V1781

REPORT NUMBERS: 208-CAL-93-6
212-CAL-93-6
301-CAL-93-6

VEHICLE SAFETY COMPLIANCE TESTING FOR OCCUPANT CRASH PROTECTION, WINDSHIELD MOUNTING, WINDSHIELD ZONE INTRUSION (PARTIAL) AND FUEL SYSTEM INTEGRITY

1993 NISSAN STANZA ALTIMA

NHTSA NUMBER: CP5202

CALSPAN TEST NUMBER: 8056-7

NOVEMBER 12, 1992

CALSPAN CORPORATION
ADVANCED TECHNOLOGY CENTER
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BUFFALO, NEW YORK 14225

FINAL REPORT

PREPARED FOR:

U. S. Department of Transportation
National Highway Traffic Safety Administration
ENFORCEMENT
Office of Vehicle Safety Compliance
400 Seventh Street, S.W.
Room No. 6115 (NEF-30)
Washington, DC 20590

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Final report of FMVSS Nos. 208, 212, 219 (partial), and 301 compliance testing of a 1993 Nissan Stanza Altima 4-door Sedan.	November 12, 1992
	6. Performing Organization Code CAL
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15. Supplementary Notes

16. Abstract

A 30 mph vehicle safety compliance test was conducted on a 1993 Nissan Stanza Altima 4-door sedan.

This test was performed at the Calspan Advanced Technology Center in Buffalo, New York on November 12, 1992. The purpose of this test was to determine compliance with the performance requirements of the following Federal Motor Vehicle Safety Standards:

1. FMVSS No. 208, "Occupant Crash Protection"
2. FMVSS No. 212, "Windshield Mounting"
3. FMVSS No. 219 (partial), "Windshield Zone Intrusion"
4. FMVSS No. 301, "Fuel System Integrity"

The test mode was perpendicular (0°) and the impact velocity was 29.6 mph. The ambient temperature at the impact face was 62°F.

The subject test vehicle appears to comply with the requirements of FMVSS Nos. 208, 212, 219 (partial) and 301.

Type of Restraint System: The test vehicle was equipped a driver side air bag and driver and right front passenger automatic torso seat belts. The manual lap belts were not used for this test.

17. Key Words	18. Distribution Statement
30 mph Vehicle Safety Compliance Testing FMVSS 208, "Occupant Crash Protection" FMVSS 212, "Windshield Mounting" FMVSS 219, "Windshield Zone Intrusion" FMVSS 301, "Fuel System Integrity" Frontal Impact	Copies of this report are available from: Technical Reference Division National Highway Traffic Safety Admin. Nassif Building, Room 5108 (NAD-52) 400 Seventh St., S.W., Washington, DC 20590

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Section 1

PURPOSE AND TEST PROCEDURE

This 30 mph frontal barrier impact test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 208, 212, 219 (partial) and 301 compliance test program conducted for the National Highway Traffic Safety Administration (NHTSA) by Calspan Advanced Technology Center under Contract No. DTNH22-90-C-01003. The purpose of this test was to determine if the subject vehicle, a 1993 Nissan Stanza Altima 4-door sedan, meets the performance requirements of FMVSS 208, "Occupant Crash Protection"; FMVSS No. 212, "Windshield Mounting"; FMVSS No. 219 (partial), "Windshield Zone Intrusion"; and FMVSS No. 301, "Fuel System Integrity". This compliance test was conducted using the requirements found in the OVSC Laboratory Test Procedure No. TP-208-08, dated September 8, 1989.

Section 2

SUMMARY OF TEST NUMBER CP5202

A frontal barrier was impacted by a 1993 Nissan Stanza Altima 4-door Sedan at a velocity of 29.6 mph. The test was performed at the Calspan Corporation Advanced Technology Center on November 12, 1992. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The frontal barrier impact event was documented by one real-time camera and 14 high-speed cameras. Camera locations and other pertinent camera information can be found in this report.

Two Part 572B, 50th percentile male anthropomorphic test devices (ATDs), were placed in the driver and right front passenger seating positions according to dummy placement instructions specified in the OVSC Laboratory Test Procedure.

Both ATDs were fully instrumented with head and chest triaxial accelerometers, and left/right femur load cells. These ATDs had been certified prior to the test.

The 23 channels of data were recorded on two 14-channel FM tape recorders. Appendix B contains the vehicle and dummy response data traces.

The driver's HIC was 516. The maximum chest deceleration over 3 milliseconds was 35.8 g's. The maximum force on the driver's left femur was 1471 pounds and 765 pounds on the right femur.

The right front passenger's HIC was 385. The maximum chest deceleration over 3 milliseconds was 34.7 g's. Loads of 1214 and 946 pounds were recorded on the left and right femurs respectively.

Table 1

CRASH TEST SUMMARY

Vehicle NHTSA No.: CP5202 Test Mode: 30 mph Frontal Barrier

Test Date: November 12, 1992 Time: 11:40 Temperature: 62 °F

Vehicle Make/Model/Body Style: 1992 Nissan Stanza Altima 4-door Sedan

Vehicle Test Weight: 3430 lbs.

Vehicle/Barrier Impact Angle: 0°

Impact Velocity: 29.6 mph

Maximum Static Crush: 17.7 inches

Vehicle Rebound: 23.3 inches

DUMMIES:	DRIVER	PASSENGER
Type:	Part 572B	Part 572B
Restraint System:	Driver air bag and automatic torso belt	Automatic Torso Belt

Number of Data Channels: 23

Number of Cameras: 1 Real Time

14 High Speed

DOOR OPENING DATA: Closed-operable - Left Front

Closed-operable - Right Front

Front Seat(s) Data:	DRIVER	PASSENGER
Seat Track Failure:	0.0 inches of shift	0.0
Seat Back Failure:	None	None

VISIBLE DUMMY CONTACT POINTS:	DRIVER	PASSENGER
Head:	Top center of air bag	Chin with chest
Abdomen:	Air bag	-
Chest:	Air bag	-
Knees:	Lower dash	Glove box door

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1993 Nissan Stanza Altima 4-door

NHTSA No.: CP5202 ; VIN: 1N4BU31F8PC110293 ; Color: Ruby Pearl

Engine Data: 4 cylinders; - CID; 2.4 Liters; - cc

Placement: - Longitudinal or In-Line; Yes Transverse or Lateral

Transmission Data: 4 speeds; - Manual; Yes Automatic; Yes Overdrive

Final Drive: - Rear Wheel Drive; Yes Front Wheel Drive; - Four Wheel Drive

Major Options: Yes A/C; Yes Pwr.Strg.; Yes Pwr.Brakes

Yes Pwr.Windows; Yes Pwr.Door Locks; Yes Tilt Wheel

Date Received: 9/24/92 ; Odometer Reading 30 miles

Selling Dealer: Southtowns Nissan, Inc.

& Address 3580 Southwestern Blvd., Orchard Park, NY 14127

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Nissan Motor Co LTD

Date of Manufacture: 9/92

GVWR: 4047 lbs.; GAWR: 2770 lbs. FRONT; 1862 lbs. REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load: 29 psi FRONT

29 psi REAR

Recommended Tire Size: P205/60R15(90H)

* Recommended Cold Tire Pressure: 29 psi FRONT; 29 psi REAR

Size of Tires on Test Vehicle: P205/60R15(90H) ; Manufacturer: Goodyear

Vehicle Capacity Data:

Type of Front Seats: - Bench; Yes Bucket; - Split Bench

Number of Occupants: 2 Front; 3 Rear; 5 Total

Vehicle Capacity Weight (VCW) = 900 lbs.

No. of Occupants x 150 lbs. = 750 lbs.

Rated Cargo/Luggage Weight (RCLW) = 150 lbs. (Difference)

*Tire pressure used for test

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS) = UDW:

Right Front = 940 lbs. Right Rear = 550 lbs.

Left Front = 940 lbs. Left Rear = 540 lbs.

TOTAL FRONT = 1880 lbs. TOTAL REAR = 1090 lbs.

% of Total Vehicle Weight = 63.3 % of Total Weight = 36.7 %

TOTAL DELIVERED WEIGHT = 2970 lbs.

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight = 2970 lbs.

Rated Cargo/Luggage Weight (RCLW) = 150 lbs.

Weight of 2 P.572 Dummies @ 164 ea. = 328 lbs.

TARGET TEST WEIGHT = 3448 lbs. (sum)

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 132 POUNDS OF CARGO WEIGHT:

Right Front = 1050 lbs. Right Rear = 680 lbs.

Left Front = 990 lbs. Left Rear = 710 lbs.

TOTAL FRONT = 2040 lbs. TOTAL REAR = 1390 lbs.

% of Total Weight = 59.5 % % of Total Weight = 40.5 %

TOTAL TEST WEIGHT = 3430 lbs.

Weight of Ballast Secured in Vehicle Trunk Area = 0 lbs.

Vehicle Components Removed for Weight Reduction: None

VEHICLE ATTITUDE (all dimensions in inches):

AS DELIVERED:	RF	27.6"	LF	27.4"	RR	27.2"	LR 27.3"
FULLY LOADED:	RF	26.2"	LF	25.6"	RR	24.2"	LR 24.4"
AS TESTED:	RF	27.4"	LF	27.3"	RR	26.3"	LR 26.3"

Vehicle's Wheel Base: 103.2 in.

Location of Vehicle's C.G.: 41.8 inches rearward of first wheel center

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 15-7/8 gallons

Usable Capacity Figure Furnished by COTR = 15.3 gallons

Test Volume Range (92 to 94% of Usable Capacity) = 14.1 to 14.4 gallons

ACTUAL TEST VOLUME = 14.2 gallons (with entire fuel system filled)

Table 3

POST IMPACT DATA

TYPE OF TEST:

Type of Test: Frontal Barrier Impact Angle: 0°

Test Date: November 12, 1992 Time: 11:40 Temperature: 62 °F

Vehicle NHTSA No.: CP5202

Required Impact Velocity Range: 28.9 to 29.9 mph

BARRIER IMPACT VELOCITY: (Speed traps within 5 feet of impact plane.)

Trap No. 1 = 29.6 mph; Trap No. 2 = 29.6 mph

Distance from vehicle to barrier: (1) entering trap = 52 inches

(2) exiting trap = 12 inches

VEHICLE STATIC CRUSH: (For frontal and rear impacts only.)

Vehicle Length:

Pre-Test	Right = 176.8 ;	C/L = 180.7 ;	Left = 177.1
Post-Test	Right = 161.6 ;	C/L = 163.0 ;	Left = 161.6
Crush	Right = 15.2 ;	C/L = 17.7 ;	Left = 15.5

AVERAGE = 16.1 inches

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:

Right = 22.7 ; C/L = 22.3 ; Left = 25.0

AVERAGE = 23.3 inches

DOOR OPENING:	Left	Right
Front	Closed	Closed
Rear	Closed	Closed

SEAT MOVEMENT:	Seat Back Failure	Seat Shift
Front	None	0.0
Rear	N/A	N/A

Table 3

POST IMPACT DATA (cont.)

GLAZING DAMAGE: None

OTHER NOTABLE IMPACT FEATURES: None

Section 3

OCCUPANT AND VEHICLE DATA

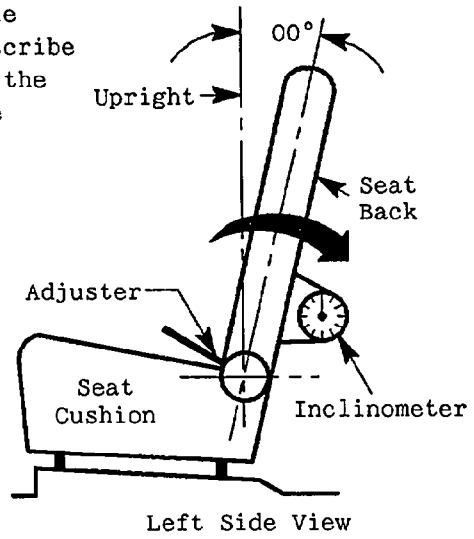
Figure 1

TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year: 1993 Vehicle Model: Nissan Stanza Altima Body Style: 4-door Sedan

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



Left Side View

Seat back angle for driver's seat: 23

Measurement instructions: Seat back placed in 7th notch rearward of full upright. Full upright is position zero.

Seat back angle for passenger's seat: 23

Measurement instructions: Same as driver

2. Seat Fore and Aft Positioning

Provide instructions for positioning the driver and front outboard passenger seat(s) in the center of fore and aft travel. For example, provide information to locate the detent in which the seat track is to be locked.

Positioning of the driver's seat: Seat was placed in 10th locking position. Full forward position is identified as zero.

Positioning of the passenger's seat (if applicable): Same as driver

3. Fuel Tank Capacity Data

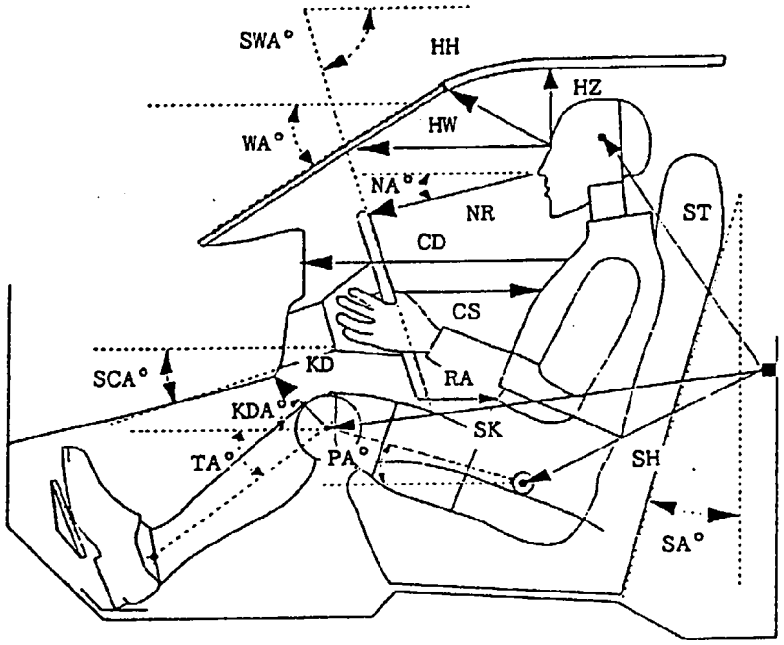
A. "Usable Capacity" of the standard equipment fuel tank is 15.3 gallons

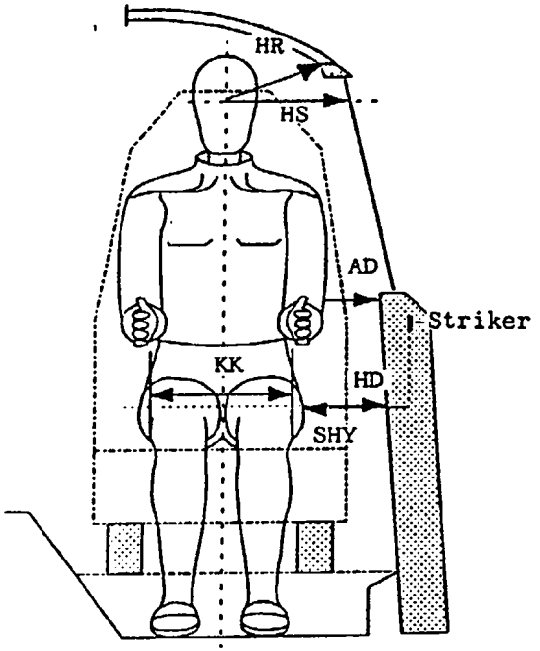
B. "Usable Capacity" of the optional equipment fuel tank is - gallons

Additional Instructions: None

Figure 2

PART 572 DUMMY IN-VEHICLE POSITION



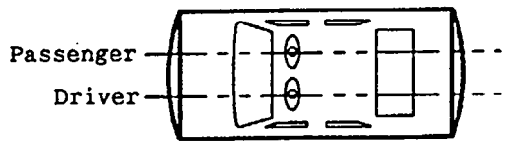


HH - Head to Header
HW - Head to Windshield
HZ - Head to Roof
NR - Nose to Rim
CS - Steering Wheel to Chest
CD - Chest to Dash
RA - Rime to Abdomen
KDL/KDR - Knee to Dash
KDA - Knee to Dash Angle
SH - Striker to H-Point

SK - Striker to Knee
ST - Striker to Head
NA - Nose to Rim Angle
TA - Tibial Angle
PA - Pelvic Angle
SA - Seat Back Angle
SCA - Steering Column Angle
SWA - Steering Wheel Angle
WA - Windshield Angle

HR - Head to Side Header
HS - Head to Side Window
AD - Arm to Door
HD - H-Point to Door
SHY - Striker to H-Point (Y Dir.)
KK - Knee to Knee

Vertical Longitudinal Planes



Vertical Transverse Plane

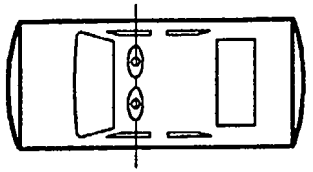


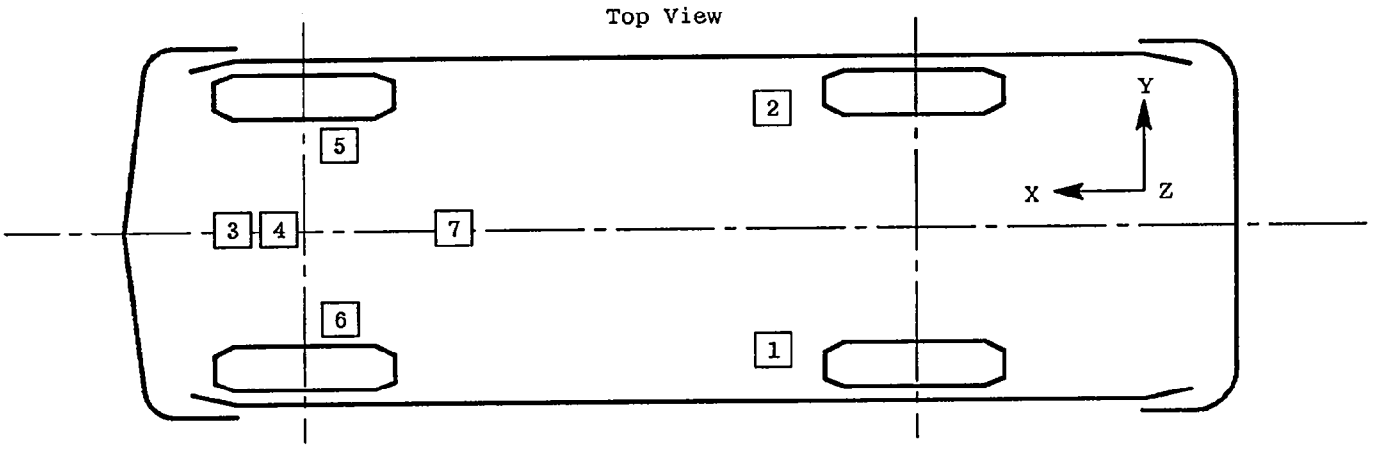
Table 4

FRONT SEAT OCCUPANT MEASUREMENTS

	DRIVER (Serial #1020)	PASS (Serial #1021)
WA°	28°	-
SWA°	65.5°	-
SCA°	24.5°	-
SA°	Seats were positioned at 7th notch rearward as specified by Manufacturer	Same as driver
HZ	5.6	5.7
HH	15.7	15.2
HW	20.7	21.8
HR	6.1	4.8 (to roof handle)
NR	20.9 Angle (NA) 17°	-
CD	24.0	25.7
CS	13.5	-
RA	7.9	-
KDL	8.5 Angle (KDA) 33°	8.1
KDR	9.4	8.4 Angle (KDA) 38°
PA°	11°	12°
TA°	29°	30°
KK	14.3	11.8
ST	21.6 Angle -2°	21.6 Angle -3°
SK	22.4 Angle 99°	21.9 Angle 99°
SH	8.2 Angle 134°	7.5 Angle 133°
SHY	8.3	8.8
HS	11.0	10.8
HD	4.6	5.0
AD	3.8	4.2

Figure 3

VEHICLE ACCELEROMETER LOCATIONS



ACCELEROMETER NUMBER*	ACCELEROMETER LOCATION	DIRECTION		
		X	Y	Z
1	Left Rear Seat Crossmember	X		
2	Right Rear Seat Crossmember	X		
3	Top of Engine	X		
4	Bottom of Engine	X		
5	Right Disc Brake Caliper	X		
6	Left Disc Brake Caliper	X		
7	Instrument Panel	X		

*The accelerometer pack number can be correlated with the vehicle response data traces found in Appendix B.

Table 5

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

NO.	LOCATION		X*	Y*	Z*	POSITIVE DIRECTION** MAX (g)	POSITIVE DIRECTION** TIME (msec)	NEGATIVE DIRECTION** MAX (g)	NEGATIVE DIRECTION** TIME (msec)
1	REAR SEAT X-MEMBER AT LEFT SIDE	PRE:	70.0	24.4	15.3				
		POST:	70.0	24.4	15.2				
	LONGITUDINAL ACCELERATION					2	181	-43	39
2	REAR SEAT X-MEMBER AT RIGHT SIDE	PRE:	68.6	-24.4	15.2				
		POST:	68.6	-24.4	15.0				
	LONGITUDINAL ACCELERATION					5	191	-39	40
3	TOP OF ENGINE BLOCK	PRE:	154.2	0.0	31.9				
		POST:	147.3	0.0	30.9				
	LONGITUDINAL ACCELERATION					25	39	-88	29
4	BOTTOM OF ENGINE	PRE:	148.7	-11.0	9.2				
		POST:	142.5	-11.0	7.4				
	LONGITUDINAL ACCELERATION					–	–	-100	24
5	BRAKE CALIPER AT RIGHT SIDE	PRE:	142.1	-22.0	20.5				
		POST:	139.1	-22.0	20.5				
	LONGITUDINAL ACCELERATION					31	63	-104	45
6	BRAKE CALIPER AT LEFT SIDE	PRE:	142.3	22.0	20.0				
		POST:	140.5	22.0	20.0				
	LONGITUDINAL ACCELERATION					20	72	-122	43
7	DASH PANEL	PRE:	114.9	-2.0	28.1				
		POST:	114.9	-2.0	27.8				
	LONGITUDINAL ACCELERATION					5	131	-58	47

		**	POSITIVE	NEGATIVE
*X	+ Forward from rear bumper	LONGITUDINAL:	FORWARD	REARWARD
Y	+ Left from vehicle centerline	LATERAL:	LEFTWARD	RIGHTWARD
Z	+ Up from ground	VERTICAL:	UPWARD	DOWNWARD

DISTANCE MEASUREMENTS IN INCHES

Figure 4

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 5.

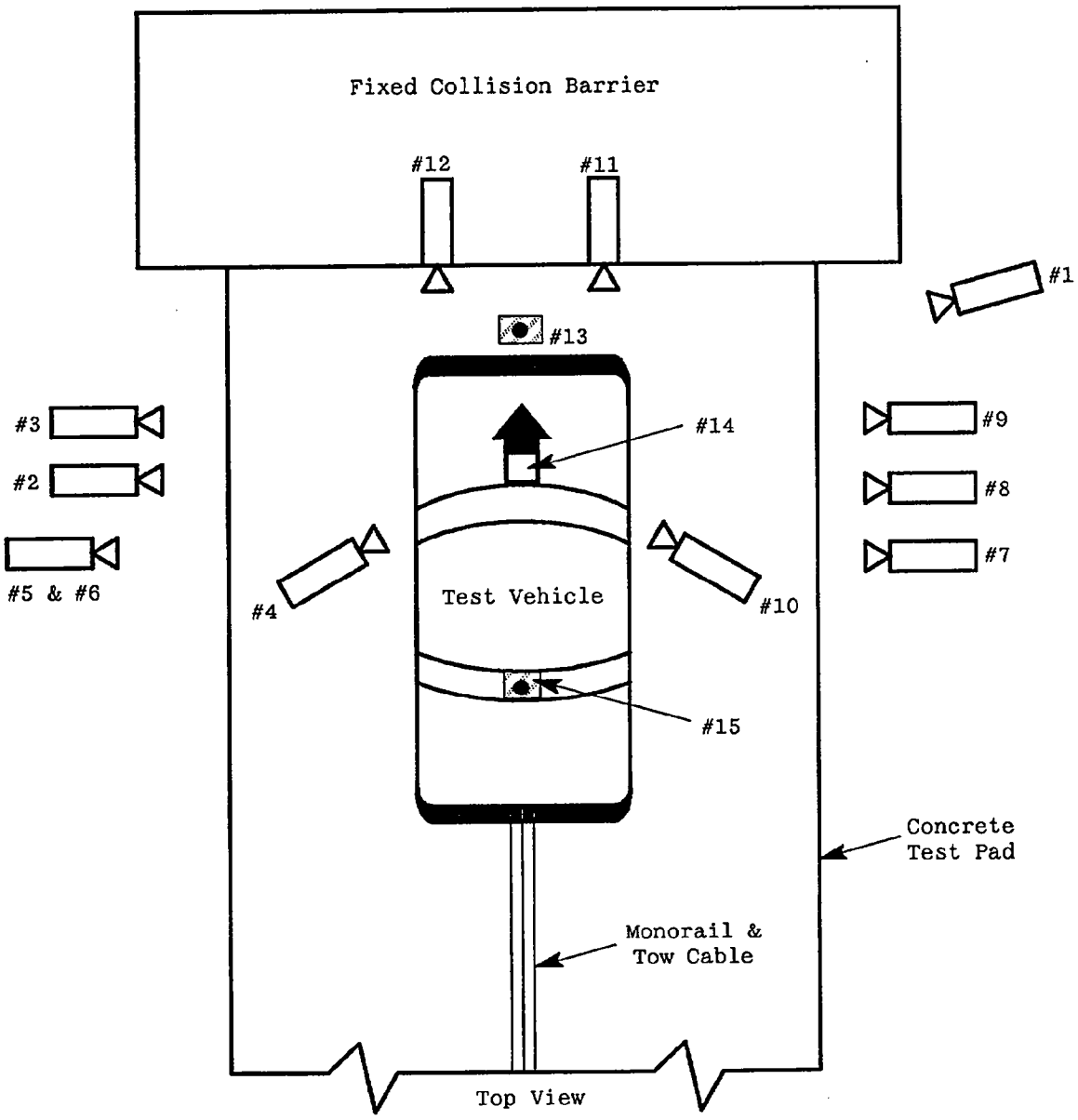


Table 6

HIGH-SPEED CAMERA LOCATIONS

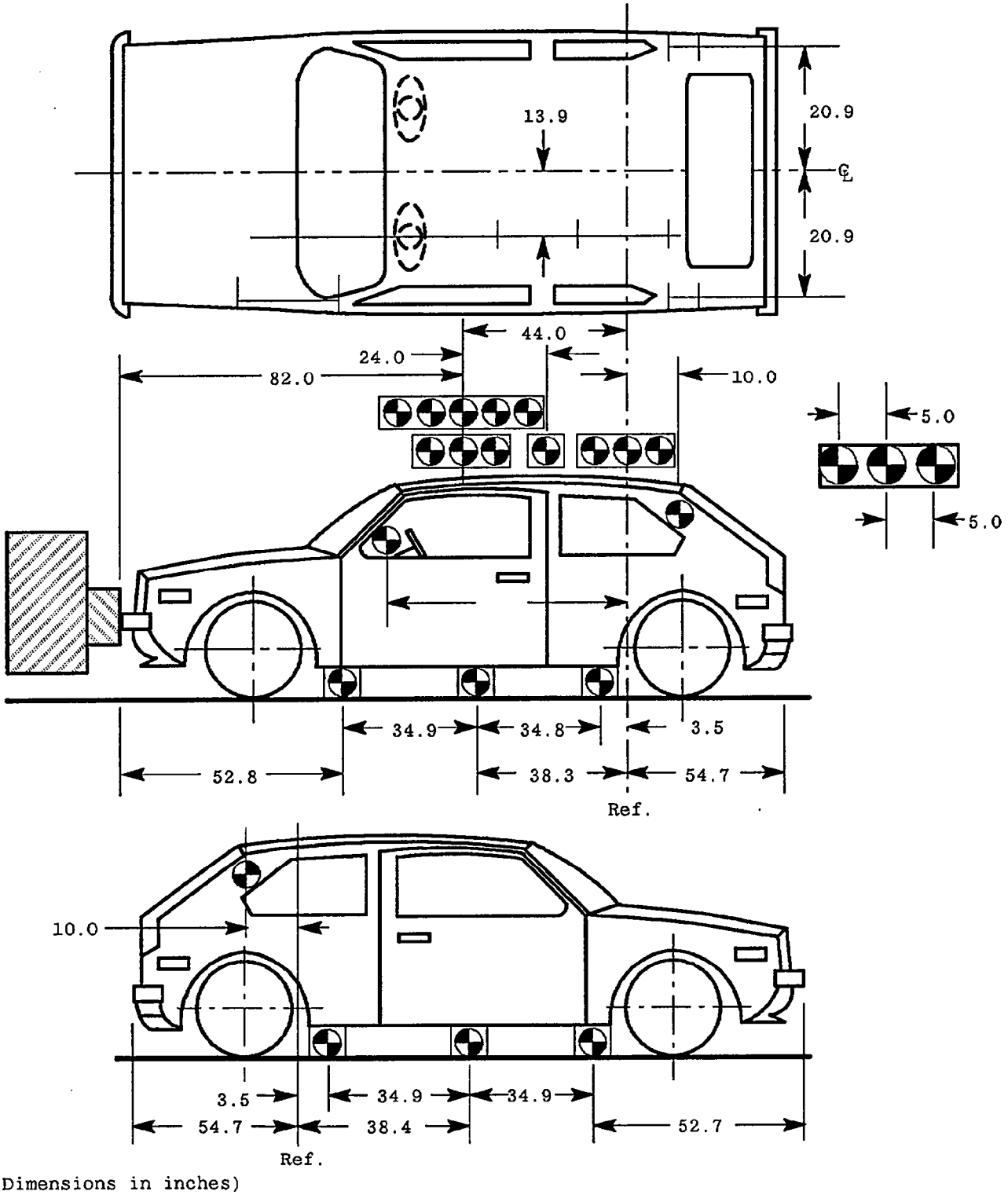
Test No. CP5202 Vehicle: 1993 Nissan Stanza Altima 4-Door Sedan

CAMERA NO.	VIEW	CAMERA POSITIONS (in)*			ANGLE** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Camera	-	-	-	-	-	-	24
2	Overall Left Side	243	69	41	-4	226.1	13	550
3	Left Side View	310	49	41	-3	293.1	25	610
4	Driver and Interior View	109	109	67	-18	-	13	570
5	Steering Column (Bottom)	270	82	46	-4	253.1	25	585
6	Steering Column (Top)	270	82	70	-8	253.1	25	575
7	Overall Right Side	239	78	42	-3	222.1	13	550
8	Right Side View	293	57	41	-2	276.1	25	570
9	Right Passenger View	297	73	56	-4	280.1	35	550
10	Passenger and Interior View	106	109	67	-20	-	13	575
11	Passenger Front View	23	20	75	-48	-	13	615
12	Driver Front View	22	20	75	-43	-	13	600
13	Windshield View	0	0	126	-59	-	13	600
14	Pit View of Engine	0	28	78	90	-	13	670
15	Pit View of Fuel Tank	0	101	76	90	-	13	850

*X = film plane to monorail centerline
Y = film plane to impact location
Z = film plane to ground
** = referenced to horizontal plane

Figure 5

VEHICLE TARGET LOCATIONS



(Dimensions in inches)

Figure 6

TEST VEHICLE MEASUREMENTS

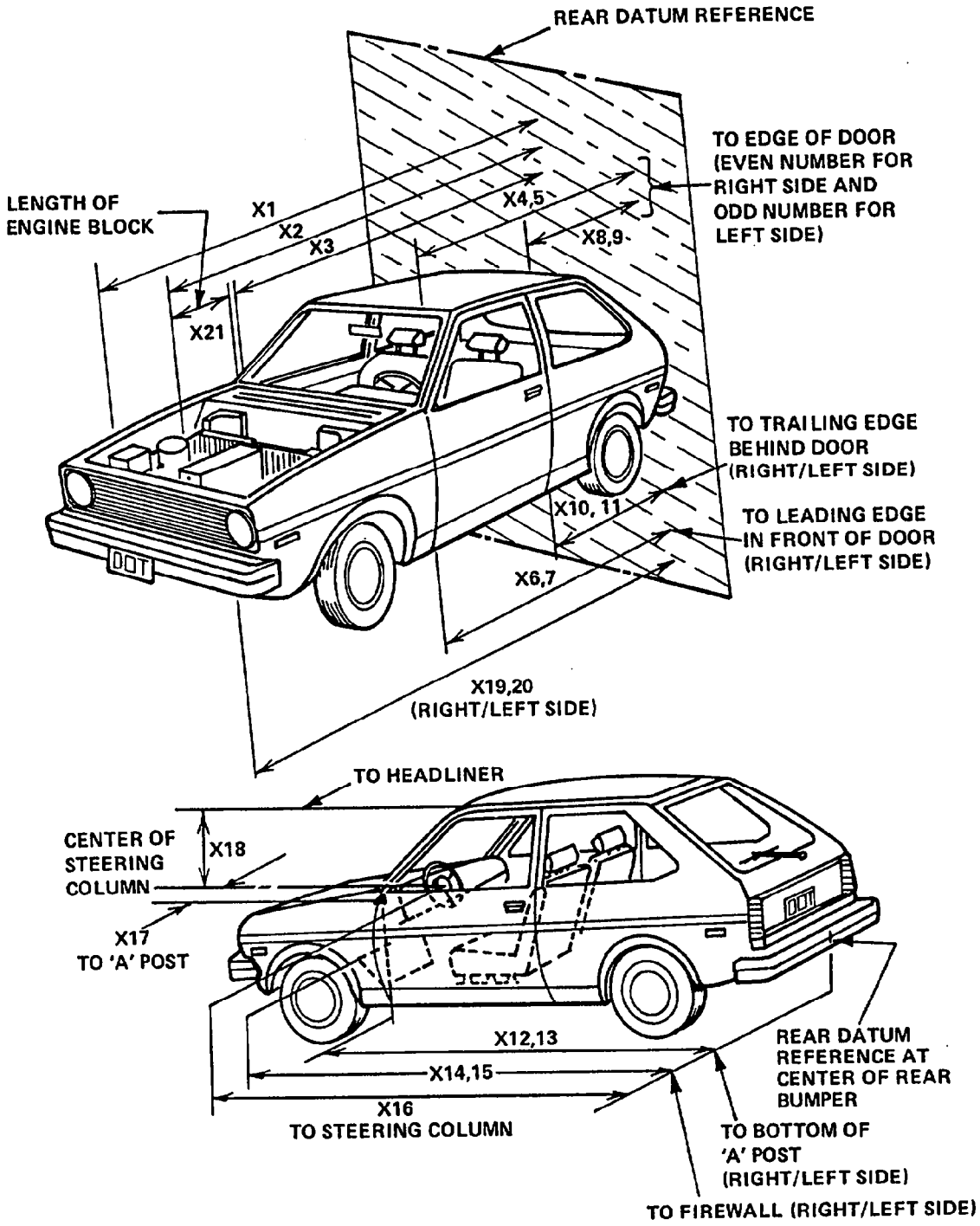


Table 7

VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	180.7	163.0	17.7
X2	Rear Surface of Vehicle to Front of Engine	157.2	150.0	7.2
X3	Rear Surface of Vehicle to Firewall	138.1	136.8	1.3
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	124.3	123.6	0.7
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	124.5	124.0	0.5
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	123.8	124.2	-0.4
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	124.0	124.6	-0.6
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	82.8	82.5	0.3
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	83.4	82.9	0.5
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	82.0	81.9	0.1
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	82.5	82.5	0.0
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	124.4	124.0	0.4
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	125.2	124.9	0.3
X14	Rear Surface of Vehicle to Firewall, Right Side	138.0	136.0	2.0
X15	Rear Surface of Vehicle to Firewall, Left Side	136.2	133.5	2.7
X16	Rear Surface of Vehicle to Steering Column	107.3	107.3	0.0
X17	Center of Steering Column to "A" Post	15.3	14.8	0.5
X18	Center of Steering Column to Headliner	17.4	16.4	1.0
X19	Rear Surface of Vehicle to Right Side of Front Bumper	176.8	161.6	15.2
X20	Rear Surface of Vehicle to Left Side of Front Bumper	177.1	161.6	15.5
X21	Length of Engine Block	14.3	14.3	0.0

Section 4

SUMMARY OF RESULTS OF FMVSS NOS. 208, 212, 219 AND 301-75

- "Occupant Crash Protection," FMVSS No. 208 Data
- "Windshield Mounting," FMVSS No. 212 Data
- "Windshield Zone Intrusion," FMVSS No. 219 (Partial) Data
- "Fuel System Integrity," FMVSS No. 301-75

Table 8

DUMMY INJURY CRITERIA VALUES

NHTSA No.: CP5202 Vehicle: 1993 Nissan Stanza Altima 4-door Sedan

	MAXIMUM ACCELERATION (g's)								
	HEAD				CHEST				
	X	Y	Z	R	X	Y	Z	R*	Displace-ment
Dummy (1)	-42	-10	56	64	-36	-12	-11	35.8	N/A
Dummy (2)	-20	24	42	44	-36	17	-9	34.7	N/A

	MAXIMUM FORCE - FEMUR LOAD (lbs.)	
	LEFT FEMUR	RIGHT FEMUR
Dummy (1)	1471	765
Dummy (2)	1214	946

	HEAD INJURY CRITERIA**			
		36 millisecond Maximum		Avg. Acc. (g)
	HIC	t_1 (msec)	t_2 (msec)	t_1 TO t_2
Dummy (1)	515.69	63.720	96.840	47.52
Dummy (2)	384.99	67.080	102.960	40.95

* Defined as exceeding 0.003 sec. duration
**As defined in FMVSS No. 208

Table 9

FMVSS NO. 208 – SEAT BELT WARNING SYSTEM CHECK

With occupant in driver's position, the lap belt in stowed position, and ignition switch placed in "Start/On" position:

Log time duration of audible warning signal = 6 sec.

Log time duration of reminder light operation = 6 sec.

With occupant in driver's position, lap belt in use, and the ignition switch placed in "Start/On" position:

Log time duration of audible warning signal = 0 sec.
(audible warning should not operate)

Log time duration of reminder light operation = 6 sec.

Note wording of visual warning:

Fasten Seat Belt –

Fasten Belt –

Symbol 101-80 X

Table 10

FMVSS NO. 208 – LABELING AND DRIVER'S MANUAL INFORMATION

Locate label which describes manufacturers maintenance or replacement schedule for crash-deployed occupant protection system.

Describe location:

Driver side sun visor

The manufacturers recommended maintenance schedule is to service this system:

after a time interval of 10 years after date of manufacture as noted on the certification label.

Also, the system must be serviced if any of the following conditions occur: the 'Air bag' lamp does not go on, flashes intermittently or remains on.

Were appropriate instructions concerning maintenance and/or replacement of this system provided?

YES X NO –

Was a description of the functional operation of the system provided?

YES X NO –

Is there a reference to the instructions and description of the system on the label?

YES X NO –

Was an owner's manual provided? YES X NO –

Did the owner's manual contain appropriate information concerning maintenance and/or replacement and a description of the functional operation of the systems?

YES X NO –

Table 11

FMVSS NO. 208 - READINESS INDICATOR

An occupant restraint system that deploys in the event of a crash shall have a monitoring system with a readiness indicator. A totally mechanical system is exempt from this requirement.

Is the system totally mechanical? YES __-__ NO __X__

Describe the location of the readiness indicator:

Lower center of tachometer

Is the readiness indicator clearly visible to the driver?

YES __X__ NO __-__

Is a list of the elements in the occupant restraint system, being monitored by the readiness indicator, provided?

YES __X__ NO __-__

Table 12

FMVSS NO. 208 - COMFORT AND CONVENIENCE TEST SUMMARY

Test Vehicle NHTSA No.:	CP5202
Make/Model:	1993 Nissan Altima 4-door Sedan
Date of Comfort/Convenience Check:	11/11/92
Technician Performing Check:	D.J.T.
GVWR:	4047 lbs.

Seat belt comfort and convenience requirements cover vehicles manufactured on or after September 1, 1986, which have a gross vehicle weight rating of 10,000 pounds or less. Exemptions to this rule are belts installed in a walk-in, van-type vehicle and manual Type 2 belt systems installed in the front outboard seating positions of passenger automobiles. On or after September 1, 1989, the exemption of the type 2 manual seat belts installed in the front outboard seating positions of passenger automobiles will change depending on the states' enactment of mandatory usage laws.

Was vehicle built after or on September 1, 1986, and is it equipped with:

1. Automatic seat belts YES X NO -

If yes, go to requirements D1, D2 and D3

2. Manual seat belts* YES - NO X

   a. The seat belts, other than Type 2 lap/shoulder belts, are located in the front outboard seating positions of a passenger automobile.

   YES X NO -

   (Go to requirements D3, D4, D5, and D6)

   b. The seat belt system is Type 2 lap/shoulder belt in the front outboard seating positions or the seat belts are located in a walk-in van.

STOP

*If the seat belts are voluntarily installed by the manufacturer they do not have to comply.

Table 12 (cont.)

D1

CONVENIENCE HOOKS

A convenience hook or other device is provided to stow seat belt webbing to facilitate entering or exiting the vehicle.

YES ___-___ NO ___X___

Check the option which applies to this test vehicle:

1. A convenience hook or other device automatically releases the webbing when the automatic belt system is operational and remains in the released mode as long as the vehicle's ignition switch is moved to the "on" or "start" position and the vehicle's drivetrain is engaged.

   YES ___N/A___ NO ___N/A___

2. A convenience hook or other device automatically releases the webbing when the automatic belt system is operational and remains in the released mode as long as the vehicle's ignition switch is moved to the "on" or "start" position and the vehicle's parking brake is in the released mode (nonengaged).

   YES ___N/A___ NO ___N/A___

D2

WEBBING TENSION - RELIEVING DEVICE

The seat belt assembly installed in the outboard designated seating position has either manual or automatic tension relieving devices permitting the introduction of slack in the webbing of the shoulder belt ("comfort clips" or "window shade" devices).

YES ___-___ NO ___X___

Check the owner's manual and determine the maximum amount of slack recommended by the manufacturer in inches. The recommended slack is ___-___ inches. Introduce this slack into the shoulder belt before testing the vehicle to comply with the requirements of FMVSS 208 S5.1. A warning is included in the owner's manual that introducing slack beyond the amount specified can significantly reduce the effectiveness of the shoulder belt.

YES ___N/A___ NO ___N/A___

(If NO, provide explanation.)

Check the option which applies to this test vehicle:

1. This vehicle is equipped with automatic seat belts and the tension relieving device is cancelled each time the adjacent door is opened.

   YES ___N/A___ NO ___N/A___

(If NO, provide explanation.)

Table 12 (cont.)

2. This vehicle is equipped with manual belts, required to meet FMVSS 208 S4.6, and the tension relieving device is cancelled each time one of the following options occurs:

   a. The adjacent door is opened. YES N/A NO N/A

   b. The latch plate is released from the buckle. YES N/A NO N/A

3. This is an open-body vehicle, without doors. Does the manual mean to cancel any shoulder belt slack introduced by a tension relieving device to operate properly?

   YES N/A NO N/A

(If NO, provide explanation.)

D3

BELT CONTACT FORCE

1. Do not measure the belt contact force if the manual or automatic seat belt assemblies in this vehicle incorporate a webbing tension relieving device. Does the vehicle incorporate a tension relieving device?

   YES - NO X

2. Seats are adjusted according to instructions in Appendix B.

   YES X NO -

3. The test dummies are positioned according to dummy position placement instructions in Appendix B and Appendix C.

   YES X NO -

4. Close the vehicle's adjacent door, pull either 12 inches of belt webbing or the maximum available amount of belt webbing, whichever is less, from the retractor and then release it, allowing the belt webbing to return to the dummy's chest, then fasten the latch. Locate the point where the centerline of the upper torso belt webbing crosses the midsagittal line on the dummy's chest. At that point, pull the belt webbing out 3 inches from the dummy's chest and release until it is within one inch from the dummy's chest. Measure the contact force exerted by the belt webbing on the dummy's chest. The contact force is 0.3 pounds. Contact the COTR if the contact force exceeds 0.7 pounds.

Table 12 (cont.)

D4

LATCHPLATE ACCESSIBILITY

1. Position the test dummy in the driver's seat or passenger's seat in its forward most adjustment position.

YES ___X___ NO ___-___

2. Attach the inboard and outboard reach string. YES ___X___ NO ___-___

3. Extend each line backward and outboard to generate arcs of the reach envelope of the test dummy's arms. With the latchplate in the normal stowed position, check to assure that the latchplates are within the reach envelope.

YES ___X___ NO ___-___

4. Using the clearance test block, determine if there is sufficient clearance between the vehicle seat and the side of vehicle interior to allow the test block to move unhindered to the latchplate or buckle.

YES ___X___ NO ___-___

D5

RETRACTION

1. Seats and seat backs are adjusted according to instructions in Appendix B "General Test Conditions" in TP-208-8.

YES ___X___ NO ___-___

2. Use anthropomorphic test dummies whose arms have been removed and position the dummies in the front outboard designated seating positions according to instructions in Appendix B and restrain the dummies, using the belt systems for the positions being tested.

YES ___X___ NO ___-___

3. Outboard armrests which are capable of being stowed on vehicle seats shall be placed in their stowed positions.

YES ___X___ NO ___-___

4. Check the option which applies to this test vehicle:

   a. The torso and lap belt webbing of the seat belt system automatically retract to a stowed position when the adjacent vehicle door is in an open position and the seat belt latch plate is released.

YES ___X___ NO ___-___

Table 12 (cont.)

b. The torso and lap belt webbing of the seat belt system automatically retract when the seat belt latch plate is released.

YES ___X___ NO ___-___

5. With the webbing and hardware in the stowed position, close the door to assure that the webbing and hardware are prevented from being pinched.-

YES ___X___ NO ___-___

6. If this test vehicle has an open body (without doors) and has a belt system with a tension-relieving device, check to assure that the belt system fully retracts when the tension-relief device is manually deactivated.

YES ___N/A___ NO ___N/A___

D6

ACCESSIBILITY

The requirements for accessibility do not apply to:

1. Seats whose seat cushions are removable so that the seat back serves a function other than seating;

2. Seats which are removable;

3. Seats which are movable so that the space formerly occupied by the seat can be used for a secondary function.

If the seats in this vehicle are different than the criteria above, then determine if:

1. Each manual seat belt assembly whose webbing is designed to pass through the seat cushion or between the seat cushion and seat back has one of the following three parts (the seat belt latchplate, the buckle, or the seat belt webbing) on top of or above the seat cushion under normal conditions (i.e., conditions other than when belt hardware is intentionally pushed behind the seat by a vehicle occupant).

YES ___X___ NO ___-___

2. The remaining two seat belt parts are accessible under normal conditions.

YES ___X___ NO ___-___

Table 12 (cont.)

3. The buckle and latchplate pass through the guides or conduits provided and do not fall behind the seat when the following events occur in order:

   a. The belt is completely retracted or, if the belt is nonretractable, the belt is unattached.

   YES X NO -

   b. The seat is moved to any position to which it is designed to be adjusted.

   YES X NO -

   c. The seat back, if foldable, is folded forward as far as possible and then moved backward into positions.

   YES X NO -

4. Is the inboard receptacle end of the seat belt assembly which is installed in the outboard designated seating position accessible with the center arm rest in any position to which it can be adjusted without moving the armrest?

   YES X NO -

D7

LATCH MECHANISM

A seat belt assembly installed in a passenger car, except an automatic belt assembly, shall have a latch mechanism: Automatic belt used

1. Whose components are accessible to a seated occupant in both the stowed and operational positions.

   YES N/A NO N/A

2. That releases both the upper torso restraint and the lap belt simultaneously, if the assembly has a lap belt and an upper torso restraint that require unlatching for release of the occupant.

   YES N/A NO N/A

3. That releases at a single point by a push button action.

   YES N/A NO N/A

Figure 7

FMVSS NO. 212 – "WINDSHIELD MOUNTING" DATA SHEET

DETAILS OF WINDSHIELD MOUNTING SUCH AS RETENTION METHOD, TRIM TYPE, ETC.:

Windshield is bonded in place with 0.7 inch wide rubber trim along the top, and 1.0 inch wide trim along the sides. Lower portion of windshield is covered by a plastic shroud.

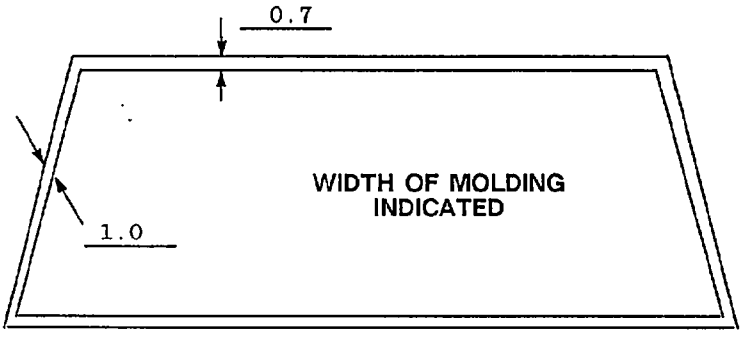
FMVSS 212 REQUIREMENTS:

The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of windshield for vehicles equipped with automatic restraint systems for front occupants.

FMVSS 212 TEST DATA:

	WINDSHIELD PERIPHERY		
	PRE-TEST (in.)	POST-TEST (in.)	PERCENT RETENTION
RIGHT SIDE	84.2	84.2	100
LEFT SIDE	84.2	84.2	100
TOTAL	168.4	168.4	100

AREA OF RETENTION FAILURE:



FRONT VIEW

FAILURE DETAILS:

None

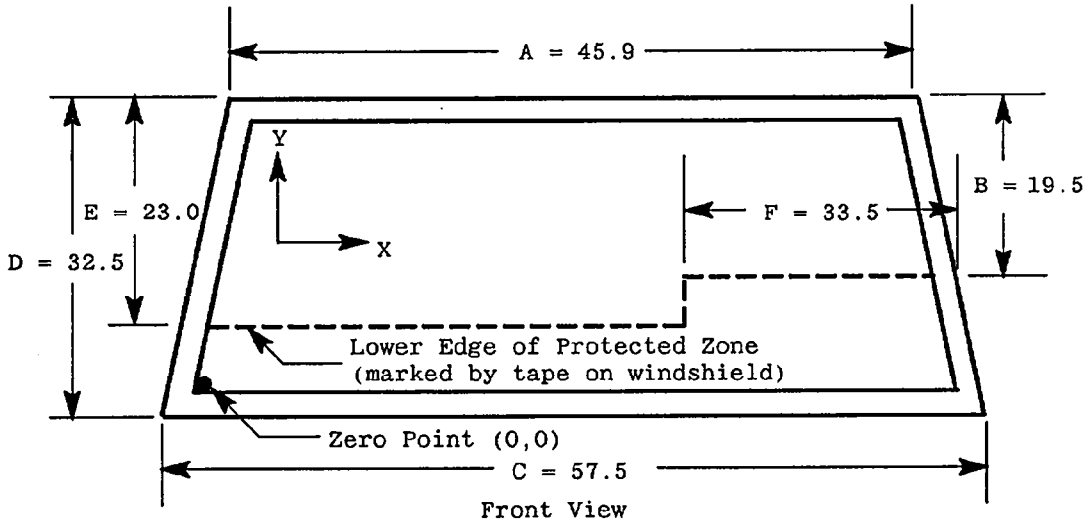
Figure 8

FMVSS NO. 219 (PARTIAL) – "WINDSHIELD ZONE INTRUSION" DATA SHEET

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 6.5" dia. rigid sphere weighing 15 pounds in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. The locus of points is drawn on the inner surface of the windshield contacted by the sphere across the width of the instrument panel. From the outermost contactable points, extend the locus line horizontally to the edges of the windshield, and then draw a line on the inner surface of the windshield below and 1/2" distant from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection of this line onto the outer surface of the windshield.

FMVSS 219 TEST DATA: (Dimensions in inches.)



DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 1/4":

(Show location of penetration on above sketch)

None

	COORDINATES	
	X	Y
1.		
2.		
3.		
4.		

Table 13

FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

FMVSS NO. 301

TEST VEHICLE NHTSA NO.: | C | P | 5 | 2 | 0 | 2 | TEST DATE: November 12, 1992

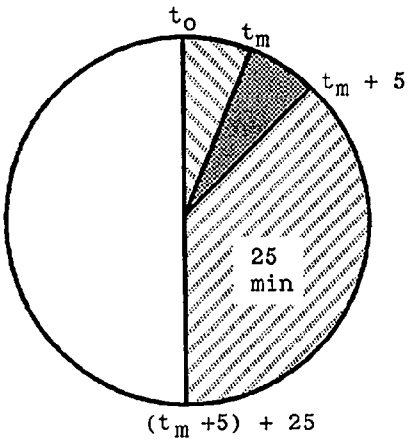
Vehicle Mfgr./Make/Model: 1993 Nissan Stanza Altima 4-door Sedan

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

TEST VEHICLE IMPACT TYPE:

- X Frontal (30 mph)
- – Oblique (30 mph) with – ° barrier face first contacting _____ (driver/passenger) side
- – Rear Moving Barrier (30 mph)
- – Lateral Moving Barrier (20 mph)

FUEL SPILLAGE MEASUREMENT:



	ACTUAL	MAX ALLOWED
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.

SOLVENT SPILLAGE DETAILS:

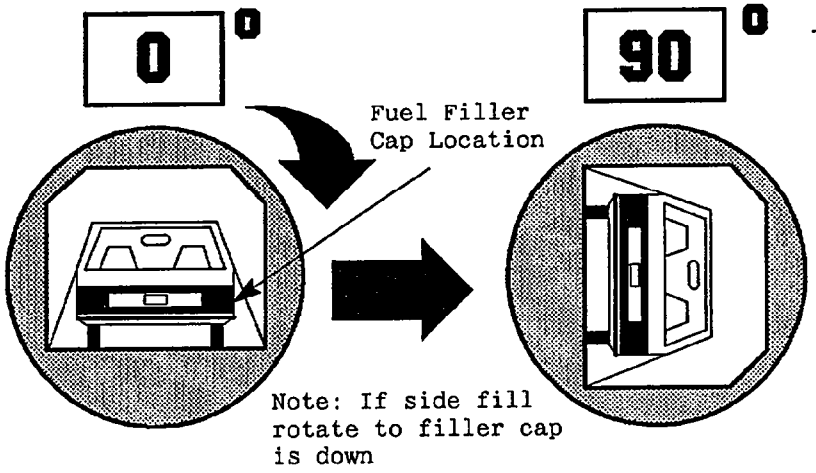
None

Table 14

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:

Vehicle NHTSA ID No.: CP5202



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	2 minutes	10 seconds
FMVSS 301 Position Hold Time +	5 minutes	0 seconds
TOTAL	7 minutes	10 seconds
Next whole minute interval	8 minutes	

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0

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

IV. SOLVENT SPILLAGE LOCATION(S):

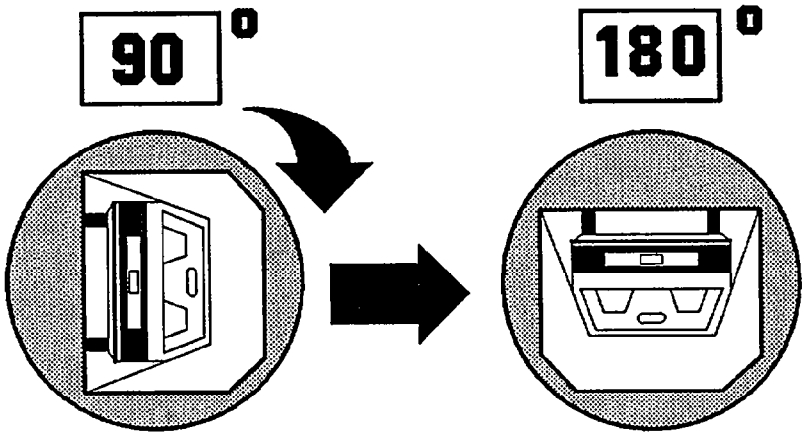
None

Table 13

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

TEST PHASE:

Vehicle NHTSA ID No.: CP5202



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	1	minutes	58	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	6	minutes	58	seconds
Next whole minute interval	7	minutes		

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	N/A

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

IV. SOLVENT SPILLAGE LOCATION(S):

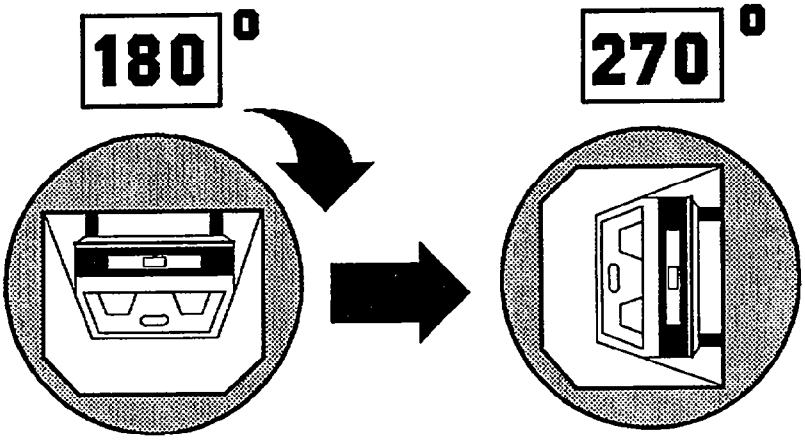
None

Table 13

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

TEST PHASE:

Vehicle NHTSA ID No.: CP5202



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	1 minutes	45 seconds
FMVSS 301 Position Hold Time +	5 minutes	00 seconds
TOTAL	6 minutes	45 seconds
Next whole minute interval	7 minutes	

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	N/A

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

IV. SOLVENT SPILLAGE LOCATION(S):

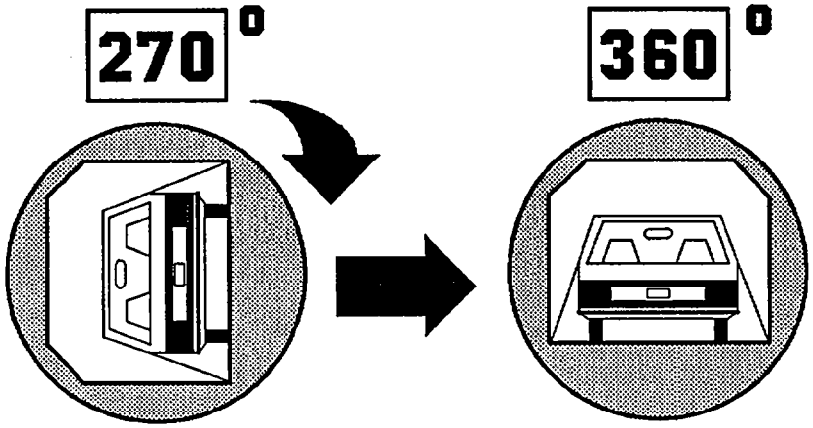
None

Table 13

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

TEST PHASE:

Vehicle NHTSA ID No.: CP5202



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	2 minutes	15 seconds
FMVSS 301 Position Hold Time +	5 minutes	00 seconds
TOTAL	7 minutes	15 seconds
Next whole minute interval	8 minutes	

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0

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

IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 15

TEST VEHICLE NONCOMPLIANCE NOTICE

NHTSA Contract Lab: Calspan Advanced Technology Center

Lab Project Manager & Telephone No.: Walter E. Levan (716) 632-7500

Date of Test: November 12, 1992 Vehicle NHTSA No.: CP5202

Vehicle Manufacturer: Nissan Motor Co., Ltd.

Model Year: 1993 VIN: 1N4BU31F8PC110293

Model: Nissan Stanza Altima Body Style: 4-door Sedan Build Date: 9/92

Dummy Stabilized Temperature at Time of Test: 70 °F (Spec. = 66-78°F)

Impact Velocity: 29.6 mph Time of Test: 11:40

Type of Automatic Restraint System: Driver airbag and driver and right front passenger automatic torso belt.

Failure Details:

The vehicle as tested appears to comply with the requirements of FMVSS Nos. 208, 212, 219 (Partial) and 301.

Appendix A

PHOTOGRAPHS

LIST OF PHOTOGRAPHS

Figure A-1 PRE-TEST FRONT VIEW

Figure A-2 POST-TEST FRONT VIEW

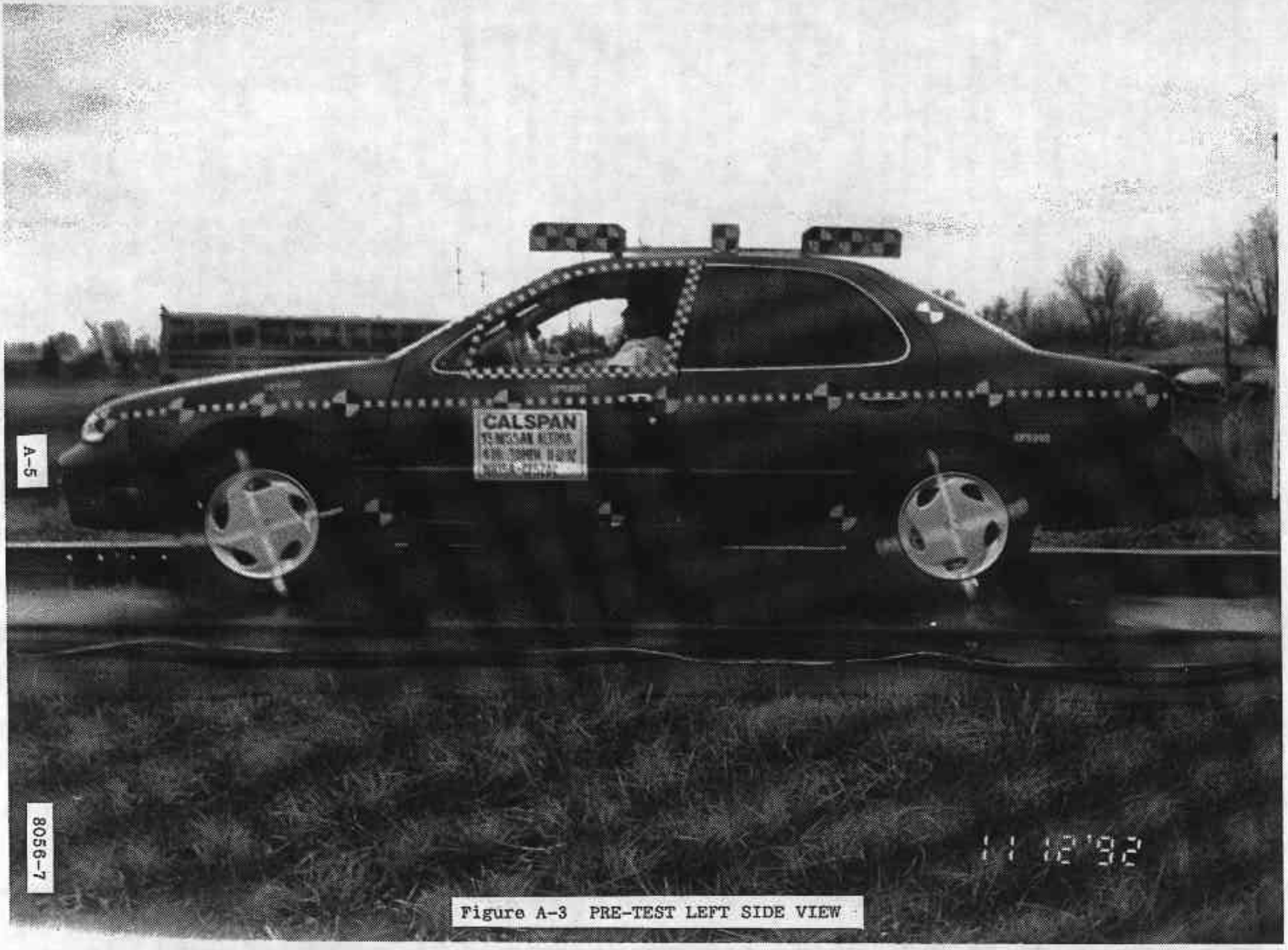


Figure A-3 PRE-TEST LEFT SIDE VIEW

Figure A-4 POST-TEST LEFT SIDE VIEW

Figure A-5 PRE-TEST RIGHT SIDE VIEW

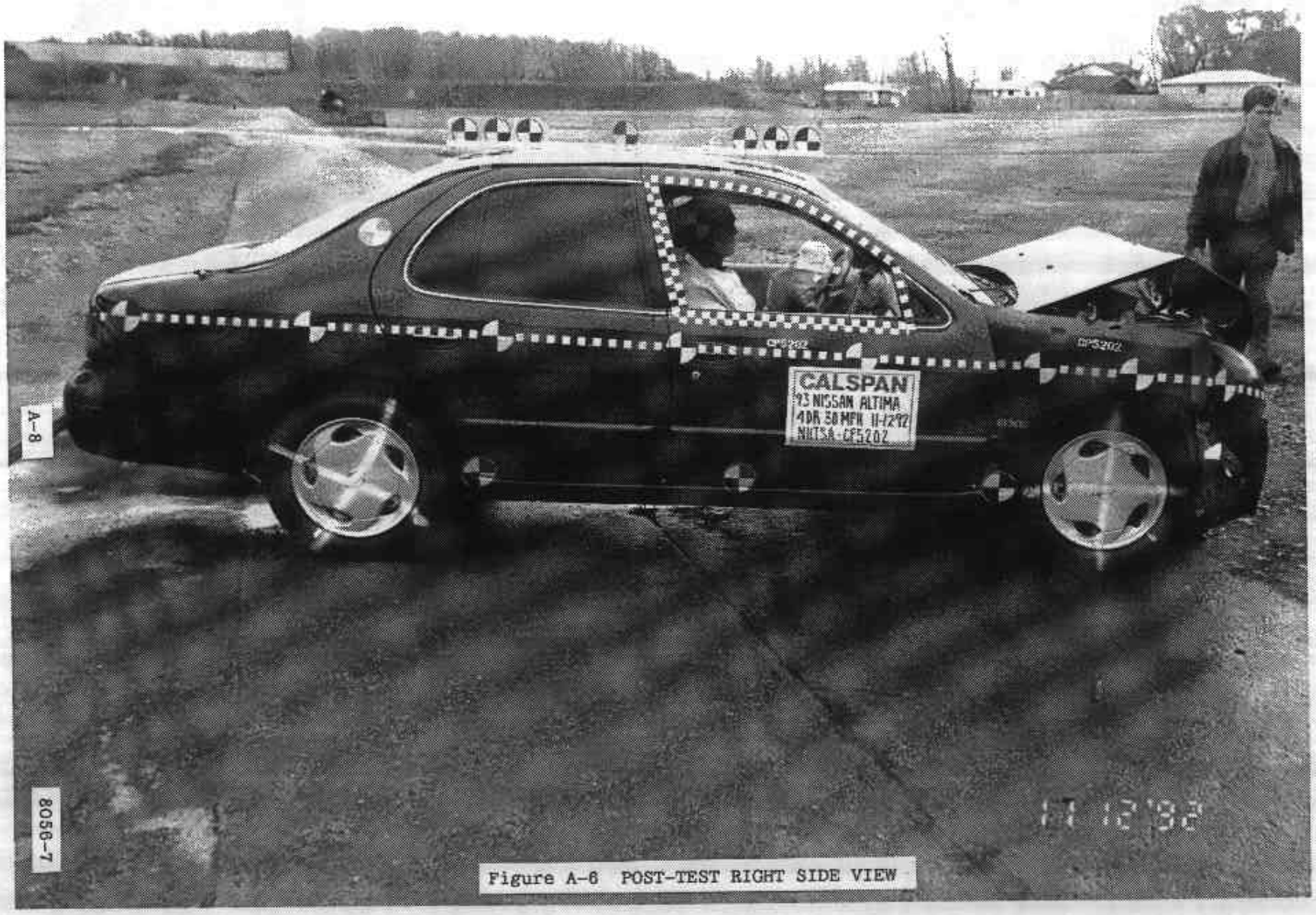


Figure A-6 POST-TEST RIGHT SIDE VIEW

Figure A-7 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

Figure A-8 POST-TEST RIGHT FRONT THREE-QUARTER VIEW

Figure A-8 PRE-TEST LEFT REAR THREE-QUARTER VIEW

Figure A-10 POST-TEST LEFT REAR THREE-QUARTER VIEW

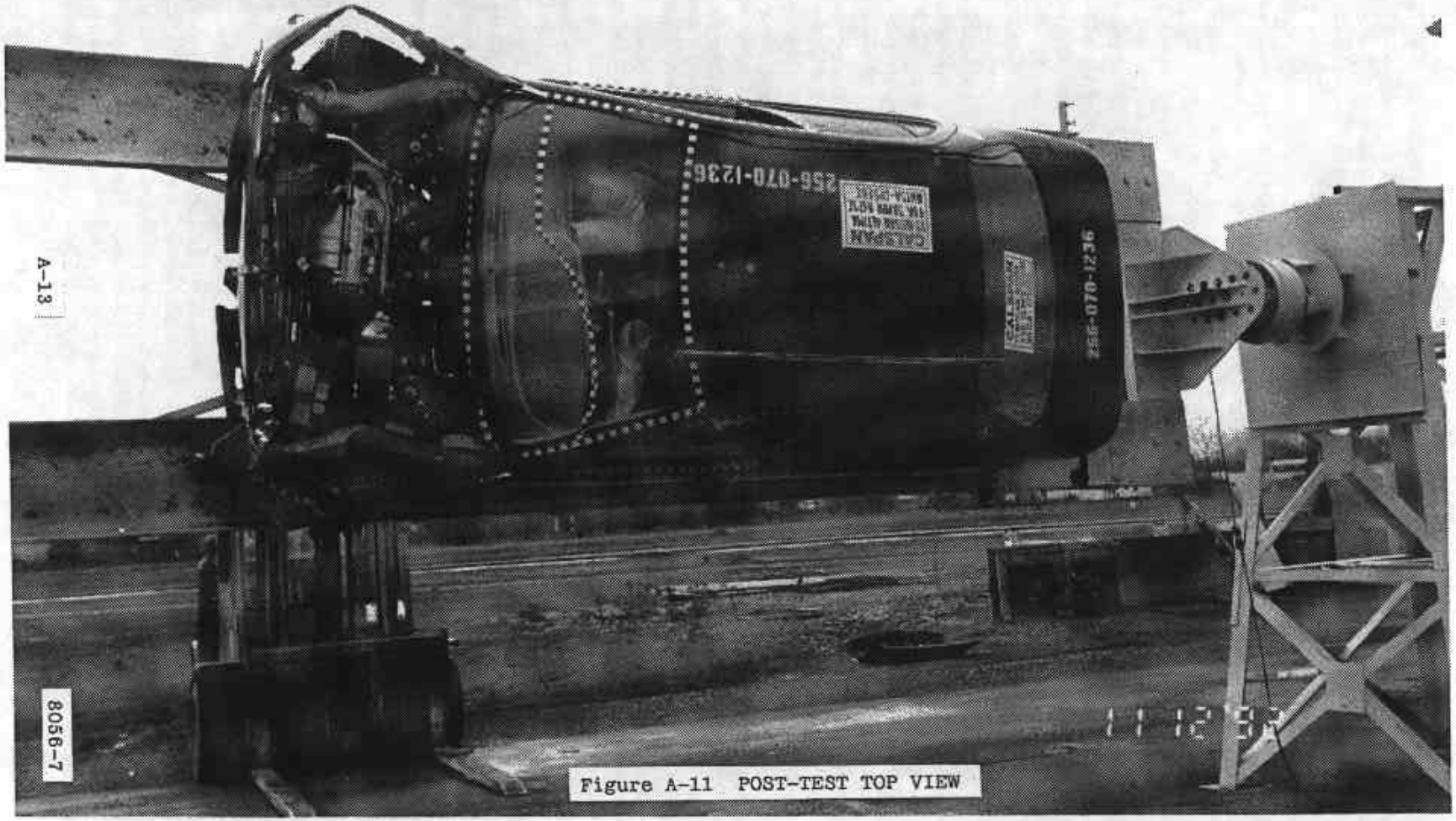


Figure A-11 POST-TEST TOP VIEW

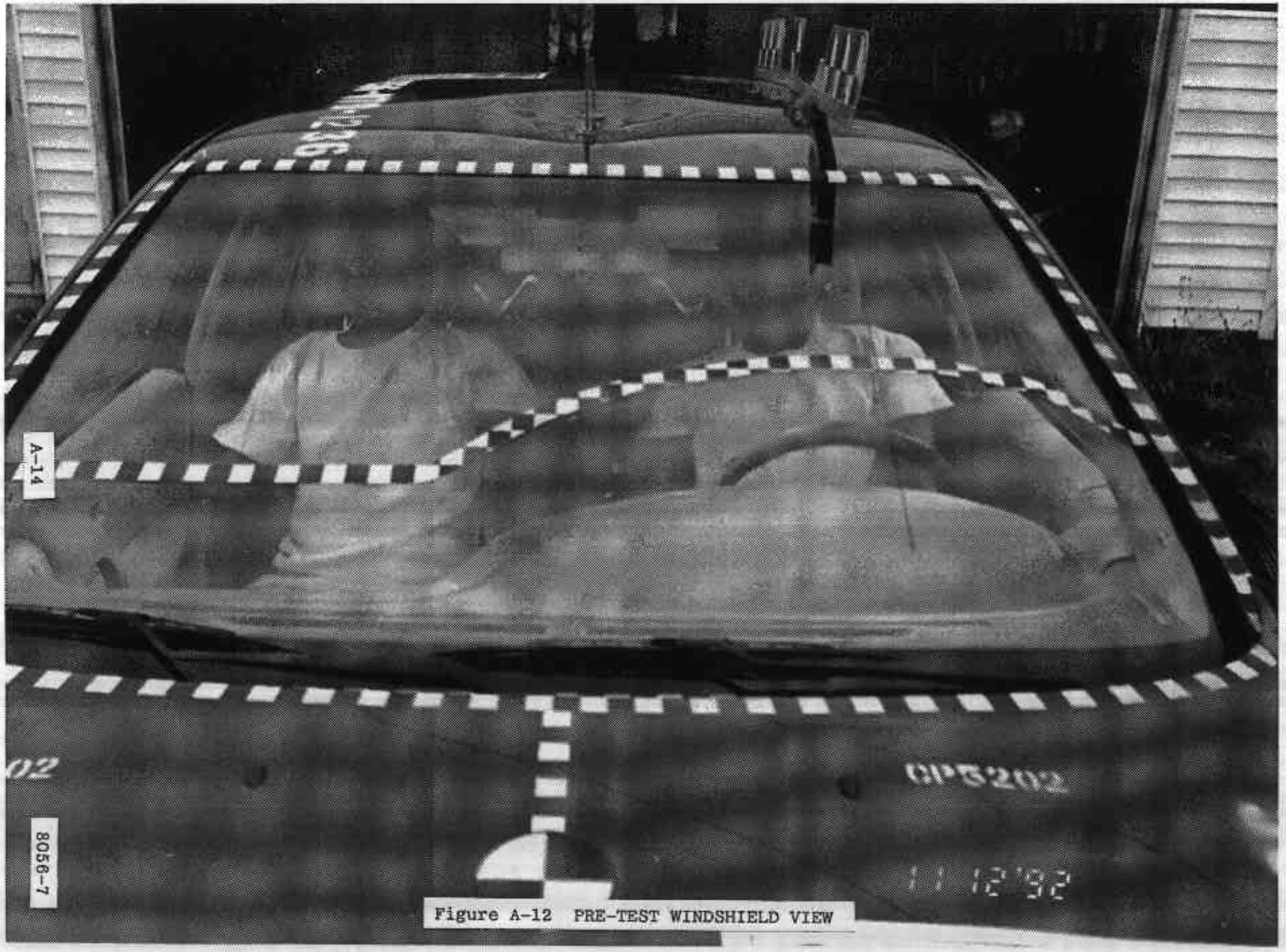


Figure A-12 PRE-TEST WINDSHIELD VIEW

Figure A-13 POST-TEST WINDSHIELD VIEW

Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW

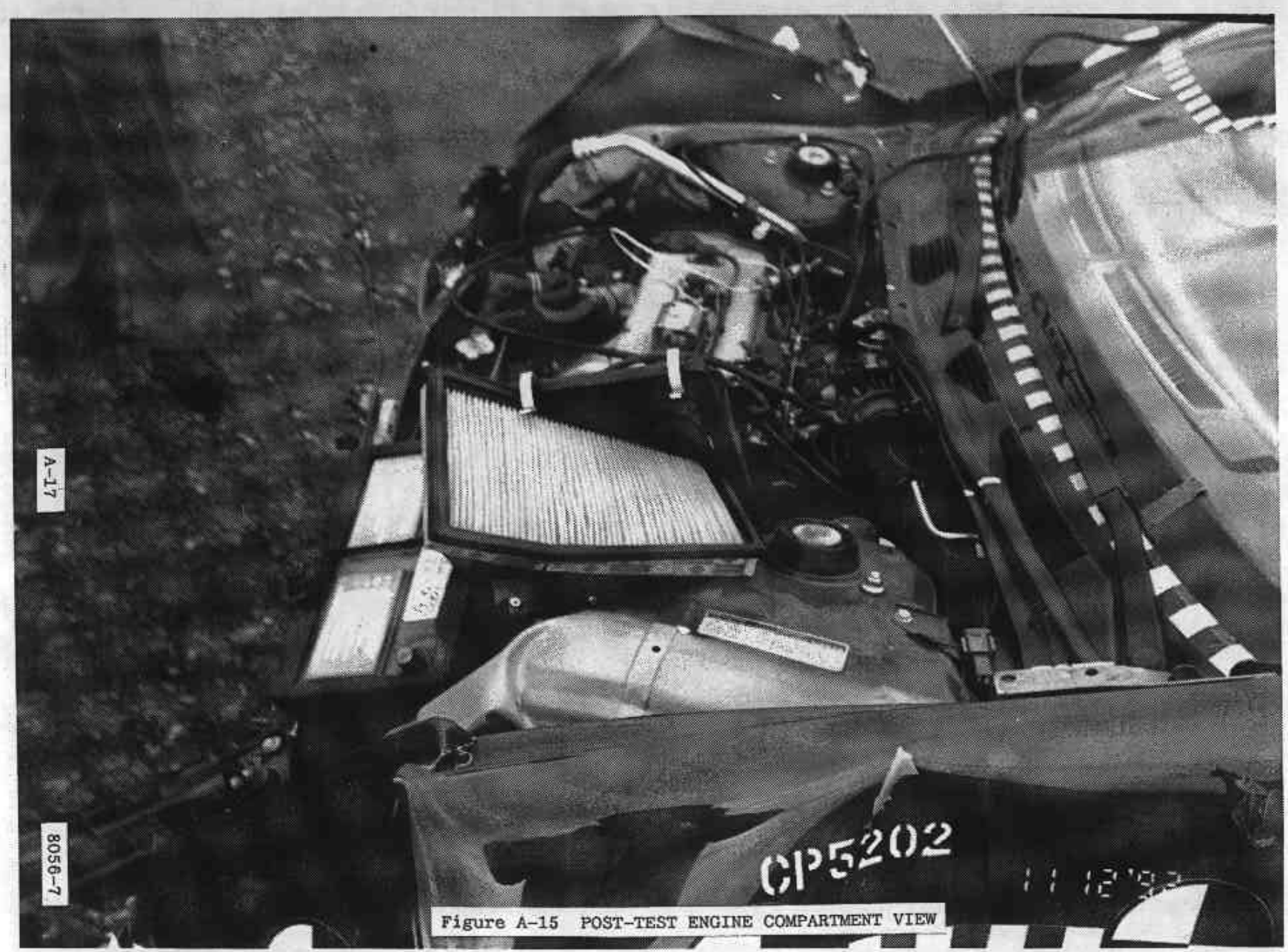


Figure A-15 POST-TEST ENGINE COMPARTMENT VIEW

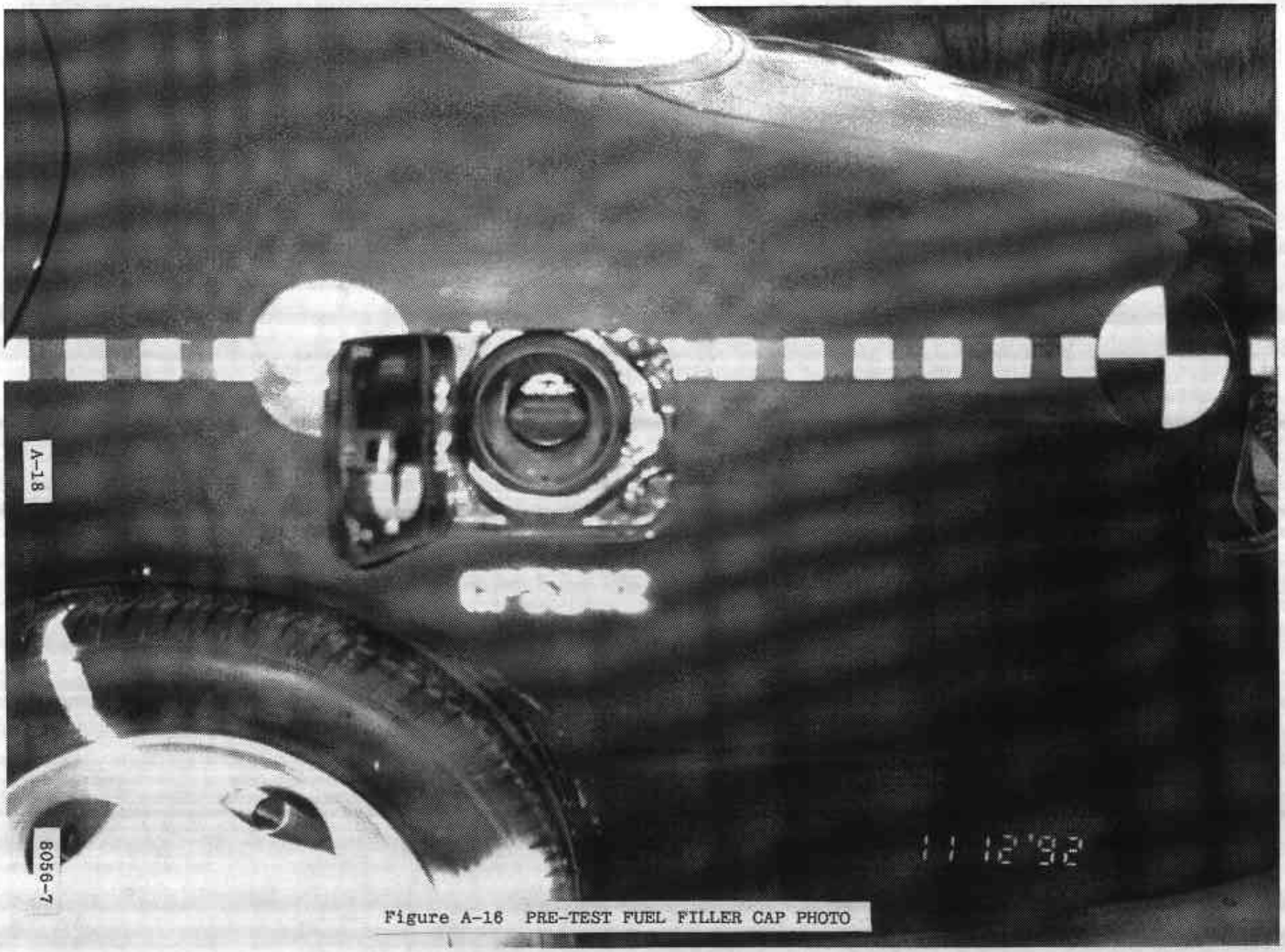


Figure A-16 PRE-TEST FUEL FILLER CAP PHOTO

Figure A-17 POST-TEST FUEL FILLER CAP PHOTO

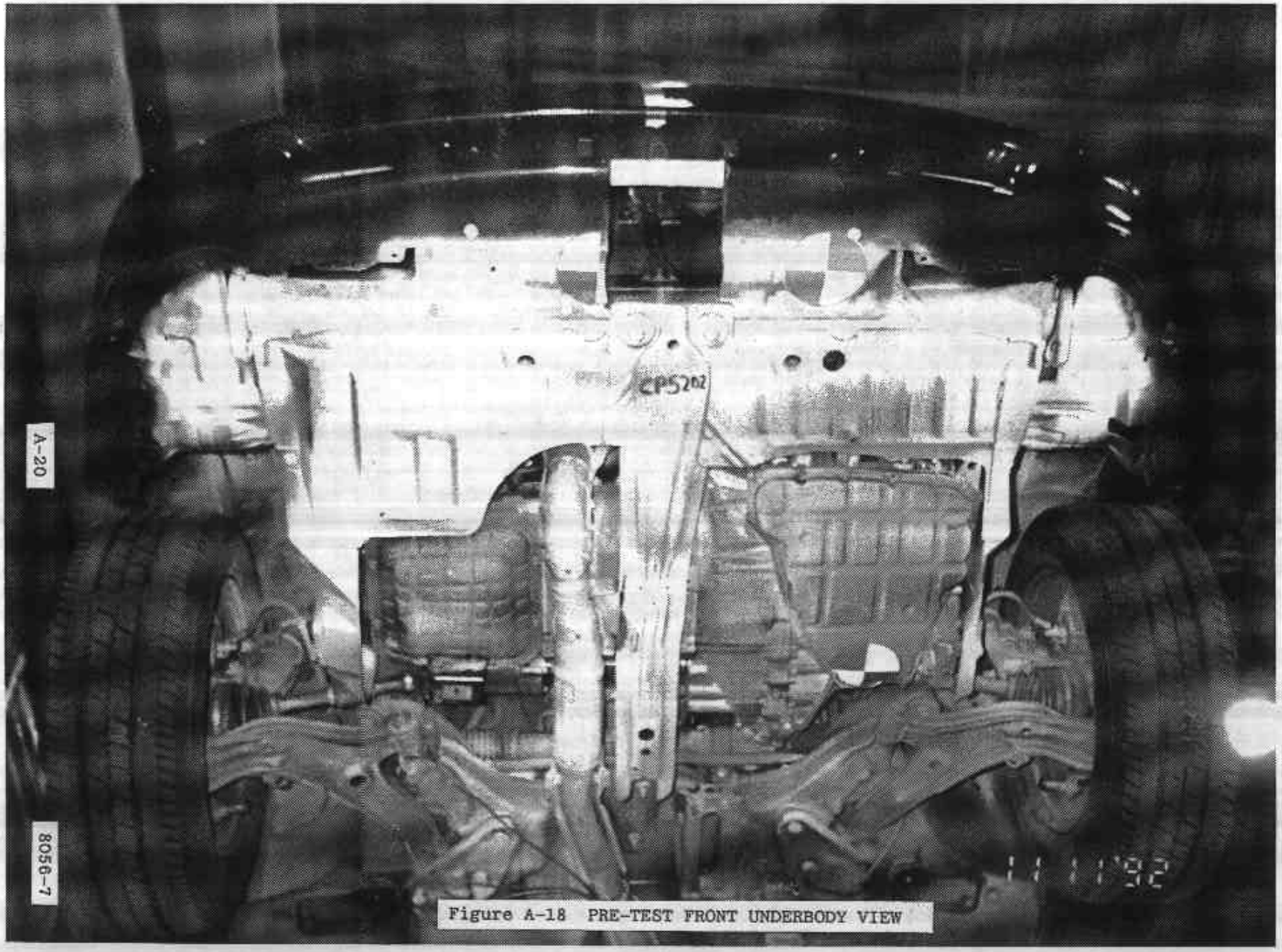


Figure A-18 PRE-TEST FRONT UNDERBODY VIEW

Figure A-19 POST-TEST FRONT UNDERBODY VIEW

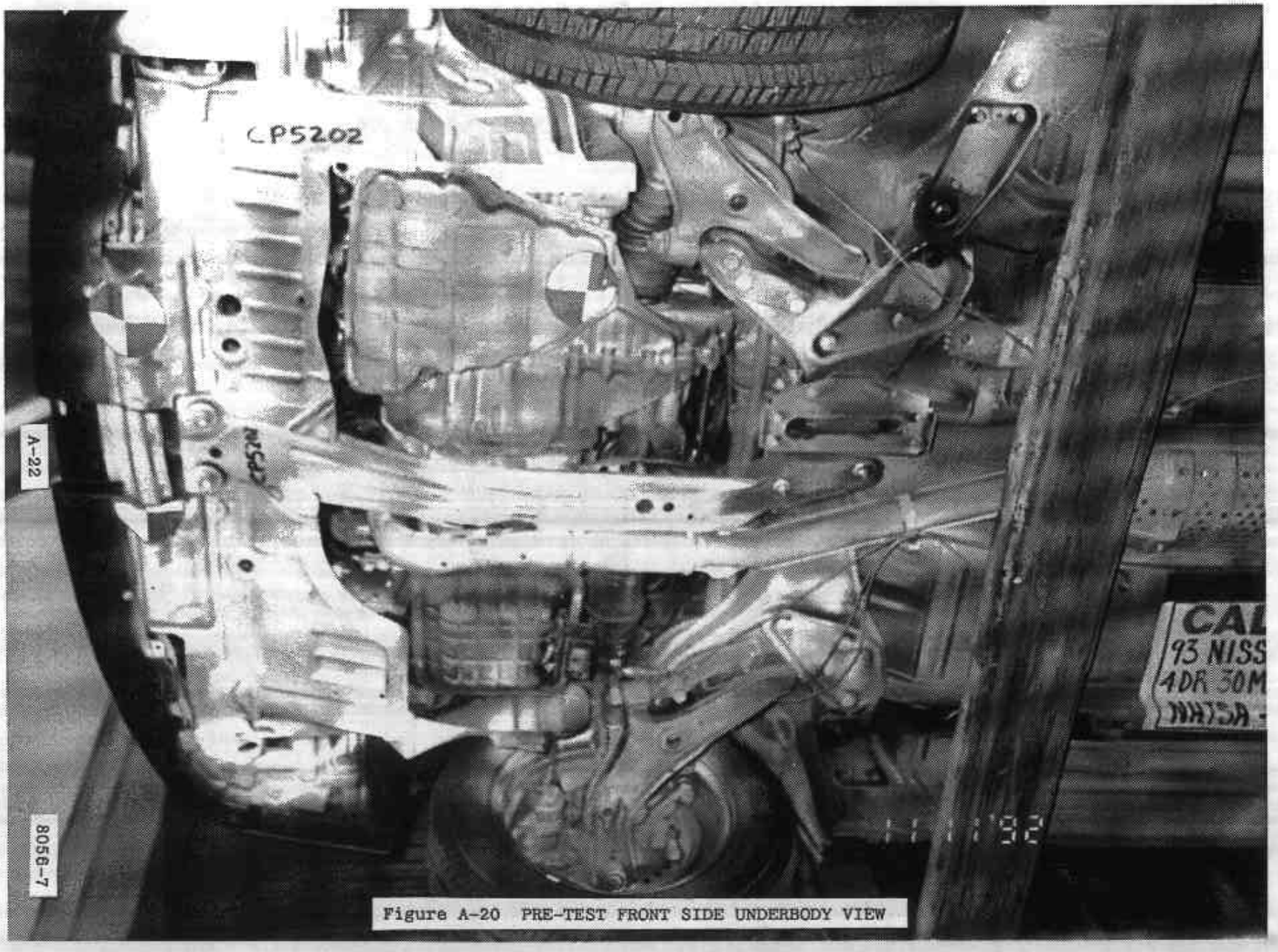


Figure A-20 PRE-TEST FRONT SIDE UNDERBODY VIEW

Figure A-21 POST-TEST FRONT SIDE UNDERBODY VIEW

8056-7

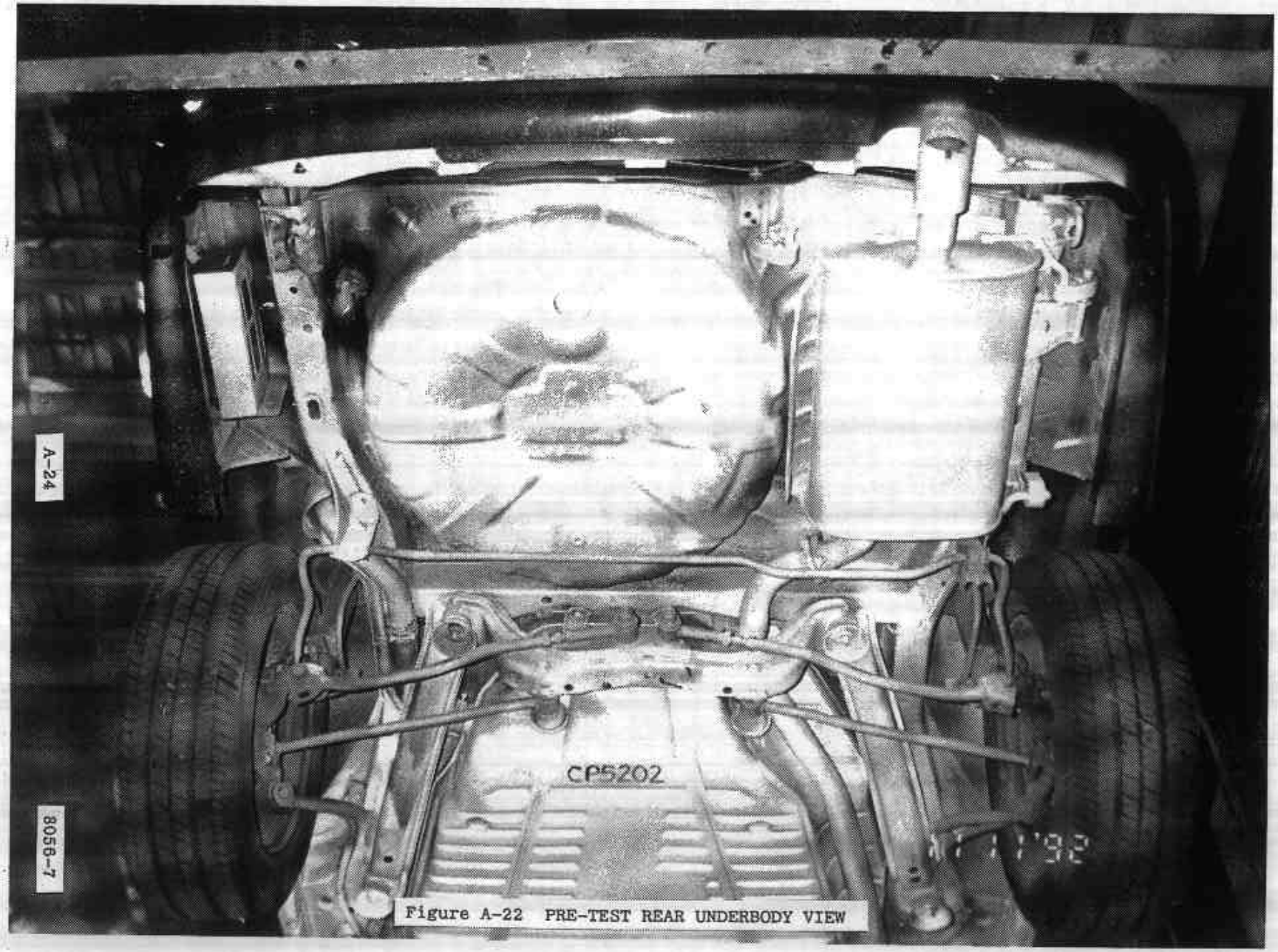


Figure A-22 PRE-TEST REAR UNDERBODY VIEW

Figure A-23 POST-TEST REAR UNDERBODY VIEW

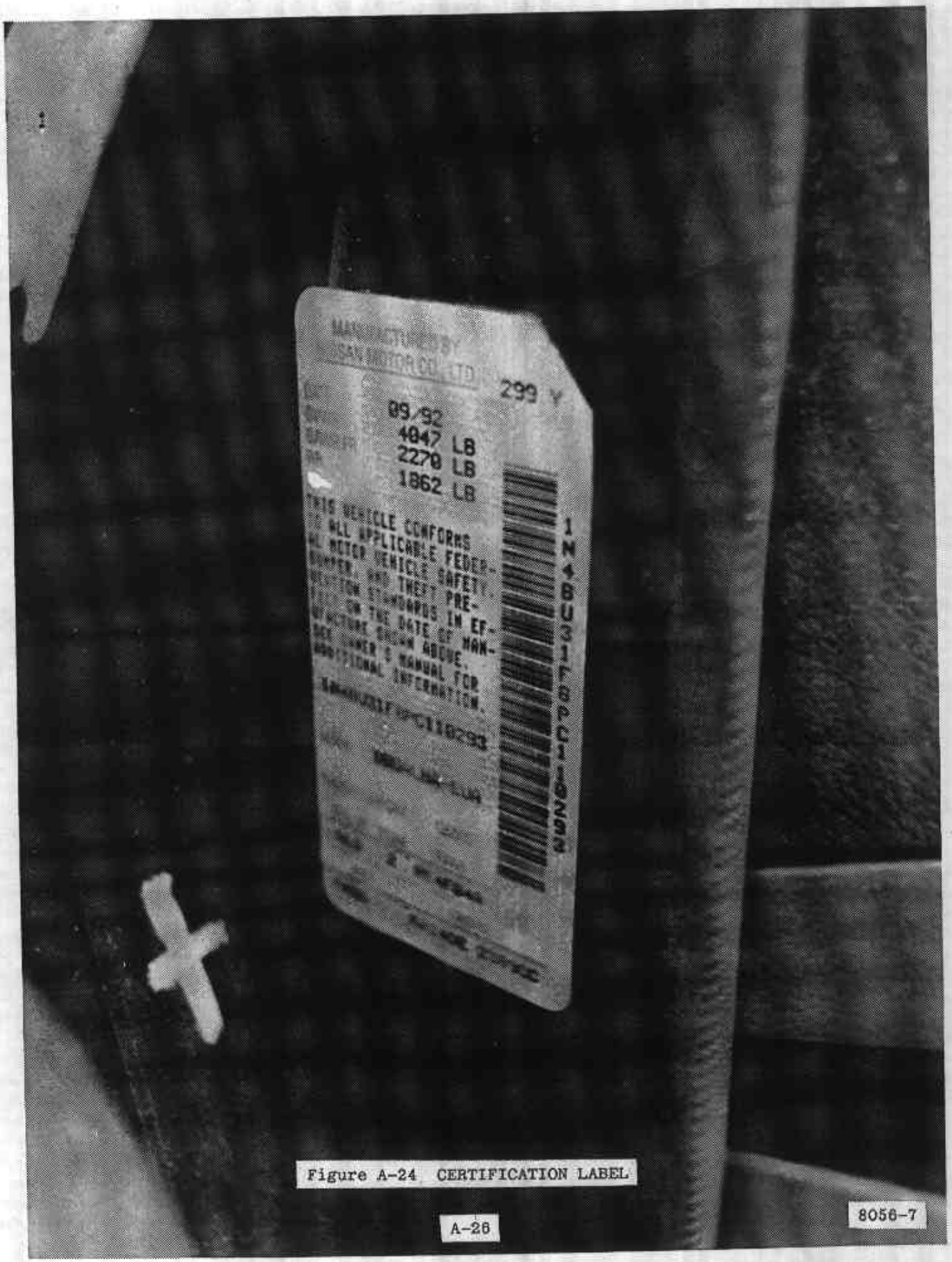


Figure A-24 CERTIFICATION LABEL

8056-7

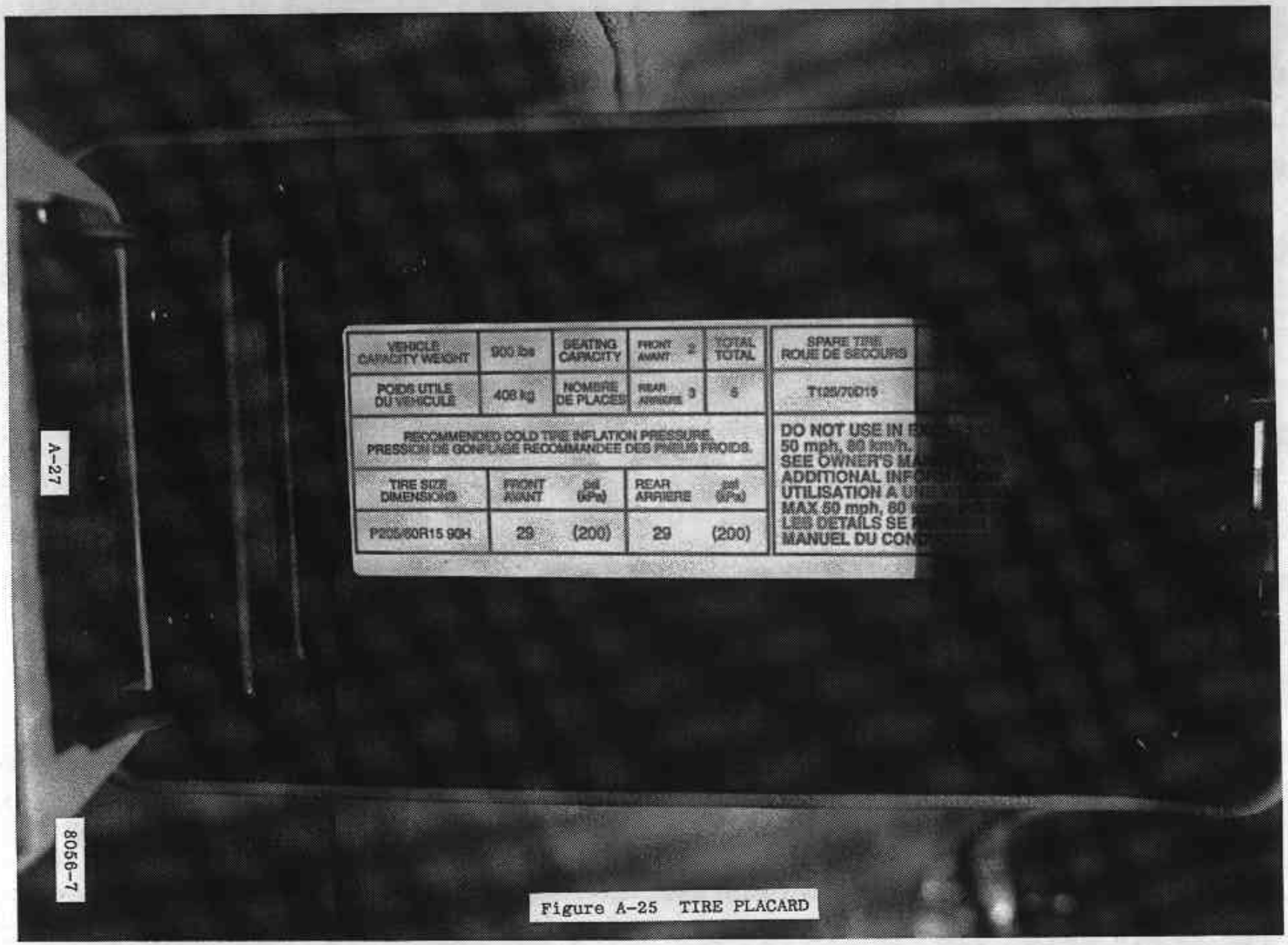


Figure A-25 TIRE PLACARD

Figure A-28 PRE-TEST DRIVER DUMMY POSITION

Figure A-27 POST-TEST DRIVER DUMMY POSITION

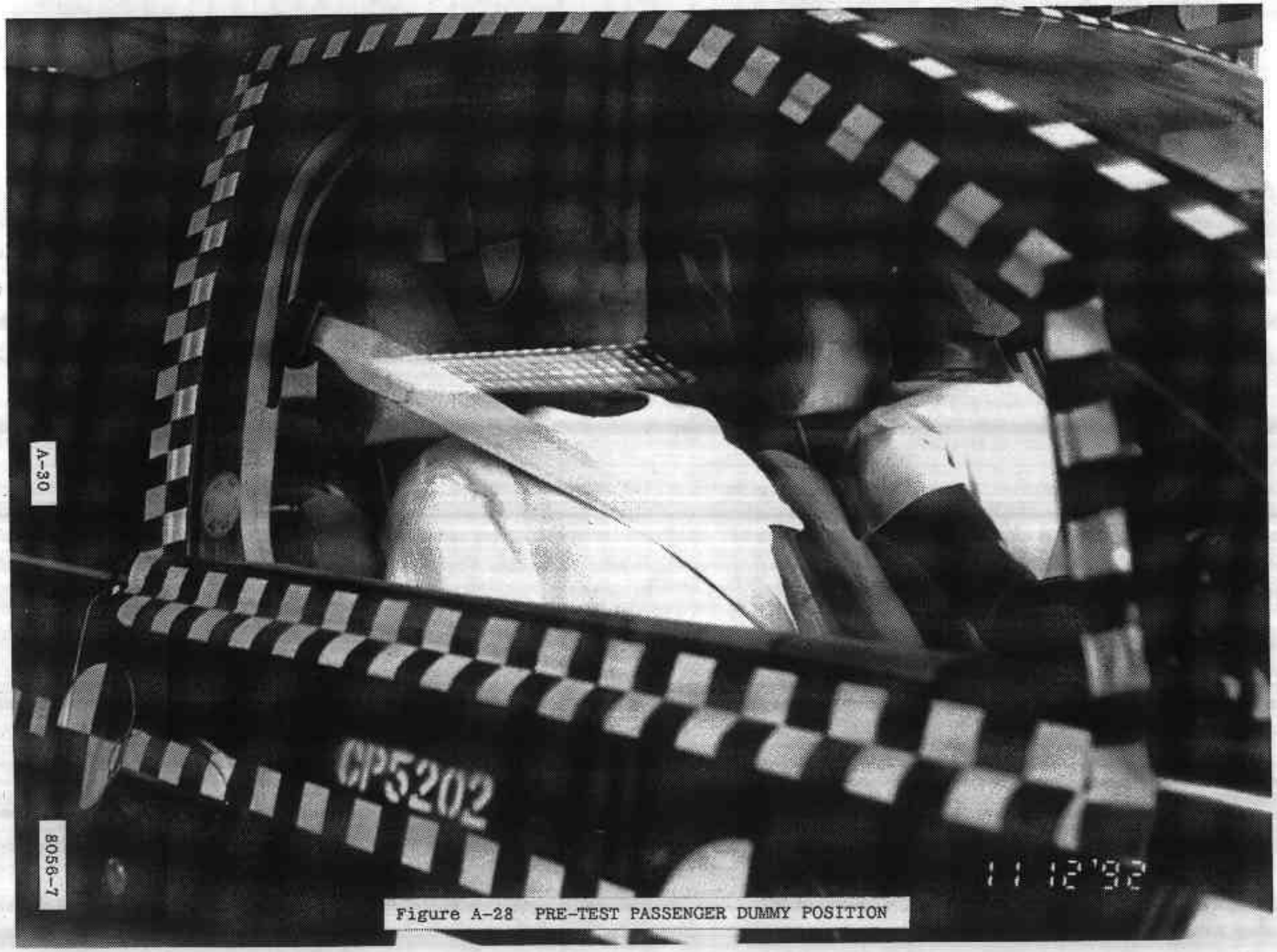


Figure A-28 PRE-TEST PASSENGER DUMMY POSITION

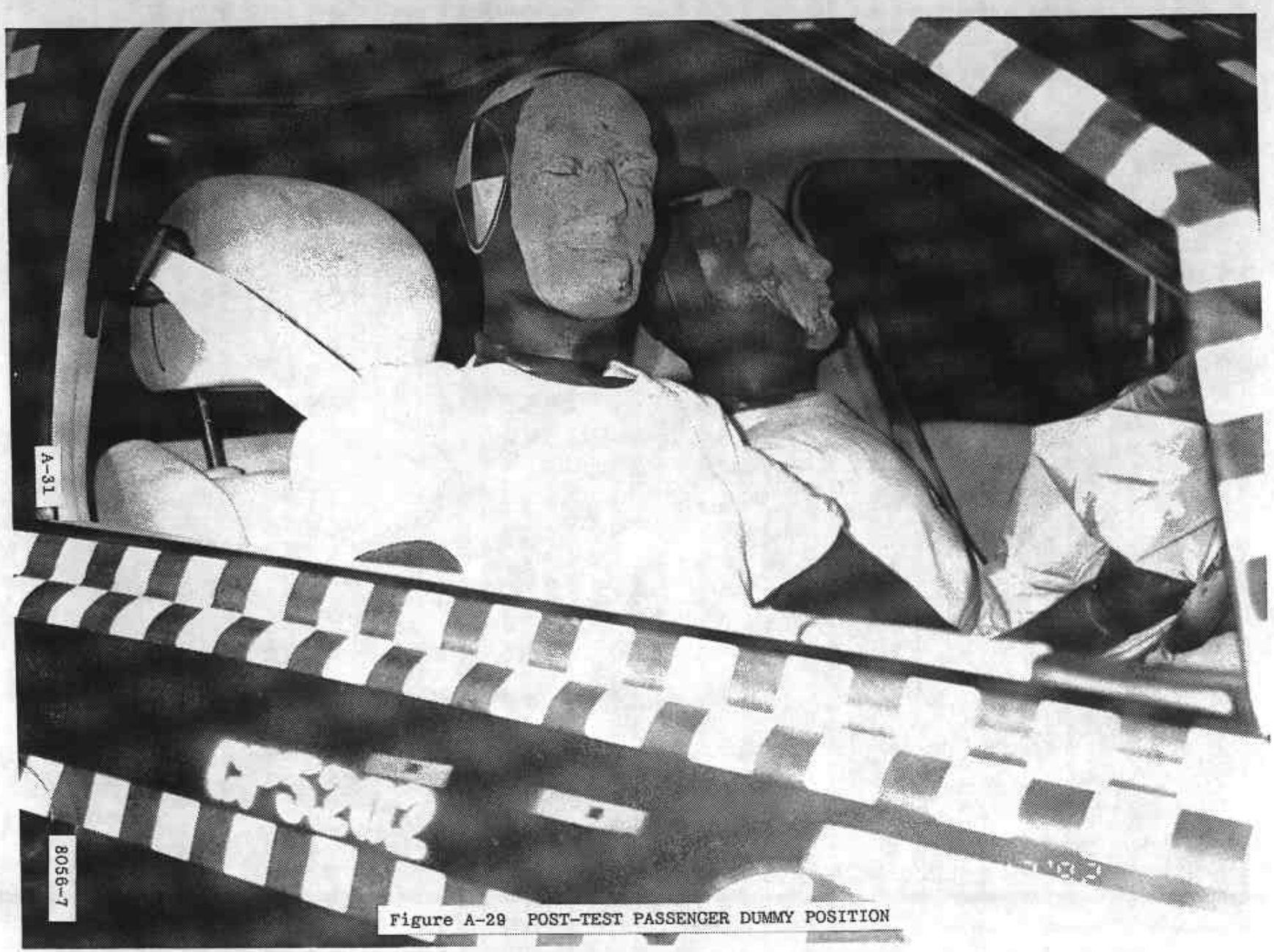


Figure A-29 POST-TEST PASSENGER DUMMY POSITION

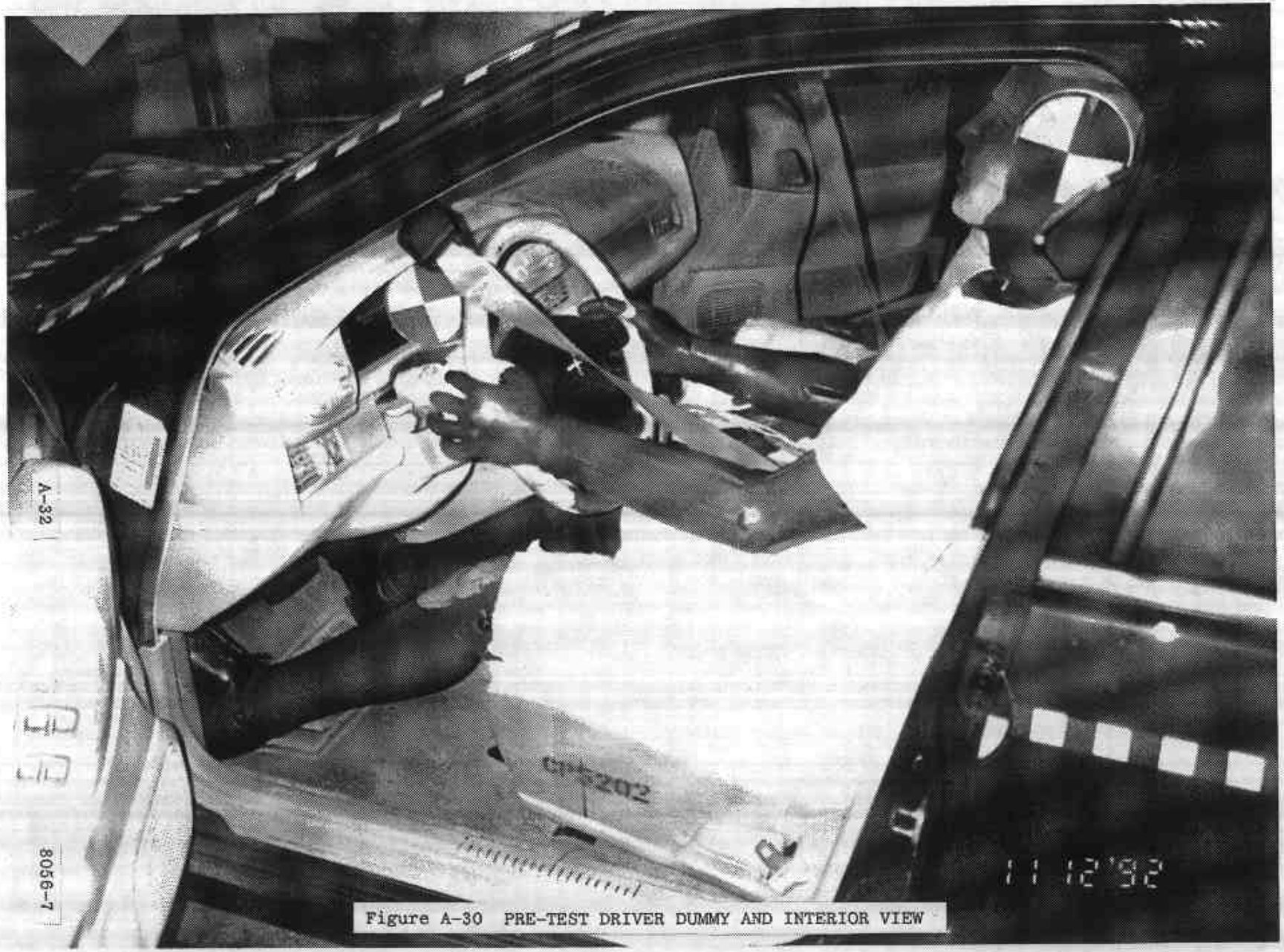


Figure A-30 PRE-TEST DRIVER DUMMY AND INTERIOR VIEW

Figure A-31 POST-TEST DRIVER DUMMY AND INTERIOR VIEW

8058-7

Figure A-32 PRE-TEST PASSENGER DUMMY AND INTERIOR VIEW

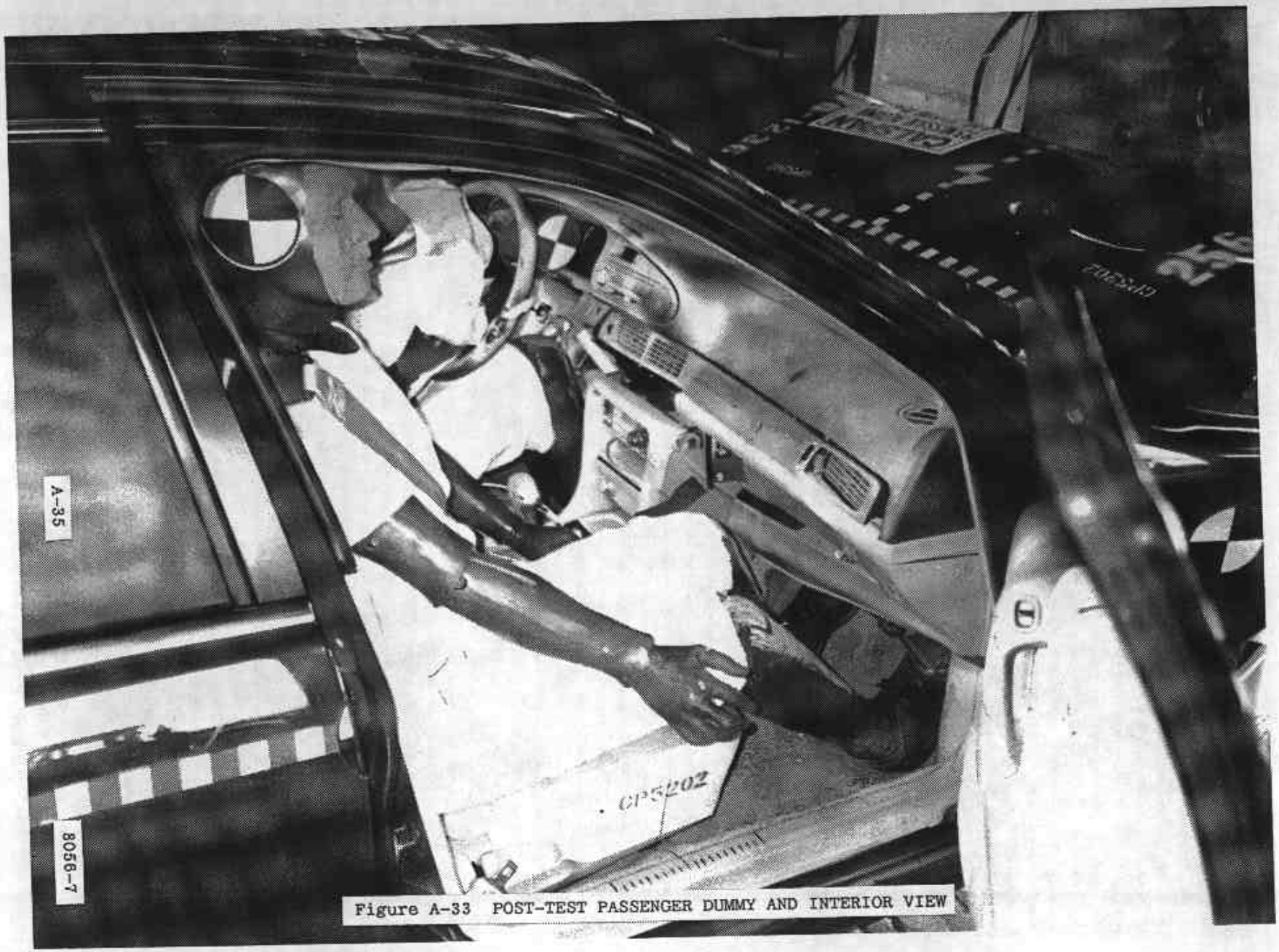


Figure A-33 POST-TEST PASSENGER DUMMY AND INTERIOR VIEW

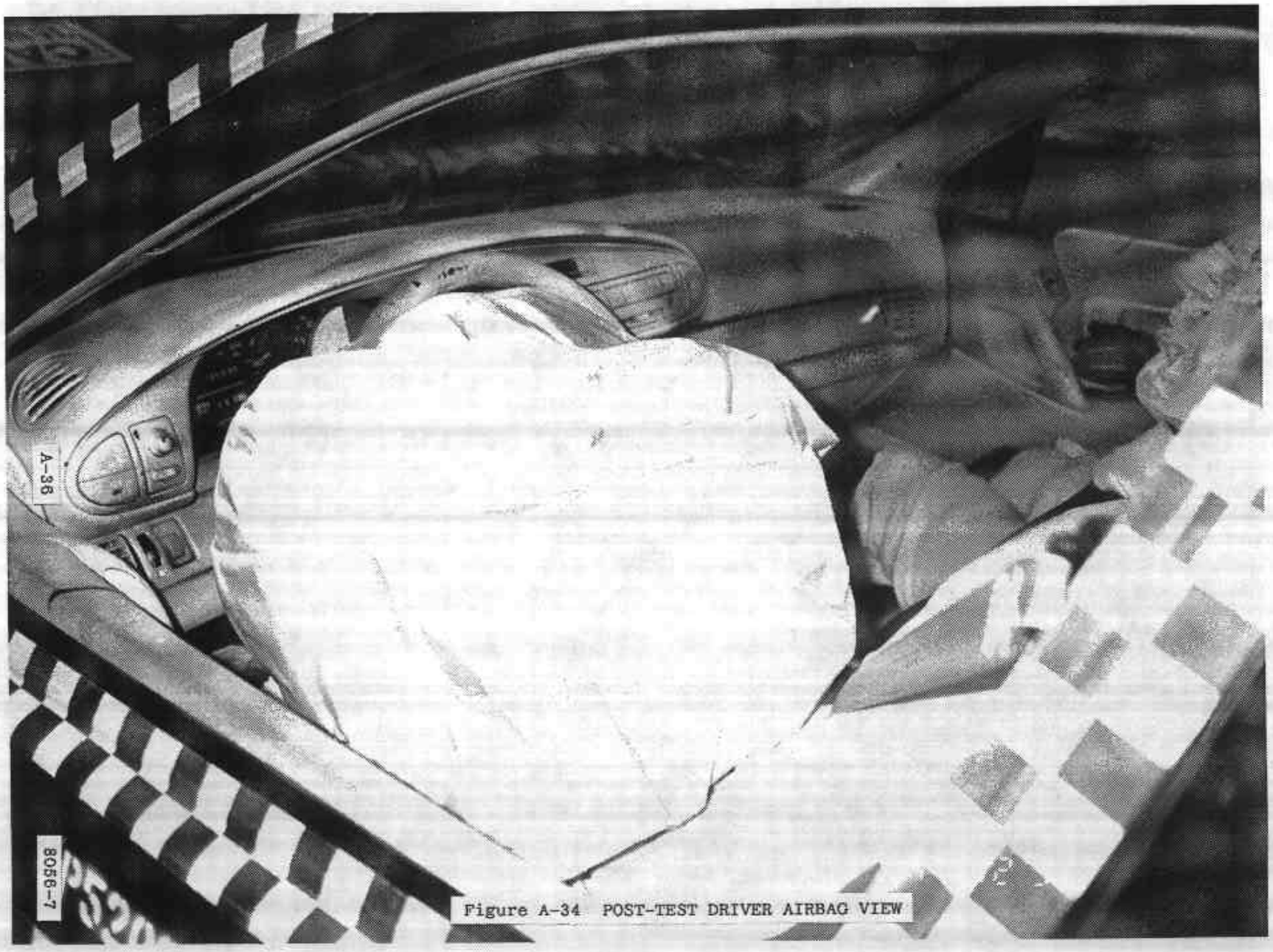


Figure A-34 POST-TEST DRIVER AIRBAG VIEW

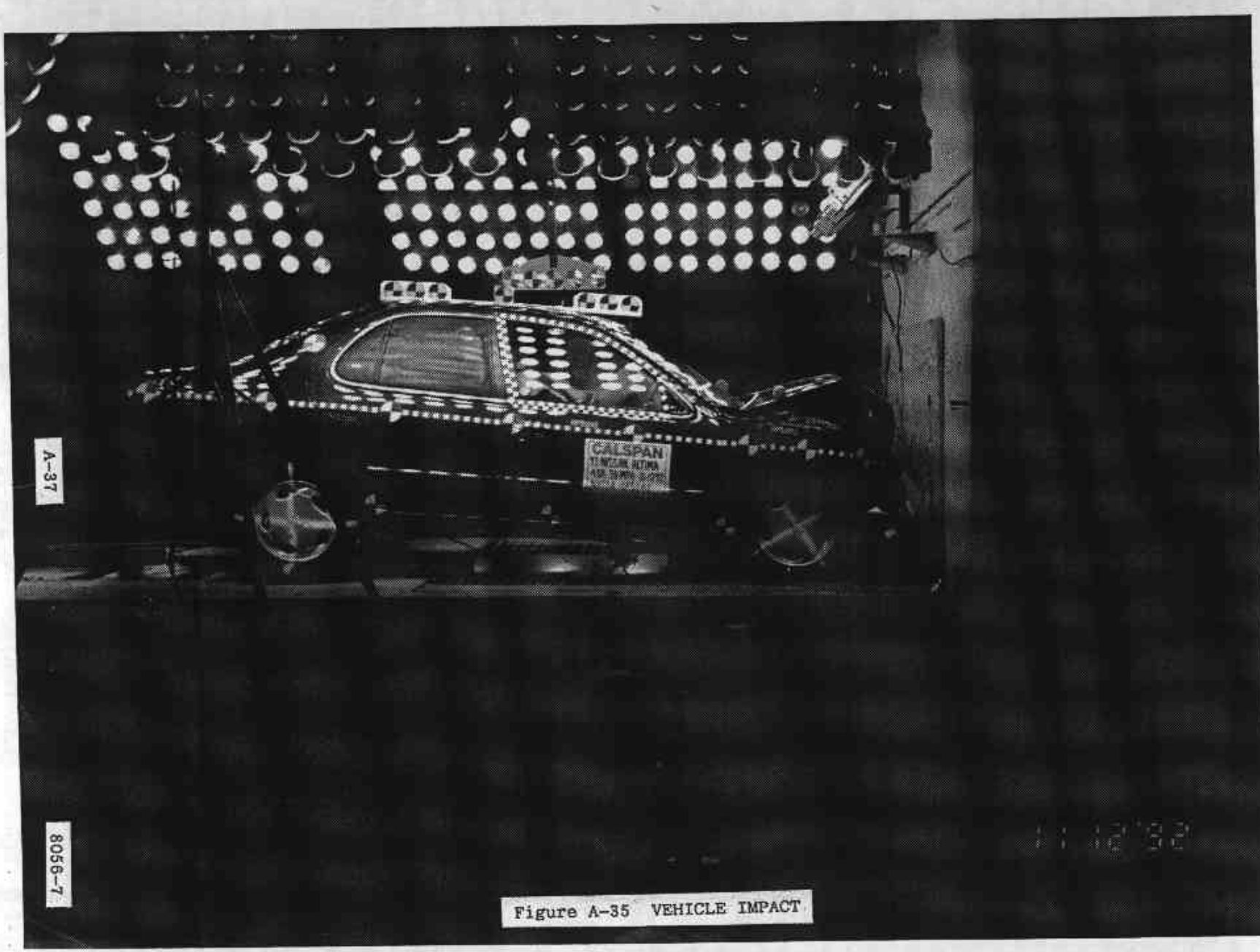


Figure A-35 VEHICLE IMPACT

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

TEST NO. CP5202

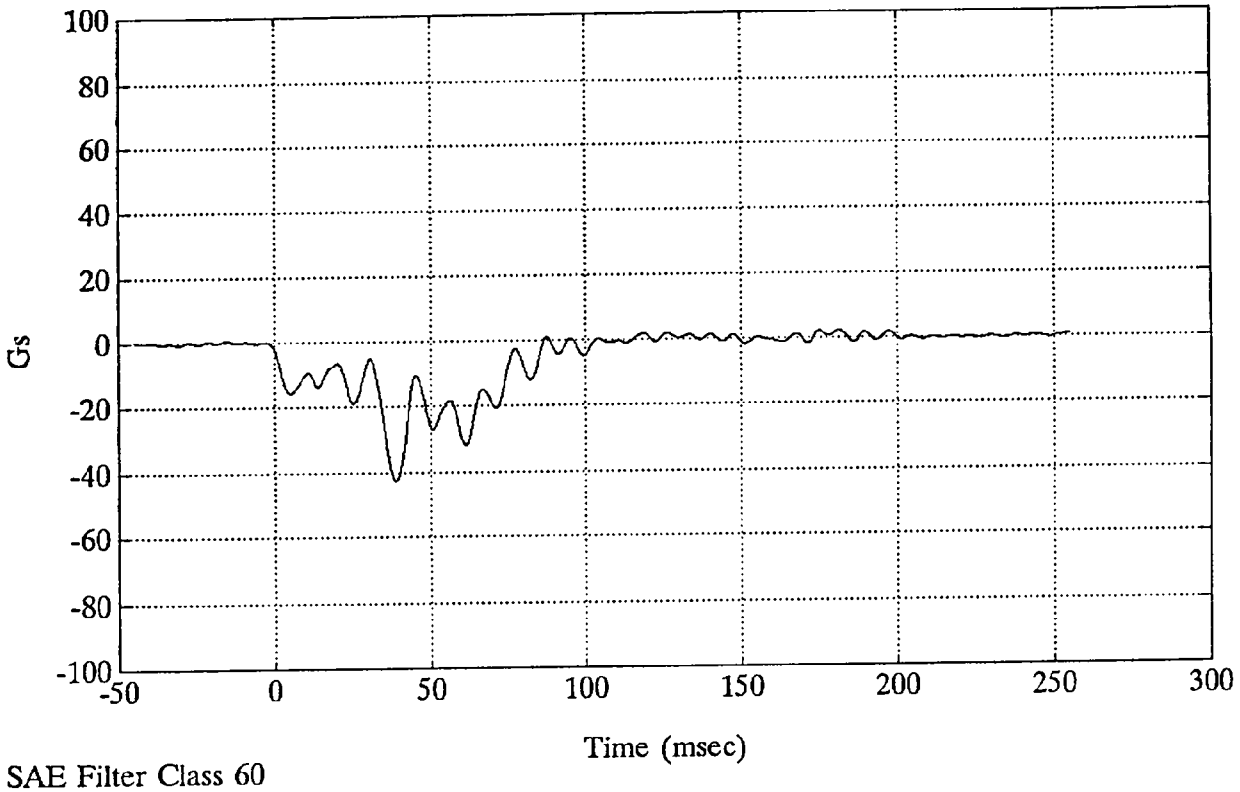
VEHICLE DATA

SAE FILTER CHANNEL CLASS

60

FMVSS 208 - 1993 NISSAN ALTIMA
L. Rear X-member X (#1)

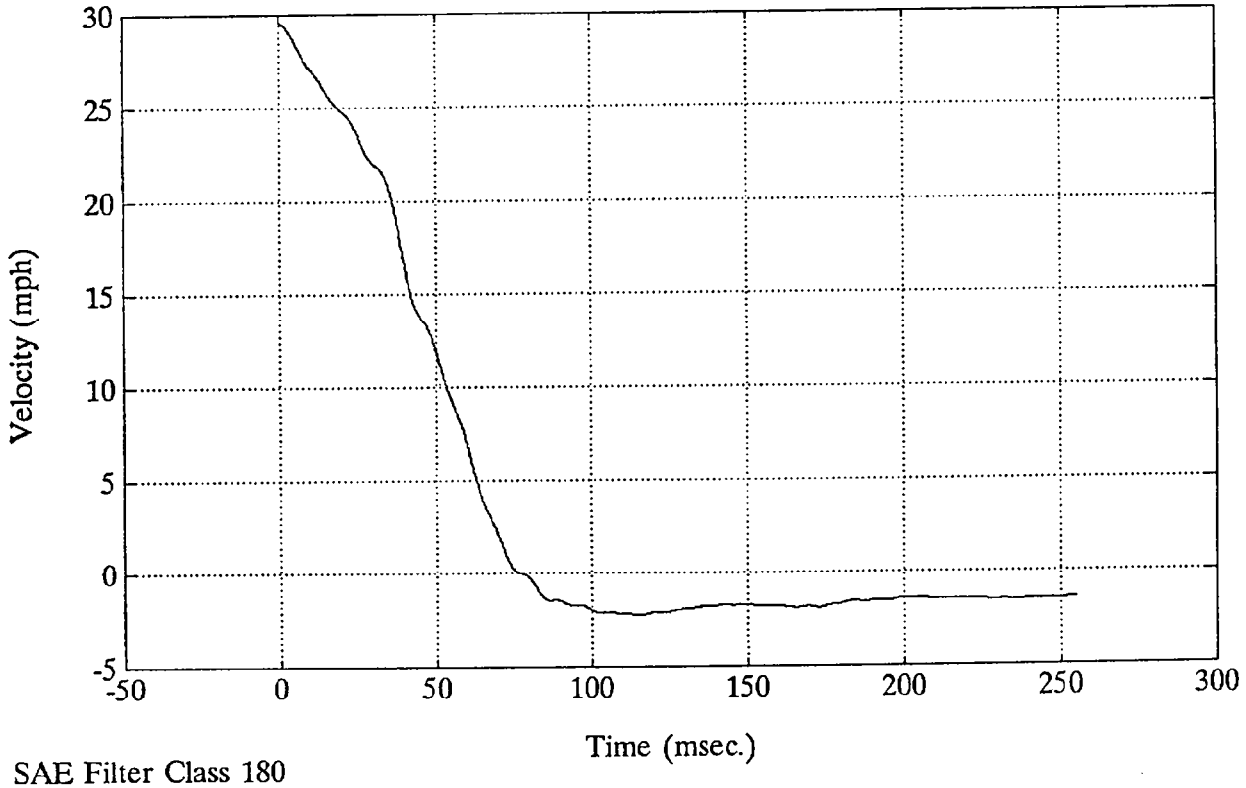
Max = 2.29 Gs @ 181.08 msec
Min = -42.57 Gs @ 39.00 msec



SAE Filter Class 60

FMVSS 208 - 1993 NISSAN ALTIMA
L. Rear X-member X (#1)

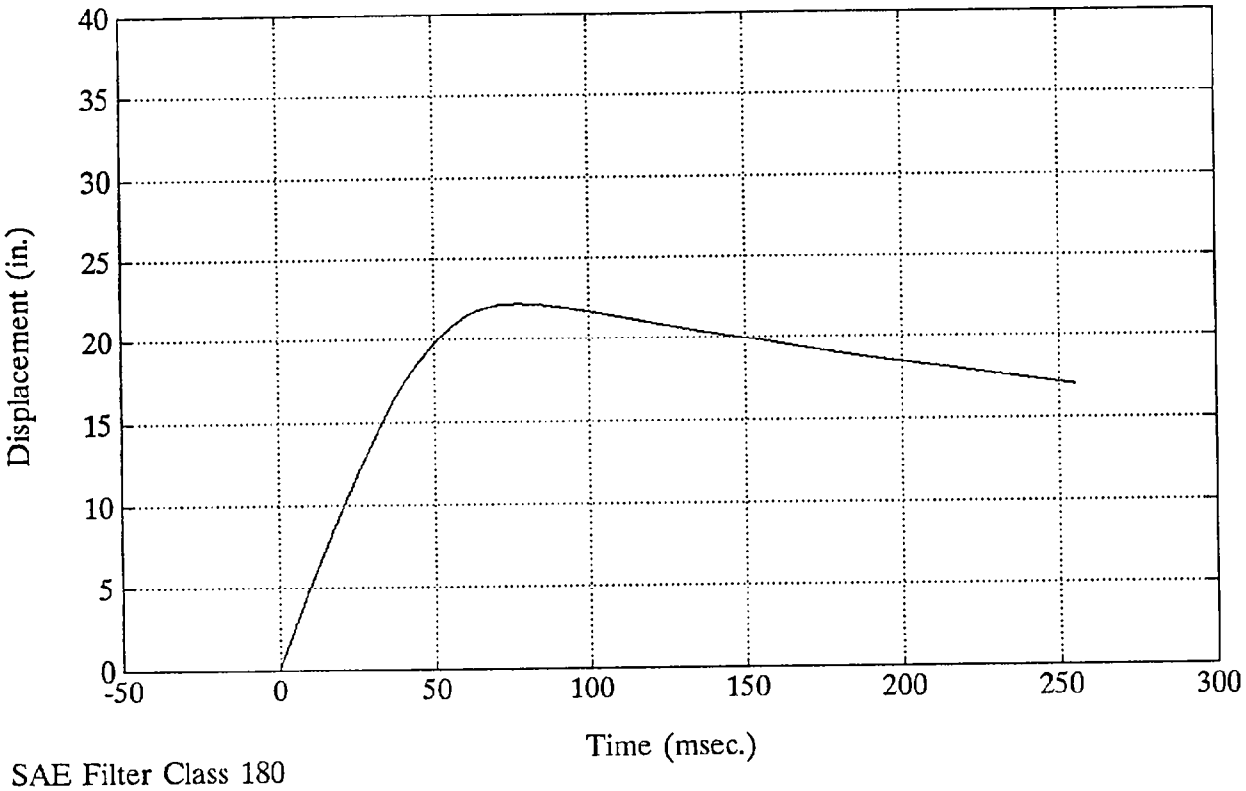
Max = 29.60 mph @ -0.00 msec
Min = -2.24 mph @ 115.20 msec



SAE Filter Class 180

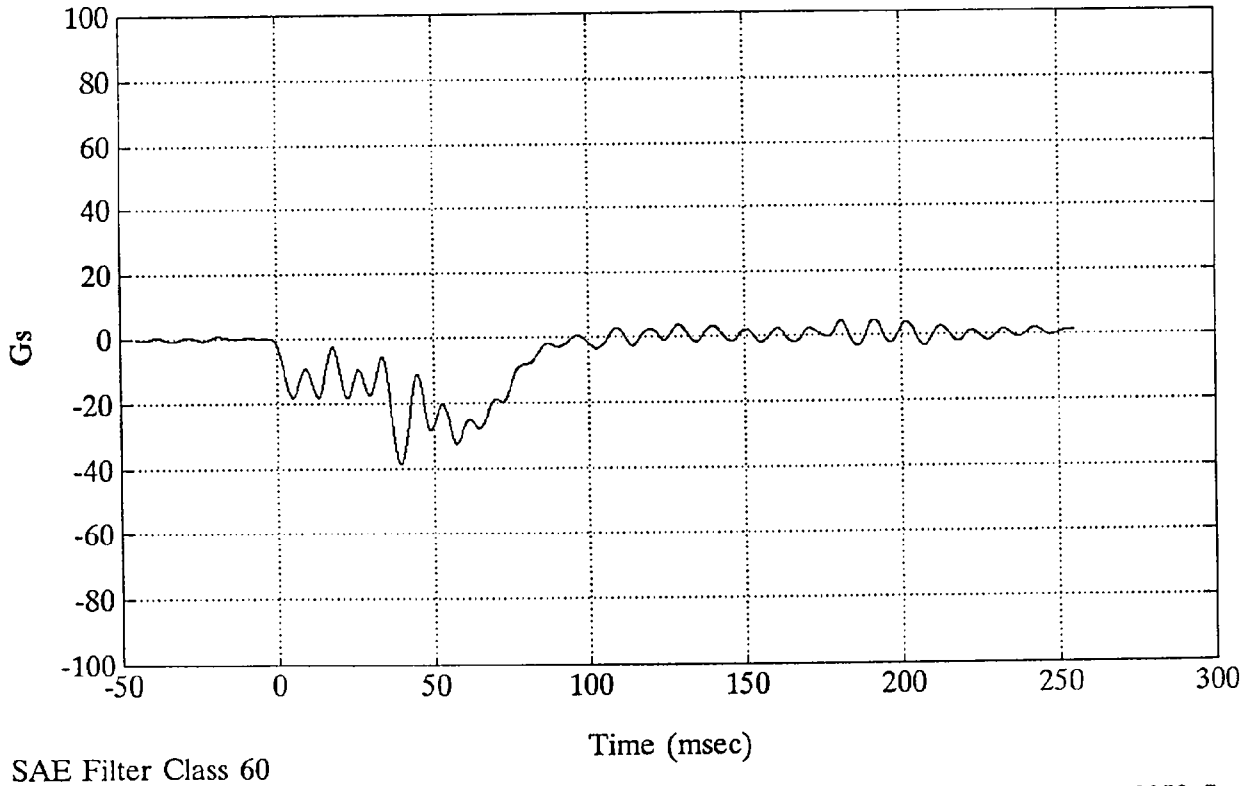
8056-7

FMVSS 208 - 1993 NISSAN ALTIMA
L. Rear X-member X (#1)
Max = 22.19 in. @ 78.48 msec
Min = 0.00 in. @ -0.00 msec



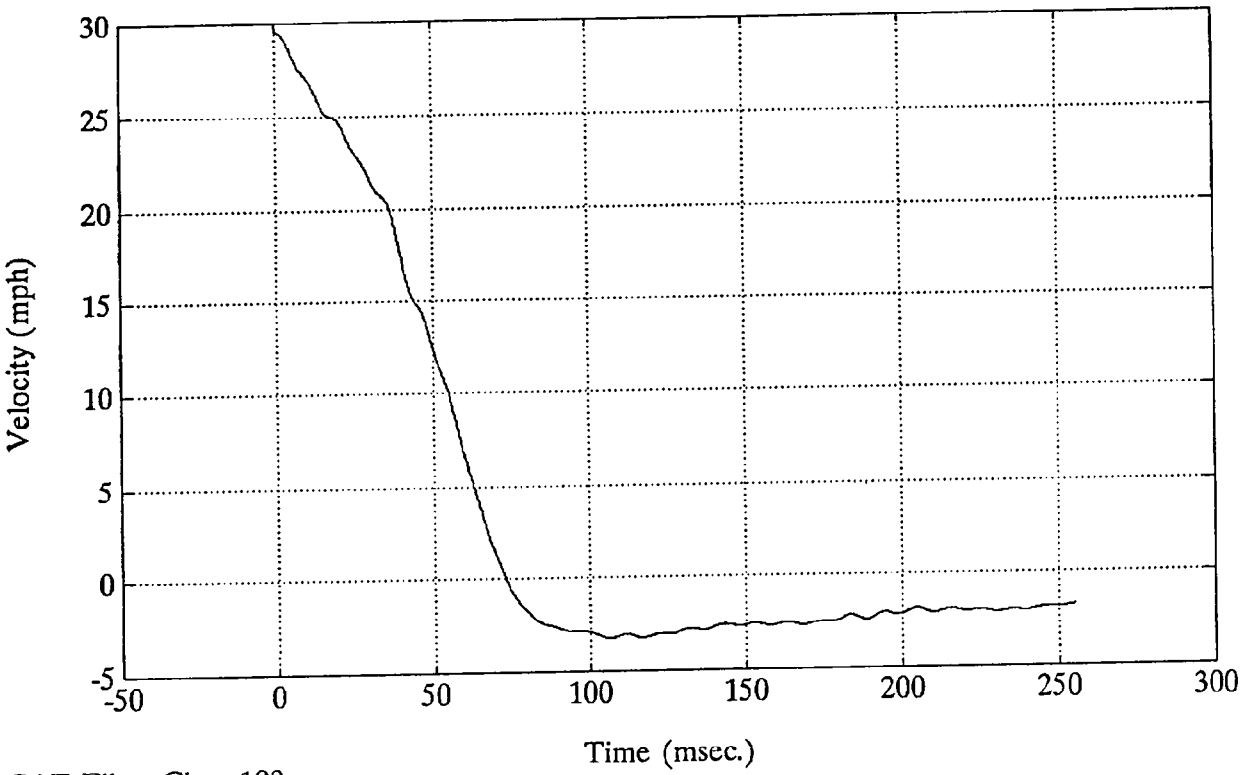
SAE Filter Class 180

FMVSS 208 - 1993 NISSAN ALTIMA
R. Rear X-member X (#2)
Max = 4.62 Gs @ 191.28 msec
Min = -38.62 Gs @ 39.60 msec



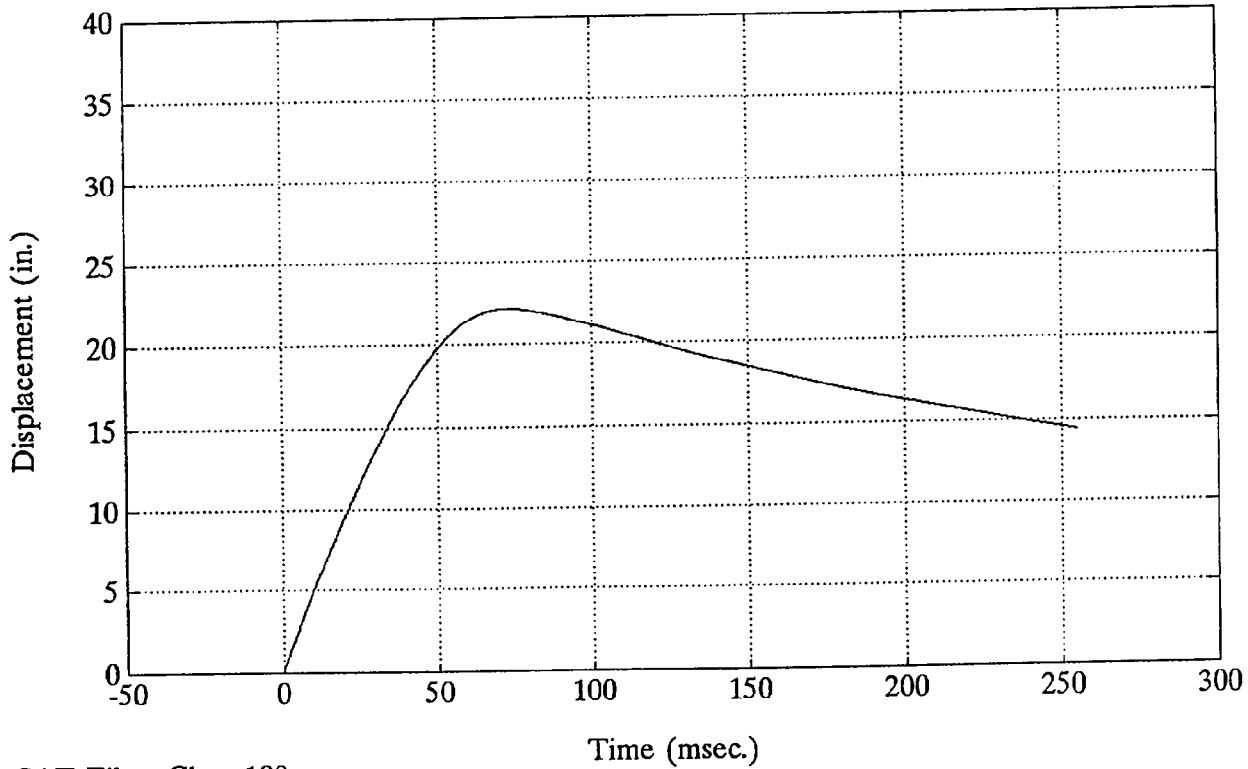
SAE Filter Class 60

FMVSS 208 - 1993 NISSAN ALTIMA
R. Rear X-member X (#2)
Max = 29.60 mph @ -0.00 msec
Min = -3.28 mph @ 106.32 msec



SAE Filter Class 180

FMVSS 208 - 1993 NISSAN ALTIMA
R. Rear X-member X (#2)
Max = 22.16 in. @ 73.92 msec
Min = 0.00 in. @ -0.00 msec

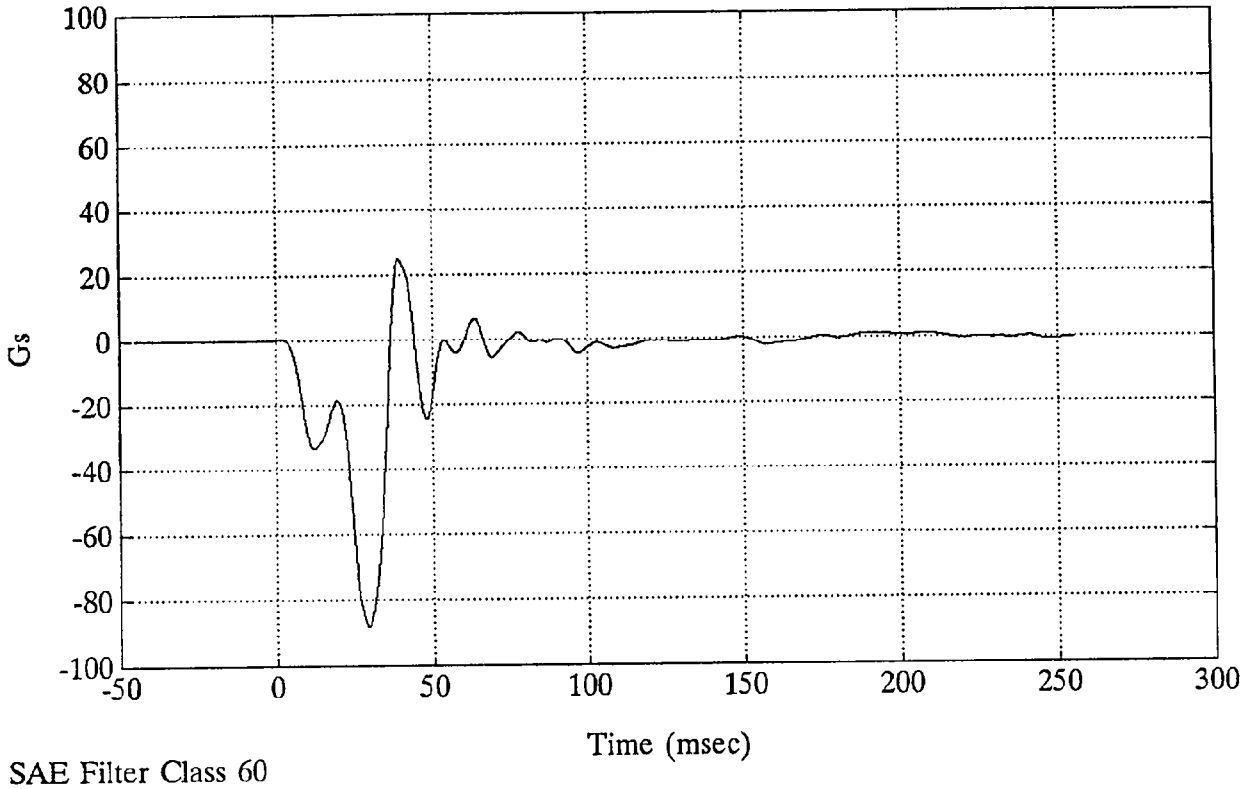


SAE Filter Class 180

FMVSS 208 - 1993 NISSAN ALTIMA

Engine Top X (#3)

Max = 24.62 Gs @ 39.36 msec
Min = -88.44 Gs @ 29.28 msec

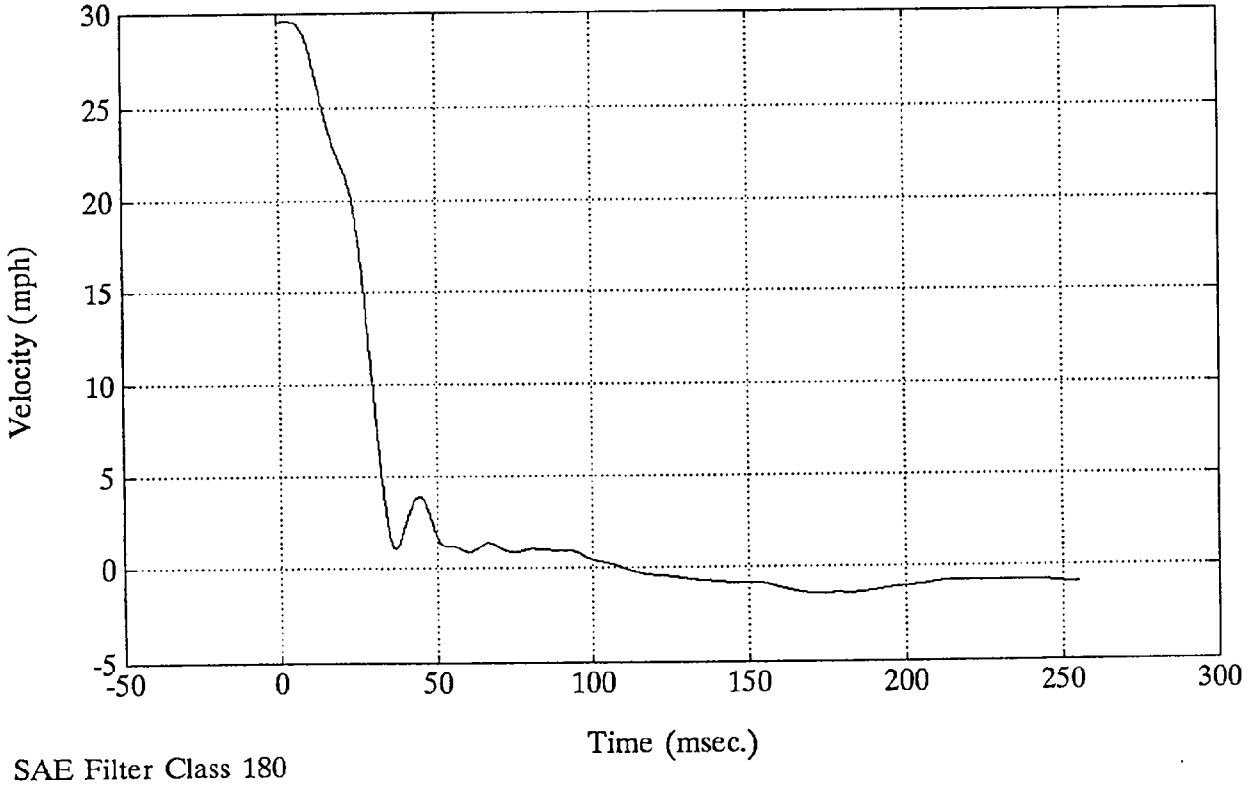


SAE Filter Class 60

FMVSS 208 - 1993 NISSAN ALTIMA

Engine Top X (#3)

Max = 29.62 mph @ 3.84 msec
Min = -1.40 mph @ 172.56 msec



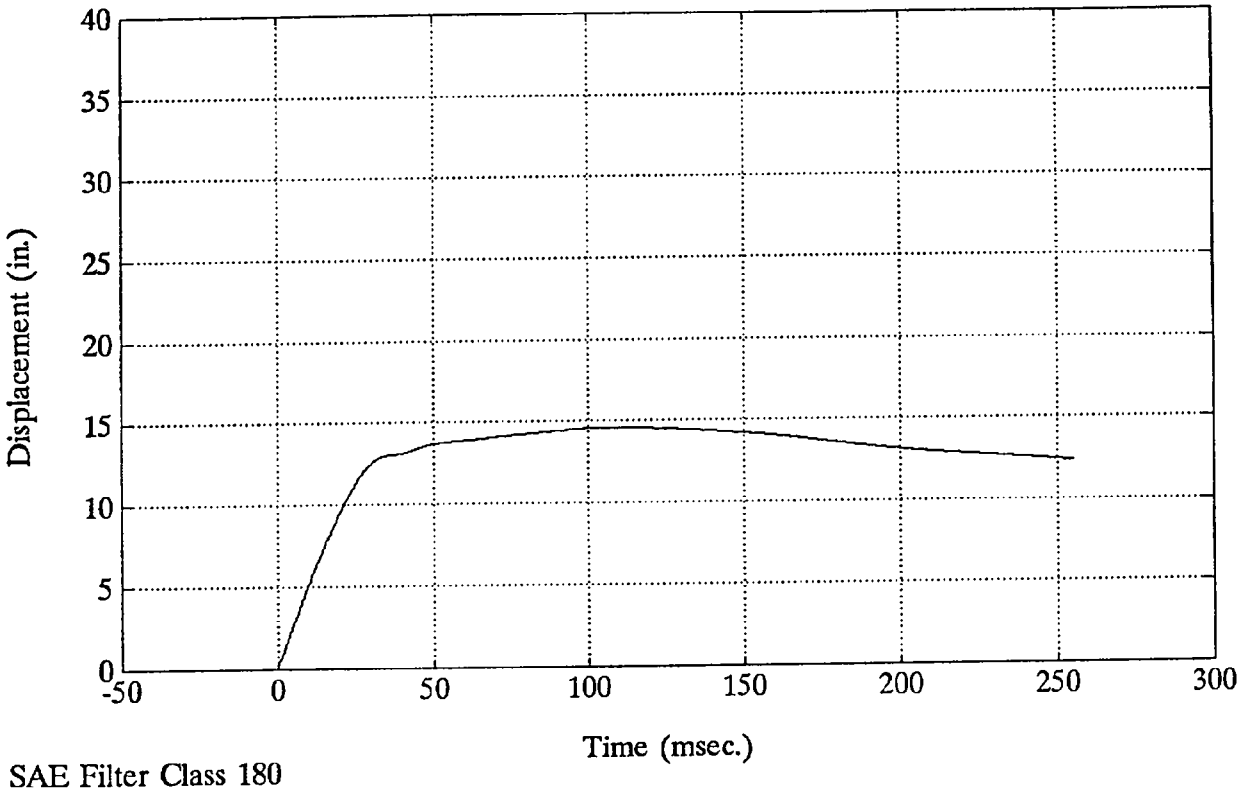
SAE Filter Class 180

8056-7

FMVSS 208 - 1993 NISSAN ALTIMA

Engine Top X (#3)

Max = 14.58 in. @ 111.36 msec
Min = 0.00 in. @ -0.00 msec

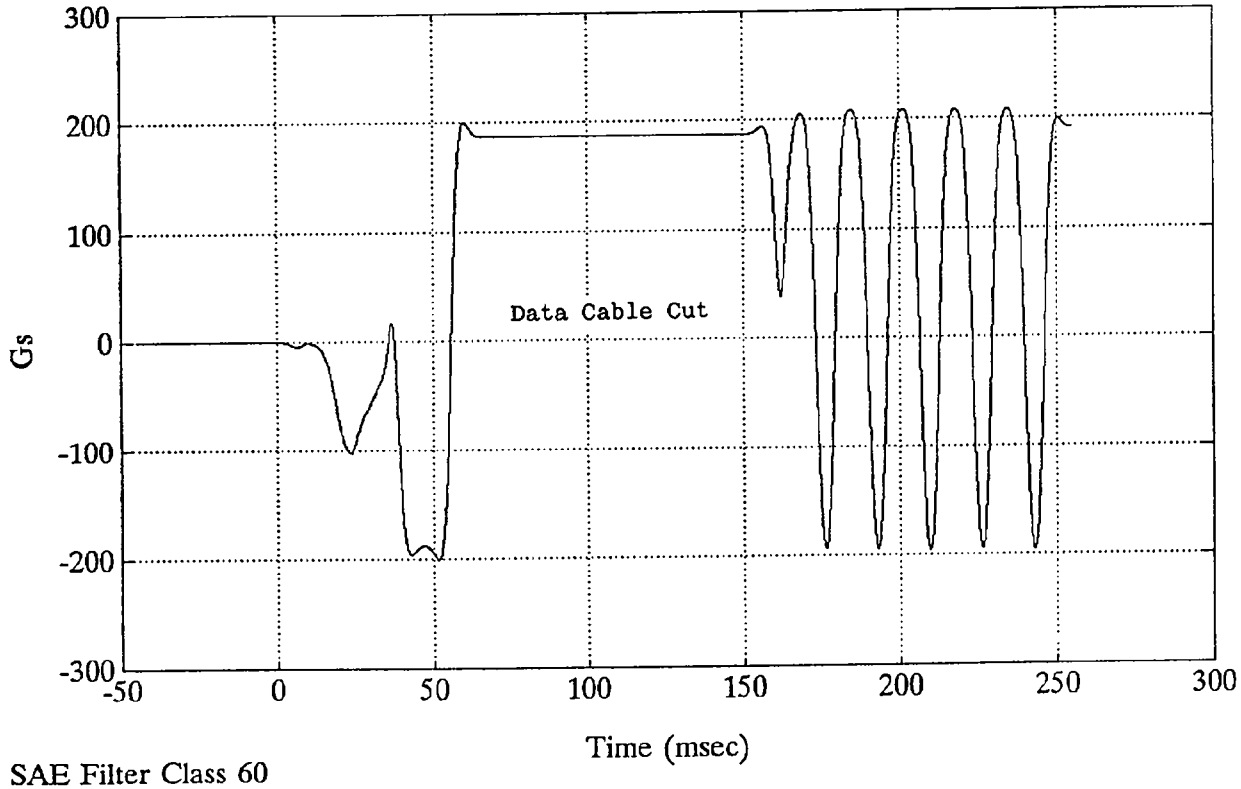


SAE Filter Class 180

FMVSS 208 - 1993 NISSAN ALTIMA

Engine Bottom X (#4)

Max = 207.70 Gs @ 234.48 msec
Min = -200.25 Gs @ 51.84 msec

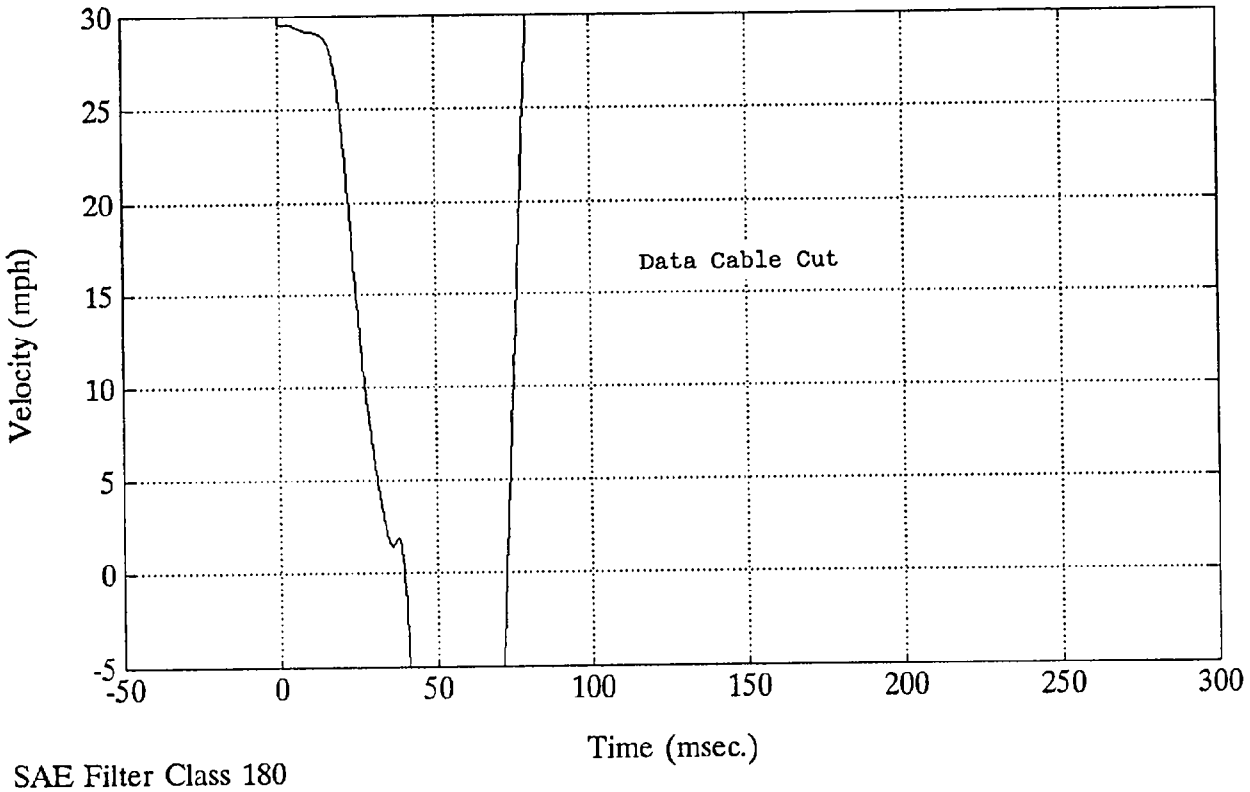


SAE Filter Class 60

FMVSS 208 - 1993 NISSAN ALTIMA

Engine Bottom X (#4)

Max = 476.52 mph @ 254.88 ms
Min = -63.40 mph @ 55.92 msec

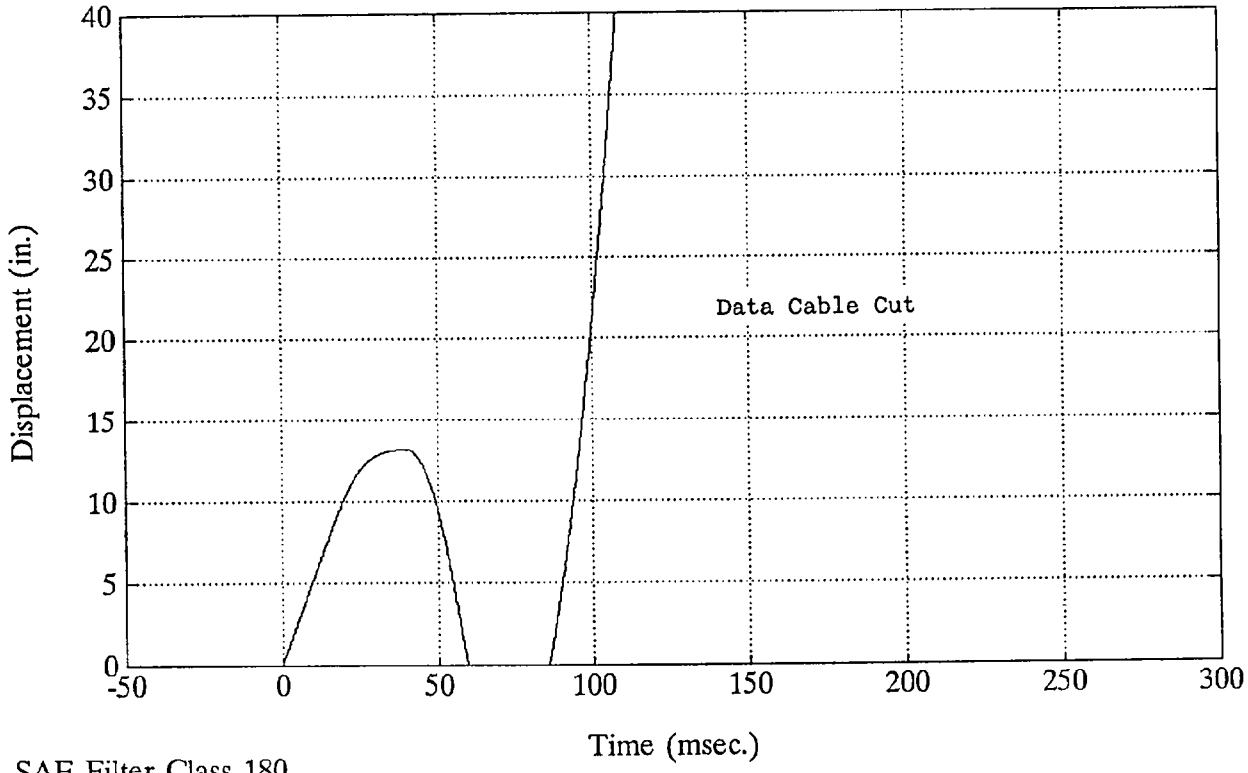


SAE Filter Class 180

FMVSS 208 - 1993 NISSAN ALTIMA

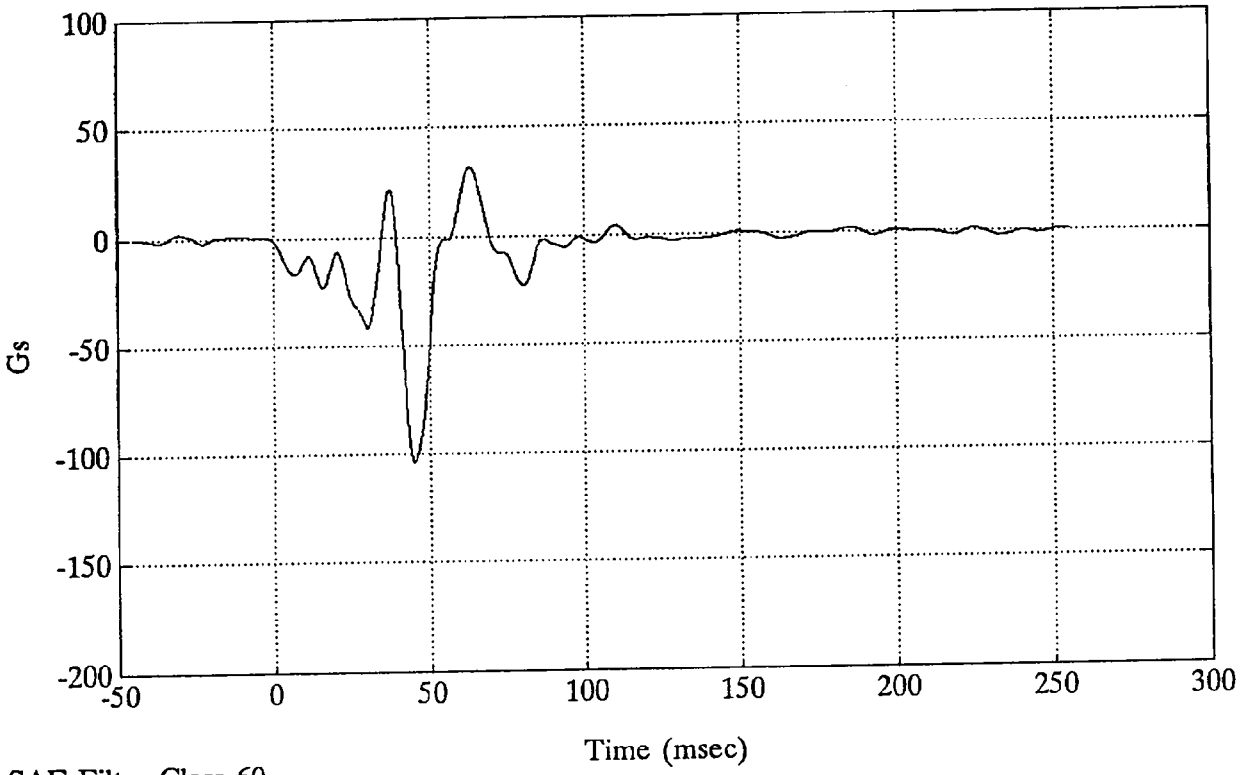
Engine Bottom X (#4)

Max = 969.00 in. @ 254.88 msec
Min = -6.06 in. @ 72.48 msec



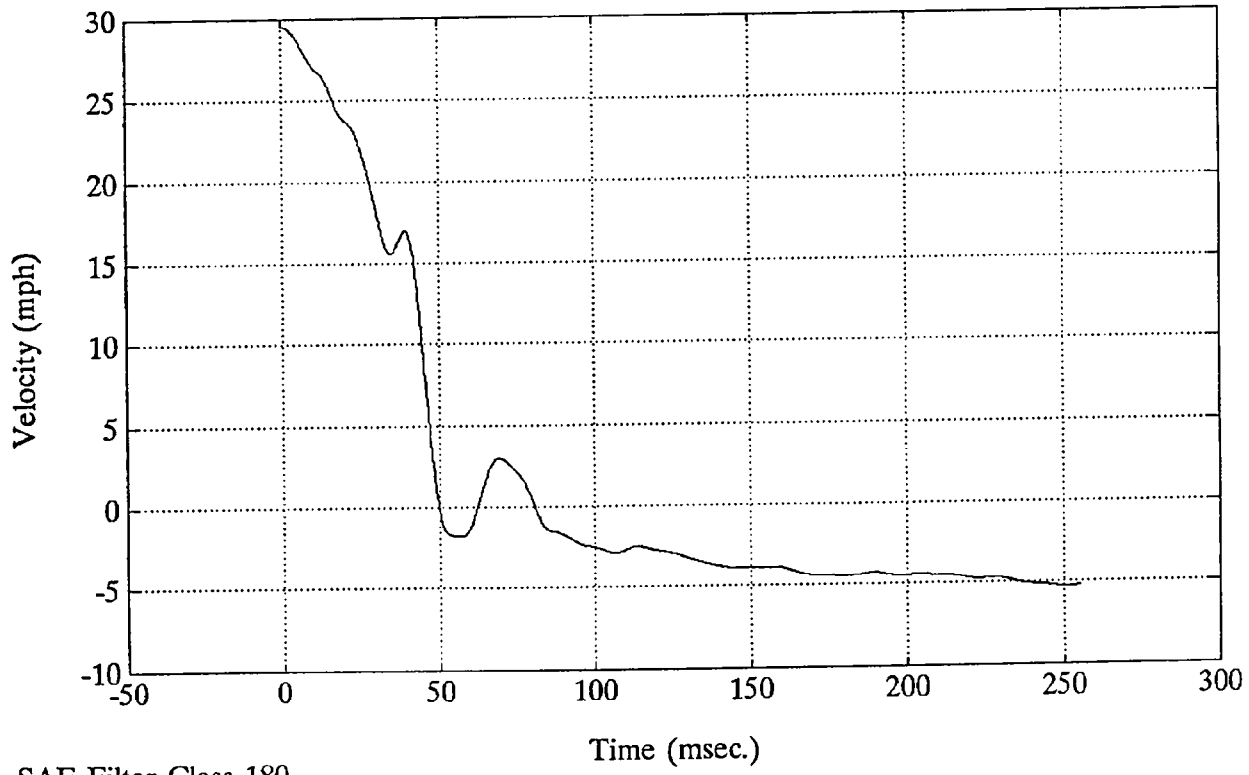
SAE Filter Class 180

FMVSS 208 - 1993 NISSAN ALTIMA
R. Brake Caliper X (#5)
Max = 31.27 Gs @ 63.12 msec
Min = -103.77 Gs @ 45.00 msec



SAE Filter Class 60

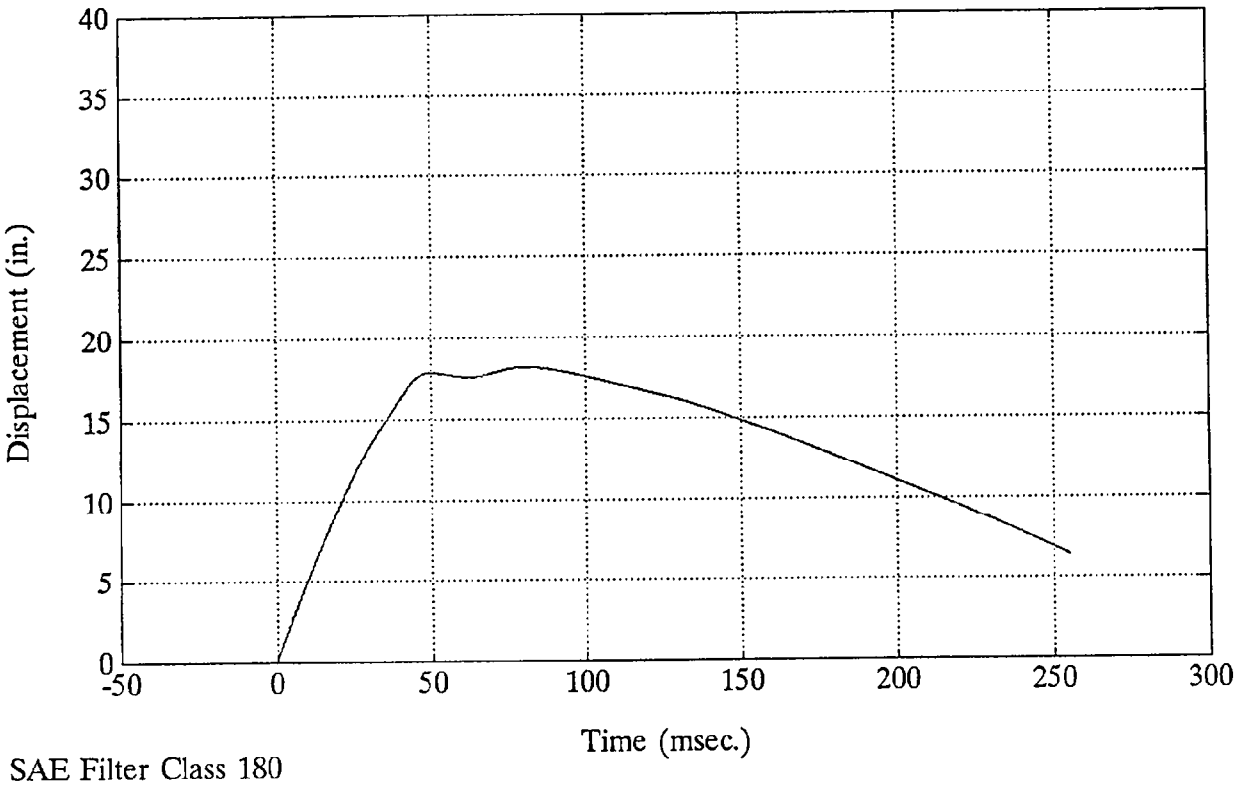
FMVSS 208 - 1993 NISSAN ALTIMA
R. Brake Caliper X (#5)
Max = 29.60 mph @ -0.00 msec
Min = -5.29 mph @ 250.32 msec



SAE Filter Class 180

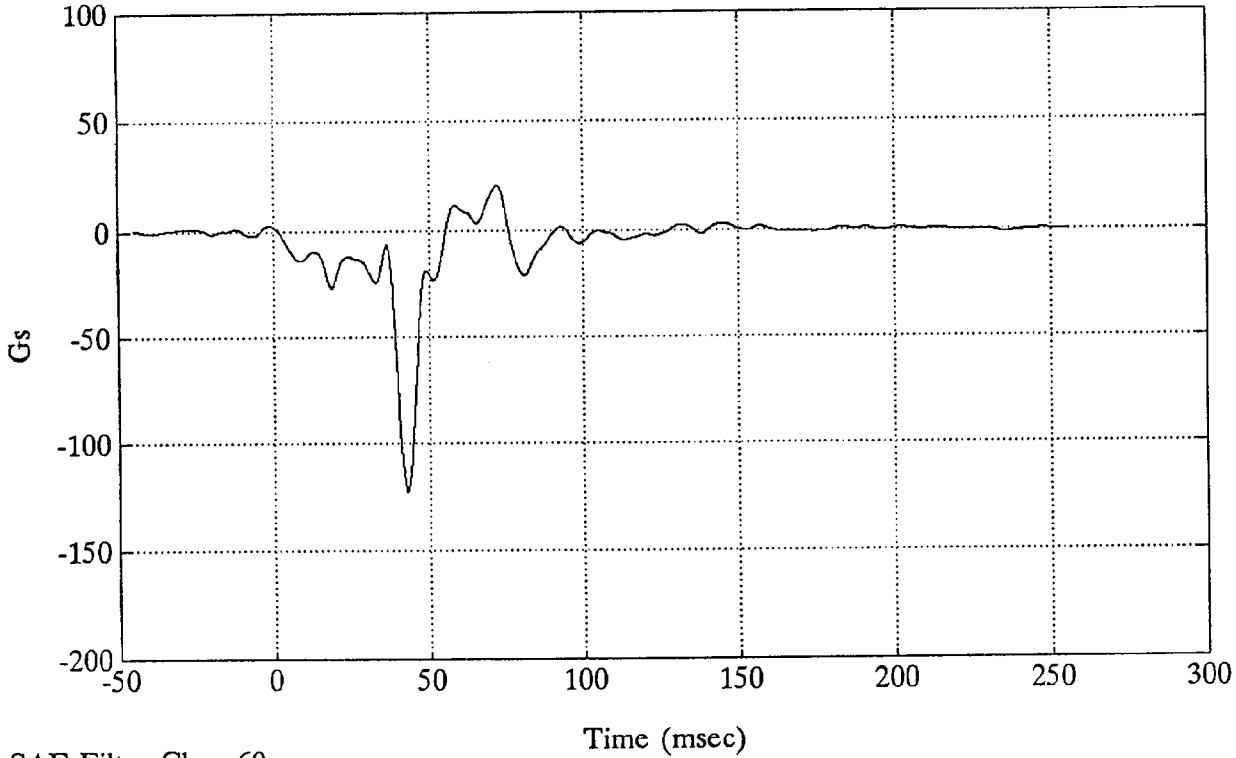
8056-7

FMVSS 208 - 1993 NISSAN ALTIMA
R. Brake Caliper X (#5)
Max = 18.20 in. @ 81.84 msec
Min = 0.00 in. @ -0.00 msec



SAE Filter Class 180

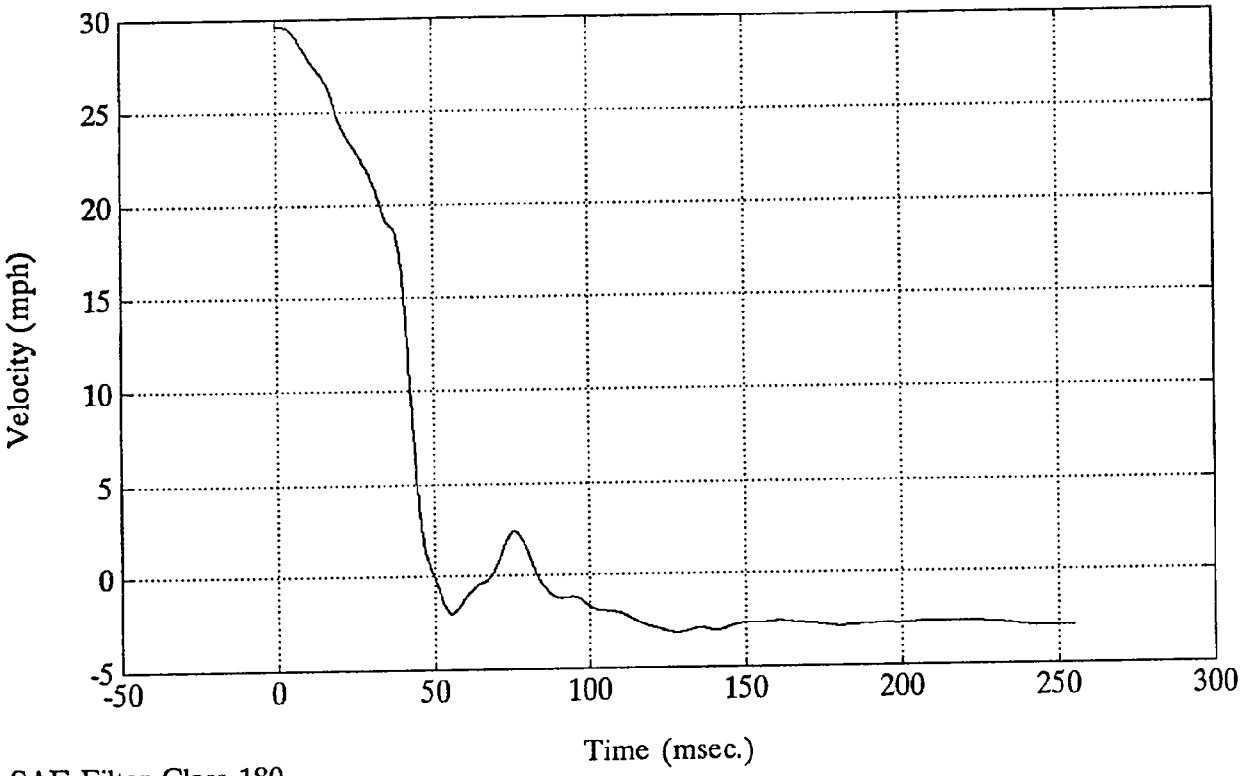
FMVSS 208 - 1993 NISSAN ALTIMA
L. Brake Caliper X (#6)
Max = 20.20 Gs @ 72.12 msec
Min = -122.33 Gs @ 42.96 msec



SAE Filter Class 60

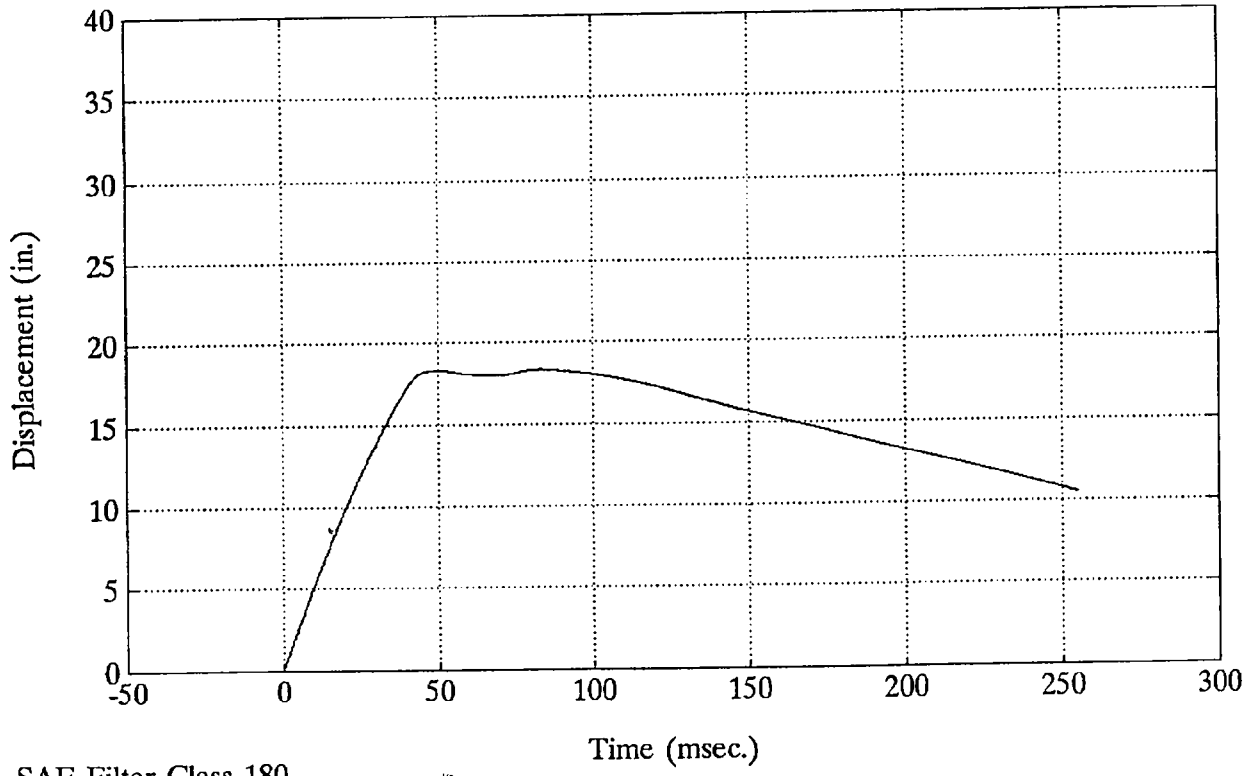
8056-7

FMVSS 208 - 1993 NISSAN ALTIMA
L. Brake Caliper X (#6)
Max = 29.64 mph @ 1.92 msec
Min = -3.19 mph @ 128.16 msec



SAE Filter Class 180

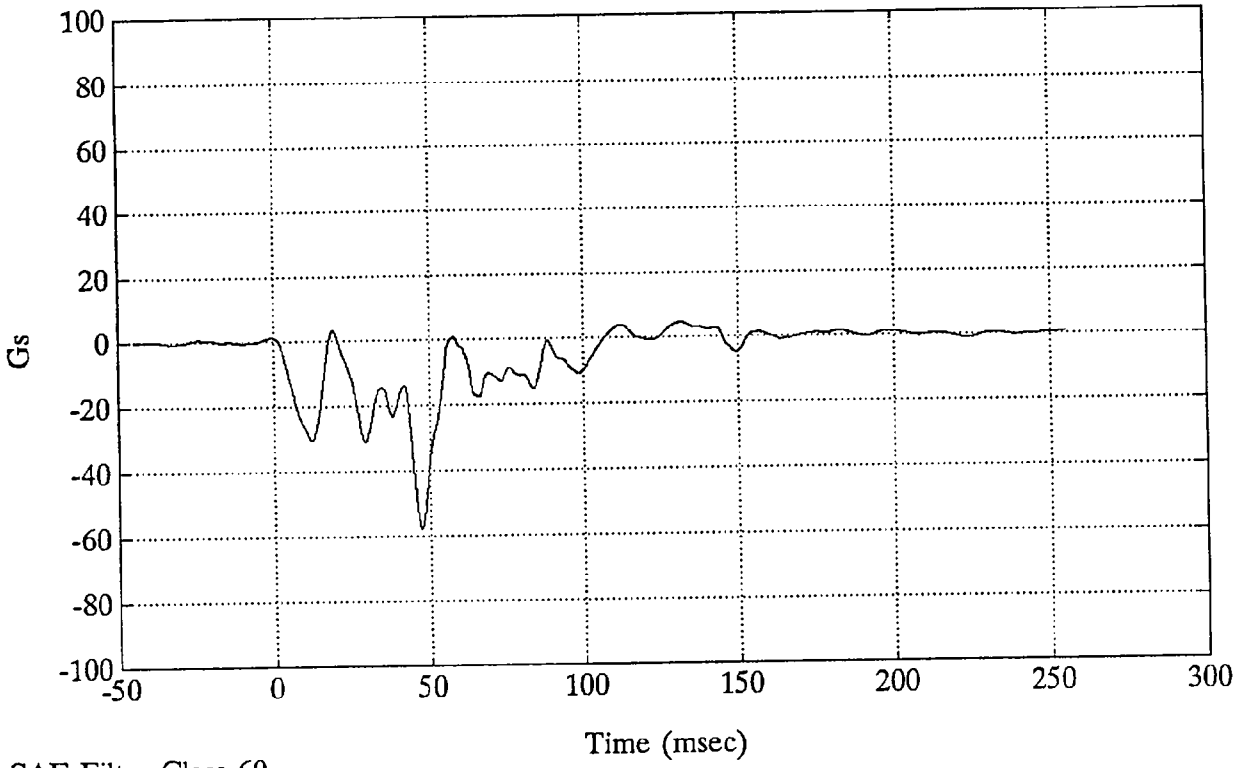
FMVSS 208 - 1993 NISSAN ALTIMA
L. Brake Caliper X (#6)
Max = 18.36 in. @ 83.28 msec
Min = 0.00 in. @ -0.00 msec



SAE Filter Class 180

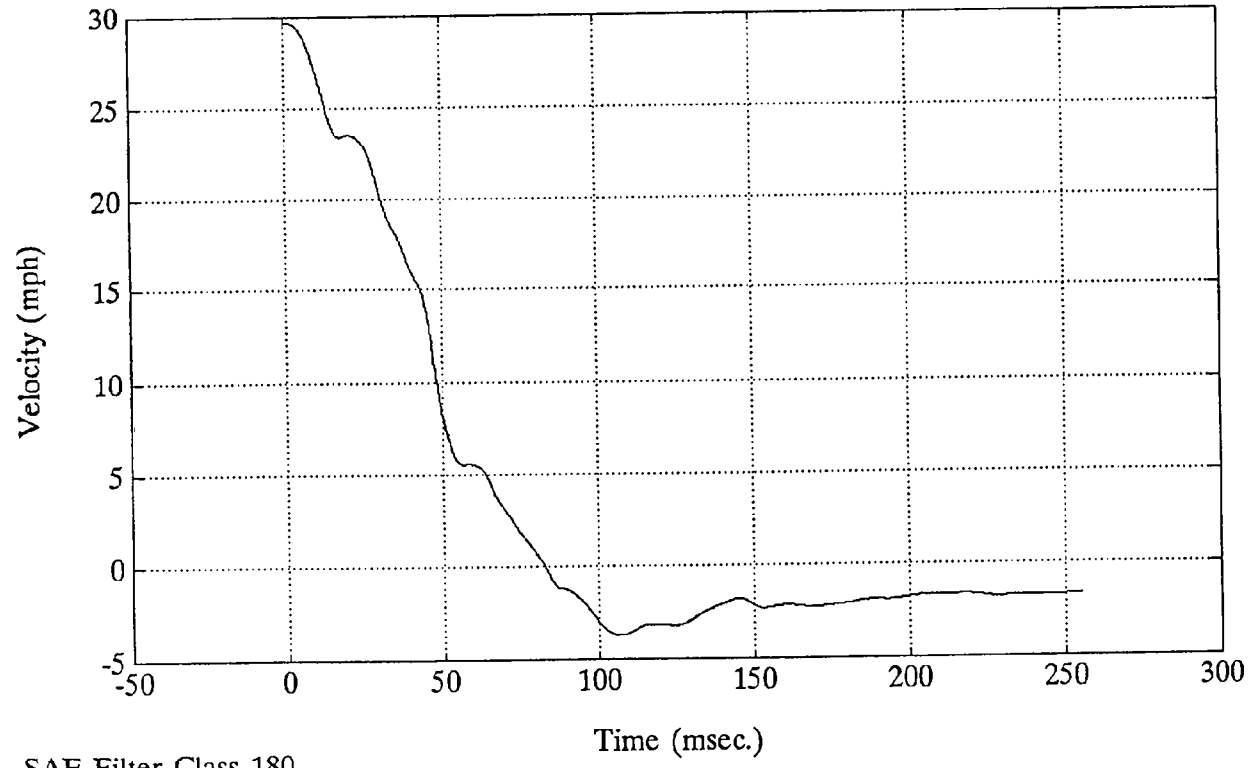
8056-7

FMVSS 208 - 1993 NISSAN ALTIMA
Instrument Panel X (#7)
Max = 4.78 Gs @ 131.28 msec
Min = -57.58 Gs @ 47.28 msec



SAE Filter Class 60

FMVSS 208 - 1993 NISSAN ALTIMA
Instrument Panel X (#7)
Max = 29.62 mph @ 1.92 msec
Min = -3.68 mph @ 106.80 msec

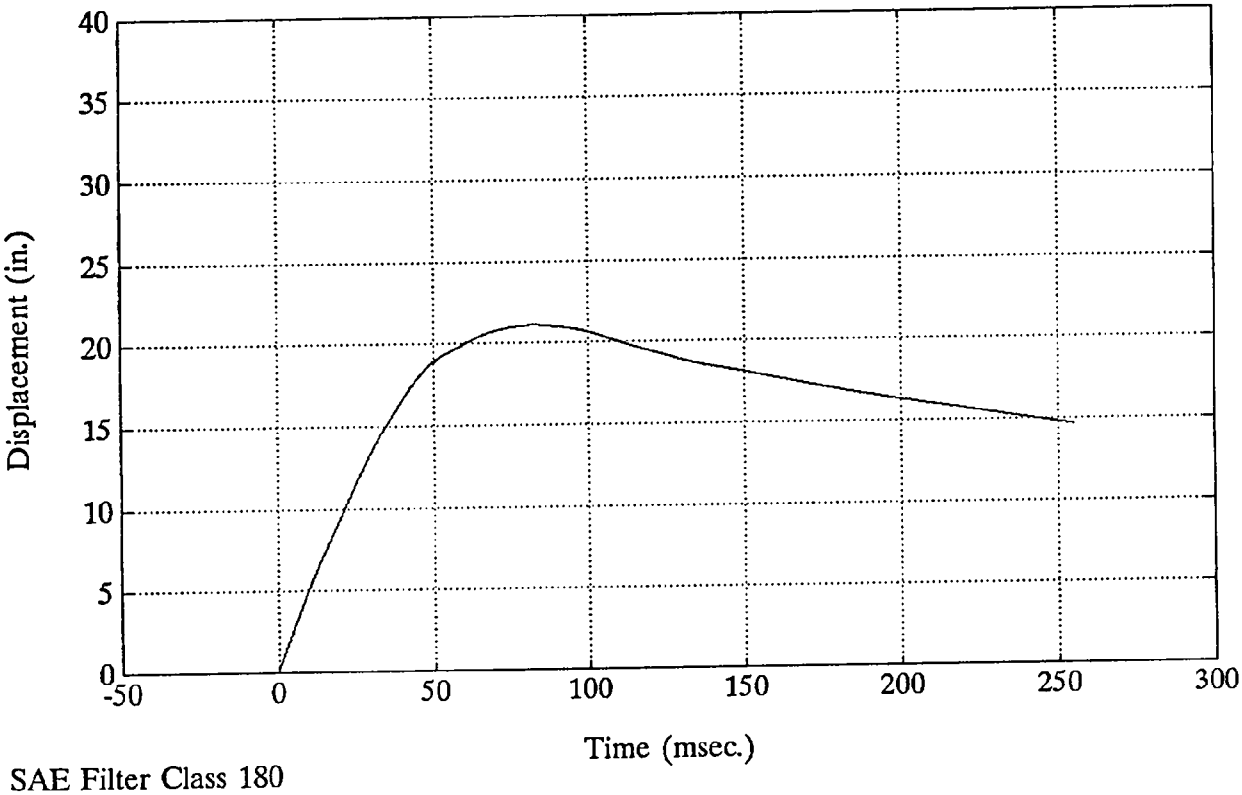


SAE Filter Class 180

FMVSS 208 - 1993 NISSAN ALTIMA

Instrument Panel X (#7)

Max = 21.08 in. @ 84.00 msec
Min = 0.00 in. @ -0.00 msec



SAE Filter Class 180

TEST NO. CP5202

DUMMY DATA	SAE FILTER CHANNEL CLASS
Head Accelerations	1000
Chest Accelerations	180
Femur Forces	600

FACILITY: TRACK TEST DATE: 12 Nov 1992
RUN #: 1236 TEST TIME: 11:20:52
SERIES #: 6 BOARD: a

TITLE: NHTSA "208" TEST #7 - 1993 NISSAN ALTIMA

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM AMP	MAXIMUM msec	MINIMUM AMP	MINIMUM msec	FILTER CLASS
1	Pos. 1 Head X	Gs	12.3	35.4	-42.0	86.5	1000.0
2	Pos. 1 Head Y	Gs	2.9	162.7	-10.1	94.8	1000.0
3	Pos. 1 Head Z	Gs	55.7	76.3	-2.5	29.6	1000.0
4	Pos. 1 Left Femur	lbs	329.1	15.2	-1471.1	60.8	600.0
5	Pos. 1 Chest X	Gs	5.3	196.6	-36.2	61.4	180.0
6	Pos. 1 Chest Y	Gs	5.0	195.2	-12.4	84.0	180.0
7	Pos. 1 Chest Z	Gs	7.2	47.2	-11.3	69.7	180.0
8	Pos. 1 Right Femur	lbs	59.5	27.7	-764.6	45.5	600.0
9	Pos. 2 Head X	Gs	9.8	185.9	-20.4	106.7	1000.0
10	Pos. 2 Head Y	Gs	24.4	97.8	-4.3	174.6	1000.0
11	Pos. 2 Head Z	Gs	41.9	71.4	-2.8	31.2	1000.0
12	Pos. 2 Left Femur	lbs	42.5	136.3	-1213.8	55.1	600.0
13	Pos. 2 Chest X	Gs	6.7	243.7	-35.9	63.4	180.0
14	Pos. 2 Chest Y	Gs	16.9	92.8	-2.1	230.2	180.0
15	Pos. 2 Chest Z	Gs	3.6	215.2	-9.2	54.6	180.0
16	Pos. 2 Right Femur	lbs	105.5	113.9	-946.0	84.4	600.0
17	Pos. 1 Head Resultant	Gs	64.0	76.2	.0	-13.3	1000.0
18	Pos. 1 Chest Resultant	Gs	38.4	61.3	.0	-21.5	180.0
19	Pos. 2 Head Resultant	Gs	44.2	88.4	.0	14.3	1000.0
20	Pos. 2 Chest Resultant	Gs	39.0	63.2	.1	-20.2	180.0

CLIP SUMMARY: Pos. 1 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 35.777 G's
Tstart = 60.0000 ms
Tend = 63.1200 ms
CSI = 222.479

CLIP SUMMARY: Pos. 2 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 34.698 G's
Tstart = 61.4400 ms
Tend = 64.5600 ms
CSI = 220.679

36 ms Fixed Duration HIC SUMMARY: Pos. 1 Head Resultant

hic: 515.69
t1 = 63.720 msec
t2 = 96.840 msec
Average G's Over Hic Duration = 47.52

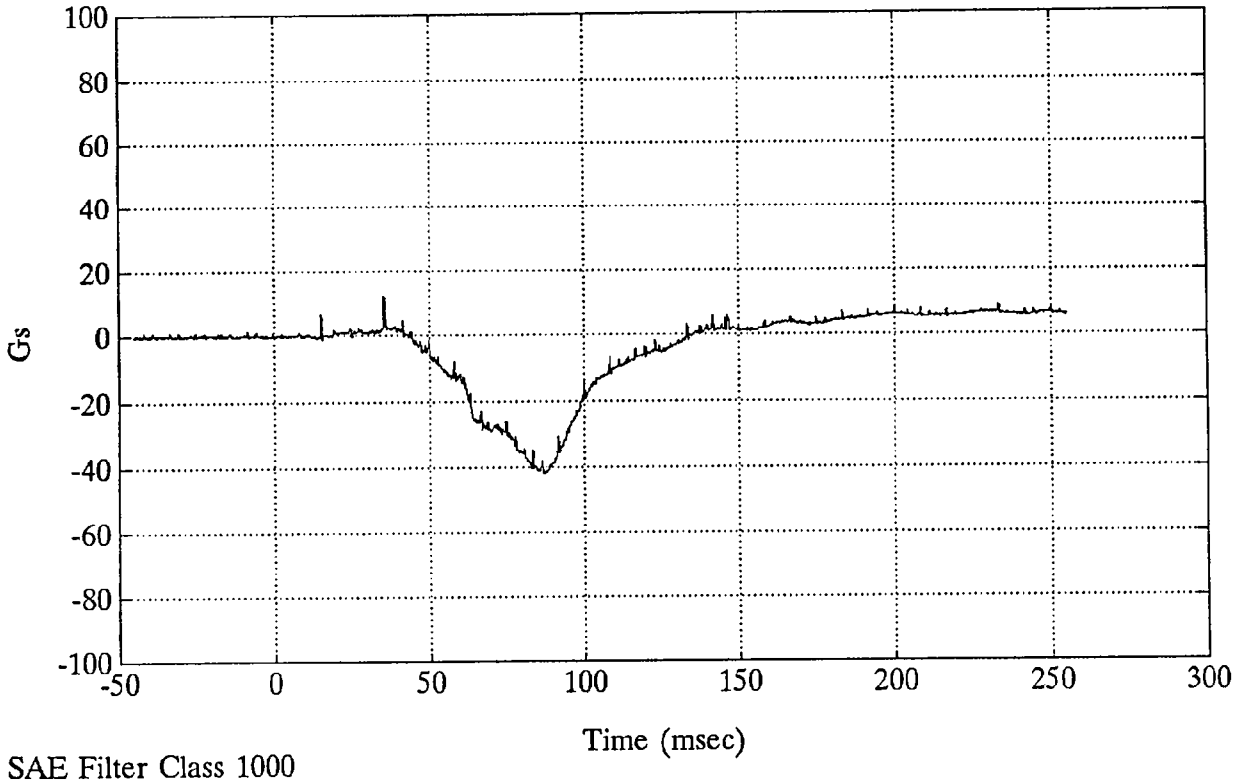
36 ms Fixed Duration HIC SUMMARY: Pos. 2 Head Resultant

hic: 384.99
t1 = 67.080 msec
t2 = 102.960 msec
Average G's Over Hic Duration = 40.95

FMVSS 208 - 1993 NISSAN ALTIMA

Pos. 1 Head X

Max = 12.32 Gs @ 35.40 msec
Min = -42.01 Gs @ 86.52 msec

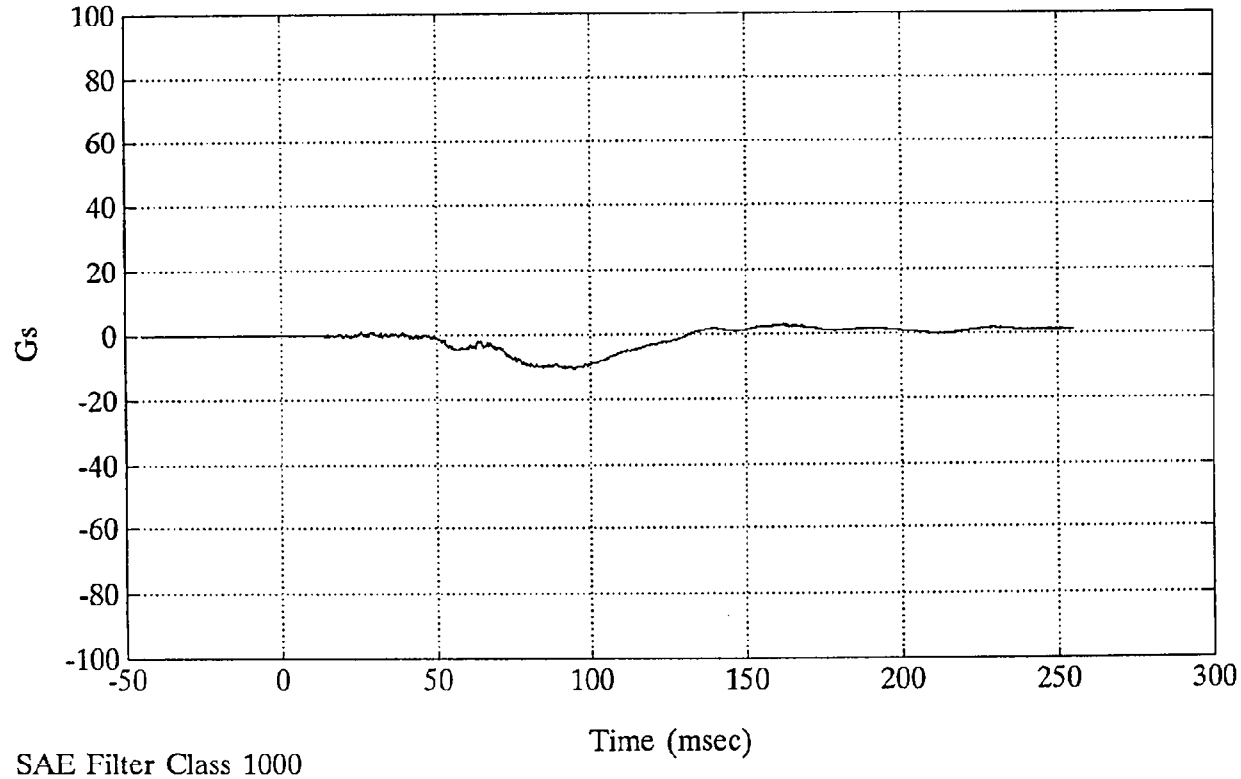


SAE Filter Class 1000

FMVSS 208 - 1993 NISSAN ALTIMA

Pos. 1 Head Y

Max = 2.93 Gs @ 162.72 msec
Min = -10.08 Gs @ 94.80 msec

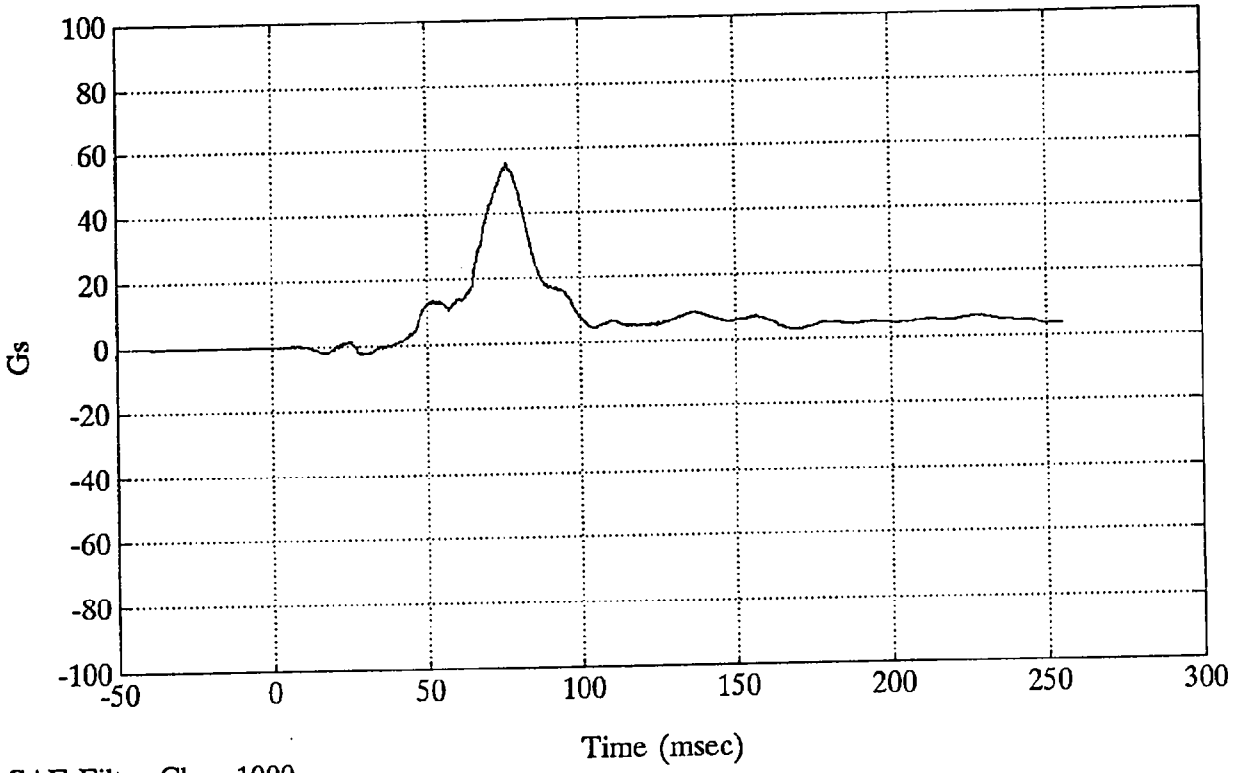


SAE Filter Class 1000

FMVSS 208 - 1993 NISSAN ALTIMA

Pos. 1 Head Z

Max = 55.66 Gs @ 76.32 msec
Min = -2.49 Gs @ 29.64 msec

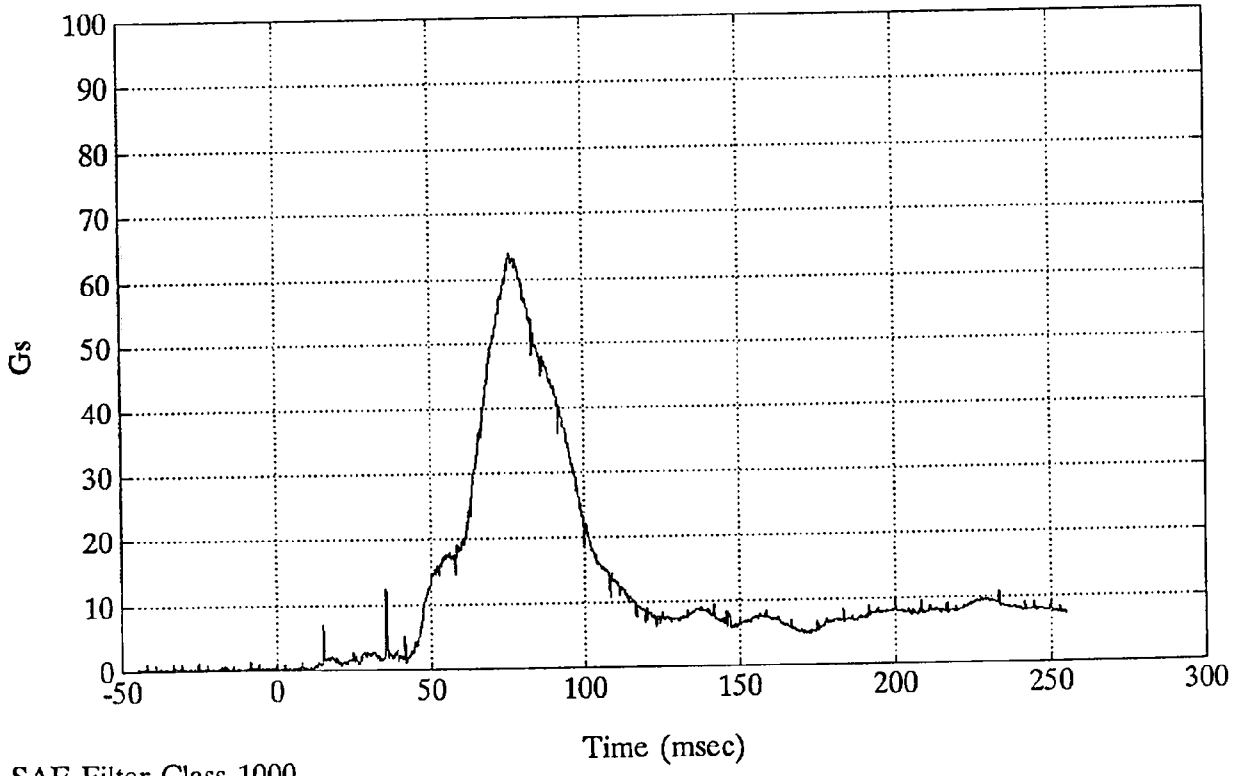


SAE Filter Class 1000

FMVSS 208 - 1993 NISSAN ALTIMA

Pos. 1 Head Resultant

Max = 63.98 Gs @ 76.20 msec
Min = 0.03 Gs @ -13.32 msec

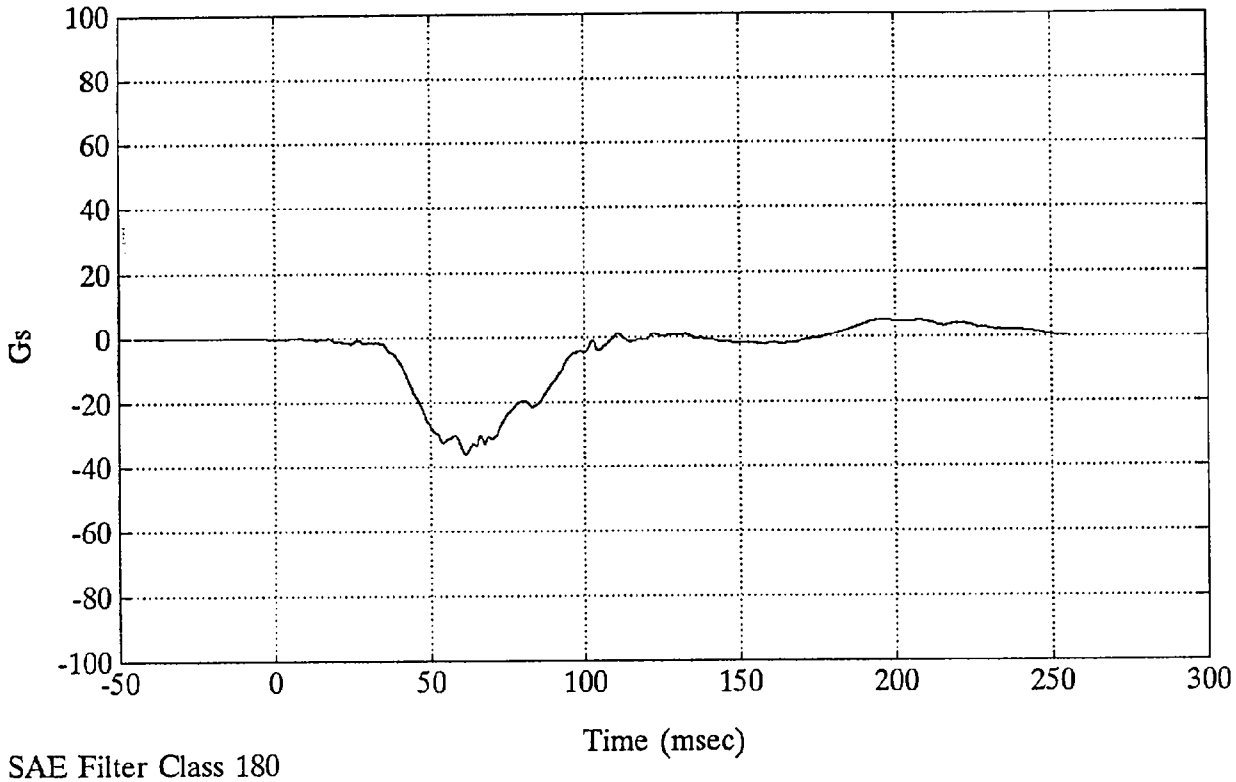


SAE Filter Class 1000

FMVSS 208 - 1993 NISSAN ALTIMA

Pos. 1 Chest X

Max = 5.31 Gs @ 196.56 msec
Min = -36.16 Gs @ 61.44 msec

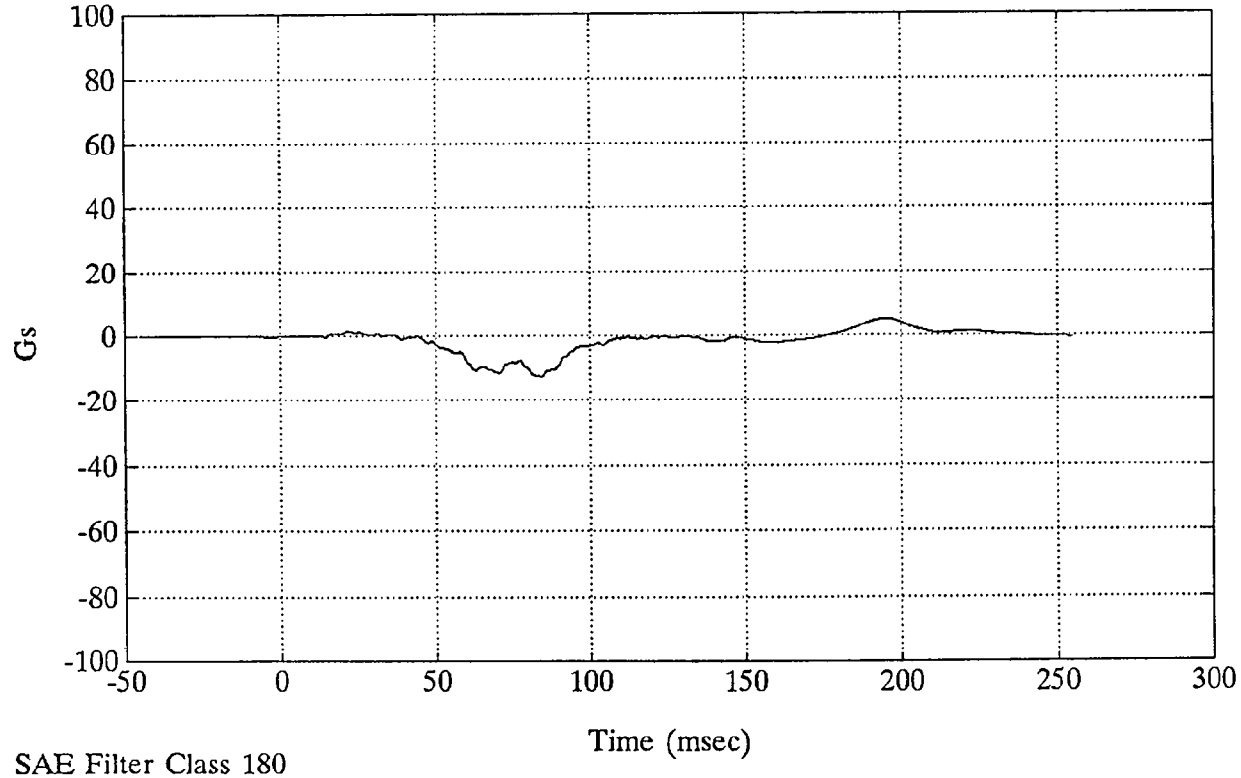


SAE Filter Class 180

FMVSS 208 - 1993 NISSAN ALTIMA

Pos. 1 Chest Y

Max = 4.99 Gs @ 195.24 msec
Min = -12.42 Gs @ 84.00 msec

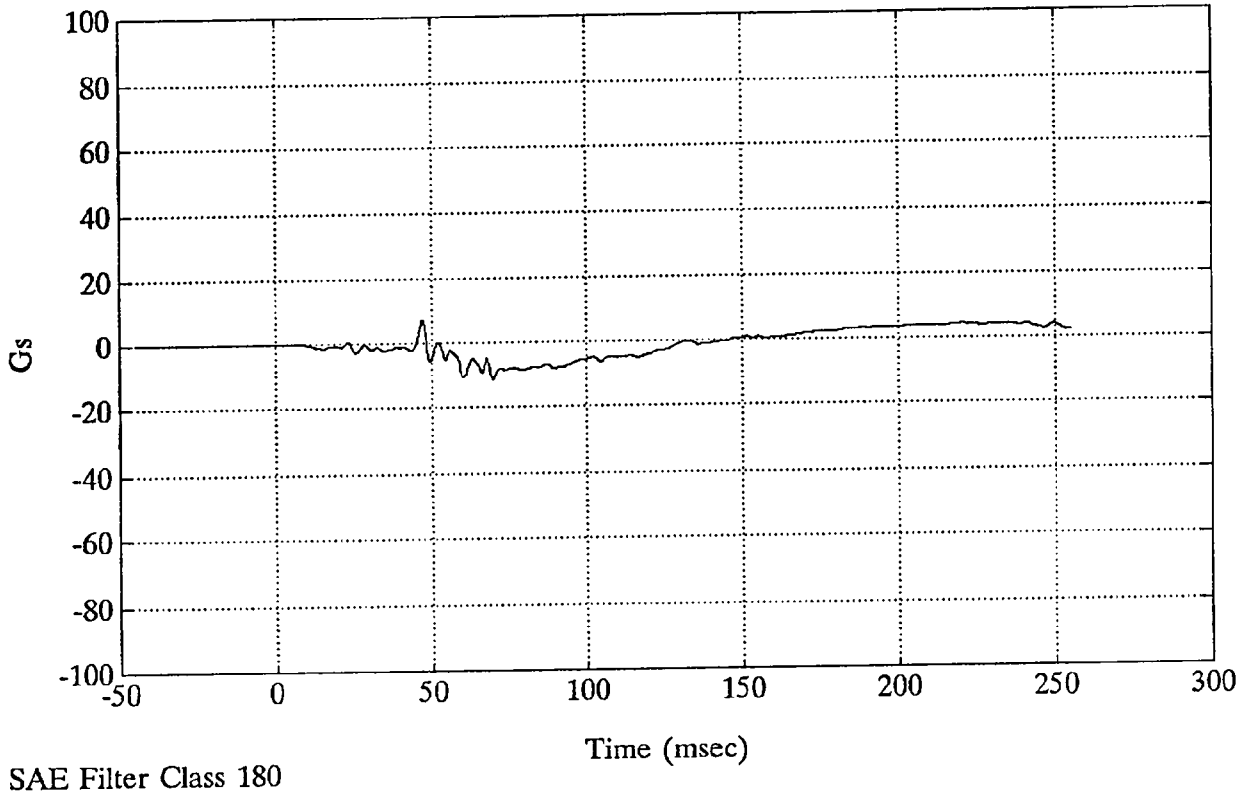


SAE Filter Class 180

FMVSS 208 - 1993 NISSAN ALTIMA

Pos. 1 Chest Z

Max = 7.17 Gs @ 47.16 msec
Min = -11.31 Gs @ 69.72 msec

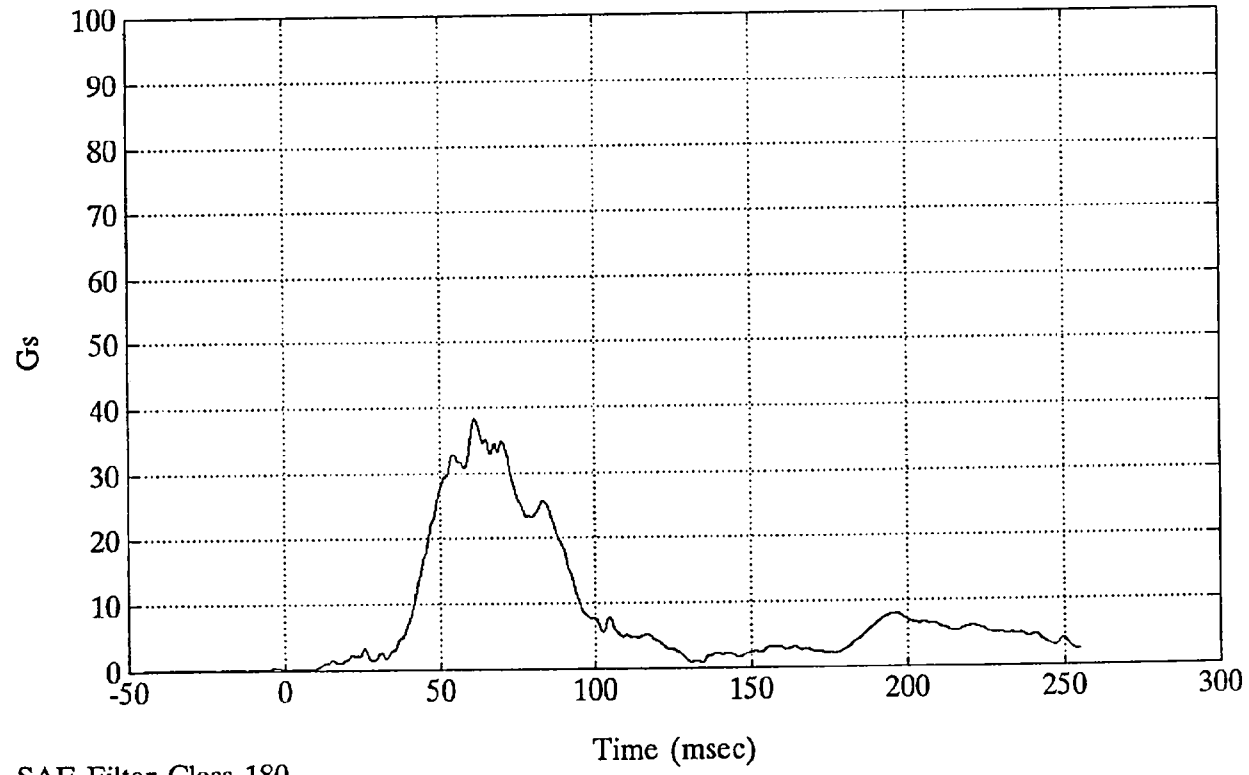


SAE Filter Class 180

FMVSS 208 - 1993 NISSAN ALTIMA

Pos. 1 Chest Resultant

Max = 38.38 Gs @ 61.32 msec
Min = 0.04 Gs @ -21.48 msec

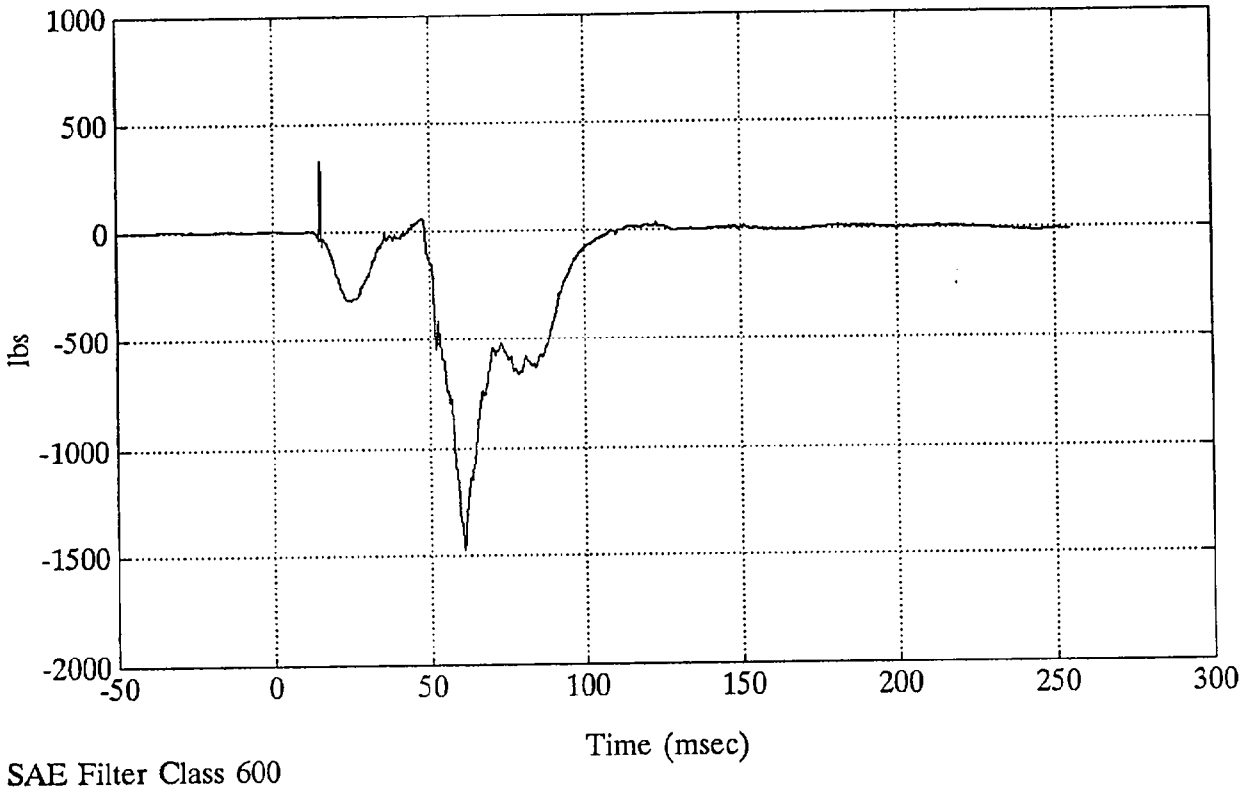


SAE Filter Class 180

FMVSS 208 - 1993 NISSAN ALTIMA

Pos. 1 Left Femur

Max = 329.12 lbs @ 15.24 msec
Min = -1471.10 lbs @ 60.84 msec

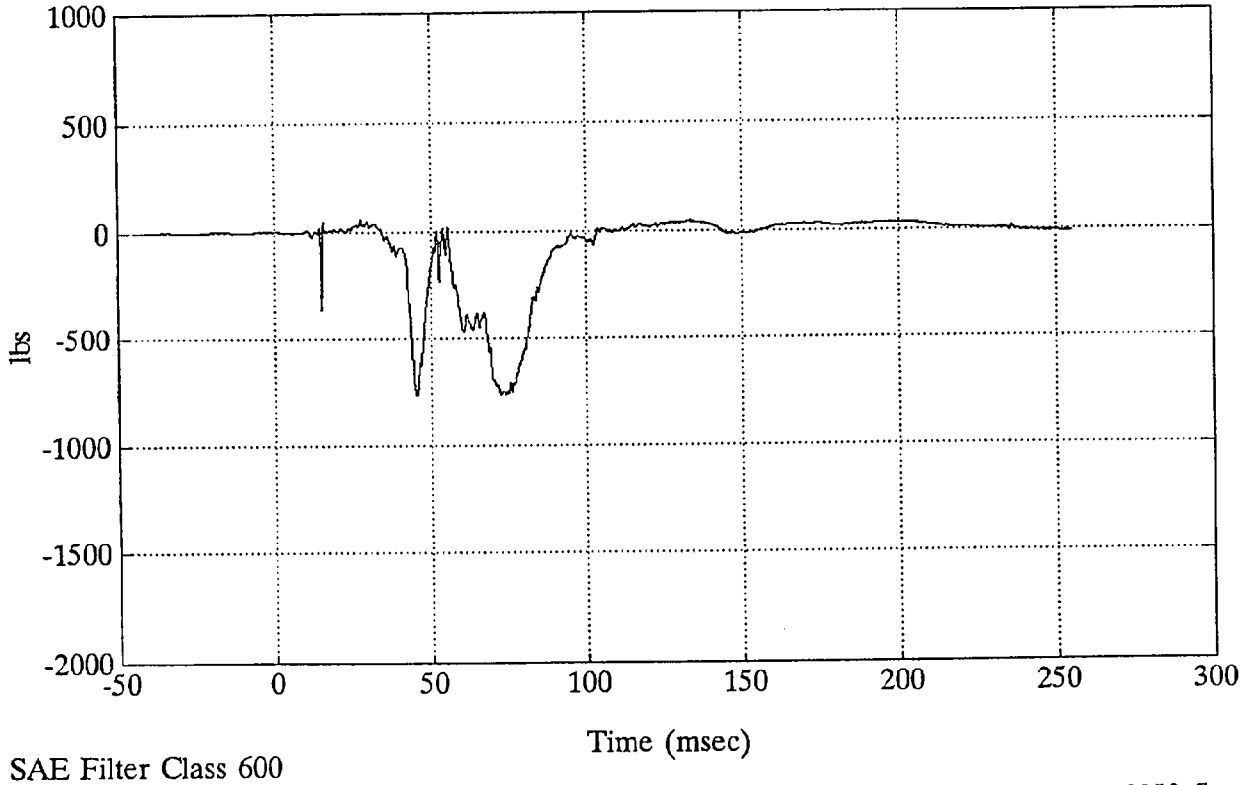


SAE Filter Class 600

FMVSS 208 - 1993 NISSAN ALTIMA

Pos. 1 Right Femur

Max = 59.53 lbs @ 27.72 msec
Min = -764.64 lbs @ 45.48 msec

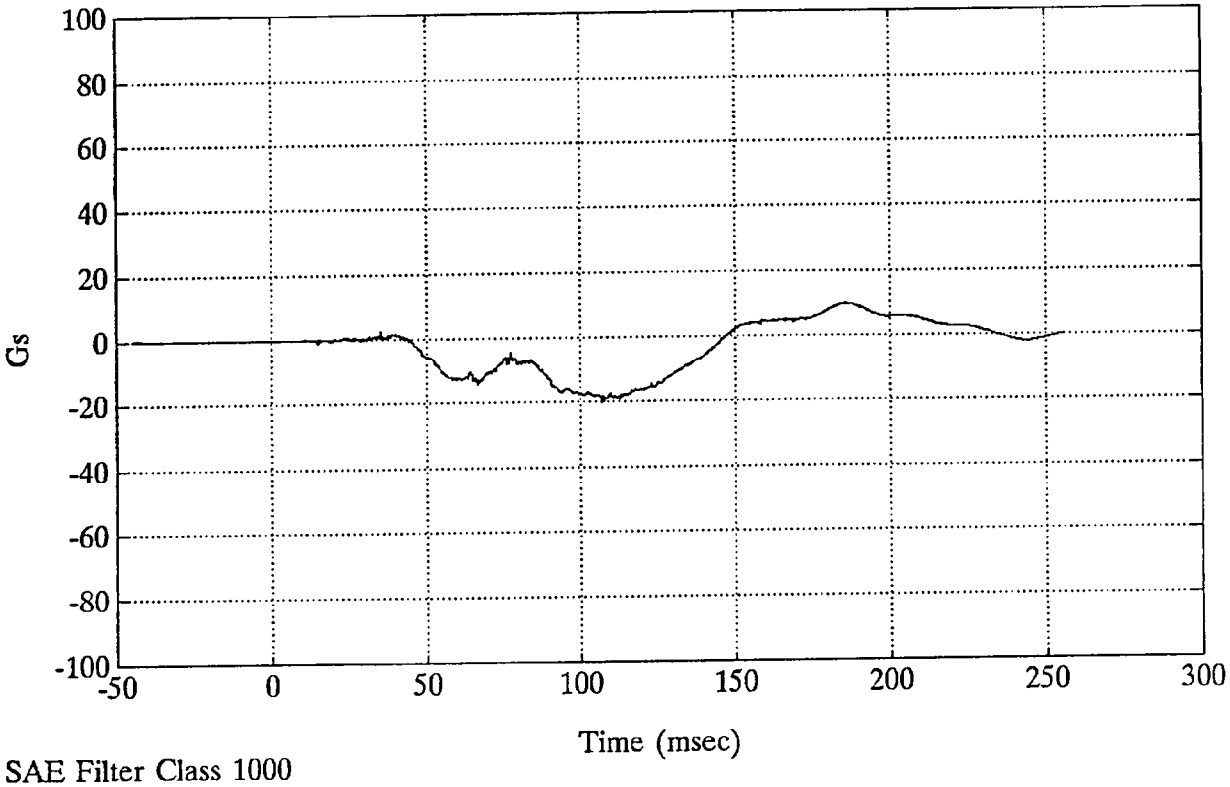


SAE Filter Class 600

FMVSS 208 - 1993 NISSAN ALTIMA

Pos. 2 Head X

Max = 9.83 Gs @ 185.88 msec
Min = -20.36 Gs @ 106.68 msec

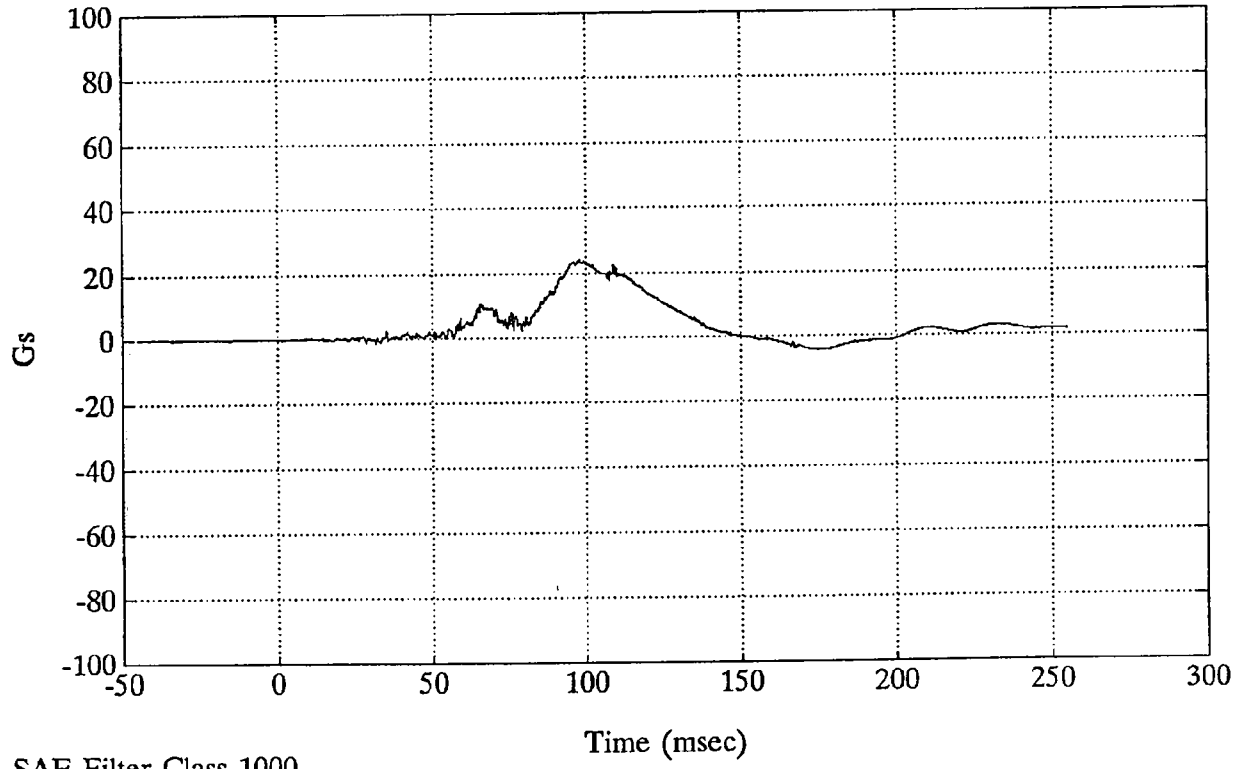


SAE Filter Class 1000

FMVSS 208 - 1993 NISSAN ALTIMA

Pos. 2 Head Y

Max = 24.35 Gs @ 97.80 msec
Min = -4.27 Gs @ 174.60 msec

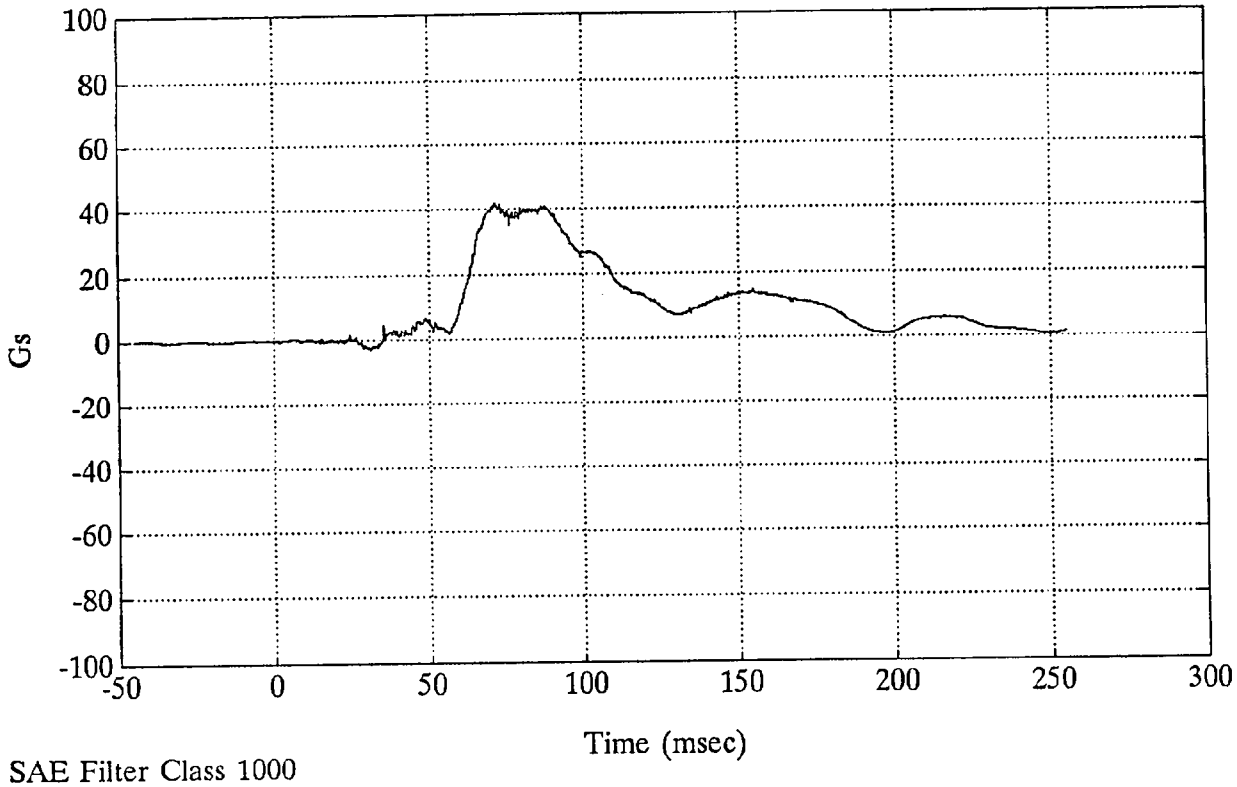


SAE Filter Class 1000

FMVSS 208 - 1993 NISSAN ALTIMA

Pos. 2 Head Z

Max = 41.88 Gs @ 71.40 msec
Min = -2.85 Gs @ 31.20 msec

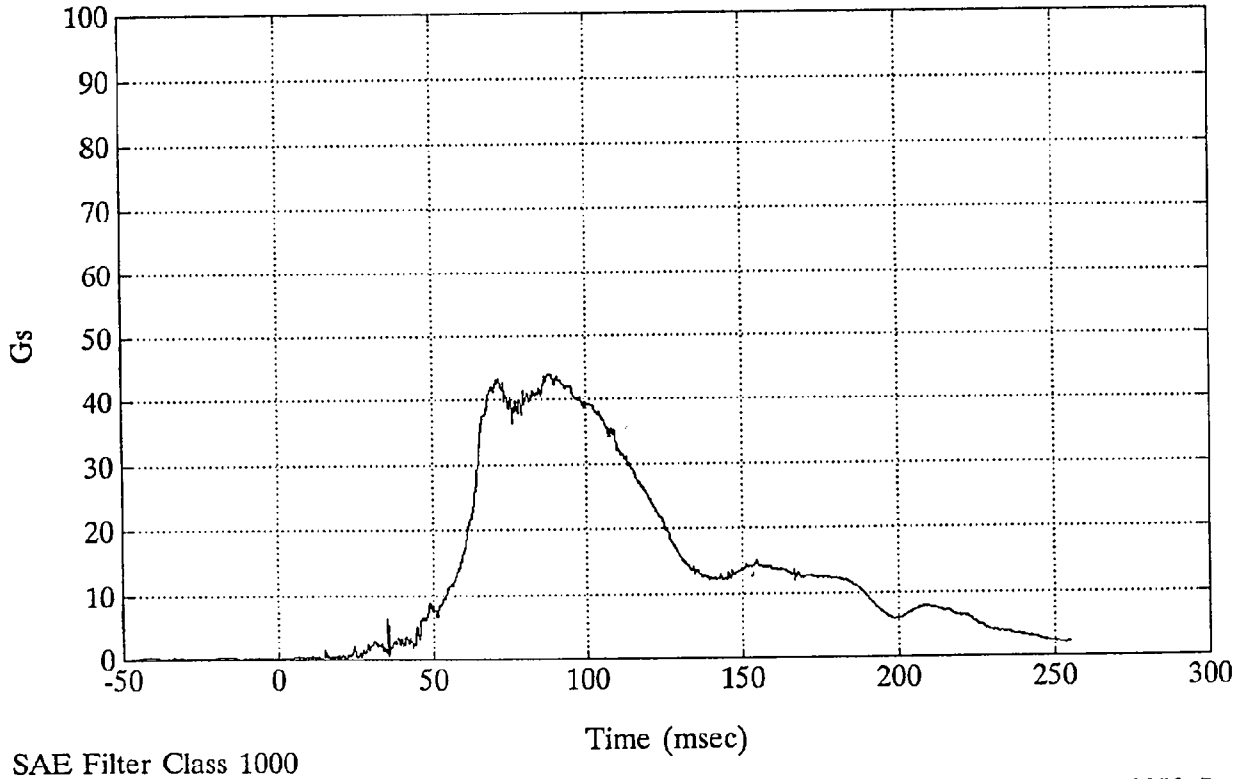


SAE Filter Class 1000

FMVSS 208 - 1993 NISSAN ALTIMA

Pos. 2 Head Resultant

Max = 44.17 Gs @ 88.44 msec
Min = 0.05 Gs @ 14.28 msec



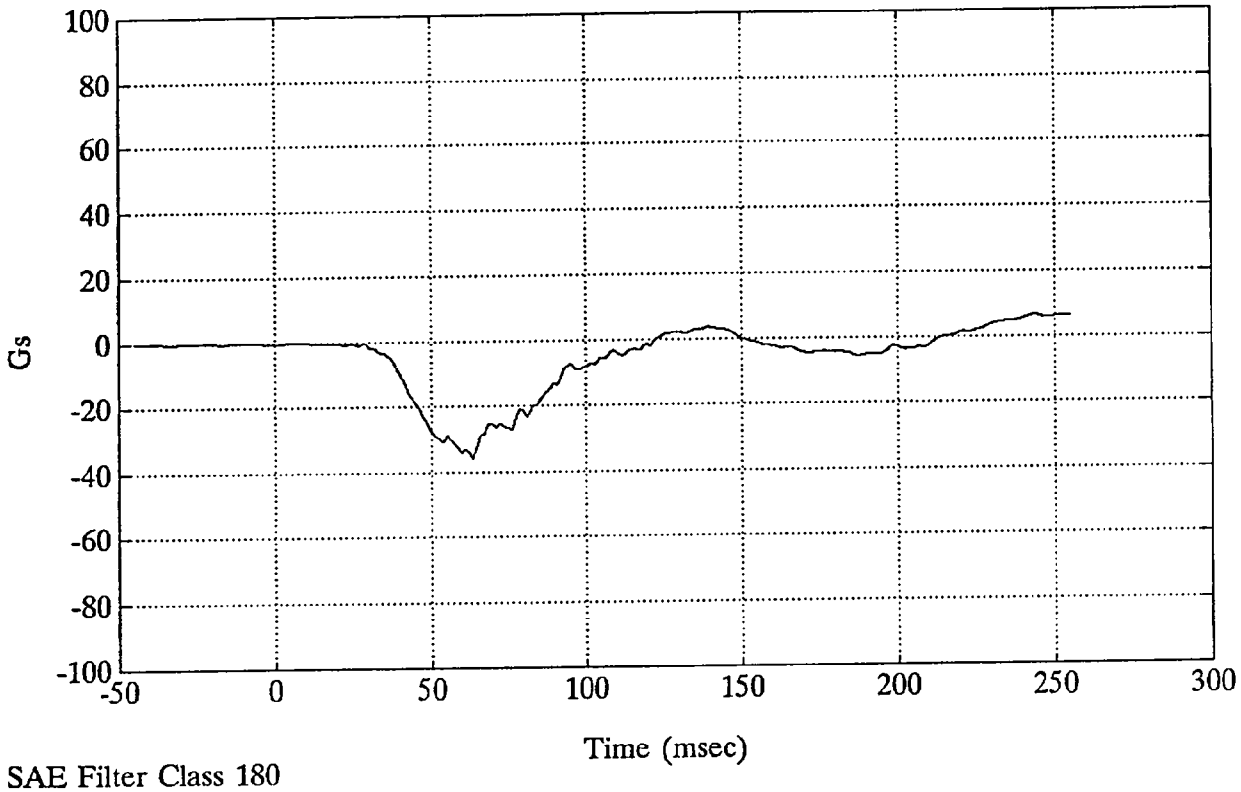
SAE Filter Class 1000

8056-7

FMVSS 208 - 1993 NISSAN ALTIMA

Pos. 2 Chest X

Max = 6.66 Gs @ 243.72 msec
Min = -35.90 Gs @ 63.36 msec

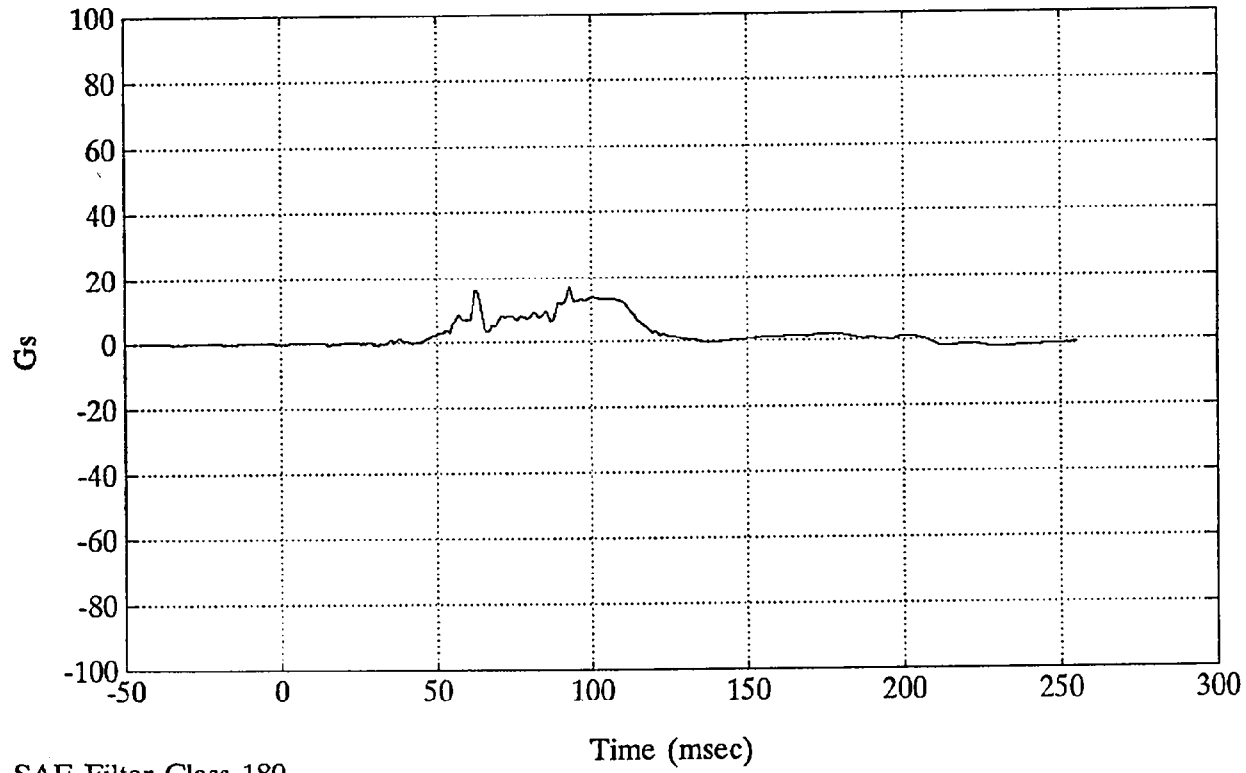


SAE Filter Class 180

FMVSS 208 - 1993 NISSAN ALTIMA

Pos. 2 Chest Y

Max = 16.85 Gs @ 92.76 msec
Min = -2.11 Gs @ 230.16 msec

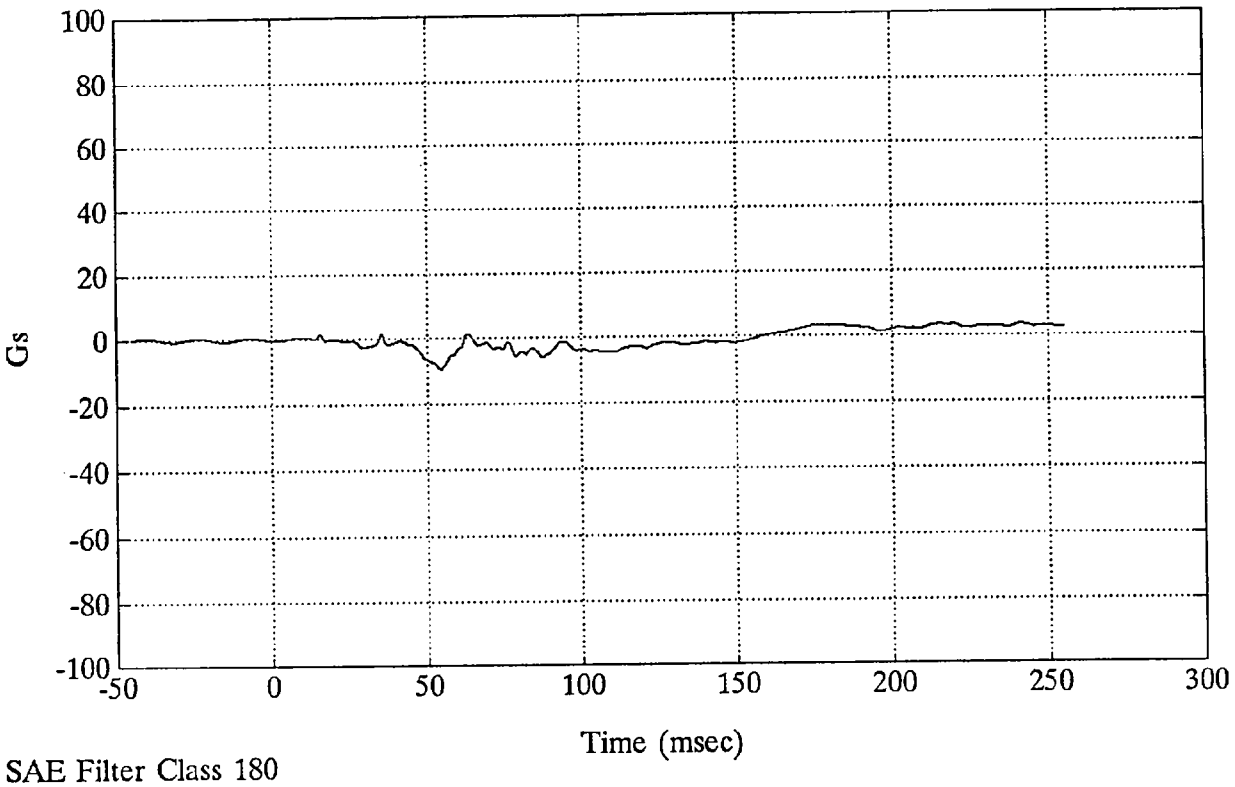


SAE Filter Class 180

FMVSS 208 - 1993 NISSAN ALTIMA

Pos. 2 Chest Z

Max = 3.61 Gs @ 215.16 msec
Min = -9.16 Gs @ 54.60 msec

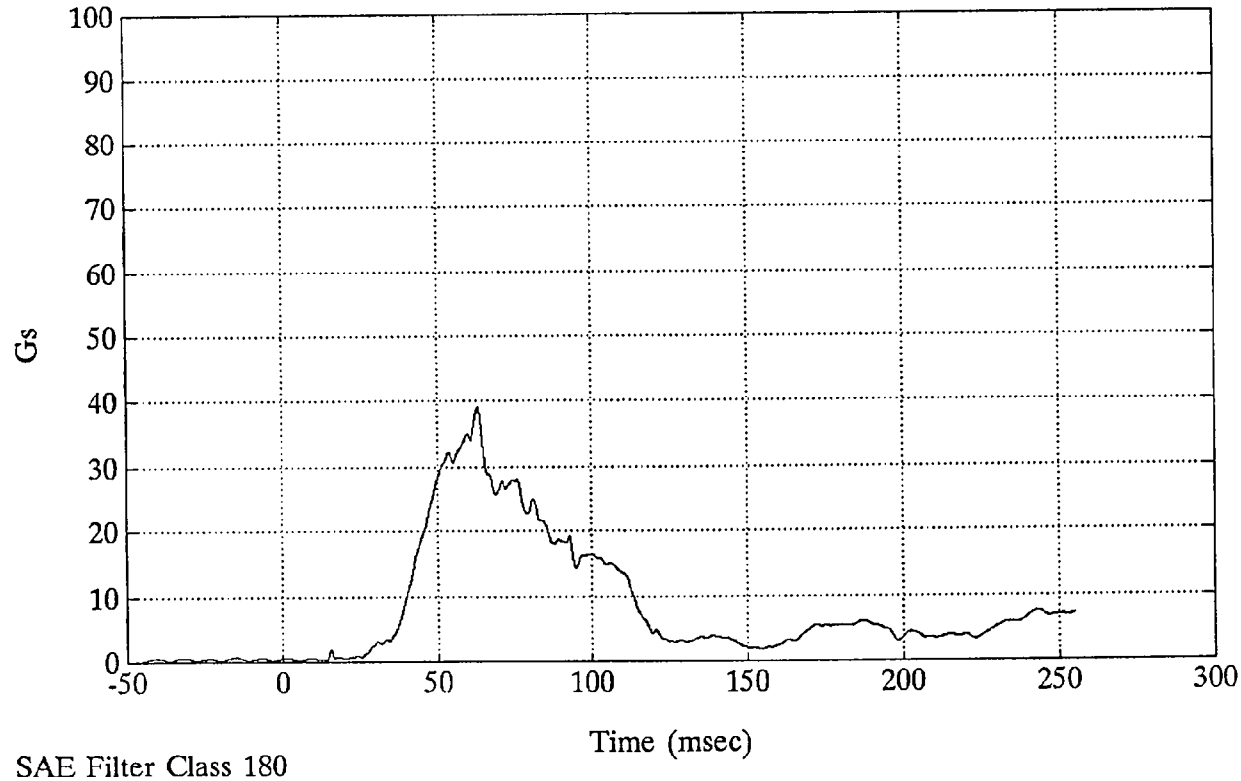


SAE Filter Class 180

FMVSS 208 - 1993 NISSAN ALTIMA

Pos. 2 Chest Resultant

Max = 39.04 Gs @ 63.36 msec
Min = 0.06 Gs @ -20.16 msec

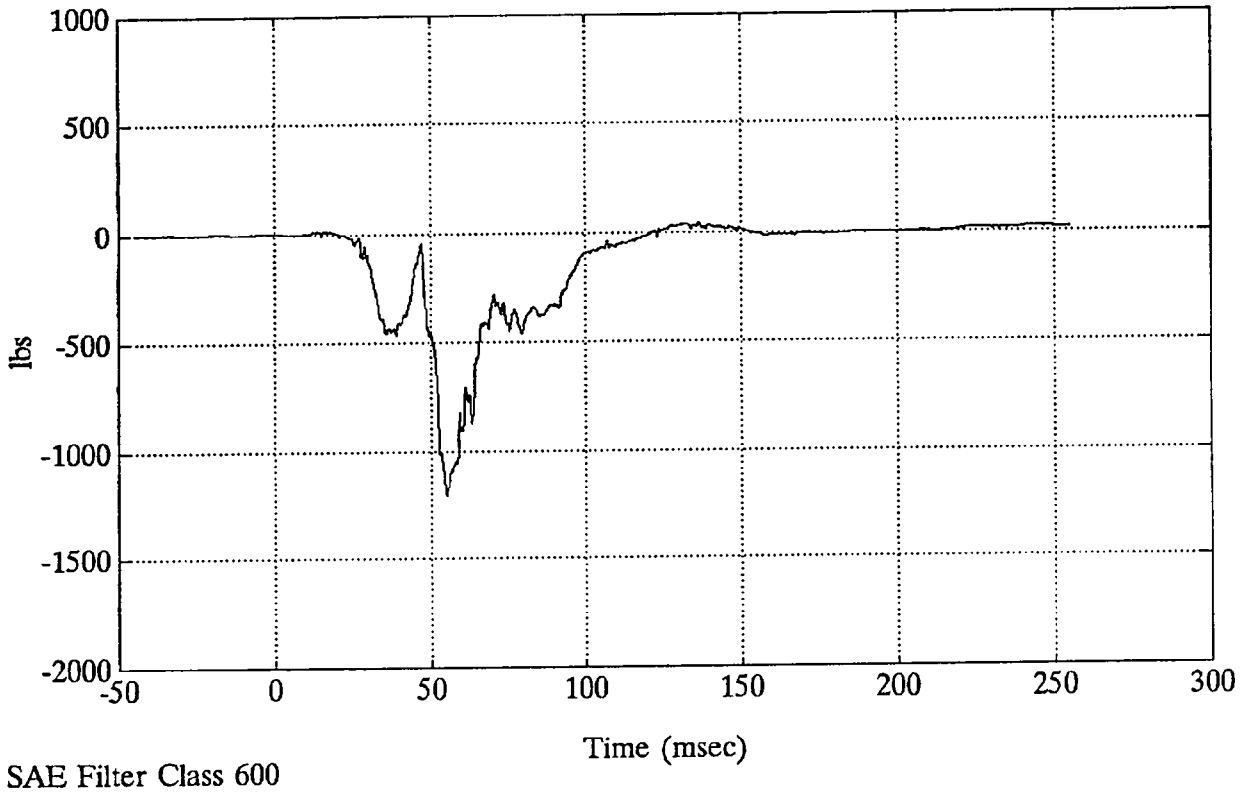


SAE Filter Class 180

FMVSS 208 - 1993 NISSAN ALTIMA

Pos. 2 Left Femur

Max = 42.48 lbs @ 136.32 msec
Min = -1213.80 lbs @ 55.08 msec

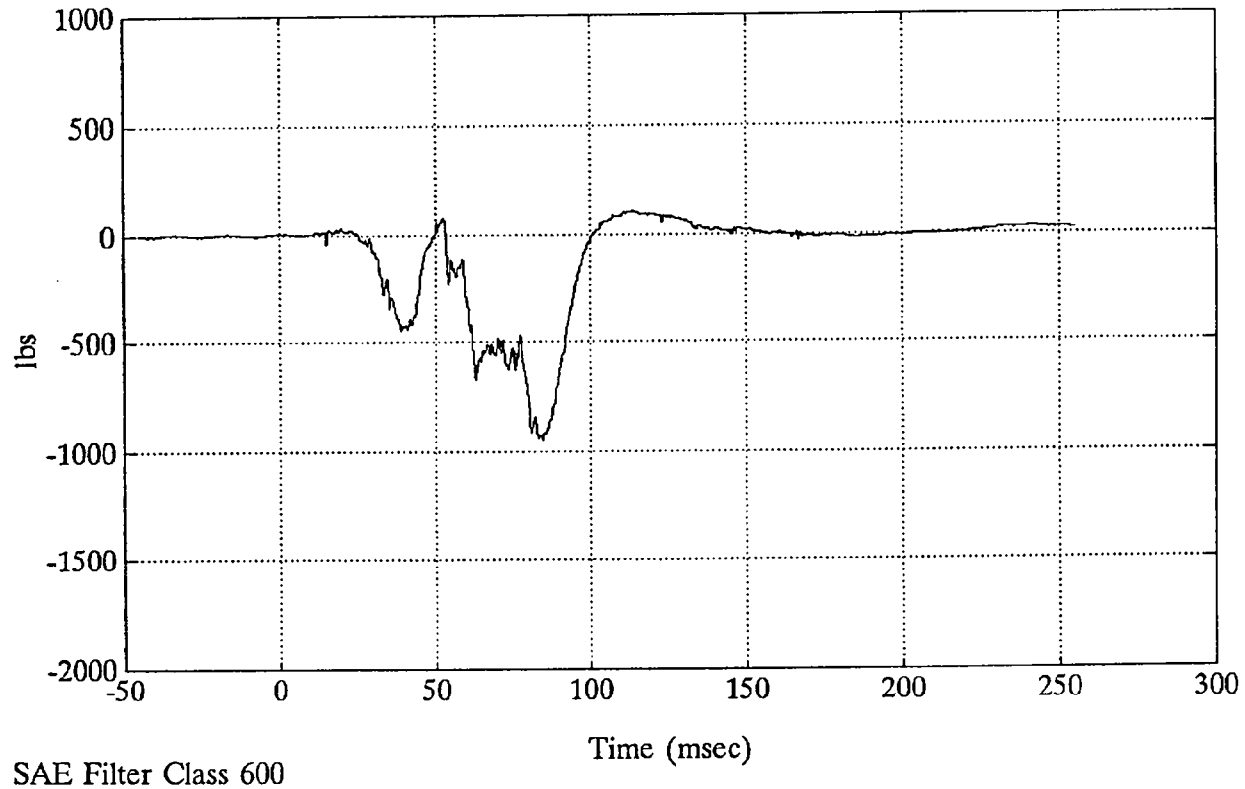


SAE Filter Class 600

FMVSS 208 - 1993 NISSAN ALTIMA

Pos. 2 Right Femur

Max = 105.47 lbs @ 113.88 msec
Min = -946.04 lbs @ 84.36 msec



SAE Filter Class 600

Appendix C

VEHICLE OWNERS MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

The air bag system consists of 3 sensors, an air bag module inside the steering wheel pad and an electronic control unit which sends electrical signals to the air bag module. The 3 sensors are as follows:

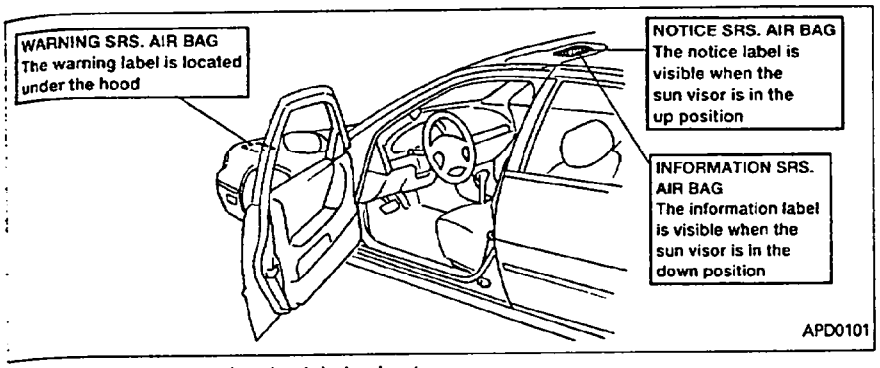
1. Crash zone sensor
2. Tunnel sensor
3. Safing sensor

In a moderate to severe frontal impact, the sensors and the diagnostic unit will trigger the deployment of the air bag.

WARNING:

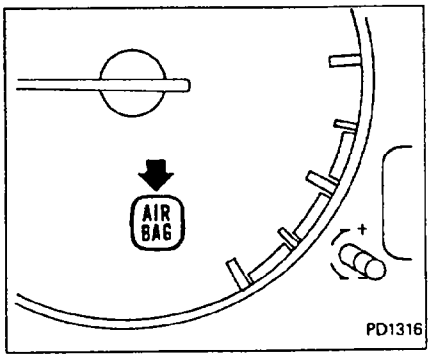
No unauthorized changes are to be made to any components or wiring of the air bag system. This is to prevent accidental deployment of the air bag or damage to the air bag operation. Tampering with the air bag system may result in serious personal injury. This includes changes to or replacement of the steering wheel, placing material over the steering wheel pad or, installing additional trim material around the air bag system. Objects attached to the steering wheel pad may become dangerous projectiles and cause injury if the air bag deploys. Work around and on the air bag system should be done by an authorized NISSAN dealer. Installation of electrical equipment should also be done by an authorized NISSAN dealer. Unauthorized electrical test equipment and probing devices must not be used on the air bag system.

INFORMATION, WARNING AND NOTICE LABELS



Information, warning and notice labels about the air bag system are placed in the vehicle.

AIR BAG WARNING LIGHT



The air bag warning light, displaying "AIR BAG" in the instrument panel, monitors the circuits of the Supplemental Restraint System. The circuits monitored by the air bag light are the crash zone sensor, tunnel sensor, safing sensor and all related wiring.

When the ignition key is in the "ON" or "START" position, the air bag light will illuminate for about 7 seconds and then turn off. This means the Supplemental Restraint System is operational.

If any of the following conditions occurs, the air bag needs servicing and must be taken to your nearest authorized NISSAN dealer:

1. The air bag light does not come on for 7 seconds and then go off as described above.
2. The air bag light flashes intermittently or remains on.
3. The air bag light does not come on at all.

Under these conditions, the Supplemental Restraint System "Air Bag" will not operate properly. It must be checked and repaired.

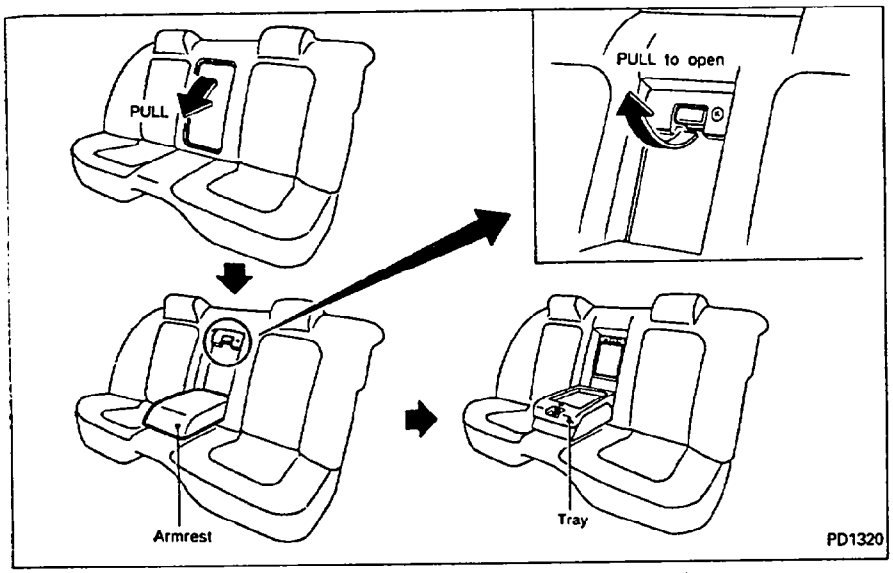
Repair and replacement procedure

The air bag system is designed to inflate on a one-time-only basis. As a reminder unless it is damaged, the air bag light will remain illuminated after deployment has occurred. Repair and replacement of the air bag system must be done only by an authorized NISSAN dealer. To ensure long-term functioning, the system must be inspected 10 years after the date of manufacture as noted on the certification label located on the driver side center pillar.

When maintenance work is required on the vehicle, the air bag system and related parts should be pointed out to the person conducting the maintenance. The ignition key must always be in the "LOCK" position when working under the hood or inside the vehicle.

WARNING:

- **Once the air bag is deployed, the air bag module will not function again and must be replaced. The air bag module cannot be repaired.**
- **The air bag system must be serviced by an authorized NISSAN dealer if there is any damage made to the front end portion of the vehicle or if the air bag has deployed.**
- **When selling your vehicle, we request that you inform the buyer about the air bag system and guide the buyer to the appropriate sections in this Owner's Manual.**
- **If you need to dispose of the air bag or scrap the vehicle, contact an authorized NISSAN dealer. Correct air bag disposal procedures are set forth in the appropriate NISSAN Service Manual. Incorrect disposal procedures could cause personal injury.**



REAR SEAT

Center armrest and tray

Pull the armrest forward and lay it horizontal. Then release the lever (inset) and pull the tray forward. In this condition you are able to gain access to the trunk.

SEAT BELTS

PRECAUTIONS ON SEAT BELT USAGE

Your chances of being injured in an accident and/or the severity of injury may be greatly reduced if you are wearing your seat belt and it is properly adjusted. NISSAN strongly encourages you and all of your passengers to buckle up every time you drive.

Some states, provinces or territories require that seat belts be worn at all times when a vehicle is being driven.

WARNING:

- **The belt should be adjusted to a snug fit. Failure to do so will reduce the effectiveness of the entire restraint system.**
- **Never wear the belt inside out or twisted.**
- **Do not allow more than one person to use the same belt.**
- **All seat belt assemblies including retractors and attaching hardware should be inspected after any collision by your NISSAN dealer. NISSAN recommends that all seat belt assemblies in use during a collision be replaced unless the collision was minor and the belts show no damage and continue to operate**

properly. Seat belt assemblies not in use during a collision should also be inspected and replaced if either damage or improper operation is noted.

Be sure to observe the following cautions when using seat belts. Failure to do so could increase the chance and/or severity of injury in an accident.

- **Always pass the shoulder belt over your shoulder and across your chest. Never run the belt under your arm. Serious injury can occur if the seat belt is not worn properly.**
- **Position the lap belt as low as possible AROUND THE HIPS, NOT THE WAIST.**

Infant or small child

NISSAN recommends that infants or small children be seated in a child restraint system. You should choose a child restraint system that fits your vehicle and always follow the manufacturer's instructions for installation and use.

Children

Children who are too large for child restraint systems should be seated and restrained by the seat belts which are provided.

NISSAN recommends that children sit in the rear seat if available. According to accident statistics, children are safer when properly restrained in the rear seat than in the front seat.

If the child's seating position has a shoulder belt that fits close to the face or neck, the use of a booster seat (commercially available) may help overcome this. The booster seat should raise the child so that the shoulder belt is properly positioned across the top, middle portion of the shoulder and the lap belt is low on the hips. The booster seat should fit the vehicle seat and have a label certifying that it complies with Federal Motor Vehicle Safety Standards or Canadian Motor Vehicle Safety Standards. Once the child has grown so the shoulder belt is no longer on or near the face and neck, use the shoulder belt without the booster seat.

Never let a child stand or kneel on any seat and do not allow a child in the cargo areas while the vehicle is moving.

Pregnant women

NISSAN recommends that pregnant women use seat belts. Contact your doctor for specific recommendations. The lap belt should be worn snug and positioned as low as possible around the hips, not the waist.

Injured persons

NISSAN recommends that injured persons use seat belts, depending on the injury. Check with your doctor for specific recommendations.

AUTOMATIC SEAT BELT SYSTEM (For U.S.A.)

The Automatic Seat Belt system consists of an automatic shoulder belt for the driver and front passenger seat positions. The shoulder belts automatically adjust to the body and seating positions when the door is closed and the ignition key is turned "ON". A manual lap belt for the driver and front passenger seating positions is also provided for increased protection in many types of accidents.

WARNING:

- **For most effective protection, always wear the manual lap belt in addition to**

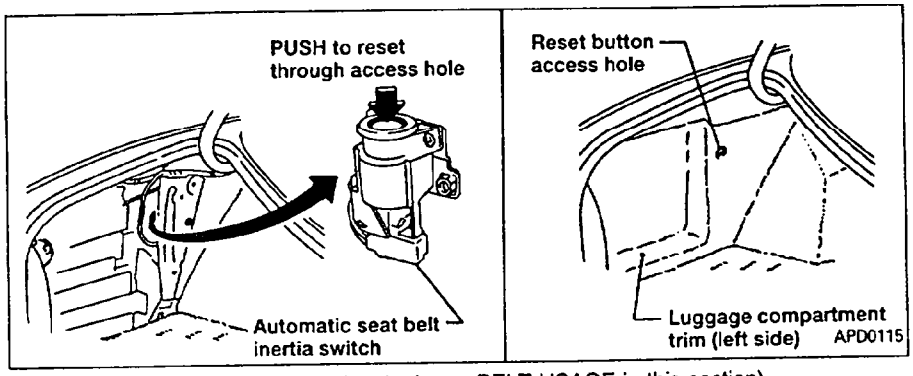
the automatic shoulder belt.

- **If you do not wear your lap belt, you may increase your chance of being injured or increase the severity of injury. The shoulder belt alone may not fully restrain you in some types of accidents.**
- **To properly operate the automatic seat belt system, the shoulder belt tongue should always remain inserted in the shoulder belt buckle, located in the rail of the door opening.**

NISSAN recommends that children be seated in the rear seats. See Precautions on Seat Belt Usage earlier in this section.

System malfunction

If, while the ignition switch is turned "ON" with either front door open, the seat belt warning light flickers and the chime sounds faster than usual for about 6 seconds, it may indicate a malfunction in the system. Have the system checked by your NISSAN dealer.



When the automatic shoulder belts do not move

This vehicle is equipped with an inertia switch in the automatic seat belt system circuit. The switch will operate when the vehicle is involved in a collision and stop the automatic belts' motors from moving the belts. After a collision, the shoulder belts may be released by pressing the buckle marked "EMERGENCY RELEASE".

For normal vehicle operation, the shoulder belts should always be connected to the buckles (see PRECAUTIONS ON SEAT BELT USAGE in this section).

WARNING:

The belts may move suddenly when the reset button is pressed. Stay clear of the shoulder belt assemblies to avoid contact when motors engage.

Press the button through the access hole to reset the inertia switch.

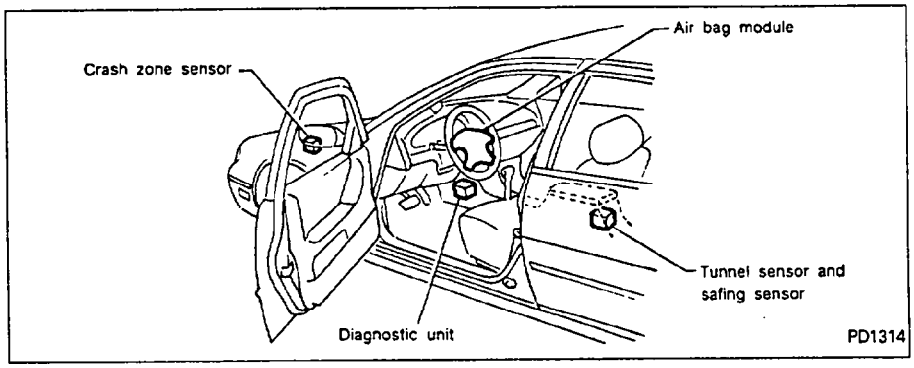
SUPPLEMENTAL RESTRAINT SYSTEM (AIR BAG SYSTEM)

The information written in this Supplemental Restraint System section contains important points concerning the air bag system installed in some models to help reduce impact force to the driver in certain frontal collisions. The air bag is designed to **supplement** the accident protection provided by the driver's seat belt and is **not a substitute** for the three-point seat belt system. The seat belt should be correctly worn and the driver seated a suitable distance from the steering wheel.

The air bag will operate only when the ignition switch is in the "ON" or "START" position.

WARNING:

The seat belts are designed to help reduce the risk or severity of injury in various kinds of accidents and should be worn by all occupants of the vehicle. The seat belt must be worn as the air bag only assists in reducing the impact force in a frontal collision. (See "Seat belts".)

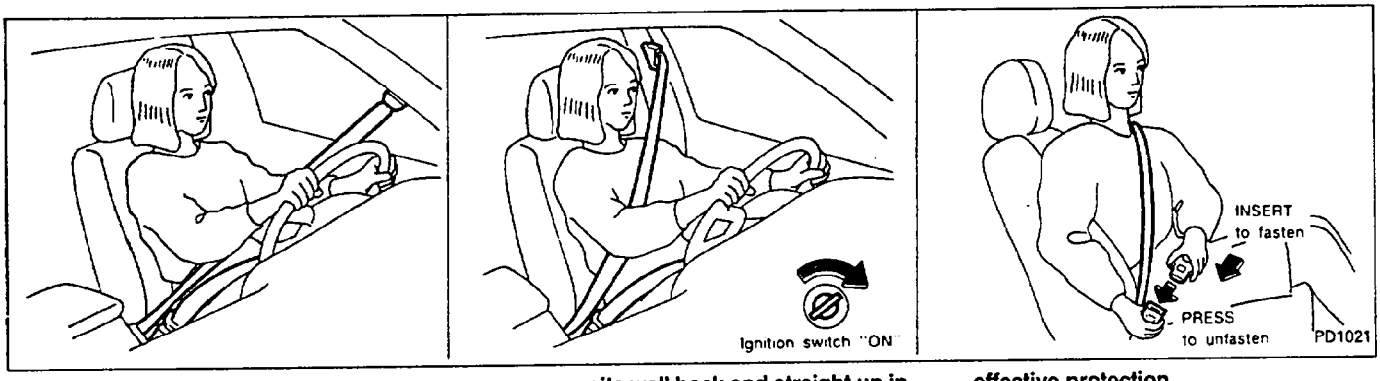


Air bag system

The air bag is located in the center of the steering wheel and will inflate in a higher severity frontal collisions. There are no air bags for the passenger seat. When the air bag system receives a signal from the crash zone sensor, a fairly loud deploying noise will be heard, followed by release of smoke. This smoke is not injurious and does not indicate a fire. The air bag, along with the use of a seat belt, helps to cushion the impact force on the driver's face and chest. The seat belt should be correctly worn and the driver seated a suitable distance from the steering wheel.

Since the air bag deploys quickly in order to protect the driver, the force of the air bag deploying can increase the risk of injury if the driver is too close to or is against the steering wheel during deployment. The air bag will deflate quickly after the collision is over.

The air bag will operate only when the ignition switch is in the "ON" or "START" position.



Fastening the belts

1. Open the door and make sure that the shoulder buckle is in the forward position. Then get into the vehicle and close the door.

When the ignition switch is in the "ON" position and the door is closed, the shoulder buckle will move to the rear position.

2. Adjust the seat.

The seatback should not be in a reclining position any more than needed for comfort. Seat belts are most effective when the passenger sits well back and straight up in the seat.

3. Turn the ignition switch "ON". The shoulder buckle will move to the rear position and will fit across your chest. Pull the shoulder belt toward the retractor to take up extra slack.

- **Do not touch the door guide rail while the shoulder buckle is moving.**
- **Do not wear the shoulder belt across the neck or under your outer arm. The shoulder belt should be positioned midway over the shoulder for the most effective protection.**

4. Slowly pull the lap belt out of the retractor and insert the tongue into the lap buckle until it snaps. Position the lap belt **low on the hips** and pull the belt toward the retractor to take up extra slack.

- **Do not wear the lap belt across the shoulder belt.**
- **The retractors are designed to lock during a sudden stop or on impact. A slow pulling motion will permit the belt to move, and allow you some freedom of movement in the seat.**

The front seat passenger side lap belt has a cinching mechanism for child seat installation. It is referred to as the automatic locking mode. When the cinching mechanism is activated the seat belt cannot be withdrawn again until the seat belt tongue is detached from the buckle and fully retracted. Refer to "Child Restraint Systems for Infants and Small Children" later in this section for more information.

WARNING:

- **The automatic locking mode should be used only for child seat installation. During normal seat belt use by a passenger, the locking mode should not be activated, if it is activated it will cause uncomfortable seat belt tension.**

Unfastening the belts

1. To unfasten the lap belt, press the button on the lap buckle. The seat belt will automatically retract.
2. Open the door. The shoulder belt buckle will move to the forward position and the shoulder belt will move away from your chest.

- **Do not touch the door guide rail while the shoulder buckle is moving.**
- **Do not unfasten the shoulder belt tongue from the buckle except in emergency. See "Operation in emergency" later in this section.**

How the automatic shoulder belt works

While the ignition switch is "ON":

The shoulder buckle will move to the forward position when the door is opened, and it will move to the rear position when the door is closed.

While the ignition switch is "OFF":

The shoulder buckle will remain or move to the front position when the door is opened, and it will remain in the front position when the door is closed until the ignition switch is turned "ON".

If the shoulder buckle operates abnormally, have the system checked by your NISSAN dealer.

Seat belt warning light "  " and warning chime

When the ignition switch is turned "ON" with the door open (the shoulder buckle is at the front position):

The chime will sound for about 6 seconds, and the warning light will flicker continuously. The warning light will go off when the door is closed and the shoulder buckle reaches the rear position.

When the ignition switch is turned "ON" with the door closed:

The chime will sound and the warning light will flicker until the shoulder buckle reaches the rear position. The warning light will remain illuminated for several seconds after the shoulder buckle reaches the rear position.

If the shoulder belt tongue is disconnected from the buckle:

When the ignition switch is turned "ON" and the shoulder buckle reaches the rear position, the warning light will come on for about 100 seconds and the chime will sound for about 6 seconds until the shoulder belt is connected to the shoulder buckle. Insert the

shoulder belt tongue into the shoulder buckle before driving.

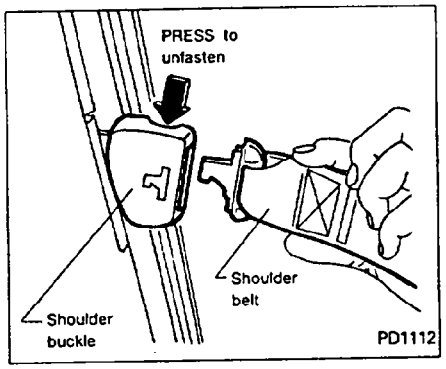
If the driver side lap belt is not fastened:

When the ignition switch is turned "ON" and the shoulder buckle reaches the rear position, the warning light will come on for about 6 seconds and the chime will sound for about 6 seconds or until the lap belt is fastened. Fasten the lap belt before driving.

WARNING:

If the seat belt warning light glows continuously while the ignition is turned "ON" with both doors closed and all seat belts fastened, it may indicate a malfunction in the system. Have the system checked by your NISSAN dealer.

If the vehicle is stopped quickly, the belt retractor may lock. Be sure to check if the shoulder belt is free before opening the door, otherwise the belt may hold tightly against the chest when the door is open.



Operation in an accident

Emergency release

If you need to release the shoulder belt from the shoulder belt buckle in an emergency, press the buckle marked with "EMERGENCY RELEASE". Use this feature only when the shoulder belt keeps you from leaving the vehicle in an accident.

For normal use, the shoulder belt should always be connected to the buckle.

Manual operation

If either shoulder belt buckle does not operate

1. Slide the seat forward as far as possible.
2. Remove the blind cap in the lower portion of the center pillar with the screwdriver. The shaft end of the motor will be visible.
3. Using the wrench supplied in the tool bag, turn the shaft of the motor counterclockwise to move the shoulder buckle to the rear position.

Have the automatic seat belt system checked and repaired by your NISSAN dealer.