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ISUZU ENGINEERING TEST REPORT

ET5 - 0632

CERTIFICATION TEST REPORT

FMVSS 301

FUEL SYSTEM INTEGRITY

REAR MOVING BARRIER IMPACT

1991 ISUZU RODEO

ISUZU MODEL NO. UCR17G / UCR21G / UCS21G

TEST NO. A9132

ISUZU MOTORS LIMITED

VEHICLE SAFETY ENGINEERING DEPT.

1.Summary Data

SUMMARY OF TEST CONDITION (1)

TYRE OF TEST:

_____ Frontal ( ) Impact

_____ Oblique ( ) Impact on _____ Left (Driver's) Side

_____ Right Side

_____ Lateral or Side Impact on _____ Left (Driver's) Side

_____ Right Side

X Rear Impact

TEST CONDITIONS:

Data of Test: November 20, 1989 Time of Test: AM: 12:00 PM: _____

Ambient Temperature: 14.0 °C at Impact area

TEST VEHICLE INFORMATION:

Manufacturer: ISUZU MOTORS LIMITED

Make / Model: SIA / UCS21G

Body Style : STATION WAGON Model Year: 1991

VIN.: JACCY58Z1M7A00030

Test No.: A- 9132 Body Color: WHITE

Engine : 6 Cylinders: 3.1 Liters

( ) Gasoline, ( ) Diesel, ( ) _____

Transmission Date: 5 Speed, (X) Manual, ( ) Automatic

Major Options : ( ) Radio; (X) Air conditioner; (X) Power Steering;
( ) Tilt wheel; ( ) Power window; ( ) Cruise control

TEST FLUID DATA:

Test Fluid Type : Red Stoddard Solvent Specific Gravity: 0.777

Kinematic Viscosity: 1.39cst

Nominal Fuel Capacity: 83.00 Liters (NFC)

Test Volume: 78.85 (95 % of NFC)

Electric Fuel Pump: __ Yes, X No Fuel Injection: __ Yes, X No

SUMMARY OF CONDITION (2)

VEHICLE TIRE DATA

Tire Pressure: Front: 2.00 kg/cm²

Rear : 2.00 kg/cm²

Tires Size on Vehicle: 31×10.5R15

Spare Tire : X Yes, ____ No

Space Saver: ____ Yes, X No

VEHICLE CAPACITY

Type of Seats: X Bench, ____ Bucket, ____ Split Bench

Designated Seating Capacity: Front : 3

Rear : 3

3rd seat : —

Total : 6

Cargo: 300 lbs.

Total: 980 lbs. (Vehicle Capacity Weight)

GVWR : 4800 lbs.

GAWR Front: 2260 lbs. Rear: 2700 lbs.

The heaviest vehicle of UCR17G/ UCR21G/UCS21G series.

CALCULATED VEHICLE TEST WEIGHT: 4642 lbs.

(with Required Dummies and 300 lbs. Cargo)

Left Front : 1235 lbs. Left Rear : 1087 lbs.

Right Front: 1199 lbs. Right Rear: 1122 lbs.

Total Front Weight: 2434 lbs. (52.4 %of Total Vehicle Weight)

Total Rear Weight : 2209 lbs. (47.6 %of Total Vehicle Weight)

Total Test Weight : 4643 lbs.

2. Test Data

POST IMPACT SUMMARY (1)

Vehicle : VCS21G

Test No.: A-9132 Date: Nov. 20, 1989

IMPACT VELOCITY:

Trap 1 = 30.6 mph

Trap 2 = - Mph

Average= 30.6 mph

VEHICLE STATIC CRUSH: Driver Side = 8.46 inches

Passenger's Side = 9.06 inches

Average = 8.76 inches

FUEL SYSTEM INTEGRITY - FMVSS 301-75

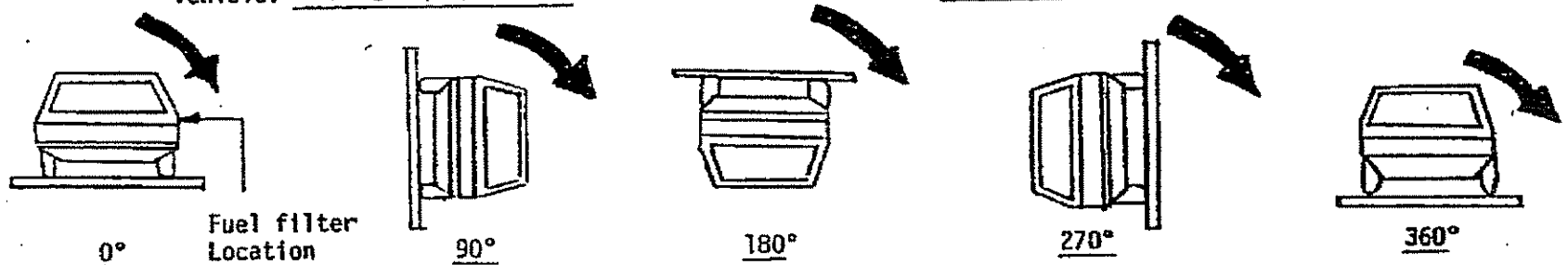
	Actual	Max. Allow.
Fuel spillage from impact until vehicle motion ceases.	0 ounce	1 ounce
Fuel spillage for 5 minute period following cessation of vehicle motion after impact.	0 ounce	5 ounce
Fuel spillage for next 25 minute period	0 ounce	1 ounce/ 1 minute

Fuel spillage Location: NONE

FUEL SYSTEM INTEGRITY - FMVSS 301-75

STATIC ROLLOVER (1st Roll;Clockwise)

Vehicle: UCS21G Test No.: A-9132



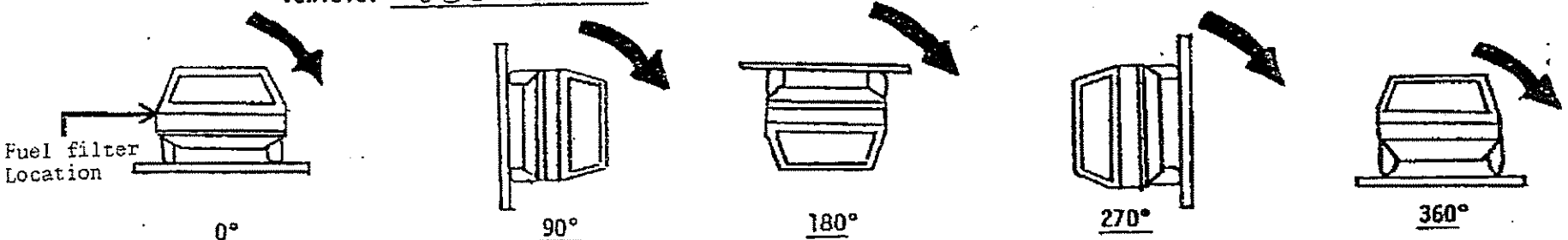
Rotation Angle	Rotation Time	Fuel spillage during 5 minute period from onset of rotation	Fuel spillage during 6th minute period from onset of rotation	Fuel spillage during 7th minute period from onset of rotation
0 - 90	60 seconds	0 ounce	0 ounce	-
90 - 180	60 seconds	0 ounce	0 ounce	-
180 - 270	60 seconds	0 ounce	0 ounce	-
270 - 360	60 seconds	0 ounce	0 ounce	-
Max. Allowed	1-3 minutes	5 ounce	1 ounce	1 ounce

Fuel Spillage Location : NONE

FUEL SYSTEM INTEGRITY - FMVSS 301-75

STATIC ROLLOVER (2nd Roll;Counterclockwise)

Vehicle: VCS21G Test No.: A-9132



Rotation Angle	Rotation Time	Fuel spillage during 5 minute period from onset of rotation	Fuel spillage during 6th minute period from onset of rotation	Fuel spillage during 7th minute period from onset of rotation
0 - 90	60 seconds	0 ounce	0 ounce	-
90 - 180	60 seconds	0 ounce	0 ounce	-
180 - 270	60 seconds	0 ounce	0 ounce	-
270 - 360	60 seconds	0 ounce	0 ounce	-
Max. Allowed	1-3 minutes	5 ounce	1 ounce	1 ounce

Fuel Spillage Location : NONE

PHOTO.1 PRE TEST TEST VEHICLE OVERALL

PHOTO.2 PRE TEST TEST VEHICLE OVERALL

PHOTO.3 POST TEST TEST VEHICLE OVERALL

PHOTO.4 POST TEST TEST VEHICLE OVERALL

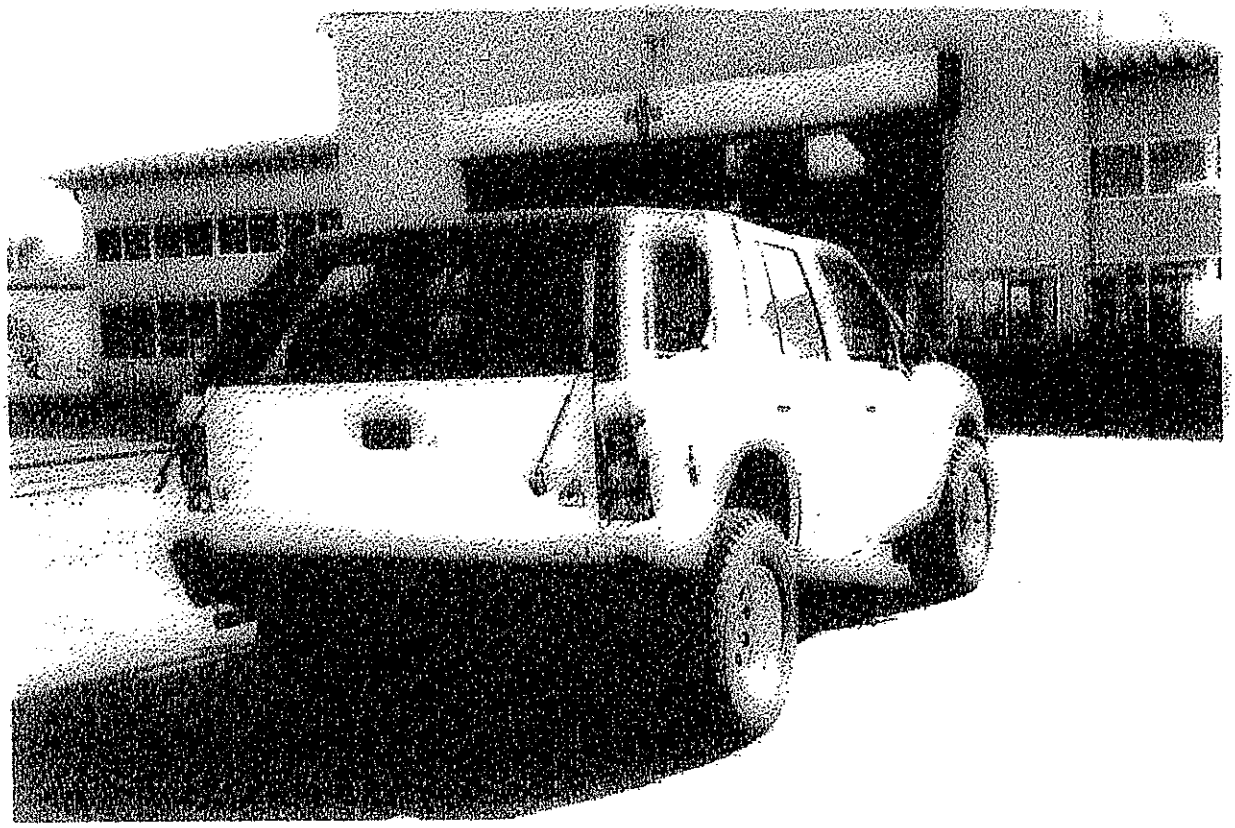


PHOTO.5 POST TEST FILER CAP

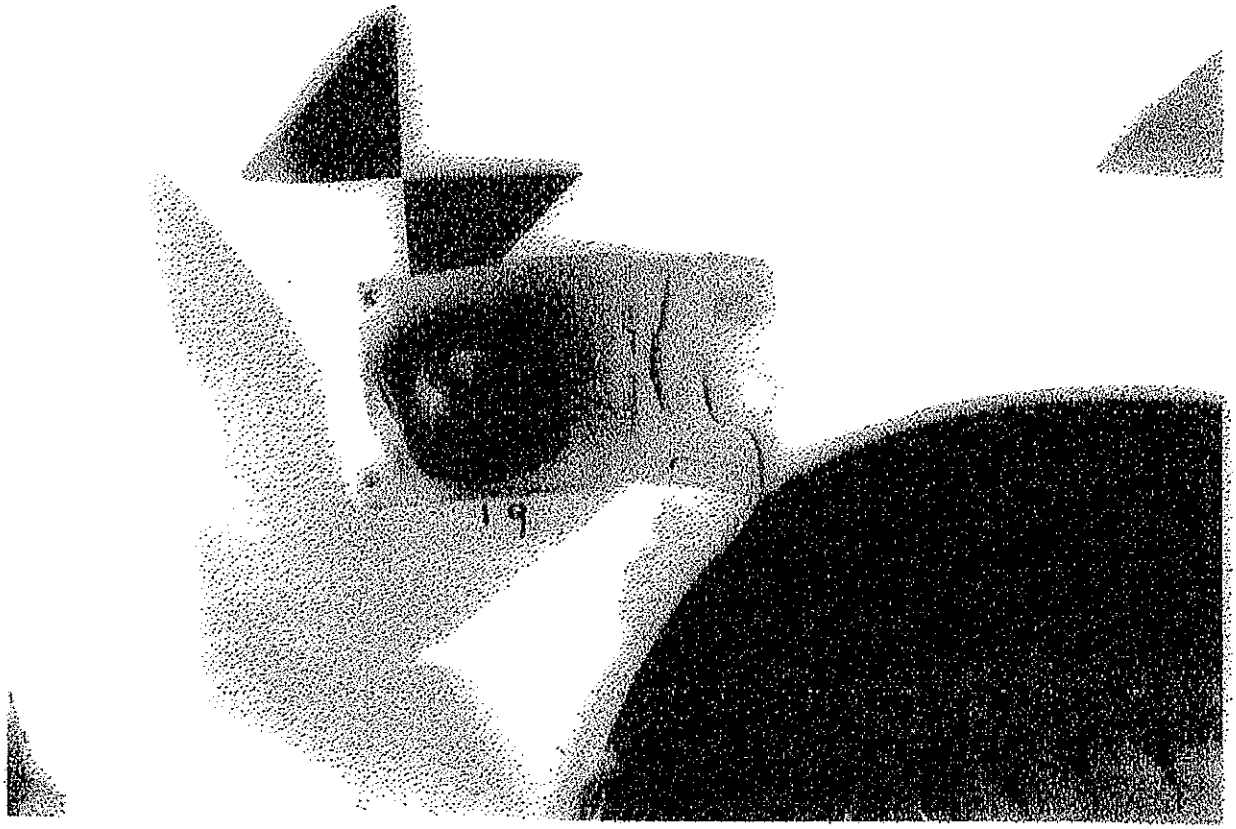
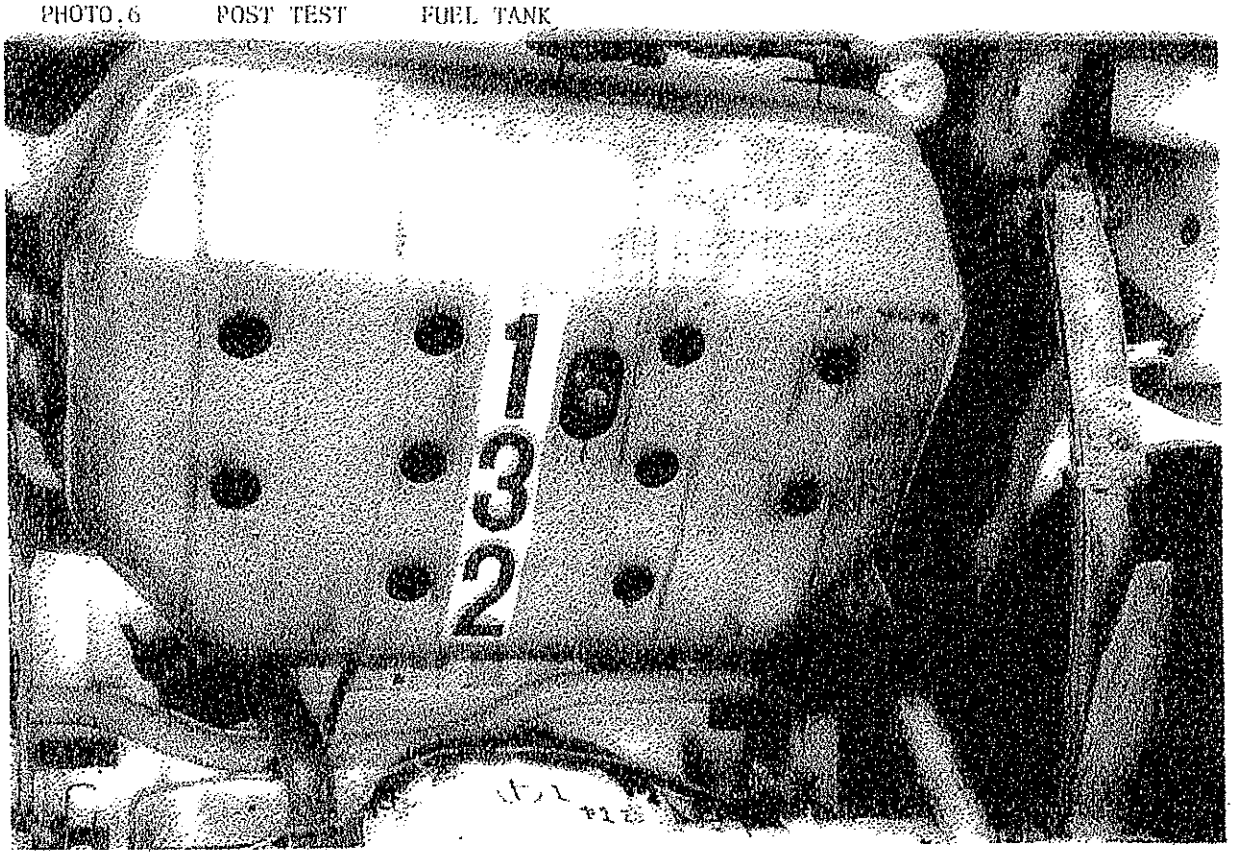


PHOTO.6 POST TEST FUEL TANK



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ISUZU ENGINEERING TEST REPORT

REPORT NO. ET5－0844

CERTIFICATION TEST REPORT

FMVSS 301 FUEL SYSTEM INTEGRITY

REAR MOVING BARRIER IMPACT

1993 ISUZU RODEO－2WD

ISUZU MODEL NO. UCR25G

ISUZU MOTORS LIMITED

RESEARCH & EXPERIMENT DEPARTMENT

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1. SUMMARY DATA

SUMMARY OF TEST CONDITION (1)

TYPE OF TEST

_____ FRONTAL (0°) IMPACT

_____ OBLIQUE (30°) IMPACT ON_____ LEFT(DRIVER'S)SIDE

_____ RIGHT SIDE

_____ LATERAL OR SIDE IMPACT ON_____ LEFT(DRIVER'S)SIDE

_____ RIGHT SIDE

__×__ REAR IMPACT

TEST CONDITIONS

DATE OF TEST: Nov. 13, 1992 TIME OF TEST: 11:30

AMBIENT TEMPERATURE AT IMPACT AREA: 18.0° C

TEMPERATURE IN OCCUPANT COMPARTMENT: ...° C

TEST VEHICLE INFORMATION

MANUFACTURER : ISUZU MOTORS LIMITED

MAKE / MODEL : ISUZU / UCR25G

BODY STYLE : MPV 4-DOOR MODEL YEAR: 1993

VIN. : 4S2CG58V6P4300039

TEST NO. : A-2099 BODY COLOR: RED

ENGINE DATA : 6 CYLINDERS ; 3.2 liters

× GASOLINE ; — DIESEL ; — TURBOCHARGED

× LONGITUDINAL ; — TRANSVERSE ;

TRANSMISSION DATA : 4 SPEED , — MANUAL , × AUTOMATIC ,

FINAL DRIVE DATA : — FWD , — RWD , × 4WD

MAJOR OPTIONS : × A/C , × P/S , × P/B , × P/wdo ,

× TILT WHEEL , — P/seats , × CRUISE CONTROL

ODOMETER READING : _____ miles

TEST FLUID DATA

TEST FLUID TYPE : RED STODDARD SOLVENT SPECIFIC GRAVITY : 0.777

KINEMATIC VISCOSITY : 1.39 CST

NOMINAL FUEL CAPACITY : 83 Liters (NFC)

TEST VOLUME : 78 Liters (94% of NFC)

ELECTRIC FUEL PUMP : × YES _____ NO FUEL INJECTION : × YES _____ NO

SUMMARY OF TEST CONDITION (2)

VEHICLE TIRE DATA

COLD TIRE PRESSURE : FRONT 1.8 kg/cm²
REAR 1.8 kg/cm²

TIRES SIZE ON VEHICLE : P225/75R15

IS SPARE TIRE A "SPACE SAVER" : NO

IS SPARE TIRE STANDARD EQUIPMENT : YES

VEHICLE CAPACITY

NUMBER OF OCCUPANTS : 2 FRONT; 3 REAR; — 3rd SEAT; 5 TOTAL

TYPE OF FRONT SEATS : × BUCKET; — BENCH; — SPLIT BENCH

TYPE OF FRONT SEAT BACK : — FIXED × Adj.with × LEVER — Rot.Knob

RATED CARGO AND LUGGAGE
WEIGHT (RCLW) = 300 lbs.

GVWR 4650 lbs. GAWR: FRONT 2100 lbs. REAR 2800 lbs.

CALCULATION FOR TARGET TEST WEIGHT

UW = Unloaded Weight (4120 lbs.)

OW = Option Weight. (46 lbs.)

DSC = Designated Seating Capacity (5)

RCLW = 300 lbs.

TARGET TEST WEIGHT = UW + OW + RCLW + (2 dummies * 164 lbs./dummy)

TARGET TEST WEIGHT = 4794 lbs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND CARGO

RIGHT FRONT = 1199 lbs. RIGHT REAR = 1195 lbs.

LEFT FRONT = 1267 lbs. LEFT REAR = 1133 lbs.

TOTAL FRONT WEIGHT = 2466 lbs. (51.4 % of Total vehicle Weight)

TOTAL REAR WEIGHT = 2328 lbs. (48.6 % of Total vehicle Weight)

TOTAL TEST WEIGHT = 4794 lbs.

2. TEST DATA

POST IMPACT SUMMARY (1)

VEHIDLE : UCR25G (VIN. 4S2CG58V6P4300039)

DATA : Nov. 13, 1992

TEST NO. : A-2099

IMPACT VELOCITY : PRIMARY = 30.3 MPH

VEHICLE STATIC CRUSH : DRIVER SIDE : 6.8 inches

PASSENGER'S SIDE : 7.8 inches

AVERAGE : 7.3 inches

FUEL SYSTEM INTEGRITY - FMVSS 301-75

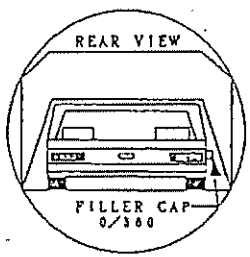
	Actual	Max. Allow.
Fuel spillage from impact until vehicle motion ceases.	0	1 ounce
Fuel spillage for 5 minute period following cessation of vehicle motion after impact.	0	5 ounce
Fuel spillage for next 25 minute period	0	1 ounce 1 minute

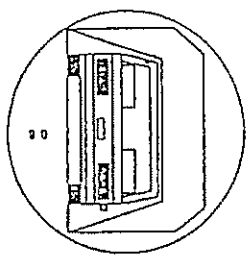
FUEL SPILLAGE LOCATION : NONE

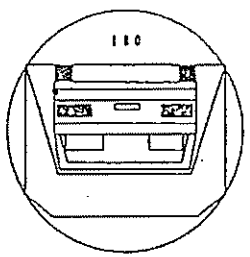
FUEL SYSTEM INTEGRITY - FMVSS 301-75

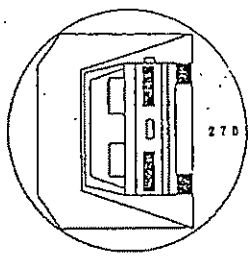
STATIC ROLLOVER (1st. Roll;Clockwise)

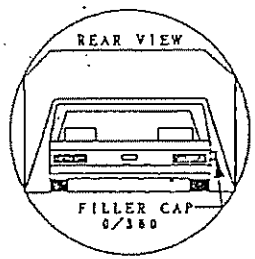
Vehicle: UCR25G (VIN. 4S2CG58V6P4300039) Test No.: A-2099











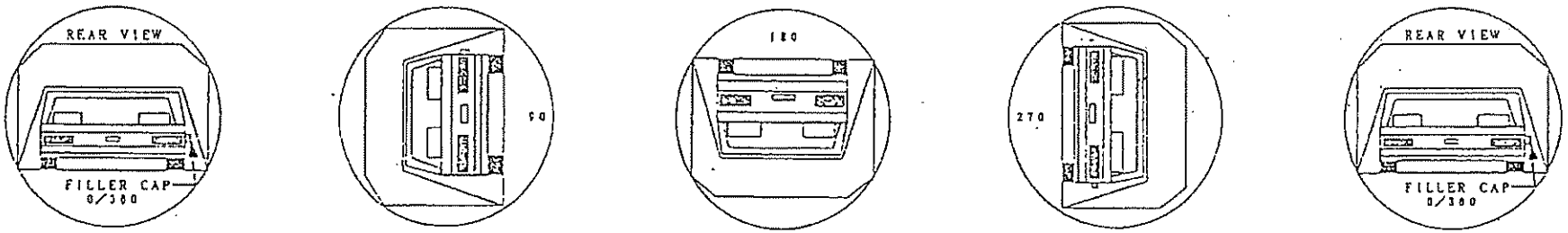
Rotation Angle	Rotation Time	Fuel spillage during 5 minute period from onset of rotation	Fuel spillage during 6th minute period from onset of rotation	Fuel spillage during 7th minute period from onset of rotation
0 - 90	60 seconds	0 ounce	0 ounce	——
90 - 180	60 seconds	0 ounce	0 ounce	——
180 - 270	60 seconds	0 ounce	0 ounce	——
270 - 360	60 seconds	0 ounce	0 ounce	——
Max. Allowed	1-3 minutes	5 ounce	1 ounce	1 ounce

FUEL SPILLAGE LOCATION : NONE

FUEL SYSTEM INTEGRITY - FMVSS 301-75

STATIC ROLLOVER (2nd. Roll;Counterclockwise)

Vehicle: UCR25G (VIN. 4S2CG58V6P4300039) Test No.: A-2099



Rotation Angle	Rotation Time	Fuel spillage during 5 minute period from onset of rotation	Fuel spillage during 6th minute period from onset of rotation	Fuel spillage during 7th minute period from onset of rotation
0 - 90	60 seconds	0 ounce	0 ounce	——
90 - 180	60 seconds	0 ounce	0 ounce	——
180 - 270	60 seconds	0 ounce	0 ounce	——
270 - 360	60 seconds	0 ounce	0 ounce	——
Max. Allowed	1-3 minutes	5 ounce	1 ounce	1 ounce

FUEL SPILLAGE LOCATION : NONE

3. PHOTOGRAPHS

PHOTO. 1 PRE-TEST LEFT SIDE VIEW

PHOTO. 2 POST-TEST LEFT SIDE VIEW

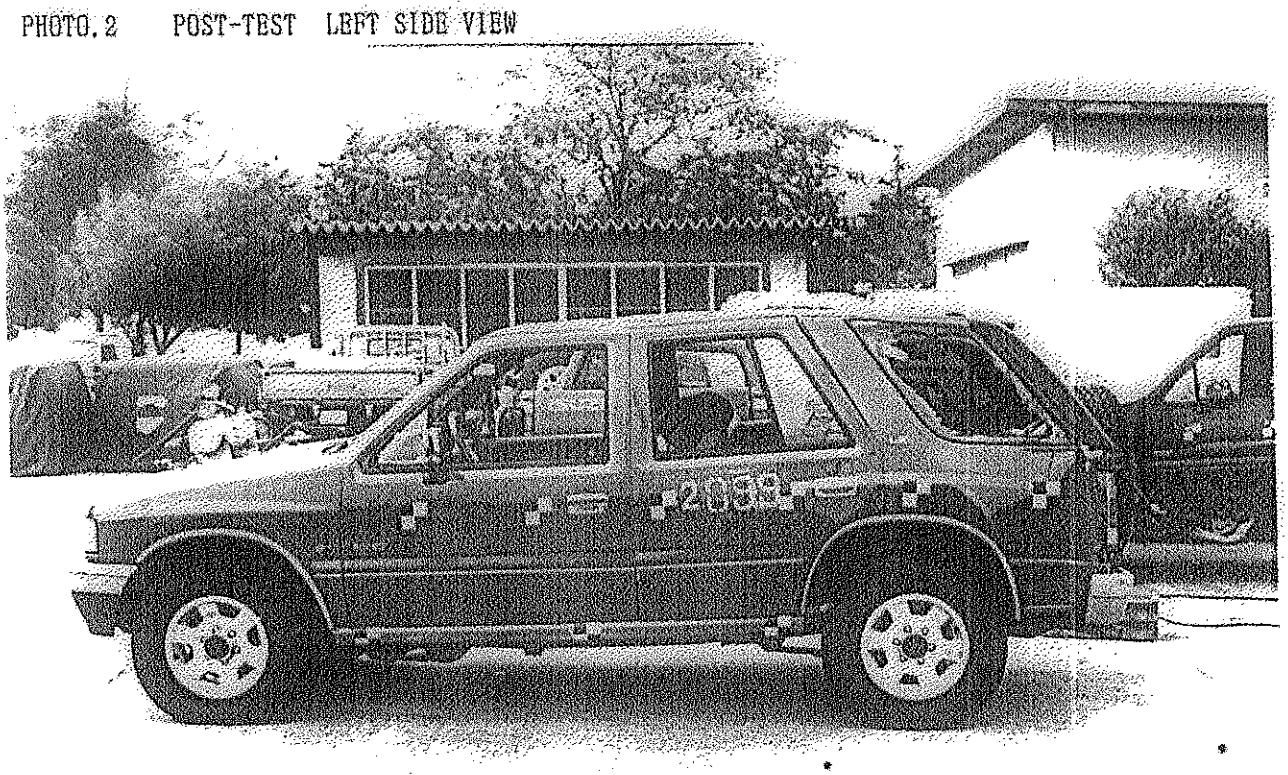


PHOTO. 3 PRE-TEST REAR VIEW

PHOTO. 4 POST-TEST REAR VIEW

PHOTO. 5 PRE-TEST RIGHR SIDE VIEW

PHOTO. 6 POST-TEST RIGHT SIDE VIEW

PHOTO. 7 PRE-TEST REAR UNDERBODY VIEW

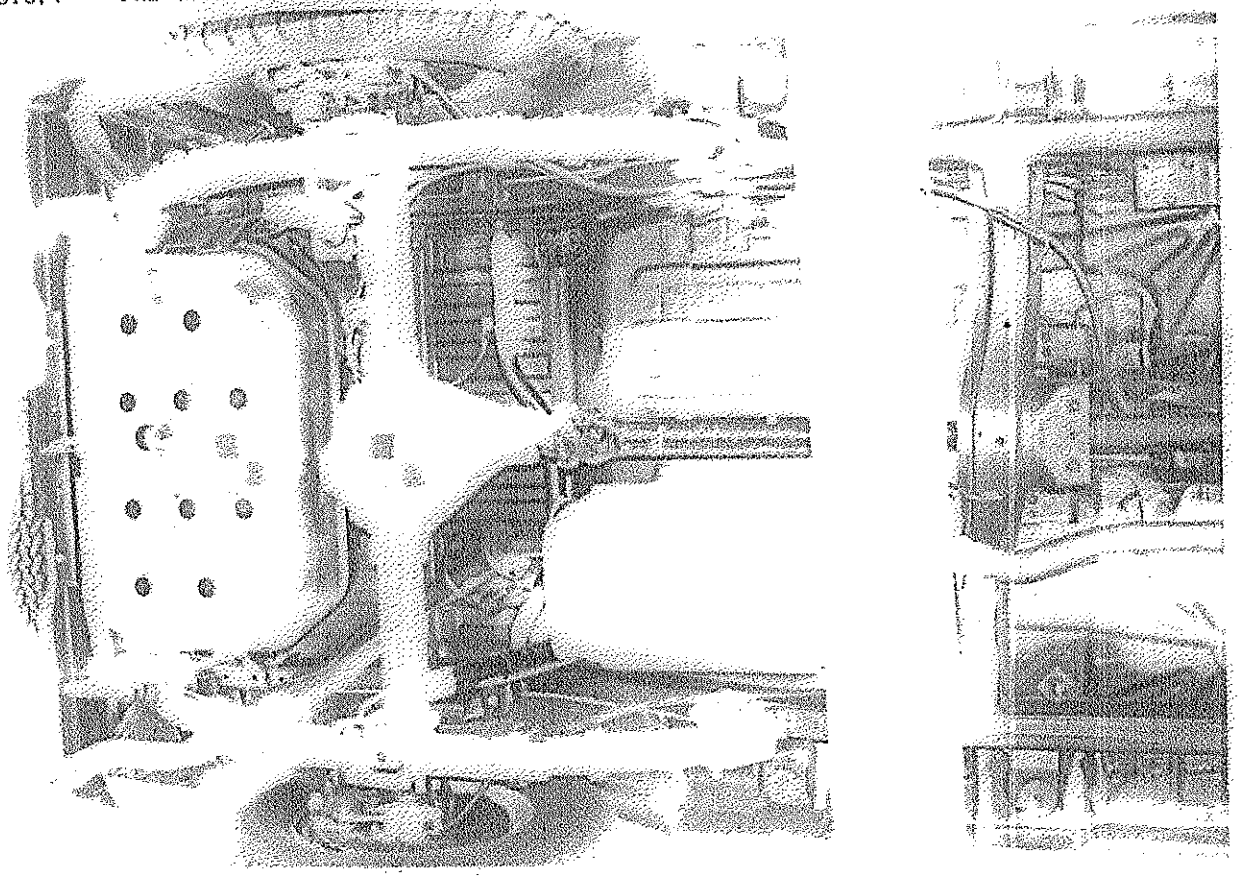


PHOTO. 8 POST-TEST REAR UNDERBODY VIEW

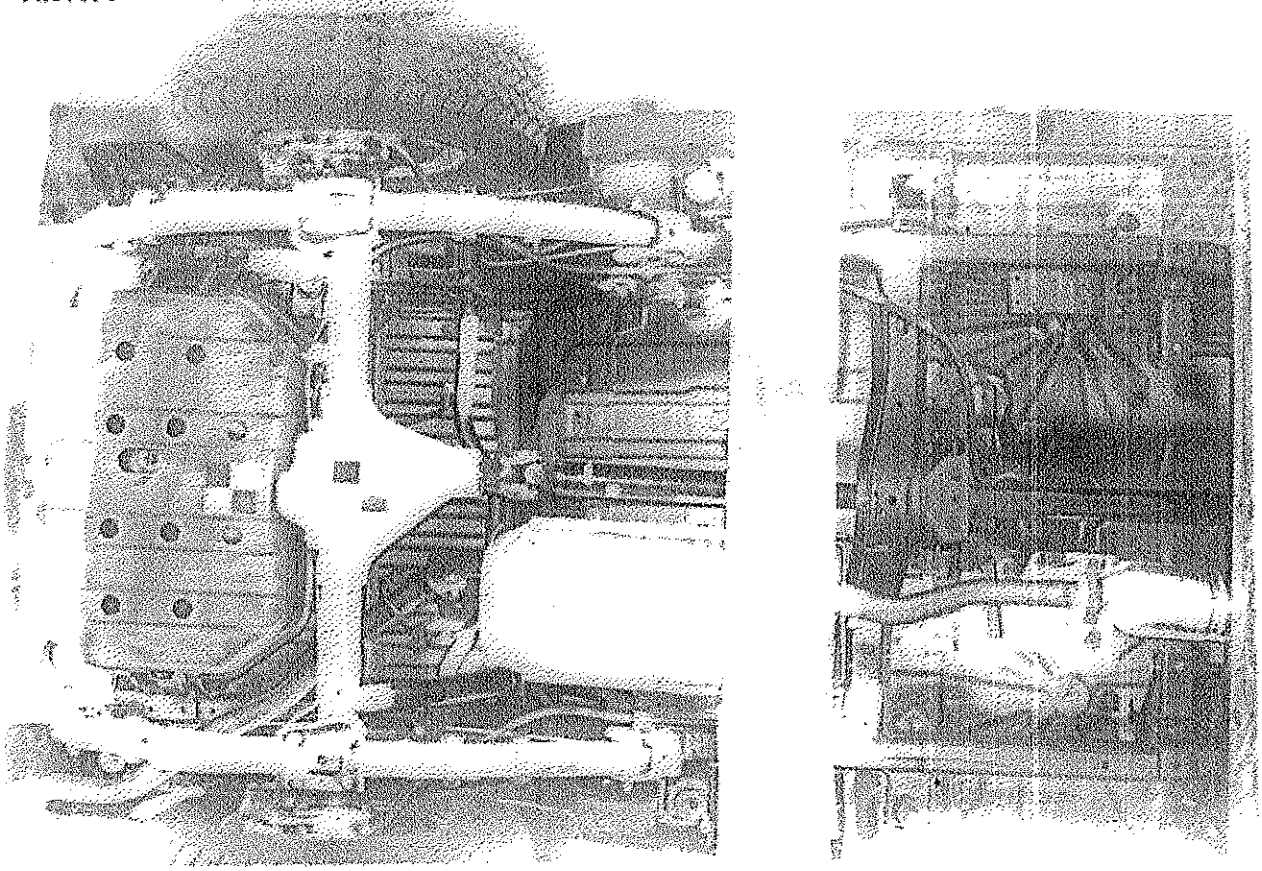


PHOTO. 9 POST TEST STATIC ROLLOVER(0 °)VIEW

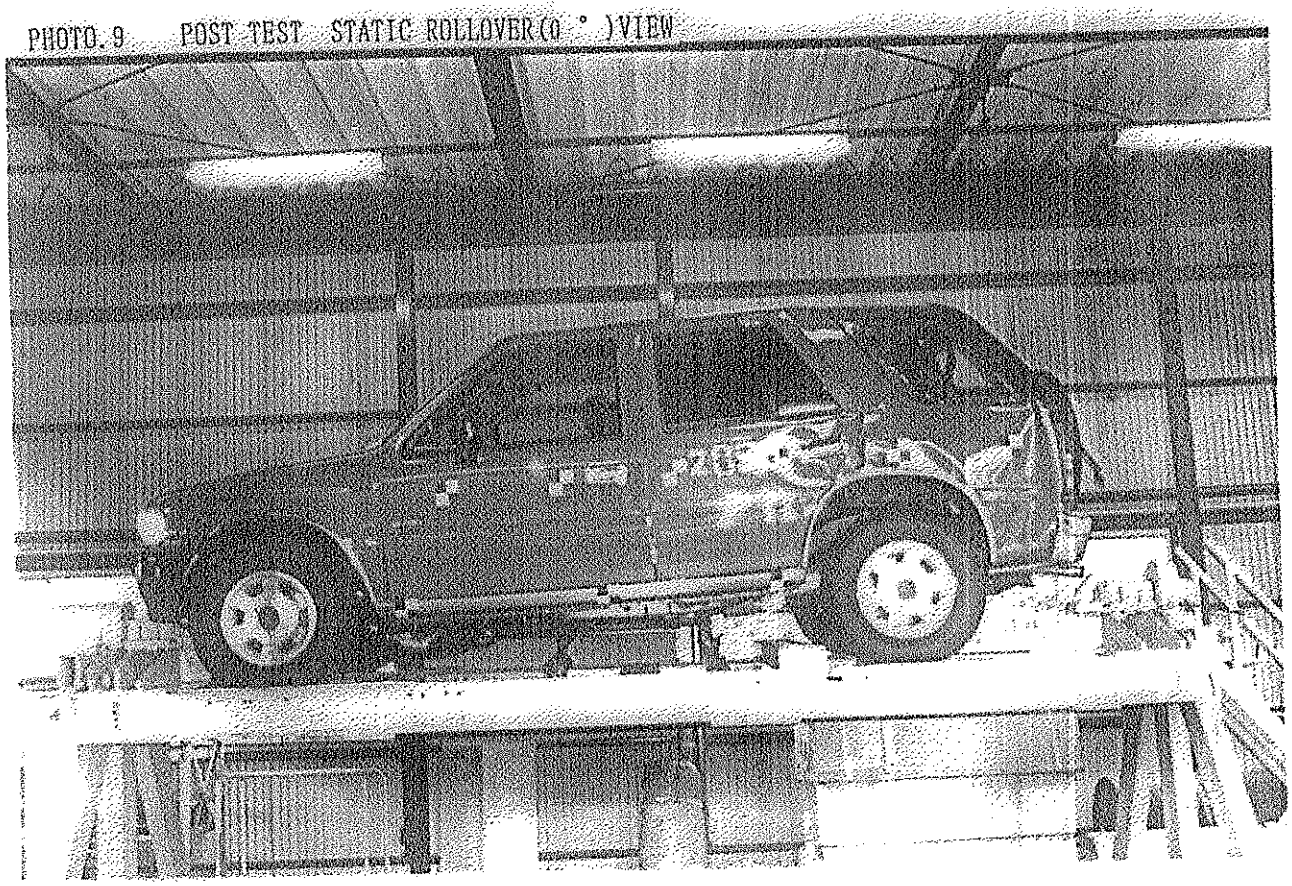
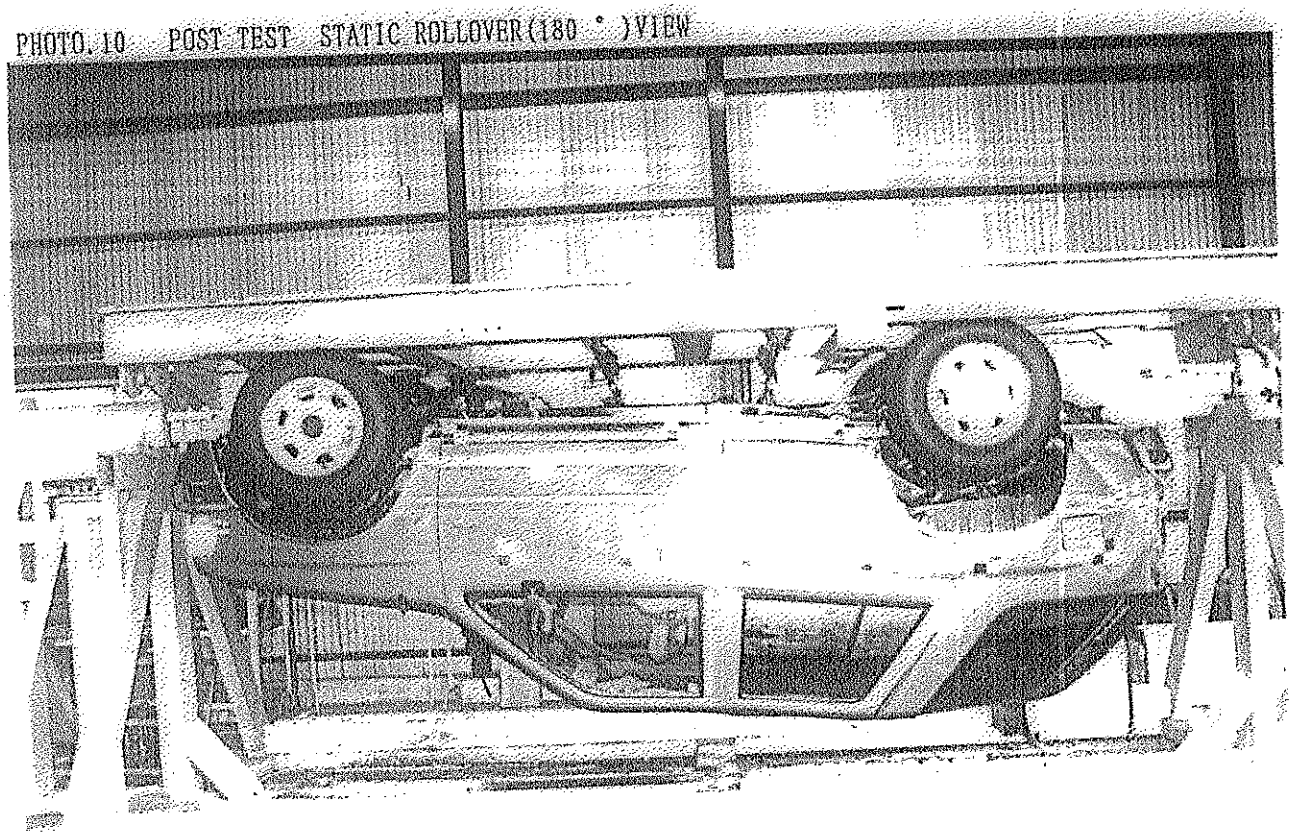


PHOTO. 10 POST TEST STATIC ROLLOVER(180 °)VIEW



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ET 5-0994

ISUZU ENGINEERING TEST REPORT

CERTIFICATION TEST REPORT
FMVSS 301 FUEL SYSTEM INTEGRITY
REAR BARRIER IMPACT

1995 ISUZU RODEO-2WD

ISUZU MODEL NO. UCR17G

TEST NO. 95020301

ISUZU MOTORS LIMITED

RESEARCH & EXPERIMENT DEPARTMENT

ET 5-0994

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GENERAL TEST AND VEHICLE PARAMETER DATA

Vehicle Yr/Make/Model/Body Style: 1995 Isuzu Rodeo (UCR 17G)

Body color: Red VIN: 4S2CK58E9S4300012

Engine: 4 Cylinders; 2.6 Liters

X Gas; __Diesel; __Turbocharged

X Longitudinal; __Transverse

Transmission: 5 Speed; X Manual; __Automatic; __Overdrive

Final Drive: __Front Wheel; X Rear Wheel; __Four Wheel

Vehicle Equipment:

X A/C; X P/S; X P/B; __P/wdo; __Tilt Wheel

__P/seats; __Cruise Control

Type of Occupant Restraint: Driver and pasenger airbags with type II belts

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 26 psi; Rear 26 psi

Recommended Tire Size: P225/75R15

Recommended Cold Tire Pressure: Front 26 psi; Rear 26 psi

Tires on Vehicle: P225/75R15 ; Manufacturer: BF Goodrich

Number of Occupants: 2 Front; 3 Rear; __3rd Seat; 5 TOTAL

Type of Front Seats: X Bucket; __Bench; __Split Bench

Type of Front Seat Back: __Fixed; X Adj. With X Lever

[redacted]

GENERAL TEST AND VEHICLE PARAMETER DATA (Cont'd)

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER

(WITH MAXIMUM FLUIDS) = UDW:

Right Front = 379.7 kg Right Rear = 420.5 kg

Left Front = 395.1 kg Left Rear = 431.4 kg

TOTAL FRONT WEIGHT = 774.8 kg (47.6% of Total Vehicle Weight)

TOTAL REAR WEIGHT = 851.9 kg (52.4% of Total Vehicle Weight)

TOTAL UNLOADED DELIVERED WEIGHT (UDW) = 1626.7 kg

TARGET TEST WEIGHT:*

Front: 837.3 kg (44.7 % of Total Vehicle Weight)

Rear: 1037.8 kg (55.3 % of Total Vehicle Weight)

Total: 1875.1 kg

* Supplied by Isuzu Motors

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND CARGO:

Right Front = 443.2 kg Right Rear = 474.0 kg

Left Front = 449.5 kg Left Rear = 488.5 kg

TOTAL FRONT WEIGHT = 912.7 kg (48.7% of Total Vehicle Weight)

TOTAL REAR WEIGHT = 962.5 kg (51.3% of Total Vehicle Weight)

TOTAL TEST WEIGHT = 1875.2 kg

Weight of Ballast Added to Vehicle = 60.0 kg in back seat

Spare tire and rack were removed at the request of Isuzu representatives

GENERAL TEST AND VEHICLE PARAMETER DATA (Cont'd)

WEIGHT OF IMPACTOR

Right Front:	555.2 kg.	Right Rear:	339.7 kg.
Left Front:	647.7 kg.	Left Rear:	279.4 kg.
Total Front:	1202.9 kg.	Total Rear:	619.1 kg.
Total Weight:	1822.0 kg.		

FMVSS 301 Impactor Weight Requirement 1796.3 ± 4.5 lbs.

GENERAL TEST AND VEHICLE PARAMETER DATA (Cont'd)

VEHICLE ATTITUDE (all dimensions in mm):

Delivered Attitude:	RF 845	LF 839	RR 871	LR 853
Test Attitude:	RF *	LF *	RR *	LR *
Post Test:	RF 817	LF 802	RR 929	LR 835

Wheel Base: 2760 mm

C.G. = 1417 mm Rearward of Front Wheel Centerline

POST-IMPACT DATA:

Type of Test: 30 mph Rear Impact Impact Angle: 90°

Date of Test: February 13, 1995

Ambient Temperature: 22°C (Spec. Range = 20.56 to 22.22°C)

Temperature in Occupant Compartment: 22°C

Windshield Molding Temperature: 22°C

Required Impact Velocity Range: 47.8 to 48.8 kph

Impact Velocity: 48.1 kph

VEHICLE CRUSH (mm):

Vehicle Length:	Pre-test =	R 4373 ;	C_L 4456 ;	L 4333
	Post-test =	R 4222 ;	C_L 4236 ;	L 4183
	Crush =	R 151 ;	C_L 220 ;	L 150

* No test attitude measurements were taken.

DOOR OPENING (without use of tools)

Front Left	opened	Rear Left	opened
Front Right	opened	Rear Right	opened

SEAT MOVEMENT

Seat Back Movement		Seat Shift (mm)	
Left	reclined	Left	4 back
Right	reclined	Right	5 back

GLAZING DAMAGE

Backlight/Windshield back window shattered

ET 5-0394

FMVSS NO. 301-75, FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

TEST DATE: February 13, 1995

VEHICLE MAKE/MODEL/BODY STYLE: 1995 Isuzu Rodeo (UCR 17G)

USABLE CAPACITY OF VEHICLE'S FUEL TANK: 83 Liters
(figure furnished by vehicle manufacturer)

TEST REQUIREMENTS:

Test vehicle's engine operated to "run dry" condition, and then a small amount of Stoddard solvent which has been dyed PURPLE shall be added to the vehicle's fuel tank. Operate the fuel pump enough to completely fill the fuel system ahead of the fuel tank, and add 92 to 94% of the stated USABLE CAPACITY to the fuel tank.

AMOUNT OF STODDARD SOLVENT ADDED TO VEHICLE'S FUEL TANK:

78 Liters which is 94 % of the Stated USABLE CAPACITY.

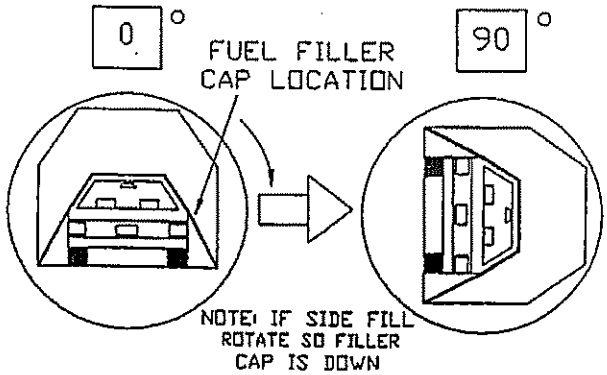
FUEL SPILLAGE MEASUREMENT:

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

SOLVENT SPILLAGE DETAILS:

NONE

FMVSS NO. 301, STATIC ROLLOVER DATA SHEET



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover fixture 90° Rotation Time — 2 minutes 45 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + — 5 minutes 0 seconds

TOTAL — 7 minutes 45 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 required

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

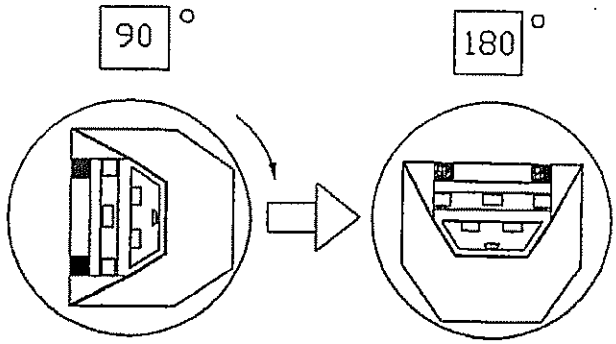
III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

Ø	Ø	Ø	Ø

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

IV. SOLVENT SPILLAGE LOCATION(S): NONE

FMVSS NO. 301, STATIC ROLLOVER DATA SHEET (Continued)



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover fixture 90° Rotation Time 2 minutes 37 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 37 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 required

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

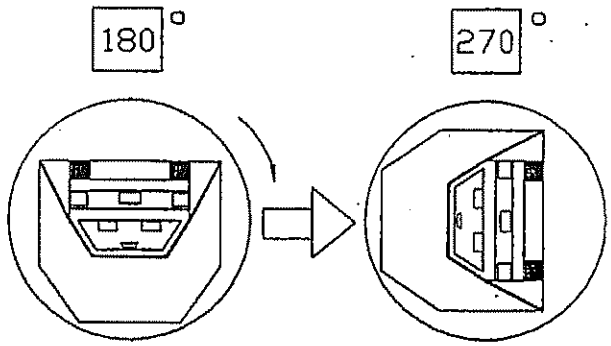
III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0

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

IV. SOLVENT SPILLAGE LOCATION(S): NONE

FMVSS NO. 301, STATIC ROLLOVER DATA SHEET (Continued)



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover fixture 90° Rotation Time — 2 minutes 32 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + — 5 minutes 0 seconds

TOTAL — 7 minutes 32 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 required

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

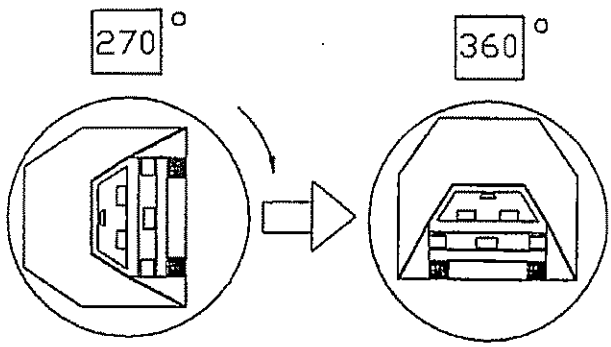
III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

Ø	Ø	Ø	Ø

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

IV. SOLVENT SPILLAGE LOCATION(S): NONE

FMVSS NO. 301, STATIC ROLLOVER DATA SHEET (Continued)



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover fixture 90° Rotation Time 2 minutes 42 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 42 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 required

(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

MY 1-0094

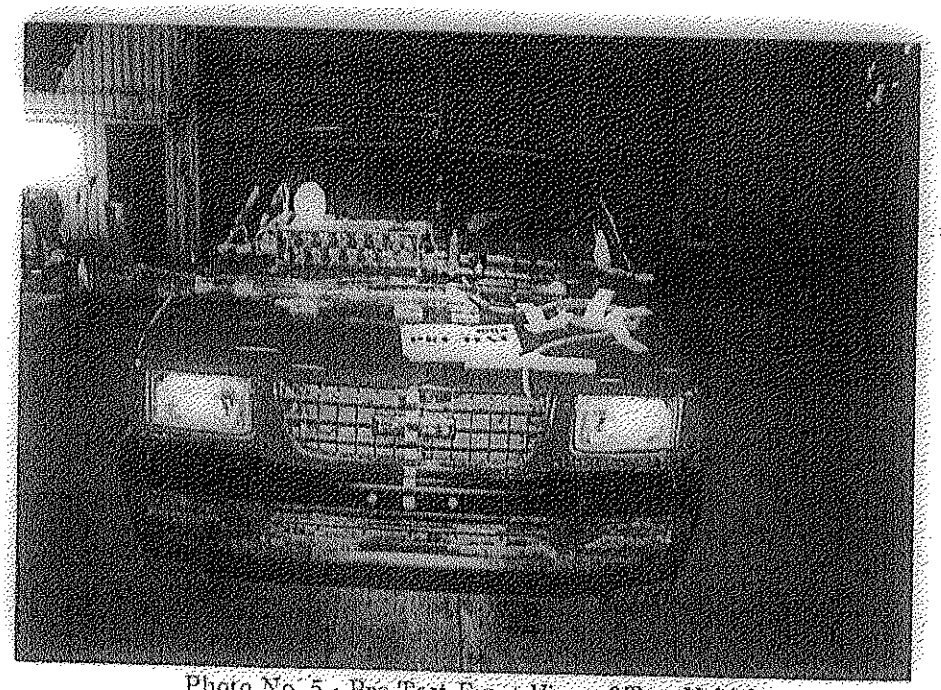


Photo No. 5 - Pre-Test Front View of Test Vehicle

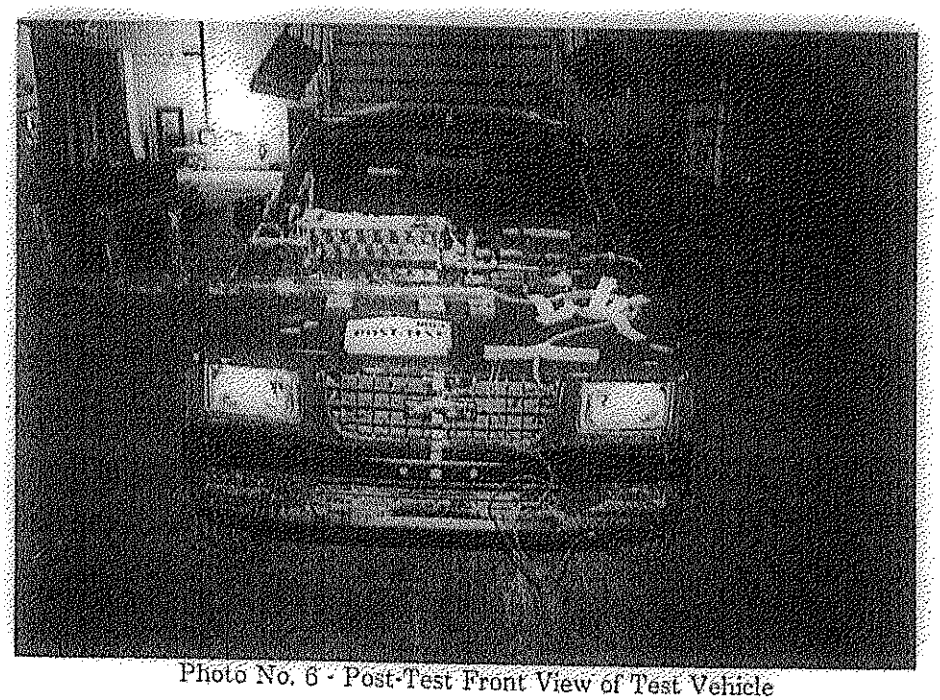


Photo No. 6 - Post-Test Front View of Test Vehicle

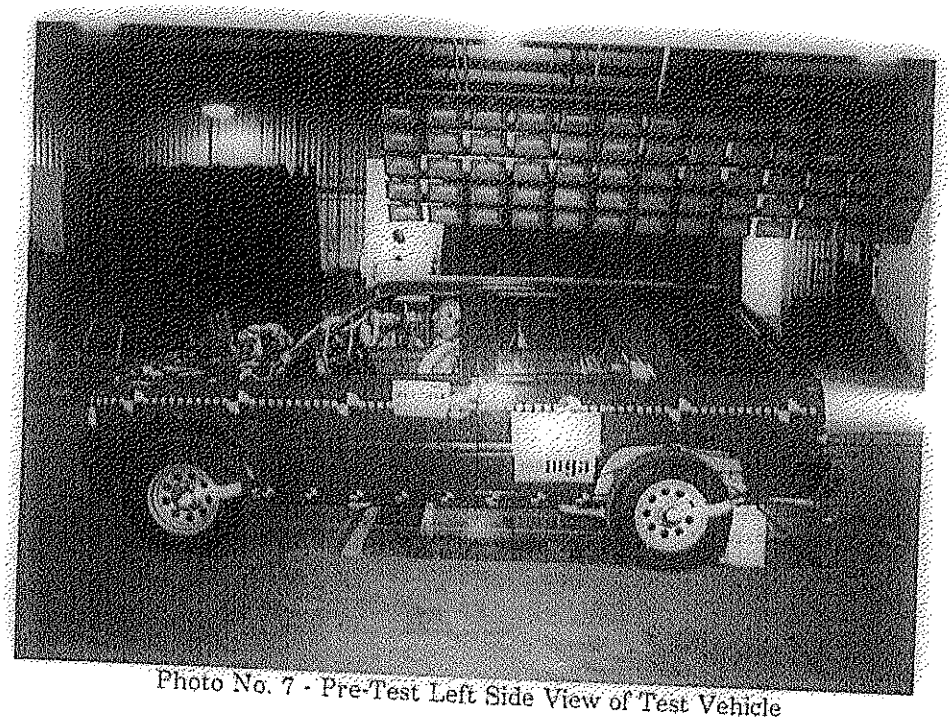


Photo No. 7 - Pre-Test Left Side View of Test Vehicle

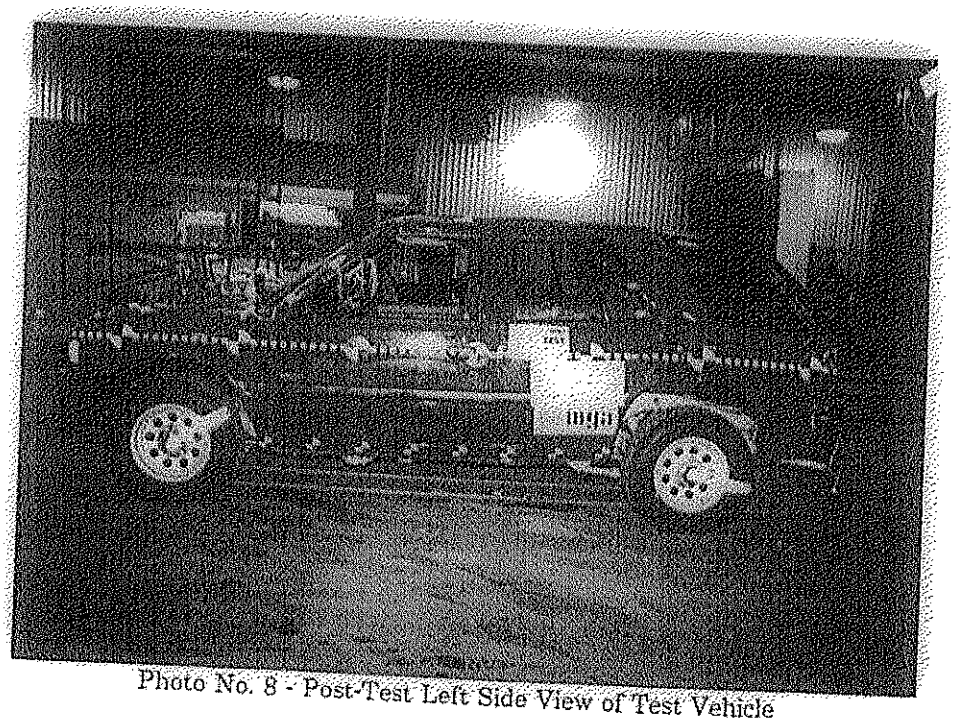


Photo No. 8 - Post-Test Left Side View of Test Vehicle

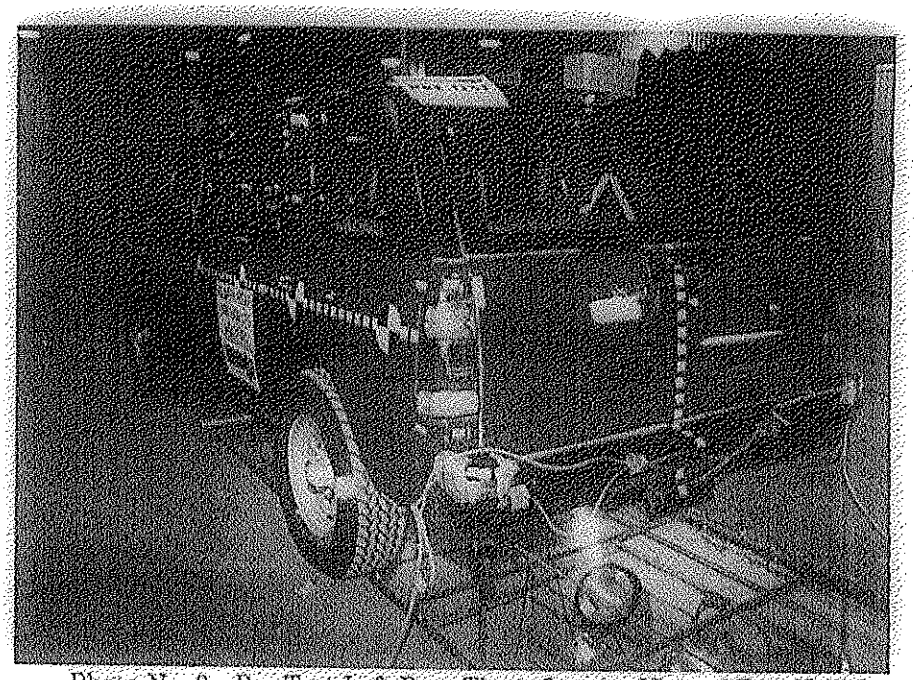


Photo No. 9 - Pre-Test Left Rear Three-Quarter View of Test Vehicle

Photo No. 10 - Post-Test Left Rear Three-Quarter View of Test Vehicle

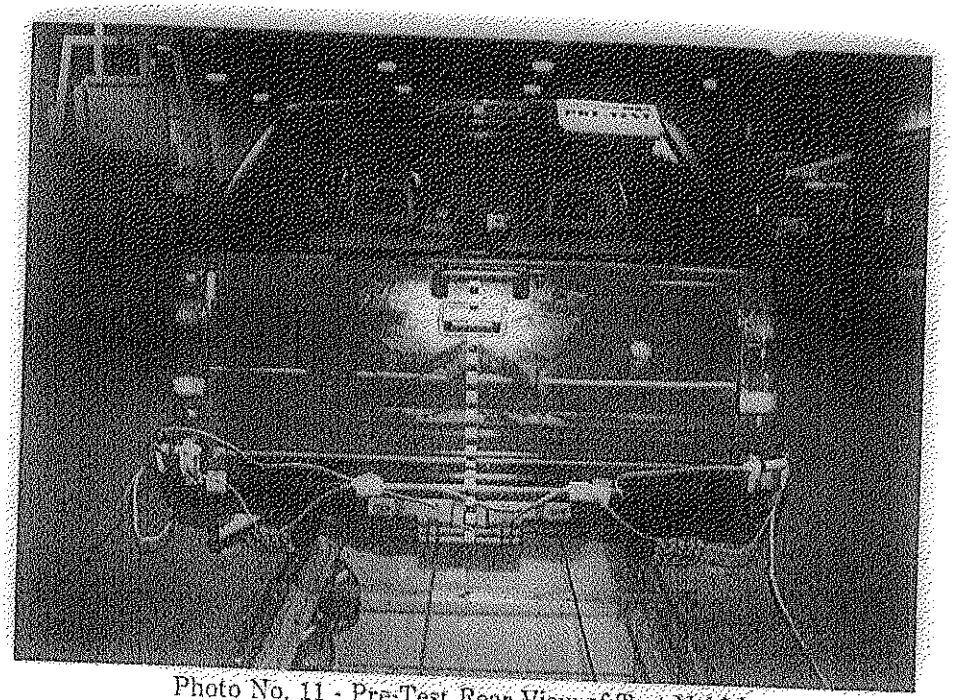


Photo No. 11 - Pre-Test Rear View of Test Vehicle

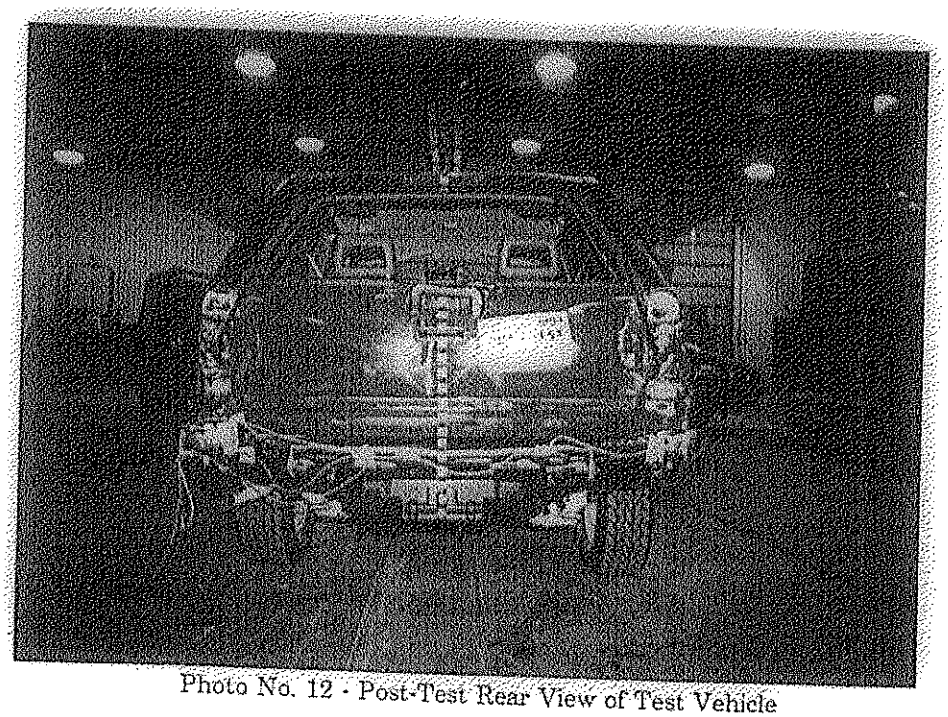


Photo No. 12 - Post-Test Rear View of Test Vehicle

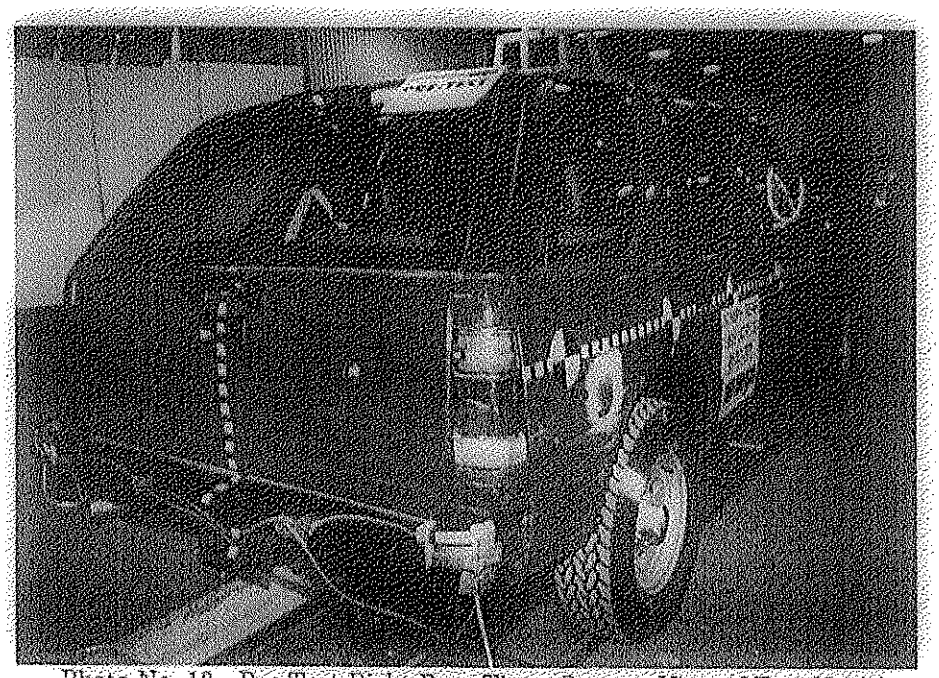


Photo No. 13 - Pre-Test Right Rear Three-Quarter View of Test Vehicle

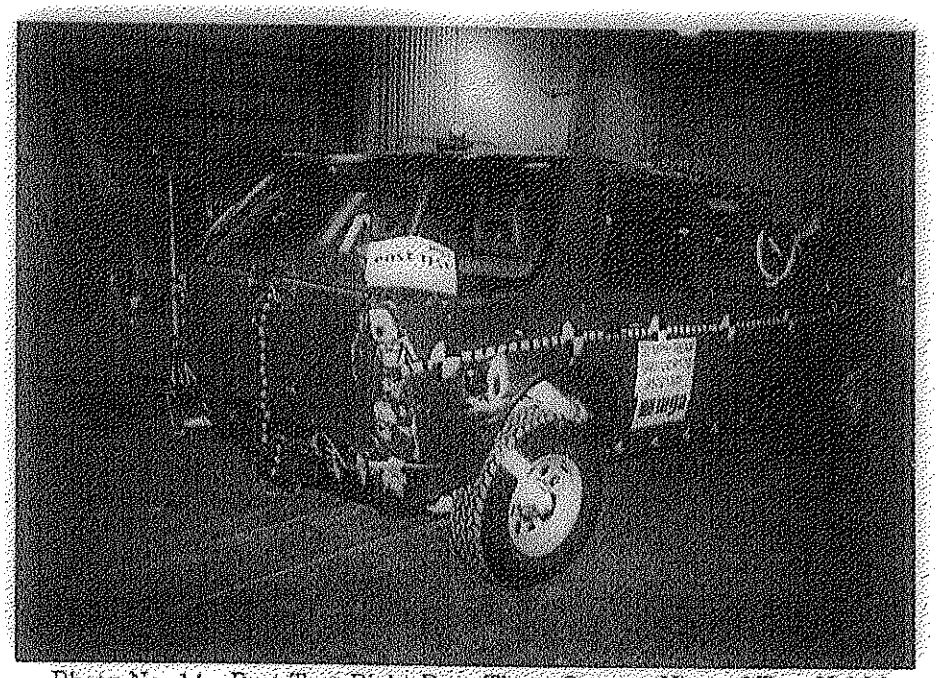


Photo No. 14 - Post-Test Right Rear Three-Quarter View of Test Vehicle

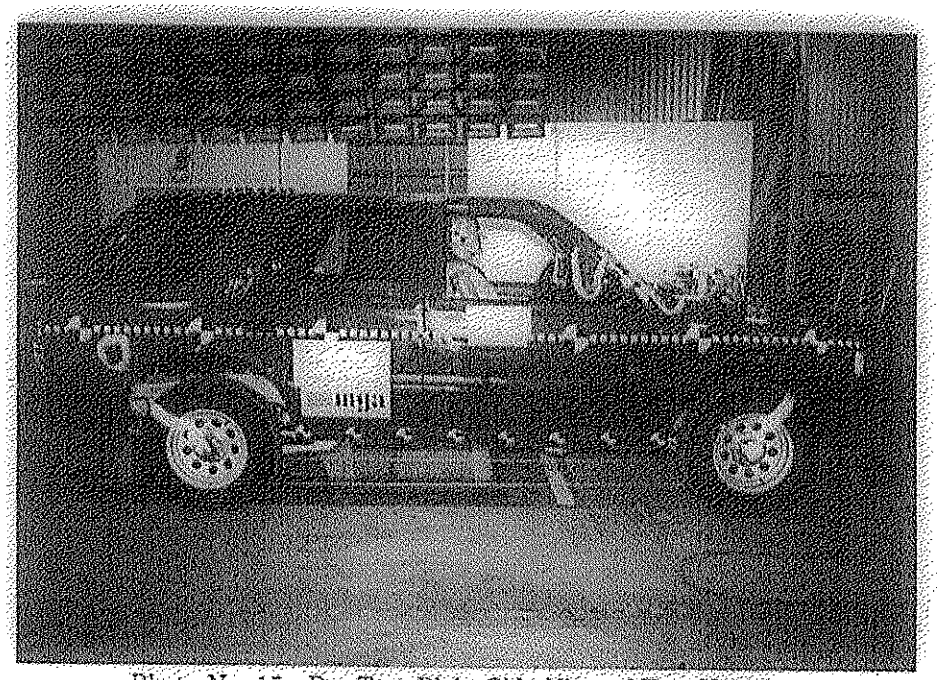


Photo No. 15 - Pre-Test Right Side View of Test Vehicle

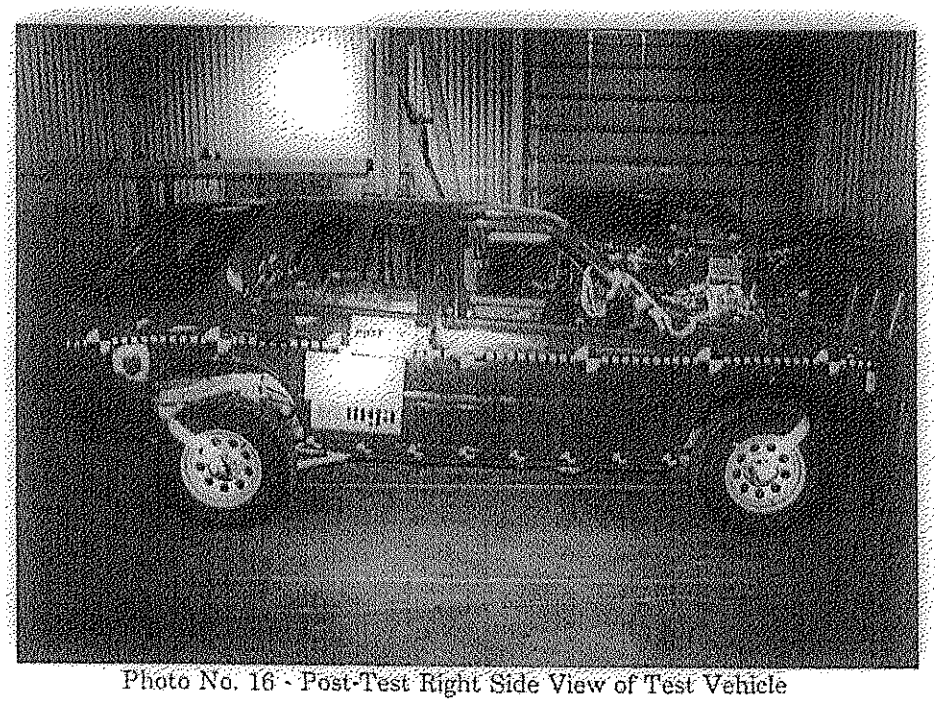


Photo No. 16 - Post-Test Right Side View of Test Vehicle

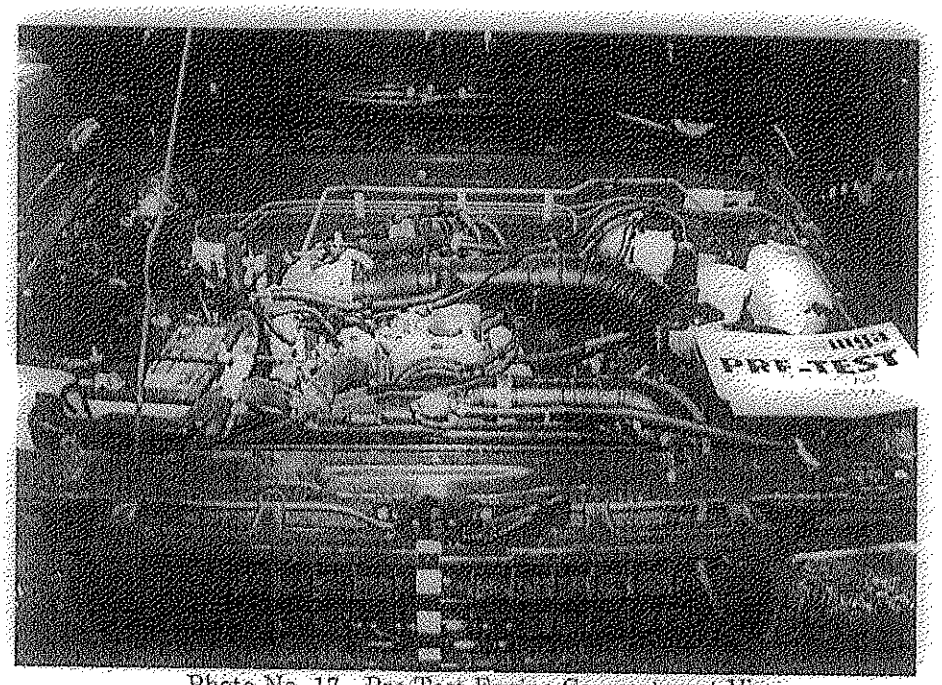


Photo No. 17 - Pre-Test Engine Compartment View

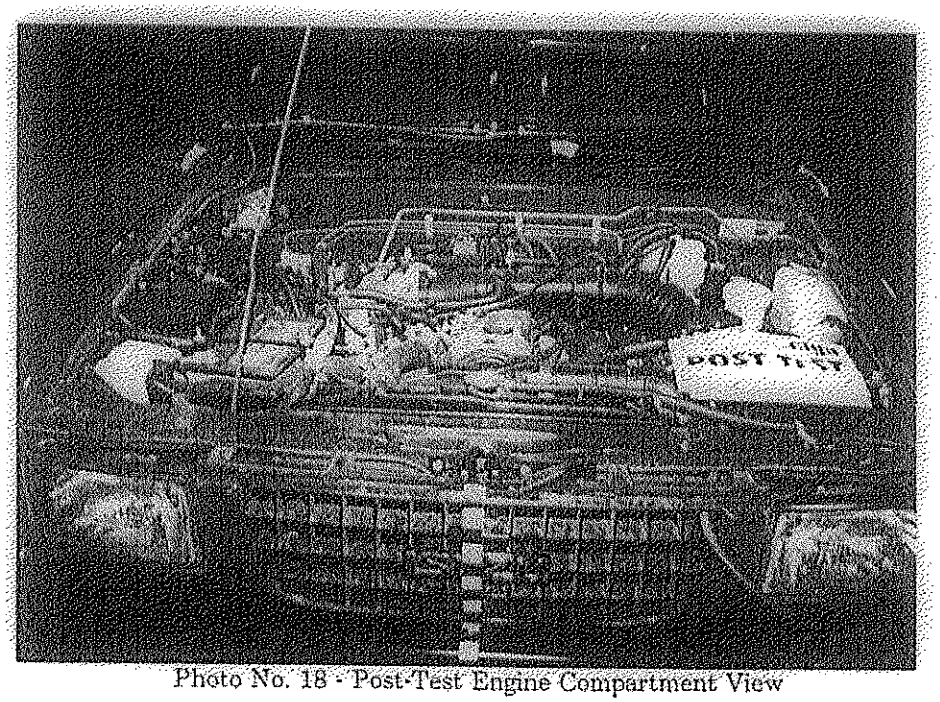


Photo No. 18 - Post-Test Engine Compartment View

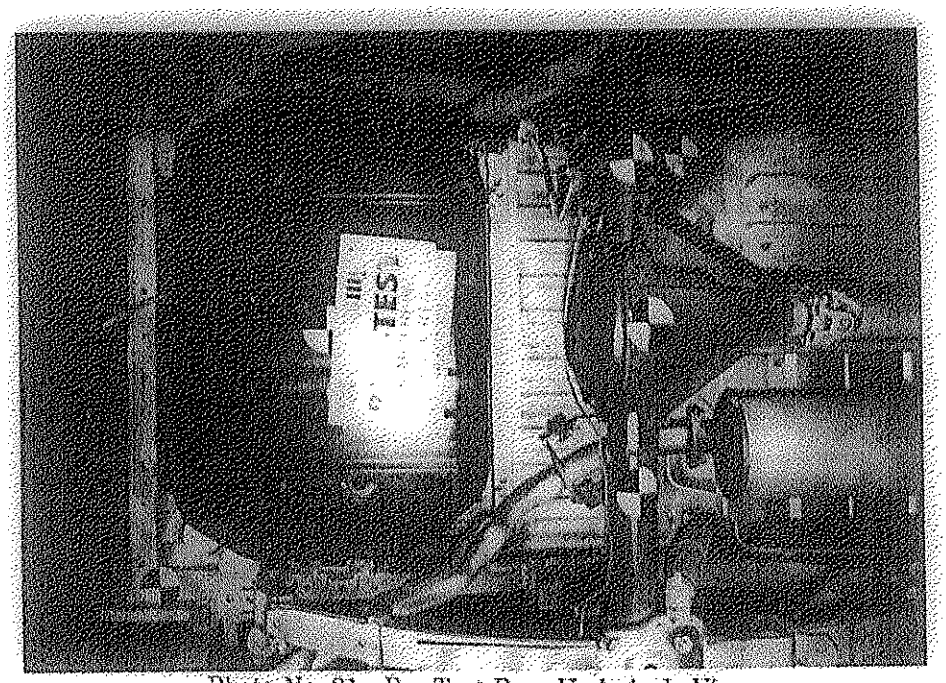


Photo No. 21 - Pre-Test Rear Underbody View

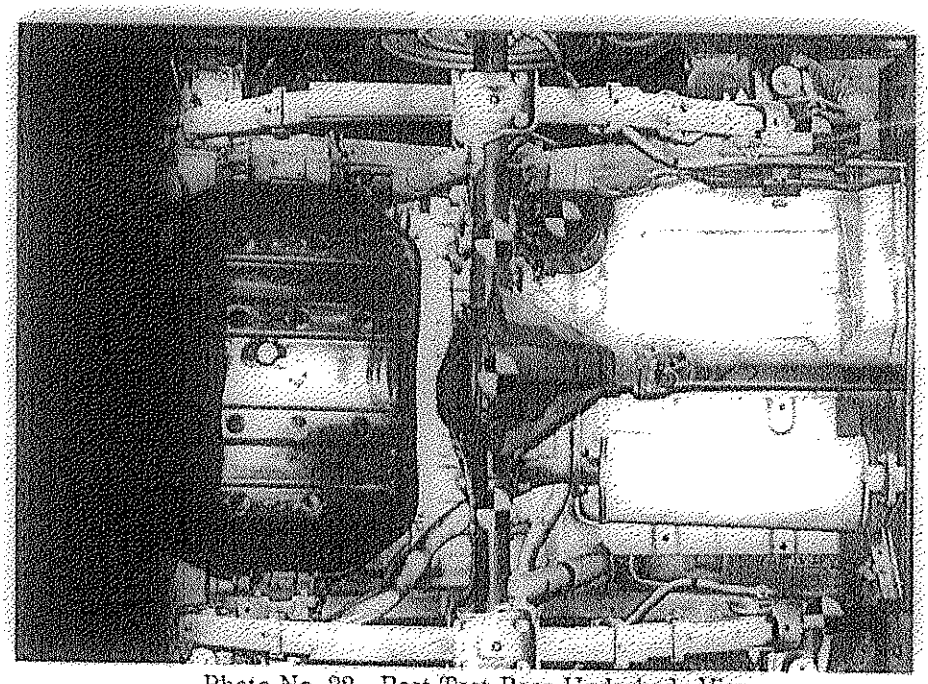


Photo No. 22 - Post-Test Rear Underbody View

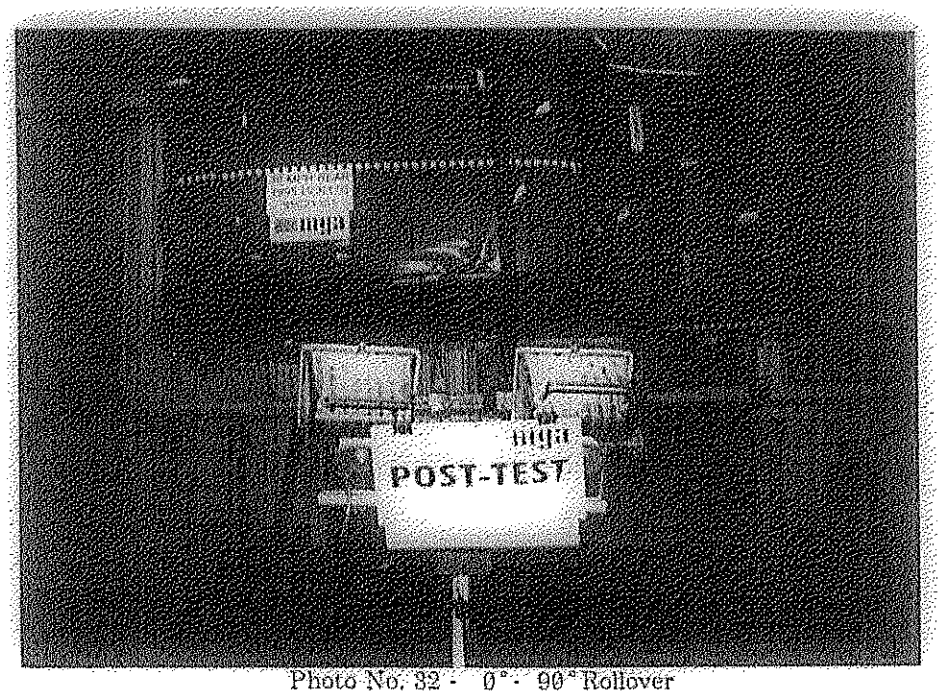


Photo No. 32 - 0° - 90° Rollover

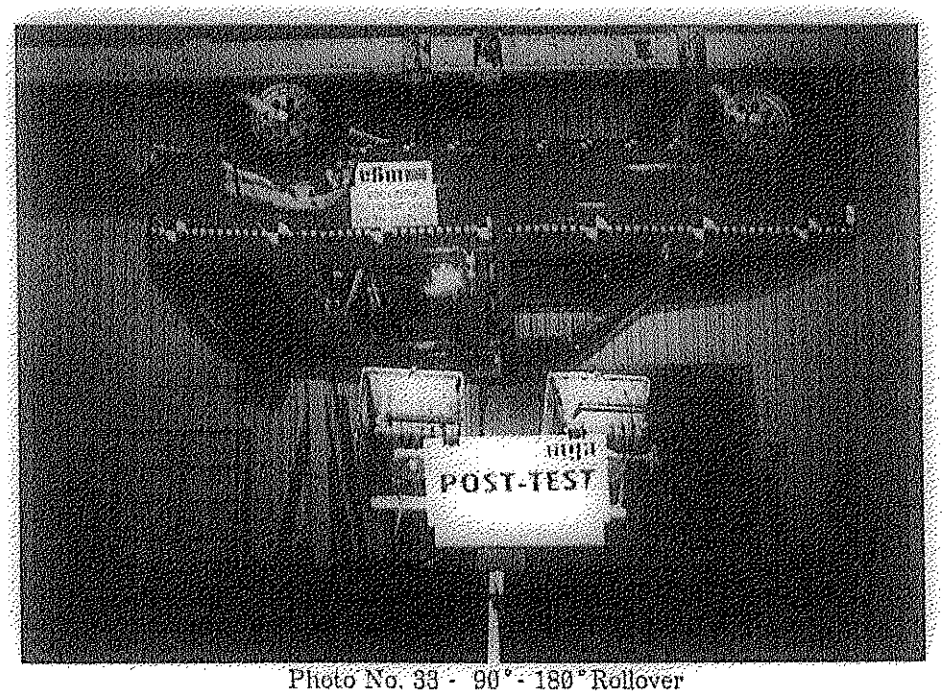


Photo No. 33 - 90° - 180° Rollover

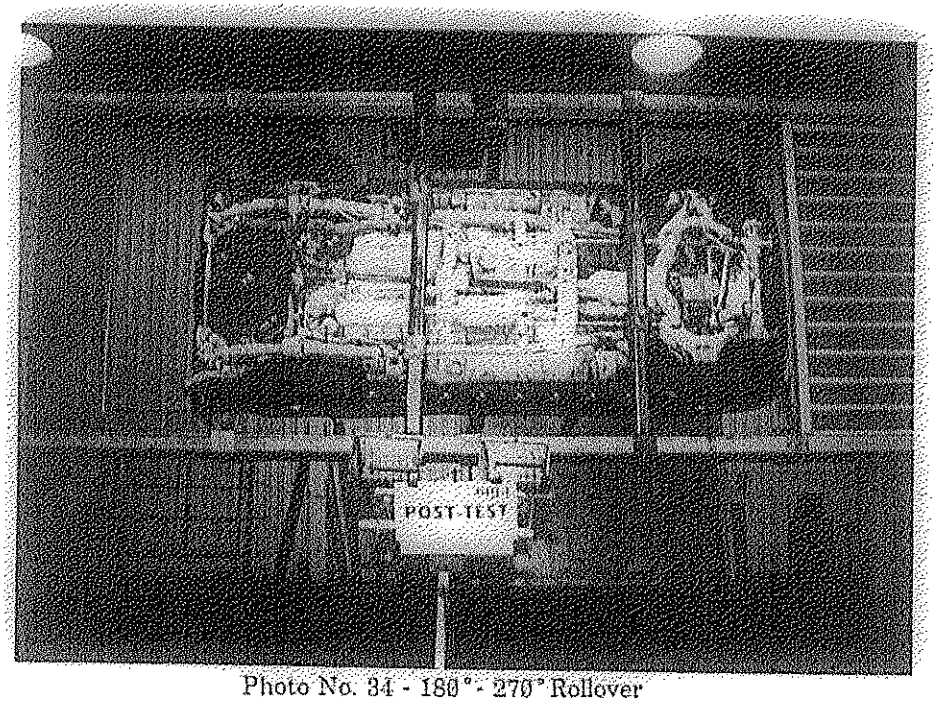


Photo No. 34 - 180° - 270° Rollover

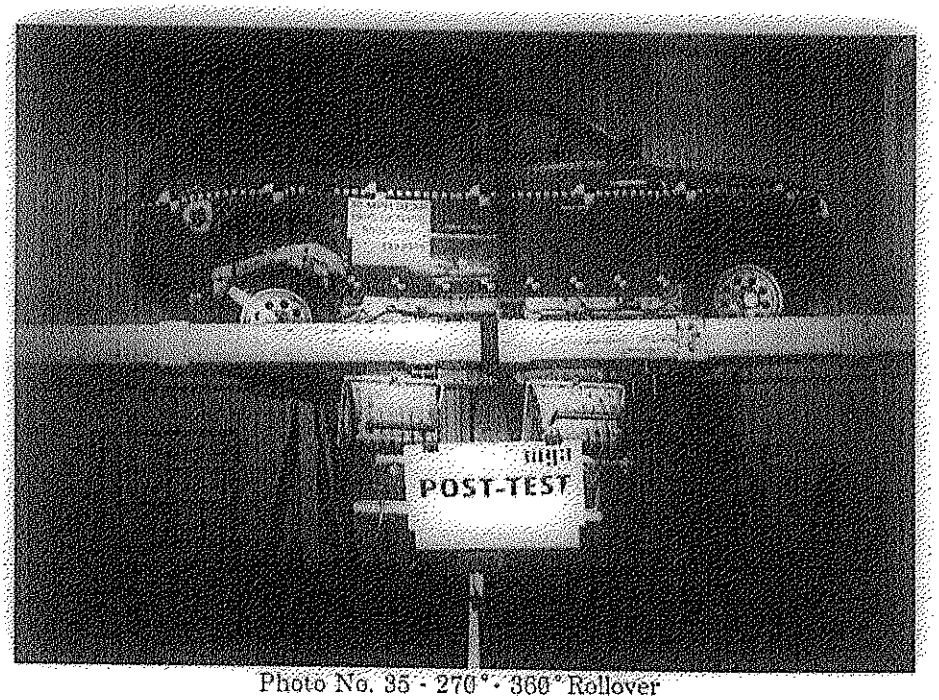


Photo No. 35 - 270° - 360° Rollover

CONFIDENTIAL INFORMATION REDACTED

ET 5-1028

ISUZU ENGINEERING TEST REPORT

REPORT NO. ET5－1029

CERTIFICATION TEST REPORT
FMVSS 301 FUEL SYSTEM INTEGRITY
REAR MOVING BARRIER IMPACT

1996 ISUZU RODEO－4WD

ISUZU MODEL NO. UCS25G

TEST NO. A－5079

ISUZU MOTORS LIMITED

LIGHT DUTY VEHICLE

RESEARCH & EXPERIMENT DEPARTMENT

CONCLUSION

This report is the certification test report for 30mph rear moving barrier test of FMVSS 301 "FUEL SYSTEM INTEGRITY".

This certification report is applicable to all models of 1996 RODEO UCS25G.

this certifies that RODEO meets the applicable requirements of 30mph rear moving barrier test on FMVSS 301.

Prepared by T. Takada
T.TAKADA

A. Matsushita
A.MATSUSHITA
Manager

Approved by S. Maeda
S.MAEDA
General Manager
L/D Vehicle
Research & Experiment Dept.

Date Nov. 24, 1995

THE TABLE OF CONTENTS

1. SUMMARY DATA

SUMMARY OF TEST CONDITION (1)

TYPE OF TEST

_____ FRONTAL ( ) IMPACT
_____ OBLIQUE (30°) IMPACT ON _____ LEFT (DRIVER'S) SIDE
_____ RIGHT SIDE
_____ LATERAL OR SIDE IMPACT ON _____ LEFT (DRIVER'S) SIDE
__×__ REAR IMPACT

TEST CONDITIONS

DATE OF TEST: June 27, 1995 TIME OF TEST: 15:00
AMBIENT TEMPERATURE AT IMPACT AREA: 25.0° C
TEMPERATURE IN OCCUPANT COMPARTMENT: 25.0° C

TEST VEHICLE INFORMATION

MANUFACTURER : ISUZU MOTORS LIMITED
MAKE / MODEL : ISUZU / UCS25G
BODY STYLE : MPV 4-DOOR MODEL YEAR: 1996
VIN. : 4S2CY58V7T4300025
TEST NO. : A-5079 BODY COLOR: CREAM WHITE
ENGINE DATA : 6 CYLINDERS ; 3.2 liters
× GASOLINE ; — DIESEL ; — TURBOCHARGED
× LONGITUDINAL ; — TRANSVERSE ;
TRANSMISSION DATA : 4 SPEED , — MANUAL , × AUTOMATIC ,
FINAL DRIVE DATA : — FWD , — RWD , × 4WD
MAJOR OPTIONS : × A/C , × P/S , × P/B , × P/wdo ,
× TILT WHEEL , — P/seats , × CRUISE CONTROL
TYPE OF OCCUPANT RESTRAINT : Driver and passenger airbags with type II belt

TEST FLUID DATA

TEST FLUID TYPE : RED STODDARD SOLVENT SPECIFIC GRAVITY : 0.777
KINEMATIC VISCOSITY : 1.39 CST
NOMINAL FUEL CAPACITY : 83 Liters (NFC)
TEST VOLUME : 78 Liters (94% of NFC)
ELECTRIC FUEL PUMP : × YES _____ NO FUEL INJECTION : × YES _____ NO

SUMMARY OF TEST CONDITION (2)

VEHICLE TIRE DATA

COLD TIRE PRESSURE : FRONT 200 KPa
REAR 220 KPa
TIRES SIZE ON VEHICLE : P225/75R16
IS SPARE TIRE A "SPACE SAVER" : NO
IS SPARE TIRE STANDARD EQUIPMENT : YES

VEHICLE CAPACITY

NUMBER OF OCCUPANTS : 2 FRONT; 3 REAR; — 3rd SEAT; 5 TOTAL
TYPE OF FRONT SEATS : × BUCKET; — BENCH; — SPLIT BENCH
TYPE OF FRONT SEAT BACK : — FIXED × Adj.with × LEVER — Rot.Knob
RATED CARGO AND LUGGAGE
WEIGHT (RCLW) = 50.7 kg
GVWR 2268.0 kg GAWR: FRONT 1066.0 kg REAR 1292.8 kg

CALCULATION FOR TARGET TEST WEIGHT

UW = Unloaded Weight (Including OW) (1850.0 kg)
OW = Option Weight (27.1 kg)
DSC = Designated Seating Capacity (5)
RCLW = 50.7 kg
TARGET TEST WEIGHT = UW + OW + RCLW + (2 dummies * 75.7 kg/dummy)
TARGET TEST WEIGHT = 2079.2 kg

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND CARGO

RIGHT FRONT = 554 kg RIGHT REAR = 529 kg
LEFT FRONT = 480 kg LEFT REAR = 490 kg
TOTAL FRONT WEIGHT = 1110 kg (53.4 % of Total vehicle Weight)
TOTAL REAR WEIGHT = 970 kg (46.6 % of Total vehicle Weight)
TOTAL TEST WEIGHT = 2080 kg

2. TEST DATA

POST IMPACT SUMMARY (1)

VEHIDLE : UCS25G (VIN. 4S2CY58V7T4300025)

DATA : June 27, 1995

TEST NO. : A-5079

IMPACT VELOCITY : PRIMARY = 48.10 km/h (29.89 MPH)

VEHICLE STATIC CRUSH : DRIVER SIDE : 221 mm

PASSENGER'S SIDE : 227 mm

AVERAGE : 224.0 mm

FUEL SYSTEM INTEGRITY - FMVSS 301-75

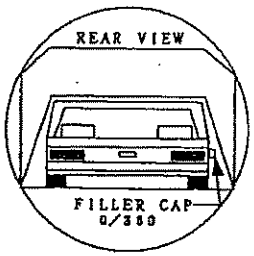
	Actual	Max. Allow.
Fuel spillage from impact until vehicle motion ceases.	0	1 ounce
Fuel spillage for 5 minute period following cessation of vehicle motion after impact.	0	5 ounce
Fuel spillage for next 25 minute period	0	1 ounce 1 minute

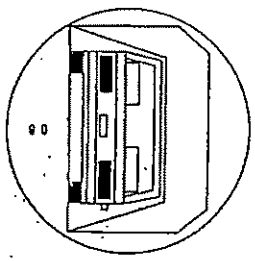
FUEL SPILLAGE LOCATION : NONE

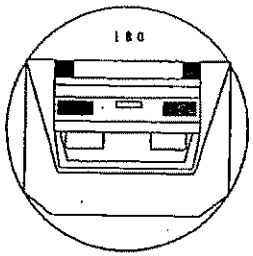
FUEL SYSTEM INTEGRITY - FMVSS 301-75

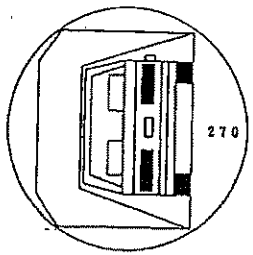
STATIC ROLLOVER (1st. Roll;Clockwise)

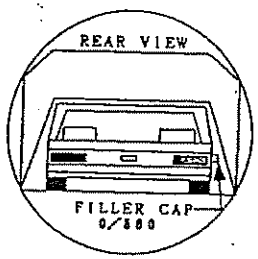
Vehicle: UCS25G (VIN. 4S2CY58V7T4300025) Test No.: A-5079











Rotation Angle	Rotation Time	Fuel spillage during 5 minute period from onset of rotation	Fuel spillage during 6th minute period from onset of rotation	Fuel spillage during 7th minute period from onset of rotation
0 - 90	60 seconds	0 ounce	0 ounce	——
90 - 180	60 seconds	0 ounce	0 ounce	——
180 - 270	60 seconds	0 ounce	0 ounce	——
270 - 360	60 seconds	0 ounce	0 ounce	——
Max. Allowed	1-3 minutes	5 ounce	1 ounce	1 ounce

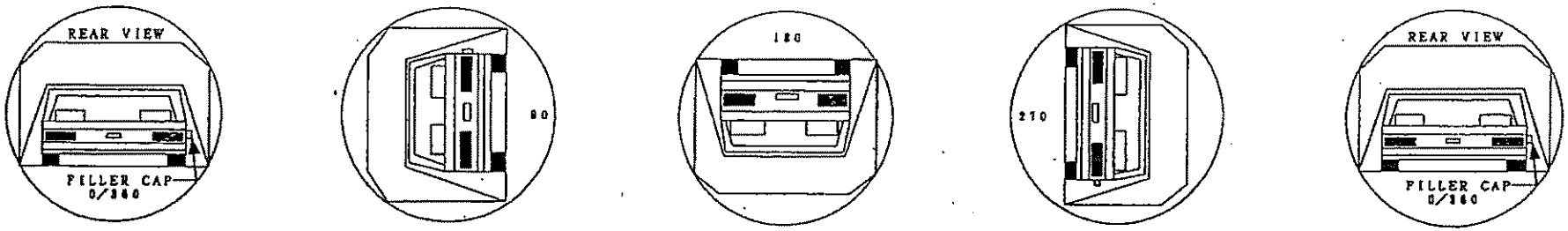
FUEL SPILLAGE LOCATION : NONE

ET 5-1028

FUEL SYSTEM INTEGRITY - FMVSS 301-75

STATIC ROLLOVER (2nd. Roll;Counterclockwise)

Vehicle: UCS25G (VIN. 4S2CY58V7T4300025) Test No.: A-5079



Rotation Angle	Rotation Time	Fuel spillage during 5 minute period from onset of rotation	Fuel spillage during 6th minute period from onset of rotation	Fuel spillage during 7th minute period from onset of rotation
0 - 90	60 seconds	0 ounce	0 ounce	——
90 - 180	60 seconds	0 ounce	0 ounce	——
180 - 270	60 seconds	0 ounce	0 ounce	——
270 - 360	60 seconds	0 ounce	0 ounce	——
Max. Allowed	1-3 minutes	5 ounce	1 ounce	1 ounce

FUEL SPILLAGE LOCATION : NONE

Ex. 5-1028

3. PHOTOGRAPHS

PHOTO. 1 : PRE-TEST LEFT SIDE VIEW OF TEST VEHICLE

PHOTO. 2 : POST-TEST LEFT SIDE VIEW OF TEST VEHICLE

PHOTO. 3 : PRE-TEST RIGHT SIDE VIEW OF TEST VEHICLE

PHOTO. 4 : POST-TEST RIGHT SIDE VIEW OF TEST VEHICLE

PHOTO. 5 : PRE-TEST REAR VIEW OF TEST VEHICLE

PHOTO. 6 : POST-TEST REAR VIEW OF TEST VEHICLE

PHOTO. 7 : PRE-TEST FRONT UNDERBODY VIEW

PHOTO. 8 : POST-TEST FRONT UNDERBODY VIEW

PHOTO. 9 : PRE-TEST REAR UNDERBODY VIEW

PHOTO. 10 : POST-TEST REAR UNDERBODY VIEW

PHOTO. 11 : PRE-TEST STATIC ROLLOVER (0°) VIEW

PHOTO. 12 : POST-TEST STATIC ROLLOVER (180°) VIEW

Photo. 1

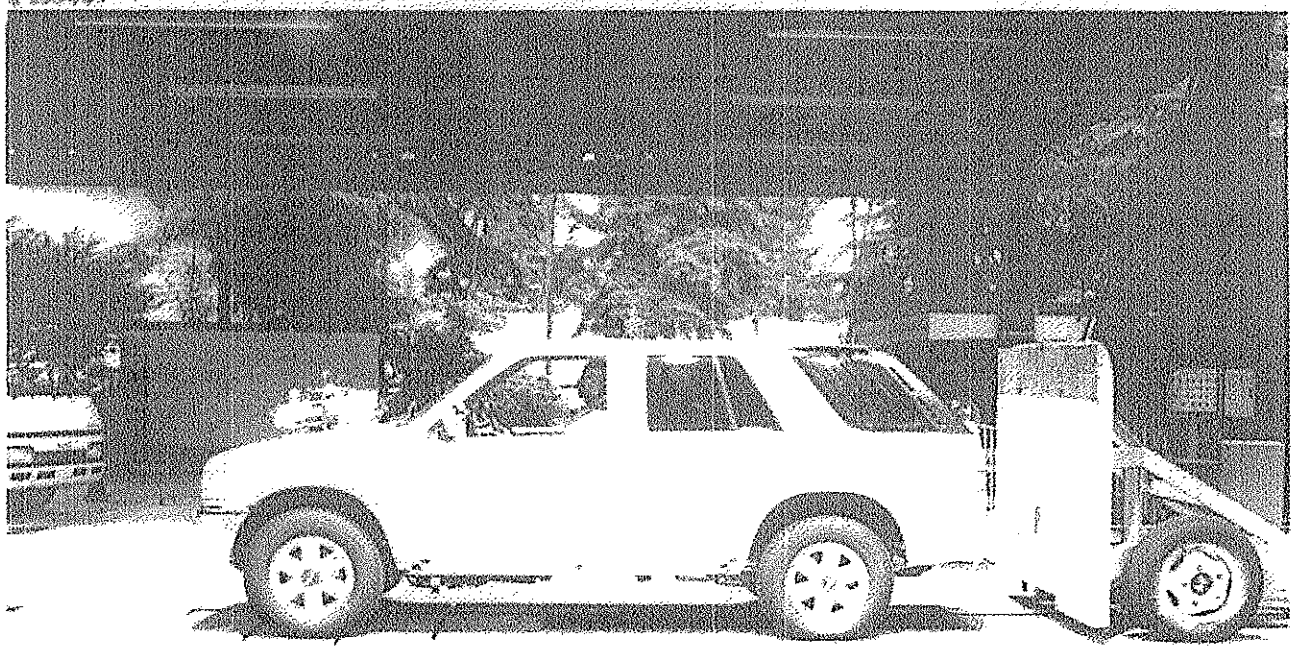


Photo 2

Photo. 3

Photo. 4

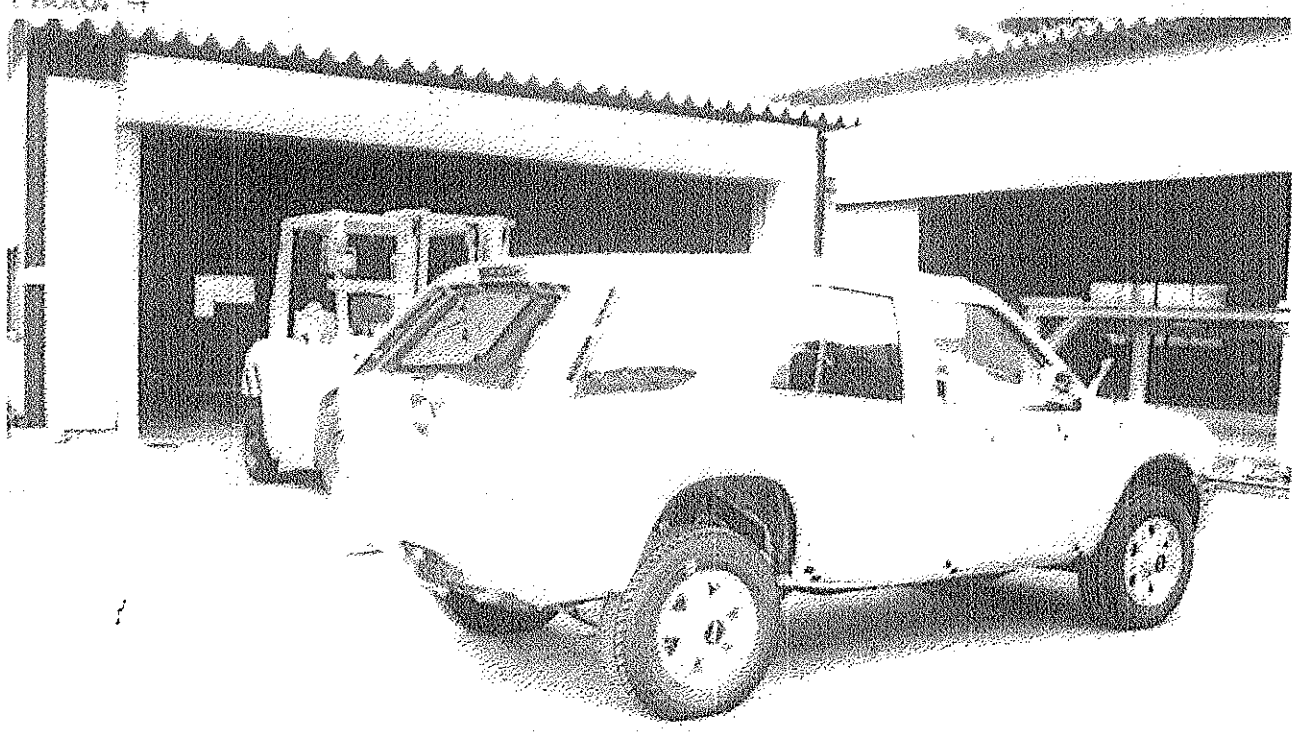


Photo. 5

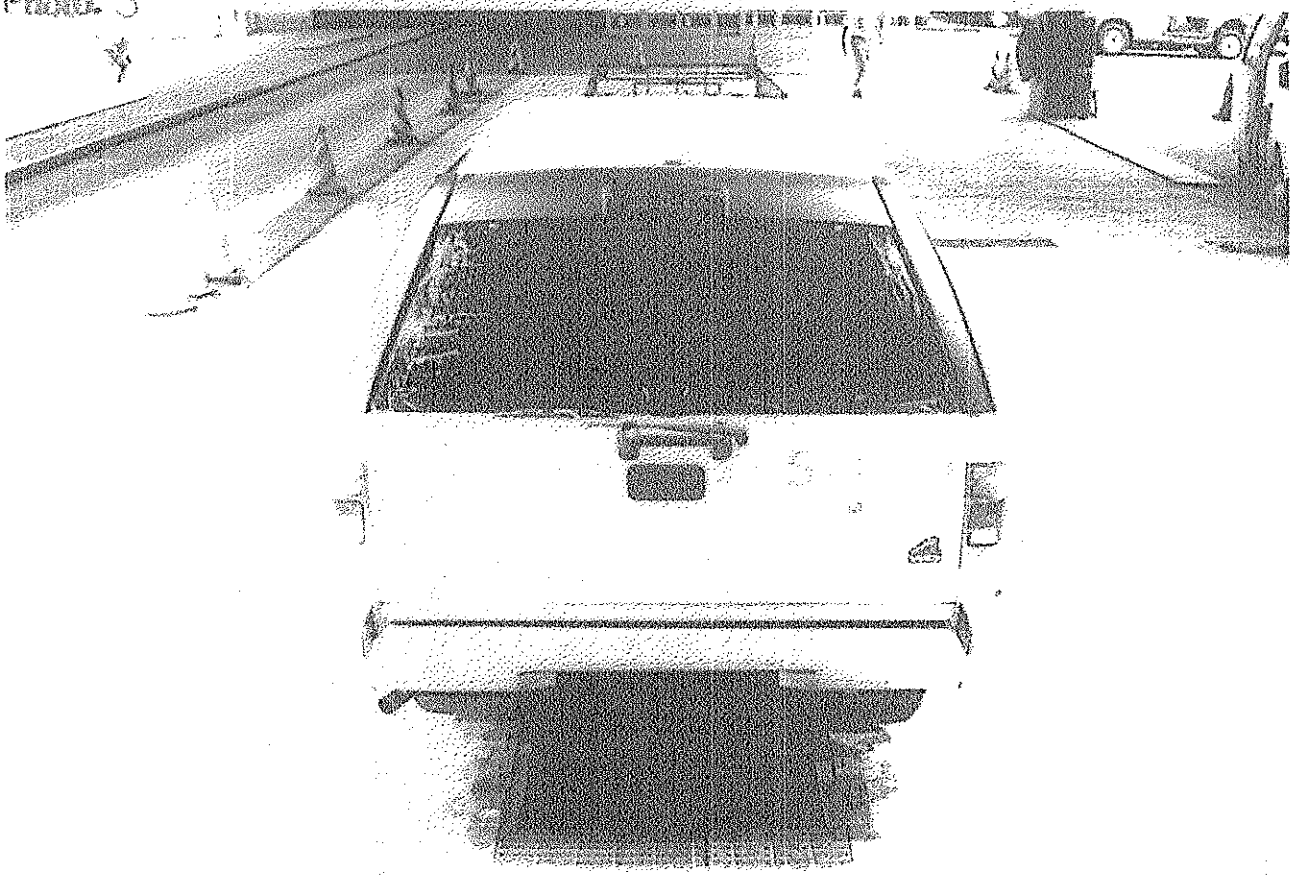


Photo. 6

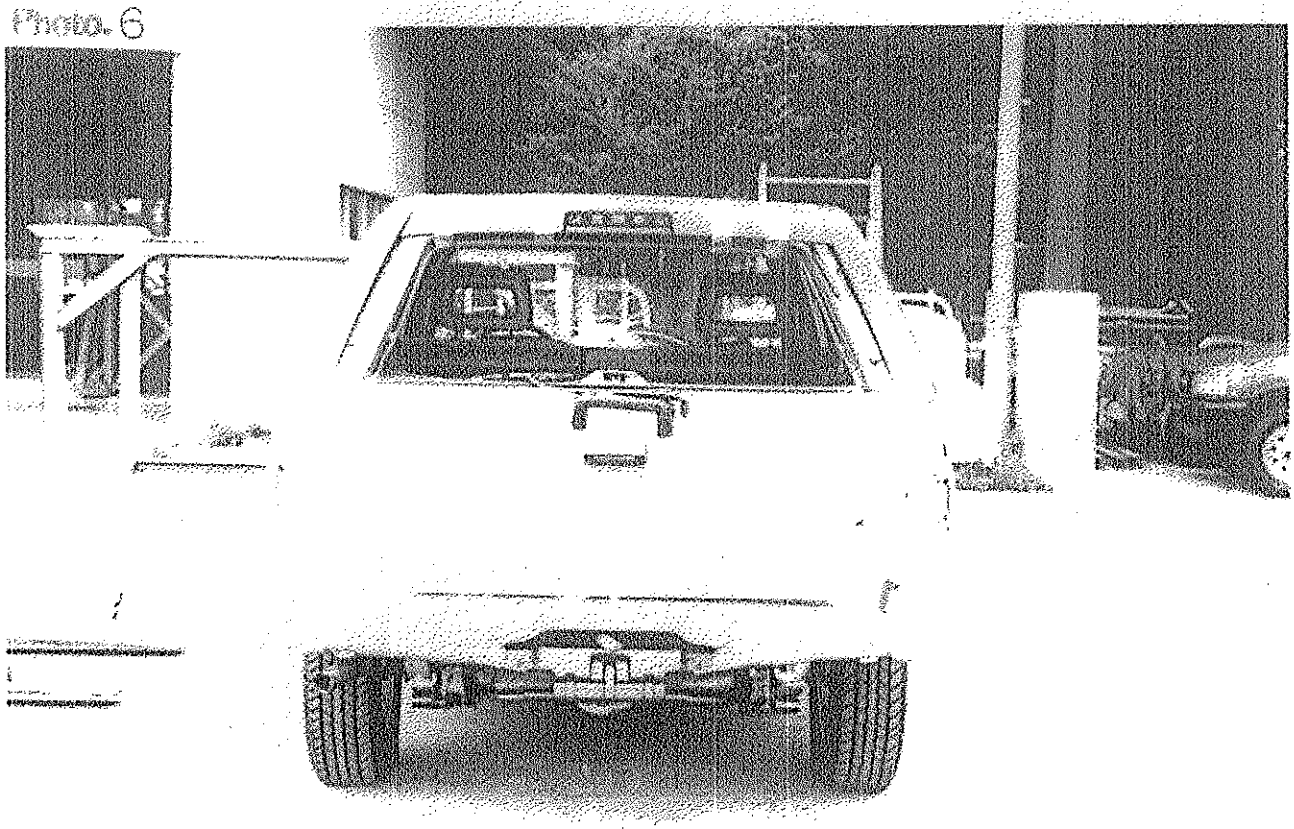


Photo. 7

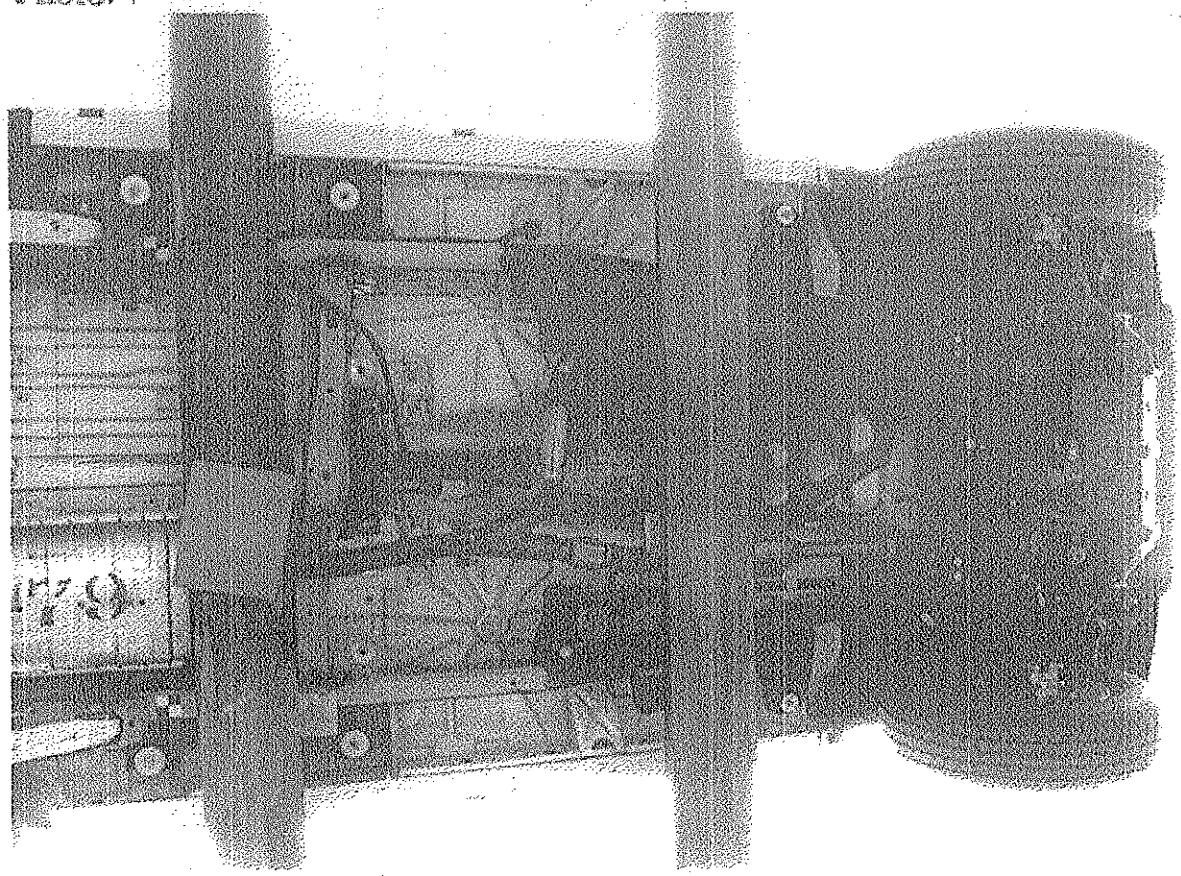


Photo. 8

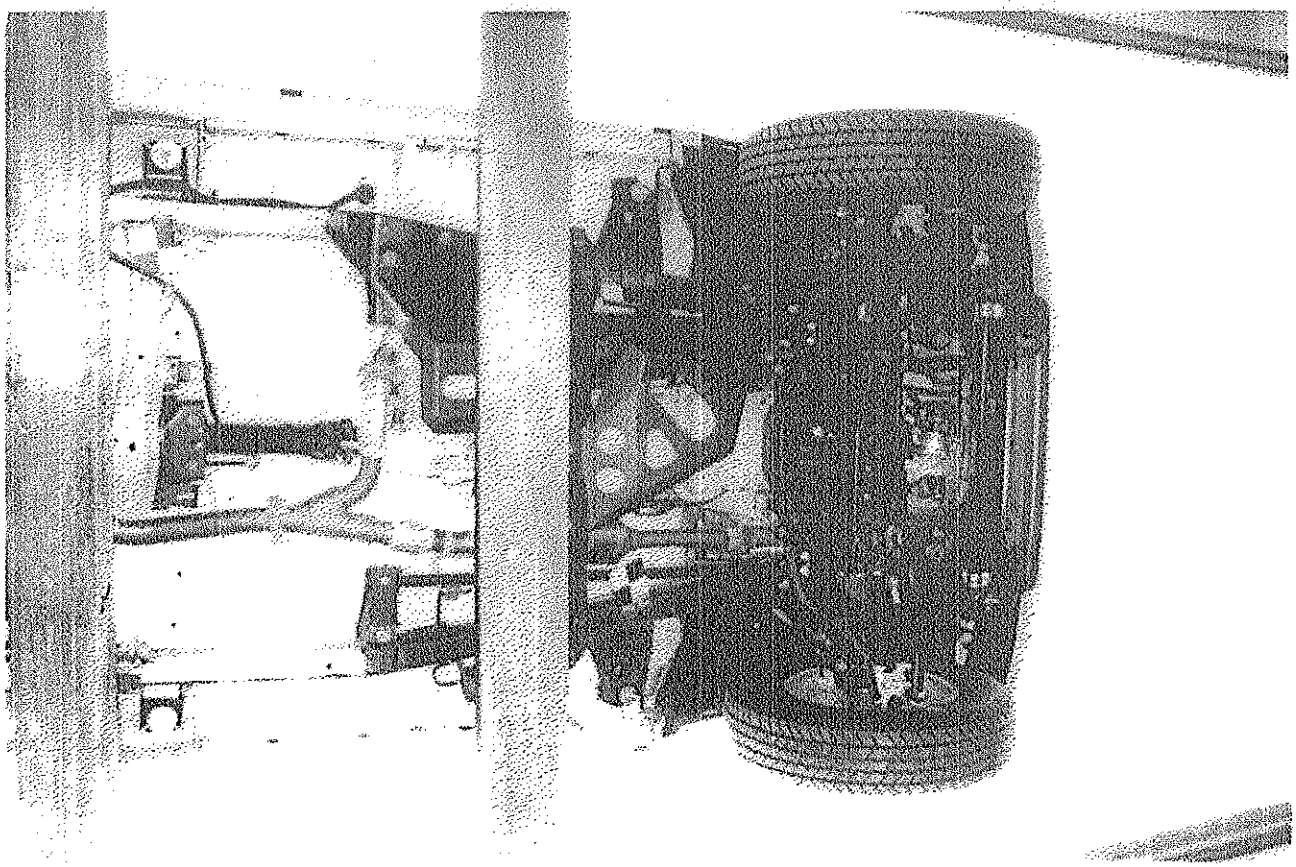


Photo. 9

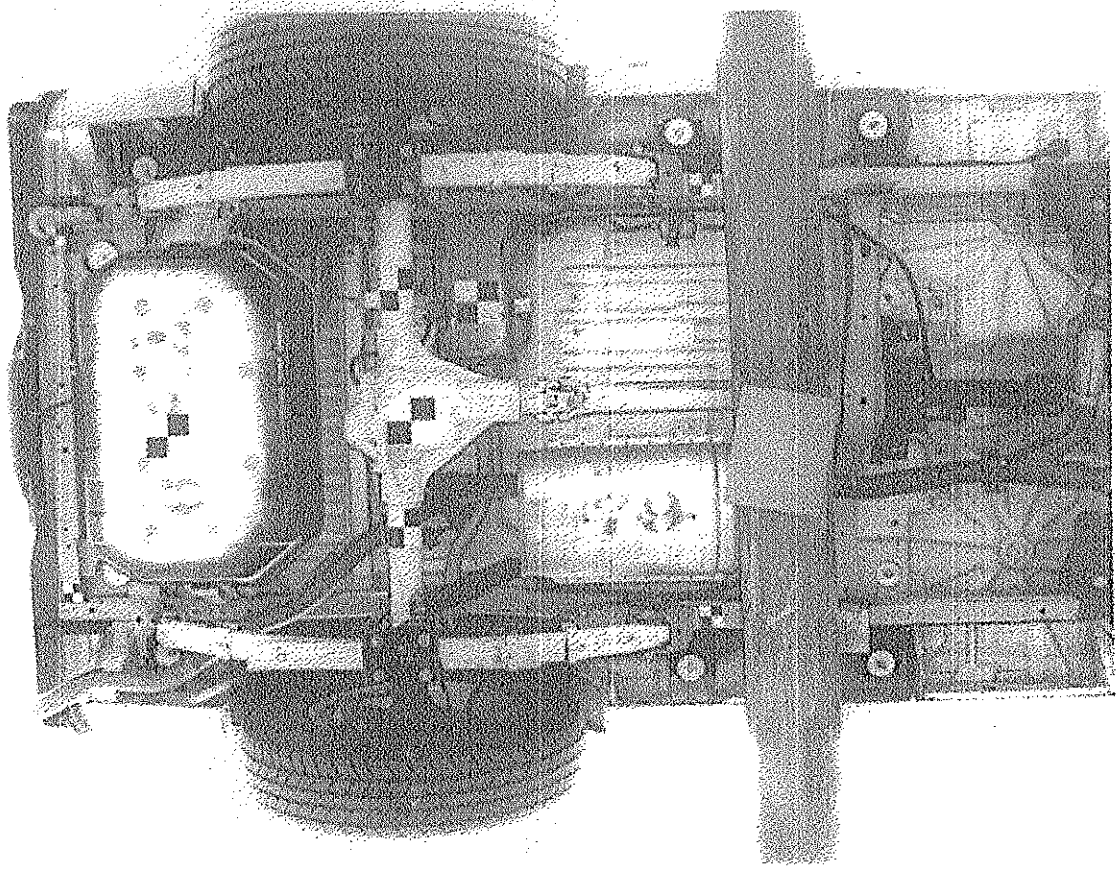


Photo. 10

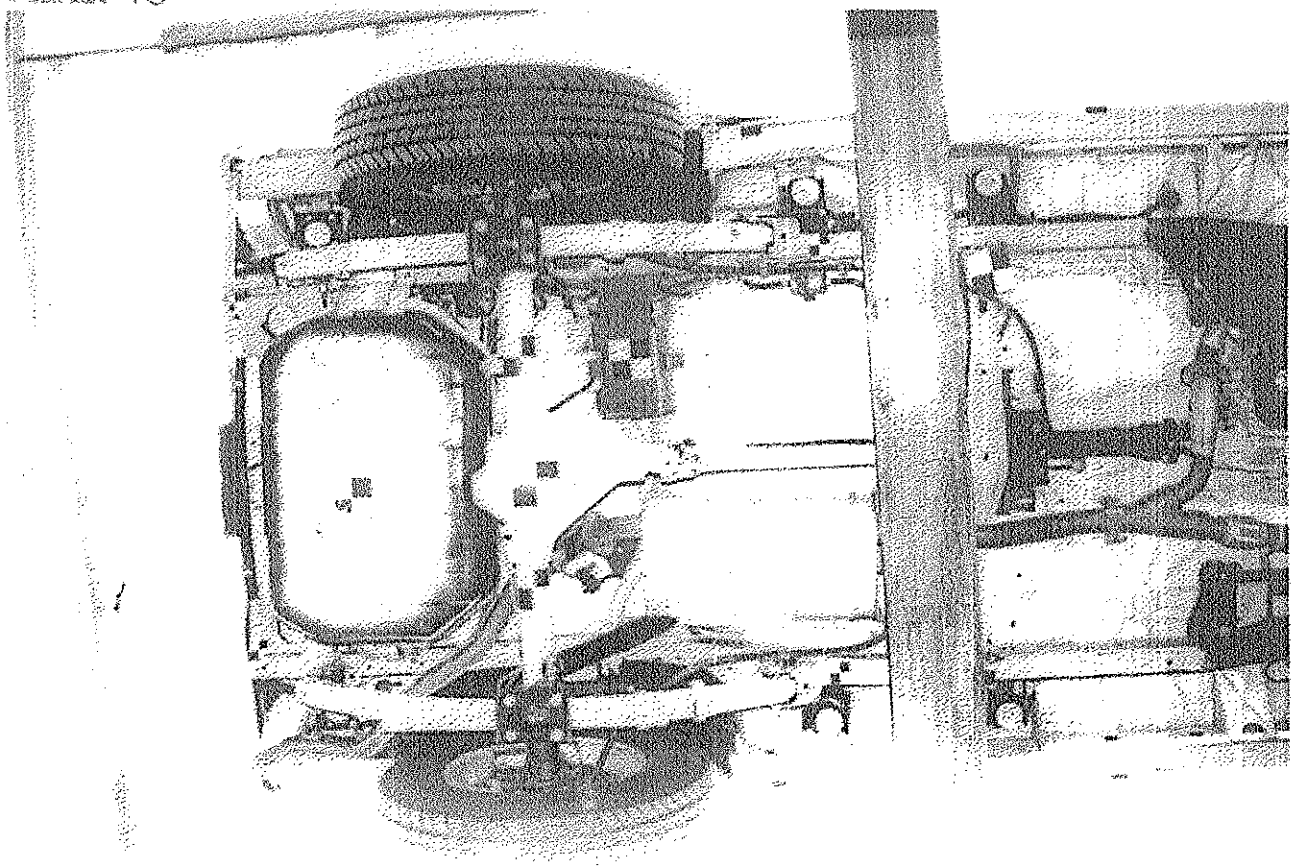


Photo. 11

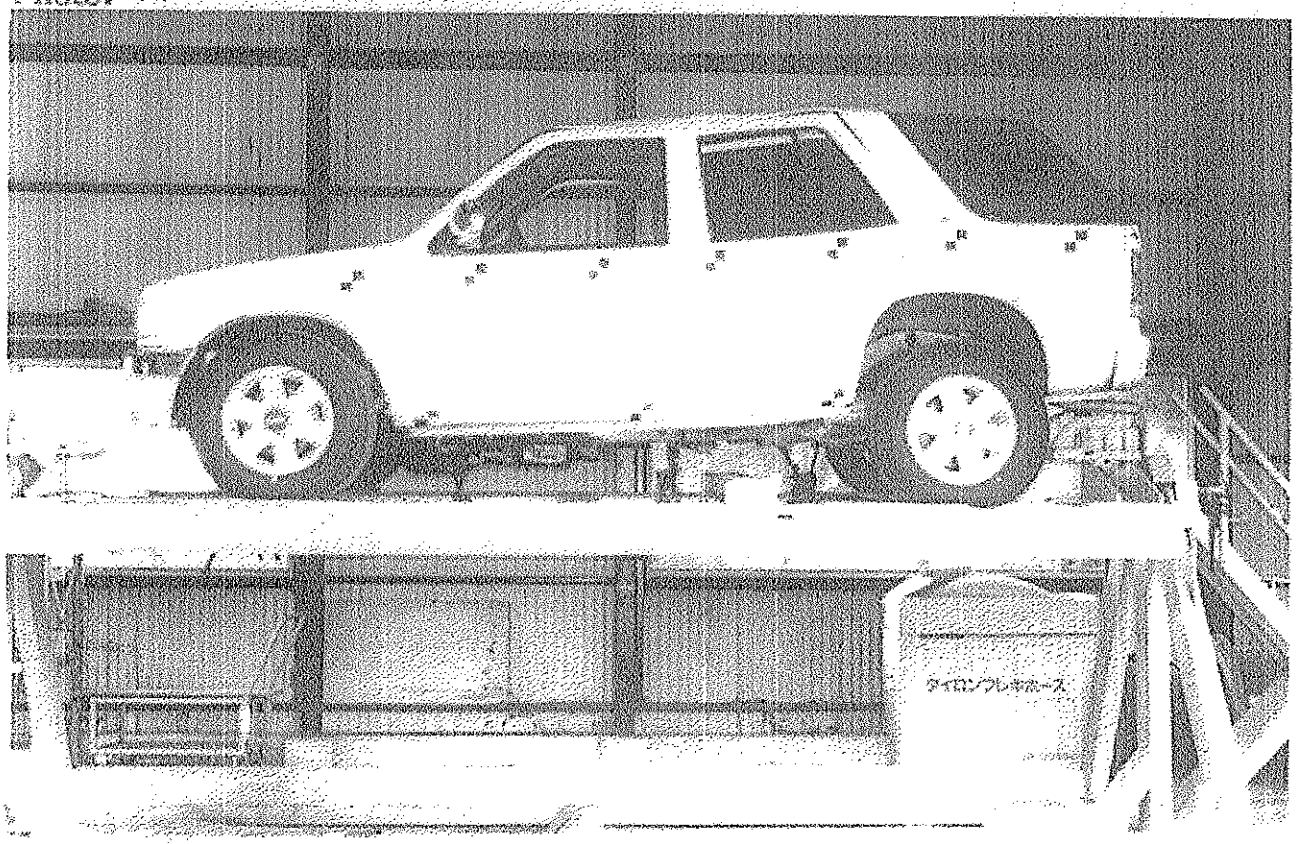
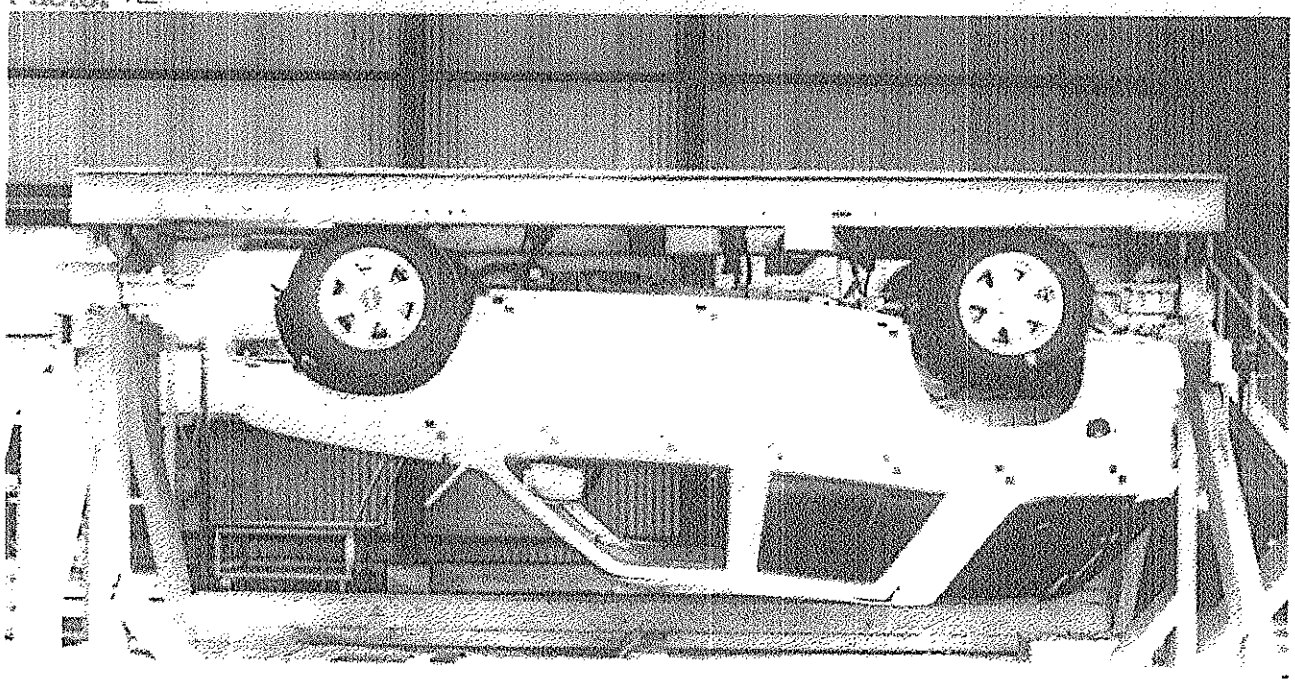


Photo. 12



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ISUZU MOTORS LIMITED ET 2-0877

DESIGN VALIDATION REPORT

REPORT NO. V-UC-005

ISSUED DATE May 11,1990

Vehicle Model : UCR17G/UCR21G/UCS21G

Model Year : 1991

Subject : FMVSS No.301, Fuel System Integrity

FMVSS Section	Item	Method of Validation	Conclusion
S5.5	Fuel Spillage: Barrier Crash	Test	Comply (cf. Attachment B to J)
S5.6	Fuel Spillage: Rollover	Test	(cf. Attachment B to J)

This certifies that UCR17G/UCR21G/UCS21G meet the applicable requirements of FMVSS No.301, published on August 26, 1976.

N. Takeda

NOBUYOSHI TAKEDA
General Manager
Car & Light Duty Truck
Research & Experiment Dept.

Attachment A

SELECTION OF TEST VEHICLE

○:Test
—:Substitute by other vehicle

Vehicle Model / Test Item	UCR17G	UCR21G	UCS21G
Perpendicular Frontal Barrier	○ Attachment B	— (by UCS21G)	○ Attachment C
Right Side Oblique Frontal Barrier	○ Attachment D	— (by UCS21G)	○ Attachment E
Left Side Oblique Frontal Barrier	○ Attachment F	— (by UCS21G)	○ Attachment G
Right-hand Side Lateral Moving Barrier	— (by UCS21G)	— (by UCS21G)	○ Attachment H
Left-hand Side Lateral Moving Barrier	— (by UCS21G)	— (by UCS21G)	○ Attachment I
Rear Moving Barrier	— (by UCS21G)	— (by UCS21G)	○ Attachment J

Attachment B (1 of 3)

Vehicle Model : UCR17G

Model Year : 1991

Subject : Compliance for S5.5 & S5.6 of FMVSS No. 301, Fuel System Integrity (Perpendicular Frontal Barrier Crash and Static Rollover)

Introduction : To determine if the fuel system of UCR17G meet the requirements of S5.5 and S5.6 of FMVSS No. 301, published on August 26, 1976.

Method of Validation : Test

Vehicle Identification No.: 4S2CG58E1M4300011 (UCR17G)

Explanation of reason why the test was conducted on the vehicle stated above;

1) The test vehicle was set on the weight of not less than the maximum vehicle weight in all vehicle models of UCR17G.

Test Date : April 25,1990

Test Conditions :

1. Frontal Barrier Crash Test

Barrier Face Angle	Perpendicular to the line of travel of the vehicle	
Vehicle Impact Speed	30.8	MPH
Vehicle Weight less Dummies	4111	lbs
Occupants		
Driver	Hybrid II (164 lbs)	
Right Front Passenger	Hybrid II (164 lbs)	
Per cent of Fuel Tank Capacity Used	92 - 94 %	

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes ?

X YES _____ NO

Continued

Test Results :

1. Frontal Barrier Crash Test Results :

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0/1 minute

2. Rollover Test Results (clockwise) ;

Rotation Angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0°- 90°	2 minute	0	0	—
90°-180°	2 minute	0	0	—
180°-270°	2 minute	0	0	—
270°-360°	2 minute	0	0	—
Max Allow	1-3 minute	5.0	1.0	1.0

Continued

Attachment B (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0°- 90°	2 minute	0	0	-
90°-180°	2 minute	0	0	-
180°-270°	2 minute	0	0	-
270°-360°	2 minute	0	0	-
Max Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements ?

__×__ YES _____ NO

Reference Report : ISUZU Research Engineering Report No. ET5-0625

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ET 2-0877

Attachment C (1 of 3)

Vehicle Model : UCR21G/UCS21G

Model Year : 1991

Subject : Compliance for S5.3 & S5.3 of FMVSS No. 301, Fuel System Integrity (Perpendicular Frontal Barrier Crash and Static Rollover)

Introduction : To determine if the fuel system of UCR/S21G meet the requirements of S5.3 and S5.3 of FMVSS No. 301, published on August 26, 1976.

Method of Validation : Test

Vehicle Identification No.: 4S2CY58ZXM4300024 (UCS21G)

Explanation of reason why the test was conducted on the vehicle stated above:

1) All vehicle models of UCR21G/UCS21G are identical in design concerning the body structure, the engine room packaging and fuel system.
2) The test vehicle was set on the weight of not less than the maximum vehicle weight in all vehicle models of UCR21G/UCS21G.

Test Date : May 2, 1990

Test Conditions :

1. Frontal Barrier Crash Test

Barrier Face Angle	Perpendicular to the line of travel of the vehicle	
Vehicle Impact Speed	30.3	MPH
Vehicle Weight less Dummies	4296	lbs
Occupants		
Driver	Hybrid II (164 lbs)	
Right Front Passenger	Hybrid II (164 lbs)	
Per cent of Fuel Tank Capacity Used	90 - 91	%

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes ?

__X__ YES _____ NO

Continued

Attachment C (2 of 3)

Test Results :

1. Frontal Barrier Crash Test Results :

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0/1 minute

2. Rollover Test Results (clockwise) ;

Rotation Angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0°- 90°	2 minute	0	0	—
90°-180°	2 minute	0	0	—
180°-270°	2 minute	0	0	—
270°-360°	2 minute	0	0	—
Max Allow	1-3 minute	5.0	1.0	1.0

Continued

Attachment C (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0°- 90°	2 minute	0	0	-
90°-180°	2 minute	0	0	-
180°-270°	2 minute	0	0	-
270°-360°	2 minute	0	0	-
Max Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements ?

× YES _____ NO

Reference Report : ISUZU Research Engineering Report No. ET5-0622

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Attachment D (1 of 3)

ET 2-0877

Vehicle Model : UCR17G

Model Year : 1991

Subject : Compliance for S5.5 & S5.6 of FMVSS No. 301, Fuel System Integrity
(Right side Oblique Frontal Barrier Crash and Static Rollover)

Introduction : To determine if the fuel system of UCR17G meet the requirements of S5.5 and S5.6 of FMVSS No. 301, published on August 26, 1976.

Method of Validation : Test

Vehicle Identification No.: 4S2CG58E1M4300008 (UCR17G)

Explanation of reason why the test was conducted on the vehicle stated above;

1) The test vehicle was set on the weight of not less than the maximum vehicle weight in all vehicle models of UCR17G.

Test Date : April 19, 1990

Test Conditions :

1. Frontal Barrier Crash Test

Barrier Face Angle	30 degrees in the right direction from the perpendicular to the line of travel of the vehicle	
Vehicle impact Speed	30.6	MPH
Vehicle Weight less Dummies	4115	lbs

Occupants

Driver	Hybrid II (164 lbs)
Right Front Passenger	Hybrid II (164 lbs)

Per cent of Fuel Tank Capacity Used 92 - 94 %

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes ?

× YES _____ NO

Continued

Attachment D (2 of 3)

Test Results :

1. Right Side Oblique Frontal Barrier Crash Test Results :

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0/1 minute

2. Rollover Test Results (clockwise) ;

Rotation Angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0°- 90°	2 minute	0	0	—
90°-180°	2 minute	0	0	—
180°-270°	2 minute	0	0	—
270°-360°	2 minute	0	0	—
Max Allow	1-3 minute	5.0	1.0	1.0

Continued

Attachment D (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0°- 90°	2 minute	0	0	-
90°-180°	2 minute	0	0	-
180°-270°	2 minute	0	0	-
270°-360°	2 minute	0	0	-
Max Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements ?

__×__ YES _____ NO

Reference Report : ISUZU Research Engineering Report No. ET5-0626

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Attachment E (1 of 3)

ET 2-0877

Vehicle Model :UCR21G/UCS21G

Model Year : 1991

Subject : Compliance for S5.5 & S5.6 of FMVSS No. 301, Fuel System Integrity
(Right Side Oblique Frontal Barrier Crash and Static Rollover)

Introduction : To determine if the fuel system of UCR/S21G meet the requirements of S5.5 and S5.6 of FMVSS No. 301, published on August 26, 1976.

Method of Validation : Test

Vehicle Identification No.: 4S2CY58Z3M4300026 (UCS21G)

Explanation of reason why the test was conducted on the vehicle stated above:

1) All vehicle models of UCR21G/UCS21G are identical in design concerning the body structure, fuel tank capacity and fuel system.
2) The test vehicle was set on the weight of not less than the maximum vehicle weight in all vehicle models of UCR21G/UCS21G.

Test Date : May 4, 1990

Test Conditions :

1. Frontal Barrier Crash Test

Barrier Face Angle	30 degrees in the right direction from the perpendicular to the line of travel of the vehicle
Vehicle Impact Speed	30.8 MPH
Vehicle Weight less Dummies	4307 lbs
Occupants	
Driver	Hybrid II (164 lbs)
Right Front Passenger	Hybrid II (164 lbs)
Per cent of Fuel Tank Capacity Used	95 %

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes ?

__X__ YES _____ NO

Continued

Attachment E (2 of 3)

Test Results :

1. Right Side Oblique Frontal Crash Test Results :

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0/1 minute

2. Rollover Test Results (clockwise) ;

Rotation Angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0°- 90°	2 minute	0	0	—
90°-180°	2 minute	0	0	—
180°-270°	2 minute	0	0	—
270°-360°	2 minute	0	0	—
Max Allow	1-3 minute	5.0	1.0	1.0

Continued

Attachment E (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0°- 90°	2 minute	0	0	-
90°-180°	2 minute	0	0	-
180°-270°	2 minute	0	0	-
270°-360°	2 minute	0	0	-
Max Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements ?

__×__ YES _____ NO

Reference Report : ISUZU Research Engineering Report No. ET5-0627

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ET 2-0877

Attachment F (1 of 3)

Vehicle Model : UCR17G

Model Year : 1991

Subject : Compliance for S5.5 & S5.6 of FMVSS No. 301, Fuel System Integrity
(Left side Oblique Frontal Barrier Crash and Static Rollover)

Introduction : To determine if the fuel system of UCR17G meet the requirements of S5.5 and S5.6 of FMVSS No. 301, published on August 26, 1976.

Method of Validation : Test

Vehicle Identification No.: 4S2CG58EXM4300007 (UCR17G)

Explanation of reason why the test was conducted on the vehicle stated above;

1) The test vehicle was set on the weight of not less than the maximum vehicle weight in all vehicle models of UCR17G.

Test Date : April 18, 1990

Test Conditions :

1. Frontal Barrier Crash Test

Barrier Face Angle	30 degrees in the left direction from the perpendicular to the line of travel of the vehicle	
Vehicle Impact Speed	30.8	MPH
Vehicle Weight less Dummies	4119	lbs
Occupants		
Driver	Hybrid II (164 lbs)	
Right Front Passenger	Hybrid II (164 lbs)	
Per cent of Fuel Tank Capacity Used	92 - 94 %	

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes ?

× YES _____ NO

Continued

Attachment F (2 of 3)

Test Results :

1. Left Side Oblique Frontal Barrier Crash Test Results :

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0/1 minute

2. Rollover Test Results (clockwise) :

Rotation Angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0°- 90°	2 minute	0	0	—
90°-180°	2 minute	0	0	—
180°-270°	2 minute	0	0	—
270°-360°	2 minute	0	0	—
Max Allow	1-3 minute	5.0	1.0	1.0

Continued

Attachment F (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0°- 90°	2 minute	0	0	-
90°-180°	2 minute	0	0	-
180°-270°	2 minute	0	0	-
270°-360°	2 minute	0	0	-
Max Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements ?

× YES _____ NO

Reference Report : ISUZU Research Engineering Report No. ET5-0628

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Attachment G (1 of 3)

ET 2-0877

Vehicle Model : UCR21G/UCS21G

Model Year : 1991

Subject : Compliance for S5.5 & S5.6 of FMVSS No. 301, Fuel System Integrity
(Left Side Obique Frontal Barrier Crash and Static Rollover)

Introduction : To determine if the fuel system of UCR/S21G meet the requirements of S5.5 and S5.6 of FMVSS No. 301, published on August 26, 1976.

Method of Validation : Test

Vehicle Identification No.: 4S2CY58Z5M4300027 (UCS21G)

Explanation of reason why the test was conducted on the vehicle stated above:

1) All vehicle models of UCR21G/UCS21G are idenitcal in design concerning the body structure, the engine room packaging and fuel system.
2) The test vehicle was set on the weight of not less than the maximum vehicle weight in all vehicle models of UCR21G/UCS21G.

Test Date : May 1, 1990

Test Conditions :

1. Frontal Barrier Crash Test

Barrier Face Angle	30 degrees in the left direction from the perpendicular to the line of travel of the vehicle	
Vehicle impact Speed	30.8	MPH
Vehicle Weight less Dummies	4309	lbs
Occupants		
Driver	Hybrid II (164 lbs)	
Right Front Passenger	Hybrid II (164 lbs)	
Per cent of Fuel Tank Capacity Used	92 - 94 %	

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes ?

__X__ YES ____ NO

Continued

Attachment G (2 of 3)

Test Results : —

1. Left Side Oblique Frontal Barrier Crash Test Results :

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0/1 minute

2. Rollover Test Results (clockwise) ;

Rotation Angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0°- 90°	2 minute	0	0	—
90°-180°	2 minute	0	0	—
180°-270°	2 minute	0	0	—
270°-360°	2 minute	0	0	—
Max Allow	1-3 minute	5.0	1.0	1.0

Continued

Attachment G (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0°- 90°	2 minute	0	0	-
90°-180°	2 minute	0	0	-
180°-270°	2 minute	0	0	-
270°-360°	2 minute	0	0	-
Max Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements ?

× YES _____ NO

Reference Report : ISUZU Research Engineering Report No. ET5-0629

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Attachment H (1 of 3)

ET 2-0877

Vehicle Model : UCR17G/UCR21G/UCS21G

Model Year : 1991

Subject : Compliance for S5.5 & S5.6 of FMVSS No. 301, Fuel System Integrity
(Right-hand Side Lateral Moving Barrier Crash and Static Rollover)

Introduction : To determine if the fuel system of UCR17G/UCR21G/UCS21G meet the requirements of S5.5 and S5.6 of FMVSS No. 301, published on August 26, 1976.

Method of Validation : Test

Vehicle Identification No.: JACCY58Z9M7A00034 (UCS21G)

Explanation of reason why the test was conducted on the vehicle stated above:

1) All vehicle models of UCR17G/UCR21G/UCS21G are identical in design concerning the body structure, fuel tank capacity and fuel tank structure.
2) The test vehicle was set on the weight of not less than the maximum vehicle weight in all vehicle models of UCR17G/UCR21G/UCS21G.

Test Date : November 15, 1989

Test Conditions :

1. Lateral Moving Barrier Crash Test

Impacted Face of the vehicle	Right-hand Side
Moving Barrier Impact Speed	20.7 MPH
Vehicle Weight less Dummies	4315 lbs
Occupants	
Driver	Hybrid II (164 lbs)
Right Front Passenger	Hybrid II (164 lbs)
Moving Barrier Weight	4000 lbs
Per cent of Fuel Tank Capacity Used	95 %

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes ?

__X__ YES _____ NO

Continued

Attachment H (2 of 3)

Test Results :

1. Right-hand Side Lateral Moving Barrier Crash Test Results :

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0/1 minute

2. Rollover Test Results (clockwise) :

Rotation Angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0°- 90°	1 minute	0	0	—
90°-180°	1 minute	0	0	—
180°-270°	1 minute	0	0	—
270°-360°	1 minute	0	0	—
Max Allow	1-3 minute	5.0	1.0	1.0

Continued

Attachment H (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0°- 90°	1 minute	0	0	-
90°-180°	1 minute	0	0	-
180°-270°	1 minute	0	0	-
270°-360°	1 minute	0	0	-
Max Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements ?

__×__ YES _____ NO

Reference Report : ISUZU Research Engineering Report No. ET5-0630

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Attachment I (1 of 3)

ET 2-0877

Vehicle Model : UCR17G/UCR21G/UCS21G

Model Year : 1991

Subject : Compliance for S5.5 & S5.6 of FMVSS No. 301, Fuel System Integrity
(Left-hand Side Lateral Moving Barrier Crash and Static Rollover)

Introduction : To determine if the fuel system of UCR17G/UCR21G/UCS21G meet the requirements of S5.5 and S5.6 of FMVSS No. 301, published on August 26, 1976.

Method of Validation : Test

Vehicle Identification No.: JACCY58Z3M7A00031 (UCS21G)

Explanation of reason why the test was conducted on the vehicle stated above:

1) All vehicle models of UCR17G/UCR21G/UCS21G are identical in design concerning the body structure, fuel tank capacity and fuel tank structure.
2) The test vehicle was set on the weight of not less than the maximum vehicle weight in all vehicle models of UCR17G/UCR21G/UCS21G.

Test Date : November 15, 1989

Test Conditions :

1. Lateral Moving Barrier Crash Test

Impacted Face of the vehicle	Left-hand Side
Moving Barrier Impact Speed	20.7 MPH
Vehicle Weight less Dummies	4319 lbs
Occupants	
Driver	Hybrid II- (164 lbs)
Right Front Passenger	Hybrid II (164 lbs)
Moving Barrier Weight	4000 lbs
Per cent of Fuel Tank Capacity Used	95 %

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes ?

__x__ YES _____ NO

Continued

Attachment I (2 of 3)

Test Results :

1. Left-hand Side Lateral Moving Barrier Crash Test Results :

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0/1 minute

2. Rollover Test Results (clockwise) :

Rotation Angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0°- 90°	1 minute	0	0	—
90°-180°	1 minute	0	0	—
180°-270°	1 minute	0	0	—
270°-360°	1 minute	0	0	—
Max Allow	1-3 minute	5.0	1.0	1.0

Continued

Attachment I (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0°- 90°	1 minute	0	0	-
90°-180°	1 minute	0	0	-
180°-270°	1 minute	0	0	-
270°-360°	1 minute	0	0	-
Max Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements ?

× YES _____ NO

Reference Report : ISUZU Research Engineering Report No. ET5-0631

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Attachment J (1 of 3)

ET 2-0877

Vehicle Model : UCR17G/UCR21G/UCS21G

Model Year : 1991

Subject : Compliance for S5.5 & S5.6 of FMVSS No. 301, Fuel System Integrity
(Rear Moving Barrier Crash and Static Rollover)

Introduction : To determine if the fuel system of UCR17G/UCR21G/UCS21G meet the requirements of S5.5 and S5.6 of FMVSS No. 301, published on August 26, 1976.

Method of Validation : Test

Vehicle Identification No.: JACCY58Z1M7A00030 (UCS21G)

Explanation of reason why the test was conducted on the vehicle stated above;

1) All vehicle models of UCR17G/UCR21G/UCS21G are identical in design concerning the body structure, fuel tank capacity and fuel tank structure.
2) The test vehicle was set on the weight of not less than the maximum vehicle weight in all vehicle models of UCR17G/UCR21G/UCS21G.

Test Date : November 20, 1989

Test Conditions :

1. Rear Moving Barrier Crash Test

Moving Barrier Impact Speed	30.6 MPH
Vehicle Weight less Dummies	4315 lbs
Occupants	
Driver	Hybrid II (164 lbs)
Right Front Passenger	Hybrid II (164 lbs)
Moving Barrier Weight	4000 lbs
Per cent of Fuel Tank Capacity Used	95 %

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes ?

__X__ YES _____ NO

Continued

Attachment J (2 of 3)

Test Results :

1. Rear Moving Barrier Crash Test Results :

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0/1 minute

2. Rollover Test Results (clockwise) ;

Rotation Angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0°- 90°	1 minute	0	0	—
90°-180°	1 minute	0	0	—
180°-270°	1 minute	0	0	—
270°-360°	1 minute	0	0	—
Max Allow	1-3 minute	5.0	1.0	1.0

Continued

ET 2-0877

Attachment J (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0°- 90°	1 minute	0	0	-
90°-180°	1 minute	0	0	-
180°-270°	1 minute	0	0	-
270°-360°	1 minute	0	0	-
Max Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements ?

__×__ YES _____ NO

Reference Report : ISUZU Research Engineering Report No. ET5-0632

Kazuyoshi Kano

KAZUYOSHI KANO

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Katsumasa Baba

KATSUMASA BABA
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CONFIDENTIAL INFORMATION REDACTED

ET 2 -0790

ISUZU MOTORS LIMITED

DESIGN VALIDATION REPORT

REPORT NO. V-UC-065

ISSUED DATE Dec. 18, 1992

Vehicle Model: UCR17G, UCR25G, UCS25G

Model Year : 1993

Subject: FMVSS No. 301, Fuel System Integrity

FMVSS Section	Item	Method of Validation	Conclusion
S5.5	Fuel Spillage: Barrier Crash	Test	Comply (cf. Attachment B to M)
S5.6	Fuel Spillage: Rollover	Test	Comply (cf. Attachment B to M)

This certifies that UCR17G, UCR/S 25G meet the applicable requirements of FMVSS No. 301.

N. TAKEDA
General Manager
Car & Light Duty Truck
Research & Experiment Dept.

Attachment A

SELECTION OF TEST VEHICLE

○ : Test

— : Substitute other vehicle model

Vehicle Models / Test Items	UCR17G	UCR25G	UCS25G
Perpendicular Frontal Barrier	○ Attachment B	○ Attachment C	○ Attachment D
Right Side Oblique Frontal Barrier	○ Attachment E	○ Attachment F	○ Attachment G
Left Side Oblique Frontal Barrier	○ Attachment H	○ Attachment I	○ Attachment J
Right-hand Side Lateral Moving Barrier	— (by UCR25G)	○ Attachment K	— (by UCR25G)
Left-hand Side Lateral Moving Barrier	— (by UCR25G)	○ Attachment L	— (by UCR25G)
Rear Moving Barrier	— (by UCR25G)	○ Attachment M	— (by UCR25G)

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Attachment B (1 of 3)

Vehicle Model: UCR17G

Model Year: 1993

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Perpendicular Frontal Barrier Crash & Static Rollover)

Introduction: To determine if the fuel system of UCR17G meet the repuirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CG58B5P4300002 (UCR17G)

Explanation of reason why the test was conducted on the vehicle stated above;

All vehicle models of UCR17G are identical design concerning the front body structure and fuel system.

Test Date: Sep. 10, 1992

Test Conditions:

1. Frontal Barrier Crash Test

Barrier Face Angle	Perpendicular to the line of travel of the vehicle
Vehicle Impact Speed	30.1 MPH
Vehicle Weight less Dummies	3722 lbs
Occupants	
Driver	Hybrid III (164 lbs)
Right Front passenger	Hybrid III (164 lbs)
Percent of Fuel Tank Capacity Used	94 %

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes?

X YBS _____ NO

Continued

Attachment B (2 of 3)

Test Results:

1. Perpendicular Frontal Barrier Crash Test Results

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (clockwise);

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minutes interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~ 90°	minute	0	0	—
90° ~180 °	minute	0	0	—
180° ~270 °	minute	0	0	—
270° ~360 °	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Continued

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Attachment B (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minutes interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~ 90°	minute	0	0	—
90° ~180 °	minute	0	0	—
180° ~270 °	minute	0	0	—
270° ~360 °	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YES _____ NO

Reference Report: ISUZU Research Engineering Report No. BT5-0821

Hiro. Nagae

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Research & Experiment Dept.

S. Maeda

S. MAEDA
Manager
Safety & Human Engineering Section
Car & Light Duty Truck
Reseach & Experiment Dept.

Attachment C (1 of 3)

Vehicle Model: UCR25G

Model Year: 1993

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Perpendicular Frontal Barrier Crash & Static Rollover)

Introduction: To determine if the fuel system of UCR25G meet the repuirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CG58V9P4300004 (UCR25G)

Explanation of reason why the test was conducted on the vehicle stated above:

All vehicle models of UCR25G are identical design concerning the front body structure and fuel system.

Test Date: Aug. 31, 1992

Test Conditions:

1. Frontal Barrier Crash Test

Barrier Face Angle	Perpendicular to the line of travel of the vehicle
Vehicle Impact Speed	30.7 MPH
Vehicle Weight less Dummies	4196 lbs
Occupants	
Driver	Hybrid Ⅲ (164 lbs)
Right Front passenger	Hybrid Ⅲ (164 lbs)
Percent of Fuel Tank Capacity Used	94 %

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes?

× YES _____ NO

Continued

Attachment C (2 of 3)

Test Results:

1. Perpendicular Frontal Barrier Crash Test Results

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (clockwise);

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minutes interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~ 90°	minute	0	0	—
90° ~180 °	minute	0	0	—
180° ~270 °	minute	0	0	—
270° ~360 °	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Continued

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Attachment C (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minutes interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~ 90°	minute	0	0	—
90° ~180 °	minute	0	0	—
180° ~270 °	minute	0	0	—
270° ~360 °	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YES _____ NO

Reference Report: ISUZU Research Engineering Report No. BT5-0824

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S. Maeda

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Reseach & Experiment Dept.

Attachment D (1 of 3)

Vehicle Model: UCS25G

Model Year: 1993

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Perpendicular Frontal Barrier Crash & Static Rollover)

Introduction: To determine if the fuel system of UCS25G meet the repuirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CY58V4P4300005 (UCS25G)

Explanation of reason why the test was conducted on the vehicle stated above;

All vehicle models of UCS25G are identical design concerning the front body structure and fuel system.

Test Date: Sep. 28, 1992

Test Conditions:

1. Frontal Barrier Crash Test

Barrier Face Angle	Perpendicular to the line of travel of the vehicle
Vehicle Impact Speed	30.3 MPH
Vehicle Weight less Dummies	4466 lbs
Occupants	
Driver	Hybrid II (164 lbs)
Right Front passenger	Hybrid II (164 lbs)
Percent of Fuel Tank Capacity Used	94 %

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes?

× YES _____ NO

Continued

Attachment D (2 of 3)

Test Results:

1. Perpendicular Frontal Barrier Crash Test Results

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (clockwise):

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minutes interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~ 90°	minute	0	0	—
90° ~180 °	minute	0	0	—
180° ~270 °	minute	0	0	—
270° ~360 °	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Continued

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Attachment D (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minutes interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~ 90°	minute	0	0	—
90° ~180 °	minute	0	0	—
180° ~270 °	minute	0	0	—
270° ~360 °	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YES _____ NO

Reference Report: ISUZU Research Engineering Report No. ET5-0827

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S. Maeda

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Reseach & Experiment Dept.

Attachment B (1 of 3)

Vehicle Model: UCR17G

Model Year: 1993

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Right Side Oblique Frontal Barrier Crash & Static Rollover)

Introduction: To determine if the fuel system of UCR17G meet the requirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CG58B4P4300010 (UCR17G)

Explanation of reason why the test was conducted on the vehicle stated above;

All vehicle models of UCR17G are identical design concerning the front body structure and fuel system.

Test Date: Sep. 14, 1992

Test Conditions:

1. Frontal Barrier Crash Test

Barrier Face Angle	30 degrees in the Right direction from the perpendicular to the line of travel of the vehicle
Vehicle Impact Speed	30.2 MPH
Vehicle weight less Dummies	3733 lbs
Occupants	
Driver	Hybrid III (164 lbs)
Right Front passenger	Hybrid III (164 lbs)
Percent of Fuel Tank Capacity Used	94 %

2. Rollover Test

Is roll duration time at each increment of 90 degress between 1-3 minute?

X YES _____ NO

Continued

Attachment E (2 of 3)

Test Results:

1. Right Side Oblique Frontal Barrier Crash Test Results :

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (clockwise);

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~90°	minute	0	0	—
90° ~ 180°	minute	0	0	—
180° ~ 270°	minute	0	0	—
270° ~ 360°	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Continued

ET 4-6/60

Attachment E (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minutes interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~ 90°	minute	0	0	—
90° ~180 °	minute	0	0	—
180° ~270 °	minute	0	0	—
270° ~360 °	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YES _____ NO

Reference Report: ISUZU Research Engineering Report No. ET5-0822

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Attachment F (1 of 3)

Vehicle Model: UCR25G

Model Year: 1993

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Right Side Oblique Frontal Barrier Crash & Static Rollover)

Introduction: To determine if the fuel system of UCR25G meet the requirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CG58V7P4300034 (UCR25G)

Explanation of reason why the test was conducted on the vehicle stated above;

All vehicle models of UCR25G are identical design concerning the front body structure and fuel system.

Test Date: Sep. 21, 1992

Test Conditions:

1. Frontal Barrier Crash Test

Barrier Face Angle	30 degrees in the Right direction from the perpendicular to the line of travel of the vehicle
Vehicle Impact Speed	30.1 MPH
Vehicle weight less Dummies	4150 lbs
Occupants	
Driver	Hybrid Ⅱ (164 lbs)
Right Front passenger	Hybrid Ⅱ (164 lbs)
Percent of Fuel Tank Capacity Used	94 %

2. Rollover Test

Is roll duration time at each increment of 90 degress between 1-3 minute?

____×____YES _____NO

Continued

Test Results:

1. Right Side Oblique Frontal Barrier Crash Test Results :

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (clockwise);

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~90°	minute	0	0	—
90° ~ 180°	minute	0	0	—
180° ~ 270°	minute	0	0	—
270° ~ 360°	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Continued

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Attachment F (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minutes interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~ 90°	minute	0	0	—
90° ~180 °	minute	0	0	—
180° ~270 °	minute	0	0	—
270° ~360 °	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YES _____ NO

Reference Report: ISUZU Research Engineering Report No. ET5-0825

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S. Maeda

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Attachment G (1 of 3)

Vehicle Model: UCS25G

Model Year: 1993

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity (Right Side Oblique Frontal Barrier Crash & Static Rollover)

Introduction: To determine if the fuel system of UCS25G meet the requirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CY58V8P430038 (UCS25G)

Explanation of reason why the test was conducted on the vehicle stated above;

All vehicle models of UCS25G are identical design concerning the front body structure and fuel system.

Test Date: Sep. 25, 1992

Test Conditions:

1. Frontal Barrier Crash Test

Barrier Face Angle	30 degrees in the Right direction from the perpendicular to the line of travel of the vehicle
Vehicle Impact Speed	30.4 MPH
Vehicle weight less Dummies	4469 lbs
Occupants	
Driver	Hybrid II (164 lbs)
Right Front passenger	Hybrid II (164 lbs)
Percent of Fuel Tank Capacity Used	94 %

2. Rollover Test

Is roll duration time at each increment of 90 degress between 1-3 minute?

X YES _____ NO

Continued

Test Results:

1. Right Side Oblique Frontal Barrier Crash Test Results :

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (clockwise);

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~90°	minute	0	0	—
90° ~ 180°	minute	0	0	—
180° ~ 270°	minute	0	0	—
270° ~ 360°	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Continued

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Attachment G (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minutes interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~ 90°	minute	0	0	—
90° ~180 °	minute	0	0	—
180° ~270 °	minute	0	0	—
270° ~360 °	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YES _____ NO

Reference Report: ISUZU Research Engineering Report No. ET5-0828

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S. Maeda

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Attachment H (1 of 3)

Vehicle Model: UCR17G

Model Year: 1993

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Left Side Oblique Frontal Barrier Crash & Static Rollover)

Introduction: To determine if the fuel system of UCR17G meet the requirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CG58B7P4300020 (UCR17G)

Explanation of reason why the test was conducted on the vehicle stated above;

All vehicle models of UCR17G are identical design concerning the front body structure and fuel system.

Test Date: Sep. 24, 1992

Test Conditions:

1. Frontal Barrier Crash Test

Barrier Face Angle	30 degrees in the Left direction from the perpendicular to the line of travel of the vehicle
Vehicle Impact Speed	30.4 MPH
Vehicle weight less Dummies	3722 lbs
Occupants	
Driver	Hybrid III (164 lbs)
Right Front passenger	Hybrid III (164 lbs)
Percent of Fuel Tank Capacity Used	94 %

2. Rollover Test

Is roll duration time at each increment of 90 degress between 1-3 minute?

___X___ YES _____ NO

Continued

Attachment H (2 of 3)

Test Results:

1. Left Side Oblique Frontal Barrier Crash Test Results :

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (clockwise);

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~90°	minute	0	0	—
90° ~ 180°	minute	0	0	—
180° ~ 270°	minute	0	0	—
270° ~ 360°	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Continued

Attachment H (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minutes interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~ 90°	minute	0	0	—
90° ~180 °	minute	0	0	—
180° ~270 °	minute	0	0	—
270° ~360 °	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YES _____ NO

Reference Report: ISUZU Research Engineering Report No. RT5-0823

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Car & Light Duty Truck
Research & Experiment Dept.

S. MAEDA
Manager
Safety & Human Engineering Section
Car & Light Duty Truck
Reseach & Experiment Dept.

Attachment I (1 of 3)

Vehicle Model: UCR25G

Model Year: 1993

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Left Side Oblique Frontal Barrier Crash & Static Rollover)

Introduction: To determine if the fuel system of UCR25G meet the requirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CG58V3P4300029 (UCR25G)

Explanation of reason why the test was conducted on the vehicle stated above;

All vehicle models of UCR25G are identical design concerning the front body structure and fuel system.

Test Date: Sep. 18, 1992

Test Conditions:

1. Frontal Barrier Crash Test

Barrier Face Angle	30 degrees in the Left direction from the perpendicular to the line of travel of the vehicle
Vehicle Impact Speed	30.1 MPH
Vehicle weight less Dummies	4147 lbs
Occupants	
Driver	Hybrid Ⅲ (164 lbs)
Right Front passenger	Hybrid Ⅲ (164 lbs)
Percent of Fuel Tank Capacity Used	94 %

2. Rollover Test

Is roll duration time at each increment of 90 degress between 1-3 minute?

____×____YES _____NO

Continued

Attachment I (2 of 3)

Test Results:

1. Left Side Oblique Frontal Barrier Crash Test Results :

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (clockwise);

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~90°	minute	0	0	—
90° ~ 180°	minute	0	0	—
180° ~ 270°	minute	0	0	—
270° ~ 360°	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Continued

Attachment I (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minutes interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~ 90°	minute	0	0	—
90° ~180 °	minute	0	0	—
180° ~270 °	minute	0	0	—
270° ~360 °	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YES _____ NO

Reference Report: ISUZU Research Engineering Report No. ET5-0826

Hiro. Nagae

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S. Maeda

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Reseach & Experiment Dept.

Attachment J (1 of 3)

Vehicle Model: UCS25G

Model Year: 1993

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Left Side Oblique Frontal Barrier Crash & Static Rollover)

Introduction: To determine if the fuel system of UCS25G meet the requirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CY58V8P4300024 (UCS25G)

Explanation of reason why the test was conducted on the vehicle stated above:

All vehicle models of UCS25G are identical design concerning the front body structure and fuel system.

Test Date: Sep. 17, 1992

Test Conditions:

1. Frontal Barrier Crash Test

Barrier Face Angle	30 degrees in the Left direction from the perpendicular to the line of travel of the vehicle
Vehicle Impact Speed	30.0 MPH
Vehicle weight less Dummies	4467 lbs
Occupants	
Driver	Hybrid Ⅲ (164 lbs)
Right Front passenger	Hybrid Ⅲ (164 lbs)
Percent of Fuel Tank Capacity Used	94 %

2. Rollover Test

Is roll duration time at each increment of 90 degress between 1-3 minute?

× YES _____ NO

Continued

Attachment J (2 of 3)

Test Results:

1. Right Side Oblique Frontal Barrier Crash Test Results :

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (clockwise);

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~90°	minute	0	0	—
90° ~ 180°	minute	0	0	—
180° ~ 270°	minute	0	0	—
270° ~ 360°	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Continued

Attachment J (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minutes interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~ 90°	minute	0	0	—
90° ~180 °	minute	0	0	—
180° ~270 °	minute	0	0	—
270° ~360 °	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YBS _____ NO

Reference Report: ISUZU Research Engineering Report No. BT5-0829

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B12-0190

Attachment K (1 of 3)

Vehicle Model: UCR17G, UCR25G, UCS25G

Model Year: 1993

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Right-hand Side Lateral Moving Barrier Crash & Static Rollover)

Introduction: To determine if the fuel system of UCR17G, UCR25G, UCS25G meet the requirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CG58V6P4300042 (UCR25G)

Explanation of reason why the test was conducted on the vehicle stated above;

All vehicle models of UCR17G, UCR25G, UCS25G are identical design concerning the side body structure and fuel system except one of engine room.

Test Date: Sep. 18, 1992

Test Conditions:

1. Lateral Moving Barrier Crash Test

Impacted Face of the vehicle	Right-hand Side
Moving Barrier Impact Speed	20.5 MPH
Vehicle weight less Dummies	4465 lbs
Occupants	
Driver	Hybrid II (164 lbs)
Right Front passenger	Hybrid II (164 lbs)
Moving Barrier Weight	3999 lbs
Per Cent of Fuel Tank Capacity Used	94%

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes ?

X YES _____NO

Attachment K (2 of 3)

Test Results:

1. Right-hand Lateral Moving Barrier Crash Test Results :

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (clockwise);

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~90°	minute	0	0	—
90° ~ 180°	minute	0	0	—
180° ~ 270°	minute	0	0	—
270° ~ 360°	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Continued

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Attachment K (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minutes interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~ 90°	minute	0	0	—
90° ~180 °	minute	0	0	—
180° ~270 °	minute	0	0	—
270° ~360 °	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YES _____ NO

Reference Report: ISUZU Research Engineering Report No. ET5-0842

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S. Maeda

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ET

Attachment L (1 of 3)

Vehicle Model: UCR17G, UCR25G, UCS25G

Model Year: 1993

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Left-hand Side Lateral Moving Barrier Crash & Static Rollover)

Introduction: To determine if the fuel system of UCR17G, UCR25G, UCS25G meet the requirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CG58V9P4300049 (UCR25G)

Explanation of reason why the test was conducted on the vehicle stated above;

All vehicle models of UCR17G, UCR25G, UCS25G are identical design concerning the side body structure and fuel system except one of engine room.

Test Date: Nov. 25, 1992

Test Conditions:

1. Lateral Moving Barrier Crash Test

Impacted Face of the vehicle	Left-hand Side
Moving Barrier Impact Speed	20.7 MPH
Vehicle weight less Dummies	4468 lbs
Occupants	
Driver	Hybrid Ⅱ (164 lbs)
Right Front passenger	Hybrid Ⅱ (164 lbs)
Moving Barrier Weight	3999 lbs
Per Cent of Fuel Tank Capacity Used	94%

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes ?

X YES _____NO

Attachment L (2 of 3)

Test Results:

1. Left-hand Lateral Moving Barrier Crash Test Results :

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (clockwise);

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~90°	minute	0	0	—
90° ~ 180°	minute	0	0	—
180° ~ 270°	minute	0	0	—
270° ~ 360°	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Continued

Attachment L (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minutes interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~ 90°	minute	0	0	—
90° ~180 °	minute	0	0	—
180° ~270 °	minute	0	0	—
270° ~360 °	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YES _____ NO

Reference Report: ISUZU Research Engineering Report No. ET5-0843

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Attachment M (1 of 3)

Vehicle Model: UCR17G, UCR25G, UCS25G

Model Year: 1993

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Rear Moving Barrier Crash & Static Rollover)

Introduction: To determine if the fuel system of UCR17G, UCR25G, UCS25G meet the requirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CG58V6P4300039 (UCR25G)

Explanation of reason why the test was conducted on the vehicle stated above:

All vehicle models of UCR17G, UCR25G, UCS25G are identical design concerning the resr body structure and fuel system except one of engine room.

Test Date: Nov. 13, 1992

Test Conditions:

1. Rear Moving Barrier Crash Test

Moving Barrier Impact Speed	30.3 MPH
Vehicle weight less Dummies	4466 lbs
Occupants	
Driver	Hybrid II (164 lbs)
Right Front passenger	Hybrid II (164 lbs)
Moving Barrier Weight	3999 lbs
Per Cent of Fuel Tank Capacity Used	94%

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes ?

X YES _____NO

Attachment M (2 of 3)

Test Results:

1. Rear Moving Barrier Crash Test Results :

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (clockwise);

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~90°	minute	0	0	—
90° ~ 180°	minute	0	0	—
180° ~ 270°	minute	0	0	—
270° ~ 360°	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Continued

Attachment M (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time	During first 5 minutes (ounce by weight)	During any 1 minutes interval (ounce by weight)	During any 1 minutes interval (ounce by weight)
0° ~ 90°	minute	0	0	—
90° ~180 °	minute	0	0	—
180° ~270 °	minute	0	0	—
270° ~360 °	minute	0	0	—
Max. Allow	1-3 minute	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YES _____ NO

Reference Report: ISUZU Research Engineering Report No. BT5-0844

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Manager
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ISUZU ISUZU MOTORS LIMITED

DESIGN VALIDATION REPORT

REPORT NO. V-UC-114

ISSUED DATE Apr. 20, 1995

Vehicle Model: UCR17G, UCR25G, UCS25G

Model Year : 1995

Subject: FMVSS No.301, Fuel System Integrity

FMVSS Section	Item	Method of Validation	Conclusion
S5.5	Fuel Spillage: Barrier Crash	Test	Comply (cf. Attachment A to J)
S5.6	Fuel Spillage: Rollover	Test	Comply (cf. Attachment A to J)

This certifies that UCR17G, UCR25G, UCS25G meet the applicable requirements of FMVSS No.301.

S. Maeda

S. MAEDA
General Manager
L/D Vehicle Research &
Experiment Dept.

Attachment A

SELECTION OF TEST VEHICLE

○ : Test

— : Substitute by other vehicle

Test Items \ Vehicle Models	UCR17G	UCR25G	UCS25G
Perpendicular Frontal Barrier	○ Attachment B	— (by UCS25G)	○ Attachment F
Right Side Oblique Frontal Barrier	○ Attachment C	— (by UCS25G)	○ Attachment G
Left Side Oblique Frontal Barrier	○ Attachment D	— (by UCS25G)	○ Attachment H
Right-hand Side Lateral Moving Barrier	— Attachment I	— Attachment I	— Attachment I
Left-hand Side Lateral Moving Barrier	— Attachment I	— Attachment I	— Attachment I
Rear Moving Barrier	○ Attachment E	— Attachment J	— Attachment J

Attachment B (1 of 3)

Vehicle Model: UCR17G

Model Year: 1995

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Perpendicular Frontal Barrier Crash & Static Rollover)

Introduction: To determine if the fuel system of UCR17G meets the requirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CK58E2S4300028

Explanation of reason why the test was conducted on the vehicle stated above;

All vehicle models of UCR17G are identical in design concerning the front body structure and fuel system.

Test Date: Jan. 10, 1995

Test Conditions:

1. Frontal Barrier Crash Test

Barrier Face Angle	Perpendicular to the line of travel of the vehicle
Vehicle Impact Speed	48.97 km/h (30.43 MPH)
Vehicle Weight with Dummies	1875.0 kg
Dummies	
Driver	Hybrid Ⅲ (74.4 kg)
Right Front passenger	Hybrid Ⅲ (74.4 kg)
Percent of Fuel Tank Capacity Used	94 %

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes?

× YES _____ NO

Continued

Test Results:

1. Perpendicular Frontal Barrier Crash Test Results

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (Clockwise);

Rotation angle	Rotation time (minutes)	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0° ～ 90°	1	0	0	—
90° ～180 °	1	0	0	—
180° ～270 °	1	0	0	—
270° ～360 °	1	0	0	—
Max. Allow	1 - 3	5.0	1.0	1.0

Continued

Attachment B (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time (minutes)	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0° ~ 90°	1	0	0	—
90° ~180 °	1	0	0	—
180° ~270 °	1	0	0	—
270° ~360 °	1	0	0	—
Max. Allow	1 - 3	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YES _____ NO

Reference Report: ISUZU Research Engineering Report No. ET5-0991

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A. Matsushita

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Manager
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Attachment C (1 of 3)

Vehicle Model: UCR17G

Model Year: 1995

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Right Side Oblique Frontal Barrier Crash & Static Rollover)

Introduction: To determine if the fuel system of UCR17G meets the requirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CK58E7S4300042

Explanation of reason why the test was conducted on the vehicle stated above;

All vehicle models of UCR17G are identical in design concerning the front body structure and fuel system.

Test Date: Feb. 1, 1995

Test Conditions:

1. Frontal Barrier Crash Test

Barrier Face Angle	30 degrees in the right direction from the perpendicular to the line of travel of the vehicle
Vehicle Impact Speed	49.24 km/h (30.59 MPH)
Vehicle Weight with Dummies	1876.0 kg
Dummies	
Driver	Hybrid Ⅲ (74.4 kg)
Right Front passenger	Hybrid Ⅲ (74.4 kg)
Percent of Fuel Tank Capacity Used	94 %

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes?

× YES _____ NO

Continue

Test Results:

1. Perpendicular Frontal Barrier Crash Test Results

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (Clockwise);

Rotation angle	Rotation time (minutes)	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0° ～ 90°	1	0	0	—
90° ～180 °	1	0	0	—
180° ～270 °	1	0	0	—
270° ～360 °	1	0	0	—
Max. Allow	1 - 3	5.0	1.0	1.0

Continued

Attachment C (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time (minutes)	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0° ~ 90°	1	0	0	—
90° ~180 °	1	0	0	—
180° ~270 °	1	0	0	—
270° ~360 °	1	0	0	—
Max. Allow	1 - 3	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YES _____ NO

Reference Report: ISUZU Research Engineering Report No. ET5-0992

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Attachment D (1 of 3)

Vehicle Model: UCR17G

Model Year: 1995

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Left Side Oblique Frontal Barrier Crash & Static Rollover)

Introduction: To determine if the fuel system of UCR17G meets the requirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CK58E3S4300040

Explanation of reason why the test was conducted on the vehicle stated above;

All vehicle models of UCR17G are identical in design concerning the front body structure and fuel system.

Test Date: Feb. 3, 1995

Test Conditions:

1. Frontal Barrier Crash Test

Barrier Face Angle	30 degrees in the left direction from the perpendicular to the line of travel of the vehicle
Vehicle Impact Speed	48.80 km/h (30.32 MPH)
Vehicle Weight with Dummies	1877.0 kg
Dummies	
Driver	Hybrid Ⅲ (74.4 kg)
Right Front passenger	Hybrid Ⅲ (74.4 kg)
Percent of Fuel Tank Capacity Used	94 %

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes?

× YES _____ NO

Contin

Test Results:

1. Perpendicular Frontal Barrier Crash Test Results

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (Clockwise);

Rotation angle	Rotation time (minutes)	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0° ~ 90°	1	0	0	—
90° ~180 °	1	0	0	—
180° ~270 °	1	0	0	—
270° ~360 °	1	0	0	—
Max. Allow	1 - 3	5.0	1.0	1.0

Continued

Attachment D (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time (minutes)	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0° ~ 90°	1	0	0	—
90° ~180 °	1	0	0	—
180° ~270 °	1	0	0	—
270° ~360 °	1	0	0	—
Max. Allow	1 - 3	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YES _____ NO

Reference Report: ISUZU Research Engineering Report No. ET5-0993

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Attachment E (1 of 3)

Vehicle Model: UCR17G

Model Year: 1995

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Rear Moving Barrier Crash & Static Rollover)

Introduction: To determine if the fuel system of UCR17G meets the requirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CK58E9S4300012

Explanation of reason why the test was conducted on the vehicle stated above;

All vehicle models of UCR17G are identical in design concerning the rear body structure and fuel system.

Test Date: Feb. 13, 1995

Test Conditions:

1. Rear moving Barrier Crash Test

Vehicle Impact Speed	48.10 km/h (29.89 MPH)
Vehicle Weight with Dummies	1875.2 kg
Dummies	
Driver	Hybrid Ⅱ (74.4 kg)
Right Front passenger	Hybrid Ⅱ (74.4 kg)
Moving Barrier Weight	1822.0 kg
Percent of Fuel Tank Capacity Used	94 %

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes?

× YES _____ NO

Continued

Test Results:

1. Perpendicular Frontal Barrier Crash Test Results

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (Clockwise);

Rotation angle	Rotation time (minutes)	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0° ～ 90°	1	0	0	—
90° ～180 °	1	0	0	—
180° ～270 °	1	0	0	—
270° ～360 °	1	0	0	—
Max. Allow	1 - 3	5.0	1.0	1.0

Continued

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time (minutes)	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0° ~ 90°	1	0	0	—
90° ~180 °	1	0	0	—
180° ~270 °	1	0	0	—
270° ~360 °	1	0	0	—
Max. Allow	1 - 3	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YES _____ NO

Reference Report: ISUZU Research Engineering Report No. ET5-0994

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Attachment F (1 of 3)

Vehicle Model: UCR25G, UCS25G

Model Year: 1995

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Perpendicular Frontal Barrier Crash & Static Rollover)

Introduction: To determine if the fuel system of UCR25G, UCS25G meets the requirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CM58V2S4300041 (UCS25G)

Explanation of reason why the test was conducted on the vehicle stated above;

(1) All vehicle models of UCR25G, UCS25G are identical in design concerning the front body structure and fuel system.
(2) UCS25G has the heaviest weight of all vehicle models of UCR25G, UCS25G.

Test Date: Dec. 19, 1994

Test Conditions:

1. Frontal Barrier Crash Test

Barrier Face Angle	Perpendicular to the line of travel of the vehicle
Vehicle Impact Speed	48.06 km/h (29.86 MPH)
Vehicle Weight with Dummies	2079.0 kg
Dummies	
Driver	Hybrid Ⅲ (74.4 kg)
Right Front passenger	Hybrid Ⅲ (74.4 kg)
Percent of Fuel Tank Capacity Used	94 %

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes?

× YES _____ NO

Continued

Test Results:

1. Perpendicular Frontal Barrier Crash Test Results

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (Clockwise);

Rotation angle	Rotation time (minutes)	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0° ～ 90°	1	0	0	—
90° ～180 °	1	0	0	—
180° ～270 °	1	0	0	—
270° ～360 °	1	0	0	—
Max. Allow	1 - 3	5.0	1.0	1.0

Continued

Attachment F (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time (minutes)	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0° ~ 90°	1	0	0	—
90° ~180 °	1	0	0	—
180° ~270 °	1	0	0	—
270° ~360 °	1	0	0	—
Max. Allow	1 - 3	5.0	1.0	1.0

Do the above test results satisfy the requirements?

___×___ YES _____ NO

Reference Report: ISUZU Research Engineering Report No. ET5-0988

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Attachment G (1 of 3)

Vehicle Model: UCR25G, UCS25G

Model Year: 1995

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Right Side Oblique Frontal Barrier Crash & Static Rollover)

Introduction: To determine if the fuel system of UCR25G, UCS25G meets the requirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CM58V0S4315346 (UCS25G)

Explanation of reason why the test was conducted on the vehicle stated above;

(1) All vehicle models of UCR25G, UCS25G are identical in design concerning the front body structure and fuel system.
(2) UCS25G has the heaviest weight of all vehicle models of UCR25G, UCS25G.

Test Date: Mar. 7, 1995

Test Conditions:

1. Frontal Barrier Crash Test

Barrier Face Angle	30 degrees in the right direction from the perpendicular to the line of travel of the vehicle
Vehicle Impact Speed	48.70 km/h (30.27 MPH)
Vehicle Weight with Dummies	2080.0 kg
Dummies	
Driver	Hybrid Ⅲ (74.4 kg)
Right Front passenger	Hybrid Ⅲ (74.4 kg)
Percent of Fuel Tank Capacity Used	94 %

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes?

× YES _____ NO

Continue

Test Results:

1. Perpendicular Frontal Barrier Crash Test Results

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (Clockwise);

Rotation angle	Rotation time (minutes)	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0° ～ 90°	1	0	0	—
90° ～180 °	1	0	0	—
180° ～270 °	1	0	0	—
270° ～360 °	1	0	0	—
Max. Allow	1 - 3	5.0	1.0	1.0

Continued

Attachment G (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time (minutes)	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0° ~ 90°	1	0	0	—
90° ~180 °	1	0	0	—
180° ~270 °	1	0	0	—
270° ~360 °	1	0	0	—
Max. Allow	1 - 3	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YES _____ NO

Reference Report: ISUZU Research Engineering Report No. ET5-0989

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Attachment H (1 of 3)

Vehicle Model: UCR25G, UCS25G

Model Year: 1995

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Left Side Oblique Frontal Barrier Crash & Static Rollover)

Introduction: To determine if the fuel system of UCR25G, UCS25G meets the requirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CM58V7S4300021 (UCS25G)

Explanation of reason why the test was conducted on the vehicle stated above;

(1) All vehicle models of UCR25G, UCS25G are identical in design concerning the front body structure and fuel system.
(2) UCS25G has the heaviest weight of all vehicle models of UCR25G, UCS25G.

Test Date: Feb. 2, 1995

Test Conditions:

1. Frontal Barrier Crash Test

Barrier Face Angle	30 degrees in the left direction from the perpendicular to the line of travel of the vehicle
Vehicle Impact Speed	48.40 km/h (30.08 MPH)
Vehicle Weight with Dummies	2079.8 kg
Dummies	
Driver	Hybrid Ⅲ (74.4 kg)
Right Front passenger	Hybrid Ⅲ (74.4 kg)
Percent of Fuel Tank Capacity Used	94 %

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes?

× YES _____ NO

Contin

Test Results:

1.Perpendicular Frontal Barrier Crash Test Results

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (Clockwise);

Rotation angle	Rotation time (minutes)	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0° ～ 90°	1	0	0	—
90° ～180 °	1	0	0	—
180° ～270 °	1	0	0	—
270° ～360 °	1	0	0	—
Max. Allow	1 - 3	5.0	1.0	1.0

Continued

Attachment H (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time (minutes)	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0° ~ 90°	1	0	0	—
90° ~180 °	1	0	0	—
180° ~270 °	1	0	0	—
270° ~360 °	1	0	0	—
Max. Allow	1 - 3	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YES _____ NO

Reference Report: ISUZU Research Engineering Report No. ET5-0990

T. Takada

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Safety Engineering Test Sect.
L/D Vehicle Research &
Experiment Dept.

A. Matsushita

A. MATSUSHITA
Manager
Safety Engineering Test Sect.
L/D Vehicle Research &
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Attachment I

Vehicle Model: UCR17G, UCR25G, UCS25G

Model Year: 1995

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Right and Left-hand Side Lateral Moving Barrier Crash
& Static Rollover)

Basis of Validation

1) The frame structure of '95 UCR / UCS is changed for '93 UCR / UCS, but the changed section is front side only, which is no deformation area.
2) The fuel systems of '95 UCR / UCS are changed for '93 UCR / UCS concerning the layout in engine compartment, which is no deformation area.
3) The fuel systems of '95 UCR17G are changed for '93 UCR17G concerning the rayout of the evaporator and the rayout of their pipe and hoses, but there are the evaporator and their hoses in no deformation area, and the rayout of their pipe is the same as that of the fuel pipes. (The fuel pipes have no damage in the crash tests stated above.)

The following Design Validation Report is applicable.

Applicable Design Validation Report No. V-UC-065

Reference Report : ISUZU Research Engineering Report No. ET5-0842, ET5-0843

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Safety Engineering Sect.
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A. Matsushita

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Manager
Safety Engineering Sect.
L/D Vehicle Research &
Experiment Dept.

Attachment J

Vehicle Model: UCR25G, UCS25G

Model Year: 1995

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Rear Moving Barrier Crash & Static Rollover)

Basis of Validation

1) The rear body structure and the fuel tank of '95 UCR25G & UCS25G are the same as those of '93 UCR25G & UCS25G.
2) The frame structure of '95 UCR25G & UCS25G is changed for '93 UCR25G & UCS25G, but the changed section is front side only, which is no deformation area.
3) The fuel systems of '95 UCR25G & UCS25G is changed for '93 UCR25G & UCS25G, but the changed section is the layout in engine compartment only, which is no deformation area.

The following Design Validation Report is applicable.

Applicable Design Validation Report No. V-UC-065

Reference Report : ISUZU Research Engineering Report No. ET5-0844

T. Takada

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Safety Engineering Sect.
L/D Vehicle Research &
Experiment Dept.

A. Matsushita

A. MATSUSHITA
Manager
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L/D Vehicle Research &
Experiment Dept.

ISUZU ISUZU MOTORS LIMITED

DESIGN VALIDATION REPORT

REPORT NO. V-UC-138

ISSUED DATE Nov. 27, 1995

Vehicle Model: UCR17G, UCR25G, UCS25G

Model Year : 1996

Subject: FMVSS No.301, Fuel System Integrity

FMVSS Section	Item	Method of Validation	Conclusion
S5.5	Fuel Spillage: Barrier Crash	Test	Comply (cf. Attachment A to G)
S5.6	Fuel Spillage: Rollover	Test	Comply (cf. Attachment A to G)

This certifies that UCR17G, UCR25G, UCS25G meet the applicable requirements of FMVSS No.301.

S. Maeda

S. MAEDA
General Manager
L/D Vehicle Research &
Experiment Dept.

Attachment A

SELECTION OF TEST VEHICLE

○ : Test

— : Substitute by other vehicle

Vehicle Models / Test Items	UCR17G	UCR25G	UCS25G
Perpendicular Frontal Barrier	— (by UCS25G)	— (by UCS25G)	○ Attachment B
Right Side Oblique Frontal Barrier	— (by UCS25G)	— (by UCS25G)	○ Attachment C
Left Side Oblique Frontal Barrier	— Attachment D	— Attachment D	— Attachment D
Right-hand Side Lateral Moving Barrier	— Attachment E	— Attachment E	— Attachment E
Left-hand Side Lateral Moving Barrier	— Attachment E	— Attachment E	— Attachment E
Rear Moving Barrier	— Attachment F	— (by UCS25G)	○ Attachment G

Attachment B (1 of 3)

Vehicle Model: UCR17G, UCR25G, UCS25G

Model Year: 1996

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Perpendicular Frontal Barrier Crash & Static Rollover)

Introduction: To determine if the fuel systems of UCR17G, UCR25G, UCS25G meet the requirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CY58VXT4300018 (UCS25G)

Explanation of reason why the test was conducted on the vehicle stated above;

(1) UCS25G has the heaviest weight of all vehicle models of UCR17G, UCR25G, UCS25G.
(2) The engine compartment of UCS25G is closest of all vehicle of UCR17G, UCR25G, UCS25G.

Test Date: Oct. 27, 1995

Test Conditions:

1. Frontal Barrier Crash Test

Barrier Face Angle	Perpendicular to the line of travel of the vehicle
Vehicle Impact Speed	56.24 km/h (34.95 MPH)
Vehicle Weight with Dummies	2079.0 kg
Dummies	
Driver	Hybrid Ⅲ (75.7 kg)
Right Front passenger	Hybrid Ⅲ (75.7 kg)
Percent of Fuel Tank Capacity Used	94 %

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes?

× YES _____ NO

Continued

Attachment B (2 of 3)

Test Results:

1. Perpendicular Frontal Barrier Crash Test Results

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (Clockwise);

Rotation angle	Rotation time (minutes)	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0° ～ 90°	1	0	0	—
90° ～180 °	1	0	0	—
180° ～270 °	1	0	0	—
270° ～360 °	1	0	0	—
Max. Allow	1 - 3	5.0	1.0	1.0

Continued

Attachment B (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time (minutes)	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0° ~ 90°	1	0	0	—
90° ~180 °	1	0	0	—
180° ~270 °	1	0	0	—
270° ~360 °	1	0	0	—
Max. Allow	1 - 3	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YES _____ NO

Reference Report: ISUZU Research Engineering Report No. ET5-1026

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Crashworthiness & Safety Sec.
L/D Vehicle Research &
Experiment Dept.

A. Matsushita

A. MATSUSHITA
Manager
Crashworthiness & Safety Sec.
L/D Vehicle Research &
Experiment Dept.

Attachment C (1 of 3)

Vehicle Model: UCR17G, UCR25G, UCS25G

Model Year: 1996

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Right Side Oblique Frontal Barrier Crash & Static Rollover)

Introduction: To determine if the fuel systems of UCR27G, UCR25G, UCS25G meet the requirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CY58V1T4300022 (UCS25G)

Explanation of reason why the test was conducted on the vehicle stated above;

(1) UCS25G has the heaviest weight of all vehicle models of UCR17G, UCR25G, UCS25G.
(2) The engine compartment of UCS25G is closest of all vehicle of UCR17G, UCR25G, UCS25G.

Test Date: Sep. 5, 1995

Test Conditions:

1. Frontal Barrier Crash Test

Barrier Face Angle	30 degrees in the right direction from the perpendicular to the line of travel of the vehicle
Vehicle Impact Speed	48.78 km/h (30.31 MPH)
Vehicle Weight with Dummies	2080.0 kg
Dummies	
Driver	Hybrid Ⅲ (75.7 kg)
Right Front passenger	Hybrid Ⅲ (75.7 kg)
Percent of Fuel Tank Capacity Used	94 %

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes?

× YES _____ NO

Continue

Attachment C (2 of 3)

Test Results:

1. Right Side Oblique Frontal Barrier Crash Test Results

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (Clockwise);

Rotation angle	Rotation time (minutes)	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0° ～ 90°	1	0	0	—
90° ～180 °	1	0	0	—
180° ～270 °	1	0	0	—
270° ～360 °	1	0	0	—
Max. Allow	1 - 3	5.0	1.0	1.0

Continued

Attachment C (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time (minutes)	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0° ~ 90°	1	0	0	—
90° ~180 °	1	0	0	—
180° ~270 °	1	0	0	—
270° ~360 °	1	0	0	—
Max. Allow	1 - 3	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YES _____ NO

Reference Report: ISUZU Research Engineering Report No. ET5-1029

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A. Matsushita

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L/D Vehicle Research &
Experiment Dept.

Attachment D

Vehicle Model: UCR17G, UCR25G, UCS25G

Model Year: 1996

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Left Side Oblique Frontal Barrier Crash & Static Rollover)

Introduction: To determine if the fuel systems of UCR17G, UCR25G, UCS25G meet the requirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Basis of Validation

Basis of Validation

(1) The fuel systems of UCR17G, UCR25G, UCS25G are lay down on the right side of vehicle.
(2) The frame structure of '96 UCR / UCS is changed for '95 UCR / UCS, but the changed section is the front suspention systems only, whose difference has no influence of the deformation in the oblique frontal crash test.

The following Design Validation Report is applicable.

Applicable Design Validation Report No. V-UC-114

Reference Report : ISUZU Research Engineering Report No. ET5-990

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A. Matsushita

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Crashworthiness & Safety Sec.
L/D Vehicle Research &
Experiment Dept.

Attachment E

Vehicle Model: UCR17G, UCR25G, UCS25G

Model Year: 1996

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Right and Left-hand Side Lateral Moving Barrier Crash
& Static Rollover)

Basis of Validation

1) The frame structure of '96 UCR / UCS is changed for '93 UCR / UCS, but the changed section is front side only, which is no deformation area.
2) The fuel systems of '96 UCR / UCS are changed for '93 UCR / UCS concerning the layout in engine compartment, which is no deformation area.
3) The fuel systems of '96 UCR25G & UCS25G are changed for '93 UCR25G & UCS25G concerning the rayout of the evaporator and the rayout of their pipe and hoses, but there are the evaporator and their hoses in no deformation area, and the rayout of their pipe is the same as that of the fuel pipes. (The fuel pipes have no damage in the crash tests stated above.)

The following Design Validation Report is applicable.

Applicable Design Validation Report No. V-UC-065

Reference Report : ISUZU Research Engineering Report No. ET5-0842, ET5-0843

T. Takada

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L/D Vehicle Research &
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A. Matsushita

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Manager
Crashworthiness & Safety Sec.
L/D Vehicle Research &
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Attachment F

Vehicle Model: UCR17G

Model Year: 1996

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Rear Moving Barrier Crash & Static Rollover)

Basis of Validation

1) The rear body structure and the fuel tank of '96 UCR17G are the same as those of '95 UCR17G.
2) The frame structure of '96 UCR17G is changed for '95 UCR17G, but the changed section is front side only, which is no deformation area.
3) The fuel systems of '96 UCR17G is changed for '95 UCR17G, but the changed section is the layout in engine compartment only, which is no deformation area.

The following Design Validation Report is applicable.

Applicable Design Validation Report No. V-UC-114

Reference Report : ISUZU Research Engineering Report No. ET5-0994

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L/D Vehicle Research &
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A. Matsushita

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L/D Vehicle Research &
Experiment Dept.

Attachment G (1 of 3)

Vehicle Model: UCR25G, UCS25G

Model Year: 1996

Subject: Compliance for S5.5 & S5.6 of FMVSS No.301, Fuel System Integrity
(Rear Moving Barrier Crash & Static Rollover)

Introduction: To determine if the fuel systems of UCR25G, UCS25G meet the requirements of S5.5 and S5.6 of FMVSS No.301.

Method of validation: Test

Vehicle Identification No.: 4S2CY58V7T4300025

Explanation of reason why the test was conducted on the vehicle stated above;

(1) All vehicle models of UCR25G, UCS25G are identical in design concerning the rear body structure and fuel systems.
(2) UCS25G has the heaviest weight of all vehicle models of UCR25G, UCS25G.

Test Date: June 27, 1995

Test Conditions:

1. Rear moving Barrier Crash Test

Vehicle Impact Speed	48.10 km/h (29.89 MPH)
Vehicle Weight with Dummies	2080.0 kg
Dummies	
Driver	Hybrid Ⅱ (75.7 kg)
Right Front passenger	Hybrid Ⅱ (75.7 kg)
Moving Barrier Weight	1822.0 kg
Percent of Fuel Tank Capacity Used	94 %

2. Rollover Test

Is roll duration time at each increment of 90 degrees between 1-3 minutes?

× YES _____ NO

Continued

Test Results:

1. Rear Moving Barrier Crash Test Results

	Results (ounce by weight)	Max. Allow (ounce by weight)
During impact	0	1.0
During first 5 minutes after impact	0	5.0
Per minutes for subsequent 25 minutes period	0	1.0 / 1 minute

2. Rollover Test Results (Clockwise);

Rotation angle	Rotation time (minutes)	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0° ～ 90°	1	0	0	—
90° ～180 °	1	0	0	—
180° ～270 °	1	0	0	—
270° ～360 °	1	0	0	—
Max. Allow	1 - 3	5.0	1.0	1.0

Continued

Attachment G (3 of 3)

3. Rollover Test Results (Counterclockwise)

Rotation angle	Rotation time (minutes)	During first 5 minutes (ounce by weight)	During any 1 minute interval (ounce by weight)	During any 1 minute interval (ounce by weight)
0° ~ 90°	1	0	0	—
90° ~180 °	1	0	0	—
180° ~270 °	1	0	0	—
270° ~360 °	1	0	0	—
Max. Allow	1 - 3	5.0	1.0	1.0

Do the above test results satisfy the requirements?

× YES _____ NO

Reference Report: ISUZU Research Engineering Report No. ET5-1028

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291- 00144

REPORT NUMBER: 301-CAL-91-002

SAFETY COMPLIANCE TESTING FOR FMVSS NO. 301 "FUEL SYSTEM INTEGRITY"

AMERICAN ISUZU MOTORS, INC.
1991 ISUZU RODEO
4-DOOR ~~SEDAN~~ MPV

NHTSA NO. CM5703

CALSPAN REPORT NO. 7903-3

CALSPAN CORPORATION
ADVANCED TECHNOLOGY CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225

DATE: MAY 13, 1991

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

This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-91-C-01041. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

Prepared: John A Pierowicz
John A. Pierowicz, Project Engineer

Approved: Walter E. Levan
Walter E. Levan, Program Manager
Transportation Sciences Center

Approval Date: _____

FINAL REPORT ACCEPTED BY:

Charles R. Carr
Contracting Officer's Technical Representative
(COTR), NHTSA, Office of Vehicle Safety Compliance

9/5/91
Date of Report Acceptance

TECHNICAL REPORT STANDARD TITLE PAGE

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301-CAL-91-002		

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Final Report of FMVSS No. 301 Compliance Testing of 1991 Isuzu Rodeo 4-Door Sedan NHTSA No. CM5703	May 13, 1991
	6. Performing Organization Code: CAL

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John A. Pierowicz, Project Engineer Walter E. Levan, Program Manager	7903-3

9. Performing Organization Name and Address	10. Work Unit No.
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15. Supplementary Notes

16. Abstract

Compliance tests were conducted on the subject 1991 Isuzu Rodeo 4-Door ~~Sedan~~ MPV in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-301-00, dated April 26, 1989, for the determination of FMVSS No. 301 compliance. Test failures were as follows:

The test vehicle appeared to comply with all requirements of FMVSS 301 "Fuel System Integrity."

17. Key Words	18. Distribution Statement
Compliance Testing Safety Engineering FMVSS 301	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 (202) 366-4946 Attn: Robert Hornickle

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Form DOT F1700.7

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Section 1

PURPOSE AND TEST PROCEDURE

This 30 mph rear moving barrier impact test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 301 Compliance Test Program conducted for the National Highway Traffic Safety Administration (NHTSA) by Calspan Advanced Technology Center under Contract No. DTNH22-91-C-01041. The purpose of this test was to determine if the subject vehicle, a 1991 Isuzu Rodeo 4-Door ~~Sedan,~~ MPV meets the performance requirements of FMVSS No. 301, "Fuel System Integrity". This compliance test was conducted using the requirements found in the OVSC Laboratory Test Procedure No. TP-301-00, dated April 26, 1989.

Section 2

SUMMARY OF RESULTS FOR TEST NUMBER CM5703

A 4040-pound 1991 Isuzu Rodeo 4-Door MPV was impacted from the rear by a 3960-pound moving barrier at a velocity of 29.3 mph. The test was performed at the Calspan Corporation Advanced Technology Center on April 19, 1991.

Two Part 572, 50th percentile male Anthropomorphic Test Devices (ATDs) were placed in the driver and right front passenger seating positions. Additional ballast (180 pounds) was secured in the vehicle cargo area.

Maximum rear crush was 6.5 inches at the vehicle rear left side. Rear crush of 6.0 inches on vehicle center and 4.8 inches on vehicle right sides were measured. Pre- and post-test photographs of the vehicles and dummies can be found in Appendix A.

The 21.9 gallon fuel tank was filled to 92 percent capacity with purple Stoddard fluid prior to the impact. After impact, t here was no fluid leakage for the first 30 minutes, nor during any phase of the rollover test. The vehicle appeared to comply with all requirements of FMVSS-301 "Fuel System Integrity." Section 4 presents the results of these tests.

The crash event was recorded by one real-time and six high-speed cameras. Camera locations and other pertinent camera information are found on pages 3-4 and 3-5 of this report.

POST-TEST IMPACT DATA

SUMMARY OF RESULTS

TYPE OF TEST:

Type of Test: Rear Moving Barrier Impact Impact Angle: 180°

Test Date: 4-19-91 Time: 3:02 PM Temperature: 58°F

Vehicle NHTSA No.: CM5703

Required Impact Velocity Range: 28.9 to 29.9 mph

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

Trap No. 1 = 29.3 mph; Trap No. 2 = 29.3 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 =	174.8 ;	C/L =	175.2 ;	Left =	175.5
Post-Test	Right =	170.0 ;	C/L =	169.2 ;	Left =	169.0
Crush	Right =	4.8 ;	C/L =	6.0 ;	Left =	6.5
AVERAGE	=	5.8 inches				

DOOR OPENING:	Left	Right
Front	operable	operable
Rear	not operable	not operable

SEAT MOVEMENT:	Seat Back Failure	Seat Shift
Front	Yes	No
Rear	No	No

POST-TEST IMPACT DATA (cont.)

SUMMARY OF RESULTS

STODDARD SPILLAGE: None observed.

GLAZING DAMAGE: Rear hatch glass shattered, glass panels behind "D" columns shattered. Cracked glass lower right side of windshield.

OTHER NOTABLE IMPACT FEATURES: Roof creased between A and B pillars, fuel filler door opened. Front seat tracks deformed allowing seat to rotate rearward; seat retained.

Section 3

VEHICLE AND TEST INFORMATION

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1991 Isuzu Rodeo 4-Door MPV

NHTSA No. CM5703 ; VIN: 4S2CG58E0M43057511; Color; Silver

Engine Data: 4 cylinders; 156 CID; 2.6 Liters; 2559 cc

Placement - Longitudinal or In-Line; X Transverse or Lateral

Transmission Data: 5 speeds; X Manual; - Automatic; - Overdrive

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

Major Options: X A/C; X Pwr. Strg.; - Pwr. Brakes; - Pwr. Windows

- Power Door Locks

Date Received: 03/01/91 ; Odometer Reading 65 miles

Selling Dealer: Marong Isuzu

& Address P.O. Box 644, Orchard Park, NY 14127

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Isuzu Motors Limited

Date of Manufacture: August 1990

GVWR: 4800 lbs.; GAWR: 2200 lbs. FRONT; 2700 lbs. REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load: 26 psi FRONT

26 psi REAR

Recommended Tire Size: P225/75R15 Load Range: -

Recommended Cold Tire Pressure: 26 psi FRONT; 26 psi REAR

Size of Tires on Test Vehicle: P225/75R15; Manufacturer: Dunlop

Vehicle Capacity Data:

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

Number of Occupants: 3 Front; 3 Rear; 6 Total

Vehicle Capacity Weight (VCW) = - lbs.

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

Rated Cargo/Luggage Weight (RCLW) = 300 lbs. (Difference)

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

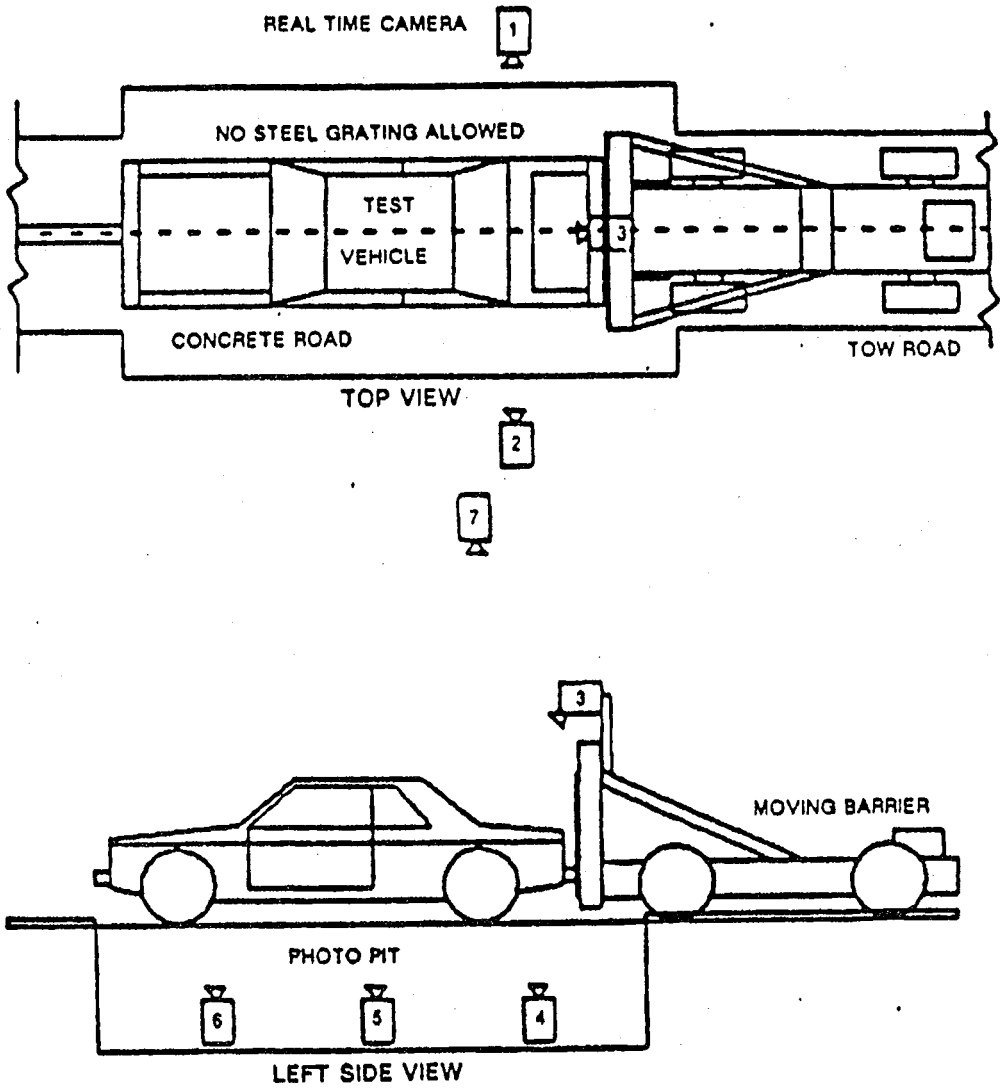
Right Front =	800 lbs.	Right Rear =	890 lbs.
Left Front =	880 lbs.	Left Rear =	860 lbs.
TOTAL FRONT =	1680 lbs.	TOTAL REAR =	1750 lbs.
% of Total Vehicle Weight =	49 %	% of Total Weight =	51 %

TOTAL DELIVERED WEIGHT = 3430 lbs.

Figure 1

CAMERA POSITIONS FOR REAR IMPACTS

NOTE: Camera Information Shown on Table 1.



CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight	=	3430	lbs.
Rated Cargo/Luggage Weight (RCLW)	=	300	lbs.
Weight of 2 P.572 Dummies @ 164 ea.	=	328	lbs.
TARGET TEST WEIGHT	=	4058	lbs. (sum)

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 180 LBS. OF CARGO WEIGHT:

Right Front = 1020 lbs. Right Rear = 980 lbs.

Left Front = 1040 lbs. Left Rear = 1000 lbs.

TOTAL FRONT = 2060 lbs. TOTAL REAR = 1980 lbs.

% of Total Weight = 51 lbs. % of Total Weight = 49 lbs.

TOTAL TEST WEIGHT = 4040 lbs.

Weight of Ballast secured in vehicle's cargo area = 180 lbs.*

Vehicle Components Removed for Weight Reduction None.

TEST VEHICLE ATTITUDE: (all dimensions in inches)

AS DELIVERED RF 33.5 ; LF 33.3 ; RR 35.0 ; LR 34.5

AS TESTED RF 32.8 ; LF 32.6 ; RR 33.6 ; LR 33.3

Vehicle's Wheelbase = 108.5 inches

Location of Vehicle's C.G. = - (if required)

FUEL SYSTEM DATA:

Fuel System Capacity from Owner's manual = 21.9 gallons

Usable Capacity Figure Furnished by COTR = 21.6 gallons

Test Volume Range (91 to 94% of Usable Capacity) = 19.7 to 20.3 gals.

ACTUAL TEST VOLUME = 20.2 gallons (with entire fuel system filled)

Test Fluid Type: Stoddard Solution ; Spec. Grav. 0.764

Kinematic Viscosity = 0.96 centistokes; Color = Purple

Type of Fuel Pump: X Electric; - Manual/Mechanical

Does Elec. Pump operate with ign. sw. "ON" & engine "OFF"? No (yes/no)

DETAILS OF FUEL SYSTEM:

Fuel fill line is on right side of vehicle behind rear wheel well. A 21.9 gallon tank is loaded behind rear axle line.

*Ballast consisted of three 60 lb. sandbags placed in back seat seating locations and restrained by rear seat belts.

Table 1

HIGH-SPEED CAMERA LOCATIONS

Test No. J67-020-1060 Vehicle: 1991 Isuzu Rodeo 4-Door Sedan NHTSA No. CM5703

CAMERA NO.	VIEW	CAMERA POSITIONS (in)*			ANGLE** (deg)	LENS (mm)	SPEED (fps)
		X	Y	Z			
1	Real-Time Camera	-	-	-	-	-	24
2	Left Side View	287	60	41	-4	13	550
3	Moving Barrier View	0	0	99	15	8	415
4	Vehicle Rear Underbody View	0	20	-77	90	13	760
5	Vehicle Mid-Section Underbody View	0	60	-77	90	13	N.T.***
6	Vehicle Front Underbody View	0	120	-77	90	13	640
7	Overhead Overall View	0	48	376	-90	13	540

*X = film plane to monorail centerline
Y = film plane to impact location
Z = film plan to ground
** = referenced to horizontal plane
*** = No speed available due to failure of timing strobe light

Section 4

SUMMARY OF RESULTS OF FMVSS NO. 301

- "Fuel System Integrity," FMVSS No. 301-75

Figure 2

FMVSS NO. 301, "FUEL SYSTEM INTEGRITY POST-TEST IMPACTS," DATA SHEET

FMVSS NO. 301

TEST VEHICLE NHTSA NO.: CM5703 TEST DATE: 4-19-91

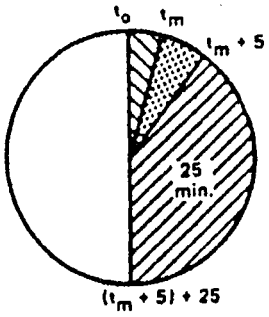
Vehicle Mfgr./Make/Model: Isuzu Rodeo 4-Door MPV

Test vehicle fuel tank filled to 91% 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
- X 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:

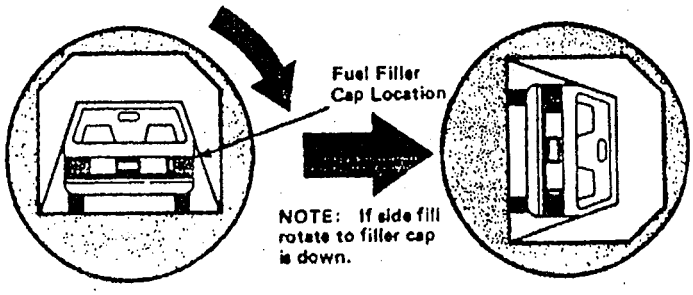
None.

Figure 3A

FMVSS NO. 301, "STATIC ROLLOVER" DATA SHEET

TEST PHASE: 0° 90°

Vehicle NHTSA ID No.: CM5703



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	3 minutes 0 seconds
FMVSS 301 Position Hold Time +	5 minutes 0 seconds
TOTAL	8 minutes 0 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):

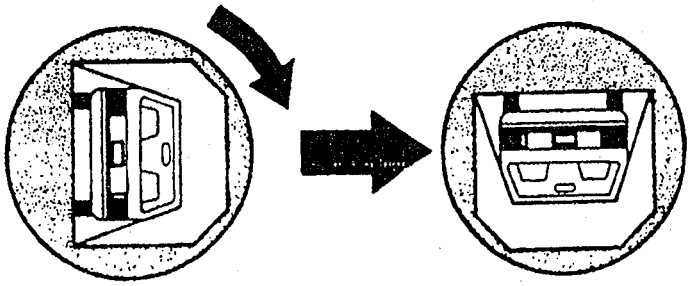
None.

Figure 3B

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

TEST PHASE: 90° 180°

Vehicle NHTSA ID No.: CM5703



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

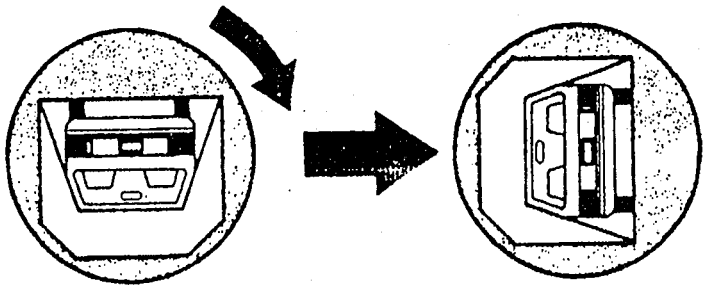
None.

Figure 3C

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

TEST PHASE: 180° 270°

Vehicle NHTSA ID No.: CM5703



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	3 minutes 0 seconds
FMVSS 301 Position Hold Time +	5 minutes 0 seconds
TOTAL	8 minutes 0 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):

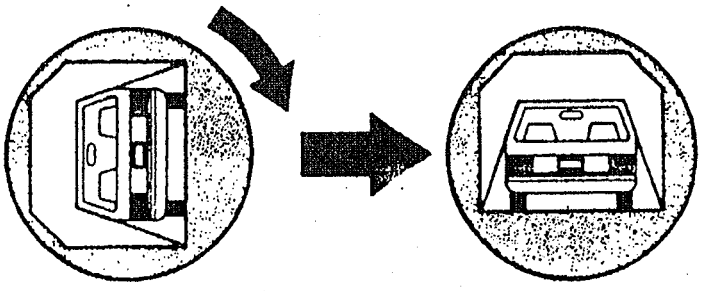
None.

Figure 3D

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

TEST PHASE: 270° 360°

Vehicle NHTSA ID No.: CM5703



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

Appendix A

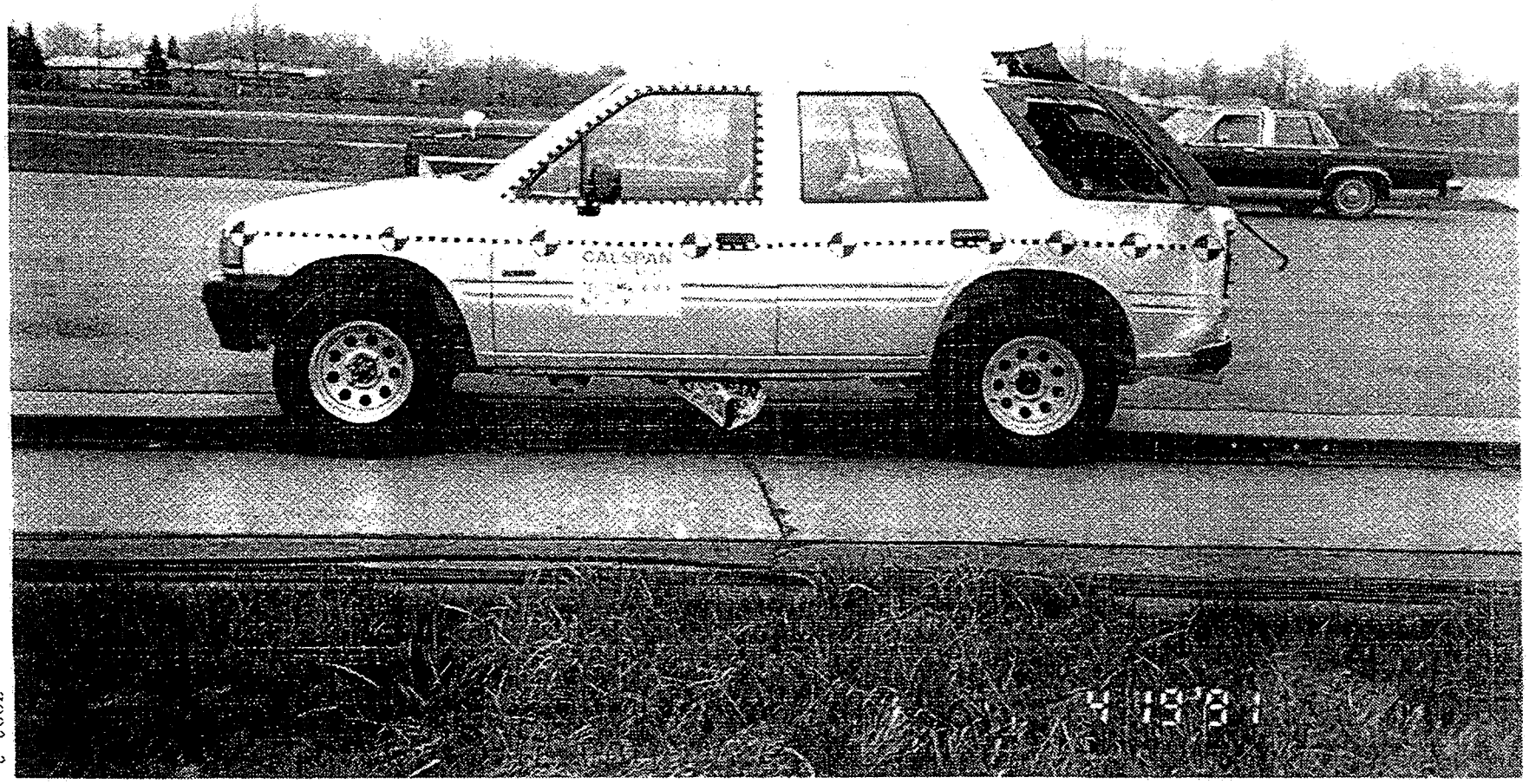
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

PRE-TEST FRONT VIEW

Figure A-2 POST-TEST FRONT VIEW

Figure A-3 PRE-TEST LEFT SIDE VIEW



A-4

7903-3

Figure A-4 POST-TEST LEFT SIDE VIEW

Figure A- PRE-TEST RIGHT SIDE VIEW

FIGURE A-2 POST-TEST RIGHT SIDE VIEW

FIGURE A-7 PRE-TEST REAR VIEW

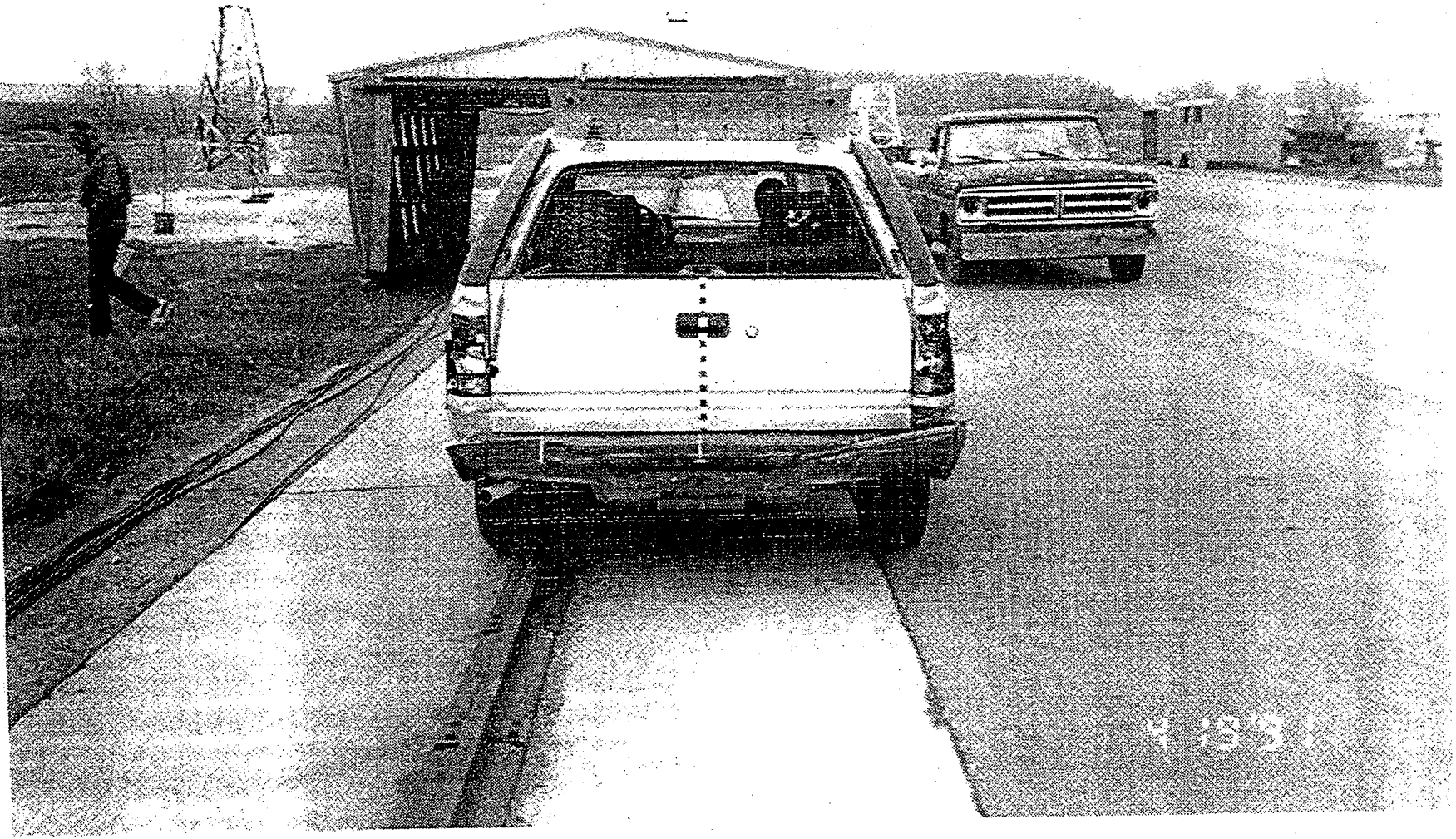


Figure A-5 POST-TEST REAR VIEW

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

Figure A-10 T-BIRD TEST LEFT FRONT THREE-QUARTER VIEW

Figure 1.1 FULL TEST RIGHT REAR THREE-QUARTER VIEW

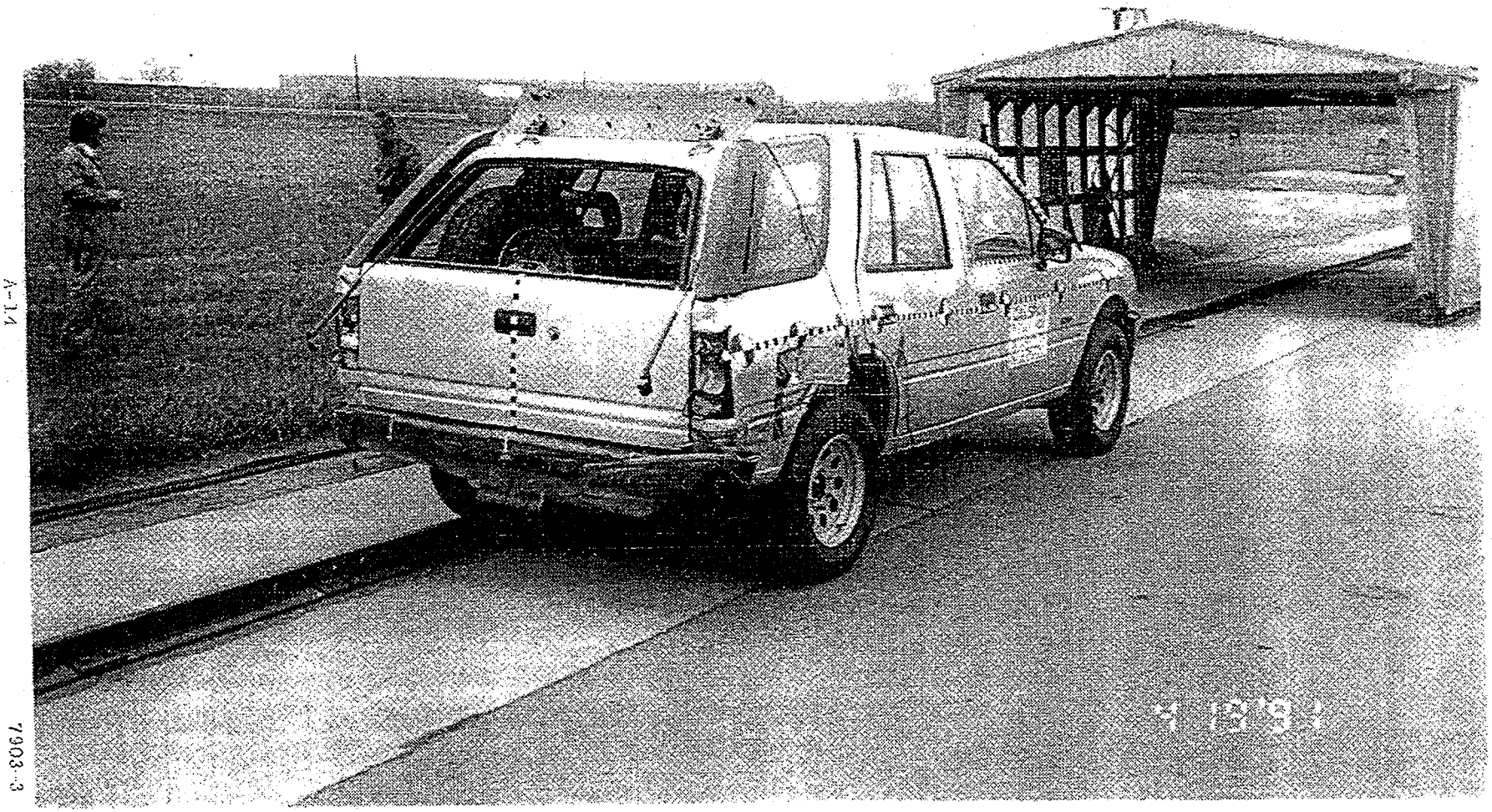


Figure A-12 POST-TEST RIGHT REAR THREE QUARTER VIEW

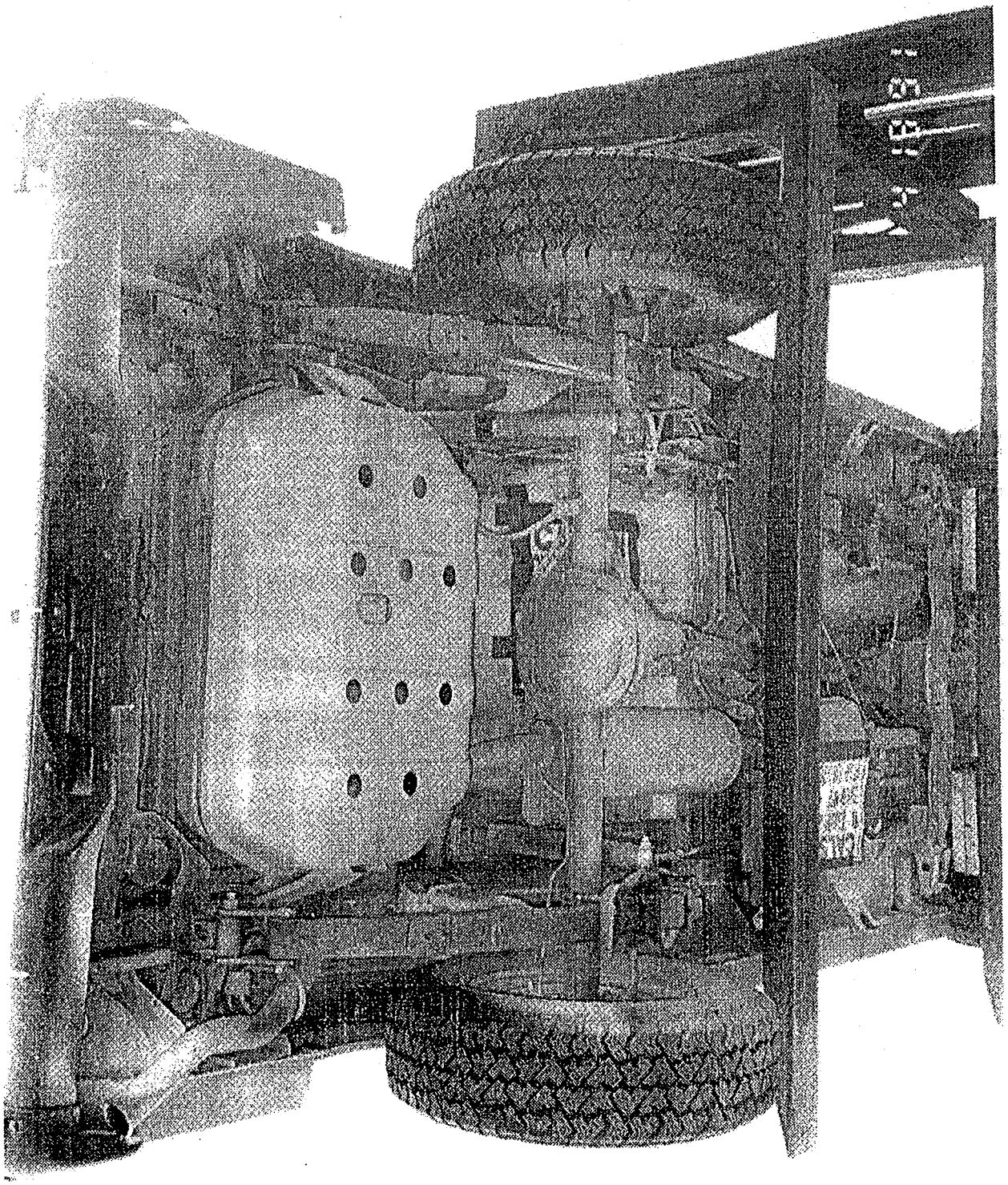


FIGURE A-13 PRE-TEST REAR UNDERBODY VIEW

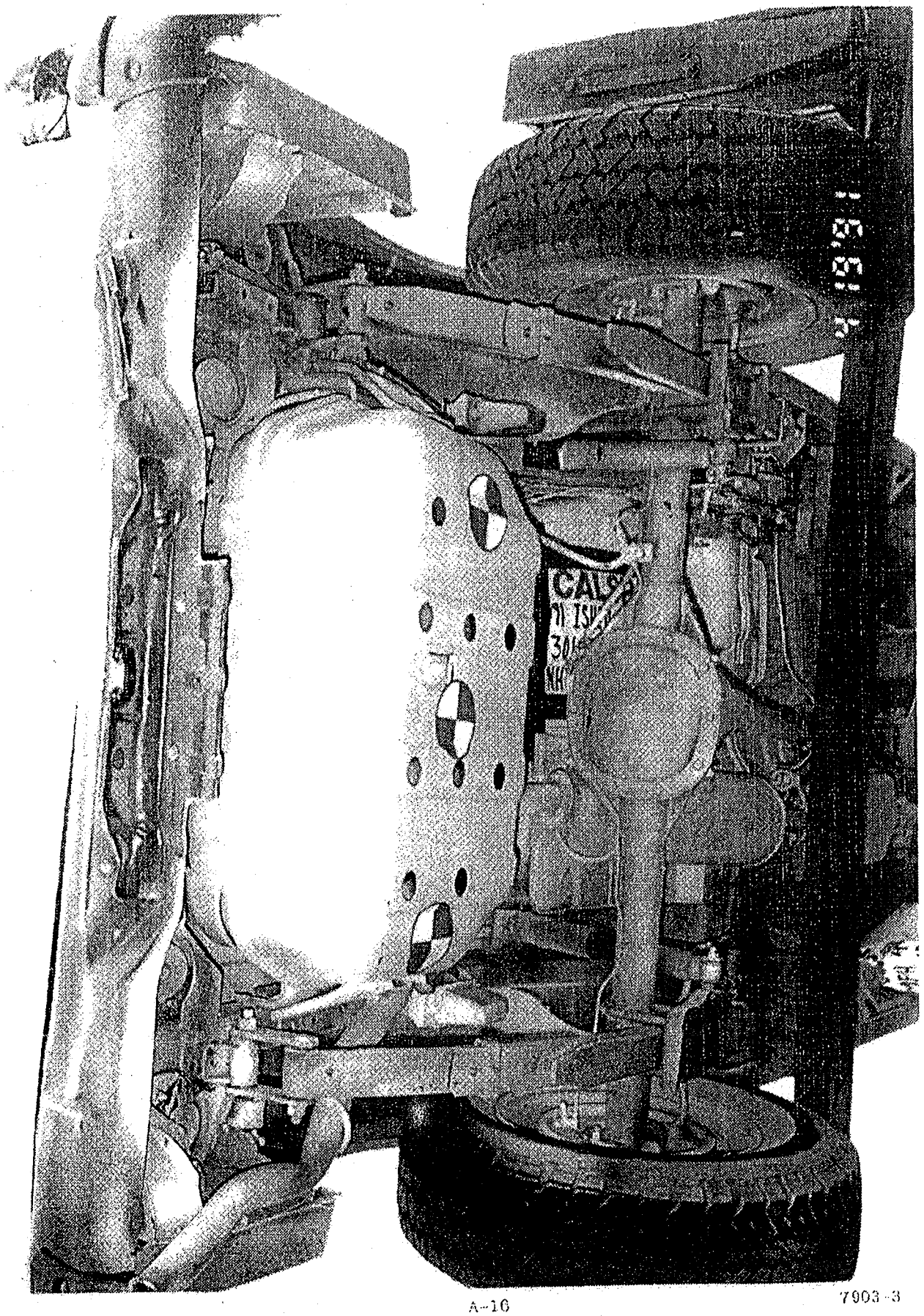


FIGURE A-12 POST-TEST KIA UNDERBODY VIEW

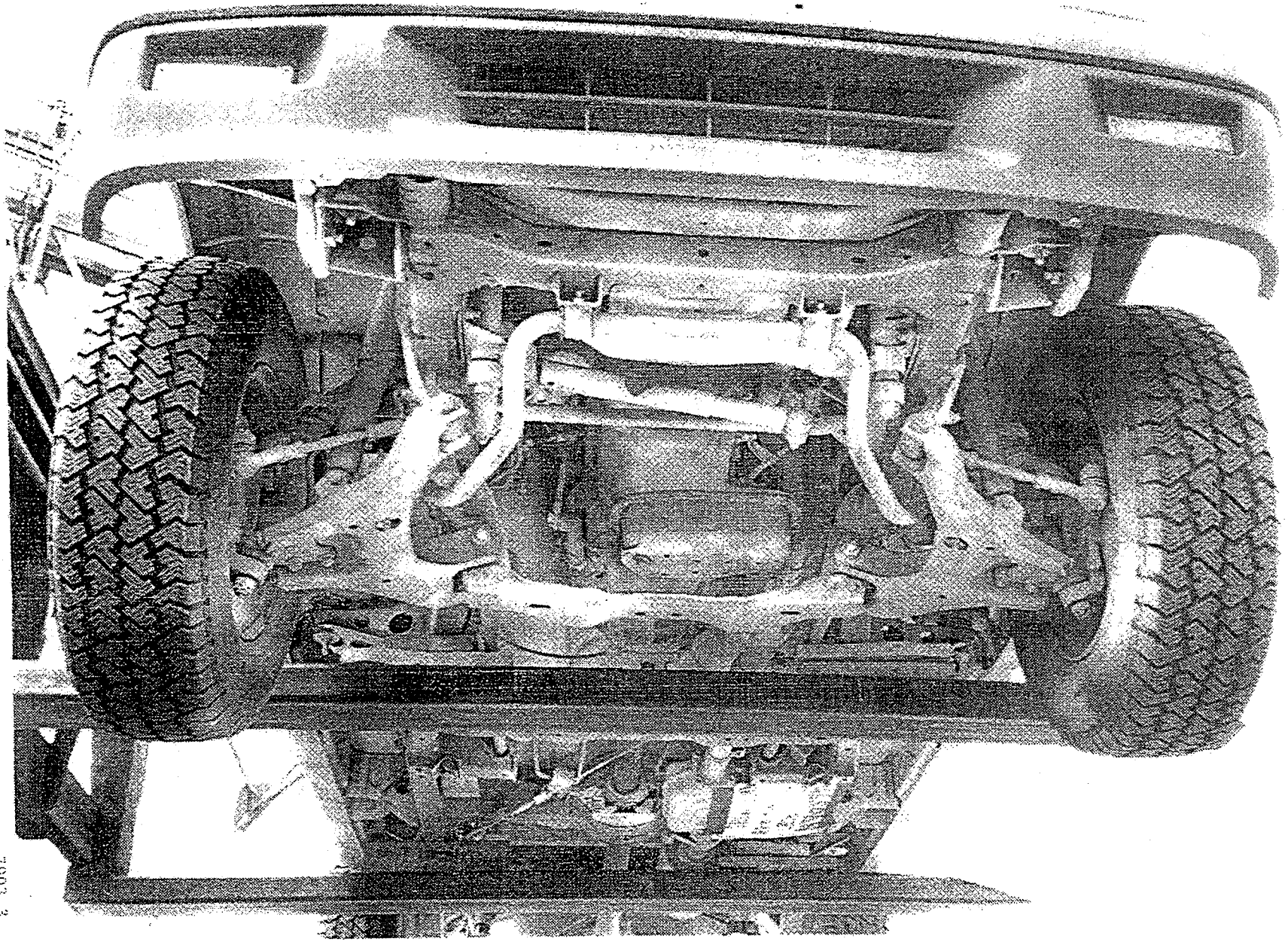
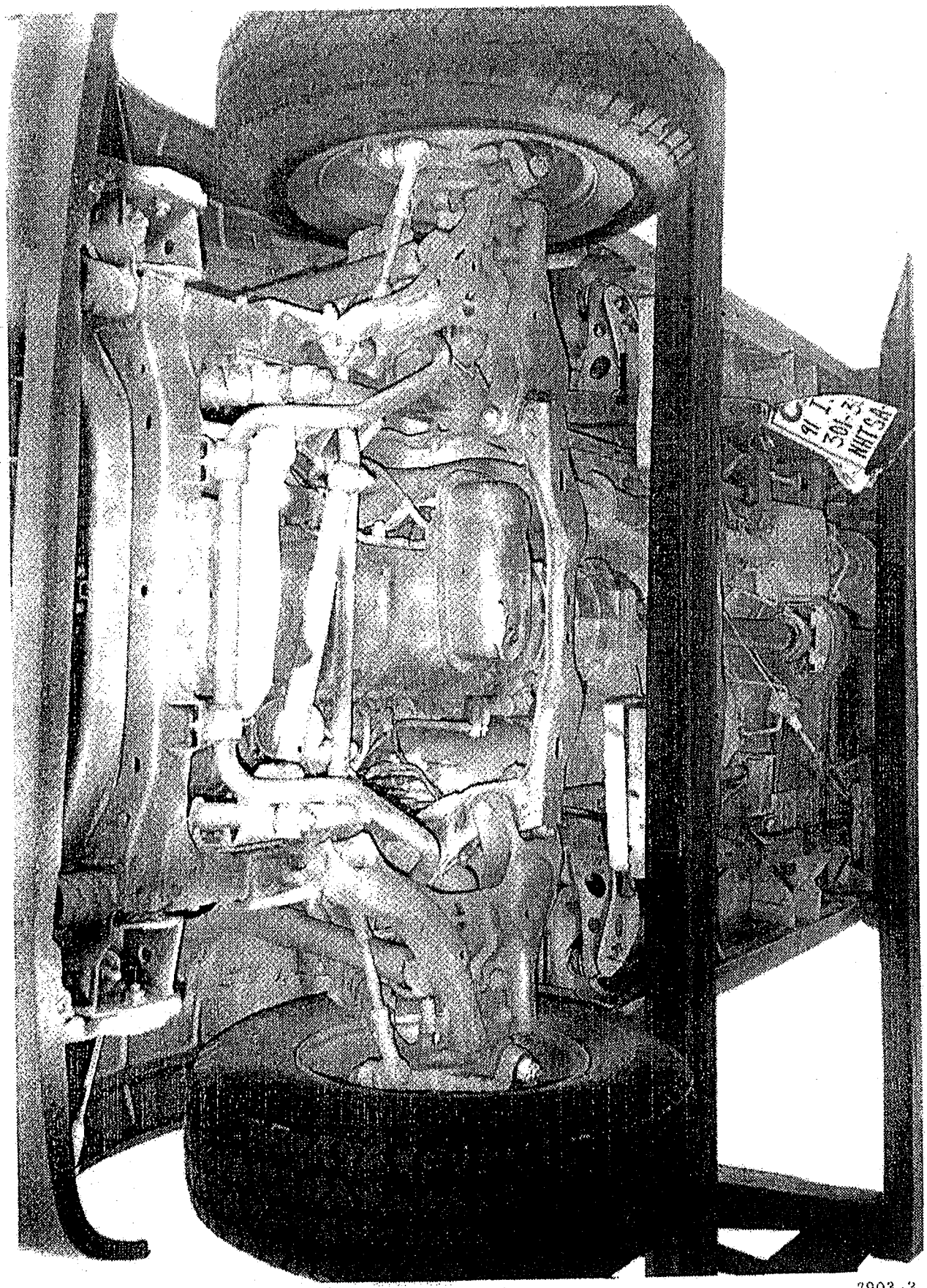


Figure 3.18 PRE-TEST FRONT UNDERBODY VIEW



7903-3

Figure A-17 PHOTOGRAPH OF [illegible]

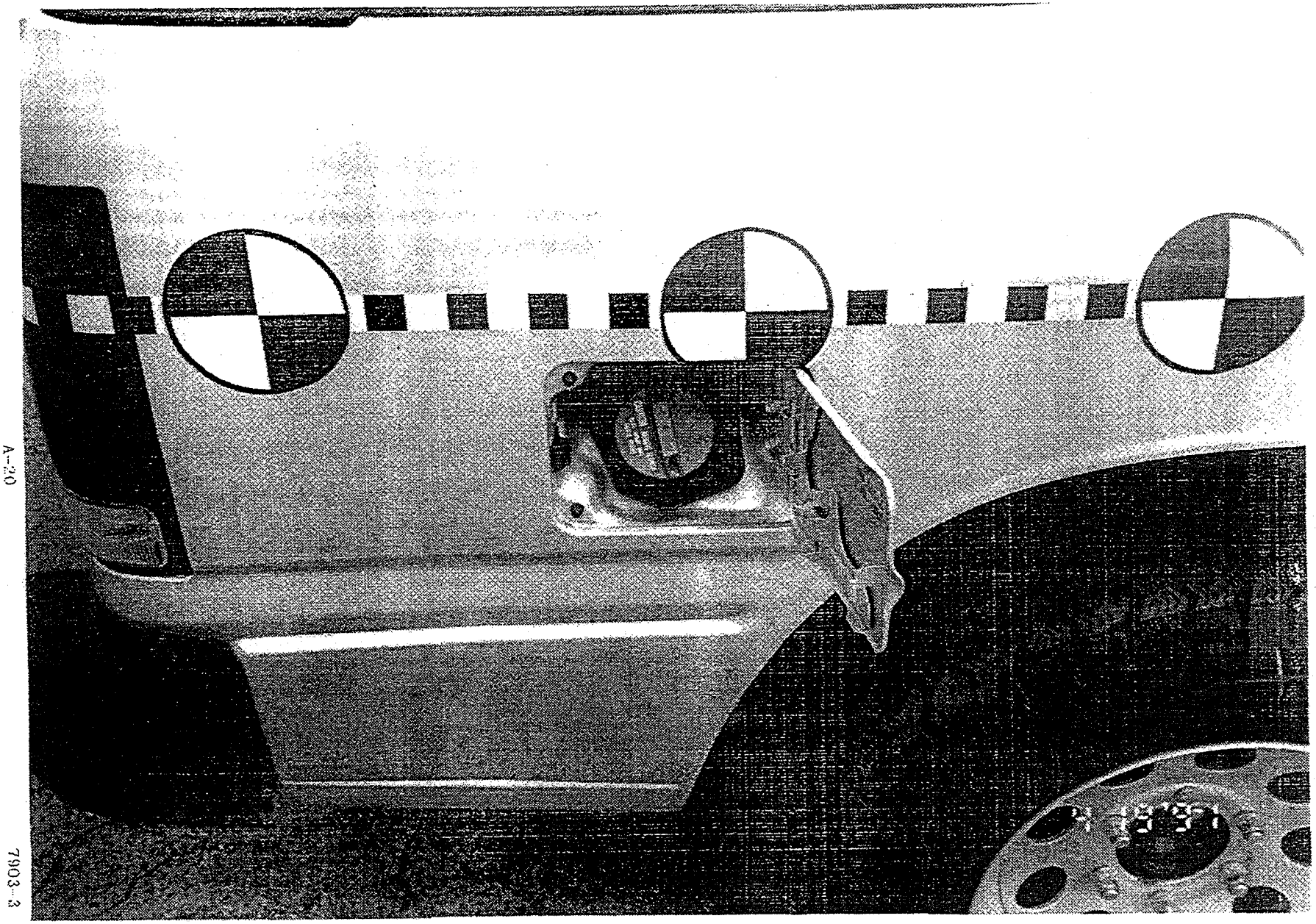


Figure A-15 PRE-TEST VIEW OF FUEL FILL CAP

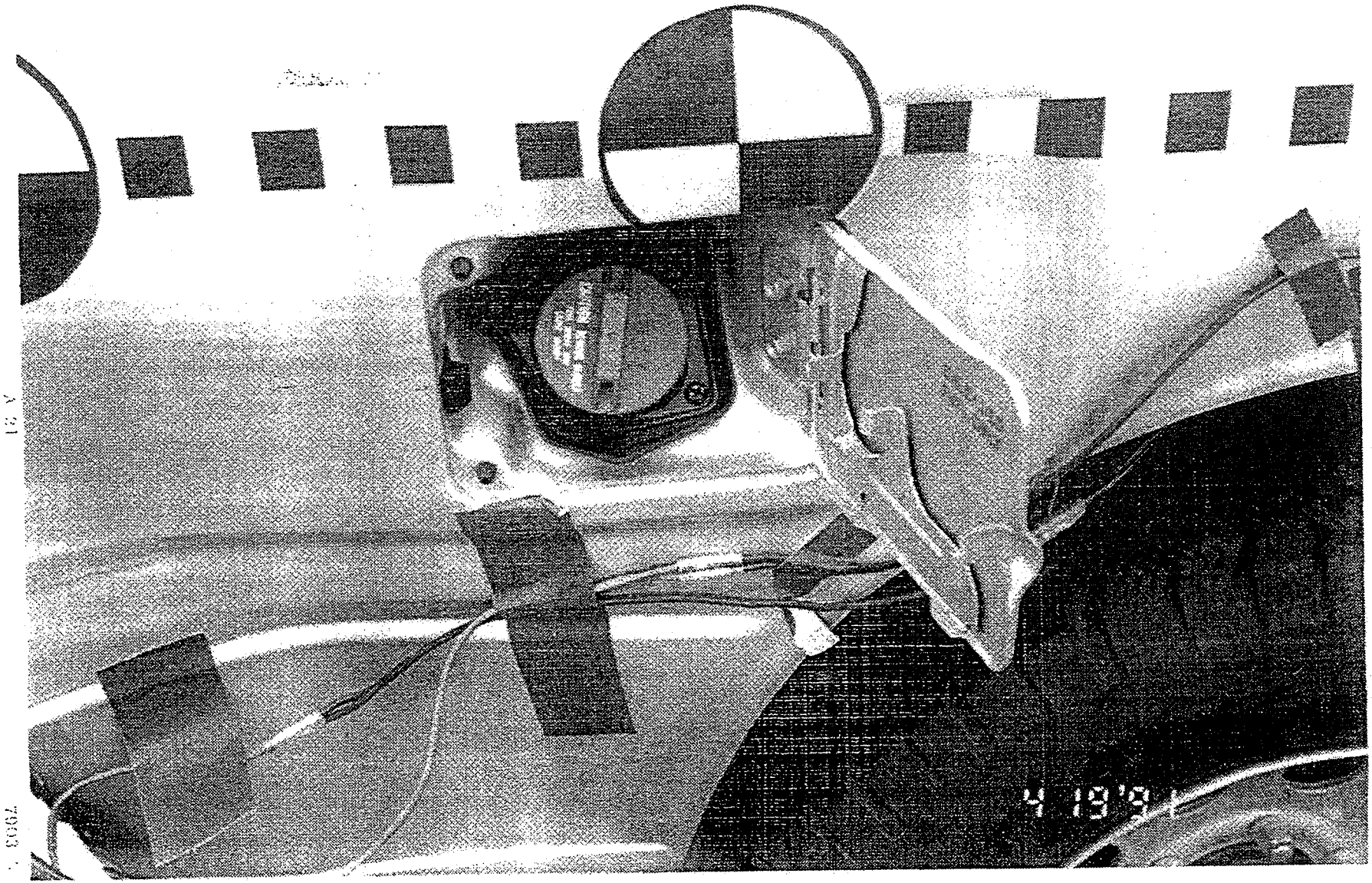


FIGURE A-10 POST-TEST VIEW OF FUEL FILL CAP

Figure A-20 PRE-TEST CONFIGURATION

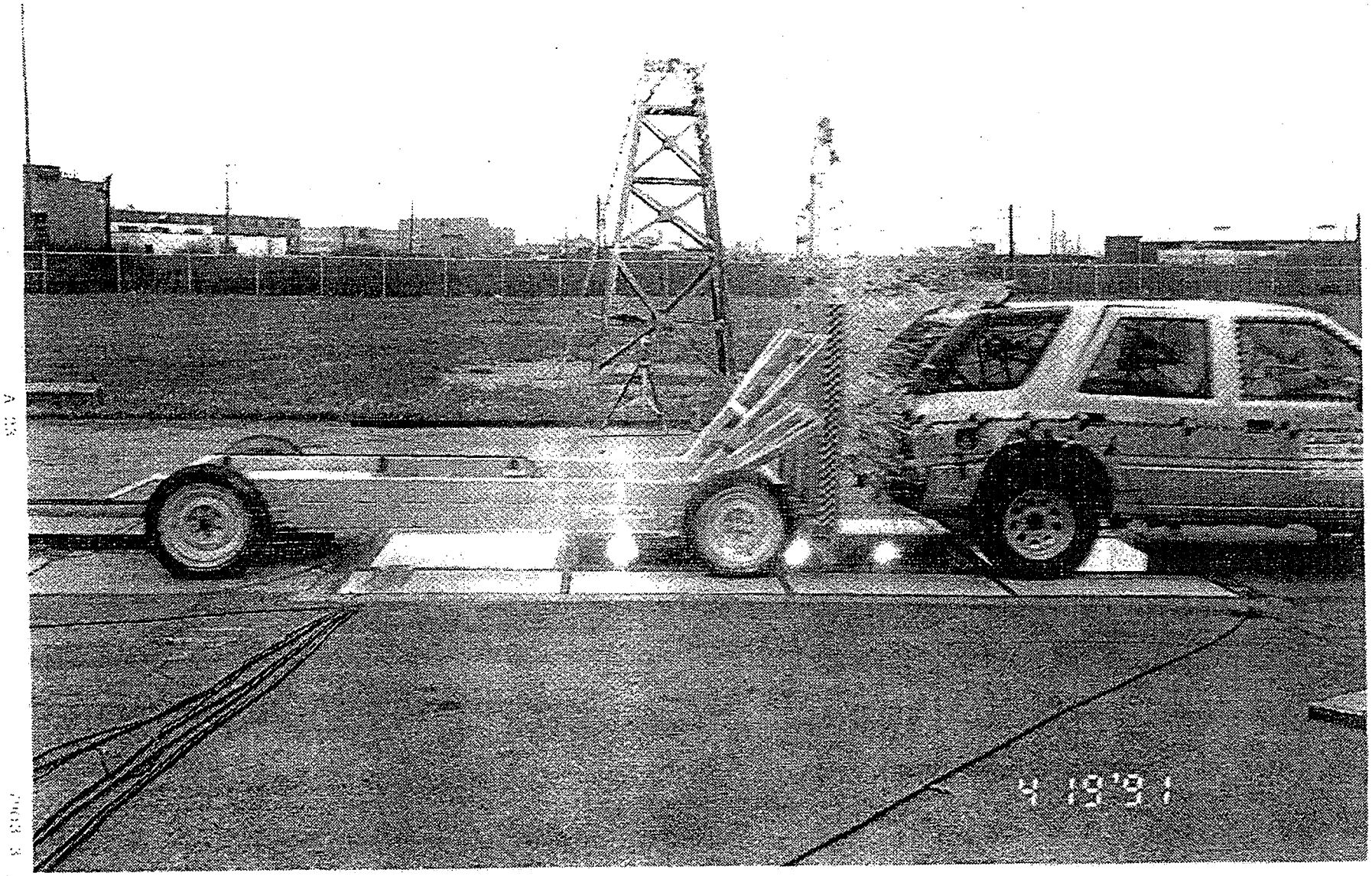


Figure A-21 IMPACT VIEW

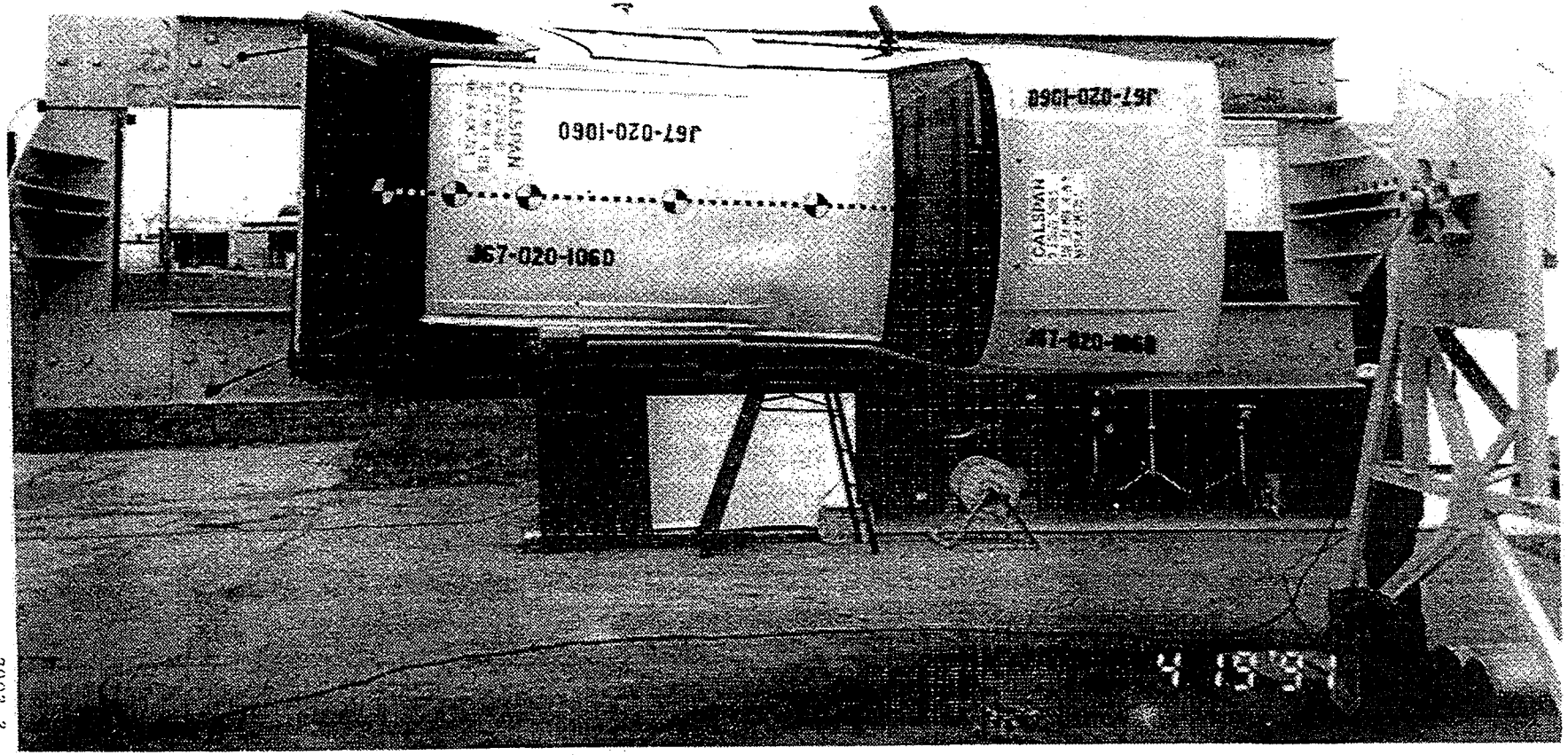


Figure A-22. STATIC ROLLOVER TEST, 90° ORIENTATION

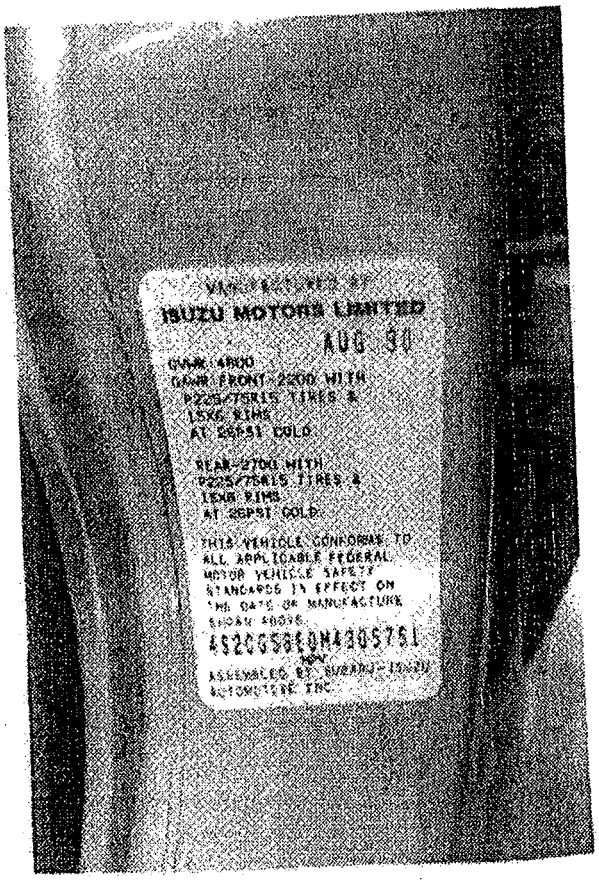


Figure A 23 CERTIFICATION STICKER/TIRE PLACARD

Z95-00145

REPORT NUMBER: 301-CAL-95-20

SAFETY COMPLIANCE TESTING FOR FMVSS 301 FUEL SYSTEM INTEGRITY

ISUZU MOTORS LIMITED
1995 HONDA PASSPORT
MPV

NHTSA NUMBER: CS5304

CALSPAN TEST NUMBER: 8247-20

CALSPAN CORPORATION
ADVANCED TECHNOLOGY CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225

May 2, 1995

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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Prepared By: Lawrence Q. Valvo, Project Engineer

Approved By: David J. Travale, Program Manager
Transportation Sciences Center

Approval Date: May 17, 1995

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By:

Acceptance Date: 6/1/95

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
301-CAL-95-20		

4. Title and Subtitle	5. Report Date
Final Report of FMVSS301 Compliance Testing of a 1995 Honda Passport MPV NHTSA No. CS5304	May 2, 1995
	6. Performing Organization Code: CAL
7. Author(s): Lawrence Q. Valvo, Project Engineer; David J. Travale, Program Manager	8. Performing Organization Report No.: 8247-20
9. Performing Organization Name and Address: Calspan Advanced Technology Center, P.O. Box 400, Buffalo, New York 14225	10. Work Unit No.
	11. Contract or Grant No.: DTNH22-94-C-01136
12. Sponsoring Agency Name and Address: U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance (NEF-30), 400 Seventh St , S.W., Rm. 6115, Washington, D.C. 20590	13. Type of Report and Period Covered: Final Test Report
	14. Sponsoring Agency Code: NEF-30

15. Supplementary Notes

16. Abstract

Compliance tests were conducted on the subject 1995 Honda Passport MPV in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-301-01 for the determination of FMVSS 301 compliance. Test failures identified were as follows:

The test vehicle appeared to comply with all requirements of FMVSS 301 "Fuel System Integrity."

17. Key Words	18. Distribution Statement
Compliance Testing Safety Engineering FMVSS 301	Copies of this report are available from: NHTSA Technical Reference Division Room 5108 (NAD-52), 400 Seventh , S.W., Washington, D.C. 20590 Telephone No. (202) 366-4946

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	87	

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Section 1

PURPOSE OF COMPLIANCE TEST

This 30 mph rear moving barrier impact test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 301 Compliance Test Program conducted for the National Highway Traffic Safety Administration (NHTSA) by Calspan Advanced Technology Center under Contract No. DTNH22-94-C-01136. The purpose of this test was to determine if the subject vehicle, a 1995 Honda Passport MPV, meets the performance requirements of FMVSS No. 301, "Fuel System Integrity." This compliance test was conducted using the requirements found in the OVSC Laboratory Test Procedure No. TP-301-01, dated March 28, 1994.

Section 2

COMPLIANCE TEST RESULTS SUMMARY

A 4480 pound 1995 Honda Passport MPV was impacted from the rear by a 3959 pound moving barrier at a velocity of 29.9 mph. The test was performed by the Calspan Corporation Advanced Technology Center on May 2, 1995.

One instrumented Part 572 E and one non-instrumented Part 572 B, 50th percentile male Anthropomorphic Test Device (ATD) were placed in the driver and right-front passenger seating positions respectively. Additional ballast (14 pounds) was secured in the vehicle rear seat area.

Average longitudinal crush was 7.4 inches. Pre- and post-test photographs of the vehicle can be found in appendix A.

The 21.2 gallon fuel tank was filled to 94.0 percent capacity with orange Stoddard fluid prior to the impact. After the impact, there was no fluid leakage for the first 30 minutes nor during any phase of the rollover test. The vehicle appeared to comply with all the requirements of FMVSS No. 301 "Fuel System Integrity." Section 3 presents the results of these tests.

The crash event was recorded by one real-time and eight high-speed cameras. Camera locations and other pertinent camera information are found on pages 3-9 and 3-10 of this report.

Table 1

CRASH TEST SUMMARY

Vehicle NHTSA No.: CS5304 Test Mode: 30 mph Rear Barrier

Test Date: May 2, 1995 Time: 15:25 Temperature : 63 °F

Vehicle Make/Model/Body Style: 1995 Honda Passport MPV

Vehicle Test Weight: 4480 lbs Impact Velocity: 29.9 mph

Static Crush: Left Side = 7.0 inches

Right Side = 7.5 inches

Centerline = 7.8 inches

Average Crush: 7.4 inches

TYPE OF FRONT OCCUPANT RESTRAINT SYSTEM INSTALLED IN TEST VEHICLE:

Driver's DSP: 3 point belt system

Right Passenger's DSP: 3 point belt system

VISIBLE DUMMY CONTACT POINTS:

Driver: Back of head with top of headrest, ATD back with seatback.

Passenger: Back of head with top of headrest, ATD back with seatback.

DOOR OPENING DATA: Closed/Operable - Left Front

Closed/Operable - Right Front

Stoddard Solvent Spillage from Vehicle's Fuel System: None

Remarks: Rear window and left side rear window shattered at impact. Both seatbacks moved to full rear position and twisted inward during the impact. Both front seat recline mechanisms remained operable after the test.

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1995 Honda Passport MPV

NHTSA No.: CS5304 ; VIN: 4S6CY58V2S4406041 ; Color: Black

Engine Data: 6 cylinders; - CID; 3.2 Liters; - cc

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

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

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

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

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

Date Received: 3-27-95 ; Odometer Reading 000214 miles

Selling Dealer: Honda of Ithaca

& Address: 316 Elmira Road Ithaca, NY 14850

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Isuzu Motors Limited

Date of Manufacture: 11/94

GVWR: 4900 lbs.; GAWR: 2300 lbs. FRONT; 2800 lbs. REAR

DATA FROM TIRE PLACARD:

Location of Placard on Vehicle: Driver side "B" pillar

Tire Pressure with Maximum Capacity Vehicle Load: 29 psi FRONT 29 psi REAR

Recommended Tire Size: P245/70R16

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

Size of Tires on Test Vehicle: P245/70R16

Type of Spare Tire: Full size

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

*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 =	996 lbs.	Right Rear =	1007 lbs.
Left Front =	1042 lbs.	Left Rear =	990 lbs.
TOTAL FRONT =	2,038 lbs.	TOTAL REAR =	1,997 lbs.

TOTAL DELIVERED WEIGHT = 4,035 lbs.

% of Total Front of Vehicle Weight = 51 % of Total Rear Weight = 49 %

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight	=	4,035 lbs.
Rated Cargo/Luggage Weight (RCLW)	=	115 lbs.
Weight of 2 p.572 Dummies, 167 & 164 lbs	=	331 lbs.
TARGET TEST WEIGHT	=	4,481 lbs.

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 114 POUNDS OF CARGO WEIGHT:

Right Front =	1206 lbs.	Right Rear =	1062 lbs.
Left Front =	1147 lbs.	Left Rear =	1065 lbs.
TOTAL FRONT =	2,353 lbs.	TOTAL REAR =	2,127 lbs.

TOTAL TEST WEIGHT = 4,480 lbs.

% of Total Front Weight = 53 % % of Total Rear Weight = 47 %

* Weight of Ballast Secured in Vehicle Trunk Area = 14 lbs.

Type of Ballast: Lead shot

Method of Securing Ballast: Rear seat belt anchorages

Vehicle Components Removed for Weight Reduction: None

VEHICLE ATTITUDE (all dimension in inches):

AS DELIVERED:	RF	37.3	LF	37.0	RR	37.6	LR	37.4
AS TESTED:	RF	36.4	LF	35.9	RR	37.1	LR	36.8

Vehicle's Wheel Base: 108.9 in.

Location of Vehicle's C.G.: 51.7 inches rearward of front wheel center.

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 21.9 gallons

Usable Capacity Figure Furnished by COTR = 21.2 gallons

Test Volume Range (91 to 94% of Usable Capacity) = 19.3 to 19.9 gallons

ACTUAL TEST VOLUME= 19.9 gallons (with entire fuel system filled)

* Ballast weight includes the RCLW, the weight of drained vehicle fluids and the weight of any removed vehicle components less the weight of onboard instrumentation, cameras, and hardware.

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

FUEL SYSTEM DATA (continued):

Test Fluid Type:	Stoddard solution	
Test Fluid Specific Gravity:	0.764	
Test Fluid Kinematic Viscosity:	0.96	centistokes
Test Fluid Color:	Orange	("red" is preferred)
Type of Vehicle Fuel Pump:	Electric	

Electric Fuel Pump Operation with Ignition Switch ON and Engine OFF - Fuel pump operated.

Details of Fuel System: The fuel filler is located on the right side of the vehicle aft of the rear axle. The fuel lines are located on the right side of the vehicle's underbody.

Table 3

POST IMPACT DATA

TYPE OF TEST:

Type of Test: Rear Barrier Impact Angle: 0°

Test Date: May 2, 1995 Time: 15:25 Temperature: 63 °F

Vehicle NHTSA No.: CS5304

Required Impact Velocity Range: 28.9 to 29.9 mph

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

Trap No. 1 = 29.9 mph; Trap No. 2 = 29.9 mph

Average Impact Speed = 29.9 mph

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

Vehicle Length:

Pre-Test	Right	=	174.3	; C/L	=	175.3	;Left =	174.3
Post-Test	Right	=	166.8	; C/L	=	167.5	;Left =	167.3
Crush	Right	=	7.5	; C/L	=	7.8	;Left =	7.0
AVERAGE		=	7.4	inches				

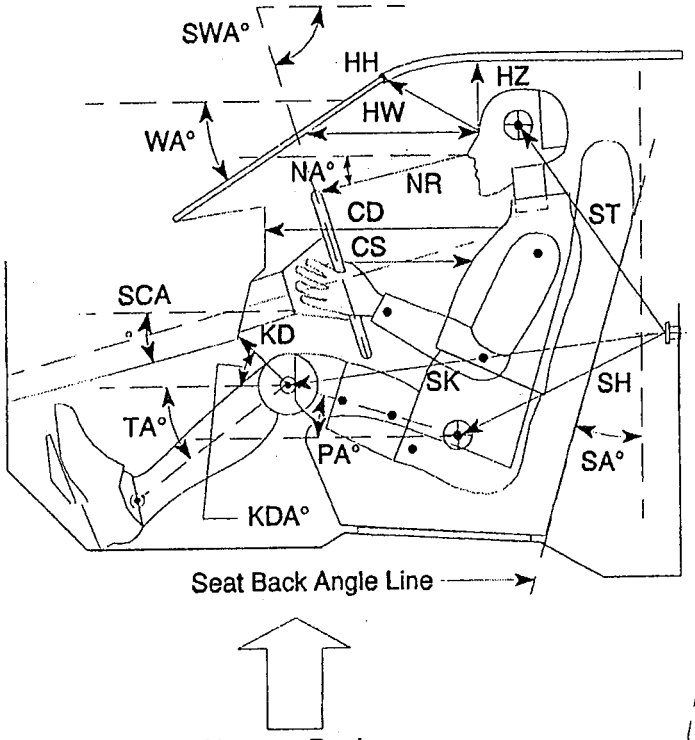
Section 3

COMPLIANCE TEST DATA

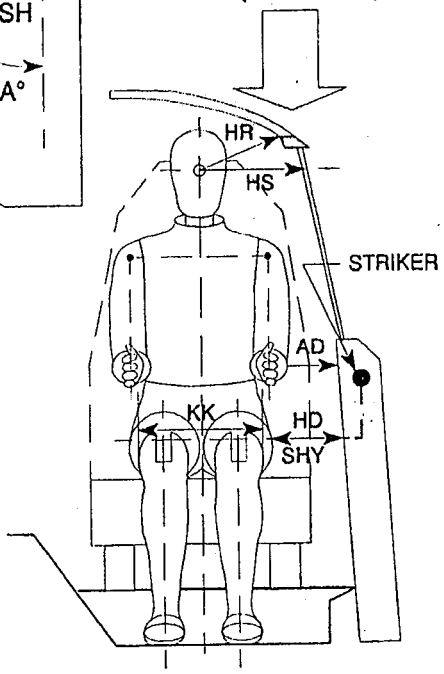
Figure 1

PART 572 DUMMY IN-VEHICLE POSITION
(FOR REAR IMPACTS ONLY)

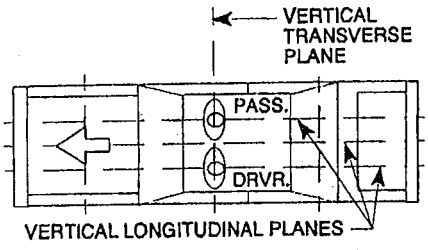
DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



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



CD - Chest to Dash
CS - Steering Wheel to Chest
HH - Head to Header
HW - Head to Windshield
HZ - Head to Roof
KDA- Knee to Dash Angle
KDL - Left Knee to Dash
KDR- Right Knee to Dash
NA - Nose to Rim Angle
NR - Nose to Rim
PA - Pelvic Angle
RA - Rim to Abdomen
SA - Seat Back Angle
SCA- Steering Column Angle
SH - Striker to H-Point
SK - Striker to Knee
ST - Striker to Head
SWA- Steering Wheel Angle
TA - Tibial Angle
WA - Windshield Angle



8247-20

Table 4

FRONT SEAT OCCUPANT MEASUREMENTS
(FOR REAR IMPACT ONLY)

	DRIVER (Serial #259)
WA°	37 deg.
SWA°	66 deg.
SCA°	24 deg.
SA°	23 deg.
HZ	8.1
HH	15.5
HW	22.0
HR	10.5
NR	16.0 Angle -14 deg.
CD	21.1
CS	12.9
RA	8.4
KDL	8.2 Angle (KDA) 9 deg.
KDR	8.5
PA°	22 deg.
TA°	-46 deg.
KK	11.7
ST	24.0 Angle 74 deg.
SK	25.5 Angle 4 deg.
SH	11.2 Angle -19 deg.
SHY	8.1
HS	12.3
HD	4.4
AD	4.0

Table 5
FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

FMVSS NO. 301

TEST VEHICLE NHTSA NO.: CS5304 TEST DATE: May 2, 1995

Vehicle Mfgr./Make/Model: 1995 Honda Passport MPV

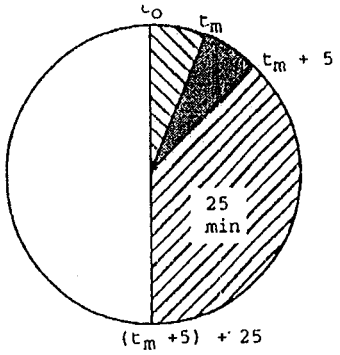
Test vehicle fuel tank filled to 91% to 94% of manufacturer's "usable" capacity and with electric fuel pump operating (if it will operate without engine operation). Part 572 test dummies located at each front designated seating position.

****

TEST VEHICLE IMPACT TYPE:

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

FUEL SPILLAGE MEASUREMENT:



1. From impact until vehicle motion ceases
2. For five 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:

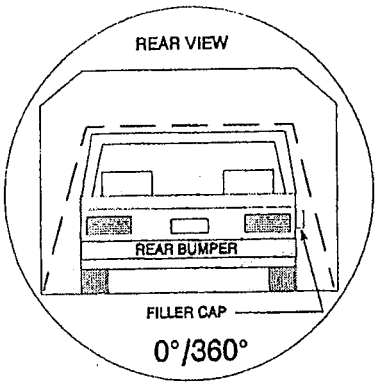
None

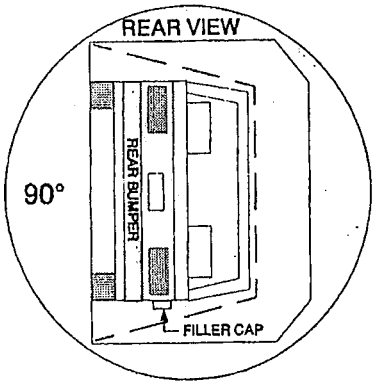
Table 6

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE :
0-90 Deg.

Vehicle NHTSA ID No. :
CS5304





I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)		1	minutes	54	seconds
FMVSS 301 Position Hold Time +		5	minutes	00	seconds
	TOTAL	6	minutes	54	seconds
Next whole minute interval		7	minutes		

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 minutes 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.

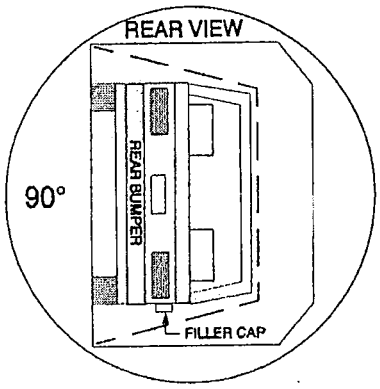
IV. SOLVENT SPILLAGE LOCATION(S):

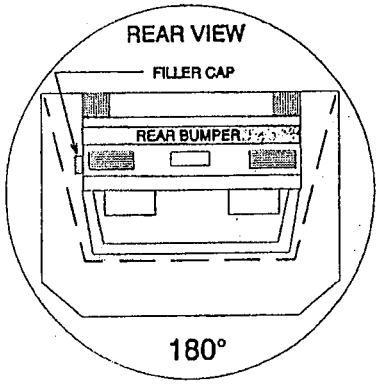
None

Table 6
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE :
90-180 Deg.

Vehicle NHTSA ID No. :
CS5304





I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)		2	minutes 17	seconds
FMVSS 301 Position Hold Time +		5	minutes 00	seconds
	TOTAL	7	minutes 17	seconds
Next whole minute interval		8	minutes	

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 minutes 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):

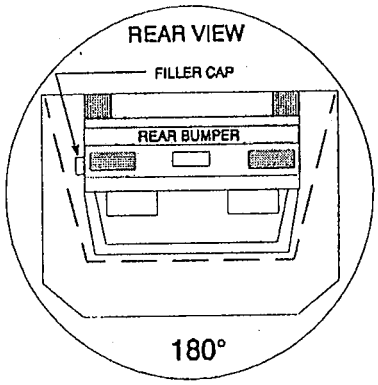
None

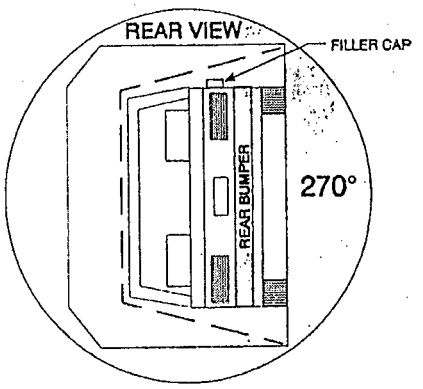
Table 6

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

TEST PHASE :
180-270 Deg.

Vehicle NHTSA ID No. :
CS5304





I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

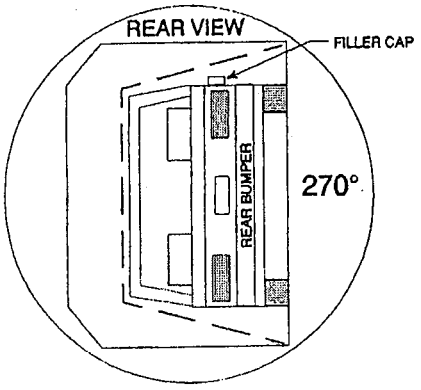
None

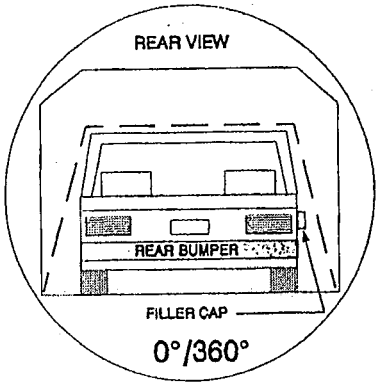
Table 6

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

TEST PHASE :
270-360 Deg.

Vehicle NHTSA ID No. :
CS5304





I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)		1	minutes	57	seconds
FMVSS 301 Position Hold Time +		5	minutes	00	seconds
	TOTAL	6	minutes	57	seconds
Next whole minute interval		7	minutes		

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 minutes 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

Figure 2

CAMERA POSITIONS FOR REAR IMPACTS

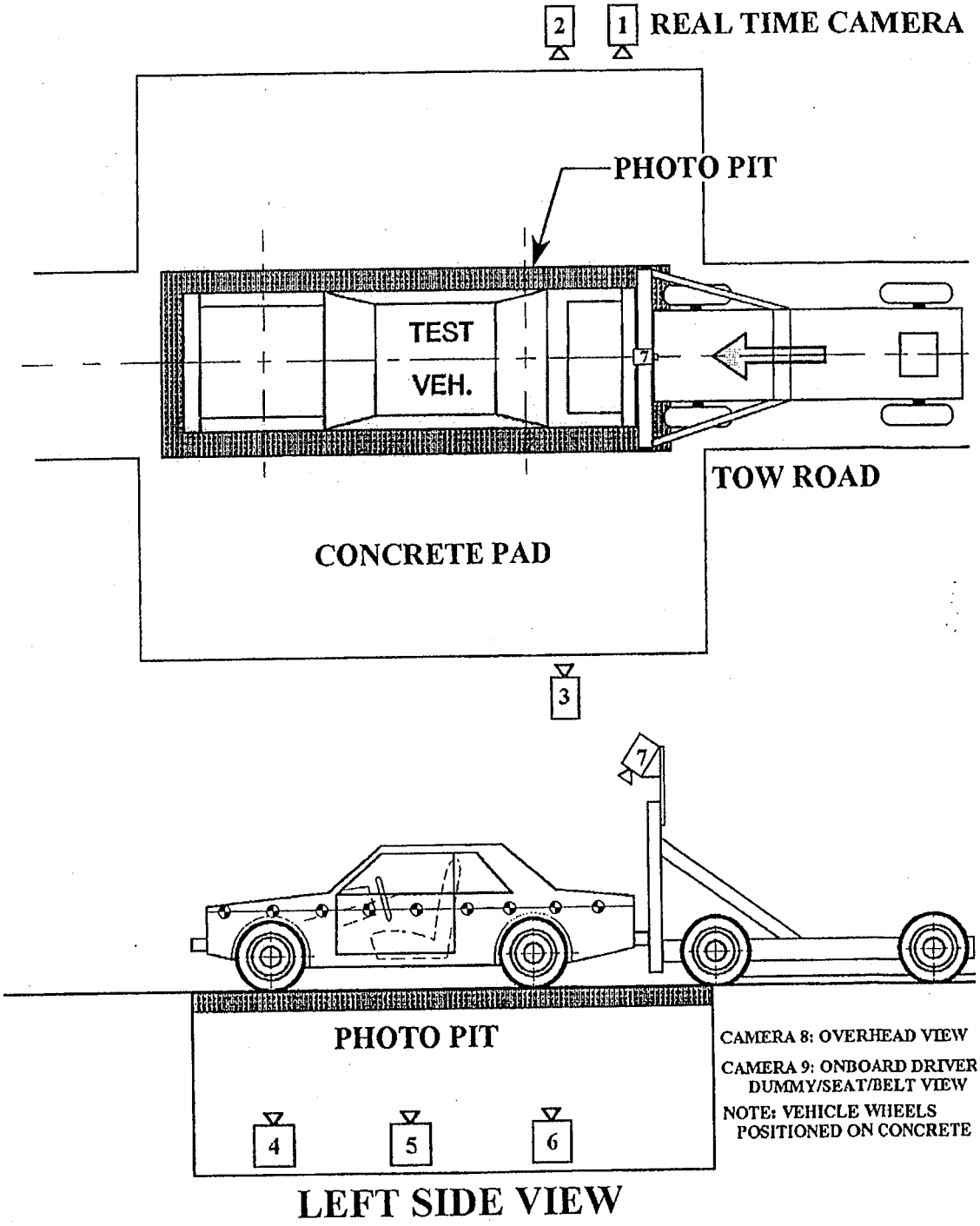


Table 7

HIGH-SPEED CAMERA LOCATIONS

NHTSA No. : CS5304 Vehicle : 1995 Honda Passport MPV

CAMERA NO.	VIEW	CAMERA POSITIONS (inches)*			ANGLE** (degrees)	LENS (mm)	SPEED (fps)
		X	Y	Z			
1	Real-Time Camera	-	-	-	-	-	24
2	Right Side View	-312	0	43	-1	13	805
3	Left Side View	410	68	44	-1	25	835
4	Vehicle Front Underbody View	0	-139	-77	90	13	750
5	Vehicle Mid-Section Underbody View	0	-89	-77	90	13	660
6	Vehicle Rear Underbody View	0	-35	-77	90	13	775
7	Moving Barrier View	0	0	99	-105	13	675
8	Overhead Overall View	-20	0	386	-90	13	850
9	Onboard Driver Dummy/Seat/Belt View	-	-	-	-	8	660

* X = film plant to monorail centerline (+ to left of of rail)
Y = film plane to impact location (+ ahead of impact location)
Z = film plane to ground (+ above ground)
** = referenced to horizontal plane

Appendix A

PHOTOGRAPHS

LIST OF PHOTOGRAPHS

Figure A-1 PRE-TEST FRONT VIEW

8247-20

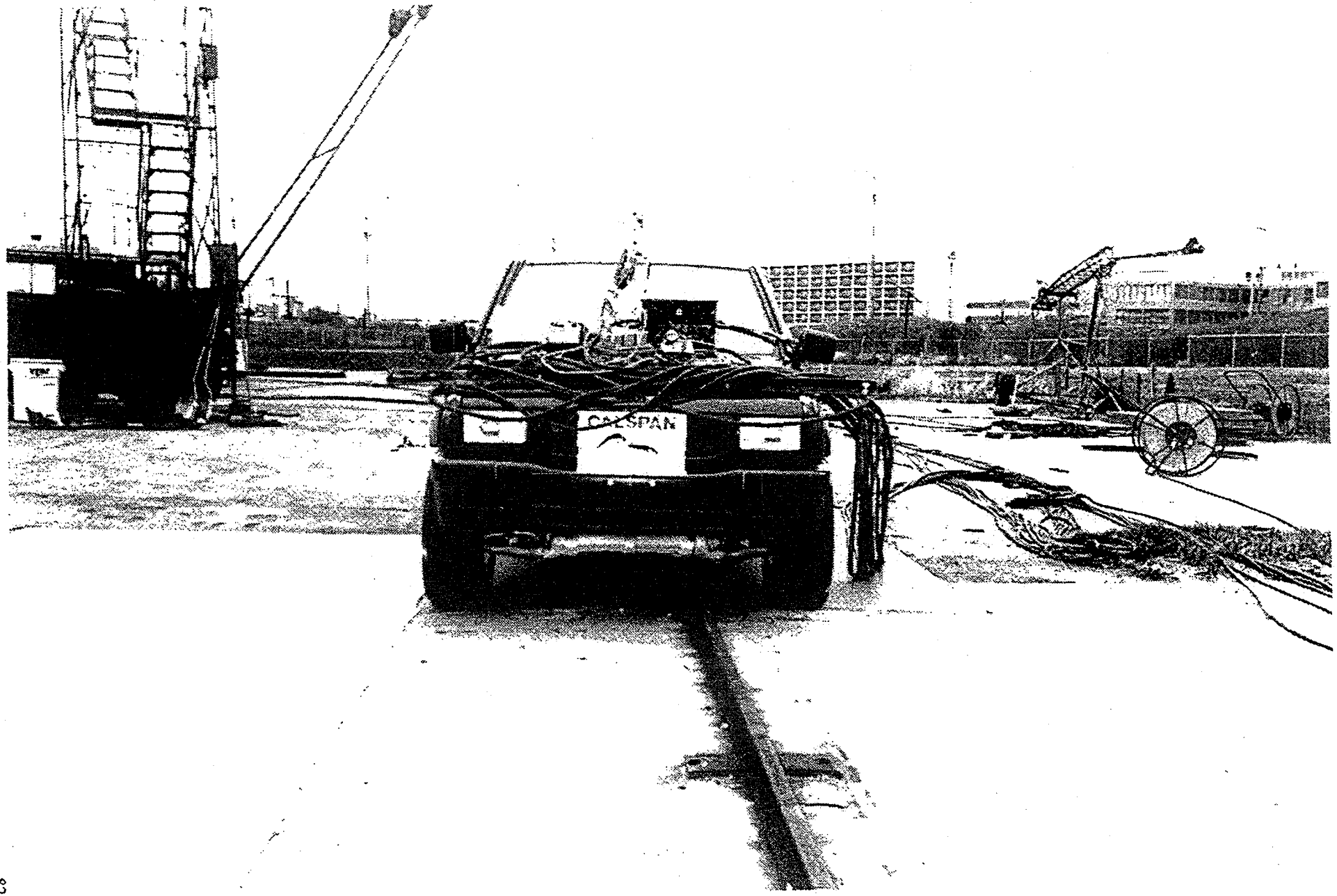


Figure A-2 POST-TEST FRONT VIEW

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

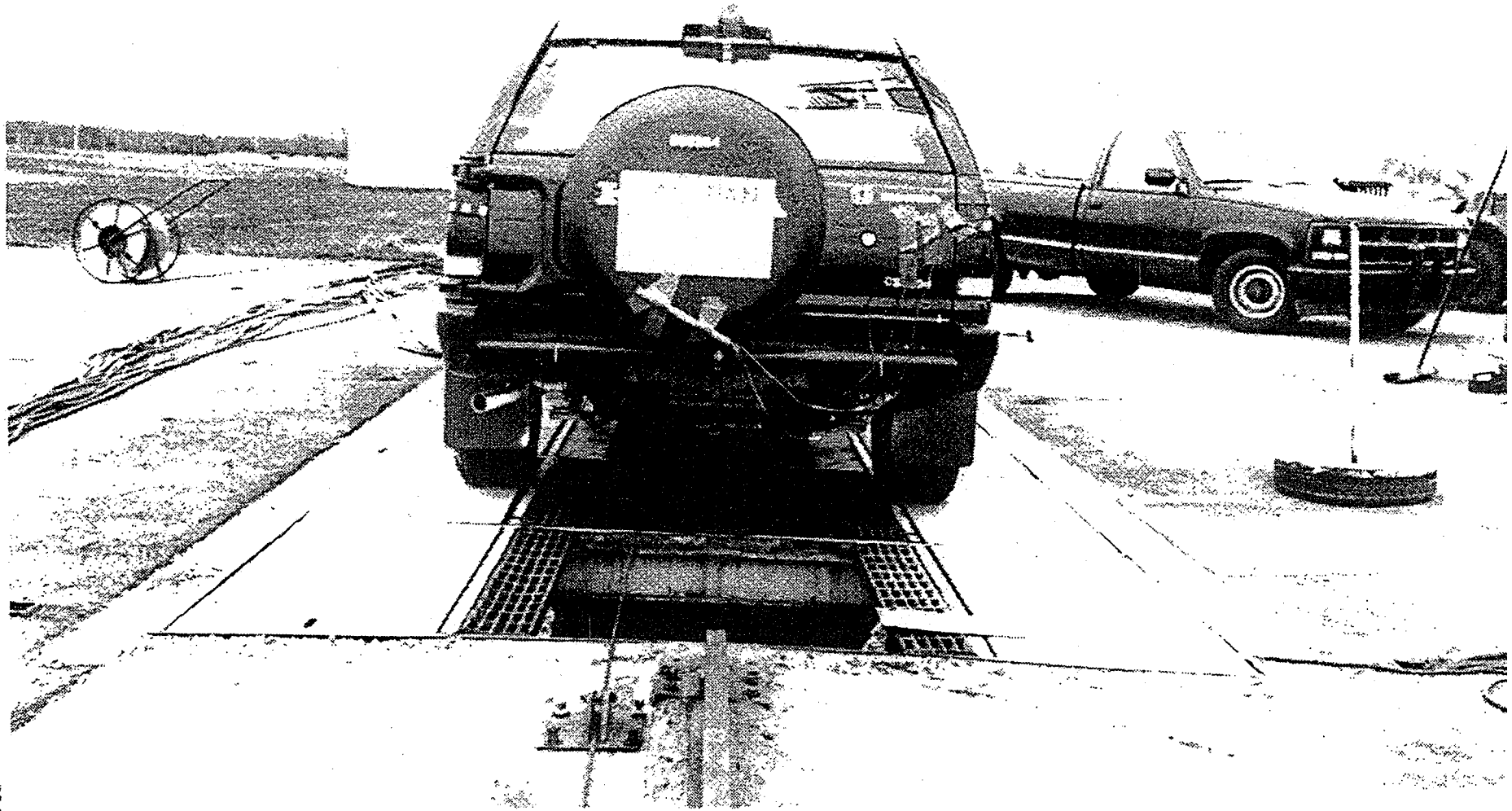


Figure A-7 PRE-TEST REAR VIEW

Figure A-8 POST-TEST REAR VIEW

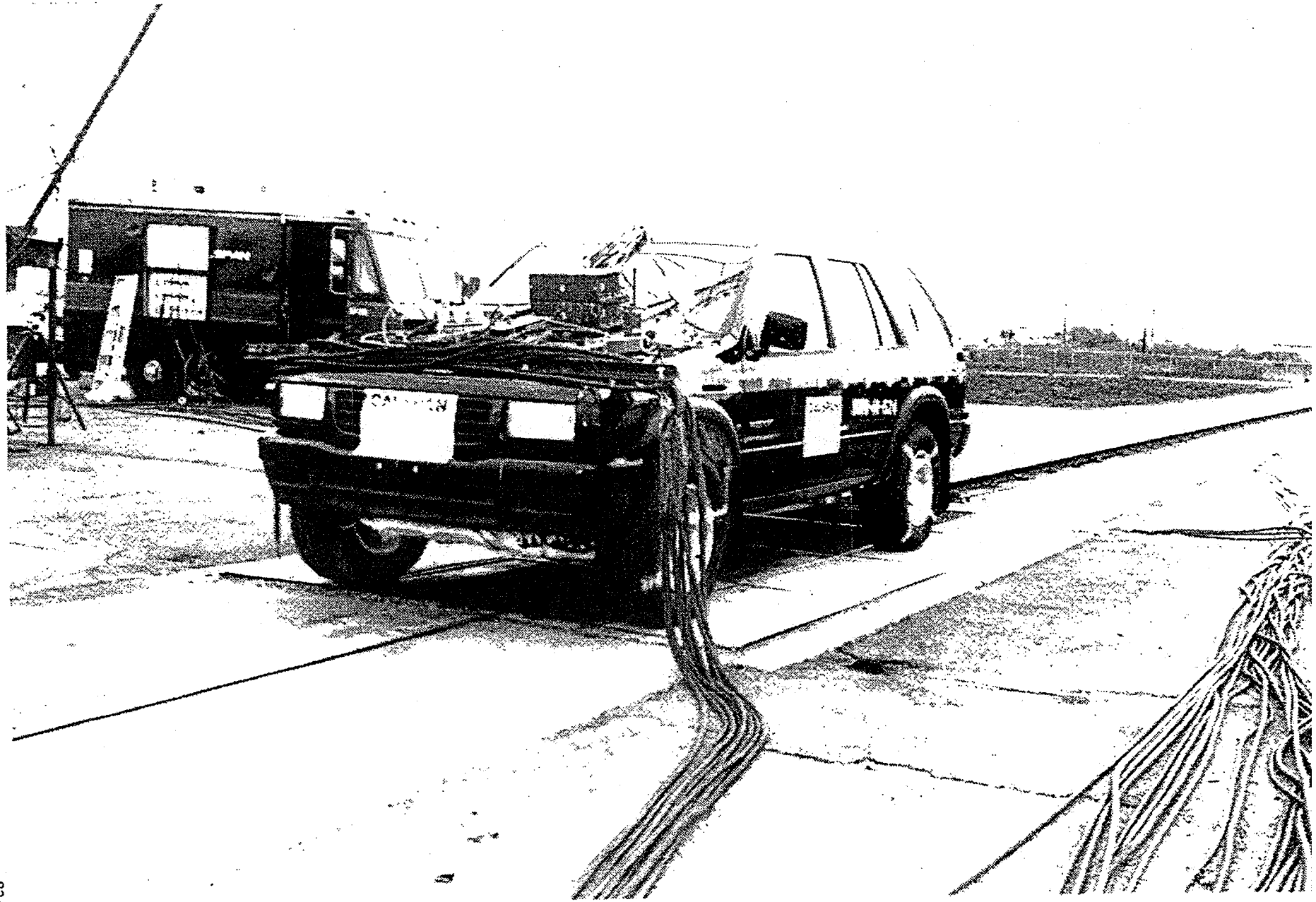


Figure A-9 PRE-TEST LEFT FRONT THREE-QUARTER VIEW

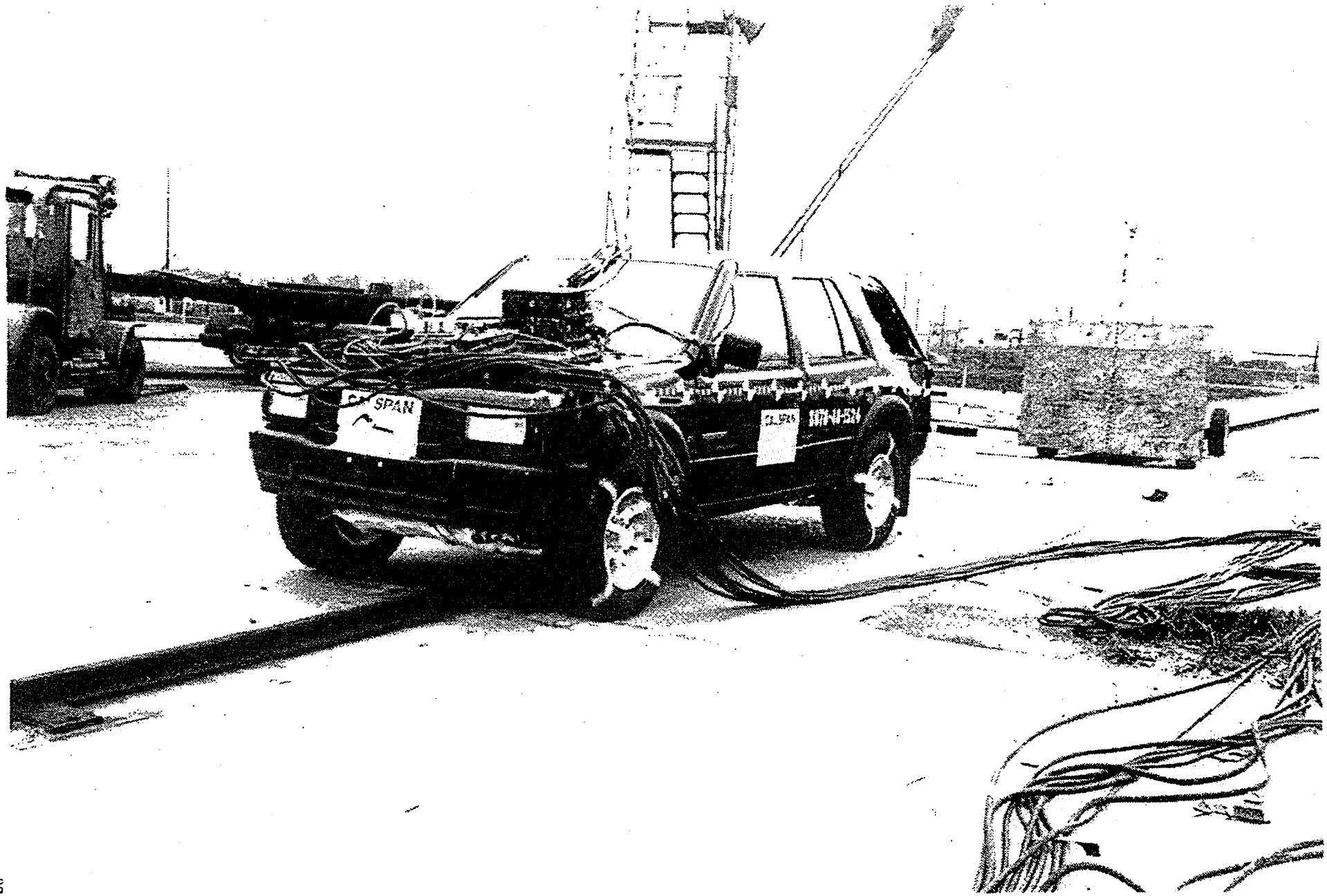


Figure A-10 POST-TEST LEFT FRONT THREE-QUARTER VIEW

Figure A-11 PRE-TEST RIGHT REAR THREE-QUARTER VIEW

8247-20

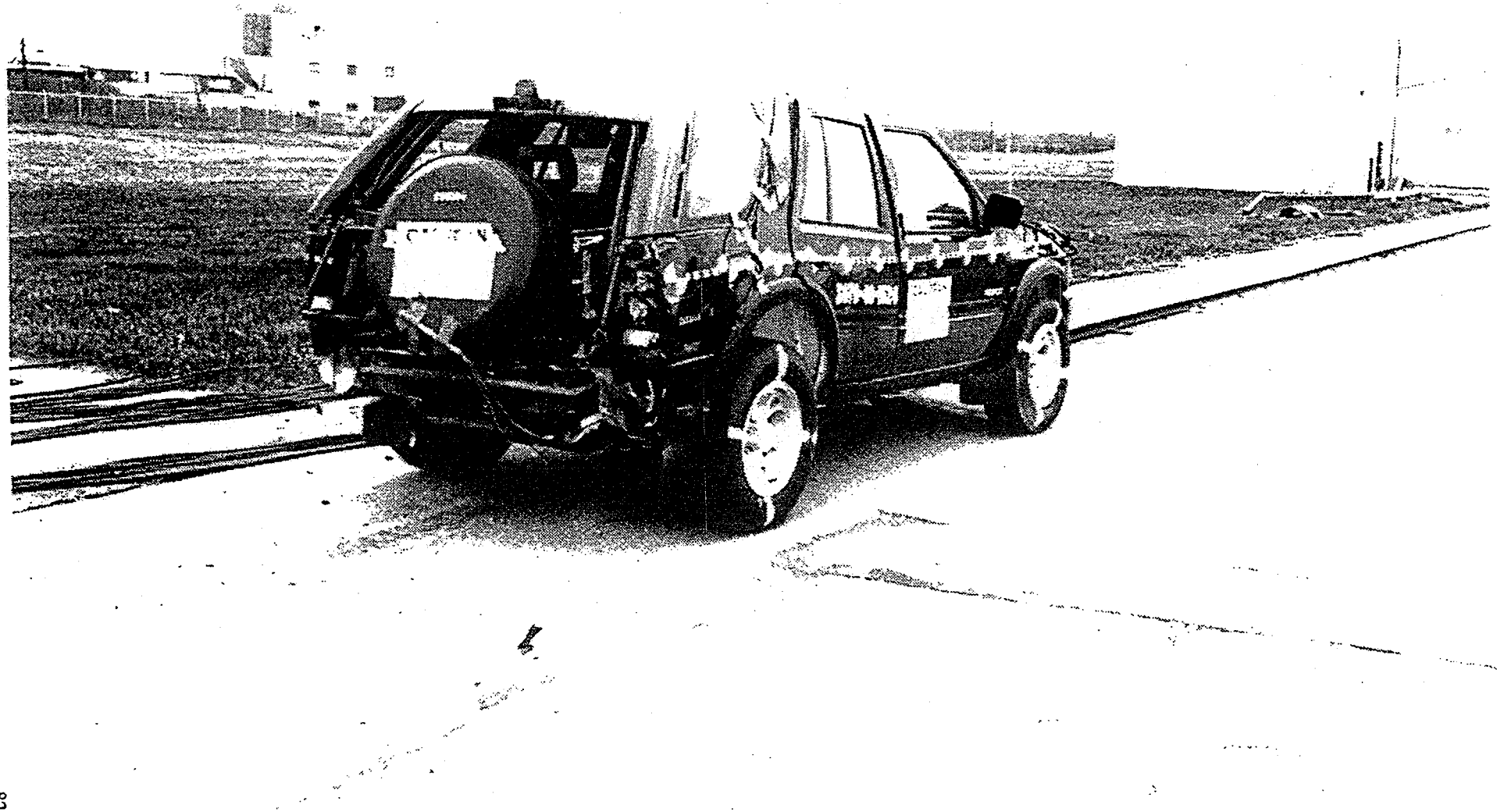


Figure A-12 POST-TEST RIGHT REAR THREE-QUARTER VIEW

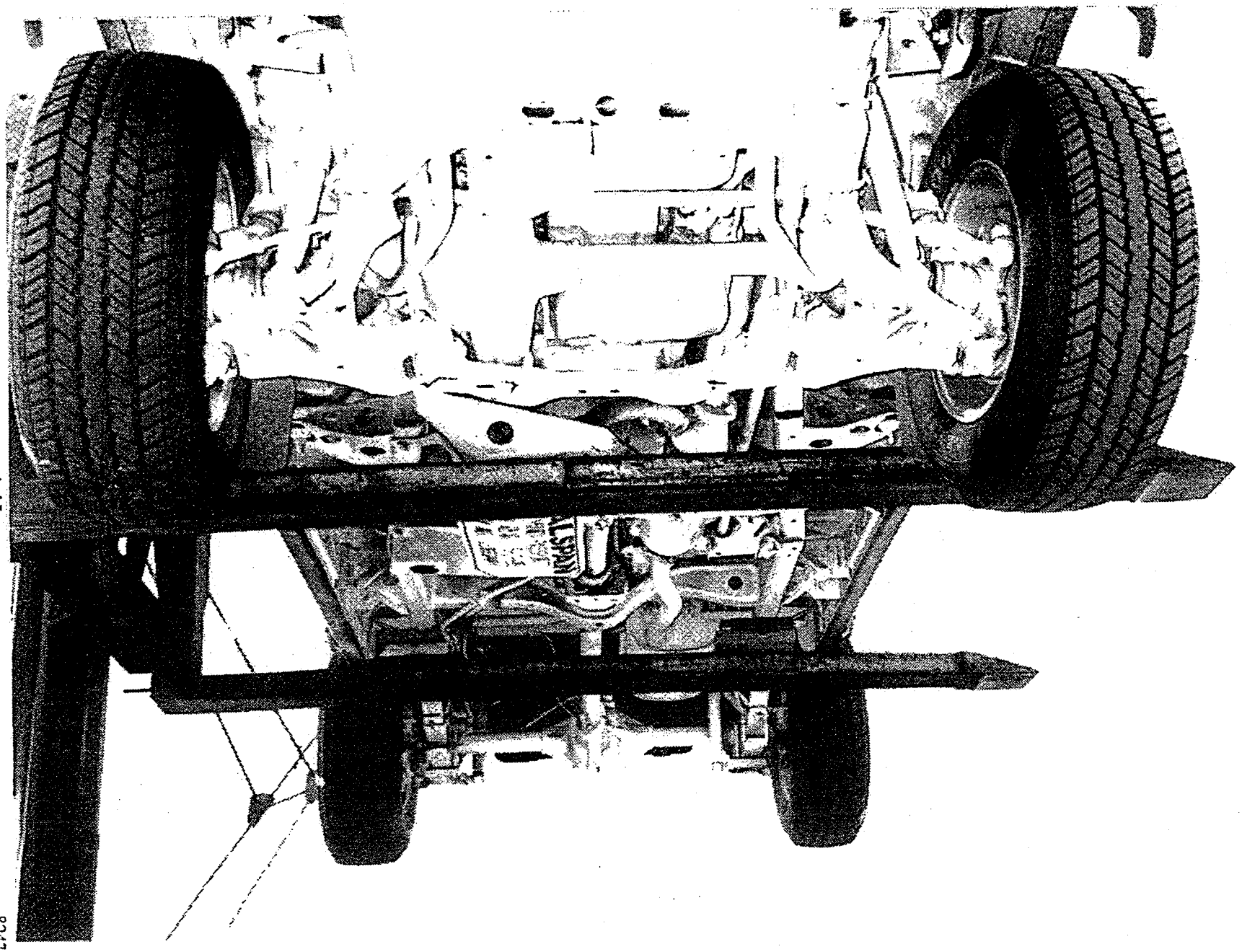


Figure A-13 PRE-TEST FRONT UNDERBODY VIEW

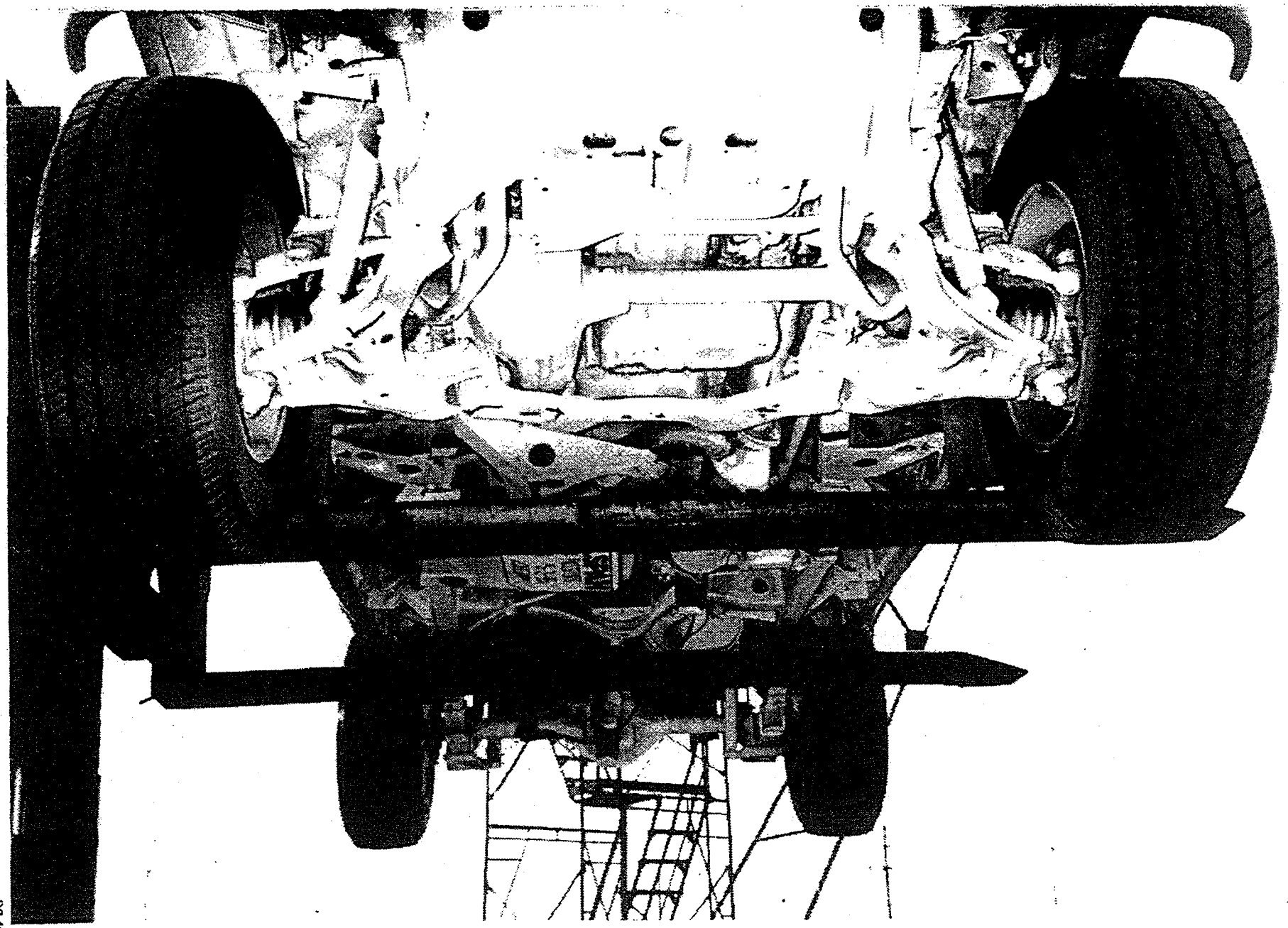


Figure A-14 POST-TEST FRONT UNDERBODY VIEW

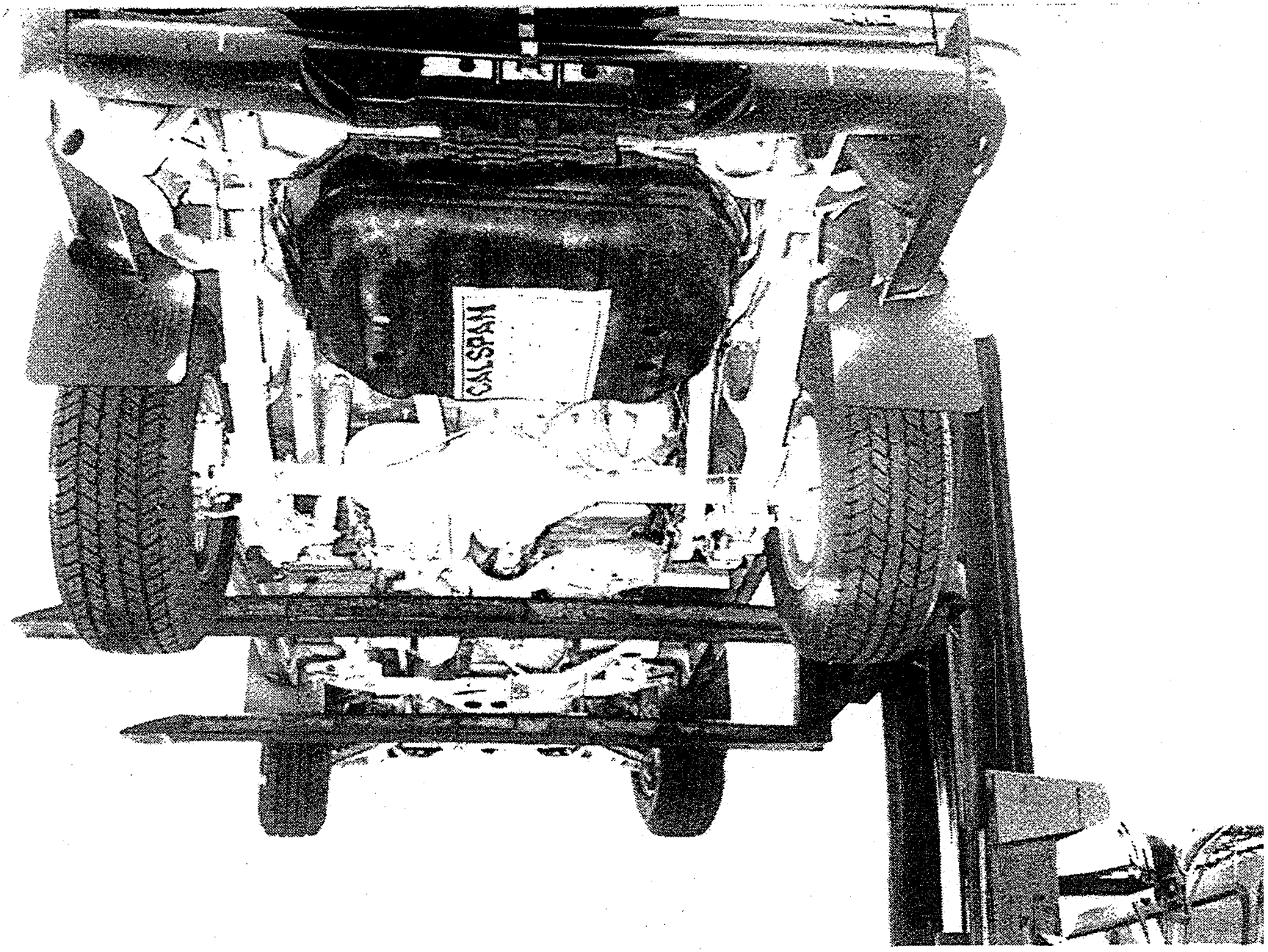


Figure A-15 PRE-TEST REAR UNDERBODY VIEW

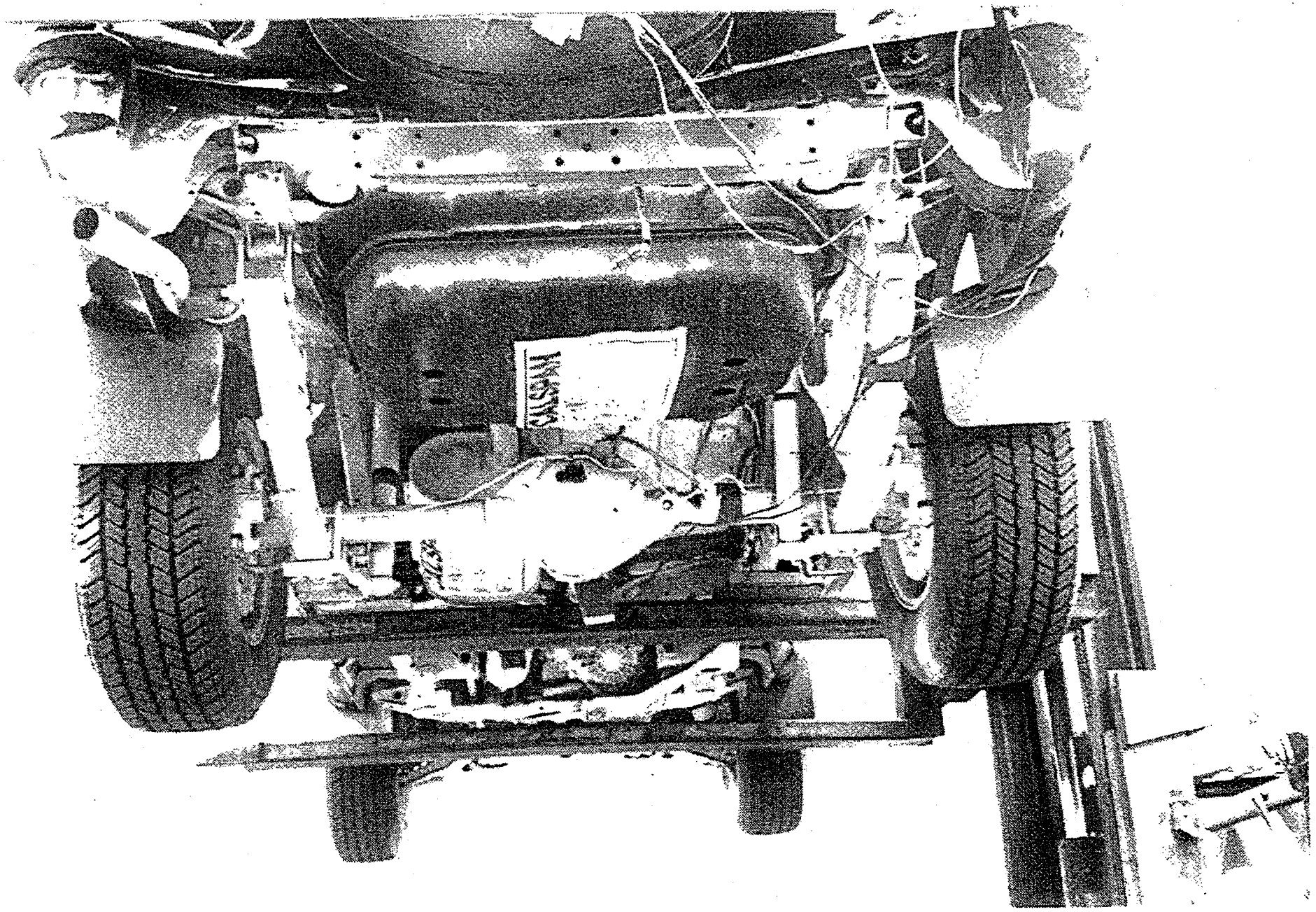


Figure A-16 POST-TEST REAR UNDERBODY VIEW

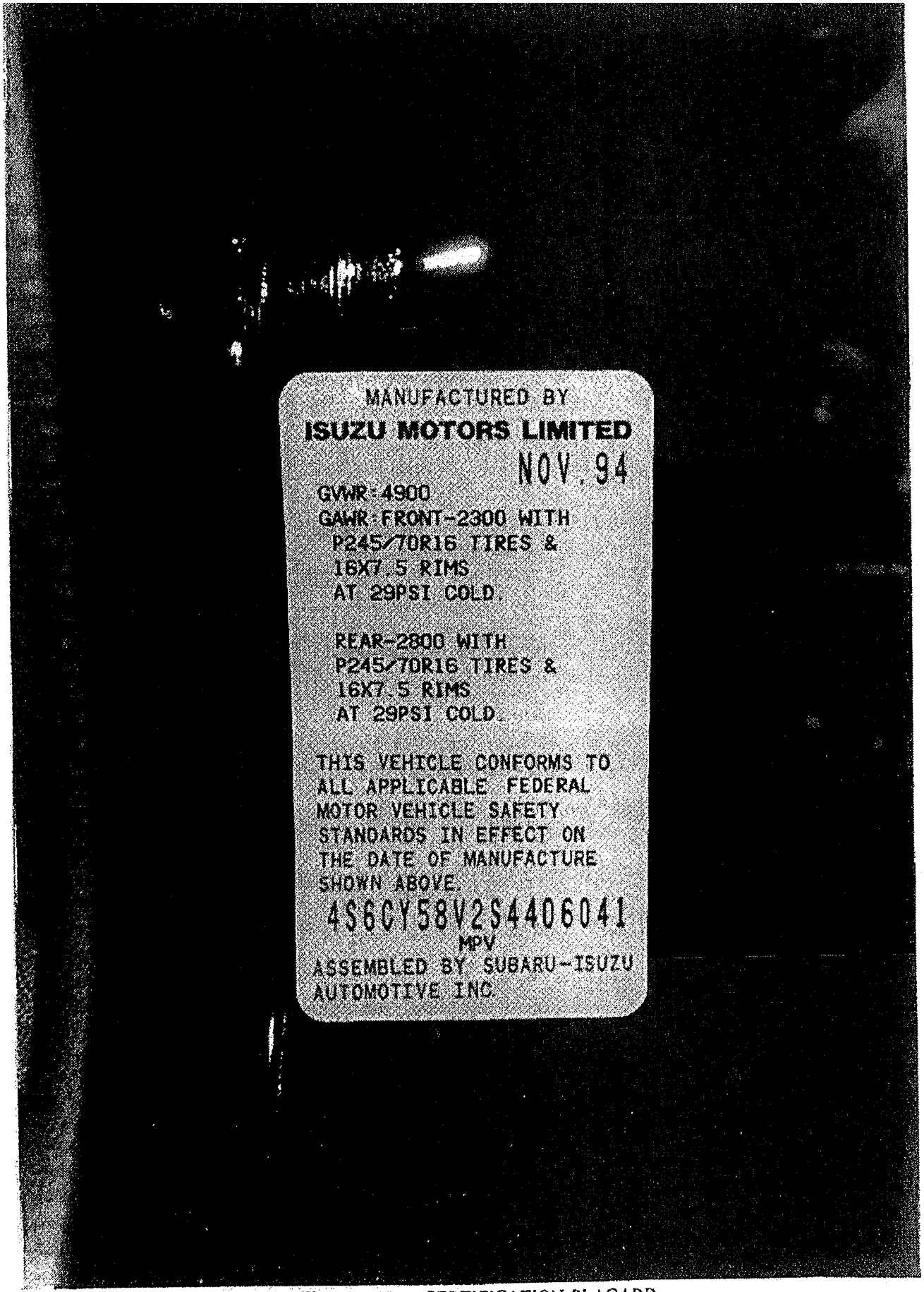


Figure A-17 CERTIFICATION PLACARD

NOT APPLICABLE

Figure A-18 TIRE PLACARD

8247

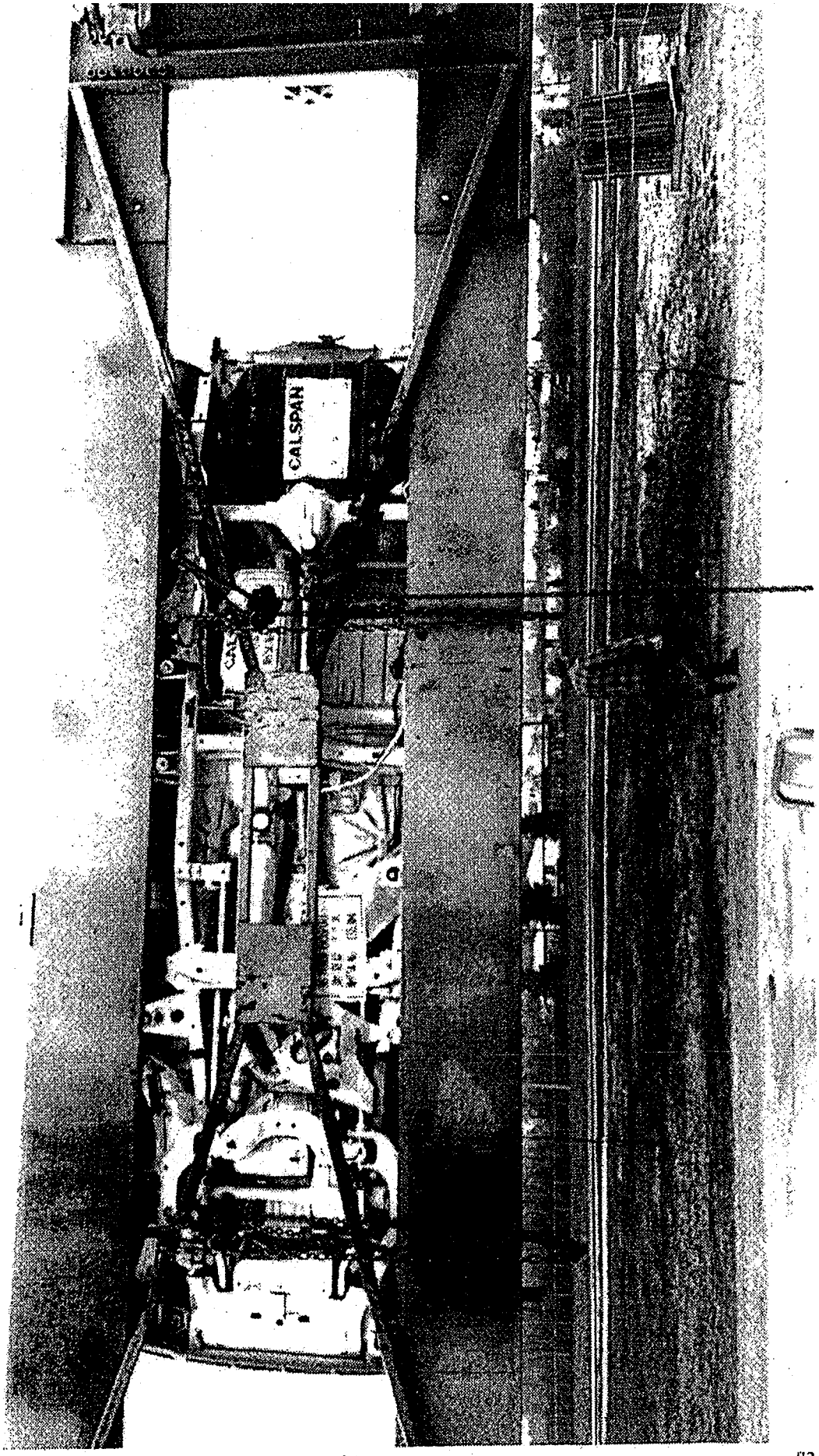


Figure A-19 ROLLOVER 90°

8247-20

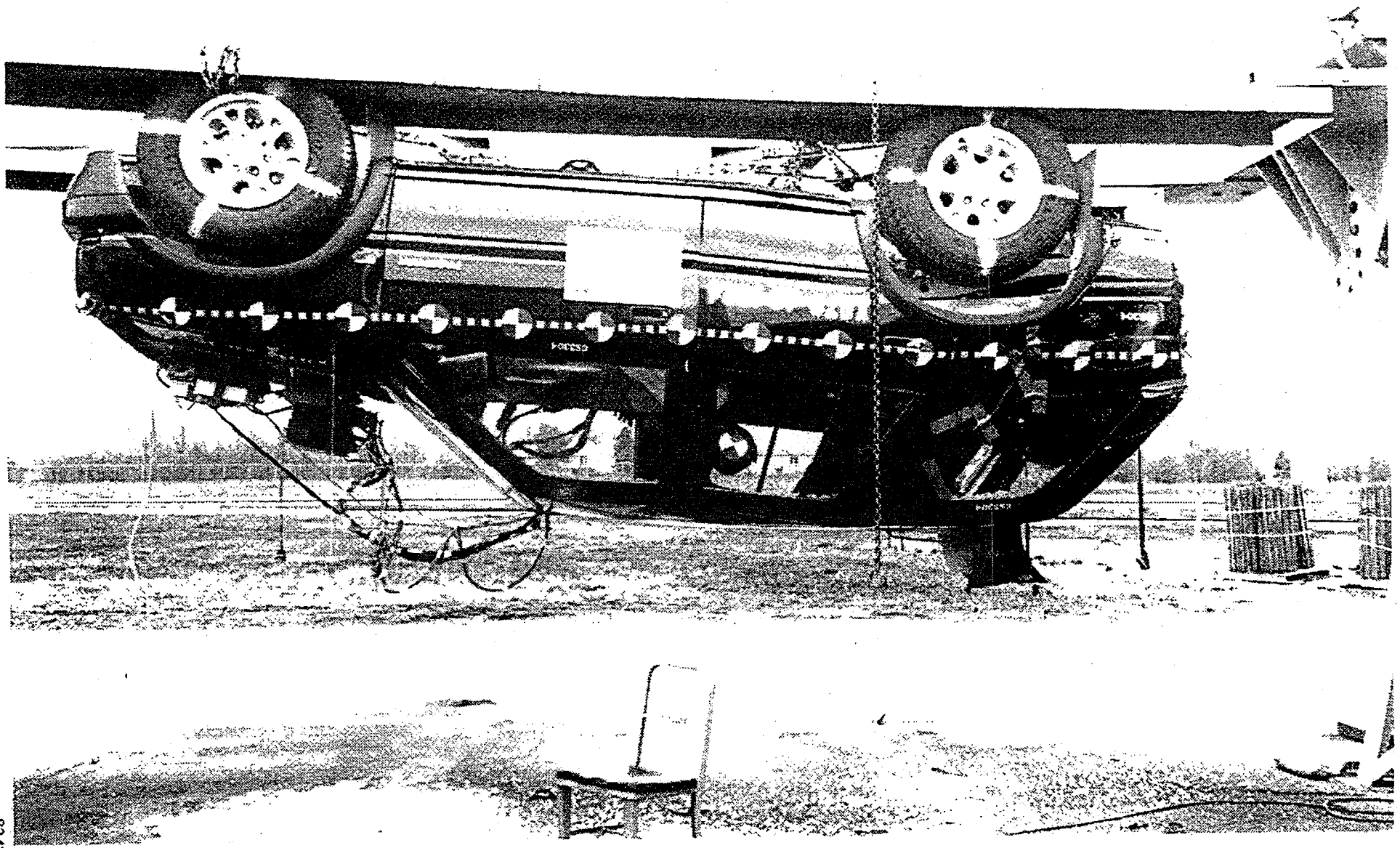


Figure A-20 ROLLOVER 180°

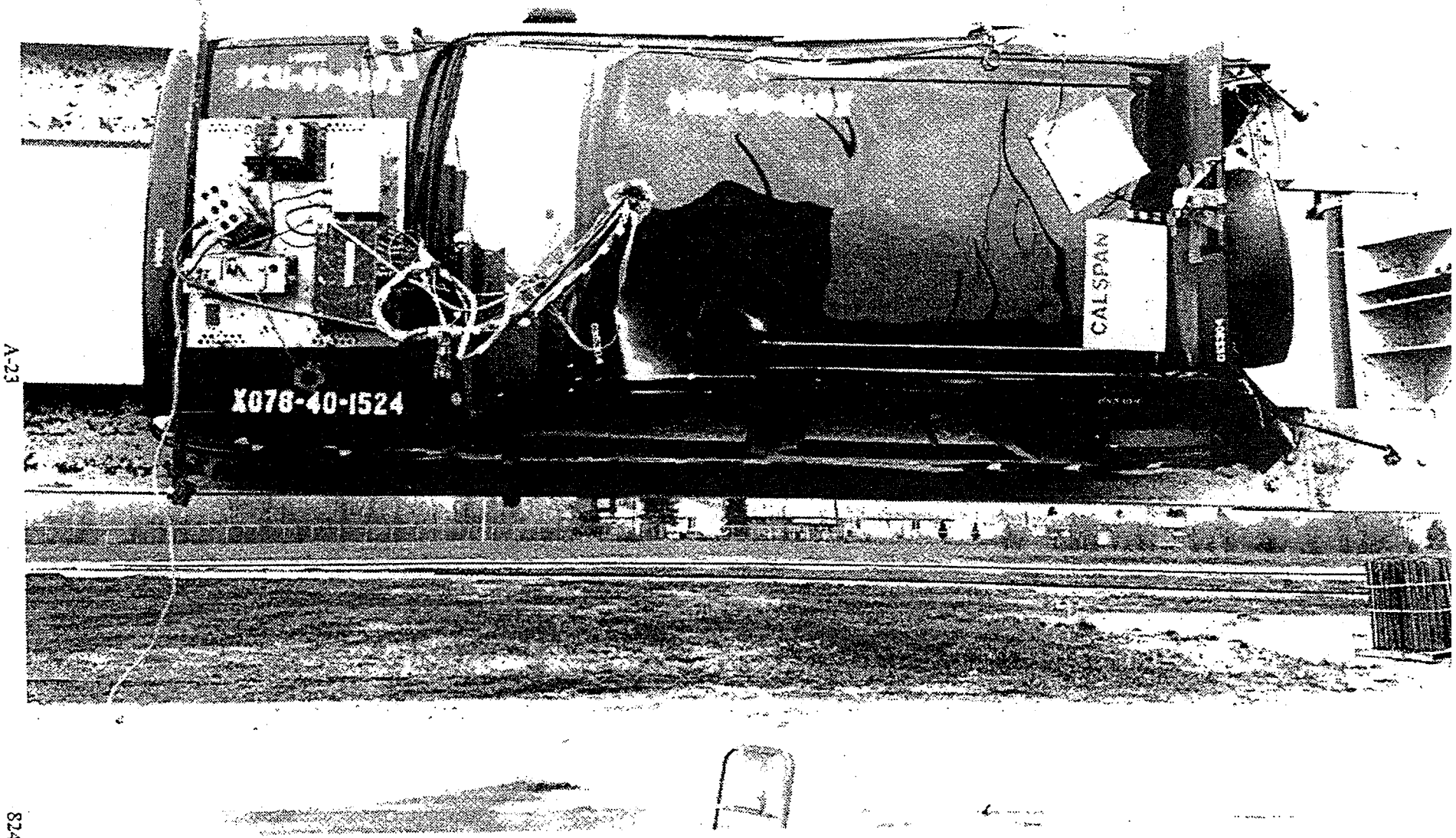


Figure A-21 ROLLOVER 270°

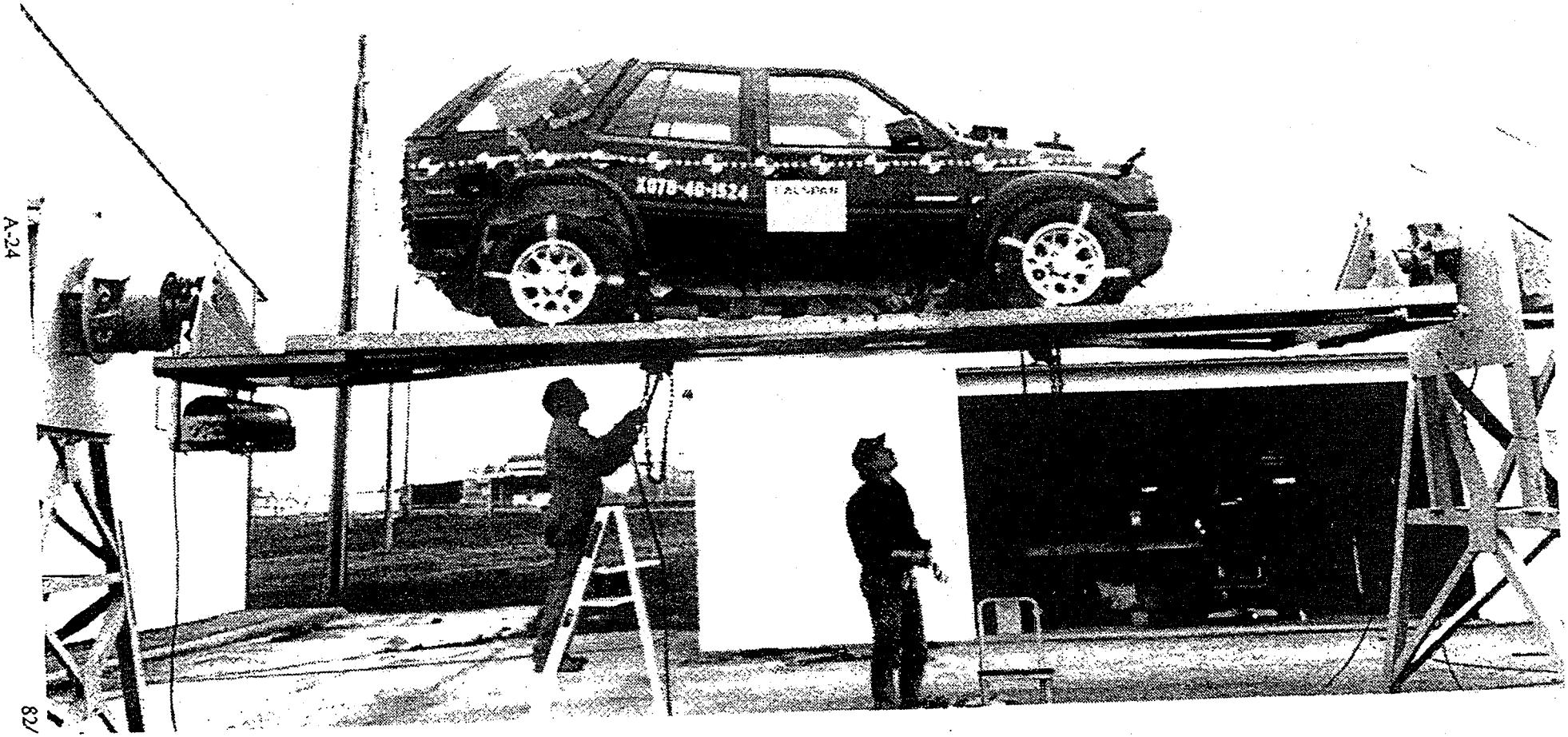


Figure A-22 ROLLOVER 360°

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

(REAR IMPACT ONLY)

FACILITY: Track
RUN #: 1524
SERIES #: 1

TEST DATE: 02 May 1995
TEST TIME: 14:13:12
BOARD: a

TITLE: 301 Rear 30 MPH-1995 Honda Passport

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM AMP	MAXIMUM msec	MINIMUM AMP	MINIMUM msec	FILTER CLASS
1	Pos. 1 Head X	Gs	27.0	146.9	-6.7	85.9	1000.0
2	Pos. 1 Head Y	Gs	1.6	71.3	-12.7	135.4	1000.0
3	Pos. 1 Head Z	Gs	27.9	131.3	-1.0	47.5	1000.0
4	Pos. 1 Chest Disp.	Ins	.0	150.8	.0	83.4	180.0
5	Pos. 1 Chest X	Gs	10.5	100.8	-2.1	143.5	180.0
6	Pos. 1 Chest Y	Gs	2.4	47.4	-4.5	135.5	180.0
7	Pos. 1 Chest Z	Gs	10.3	135.5	-.3	133.4	180.0
8	Pos. 1 Lap Belt	lbs	157.4	194.4	-104.2	135.4	60.0
9	Pos. 1 Pelvic X	Gs	22.9	70.4	-5.0	188.8	1000.0
10	Pos. 1 Pelvic Y	Gs	5.8	47.5	-6.1	135.4	1000.0
11	Pos. 1 Pelvic Z	Gs	7.4	57.5	-7.7	135.4	1000.0
12	Left Rear Crossmember X	Gs	32.6	35.9	-6.9	151.2	60.0
13	Pos. 1 Upper Neck Fx	lbs	68.2	47.5	-53.2	86.8	1000.0
14	Pos. 1 Upper Neck Fy	lbs	15.6	73.0	-70.2	135.4	1000.0
15	Pos. 1 Upper Neck Fz	lbs	322.1	142.3	-47.7	170.9	1000.0
16	Right Rear Crossmember X	Gs	37.9	37.8	-11.6	135.5	60.0
17	Pos. 1 Head Resultant	Gs	32.7	146.9	.0	14.8	1000.0
18	Pos. 1 Chest Resultant	Gs	12.9	93.8	.0	-54.0	180.0
19	Pos. 1 Pelvic Resultant	Gs	23.4	70.3	.0	12.5	1000.0
20	Pos. 1 Neck Force Res.	lbs	324.7	142.3	1.2	15.6	1000.0

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

hic: 157.15
t1 = 118.680 msec
t2 = 154.680 msec
Average G's Over Hic Duration = 28.58

CLIP SUMMARY: Pos. 1 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 10.964 G's
Tstart = 92.7600 ms
Tend = 95.7600 ms
CSI = 23.488

FACILITY: Track
RUN #: 1524
SERIES #: 1

TEST DATE: 02 May 1995
TEST TIME: 14:13:12
BOARD: b

TITLE: 301 Rear 30 MPH-1995 Honda Passport

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM AMP	MAXIMUM msec	MINIMUM AMP	MINIMUM msec	FILTER CLASS
1	Pos. 1 Upper Neck Mx	ft-lbs	7.8	47.5	-11.7	155.2	600.0
2	Pos. 1 Upper Neck My	ft-lbs	21.0	97.8	-30.1	135.4	600.0
3	Pos. 1 Upper Neck Mz	ft-lbs	11.0	71.6	-12.7	151.4	600.0
4	Upper Seatback X	Gs	21.1	57.8	-24.5	54.7	60.0
5	Lower Seatback X	Gs	19.6	37.7	-12.3	71.4	60.0
6	Pos. 1 Belt Spoolout	Ins	.0	-13.6	-3.3	137.6	60.0
17	Pos. 1 Neck Moment Res.	ft-lbs	31.4	135.4	.0	-4.9	600.0

TEST NO. CS5304

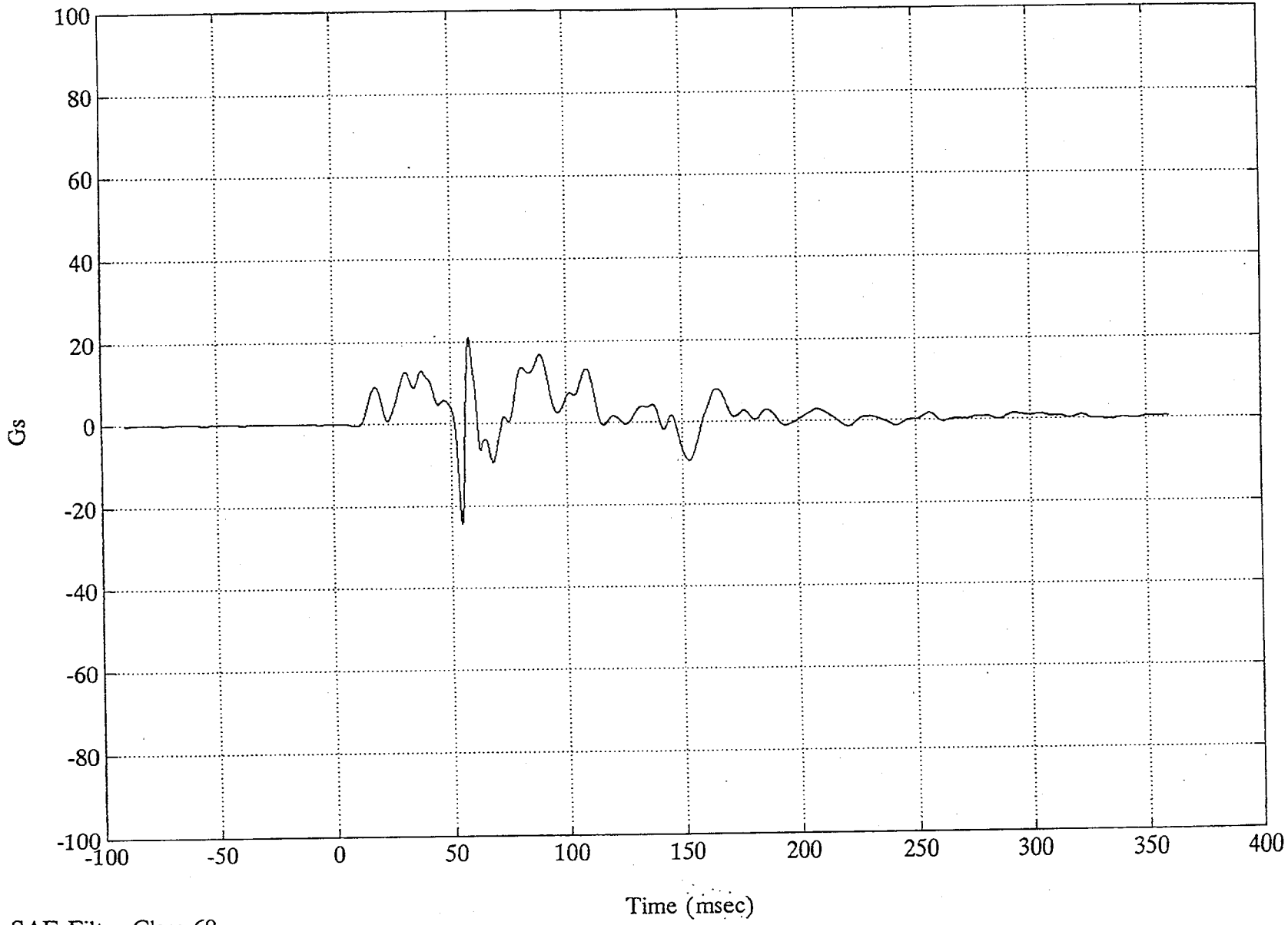
VEHICLE	SAE FILTER CHANNEL CLASS
	60

Note: Angular seatback position is measured in degrees of rotation from the initial (design) position.

301 Rear 30 MPH-1995 Honda Passport

Upper Seatback X

Max = 21.08 Gs @ 57.84 msec
Min = -24.46 Gs @ 54.72 msec



SAE Filter Class 60

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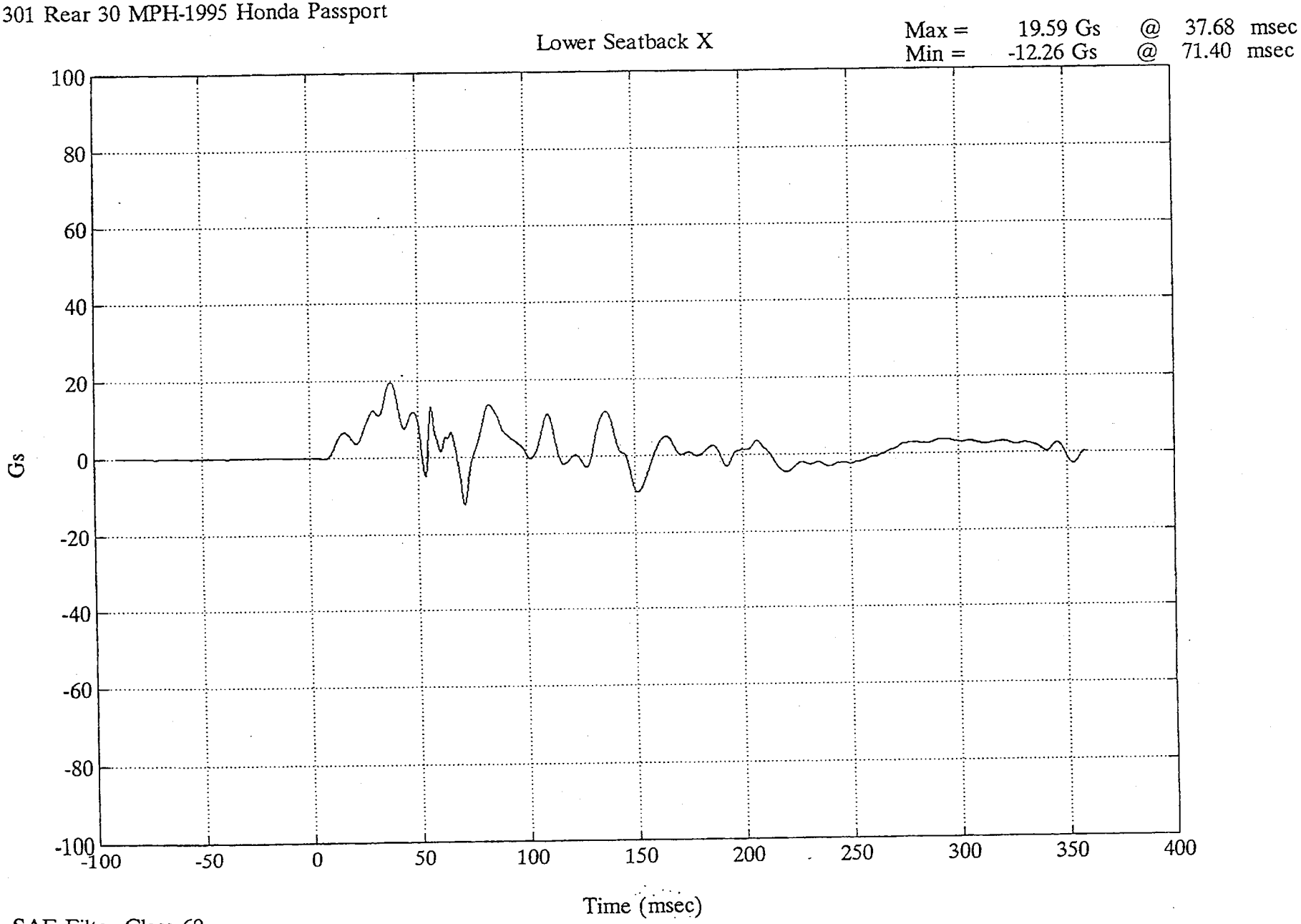
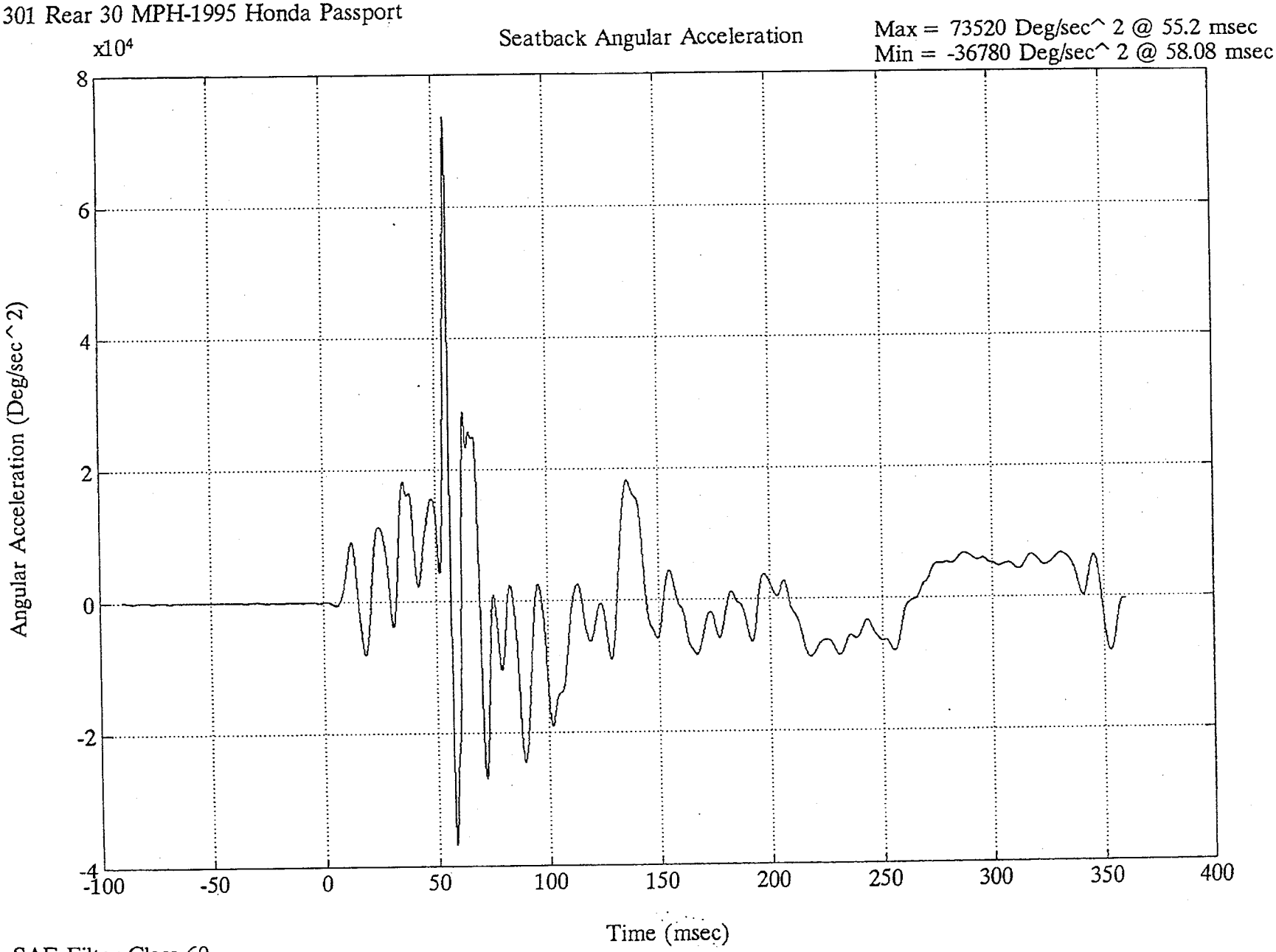
301 Rear 30 MPH-1995 Honda Passport



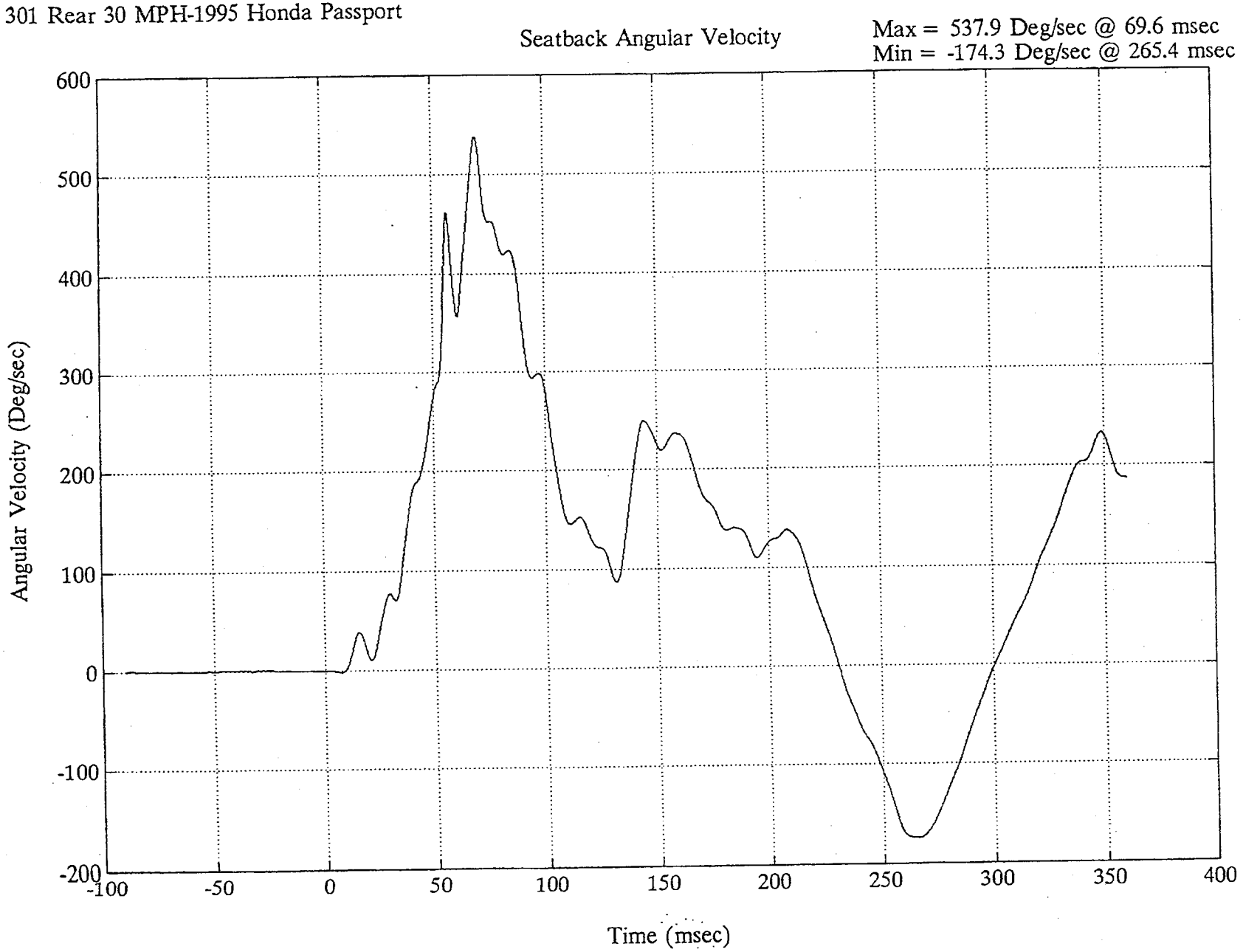
SAE Filter Class 60

301 Rear 30 MPH-1995 Honda Passport

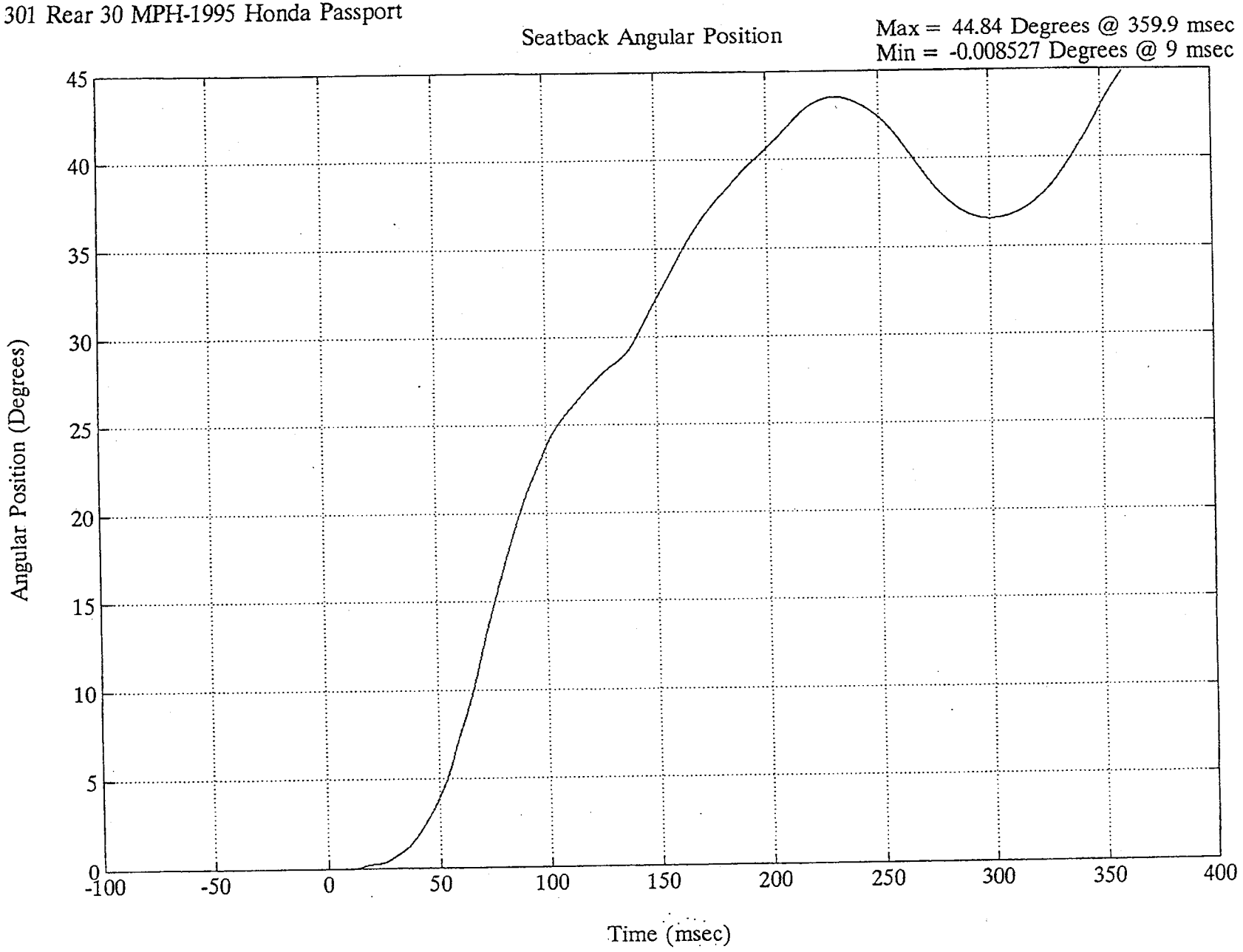


SAE Filter Class 60

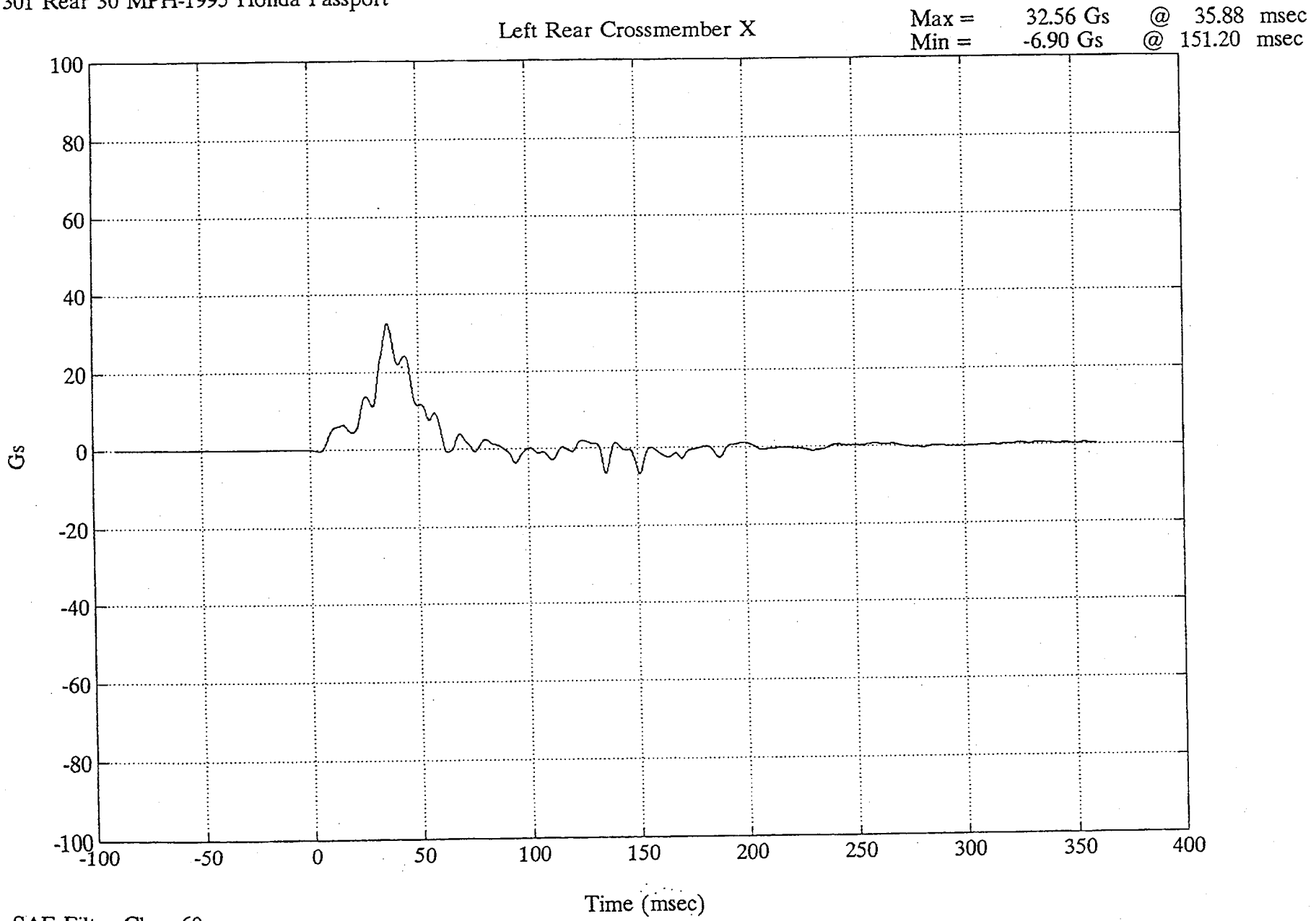
301 Rear 30 MPH-1995 Honda Passport



301 Rear 30 MPH-1995 Honda Passport



301 Rear 30 MPH-1995 Honda Passport

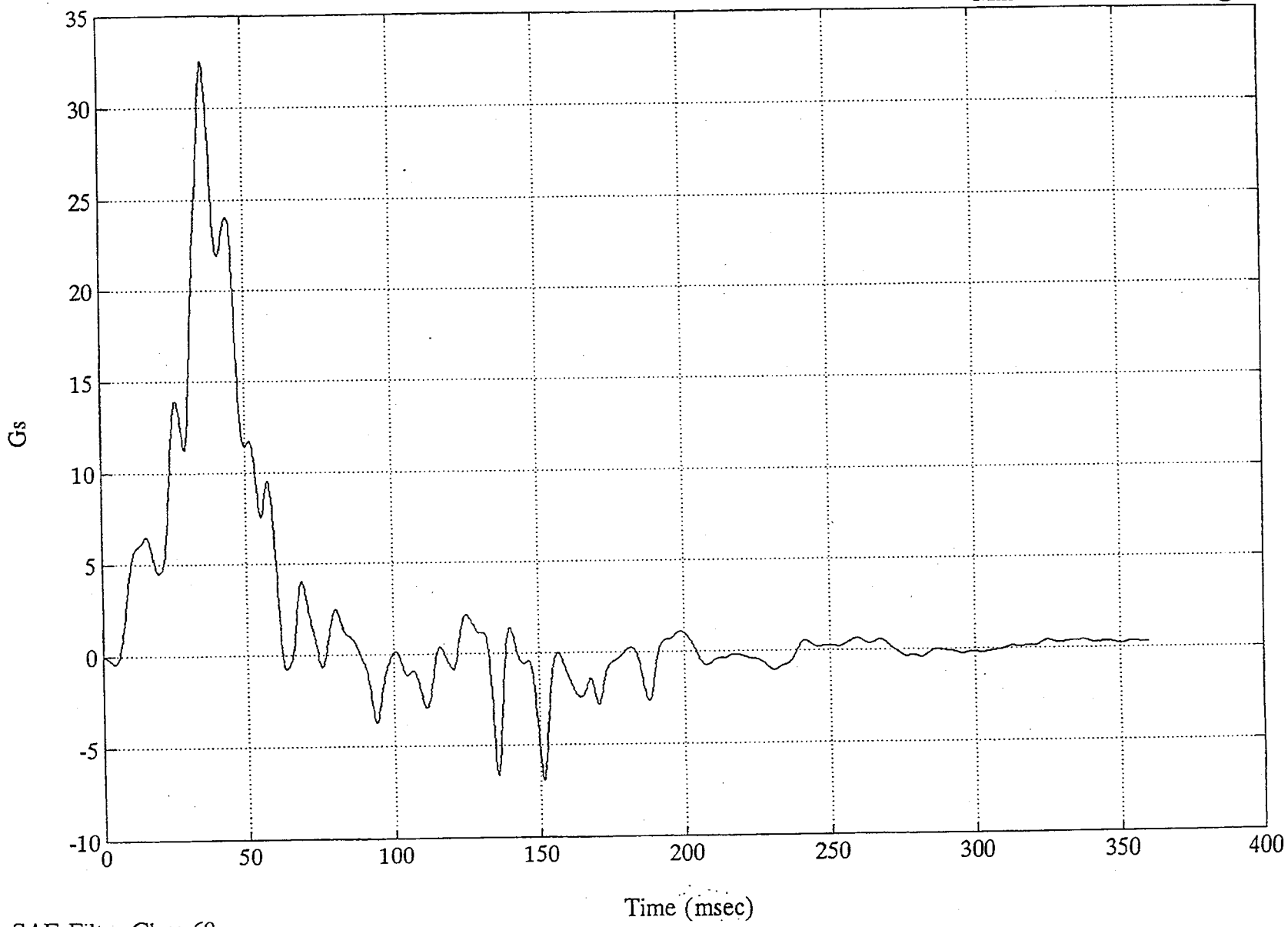


SAE Filter Class 60

301 Rear 30 MPH-1995 Honda Passport

Left Rear Crossmember X

Max = 32.5 Gs @ 35.87 msec
Min = -6.9 Gs @ 151.20 msec



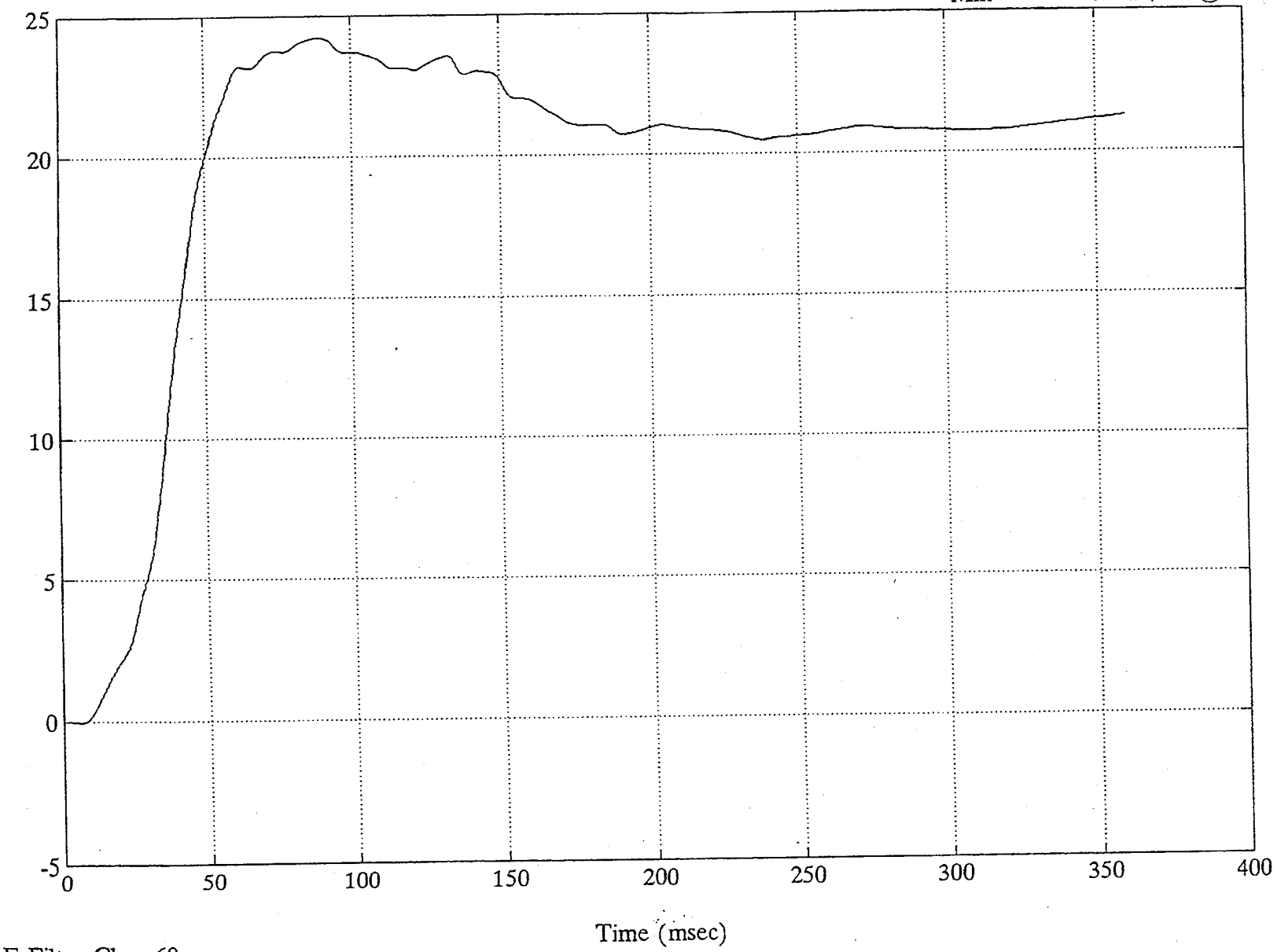
SAE Filter Class 60

8247-20

301 Rear 30 MPH-1995 Honda Passport

1st Integral Left Rear Crossmember X

Max = 24.2 Ft/sec @ 88.80 msec
Min = -0.0 Ft/sec @ 5.63 msec



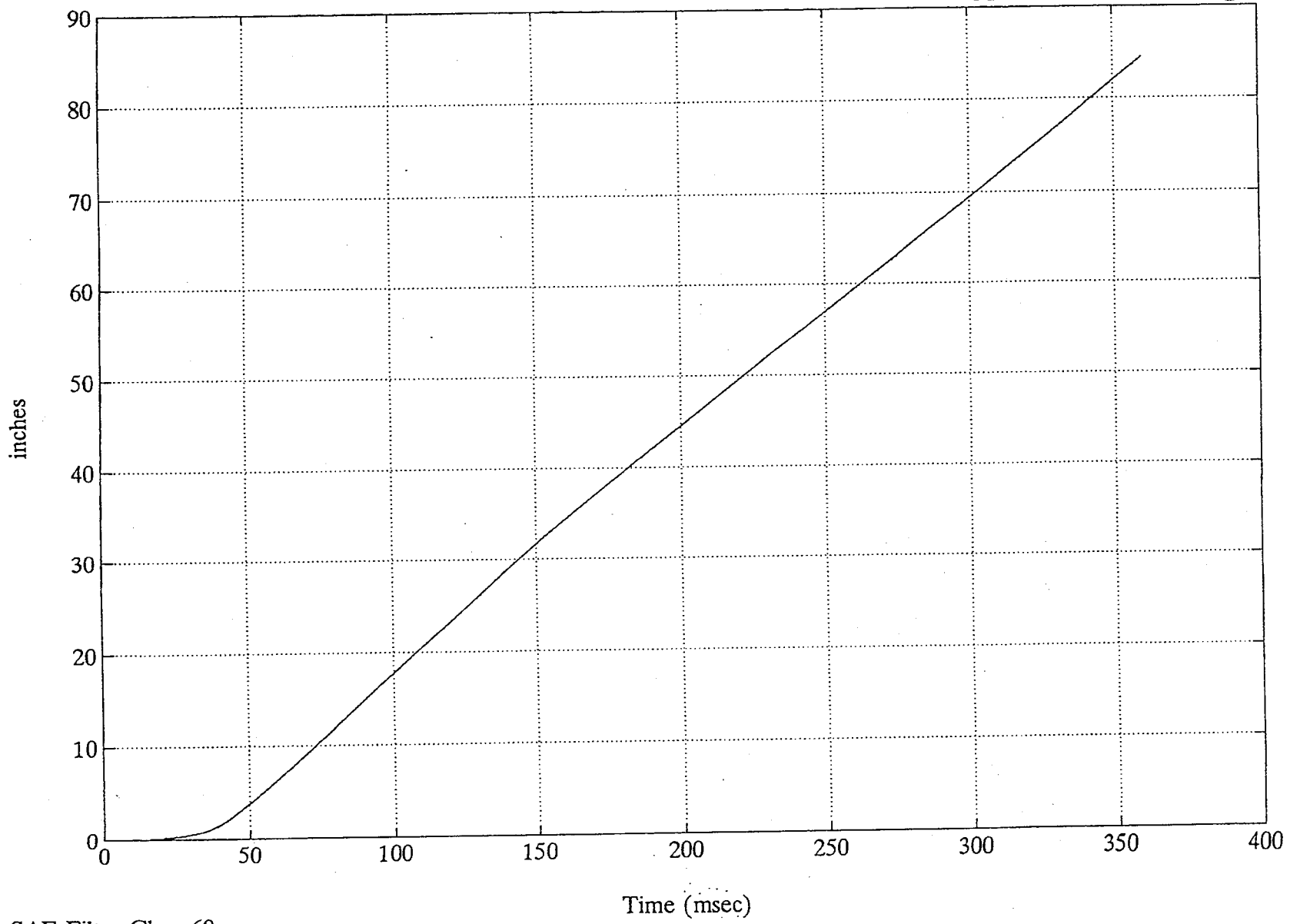
SAE Filter Class 60

8247-20

301 Rear 30 MPH-1995 Honda Passport

2nd Integral Left Rear Crossmember X

Max = 84.4 Inches @ 359.88 msec
Min = -0.0 Inches @ 7.31 msec

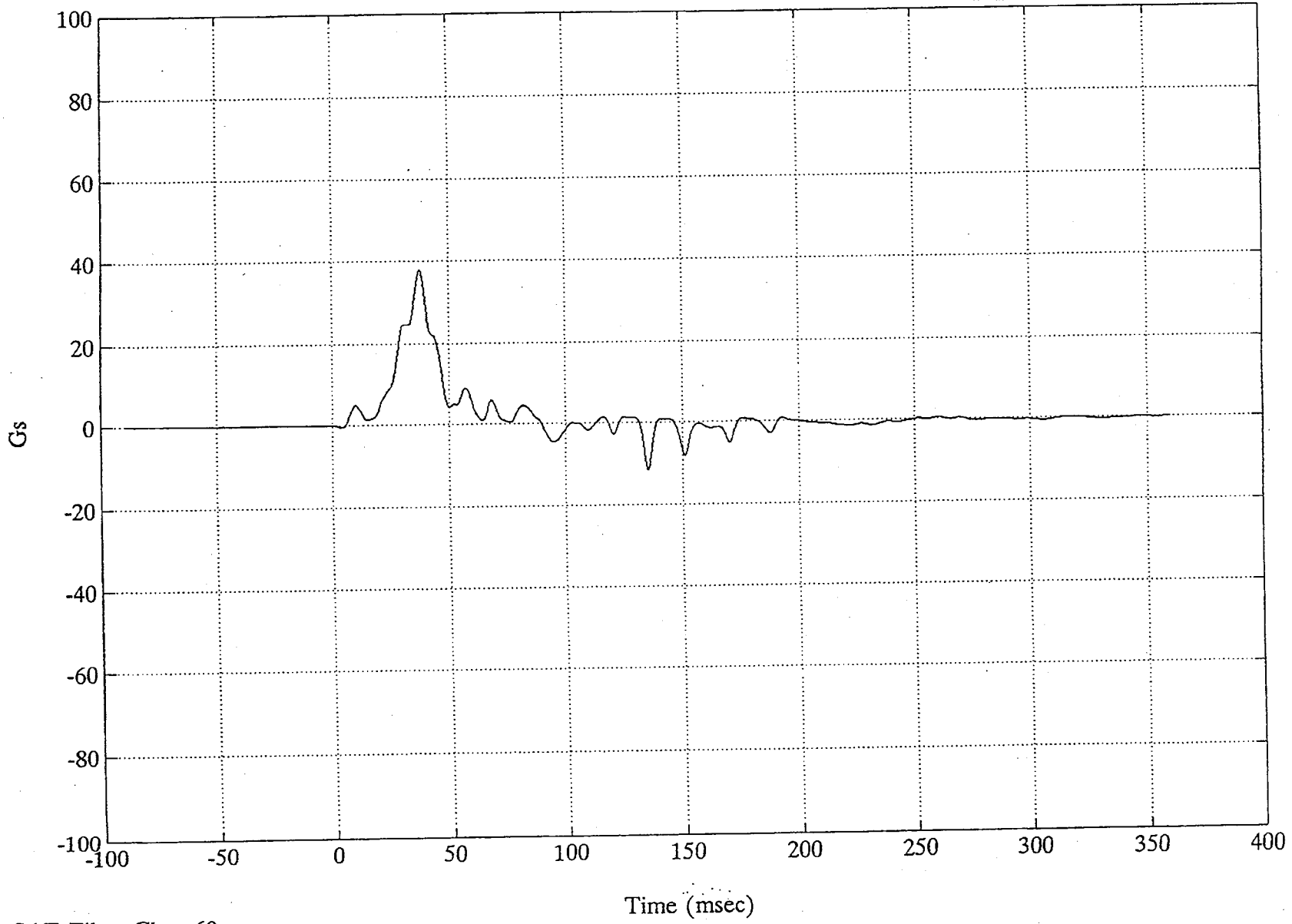


SAE Filter Class 60

301 Rear 30 MPH-1995 Honda Passport

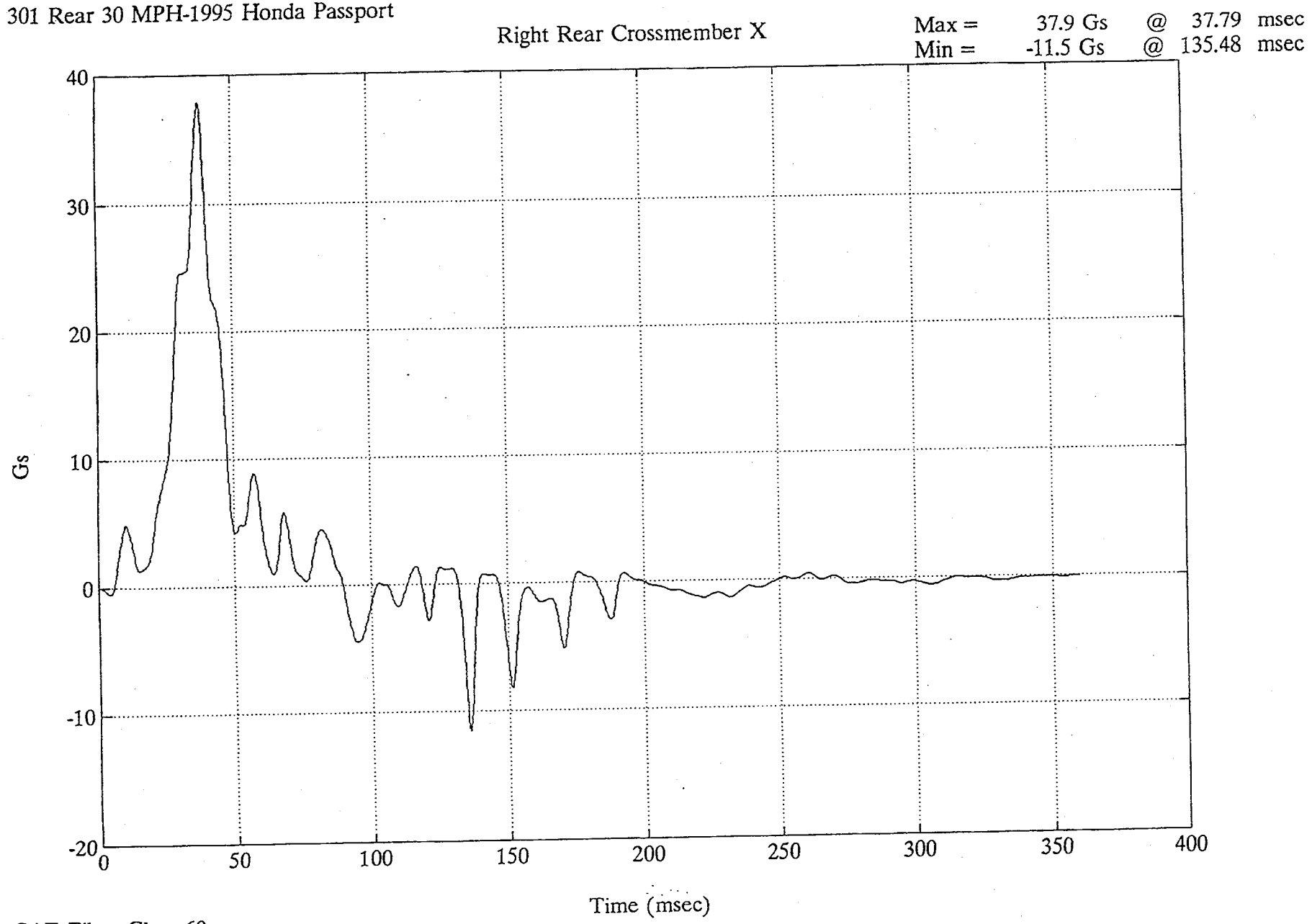
Right Rear Crossmember X

Max = 37.90 Gs @ 37.79 msec
Min = -11.57 Gs @ 135.47 msec



SAE Filter Class 60

301 Rear 30 MPH-1995 Honda Passport

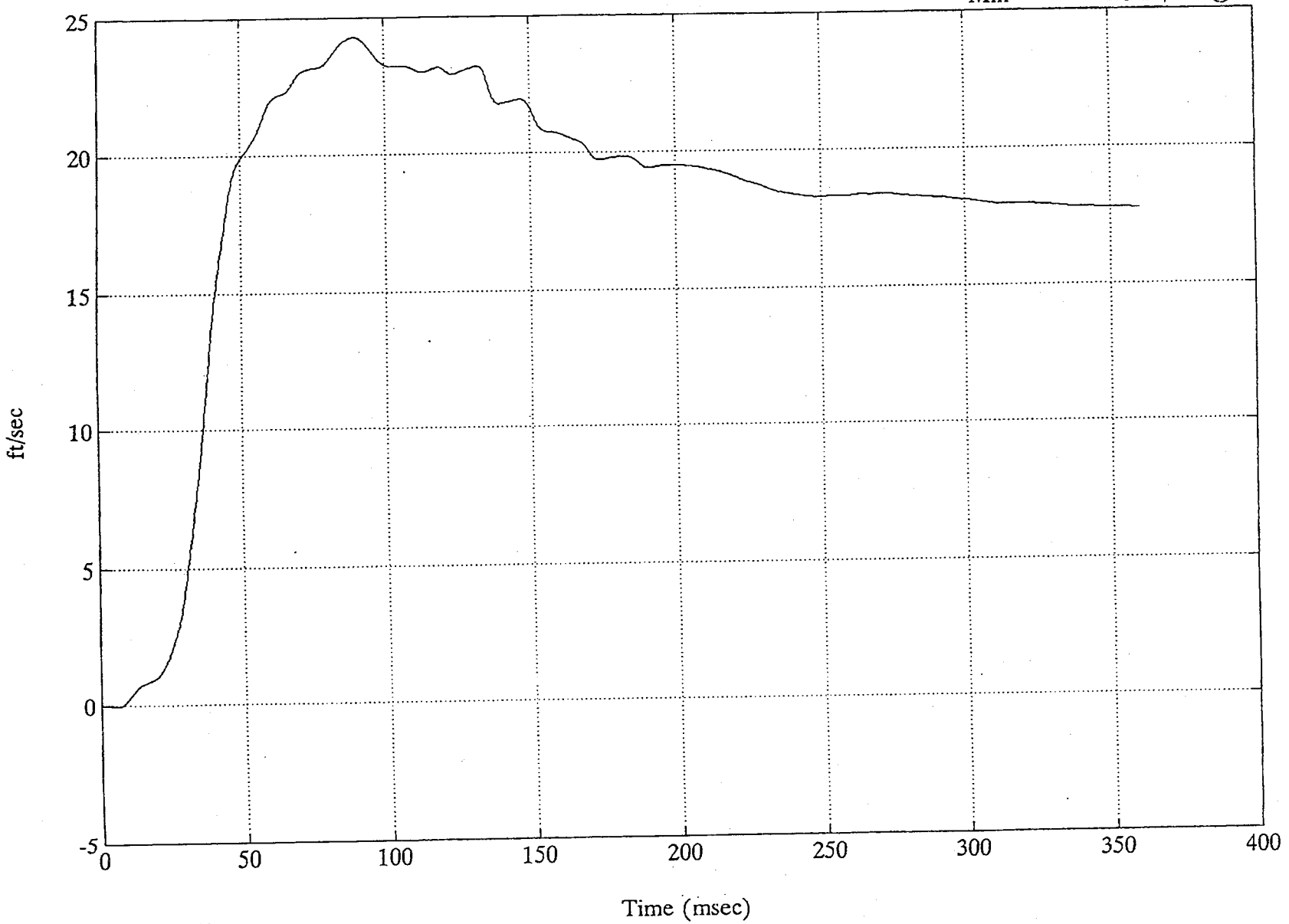


SAE Filter Class 60

301 Rear 30 MPH-1995 Honda Passport

1st Integral Right Rear Crossmember X

Max = 24.2 Ft/sec @ 89.76 msec
Min = -0.0 Ft/sec @ 5.75 msec



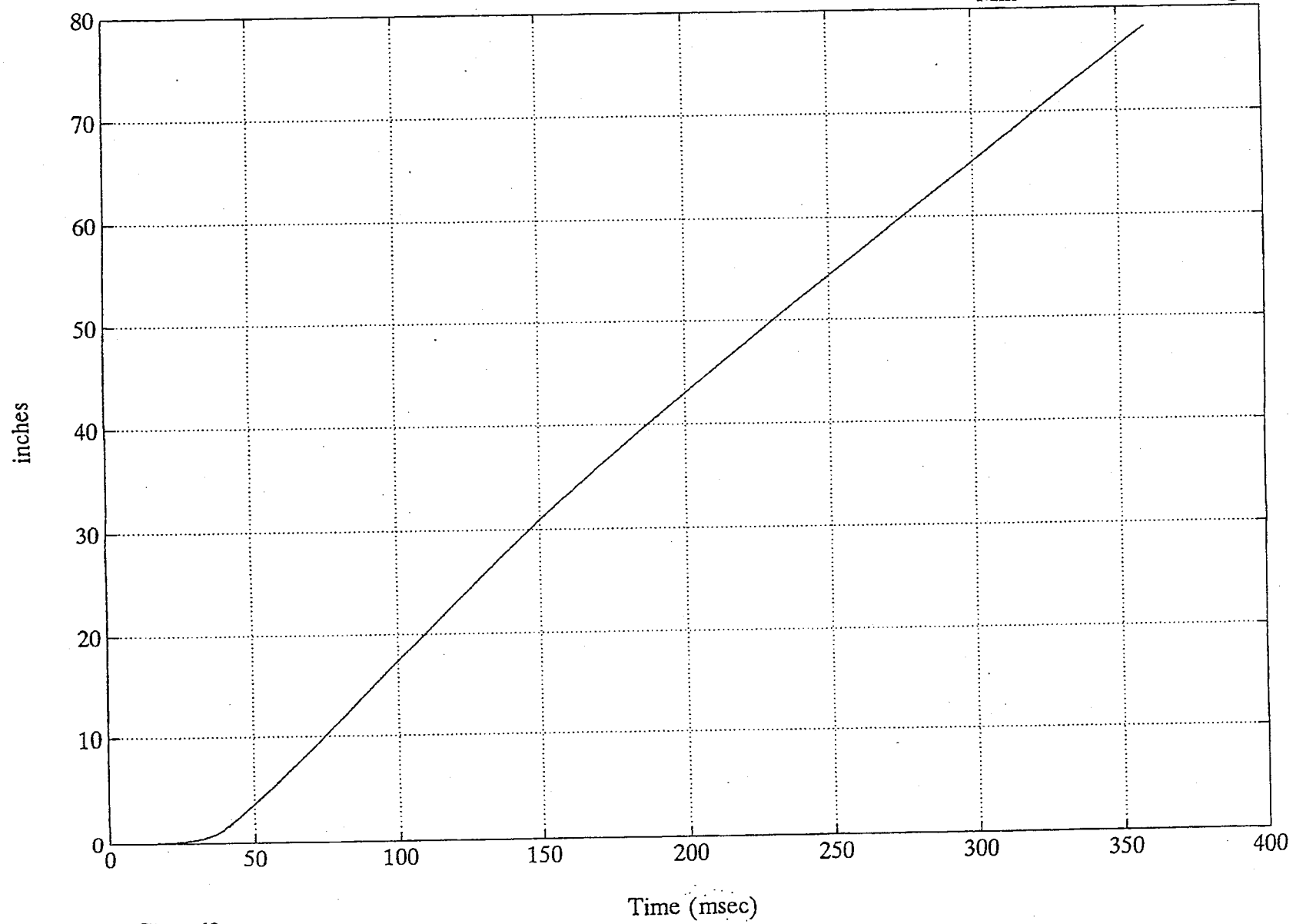
SAE Filter Class 60

8247-20

301 Rear 30 MPH-1995 Honda Passport

2nd Integral Right Rear Crossmember X

Max = 78.1 Inches @ 359.88 msec
Min = -0.0 Inches @ 7.19 msec



SAE Filter Class 60

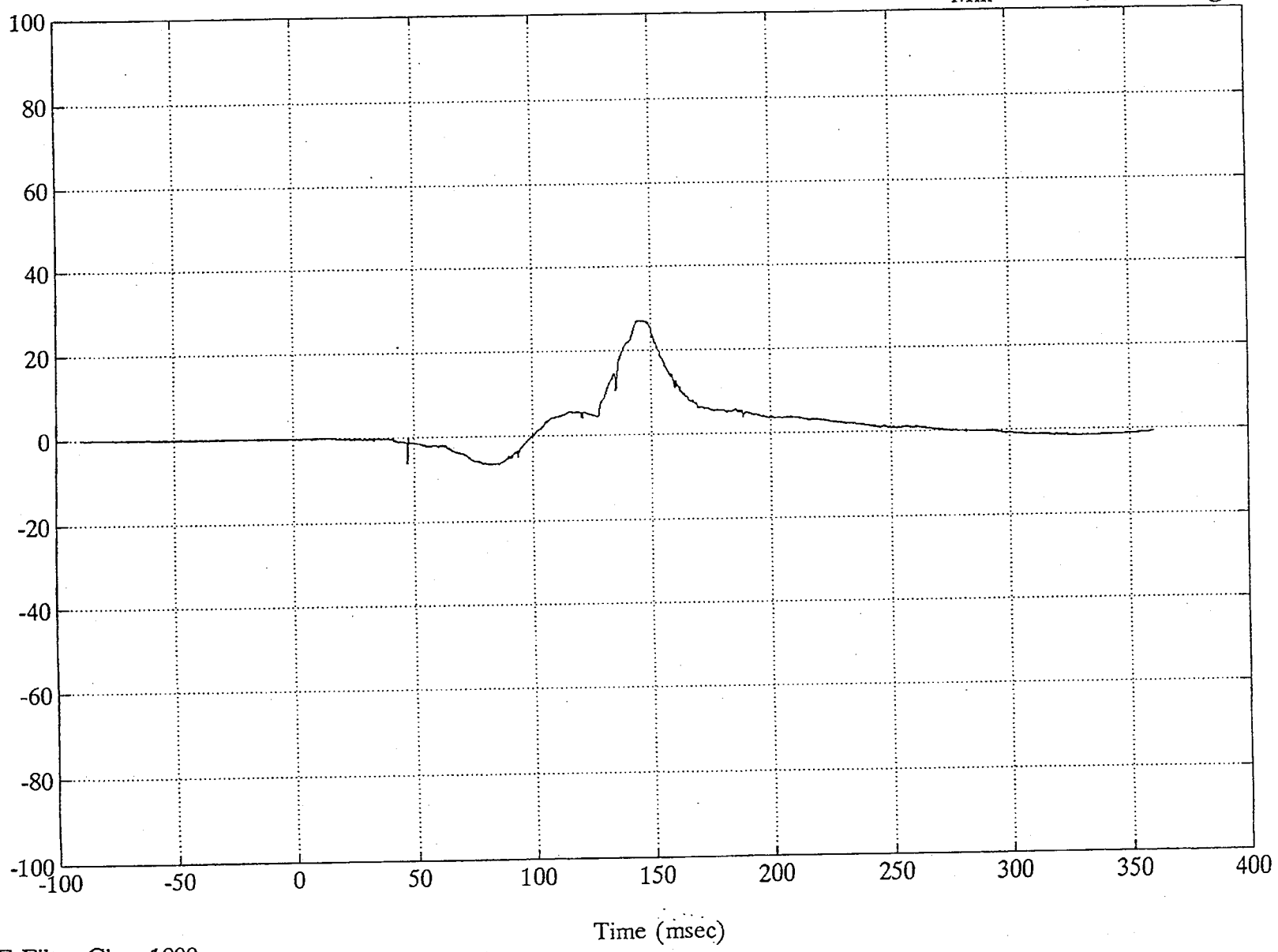
TEST NO. CS5304

DRIVER DUMMY (Pos. 1)	SAE FILTER CHANNEL CLASS
Head Accelerations	1000
Chest Accelerations	180
Pelvic Accelerations	1000
Upper Neck Forces	1000
Upper Neck Moments	600
Belt Forces	60
Belt Spoolout	60

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Head X

Max = 27.02 Gs @ 146.88 msec
Min = -6.66 Gs @ 85.91 msec



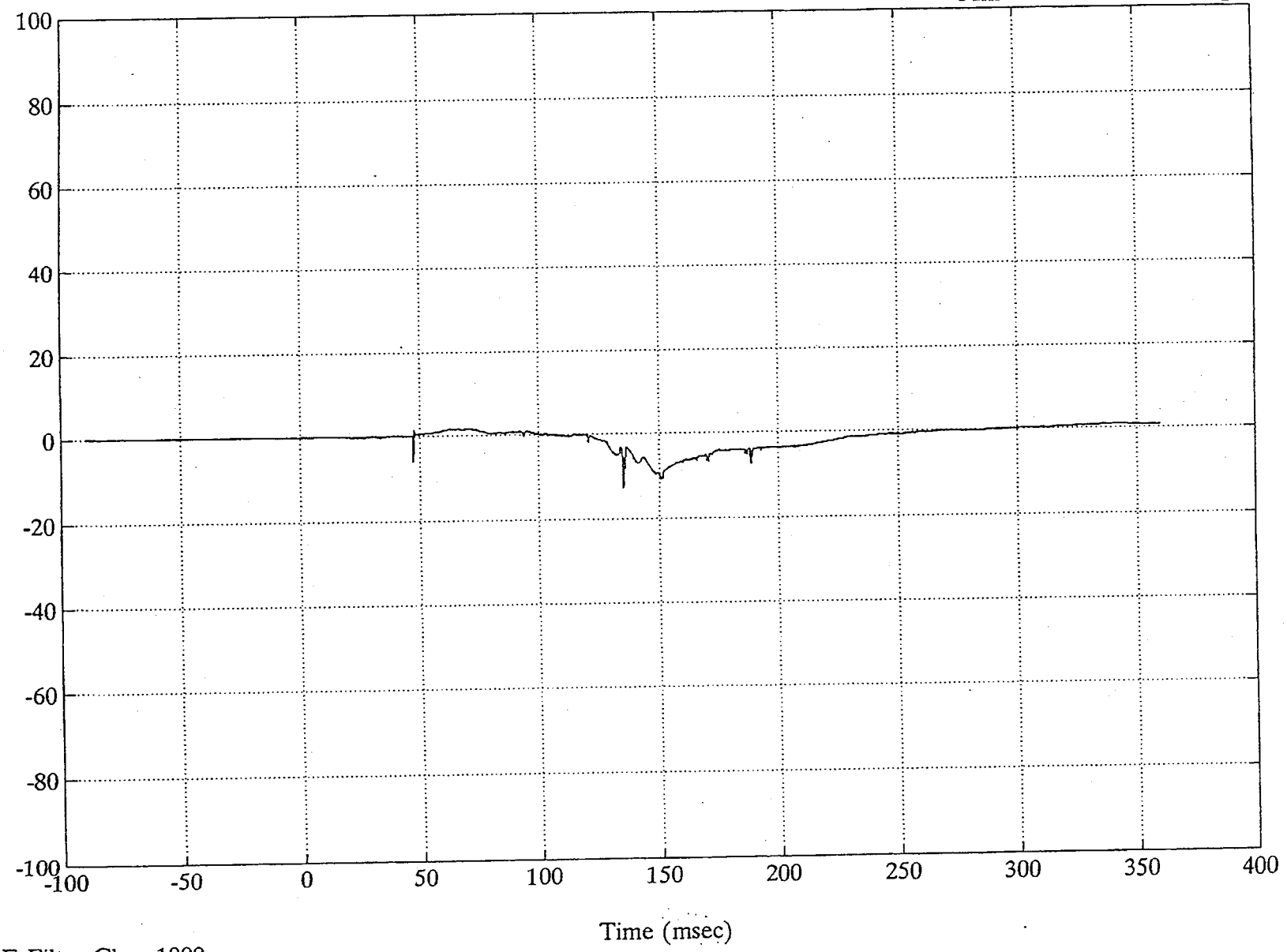
SAE Filter Class 1000

8247-20

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Head Y

Max = 1.64 Gs @ 71.27 msec
Min = -12.68 Gs @ 135.36 msec



B-20

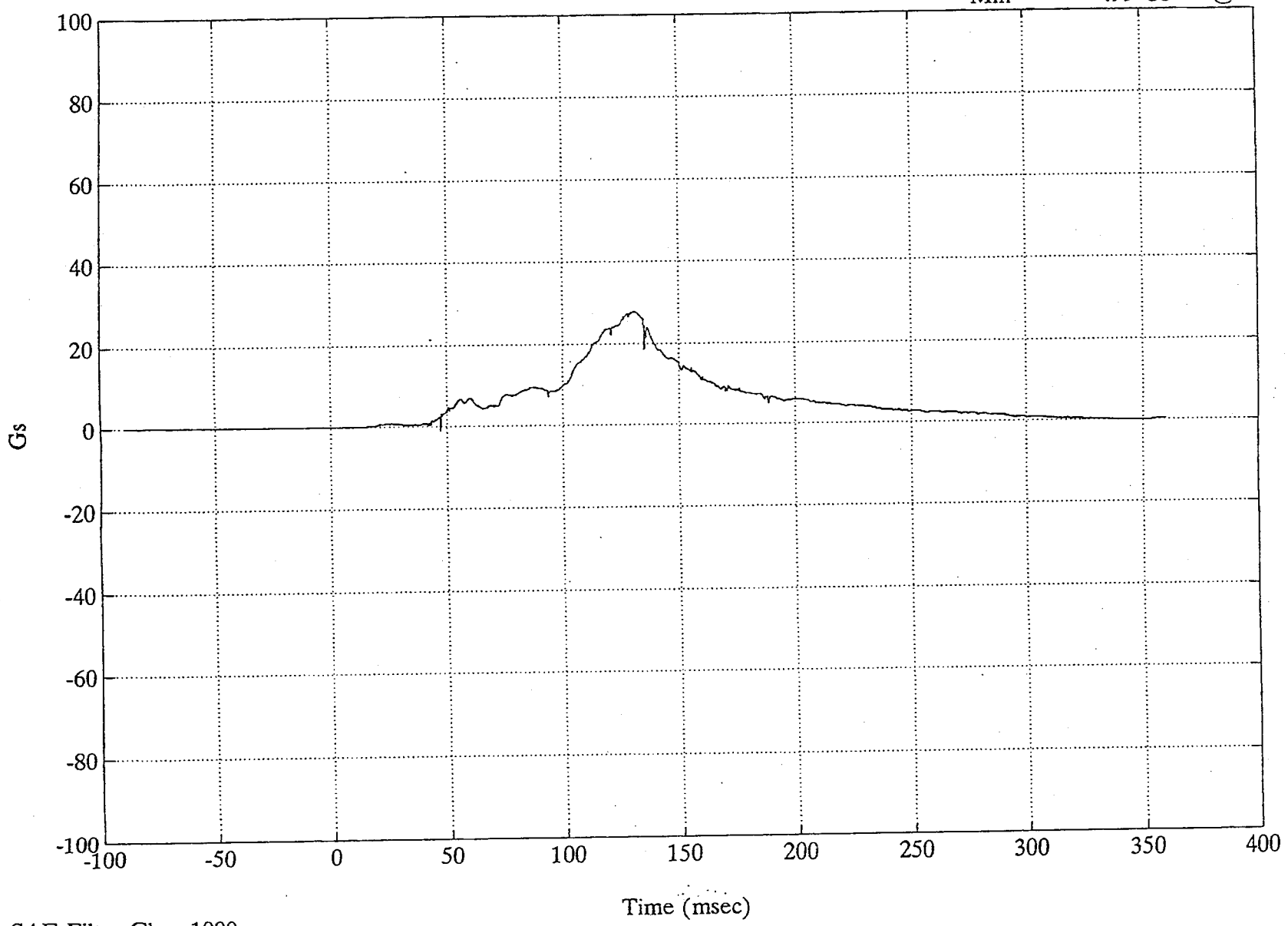
8247-20

SAE Filter Class 1000

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Head Z

Max = 27.89 Gs @ 131.27 msec
Min = -.99 Gs @ 47.52 msec



SAE Filter Class 1000

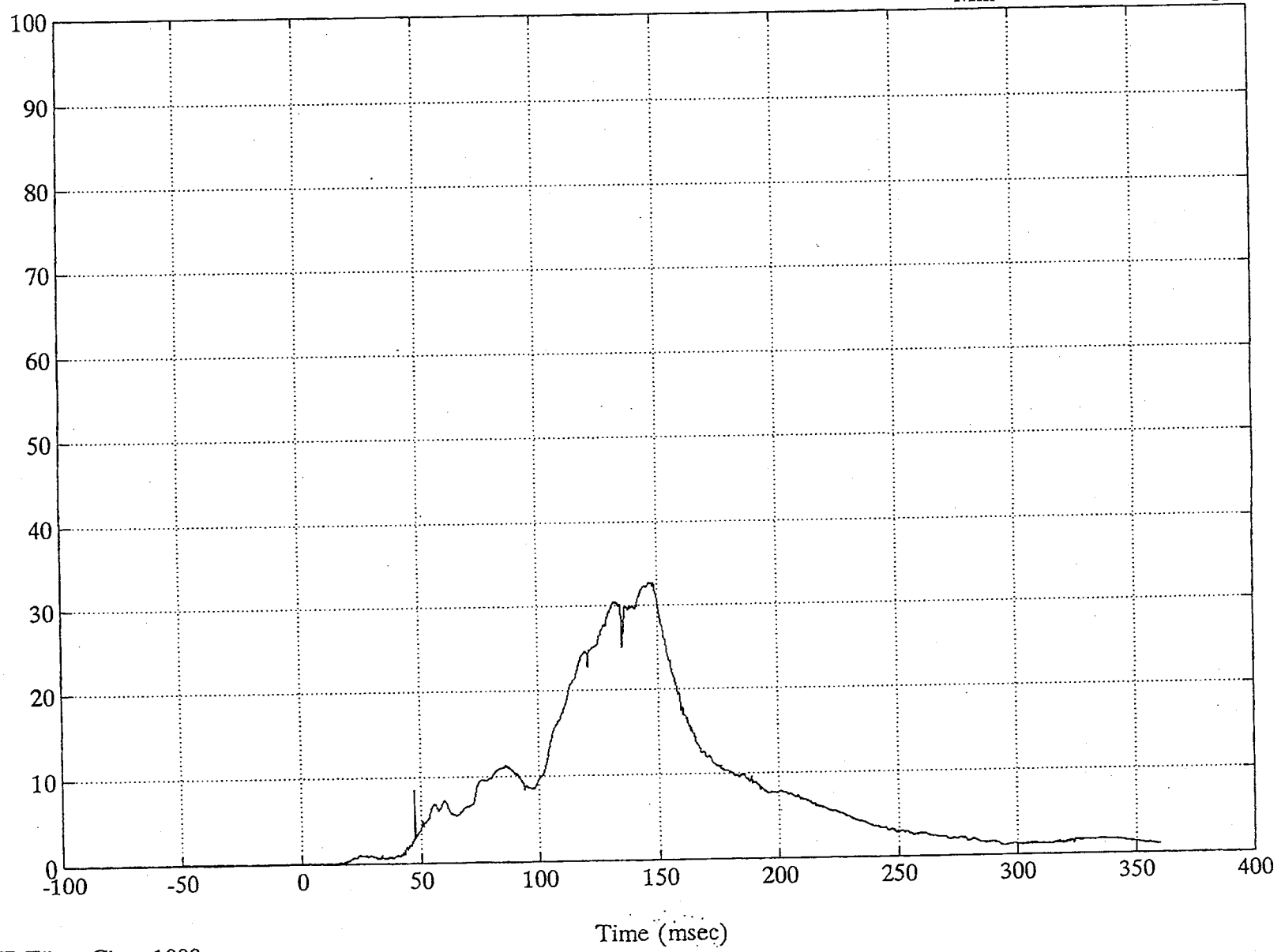
B-21

8247-20

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Head Resultant

Max = 32.69 Gs @ 146.88 msec
Min = .04 Gs @ 14.75 msec



B-22

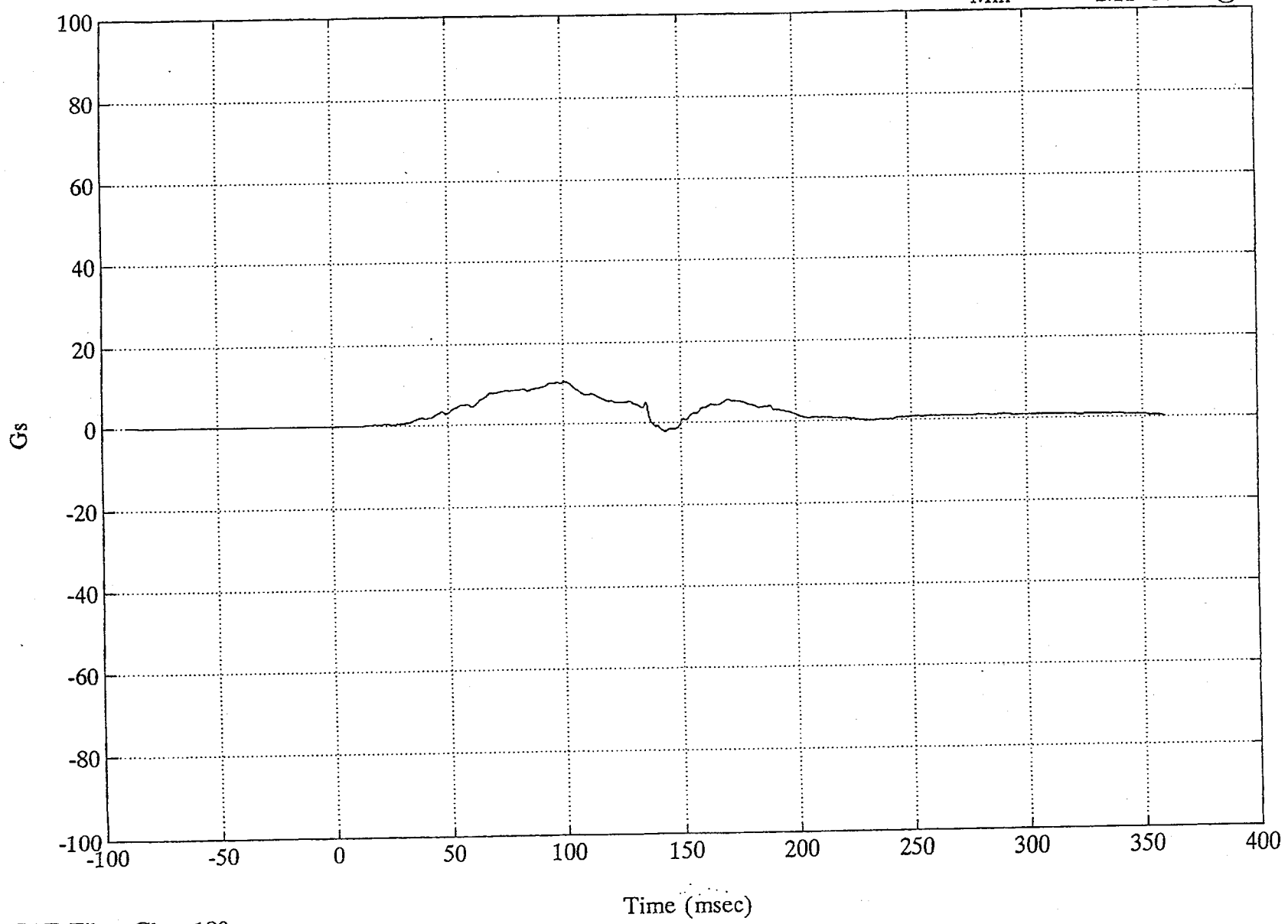
8247-20

SAE Filter Class 1000

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Chest X

Max = 10.45 Gs @ 100.80 msec
Min = -2.11 Gs @ 143.52 msec



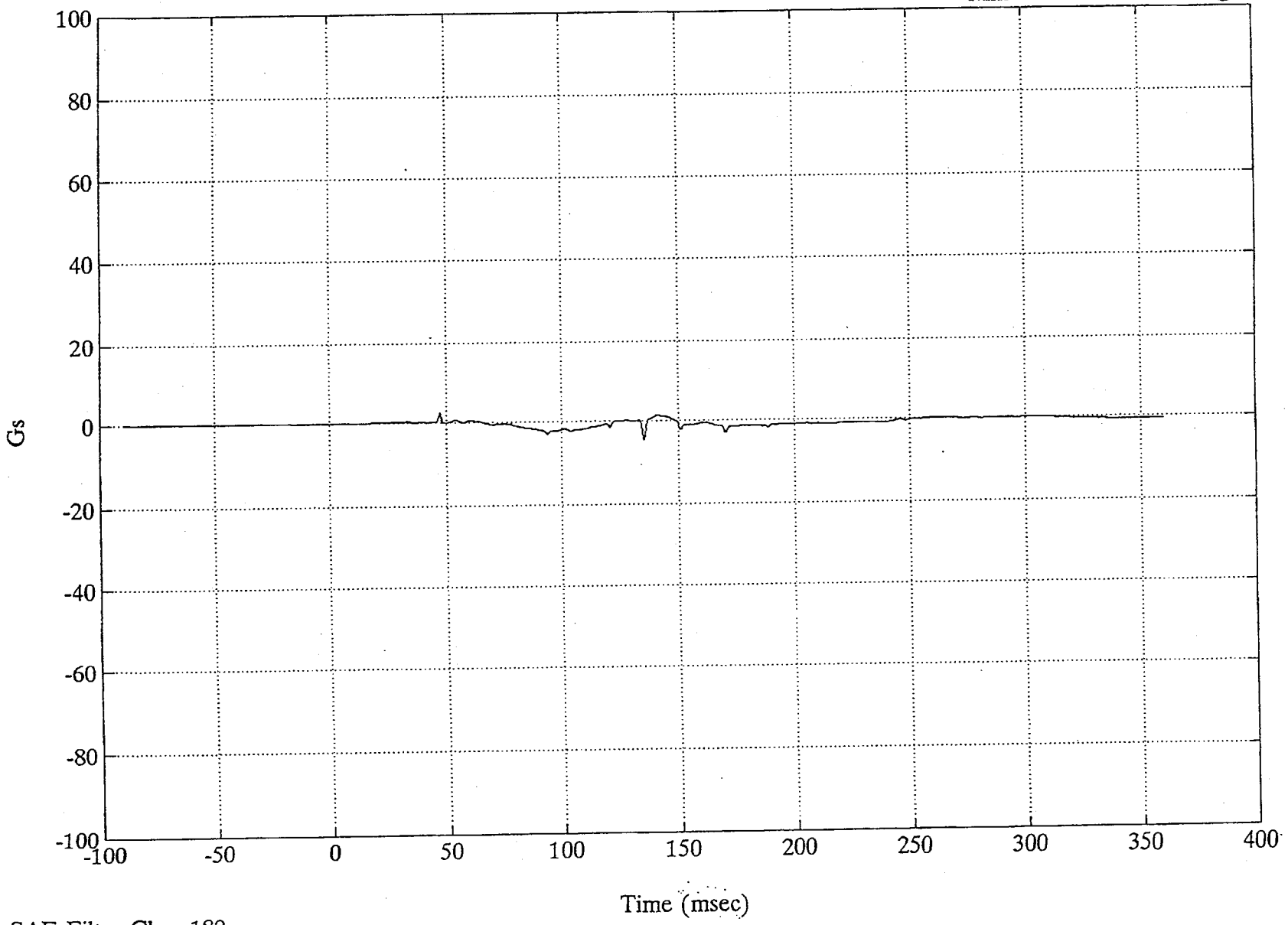
SAE Filter Class 180

8247-20

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Chest Y

Max = 2.41 Gs @ 47.40 msec
Min = -4.54 Gs @ 135.47 msec



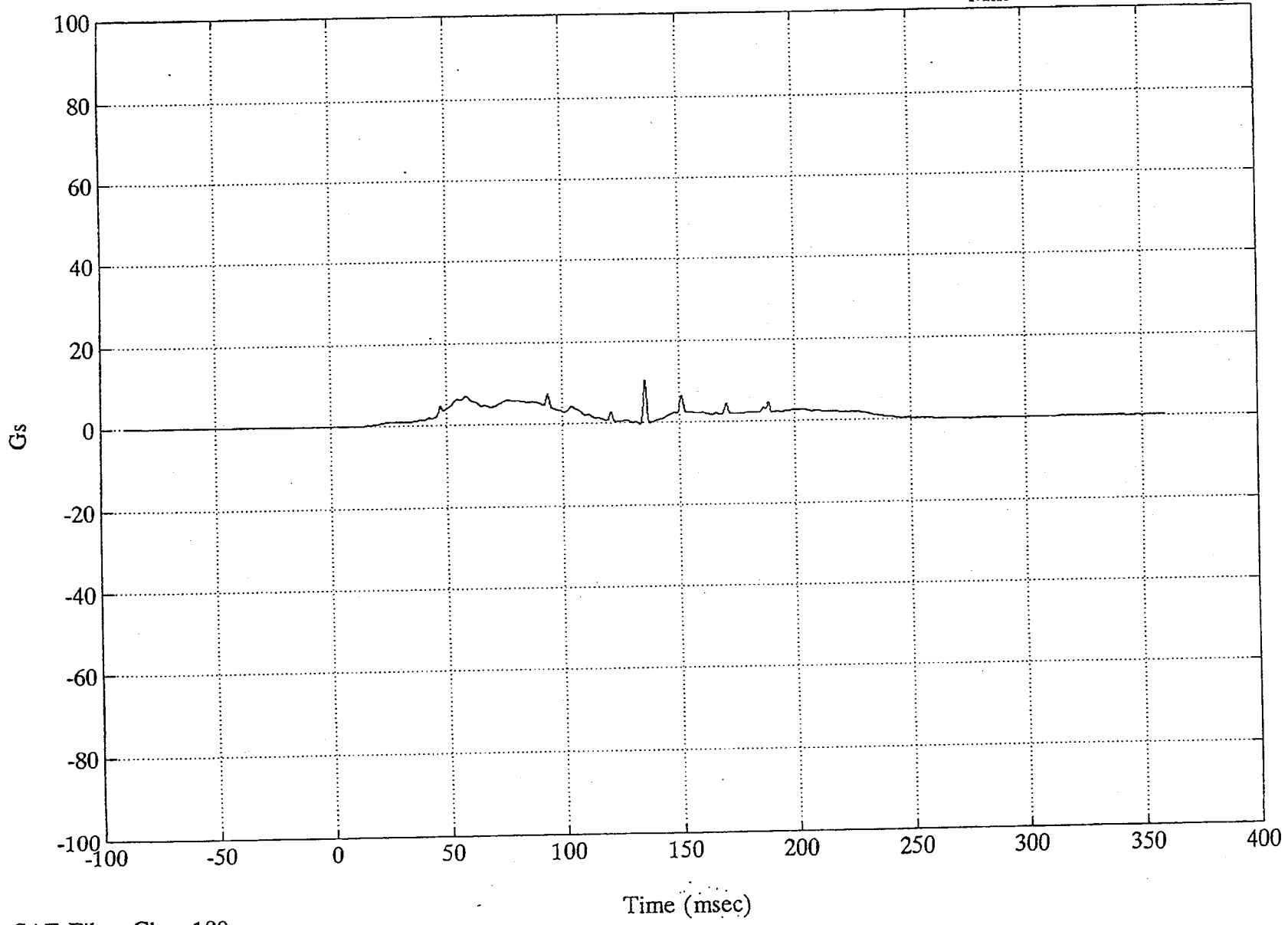
SAE Filter Class 180

8247-20

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Chest Z

Max = 10.32 Gs @ 135.47 msec
Min = -.34 Gs @ 133.44 msec



B-25

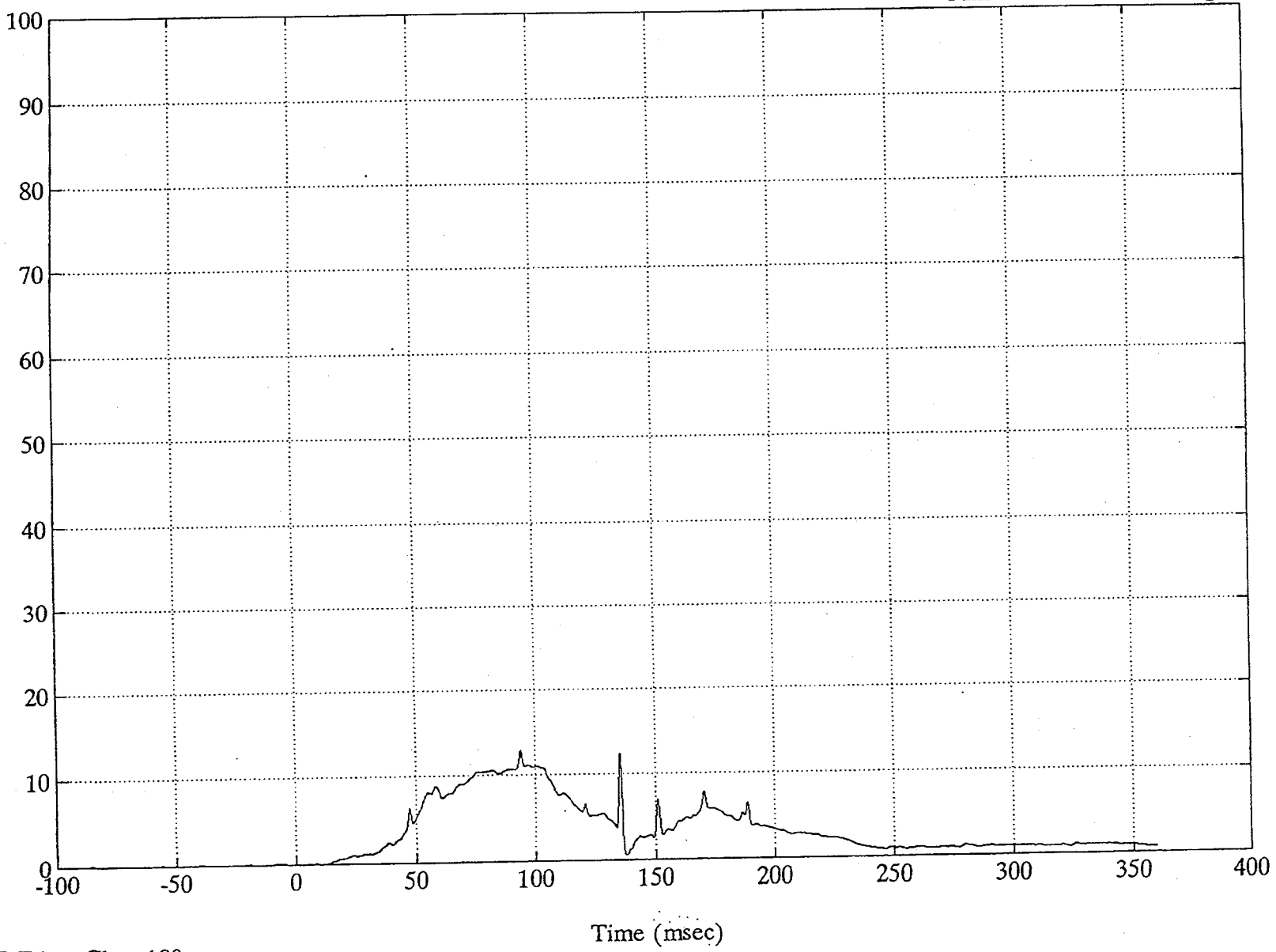
8247-20

SAE Filter Class 180

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Chest Resultant

Max = 12.89 Gs @ 93.84 msec
Min = .00 Gs @ -54.00 msec

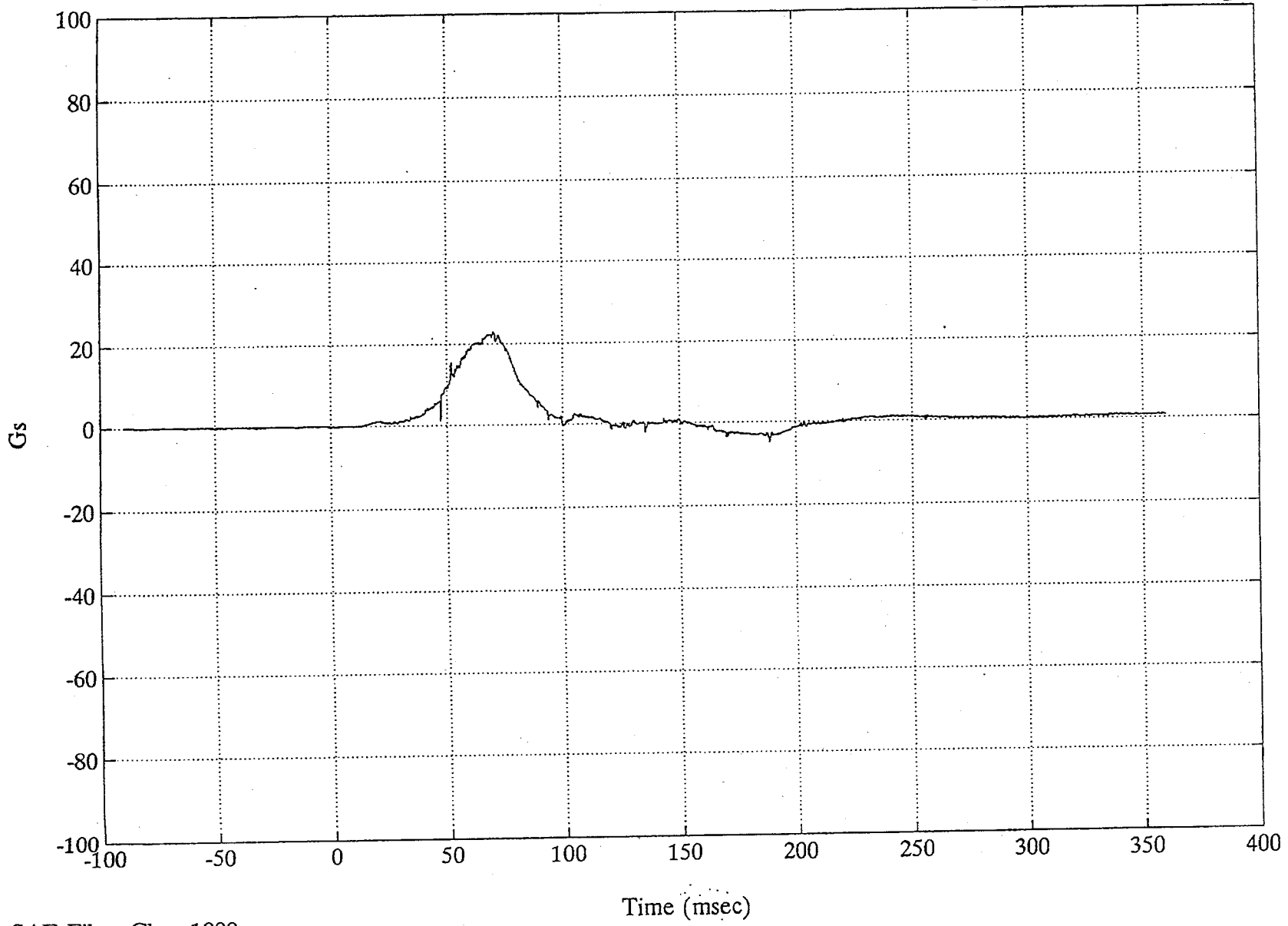


SAE Filter Class 180

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Pelvic X

Max = 22.91 Gs @ 70.44 msec
Min = -4.98 Gs @ 188.76 msec



SAE Filter Class 1000

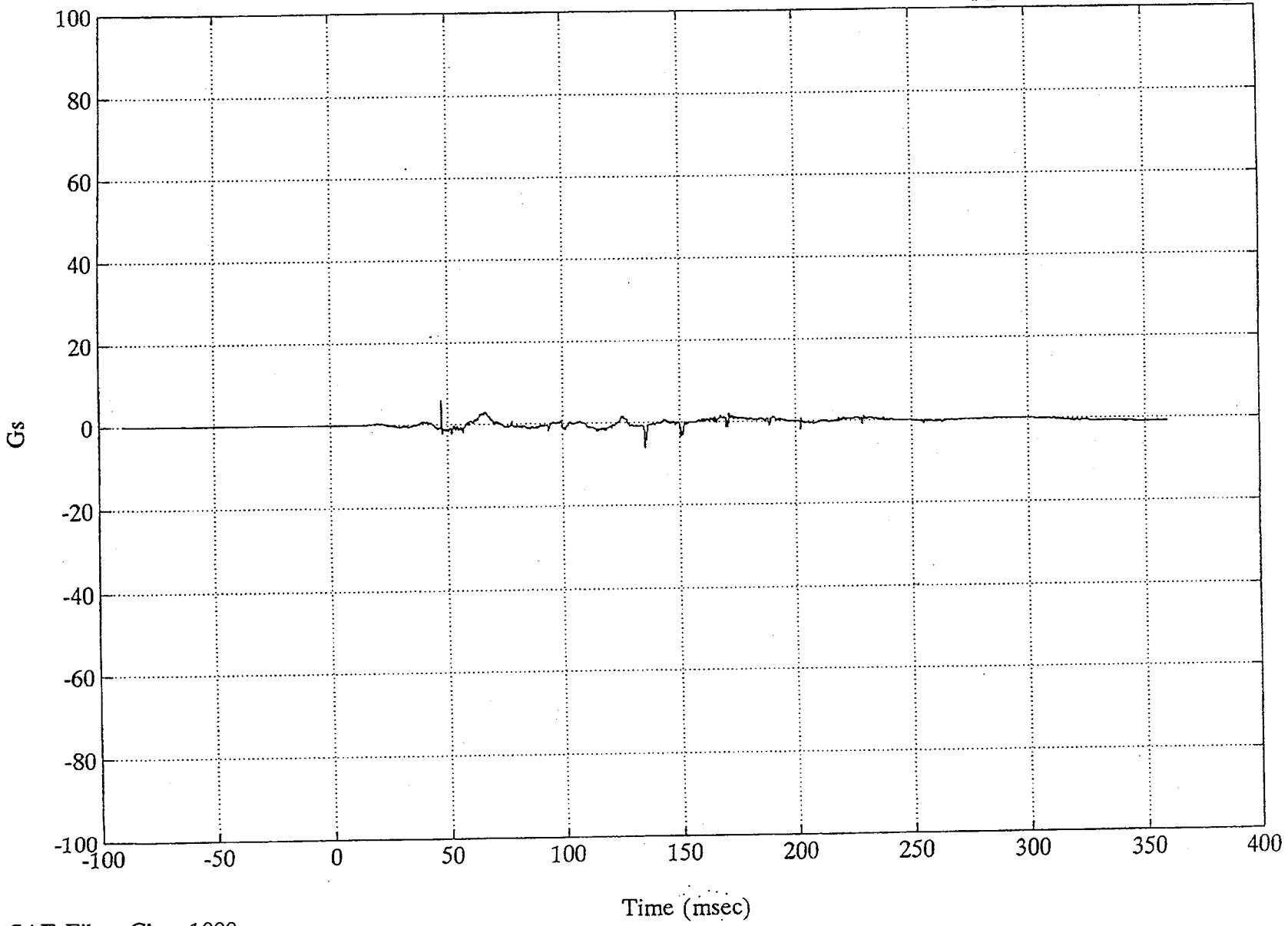
B-27

8247-20

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Pelvic Y

Max = 5.77 Gs @ 47.52 msec
Min = -6.08 Gs @ 135.36 msec



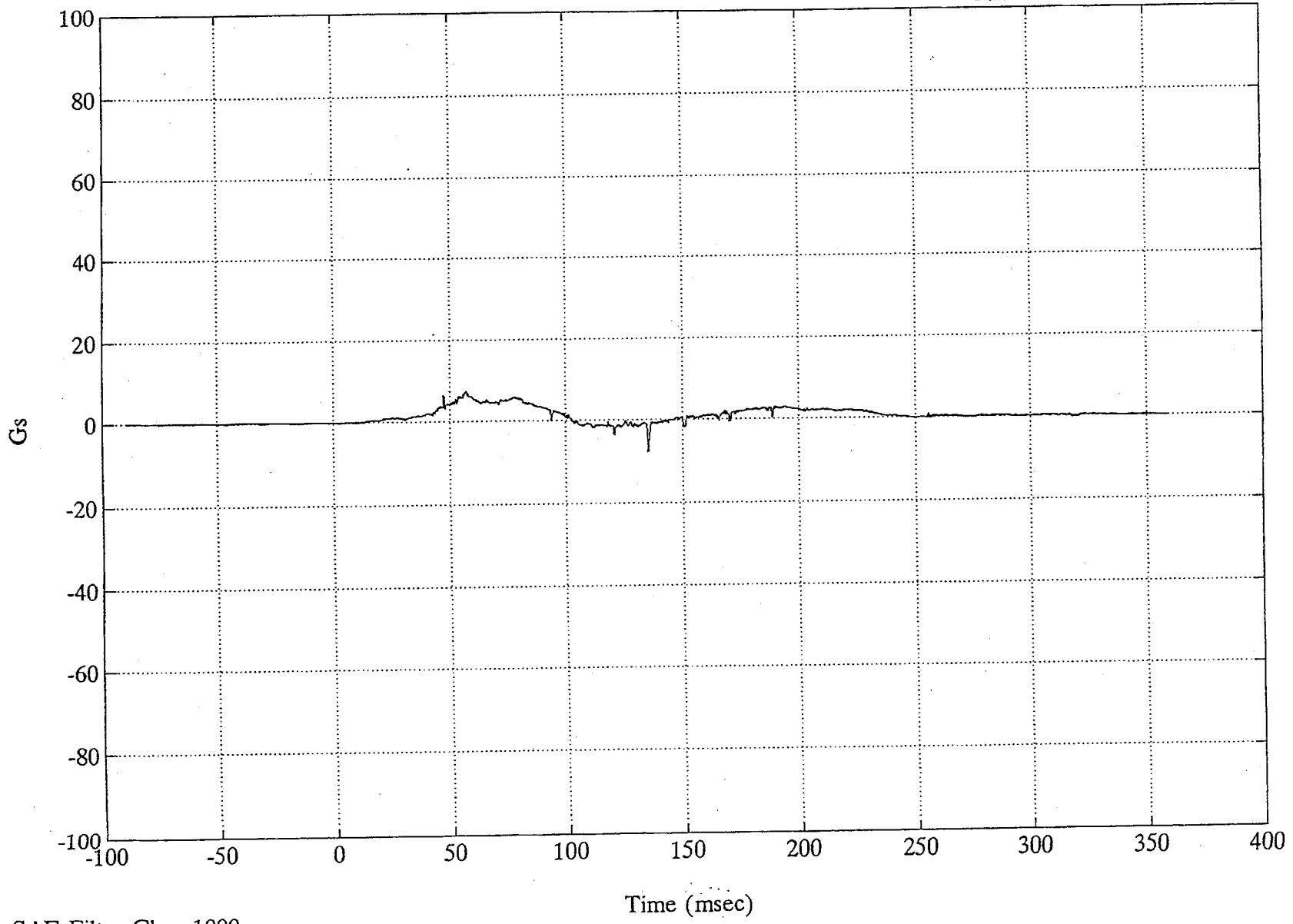
SAE Filter Class 1000

8247-20

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Pelvic Z

Max = 7.42 Gs @ 57.47 msec
Min = -7.69 Gs @ 135.36 msec



SAE Filter Class 1000

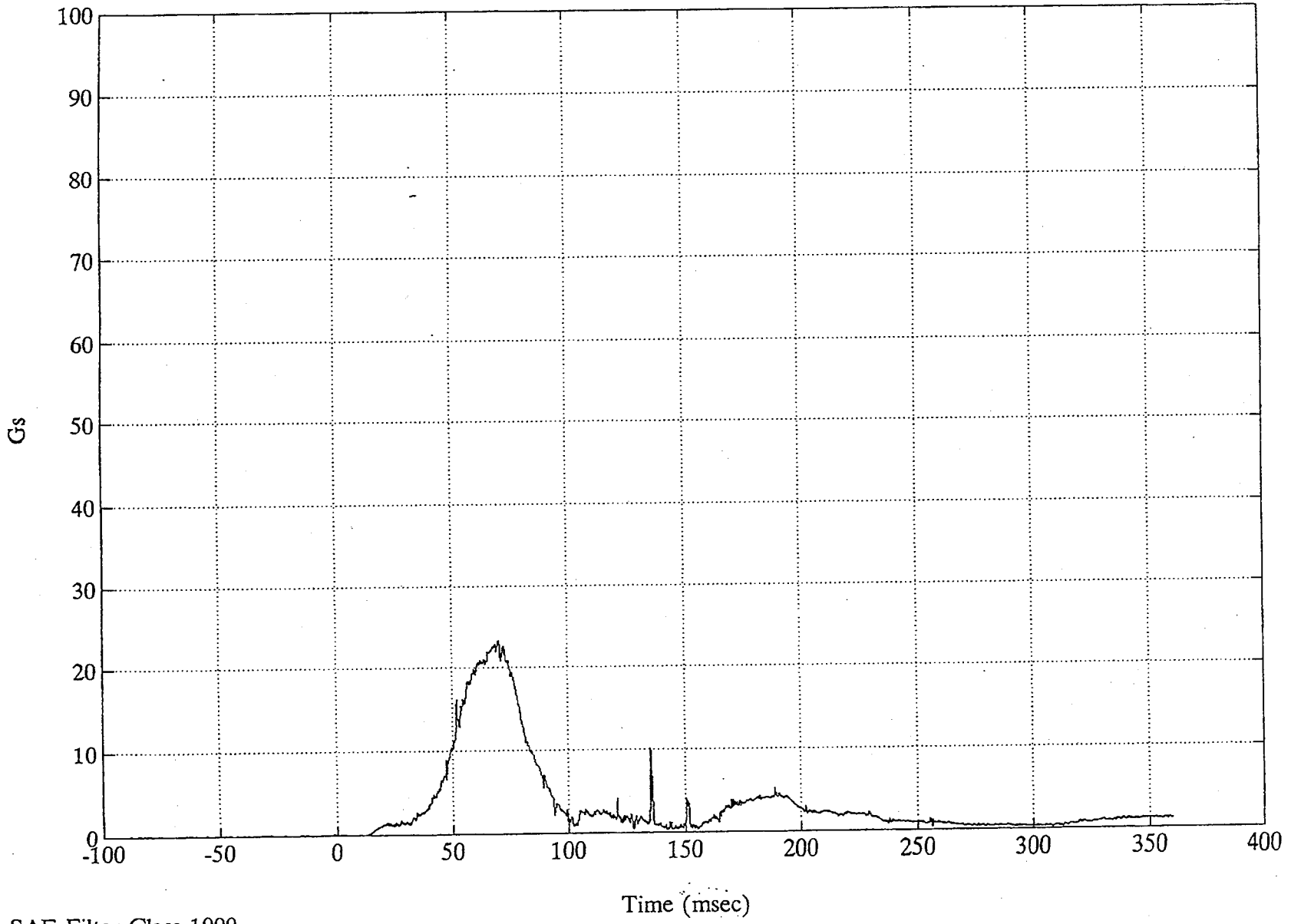
B-29

8247-20

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Pelvic Resultant

Max = 23.39 Gs @ 70.31 msec
Min = .03 Gs @ 12.47 msec



SAE Filter Class 1000

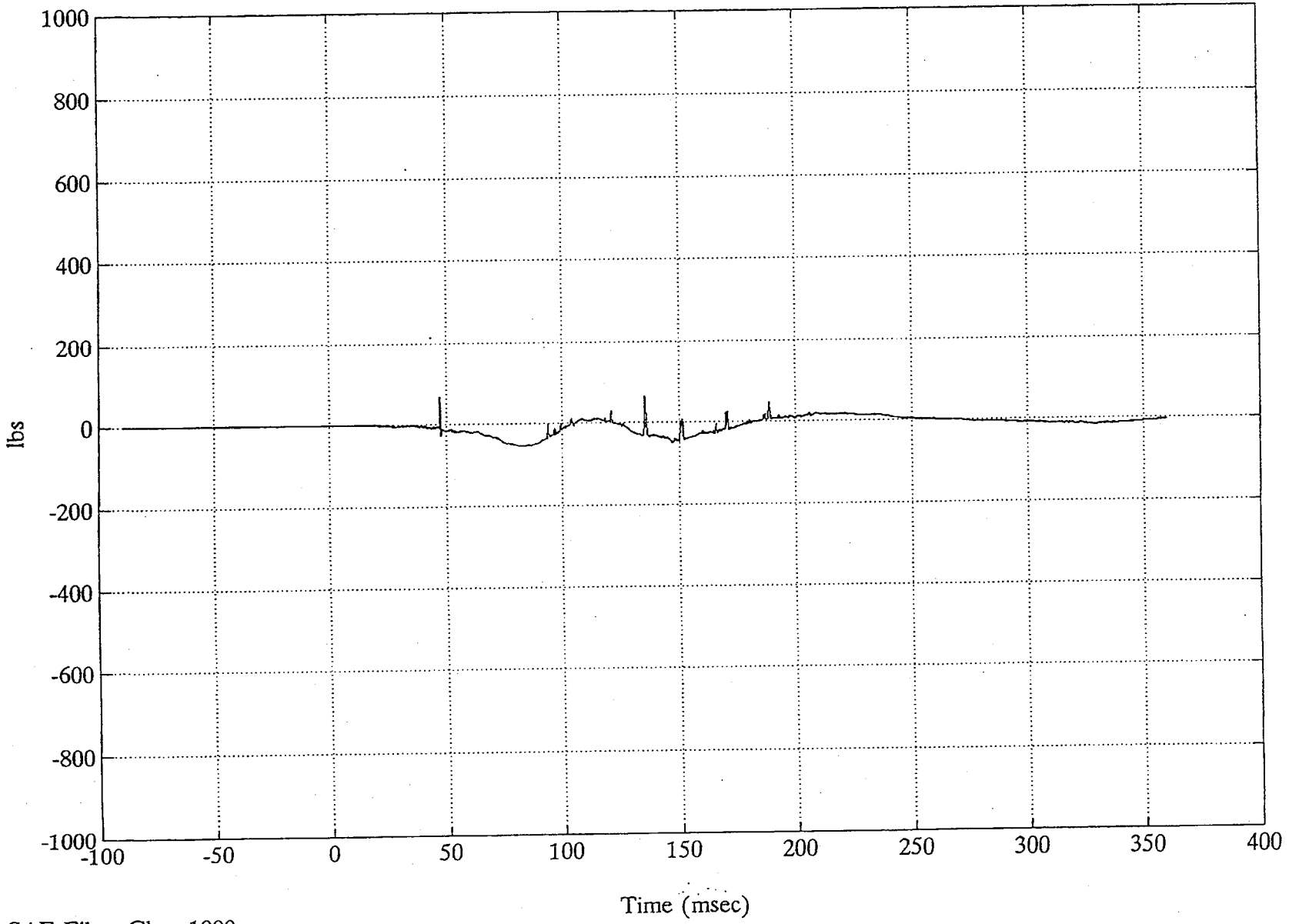
B-30

8247-20

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Upper Neck Fx

Max = 68.17 lbs @ 47.52 msec
Min = -53.23 lbs @ 86.76 msec

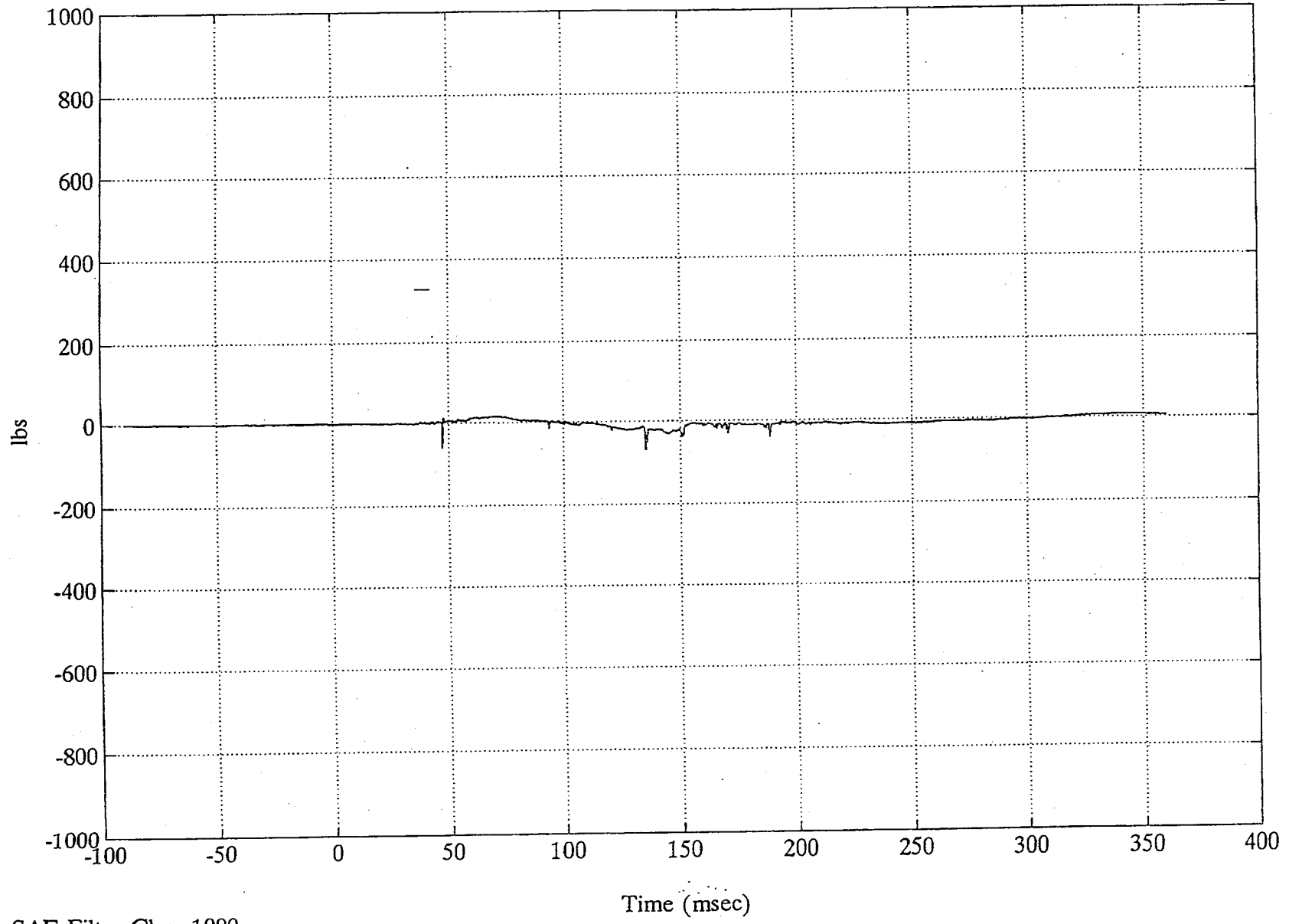


SAE Filter Class 1000

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Upper Neck Fy

Max = 15.55 lbs @ 72.96 msec
Min = -70.18 lbs @ 135.36 msec

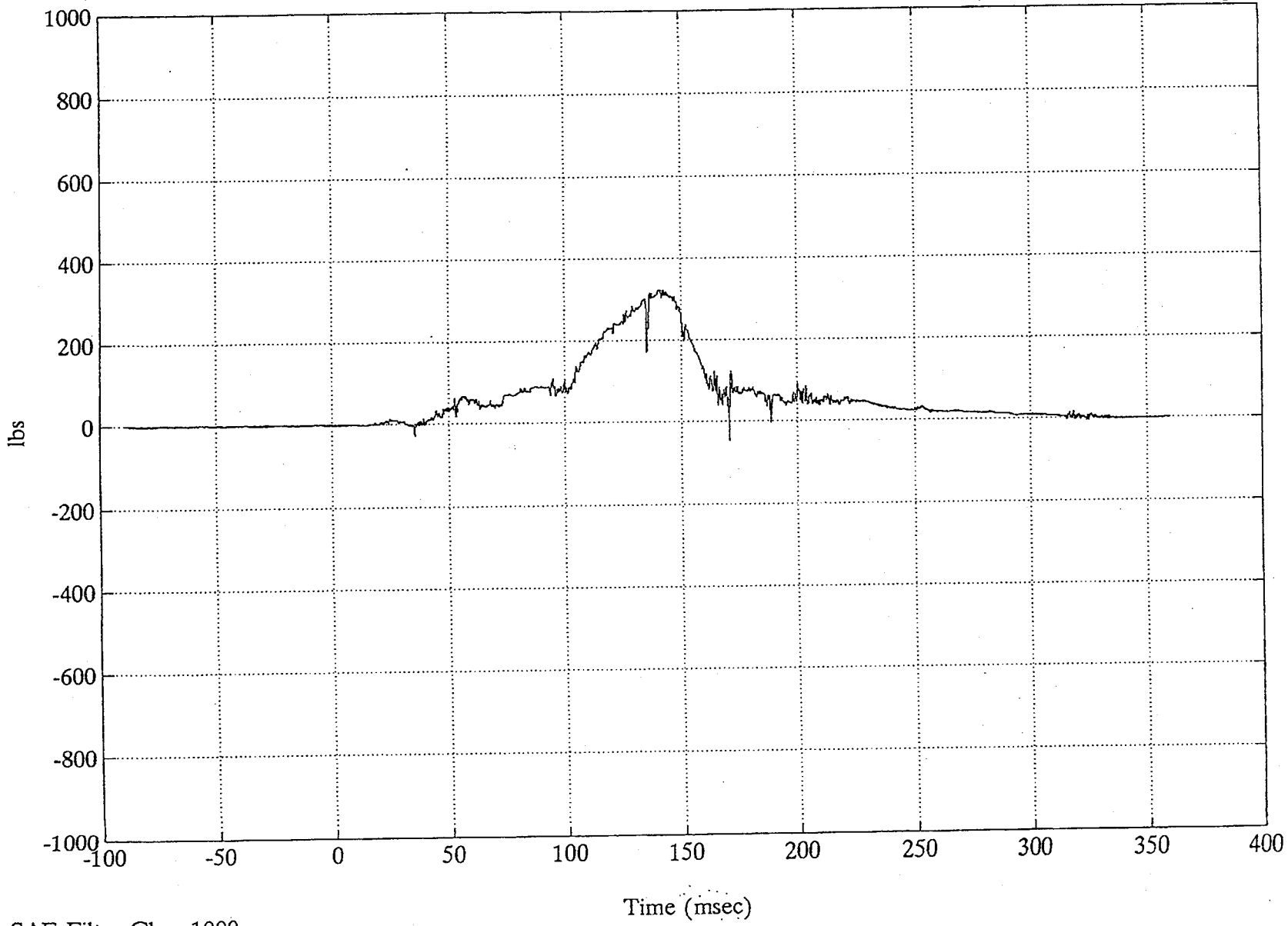


SAE Filter Class 1000

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Upper Neck Fz

Max = 322.07 lbs @ 142.32 msec
Min = -47.69 lbs @ 170.88 msec

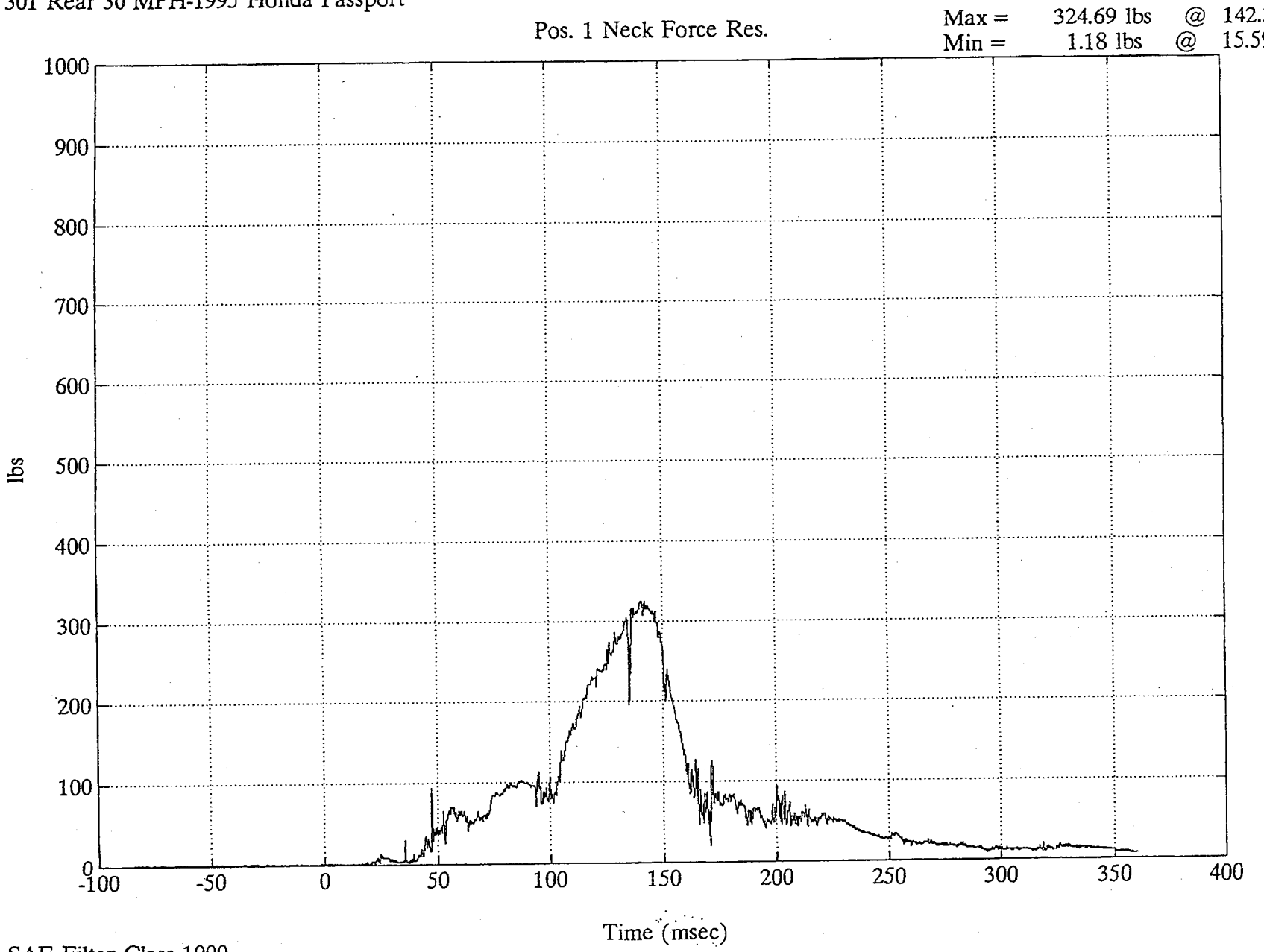


SAE Filter Class 1000

B-33

8247-20

301 Rear 30 MPH-1995 Honda Passport



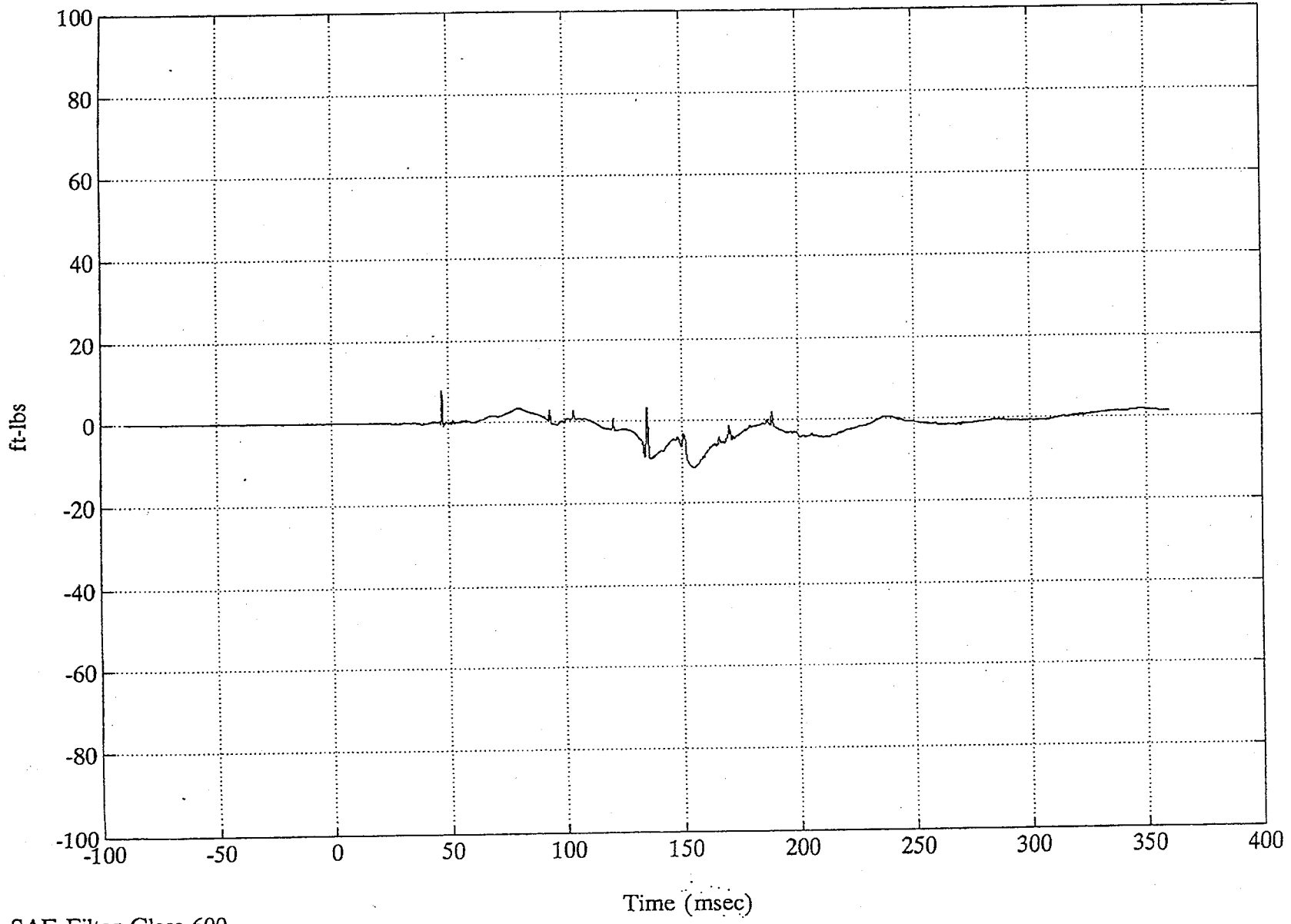
SAE Filter Class 1000

8247-20

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Upper Neck Mx

Max = 7.80 ft-lbs @ 47.52 msec
Min = -11.66 ft-lbs @ 155.16 msec



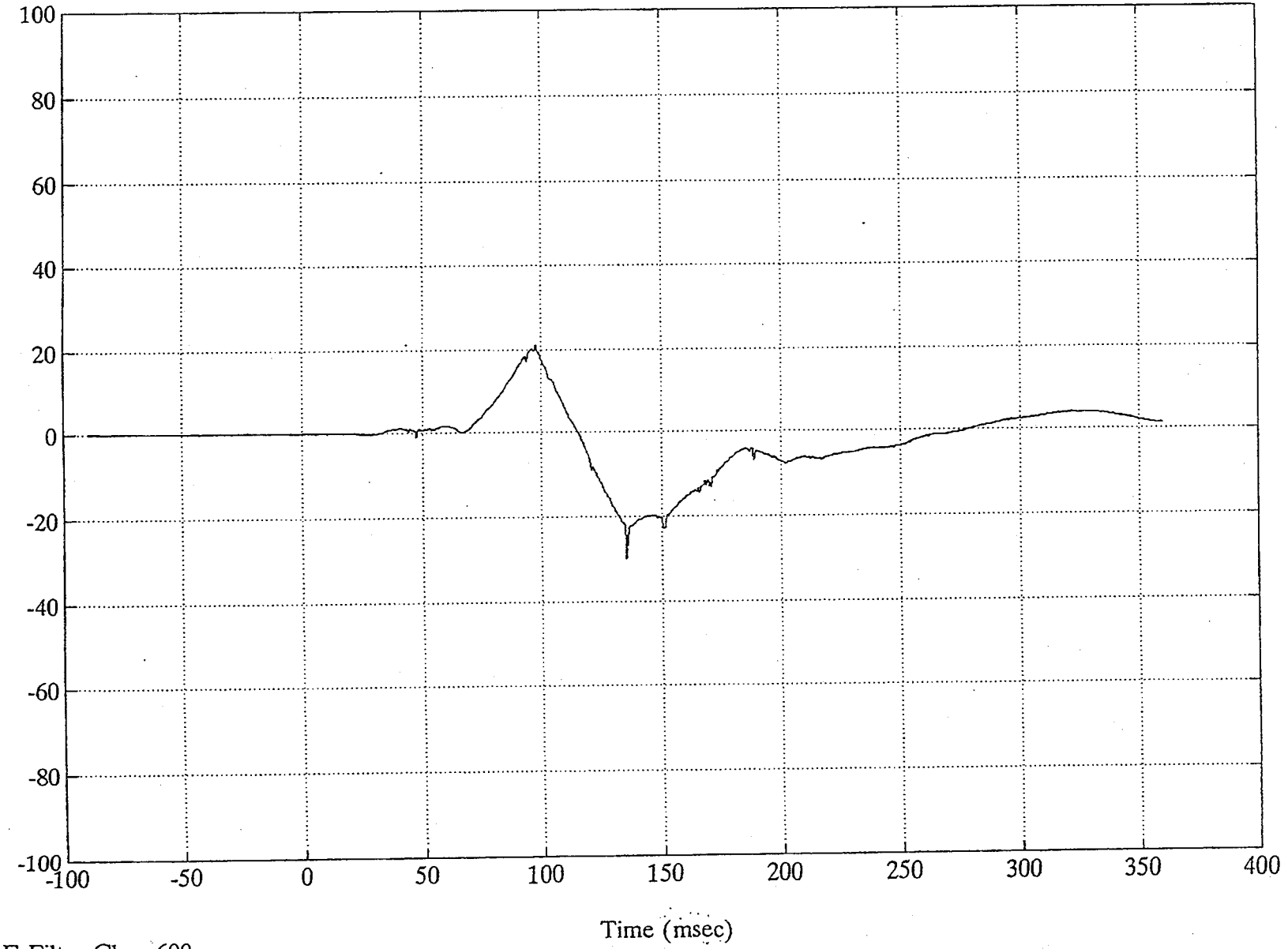
SAE Filter Class 600

8247-20

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Upper Neck My

Max = 21.00 ft-lbs @ 97.80 msec
Min = -30.11 ft-lbs @ 135.36 msec



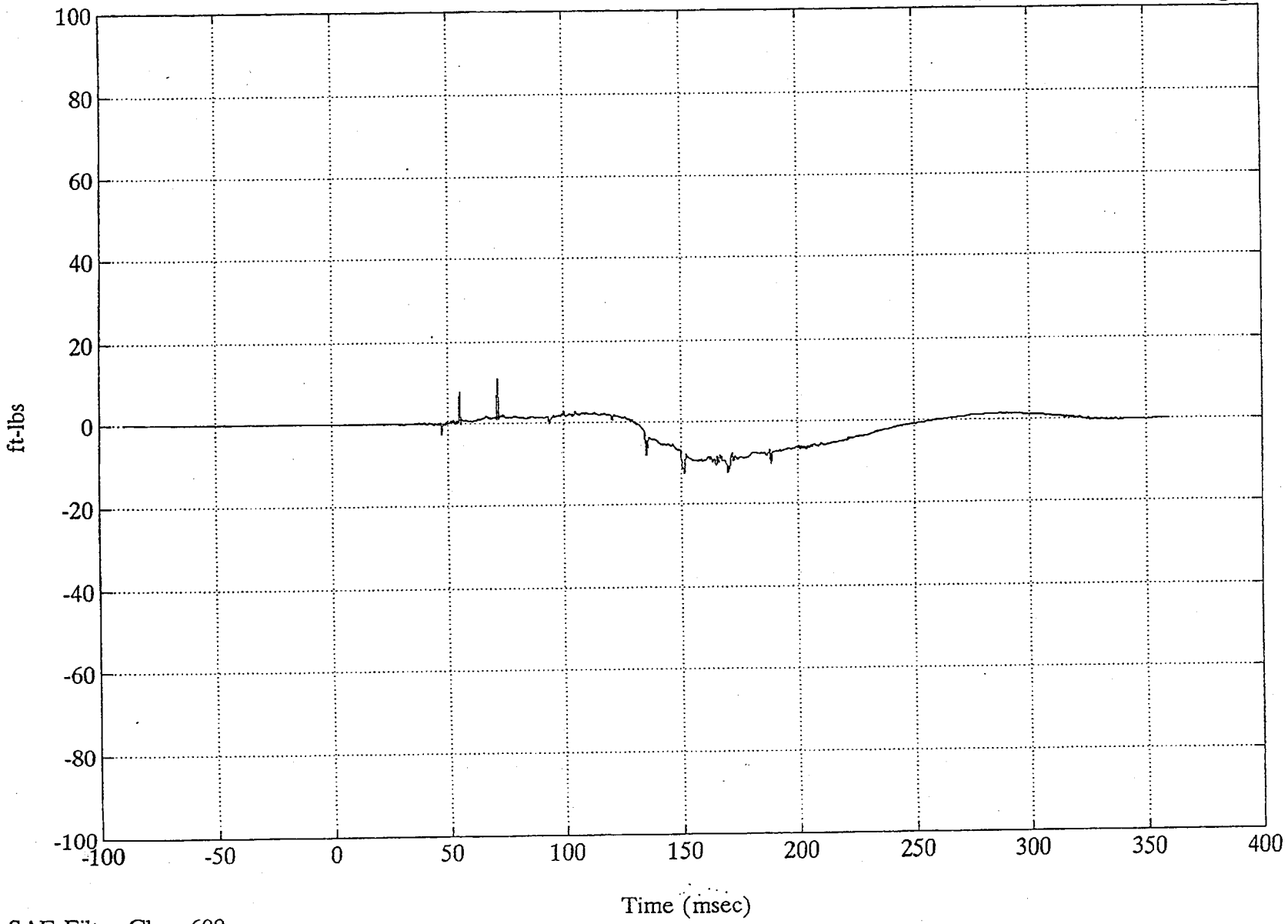
SAE Filter Class 600

8247-20

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Upper Neck Mz

Max = 10.99 ft-lbs @ 71.63 msec
Min = -12.66 ft-lbs @ 151.44 msec



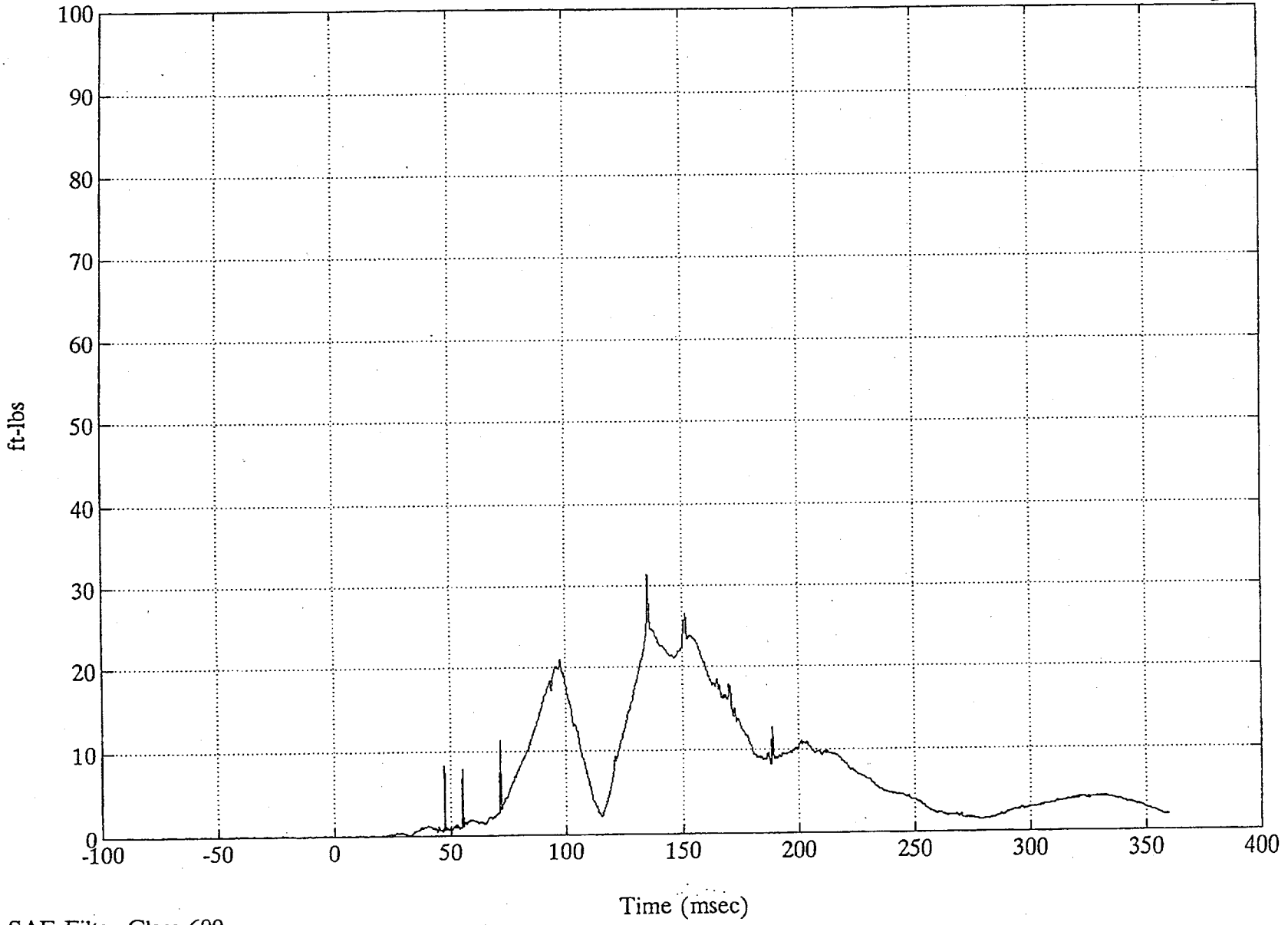
SAE Filter Class 600

8247-20

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Neck Moment Res.

Max = 31.35 ft-lbs @ 135.36 msec
Min = .00 ft-lbs @ -4.92 msec



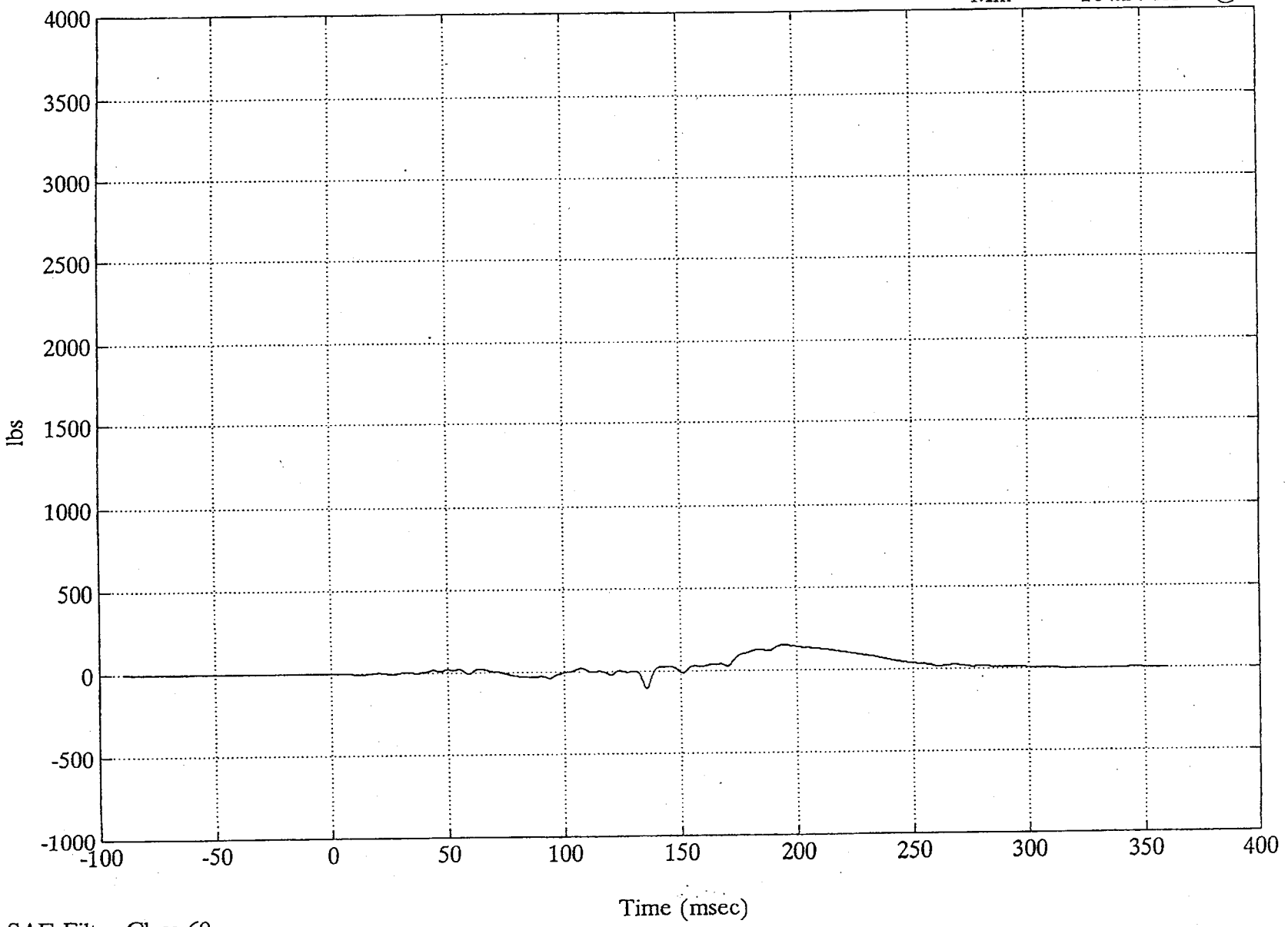
SAE Filter Class 600

8247-20

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Lap Belt

Max = 157.40 lbs @ 194.40 msec
Min = -104.24 lbs @ 135.36 msec



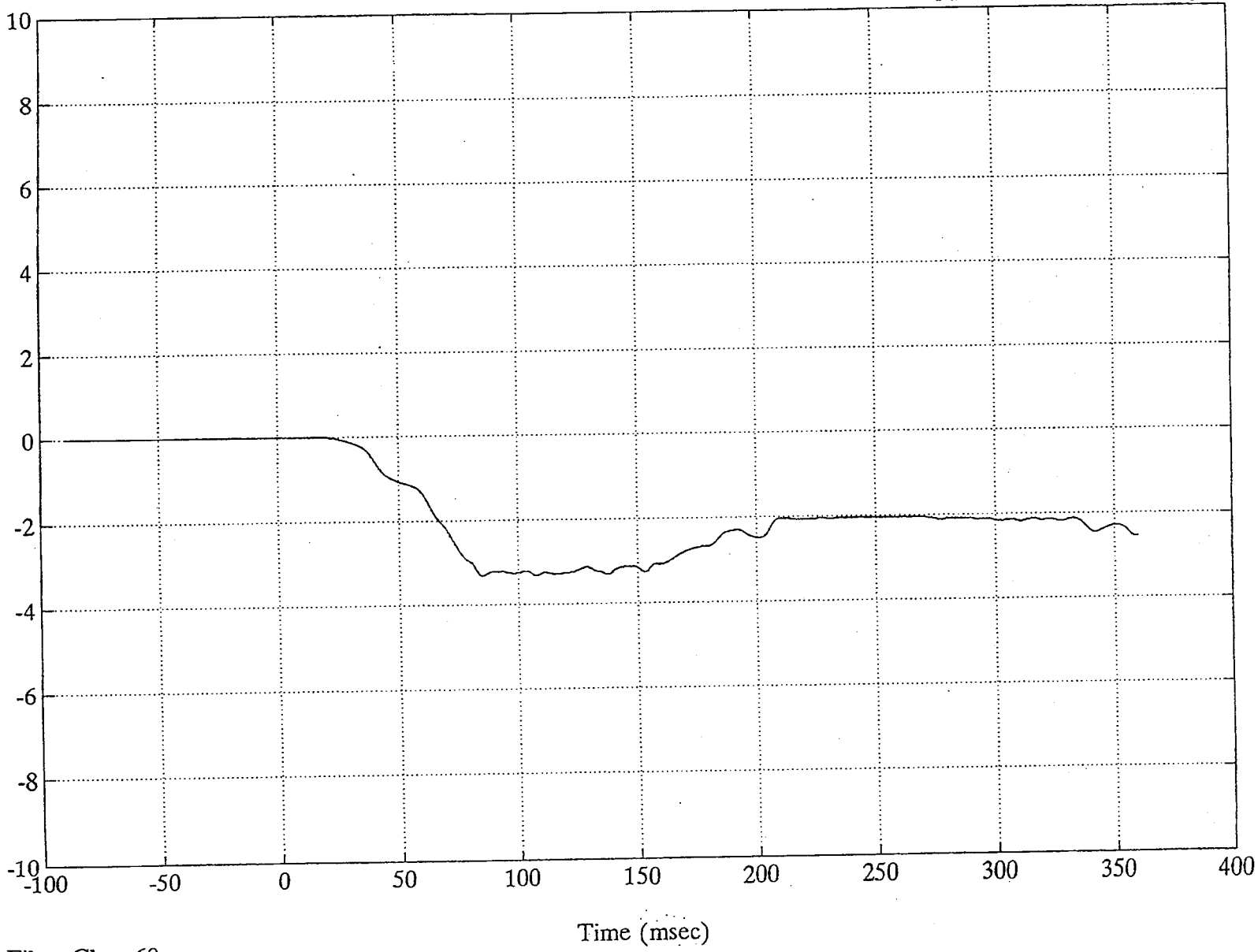
SAE Filter Class 60

8247-20

301 Rear 30 MPH-1995 Honda Passport

Pos. 1 Belt Spoolout

Max = .00 Ins @ -13.56 msec
Min = -3.31 Ins @ 137.63 msec



SAE Filter Class 60

8247-20