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

CHRYSLER CORPORATION
1993 DODGE SHADOW
4-DOOR HATCHBACK

NHTSA NUMBER: CP0311

CALSPAN TEST NUMBER: 8056-16

APRIL 13, 1993

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FINAL REPORT

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National Highway Traffic Safety Administration
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Office of Vehicle Safety Compliance
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16. Abstract A 30 mph vehicle safety compliance test was conducted on a 1993 Dodge Shadow 4-Door Hatchback. This test was performed at the Calspan Advanced Technology Center in Buffalo, New York on April 13, 1993. 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 29.0 mph. The ambient temperature at the impact face was 52°F. The subject test vehicle appears to comply with the requirements of FMVSS Nos. 208, 212, 219 (partial) and 301. <u>Type of Restraint System:</u> The test vehicle was equipped a driver side air-bag. The right-front passenger used a 3-point manual continuous loop belt. The driver's manual 3-point belt was not used for this test.					
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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 Dodge Shadow 4-Door Hatchback, 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 CP0311

A frontal barrier was impacted by a 1993 Dodge Shadow 4-Door Hatchback at a velocity of 29.0 mph. The test was performed at the Calspan Corporation Advanced Technology Center on April 13, 1993. 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 572E, 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, chest displacement potentiometers and left/right femur load cells. These ATDs had been certified prior to the test.

The 25 channels of data were recorded on PC based data acquisition system. Appendix B contains the vehicle and dummy response data traces.

The driver's HIC was 188. The maximum chest deceleration over 3 milliseconds was 33.8 g's with 1.1 inches of deflection. The maximum force on the driver's left femur was 1092 pounds and 950 pounds on the right femur.

The right front passenger's HIC was 226. The maximum chest deceleration over 3 milliseconds was 36.5 g's with 1.2 inches of deflection. Loads of 266 and 582 were recorded on the left and right femurs respectively.

Table 1

CRASH TEST SUMMARY

Vehicle NHTSA No.: CP0311 Test Mode: 30 mph Frontal Barrier

Test Date: April 13, 1993 Time: 13:50 Temperature: 52°F

Vehicle Make/Model/Body Style: 1993 Dodge Shadow 4-Door Hatchback

Vehicle Test Weight: 3170 lbs.

Vehicle/Barrier Impact Angle: 0°

Impact Velocity: 29.0 mph

Maximum Static Crush: 19.0 inches

Average Vehicle Rebound: 12.7 inches

DUMMIES:

	<u>DRIVER</u>	<u>PASSENGER</u>
Type:	<u>Part 572E</u>	<u>Part 572E</u>
Restraint System:	<u>Airbag*</u>	<u>3-Point Continuous Loop Belt</u>

Number of Data Channels: 25

Number of Cameras: 1 Real Time
14 High Speed

DOOR OPENING DATA: Closed - Left Front
Closed - Right Front

Front Seat(s) Data:

	<u>DRIVER</u>	<u>PASSENGER</u>
Seat Track Failure:	<u>0.0</u>	<u>0.0</u>
	inches of shift	
Seat Back Failure:	<u>None</u>	<u>None</u>

VISIBLE DUMMY CONTACT POINTS:

	<u>DRIVER</u>	<u>PASSENGER</u>
Head:	• Face with airbag • <u>Rear of head with headrest</u>	• Rear of head with headrest • <u>Chin with chest</u>
Abdomen:	<u>Airbag</u>	<u>No Contact</u>
Chest:	<u>Airbag</u>	<u>No Contact</u>
Knees:	<u>Lower Dash Panel</u>	<u>Glove Box Door</u>

*Driver side 3-point continuous loop belt was not used in this test.

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATATEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1993 Dodge Shadow 4-Door Hatchback
 NHTSA No.: CP0311; VIN: 1B3XP28K1PN523490; Color: White
 Engine Data: 4 cylinders; - CID; 2.5 Liters; - cc
 Placement: - Longitudinal or In-Line; X Transverse or Lateral
 Transmission Data: 3 speeds; - Manual; X Automatic; - Overdrive
 Final Drive: - Rear Wheel Drive; X Front Wheel Drive; - Four Wheel Drive
 Major Options: X A/C; X Pwr.Strg.; X Pwr.Brakes
- Pwr.Windows; - Pwr.Door Locks; X Tilt Wheel
 Date Received: 3-18-93; Odometer Reading 122 miles
 Selling Dealer: Westfield Dodge City, Inc.
 & Address E. Main Road Westfield, NY 14787

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Chrysler Corporation
 Date of Manufacture: 8-92
 GVWR: 3685 lbs.; GAWR: 2025 lbs. FRONT; 1710 lbs. REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load: 32 psi FRONT
32 psi REAR

Recommended Tire Size: P185/70R14

* Recommended Cold Tire Pressure: 32 psi FRONT; 32 psi REAR

Size of Tires on Test Vehicle: P185/70R14; Manufacturer: Goodyear

Vehicle Capacity Data:

Type of Front Seats: - Bench; X Bucket; - Split Bench
 Number of Occupants: 2 Front; 3 Rear; 5 Total
 Vehicle Capacity Weight (VCW) = 865 lbs.
 No. of Occupants x 150 lbs. = 750 lbs.
 Rated Cargo/Luggage Weight (RCLW) = 115 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 = 820 lbs. Right Rear = 500 lbs.
 Left Front = 900 lbs. Left Rear = 520 lbs.
 TOTAL FRONT = 1720 lbs. TOTAL REAR = 1020 lbs.
 % of Total Vehicle Weight = 62.8 % of Total Weight = 37.2 %
 TOTAL DELIVERED WEIGHT = 2740 lbs.

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight = 2740 lbs.
 Rated Cargo/Luggage Weight (RCLW) = 115 lbs.
 Weight of 2 P.572 Dummies @ 167 ea. = 334 lbs.
 TARGET TEST WEIGHT = 3189 lbs. (sum)

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 96 POUNDS OF CARGO WEIGHT:

Right Front = 930 lbs. Right Rear = 630 lbs.
 Left Front = 960 lbs. Left Rear = 650 lbs.
 TOTAL FRONT = 1890 lbs. TOTAL REAR = 1280 lbs.
 % of Total Weight = 59.6 % % of Total Weight = 40.4 %
 TOTAL TEST WEIGHT = 3170 lbs.

Weight of Ballast Secured in Vehicle Trunk Area = 25 lbs.

Vehicle Components Removed for Weight Reduction: None

VEHICLE ATTITUDE (all dimensions in inches):

AS DELIVERED:	RF <u>26.3</u>	LF <u>26.3</u>	RR <u>26</u>	LR <u>25.9</u>
FULLY LOADED:	RF <u>25.6</u>	LF <u>25.6</u>	RR <u>23.25</u>	LR <u>23.3</u>
AS TESTED:	RF <u>26.2</u>	LF <u>26.1</u>	RR <u>25.0</u>	LR <u>25.0</u>

Vehicle's Wheel Base: 97.4 in.

Location of Vehicle's C.G.: 39.3 inches rearward of front wheel center

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 14* gallons
 Usable Capacity Figure Furnished by COTR = 13.7 gallons
 Test Volume Range (92 to 94% of Usable Capacity) = 12.6 to 12.9 gallons
 ACTUAL TEST VOLUME = 12.7 gallons (with entire fuel system filled)

*Approximate value

Table 3
POST IMPACT DATA

TYPE OF TEST:

Type of Test: Frontal Barrier Impact Angle: 0°
Test Date: April 13, 1993 Time: 13:50 Temperature: 52°F
Vehicle NHTSA No.: CP0311
Required Impact Velocity Range: 28.9 to 29.9 mph

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

Trap No. 1 = 29.0 mph; Trap No. 2 = 28.9 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 = 167.9; C/L = 171.7; Left = 168.1
Post-Test Right = 152.2; C/L = 152.7; Left = 151.7
Crush Right = 15.7; C/L = 19.0; Left = 16.4
AVERAGE = 17.0 inches

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:
Right = 11.8; C/L = 12.5; Left = 13.7
AVERAGE = 12.7 inches

DOOR OPENING:

	Left	Right
Front	<u>Closed</u>	<u>Closed</u>
Rear	<u>Closed</u>	<u>Closed</u>

SEAT MOVEMENT:

	Seat Back Failure	Seat Shift
Front	<u>None</u>	<u>0.0"</u>
Rear	<u>N/A</u>	<u>N/A</u>

Table 3
POST IMPACT DATA (cont.)

GLAZING DAMAGE: None

OTHER NOTABLE IMPACT FEATURES: None

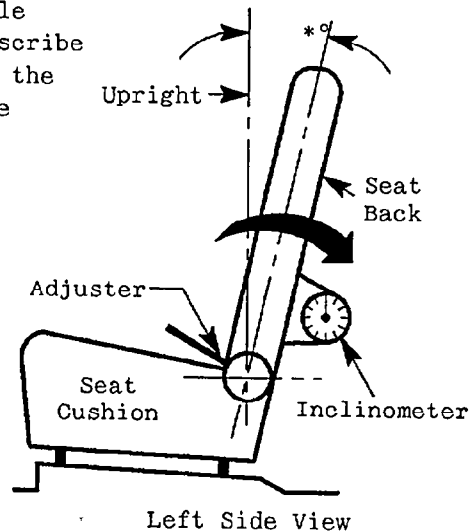
Section 3
OCCUPANT AND VEHICLE DATA

Figure 1
TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year: 1993 Vehicle Model: Dodge Shadow Body Style: 4-Door Hatchback

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.



*Seat back was positioned according to manufacturer specifications

Seat back angle for driver's seat: *

Measurement instructions: Seat set by aligning retractor plate with third line on retractor backing plate per manufacturer instructions

Seat back angle for passenger's seat: *

Measurement instructions: Same as driver

2. Seat Fore and Aft Positioning

Positioning of the driver's seat: Seat set in 6th detent (mid-position) of eleven total detents

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 13.7 gallons

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

4. Steering Column Position: Not adjustable

5. Other: None

Figure 2

PART 572 DUMMY IN-VEHICLE POSITION

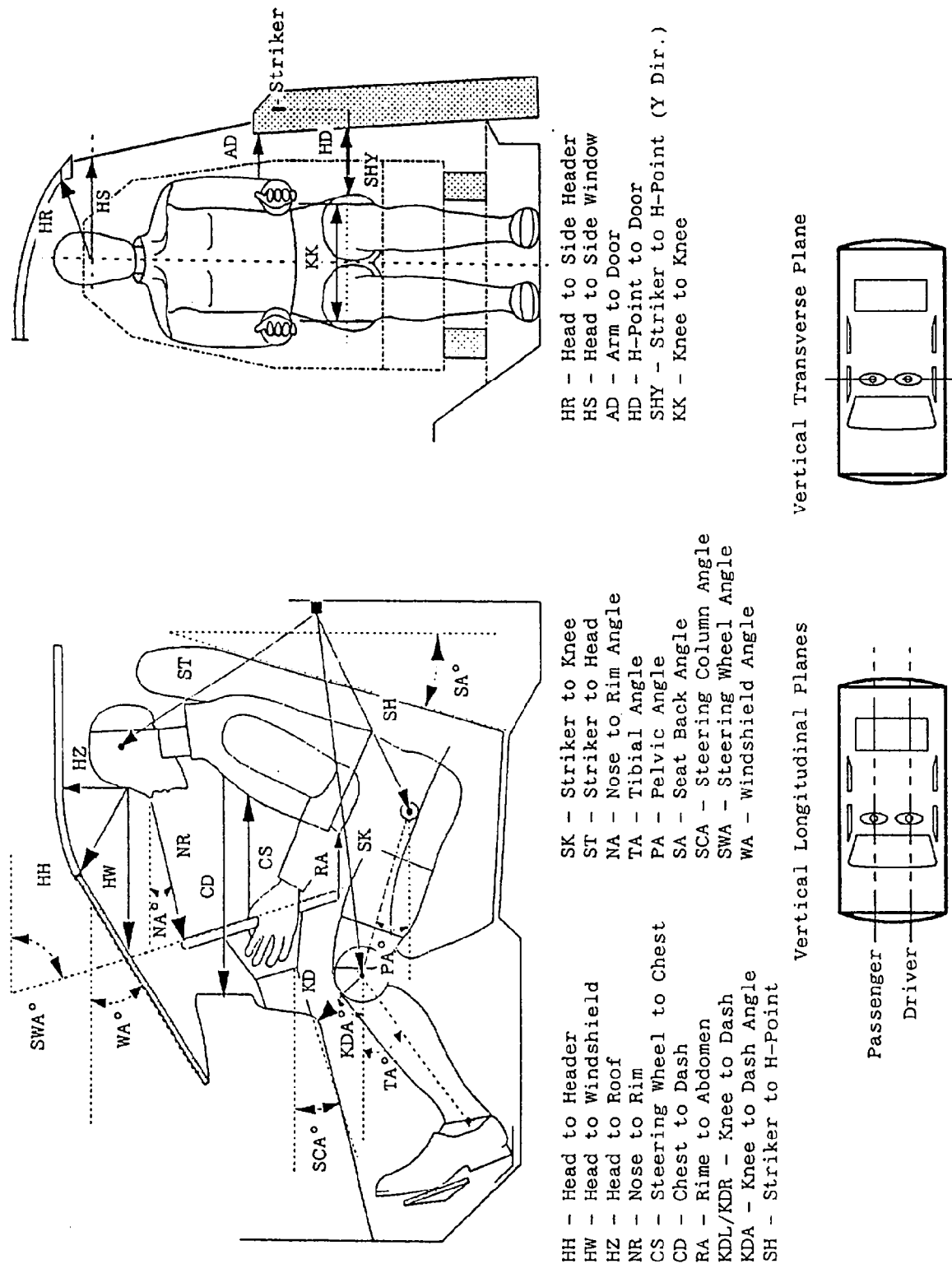


Table 4

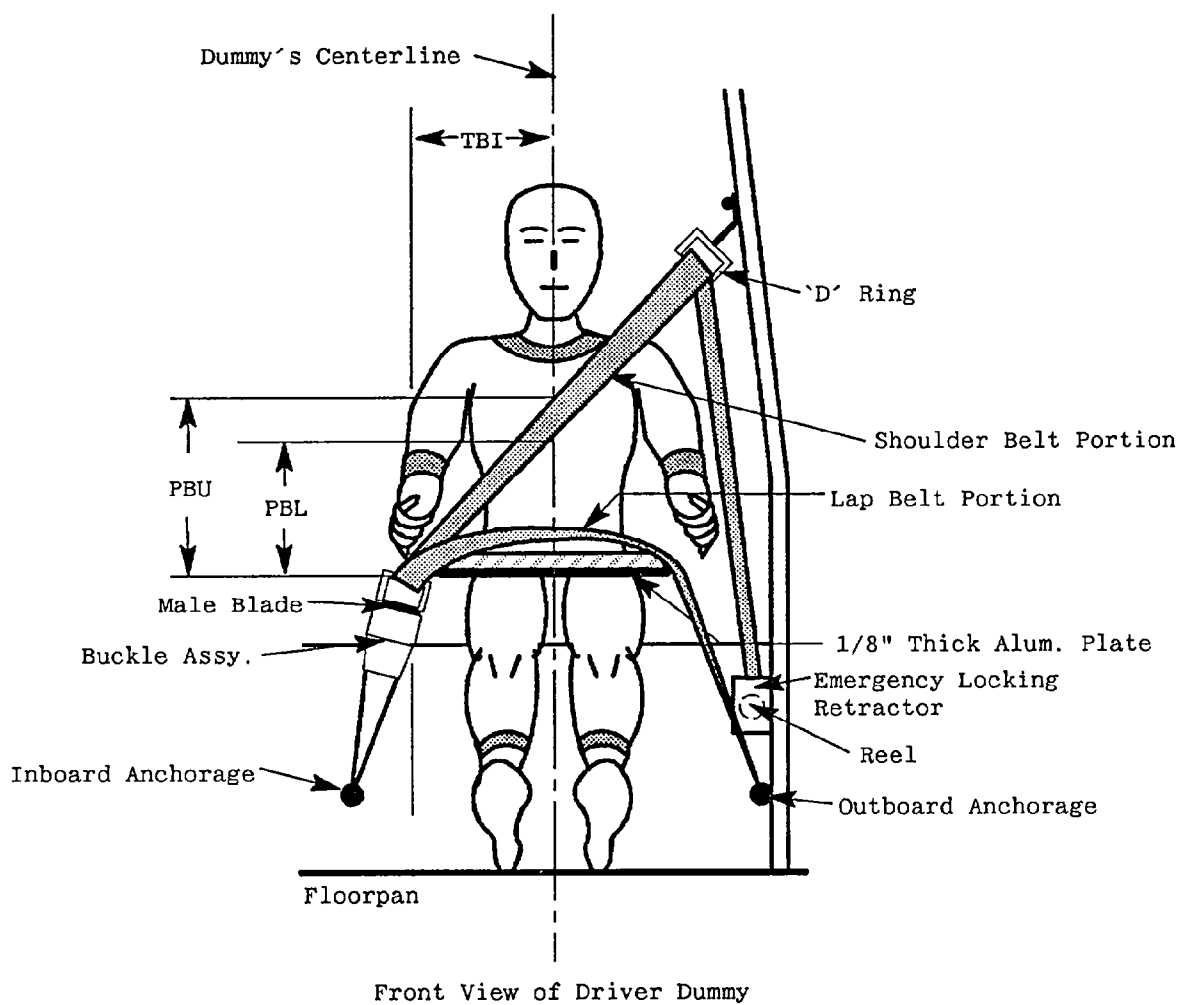
FRONT SEAT OCCUPANT MEASUREMENTS

(all dimensions in inches unless otherwise specified)

	DRIVER (Serial #290)	PASS (Serial #313)
WA°	32°	—
SWA°	65°	—
SCA°	25°	—
SA°	See Note	See Note
HZ	6.3	6.7
HH	12.4	12.5
HW	17.4	19.3
HR	7.4	7.8
NR	14.2 Angle (NA) 18°	—
CD	19.1	21.7
CS	9.0	—
RA	5.2	—
KDL	7.0 in. Angle (KDA) 26°	6.6
KDR	7.4	6.7 Angle (KDA) 30°
PA°	22°	23°
TA°	37°	43°
KK	10.9	10.5
ST	20.6 Angle 13°	20.1 Angle 14°
SK	24.1 Angle 100°	24.0 Angle 97°
SH	10.4 Angle 133°	10.2 Angle 131°
SHY	10.3	10.0
HS	9.1	9.3
HD	6.9	6.7
AD	4.6	4.5

Note: Seat back was positioned as specified by the manufacturer.

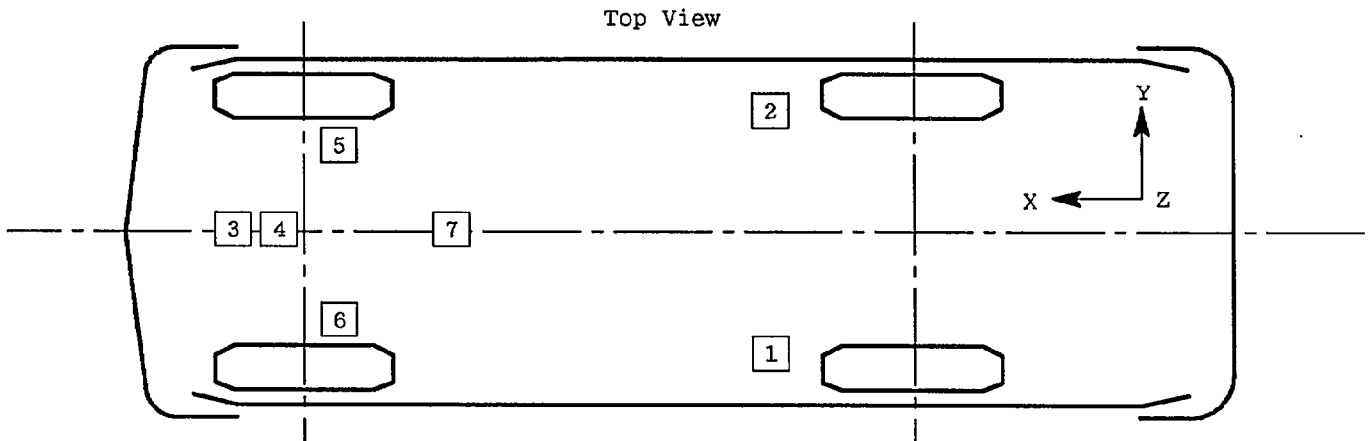
Figure 3
SEAT BELT POSITIONING DATA



	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> -- Top surface of alum. plate to upper edge	*	14.0
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	*	11.0
<u>TBI</u> -- Distance from torso centerline to buckle	*	9.0

*Manual 3-point continuous loop belt was not used for this test. Vehicle was equipped with a driver side airbag.

Figure 4
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**		NEGATIVE DIRECTION**	
						MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	REAR SEAT X-MEMBER AT LEFT SIDE	PRE:	60.8	24.5	14.5				
		POST:	60.8	24.5	14.7				
		LONGITUDINAL ACCELERATION				2	137	-32	41
2	REAR SEAT X-MEMBER AT RIGHT SIDE	PRE:	60.6	-24.5	14.5				
		POST:	60.6	-24.5	14.7				
		LONGITUDINAL ACCELERATION				9	110	-31	43
3	TOP OF ENGINE BLOCK	PRE:	143.2	-0.5	31.7				
		POST:	140.2	-0.5	30.3				
		LONGITUDINAL ACCELERATION				18	51	-65	42
4	BOTTOM OF ENGINE	PRE:	137.4	-2.0	8.8				
		POST:	135.8	-2.0	8.0				
		LONGITUDINAL ACCELERATION				81	45	-128	36
5	BRAKE CALIPER AT RIGHT SIDE	PRE:	131.9	-22.5	18.9				
		POST:	128.1	-22.5	18.9				
		LONGITUDINAL ACCELERATION				53	72	-122	51
6	BRAKE CALIPER AT LEFT SIDE	PRE:	131.9	22.5	18.8				
		POST:	127.8	22.5	18.8				
		LONGITUDINAL ACCELERATION				47	73	-103	48
7	DASH PANEL	PRE:	105.2	-3.5	31.4				
		POST:	105.2	-3.5	32.0				
		LONGITUDINAL ACCELERATION				20	87	-62	58

** *X + Forward from rear bumper Y + Left from vehicle centerline Z + Up from ground	LONGITUDINAL: LATERAL: VERTICAL:	<u>POSITIVE</u> FORWARD LEFTWARD UPWARD	<u>NEGATIVE</u> REARWARD RIGHTWARD DOWNWARD
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DISTANCE MEASUREMENTS IN INCHES

Figure 5
CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 5.

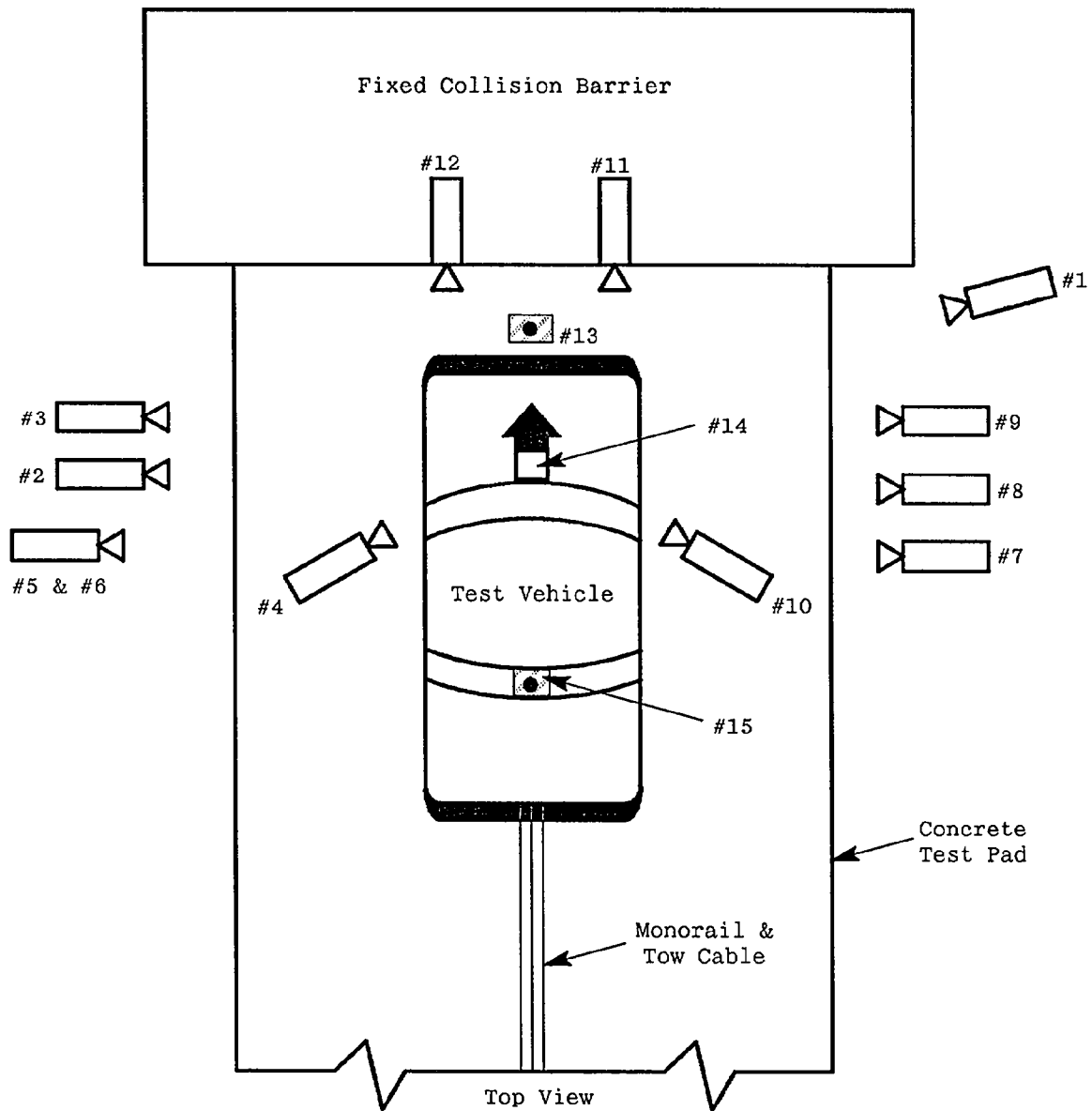


Table 6

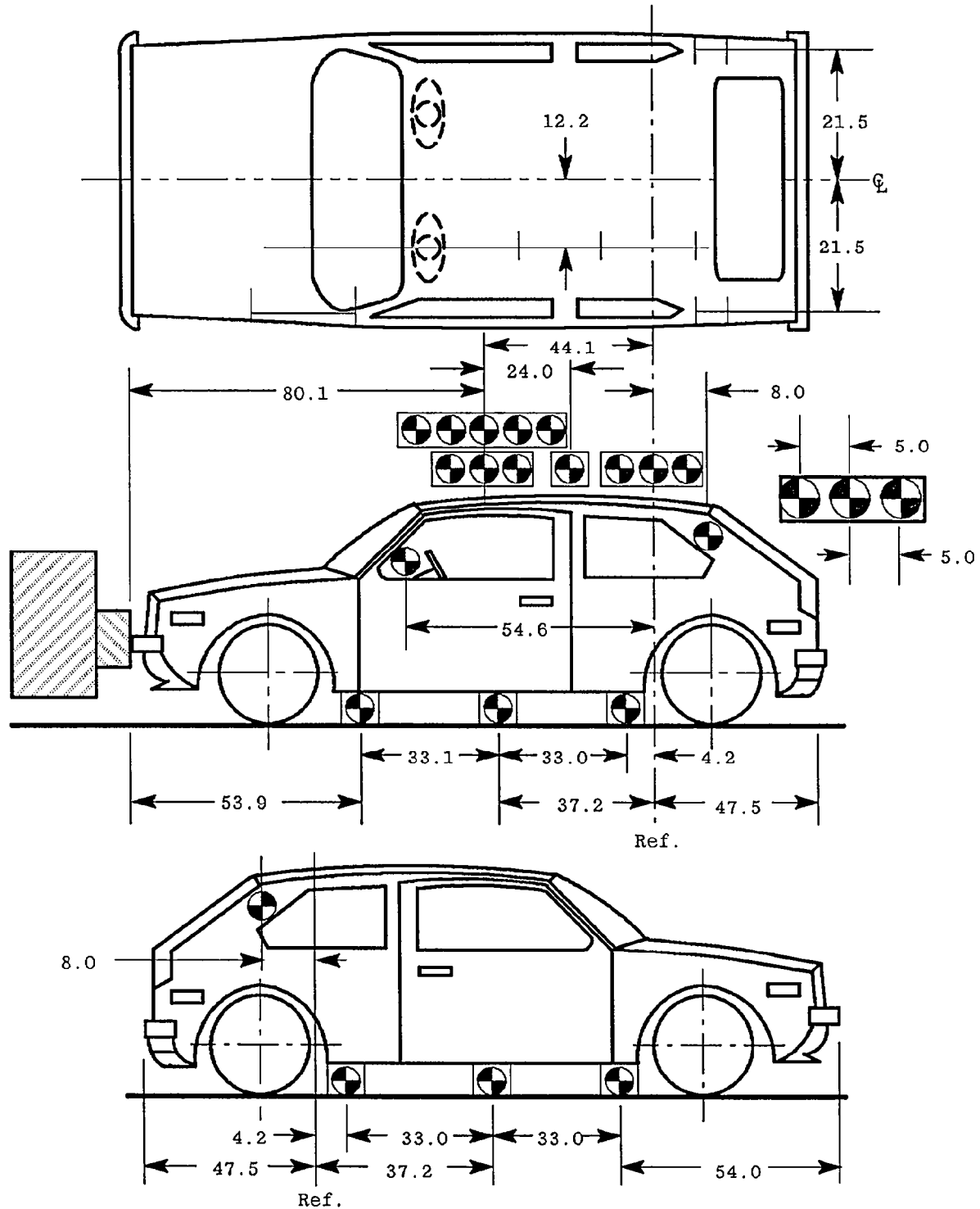
HIGH-SPEED CAMERA LOCATIONS

Test No. CP0311 Vehicle: 1993 Dodge Shadow 4-Door Hatchback

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	240	64	42	-3	225	13	555
3	Left Side View	305	43	41	-3	290	25	625
4	Driver and Interior View	111	105	67	-18	-	13	580
5	Steering Column (Bottom)	267	70	47	-3	252	25	1000
6	Steering Column (Top)	267	70	71	-9	252	25	1000
7	Overall Right Side	231	79	42	-3	216	13	550
8	Right Side View	298	55	41	-4	283	25	580
9	Right Passenger View	300	73	56	-5	-	35	590
10	Passenger and Interior View	109	103	66	-17	-	13	580
11	Passenger Front View	22	19	76	-44	-	13	630
12	Driver Front View	22	19	77	-40	-	13	N.T.
13	Windshield View	0	0	126	-60	-	13	600
14	Pit View of Engine	0	30	-86	90	-	13	710
15	Pit View of Fuel Tank	0	120	-86	90	-	13	880

*X = film plane to monorail centerline
 Y = film plane to impact location
 Z = film plane to ground
 ** = referenced to horizontal plane
 N.T. = No timing

Figure 6
VEHICLE TARGET LOCATIONS



(Dimensions in inches)

Figure 7
TEST VEHICLE MEASUREMENTS

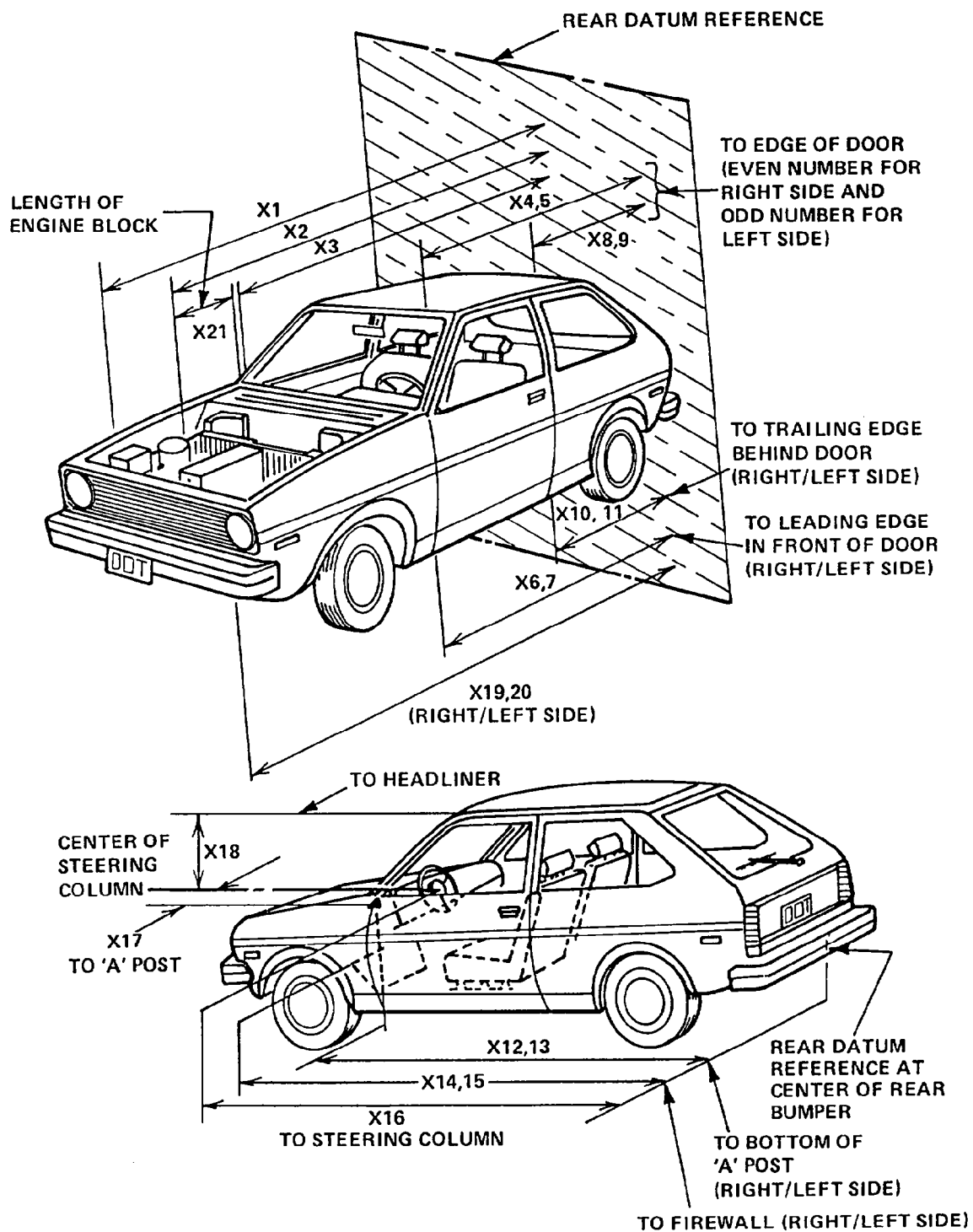


Table 7

VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	171.7	152.7	19.0
X2	Rear Surface of Vehicle to Front of Engine	142.0	139.7	2.3
X3	Rear Surface of Vehicle to Firewall	125.7	124.6	1.1
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	113.4	113.1	0.3
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	113.6	113.5	0.1
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	112.9	112.8	0.1
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	113.0	113.1	0.1
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	74.2	73.8	0.4
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	74.2	74.2	0.0
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	74.5	74.6	0.1
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	74.8	74.8	0.0
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	112.3	112.5	0.2
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	112.4	112.9	0.5
X14	Rear Surface of Vehicle to Firewall, Right Side	167.9	125.3	1.4
X15	Rear Surface of Vehicle to Firewall, Left Side	168.1	126.5	0.5
X16	Rear Surface of Vehicle to Steering Column	94.6	*	*
X17	Center of Steering Column to "A" Post	16.1	*	*
X18	Center of Steering Column to Headliner	16.8	*	*
X19	Rear Surface of Vehicle to Right Side of Front Bumper	167.9	152.2	15.7
X20	Rear Surface of Vehicle to Left Side of Front Bumper	168.1	151.7	16.4
X21	Length of Engine Block	14.5	14.5	0.0

*Steering column was removed from vehicle after test per NHTSA request.

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 VALUESNHTSA No.: CP0311 Vehicle: 1993 Dodge Shadow 4-Door Hatchback

	MAXIMUM ACCELERATION (g's)								
	HEAD				CHEST				
	X	Y	Z	R	X	Y	Z	R*	Displacement
Dummy (1)	-44	7	12	44.1	-34	5	-7	33.9	-1.1
Dummy (2)	-32	-5	34	41.2	-40	-8	-14	36.5	-1.2

	MAXIMUM FORCE - FEMUR LOAD (lbs.)	
	LEFT FEMUR	RIGHT FEMUR
Dummy (1)	1092	950
Dummy (2)	266	582

	HEAD INJURY CRITERIA**			
	HIC	36 millisecond Maximum		Avg. Acc. (g) t ₁ TO t ₂
		t ₁ (msec)	t ₂ (msec)	
Dummy (1)	188.4	54.120	90.000	30.76
Dummy (2)	225.8	73.680	109.560	33.08

* 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 = 6.0 sec.

Log time duration of reminder light operation = 6.0 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 = 0 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: Label located on inside of glove box door.

The manufacturer state the SRS system is designed to be maintenance free.

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:

Indicator located on right side of instrument cluster

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.: CP0311
 Make/Model: 1993 Dodge Shadow
 Date of Comfort/Convenience Check: 3/12/93
 Technician Performing Check: D.J.T.
 GVWR: 3685 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 - NO X

If yes, go to requirements D1, D2 and D3

2. Manual seat belts* YES X NO -

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

YES - NO X

(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 0.4 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:

- 1. Whose components are accessible to a seated occupant in both the stowed and operational positions.
YES X NO -
- 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 X NO -
- 3. That releases at a single point by a push button action.
YES X NO -

Figure 8

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 and 0.8 inch rubber trim covering the top and sides respectively. Lower portion of windshield is covered by a plastic shroud.

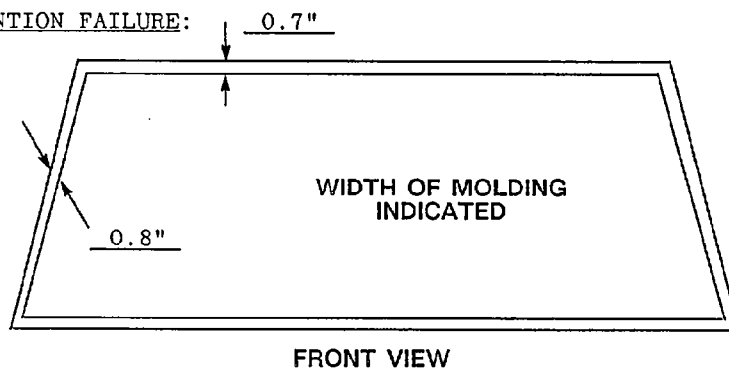
FMVSS 212 REQUIREMENTS:

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		PERCENT RETENTION
	PRE-TEST (in.)	POST-TEST (in.)	
RIGHT SIDE	79.5	79.5	100%
LEFT SIDE	79.5	79.5	100%
TOTAL	159.0	159.0	100%

AREA OF RETENTION FAILURE:



FAILURE DETAILS:

None

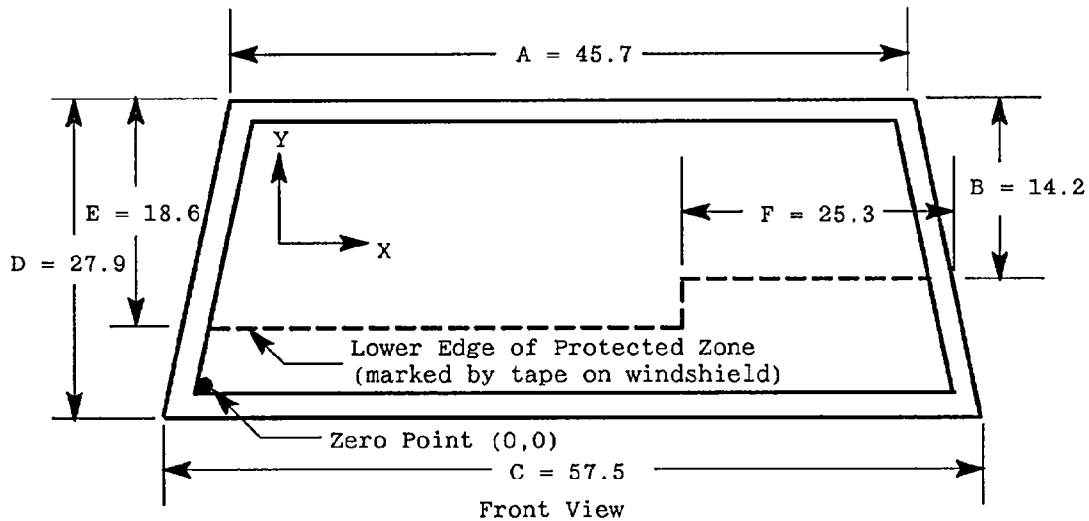
Figure 9

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	0	3	1	1
---	---	---	---	---	---

TEST DATE: April 13, 1993

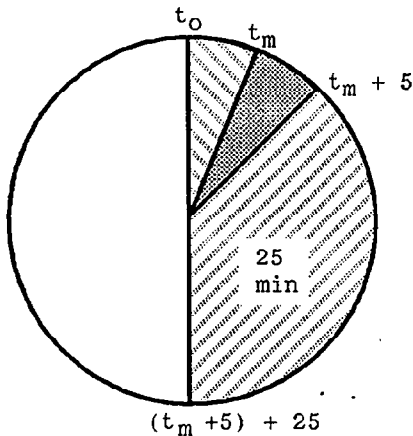
Vehicle Mfr./Make/Model: 1993 Dodge Shadow 4-Door Hatchback

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:

- ☒ 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:



1. From impact until vehicle motion ceases
2. For 5 minute period after vehicle motion ceases
3. For next 25 minutes

ACTUAL	MAX ALLOWED
0	1 oz.
0	5 oz.
0	1 oz./1 min.

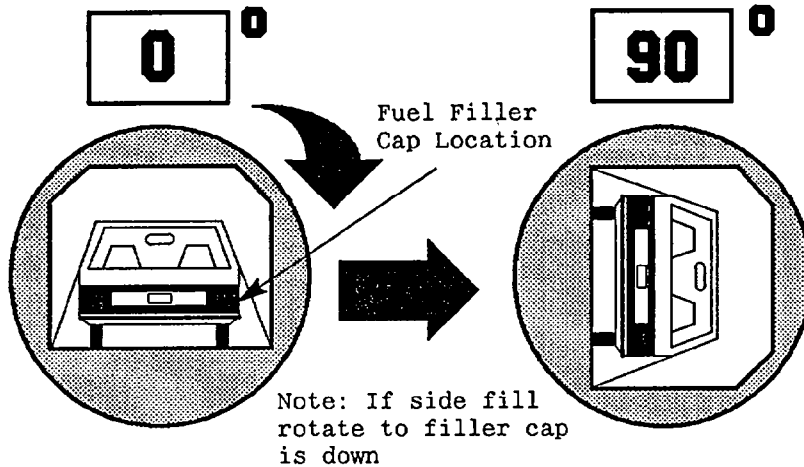
SOLVENT SPILLAGE DETAILS:

None

Table 14
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:

Vehicle NHTSA ID No.:



CP0311

I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	1	minutes	50	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	6	minutes	50	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	0
---	---	---	---

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

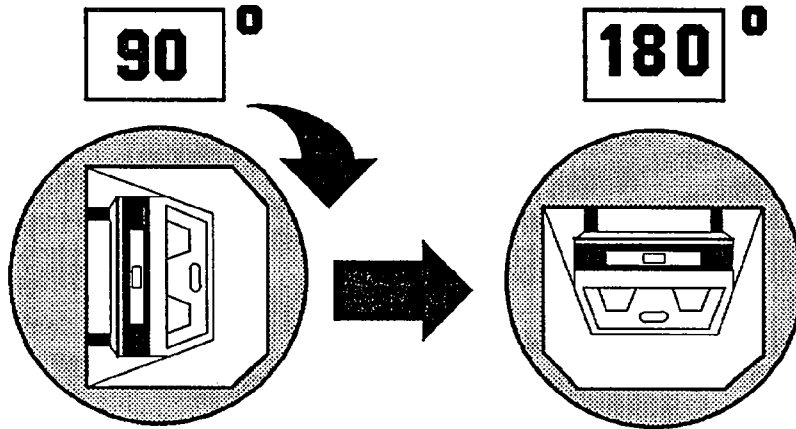
IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 13
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont..)

TEST PHASE:

Vehicle NHTSA ID No.:



CPO311

I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time _____ 2 _____ minutes _____ 01 _____ seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + _____ 5 _____ minutes _____ 00 _____ seconds

TOTAL _____ 7 _____ minutes _____ 01 _____ 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.

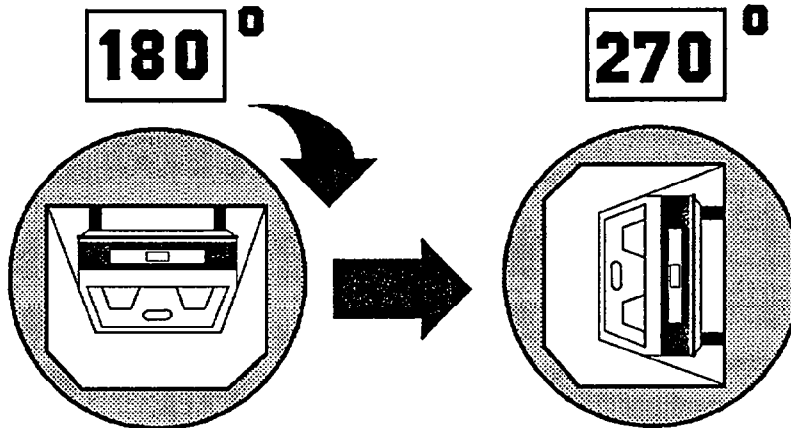
IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 13
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:

Vehicle NHTSA ID No.:



CP0311

I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time _____ 2 _____ minutes _____ 05 _____ seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + _____ 5 _____ minutes _____ 00 _____ seconds

TOTAL _____ 7 _____ minutes _____ 05 _____ 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.

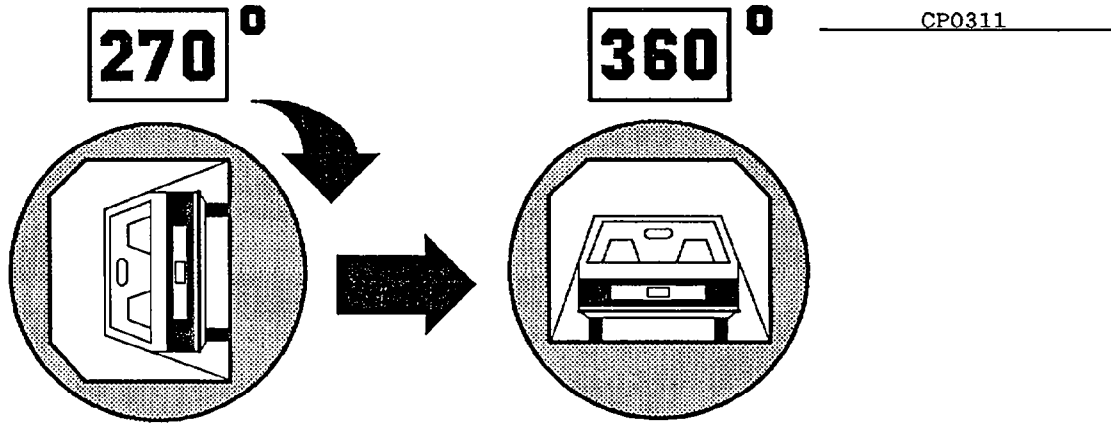
IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 13
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:

Vehicle NHTSA ID No.:



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time _____ 2 _____ minutes _____ 05 _____ seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + _____ 5 _____ minutes _____ 00 _____ seconds

TOTAL _____ 7 _____ minutes _____ 05 _____ 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: April 13, 1993 Vehicle NHTSA No.: CP0311
Vehicle Manufacturer: Chrysler Corporation
Model Year: 1993 VIN: 1B3XP28K1PN523490
Model: Shadow Body Style: 4-Door Hatchback Build Date: 8/92
Dummy Stabilized Temperature at Time of Test: 70 °F (Spec. = 69-72°F)
Impact Velocity: 29.0 mph Time of Test: 13:50
Type of Automatic Restraint System: Driver side airbag; right-front passenger
used a manual 3-point continuous loop restraint

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

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Figure A-1 PRE-TEST FRONT VIEW

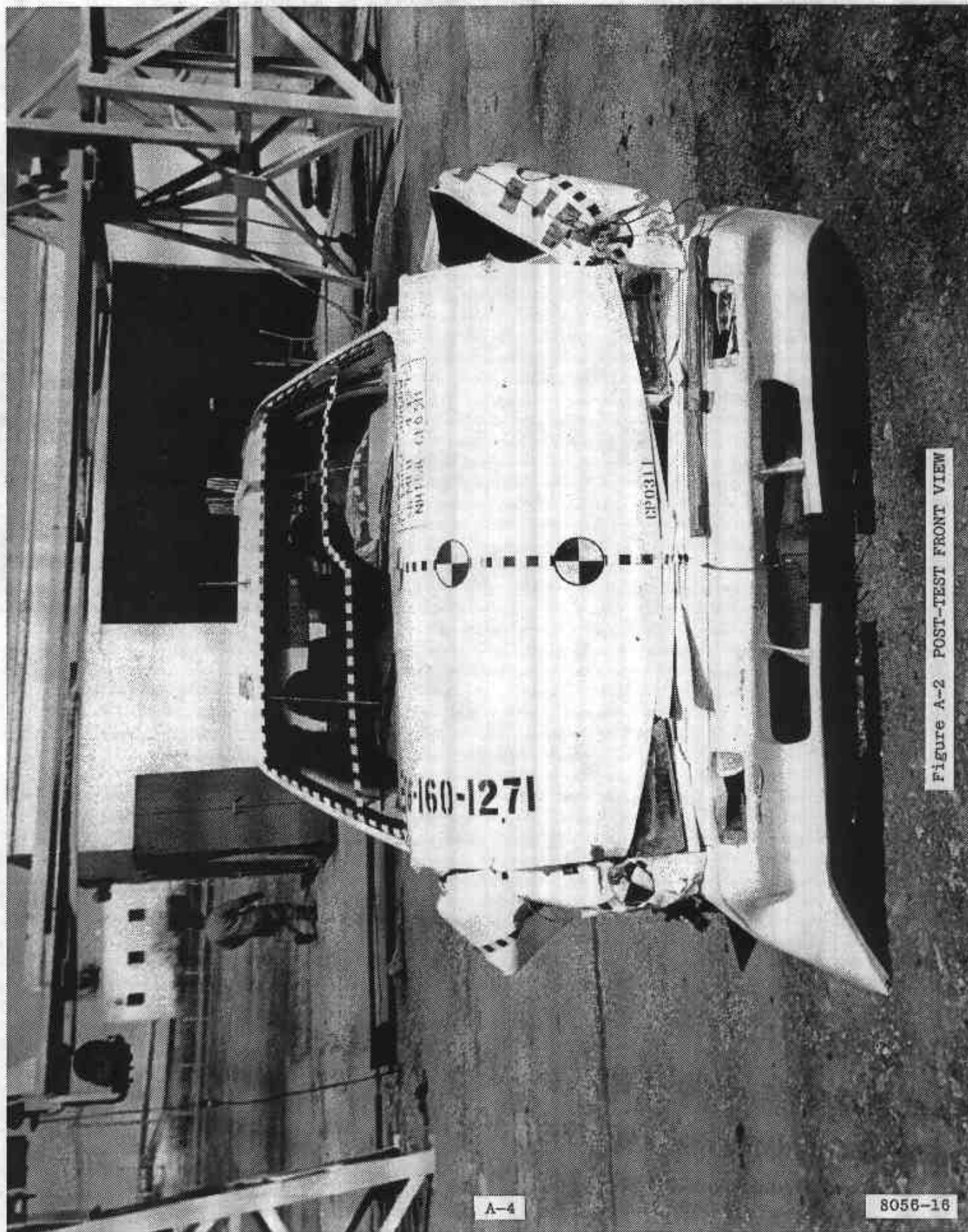


Figure A-2 POST-TEST FRONT VIEW

A-4

8056-16

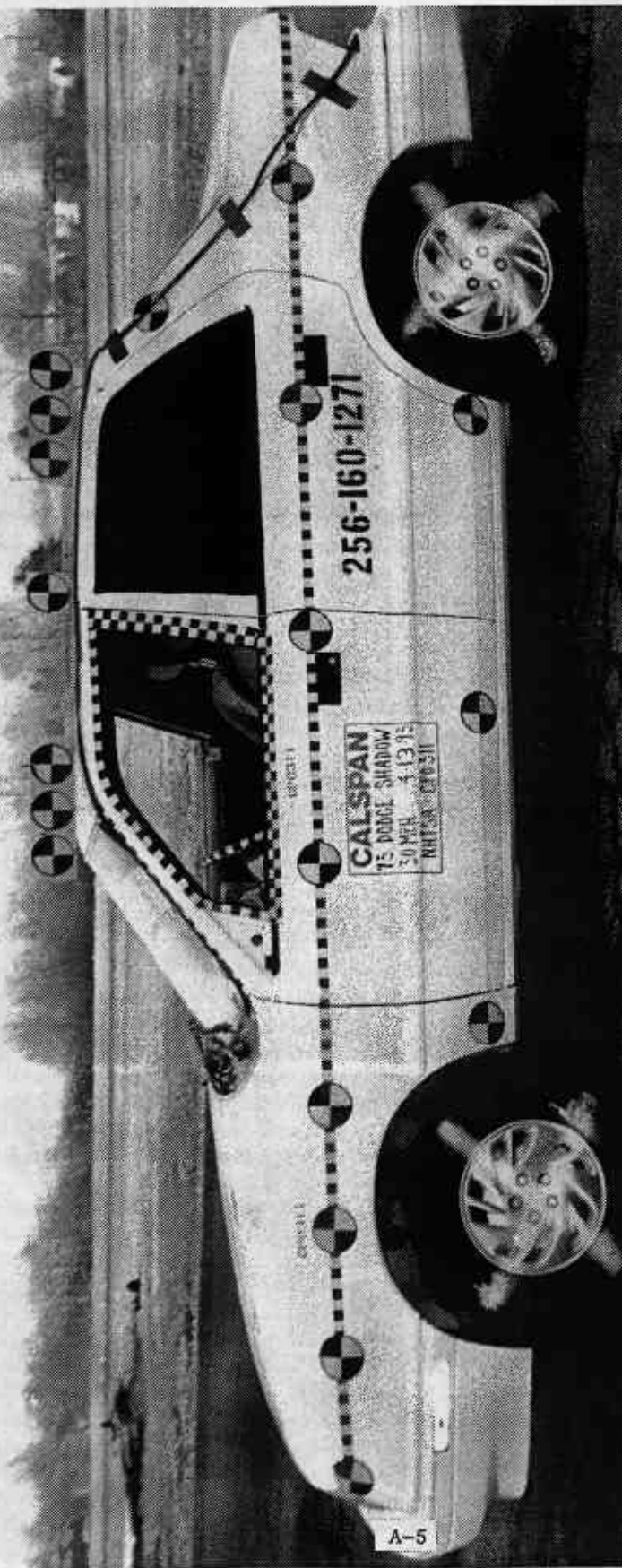


Figure A-3 PRE-TEST LEFT SIDE VIEW

A-5

8058-16

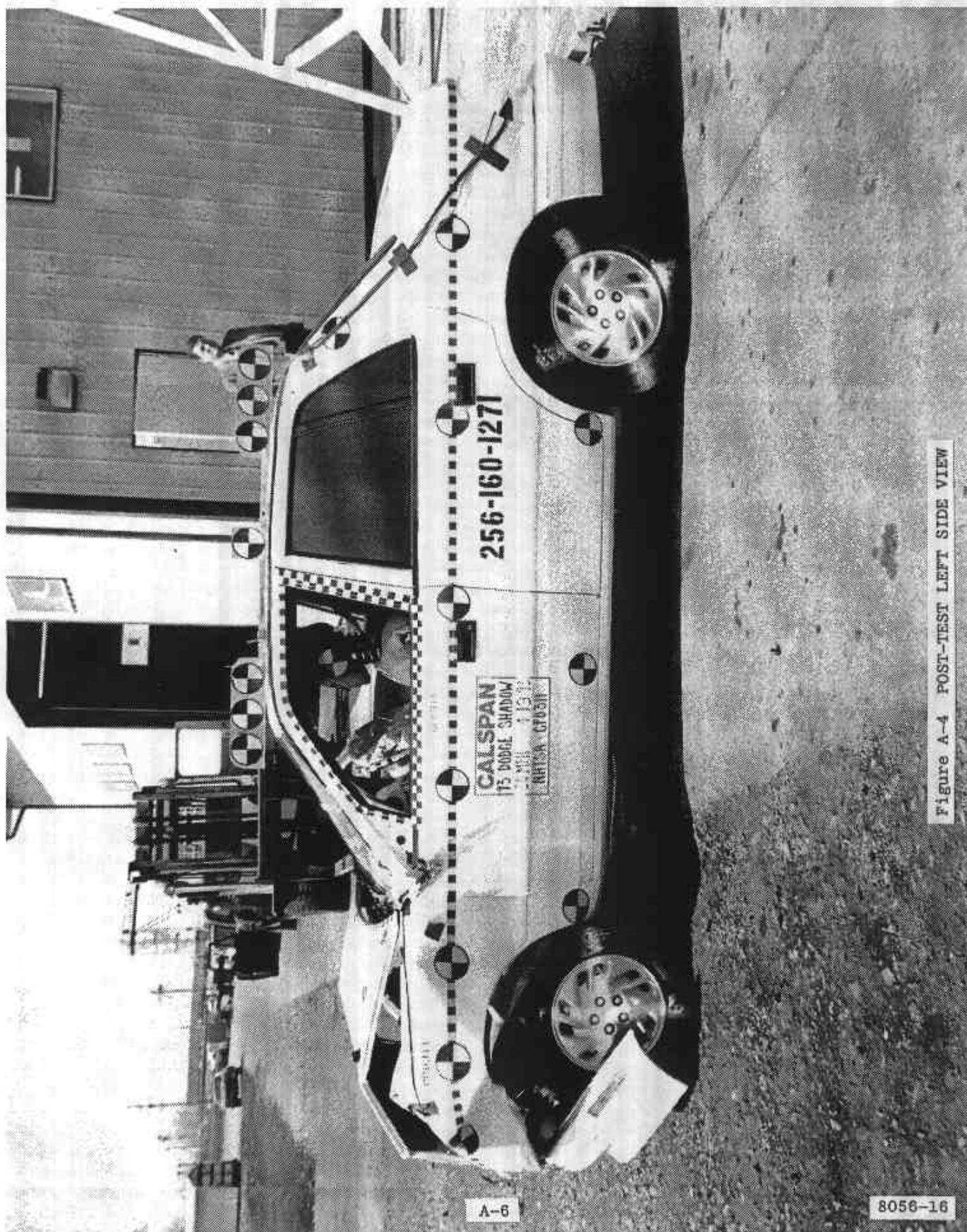
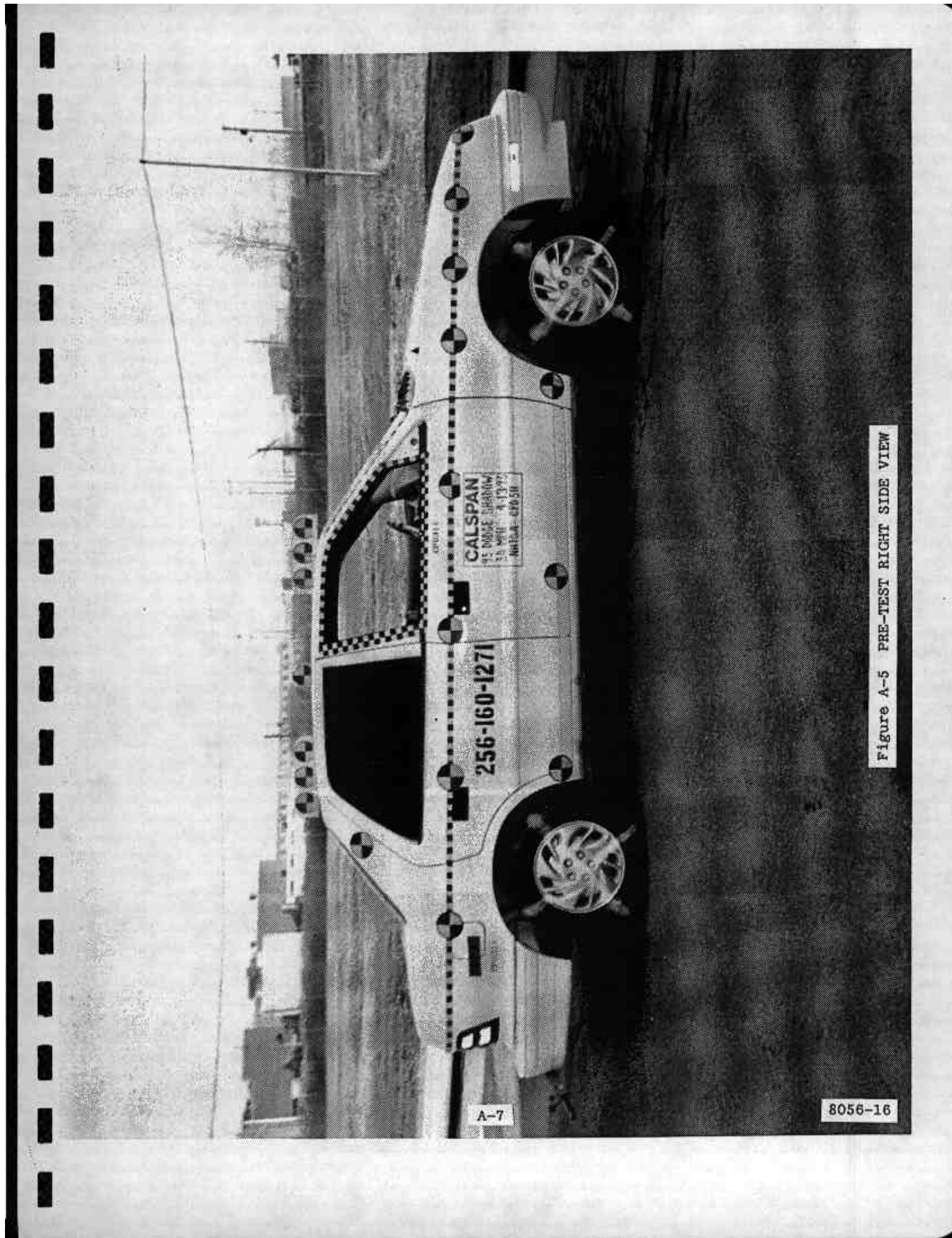


Figure A-4 POST-TEST LEFT SIDE VIEW



A-7

8056-16

Figure A-5 PRE-TEST RIGHT SIDE VIEW



Figure A-6 POST-TEST RIGHT SIDE VIEW

8056-16



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

A-9

8056-16

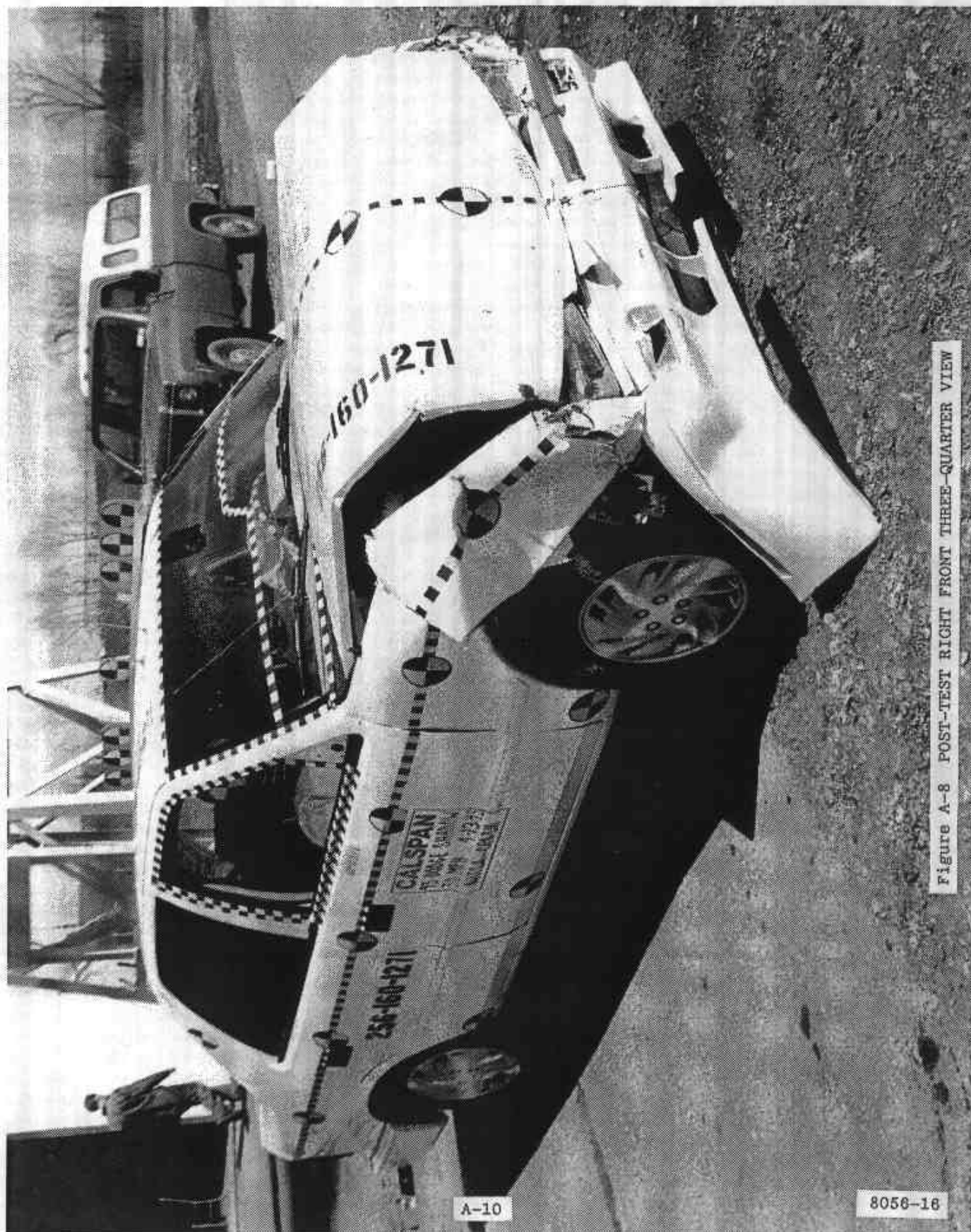


Figure A-8 POST-TEST RIGHT FRONT THREE-QUARTER VIEW



Figure A-9 PRE-TEST LEFT REAR THREE-QUARTER VIEW

A-11

8056-16



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

A-12

8056-16

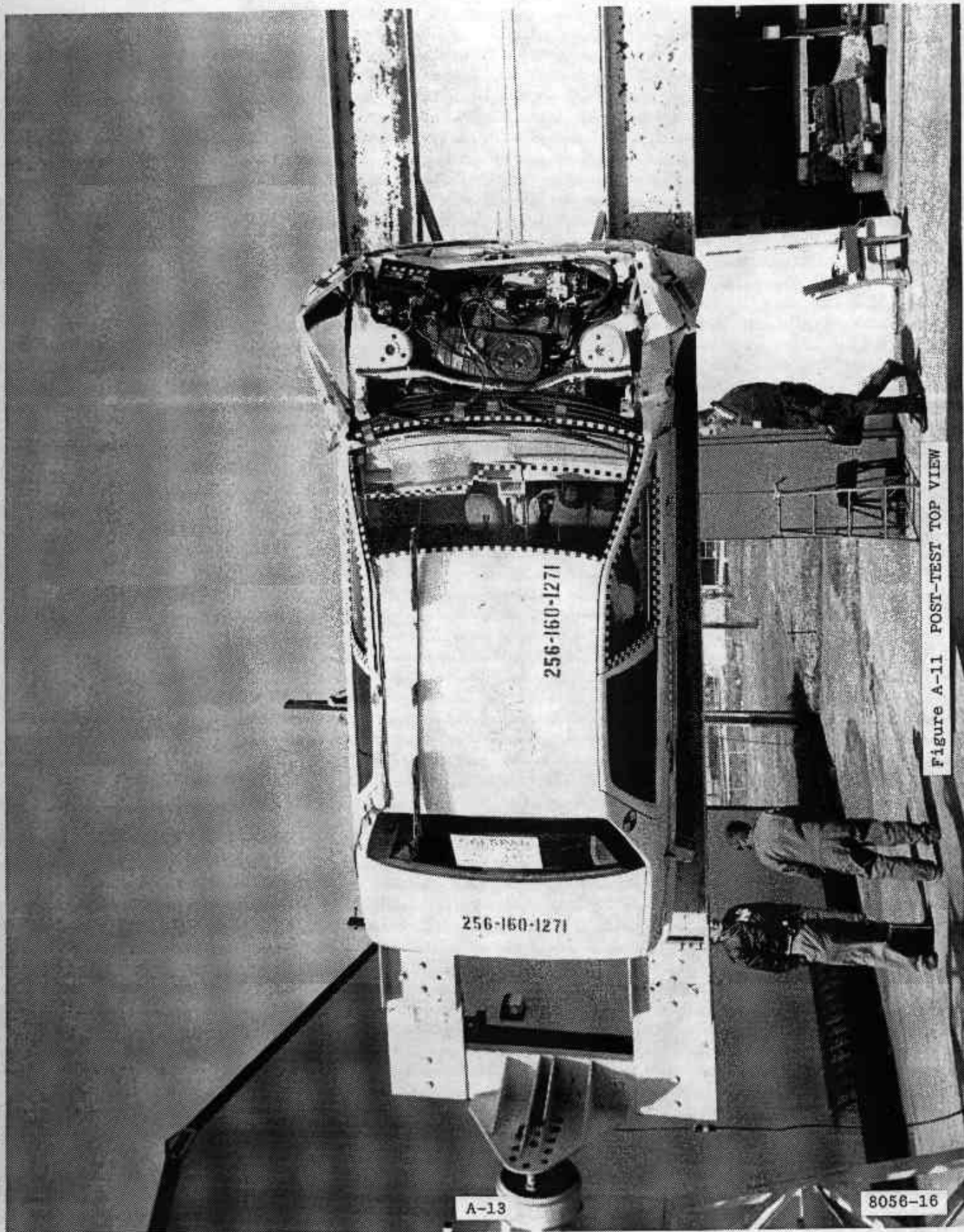


Figure A-11 POST-TEST TOP VIEW

A-13

8056-16

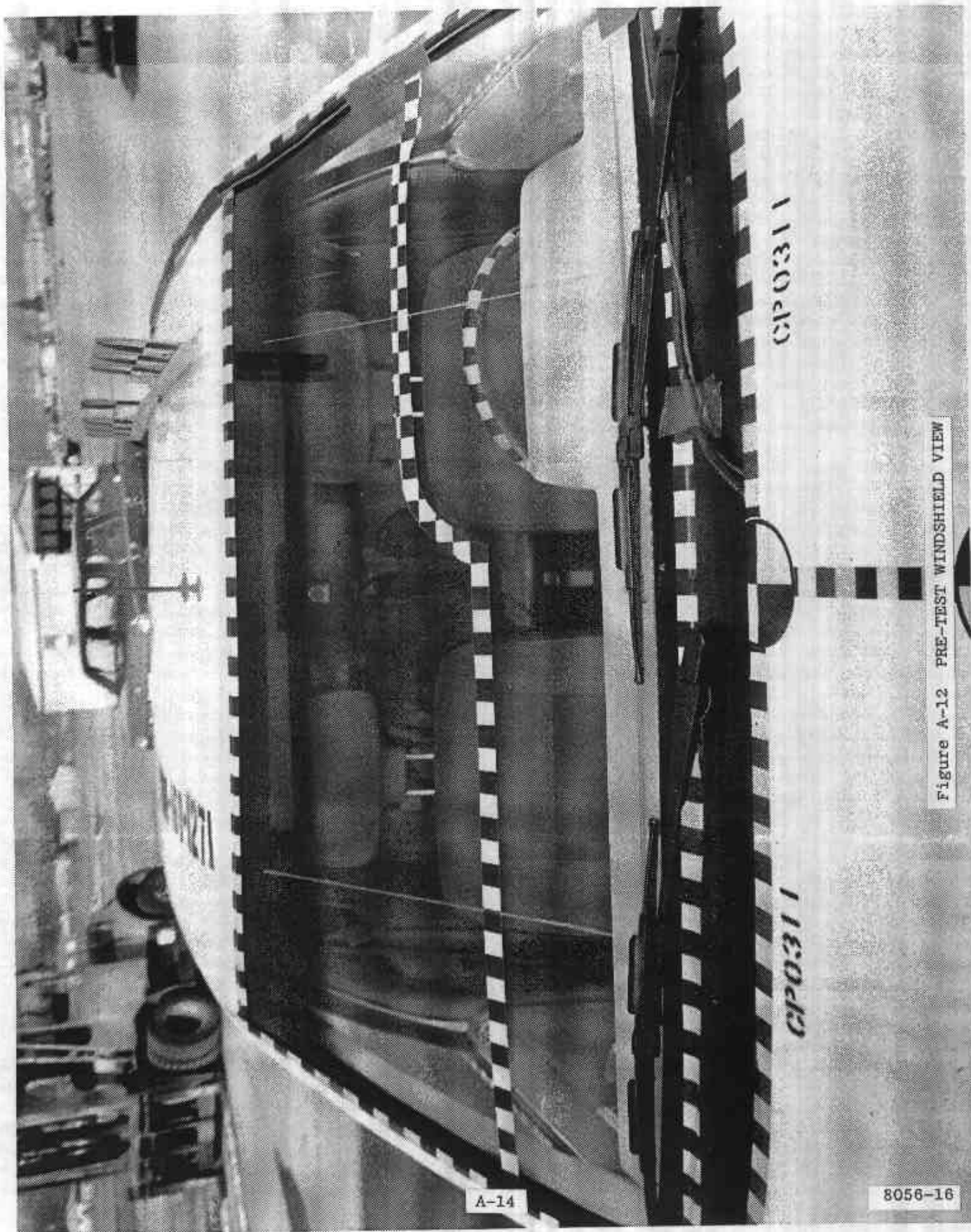
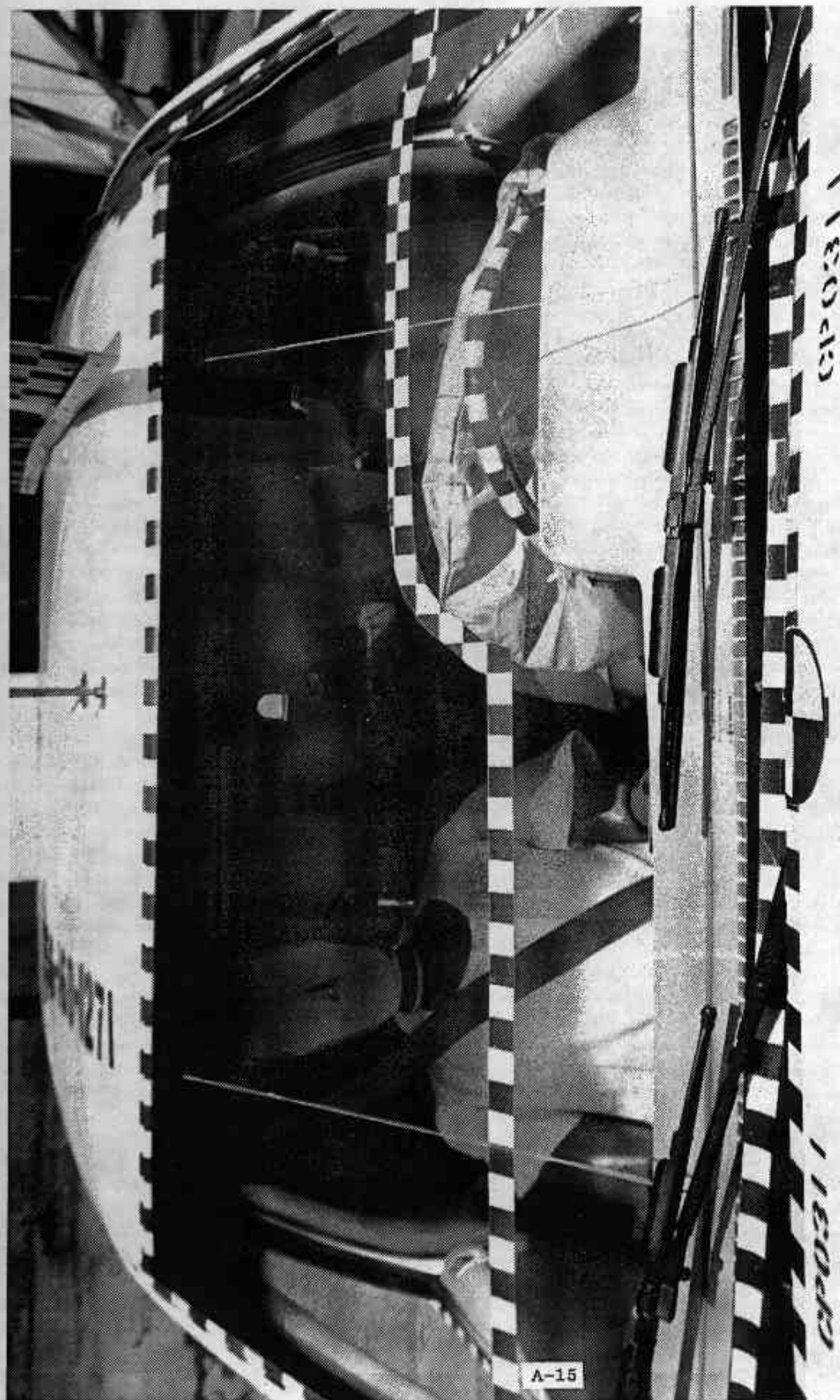


Figure A-12 PRE-TEST WINDSHIELD VIEW

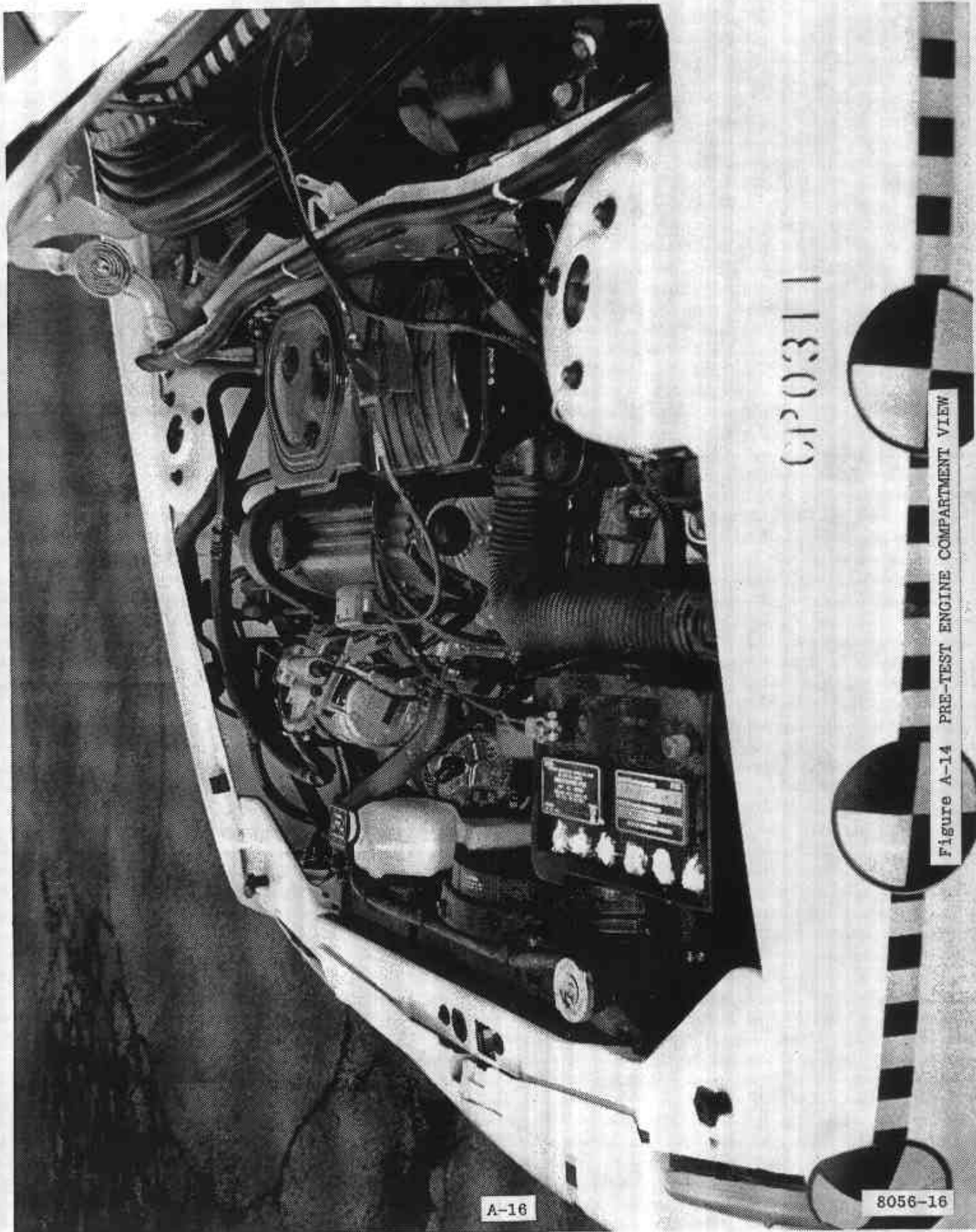


A-15

8056-16

Figure A-13 POST-TEST WINDSHIELD VIEW





CP0311

Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW

A-16

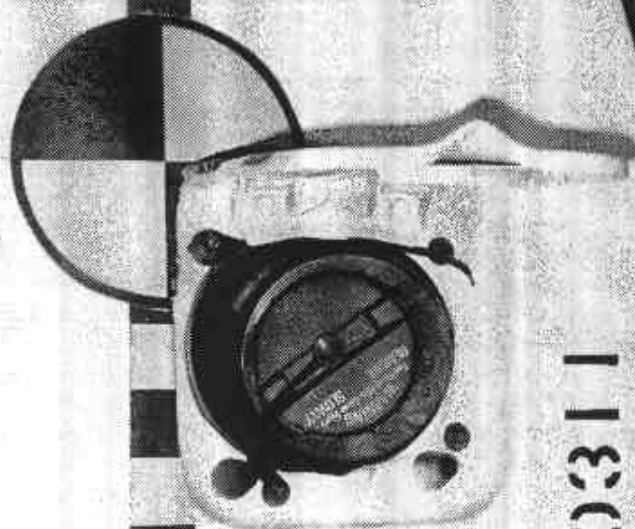
8056-16



Figure A-15 POST-TEST ENGINE COMPARTMENT VIEW

A-17

8056-18



CP0311

Figure A-16 PRE-TEST FUEL FILLER CAP PHOTO

A-18

8056-16

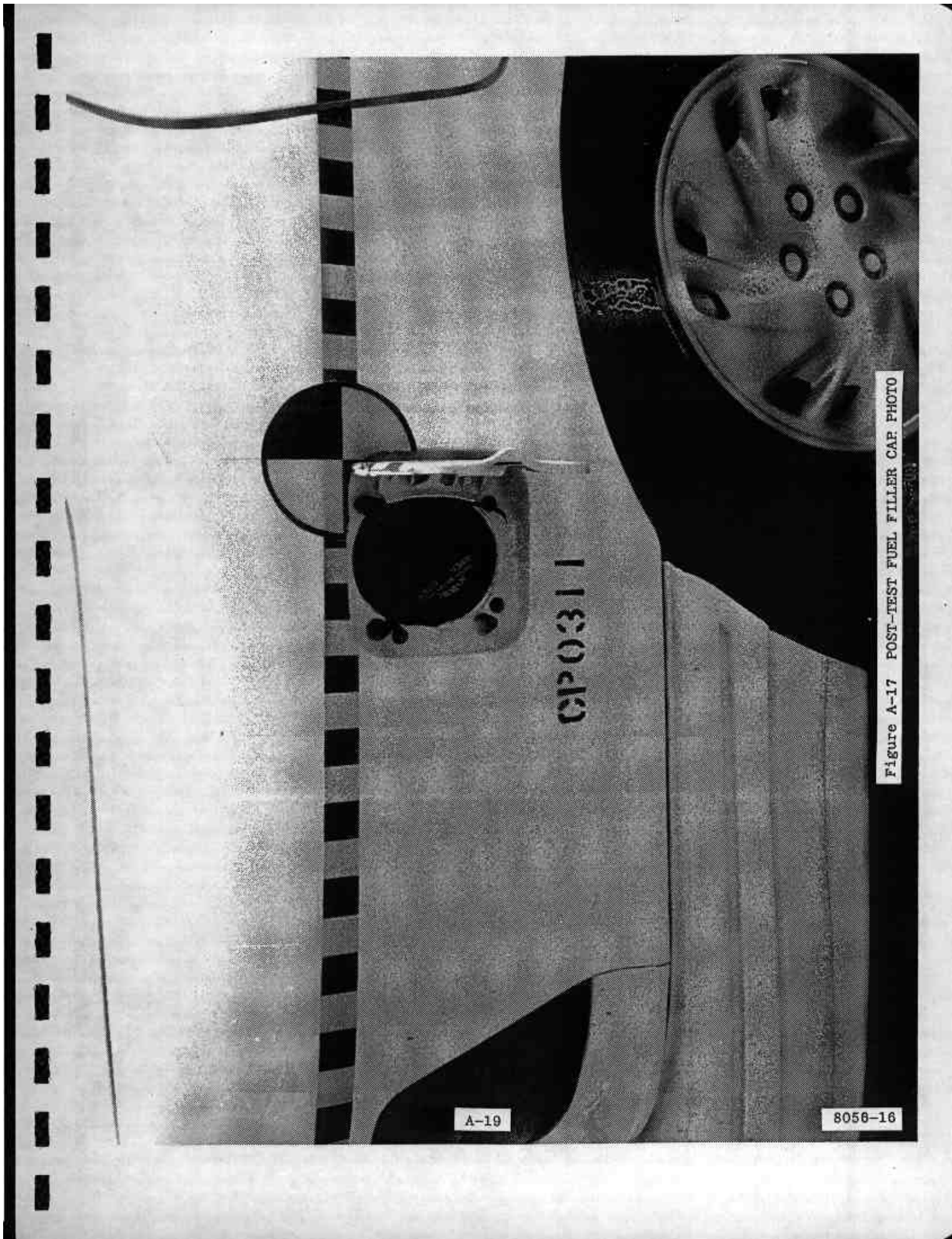


Figure A-17 POST-TEST FUEL FILLER CAP PHOTO

A-19

8058-16

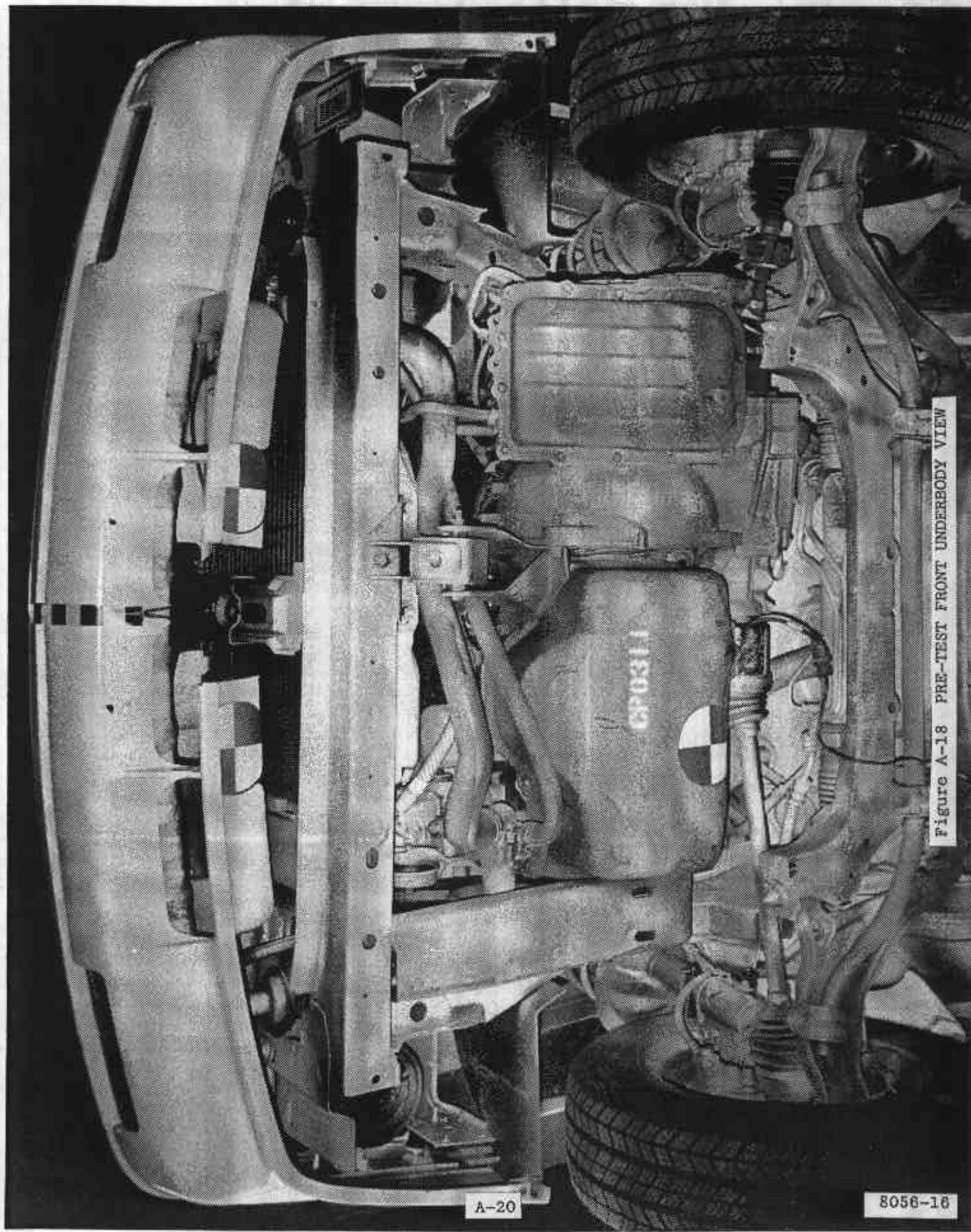


Figure A-18 PRE-TEST FRONT UNDERBODY VIEW

A-20

8056-16

Figure A-19 POST-TEST FRONT UNDERBODY VIEW



A-21

8056-16

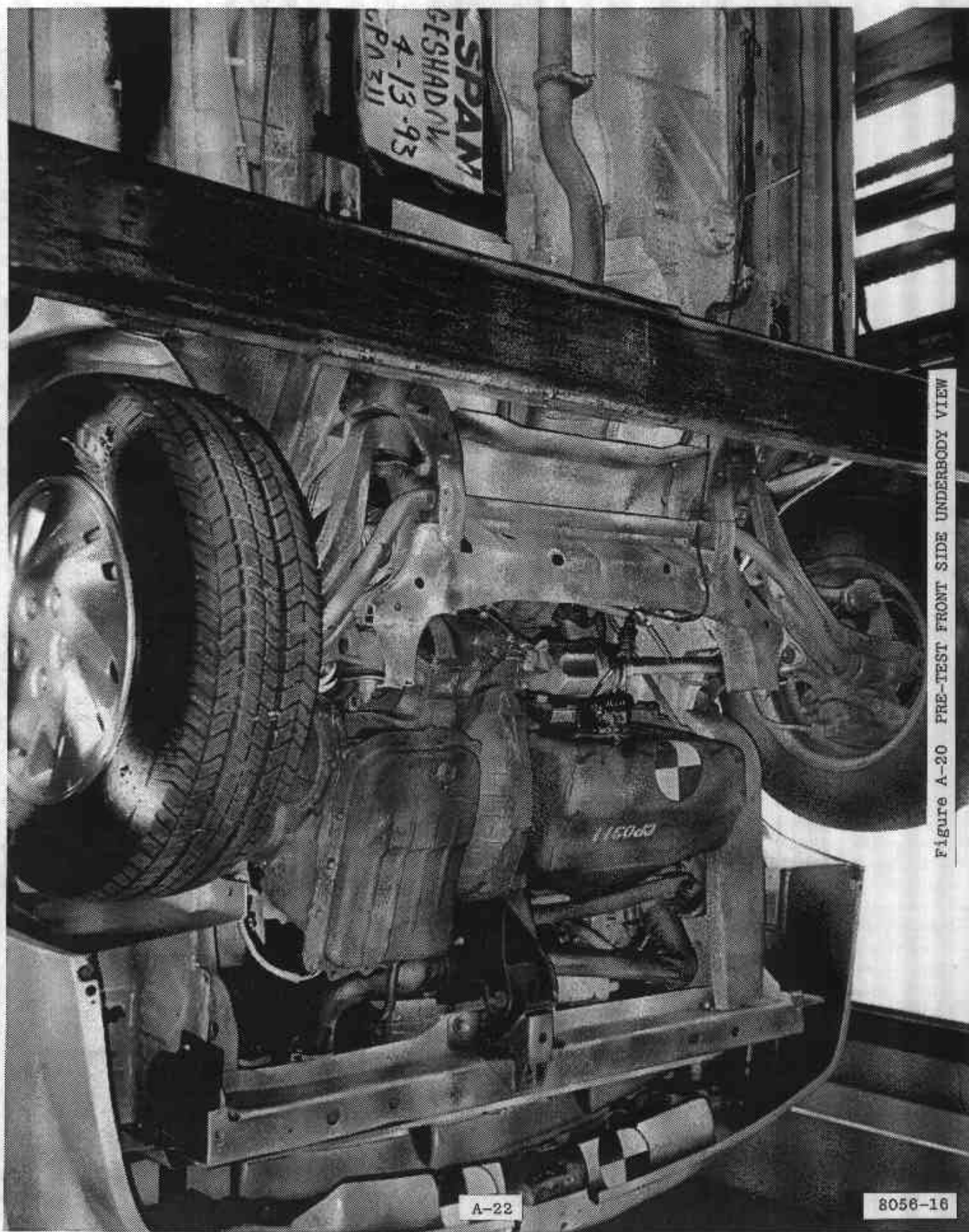
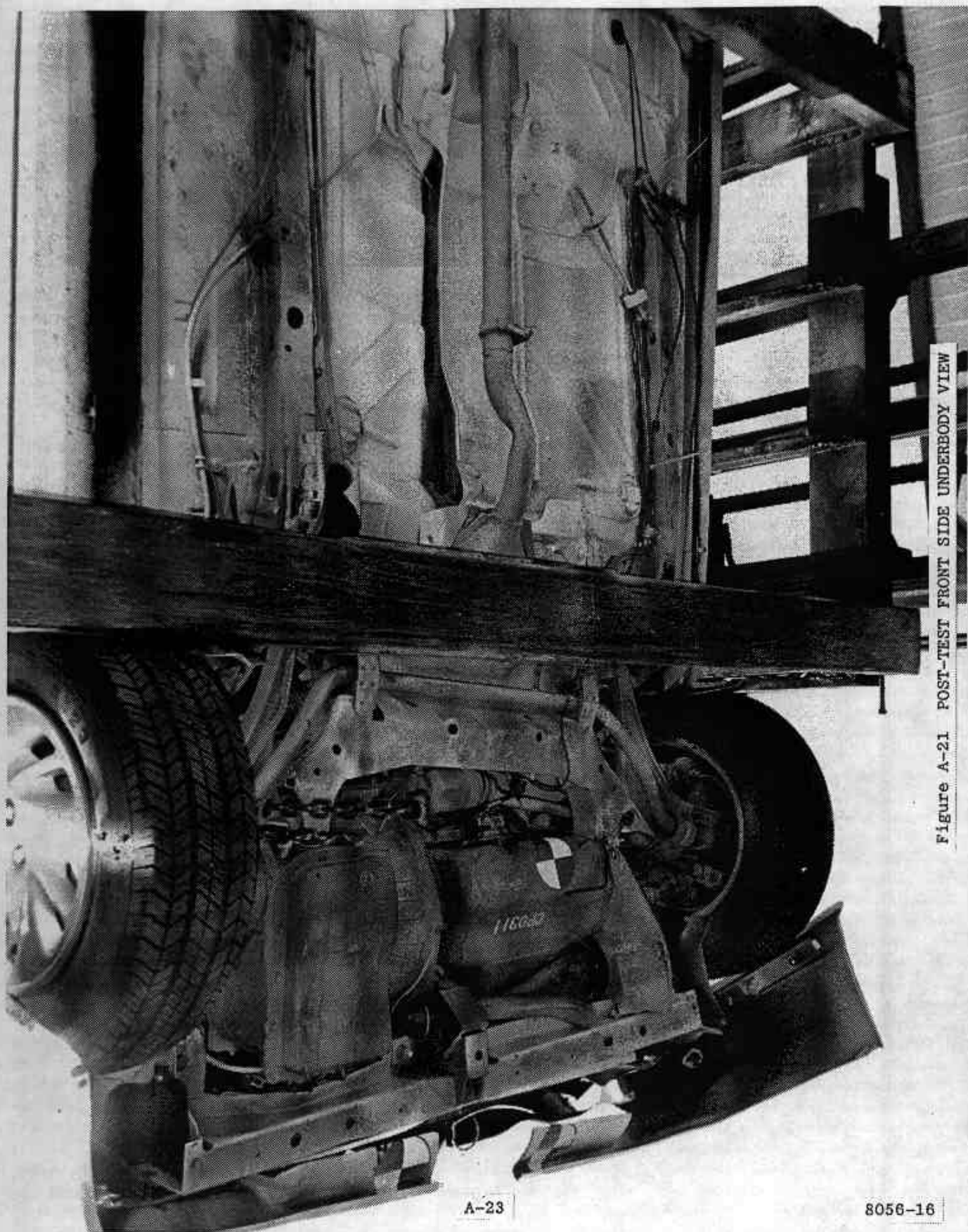


Figure A-20 PRE-TEST FRONT SIDE UNDERBODY VIEW

A-22

8058-16

Figure A-21 POST-TEST FRONT SIDE UNDERBODY VIEW



A-23

8056-16

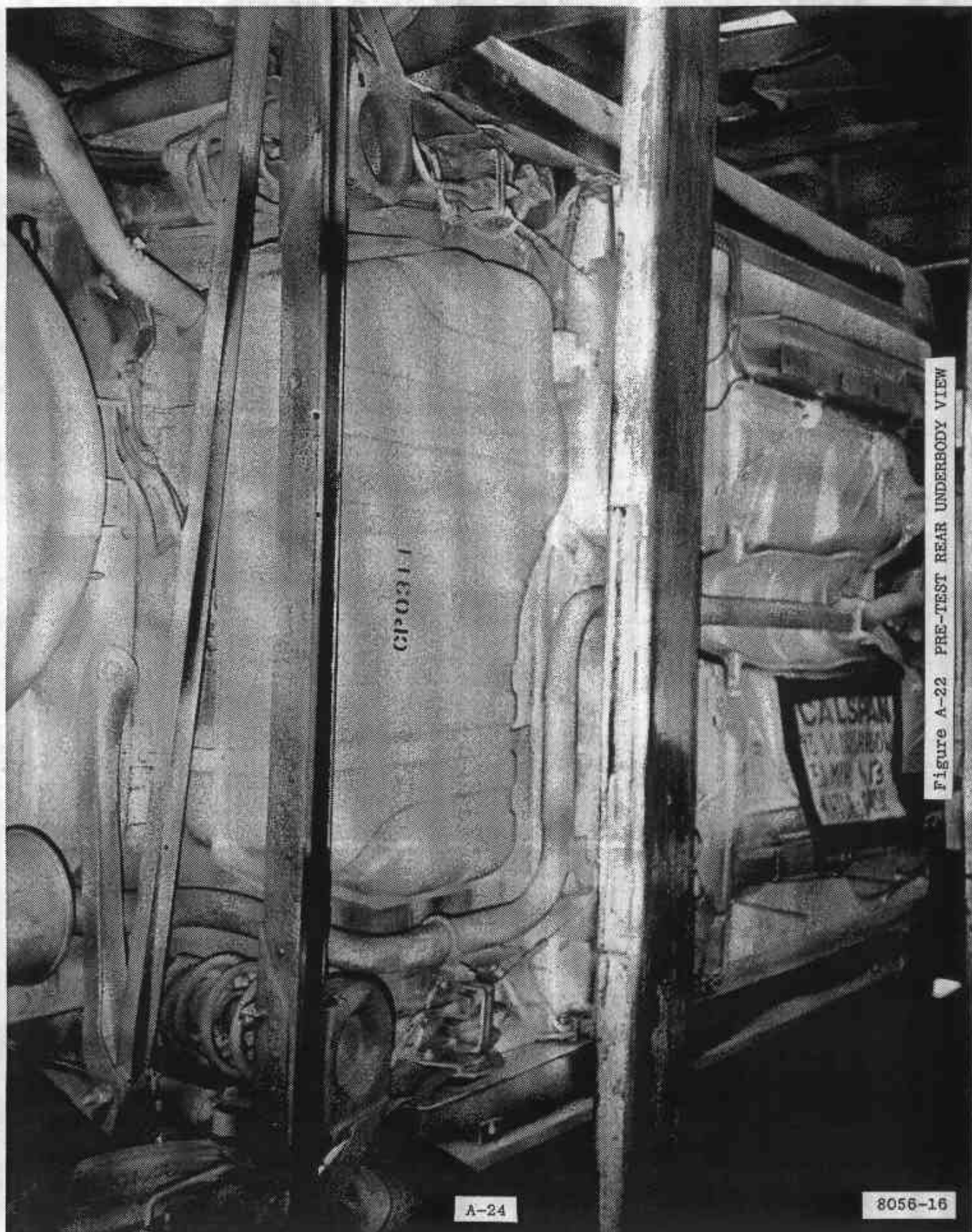


Figure A-22 PRE-TEST REAR UNDERBODY VIEW

A-24

8056-16

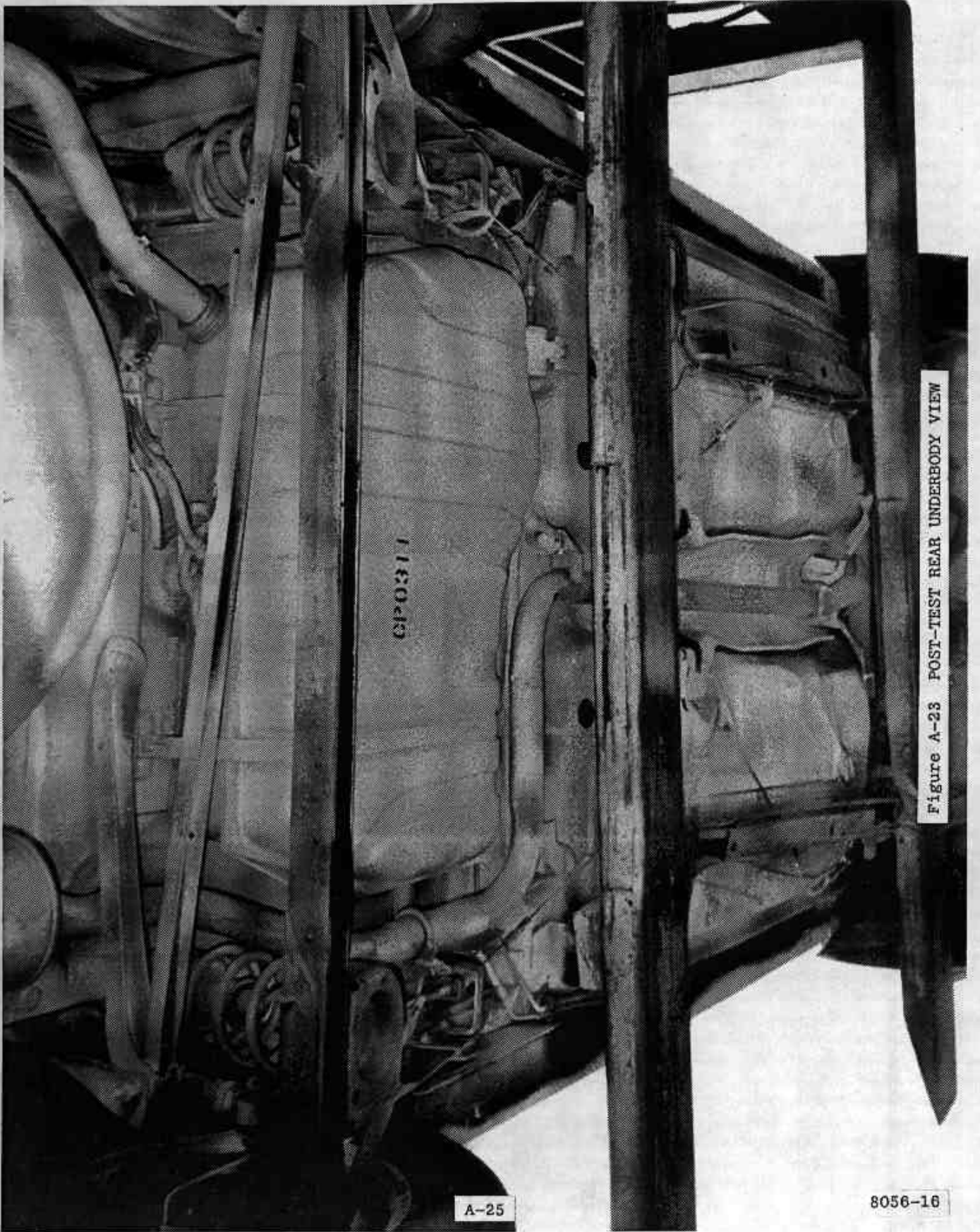


Figure A-23 POST-TEST REAR UNDERBODY VIEW

A-25

8056-16

MFD BY CHRYSLER CORPORATION

DATE OF MFG: 8-52

GWR 3385 LB
1672 KG

GWR 2825 LB
FRONT 8919 KG

GWR 1719 LB
REAR 6775 KG

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY, BUREAU OF
THEFT PREVENTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

VIN: 1B3XP28K1PN523490

TYPE: PASSENGER CAR



NOH: 083119 513

VEHICLE MADE IN U.S.A.

4841142

Figure A-24 CERTIFICATION LABEL

	VEHICLE CAPACITY OR LESS
1ST SEAT	2 PASS
2ND SEAT	3 PASS
LUGGAGE	115 LBS-52 kg
TOTAL	5 PASS
TOTAL WEIGHT	865 LBS-392kg
TIRE PRESSURE COLD	32 PSI 220 kPa FRONT AND REAR
MINIMUM TIRE SIZE	
P185/70R14 STANDARD LOAD	
SEE OWNERS MANUAL FOR ADDITIONAL DATA	
PRINTED IN USA 4472 202	

Figure A-25 TIRE PLACARD



Figure A-26 PRE-TEST DRIVER DUMMY POSITION



Figure A-27 POST-TEST DRIVER DUMMY POSITION

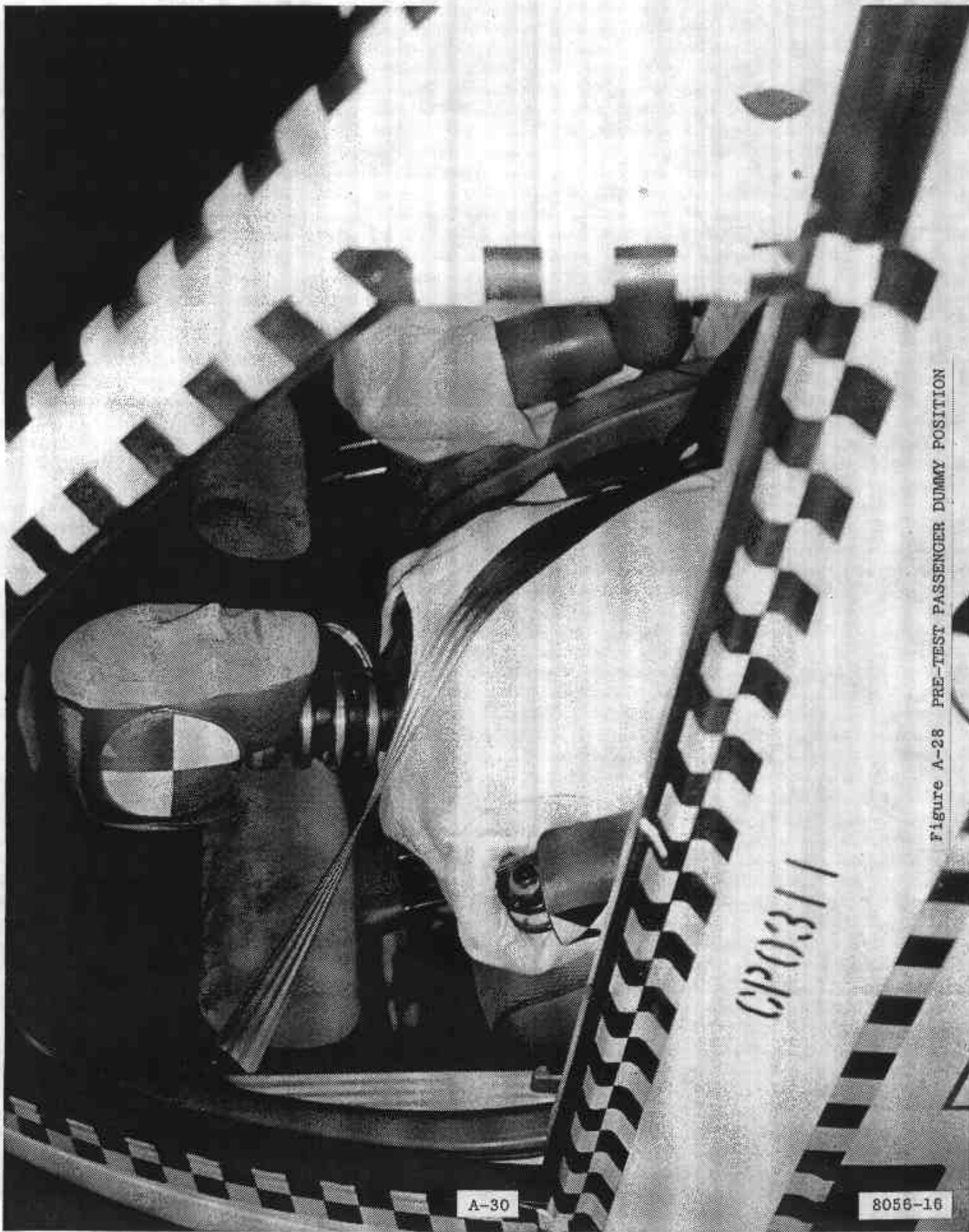


Figure A-28 PRE-TEST PASSENGER DUMMY POSITION

A-30

8056-16

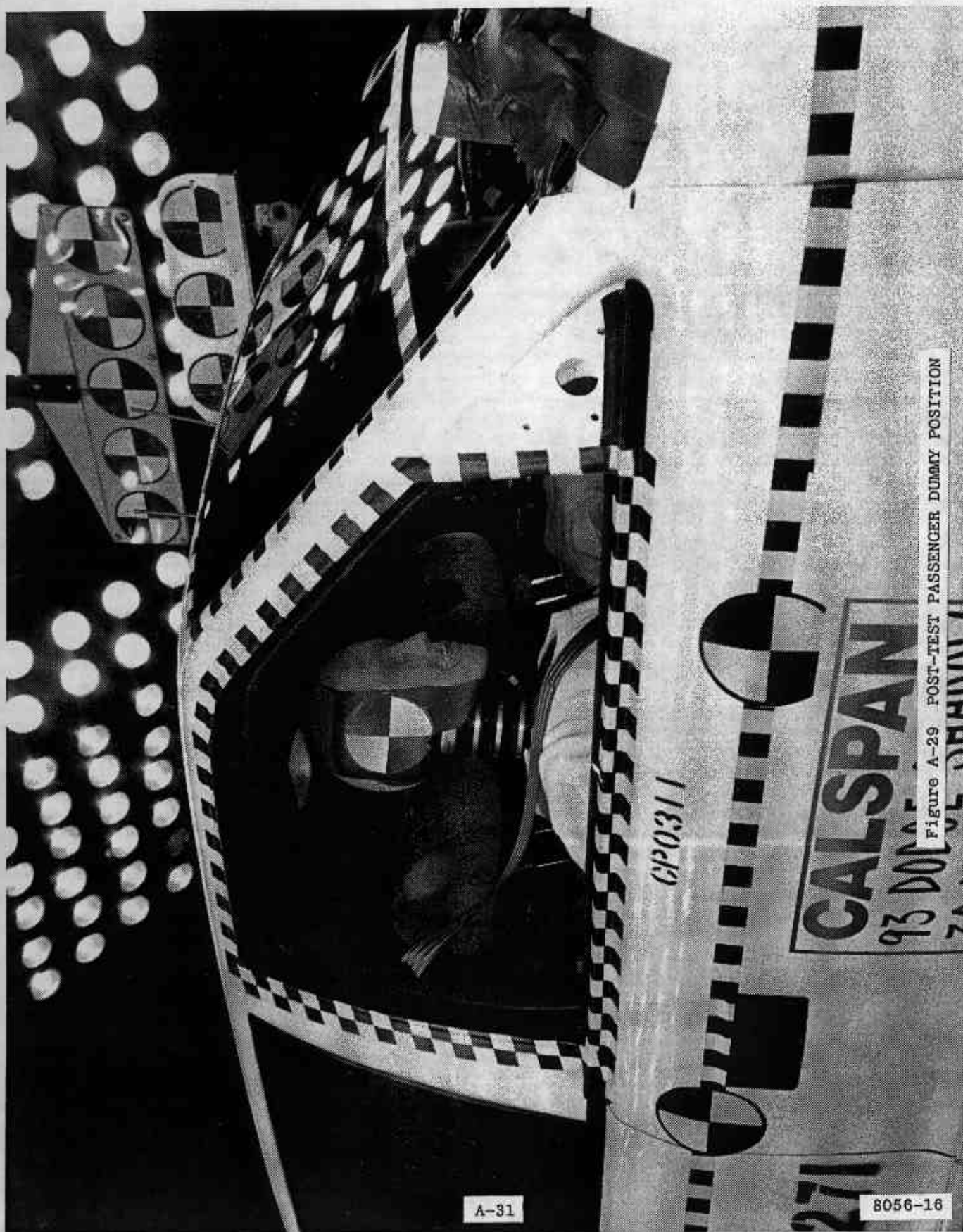


Figure A-29 POST-TEST PASSENGER DUMMY POSITION

A-31

8056-16



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

A-32

8056-16



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

A-33

8056-16



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

A-34

8056-16



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

A-35

8056-16



Figure A-34 POST-TEST DRIVER AIRBAG VIEW

A-36

8056-16

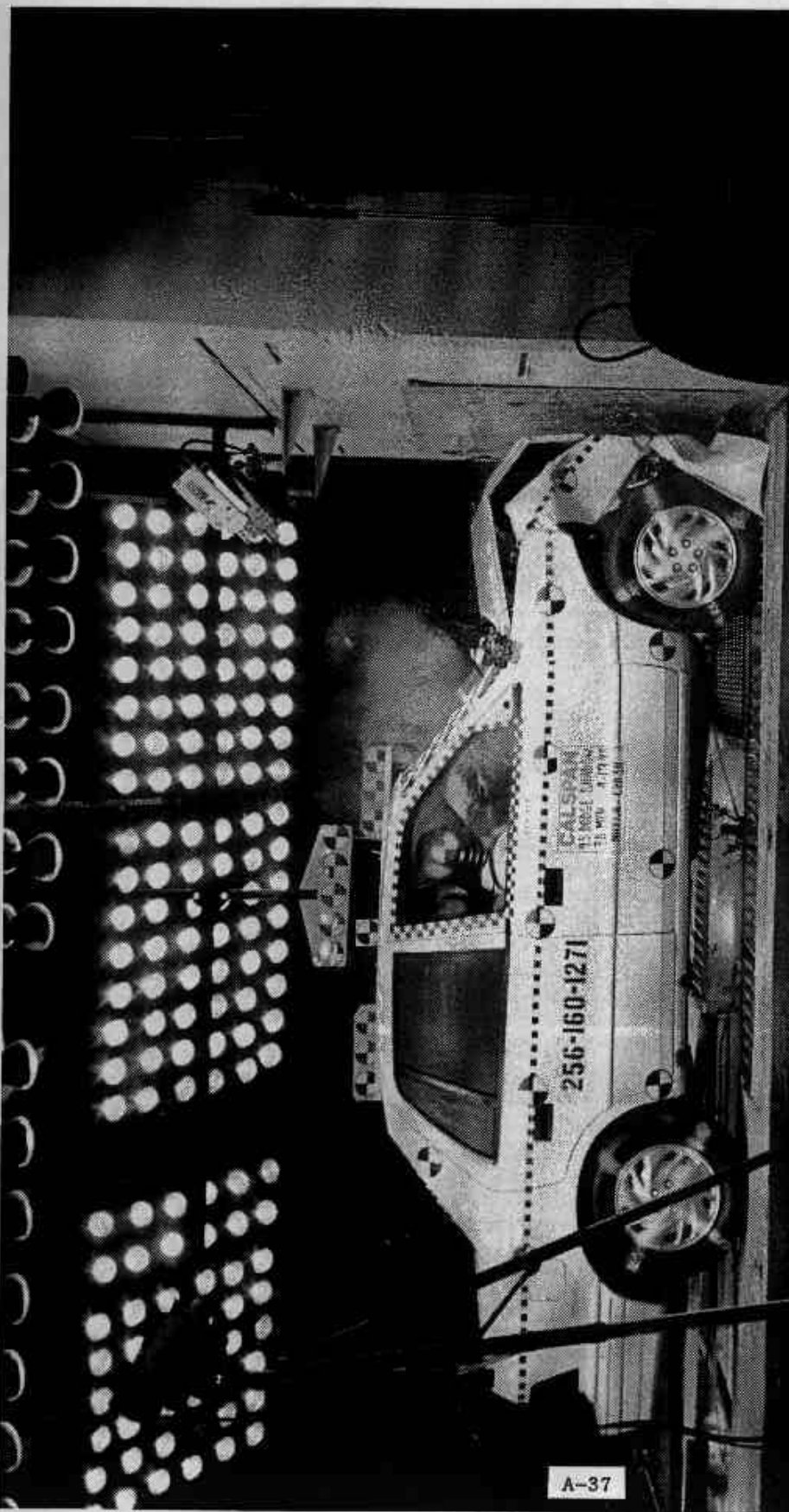


Figure A-35 VEHICLE IMPACT

A-37

8056-16

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

TEST NO. CP0311

VEHICLE DATA

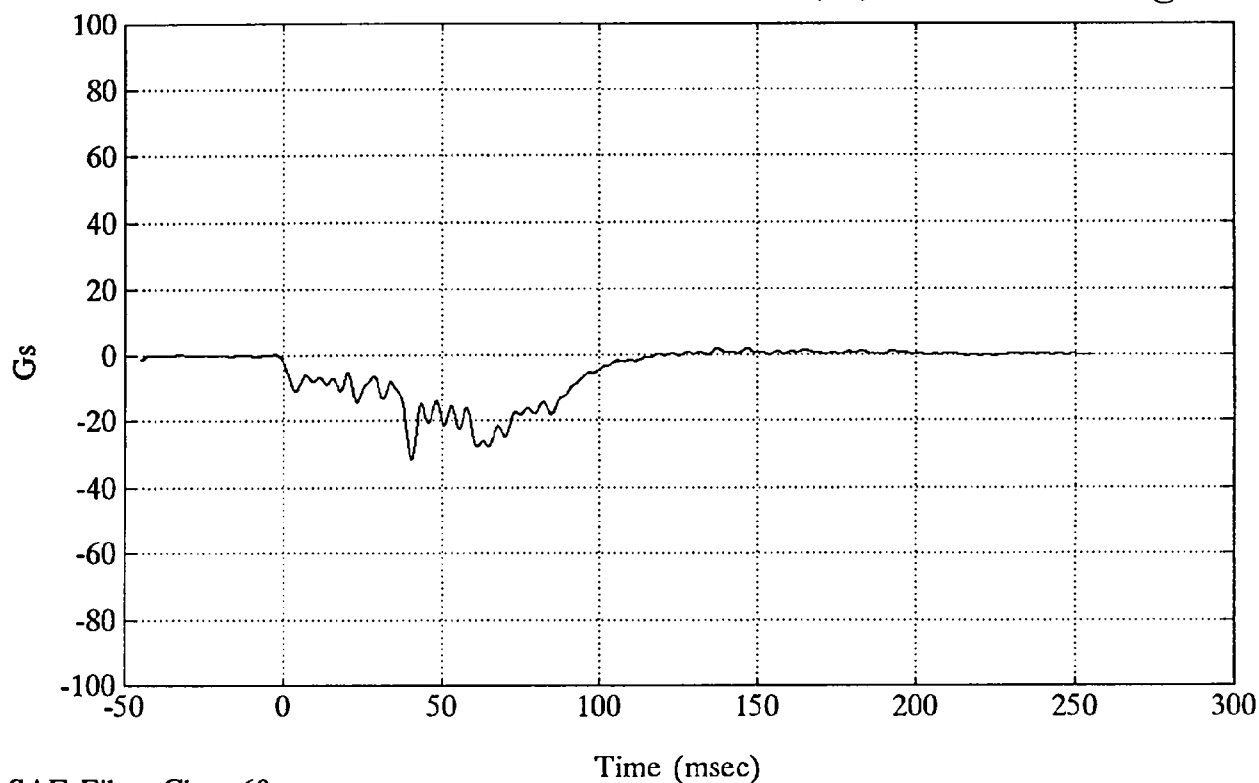
SAE FILTER CHANNEL CLASS

60

FMVSS 208 - 1993 DODGE SHADOW

L. Rear Crossmember X (#1)

Max = 2.00 Gs @ 137.28 msec
Min = -31.65 Gs @ 40.56 msec

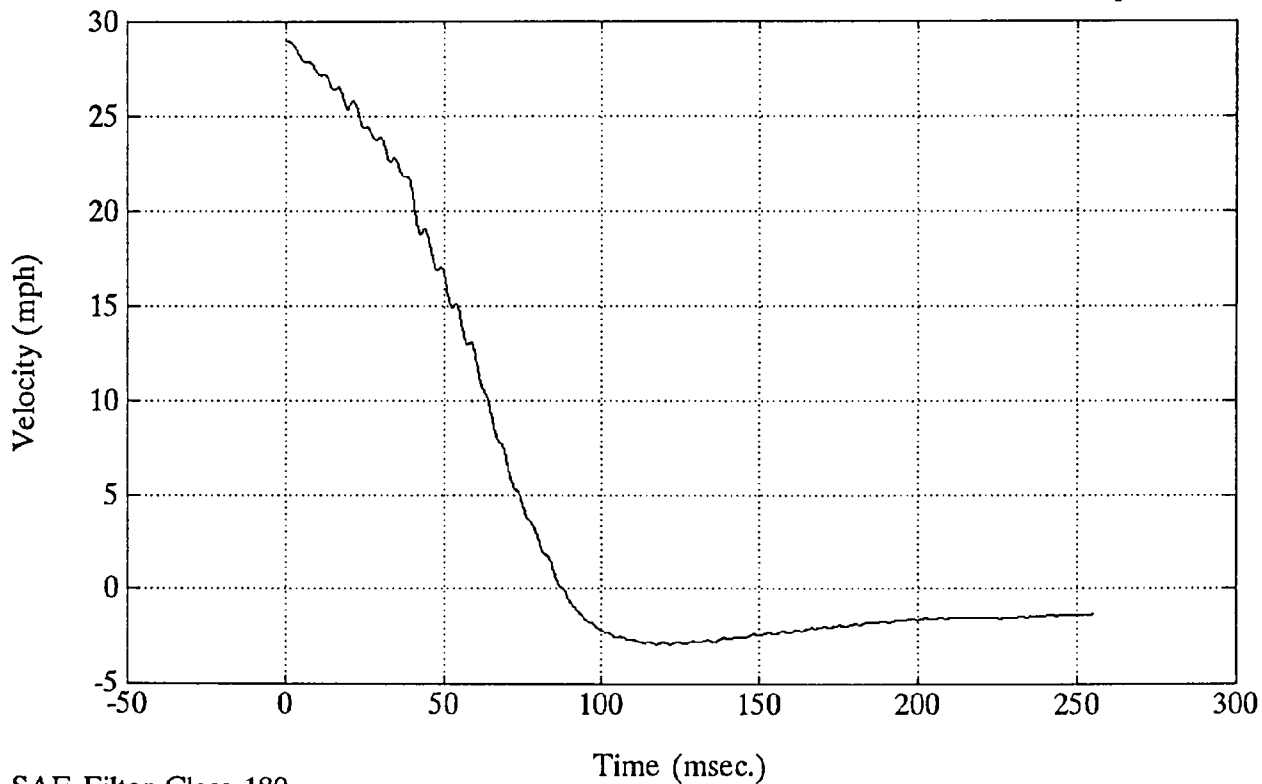


SAE Filter Class 60

FMVSS 208 - 1993 DODGE SHADOW

L. Rear Crossmember X (#1)

Max = 29.00 mph @ 0.24 msec
Min = -2.93 mph @ 117.36 msec

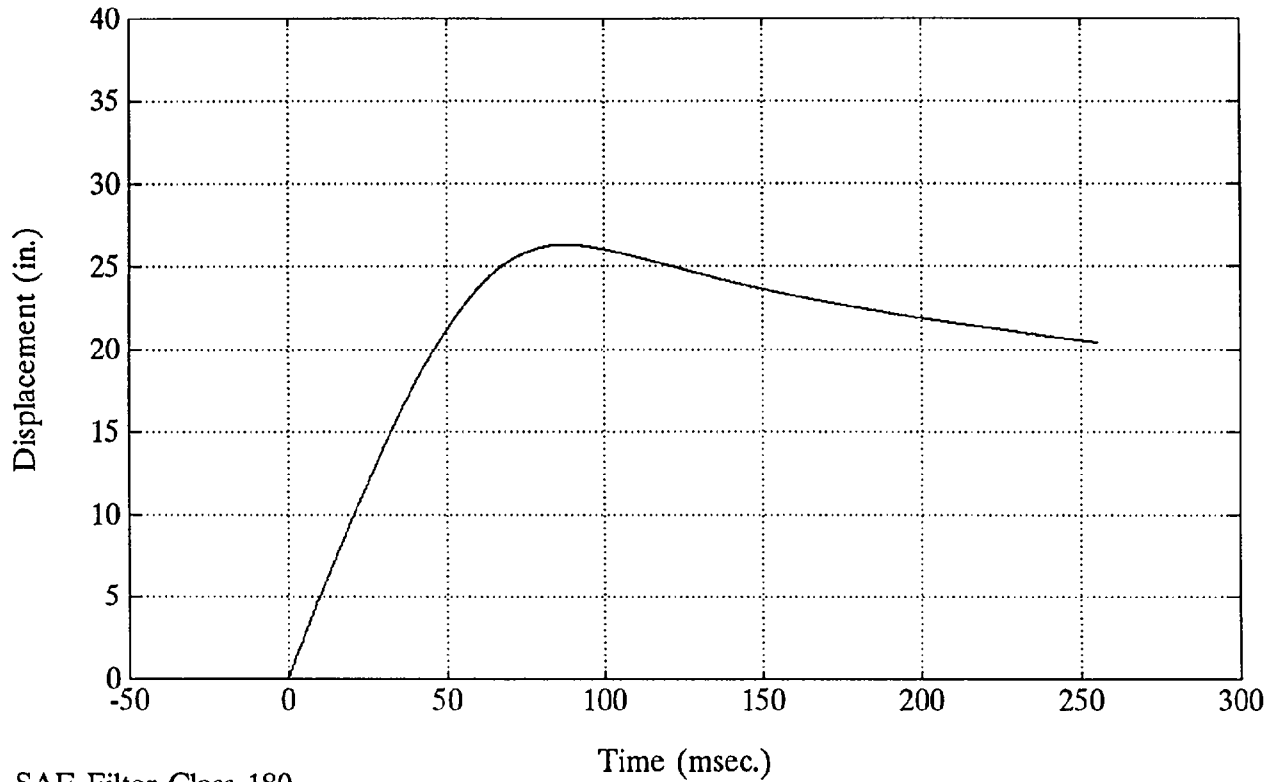


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

L. Rear Crossmember X (#1)

Max = 26.29 in. @ 89.52 msec
Min = 0.00 in. @ -0.00 msec

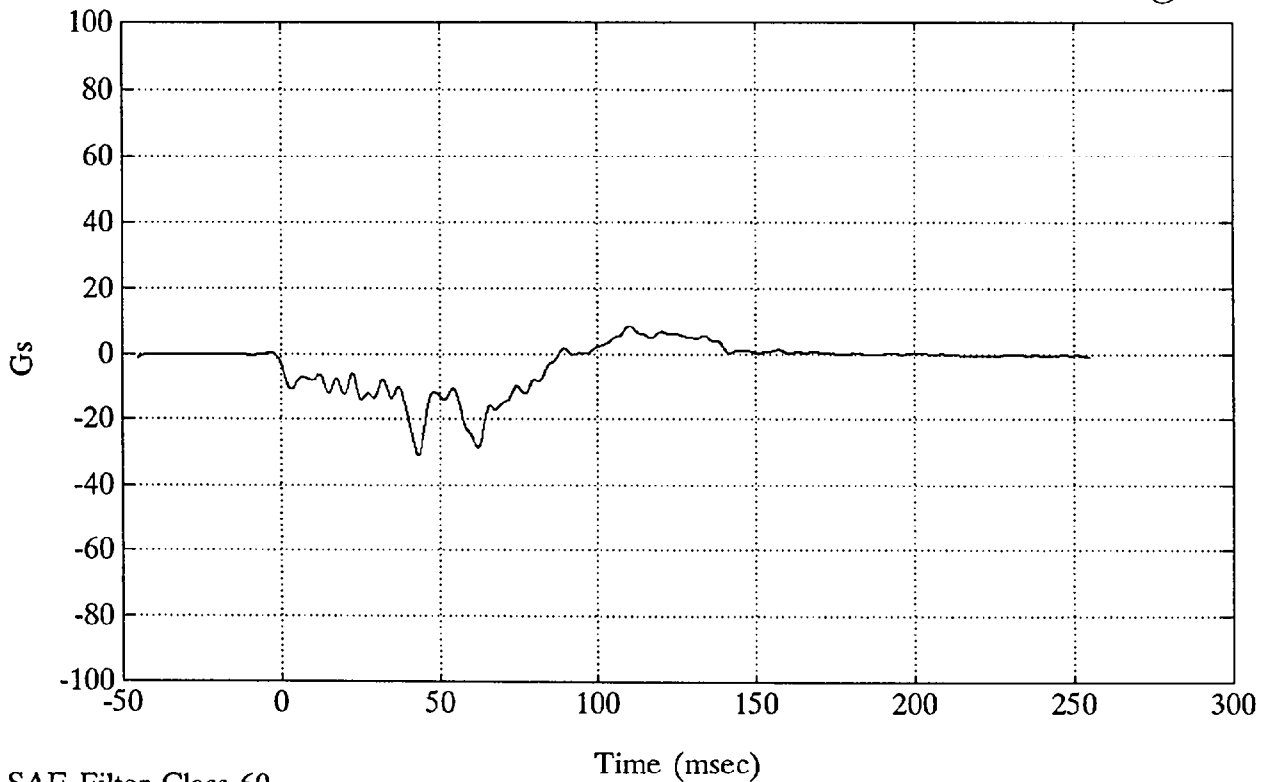


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

R. Rear Crossmember X (#2)

Max = 8.56 Gs @ 110.04 msec
Min = -30.89 Gs @ 43.32 msec

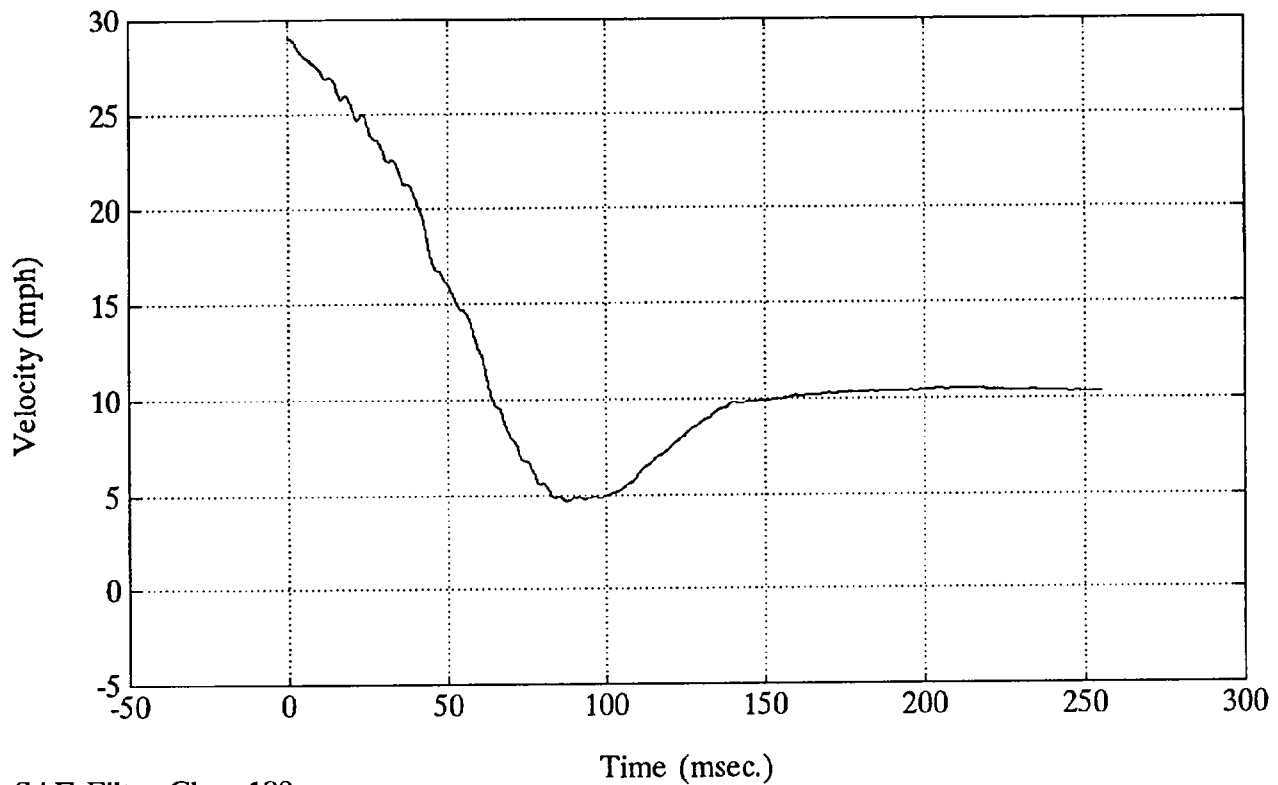


SAE Filter Class 60

FMVSS 208 - 1993 DODGE SHADOW

R. Rear Crossmember X (#2)

Max = 29.00 mph @ 0.24 msec
Min = 4.68 mph @ 87.60 msec

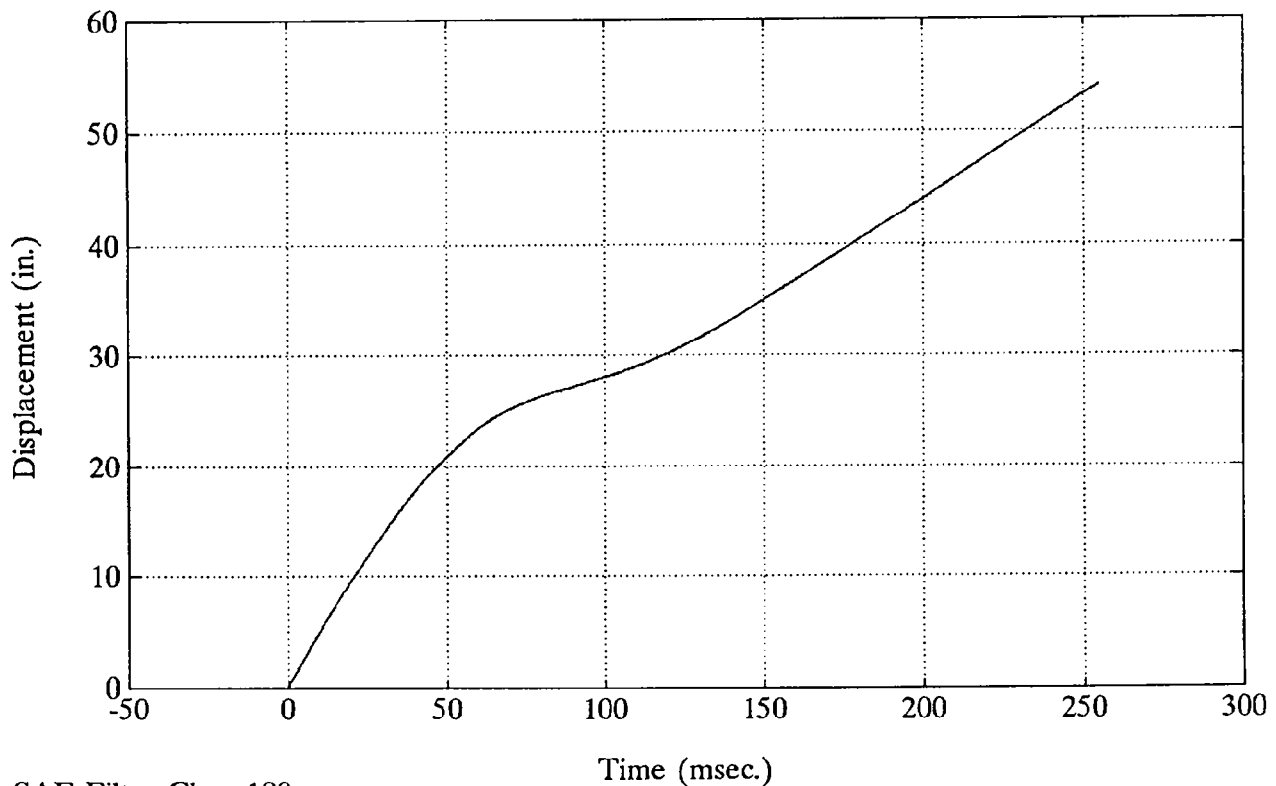


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

R. Rear Crossmember X (#2)

Max = 54.11 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec

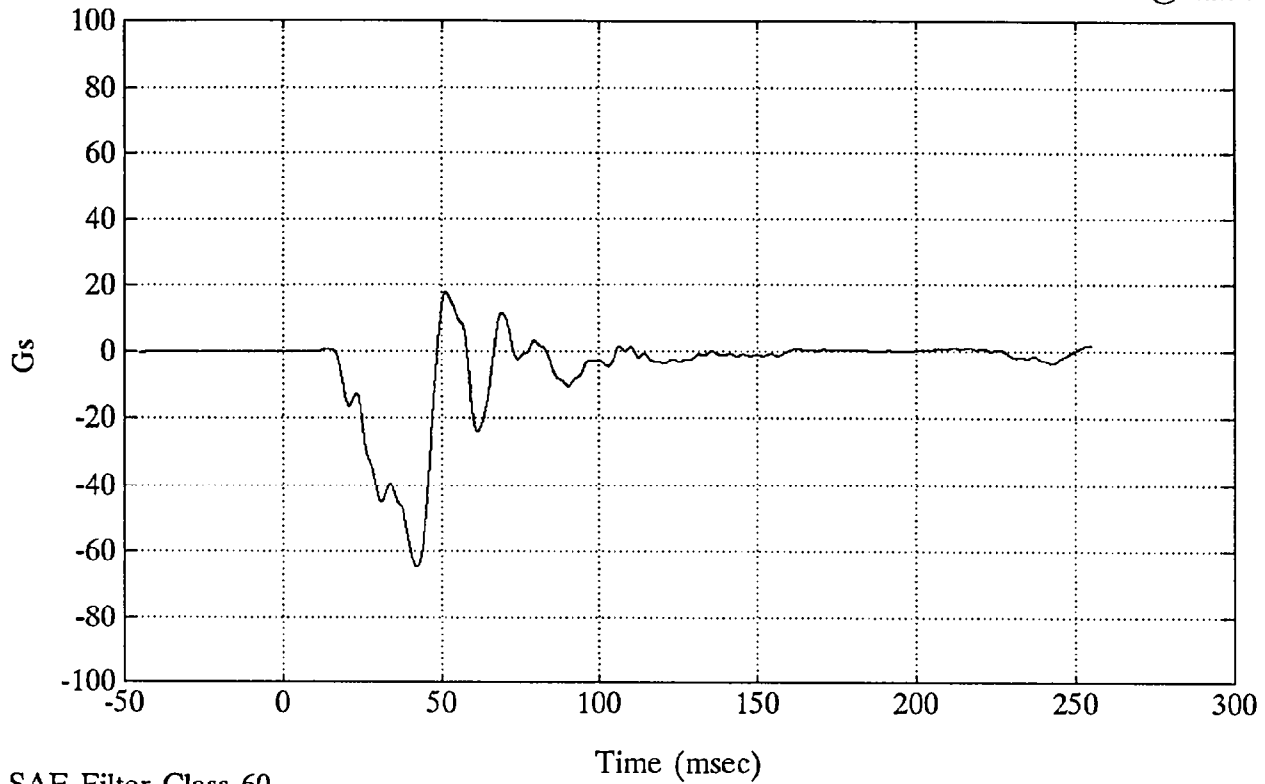


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

Engine Top X (#3)

Max = 17.83 Gs @ 51.36 msec
Min = -64.48 Gs @ 42.36 msec

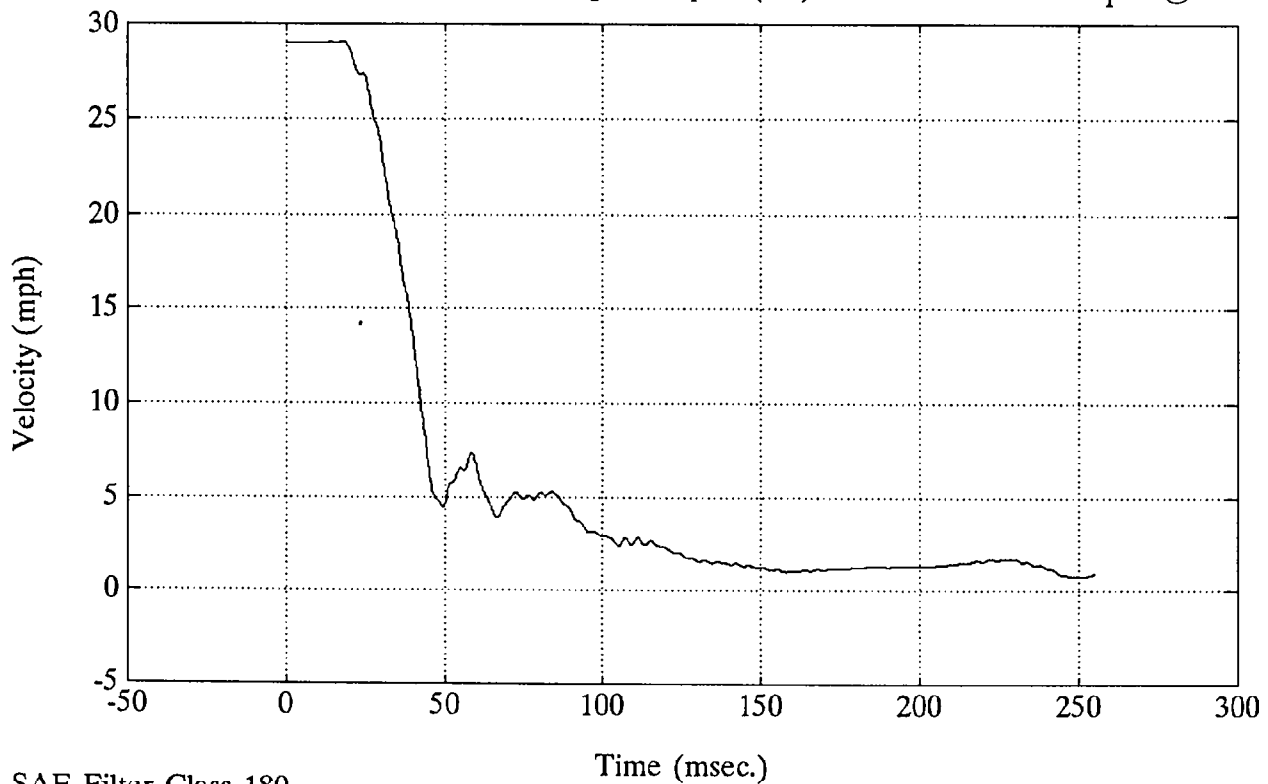


SAE Filter Class 60

FMVSS 208 - 1993 DODGE SHADOW

Engine Top X (#3)

Max = 29.09 mph @ 18.00 msec
Min = 0.76 mph @ 247.92 msec

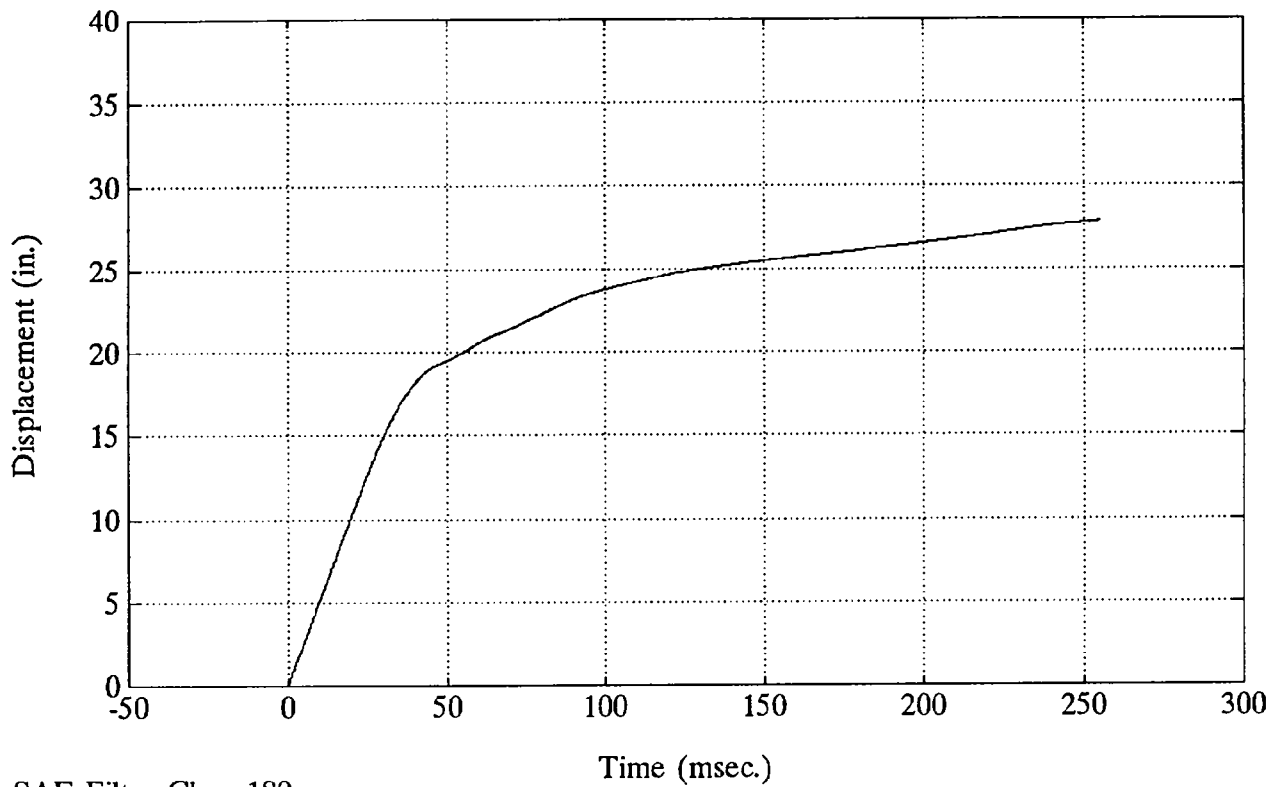


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

Engine Top X (#3)

Max = 27.86 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec

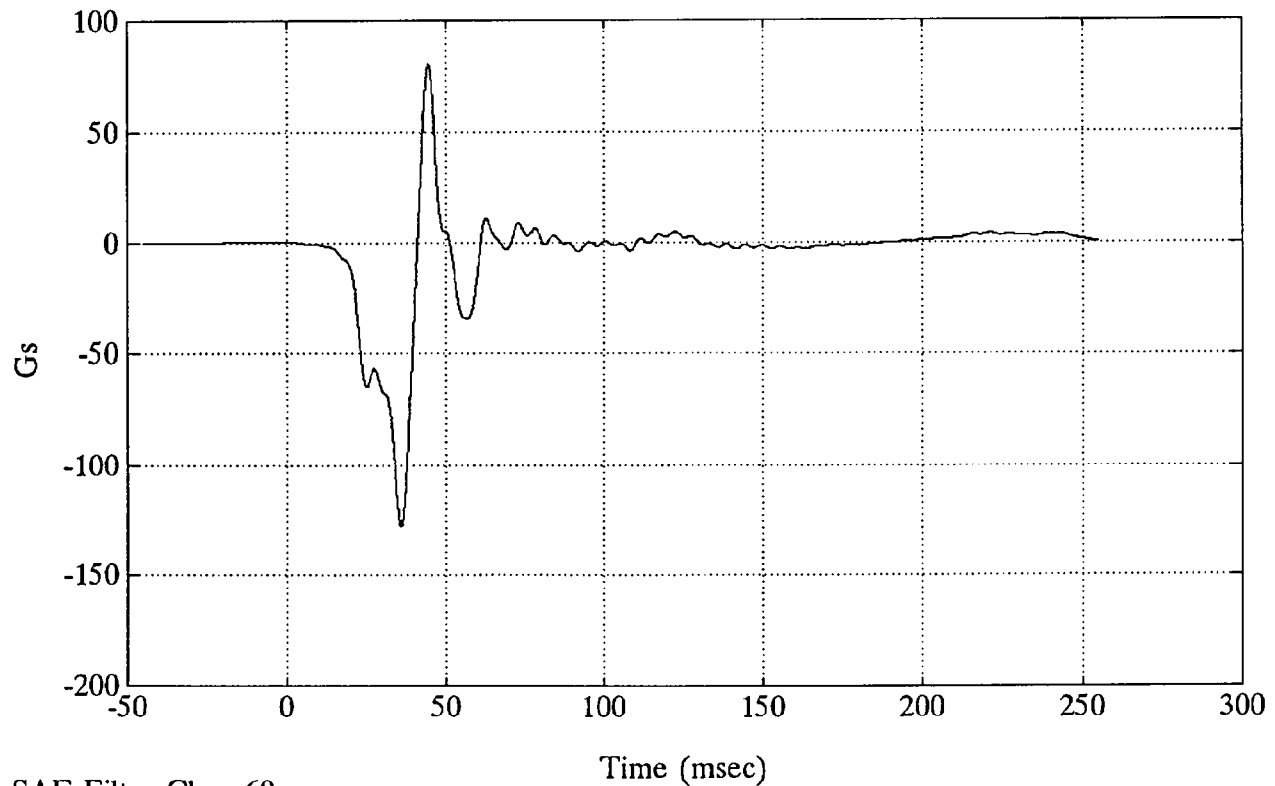


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

Engine Bottom X (#4)

Max = 80.66 Gs @ 44.64 msec
Min = -127.95 Gs @ 36.12 msec

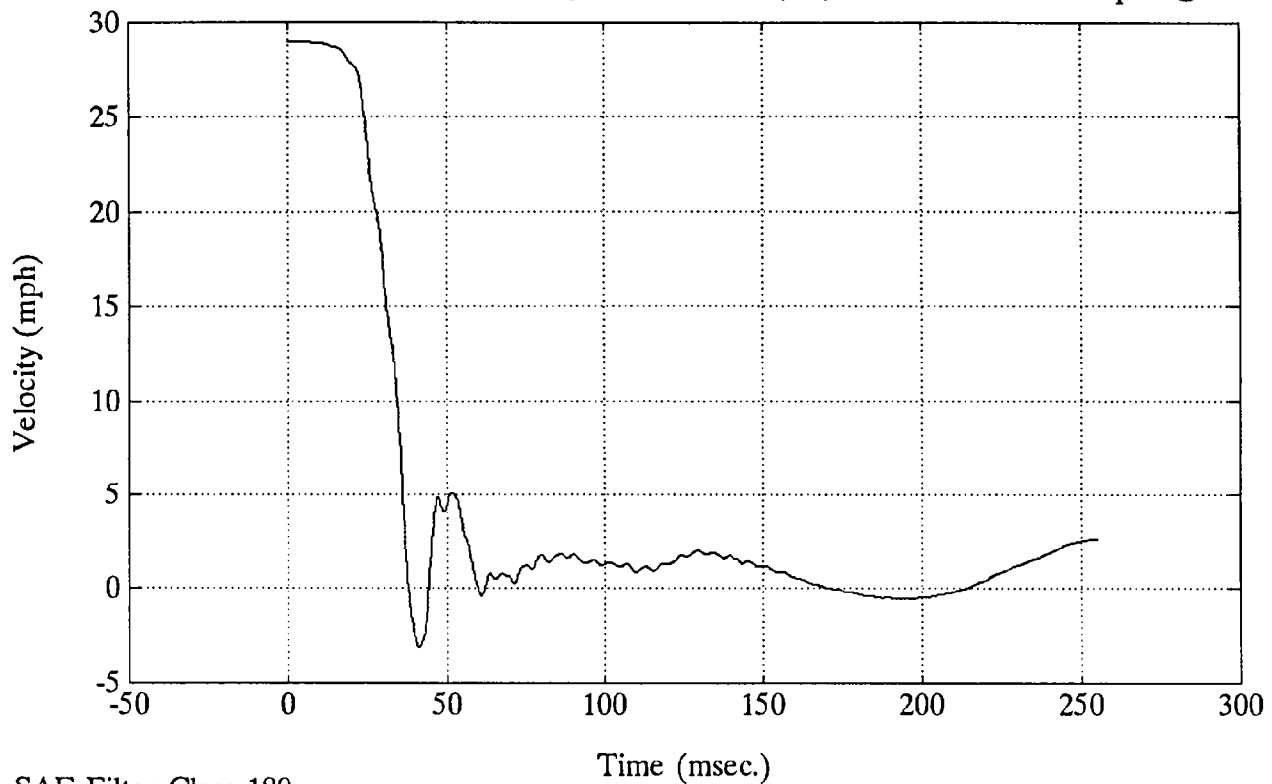


SAE Filter Class 60

FMVSS 208 - 1993 DODGE SHADOW

Engine Bottom X (#4)

Max = 29.02 mph @ 4.56 msec
Min = -3.15 mph @ 41.28 msec

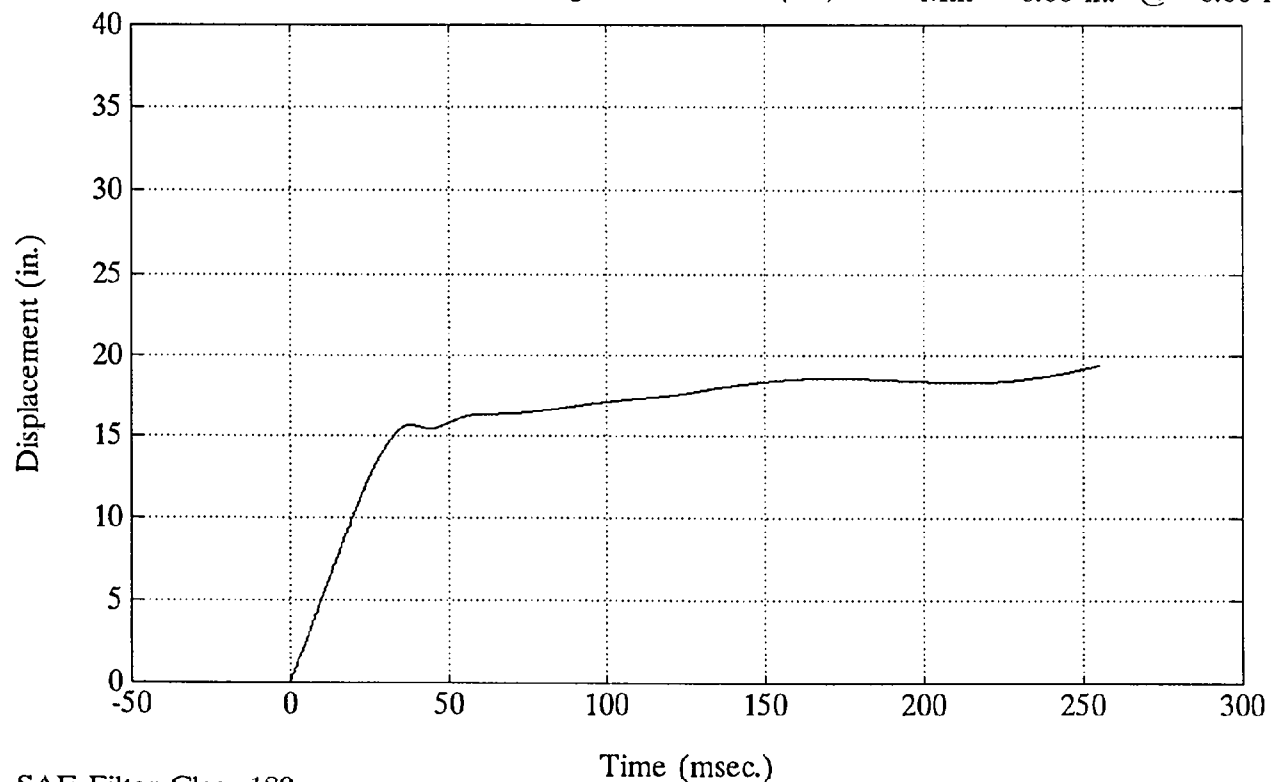


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

Engine Bottom X (#4)

Max = 19.43 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec

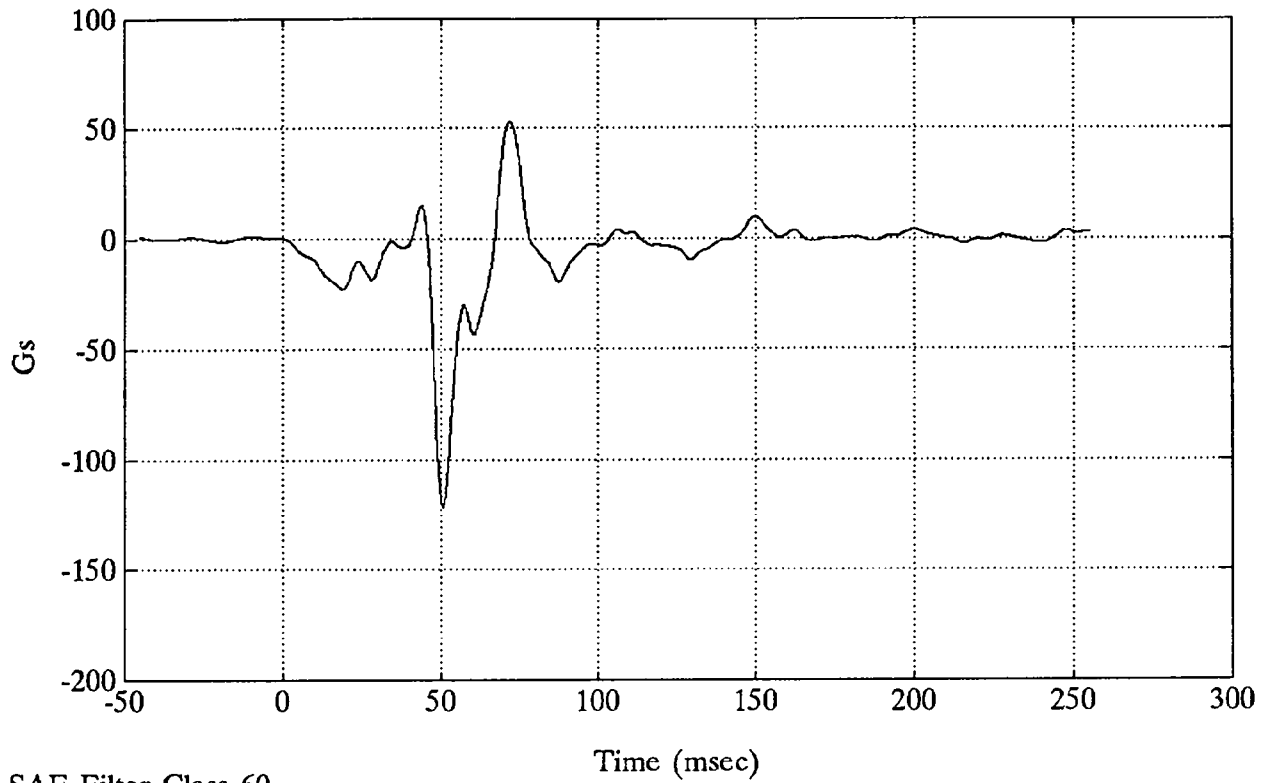


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

R. Brake Caliper X (#5)

Max = 52.89 Gs @ 72.00 msec
Min = -121.94 Gs @ 50.76 msec

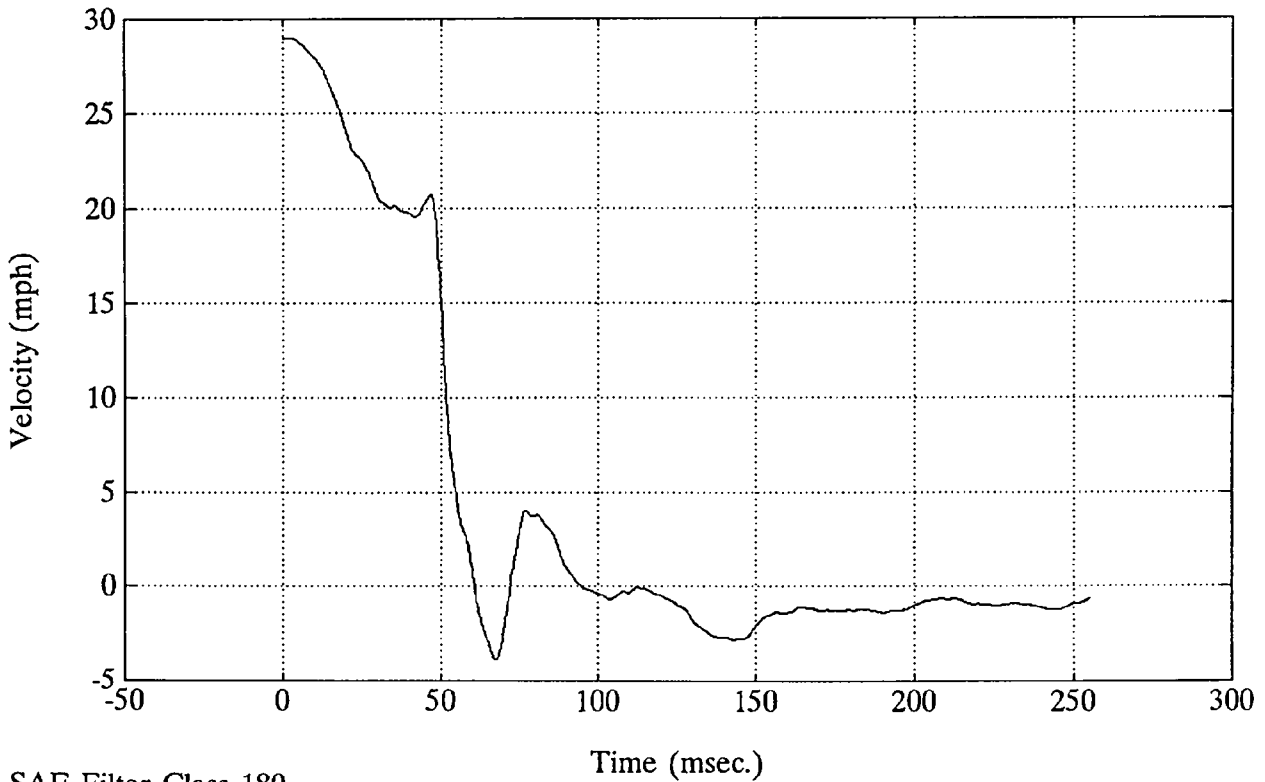


SAE Filter Class 60

FMVSS 208 - 1993 DODGE SHADOW

R. Brake Caliper X (#5)

Max = 29.00 mph @ 2.64 msec
Min = -3.87 mph @ 67.44 msec

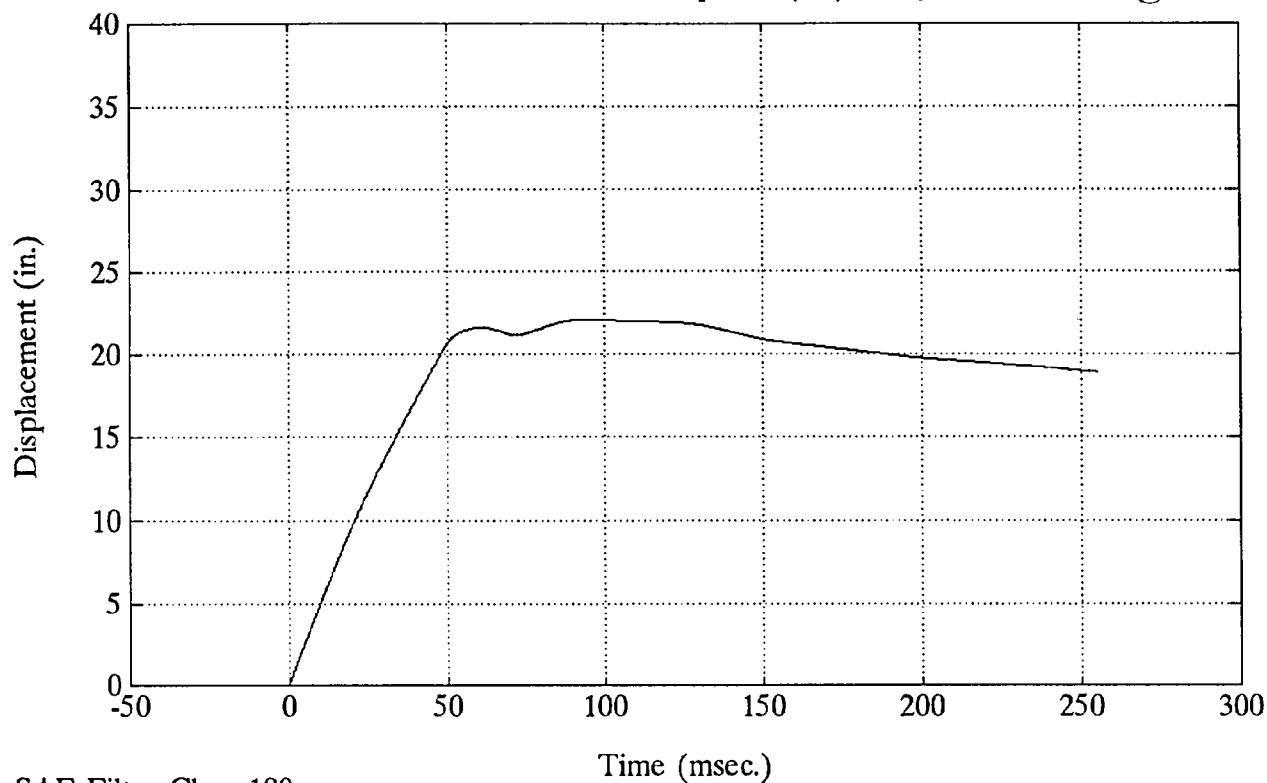


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

R. Brake Caliper X (#5)

Max = 22.09 in. @ 95.52 msec
Min = 0.00 in. @ -0.00 msec

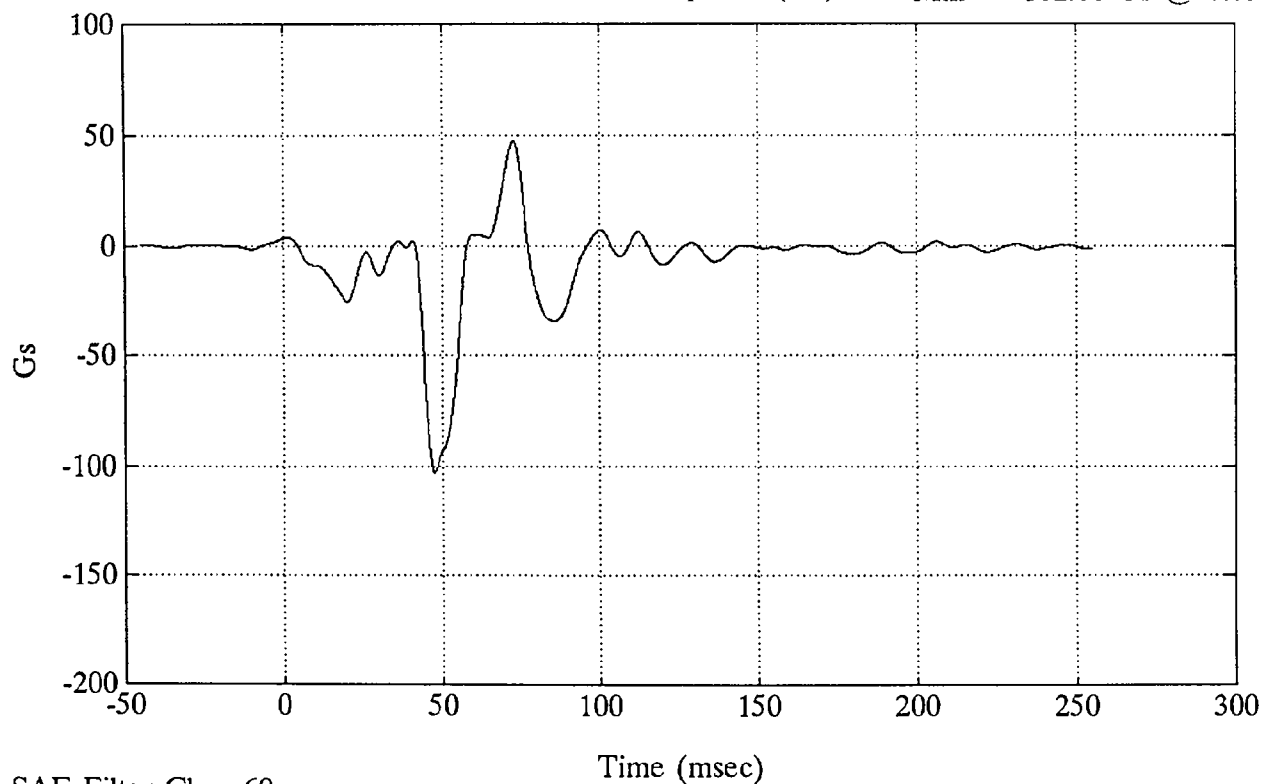


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

L. Brake Caliper X (#6)

Max = 47.31 Gs @ 72.60 msec
Min = -102.66 Gs @ 47.64 msec

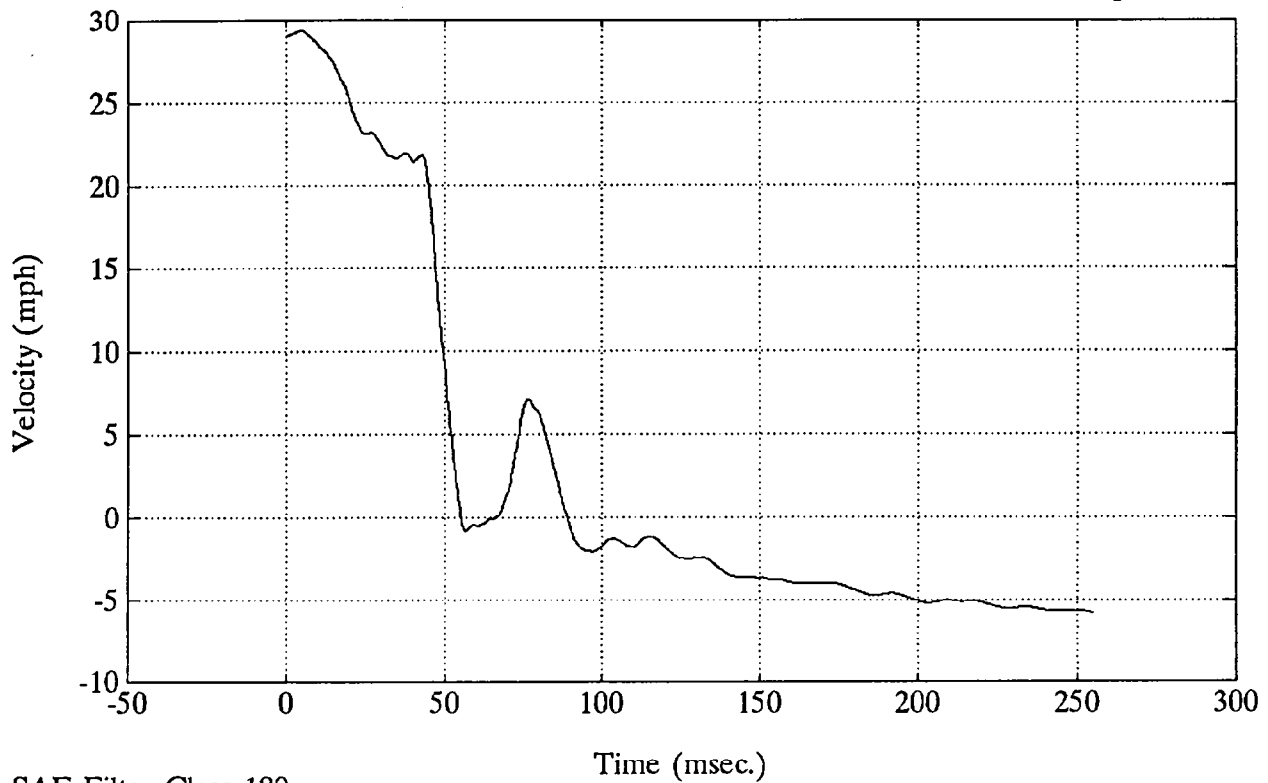


SAE Filter Class 60

FMVSS 208 - 1993 DODGE SHADOW

L. Brake Caliper X (#6)

Max = 29.35 mph @ 5.28 msec
Min = -5.82 mph @ 254.88 msec

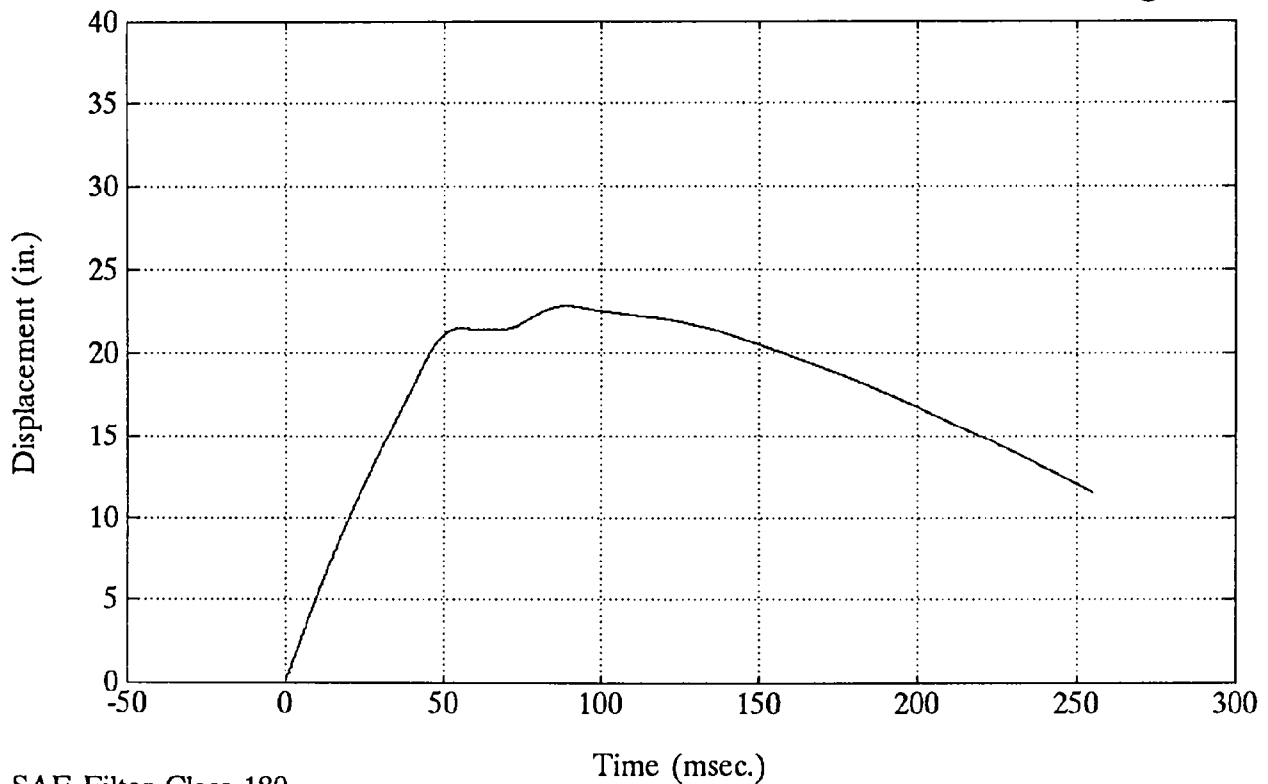


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

L. Brake Caliper X (#6)

Max = 22.87 in. @ 89.76 msec
Min = 0.00 in. @ -0.00 msec

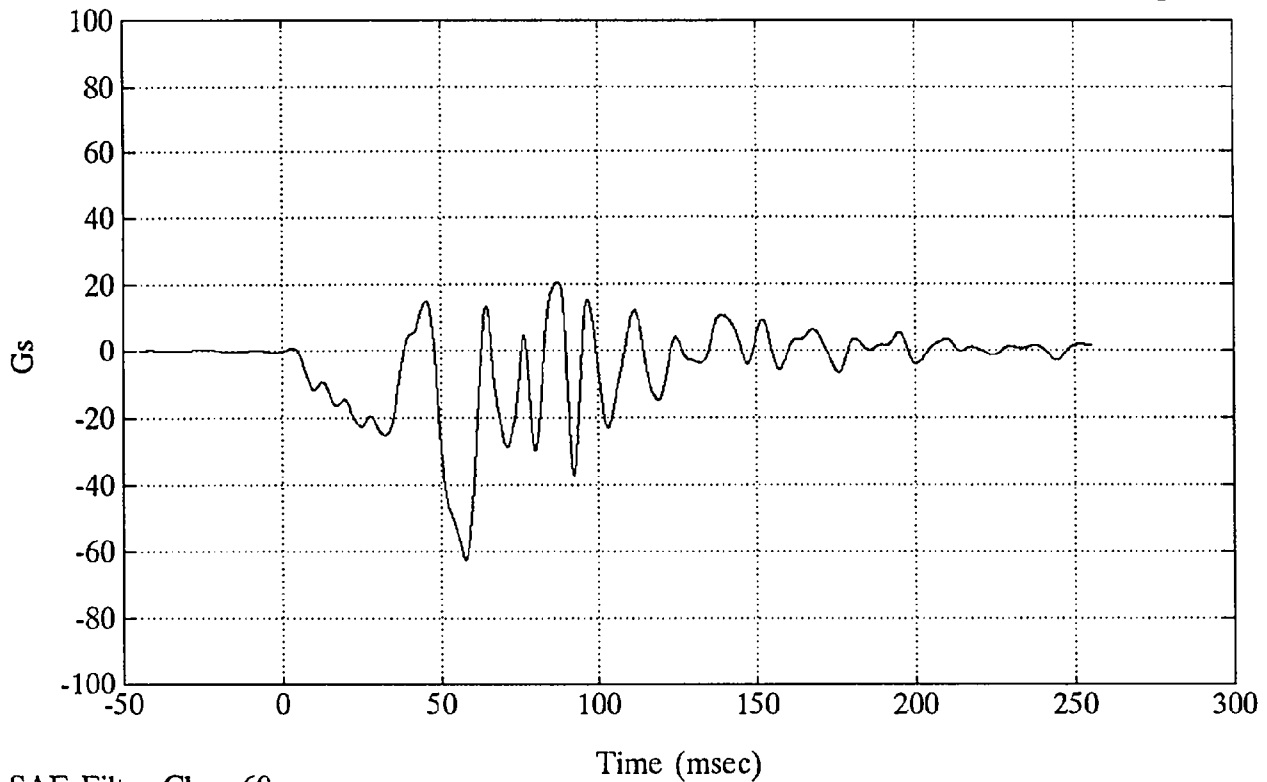


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

Instrument Panel X (#7)

Max = 20.38 Gs @ 87.12 msec
Min = -62.42 Gs @ 57.84 msec

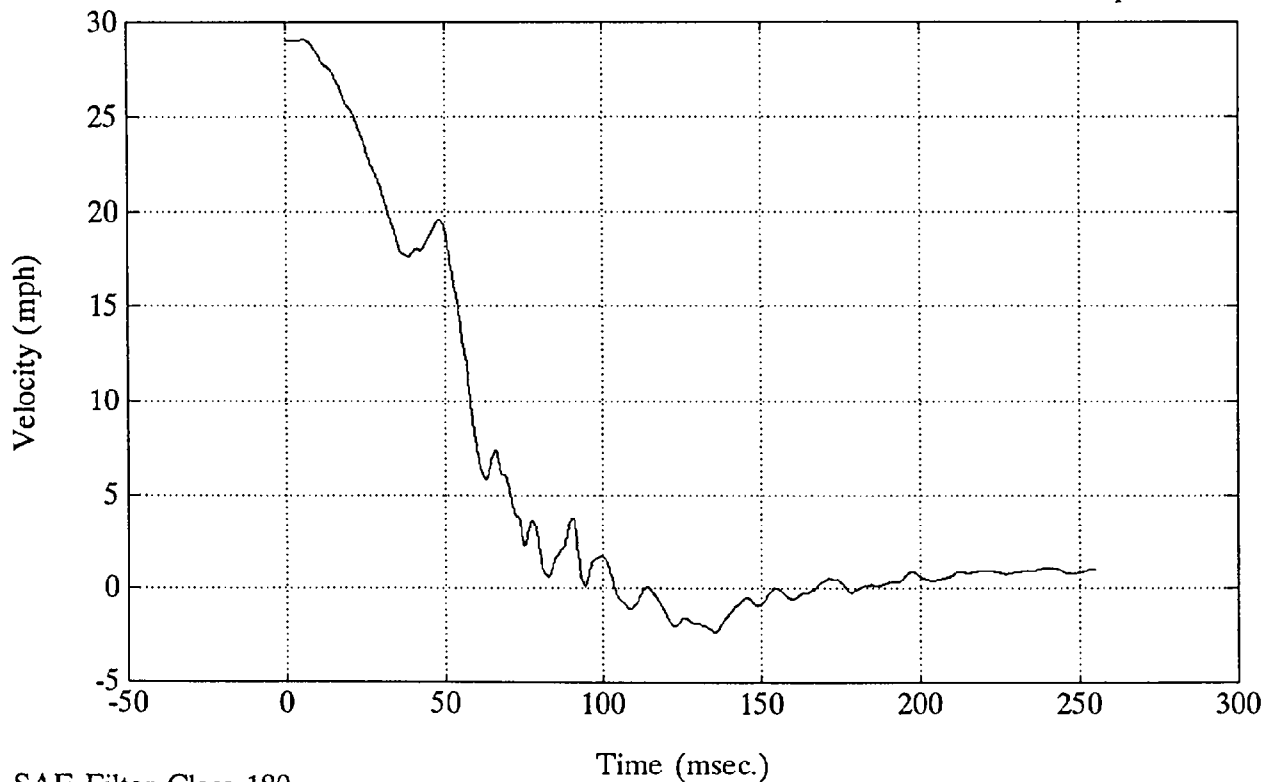


SAE Filter Class 60

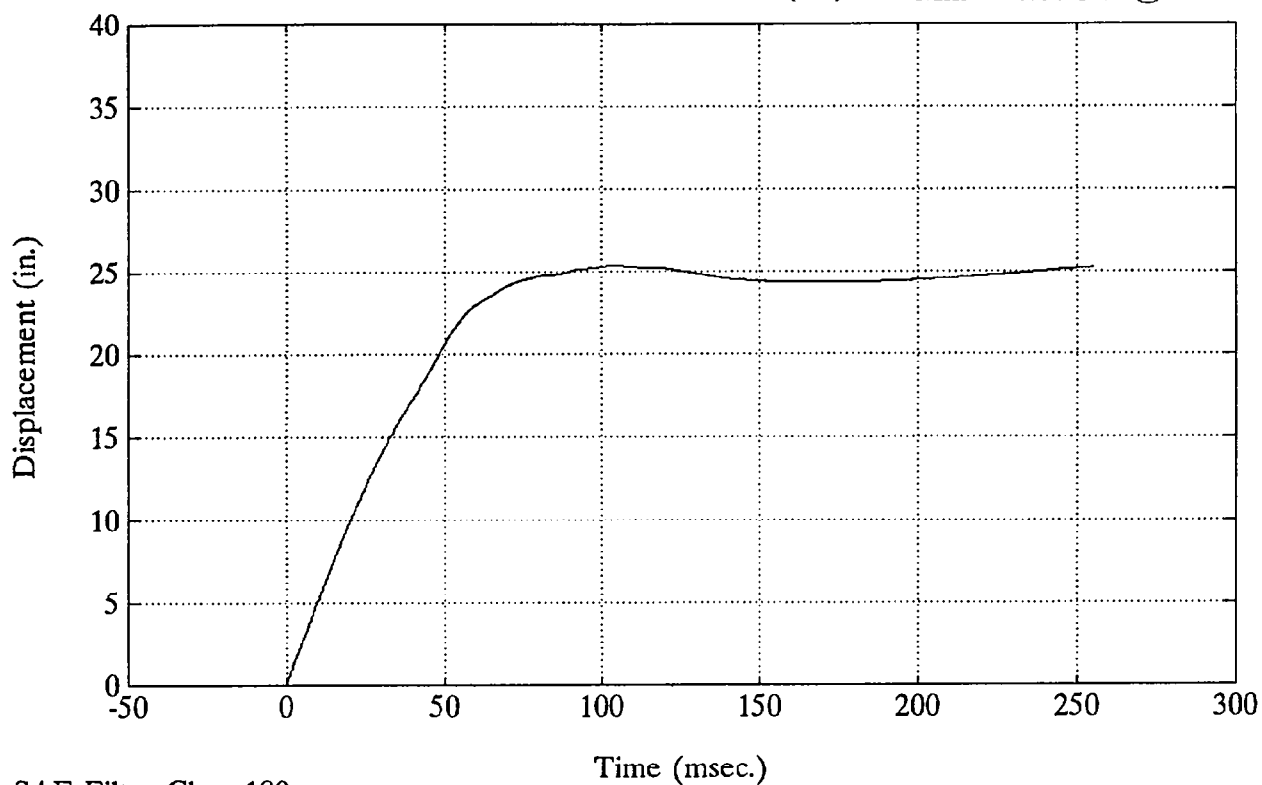
FMVSS 208 - 1993 DODGE SHADOW

Instrument Panel X (#7)

Max = 29.05 mph @ 5.76 msec
Min = -2.31 mph @ 135.36 msec



SAE Filter Class 180



SAE Filter Class 180

TEST NO. CP0311

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

FACILITY: TRACK TEST DATE: 13 Apr 1993
RUN #: 1271
SERIES #: 16

TITLE: NHTSA "208" TEST #16 - 1993 DODGE SHADOW

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

hic: 188.35
t1 = 54.120 msec
t2 = 90.000 msec
Average G's Over Hic Duration = 30.76

CLIP SUMMARY: Pos. 1 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 33.847 G's
Tstart = 85.5600 ms
Tend = 88.5600 ms
CSI = 205.896

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

hic: 225.81
t1 = 73.680 msec
t2 = 109.560 msec
Average G's Over Hic Duration = 33.08

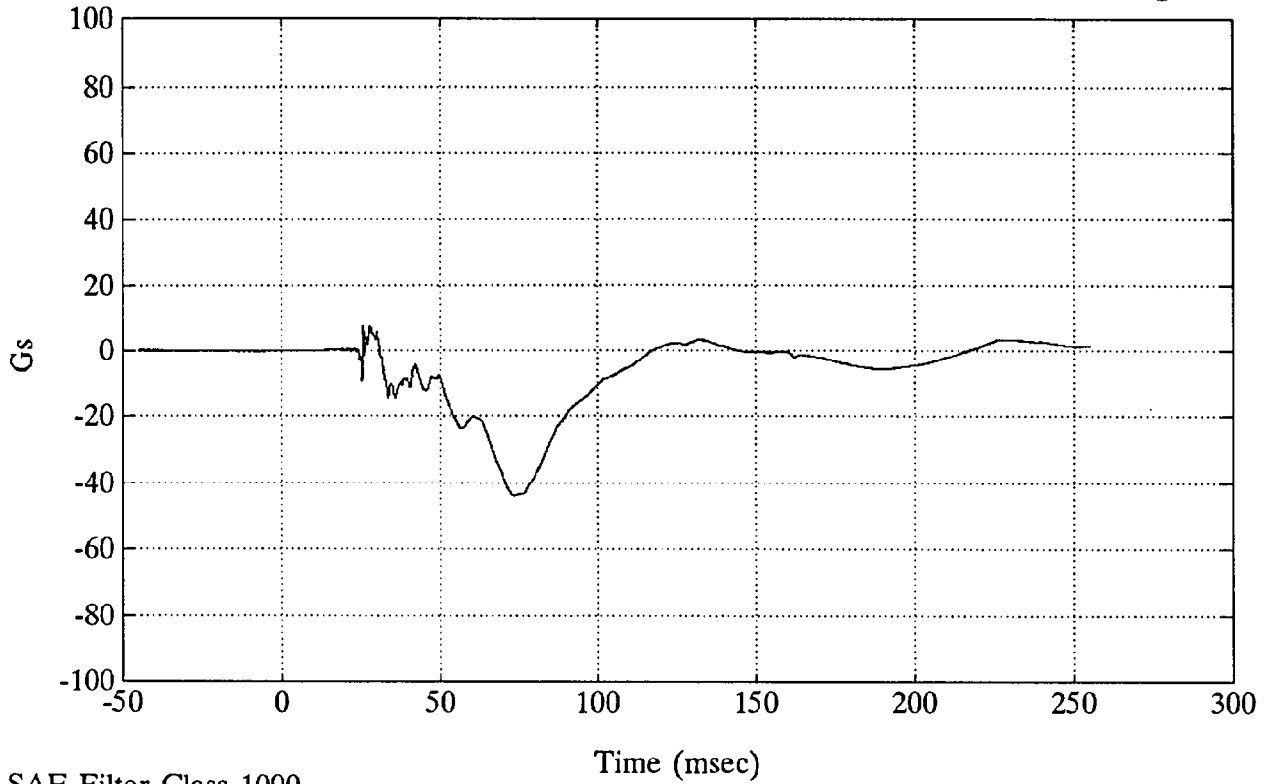
CLIP SUMMARY: Pos. 2 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 36.507 G's
Tstart = 69.4800 ms
Tend = 72.6000 ms
CSI = 212.110

FMVSS 208 - 1993 DODGE SHADOW

Pos. 1 Head X

Max = 7.81 Gs @ 25.92 msec
Min = -43.93 Gs @ 73.44 msec

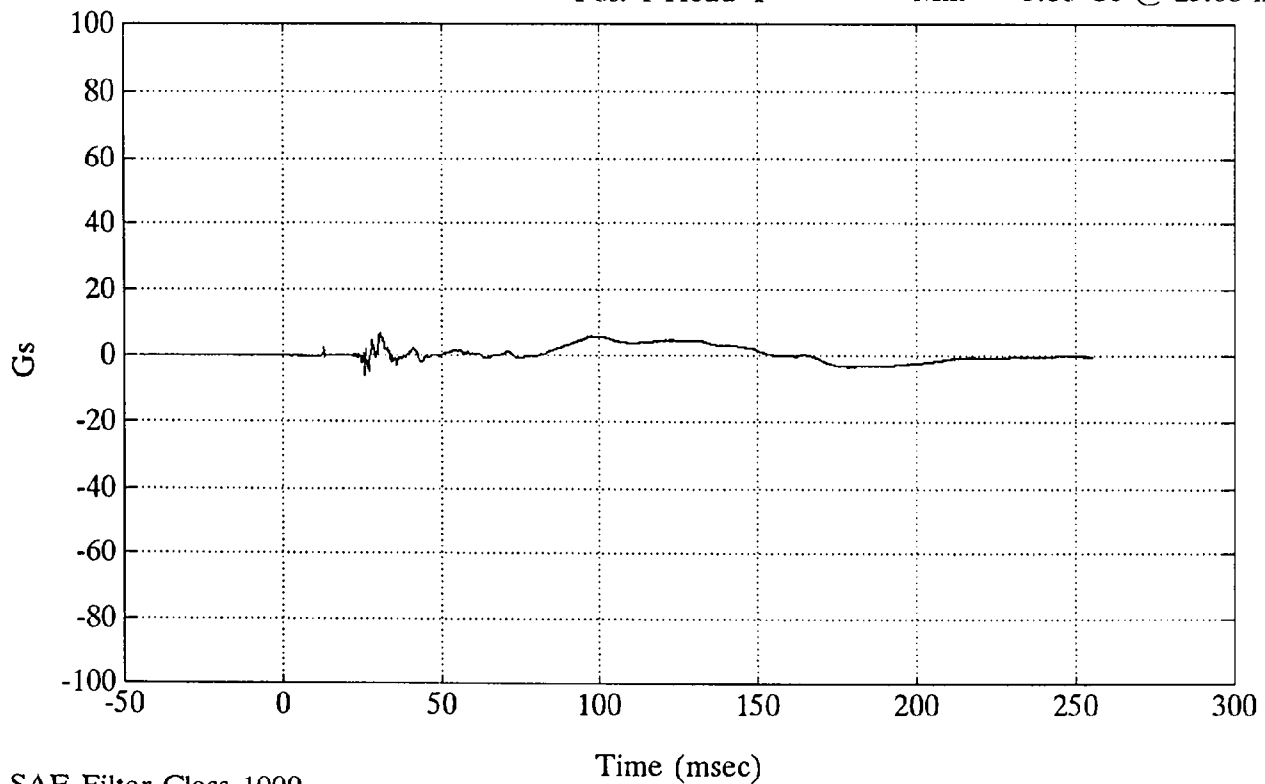


SAE Filter Class 1000

FMVSS 208 - 1993 DODGE SHADOW

Pos. 1 Head Y

Max = 6.69 Gs @ 30.60 msec
Min = -5.88 Gs @ 25.68 msec

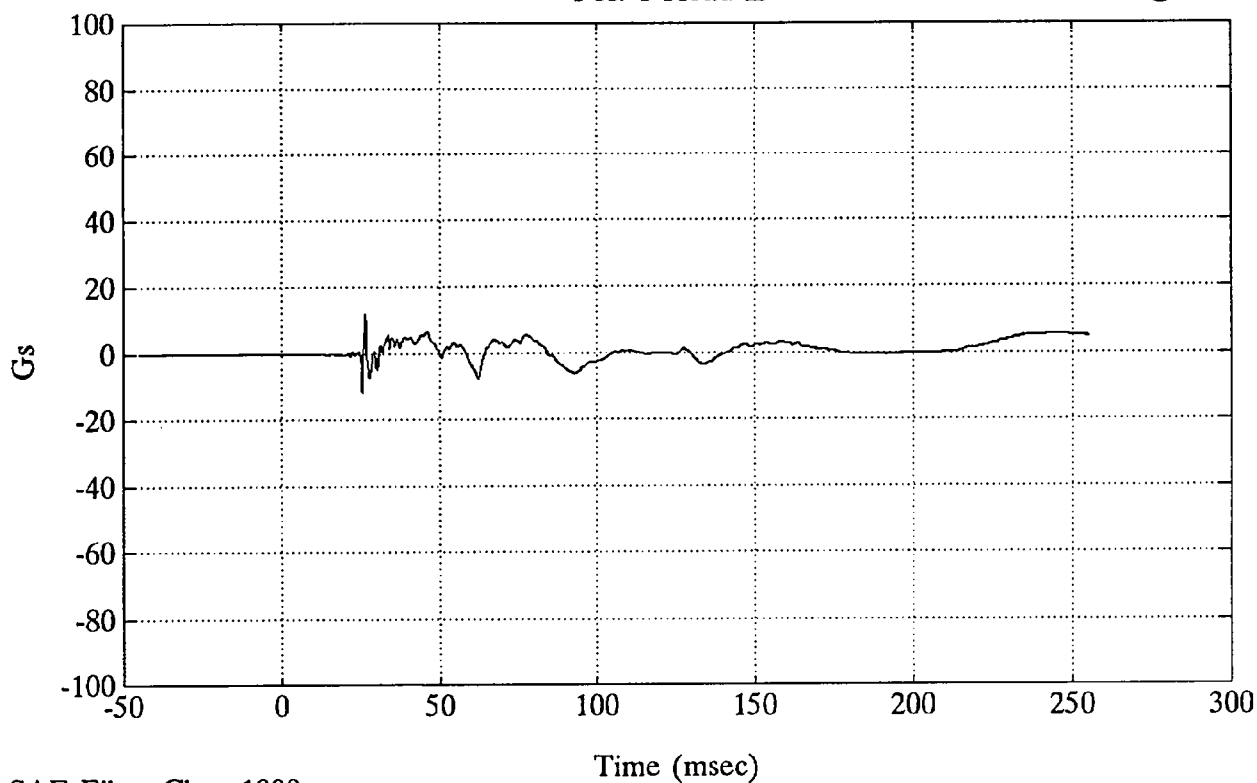


SAE Filter Class 1000

FMVSS 208 - 1993 DODGE SHADOW

Pos. 1 Head Z

Max = 11.71 Gs @ 26.64 msec
Min = -11.25 Gs @ 25.56 msec

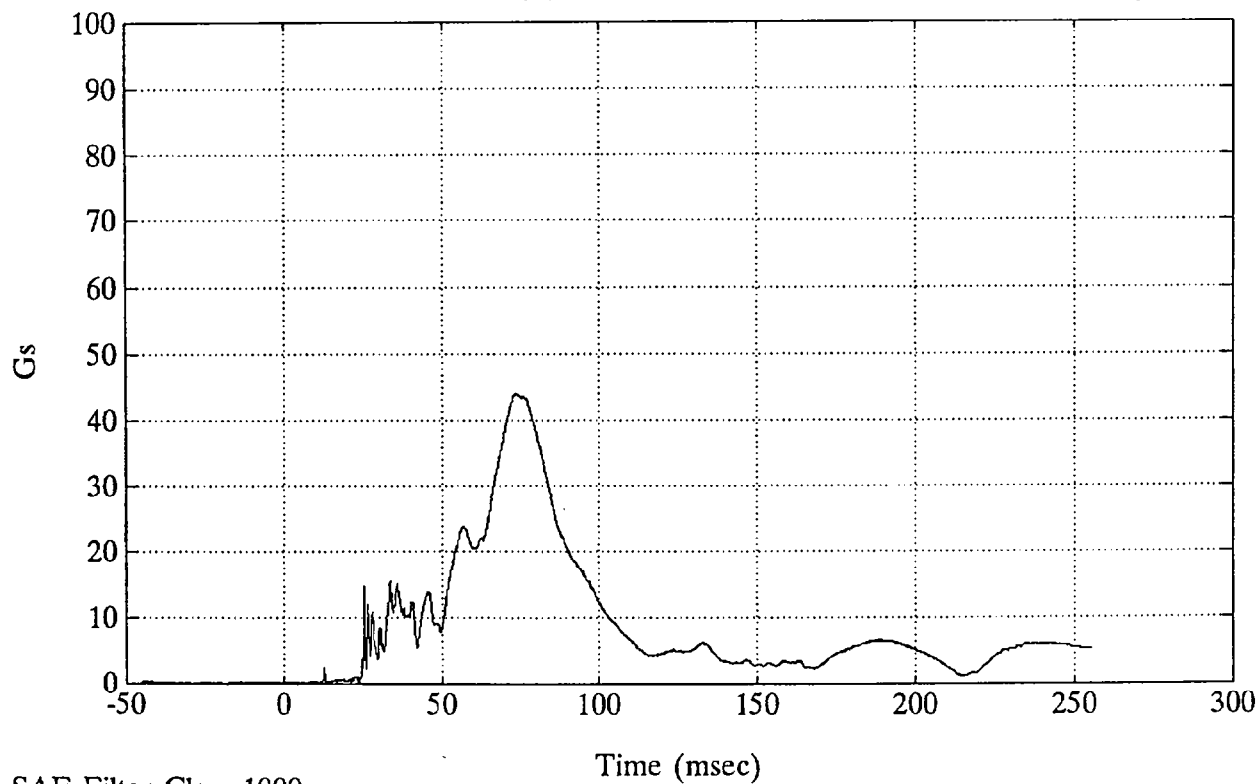


SAE Filter Class 1000

FMVSS 208 - 1993 DODGE SHADOW

Pos. 1 Head Resultant

Max = 44.08 Gs @ 73.44 msec
Min = 0.04 Gs @ -15.60 msec

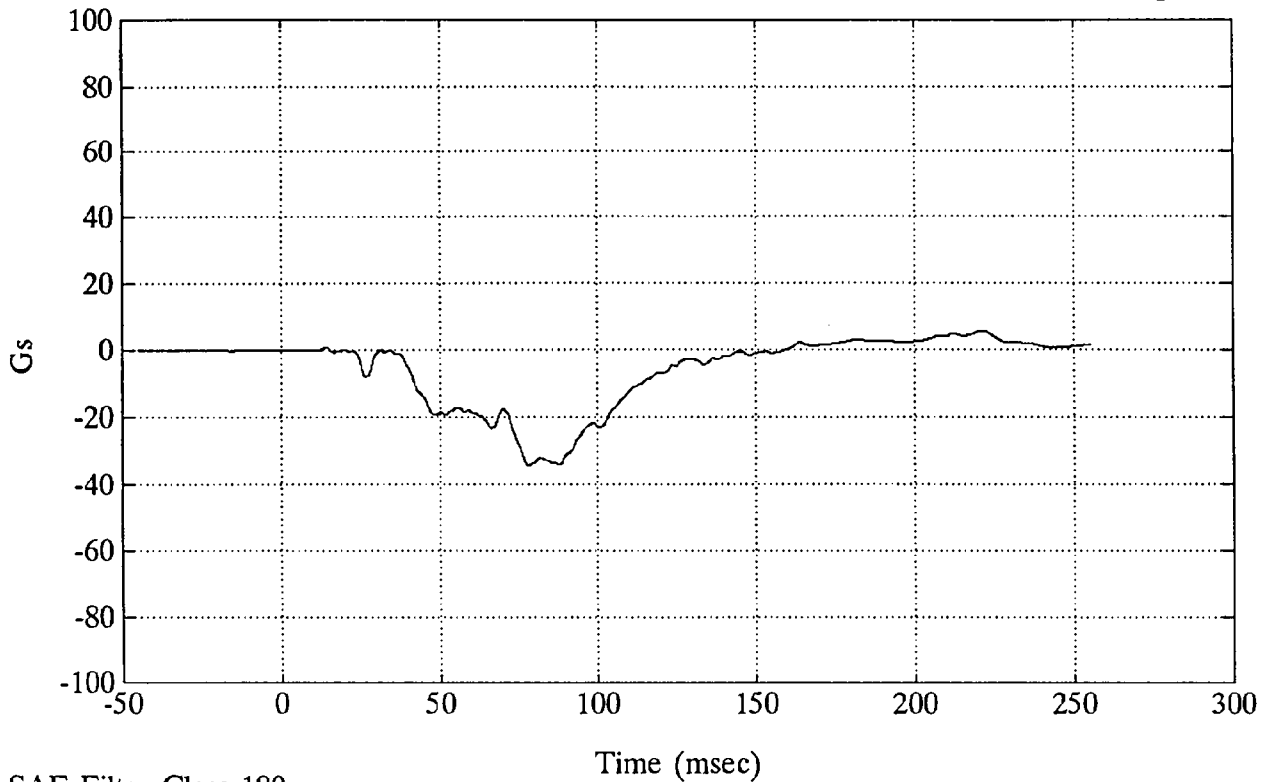


SAE Filter Class 1000

FMVSS 208 - 1993 DODGE SHADOW

Pos. 1 Chest X

Max = 5.74 Gs @ 220.92 msec
Min = -34.15 Gs @ 77.88 msec

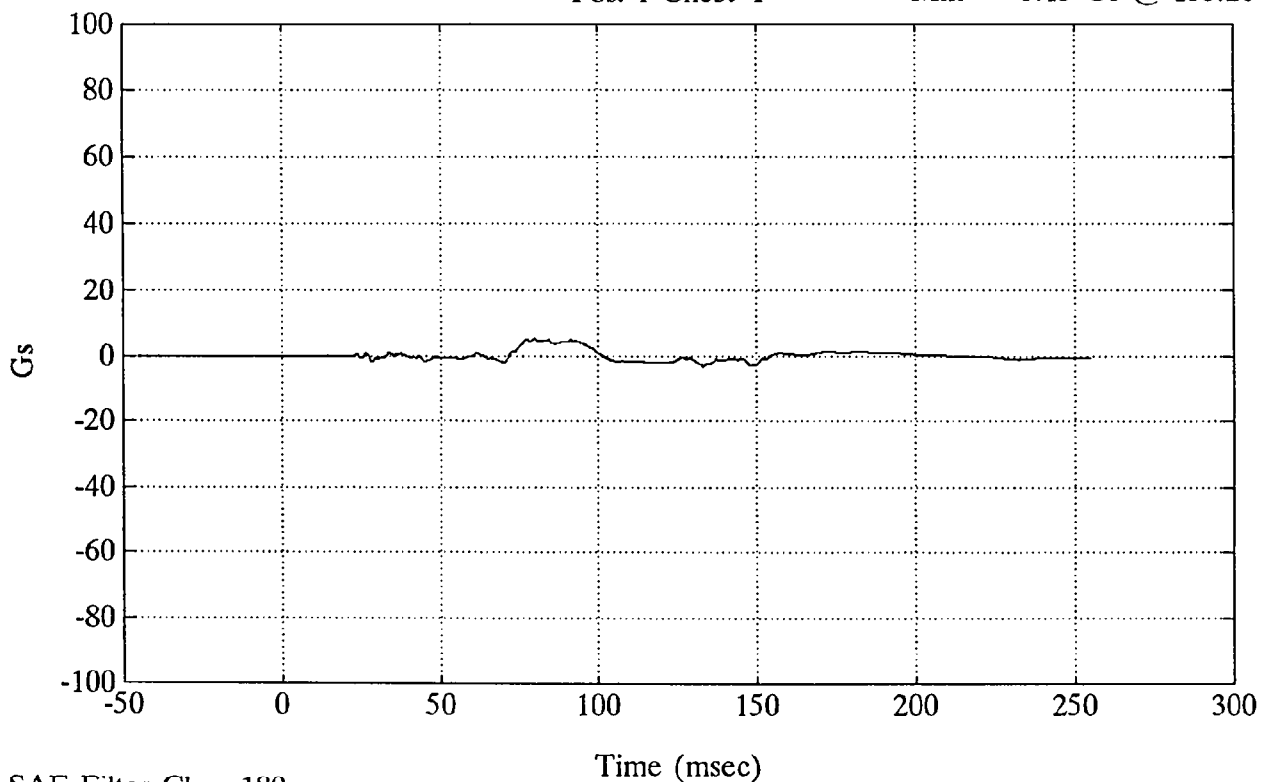


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

Pos. 1 Chest Y

Max = 5.42 Gs @ 80.04 msec
Min = -3.15 Gs @ 133.20 msec

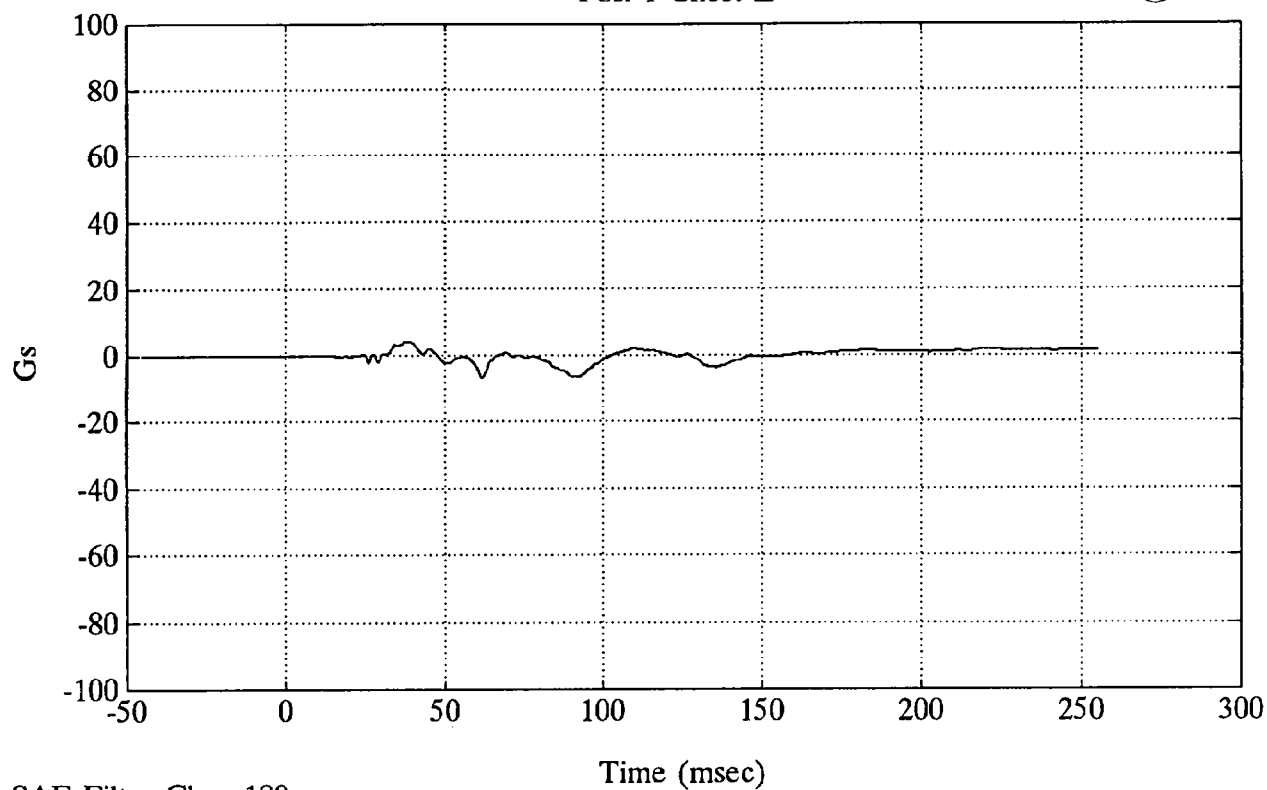


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

Pos. 1 Chest Z

Max = 4.08 Gs @ 37.56 msec
Min = -6.67 Gs @ 61.92 msec

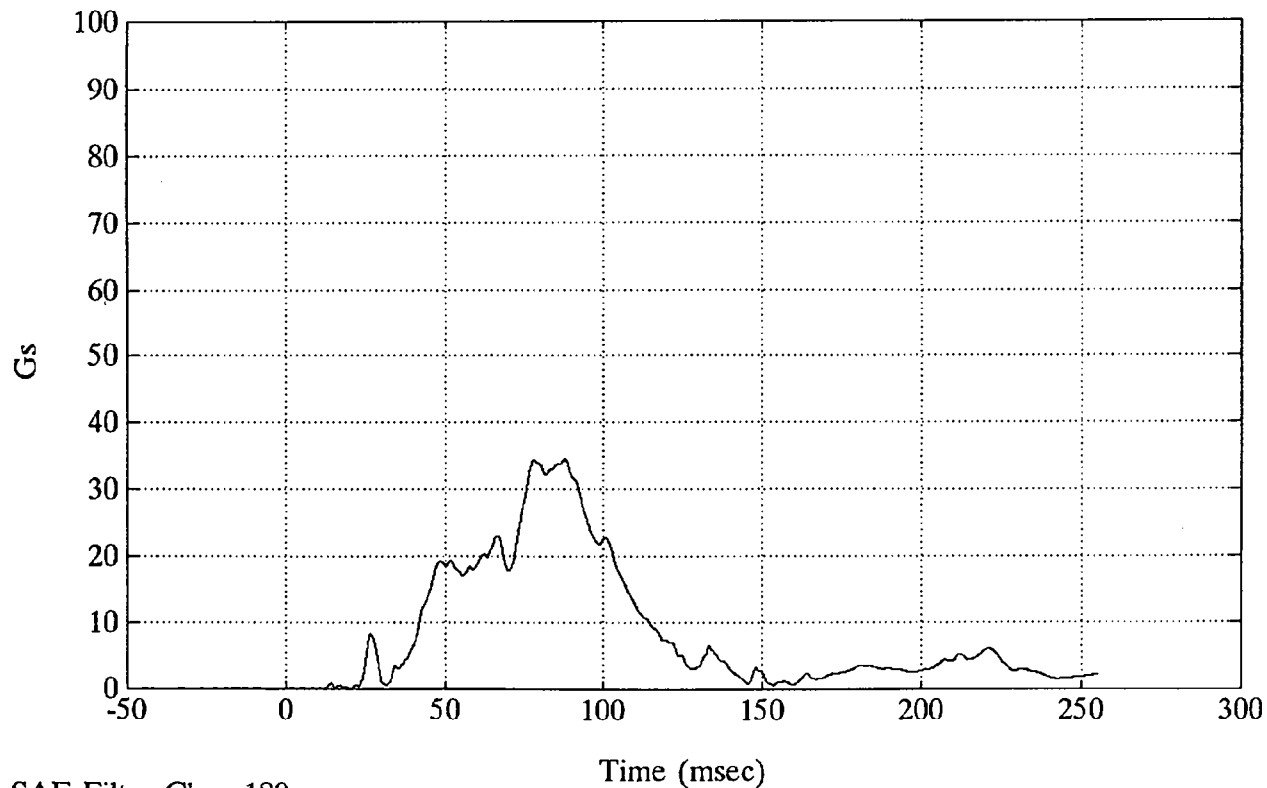


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

Pos. 1 Chest Resultant

Max = 34.53 Gs @ 87.84 msec
Min = 0.01 Gs @ -2.40 msec

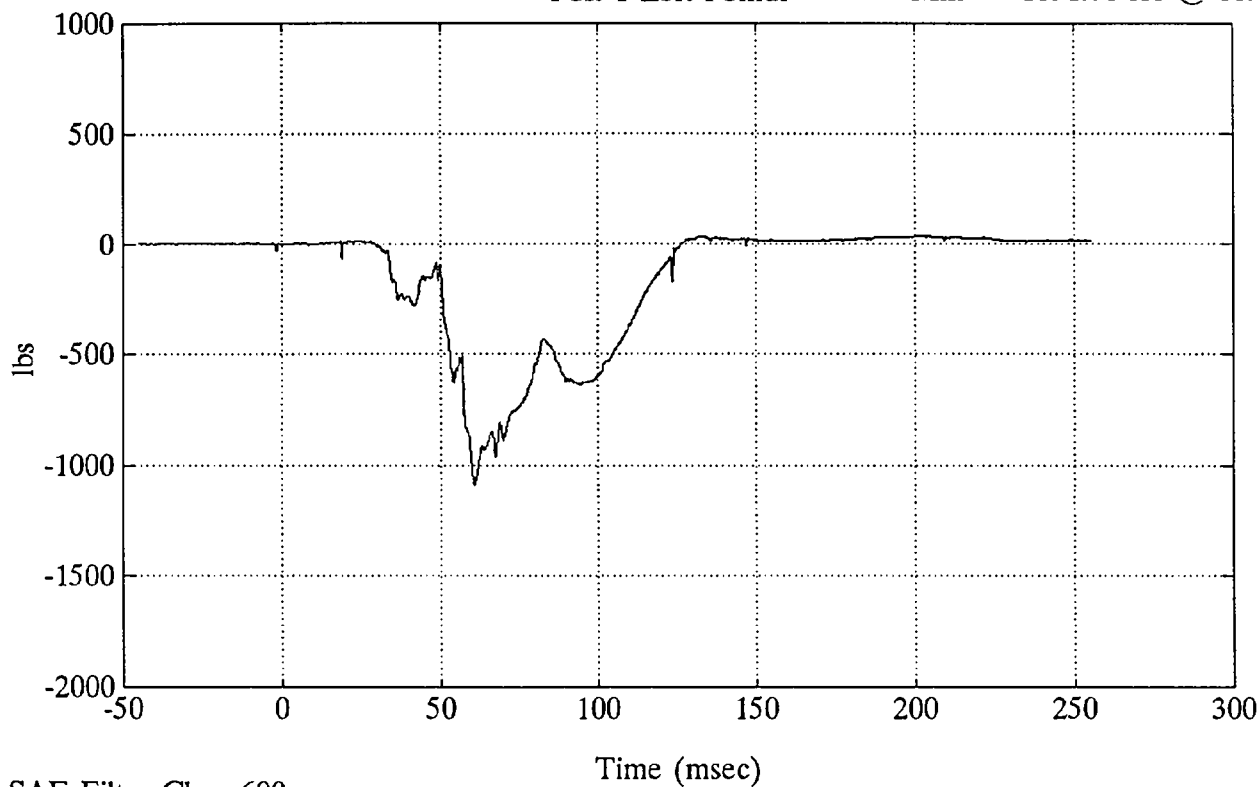


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

Pos. 1 Left Femur

Max = 35.27 lbs @ 200.40 msec
Min = -1091.70 lbs @ 60.72 msec

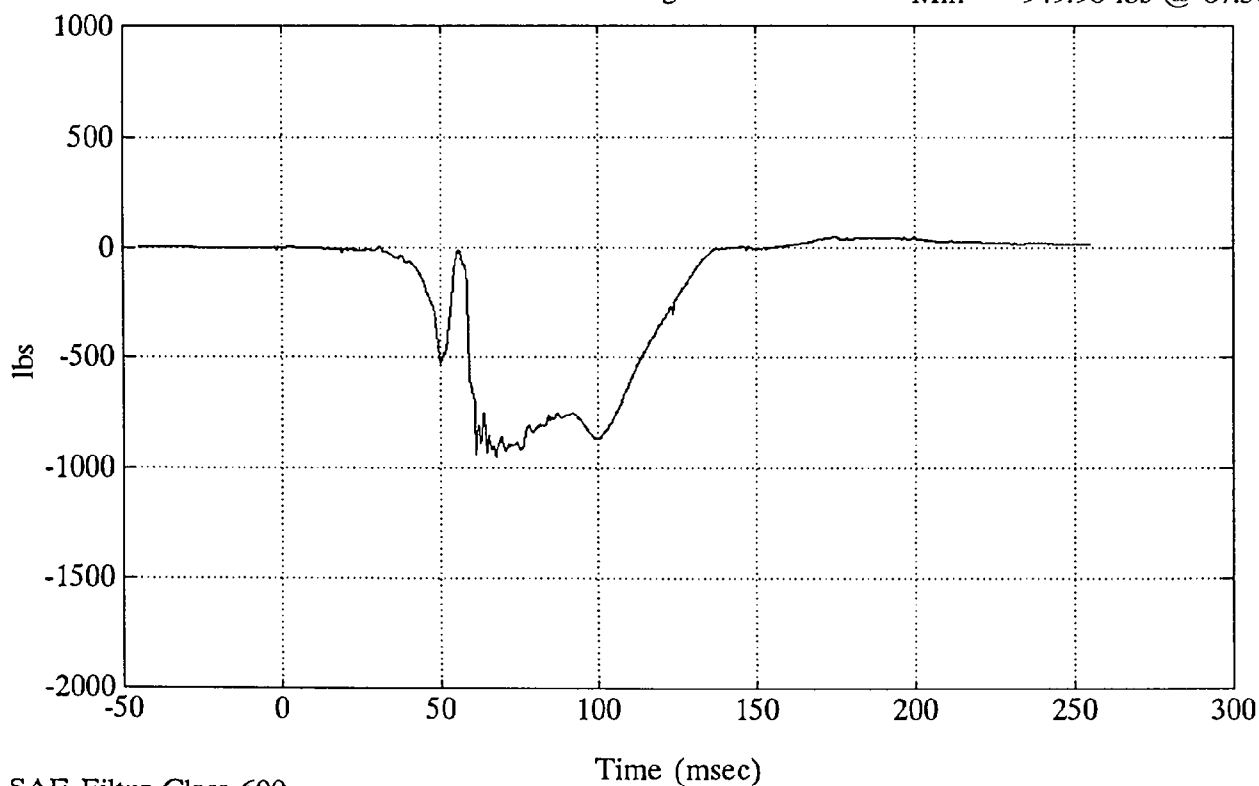


SAE Filter Class 600

FMVSS 208 - 1993 DODGE SHADOW

Pos. 1 Right Femur

Max = 46.92 lbs @ 174.24 msec
Min = -949.96 lbs @ 67.56 msec

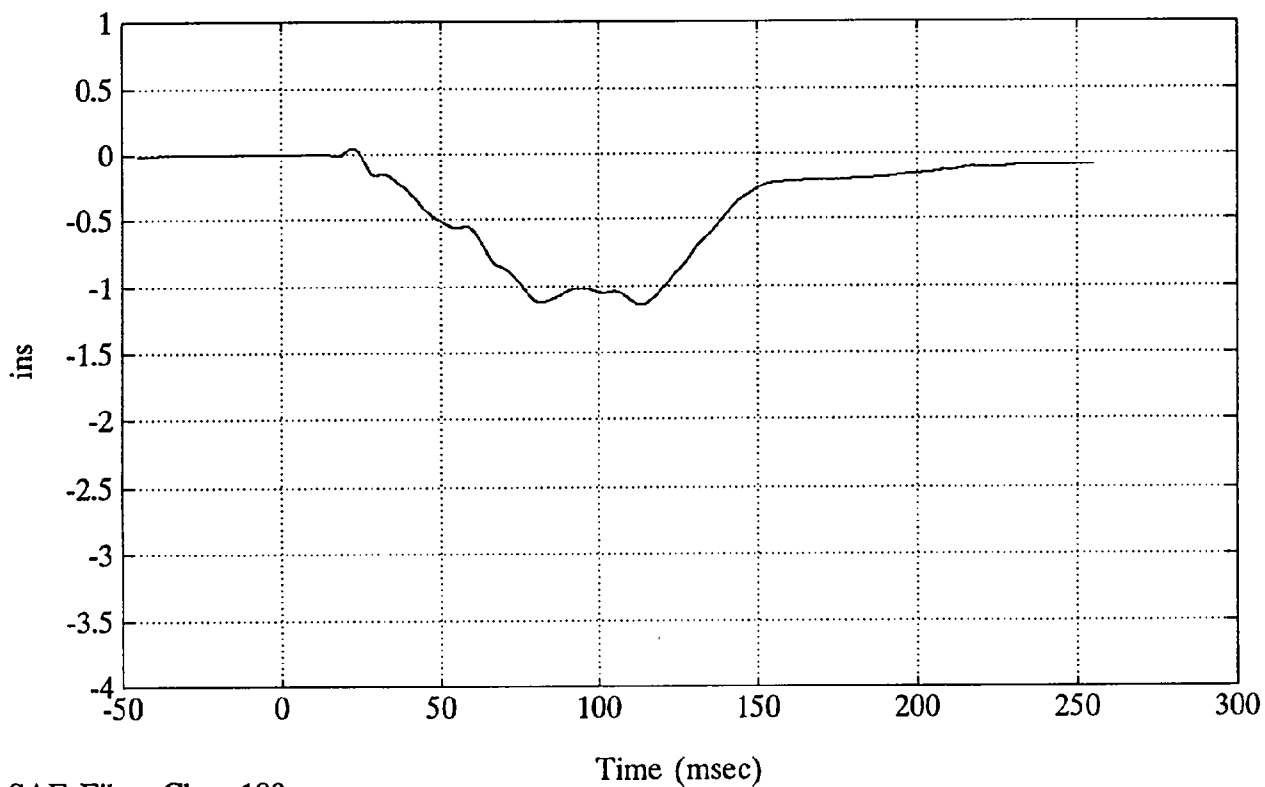


SAE Filter Class 600

FMVSS 208 - 1993 DODGE SHADOW

Pos. 1 Chest Displacement

Max = 0.05 ins @ 22.44 msec
Min = -1.14 ins @ 113.28 msec

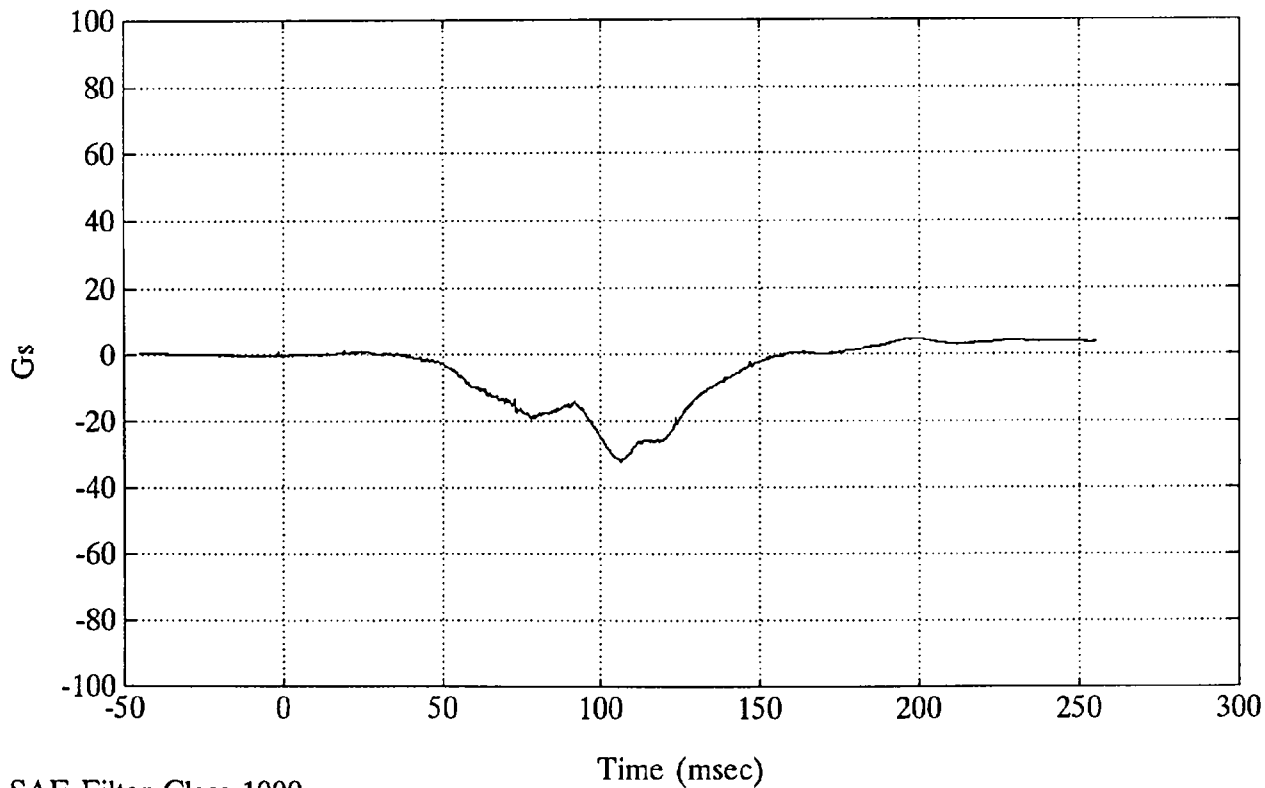


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

Pos. 2 Head X

Max = 4.92 Gs @ 200.28 msec
Min = -31.94 Gs @ 106.08 msec

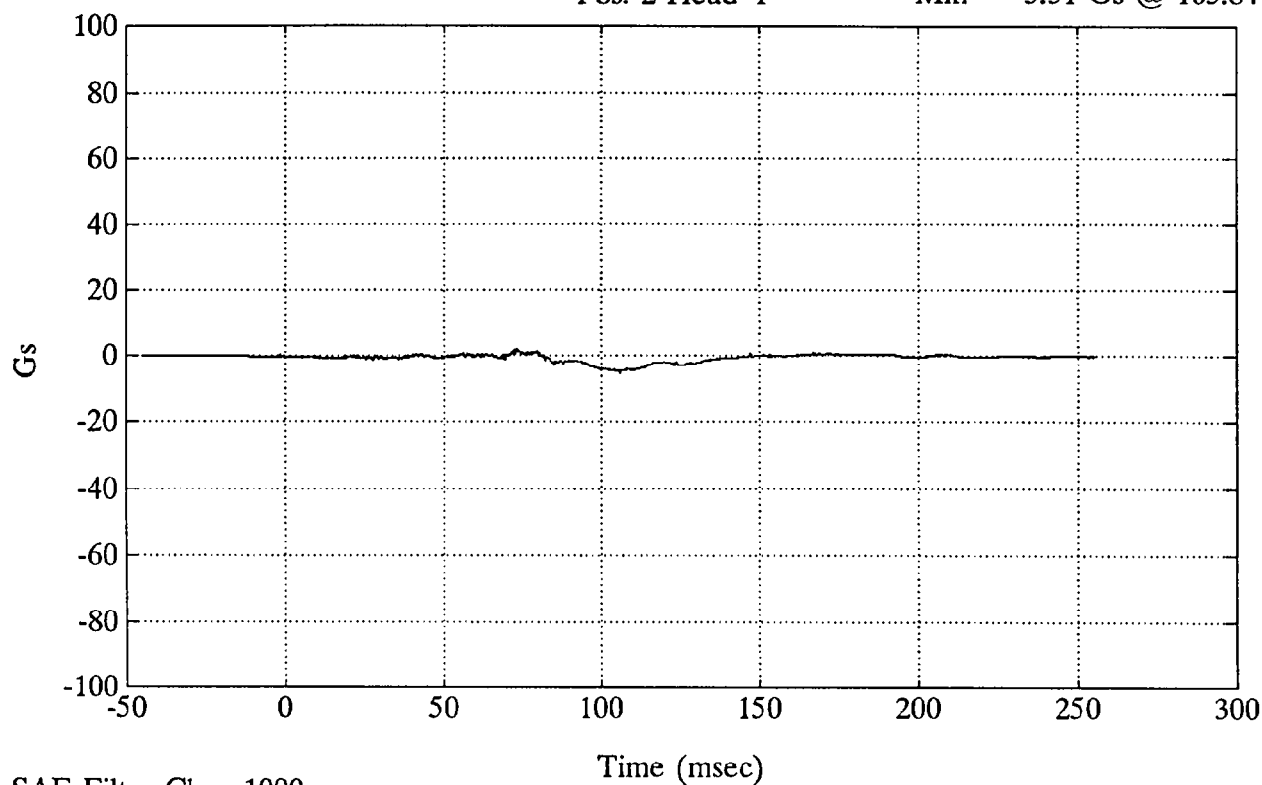


SAE Filter Class 1000

FMVSS 208 - 1993 DODGE SHADOW

Pos. 2 Head Y

Max = 2.35 Gs @ 73.20 msec
Min = -5.31 Gs @ 105.84 msec

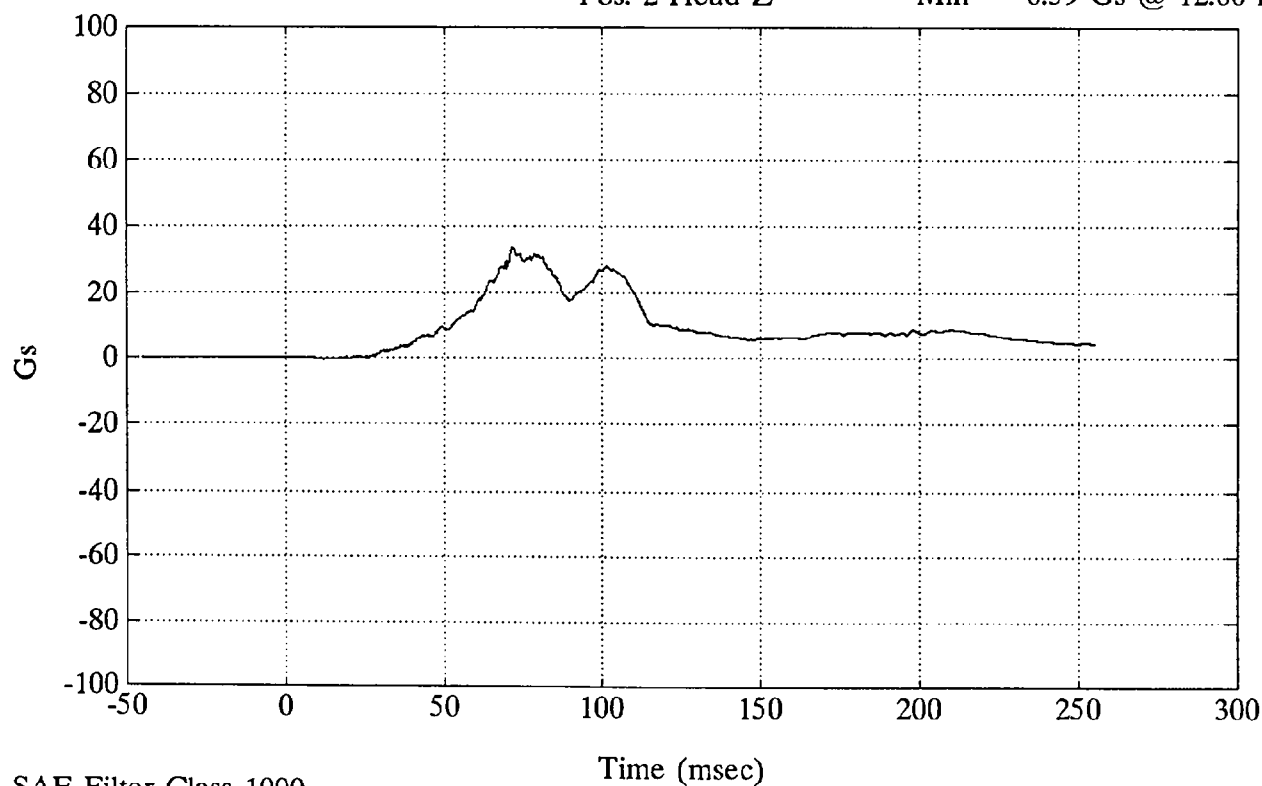


SAE Filter Class 1000

FMVSS 208 - 1993 DODGE SHADOW

Pos. 2 Head Z

Max = 33.86 Gs @ 71.52 msec
Min = -0.59 Gs @ 12.00 msec

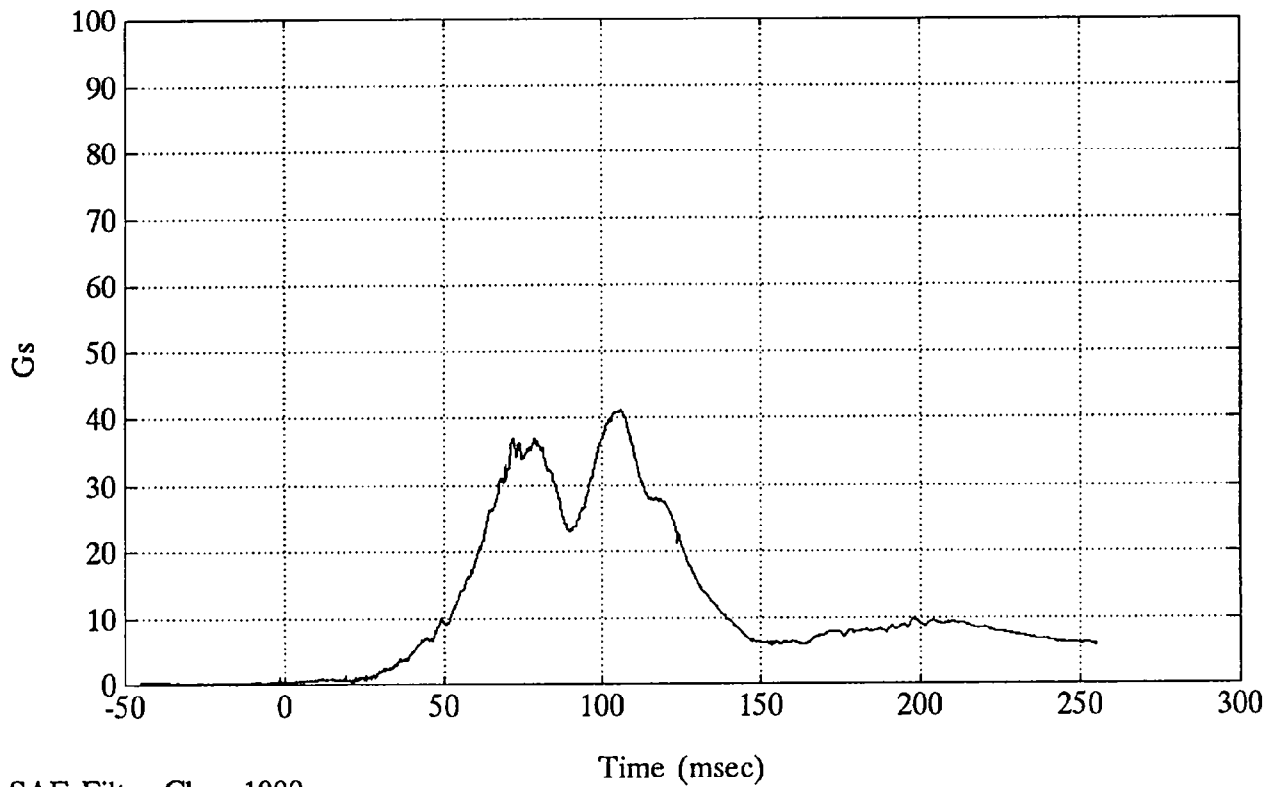


SAE Filter Class 1000

FMVSS 208 - 1993 DODGE SHADOW

Pos. 2 Head Resultant

Max = 41.16 Gs @ 105.96 msec
Min = 0.08 Gs @ -26.40 msec

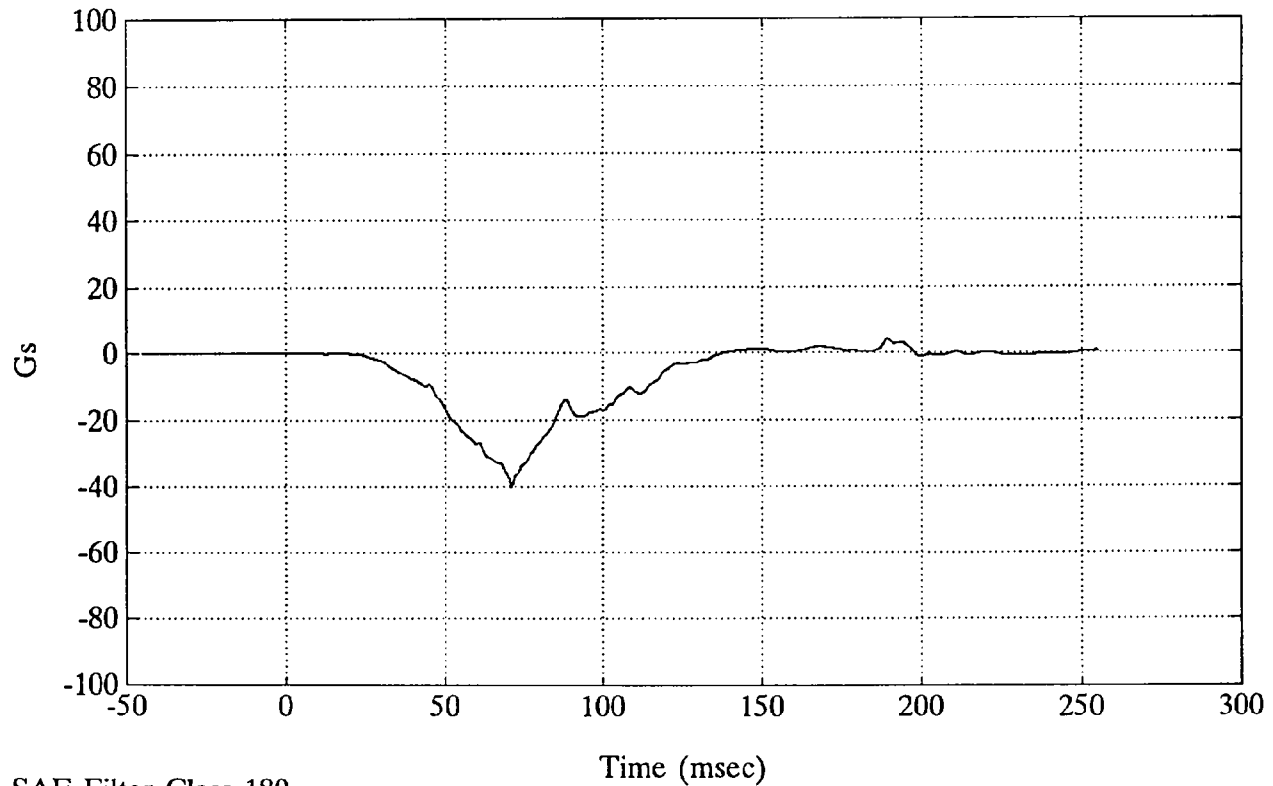


SAE Filter Class 1000

FMVSS 208 - 1993 DODGE SHADOW

Pos. 2 Chest X

Max = 4.28 Gs @ 189.12 msec
Min = -39.95 Gs @ 71.04 msec

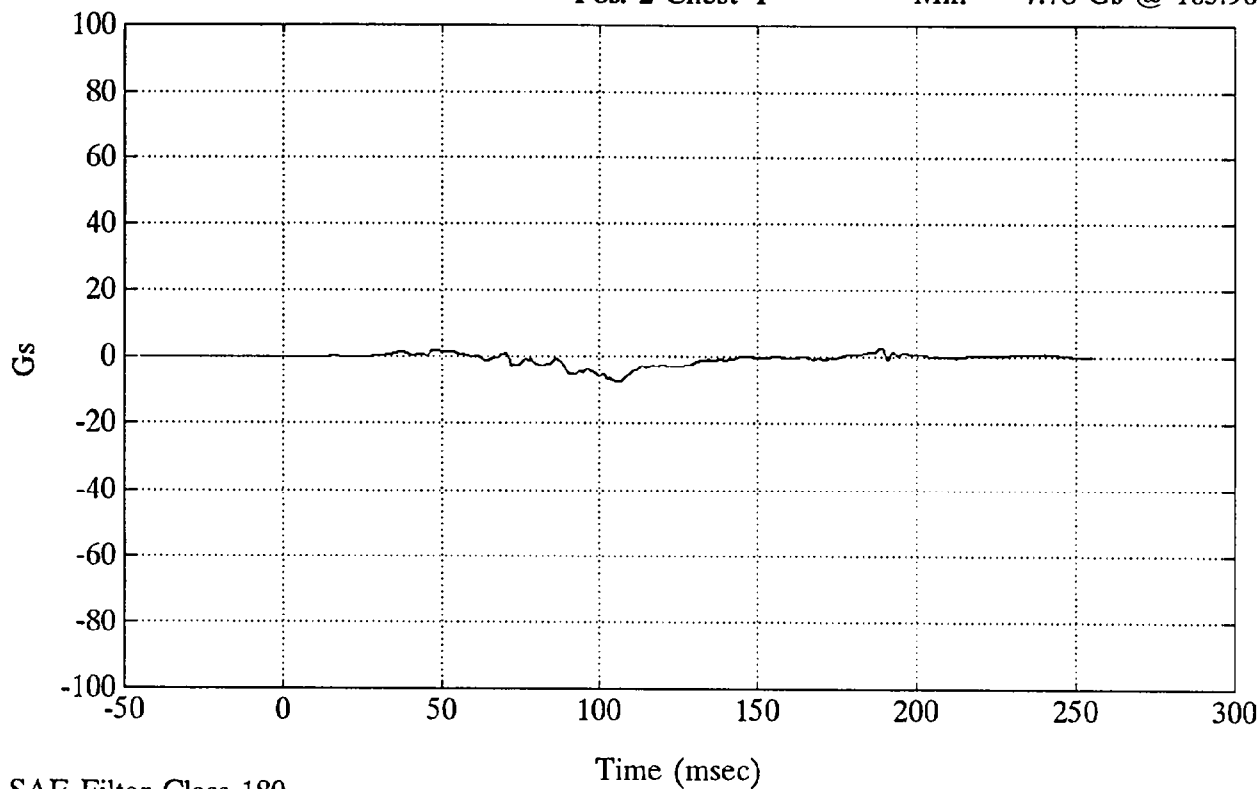


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

Pos. 2 Chest Y

Max = 2.72 Gs @ 188.64 msec
Min = -7.78 Gs @ 105.96 msec

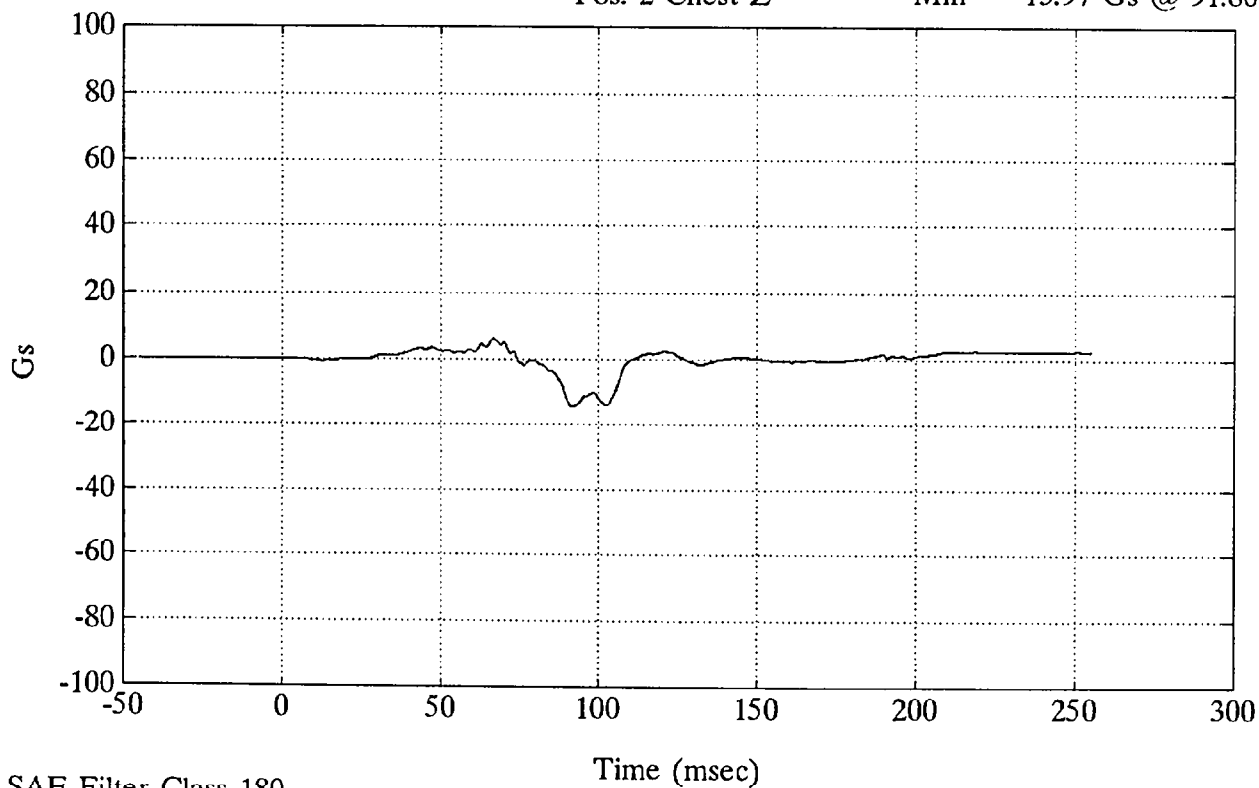


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

Pos. 2 Chest Z

Max = 6.16 Gs @ 66.72 msec
Min = -13.97 Gs @ 91.80 msec

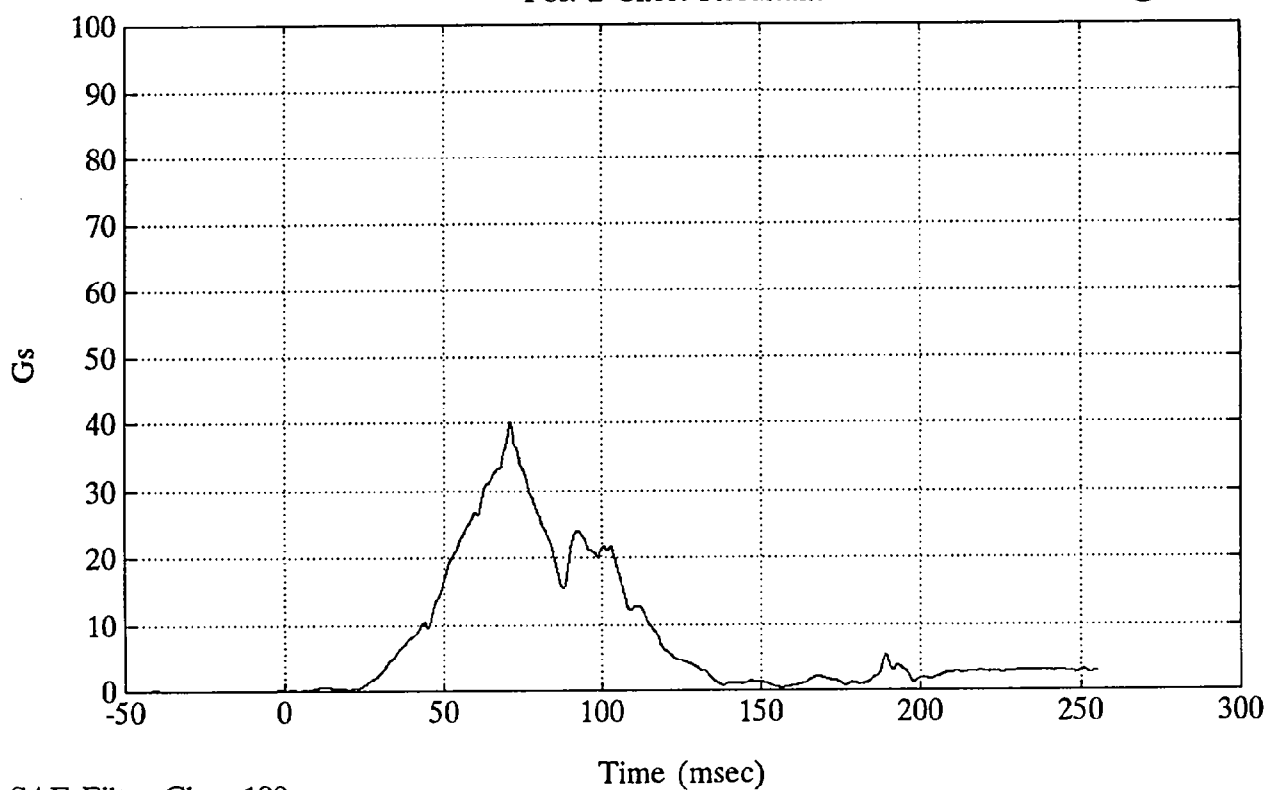


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

Pos. 2 Chest Resultant

Max = 40.10 Gs @ 71.04 msec
Min = 0.00 Gs @ -5.40 msec

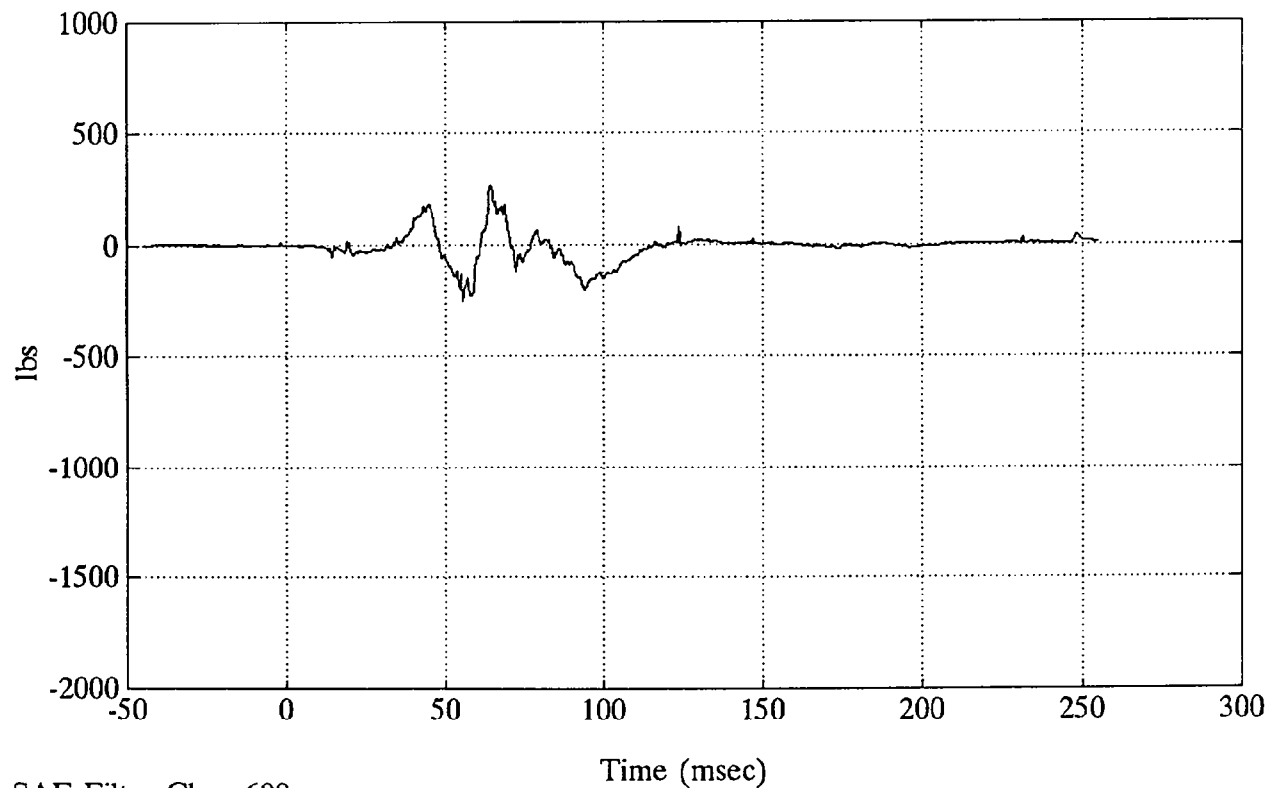


SAE Filter Class 180

FMVSS 208 - 1993 DODGE SHADOW

Pos. 2 Left Femur

Max = 266.17 lbs @ 64.20 msec
Min = -249.13 lbs @ 55.56 msec

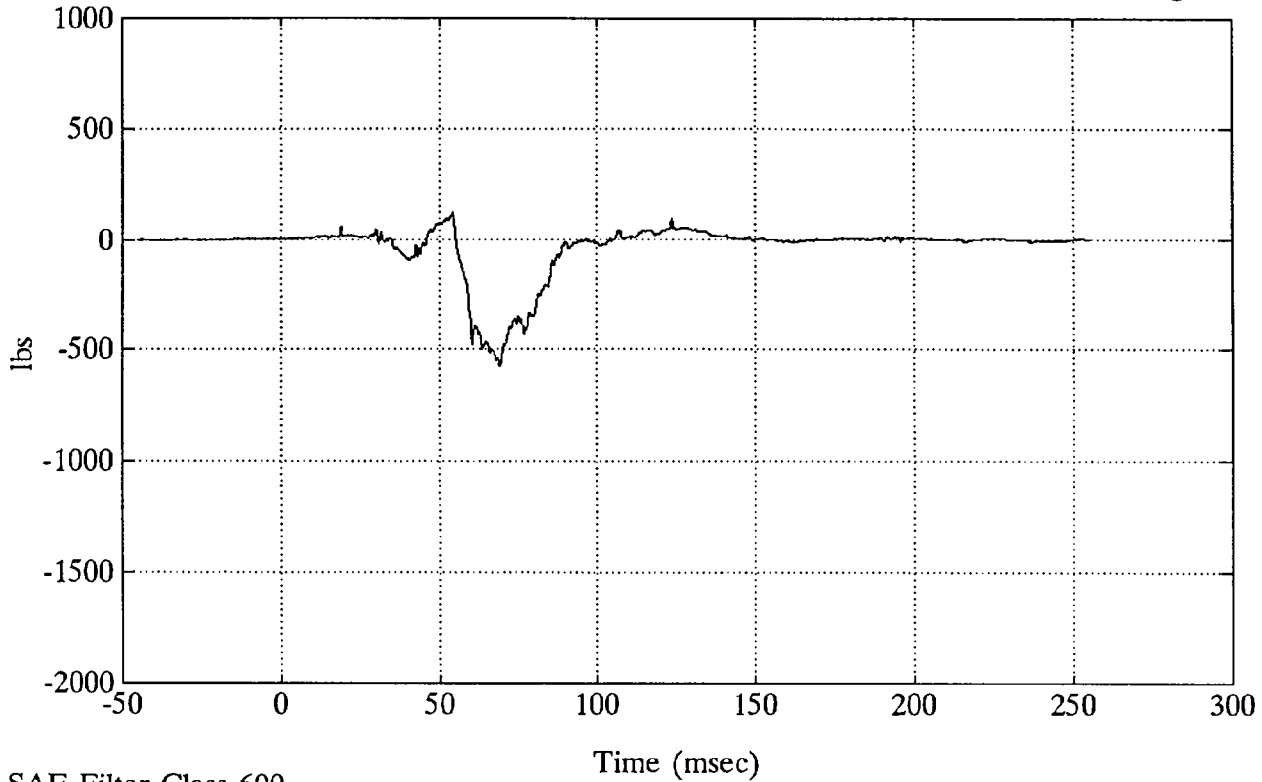


SAE Filter Class 600

FMVSS 208 - 1993 DODGE SHADOW

Pos. 2 Right Femur

Max = 123.47 lbs @ 54.24 msec
Min = -581.57 lbs @ 69.24 msec

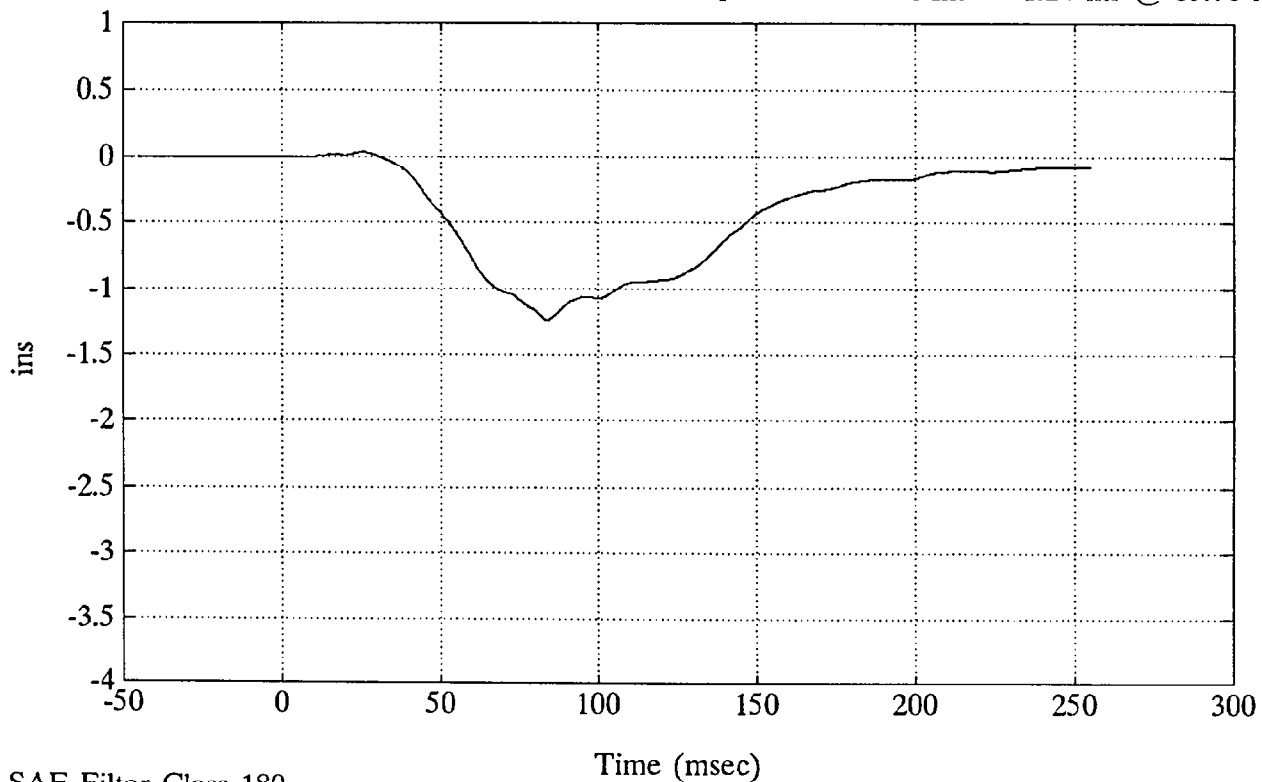


SAE Filter Class 600

FMVSS 208 - 1993 DODGE SHADOW

Pos. 2 Chest Displacement

Max = 0.04 ins @ 25.56 msec
Min = -1.24 ins @ 83.76 msec



SAE Filter Class 180

Appendix C

VEHICLE OWNERS MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

WARNING! In a collision, you and your passengers can suffer much greater injuries if you are not properly buckled up. You can strike parts of the inside of your vehicle or other passengers, or you can be thrown out of the vehicle. Always be sure you and others in your vehicle are buckled up properly.

Buckle up even though you are an excellent driver. Even on short trips. Someone on the road may be a poor driver and cause a collision that includes you. And this can happen far away from home or on your street.

Research has shown that seat belts save lives. They also can reduce the seriousness of injuries in a collision. Some of the worst injuries happen when people are thrown from the vehicle. Seat belts provide protection against that, and they reduce the risk of injury caused by striking the inside of the vehicle. **Everyone** in a motor vehicle needs to be buckled up **all the time**.

UNIBELTS

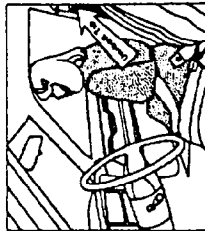
The seats next to the front and rear doors of your vehicle have UNIBELTS.

Each unbelt is a combined lap/shoulder belt system. The belt webbing retractor will lock only during very sudden stops or impacts. This feature allows the shoulder part of the belt to move freely with you under normal conditions. But, in a collision, the belt will lock and reduce the risk of your striking the inside of the vehicle or being thrown out.

WARNING! Wearing a seat belt incorrectly is dangerous. Seat belts are designed to go around the large bones of your body. These are the strongest parts of your body and can take the forces of a collision the best. Wearing your belt in the wrong place could make your injuries in a collision much worse. You might suffer internal injuries, or you could even slide out of part of the belt. Follow these instructions to wear your seat belt safely and to keep your passengers safe, too.

UNIBELT OPERATING INSTRUCTIONS

1. Enter the vehicle and close the door. Sit back and adjust the seat.



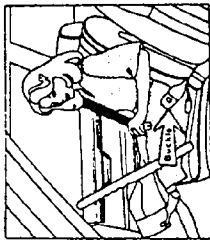
1

2. The seat belt latch plate is above the back of your seat. Grasp the latch plate and pull out the belt. Slide the latch plate up the webbing as far as necessary to make the belt go around your lap.



2

3. When the belt is long enough to fit, insert the latch plate into the buckle until you hear a "click".



3

WARNING! A belt that is buckled into the wrong buckle will not protect you properly. The lap portion could ride too high on your body, possibly causing internal injuries. Always buckle your belt into the buckle nearest you.

A belt that is too loose will not protect you as well. In a sudden stop you could move too far forward, increasing the possibility of injury. Wear your seat belt snugly.

A belt that is worn under your arm is very dangerous. Your body could fall into the inside surfaces of the vehicle in a collision, increasing head and neck injury. And a belt worn under the arm can cause internal injuries. Ribs aren't as strong as shoulder bones. Wear the belt over your shoulder so that your strongest bones will take the force in a collision.

4. Position the lap belt across your thighs, below your abdomen. To remove slack in the lap belt portion, pull up a little on the shoulder belt, as shown. To loosen the lap belt if it is too tight, tilt the latch plate and pull



4

on the lap belt. A snug belt reduces the risk of sliding under the belt in a collision.

WARNING! A lap belt worn too high can increase the risk of internal injury in a collision. The belt forces won't be at the strong hip and pelvic bones, but across your abdomen. Always wear the lap belt as low as possible and keep it snug.

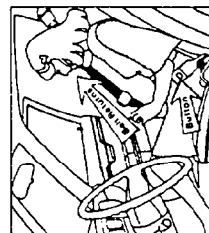
5. Position the shoulder belt on your chest so that it is comfortable and not resting on your neck. The retractor will withdraw any slack in the belt.



5

WARNING! A twisted belt can't do its job as well. In a collision it could even cut into you. Be sure the belt is straight. If you can't straighten a belt in your vehicle, take it to your dealer and have it fixed.

6. To release the belt, push the red button marked **PRESS** on the buckle. The belt will automatically retract to its stowed position. If necessary, slide the latch plate down the webbing to allow it to retract fully.



6

SEAT BELTS AND PREGNANT WOMEN

We recommend that pregnant women use seat belts throughout their pregnancy. Keeping the mother safe is the best way to keep the baby safe.

Pregnant women should wear the lap part of the belt across the thighs and as snug across the hips as possible. Keep the belt low so that it does not come across the abdomen. That way the strong bones of the hips will take the force if there is a collision.

REAR CENTER LAP BELTS — Sedan Models

Center seating positions have a lap belt only.

To fasten a lap belt, slip the latch plate into the buckle.

To lengthen the lap belt, tilt the latch plate and pull. To shorten the belt, pull the loose end of the webbing.

Wear the lap belt snug against the hips. Sit back and erect in the seat, then adjust the belt as tightly as is comfortable.

WARNING! A lap belt worn too loose or too high is dangerous.

A belt worn too loose can allow you to slip down and under the belt in a collision.

A belt that is too high will apply crash forces to the abdomen, not to the stronger hip bones.

In either case, the risk of internal injuries is greater. Wear the lap belt low and snug.

DRIVER SUPPLEMENTAL RESTRAINT SYSTEM - AIRBAG (if so equipped)

This vehicle has an airbag for the driver as a supplement to the seat belt restraint system. The airbag is mounted in the steering wheel. Its job is to inflate in higher speed frontal impacts. It works with the instrument panel knee bolster and the seat belt to provide improved protection for the driver.

WARNING! Relying on the airbag alone could lead to more severe injuries in a collision. The airbag works with your seat belt to restrain you properly. In some collisions the airbag won't deploy at all. Wear your seat belt even though you have an airbag.

The seat belt system is designed to protect you in many types of collisions. The airbag deploys only in frontal collisions. And it will not deploy in collisions at slow speed. But even in collisions where the airbag does work, you need the seat belt to help keep you in the right position for the airbag to protect you properly.

Ignoring the airbag light in your instrument panel could mean you won't have the airbag to protect you in a collision. If the light does not come on, stays on after you start the vehicle, or if it comes on as you drive, have the airbag system checked right away.

The airbag system consists of the following:

- Crash Sensors
- Diagnostic Unit
- AIRBAG Readiness Light
- Airbag/inflator Unit
- Unique Steering Wheel and Column

- Interconnecting Wiring
- Knee Impact Bolster

How The Airbag System Works

- **Crash Sensors** in the front of the vehicle and in the occupant compartment determine if a frontal impact is severe enough to require the airbag. The sensors will not detect side, rollover, or rear impacts. Switches in the sensors are connected to the diagnostic unit and to the airbag/inflator unit.
- The **Diagnostic Unit** monitors the readiness of the electronic parts of the system whenever the ignition switch is in the START or RUN positions. These include all of the items listed above except the knee bolster. The Diagnostic Unit also turns on the AIRBAG light in the instrument panel for 6 to 8 seconds when the ignition is first turned on, then turns the light off. If it detects a malfunction in any part of the system, it turns the light on either momentarily or continuously.
- The **Airbag/Inflator Unit** is in the center of the steering wheel. When the crash sensors detect an impact requiring the airbag, they signal the inflator unit. A large quantity of non-toxic nitrogen gas is generated to inflate the airbag. The steering wheel hub trim cover separates and folds out of the way as the bag inflates to its full size. The bag fully inflates in about 50 milliseconds. This is about half of the time it takes to blink your eye. It then quickly deflates by venting the nitrogen gas through holes in the airbag toward the instrument panel. In this way the bag does not interfere with your control of the vehicle.

If A Deployment Occurs

The airbag system is designed to deploy when the impact sensors detect a moderate-to-severe frontal collision, and then immediately deflate.

NOTE: A frontal collision that is not severe enough to need airbag protection will not activate the system. This does not mean something is wrong with the airbag system.

If you do have a collision which deploys the airbag, any or all of the following may occur:

- The nylon airbag material may sometimes cause abrasions and/or skin reddening to the driver as the airbag deploys and unfolds itself from the steering wheel.

The abrasions are similar to friction rope burns or those you might get sliding along a carpet or gymnasium floor. They are not caused by contact with chemicals. They are not permanent and normally heal quickly. However, if you haven't healed significantly within a few days, or if you have any blistering, see your doctor immediately.

- As the airbag deflates you may see some smoke-like particles. The particles are a normal by-product of the process generating the non-toxic nitrogen gas used for airbag inflation. These airborne particles may cause irritation of the skin, eyes, nose, or throat. If you have skin or eye irritation, rinse the area with cool water. For nose or throat irritation, move to fresh air. If the irritation continues, see your doctor.

If these particles settle on your clothing, follow the garment manufacturer's instructions for cleaning.

- Your vehicle may be safely driveable after the airbag deploys. If so, you can tuck the deployed airbag inside the opening in the steering wheel hub trim cover to make driving somewhat easier.

WARNING! A deployed airbag cannot protect you in another collision. Have the airbag replaced by an authorized dealer as soon as possible.

MAINTAINING YOUR AIRBAG SYSTEM

WARNING! Modifications to any part of the airbag system could cause it to fail when you need it. You could be injured because the airbag is not there to protect you. Do not modify the components or wiring, including adding any kind of badges or stickers to the steering wheel hub trim cover. Do not modify the front bumper or vehicle body structure.

You need proper knee impact protection in a collision. Make sure the fuse access panel, in the lower portion of the knee bolster, is in place before driving the vehicle. Do not mount or locate any aftermarket equipment on or behind the knee bolster.

You can be injured if you are too close to the steering wheel hub and the airbag inflates. It is dangerous to try to repair any part of the airbag system yourself. Don't try to repair the airbag system. Be sure to tell anyone who works on your vehicle that it has an airbag.

You will want to have the airbag ready to inflate for your protection in an impact. So if any of the following occurs, have an authorized dealer service the system promptly.

- The AIRBAG light does not come on or flickers for the 6 to 8 seconds when the ignition switch is first turned on.
- The light remains on or flickers after the 6 to 8 second interval.