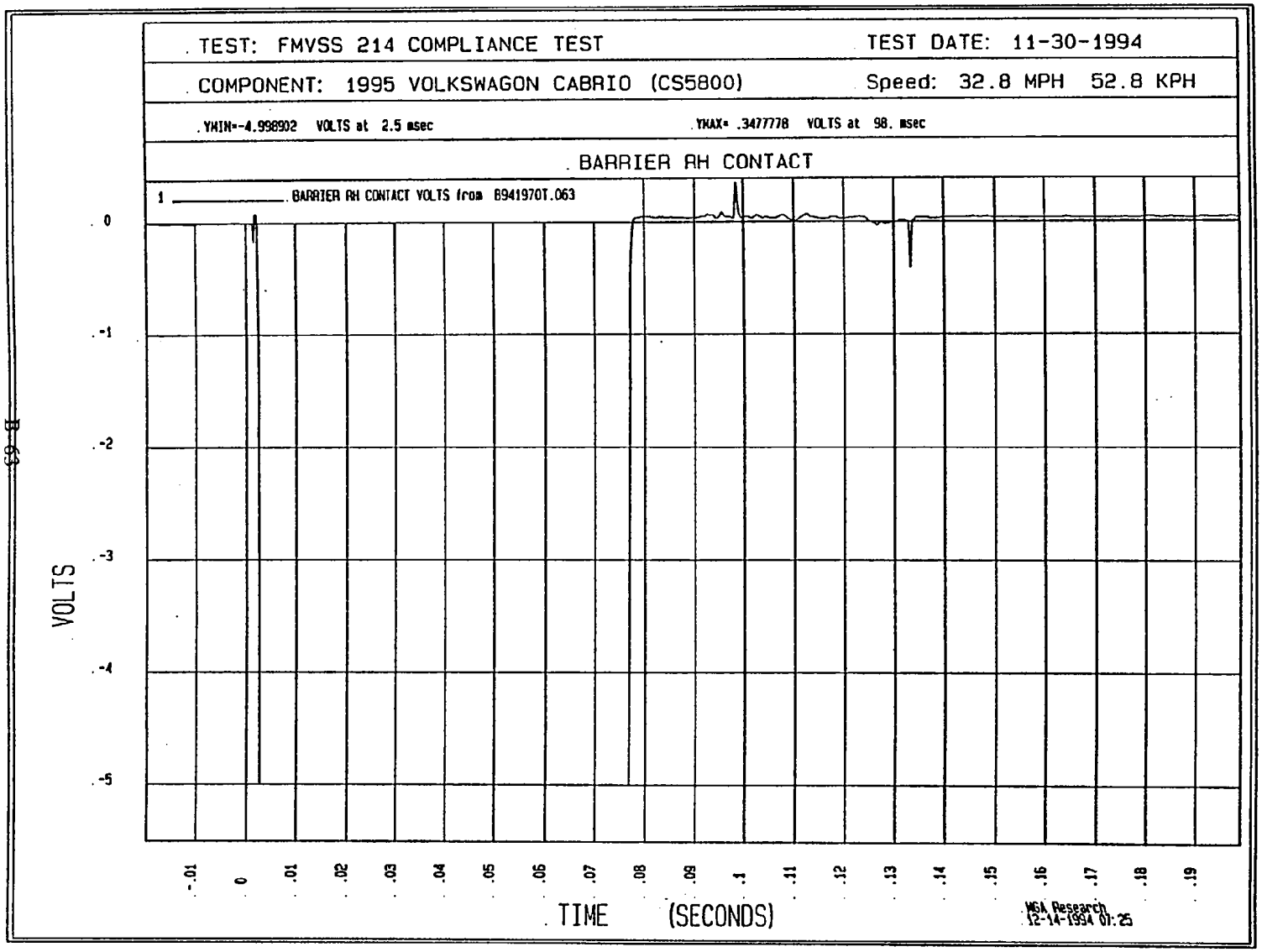
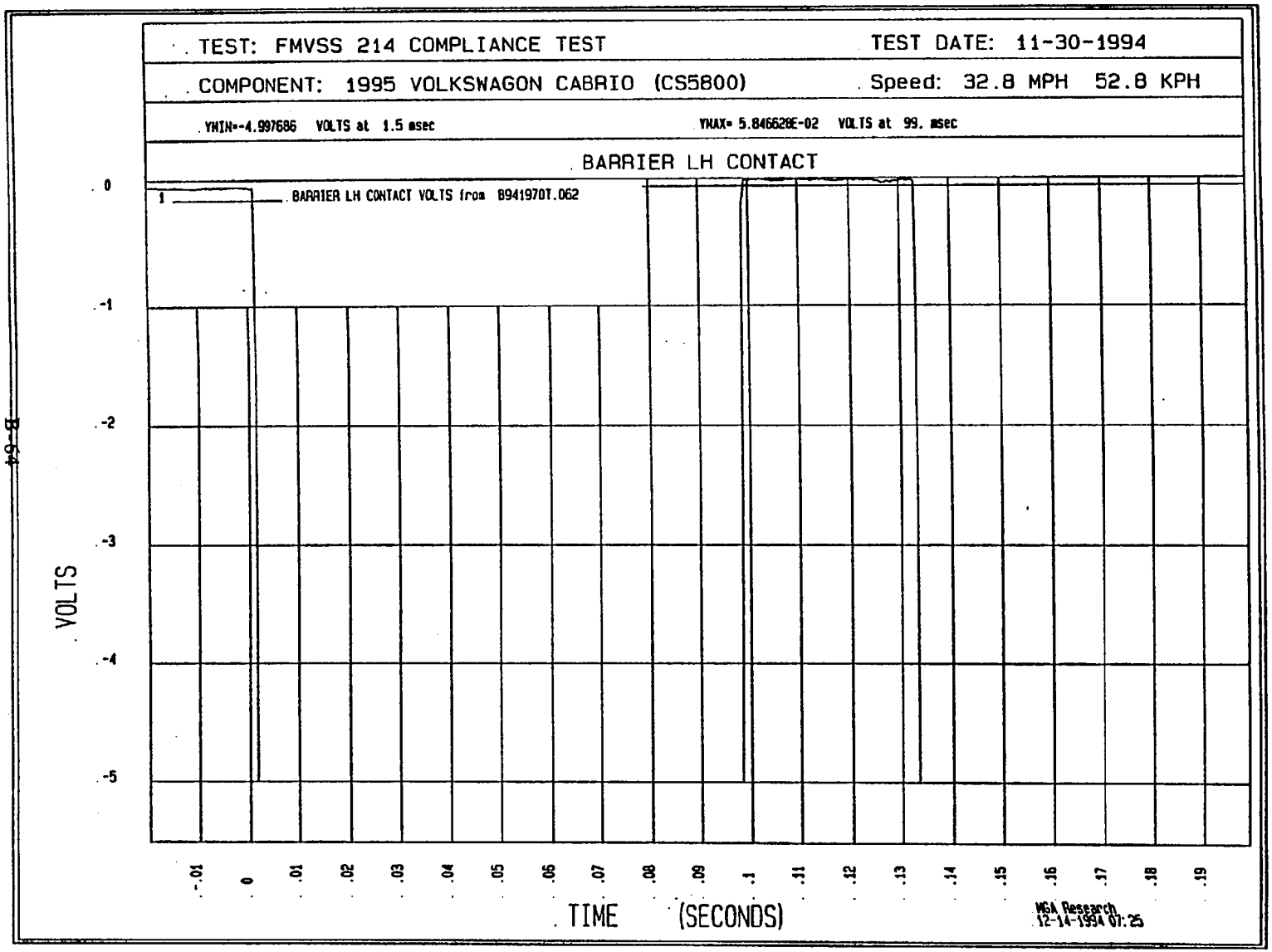


Figure B-63 - Right Hand Barrier Contact

Filter: Class 1000 (1650 Hz)



B-64

Figure B-64 - Left Hand Barrier Contact

Filter: Class 180 (300 Hz)

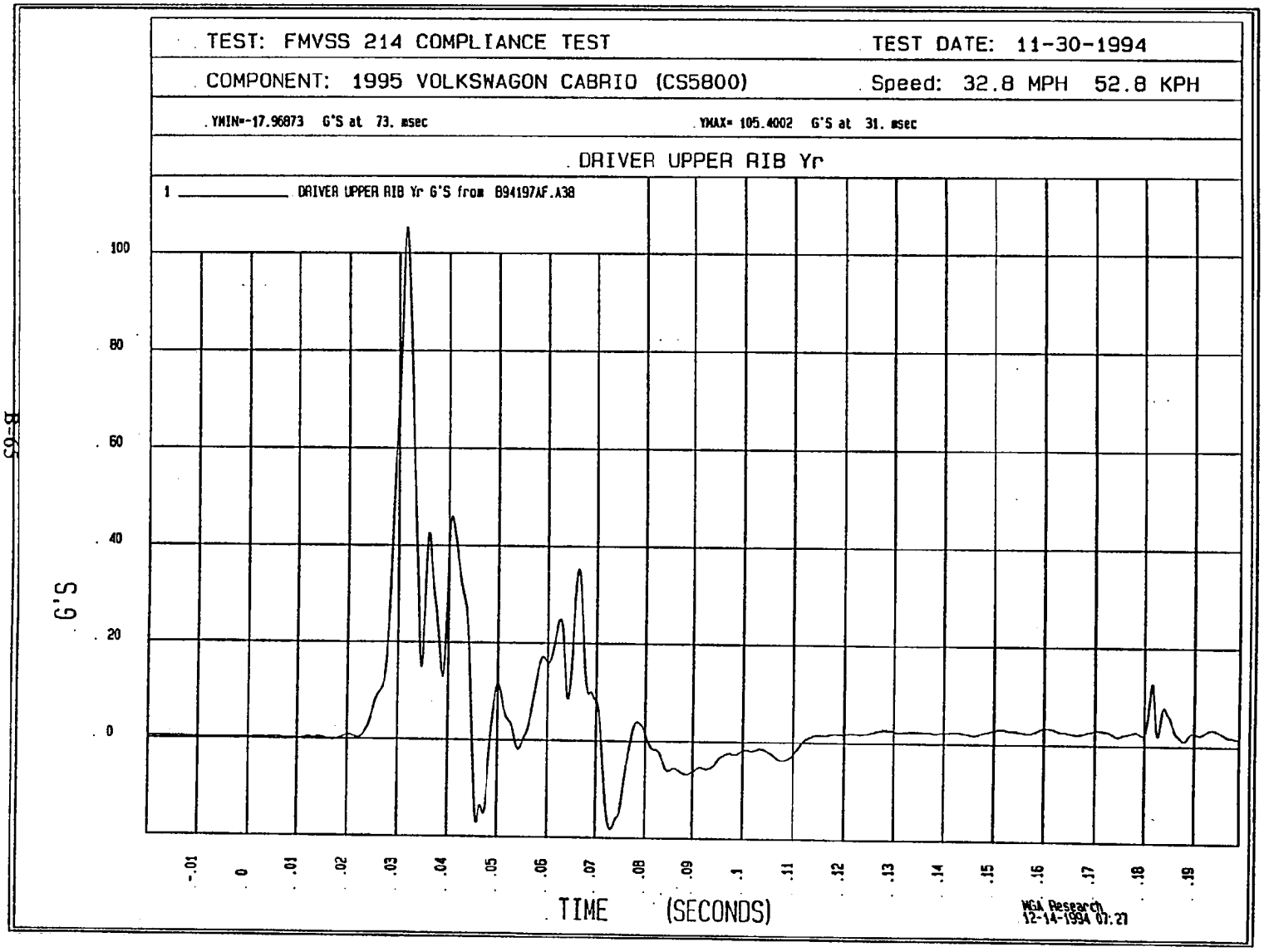
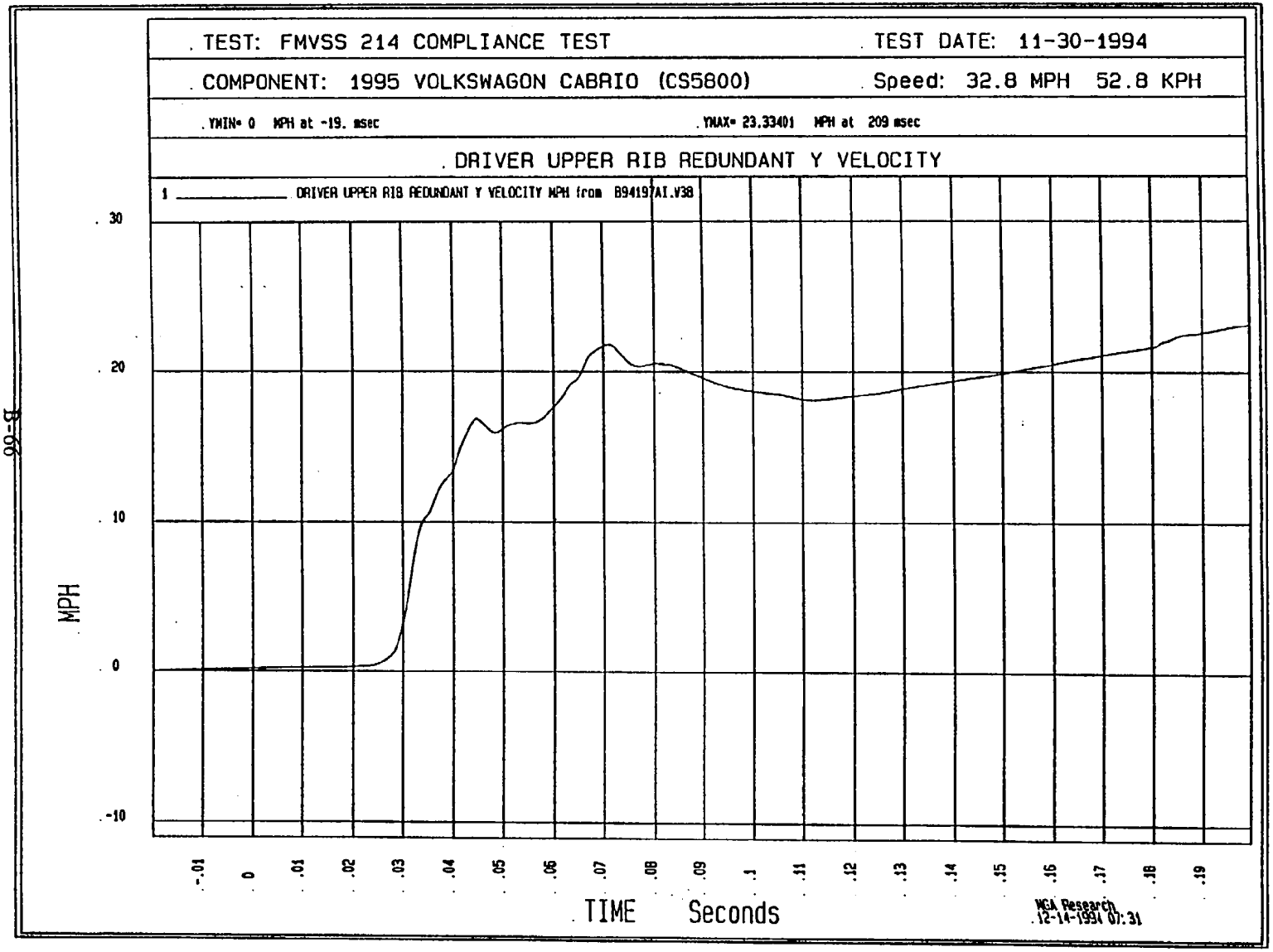


Figure B-65 - Driver Upper Rib Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)



B-66

Figure B-66 - Driver Upper Rib Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

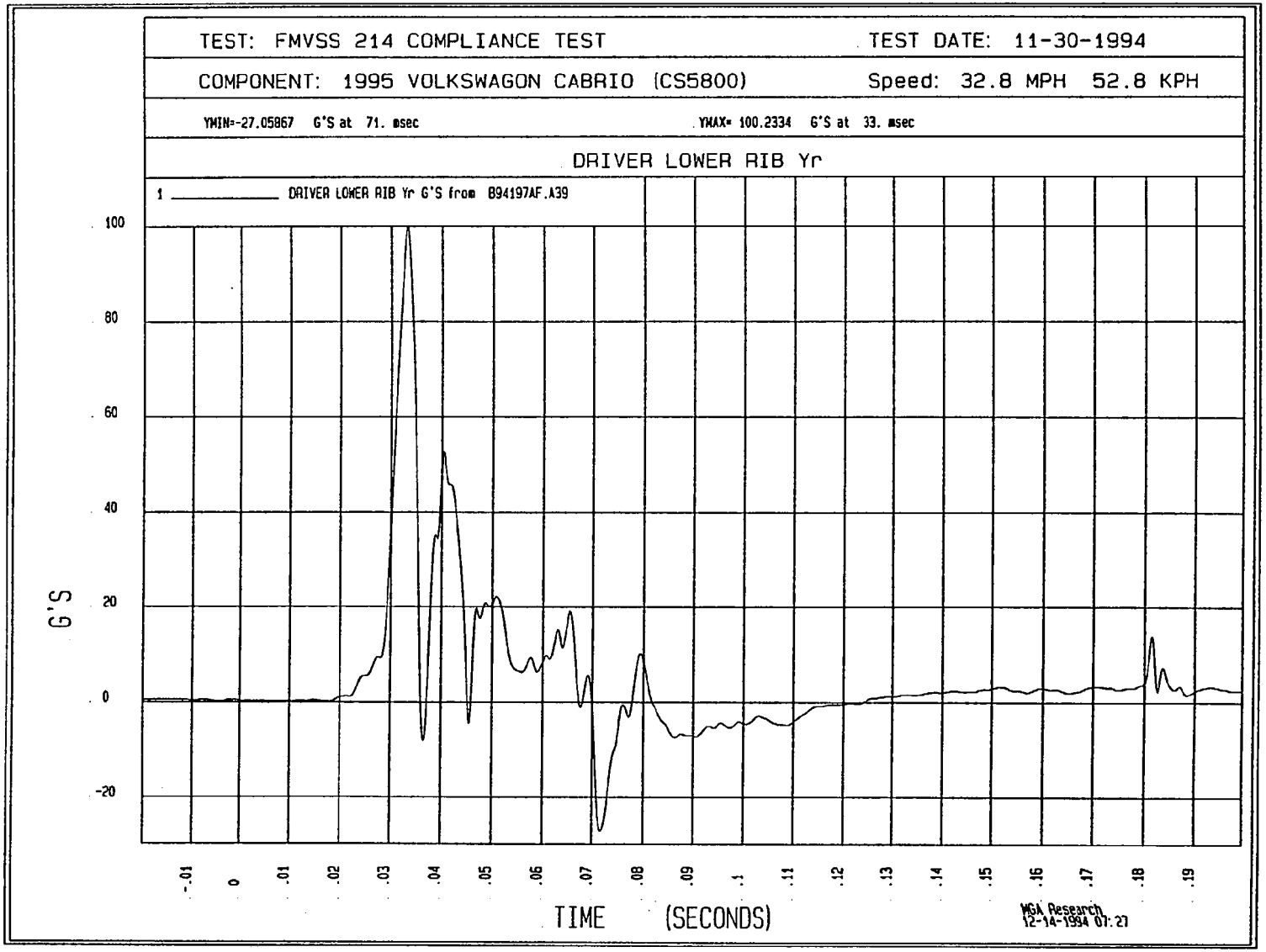


Figure B-67 - Driver Lower Rib Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

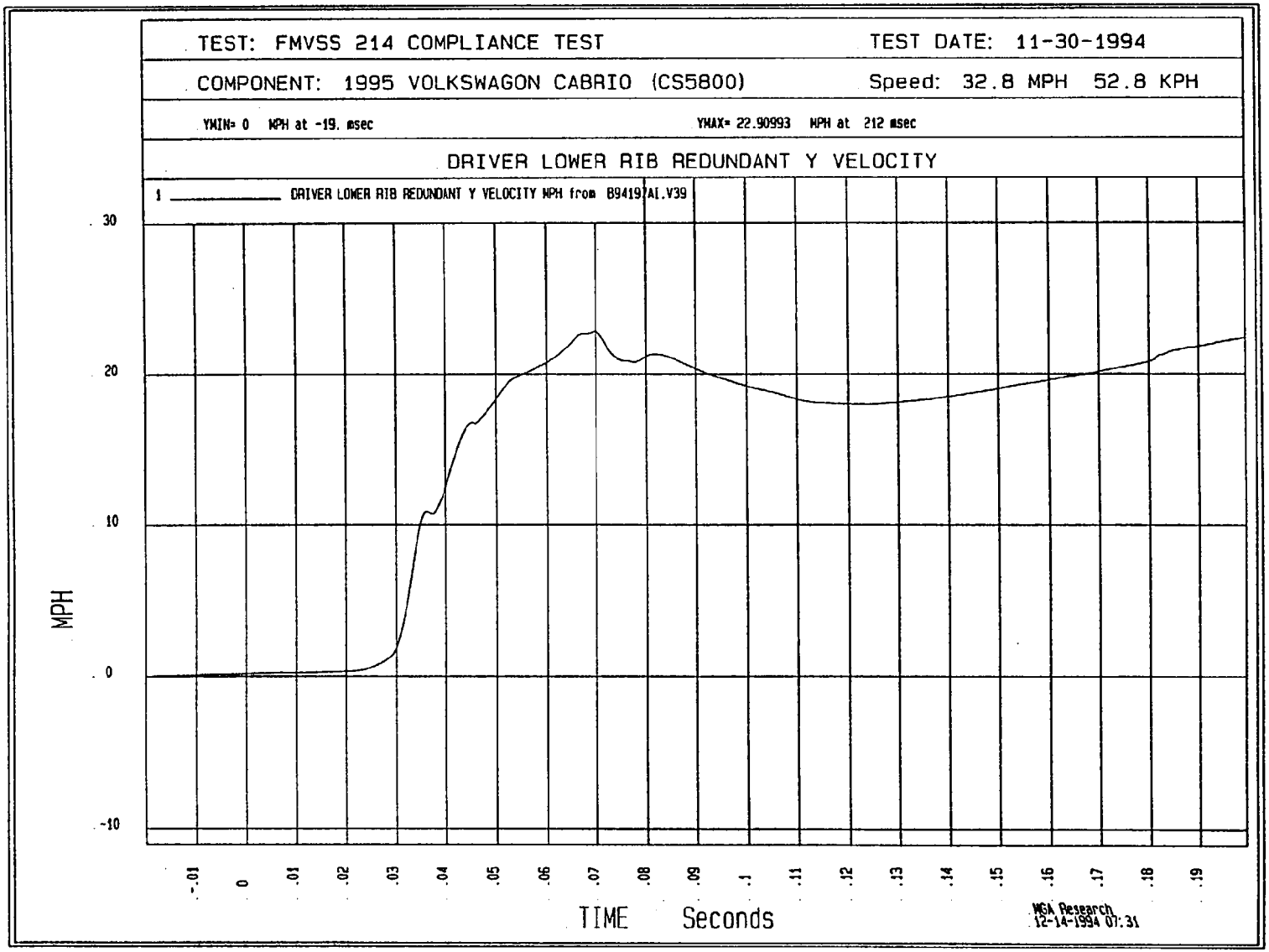


Figure B-68 - Driver Lower Rib Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

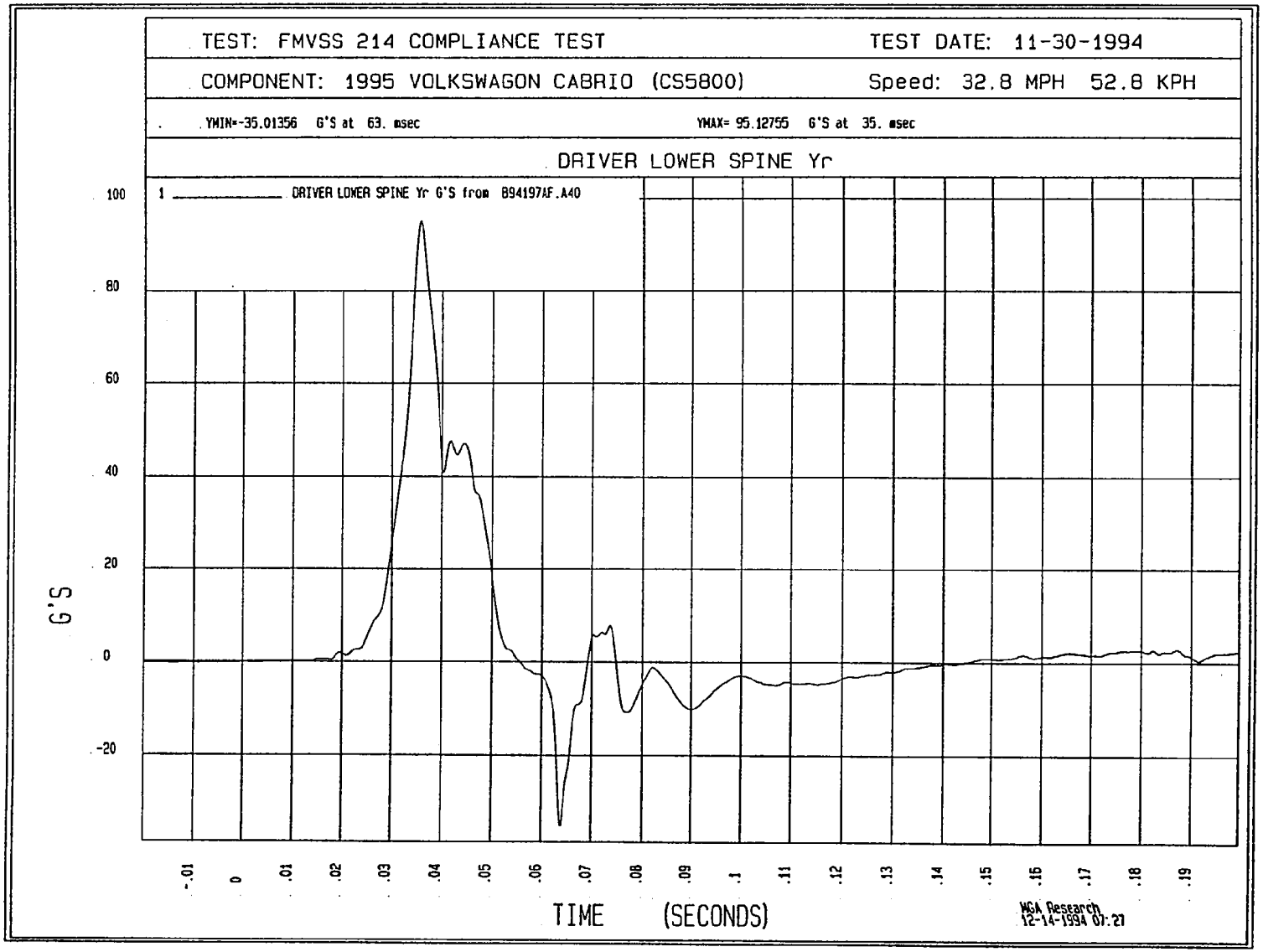


Figure B-69 - Driver Lower Spine Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

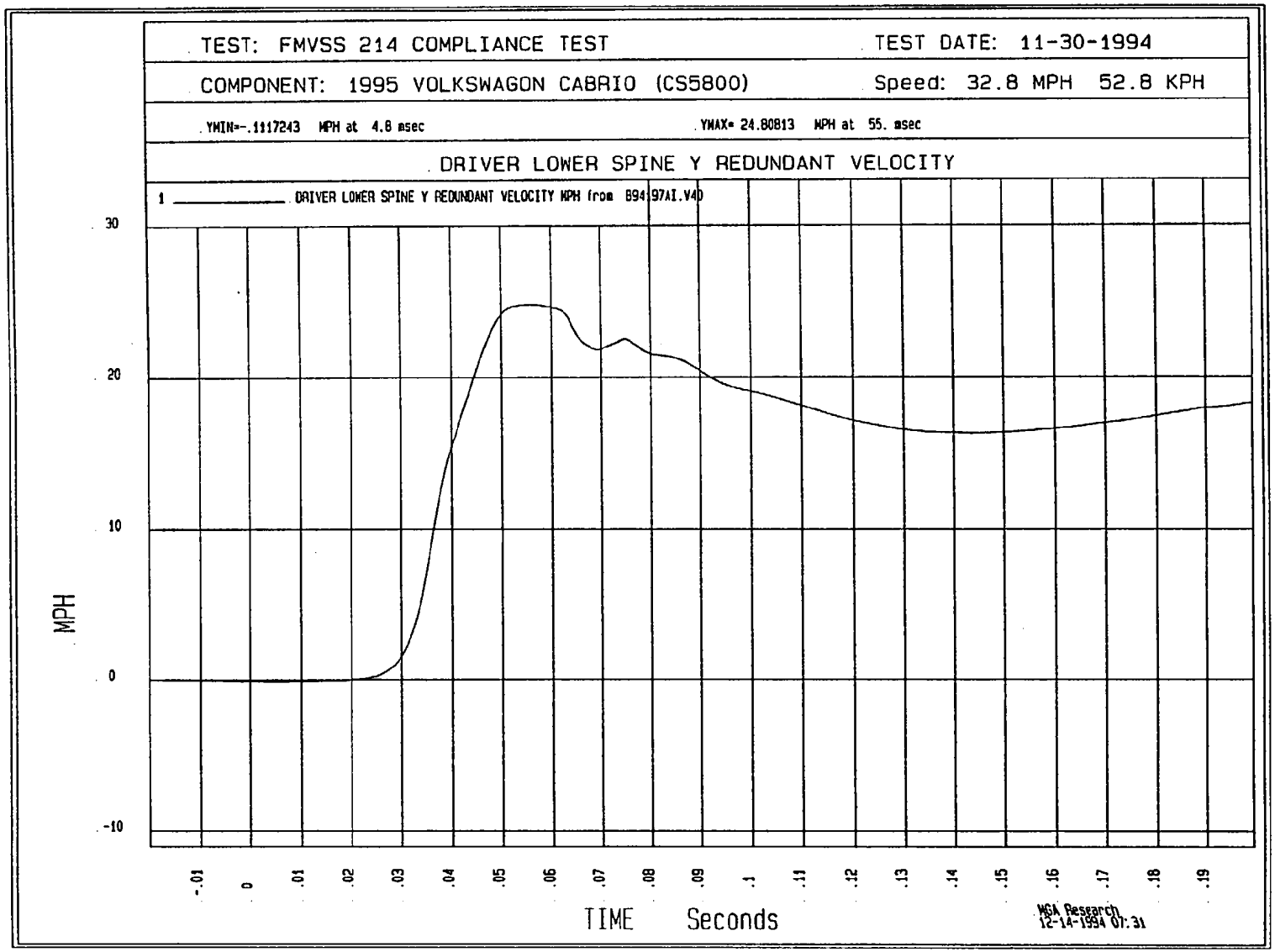


Figure B-70 - Driver Lower Spine Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

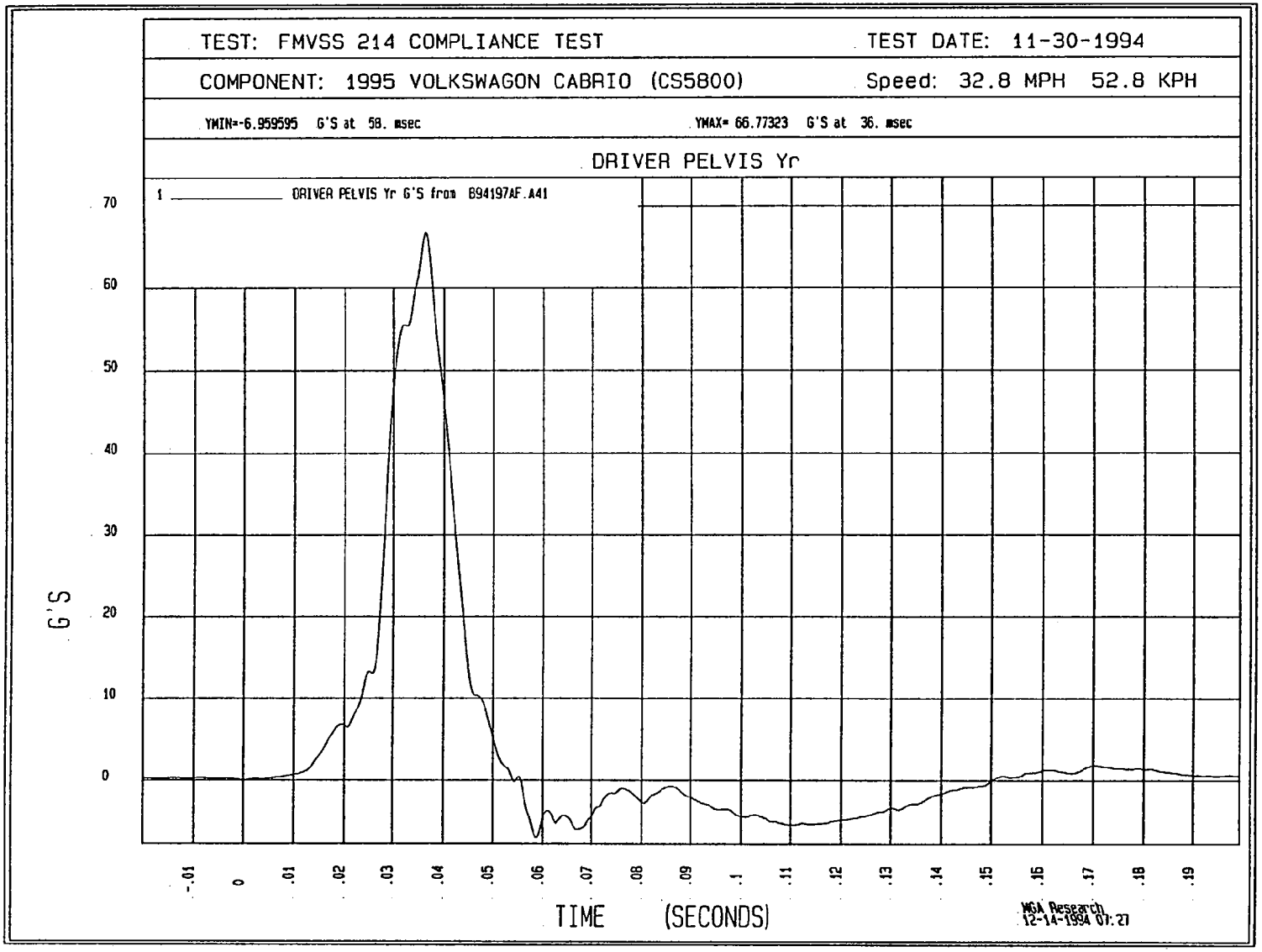
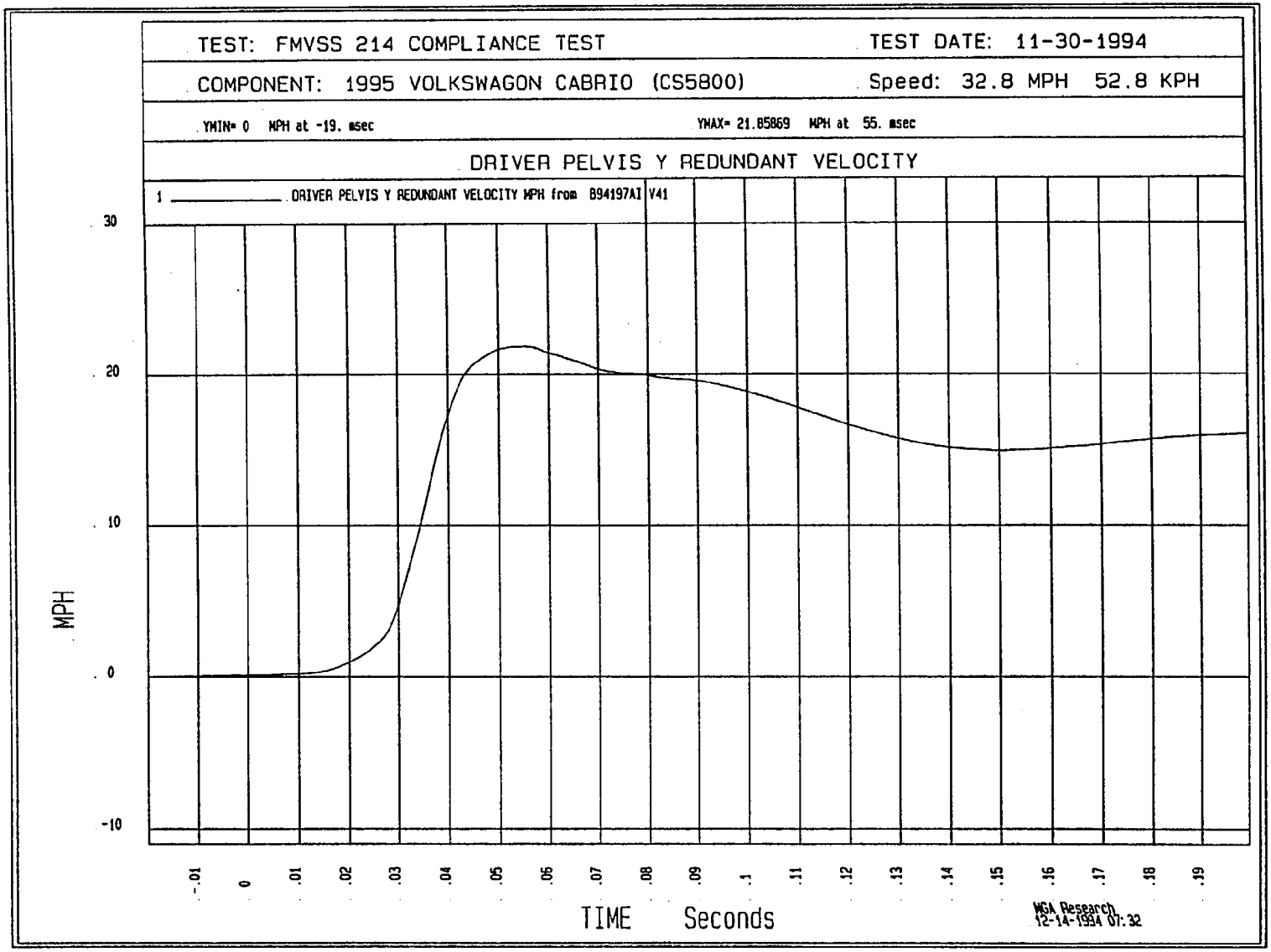


Figure B-71 - Driver Pelvis Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)



B-72

Figure B-72 - Driver Pelvis Y Redundant Velocity vs. Time

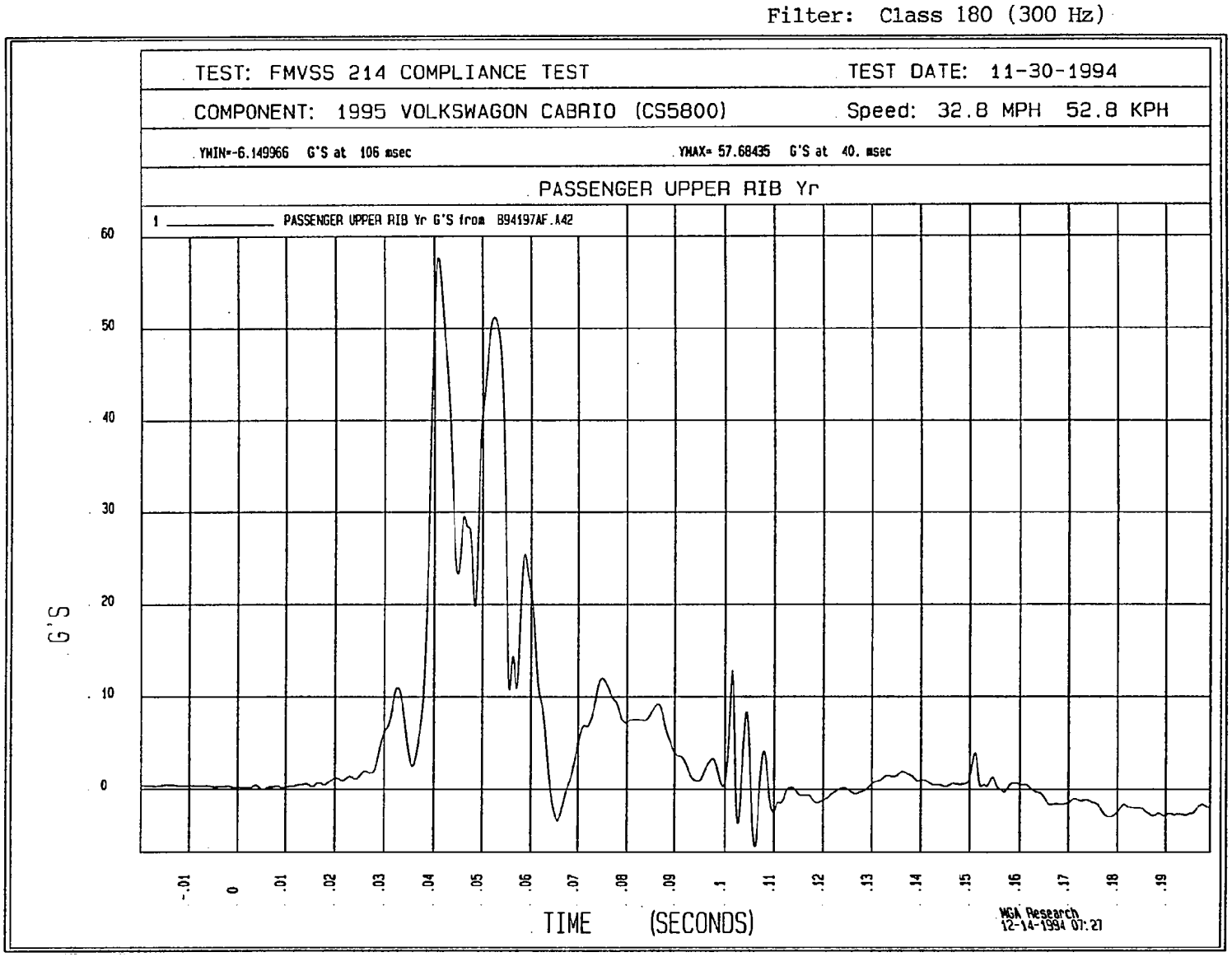


Figure B-73 - Passenger Upper Rib Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

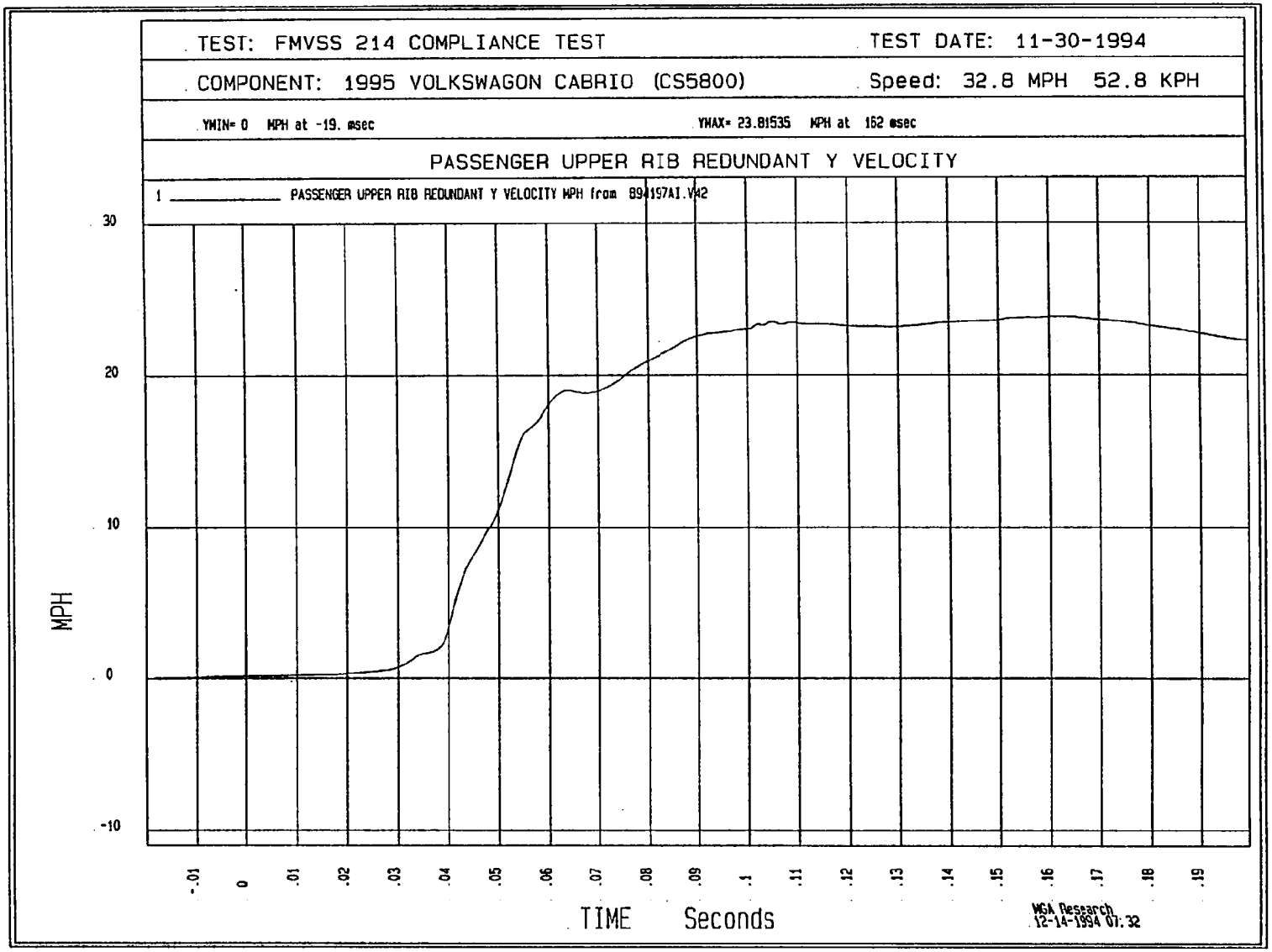


Figure B-74 - Passenger Upper Rib Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

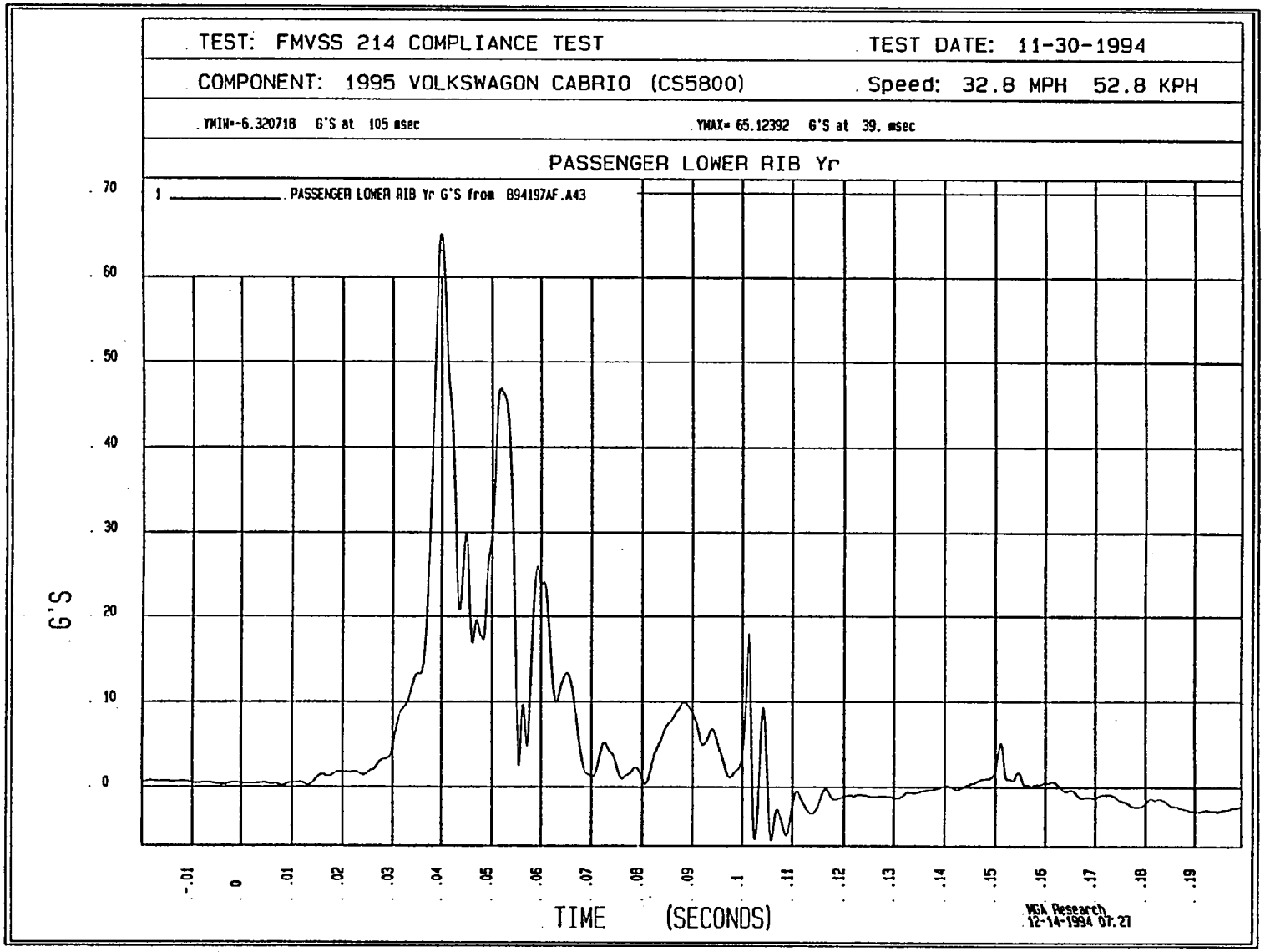


Figure B-75 - Passenger Lower Rib Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

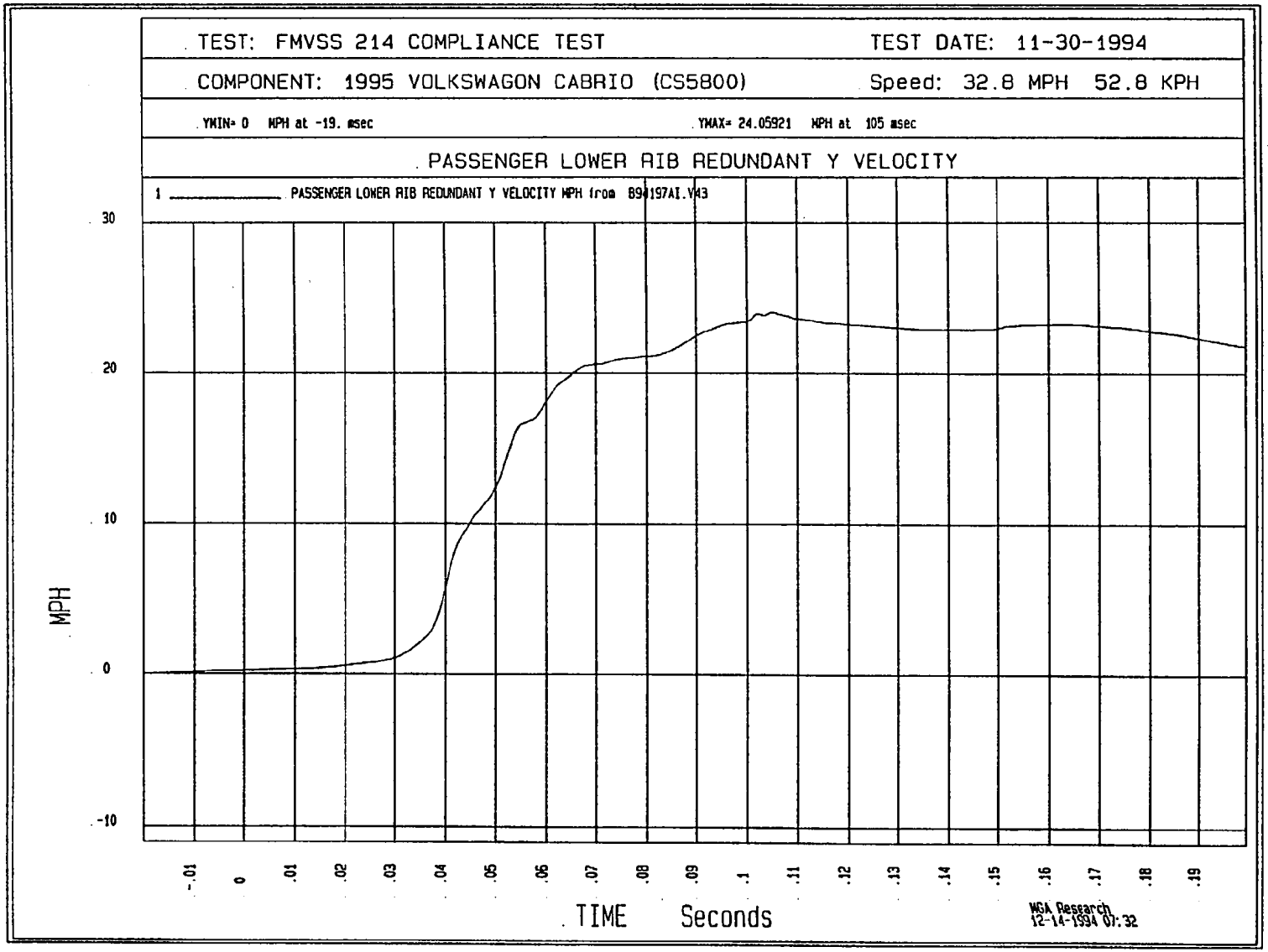


Figure B-76 - Passenger Lower Rib Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

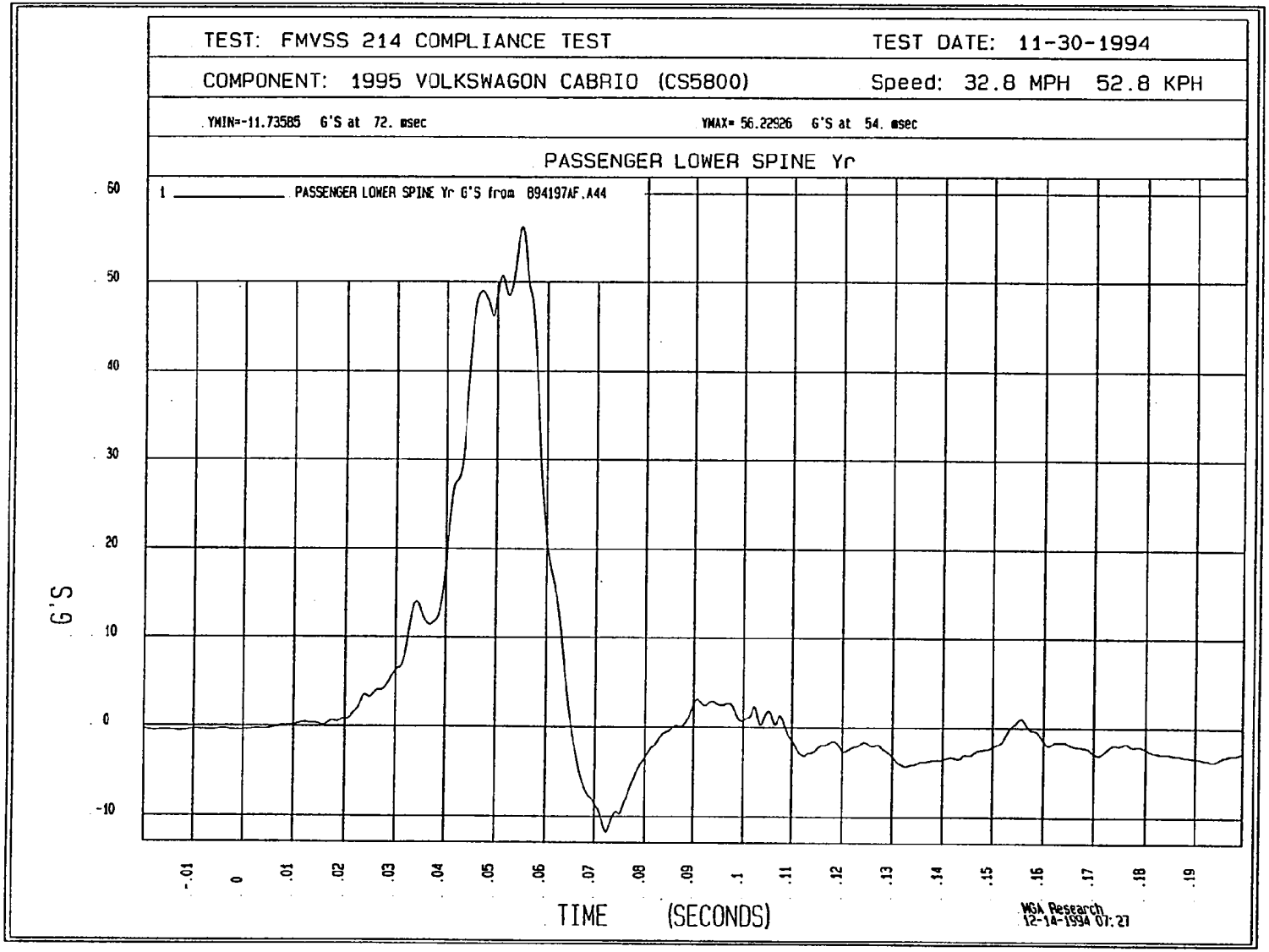


Figure B-77 - Passenger Lower Spine Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

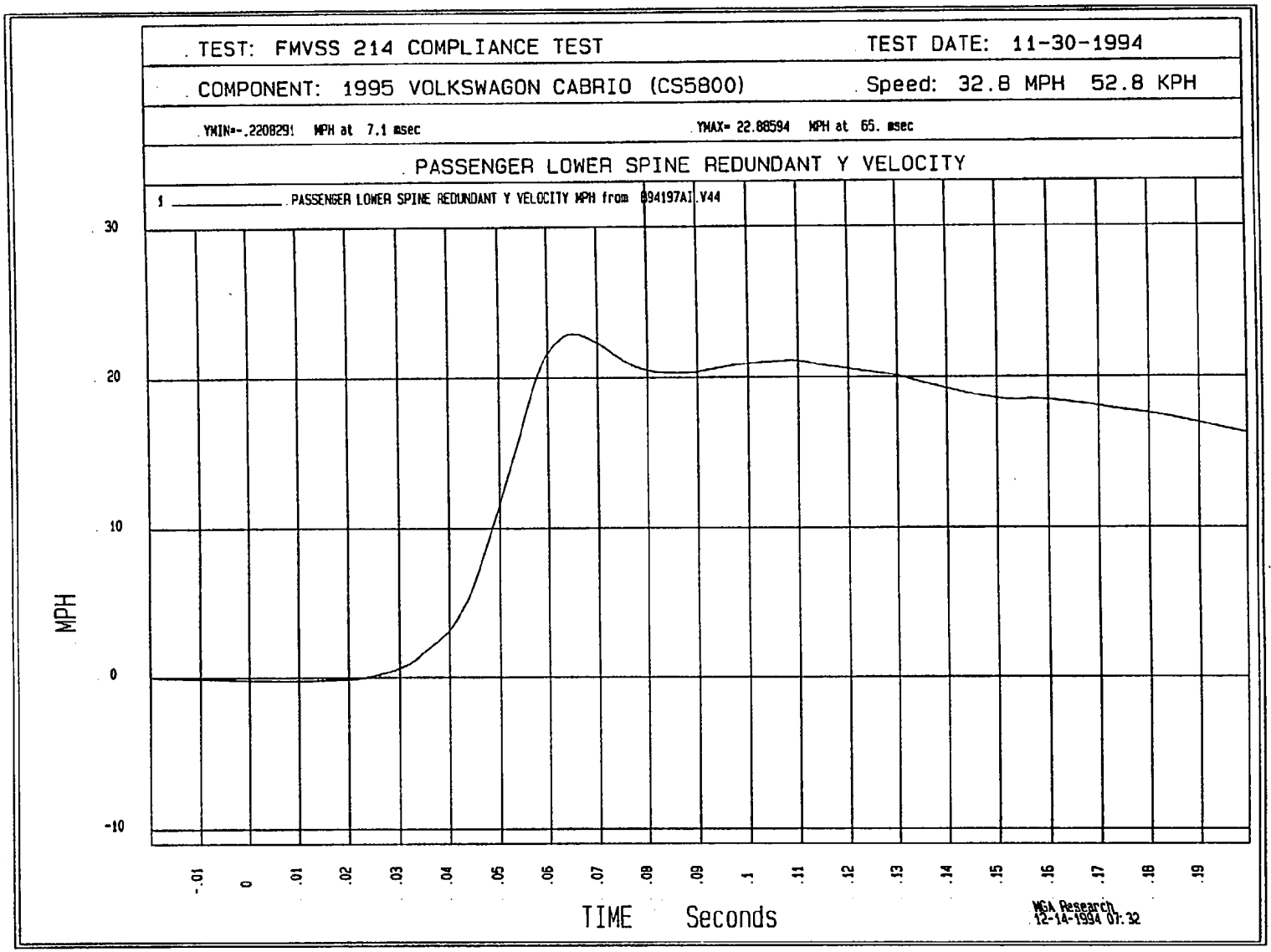


Figure B-78 - Passenger Lower Spine Y Redundant Velocity vs. Time

Filter; Class 180 (300 Hz)

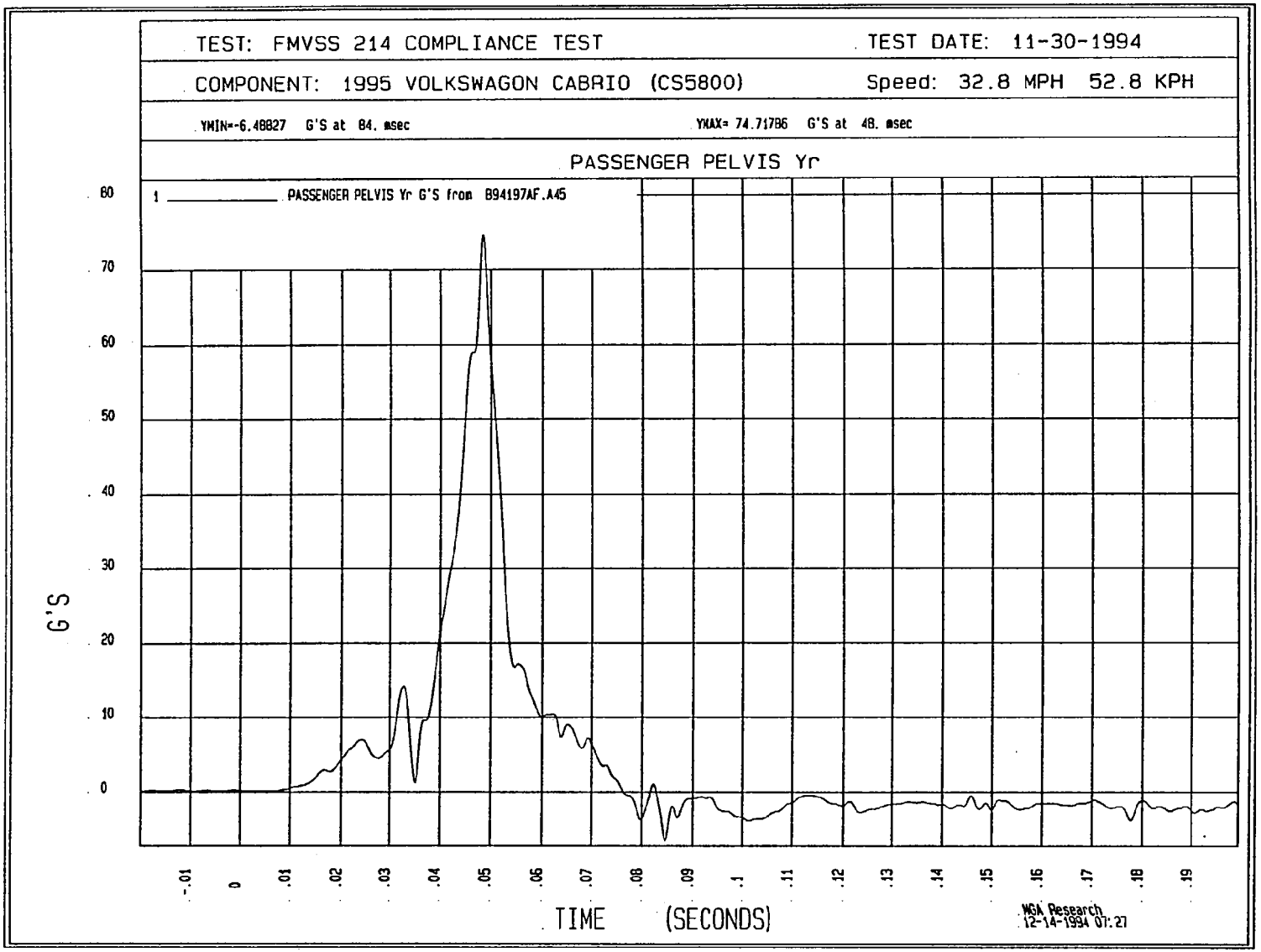


Figure B-79 - Passenger Pelvis Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

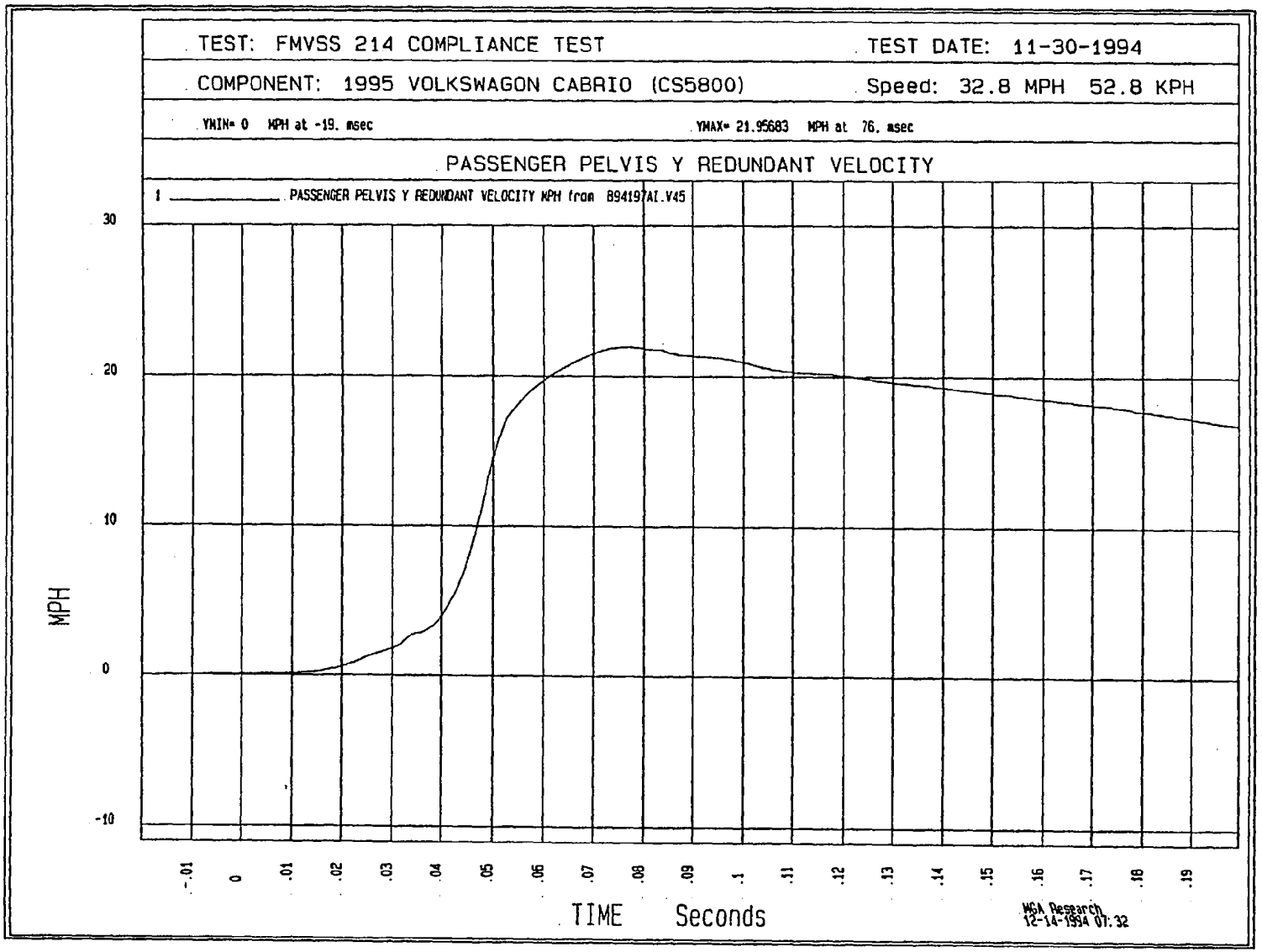


Figure B-8Ø - Passenger Pelvis Y Redundant Velocity vs. Time

FINITE IMPULSE RESPONSE (FIR) FILTERED DATA

Table of Data Plots

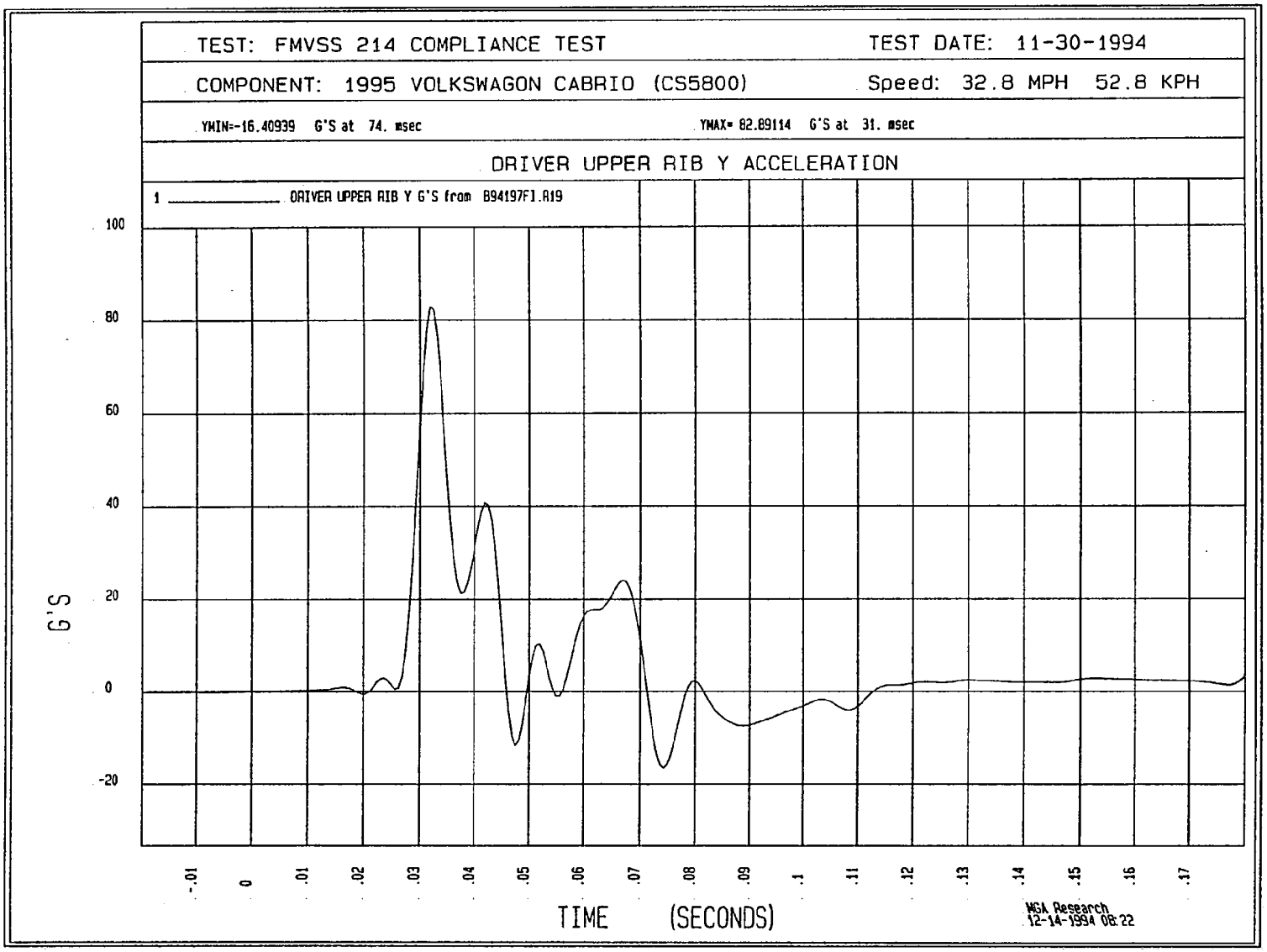


Figure B-81 - Driver Upper Rib Y Acceleration vs. Time

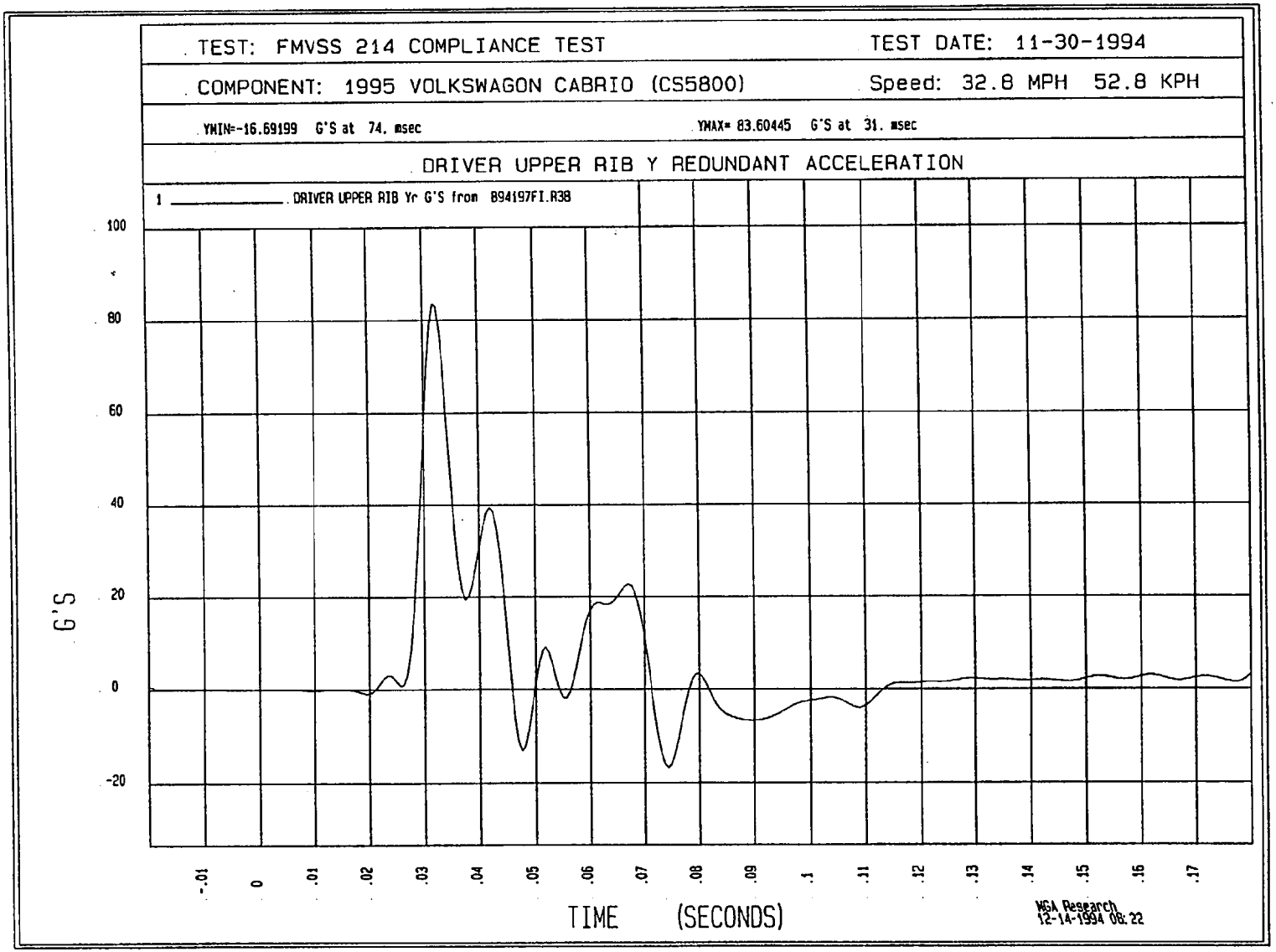


Figure B-82 - Driver Upper Rib Y Redundant Acceleration vs. Time

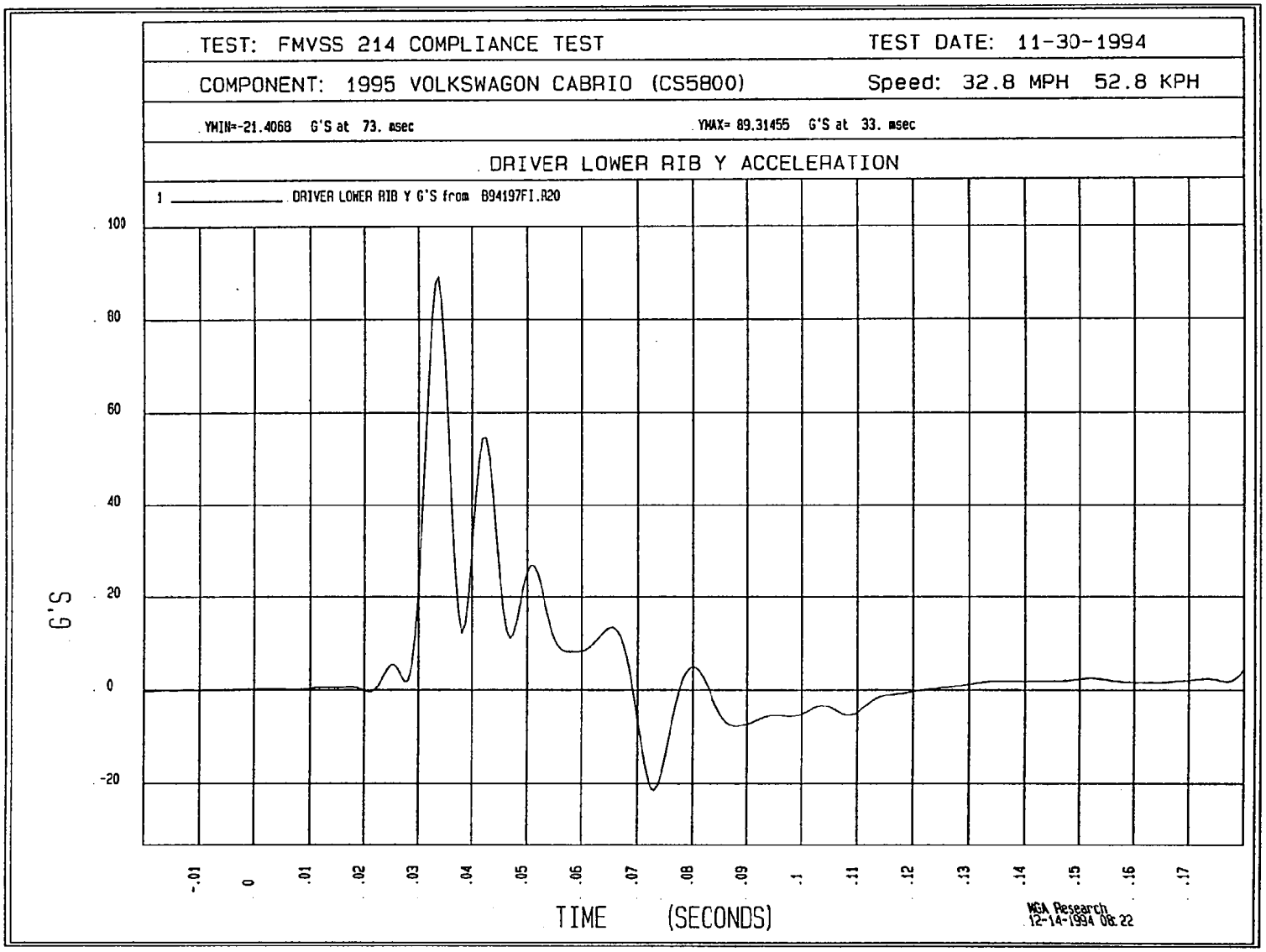


Figure B-83 - Driver Lower Rib Y Acceleration vs. Time

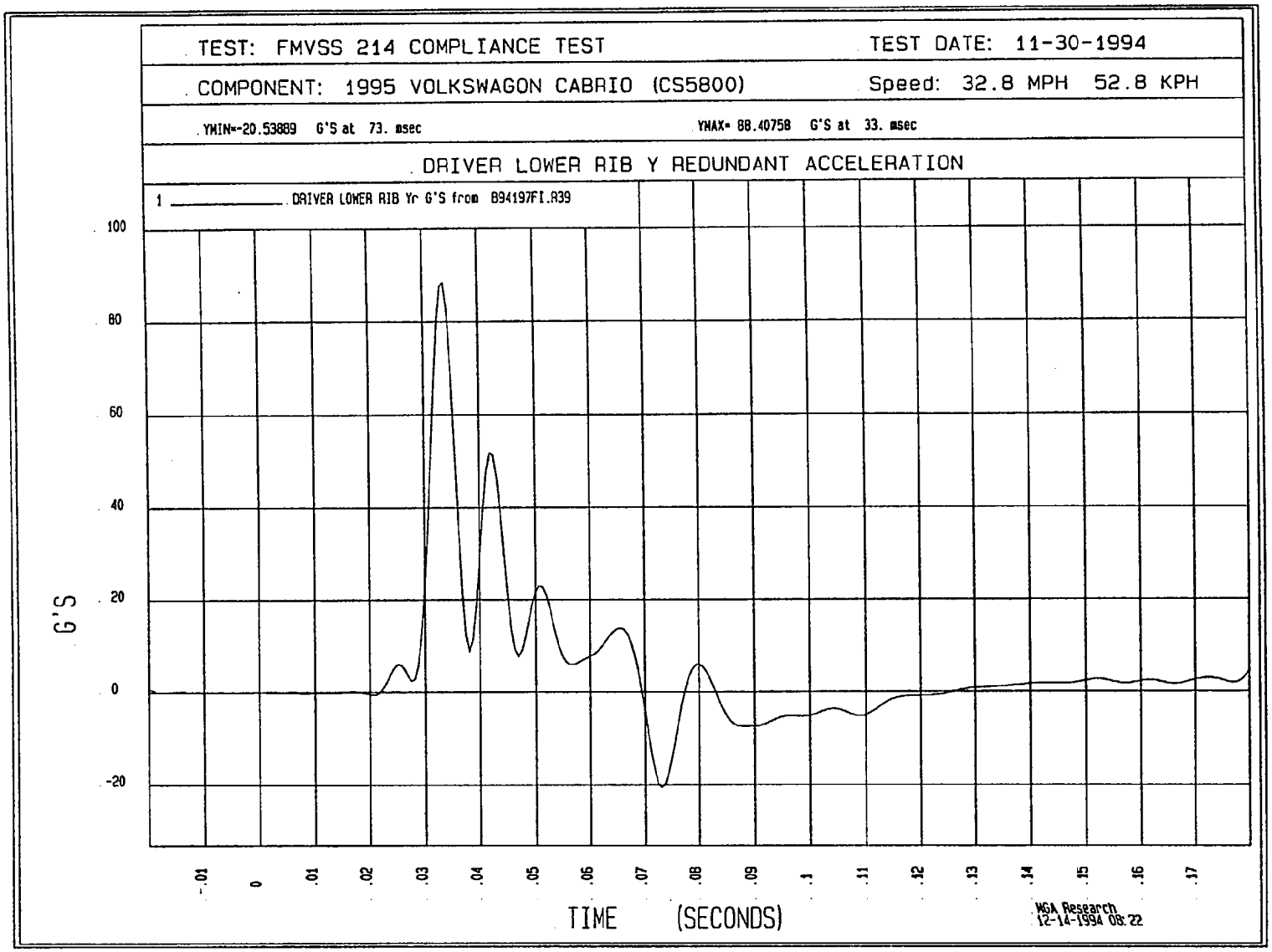


Figure B-84 - Driver Lower Rib Y Redundant Acceleration vs. Time

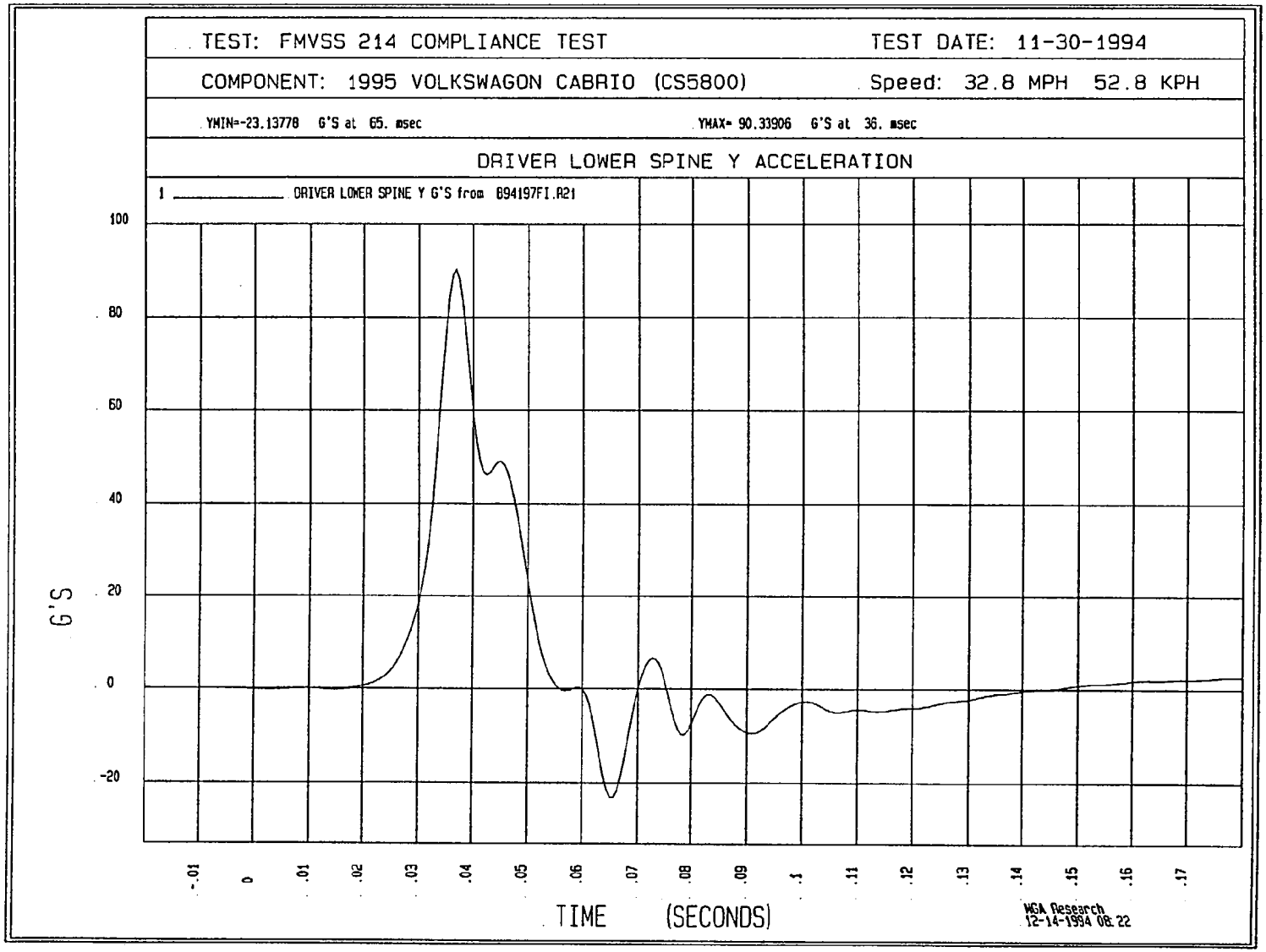


Figure B-85 - Driver Lower Spine Y Acceleration vs. Time

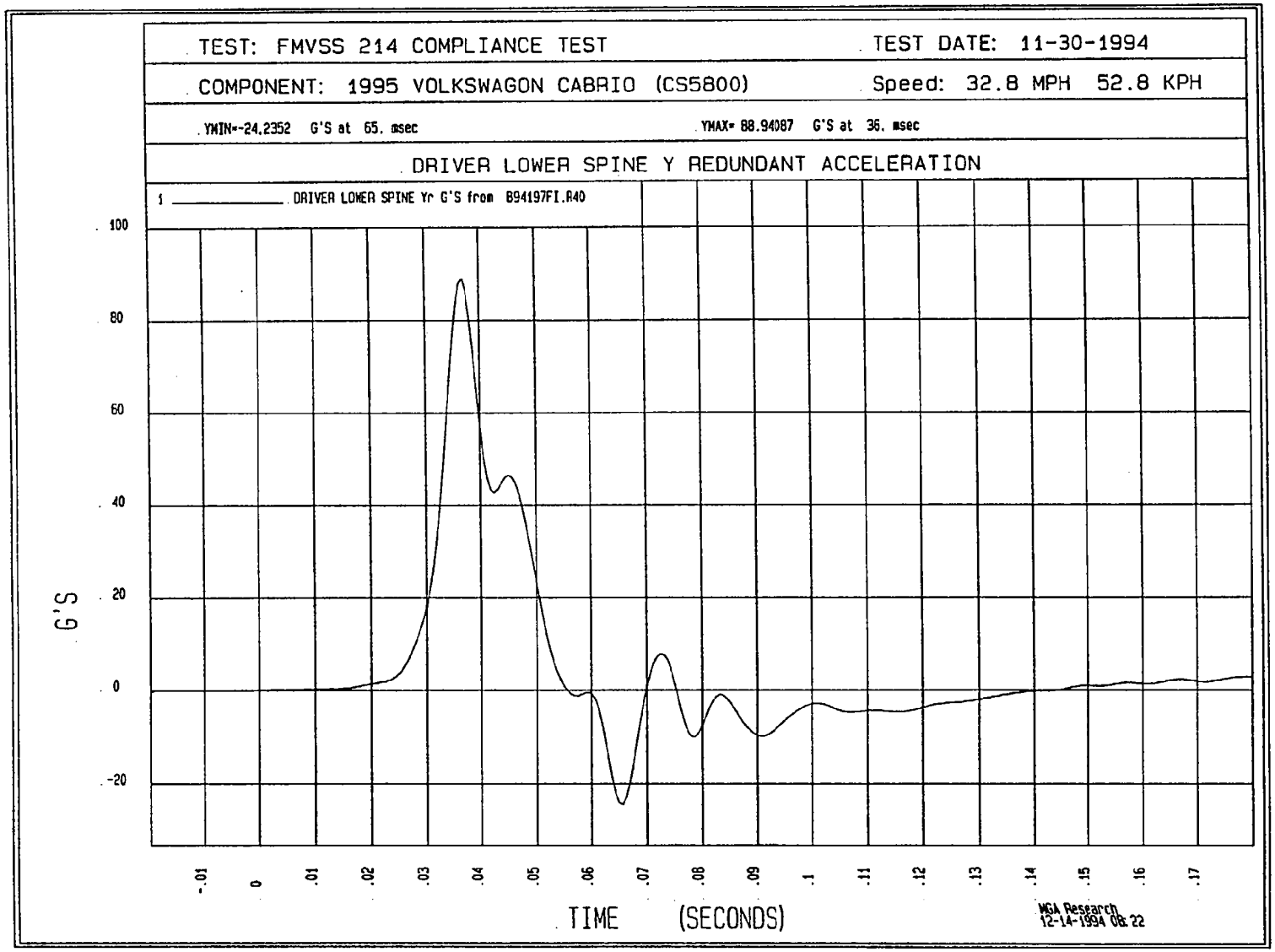


Figure B-86 - Driver Lower Spine Y Redundant Acceleration vs. Time

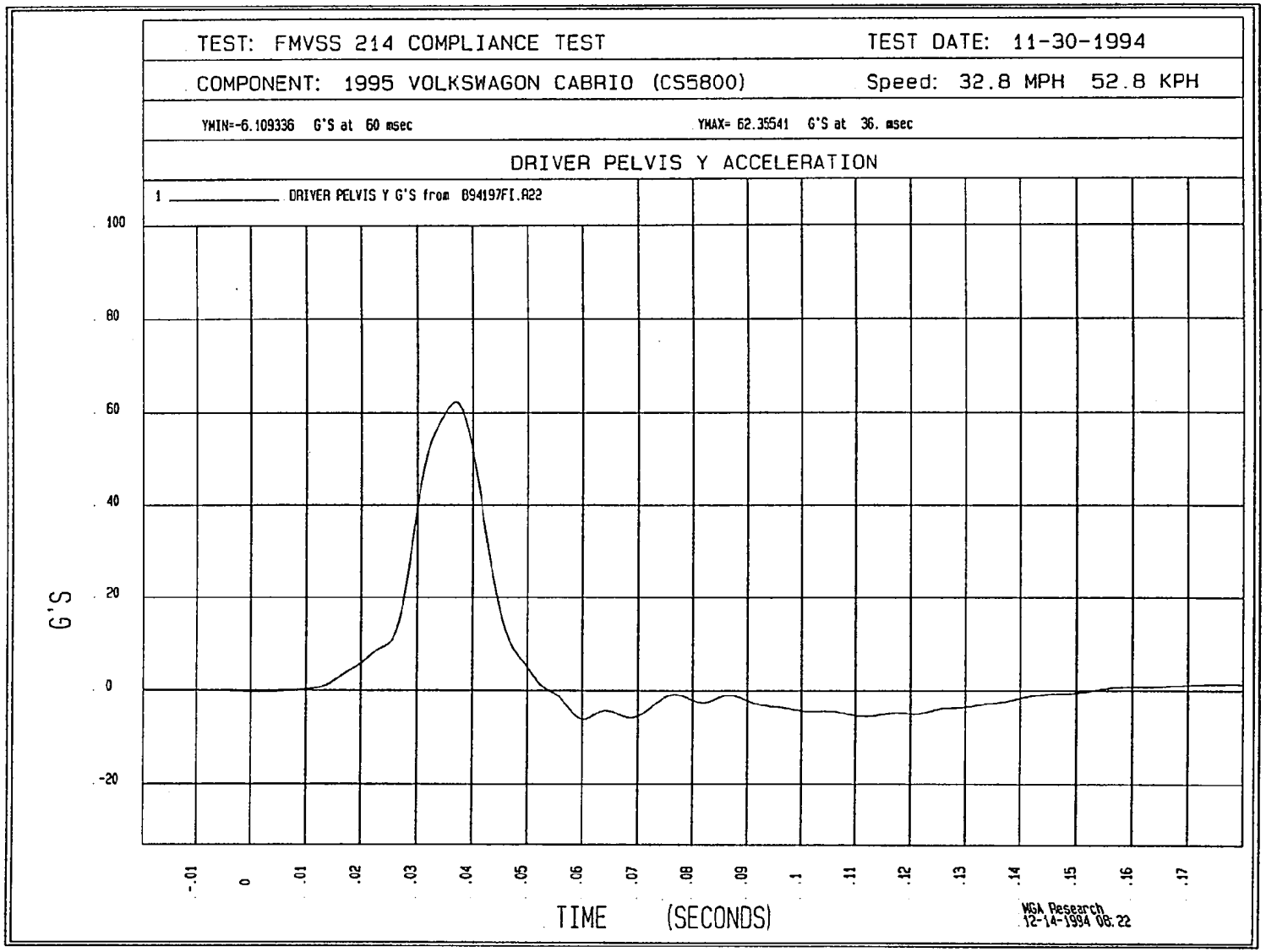


Figure B-87 - Driver Pelvis Y Acceleration vs. Time

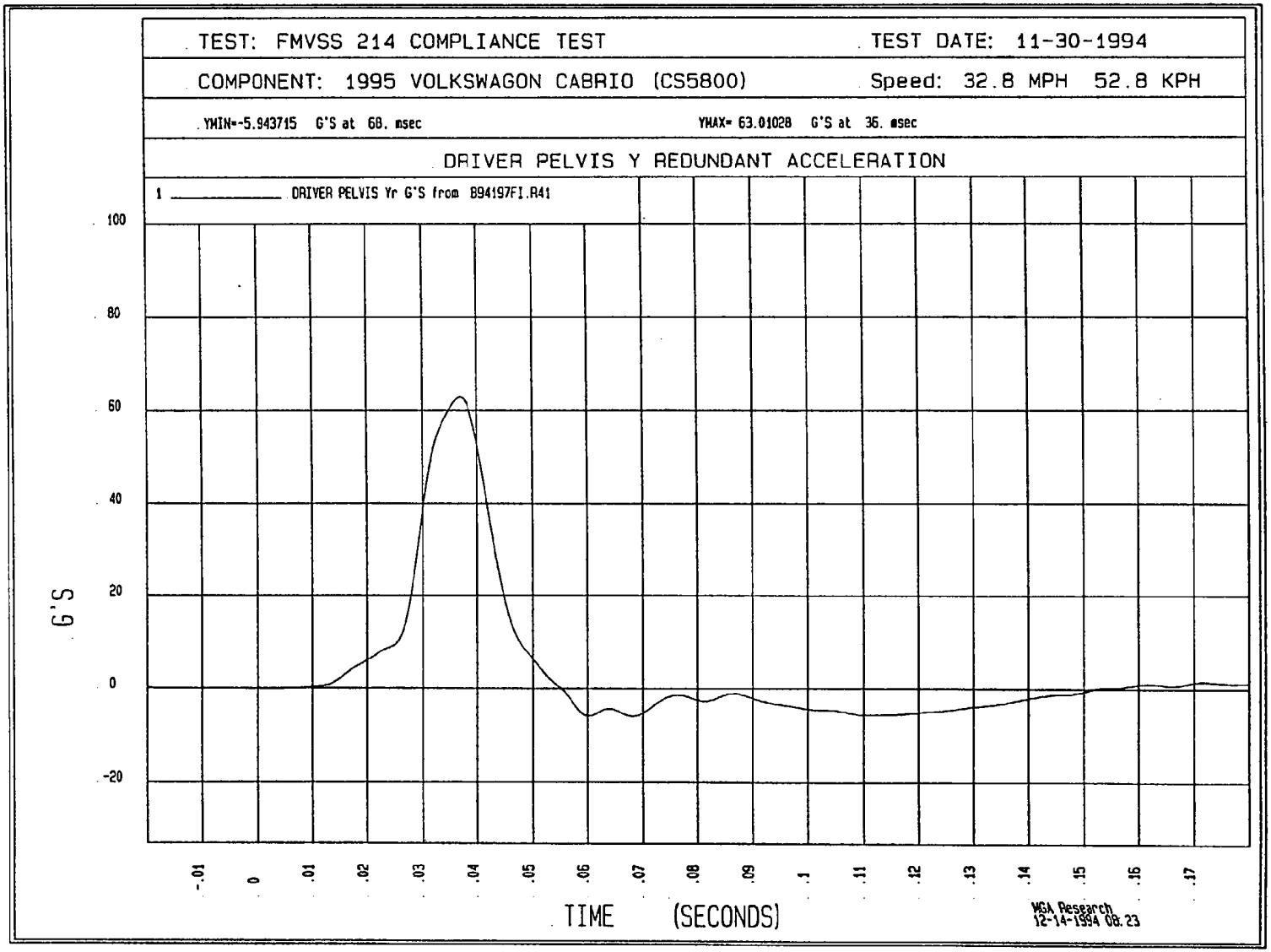


Figure B-88 - Driver Pelvis Y Redundant Acceleration vs. Time

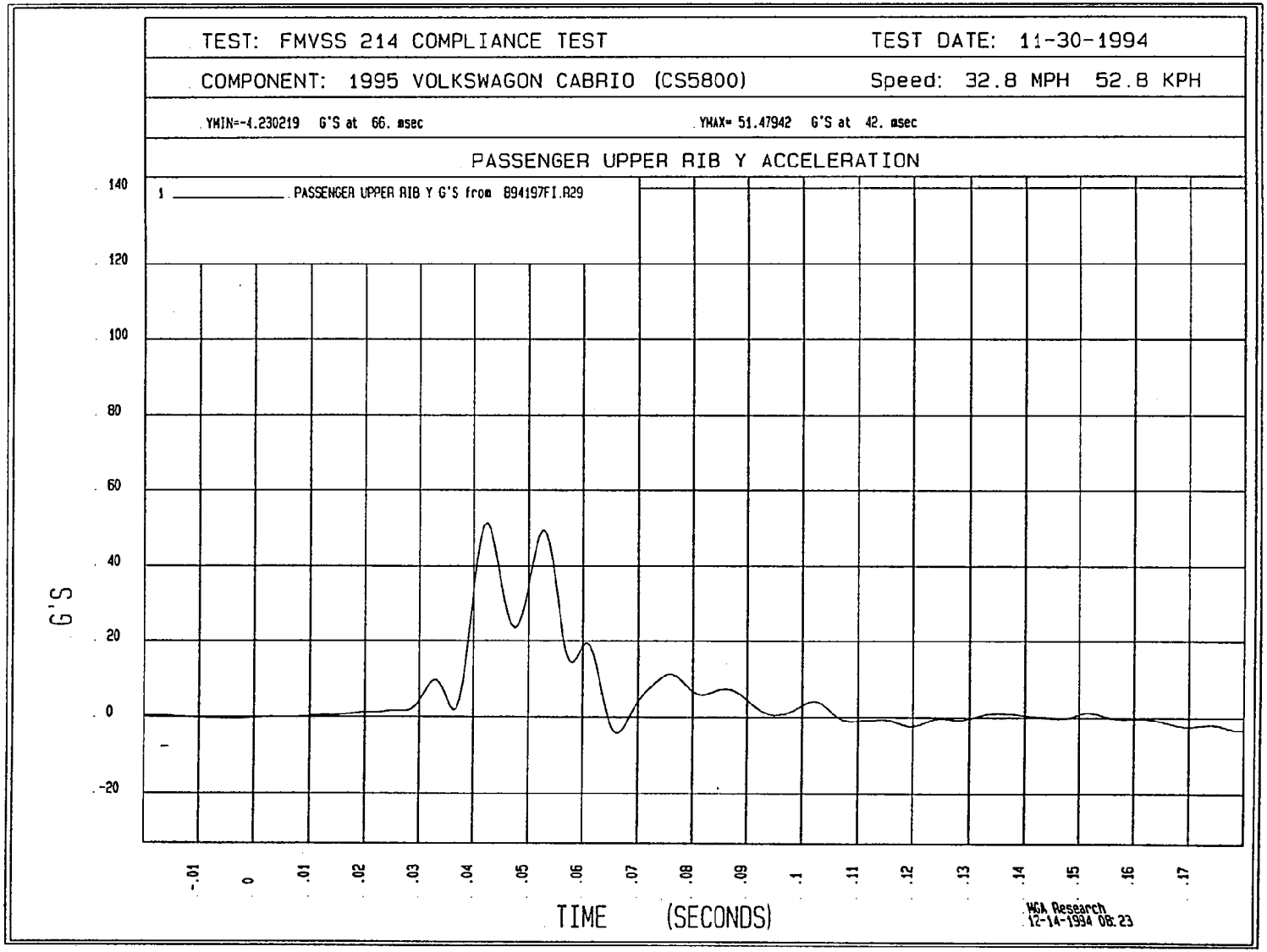


Figure B-89 - Passenger Upper Rib Y Acceleration vs. Time

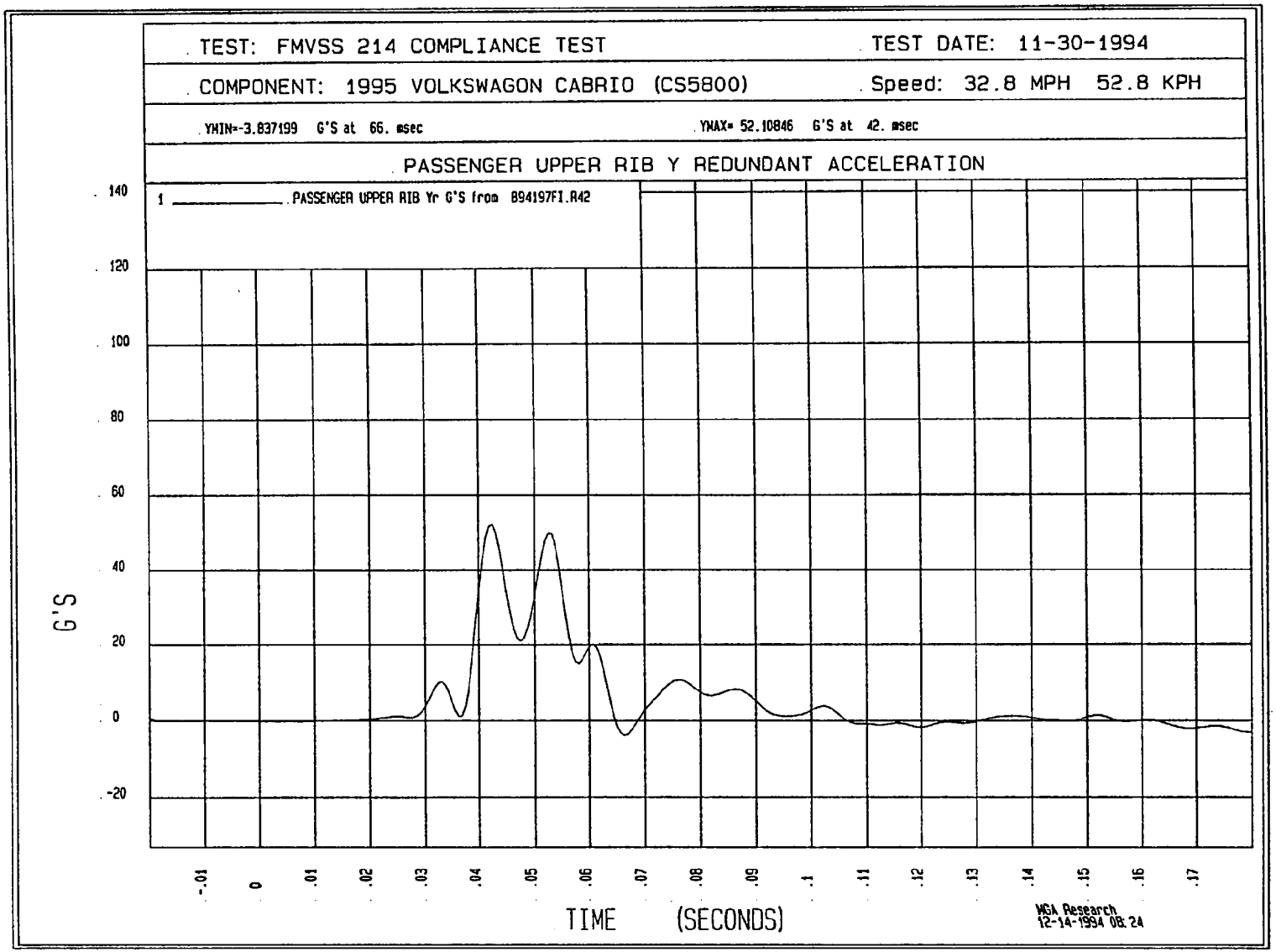


Figure B-90 - Passenger Upper Rib Y Redundant Acceleration vs. Time

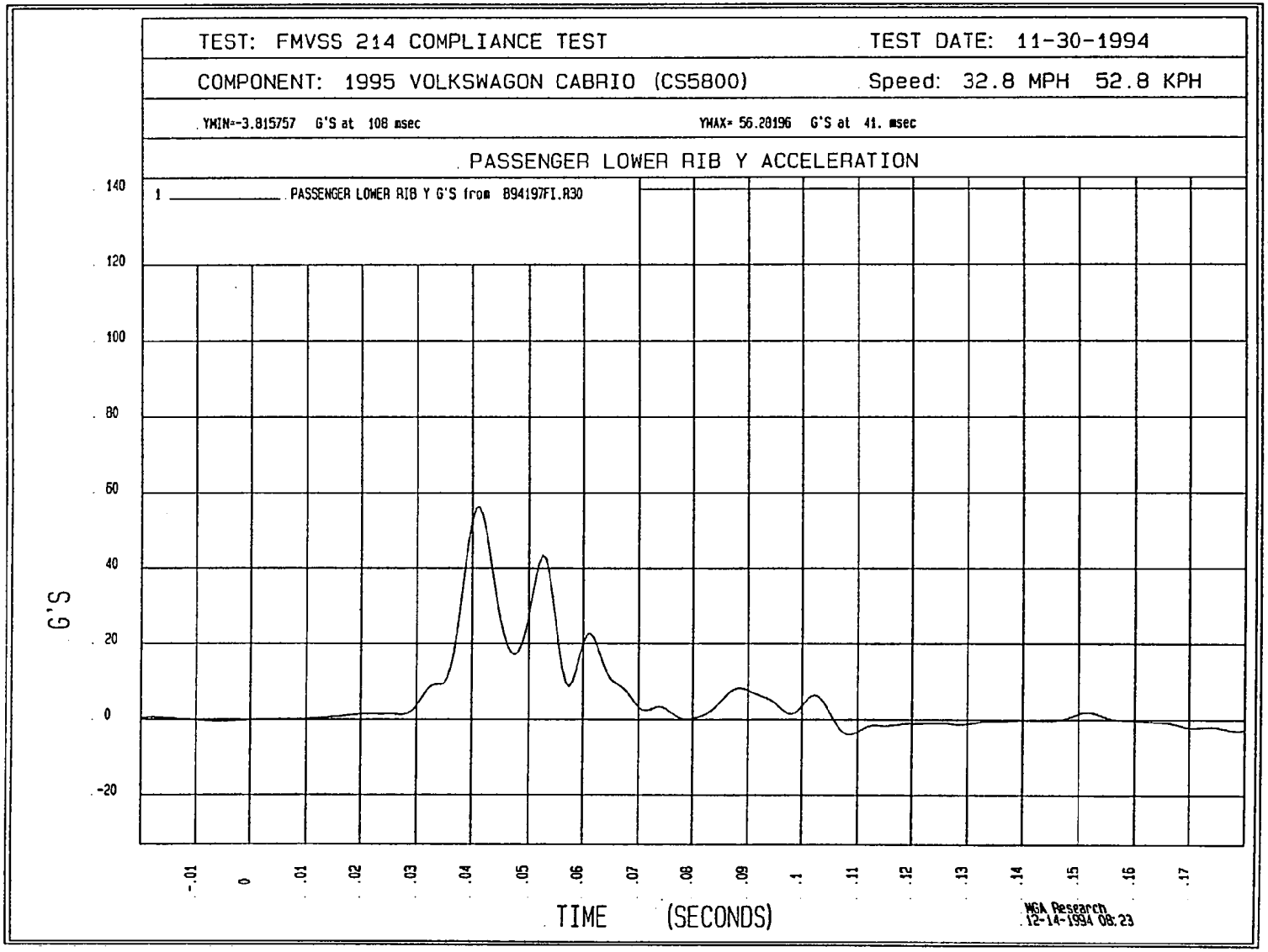


Figure B-91 - Passenger Lower Rib Y Acceleration vs. Time

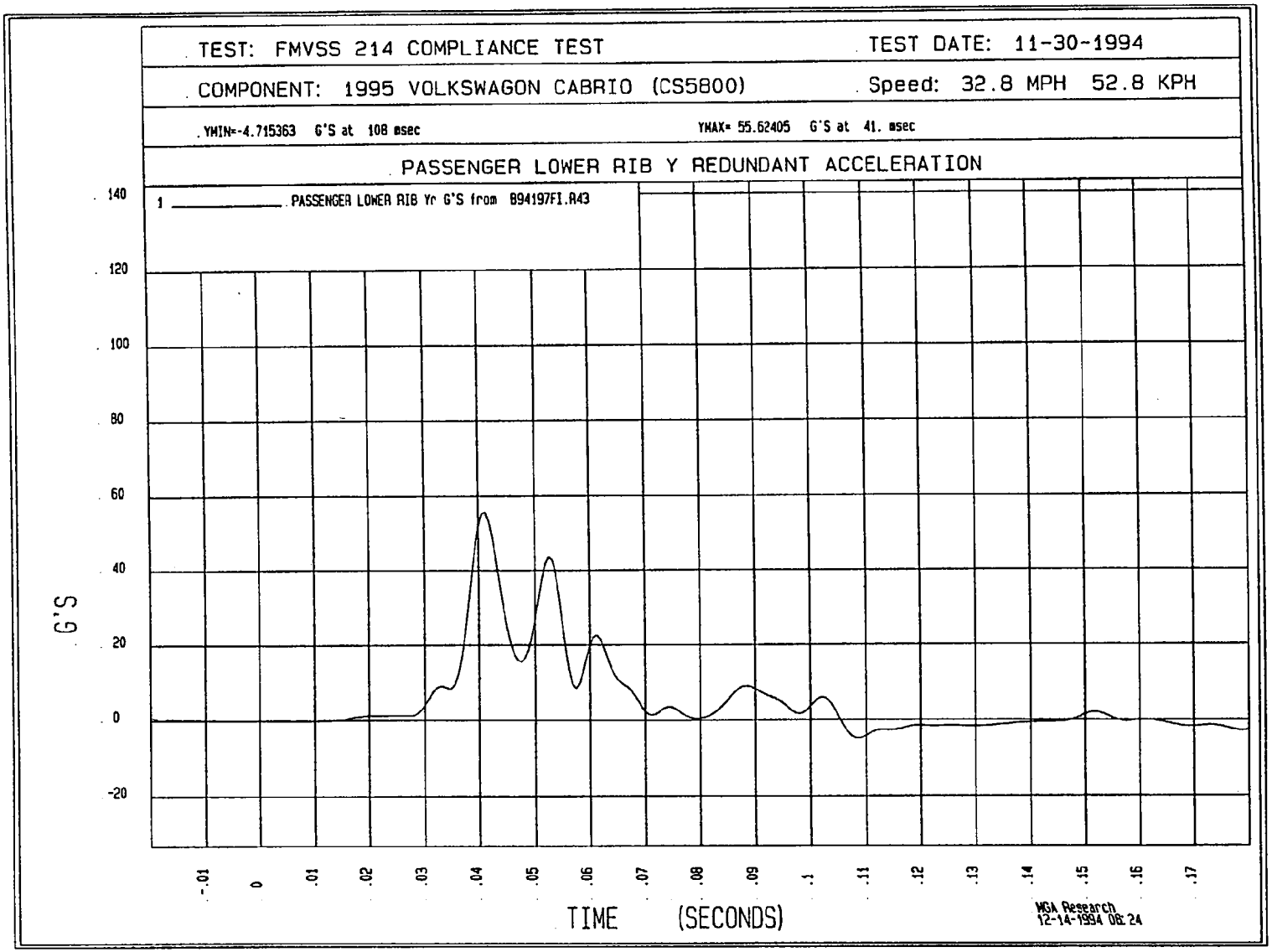


Figure B-92 - Passenger Lower Rib Y Redundant Acceleration vs. Time

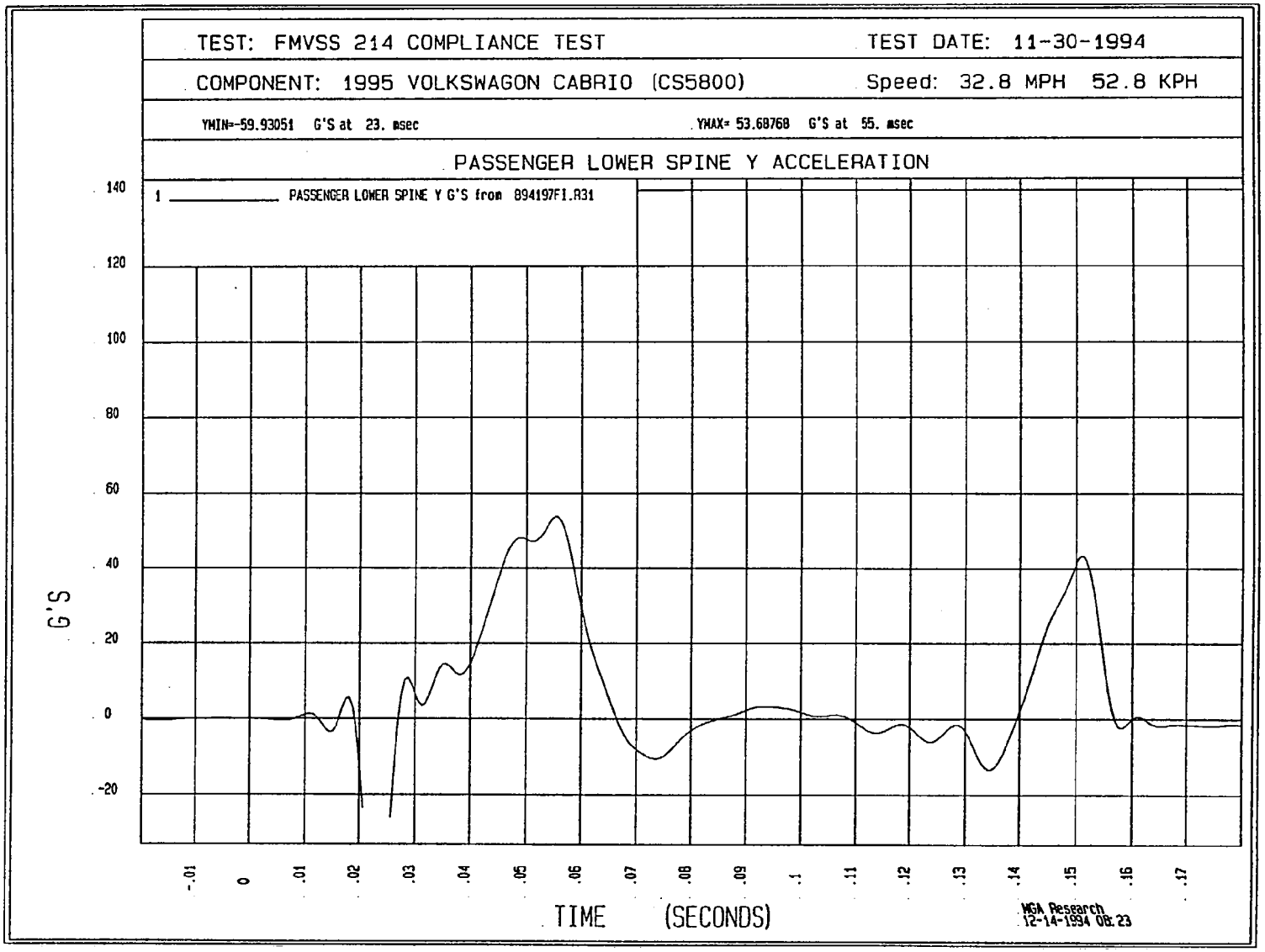


Figure B-93 - Passenger Lower Spine Y Acceleration vs. Time

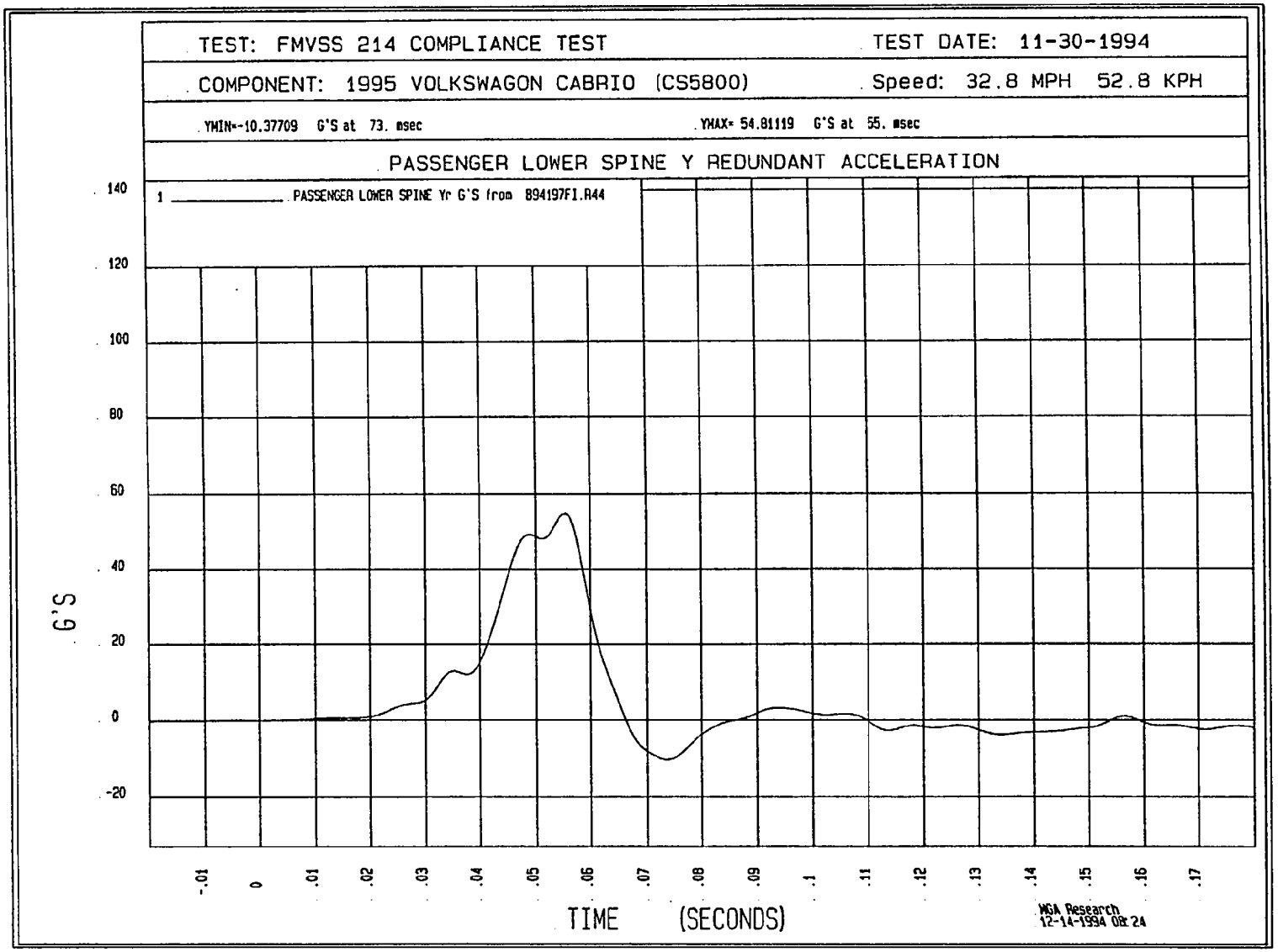


Figure B-94 - Passenger Lower Spine Y Redundant Acceleration vs. Time

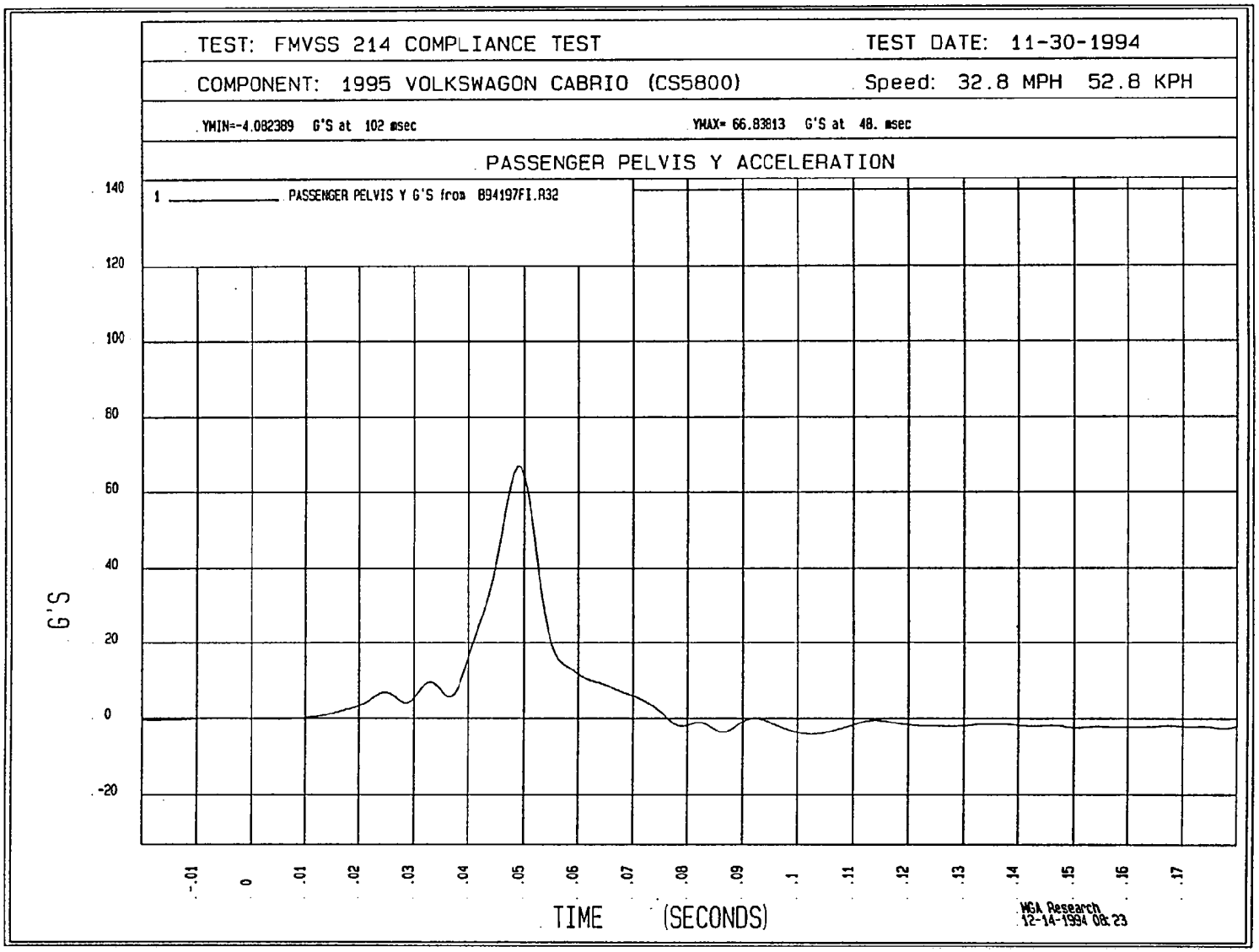


Figure B-95 - Passenger Pelvis Y Acceleration vs. Time

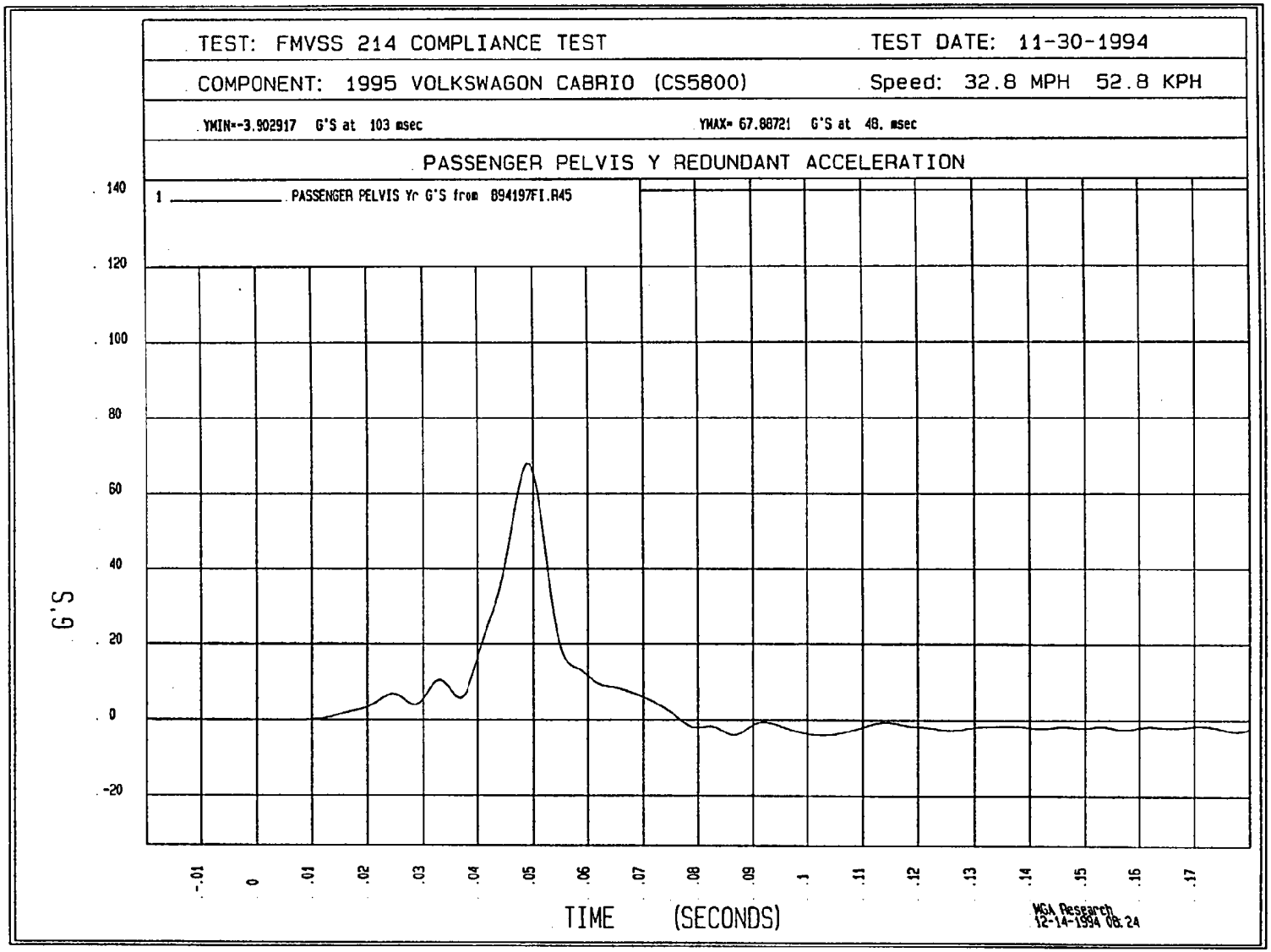


Figure B-96 - Passenger Pelvis Y Redundant Acceleration vs. Time

APPENDIX C

SID CONFIGURATION AND PERFORMANCE VERIFICATION

REPORT NO. MGA-95-DC00Ø8

DUMMY PERFORMANCE CALIBRATIONS

FMVSS 214 - SIDE IMPACT TEST

VOLKSWAGEN OF AMERICA
1995 VOLKSWAGEN CABRIO (CONVERTIBLE) 2 DOOR
NHTSA NO. CS58ØØ

MGA PROVING GROUNDS
5ØØØ WARREN ROAD
BURLINGTON, WI 53105

Test Date: November 3Ø, 1994

Report Date: December 23, 1994

FINAL REPORT

Prepared For:

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
MAIL CODE: NEF-3Ø
4ØØ SEVENTH STREET, S.W., ROOM 6115
Washington, D.C. 2Ø59Ø

TABLE OF CONTENTS

PRE-TEST CERTIFICATION DATA

Driver Dummy Serial Number: 270

Calibration Test Results Summary

Dummy Serial Number: 270

Pre-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 270 DATE OF VERIFICATION: November 28, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.0
RH - Rib Height	19.75" - 20.50"	20.25
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.3
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.4
SW - Knee Pivot to Floor	19.3" - 19.9"	19.5
HW - Hip Width	14.0" - 15.4"	15.0

MEASUREMENTS BY: _____

APPROVED BY: _____

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: November 28, 1994

DUMMY NUMBER: 270 TEST NUMBER: D94232

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	36%
PROBE SPEED	13.8 - 14.2 fps	13.8
UPPER RIB	37 - 46 g's	43
LOWER RIB	37 - 46 g's	41
LOWER SPINE	15 - 22 g's	20

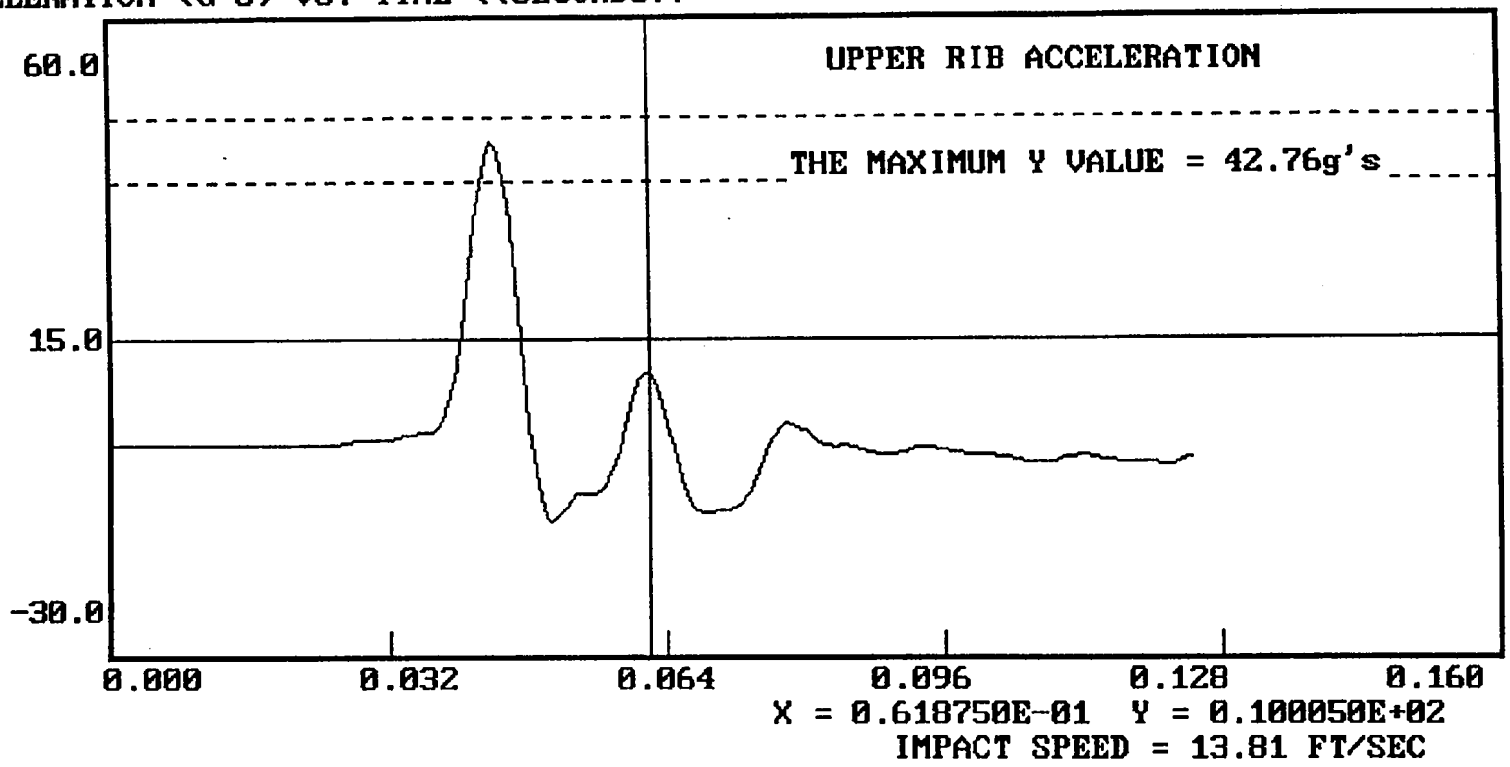
TEST MEETS SPECIFICATIONS

TECHNICIAN _____

APPROVED BY _____

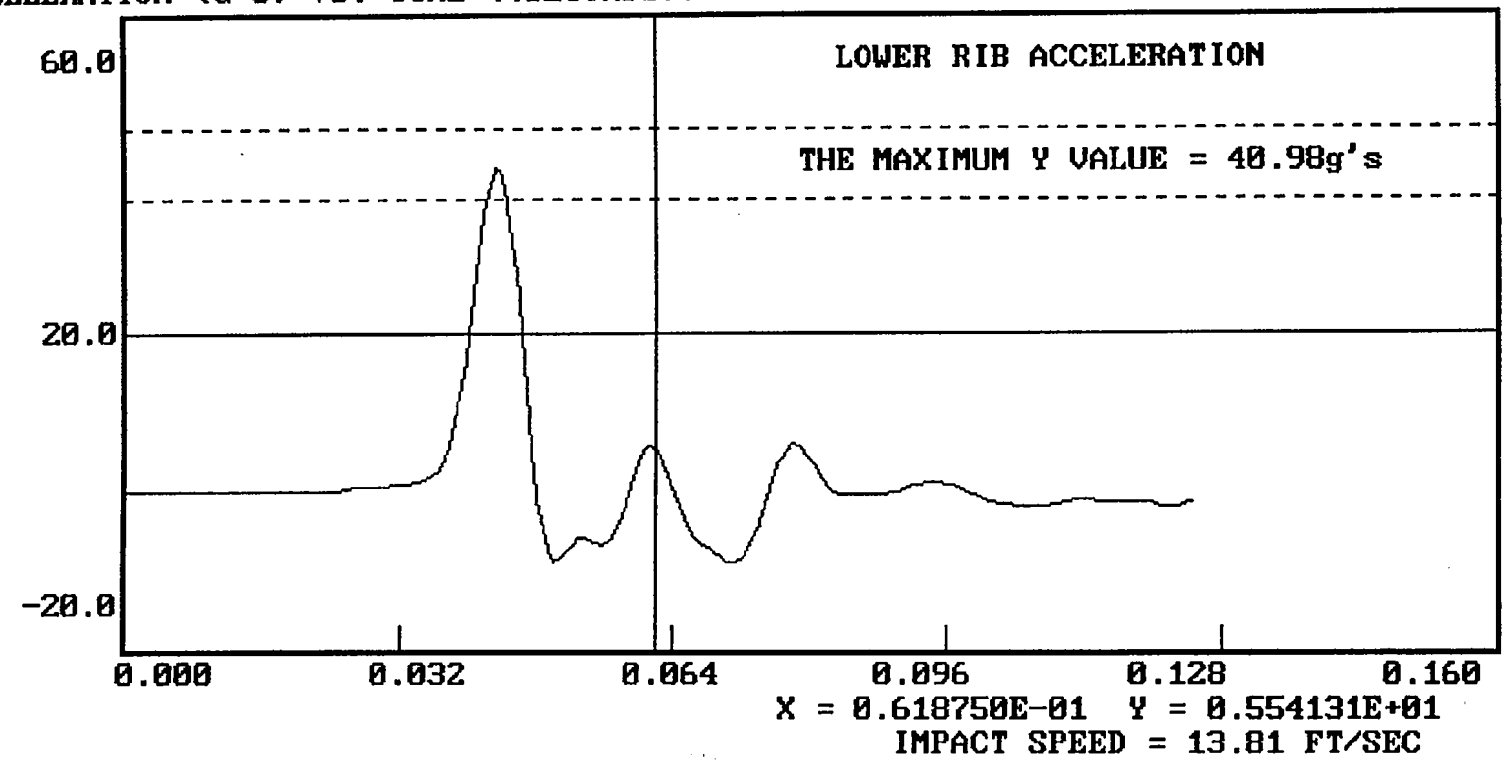
DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 270
ACCELERATION (G'S) VS. TIME ((SECONDS))

11-28-1994 09:36

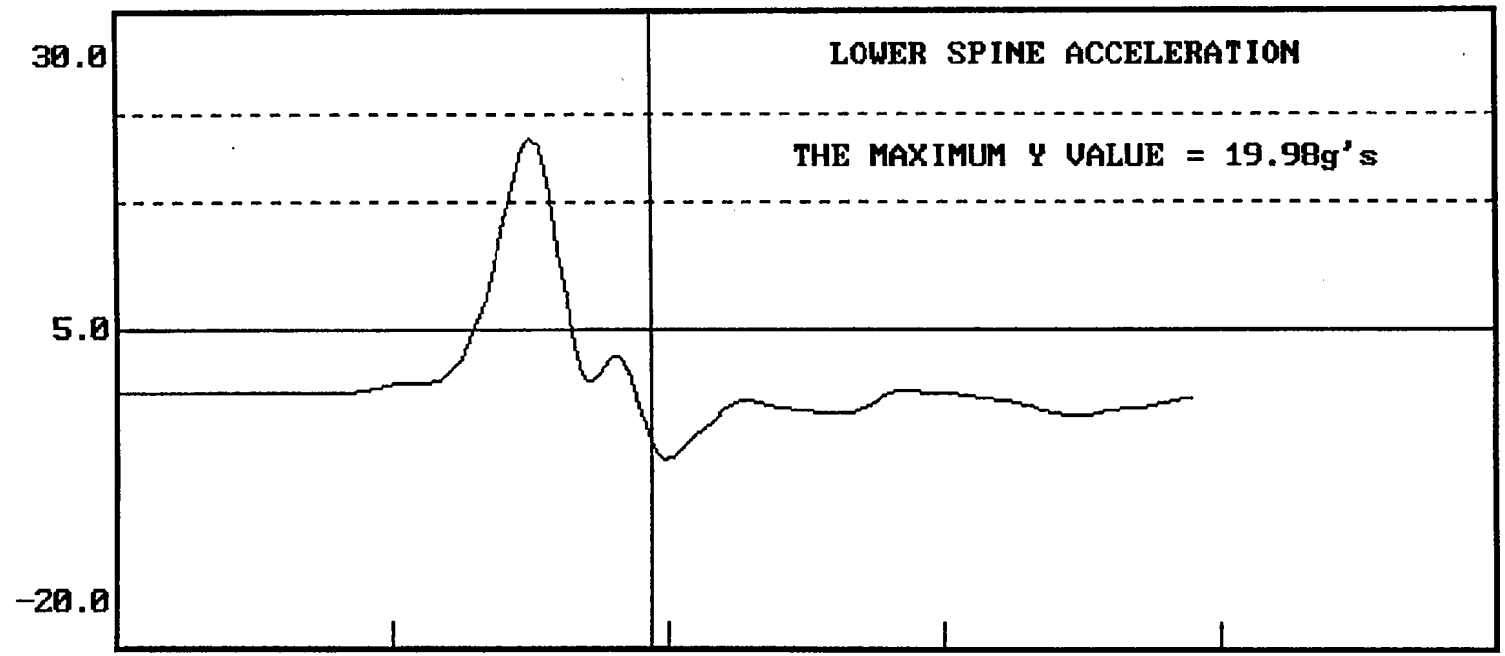


DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 270
ACCELERATION (G'S) VS. TIME ((SECONDS))

11-28-1994 09:36



DUMMY CALIBRATION - THORAX IMPACT 11-28-1994 09:36
DUMMY # 270
() VS. TIME ((SECONDS))



X = 0.618750E-01 Y = -.377679E+01
IMPACT SPEED = 13.81 FT/SEC

MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: November 28, 1994

DUMMY NUMBER: 270 TEST NUMBER: D94233

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	36%
PROBE SPEED	13.8 - 14.2 f/s	13.8
PELVIS ACCELERATION	40 - 60 g's	54

TEST MEETS SPECIFICATIONS

TECHNICIAN: Alan Clark

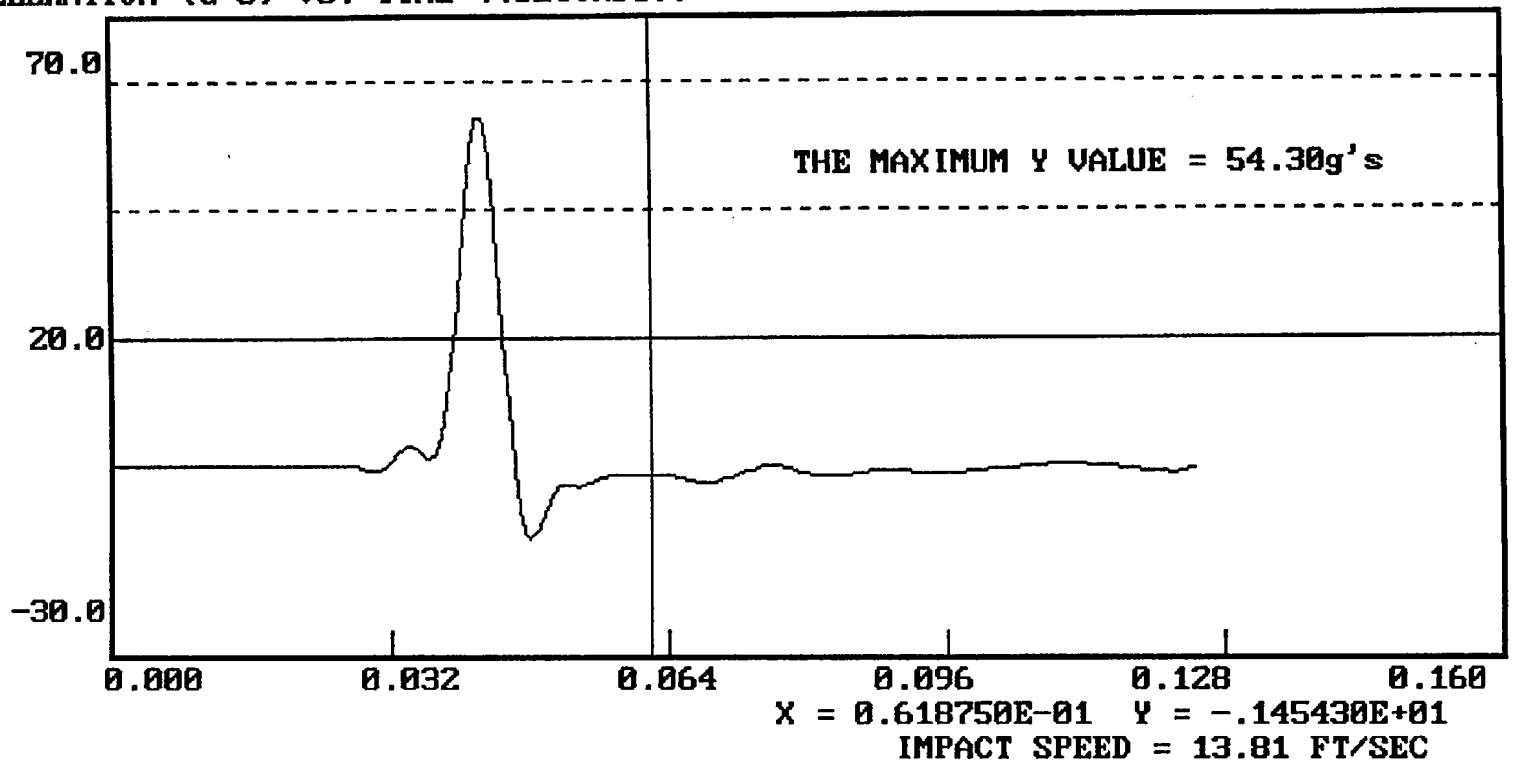
APPROVED BY Dave Kobaske

DUMMY CALIBRATION - PELVIS IMPACT

11-28-1994 10:40

DUMMY # 270

ACCELERATION (G'S) VS. TIME ((SECONDS))



X = 0.618750E-01 Y = -.145430E+01

IMPACT SPEED = 13.81 FT/SEC

MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: November 28, 1994

DUMMY NUMBER: 270 TEST NUMBER: D94234

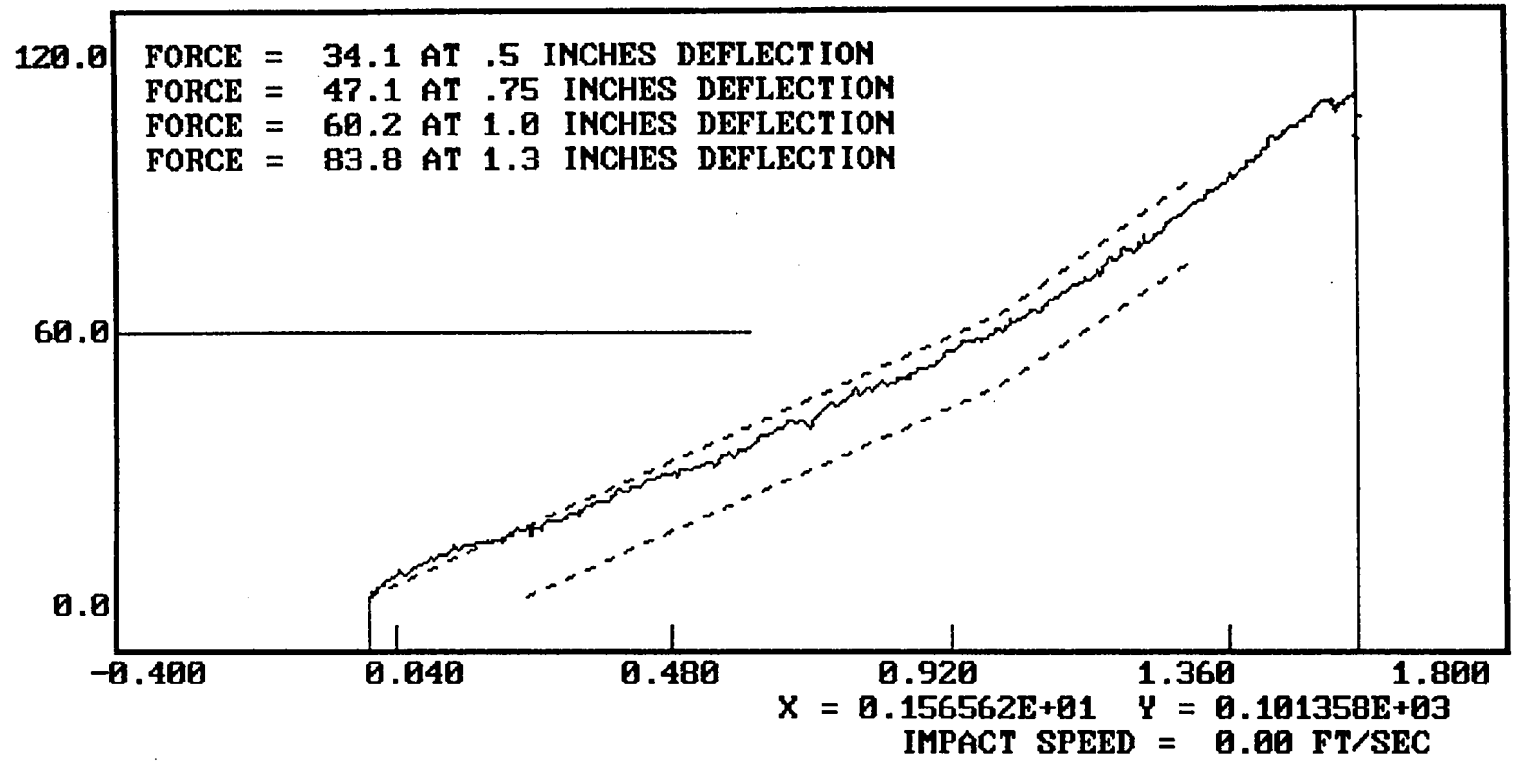
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	36%
FORCE @ 0.5 in	23.3 - 36.5 lbs	34.1
FORCE @ 0.75 in	36.7 - 49.8 lbs	47.1
FORCE @ 1.0 in	50 - 63 lbs	60
FORCE @ 1.3 in	73 - 88 lbs	84

TEST MEETS SPECIFICATIONS

TECHNICIAN _____

APPROVED BY _____

DUMMY CALIBRATION - ABDOMEN COMPRESSION 11-28-1994 11:49
DUMMY # 270
ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



X = 0.156562E+01 Y = 0.101358E+03
IMPACT SPEED = 0.00 FT/SEC

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: November 28, 1994

DUMMY NUMBER: 270 TEST NUMBER: D94235

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	36%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	26
FORCE @ 30°	34 - 46 lbs	38
FORCE @ 40°	46 - 58 lbs	52
RETURN ANGLE	12° maximum	9°

TEST MEETS SPECIFICATIONS

TECHNICIAN

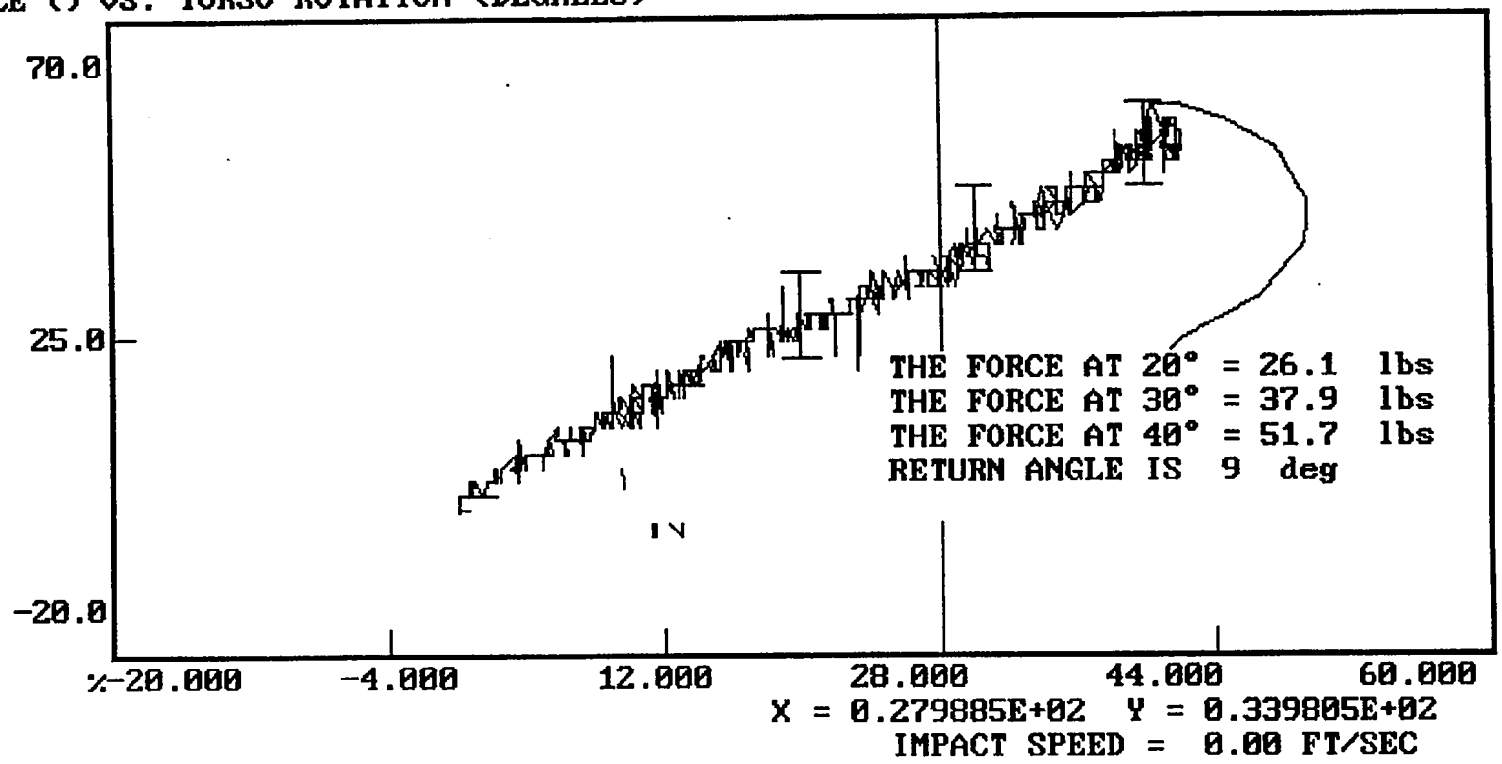
APPROVED BY

DUMMY CALIBRATION - LUMBAR FLEXION

11-28-1994 11:20

DUMMY # 270

FORCE () VS. TORSO ROTATION (DEGREES)



X = 0.279885E+02 Y = 0.339805E+02

IMPACT SPEED = 0.00 FT/SEC

PRE-TEST CERTIFICATION DATA

Passenger Dummy Serial Number: 272

Calibration Test Results Summary

Passenger Serial Number: 272

Pre-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 272 DATE OF VERIFICATION: November 28, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.2
RH - Rib Height	19.75" - 20.50"	20.25
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.2
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.6
SW - Knee Pivot to Floor	19.3" - 19.9"	19.5
HW - Hip Width	14.0" - 15.4"	15.0

MEASUREMENTS BY: _____

APPROVED BY: _____

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

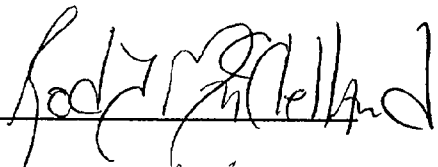
SIDE IMPACT DUMMY (SID)

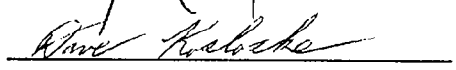
DATE: November 28, 1994

DUMMY NUMBER: 272 TEST NUMBER: D94242

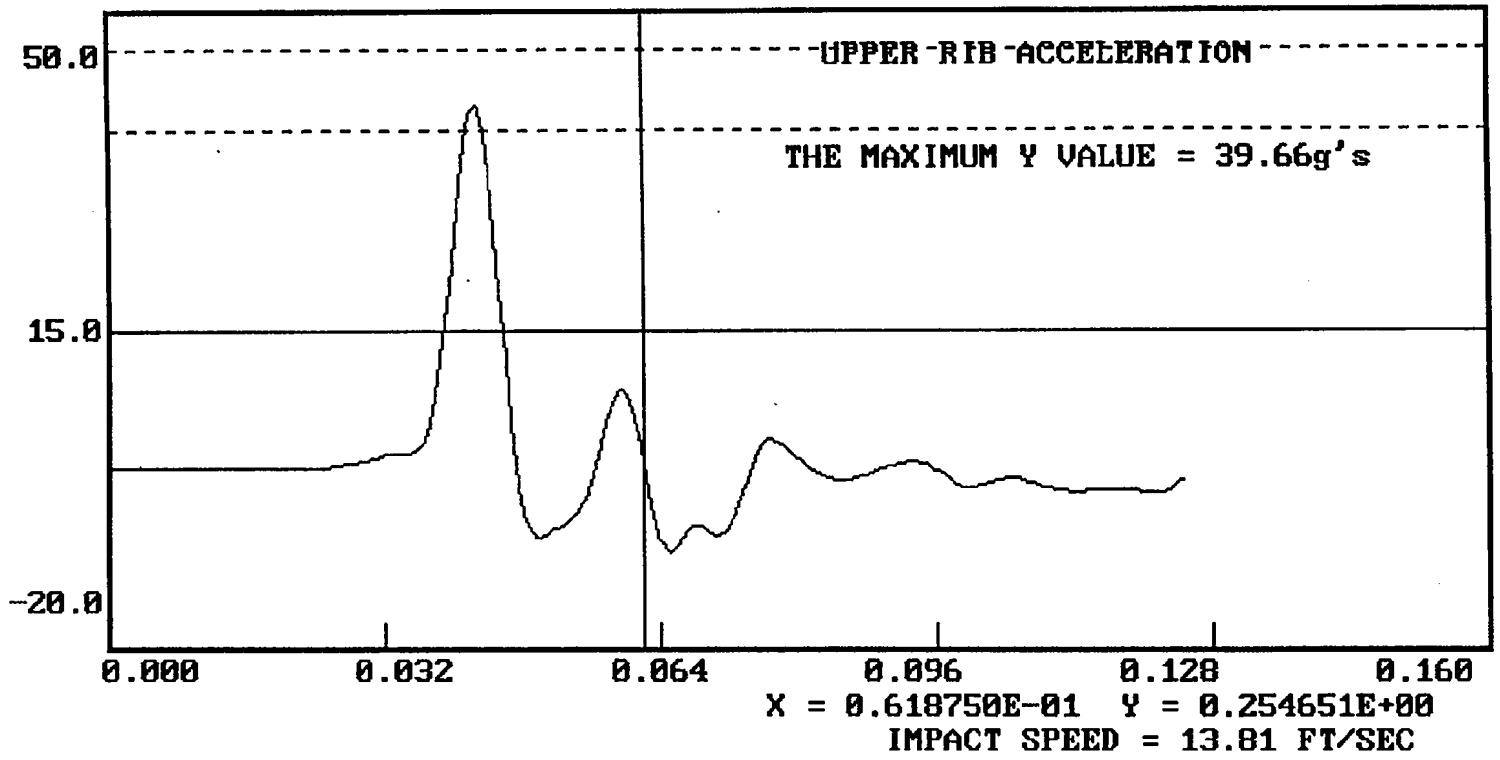
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	36%
PROBE SPEED	13.8 - 14.2 fps	13.8
UPPER RIB	37 - 46 g's	40
LOWER RIB	37 - 46 g's	38
LOWER SPINE	15 - 22 g's	21

TEST MEETS SPECIFICATIONS

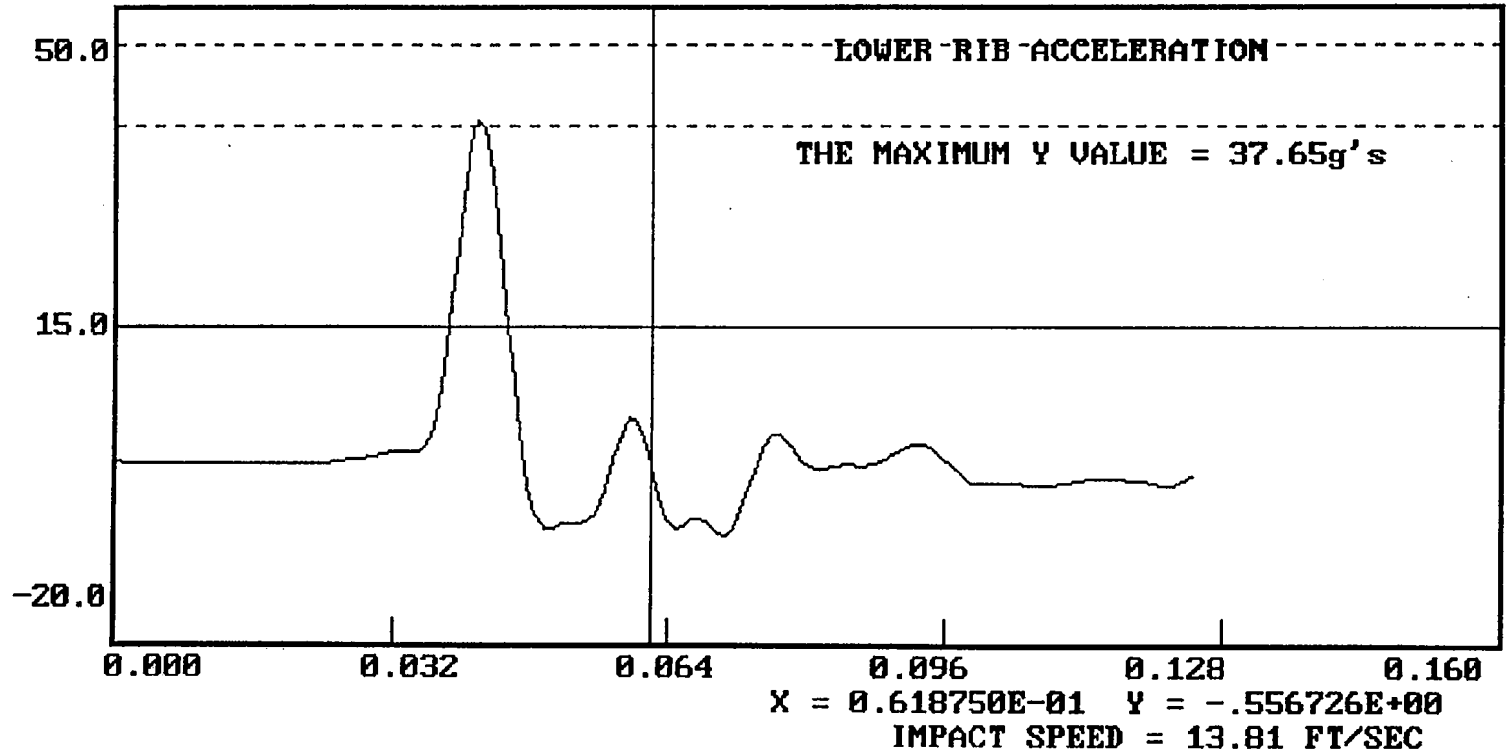
TECHNICIAN 

APPROVED BY 

DUMMY CALIBRATION - THORAX IMPACT 11-28-1994 09:59
DUMMY # 272
ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT 11-28-1994 09:59
DUMMY # 272
ACCELERATION (G'S) VS. TIME ((SECONDS))

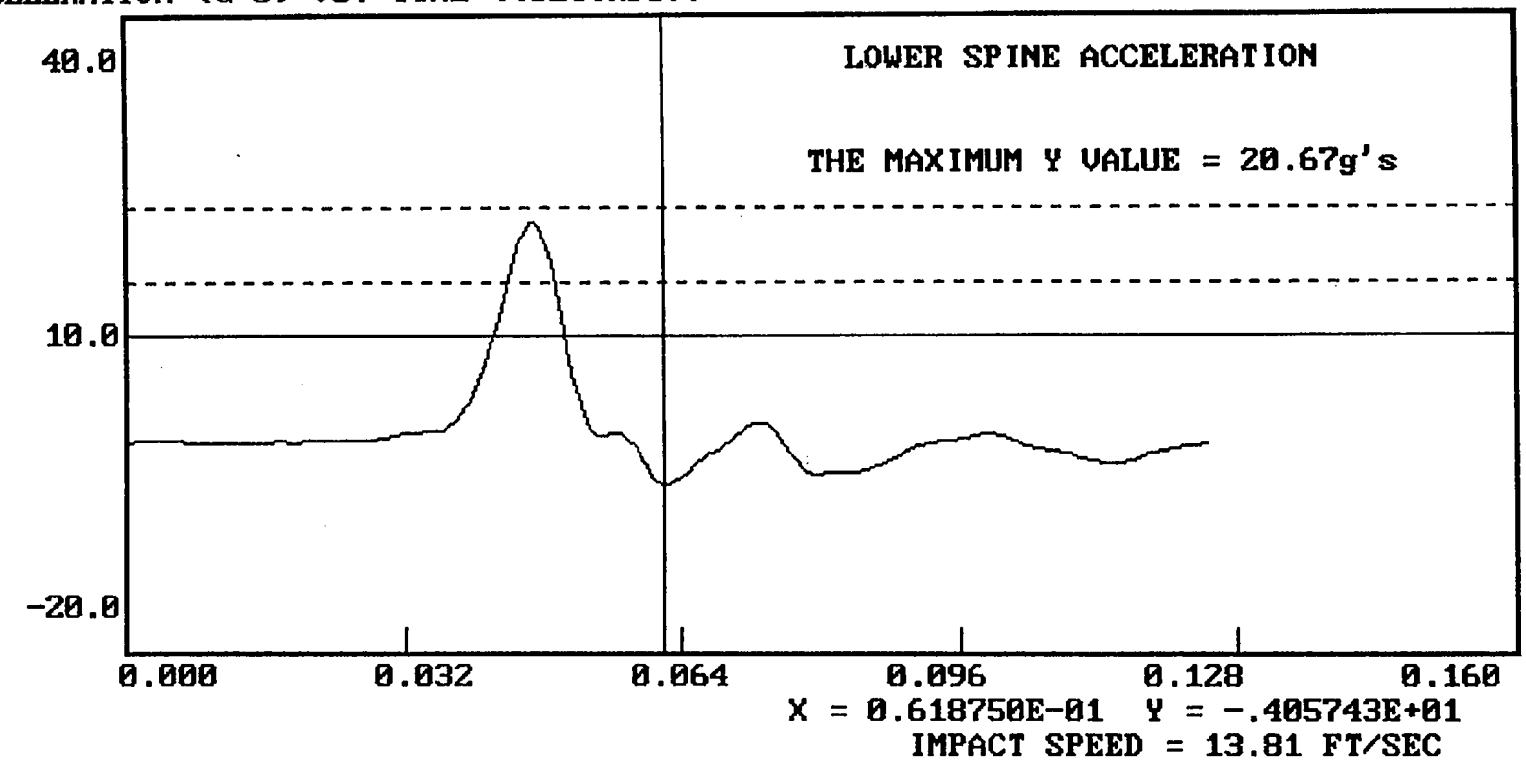


DUMMY CALIBRATION - THORAX IMPACT

11-28-1994 09:59

DUMMY # 272

ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: November 28, 1994

DUMMY NUMBER: 272 TEST NUMBER: D94243

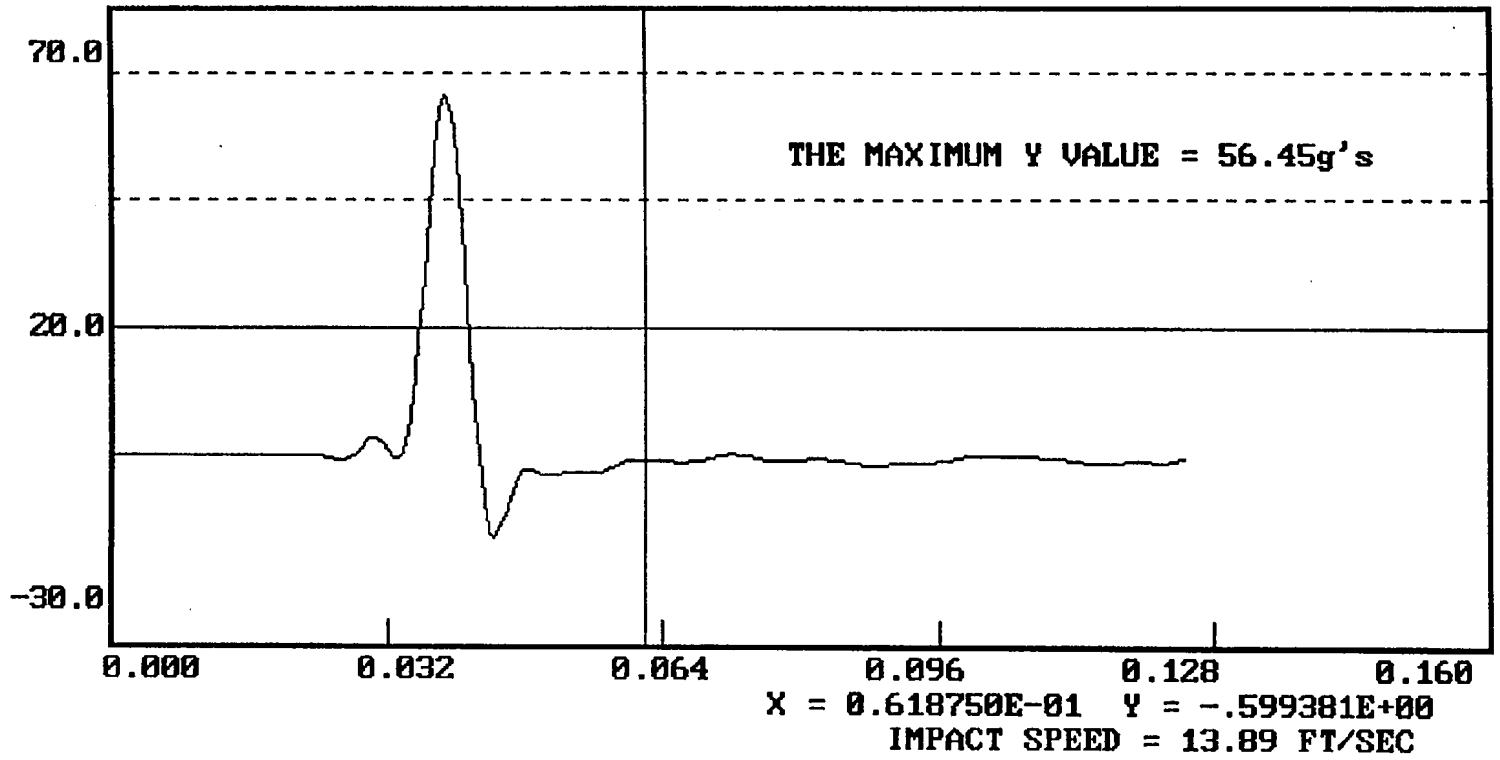
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	36%
PROBE SPEED	13.8 - 14.2 f/s	13.9
PELVIS ACCELERATION	40 - 60 g's	56

TEST MEETS SPECIFICATIONS

TECHNICIAN

APPROVED BY

DUMMY CALIBRATION - PELVIS IMPACT 11-28-1994 10:32
DUMMY # 272
ACCELERATION (G'S) VS. TIME ((SECONDS))



X = 0.618750E-01 Y = -.599381E+00
IMPACT SPEED = 13.89 FT/SEC

MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: November 28, 1994

DUMMY NUMBER: 272 TEST NUMBER: D94244

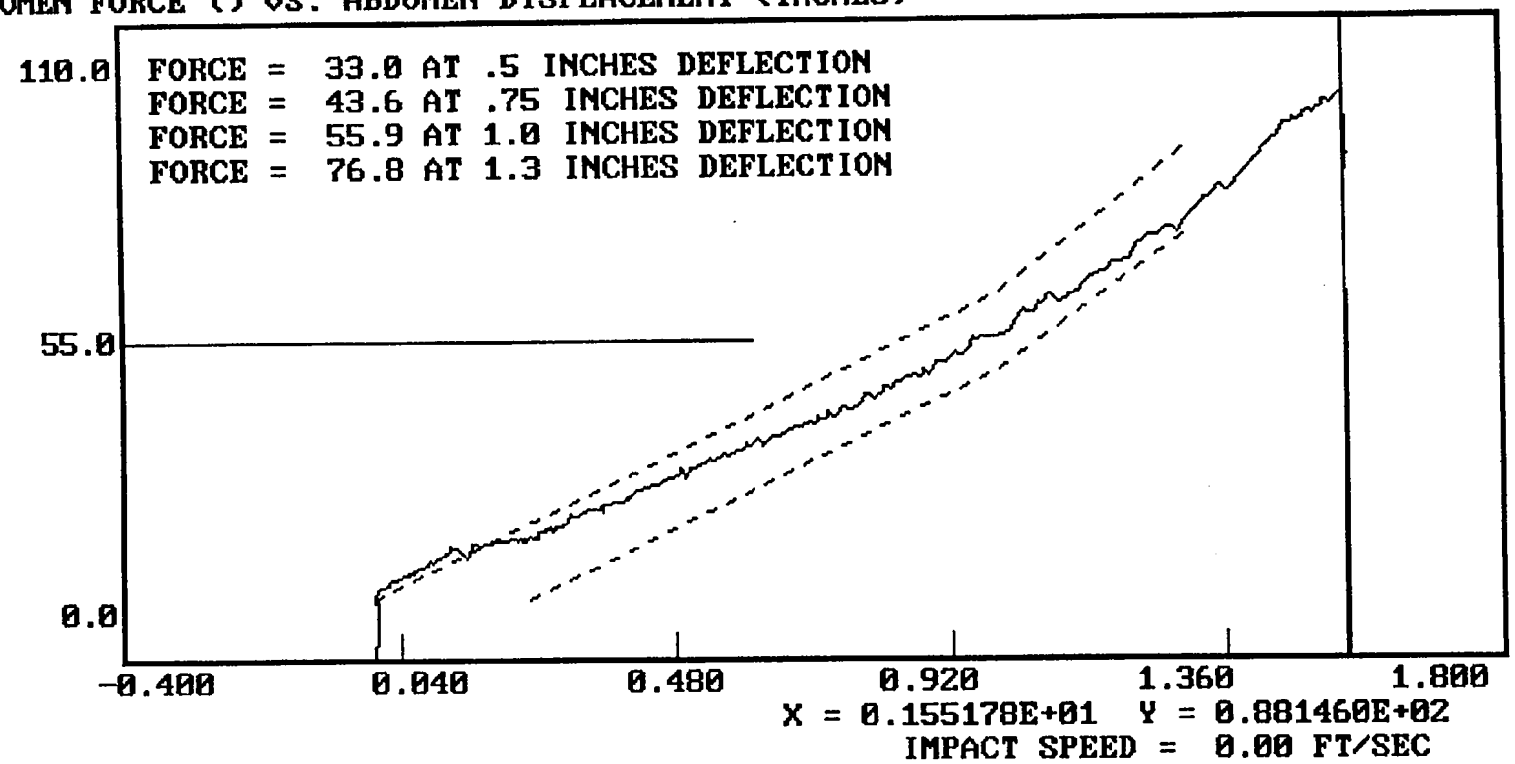
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	36%
FORCE @ 0.5 in	23.3 - 36.5 lbs	33.0
FORCE @ 0.75 in	36.7 - 49.8 lbs	43.6
FORCE @ 1.0 in	50 - 63 lbs	56
FORCE @ 1.3 in	73 - 88 lbs	77

TEST MEETS SPECIFICATIONS

TECHNICIAN _____

APPROVED BY _____

DUMMY CALIBRATION - ABDOMEN COMPRESSION 11-28-1994 11:54
DUMMY # 272
ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



X = 0.155178E+01 Y = 0.881460E+02
IMPACT SPEED = 0.00 FT/SEC

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: November 28, 1994

DUMMY NUMBER: 272 TEST NUMBER: D94245

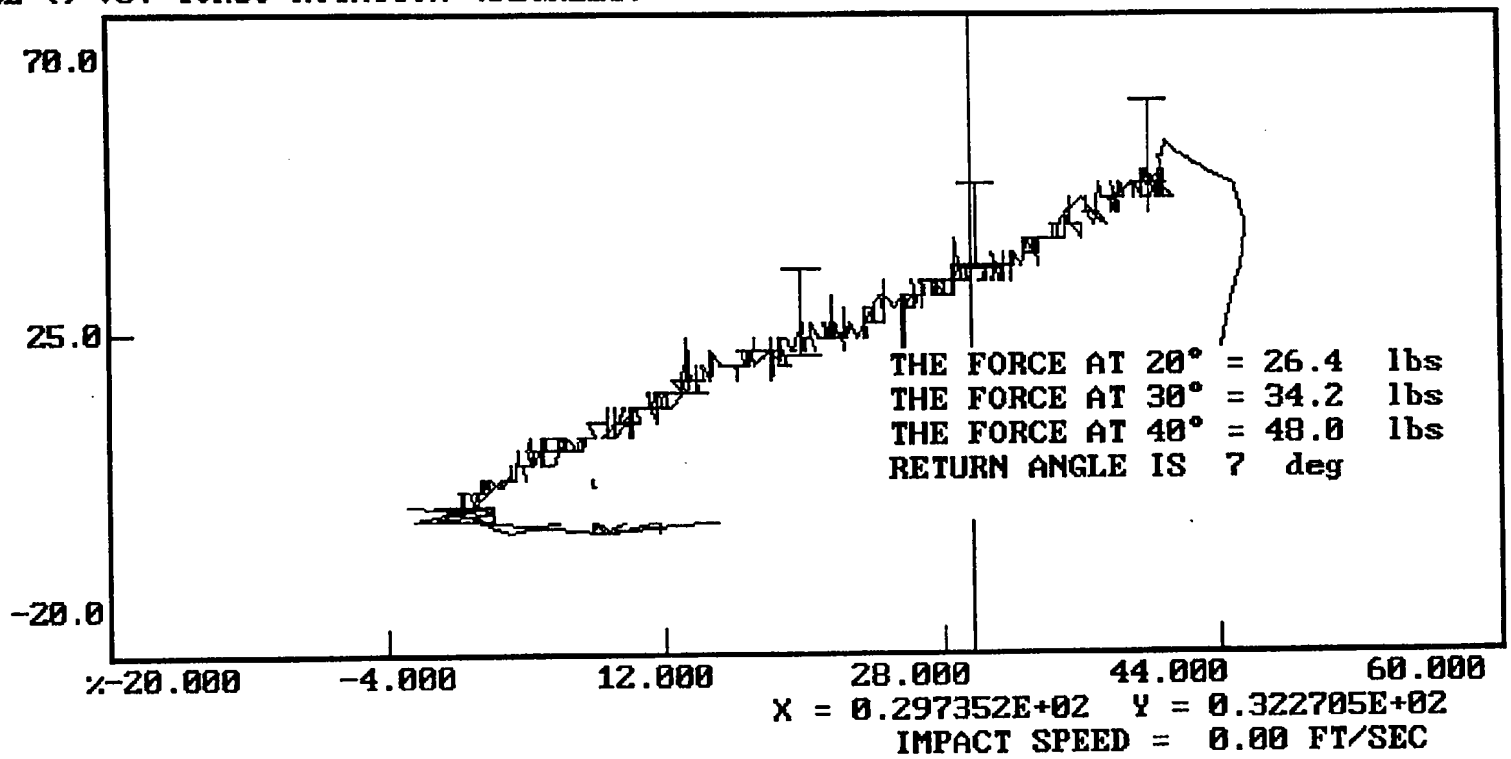
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	36%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	26
FORCE @ 30°	34 - 46 lbs	34
FORCE @ 40°	46 - 58 lbs	48
RETURN ANGLE	12° maximum	7°

TEST MEETS SPECIFICATIONS

TECHNICIAN Lu Clan

APPROVED BY Dave Kozlosky

DUMMY CALIBRATION - LUMBAR FLEXION 11-28-1994 11:32
DUMMY # 272
FORCE () VS. TORSO ROTATION (DEGREES)



POST-TEST CERTIFICATION DATA

Driver Dummy Serial Number: 270

Calibration Test Results Summary

Dummy Serial Number: 270

Post-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 270 DATE OF VERIFICATION: December 5, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.0
RH - Rib Height	19.75" - 20.50"	20.20
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.3
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.5
SW - Knee Pivot to Floor	19.3" - 19.9"	19.4
HW - Hip Width	14.0" - 15.4"	14.9

MEASUREMENTS BY: _____

APPROVED BY: _____

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 5, 1994

DUMMY NUMBER: 270 TEST NUMBER: D94322

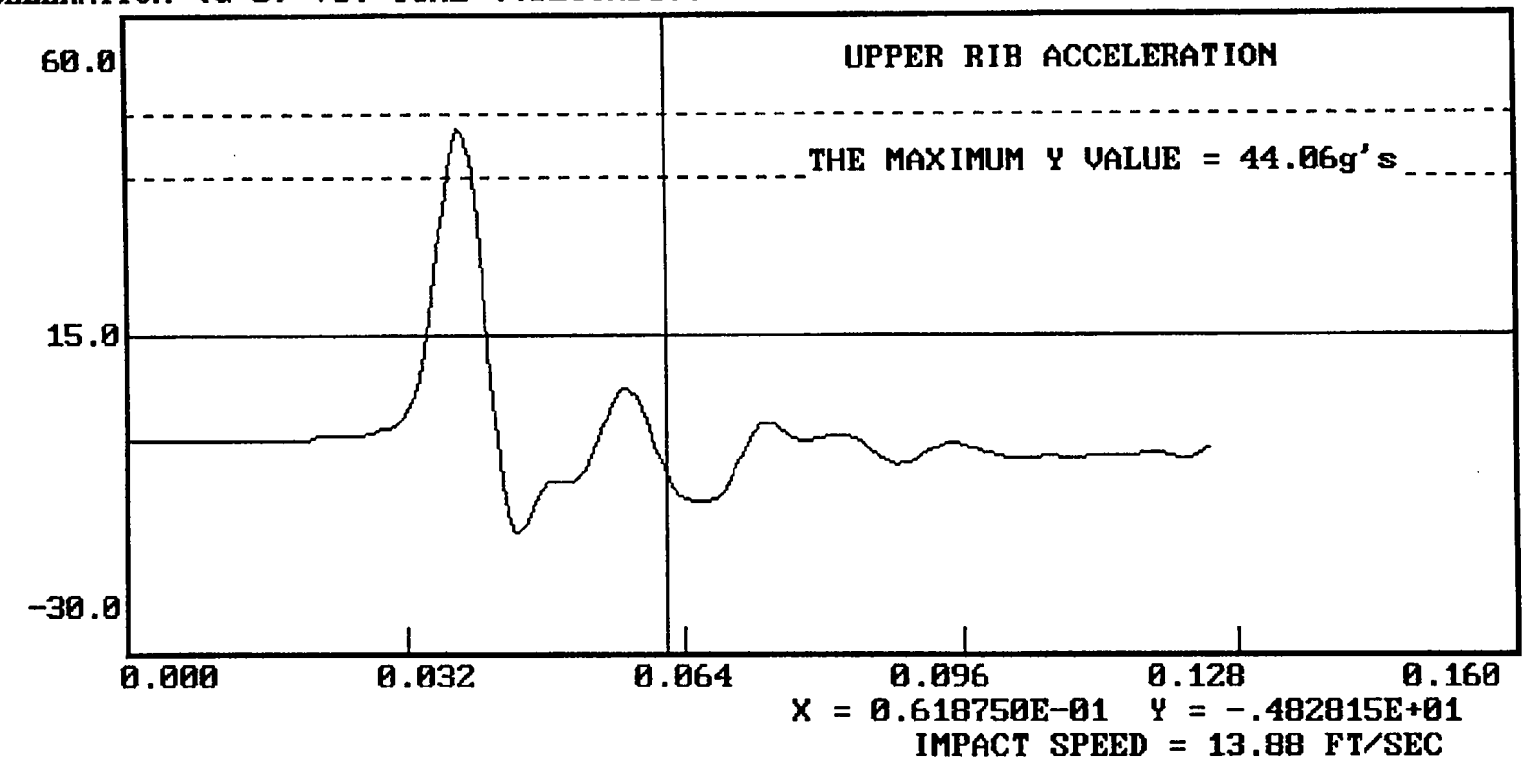
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	33%
PROBE SPEED	13.8 - 14.2 fps	13.9
UPPER RIB	37 - 46 g's	44
LOWER RIB	37 - 46 g's	41
LOWER SPINE	15 - 22 g's	20

TEST MEETS SPECIFICATIONS

TECHNICIAN _____

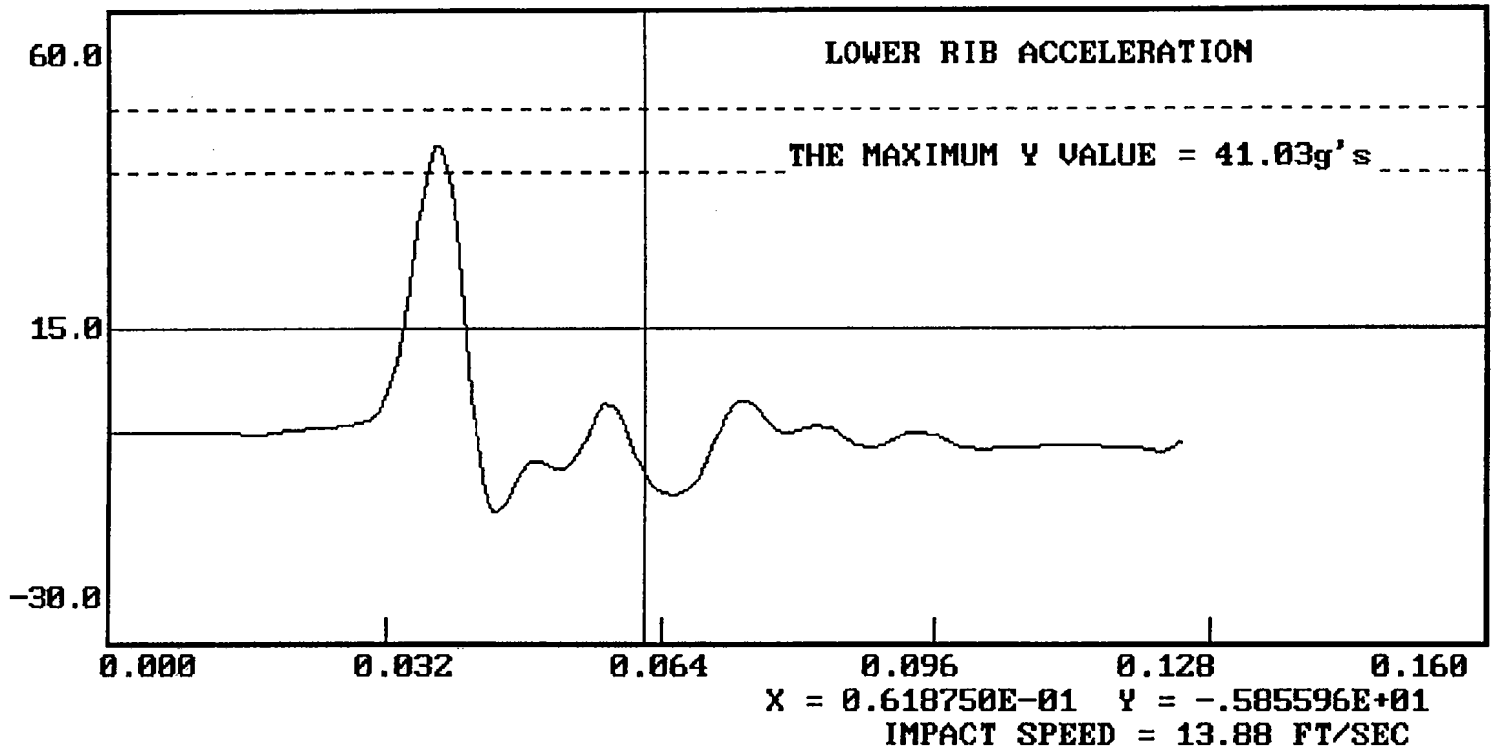
APPROVED BY _____

DUMMY CALIBRATION - THORAX IMPACT 12-05-1994 11:13
DUMMY # 270
ACCELERATION (G'S) VS. TIME ((SECONDS))



X = 0.618750E-01 Y = -.482815E+01
IMPACT SPEED = 13.88 FT/SEC

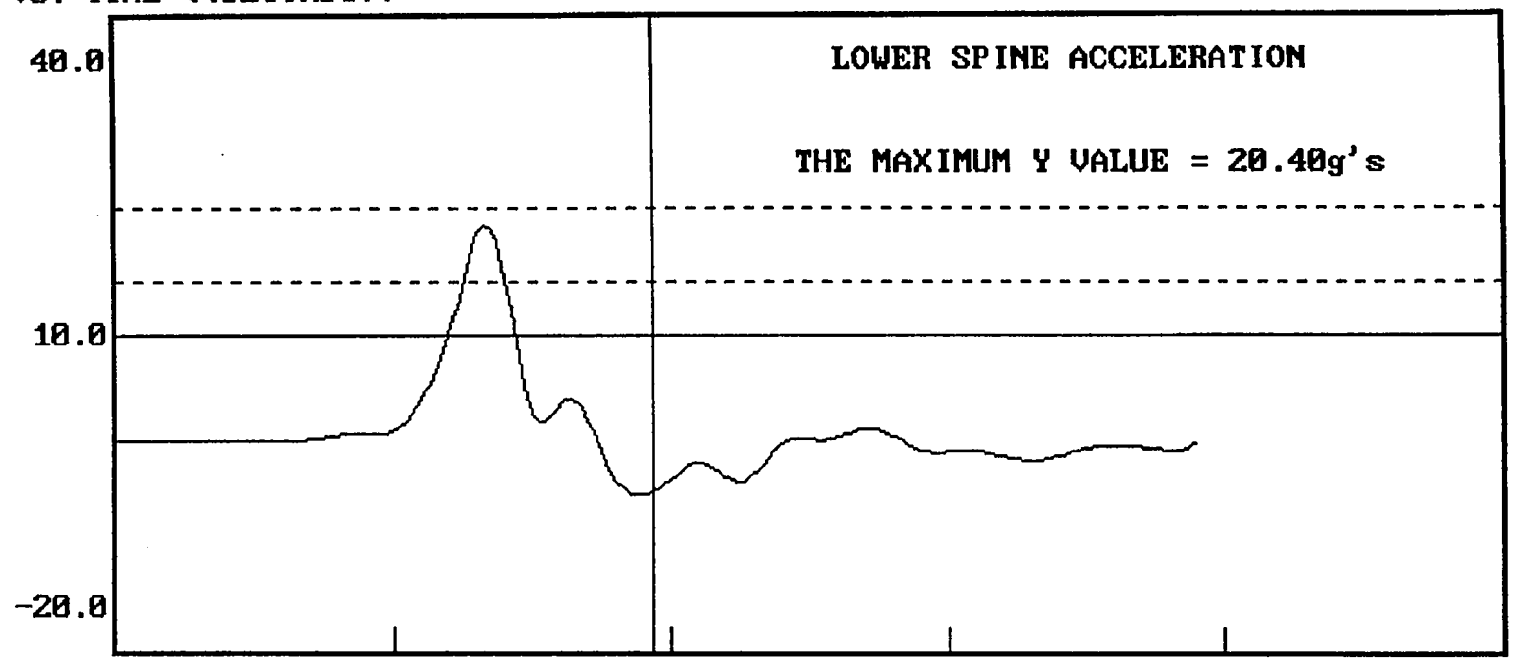
DUMMY CALIBRATION - THORAX IMPACT 12-05-1994 11:13
DUMMY # 270
ACCELERATION (G'S) VS. TIME ((SECONDS))



X = 0.618750E-01 Y = -.585596E+01
IMPACT SPEED = 13.88 FT/SEC

DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 270
() VS. TIME ((SECONDS))

12-05-1994 11:13



X = 0.618750E-01 Y = -.476404E+01
IMPACT SPEED = 13.88 FT/SEC

MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 5, 1994

DUMMY NUMBER: 270 TEST NUMBER: D94323

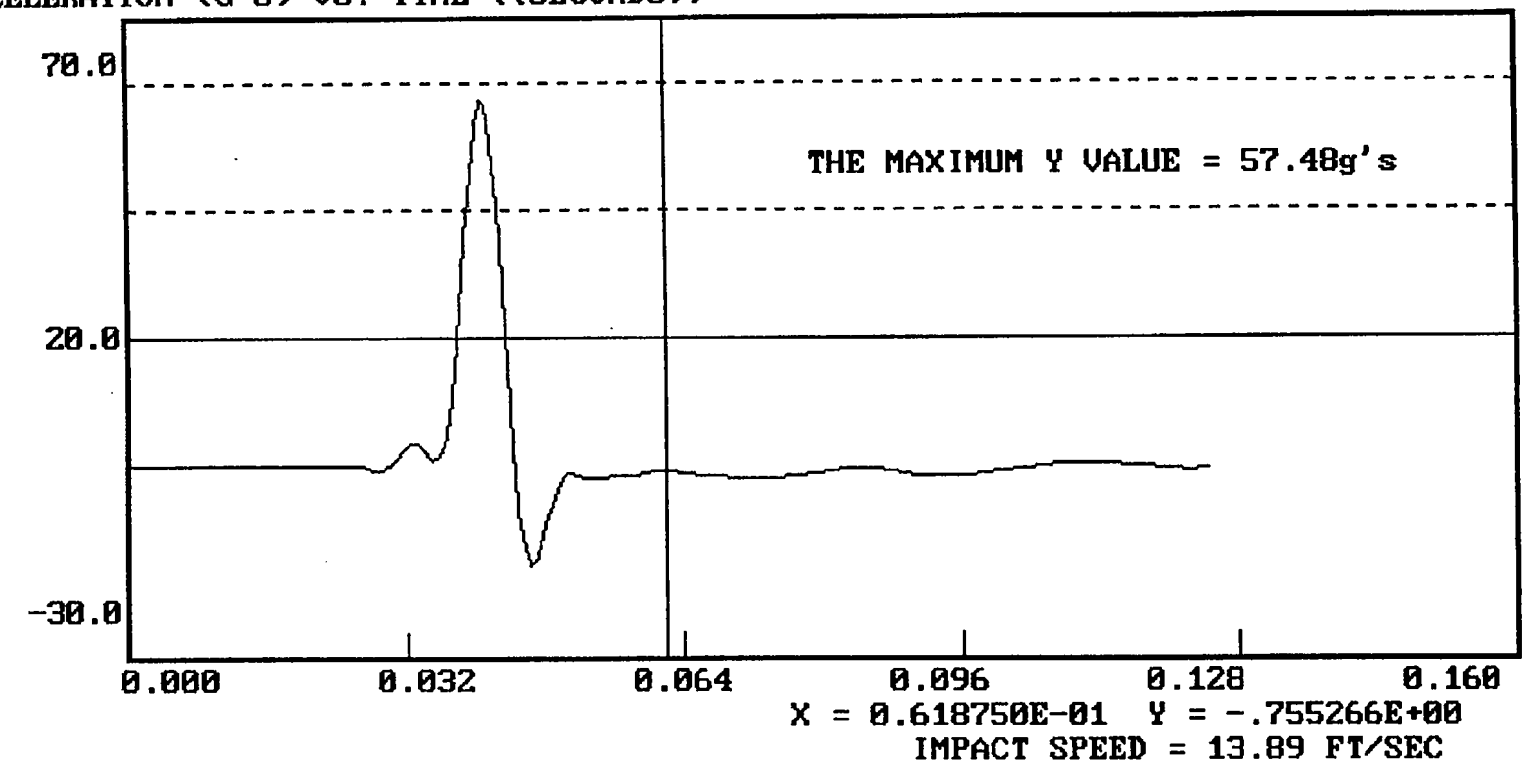
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	33%
PROBE SPEED	13.8 - 14.2 f/s	13.9
PELVIS ACCELERATION	40 - 60 g's	57

TEST MEETS SPECIFICATIONS

TECHNICIAN

APPROVED BY

DUMMY CALIBRATION - PELVIS IMPACT 12-05-1994 13:48
DUMMY # 270
ACCELERATION (G'S) VS. TIME ((SECONDS))



X = 0.618750E-01 Y = -.755266E+00
IMPACT SPEED = 13.89 FT/SEC

MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: December 4, 1994

DUMMY NUMBER: 270 TEST NUMBER: D94324

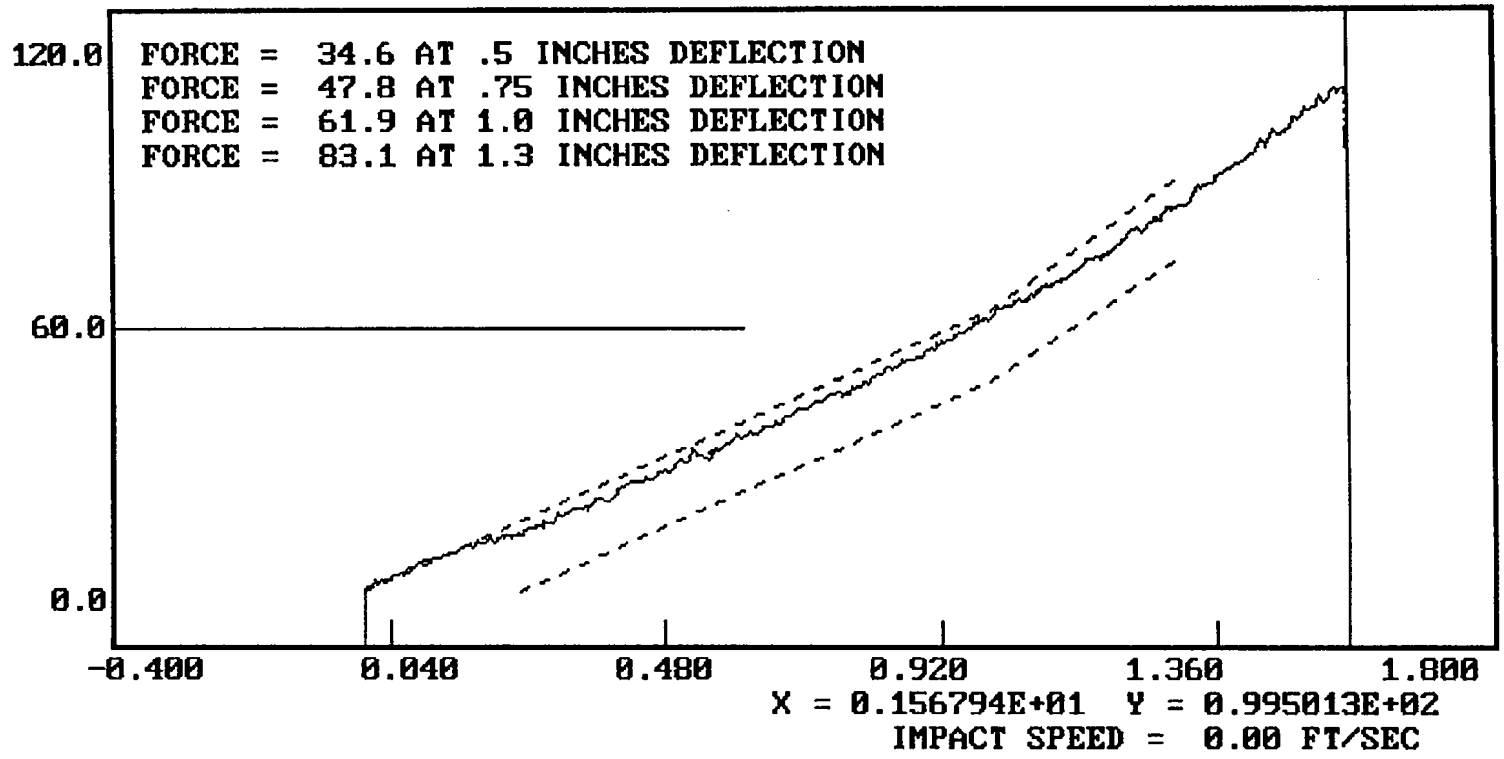
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	33%
FORCE @ 0.5 in	23.3 - 36.5 lbs	34.6
FORCE @ 0.75 in	36.7 - 49.8 lbs	47.8
FORCE @ 1.0 in	50 - 63 lbs	62
FORCE @ 1.3 in	73 - 88 lbs	83

TEST MEETS SPECIFICATIONS

TECHNICIAN Rod McClelland

APPROVED BY Dave Kalbaske

DUMMY CALIBRATION - ABDOMEN COMPRESSION 12-04-1994 15:19
DUMMY # 270
ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

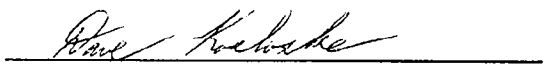
DATE: December 4, 1994

DUMMY NUMBER: 270 TEST NUMBER: D94325

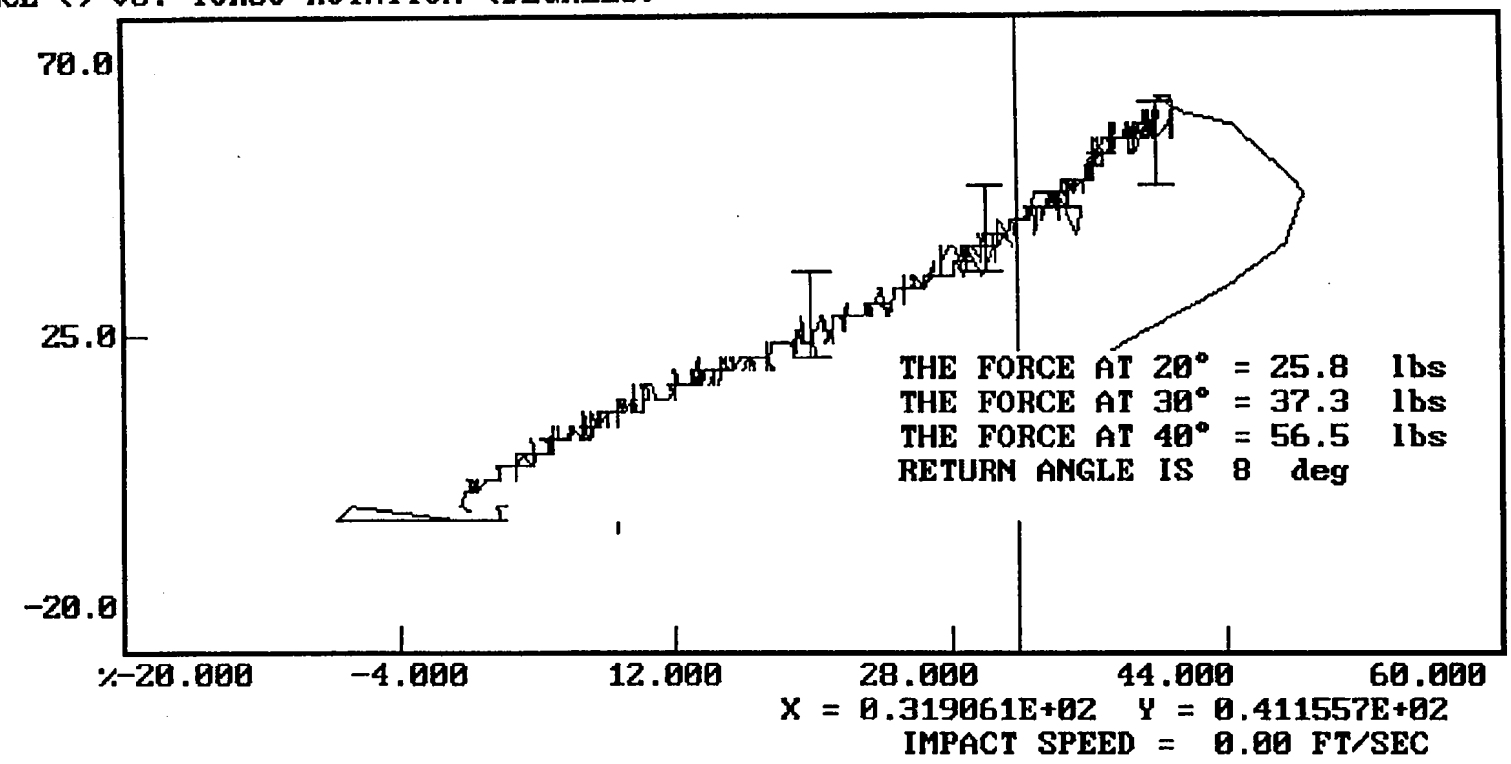
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	33%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	26
FORCE @ 30°	34 - 46 lbs	37
FORCE @ 40°	46 - 58 lbs	57
RETURN ANGLE	12° maximum	8°

TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

DUMMY CALIBRATION - LUMBAR FLEXION 12-04-1994 14:52
DUMMY # 270
FORCE () VS. TORSO ROTATION (DEGREES)



POST-TEST CERTIFICATION DATA

Passenger Dummy Serial Number: 272

Calibration Test Results Summary

Dummy Serial Number: 272

Post-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 272

DATE OF VERIFICATION: December 5, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.3
RH - Rib Height	19.75" - 20.50"	20.20
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.3
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.6
SW - Knee Pivot to Floor	19.3" - 19.9"	19.5
HW - Hip Width	14.0" - 15.4"	15.0

MEASUREMENTS BY: _____

APPROVED BY: _____

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 5, 1994

DUMMY NUMBER: 272

TEST NUMBER: D94332

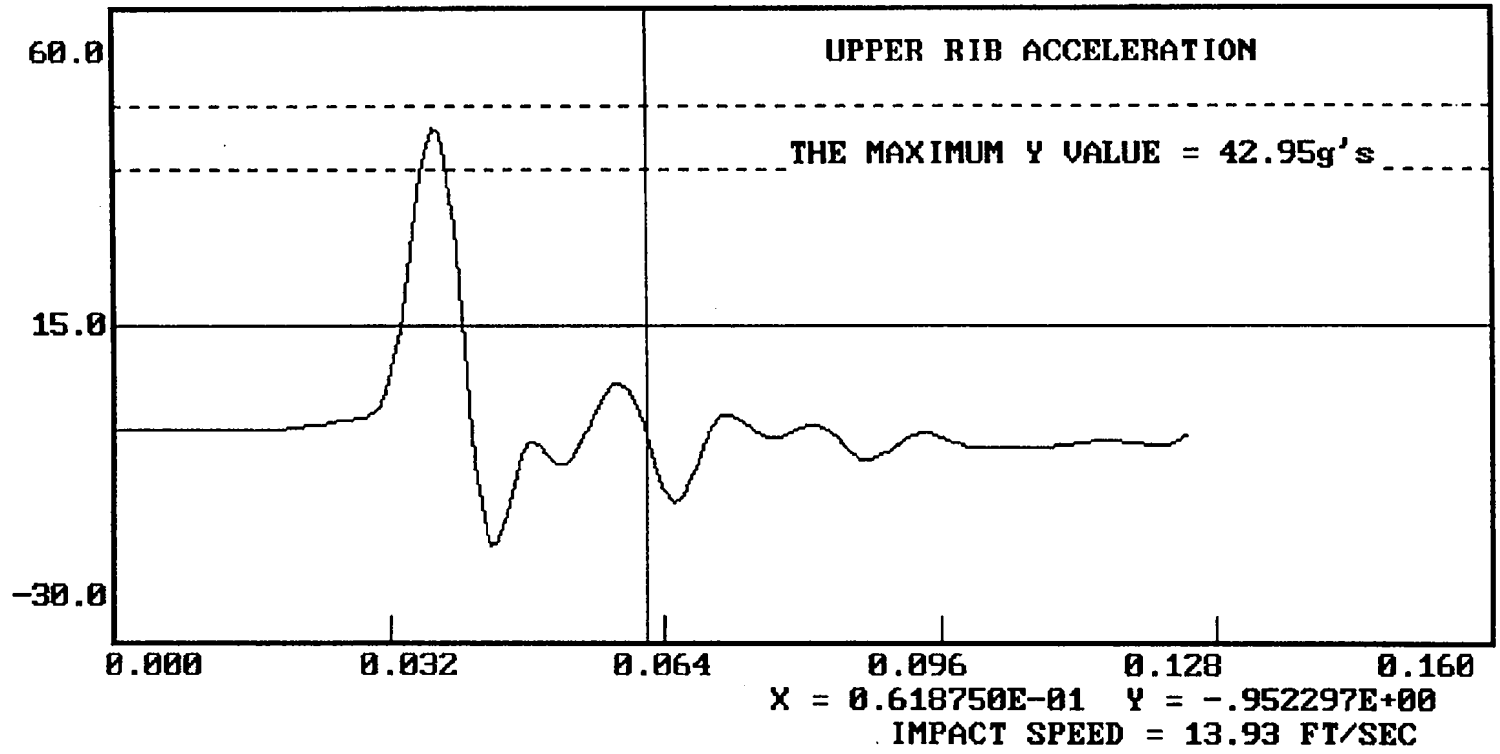
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	33%
PROBE SPEED	13.8 - 14.2 fps	13.9
UPPER RIB	37 - 46 g's	43
LOWER RIB	37 - 46 g's	41
LOWER SPINE	15 - 22 g's	21

TEST MEETS SPECIFICATIONS

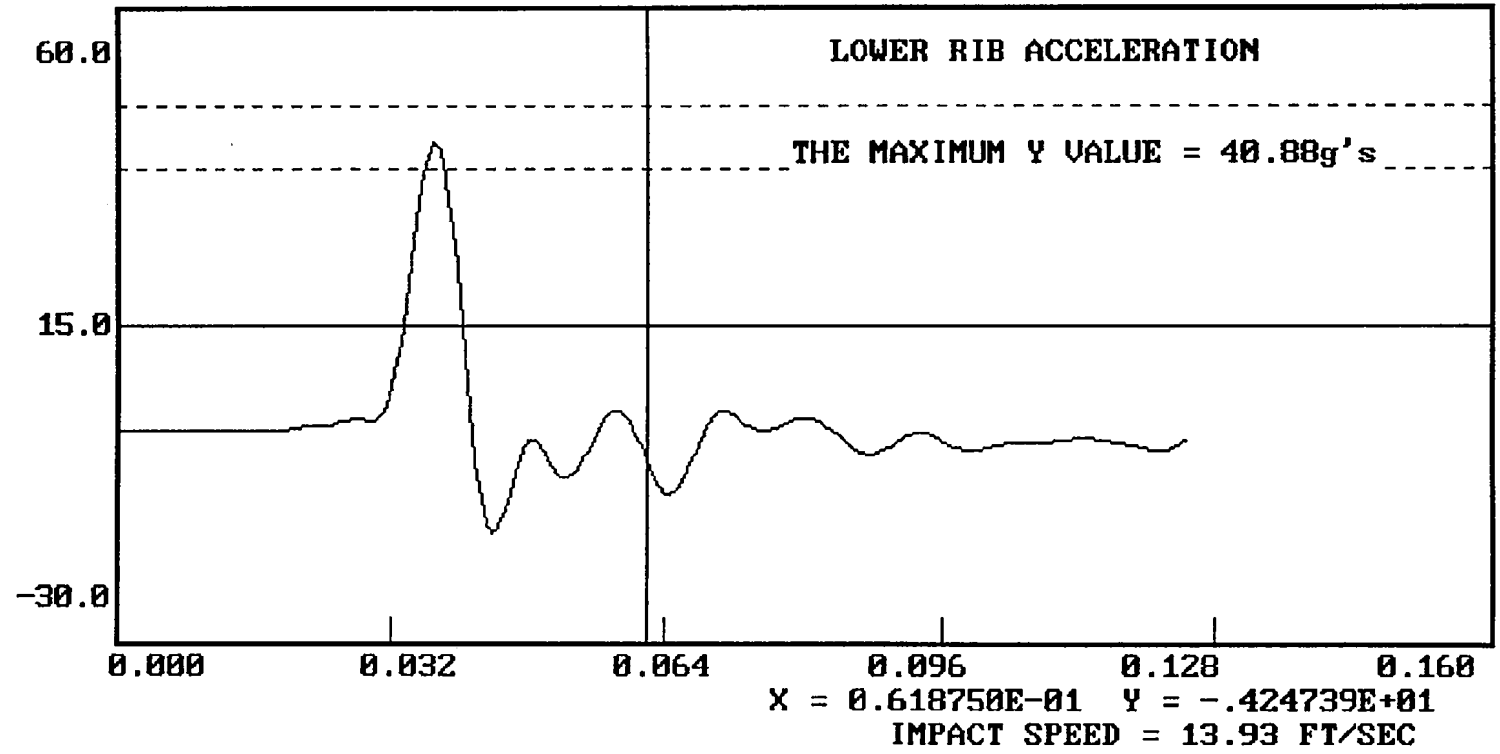
TECHNICIAN _____

APPROVED BY _____

DUMMY CALIBRATION - THORAX IMPACT 12-05-1994 12:13
DUMMY # 272
ACCELERATION (G'S) VS. TIME ((SECONDS))

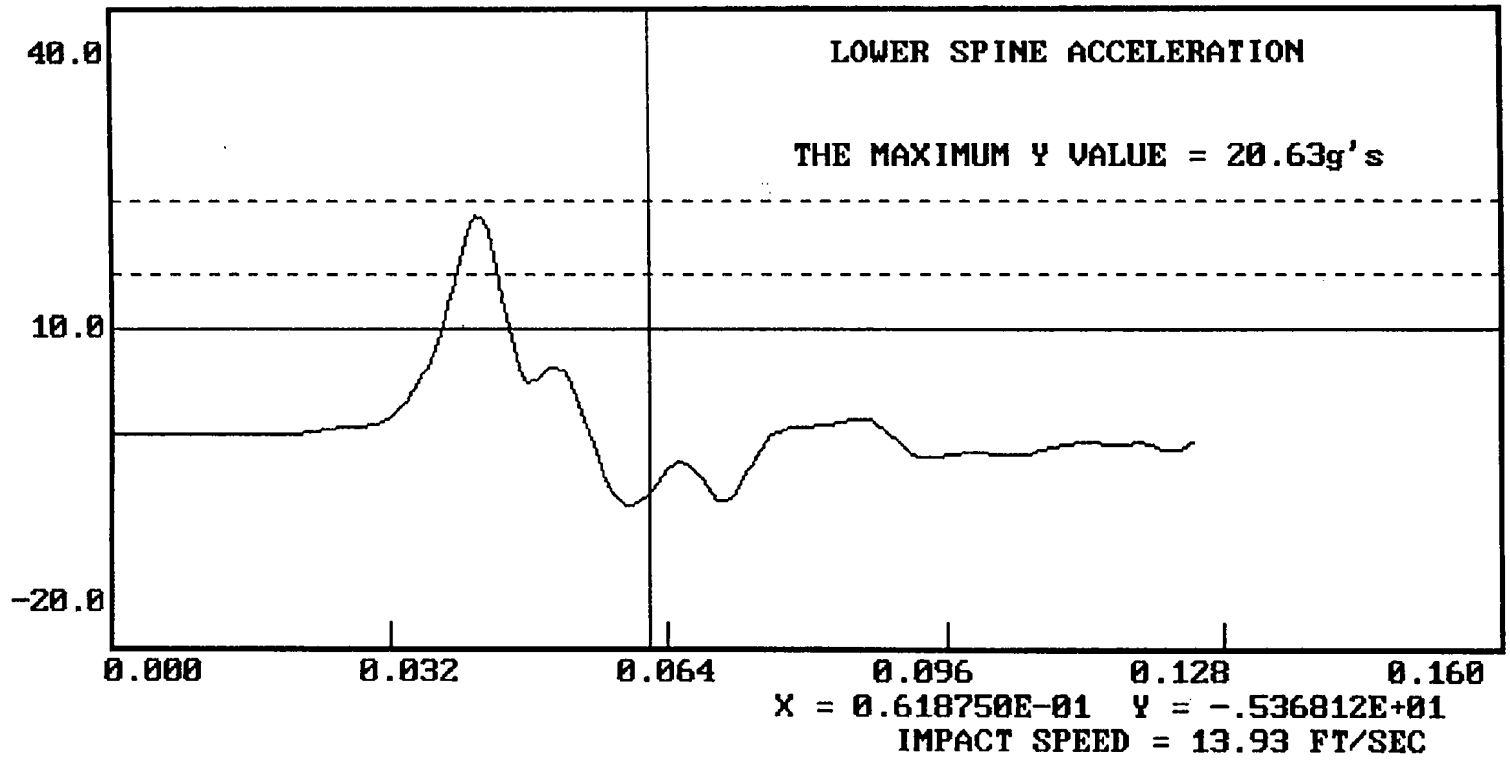


DUMMY CALIBRATION - THORAX IMPACT 12-05-1994 12:13
DUMMY # 272
ACCELERATION (G'S) VS. TIME ((SECONDS))



X = 0.618750E-01 Y = -.424739E+01
IMPACT SPEED = 13.93 FT/SEC

DUMMY CALIBRATION - THORAX IMPACT 12-05-1994 12:13
DUMMY # 272
ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

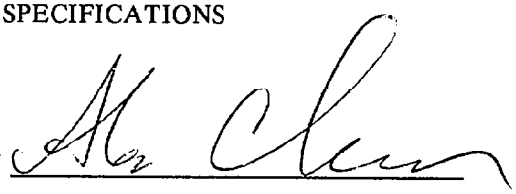
SIDE IMPACT DUMMY (SID)

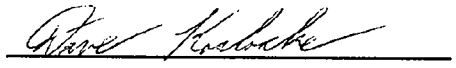
DATE: December 5, 1994

DUMMY NUMBER: 272 TEST NUMBER: D94333

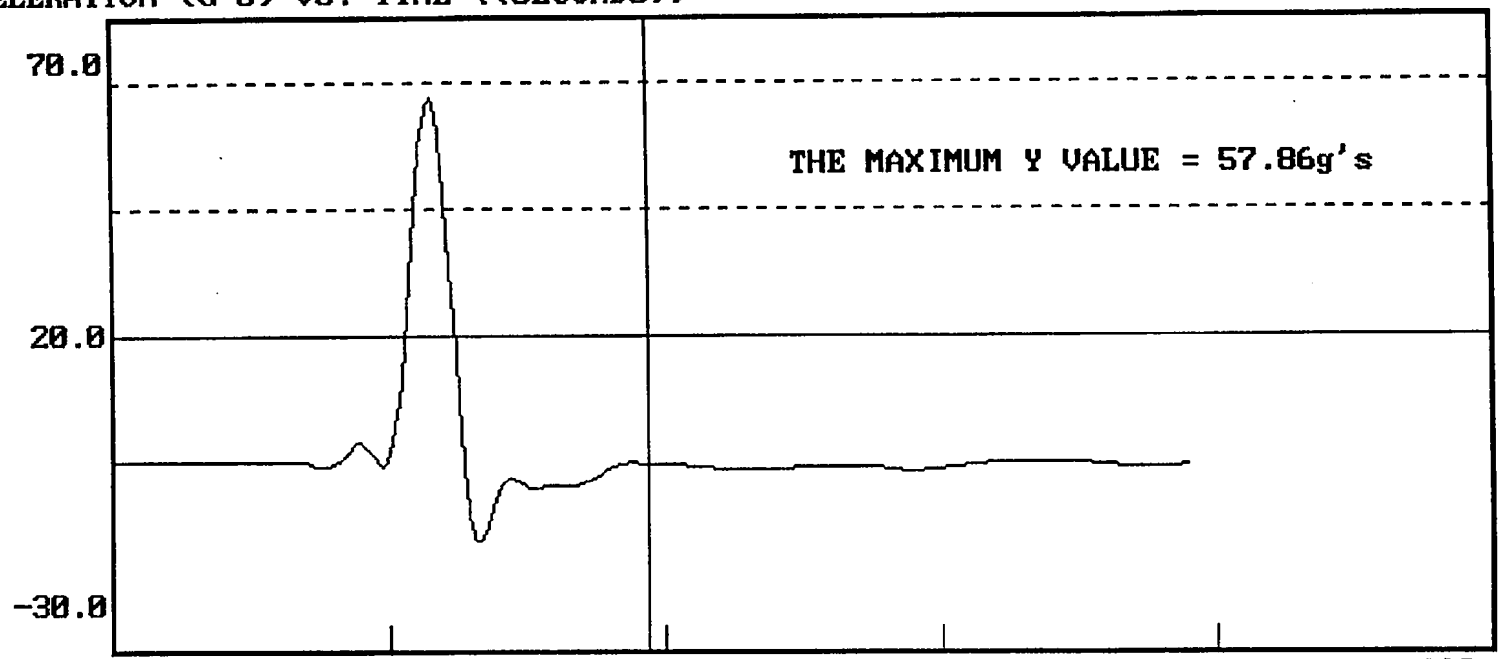
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	33%
PROBE SPEED	13.8 - 14.2 f/s	13.9
PELVIS ACCELERATION	40 - 60 g's	58

TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

DUMMY CALIBRATION - PELVIS IMPACT 12-05-1994 13:38
DUMMY # 272
ACCELERATION (G'S) VS. TIME ((SECONDS))



X = 0.618750E-01 Y = -.365334E+00
IMPACT SPEED = 13.89 FT/SEC

MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: December 4, 1994

DUMMY NUMBER: 272 TEST NUMBER: D94334

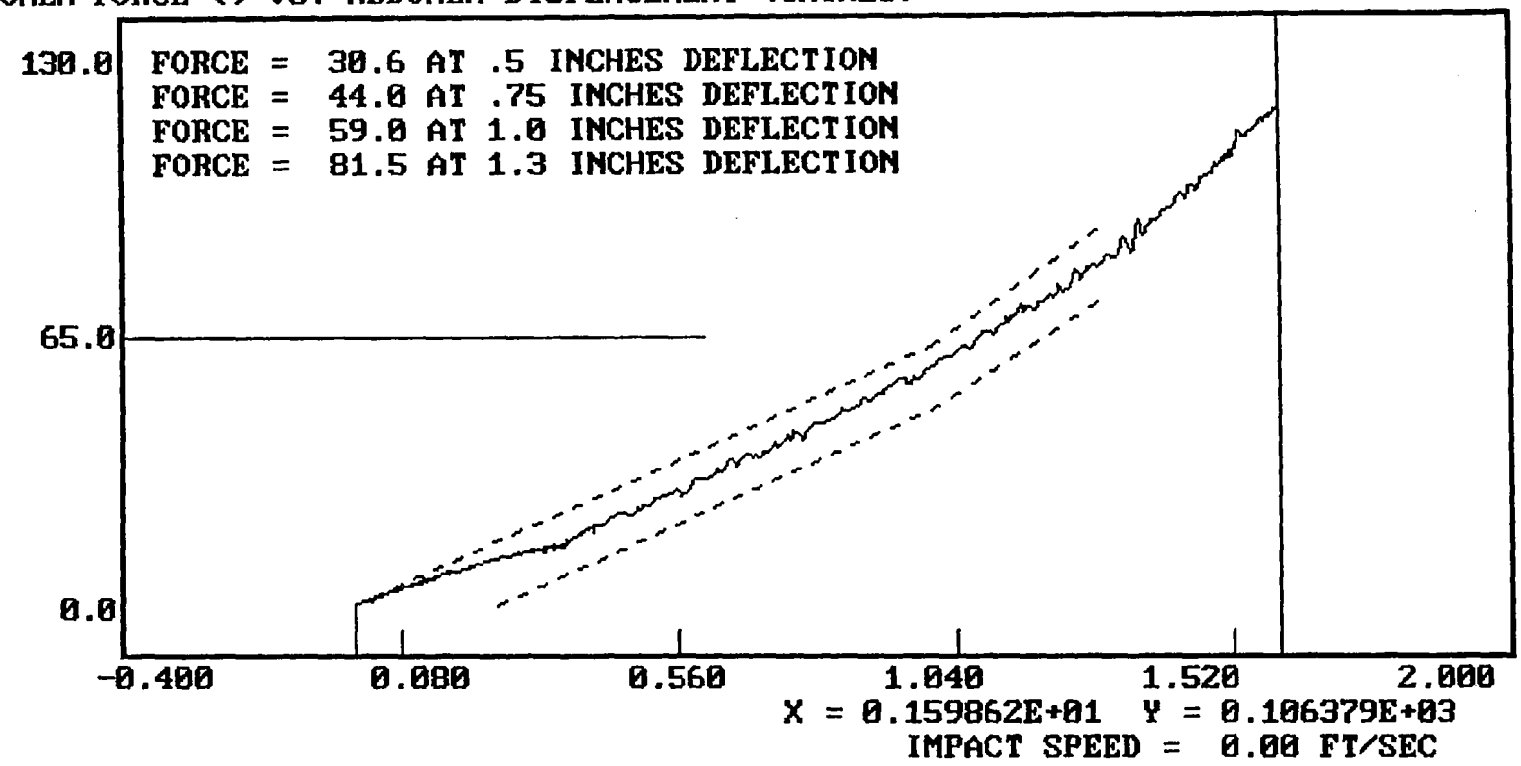
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	38%
FORCE @ 0.5 in	23.3 - 36.5 lbs	30.6
FORCE @ 0.75 in	36.7 - 49.8 lbs	44.0
FORCE @ 1.0 in	50 - 63 lbs	59
FORCE @ 1.3 in	73 - 88 lbs	82

TEST MEETS SPECIFICATIONS

TECHNICIAN _____

APPROVED BY _____

DUMMY CALIBRATION - ABDOMEN COMPRESSION 12-04-1994 15:27
DUMMY # 272
ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



X = 0.159862E+01 Y = 0.106379E+03
IMPACT SPEED = 0.00 FT/SEC

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: December 4, 1994

DUMMY NUMBER: 272 TEST NUMBER: D94335

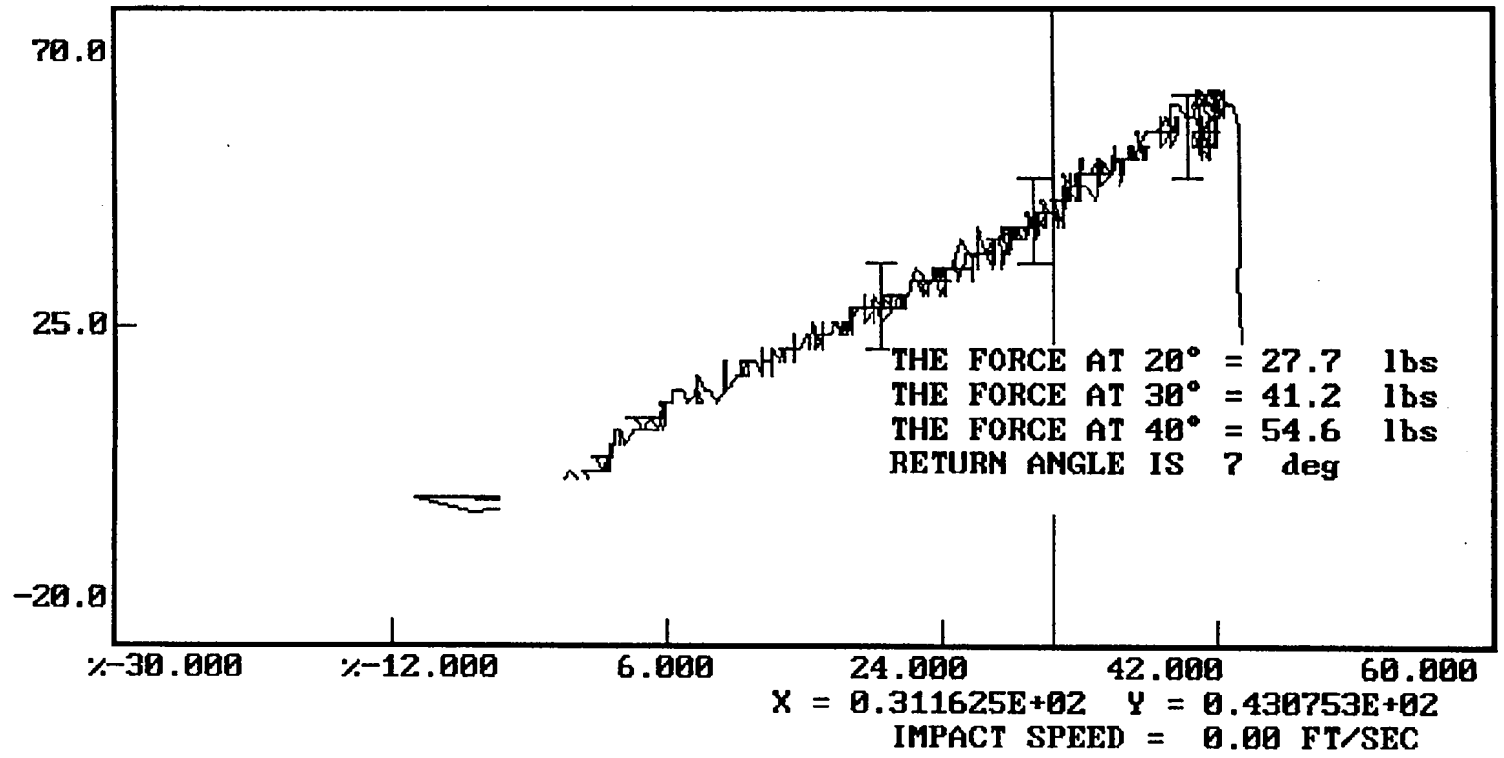
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	38%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	28
FORCE @ 30°	34 - 46 lbs	41
FORCE @ 40°	46 - 58 lbs	55
RETURN ANGLE	12° maximum	7°

TEST MEETS SPECIFICATIONS

TECHNICIAN

APPROVED BY

DUMMY CALIBRATION - LUMBAR FLEXION 12-04-1994 15:04
DUMMY # 272
FORCE () VS. TORSO ROTATION (DEGREES)



POST-TEST DRIVER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 270

Inspected By: Al Chalmers

Date: December 5, 1994

Part	Items Checked	Comments
Skin	visual inspection	OK
Head	visual, ballast, accelerometer mount	OK
Neck	visual, cable torque	OK
Spine box	visual, ballast, weldment, accelerometer mount	OK
Rib cage	visual, measure, stiffeners	OK
Sternum	visual	OK
Lumbar spine	visual	OK
Abdomen	visual	OK
Pelvis	visual, palpate, accelerometer mount	OK
Upper legs	visual	OK
Knees	visual, stops, inserts	OK
Lower legs	visual, range of motion	OK
Ankles	visual, range of motion	OK
Feet	visual, range of motion	OK
Joints	1 to 2 g range	OK
Other		

NOTES: (include component/problem/action/reason):

POST-TEST PASSENGER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 272

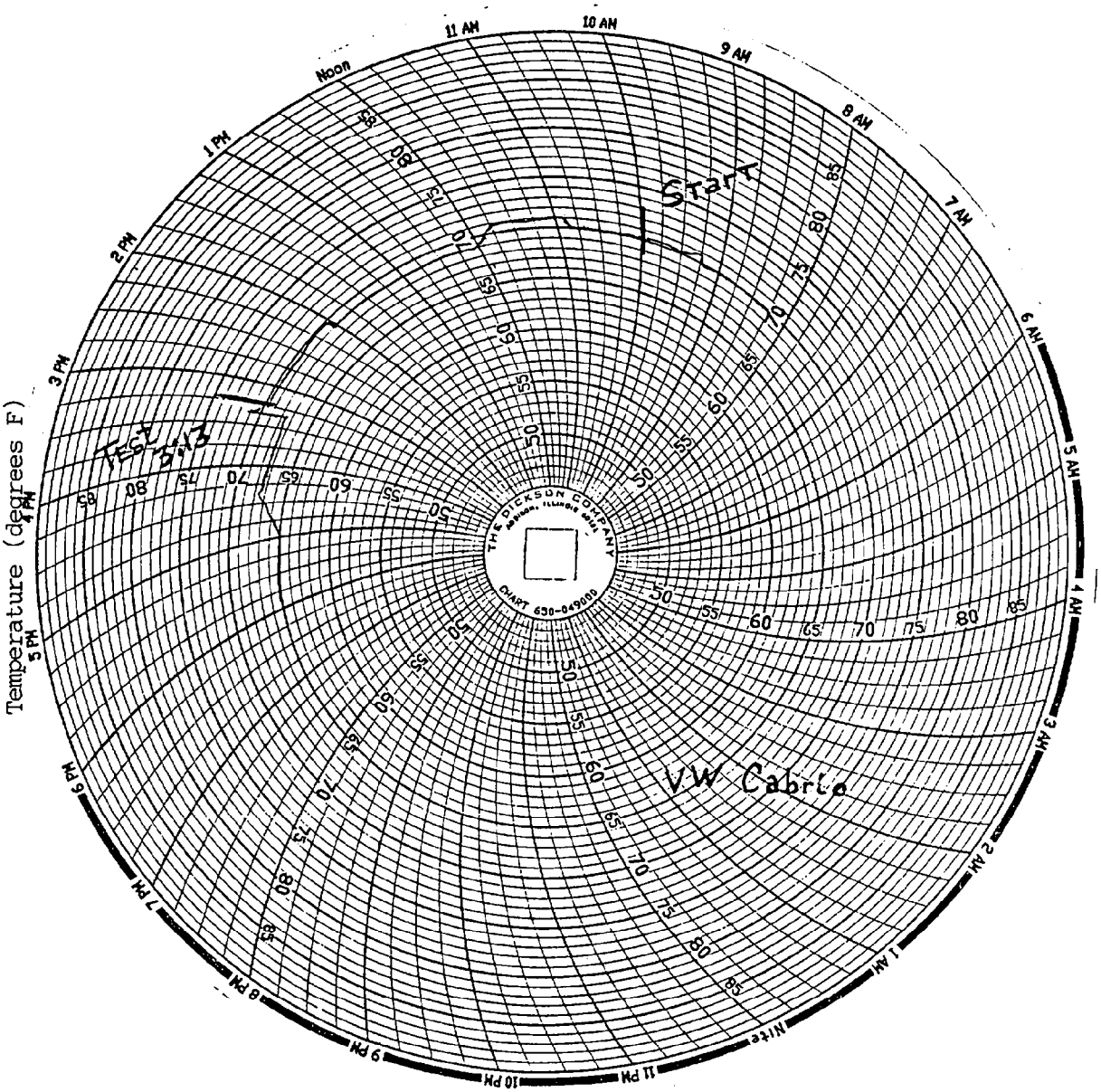
Inspected By: Tim Michnay

Date: December 5, 1994

Part	Items Checked	Comments
Skin	visual inspection	OK
Head	visual, ballast, accelerometer mount	OK
Neck	visual, cable torque	OK
Spine box	visual, ballast, weldment, accelerometer mount	OK
Rib cage	visual, measure, stiffeners	OK
Sternum	visual	OK
Lumbar spine	visual	OK
Abdomen	visual	OK
Pelvis	visual, palpate, accelerometer mount	OK
Upper legs	visual	OK
Knees	visual, stops, inserts	OK
Lower legs	visual, range of motion	OK
Ankles	visual, range of motion	OK
Feet	visual, range of motion	OK
Joints	1 to 2 g range	OK
Other		

NOTES: (include component/problem/action/reason):

VEHICLE AND DUMMY TEMPERATURE



APPENDIX D

DUMMY AND VEHICLE CALIBRATION DATA

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DRIVER DUMMY NO. 270

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib	AHTF1	Endevco	September 01, 1994
Lower Rib	AGTP7	Endevco	June 10, 1994
Lower Spine	AATE9	Endevco	June 27, 1994
Pelvis	AJ808	Endevco	October 12, 1994
Upper Rib Redundant	AGTB5	Endevco	September 16, 1994
Lower Rib Redundant	AJ7E9	Endevco	August 26, 1994
Lower Spine Redundant	AC9B7	Endevco	August 1, 1994
Pelvis Redundant	AJ9N4	Endevco	October 12, 1994

INSTRUMENTS FOR PASSENGER DUMMY NO. 272

	LEFT REAR PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib	AHW95	Endevco	July 07, 1994
Lower Rib	AHY99	Endevco	September 02, 1994
Lower Spine	AJ7C2	Endevco	September 02, 1994
Pelvis	AGP07	Endevco	September 16, 1994
Upper Rib Redundant	AHR15	Endevco	September 02, 1994
Lower Rib Redundant	AT614	Endevco	November 07, 1994
Lower Spine Redundant	AJ420	Endevco	September 02, 1994
Pelvis Redundant	AHWN3	Endevco	September 02, 1994

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
MDB CG X	AHTA5	Endevco	July 12, 1994
MDB CG Y	AKAE8	Endevco	October 14, 1994
MDB CG Z	AJ9D5	Endevco	October 17, 1994
MDB Rear Axle X	MGA119	Entran	November Ø4, 1994
MDB Rear Axle Y	MGAØ14	Entran	June Ø2, 1994
Lower Left A-Post Y	MGAØ35	Entran	November 1Ø, 1994
Mid Left A-Post Y	MGAØ76	Entran	November 18, 1994
Lower Left B-Post Y	MGA157	Entran	May 16, 1994
Mid Left B-Post Y	MGA1Ø9	Entran	November 18, 1994
Trunk Centerline X	AJ638	Endevco	October 14, 1994
Trunk Centerline Y	AHT35	Endevco	July 12, 1994
Trunk Centerline Z	AJ468	Endevco	October 14, 1994
Right Front Sill X	AØ6	Endevco	November Ø7, 1994
Right Front Sill Y	AJ9E8	Endevco	October 14, 1994
Right Front Sill Z	MGAØ73	Entran	May 24, 1994
Right Rear Sill X	X14	Endevco	October 3Ø, 1994
Right Rear Sill Y	AHYR7	Endevco	July 12, 1994
Right Rear Sill Z	AHØP9	Endevco	October 12, 1994
Left Front Sill Y	MGAØ27	Entran	November 18, 1994
Left Rear Sill Y	BC49	Endevco	June 23, 1994
Right Rear Seat Occupant Compartment Y	AØ3	Endevco	November Ø7, 1994

Note: All Endevco accelerometers are Model No. 7264-2ØØØ
All Entran accelerometers are Model No. AGM-72E