V2365

REPORT NO.: 214-MGA-96-007
SAFETY COMPLIANCE TESTING FOR
FMVSS 214 "SIDE IMPACT PROTECTION -
PASSENGER CARS"

NISSAN MOTOR CORPORATION
1996 NISSAN SENTRA 4 DOOR
NHTSA NO: CT5201

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105

Test Date: December 11, 1995

Report Date: December 15, 1995

FINAL REPORT

Prepared For:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
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Approval Date: 12-20-95

FINAL REPORT ACCEPTED BY (OVSC):

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16. Abstract

A 48/24 kph 90° Impact (Moving Deformable Barrier) Compliance Test was conducted on the subject 1996 Nissan Sentra 4 Door in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-214D-04 for the determination of FMVSS No. 214 Side Impact Protection compliance. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on December 11, 1995.

The impact velocity of the Moving Deformable Barrier (MDB) was 53.6 kph, and the ambient temperature at the struck side (driver's) of the target vehicle at the time of impact was 20°C. The target vehicle post test maximum crush was 310 mm at level 2. The test vehicle's performance follows:

| | DRIVER | PASS. |
|---|---|---|
| Left Upper Rib (LUR) Accel., g | 67 | 42 |
| Left Lower Rib (LLR) Accel., g | 67 | 51 |
| Lower Spine ($T_{12}$) Accel., g | 66 | 51 |
| Thoracic Trauma Index (TTI) | 67 | 51 |
| Pelvis (PEV) Accel., g | 94 | 74 |

The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.

| 17. Key Words | 18. Distribution Statement |
|---|---|
| Compliance Testing<br>Side Impact Protection<br>FMVSS 214<br>Side Impact Dummy (SID) | Copies of this report are available from:<br>National Highway Traffic Safety Adm.<br>Technical Ref. Division,<br>Room 5108 (NAD-52)<br>400 Seventh Street, S.W.<br>Washington, D.C. 20590<br>Telephone No. 202-366-4946<br>Attn: Robert Hornickle |

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TABLE OF CONTENTS

## SECTION 1

## PURPOSE AND TEST PROCEDURE

This side impact test is part of the FY 96 FMVSS 214 Side Impact Protection 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 1996 Nissan Sentra 4 Door.

This side impact test was conducted in accordance with the Vehicle Safety Compliance's FMVSS 214 test procedure (TP-214D-04, dated September 1, 1995).

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 1996 Nissan Sentra 4 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 tow road guidance system at a velocity of 33.3 mph (53.6 kph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by MGA Research Corporation in Burlington, Wisconsin, on December 11, 1995. Pre- and post-test photographs of the test vehicle, the MDB and the side impact dummies (SIDs) are included in Appendix A.

Two Side Impact Dummies (SIDs) were placed in the driver and left rear designated seating positions according to instructions specified in the OVSC Side Impact Laboratory Test Procedure which is dated September 1, 1995. The side impact event was documented by nine high speed cameras. Camera locations and other pertinent camera information can be found in this report.

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)

Appendix B contains the vehicle and dummy response data traces. A summary of the side impact dummy (SID) configuration and performance verification test data is shown in Appendix C. Dummy and vehicle calibration data can be found in Appendix D of this report.

The following table summarizes the results of the test:

| Injury Criteria | Front SID | Rear SID |
|---|---|---|
| TTI (g) | 67 | 51 |
| Pelvis (g) | 94 | 74 |

## TEST NOTES

The following accelerometers were not used for this test:

Left Front Door on Centerline

Midrear of Left Front Door

Left Front Door Upper Centerline

Midrear of Left Rear Door

Left Rear Door Upper Centerline

Rear Seat Track

Due to a malfunction in the camera shutter, many of the still photographs are not available.

# SECTION 3
# SIDE IMPACT DUMMY (SID) AND VEHICLE TEST DATA

DATA SHEET NO. 1

GENERAL VEHICLE TEST PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

Vehicle NHTSA No.: CT5201 VIN: 1N4AB41D3TC714706

Vehicle Body Color: light blue Build Date: 9/95

Engine Data: 4 Cylinders; __ CID; 1.6 Liter; ___cc

Placement __ Longitudinal; X Lateral

Transmission: 5 speed; X Manual; __ Automatic; __ Overdrive

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

Odometer Reading 119 miles

Options: __A/C; __ Pwr. Steering.; X Pwr. Brakes; __ Pwr. Windows;

__Cruise Control; X Tilt Wheel; __Power Door Locks;

DATA FROM TIRE PLACARD:

Tire Pressure (at capacity): 35 Psi FRONT

32 Psi REAR

Recommended Tire Size: P155/80R13

Tires on Test Vehicle: P155/80R13 Manufacturer: General

Vehicle Capacity Data:

Number of Occupants: 2 Front; 3 Rear; __ 3rd Seat 5 Total

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

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

Vehicle Maximum Capacity Loading = 369 kg (A)

No. of Occupants x 68.04 kg. = 340 kg (B)

Cargo Capacity (A-B) = 29 kg

## GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

WEIGHT OF TEST VEHICLE WITH MAXIMUM FLUIDS:

Right Front = 318.4 kg Right Rear = 202.3 kg

Left Front = 323.9 kg Left Rear = 197.8 kg

TOTAL FRONT = 642.3 kg TOTAL REAR = 400.1 kg

% of Total Vehicle Weight = 61.6 %; % of Total Weight = 38. 4 %

TOTAL WEIGHT = 1042.4 kg

## GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

Vehicle NHTSA No.: CT5201 Test Date: December 11, 1995

### CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

| | |
|---|---|
| Total Test Vehicle Delivered Weight with Maximum Fluids | = 1042.4 kg |
| Cargo Carrying Capacity of Test Vehicle | = 29.0 kg |
| Weight of 2 Side Impact Dummies (2 x 80.7 kg.) | = 161.4 kg |
| TEST VEHICLE TARGET WEIGHT | = 1232.8 kg |

### ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

| | | | |
|---|---|---|---|
| Right Front | = 339.7 kg | Right Rear | = 246.3 kg |
| Left Front | = 368.3 kg | Left Rear | = 274.0 kg |
| TOTAL FRONT | = 708.0 kg | TOTAL REAR | = 520.3 kg |
| % of Total Weight | = 57.6 % | % of Total Weight | = 42.4 % |
| TOTAL TEST WEIGHT | = 1228.3 kg | | |

### TEST VEHICLE ATTITUDE:

CURB WEIGHT ATTITUDE:

Right Front 659 mm Left Front 660 mm Right Rear 650 mm Left Rear 651 mm

FULLY LOADED WEIGHT ATTITUDE:

Right Front 658 mm Left Front 634 mm Right Rear 615 mm Left Rear 594 mm

TEST ATTITUDE:

Right Front 649 mm Left Front 639 mm Right Rear 615 mm Left Rear 596 mm

## GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Test Vehicle Wheelbase: 2536 mm

C.G. = 1074 mm rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 4110 mm

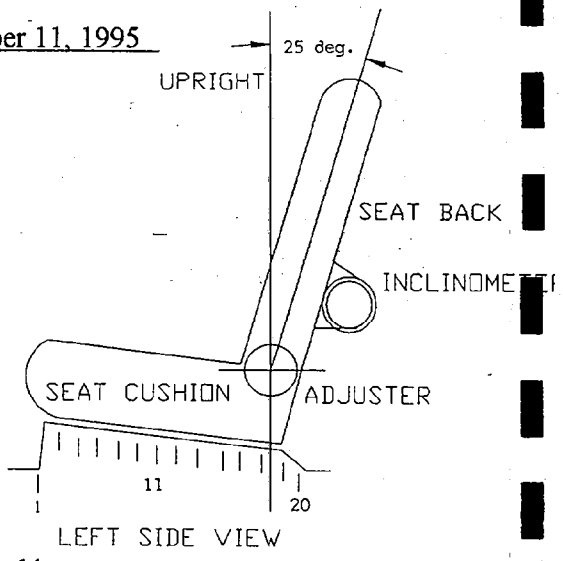
Centerline = 4296 mm

Left Side = 4110 mm

## GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

Vehicle NHTSA No.: CT5201 . Test Date: December 11, 1995




FRONT SEAT CUSHION PLACEMENT:

Total Length of Adjustment Travel: 225 mm

Test Position: 11th detent rearward out of 20 total

FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Angle = 25° degrees

SECOND POSITION SEAT:

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

Seat Back Adjustment Position: Non-Adjustable

ADJUSTABLE STEERING COLUMN POSITION: Non-Adjustable

WINDOW POSITIONS: Left Front Closed Left Rear Closed

Right Front Open Right Rear Open

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

Fuel system usable capacity = 50 liters

Test Volume: 46.6 liters 93 % of capacity

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

Wheelbase: = 2536 mm

Impact Point is 328 mm rearward of front axle centerline

DATA SHEET NO. 2

TEST VEHICLE SUMMARY OF RESULTS

Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

Vehicle NHTSA No.: CT5201 Test Date: December 11, 1995

Overall Length = 4296 mm; Overall Width = 1690 mm

TEST WEIGHT:

Right Front = 339.7 kg Right Rear = 246.3 kg

Left Front = 368.3 kg Left Rear = 274.0 kg

TOTAL FRONT = 708.0 kg TOTAL REAR = 520.3 kg

% of Total Weight = 57.6 % % of Total Weight = 42.4 %

TOTAL VEHICLE WEIGHT = 1228.3 kg

Wheelbase = 2536 mm

Longitudinal C.G. from Center of Front Axle = 1074 mm

Impact Angle with Respect to Impactor = 90° degrees

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 ( 275 mm above ground) = 166 mm
2. LEVEL 2 ( 460 mm above ground) = 310 mm
3. LEVEL 3 ( 578 mm above ground) = 280 mm
4. LEVEL 4 ( 825 mm above ground) = 225 mm
5. LEVEL 5 ( 1280 mm above ground) = 36 mm

Maximum Post-Test Intrusion = 310 mm

| OCCUPANTS: | Left Front Passenger | Left Rear Passenger |
|---|---|---|
| Type of Dummy | SID | SID |
| Restraints Used | type II belt system | type II belt system |

## TEST VEHICLE SUMMARY OF RESULTS (Cont'd)

INSTRUMENTATION:

| | | |
|---|---|---|
| Number of Vehicle Data Channels: | | = 19 |
| Number of Cameras: | Onboard Vehicle | = 3 |
| | Offboard Vehicle | = 4 |
| | Deformable Barrier | = 2 |
| | TOTAL | = 9 |

DATA SHEET NO. 3

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

Vehicle NHTSA No.: CT5201 Test Date: December 11, 1995

POSITION OF IMPACT (MDB) ON MONORAIL:

Crabbed 27° to left

MDB DETAILS:

| | |
|---|---|
| Overall Width of Framework Carriage | = 1252 mm |
| Overall Length of MDB (incl. honeycomb impact face) | = 4115 mm |
| Wheelbase of Framework Carriage | = 2591 mm |
| Tread of Framework Carriage (Front & Rear) | = 1880 mm |
| C.G. Location Rearward of Front Axle | = 1102 mm |
| C.G. Location From Center Line | = -8 mm |
| C.G. Location Above Ground Level | = 488 mm |

MDB WEIGHT:

| | | | |
|---|---|---|---|
| Left Front | = 496.7 kg | Left Rear | = 187.3 kg |
| Right Front | = 283.0 kg | Right Rear | = 389.2 kg |
| TOTAL FRONT = 779.7 kg | | TOTAL REAR = 576.5 kg | |

TOTAL MDB WEIGHT = 1356.2 kg

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

Impact Speed = Primary: 33.3 mph (53.6 kph) Secondary: 33.3 mph (53.6 kph)

## CRASH TEST SUMMARY FOR SIDE IMPACTOR (Cont'd)

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

1. Row A Top of Stack (813 mm) = 135 mm
2. Row B Mid Stack (686 mm) = 109 mm
3. Row C Top of Bumper (533 mm) = 63 mm
4. Row D Center of Bumper (432 mm) = 104 mm

INSTRUMENTATION:

Number of MDB Data Channels = 7

DATA SHEET NO. 4

POST-TEST OBSERVATIONS

Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

Vehicle NHTSA No.: CT5201 Test Date: December 11, 1995

VISIBLE DUMMY CONTACT POINTS:

| | LEFT FRONT SID | LEFT REAR SID |
|---|---|---|
| Head | to headrest | to C Post, rear window |
| Arm | to door | to door |
| Pelvis | to door | to door |
| Left Knee | to door | to door |
| Right Knee | to left knee | to left knee |

DOOR OPENING:

| | LEFT SIDE | RIGHT SIDE |
|---|---|---|
| Front | remained closed | remained closed |
| Rear | remained closed | remained closed |

MDB DISTANCE FROM TARGET IMPACT POINT:

Horizontal: 7 mm forward Vertical: 7 mm high

ARM REST LOCATIONS:

Front: 215 mm Below window opening

Rear: 210 mm Below window opening

## POST-TEST OBSERVATIONS (Cont'd)

SEAT CRUSH:

Front Seat Back: 50 mm Front Seat Cushion: 43 mm

Left Rear Seat Back: 70 mm Rear Seat Cushion: 170 mm

GLAZING DAMAGE:

Both left side windows broke, windshield cracked

PILLAR PERFORMANCE:

No failure noted

SILL SEPARATION:

No failure noted

OTHER NOTABLE IMPACT EFFECTS:

None

# SECTION 4
# OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 5

SIDE IMPACT DUMMY (SID) INSTRUMENTATION DATA

Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

Vehicle NHTSA No.: CT5201 Test Date: December 11, 1995

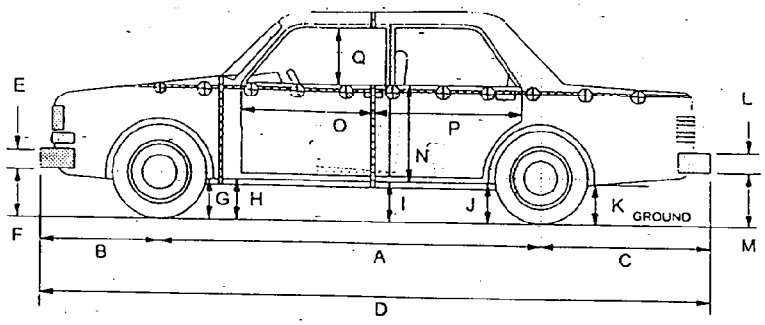
| | Front Dummy ID #271 | | | | Rear Dummy ID #270 | | | |
|---|---|---|---|---|---|---|---|---|
| | Pos. Direct. | | Neg. Direct | | Pos. Direct. | | Neg. Direct | |
| | Max (g) | Time (msec) | Max (g) | Time (msec) | Max (g) | Time (msec) | Max (g) | Time (msec) |
| **RIB ACCELERATIONS** | | | | | | | | |
| Left Upper Rib (LUR) Y | 66.9 | 40 | 20.0 | 74 | 42.0 | 51 | 6.9 | 166 |
| Left Lower Rib (LLR) Y | 67.4 | 39 | 19.9 | 73 | 51.5 | 45 | 13.6 | 69 |
| **SPINE ACCELERATIONS** | | | | | | | | |
| Lower Lateral Y | 65.7 | 34 | 14.2 | 77 | 51.2 | 40 | 9.7 | 62 |
| **PELVIS ACCELERATIONS** | | | | | | | | |
| Lateral Y | 94.0 | 30 | 12.9 | 59 | 74.0 | 35 | 10.0 | 60 |

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

Negative Direction - Longitudinal (X) = rearward
Lateral (Y) = to left
Vertical (Z) = up

DATA SHEET NO. 6

VEHICLE 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

ALL MEASUREMENTS IN (mm)

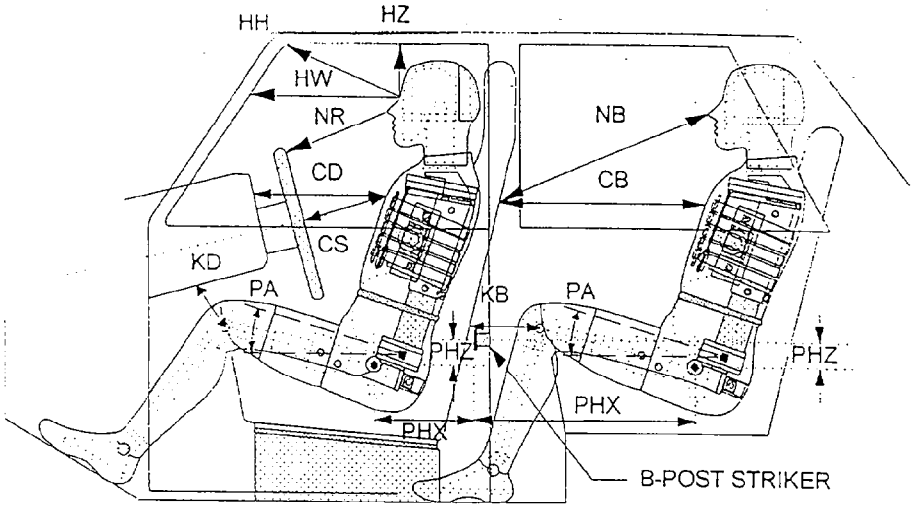
| | PRE-TEST | POST-TEST | Δ CHANGE |
|---|---|---|---|
| A | 2536 | 2511 | 25 |
| B | 860 | 836 | 24 |
| C | 900 | 919 | 19 |
| D | 4296 | 4266 | 30 |
| E | 136 | 136 | 0 |
| F | 383 | 403 | 20 |
| G | 208 | 217 | 9 |
| H | 181 | 205 | 24 |
| I | 174 | 186 | 12 |
| J1/J2 | 175/173 | 175/180 | 0/7 |
| K | 208 | 213 | 5 |
| L | 270 | 270 | 0 |
| M | 264 | 275 | 11 |
| N | 595 | 556 | 39 |
| O | 758 | 738 | 20 |
| P | 1355 | 1264 | 91 |
| Q | 410 | 388 | 22 |
| R | 4110 | 4082 | 28 |
| S | 4110 | 4076 | 34 |
| T | 1690 | 1379 | 311 |

DATA SHEET NO. 7

SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONS

Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

NHTSA NO.: CT5201 Test Date: December 11, 1995




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

| | FRONT SID ID #271 |
|---|---|
| HH | 384 |
| HW | 591 |
| HZ | 172 |
| NR | 468 |
| CD | 542 |
| CS | 350 |
| KDL(KDA°) | 184 (10.0) |
| KDR(KDA°) | 188 (24.0) |
| PA° | 24.4 |
| PHX | 197 |
| PHZ | 122 |

| | REAR PASSENGER SID ID #270 |
|---|---|
| HZ | 126 |
| NB | 658 |
| CB | 509 |
| KBL (KBA) | 195 (6.1) |
| KBR (KBA) | 198 (1.4) |
| PA° | 25.0 |
| PHX* | 653 |
| PHZ | 75 |

* From B Post Striker

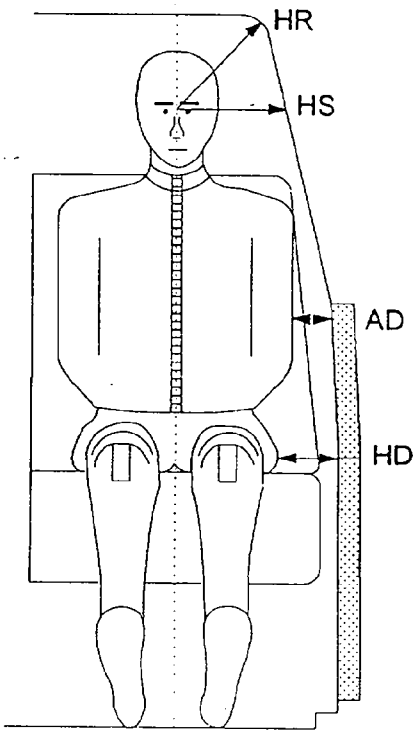
NOTE: 2-door vehicle shown. Rear dummy PHX & PHZ measurements for 4-door vehicle would use the C-post striker as reference point.

DATA SHEET NO. 8

SIDE IMPACT DUMMY (SID) LATERAL CLEARANCE DIMENSIONS

Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

NHTSA NO.: CT5201 Test Date: December 11, 1995



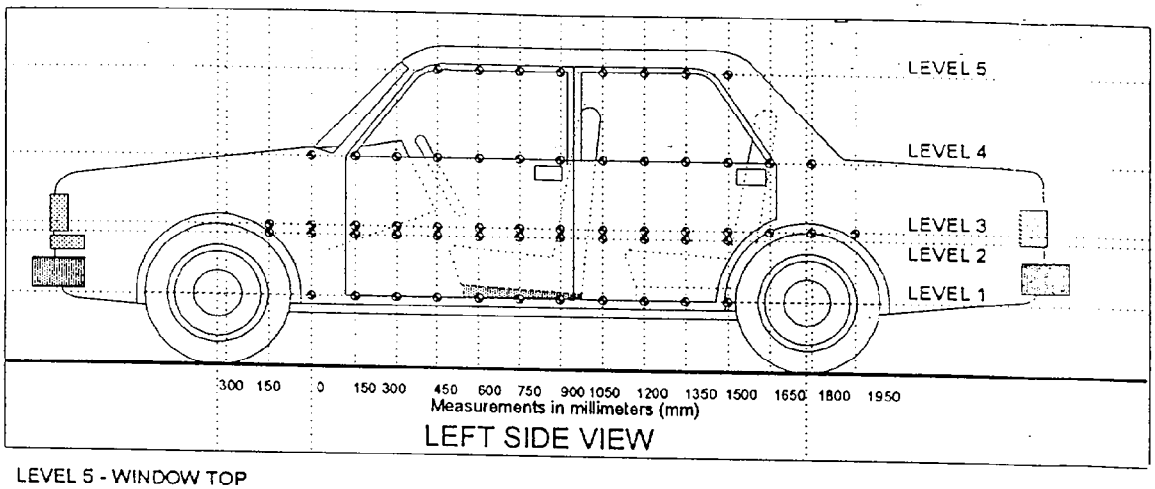

NOTE: All dimensions are in mm

| | DRIVER ID #271 | LEFT REAR PASSENGER ID #270 |
|---|---|---|
| HR | 218 | 213 |
| HS | 340 | 236 |
| AD | 40 | 103 |
| HD | 128 | 145 |

DATA SHEET NO. 9
VEHICLE SIDE MEASUREMENTS

Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

NHTSA NO.: CT5201 Test Date: December 11, 1995




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

MEASUREMENTS ARE TAKEN WHEN THE VEHICLE IS IN THE "AS TESTED" CONFIGURATION

MEASUREMENTS ALONG THE VERTICAL 750 mm. LINE SHOWN ABOVE

| | |
|---|---|
| Level 5 @ Window Top | = 1280 mm |
| Level 4 @ Window Sill | = 825 mm |
| Level 3 @ Mid Door | = 578 mm |
| Level 2 @ Occupant H-Point | = 460 mm |
| Level 1 @ Axle Centerline Height (or Sill Top Height) | = 275 mm |

## VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS

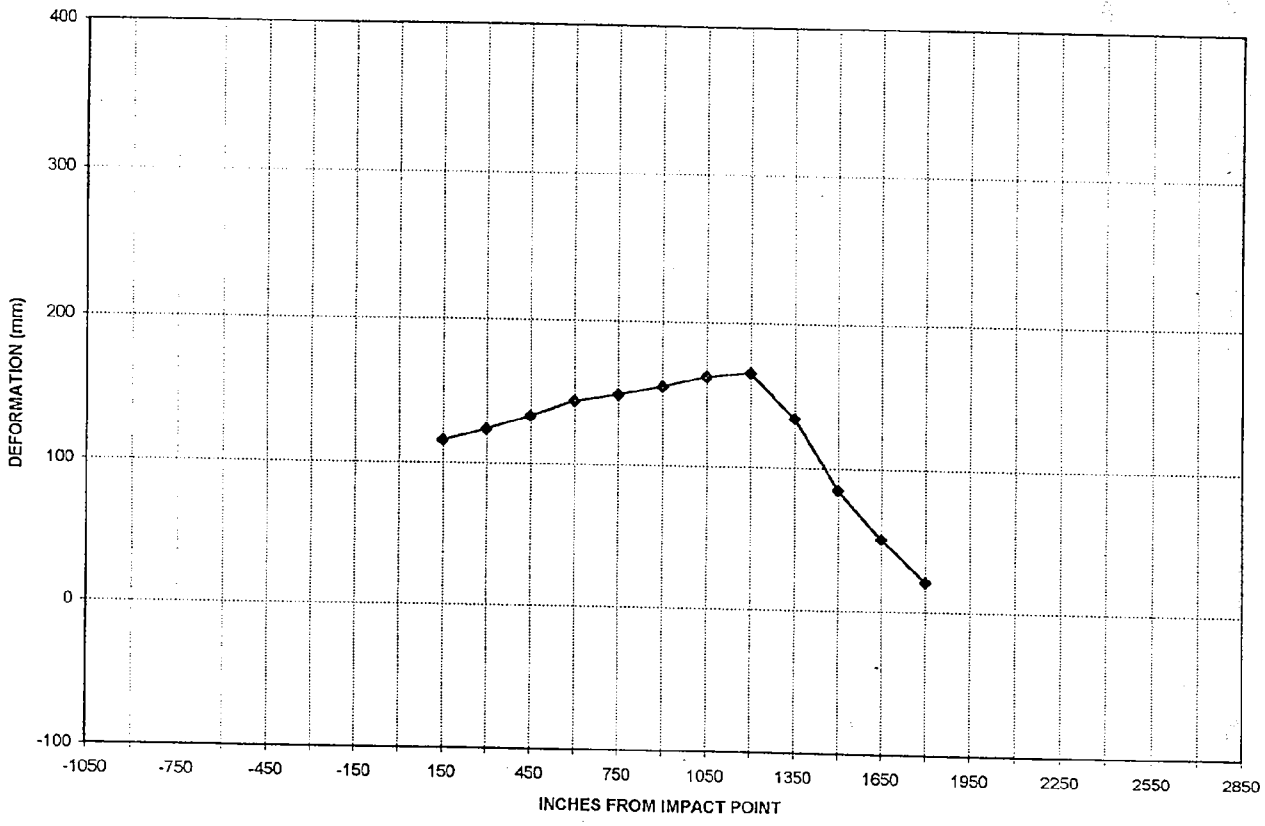
Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

NHTSA NO.: CT5201 Test Date: December 11, 1995

| | Level 1 - Axle Centerline | | |
|---|---|---|---|
| Longitudinal Distance (mm ) | Pre-Test (mm) | Post-Test (mm) | Static Crush (mm) |
| -1050 | | | |
| -900 | | | |
| -750 | | | |
| -600 | | | |
| -450 | | | |
| -300 | | | |
| -150 | | | |
| 0 (impact point) | | | |
| 150 | 817 | 933 | 116 |
| 300 | 820 | 944 | 124 |
| 450 | 818 | 952 | 134 |
| 600 | 815 | 960 | 145 |
| 750 | 816 | 966 | 150 |
| 900 | 814 | 970 | 156 |
| 1050 | 815 | 978 | 163 |
| 1200 | 816 | 982 | 166 |
| 1350 | 817 | 952 | 135 |
| 1500 | 817 | 902 | 85 |
| 1650 | 817 | 868 | 51 |
| 1800 | 816 | 837 | 21 |
| 1950 | | | |
| 2100 | | | |
| 2250 | | | |
| 2400 | | | |
| 2550 | | | |
| 2700 | | | |

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

## VEHICLE EXTERIOR STATIC CRUSH




LEVEL 1 - AXLE CENTERLINE

DATA SHEET NO. 10

VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS

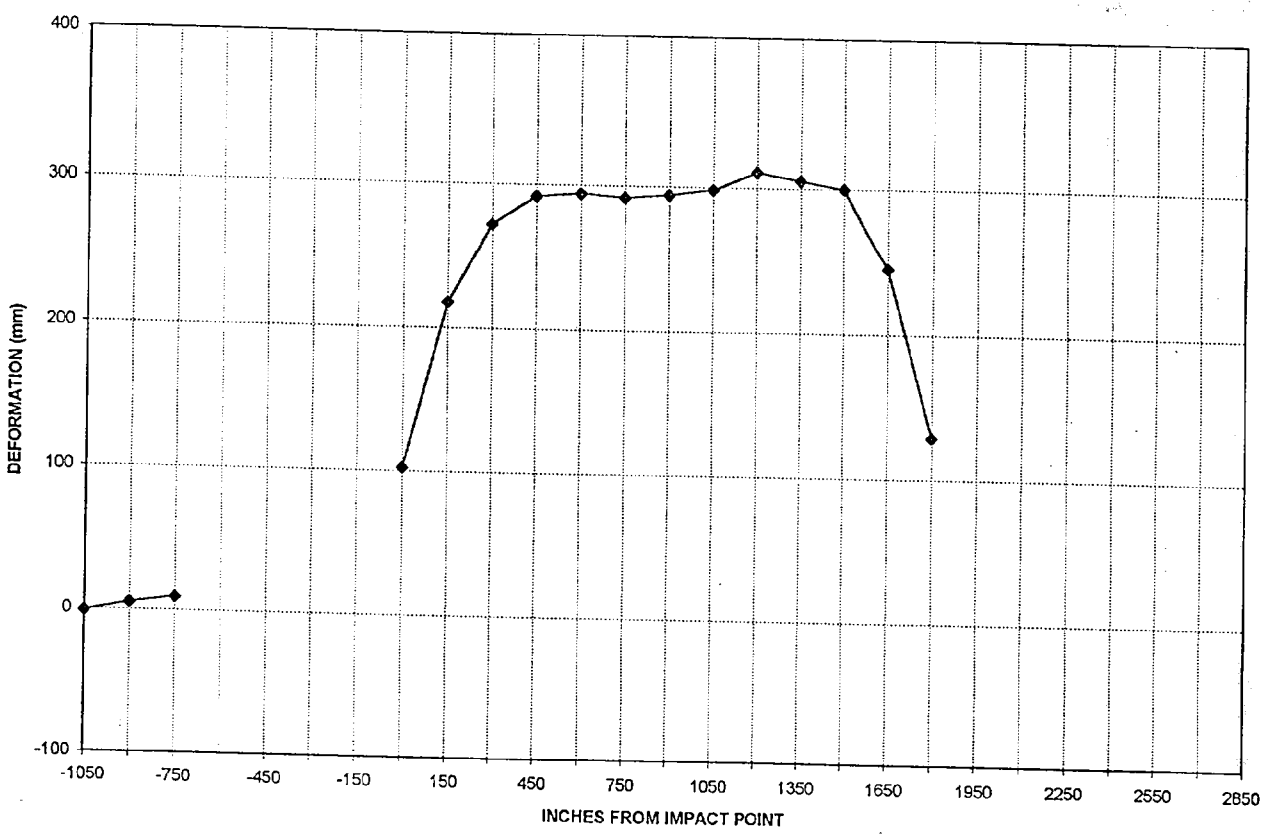
Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

NHTSA NO.: CT5201 Test Date: December 11, 1995

| | Level 2 - Occupant H-Point | | |
|---|---|---|---|
| Longitudinal Distance (mm ) | Pre-Test (mm) | Post-Test (mm) | Static Crush (mm) |
| -1050 | 846 | 845 | -1 |
| -900 | 800 | 805 | 5 |
| -750 | 771 | 780 | 9 |
| -600 | | | |
| -450 | | | |
| -300 | | | |
| -150 | | | |
| 0 (impact point) | 751 | 853 | 102 |
| 150 | 756 | 974 | 218 |
| 300 | 755 | 1028 | 273 |
| 450 | 757 | 1049 | 292 |
| 600 | 757 | 1051 | 294 |
| 750 | 760 | 1052 | 292 |
| 900 | 758 | 1052 | 294 |
| 1050 | 758 | 1056 | 298 |
| 1200 | 757 | 1067 | 310 |
| 1350 | 757 | 1062 | 305 |
| 1500 | 756 | 1056 | 300 |
| 1650 | 755 | 1001 | 246 |
| 1800 | 752 | 881 | 129 |
| 1950 | | | |
| 2100 | | | |
| 2250 | | | |
| 2400 | | | |
| 2550 | | | |
| 2700 | | | |

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

## VEHICLE EXTERIOR STATIC CRUSH




LEVEL 2 - OCCUPANT H-POINT

DATA SHEET NO. 10

VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS

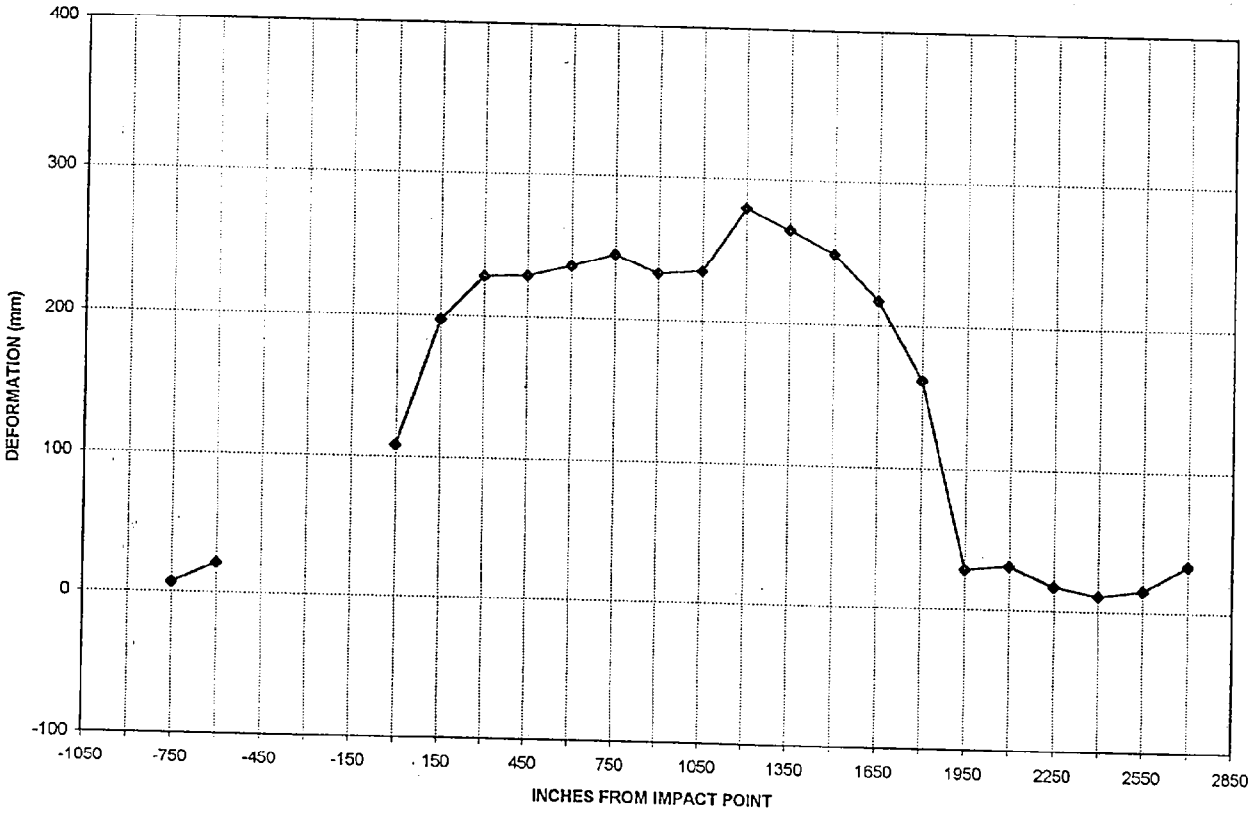
Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

NHTSA NO.: CT5201 Test Date: December 11, 1995

| | Level 3 - Mid Door | | |
|---|---|---|---|
| Longitudinal Distance (mm ) | Pre-Test (mm) | Post-Test (mm) | Static Crush (mm) |
| -1050 | | | |
| -900 | | | |
| -750 | 780 | 787 | 7 |
| -600 | 746 | 767 | 21 |
| -450 | | | |
| -300 | | | |
| -150 | | | |
| 0 (impact point) | 747 | 855 | 108 |
| 150 | 746 | 943 | 197 |
| 300 | 748 | 976 | 228 |
| 450 | 750 | 979 | 229 |
| 600 | 747 | 984 | 237 |
| 750 | 745 | 991 | 246 |
| 900 | 746 | 979 | 233 |
| 1050 | 745 | 980 | 235 |
| 1200 | 746 | 1026 | 280 |
| 1350 | 746 | 1012 | 266 |
| 1500 | 746 | 996 | 250 |
| 1650 | 747 | 964 | 217 |
| 1800 | 745 | 907 | 162 |
| 1950 | 744 | 772 | 28 |
| 2100 | 738 | 769 | 31 |
| 2250 | 741 | 758 | 17 |
| 2400 | 755 | 766 | 11 |
| 2550 | 763 | 778 | 15 |
| 2700 | 768 | 801 | 33 |

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

# VEHICLE EXTERIOR STATIC CRUSH




LEVEL 3 - MID DOOR

DATA SHEET NO. 10

VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS

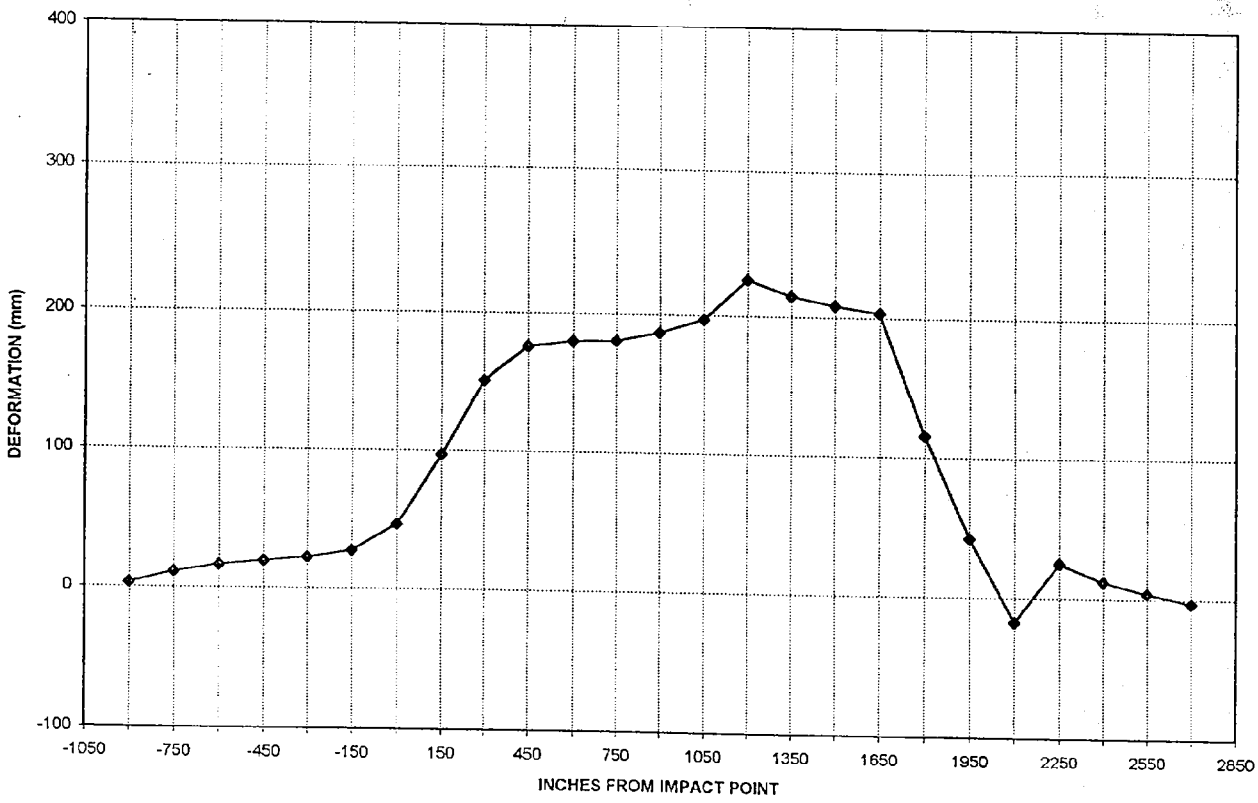
Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

NHTSA NO.: CT5201 Test Date: December 11, 1995

| | Level 4 - Window Sill | | |
|---|---|---|---|
| Longitudinal Distance (mm ) | Pre-Test (mm) | Post-Test (mm) | Static Crush (mm) |
| -1050 | | | |
| -900 | 881 | 884 | 3 |
| -750 | 851 | 862 | 11 |
| -600 | 836 | 852 | 16 |
| -450 | 825 | 844 | 19 |
| -300 | 816 | 838 | 22 |
| -150 | 806 | 833 | 27 |
| 0 (impact point) | 801 | 847 | 46 |
| 150 | 796 | 893 | 97 |
| 300 | 795 | 946 | 151 |
| 450 | 800 | 976 | 176 |
| 600 | 798 | 978 | 180 |
| 750 | 798 | 979 | 181 |
| 900 | 798 | 985 | 187 |
| 1050 | 797 | 994 | 197 |
| 1200 | 797 | 1022 | 225 |
| 1350 | 801 | 1015 | 214 |
| 1500 | 800 | 1008 | 208 |
| 1650 | 800 | 1003 | 203 |
| 1800 | 800 | 916 | 116 |
| 1950 | 803 | 845 | 42 |
| 2100 | 795 | 778 | -17 |
| 2250 | 790 | 815 | 25 |
| 2400 | 802 | 814 | 12 |
| 2550 | 821 | 825 | 4 |
| 2700 | 847 | 844 | -3 |

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

## VEHICLE EXTERIOR STATIC CRUSH




LEVEL 4 - WINDOW SILL

DATA SHEET NO. 10

VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS

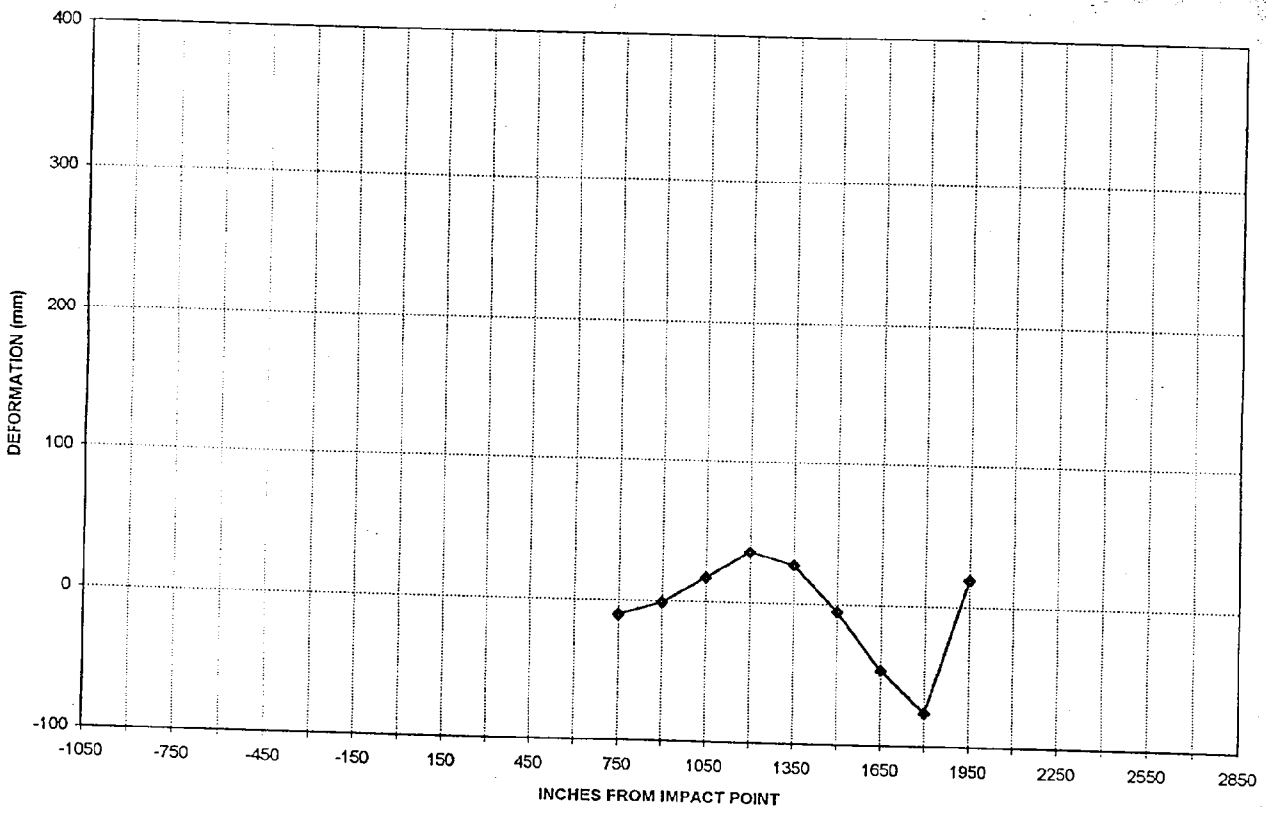
Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

NHTSA NO.: CT5201 Test Date: December 11, 1995

| | Level 5 - Window Top | | |
|---|---|---|---|
| Longitudinal Distance (mm ) | Pre-Test (mm) | Post-Test (mm) | Static Crush (mm) |
| -1050 | | | |
| -900 | | | |
| -750 | | | |
| -600 | | | |
| -450 | | | |
| -300 | | | |
| -150 | | | |
| 0 (impact point) | | | |
| 150 | | | |
| 300 | | | |
| 450 | | | |
| 600 | | | |
| 750 | 1000 | 990 | -10 |
| 900 | 1007 | 1006 | -1 |
| 1050 | 1010 | 1027 | 17 |
| 1200 | 1011 | 1047 | 36 |
| 1350 | 1009 | 1036 | 27 |
| 1500 | 1003 | 998 | -5 |
| 1650 | 998 | 952 | -46 |
| 1800 | 993 | 917 | -76 |
| 1950 | 997 | 1016 | 19 |
| 2100 | | | |
| 2250 | | | |
| 2400 | | | |
| 2550 | | | |
| 2700 | | | |

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

# VEHICLE EXTERIOR STATIC CRUSH



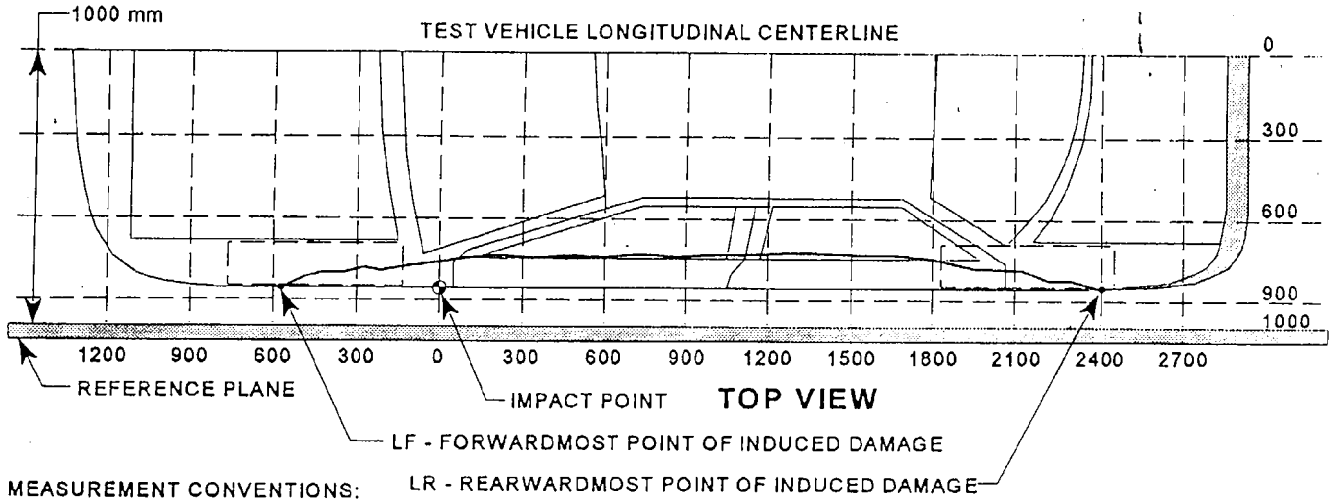

LEVEL 5 - WINDOW TOP

DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

NHTSA NO.: CT5201 Test Date: December 11, 1995




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

| DPD MEASUREMENTS | POST-TEST (mm) | PRE-TEST (mm) | STATIC CRUSH (mm) |
|---|---|---|---|
| 1. (LF = -450 mm) | 848 | 848 | 0.0 |
| 2. 60 mm | 917 | 749 | 168 |
| 3. 580 mm | 959 | 752 | 207 |
| 4. 1110 mm | 1058 | 751 | 307 |
| 5. 1680 mm | 1001 | 751 | 250 |
| 6. (LR = 2050 mm) | 761 | 761 | 0.0 |

DATA SHEET NO. 12

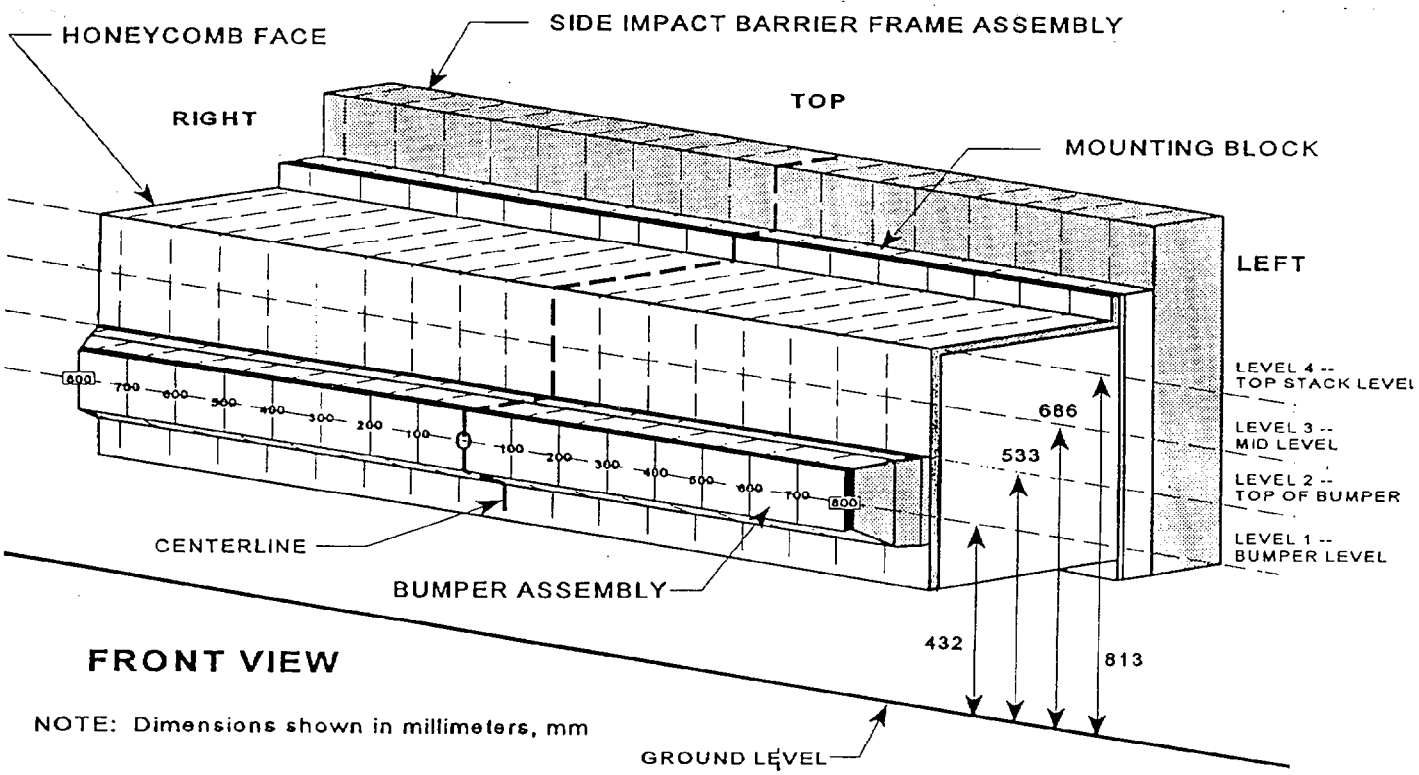
EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR

Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

Vehicle NHTSA No.: CT5201 Test Date: December 11, 1995

| | | Distance Right of Center (mm) | | | | | | | | | Distance Left of Center (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Height at CL* | 800 | 700 | 600 | 500 | 400 | 300 | 200 | 100 | 0 | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 |
| Top Stack Level 4 | 813 mm | 4 | -2 | -2 | -7 | -5 | -4 | -4 | -2 | 0 | 1 | 2 | 2 | 10 | 29 | 56 | 89 | 135 |
| Mid Level Level 3 | 686 mm | 15 | -6 | -6 | -5 | -3 | -1 | 0 | 1 | 2 | 2 | 3 | 3 | 5 | 7 | 19 | 53 | 109 |
| Top Bumper Level 2 | 533 mm | 22 | 23 | -3 | 0 | 2 | 3 | 3 | 4 | 6 | 8 | 10 | 10 | 13 | 14 | 27 | 51 | 63 |
| Mid Bumper Level 1 | 432 mm | 50 | 34 | 15 | 13 | 17 | 14 | 14 | 14 | 15 | 18 | 20 | 22 | 25 | 30 | 48 | 90 | 104 |

See next page for Barrier Face Graphic

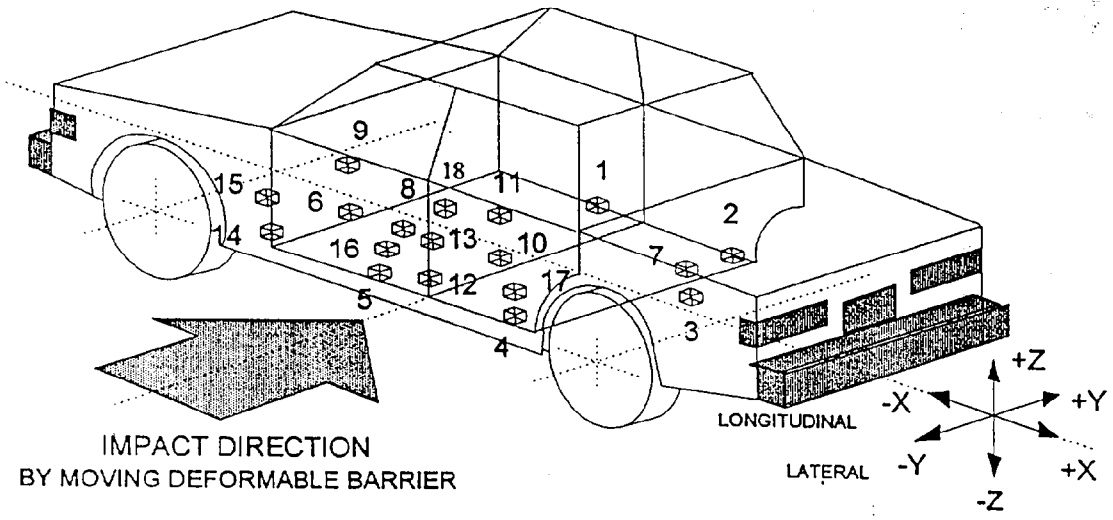

HONEYCOMB FACE
SIDE IMPACT BARRIER FRAME ASSEMBLY
RIGHT
TOP
MOUNTING BLOCK
LEFT
LEVEL 4 -- TOP STACK LEVEL
LEVEL 3 -- MID LEVEL
LEVEL 2 -- TOP OF BUMPER
LEVEL 1 -- BUMPER LEVEL
686
533
432
813
CENTERLINE
BUMPER ASSEMBLY
GROUND LEVEL
FRONT VIEW
NOTE: Dimensions shown in millimeters, mm

DATA SHEET 13

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

Vehicle NHTSA No.: CT5201 Test Date: December 11, 1995




IMPACT DIRECTION
BY MOVING DEFORMABLE BARRIER

1-Rt. Side Sill @ Frt Seat
2-Rt. Side Sill @ Rr. Seat
3-Rr. Floorpan Above Axle
4-Left Side Sill @ Rr. Seat
5-Left Side Sill @ Frt. Seat
6-Left Frt. Door On Centerline
7-Rt. Rr. Occ Compartment
8-Midrear of Left Frt. Door
9-Left Frt. Door Upper Ctrline
10-Midrear of Left Rear Door
11-Left Rear Door Upper Ctrline
12-Left Lower B-Post
13-Left Middle B-Post
14-Left Lower A-Post
15-Left Middle A-Post
16-Front Seat Track
17-Rear Seat Track
18-Vehicle C.G.

DATA SHEET NO. 13

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

Vehicle NHTSA No.: CT5201 Test Date: December 11, 1995

| 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 | 2302 | 635 | 215 | 2.2 | 7.3 | 20.3 | 3.4 | 8.3 | 3.3 | 20.8 |
| 2 | Rt. Side Sill @ Rear Seat | 1419 | 705 | 212 | 3.9 | 4.5 | 21.8 | 2.7 | 7.6 | 6.0 | 22.3 |
| 3 | Rr. Floorpan Above Axle | 870 | -40 | 540 | 2.1 | 12.0 | 22.4 | 2.9 | 8.4 | 10.0 | 25.5 |
| 4 | Left Side Sill @ Rr. Seat | 2159 | -625 | 215 | --- | --- | 37.2 | 6.4 | --- | --- | --- |
| 5 | Left Side Sill @ Frt. Seat | 1408 | -664 | 217 | --- | --- | 39.8 | 5.8 | --- | --- | --- |
| 7 | Right Rear Occupant Compartment | 1664 | 360 | 290 | --- | --- | 19.2 | 2.1 | --- | --- | --- |
| 12 | Left Lower B-Post | 1890 | 650 | 305 | --- | --- | 67.4 | 14.8 | --- | --- | --- |
| 13 | Left Mid B-Post | 1894 | 670 | 810 | --- | --- | 157.8 | 17.6 | --- | --- | --- |
| 14 | Left Lower A-Post | 2952 | 672 | 430 | --- | --- | 132.8 | 98.2 | --- | --- | --- |
| 15 | Left Mid A-Post | 2984 | 740 | 698 | --- | --- | 54.3 | 15.0 | --- | --- | --- |
| 16 | Driver Left Seat Track | 2132 | 540 | 240 | --- | --- | 95.8 | 38.1 | --- | --- | --- |
| 18 | Vehicle CG | 2570 | 0 | 320 | ** | ** | ** | ** | ** | ** | ** |

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

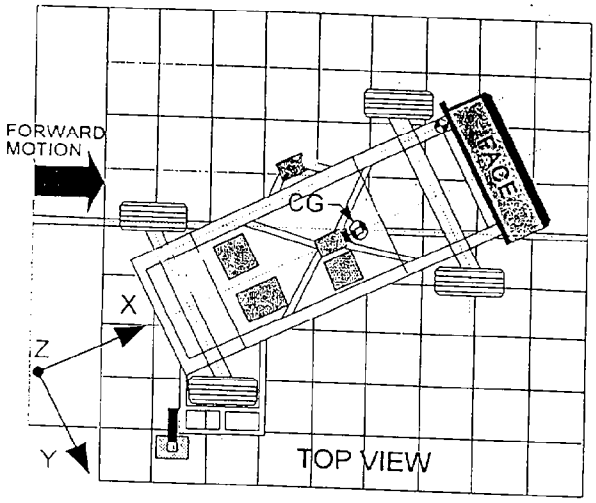
** No valid data collected

DATA SHEET NO. 14

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

Vehicle NHTSA No.: CT5201 Test Date: December 11, 1995




| Accel. No. | Description | Coordinates (mm)* | | | (+) Positive | | (-) Negative | |
|---|---|---|---|---|---|---|---|---|
| | | X | Y | Z | Max. (g) | Time (msec) | Max. (g) | Time (msec) |
| 1 | MDB Center of Gravity | -1092 | 0 | 483 | | | | |
| | Longitudinal (X) | --- | --- | --- | 1.4 | 110 | 15.4 | 35 |
| | Lateral (Y) | --- | --- | --- | 0.8 | 1.4 | 6.7 | 20 |
| | Vertical (Z) | --- | --- | --- | 9.1 | 30 | 7.2 | 19 |
| | Resultant (R) | --- | --- | --- | 18.1 | 30 | --- | --- |
| 2 | Rear Frame Member | -2591 | -625 | 622 | | | | |
| | Longitudinal (X) | --- | --- | --- | 1.8 | 176 | 20.6 | 29 |
| | Lateral (Y) | --- | --- | --- | 3.8 | 22 | 2.2 | 1 |

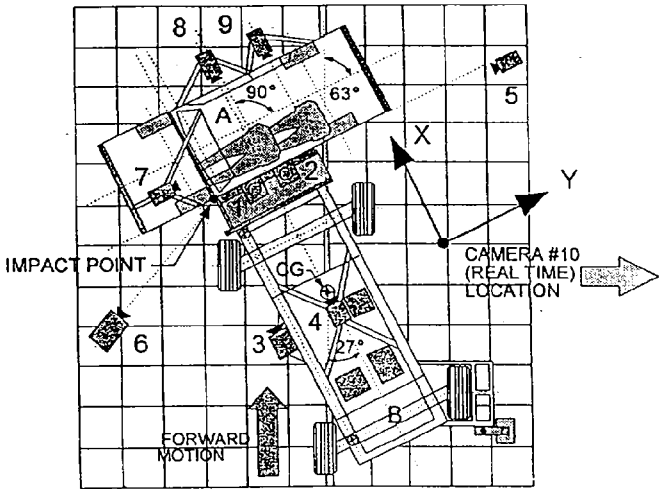
*Reference: X - Front Axle (+ Forward)
Y - Vehicle Centerline (+ To right)
Z - Ground Level (+ Up)

DATA SHEET NO. 15

HIGH SPEED CAMERA LOCATIONS AND DATA

Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

Vehicle NHTSA No.: CT5201 Test Date: December 11, 1995




| Camera No. | View | Coordinates (mm)* | | | Angle | Lens (mm) | Film Speed (fps) |
|---|---|---|---|---|---|---|---|
| | | X | Y | Z | | | |
| | Real Time | | | | | 13 | 24 |
| 1 | Top Impact | -350 | 850 | 5400 | | 13 | 935 |
| 2 | Top Wide | -700 | 0 | 5130 | | 8 | 1143 |
| 3 | Cart Pointer | | | | | 35 | NR |
| 4 | Cart | | | | | 13 | NR |
| 5 | Right Impact | 3630 | 7460 | 1840 | 90° | 25 | 1136 |
| 6 | Left Overall | 3000 | 2260 | 1880 | 90° | 13 | 990 |
| 7 | Onboard Driver | | | | | 8 | 943 |
| 8 | Onboard Hood | | | | | 13 | 1031 |
| 9 | Onboard Passenger | | | | | 8 | 909 |

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

DATA SHEET 16

FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

Vehicle Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

Vehicle NHTSA No.: CT5201 Test Date: December 11, 1995

TEST REQUIREMENTS:

Drain the test vehicle's fuel system and operate the engine until the fuel system is dry. Add Stoddard solvent, which has been dyed purple, until 92-94% of the stated usable capacity is reached. Operate the engine to assure the Stoddard solvent is present throughout the entire fuel system.

TEST VEHICLE IMPACT TYPE: X Side Impact MDB 33.3 mph (53.6 kph)

FUEL SPILLAGE MEASUREMENT:

| POST IMPACT TEST | TEST RESULTS | MAXIMUM ALLOWABLE |
|---|---|---|
| 1. From impact until vehicle motion ceases | 0 | 1 oz |
| 2. For 5 minute period after vehicle motion ceases | 0 | 5 oz |
| 3. For next 25 minutes | 0 | 1 oz./1 min |

FUEL SPILLAGE LOCATION(S): None

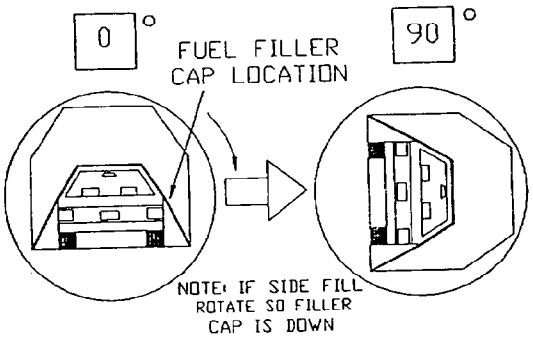
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

Vehicle NHTSA No.: CT5201 Test Date: December 11, 1995

TEST PHASE: 0° - 90°




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 TIME = 7 minutes 50 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

| 0° TO 90° ROTATION (FILLER CAP DOWN) | TEST RESULTS | MAXIMUM ALLOWABLE |
|---|---|---|
| 1. First 5 Minutes From Onset of Rotation | 0 oz | 5 oz |
| 2. Sixth Minute From Onset of Rotation | 0 oz | 1 oz |
| 3. Seventh Minute From Onset of Rotation | 0 oz | 1 oz |
| 4. Eighth Minute if Required | N/R | 1 oz |

FUEL SPILLAGE LOCATIONS(S): None

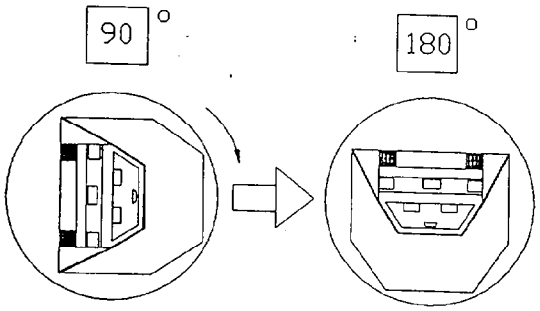
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)

Vehicle Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

Vehicle NHTSA No.: CT5201 Test Date: December 11, 1995

TEST PHASE: 90° - 180°




DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 35 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 35 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

| 90° TO 180° ROTATION | TEST RESULTS | MAXIMUM ALLOWABLE |
|---|---|---|
| 1. First 5 Minutes From Onset of Rotation | 0 oz | 5 oz |
| 2. Sixth Minute From Onset of Rotation | 0 oz | 1 oz |
| 3. Seventh Minute From Onset of Rotation | 0 oz | 1 oz |
| 4. Eighth Minute if Required | N/R | 1 oz |

FUEL SPILLAGE LOCATIONS(S): None

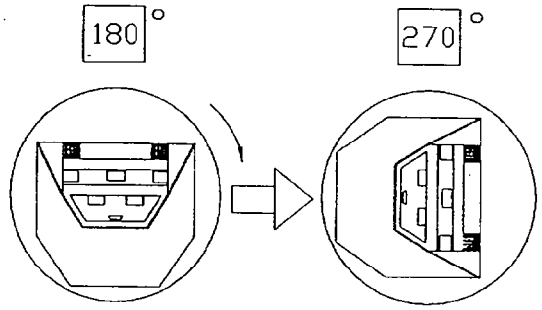
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)

Vehicle Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

Vehicle NHTSA No.: CT5201 Test Date: December 11, 1995

TEST PHASE: 180° - 270°




DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 20 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 20 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

| 180° TO 270° ROTATION | TEST RESULTS | MAXIMUM ALLOWABLE |
|---|---|---|
| 1. First 5 Minutes From Onset of Rotation | 0 oz | 5 oz |
| 2. Sixth Minute From Onset of Rotation | 0 oz | 1 oz |
| 3. Seventh Minute From Onset of Rotation | 0 oz | 1 oz |
| 4. Eighth Minute if Required | N/R | 1 oz |

FUEL SPILLAGE LOCATIONS(S): None

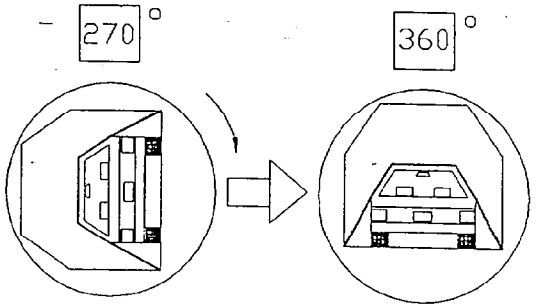
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1996/Nissan/Sentra/4 Door

Vehicle NHTSA No.: CT5201 Test Date: December 11, 1995

TEST PHASE: 270° - 360°




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 TIME = 7 minutes 30 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

| 270° TO 360° ROTATION | TEST RESULTS | MAXIMUM ALLOWABLE |
|---|---|---|
| 1. First 5 Minutes From Onset of Rotation | 0 oz | 5 oz |
| 2. Sixth Minute From Onset of Rotation | 0 oz | 1 oz |
| 3. Seventh Minute From Onset of Rotation | 0 oz | 1 oz |
| 4. Eighth Minute if Required | N/R | 1 oz |

FUEL SPILLAGE LOCATIONS(S): None

# APPENDIX A - PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

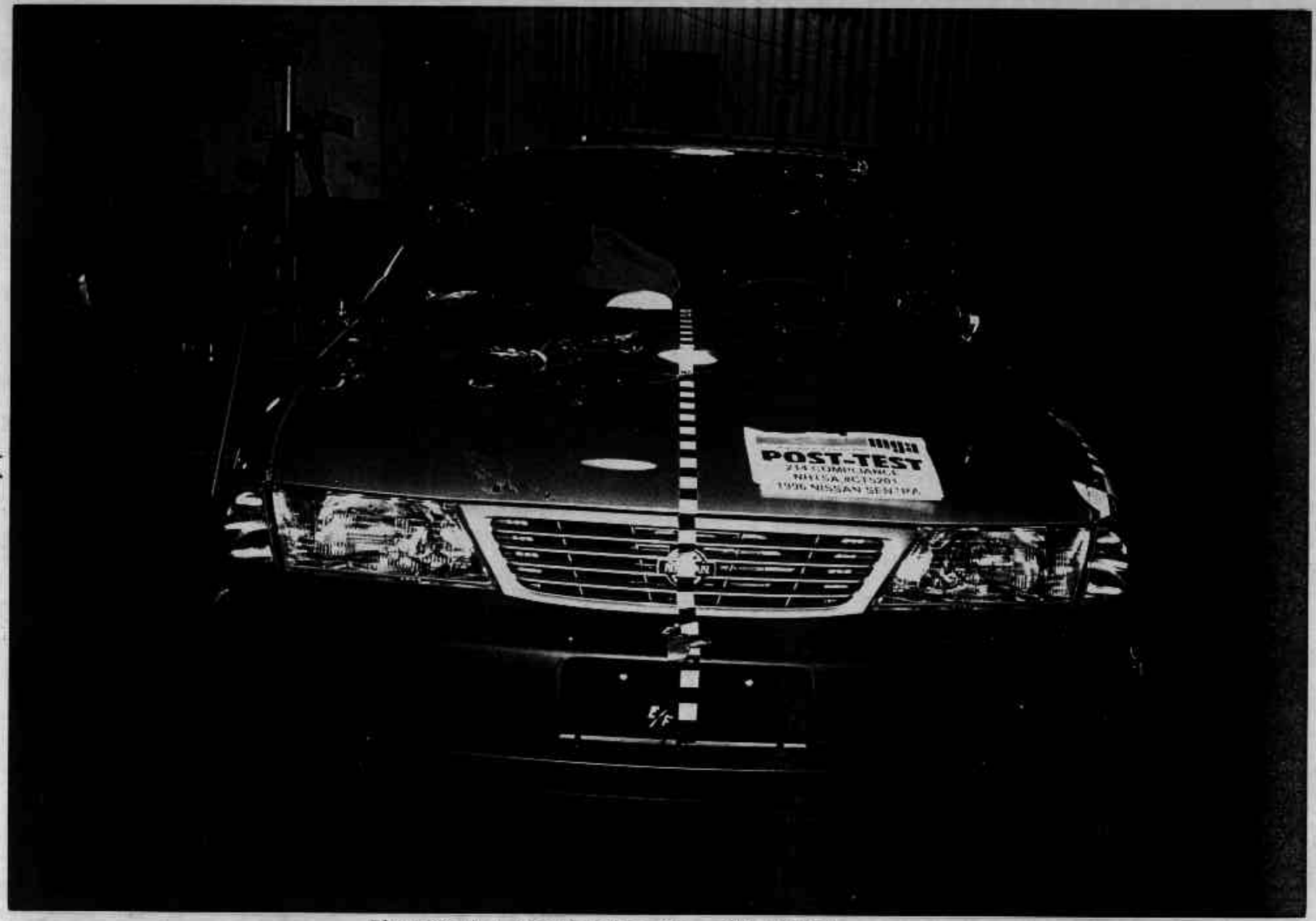



Photo No. A-1 - Post-Test Front View of Test Vehicle

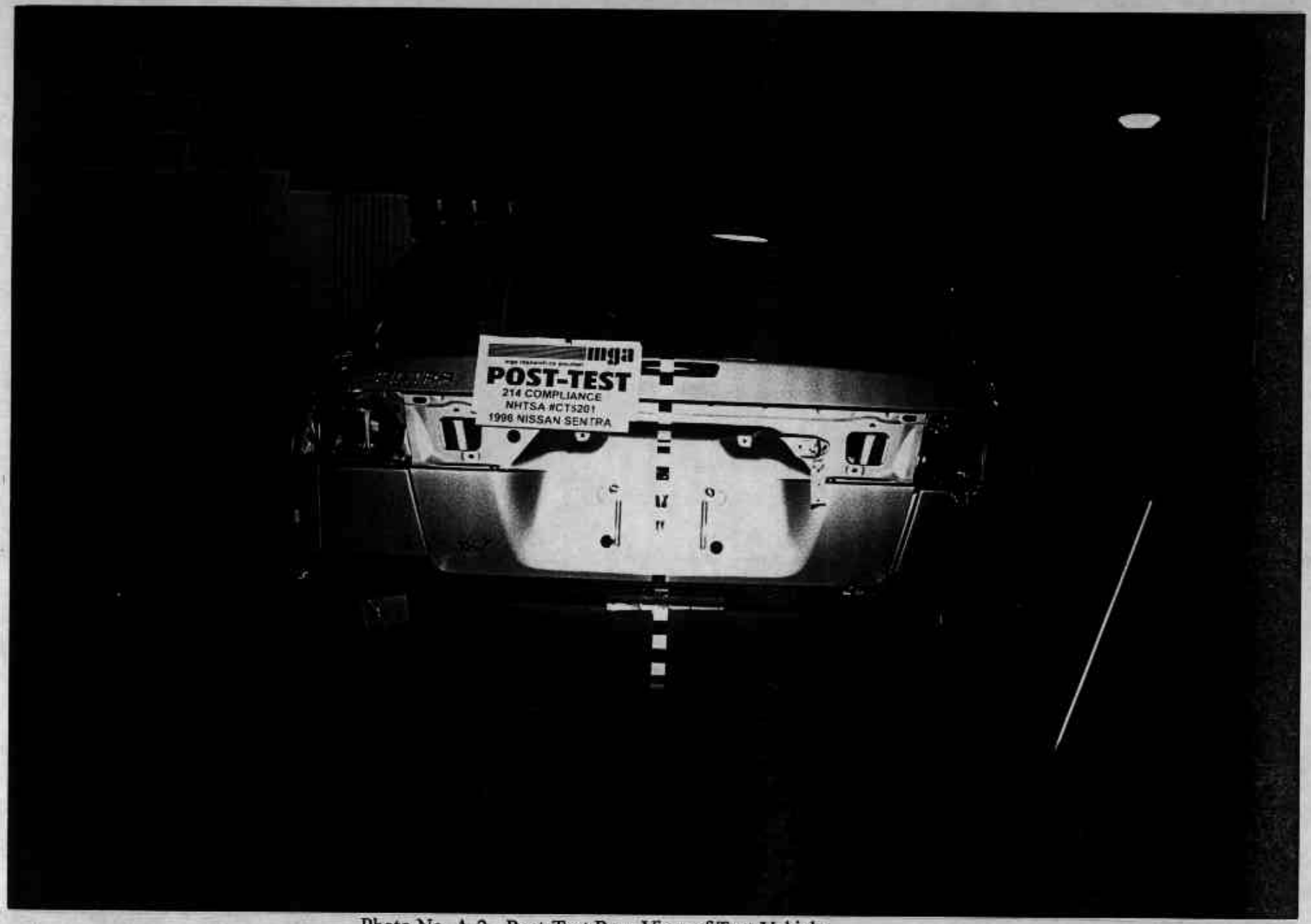



Photo No. A-2 - Post-Test Rear View of Test Vehicle

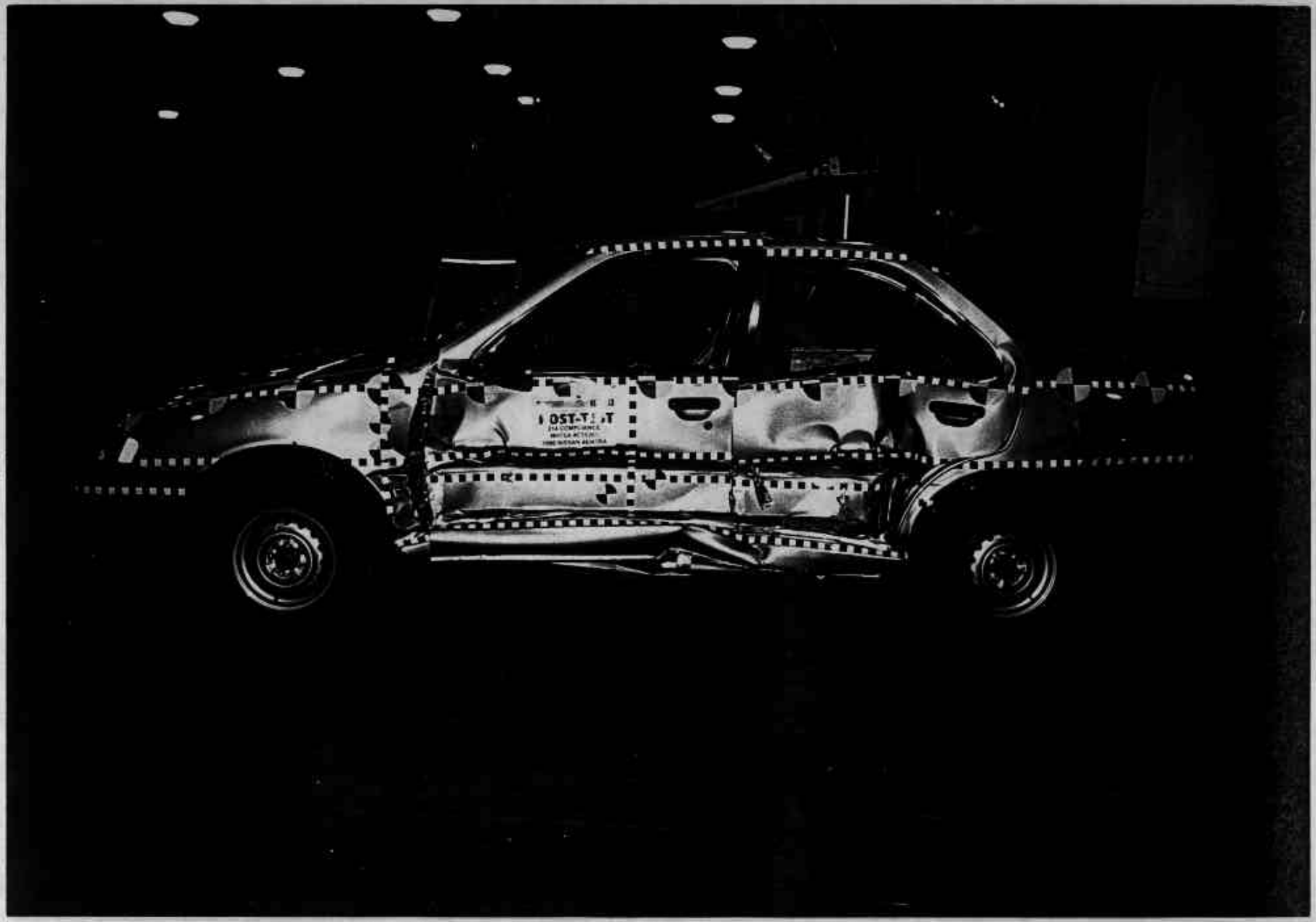


Photo No. A-3 - Post-Test Left Side View of Test Vehicle

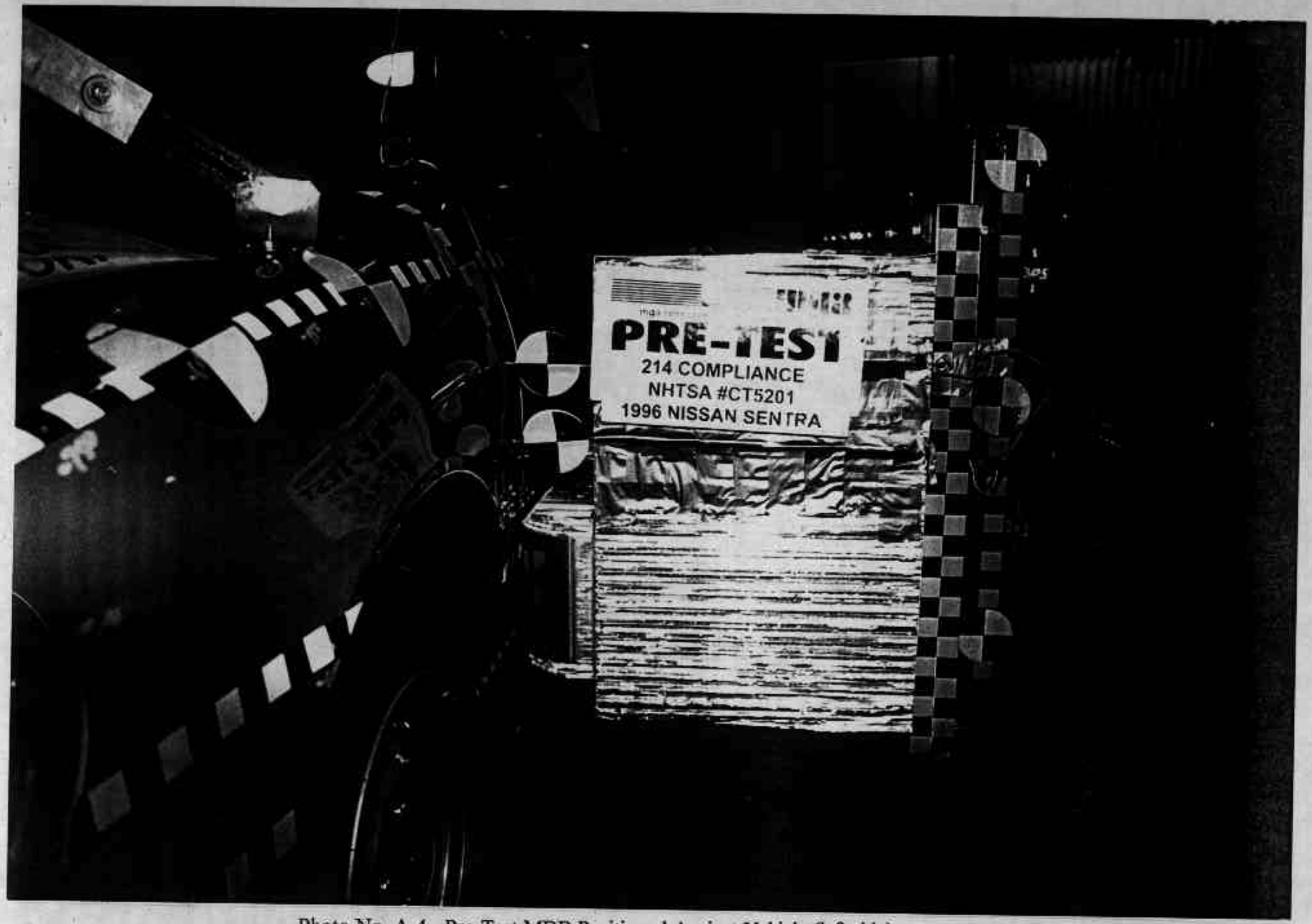





Photo No. A-4 - Pre-Test MDB Positioned Against Vehicle (left side)

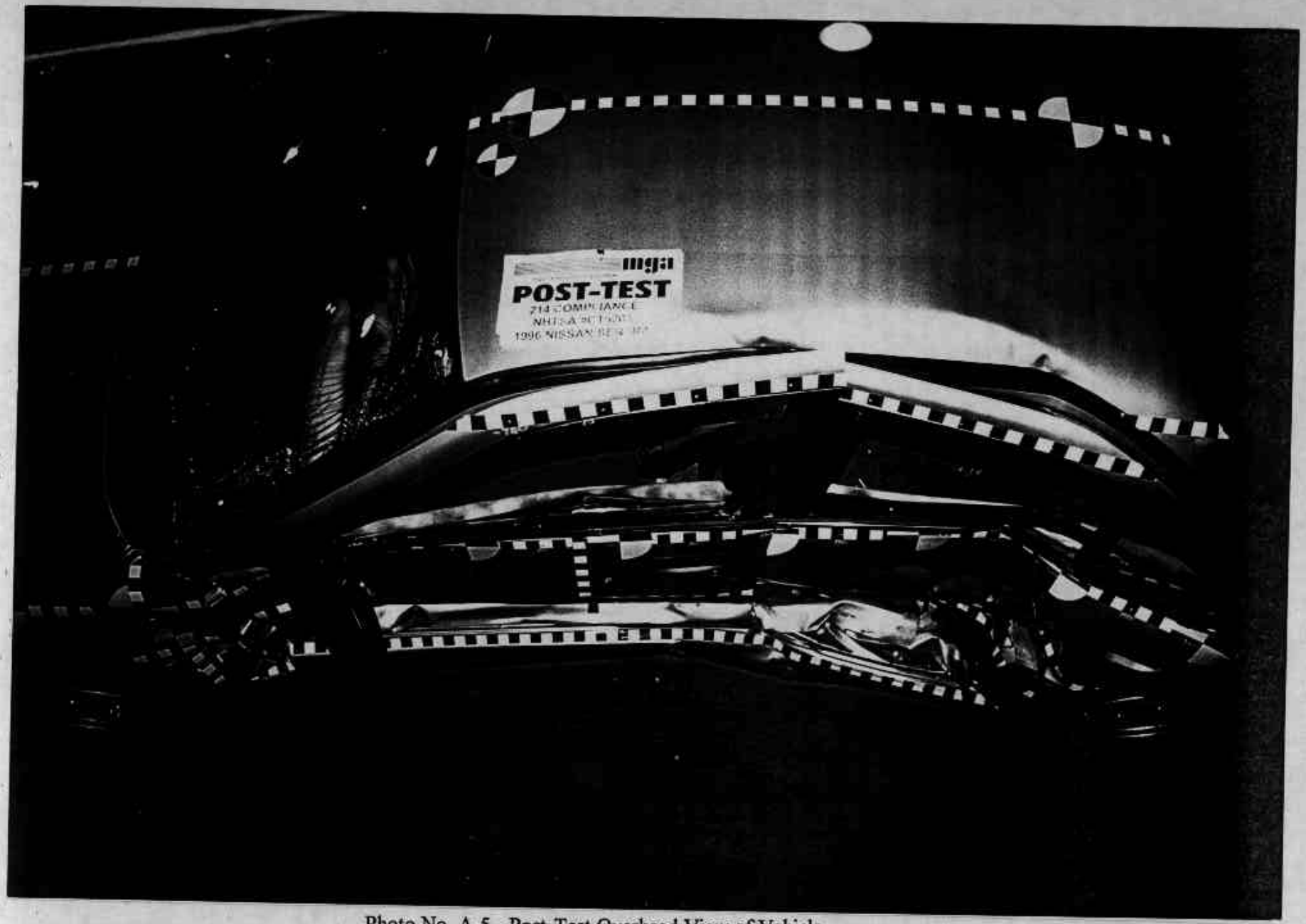



Photo No. A-5 - Post-Test Overhead View of Vehicle

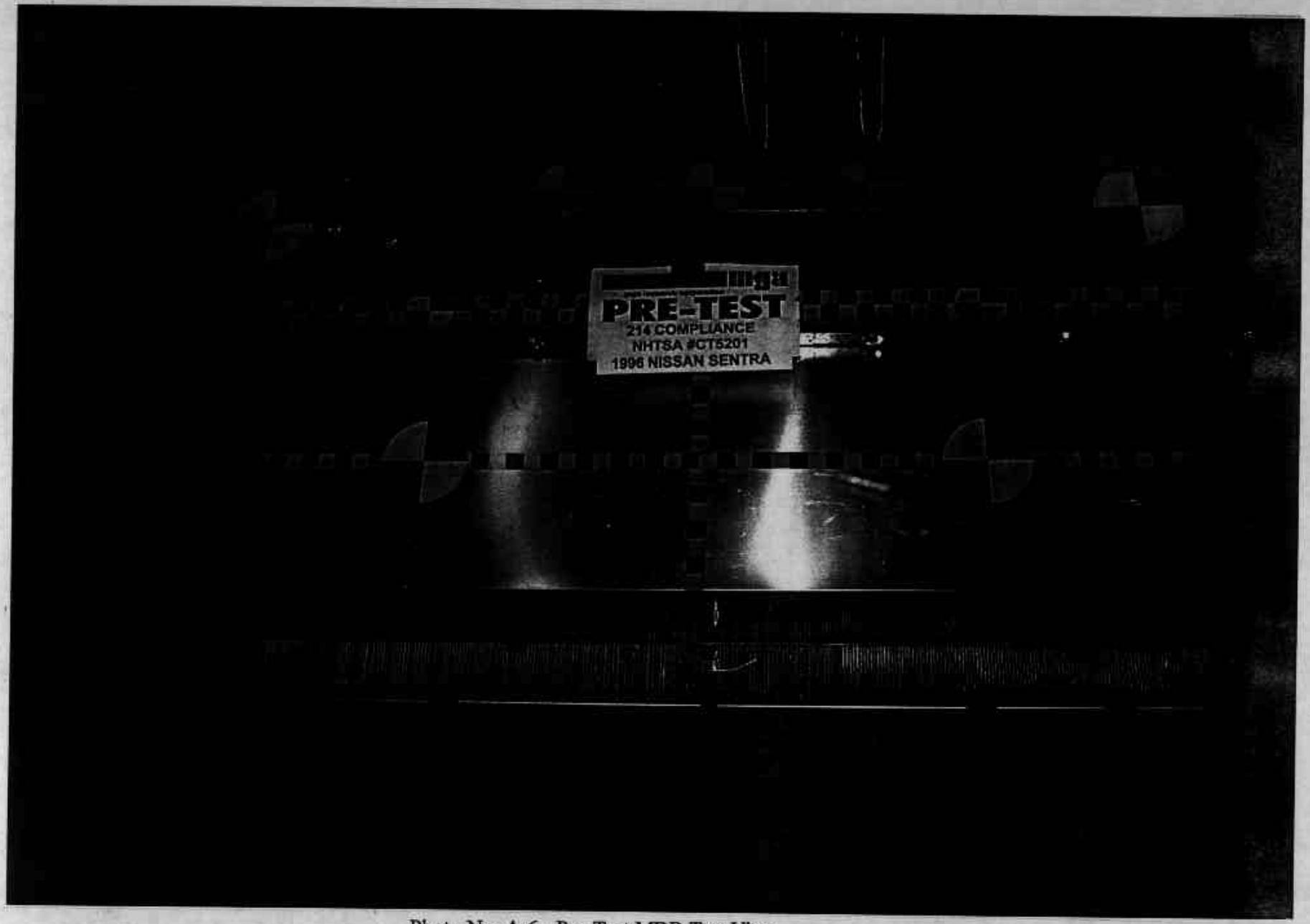



Photo No. A-6 - Pre-Test MDB Top View

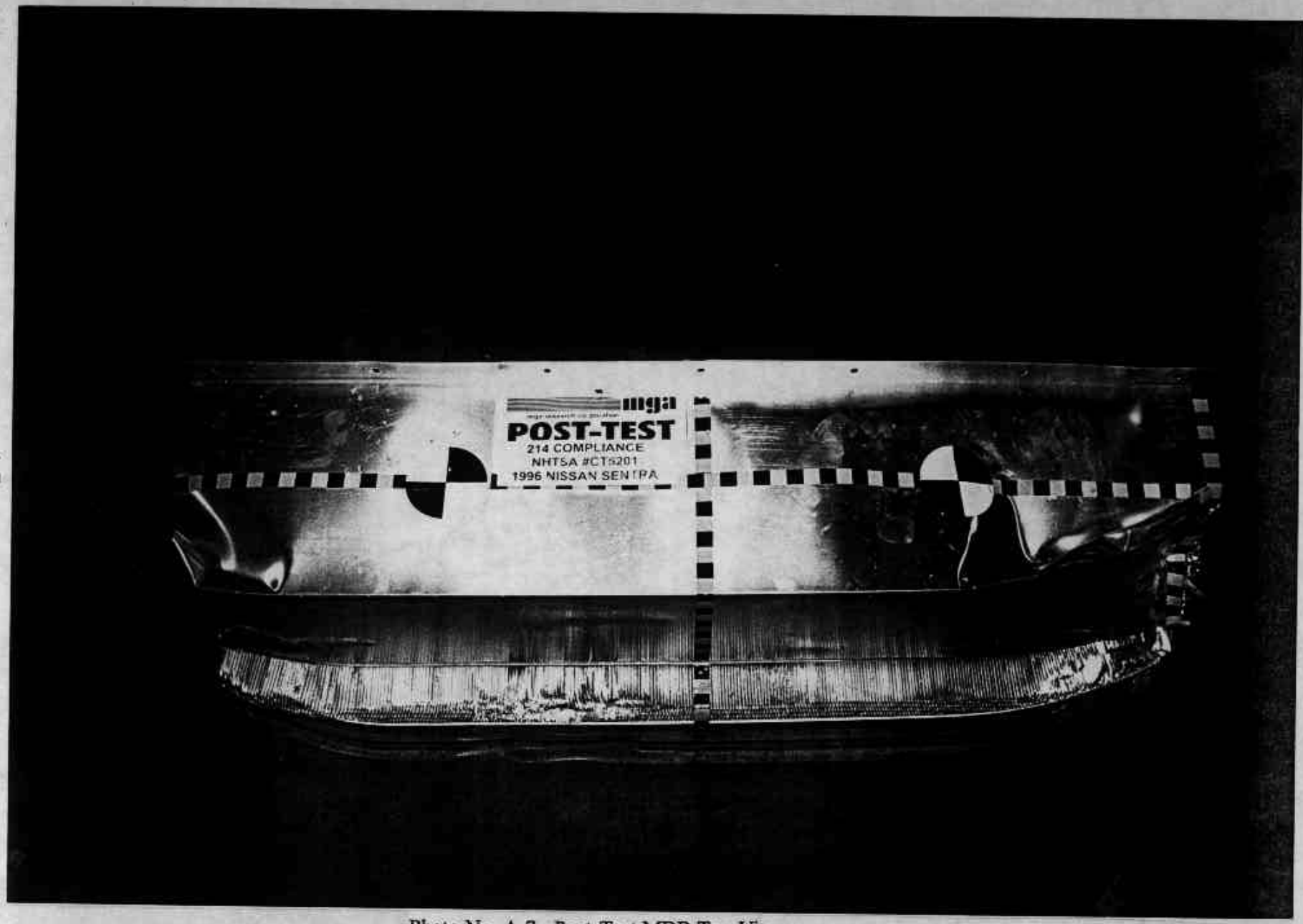



Photo No. A-7 - Post-Test MDB Top View


Photo No. A-8 - Pre-Test MDB Front View

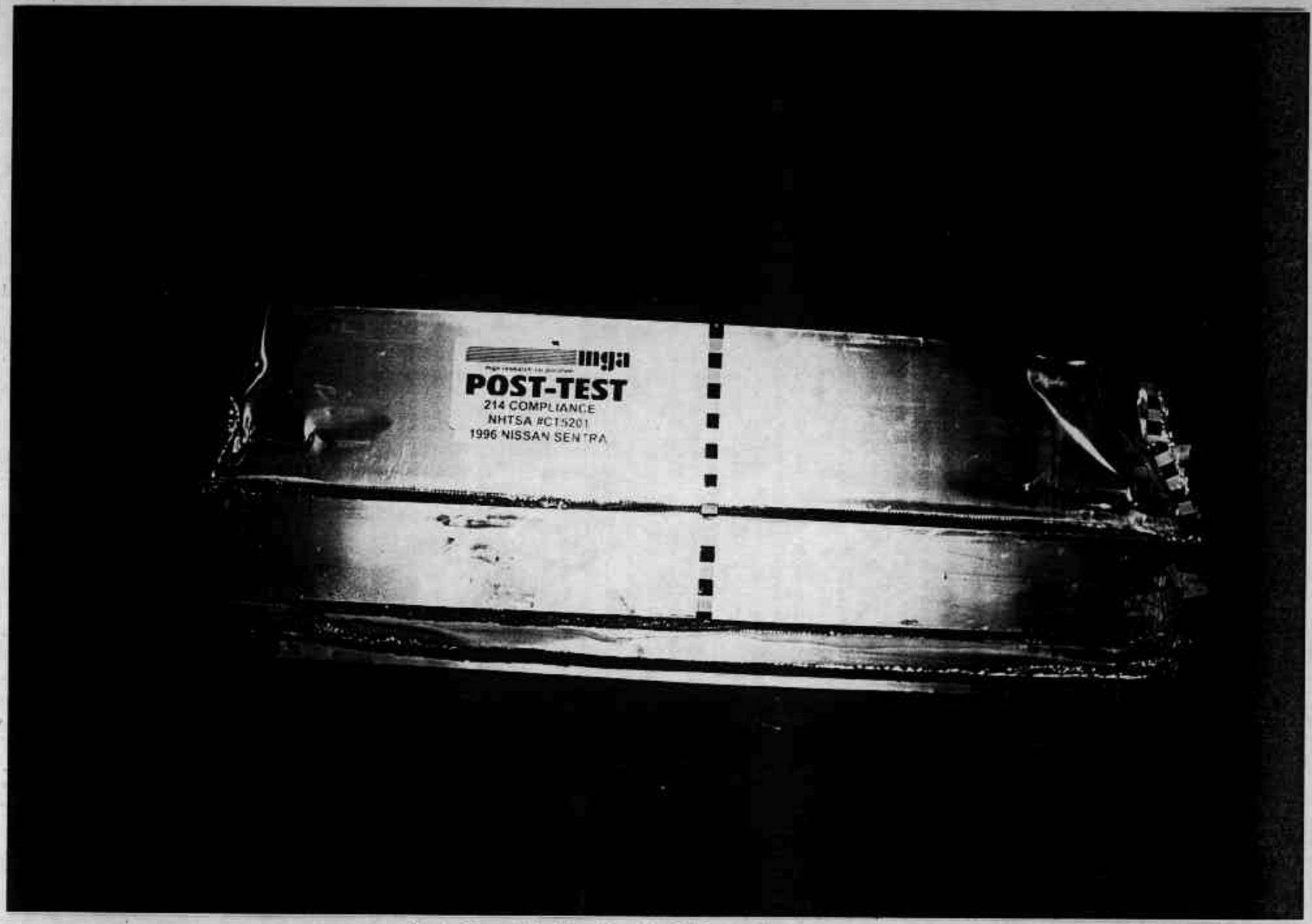



Photo No. A-9 - Post-Test MDB Front View

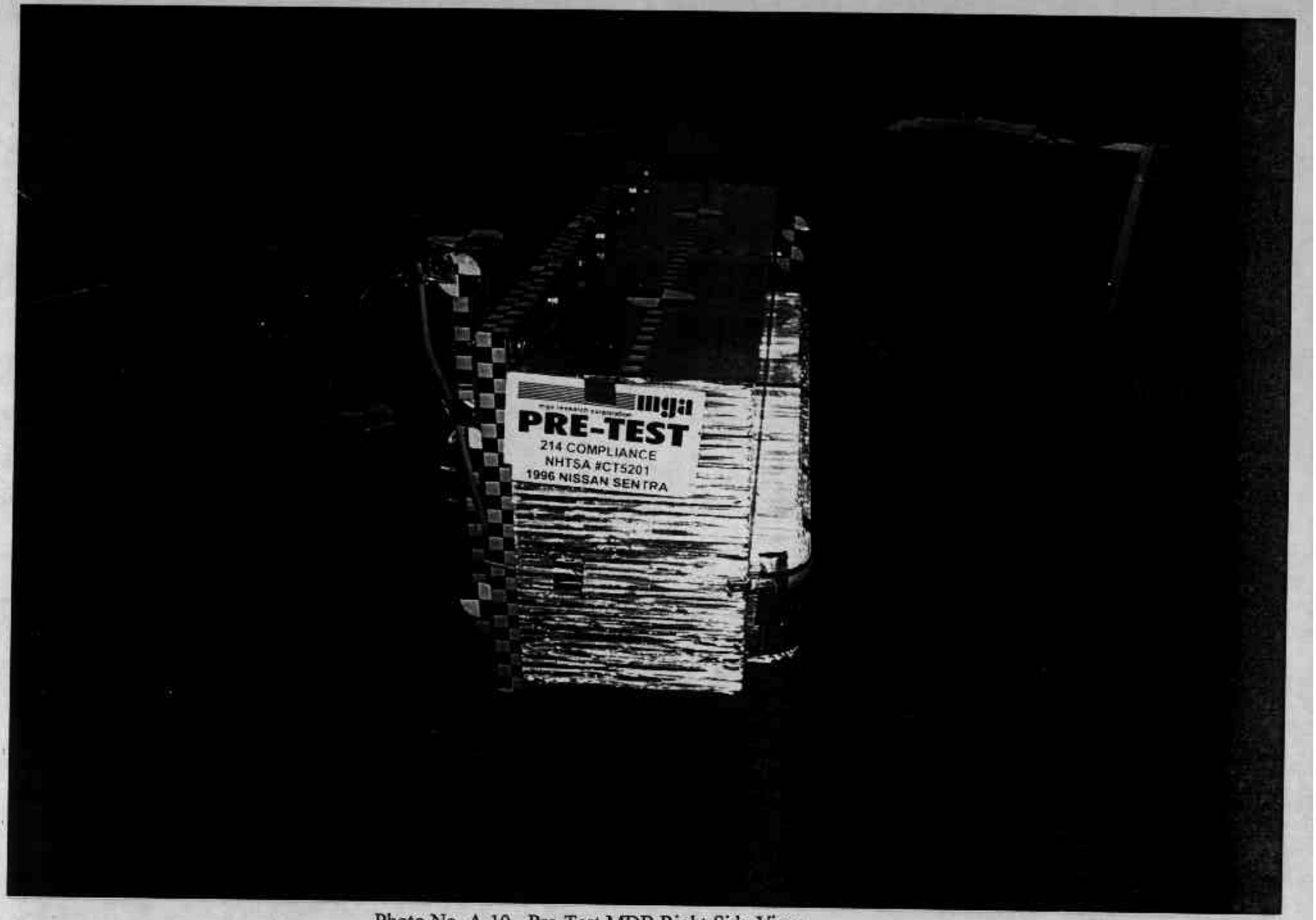



Photo No. A-10 - Pre-Test MDB Right Side View


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


A-12

Photo No. A-12 - Post-Test MDB Left Side View

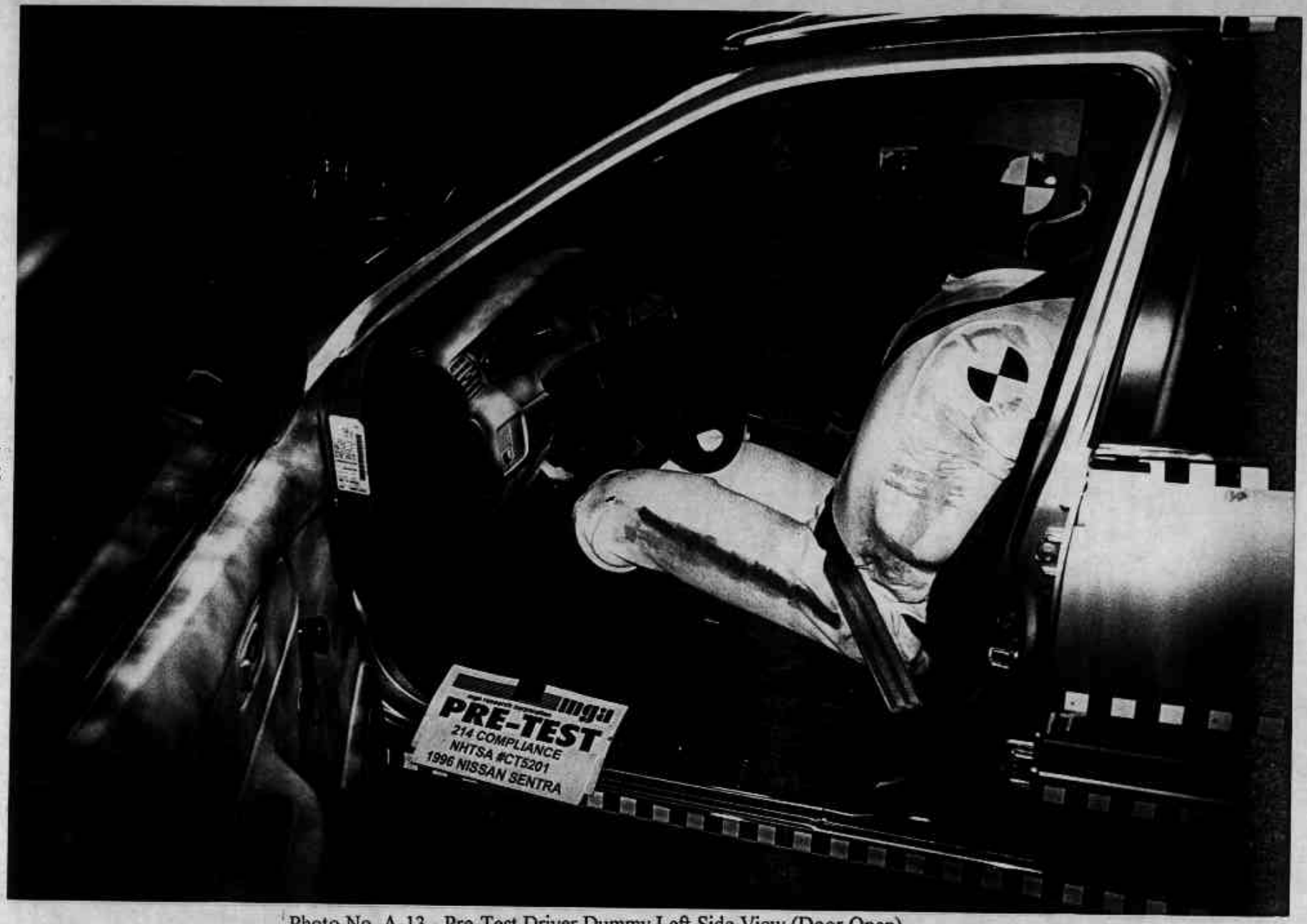



Photo No. A-13 - Pre-Test Driver Dummy Left Side View (Door Open)

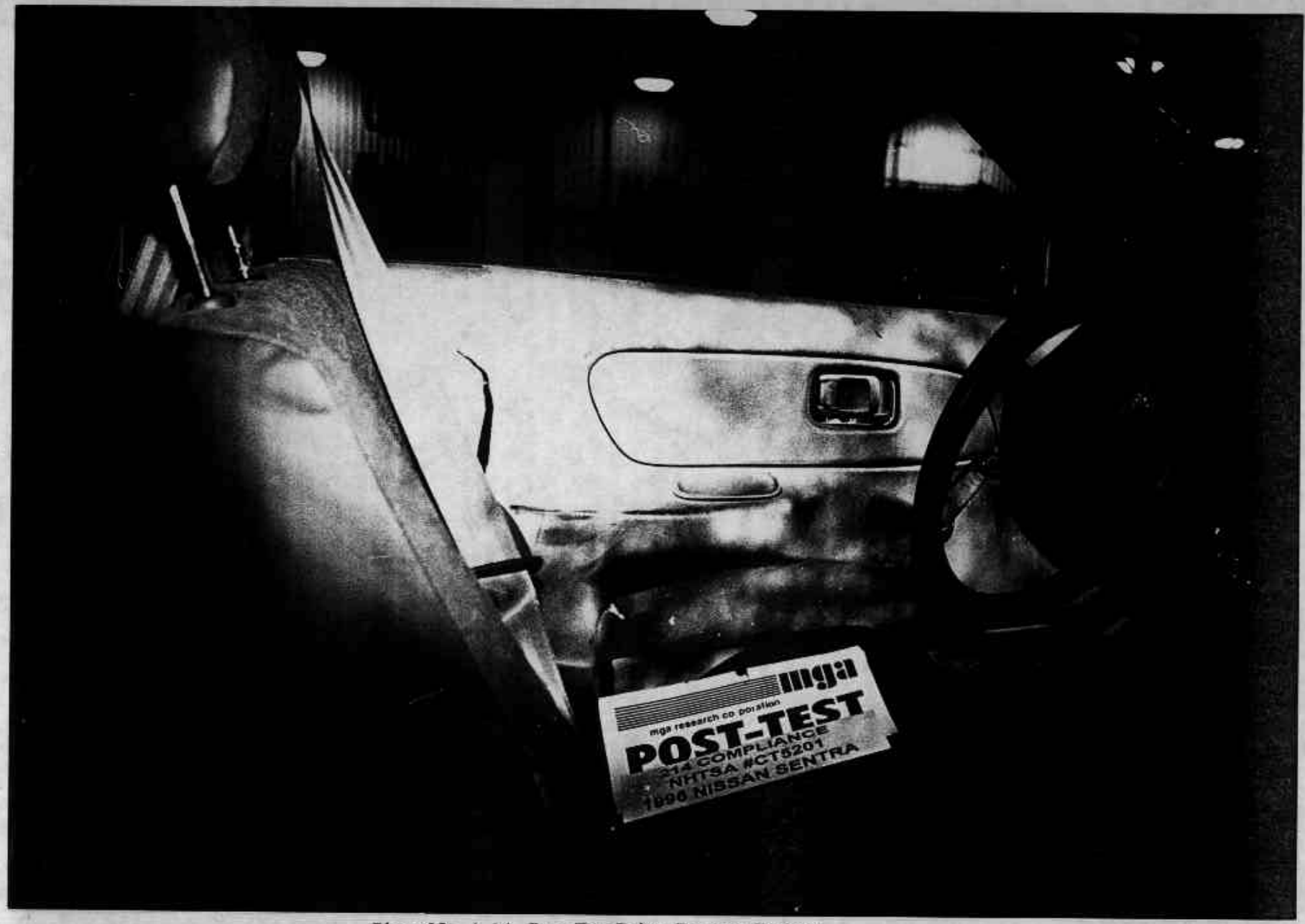



Photo No. A-14 - Post-Test Driver Dummy Contact

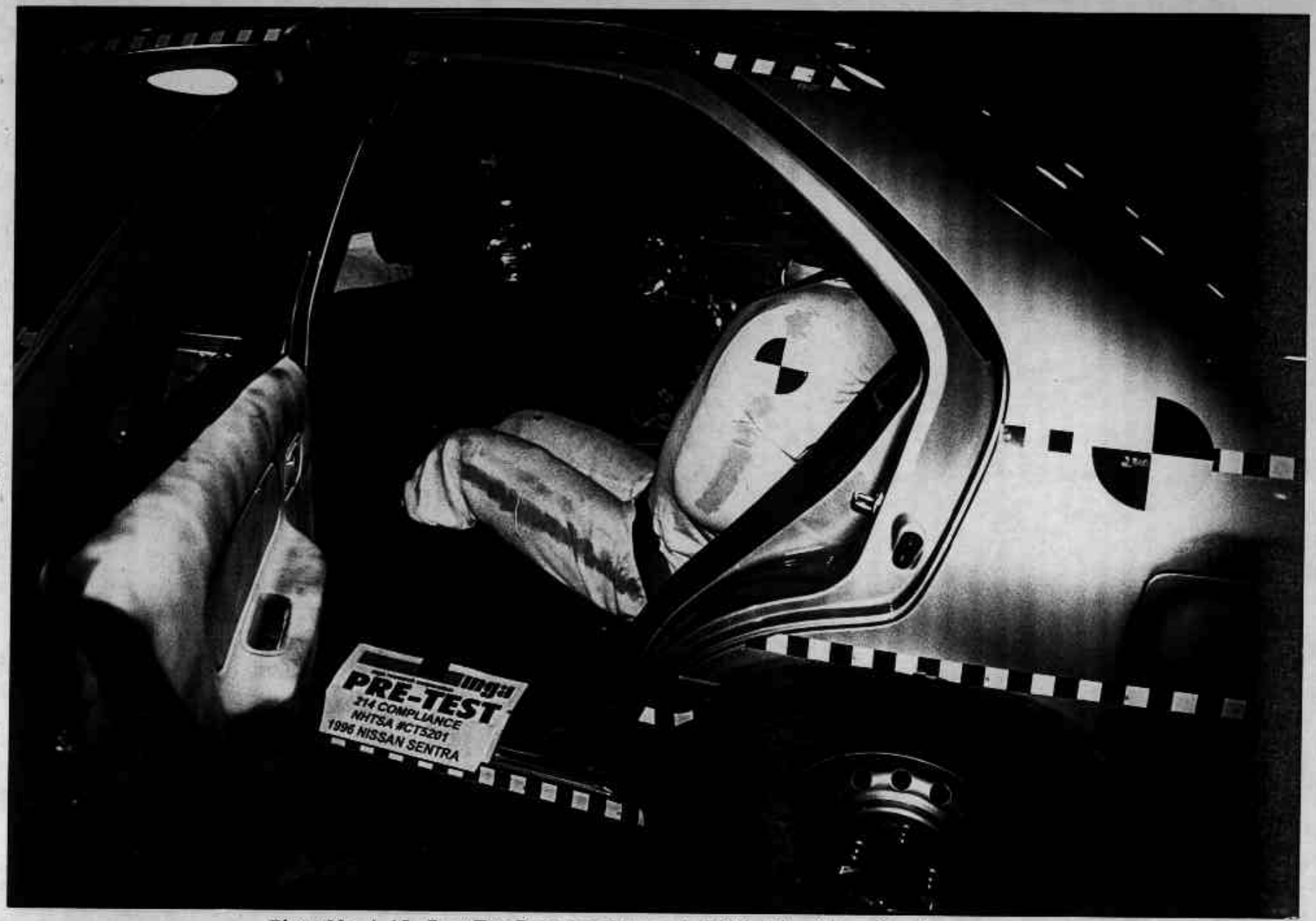
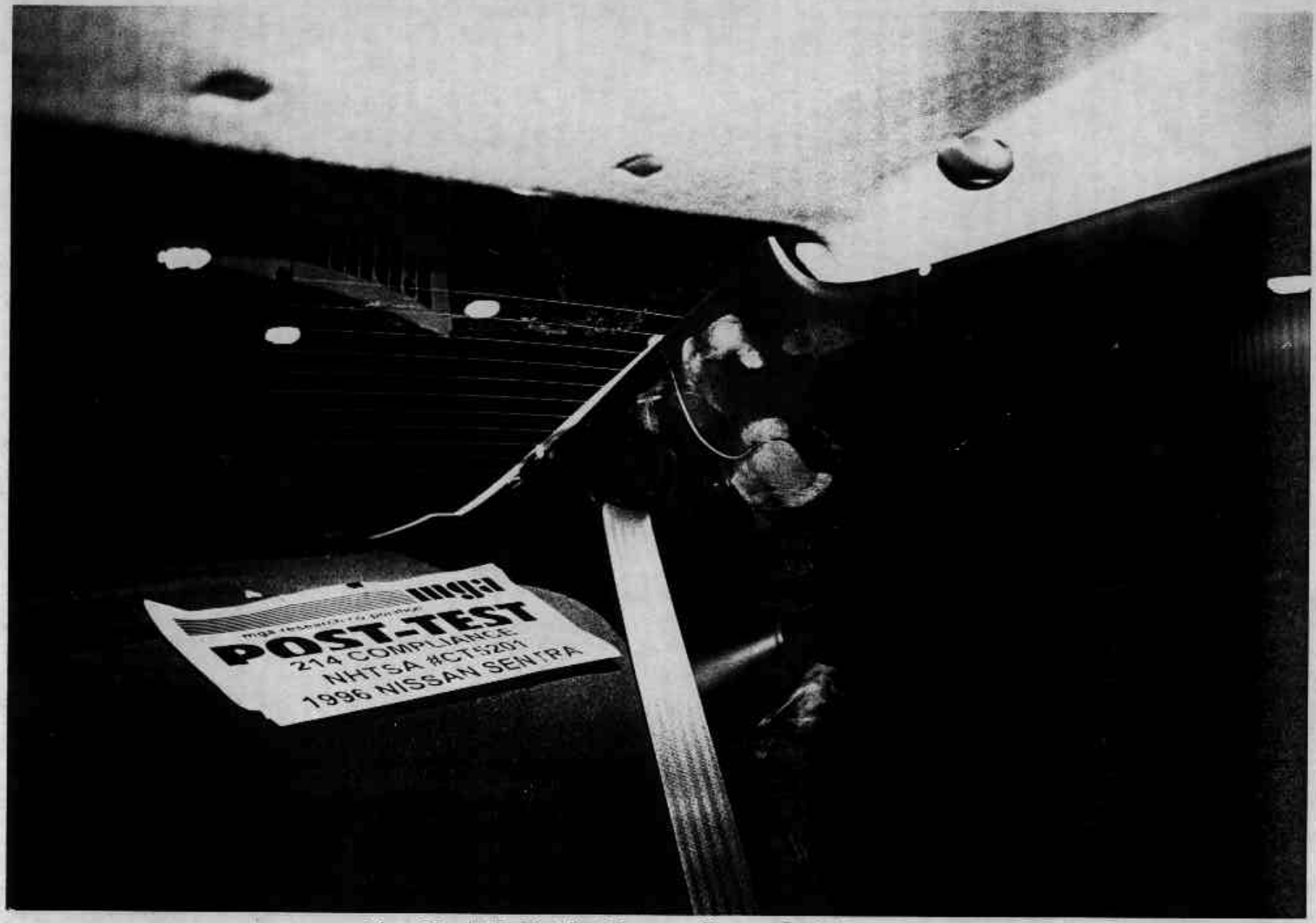



Photo No. A-15 - Post-Test Passenger Dummy Left Side View (Door Open)


Photo No. A-16 - Post-Test Passenger Dummy Contact




A-17

Photo No. A-17 - Post-Test Passenger Dummy Contact


Photo No. A-18 - Left Front Impact Point on Vehicle

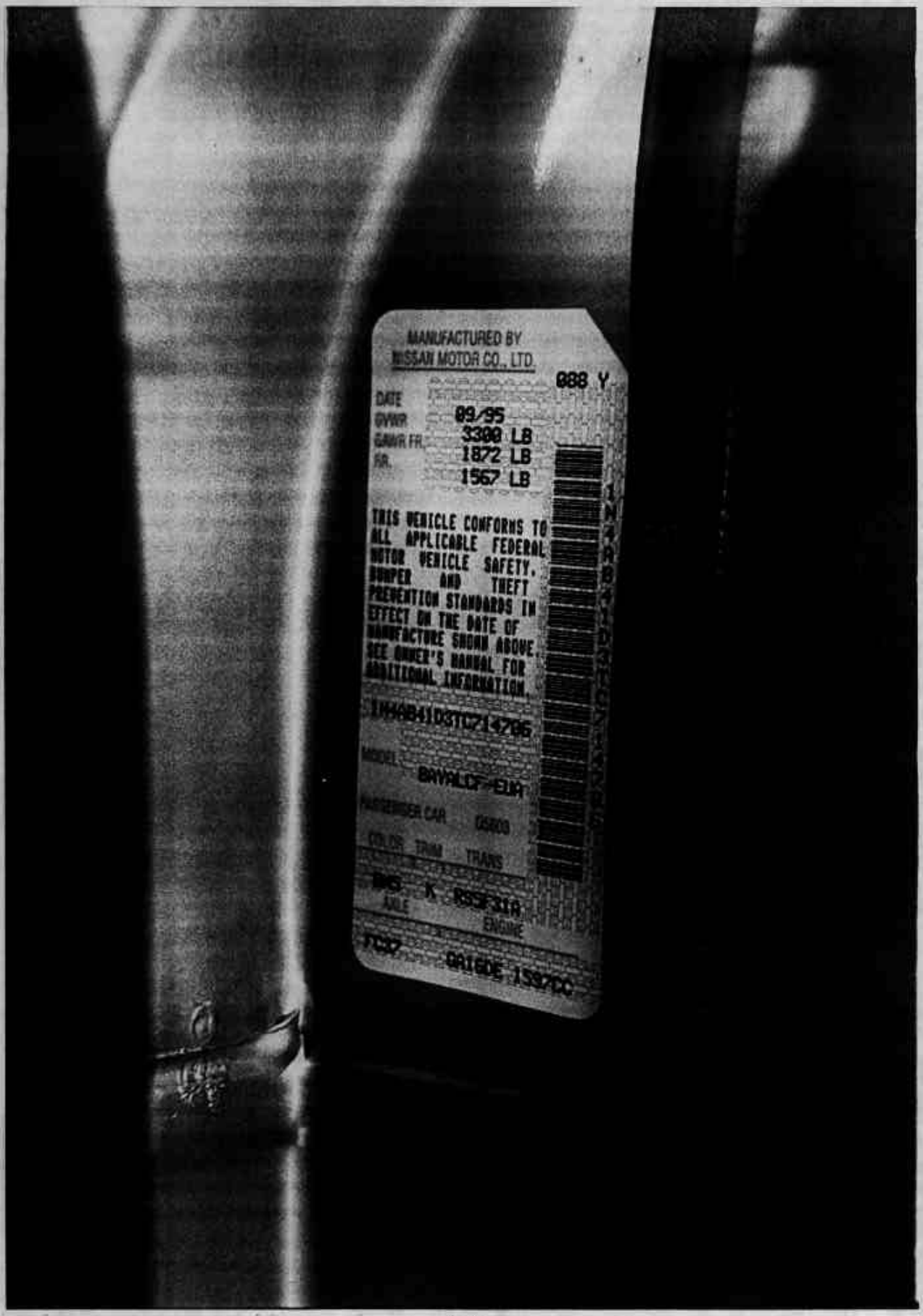



Photo No. A-19 - Vehicle Certification Label


A-20

Photo No. A-20 - Tire Placard

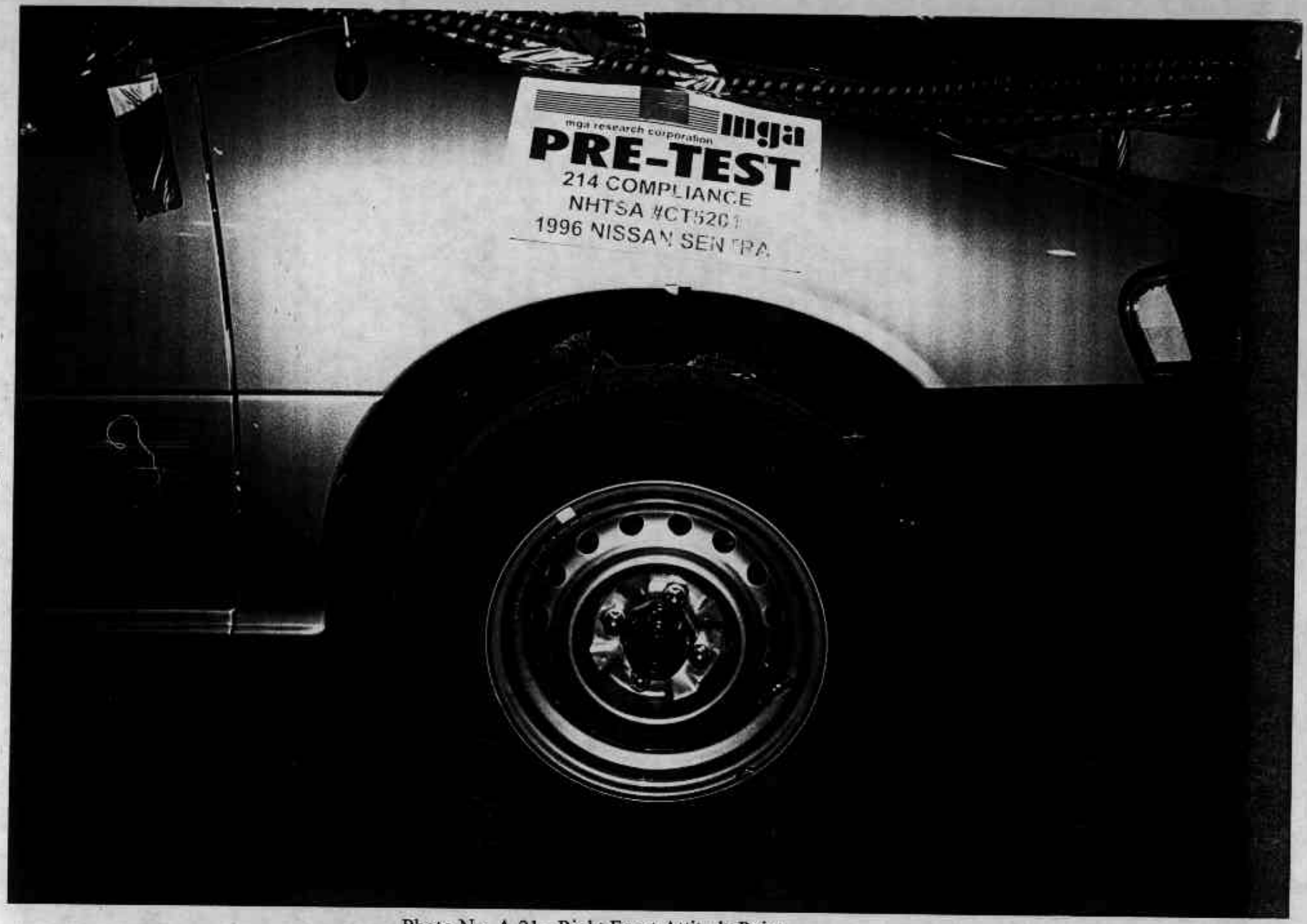



Photo No. A-21 - Right Front Attitude Point


A-22

Photo No. A-22 - Right Rear Attitude Point

# APPENDIX B - VEHICLE AND SID REPSONSE DATA

Table of Data Plots

Table of Data Plots



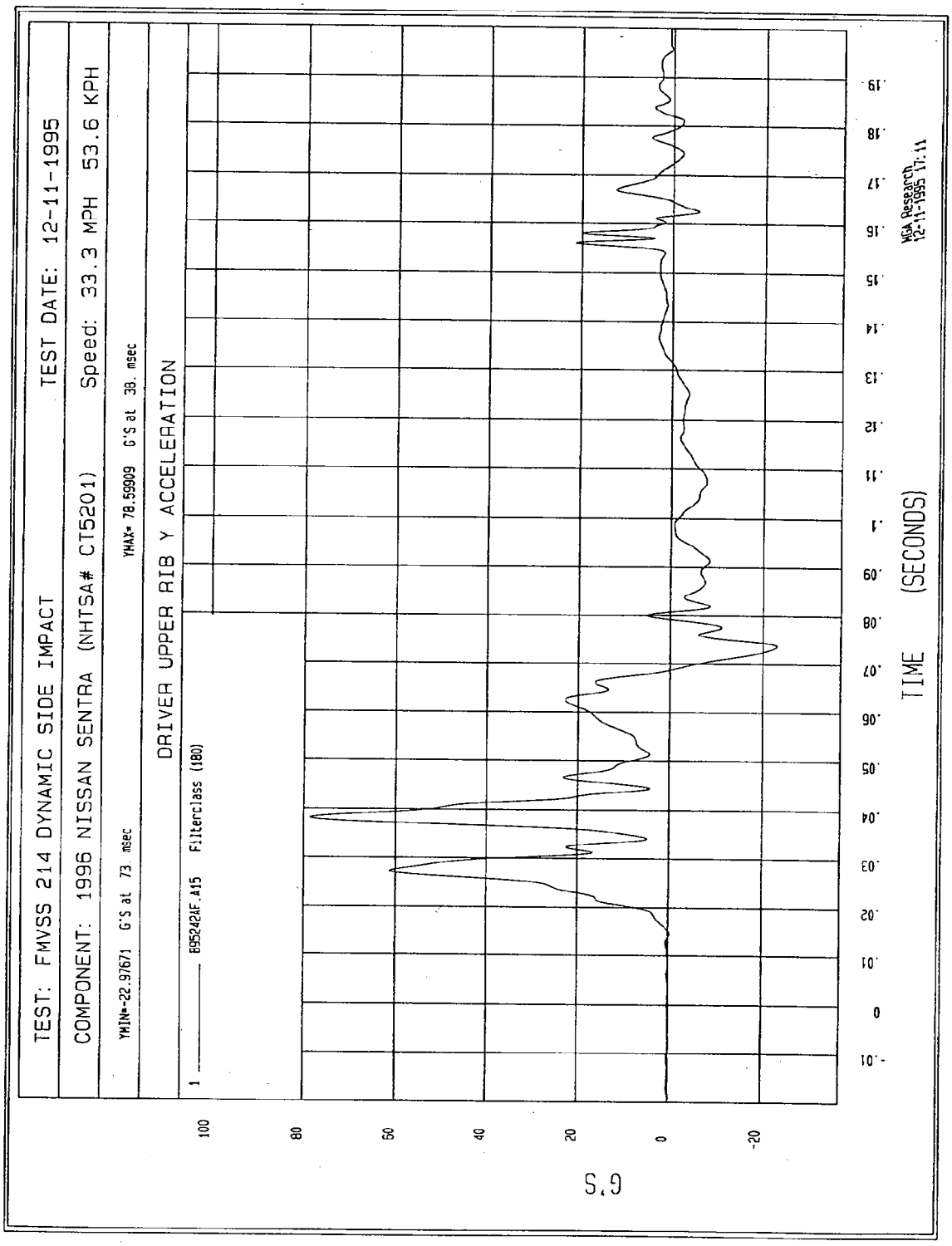
* No valid data collected

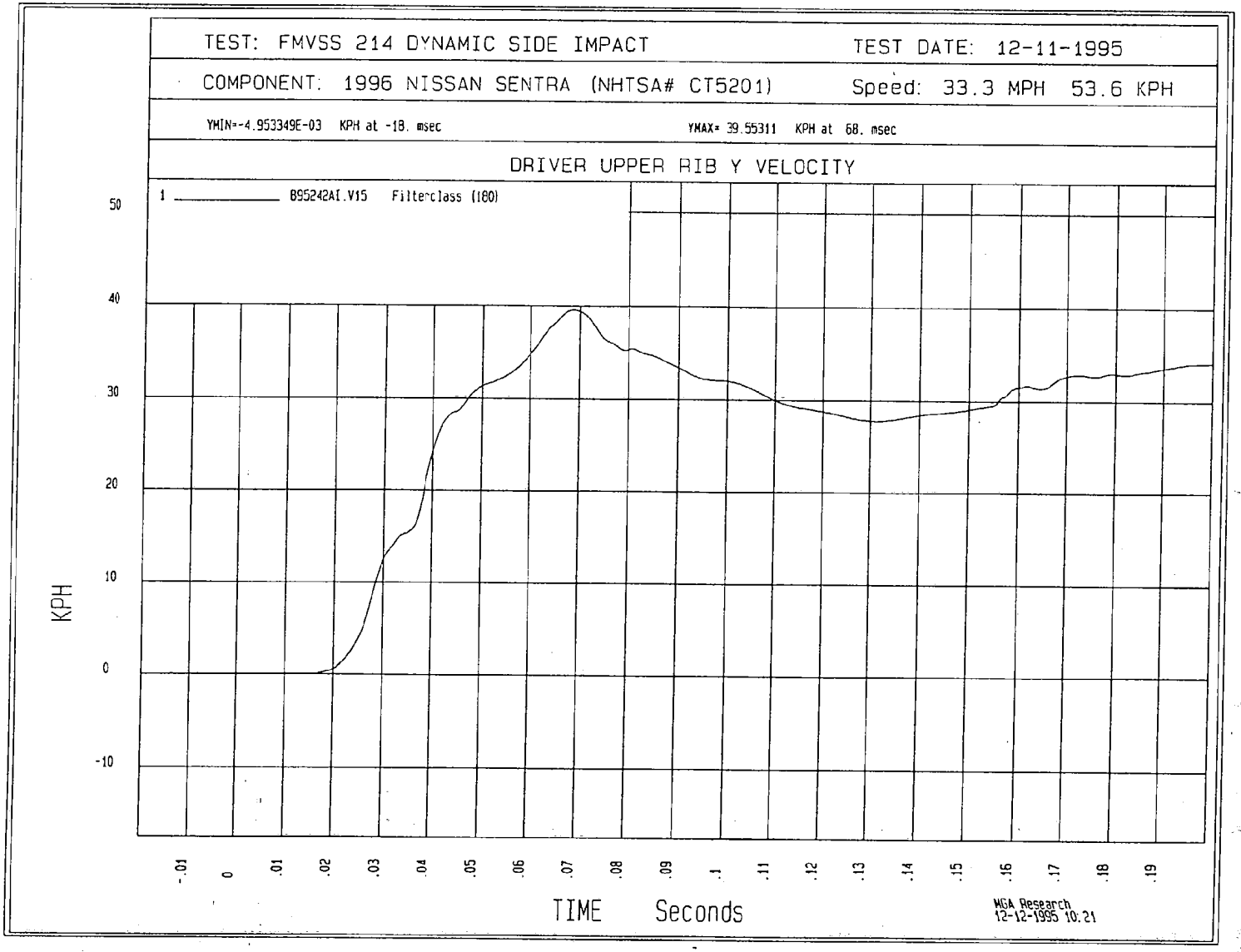
Table of Data Plots

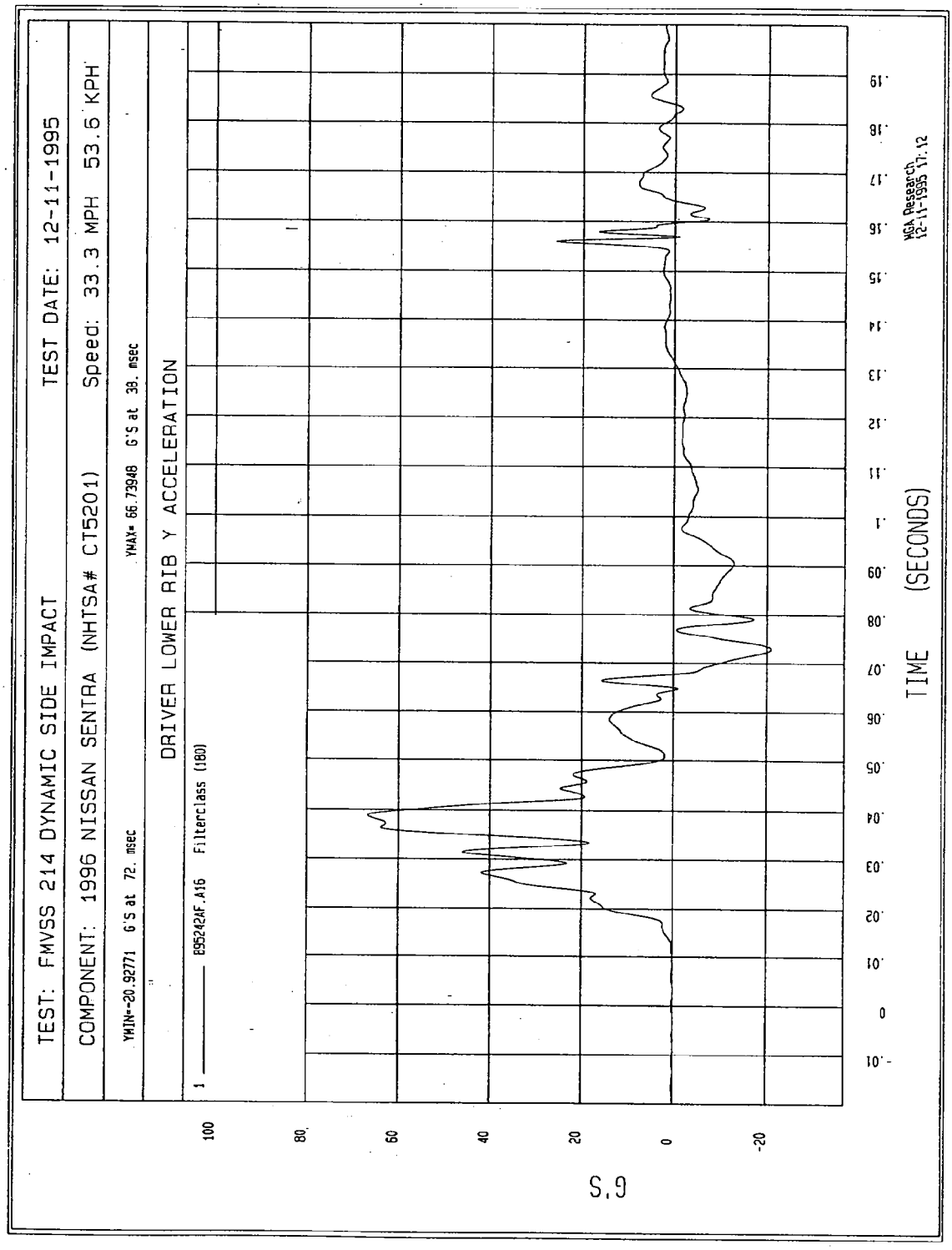


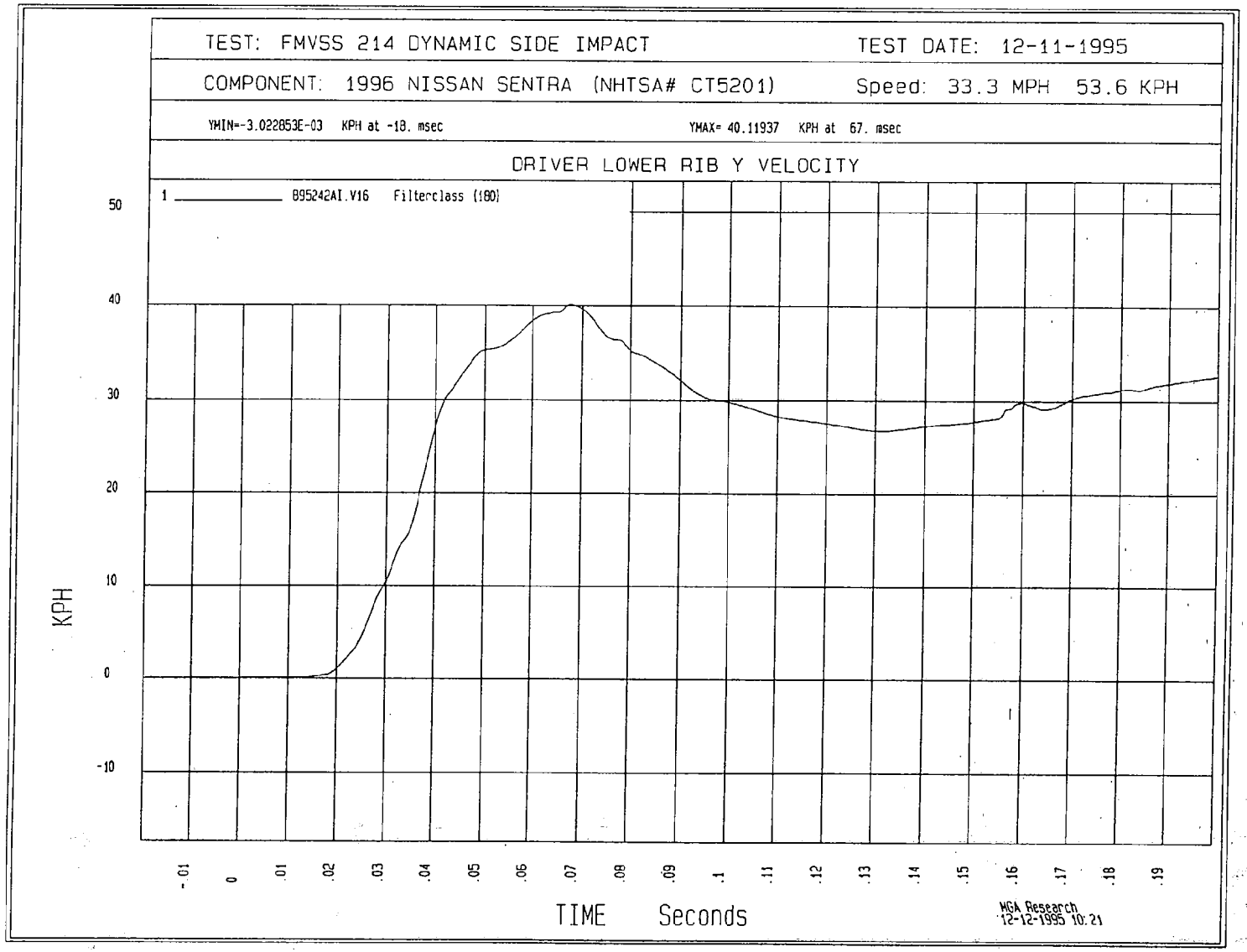
* No valid data collected

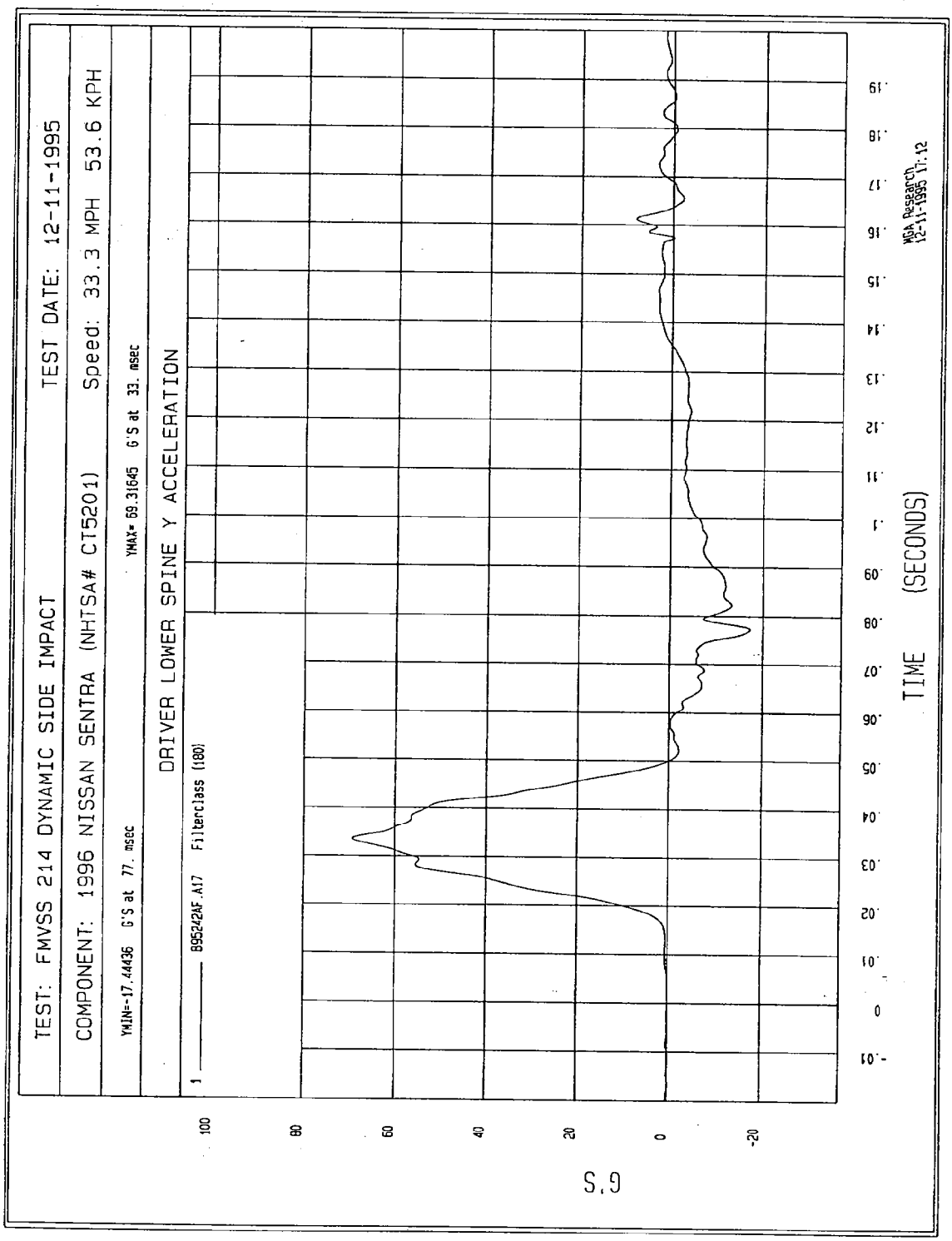
Table of Data Plots

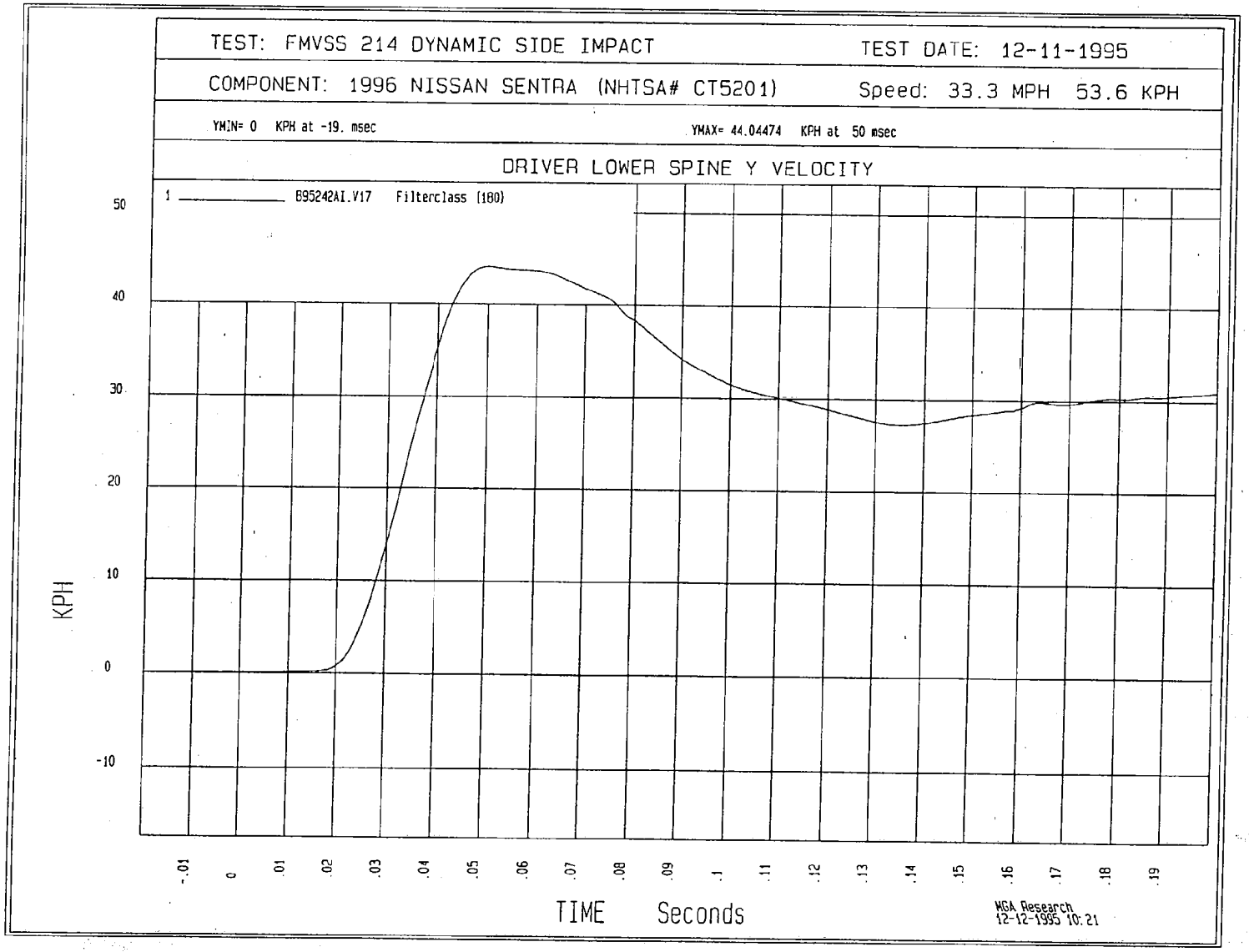

TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-22.97671 G'S at 73 msec
YMAX= 78.59909 G'S at 38. msec
DRIVER UPPER RIB Y ACCELERATION
1 B95242AF.A15 Filterclass (180)
100
80
60
40
20
0
-20
G'S
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
12-11-1995 17:11


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-4.953349E-03 KPH at -18. msec
YMAX= 39.55311 KPH at 68. msec
DRIVER UPPER RIB Y VELOCITY
1 B95242AI.V15 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME Seconds
MGA Research
12-12-1995 10:21


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-20.92771 G'S at 72. msec
YMAX= 66.73948 G'S at 38. msec
DRIVER LOWER RIB Y ACCELERATION
1 E952424F.A16 Filterclass (180)
100
80
60
40
20
0
-20
G'S
TIME (SECONDS)
MGA Research
12-11-1995 17:12


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-3.022853E-03 KPH at -18. msec
YMAX= 40.11937 KPH at 67. msec
DRIVER LOWER RIB Y VELOCITY
1 B95242AI.V16 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME Seconds
MGA Research
12-12-1995 10:21


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-17.44436 G'S at 77. msec
YMAX= 69.31645 G'S at 33. msec
DRIVER LOWER SPINE Y ACCELERATION
1 B95242AF.A17 Filterclass (180)
100
80
60
40
20
0
-20
G's
.19
.18
.17
.16
.15
.14
.13
.12
.11
.1
.09
.08
.07
.06
.05
.04
.03
.02
.01
0
-.01
TIME (SECONDS)
MGA Research
12-11-1995 17:12


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN= 0 KPH at -19. msec
YMAX= 44.04474 KPH at 50 msec
DRIVER LOWER SPINE Y VELOCITY
1 B95242AI.V17 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
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.14
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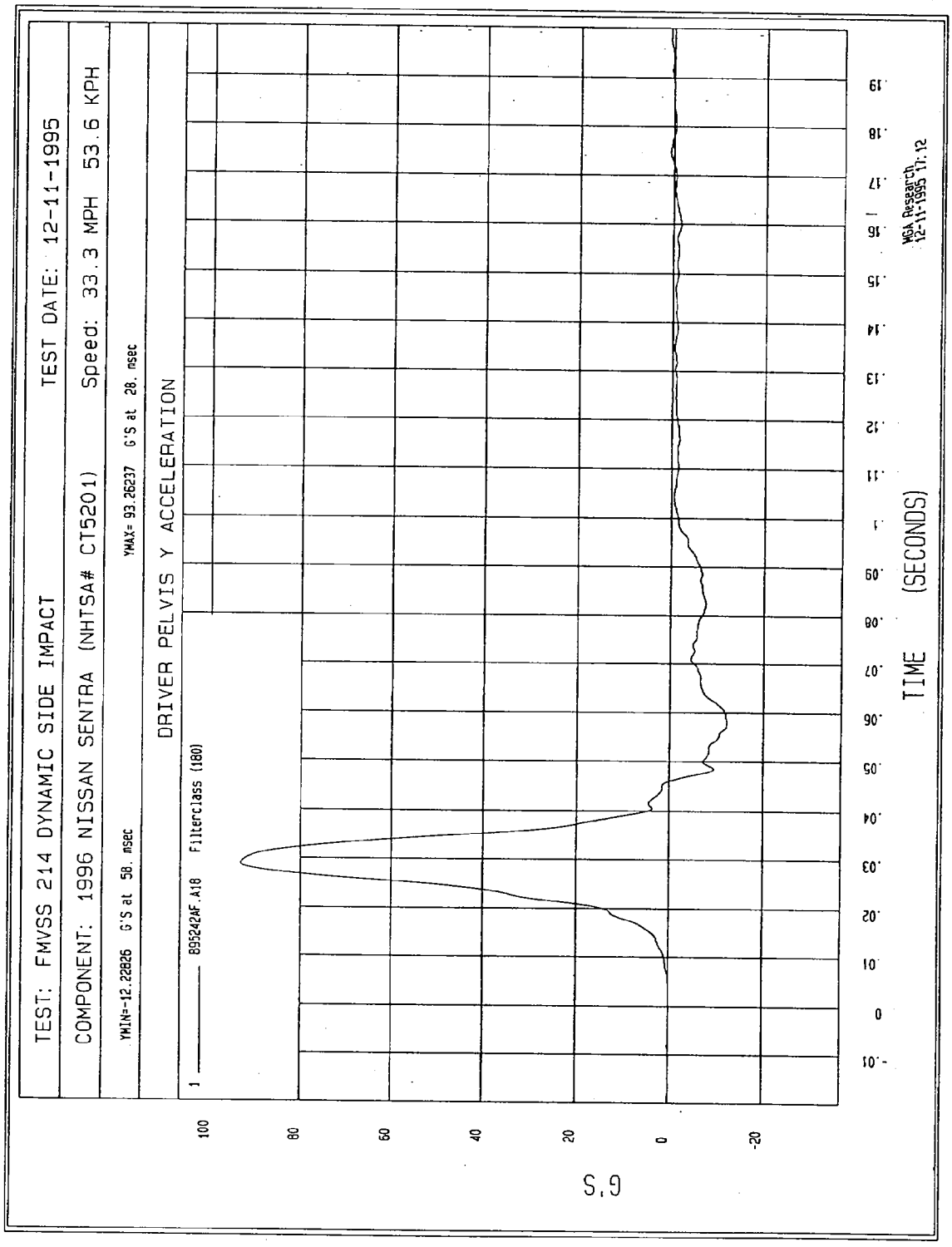
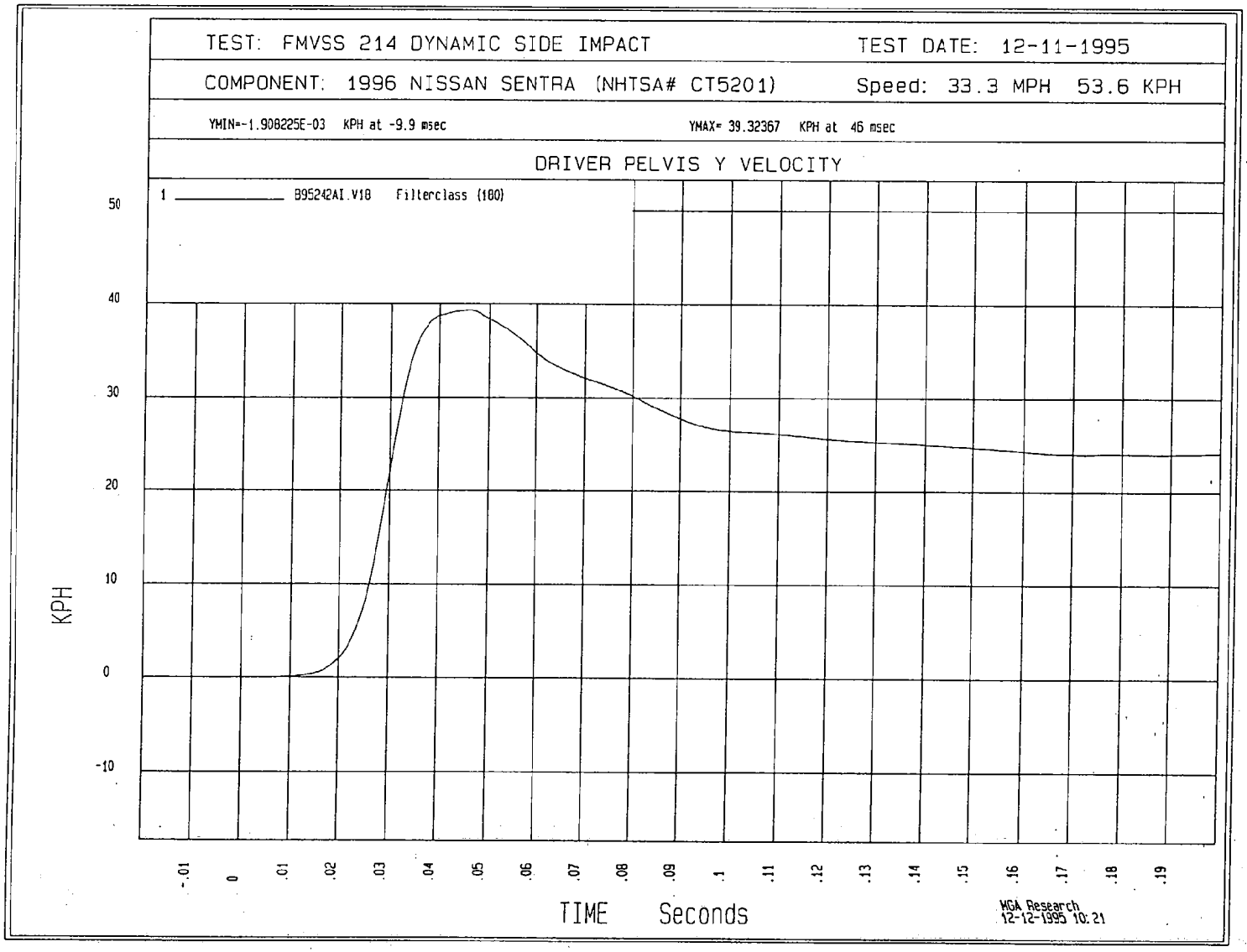
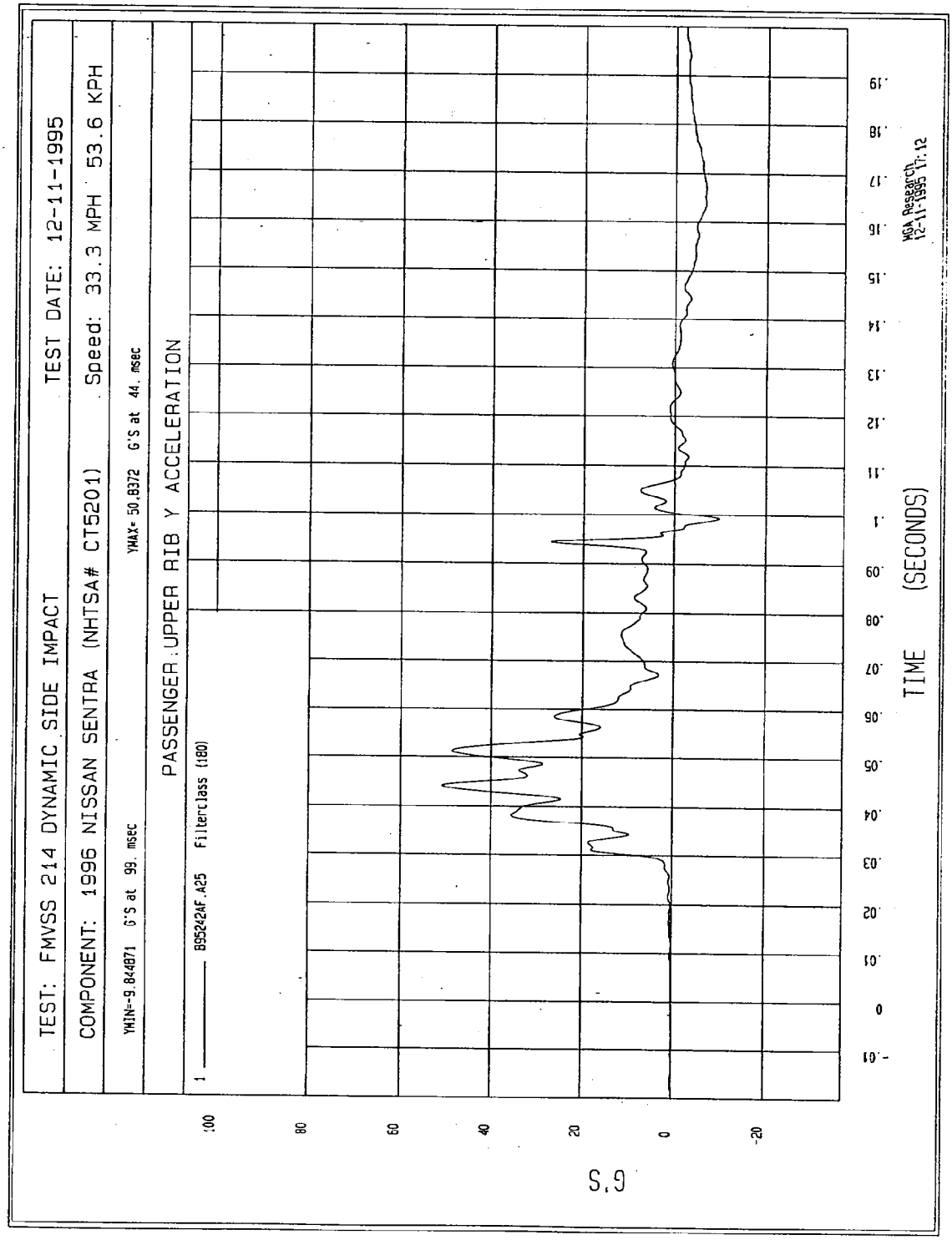
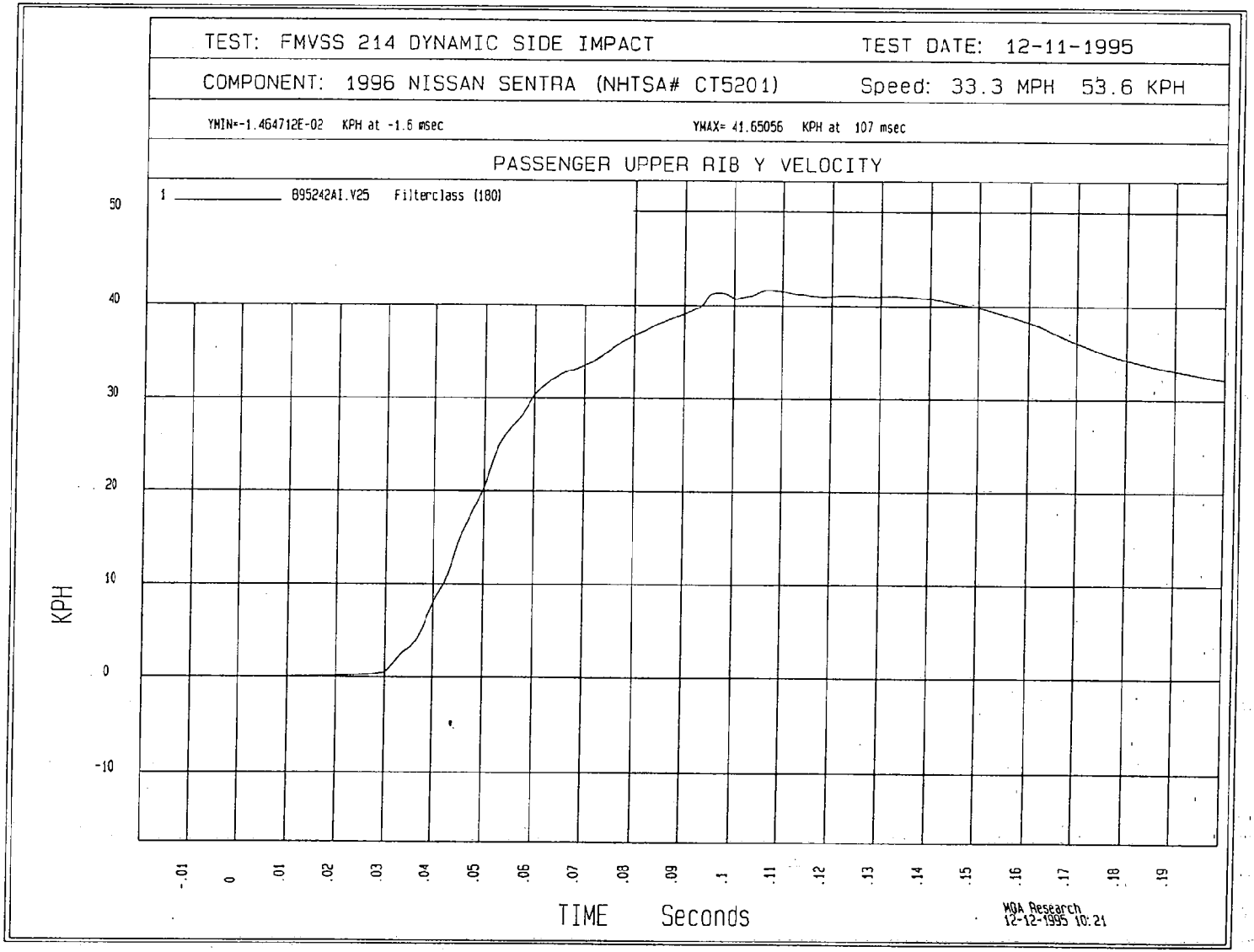
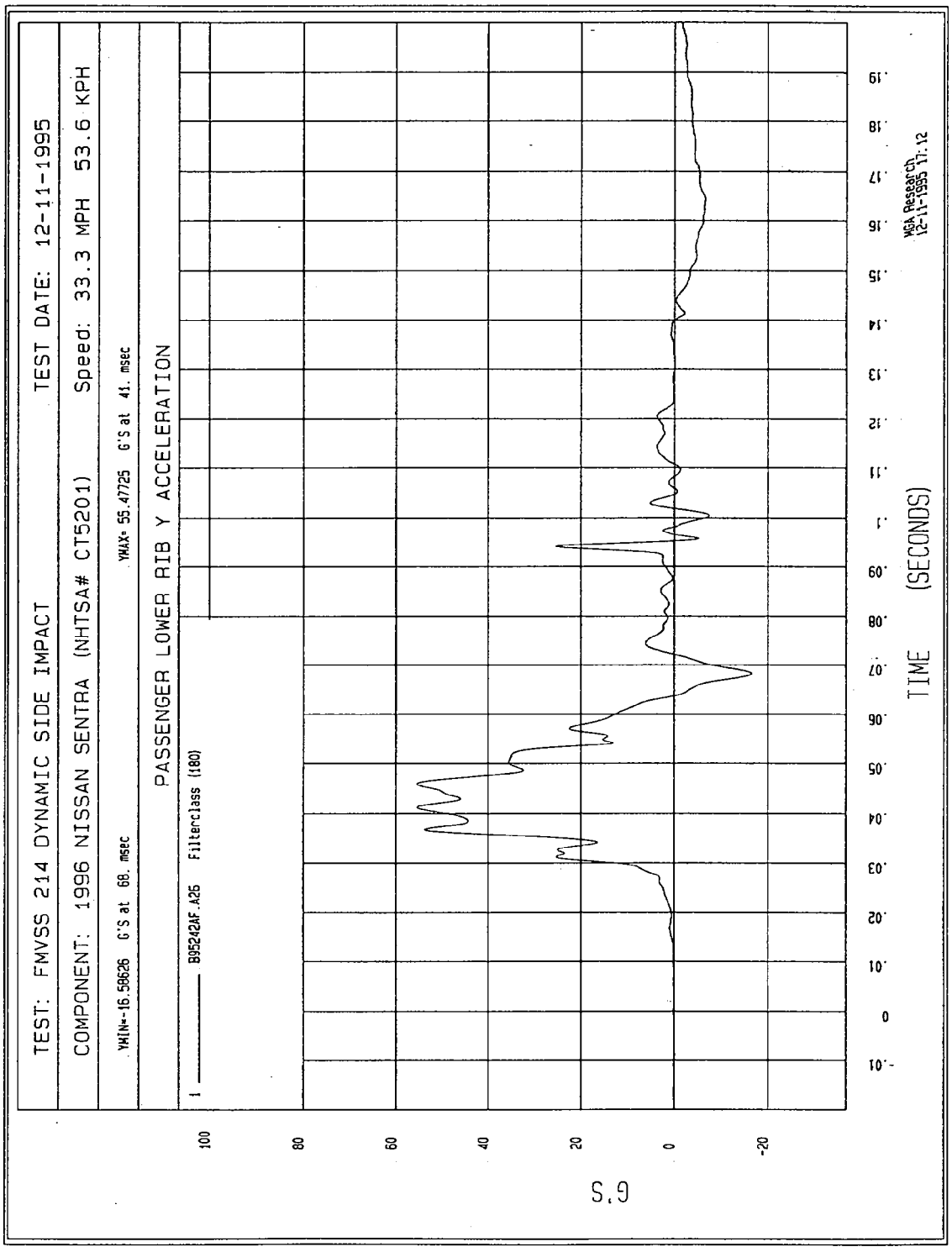
.16
.17
.18
.19
TIME Seconds
MGA Research
12-12-1995 10:21

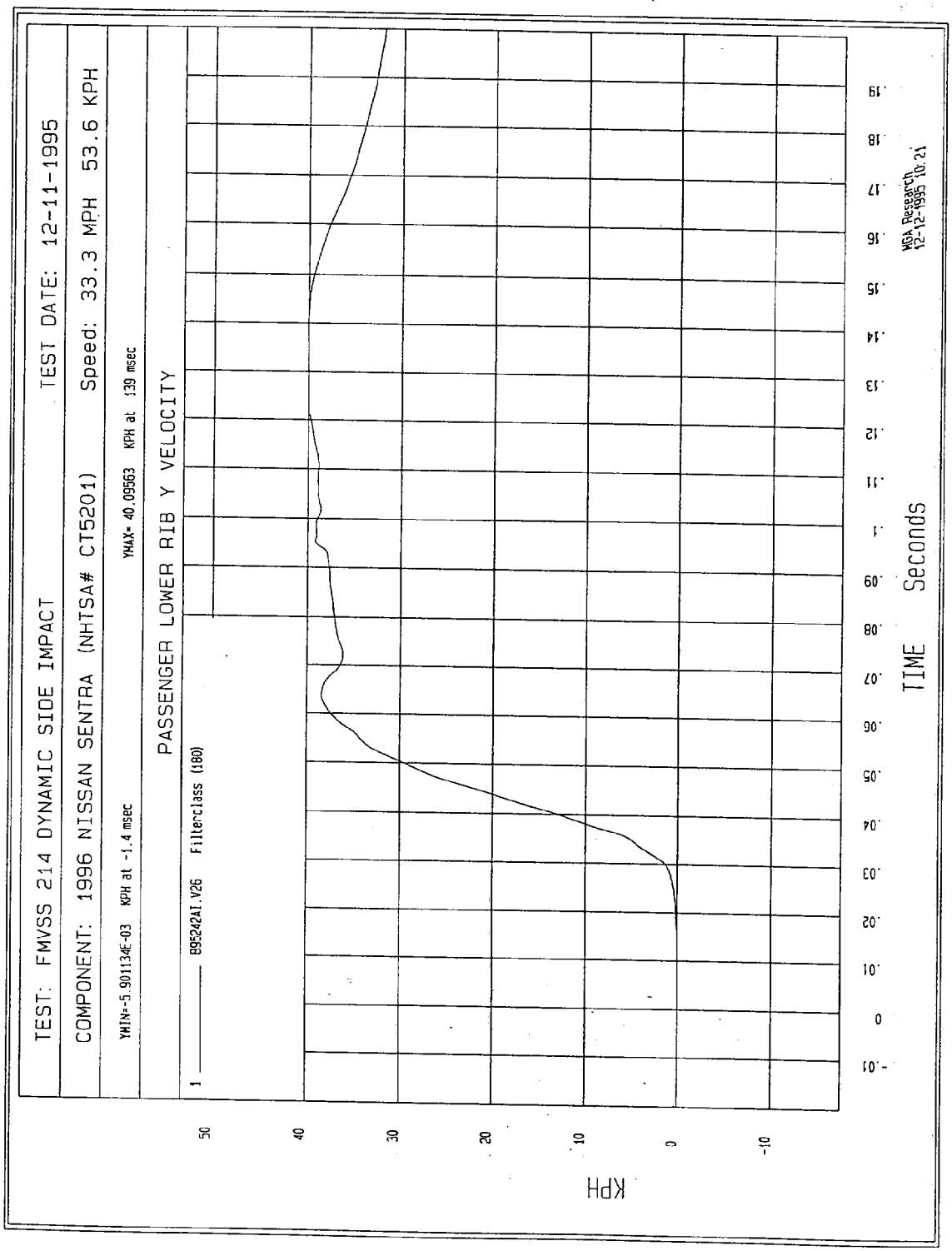

TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-12.22826 G'S at 58. msec
YMAX= 93.26237 G'S at 28. msec
DRIVER PELVIS Y ACCELERATION
1 B952424F.A18 Filterclass (180)
100
80
60
40
20
0
-20
G'S
.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
12-11-1995 11:12

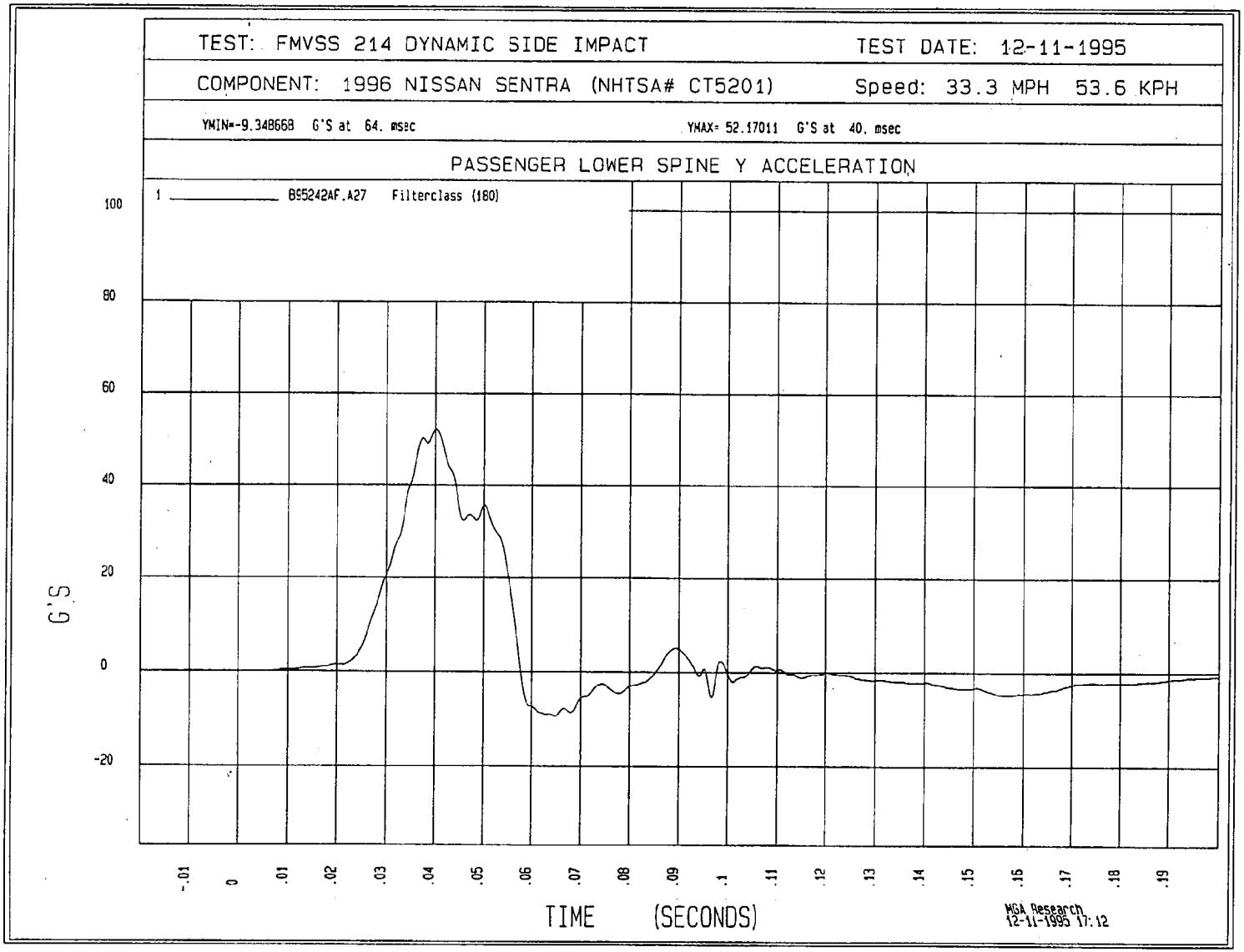

TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-1.908225E-03 KPH at -9.9 msec
YMAX= 39.32367 KPH at 46 msec
DRIVER PELVIS Y VELOCITY
1 B95242AI.V18 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME Seconds
MGA Research
12-12-1995 10:21

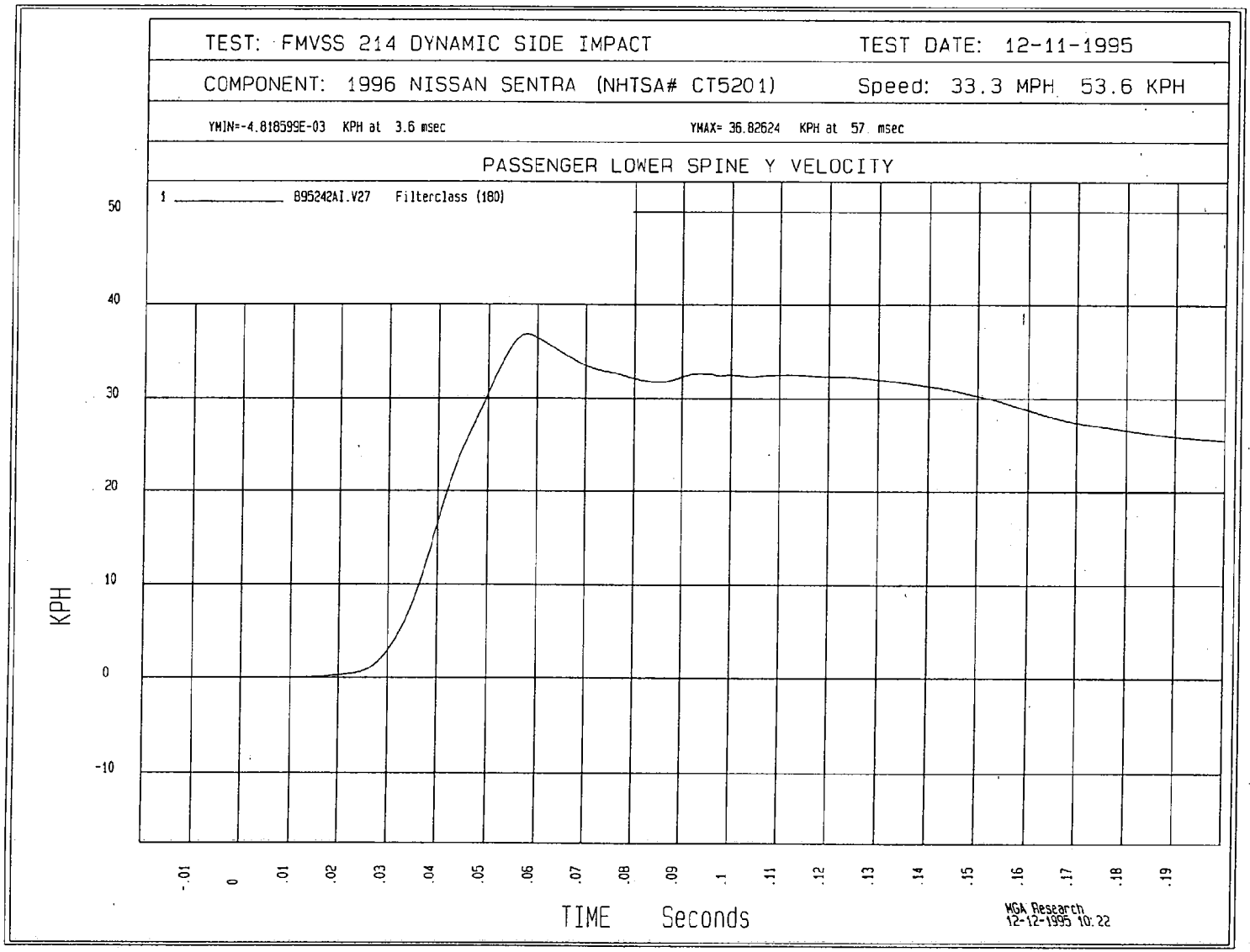

TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-9.840871 G'S at 99. msec
YMAX= 50.8372 G'S at 44. msec
PASSENGER UPPER RIB Y ACCELERATION
1 B952424F.A25 Filterclass (180)
100
80
60
40
20
0
-20
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
12-11-1995 17:12
G's


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-1.464712E-02 KPH at -1.6 msec
YMAX= 41.65056 KPH at 107 msec
PASSENGER UPPER RIB Y VELOCITY
1 B95242AI.V25 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME Seconds
MGA Research
12-12-1995 10:21


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-16.58626 G'S at 68. msec
YMAX= 55.47725 G'S at 41. msec
PASSENGER LOWER RIB Y ACCELERATION
1 B95242AF.A25 Filterclass (180)
G'S
TIME (SECONDS)
MGA Research
12-11-1995 11:12


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-5.901134E-03 KPH at -1.4 msec
YMAX= 40.09563 KPH at 139 msec
PASSENGER LOWER RIB Y VELOCITY
1 B95242AI.V26 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME Seconds
MGA Research
12-12-1995 10:21


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-9.348668 G'S at 64. msec
YMAX= 52.17011 G'S at 40. msec
PASSENGER LOWER SPINE Y ACCELERATION
1 B95242AF.A27 Filterclass (180)
100
80
60
40
20
0
-20
G'S
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
12-11-1995 17:12


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-4.818599E-03 KPH at 3.6 msec
YMAX= 36.82624 KPH at 57 msec
PASSENGER LOWER SPINE Y VELOCITY
1 B95242AI.V27 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
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.14
.15
.16
.17
.18
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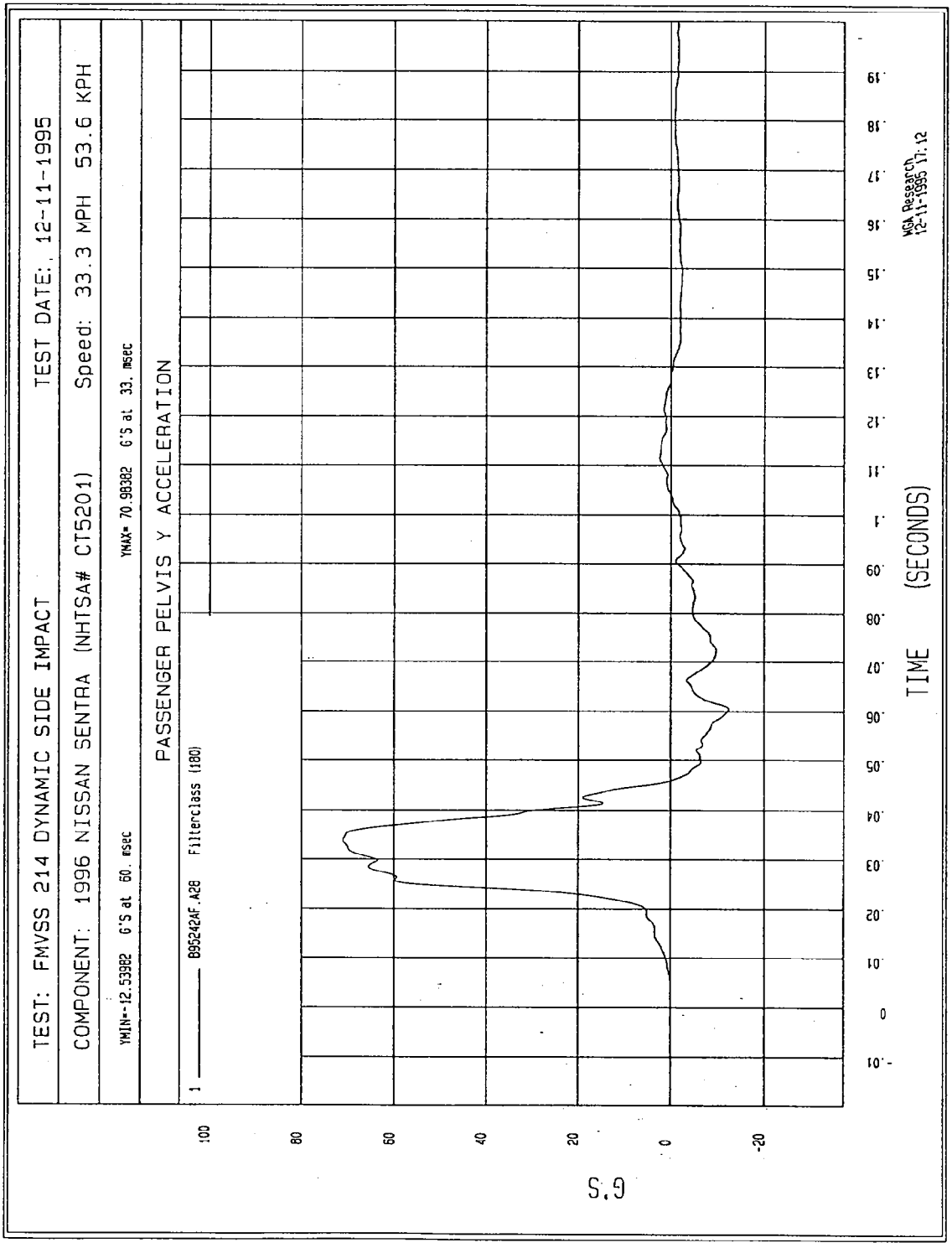
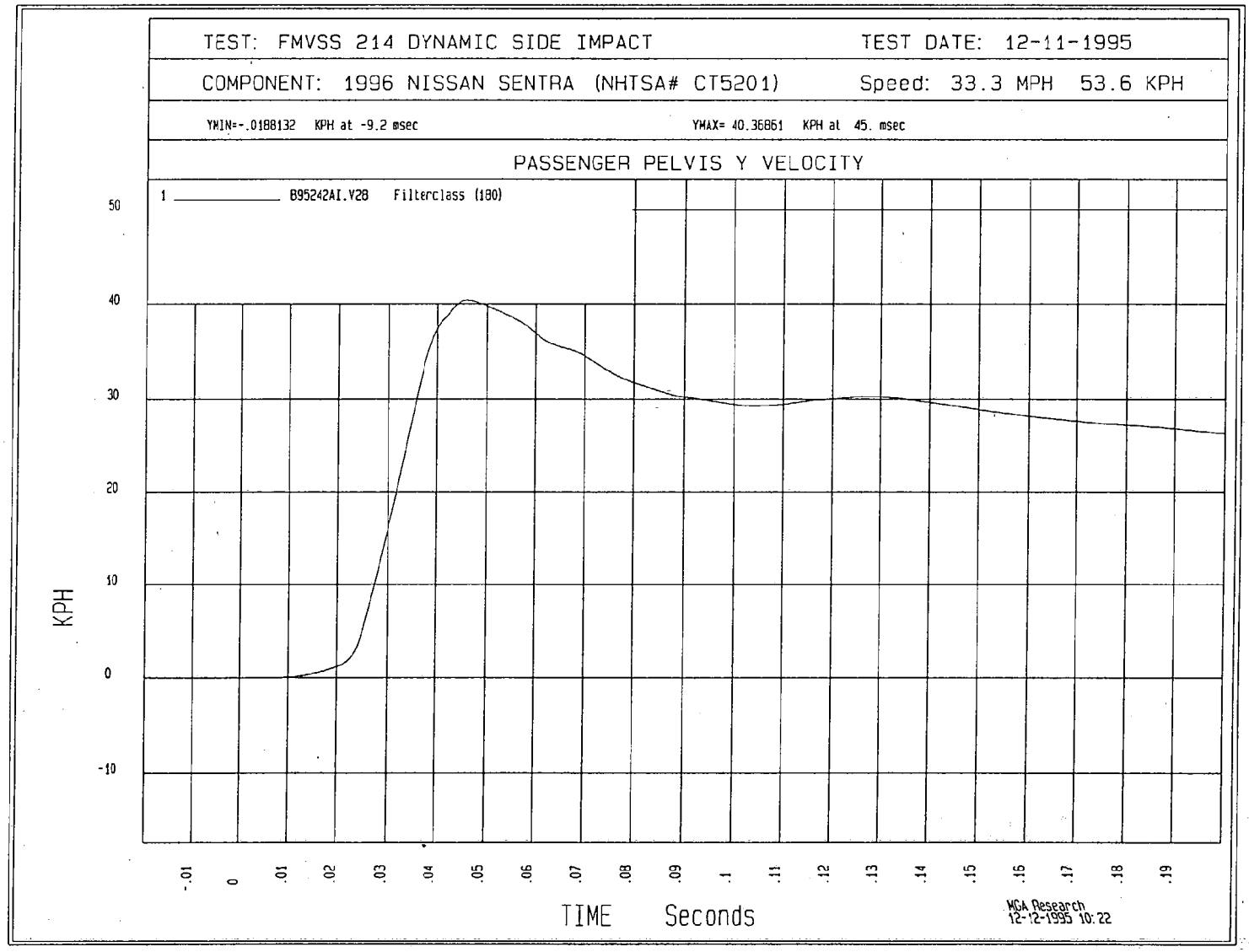
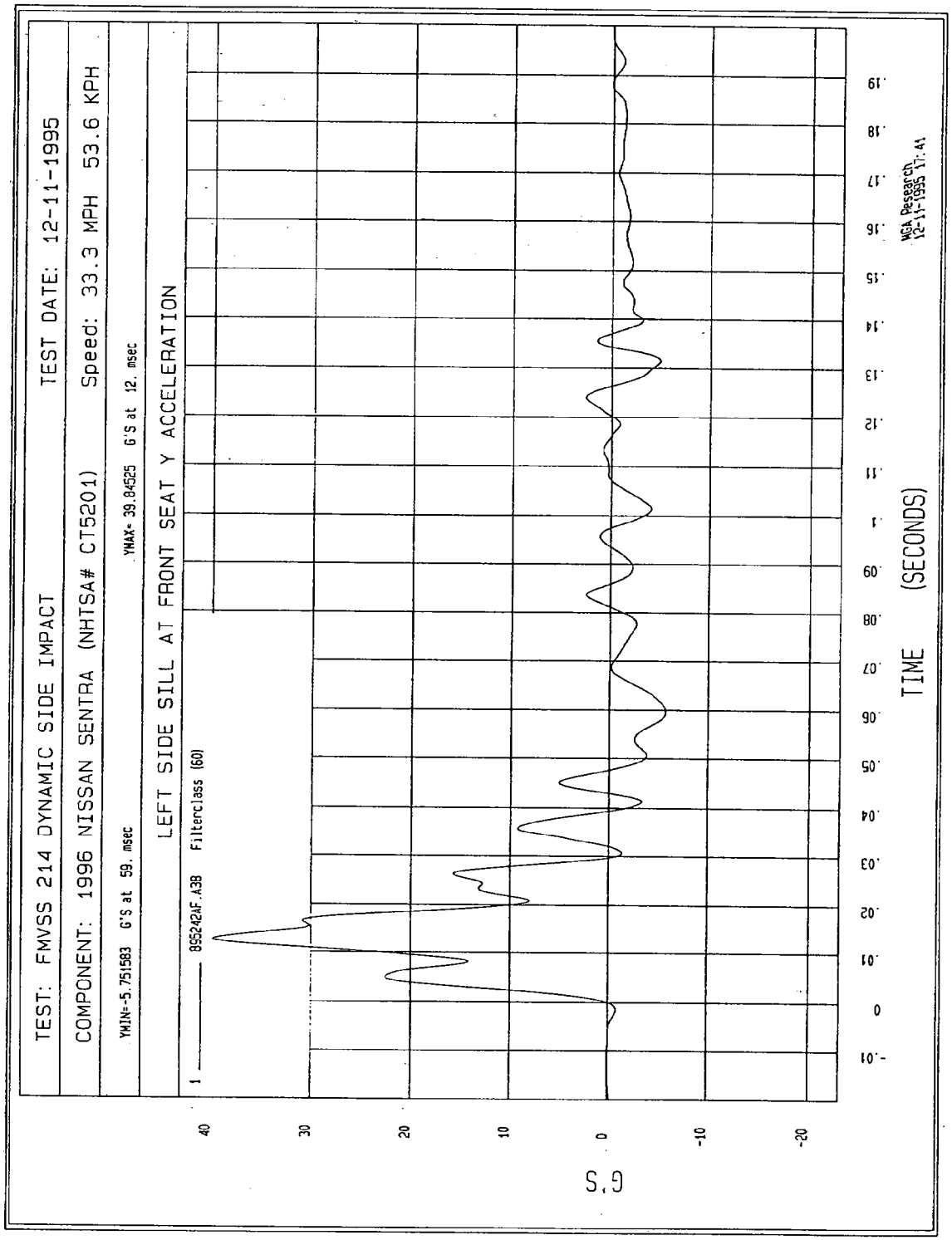
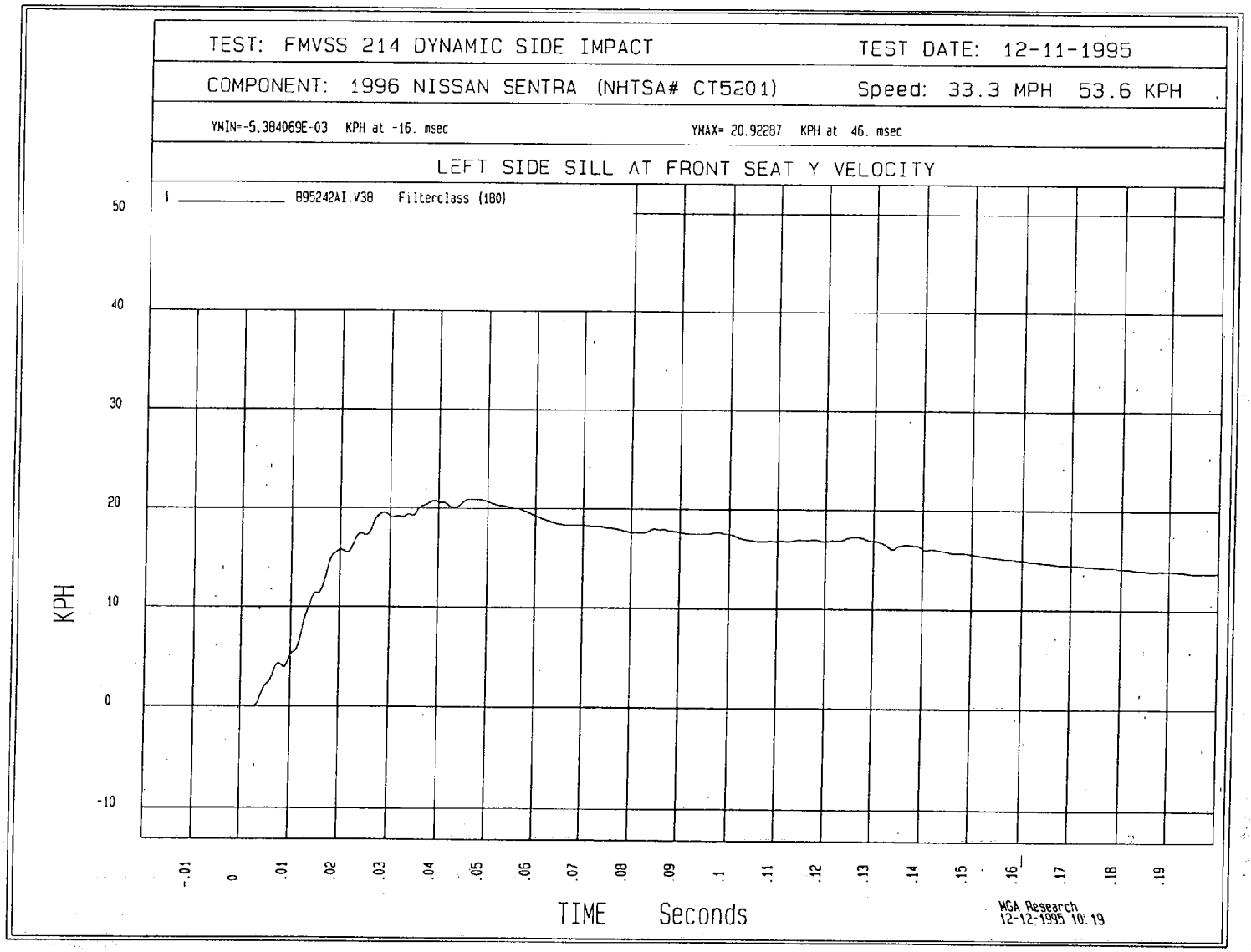
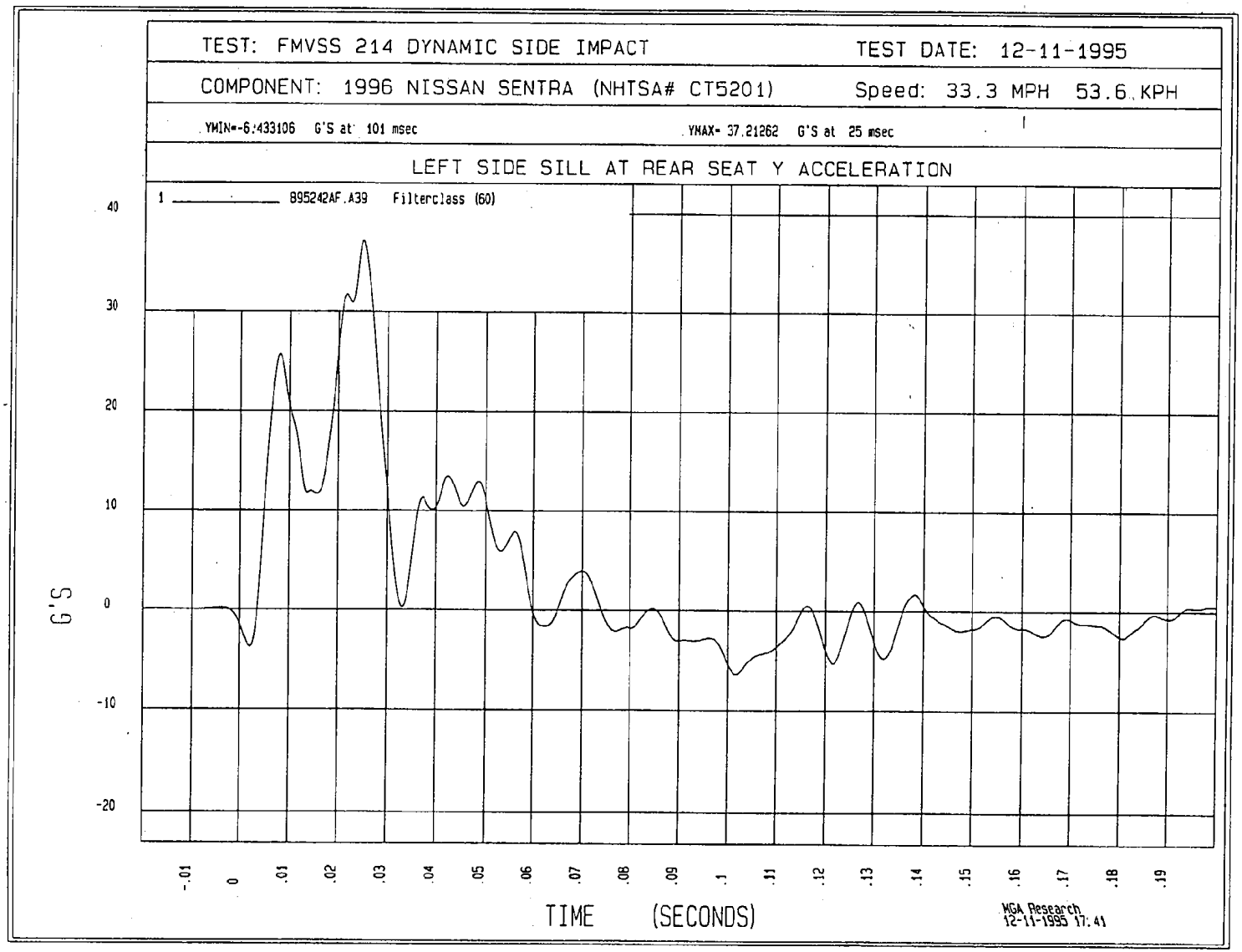
TIME Seconds
MGA Research
12-12-1995 10:22


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-12.53982 G'S at 60. msec
YMAX= 70.98382 G'S at 33. msec
PASSENGER PELVIS Y ACCELERATION
1 B95242AF.A2B Filterclass (180)
100
80
60
40
20
0
-20
G's
TIME (SECONDS)
MGA Research
12-11-1995 17:12


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-.0188132 KPH at -9.2 msec
YMAX= 40.36861 KPH at 45. msec
PASSENGER PELVIS Y VELOCITY
1 B95242AI.V28 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME Seconds
MGA Research
12-12-1995 10:22


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-5.751563 G'S at 59. msec
YMAX= 39.84525 G'S at 12. msec
LEFT SIDE SILL AT FRONT SEAT Y ACCELERATION
1 ——— 9952424F.A3B Filterclass (60)
40
30
20
10
0
-10
-20
G'S
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
12-11-1995 17:44


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-5.384069E-03 KPH at -16. msec
YMAX= 20.92287 KPH at 46. msec
LEFT SIDE SILL AT FRONT SEAT Y VELOCITY
1 B95242AI.V38 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME Seconds
MGA Research
12-12-1995 10:19


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-6.433106 G'S at 101 msec
YMAX= 37.21262 G'S at 25 msec
LEFT SIDE SILL AT REAR SEAT Y ACCELERATION
1 895242AF.A39 Filterclass (60)
40
30
20
10
0
-10
-20
G'S
-.01
0
.01
.02
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.04
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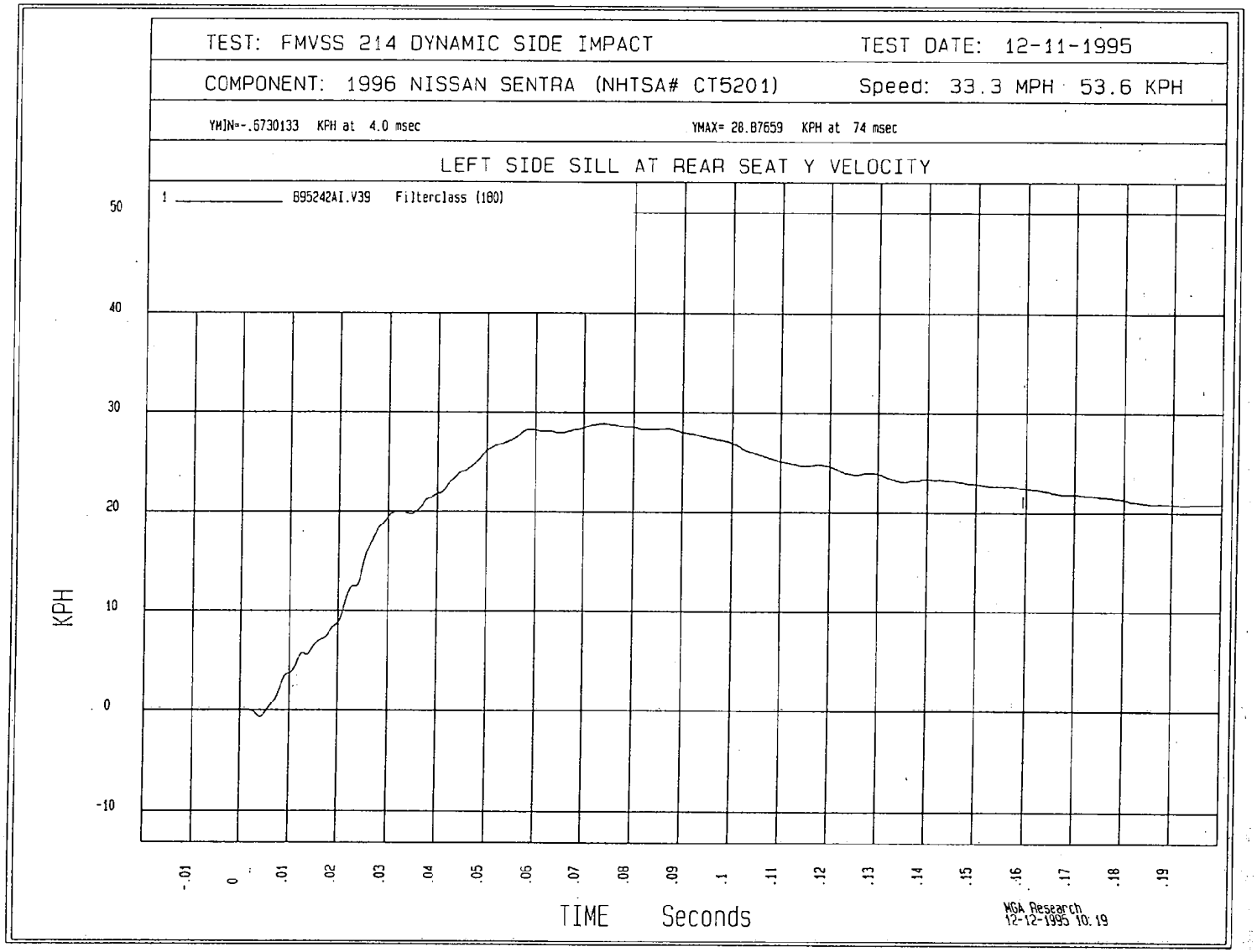
TIME (SECONDS)
MGA Research
12-11-1995 17:41


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-.6730133 KPH at 4.0 msec
YMAX= 28.87659 KPH at 74 msec
LEFT SIDE SILL AT REAR SEAT Y VELOCITY
1 895242AI.V39 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
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.02
.03
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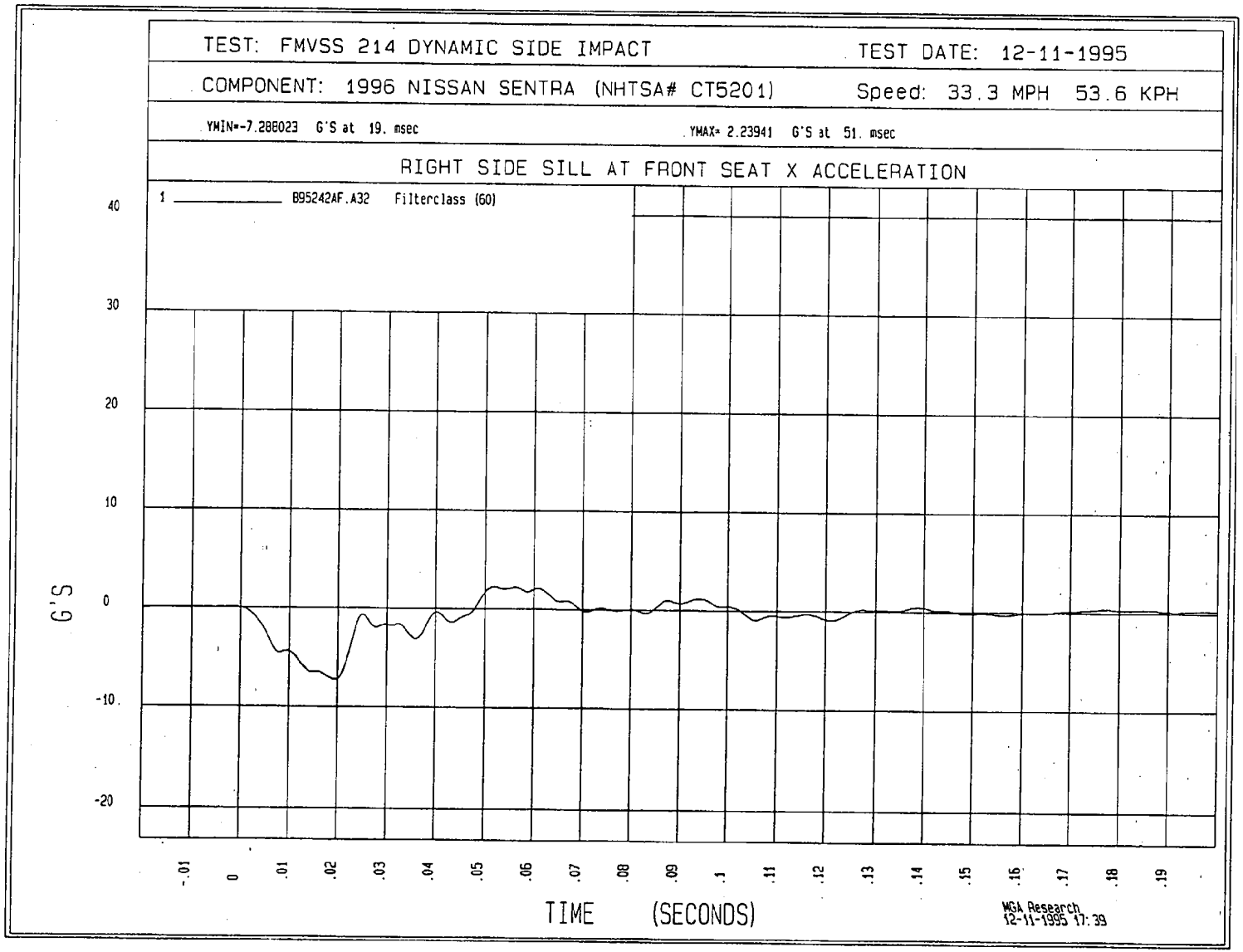
TIME Seconds
MGA Research
12-12-1995 10:19


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-7.288023 G'S at 19. msec
YMAX= 2.23941 G'S at 51. msec
RIGHT SIDE SILL AT FRONT SEAT X ACCELERATION
1 B95242AF.A32 Filterclass (60)
40
30
20
10
0
-10
-20
G'S
-.01
0
.01
.02
.03
.04
.05
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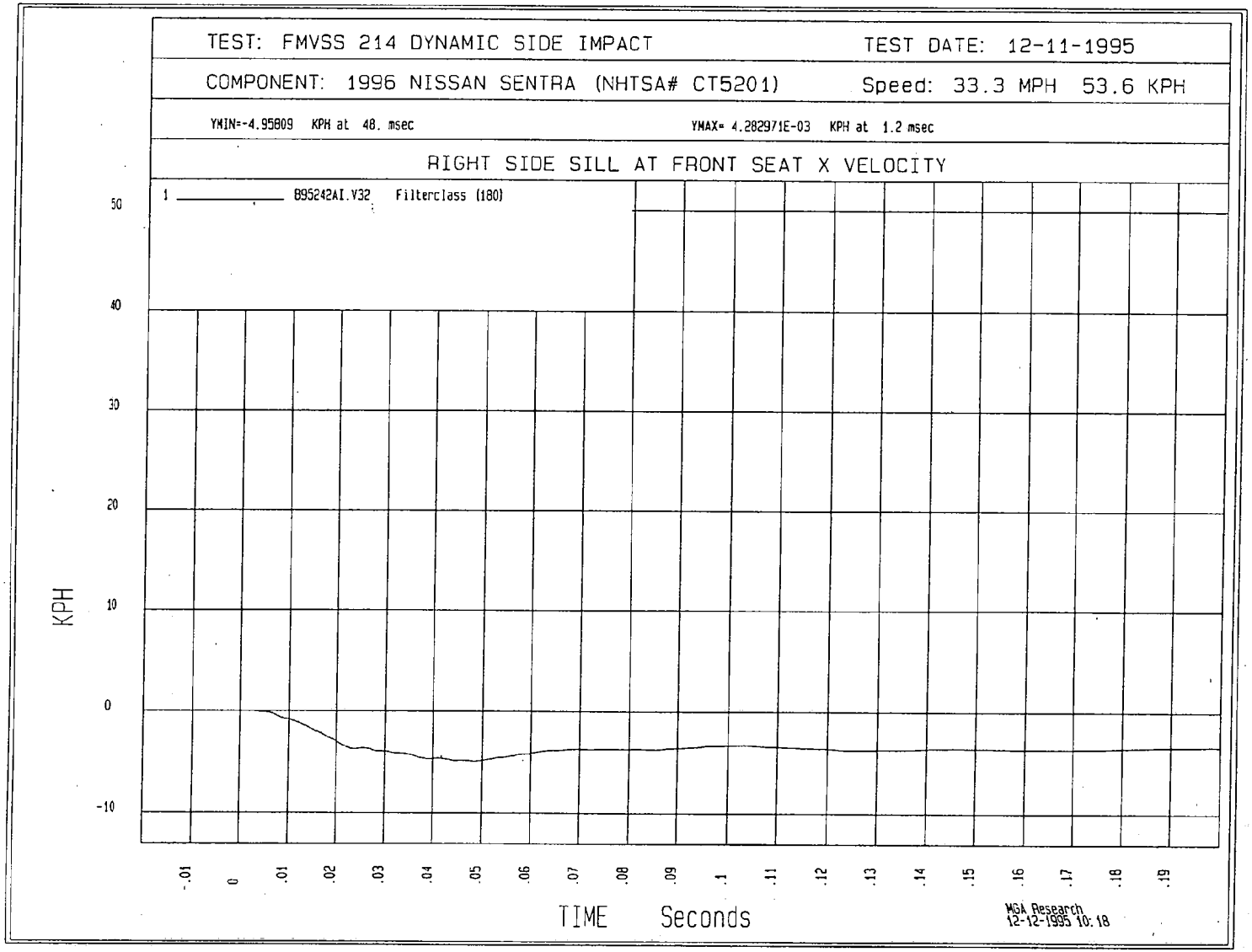
TIME (SECONDS)
MGA Research
12-11-1995 17:39


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-4.95809 KPH at 48. msec
YMAX= 4.282971E-03 KPH at 1.2 msec
RIGHT SIDE SILL AT FRONT SEAT X VELOCITY
1 B95242AI.V32 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.01
.02
.03
.04
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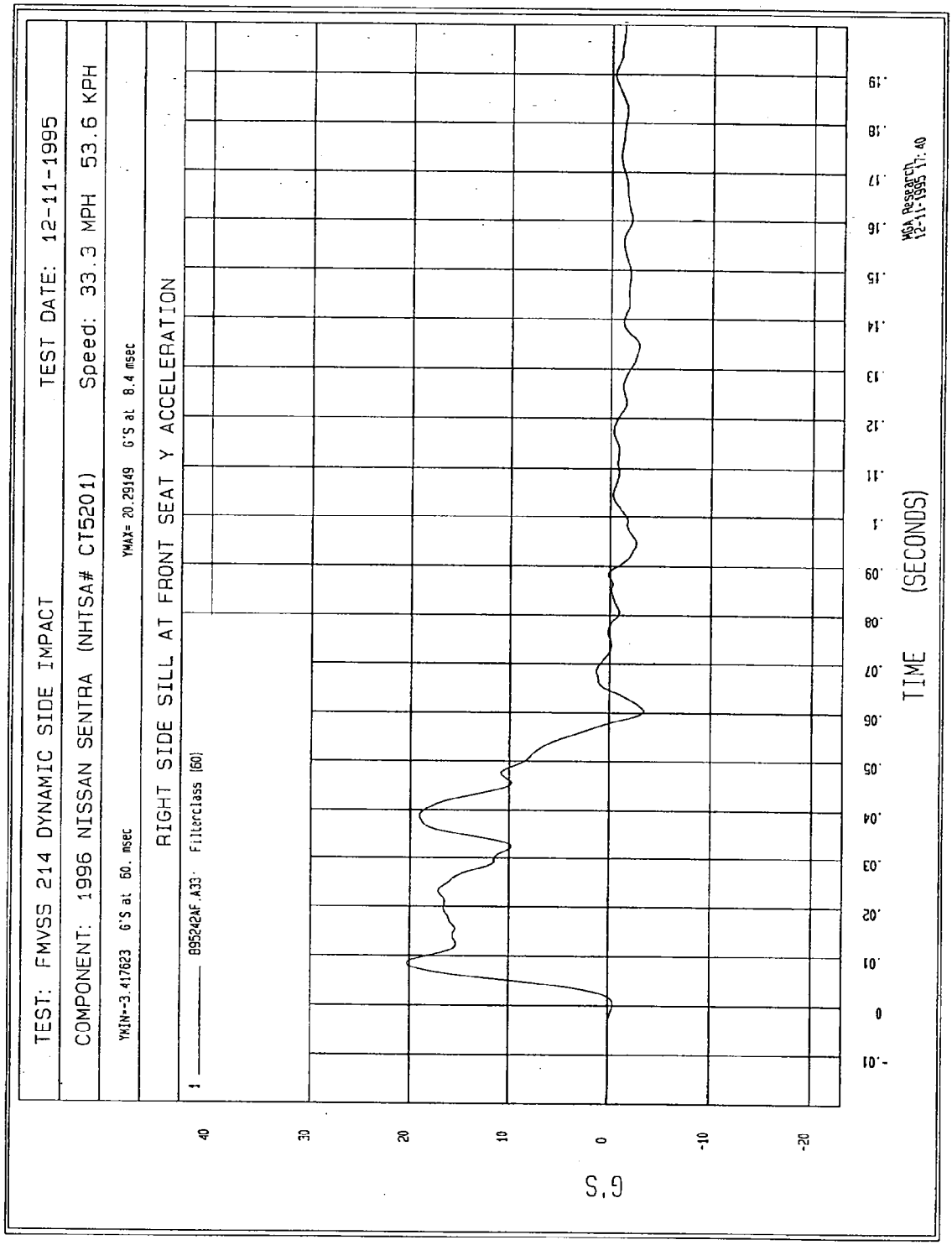
TIME Seconds
MGA Research
12-12-1995 10:18


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-3.417623 G'S at 60. msec
YMAX= 20.29149 G'S at 8.4 msec
RIGHT SIDE SILL AT FRONT SEAT Y ACCELERATION
1 B95242AF.A33: Filterclass (60)
40
30
20
10
0
-10
-20
G'S
-.01
0
.01
.02
.03
.04
.05
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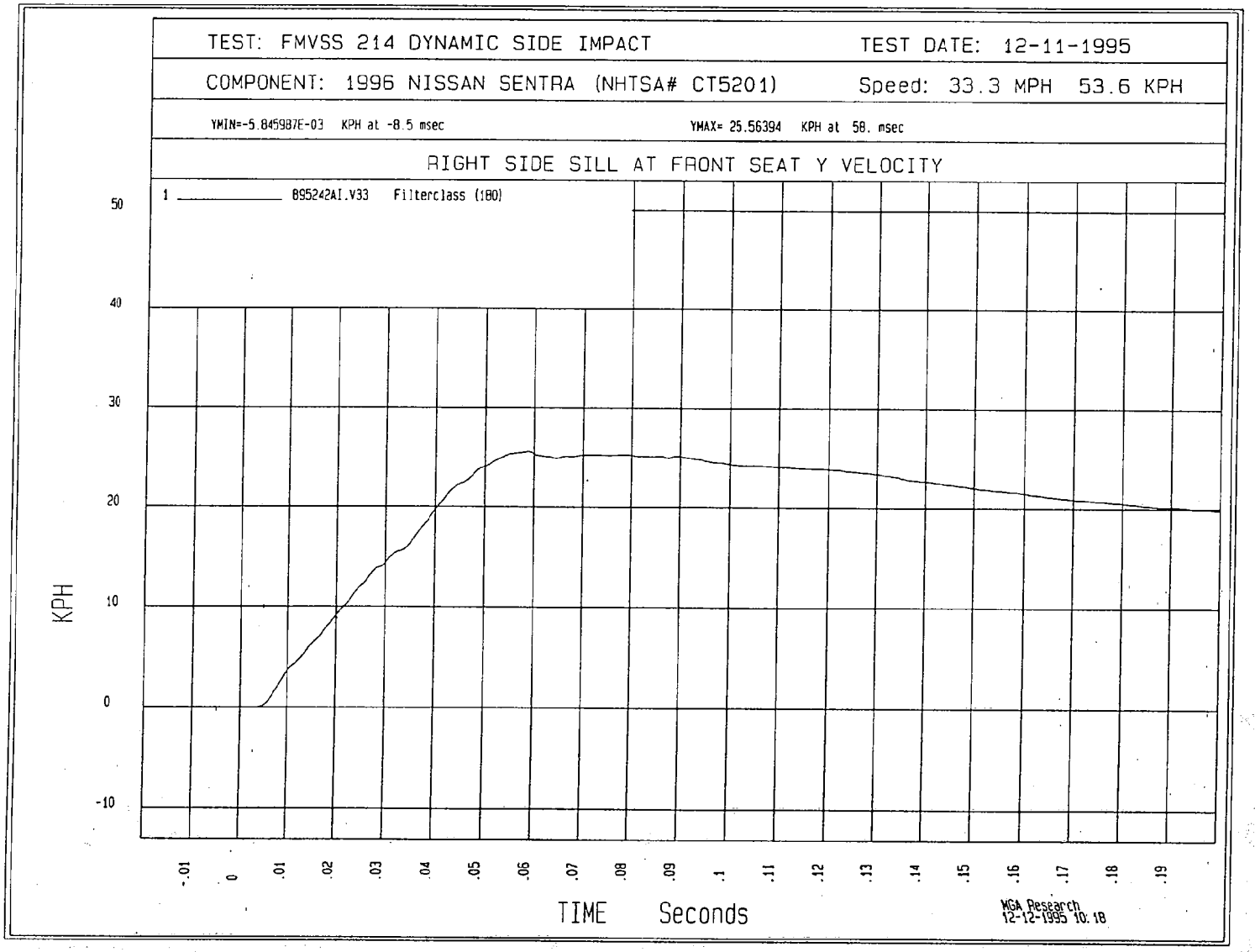
TIME (SECONDS)
MGA Research
12-11-1995 17:40


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-5.845987E-03 KPH at -8.5 msec
YMAX= 25.56394 KPH at 58. msec
RIGHT SIDE SILL AT FRONT SEAT Y VELOCITY
1 B95242AI.V33 Filterclass (180)
KPH
50
40
30
20
10
0
-10
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0
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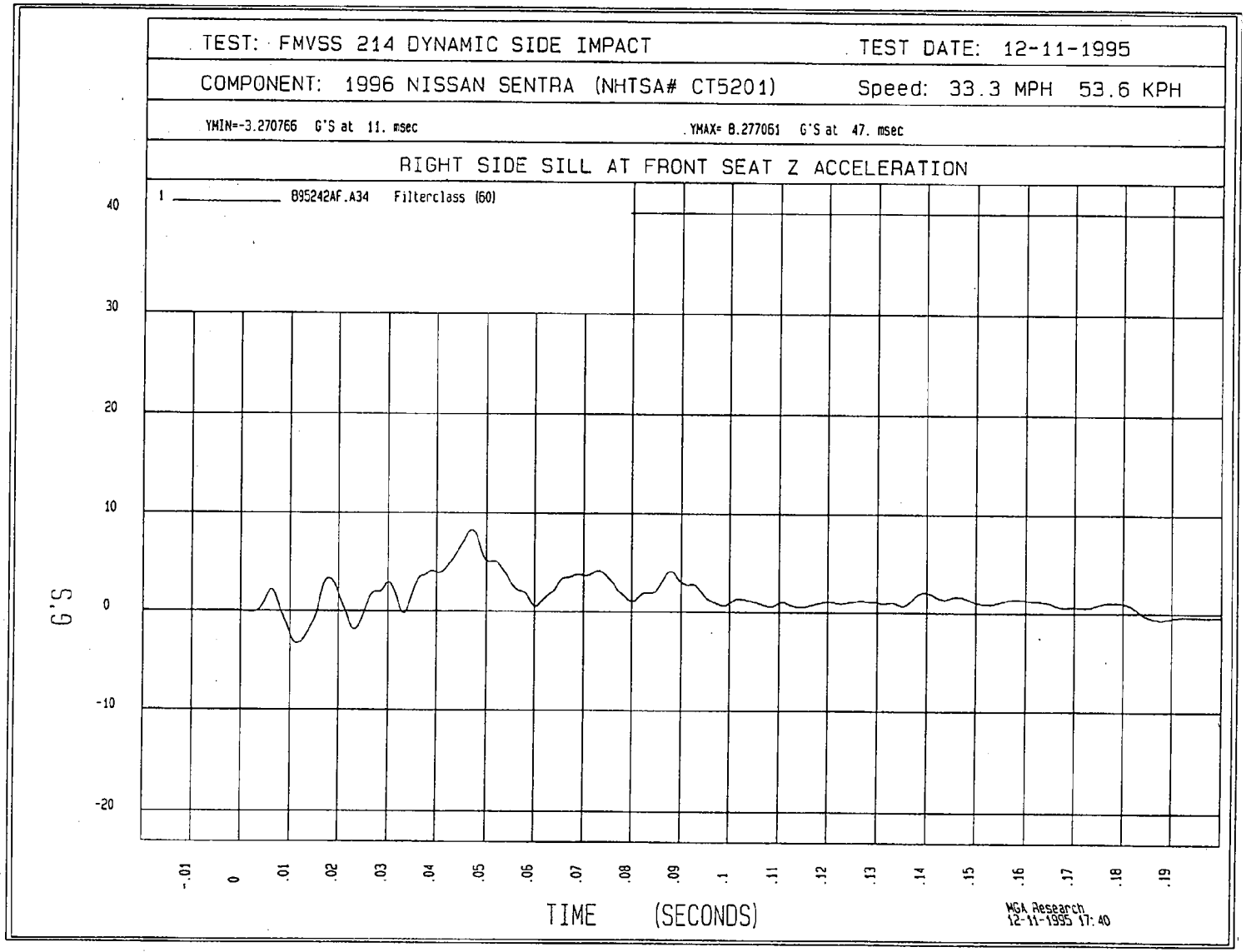
TIME Seconds
MGA Research
12-12-1995 10:18


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-3.270766 G'S at 11. msec
YMAX= 8.277061 G'S at 47. msec
RIGHT SIDE SILL AT FRONT SEAT Z ACCELERATION
1 B95242AF.A34 Filterclass (60)
40
30
20
10
0
-10
-20
G'S
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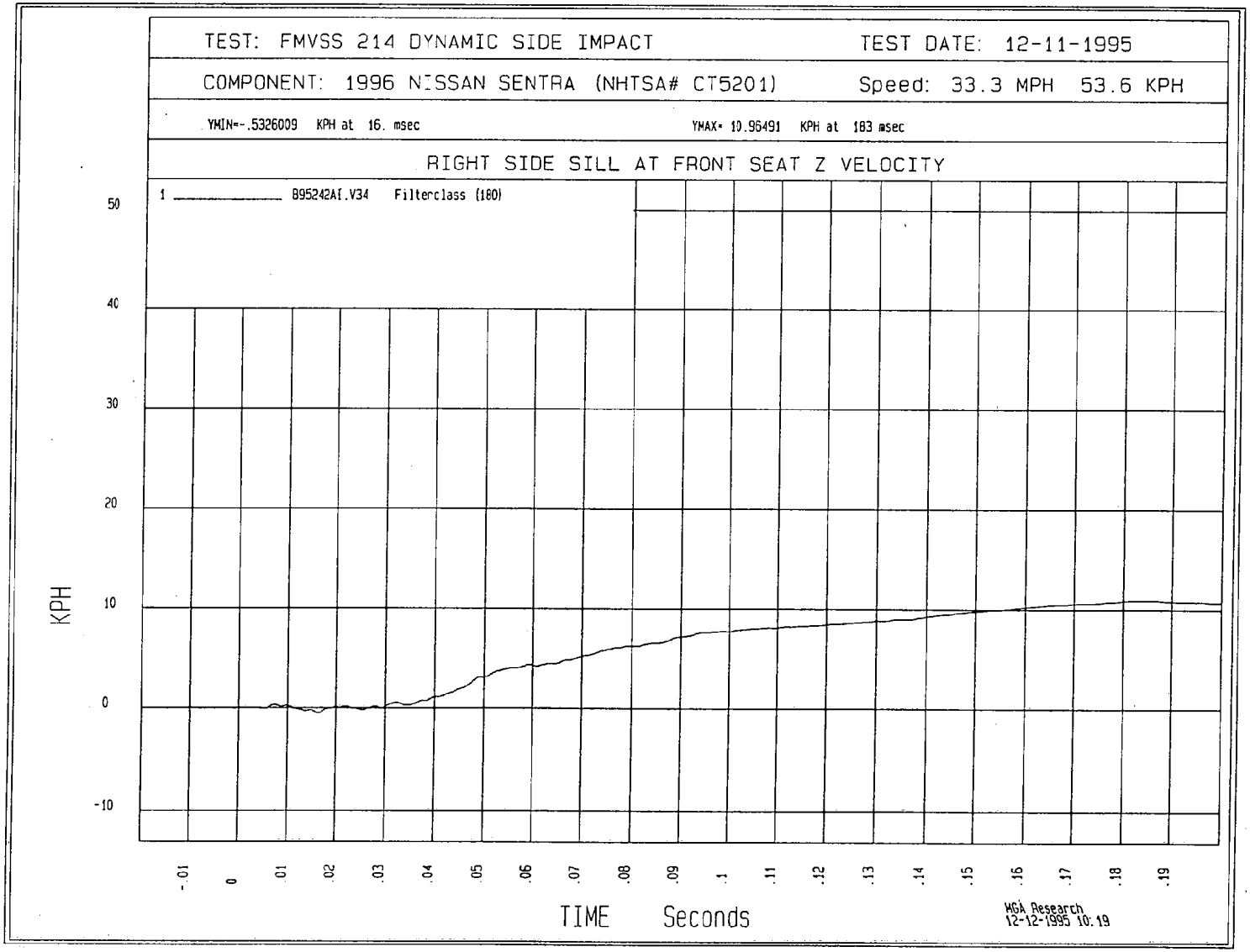
TIME (SECONDS)
MGA Research
12-11-1995 17:40


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-.5326009 KPH at 16. msec
YMAX= 10.96491 KPH at 183 msec
RIGHT SIDE SILL AT FRONT SEAT Z VELOCITY
1 B95242AI.V34 Filterclass (180)
50
40
30
20
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0
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KPH
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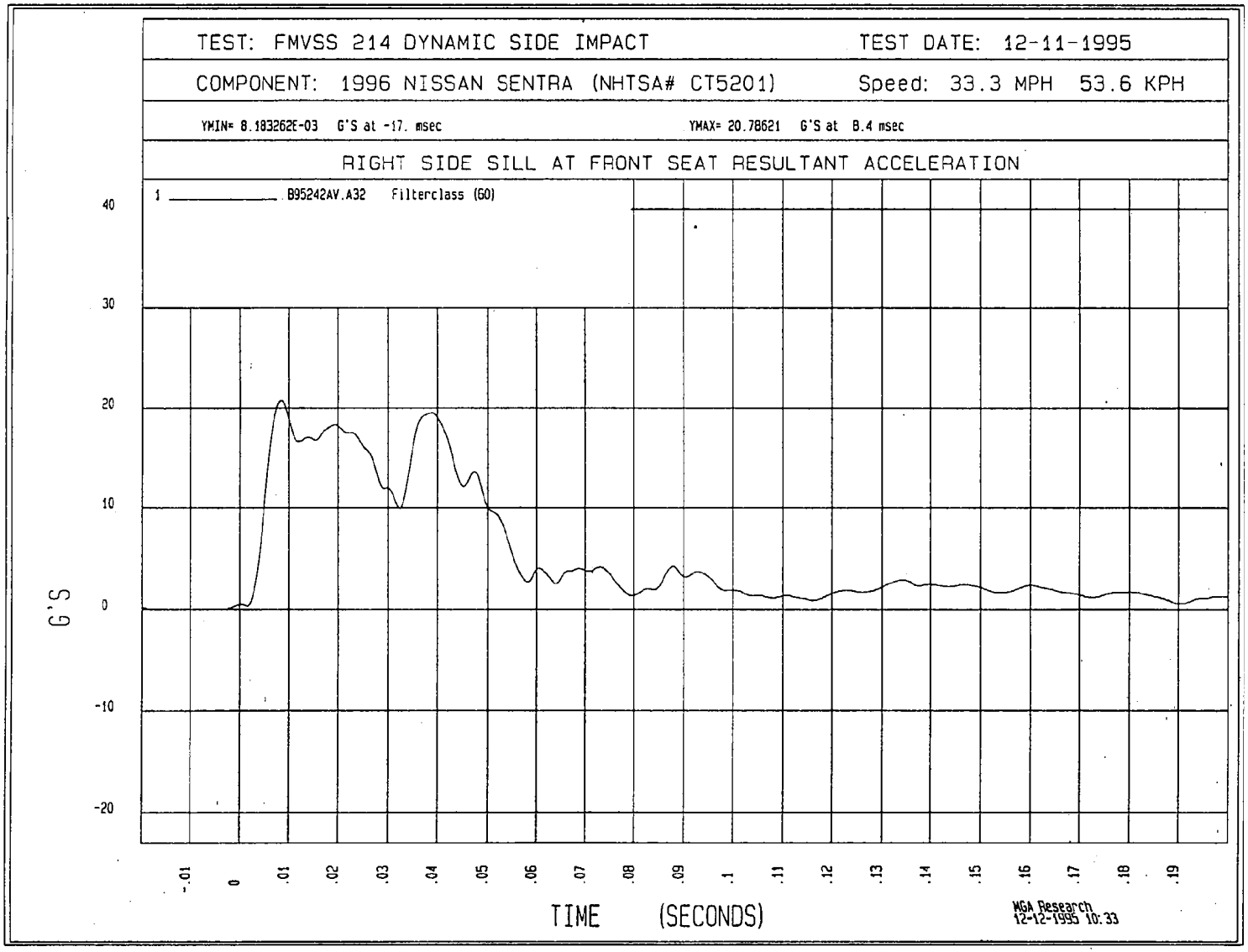
TIME Seconds
HGA Research
12-12-1995 10:19


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN= 8.183262E-03 G'S at -17. msec
YMAX= 20.78621 G'S at 8.4 msec
RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION
1 B95242AV.A32 Filterclass (60)
40
30
20
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-10
-20
G'S
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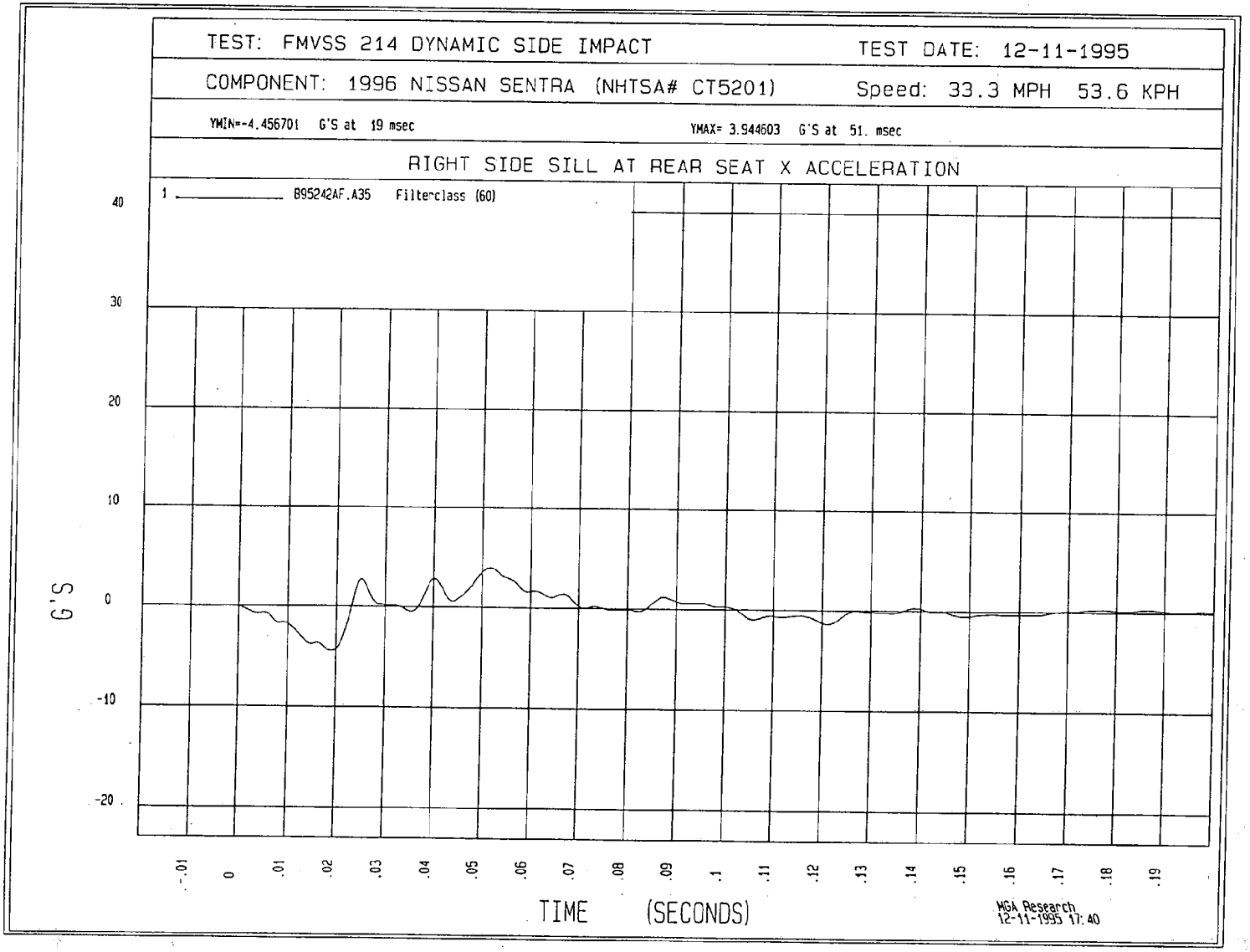
TIME (SECONDS)
MGA Research
12-12-1995 10:33


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-4.456701 G'S at 19 msec
YMAX= 3.944603 G'S at 51. msec
RIGHT SIDE SILL AT REAR SEAT X ACCELERATION
1 B95242AF.A35 Filterclass (60)
40
30
20
10
0
-10
-20
G'S
-.01
0
.01
.02
.03
.04
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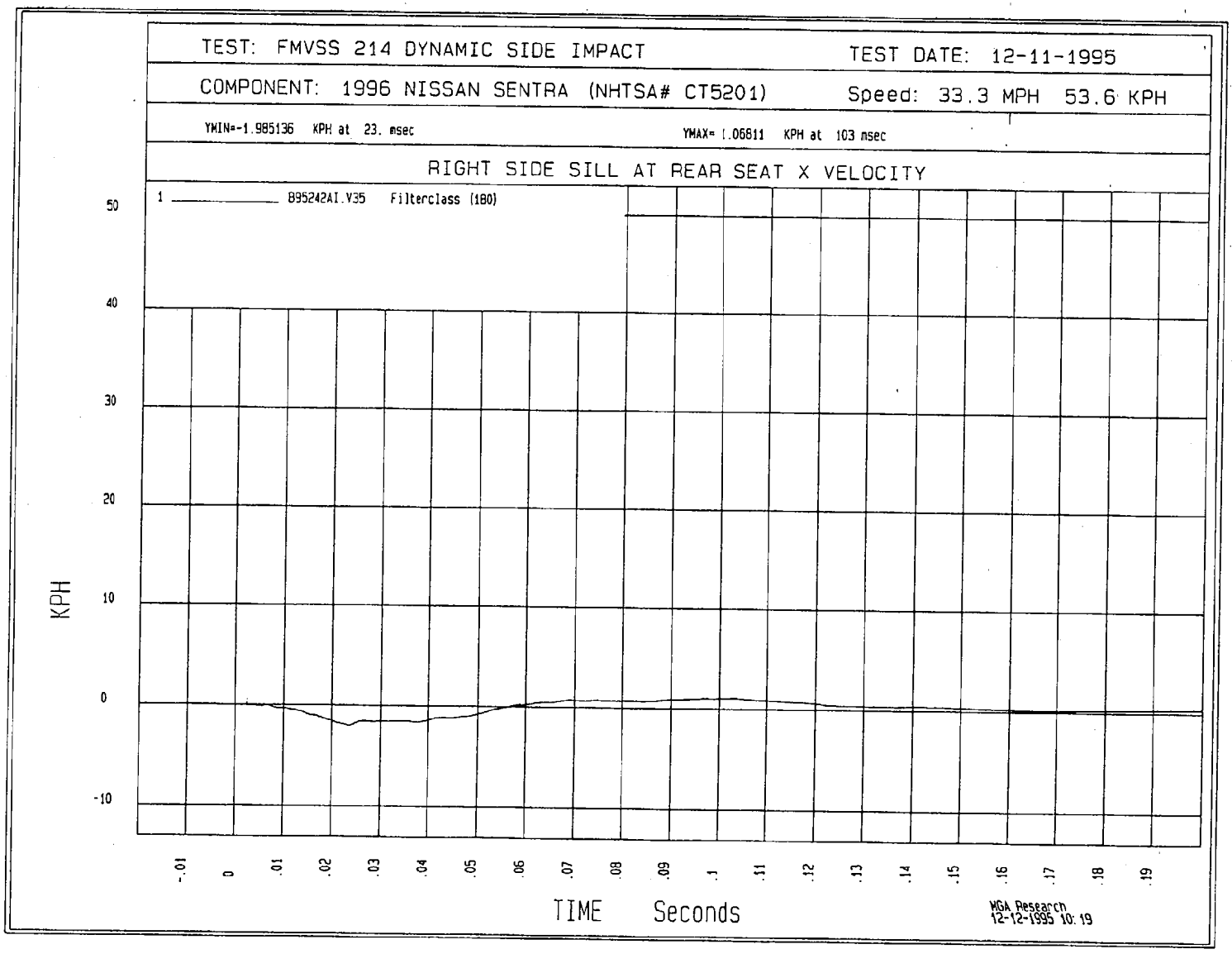
TIME (SECONDS)
MGA Research
12-11-1995 17:40


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-1.985136 KPH at 23. msec
YMAX= 1.06811 KPH at 103 msec
RIGHT SIDE SILL AT REAR SEAT X VELOCITY
1 B95242AI.V35 Filterclass (180)
50
40
30
20
10
0
-10
KPH
-.01
0
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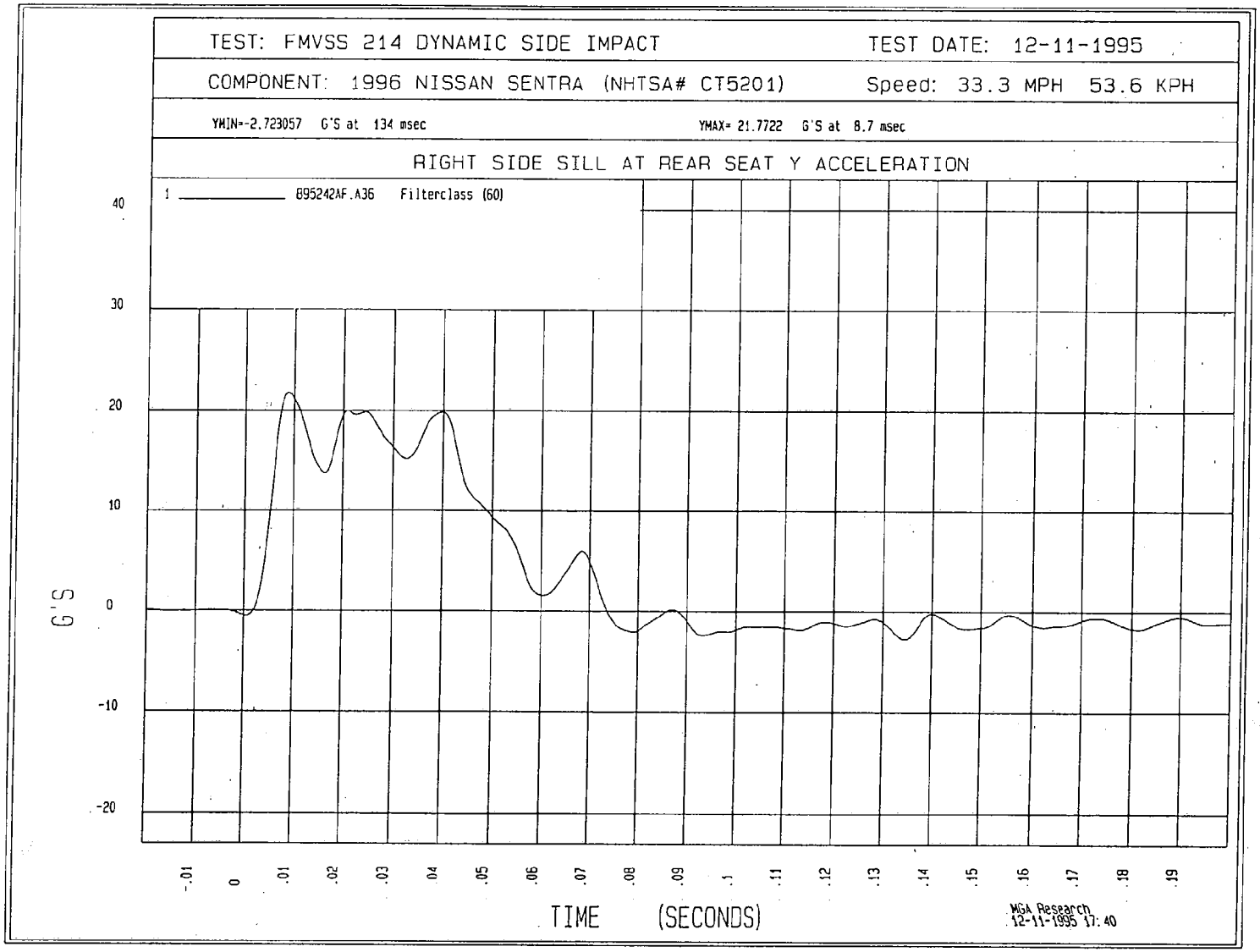
TIME Seconds
MGA Research
12-12-1995 10:19


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-2.723057 G'S at 134 msec
YMAX= 21.7722 G'S at 8.7 msec
RIGHT SIDE SILL AT REAR SEAT Y ACCELERATION
1 895242AF.A36 Filterclass (60)
40
30
20
10
0
-10
-20
G'S
-.01
0
.01
.02
.03
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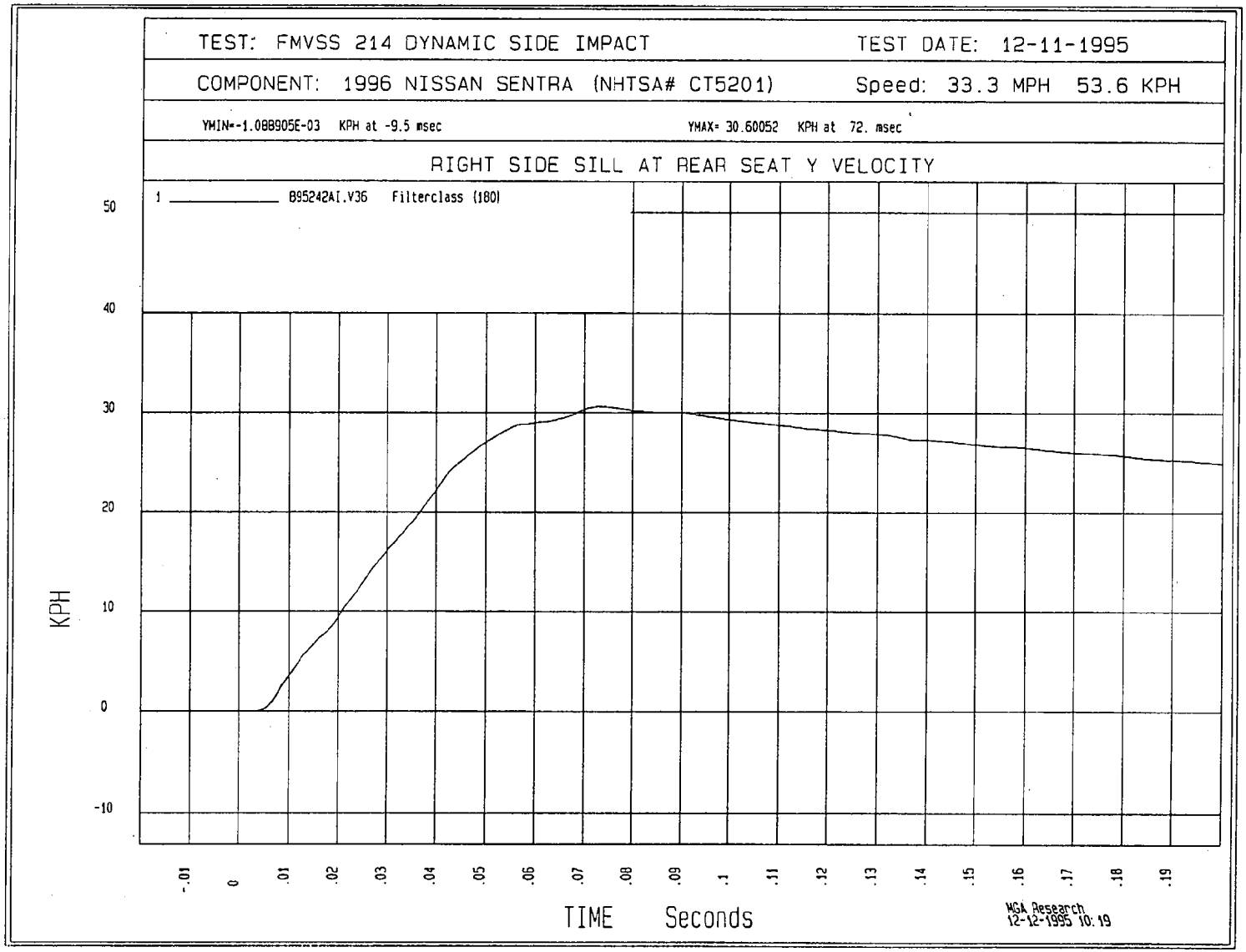
TIME (SECONDS)
MGA Research
12-11-1995 17:40


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-1.0889O5E-03 KPH at -9.5 msec
YMAX= 30.60052 KPH at 72. msec
RIGHT SIDE SILL AT REAR SEAT Y VELOCITY
1 B95242AI.V36 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.01
.02
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.04
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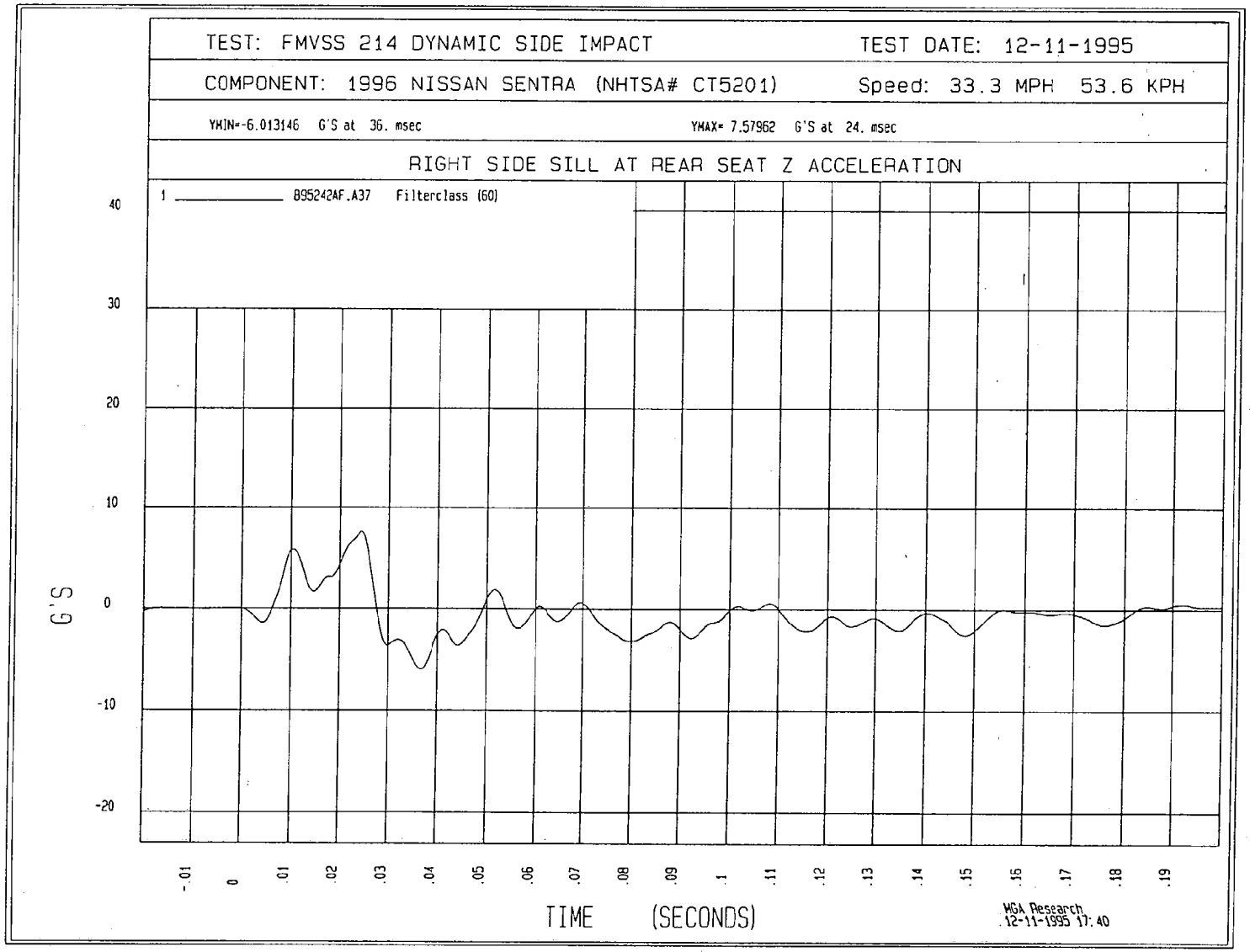
TIME Seconds
MGA Research
12-12-1995 10:19


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-6.013146 G'S at 36. msec
YMAX= 7.57962 G'S at 24. msec
RIGHT SIDE SILL AT REAR SEAT Z ACCELERATION
1 B95242AF.A37 Filterclass (60)
40
30
20
10
0
-10
-20
G'S
-.01
0
.01
.02
.03
.04
.05
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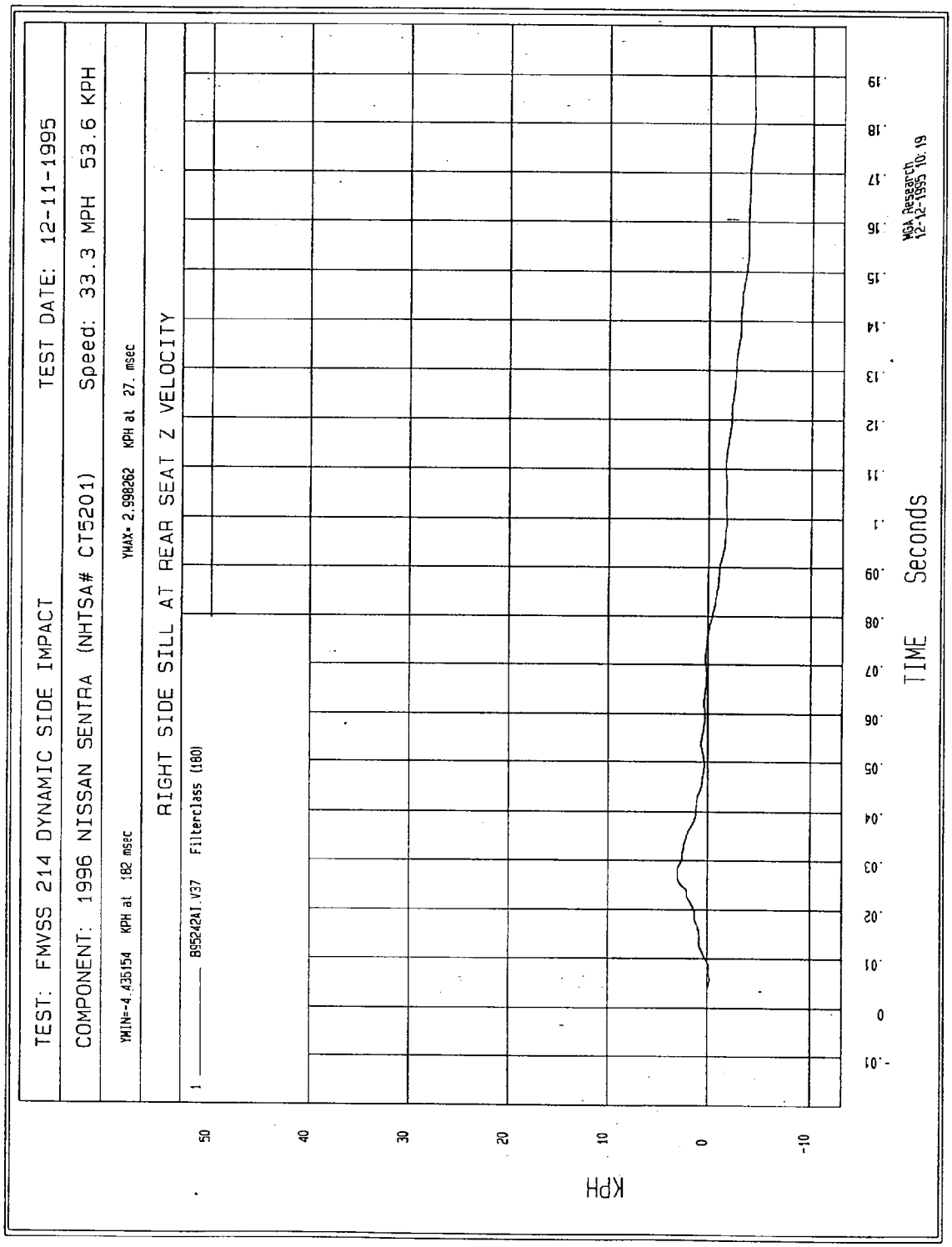
TIME (SECONDS)
MGA Research
12-11-1995 17:40


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-4.435154 KPH at 182 msec
YMAX= 2.998262 KPH at 27. msec
RIGHT SIDE SILL AT REAR SEAT Z VELOCITY
1 ——— 895242AI.V37 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.01
.02
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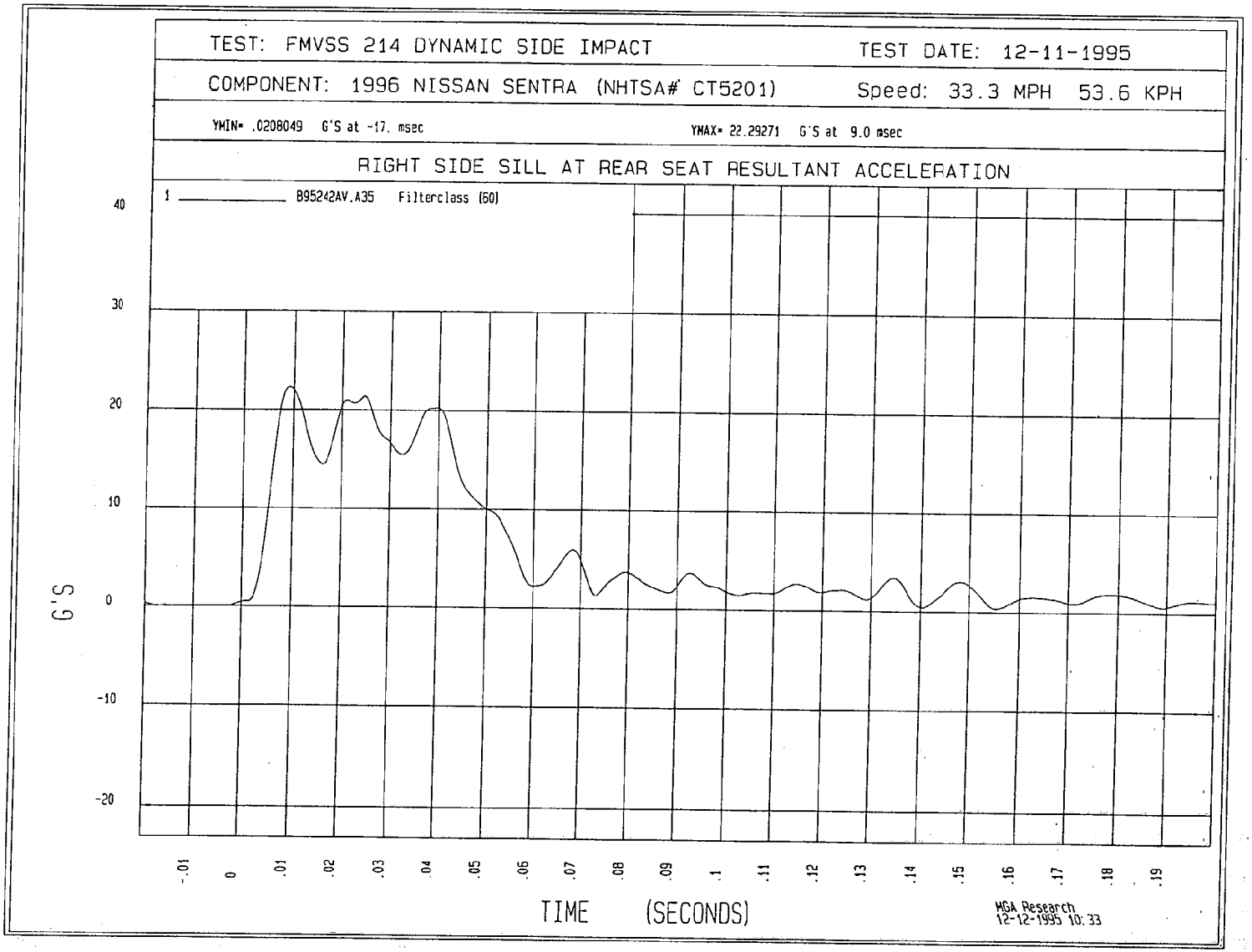
TIME Seconds
MGA Research
12-12-1995 10:19


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN= .0208049 G'S at -17. msec
YMAX= 22.29271 G'S at 9.0 msec
RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION
1 B95242AV.A35 Filterclass (60)
40
30
20
10
0
-10
-20
G'S
-.01
0
.01
.02
.03
.04
.05
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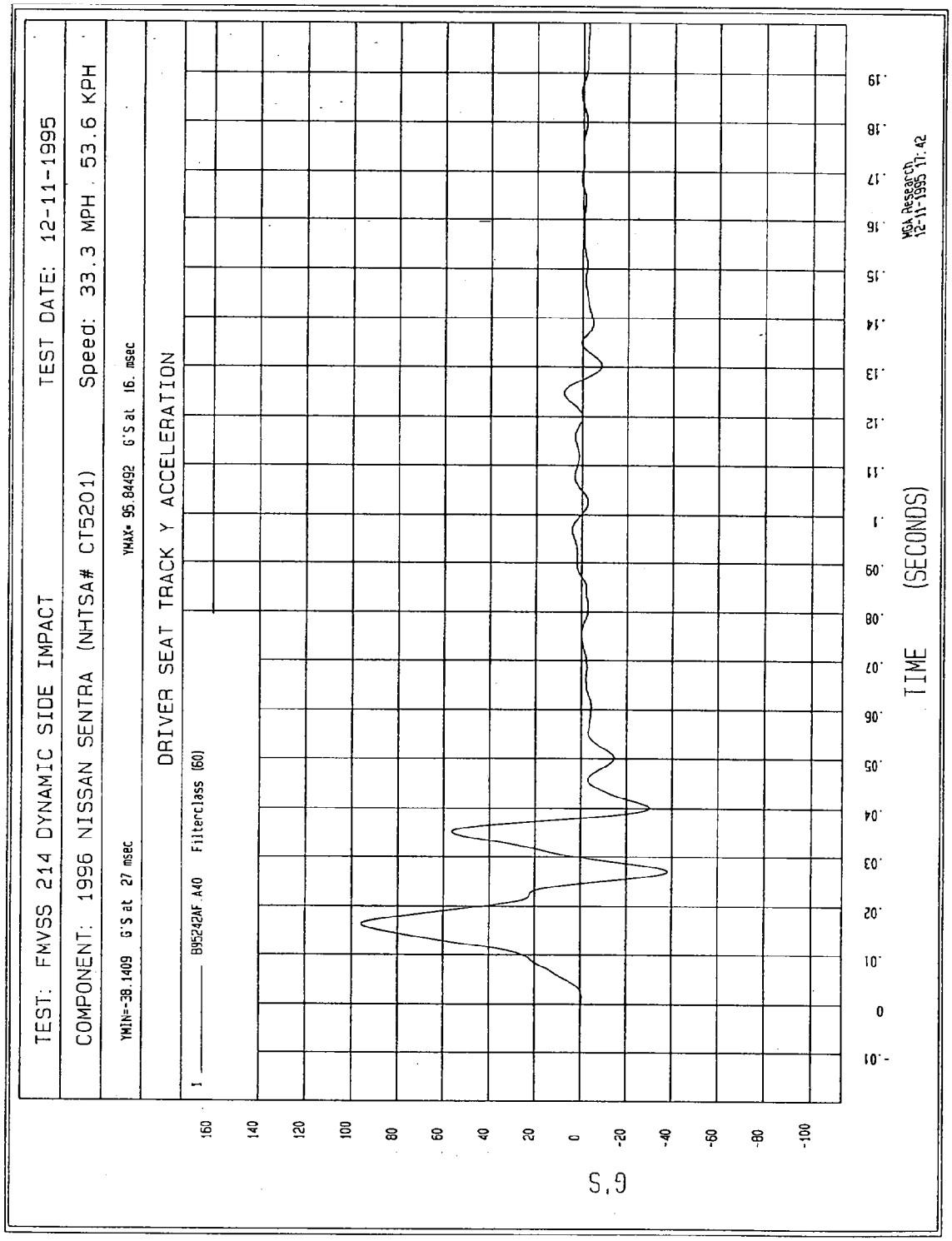
TIME (SECONDS)
MGA Research
12-12-1995 10:33


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-38.1409 G'S at 27 msec
YMAX= 95.84492 G'S at 16. msec
DRIVER SEAT TRACK Y ACCELERATION
1 B95242AF A40 Filterclass (60)
160
140
120
100
80
60
40
20
0
-20
-40
-60
-80
-100
G'S
-.01
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.01
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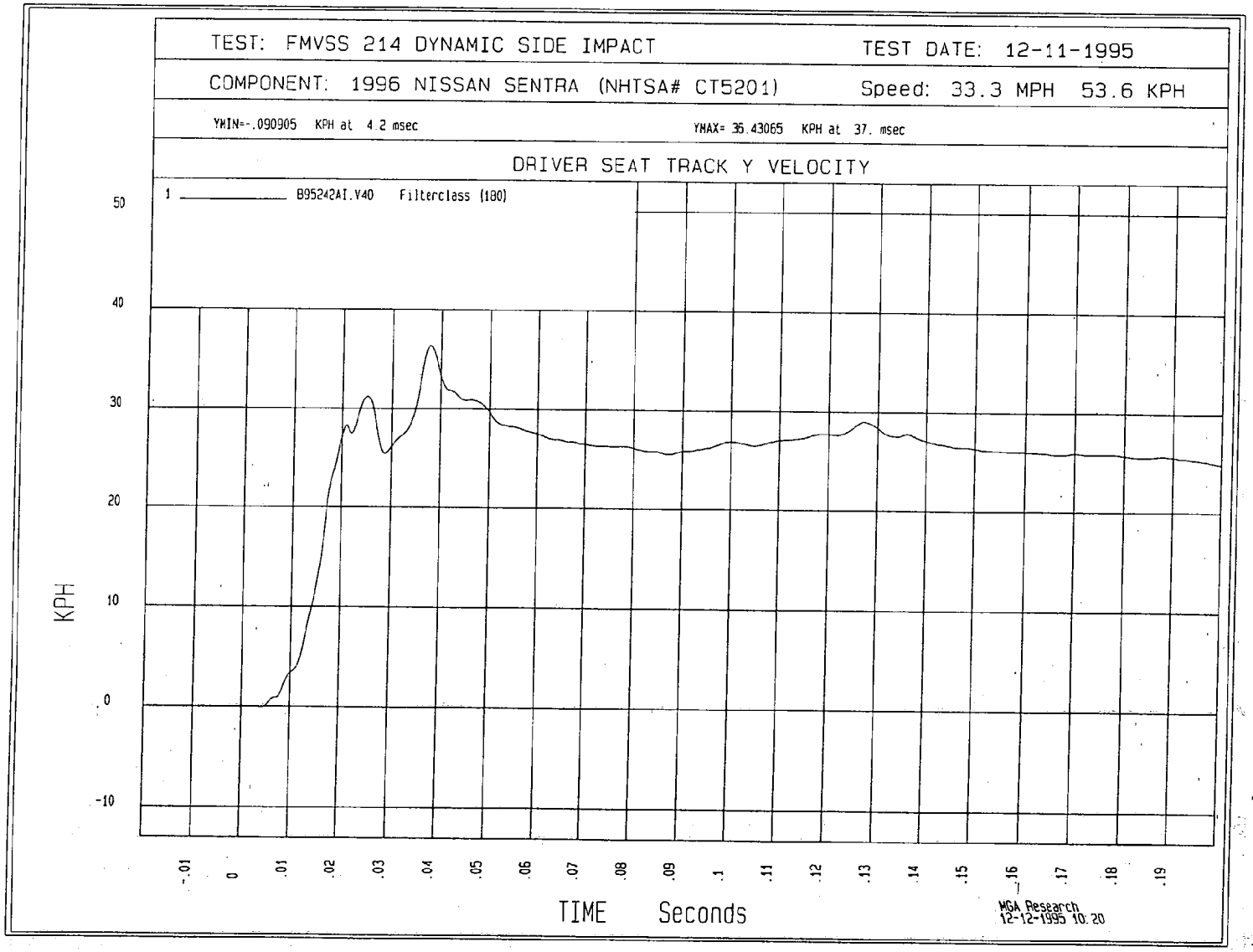
TIME (SECONDS)
MGA Research
12-11-1995 17:42


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-.090905 KPH at 4.2 msec
YMAX= 36.43065 KPH at 37. msec
DRIVER SEAT TRACK Y VELOCITY
1 B95242AI.V40 Filterclass (180)
KPH
50
40
30
20
10
0
-10
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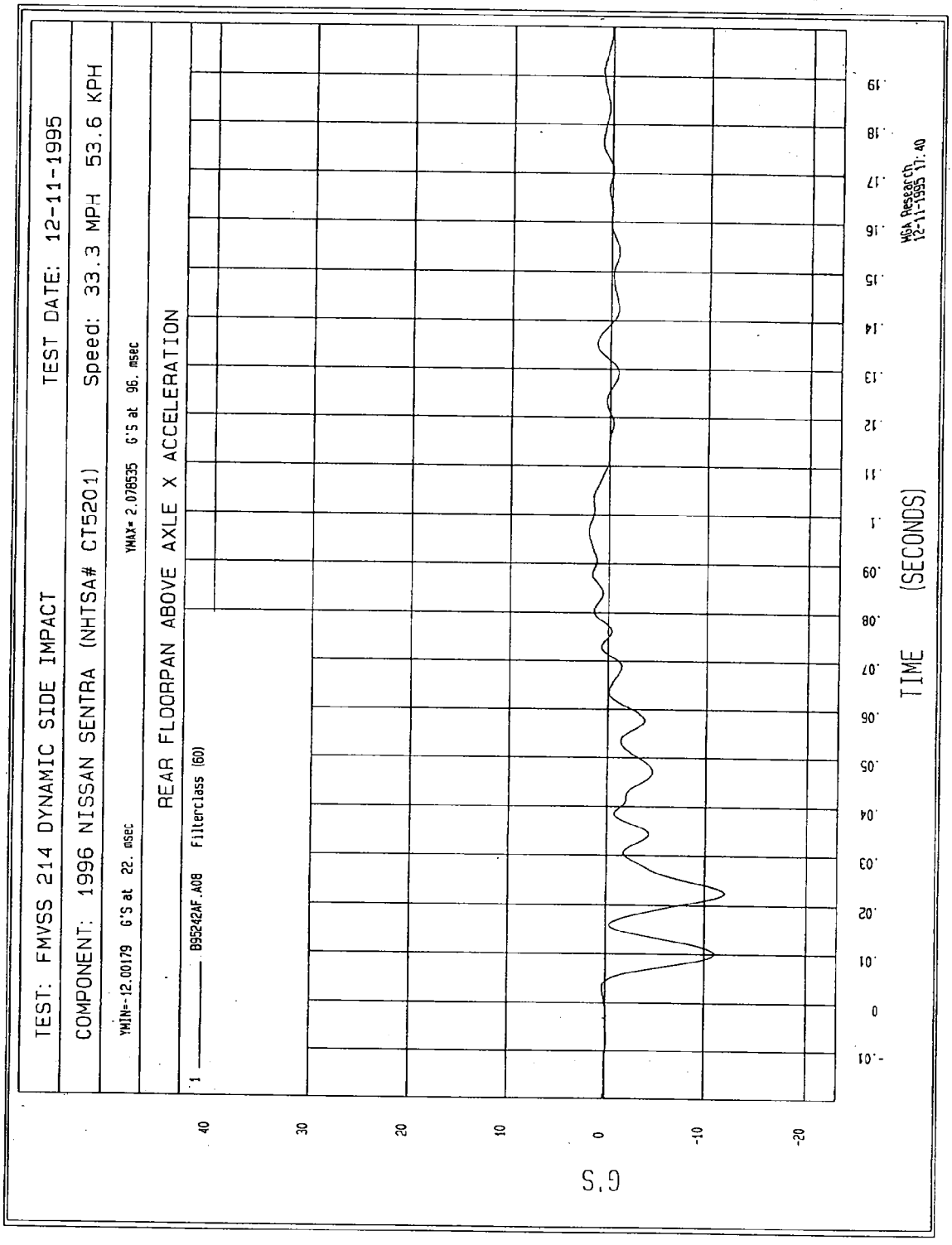
TIME Seconds
MGA Research
12-12-1995 10:20


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-12.00179 G'S at 22. msec
YMAX= 2.078535 G'S at 96. msec
REAR FLOORPAN ABOVE AXLE X ACCELERATION
1 B95242AF.A08 Filterclass (60)
40
30
20
10
0
-10
-20
G'S
-.01
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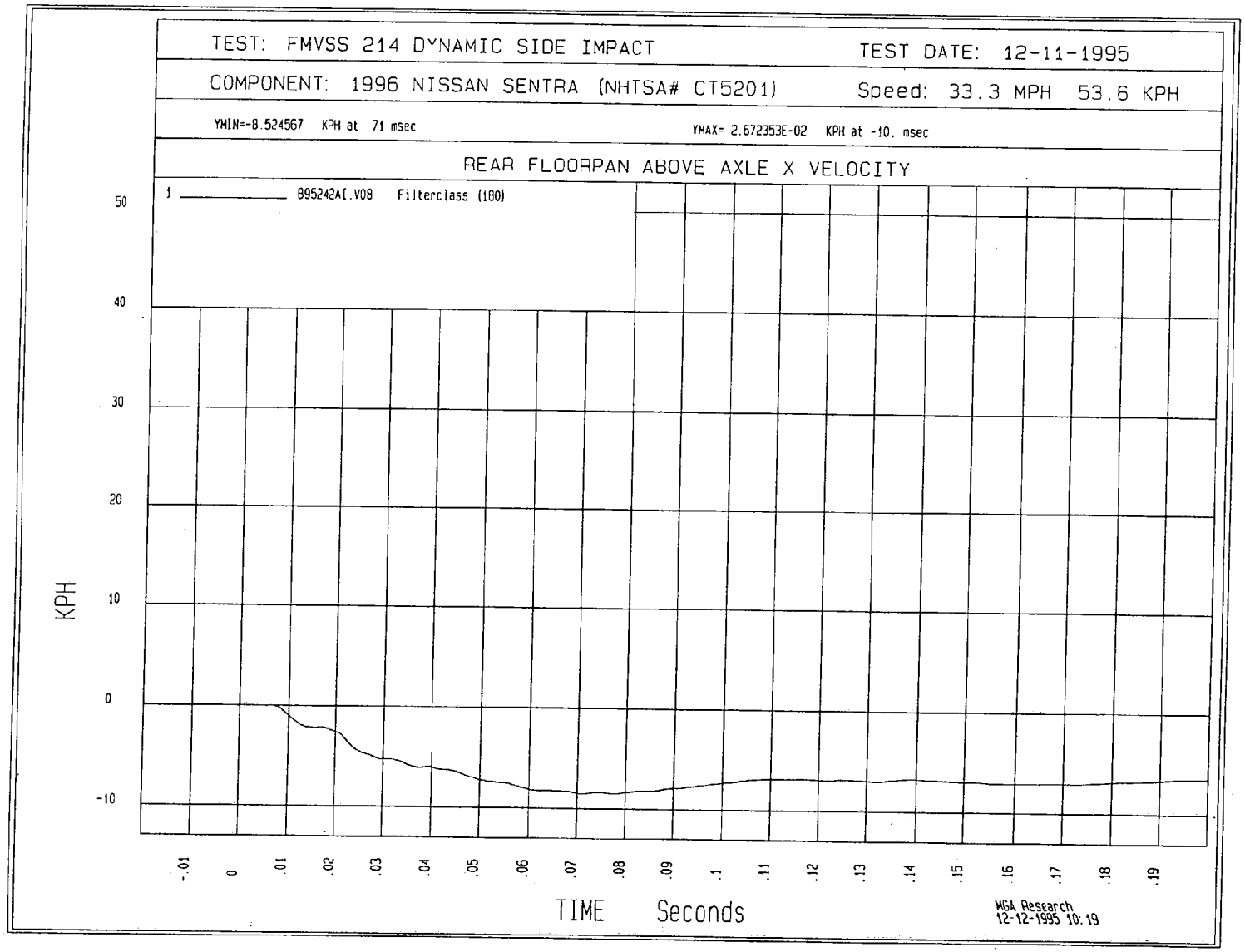
TIME (SECONDS)
MGA Research
12-11-1995 11:40


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-8.524567 KPH at 71 msec
YMAX= 2.672353E-02 KPH at -10. msec
REAR FLOORPAN ABOVE AXLE X VELOCITY
1 895242AI.V08 Filterclass (180)
KPH
50
40
30
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-10
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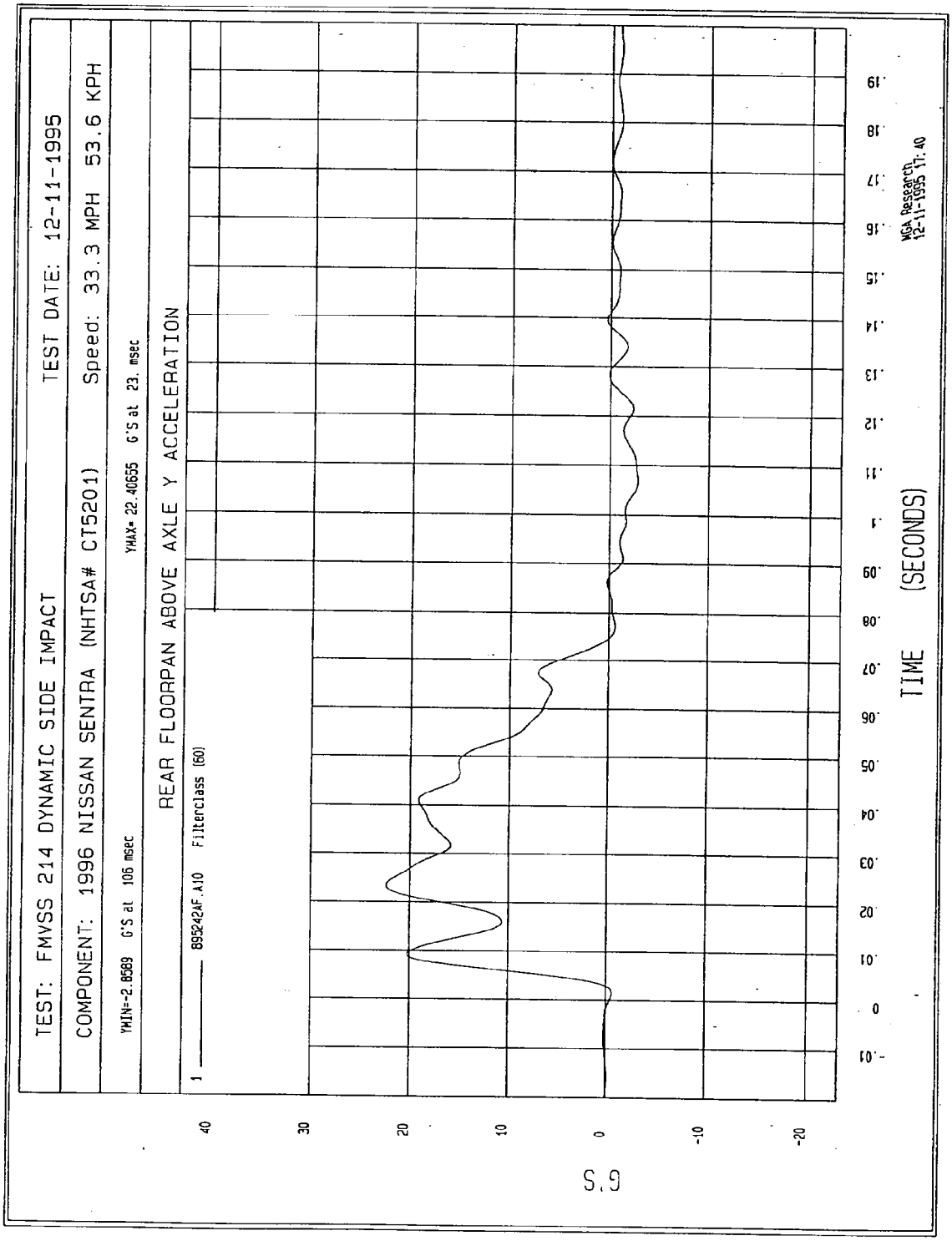
TIME Seconds
MGA Research
12-12-1995 10:19


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-2.8589 G'S at 106 msec
YMAX= 22.40655 G'S at 23. msec
REAR FLOORPAN ABOVE AXLE Y ACCELERATION
1 895242AF.A10 Filterclass (60)
40
30
20
10
0
-10
-20
G'S
TIME (SECONDS)
-.01
0
.01
.02
.03
.04
.05
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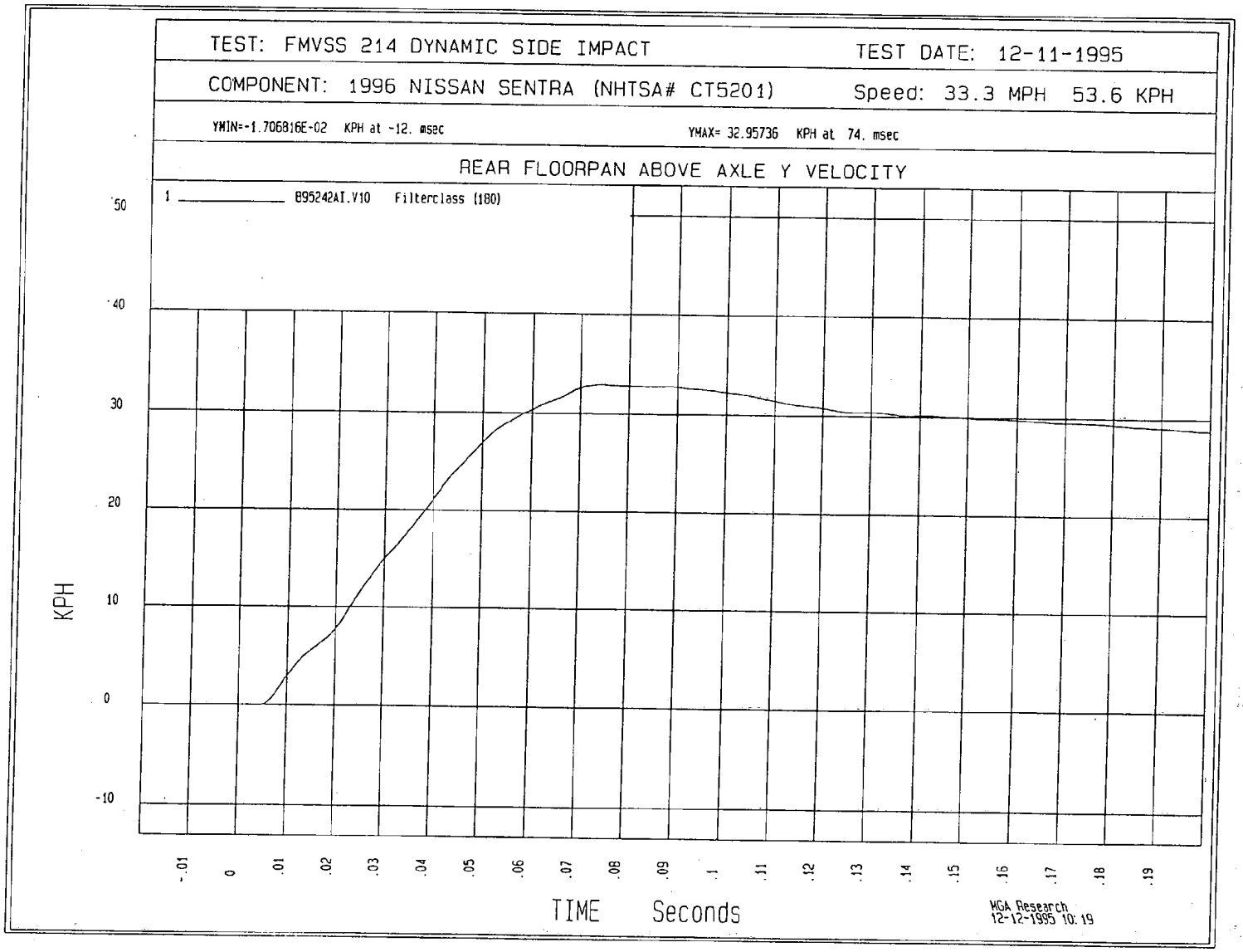
MGA Research
12-11-1995 17:40


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-1.706816E-02 KPH at -12. msec
YMAX= 32.95736 KPH at 74. msec
REAR FLOORPAN ABOVE AXLE Y VELOCITY
1 B95242AI.V10 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.01
.02
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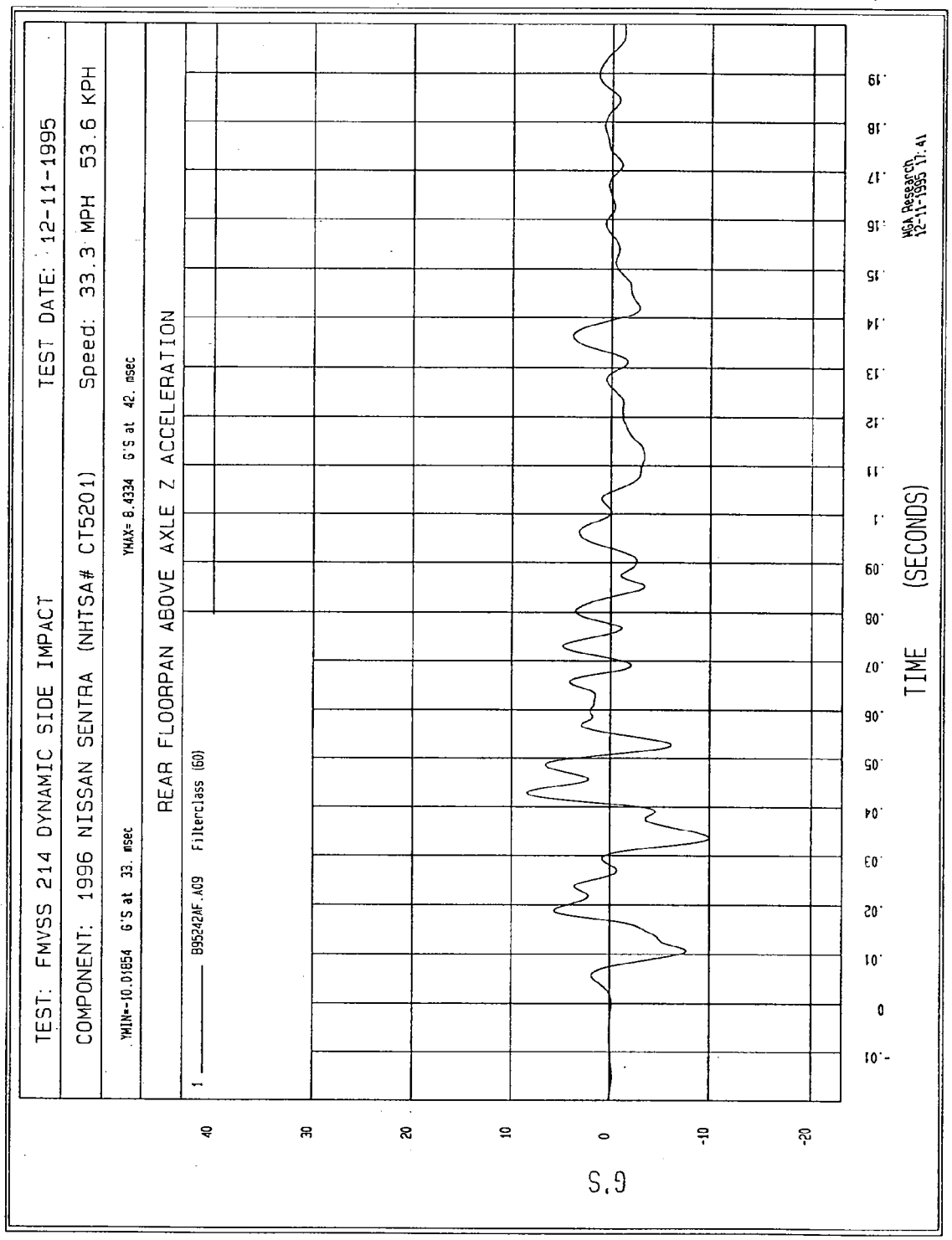
TIME Seconds
MGA Research
12-12-1995 10:19


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-10.01854 G'S at 33. msec
YMAX= 8.4334 G'S at 42. msec
REAR FLOORPAN ABOVE AXLE Z ACCELERATION
1 B95242AF.A09 Filterclass (60)
40
30
20
10
0
-10
-20
G'S
-.01
0
.01
.02
.03
.04
.05
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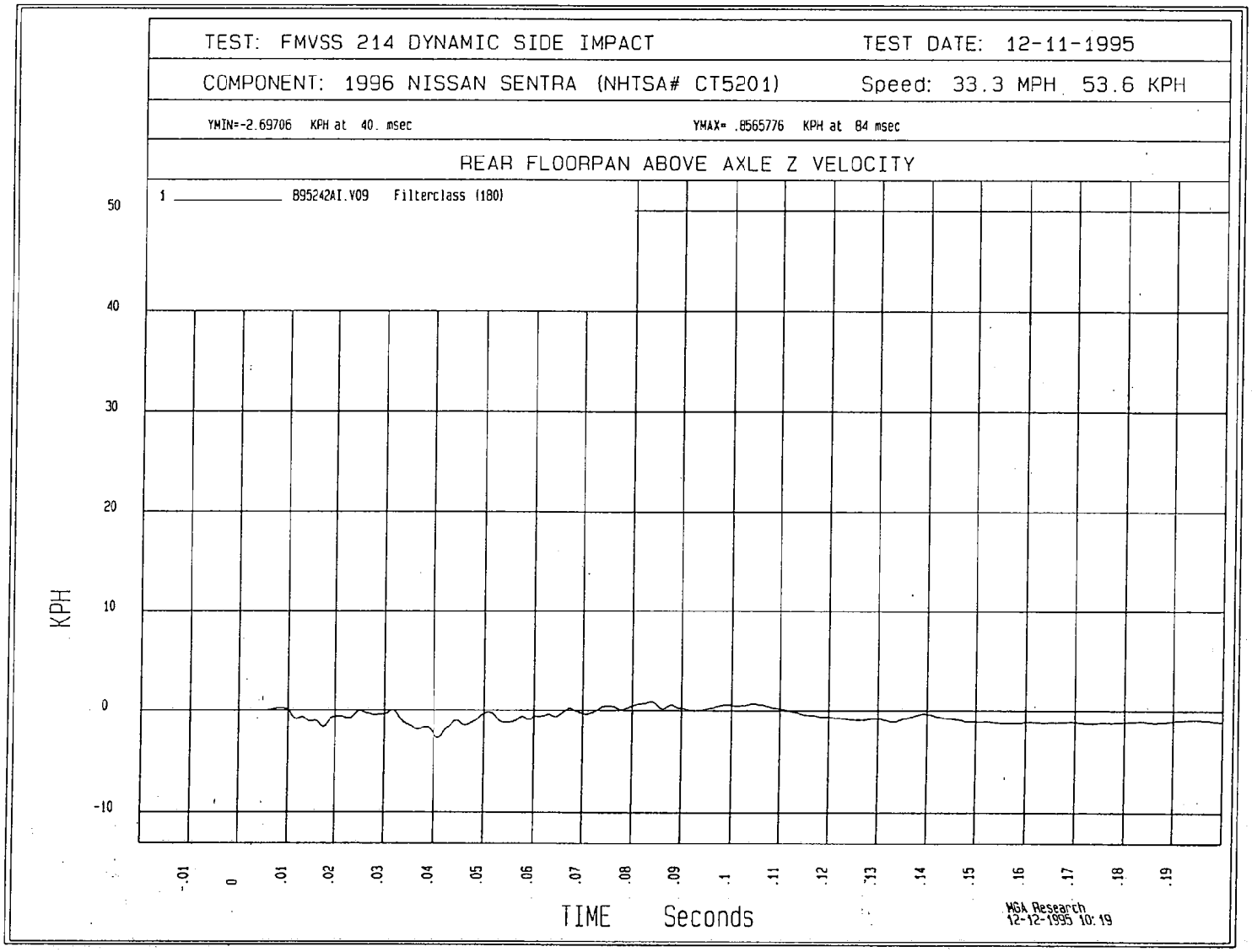
TIME (SECONDS)
MGA Research
12-11-1995 17:41


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-2.69706 KPH at 40. msec
YMAX= .8565776 KPH at 84 msec
REAR FLOORPAN ABOVE AXLE Z VELOCITY
1 B95242AI.V09 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.01
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.03
.04
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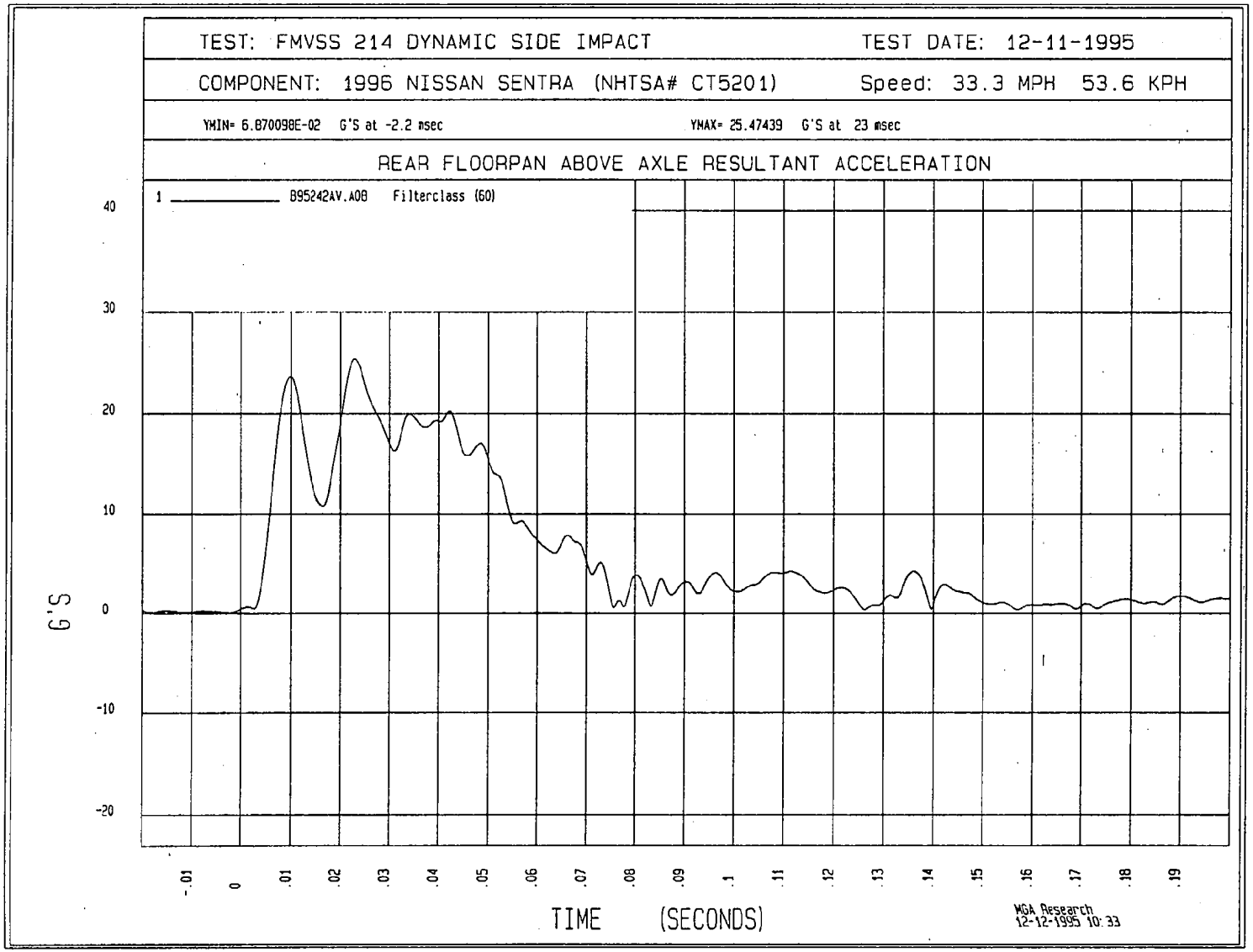
TIME Seconds
MGA Research
12-12-1995 10:19


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN= 6.870098E-02 G'S at -2.2 msec
YMAX= 25.47439 G'S at 23 msec
REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION
1 B95242AV.A08 Filterclass (60)
40
30
20
10
0
-10
-20
G'S
-.01
0
.01
.02
.03
.04
.05
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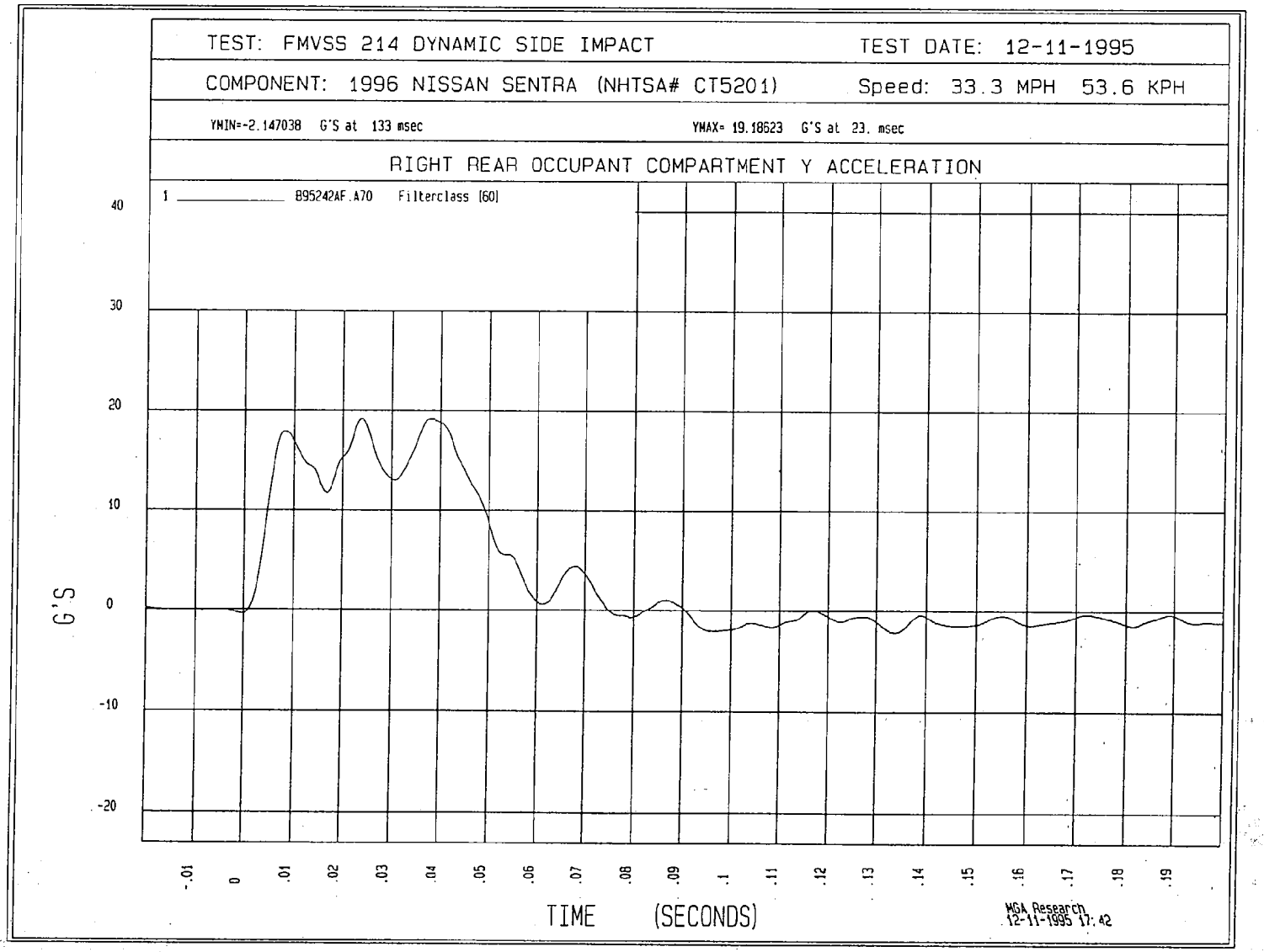
TIME (SECONDS)
MGA Research
12-12-1995 10:33


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-2.147038 G'S at 133 msec
YMAX= 19.18623 G'S at 23. msec
RIGHT REAR OCCUPANT COMPARTMENT Y ACCELERATION
1 B95242AF.A70 Filterclass [60]
40
30
20
10
0
-10
-20
G'S
-.01
0
.01
.02
.03
.04
.05
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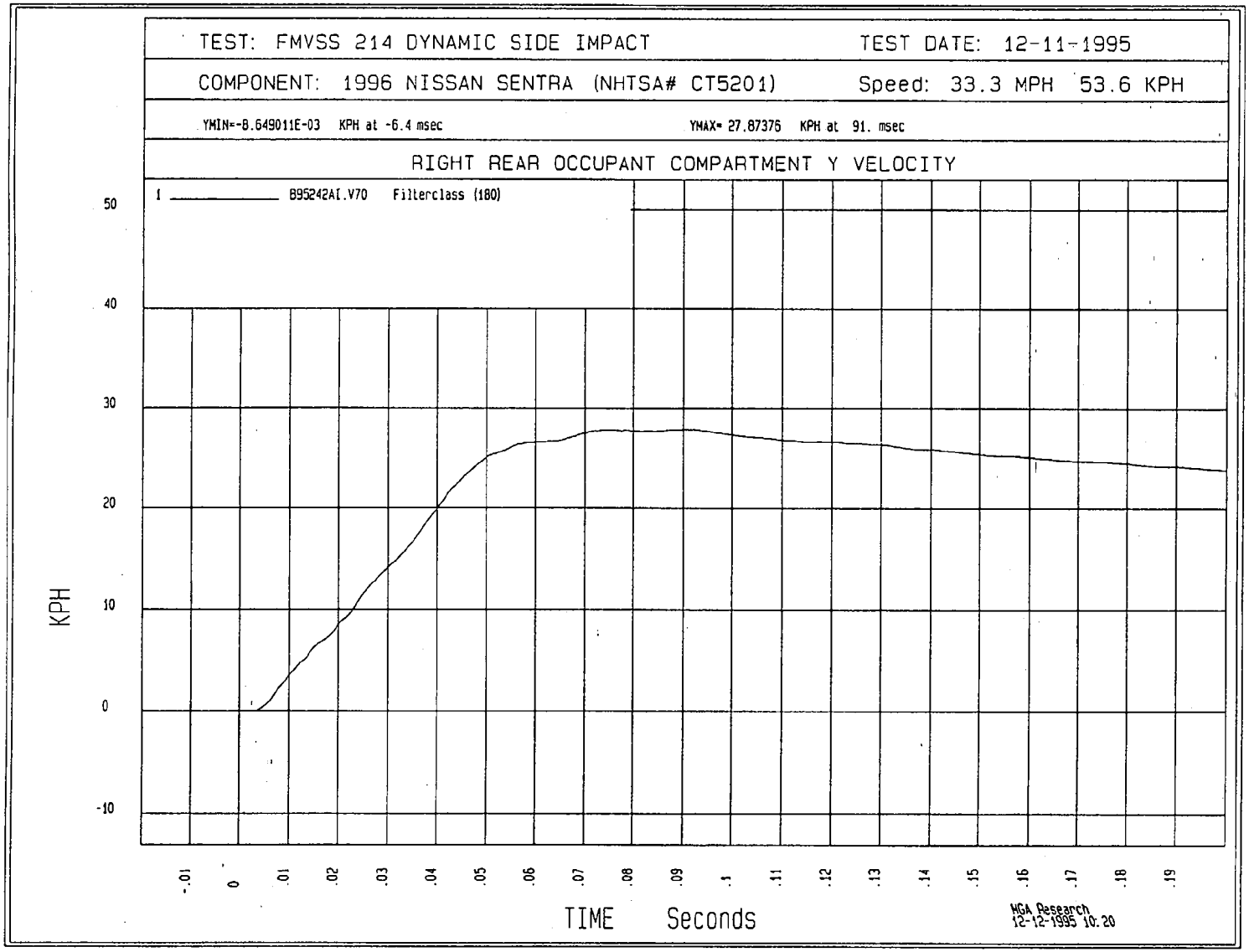
TIME (SECONDS)
MGA Research
12-11-1995 17:42


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-8.649011E-03 KPH at -6.4 msec
YMAX= 27.87376 KPH at 91. msec
RIGHT REAR OCCUPANT COMPARTMENT Y VELOCITY
1 B95242AI.V70 Filterclass (180)
50
40
30
20
10
0
-10
KPH
-.01
0
.01
.02
.03
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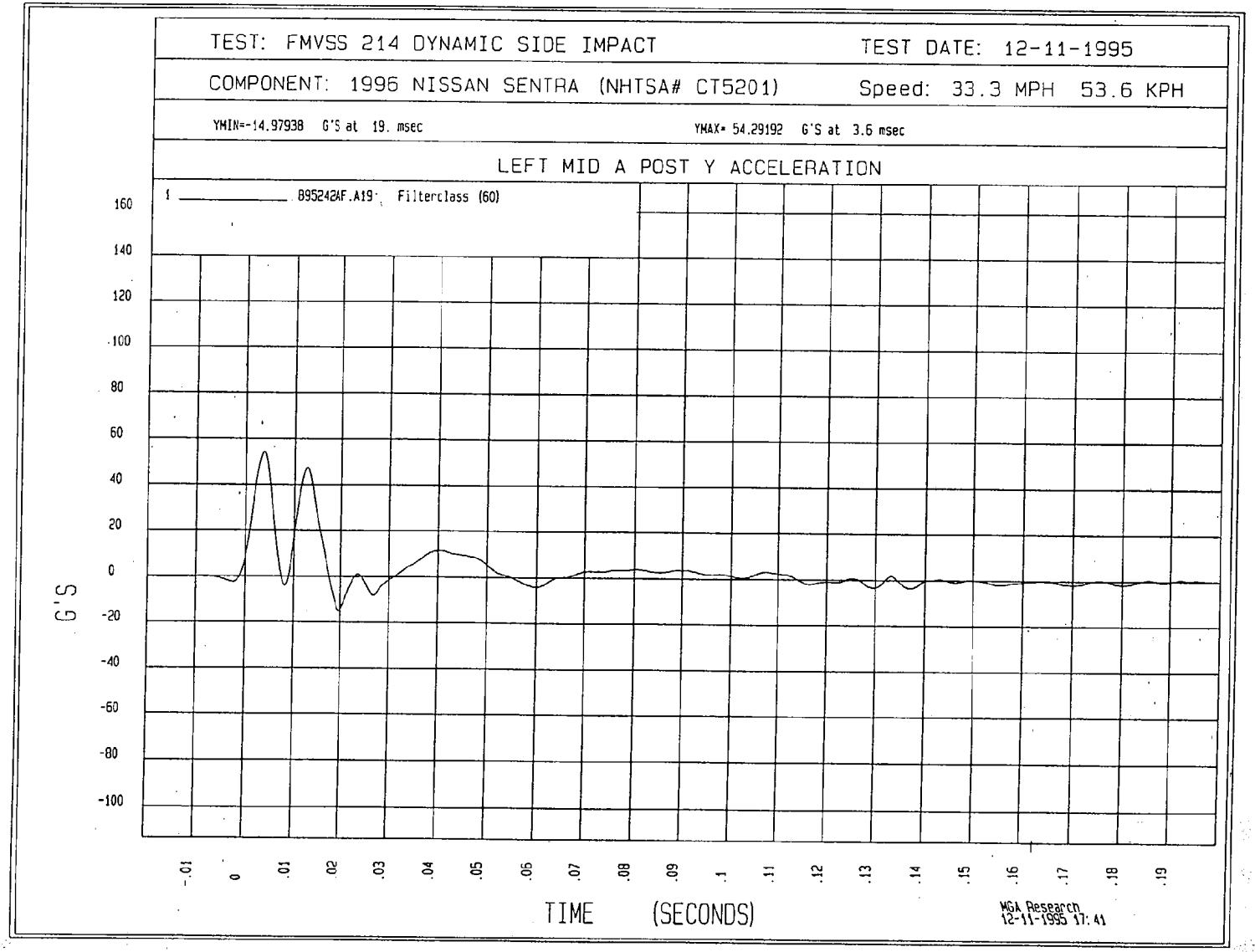
TIME Seconds
MGA Research
12-12-1995 10:20


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-14.97938 G'S at 19. msec
YMAX= 54.29192 G'S at 3.6 msec
LEFT MID A POST Y ACCELERATION
1 B95242AF.A19 Filterclass (60)
160
140
120
100
80
60
40
20
0
-20
-40
-60
-80
-100
G'S
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
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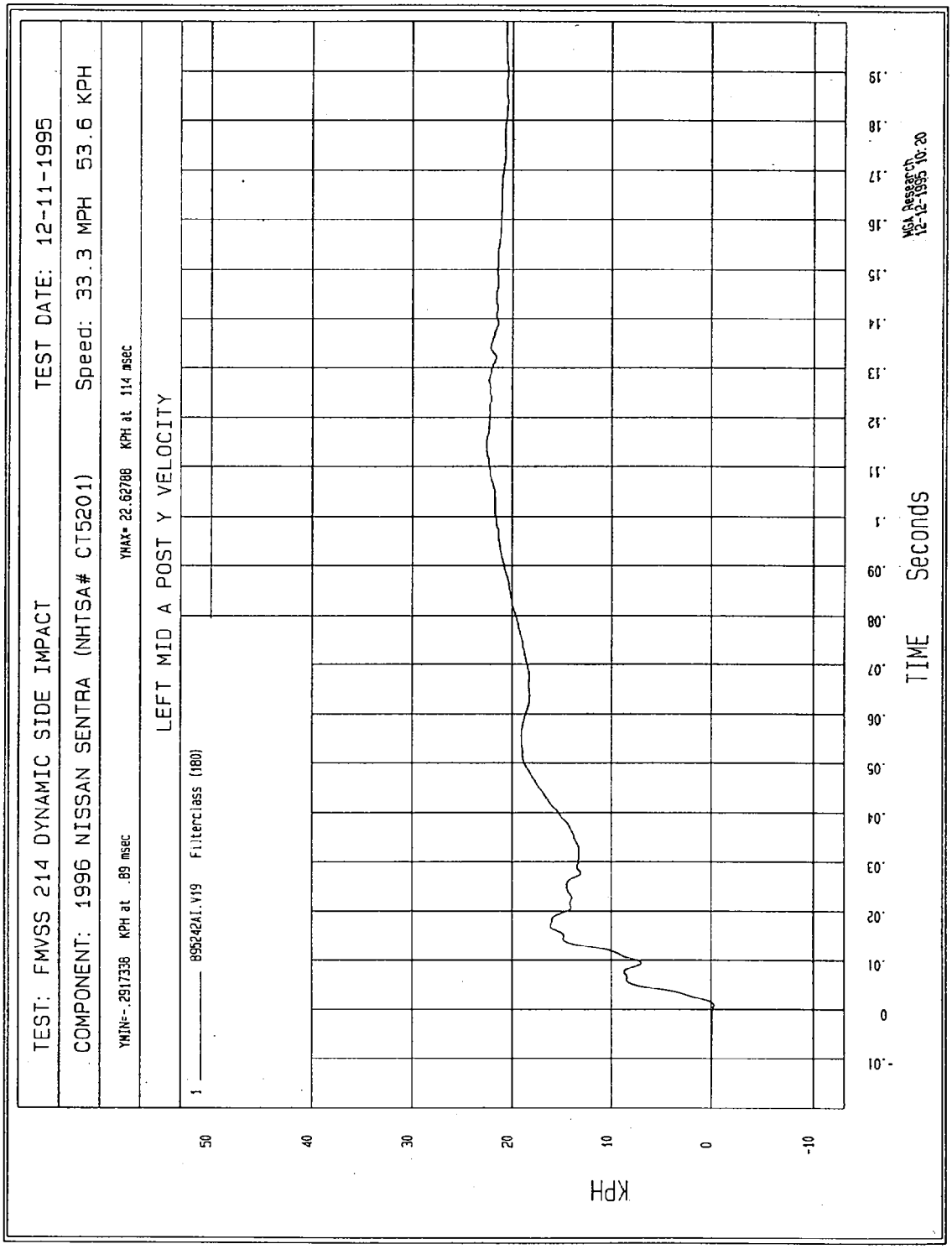
TIME (SECONDS)
MGA Research
12-11-1995 17:41


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-.2917338 KPH at .89 msec
YMAX= 22.62788 KPH at 114 msec
LEFT MID A POST Y VELOCITY
1 B95242AI.V19 Filterclass (180)
KPH
50
40
30
20
10
0
-10
TIME Seconds
-.01
0
.01
.02
.03
.04
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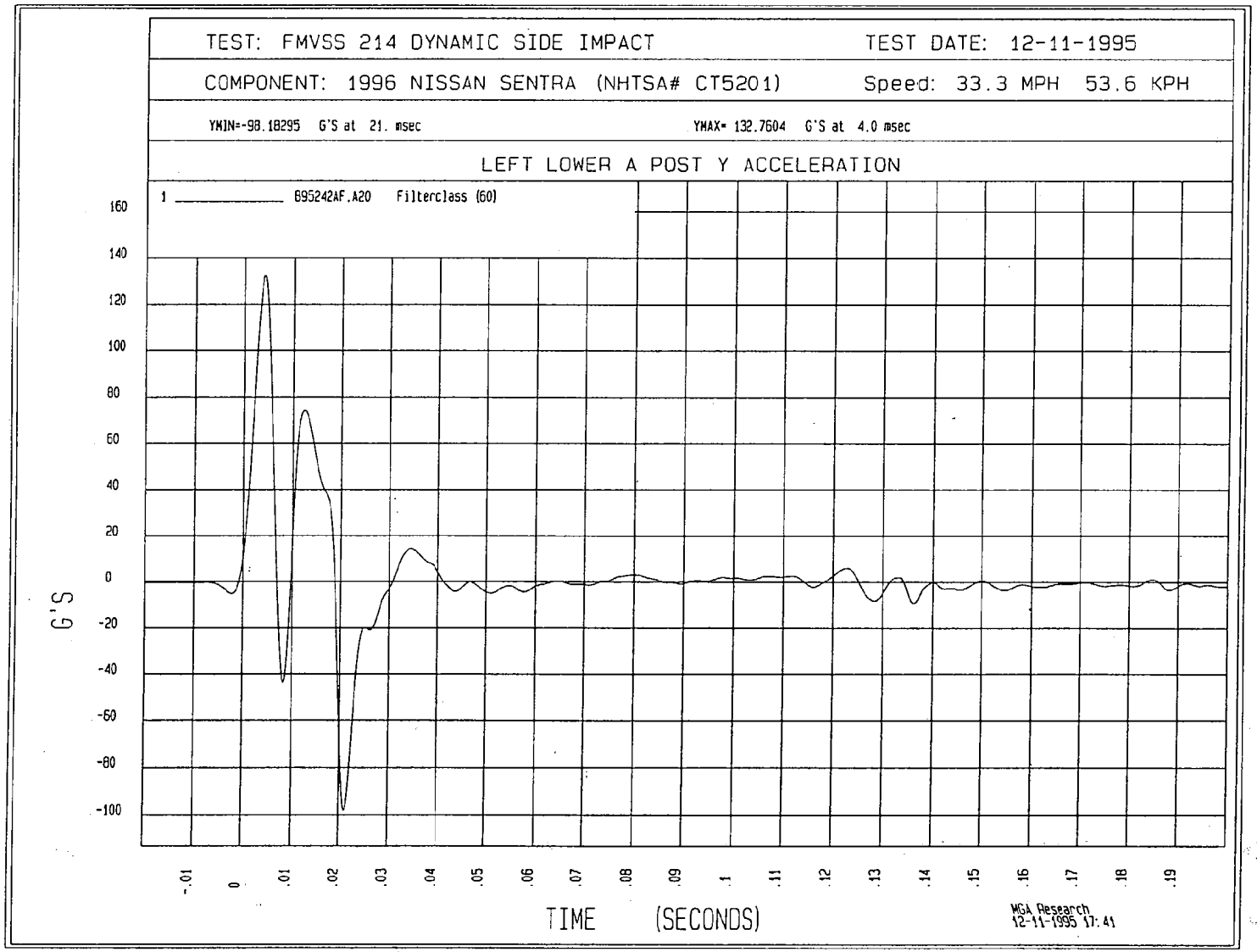
MGA Research
12-12-1995 10:20


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-98.18295 G'S at 21. msec
YMAX= 132.7604 G'S at 4.0 msec
LEFT LOWER A POST Y ACCELERATION
1 B95242AF.A20 Filterclass (60)
160
140
120
100
80
60
40
20
0
-20
-40
-60
-80
-100
G'S
-.01
0
.01
.02
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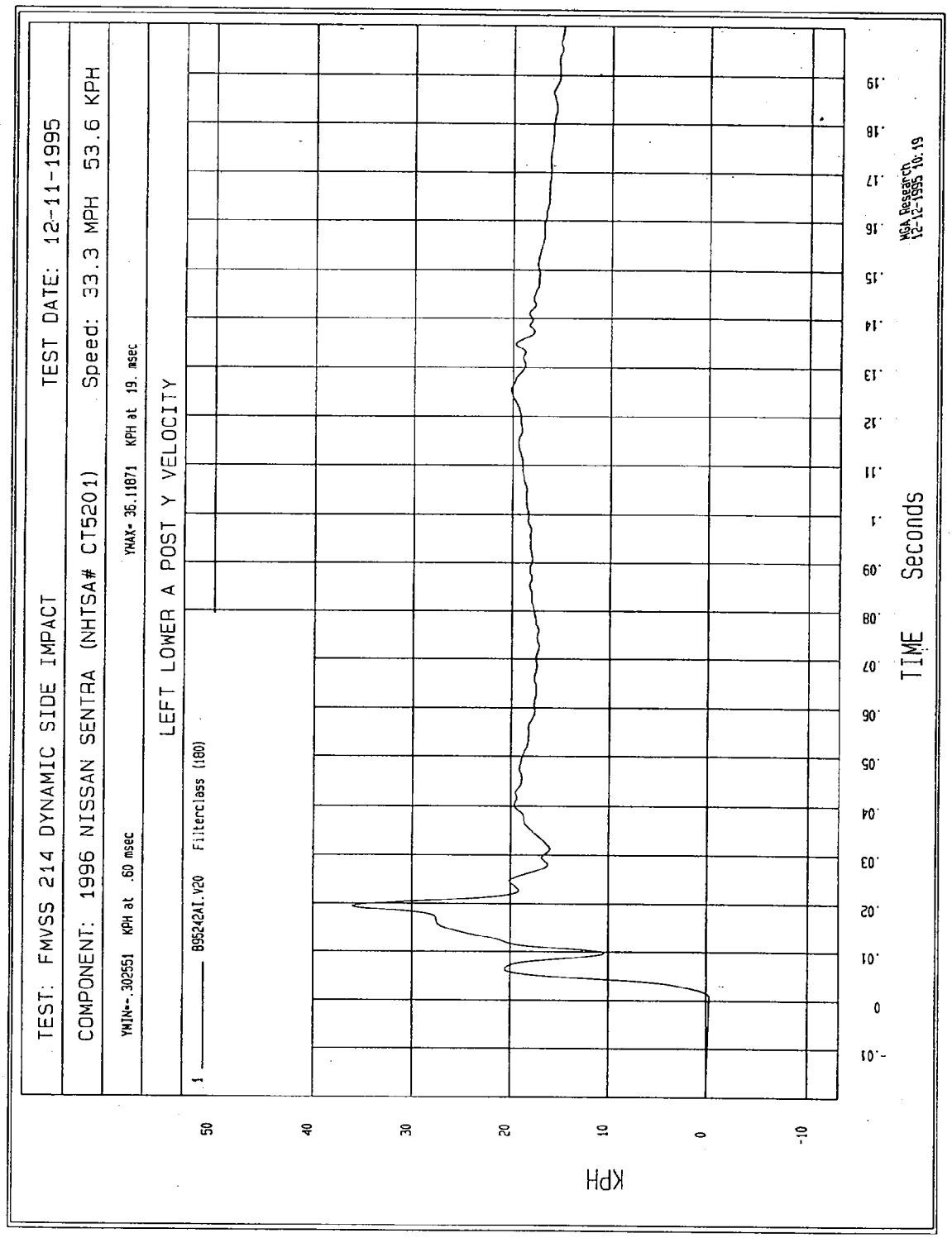
TIME (SECONDS)
MGA Research
12-11-1995 17:41


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-.302551 KPH at .60 msec
YMAX= 36.11871 KPH at 19. msec
LEFT LOWER A POST Y VELOCITY
1 B95242AI.V20 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.01
.02
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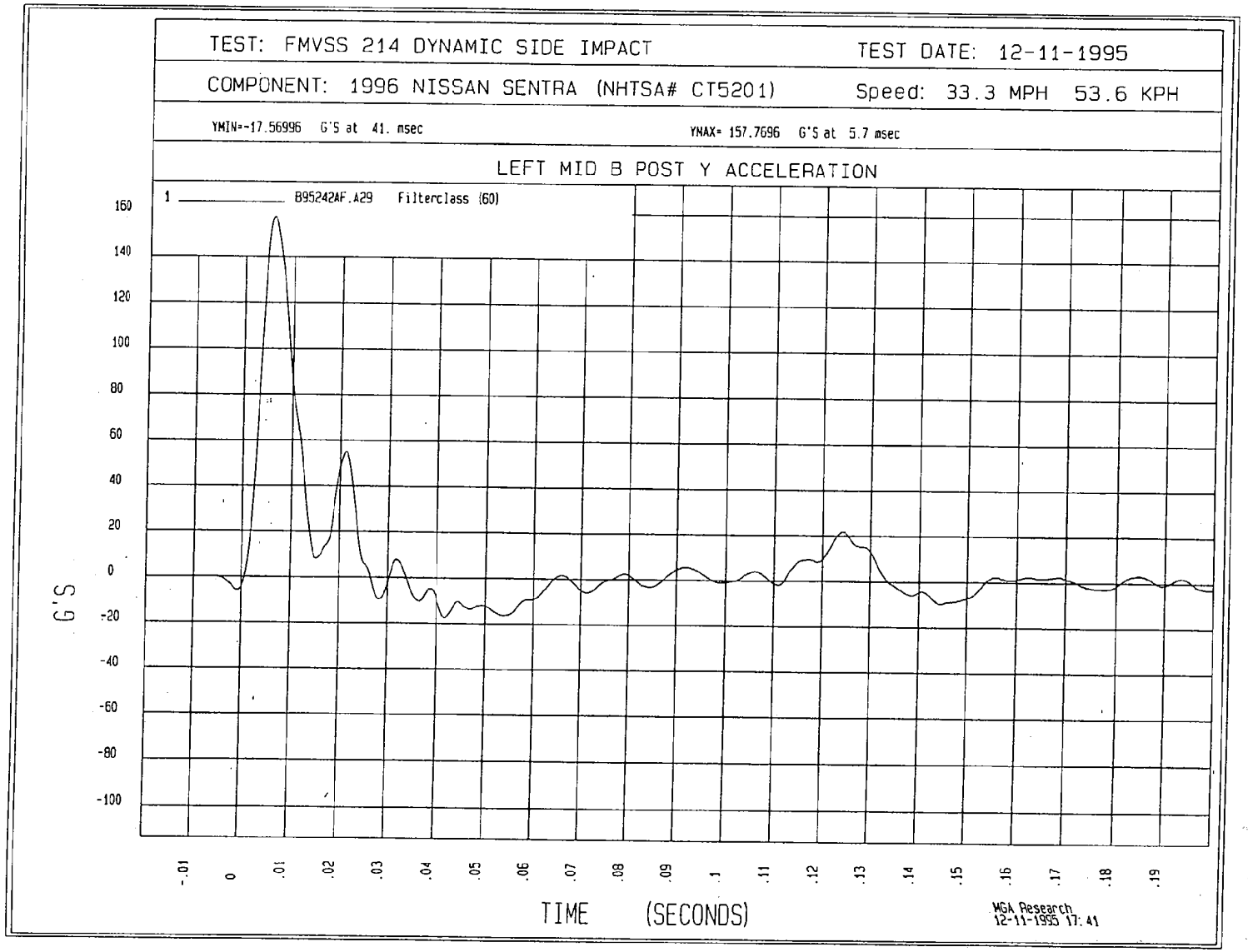
TIME Seconds
MGA Research
12-12-1995 10:19


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-17.56996 G'S at 41. msec
YMAX= 157.7696 G'S at 5.7 msec
LEFT MID B POST Y ACCELERATION
1 B95242AF.A29 Filterclass (60)
160
140
120
100
80
60
40
20
0
-20
-40
-60
-80
-100
G'S
-.01
0
.01
.02
.03
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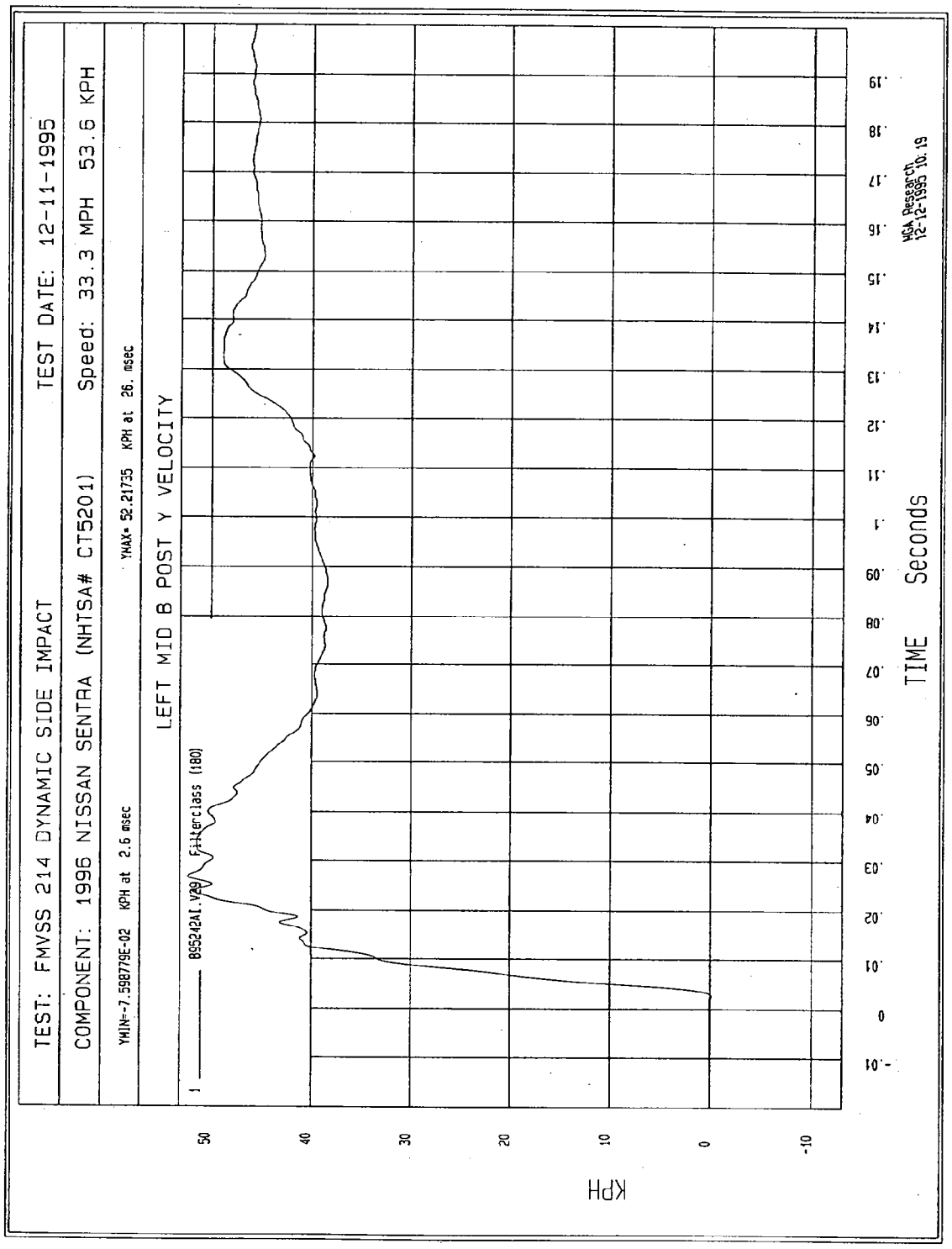
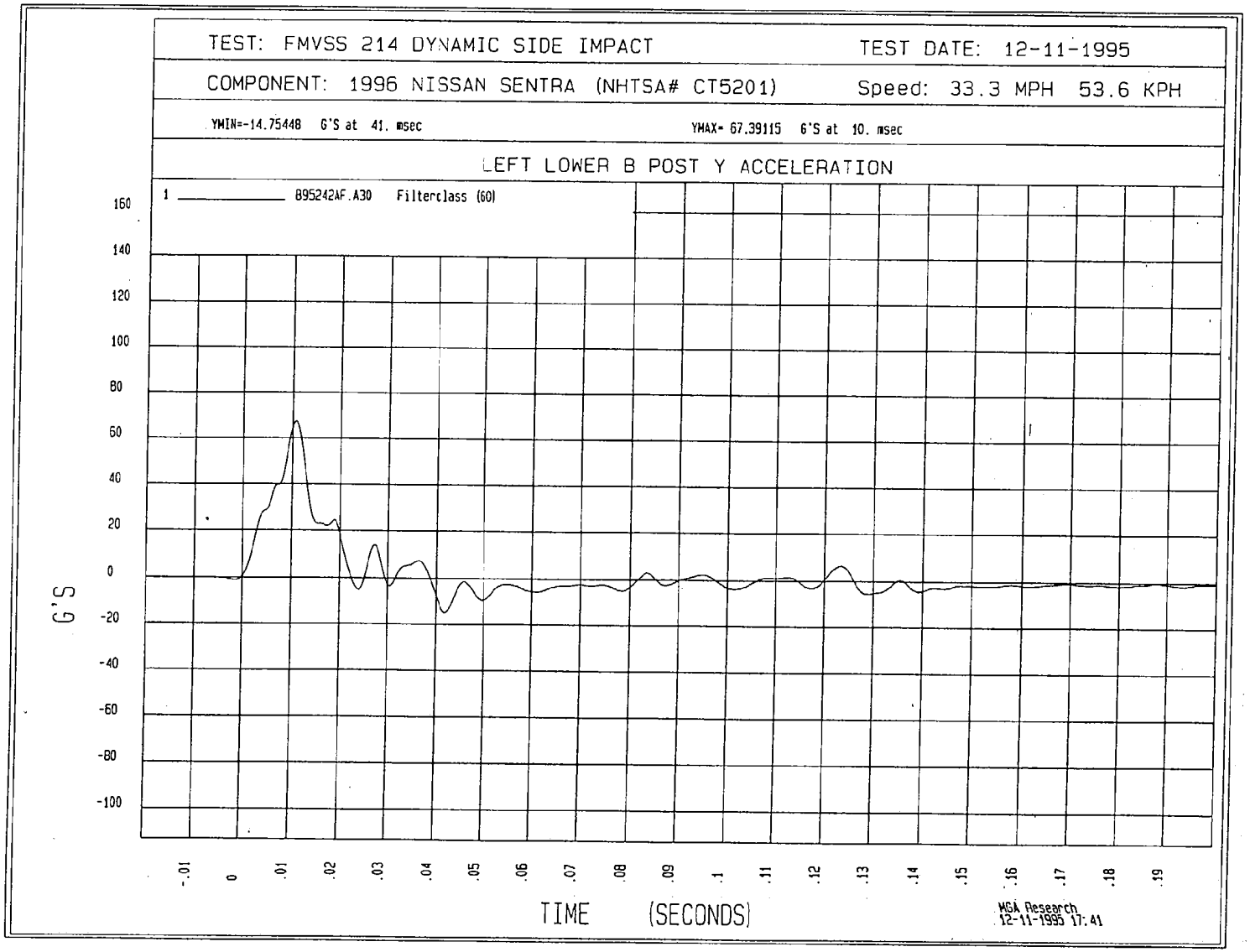
TIME (SECONDS)
MGA Research
12-11-1995 17:41


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-7.598779E-02 KPH at 2.6 msec
YMAX= 52.21735 KPH at 26. msec
LEFT MID B POST Y VELOCITY
1 B65242A1.V29 Filterclass (180)
KPH
TIME Seconds
MGA Research
12-12-1995 10.19


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-14.75448 G'S at 41. msec
YMAX= 67.39115 G'S at 10. msec
LEFT LOWER B POST Y ACCELERATION
1 B95242AF.A30 Filterclass (60)
160
140
120
100
80
60
40
20
0
-20
-40
-60
-80
-100
G'S
-.01
0
.01
.02
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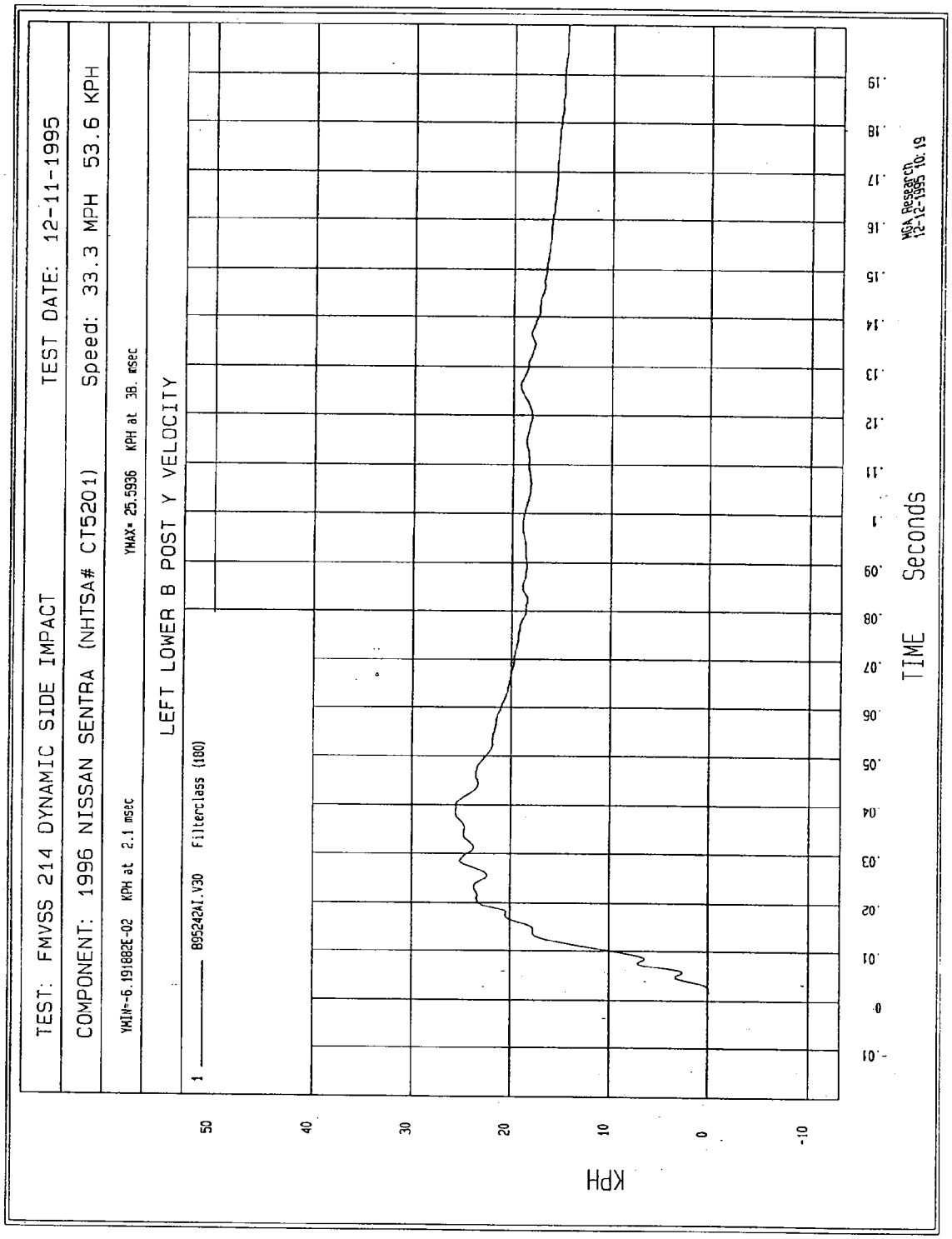
TIME (SECONDS)
MGA Research
12-11-1995 17:41


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-6.191882E-02 KPH at 2.1 msec
YMAX= 25.5936 KPH at 38. msec
LEFT LOWER B POST Y VELOCITY
1 B95242AI.V30 Filterclass (180)
KPH
50
40
30
20
10
0
-10
TIME Seconds
-.01
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MGA Research
12-12-1995 10:19

VEHICLE CENTER OF GRAVITY X ACCELERATION VS. TIME

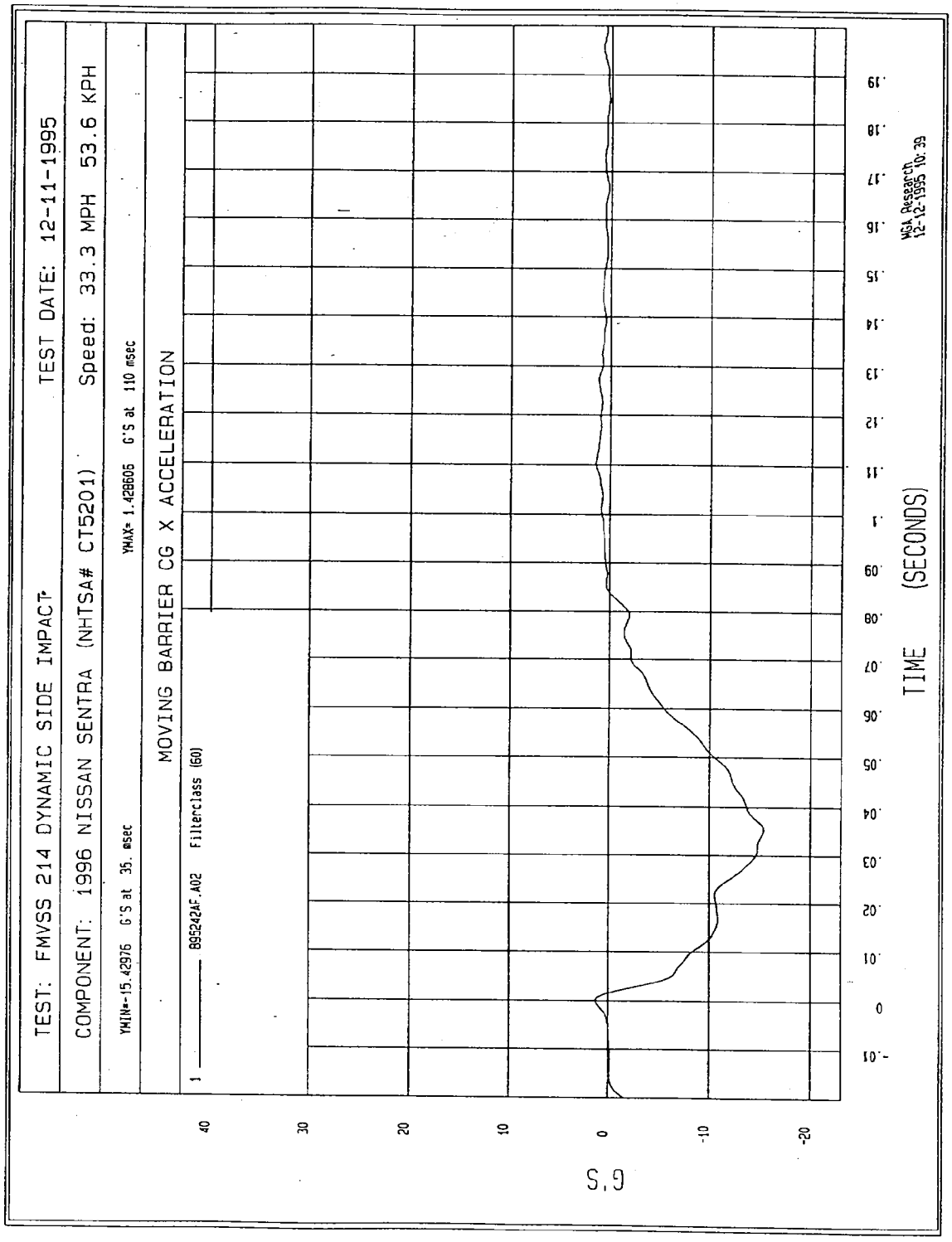
NO VALID DATA COLLECTED

VEHICLE CENTER OF GRAVITY Y ACCELERATION VS. TIME

NO VALID DATA COLLECTED

VEHICLE CENTER OF GRAVITY Z ACCELERATION VS. TIME

NO VALID DATA COLLECTED


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-15.42976 G'S at 35. msec
YMAX= 1.428606 G'S at 110 msec
MOVING BARRIER CG X ACCELERATION
1 B95242AF.A02 Filterclass (60)
40
30
20
10
0
-10
-20
G'S
-.01
0
.01
.02
.03
.04
.05
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.07
.08
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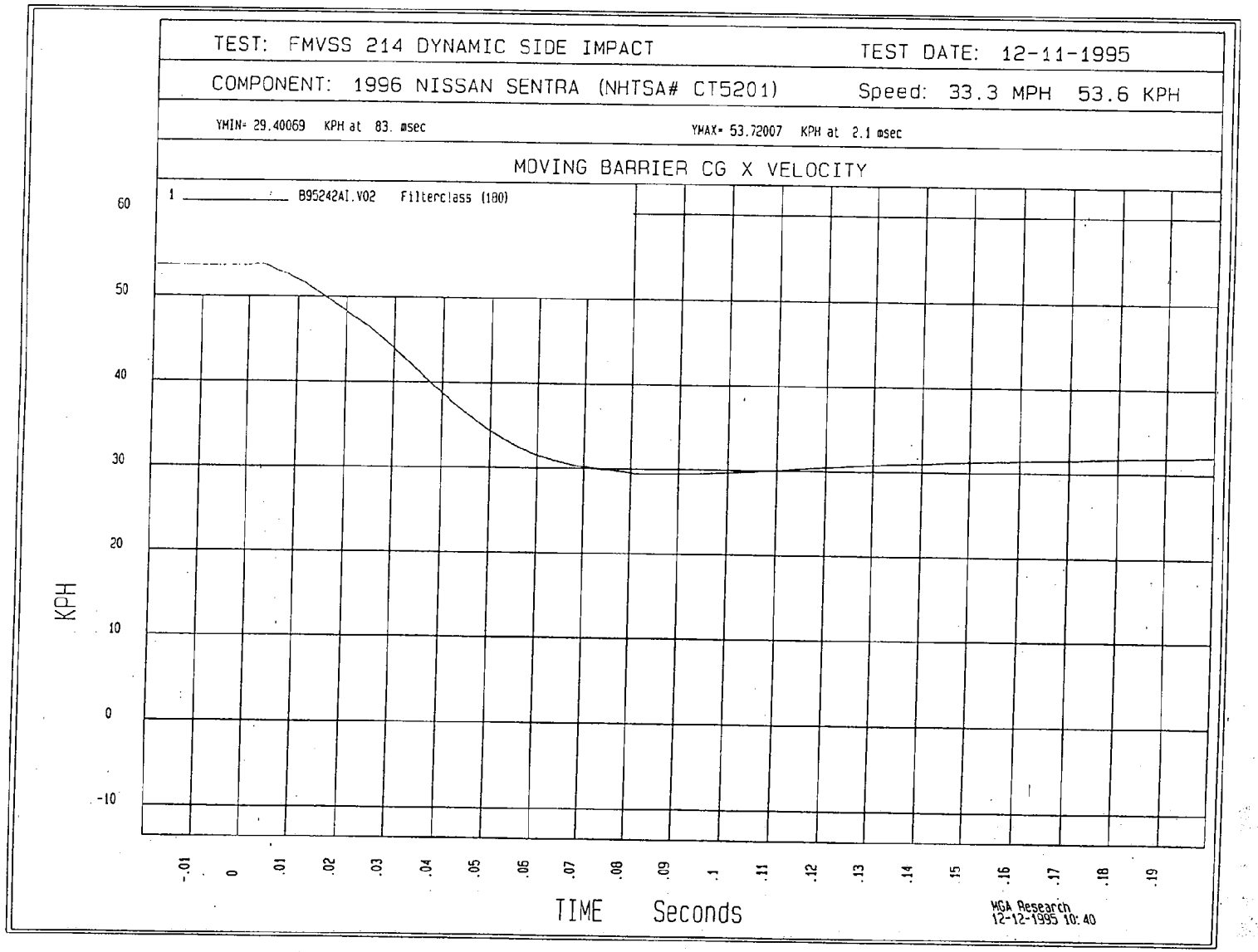
TIME (SECONDS)
MGA Research
12-12-1995 10:39


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN= 29.40069 KPH at 83. msec
YMAX= 53.72007 KPH at 2.1 msec
MOVING BARRIER CG X VELOCITY
1 B95242AI.V02 Filterclass (180)
60
50
40
30
20
10
0
-10
KPH
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
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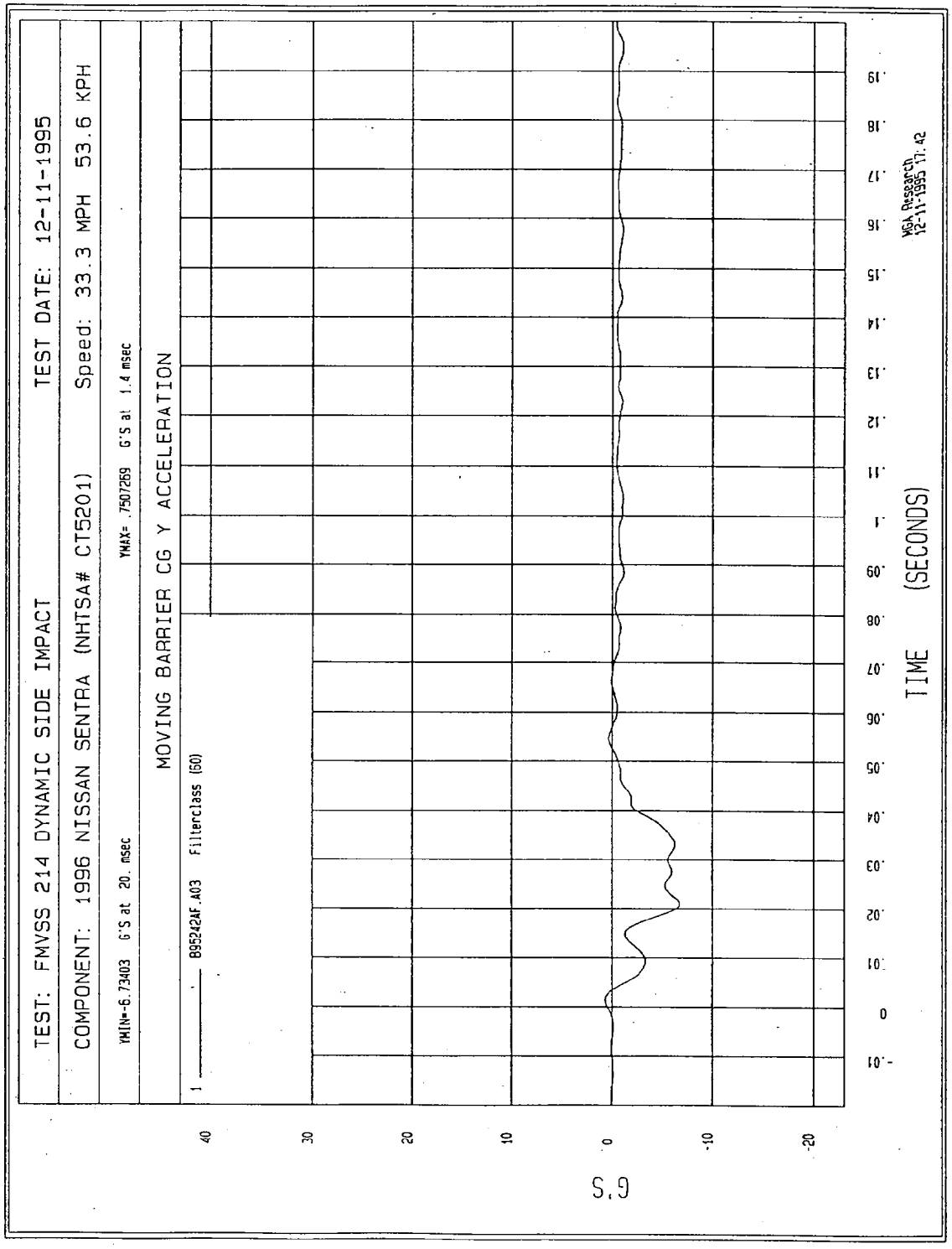
TIME Seconds
MGA Research
12-12-1995 10:40


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-6.73403 G'S at 20. msec
YMAX= .7507269 G'S at 1.4 msec
MOVING BARRIER CG Y ACCELERATION
1 B95242AF.A03 Filterclass (60)
40
30
20
10
0
-10
-20
-.01
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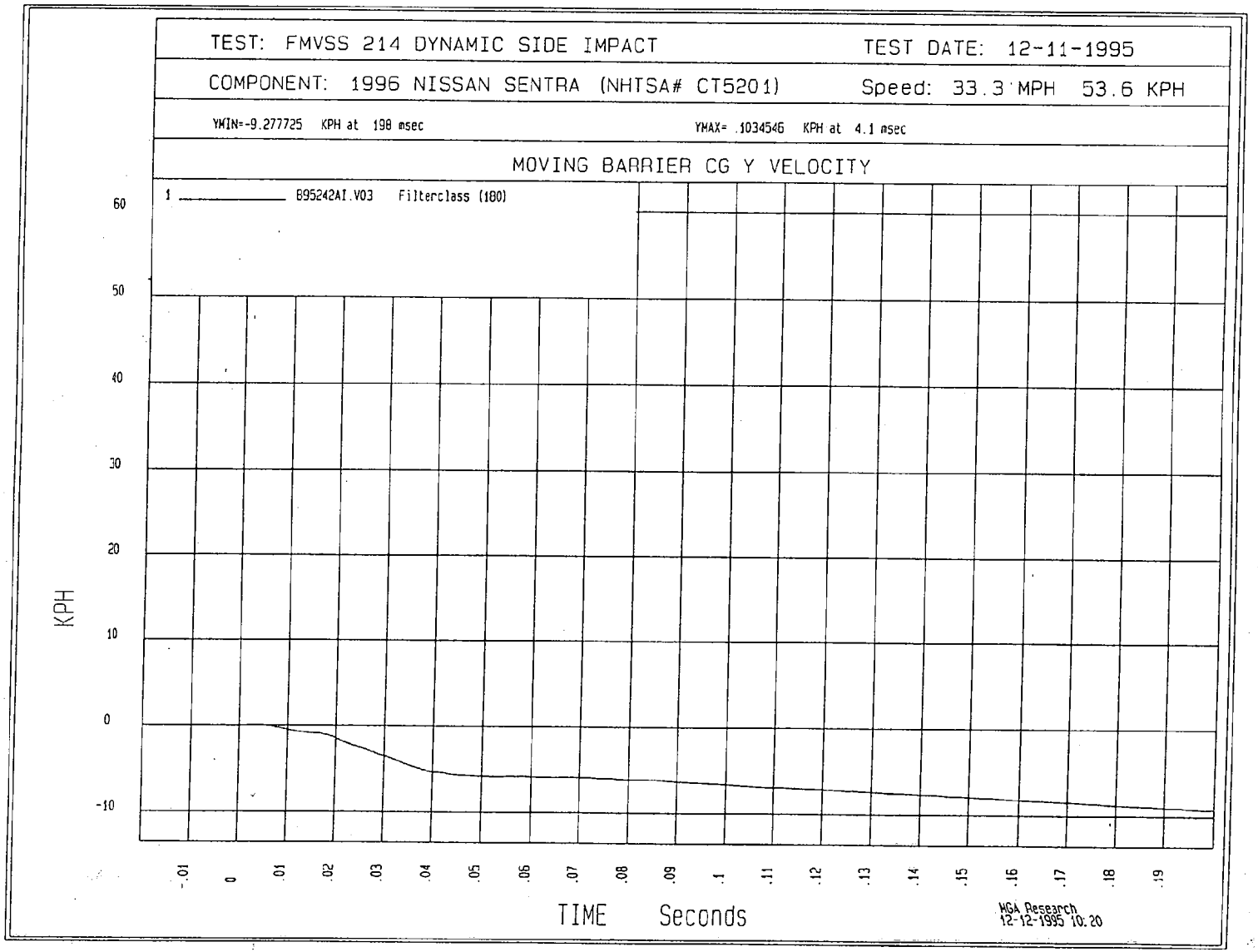
TIME (SECONDS)
MGA Research
12-11-1995 17:42
G's


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-9.277725 KPH at 198 msec
YMAX= .1034546 KPH at 4.1 msec
MOVING BARRIER CG Y VELOCITY
1 B95242AI.V03 Filterclass (180)
KPH
60
50
40
30
20
10
0
-10
-.01
0
.01
.02
.03
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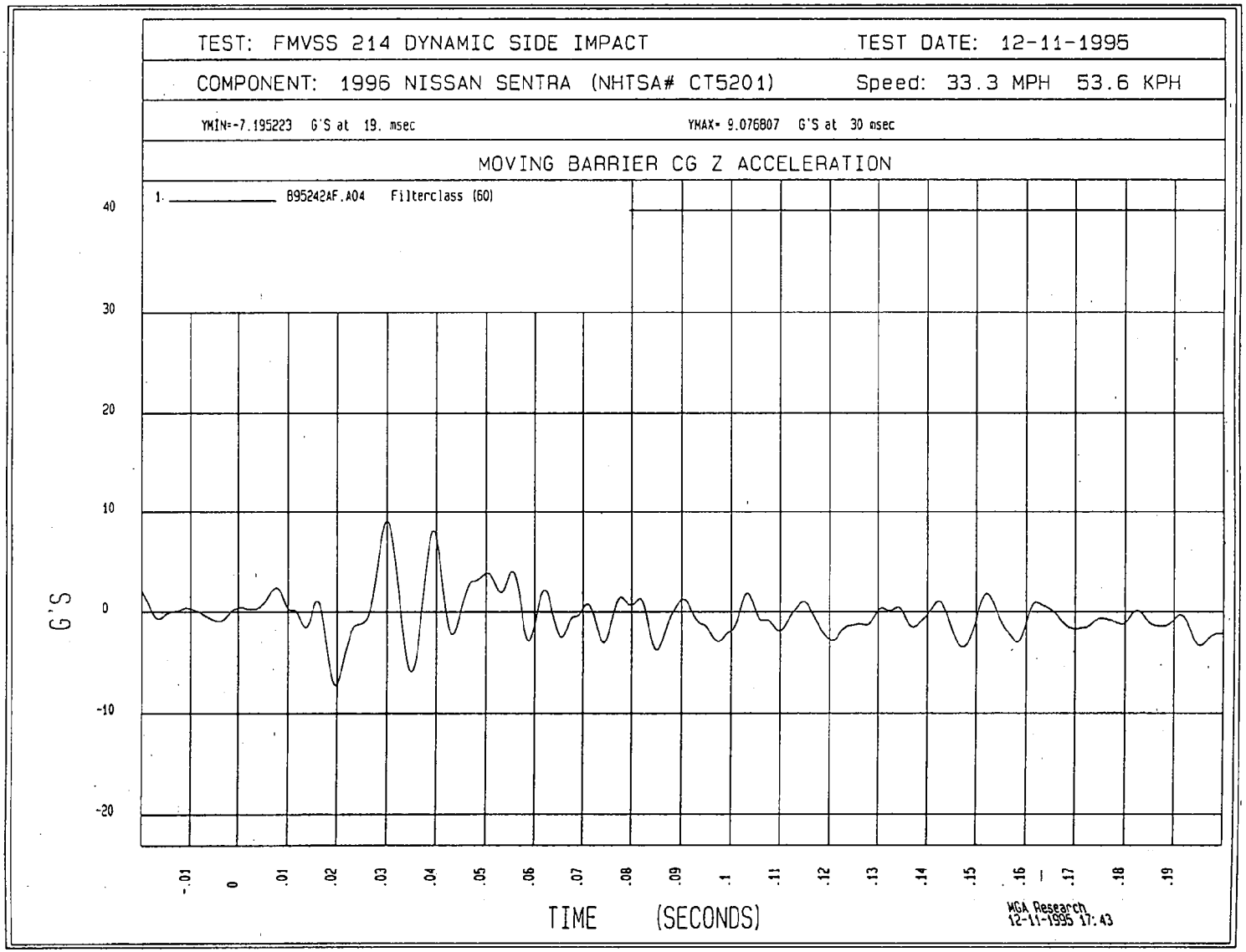
TIME Seconds
MGA Research
12-12-1995 10:20


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-7.195223 G'S at 19. msec
YMAX= 9.076807 G'S at 30 msec
MOVING BARRIER CG Z ACCELERATION
1. B95242AF.A04 Filterclass (60)
40
30
20
10
0
-10
-20
G'S
-.01
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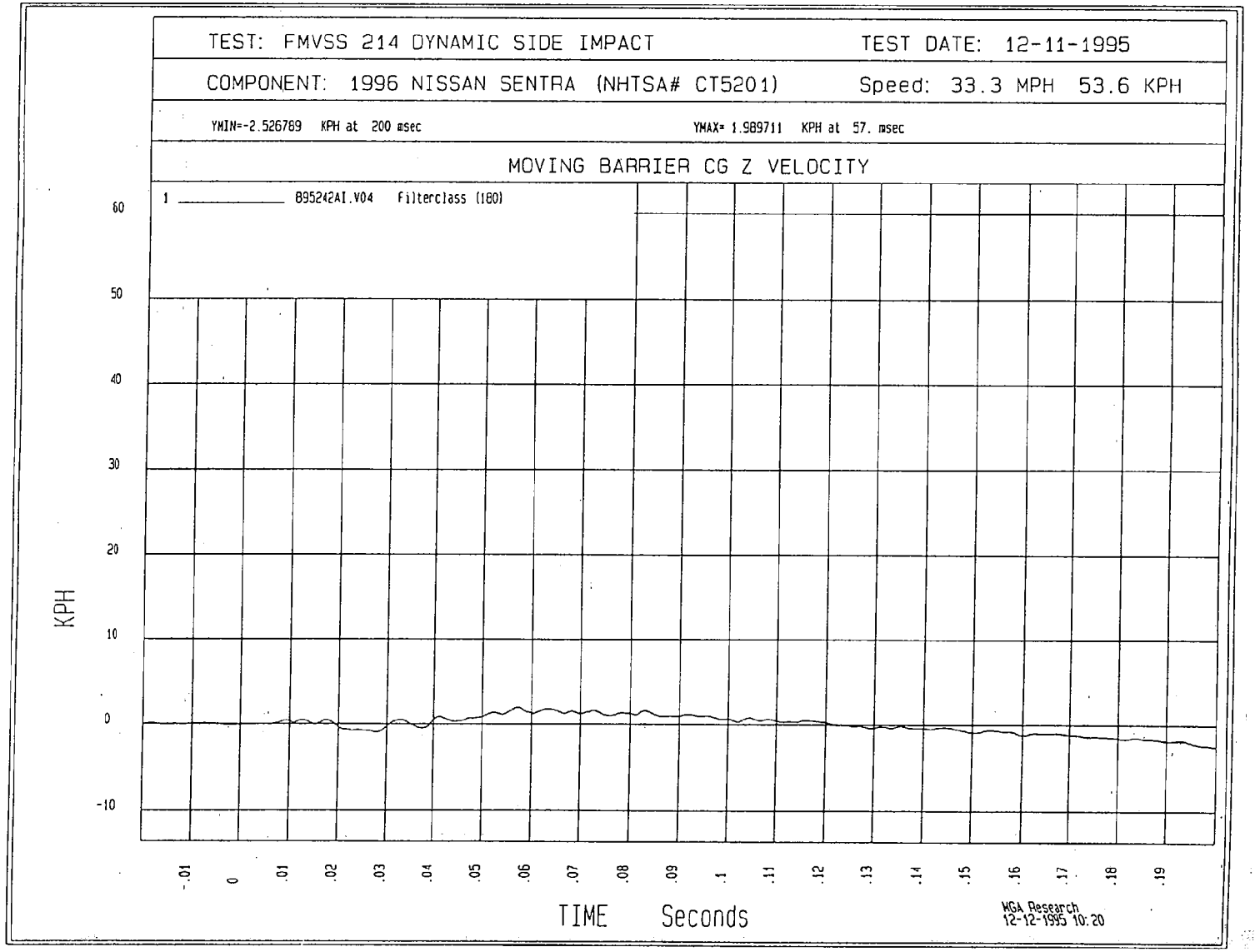
TIME (SECONDS)
MGA Research
12-11-1995 17:43


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-2.526789 KPH at 200 msec
YMAX= 1.989711 KPH at 57. msec
MOVING BARRIER CG Z VELOCITY
1 B95242AI.V04 Filterclass (180)
60
50
40
30
20
10
0
-10
KPH
-.01
0
.01
.02
.03
.04
.05
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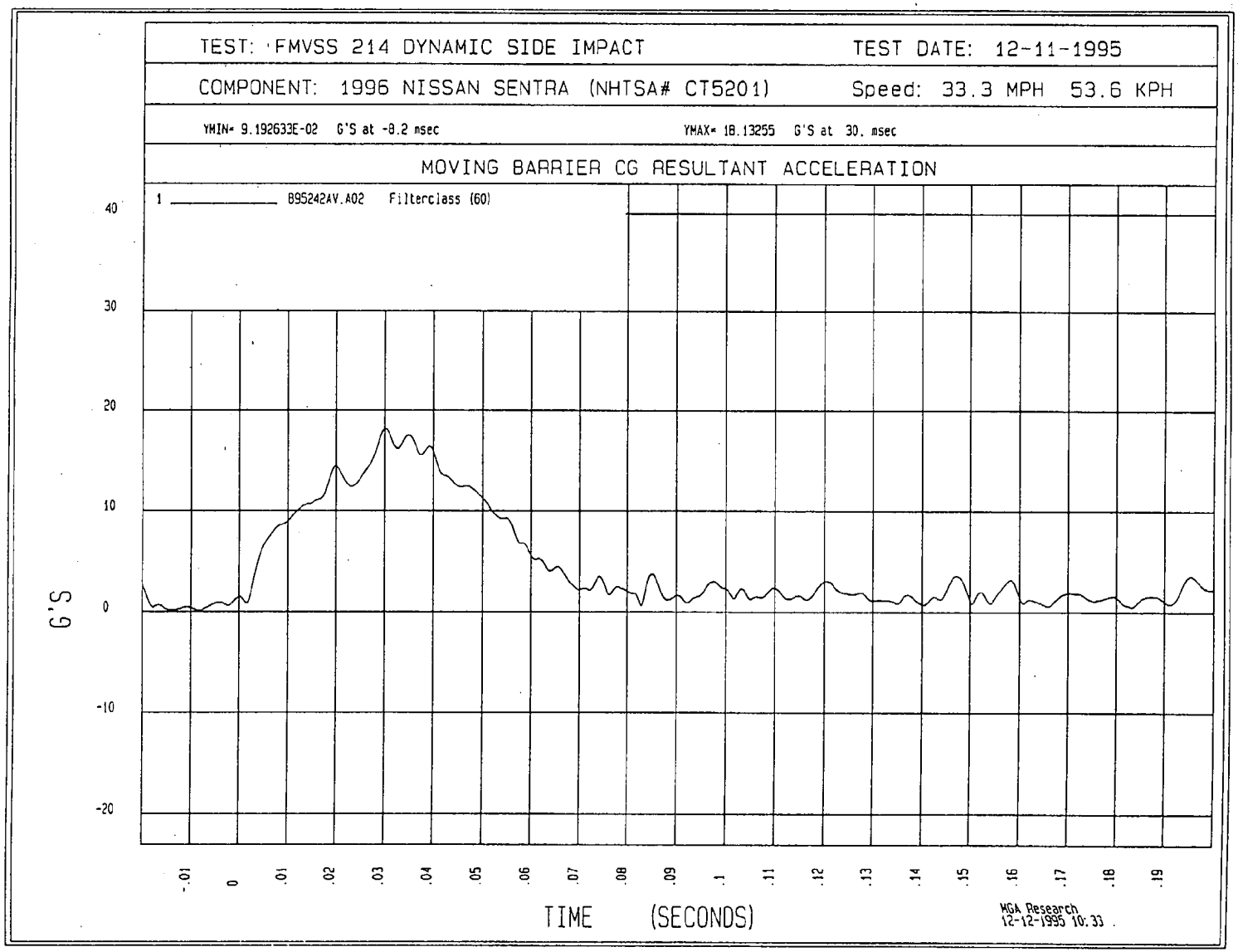
TIME Seconds
MGA Research
12-12-1995 10:20


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN= 9.192633E-02 G'S at -8.2 msec
YMAX= 18.13255 G'S at 30. msec
MOVING BARRIER CG RESULTANT ACCELERATION
1 B95242AV.A02 Filterclass (60)
40
30
20
10
0
-10
-20
G'S
-.01
0
.01
.02
.03
.04
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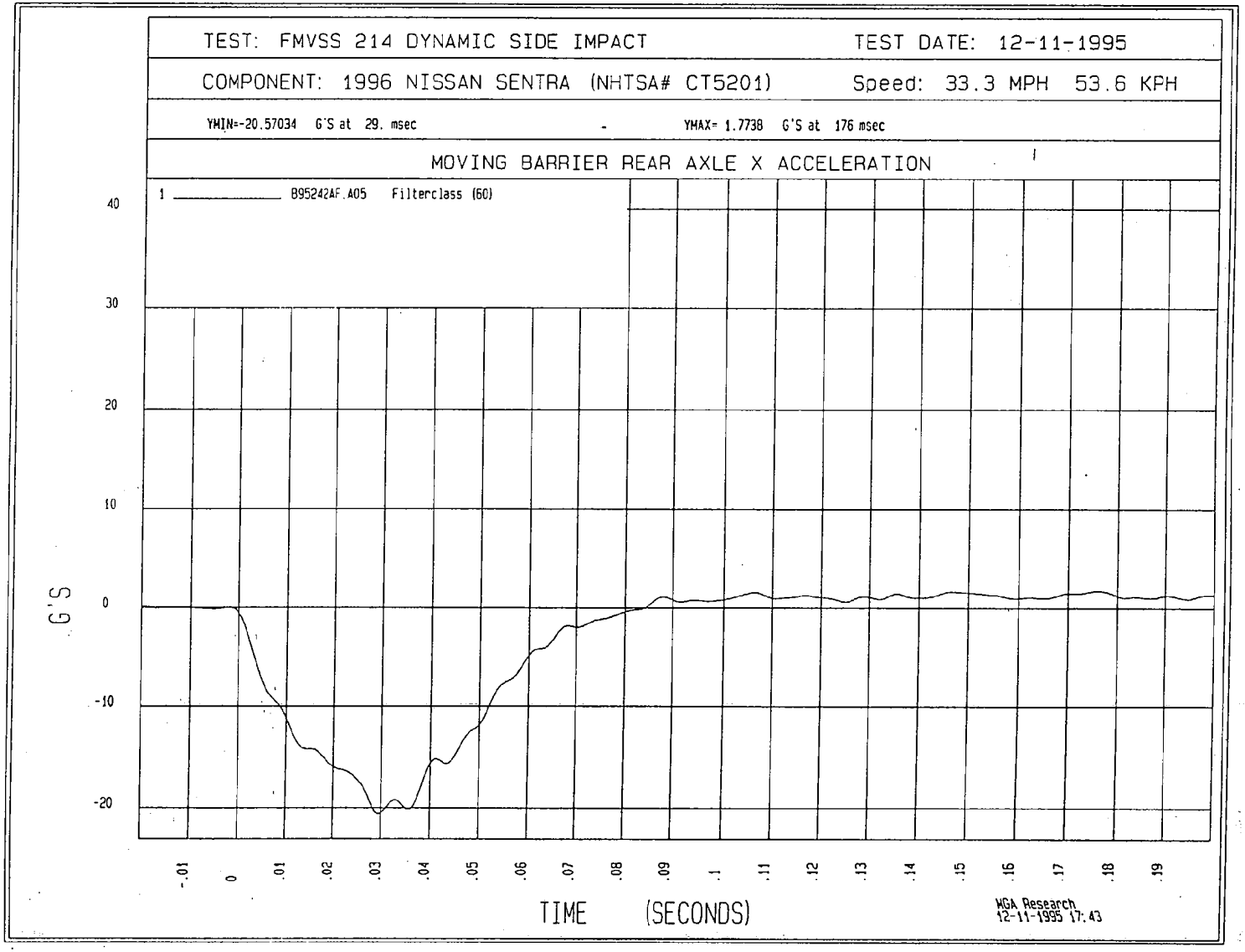
TIME (SECONDS)
MGA Research
12-12-1995 10:33


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-20.57034 G'S at 29. msec
YMAX= 1.7738 G'S at 176 msec
MOVING BARRIER REAR AXLE X ACCELERATION
1 B95242AF.A05 Filterclass (60)
40
30
20
10
0
-10
-20
G'S
-.01
0
.01
.02
.03
.04
.05
.06
.07
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.1
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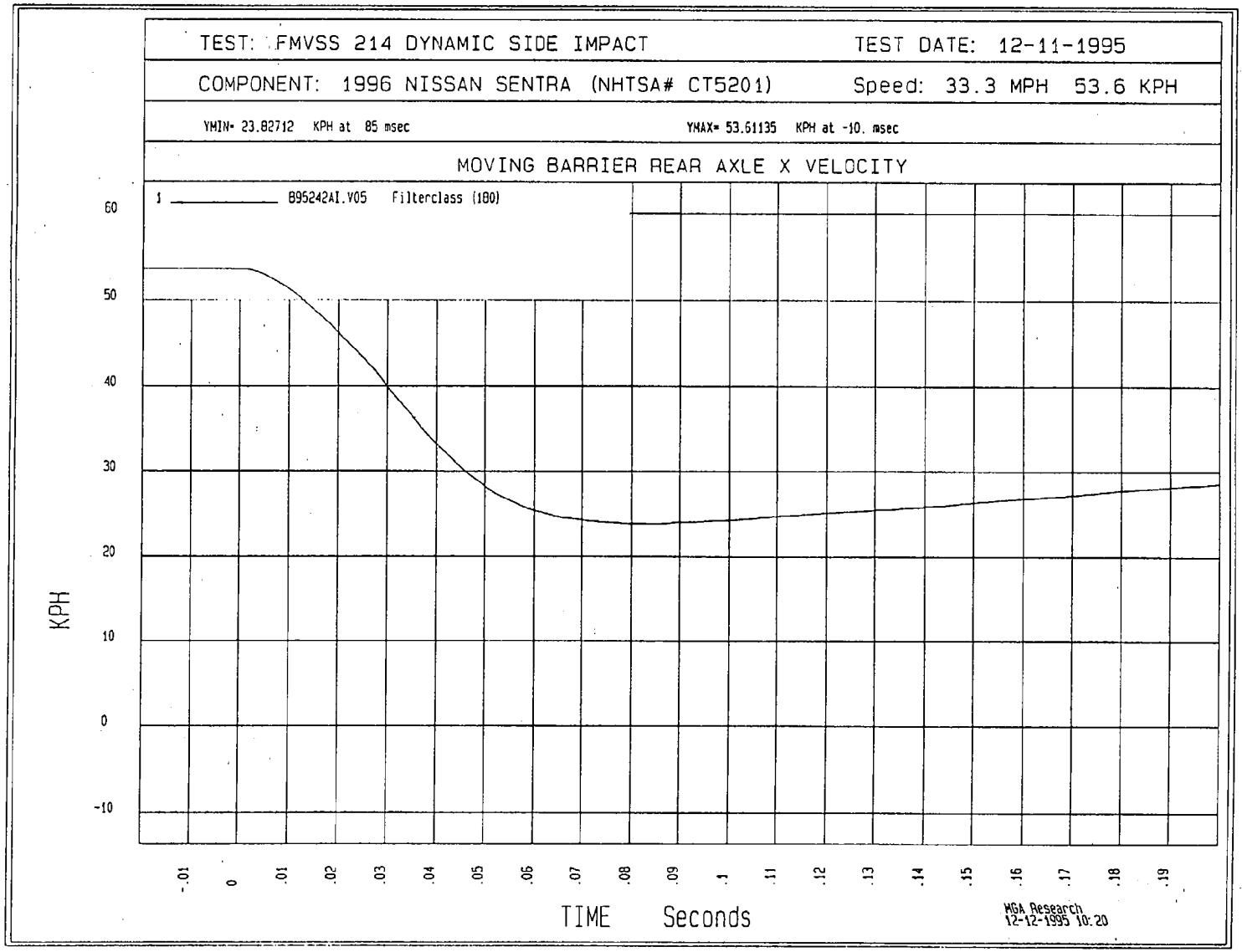
TIME (SECONDS)
MGA Research
12-11-1995 17:43


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN= 23.82712 KPH at 85 msec
YMAX= 53.61135 KPH at -10. msec
MOVING BARRIER REAR AXLE X VELOCITY
1 B95242AI.V05 Filterclass (180)
KPH
60
50
40
30
20
10
0
-10
-.01
0
.01
.02
.03
.04
.05
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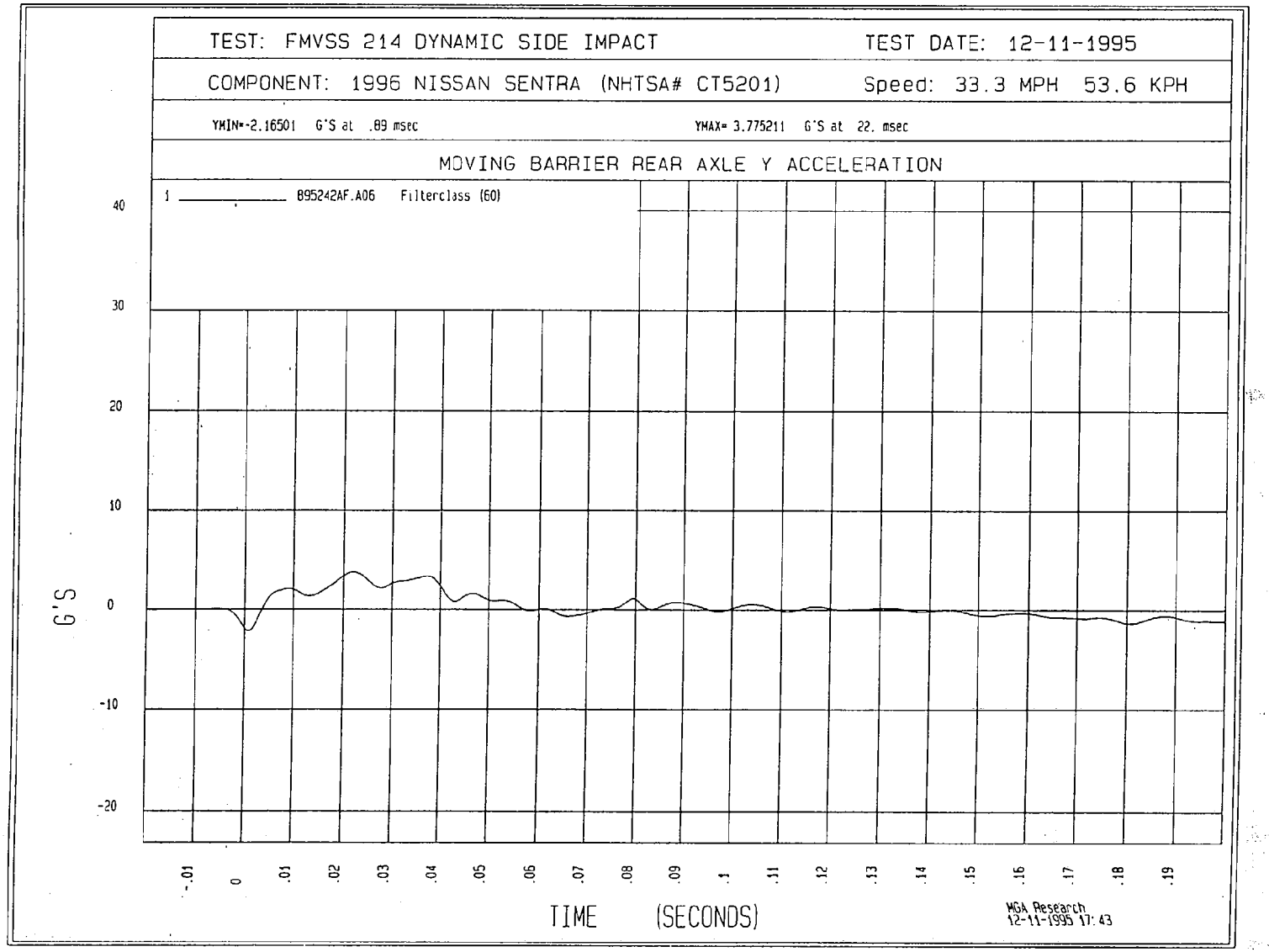
TIME Seconds
MGA Research
12-12-1995 10:20


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-2.16501 G'S at .89 msec
YMAX= 3.775211 G'S at 22. msec
MOVING BARRIER REAR AXLE Y ACCELERATION
1 B95242AF.A06 Filterclass (60)
40
30
20
10
0
-10
-20
G'S
-.01
0
.01
.02
.03
.04
.05
.06
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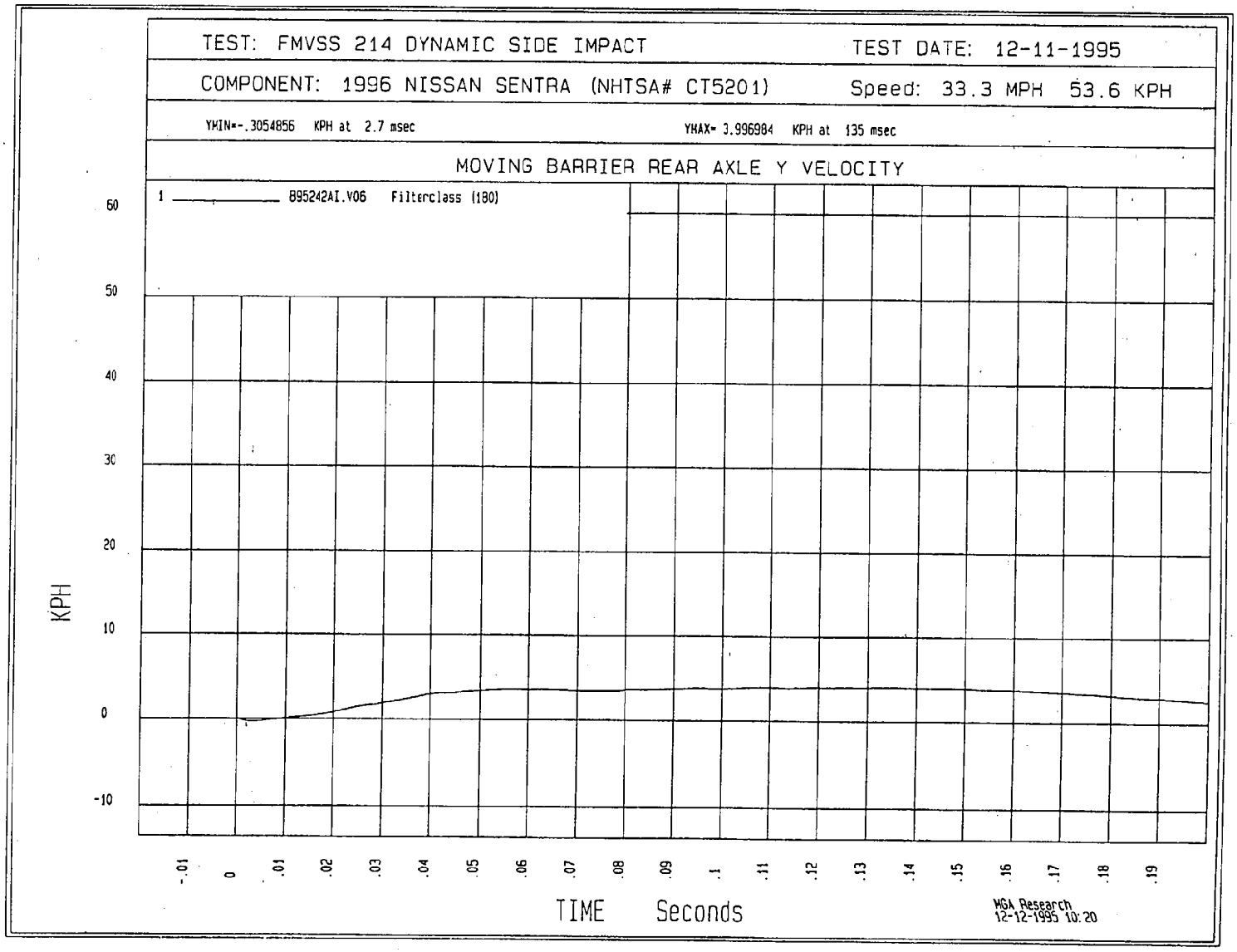
TIME (SECONDS)
MGA Research
12-11-1995 17:43


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-.3054856 KPH at 2.7 msec
YMAX= 3.996984 KPH at 135 msec
MOVING BARRIER REAR AXLE Y VELOCITY
1 B95242AI.V06 Filterclass (180)
60
50
40
30
20
10
0
-10
KPH
-.01
0
.01
.02
.03
.04
.05
.06
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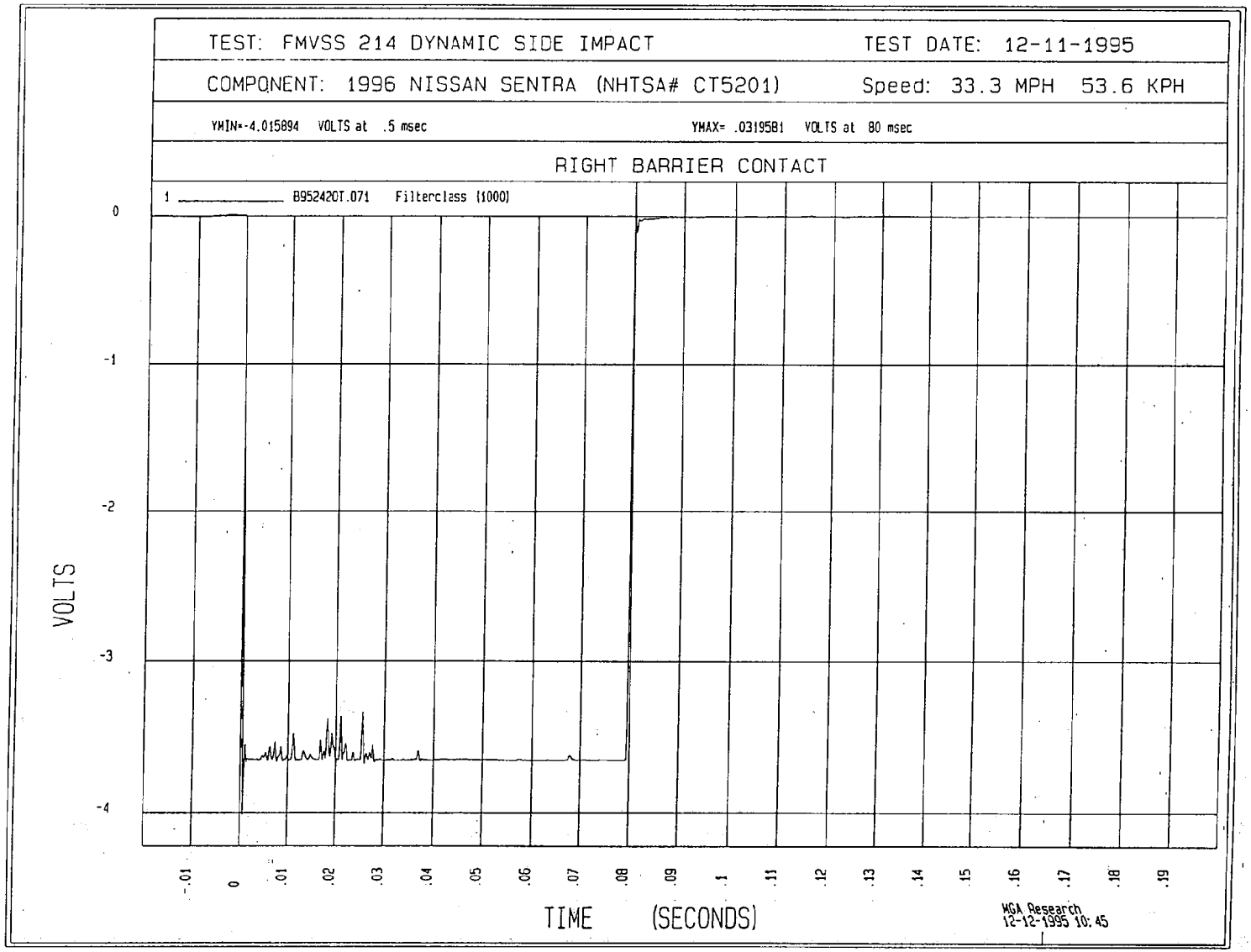
TIME Seconds
MGA Research
12-12-1995 10:20


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-4.015894 VOLTS at .5 msec
YMAX= .0319581 VOLTS at 80 msec
RIGHT BARRIER CONTACT
1 B952420T.071 Filterclass (1000)
VOLTS
0
-1
-2
-3
-4
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
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.14
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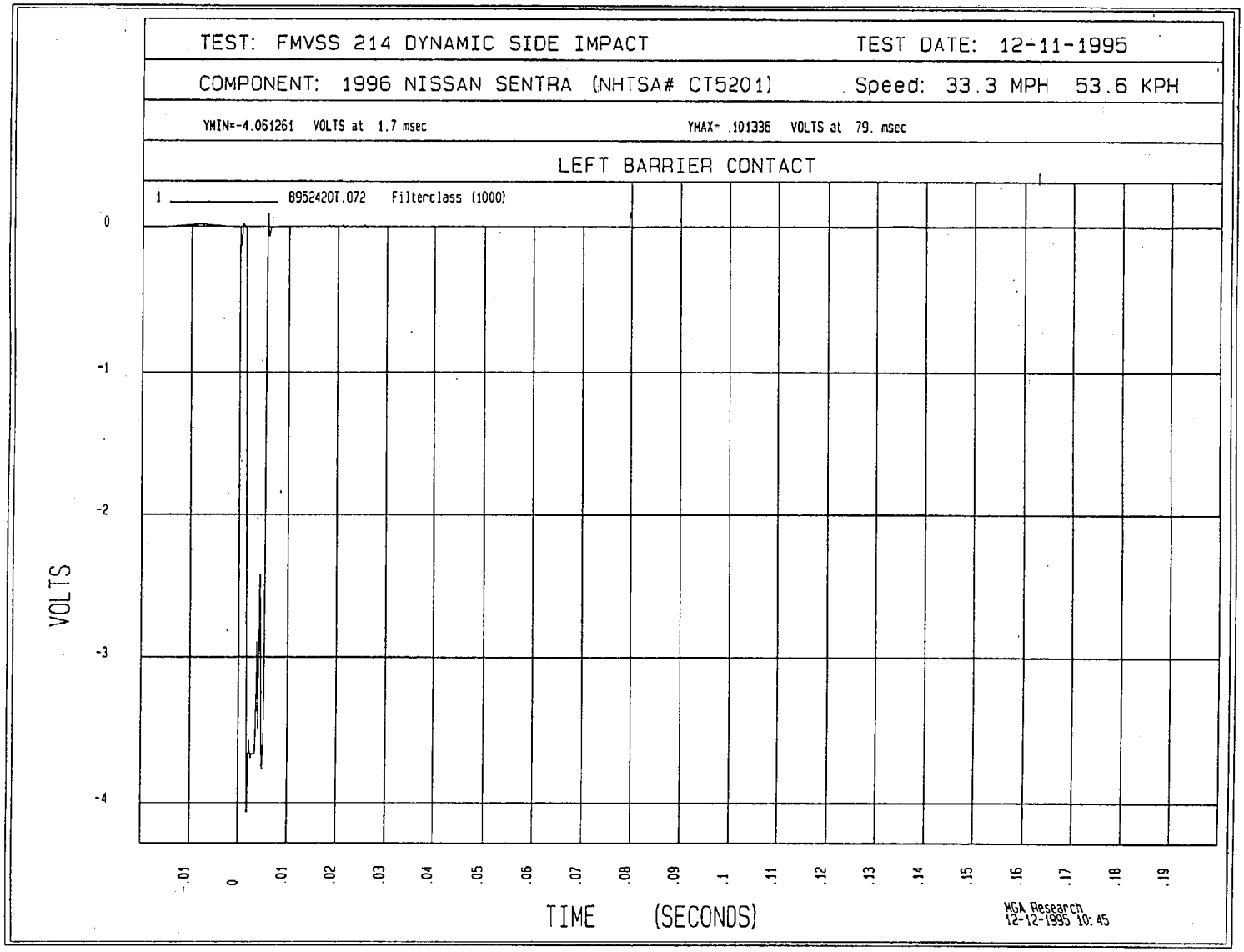
.19
TIME (SECONDS)
MGA Research
12-12-1995 10:45


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-4.061261 VOLTS at 1.7 msec
YMAX= .101336 VOLTS at 79. msec
LEFT BARRIER CONTACT
1 B952420T.072 Filterclass (1000)
VOLTS
0
-1
-2
-3
-4
-.01
0
.01
.02
.03
.04
.05
.06
.07
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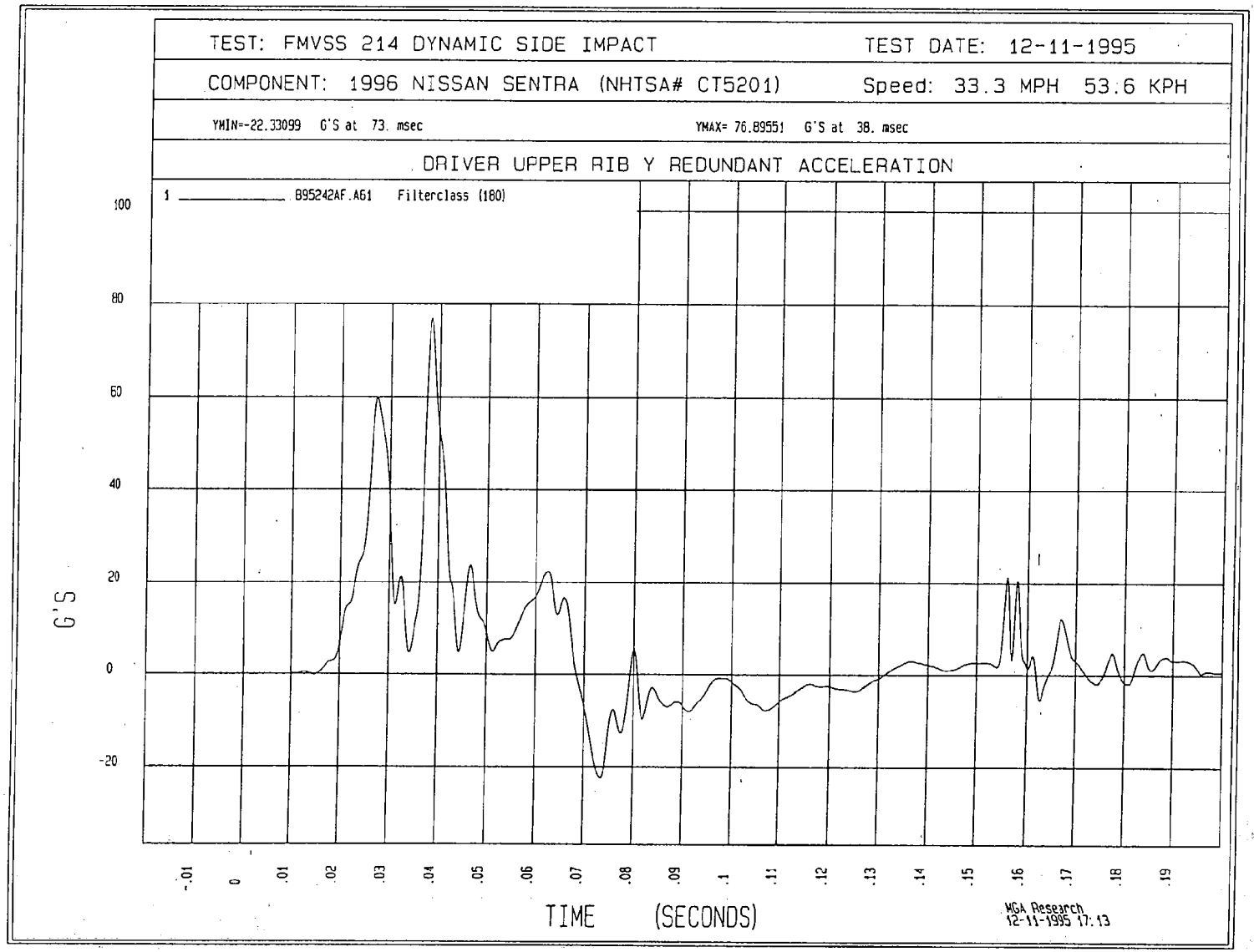
TIME (SECONDS)
MGA Research
12-12-1995 10:45


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-22.33099 G'S at 73. msec
YMAX= 76.89551 G'S at 38. msec
DRIVER UPPER RIB Y REDUNDANT ACCELERATION
1 B95242AF.A61 Filterclass (180)
100
80
60
40
20
0
-20
G'S
-.01
0
.01
.02
.03
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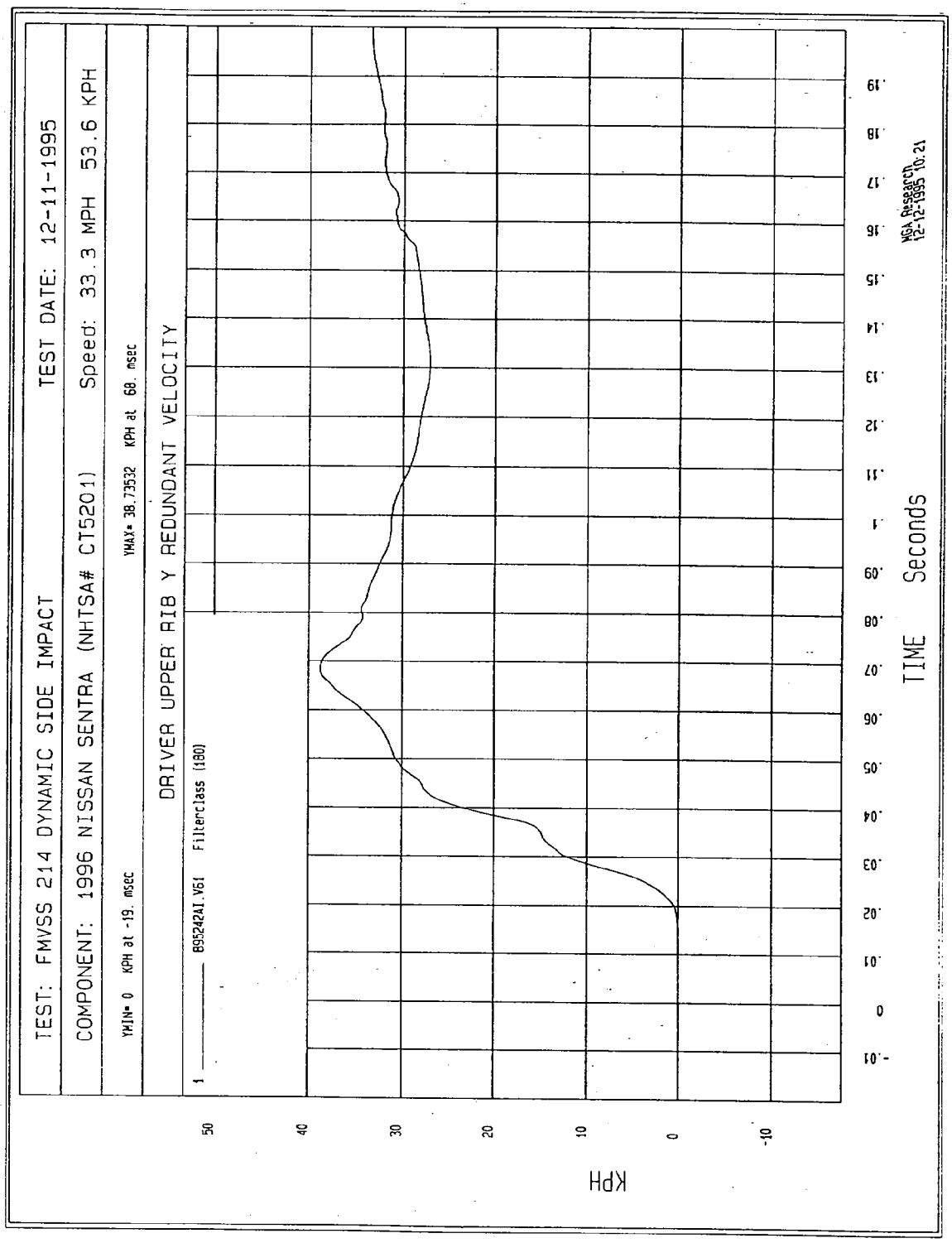
TIME (SECONDS)
MGA Research
12-11-1995 17:13


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN= 0 KPH at -19. msec
YMAX= 38.73532 KPH at 68. msec
DRIVER UPPER RIB Y REDUNDANT VELOCITY
1 B95242A1.V61 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.01
.02
.03
.04
.05
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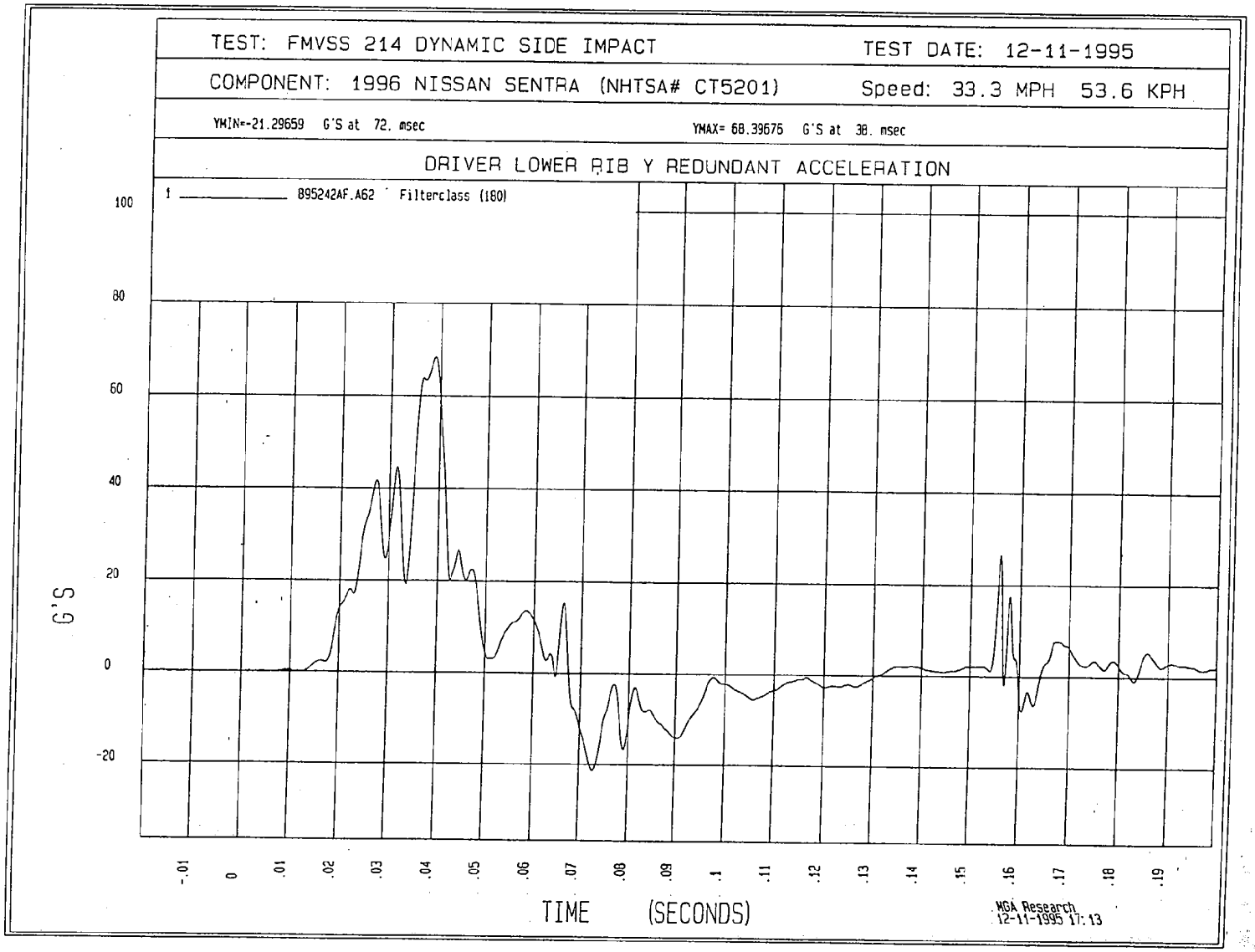
TIME Seconds
MGA Research
12-12-1995 10:21


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-21.29659 G'S at 72. msec
YMAX= 68.39675 G'S at 38. msec
DRIVER LOWER RIB Y REDUNDANT ACCELERATION
1 895242AF.A62 Filterclass (180)
100
80
60
40
20
0
-20
G'S
-.01
0
.01
.02
.03
.04
.05
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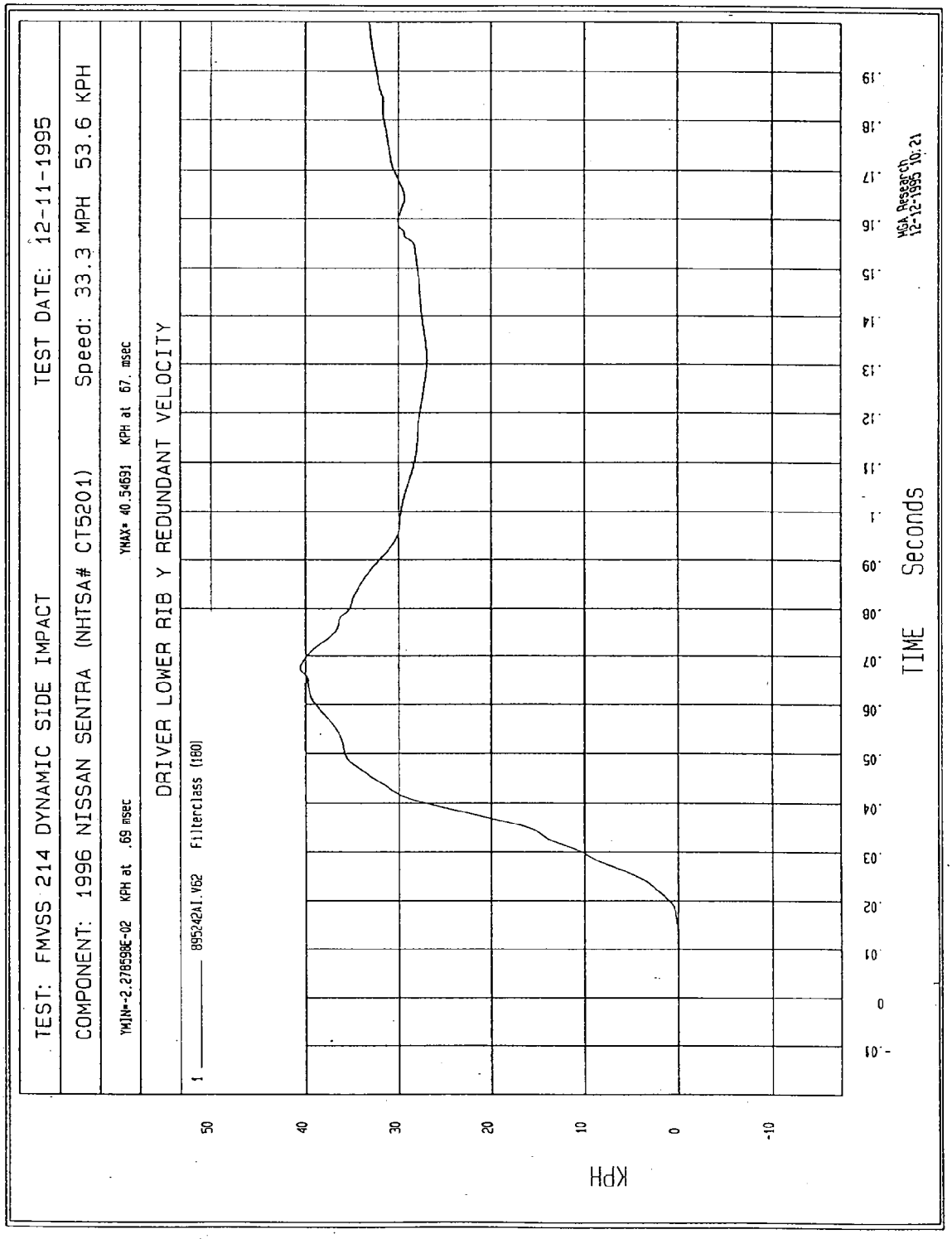
TIME (SECONDS)
MGA Research
12-11-1995 17:13


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-2.278598E-02 KPH at .69 msec
YMAX= 40.54691 KPH at 67. msec
DRIVER LOWER RIB Y REDUNDANT VELOCITY
1 _____ 895242A1.V62 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.01
.02
.03
.04
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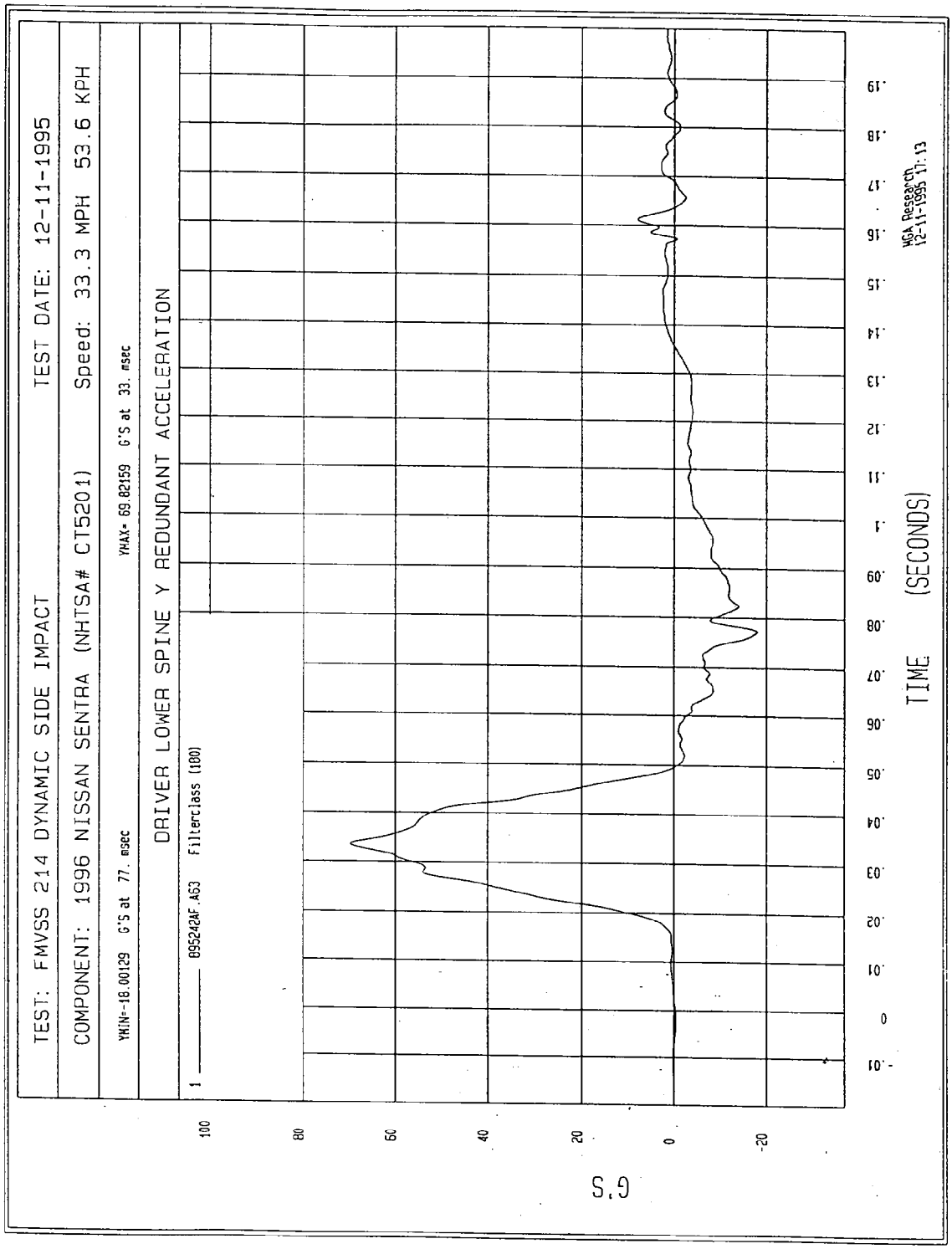
TIME Seconds
MGA Research
12-12-1995 10:21


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-18.00129 G'S at 77. msec
YMAX= 69.82159 G'S at 33. msec
DRIVER LOWER SPINE Y REDUNDANT ACCELERATION
1 0952424F.A63 Filterclass (180)
100
80
60
40
20
0
-20
G'S
.19
.18
.17
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.15
.14
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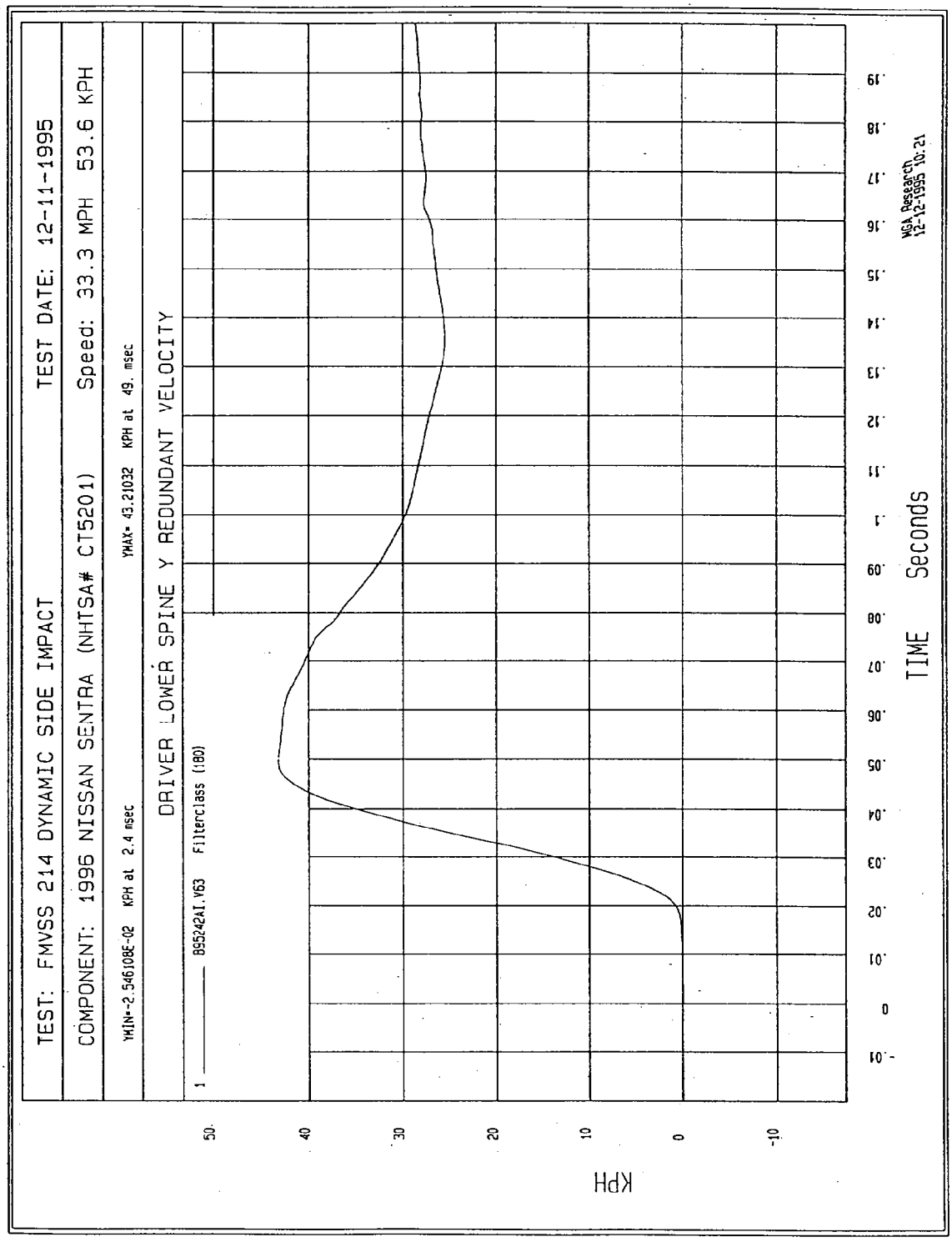
0
-.01
TIME (SECONDS)
MGA Research
12-11-1995 17:13


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-2.546108E-02 KPH at 2.4 msec
YMAX= 43.21032 KPH at 49. msec
DRIVER LOWER SPINE Y REDUNDANT VELOCITY
1 B95242AI.V63 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.01
.02
.03
.04
.05
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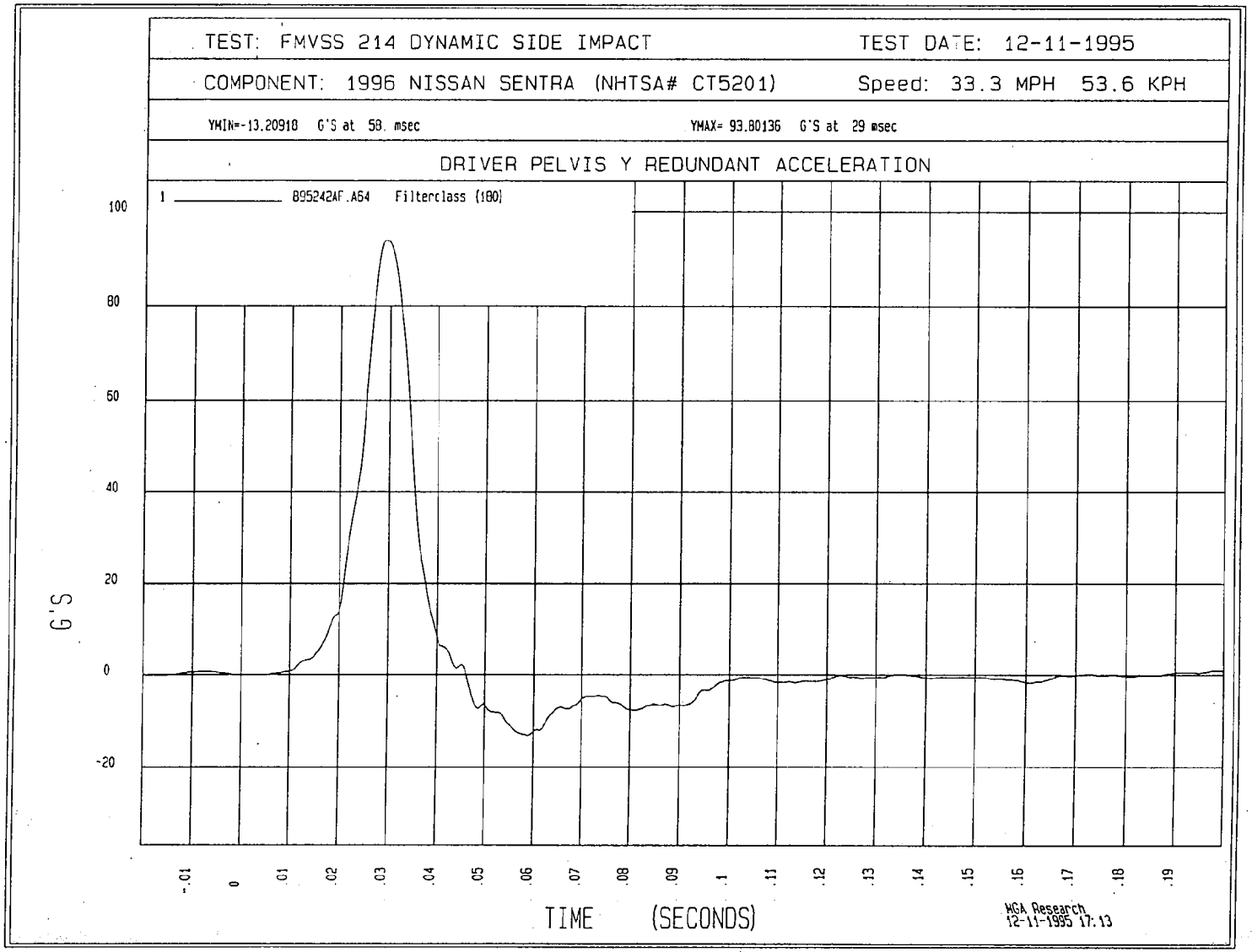
TIME Seconds
MGA Research
12-12-1995 10:21


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-13.20918 G'S at 58. msec
YMAX= 93.80136 G'S at 29 msec
DRIVER PELVIS Y REDUNDANT ACCELERATION
1 B95242AF.A64 Filterclass (180)
100
80
60
40
20
0
-20
G'S
-.01
0
.01
.02
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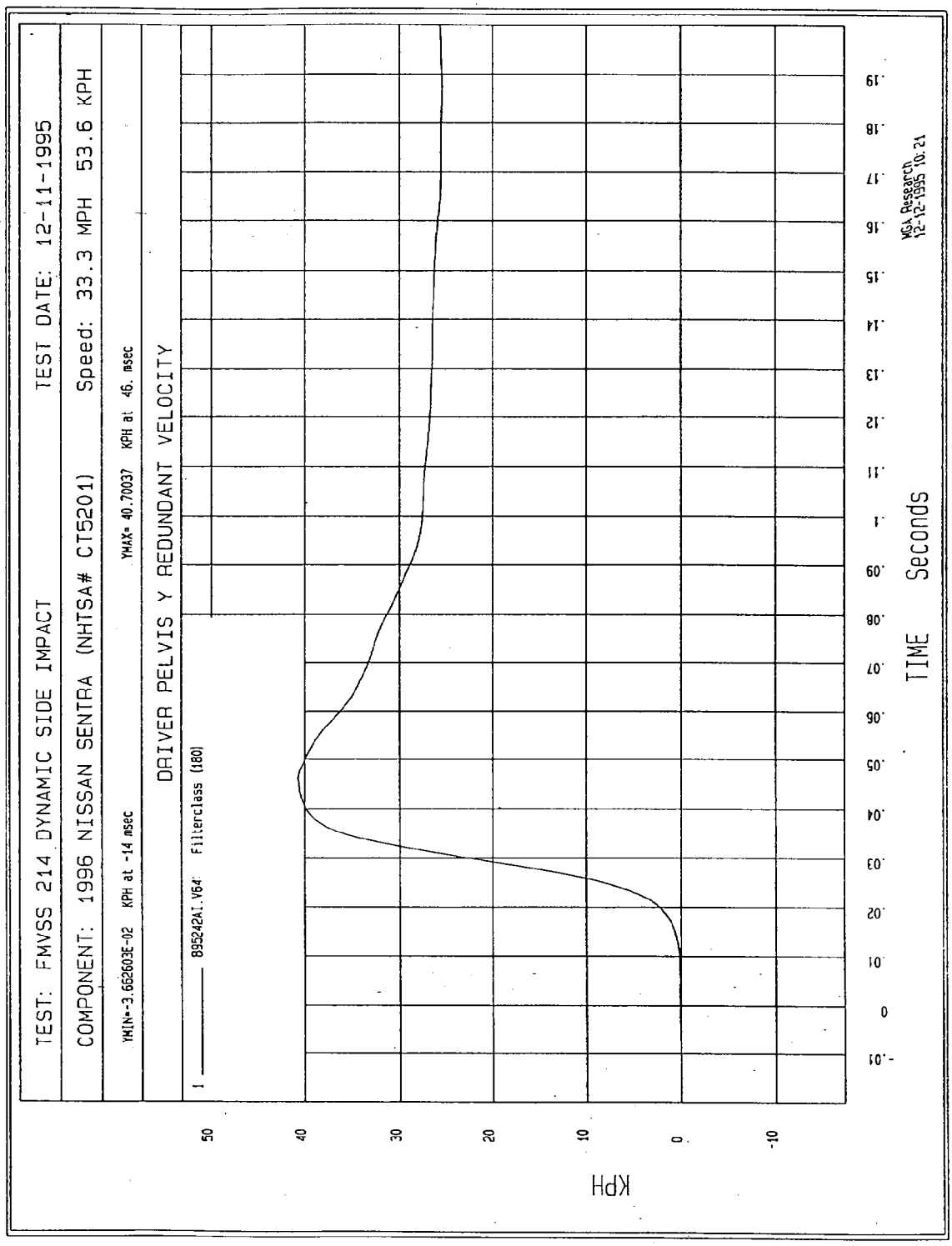
TIME (SECONDS)
MGA Research
12-11-1995 17:13


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-3.662603E-02 KPH at -14 msec
YMAX= 40.70037 KPH at 46. msec
DRIVER PELVIS Y REDUNDANT VELOCITY
1 B95242AI.V64: Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.10
.20
.03
.04
.05
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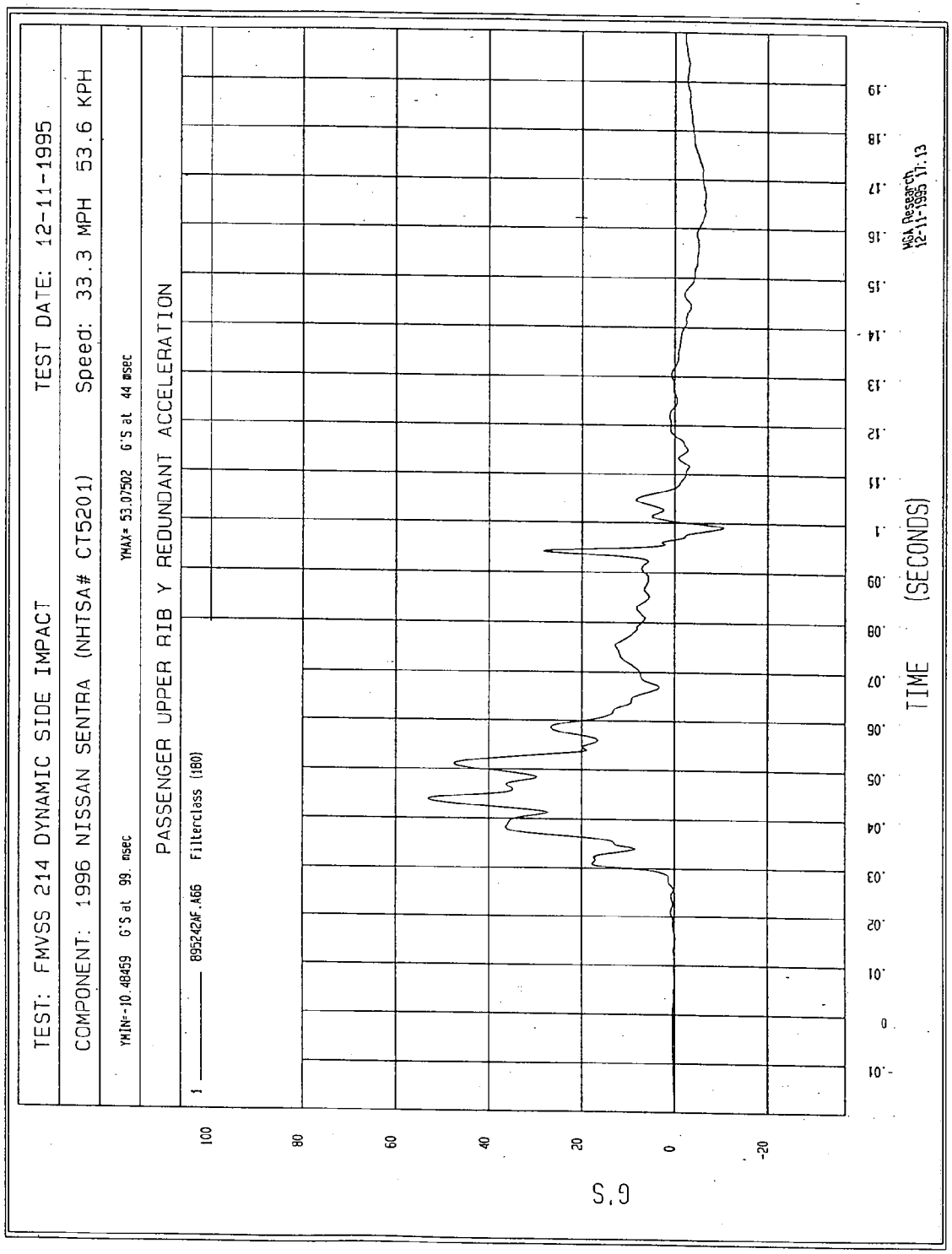
TIME Seconds
MGA Research
12-12-1995 10:21


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-10.48459 G'S at 99. msec
YMAX= 53.07502 G'S at 44 msec
PASSENGER UPPER RIB Y REDUNDANT ACCELERATION
1 _____ 895242AF.A6G Filterclass (180)
100
80
60
40
20
0
-20
G'S
.19
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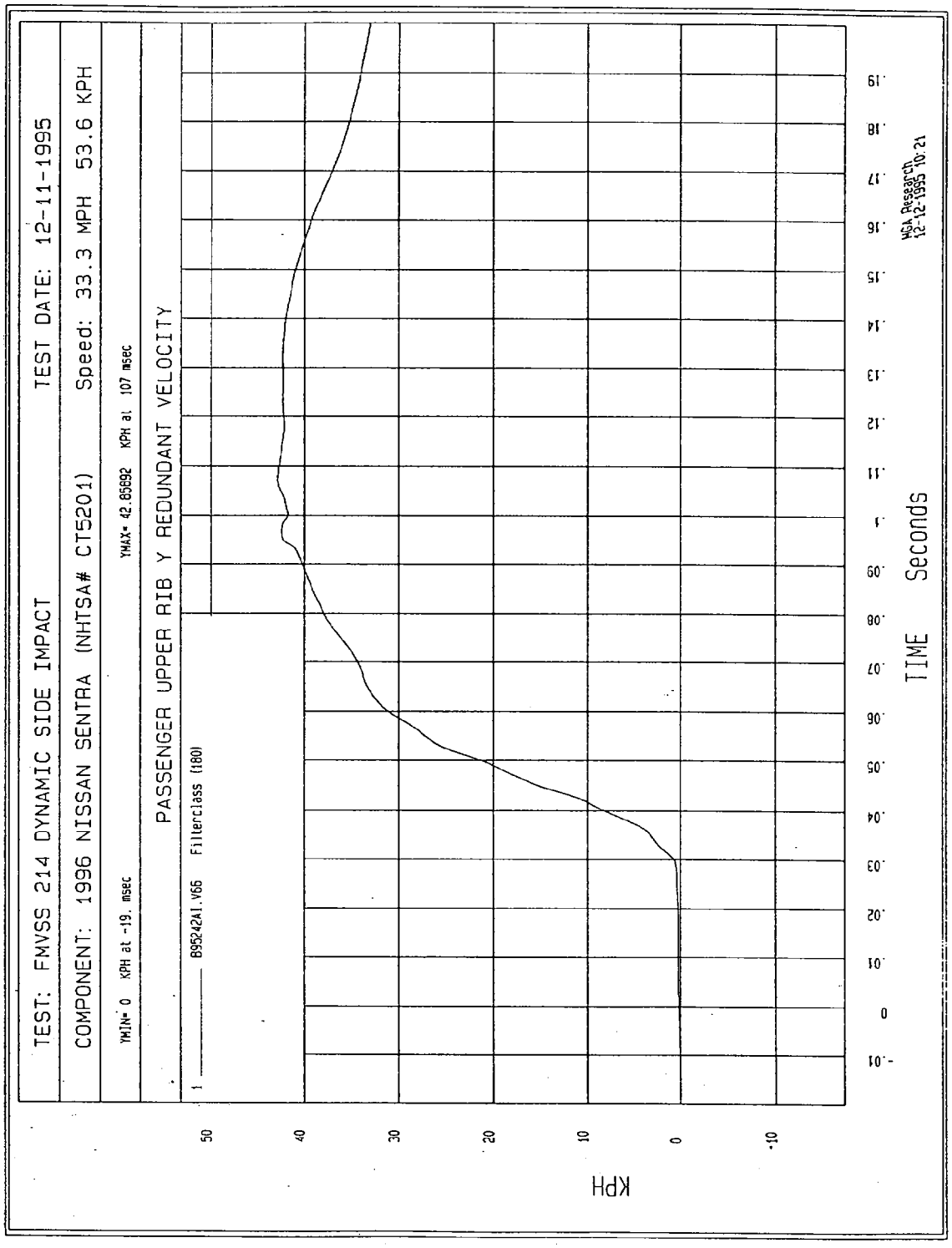
-.01
TIME (SECONDS)
MGA Research
12-11-1995 17:13


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN= 0 KPH at -19. msec
YMAX= 42.85692 KPH at 107 msec
PASSENGER UPPER RIB Y REDUNDANT VELOCITY
1 B95242A1.V66 Filterclass (180)
KPH
50
40
30
20
10
0
-10
TIME Seconds
-.01
0
.01
.02
.03
.04
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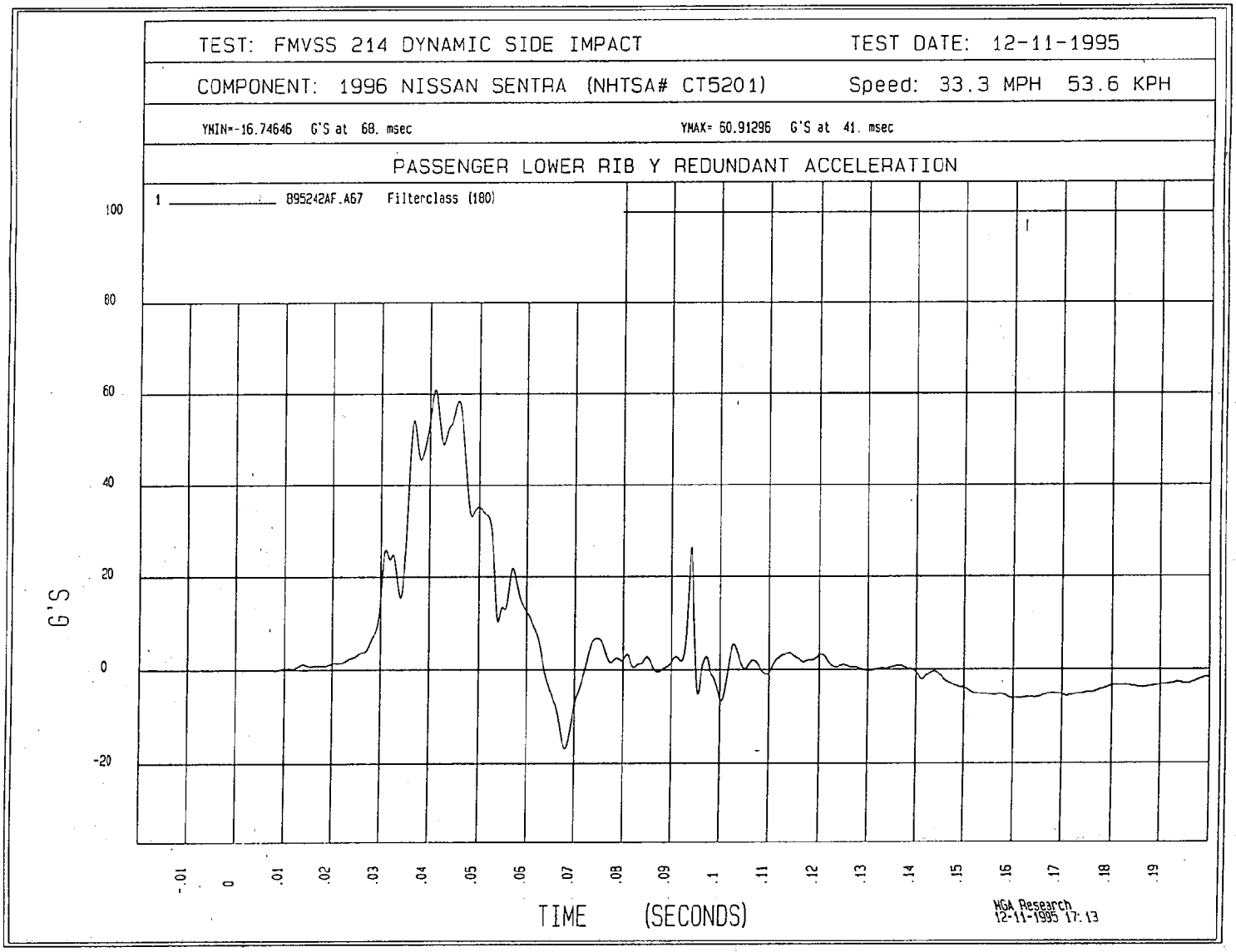
MGA Research
12-12-1995 10:21


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-16.74646 G'S at 68. msec
YMAX= 60.91296 G'S at 41. msec
PASSENGER LOWER RIB Y REDUNDANT ACCELERATION
1 B95242AF.A67 Filterclass (180)
100
80
60
40
20
0
-20
G'S
-.01
0
.01
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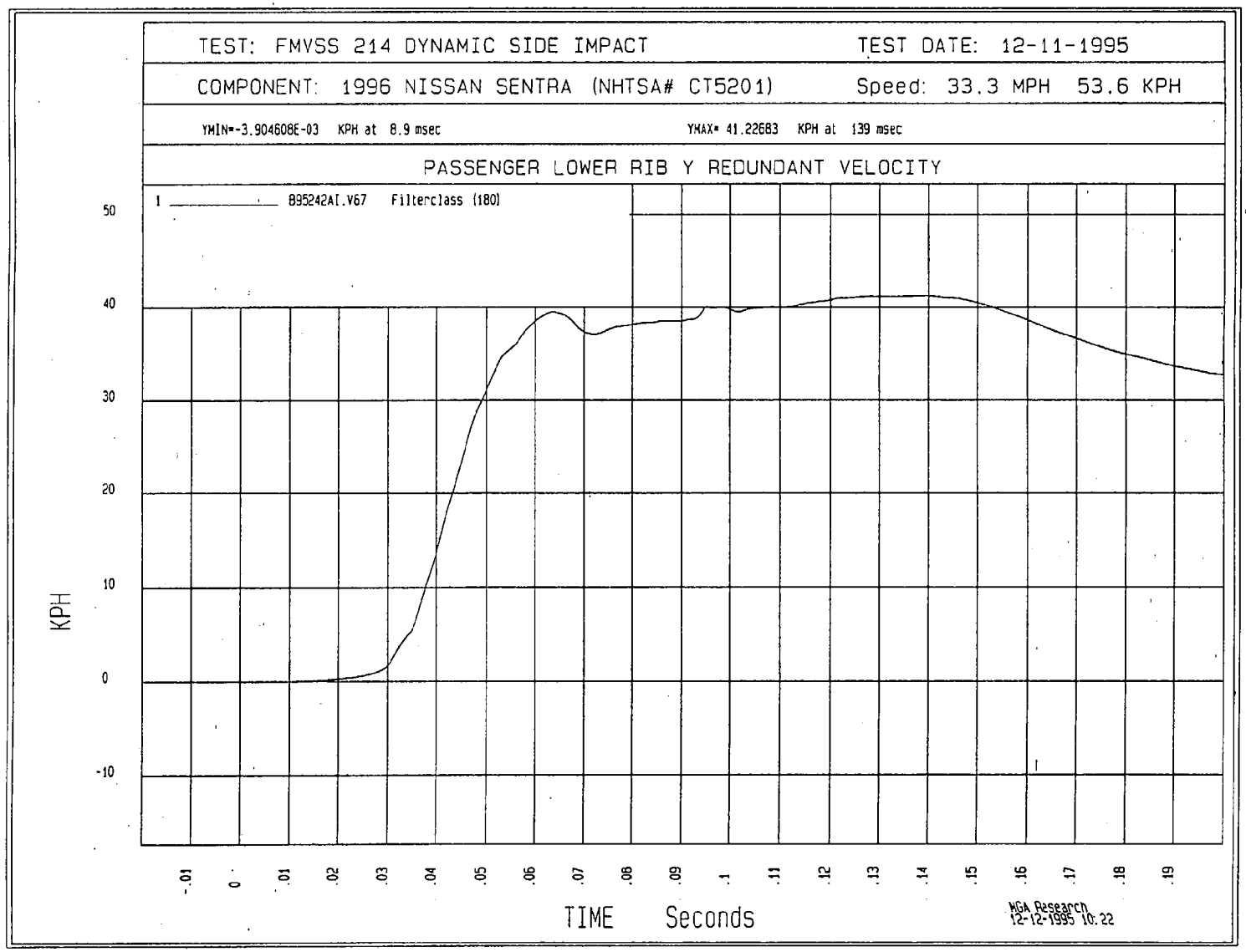
TIME (SECONDS)
MGA Research
12-11-1995 17:13


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-3.904608E-03 KPH at 8.9 msec
YMAX= 41.22683 KPH at 139 msec
PASSENGER LOWER RIB Y REDUNDANT VELOCITY
1 895242AI.V67 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.01
.02
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.04
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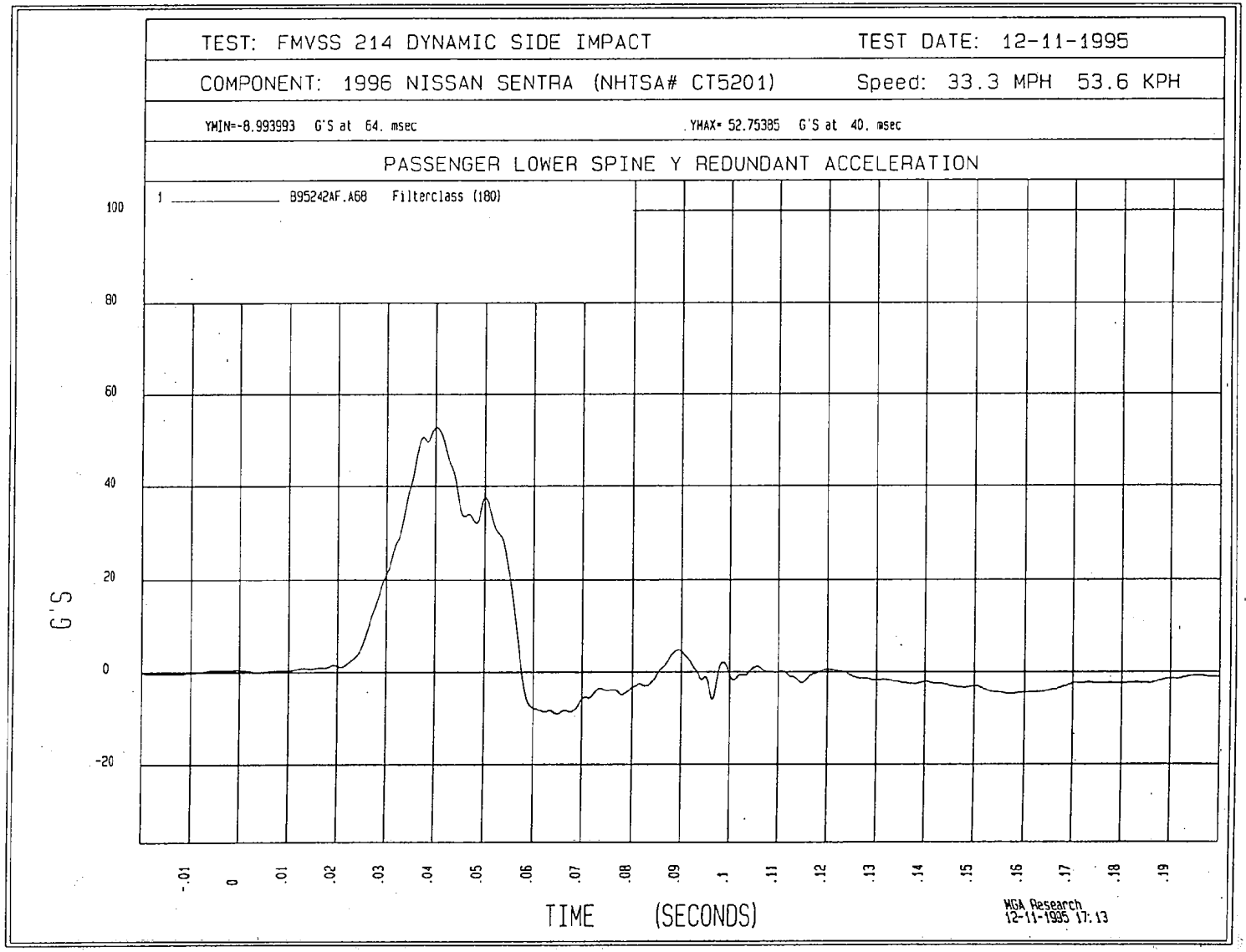
TIME Seconds
MGA Research
12-12-1995 10:22


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-8.993993 G'S at 64. msec
YMAX= 52.75385 G'S at 40. msec
PASSENGER LOWER SPINE Y REDUNDANT ACCELERATION
1 B95242AF.A68 Filterclass (180)
100
80
60
40
20
0
-20
G'S
-.01
0
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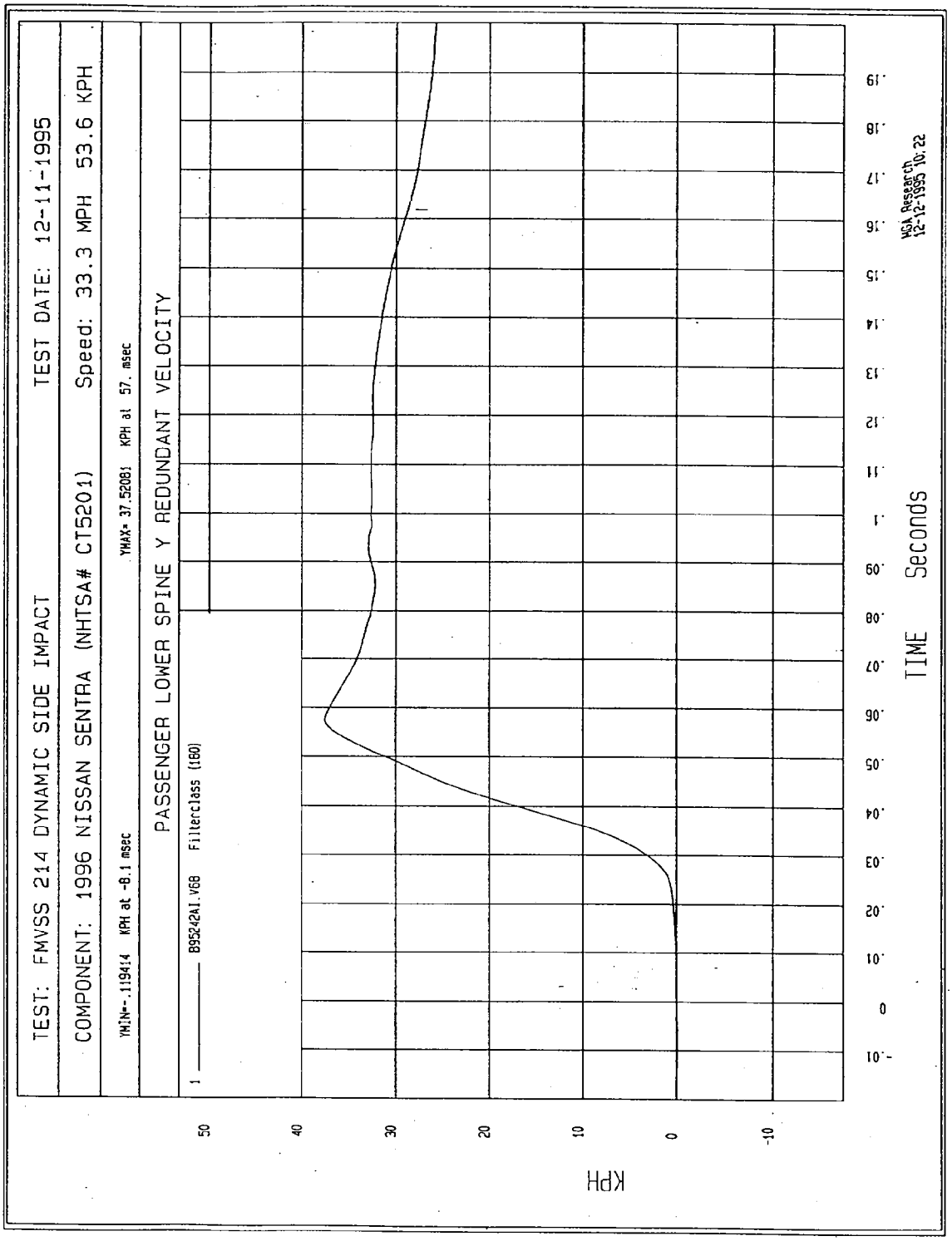
TIME (SECONDS)
MGA Research
12-11-1995 17:13


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-.119414 KPH at -8.1 msec
YMAX= 37.52081 KPH at 57. msec
PASSENGER LOWER SPINE Y REDUNDANT VELOCITY
1 B95242AI.V6B Filterclass (160)
KPH
50
40
30
20
10
0
-10
TIME Seconds
19
18
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07
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01
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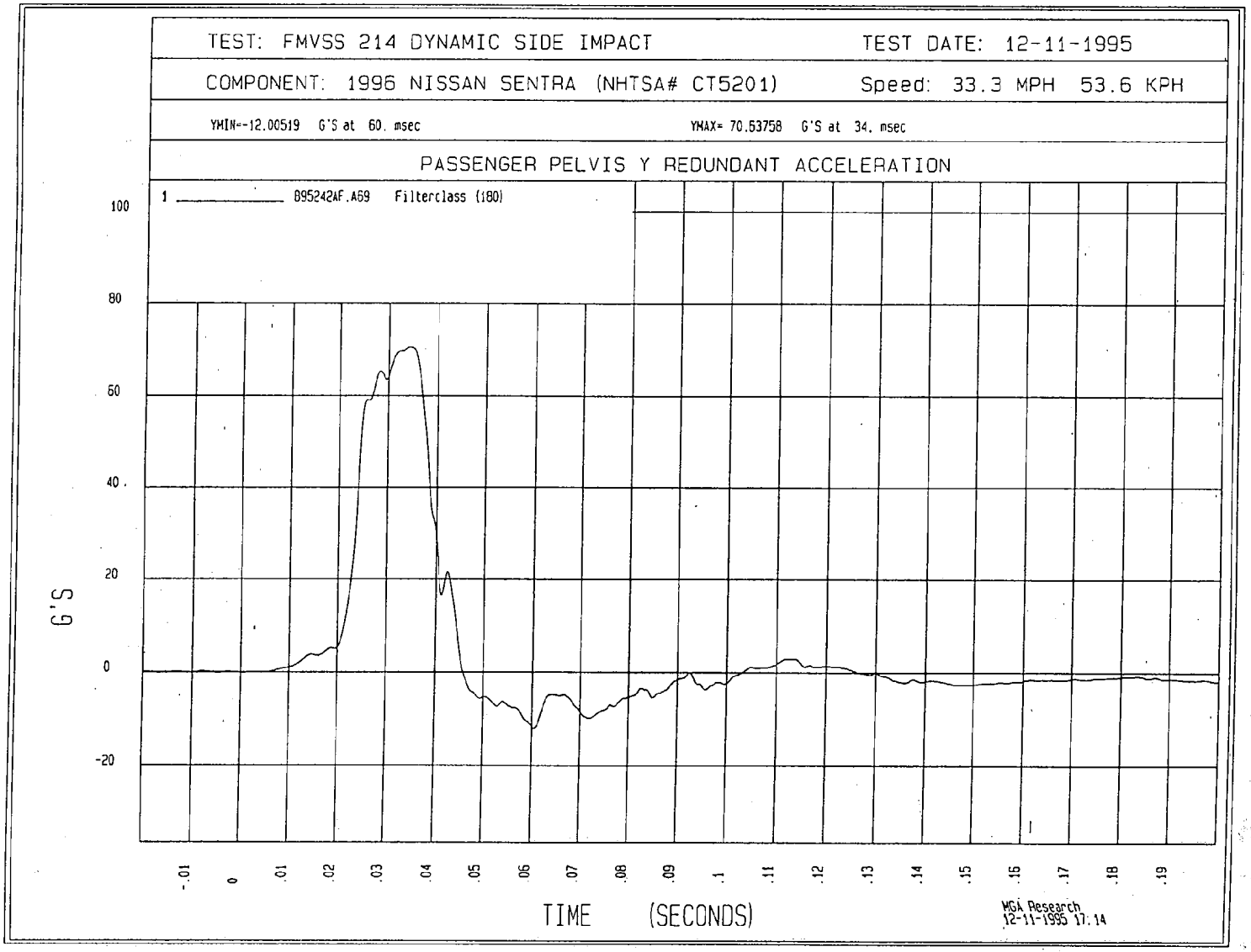
-.01
MGA Research
12-12-1995 10:22


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-12.00519 G'S at 60. msec
YMAX= 70.53758 G'S at 34. msec
PASSENGER PELVIS Y REDUNDANT ACCELERATION
1 B95242AF.A69 Filterclass (180)
100
80
60
40
20
0
-20
G'S
-.01
0
.01
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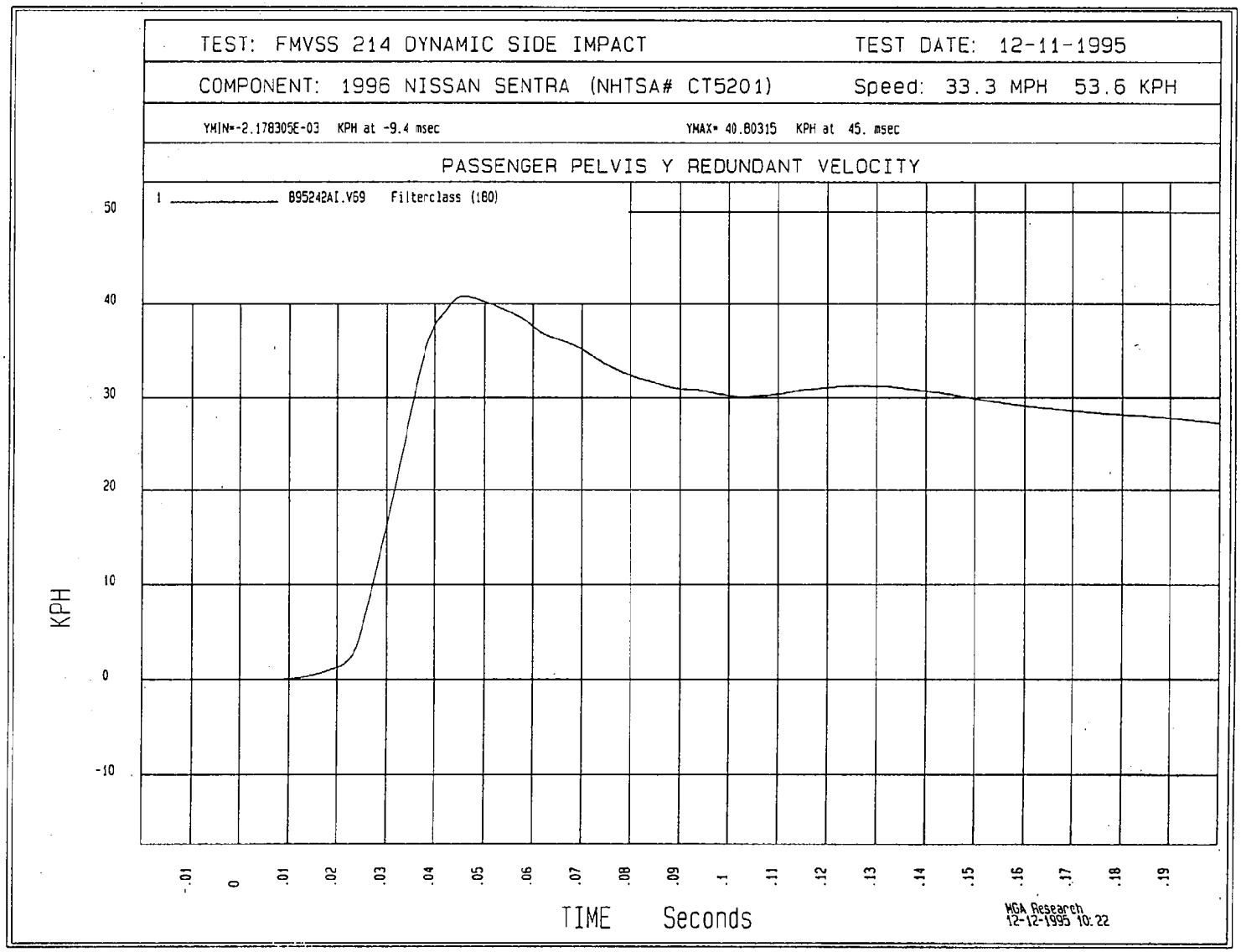
TIME (SECONDS)
MGA Research
12-11-1995 17:14


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-2.178305E-03 KPH at -9.4 msec
YMAX= 40.80315 KPH at 45. msec
PASSENGER PELVIS Y REDUNDANT VELOCITY
1 B95242AI.V59 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.01
0
.01
.02
.03
.04
.05
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.09
.1
.11
.12
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.16
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.18
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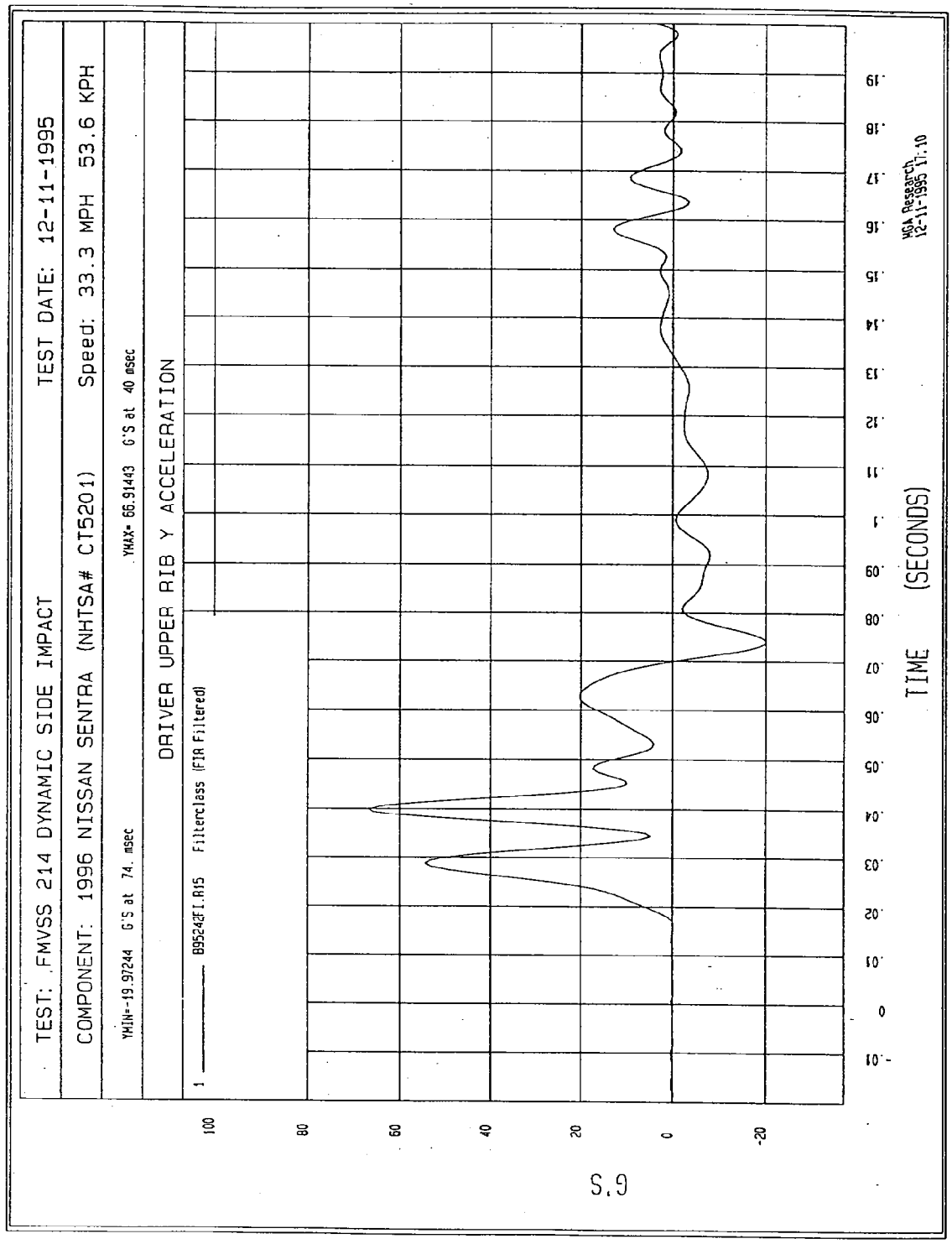
TIME Seconds
MGA Research
12-12-1995 10:22

FINITE IMPULSE RESPONSE (FIR) FILTERED DATA


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-19.97244 G'S at 74. msec
YMAX= 66.91443 G'S at 40 msec
DRIVER UPPER RIB Y ACCELERATION
1 B95243FI.R15 Filterclass (FIR Filtered)
100
80
60
40
20
0
-20
-.01
0
.01
.02
.03
.04
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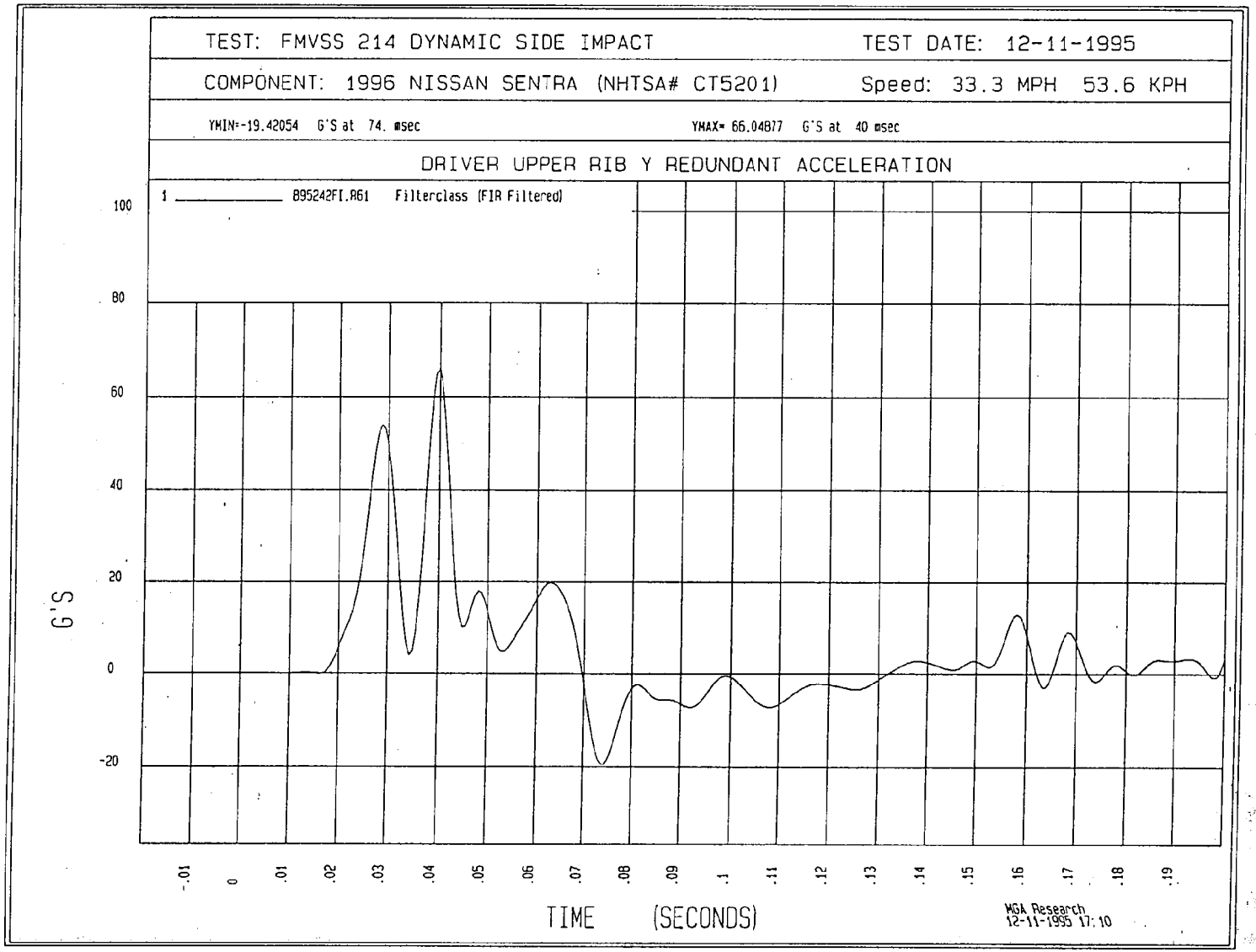
TIME (SECONDS)
MGA Research
12-11-1995 11:10


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-19.42054 G'S at 74. msec
YMAX= 66.04877 G'S at 40 msec
DRIVER UPPER RIB Y REDUNDANT ACCELERATION
1 B95242FI.A61 Filterclass (FIR Filtered)
100
80
60
40
20
0
-20
G'S
-.01
0
.01
.02
.03
.04
.05
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.07
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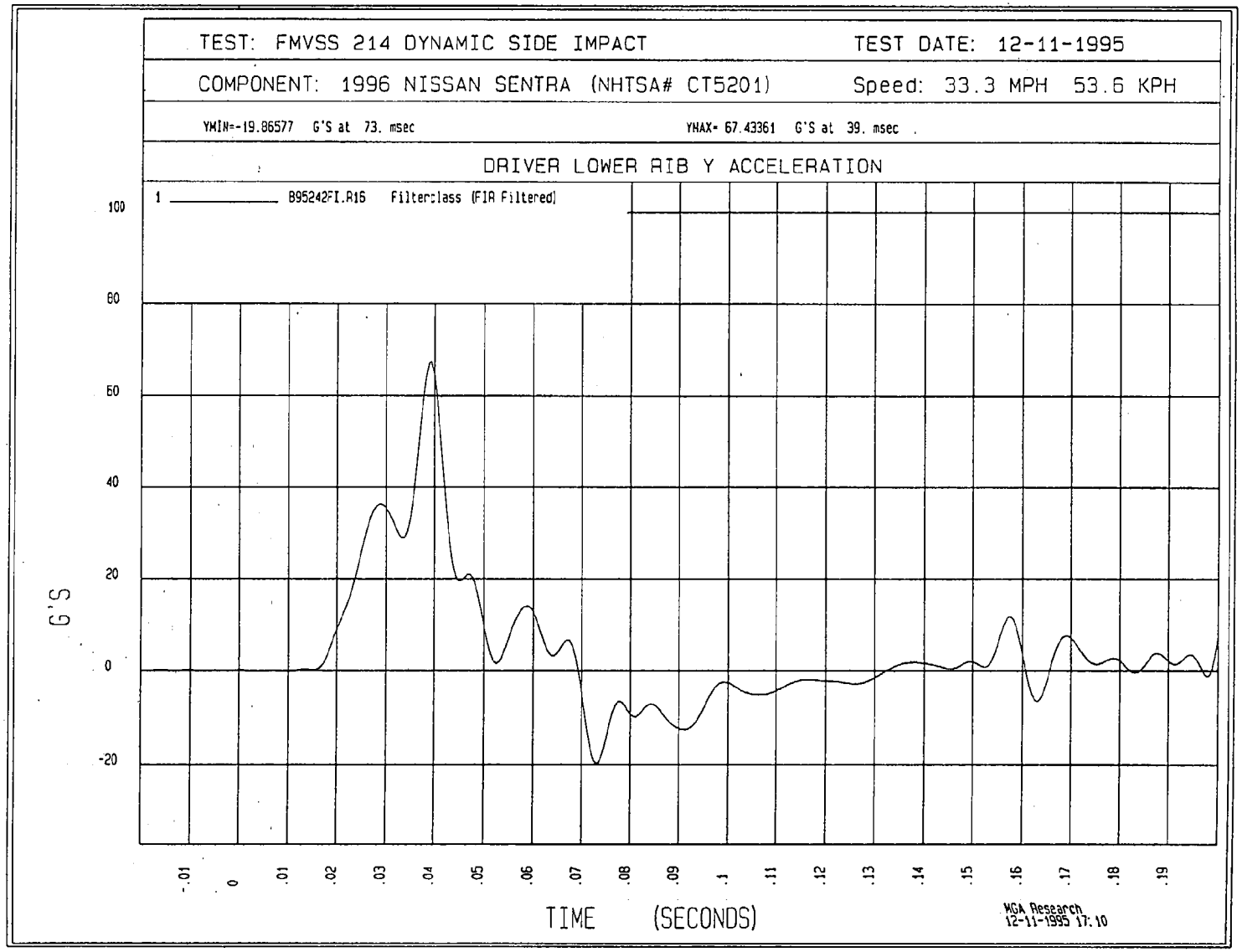
TIME (SECONDS)
MGA Research
12-11-1995 17:10


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-19.86577 G'S at 73. msec
YMAX= 67.43361 G'S at 39. msec
DRIVER LOWER RIB Y ACCELERATION
1 B95242FI.R16 Filter:lass (FIR Filtered)
100
80
60
40
20
0
-20
G'S
-.01
0
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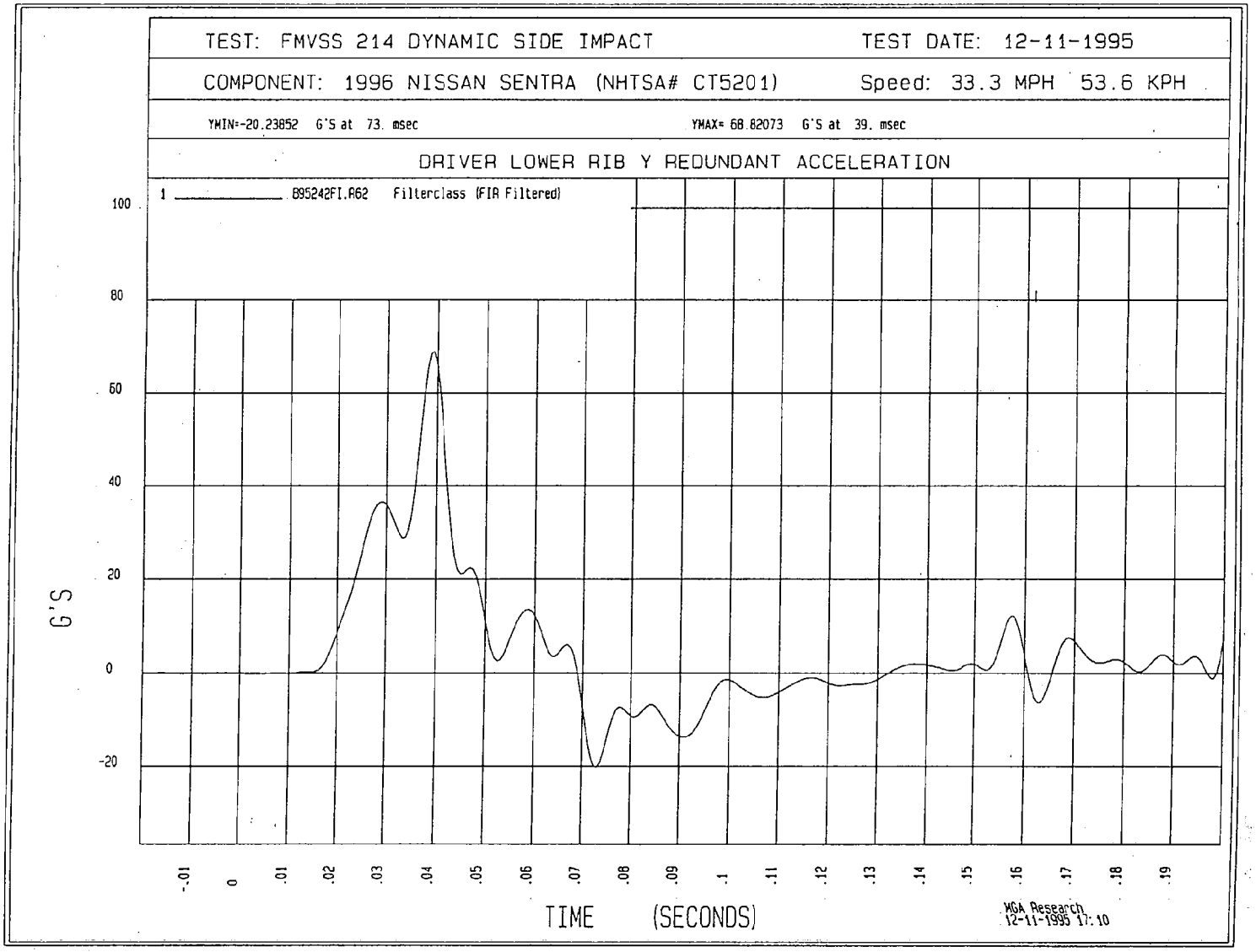
TIME (SECONDS)
MGA Research
12-11-1995 17:10


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-20.23852 G'S at 73. msec
YMAX= 68.82073 G'S at 39. msec
DRIVER LOWER RIB Y REDUNDANT ACCELERATION
1 B95242FI.A62 Filterclass (FIR Filtered)
100
80
60
40
20
0
-20
G'S
-.01
0
.01
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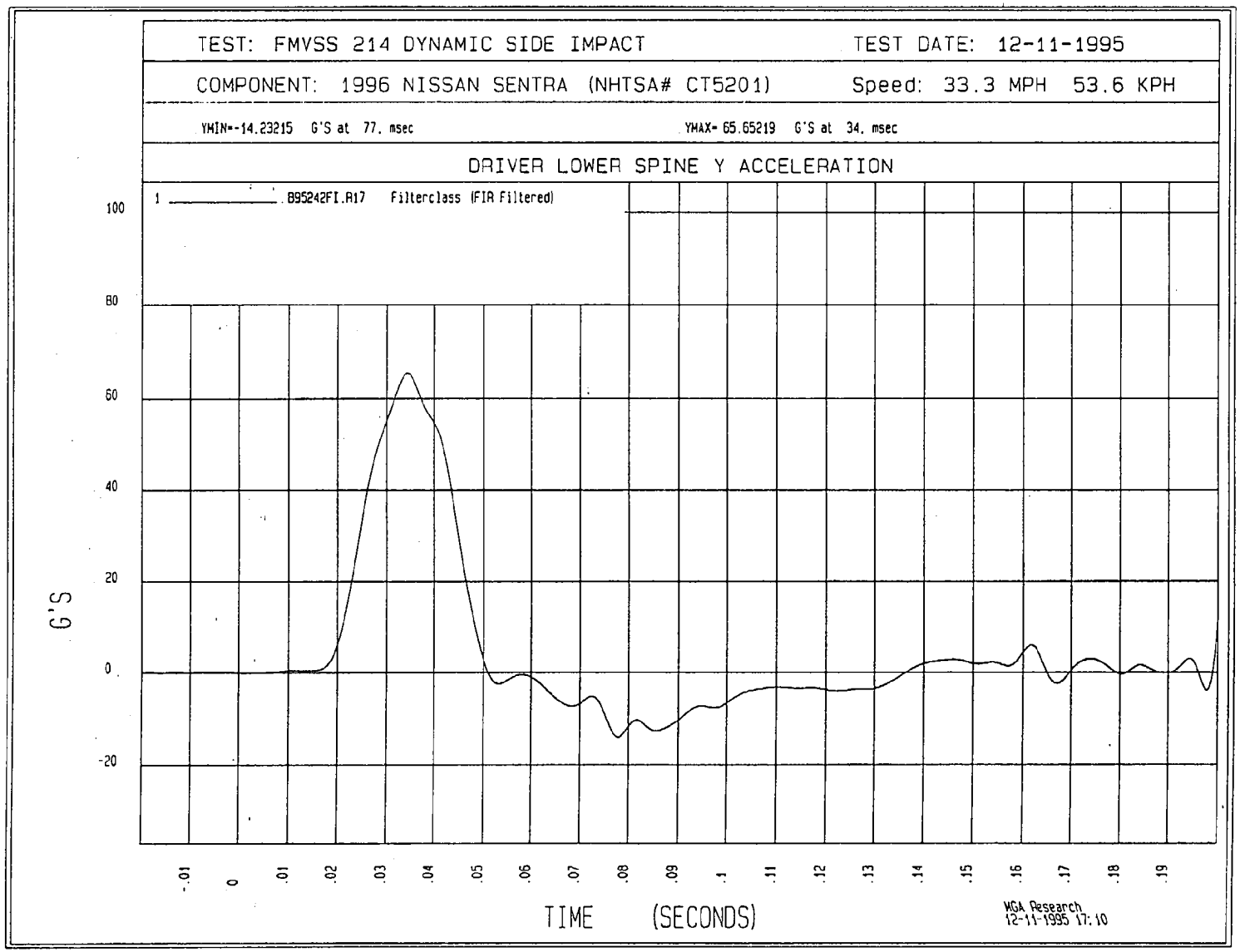
TIME (SECONDS)
MGA Research
12-11-1995 17:10


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-14.23215 G'S at 77. msec
YMAX= 65.65219 G'S at 34. msec
DRIVER LOWER SPINE Y ACCELERATION
1 B95242FI.A17 Filterclass (FIR Filtered)
100
80
60
40
20
0
-20
G'S
-.01
0
.01
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.03
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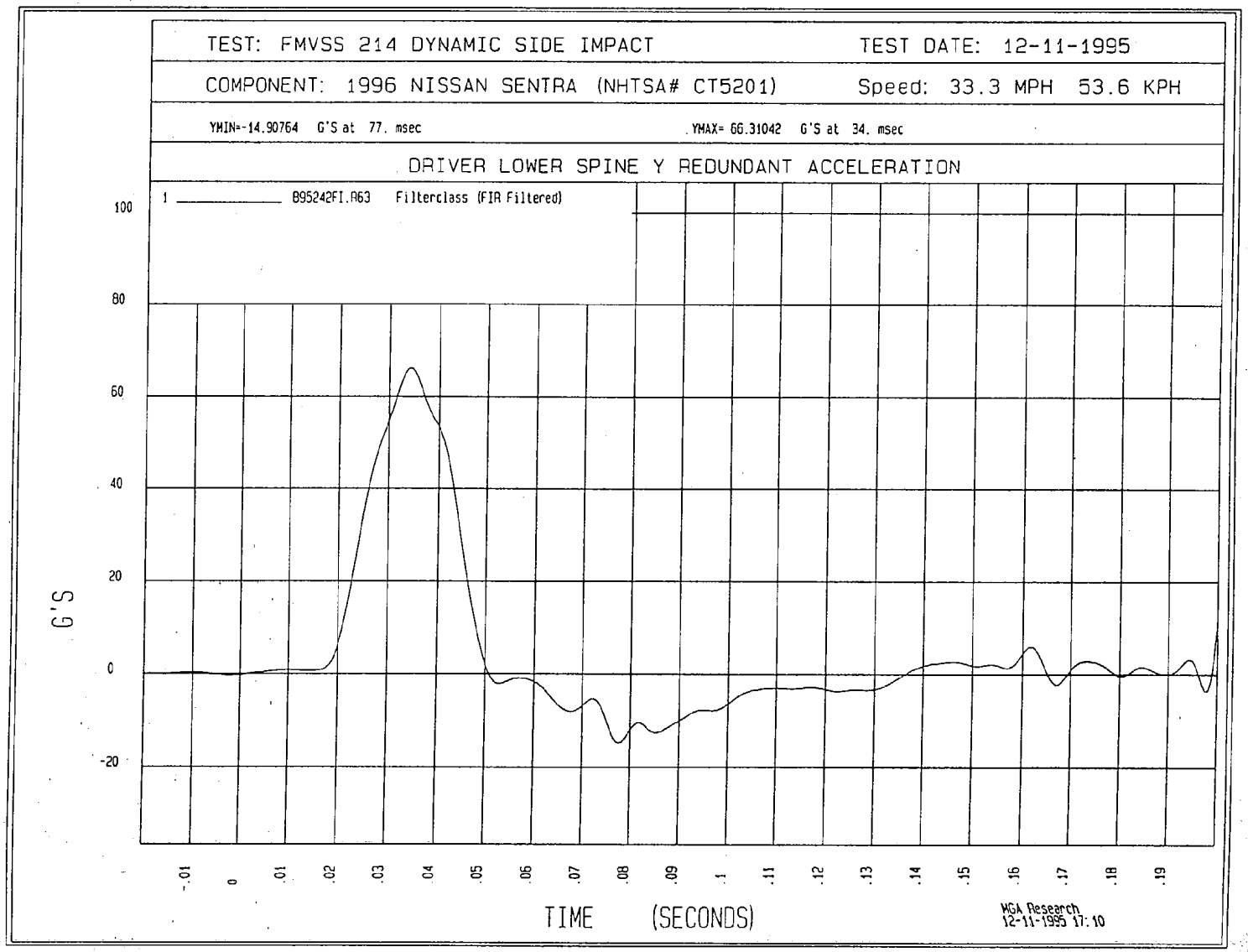
TIME (SECONDS)
MGA Research
12-11-1995 17:10


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-14.90764 G'S at 77. msec
YMAX= 66.31042 G'S at 34. msec
DRIVER LOWER SPINE Y REDUNDANT ACCELERATION
1 B95242FI.A63 Filterclass (FIR Filtered)
100
80
60
40
20
0
-20
G'S
-.01
0
.01
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.04
.05
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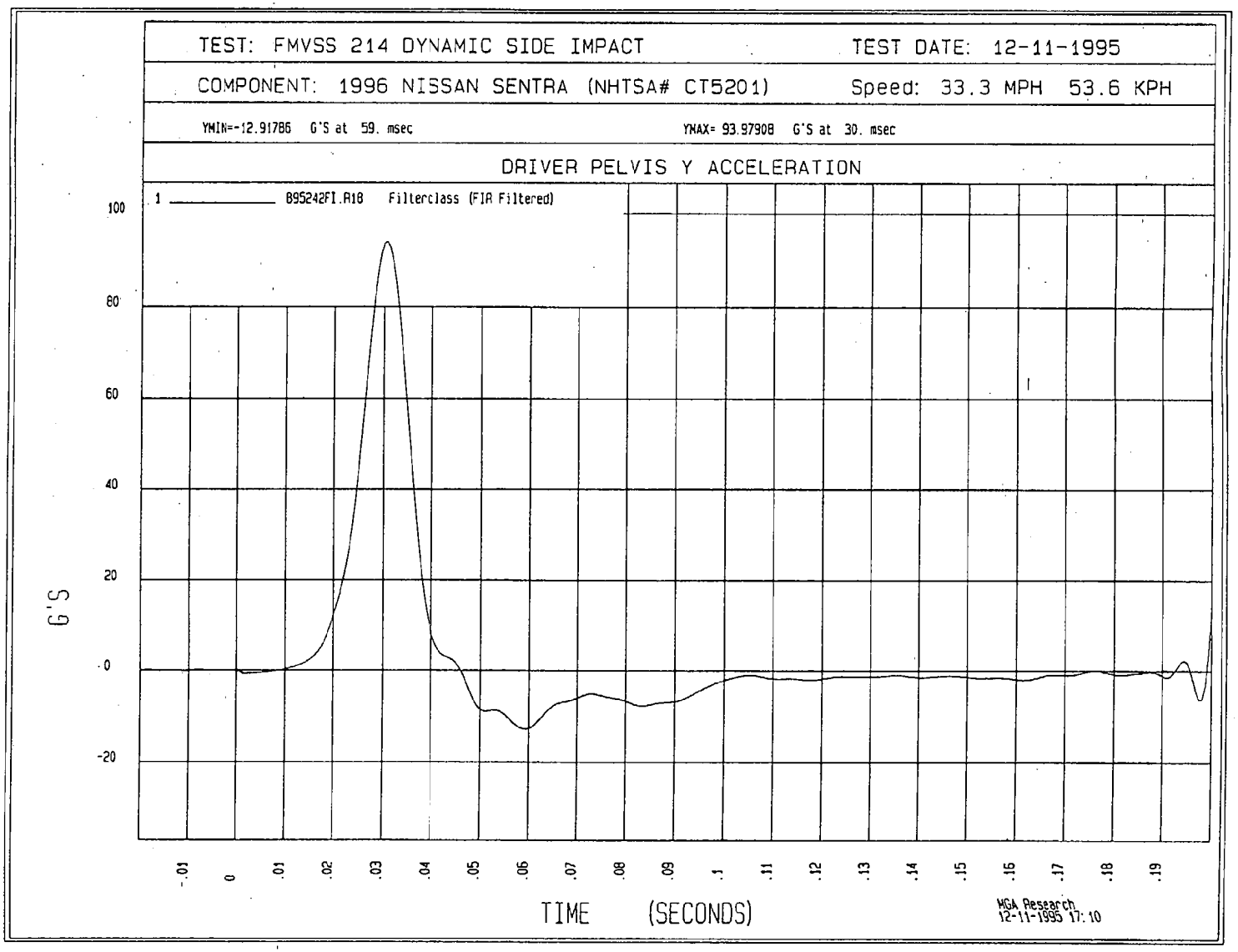
TIME (SECONDS)
MGA Research
12-11-1995 17:10


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-12.91786 G'S at 59. msec
YMAX= 93.97908 G'S at 30. msec
DRIVER PELVIS Y ACCELERATION
1 B95242FI.A18 Filterclass (FIR Filtered)
100
80
60
40
20
0
-20
G'S
-.01
0
.01
.02
.03
.04
.05
.06
.07
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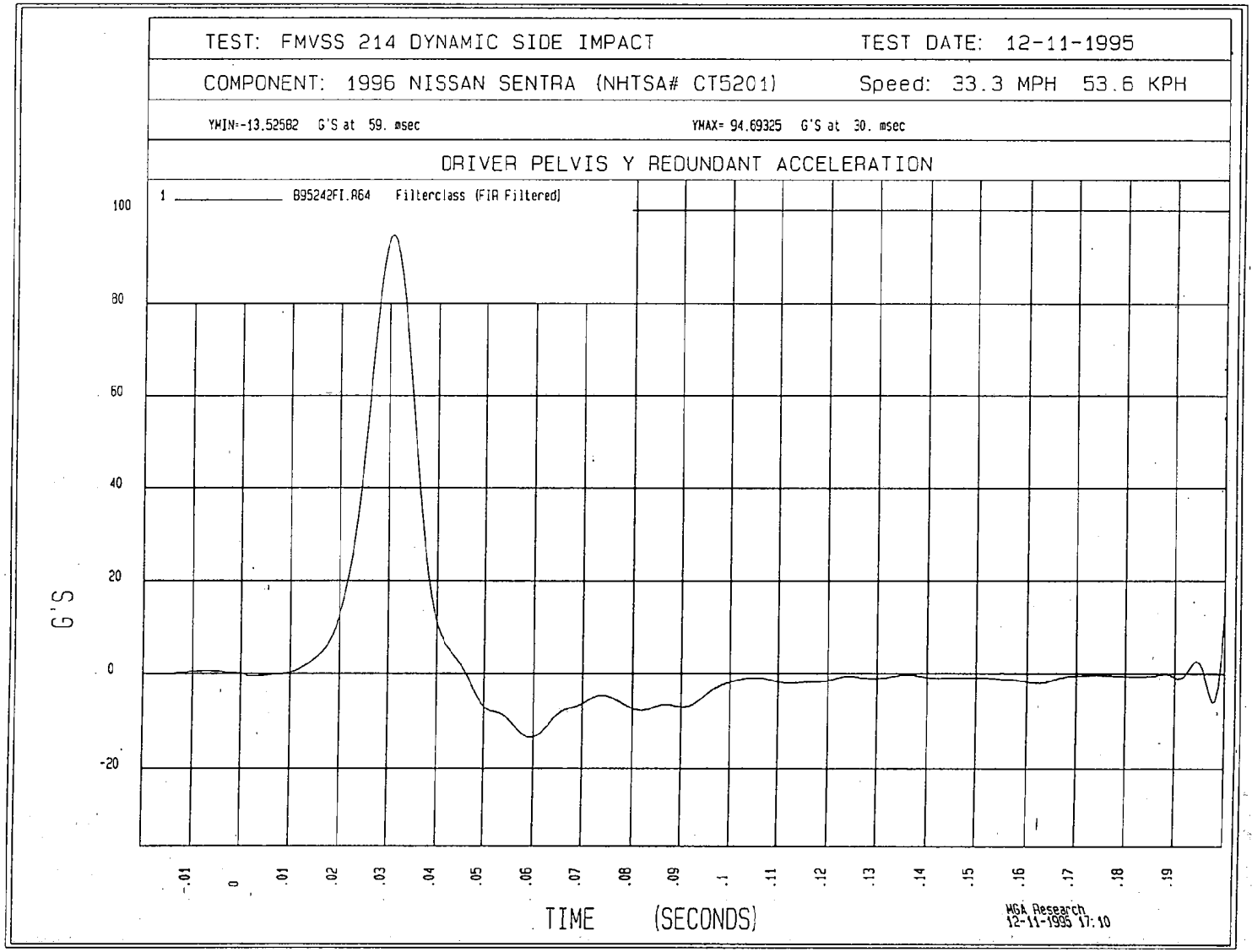
TIME (SECONDS)
MGA Research
12-11-1995 17:10


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-13.52582 G'S at 59. msec
YMAX= 94.69325 G'S at 30. msec
DRIVER PELVIS Y REDUNDANT ACCELERATION
1 B95242FI.A64 Filterclass (FIR Filtered)
100
80
60
40
20
0
-20
G'S
-.01
0
.01
.02
.03
.04
.05
.06
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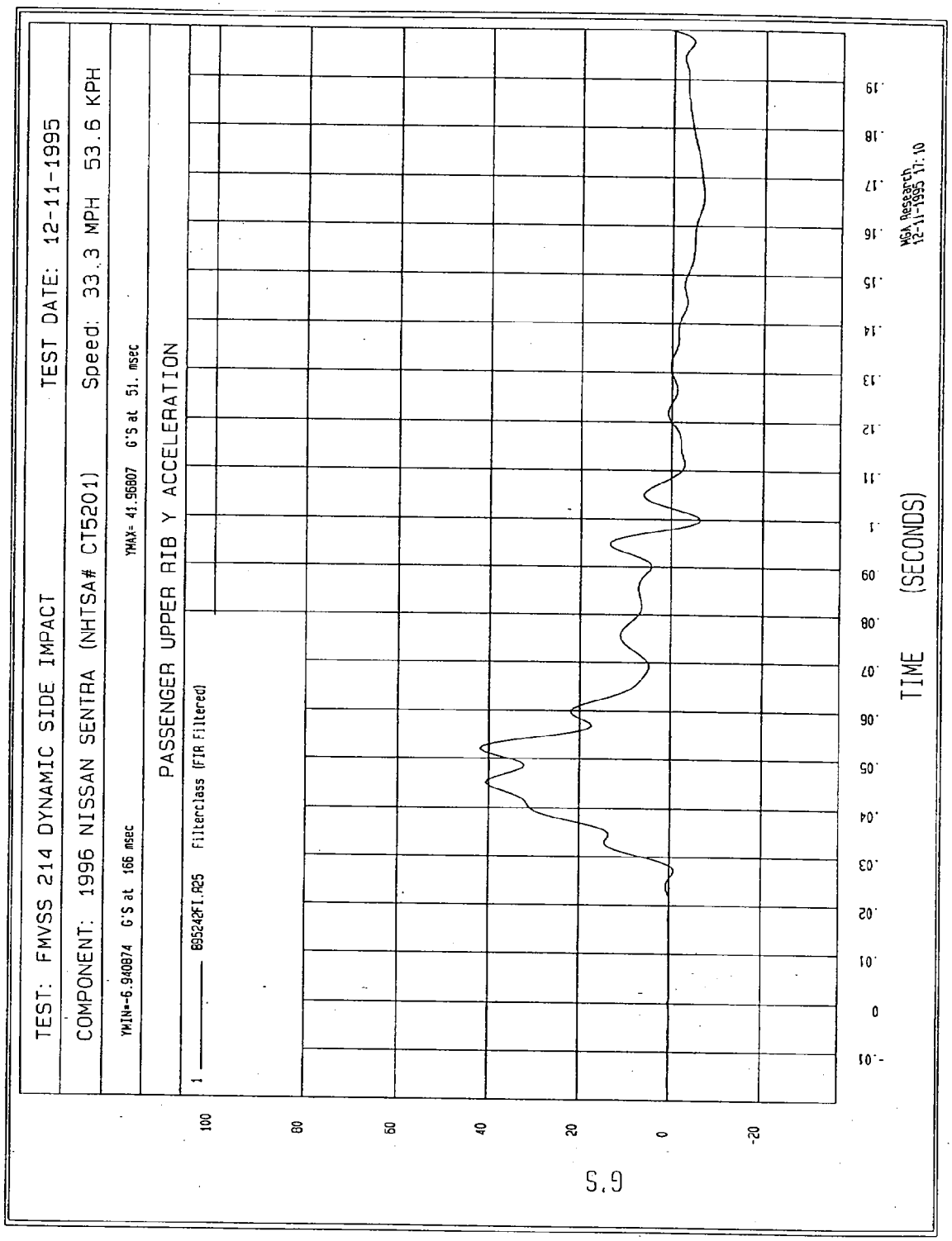
TIME (SECONDS)
MGA Research
12-11-1995 17:10


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-6.940874 G'S at 166 msec
YMAX= 41.96807 G'S at 51. msec
PASSENGER UPPER RIB Y ACCELERATION
1 ——— 895242FI.A25 Filterclass (FIR Filtered)
100
80
60
40
20
0
-20
G'S
-.01
0
.01
.02
.03
.04
.05
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.07
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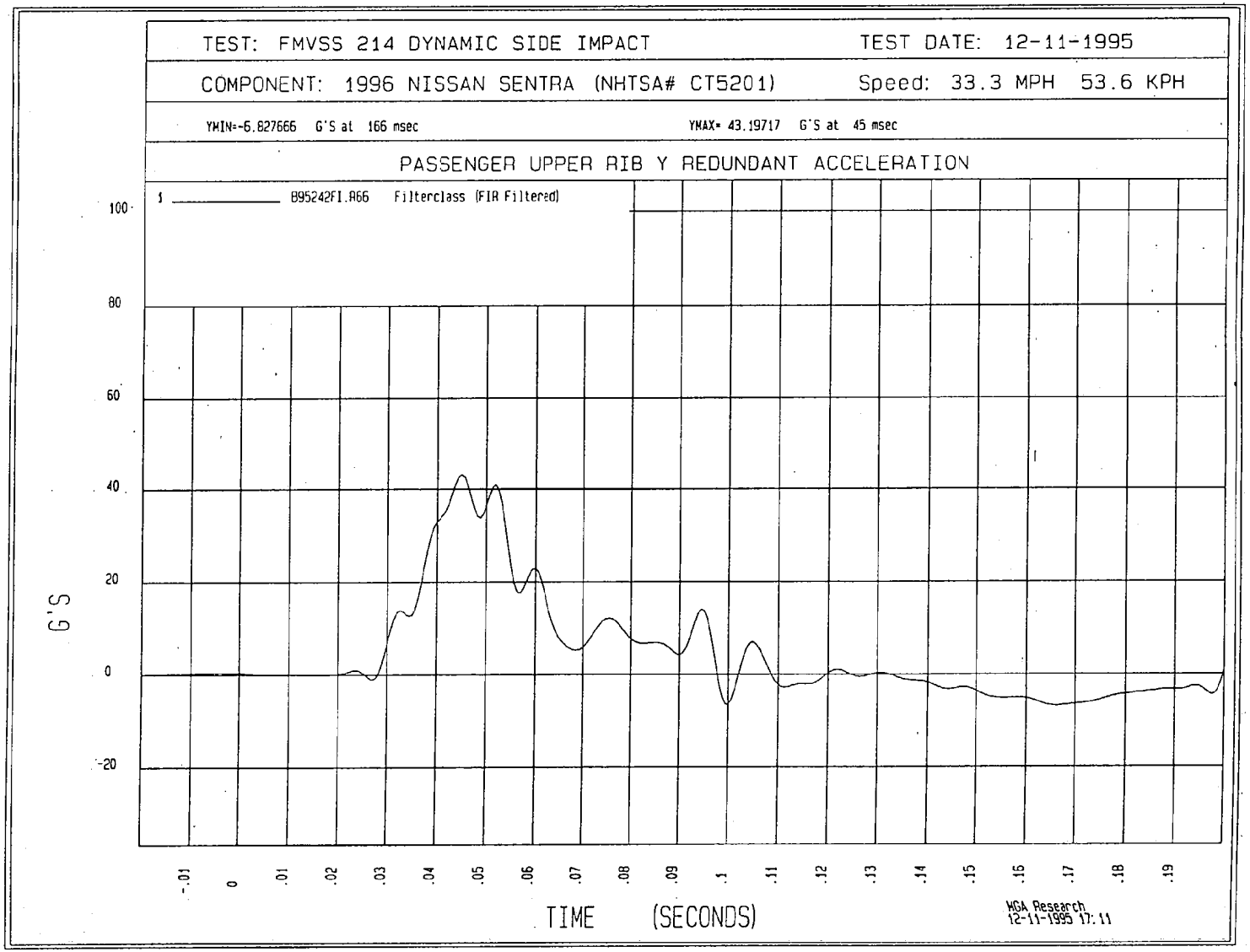
TIME (SECONDS)
MGA Research
12-11-1995 17:10


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-6.827666 G'S at 166 msec
YMAX= 43.19717 G'S at 45 msec
PASSENGER UPPER RIB Y REDUNDANT ACCELERATION
1 B95242FI.A66 Filterclass (FIR Filtered)
100
80
60
40
20
0
-20
G'S
-.01
0
.01
.02
.03
.04
.05
.06
.07
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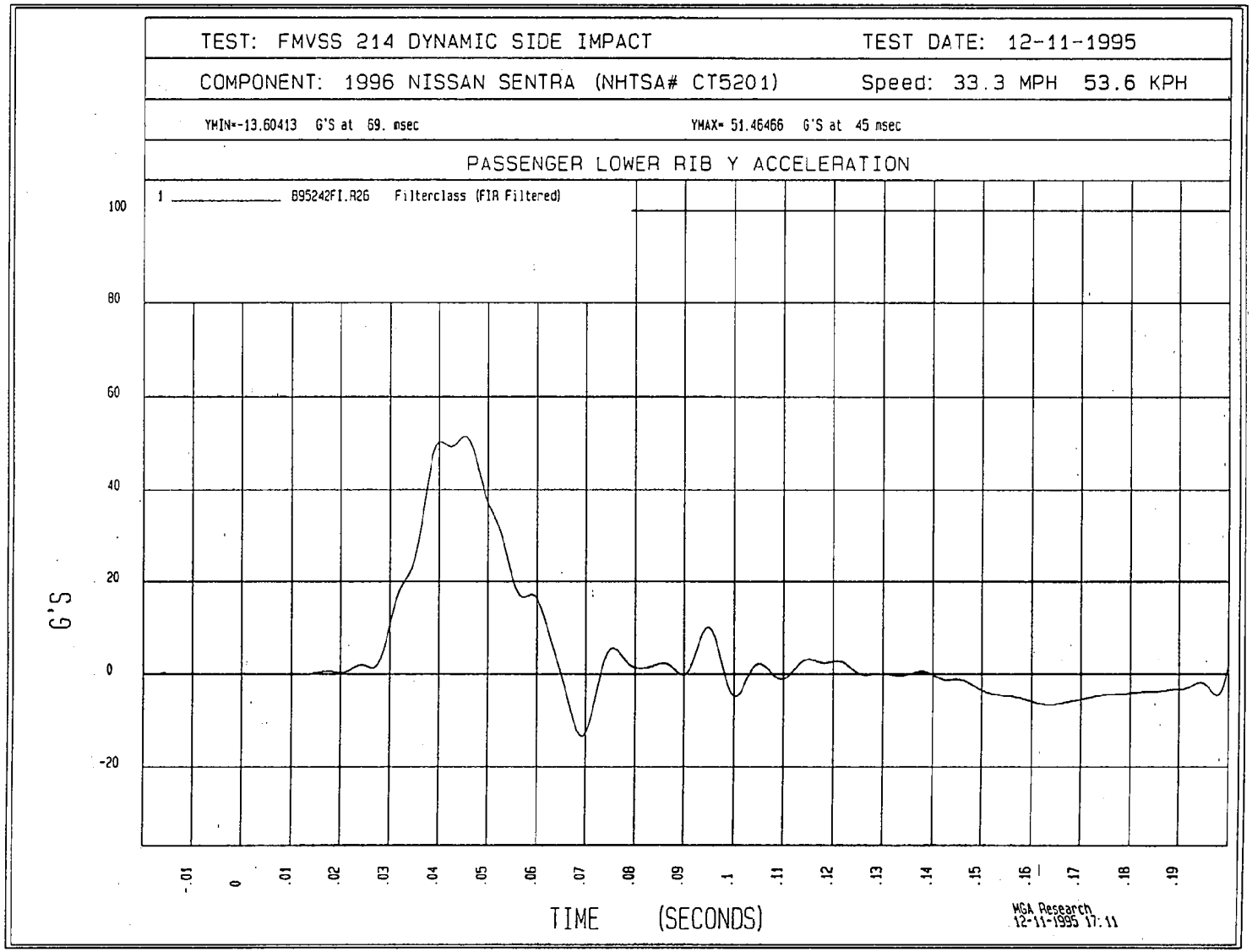
TIME (SECONDS)
MGA Research
12-11-1995 17:11


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-13.60413 G'S at 69. msec
YMAX= 51.46466 G'S at 45 msec
PASSENGER LOWER RIB Y ACCELERATION
1 B95242FI.R26 Filterclass (FIR Filtered)
100
80
60
40
20
0
-20
G'S
-.01
0
.01
.02
.03
.04
.05
.06
.07
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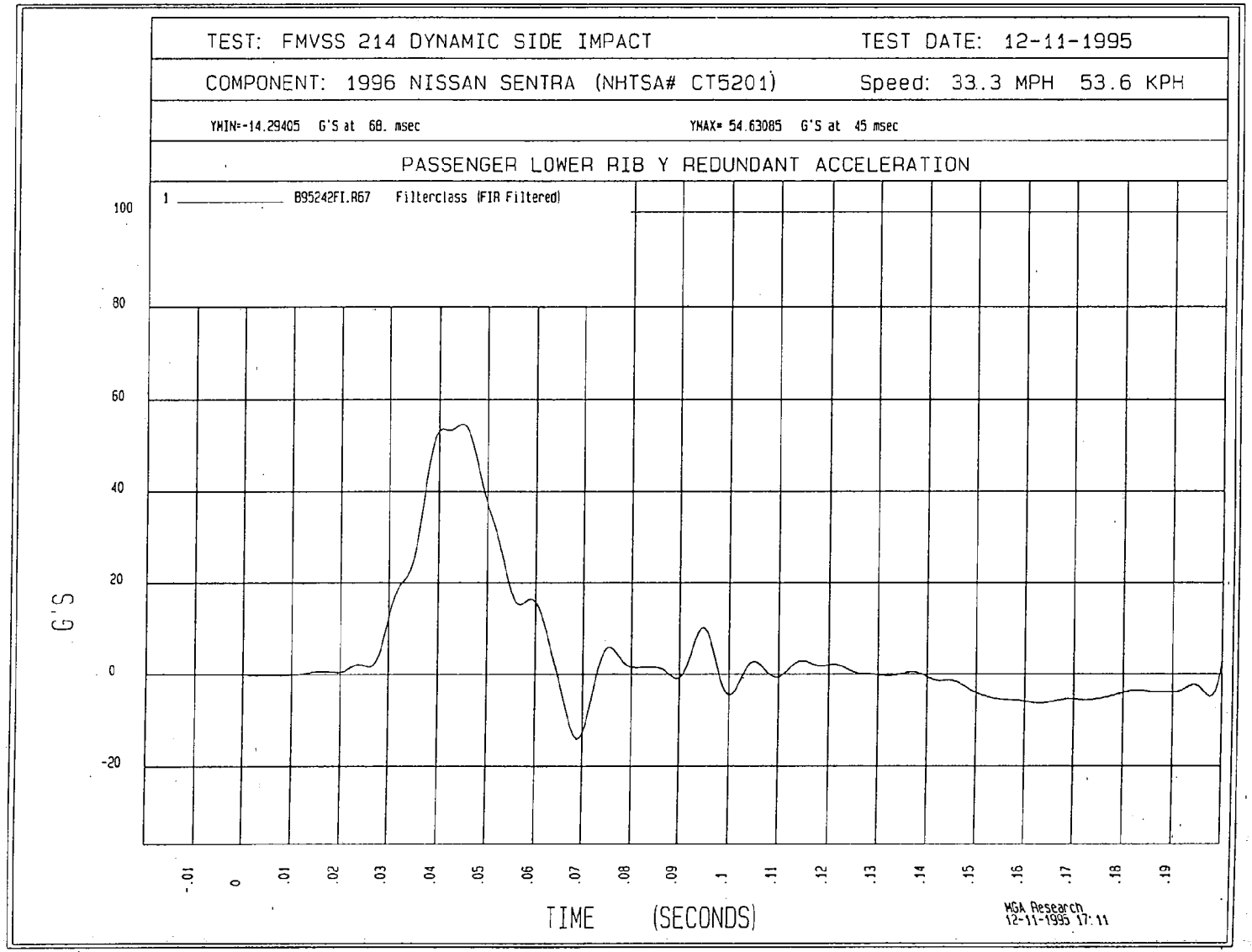
TIME (SECONDS)
MGA Research
12-11-1995 17:11


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-14.29405 G'S at 68. msec
YMAX= 54.63085 G'S at 45 msec
PASSENGER LOWER RIB Y REDUNDANT ACCELERATION
1 B95242FI.R67 Filterclass (FIR Filtered)
100
80
60
40
20
0
-20
G'S
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
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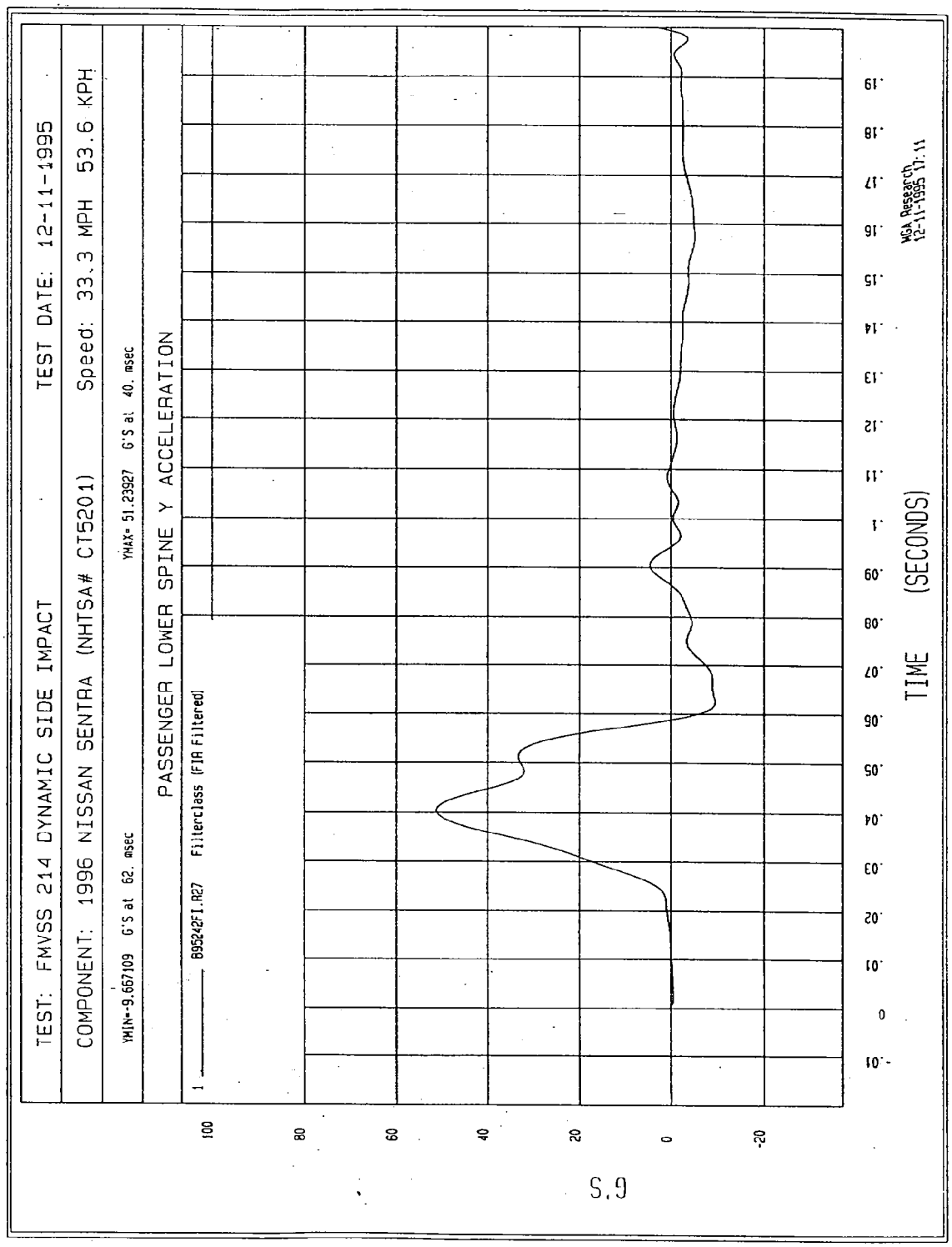
TIME (SECONDS)
MGA Research
12-11-1995 17:11


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-9.667109 G'S at 62. msec
YMAX= 51.23927 G'S at 40. msec
PASSENGER LOWER SPINE Y ACCELERATION
1 B95242FI.R27 Filterclass (FIR Filtered)
100
80
60
40
20
0
-20
-.01
0
.01
.02
.03
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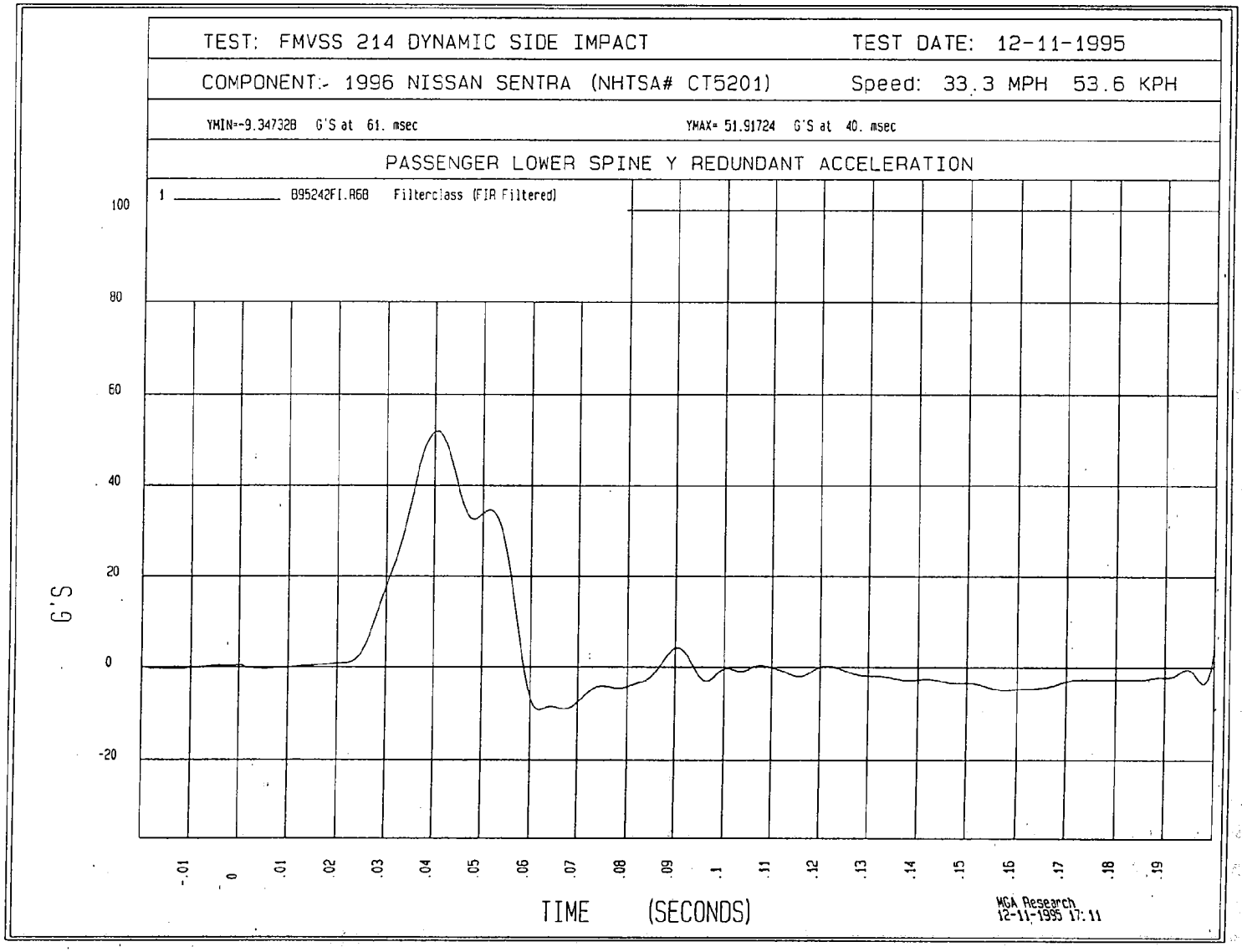
TIME (SECONDS)
MGA Research
12-11-1995 17:11


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-9.34732B G'S at 61. msec
YMAX= 51.91724 G'S at 40. msec
PASSENGER LOWER SPINE Y REDUNDANT ACCELERATION
1 B95242FI.R6B Filterclass (FIR Filtered)
100
80
60
40
20
0
-20
G'S
-.01
0
.01
.02
.03
.04
.05
.06
.07
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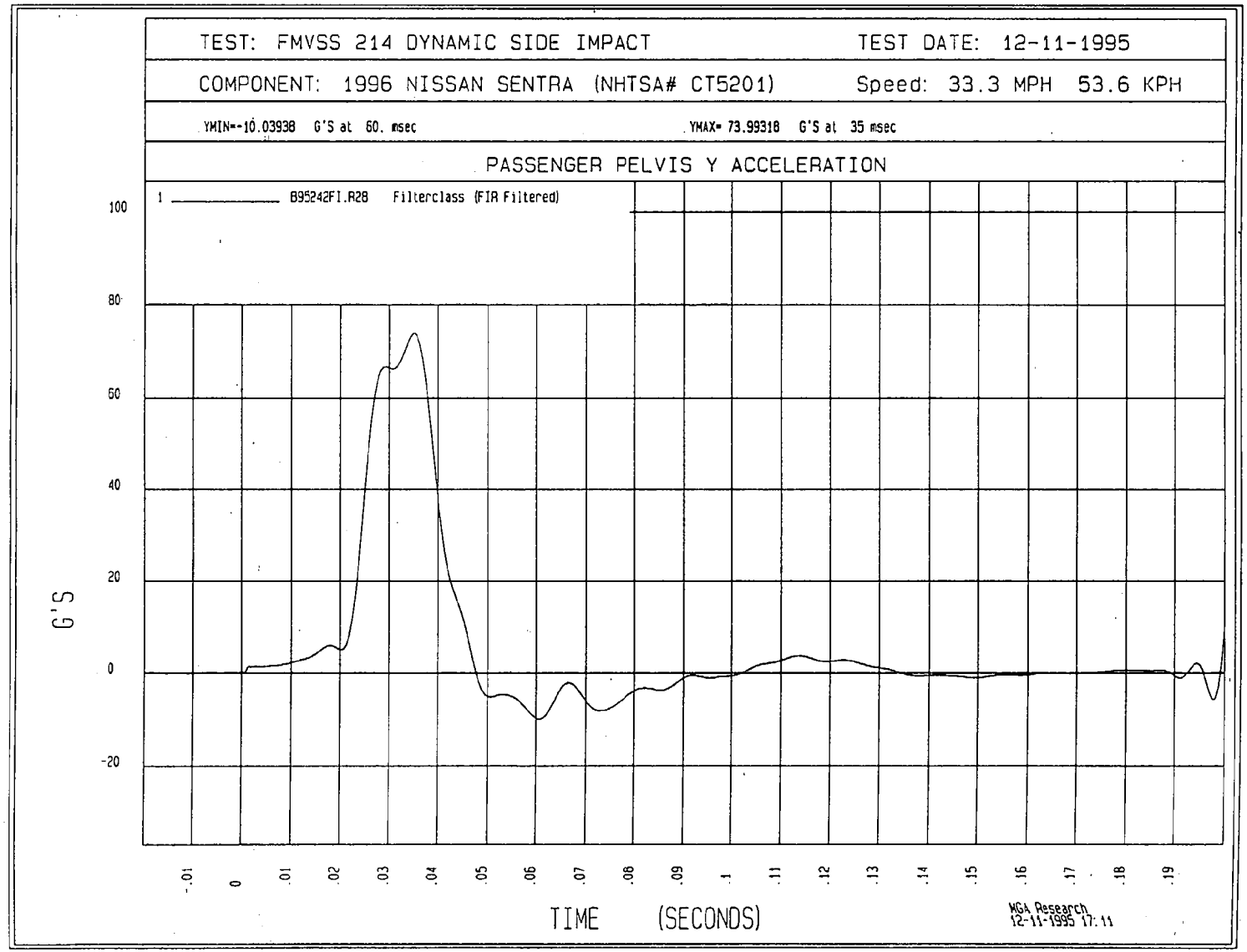
TIME (SECONDS)
MGA Research
12-11-1995 17:11


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-10.03938 G'S at 60. msec
YMAX= 73.99318 G'S at 35 msec
PASSENGER PELVIS Y ACCELERATION
1 B95242FI.R28 Filterclass (FIR Filtered)
100
80
60
40
20
0
-20
G'S
-.01
0
.01
.02
.03
.04
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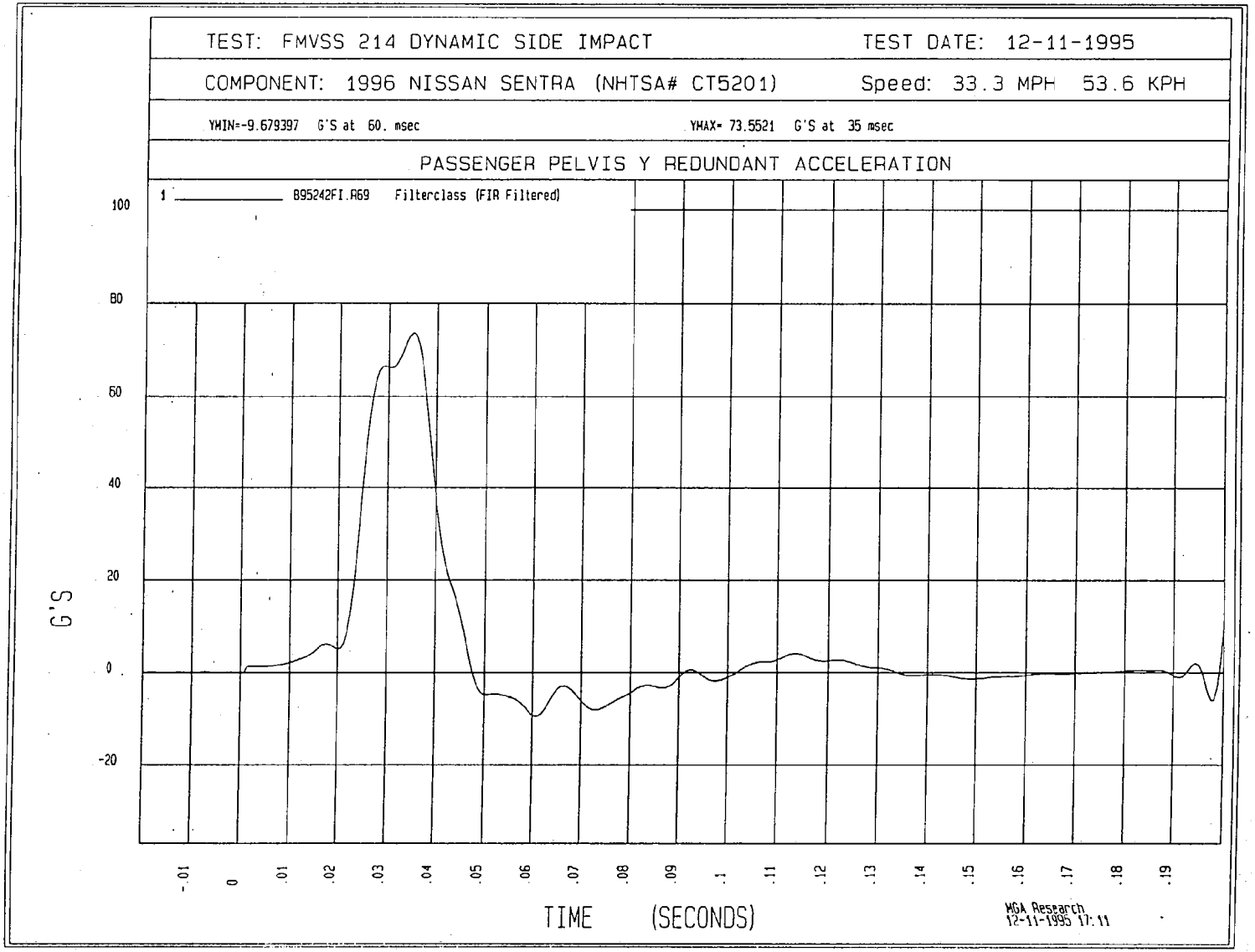
TIME (SECONDS)
MGA Research
12-11-1995 17:11


TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 12-11-1995
COMPONENT: 1996 NISSAN SENTRA (NHTSA# CT5201)
Speed: 33.3 MPH 53.6 KPH
YMIN=-9.679397 G'S at 60. msec
YMAX= 73.5521 G'S at 35 msec
PASSENGER PELVIS Y REDUNDANT ACCELERATION
1 B95242FI.R69 Filterclass (FIR Filtered)
100
80
60
40
20
0
-20
G'S
-.01
0
.01
.02
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TIME (SECONDS)
MGA Research
12-11-1995 17:11

# APPENDIX C

# SID CONFIGURATION AND PERFORMANCE VERIFICATION

REPORT NO. MGA-96-DC07

# DUMMY PERFORMANCE CALIBRATIONS

# FMVSS 214 - SIDE IMPACT TEST

NISSAN MOTOR CORPORATION
1996 NISSAN SENTRA 4-DOOR
NHTSA NO. CT5201

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105

Test Date: December 11, 1995

Report Date: December 15, 1995

FINAL REPORT

Prepared For:

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
MAIL CODE: NSA-30
400 SEVENTH STREET, S.W., ROOM 6115
WASHINGTON, D.C. 20590

TABLE OF CONTENTS

PRE-TEST CERTIFICATION DATA

Driver Dummy Serial Number: 271

## Calibration Test Results Summary

Dummy Serial Number: 271

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.: 271

DATE OF VERIFICATION: December 7, 1995

| DESCRIPTION | SPECIFICATION | TEST RESULTS |
|---|---|---|
| SH - Seated Height | 35.0" - 35.8" | 35.4 |
| RH - Rib Height | 19.75" - 20.50" | 20.40 |
| HP - Hip Pivot Height | 3.9" ref. | 3.9 |
| RD - Rib From Back Line | 9.0" to 9.5" | 9.4 |
| 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)

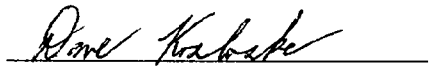
DATE: December 6, 1995

DUMMY NUMBER: 271 TEST NUMBER: D952012

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 66 - 78° F | 70° |
| RELATIVE HUMIDITY | 10 - 70% | 12% |
| PROBE SPEED | 13.8 - 14.2 fps | 13.9 |
| UPPER RIB | 37 - 46 g's | 45 |
| LOWER RIB | 37 - 46 g's | 41 |
| LOWER SPINE | 15 - 22 g's | 21 |

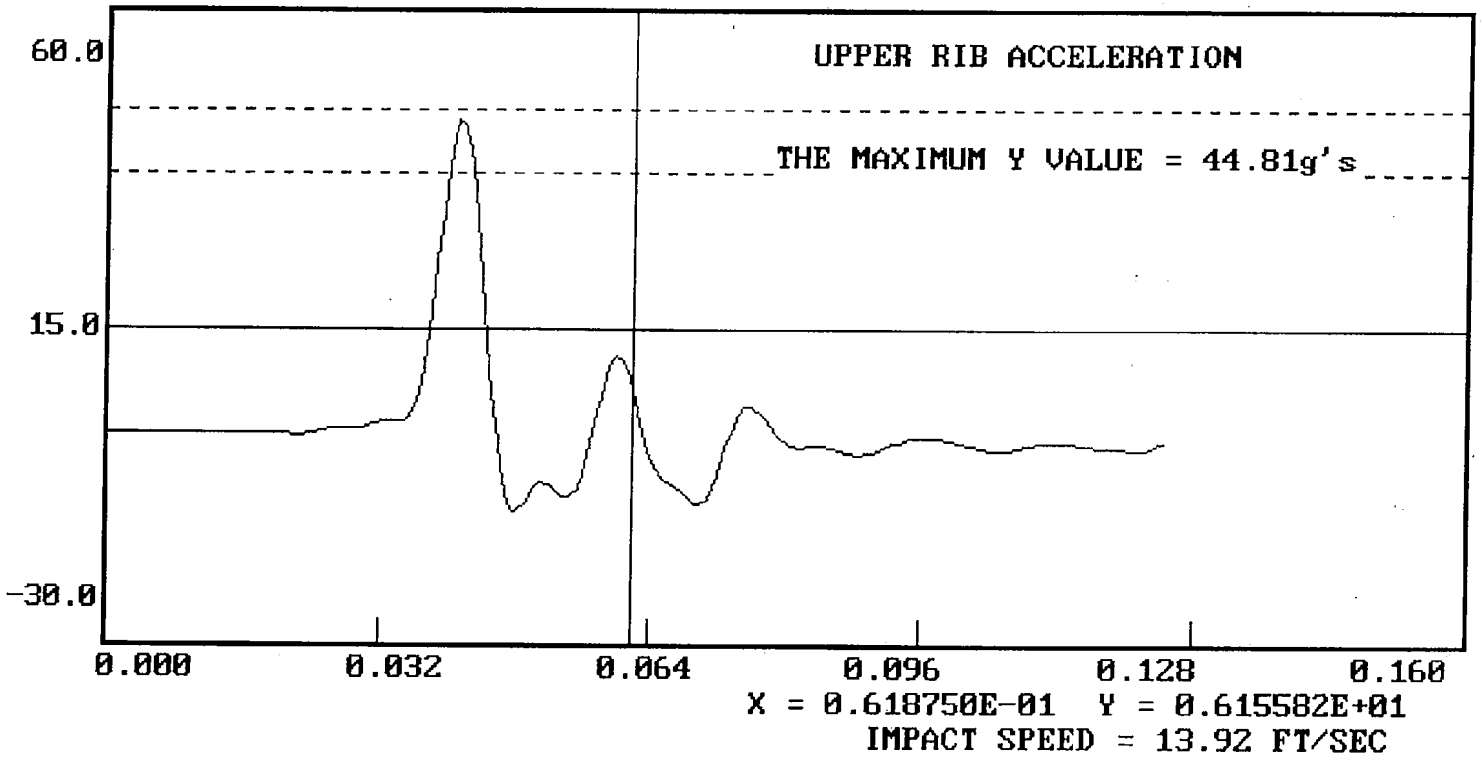
TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

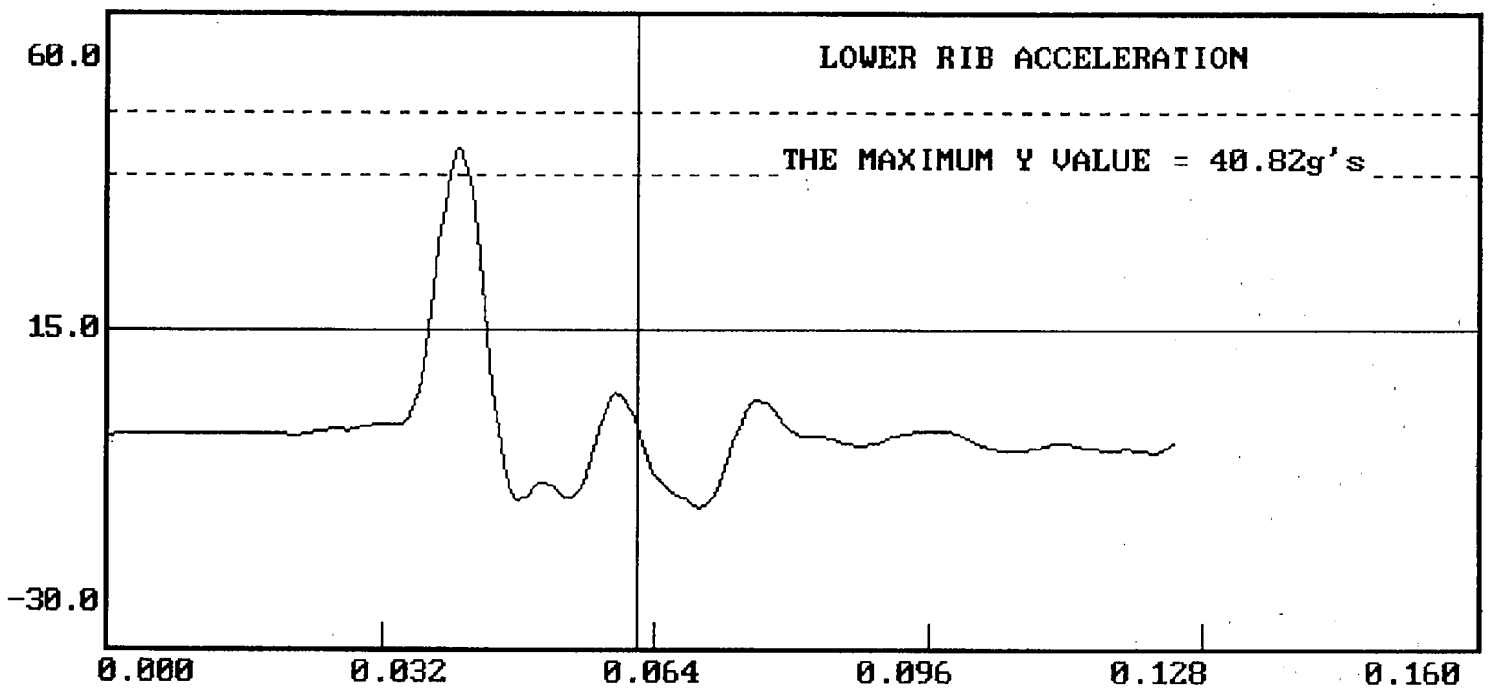
DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 271
ACCELERATION (G'S) VS. TIME ((SECONDS))

12-06-1995 09:15




X = 0.618750E-01 Y = 0.615582E+01
IMPACT SPEED = 13.92 FT/SEC

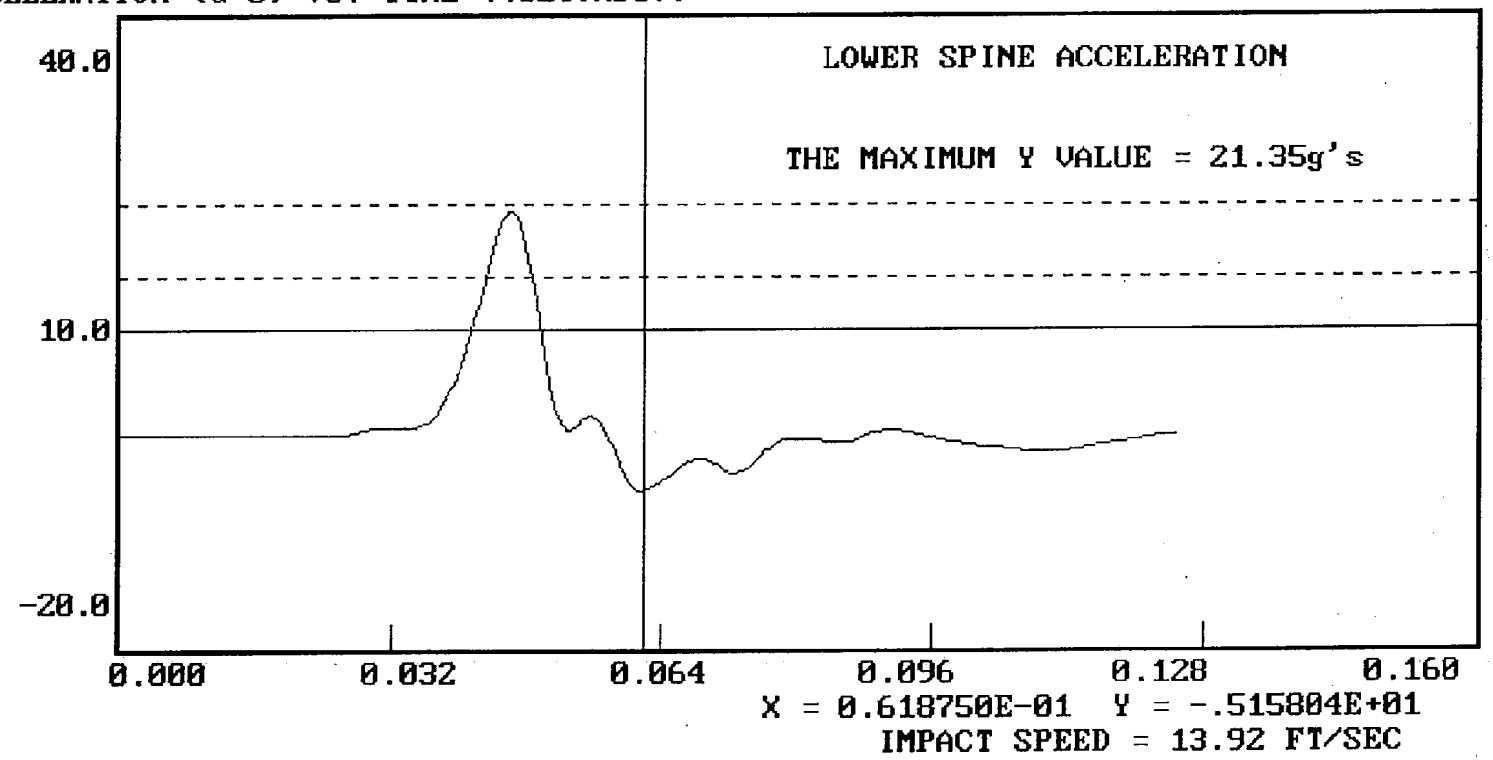
DUMMY CALIBRATION - THORAX IMPACT 12-06-1995 09:15
DUMMY # 271
ACCELERATION (G'S) VS. TIME ((SECONDS))




X = 0.618750E-01 Y = 0.647872E+00
IMPACT SPEED = 13.92 FT/SEC

DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 271
ACCELERATION (G'S) VS. TIME ((SECONDS))

12-06-1995 09:15




X = 0.618750E-01 Y = -.515804E+01
IMPACT SPEED = 13.92 FT/SEC

MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 6, 1995

DUMMY NUMBER: 271 TEST NUMBER: D952013

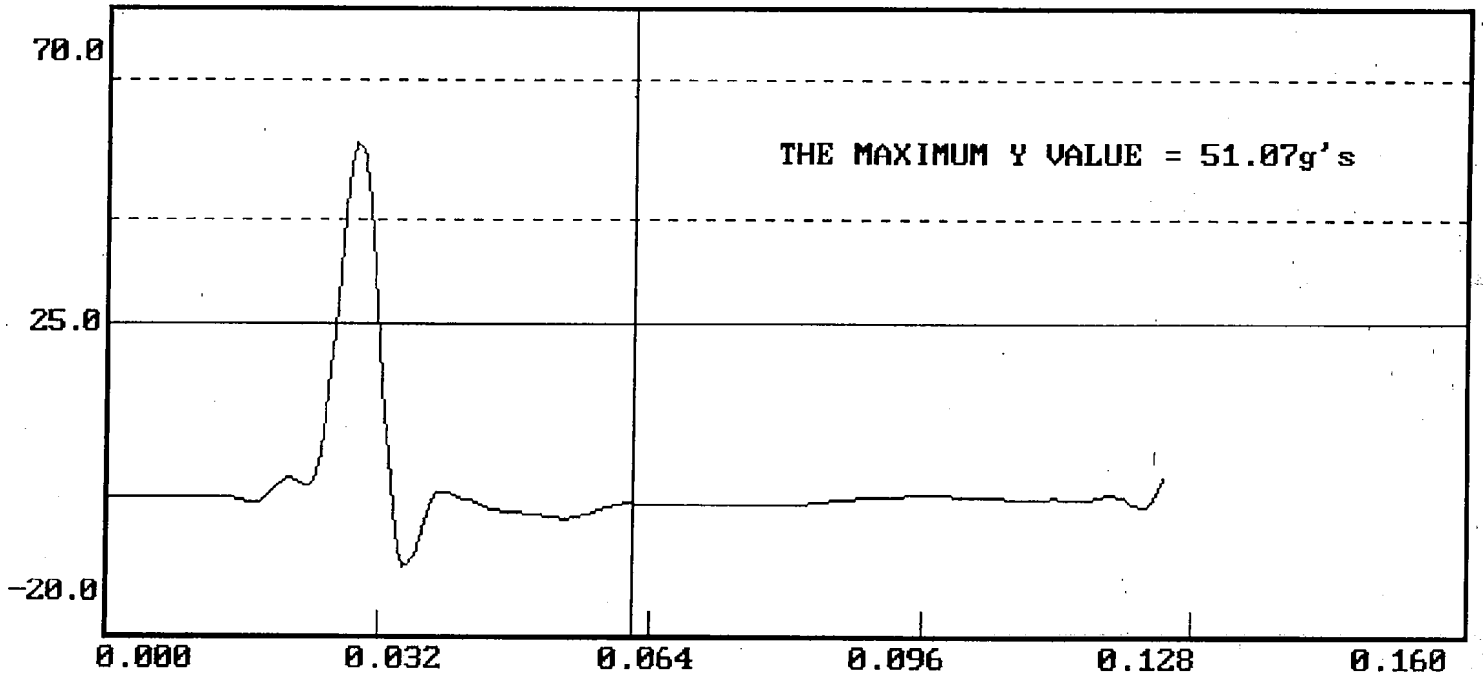
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 66 - 78° F | 70° |
| RELATIVE HUMIDITY | 10 - 70% | 12% |
| PROBE SPEED | 13.8 - 14.2 f/s | 13.9 |
| PELVIS ACCELERATION | 40 - 60 g's | 51 |

TEST MEETS SPECIFICATIONS

TECHNICIAN

APPROVED BY

DUMMY CALIBRATION - PELVIS IMPACT 12-06-1995 09:22
DUMMY # 271
ACCELERATION (G'S) VS. TIME ((SECONDS))




X = 0.618750E-01 Y = -.764742E+00
IMPACT SPEED = 13.87 FT/SEC

MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

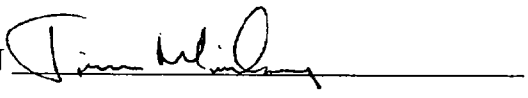
SIDE IMPACT DUMMY (SID)

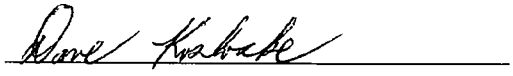
DATE: December 7, 1995

DUMMY NUMBER: 271 TEST NUMBER: D952014

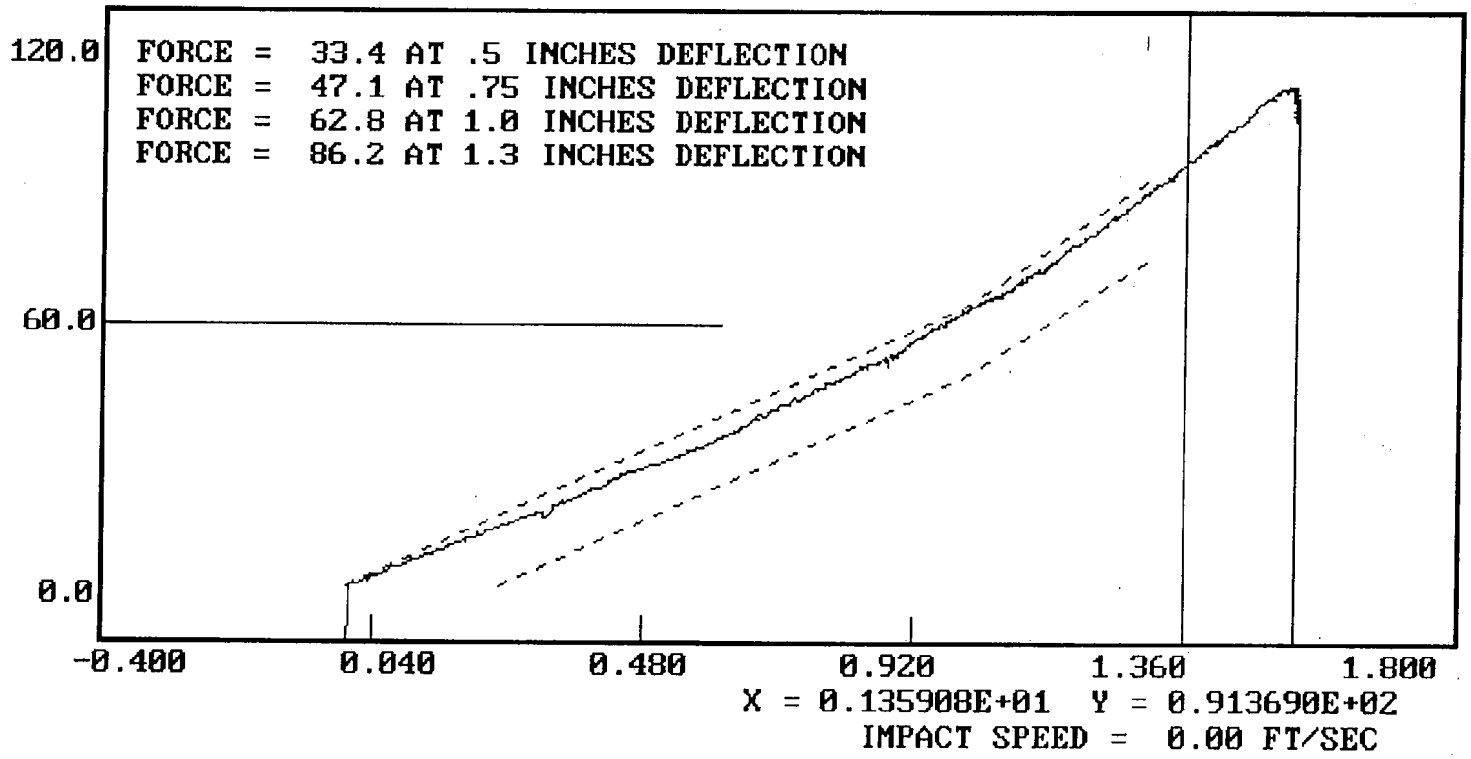
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 66 - 78° F | 70° |
| RELATIVE HUMIDITY | 10 - 70% | 12% |
| FORCE @ 0.5 in | 23.3 - 36.5 lbs | 33.4 |
| FORCE @ 0.75 in | 36.7 - 49.8 lbs | 47.1 |
| FORCE @ 1.0 in | 50 - 63 lbs | 63 |
| FORCE @ 1.3 in | 73 - 88 lbs | 86 |

TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

DUMMY CALIBRATION - ABDOMEN COMPRESSION 12-07-1995 16:49
DUMMY # 271
ABDOMEN FORCE (LBS) VS. ABDOMEN DISPLACEMENT (INCHES)




X = 0.135908E+01 Y = 0.913690E+02
IMPACT SPEED = 0.00 FT/SEC

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: December 6, 1995

DUMMY NUMBER: 271 TEST NUMBER: D952015

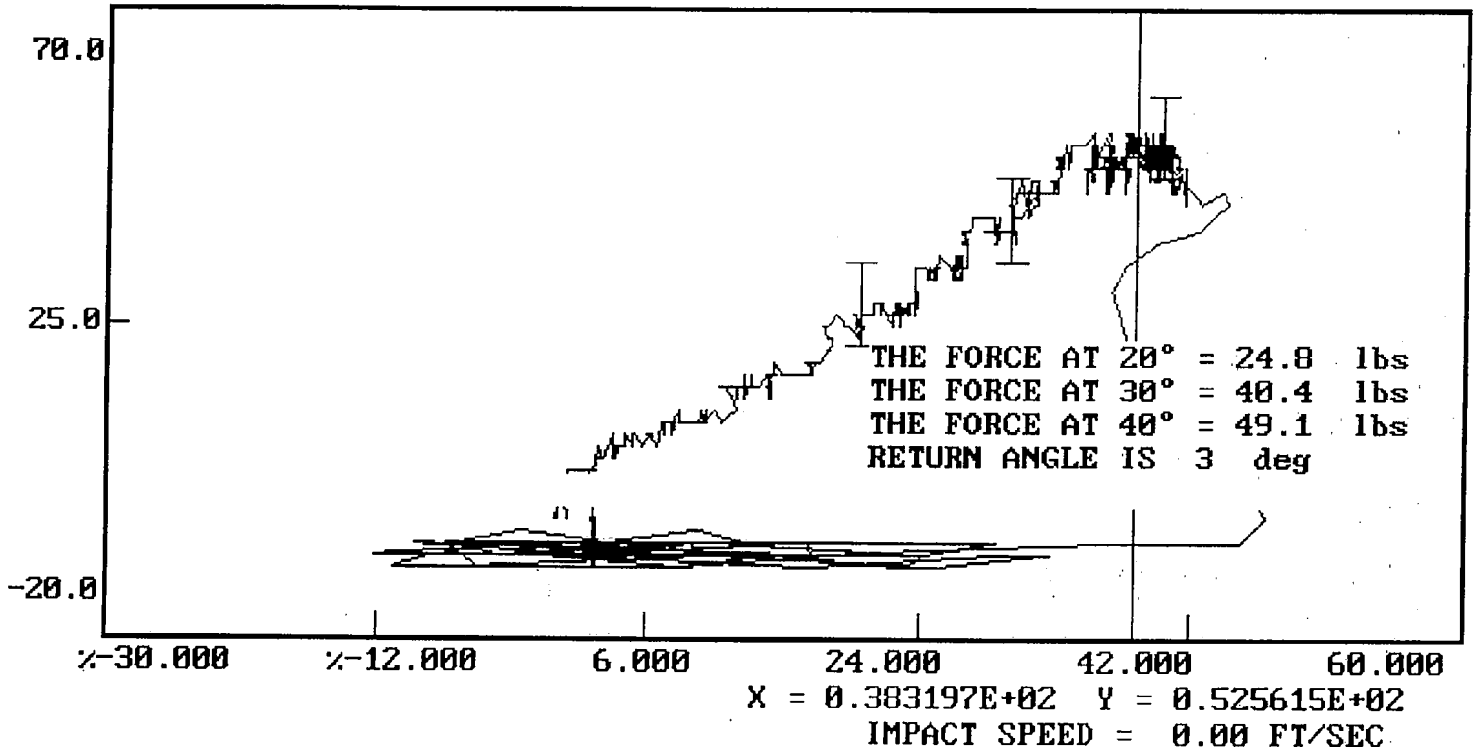
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 66 - 78° F | 70° |
| RELATIVE HUMIDITY | 10 - 70% | 12% |
| FORCE @ 0° | 0 - 6 lbs | 0 |
| FORCE @ 20° | 22 - 34 lbs | 25 |
| FORCE @ 30° | 34 - 46 lbs | 40 |
| FORCE @ 40° | 46 - 58 lbs | 49 |
| RETURN ANGLE | 12° maximum | 3° |

TEST MEETS SPECIFICATIONS

TECHNICIAN _____

APPROVED BY _____

DUMMY CALIBRATION - LUMBAR FLEXION 12-06-1995 17:23
DUMMY # 271
FORCE (LBS) VS. TORSO ROTATION (DEGREES)




X = 0.383197E+02 Y = 0.525615E+02
IMPACT SPEED = 0.00 FT/SEC

## PRE-TEST CERTIFICATION DATA

Passenger Dummy Serial Number: 270

## Calibration Test Results Summary

Passenger 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: December 7, 1995

| DESCRIPTION | SPECIFICATION | TEST RESULTS |
|---|---|---|
| SH - Seated Height | 35.0" - 35.8" | 35.3 |
| RH - Rib Height | 19.75" - 20.50" | 20.50 |
| HP - Hip Pivot Height | 3.9" ref. | 3.9 |
| RD - Rib From Back Line | 9.0" to 9.5" | 9.5 |
| KV - Knee Pivot From Back Line | 20.1" - 20.7" | 20.7 |
| 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, 1995

DUMMY NUMBER: 270 TEST NUMBER: D952002

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 66 - 78° F | 70° |
| RELATIVE HUMIDITY | 10 - 70% | 12% |
| PROBE SPEED | 13.8 - 14.2 fps | 13.9 |
| UPPER RIB | 37 - 46 g's | 41 |
| LOWER RIB | 37 - 46 g's | 45 |
| LOWER SPINE | 15 - 22 g's | 20 |

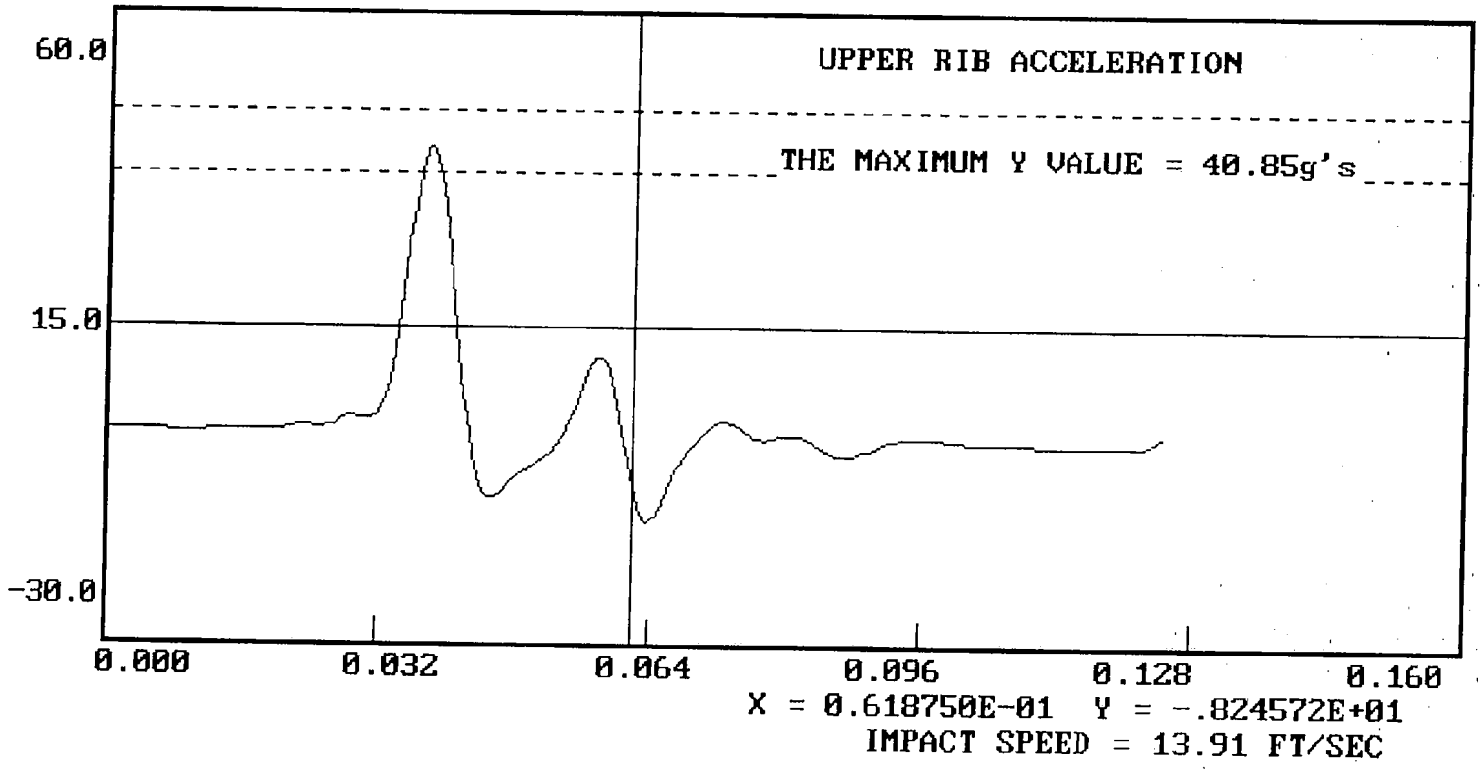
TEST MEETS SPECIFICATIONS

TECHNICIAN

APPROVED BY

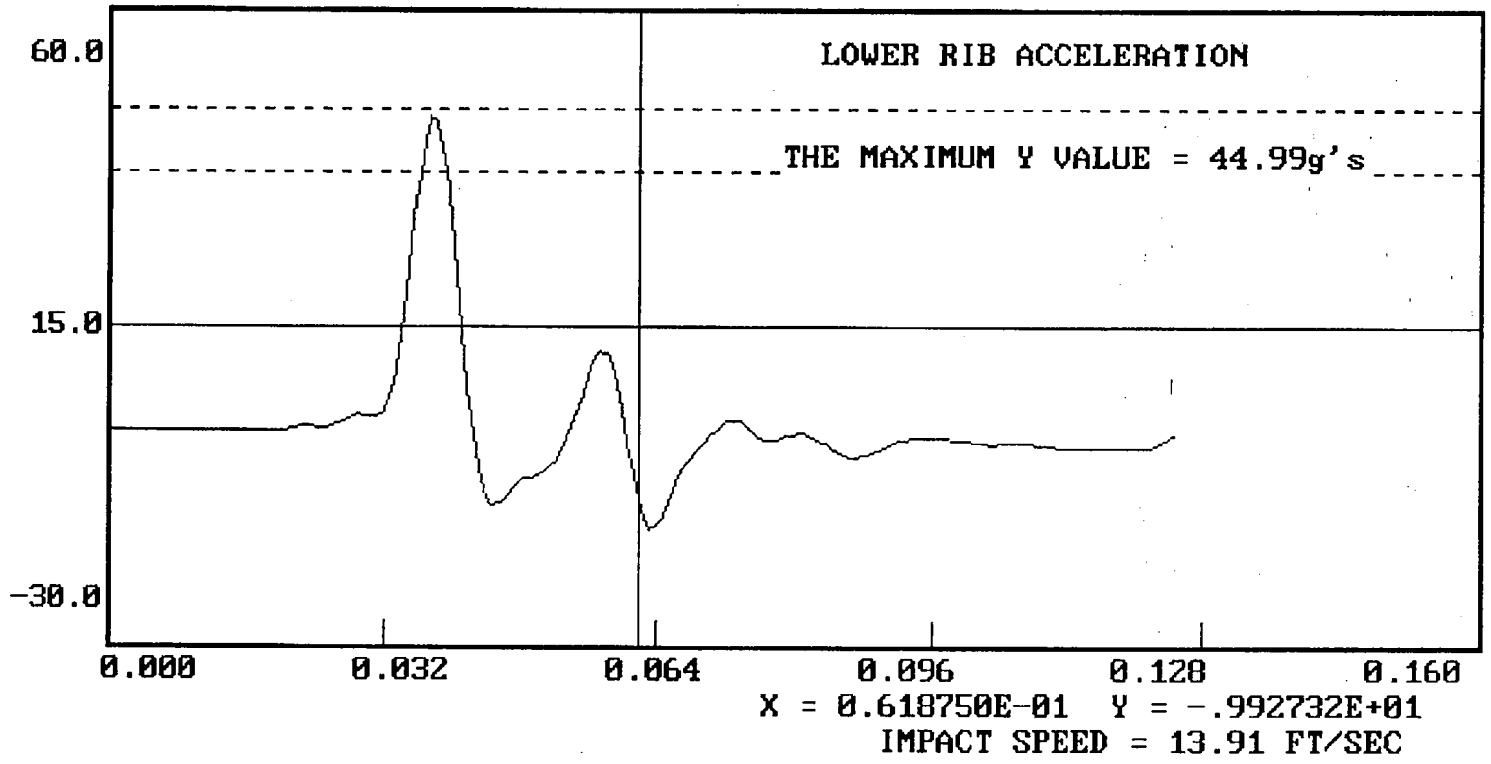
DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 270
ACCELERATION (G'S) VS. TIME ((SECONDS))

12-05-1995 22:44




X = 0.618750E-01 Y = -.824572E+01
IMPACT SPEED = 13.91 FT/SEC

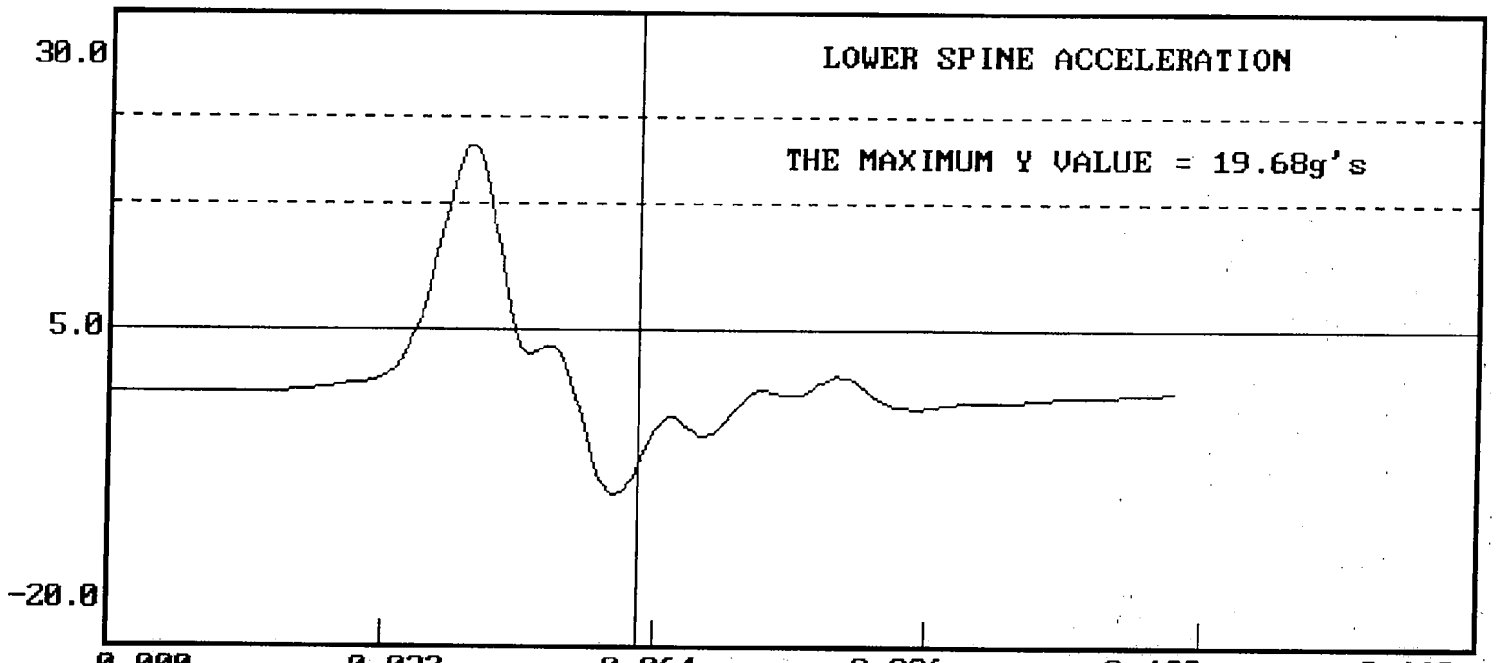
DUMMY CALIBRATION - THORAX IMPACT 12-05-1995 22:44
DUMMY # 270
ACCELERATION (G'S) VS. TIME ((SECONDS))




X = 0.618750E-01 Y = -.992732E+01
IMPACT SPEED = 13.91 FT/SEC

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

12-05-1995 22:44




X = 0.618750E-01 Y = -.562361E+01
IMPACT SPEED = 13.91 FT/SEC

MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 5, 1995

DUMMY NUMBER: 270 TEST NUMBER: D952003

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 66 - 78° F | 70° |
| RELATIVE HUMIDITY | 10 - 70% | 12% |
| PROBE SPEED | 13.8 - 14.2 f/s | 13.9 |
| PELVIS ACCELERATION | 40 - 60 g's | 55 |

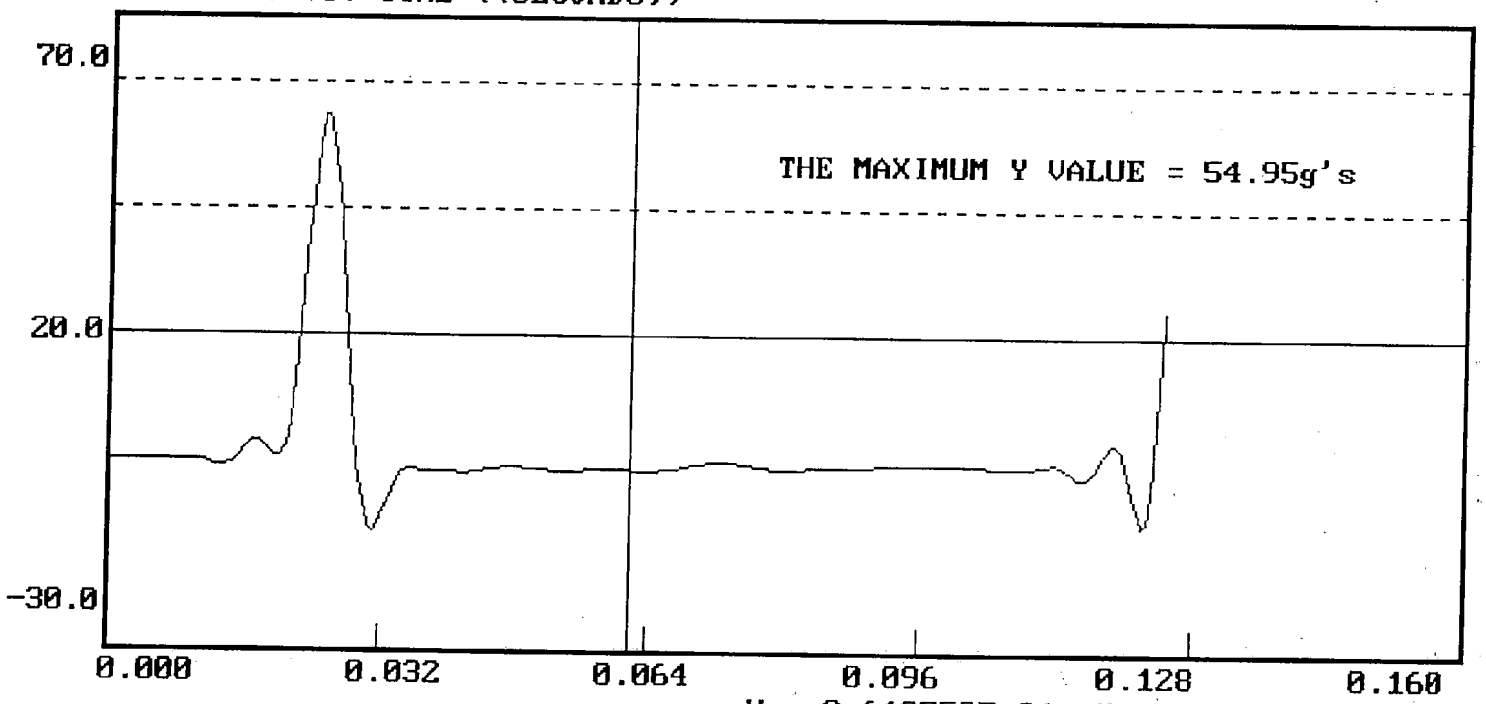
TEST MEETS SPECIFICATIONS

TECHNICIAN

APPROVED BY

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

12-05-1995 22:53




X = 0.618750E-01 Y = -.132461E+01
IMPACT SPEED = 13.91 FT/SEC

MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: December 7, 1995

DUMMY NUMBER: 270 TEST NUMBER: D952004

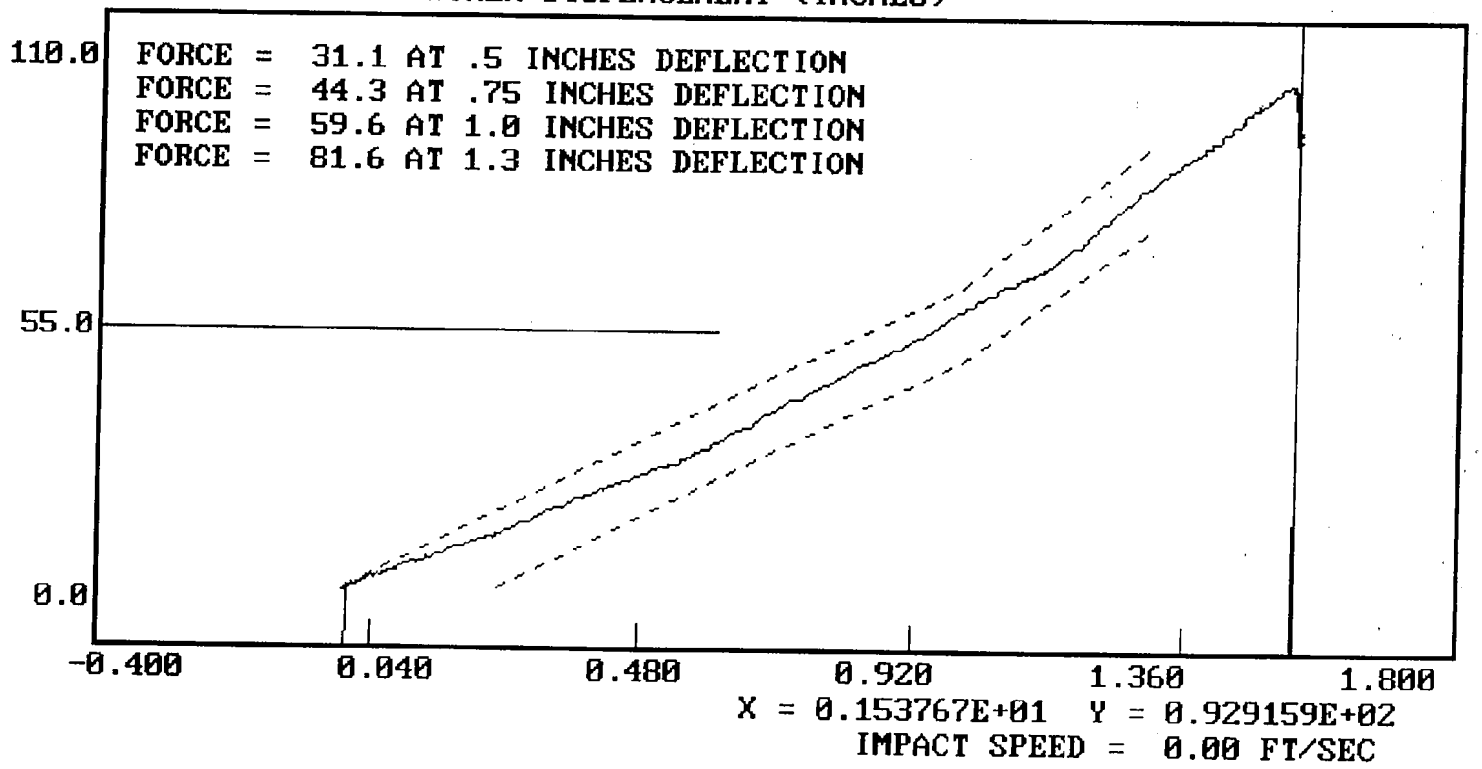
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 66 - 78° F | 70° |
| RELATIVE HUMIDITY | 10 - 70% | 12% |
| FORCE @ 0.5 in | 23.3 - 36.5 lbs | 31.1 |
| FORCE @ 0.75 in | 36.7 - 49.8 lbs | 44.3 |
| FORCE @ 1.0 in | 50 - 63 lbs | 60 |
| FORCE @ 1.3 in | 73 - 88 lbs | 82 |

TEST MEETS SPECIFICATIONS

TECHNICIAN _____

APPROVED BY _____

DUMMY CALIBRATION - ABDOMEN COMPRESSION 12-07-1995 16:41
DUMMY # 270
ABDOMEN FORCE (LBS) VS. ABDOMEN DISPLACEMENT (INCHES)




X = 0.153767E+01 Y = 0.929159E+02
IMPACT SPEED = 0.00 FT/SEC

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

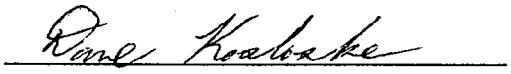
DATE: December 6, 1995

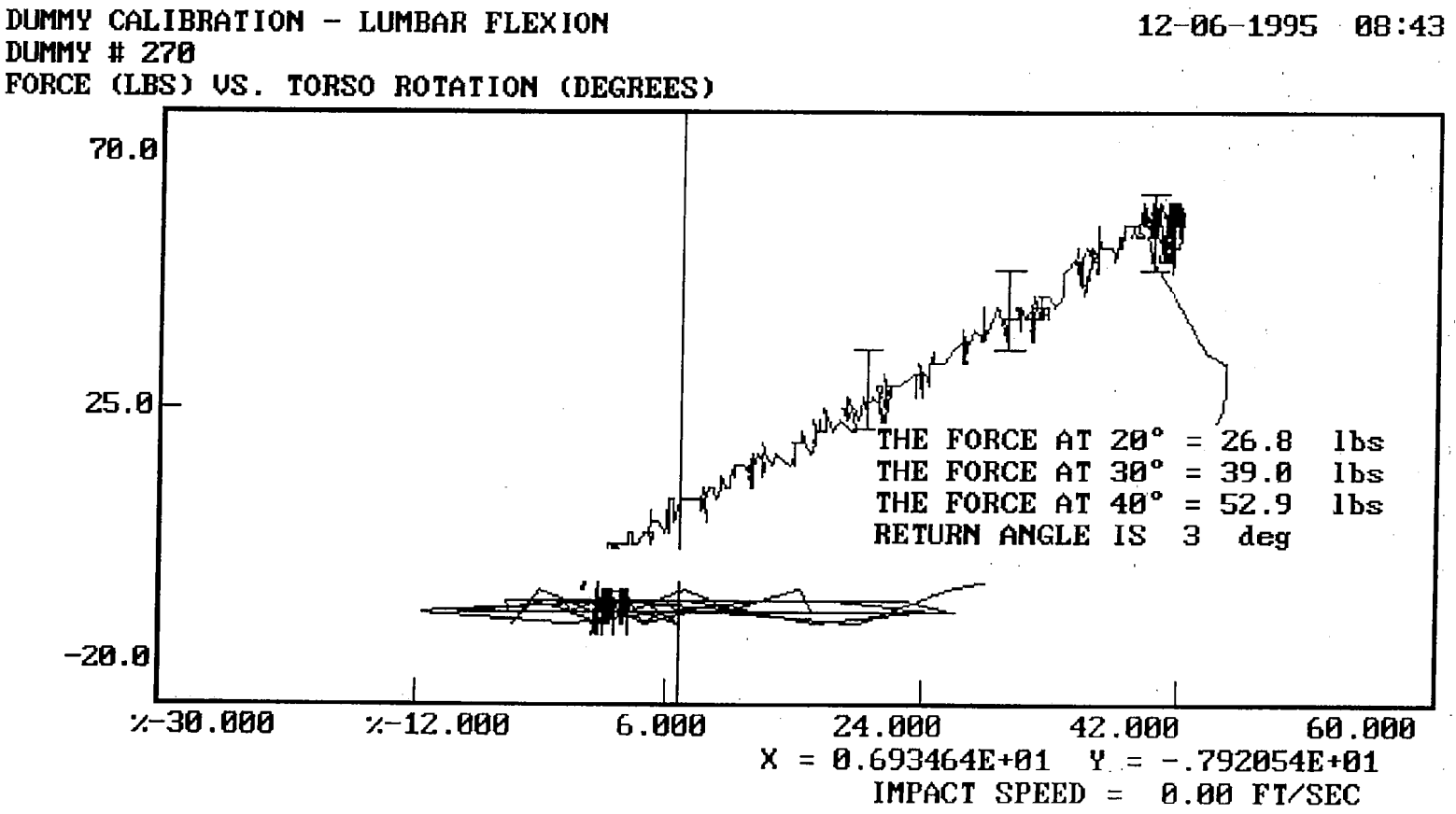
DUMMY NUMBER: 270 TEST NUMBER: D952005

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 66 - 78° F | 70° |
| RELATIVE HUMIDITY | 10 - 70% | 12% |
| FORCE @ 0° | 0 - 6 lbs | 0 |
| FORCE @ 20° | 22 - 34 lbs | 27 |
| FORCE @ 30° | 34 - 46 lbs | 39 |
| FORCE @ 40° | 46 - 58 lbs | 53 |
| RETURN ANGLE | 12° maximum | 3° |

TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 


DUMMY CALIBRATION - LUMBAR FLEXION
12-06-1995 08:43
DUMMY # 270
FORCE (LBS) VS. TORSO ROTATION (DEGREES)
70.0
25.0
-20.0
%-30.000
%-12.000
6.000
24.000
42.000
60.000
THE FORCE AT 20° = 26.8 lbs
THE FORCE AT 30° = 39.0 lbs
THE FORCE AT 40° = 52.9 lbs
RETURN ANGLE IS 3 deg
X = 0.693464E+01 Y = -.792054E+01
IMPACT SPEED = 0.00 FT/SEC

## POST-TEST CERTIFICATION DATA

Driver Dummy Serial Number: 271

## Calibration Test Results Summary

Dummy Serial Number: 271

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.: 271 DATE OF VERIFICATION: December 12, 1995

| DESCRIPTION | SPECIFICATION | TEST RESULTS |
|---|---|---|
| SH - Seated Height | 35.0" - 35.8" | 35.4 |
| RH - Rib Height | 19.75" - 20.50" | 20.40 |
| HP - Hip Pivot Height | 3.9" ref. | 3.9 |
| RD - Rib From Back Line | 9.0" to 9.5" | 9.4 |
| 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: Dave Kozlosake

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 12, 1995

DUMMY NUMBER: 271 TEST NUMBER: D952102

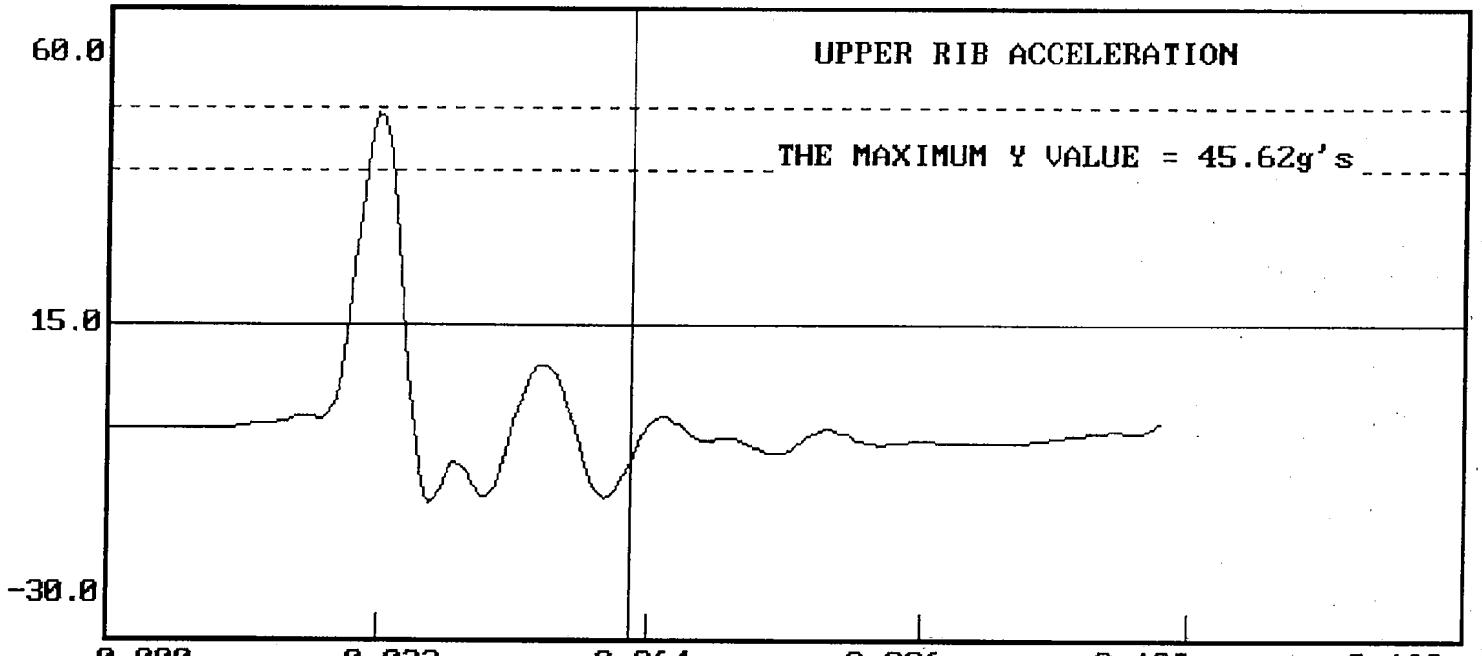
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 66 - 78° F | 70° |
| RELATIVE HUMIDITY | 10 - 70% | 12% |
| PROBE SPEED | 13.8 - 14.2 fps | 14.0 |
| UPPER RIB | 37 - 46 g's | 46 |
| LOWER RIB | 37 - 46 g's | 46 |
| LOWER SPINE | 15 - 22 g's | 22 |

TEST MEETS SPECIFICATIONS

TECHNICIAN _____

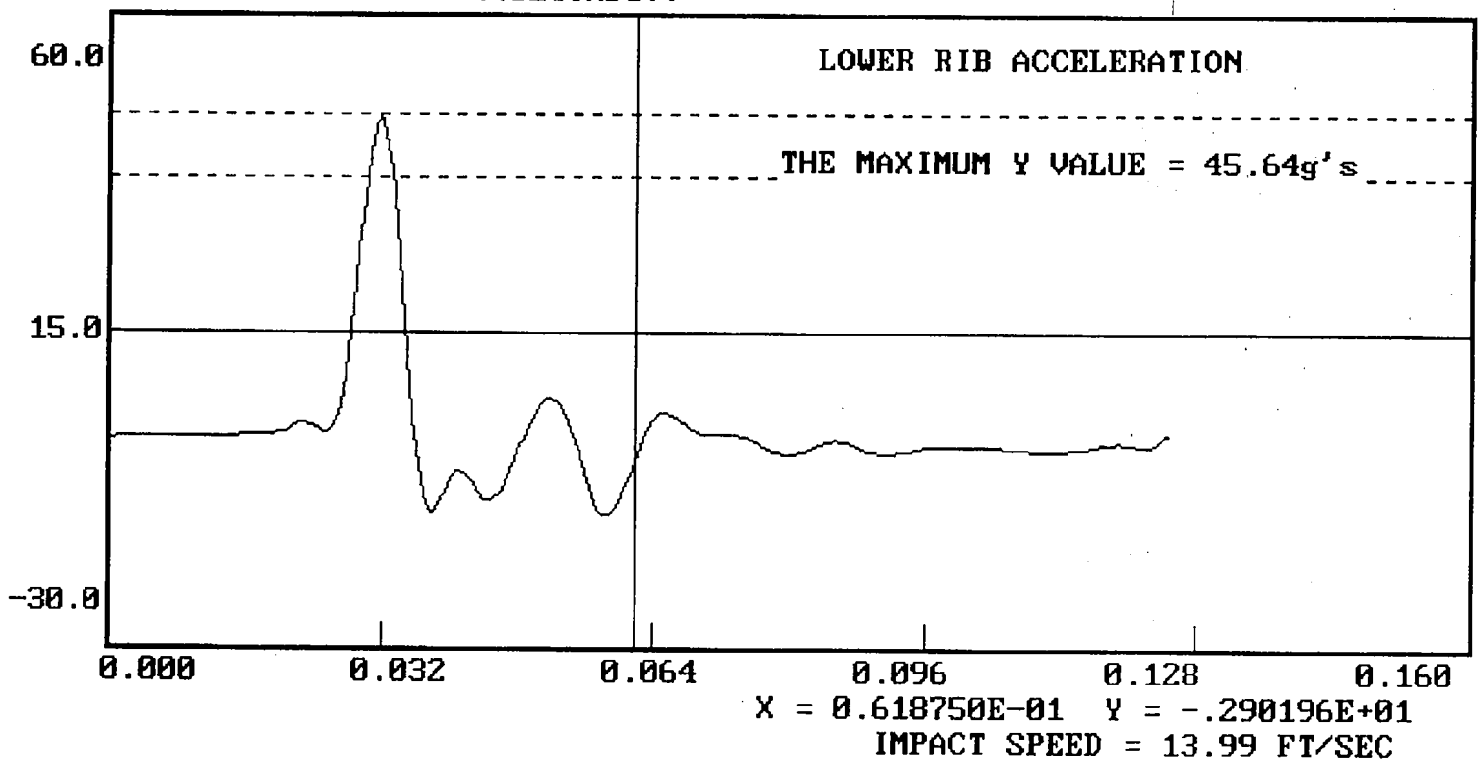
APPROVED BY _____

DUMMY CALIBRATION - THORAX IMPACT 12-12-1995 09:44
DUMMY # 271
ACCELERATION (G'S) VS. TIME ((SECONDS))



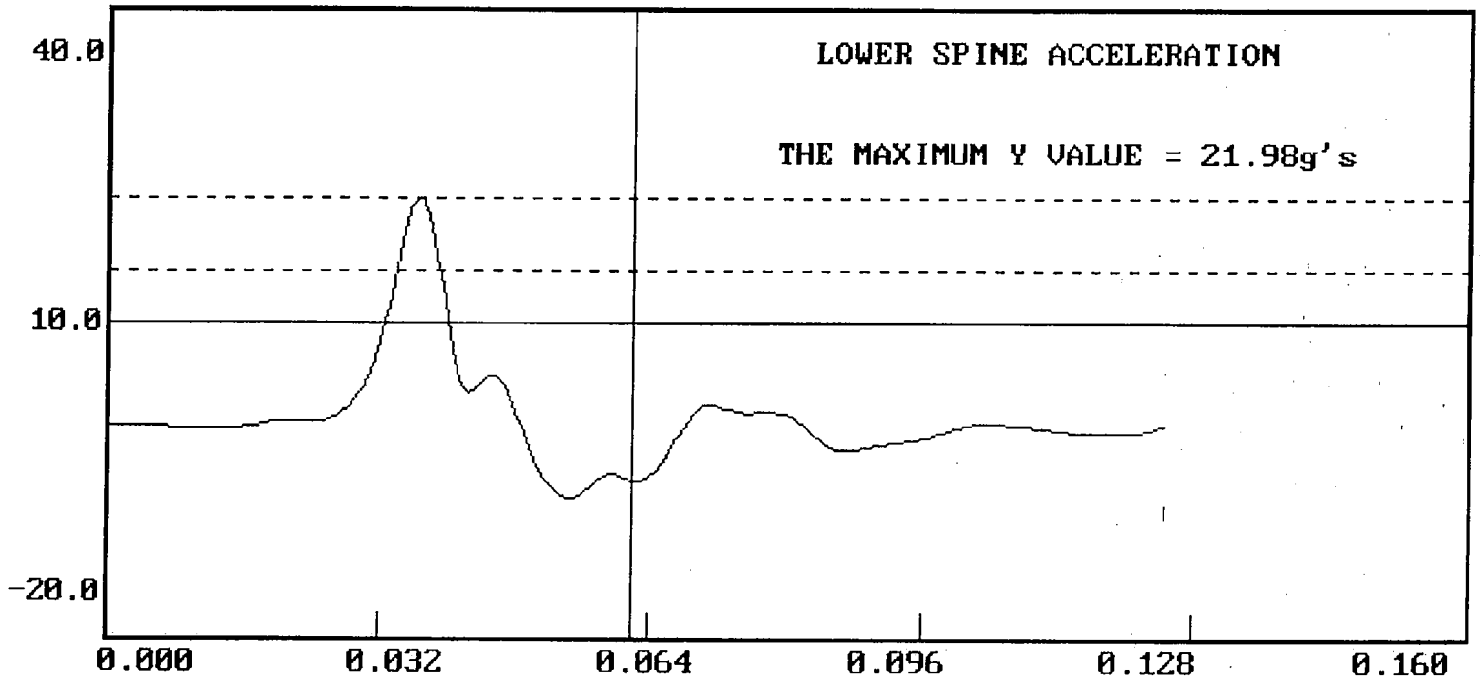

X = 0.618750E-01 Y = -.423639E+01
IMPACT SPEED = 13.99 FT/SEC

DUMMY CALIBRATION - THORAX IMPACT 12-12-1995 09:44
DUMMY # 271
ACCELERATION (G'S) VS. TIME ((SECONDS))




X = 0.618750E-01 Y = -.290196E+01
IMPACT SPEED = 13.99 FT/SEC

DUMMY CALIBRATION - THORAX IMPACT 12-12-1995 09:44
DUMMY # 271
ACCELERATION (G'S) VS. TIME ((SECONDS))




X = 0.618750E-01 Y = -.518447E+01
IMPACT SPEED = 13.99 FT/SEC

MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 12, 1995

DUMMY NUMBER: 271 TEST NUMBER: D952103

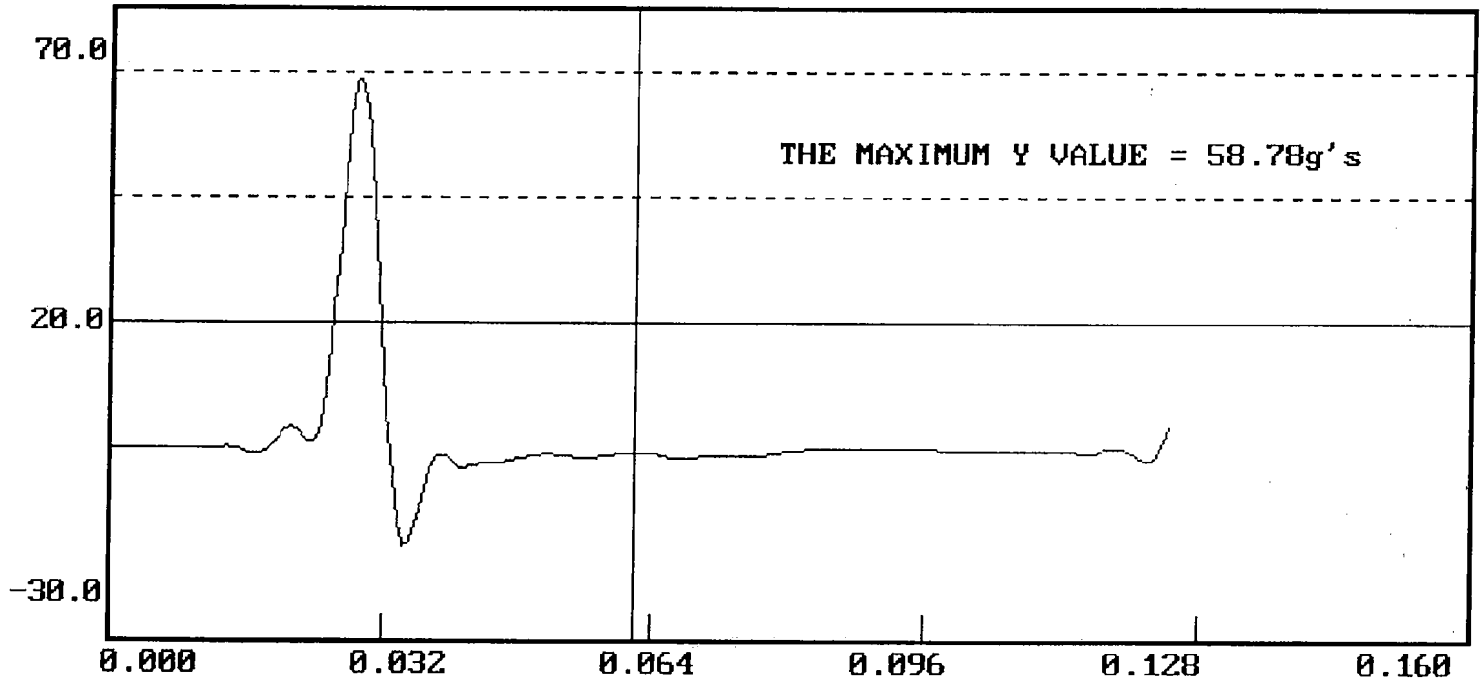
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 66 - 78° F | 70° |
| RELATIVE HUMIDITY | 10 - 70% | 12% |
| PROBE SPEED | 13.8 - 14.2 f/s | 14.0 |
| PELVIS ACCELERATION | 40 - 60 g's | 59 |

TEST MEETS SPECIFICATIONS

TECHNICIAN

APPROVED BY

DUMMY CALIBRATION - PELVIS IMPACT 12-12-1995 10:11
DUMMY # 271
ACCELERATION (G'S) VS. TIME ((SECONDS))




X = 0.618750E-01 Y = -.599148E+00
IMPACT SPEED = 13.99 FT/SEC

MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: December 12, 1995

DUMMY NUMBER: 271 TEST NUMBER: D952104

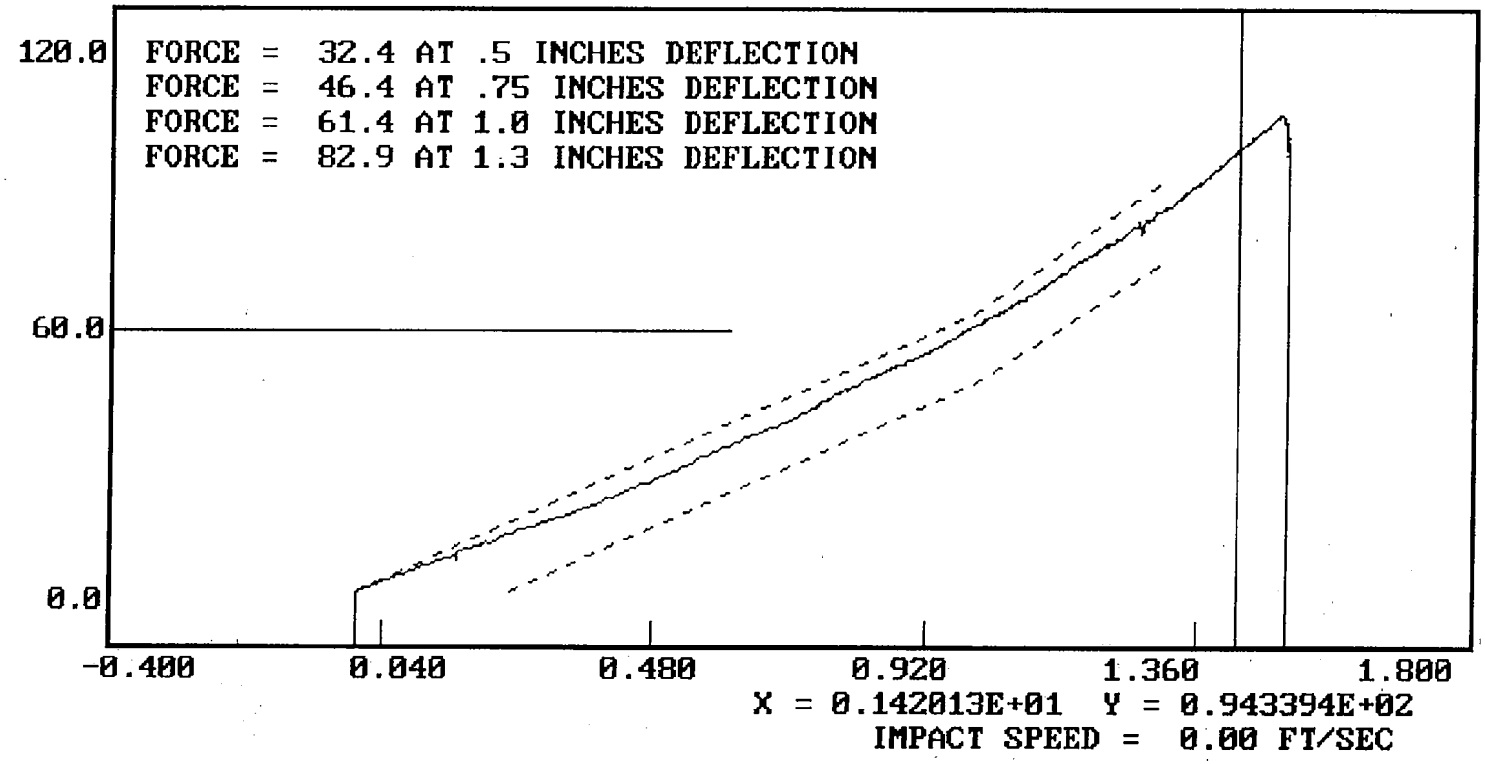
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 66 - 78° F | 70° |
| RELATIVE HUMIDITY | 10 - 70% | 12% |
| FORCE @ 0.5 in | 23.3 - 36.5 lbs | 32.4 |
| FORCE @ 0.75 in | 36.7 - 49.8 lbs | 46.4 |
| FORCE @ 1.0 in | 50 - 63 lbs | 61 |
| FORCE @ 1.3 in | 73 - 88 lbs | 83 |

TEST MEETS SPECIFICATIONS

TECHNICIAN _____

APPROVED BY _____

DUMMY CALIBRATION - ABDOMEN COMPRESSION 12-12-1995 11:18
DUMMY # 271
ABDOMEN FORCE (LBS) VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: December 12, 1995

DUMMY NUMBER: 271 TEST NUMBER: D952105

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 66 - 78° F | 70° |
| RELATIVE HUMIDITY | 10 - 70% | 12% |
| FORCE @ 0° | 0 - 6 lbs | 0 |
| FORCE @ 20° | 22 - 34 lbs | 26 |
| FORCE @ 30° | 34 - 46 lbs | 38 |
| FORCE @ 40° | 46 - 58 lbs | 50 |
| RETURN ANGLE | 12° maximum | 4° |

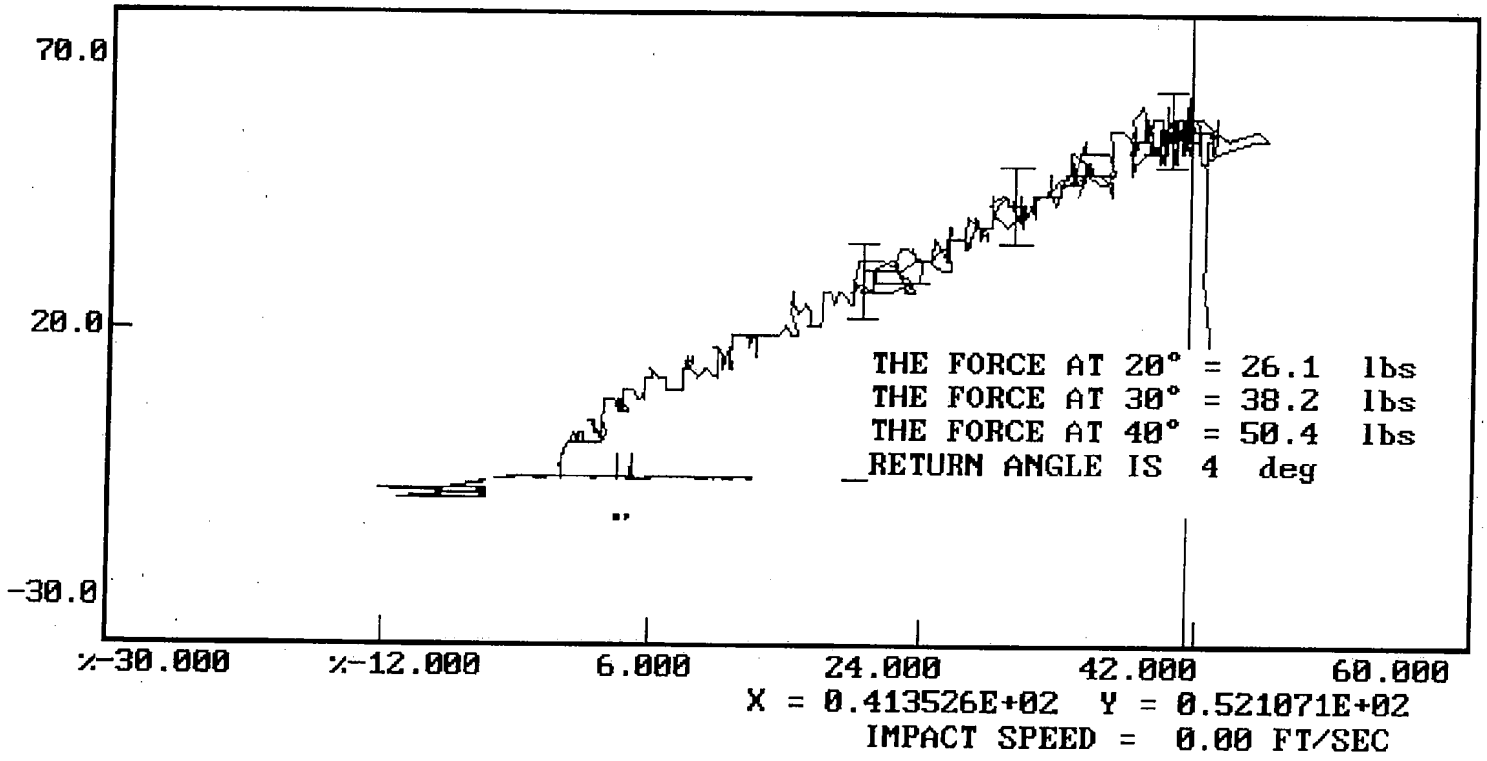
TEST MEETS SPECIFICATIONS

TECHNICIAN

APPROVED BY

DUMMY CALIBRATION - LUMBAR FLEXION
DUMMY # 271
FORCE (LBS) VS. TORSO ROTATION (DEGREES)

12-12-1995 10:37




X = 0.413526E+02 Y = 0.521071E+02
IMPACT SPEED = 0.00 FT/SEC

## POST-TEST CERTIFICATION DATA

Passenger 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 12, 1995

| DESCRIPTION | SPECIFICATION | TEST RESULTS |
|---|---|---|
| SH - Seated Height | 35.0" - 35.8" | 35.3 |
| RH - Rib Height | 19.75" - 20.50" | 20.50 |
| HP - Hip Pivot Height | 3.9" ref. | 3.9 |
| RD - Rib From Back Line | 9.0" to 9.5" | 9.5 |
| KV - Knee Pivot From Back Line | 20.1" - 20.7" | 20.7 |
| 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 12, 1995

DUMMY NUMBER: 270

TEST NUMBER: D952092

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 66 - 78° F | 70° |
| RELATIVE HUMIDITY | 10 - 70% | 12% |
| PROBE SPEED | 13.8 - 14.2 fps | 14.0 |
| UPPER RIB | 37 - 46 g's | 41 |
| LOWER RIB | 37 - 46 g's | 41 |
| LOWER SPINE | 15 - 22 g's | 21 |

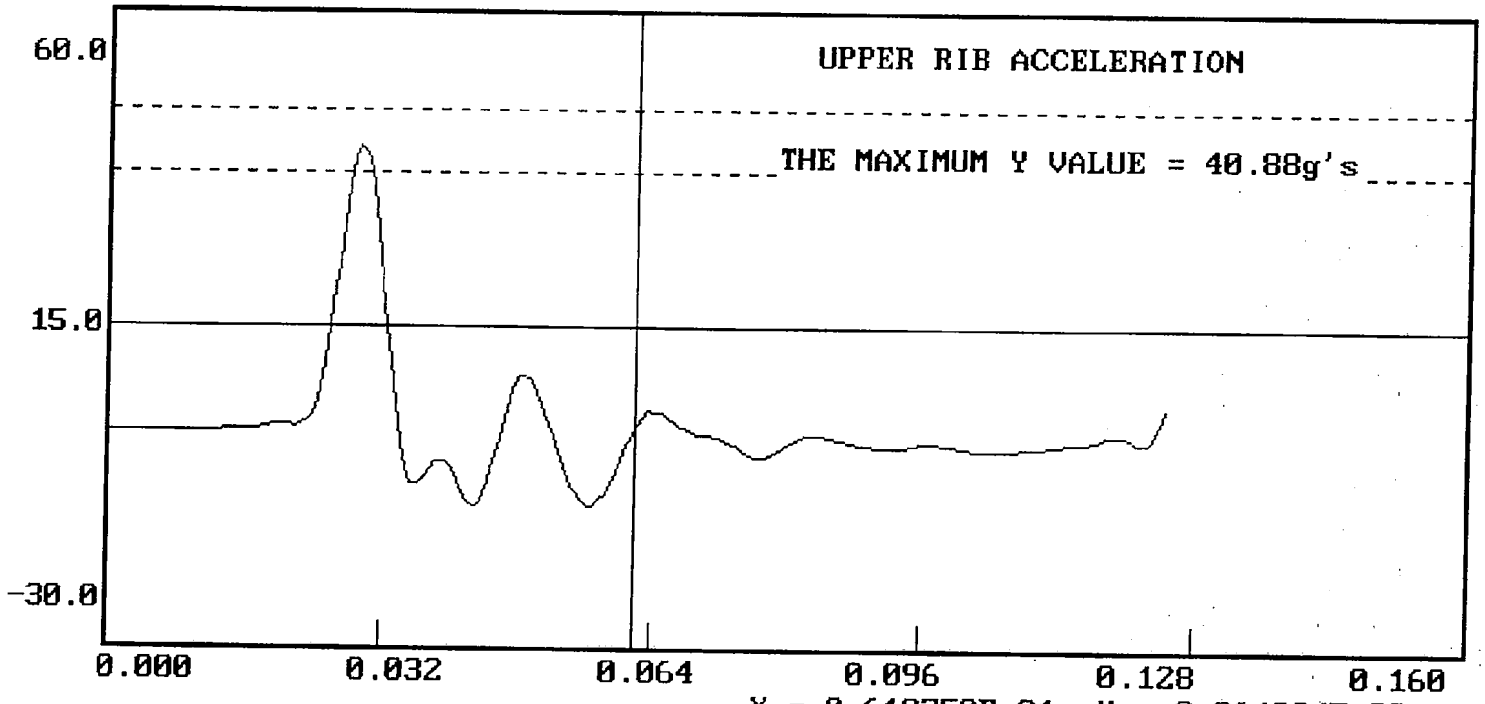
TEST MEETS SPECIFICATIONS

TECHNICIAN

APPROVED BY

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

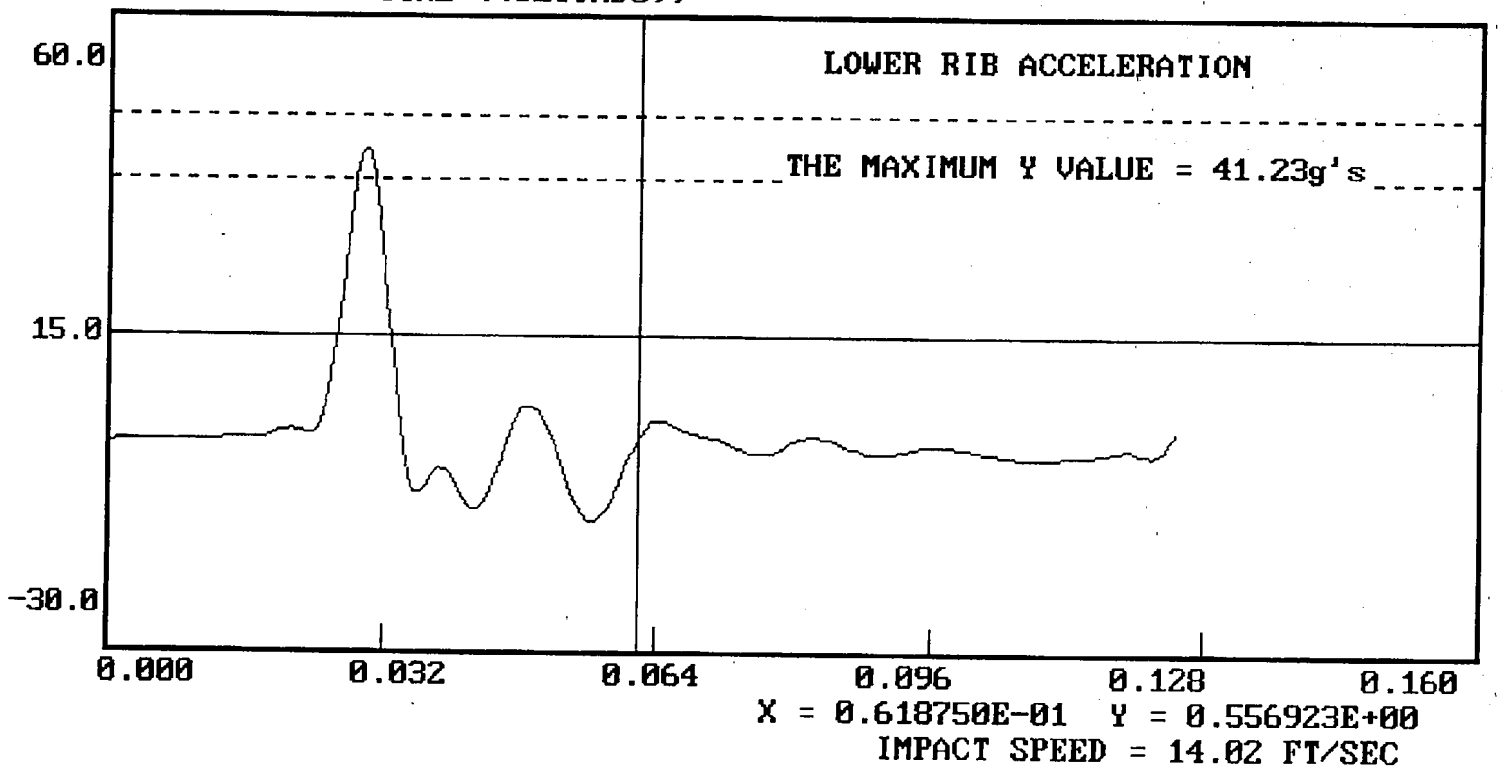
12-12-1995 09:05




X = 0.618750E-01 Y = 0.864984E+00
IMPACT SPEED = 14.02 FT/SEC

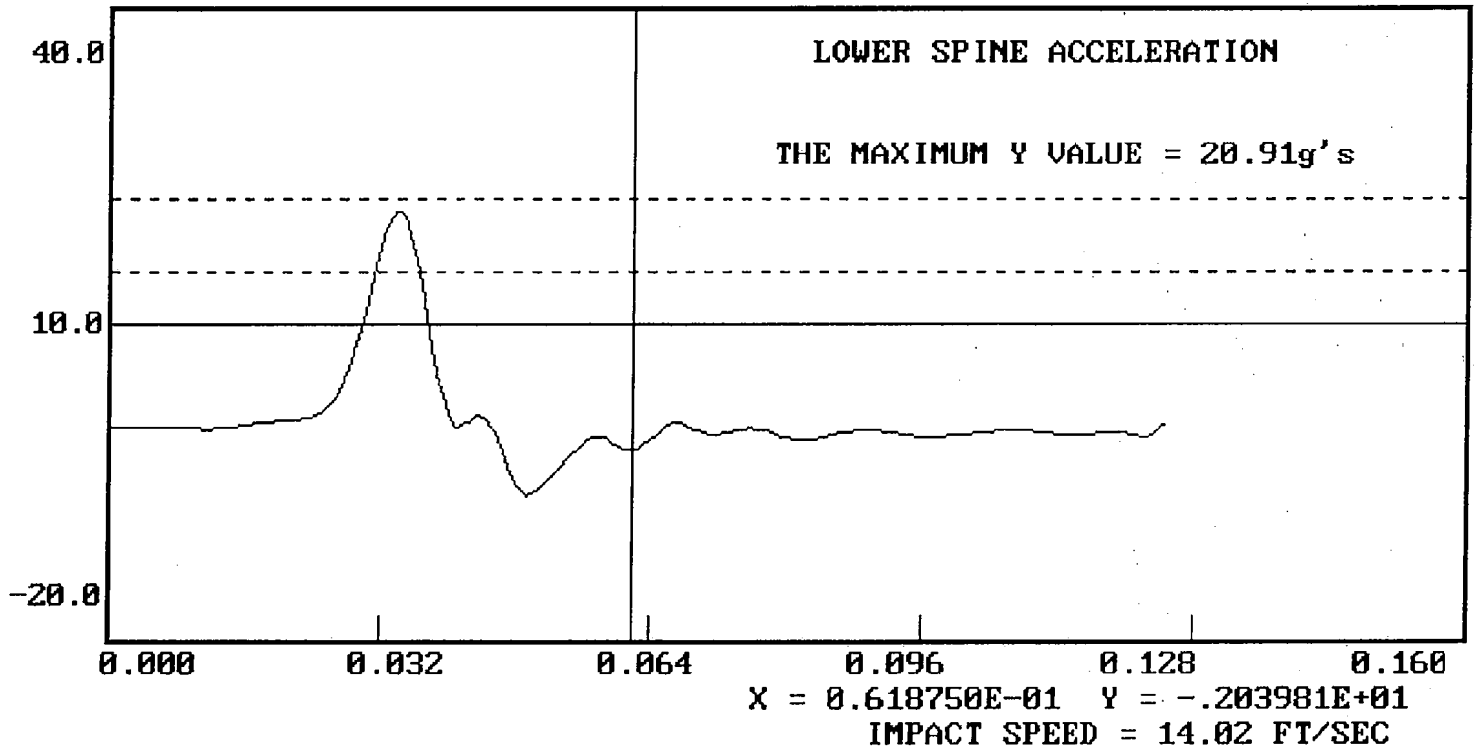
DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 270
ACCELERATION (G'S) VS. TIME ((SECONDS))

12-12-1995 09:05




X = 0.618750E-01 Y = 0.556923E+00
IMPACT SPEED = 14.02 FT/SEC

DUMMY CALIBRATION - THORAX IMPACT 12-12-1995 09:05
DUMMY # 270
ACCELERATION (G'S) VS. TIME ((SECONDS))




X = 0.618750E-01 Y = -.203981E+01
IMPACT SPEED = 14.02 FT/SEC

MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 12, 1995

DUMMY NUMBER: 270 TEST NUMBER: D952093

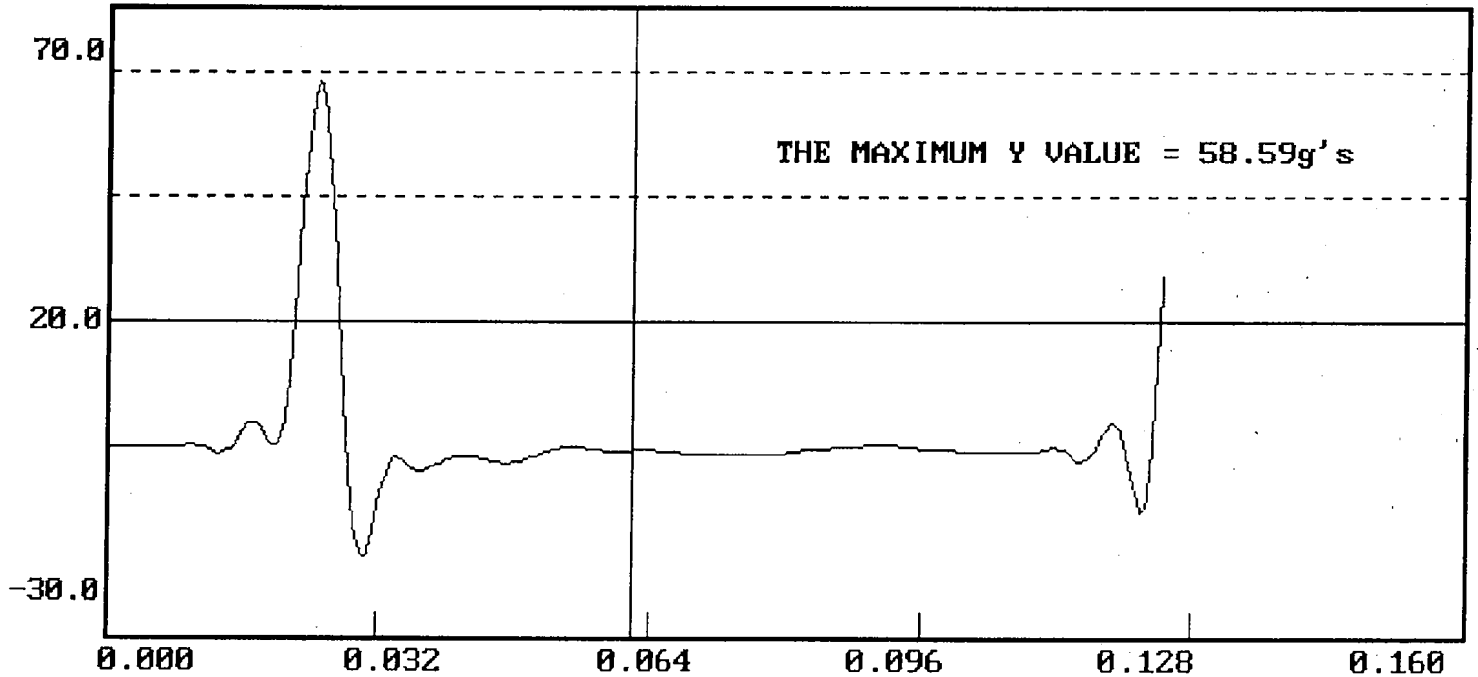
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 66 - 78° F | 70° |
| RELATIVE HUMIDITY | 10 - 70% | 12% |
| PROBE SPEED | 13.8 - 14.2 f/s | 14.0 |
| PELVIS ACCELERATION | 40 - 60 g's | 59 |

TEST MEETS SPECIFICATIONS

TECHNICIAN

APPROVED BY

DUMMY CALIBRATION - PELVIS IMPACT 12-12-1995 09:19
DUMMY # 270
ACCELERATION (G'S) VS. TIME ((SECONDS))




X = 0.618750E-01 Y = -.604318E+00
IMPACT SPEED = 13.98 FT/SEC

MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: December 12, 1995

DUMMY NUMBER: 270 TEST NUMBER: D952094

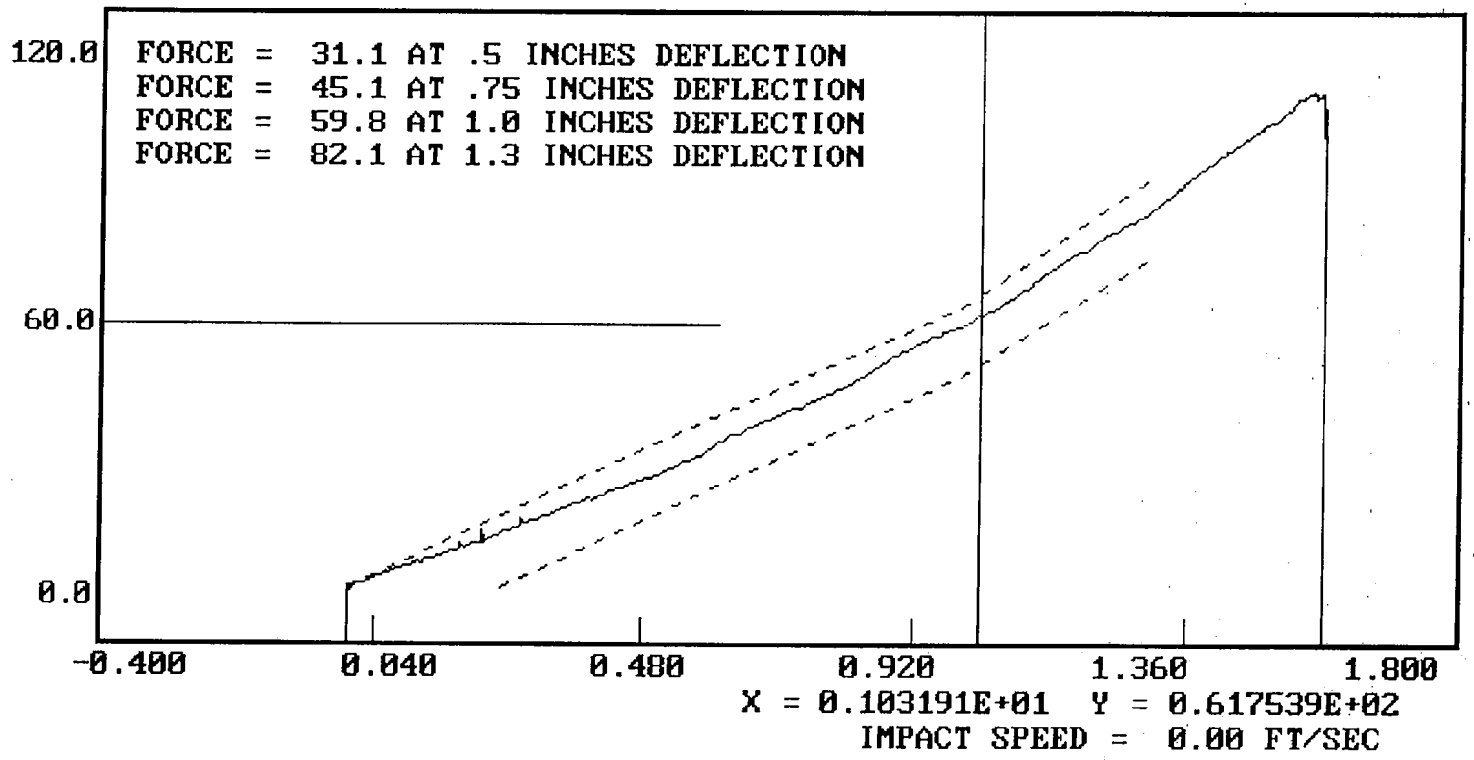
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 66 - 78° F | 70° |
| RELATIVE HUMIDITY | 10 - 70% | 12% |
| FORCE @ 0.5 in | 23.3 - 36.5 lbs | 31.1 |
| FORCE @ 0.75 in | 36.7 - 49.8 lbs | 45.1 |
| FORCE @ 1.0 in | 50 - 63 lbs | 60 |
| FORCE @ 1.3 in | 73 - 88 lbs | 82 |

TEST MEETS SPECIFICATIONS

TECHNICIAN _____

APPROVED BY _____

DUMMY CALIBRATION - ABDOMEN COMPRESSION 12-12-1995 11:13
DUMMY # 270
ABDOMEN FORCE (LBS) VS. ABDOMEN DISPLACEMENT (INCHES)




X = 0.103191E+01 Y = 0.617539E+02
IMPACT SPEED = 0.00 FT/SEC

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

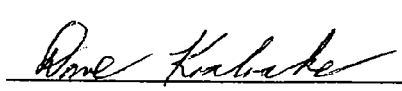
DATE: December 12, 1995

DUMMY NUMBER: 270 TEST NUMBER: D952095

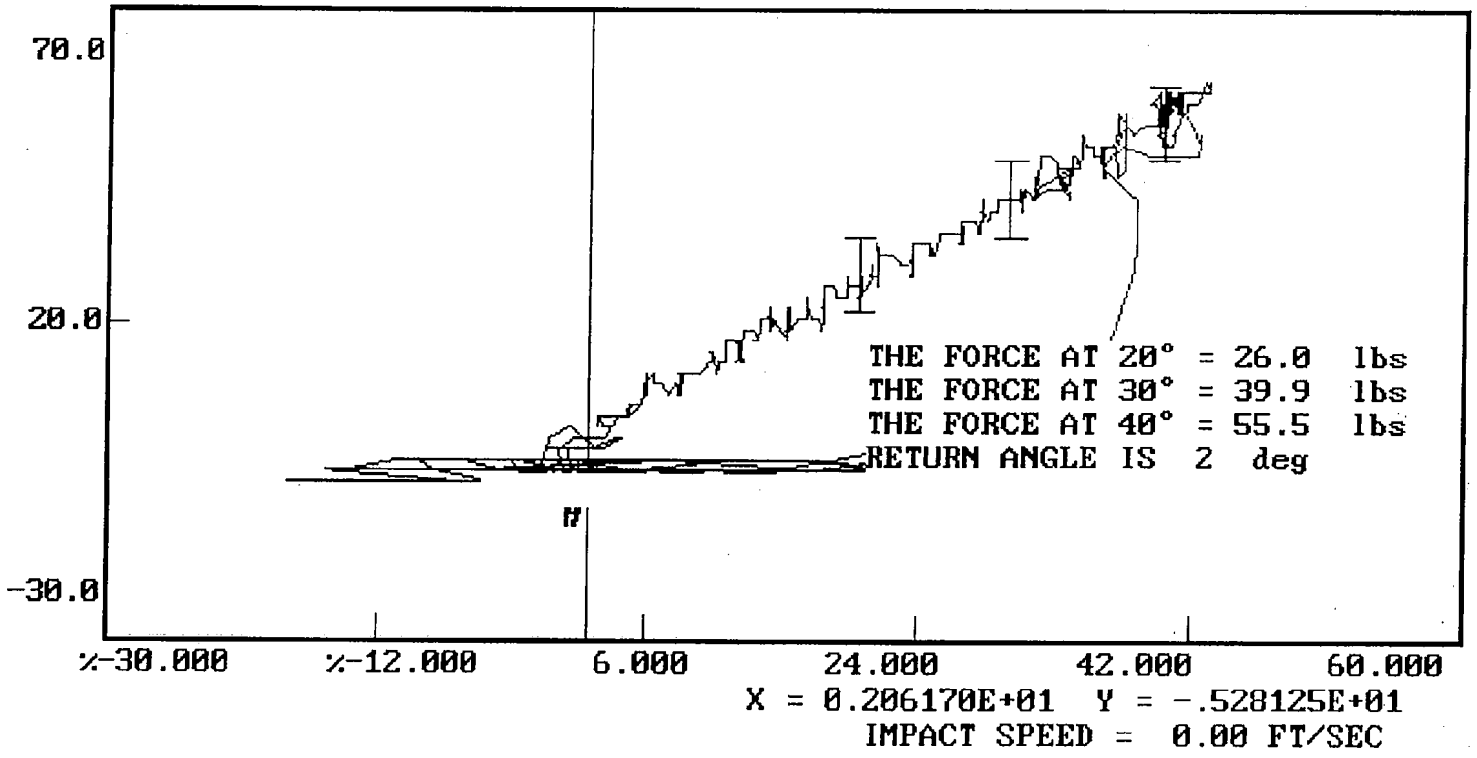
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 66 - 78° F | 70° |
| RELATIVE HUMIDITY | 10 - 70% | 12% |
| FORCE @ 0° | 0 - 6 lbs | 0 |
| FORCE @ 20° | 22 - 34 lbs | 26 |
| FORCE @ 30° | 34 - 46 lbs | 40 |
| FORCE @ 40° | 46 - 58 lbs | 56 |
| RETURN ANGLE | 12° maximum | 2° |

TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

DUMMY CALIBRATION - LUMBAR FLEXION 12-12-1995 10:26
DUMMY # 270
FORCE (LBS) VS. TORSO ROTATION (DEGREES)




X = 0.206170E+01 Y = -.528125E+01
IMPACT SPEED = 0.00 FT/SEC

## POST-TEST DRIVER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 271

Inspected By: Al Chalmers

Date: December 12, 1995

| Part | Items Checked | Comments |
|---|---|---|
| Skin | visual inspection | OK |
| Head | visual, ballast, accelerometer mount | OK |
| Neck | visual | OK |
| Spine box | visual, ballast, weldment, accelerometer mount | OK |
| Rib cage | visual, measure | OK |
| Sternum | visual | OK |
| Lumbar spine | visual | OK |
| Abdomen | visual | OK |
| Pelvis | visual, palpate, accelerometer mount | OK |
| Upper legs | visual | OK |
| Knees | visual, stops | 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: 270

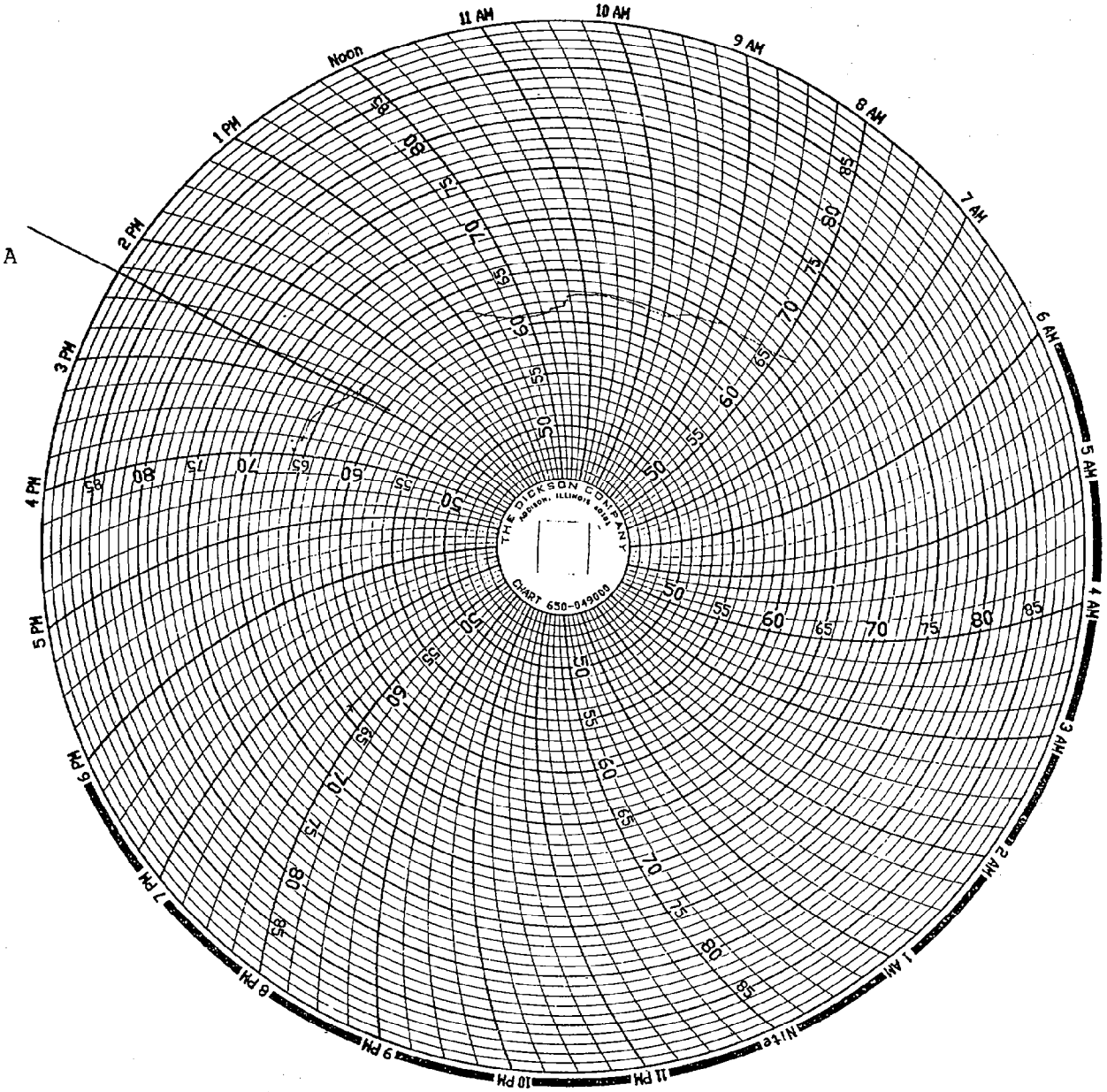
Inspected By: Al Chalmers

Date: December 12, 1995

| Part | Items Checked | Comments |
|---|---|---|
| Skin | visual inspection | OK |
| Head | visual, ballast, accelerometer mount | OK |
| Neck | visual | OK |
| Spine box | visual, ballast, weldment, accelerometer mount | OK |
| Rib cage | visual, measure | OK |
| Sternum | visual | OK |
| Lumbar spine | visual | OK |
| Abdomen | visual | OK |
| Pelvis | visual, palpate, accelerometer mount | OK |
| Upper legs | visual | OK |
| Knees | visual, stops | 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




A = Test Conducted

Note: Temperature was approved by NHTSA COTR

# APPENDIX D

# TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

DUMMY AND VEHICLE CALIBRATION DATA

INSTRUMENTS FOR DRIVER DUMMY NO. 271

| | DRIVER | | |
|---|---|---|---|
| | SERIAL NO. | MANUFACTURER | CALIBRATION DATE |
| Upper Rib Y | AP2A4 | Endevco | September 14, 1995 |
| Lower Rib Y | AP1B3 | Endevco | September 25, 1995 |
| Lower Spine Y | ANAP1 | Endevco | November 08, 1995 |
| Pelvis Y | AJ417 | Endevco | July 10, 1995 |
| Upper Rib Redundant Y | AP2D8 | Endevco | September 14, 1995 |
| Lower Rib Redundant Y | AP1C6 | Endevco | September 25, 1995 |
| Lower Spine Redundant Y | ANAT6 | Endevco | November 08, 1995 |
| Pelvis Redundant Y | ABP20 | Endevco | July 10, 1995 |

INSTRUMENTS FOR PASSENGER DUMMY NO. 270

| | LEFT REAR PASSENGER | | |
|---|---|---|---|
| | SERIAL NO. | MANUFACTURER | CALIBRATION DATE |
| Upper Rib Y | AP1H2 | Endevco | September 25, 1995 |
| Lower Rib Y | AJ9C2 | Endevco | September 25, 1995 |
| Lower Spine Y | AP2D7 | Endevco | September 25, 1995 |
| Pelvis Y | ALCH7 | Endevco | September 15, 1995 |
| Upper Rib Redundant Y | AH0B0 | Endevco | September 25, 1995 |
| Lower Rib Redundant Y | AHTT2 | Endevco | September 25, 1995 |
| Lower Spine Redundant Y | AP1T8 | Endevco | September 25, 1995 |
| Pelvis Redundant Y | AJ420 | Endevco | September 15, 1995 |

VEHICLE INSTRUMENT CALIBRATION

| | VEHICLE ACCELEROMETERS | | |
|---|---|---|---|
| | SERIAL NO. | MANUFACTURER | CALIBRATION DATE |
| Moving Barrier CG X | L14-D14 | Entran | October 24, 1995 |
| Moving Barrier CG Y | L18-E07 | Entran | October 23, 1995 |
| Moving Barrier CG Z | C27-B02 | Entran | September 28, 1995 |
| Moving Barrier Rear Axle X | H07-A24 | Entran | September 15, 1995 |
| Moving Barrier Rear Axle Y | C06-G19 | Entran | September 05, 1995 |
| Left Mid A-Post Y | E25-G08 | Entran | June 28, 1995 |
| Left Lower A-Post Y | L14-D03 | Entran | October 23, 1995 |
| Left Mid B-Post Y | L14-D10 | Entran | October 23 1995 |
| Left Lower B-Post Y | L18-G02 | Entran | October 24, 1995 |
| Rear Floorpan Above Axle X | L14-D11 | Entran | October 23, 1995 |
| Rear Floorpan Above Axle Y | D06-A06 | Entran | October 23, 1995 |
| Rear Floorpan Above Axle Z | B02-G02 | Entran | September 29, 1995 |
| Driver Seat Track Y | L14-D15 | Entran | October 23, 1995 |
| Right Side Sill at Front Seat X | C25-A08 | Entran | October 24, 1995 |
| Right Side Sill at Front Seat Y | H07-A14 | Entran | September 15, 1995 |
| Right Side Sill at Front Seat Z | C25-A01 | Entran | October 05, 1995 |
| Right Side Sill at Rear Seat X | L18-G01 | Entran | October 24, 1995 |
| Right Side Sill at Rear Seat Y | E25-G09 | Entran | June 26, 1995 |
| Right Side Sill at Rear Seat Z | E25-G05 | Entran | September 29, 1995 |
| Left Side Sill at Front Seat Y | E24-G06 | Entran | September 29, 1995 |

VEHICLE INSTRUMENT CALIBRATION

| | VEHICLE ACCELEROMETERS | | |
|---|---|---|---|
| | SERIAL NO | MANUFACTURER | CALIBRATION DATE |
| Left Side Sill at Rear Seat Y | L18-E11 | Entran | October 19, 1995 |
| Right Rear Occupant Compartment Y | L15-G20 | Entran | September 29, 1995 |
| Vehicle CG X | E25-G11 | Entran | June 26, 1995 |
| Vehicle CG Y | H16-X11 | Entran | September 21, 1995 |
| Vehicle CG Z | C27-B04 | Entran | September 28, 1995 |

Note:All Endevco accelerometers are Model No. 7264-2000 All Entran accelerometers are Model No. EGE-72