2637

REPORT NO. KAR-97-06

NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST

KIA MOTOR COMPANY, LTD.
1997 KIA SPORTAGE
MULTI-PURPOSE VEHICLE
NHTSA NO. MV0504

PREPARED BY:
KARCO ENGINEERING
9270 HOLLY ROAD
ADELANTO, CALIFORNIA 92301

MAY 25, 1997
FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF MARKET INCENTIVES
ROOM NO. 5313 (NRM-22)
400 SEVENTH ST., S.W.
WASHINGTON D.C. 20590

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-97-D-02007.

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Date of Acceptance

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Date of Acceptance

Technical Report Documentation Page

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16. Abstract

A 35 mph (56.3 kph) frontal barrier impact test was conducted on a 1997 Kia Sportage sport utility vehicle at KARCO Engineering on April 24, 1997. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), and 301 performance. The impact velocity was 55.64 kph. The ambient temperature at the barrier face at the time of impact was 23.9 degrees C. The vehicle's maximum post-test static crush was 354 mm.

Type of occupant restraint system tested: A 3-point continuous webbing belt system at both seating positions with driver side and passenger side air bags. Occupant injury response data summary is as follows:

Injury Criteria	Threshold Value	Driver Dummy	Passenger Dummy
Head Injury Criteria	HIC = 1000)	968.7	1036.4
Chest Resultant 3 msec clip	60 G's	48.5	54.3
Left Femur Force	10009 N	-5299.3	-4640.2
Right Femur Force	10009 N	-4472.8	-3729.4

17. Key Words	18. Distribution Statement
35 MPH (56.3 KPH) Frontal Barrier Impact Test New Car Assessment Program (NCAP) 1997 Kia Sportage NHTSA No. MV0504	Copies of this report are available from: Technical Reference Division National Highway Traffic Safety Admin. Room 5108, Nassif Building 400 7th St., SW WASHINGTON, DC 20590

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SECTION 1.

PURPOSE, TEST PROCEDURE AND SUMMARY OF TEST MV0504

1.1 PURPOSE

This 35 mph (56.3 kph) frontal barrier impact test is part of the Composite FY' 97 New Car Assessment Program (NCAP) sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract No. DTNH22-97-D-02007. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 30 mph (48 kph) FMVSS 208/212/219/301 requirements.

1.2 TEST PROCEDURE

This 35 mph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) Laboratory Indicant Test Procedure, dated 01 September, 1996 and corresponding KARCO Engineering Test Procedure KTP-001, dated September 18, 1996. Data was obtained indicant of FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Retention"; FMVSS 219, "Windshield Zone Intrusion (Partial)"; and FMVSS 301" "Fuel System Integrity" performance. Procedures for receiving, inspection testing and reporting of test results are described in the test procedures and are not repeated in this report.

The test vehicle was instrumented with nine (9) accelerometers to measure longitudinal axis accelerations. The driver's and passenger's restraint systems were instrumented with four (4) seat belt load cells to measure lap and shoulder belt tension. The vehicle specified impact velocity range was 55.5 to 57.1 kph.

The test vehicle contained two (2) part 572E 50th percentile adult male anthropomorphic test devices (ATDs). Both ATDs were instrumented with head, chest, pelvic and redundant head and chest triaxial accelerometers, left/right femur load cells and left/right lower leg sensors (driver side only). In addition, each ATD contained a chest displacement potentiometer and a six-axis neck transducer. The ATDs were positioned in the front outboard seating positions according to the dummy placement procedures specified in Appendices VII and VIII of the Laboratory Indicant Test Procedure. Ninety-seven channels of data were recorded with a PC based (TDAS) on-board data acquisition system. The data were digitally sampled at 10,000 samples per second and processed per section IP11 of the Laboratory Indicant Test Procedure.

The Driver ATD (serial No. 34) and the right-front passenger ATD (serial No. 35) were both calibrated prior to this test. Injury criteria was exceeded by the passenger ATD during test MV0504.

The test was conducted at KARCO Engineering Automotive Research Center on 04/24/97 at a speed of 55.64 kph. The frontal barrier impact event was documented by one (1) real-time camera panning motion picture camera and seventeen (17) high-speed motion picture cameras. The pre- and post-test conditions were recorded by one (1) real-time motion picture camera.

1.3 SUMMARY OF FRONTAL BARRIER IMPACT TEST

No load cell barrier data channels were recorded in conducting this April 24, 1997, NCAP test. The barrier was impacted by a 1997 Kia Sportage at a velocity of 55.64 kph. The 1997 Kia Sportage was equipped with a 2.0 liter, four cylinder engine and a five speed manual transmission. The test weight, with two (2) 50th percentile male dummies, was 1680 kg.

The driver's Head Injury Criteria (HIC) was 968.7, the maximum chest deceleration over three (3) milliseconds was 48.5 g and the left and right femur loads were -5299.3 and -4472.8 Newtons, respectively.

The right front passenger's HIC was 1036.4, maximum chest deceleration over three (3) milliseconds was 54.3 g, and the left and right femur loads were -4640.2 and -3729.4 Newtons respectively.

There was 100 percent windshield retention, no intrusion into the protected or unprotected zone of the windshield, and no Stoddard solvent leakage occurred after impact or during any phase of the static rollover test.

The test vehicle sustained a maximum static crush of 335 mm at the right side of the vehicle center. The windshield was severely damaged but the vehicle glazing remained intact. The driver and passenger side doors opened without the aid of tools, the rear doors on both sides were jammed. The driver ATD's head, chest and abdomen contacted the airbag, and his head also contacted the 'B' pillar; both knees impacted the dash panel, airbag and steering column.

The passenger ATD's chin contacted his chest, his chest and abdomen contacted the seat belt, and both knees contacted the glove box and the dash.

Seat belt spoolout, measured by high-speed film analysis, was 75 mm for the driver ATD and 80 mm for the passenger ATD. On-board pullout potentiometers measured 75.8 mm for the driver ATD and 79.1 mm for the passenger ATD. Shoulder belt stretch was 0.091 cm/cm for the driver and 0.073 cm/cm for the passenger ATD's. Chest deflection for the driver ATD was -4.71 mm. Chest deflection for the passenger ATD was -5.08 mm.

1.4 GENERAL COMMENTS

The 1997 Kia Sportage MPV passed the requirements of FMVSS 212, FMVSS 219 and FMVSS 301-75. Data pertaining to these standards are presented in the data sheets.

The vehicle, occupant, camera and measurement data are presented in Section 2. Appendix A contains the still photograph prints. The dummy, vehicle and response data traces are presented in Appendix B. Appendix C is for load cell barrier data, eight channels were collected for this test. Appendix D contains the test equipment and instrument calibration data. Appendix E contains the dummy calibration data and Appendix F the owner's manual occupant restraint system instructions.

SECTION 2.

DATA SHEETS

TEST MODE: 35 MPH FRONTAL NCAP

CONVERSION FACTORS USED IN THIS REPORT:

2.2 pounds (lb)	=	1 kilogram (kg)
1 mile (mi.)	=	1.609 kilometers (km)
1 gallon (gal.)	=	3.785 liters (L)

DATA SHEET NO. 1

CRASH TEST SUMMARY

VEHICLE MAKE/MODEL/BODY STYLE: Kia/Sportage/ MPV

NHTSA NO.: MV0504 TEST DATE: 04/24/97 TIME: 3:25 PM

BARRIER TEMPERATURE: 23.9 °C WINDSHIELD MOLDING TEMPERATURE: 23.9 °C

VEHICLE TEST WEIGHT: 1680 kg VEHICLE/BARRIER IMPACT ANGLE: 90 °

IMPACT VELOCITY: PRIMARY 55.64 kph SECONDARY 55.74 kph THIRD 55.61 kph

VEHICLE REBOUND FROM BARRIER:

Left Side	615 mm
Centerline	630 mm
Right Side	610 mm

MAXIMUM STATIC CRUSH: 335 mm at center

	Pre-test	Post-test	Static Crush
Left Side	3945 mm	3625 mm	320 mm
Centerline	4080 mm	3745 mm	335 mm
Right Side	3945 mm	3645 mm	300 mm

DUMMIES:	DRIVER	PASSENGER
DUMMY TYPE	572E	572E
SERIAL NUMBER	34	35
RESTRAINT SYSTEM	TYPE II	TYPE II
NO. DATA CHANNELS:	44	34
NUMBER OF CAMERAS:	1 Real Time	17 High Speed
DOOR OPENING DATA:	OK - Left Front	OK - Right Front
FRONT SEAT(S) DATA:	DRIVER	PASSENGER
Seat Track Failure (shift)-	0 mm	0 mm
Seat Back Failure -	N/A	N/A

VISIBLE DUMMY CONTACT POINTS:

	DRIVER	PASSENGER
Head	"B" PILLAR, AIRBAG	CHEST
Chest	AIRBAG	CHIN
Knees	AIRBAG, DASH, STEERING COLUMN	DASH AND GLOVE BOX

DATA SHEET NO. 2

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1997 Kia/ Sportage/ MPV

NHTSA No.: MV0504 VIN: KNDJB4232V5528082 Color: Dark Blue

Date Received: 04/02/97 Odometer Reading: 86 miles

Selling Dealer: Spreen Kia

ENGINE & DRIVE TRAIN DATA:

No. Cylinders: 4 Displacement: 2.0 litter

Placement: Longitudinal/In-line: x Transverse/Lateral:

Transmission Data:

Speeds: 5 Manual: X Automatic: Overdrive:

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

MAJOR OPTIONS:

Airconditioner: Power Steering: X Power Brakes: X ABS: x

Power Windows: x Power Door Locks: Other: Rear Defroster, Console, Tachometer, Clock, Front Disc Brakes, Driver side knee air bag

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: Kia Motor Co., Ltd.

Date of Manufacture: 11/96 VIN: KNDJB4232V5528082

GVWR: 1911 kg GAWR FRONT: 951.8 kg GAWR REAR: 1032.3 kg

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:

FRONT: 26 kPa REAR: 26 kPa

Recommended Tire Size: 205/75/R15 Load Range: 726.4 kg

Recommended Cold Tire Pressure:

FRONT: 26 kPa REAR: 26 kPa

Size of Tires on Test Vehicle: 205/75/R15 Manufacturer Michelin

Type of Spare Tire: Full size

Data Sheet No. 2 (Continued)

VEHICLE CAPACITY DATA:

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

Number of Occupants: Front 2 Rear 3 TOTAL 5

VEHICLE CAPACITY WEIGHT (VCW) = 380 kg

No. of Occupants x 68 kg. = 340 kg

Rated Cargo/Luggage Weight (RCLW) = 40 kg (Difference)*

WEIGHT OF TEST VEHICLE AS RECEIVED AT LABORATORY: (with maximum fluids)

Right Front =	397 kg	Right Rear =	312 kg
Left Front =	368 kg	Left Rear =	319 kg
TOTAL FRONT =	765 kg	TOTAL REAR =	631 kg
% Total Weight =	55 %	% Total Weight =	45 %

TOTAL DELIVERED WEIGHT = 1398 kg

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight = 1398 kg

Rated Cargo/Luggage Weight = 136 kg

Weight of 2 P572 Dummies = 149 kg

TARGET TEST WEIGHT = 1683 kg (SUM)

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES 90.5 kg OF CARGO (BALLAST):

Right Front =	392 kg	Right Rear =	437 kg
Left Front =	417 kg	Left Rear =	434 kg
TOTAL FRONT =	809 kg	TOTAL REAR =	871 kg
% Total Weight =	48.15 %	% Total Weight =	51.84 %

TOTAL TEST WEIGHT = 1680 kg

Weight of Ballast secured in cargo area = 90.5 kg (Includes cameras & instrumentation)

Vehicle Components Removed For Weight Reduction: Side mirrors, jack, tools, rear seat assembly and spare tire.

* For MPV's, this weight is 136 kg.

Data Sheet No. 2 (Continued)

TEST VEHICLE ATTITUDE: (all dimensions in mm)

AS DELIVERED:	RF 800	LF 800	RR 812	LR 812
AS TESTED:	RF 800	LF 800	RR 762	LR 762

Vehicle's Wheelbase = 2459 mm

Location of Vehicle's CG = (if required)

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 60 liters

Usable Capacity Figure Furnished by COTR = N/A liters

Test Volume Range (92 to 94% of Usable Capacity) = 55.2 to 56.4 liters

ACTUAL TEST VOLUME = 55.6 liters

Test Fluid Type: Stoddard Solvent Specific Gravity = 0.764

Kinematic Viscosity = as per ASTM Standard D484-71

Color = Red

Type of Fuel Pump: Electric X Mechanical _____

Does electric pump operate with ignition switch "ON" & engine "OFF"?

Yes ____ No X

DETAILS OF FUEL SYSTEM: Ignition operated fuel pump with automatic shut off relay

DATA SHEET NO. 3

POST IMPACT DATA

TEST DATE: 04/24/97 TIME: 3:25 PM

TEMPERATURE: 22 °C

VEHICLE NHTSA NO.: MV0504 VIN: KNDJB4232V5528082

REQUIRED IMPACT VELOCITY RANGE: 55.5 km/h to 57.1 km/h

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

Trap No. 1 = 55.64 kph Trap No. 2 = 55.74 kph

Distance from vehicle to barrier - -

A. entering trap = 1829 mm

B. leaving trap = 610 mm

VEHICLE STATIC CRUSH: (for Frontal and Rear Impacts Only)

Vehicle Length - -

Pretest:	Right = 3945 mm	C/L = 4080 mm	Left = 3945 mm
Post Test:	Right = 3645 mm	C/L = 3745 mm	Left = 3625 mm
CRUSH:	Right = 300 mm	C/L = 335 mm	Left = 320 mm

AVERAGE = 318 mm

VEHICLE REBOUND: (from rigid barrier only)

Distance from rear of test vehicle to impact point - -

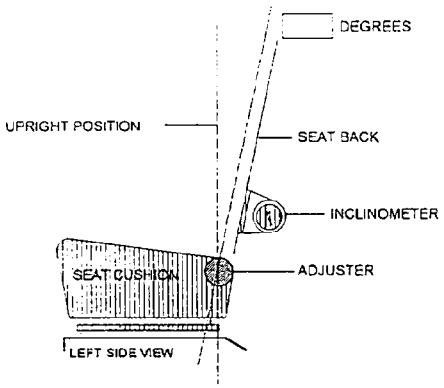
Right = 610 mm C/L = 630 mm Left = 615 mm

AVERAGE = 618 mm

DATA SHEET NO. 4

TEST VEHICLE INFORMATION

VEHICLE MODEL YEAR & MAKE: 1997 KIA VEHICLE MODEL & BODY STYLE: SPORTAGE MPV



FRONT SEAT ASSEMBLY

1. NOMINAL DESIGN RIDING POSITION -
For adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent if applicable. Indicate, if applicable, how the detents are numbered (Is the first detent "0" of "1"?).

Measurement Instructions: A special application tool with pointed probes was inserted through the fabric to make contact with the rigid portion of the lower seat frame assembly approximately 4 inches above the pivot point of the seat back. The inclinometer was placed against the flat surface of the tool and the seat back angle was measured directly from the dial face. For reference purposes the first detent from the front of the seat was identified as number "1".
Seat back angle for driver's seat = 27.0 °

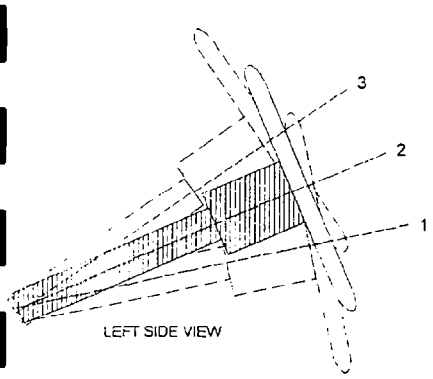
Measurement Instructions: A special application tool with pointed probes was inserted through the fabric to make contact with the rigid portion of the lower seat frame assembly approximately 4 inches above the pivot point of the seat back. The inclinometer was placed against the flat surface of the tool and the seat back angle was measured directly from the dial face. For reference purposes the first detent from the front of the seat was identified as number "1". Seat back angle for passenger's seat = 28.0 °

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

Positioning of the driver's seat: 18 seating positions; set to 10th position from front.

Positioning of the passenger's seat (if applicable): 18 seating positions; set to 10th position from front.

3. STEERING COLUMN ADJUSTMENTS:



STEERING COLUMN ASSEMBLY

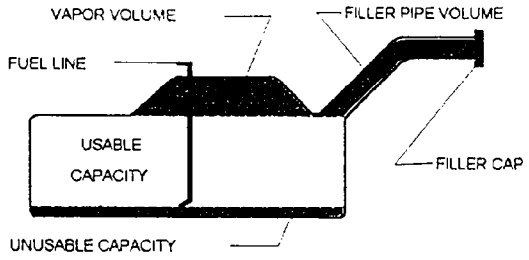
Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine the geometric center.

Operational Instructions:
Position No. 1 is at N/A°
Position No. 2 is at 30°
Position No. 3 is at N/A°

4. SEAT BELT UPPER ANCHORAGE:

Nominal design riding position:

Data Sheet No. 4 (continued)



VEHICLE FUEL TANK ASSEMBLY

5. FUEL TANK CAPACITY DATA

5.1 A. Usable Capacity" of standard equipment fuel tank = 60 liters.

B. Usable Capacity" of optional equipment fuel tank = N/A liters.

C. Usable Capacity" of vehicle(s) used for certification testing to requirements of FMVSS 301 = 55.2 to 56.4 liters.

0

Operational Instructions:

5.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 55.6 liters

5.3 Is vehicle equipped with electric fuel pump?

Yes X No ____

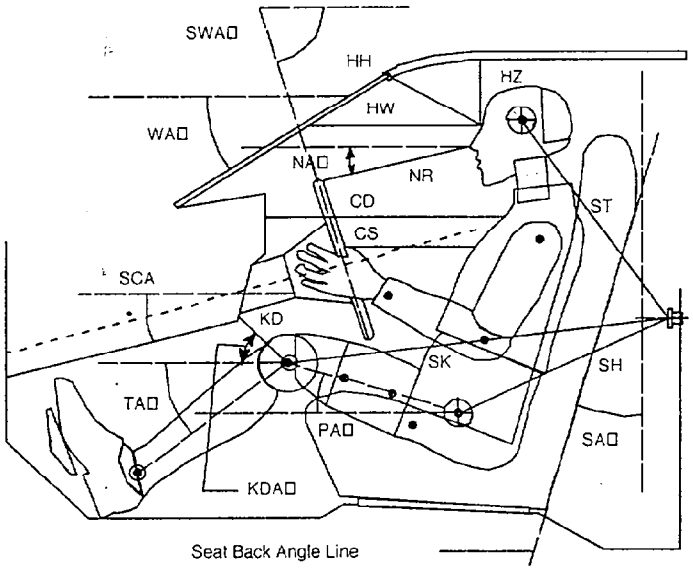
If YES, explain the vehicle operating conditions under which the fuel pump will pump fuel.

Ignition operated fuel pump with automatic shut off relay.

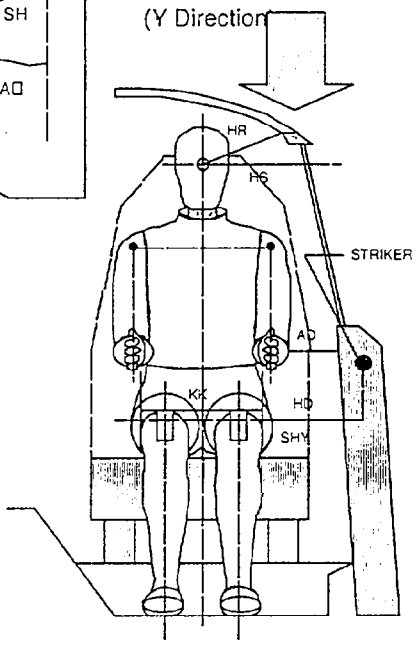
DATA SHEET NO. 5

DUMMY POSITIONING IN VEHICLE

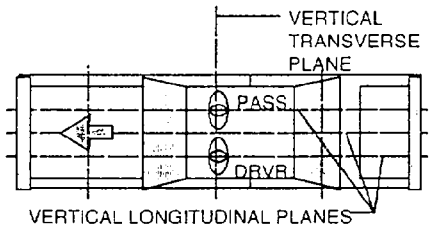
DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



AD Arm to Door
HD HPoint to Door
HR Head to Side Header
HS Head to Side Window
KK Knee to Knee
SHY Striker to HPoint (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 HPoint
SK Striker to Knee
ST Striker to Head
SWA Steering Wheel Angle
TA Tibial Angle
WA Windshield Angle



DUMMY POSITIONING IN VEHICLE

FRONT SEAT MEASUREMENT TABLE

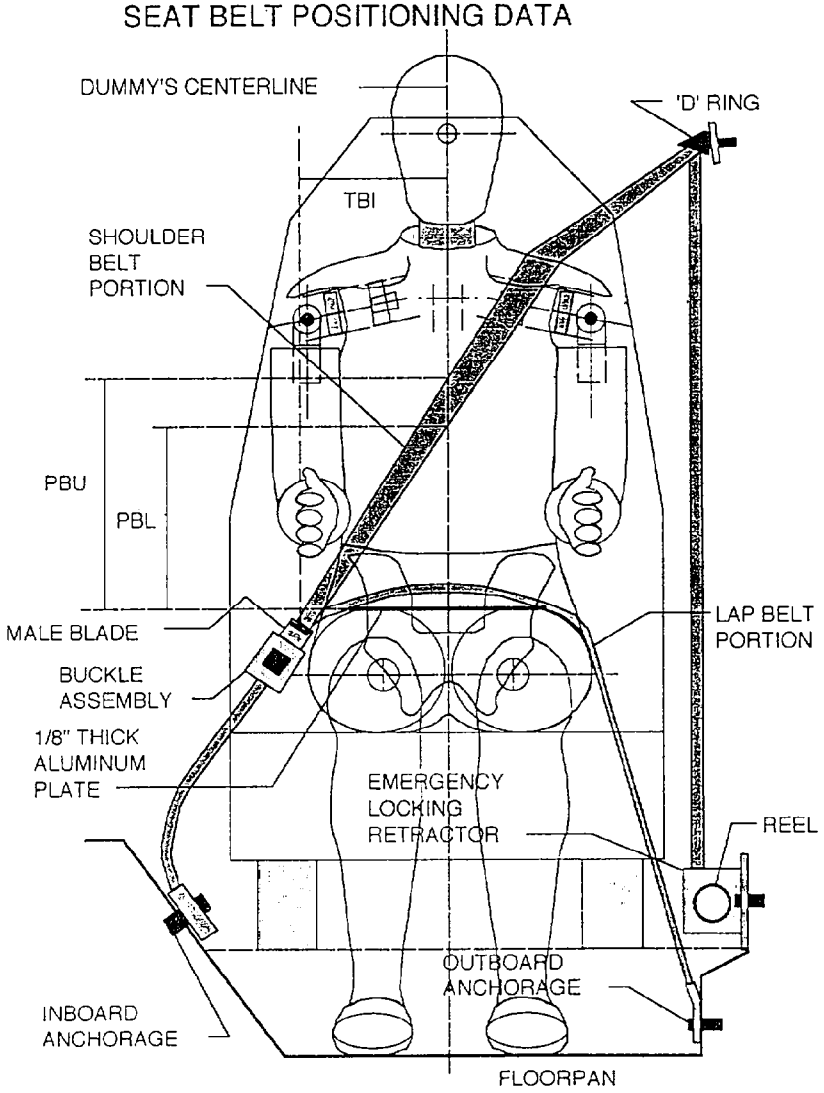
	DRIVER (Serial No. 34)	PASS. (Serial No. 35)
WA°	38°	
SWA°	30°	
SCA°	30°	
SA°	25°	25°
HZ	220 mm	250 mm
HH	440 mm	460 mm
HW	600 mm	700 mm
HR	270 mm	255 mm
NR	450@ 15°	-
CD	595 mm	555 mm
CS	320 mm	-
RA	220 mm	-
KDL	220 mm @ 25°	120 mm
KDR	215 mm	130 mm @ 29°
PA°	25°	23°
TA°	45°	50°
KK	210 mm	235 mm
ST	670 mm @ 6°	670 mm @ 1°
SK	N/A	N/A
SH	80 mm @ 36°	90 mm @ 4°
SHY	240 mm	250 mm
HS	325 mm	320 mm
HD	175 mm	175 mm
AD	100 mm	30 mm

DATA SHEET NO. 6

SEAT BELT POSITIONING DATA

	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU--Top surface of aluminum plate to belt upper edge	304.8	317.5
PBL--Top surface of aluminum plate to belt lower edge	228.6	241.3

SEAT BELT POSITIONING DATA



FRONT VIEW OF DUMMY

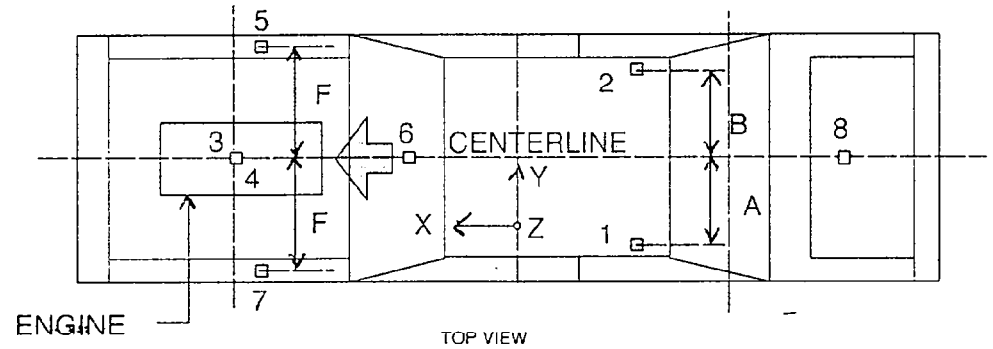
DATA SHEET NO. 7
VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

DIMENSION	LENGTH (mm)	
	PRETEST VALUES	POST TEST VALUES
A	460	460
B	480	480
C	4015	3321
D	3190	3110
E	3230	3110
F	580	510
G	2700	2600
H	1050	1050
K	900	900

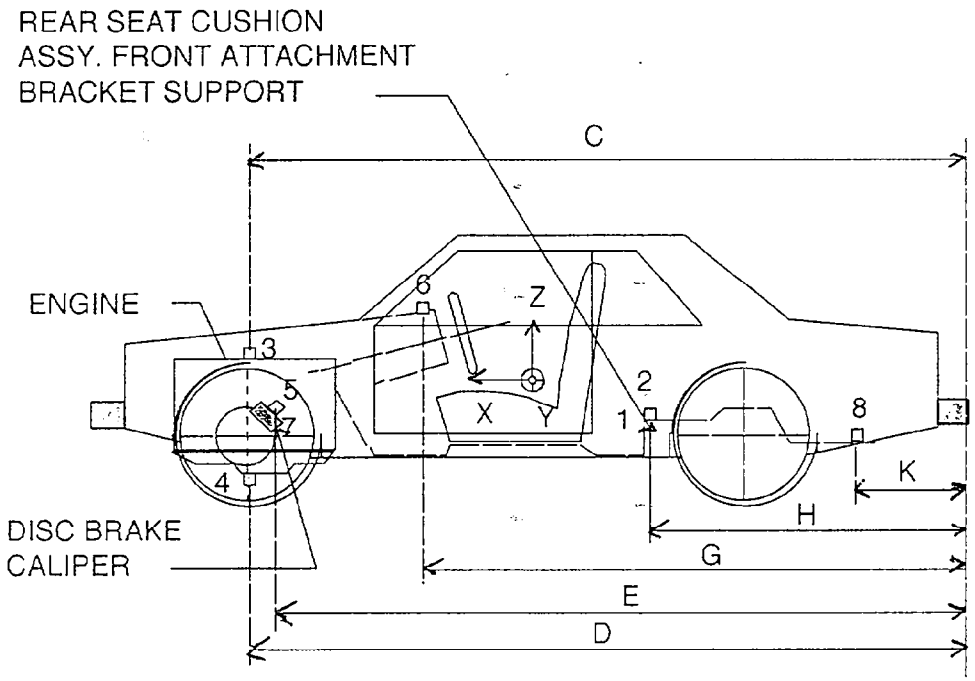
LOCATION NO.	DESCRIPTION	MAXIMUM VALUE (G's)			
		Max.	msec.	Min.	msec.
1*	Rear Seat X-Member @ Left Side	1.0	3.9	-35.8	35.6
2*	Rear Seat X-Member @ Right Side	0.9	3.8	-41.5	11.7
3*	Top of Engine Block	18.0	43.9	-46.2	34.6
4*	Bottom of Engine	6.2	45.1	-50.8	36.7
5*	Disc Brake Caliper @ Left Side	68.5	33.6	-107.6	14.0
6*	Disc Brake Caliper @ Right Side	2.7	6.2	-95.4	28.4
7*	Instrument Panel	0.2	0.0	-40.5	28.4
8*	Left Rear, Redundant	0.5	3.3	-35.8	11.5
9	Right Rear, Redundant	4.3	108.4	-38.4	12.0

* Channel failed; see data plots for time of failure.

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



TOP VIEW



LEFT SIDE VIEW

DATA SHEET NO. 8

DUMMY INJURY CRITERIA VALUES

VEHICLE MODEL YEAR & MAKE: 1997 KIA SPORTAGE NHTSA No.: MV0504

MAXIMUM HEAD ACCELERATIONS - PRIMARY (G's)								
	DRIVER				PASSENGER			
LOCATION	MAX.	TIME	MIN.	TIME	MAX.	TIME	MIN.	TIME
Head CG - X	12.9	193.3	-69.0	70.0	21.5	202.8	-58.7	101.7
Head CG - Y	3.2	299.5	-8.1	79.4	6.9	94.5	-3.2	120.9
Head CG - Z	39.6	56.9	-12.7	107.2	58.0	68.7	-1.2	17.8
Head CG Resultant	74.0	69.9			66.0	86.2		

MAXIMUM CHEST ACCELERATIONS - PRIMARY (G's)								
	DRIVER				PASSENGER			
LOCATION	MAX.	TIME	MIN.	TIME	MAX.	TIME	MIN.	TIME
Chest CG - X	3.9	163.1	-48.1	70.1	3.8	141.6	-54.2	56.7
Chest CG - Y	0.4	9.58	-8.5	38.4	10.6	63.3	-9.2	83.3
Chest CG - Z	12.1	55.9	-17.2	108.0	14.1	51.2	-12.0	109.4
Chest CG Resultant	49.1	70.2			54.5	56.7		

MAXIMUM FORCE - FEMUR LOAD (Newtons)								
	DRIVER				PASSENGER			
LOCATION	MAX.	TIME	MIN.	TIME	MAX.	TIME	MIN.	TIME
Left Femur	745.2	92.7	-5299.3	63.4	1098.6	39.2	-4640.2	59.0
Right femur	409.5	19.5	-4472.8	58.0	725.9	36.9	-3729.4	53.2

MAXIMUM FORCE - SEAT BELT LOAD (Newtons)								
	DRIVER				PASSENGER			
LOCATION	MAX.	TIME	MIN.	TIME	MAX.	TIME	MIN.	TIME
Lap Belt	4554.2	63.9	-33.0	127.9	13754.9	53.7	-10.7	4.7
Shoulder Belt	12486.3	68.7	-10.0	136.6	14395.8	62.9	1.6	292.7

HEAD INJURY CRITERIA (HIC)								
	DRIVER				PASSENGER			
LOCATION	HIC	T1 (msec)	T2 (msec)	Avg. Accel.	HIC	T1 (msec)	T2 (msec)	Avg. Accel.
Head CG Primary	968.7	55.2	91.1	59.2	1036.4	68.0	103.9	60.8

CHEST CLIP (3 MSEC)						
	DRIVER			PASSENGER		
LOCATION	CLIP	T1 (msec)	T2 (msec)	CLIP	T1 (msec)	T2 (msec)
Chest CG Primary	48.5	68.5	71.5	54.3	55.4	58.4

Data Sheet No. 8 ... (continued)

NECK, CHEST, PELVIC, LOWER LEG AND FOOT DATA

UPPER NECK MAXIMUM FORCES (Newtons) & MOMENTS (Joules)								
	DRIVER				PASSENGER			
LOCATION	MAX.	TIME	MIN.	TIME	MAX.	TIME	MIN.	TIME
Neck Force 'X'	824.6	64.4	-117.0	105.7	2247.8	100.7	-326.1	206.2
Neck Force 'Y'	134.6	131.9	-66.6	192.6	313.0	98.1	-107.0	121.7
Neck Force 'Z'	3610.8	72.8	-495.8	107.5	2596.6	87.1	-828.1	258.2
Neck Moment 'X'	4.5	254.0	-6.7	143.1	26.9	105.9	-20.7	75.0
Neck Moment 'Y'	17.0	143.3	-54.5	57.6	104.4	97.5	-57.6	260.2
Neck Moment 'Z'	6.2	86.0	-1.9	59.3	12.7	105.8	-1.6	47.1

PEAK PELVIC ACCELERATIONS (G's)								
	DRIVER				PASSENGER			
LOCATION	MAX.	TIME	MIN.	TIME	MAX.	TIME	MIN.	TIME
Pelvis 'X'	6.5	94.1	-55.4	53.5	9.1	116.4	-73.6	53.6
Pelvis 'Y'	14.3	67.7	-7.2	37.3	8.9	59.0	-12.5	104.0
Pelvis 'Z'	2.8	232.2	-12.3	98.1	3.7	202.4	-26.8	64.0

TIBIA PEAK FORCES & MOMENTS (G's)								
	DRIVER				PASSENGER			
LOCATION	MAX.	TIME	MIN.	TIME	MAX.	TIME	MIN.	TIME
Lt. Upper Moment 'Y'	111.7	76.3	-133.6	38.0	N/A	N/A	N/A	N/A
Left Lower Force 'Z'	4528.0	53.1	-735.6	28.3	N/A	N/A	N/A	N/A
Rt. Upper Moment 'Y'	53.0	55.0	-151.6	38.4	N/A	N/A	N/A	N/A
Right Lower Force 'Z'	5124.1	55.2	-469.7	49.2	N/A	N/A	N/A	N/A

N/A - Instrumentation not supplied by VRTC.

FOOT PEAK ACCELERATIONS (G's)								
	DRIVER				PASSENGER			
LOCATION	MAX.	TIME	MIN.	TIME	MAX.	TIME	MIN.	TIME
Left Foot Aft 'X'	120.8	28.3	-50.9	51.0	128.9	36.4	-110.0	77.8
Left Foot Aft 'Z'	89.1	26.4	-61.2	49.0	65.9	80.0	-127.4	76.5
Left Foot Fore 'Z'	187.1	27.0	-102.2	39.7	166.2	81.3	-182.9	74.9
Right Foot Aft 'X'	162.5	44.5	-108.4	86.8	106.3	45.7	-138.6	37.5
Right Foot Aft 'Z'	52.7	73.2	-160.5	56.4	40.7	48.1	-72.4	47.2
Right Foot Fore 'Z'	124.7	54.8	-155.8	43.8	78.3	48.4	-151.6	47.3

Data Sheet No. 8 ...(Continued)

REDUNDANT DUMMY INJURY CRITERIA VALUES

MAXIMUM HEAD ACCELERATIONS - REDUNDANT (G's)								
	DRIVER				PASSENGER			
LOCATION	MAX.	TIME	MIN.	TIME	MAX.	TIME	MIN.	TIME
Head CG - X	12.1	193.7	-69.5	77.2	21.8	203.9	-58.9	102.1
Head CG - Y	4.4	298.8	-5.1	80.3	7.7	94.5	-1.9	127.2
Head CG - Z	35.6	72.8	-11.5	109.7	59.2	84.8	-1.5	-25.6
Head CG Resultant	75.7	69.8			69.8	100.8		

MAXIMUM CHEST ACCELERATIONS - REDUNDANT (G's)								
	DRIVER				PASSENGER			
LOCATION	MAX.	TIME	MIN.	TIME	MAX.	TIME	MIN.	TIME
Chest CG - X	3.0	192.7	-48.2	68.4	4.1	141.8	-53.5	57.5
Chest CG - Y	3.7	82.0	-4.0	38.6	10.0	63.3	-10.5	83.4
Chest CG - Z	13.9	101.0	-16.3	55.7	10.6	51.2	-10.6	109.7
Chest CG Resultant	50.0	70.4			53.8	57.6		

REDUNDANT HEAD INJURY CRITERIA (HIC)								
	DRIVER				PASSENGER			
LOCATION	HIC	T1 (msec)	T2 (msec)	Avg. Accel.	HIC	T1 (msec)	T2 (msec)	Avg. Accel.
Head CG Redundant	977.1	55.6	91.5	59.4	1062.3	71.2	107.1	61.4

REDUNDANT CHEST CLIP (3 MSEC)						
	DRIVER			PASSENGER		
LOCATION	CLIP	T1 (msec)	T2 (msec)	CLIP	T1 (msec)	T2 (msec)
Chest CG Redundant	49.6	68.5	71.5	53.4	55.8	58.8

DATA SHEET NO. 9

SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

VEHICLE MODEL YEAR & MAKE: 1997 KIA SPORTAGE NHTSA No.: MV0504

BELT LENGTH DATA (mm)	DRIVER	PASSENGER
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	3048	3048
Shoulder belt length as measured on Part 572 Dummy	787	787
Lap belt length as measured on Part 572 Dummy	736	736

SHOULDER BELT SPOOL-OFF DATA (mm)	DRIVER	PASSENGER
As determined by film analysis	75	80
As determined mechanically	92	114
As determined electronically	75.8	79.1

BELT STRETCH DATA (cm/cm)	DRIVER	PASSENGER
Measured electronically between shoulder belt load cell and the "D" ring	0.091	0.073
Measured mechanically	0.1	0.1

DATA SHEET NO. 10

SUMMARY OF FMVSS 212 DATA

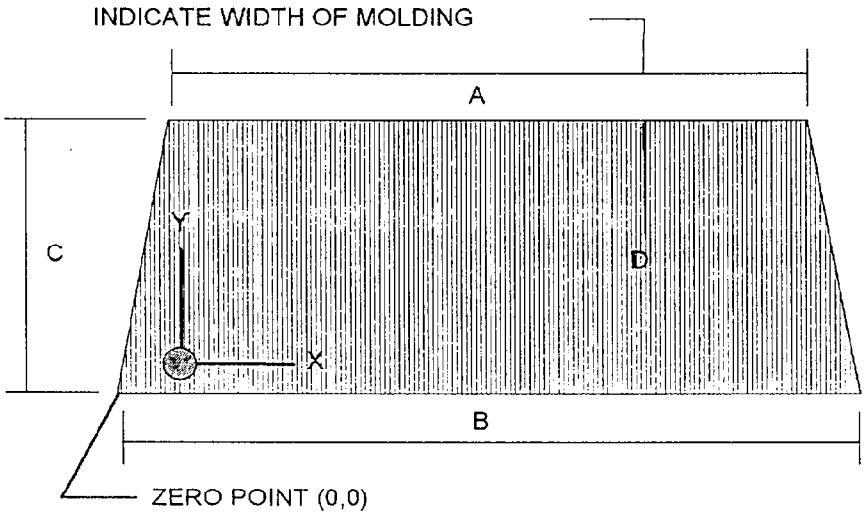
VEHICLE MODEL YEAR & MAKE: 1997 KIA SPORTAGE NHTSA No.: MV0504

Details of windshield mounting (method of retention, type of trim, etc.):
Windshield glass is secured to the vehicle frame with a rubber adhesive type adhesive with rubber molding along the top and sides with rubber and plastic molding along the bottom.

The standard requires that the post test retention measurement be a minimum of 75 percent of the pretest total periphery measurement for vehicles not equipped with occupant passive restraints and 50 percent for each side of the windshield for vehicles which are equipped with occupant passive restraints.

WINDSHIELD PERIPHERY MEASUREMENTS (mm)			
	PRETEST	POST TEST	PERCENT RETENTION
Right Side	690	690	100
Left Side	690	690	100
Total	3980	3980	100

Indicate area of retention failure.



FRONT VIEW OF WINDSHIELD

Width of molding = Top & Side 10 mm, Bottom 17 mm.

Temperature of windshield molding during test = 23.9 °C

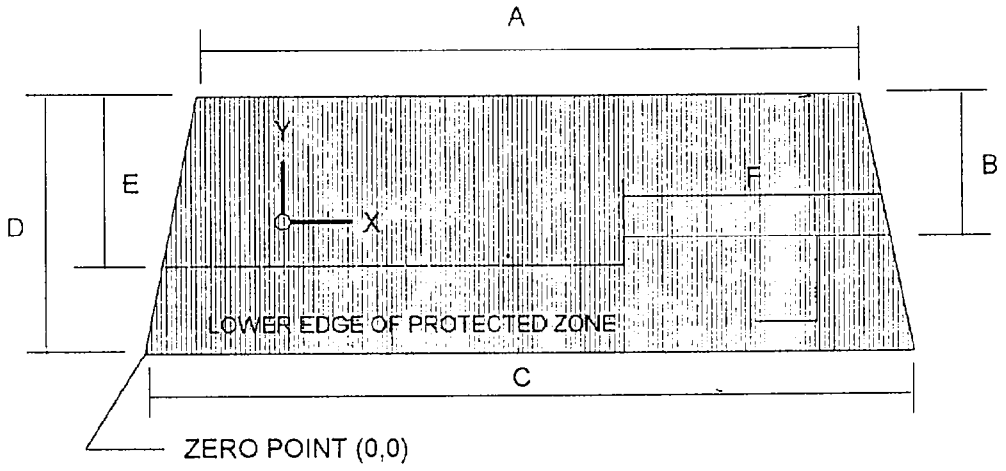
DATA SHEET NO. 11

WINDSHIELD ZONE INTRUSION FMVSS 219 DATA

VEHICLE MODEL YEAR & MAKE: 1997 KIA SPORTAGE NHTSA No.: MV0504

SKETCH OF FRONT VIEW OF WINDSHIELD:

Provide all dimensions necessary to reproduce the protected area.



FRONT VIEW OF WINDSHIELD

WINDSHIELD MEASUREMENTS:

A = 1190 mm

B = 350 mm

C = 1410 mm

D = 690 mm

E = 570 mm

F = 580 mm

Data Sheet No. 11 (Continued)

AREA OF PROTECTED ZONE FAILURES:

A. Provide coordinates of the area that the protected zone was penetrated more than 0.25 in. by a vehicle component other than one which is normally in contact with the windshield.

X	Y
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

B. Provide coordinates of the area beneath the protected zone template that the inner surface of the windshield was penetrated by a vehicle component

X	Y
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

C. Record any windshield retention clips or brackets used to insure that the windshield would not disengage from the body.

DATA SHEET NO. 12

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

VEHICLE MODEL YEAR & MAKE: 1997 KIA NHTSA NO.: MV0504

VEHICLE MODEL & BODY STYLE: SPORTAGE MPV TEST. DATE: 04/24/97

TYPE OF IMPACT: Frontal Barrier

STODDARD SOLVENT SPILLAGE MEASUREMENT:

A. From impact until vehicle motion ceases - -
Actual = 0.0 oz. (Maximum Allowable = 1 ounce)

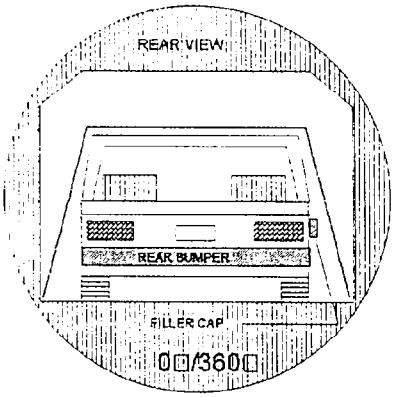
B. For 5 minute period after vehicle motion ceases - -
Actual = 0.0 oz. (Maximum Allowable = 5 ounces)

C. For next 25 minutes - -
Actual = 0.0 oz. (Maximum Allowable = 1 oz./minute)

D. Provide Spillage Details: No solvent spillage occurred

DATA SHEET NO. 13

FMVSS 301 STATIC ROLLOVER DATA SHEET



A. TEST PHASE = 0° TO 90°

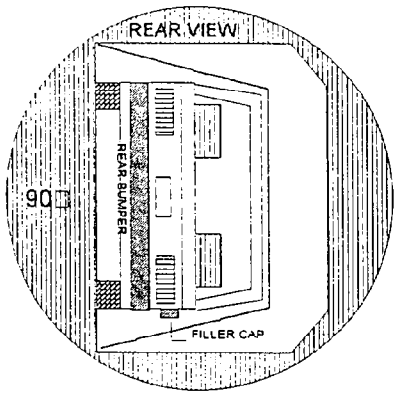
Determination of Stoddard Solvent Collection Time Period:

1. Rollover Fixture 90° Rotation Time = __1__ minutes, __30__ seconds (Specified Range is 1 to 3 minutes)

2. FMVSS 301 Position Hold Time = 5 minutes, 0 seconds

3. TOTAL = __6__ minutes, __30__ seconds

4. NEXT WHOLE MINUTE INTERVAL = __7__ minutes



Actual Test Vehicle Stoddard Solvent Spillage:

1. First 5 min. from onset of rotation = __0__ oz. (5 oz. allowed)

2. 6th minute = __0__ oz. (1 oz. allowed)

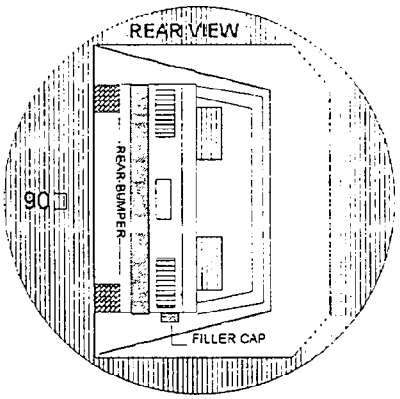
3. 7th minute = __0__ oz. (1 oz. allowed)

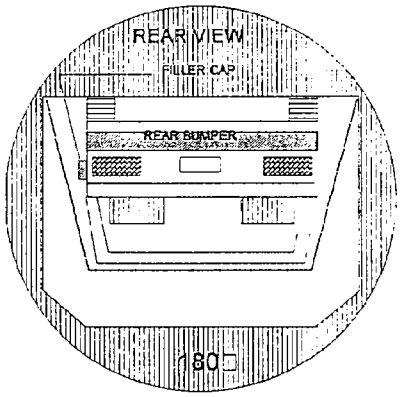
4. 8th minute (if required) = __N/A__ oz. (1 oz. allowed)

Provide Details of Stoddard Solvent Spillage Locations--

No solvent leakage occurred during rollover tests.

Data Sheet No. 13 (Continued)





B. TEST PHASE = 90° TO 180°

Determination of Stoddard Solvent Collection Time Period:

1. Rollover Fixture 90° Rotation Time = 2 minutes, 05 seconds (Specified Range is 1 to 3 minutes)

2. FMVSS 301 Position Hold Time = 5 minutes, 0 seconds

3. TOTAL = 7 minutes, 5 seconds

4. NEXT WHOLE MINUTE INTERVAL = 6 minutes

Actual Test Vehicle Stoddard Solvent Spillage:

1. First 5 min. from onset of rotation = 0 oz.
(5 oz. allowed)

2. 6th minute = 0 oz.
(1 oz. allowed)

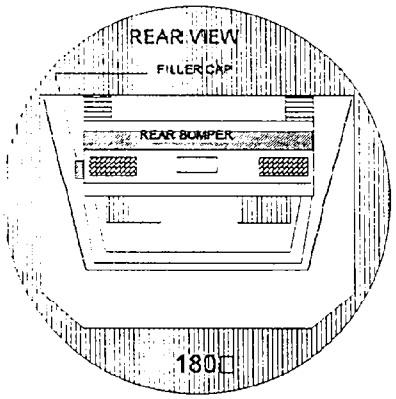
3. 7th minute = 0 oz.
(1 oz. allowed)

4. 8th minute (if required) = N/A oz.
(1 oz. allowed)

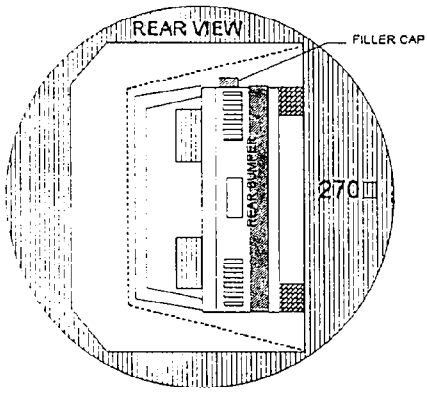
Provide Details of Stoddard Solvent Spillage Locations--

No solvent leakage occurred during rollover tests.

Data Sheet No. 13 (Continued)



(1 oz. allowed)



C. TEST PHASE = 180° TO 270°

Determination of Stoddard Solvent Collection Time Period:

1. Rollover Fixture 90° Rotation Time = 1 minutes, 20 seconds (Specified Range is 1 to 3 minutes)

2. FMVSS 301 Position Hold Time = 5 minutes, 0 seconds

3. TOTAL = 6 minutes, 20 seconds

4. NEXT WHOLE MINUTE INTERVAL = 7 minutes

Actual Test Vehicle Stoddard Solvent Spillage:

1. First 5 min. from onset of rotation = 0 oz.
(5 oz. allowed)

2. 6th minute = 0 oz.

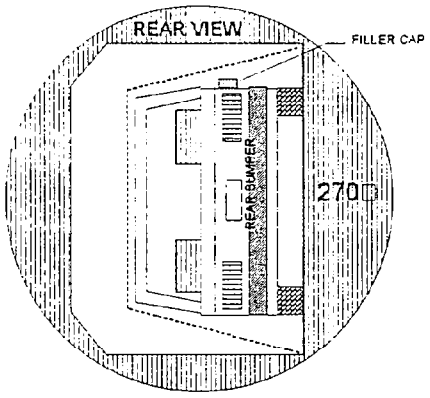
3. 7th minute = 0 oz.
(1 oz. allowed)

4. 8th minute (if required) = N/A oz.
(1 oz. allowed)

Provide Details of Stoddard Solvent Spillage Locations--

No solvent leakage occurred during rollover tests.

Data Sheet No. 13 (Continued)



D. TEST PHASE = 270° TO 360°

Determination of Stoddard Solvent Collection Time Period:

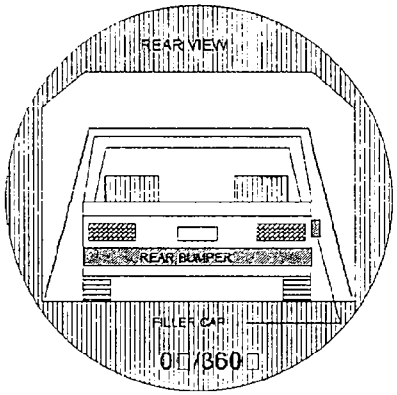
1. Rollover Fixture 90° Rotation Time = 1 minutes, 20 seconds (Specified Range is 1 to 3 minutes)

2. FMVSS 301 Position Hold Time = 5 minutes, 0 seconds

3. TOTAL = 6 minutes, 20 seconds

4. NEXT WHOLE MINUTE INTERVAL = 7 minutes

Actual Test Vehicle Stoddard Solvent Spillage:



1. First 5 min. from onset of rotation = 0 oz.
(5 oz. allowed)

2. 6th minute = 0 oz.
(1 oz. allowed)

3. 7th minute = 0 oz.
(1 oz. allowed)

4. 8th minute (if required) = N/A oz.
(1 oz. allowed)

Provide Details of Stoddard Solvent Spillage Locations--

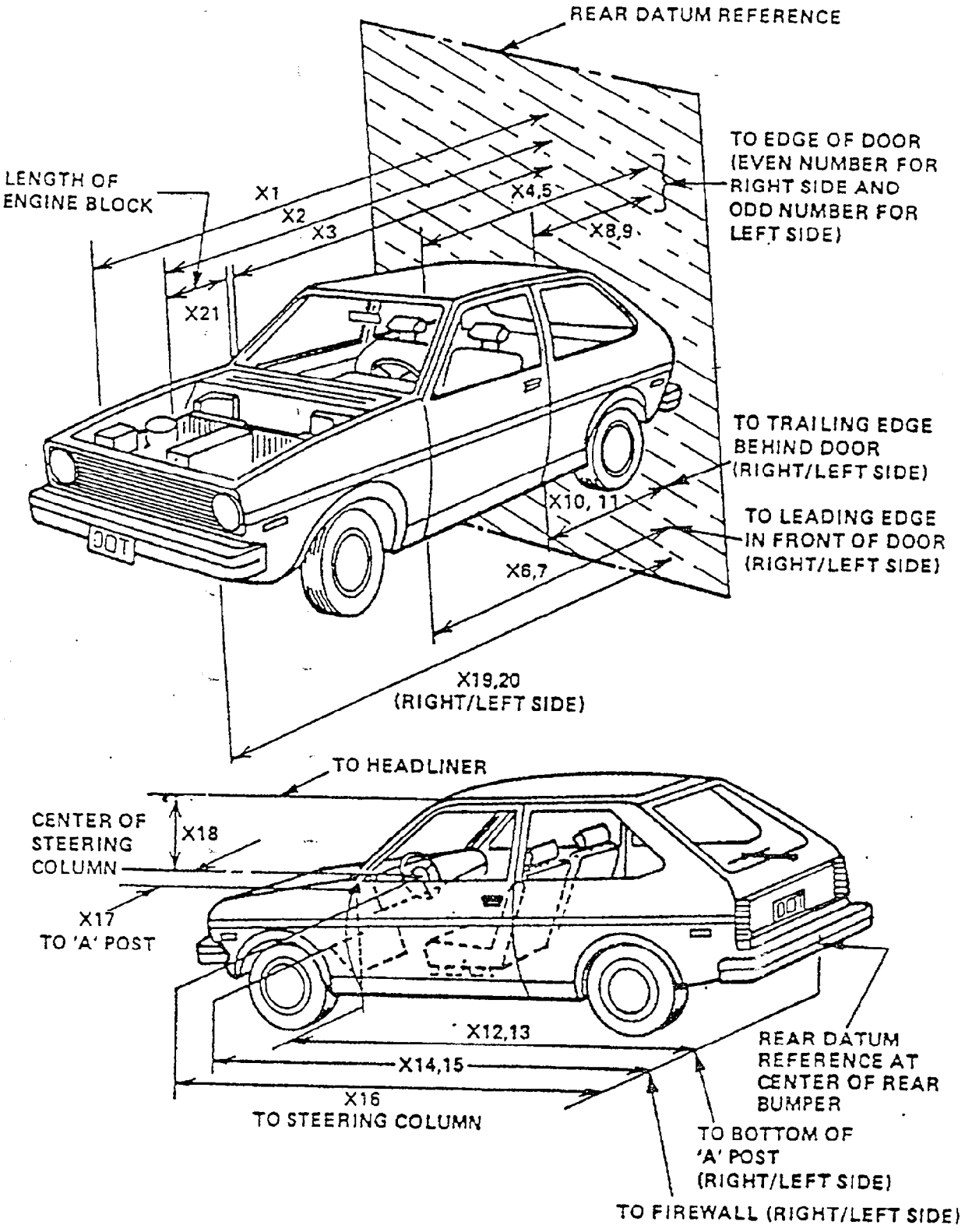
No solvent leakage occurred during rollover tests.

DATA SHEET NO. 14

VEHICLE MEASUREMENTS

VEHICLE MODEL YEAR & MAKE: 1997 KIA SPORTAGE NHTSA No.: MV0504

NO.	MEASUREMENT DESCRIPTION	DIMENSIONS IN MM		
		PRE-TEST	POST-TEST	DIFFERENCE
1	Total length of vehicle at centerline	4080	3745	335
2	Rear surface of vehicle (RSOV) to front of engine	3460	3282	178
3	RSOV to firewall centerline	3090	2890	200
4	RSOV to leading edge of right door	2853	2862	-9
5	RSOV to leading edge of left door	2860	2849	11
6	RSOV to lower leading edge of right door	2847	2839	8
7	RSOV to lower leading edge of left door	2852	2841	11
8	RSOV to upper trailing edge of right door	1760	1771	-11
9	RSOV to upper trailing edge of left door	1768	1754	4
10	RSOV to lower trailing edge of right door	1752	1738	14
11	RSOV to lower trailing edge of left door	1750	1742	8
12	RSOV to bottom of right 'A' pillar	2830	2820	10
13	RSOV to bottom of left 'A' pillar	2830	2810	20
14	RSOV to firewall on right side	3020	2952	68
15	RSOV to firewall of left side	3100	3051	49
16	RSOV to steering column	2310	2357	-47
17	Center of steering column to left 'A' pillar	265	330	-65
18	Center of steering column to headlining	480	430	50
19	RSOV to right side of front bumper	3945	3645	300
20	RSOV to left side of front bumper	3945	3625	320
21	Length of engine block	430	440	-10
22	Right side to dash panel	2540	2527	13
23	Center to dash panel	2510	2487	23
24	Left side to dash panel	3950	3700	250



VEHICLE MEASUREMENTS

DATA SHEET 15 CAMERA LOCATIONS

VEH. NHTSA No.: MV0504 TEST DATE: 04/24/97 TIME: 3:25 PM

VEH. YEAR/MAKE/MODEL/BODY STYLE: 1997 Kia Sportage

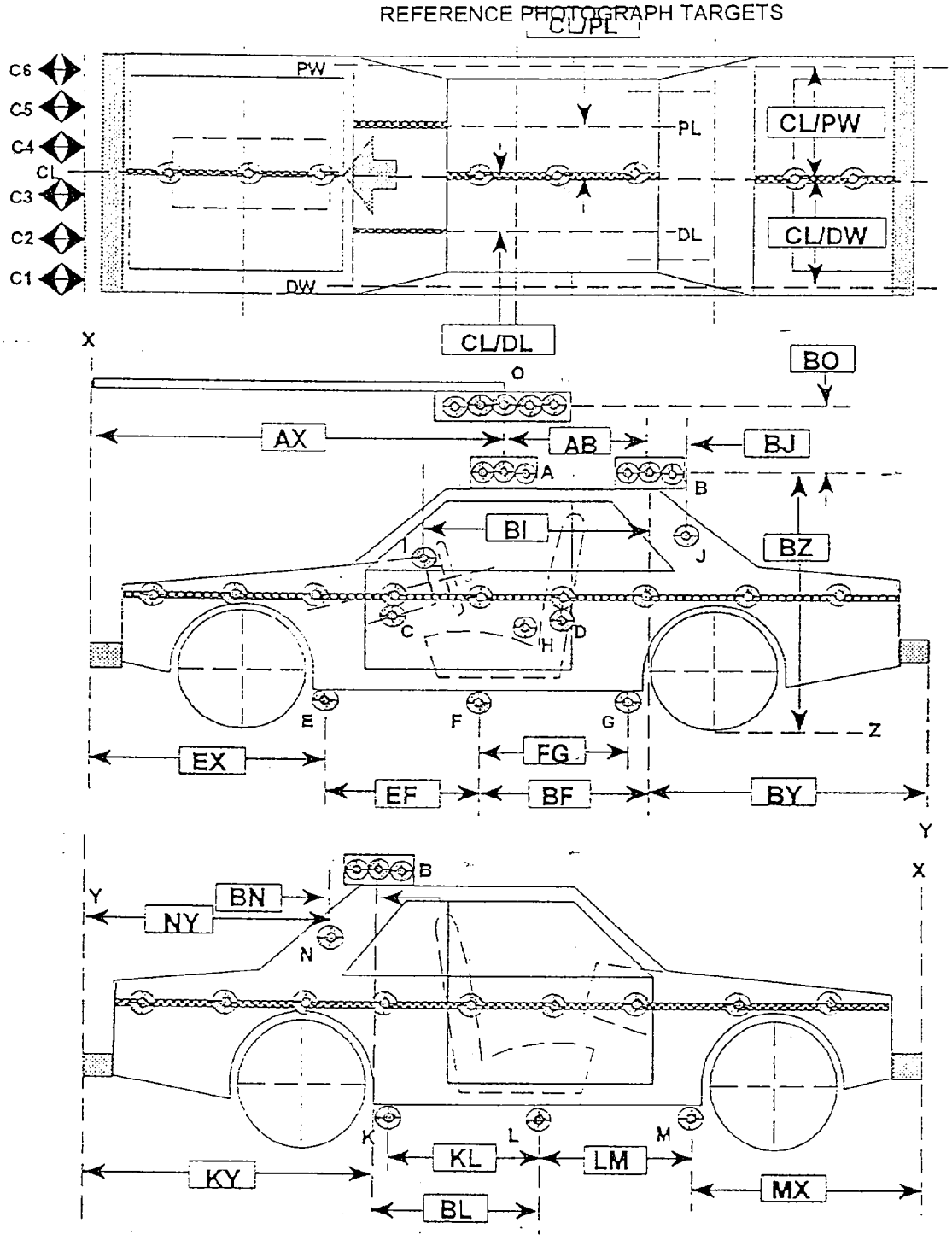
CAMERA NO.	VIEW	CAMERA POSITIONS (mm) *			ANGLE (deg.)	FILM PLANE TO HEAD TARGET (mm)	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Right Side View	3050	14500	1524	0	14820	12-50 Zoom	24
2a	Left Side View	1270	-8280	765	0	8015	25	1350
2b	Left Side Overall View	450	23310	2600	3	23740	50	1000
3	Left Side View	3327	-2210	1994	0	2038	80	1/
4	Left Side View	3200	2400	1990	22	2239	14	980
5	Left Side View	2057	-8280	3073	16	8669	25	980
6	Left Side View	2057	-8280	2540	14	8555	25	1020
7	Right Side View	1905	8204	1219	3	7930	17	1040
8	Right Side View	3023	11608	914	1	11318	50	1250
9	Right Side View	3310	2490	2000	22	2050	19	900
10	Right Side View	991	9677	940	2	9757	50	1150
11	Front View Windshield	-330	0	3531	64	N/A	12.5	500
12	Front View Driver	-292	-318	2489	45	N/A	19	870
13	Front View Passenger	-368	318	2489	45	N/A	19	970
14	Pit Camera Engine View	559	0	1651	86	N/A	13	940
15	Pit Camera Fuel Tank View	4030	0	-173	57	N/A	13	1000
16	Driver Side Belt	3310	150	660	17	N/A	13	1000
17	Passenger Side Belt	3310	130	670	15	N/A	13	1000

X - film plane to barrier face Y - film plane to monorail centerline Z - film plane to ground

1/ Camera #3 did not run; film broke at start up.

DATA SHEET NO. 16

REFERENCE PHOTOGRAPH TARGETS



Distance in mm

CL/PL =350

CL/PW =750

CL/DW =750

CL/DL =50

AX = 2060

AB = 60.91

BJ = 240

AZ = 174

BI = 430

EX =1370

EF =820

FG = 820

BF = 720

BY =1440

BN = 950

NY =490

KY =1240

KL =740

BL =560

LM = 730

MX =1430

DATA SHEET NO. 17

ACCIDENT INVESTIGATION DIVISION DATA

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1997 KIA SPORTAGE MPV

VEHICLE NHTSA NO.: MV0504 VIN: KNDJB4232V5528082

WHEELBASE: 2459 mm BUILD DATE: 11/96

TEST DATE: 04/24/97

VEHICLE SIZE CATEGORY: MPV

TEST WEIGHT: 1680 kg

ACCELEROMETER DATA:

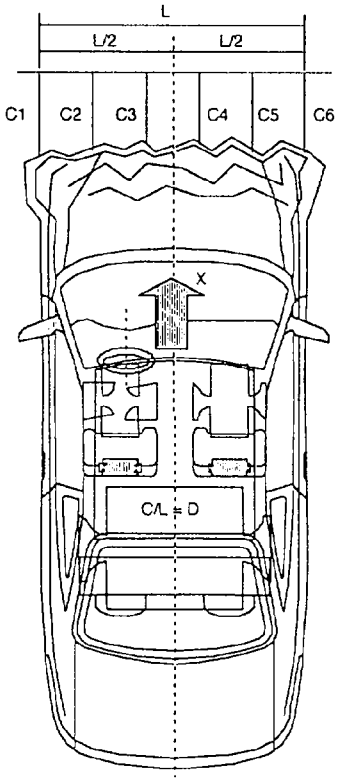
LOCATION: Left and right side passenger compartment

CALIBRATION PROCEDURE: 6 months/ drop test

LINEARITY: Good INTEGRATION ALGORITHM: NHTSA Standard

VEHICLE IMPACT SPEED: 55.64 kph TIME OF SEPARATION: 67.1 msec

VELOCITY CHANGE: 66.5 kph



COLLISION DEFORMATION CLASSIFICATION (CDC)
CODE: F (frontal)

IMPACT MODE: Frontal NCAP

CRUSH DEPTH DIMENSIONS:

C1 = 320 mm

C2 = 325 mm

C3 = 335 mm

C4 = 335 mm

C5 = 310 mm

C6 = 300 mm

MIDPOINT OF DAMAGE: D = Vehicle centerline

(Vehicle Longitudinal Centerline)

LENGTH OF DAMAGE REGION:

L = 1654 mm

APPENDIX A

PHOTOGRAPHS

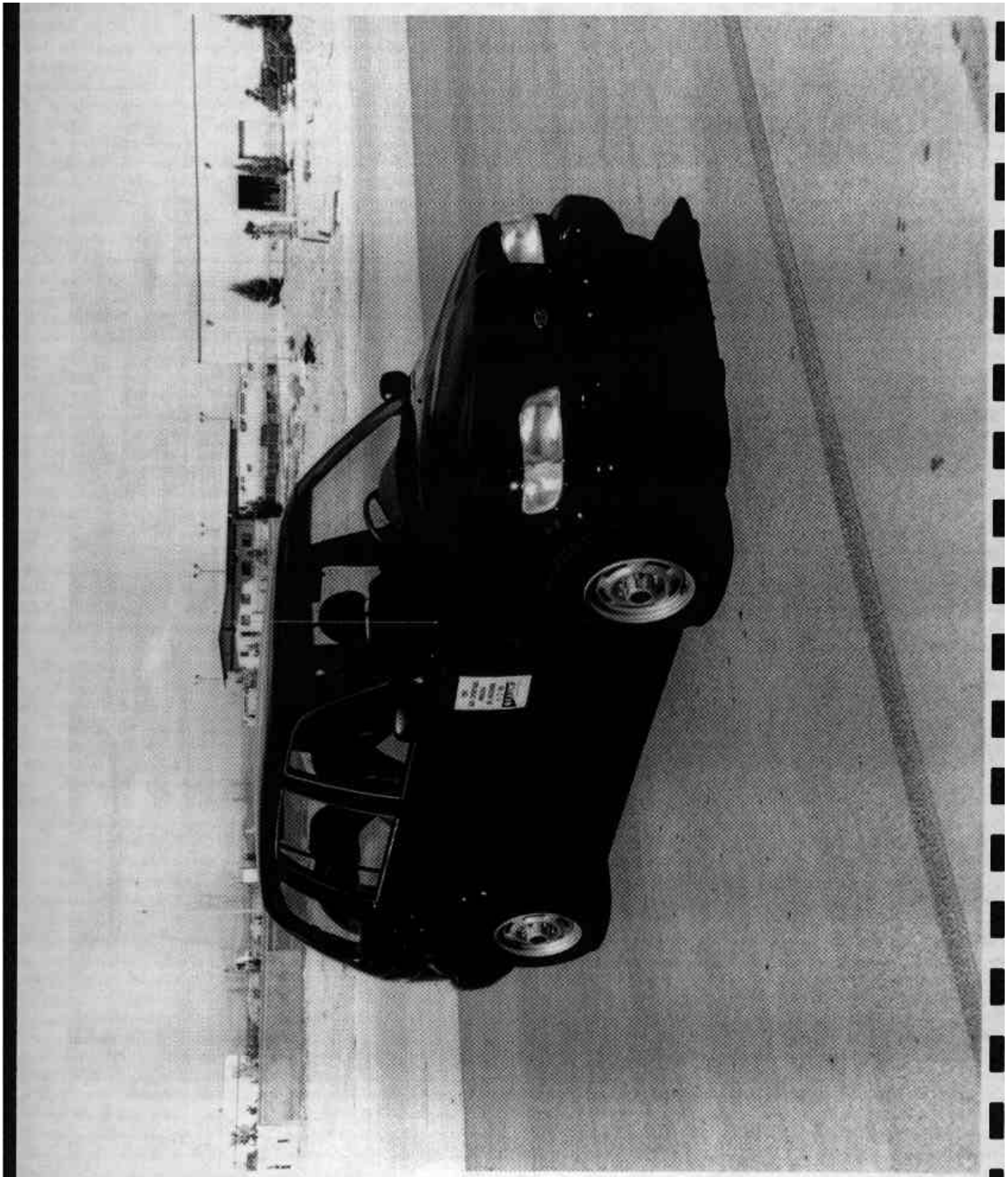


FIGURE A-1. RIGHT FRONT AS RECEIVED

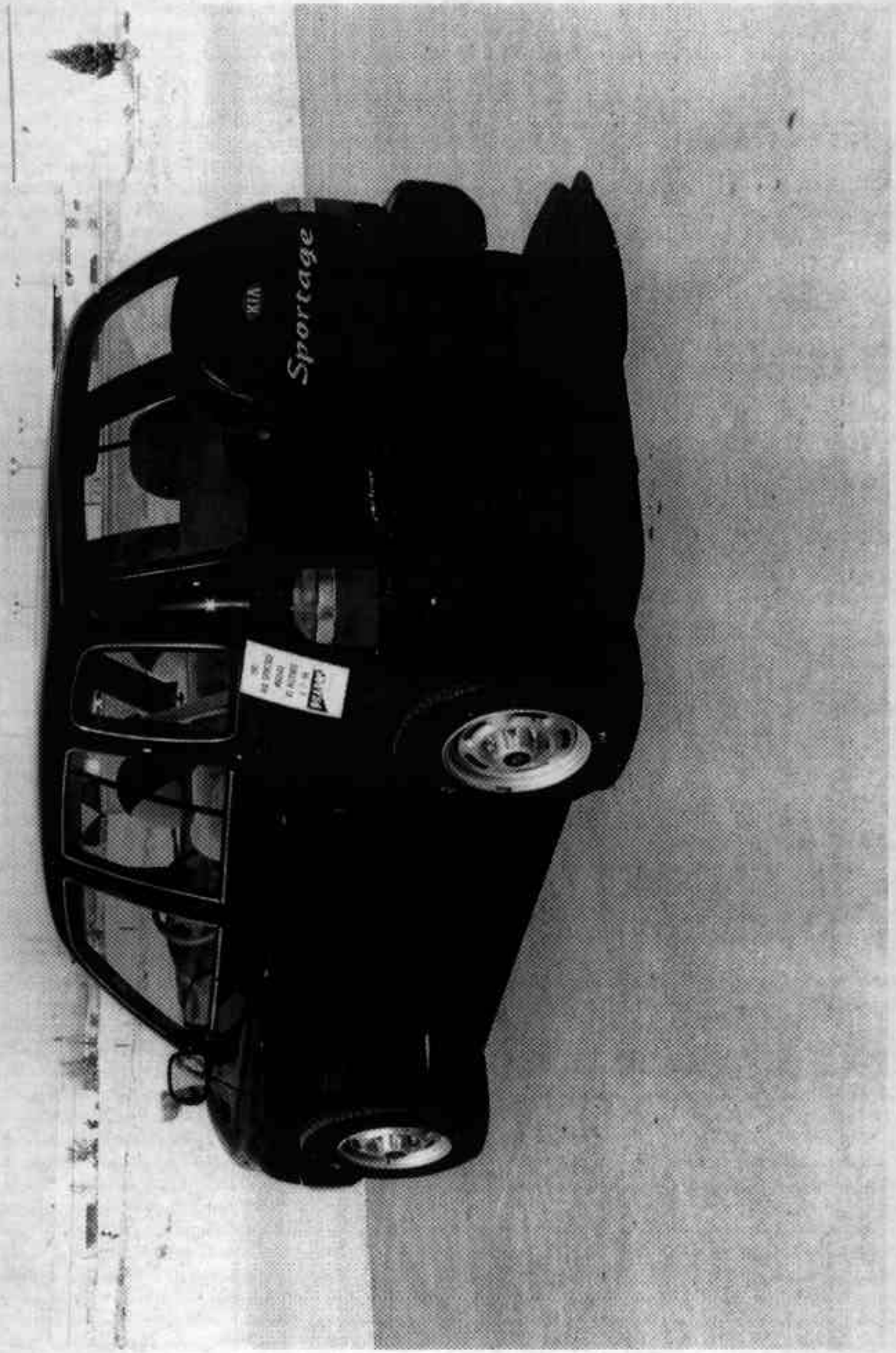


FIGURE A-2. LEFT REAR AS RECEIVED

FIGURE A-3. VEHICLE CERTIFICATION LABEL

FIGURE A-4. VEHICLE TIRE PLACARD

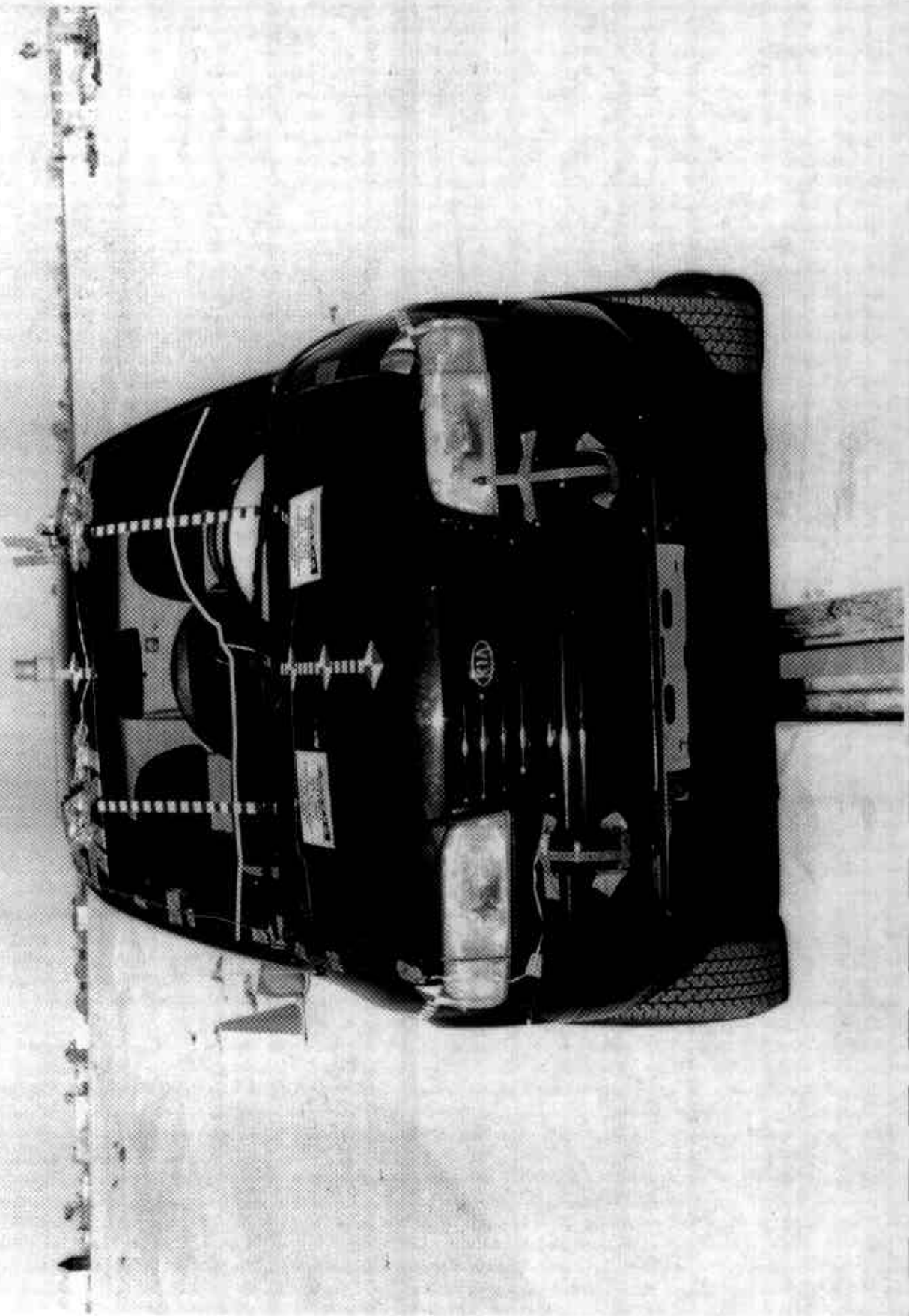


FIGURE A-5. PRE-TEST FRONT VIEW

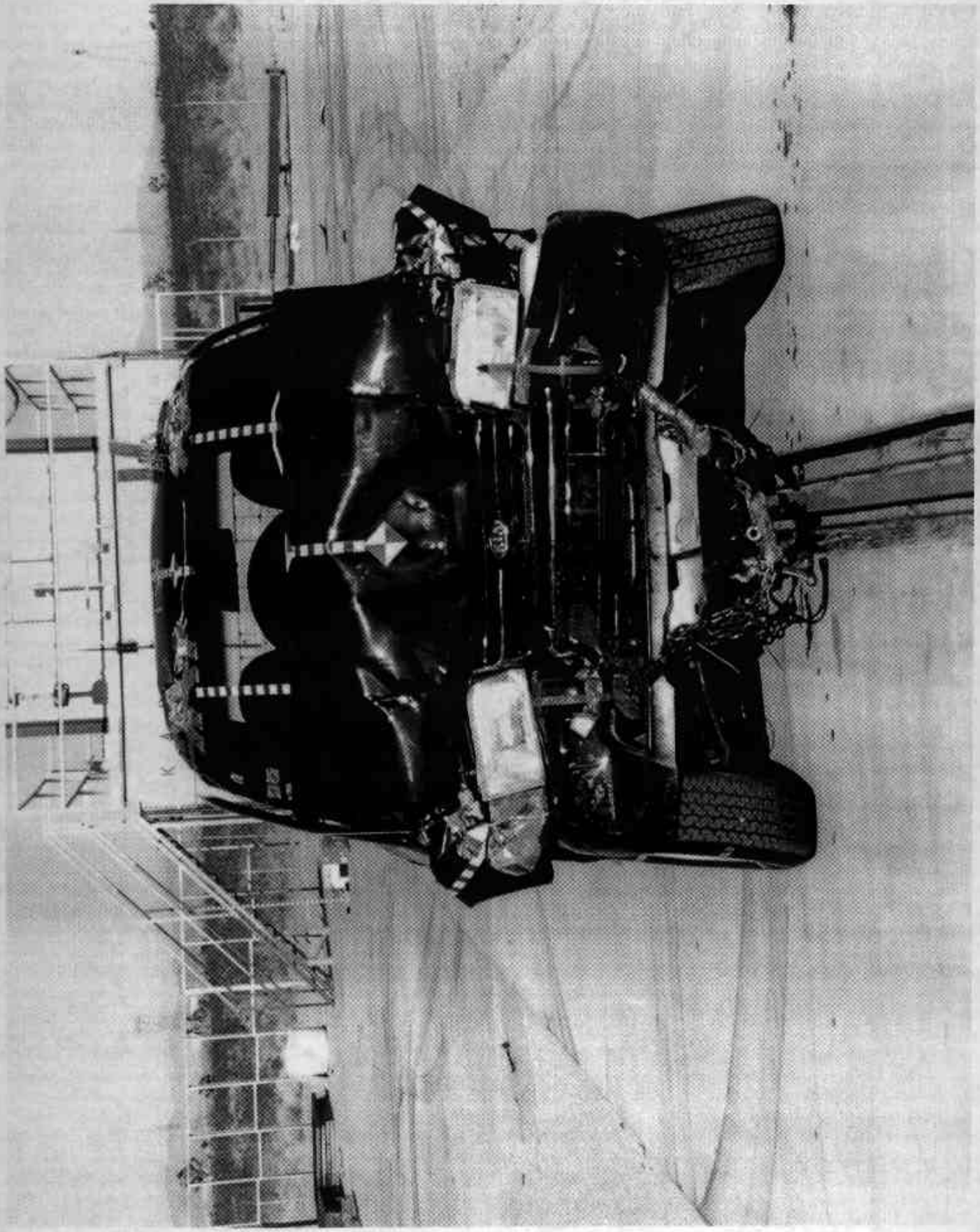


FIGURE A-6. POST-TEST FRONT VIEW

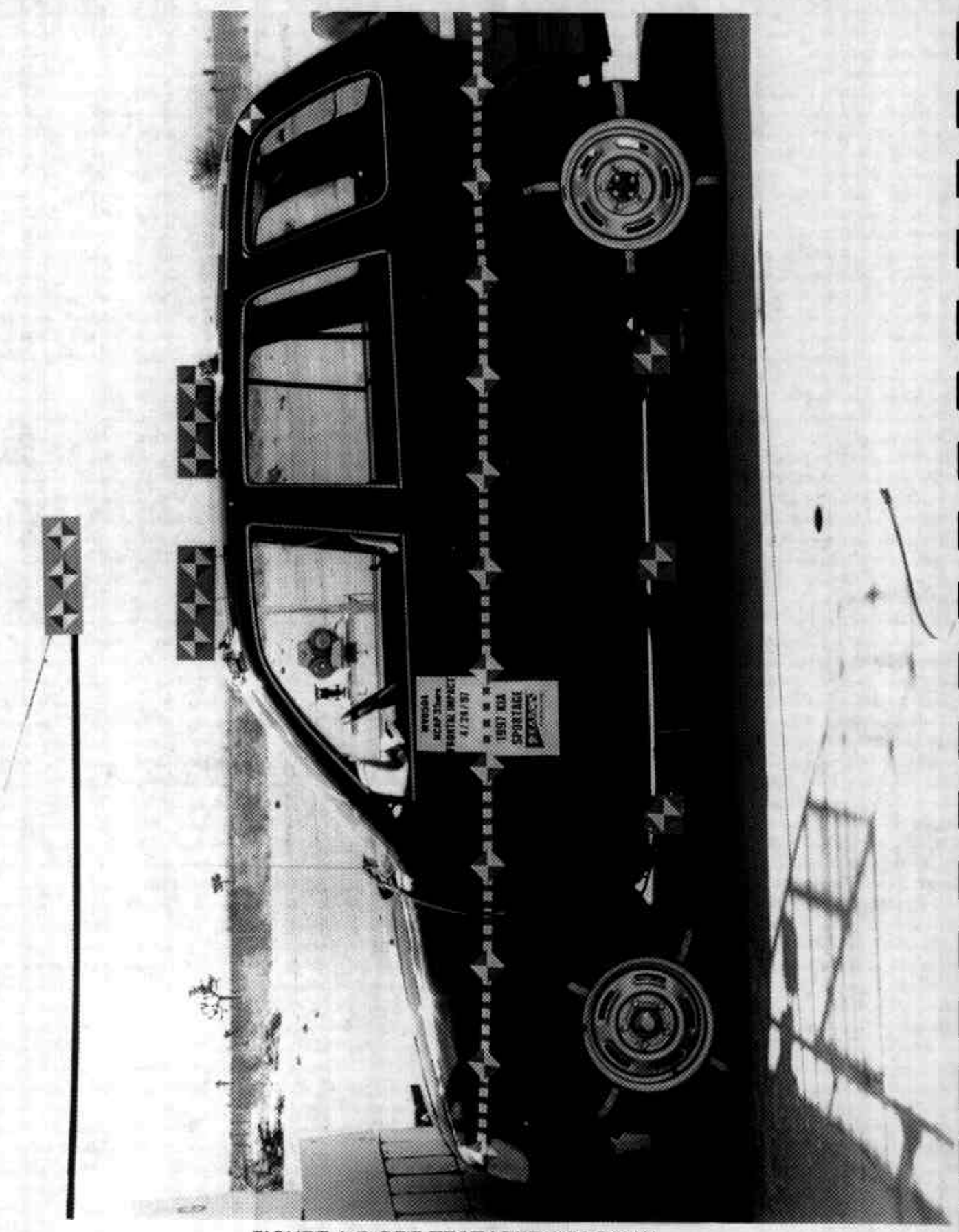


FIGURE A-7. PRE-TEST LEFT SIDE VIEW

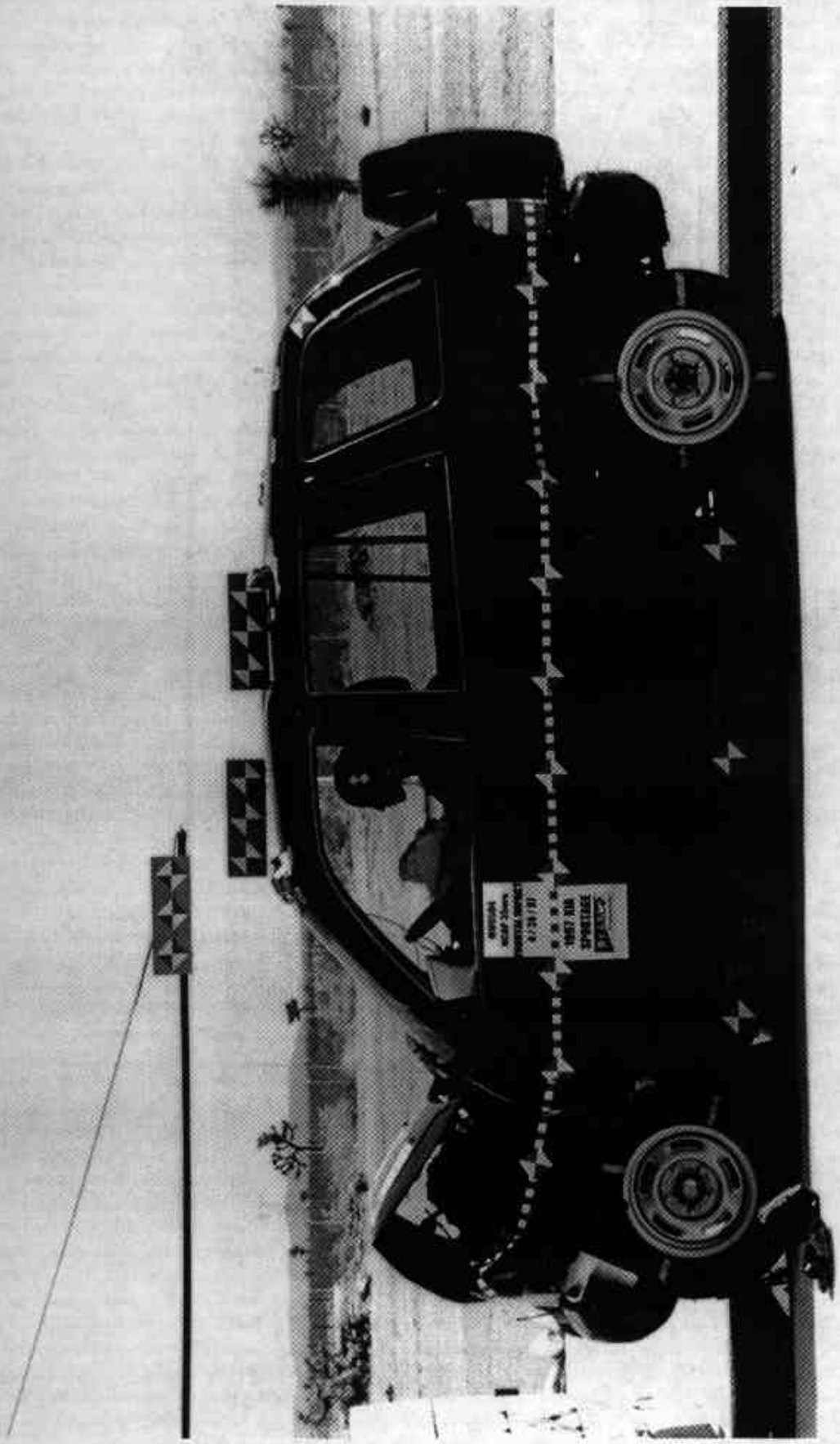


FIGURE A-8. POST-TEST LEFT SIDE VIEW

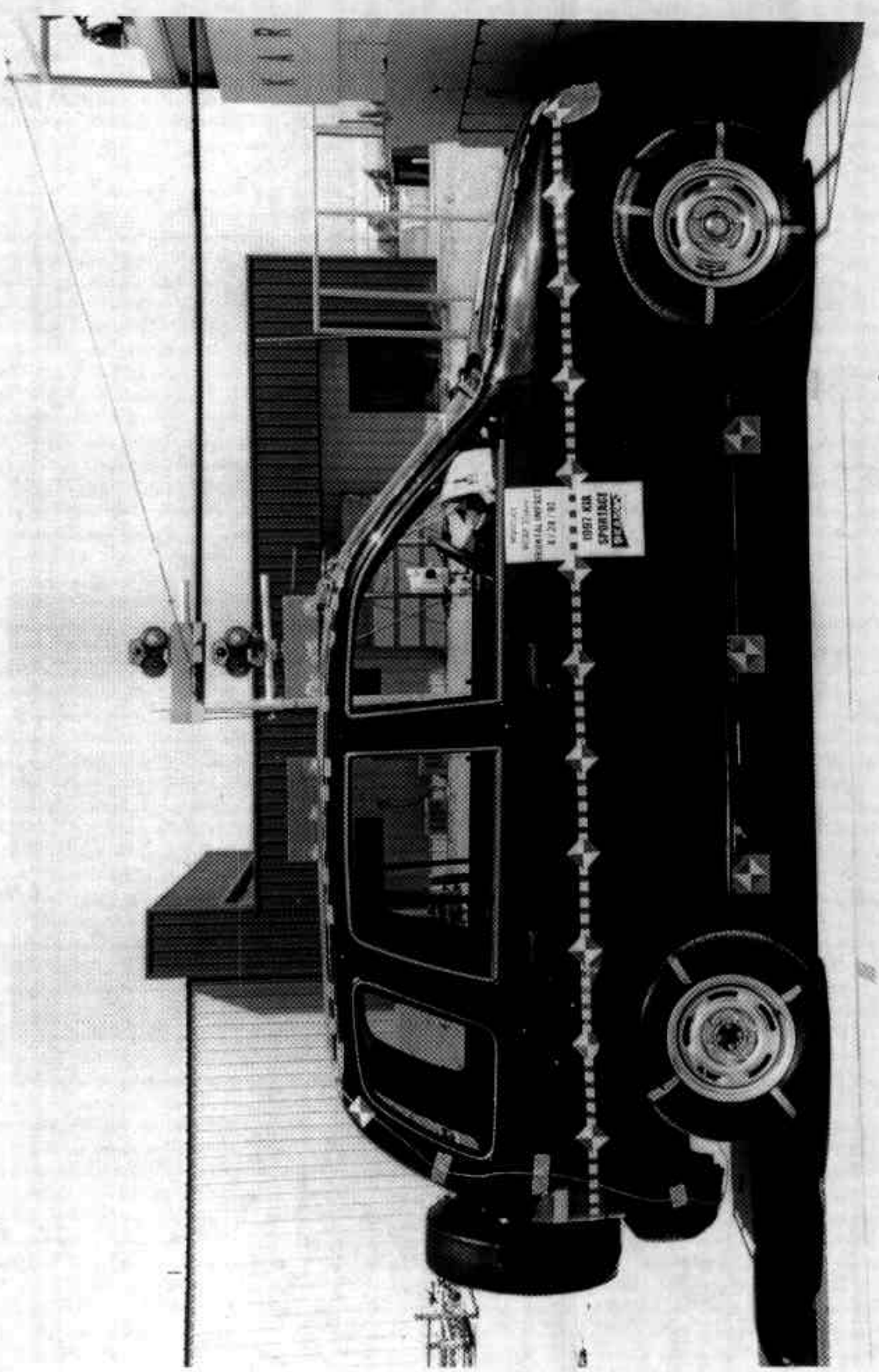


FIGURE A-9. PRE-TEST RIGHT SIDE VIEW

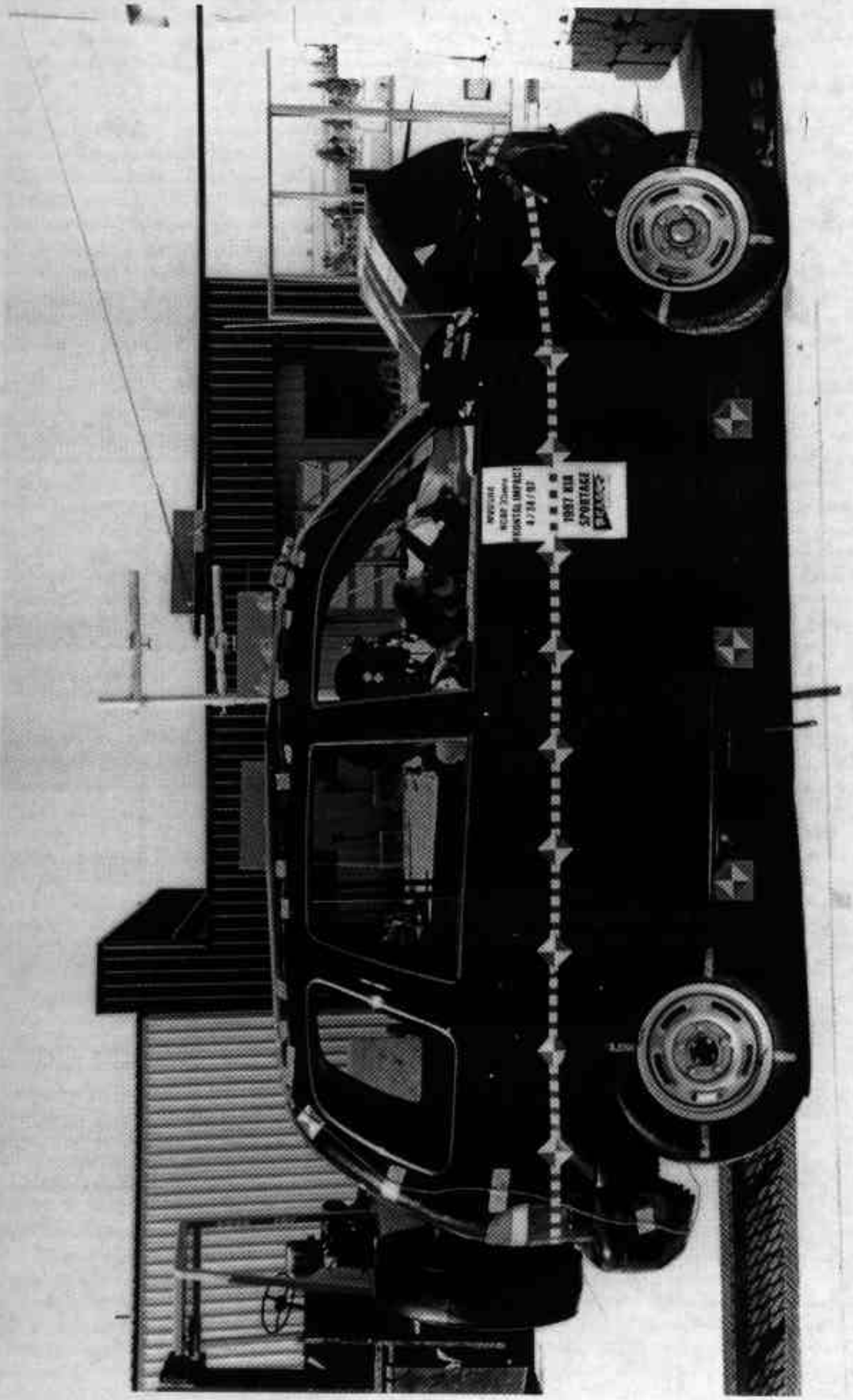


FIGURE A-10. POST-TEST RIGHT SIDE VIEW

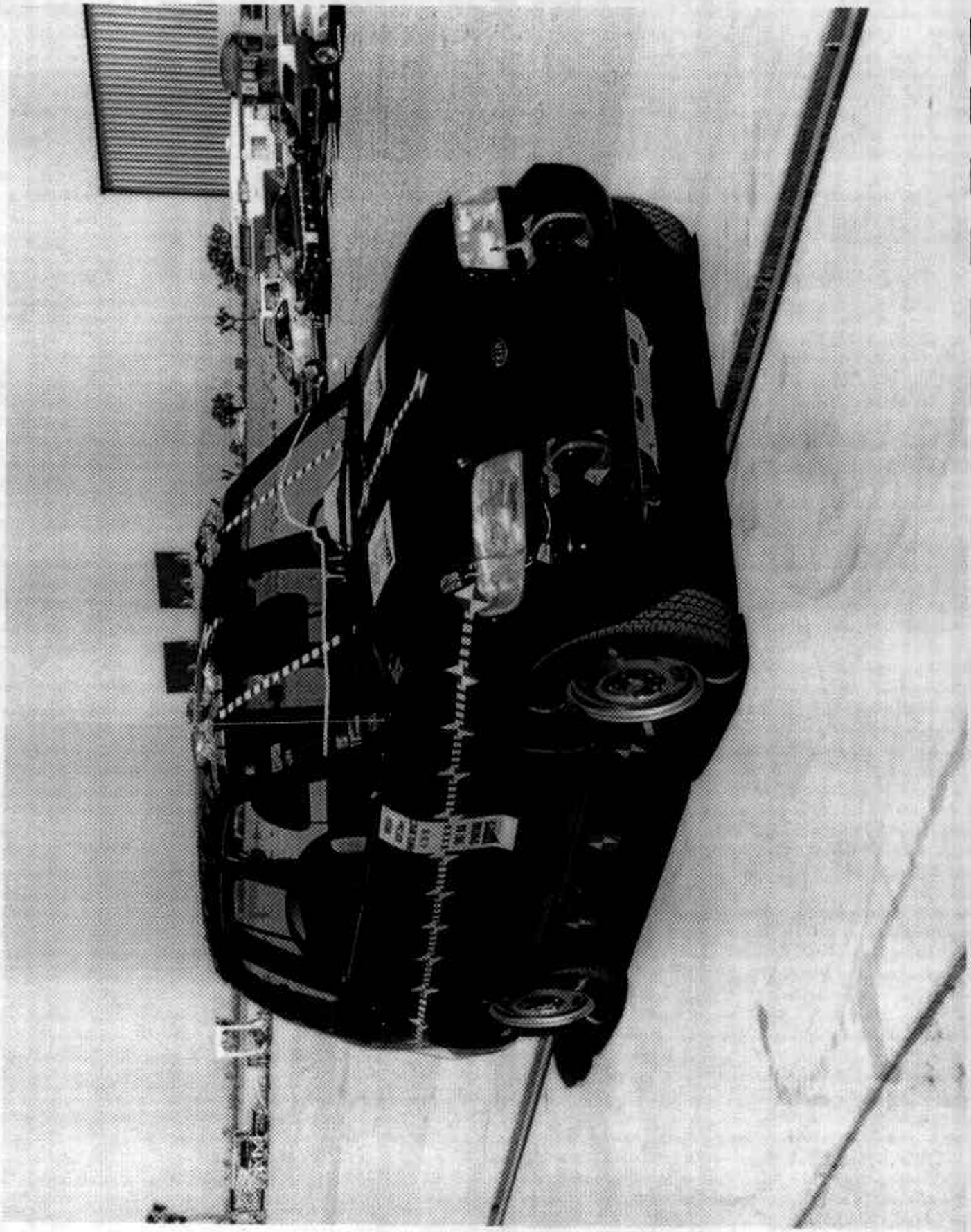


FIGURE A-11. PRE-TEST RIGHT FRONT 3/4 VIEW

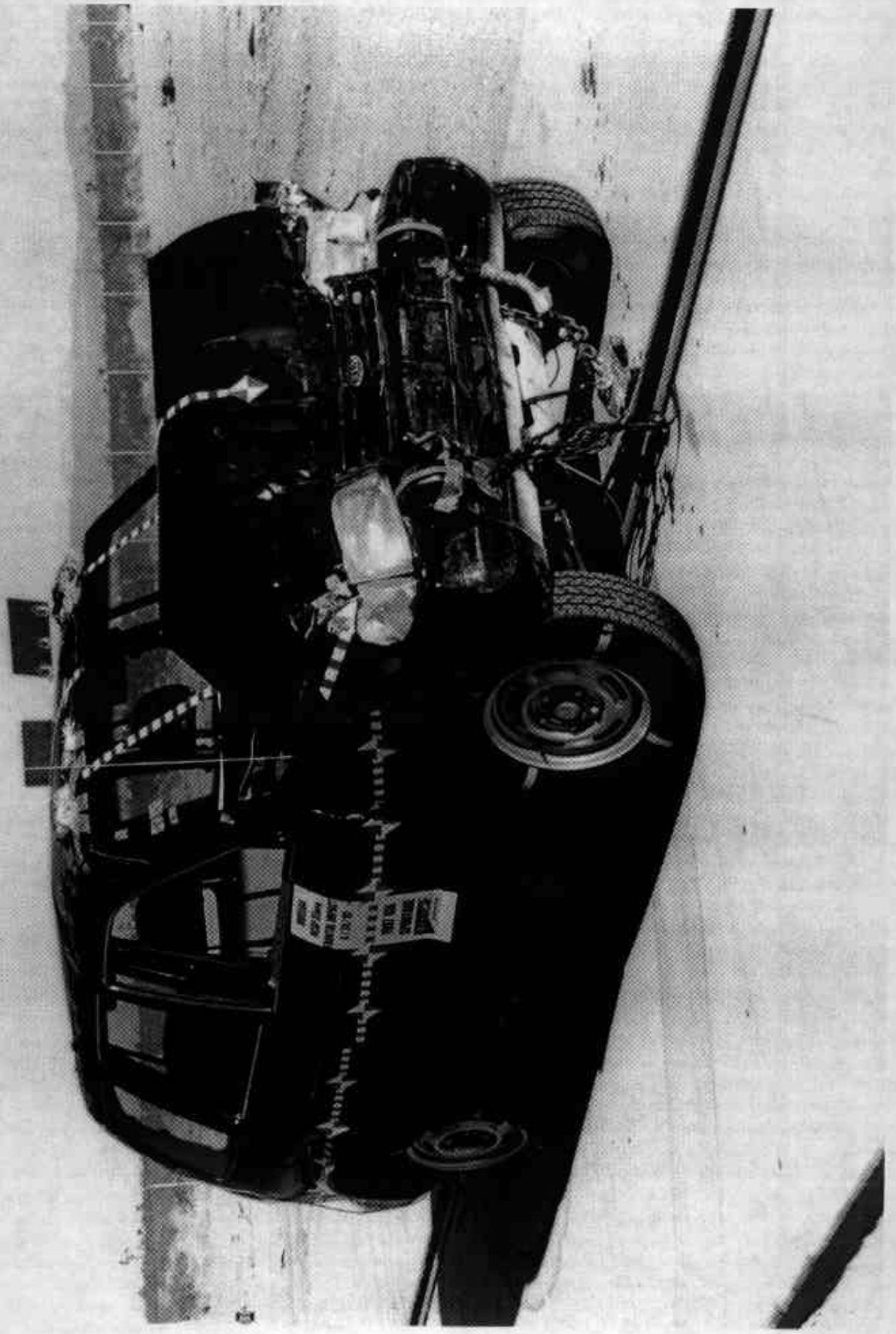


FIGURE A-12. POST-TEST RIGHT FRONT 3/4 VIEW

FIGURE A-13. PRE-TEST LEFT REAR 3/4 VIEW

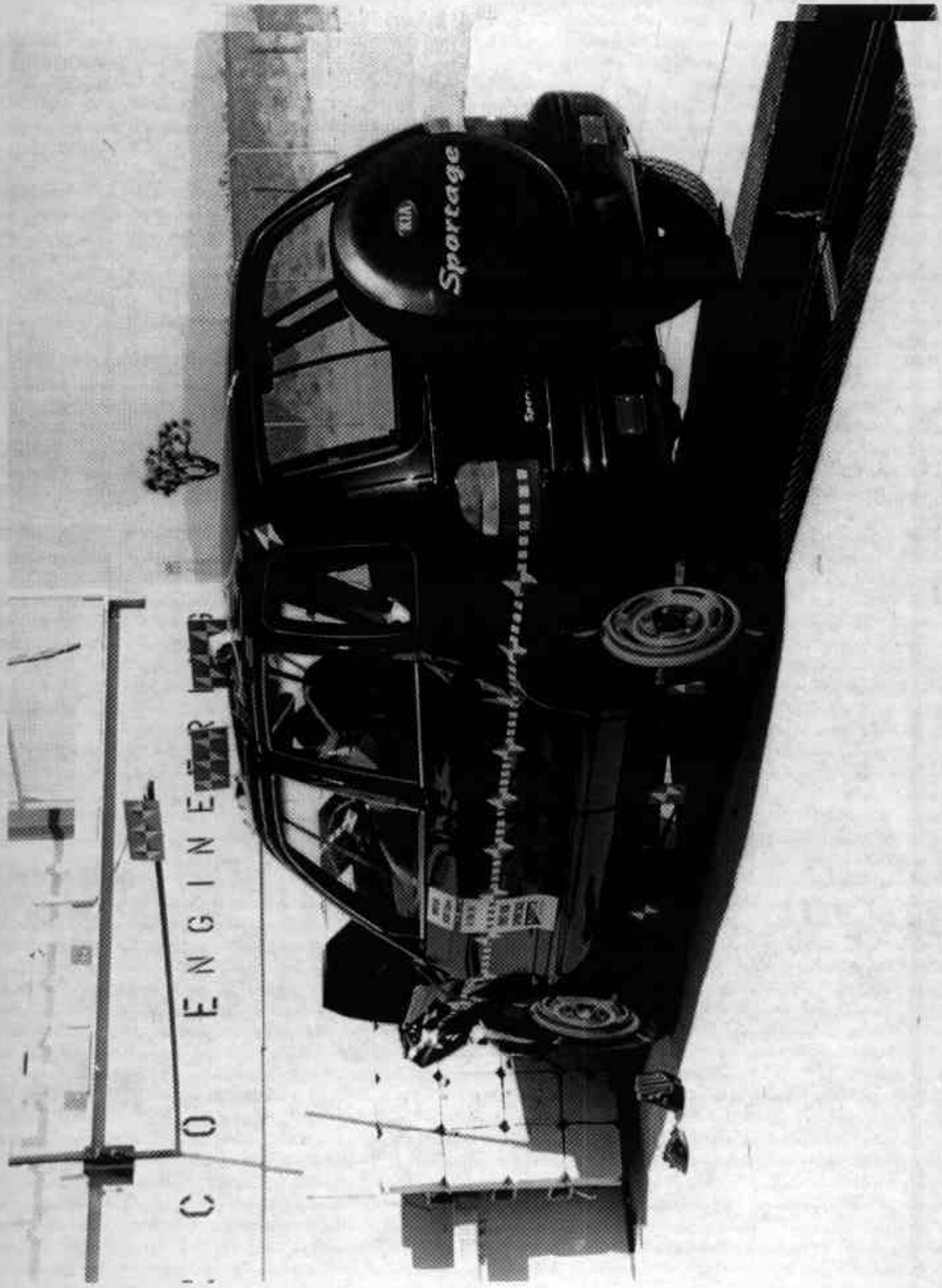


FIGURE A-14. POST-TEST LEFT REAR 3/4 VIEW

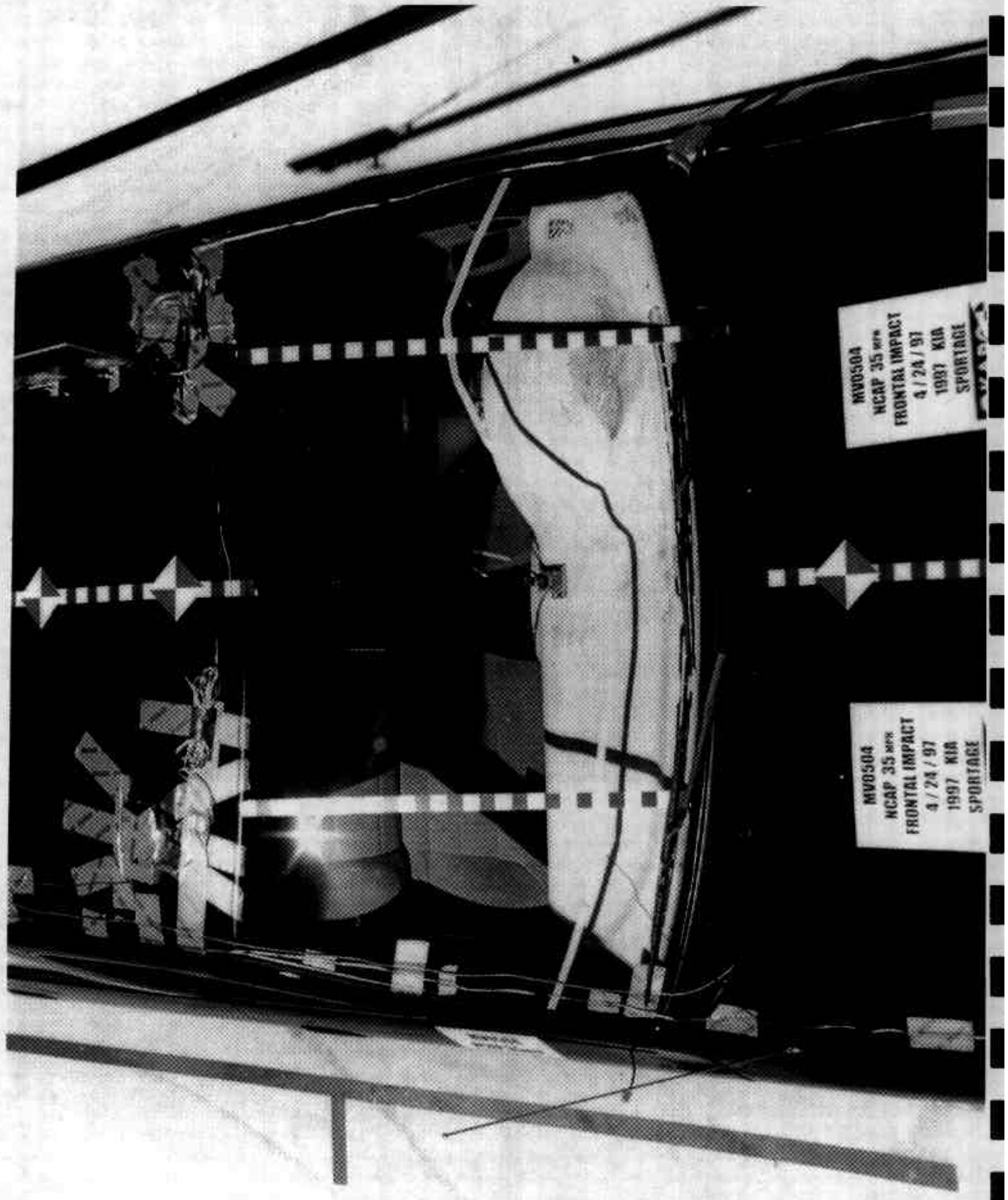


FIGURE A-15. PRE-TEST WINDSHIELD

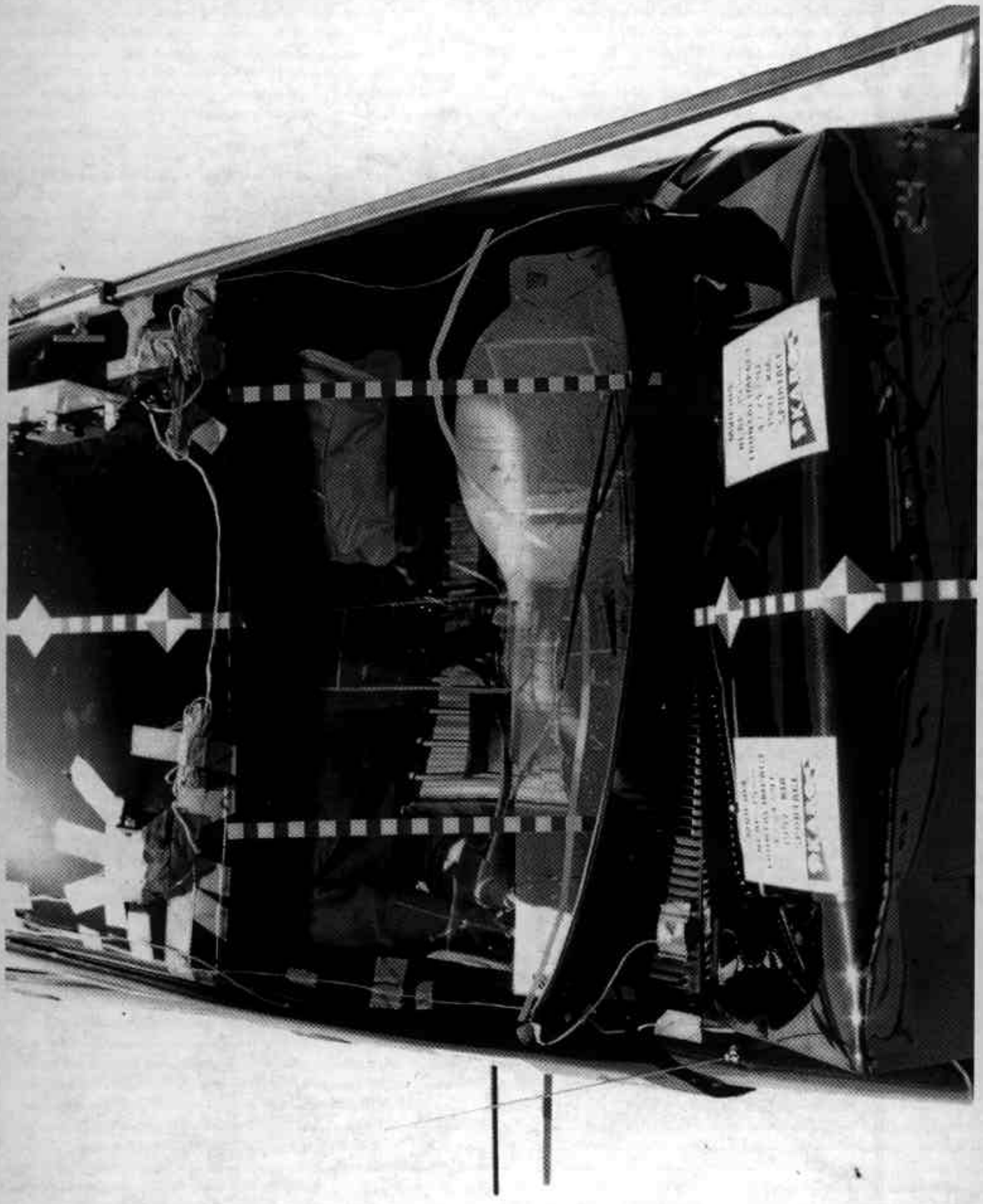


FIGURE A-16. POST-TEST WINDSHIELD

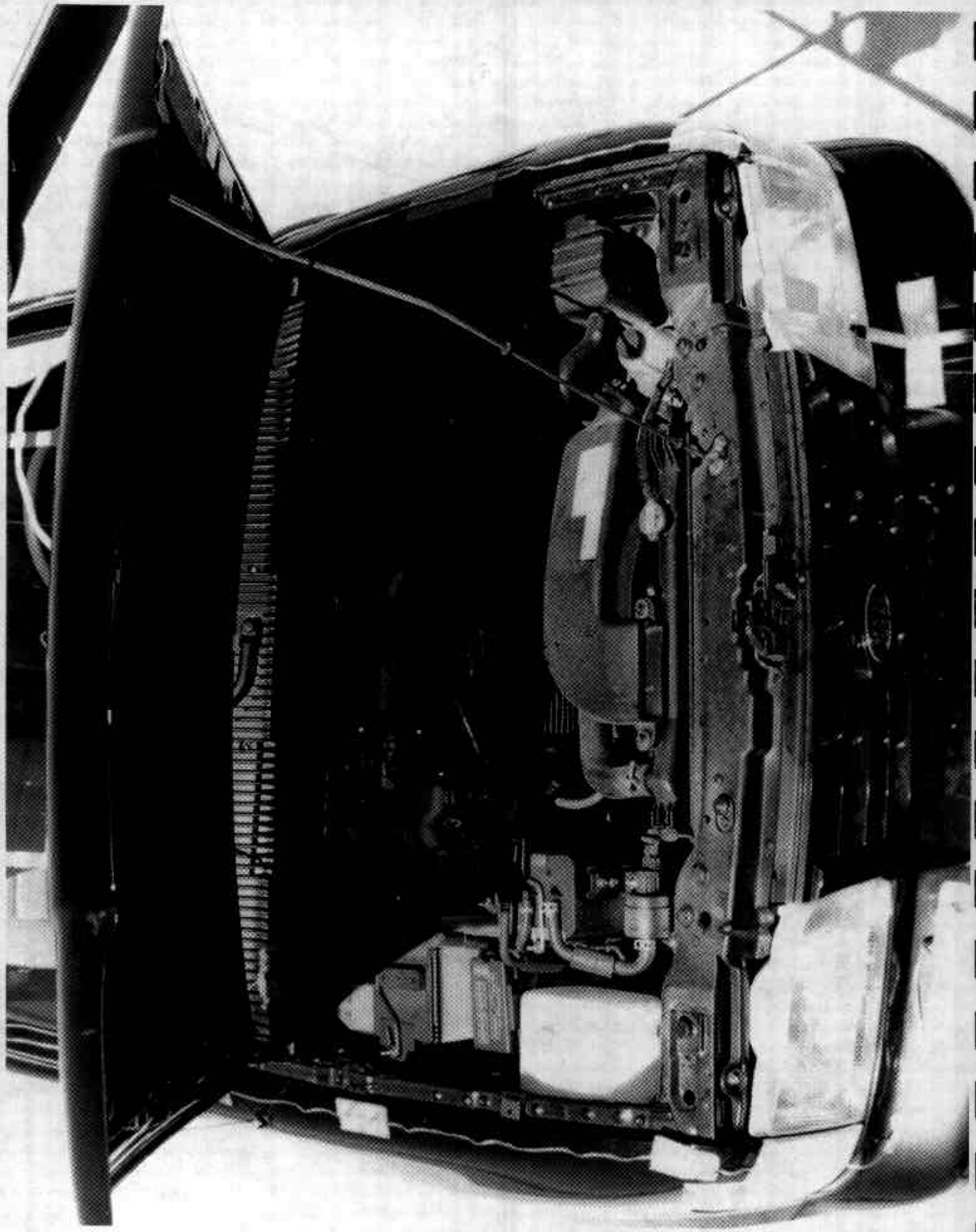


FIGURE A-17. PRE-TEST ENGINE COMPARTMENT

FIGURE A-18. POST-TEST ENGINE COMPARTMENT

FIGURE A-19. PRE-TEST FUEL FILLER CAP

FIGURE A-20. POST-TEST FUEL FILLER CAP

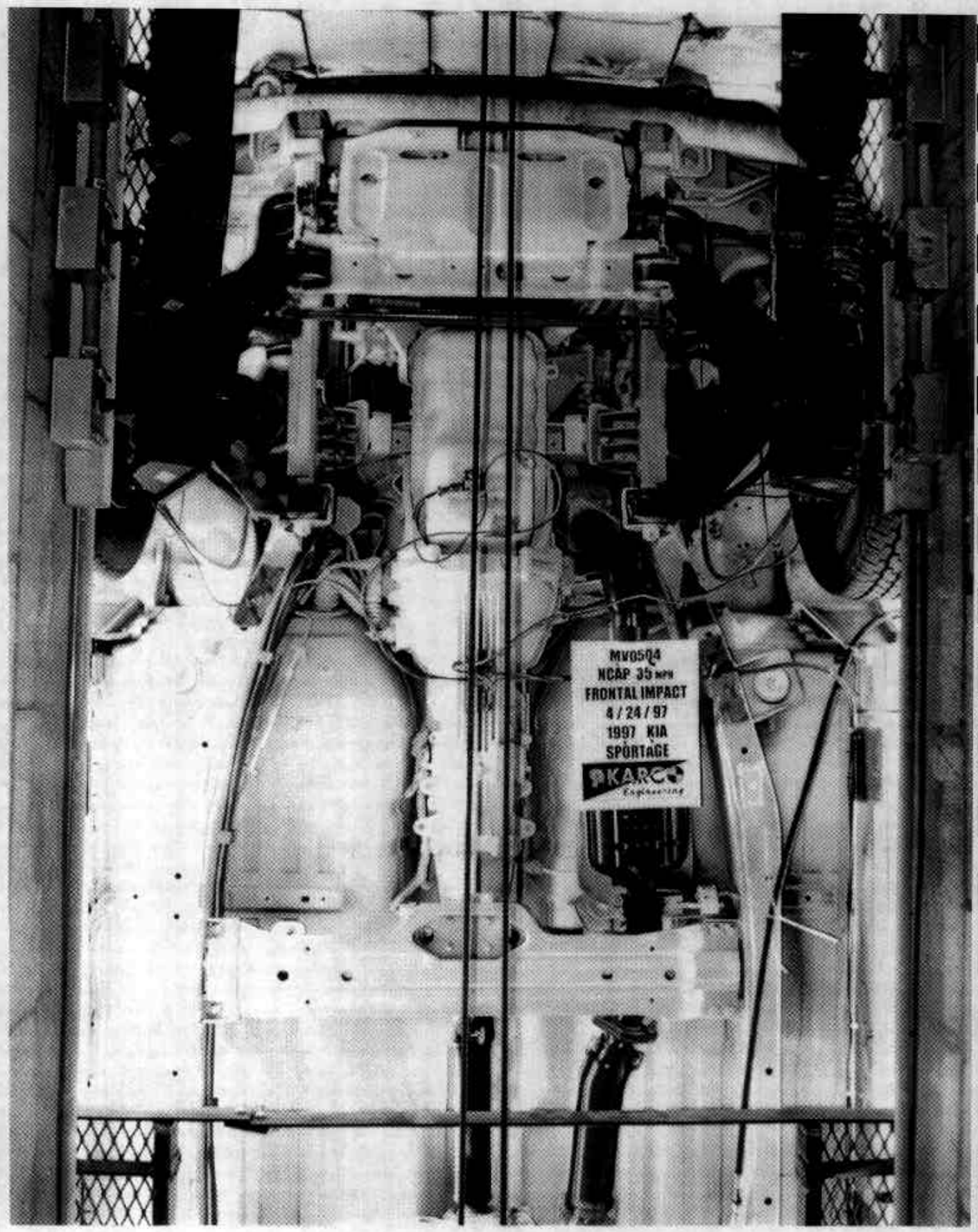


FIGURE A-21. PRE-TEST FRONT UNDERBODY

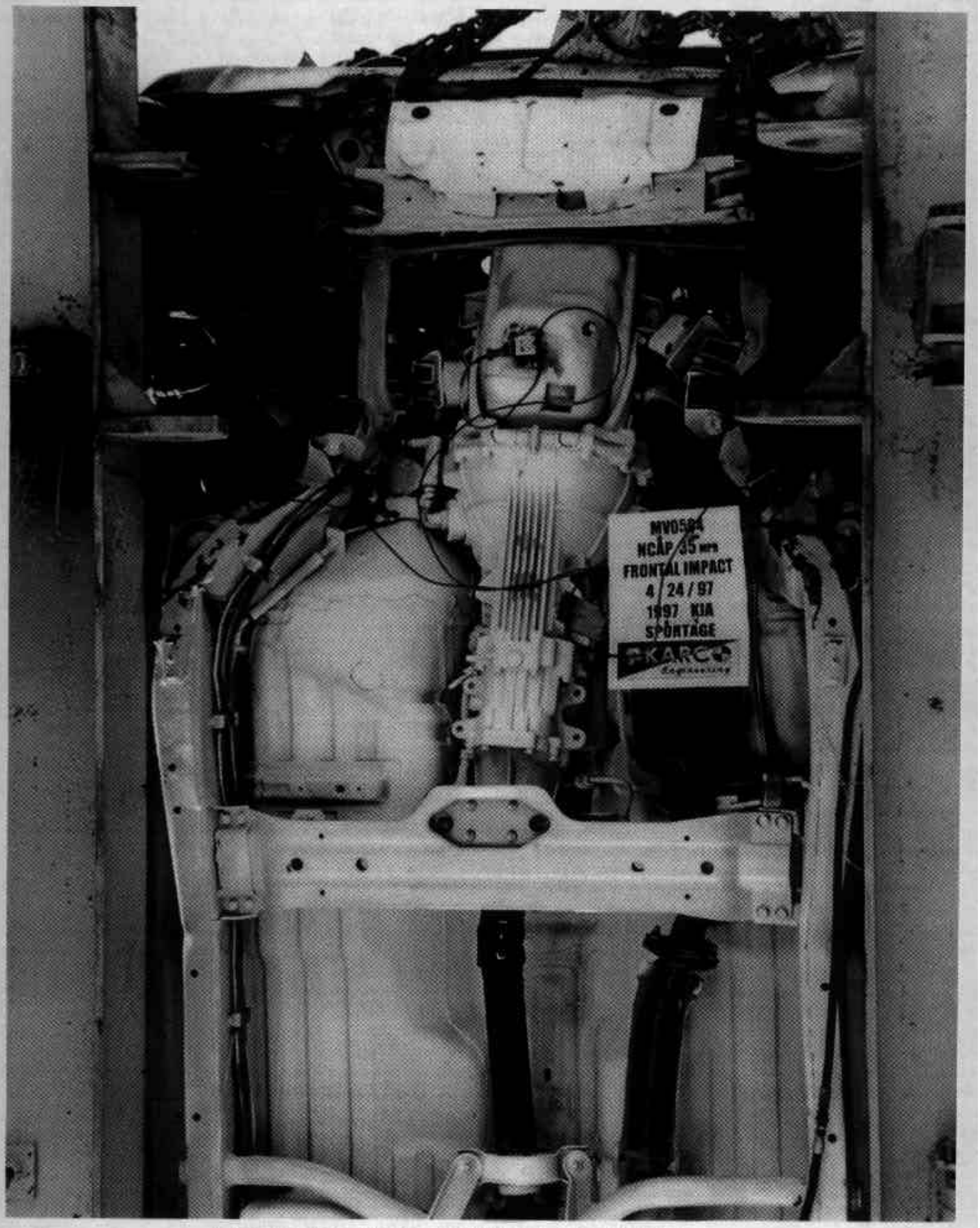


FIGURE A-22. POST-TEST FRONT UNDERBODY

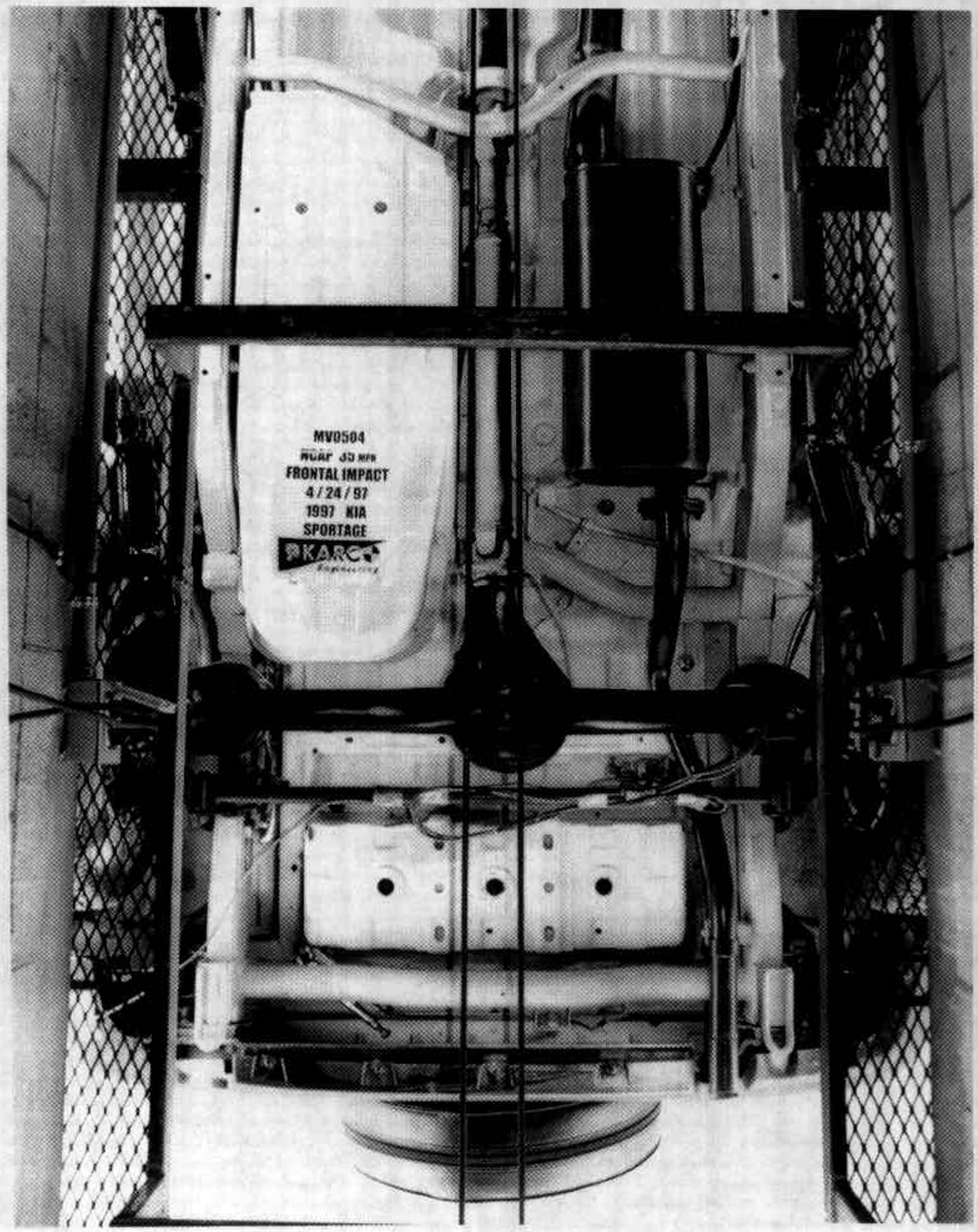


FIGURE A-23. PRE-TEST REAR UNDERBODY

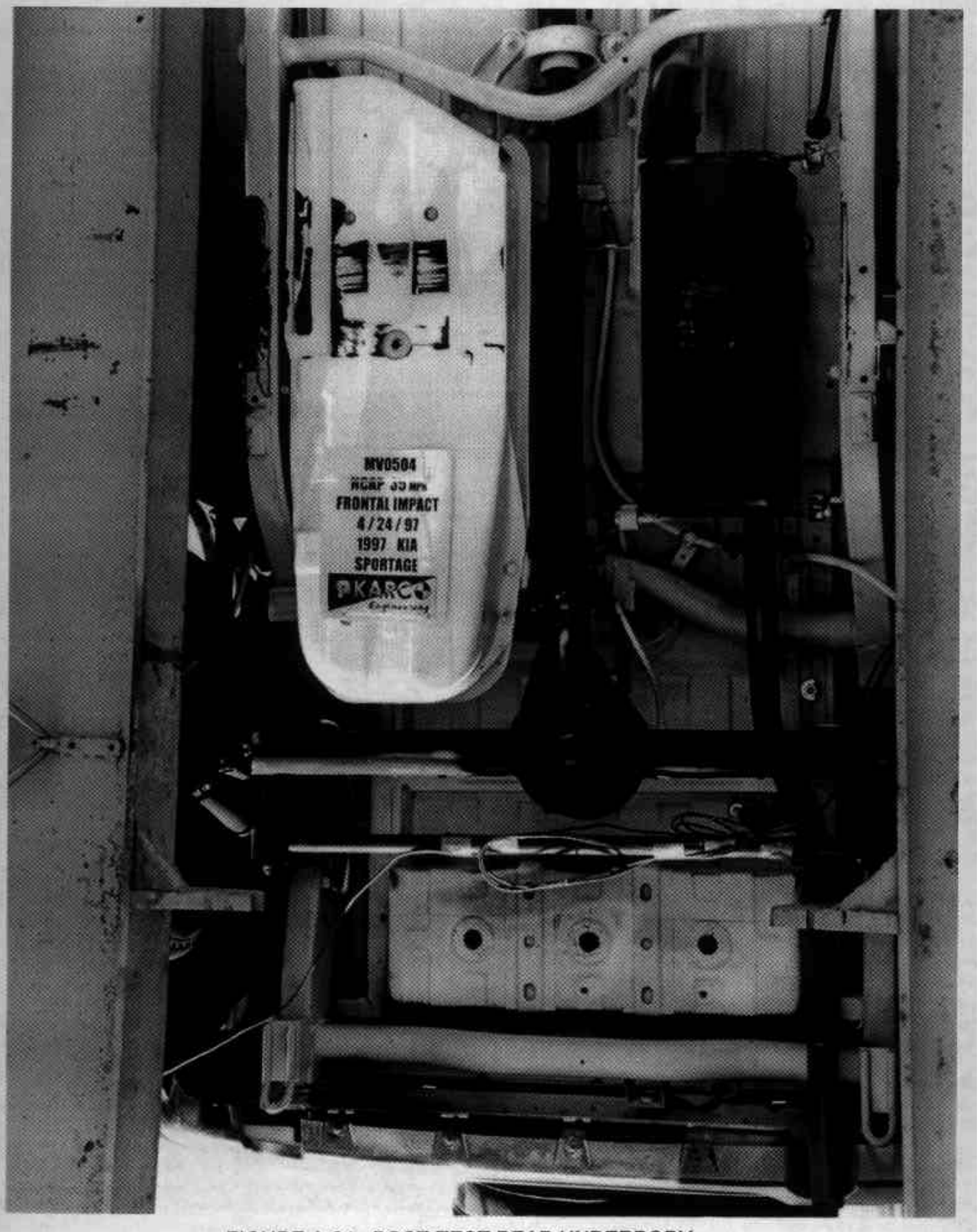


FIGURE A-24. POST-TEST REAR UNDERBODY

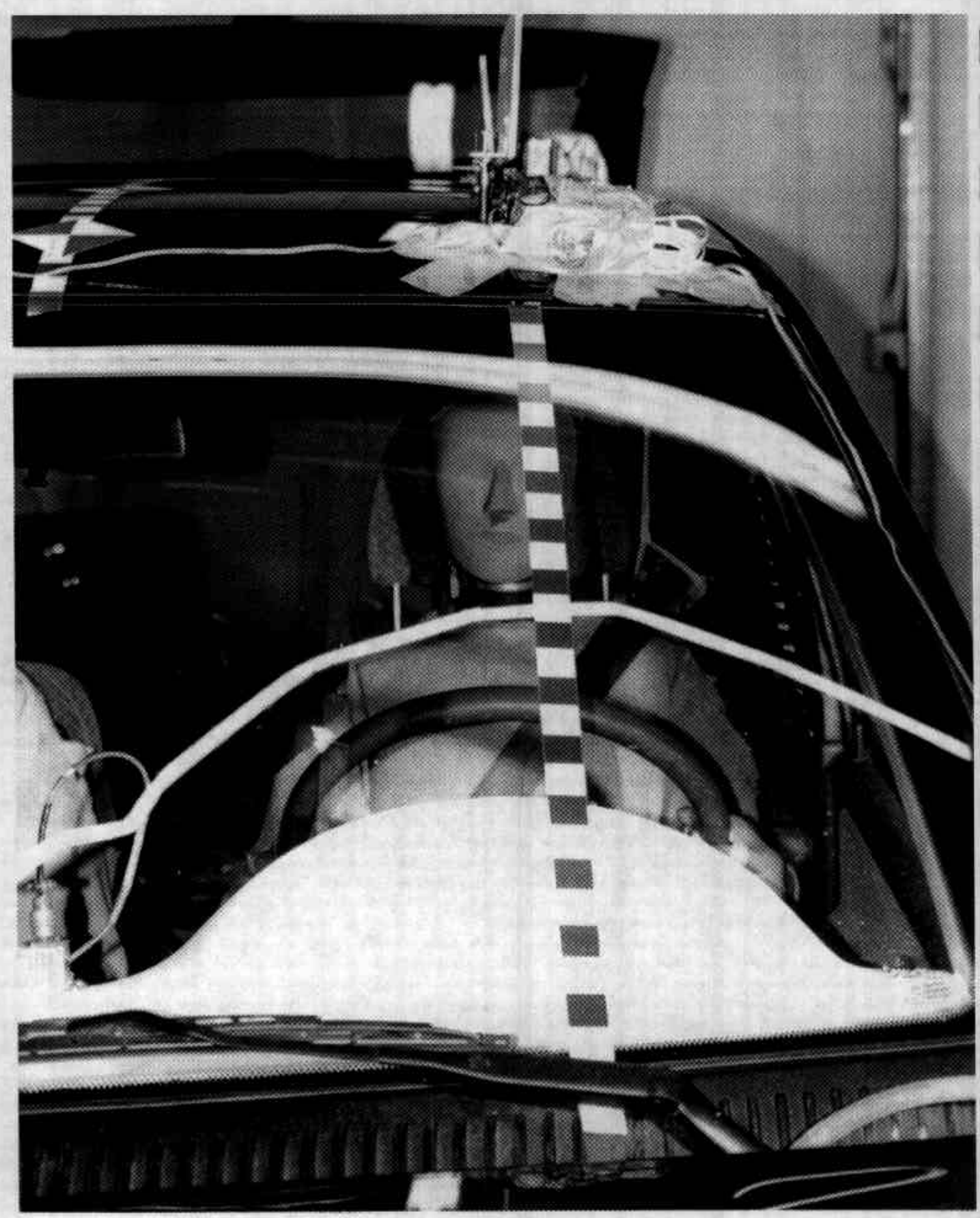


FIGURE A-25. PRE-TEST DRIVER DUMMY (FRONT VIEW)

FIGURE A-26. POST TEST DRIVER DUMMY (FRONT VIEW)

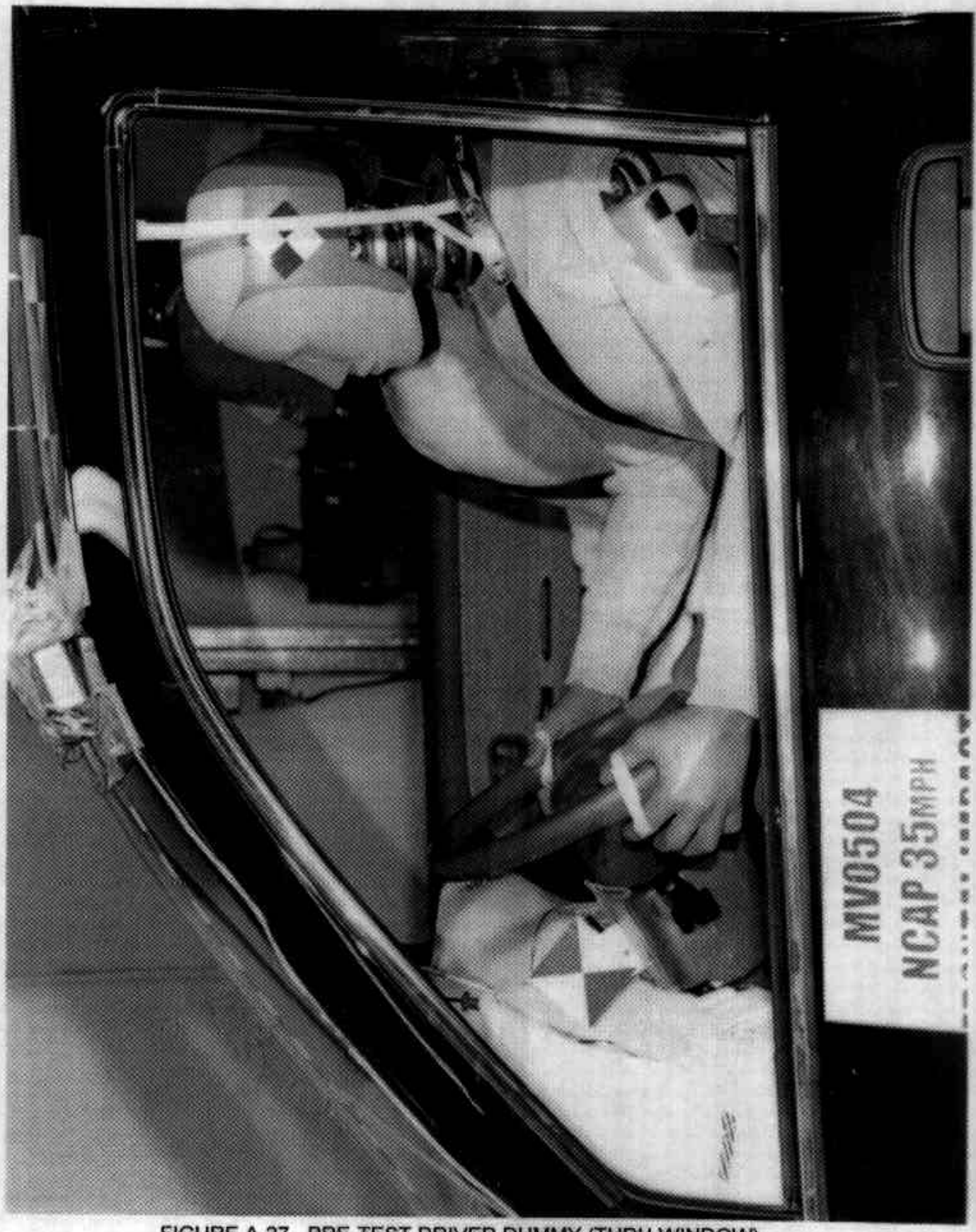


FIGURE A-27. PRE-TEST DRIVER DUMMY (THRU WINDOW)

FIGURE A-28. POST-TEST DRIVER DUMMY (THRU WINDOW)

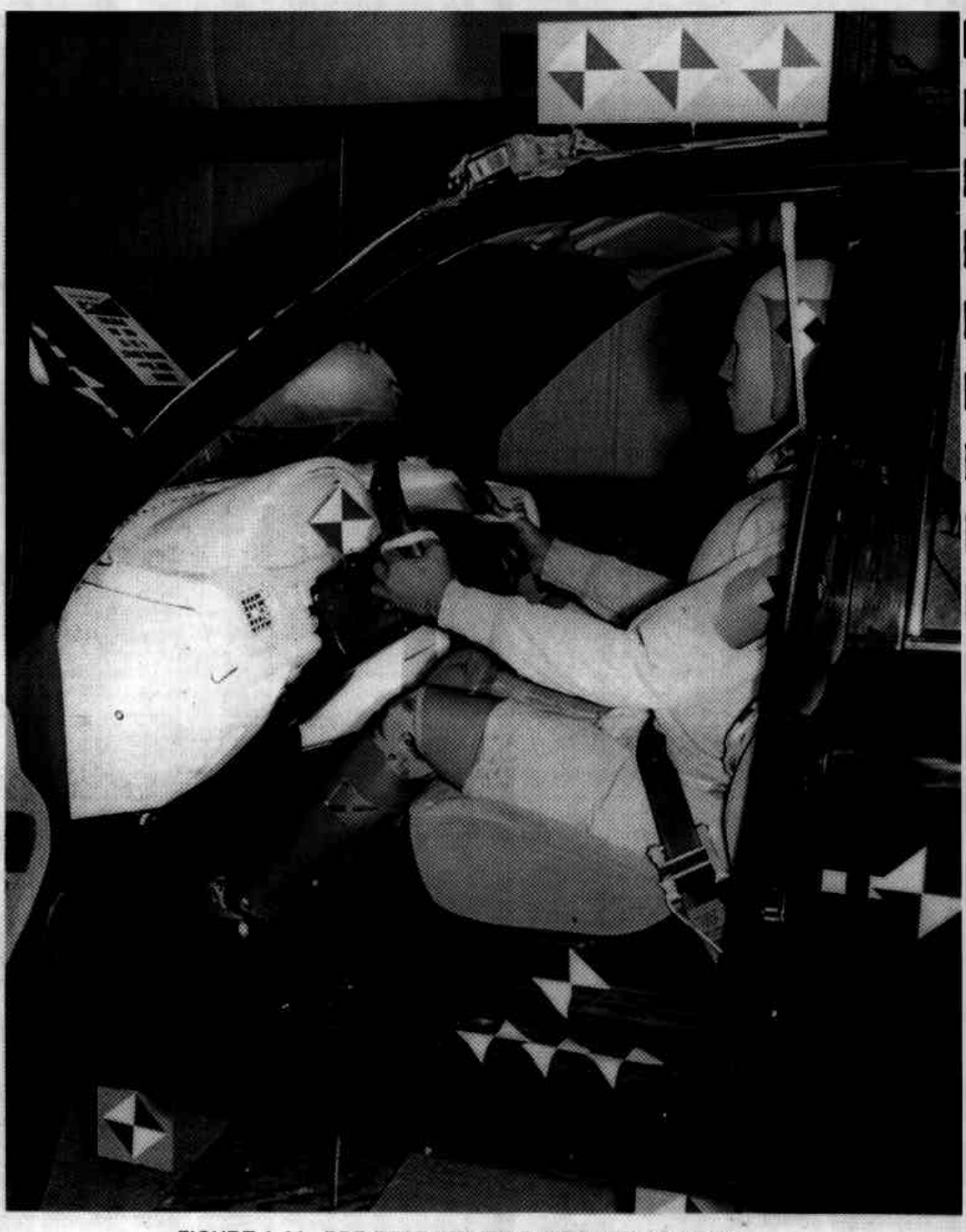


FIGURE A-29. PRE-TEST DRIVER DUMMY (DOOR OPEN)

FIGURE A-30. POST-TEST DRIVER DUMMY (DOOR OPEN)

FIGURE A-31. PRE-TEST DRIVER DUMMY (90• TO VEHICLE)

FIGURE A-32. POST-TEST DRIVER DUMMY (90• TO VEHICLE)

FIGURE A-33. POST-TEST DRIVER DUMMY CONTACT POINTS (1 OF 4)

FIGURE A-34. POST-TEST DRIVER DUMMY CONTACT POINTS (2 OF 4)

FIGURE A-35. POST-TEST DRIVER DUMMY CONTACT POINTS (3 OF 4)

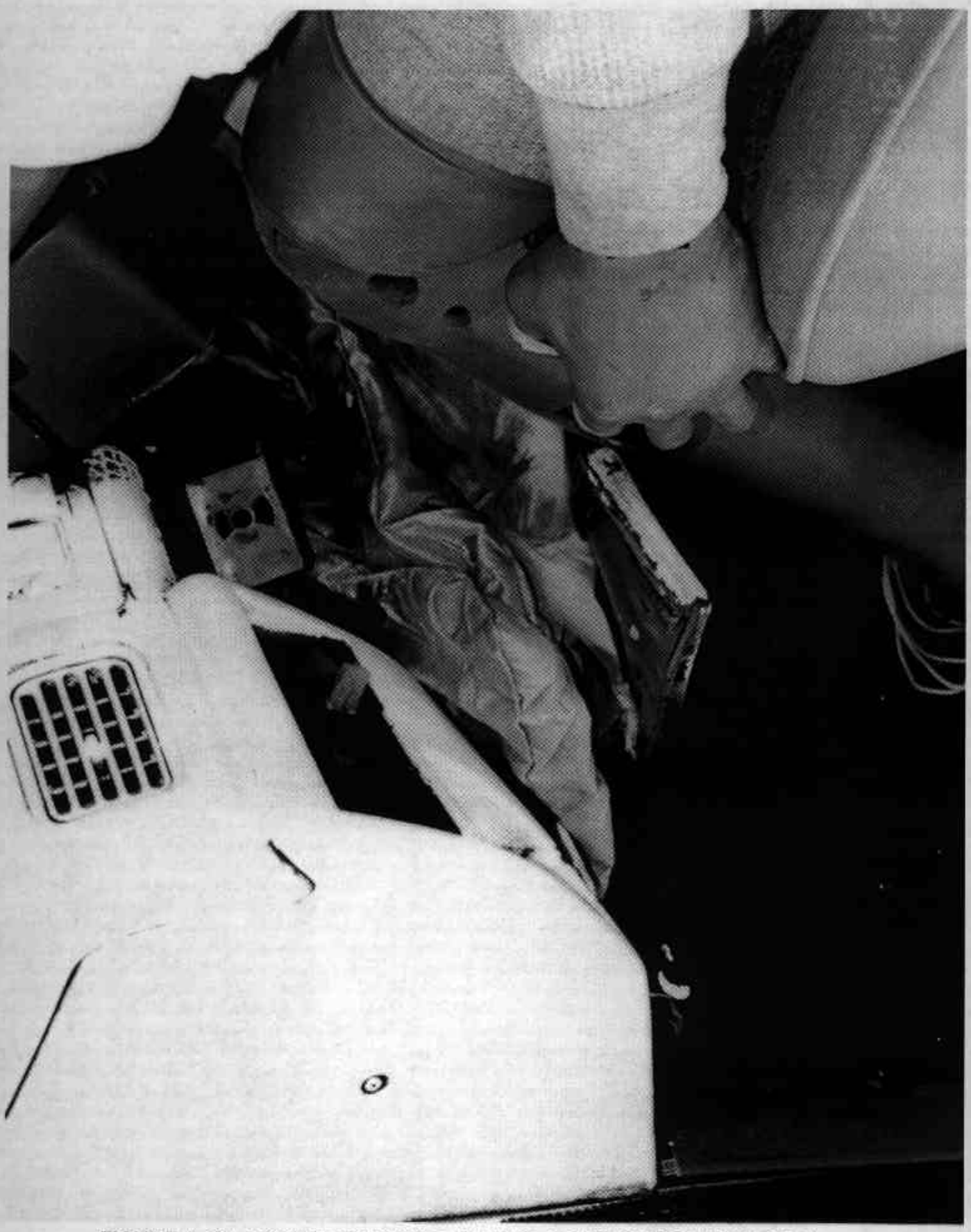


FIGURE A-36. POST-TEST DRIVER DUMMY CONTACT POINTS (4 OF 4)

FIGURE A-37. PRE-TEST DRIVER SIDE KNEE BOLSTER

FIGURE A-38. POST-TEST DRIVER SIDE KNEE BOLSTER

FIGURE A-39. PRE-TEST PASSENGER DUMMY (FRONT VIEW)

FIGURE A-40. POST TEST PASSENGER DUMMY (FRONT VIEW)

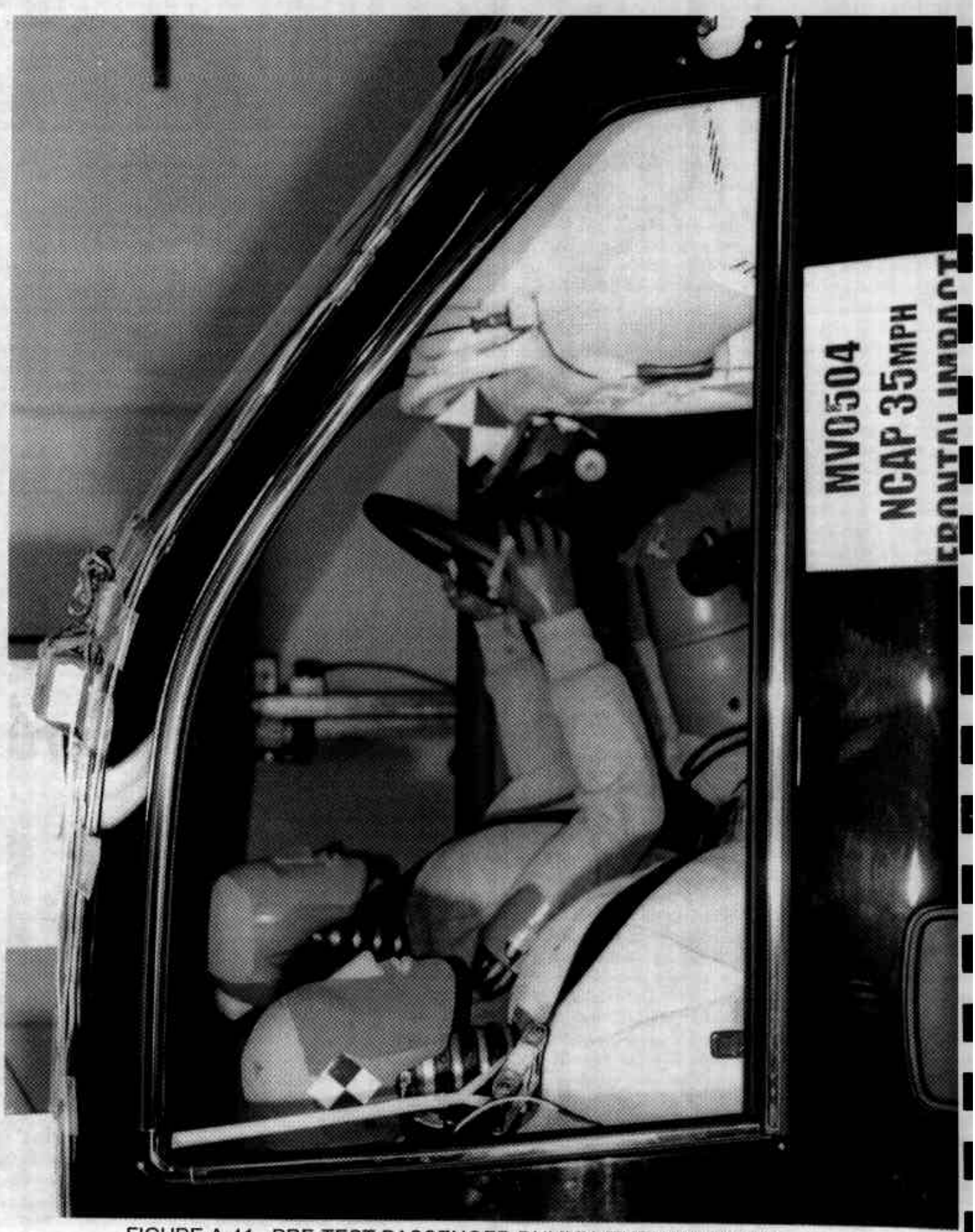


FIGURE A-41. PRE-TEST PASSENGER DUMMY (THRU WINDOW)

FIGURE A-42. POST-TEST PASSENGER DUMMY (THRU WINDOW)

FIGURE A-43. PRE-TEST PASSENGER DUMMY (DOOR OPEN)

FIGURE A-44. POST-TEST PASSENGER DUMMY (DOOR OPEN)

FIGURE A-45. PRE-TEST PASSENGER DUMMY (90• TO VEHICLE)

FIGURE A-46. POST-TEST PASSENGER DUMMY (90• TO VEHICLE)

FIGURE A-47. POST-TEST PASSENGER DUMMY CONTACT POINTS (1 OF 3)

FIGURE A-48. POST-TEST PASSENGER DUMMY CONTACT POINTS (2 OF 3)

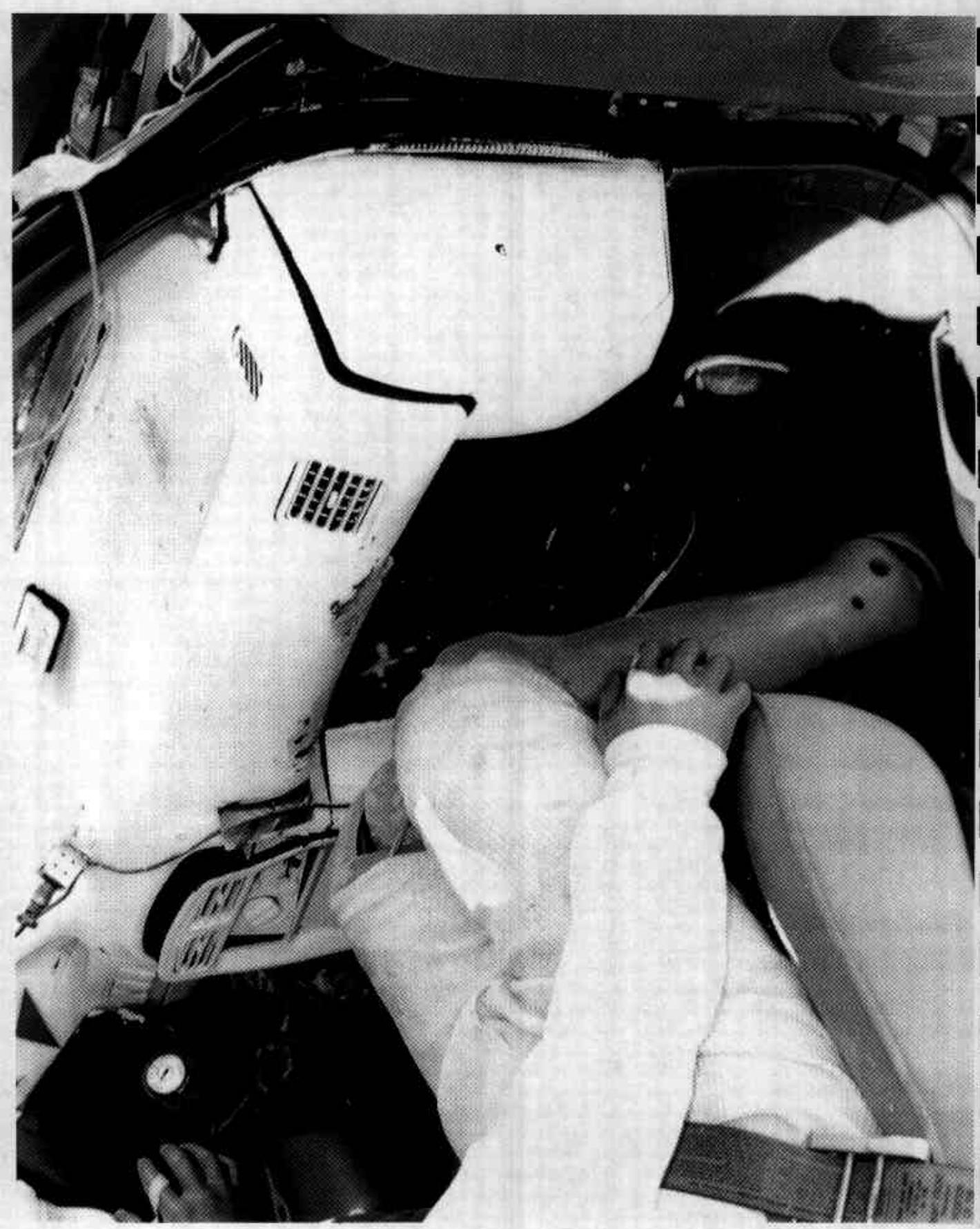


FIGURE A-49. POST-TEST PASSENGER DUMMY CONTACT POINTS (3 OF 3)

FIGURE A-50. PRE-TEST PASSENGER SIDE KNEE BOLSTER

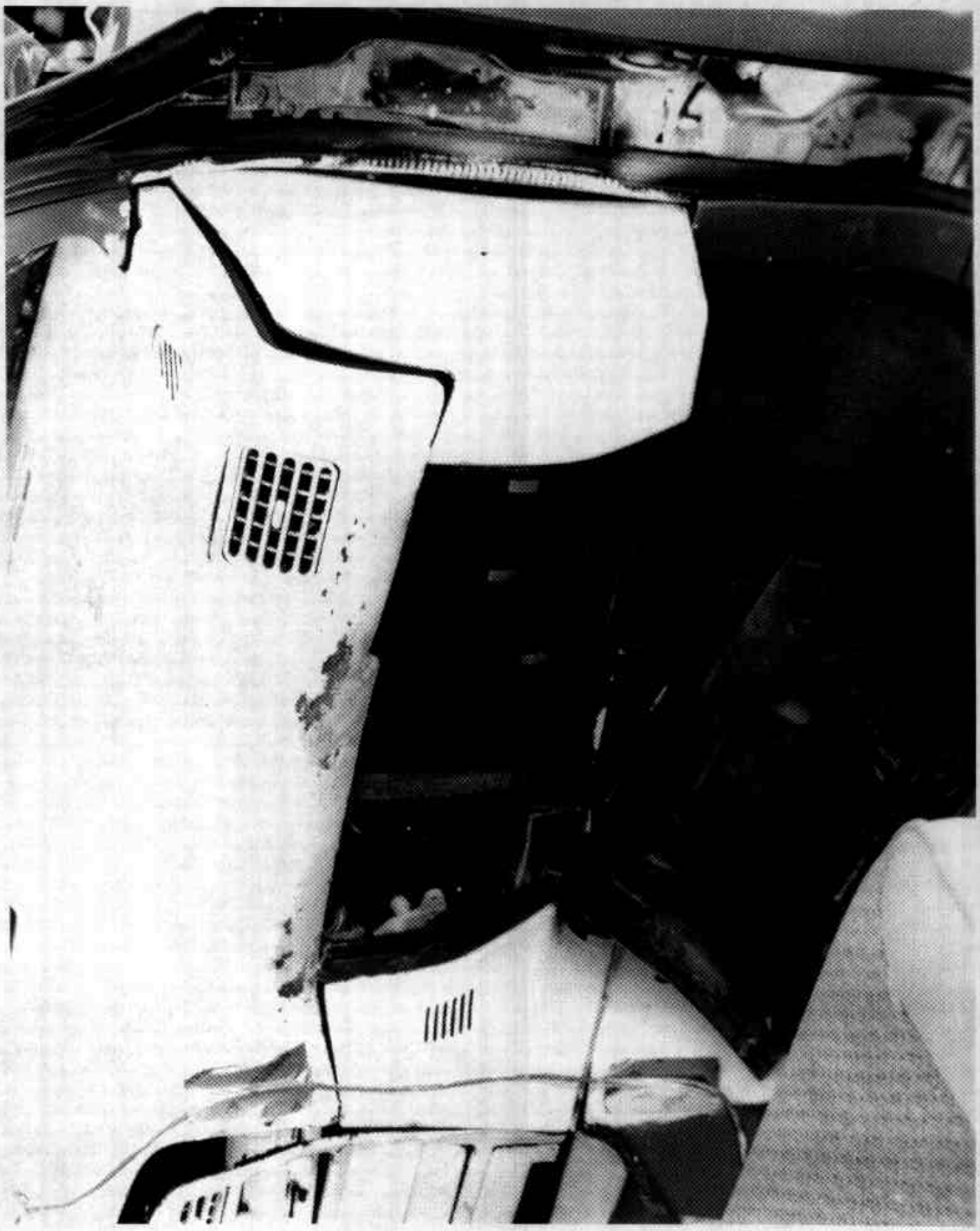


FIGURE A-51. POST-TEST PASSENGER SIDE KNEE BOLSTER

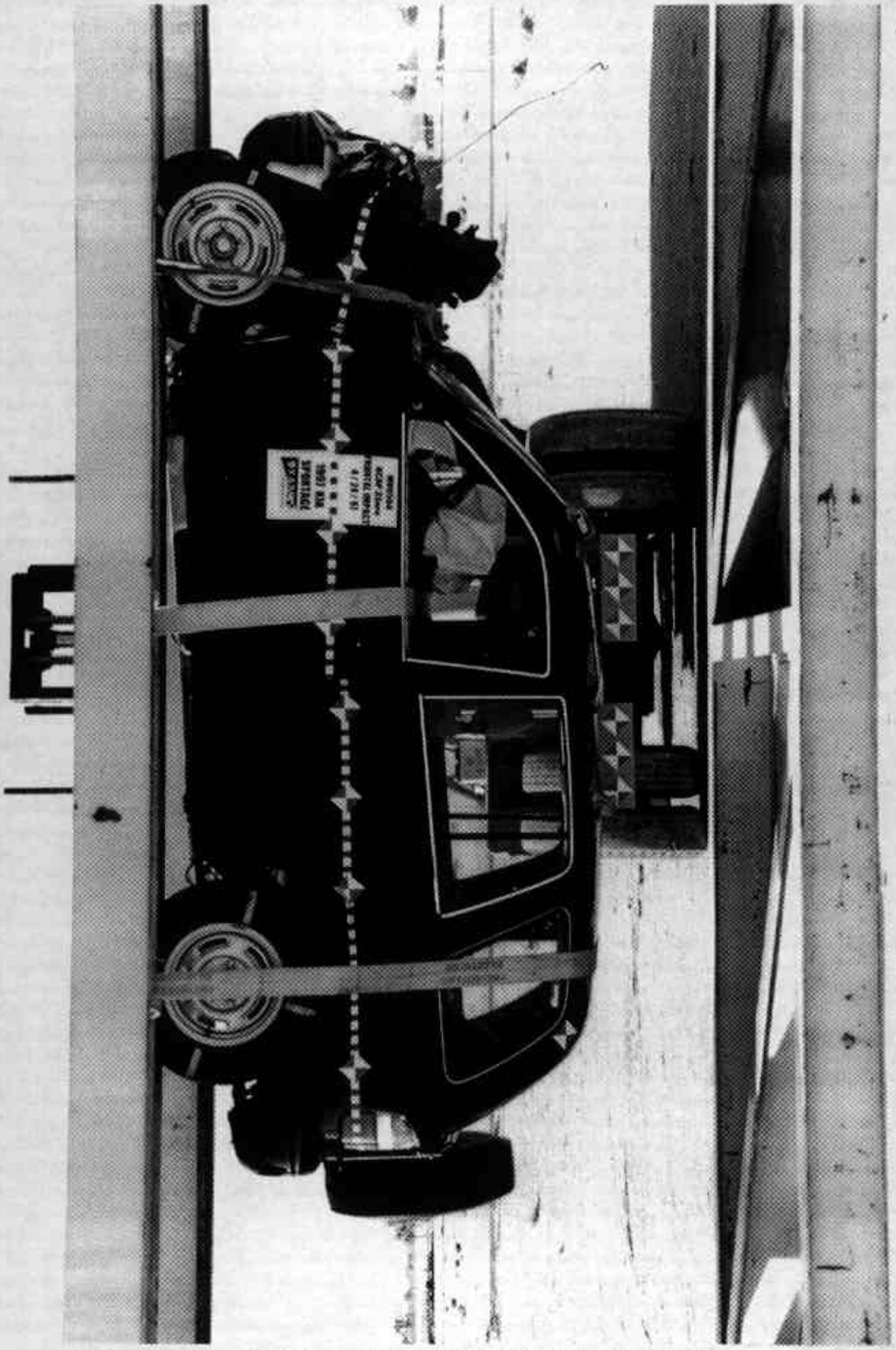


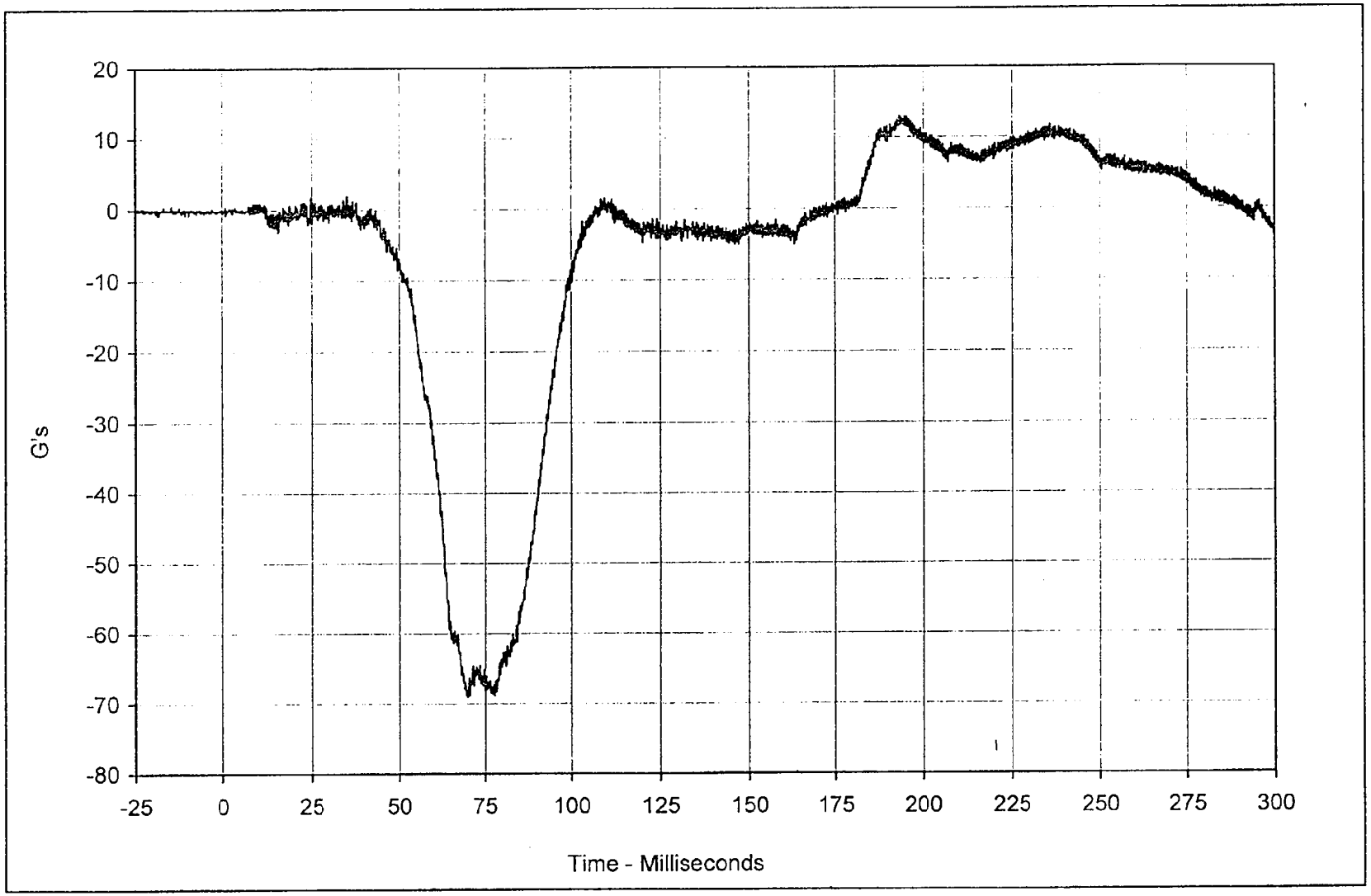
FIGURE A-52. VEHICLE ON STATIC ROLLOVER MACHINE

APPENDIX B

DUMMY AND VEHICLE RESPONSE DATA TRACES

KAR-96-R96024-06

B1



Curve Description:	Driver Head Primary X			Testing Program:	1997 New Car Assesment Program
Maximum Value:	12.9	at	193.3 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-69.0	at	70.0 Milliseconds		
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	FIL-001				

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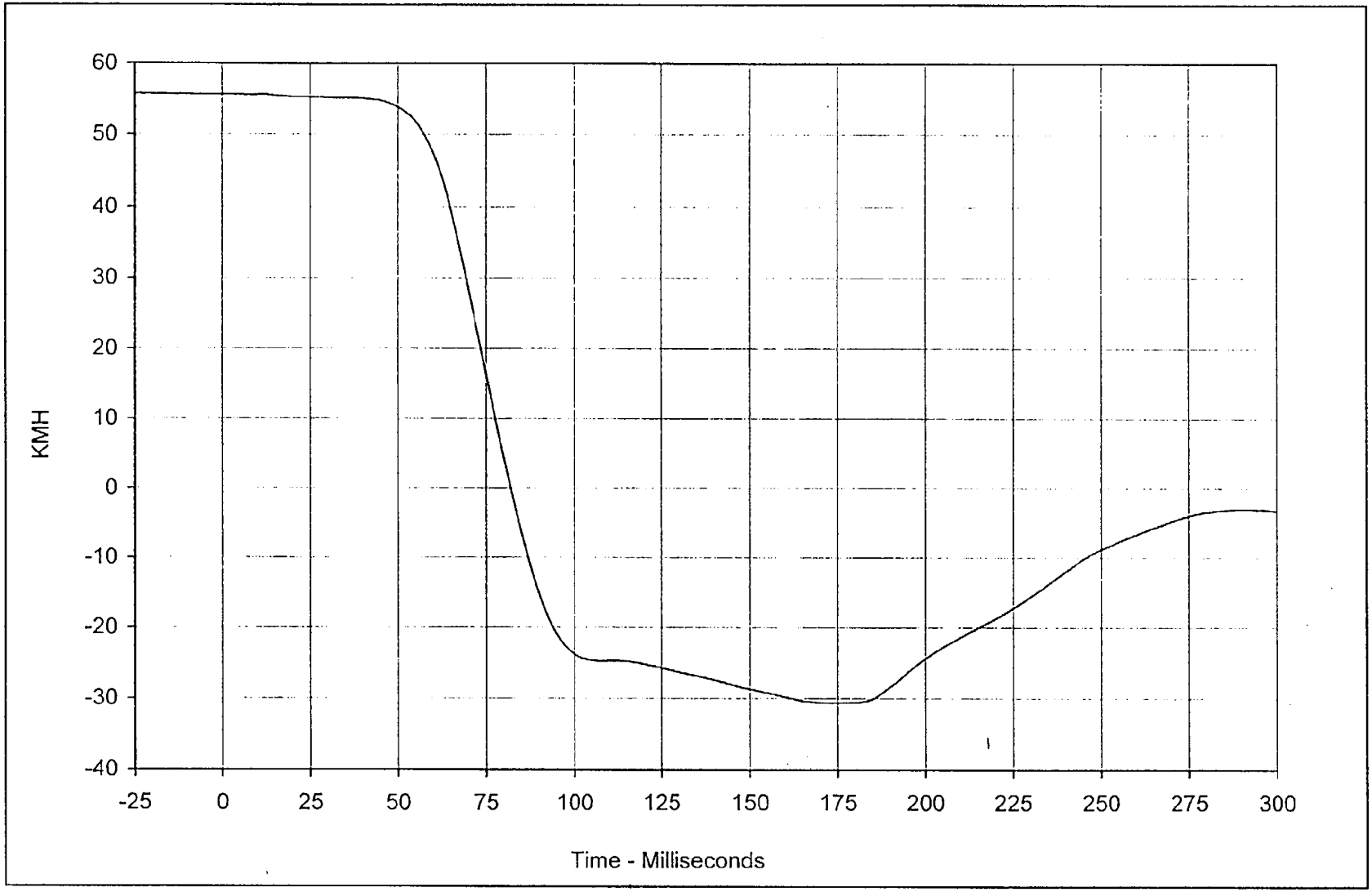
B2



Curve Description:	Driver Head Primary X Velocity			Testing Program:	1997 New Car Assessment Program
Maximum Value:	55.6	at	0.0 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-30.6	at	174.1 Milliseconds		
SAE Filter Class:	180				
Date of Test:	4/24/97				
Curve Number:	IN1-001				

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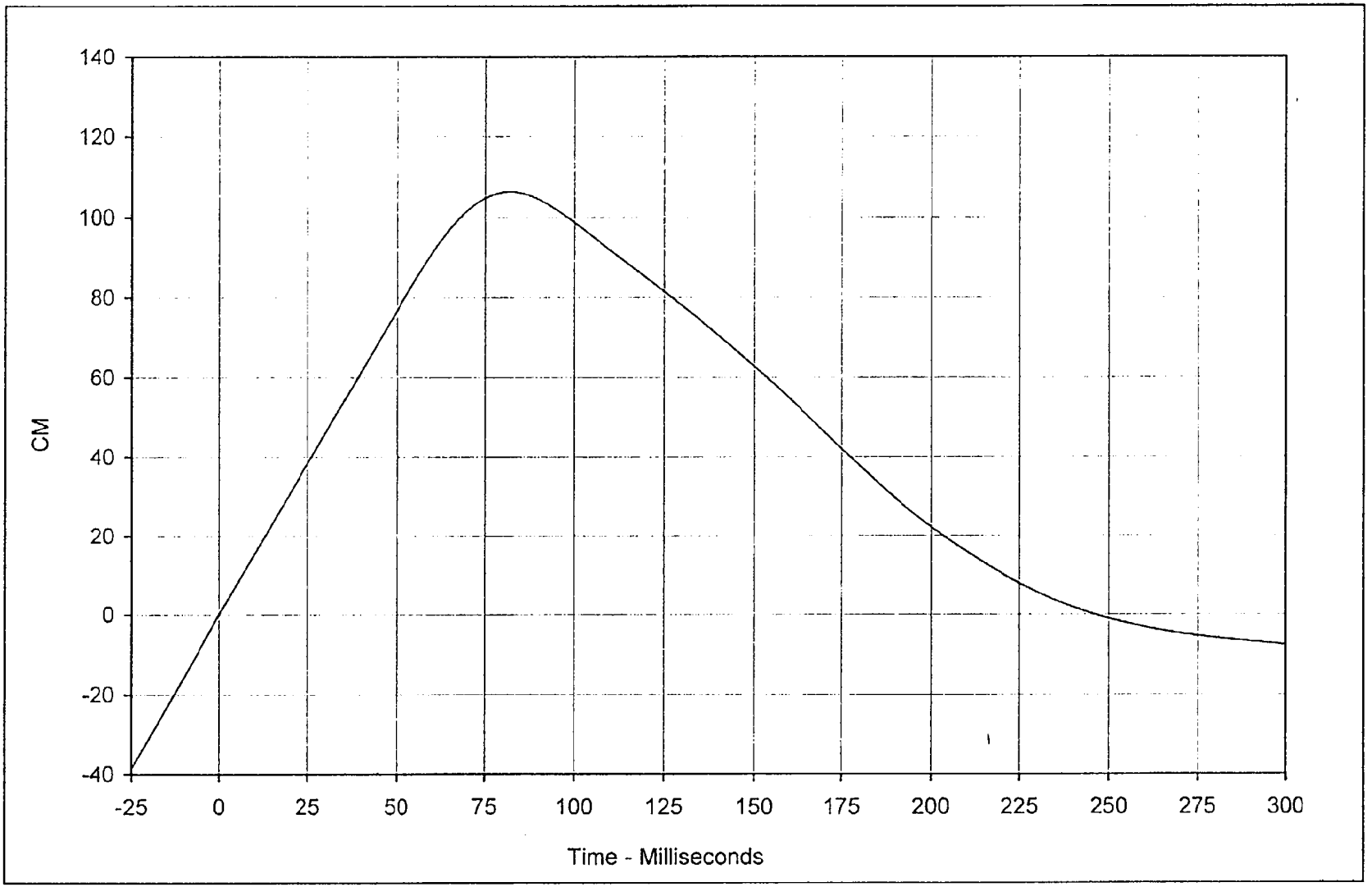

Curve Description: Driver Head Primary X Displ.

Maximum Value: 106.3 at 82.1 Milliseconds

Minimum Value: -7.5 at 299.9 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN2-001

Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

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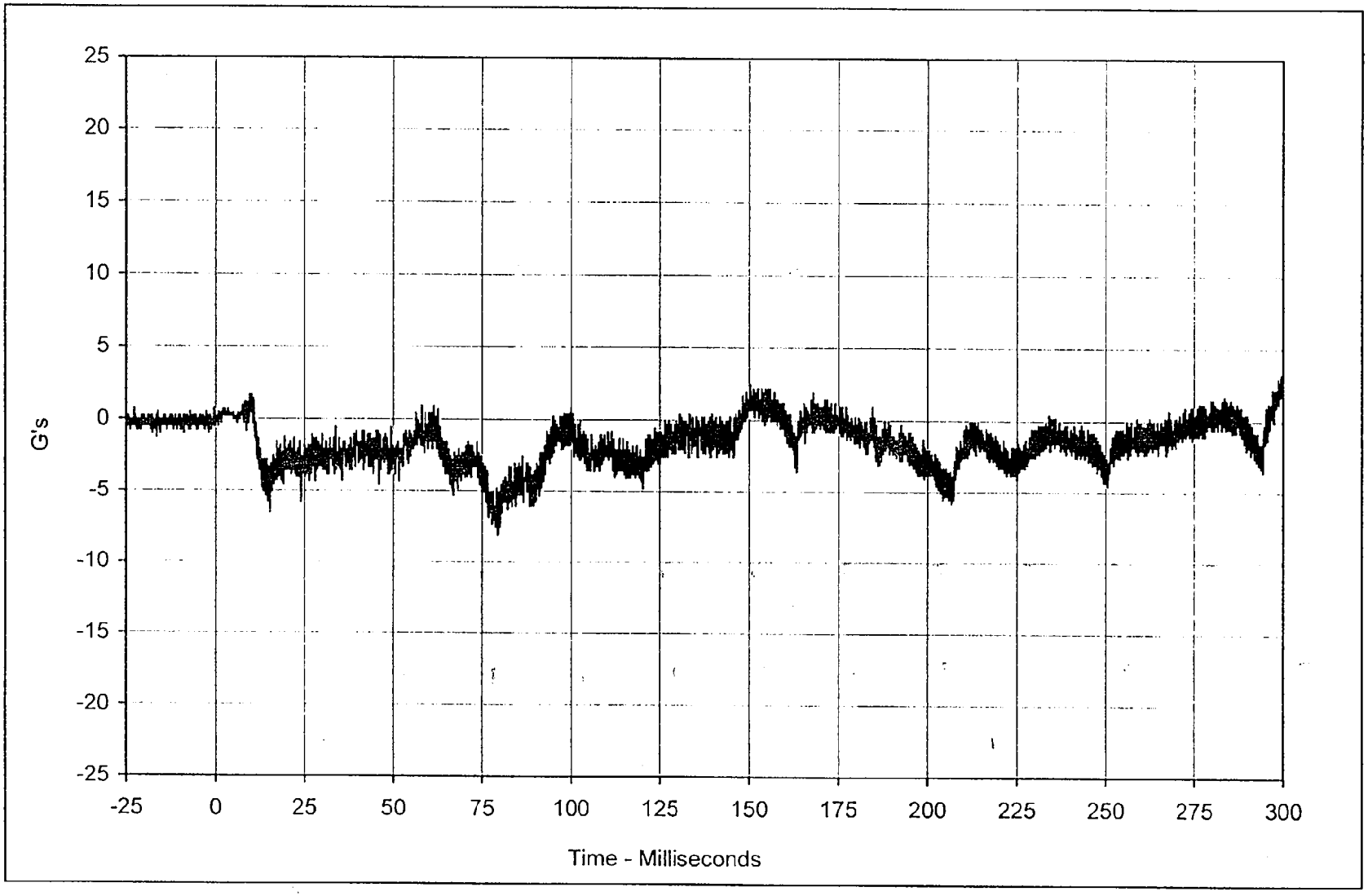

Curve Description:	Driver Head Primary Y			Testing Program:	1997 New Car Assesment Program
Maximum Value:	3.2	at	299.5 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-8.1	at	79.4 Milliseconds		
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	FIL-002				

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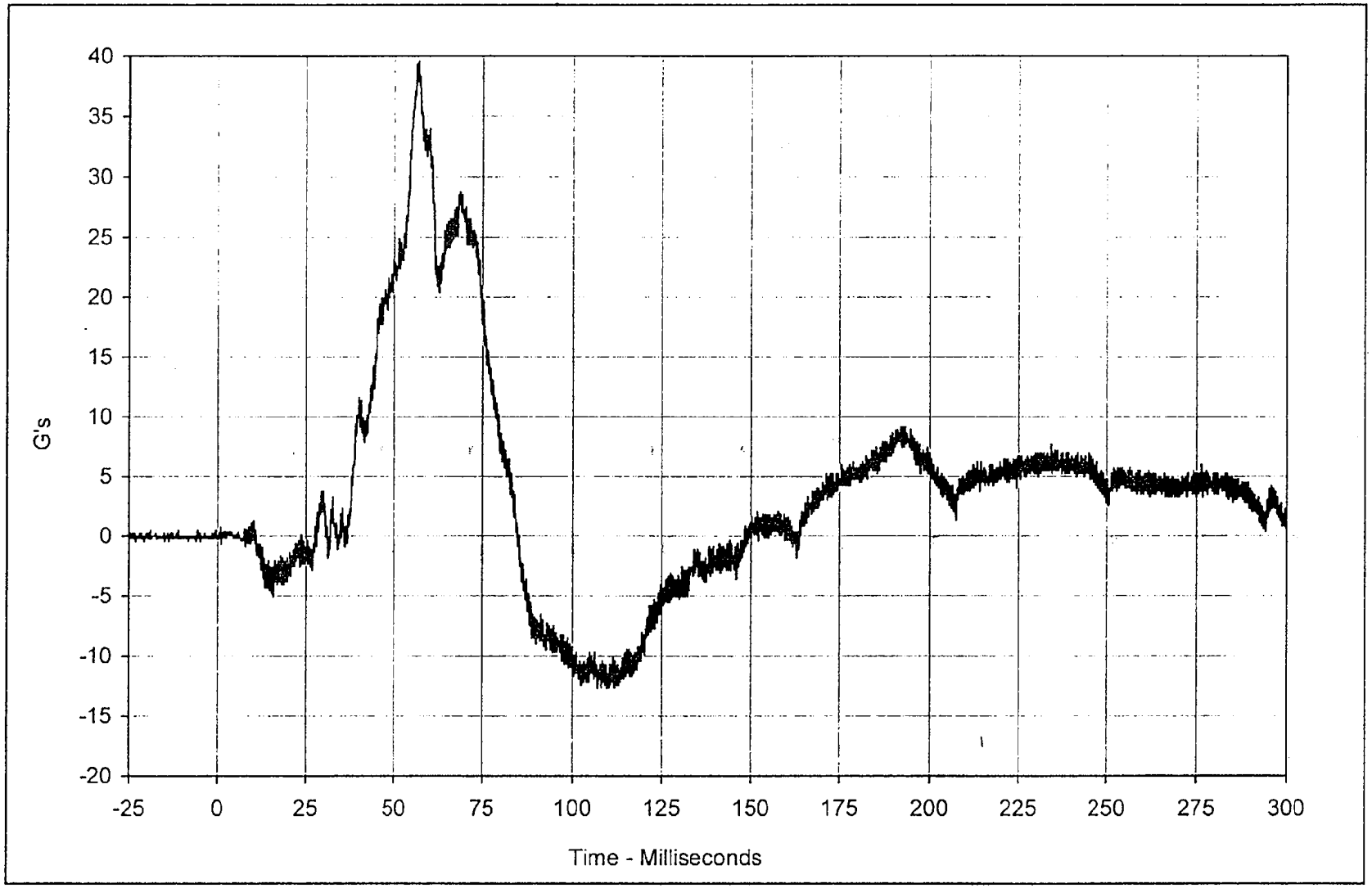

Curve Description:	Driver Head Primary Z			Testing Program:	1997 New Car Assesment Program
Maximum Value:	39.6	at	56.9 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-12.7	at	107.2 Milliseconds		
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	FIL-003				

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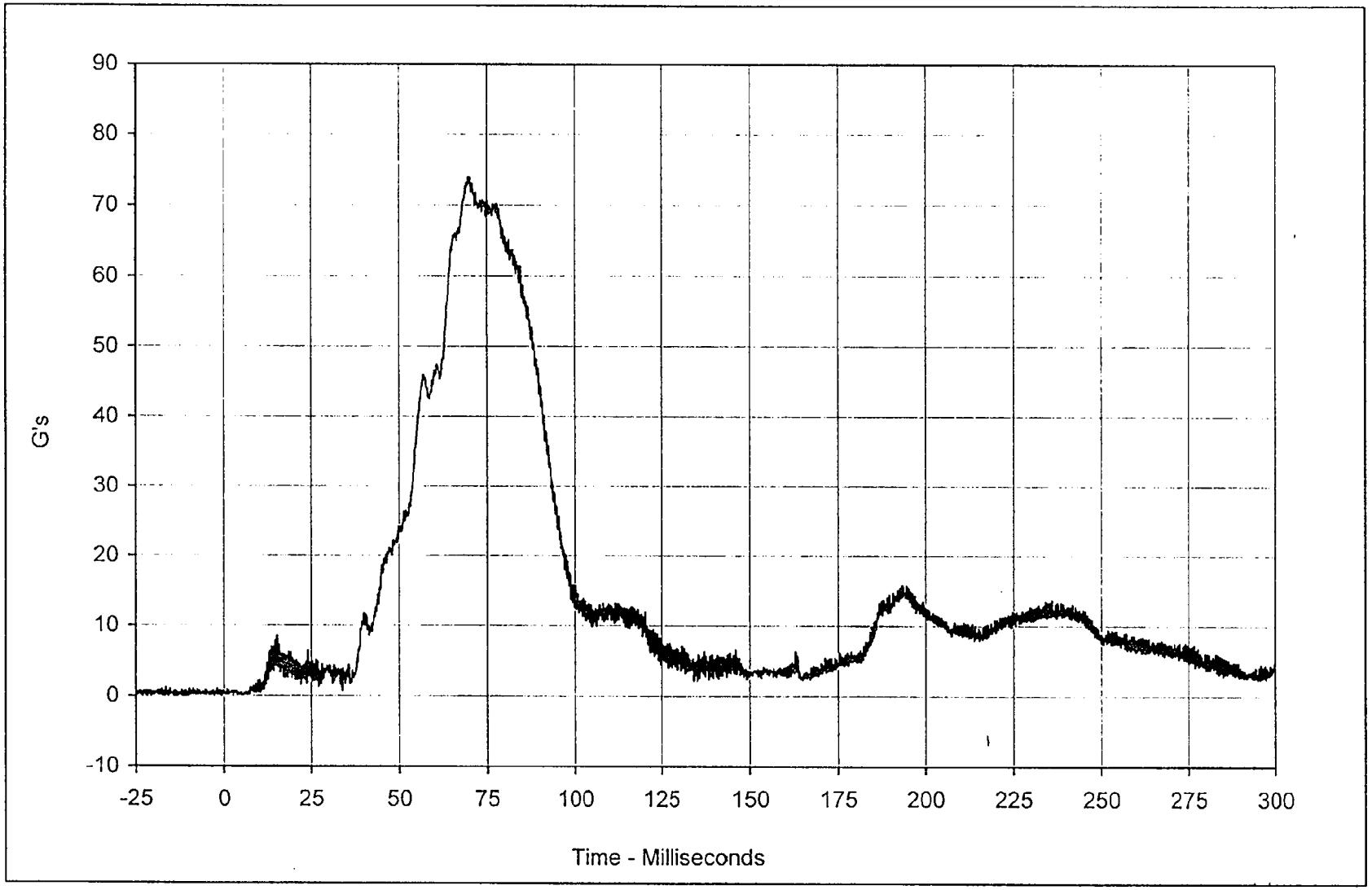

Curve Description:	Driver Head Resultant Primary			Testing Program:	1997 New Car Assesment Program
Maximum Value:	74.0	at	69.6 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	0.1	at	5.1 Milliseconds		
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	RES-001				

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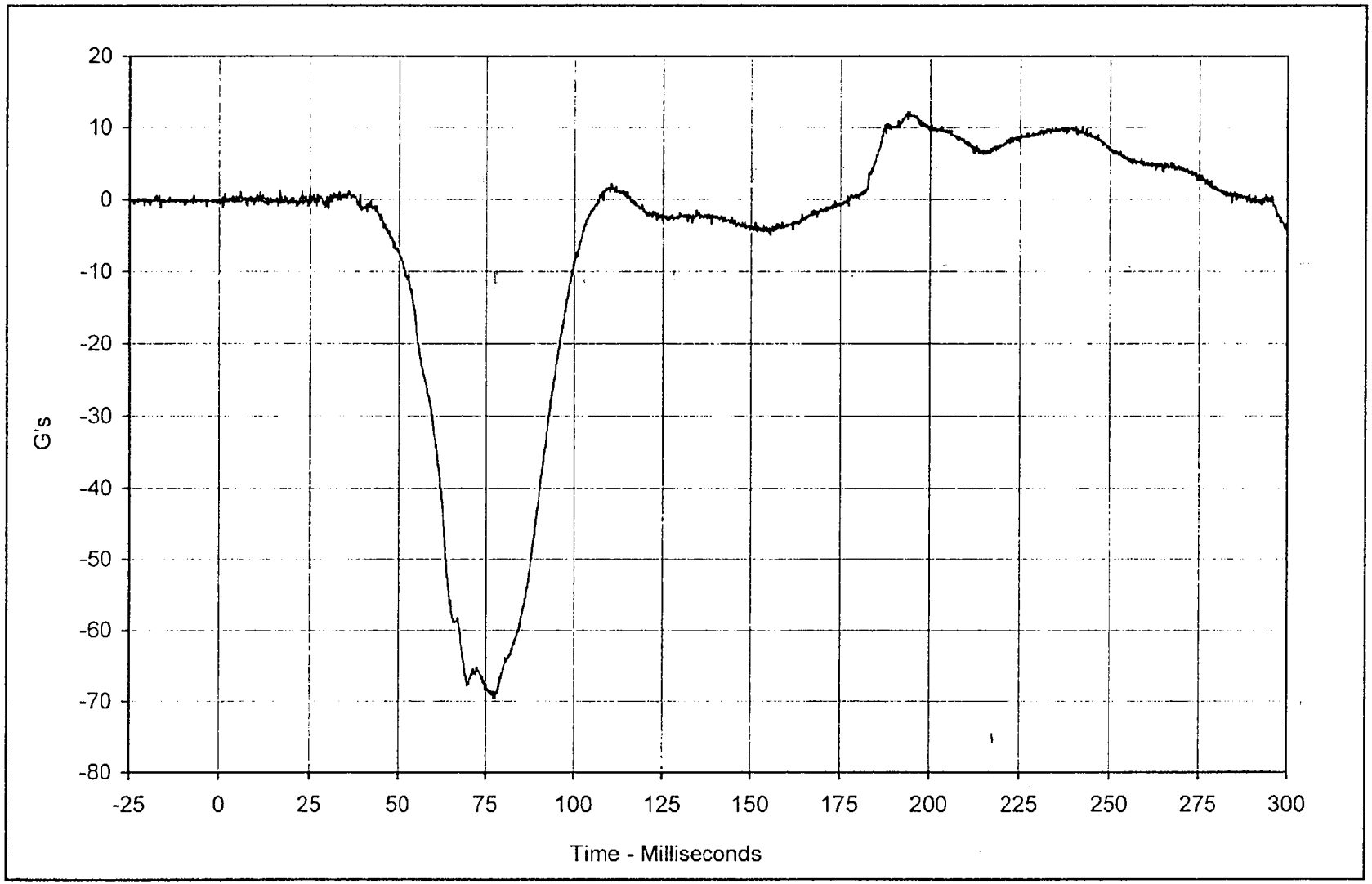

Curve Description:	Driver Head Redundant X			Testing Program:	1997 New Car Assesment Program
Maximum Value:	12.1	at	193.7 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-69.5	at	77.2 Milliseconds		
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	FIL-004				

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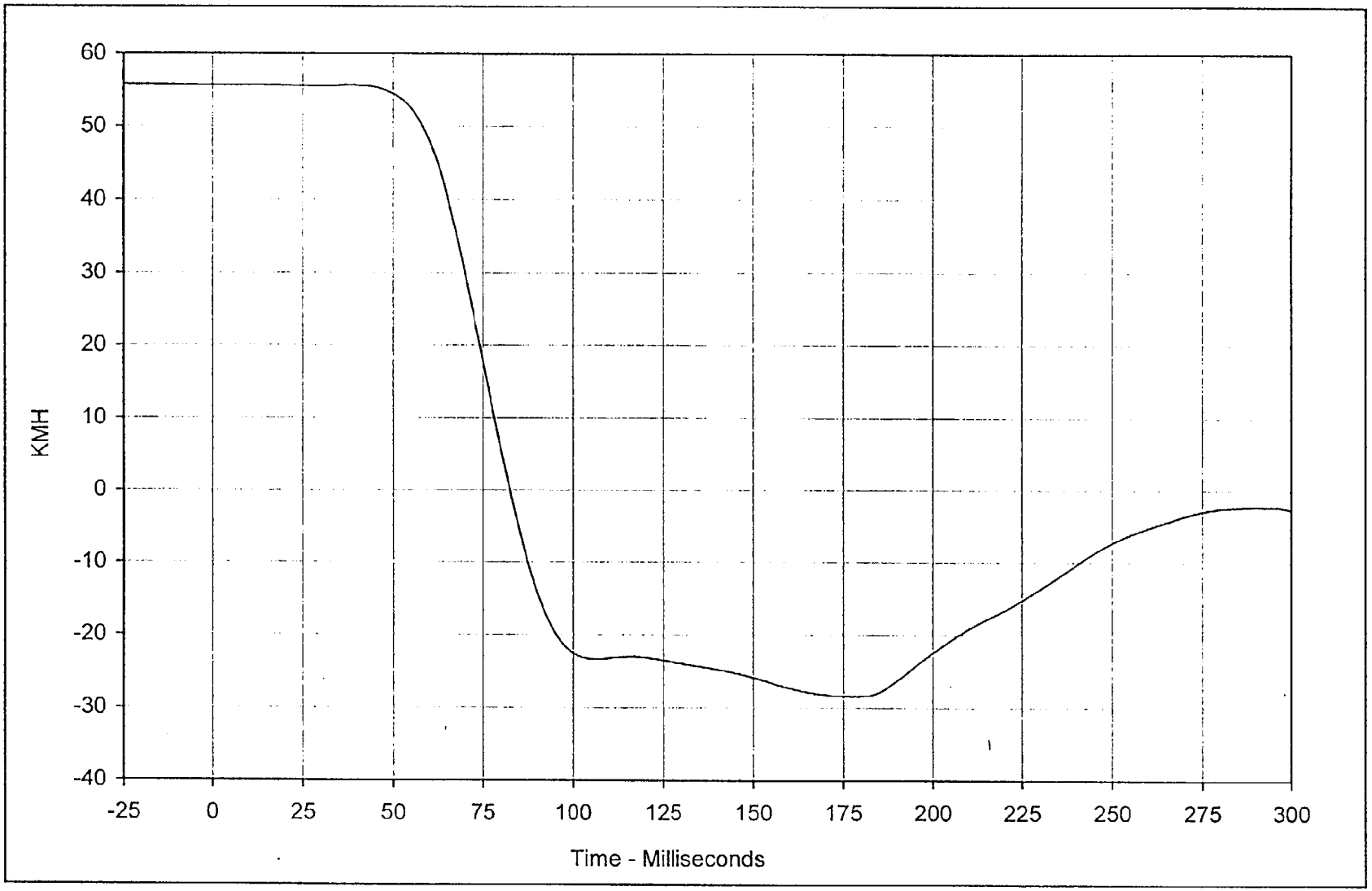

Curve Description: Driver Head Redundant X Velocity

Maximum Value: 55.7 at 38.1 Milliseconds

Minimum Value: -28.4 at 177.3 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN1-004

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

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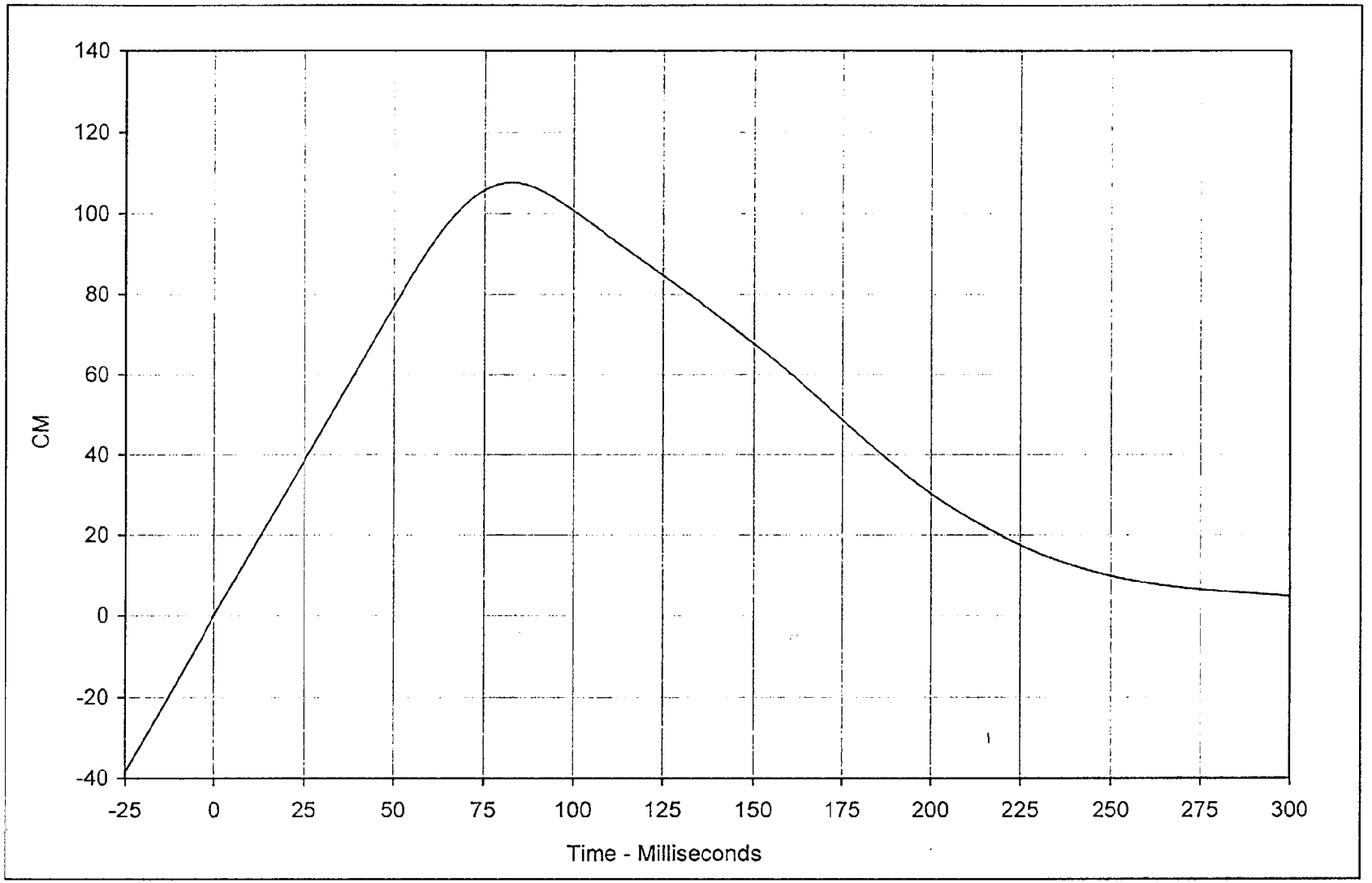

Curve Description:	Driver Head Redundant X Displ.			Testing Program:	1997 New Car Assesment Program
Maximum Value:	107.7	at	82.7 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	0.0	at	0.0 Milliseconds		
SAE Filter Class:	180				
Date of Test:	4/24/97				
Curve Number:	IN2-004				

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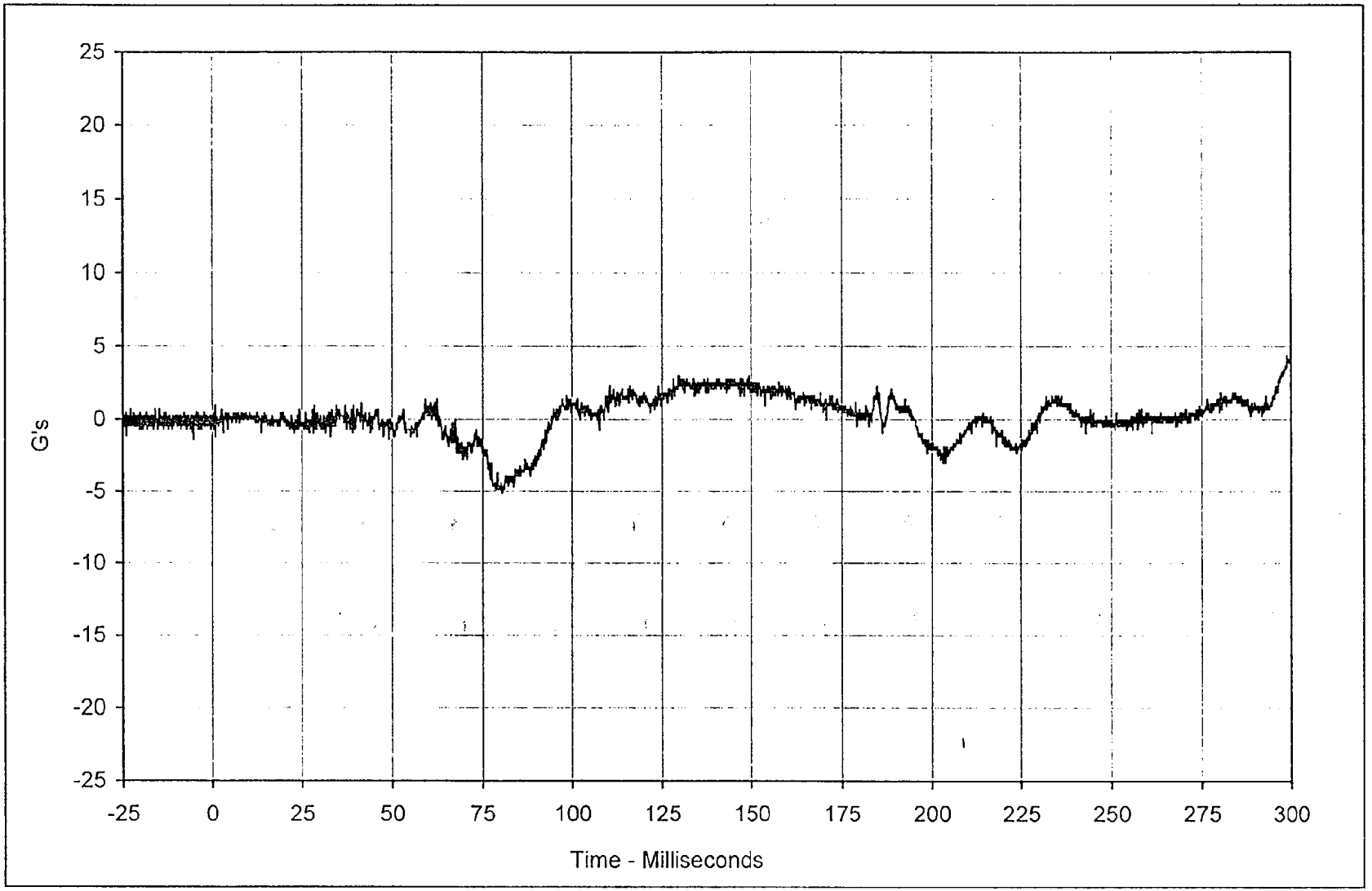

Curve Description:	Driver Head Redundant Y			Testing Program:	1997 New Car Assesment Program
Maximum Value:	4.4	at	298.8 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-5.1	at	80.3 Milliseconds		
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	FIL-005				

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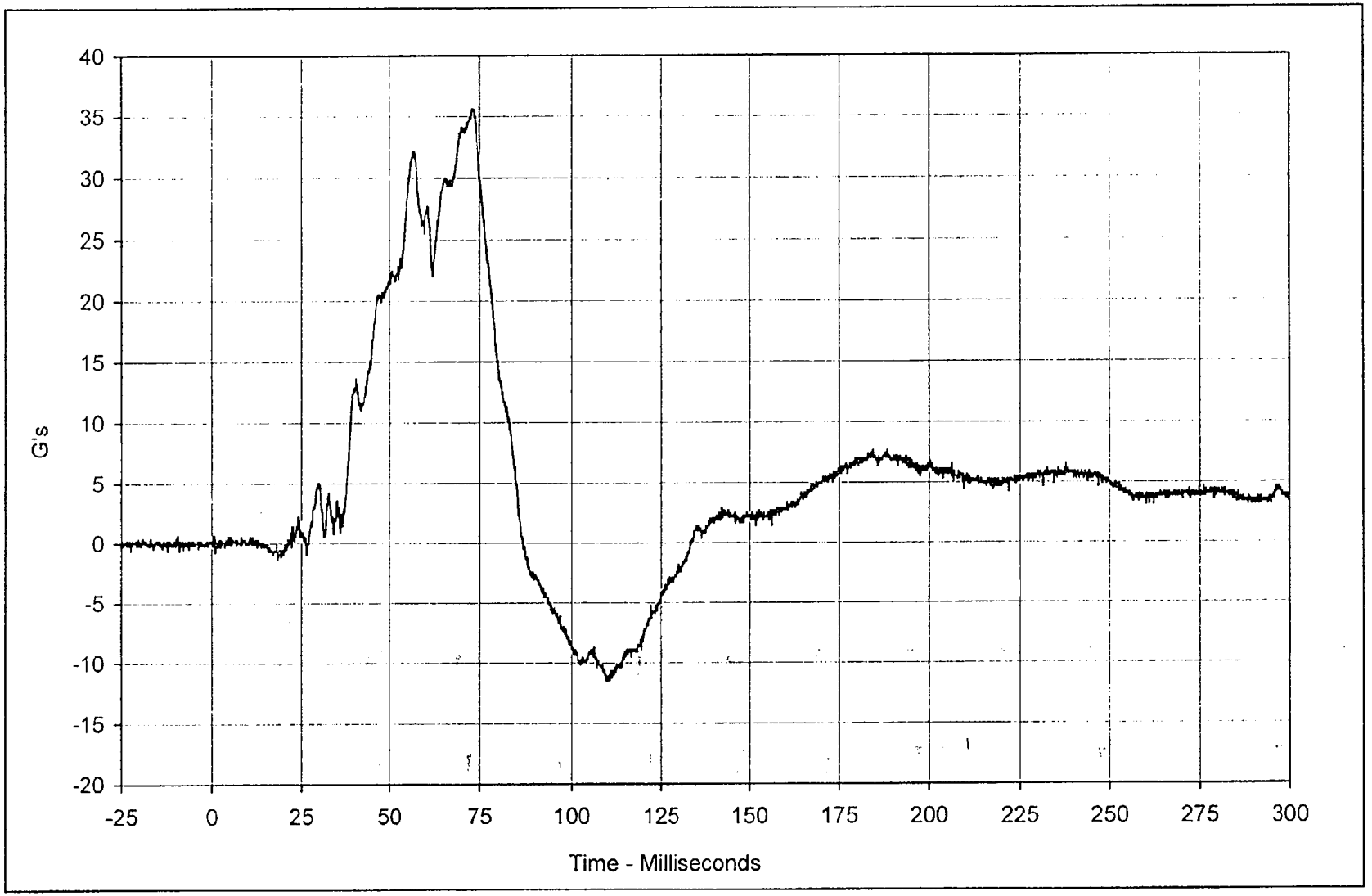

Curve Description: Driver Head Redundant Z

Maximum Value: 35.6 at 72.8 Milliseconds

Minimum Value: -11.5 at 109.7 Milliseconds

SAE Filter Class: 1000

Date of Test: 4/24/97

Curve Number: FIL-006

Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

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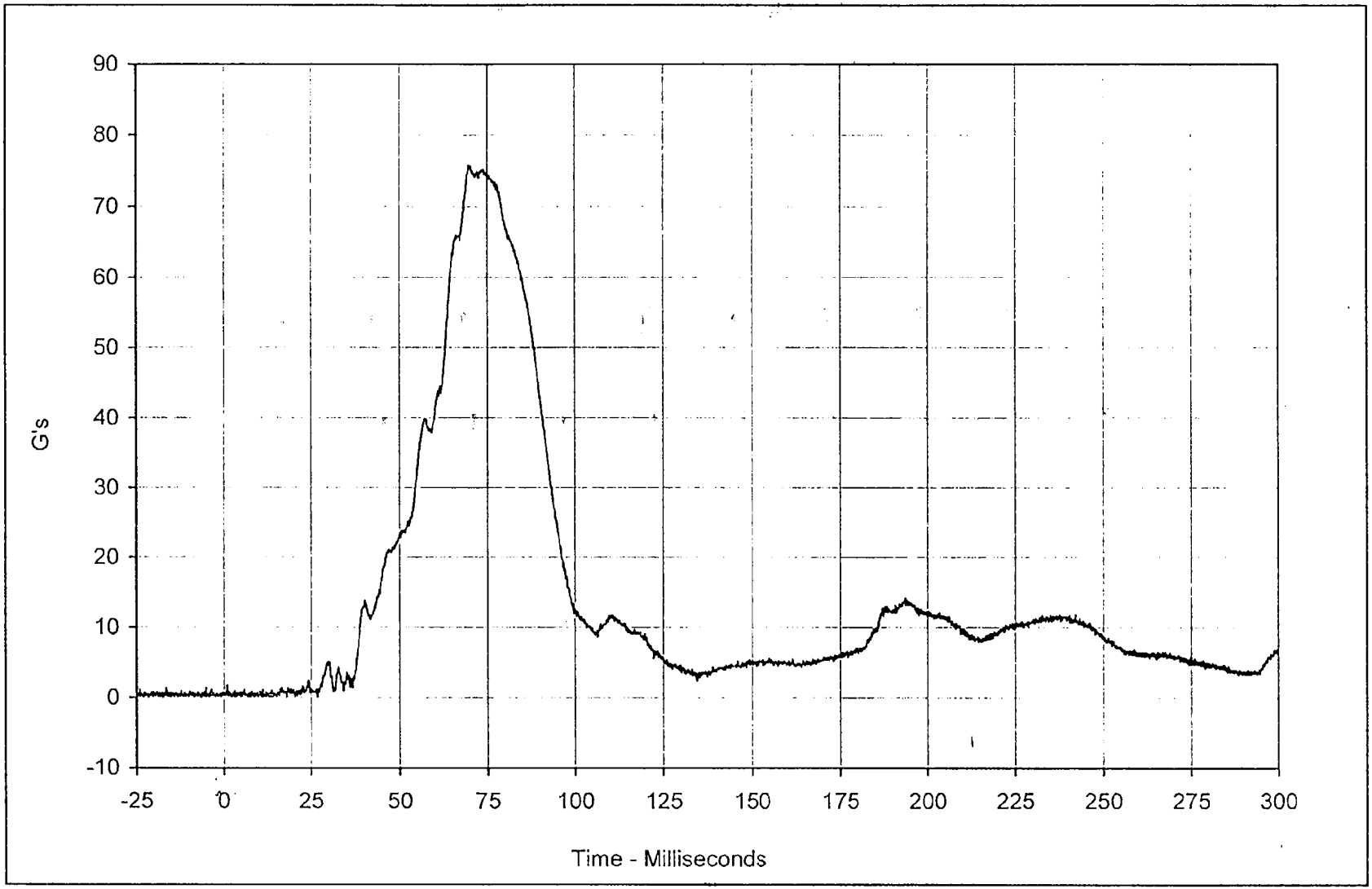

Curve Description:	Driver Head Resultant Redundant			Testing Program:	1997 New Car Assesment Program
Maximum Value:	75.7	at	69.8 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	0.1	at	2.2 Milliseconds		
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	RES-004				

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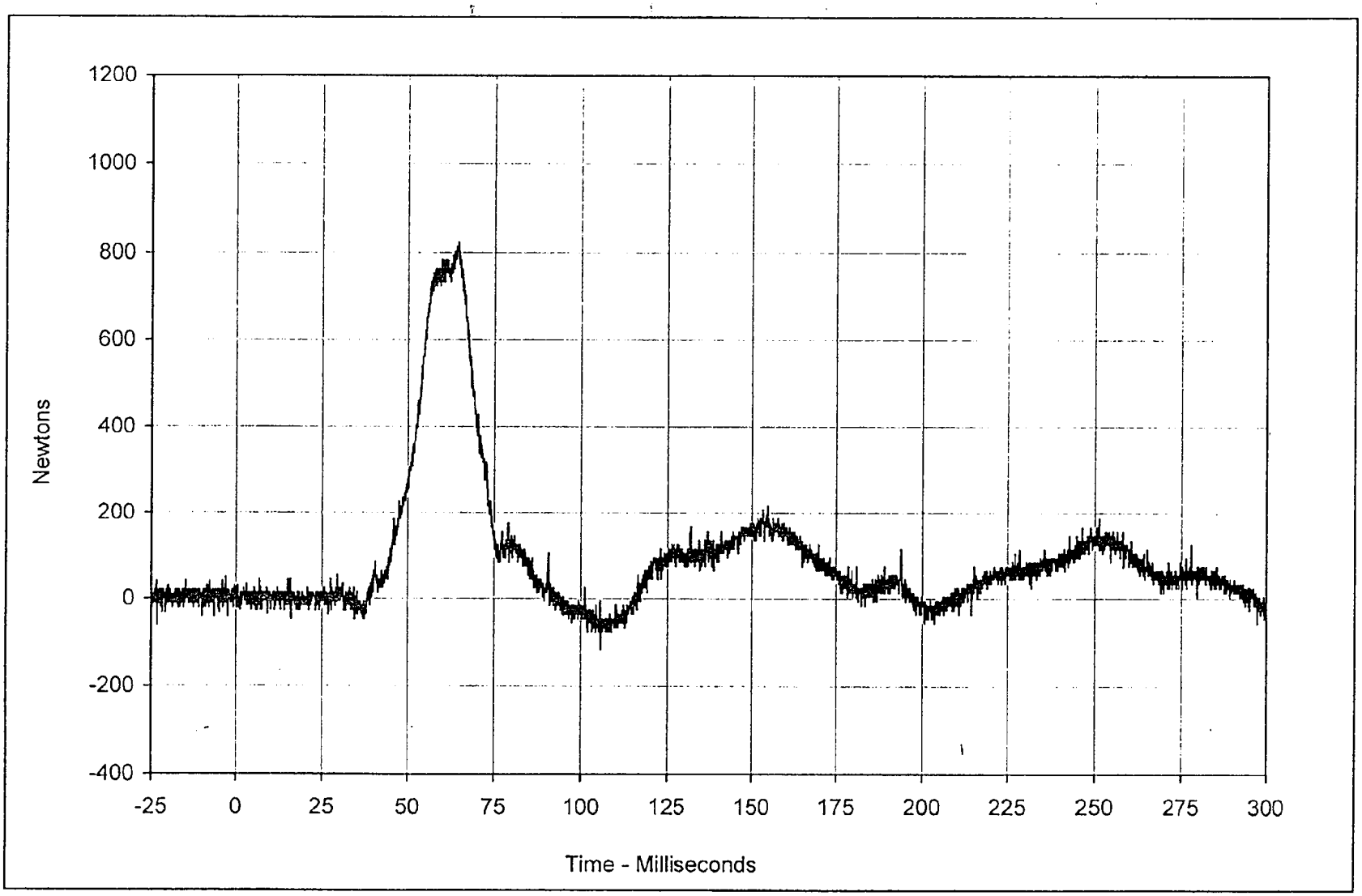

Curve Description:	Driver Neck Force X			
Maximum Value:	824.6	at	64.4	Milliseconds
Minimum Value:	-117.0	at	105.7	Milliseconds
SAE Filter Class:	1000			
Date of Test:	4/24/97			
Curve Number:	FIL-007			

Testing Program:	1997 New Car Assesment Program
Test Vehicle:	1997 Kia Sportage

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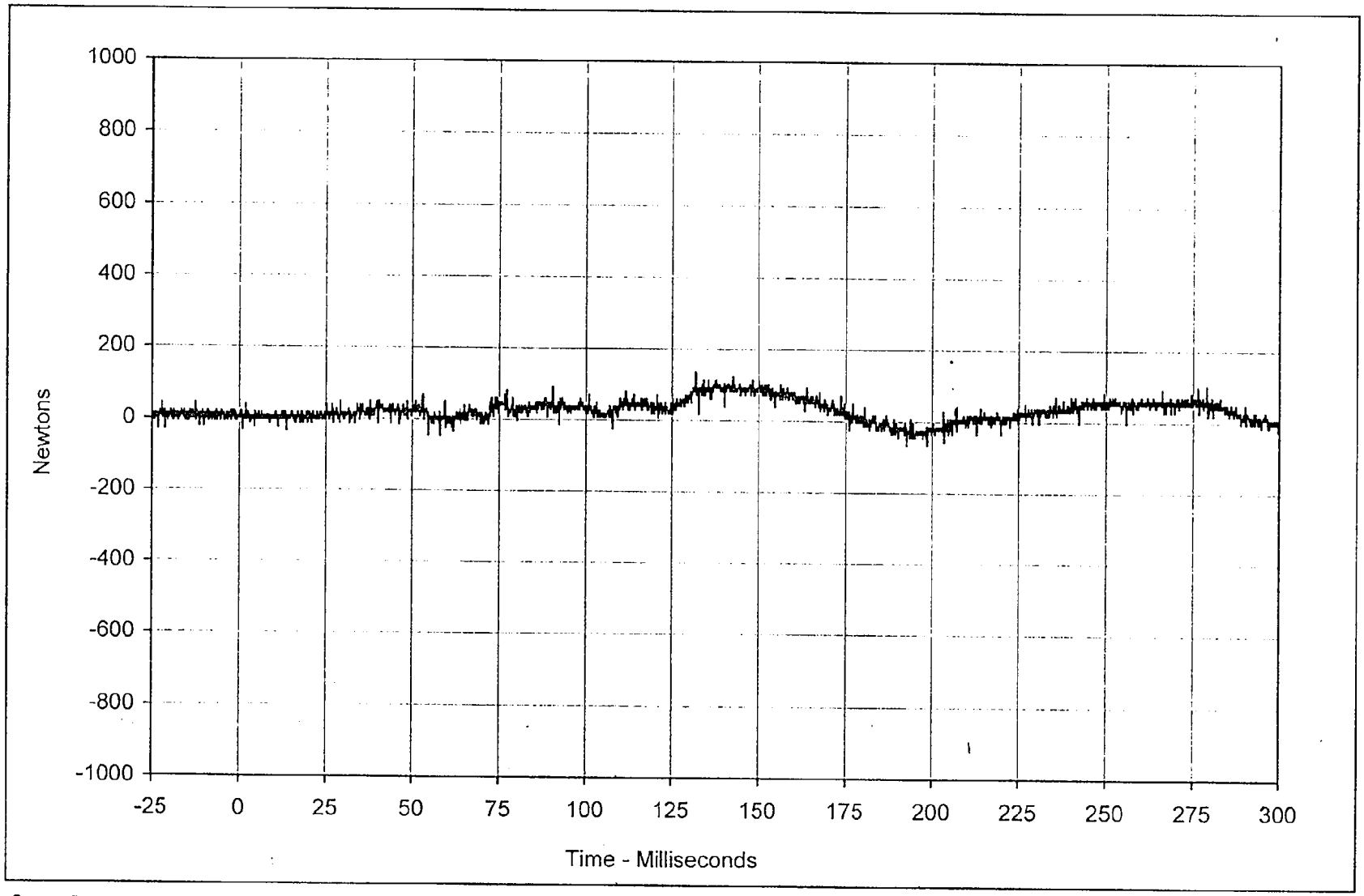

Curve Description:	Driver Neck Force Y			
Maximum Value:	134.8	at	131.9	Milliseconds
Minimum Value:	-66.6	at	192.6	Milliseconds
SAE Filter Class:	1000			
Date of Test:	4/24/97			
Curve Number:	FIL-008			

Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

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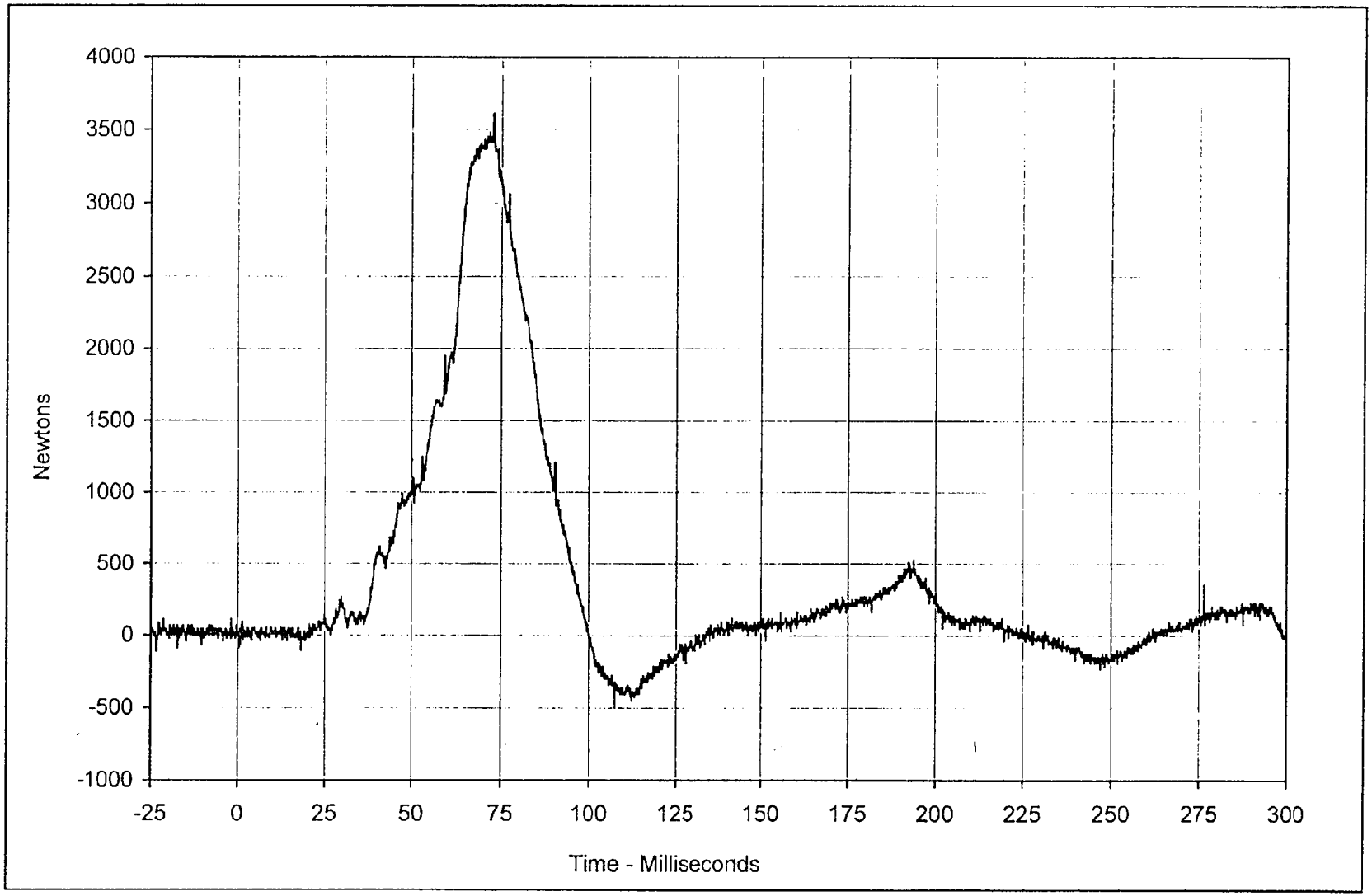

Curve Description: Driver Neck Force Z

Maximum Value: 3610.8 at 72.8 Milliseconds

Minimum Value: -495.8 at 107.5 Milliseconds

SAE Filter Class: 1000

Date of Test: 4/24/97

Curve Number: FIL-009

Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

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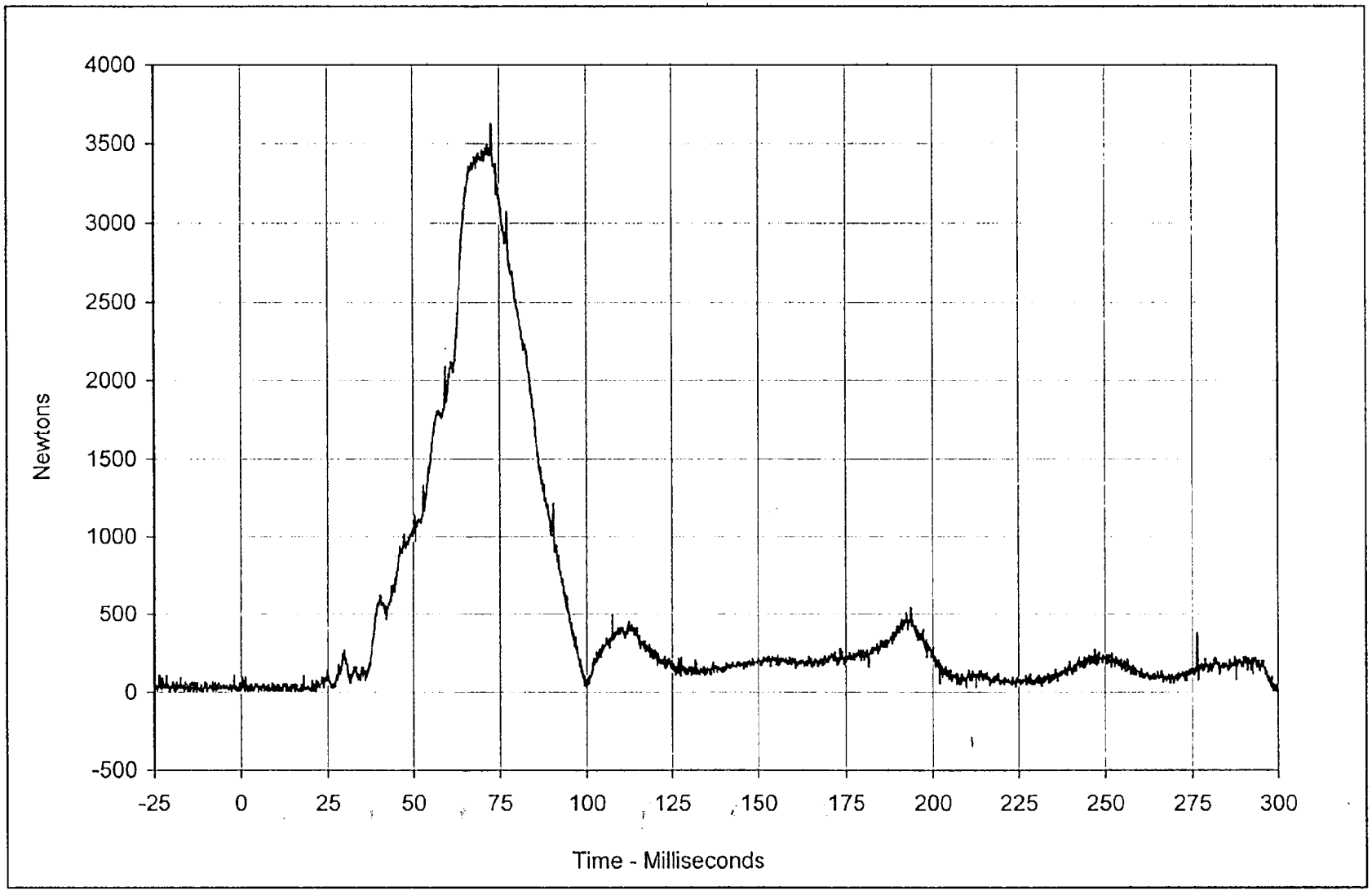

Curve Description:	Driver Neck Force Resultant			Testing Program:	1997 New Car Assesment Program
Maximum Value:	3625.1	at	72.8 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	8.5	at	2.1 Milliseconds		
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	RES-007				

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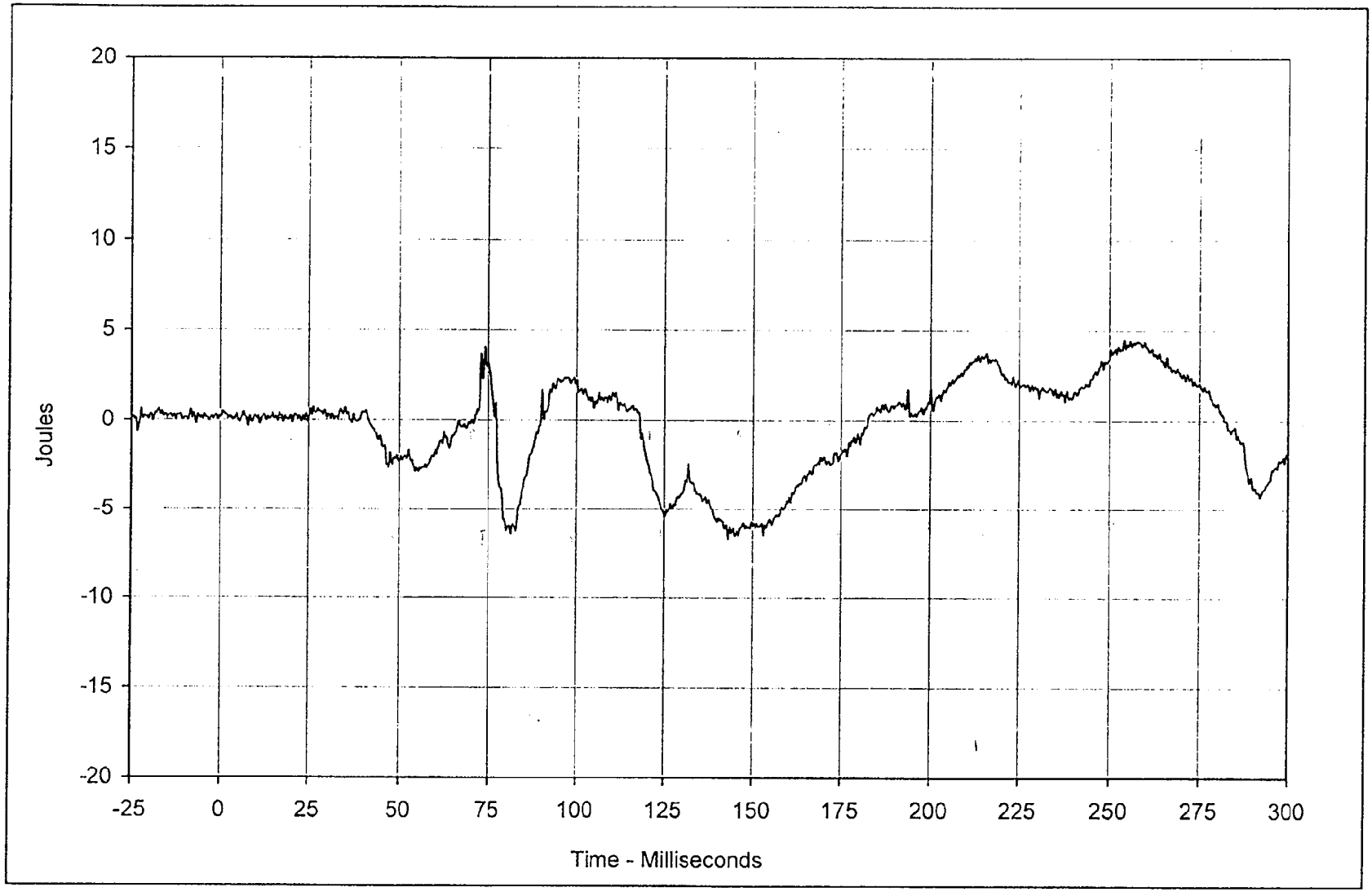

Curve Description:	Driver Neck Moment X			
Maximum Value:	4.5	at	254.0	Milliseconds
Minimum Value:	-6.7	at	143.1	Milliseconds
SAE Filter Class:	600			
Date of Test:	4/24/97			
Curve Number:	FIL-010			

Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering

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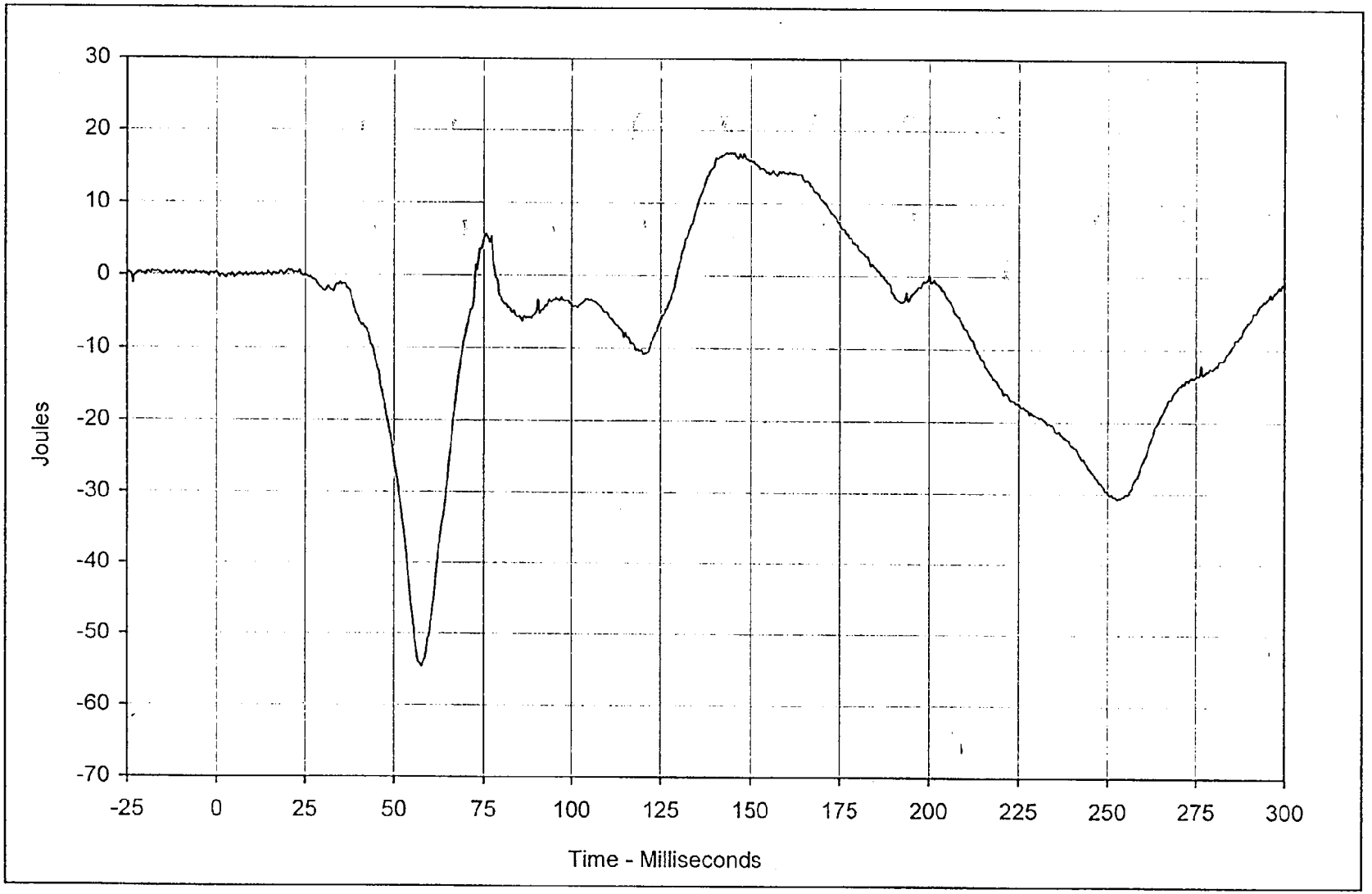
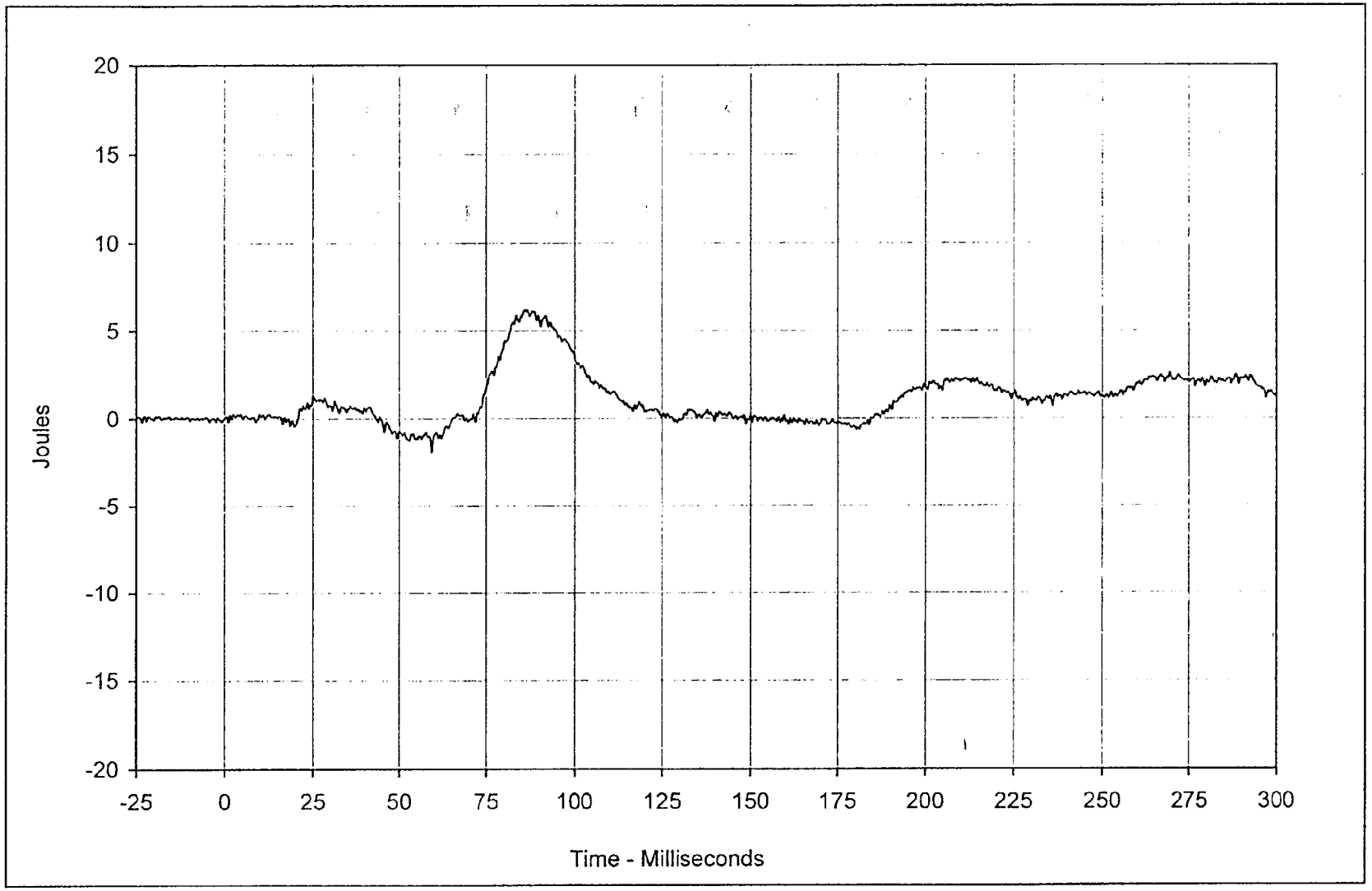


Curve Description:	Driver Neck Moment Y			
Maximum Value:	17.0	at	143.3	Milliseconds
Minimum Value:	-54.5	at	57.6	Milliseconds
SAE Filter Class:	600			
Date of Test:	4/24/97			
Curve Number:	FIL-011			

Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering

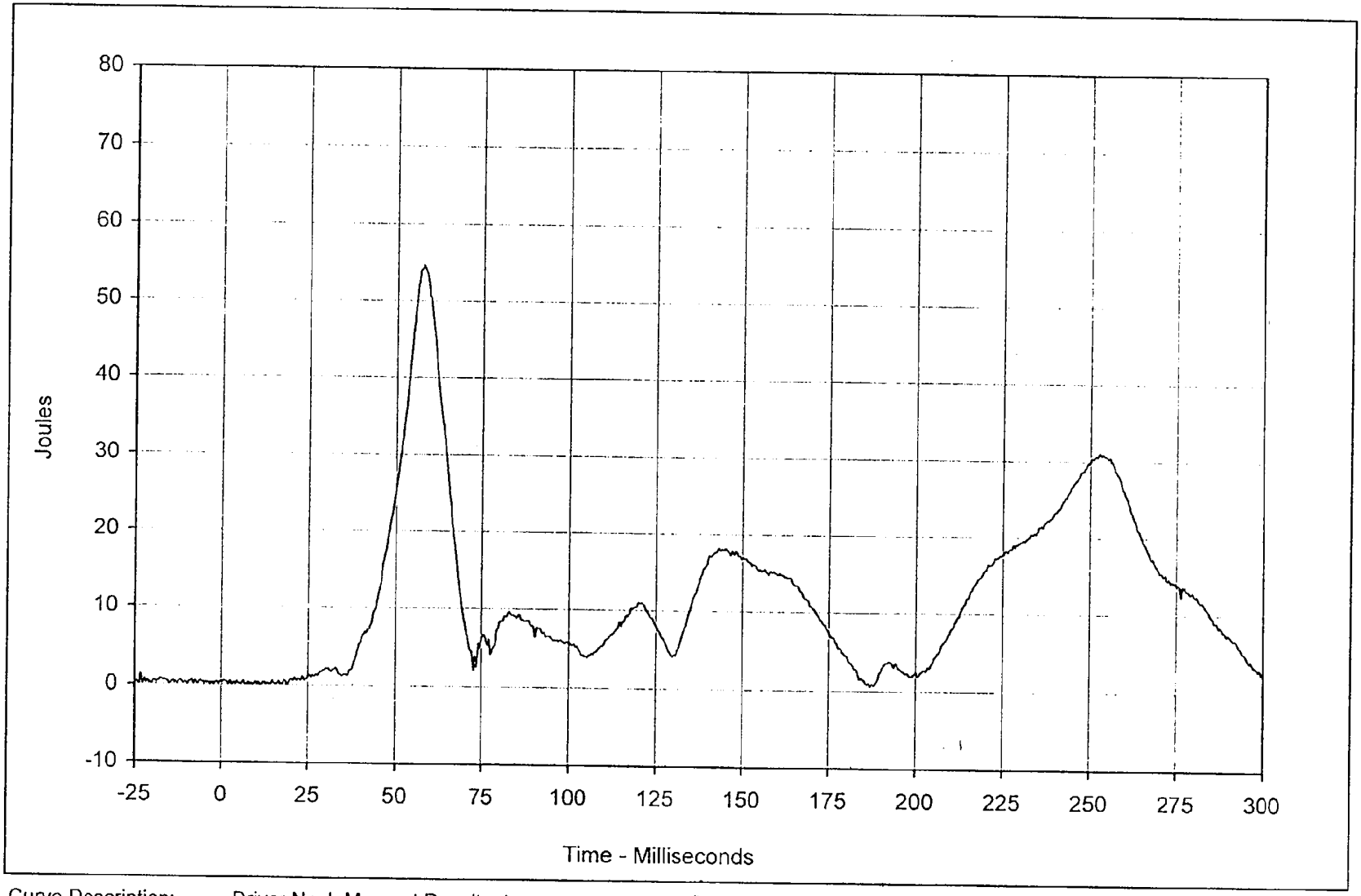


Curve Description:	Driver Neck Moment Z				
Maximum Value:	6.2	at	86.0	Milliseconds	
Minimum Value:	-1.9	at	59.3	Milliseconds	
SAE Filter Class:	600				
Date of Test:	4/24/97				
Curve Number:	FIL-012				

Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering



Curve Description: Driver Neck Moment Resultant

Maximum Value: 54.6 at 57.6 Milliseconds

Minimum Value: 0.0 at 11.3 Milliseconds

SAE Filter Class: 600

Date of Test: 4/24/97

Curve Number: RES-010

Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering

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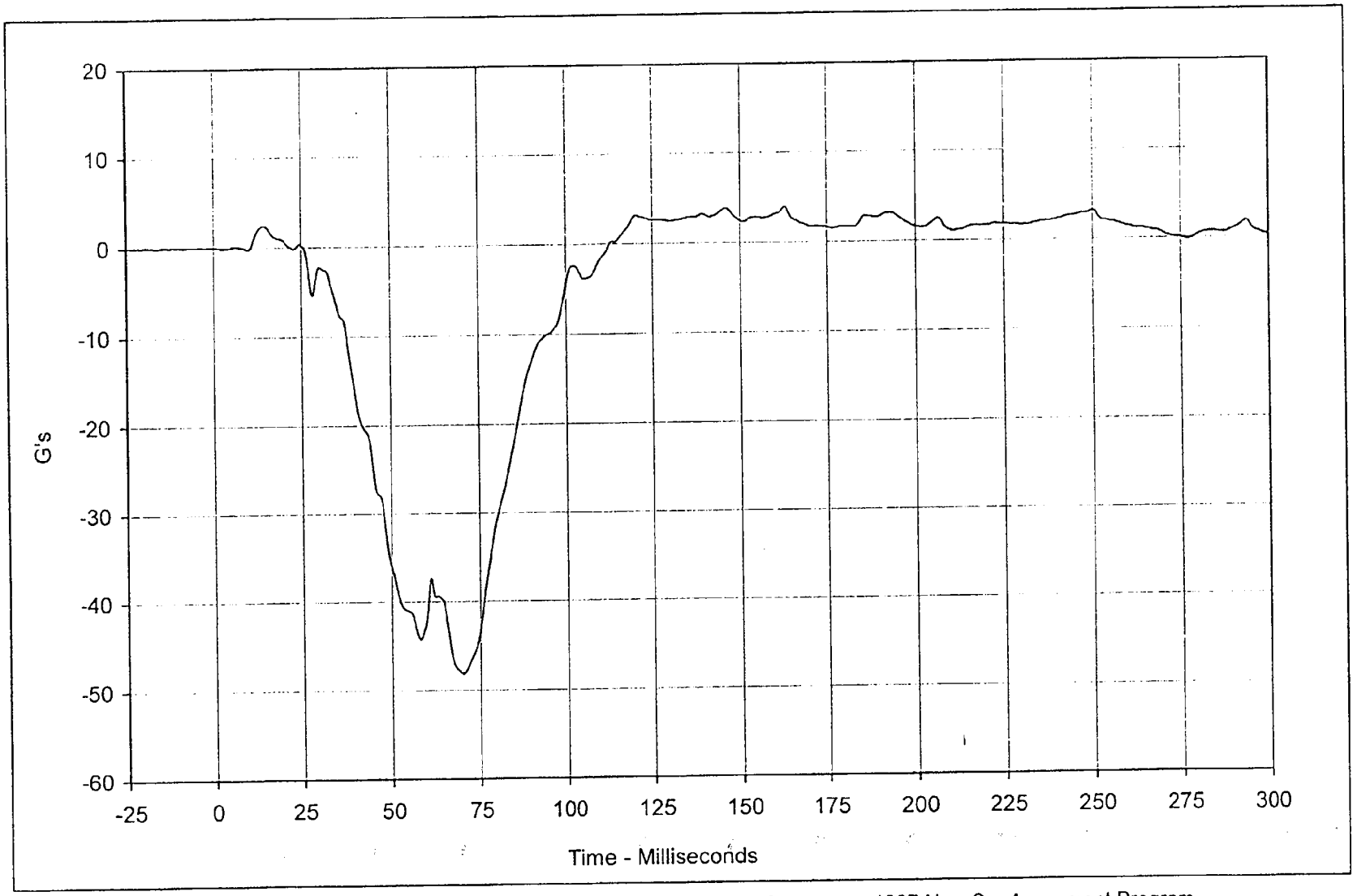


Curve Description: Driver Chest Primary X

Maximum Value: 3.9 at 163.1 Milliseconds

Minimum Value: -48.1 at 70.1 Milliseconds

SAE Filter Class: 180

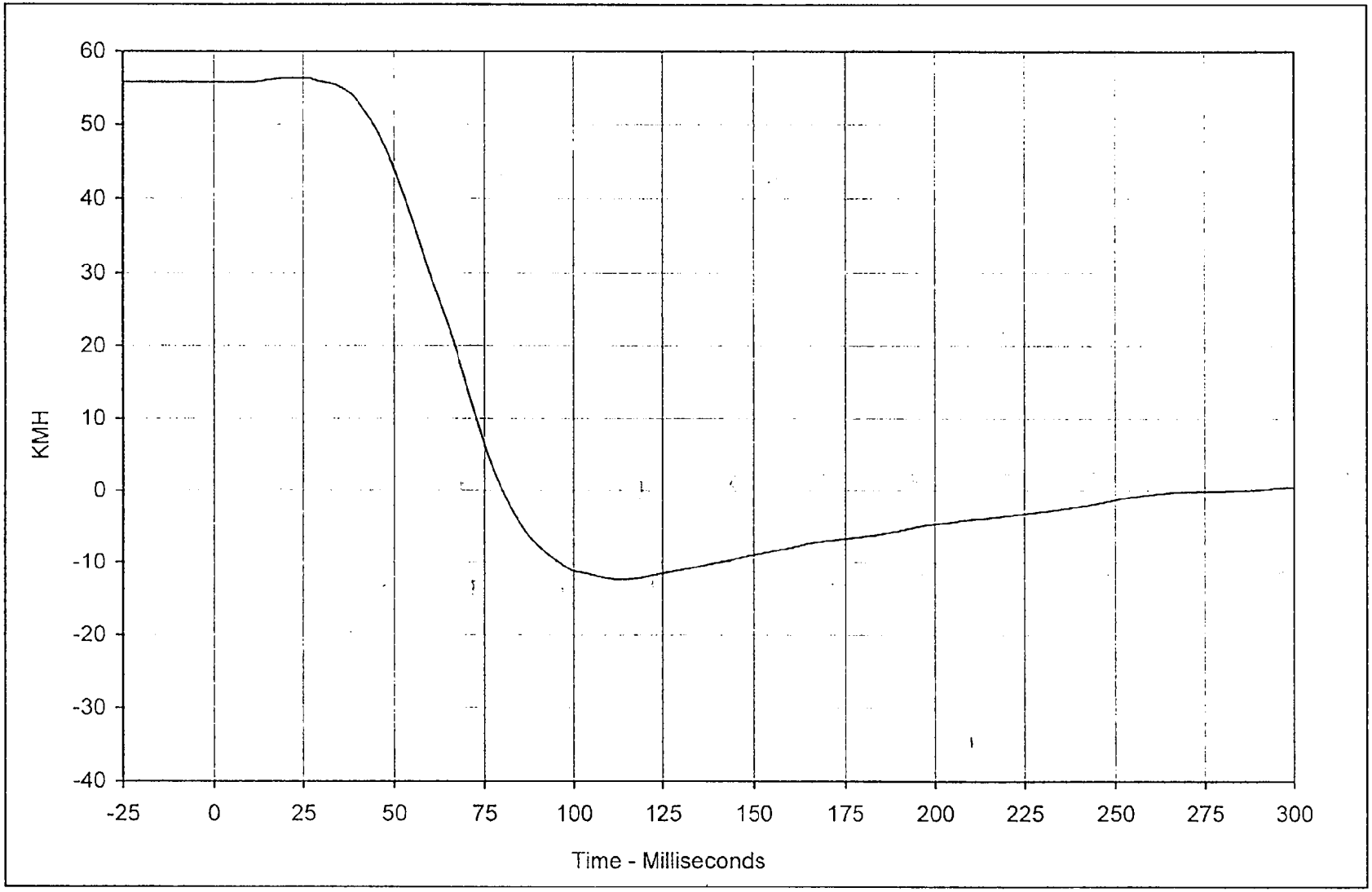
Date of Test: 4/24/97

Curve Number: FIL-013

Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering



Curve Description: Driver Chest Primary X Velocity

Maximum Value: 56.4 at 25.6 Milliseconds

Minimum Value: -12.3 at 112.7 Milliseconds

SAE Filter Class: 180

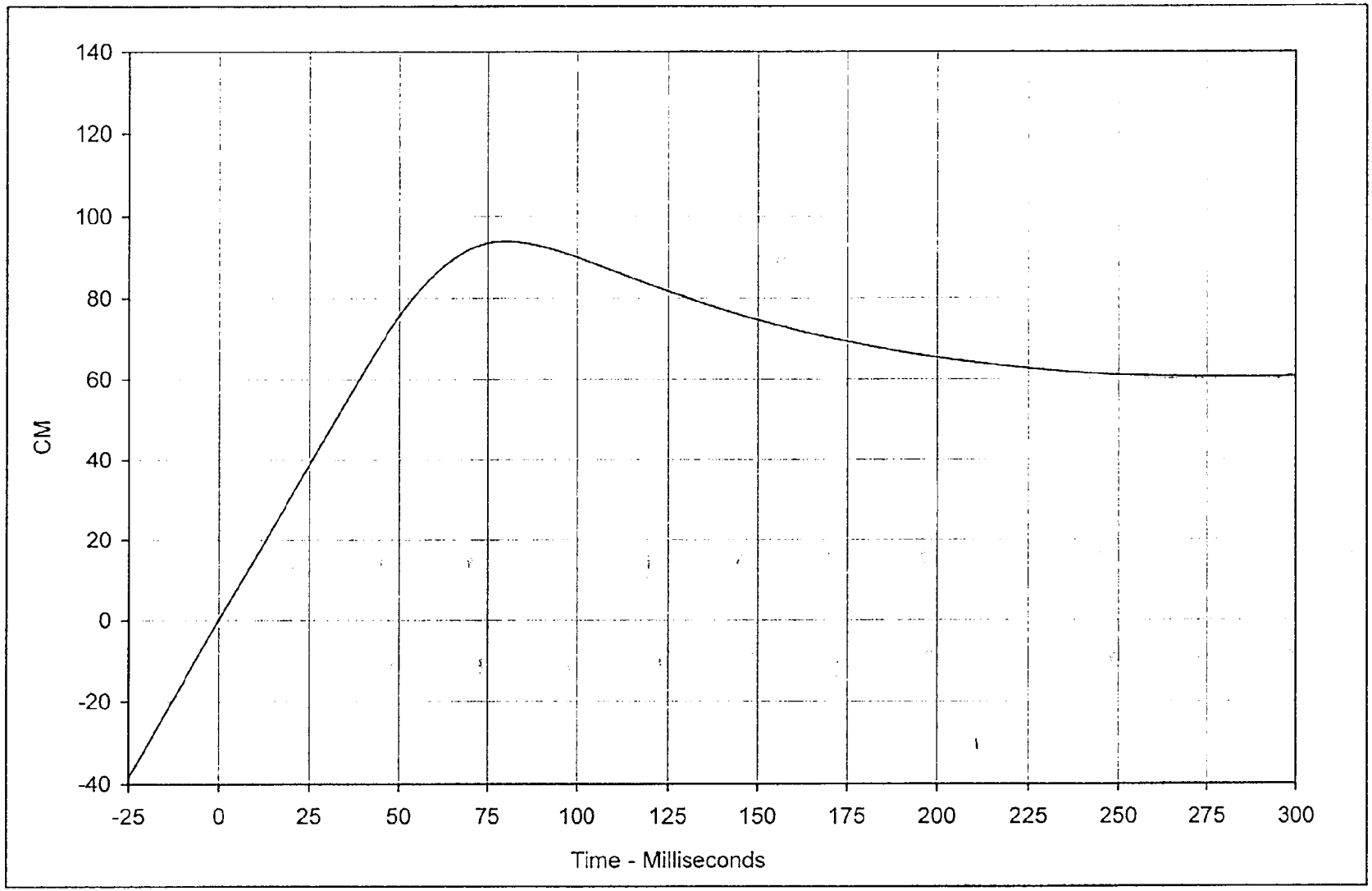
Date of Test: 4/24/97

Curve Number: IN1-013

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering



Curve Description:	Driver Chest Primary X Displ.				Testing Program:	1997 New Car Assesment Program
Maximum Value:	93.9	at	79.9	Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	0.1	at	0.0	Milliseconds		
SAE Filter Class:	180					
Date of Test:	4/24/97					
Curve Number:	IN2-013					

KARCO Engineering

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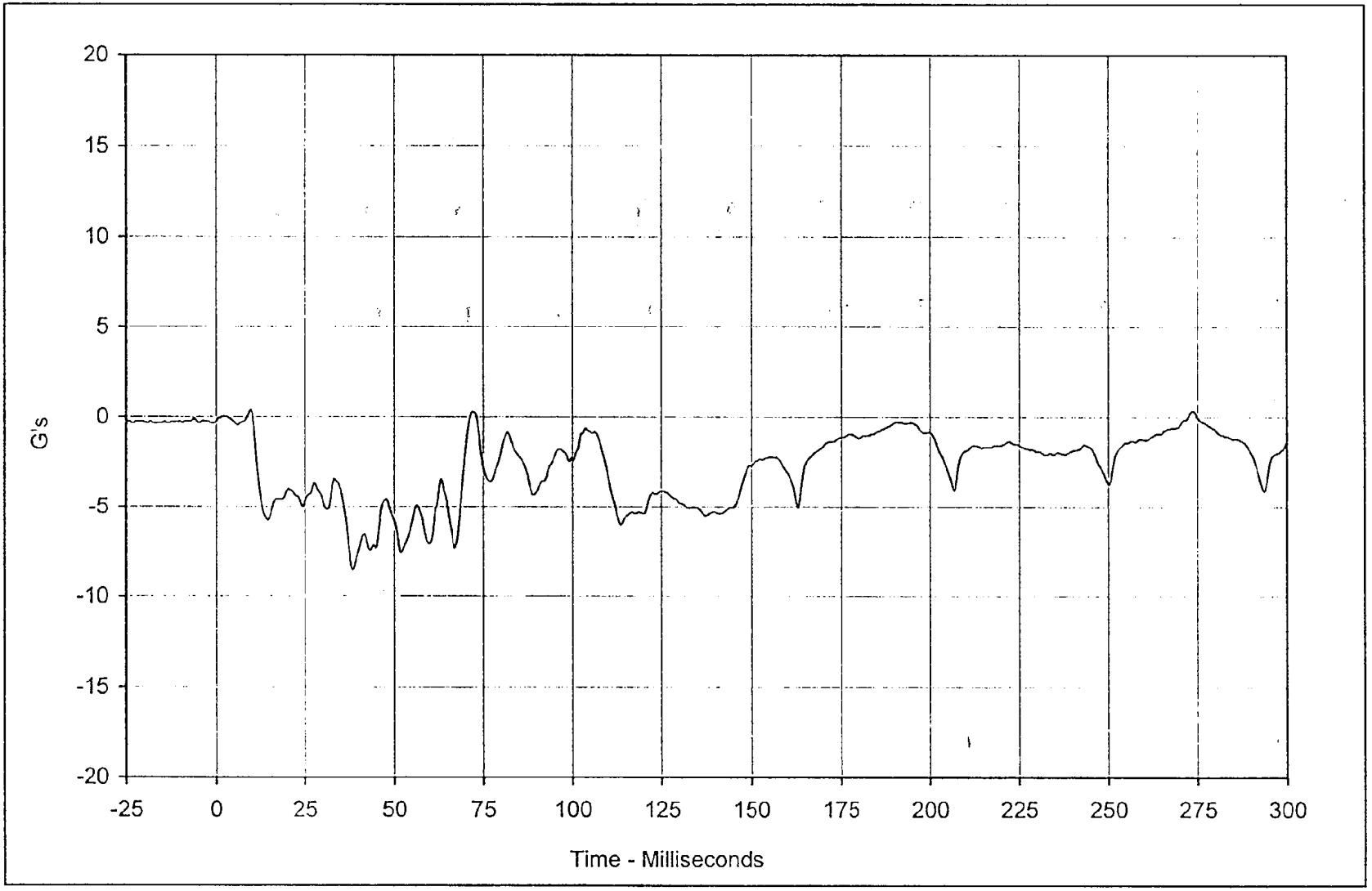
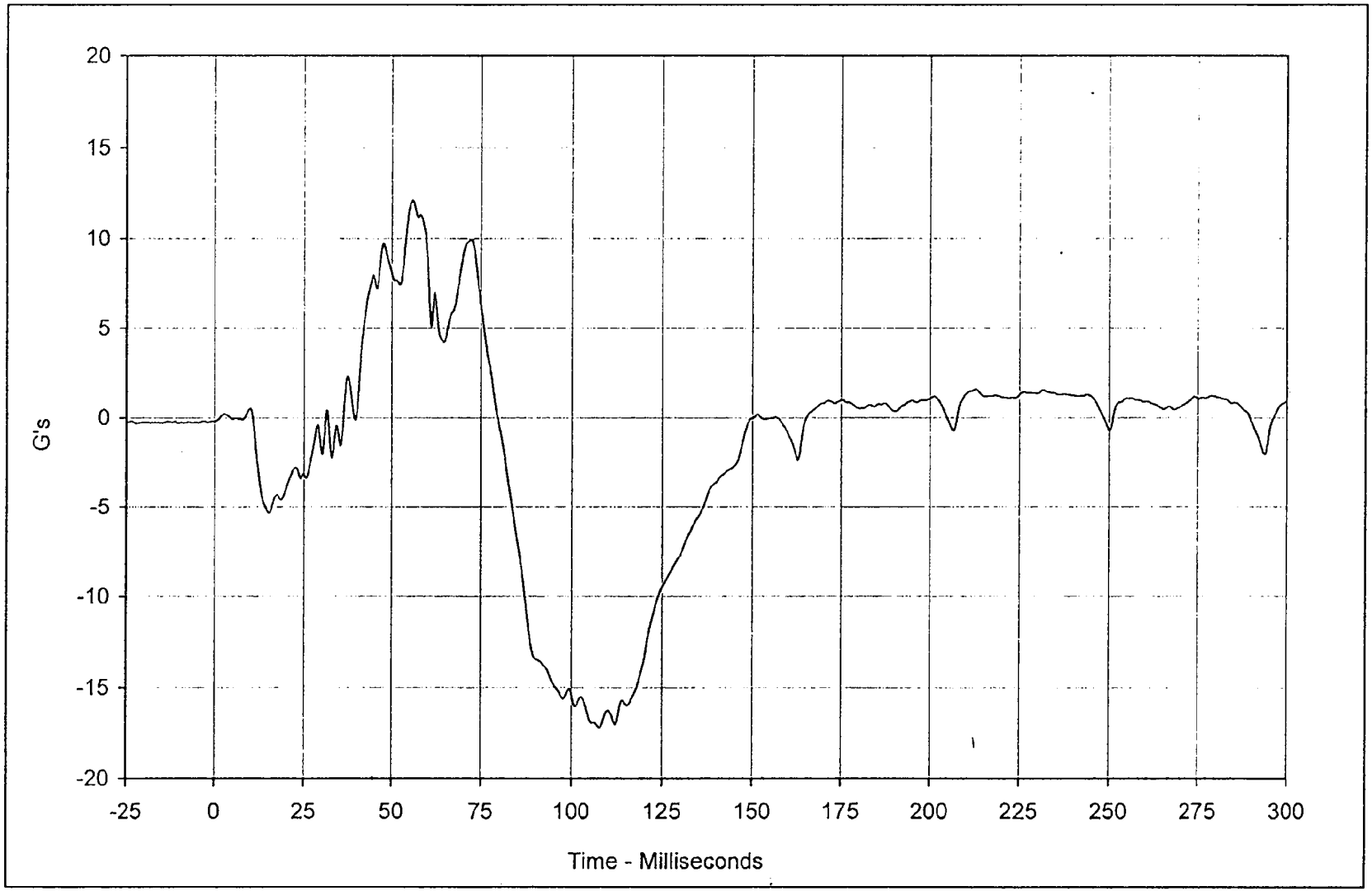


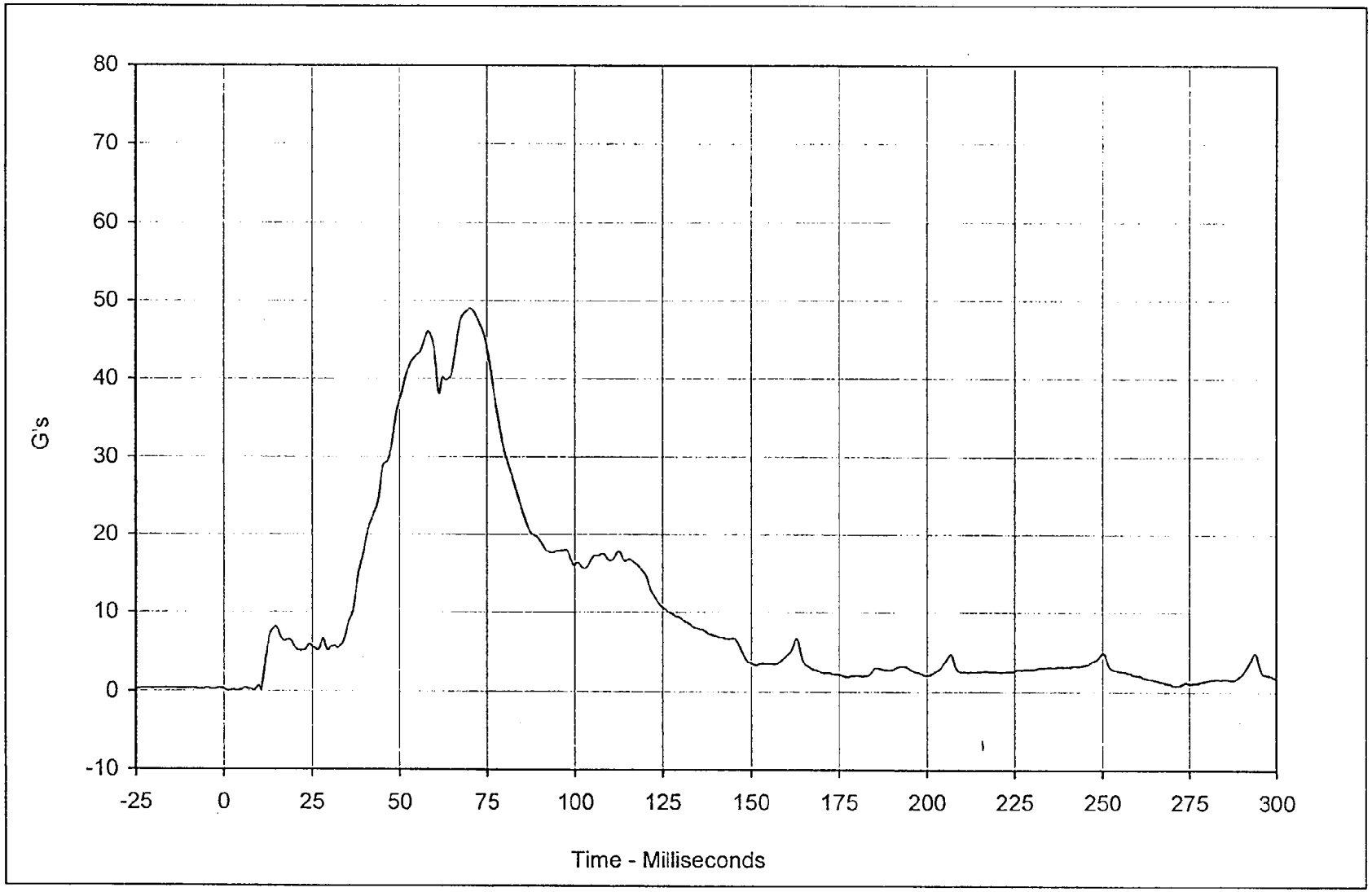
Curve Description:	Driver Chest Primary Y			Testing Program:	1997 New Car Assesment Program
Maximum Value:	0.4	at	9.8 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-8.5	at	38.4 Milliseconds		
SAE Filter Class:	180				
Date of Test:	4/24/97				
Curve Number:	FIL-014				

KARCO Engineering



Curve Description:	Driver Chest Primary Z			Testing Program:	1997 New Car Assesment Program
Maximum Value:	12.1	at	55.9 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-17.2	at	108 Milliseconds		
SAE Filter Class:	180				
Date of Test:	4/24/97				
Curve Number:	FIL-015				

KARCO Engineering



Curve Description:	Driver Chest Resultant Primary			Testing Program:	1997 New Car Assesment Program
Maximum Value:	49.1	at	70.2 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	0.0	at	1.4 Milliseconds		
SAE Filter Class:	180				
Date of Test:	4/24/97				
Curve Number:	RES-013				

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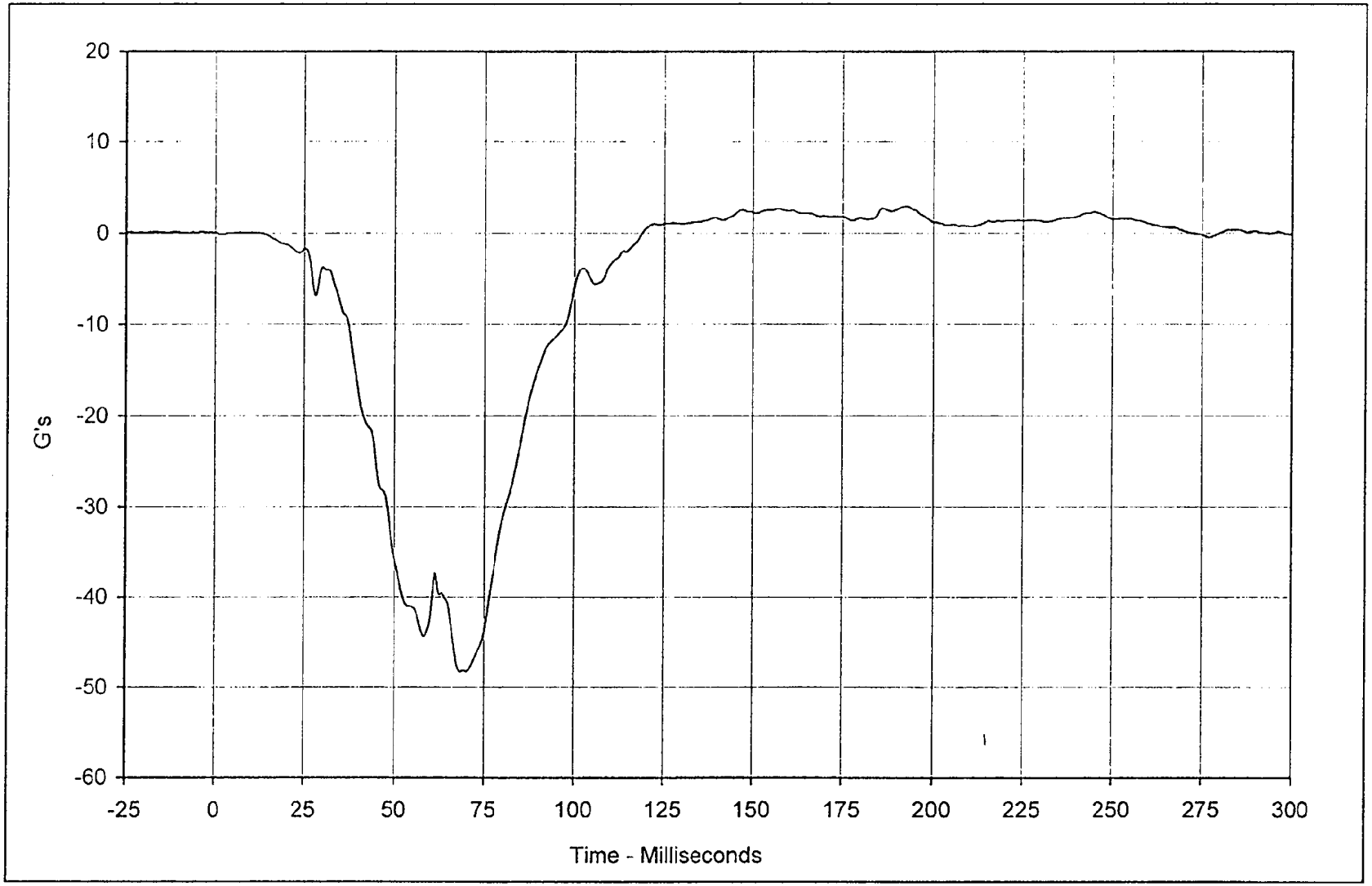

Curve Description:	Driver Chest Redundant X			Testing Program:	1997 New Car Assesment Program
Maximum Value:	3.0	at	192.7 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-48.2	at	68.4 Milliseconds		
SAE Filter Class:	180				
Date of Test:	4/24/97				
Curve Number:	FIL-016				

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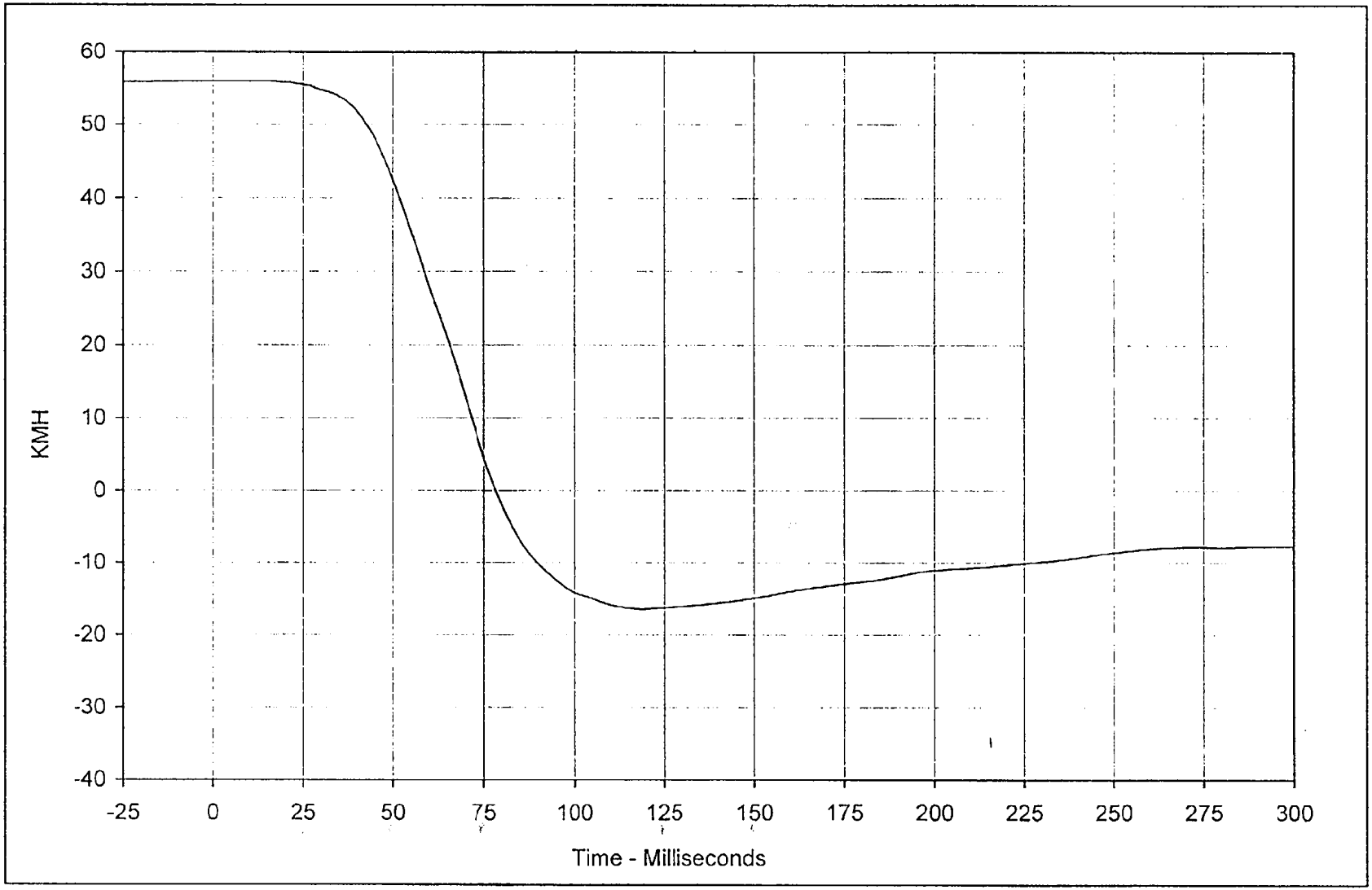


Curve Description: Driver Chest Redundant X Velocity

Maximum Value: 56.0 at 13.2 Milliseconds

Minimum Value: -16.4 at 119.0 Milliseconds

SAE Filter Class: 180

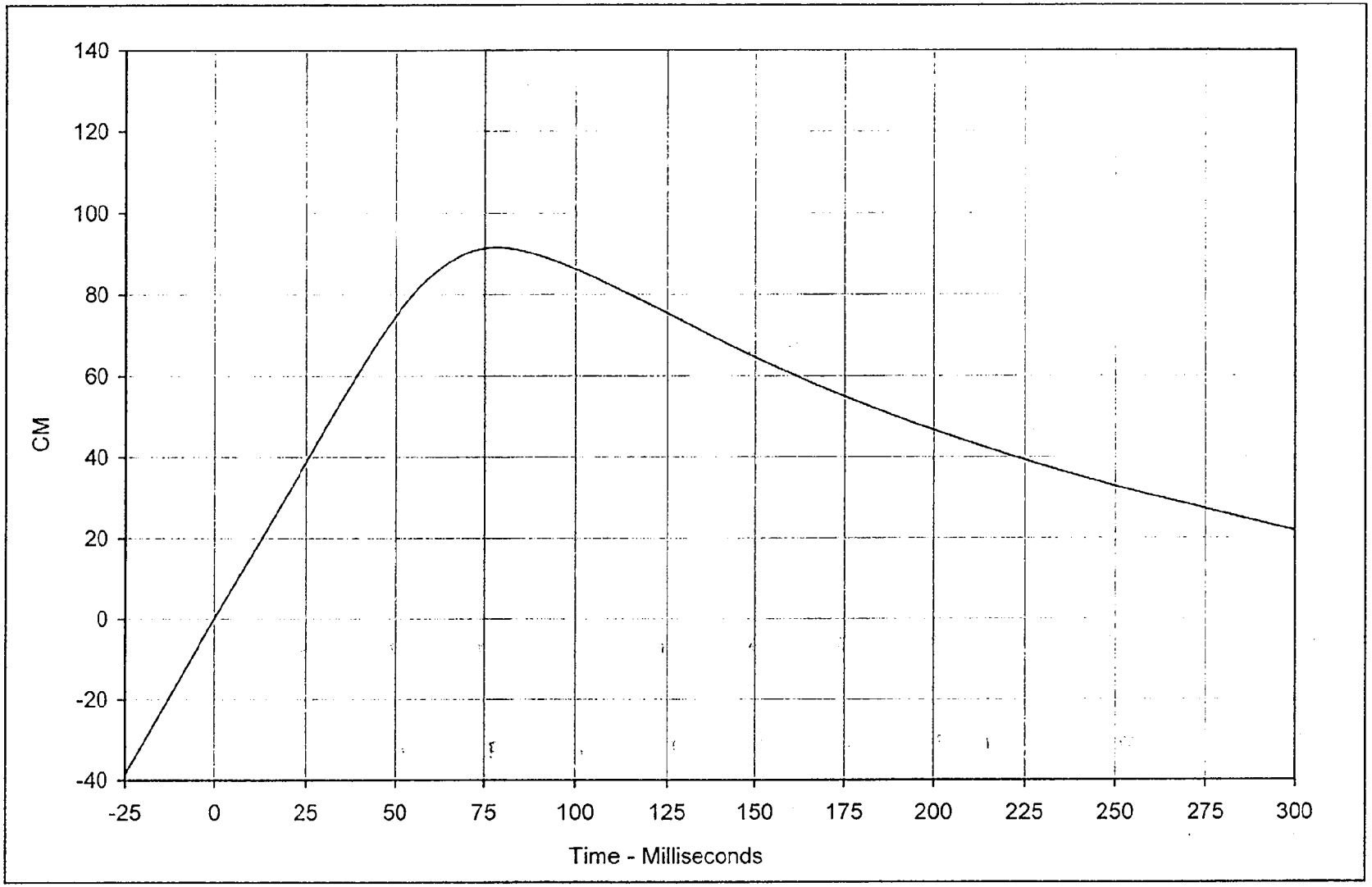
Date of Test: 4/24/97

Curve Number: IN1-016

Testing Program: 1997 New Car Assessment Program

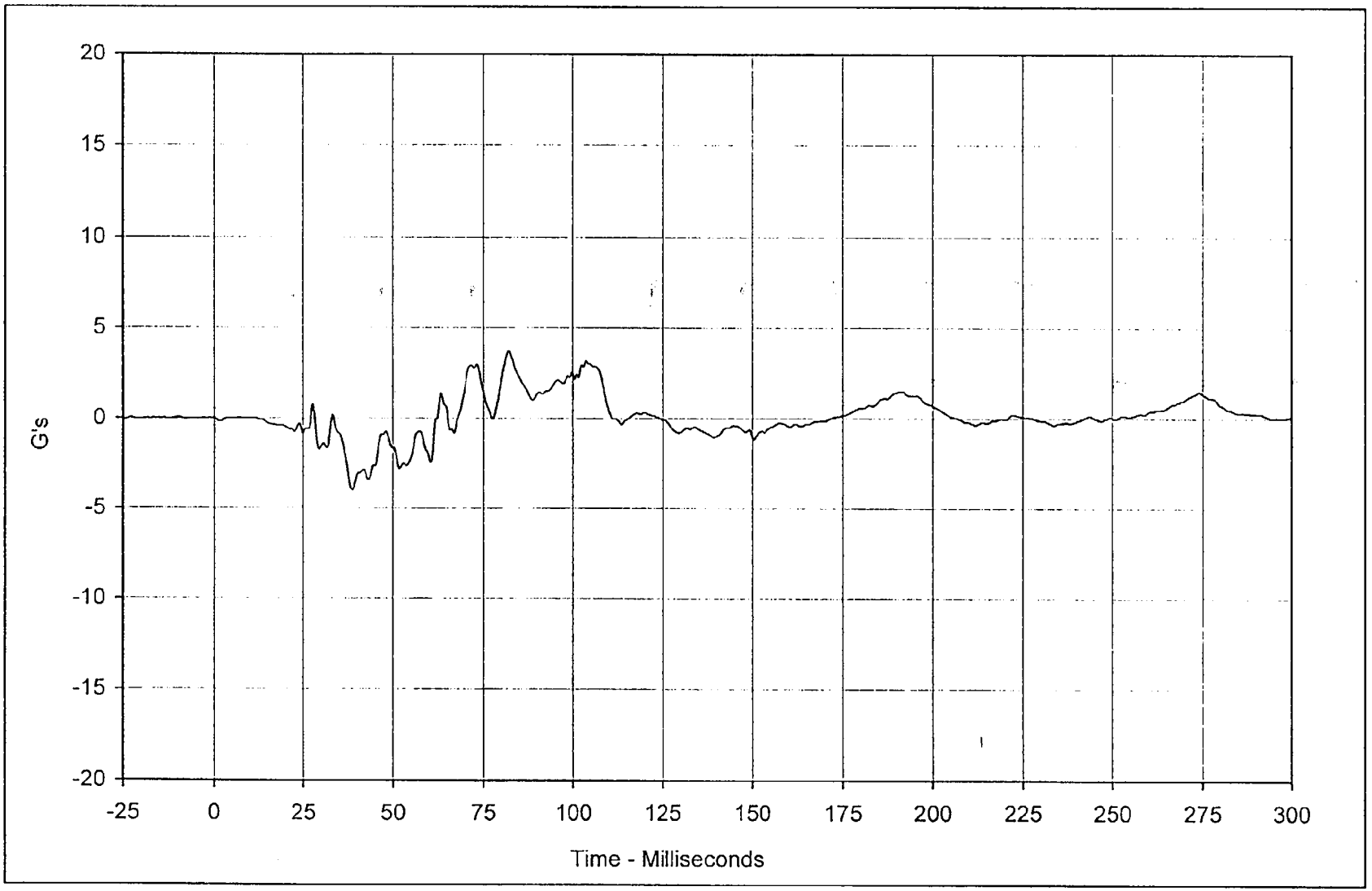
Test Vehicle: 1997 Kia Sportage

KARCO Engineering



Curve Description:	Driver Chest Redundant X Displ.				Testing Program:	1997 New Car Assesment Program	
Maximum Value:	91.6	at	78.3	Milliseconds	Test Vehicle:	1997 Kia Sportage	
Minimum Value:	0.1	at	0.0	Milliseconds			
SAE Filter Class:	180						
Date of Test:	4/24/97						
Curve Number:	IN2-016						

KARCO Engineering



Curve Description: Driver Chest Redundant Y

Maximum Value: 3.7 at 82.0 Milliseconds

Minimum Value: -4.0 at 38.6 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: FIL-017

Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

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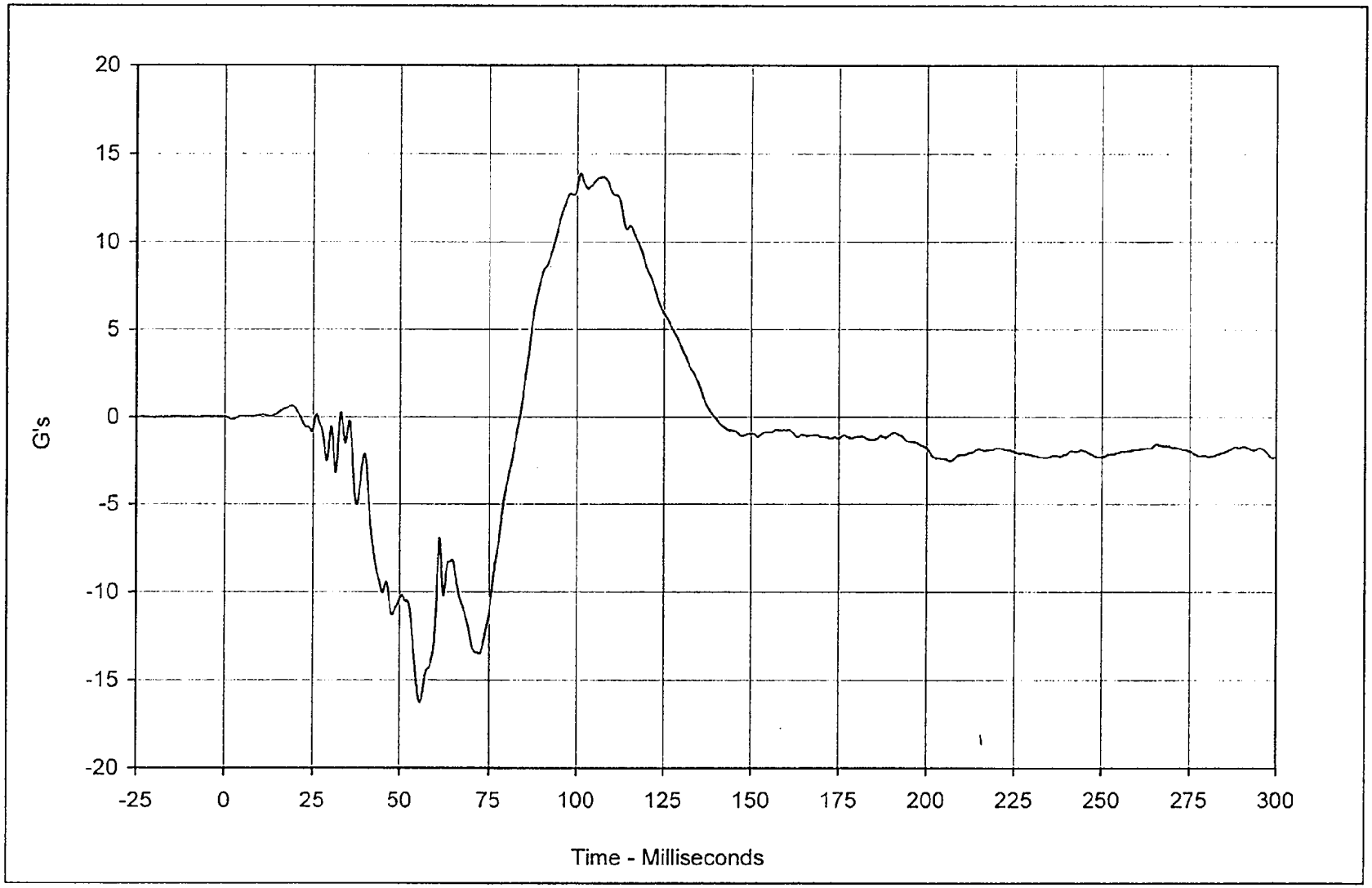

Curve Description:	Driver Chest Redundant Z				Testing Program:	1997 New Car Assesment Program	
Maximum Value:	13.9	at	101.0	Milliseconds	Test Vehicle:	1997 Kia Sportage	
Minimum Value:	-16.3	at	55.7	Milliseconds			
SAE Filter Class:	180						
Date of Test:	4/24/97						
Curve Number:	FIL-015						

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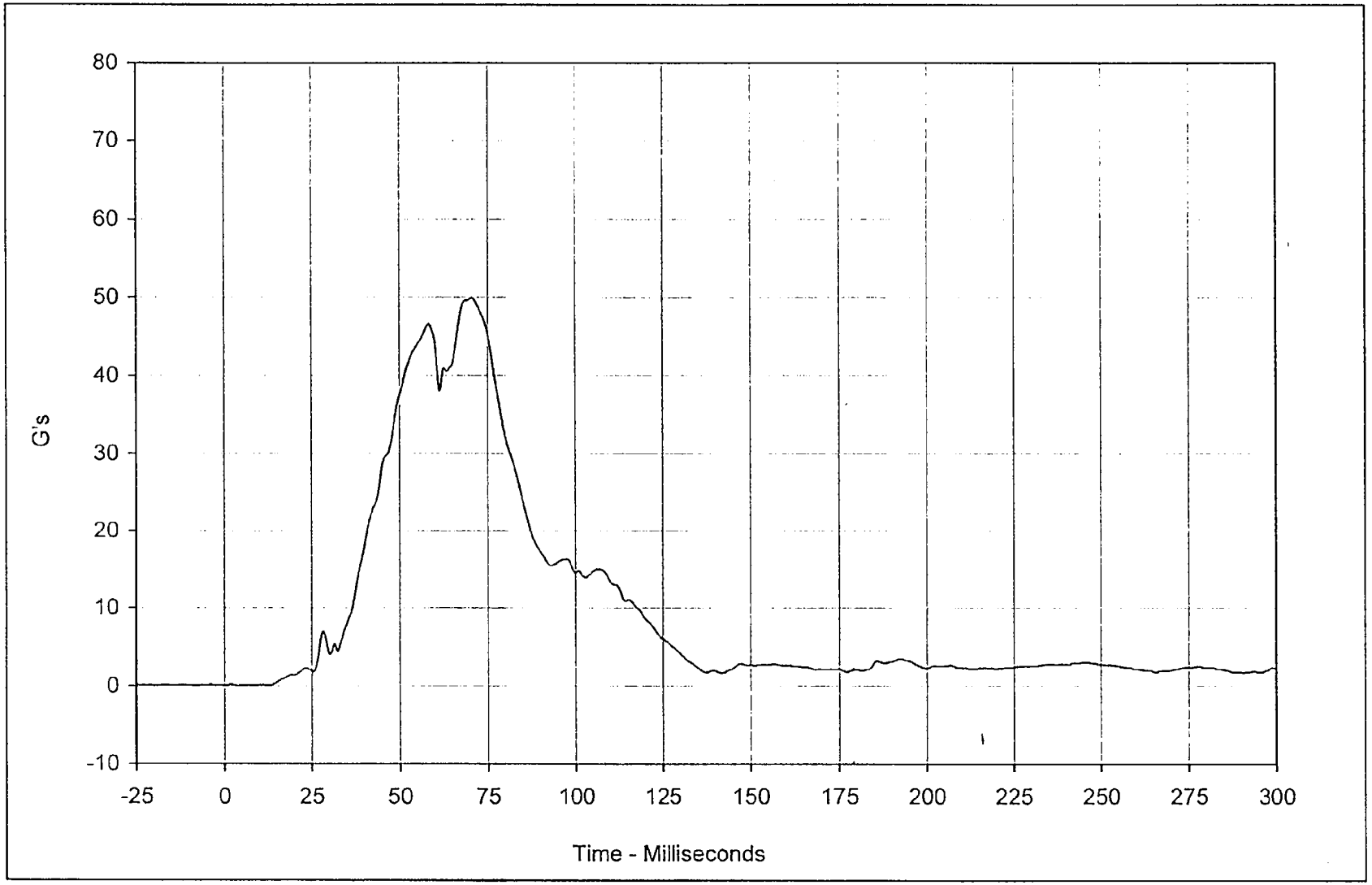

Curve Description:	Driver Chest Resultant Redundant			Testing Program:	1997 New Car Assesment Program
Maximum Value:	50.0	at	70.4 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	0.0	at	3.7 Milliseconds		
SAE Filter Class:	180				
Date of Test:	4/24/97				
Curve Number:	RES-016				

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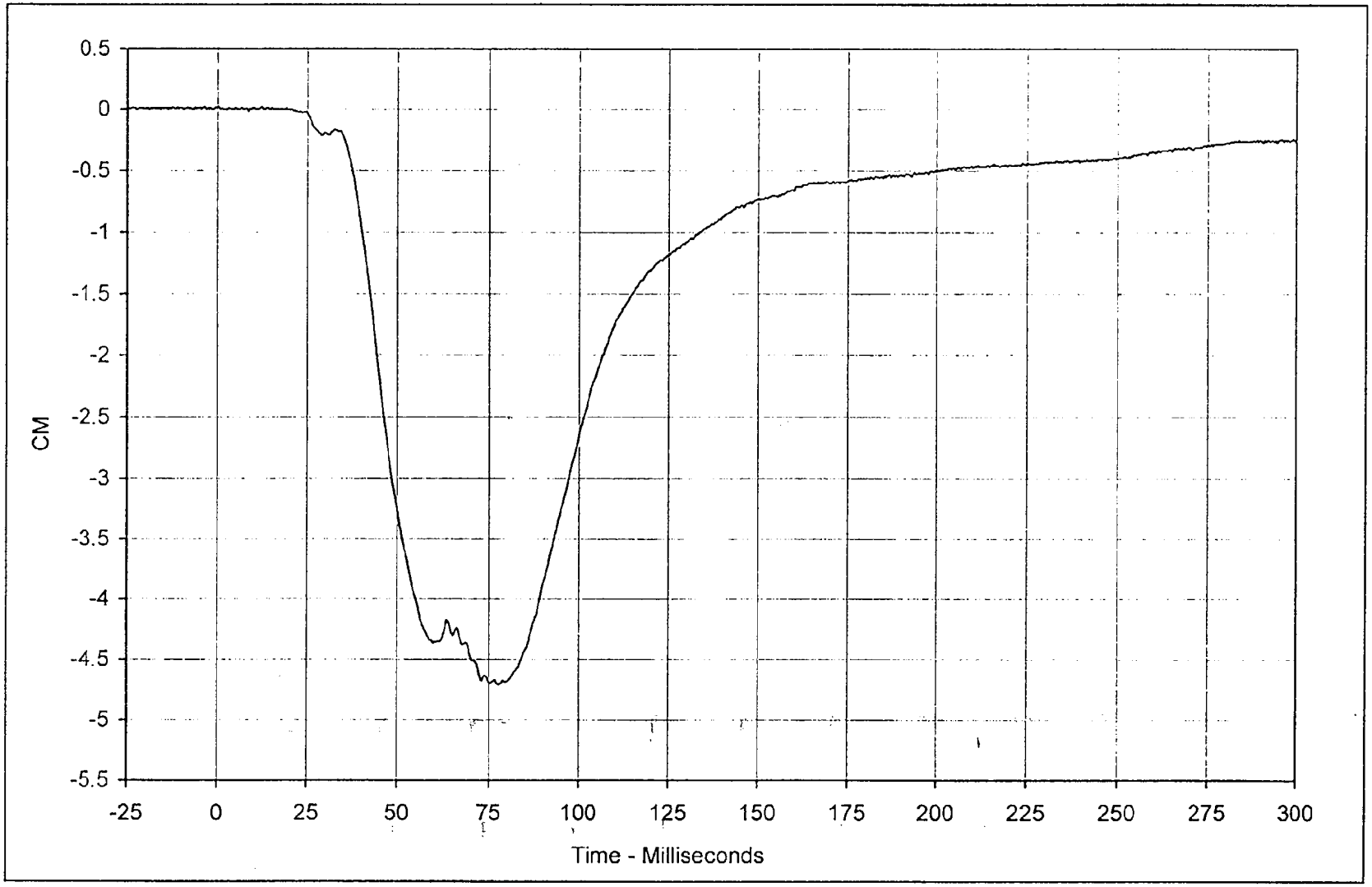
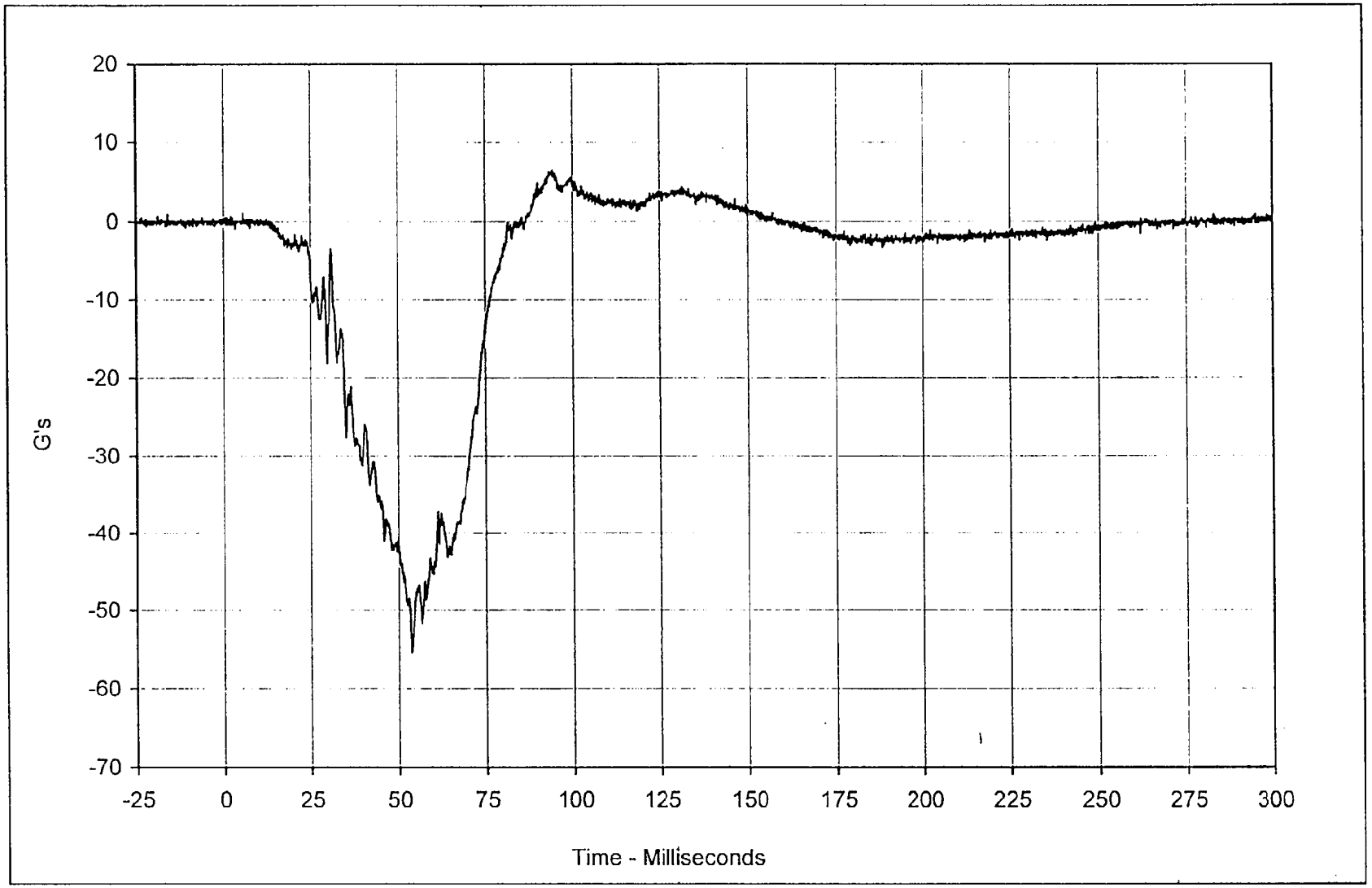


Curve Description:	Driver Chest Displacement X			Testing Program:	1997 New Car Assessment Program
Maximum Value:	0.02	at	0.3 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-4.71	at	77.7 Milliseconds		
SAE Filter Class:	600				
Date of Test:	4/24/97				
Curve Number:	FIL-019				

KARCO Engineering



Curve Description:	Driver Pelvis X			
Maximum Value:	6.5	at	94.1	Milliseconds
Minimum Value:	-55.4	at	53.5	Milliseconds
SAE Filter Class:	1000			
Date of Test:	4/24/97			
Curve Number:	FIL-020			

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

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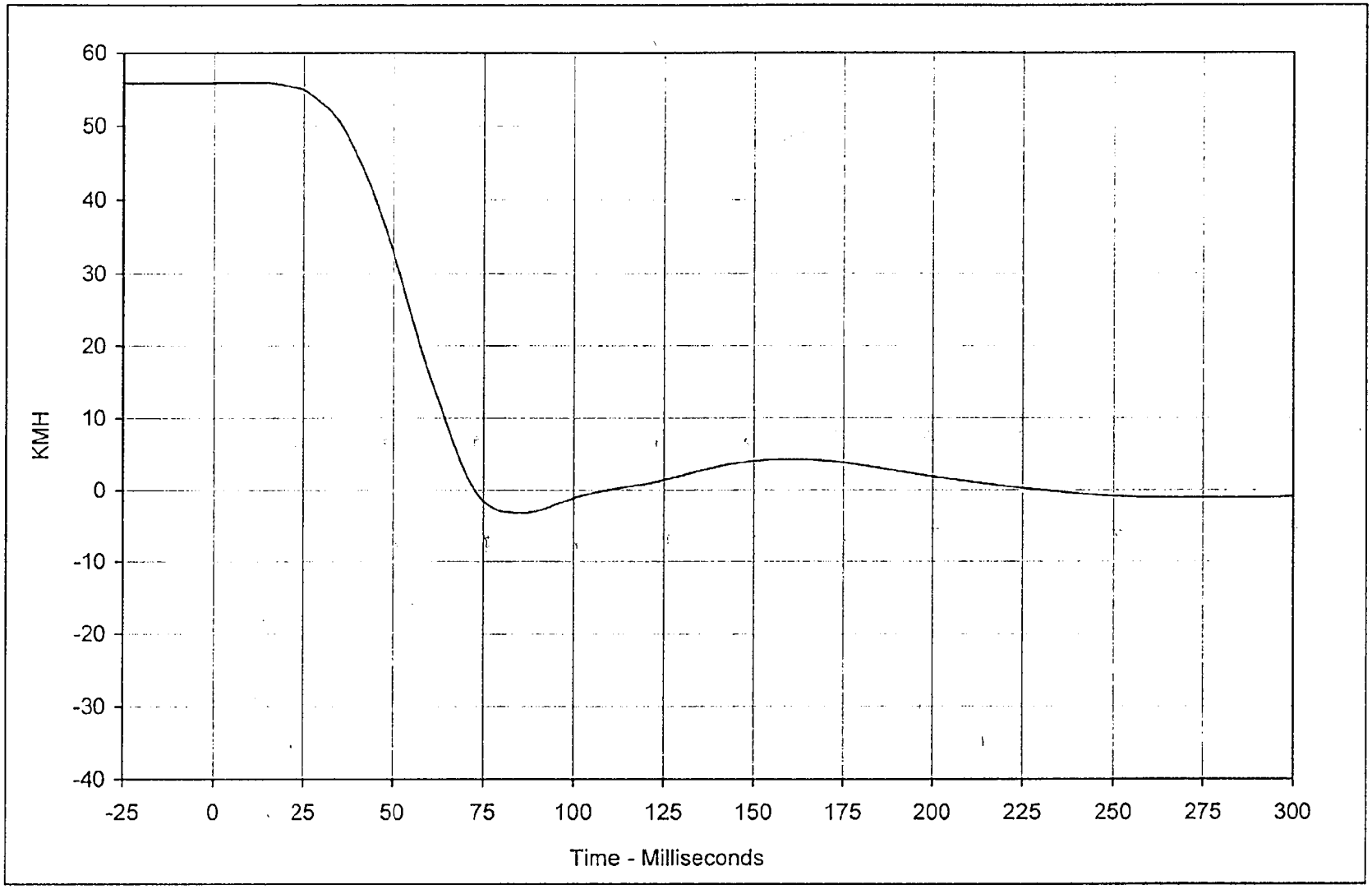
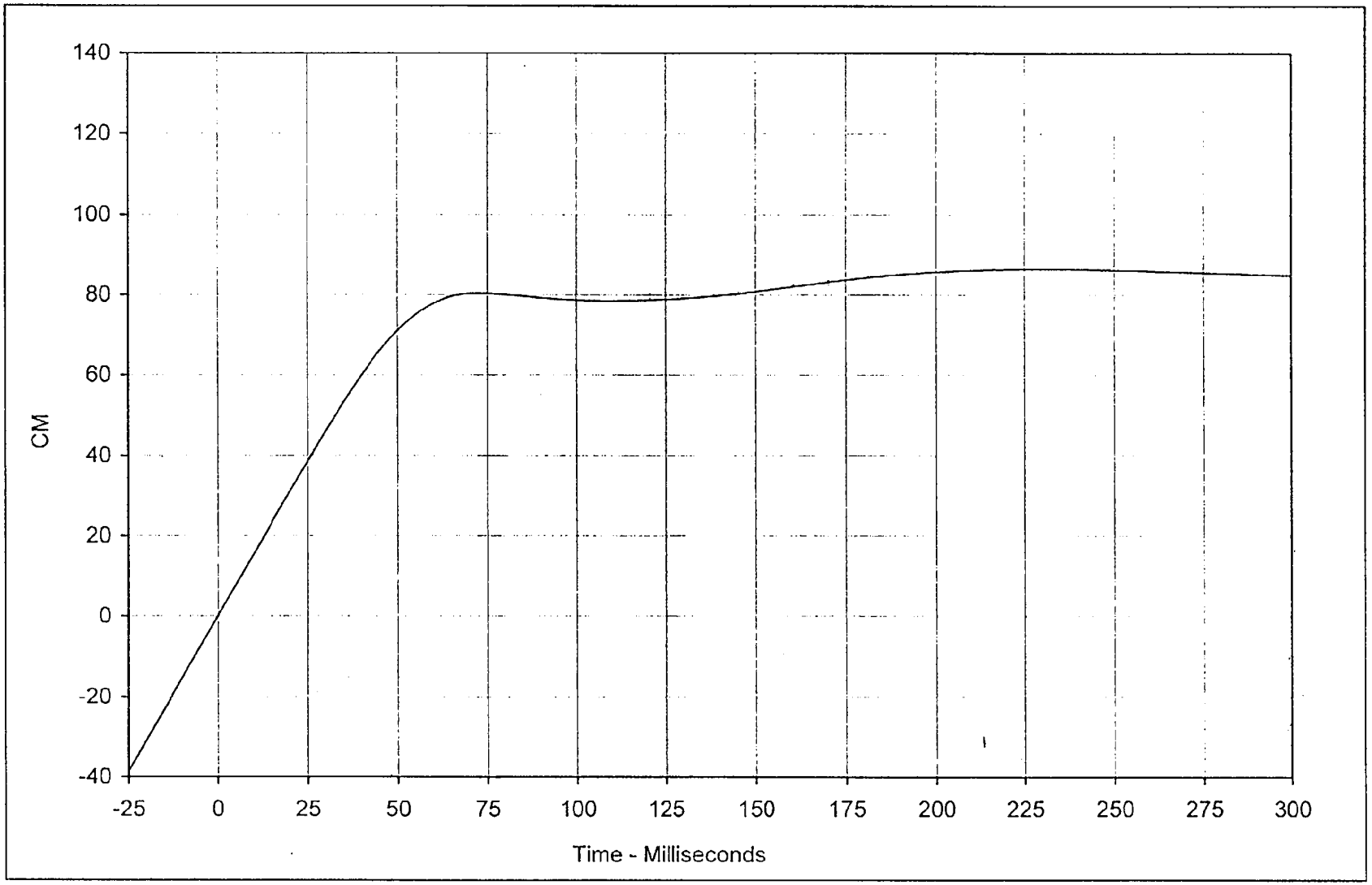


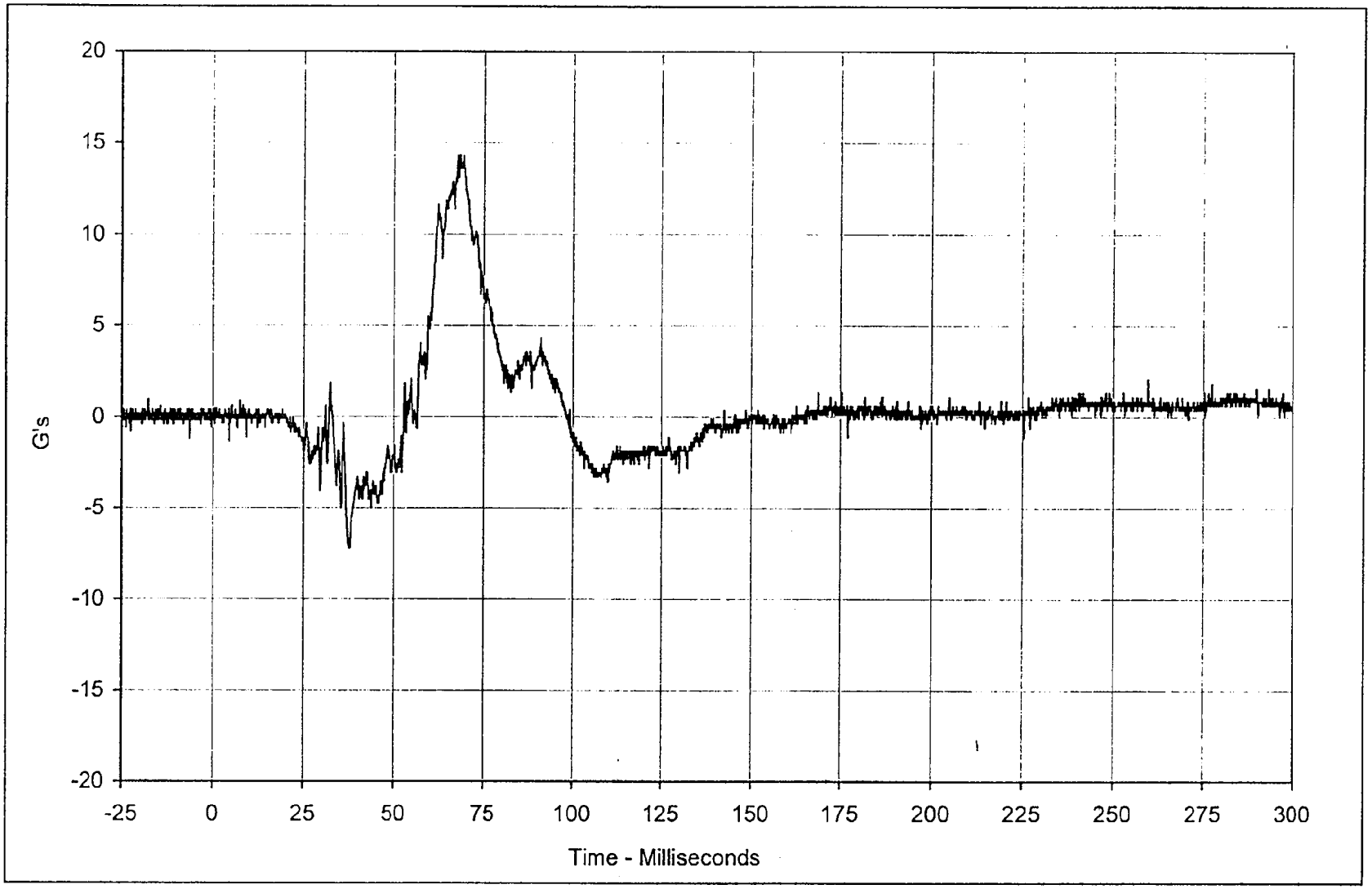
Curve Description:	Driver Pelvis X Velocity			Testing Program:	1997 New Car Assessment Program
Maximum Value:	55.8	at	12.7 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-3.1	at	86.3 Milliseconds		
SAE Filter Class:	180				
Date of Test:	4/24/97				
Curve Number:	IN1-020				

KARCO Engineering



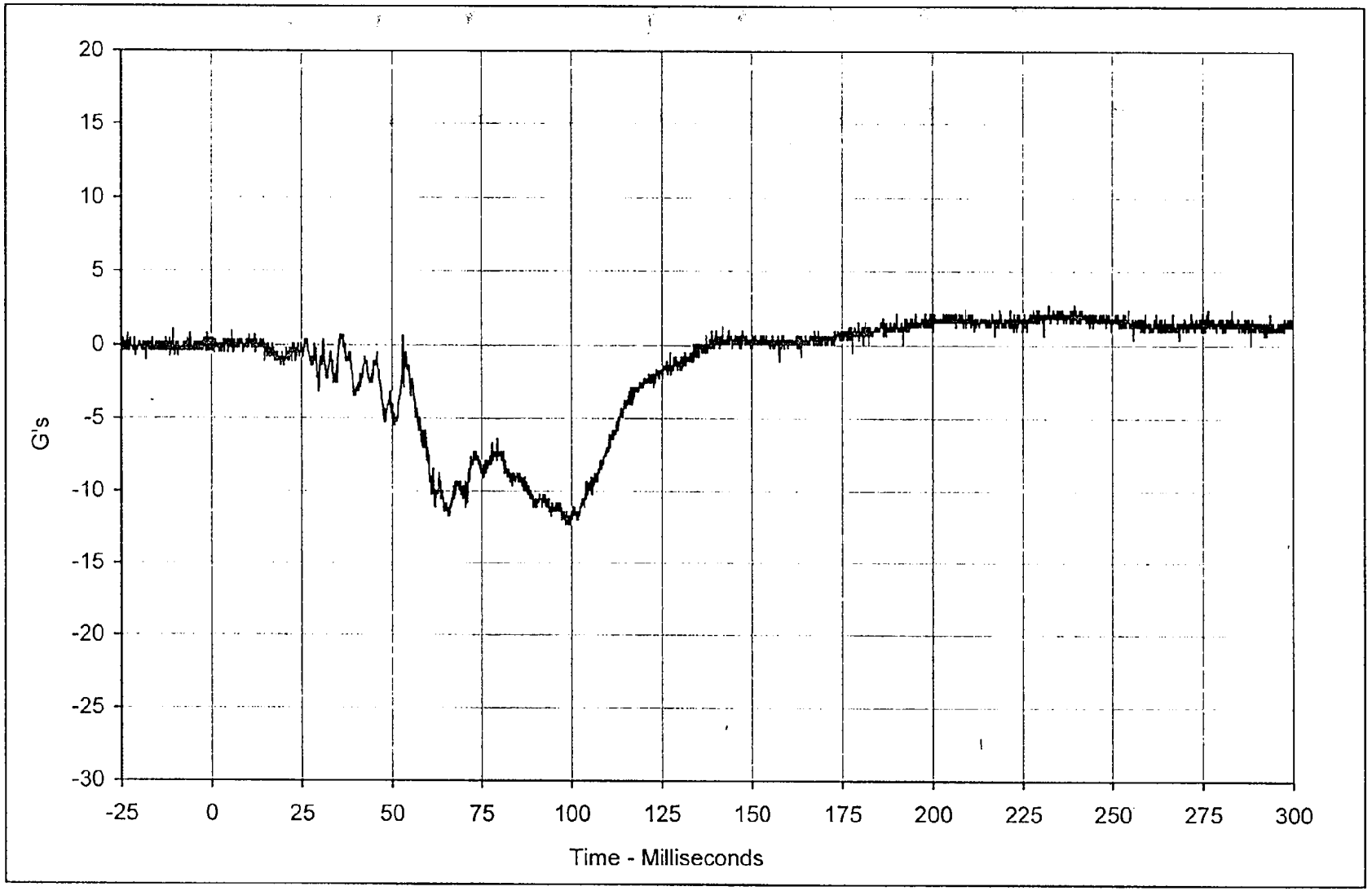
Curve Description:	Driver Pelvis X Displ.			Testing Program:	1997 New Car Assesment Program
Maximum Value:	86.5	at	230.7 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	0.1	at	0.0 Milliseconds		
SAE Filter Class:	180				
Date of Test:	4/24/97				
Curve Number:	IN2-020				

KARCO Engineering



Curve Description:	Driver Pelvis Y			Testing Program:	1997 New Car Assessment Program
Maximum Value:	14.3	at	67.7 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-7.2	at	37.3 Milliseconds		
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	FIL-021				

KARCO Engineering



Curve Description: Driver Pelvis Z

Maximum Value: 2.8 at 232.2 Milliseconds

Minimum Value: -12.3 at 98.1 Milliseconds

SAE Filter Class: 1000

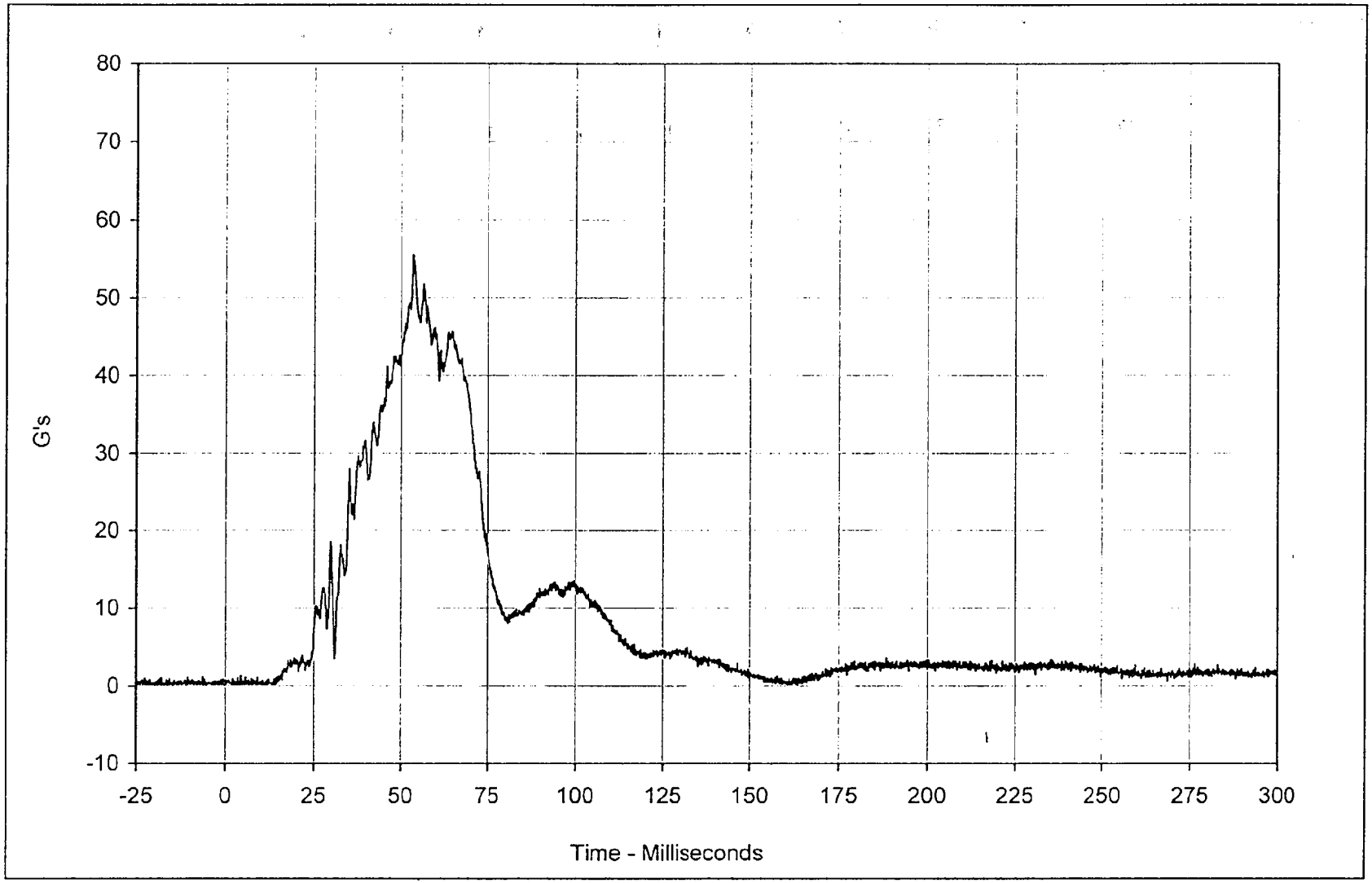
Date of Test: 4/24/97

Curve Number: FIL-022

Testing Program: 1997 New Car Assessment Program

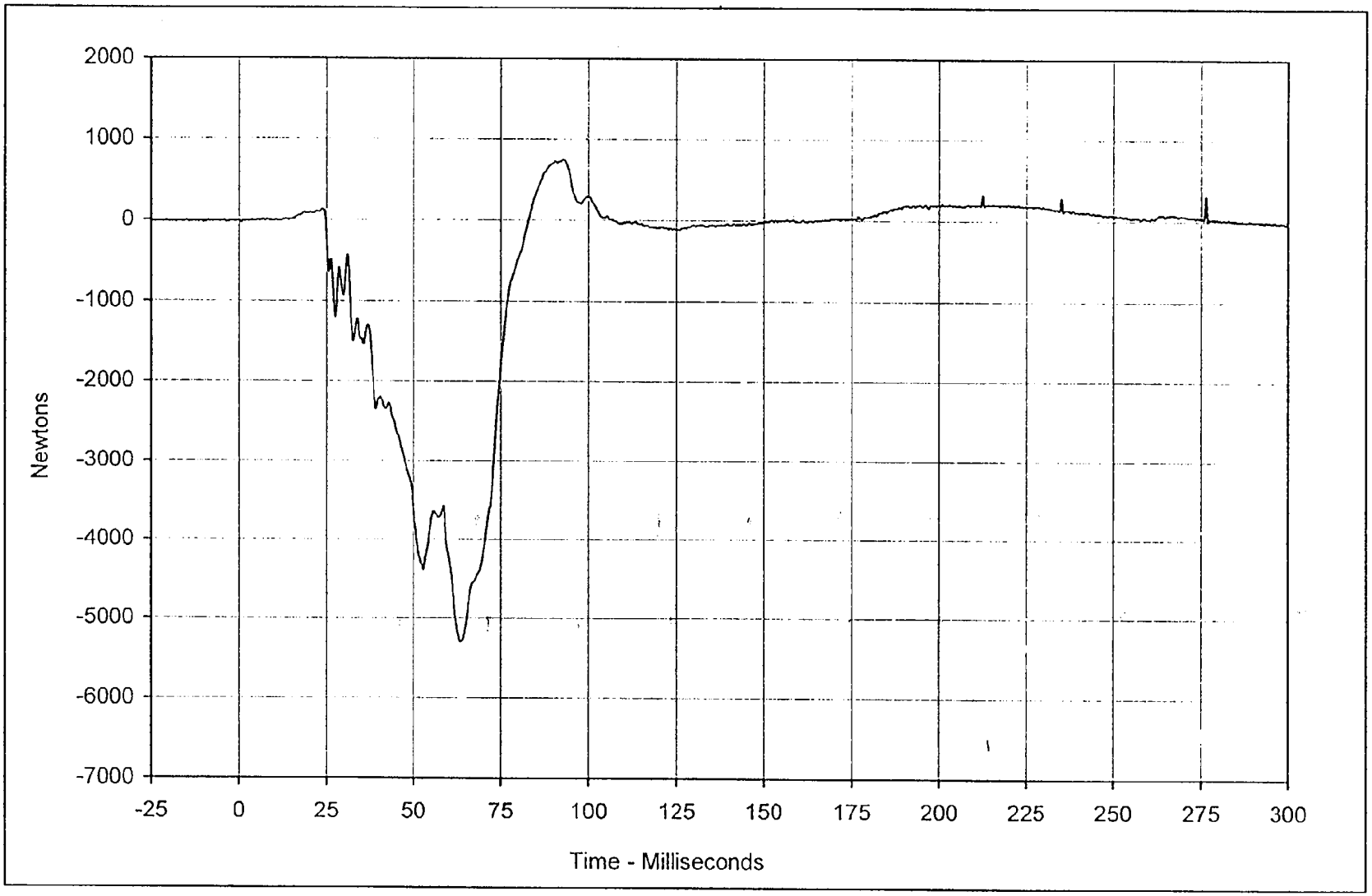
Test Vehicle: 1997 Kia Sportage

KARCO Engineering



Curve Description:	Driver Pelvis Resultant			Testing Program:	1997 New Car Assesment Program
Maximum Value:	55.5	at	53.5 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	0.1	at	10.6 Milliseconds		
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	RES-020				

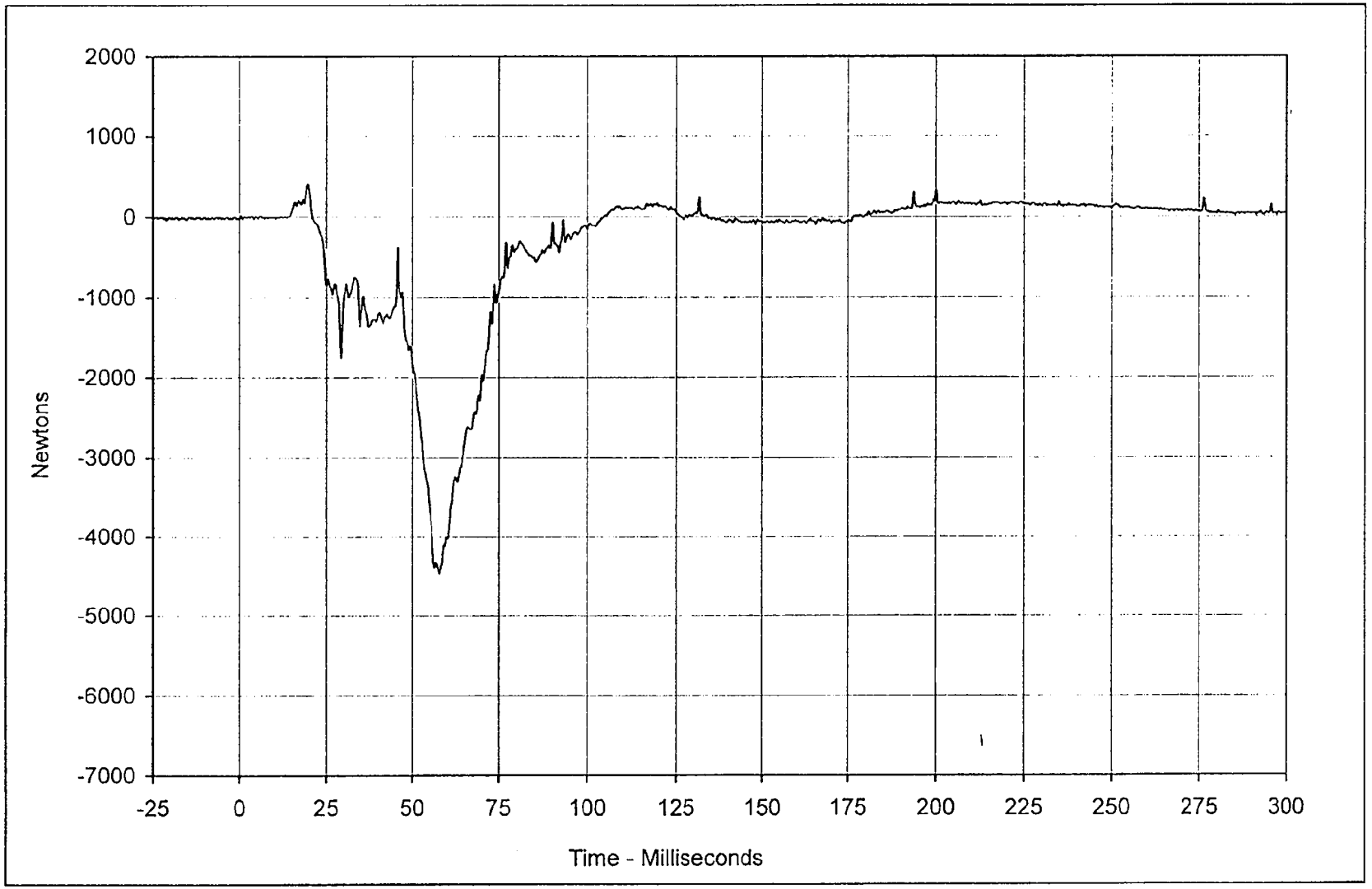
KARCO Engineering



Curve Description:	Driver Left Femur Force			
Maximum Value:	745.2	at	92.7	Milliseconds
Minimum Value:	-5299.3	at	63.4	Milliseconds
SAE Filter Class:	600			
Date of Test:	4/24/97			
Curve Number:	FIL-023			

Testing Program:	1997 New Car Assesment Program
Test Vehicle:	1997 Kia Sportage

KARCO Engineering



Curve Description: Driver Right Femur Force

Maximum Value: 409.5 at 19.9 Milliseconds

Minimum Value: -4472.8 at 58.0 Milliseconds

SAE Filter Class: 600

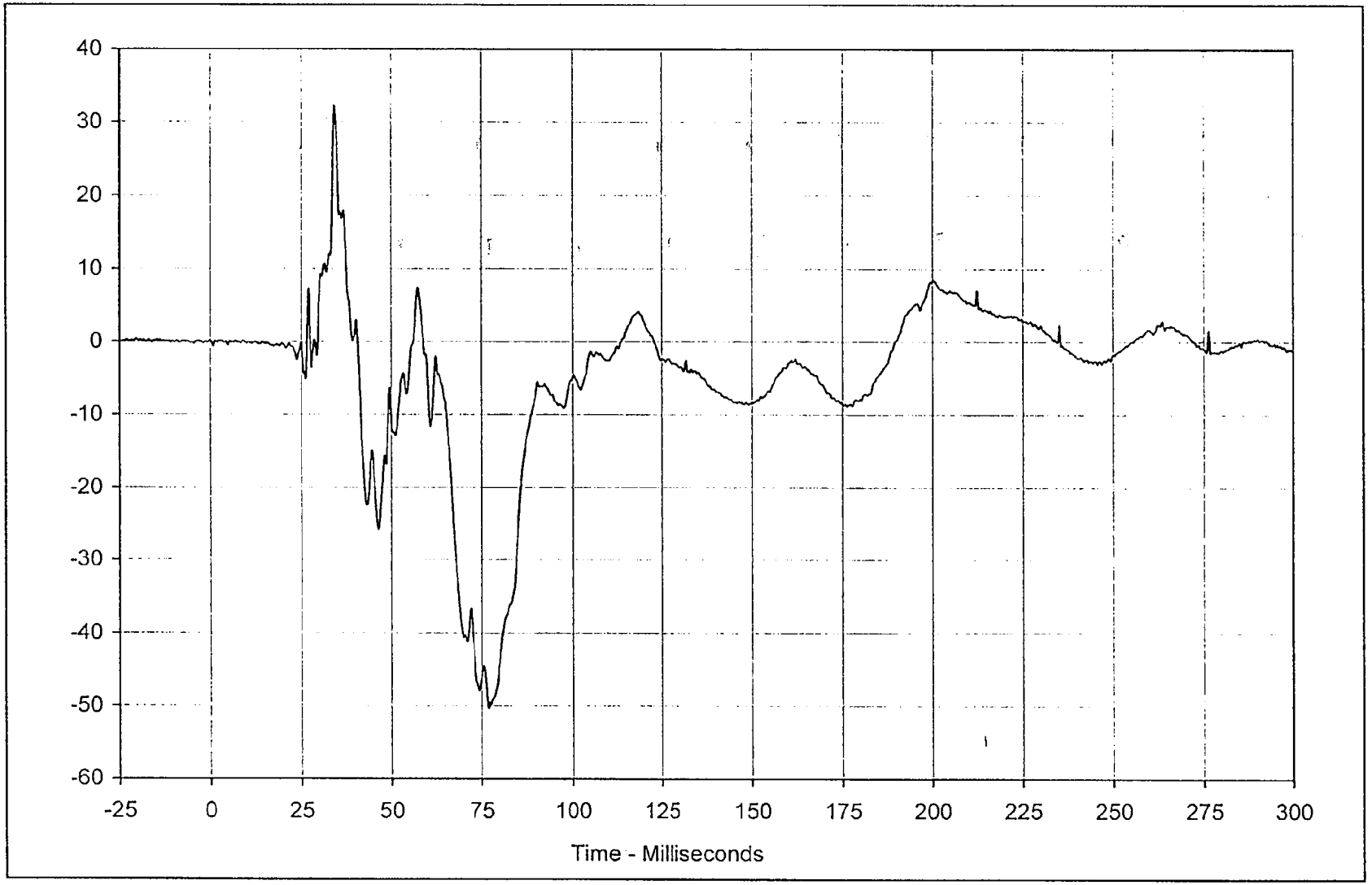
Date of Test: 4/24/97

Curve Number: FIL-024

Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering



Curve Description: Driver Left Upper Tibia Moment X

Maximum Value: 32.2 at 34.1 Milliseconds

Minimum Value: -50.3 at 76.9 Milliseconds

SAE Filter Class: 600

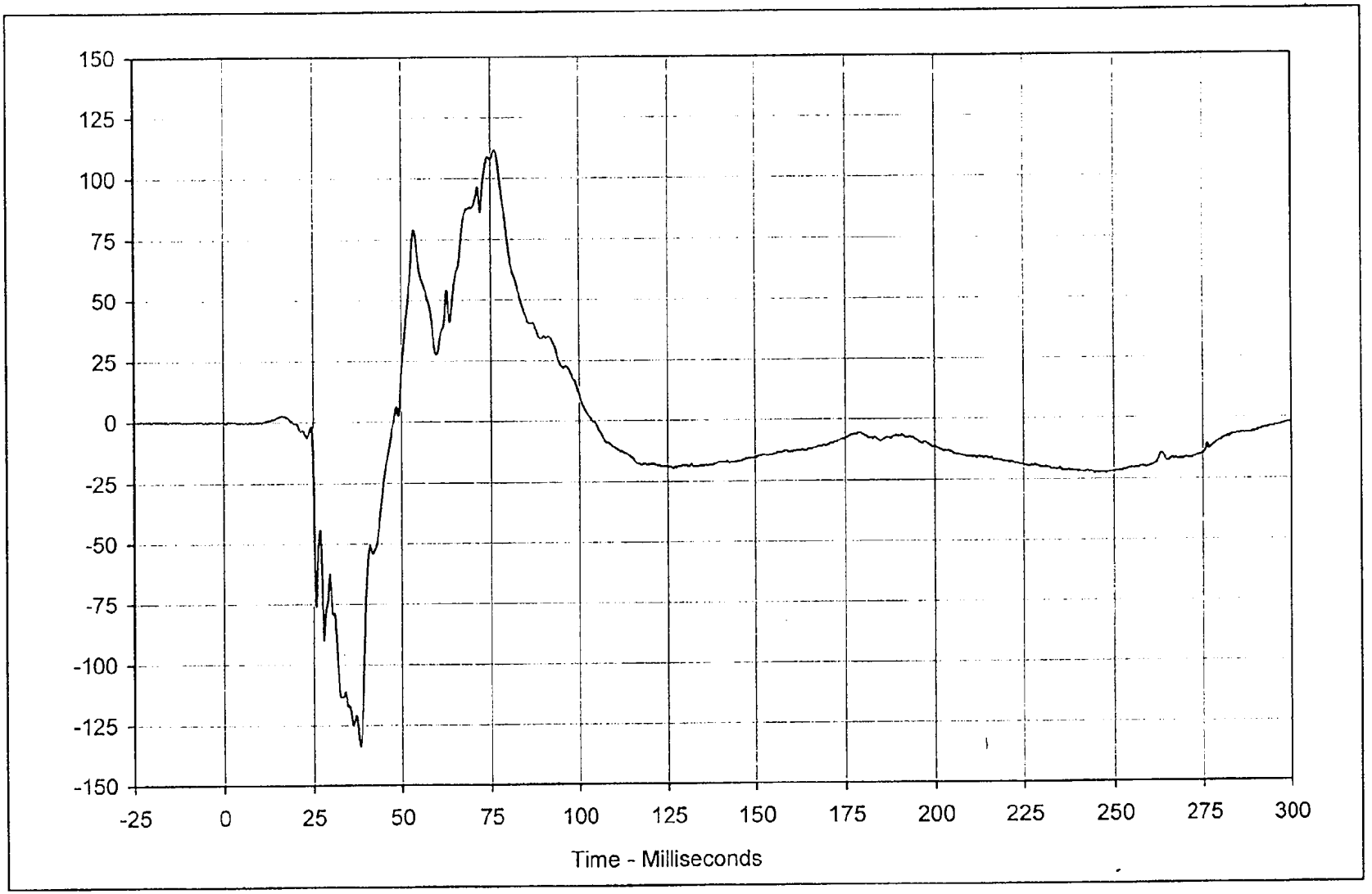
Date of Test: 4/24/97

Curve Number: FIL-025

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering

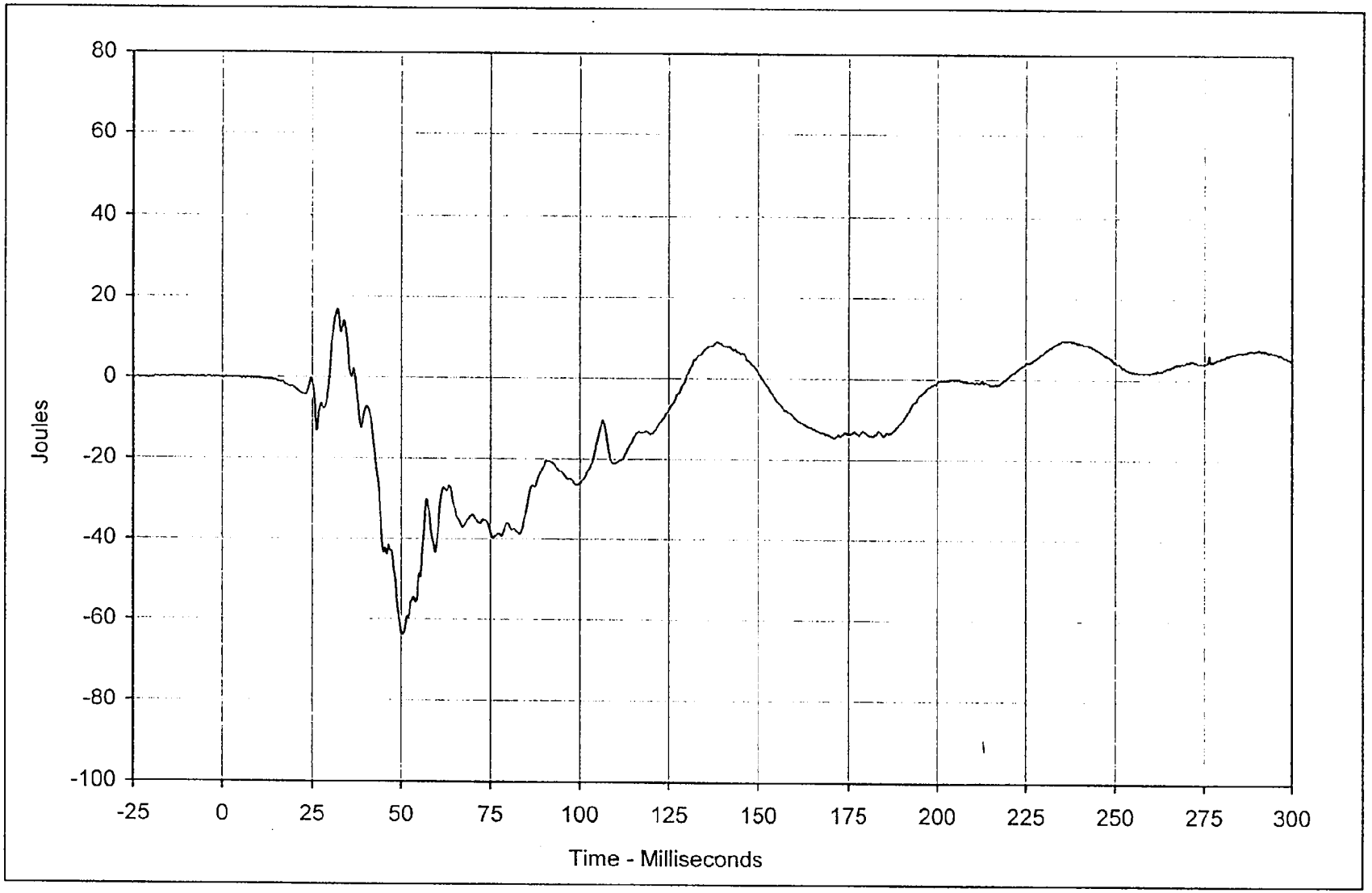


Curve Description:	Driver Left Upper Tibia Moment Y			
Maximum Value:	111.7	at	76.3	Milliseconds
Minimum Value:	-133.6	at	38.0	Milliseconds
SAE Filter Class:	600			
Date of Test:	4/24/97			
Curve Number:	FIL-026			

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering



Curve Description: Driver Right Upper Tibia Moment X

Maximum Value: 16.8 at 32.1 Milliseconds

Minimum Value: -63.7 at 50.4 Milliseconds

SAE Filter Class: 600

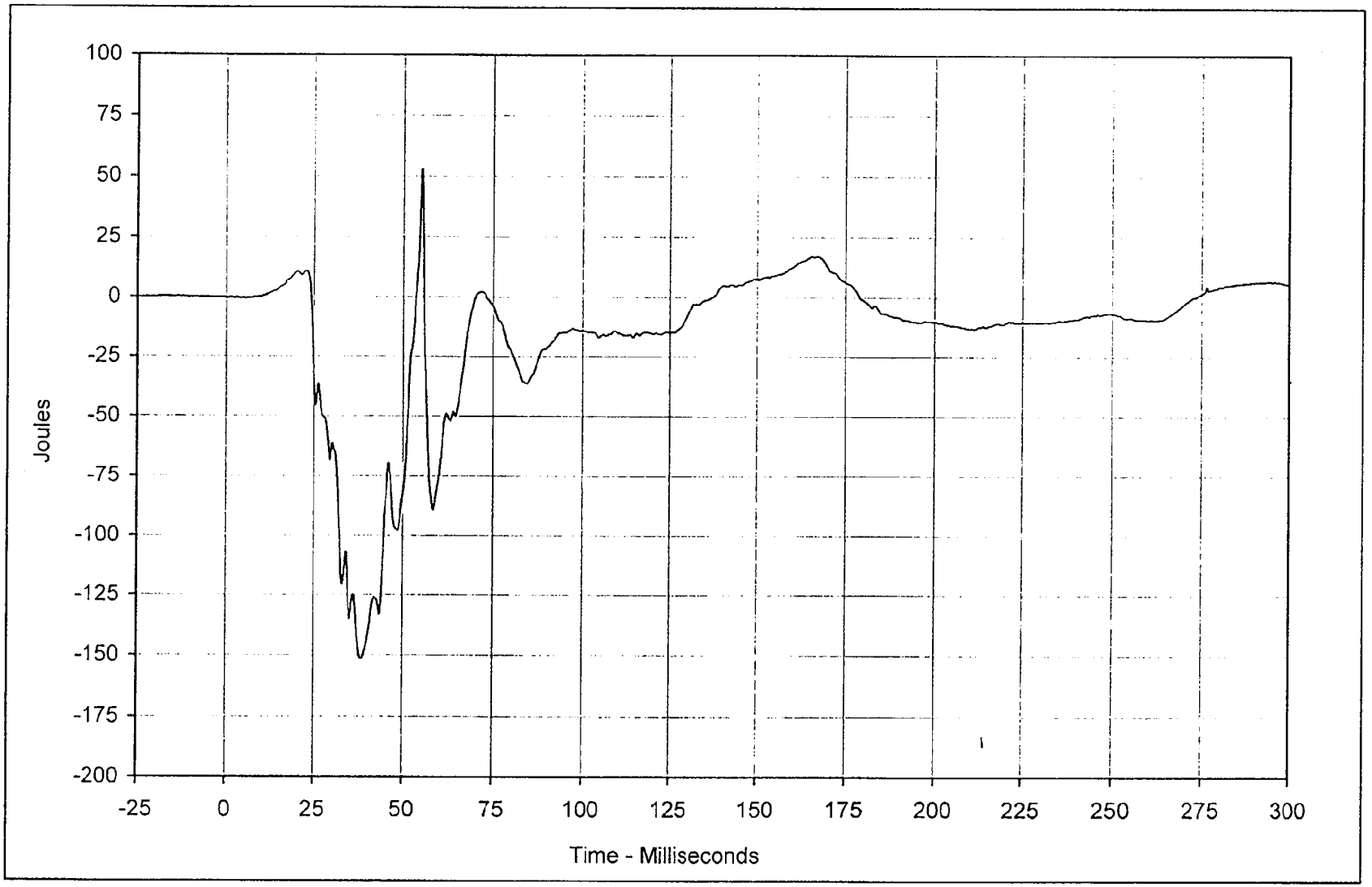
Date of Test: 4/24/97

Curve Number: FIL-027

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering



Curve Description: Driver Right Upper Tibia Moment Y

Maximum Value: 53.0 at 55.0 Milliseconds

Minimum Value: -151.6 at 38.4 Milliseconds

SAE Filter Class: 600

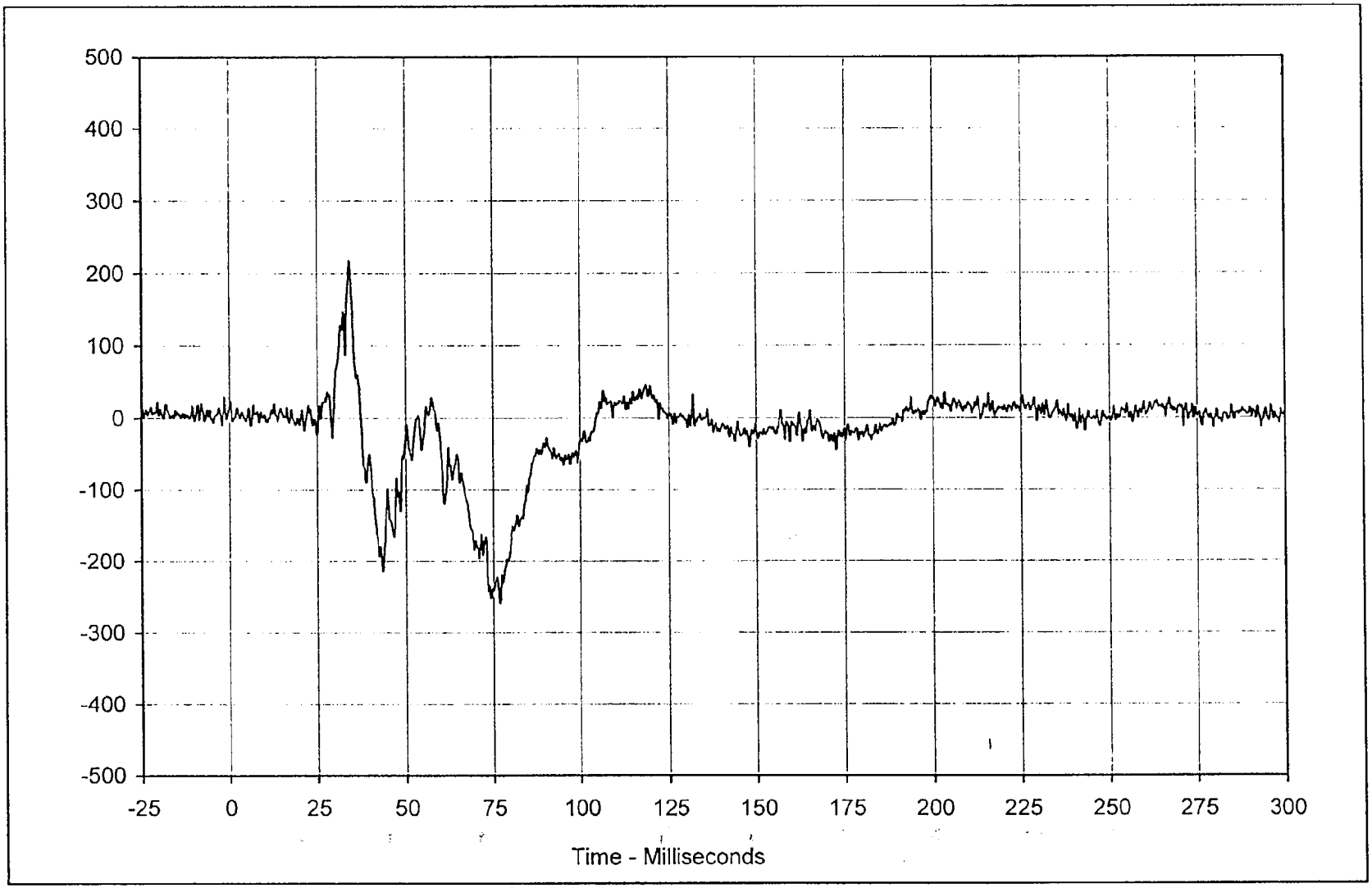
Date of Test: 4/24/97

Curve Number: FIL-028

Testing Program: 1997 New Car Assessment Program

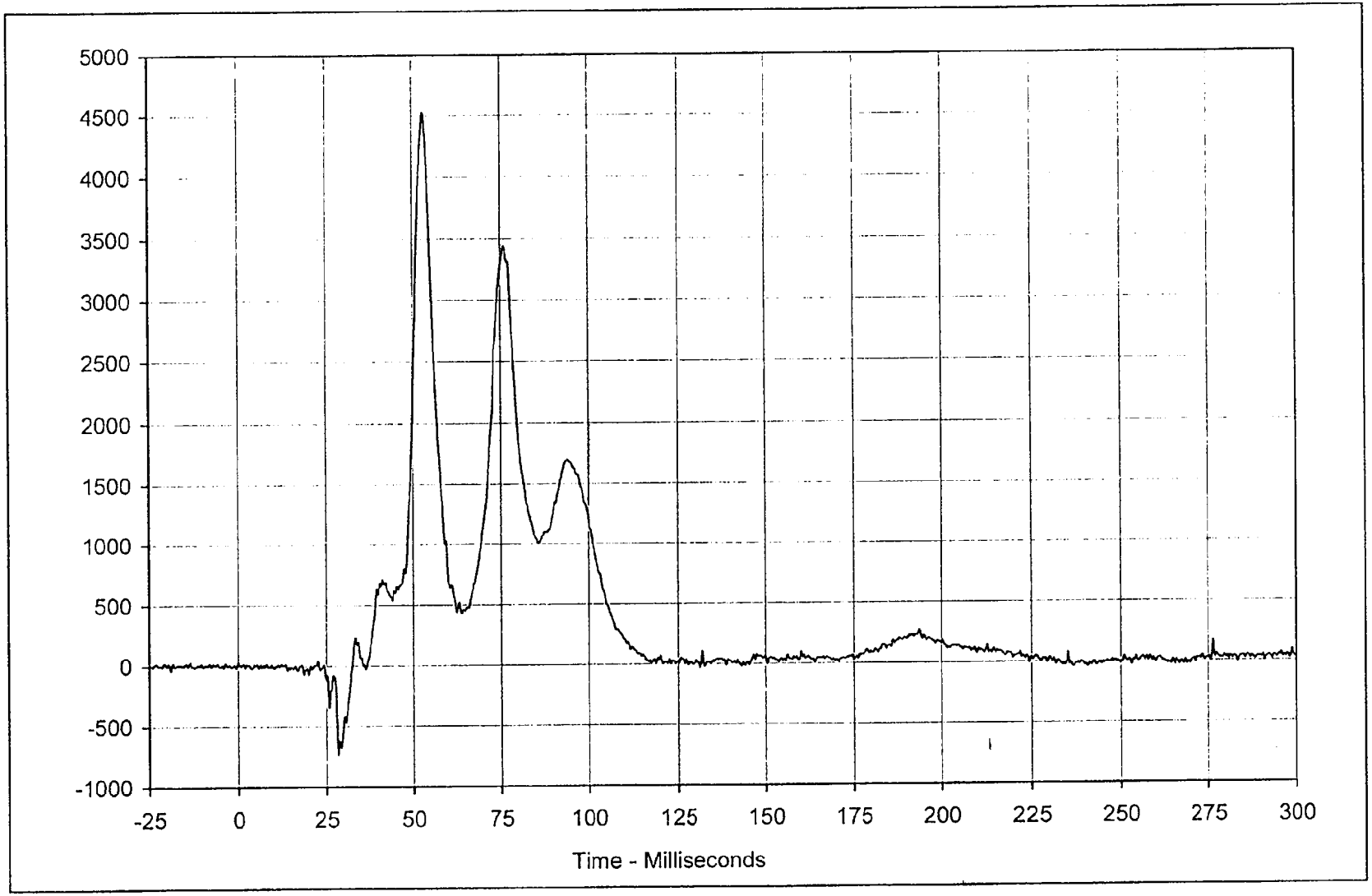
Test Vehicle: 1997 Kia Sportage

KARCO Engineering



Curve Description:	Driver Left Lower Tibia Force Y				Testing Program:	1997 New Car Assessment Program	
Maximum Value:	218.4	at	34.2	Milliseconds	Test Vehicle:	1997 Kia Sportage	
Minimum Value:	-258.9	at	76.8	Milliseconds			
SAE Filter Class:	600						
Date of Test:	4/24/97						
Curve Number:	FIL-029						

KARCO Engineering



Curve Description: Driver Left Lower Tibia Force Z

Maximum Value: 4528.0 at 53.1 Milliseconds

Minimum Value: -735.6 at 28.3 Milliseconds

SAE Filter Class: 600

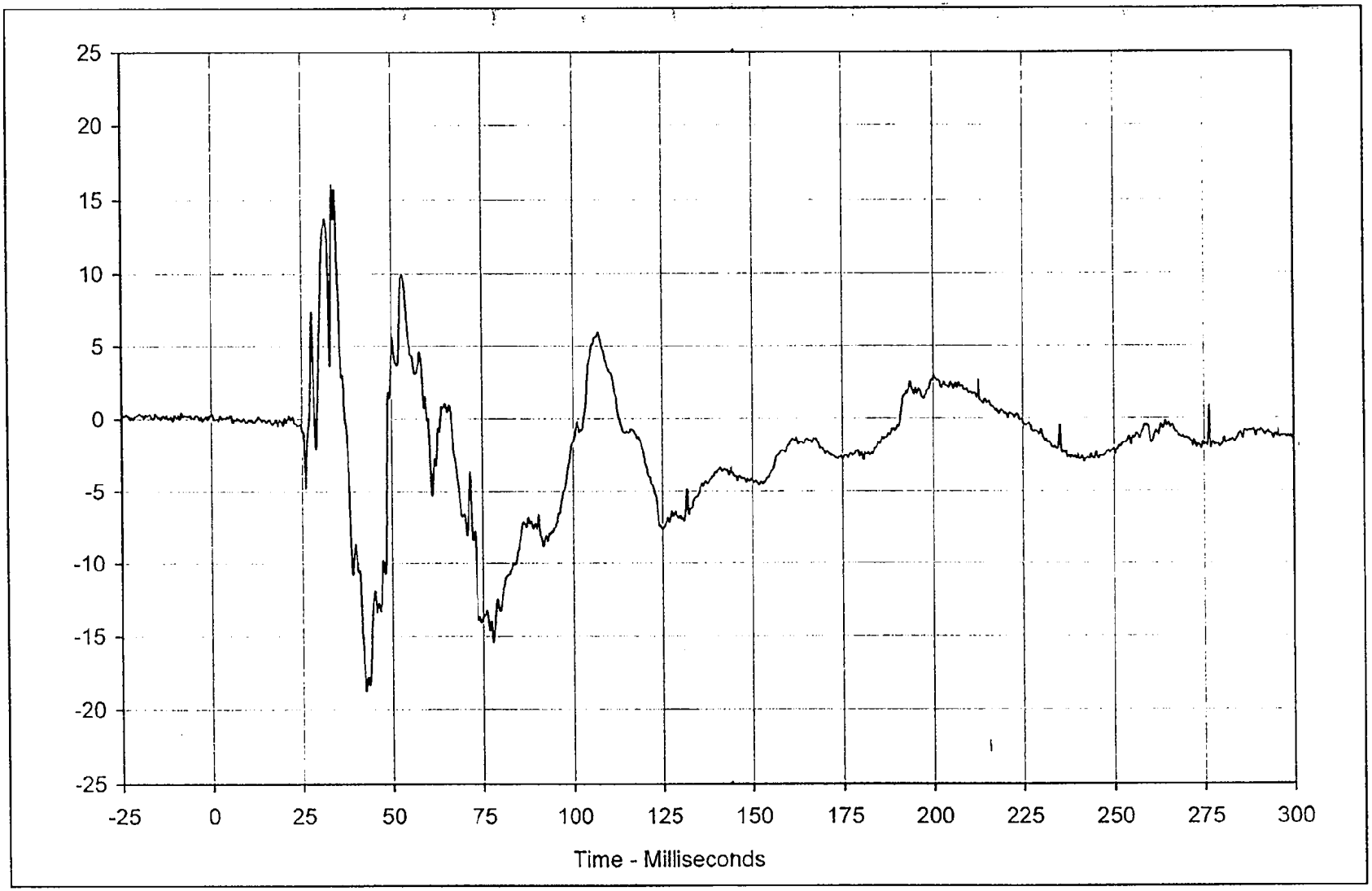
Date of Test: 4/24/97

Curve Number: FIL-030

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering



Curve Description: Driver Left Lower Tibia Moment X

Maximum Value: 16.0 at 33.6 Milliseconds

Minimum Value: -18.7 at 42.4 Milliseconds

SAE Filter Class: 600

Date of Test: 4/24/97

Curve Number: FIL-031

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

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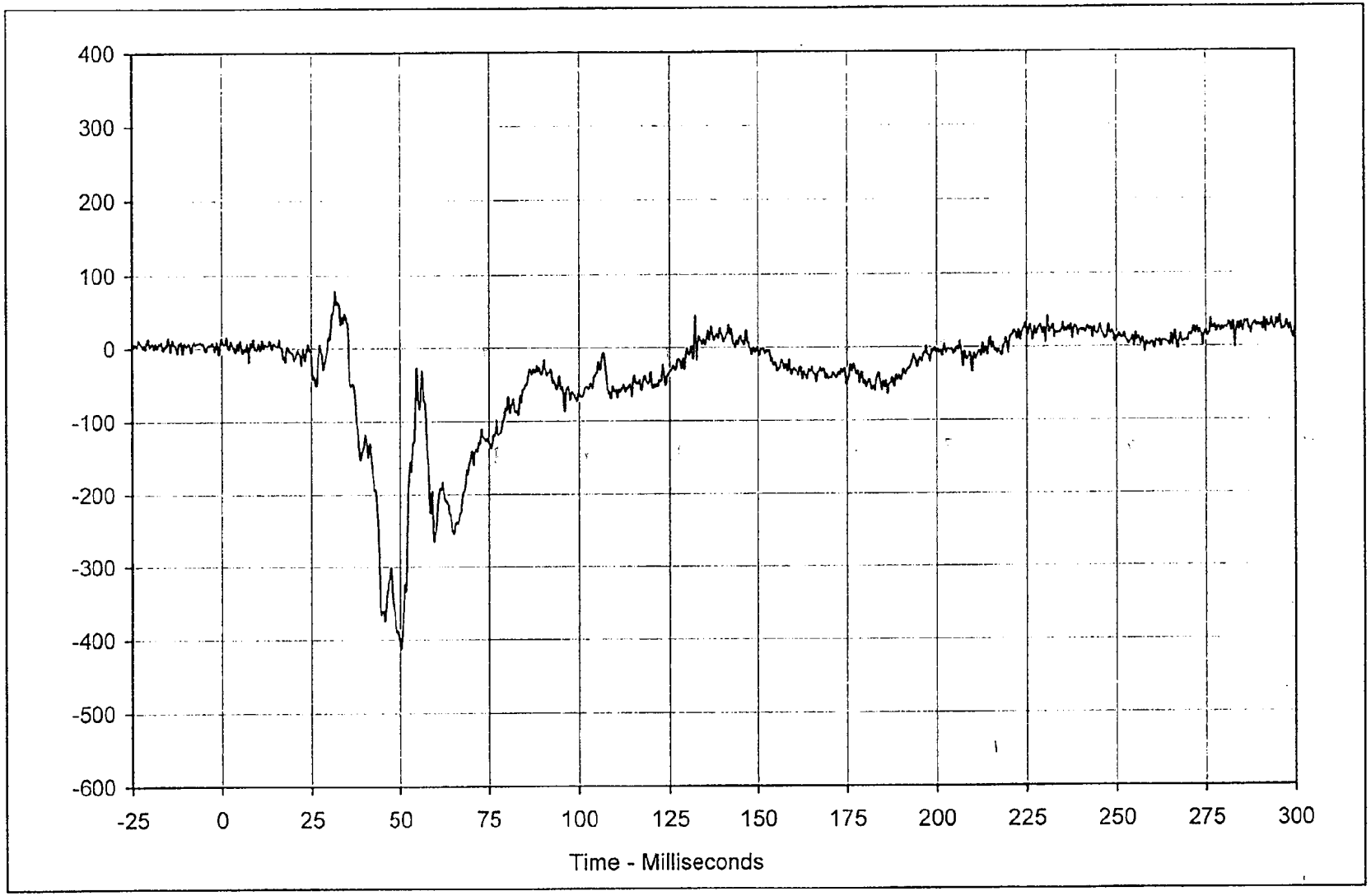

Curve Description: Driver Right Lower Tibia Force Y

Maximum Value: 78.8 at 31.5 Milliseconds

Minimum Value: -411.9 at 50.3 Milliseconds

SAE Filter Class: 600

Date of Test: 4/24/97

Curve Number: FIL-032

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

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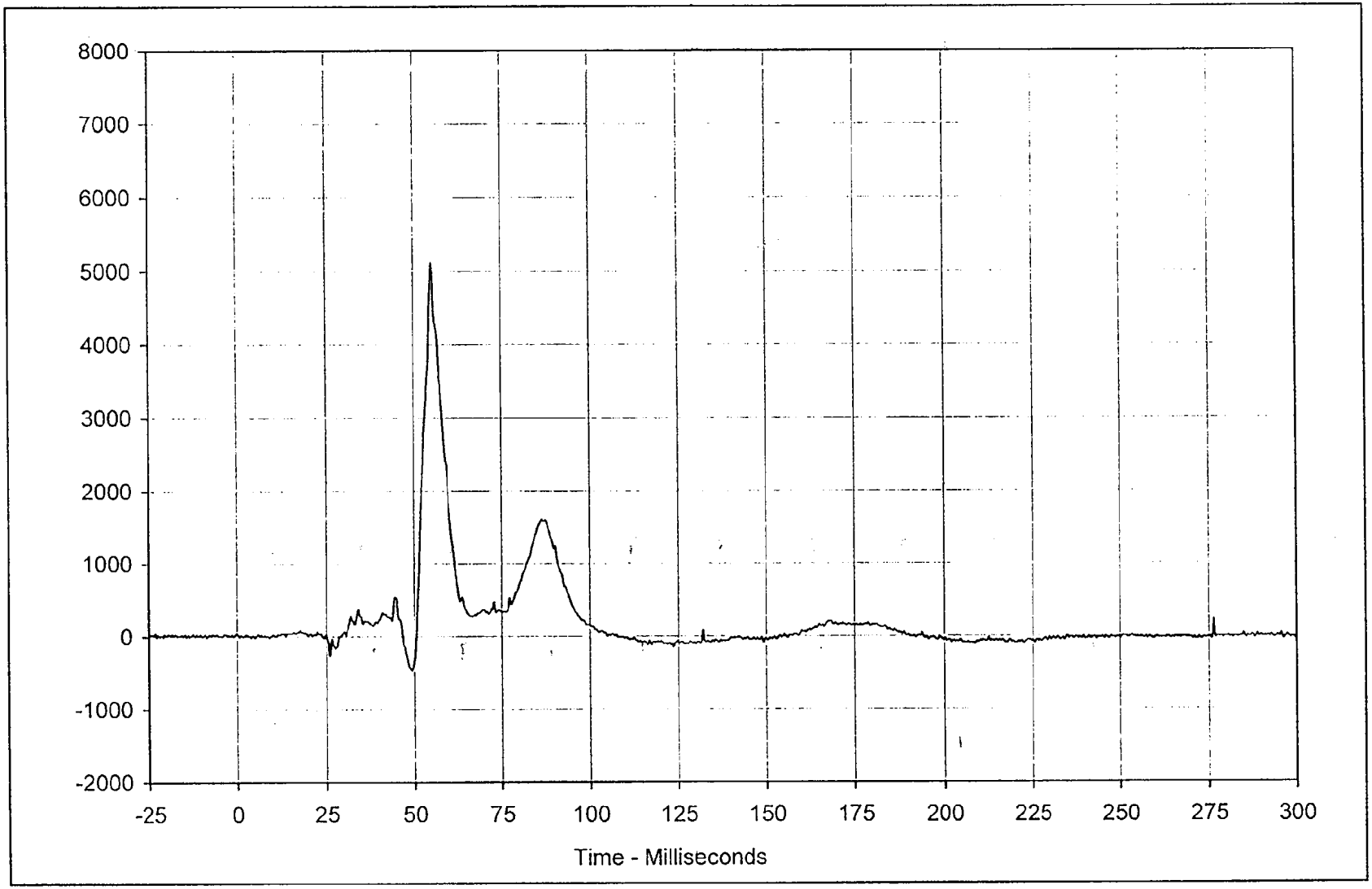

Curve Description: Driver Right Lower Tibia Force Z

Maximum Value: 5124.1 at 55.2 Milliseconds

Minimum Value: -469.7 at 49.2 Milliseconds

SAE Filter Class: 600

Date of Test: 4/24/97

Curve Number: FIL-033

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering

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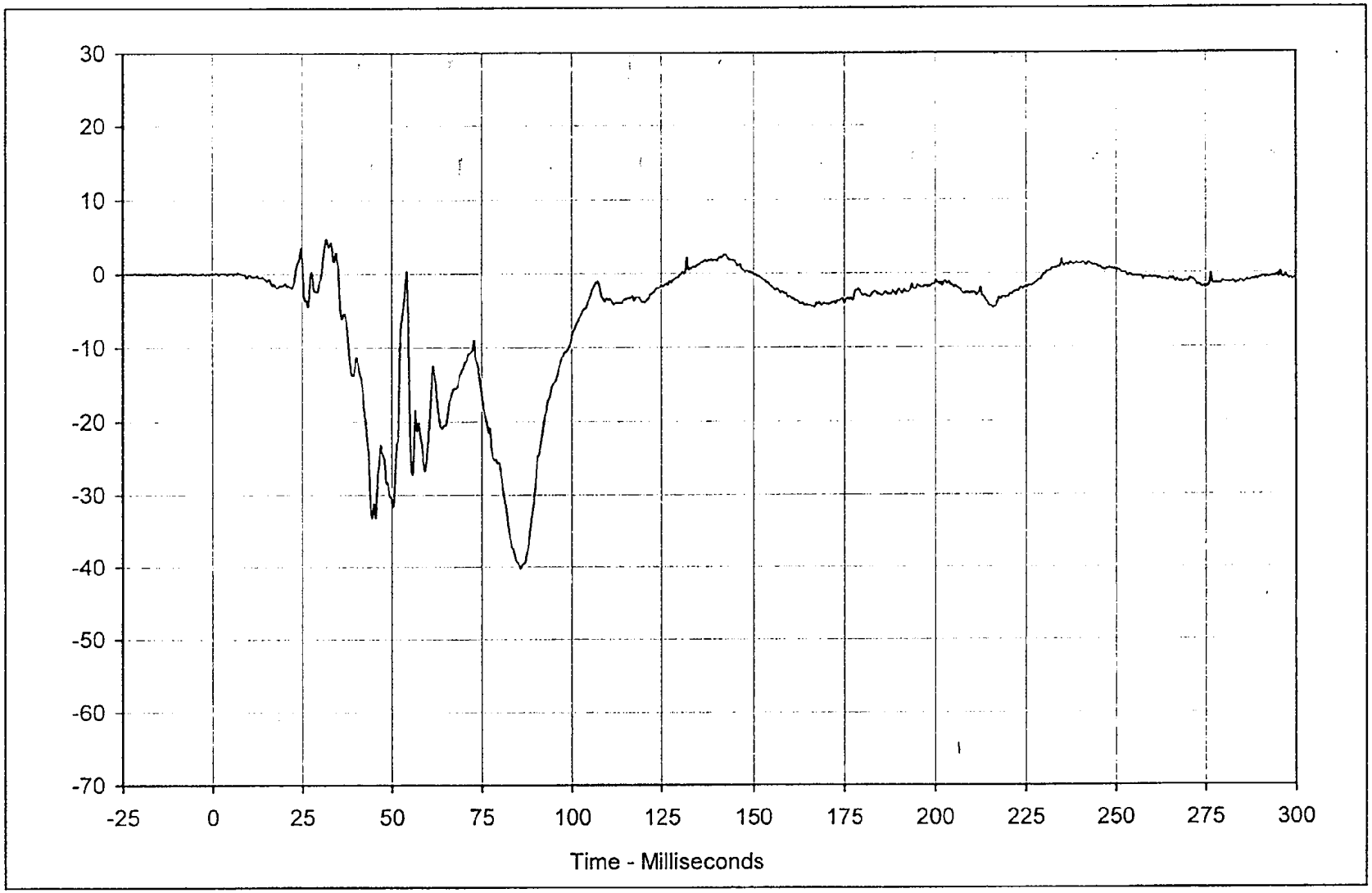
B51



Curve Description: Driver Right Lower Tibia Moment X

Maximum Value: 4.8 at 31.6 Milliseconds

Minimum Value: -40.2 at 85.8 Milliseconds

SAE Filter Class: 600

Date of Test: 4/24/97

Curve Number: FIL-034

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering

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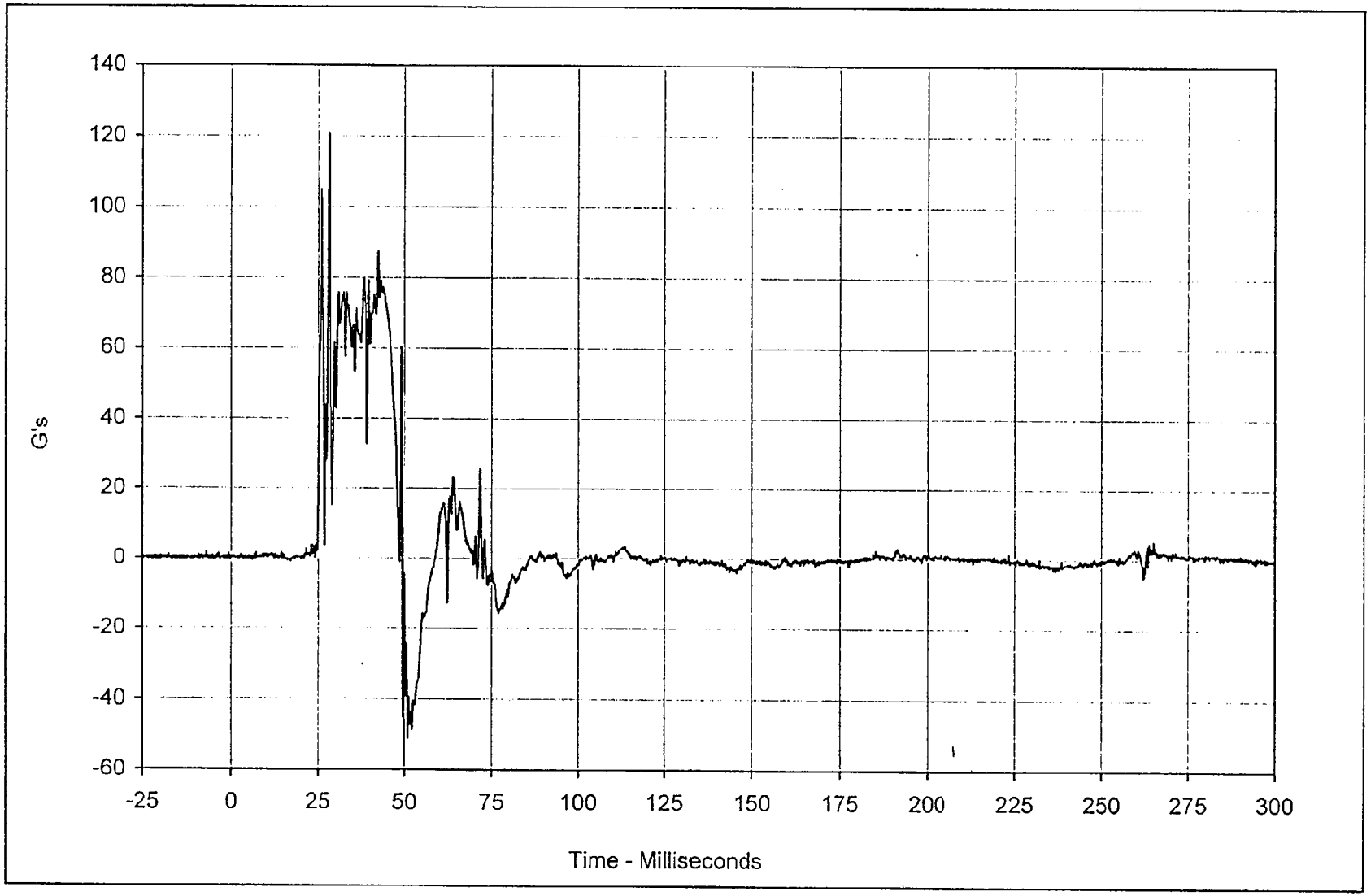
B52



Curve Description:	Driver Left Foot Aft X			
Maximum Value:	120.8	at	28.3	Milliseconds
Minimum Value:	-50.9	at	51.0	Milliseconds
SAE Filter Class:	1000			
Date of Test:	4/24/97			
Curve Number:	FIL-035			

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

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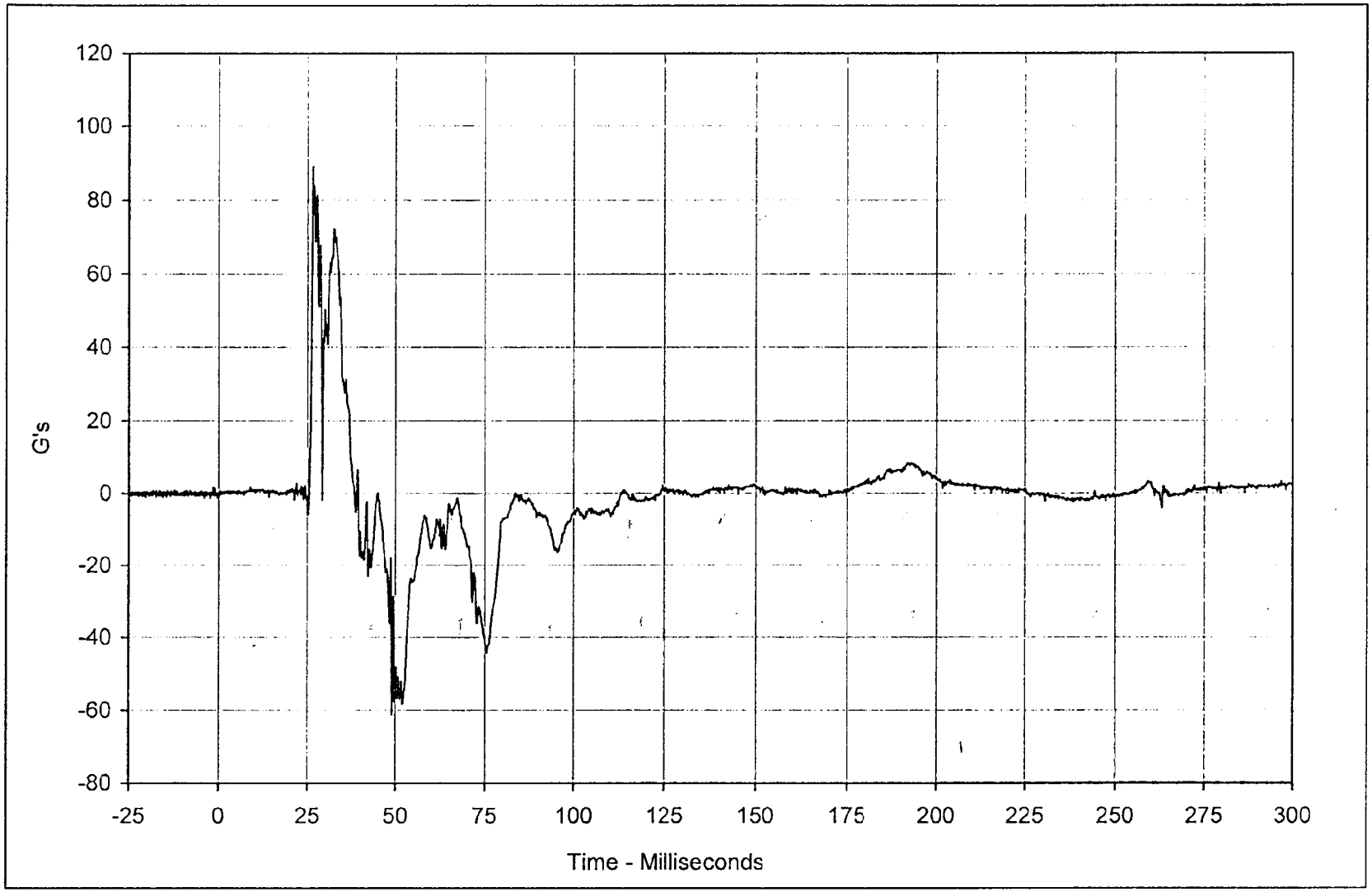
B53



Curve Description:	Driver Left Foot Aft Z			Testing Program:	1997 New Car Assessment Program
Maximum Value:	89.1	at	26.4 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-61.2	at	49 Milliseconds		
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	FIL-036				

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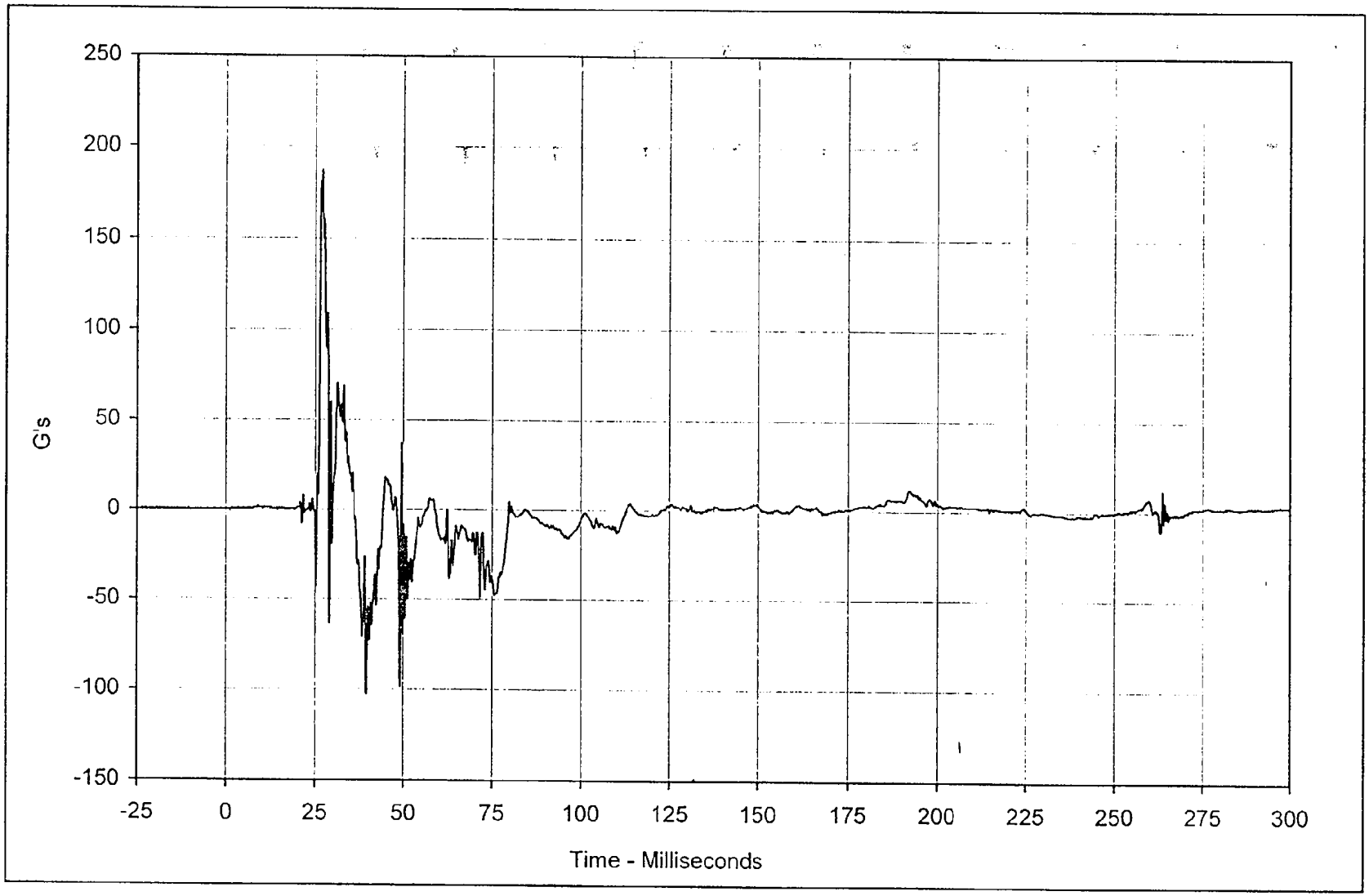
B54



Curve Description:	Driver Left Foot Fore Z			Testing Program:	1997 New Car Assessment Program
Maximum Value:	187.1	at	27.0 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-102.2	at	39.7 Milliseconds		
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	FIL-037				

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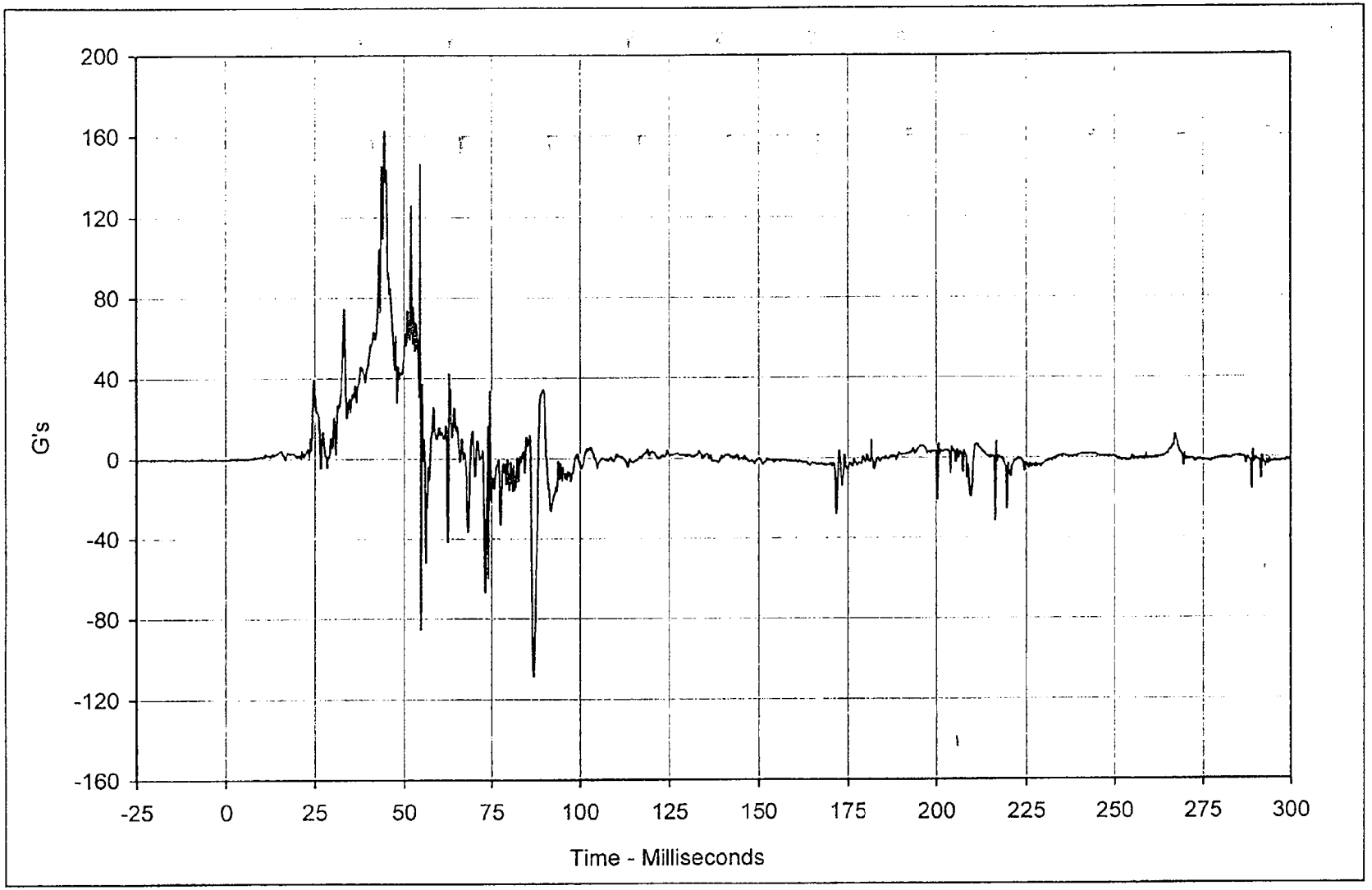
B55



Curve Description:	Driver Right Foot Aft X			Testing Program:	1997 New Car Assessment Program
Maximum Value:	162.5	at	44.5 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-108.4	at	86.8 Milliseconds		
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	FIL-038				

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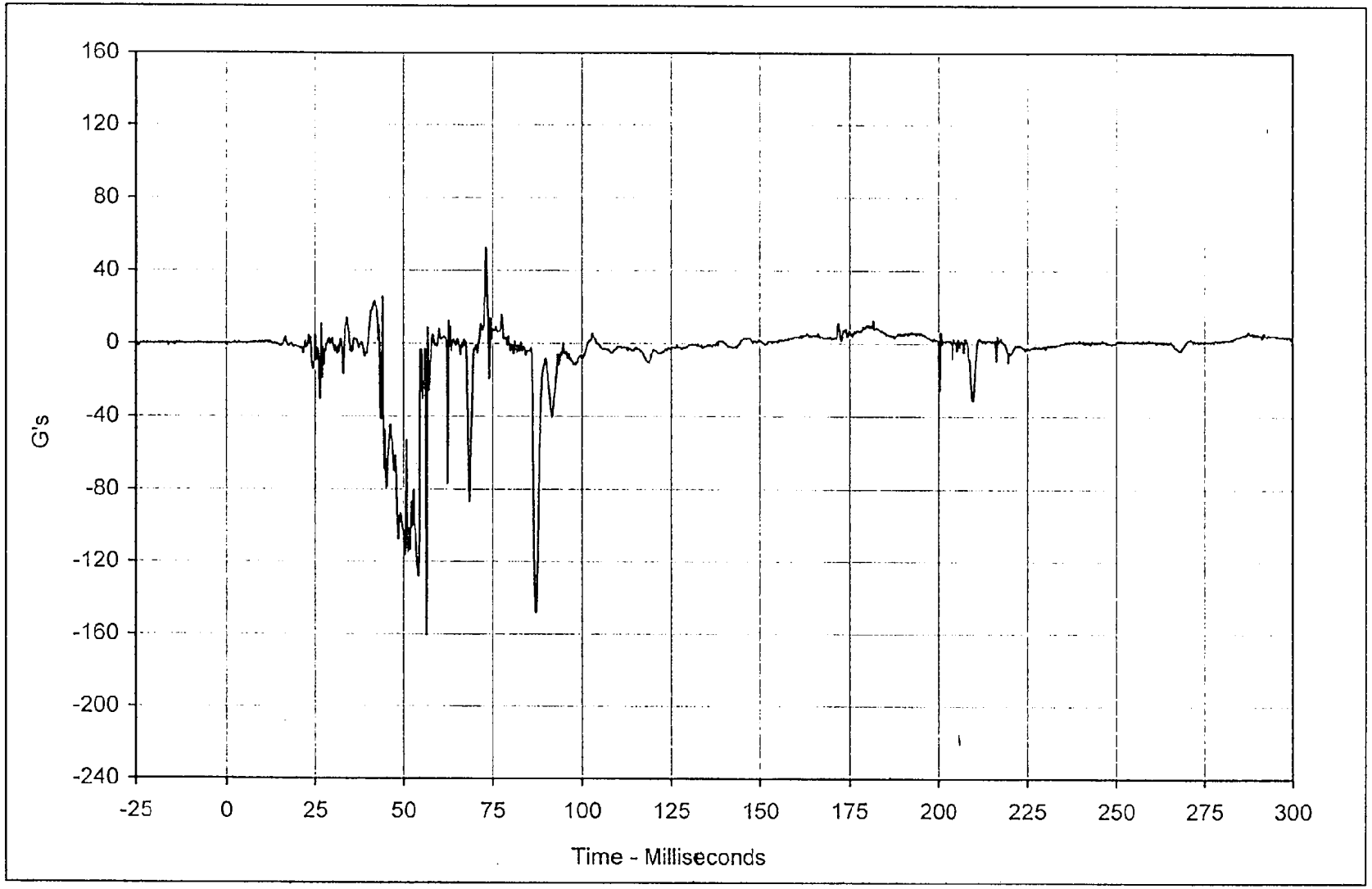
B56



Curve Description: Driver Right Foot Aft Z

Maximum Value: 52.7 at 73.2 Milliseconds

Minimum Value: -160.5 at 56.4 Milliseconds

SAE Filter Class: 1000

Date of Test: 4/24/97

Curve Number: FIL-039

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

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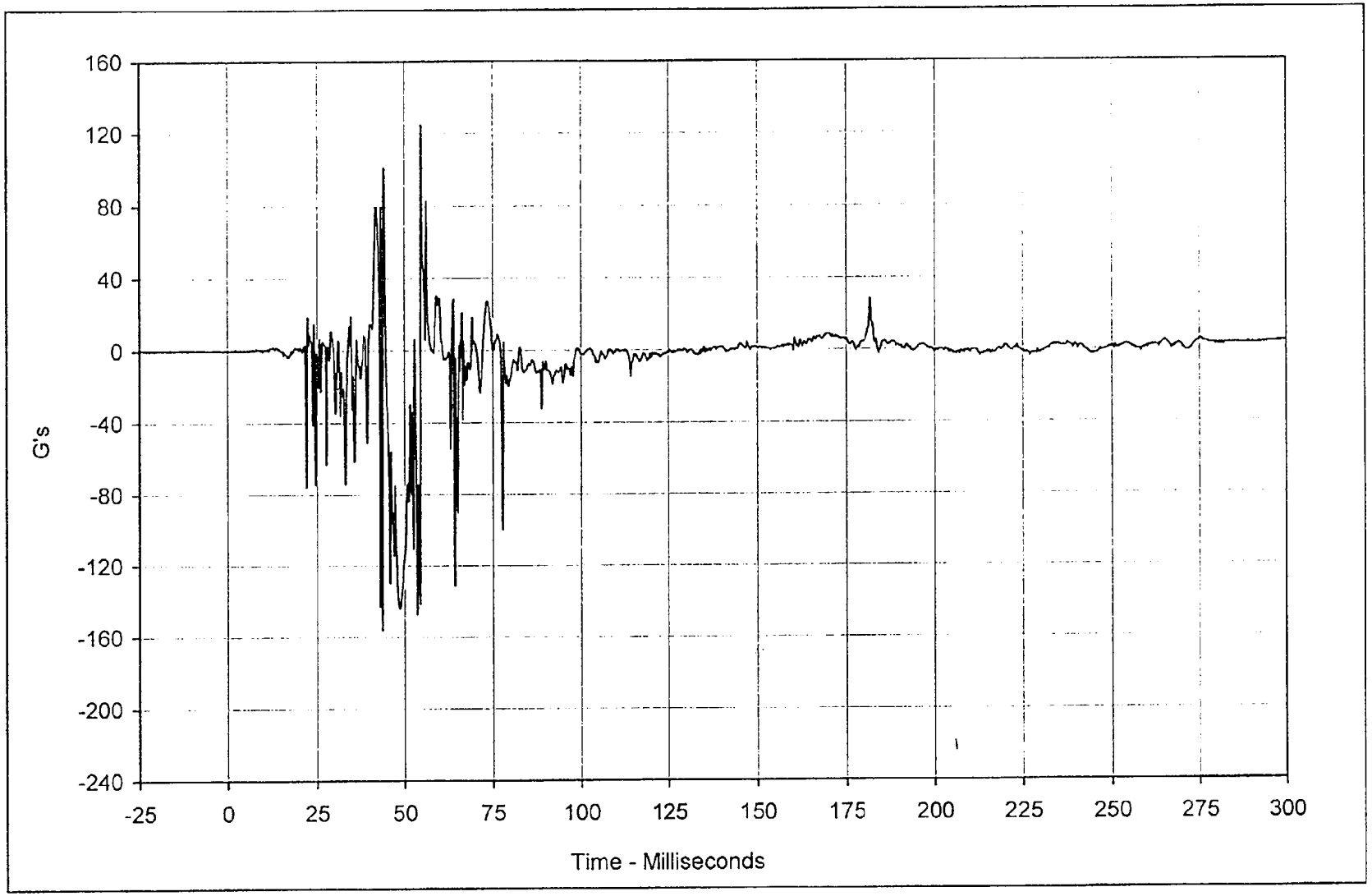
B57



Curve Description: Driver Right Foot Fore Z

Maximum Value: 124.7 at 54.8 Milliseconds

Minimum Value: -155.8 at 43.8 Milliseconds

SAE Filter Class: 1000

Date of Test: 4/24/97

Curve Number: FIL-040

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

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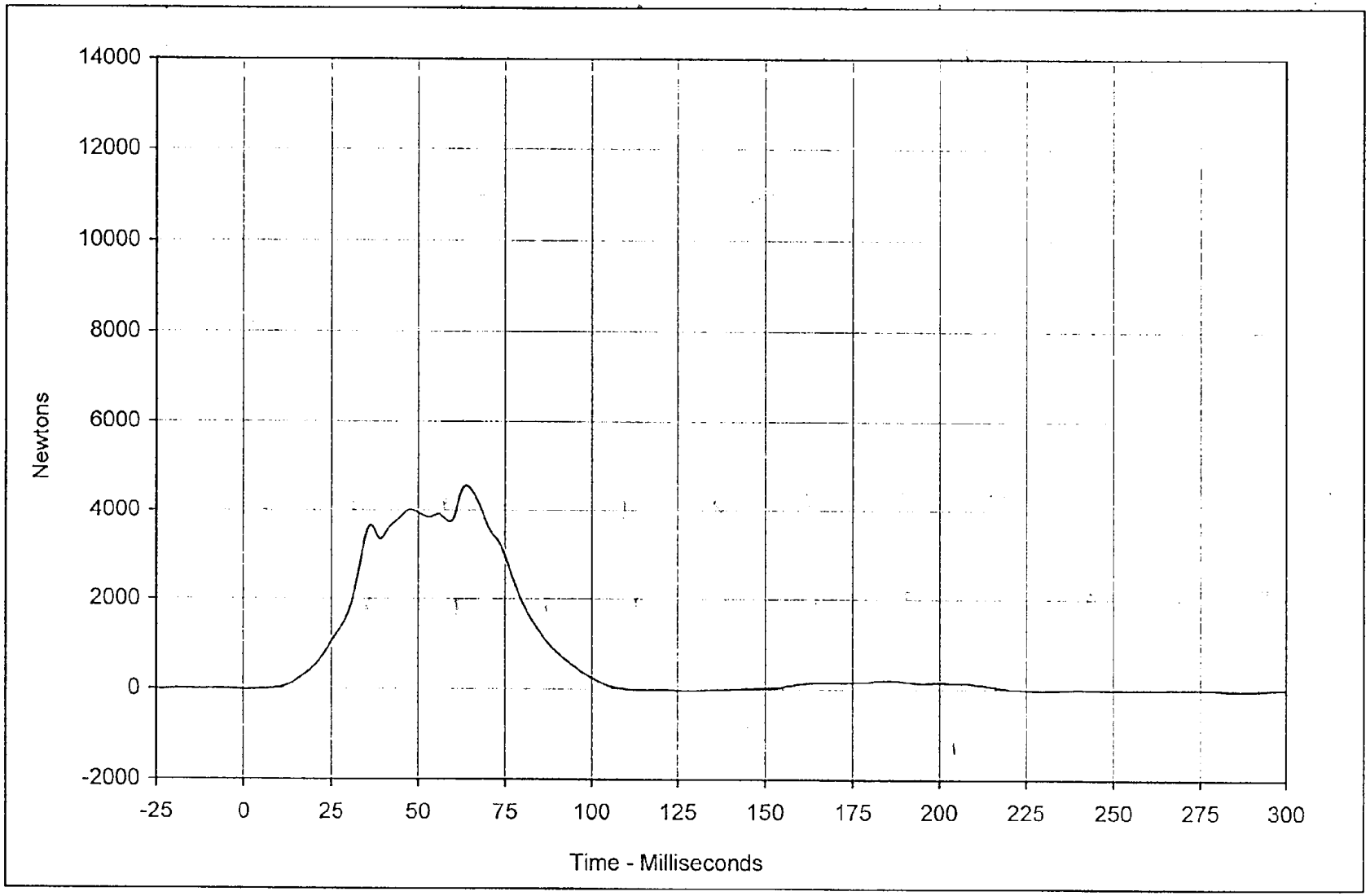
B58



Curve Description:	Driver Lap Belt Force			
Maximum Value:	4554.2	at	63.9	Milliseconds
Minimum Value:	-33.0	at	127.9	Milliseconds
SAE Filter Class:	60			
Date of Test:	4/24/97			
Curve Number:	FIL-041			

Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

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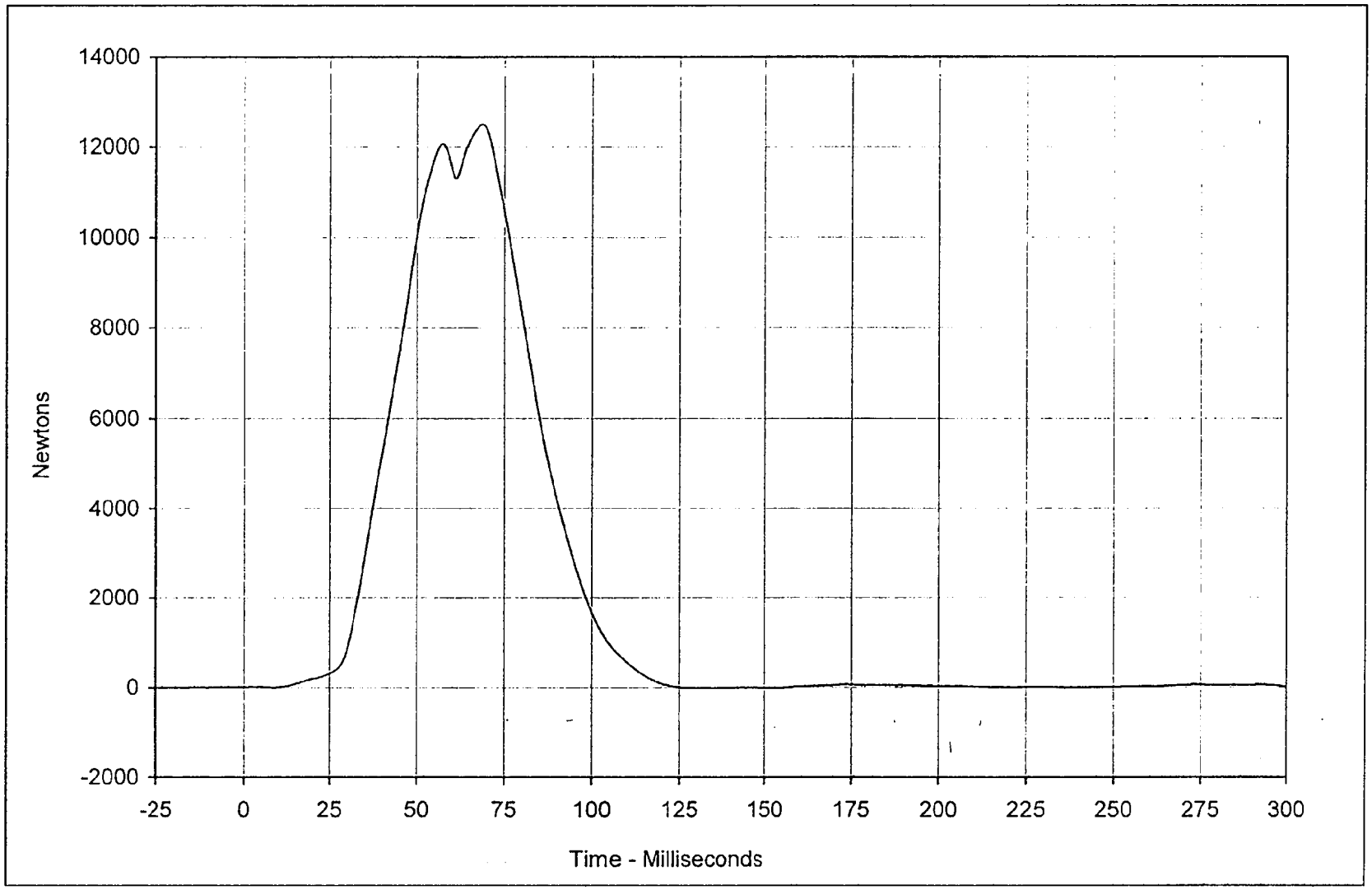

Curve Description:	Driver Shoulder Belt Force			Testing Program:	1997 New Car Assesment Program
Maximum Value:	12486.3	at	68.7 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-10.0	at	136.6 Milliseconds		
SAE Filter Class:	60				
Date of Test:	4/24/97				
Curve Number:	FIL-042				

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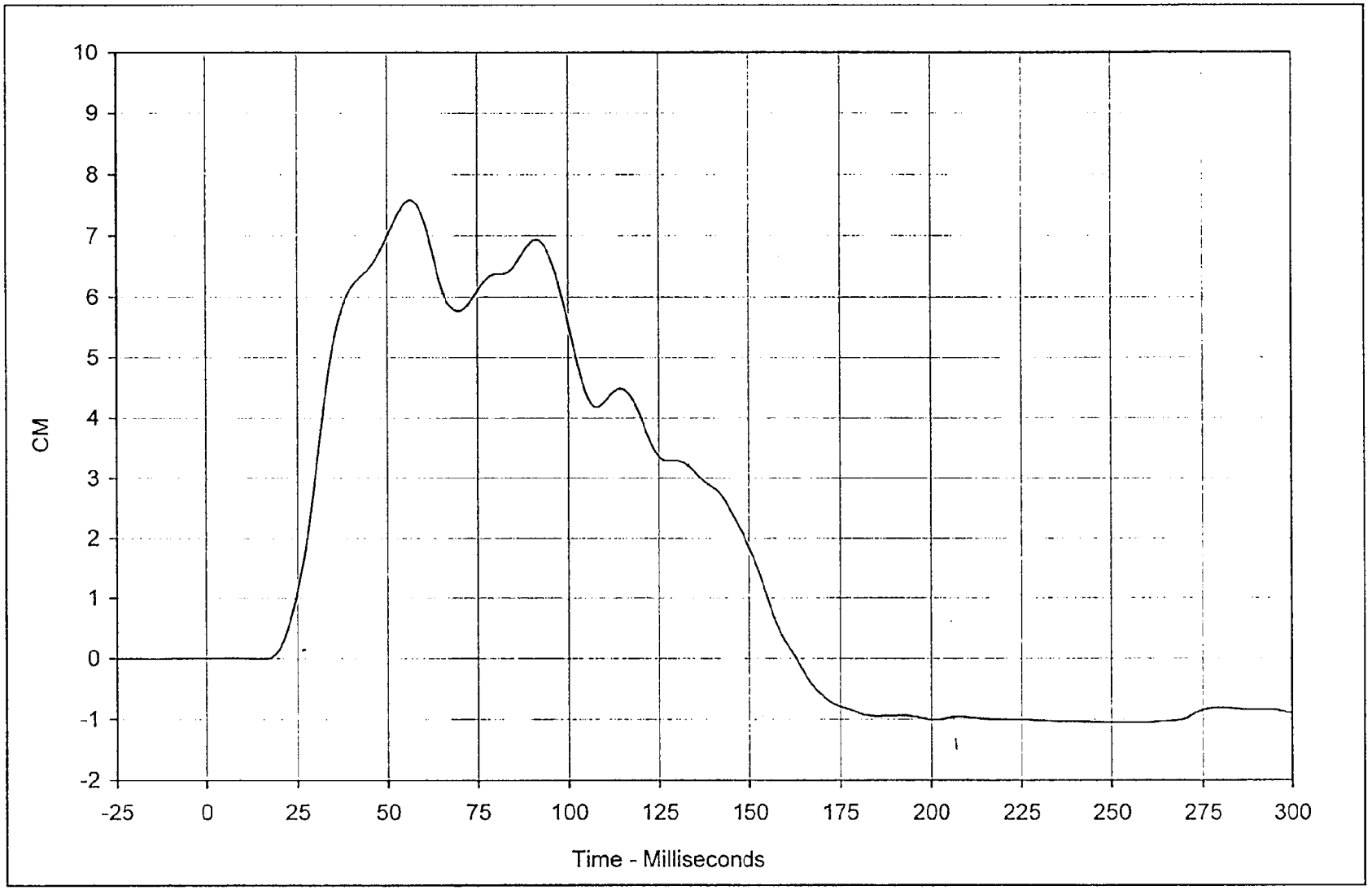
B60



Curve Description:	Driver Shoulder Belt Pullout			Testing Program:	1997 New Car Assesment Program
Maximum Value:	7.58	at	56.4 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-1.06	at	254.7 Milliseconds		
SAE Filter Class:	60				
Date of Test:	4/24/97				
Curve Number:	FIL-043				

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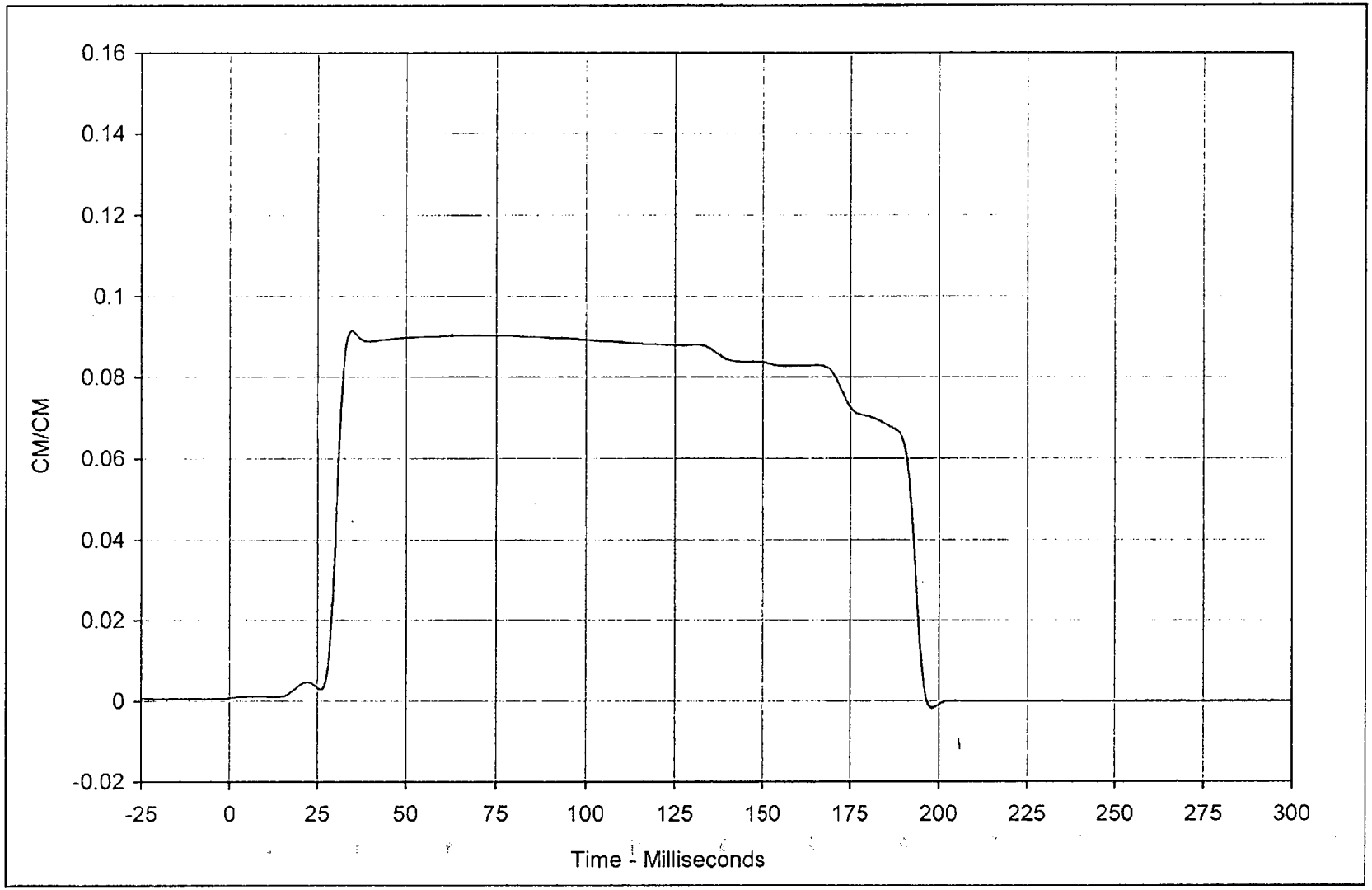
B61



Curve Description:	Driver Shoulder Belt Elongation			Testing Program:	1997 New Car Assesment Program
Maximum Value:	0.091	at	34.7 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-0.002	at	198.2 Milliseconds		
SAE Filter Class:	60				
Date of Test:	4/24/97				
Curve Number:	FIL-044				

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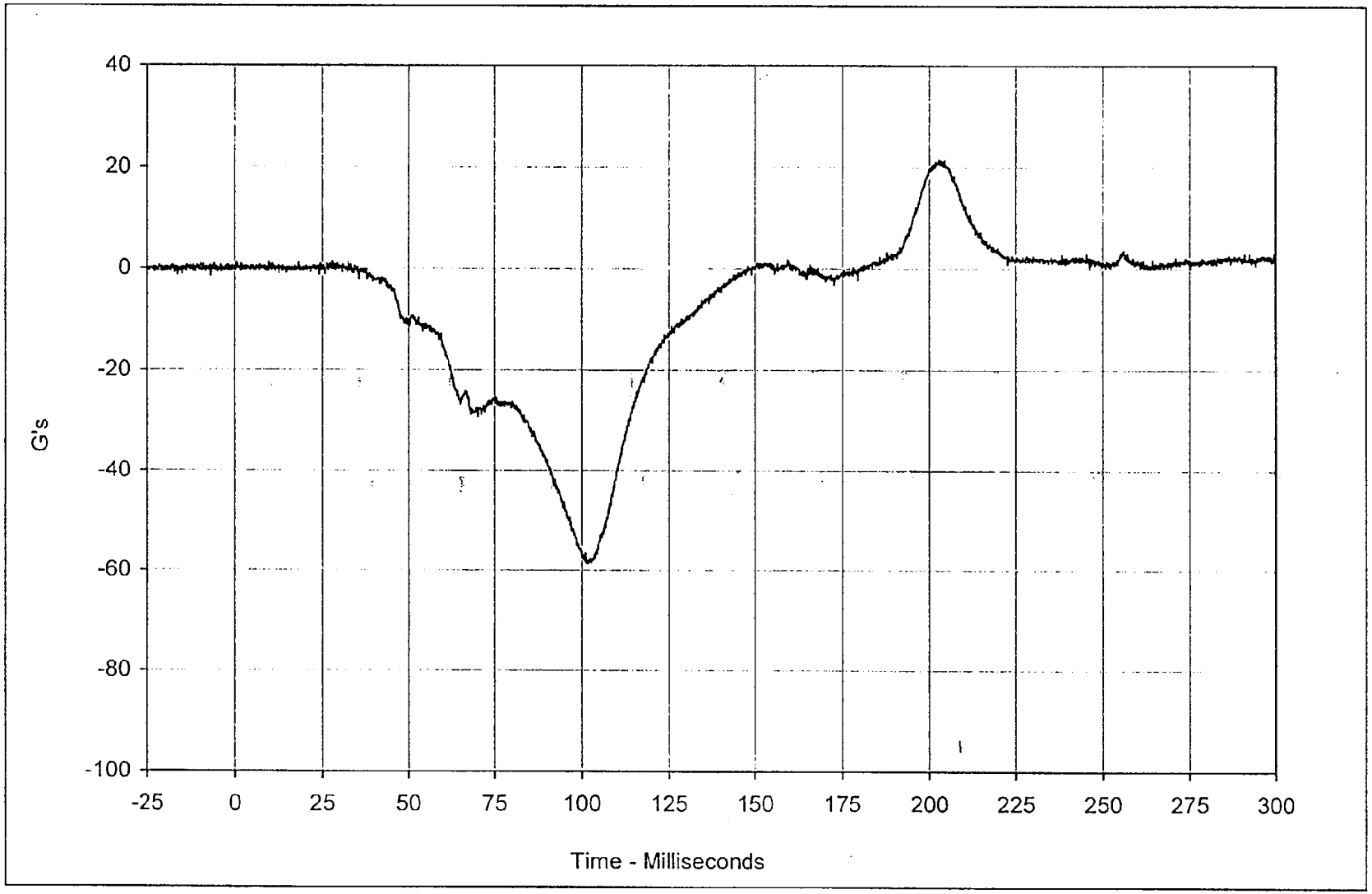
B62



Curve Description:	Passenger Head Primary X				
Maximum Value:	21.5	at	202.8	Milliseconds	
Minimum Value:	-58.7	at	101.7	Milliseconds	
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	FIL-045				

Testing Program:	1997 New Car Assesment Program
Test Vehicle:	1997 Kia Sportage

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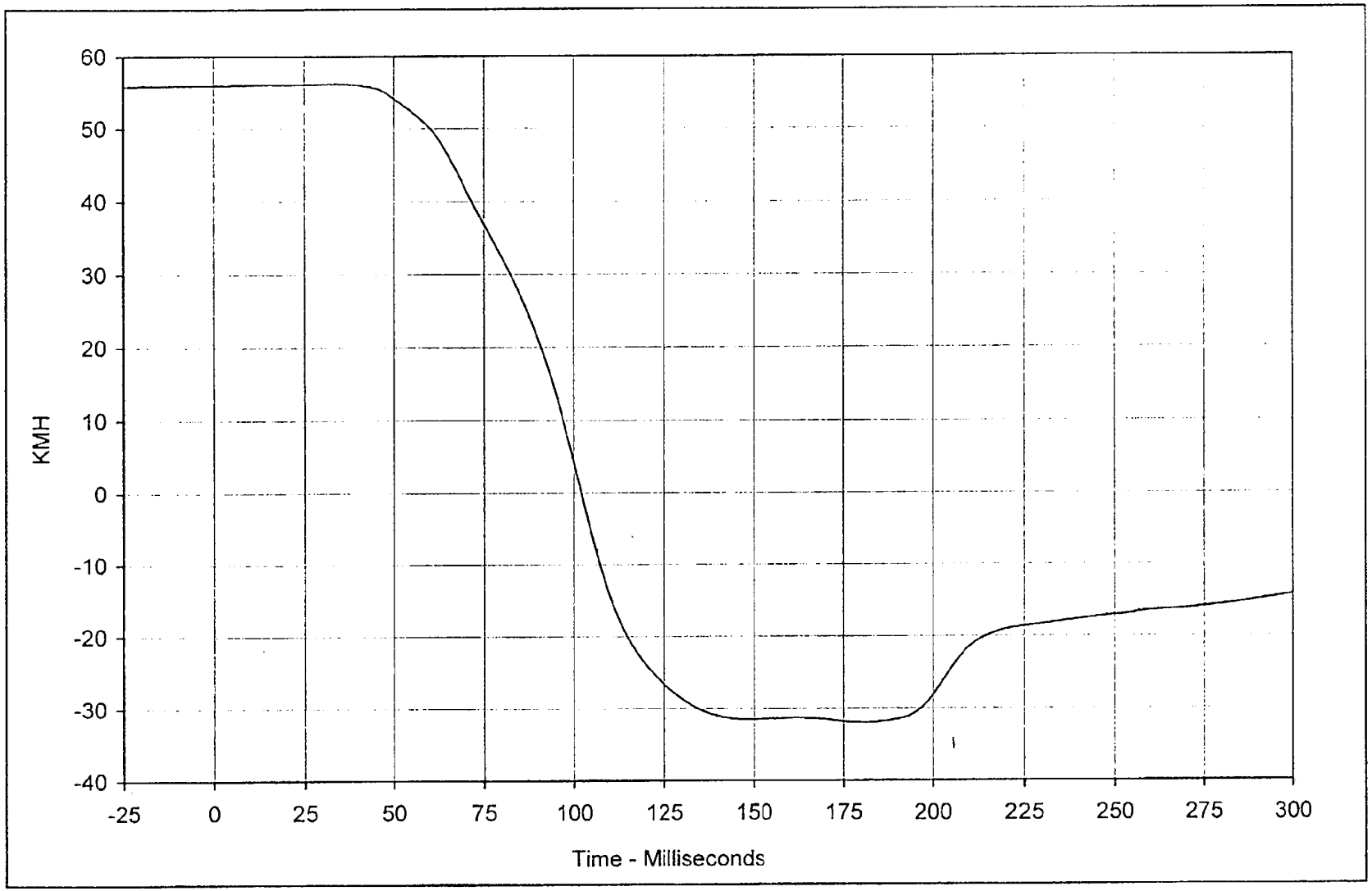

Curve Description: Passenger Head Primary X Velocity

Maximum Value: 56.1 at 33.0 Milliseconds

Minimum Value: -32.0 at 180.7 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN1-045

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

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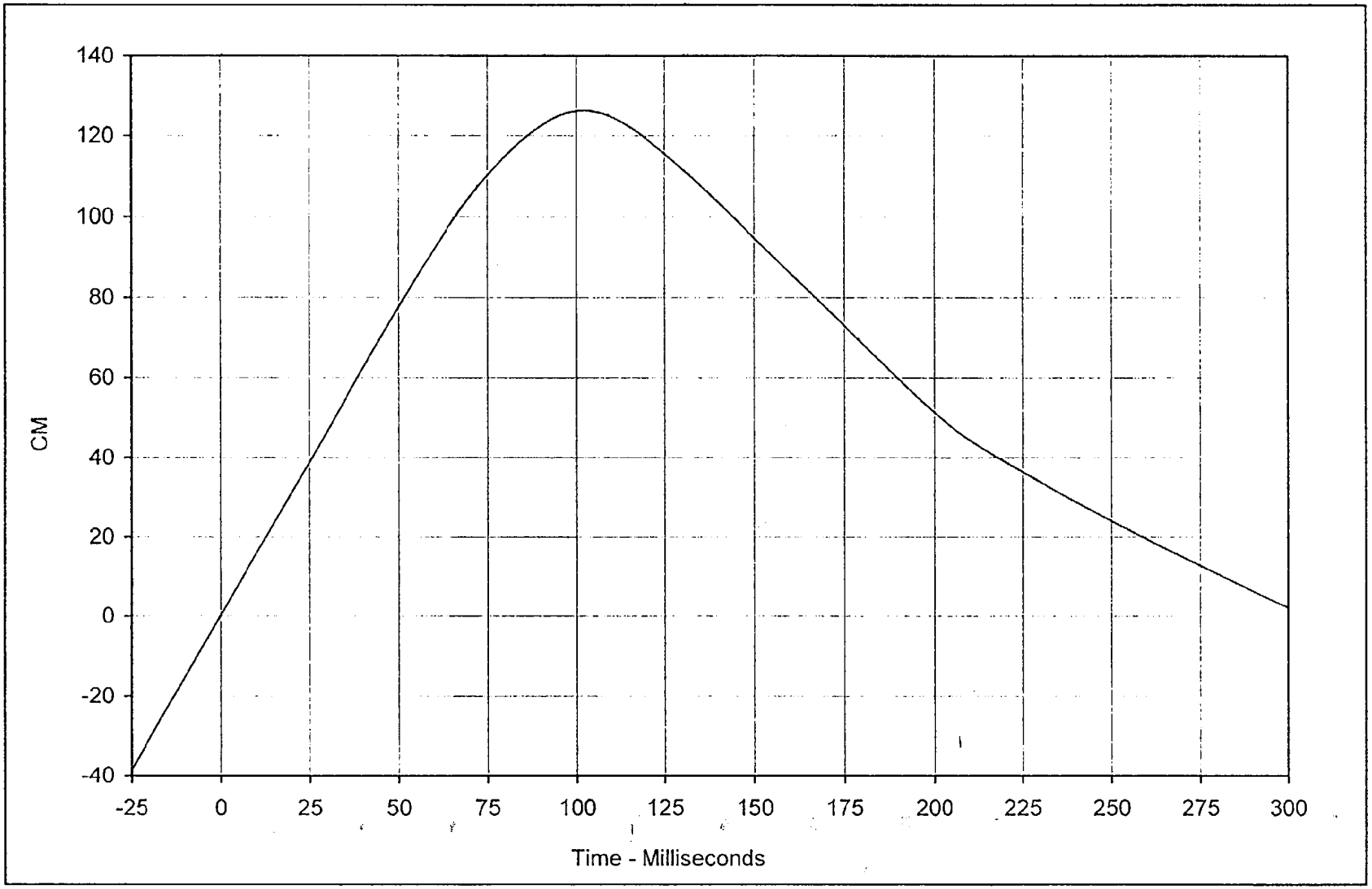

Curve Description:	Passenger Head Primary X Displ.				Testing Program:	1997 New Car Assessment Program
Maximum Value:	126.3	at	102.1	Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	0.1	at	0.0	Milliseconds		
SAE Filter Class:	180					
Date of Test:	4/24/97					
Curve Number:	IN2-045					

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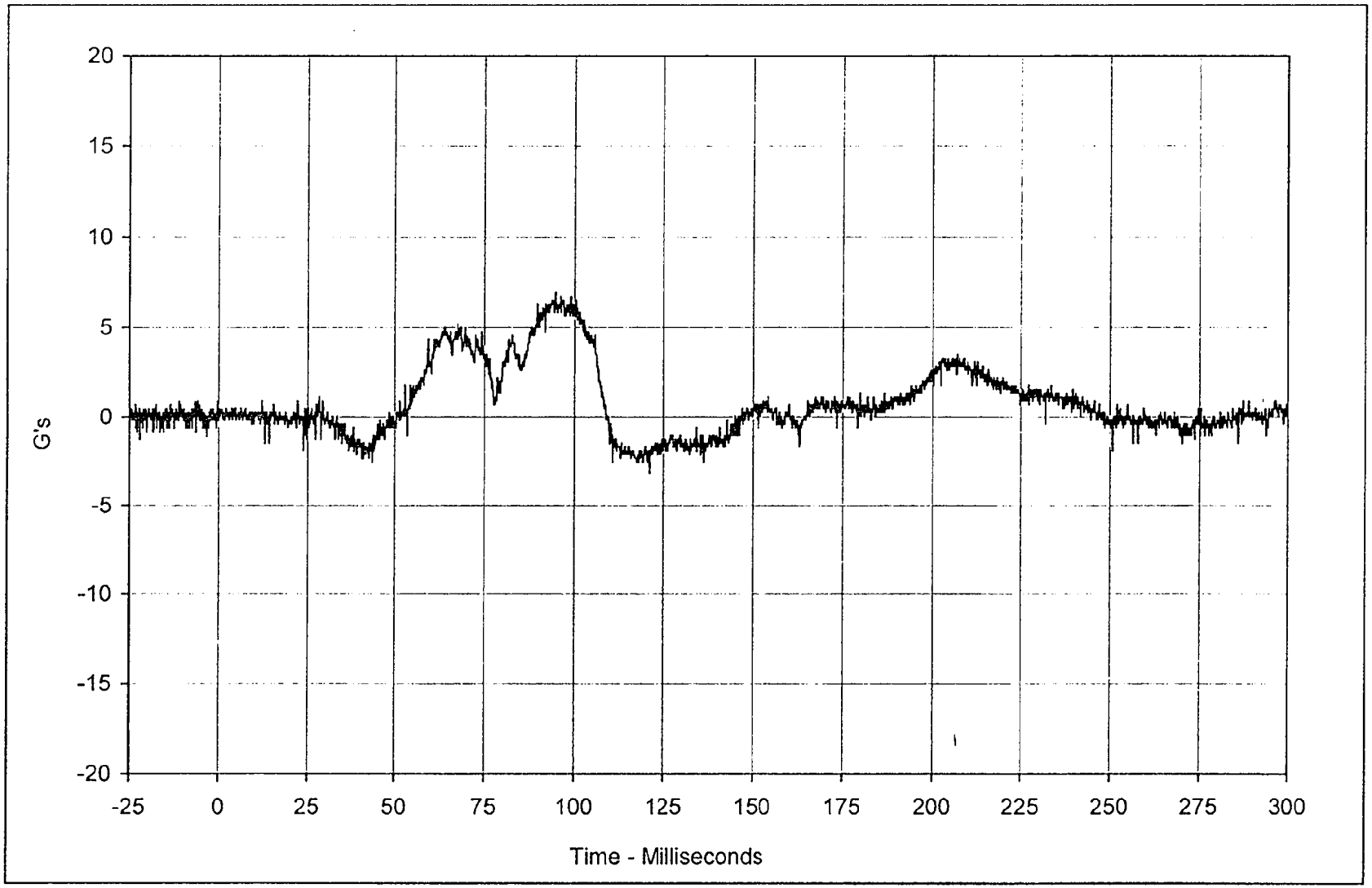

Curve Description:	Passenger Head Primary Y				
Maximum Value:	6.9	at	94.5	Milliseconds	
Minimum Value:	-3.2	at	120.9	Milliseconds	
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	FIL-046				

Testing Program:	1997 New Car Assesment Program
Test Vehicle:	1997 Kia Sportage

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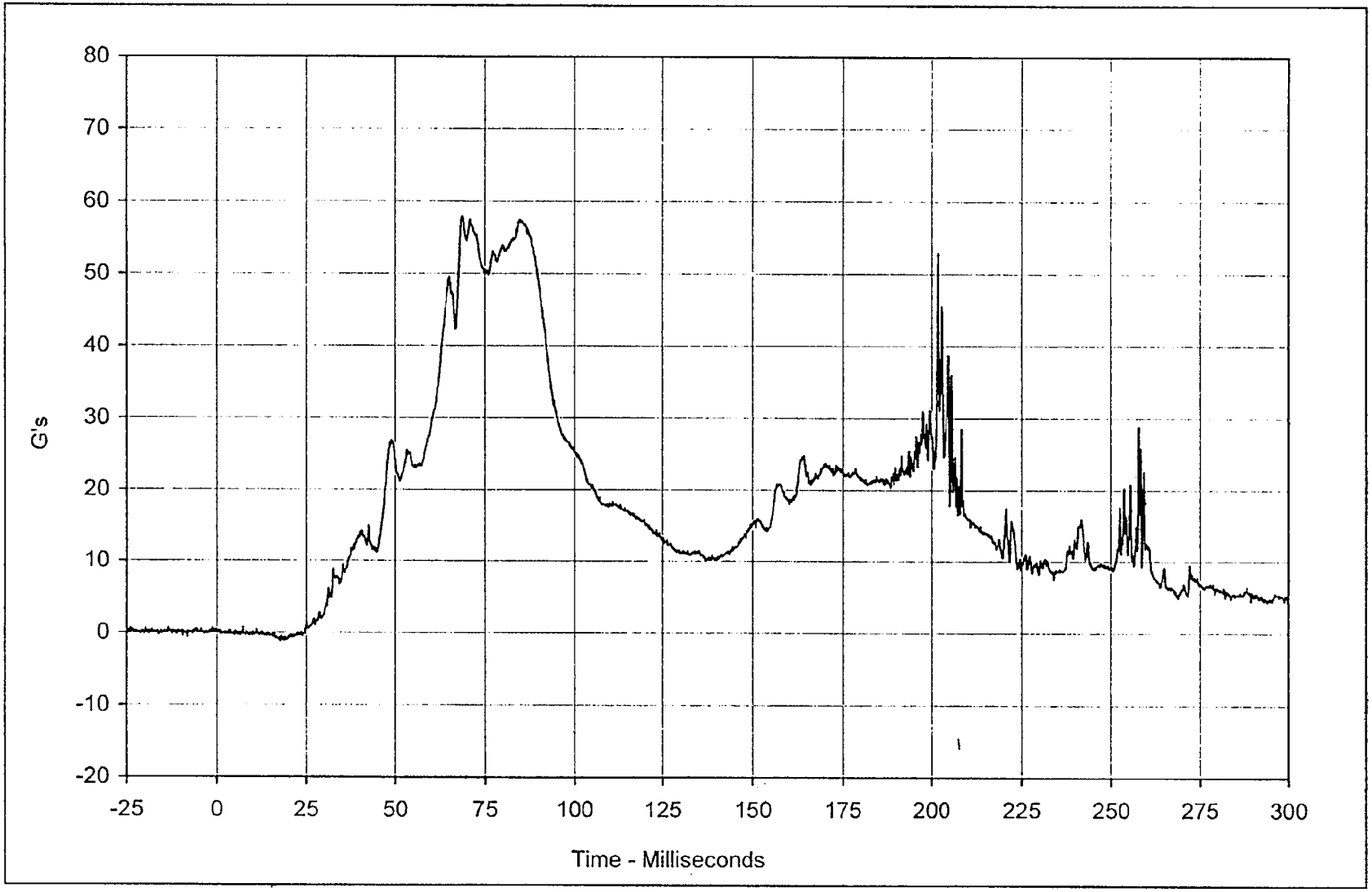
B66



Curve Description:	Passenger Head Primary Z			Testing Program:	1997 New Car Assesment Program
Maximum Value:	58.0	at	68.7 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-1.2	at	17.8 Milliseconds		
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	FIL-047				

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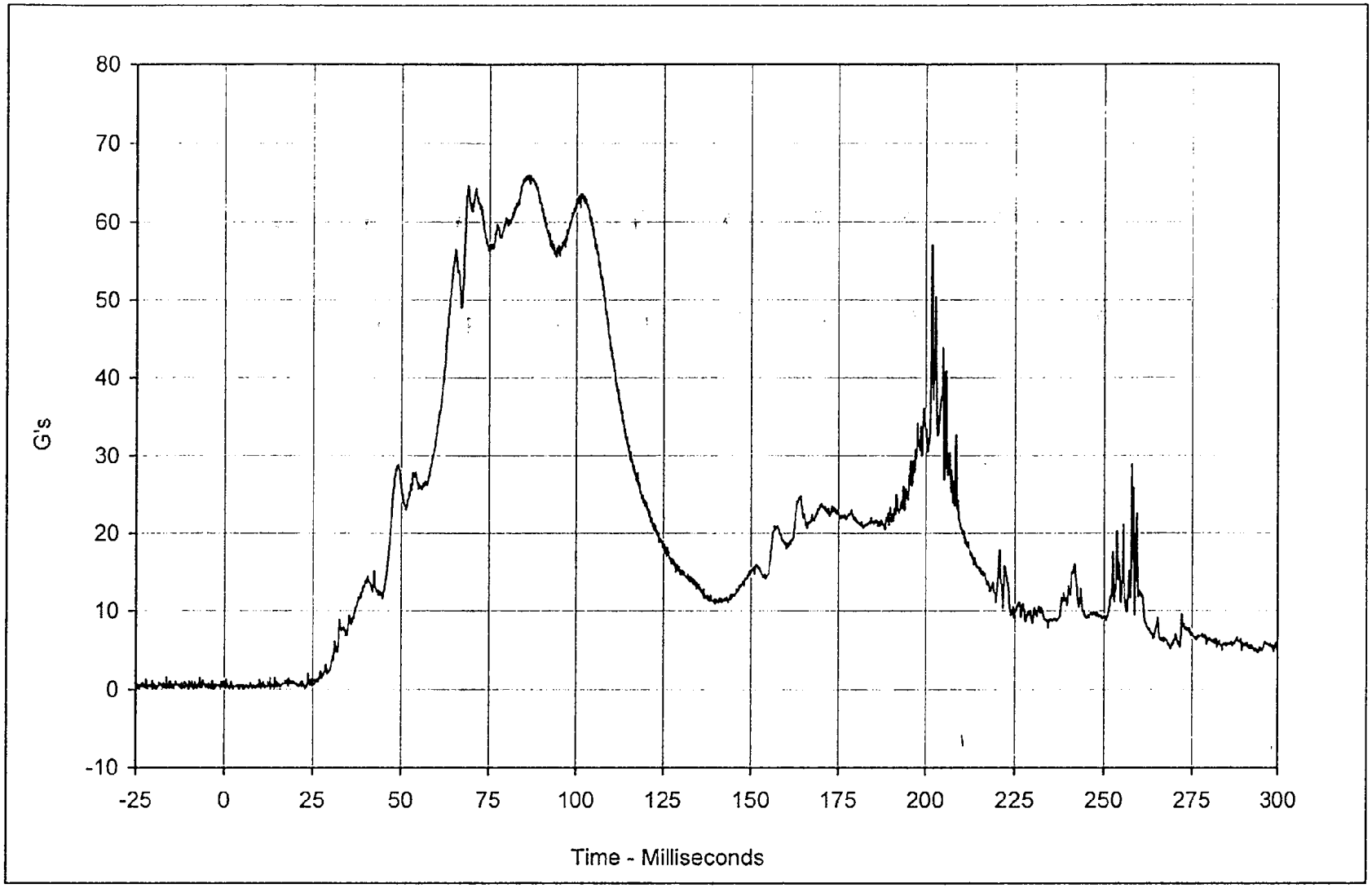

Curve Description:	Passenger Head Resultant Primary				Testing Program:	1997 New Car Assesment Program
Maximum Value:	66.0	at	86.2	Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	0.1	at	2.4	Milliseconds		
SAE Filter Class:	1000					
Date of Test:	4/24/97					
Curve Number:	RES-045					

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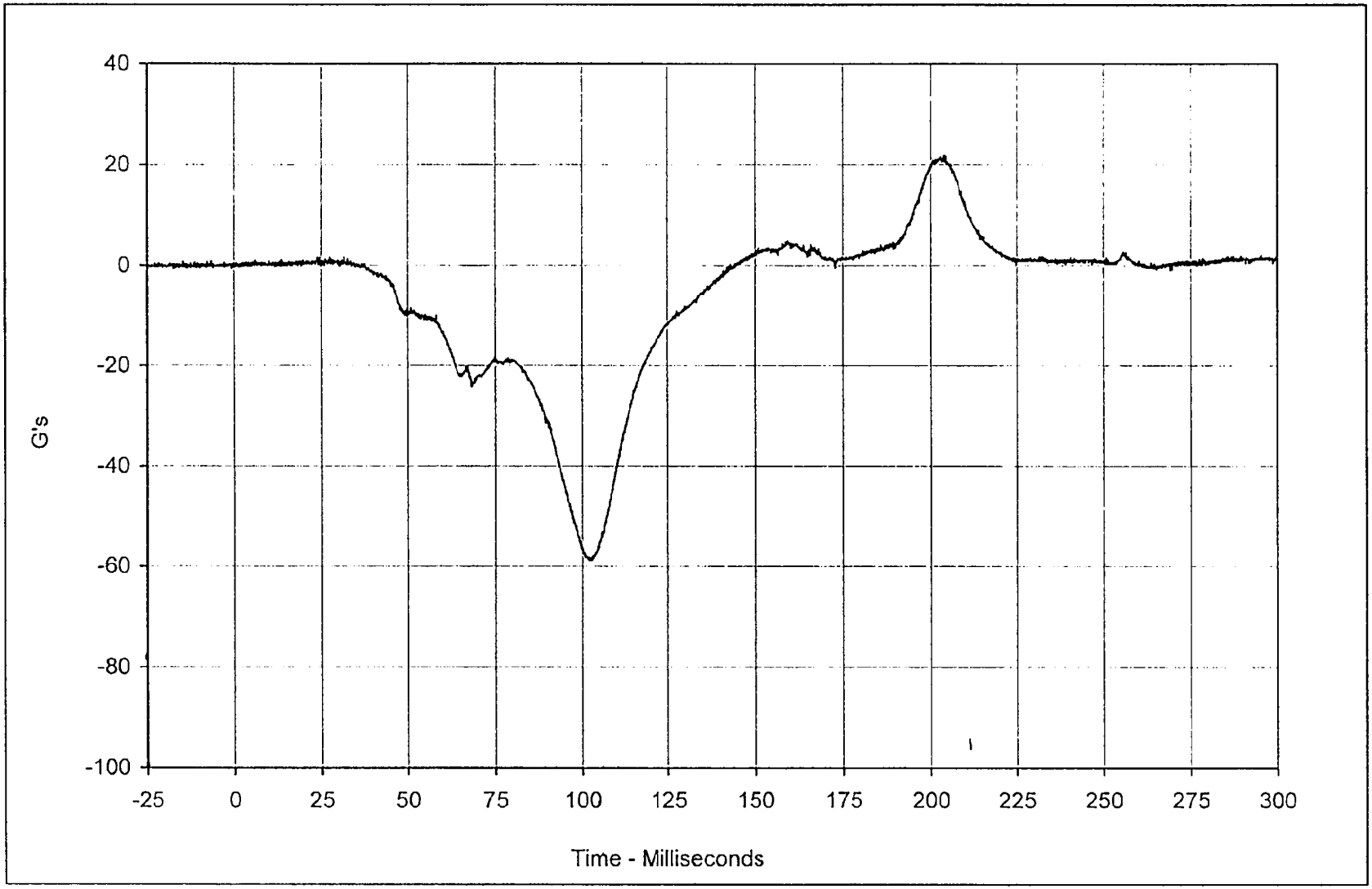
B68



Curve Description:	Passenger Head Redundant X			Testing Program:	1997 New Car Assesment Program
Maximum Value:	21.8	at	203.9 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-58.9	at	102.1 Milliseconds		
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	FIL-048				

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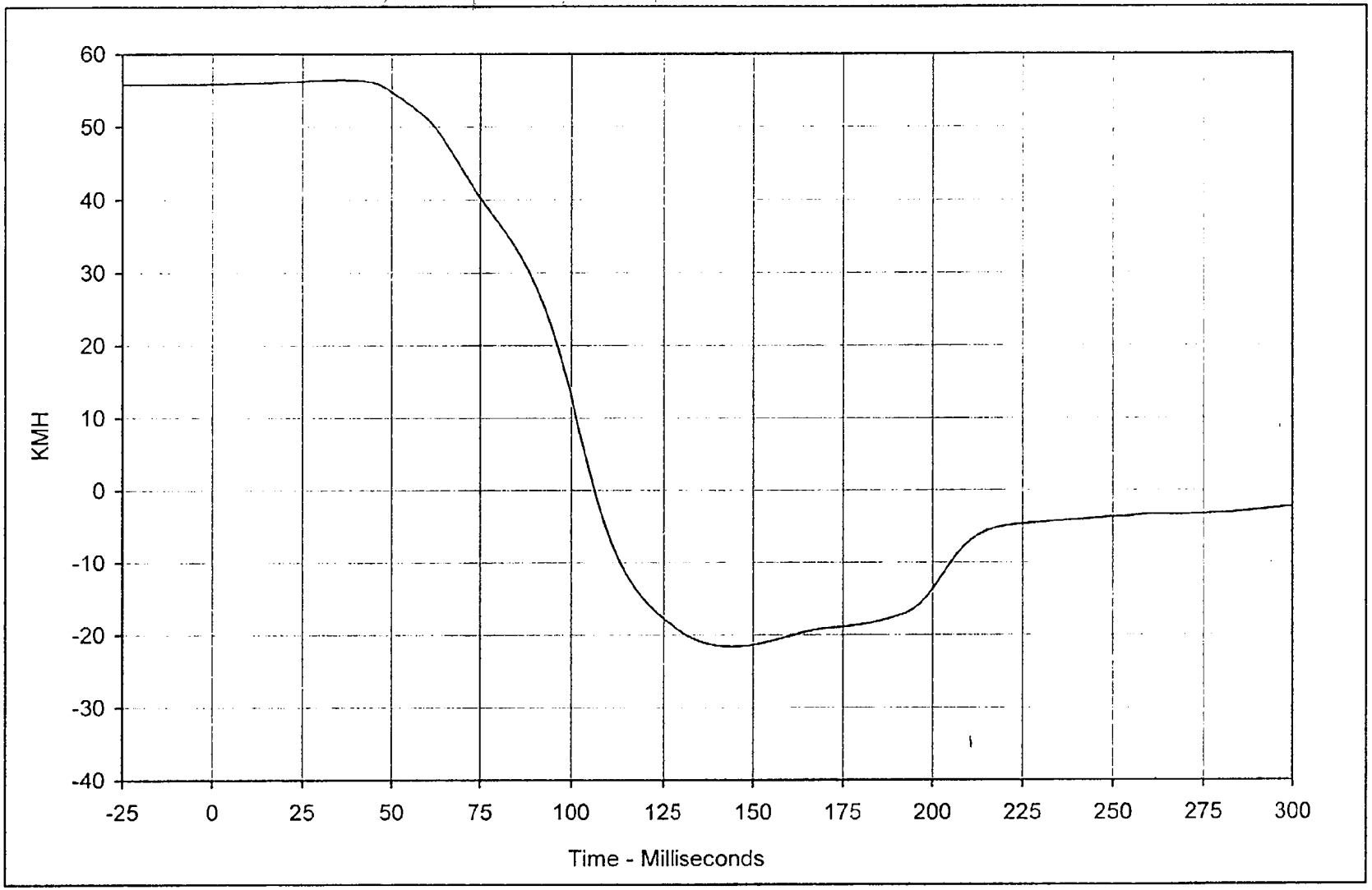

Curve Description: Passenger Head Redundant X Velocity

Maximum Value: 56.5 at 35.5 Milliseconds

Minimum Value: -21.6 at 144.4 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN1-048

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

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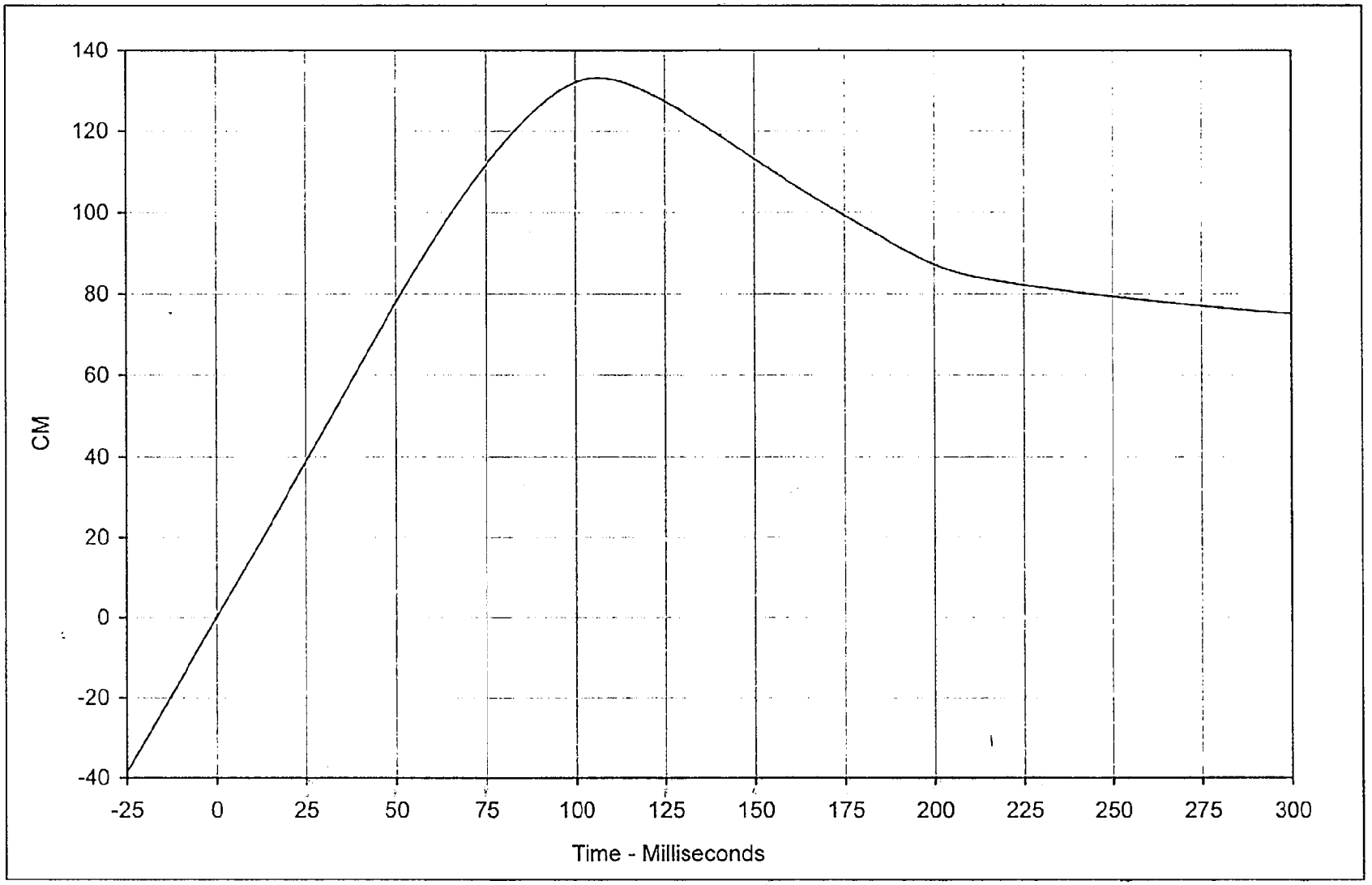

Curve Description:	Passenger Head Redundant X Displ.				Testing Program:	1997 New Car Assessment Program
Maximum Value:	133.2	at	106.4	Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	0.1	at	0.0	Milliseconds		
SAE Filter Class:	180					
Date of Test:	4/24/97					
Curve Number:	IN2-048					

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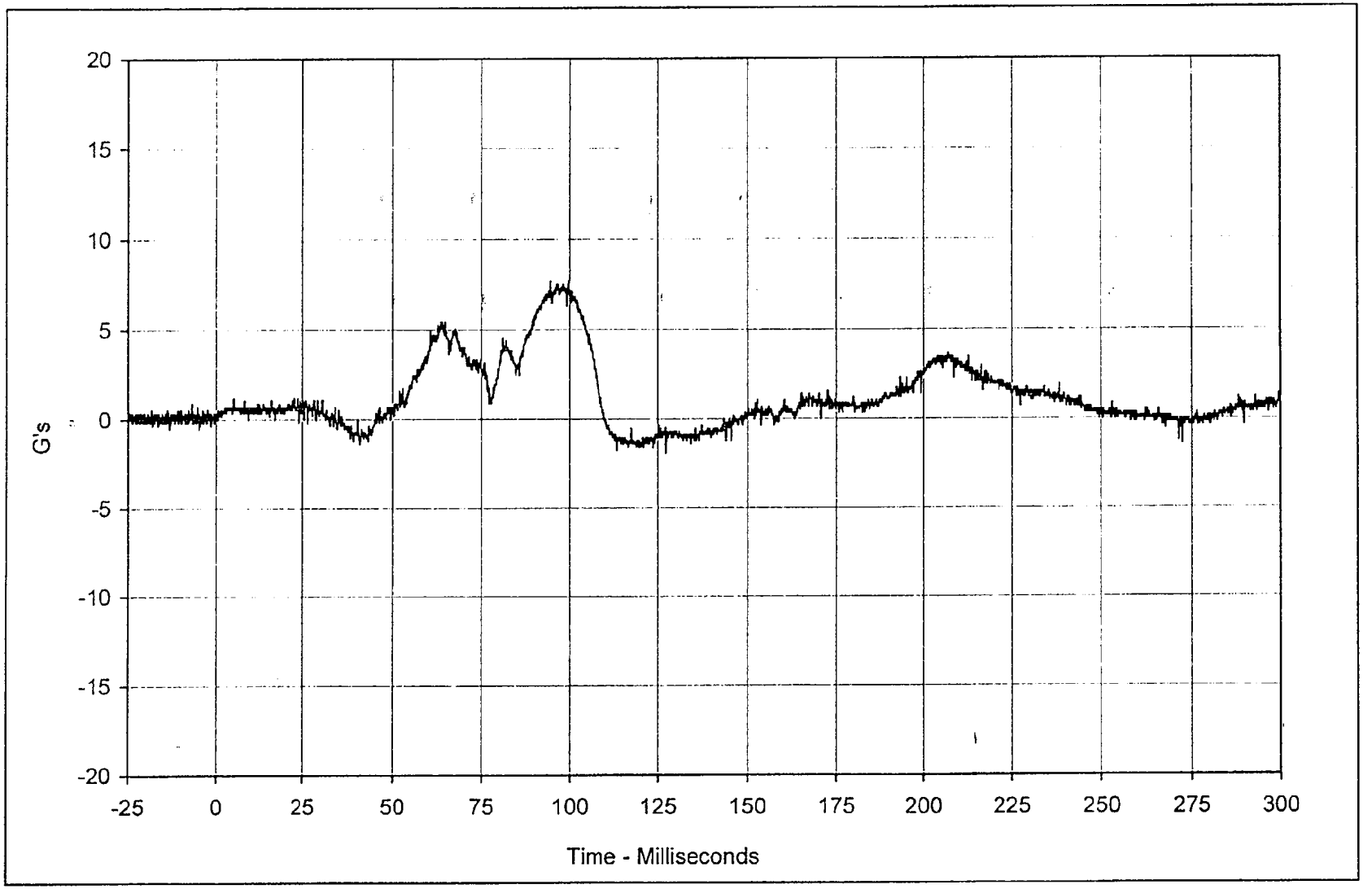

Curve Description: Passenger Head Redundant Y

Maximum Value: 7.7 at 94.5 Milliseconds

Minimum Value: -1.9 at 127.2 Milliseconds

SAE Filter Class: 1000

Date of Test: 4/24/97

Curve Number: FIL-049

Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

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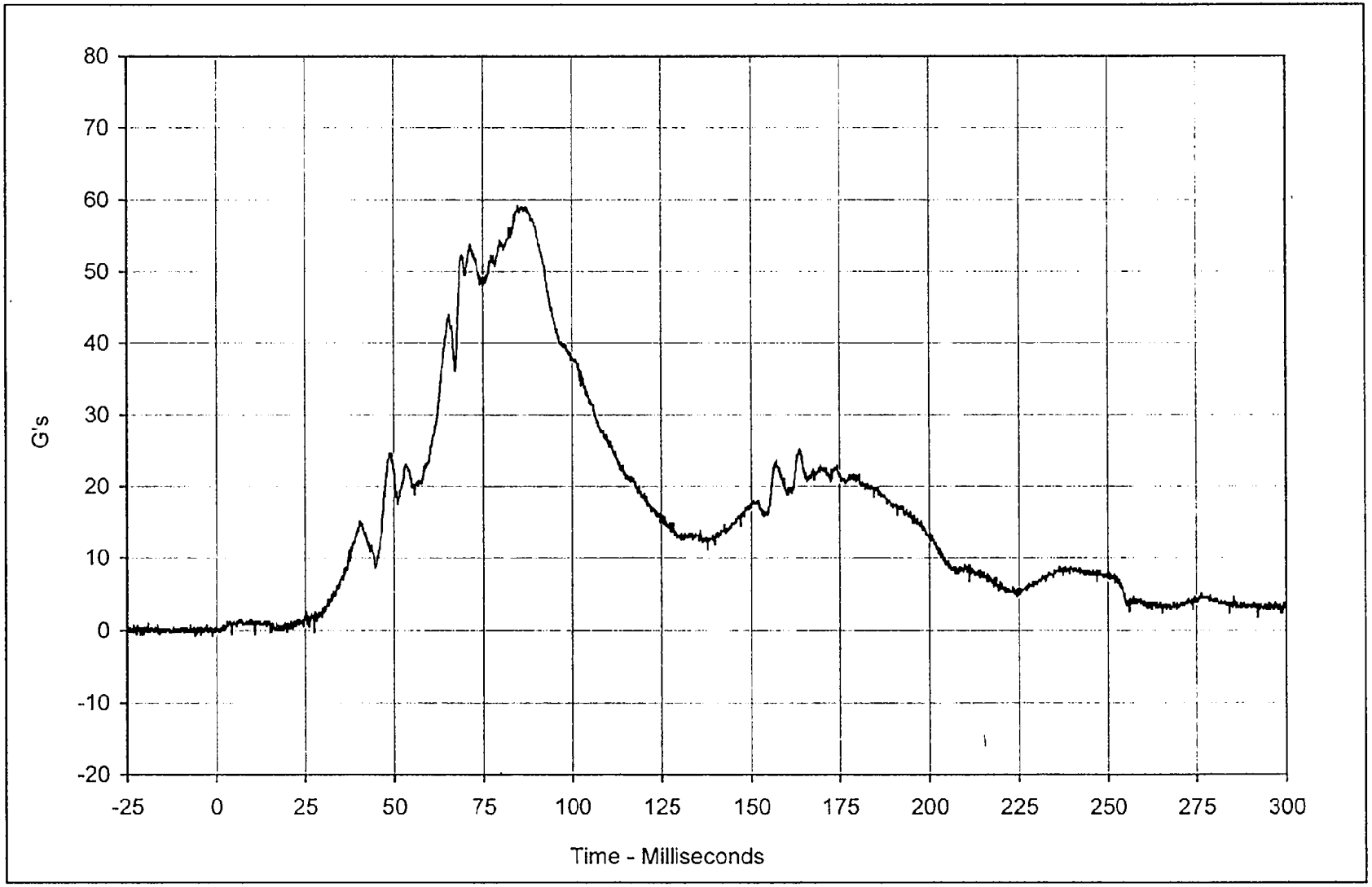
B72



Curve Description:	Passenger Head Redundant Z			Testing Program:	1997 New Car Assesment Program
Maximum Value:	59.2	at	84.8 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-1.5	at	-25.6 Milliseconds		
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	FIL-050				

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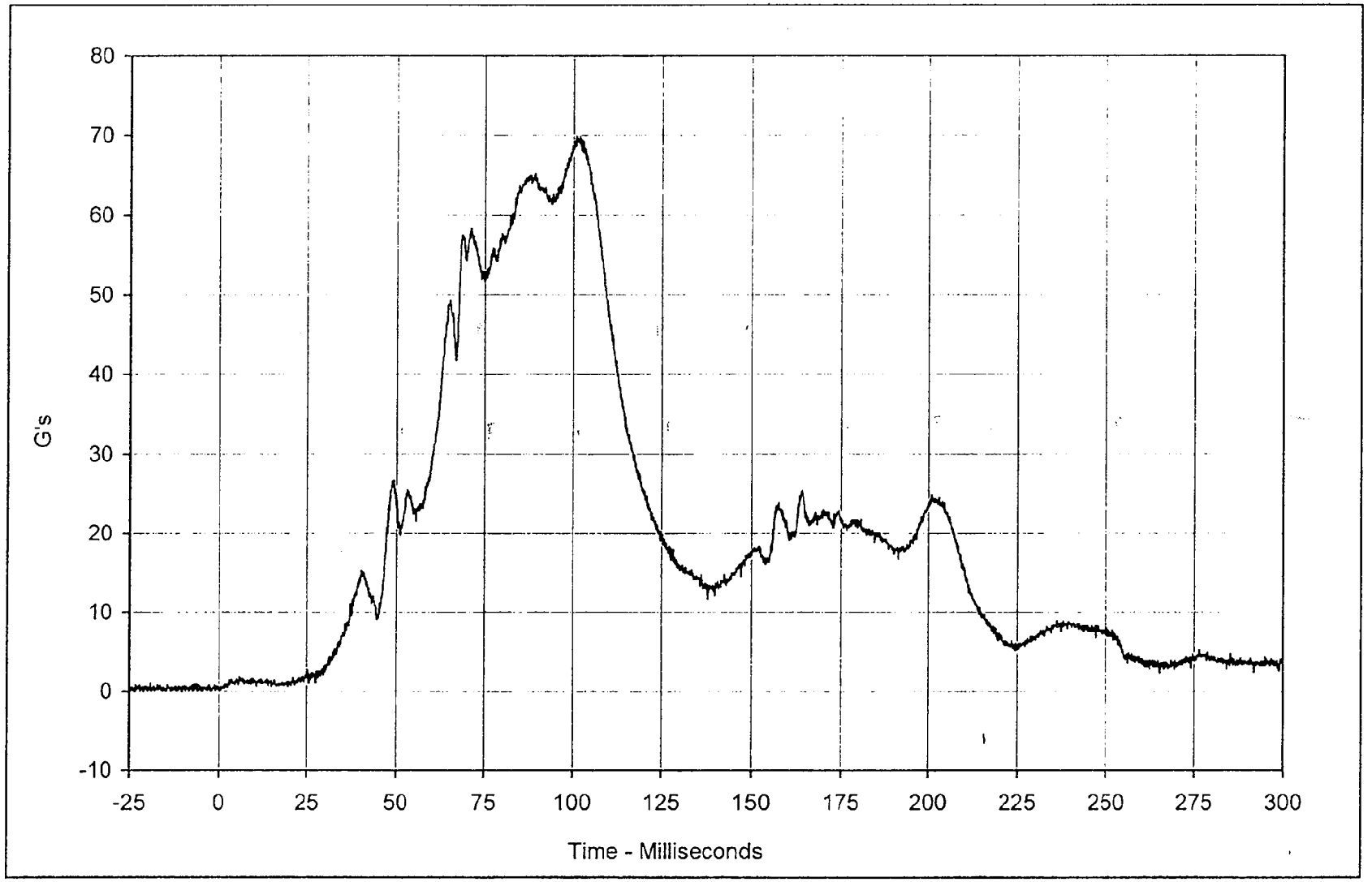
B73



Curve Description:	Passenger Head Resultant Redundant				Testing Program:	1997 New Car Assesment Program
Maximum Value:	69.8	at	100.8	Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	0.2	at	0.1	Milliseconds		
SAE Filter Class:	1000					
Date of Test:	4/24/97					
Curve Number:	RES-048					

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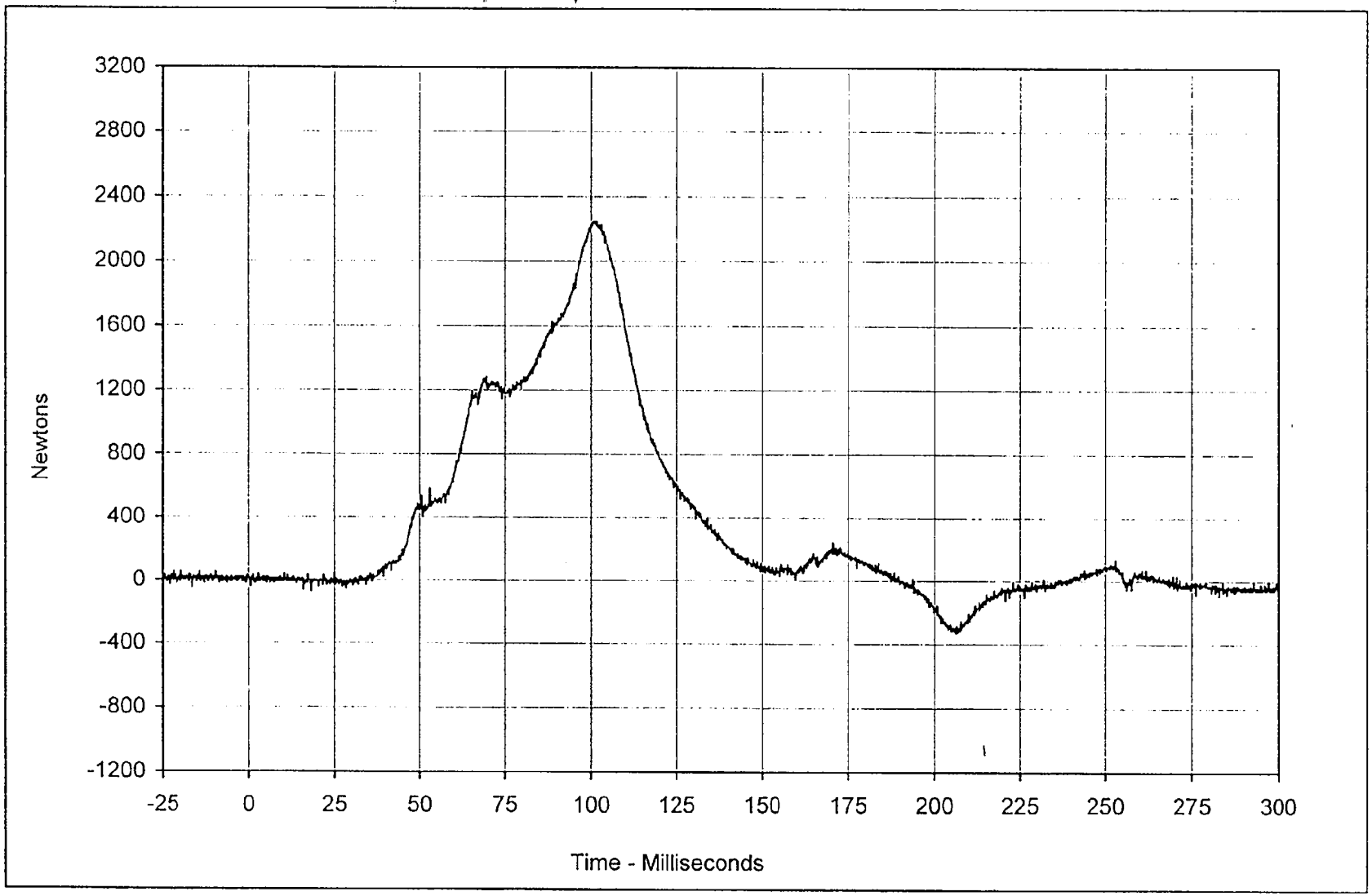

Curve Description: Passenger Neck Force X

Maximum Value: 2247.8 at 100.7 Milliseconds

Minimum Value: -326.1 at 206.2 Milliseconds

SAE Filter Class: 1000

Date of Test: 4/24/97

Curve Number: FIL-051

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

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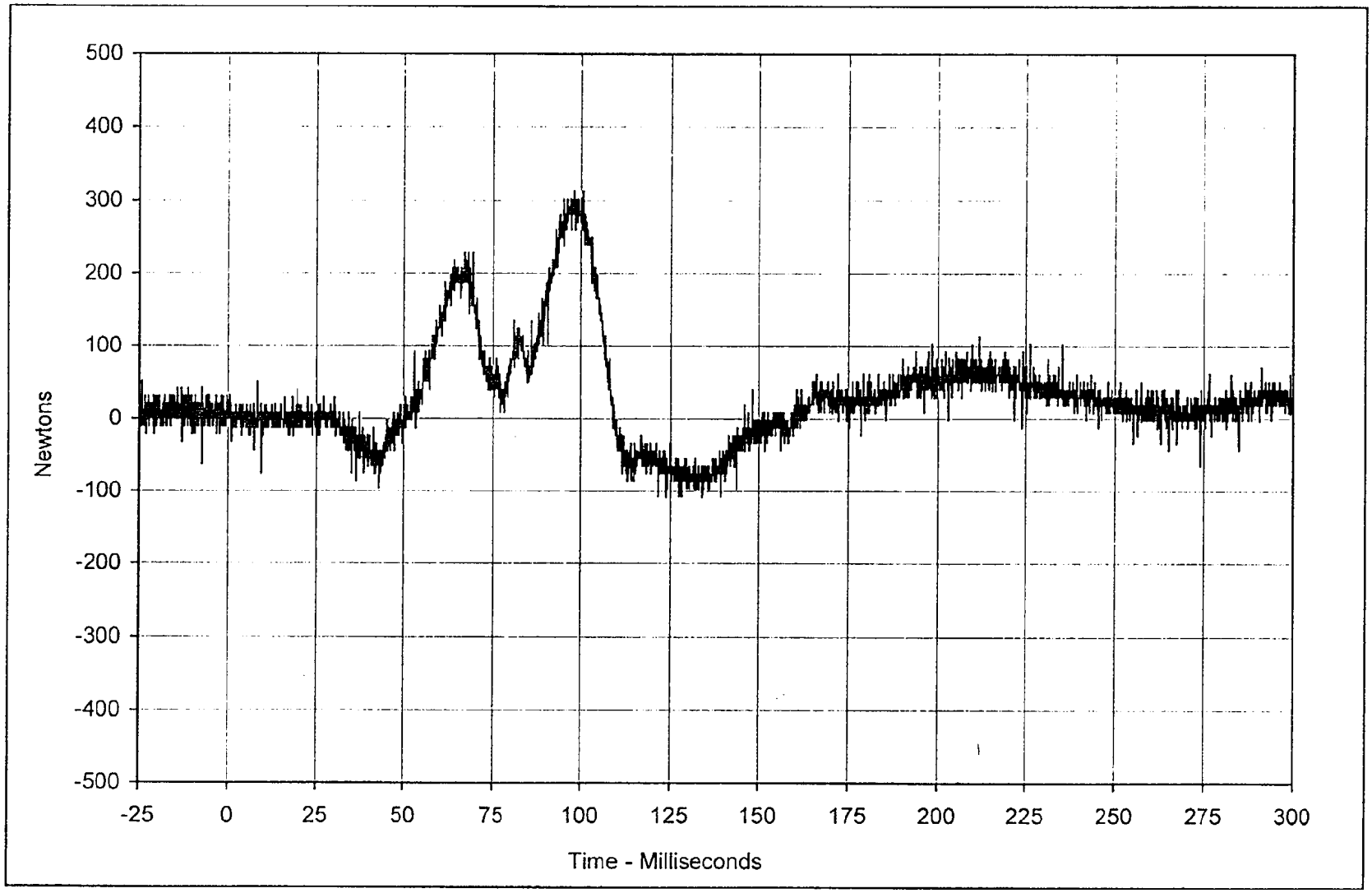

Curve Description:	Passenger Neck Force Y			Testing Program:	1997 New Car Assessment Program
Maximum Value:	313.0	at	98.1 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-107.0	at	121.7 Milliseconds		
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	FIL-052				

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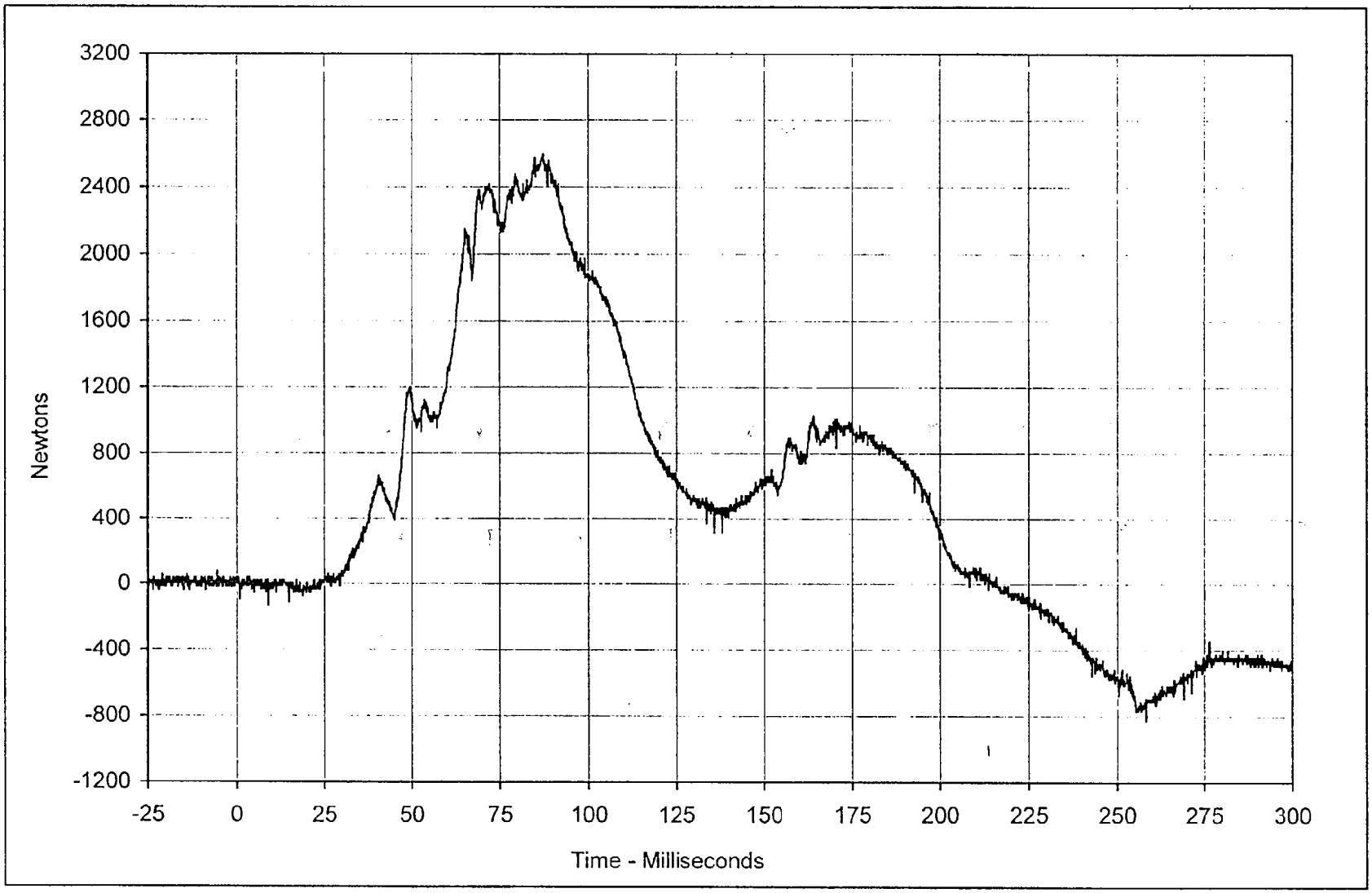

Curve Description:	Passenger Neck Force Z			
Maximum Value:	2596.6	at	87.1	Milliseconds
Minimum Value:	-828.1	at	258.2	Milliseconds
SAE Filter Class:	1000			
Date of Test:	4/24/97			
Curve Number:	FIL-053			

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

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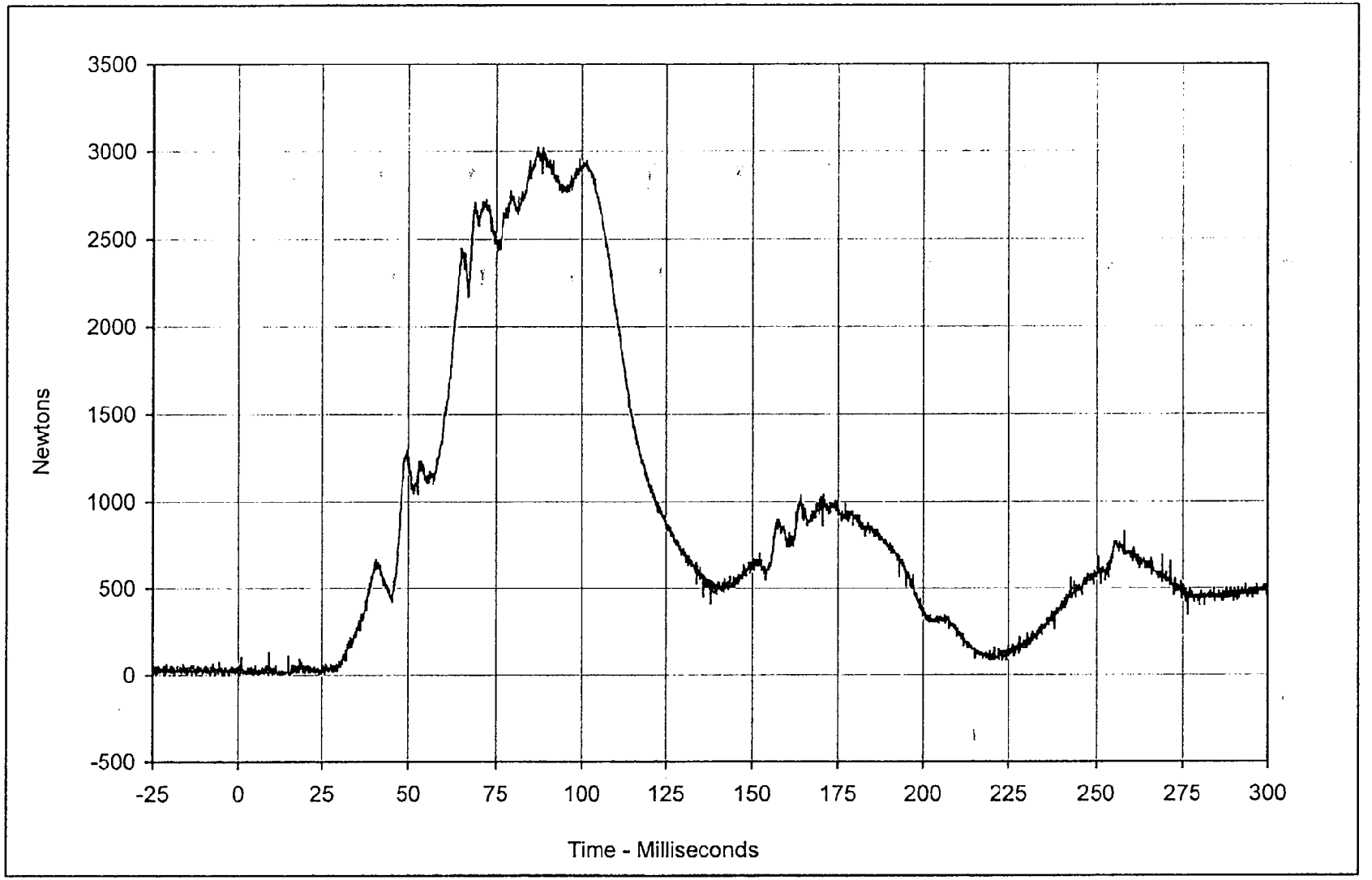

Curve Description: Passenger Neck Force Resultant

Maximum Value: 3023.7 at 87.1 Milliseconds

Minimum Value: 0.0 at 0.3 Milliseconds

SAE Filter Class: 1000

Date of Test: 4/24/97

Curve Number: RES-051

Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

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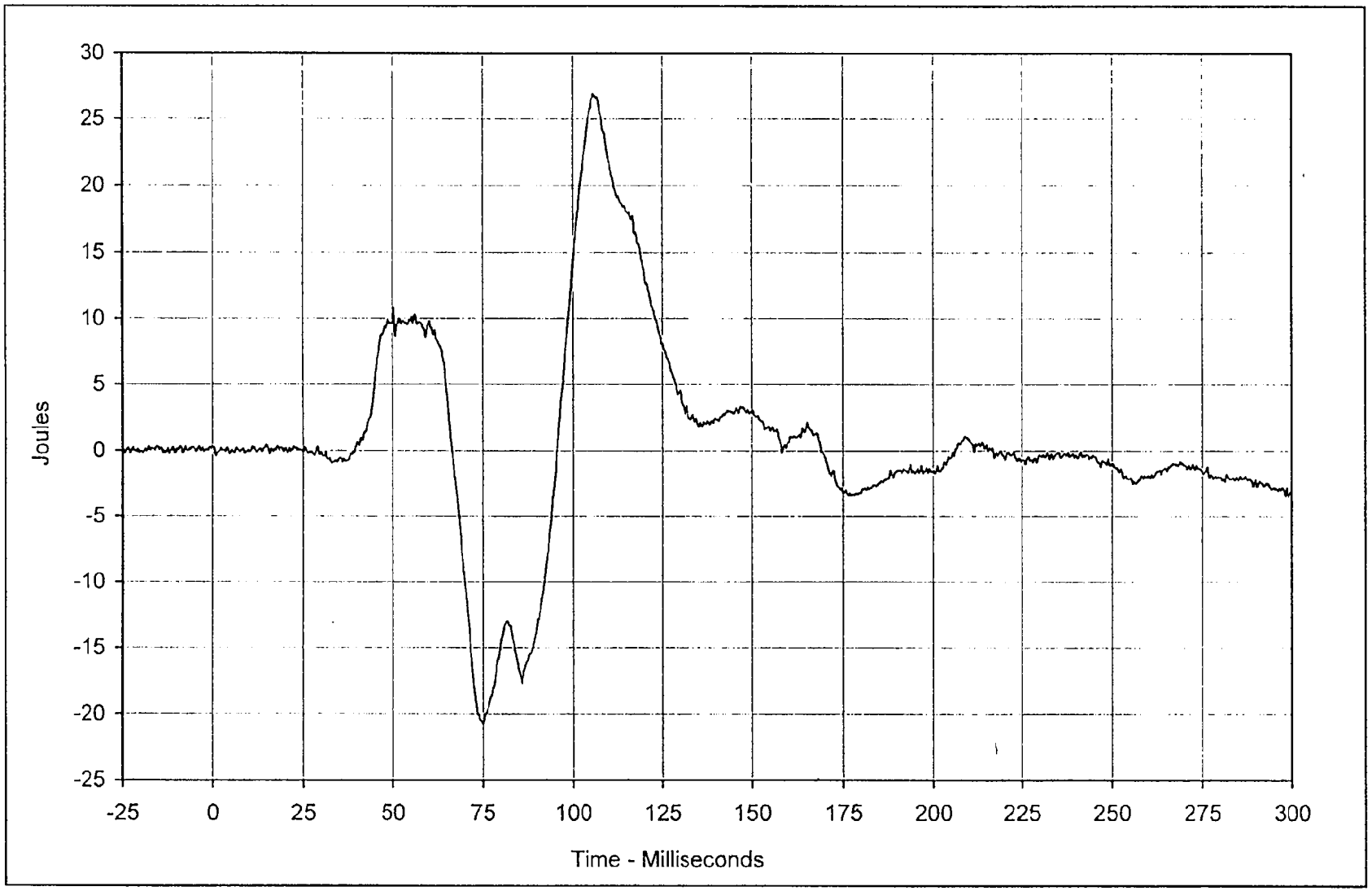

Curve Description:	Passenger Neck Moment X			Testing Program:	1997 New Car Assessment Program
Maximum Value:	26.9	at	105.9 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-20.7	at	75.0 Milliseconds		
SAE Filter Class:	600				
Date of Test:	4/24/97				
Curve Number:	FIL-054				

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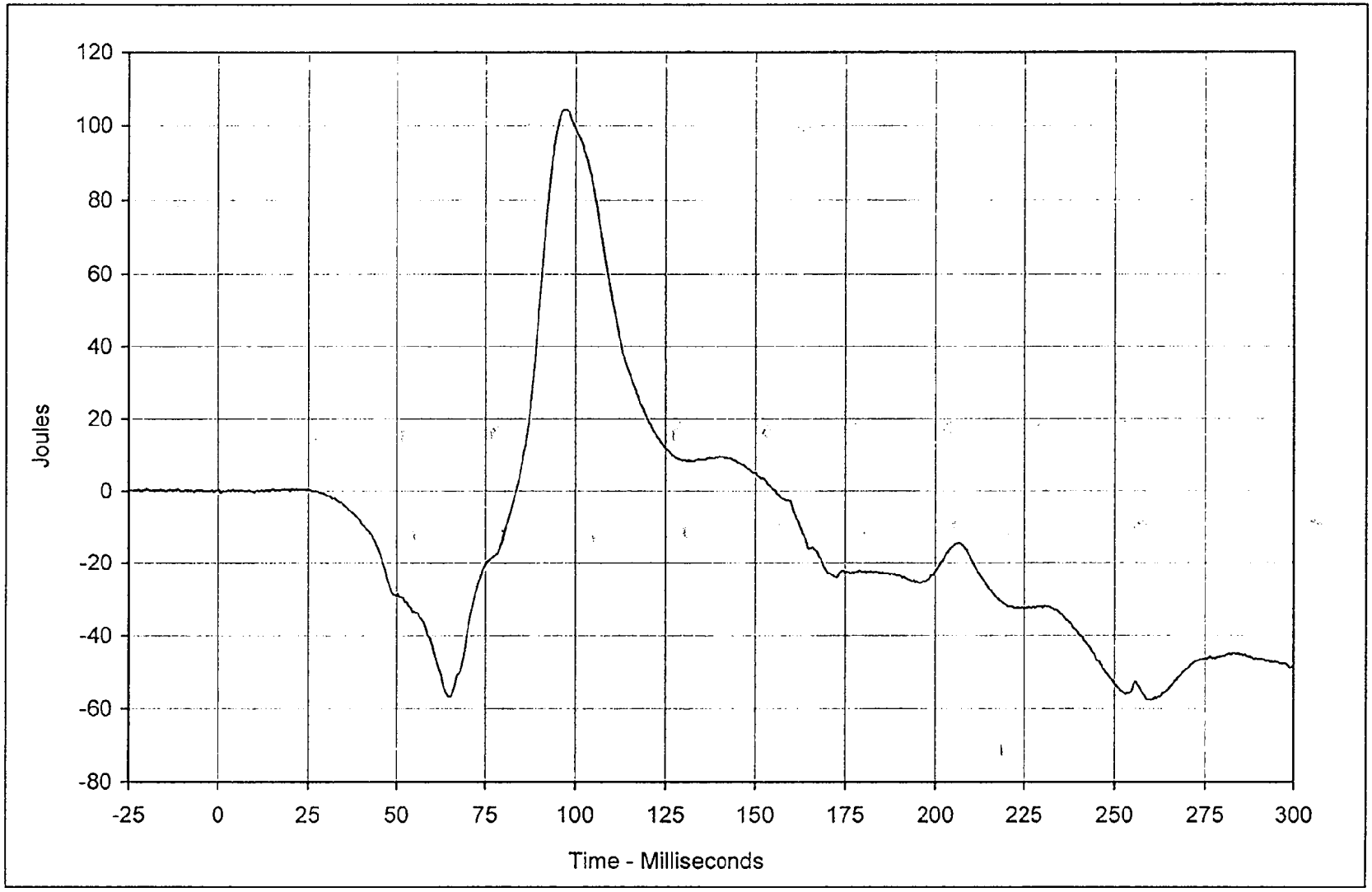

Curve Description: Passenger Neck Moment Y

Maximum Value: 104.4 at 97.5 Milliseconds

Minimum Value: -57.6 at 260.2 Milliseconds

SAE Filter Class: 600

Date of Test: 4/24/97

Curve Number: FIL-055

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

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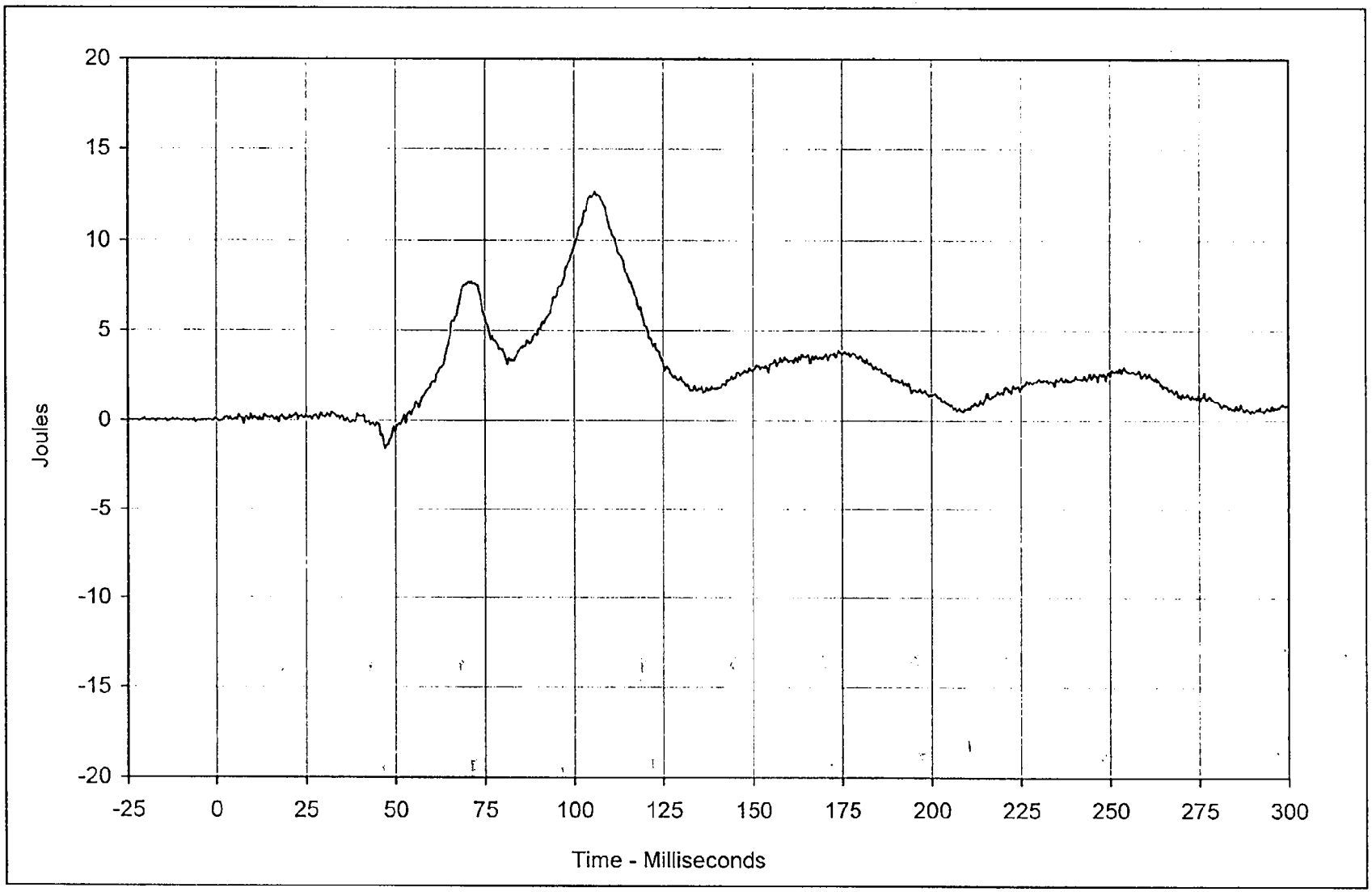
B80



Curve Description:	Passenger Neck Moment Z				Testing Program:	1997 New Car Assessment Program
Maximum Value:	12.7	at	105.8	Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-1.6	at	47.1	Milliseconds		
SAE Filter Class:	600					
Date of Test:	4/24/97					
Curve Number:	FIL-056					

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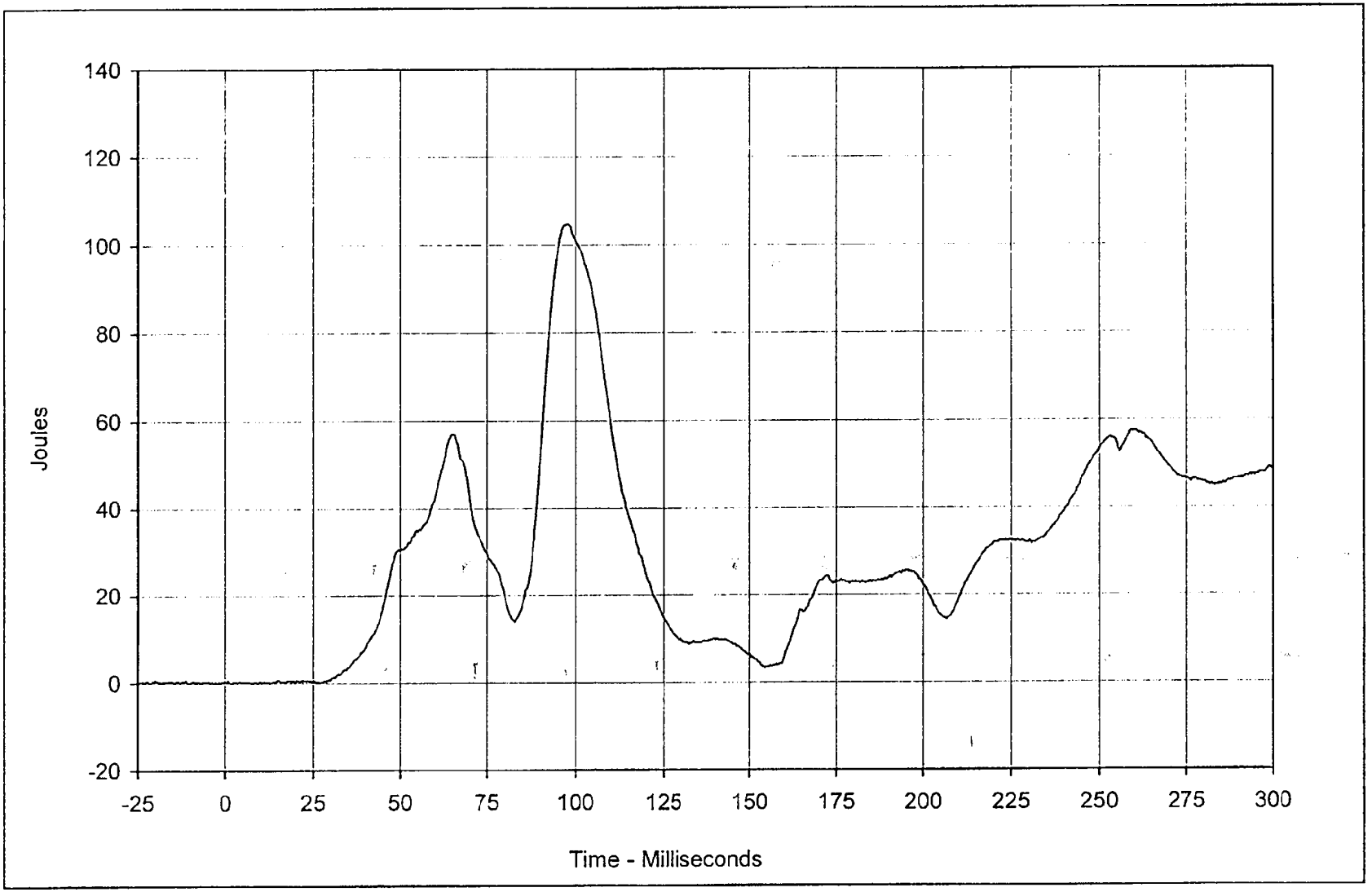
B81



Curve Description:	Passenger Neck Moment Resultant				Testing Program:	1997 New Car Assesment Program
Maximum Value:	104.9	at	97.6	Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	0.0	at	1.8	Milliseconds		
SAE Filter Class:	600					
Date of Test:	4/24/97					
Curve Number:	RES-054					

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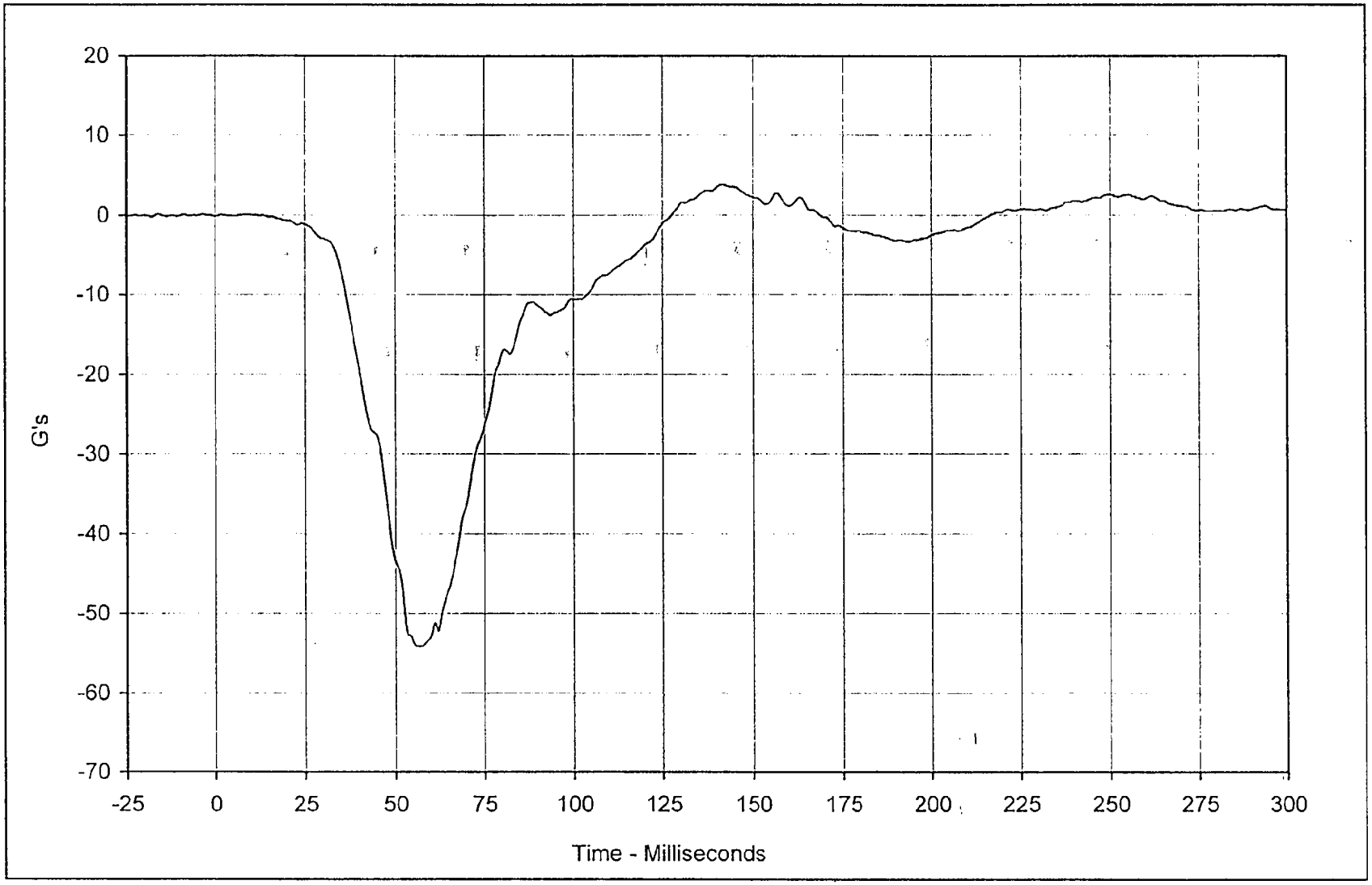

Curve Description: Passenger Chest Primary X

Maximum Value: 3.8 at 141.6 Milliseconds

Minimum Value: -54.2 at 56.7 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: FIL-057

Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

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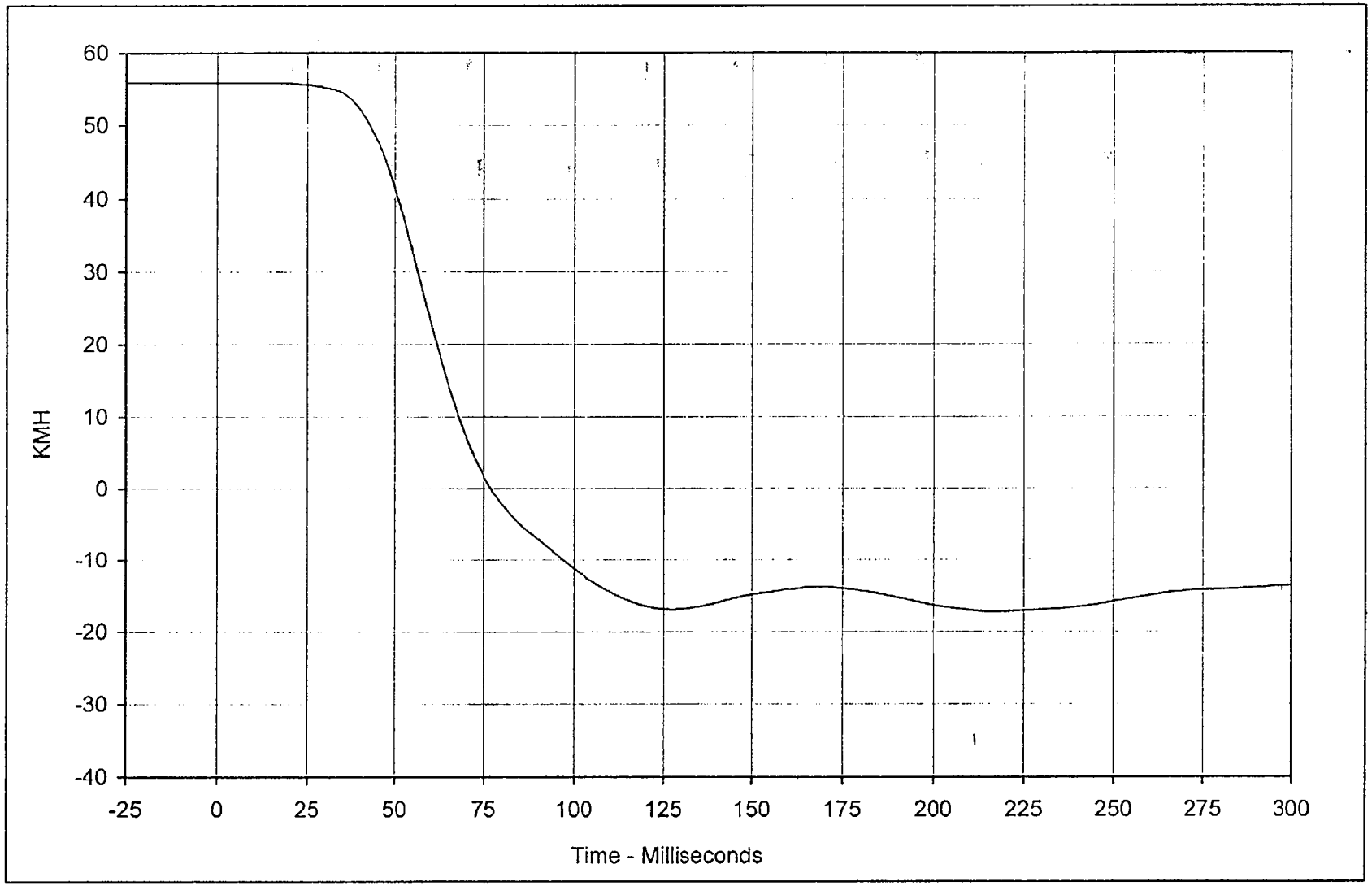


Curve Description: Passenger Chest Primary X Velocity

Maximum Value: 55.8 at 12.0 Milliseconds

Minimum Value: -17.2 at 216.7 Milliseconds

SAE Filter Class: 180

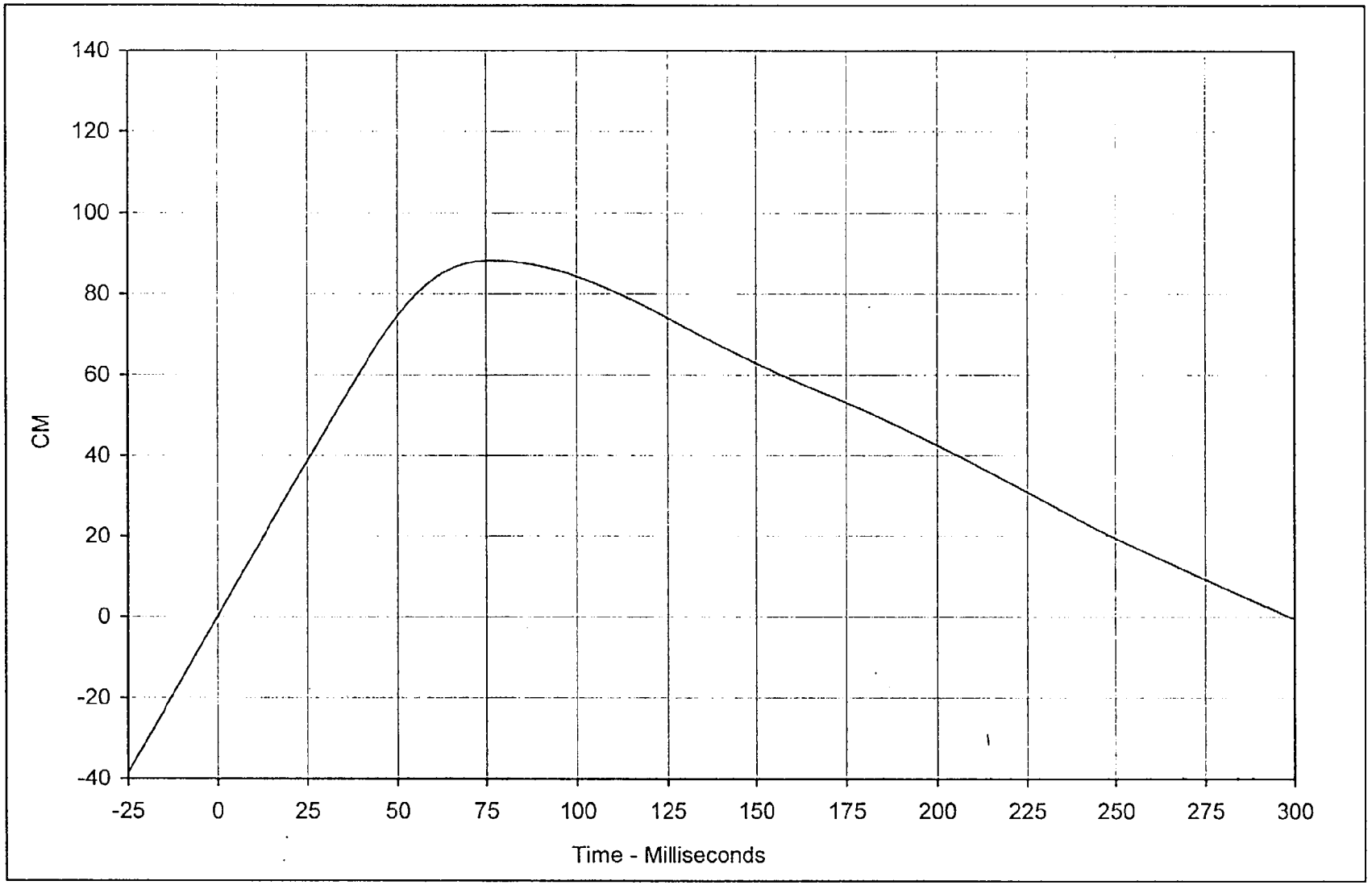
Date of Test: 4/24/97

Curve Number: IN1-057

Testing Program: 1997 New Car Assessment Program

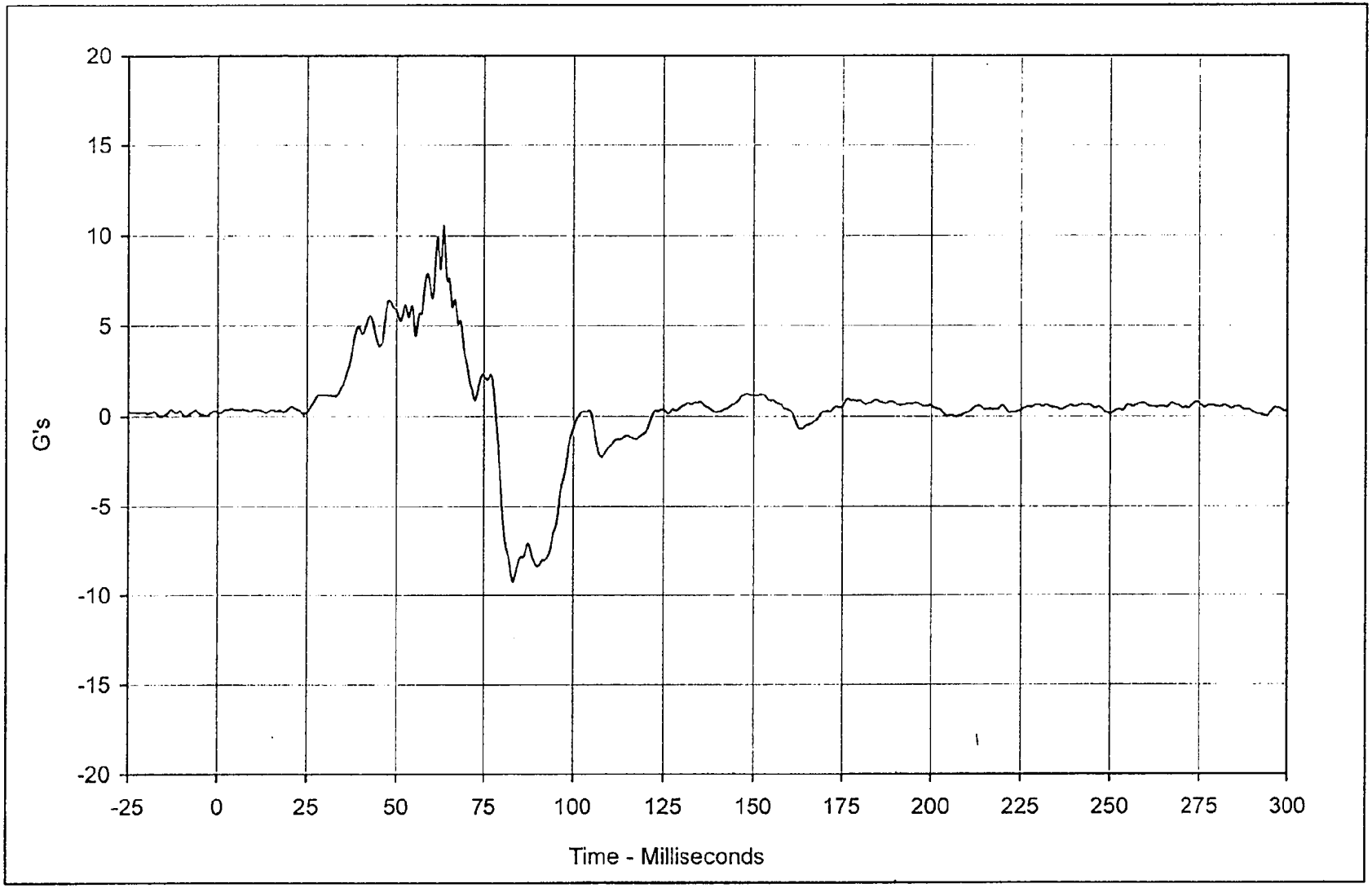
Test Vehicle: 1997 Kia Sportage

KARCO Engineering



Curve Description:	Passenger Chest Primary X Displ.				Testing Program:	1997 New Car Assessment Program
Maximum Value:	88.3	at	76.9	Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-0.5	at	299.9	Milliseconds		
SAE Filter Class:	180					
Date of Test:	4/24/97					
Curve Number:	IN2-057					

KARCO Engineering



Curve Description: Passenger ChestPrimary Y

Maximum Value: 10.6 at 63.3 Milliseconds

Minimum Value: -9.2 at 83.3 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: FIL-058

Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering

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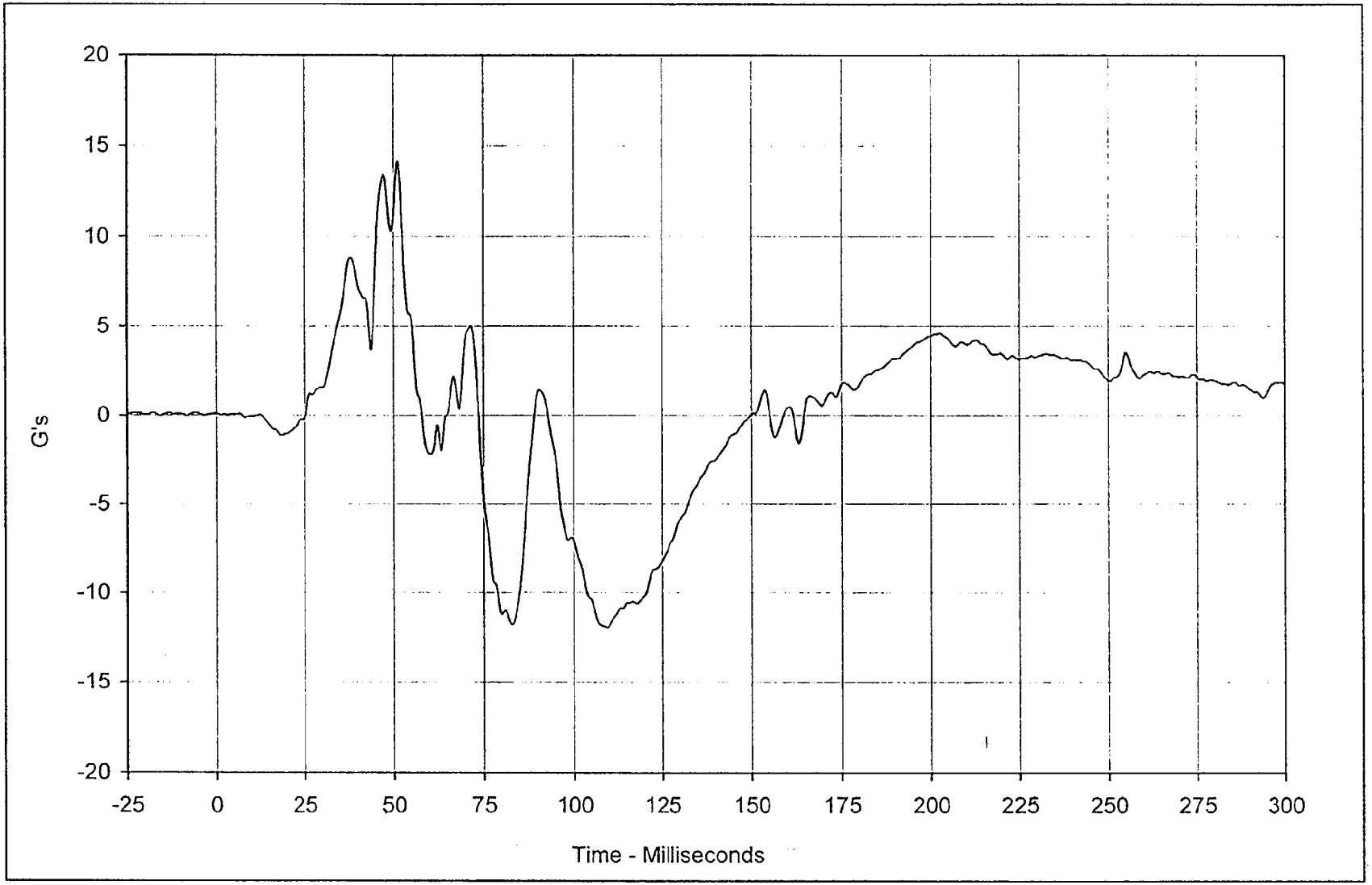
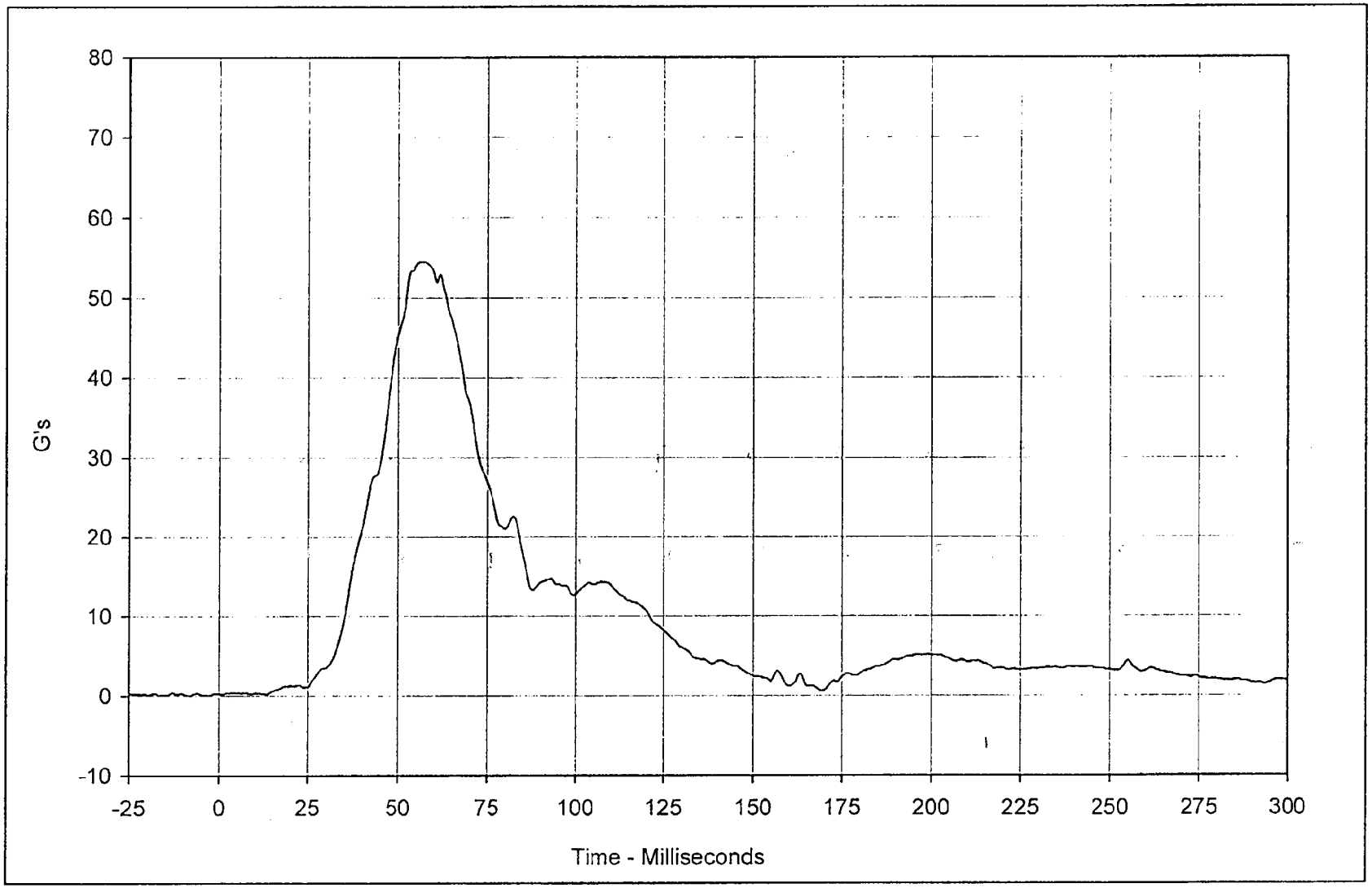
B86



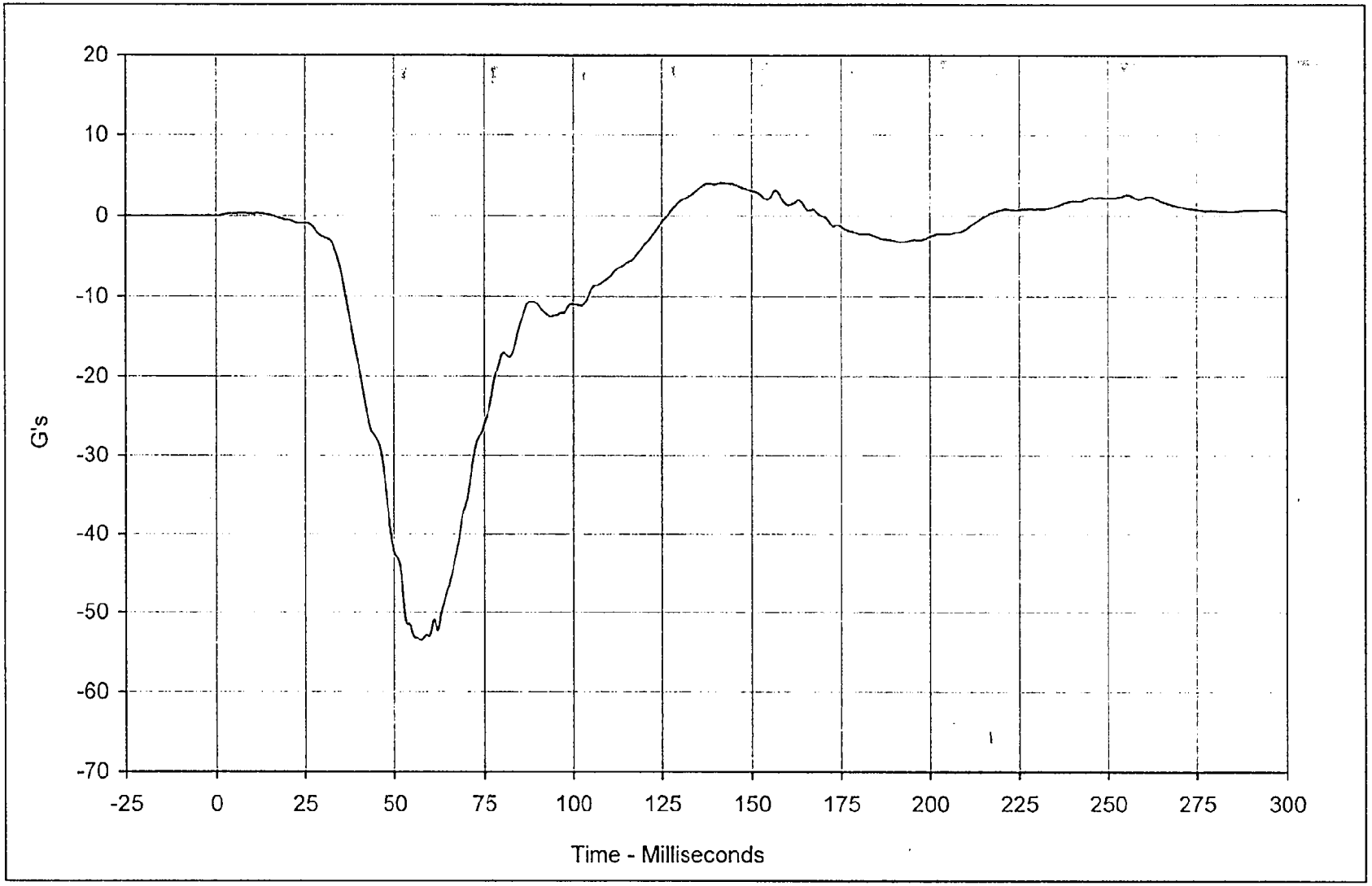
Curve Description:	Passenger Chest Primary Z				Testing Program:	1997 New Car Assesment Program
Maximum Value:	14.1	at	51.2	Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-12.0	at	109.4	Milliseconds		
SAE Filter Class:	180					
Date of Test:	4/24/97					
Curve Number:	FIL-059					

KARCO Engineering



Curve Description:	Passenger Chest Resultant Primary			Testing Program:	1997 New Car Assesment Program
Maximum Value:	54.5	at	56.7 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	0.2	at	0.9 Milliseconds		
SAE Filter Class:	180				
Date of Test:	4/24/97				
Curve Number:	RES-057				

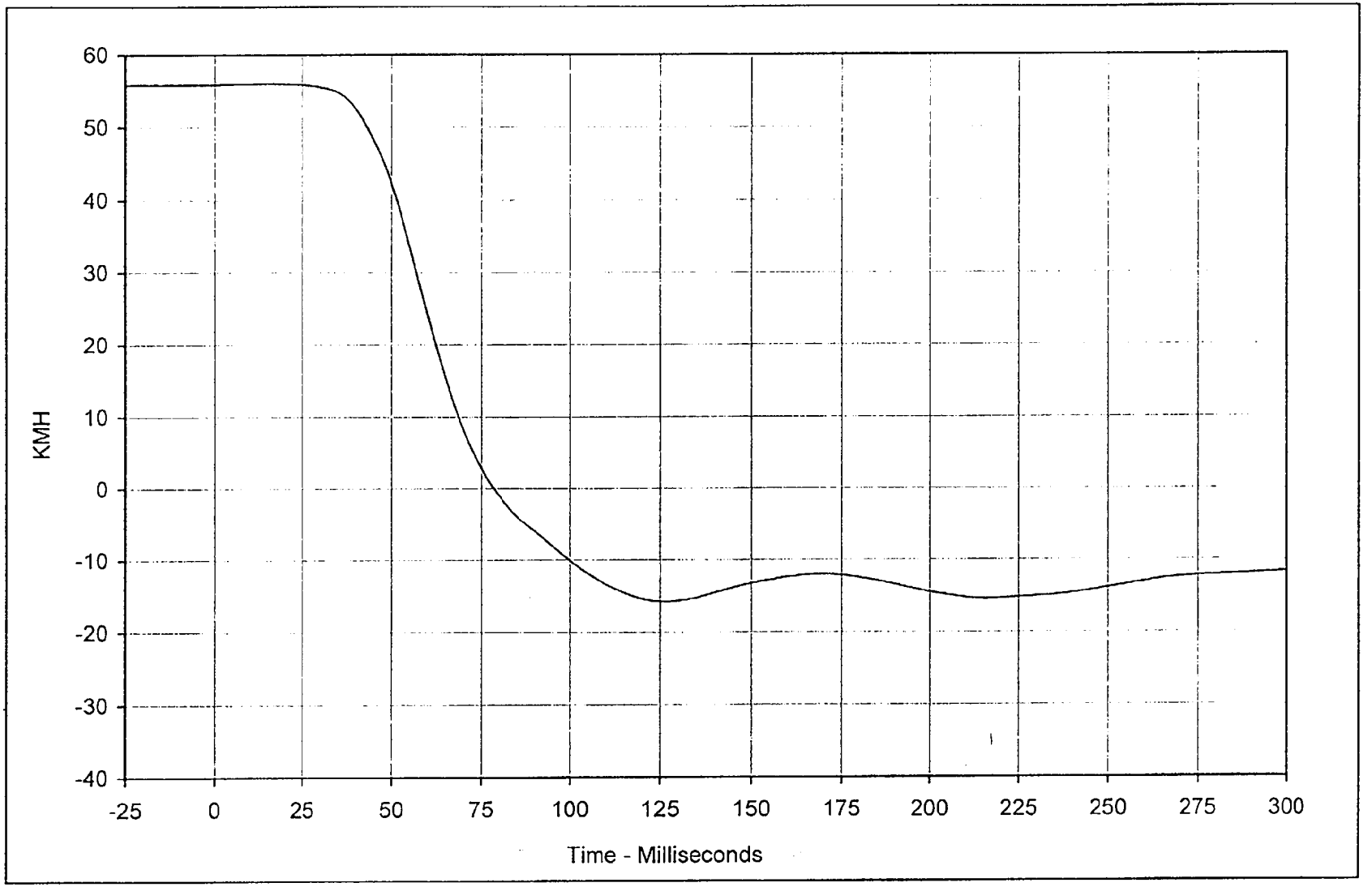
KARCO Engineering



Curve Description:	Passenger Chest Redundant X				
Maximum Value:	4.1	at	141.8	Milliseconds	
Minimum Value:	-53.5	at	57.5	Milliseconds	
SAE Filter Class:	180				
Date of Test:	4/24/97				
Curve Number:	FIL-060				

Testing Program:	1997 New Car Assesment Program
Test Vehicle:	1997 Kia Sportage

KARCO Engineering



Curve Description: Passenger Chest Redundant X Velocity

Maximum Value: 56.0 at 16.0 Milliseconds

Minimum Value: -15.9 at 126.5 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN1-060

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering

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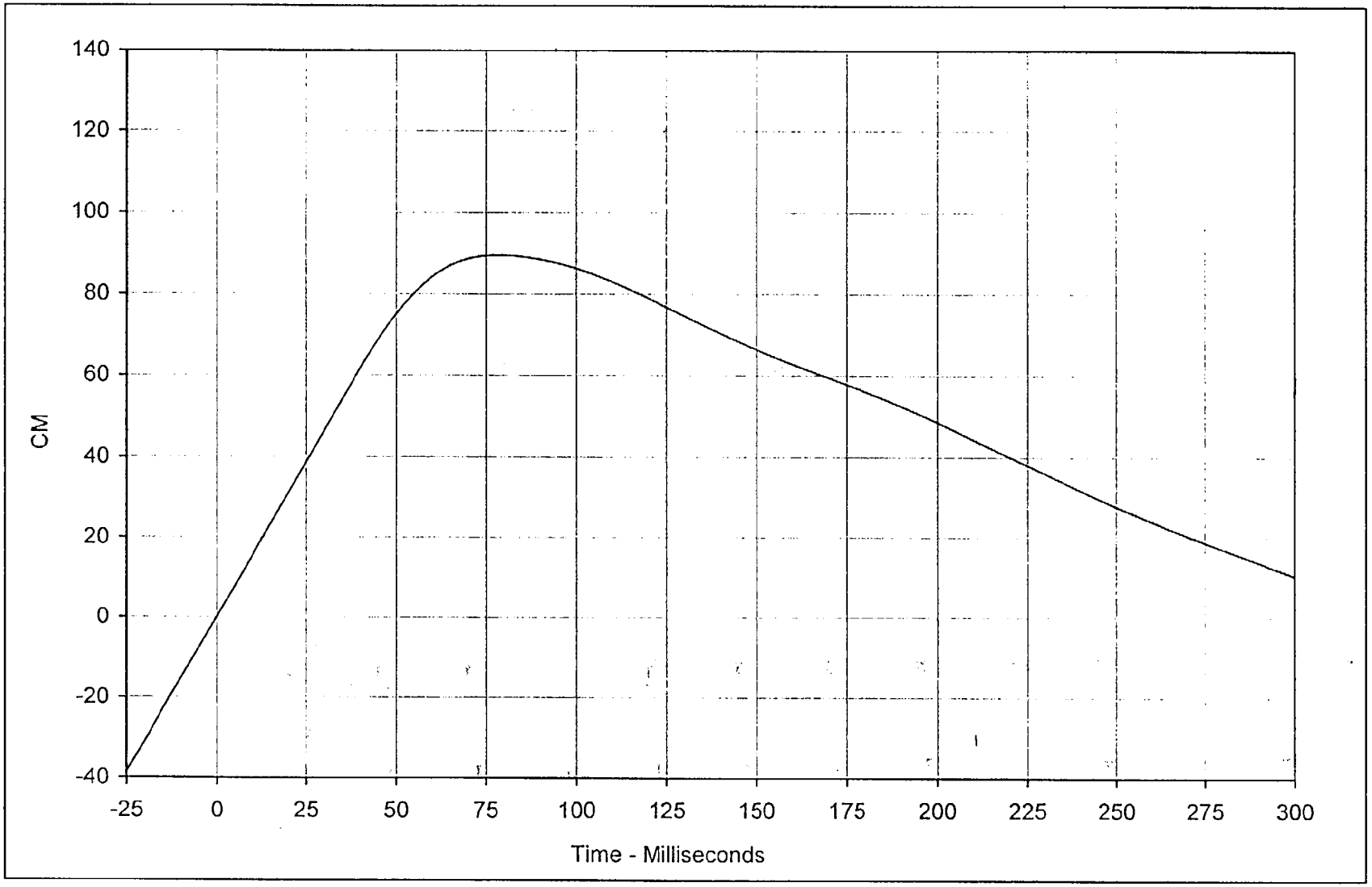
B90



Curve Description: Passenger Chest Redundant X Displ.

Maximum Value: 89.5 at 78.6 Milliseconds

Minimum Value: 0.1 at 0.0 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN2-060

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering

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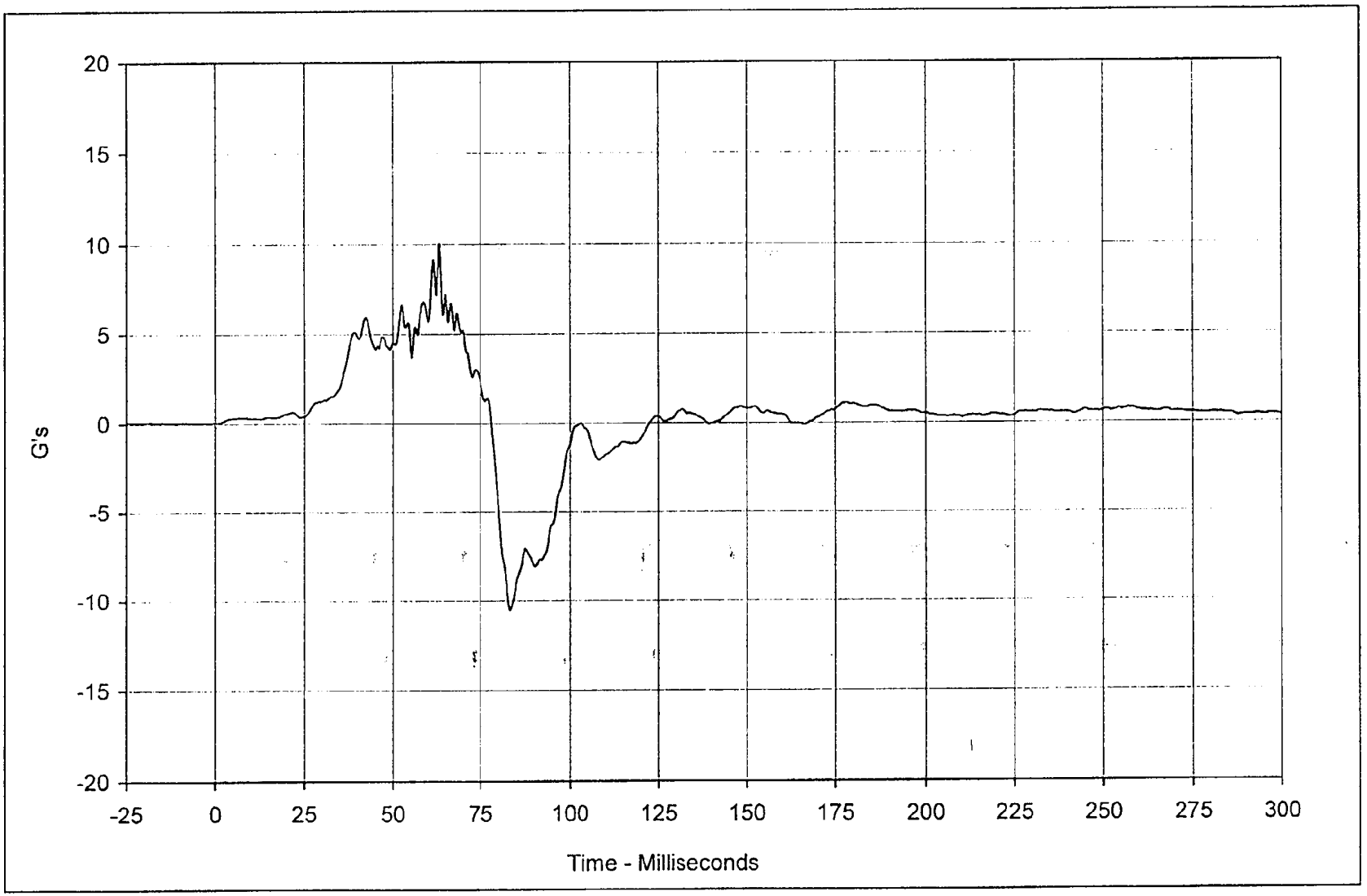
B91



Curve Description:	Passenger Chest Redundant Y				Testing Program:	1997 New Car Assesment Program
Maximum Value:	10.0	at	63.3	Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-10.5	at	83.4	Milliseconds		
SAE Filter Class:	180					
Date of Test:	4/24/97					
Curve Number:	FIL-061					

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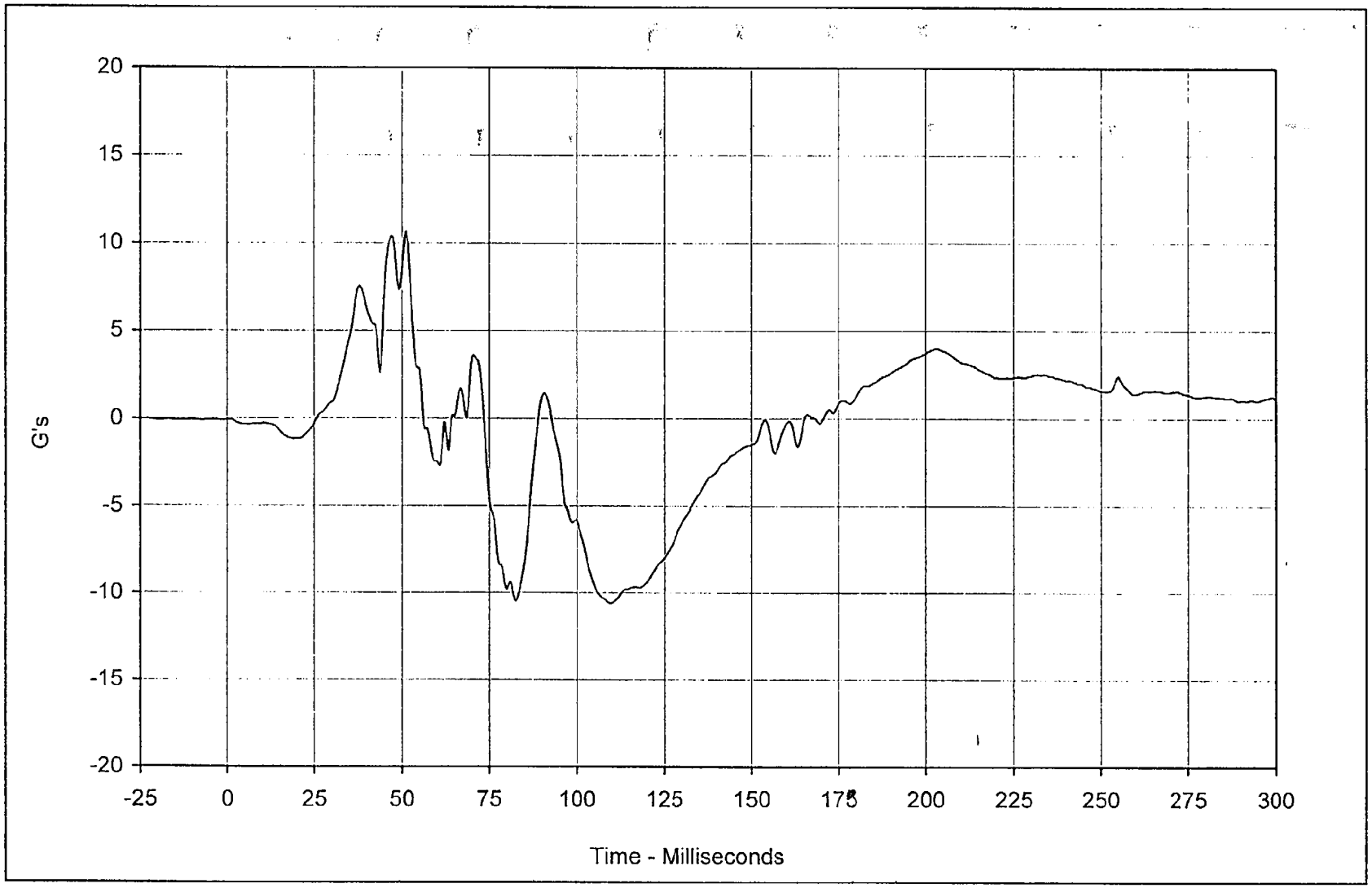
B92



Curve Description:	Passenger Chest Redundant Z	Testing Program:	1997 New Car Assesment Program
Maximum Value:	10.6 at 51.2 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-10.6 at 109.7 Milliseconds		
SAE Filter Class:	180		
Date of Test:	4/24/97		
Curve Number:	FIL-062		

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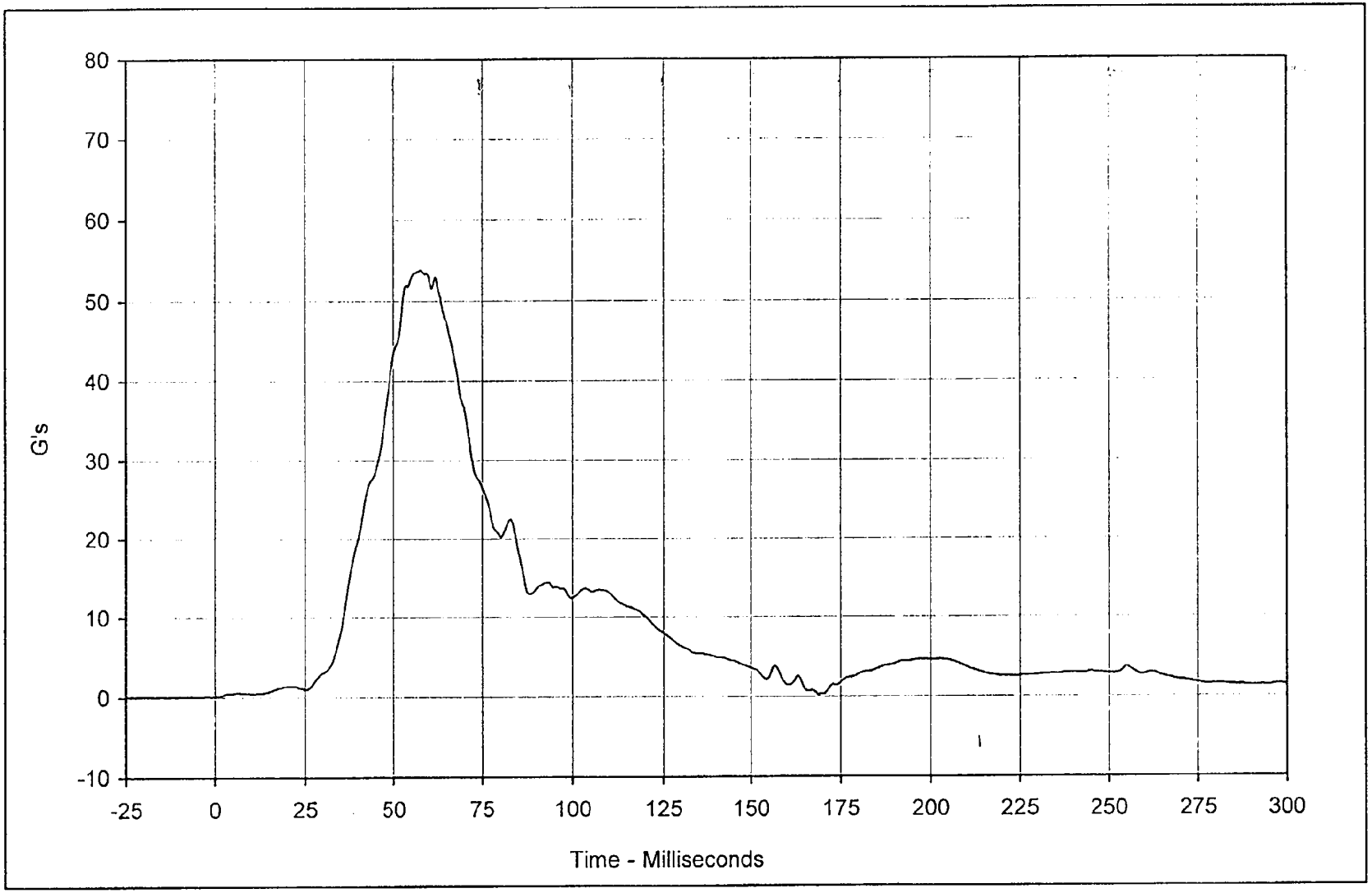
B93



Curve Description: Passenger Chest Resultant Redundant

Maximum Value: 53.8 at 57.6 Milliseconds

Minimum Value: 0.1 at 0.5 Milliseconds

SAE Filter Class: 180

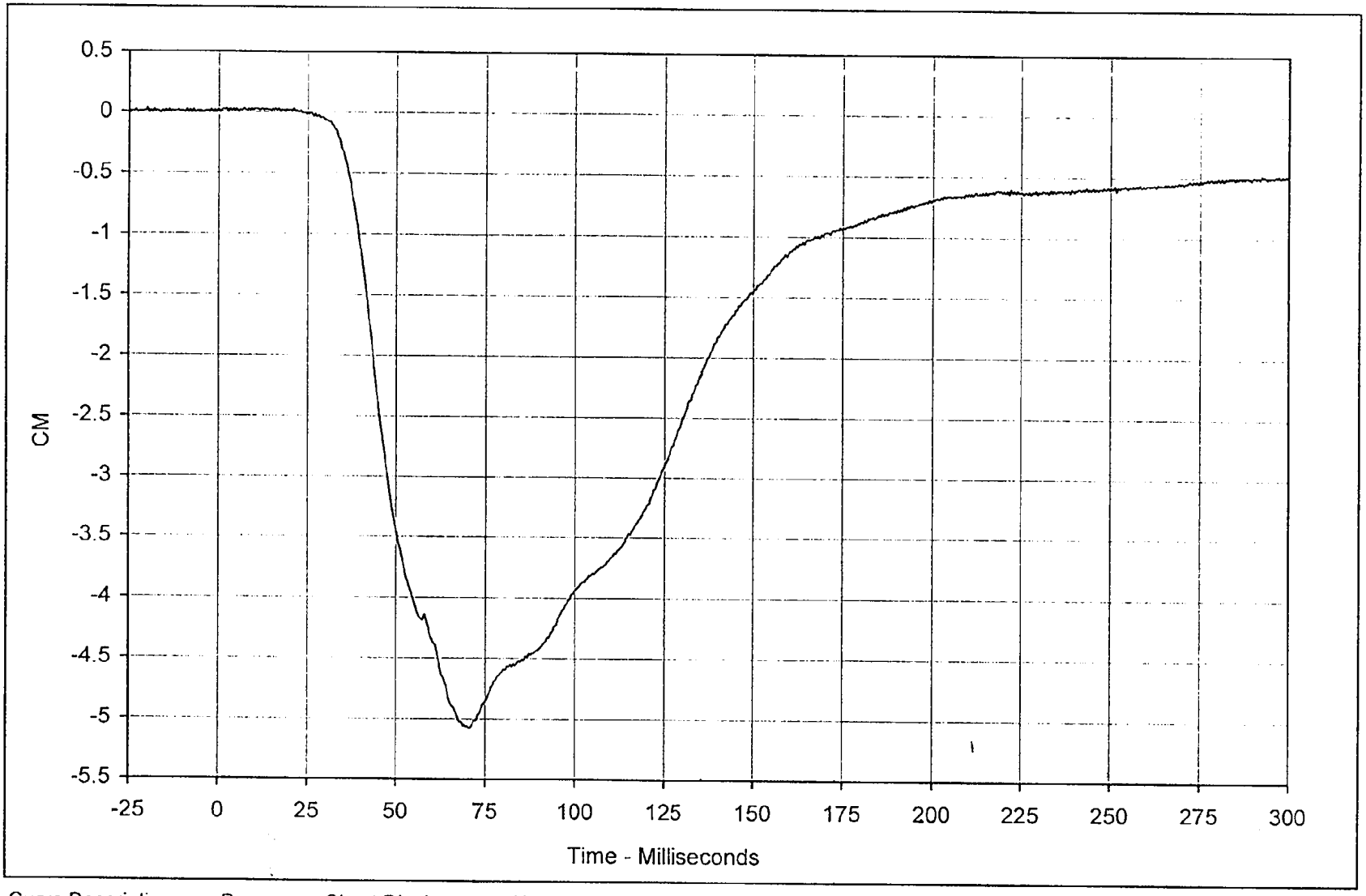
Date of Test: 4/24/97

Curve Number: RES-060

Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering



Curve Description: Passenger Chest Displacement X

Maximum Value: 0.03 at 10.2 Milliseconds

Minimum Value: -5.08 at 70.4 Milliseconds

SAE Filter Class: 600

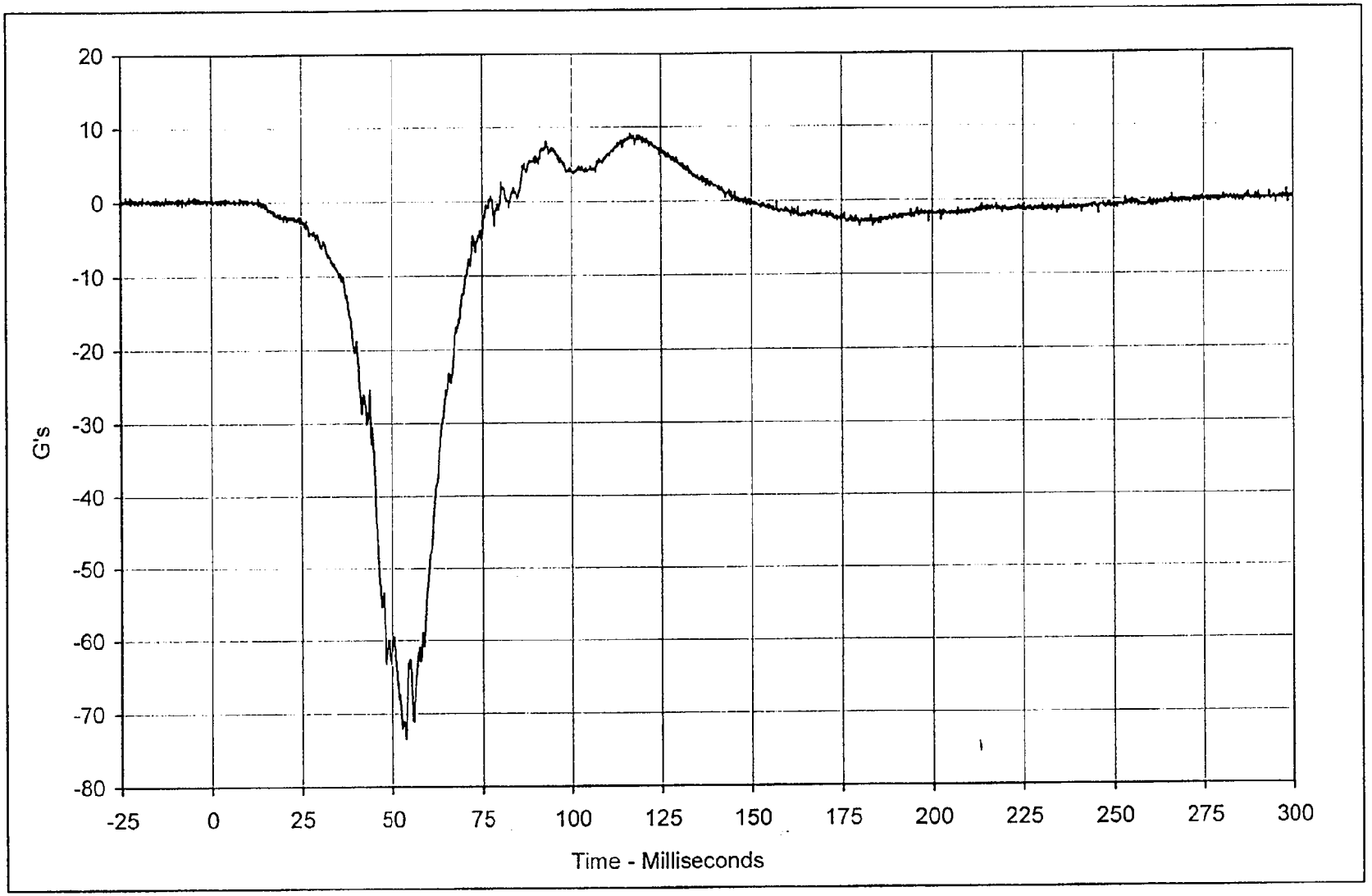
Date of Test: 4/24/97

Curve Number: FIL-063

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering



Curve Description: Passenger Pelvis X

Maximum Value: 9.1 at 116.4 Milliseconds

Minimum Value: -73.4 at 53.6 Milliseconds

SAE Filter Class: 1000

Date of Test: 4/24/97

Curve Number: FIL-064

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

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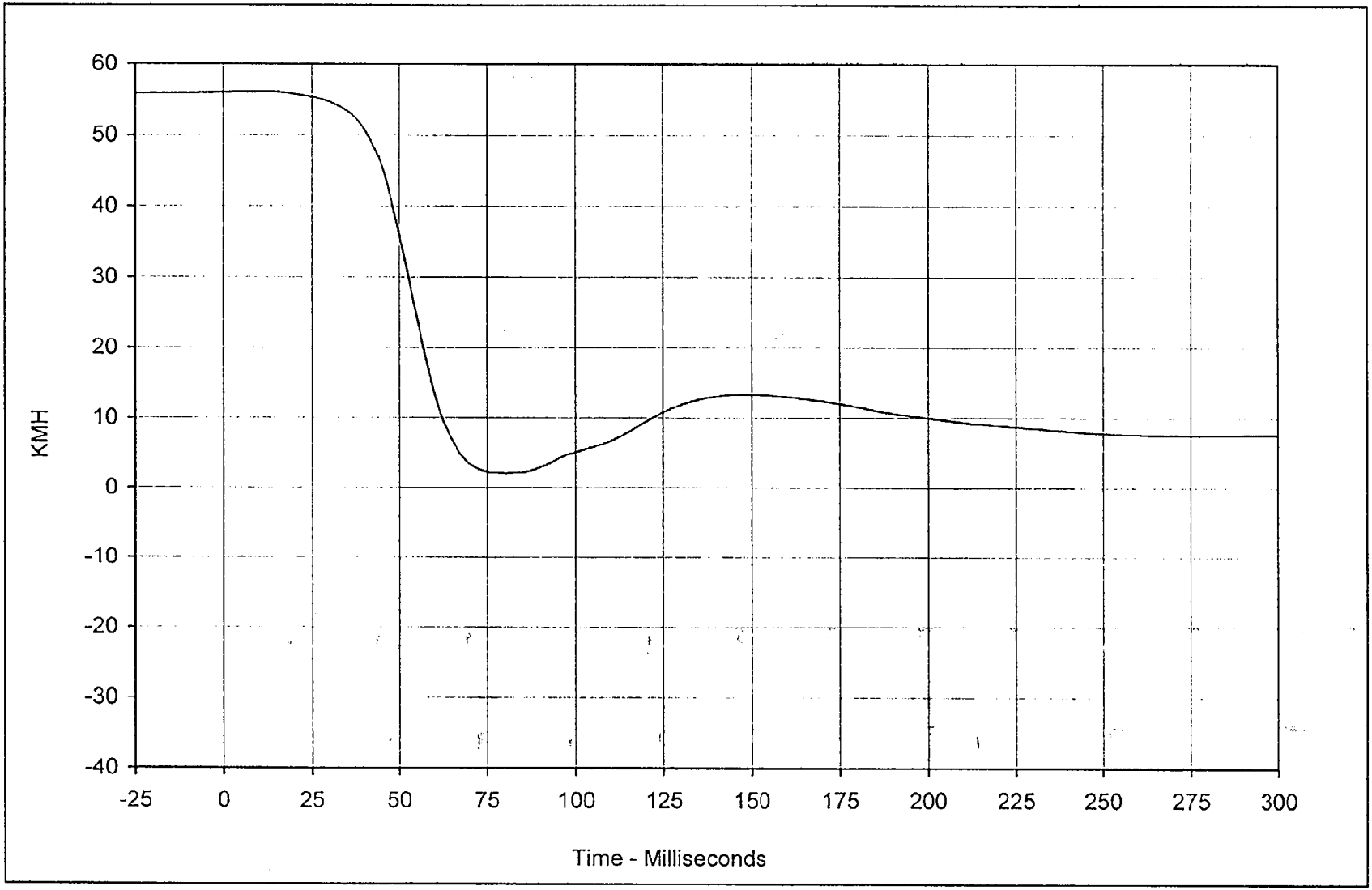
B96



Curve Description:	Passenger Pelvis X Velocity			Testing Program:	1997 New Car Assessment Program
Maximum Value:	56.0	at	12.9 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	2.1	at	80.0 Milliseconds		
SAE Filter Class:	180				
Date of Test:	4/24/97				
Curve Number:	IN1-064				

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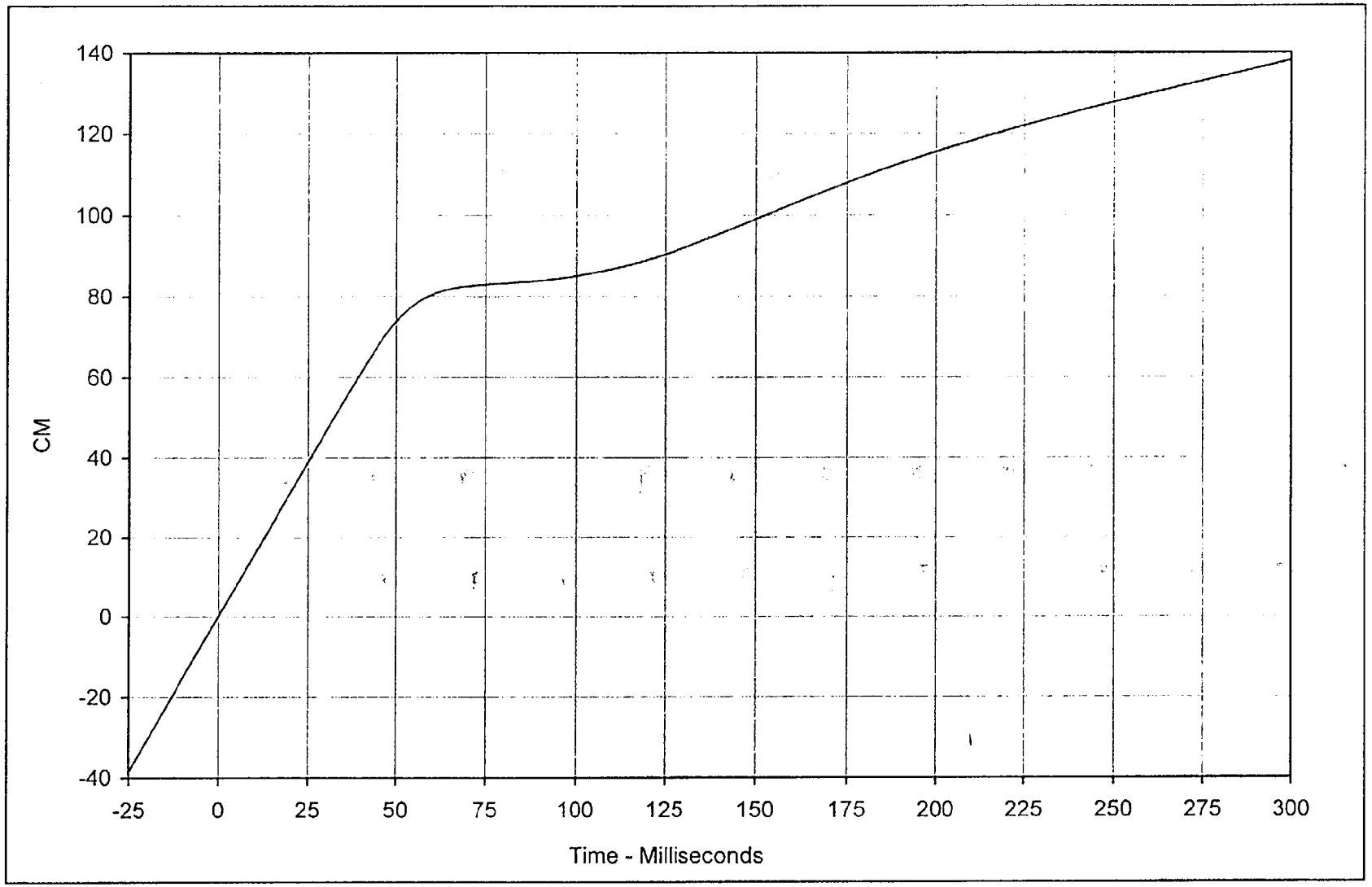
B97



Curve Description: Passenger Pelvis X Displ.

Maximum Value: 138.1 at 299.9 Milliseconds

Minimum Value: 0.1 at 0.0 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN2-064

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering

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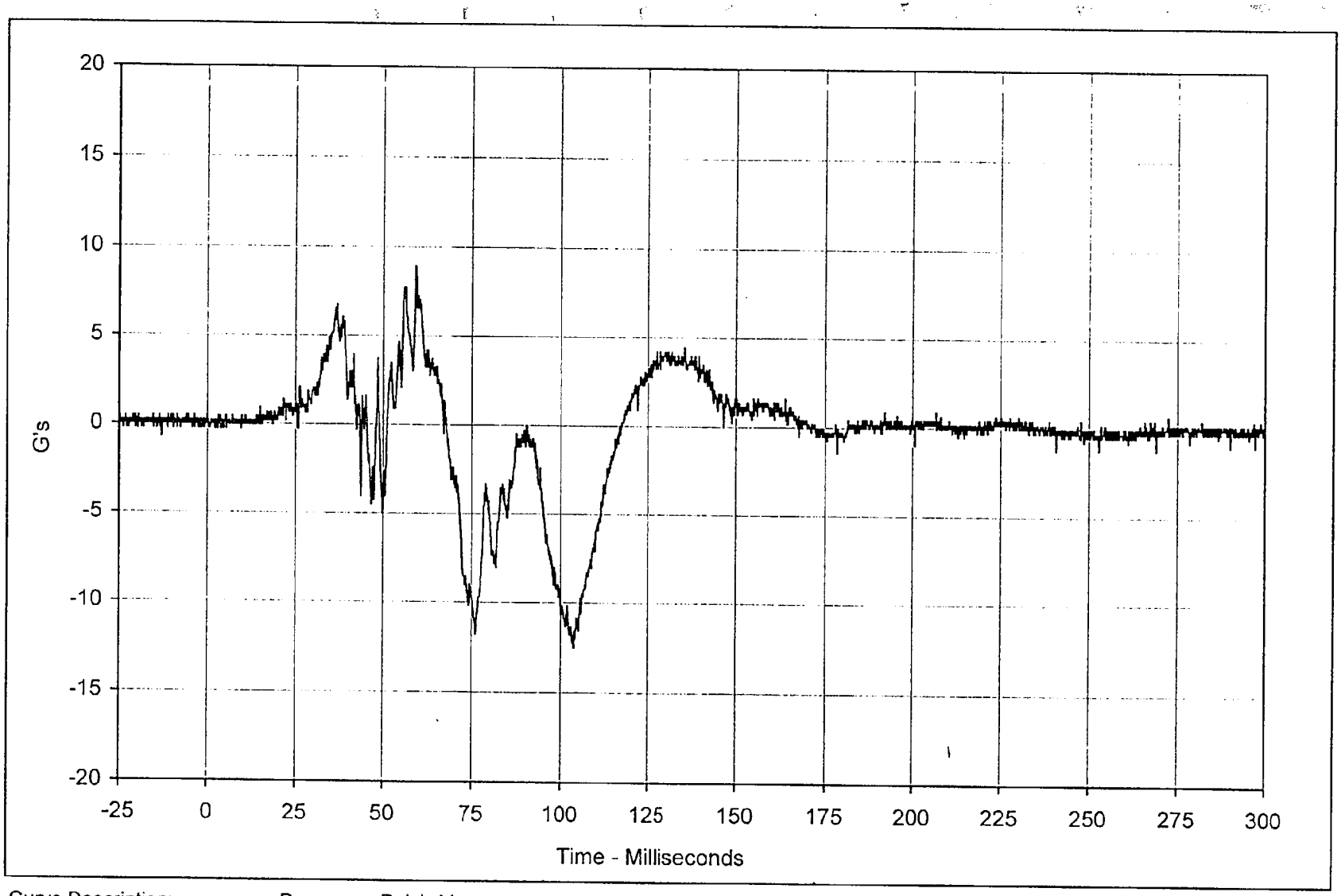
B98



Curve Description:	Passenger Pelvis Y			
Maximum Value:	8.9	at	59.0	Milliseconds
Minimum Value:	-12.5	at	104.0	Milliseconds
SAE Filter Class:	1000			
Date of Test:	4/24/97			
Curve Number:	FIL-065			

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering

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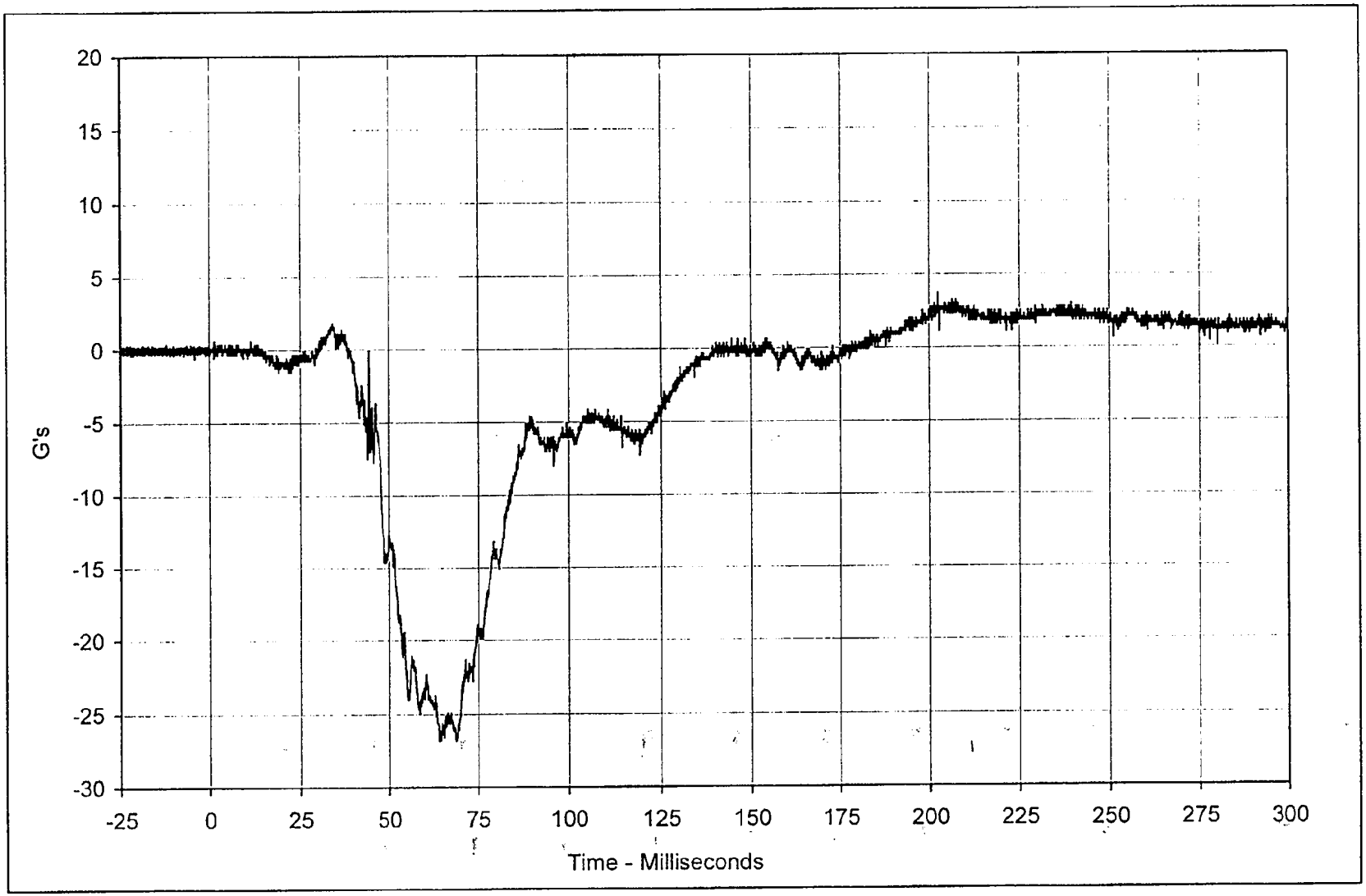
B99



Curve Description:	Passenger Pelvis Z			
Maximum Value:	3.7	at	202.4	Milliseconds
Minimum Value:	-26.8	at	64.0	Milliseconds
SAE Filter Class:	1000			
Date of Test:	4/24/97			
Curve Number:	FIL-066			

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering

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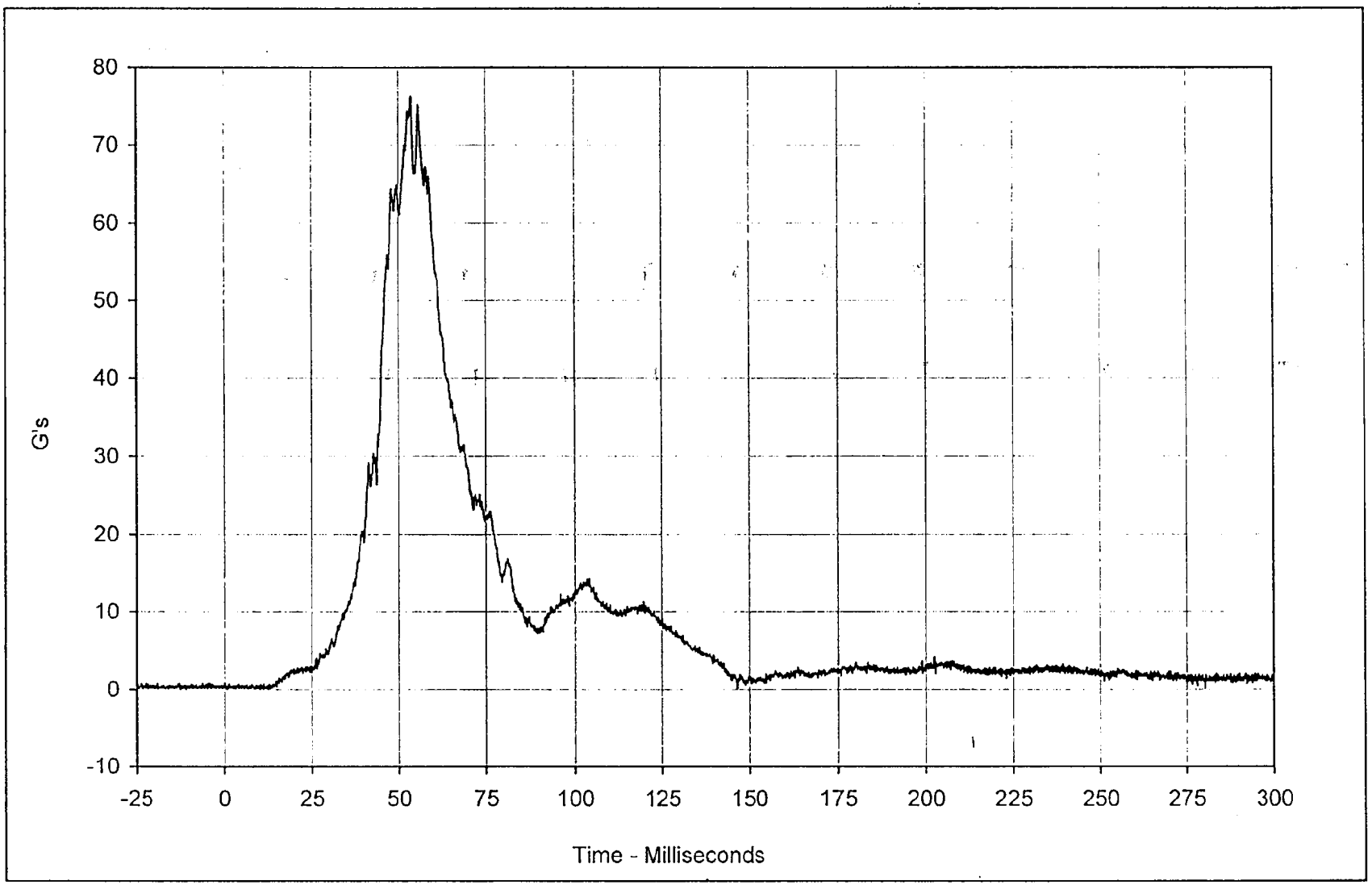
B100

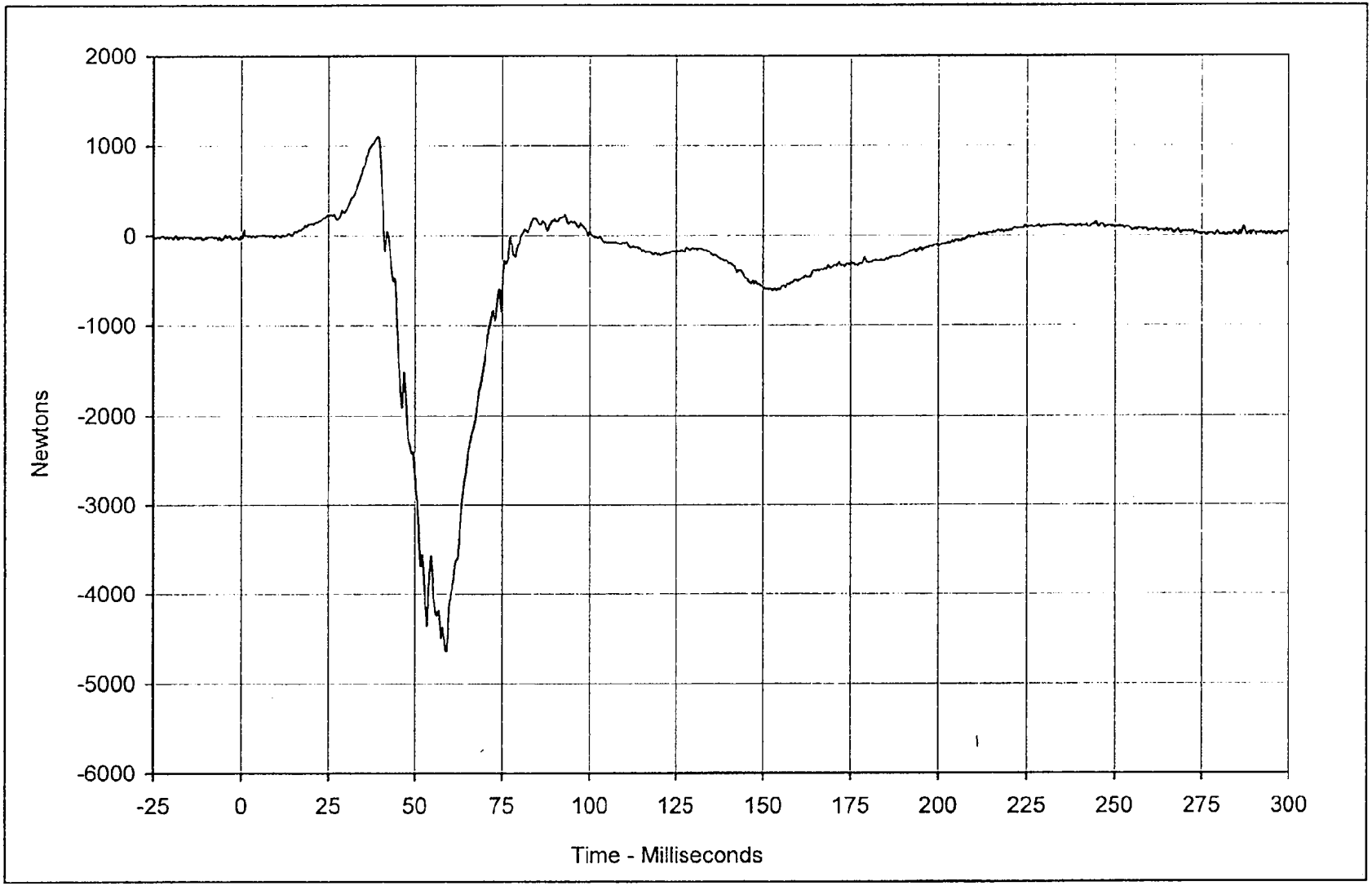


Curve Description:	Passenger Pelvis Resultant			Testing Program:	1997 New Car Assesment Program
Maximum Value:	76.3	at	53.7 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	0.1	at	0.8 Milliseconds		
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	RES-064				

KARCO Engineering

KAR-96-R96024-06

B101



Curve Description:	Passenger Left Femur Force			Testing Program:	1997 New Car Assesment Program
Maximum Value:	1098.6	at	39.2 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-4640.2	at	59.0 Milliseconds		
SAE Filter Class:	600				
Date of Test:	4/24/97				
Curve Number:	FIL-067				

KARCO Engineering

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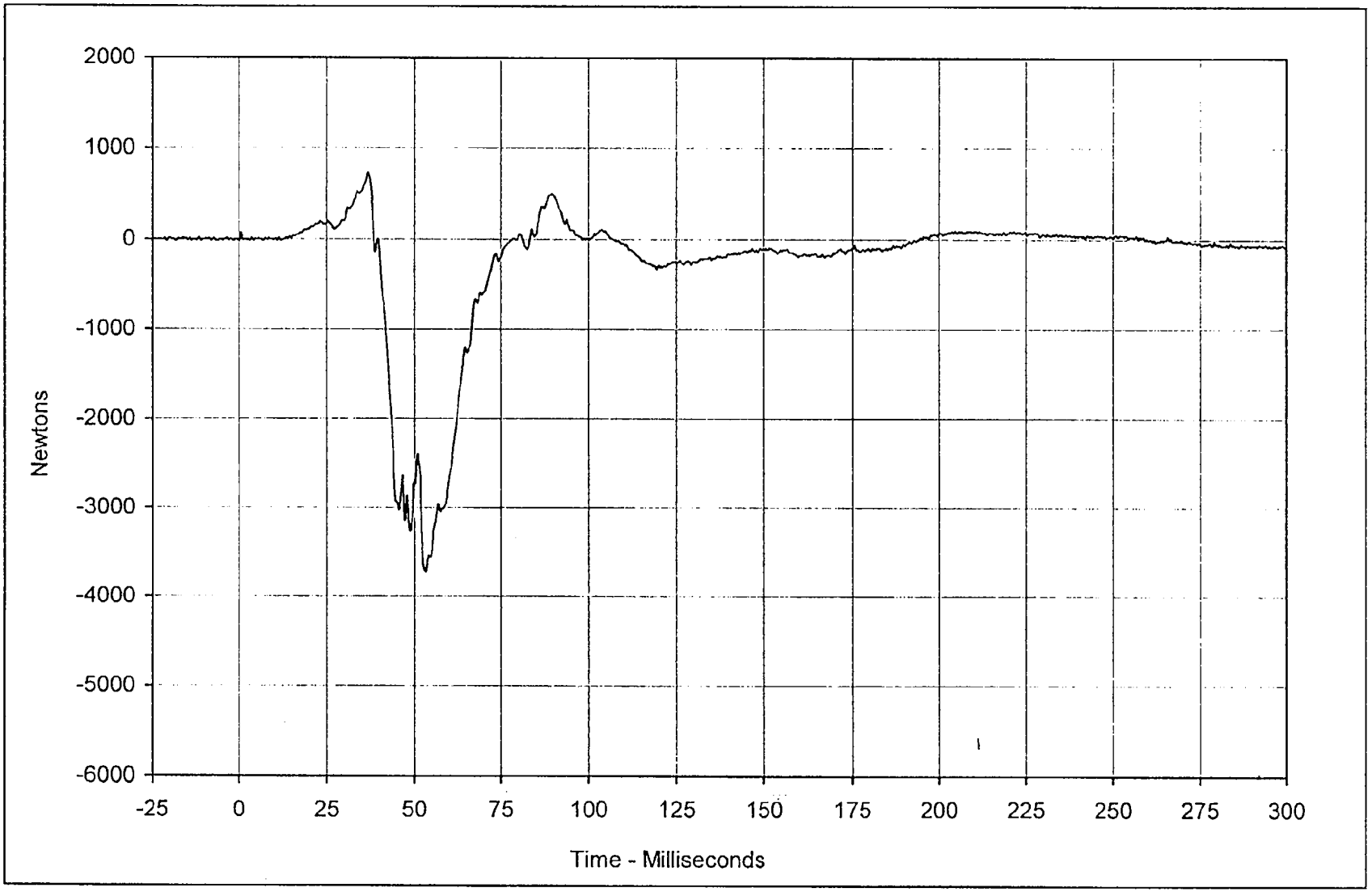
B102

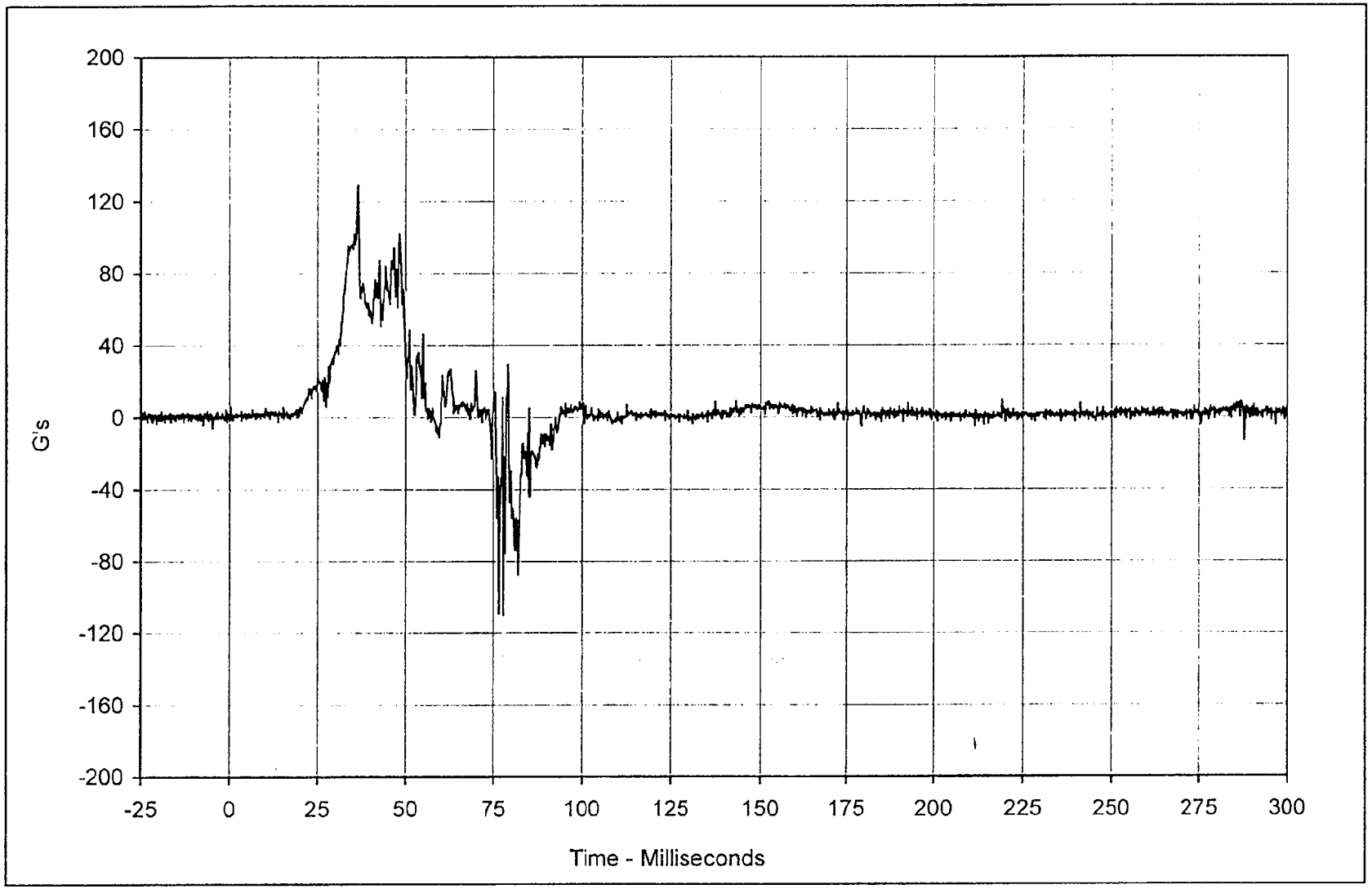


Curve Description:	Passenger Right Femur Force				Testing Program:	1997 New Car Assesment Program
Maximum Value:	725.9	at	36.9	Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-3729.4	at	53.2	Milliseconds		
SAE Filter Class:	600					
Date of Test:	4/24/97					
Curve Number:	FIL-068					

KARCO Engineering

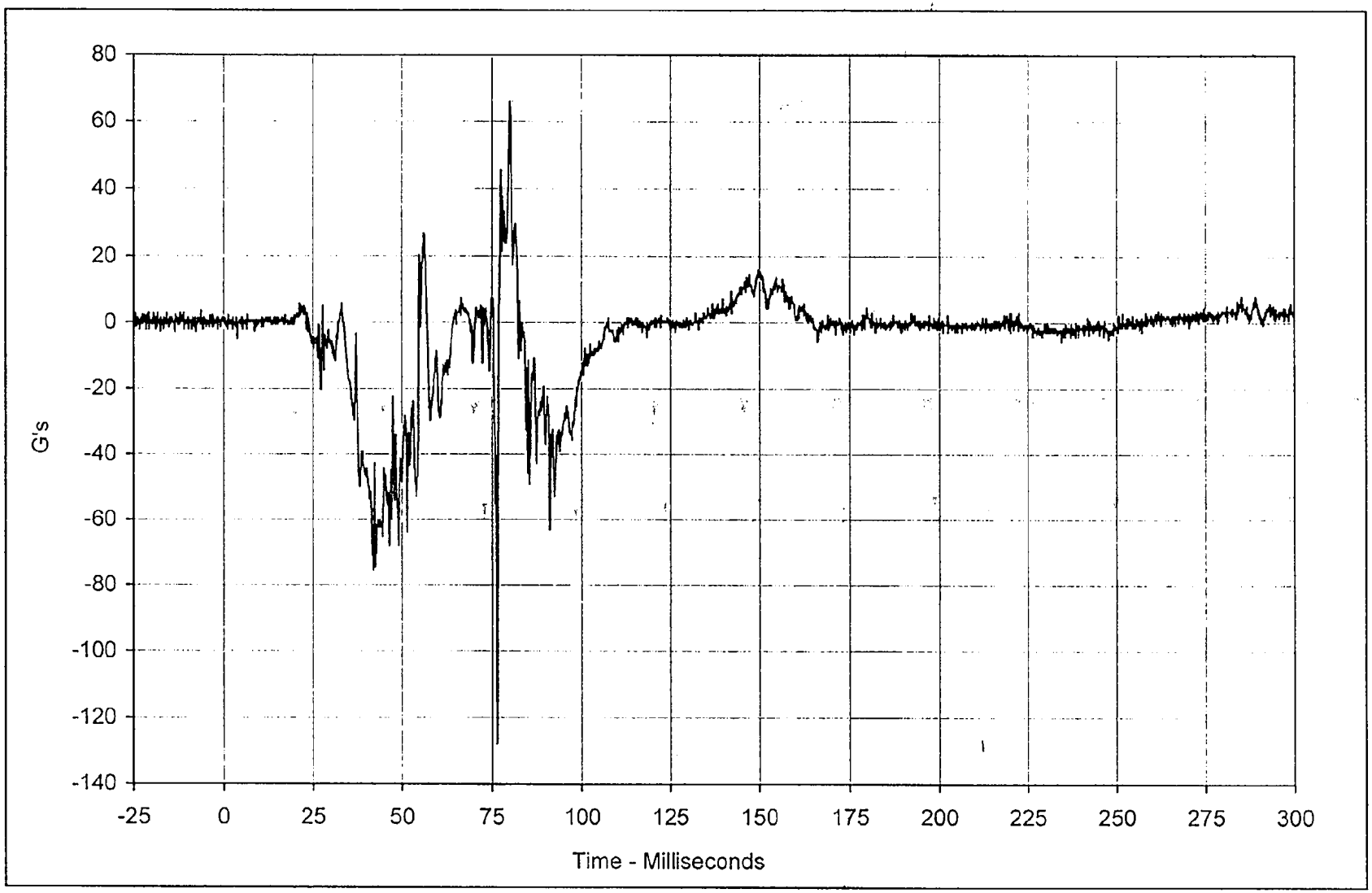
KAR-96-R96024-06

B113



Curve Description:	Passenger Left Foot Aft X				Testing Program:	1997 New Car Assesment Program
Maximum Value:	128.9	at	36.4	Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-110.0	at	77.8	Milliseconds		
SAE Filter Class:	1000					
Date of Test:	4/24/97					
Curve Number:	FIL-079					

KARCO Engineering



Curve Description: Passenger Left Foot Aft Z

Maximum Value: 65.9 at 80.0 Milliseconds

Minimum Value: -127.4 at 76.5 Milliseconds

SAE Filter Class: 1000

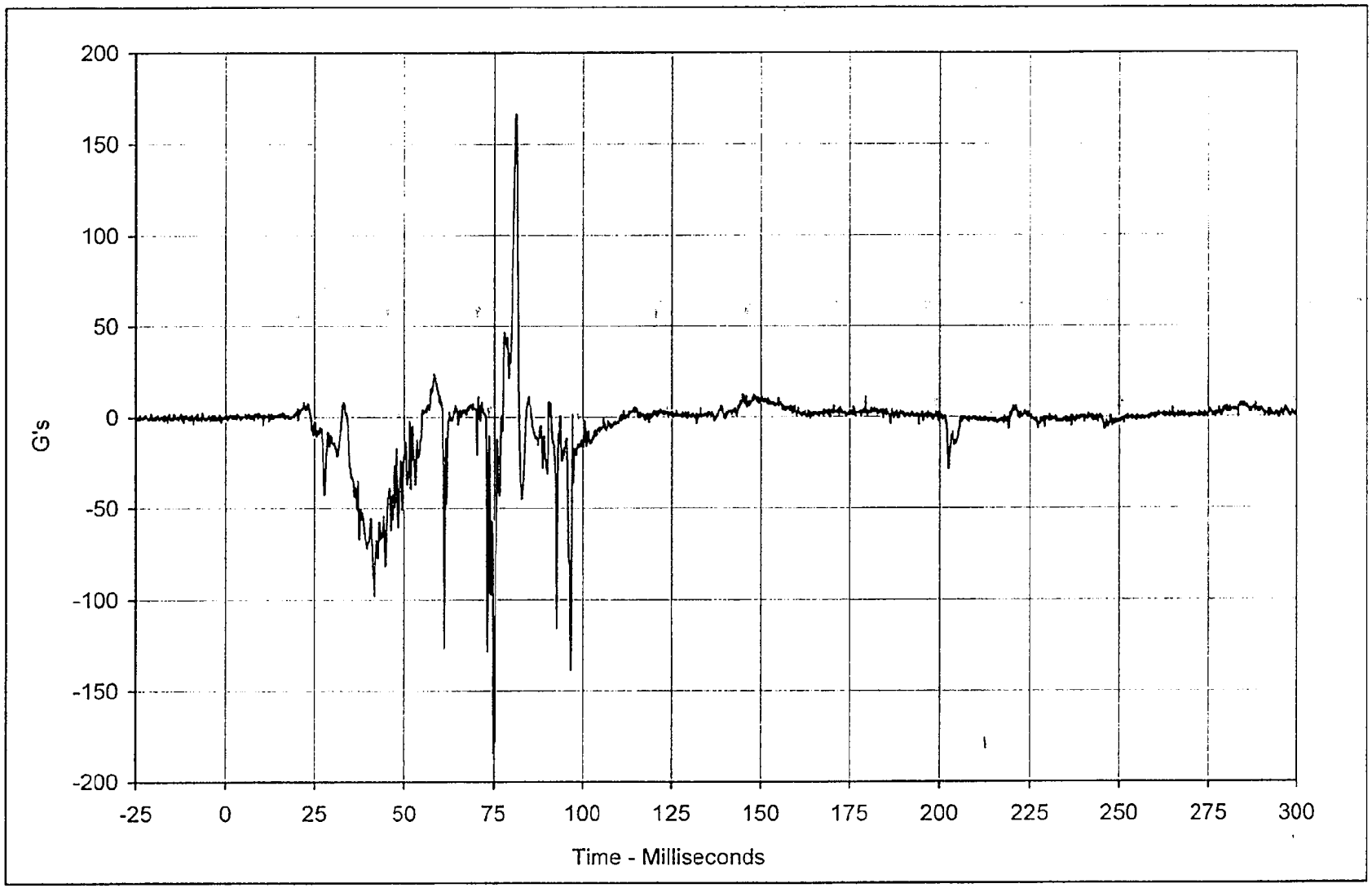
Date of Test: 4/24/97

Curve Number: FIL-080

Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering



Curve Description: Passenger Left Foot Fore Z

Maximum Value: 166.2 at 81.3 Milliseconds

Minimum Value: -182.9 at 74.9 Milliseconds

SAE Filter Class: 1000

Date of Test: 4/24/97

Curve Number: FIL-081

Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering

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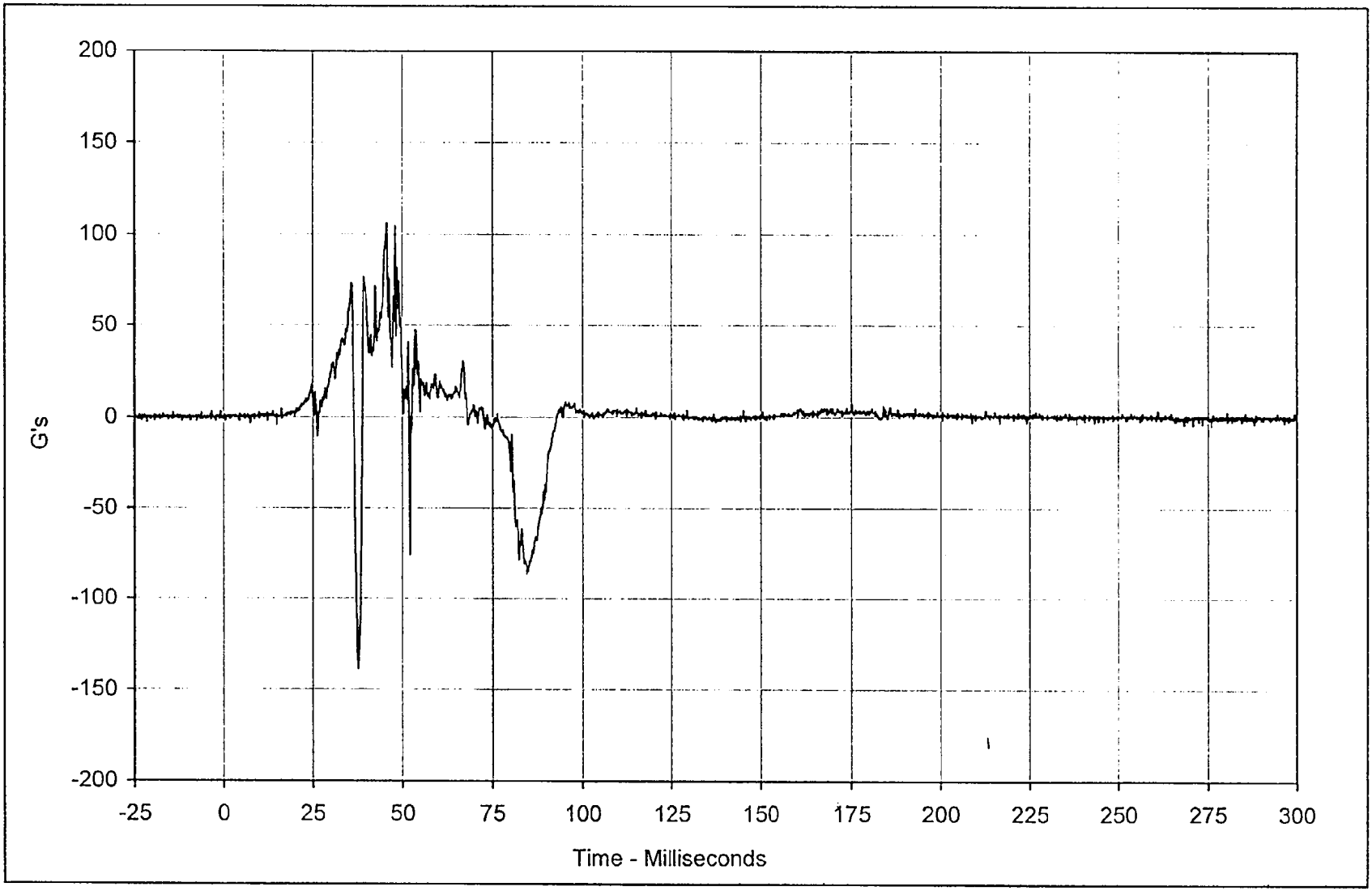
B116



Curve Description: Passenger Right Foot Aft X

Maximum Value: 106.3 at 45.7 Milliseconds

Minimum Value: -138.6 at 37.5 Milliseconds

SAE Filter Class: 1000

Date of Test: 4/24/97

Curve Number: FIL-082

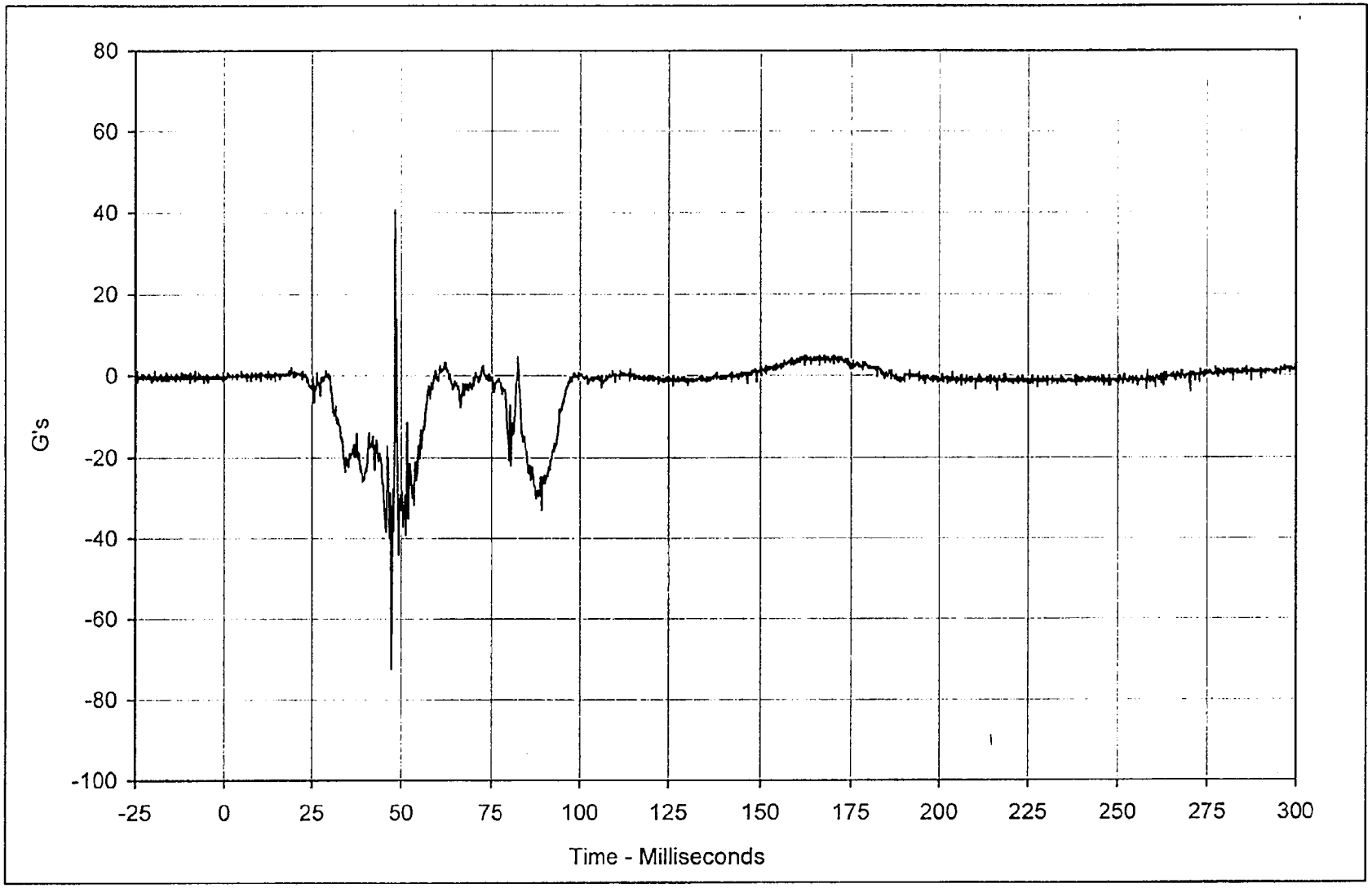
Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering

KAR-96-R96024-06

B117



Curve Description: Passenger Right Foot Aft Z

Maximum Value: 40.7 at 48.1 Milliseconds

Minimum Value: -72.4 at 47.2 Milliseconds

SAE Filter Class: 1000

Date of Test: 4/24/97

Curve Number: FIL-083

Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering

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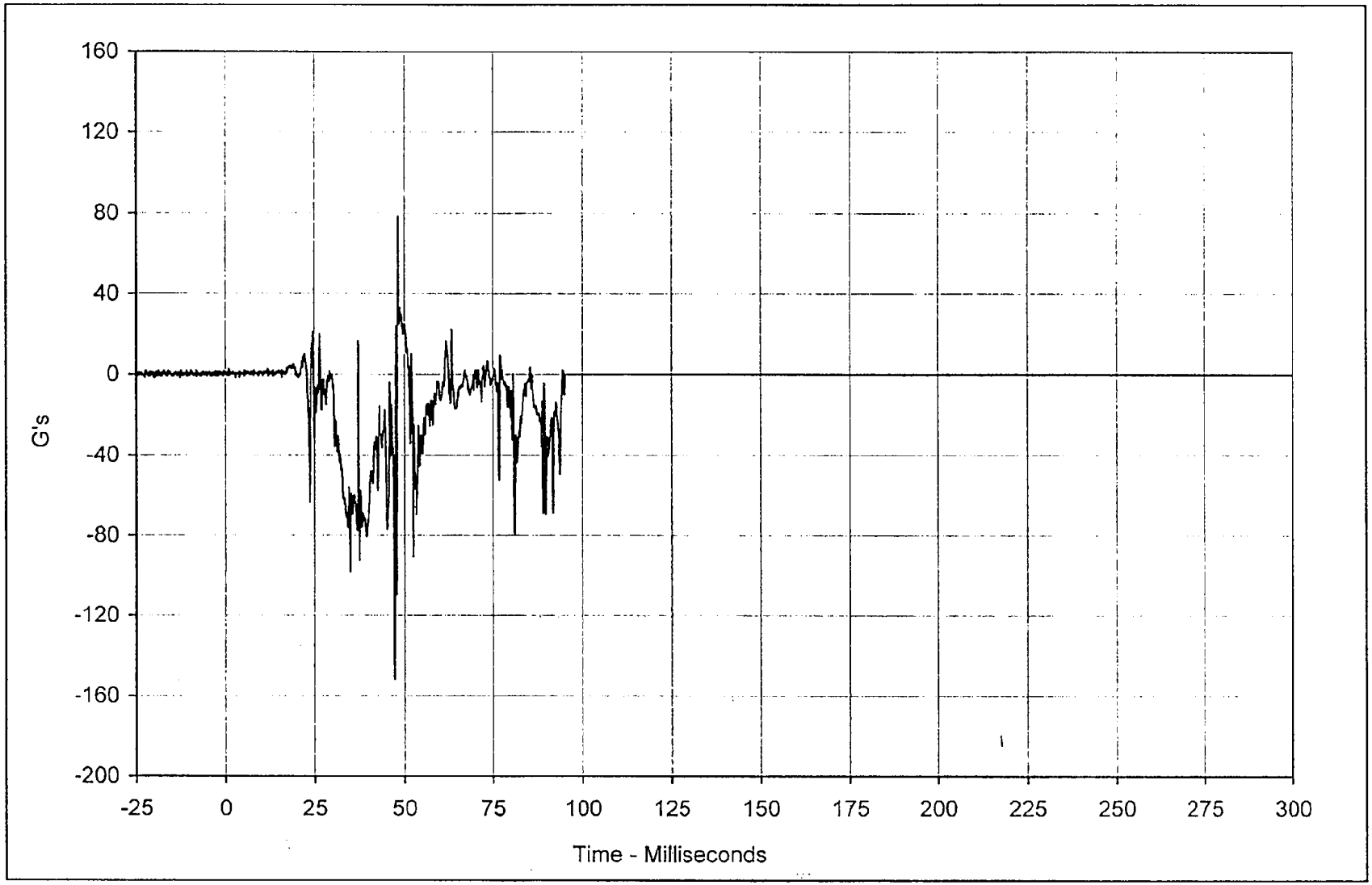
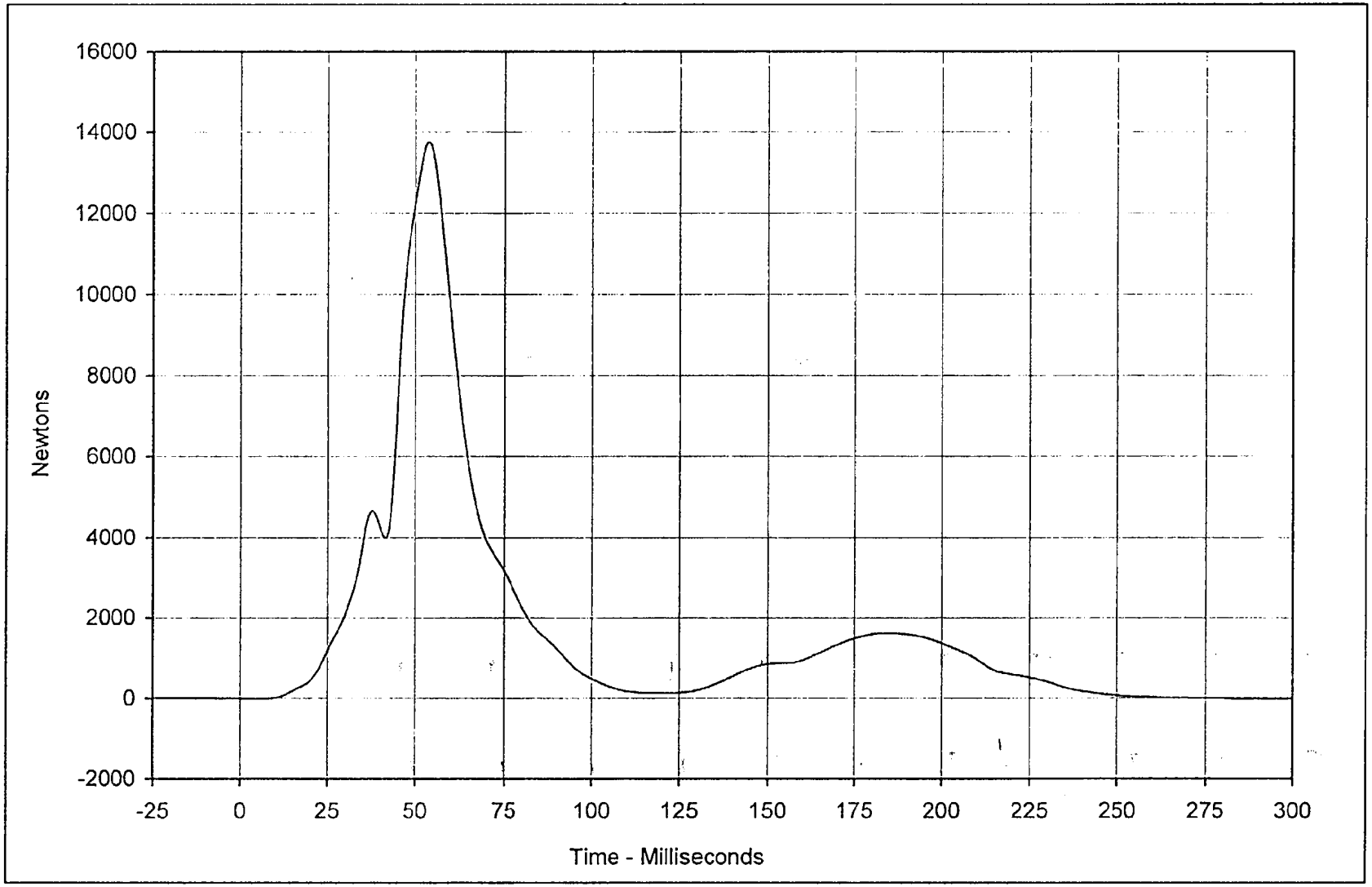
B118



Curve Description:	Passenger Right Foot Fore Z *			Testing Program:	1997 New Car Assesment Program
Maximum Value:	78.3	at	48.4 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-151.6	at	47.3 Milliseconds		
SAE Filter Class:	1000				
Date of Test:	4/24/97				
Curve Number:	FIL-084				

*Channel failed at 95 Msec

KARCO Engineering

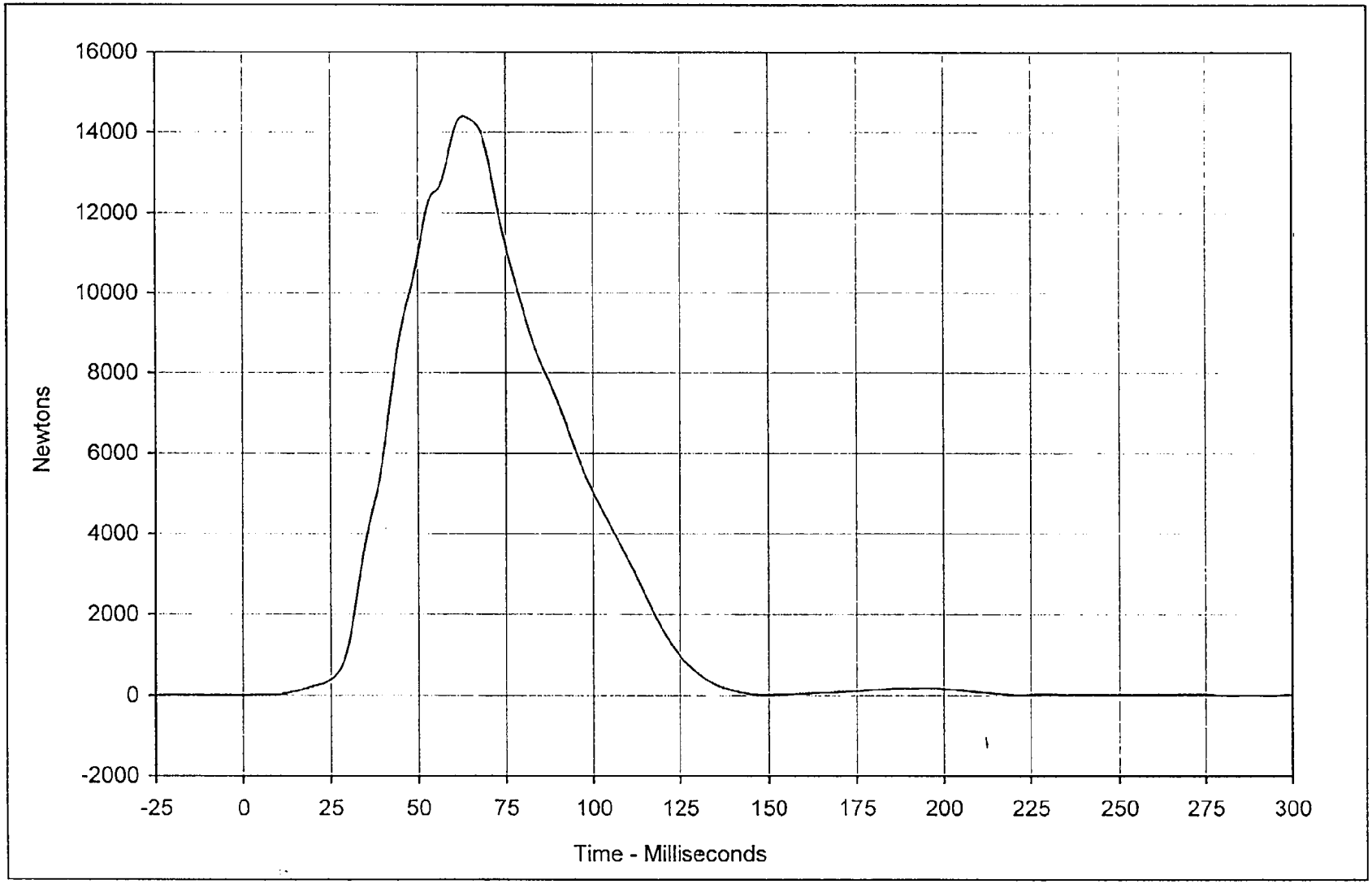


Curve Description:	Passenger Lap Belt Force			Testing Program:	1997 New Car Assessment Program
Maximum Value:	13754.9	at	53.7 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-10.7	at	4.7 Milliseconds		
SAE Filter Class:	60				
Date of Test:	4/24/97				
Curve Number:	FIL-085				

KARCO Engineering

KAR-96-R96024-06

B120

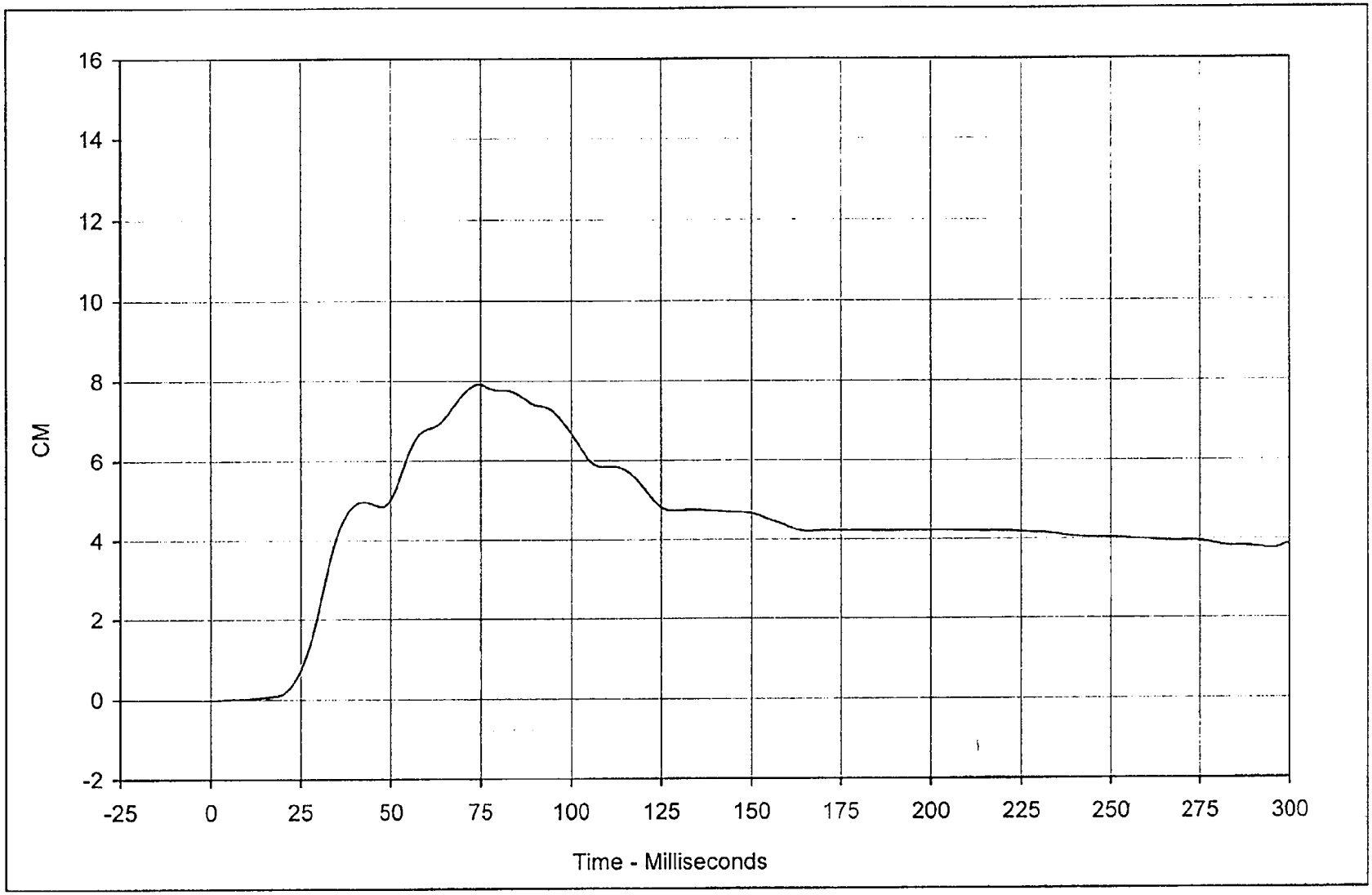


Curve Description:	Passenger Shoulder Belt Force				Testing Program:	1997 New Car Assessment Program
Maximum Value:	14395.8	at	62.9	Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	1.6	at	292.7	Milliseconds		
SAE Filter Class:	60					
Date of Test:	4/24/97					
Curve Number:	FIL-086					

KARCO Engineering

KAR-96-R96024-06

B121



Curve Description: Passenger Shoulder Belt Pullout

Maximum Value: 7.91 at 74.4 Milliseconds

Minimum Value: -0.02 at -30.0 Milliseconds

SAE Filter Class: 60

Date of Test: 4/24/97

Curve Number: FIL-087

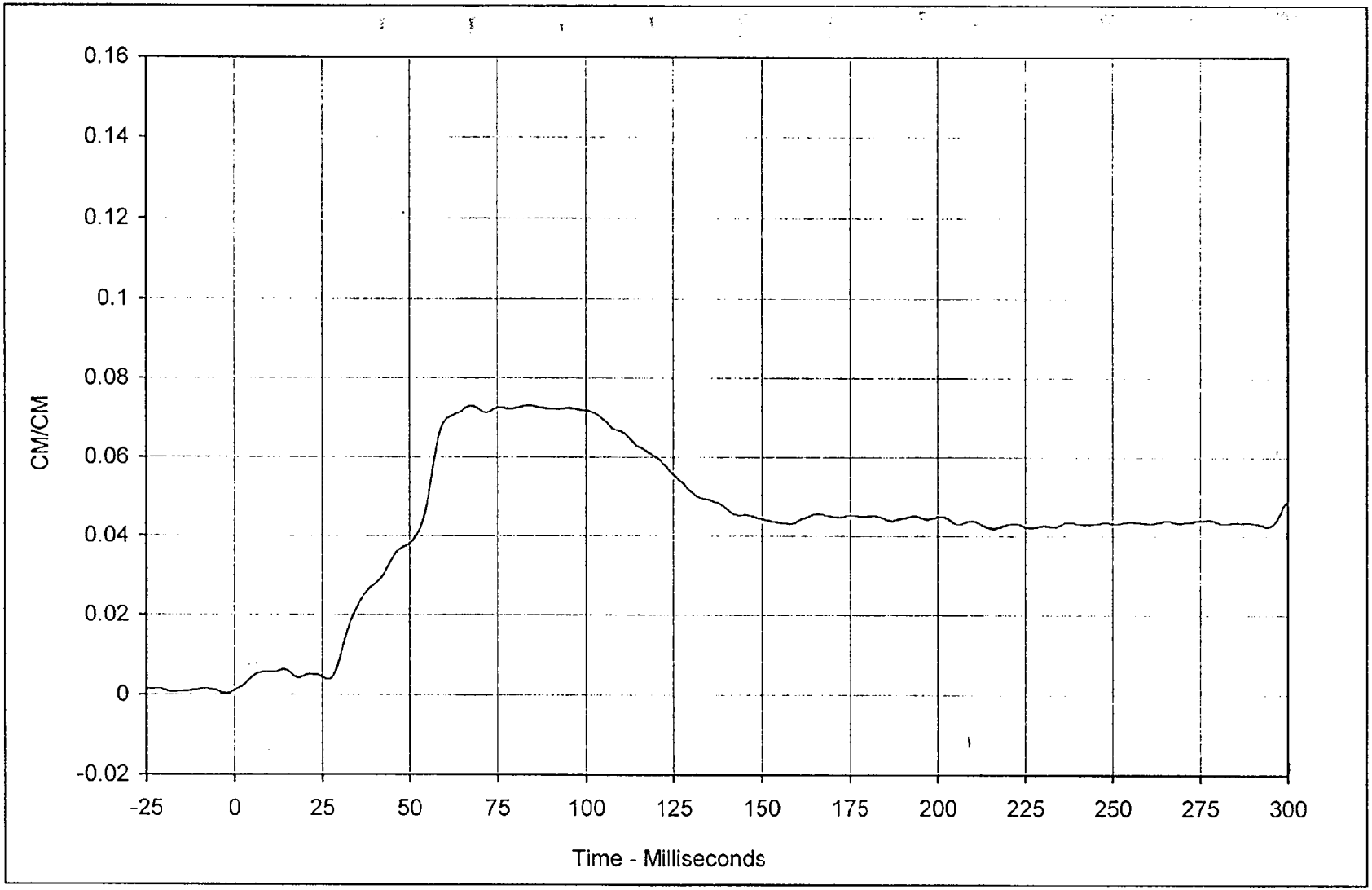
Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering

KAR-96-R96024-06

B122



Curve Description: Passenger Shoulder Belt Elongation

Maximum Value: 0.073 at 83.7 Milliseconds

Minimum Value: 0.001 at 0.0 Milliseconds

SAE Filter Class: 60

Date of Test: 4/24/97

Curve Number: FIL-088

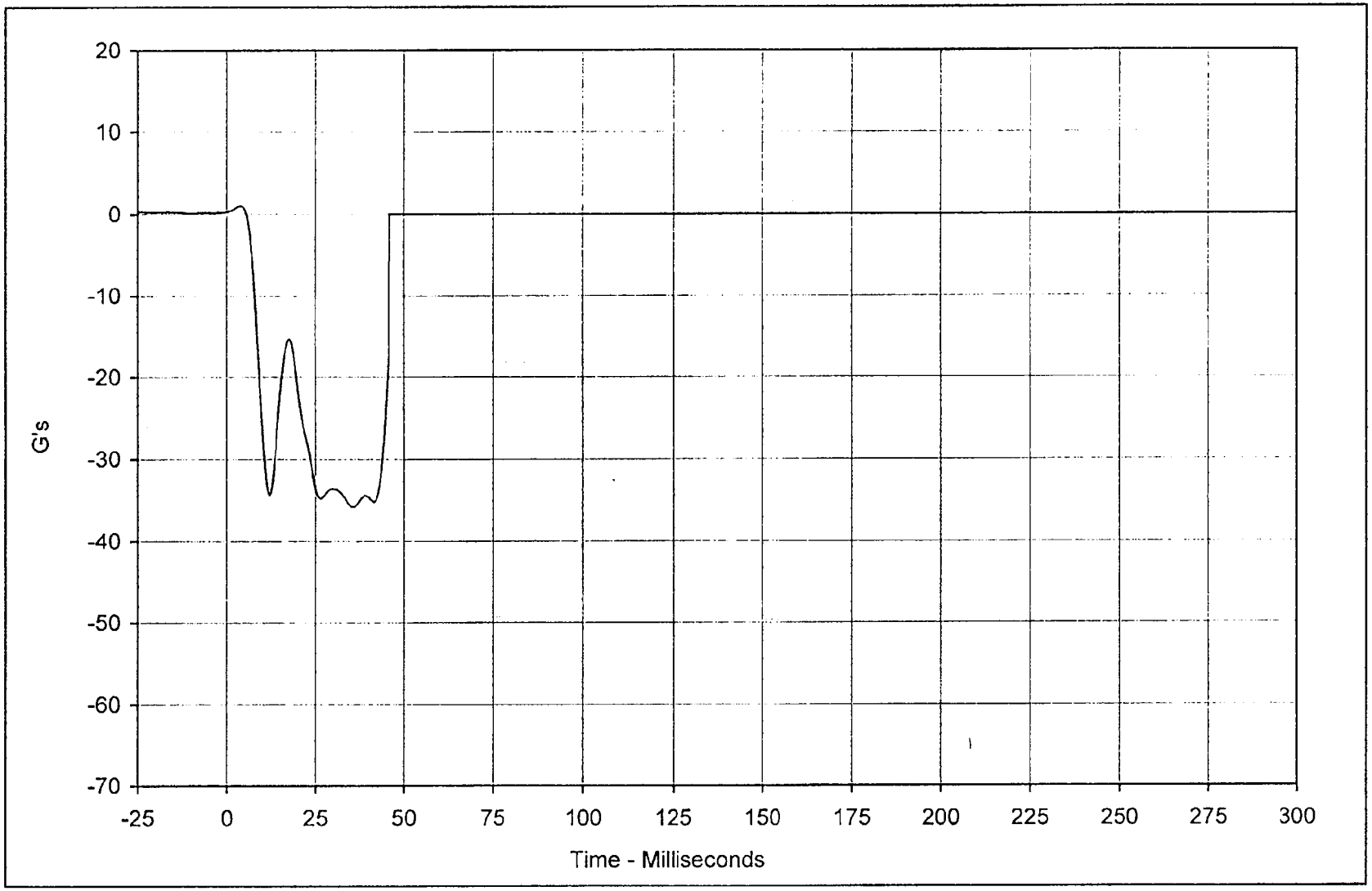
Testing Program: 1997 New Car Assesment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering

KAR-96-R96024-06

B123



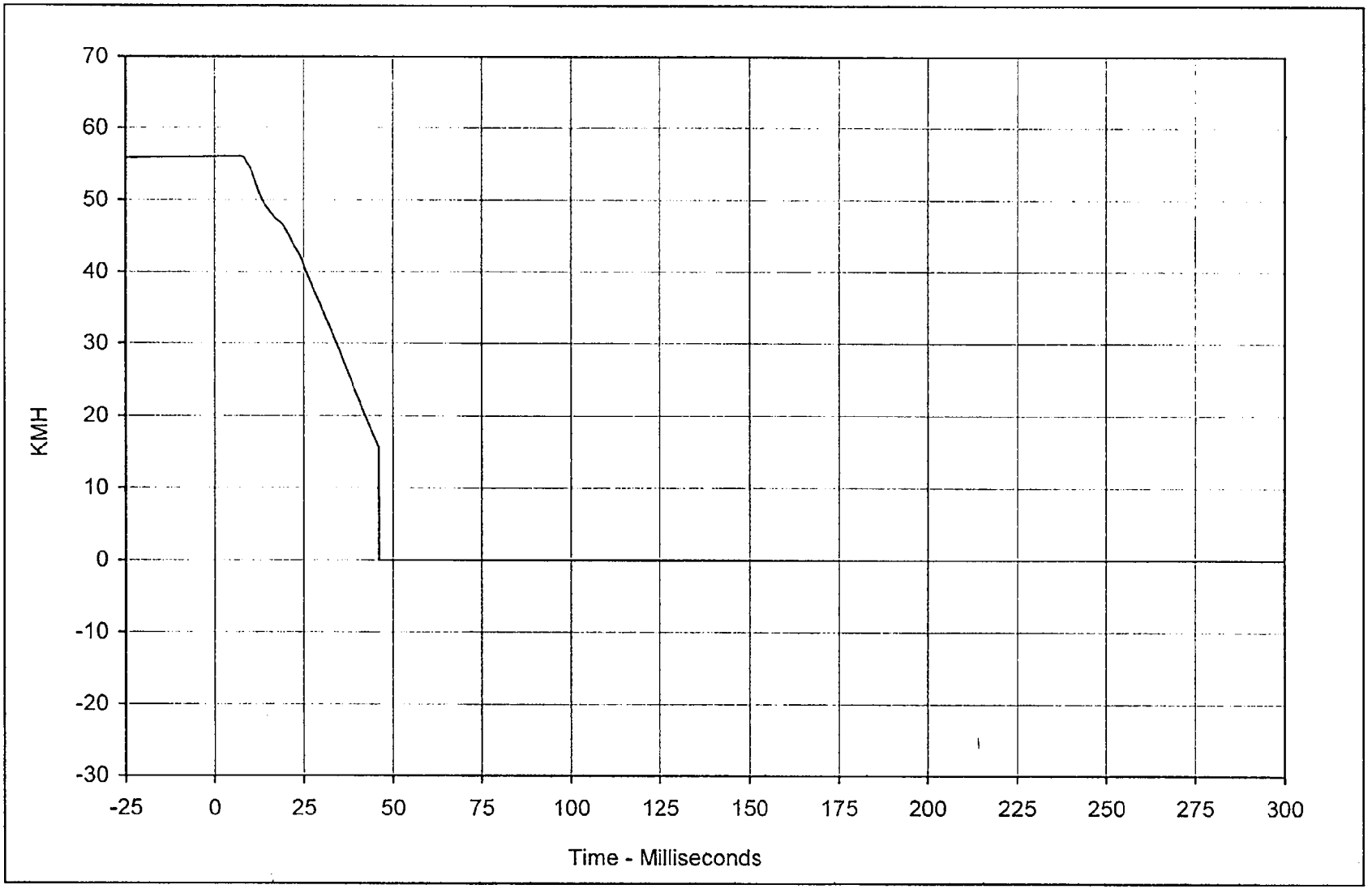
Curve Description:	Vehicle Left Rear Primary X	*			Testing Program:	1997 New Car Assessment Program	
Maximum Value:	1.0	at	3.9	Milliseconds	Test Vehicle:	1997 Kia Sportage	
Minimum Value:	-35.8	at	35.6	Milliseconds			
SAE Filter Class:	60						
Date of Test:	4/24/97						
Curve Number:	FIL-089						

*Channel Failed at 46 Msec

KARCO Engineering

KAR-96-R96024-06

B124



Curve Description: Vehicle Left Rear Primary X Velocity *

Maximum Value: 56.1 at 4.9 Milliseconds

Minimum Value: 0.0 at 46.0 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN1-089

Testing Program: 1997 New Car Assessment Program

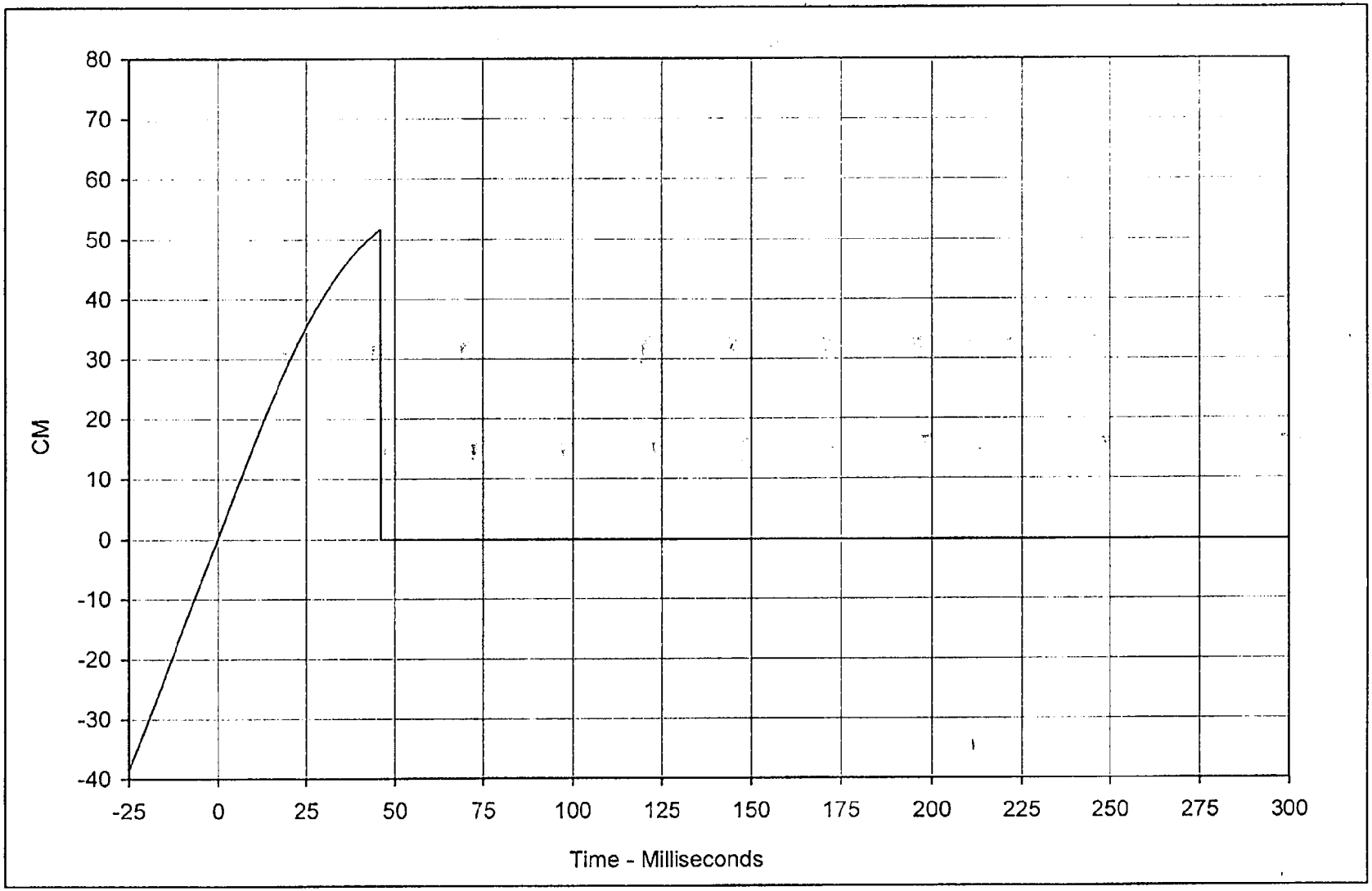
Test Vehicle: 1997 Kia Sportage

*Channel Failed at 46 Msec

KARCO Engineering

KAR-96-R96024-06

B125



Curve Description: Vehicle Left Rear Primary X Displ. *

Maximum Value: 51.8 at 45.9 Milliseconds

Minimum Value: 0.0 at 46.0 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN2-089

Testing Program: 1997 New Car Assessment Program

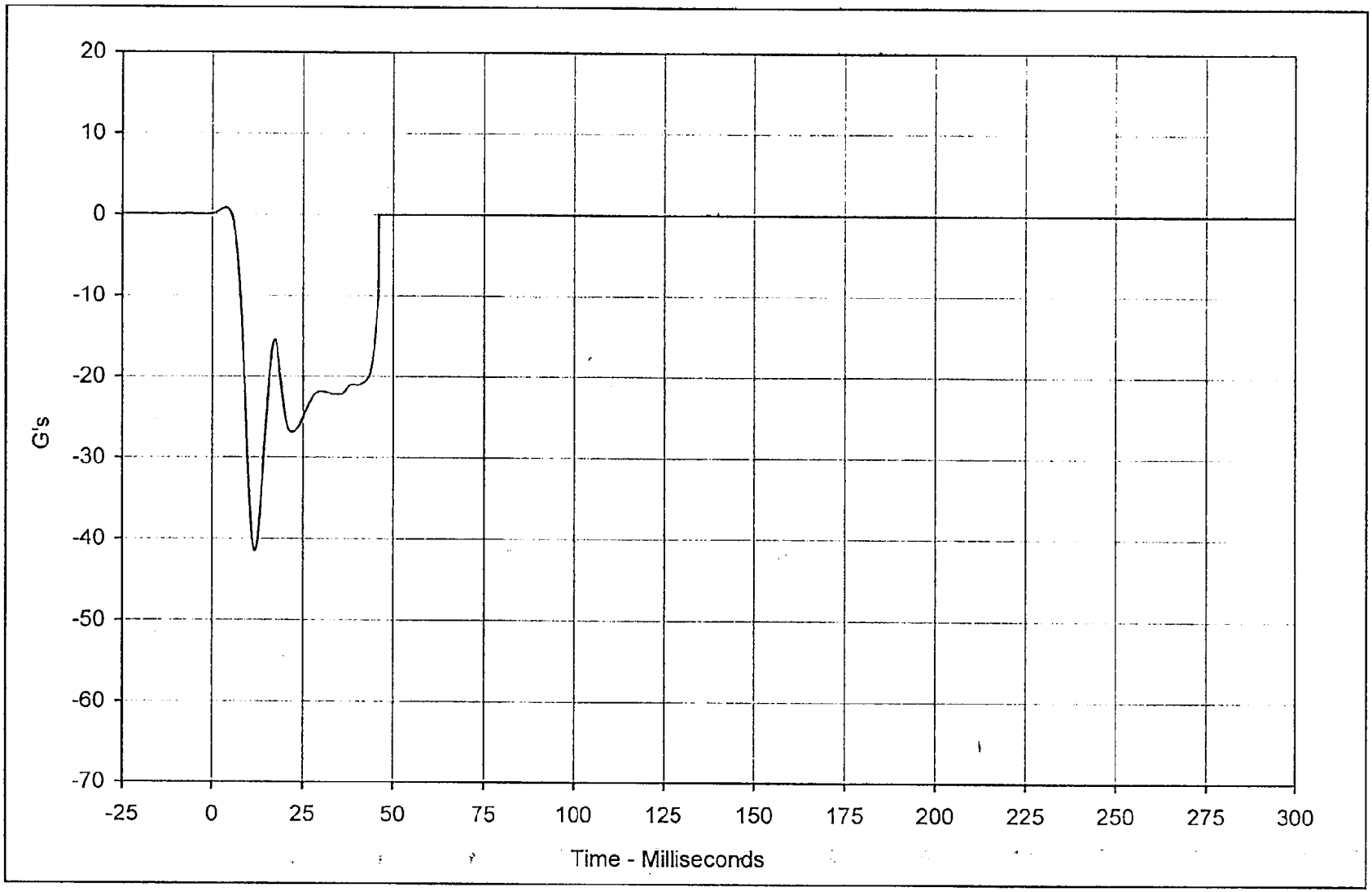
Test Vehicle: 1997 Kia Sportage

*Channel Failed at 46 Msec

KARCO Engineering

KAR-96-R96024-06

B126



Curve Description: Vehicle Right Rear Primary X *

Maximum Value: 0.9 at 3.8 Milliseconds

Minimum Value: -41.5 at 11.7 Milliseconds

SAE Filter Class: 60

Date of Test: 4/24/97

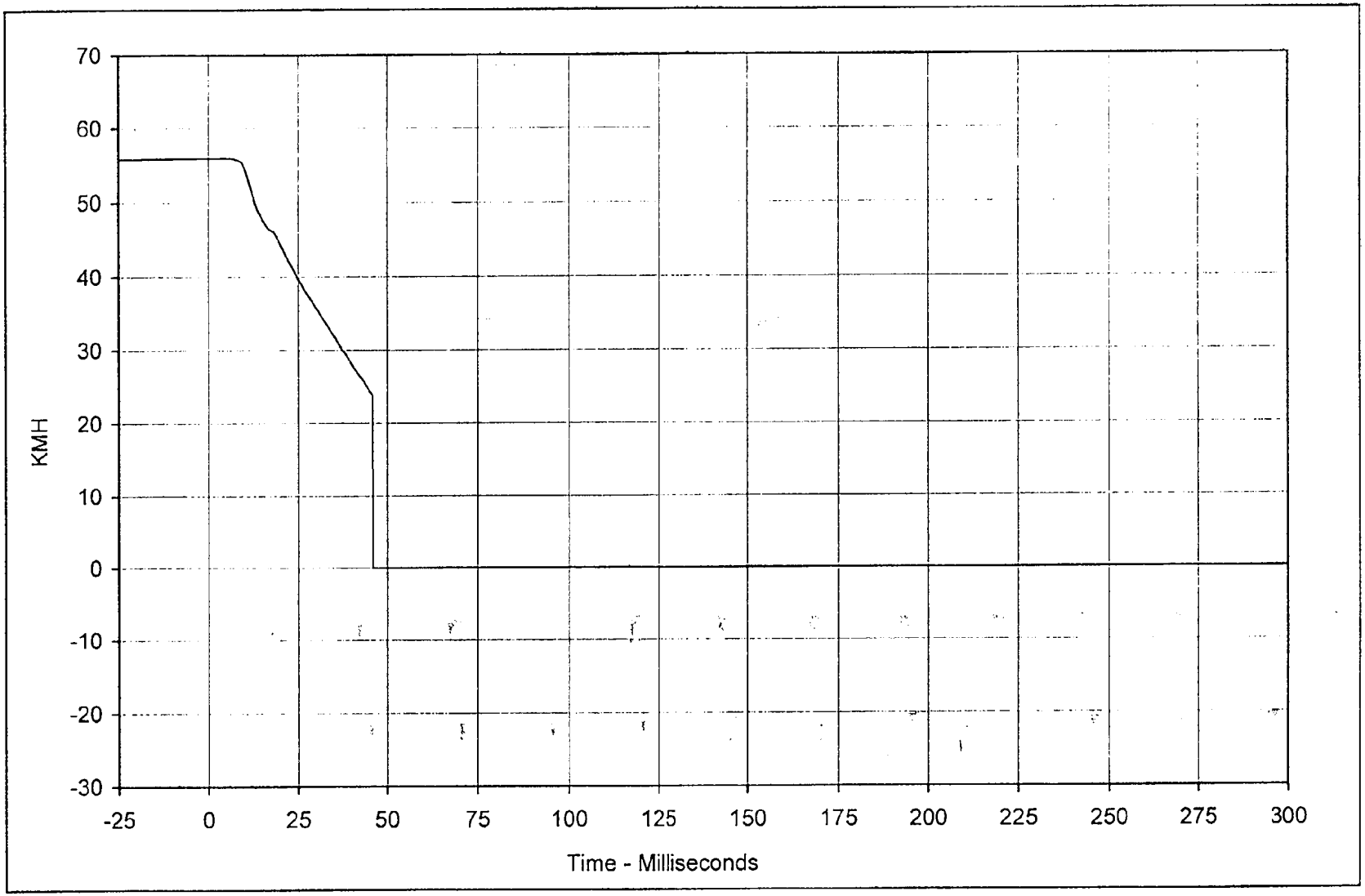
Curve Number: FIL-090

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

*Channel Failed at 46 Msec

KARCO Engineering



Curve Description: Vehicle Right Rear Primary X Velocity *

Maximum Value: 56.0 at 4.0 Milliseconds

Minimum Value: 0.0 at 46.0 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN1-090

Testing Program: 1997 New Car Assessment Program

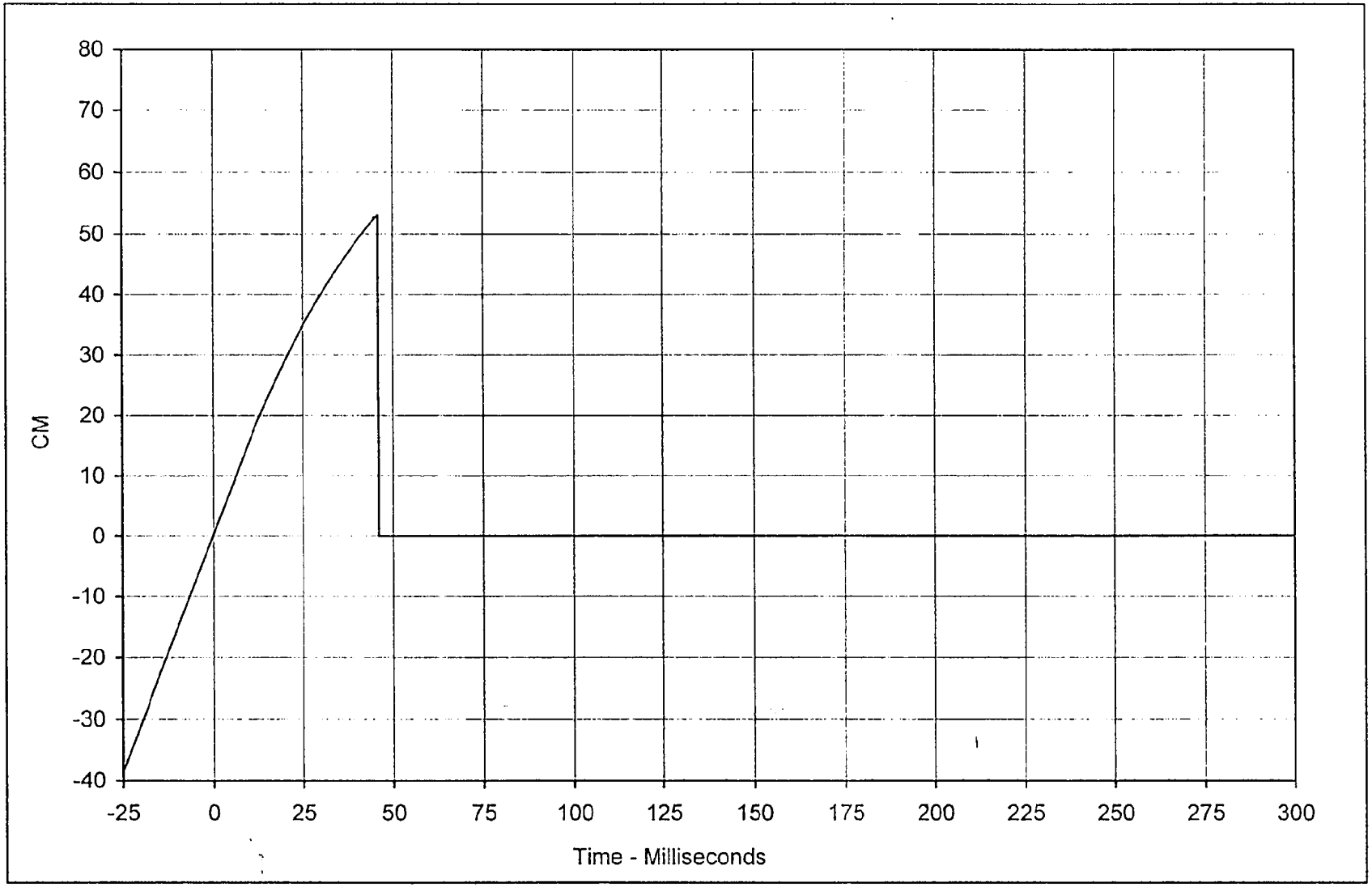
Test Vehicle: 1997 Kia Sportage

*Channel Failed at 46 Msec

KARCO Engineering

KAR-96-R96024-06

B128



Curve Description: Vehicle Right Rear Primary X Displ. *

Maximum Value: 53.1 at 45.9 Milliseconds

Minimum Value: 0.0 at 46.0 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN2-090

Testing Program: 1997 New Car Assessment Program

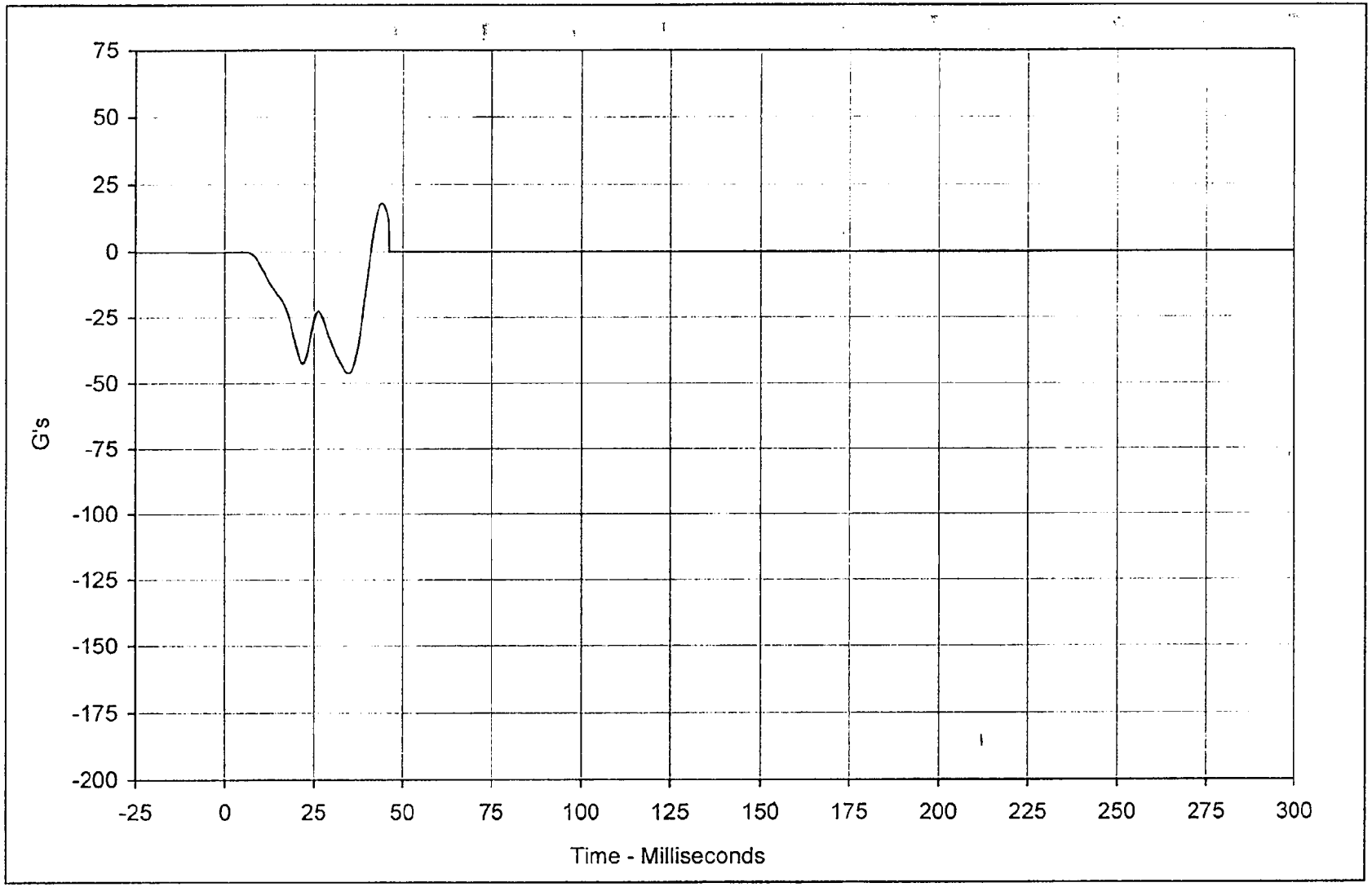
Test Vehicle: 1997 Kia Sportage

*Channel Failed at 46 Msec

KARCO Engineering

KAR-96-R96024-06

B129



Curve Description: Vehicle Engine Top X *

Maximum Value: 18.0 at 43.9 Milliseconds

Minimum Value: -46.2 at 34.6 Milliseconds

SAE Filter Class: 60

Date of Test: 4/24/97

Curve Number: FIL-091

Testing Program: 1997 New Car Assessment Program

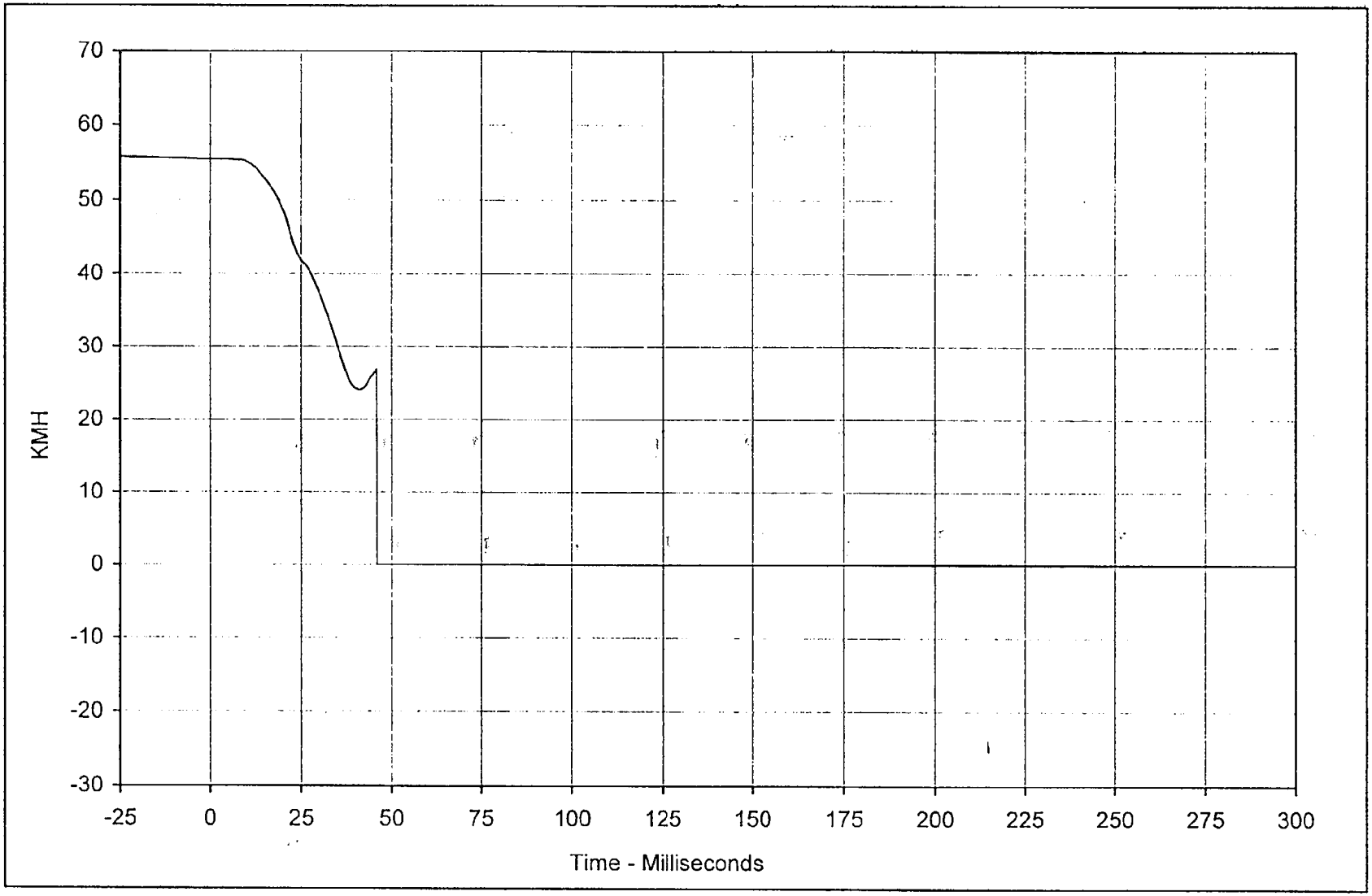
Test Vehicle: 1997 Kia Sportage

*Channel Failed at 46 Msec

KARCO Engineering

KAR-96-R96024-06

B130



Curve Description: Vehicle Engine Top X Velocity *

Maximum Value: 55.5 at 0.0 Milliseconds

Minimum Value: 0.0 at 46.0 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN1-091

Testing Program: 1997 New Car Assessment Program

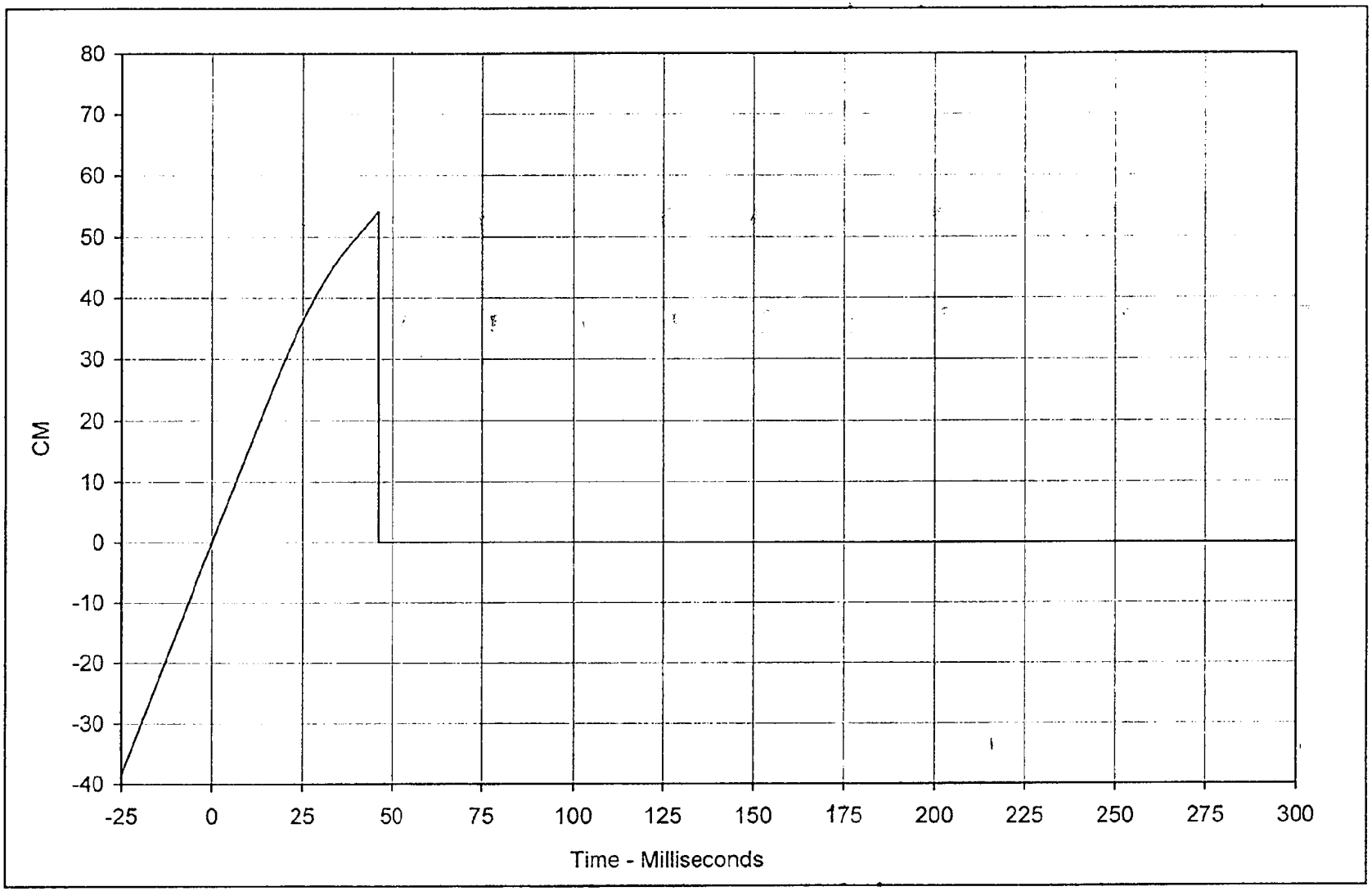
Test Vehicle: 1997 Kia Sportage

*Channel Failed at 46 Msec

KARCO Engineering

KAR-96-R96024-06

B131



Curve Description: Vehicle Engine Top X Displ. *

Maximum Value: 54.1 at 45.9 Milliseconds

Minimum Value: -0.1 at 0.0 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN2-091

Testing Program: 1997 New Car Assessment Program

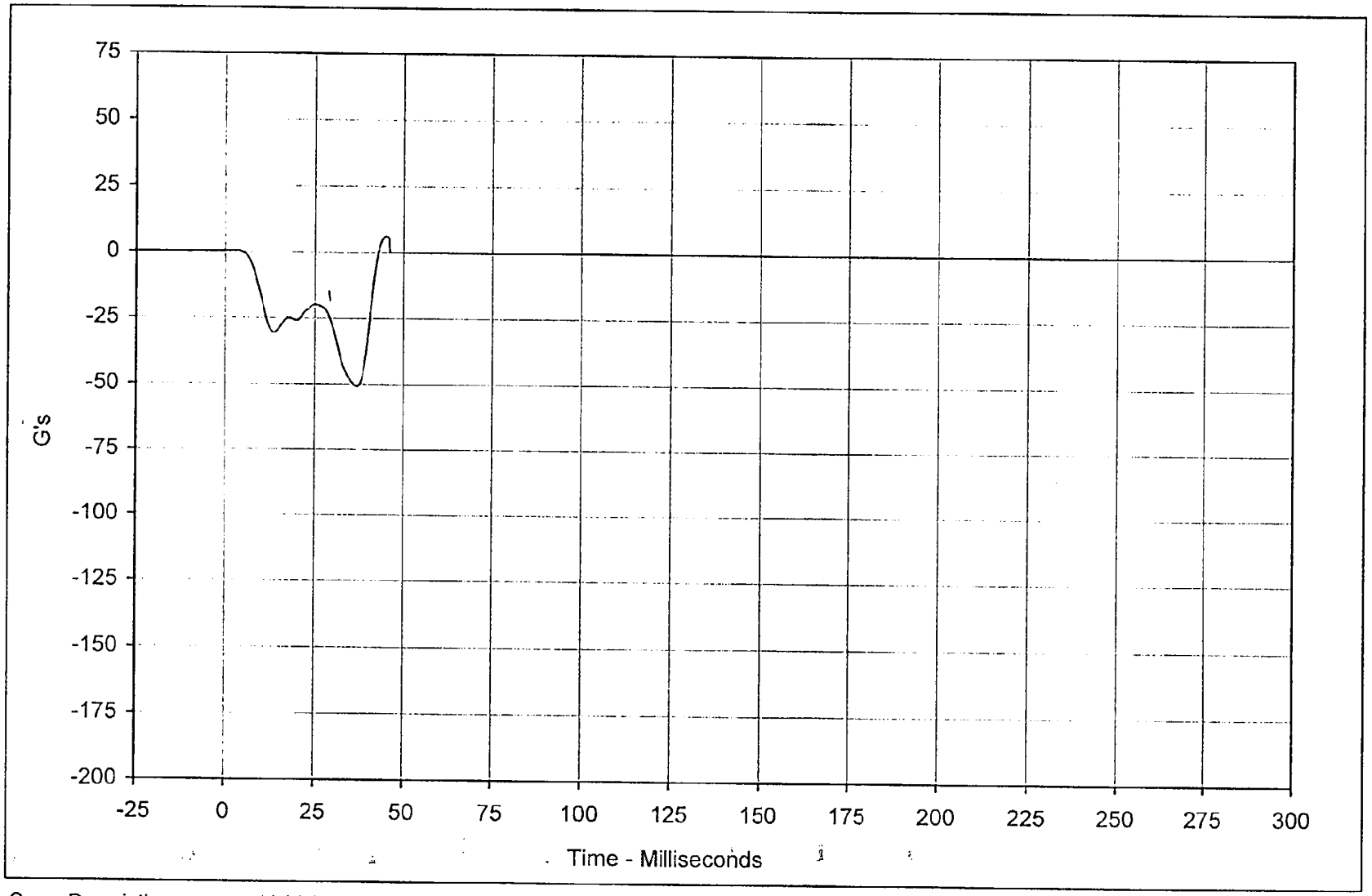
Test Vehicle: 1997 Kia Sportage

*Channel Failed at 46 Msec

KARCO Engineering

KAR-96-R96024-06

B132



Curve Description: Vehicle Engine Bottom X *

Maximum Value: 6.2 at 45.1 Milliseconds

Minimum Value: -50.8 at 36.7 Milliseconds

SAE Filter Class: 60

Date of Test: 4/24/97

Curve Number: FIL-092

Testing Program: 1997 New Car Assessment Program

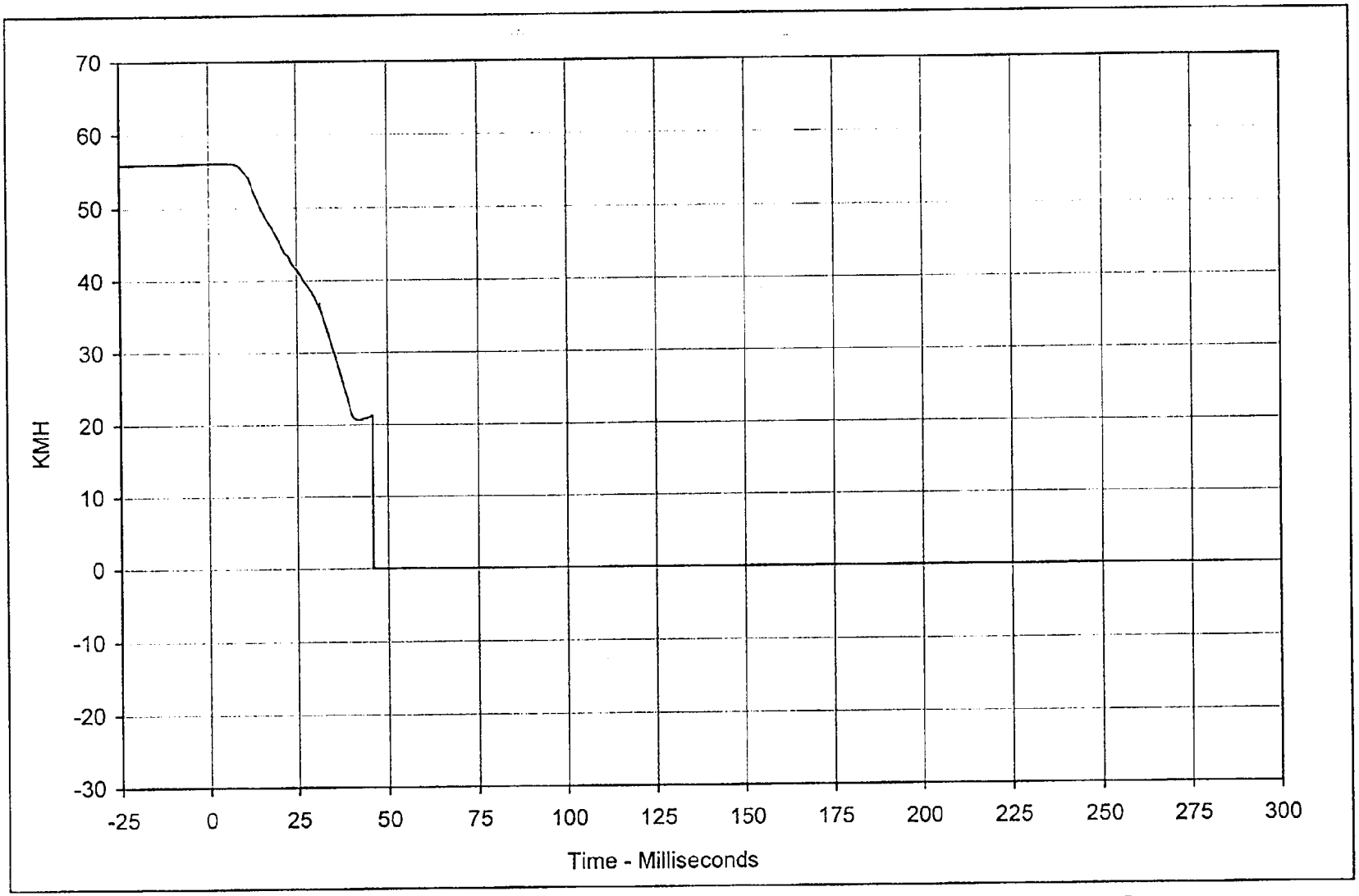
Test Vehicle: 1997 Kia Sportage

*Channel Failed at 46 Msec

KARCO Engineering

KAR-96-R96024-06

B133



Curve Description: Vehicle Engine Bottom X Velocity *

Maximum Value: 56.0 at 3.9 Milliseconds

Minimum Value: 0.0 at 46.0 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN1-092

Testing Program: 1997 New Car Assessment Program

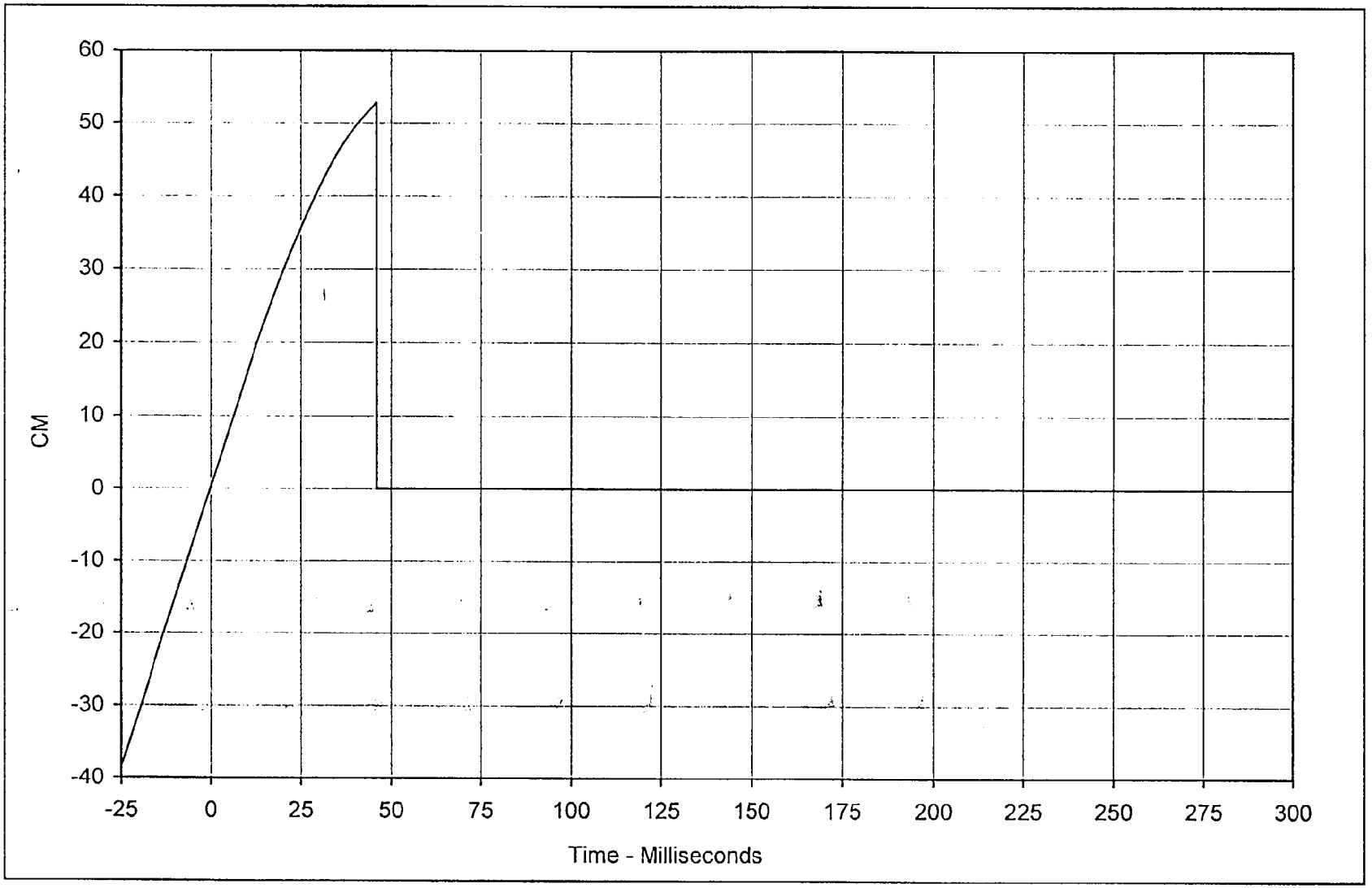
Test Vehicle: 1997 Kia Sportage

*Channel Failed at 46 Msec

KARCO Engineering

KAR-96-R96024-06

B134



Curve Description: Vehicle Engine Bottom X Displ. *

Maximum Value: 52.8 at 45.9 Milliseconds

Minimum Value: 0.0 at 46.0 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN2-092

Testing Program: 1997 New Car Assessment Program

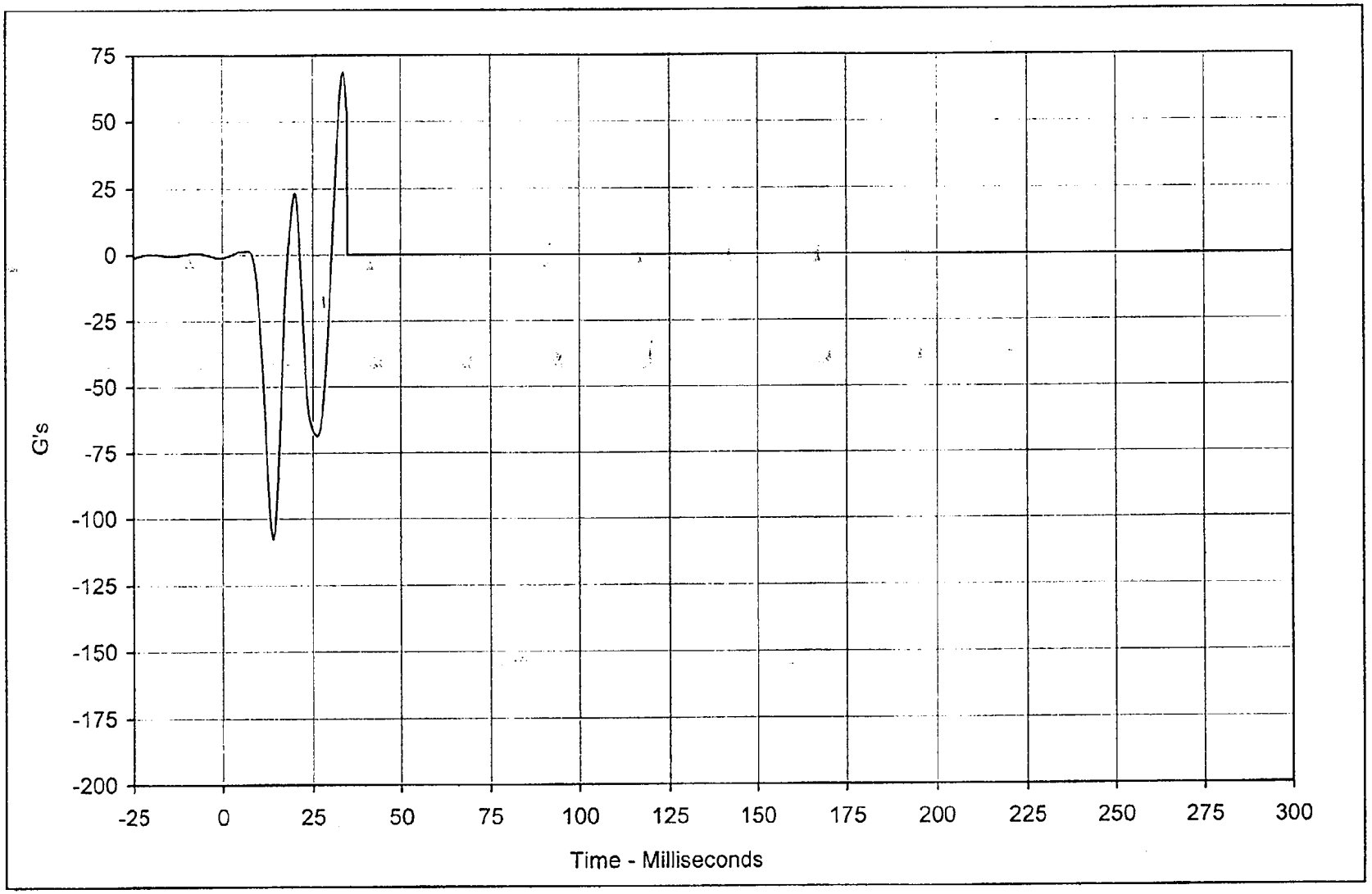
Test Vehicle: 1997 Kia Sportage

*Channel Failed at 46 Msec

KARCO Engineering

KAR-96-R96024-06

B135



Curve Description: Vehicle Left Brake Caliper X *

Maximum Value: 68.5 at 33.6 Milliseconds

Minimum Value: -107.6 at 14.0 Milliseconds

SAE Filter Class: 60

Date of Test: 4/24/97

Curve Number: FIL-093

Testing Program: 1997 New Car Assessment Program

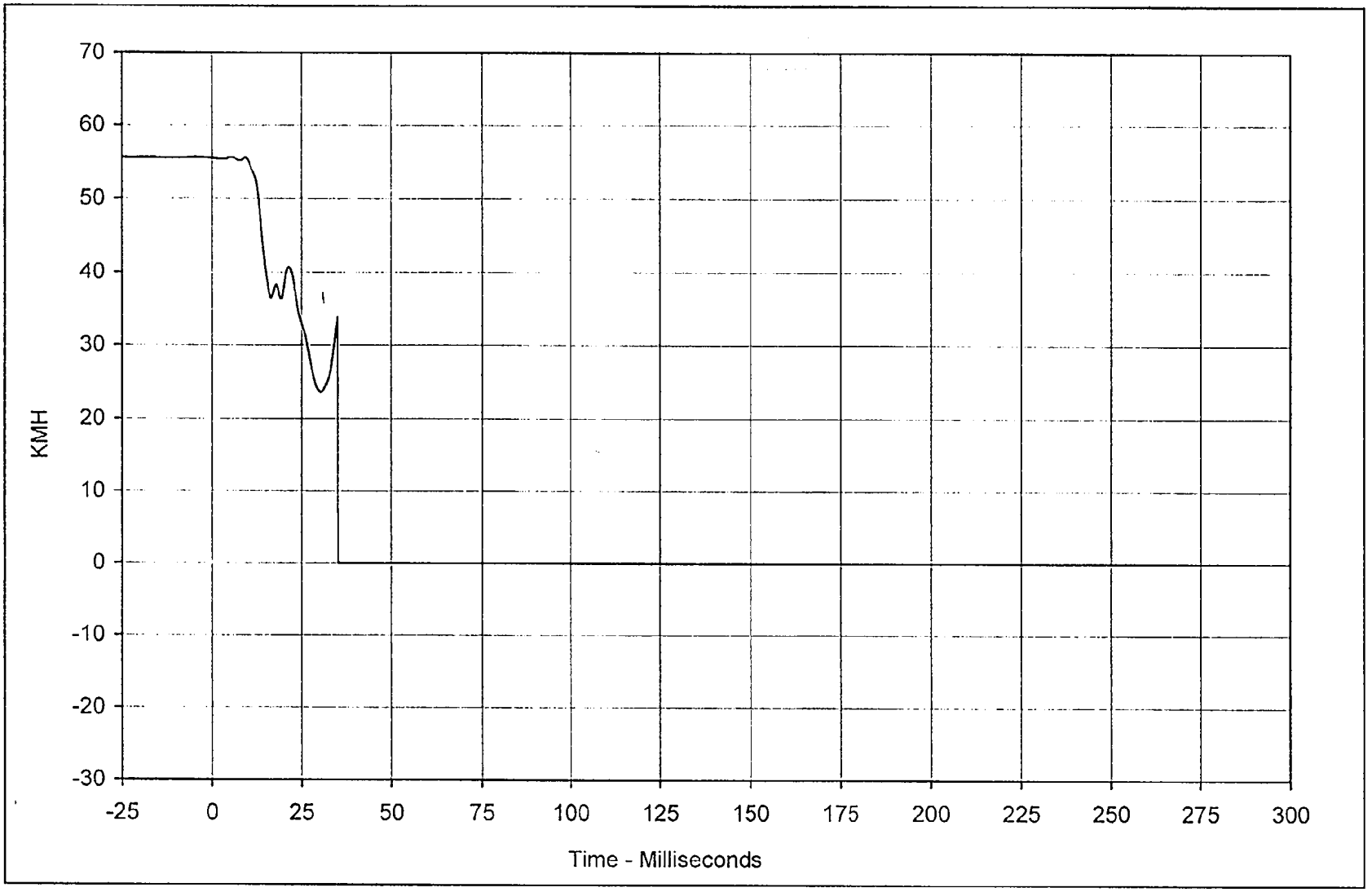
Test Vehicle: 1997 Kia Sportage

*Channel Failed at 35 Msec

KARCO Engineering

KAR-96-R96024-06

B136



Curve Description: Vehicle Left Brake Caliper X Velocity *

Maximum Value: 55.6 at 5.6 Milliseconds

Minimum Value: 0.0 at 35.0 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN1-093

Testing Program: 1997 New Car Assessment Program

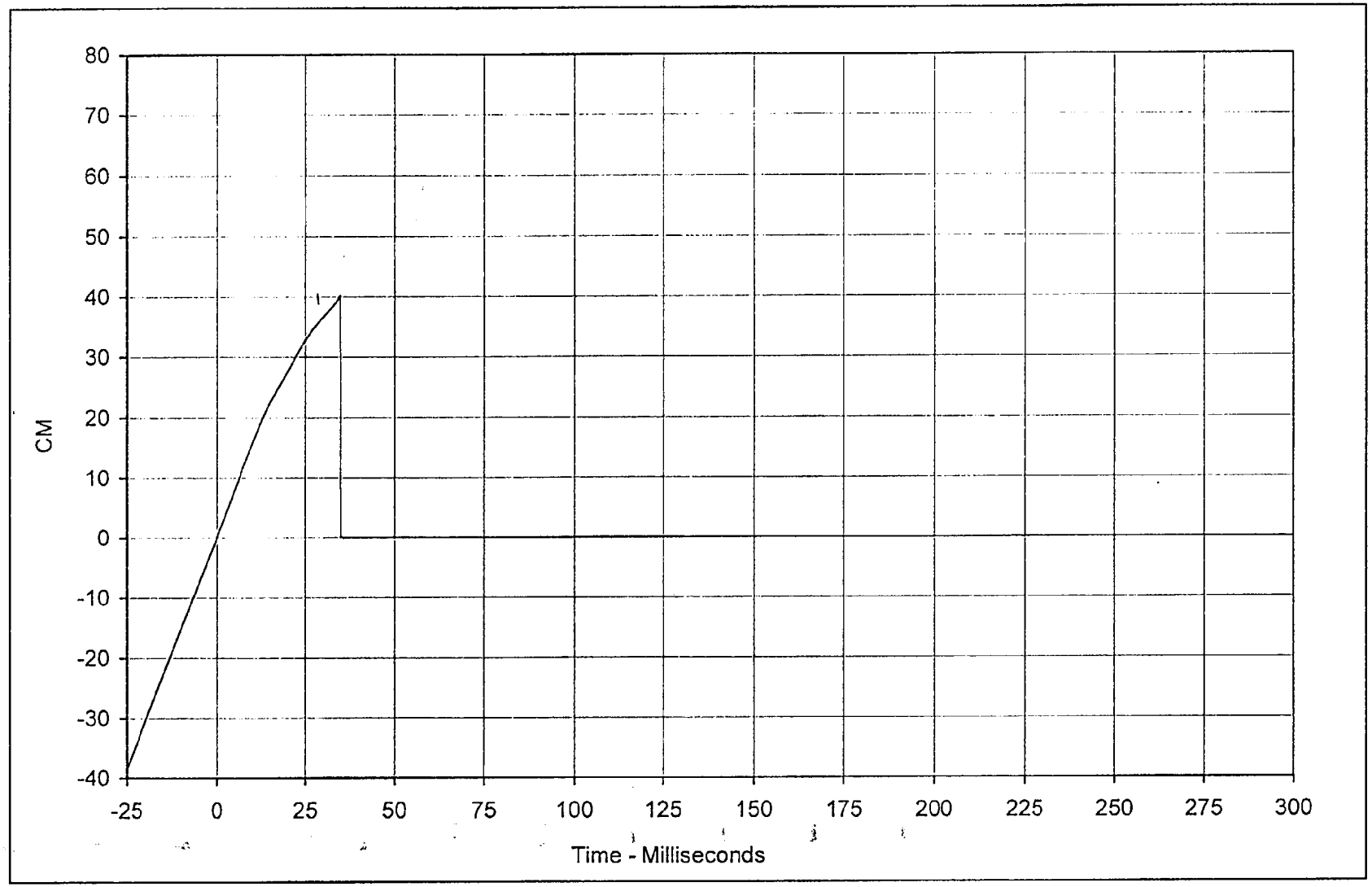
Test Vehicle: 1997 Kia Sportage

*Channel Failed at 35 Msec

KARCO Engineering

KAR-96-R96024-06

B137



Curve Description: Vehicle Left Brake Caliper X Displ. *

Maximum Value: 40.2 at 34.9 Milliseconds

Minimum Value: -0.1 at 0.0 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN2-093

Testing Program: 1997 New Car Assessment Program

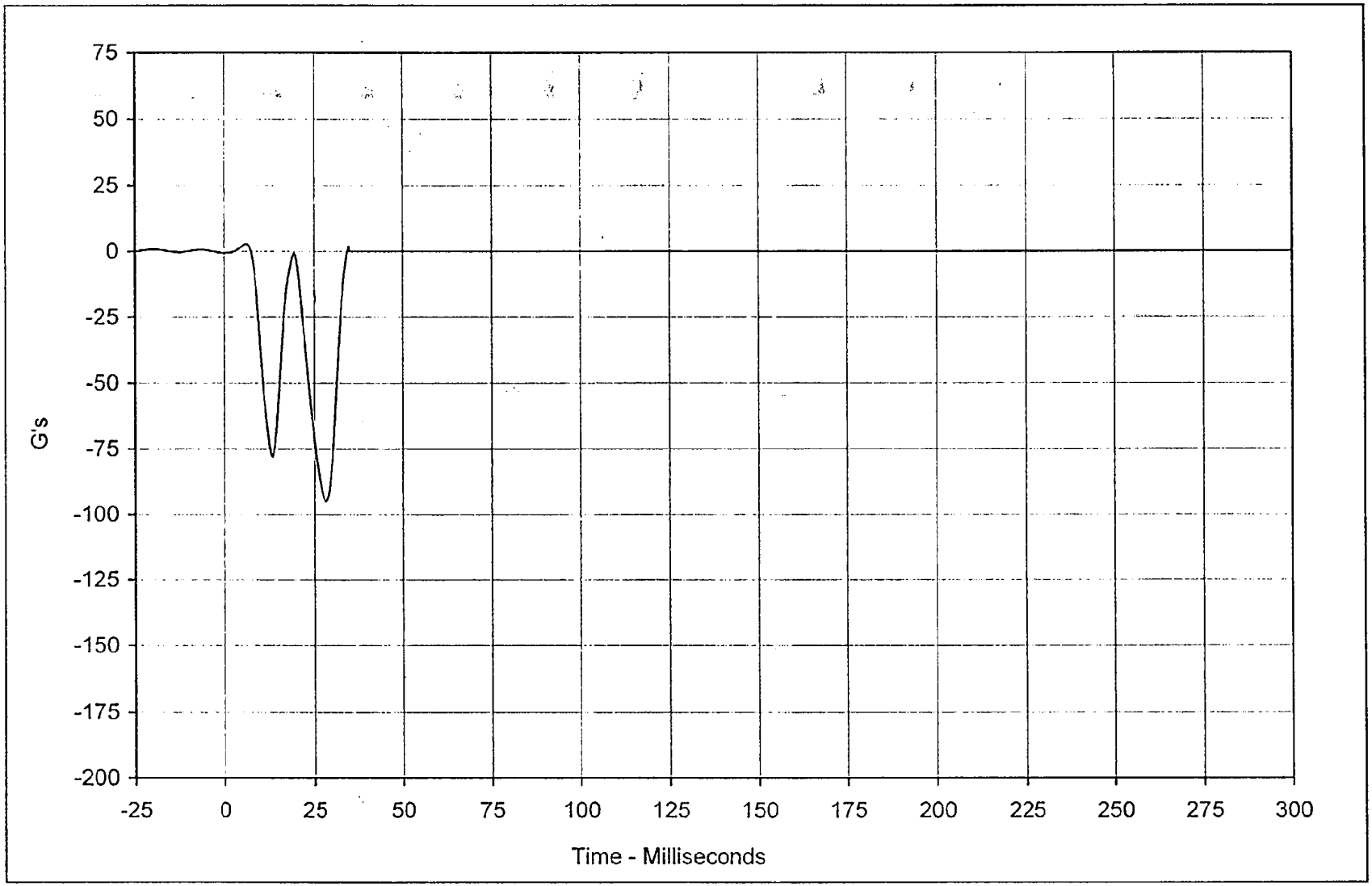
Test Vehicle: 1997 Kia Sportage

*Channel Failed at 35 Msec

KARCO Engineering

KAR-96-R96024-06

B138



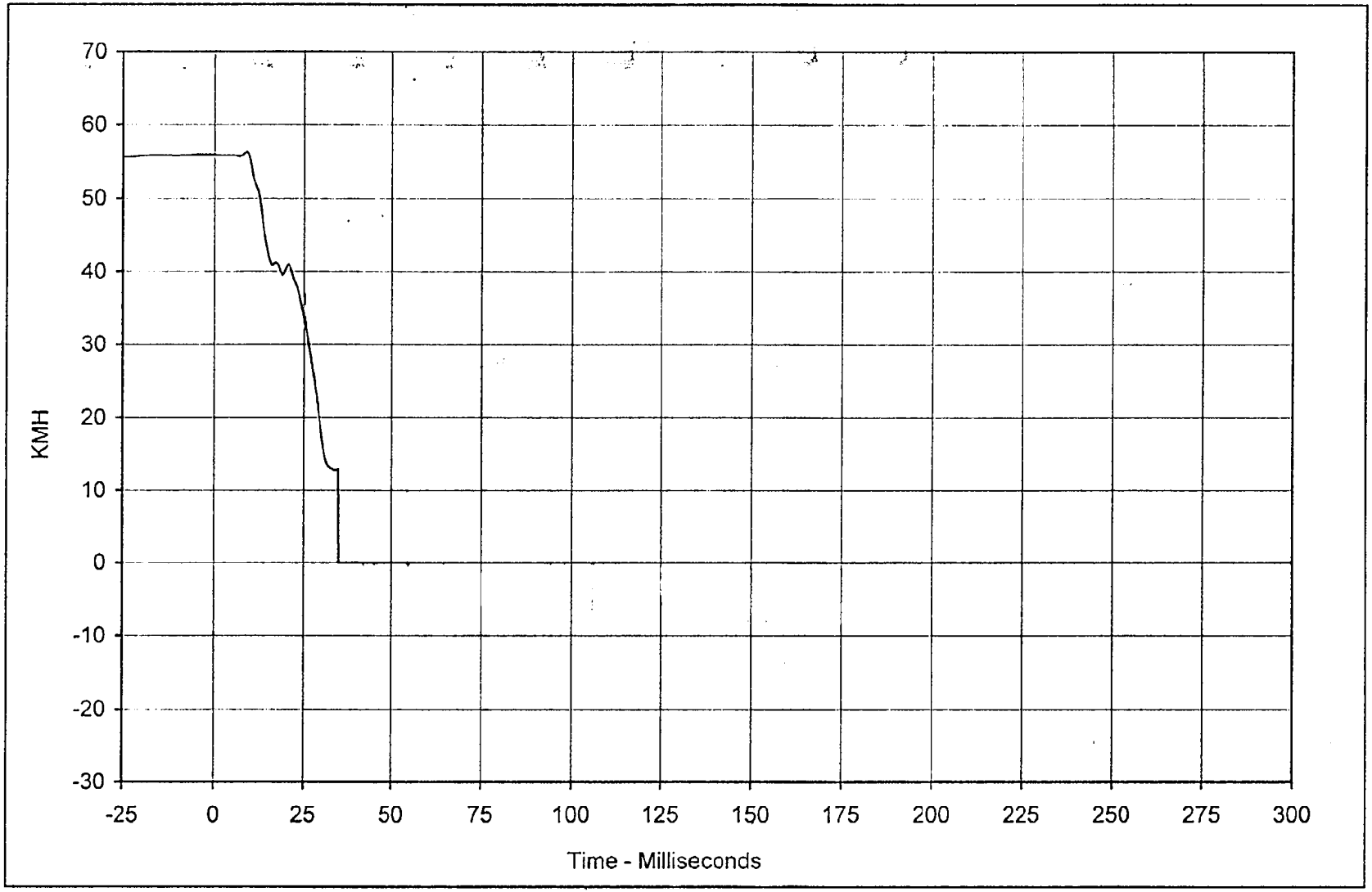
Curve Description:	Vehicle Right Brake Caliper X *			Testing Program:	1997 New Car Assessment Program
Maximum Value:	2.7	at	6.2 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-95.0	at	28.3 Milliseconds		
SAE Filter Class:	60				
Date of Test:	4/24/97				
Curve Number:	FIL-094				

*Channel Failed at 35 Msec

KARCO Engineering

KAR-96-R96024-06

B139



Curve Description: Vehicle Right Brake Caliper X Velocity *

Maximum Value: 56.4 at 9.2 Milliseconds

Minimum Value: 0.0 at 35.0 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN1-094

Testing Program: 1997 New Car Assessment Program

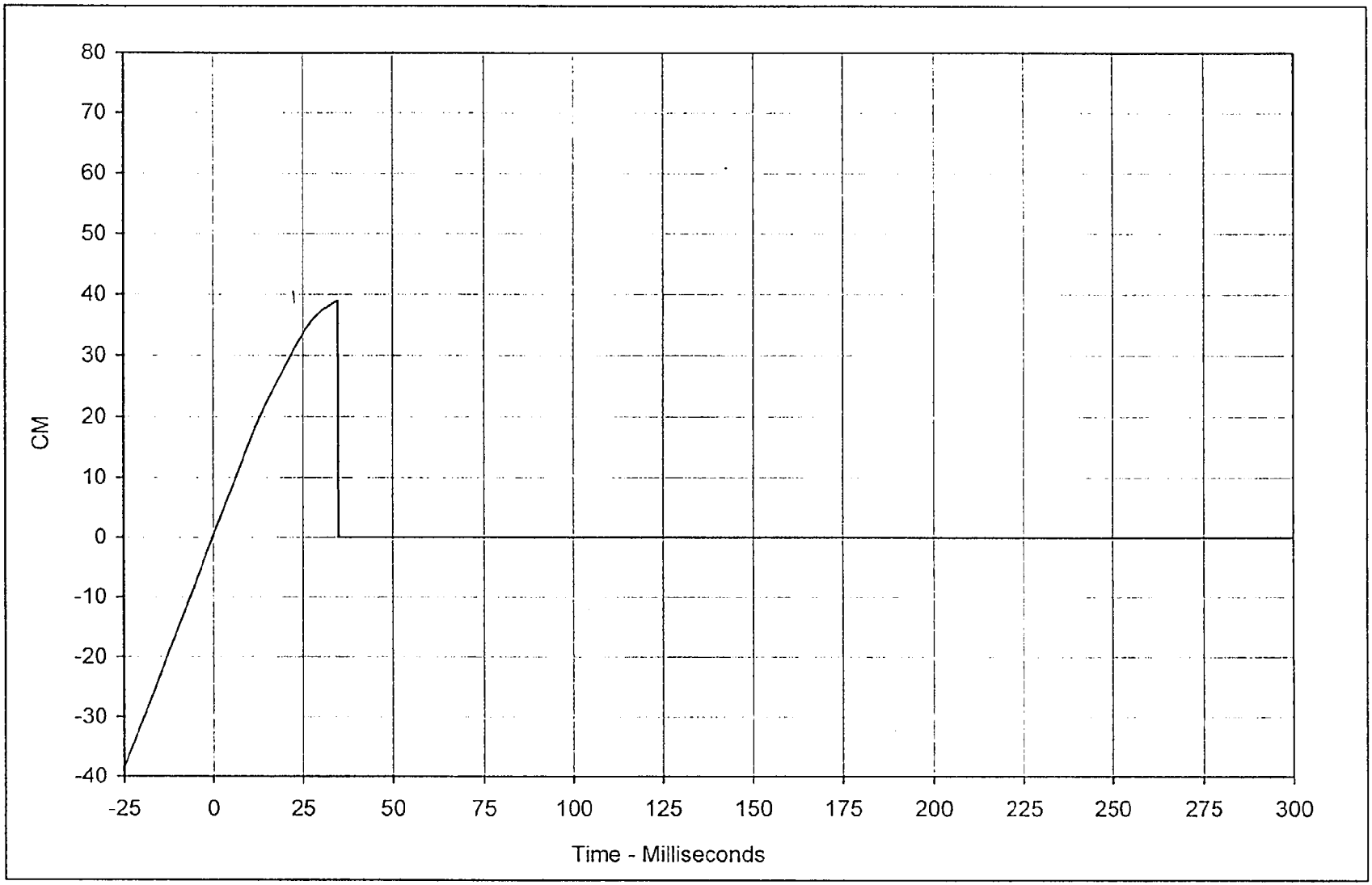
Test Vehicle: 1997 Kia Sportage

*Channel Failed at 35 Msec

KARCO Engineering

KAR-96-R96024-06

B140



Curve Description: Vehicle Right Brake Caliper X Displ. *

Maximum Value: 39.0 at 34.9 Milliseconds

Minimum Value: 0.0 at 35.0 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN2-094

Testing Program: 1997 New Car Assessment Program

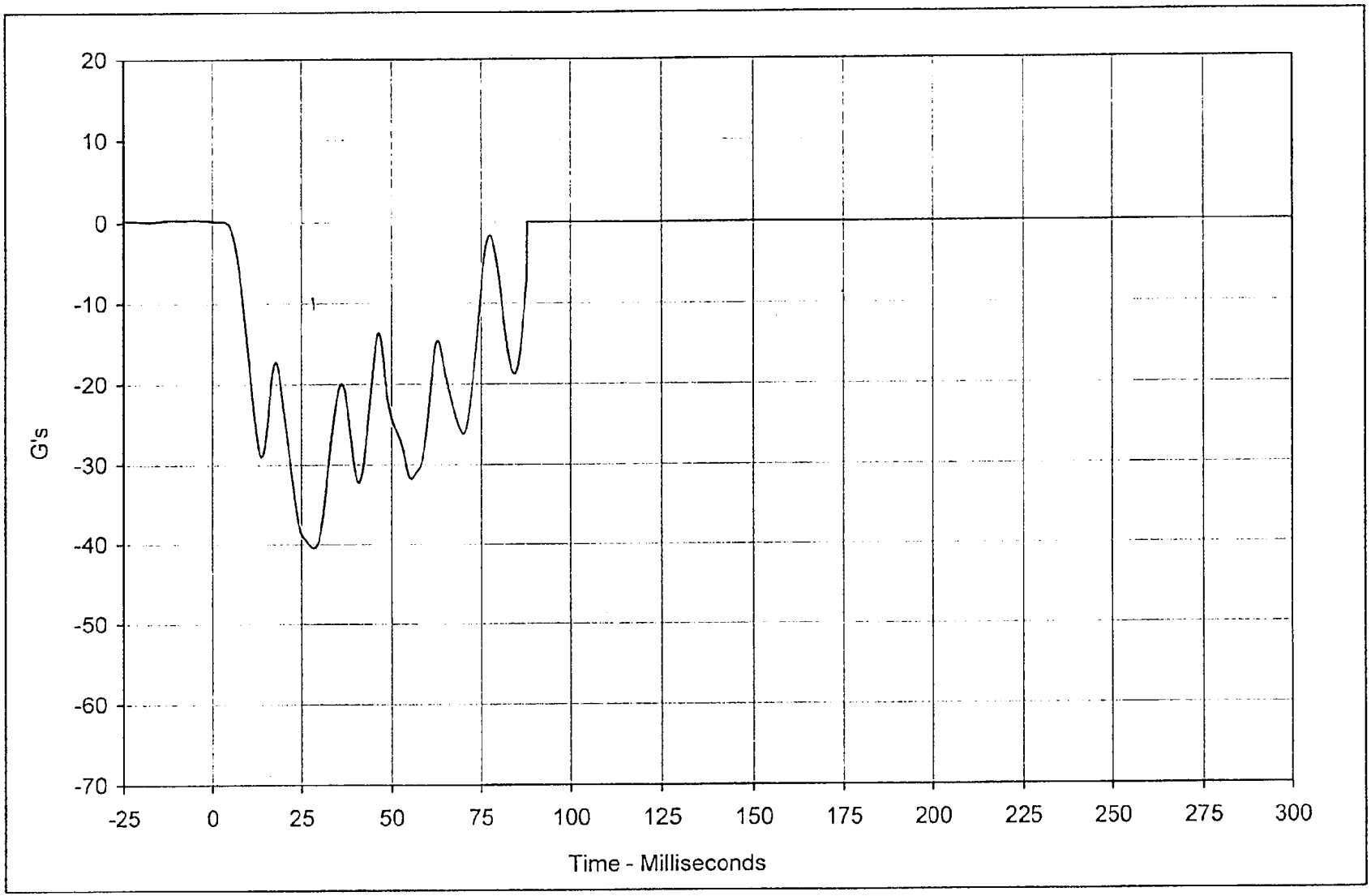
Test Vehicle: 1997 Kia Sportage

*Channel Failed at 35 Msec

KARCO Engineering

KAR-96-R96024-06

B141



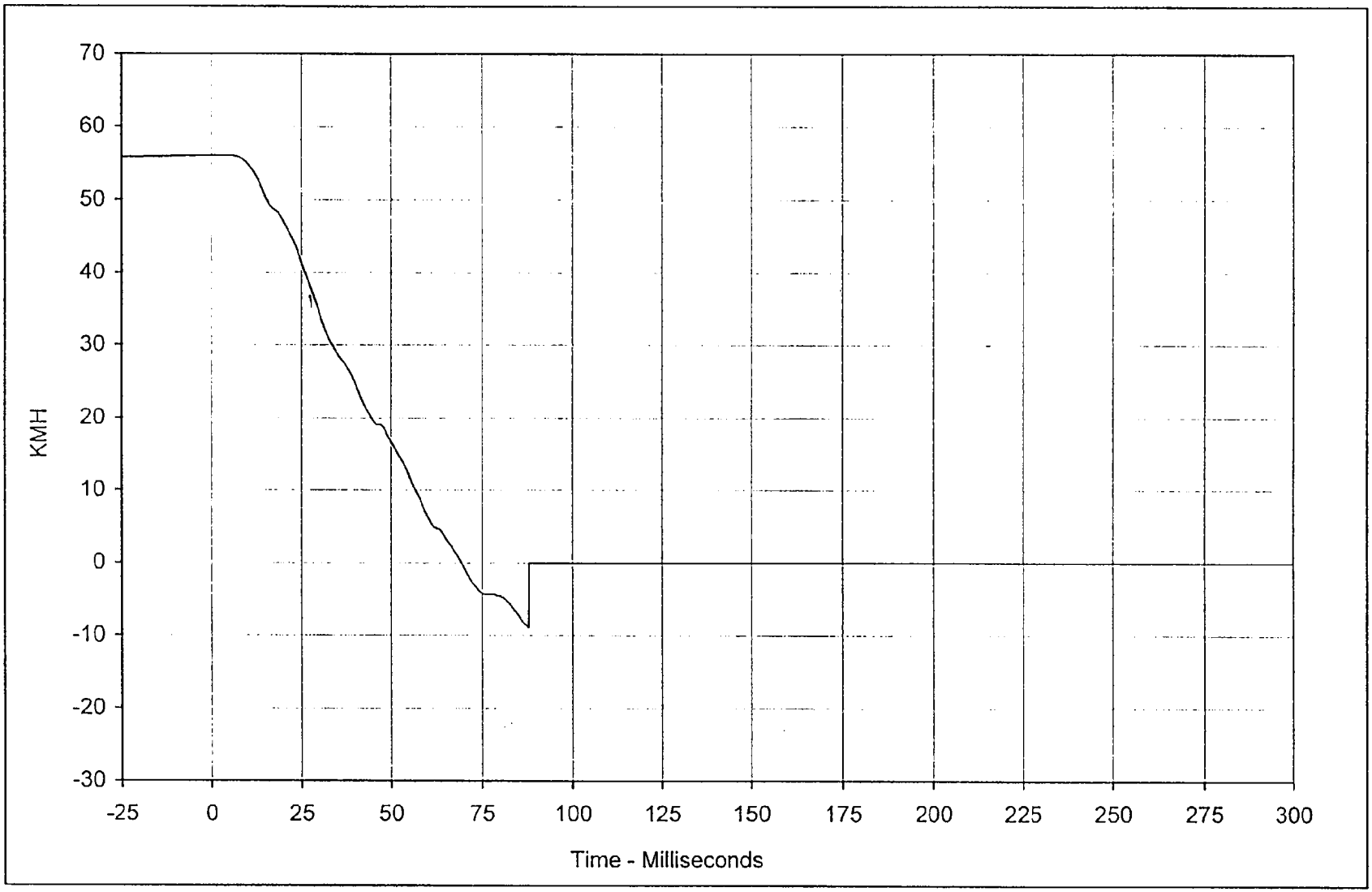
Curve Description:	Vehicle Instrument Panel X	*		Testing Program:	1997 New Car Assessment Program
Maximum Value:	0.2	at	0.0 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-40.5	at	28.4 Milliseconds		
SAE Filter Class:	60				
Date of Test:	4/24/97				
Curve Number:	FIL-095				

*Channel Failed at 88 Msec

KARCO Engineering

KAR-96-R96024-06

B142



Curve Description: Vehicle Instrument Panel X Velocity *

Maximum Value: 56.1 at 1.0 Milliseconds

Minimum Value: -8.9 at 87.9 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN1-095

Testing Program: 1997 New Car Assessment Program

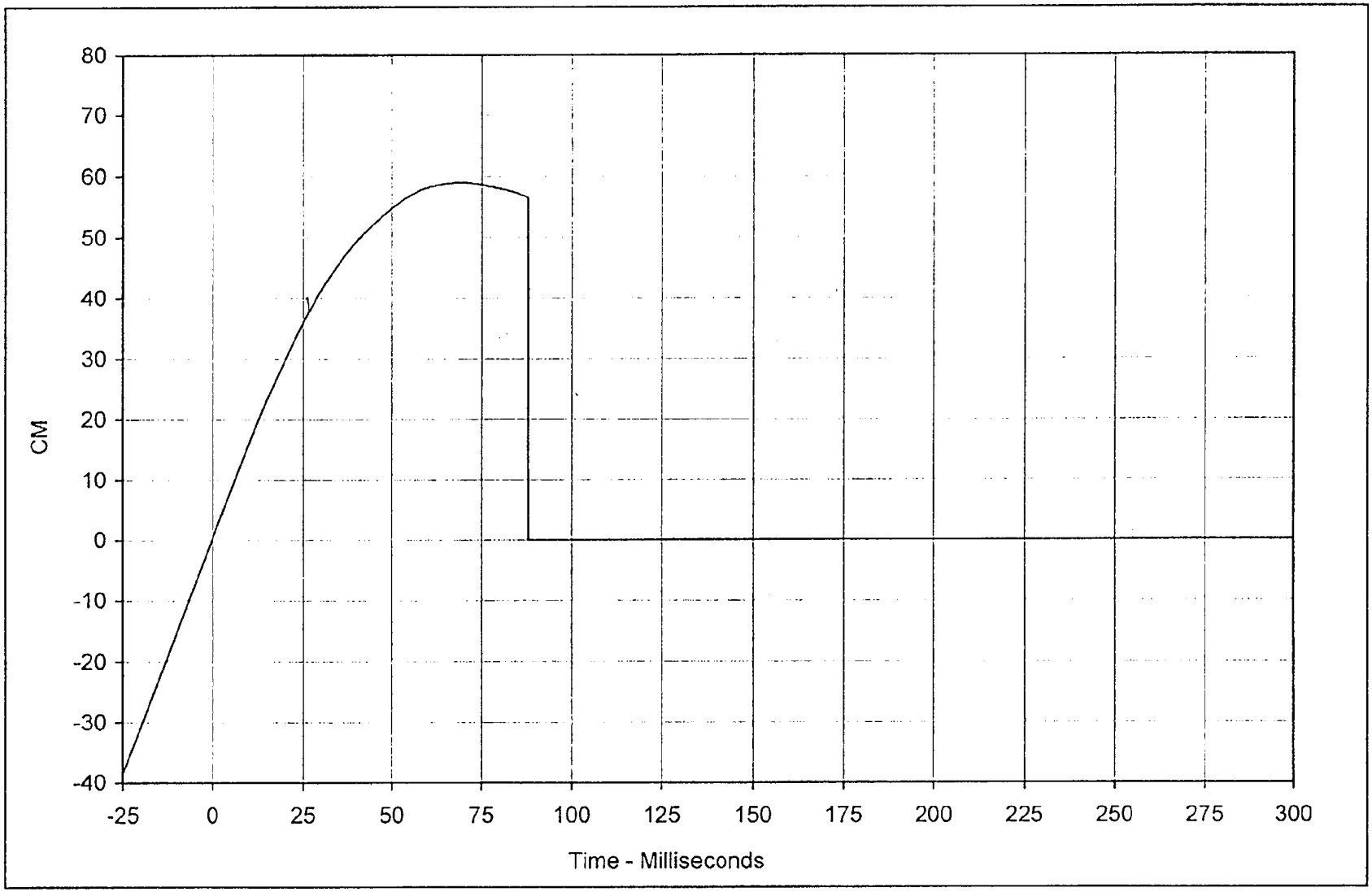
Test Vehicle: 1997 Kia Sportage

*Channel Failed at 88 Msec

KARCO Engineering

KAR-96-R96024-06

B143



Curve Description: Vehicle Instrument Panel X Displ. *

Maximum Value: 59.0 at 69.4 Milliseconds

Minimum Value: 0.0 at 88.0 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN2-095

Testing Program: 1997 New Car Assessment Program

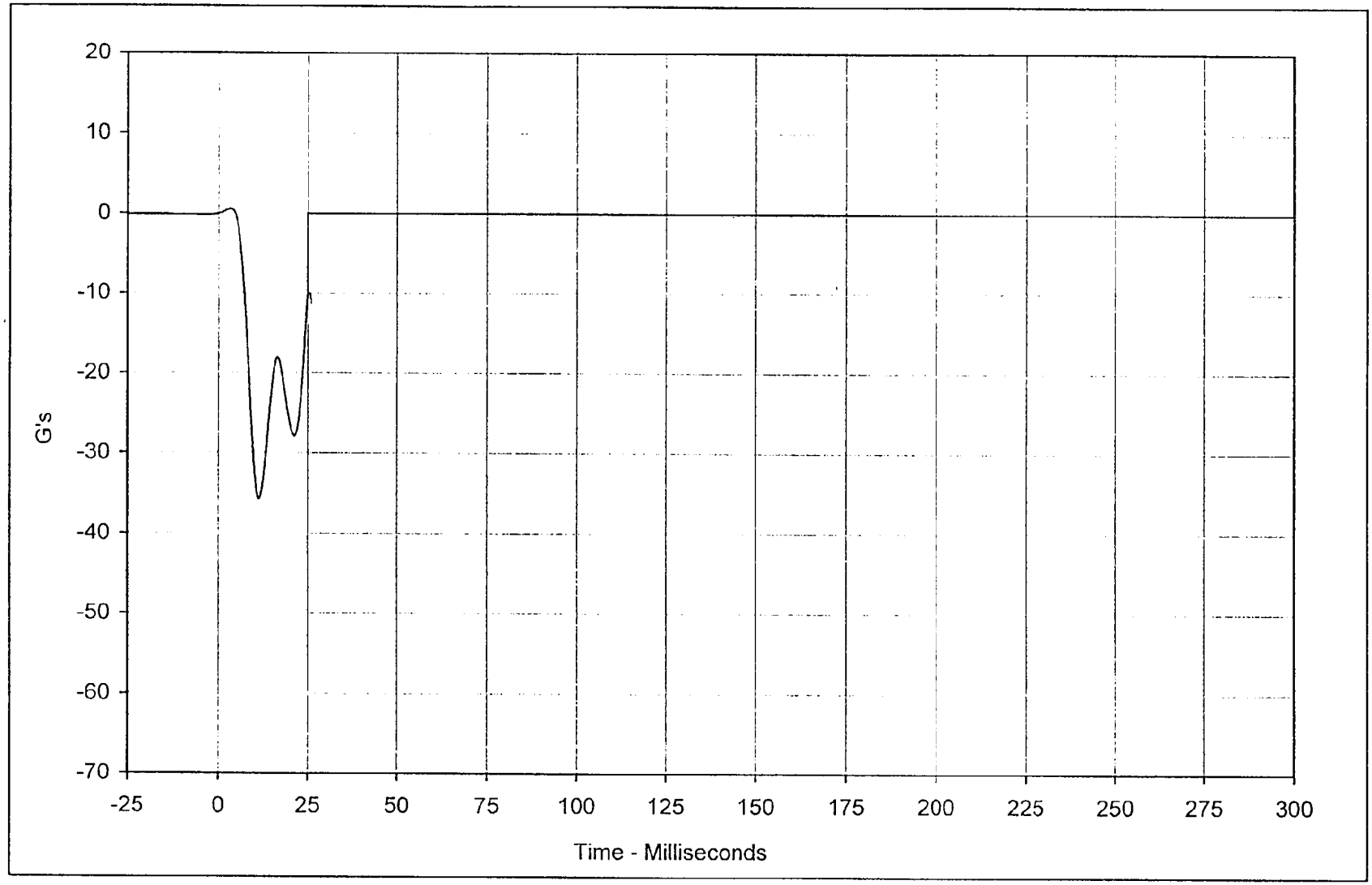
Test Vehicle: 1997 Kia Sportage

*Channel Failed at 88 Msec

KARCO Engineering

KAR-96-R96024-06

B144



Curve Description: Vehicle Left Rear Redundant X *

Maximum Value: 0.5 at 3.3 Milliseconds

Minimum Value: -35.8 at 11.5 Milliseconds

SAE Filter Class: 60

Date of Test: 4/24/97

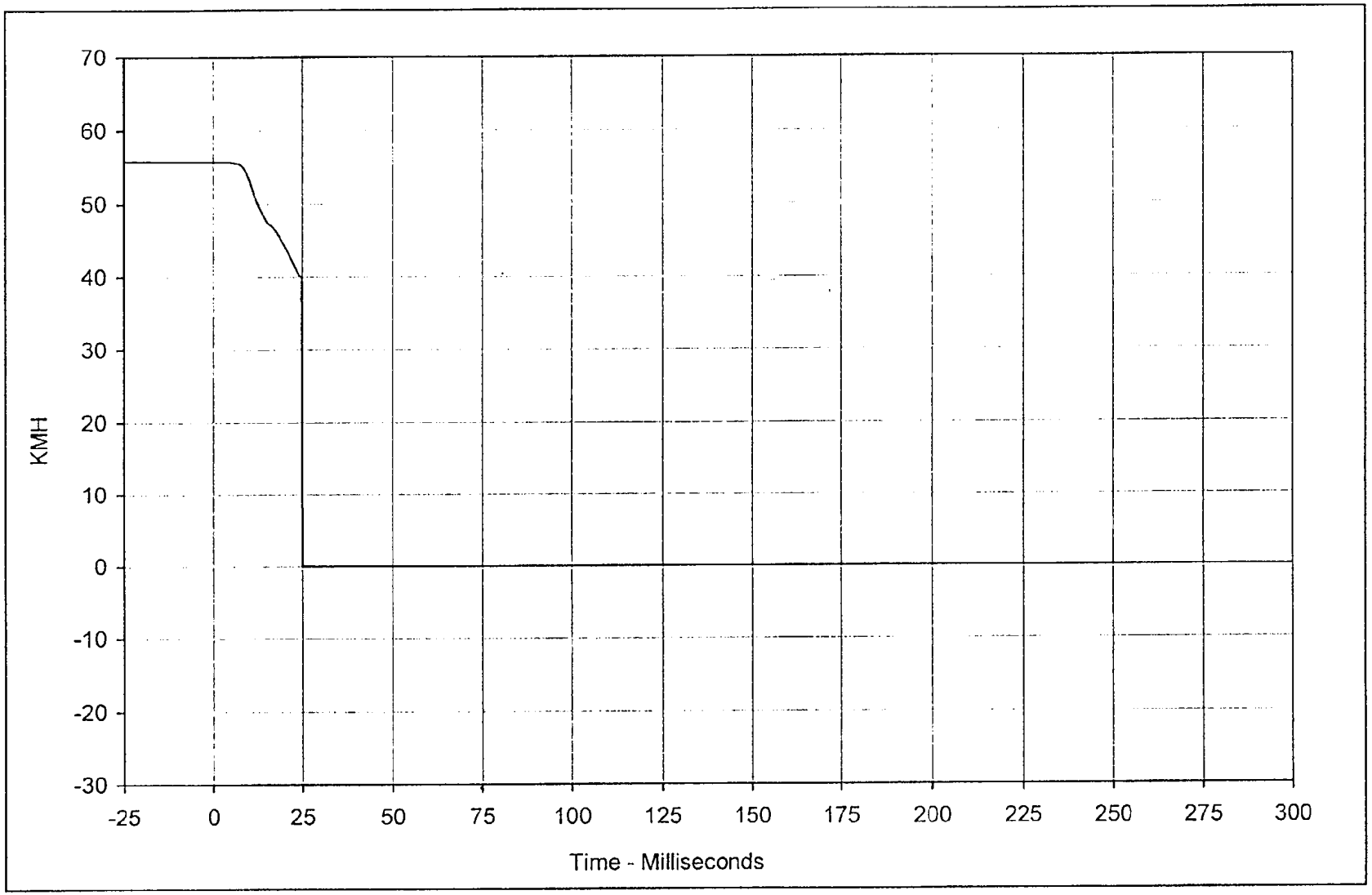
Curve Number: FIL-096

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

*Channel Failed at 25 Msec

KARCO Engineering



Curve Description: Vehicle Left Rear Redundant X Velocity *

Maximum Value: 55.6 at 0.0 Milliseconds

Minimum Value: 0.0 at 25.0 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN1-096

Testing Program: 1997 New Car Assessment Program

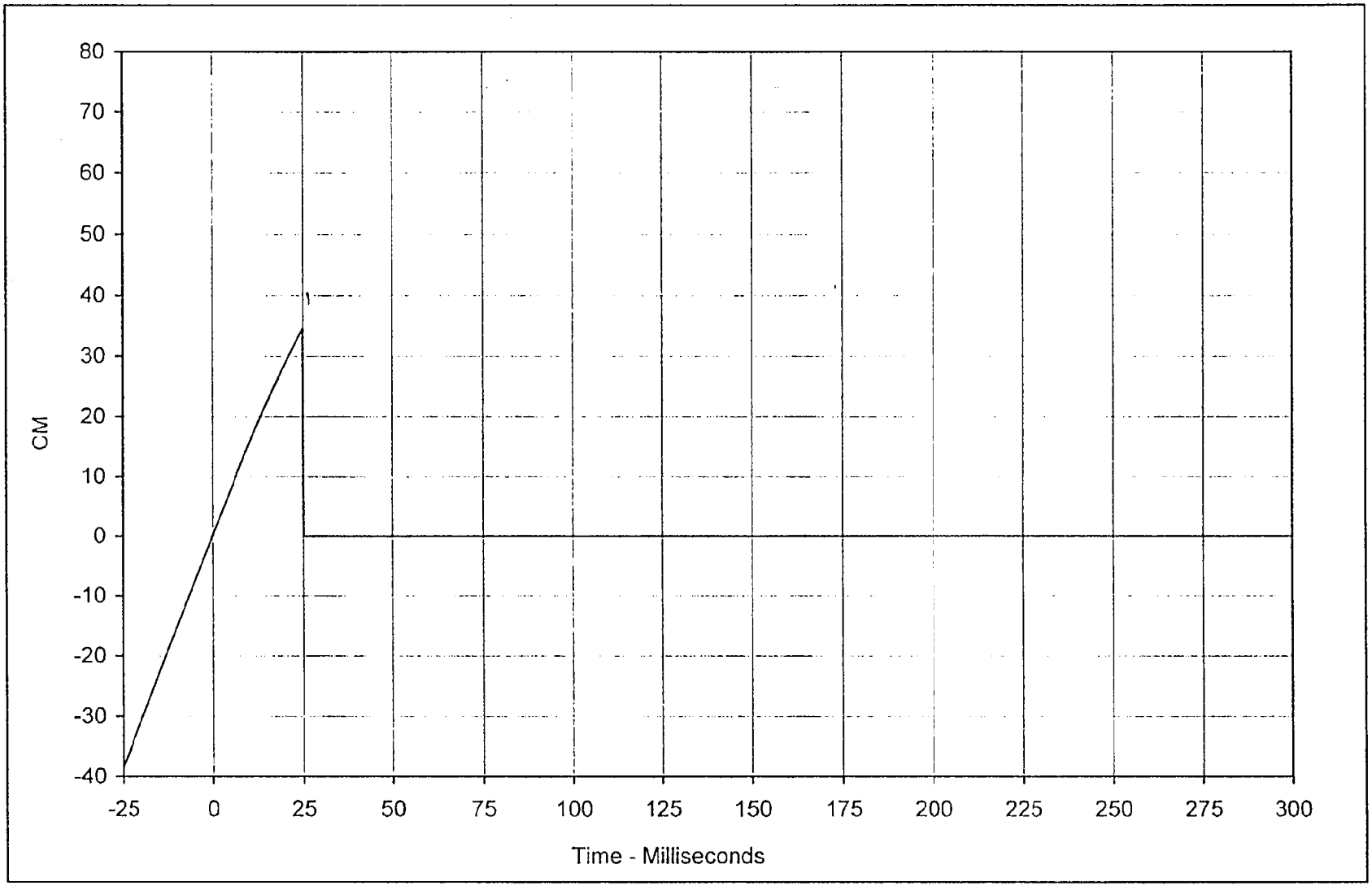
Test Vehicle: 1997 Kia Sportage

*Channel Failed at 25 Msec

KARCO Engineering

KAR-96-R96024-06

B146



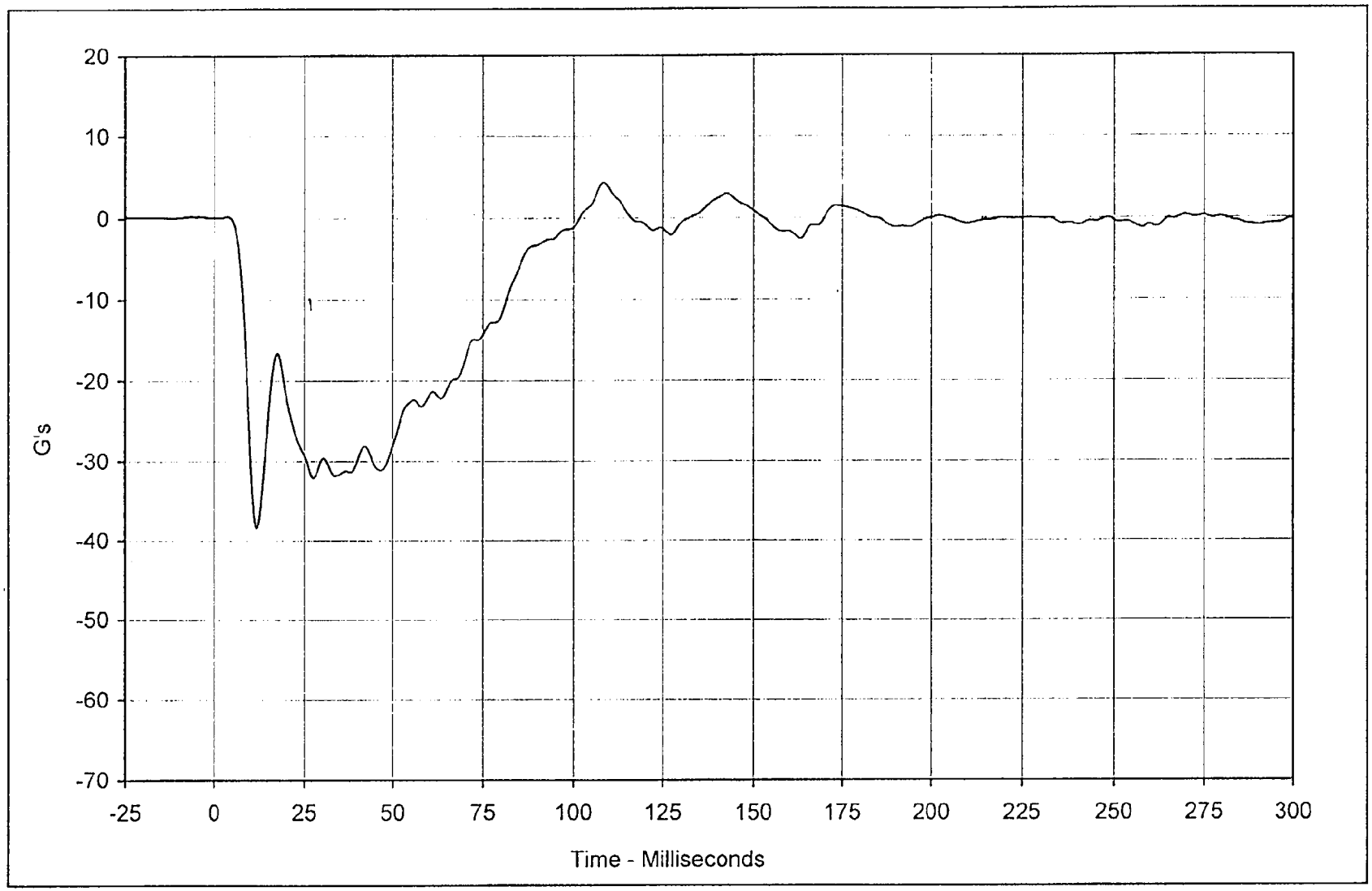
Curve Description:	Vehicle Left Rear Redundant X Displ. *				Testing Program:	1997 New Car Assessment Program	
Maximum Value:	34.4	at	24.9	Milliseconds	Test Vehicle:	1997 Kia Sportage	
Minimum Value:	0.0	at	25.0	Milliseconds			
SAE Filter Class:	180						
Date of Test:	4/24/97						
Curve Number:	IN2-096						

*Channel Failed at 25 Msec

KARCO Engineering

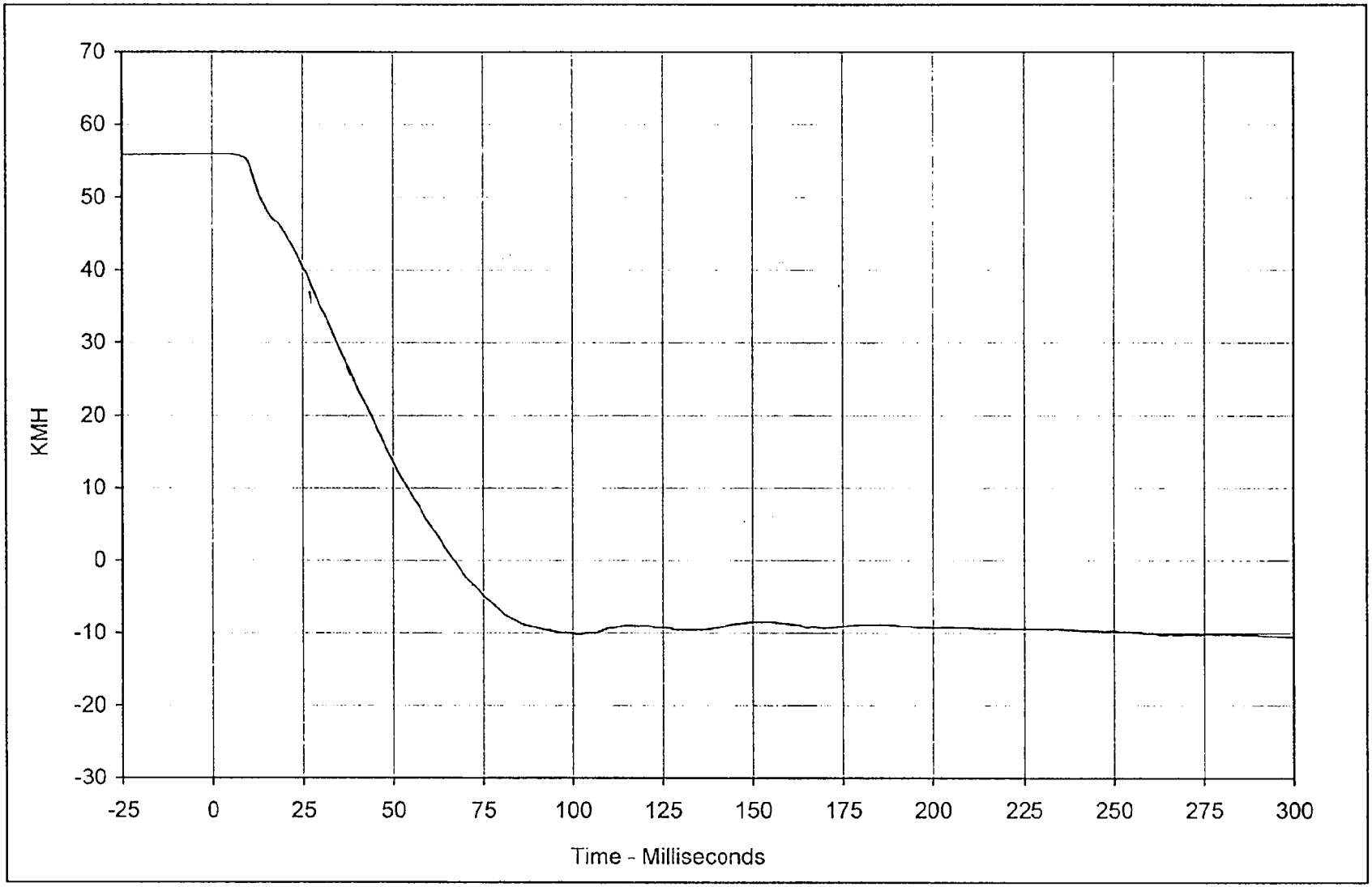
KAR-96-R96024-06

B147



Curve Description:	Vehicle Right Rear Redundant X			Testing Program:	1997 New Car Assesment Program
Maximum Value:	4.3	at	108.4 Milliseconds	Test Vehicle:	1997 Kia Sportage
Minimum Value:	-38.4	at	12.0 Milliseconds		
SAE Filter Class:	60				
Date of Test:	4/24/97				
Curve Number:	FIL-097				

KARCO Engineering



Curve Description: Vehicle Right Rear Redundant X Velocity

Maximum Value: 56.0 at 1.2 Milliseconds

Minimum Value: -10.6 at 298.5 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN1-097

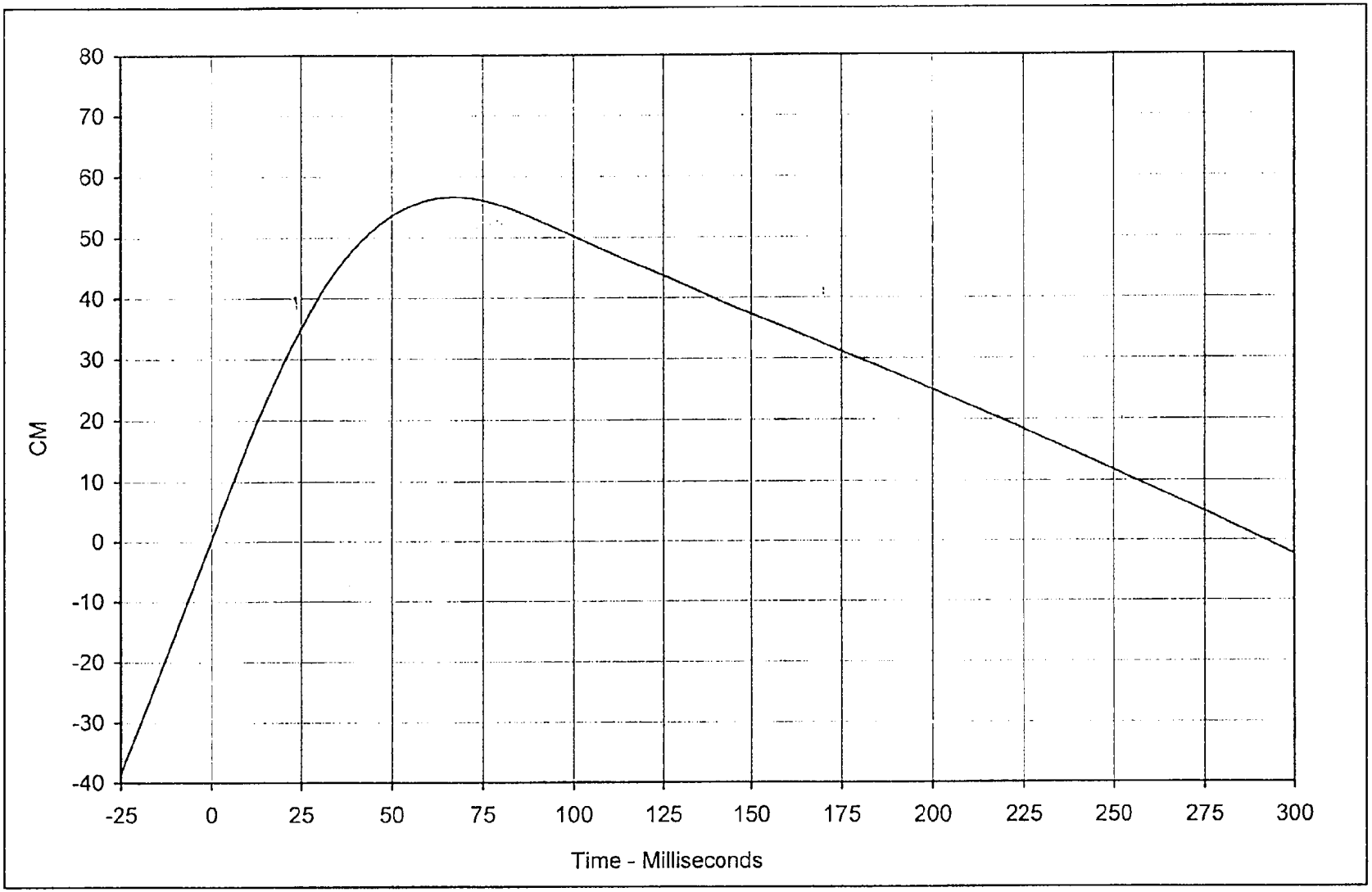
Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering

KAR-96-R96024-06

B149



Curve Description: Vehicle Right Rear Redundant X Displ.

Maximum Value: 56.6 at 67.1 Milliseconds

Minimum Value: -2.3 at 299.9 Milliseconds

SAE Filter Class: 180

Date of Test: 4/24/97

Curve Number: IN2-097

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Kia Sportage

KARCO Engineering

APPENDIX C

LOAD CELL BARRIER DATA

APPENDIX D

INSTRUMENTATION DATA CHANNEL ASSIGNMENTS

New Car Assesment Program
Instrumentation Data Channel Assignments
Driver A.T.D Serial Number 34
Test Date: 4/24/97
Vehicle: 1997 Kia Sportage

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
1	HEAD, PRIMARY	X	GPAC027	Accel., 1/2 bridge	Endevco	7264-2000	G
2	HEAD, PRIMARY	Y	GPAC002	Accel., 1/2 bridge	Endevco	7264-2000	G
3	HEAD, PRIMARY	Z	GPAC003	Accel., 1/2 bridge	Endevco	7264-2000	G
4	HEAD, REDUNDANT	X	GPAC032	Accel., 1/2 bridge	Endevco	7264-2000	G
5	HEAD, REDUNDANT	Y	GPAC021	Accel., 1/2 bridge	Endevco	7264-2000	G
6	HEAD, REDUNDANT	Z	GPAC026	Accel., 1/2 bridge	Endevco	7264-2000	G
7	NECK FORCE	X	GPLC001FX	Load cell, six axis neck	R. A. Denton	1716	N
8	NECK FORCE	Y	GPLC001FY	Load cell, six axis neck	R. A. Denton	1716	N
9	NECK FORCE	Z	GPLC001FZ	Load cell, six axis neck	R. A. Denton	1716	N
10	NECK MOMENT	X	GPLC001MX	Load cell, six axis neck	R. A. Denton	1716	J
11	NECK MOMENT	Y	GPLC001MY	Load cell, six axis neck	R. A. Denton	1716	J
12	NECK MOMENT	Z	GPLC001MZ	Load cell, six axis neck	R. A. Denton	1716	J
13	CHEST , PRIMARY	X	GPAC005	Accel., 1/2 bridge	Endevco	7264-2000	G
14	CHEST , PRIMARY	Y	GPAC011	Accel., 1/2 bridge	Endevco	7264-2000	G
15	CHEST , PRIMARY	Z	GPAC010	Accel., 1/2 bridge	Endevco	7264-2000	G
16	CHEST , REDUNDANT	X	GPAC034	Accel., 1/2 bridge	Endevco	7264-2000	G
17	CHEST , REDUNDANT	Y	GPAC023	Accel., 1/2 bridge	Endevco	7264-2000	G
18	CHEST , REDUNDANT	Z	GPAC020	Accel., 1/2 bridge	Endevco	7264-2000	G
19	CHEST DISPLACEMENT	X	GPRP001	Potentiometer, Rotary	Servo	14CBI	CM
20	PELVIS, PRIMARY	X	GPAC025	Accel., 1/2 bridge	Endevco	7264-2000	G
21	PELVIS, PRIMARY	Y	GPAC022	Accel., 1/2 bridge	Endevco	7264-2000	G
22	PELVIS, PRIMARY	Z	GPAC019	Accel., 1/2 bridge	Endevco	7264-2000	G
23	LEFT FEMUR FORCE	Z	KEFF001	Load cell, Femur	R.A. Denton	2121	N
24	RIGHT FEMUR FORCE	Z	GPLC001	Load cell, Femur	G.S.E.	2430	N

New Car Assesment Program
Instrumentation Data Channel Assignments
Driver A.T.D Serial Number 34
Test Date: 4/24/97
Vehicle: 1997 Kia Sportage

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
25	UP. TIBIA LEFT MOM.	X	GPUT01MX	2 ch., Upper tibia gage	R. A. Denton	1583	J
26	UP. TIBIA LEFT MOM.	Y	GPUT01MY	2 ch., Upper tibia gage	R. A. Denton	1583	J
27	UP. TIBIA RIGHT MOM.	X	GPUT02MX	2 ch., Upper tibia gage	R. A. Denton	1583	J
28	UP. TIBIA RIGHT MOM.	Y	GPUT02MY	2 ch., Upper tibia gage	R. A. Denton	1583	J
29	LWR. TIBIA LEFT FORCE	Y	GPLT02FY	3 ch., lower tibia gage	R. A. Denton	1584	N
30	LWR. TIBIA LEFT FORCE	Z	GPLT01FZ	3 ch., lower tibia gage	R. A. Denton	1584	N
31	LWR. TIBIA LEFT MOM.	X	GPLT01MX	3 ch., lower tibia gage	R. A. Denton	1584	J
32	LWR. TIBIA RIGHT FORCE	Y	GPLT02FY	3 ch., lower tibia gage	R. A. Denton	1584	N
33	LWR. TIBIA RIGHT FORCE	Z	GPLT02FZ	3 ch., lower tibia gage	R. A. Denton	1584	N
34	LWR. TIBIA RIGHT MOM.	X	GPLT02MX	3 ch., lower tibia gage	R. A. Denton	1584	J
35	FOOT LEFT	X	GPAC030	Accel., 1/2 bridge	Endevco	7264-2000	G
36	FOOT LEFT	Y	GPAC007	Accel., 1/2 bridge	Endevco	7264-2000	G
37	FOOT LEFT	Z	GPAC008	Accel., 1/2 bridge	Endevco	7264-2000	G
38	FOOT RIGHT	X	KEAC033	Accel.,1/2 bridge	Endevco	7264-2000	G
39	FOOT RIGHT	Y	GPAC016	Accel., 1/2 bridge	Endevco	7264-2000	G
40	FOOT RIGHT	Z	KEAC035	Accel.,1/2 bridge	Endevco	7264-2000	G
41	LAP BELT FORCE	X	KELC001	Load cell, Seat belt	Lebow	3371	N
42	SHOULDER BELT FORCE	X	KELC002	Load cell, Seat belt	Lebow	3371	N
43	SHOULDER BELT SPOOL	X	KEPP001	Pullout pot	Celesco	PTX101-0030	CM
44	SHOULDER BELT ELONG.	X	KEEP001	Linear pot., belt stretch	E.T.I.	LCP8-10 10K	CM

New Car Assesment Program
Instrumentation Data Channel Assignments
Passenger A.T.D Serial Number 35
Test Date: 4/24/97
Vehicle: 1997 Kia Sportage

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
45	HEAD, PRIMARY	X	KEAC039	Accel.,1/2 bridge	Endevco	7264-2000	G
46	HEAD, PRIMARY	Y	KEAC038	Accel.,1/2 bridge	Endevco	7264-2000	G
47	HEAD, PRIMARY	Z	KEAC027	Accel.,1/2 bridge	Endevco	7264-2000	G
48	HEAD, REDUNDANT	X	KEAC031	Accel.,1/2 bridge	Endevco	7264-2000	G
49	HEAD, REDUNDANT	Y	KEAC032	Accel.,1/2 bridge	Endevco	7264-2000	G
50	HEAD, REDUNDANT	Z	KEAC026	Accel.,1/2 bridge	Endevco	7264-2000	G
51	NECK FORCE	X	GPLC002FX	Load cell, six axis neck	R. A. Denton	1716	N
52	NECK FORCE	Y	GPLC002FY	Load cell, six axis neck	R. A. Denton	1716	N
53	NECK FORCE	Z	GPLC002FZ	Load cell, six axis neck	R. A. Denton	1716	N
54	NECK MOMENT	X	GPLC002MX	Load cell, six axis neck	R. A. Denton	1716	J
55	NECK MOMENT	Y	GPLC002MY	Load cell, six axis neck	R. A. Denton	1716	J
56	NECK MOMENT	Z	GPLC002MZ	Load cell, six axis neck	R. A. Denton	1716	J
57	CHEST , PRIMARY	X	GPAC031	Accel., 1/2 bridge	Endevco	7264-2000	G
58	CHEST , PRIMARY	Y	GPAC024	Accel., 1/2 bridge	Endevco	7264-2000	G
59	CHEST , PRIMARY	Z	GPAC029	Accel., 1/2 bridge	Endevco	7264-2000	G
60	CHEST , REDUNDANT	X	KEAC023	Accel.,1/2 bridge	Endevco	7264-200	G
61	CHEST , REDUNDANT	Y	KEAC022	Accel.,1/2 bridge	Endevco	7264-200	G
62	CHEST , REDUNDANT	Z	KEAC024	Accel.,1/2 bridge	Endevco	7264-200	G
63	CHEST DISPLACEMENT	X	GPRP002	Potentiometer, Rotary	Servo	14CBI	CM
64	PELVIS, PRIMARY	X	GPAC009	Accel., 1/2 bridge	Endevco	7264-2000	G
65	PELVIS, PRIMARY	Y	GPAC017	Accel., 1/2 bridge	Endevco	7264-2000	G
66	PELVIS, PRIMARY	Z	GPAC018	Accel., 1/2 bridge	Endevco	7264-2000	G
67	LEFT FEMUR FORCE	Z	KEFF003	Load cell, Femur	R.A. Denton	2121	N
68	RIGHT FEMUR FORCE	Z	KEFF002	Load cell, Femur	R.A. Denton	2121	N

New Car Assesment Program
Instrumentation Data Channel Assignments
Passenger A.T.D Serial Number 35
Test Date: 4/24/97
Vehicle: 1997 Kia Sportage

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
69	UP. TIBIA LEFT MOM.	X	NOTE 1				
70	UP. TIBIA LEFT MOM.	Y	NOTE 1				
71	UP. TIBIA RIGHT MOM.	X	NOTE 1				
72	UP. TIBIA RIGHT MOM.	Y	NOTE 1				
73	LWR. TIBIA LEFT FORCE	Y	NOTE 1				
74	LWR. TIBIA LEFT FORCE	Z	NOTE 1				
75	LWR. TIBIA LEFT MOM.	X	NOTE 1				
76	LWR. TIBIA RIGHT FORCE	Y	NOTE 1				
77	LWR. TIBIA RIGHT FORCE	Z	NOTE 1				
78	LWR. TIBIA RIGHT MOM.	X	NOTE 1				
79	FOOT LEFT	X	KEAC019	Accel.,1/2 bridge	Endevco	7264-200	G
80	FOOT LEFT	Y	KEAC020	Accel.,1/2 bridge	Endevco	7264-200	G
81	FOOT LEFT	Z	KEAC021	Accel.,1/2 bridge	Endevco	7264-200	G
82	FOOT RIGHT	X	KEAC005	Accel.,1/2 bridge	Endevco	7264-200	G
83	FOOT RIGHT	Y	KEAC004	Accel.,1/2 bridge	Endevco	7264-200	G
84	FOOT RIGHT	Z	KEAC003	Accel.,1/2 bridge	Endevco	7264-200	G
85	LAP BELT FORCE	X	KELC003	Load cell, Seat belt	Lebow	3371	N
86	SHOULDER BELT FORCE	X	KELC004	Load cell, Seat belt	Lebow	3371	N
87	SHOULDER BELT SPOOL	X	KEPP001	Pullout pot	Celesco	PTX101-0030	CM
88	SHOULDER BELT ELONG.	X	KEEP001	Linear pot., belt stretch	E.T.I.	LCP8-10 10K	CM

NOTE 1: Not provided by D.O.T.. channel assignments will include "0" data to maintain channel identification conformity with subsequent tests.

New Car Assesment Program
Instrumentation Data Channel Assignments
Vehicle Accelerometers
Test Date: 4/24/97
Vehicle: 1997 Kia Sportage

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
89	LEFT REAR, PRIMARY	X	KEVA005	Accel., Vehicle block	I.C. Sensor	3031-500	G'S
90	RIGHT REAR, PRIMARY	X	KEVA006	Accel., Vehicle block	I.C. Sensor	3031-200	G'S
91	ENGINE TOP	X	KEVA001	Accel., Vehicle block	I.C. Sensor	3031-500	G'S
92	ENGINE BOTTOM	X	KEVA002	Accel., Vehicle block	I.C. Sensor	3031-500	G'S
93	LEFT BRAKE CALIPER	X	KEVA010	Accel., Vehicle block	I.C. Sensor	3031-500	G'S
94	RIGHT BRAKE CALIPER	X	KEVA004	Accel., Vehicle block	I.C. Sensor	3031-500	G'S
95	INSTRUMENT PANEL	X	KEVA007	Accel., Vehicle block	I.C. Sensor	3031-200	G'S
96	LEFT REAR , REDNT.	X	KEVA011	Accel., Vehicle block	I.C. Sensor	3031-200	G'S
97	RIGHT REAR , REDNT.	X	KEVA008	Accel., Vehicle block	I.C. Sensor	3031-200	G'S

APPENDIX E

DUMMY CALIBRATION

Hybrid III Calibration Data
Knee Impact Test
(Metric units)

Part 572E ATD I.D. Number 34

Calibration Sequence 9701

Left Knee Impact Test				
Tested Parameter	Units	Spec	Result	Pass/Fail
Laboratory temperature	°C	18.8 to 25.4	22.7	Pass
Laboratory relative humidity	%	10 to 70	41	Pass
Probe Velocity	MPS	2.07 to 2.13	2.10	Pass
Peak Acceleration	G's	96.36 to 118.18	105.32	Pass
Pendulum Mass	Kgs	4.994	4.994	Pass
Peak Impact Force	Kgs	481.2 to 590.2	526.0	Pass
		Overall Test Results		Pass

Michael Dunlap — Laboratory Technician

4/18/97 — Test Date

Right Knee Impact Test				
Tested Parameter	Units	Spec	Result	Pass/Fail
Laboratory temperature	°C	18.8 to 25.4	22.7	Pass
Laboratory relative humidity	%	10 to 70	41	Pass
Probe Velocity	MPS	2.07 to 2.13	2.09	Pass
Peak Acceleration	G's	96.36 to 118.18	111.20	Pass
Pendulum Mass	Kgs	4.994	4.994	Pass
Peak Impact Force	Kgs	481.2 to 590.2	555.3	Pass
		Overall Test Results		Pass

Michael Dunlap — Laboratory Technician

4/18/97 — Test Date

J D Richardson — Approved By

4/18/97 — Date

KARCO Engineering

Hybrid III Calibration Data
Head Drop Test
(Metric units)

Part 572E ATD I.D. Number 34

Calibration Sequence 9701

Head Drop Test				
Tested Parameter	Units	Spec	Result	Pass/Fail
Laboratory temperature	°C	18.8 to 25.4	22.7	Pass
Laboratory relative humidity	%	10 to 70	41	Pass
Peak resultant acceleration	G's	225.0 to 275.0	229.1	Pass
Peak lateral acceleration	G's	15.0 Max.	2.8	Pass
Is acceleration unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass

Michael Dunlap
Laboratory Technician

4/18/97
Test Date

Approved By

4/18/97
Date

KARCO Engineering

Hybrid III Calibration Data
Thorax Impact Test
(Metric units)

Part 572E ATD I.D. Number 34

Calibration Sequence 9701

Thorax Impact Test				
Tested Parameter	Units	Spec	Result	Pass/Fail
Laboratory temperature	°C	20.6 to 22.2	21.9	Pass
Laboratory relative humidity	%	10 to 70	47	Pass
Probe Velocity	MPS	6.58 to 6.83	6.76	Pass
Peak acceleration	G's	22.53 to 25.73	24.5	Pass
Pendulum Mass	Kgs	23.4	23.4	Pass
Peak resistive force	Kgs	526.6 to 601.6	582.8	Pass
Peak chest deflection	CM	6.35 to 7.26	6.72	Pass
Internal hysteresis	%	69 to 85	76.3	Pass
		Overall Test Results		Pass

Michael Dunlap
Laboratory Technician

4/21/97
Test Date

J. W. Richardson
Approved By

4/21/97
Date

KARCO Engineering

Hybrid III Calibration Data
Neck Flexion Test
(Metric units)

Part 572E ATD I.D. Number 34

Calibration Sequence 9701

Neck Flexion Test					
Tested Parameter		Units	Spec	Result	Pass/Fail
Laboratory temperature		°C	20.6 to 22.2	21.9	Pass
Laboratory relative humidity		%	10 to 70	47	Pass
Pendulum velocity		MPS	6.89 to 7.14	6.97	Pass
Peak deceleration	10 Msec	G's	22.5 to 27.5	25.28	Pass
	20 Msec	G's	17.6 to 22.6	21.50	Pass
	30 Msec	G's	12.5 to 18.5	16.50	Pass
Max. decel. above 30 Msec.		G's	29.0 maximum	15.03	Pass
Deceleration decay time to first cross 5 G's		Msec.	34.0 to 42.0	39.80	Pass
"D" plane rotation	maximum	Degrees	64.0 to 78.0	66.1	Pass
	Time	Msec.	57.0 to 64.0	63.1	Pass
Moment about	maximum	N.m	84.1 to 108.5	91.2	Pass
Occipital Condyle	Time	Msec.	47.0 to 58.0	57.8	Pass
Rotation angle decay time to cross zero		Msec.	113.0 to 128.0	126.8	Pass
Positive moment decay time to cross zero		Msec.	97.0 to 107.0	105.2	Pass
			Overall Test Results		Pass

Michael Dunlap
Laboratory Technician

4/21/97
Test Date

J D Richardson
Approved By

4/21/97
Date

KARCO Engineering

Hybrid III Calibration Data
Neck Extension Test
(Metric units)

Part 572E ATD I.D. Number 34

Calibration Sequence 9701

Neck Extension Test					
Tested Parameter		Units	Spec	Result	Pass/Fail
Laboratory temperature		°C	20.6 to 22.2	21.9	Pass
Laboratory relative humidity		%	10 to 70	47	Pass
Pendulum velocity		MPS	5.94 to 6.19	6.11	Pass
Peak deceleration	10 Msec	G's	17.2 to 21.2	18.90	Pass
	20 Msec	G's	14.0 to 19.0	15.60	Pass
	30 Msec	G's	11.0 to 16.0	14.90	Pass
Max. decel. above 30 Msec.		G's	22.0 maximum	14.00	Pass
Deceleration decay time to first cross 5 G's		Msec.	38.0 to 46.0	42.7	Pass
"D" plane rotation	maximum	Degrees	81.0 to 106.0	97.2	Pass
	Time	Msec.	72.0 to 82.0	73.9	Pass
Moment about Occipital Condyle	maximum	Mt. Kgs	-80.0 to -53.0	-73.5	Pass
	Time	Msec.	65.0 to 79.0	72.0	Pass
Rotation angle decay time to cross zero		Msec.	147.0 to 174.0	163.7	Pass
Negative moment decay time to cross zero		Msec.	120.0 to 148.0	135.6	Pass
			Overall Test Results		Pass

Michael Dunlap
Laboratory Technician

4/21/97
Test Date

Approved By

4/21/97
Date

Hybrid III Calibration Data
Configuration Verification Data
(Metric units)

Part 572E ATD I.D. Number 34
Calibration Sequence 9701

External Measurement Data				
Tested Parameter	Units	Spec	Result	Pass/Fail
Laboratory temperature	°C	20.4 to 22.1	20.9	Pass
Laboratory relative humidity	%	10 to 70	43	Pass
A - Total sitting height	mm	878.8 to 889.0	880.3	Pass
B - Shoulder pivot height	mm	505.5 to 520.7	513.1	Pass
C - "H" point height	mm	83.8 to 88.9	83.8	Pass
D - "H" point from seat back	mm	134.6 to 139.7	137.4	Pass
E - Shoulder pivot from back	mm	83.8 to 94.0	91.4	Pass
F - Thigh clearance	mm	139.7 to 154.9	144.8	Pass
G - Elbow back to wrist pivot	mm	289.6 to 304.8	294.6	Pass
H - Skull cap to back line	mm	40.6 to 45.7	43.2	Pass
I - Shoulder to elbow length	mm	330.2 to 345.4	337.8	Pass
J - Elbow rest height	mm	190.5 to 210.8	198.1	Pass
K - Buttock to knee length	mm	579.1 to 604.5	596.9	Pass
L - Poplipteal length	mm	429.3 to 454.7	436.9	Pass
M - Knee pivot height	mm	485.1 to 500.4	492.8	Pass
N - Buttock poplipteal length	mm	452.1 to 477.5	469.9	Pass
O - Chest depth	mm	213.4 to 228.6	216.4	Pass
P - Foot length	mm	251.5 to 266.7	259.1	Pass
V - Shoulder breadth	mm	421.6 to 436.9	426.7	Pass
W - Foot breadth	mm	91.4 to 106.7	106.7	Pass
Y - Chest circumference	mm	970.3 to 1000.8	980.4	Pass
Z - Waist circumference	mm	835.7 to 866.1	856.0	Pass
AA - Location for chest circ.	mm	429.3 to 434.3	431.8	Pass
BB - Location for waist circ.	mm	226.1 to 231.1	228.6	Pass
		Overall Test Results		Pass

Michael Dunlap
Laboratory Technician

4/22/97
Test Date

Approved By

4/22/97
Date

KARCO Engineering

Hybrid III Calibration Data
Knee Impact Test
(Metric units)

Part 572E ATD I.D. Number 35
Calibration Sequence 9701

Left Knee Impact Test				
Tested Parameter	Units	Spec	Result	Pass/Fail
Laboratory temperature	°C	18.8 to 25.4	22.7	Pass
Laboratory relative humidity	%	10 to 70	41	Pass
Probe Velocity	MPS	2.07 to 2.13	2.11	Pass
Peak Acceleration	G's	96.36 to 118.18	98.69	Pass
Pendulum Mass	Kgs	4.994	4.994	Pass
Peak Impact Force	Kgs	481.2 to 590.2	503.2	Pass
		Overall Test Results		Pass

Michael Dunlap — Laboratory Technician

4/18/97 — Test Date

Right Knee Impact Test				
Tested Parameter	Units	Spec	Result	Pass/Fail
Laboratory temperature	°C	18.8 to 25.4	22.7	Pass
Laboratory relative humidity	%	10 to 70	41	Pass
Probe Velocity	MPS	2.07 to 2.13	2.09	Pass
Peak Acceleration	G's	96.36 to 118.18	115.16	Pass
Pendulum Mass	Kgs	4.994	4.994	Pass
Peak Impact Force	Kgs	481.2 to 590.2	550.2	Pass
		Overall Test Results		Pass

Michael Dunlap — Laboratory Technician

4/18/97 — Test Date

J. D. Richardson — Approved By

4/18/97 — Date

Hybrid III Calibration Data
Head Drop Test
(Metric units)

Part 572E ATD I.D. Number 35

Calibration Sequence 9701

Head Drop Test				
Tested Parameter	Units	Spec	Result	Pass/Fail
Laboratory temperature	°C	18.8 to 25.4	22.7	Pass
Laboratory relative humidity	%	10 to 70	41	Pass
Peak resultant acceleration	G's	225.0 to 275.0	256.8	Pass
Peak lateral acceleration	G's	15.0 Max.	6.8	Pass
Is acceleration unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass

Michael Dunlap
Laboratory Technician

4/18/97
Test Date

JD Richardson
Approved By

4/18/97
Date

KARCO Engineering

Hybrid III Calibration Data
Thorax Impact Test
(Metric units)

Part 572E ATD I.D. Number 35

Calibration Sequence 9701

Thorax Impact Test				
Tested Parameter	Units	Spec	Result	Pass/Fail
Laboratory temperature	°C	20.6 to 22.2	21.9	Pass
Laboratory relative humidity	%	10 to 70	47	Pass
Probe Velocity	MPS	6.58 to 6.83	6.75	Pass
Peak acceleration	G's	22.53 to 25.73	25.7	Pass
Pendulum Mass	Kgs	23.4	23.4	Pass
Peak resistive force	Kgs	526.6 to 601.6	601.2	Pass
Peak chest deflection	CM	6.35 to 7.26	7.11	Pass
Internal hysteresis	%	69 to 85	77.8	Pass
		Overall Test Results		Pass

Michael Dunlap
Laboratory Technician

4/21/97
Test Date

Approved By

4/21/97
Date

KARCO Engineering

Hybrid III Calibration Data
Neck Flexion Test
(Metric units)

Part 572E ATD I.D. Number 35

Calibration Sequence 9701

Neck Flexion Test					
Tested Parameter		Units	Spec	Result	Pass/Fail
Laboratory temperature		°C	20.6 to 22.2	21.9	Pass
Laboratory relative humidity		%	10 to 70	47	Pass
Pendulum velocity		MPS	6.89 to 7.14	7.03	Pass
Peak deceleration	10 Msec	G's	22.5 to 27.5	24.60	Pass
	20 Msec	G's	17.6 to 22.6	20.40	Pass
	30 Msec	G's	12.5 to 18.5	16.93	Pass
Max. decel. above 30 Msec.		G's	29.0 maximum	21.05	Pass
Deceleration decay time to first cross 5 G's		Msec.	34.0 to 42.0	39.10	Pass
"D" plane rotation	maximum	Degrees	64.0 to 78.0	66.0	Pass
	Time	Msec.	57.0 to 64.0	58.2	Pass
Moment about	maximum	N.m	84.1 to 108.5	100.6	Pass
Occipital Condyle	Time	Msec.	47.0 to 58.0	53.8	Pass
Rotation angle decay time to cross zero		Msec.	113.0 to 128.0	121.6	Pass
Positive moment decay time to cross zero		Msec.	97.0 to 107.0	102.1	Pass
			Overall Test Results		Pass

Michael Dunlap
Laboratory Technician

4/21/97
Test Date

J D Richardson
Approved By

4/21/97
Date

Hybrid III Calibration Data
Neck Extension Test
(Metric units)

Part 572E ATD I.D. Number 35

Calibration Sequence 9701

Neck Extension Test					
Tested Parameter		Units	Spec	Result	Pass/Fail
Laboratory temperature		°C	20.6 to 22.2	21.9	Pass
Laboratory relative humidity		%	10 to 70	47	Pass
Pendulum velocity		MPS	5.94 to 6.19	6.12	Pass
Peak deceleration	10 Msec	G's	17.2 to 21.2	20.68	Pass
	20 Msec	G's	14.0 to 19.0	16.90	Pass
	30 Msec	G's	11.0 to 16.0	15.20	Pass
Max. decel. above 30 Msec.		G's	22.0 maximum	17.00	Pass
Deceleration decay time to first cross 5 G's		Msec.	38.0 to 46.0	44.8	Pass
"D" plane rotation	maximum	Degrees	81.0 to 106.0	101.0	Pass
	Time	Msec.	72.0 to 82.0	79.1	Pass
Moment about Occipital Condyle	maximum	Mt. Kgs	-80.0 to -53.0	-78.8	Pass
	Time	Msec.	65.0 to 79.0	68.9	Pass
Rotation angle decay time to cross zero		Msec.	147.0 to 174.0	163.0	Pass
Negative moment decay time to cross zero		Msec.	120.0 to 148.0	137.0	Pass
			Overall Test Results		Pass

Michael Dunlap
Laboratory Technician

4/21/97
Test Date

Approved By

4/24/97
Date

Hybrid III Calibration Data
Configuration Verification Data
(Metric units)

Part 572E ATD I.D. Number 35
Calibration Sequence 9701

External Measurement Data				
Tested Parameter	Units	Spec	Result	Pass/Fail
Laboratory temperature	°C	20.4 to 22.1	20.9	Pass
Laboratory relative humidity	%	10 to 70	43	Pass
A - Total sitting height	mm	878.8 to 889.0	886.3	Pass
B - Shoulder pivot height	mm	505.5 to 520.7	510.5	Pass
C - "H" point height	mm	83.8 to 88.9	88.9	Pass
D - "H" point from seat back	mm	134.6 to 139.7	138.6	Pass
E - Shoulder pivot from back	mm	83.8 to 94.0	88.9	Pass
F - Thigh clearance	mm	139.7 to 154.9	152.4	Pass
G - Elbow back to wrist pivot	mm	289.6 to 304.8	292.1	Pass
H - Skull cap to back line	mm	40.6 to 45.7	43.2	Pass
I - Shoulder to elbow length	mm	330.2 to 345.4	342.9	Pass
J - Elbow rest height	mm	190.5 to 210.8	190.5	Pass
K - Buttock to knee length	mm	579.1 to 604.5	596.9	Pass
L - Poplipteal length	mm	429.3 to 454.7	444.5	Pass
M - Knee pivot height	mm	485.1 to 500.4	492.8	Pass
N - Buttock poplipteal length	mm	452.1 to 477.5	475.0	Pass
O - Chest depth	mm	213.4 to 228.6	216.4	Pass
P - Foot length	mm	251.5 to 266.7	256.5	Pass
V - Shoulder breadth	mm	421.6 to 436.9	436.9	Pass
W - Foot breadth	mm	91.4 to 106.7	104.1	Pass
Y - Chest circumference -	mm	970.3 to 1000.8	975.4	Pass
Z - Waist circumference	mm	835.7 to 866.1	843.3	Pass
AA - Location for chest circ.	mm	429.3 to 434.3	431.8	Pass
BB - Location for waist circ.	mm	226.1 to 231.1	231.1	Pass
		Overall Test Results		Pass

Michael Dunlap
Laboratory Technician

4/22/97
Test Date

Approved By

4/22/97
Date

APPENDIX F

VEHICLE OWNER'S MANUAL

OCCUPANT RESTRAIN INSTRUCTIONS

Safety Belts

Safety Belt Restraint System

⚠WARNING

The driver and all passengers should always use the safety belts provided in order to minimize the risk of severe bodily injury.

We strongly recommend that the driver and all passengers be properly restrained at all times by using the safety belts provided with the vehicle. Proper use of the safety belts decreases the risk of severe injury or death in accidents or sudden stops.

All seats, except the center rear seat, have lap/shoulder belts. The center rear seat has a lap belt.

Inertial locks in the safety belt retractors allow all of the lap/shoulder safety belts to remain unlocked during normal vehicle operation. This allows the occupants some freedom of movement and increased comfort while using the safety belts. If a force is applied to the vehicle, such as a strong stop, a sharp turn, or a collision, the safety belt retractors will automatically lock the safety belts.

Since the inertial locks do not require a collision to lock up, you may become aware of the safety belts locking while braking or going around sharp corners.

The center rear seat safety belt does not have an inertial lock so it is always in a locked condition. Whenever possible, use the center rear seat position to install your child-restraint. If the center seat is unavailable, a child-restraint may be installed in the front passenger seat or in the rear outboard seats.

The front passenger safety belt and rear outboard safety belts have been designed to allow a child-restraint to be used in these positions without a safety belt locking clip. Those safety belts normally lock only under extreme or emergency conditions (this is the emergency lock mode which uses the locking retractor). However, they can be adjusted so that they remain fixed and locked when a child-restraint is placed in those positions

(this auto lock mode should only be used to secure a child-restraint). See Page 4-29 for instructions on how to place the safety belt in the auto lock mode.

The drivers safety belt can only operate in the emergency lock mode.

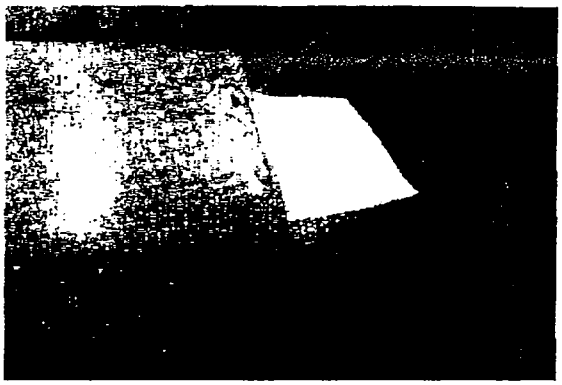
⚠WARNING - After a Collision

- **Lap/shoulder belt assemblies may be stretched or damaged when subjected to the stress and forces of a collision.**
- **A safety belt must be replaced if any part of the "Replace Belt" label is visible. You won't see this label unless your restraint system has been heavily loaded in a collision. This "Replace Belt" label, in the picture at right, is located on the front belts near the door opening.**

(Continued)

(Continued)

The entire restraint system should be inspected following any collision. All belts, retractors, anchors and hardware damaged by a collision should be replaced before the vehicle is operated again.



⚠WARNING - Cargo Area

Passengers should never be allowed to ride in the cargo area of a vehicle. No safety belts are provided for the cargo area. Persons riding in the vehicle without a fastened safety belt are much more likely to suffer serious bodily injury or death during an accident.

Maintenance and Care

Safety belts should be inspected periodically for excessive wear or damage. Pull out each belt fully and look for fraying, cuts, burns or other damage.

Pull the safety belt out and let it retract a number of times. Make sure that the lap/shoulder belts return smoothly and easily into the retractor.

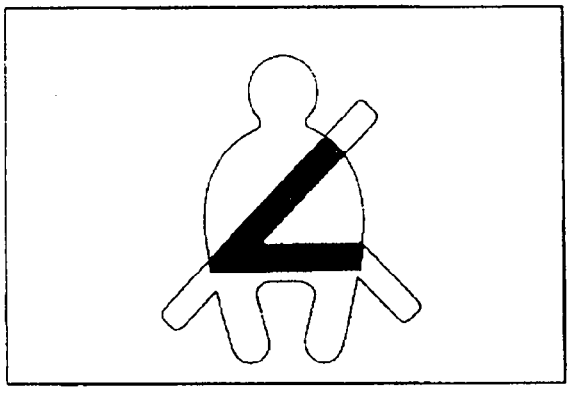
Check the latches to make sure they latch and release without interference or delay. Any belt not in good condition or in good working order should be promptly replaced.

⚠ CAUTION - Damage to Safety Belts

Never close the doors on any part of the lap or shoulder belt. It can damage the safety belt or buckle which could increase the risk of injury in case of an accident.

Safety Belt Warning Light and Chime

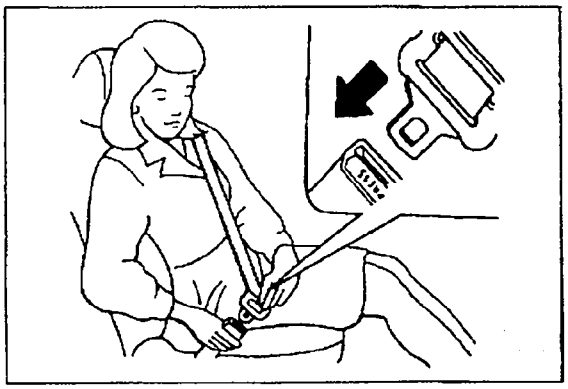
If the driver's lap/shoulder belt is not fastened when the key is turned ON or if it is disconnected after the key is ON, the safety belt warning chime sounds for approximately six seconds and the safety belt warning light remains on until the safety belt is buckled.



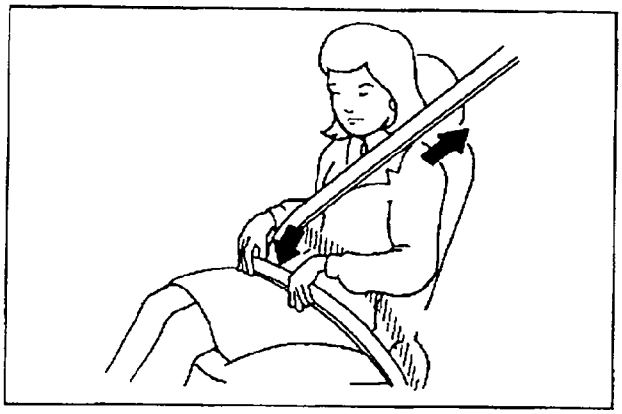
Front Lap/Shoulder Belt

To fasten the front lap/shoulder belt:

1. Grasp the buckle and tongue plate.
2. Slowly pull the lap/shoulder belt out from the retractor.

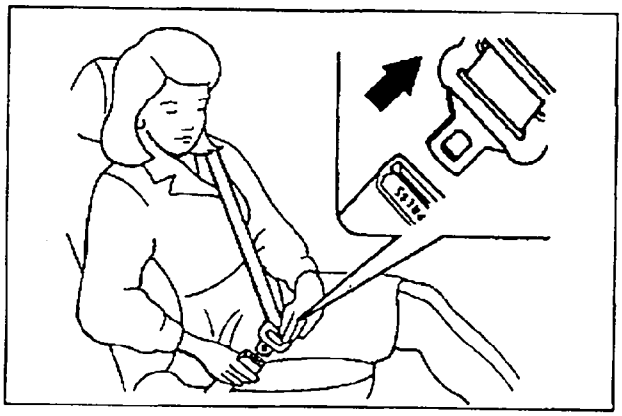


3. Insert the tongue plate into the open end of the buckle until an audible "click" is heard, indicating the belt is locked in the buckle.



4. Position the lap portion of the belt across your lap as LOW ON THE HIPS as possible to reduce the risk of sliding under it during an accident. Adjust the belt to a SNUG FIT by pulling up on the shoulder portion of the safety belt. The belt retractor is designed to take up excess webbing automatically and to maintain tension on the belt. For maximum safety, do not put any excess slack into the safety belt.

To unfasten the front lap/shoulder belt:



Press the release button on the buckle and allow the belt to slowly retract.

⚠WARNING - Front Safety Belts

- The front seatbacks should always remain in a comfortable, upright position while the vehicle is in motion. The safety belt system will provide the most protection with the seatbacks in an upright position.
- Never wear the shoulder portion of the safety belt under the outside arm or behind the back.
- Never wear the shoulder portion of the safety belt across the neck or face.

(Continued)

(Continued)

- Wear the lap portion of the safety belt as low as possible. Be sure the lap belt fits snugly around the hips. Never wear the lap belt over your waist.
- Make sure the safety belts are not twisted while in use.
- Never use a single belt to restrain more than one person at a time.

Failure to follow these warnings will increase the chance and severity of injury in an accident.

Rear safety belts

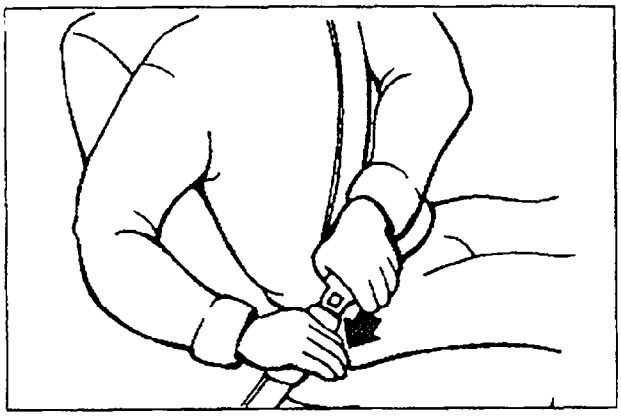
Two kinds of belts are provided:

- Lap/shoulder belts for people who sit on the outboard sides of the rear seat.
- A lap belt for people who sit in the center of the rear seat.

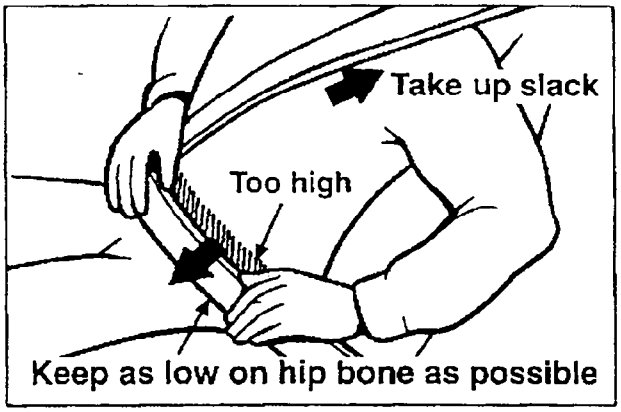
Rear Lap/Shoulder Belt (Outboard Seats)

To fasten the rear lap/shoulder belt:

1. Grasp the buckle and tongue plate.
2. Slowly pull the lap/shoulder belt out.



3. Insert the tongue plate into the open end of the buckle until an audible "click" is heard, indicating the belt is locked in the buckle.



4. Position the lap portion of the belt across your lap as LOW ON THE HIPS as possible to reduce the risk of sliding under it during an accident. Adjust the belt to a SNUG FIT by pulling up on the shoulder portion of the safety belt. The belt retractor is designed to take up excess webbing automatically and to maintain tension on the belt. This is for your safety. Do not put excess slack into the safety belt.

To unfasten:

Press the button on the buckle and allow the belt to slowly retract.

⚠WARNING - Rear Lap/ Shoulder Safety Belts

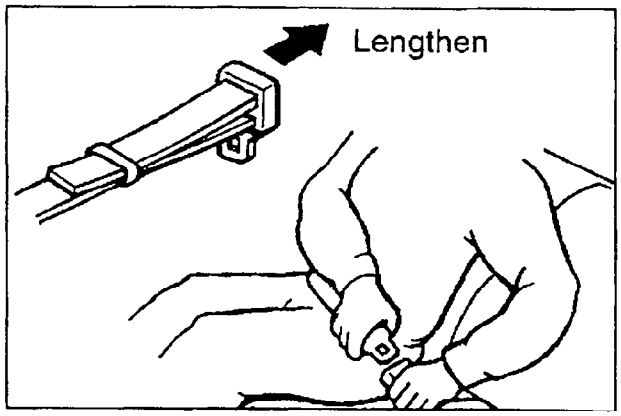
- **Never wear the shoulder portion of the safety belt under the outside arm or behind the back.**
- **Never wear the shoulder portion of the safety belt across the neck or face.**
- **Wear the lap portion of the safety belt as low as possible. Be sure the lap belt fits snugly around the hips. Never wear the lap belt over your waist.**
- **Make sure the safety belts are not twisted while in use.**
- **Never use a single belt to restrain more than one person at a time.**

Failure to follow these warnings could increase the chance and severity of injury in a

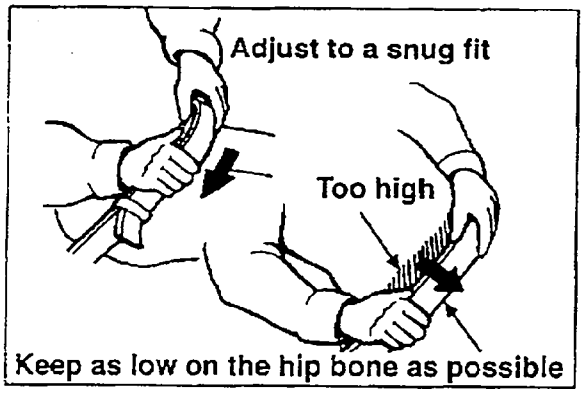
Lap Belt Only (Rear Center Seat)

To fasten the rear lap belt:

1. Grasp the buckle end and pull it low over the abdomen.
2. Insert the tongue plate into the open end of the buckle until an audible "click" is heard, indicating the latch is locked. Make sure the belt is not twisted.

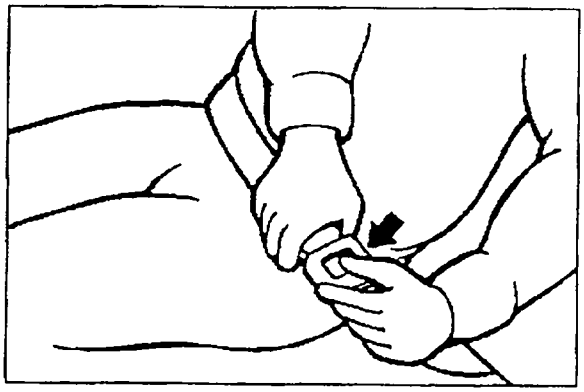


3. Grasp the free portion of the belt webbing and pull until the belt is snug over the hips and lower abdomen. If it becomes necessary to lengthen or shorten the belt, hold the latch plate tongue at right angles to the webbing and pull.



4. Make sure that the belt is placed as LOW ON THE HIPS as possible.

To unfasten the rear lap belt:



Press the release button on buckle.

⚠WARNING - Center Rear Lap Belt

Be sure the center rear lap belt is positioned snugly around the hips, and not on the waist. Failure to position the center rear lap belt snugly around the hips will increase the chance and severity of injury in the event of a collision.

Proper Use and Care of the Safety Belt System

To ensure that the safety belts provide the maximum protection, please follow these instructions:

- Use the belts at all times – even on short trips.
- If the safety belt is twisted, straighten it prior to use.
- Keep sharp edges and damaging objects away from the belt.
- Periodically inspect belt webbing, anchors, buckles, and all other parts for signs of wear and damage. Replace damaged, excessively worn or questionable parts immediately.
- To clean the belt webbing, use any mild soap solution recommended for cleaning upholstery or carpets. Follow the instructions provided with the soap. Do not bleach or dye the webbing because this may weaken the webbing fibers and allow them to fail when loaded in a collision.
- Do not make modifications or additions to the safety belt.
- After wearing a safety belt, make sure it fully retracts to the stowed position. Do not allow the belt to get caught in the door when you close it.

Restraint of Pregnant Women

Pregnant women should wear lap/shoulder belt assemblies whenever possible according to specific recommendations by their doctors. The lap portion of the belt should be worn AS SNUGLY AND AS LOW AS POSSIBLE.

⚠ WARNING - Pregnant Women

Pregnant women must never place the lap portion of the safety belt over the area of the abdomen where the fetus is located or above the abdomen.

Restraint of Infants and Small Children

Small children and infants should be restrained by an approved child-restraint system to help protect them while riding in a vehicle.

Never allow a child to stand or kneel on the seat of a moving vehicle. Never allow a safety belt to be placed around both a child and an adult or around two children at the same time.

⚠ WARNING - Children on Laps

Never hold a child on your lap or in your arms in a moving vehicle. Even a very strong person cannot hold onto a child in the event of even a minor collision.

Never hold a child on your lap or in your arms in a moving vehicle. Even a very strong person cannot hold onto a child in the event of even a minor collision.

Many companies manufacture child-restraint systems (often called child seats) for infants and small children. An acceptable child-restraint system must always satisfy U.S. Federal Motor Vehicle Safety Standards. Make sure that any child-restraint system you use in your vehicle is labeled as complying with those safety standards.

The child restraint system should be chosen to fit both the size of the child and the size of the vehicle seat. Be sure to follow any instructions provided by the child restraint system manufacturer when installing the child-restraint system.

⚠ CAUTION - Hot Metal Parts

Since a safety belt or child-restraint system can become very hot in a closed vehicle during warm weather, be sure to check the seat cover and buckles before placing a child in the seat.

Restraint of Large Children

As children grow, they may need to use new child-restraints, including larger child seats or booster seats, which are appropriate for their increased size.

A child who has outgrown available child-restraint systems should use the belts provided in the vehicle. When seated, the child should be restrained by the lap/shoulder belt.

If the shoulder belt slightly touches the child's neck or face, try placing the child closer to the center of the vehicle. If the shoulder belt still touches their face or neck, after-market devices are available from independent manufacturers which help pull the shoulder belt lower and away from the child's face or neck.

⚠ WARNING - Shoulder Belts on Children

Never allow a shoulder belt to be in contact with a child's neck or face while the vehicle is in motion.

⚠WARNING - Child Restraints

- All child-restraint systems are designed to be secured in vehicle seats by lap belts or the lap-belt portion of a lap/shoulder belt.

  Children will be endangered in a crash if their child-restraint systems are not properly secured by the safety belts in the vehicle.
- According to accident statistics, children are provided more protection when properly restrained in the rear seats instead of the front seat.s
- When the child-restraint system is not in use, make sure that it is secured by a safety belt so that it will not be thrown forward in the event of a sudden stop or accident.

Placement of a Child-Restraint System

We recommend that, whenever possible, you put the child restraint in the center position of the rear seat and secure it to the vehicle with the lap belt.

If the center rear seat is not available, or you are using more that one child-restraint system in the vehicle at the same time, be sure to follow the instructions provided by the manufacturer regarding installation in other seating positions.

The front passenger safety belt and rear outboard safety belts have been designed to allow a child restraint to be used in these positions. Since those safety belts normally lock only under extreme or emergency conditions (emergency lock mode) you must manually adjust those belts to the auto lock mode.

⚠WARNING - Child Restraints

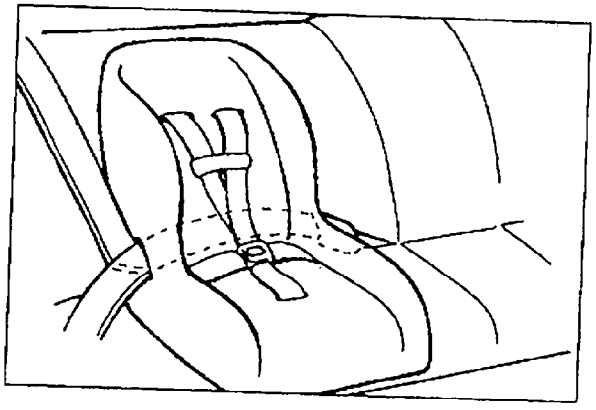
Failure to observe this manual's instructions regarding child-restraint systems and the instructions provided with the child-restraint system could increase the chance and/or severity of injury in an accident.

Installing a Child-Restraint System in the Front Seat and Rear Outboard Seats

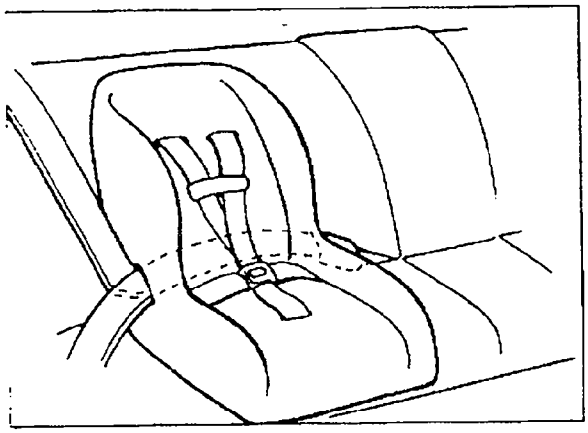
The use of the auto lock mode will ensure that the normal movement of the child in the vehicle does not cause the safety belt to be pulled out and loosen the firmness of its hold on the child-restraint system.

To secure a child-restraint system in the front passenger seat or rear outboard seats, use the following procedure.

Placing a Passenger Safety Belt into the "Auto Lock" Mode

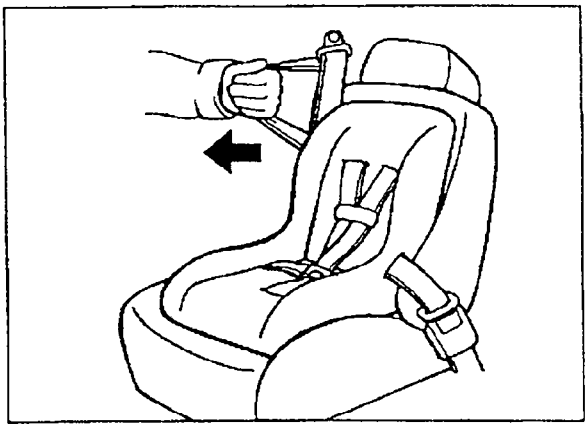


1. Place the child-restraint system in the seat and route the lap/shoulder belt around or through the restraint, following the restraint manufacturer's instructions.

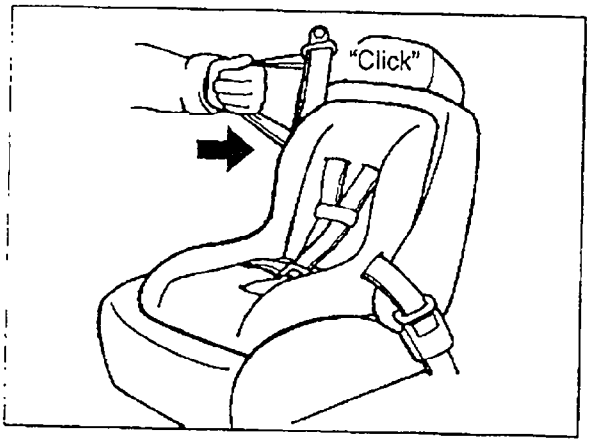


2. Fasten the lap/shoulder belt latch into the buckle. Listen for the distinct "click" sound.

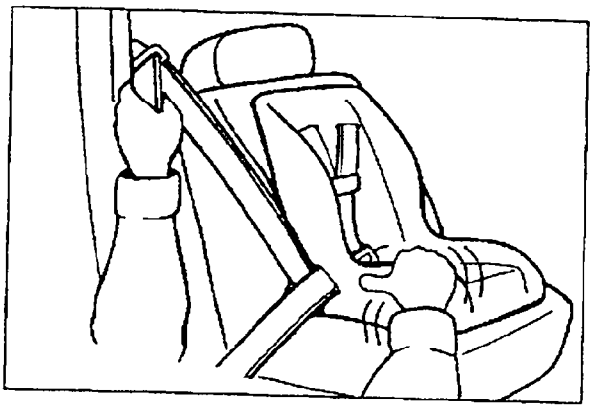
Position the release button so that it is easy to access in case of an emergency.



3. Pull the shoulder portion of the safety belt all the way out. When the shoulder portion of the safety belt is fully extended, it will shift the retractor to the "Auto Lock" mode.



4. Slowly allow the shoulder portion of the safety belt to retract and listen for an audible "clicking" or "ratcheting" sound. If no distinct sound is heard, repeat steps 3 and 4.



5. Remove as much slack from the belt as possible by pushing down on the child-restraint system while feeding the shoulder belt back into the retractor.
6. Push and pull on the child-restraint system to confirm that the safety belt is holding it firmly in place. If it is not, release the safety belt and repeat steps 2 through 6.

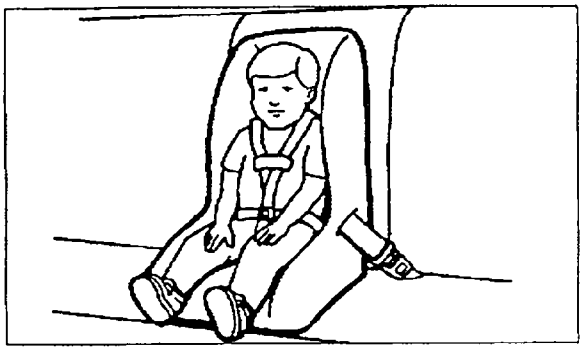
To remove the child-restraint, press the release button on the buckle and then pull the lap/shoulder belt out of the restraint and allow the safety belt to retract fully.

⚠WARNING - Auto Lock Mode

The lap/shoulder belt automatically returns to the "emergency lock mode" whenever the belt is allowed to retract fully. Therefore, the preceding six steps must be followed each time a child-restraint is installed.

If the safety belt is not placed in the "auto lock" mode, severe injury or death could occur to the child and/or other occupants in the vehicle.

Installing a Child-Restraint System in the Rear Center Seat



To install a child-restraint system in the rear center seat, do the following:

1. Place the child-restraint in the desired position. Route the lap belt through the child-restraint according to the seat manufacturer's instructions.
2. Insert the latch plate into the buckle.
3. Adjust the lap safety belt for a snug hold on the child-restraint by pulling on the loose end of the belt webbing.

Air-Bag – Supplemental Restraint System Driver's Side Only

What Your Air Bag System Does

Your vehicle is equipped with a Supplemental Restraint System (SRS). The SRS in your vehicle includes an air bag in the steering wheel and a second air bag, called a "knee air bag," which is stored below the steering column inside the driver's side knee bolster. The steering wheel air bag is designed to help restrain the forward movement of the driver's head and chest in a severe frontal collision. The knee air bag helps hold the driver in the proper position to receive the maximum protection from the steering wheel air bag and it offers added protection for the driver's legs in the event of such a collision.

What Your Air Bag System Does Not Do

The air bag system is designed to supplement or add to the protection offered by the driver's safety belt system. It is not a substitute for the driver's safety belt.

Why Didn't My Air Bag Go Off in a Collision?

There are many types of accidents in which the air bag would not be expected to provide additional protection. These include side or rear impacts, rollovers, and second or third collisions in multiple-impact accidents.

Air bags are only designed to inflate when the impact would throw the occupant into the air bags – generally from an area a little to the left or a little to the right of straight ahead.

In other words, just because your vehicle is damaged and even if it is totally unusable, don't be surprised that the air bags did not inflate.

⚠WARNING

- **Even in vehicles with air bags, you and your passengers must always wear the safety belts provided in order to minimize the risk and severity of injury in the event of a collision or rollover.** *(Continued)*

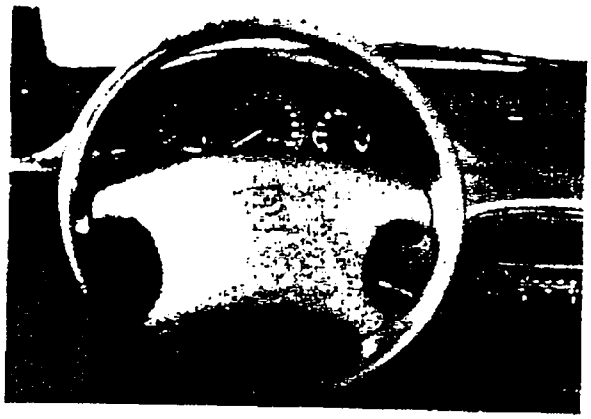
(Continued)

- **Always wear your safety belt. It can help keep you away from the air bags during heavy braking just before a collision. Air bags are designed to inflate only in severe frontal collisions and will generally not provide protection in side or rear impacts, rollovers or less severe frontal collisions. They will also not provide protection from later impacts in a multi-impact collision.**
- **If your vehicle has been subjected to flood conditions (e.g. soaked carpeting/standing water on the floor of the vehicle, etc.) or if your vehicle has become flood damaged in any way, do not attempt to start the vehicle or put the key in the ignition before disconnecting the battery. This may cause air bag deployment, which could result in serious personal injury or death. Have the vehicle towed to an authorized Kia dealer for inspection and necessary repairs.**

Air Bag System Components

The main components of your driver's side SRS are:

- An air bag in the steering wheel.
- A second air bag in the driver's side knee bolster.
- A diagnostic system that continually monitors system operation.
- An indicator light to warn you of a possible problem with the system.
- Emergency power backup in case your car's electrical system is disconnected in a crash.



To indicate that your vehicle is equipped with driver's side air bags, the air bag cover on the steering wheel is marked "SRS AIR BAG" and the cover on the driver's side knee bolster, located below the steering wheel on the underside of the instrument panel is marked "KNEE AIR BAG."

How the Driver's Air Bags (SRS) Work

The driver's air bags are stored in the steering wheel hub and in the knee bolster below the steering column. There are no air bags in front of the passenger seating positions.

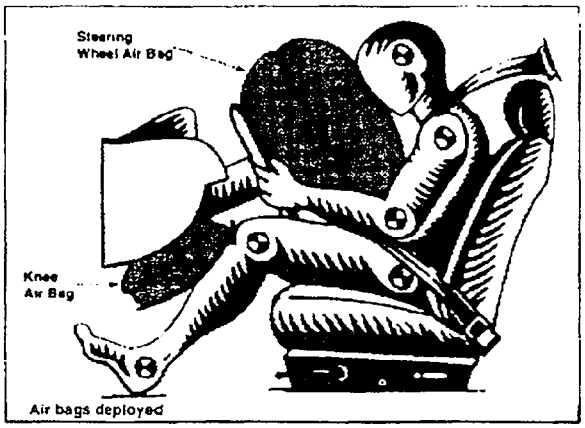
There is no single vehicle speed at which the air bags will inflate. Generally, air bags are designed to inflate in severe frontal collisions. The air bag Supplemental Restraint System (SRS) reacts to the severity of a collision and its direction. These two factors determine whether the sensors send out an electronic deployment/inflation signal. Whether the air bags will inflate depends on a number of factors including vehicle speeds, angles of impact and the density and stiffness of the vehicles or objects which your vehicle hits in the collision.

The driver's two air bags are designed to inflate instantly in the event of a severe frontal collision in order to help protect the driver from serious physical injury.

The air bags will completely inflate and deflate in less than 1/10 of one second. The speed of inflation and deflation protects the driver's ability to operate the vehicle. This is important in crashes where a vehicle continues to move after an impact and the driver still has some control of the vehicle's steering, braking, throttle and/or transmission systems.

It is virtually impossible for you to see the air bags inflate during an accident. It is much more likely that you will simply see the deflated air bags hanging out of their storage compartments after the collision.

In order to help provide protection in a severe collision, the air bags must inflate rapidly. However, that speed also causes the air bags to expand with a great deal of force. The speed of this inflation can reduce the likelihood of serious or life-threatening injuries and is thus desirable.



Thus, air bag inflation can also cause injuries which normally can include facial abrasions, bruises and broken bones. There are even circumstances under which contact with the steering wheel air bag can cause fatal injuries, especially is the occupant is positioned excessively close to the steering wheel.

YOU MUST ALWAYS SIT AS FAR BACK FROM THE STEERING WHEEL AIR BAG AS POSSIBLE, WHILE STILL MAINTAINING A COMFORTABLE SEATING POSITION FOR GOOD VEHICLE CONTROL, IN ORDER TO REDUCE THE RISK OF INJURY OR DEATH IN A COLLISION.

⚠ WARNING - Air Bag Injuries

- Sit as far back from the steering wheel as possible without interfering with your control of the vehicle. Positioning yourself too close to the steering wheel can result in serious or even fatal injuries if the air bag deploys.
- Never place objects over the air bag storage compartments or between the air bags and yourself. Due to the speed and force of the air bag inflation, such objects could hit your body at high speed and cause severe bodily injury and even death.

When the air bags inflate, they make a loud noise and they leave smoke and powder in the air inside of the vehicle. This is normal and is a result of the ignition of the air bag inflator.

After the air bags inflate, you may feel substantial discomfort in breathing due both to the contact by your chest with both the safety belt and the air bag, as well as from breathing the smoke and powder. WE STRONGLY URGE YOU TO OPEN YOUR DOORS AND/OR WINDOWS AS PROMPTLY AS POSSIBLE AFTER IMPACT IN ORDER TO REDUCE DISCOMFORT AND PREVENT PROLONGED EXPOSURE TO THE SMOKE AND POWDER.

⚠ CAUTION - Hot Metal Parts

- When the air bags deploy, the air bag inflators in the steering wheel and/or below the dashboard are very hot. To prevent injury, do not touch the air bag storage areas internal components after an air bag has inflated.

Air Bag Warning Light

The purpose of the air bag warning light in your instrument panel is to alert you of a potential problem with your Air Bag – Supplemental Restraint System (SRS).

Have the system checked if:

- The light does not illuminate briefly when you turn the ignition ON.
- The light stays on after the engine starts.
- The light comes on or flashes while you are driving.

Supplemental Restraint System Service

Your Supplemental Restraint System is virtually maintenance-free. There are no parts which you can service.

You must have the system serviced under the following circumstances:

- If an air bag ever inflates, the air bag must be replaced. Do not try to remove or discard the air bag by yourself. This must be done by an authorized Kia dealer or service representative.
- If the air bag warning indicator light alerts you of a problem, have the air bag system checked as soon as possible. Otherwise, your air bag might not inflate when you need it.

⚠ WARNING

- **Do not modify your steering wheel or any other part of the Supplemental Restraint System. Modification could make the system ineffective.**
- **Do not work on the system's components or wiring. This could cause the air bags to inflate inadvertently, possibly injuring someone very seriously. Working on the system could also disable the system so that the air bags did not deploy in a collision.**