

REPORT NOS. 208-TRC-87-009
212-TRC-87-009
301-TRC-87-009

1064

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

FUJI HEAVY INDUSTRIES, LTD.

1987 SUBARU XT DL

2-DOOR COUPE

NHTSA NO. CH5502

TRC TEST NO. 870831

THE TRANSPORTATION RESEARCH CENTER OF OHIO
U.S. RT. 33, LOGAN COUNTY
EAST LIBERTY, OHIO 43319



SEPTEMBER 21, 1987

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF VEHICLE SAFETY COMPLIANCE
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METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
AREA				
in ²	square inches	6.5	square centimeters	cm ²
ft ²	square feet	0.09	square meters	m ²
yd ²	square yards	0.8	square meters	m ²
mi ²	square miles	2.6	square kilometers	km ²
acres	acres	0.4	hectares	ha
MASS (weight)				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons	0.9	metric ton	t
	(2000 lb)			
VOLUME				
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
in ³	cubic inches	16	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	L
pt	pints	0.47	liters	L
qt	quarts	0.95	liters	L
gal	gallons	3.8	liters	L
ft ³	cubic feet	0.03	cubic meters	m ³
yd ³	cubic yards	0.76	cubic meters	m ³
TEMPERATURE (exact)				
°F	degrees Fahrenheit	5	degrees Celsius	°C
		subtracting 32)		

Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
AREA				
cm ²	square centimeters	0.16	square inches	in ²
m ²	square meters	1.2	square yards	yd ²
km ²	square kilometers	0.4	square miles	mi ²
ha	hectares	2.5	acres	
	(10 000 m ²)			
MASS (weight)				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	metric ton	1.1	short tons	
	(1000 kg)			
VOLUME				
ml	milliliters	0.03	fluid ounces	fl oz
ml	milliliters	0.06	cubic inches	in ³
L	liters	2.1	pints	pt
L	liters	1.06	quarts	qt
L	liters	0.26	gallons	gal
m ³	cubic meters	35	cubic feet	ft ³
m ³	cubic meters	1.3	cubic yards	yd ³
TEMPERATURE (exact)				
°C	degrees Celsius	9/5 (then add 32)	degrees Fahrenheit	°F

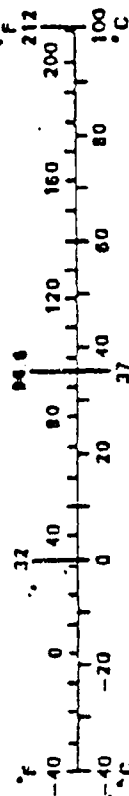


TABLE OF CONTENTS

<u>SECTION</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
1.0	PURPOSE AND TEST SUMMARY	1-1
2.0	SUMMARY OF RESULTS FOR:	2-1
	FMVSS 208, "OCCUPANT CRASH PROTECTION"	
	FMVSS 212, "WINDSHIELD MOUNTING"	
	FMVSS 219, (PARTIAL), "WINDSHIELD ZONE INTRUSION"	
	FMVSS 301, "FUEL SYSTEM INTEGRITY"	
3.0	CAMERA INFORMATION	3-1
APPENDIX A	PHOTOGRAPHS	A-1
APPENDIX B	DATA PLOTS	B-1

LIST OF TABLES

<u>NUMBER</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
1	CRASH TEST SUMMARY	1-5
2	TEST VEHICLE INFORMATION	1-6
3	TEST CONDITIONS	1-9
4	VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY	1-11
5	IMPACTED VEHICLE MEASUREMENTS	1-14
6	DUMMY INJURY CRITERIA	2-3
7	FMVSS 208 COMFORT AND CONVENIENCE DATA	2-10
8	FMVSS 208 SEAT BELT WARNING SYSTEM DATA	2-11
9	FMVSS 208 LABELING AND DRIVER'S MANUAL DATA	2-12
10	FMVSS 208 READINESS INDICATOR DATA	2-13
11	SUMMARY OF FMVSS 301 DATA	2-14
12	"FUEL SYSTEM INTEGRITY" POST-IMPACT TEST DATA	2-17
13	HIGH SPEED CAMERA LOCATIONS	3-4

LIST OF FIGURES

<u>NUMBER</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
1	VEHICLE ACCELEROMETER LOCATIONS	1-10
2	ACCIDENT INVESTIGATION DIVISION DATA	1-12
3	PRE-TEST AND POST-TEST MEASUREMENT POINTS	1-13
4	VEHICLE TARGET LOCATIONS	1-16
5	DUMMY POSITIONING DATA	2-6
6	DUMMY IN-VEHICLE POSITION RECORDING SHEET	2-7
7	DRIVER DUMMY TO STEERING COLUMN ASSEMBLY REFERENCE DIMENSIONS	2-8
8	SEAT BELT POSITIONING DATA	2-9
9	FMVSS NO. 212, "WINDSHIELD MOUNTING" DATA SHEET	2-15
10	FMVSS NO. 219, "WINDSHIELD INTRUSION" DATA SHEET	2-16
11	FMVSS NO. 301, STATIC ROLLOVER DATA SHEETS	2-18
12	CAMERA POSITIONS	3-2

SECTION 1.0

PURPOSE AND TEST SUMMARY

PURPOSE

This 30 mph frontal barrier impact test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 208, 212, 219 (Partial), and 301 compliance test program conducted for the National Highway Traffic Safety Administration (NHTSA) by the Transportation Research Center of Ohio (TRC) under Contract No. DTNH22-87-C-01024. The purpose of this test was to determine if the subject vehicle, a 1987 Subaru XT DL 2-door coupe, NHTSA No. CH5502, meets the performance requirements of FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Mounting"; FMVSS 219 (partial), "Windshield Zone Intrusion"; and FMVSS 301, "Fuel System Integrity." The test was conducted in accordance with the Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure No. TP-208-06 dated May 15, 1987.

TEST SUMMARY

The 1987 Subaru XT DL 2-door coupe, NHTSA No. CH5502, was equipped with a 1.8 liter transverse engine, manual transmission, and power brakes. The test weight of the vehicle was 2844 pounds. The test vehicle appeared to comply with the performance requirements of FMVSS test Nos. 208, 212, 219 (partial), and 301. The Head Injury Criteria (HIC) calculations were less than 1000, the resultant accelerations of the thorax did not exceed 60 g's and the compressive forces transmitted through the upper legs did not exceed 2,250 pounds as measured by Part 572 B dummies seated in the driver's and right front passenger's seats. There was 100 percent windshield retention. There was no intrusion into the windshield. There was no fluid leakage from the fuel system following the impact or during the static rollover test.

Two Part 572 B, 50th percentile, adult male anthropomorphic test devices (ATDs) were seated in the front outboard designated seating positions. The dummies were positioned according to the dummy placement procedures specified in optional Appendices B and C of the Laboratory Test Procedure No. TP-208-06 dated May 15, 1987.

Both ATDs were instrumented with head and chest accelerometers oriented to measure accelerations in the longitudinal, lateral, and vertical directions and with right and left femur load cells.

The vehicle was instrumented with seven accelerometers oriented to measure longitudinal axis acceleration.

The crash event was recorded by one (1) real time panning camera and fourteen (14) high speed motion picture cameras operating at approximately 500 frames per second.

The twenty-three (23) channels of data were multiplexed and recorded on a 14-track tape drive. The data was digitally sampled at 8000 samples per second and digitally processed per sections 12.8 and 12.9 of the laboratory procedure.

The vehicle was impacted into the rigid, flat frontal barrier at the Transportation Research Center of Ohio on August 31, 1987. The test vehicle's impact speed was 29.3 mph. The vehicle sustained 19.7 inches of static crush.

The FMVSS 208, 212, 219 (partial) and 301 compliance data is presented in Section 2.0. The camera information is presented in Section 3.0. Appendix A contains the still photographic prints. Appendix B contains the vehicle and dummy data plots.

TABLE 1

CRASH TEST SUMMARY

NHTSA NO.: CH5502 PROJECT: 30 MPH FRONTAL BARRIER IMPACT TEST

DATE: August 31, 1987 TIME: 1248 TEMP: 67°F

VEHICLE: 1987 Subaru XT DL 2-door coupe

TEST WEIGHT (LBS): 2844

IMPACT ANGLE (DEG)*: 0

IMPACT VELOCITY (MPH)**: PRIMARY = 29.3 SECONDARY = 29.4

MAX CRUSH (IN) STATIC: 19.7

VEHICLE REBOUND (IN): 24.9

DUMMIES:	Driver	Passenger
TYPE:	Part 572 B	Part 572 B
LOCATION:	Front Left	Front Right
RESTRAINT:	2-point passive seatbelt	2-point passive seatbelt

NUMBER OF DATA CHANNELS: 23

NUMBER OF HIGH SPEED CAMERAS: 14 and 1 real-time cameras

*With respect to tow track centerline.

**Speed trap measurement ($\pm$.05 mph accuracy).

TABLE 2

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Fuji Heavy Industries LTD.

MAKE/MODEL: Subaru XT DL

VIN: JF 1AX4226HB310701

BODY STYLE: 2-door coupe

MODEL YEAR: 1987

NHTSA NO.: CH5502

COLOR: White

ENGINE DATA: TYPE: Transverse CYLINDERS: 4 DISPLACEMENT: 1800

 X GAS, DIESEL, TURBOCHARGE

TRANSMISSION DATA: 5 SPEED, X MANUAL, AUTOMATIC, X FWD RWD

DATE VEHICLE RECEIVED: 7/15/87

ODOMETER READING:

ACCESSORIES:

POWER STEERING	No	AUTOMATIC TRANSMISSION	No
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	No
POWER SEATS	No	TILTING STEERING WHEEL	Yes
POWER WINDOWS	No	TELESCOPING STEERING WHEEL	Yes
TINTED GLASS	Yes	AIR CONDITIONING	No
RADIO	Yes	ANTI-SKID BRAKE	No
CLOCK	Yes	REAR WINDOW DEFROSTER	Yes
OTHER	None		

DATA FROM CERTIFICATION LABEL ON LEFT DOOR FACE OR "B" POST:

VEHICLE MANUFACTURED BY: Fuji Heavy Industries, Ltd

CERTIFICATION DATE: 02/87

GVWR: 3090 LBS.,

GAWR: FRONT 1630 LBS., REAR 1460 LBS.

TABLE 2, CONT'D.

DATA FROM "RECOMMENDED TIRE PRESSURE" LABEL ON DOOR, POST, GLOVEBOX, ETC.

VEHICLE LOAD (UP TO CAPACITY): FRONT 28 psi cold; REAR 28 psi cold

RECOMMENDED TIRE SIZE: P165/SR13 LOAD RANGE X B, C, D

TIRES ON VEHICLE (MFR., LINE, SIZE): Bridgestone, SF406 steel, 185/70HR13

IS SPARE TIRE A "SPACE SAVER": Yes

IS SPARE TIRE STANDARD EQUIPMENT: Yes

VEHICLE CAPACITY: TYPES OF SEATS Bucket

TYPE OF FRONT SEAT BACKS Manual adjustable

NUMBER OF OCCUPANTS 2 FRONT 2 REAR 4 TOTAL

CARGO LOAD 60 LBS. TOTAL 660 LBS.

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

RIGHT FRONT 773 LBS. RIGHT REAR 510 LBS.

LEFT FRONT 717 LBS. LEFT REAR 470 LBS.

TOTAL FRONT WEIGHT 1490 LBS. (60.3% OF TOTAL VEHICLE WEIGHT)

TOTAL REAR WEIGHT 980 LBS. (39.7% OF TOTAL VEHICLE WEIGHT)

TOTAL DELIVERED WEIGHT 2470 LBS.

CALCULATION FOR TARGET TEST WEIGHT:

RCLW = RATED CARGO AND LUGGAGE WEIGHT

UDW = UNLOADED DELIVERED WEIGHT (2470 LBS)

VCW = VEHICLE CAPACITY WEIGHT (660 LBS)

DSC = DESIGNATED SEATING CAPACITY (4)

RCLW = VCW - 150 (DCS) = (60 LBS)

TARGET TEST WEIGHT = UDW + RCLW + (2 DUMMIES X 164 LBS/DUMMY)

= 2470 + 60 + 328 LBS

TARGET TEST WEIGHT = 2858 LBS

TABLE 2, CONT'D.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 46 LBS. CARGO:

RIGHT FRONT	749 LBS.	RIGHT REAR	669 LBS.
LEFT FRONT	786 LBS.	LEFT REAR	640 LBS.
TOTAL FRONT WEIGHT	1535 LBS.	(54.0% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1309 LBS.	(46.0% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	2844 LBS.	(0.5% UNDER TARGET WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE TRUNK AREA: 20 LBS.

COMPONENTS REMOVED TO MEET TARGET WEIGHT: None

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	LF 26.3	;RF 26.4	;LR 24.1	;RR 24.1
PRE-TEST ATTITUDE:	LF 25.8	;RF 25.9	;LR 22.6	;RR 22.8
POST-TEST ATTITUDE:	LF 28.6	;RF 27.9	;LR 21.8	;RR 22.1

WHEELBASE: 96.8 INCHES

MAX. WIDTH: 66.6 INCHES

CG = 44.5 INCHES REARWARD OF FRONT WHEEL CENTERLINE

TABLE 3
TEST CONDITIONS

TEST NUMBER: 870831

DATE OF TEST: 8/31/87

TIME OF TEST: 1248

TYPE OF TEST: FRONTAL BARRIER IMPACT

IMPACT ANGLE: 0°

AMBIENT TEMPERATURE AT IMPACT AREA: 67°F

IMPACT VELOCITY: PRIMARY = 29.3 MPH

SECONDARY = 29.4 MPH

(SPECIFIED RANGE = 28.9 TO 29.9 MPH)

DISTANCE FROM VEHICLE TO BARRIER: ENTERING TRAP = 26.0 IN.

EXITING TRAP = 2.0 IN.

VEHICLE REBOUND AND CRUSH (ALL DIMENSIONS IN INCHES)

OVERALL LENGTH OF TEST VEHICLE: PRE-TEST: L 175.2 ;C 177.6 ;R 175.0

POST-TEST: L 157.1 ;C 158.0 ;R 156.1

TOTAL CRUSH: L 18.1 ;C 19.6 ;R 18.9

FOR FRONTAL IMPACTS, DISTANCE FROM FRONT OF TEST VEHICLE TO BARRIER AFTER
IMPACT: L: 25.9 ;C: 24.1 ;R: 24.6 AVG.: 24.9

FIGURE 1

VEHICLE ACCELEROMETER LOCATIONS

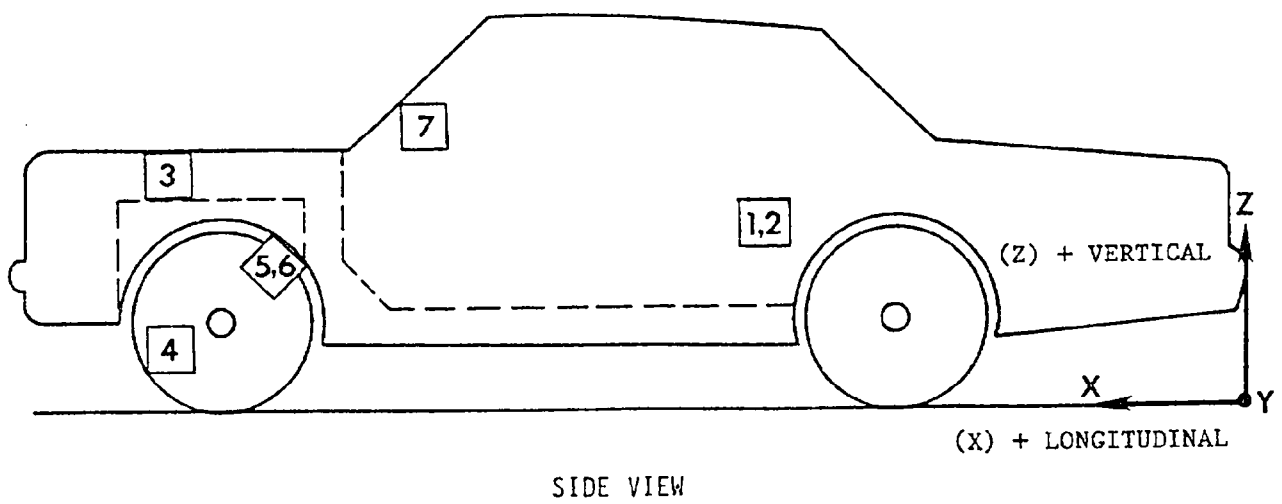
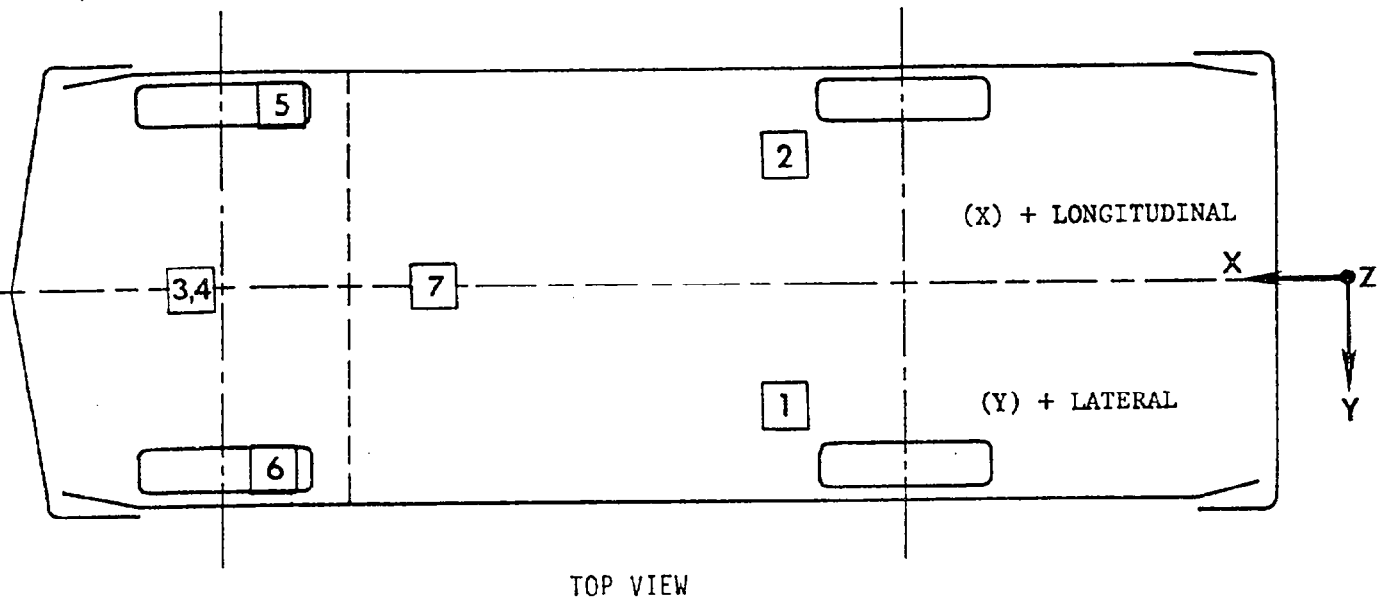


TABLE 4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION**		NEGATIVE DIRECTION**	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	REAR SEAT X-MEMBER AT LEFT SIDE	PRE: 65.5	15.4	12.5				
		POST: 65.5	15.4	12.0				
	LONGITUDINAL				1.2	140.6	27.7	66.2
2	REAR SEAT X-MEMBER AT RIGHT SIDE	PRE: 65.3	-15.3	12.3				
		POST: 65.3	-15.3	12.5				
	LONGITUDINAL				1.5	172.8	26.5	65.9
3	TOP OF ENGINE BLOCK	PRE: 152.6	0.9	23.8				
		POST: 146.0	0.8	25.0				
	LONGITUDINAL				25.0	51.5	115.5	40.1
4	BOTTOM OF ENGINE BLOCK	PRE: 149.8	0.0	8.6				
		POST: 145.0	0.0	10.1				
	LONGITUDINAL				26.1	53.6	99.3	41.4
5	BRAKE CALIPER AT RIGHT SIDE	PRE: 133.1	-24.6	8.4				
		POST: 133.2	-25.0	8.1				
	LONGITUDINAL				10.4	90.9	47.4	71.0
6	BRAKE CALIPER AT LEFT SIDE	PRE: 133.2	24.6	8.3				
		POST: 133.5	26.1	7.8				
	LONGITUDINAL				10.8	88.2	37.4	67.9
7	DASH PANEL	PRE: 112.4	0.0	35.6				
		POST: 112.5	0.0	37.6				
	LONGITUDINAL				22.0	77.1	61.2	88.8

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

DISTANCE MEASUREMENTS IN INCHES

FIGURE 2
ACCIDENT INVESTIGATION DIVISION DATA
FOR 30 MPH FRONTAL BARRIER IMPACT

VEHICLE MAKE/MODEL/BODY STYLE: Subaru XT DL 2-door Coupe
VEH. NHTSA NO.: CH5502; VIN: JF1AX4226HB310701
MODEL YEAR: 1987; BUILD DATE: 2/87; TEST DATE 8/31/87
VEH. SIZE CATEGORY: Two-seater; TEST WEIGHT: 2844
VEH. WHEELBASE: 96.8 FRONT OVERHANG: 39.1 OVERALL WIDTH: 66.6

COLLISION DEFORMATION CLASSIFICATION (CDC) CODE: 12FDEW2

F (Frontal)

CRUSH DEPTH
DIMENSIONS:

C1 = 18.1 inches

C2 = 18.9 inches

C3 = 19.6 inches

C4 = 19.7 inches

C5 = 19.0 inches

C6 = 18.9 inches

MIDPOINT OF DAMAGE: D = Vehicle Centerline
(Longitudinal)

LENGTH OF DAMAGED
REGION: L = 19.6 inches

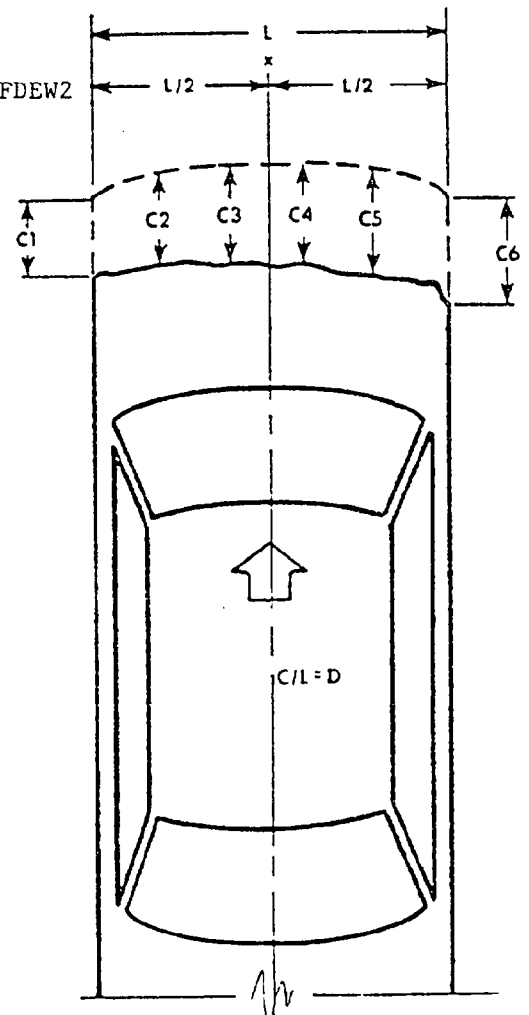
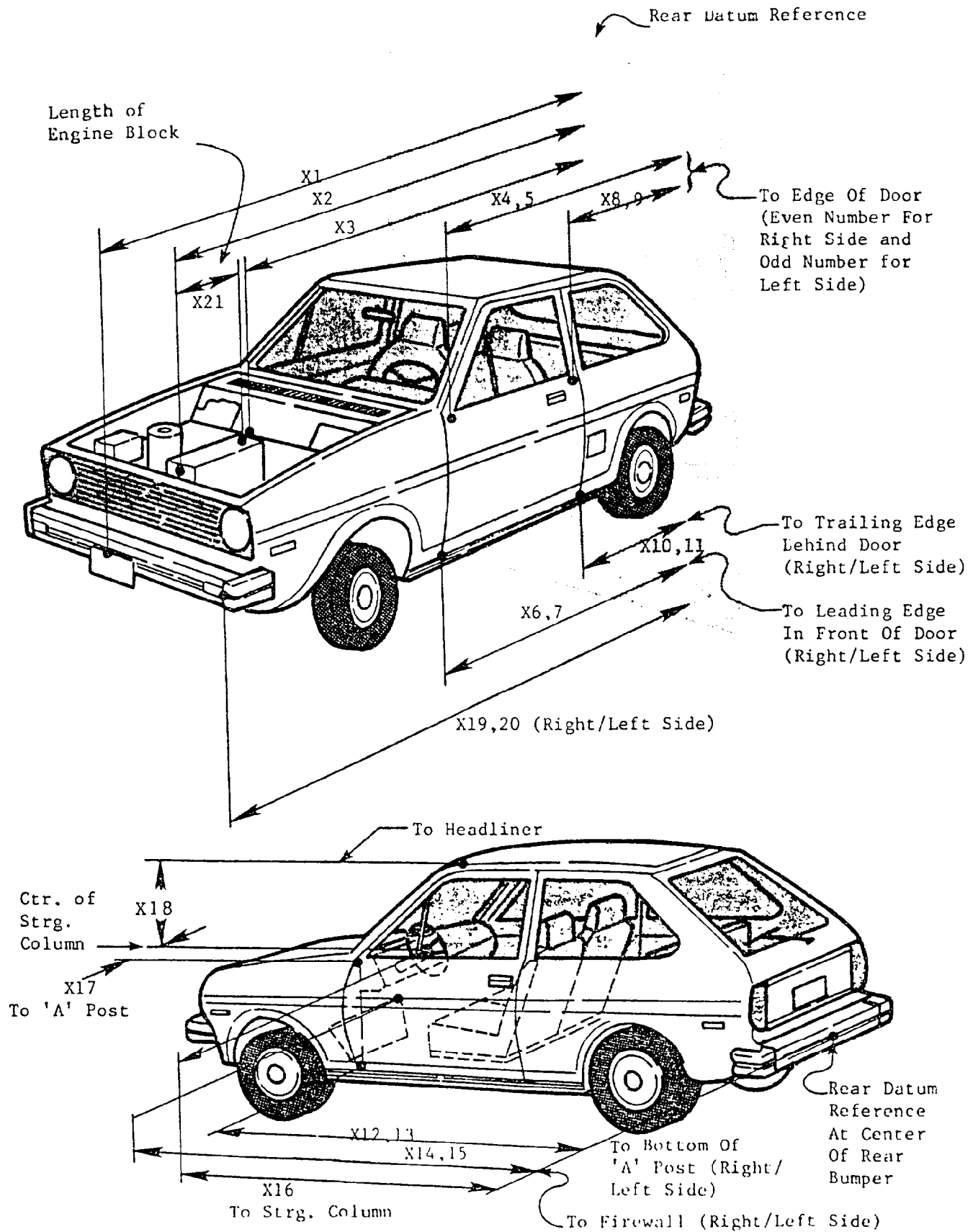


FIGURE 3
PRE-TEST AND POST-TEST MEASUREMENT POINTS



IMPACTED VEHICLE MEASUREMENTS

TEST NUMBER 870831

VEHICLE MAKE/MODEL Subaru XT DL

TABLE 5

NO.	TYPE OF MEASUREMENT	DIMENSIONS IN INCHES		
		PRE-TEST	POST-TEST	DIFF.
X 1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	177.6	158.0	19.6
X 2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	153.6	147.0	6.6
X 3	REAR SURFACE OF VEHICLE TO FIREWALL	124.0	123.5	0.5
X 4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	115.1	115.2	-0.1
X 5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	115.1	115.0	0.1
X 6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	117.9	118.0	-0.1
X 7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	117.9	117.9	0.0
X 8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	70.9	71.6	-0.7
X 9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	70.8	70.7	0.1
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	71.1	71.3	-0.2
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE ON LEFT DOOR	71.3	71.2	0.1
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	117.3	117.7	-0.4
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	117.6	117.4	0.2
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	126.6	126.6	0.0
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	126.8	126.5	0.3
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	97.9	98.0	-0.1
X17	CENTER OF STEERING COLUMN TO "A" POST	14.6	13.8	0.8

IMPACTED VEHICLE MEASUREMENTS CONTD

TEST NUMBER 870831

VEHICLE MAKE/MODEL Subaru XT DL

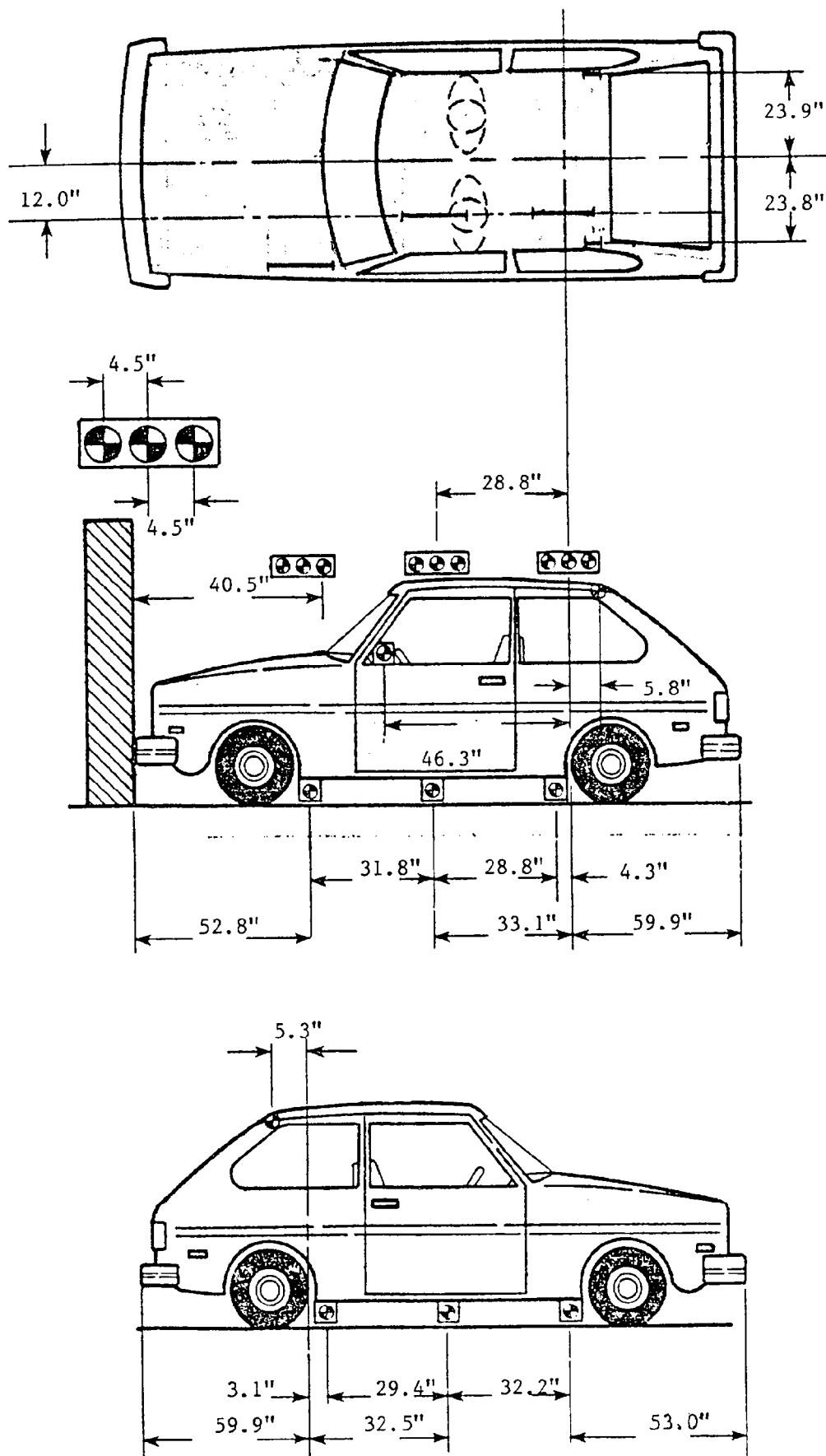
DIMENSIONS IN INCHES

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X18	REAR OF WINDSHIELD HEADER TO STEERING WHEEL CENTER	14.8	13.9	0.9
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	175.0	156.1	18.9
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	175.2	157.1	18.1
X21	LENGTH OF ENGINE BLOCK	13.0	13.0	0.0

TABLE 5 CONT'D

FIGURE 4

VEHICLE TARGET LOCATIONS



SECTION 2.0

SUMMARY OF RESULTS FOR - - -

FMVSS 208, "Occupant Crash Protection"

FMVSS 212, "Windshield Mounting"

FMVSS 219, (Partial), "Windshield Zone Intrusion"

FMVSS 301, "Fuel System Integrity"

COMPLIANCE DATA SUMMARY

The test vehicle, a 1987 Subaru XT GL 2-door coupe, NHTSA No. CH5502, appeared to comply with the requirements of FMVSS Nos. 208, 212, 219 (partial), and 301.

The driver's Head Injury Criteria (HIC) was 353. The driver's maximum chest deceleration over three milliseconds was 33.8 g. The driver's right and left compressive femur loads were 783 pounds and 949 pounds, respectively.

The right front passenger's Head Injury Criteria (HIC) was 292. The right front passenger's maximum chest deceleration over three milliseconds was 32.5 g. The right front passenger's right and left compressive femur loads were 444 pounds and 490 pounds, respectively.

The vehicle's restraint system met the comfort and convenience requirements of FMVSS 208.

The windshield retention was 100 percent.

There was no intrusion into the inner surface of the windshield below the protected zone.

There was no Stoddard fluid leakage following the crash test event or during any phase of the rollover test.

TABLE 6

DUMMY INJURY CRITERIA

MAXIMUM ACCELERATION ('G')

	<u>HEAD</u>				<u>CHEST</u>			R*
	X	Y	Z	R	X	Y	Z	
DRIVER	-49.1	19.9	-38.9	58.1	-35.1	9.9	10.6	33.8
PASSENGER	31.3	-20.5	-41.1	45.8	-32.9	-16.6	11.8	32.5

MAXIMUM FORCE-FEMUR LOAD (LBS)

	<u>RIGHT FEMUR</u>	<u>LEFT FEMUR</u>
DRIVER	783	949
PASSENGER	444	490

HEAD INJURY CRITERIA**

	HIC	TIME t_1	TIME t_2
		(MSEC)	(MSEC)
DRIVER	353	66.5	102.5
PASSENGER	292	68.2	104.2

*Defined as exceeding 0.003 sec. duration

**As defined in FMVSS No. 208

DUMMY KINEMATIC SUMMARY

DRIVER DUMMY

Upon impact, the driver dummy translated forward on the seat impacting both knees into the dash panel. The dummy's head rotated forward, contacting the steering wheel hub, as the driver's chest was restrained by the two-point, motorized, passive seatbelt. The dummy's head rotated rearward into the head restraint as the dummy rebounded into the seatback. The driver dummy came to rest seated in the driver's seat, leaning to the right, restrained by the two-point passive seatbelt.

PASSENGER DUMMY

Upon impact, the passenger dummy translated forward on the seat impacting both knees into the dash panel. The passenger's head rotated forward as the dummy's chest was restrained by the two-point, motorized, passive seatbelt. The dummy's head rotated rearward into the head restraint as the dummy rebounded into the seatback. The passenger dummy came to rest seated upright in the passenger's seat restrained by the two-point passive seatbelt.

VISIBLE DUMMY CONTACT POINTS:

	DRIVER #758	PASSENGER #690
Head	<u>Steering wheel hub</u>	<u>None</u>
Chest	<u>None</u>	<u>None</u>
Abdomen	<u>None</u>	<u>None</u>
Left Knee	<u>Instrument panel</u>	<u>Instrument panel</u>
Right knee	<u>Instrument panel</u>	<u>Instrument panel</u>

DOOR OPENING:

	LEFT	RIGHT
Front	<u>Easy</u>	<u>Easy</u>
Rear	<u>NA</u>	<u>NA</u>

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
Front	<u>None</u>	<u>None</u>
Rear	<u>NA</u>	<u>NA</u>

GLAZING DAMAGE: The windshield was cracked along each side.

OTHER NOTABLE IMPACT EFFECTS:

None

FIGURE 5
DUMMY POSITIONING DATA FOR
30 MPH FRONTAL BARRIER IMPACT TEST

PRE-IMPACT DATA:

Make/Model: Subaru XT DL
Body Style: 2-door coupe **Model Year:** 1987
NHTSA No.: CH5502 **Color:** White

DATA FROM CERTIFICATION LABEL:

Vehicle Manufacturer: Fuji Heavy Industries Ltd.
Date of Manufacture: 2/87 ; **VIN:** JF1AX4226HB310701
GVWR: 3090 lb; **GAWR:** Front = 1630 lb; Rear = 1460 lb

POST-IMPACT DATA:

Date of Test: 8/31/87 **Time:** 1248 **Temperature** 67 °F
Required Impact Velocity Range: 28.9 to 29.9 mph
Impact Velocity: Primary = 29.3 mph Secondary = 29.4 mph
Seat Type: Bucket **Adjuster Type:** Manual
Bucket Seat Back Type: Manual adjustable

Technicians:

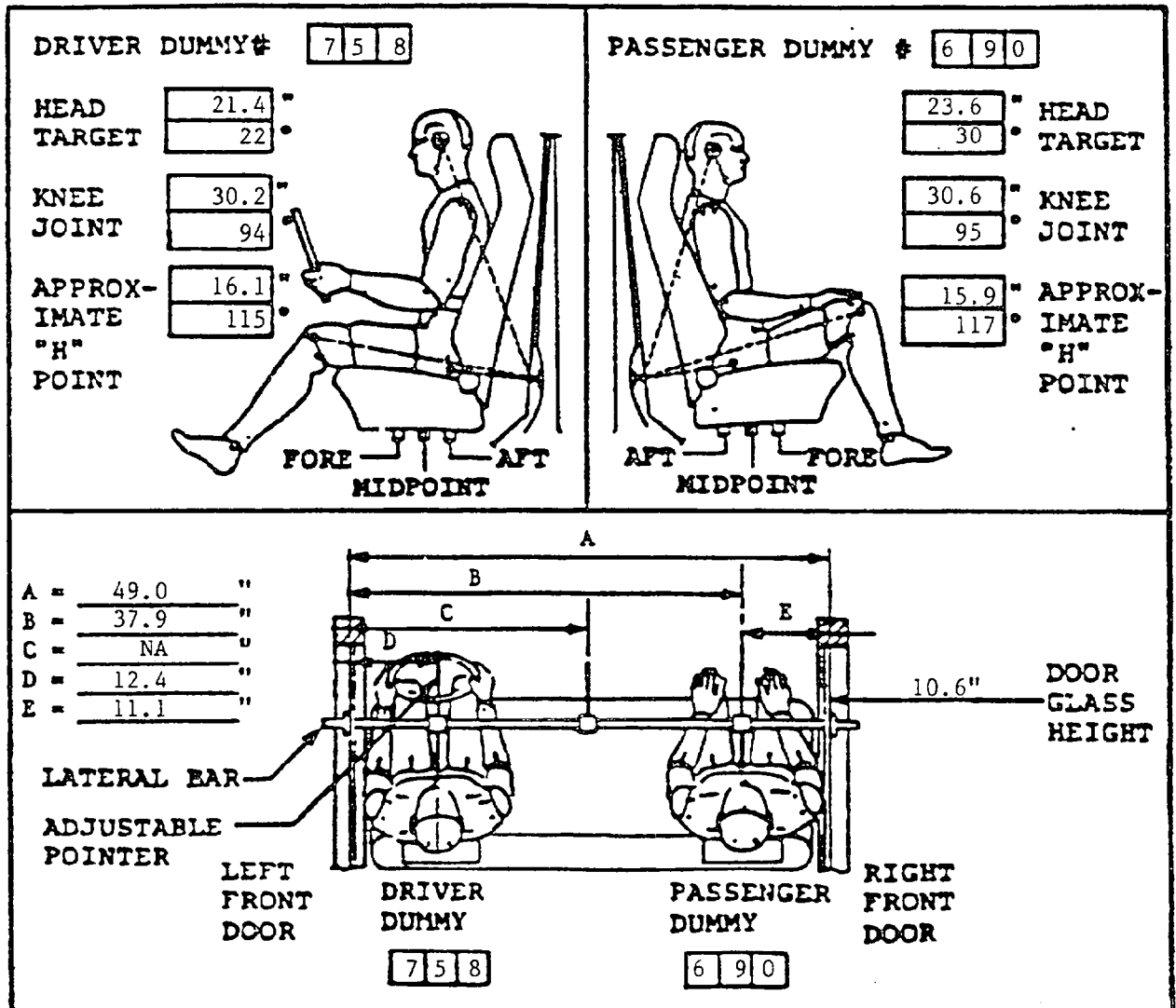
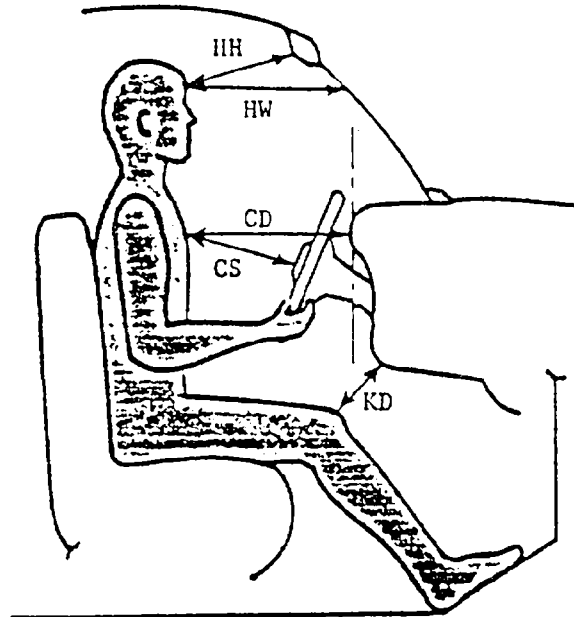


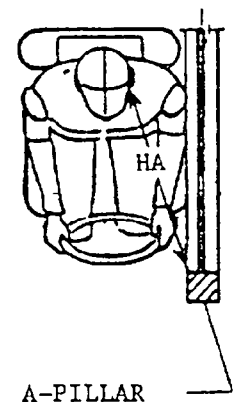
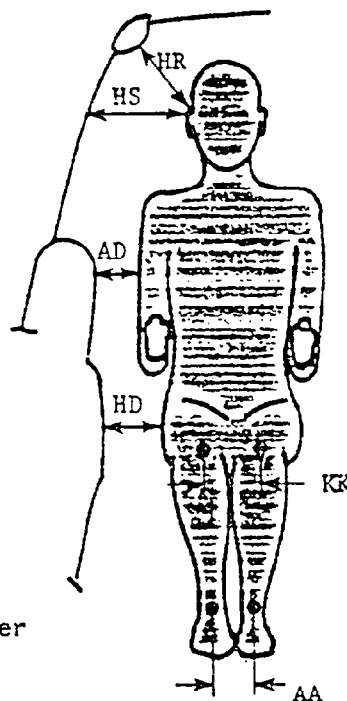
FIGURE 6

DUMMY IN-VEHICLE POSITION RECORDING SHEET

	DRIVER 758	PASSENGER 690
HH	10.1	9.8
HW	17.1	14.0
CD	22.4	21.7
CS	11.2	NA
KDL	5.7	5.8
KDR	5.8	5.5
TA	14°	14°
SA	26°	26°
HA	11.1	10.0



	DRIVER 758	PASSENGER 690
HR	5.1	3.9
HS	9.1	7.8
AD	3.6	3.2
HD	7.4	7.2
KK	10.8	7.6
AA	9.2	7.3



A-PILLAR

Knee outer bolt head to outer bolt head spacing:

Driver = 14.6

Passenger = 11.4

HH = Head to Windshield Header
 HW = Head to Windshield
 CD = Chest to Dash
 CS = Chest to Steering Wheel
 KD = Knee to Dash
 TA = Torso Angle
 SA = Seat Back Angle

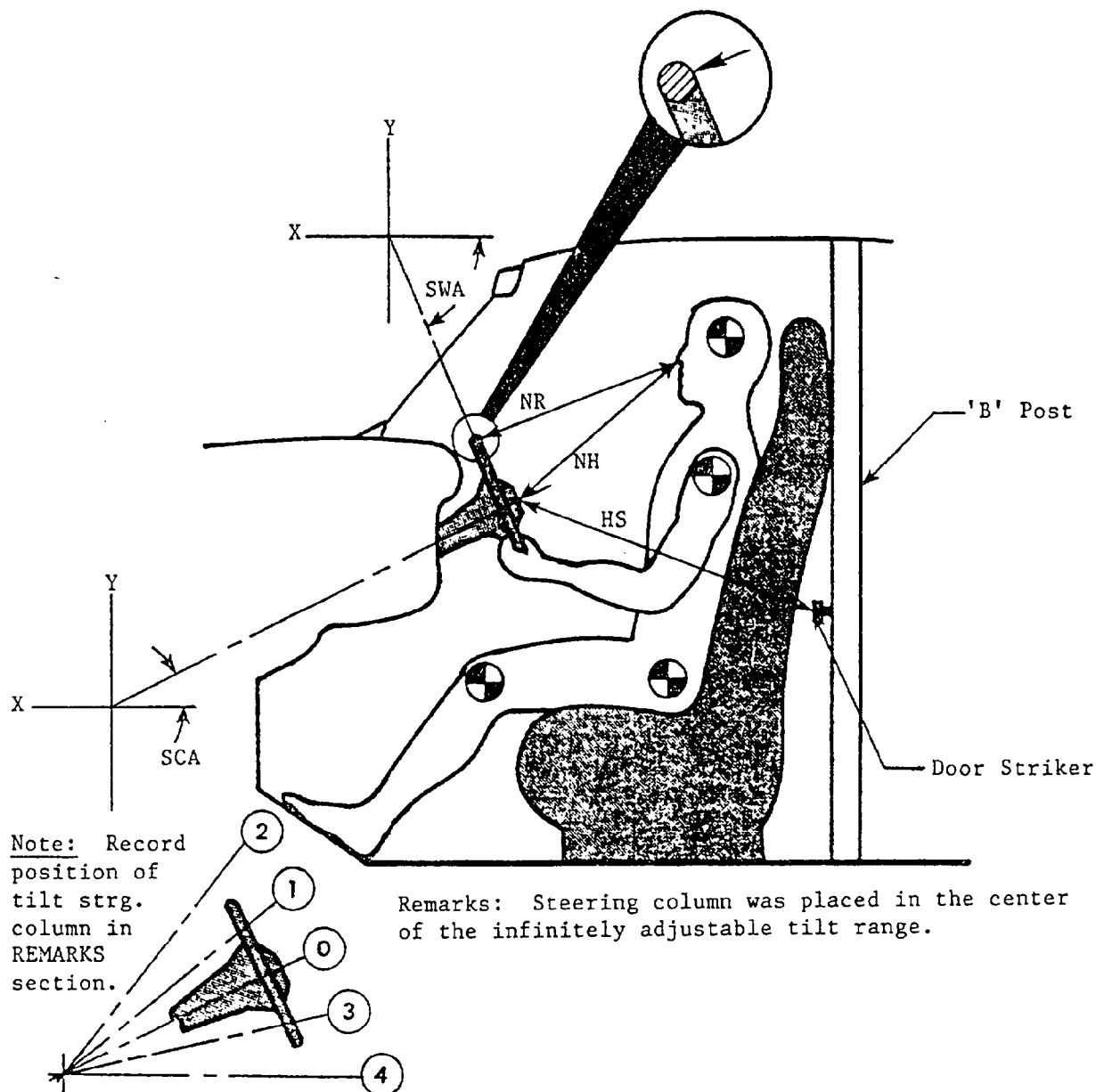
HR = Head to Side Roof
 HS = Head to Side Window
 AD = Arm to Door
 HD = Hip to Door
 KK = Knee to Knee
 AA = Ankle to Ankle
 HA = Head to A Pillar

Torso and seat back angles are relative to vertical.

ALL DISTANCE MEASUREMENTS IN INCHES

FIGURE 7

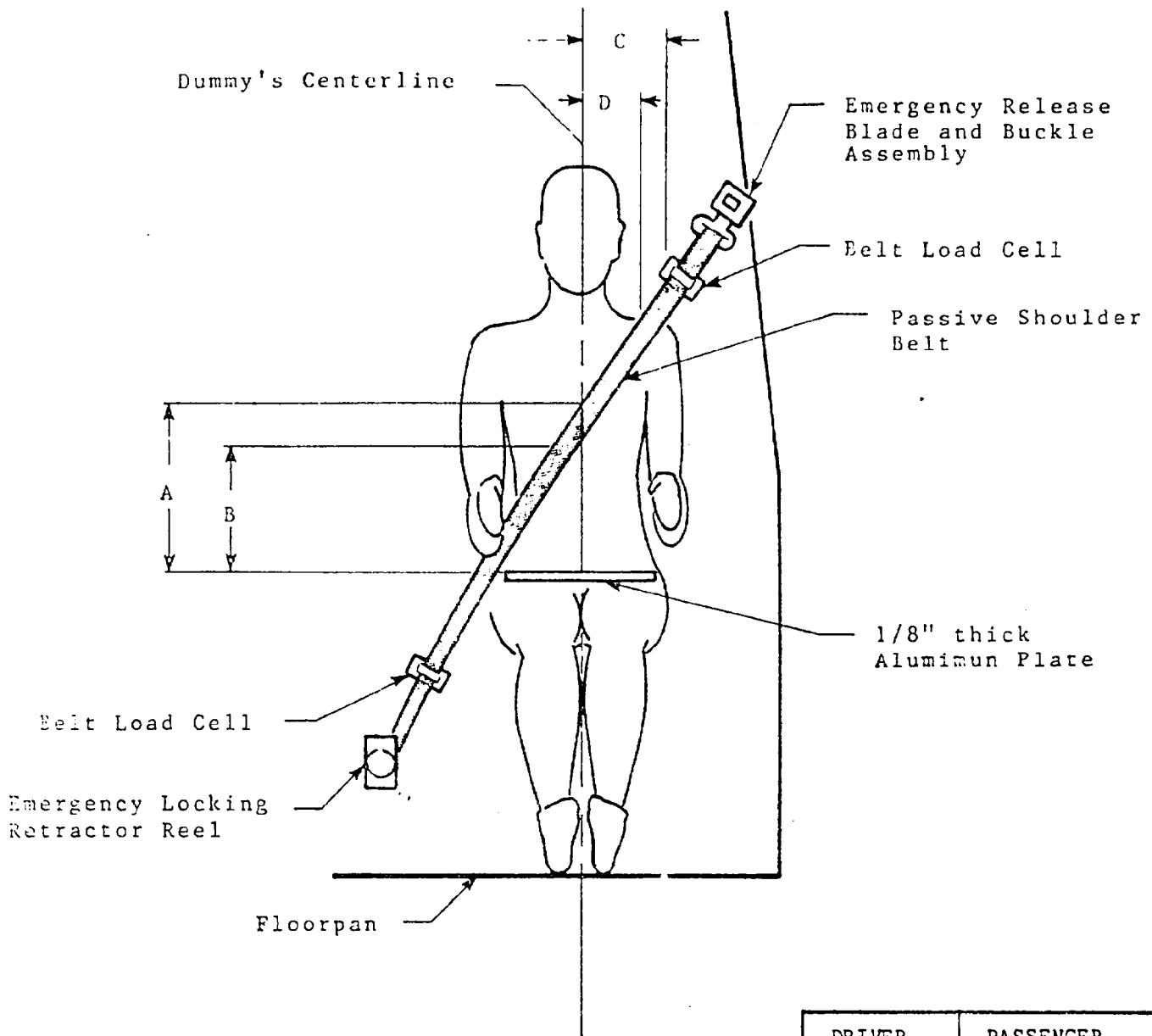
DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS



MEASUREMENTS	
NR - Distance from tip of dummy's nose to top rear surface of steering wheel rim.	13.6
NH - Distance from tip of dummy's nose to center of steering column hub.	14.6
HS - Distance from center of steering column hub to the forward surface of the door lock striker pin.	27.9
SCA - Angle of steering column relative to the horizontal X axis.	21°
SWA - Angle of steering wheel relative to the horizontal X axis.	69°

FIGURE 8

SEAT BELT POSITIONING DATA



	DRIVER DUMMY	PASSENGER DUMMY
A - Top surface of alum. plate to belt upper edge (in)	11.8	11.1
B - Top surface of alum. plate to belt lower edge (in)	8.5	8.0
C - Dummy centerline to outer edge of belt at chest flesh top (in)	4.5	4.8
D - Dummy centerline to inner edge of belt at chest flesh top (in)	2.0	2.4

TABLE 7

FMVSS 208 COMFORT AND CONVENIENCE DATA

VEHICLE VIN NO: JF1AX4226HB310701 NHTSA NO: CH5502
MAKE: Subaru MODEL: XT DL
VEHICLE CERTIFICATION DATE: 2/87 VEHICLE TYPE: 2-door coupe
FRONT OUTBOARD SEATING POSITIONS SEAT BELT TYPE:
(check one): X Automatic belts
 Type 2 lap/shoulder belts
 Other

CONVENIENCE HOOKS:

DEVICE AUTOMATICALLY RELEASES WHEN IGNITION IS TURNED TO "ON" OR "START"
NA, VEHICLE'S RESTRAINT SYSTEM DOES NOT INCLUDE CONVENIENCE HOOKS.

WEBBING TENSION - RELIEVING DEVICE:

DO OUTBOARD SEATING POSITION BELTS HAVE TENSION - RELIEVING DEVICES?
NO

MAXIMUM SLACK RECOMMENDED IN OWNERS MANUAL: NA INCHES
DOES OWNER'S MANUAL WARN THAT INTRODUCING SLACK BEYOND THE AMOUNT
SPECIFIED CAN SIGNIFICANTLY REDUCE THE EFFECTIVENESS OF THE SHOULDER
BELT? NA

IF NO, EXPLAIN:

AUTOMATIC BELTS: IS TENSION - RELIEVING DEVICE CANCELLED EACH TIME THE
ADJACENT DOOR IS OPENED? NA

IF NO, EXPLAIN:

BELT CONTACT FORCE:

FOR BELTS WITHOUT TENSION-RELIEVING DEVICES: BELT CONTACT FORCE:
.4 POUNDS

LATCHPLATE ACCESS: NA

RETRACTION: NA

ACCESSIBILITY: NA

LATCH MECHANISM: NA

TABLE 8

FMVSS NO. 208 - SEAT BELT WARNING SYSTEM DATA

WITH OCCUPANT IN DRIVER'S POSITION AND LAP BELT IN STOWED POSITION AND
IGNITION SWITCH PLACED IN "START/ON" POSITION:

Duration of audible warning signal = 7 sec.

Duration of reminder light operation = 7 sec.

WITH OCCUPANT IN DRIVER'S POSITION AND LAP BELT IN USE AND THE IGNITION
SWITCH PLACED IN "START/ON" POSITION:

Duration of audible warning signal = 0 sec.

(NOTE: audible warning should not operate)

Duration of reminder light operation = 7 sec.

Wording of visual warning:

Fasten Seat Belt

Fasten Belt

Symbol 101-80 X

TABLE 9

FMVSS NO. 208 - LABELING AND DRIVER'S MANUAL DATA

DESCRIBE LOCATION OF LABEL WHICH DESCRIBES MANUFACTURER'S MAINTENANCE OR
REPLACEMENT SCHEDULE FOR CRASH-DEPLOYED OCCUPANT PROTECTION SYSTEM: NA,
VEHICLE DID NOT INCLUDE A CRASH-DEPLOYED OCCUPANT PROTECTION SYSTEM

TABLE 10

FMVSS NO. 208 - READINESS INDICATOR DATA

AN OCCUPANT RESTRAINT SYSTEM THAT DEPLOYS IN THE EVENT OF A CRASH SHALL HAVE A MONITORING SYSTEM WITH A READINESS INDICATOR. A TOTALLY MECHANICAL SYSTEM IS EXEMPT FROM THIS REQUIREMENT. NA, VEHICLE DID NOT INCLUDE A CRASH-DEPLOYED OCCUPANT PROTECTION SYSTEM

TABLE 11

SUMMARY OF FMVSS 301 DATA

PRE-IMPACT DATA

MAKE/MODEL: Subaru DL XT

BODY STYLE: 2-door coupe

MODEL YEAR: 1987

NHTSA NO.: CH5502

COLOR: White

DATA FROM CERTIFICATION LABEL

VEHICLE MANUFACTURER: Fuji Heavy Industries Ltd

CERTIFICATION DATE: 2/87

VIN: JF1AX4226HB310701

GVWR: 3090 LBS., GAWR: FRONT 1630 LBS., REAR 1460 LBS.

POST-IMPACT DATA

TYPE OF TEST: Frontal Barrier Impact

DATE OF TEST: 8/31/87

TIME: 1248

TEMP: 67°F

REQUIRED IMPACT VELOCITY RANGE: 28.9 MPH TO 29.9 MPH

IMPACT VELOCITY: PRIMARY = 29.3 MPH SECONDARY = 29.4 MPH

TEST WEIGHT = 2844 LBS., STATIC CRUSH MAX. = 19.7 IN. REBOUND = 24.9 IN

FUEL SYSTEM DATA

TEST FLUID TYPE: PURPLE STODDARD SOLVENT #2; SPEC. GRAVITY: 0.764

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

"USEABLE" CAPACITY*: 15.9 GALLONS (FURNISHED BY CTM)

TEST VOLUME: 14.8 GALLONS (92-94% OF USEABLE)

FUEL SYSTEM CAPACITY (DATA FROM OWNERS MANUAL): 15.9 GALLONS

DETAILS OF FUEL SYSTEM: Fuel tank is located beneath rear axle. Fuel
filler neck is located on right side and enters right side of tank. Fuel
lines enter front of tank.

ELECTRIC FUEL PUMP: Yes

FUEL INJECTION: Yes

DOES ELECTRIC FUEL PUMP OPERATE WITH IGNITION SWITCH "ON" AND THE ENGINE NOT
OPERATING? No

*WITH ENTIRE FUEL SYSTEM FILLED.

FIGURE 9

FMVSS NO. 212, "WINDSHIELD MOUNTING", DATA SHEET

Details of windshield mounting such as retention method, trim type, etc.:

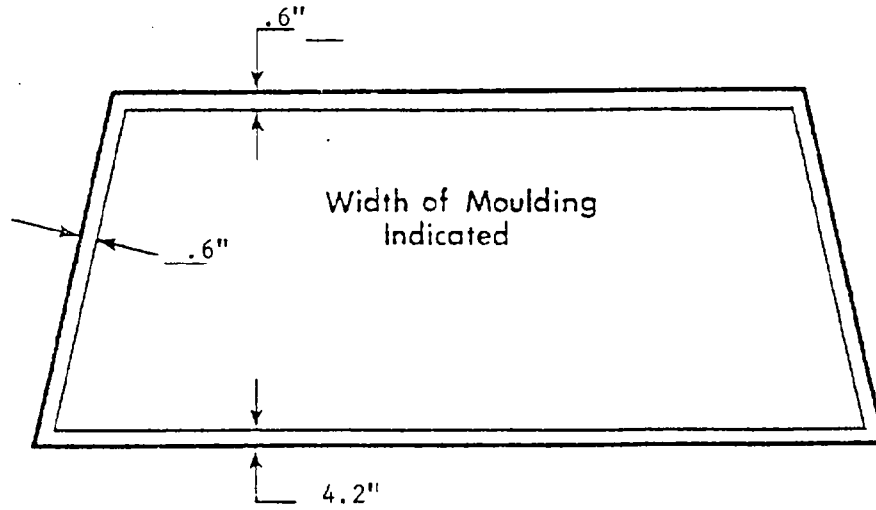
FMVSS 212 REQUIREMENTS: The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of windshield for vehicles equipped with automatic restraint systems for front occupants.

FMVSS 212 TEST DATA:

WINDSHIELD PERIPHERY

	PRE-TEST (in.)	POST-TEST (in.)	PERCENT RETENTION
RIGHT SIDE	80.2	80.2	100%
LEFT SIDE	80.2	80.2	100%
TOTAL	160.4	160.4	100%

AREA OF RETENTION FAILURE:



TEST VEHICLE TEMP = 71°F

FAILURE DETAILS: None

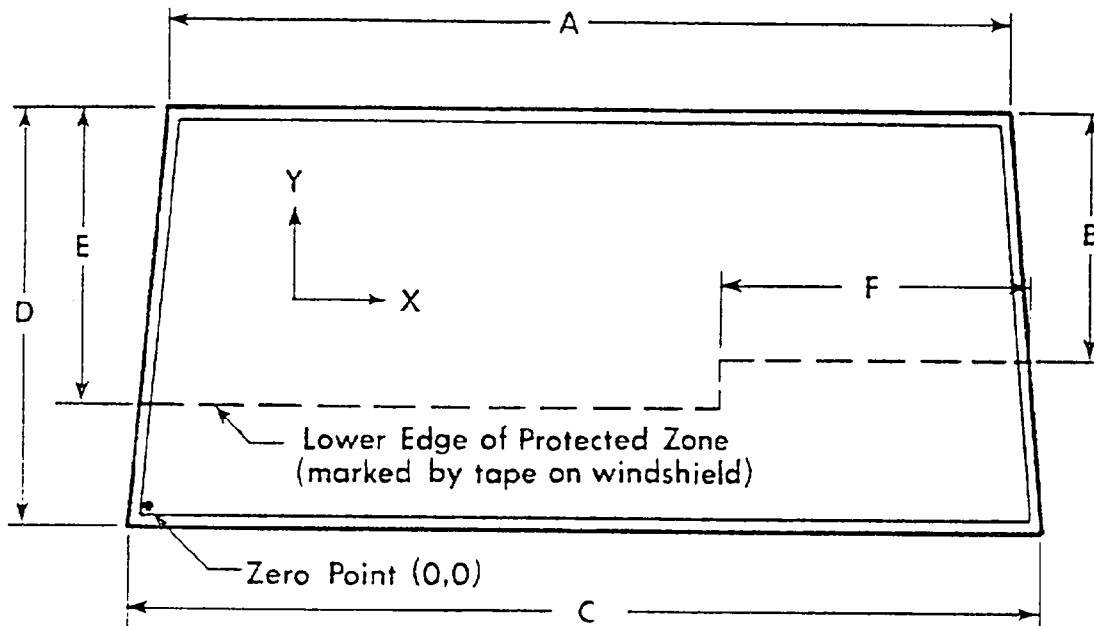
FIGURE 10

FMVSS NO. 219, "WINDSHIELD ZONE INTRUSION", DATA SHEET

PROTECTED ZONE LOWER EDGE REQUIREMENT:

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

FMVSS 219 TEST DATA:



FRONT VIEW

A = 45.3

C = 59.8

E = 21.8

B = 17.8

D = 29.1

F = 30.8

DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 1/4":
(Show location of penetration on above sketch)

None

COORDINATES
X Y

- 1.
- 2.
- 3.
- 4.

TABLE 12

"FUEL SYSTEM INTEGRITY" POST-IMPACT

TEST DATA, FMVSS NO. 301

TEST VEHICLE NHTSA NO.: CH5502; TEST DATE: August 31, 1987
VEH. MFR./MAKE/MODEL: Fuji Heavy Industries Ltd./Subaru XT DL

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

.....

TEST VEHICLE IMPACT TYPE:

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

FUEL SPILLAGE MEASUREMENT:

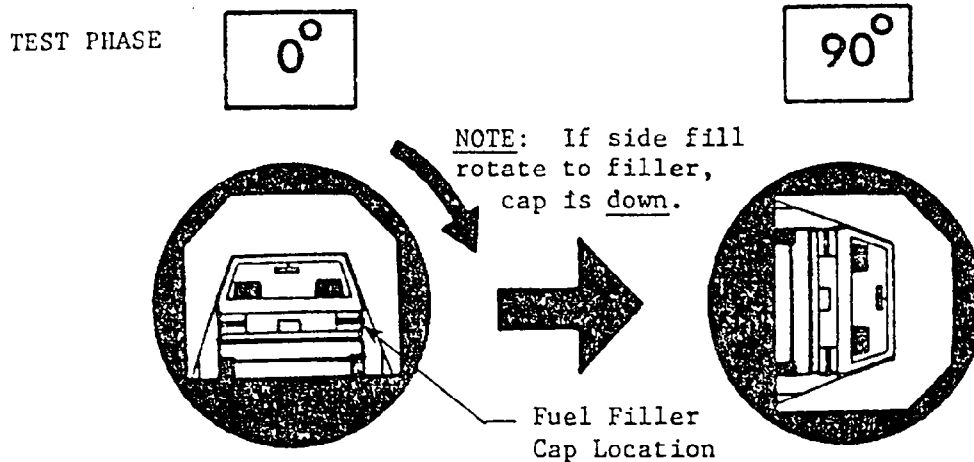
	<u>ACTUAL</u>	<u>MAX. ALLOW.</u>
1. From impact until vehicle motion ceases - -	0	1 oz.
2. For 5 min. period after veh. motion ceases-	0	5 oz.
3. For next 25 minutes - - - - -	0	1 oz./1 min.

SOLVENT SPILLAGE DETAILS:

No Stoddard solvent leakage during the post-impact time intervals.

FIGURE 11

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET



STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1 to 3 min.)

Time req. for machine to rotate 90° = 2 minutes, 00 seconds

FMVSS 301 Position Hold Time = 5 minutes, 00 seconds

TOTAL - - - - - = 7 minutes, 00 seconds

Next Whole Minute Interval - - - - = 7 minutes

FMVSS 301 REQUIREMENTS

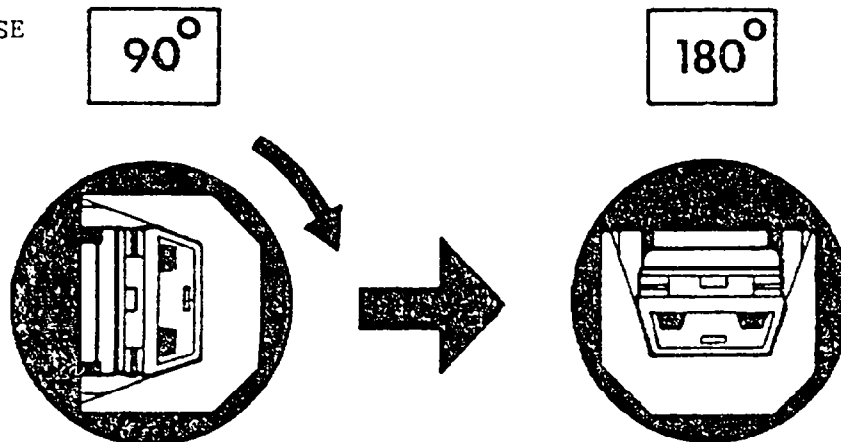
	First 5 Minutes FROM ONSET OF ROTATION	6th Minute	7th Minute
Maximum Allowable Solvent Spillage - -	5 oz.	1 oz.	1 oz.
0 to 90° (filler cap down) - - - - -	0 oz.	0 oz.	0 oz.

SOLVENT SPILLAGE LOCATION(S)

FIGURE 11, CONT'D

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE



STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1 to 3 min.)

Time req. for machine to rotate 90° = 2 minutes, 00 seconds
 FMVSS 301 Position Hold Time = 5 minutes, 00 seconds
 TOTAL - - - - - = 7 minutes, 00 seconds
 Next Whole Minute Interval - - - - = 14 minutes

FMVSS 301 REQUIREMENTS

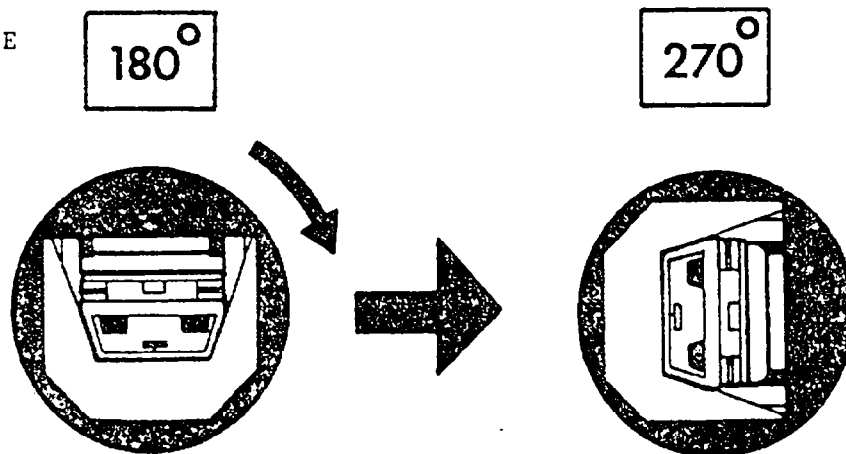
	First 5 Minutes FROM ONSET OF ROTATION	6th Minute	7th Minute
Maximum Allowable Solvent Spillage -	5 oz.	1 oz.	1 oz.
90° to 180° - - - - -	0 oz.	0 oz.	0 oz.

SOLVENT SPILLAGE LOCATION(S)

FIGURE 11, CONT'D

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE



STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1 to 3 min.)

Time req. for machine to rotate 90° = 2 minutes, 00 seconds

FMVSS 301 Position Hold Time = 5 minutes, 00 seconds

TOTAL - - - - - = 7 minutes, 00 seconds

Next Whole Minute Interval - - - - = 21 minutes

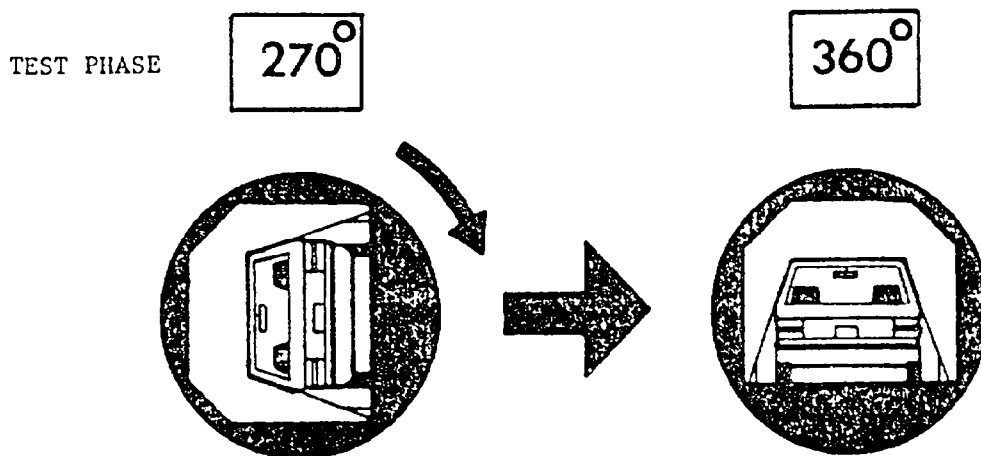
FMVSS 301 REQUIREMENTS

	First 5 Minutes FROM ONSET OF ROTATION	6th Minute	7th Minute
Maximum Allowable Solvent Spillage - -	5 oz.	1 oz.	1 oz.
180° to 270° - - - - -	0 oz.	0 oz.	0 oz.

SOLVENT SPILLAGE LOCATION(S)

FIGURE 11, CONT'D

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET



STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1 to 3 min.)

Time req. for machine to rotate 90° = 2 minutes, 00 seconds

FMVSS 301 Position Hold Time = 5 minutes, 00 seconds

TOTAL - - - - - = 7 minutes, 00 seconds

Next Whole Minute Interval - - - - = 28 minutes

FMVSS 301 REQUIREMENTS

	First 5 Minutes FROM ONSET OF ROTATION	6th Minute	7th Minute
Maximum Allowable Solvent Spillage - -	5 oz.	1 oz.	1 oz.
270° to 360° - - - - -	0 oz.	0 oz.	0 oz.

SOLVENT SPILLAGE LOCATION(S)

SECTION 3.0

CAMERA INFORMATION

FIGURE 12
CAMERA POSITIONS

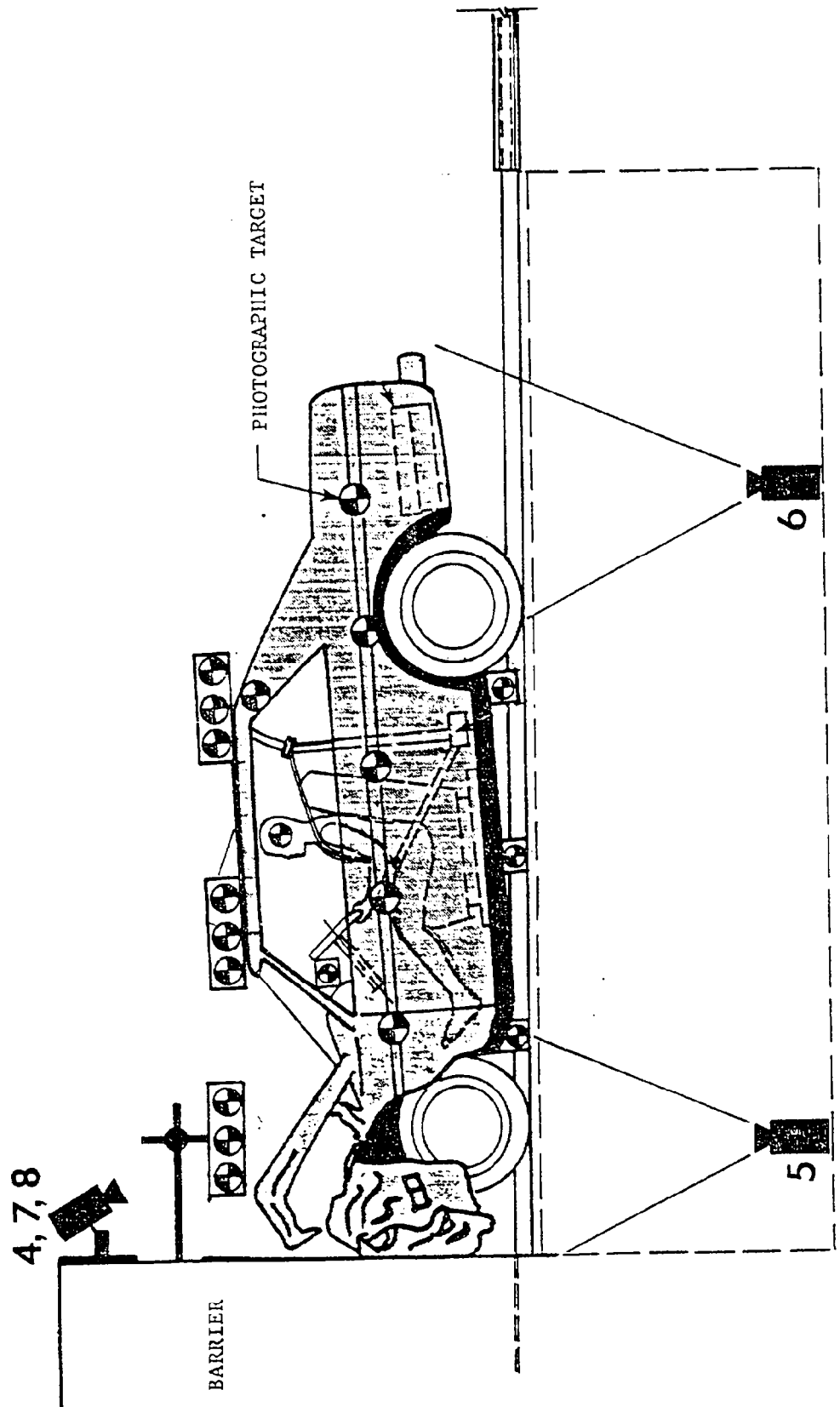


FIGURE 12 CONT'D

CAMERA POSITIONS

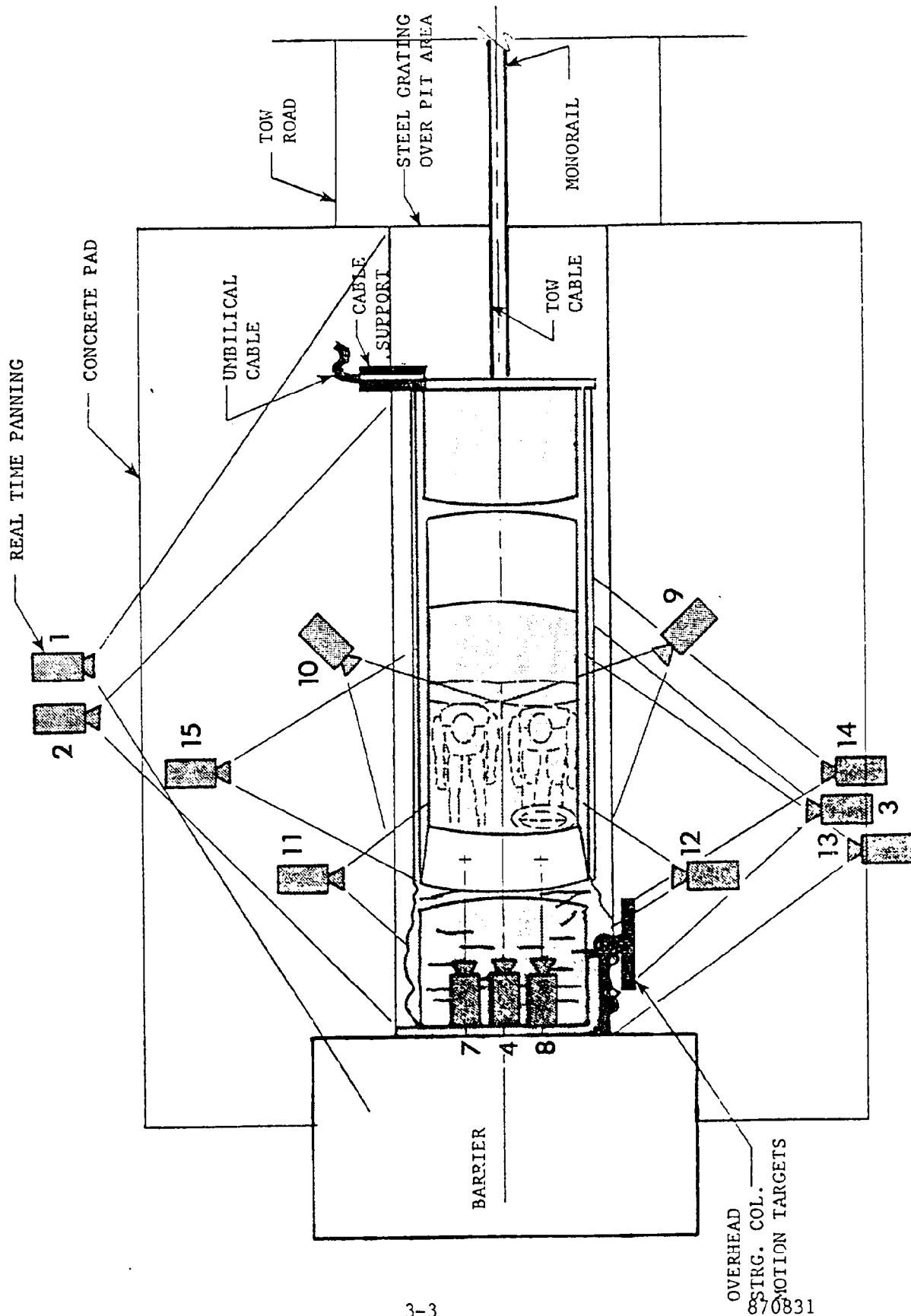


TABLE 13
HIGH SPEED CAMERA LOCATIONS

TEST NO.: 870831 VEHICLE: Subaru XT DL

CAMERA NO.	VIEW	CAMERA POSITIONS (IN)*			ANGLE ** (DEG)	FILM PLANE TO HEAD TARGET	LENS (MM)	SPEED (FPS)
		X	Y	Z				
1	Real time panning	-142.0	504.0	61.0	NA	NA	16	24
2	Vehicle crush	-81.3	266.4	37.1	-2	NA	13	500
3	Dummy kinematics	-41.5	-295.0	44.0	-4	252.8	25	490
4	Windshield damage	-6.0	0.0	89.0	40	NA	8.5	502
5	Crush & fluid spillage	-50.5	0.0	-92.4	90	NA	13	998
6	Fluid spillage	-99.3	0.0	-99.0	90	NA	13	995
7	Passenger kinematics	-4.5	13.8	93.0	-50	NA	17	495
8	Driver kinematics	-6.8	-14.5	93.0	-50	NA	17	502
9	Driver kinematics	-157.3	-116.0	87.0	-27	127.8	25	502
10	Passenger kinematics	-152.1	116.0	87.0	-26	130.5	25	500
11	Windshield intrusion	-38.1	306.1	44.0	0	NA	50	502
12	Windshield intrusion	-53.0	-309.4	42.3	0	NA	50	500
13	Column movement	-139.0	-286.0	103.0	-14	NA	25	500
14	Column movement	-139.0	-286.0	75.1	-9	NA	25	500
15	Passenger kinematics	-38.8	293.0	45.3	-4	251.5	25	502

* X = Film plane to plane of barrier face
Y = Film plane to monorail centerline
Z = Film plane to ground
** Referenced to horizontal plane

APPENDIX A

PHOTOGRAPHS

1. PRE-TEST FRONT VIEW
2. POST-TEST FRONT VIEW
3. PRE-TEST LEFT SIDE VIEW
4. POST-TEST LEFT SIDE VIEW
5. PRE-TEST RIGHT SIDE VIEW
6. POST-TEST RIGHT SIDE VIEW
7. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW
8. POST-TEST RIGHT FRONT THREE-QUARTER VIEW
9. PRE-TEST LEFT REAR THREE-QUARTER VIEW
10. POST-TEST LEFT REAR THREE-QUARTER VIEW
11. PRE-TEST REAR VIEW
12. POST-TEST REAR VIEW
13. PRE-TEST WINDSHIELD VIEW
14. POST-TEST WINDSHIELD VIEW
15. PRE-TEST ENGINE COMPARTMENT VIEW
16. POST-TEST ENGINE COMPARTMENT VIEW
17. PRE-TEST FUEL FILLER CAP VIEW
18. POST-TEST FUEL FILLER CAP VIEW
19. PRE-TEST FRONT UNDERBODY VIEW
20. POST-TEST FRONT UNDERBODY VIEW
21. PRE-TEST REAR UNDERBODY VIEW
22. POST-TEST REAR UNDERBODY VIEW
23. PRE-TEST FUEL LINES - VIEW 1
24. PRE-TEST FUEL LINES - VIEW 2
25. PRE-TEST DRIVER DUMMY POSITION VIEW
26. POST-TEST DRIVER DUMMY POSITION VIEW
27. PRE-TEST PASSENGER DUMMY POSITION VIEW
28. POST-TEST PASSENGER DUMMY POSITION VIEW
29. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW
30. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1
31. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

PHOTOGRAPHS CONTINUED

32. PRET-TEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW
33. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
34. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2
35. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 1
36. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 2
37. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 3
38. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 4
39. POST-TEST PASSENGER HEAD/KNEE CONTACT - VIEW 1
40. POST-TEST PASSENGER HEAD/KNEE CONTACT - VIEW 2
41. POST-TEST VEHICLE CERTIFICATION AND TIRE LOAD LABEL VIEW
42. PRE-TEST BALLAST VIEW
43. POST-TEST VEHICLE ON STATIC ROLLOVER MACHINE VIEW

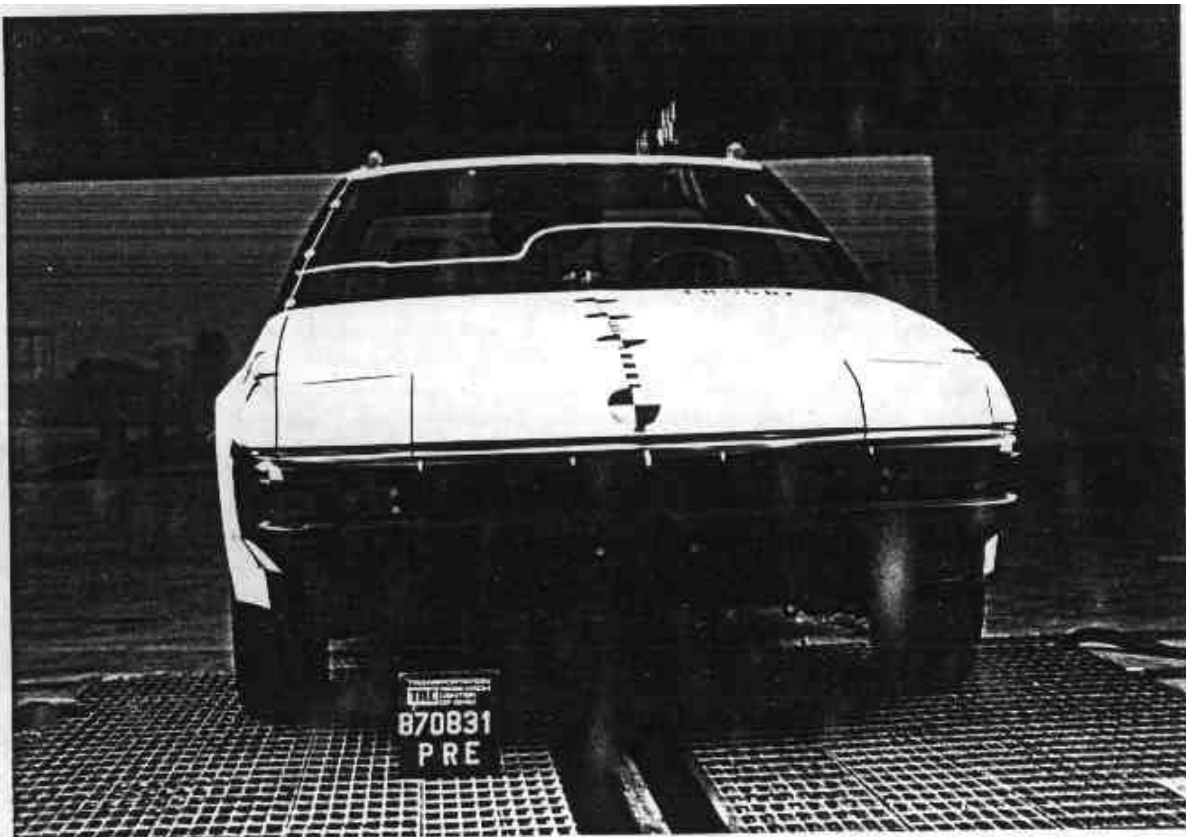


Figure 1. PRE-TEST FRONT VIEW

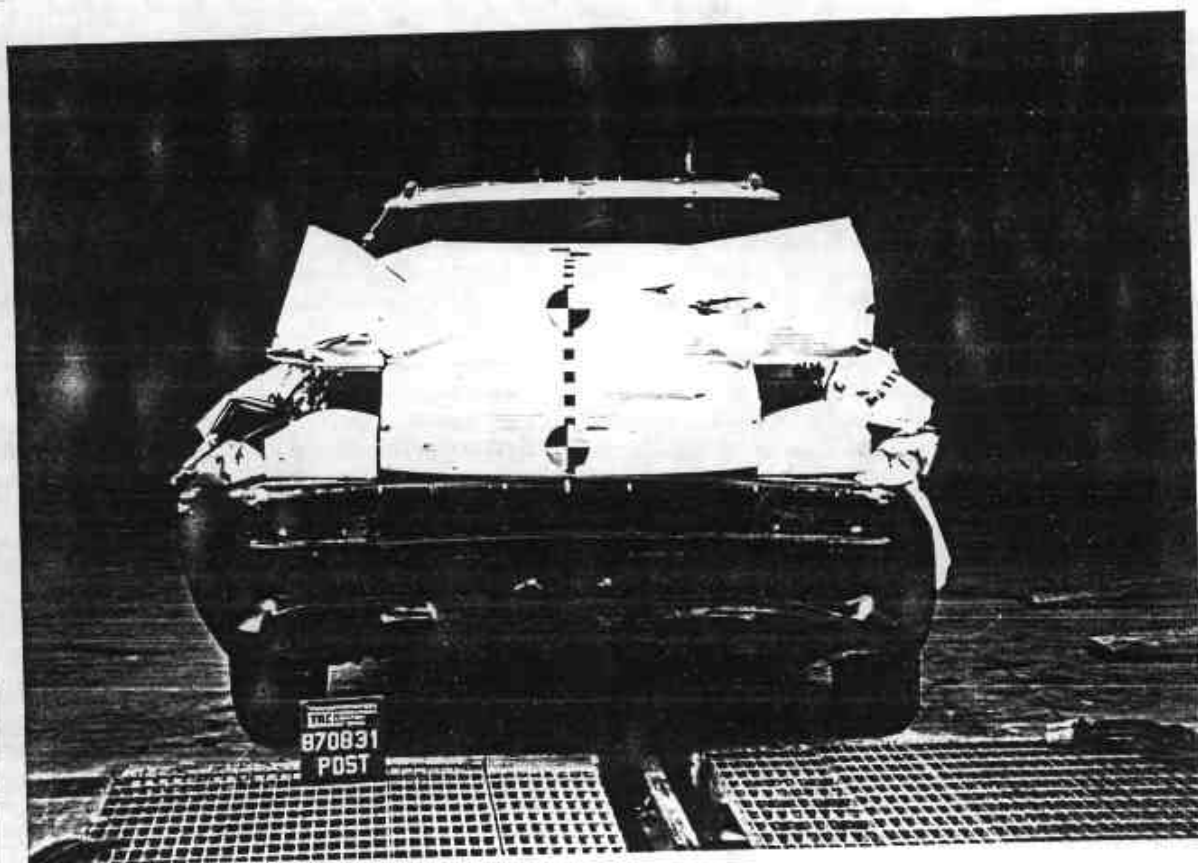


Figure 2. POST-TEST FRONT VIEW
A-3

870831

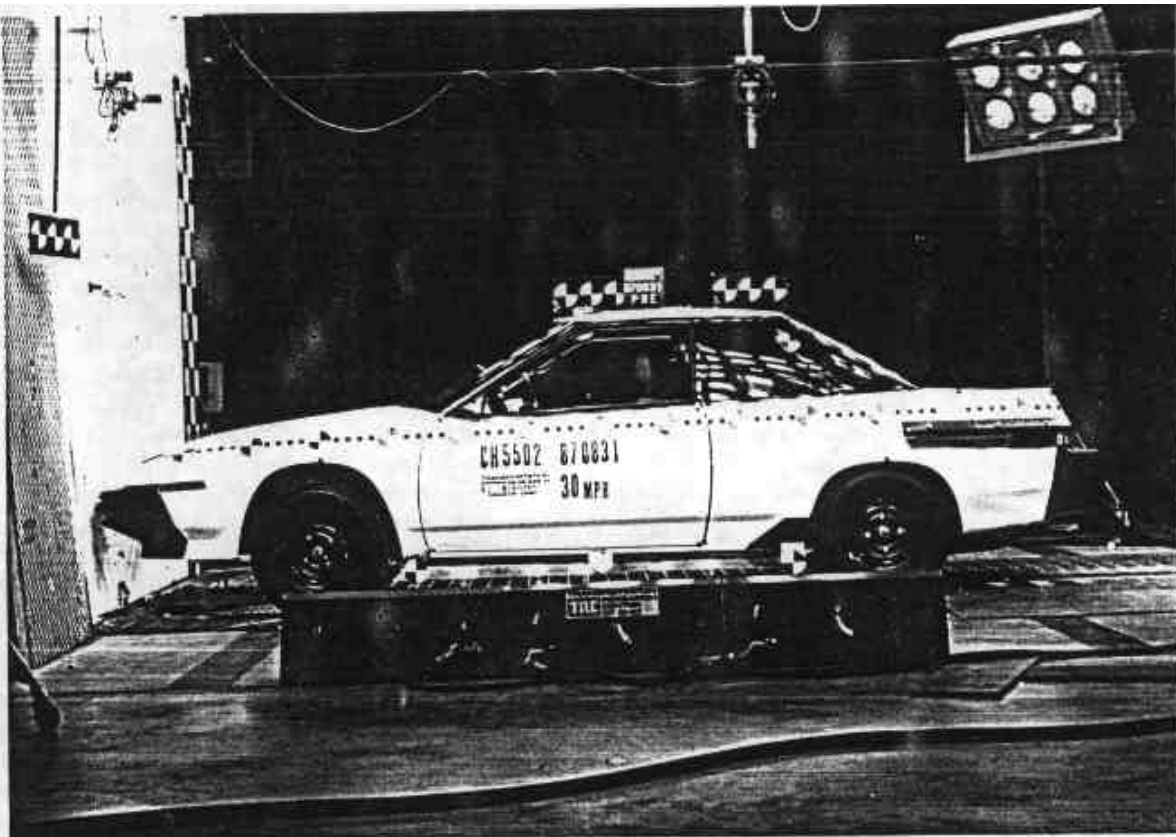


Figure 3. PRE-TEST LEFT SIDE VIEW

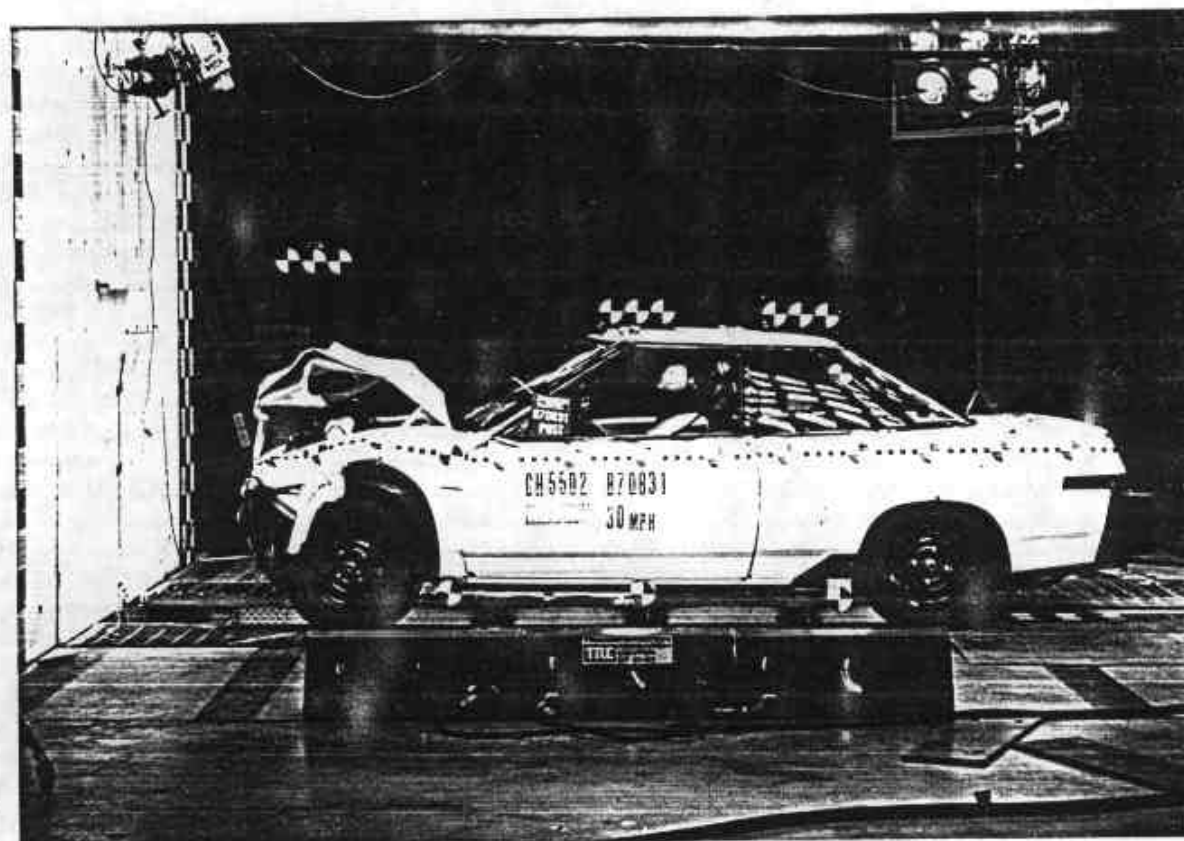


Figure 4. POST-TEST LEFT SIDE VIEW
A-4

870831

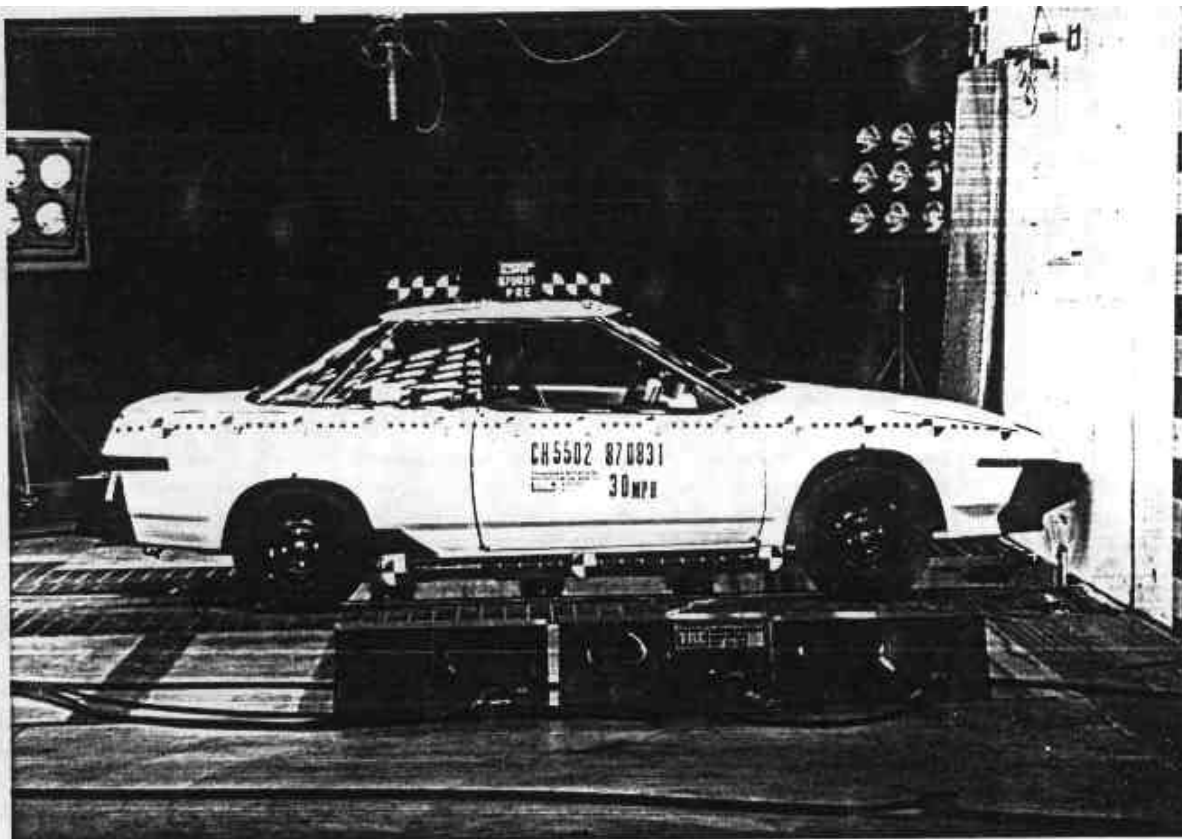


Figure 5. PRE-TEST RIGHT SIDE VIEW



Figure 6. POST-TEST RIGHT SIDE VIEW



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

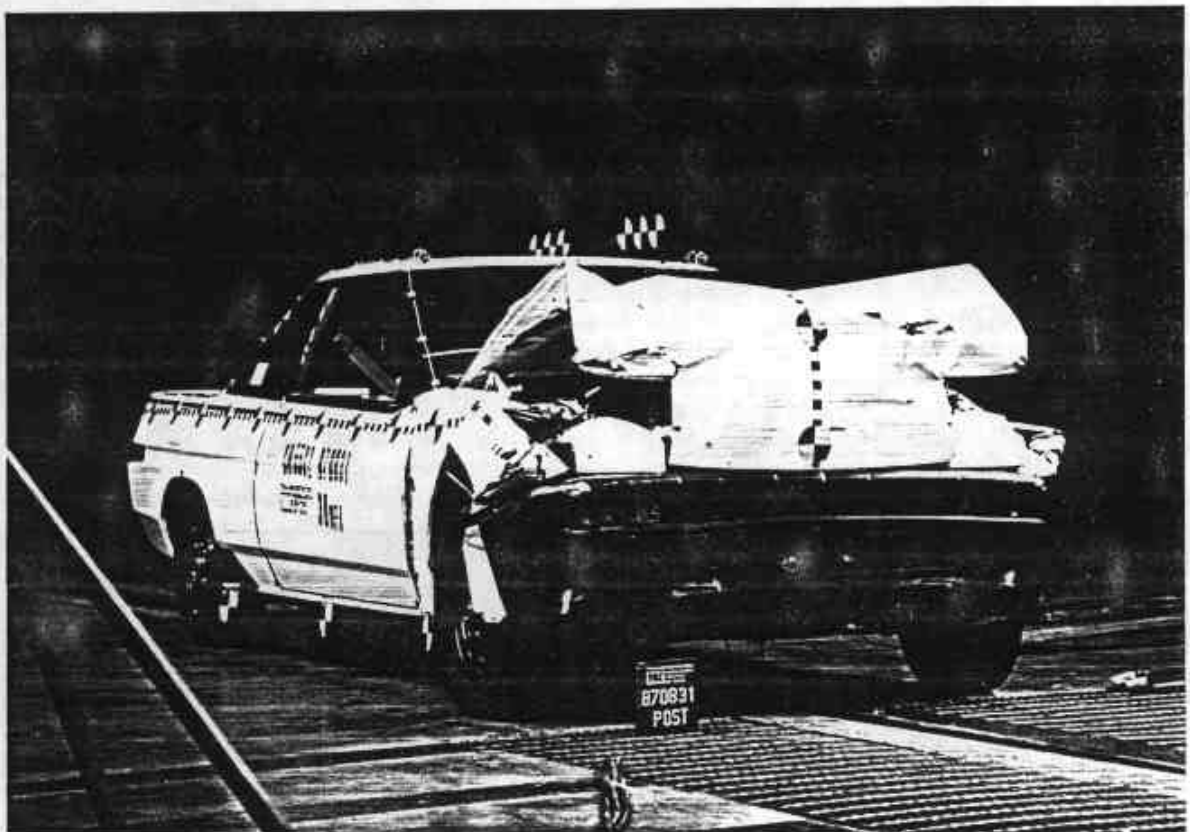


Figure 8. POST-TEST RIGHT FRONT THREE-QUARTER VIEW
A-6

870831

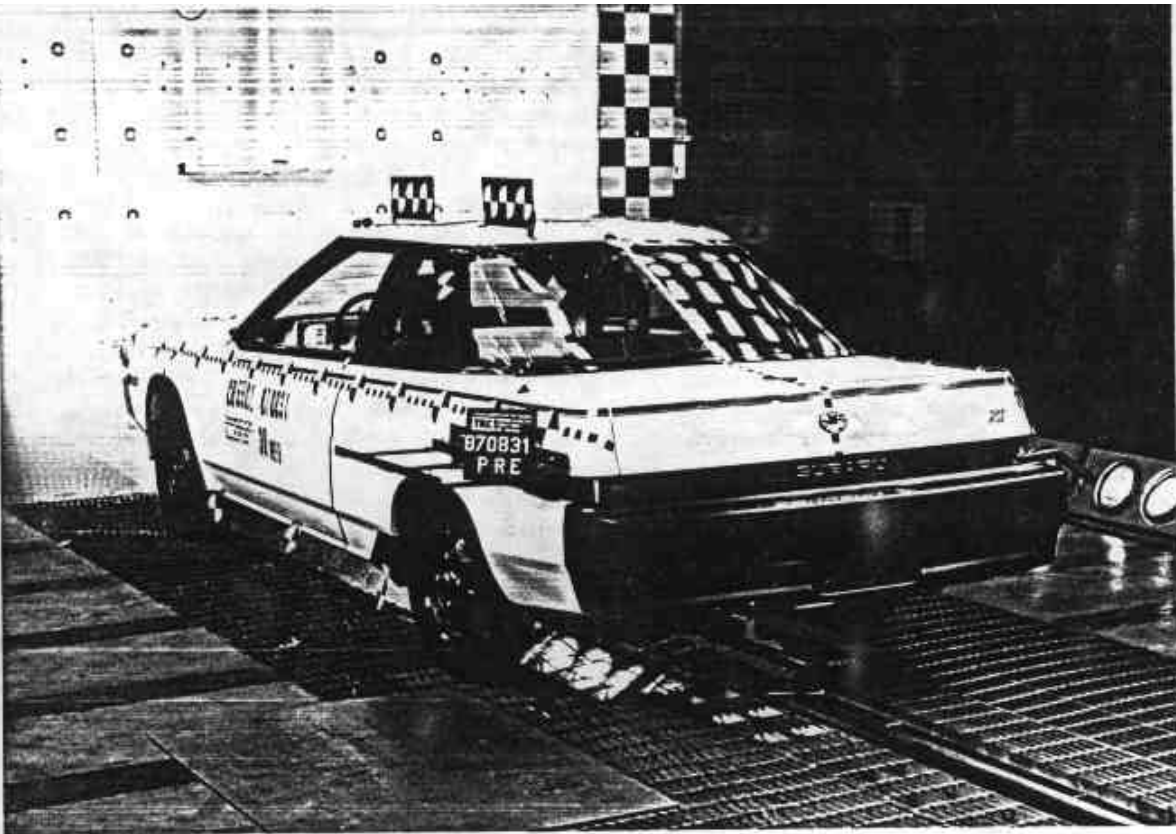


Figure 9. PRE-TEST LEFT REAR THREE-QUARTER VIEW

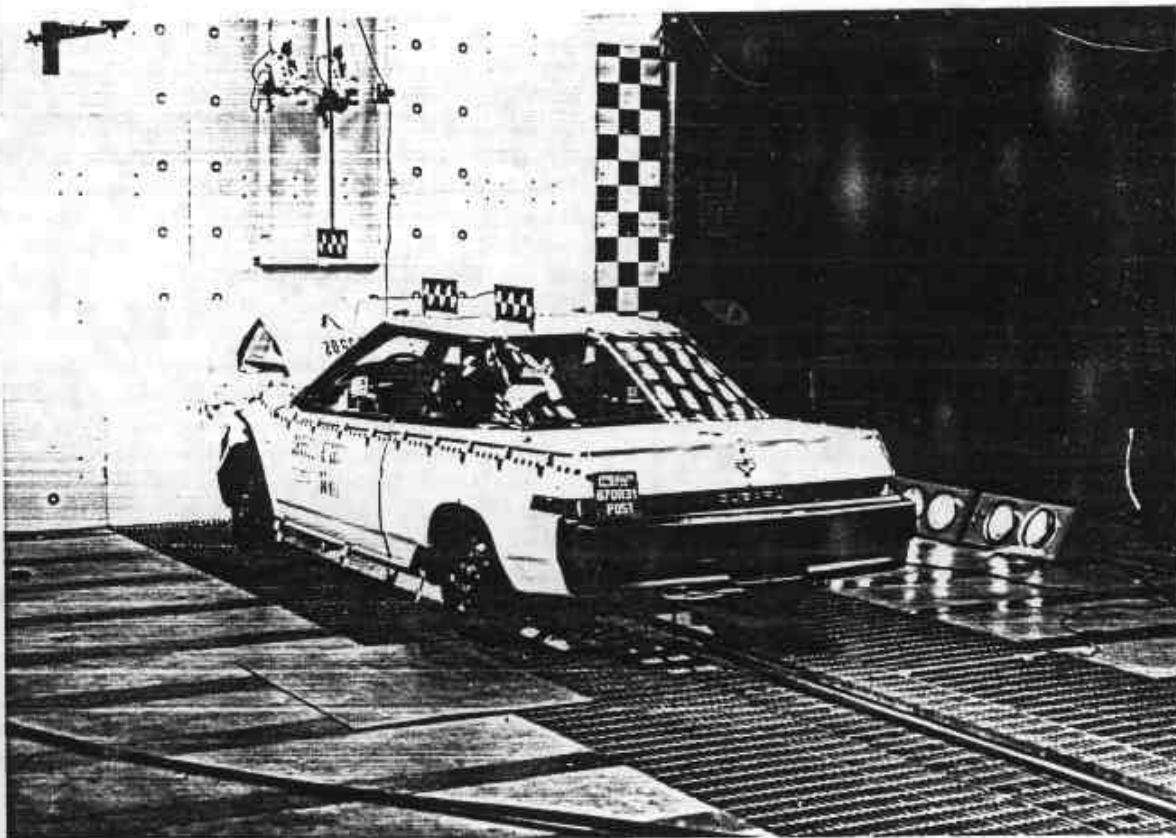


Figure 10. POST-TEST LEFT REAR THREE-QUARTER VIEW
A-7

870831

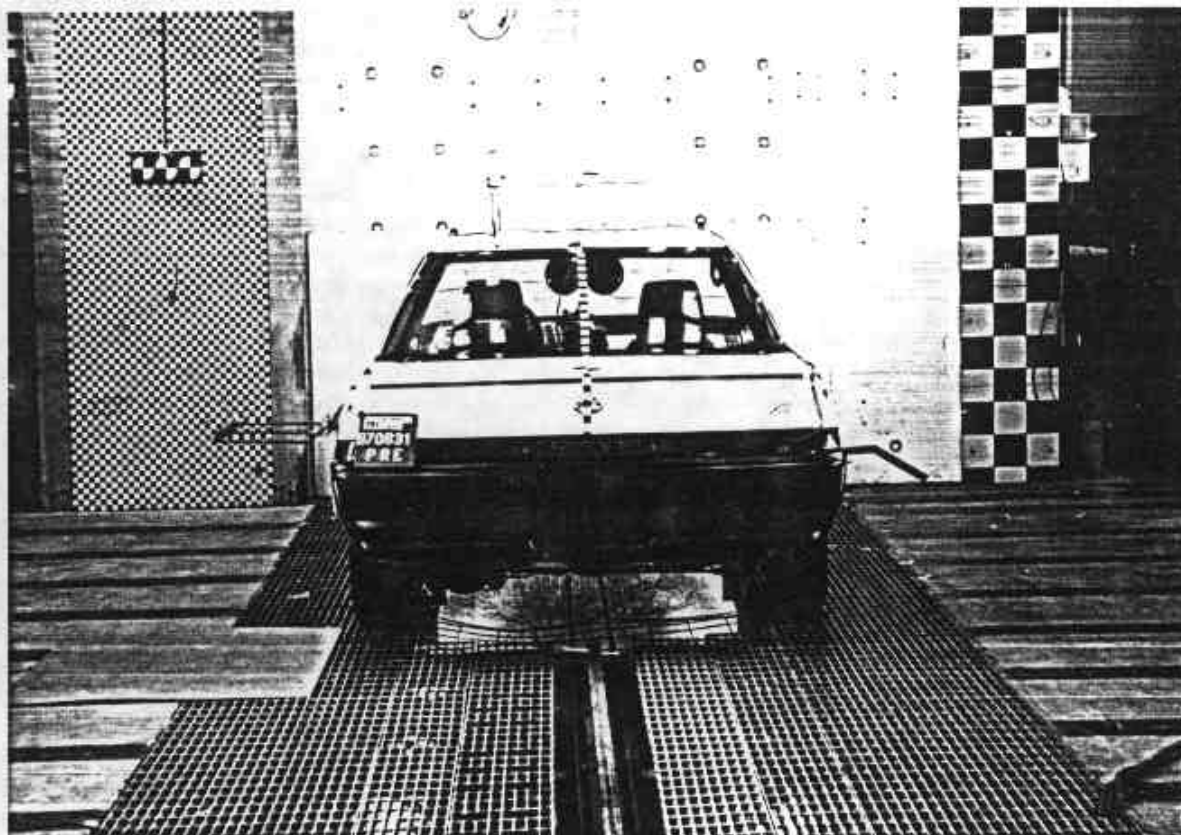


Figure 11. PRE-TEST REAR VIEW

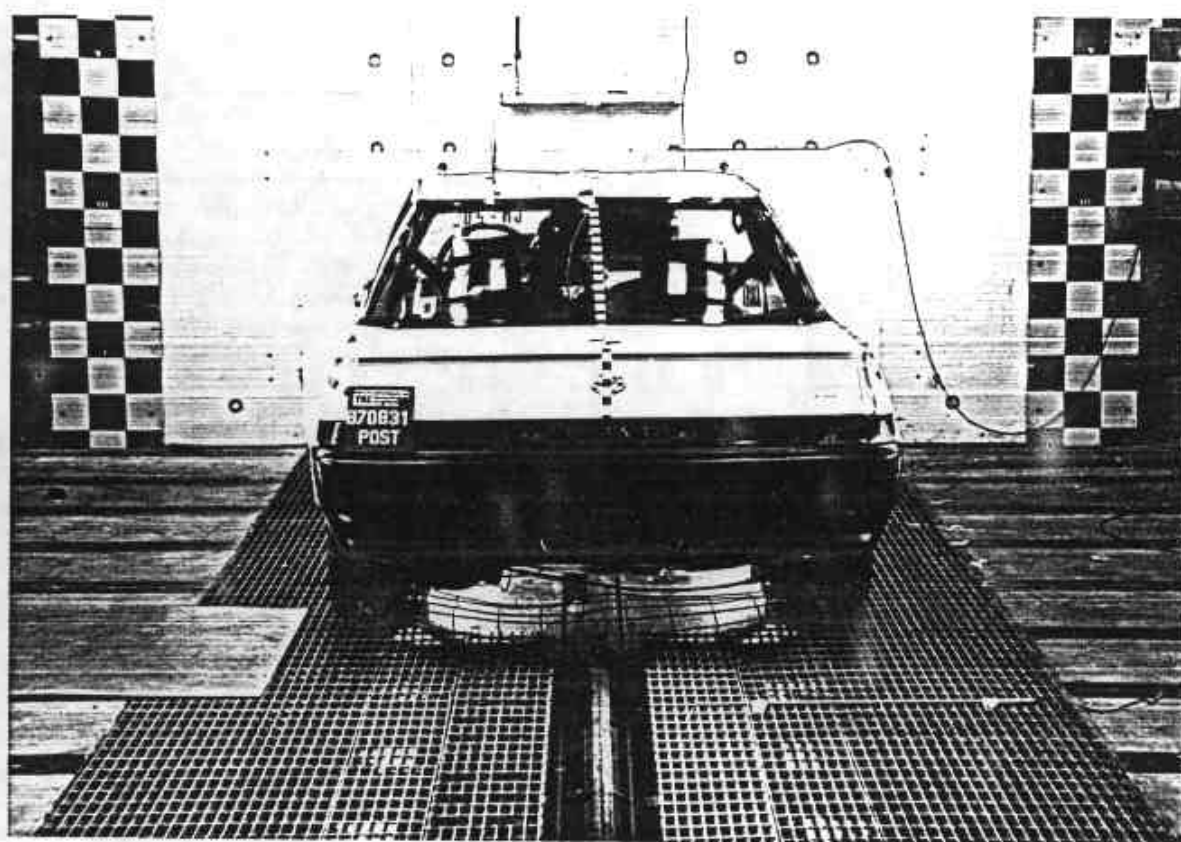


Figure 12. POST-TEST REAR VIEW
A-8

870831



Figure 13. PRE-TEST WINDSHIELD VIEW



Figure 14. POST-TEST WINDSHIELD VIEW
A-9

870831



Figure 15. PRE-TEST ENGINE COMPARTMENT VIEW

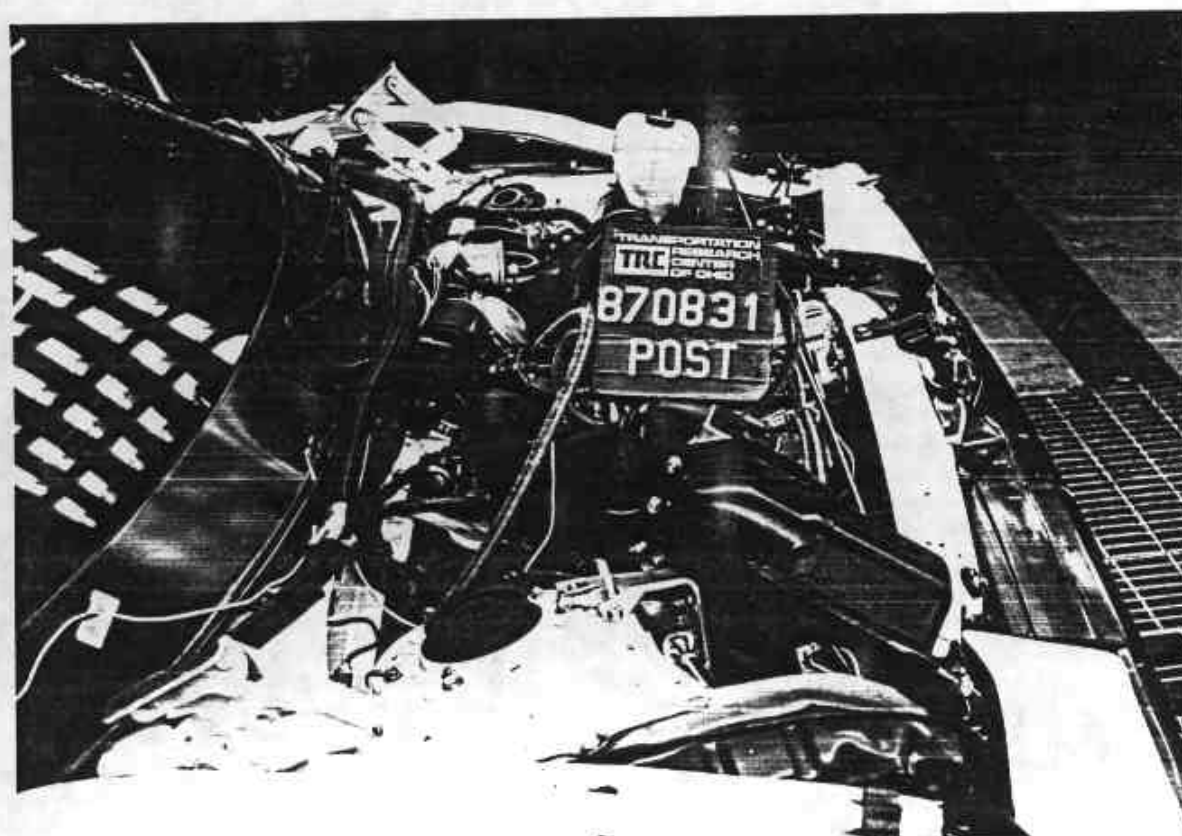


Figure 16. POST-TEST ENGINE COMPARTMENT VIEW
A-10

870831

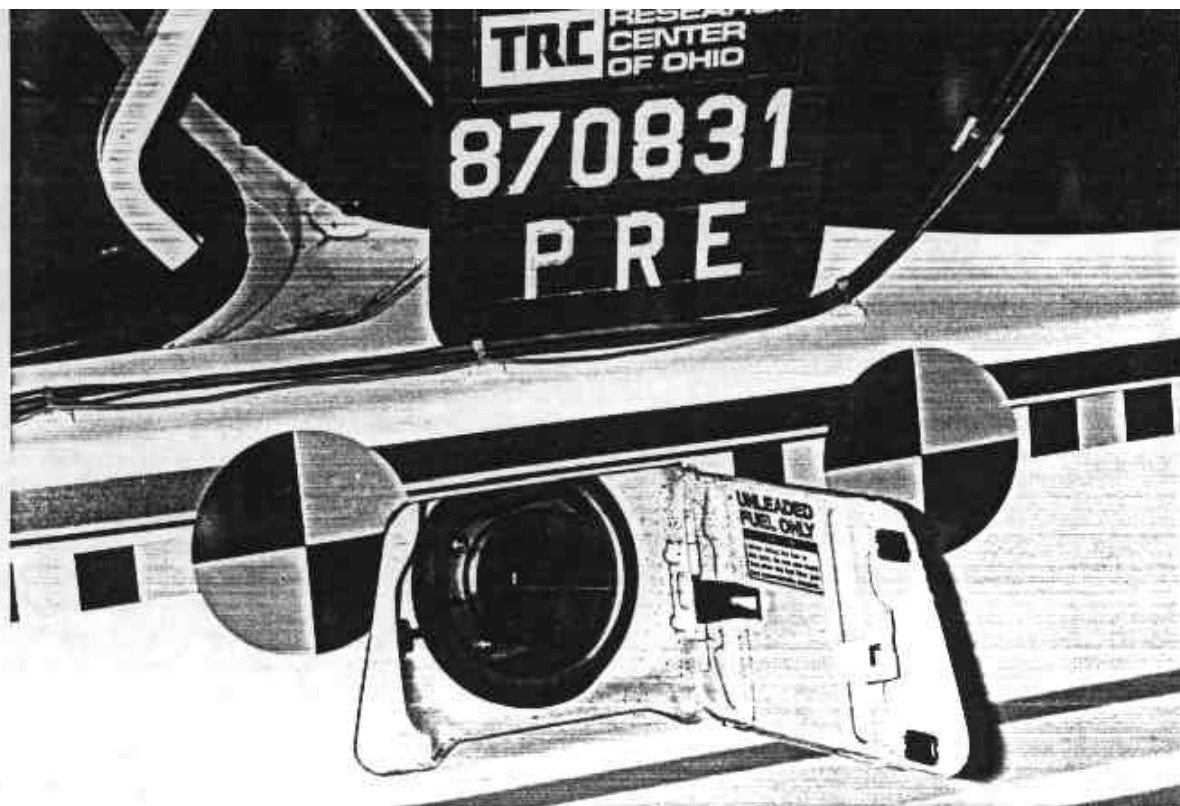


Figure 17. PRE-TEST FUEL FILLER CAP VIEW

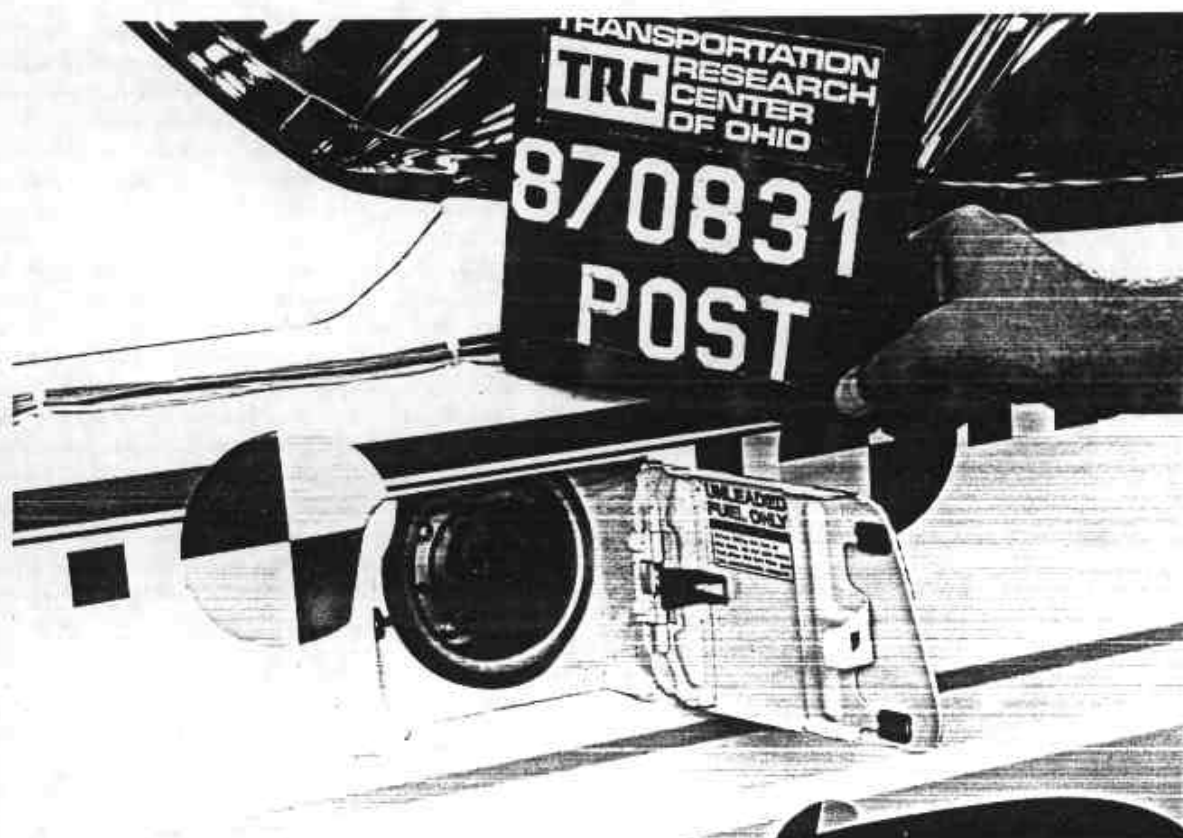


Figure 18. POST-TEST FUEL FILLER CAP VIEW
A-11

870831

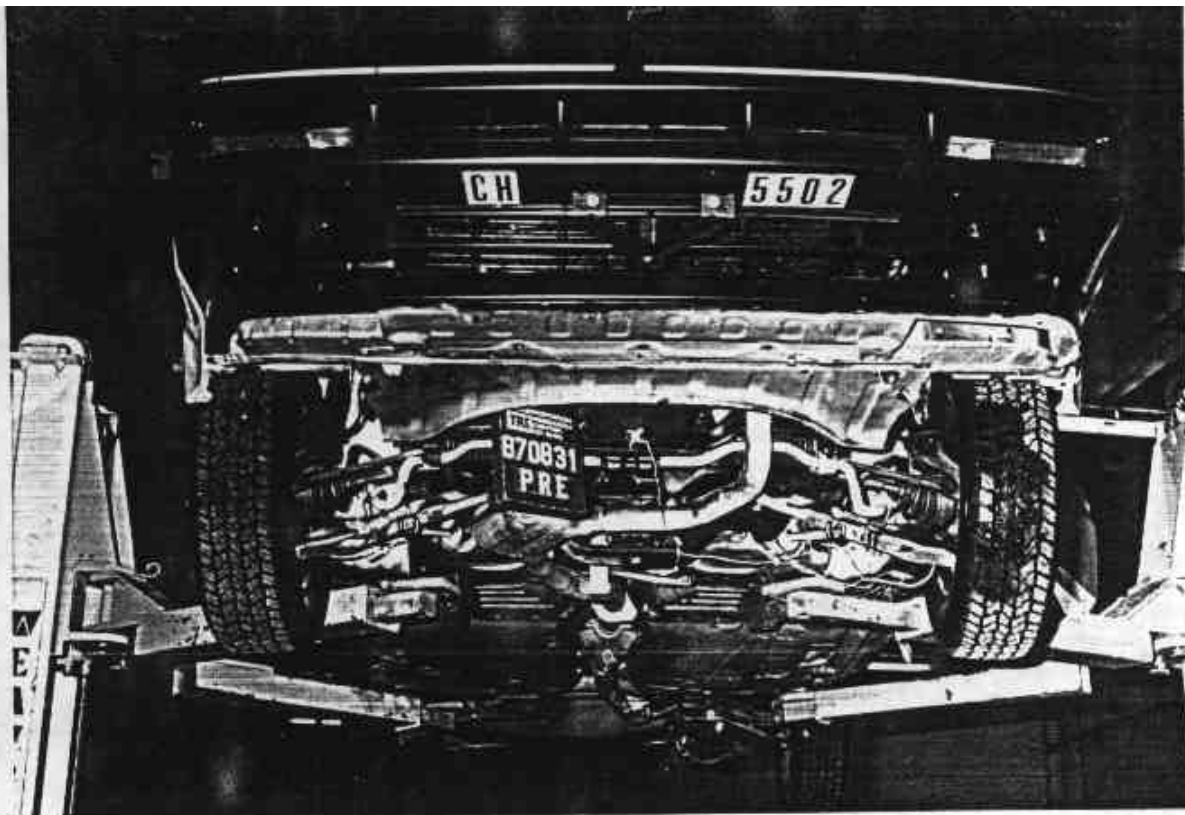


Figure 19. PRE-TEST FRONT UNDERBODY VIEW

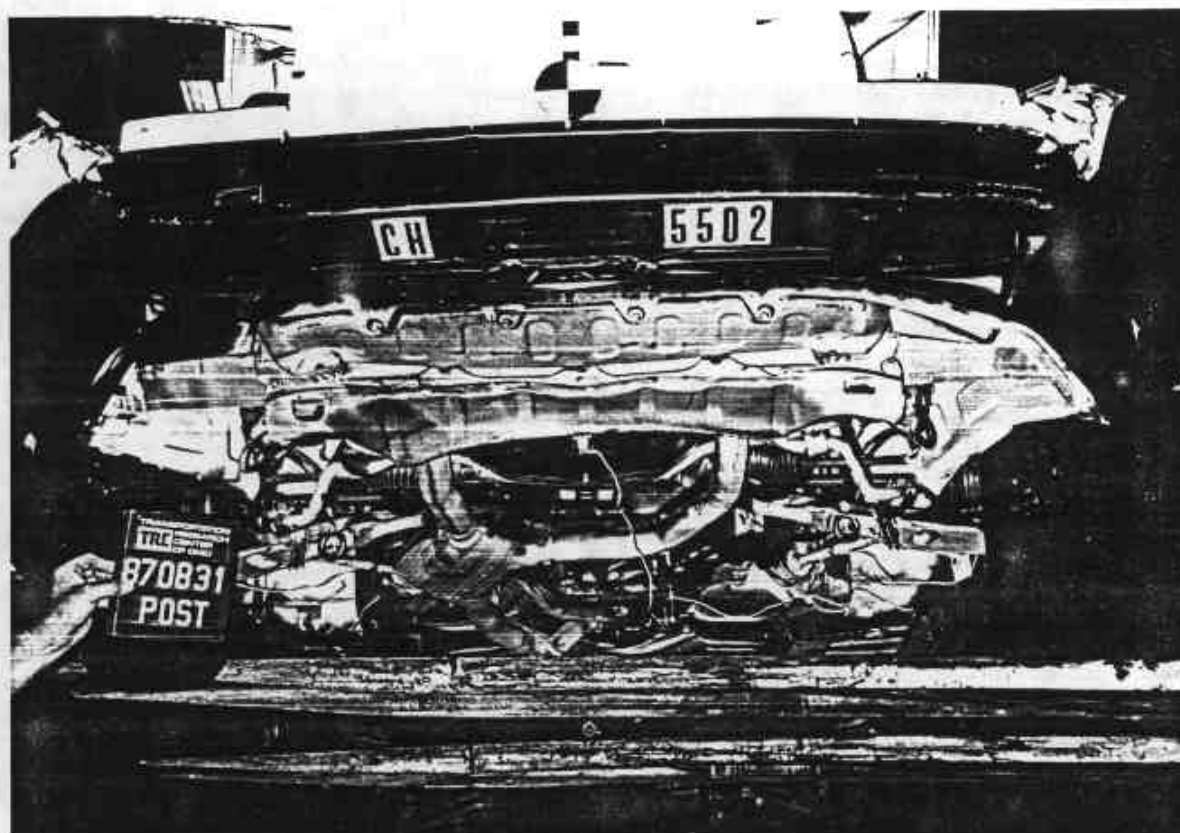


Figure 20. POST-TEST FRONT UNDERBODY VIEW
A-12

870831

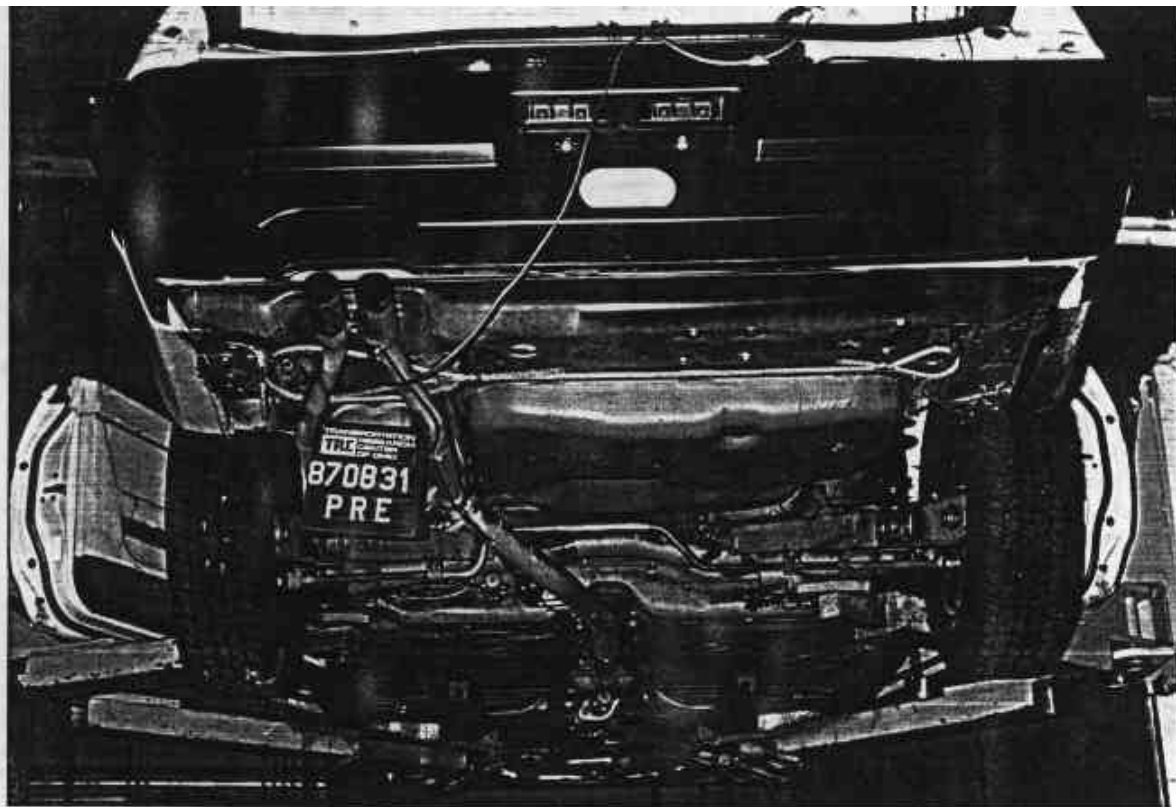


Figure 21. PRE-TEST REAR UNDERBODY VIEW



Figure 22. POST-TEST REAR UNDERBODY VIEW
A-13

870831

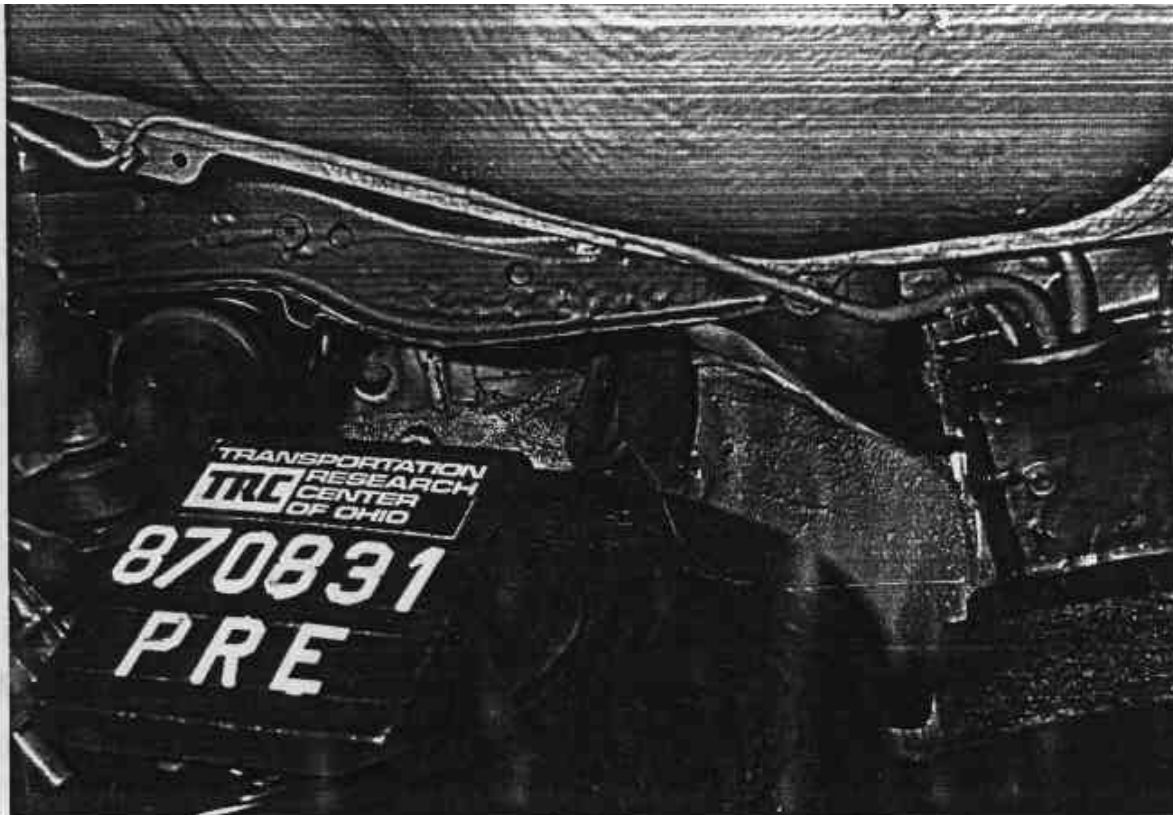


Figure 23. PRE-TEST FUEL LINES - VIEW 1



Figure 24. PRE-TEST FUEL LINES - VIEW 2
A-14

870831



Figure 25. PRE-TEST DRIVER DUMMY POSITION VIEW



Figure 26. POST-TEST DRIVER DUMMY POSITION VIEW

A-15

870831



Figure 27. PRE-TEST PASSENGER DUMMY POSITION VIEW

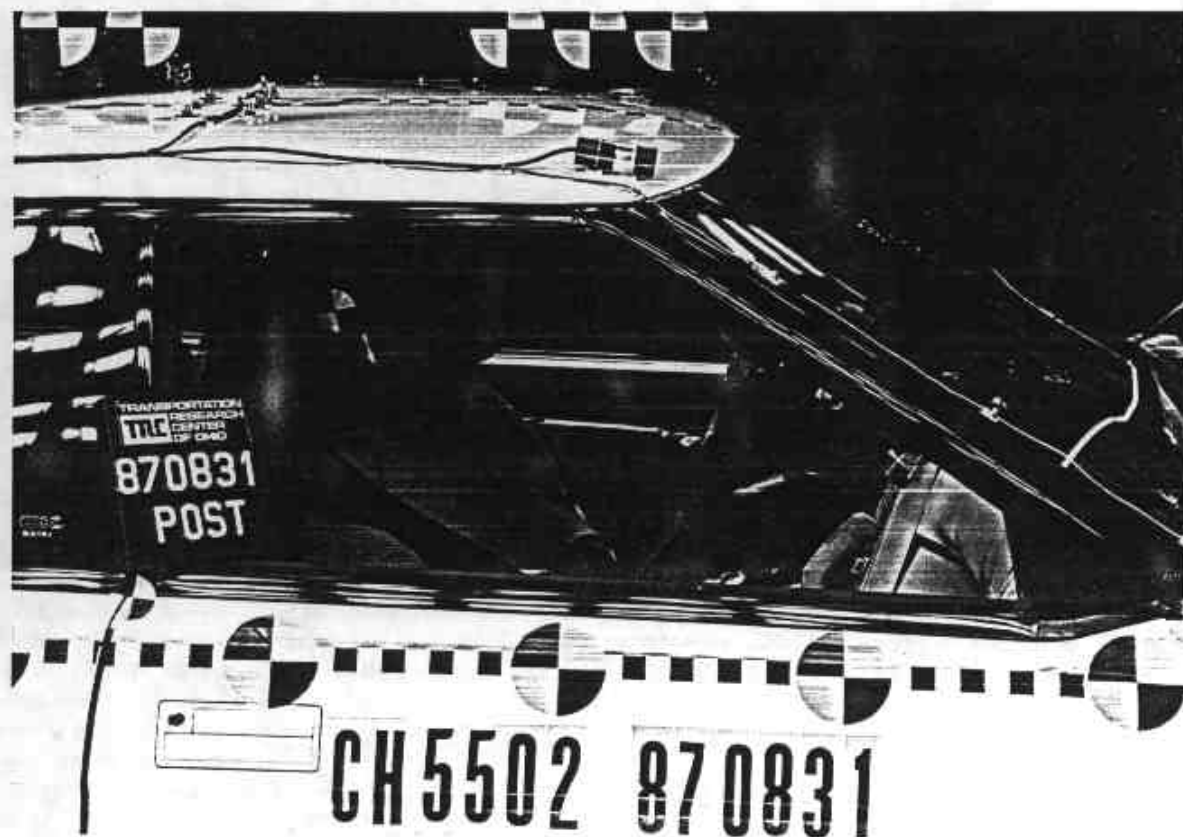


Figure 28. POST-TEST PASSENGER DUMMY POSITION VIEW
A-16

870831

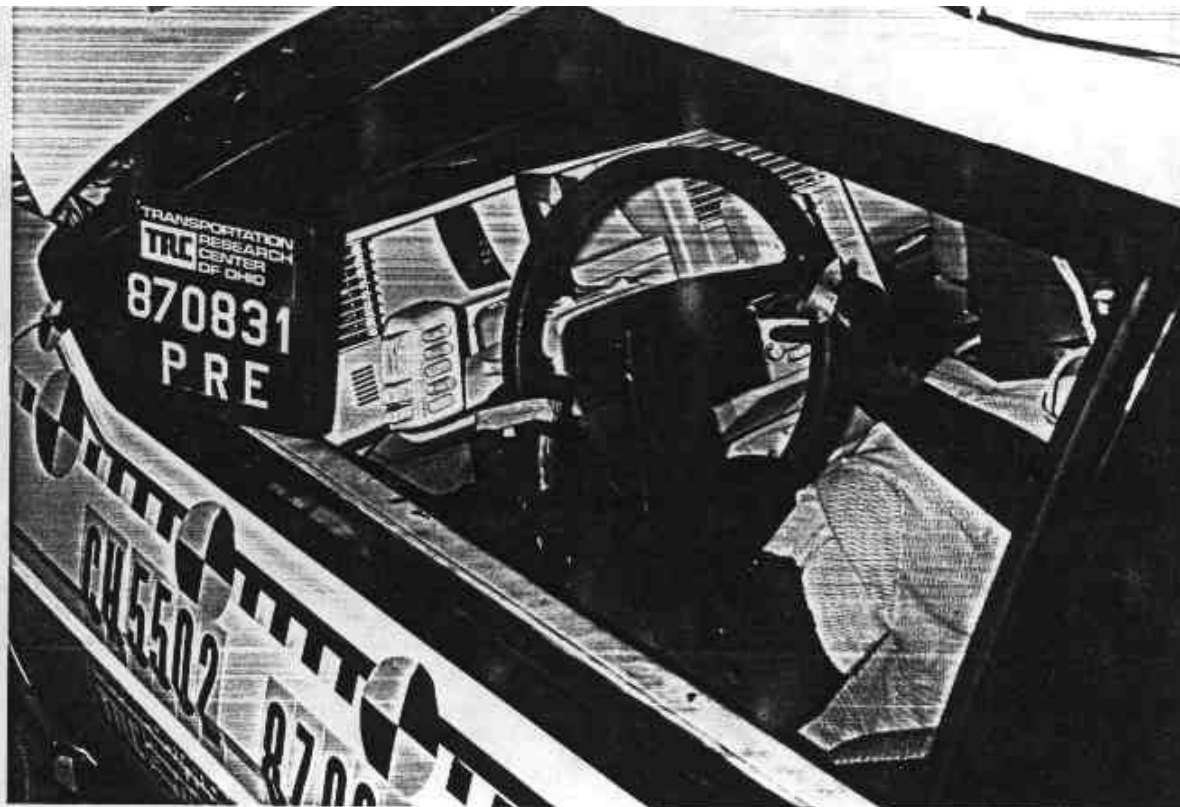


Figure 29. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW

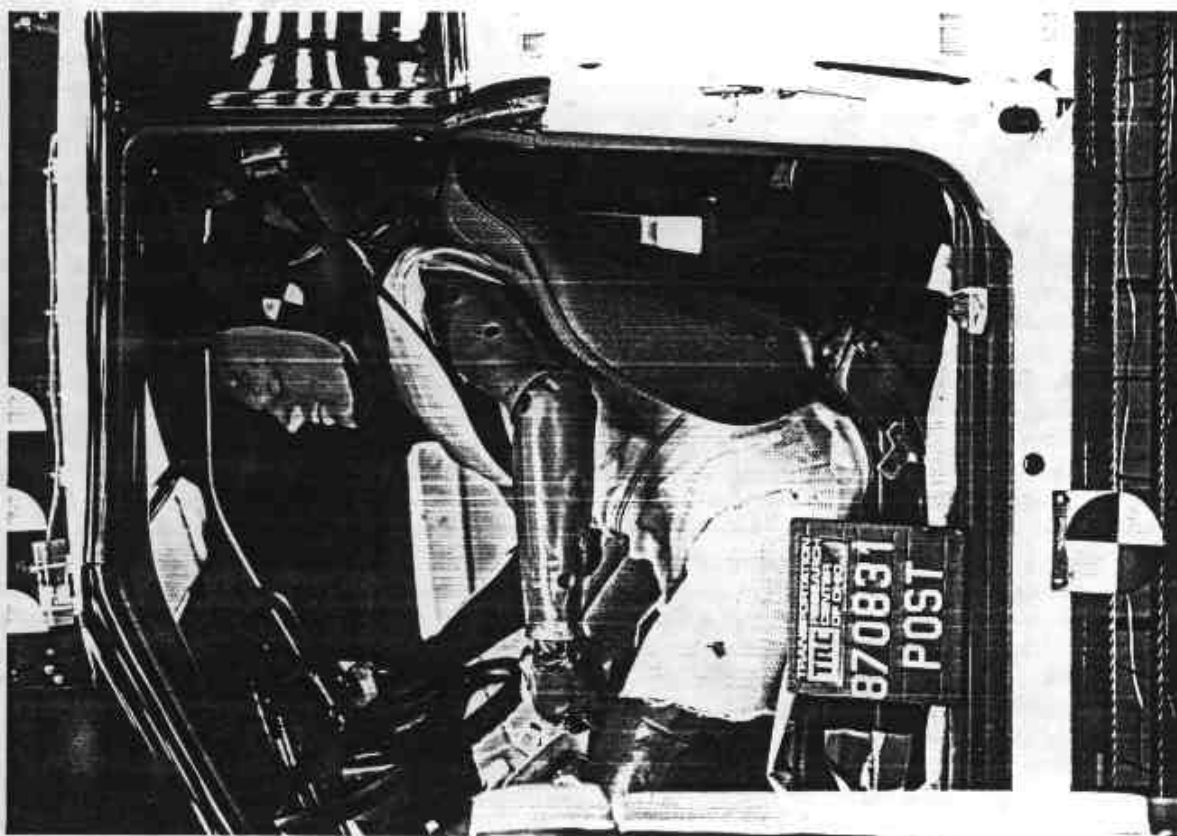


Figure 30. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

A-17

870831

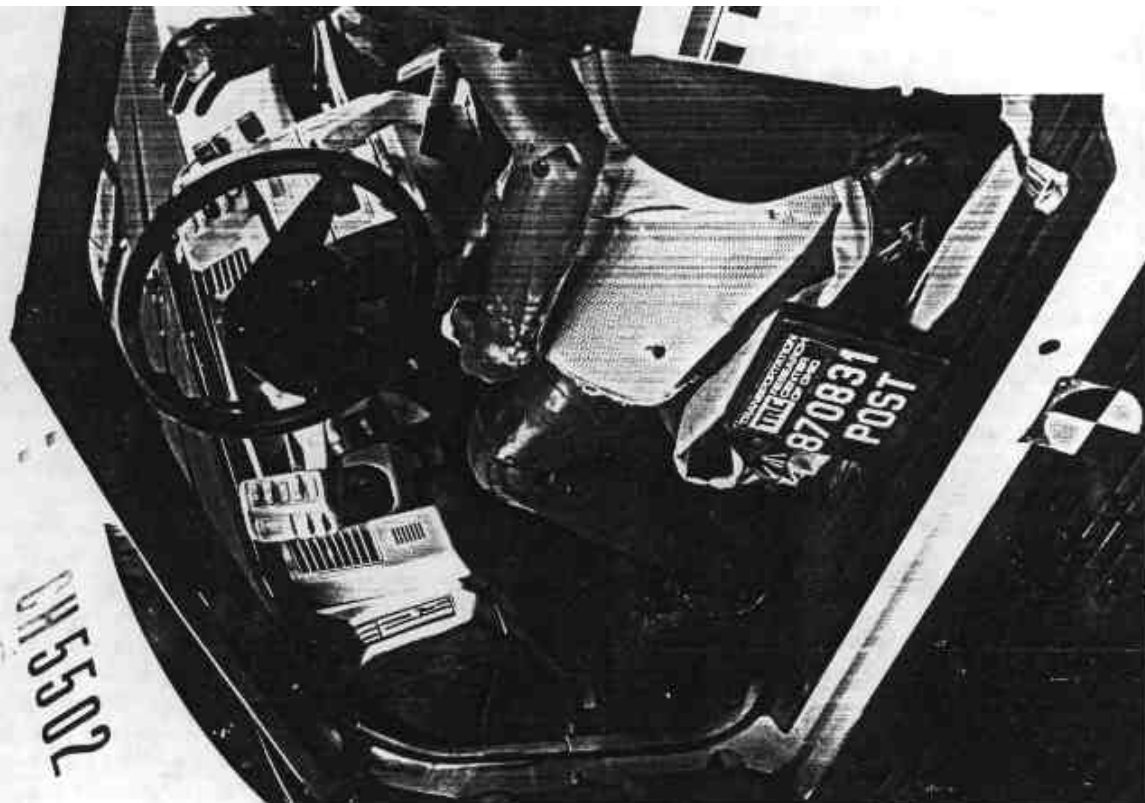


Figure 31. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

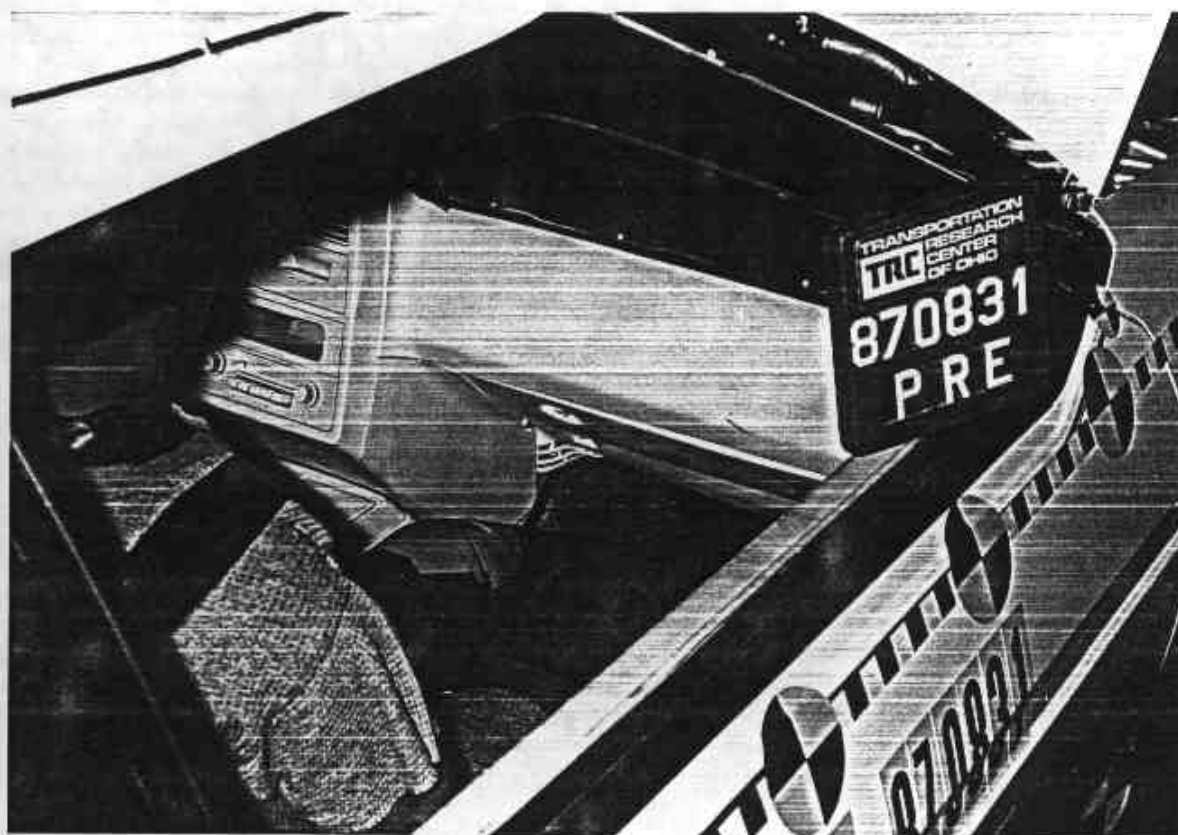


Figure 32. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW

A-18

870831

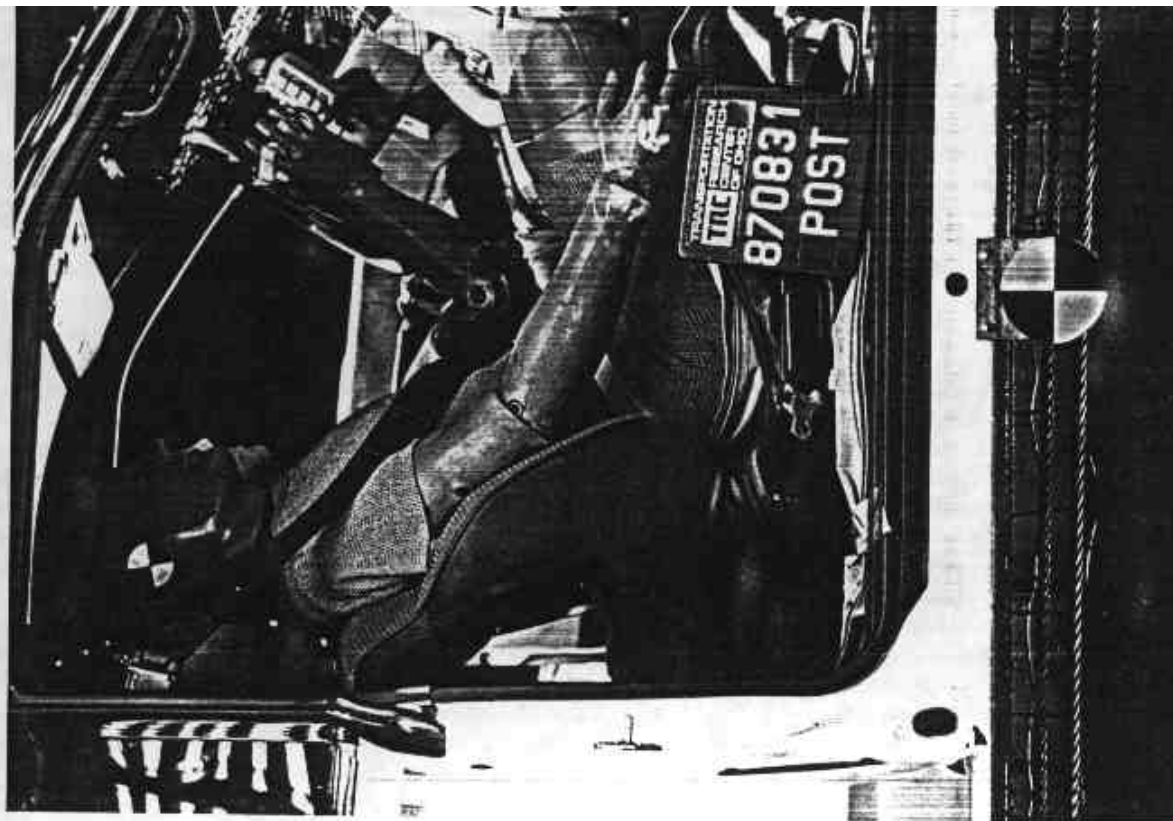


Figure 33. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1



Figure 34. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2



Figure 35. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 1

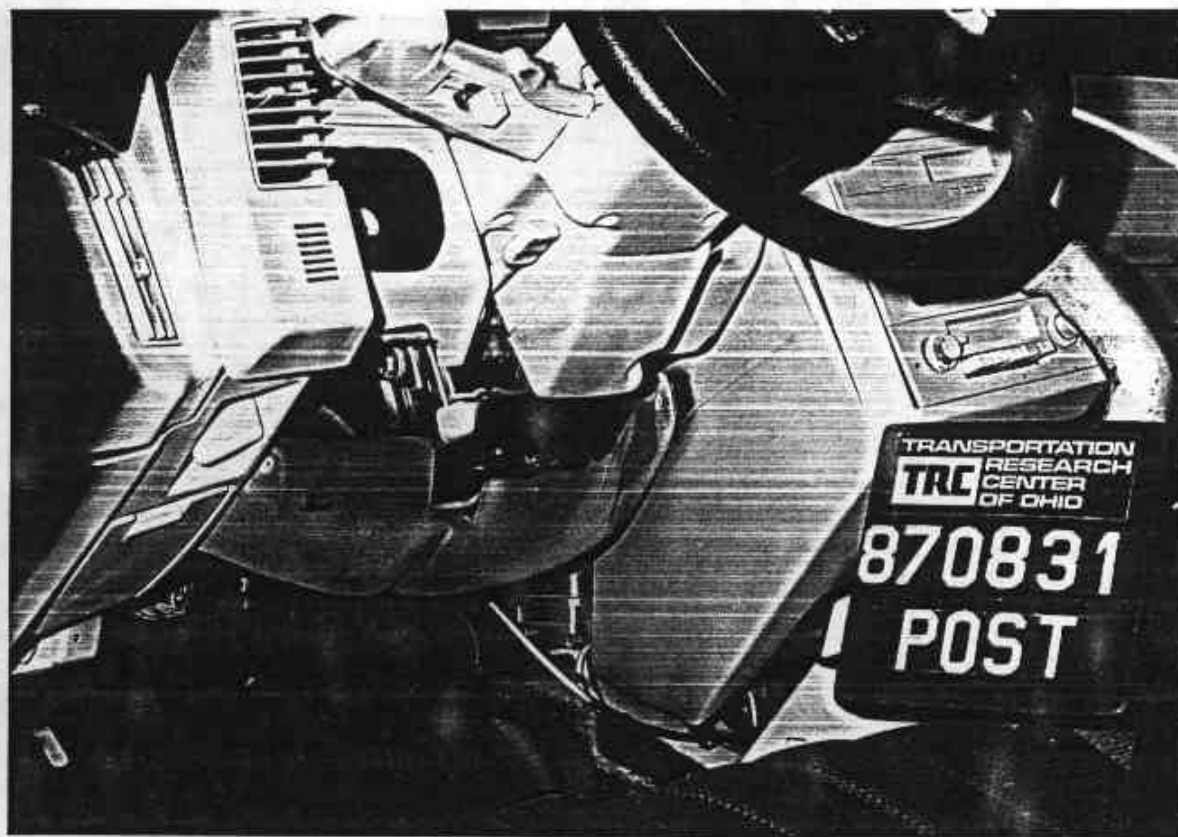


Figure 36. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 2

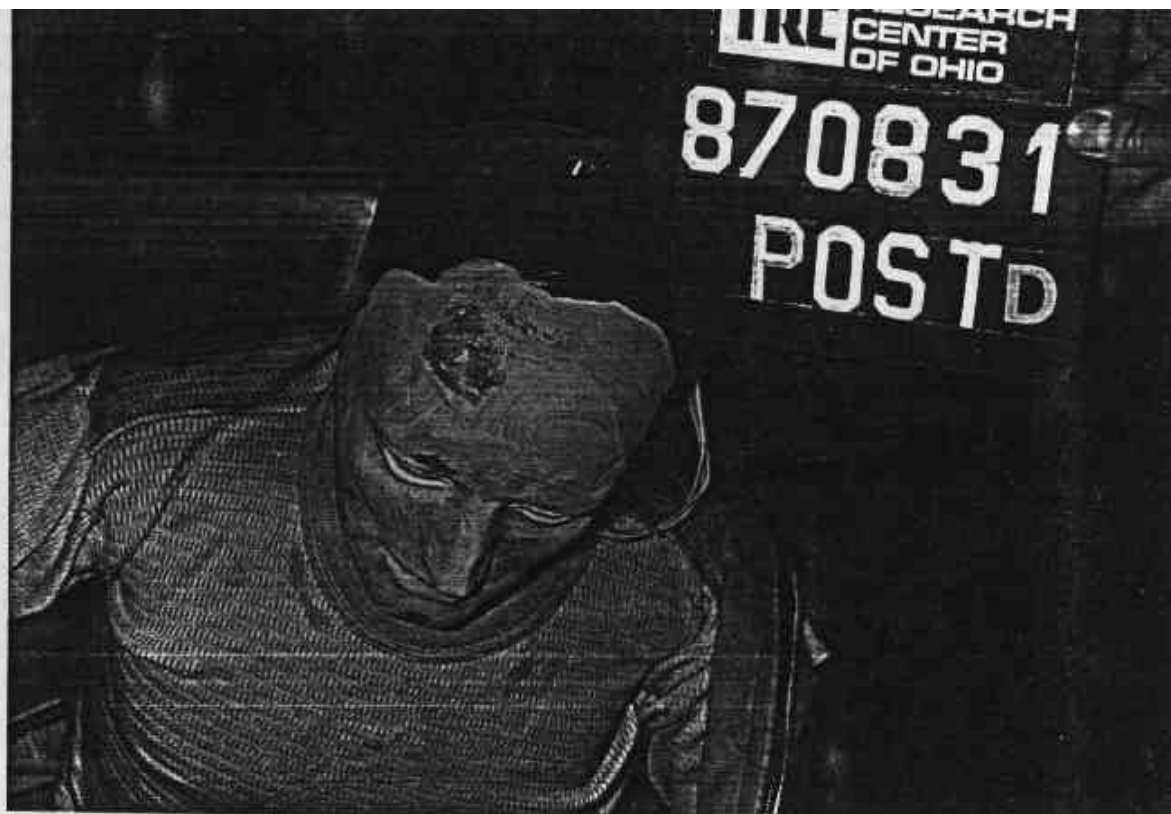


Figure 37. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 3

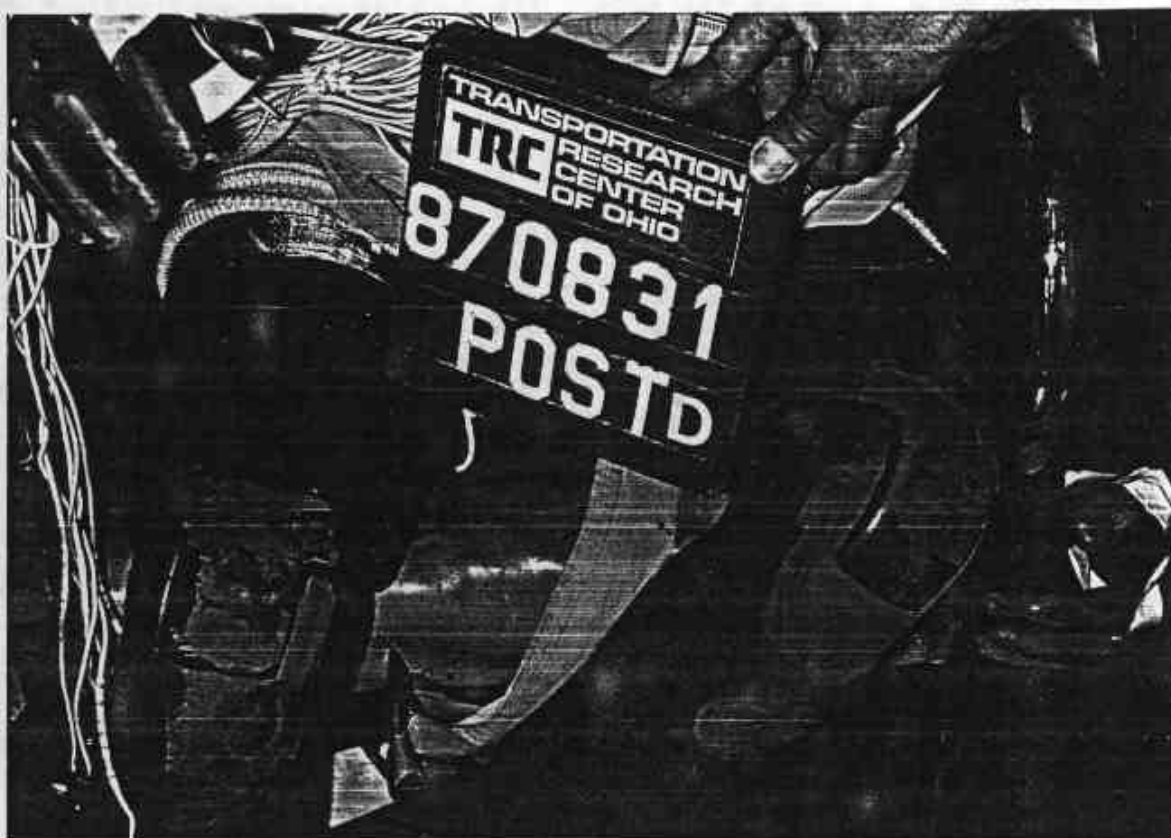


Figure 38. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 4

A-21

870831

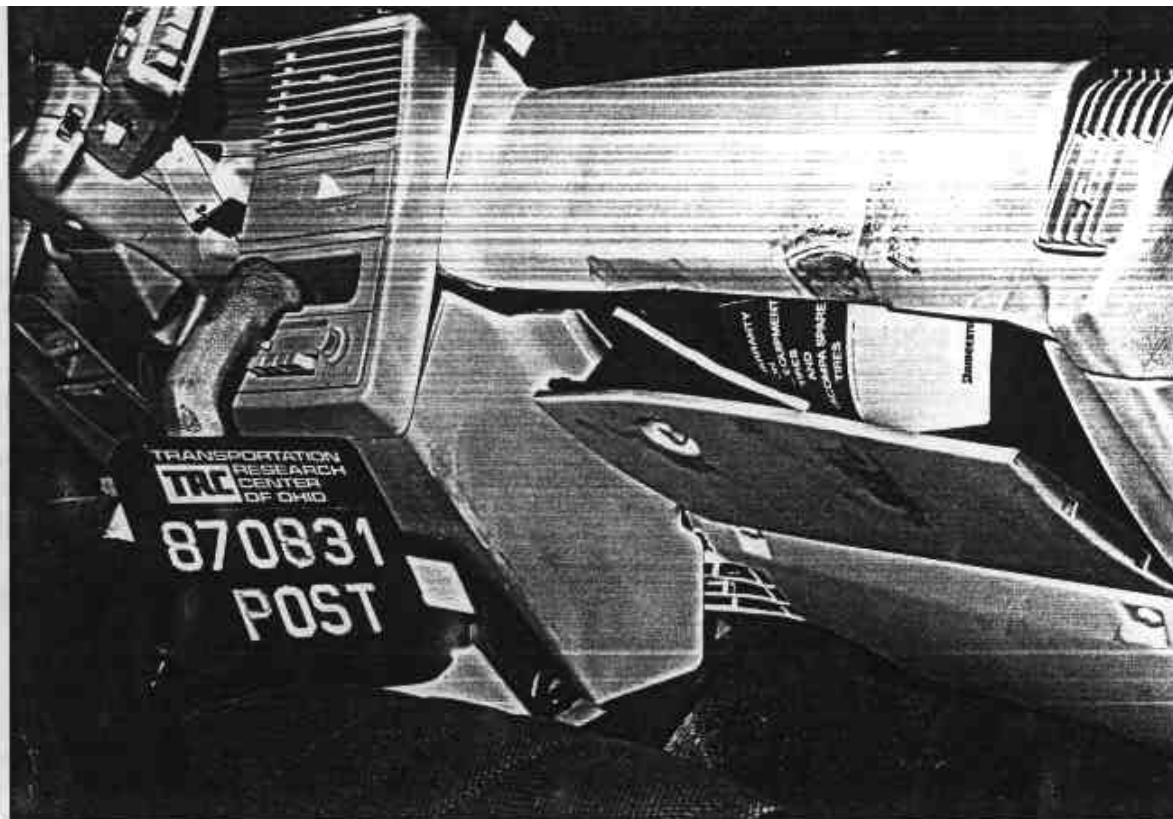


Figure 39. POST-TEST PASSENGER HEAD/KNEE CONTACT - VIEW 1

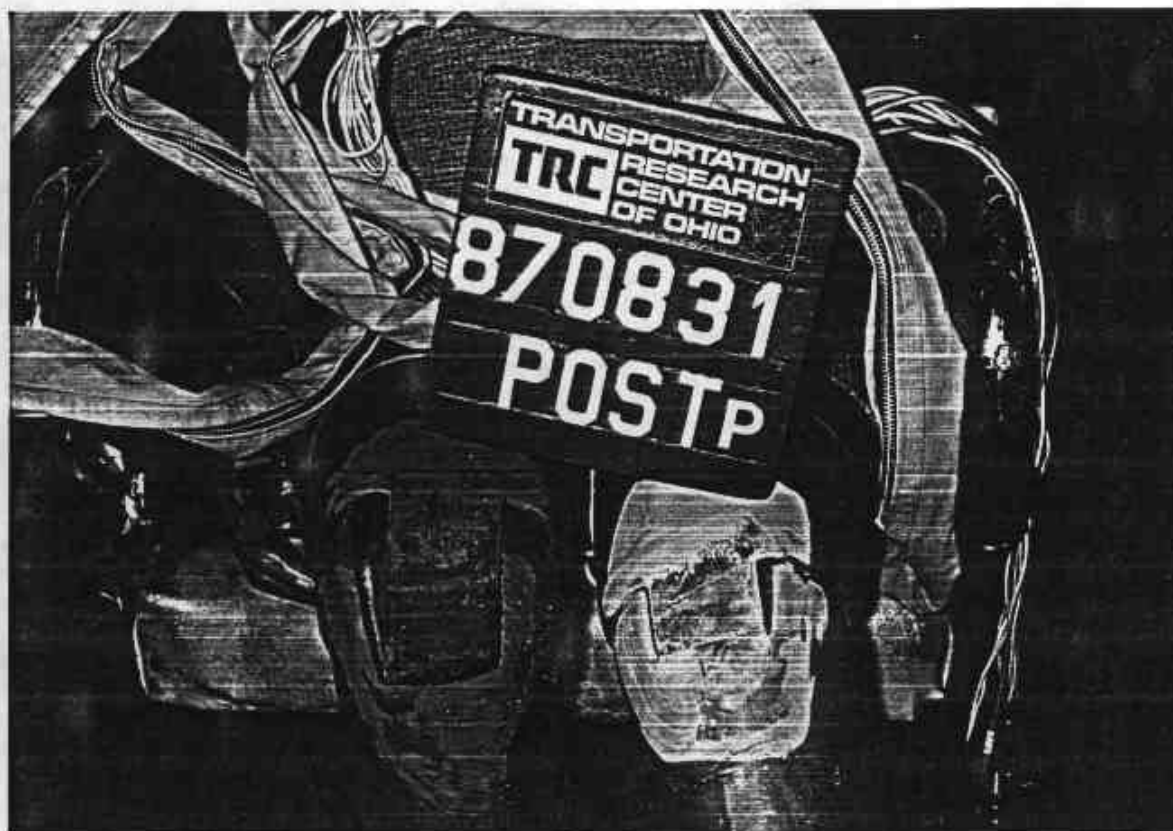


Figure 40. POST-TEST PASSENGER HEAD/KNEE CONTACT - VIEW 2

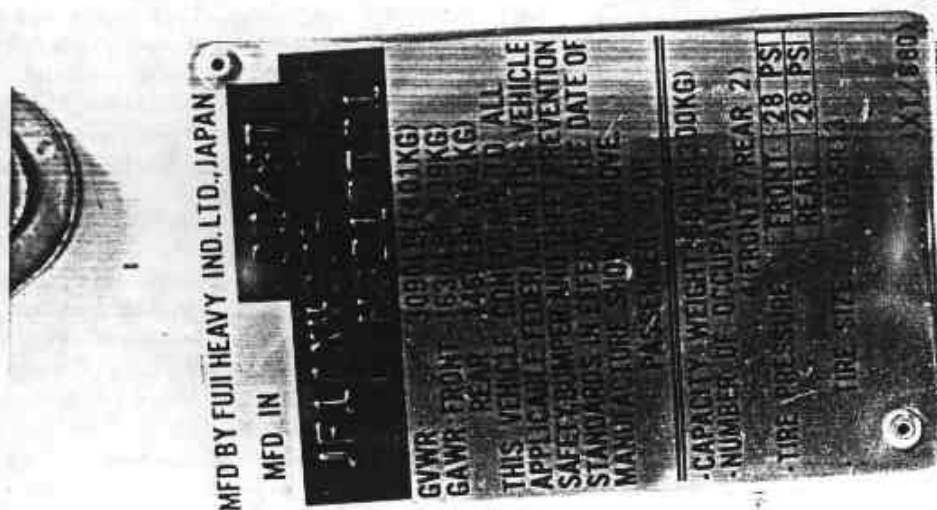


Figure 41. PRE-TEST VEHICLE CERTIFICATION AND TIRE LOAD LABEL VIEW

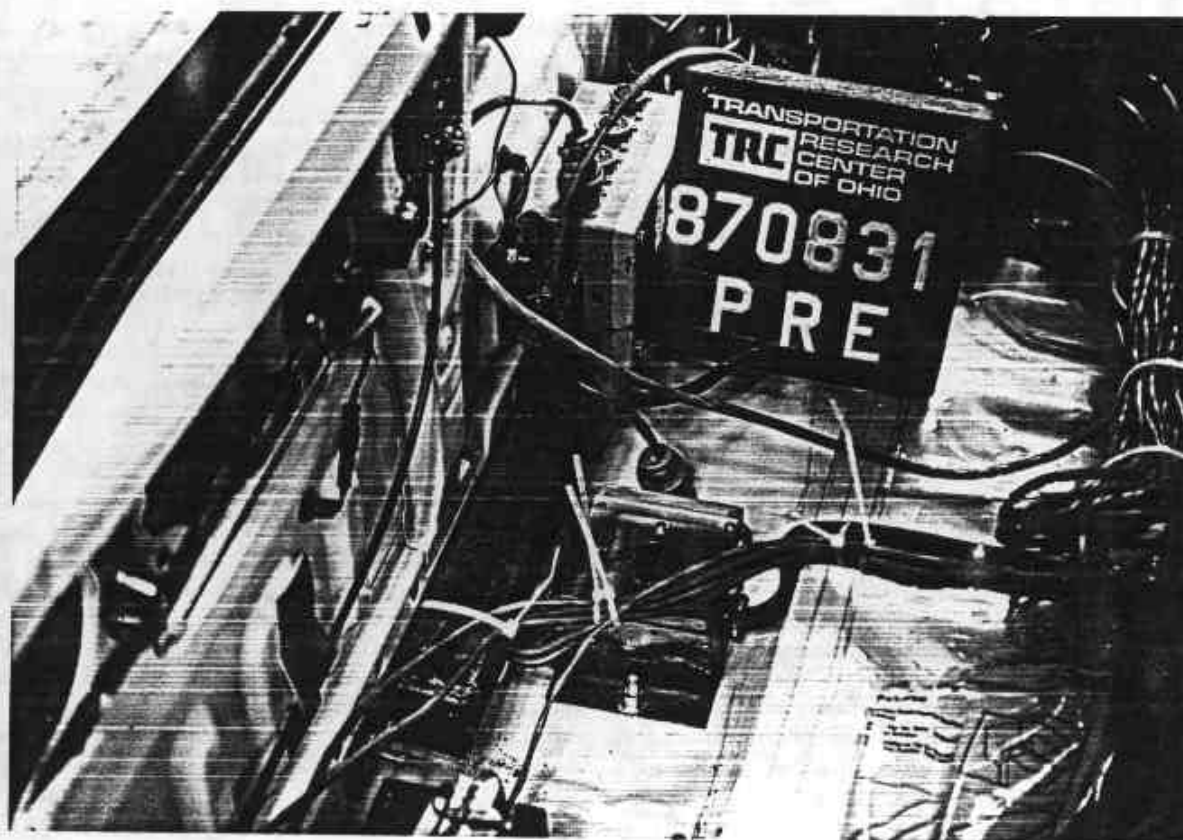


Figure 42. PRE-TEST BALLAST VIEW
A-23

870831

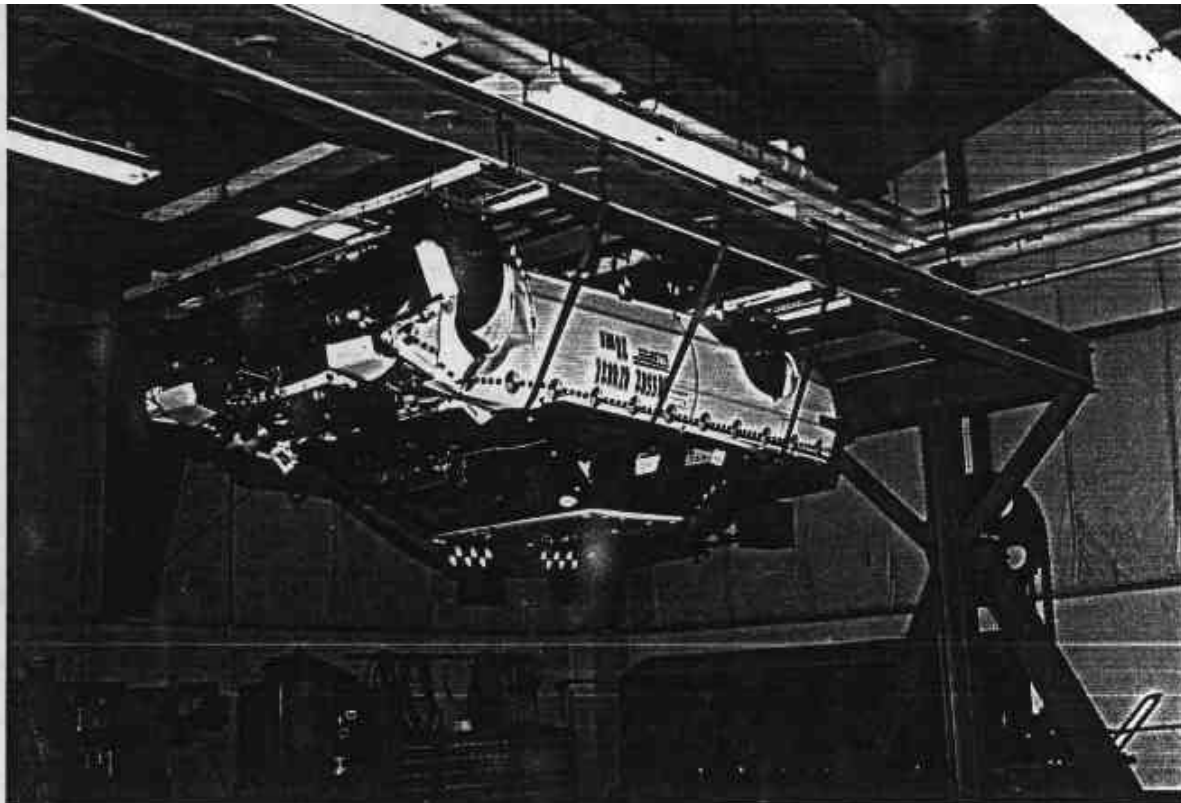


Figure 43. POST-TEST VEHICLE ON STATIC ROLLOVER MACHINE VIEW

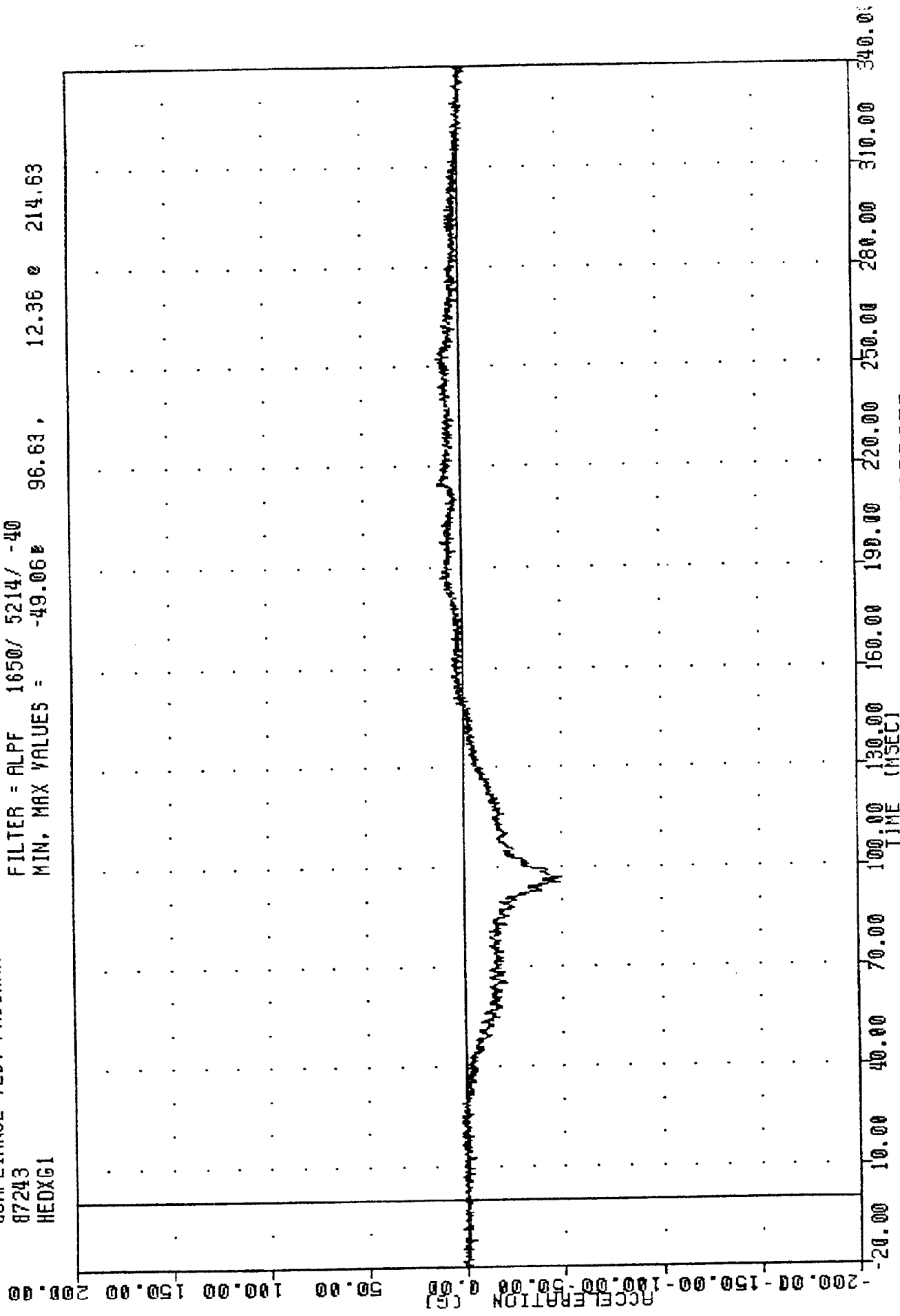
APPENDIX B

DATA PLOTS

DUMMY AND VEHICLE AXES: X: FRONT/REAR
Y: LEFT/RIGHT
Z: UP/DOWN

TRC
COMPLIANCE TEST PROGRAM
87243
HEDXG1

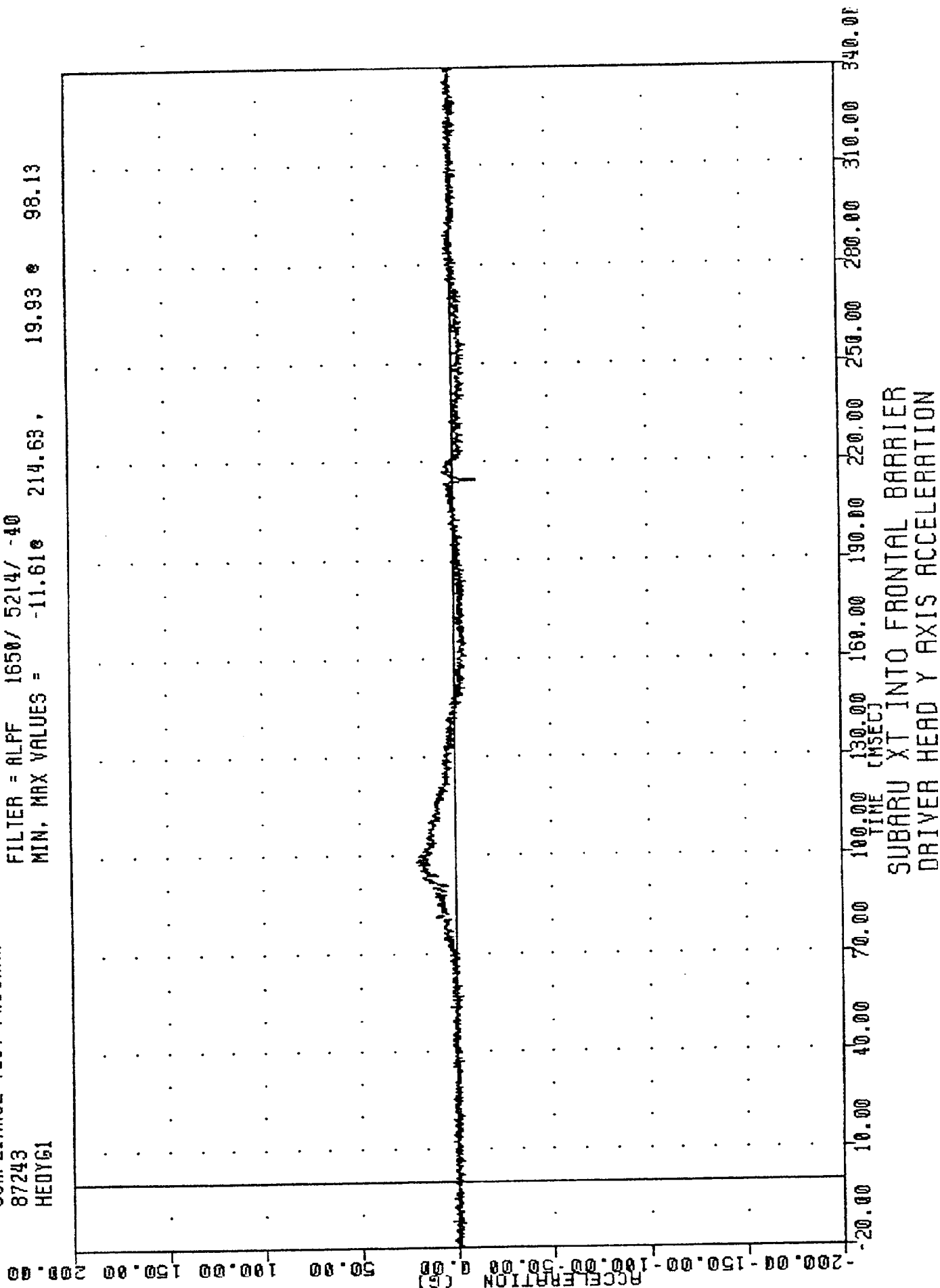
FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -49.06 96.63, 12.36 214.63



SUBARU XT INTO FRONTAL BARRIER
DRIVER HEAD X AXIS ACCELERATION

TRC
COMPLIANCE TEST PROGRAM
87243
HEDY61

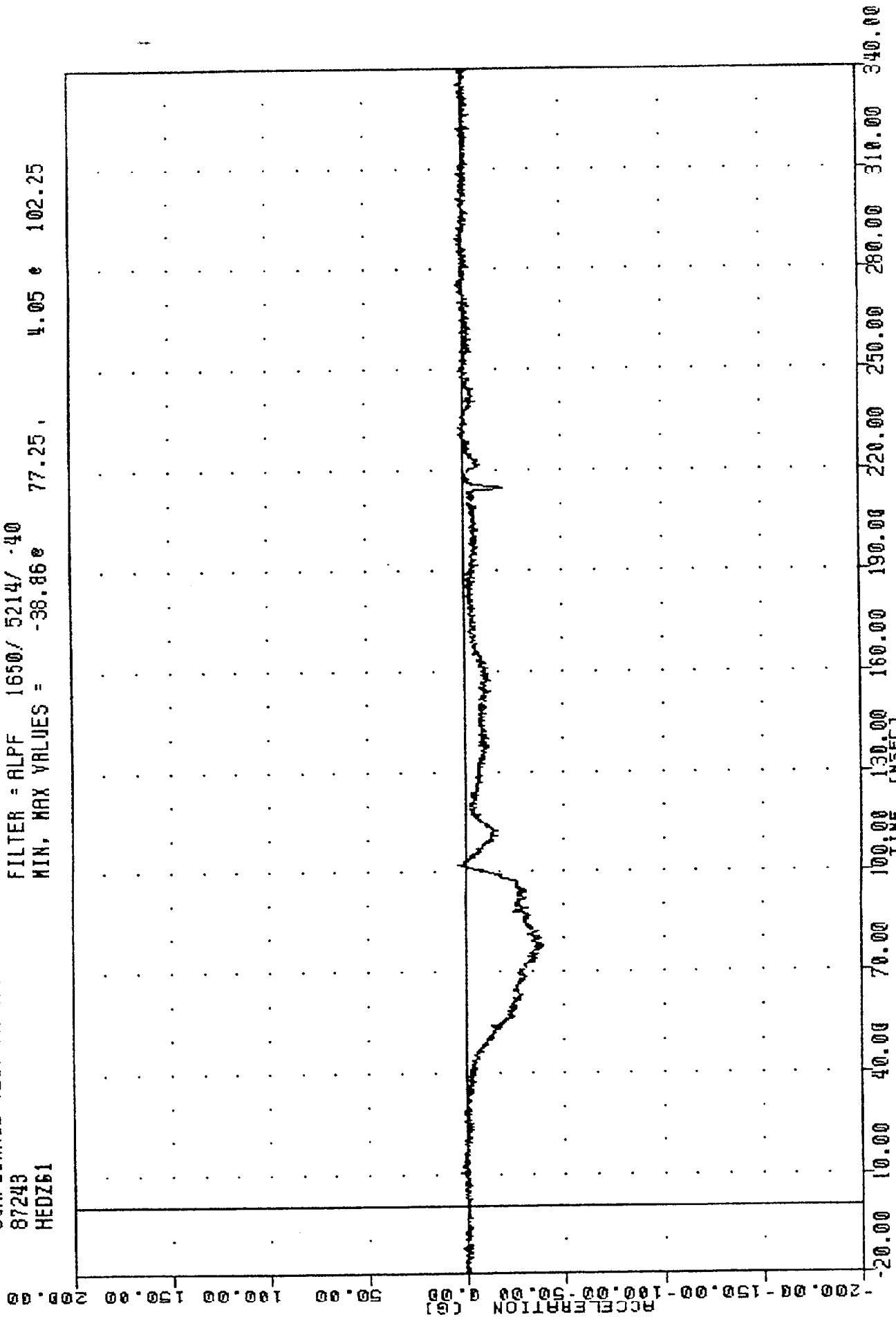
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -11.61e 214.63, 19.93 e 98.13



TRC
COMPLIANCE TEST PROGRAM
87243
HEDZ61

870831

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -38.86e 77.25, 4.05 e 102.25

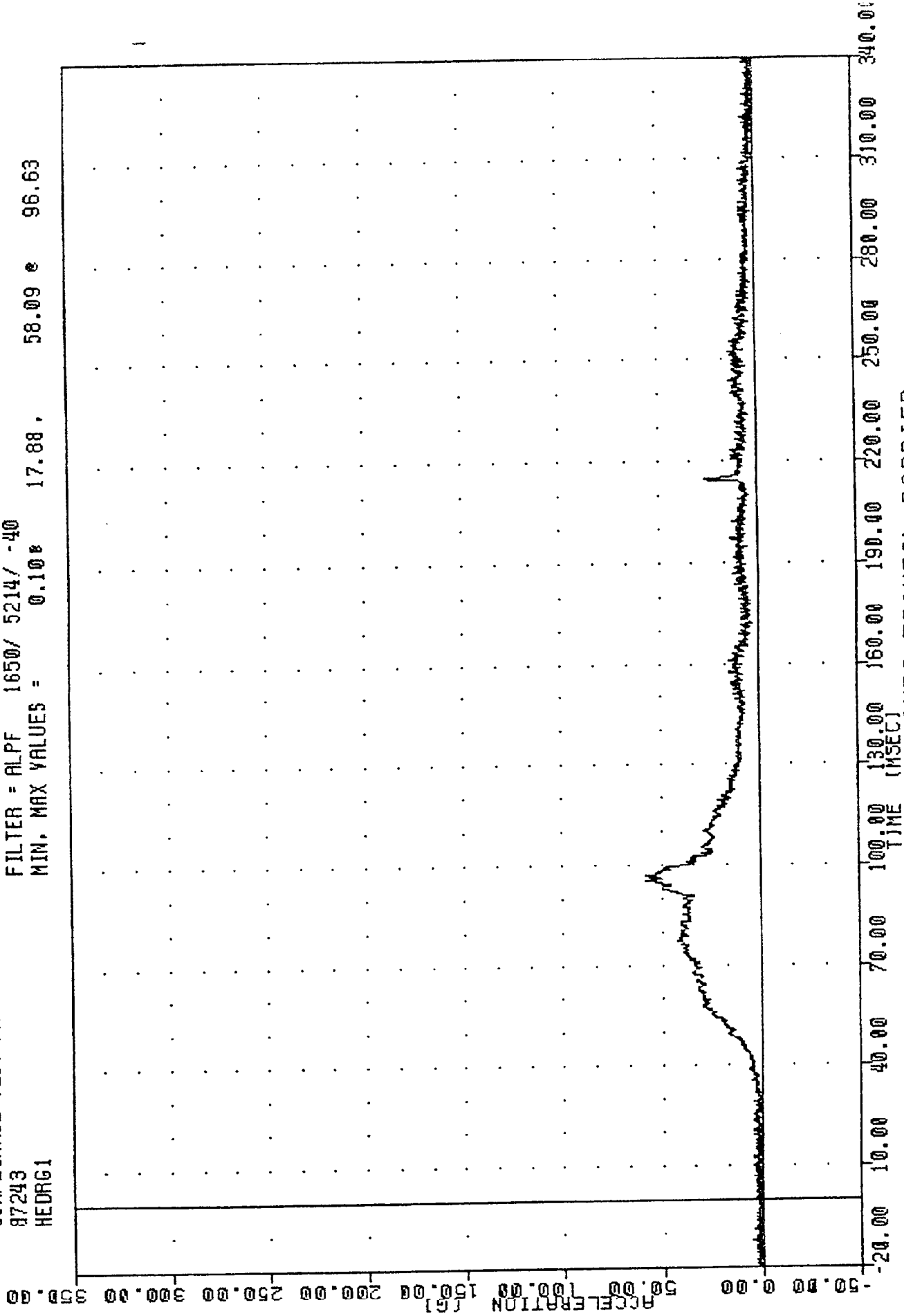


SUBARU XT INTO FRONTAL BARRIER
DRIVER HEAD Z AXIS ACCELERATION

TRC
COMPLIANCE TEST PROGRAM
87243
HEDRG1

, 870831

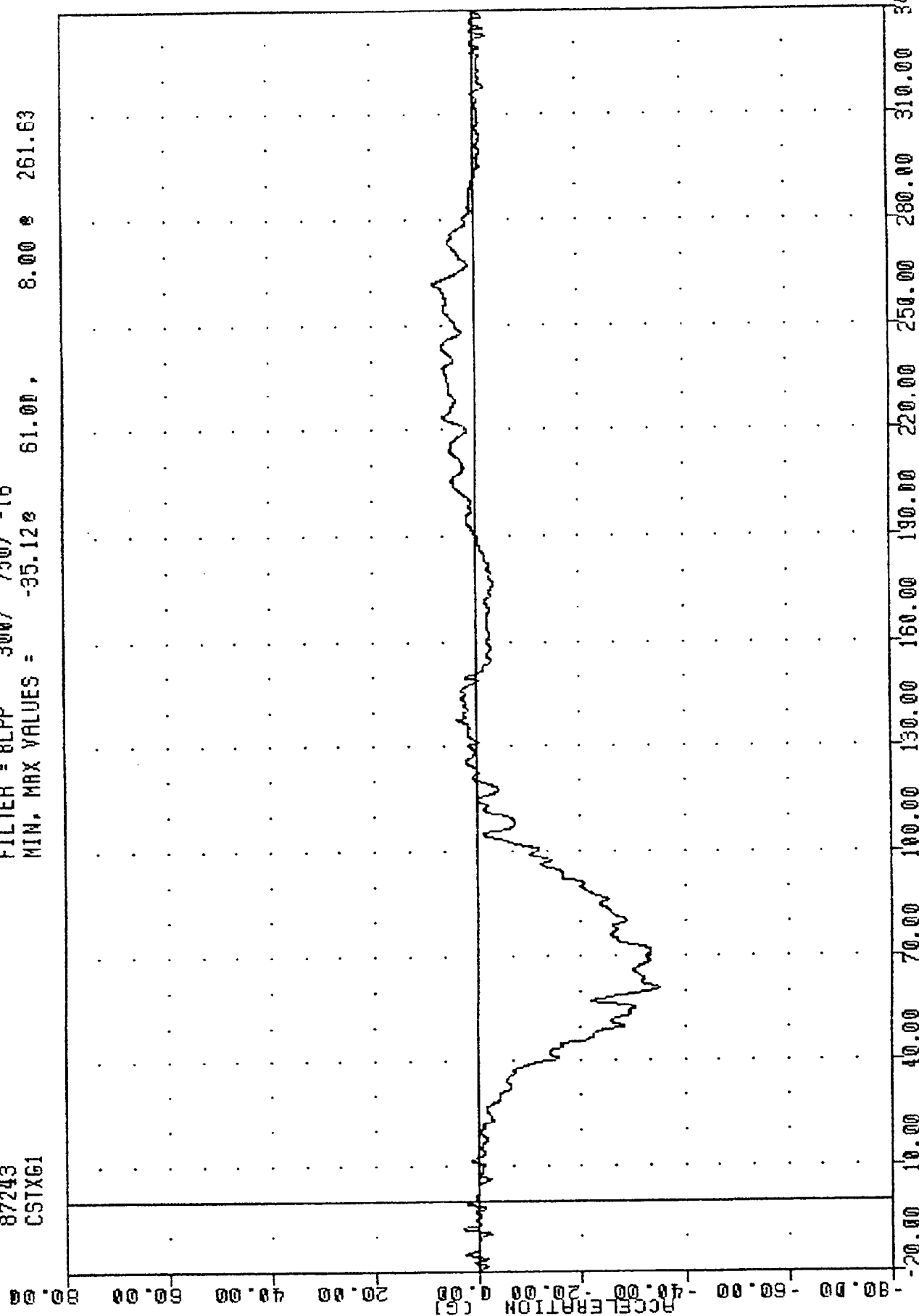
FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = 0.10% 17.88, 58.09 & 96.63



SUBARU XT INTO FRONTAL BARRIER
DRIVER HEAD RESULTANT ACCELERATION

TRC
 COMPLIANCE TEST PROGRAM
 87243
 CSTXG1

FILTER = RLPP 300/ 750/ -16
 MIN, MAX VALUES = -35.128 61.00, 8.00 261.63

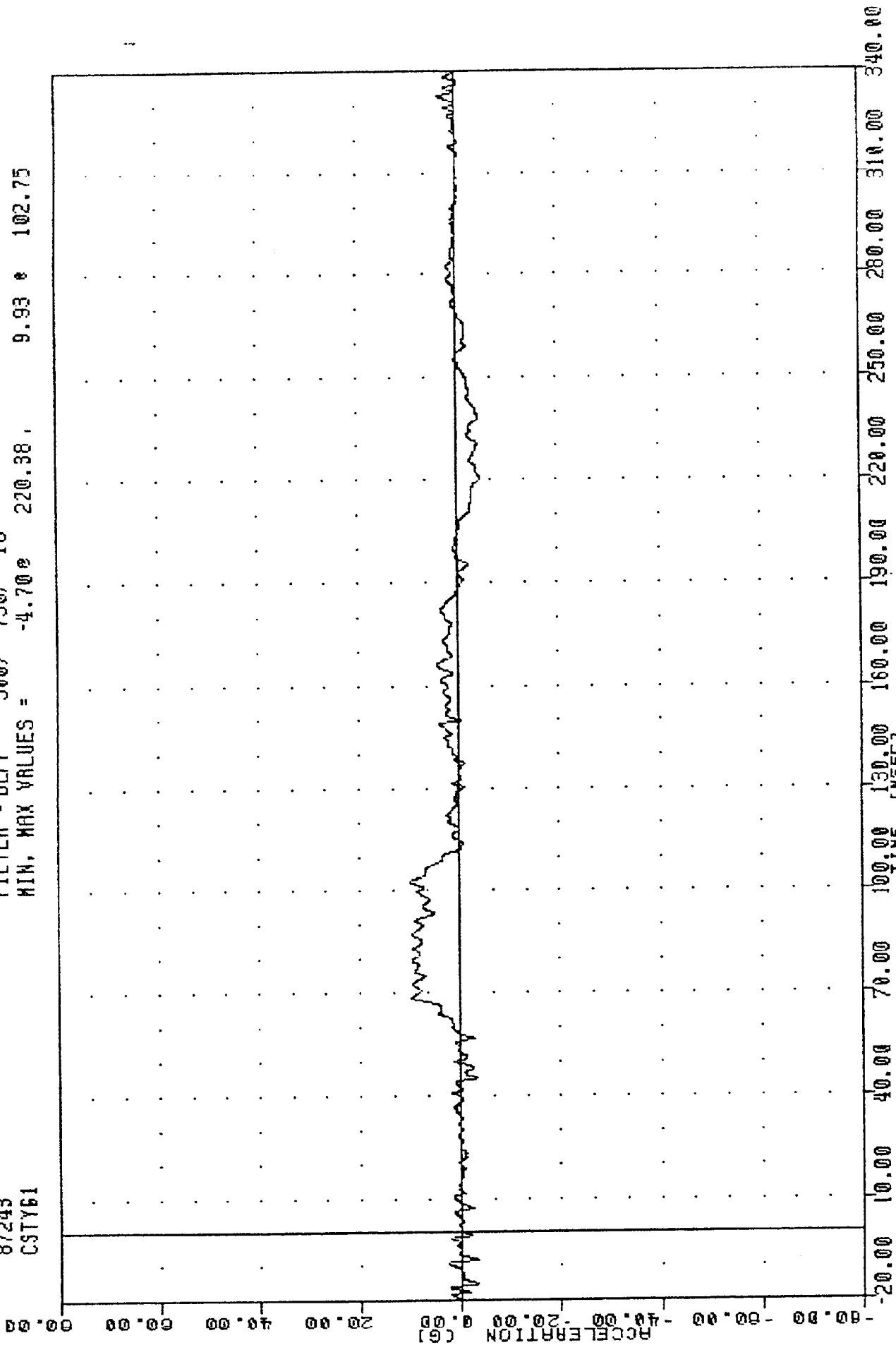


SUBARU XT INTO FRONTAL BARRIER
 DRIVER CHEST X AXIS ACCELERATION

TAC
COMPLIANCE TEST PROGRAM
87243
CSTY61

, 870831

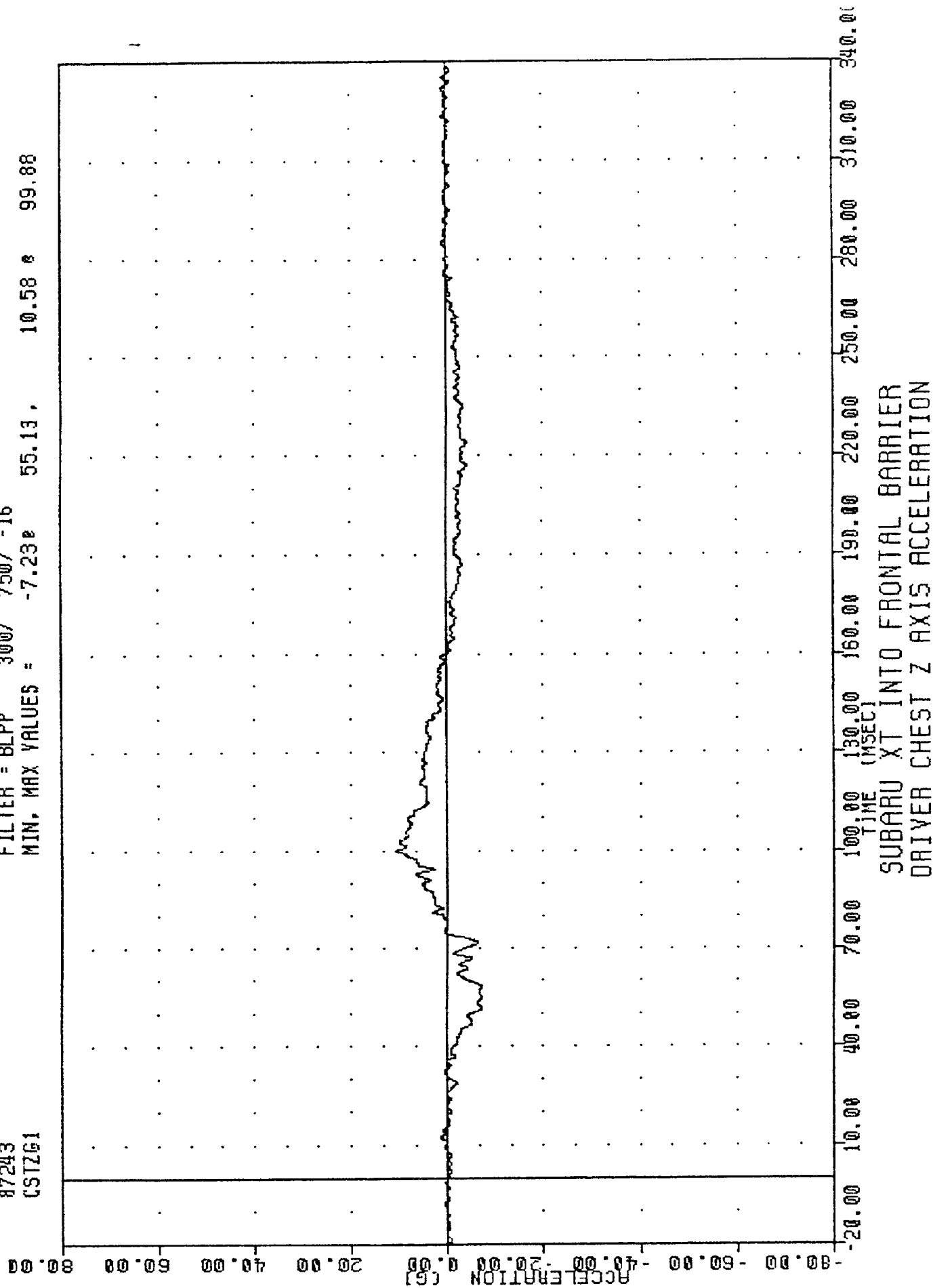
FILTER = BLPP 300/ 750/ .16
MIN. MAX VALUES = -4.70e 220.38, 9.93 * 102.75



SUBARU XT INTO FRONTAL BARRIER
DRIVER CHEST Y AXIS ACCELERATION

TRC
COMPLIANCE TEST PROGRAM
87243
CS1ZG1

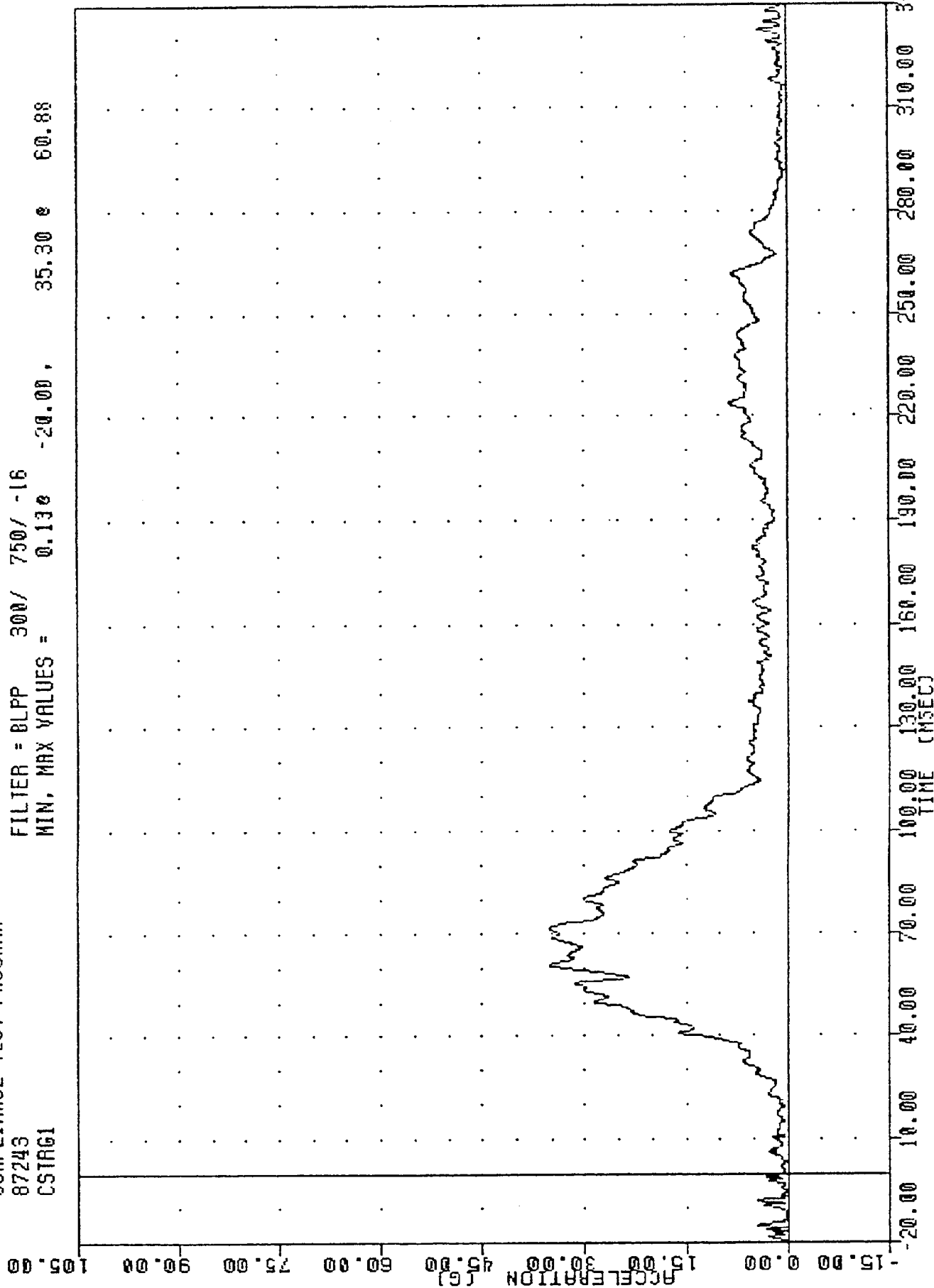
FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -7.23e 55.13, 10.58 e 99.88



TRC
COMPLIANCE TEST PROGRAM
87243
CSTRG1

870831

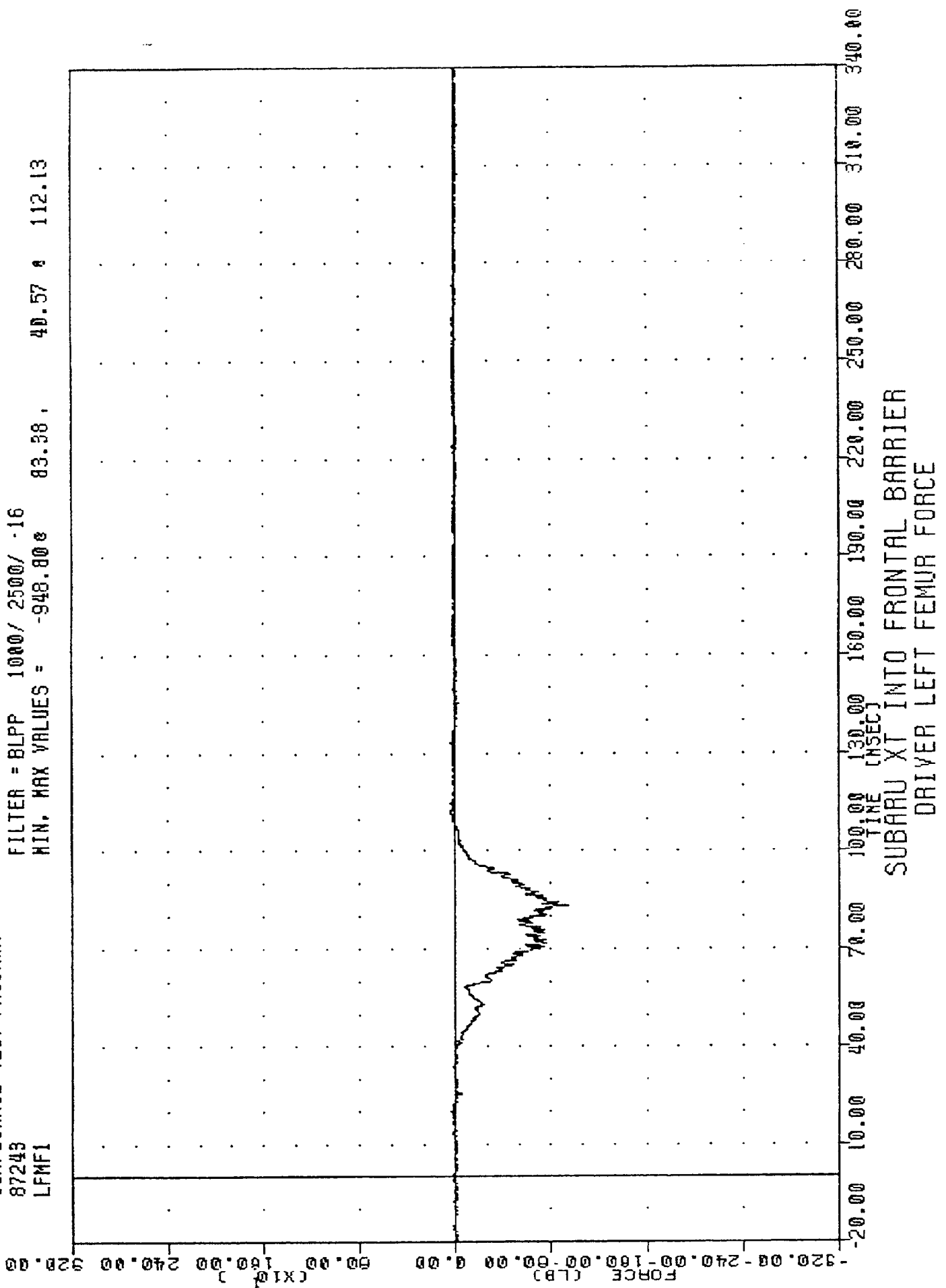
FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = 0.130 -20.00, 35.30 e 60.88



SUBARU XT INTO FRONTAL BARRIER
DRIVER CHEST RESULTANT ACCELERATION

TAC
COMPLIANCE TEST PROGRAM
87243
LFMF1

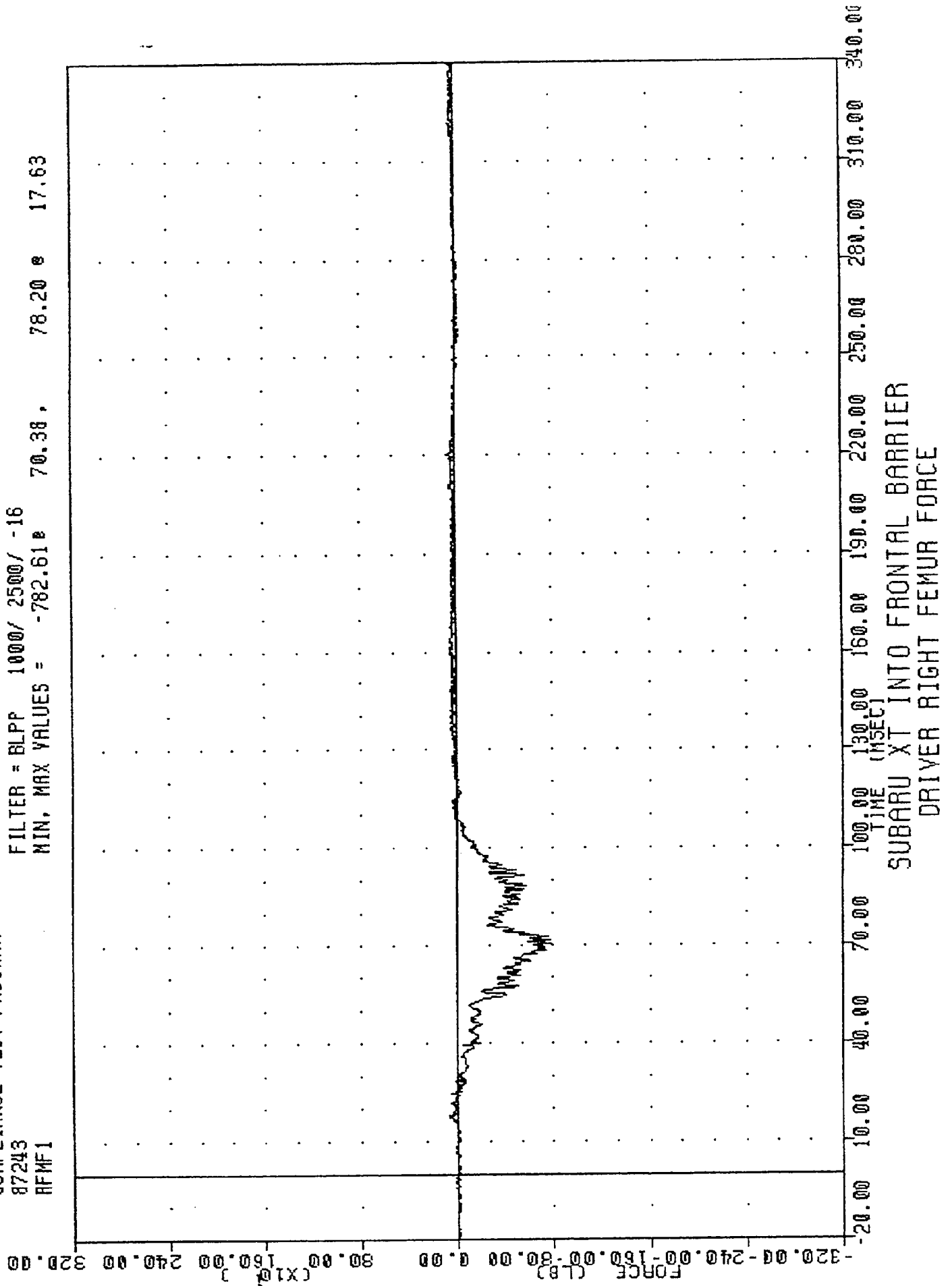
FILTER = BLPP 1000/ 2500/ -16
MIN. MAX VALUES = -948.80 83.38 , 40.57 112.13



TRC
COMPLIANCE TEST PROGRAM
87243
RFMF1

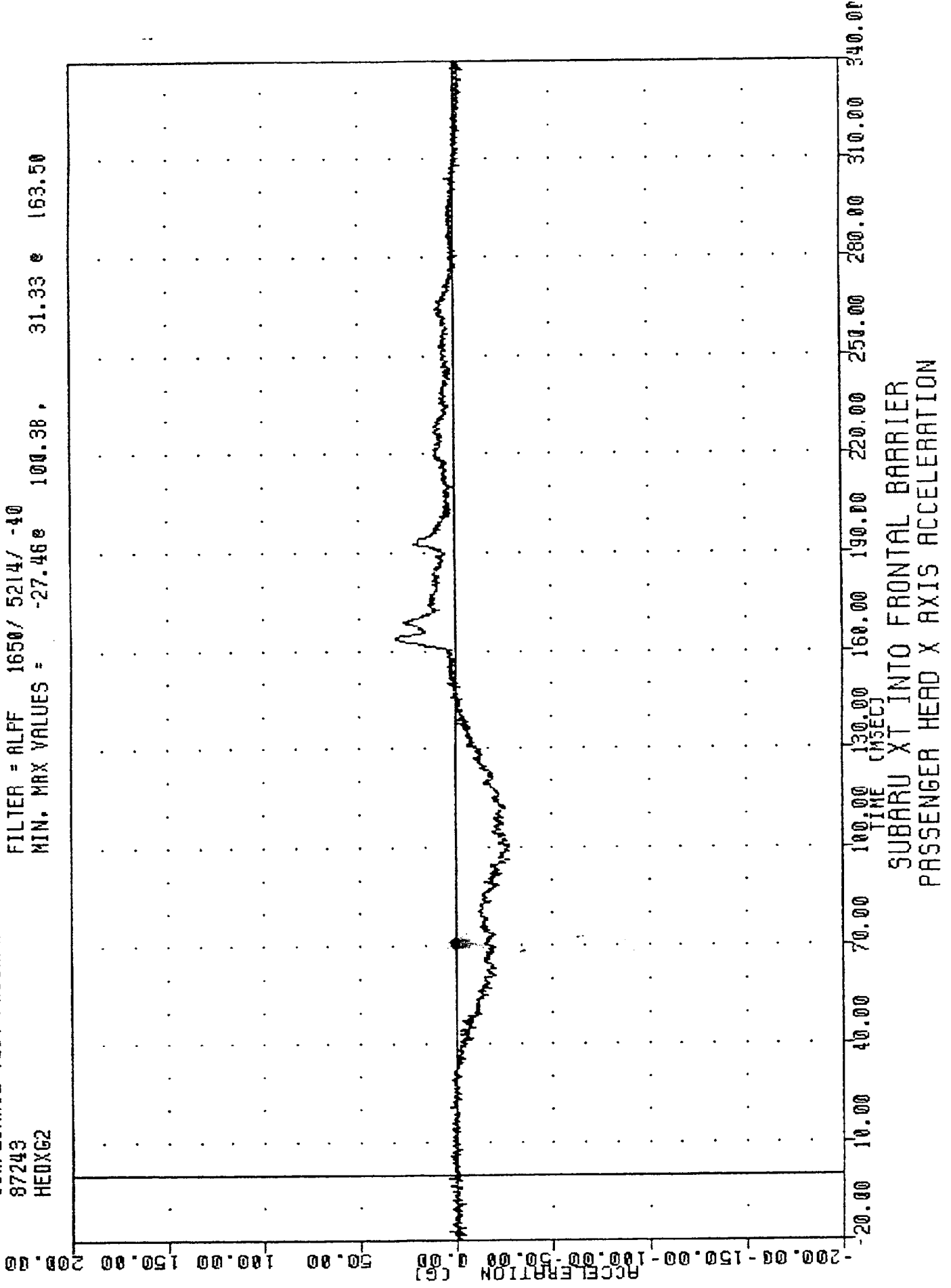
, 870831

FILTER = BLPP 1000/ 2500/ -16
MIN, MAX VALUES = -782.61 70.38, 78.20 17.63



TRC
 COMPLIANCE TEST PROGRAM
 87243
 HEDXG2

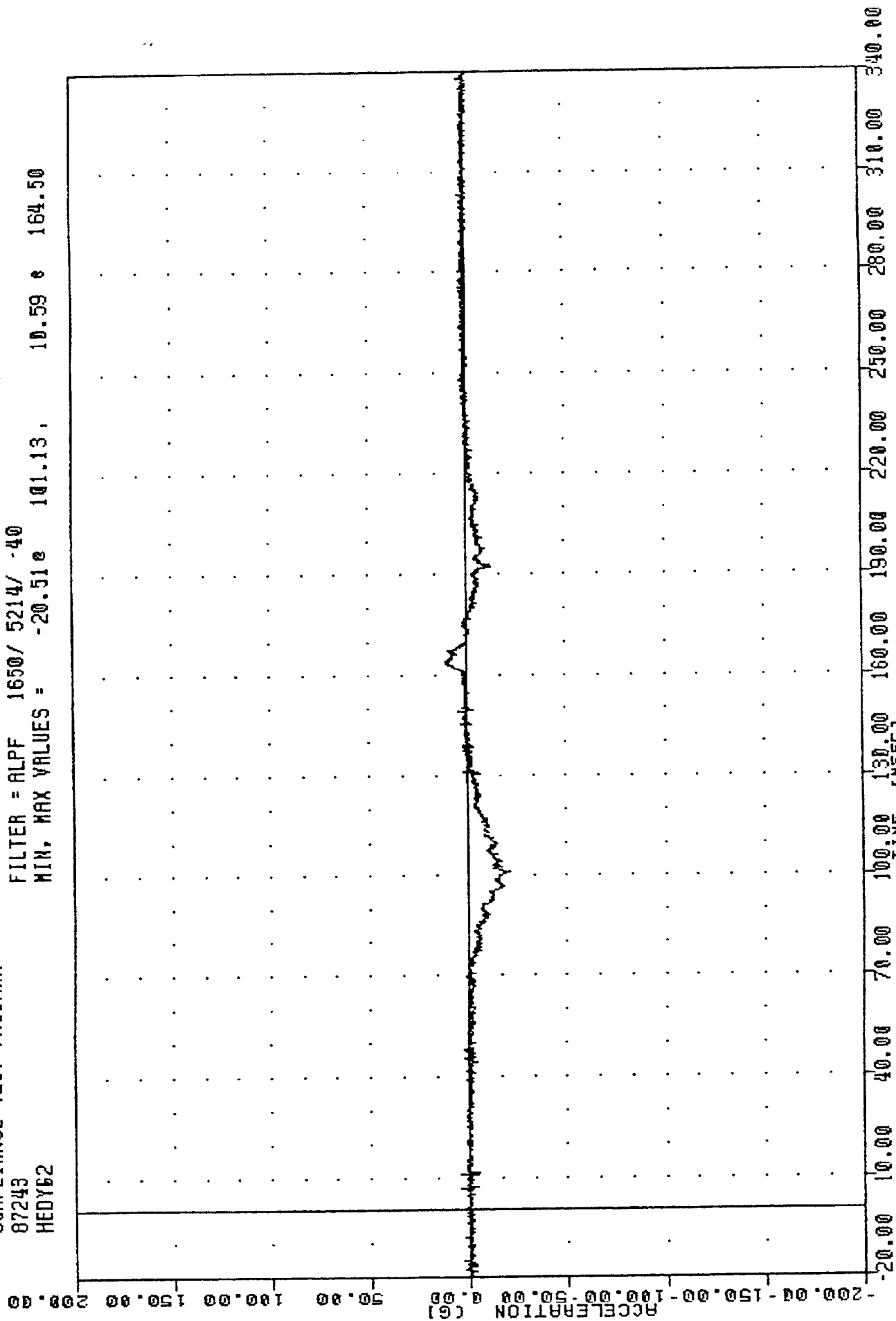
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -27.46e 100.38, 31.33 e 163.50



TAC
COMPLIANCE TEST PROGRAM
87243
HEDY62

, 870831

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -20.510 101.13, 10.59 e 164.50

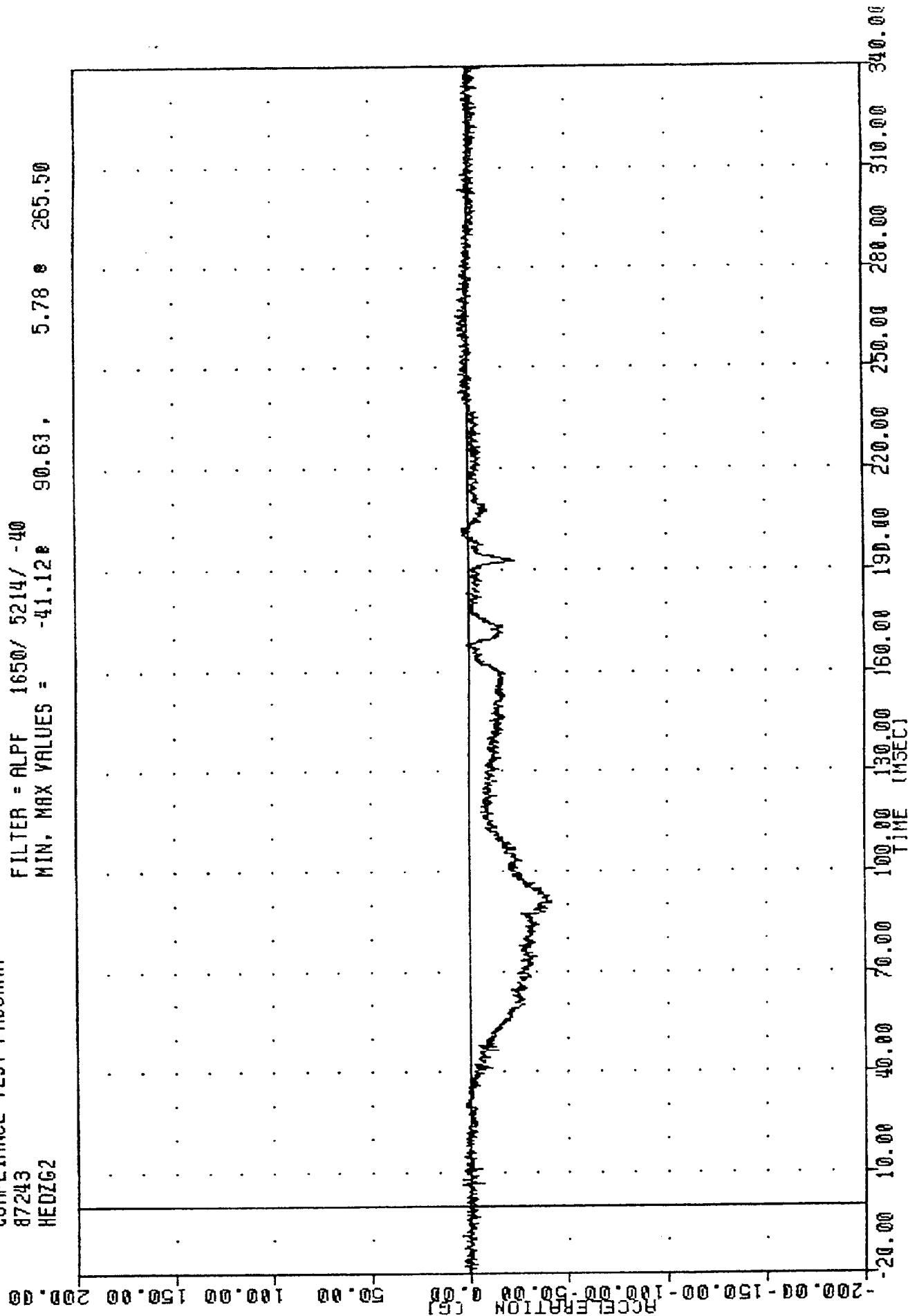


SUBARU XT INTO FRONTAL BARRIER
PASSENGER HEAD Y AXIS ACCELERATION

TRC
 COMPLIANCE TEST PROGRAM
 87243
 HEDIG2

, 870831

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -41.12 90.63, 5.78 265.50

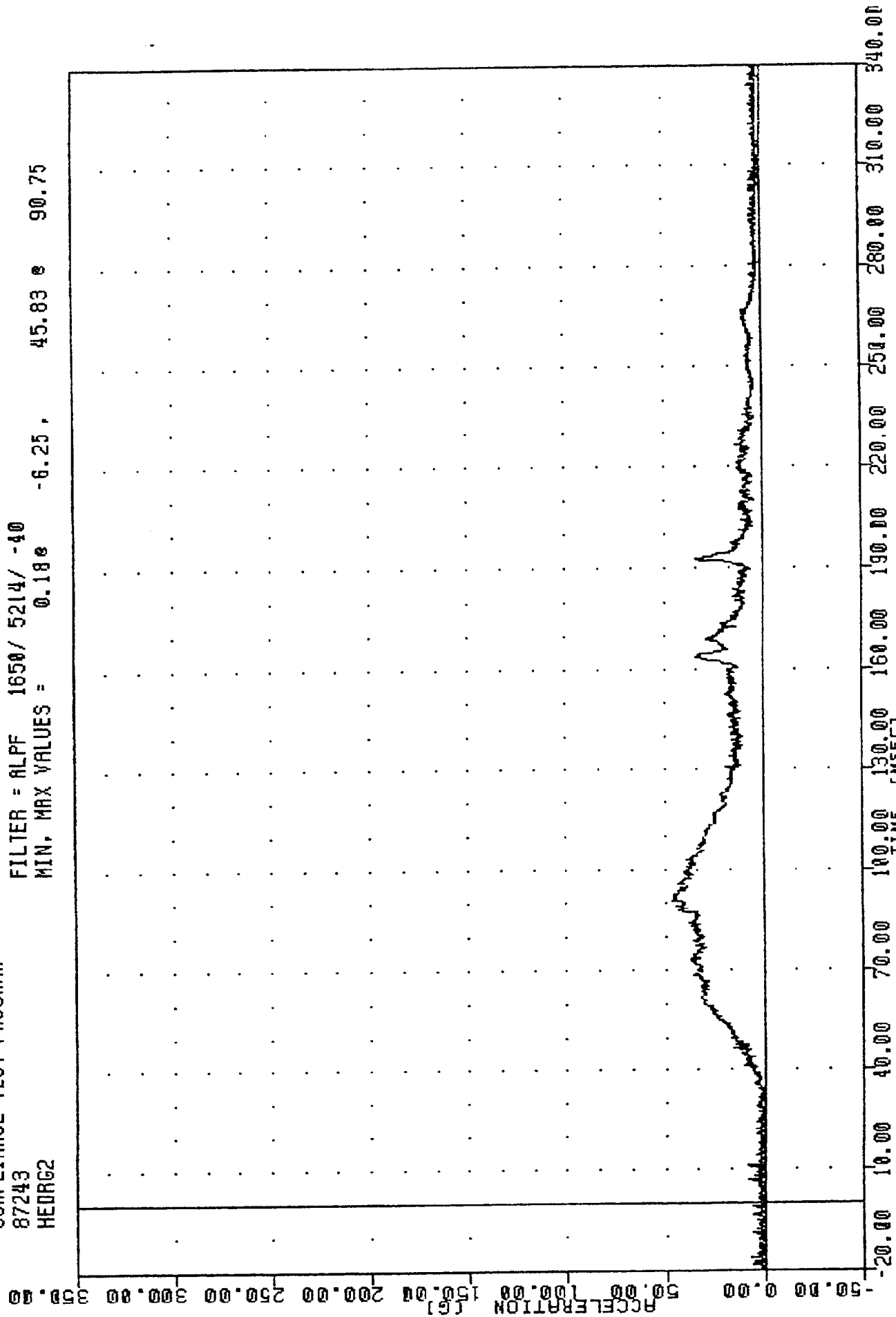


SUBARU XT INTO FRONTAL BARRIER
 PASSENGER HEAD Z AXIS ACCELERATION

TRC
COMPLIANCE TEST PROGRAM
87243
HEORC2

, 870831

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = 0.183 -6.25, 45.83 90.75

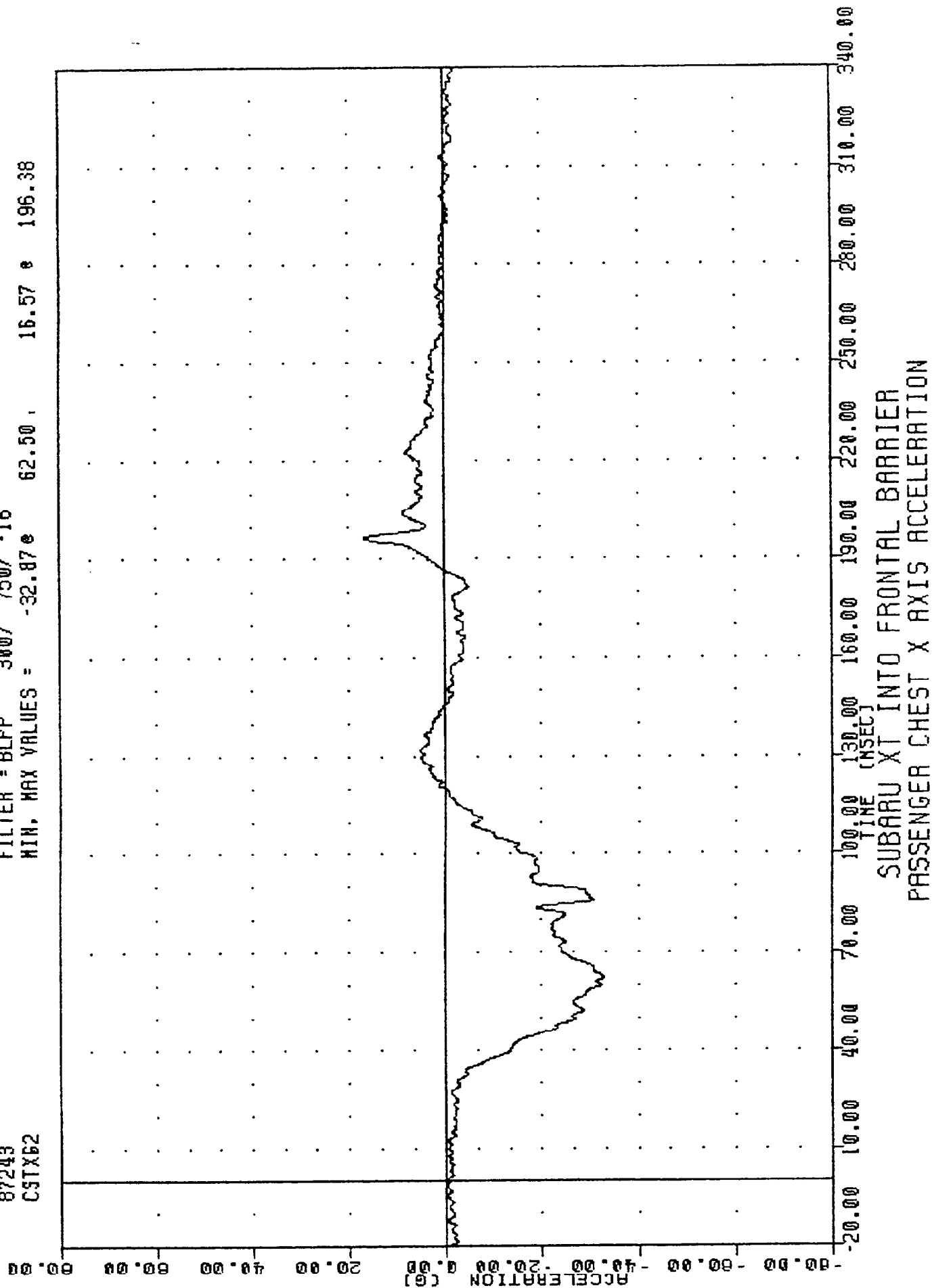


SUBARU XT INTO FRONTAL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION

TAC
COMPLIANCE TEST PROGRAM
87243
CSTX62

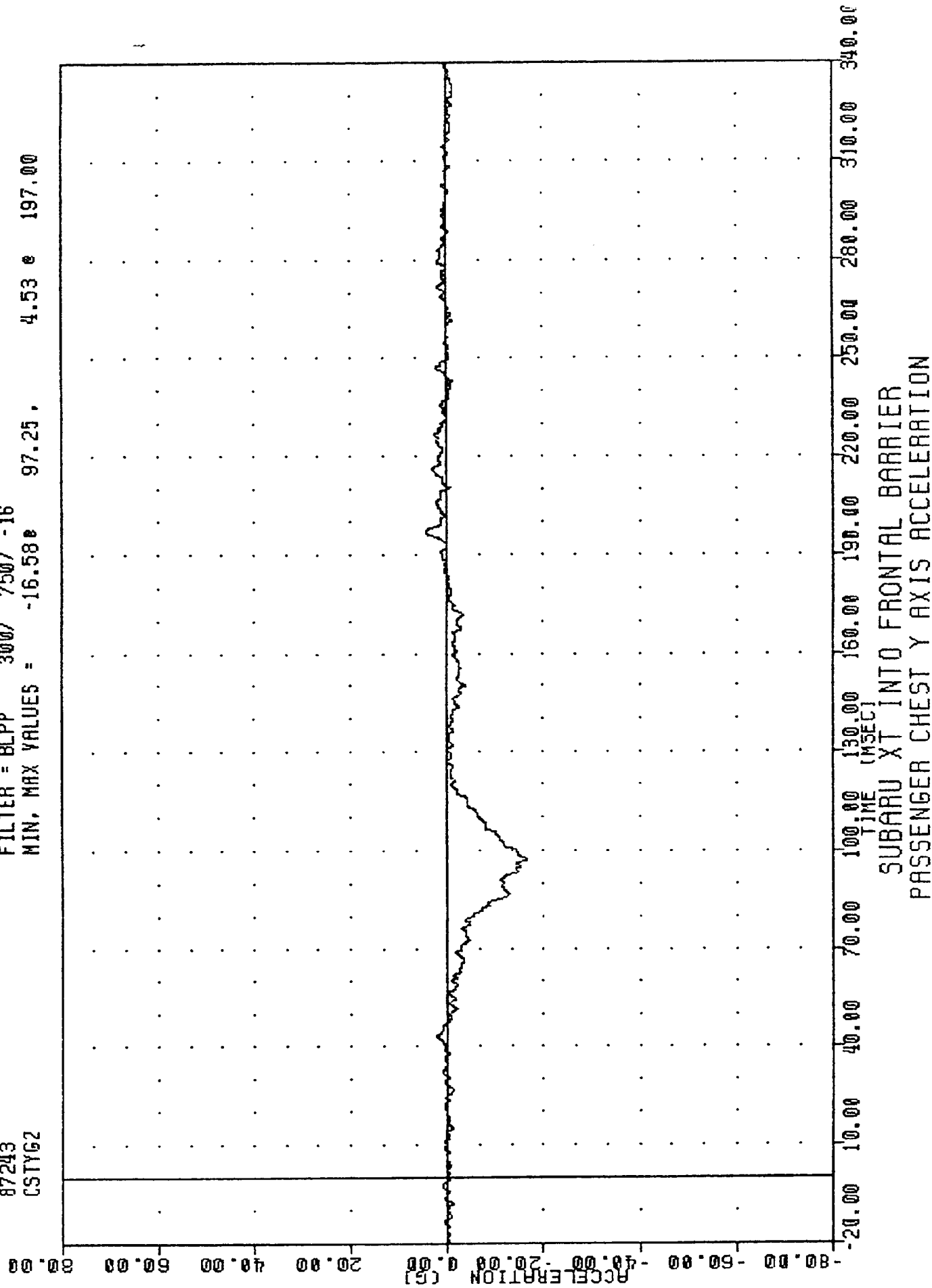
, 870831

FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -32.87 e 62.50 , 16.57 e 196.38



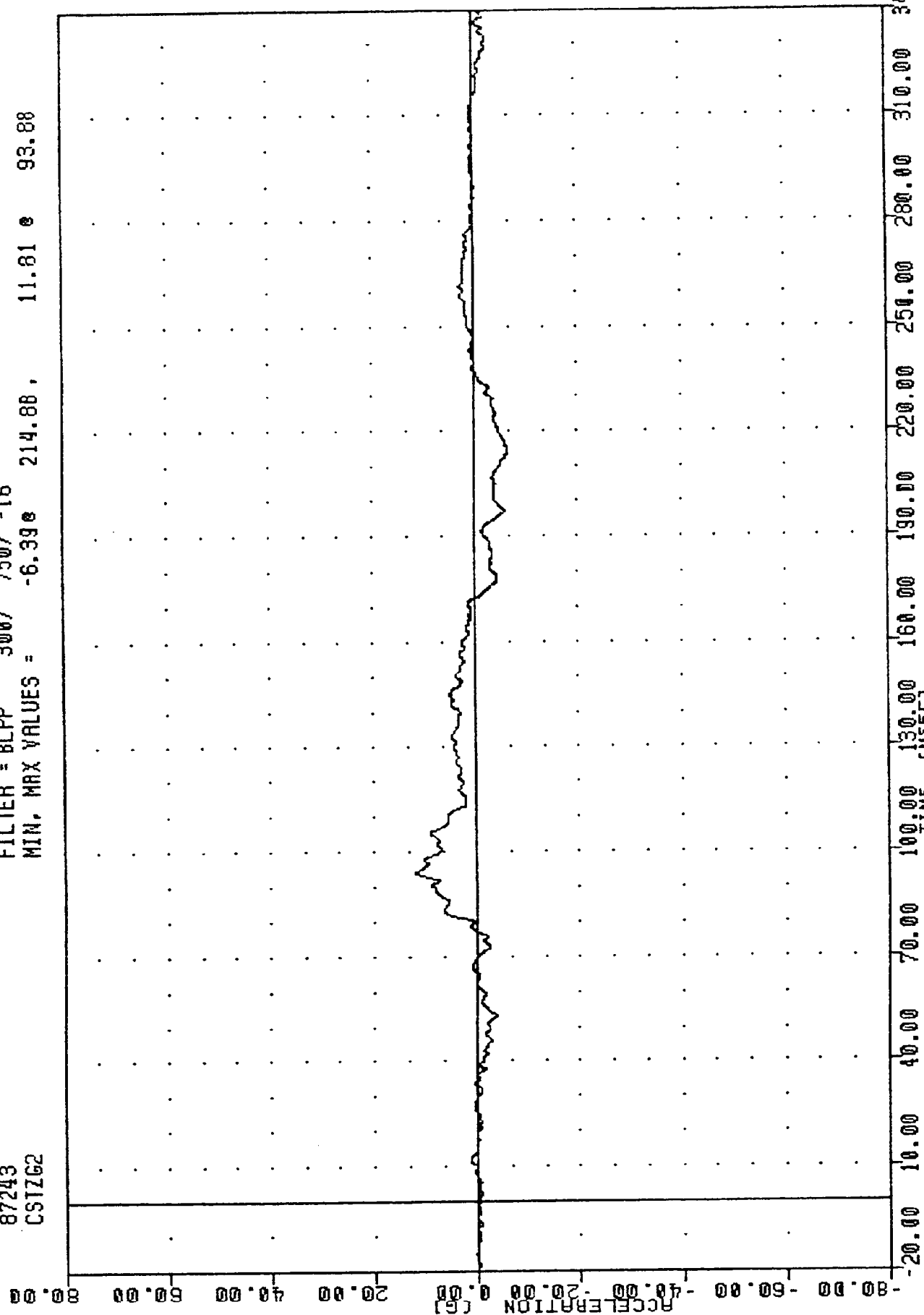
TRC
COMPLIANCE TEST PROGRAM
87243
CSTYG2

FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -16.58e 97.25, 4.53 e 197.00



TRC
COMPLIANCE TEST PROGRAM
87243
CS1ZG2

FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -6.39e 214.88, 11.81 e 93.88

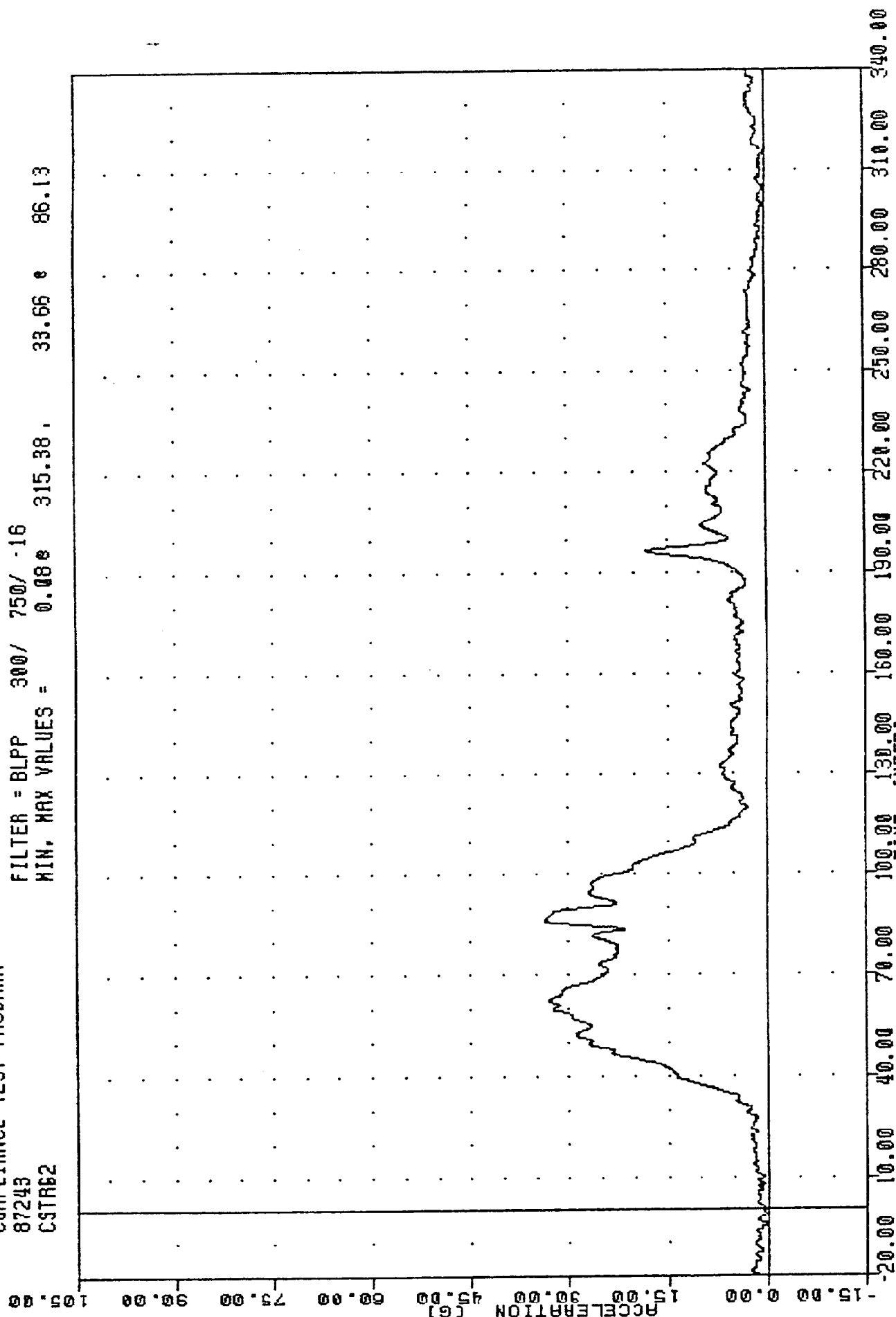


SUBARU XT INTO FRONTAL BARRIER
PASSENGER CHEST Z AXIS ACCELERATION

TAC
COMPLIANCE TEST PROGRAM
87243
C5TR62

, 870831

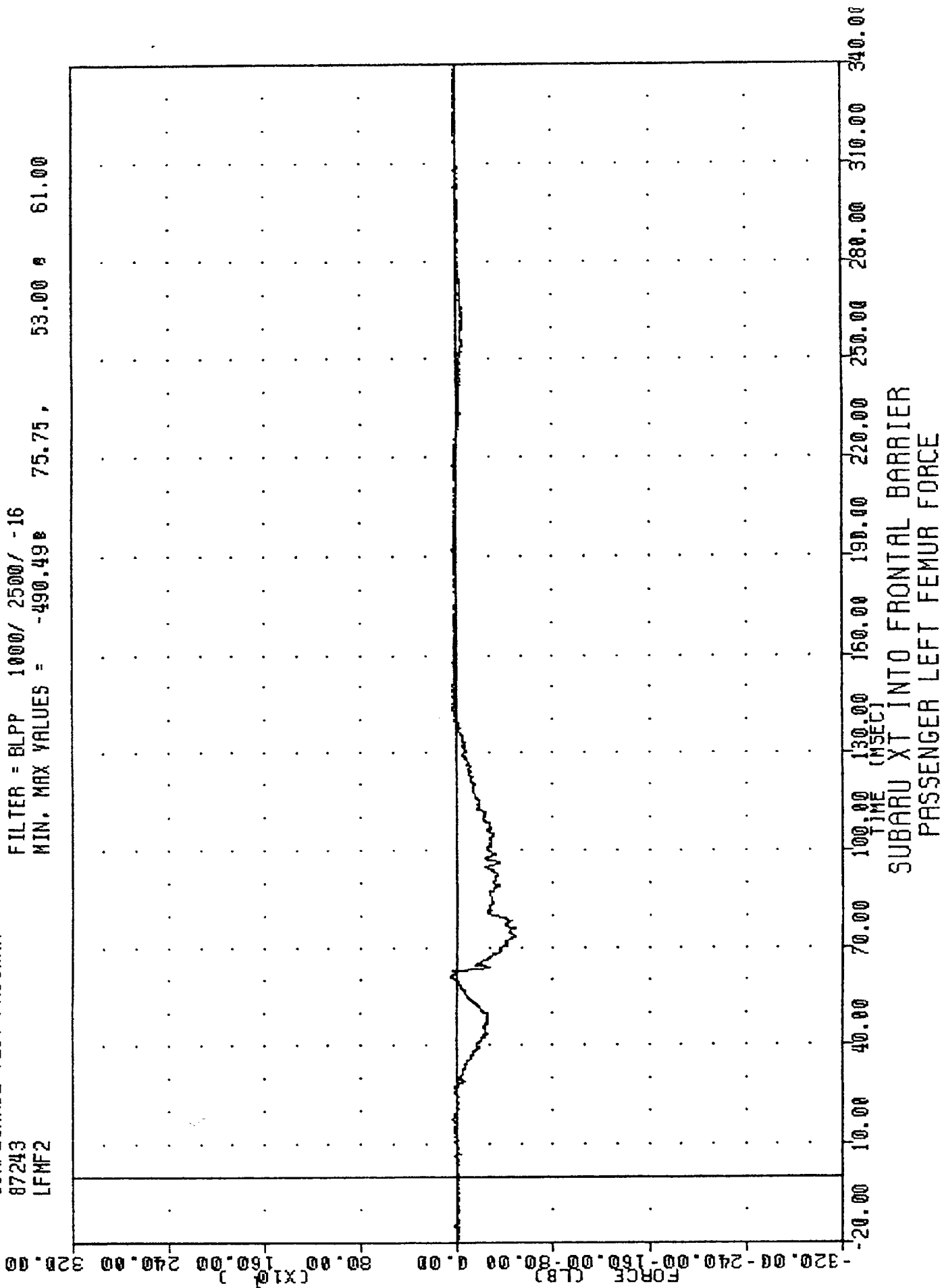
FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = 0.08 315.38 33.66 86.13



TRC
COMPLIANCE TEST PROGRAM
87243
LFMF2

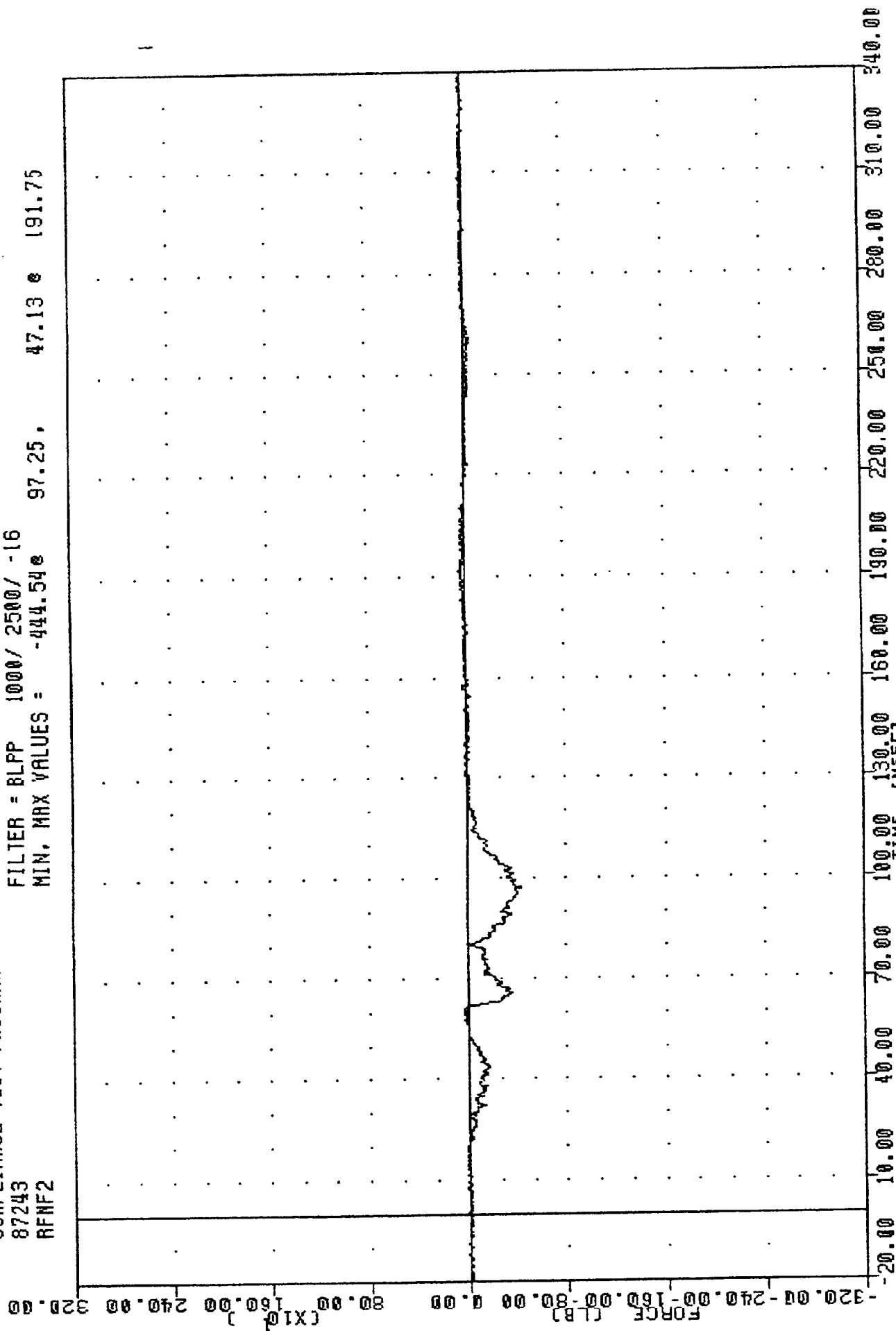
, 870831

FILTER = BLPP 1000/ 2500/ -16
MIN. MAX VALUES = -490.49 75.75, 53.00 61.00



TRC
COMPLIANCE TEST PROGRAM
87243
RFNF2

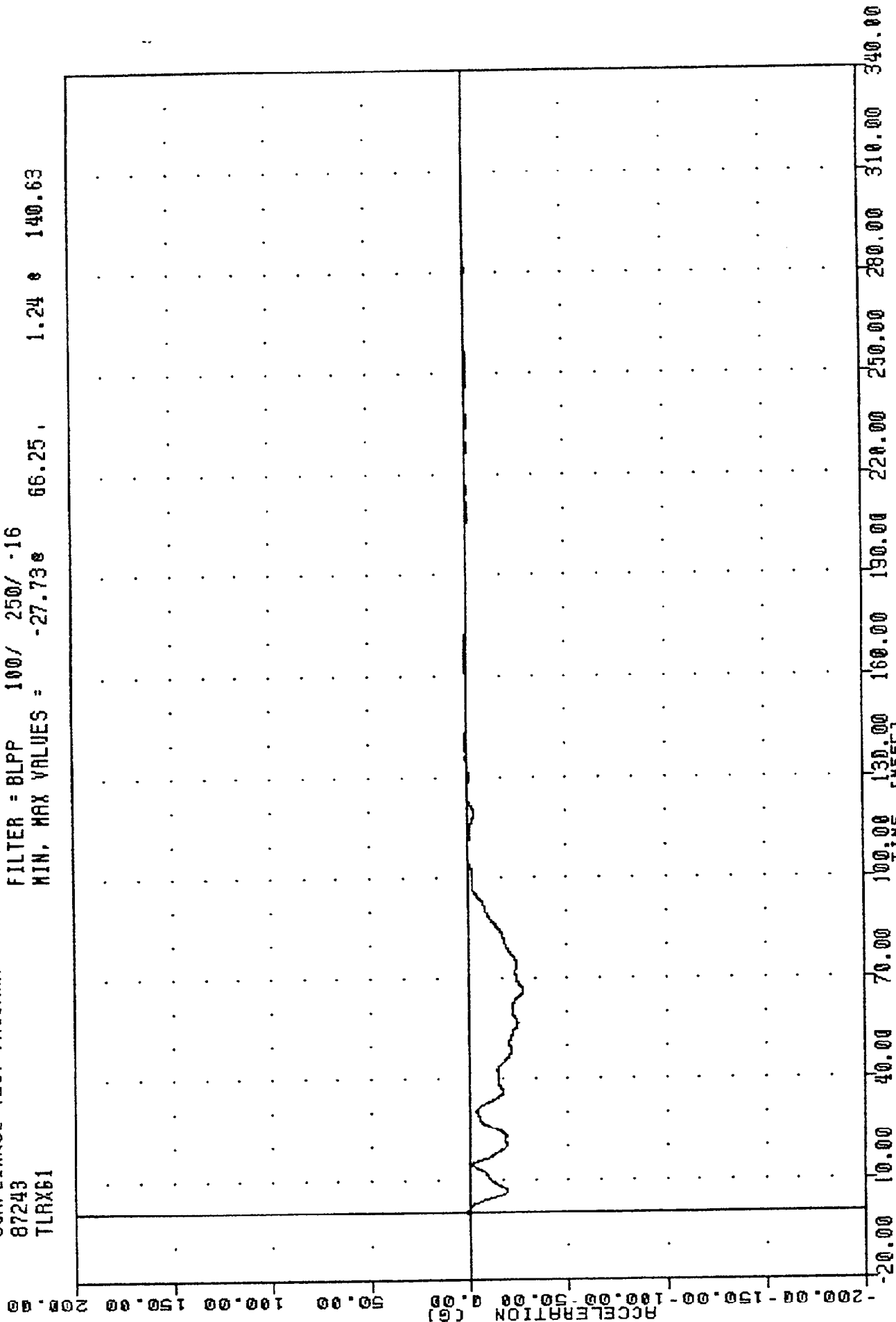
FILTER = BLPP 1000/ 2500/ -16
MIN. MAX VALUES = -444.54 97.25 47.13 191.75



SUBARU XT INTO FRONTAL BARRIER
PASSENGER RIGHT FEMUR FORCE

TAC
COMPLIANCE TEST PROGRAM
87243
TLRX61

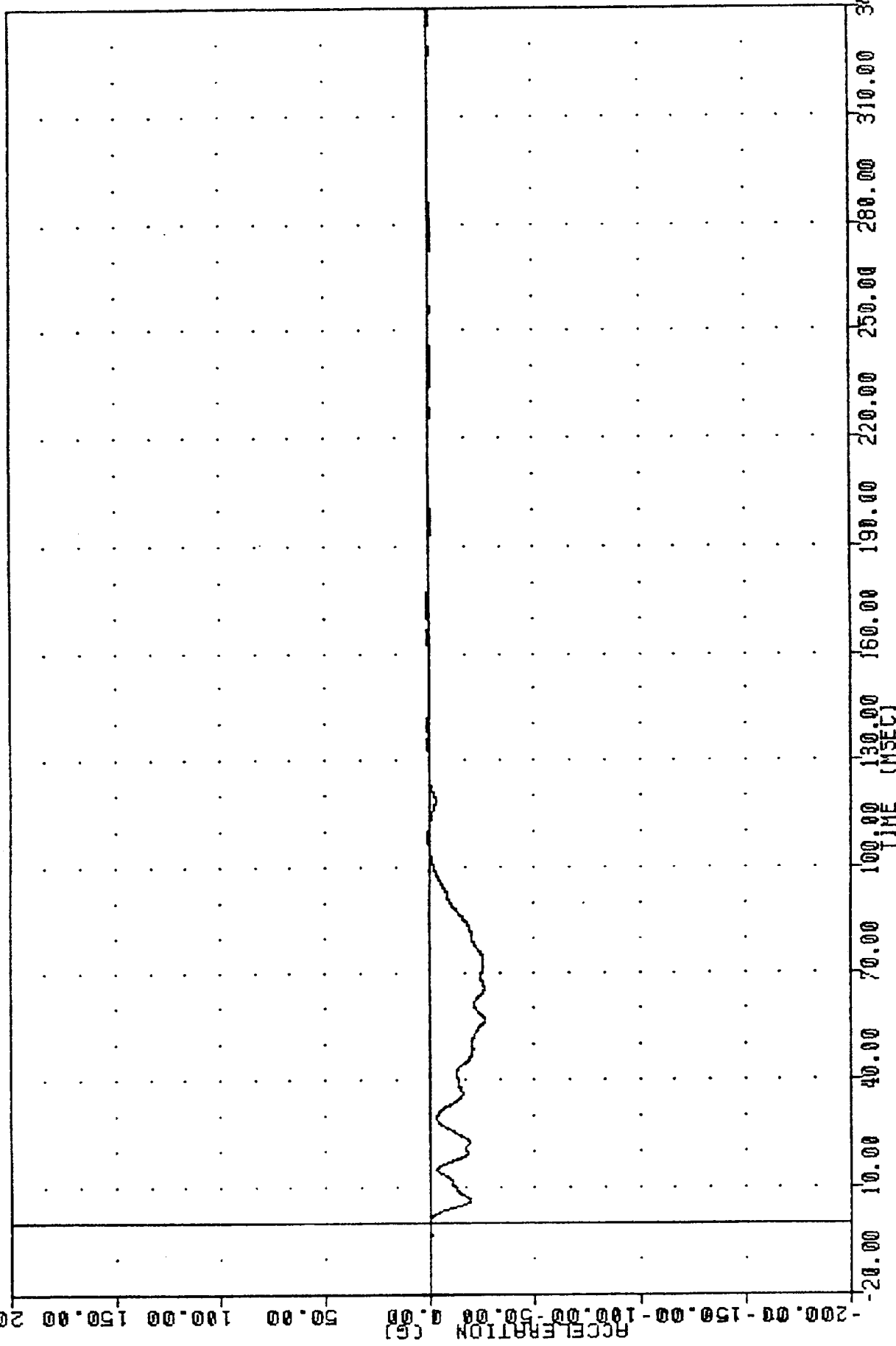
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -27.73 66.25 1.24 140.63



SUBARU XT INTO FRONTAL BARRIER
LEFT REAR SEAT X AXIS ACCELERATION

TRC
COMPLIANCE TEST PROGRAM
87243
TRRXG1

FILTER = BLPP 100/ 250/ -18
MIN. MAX VALUES = -26.52 56.88, 1.49 172.75

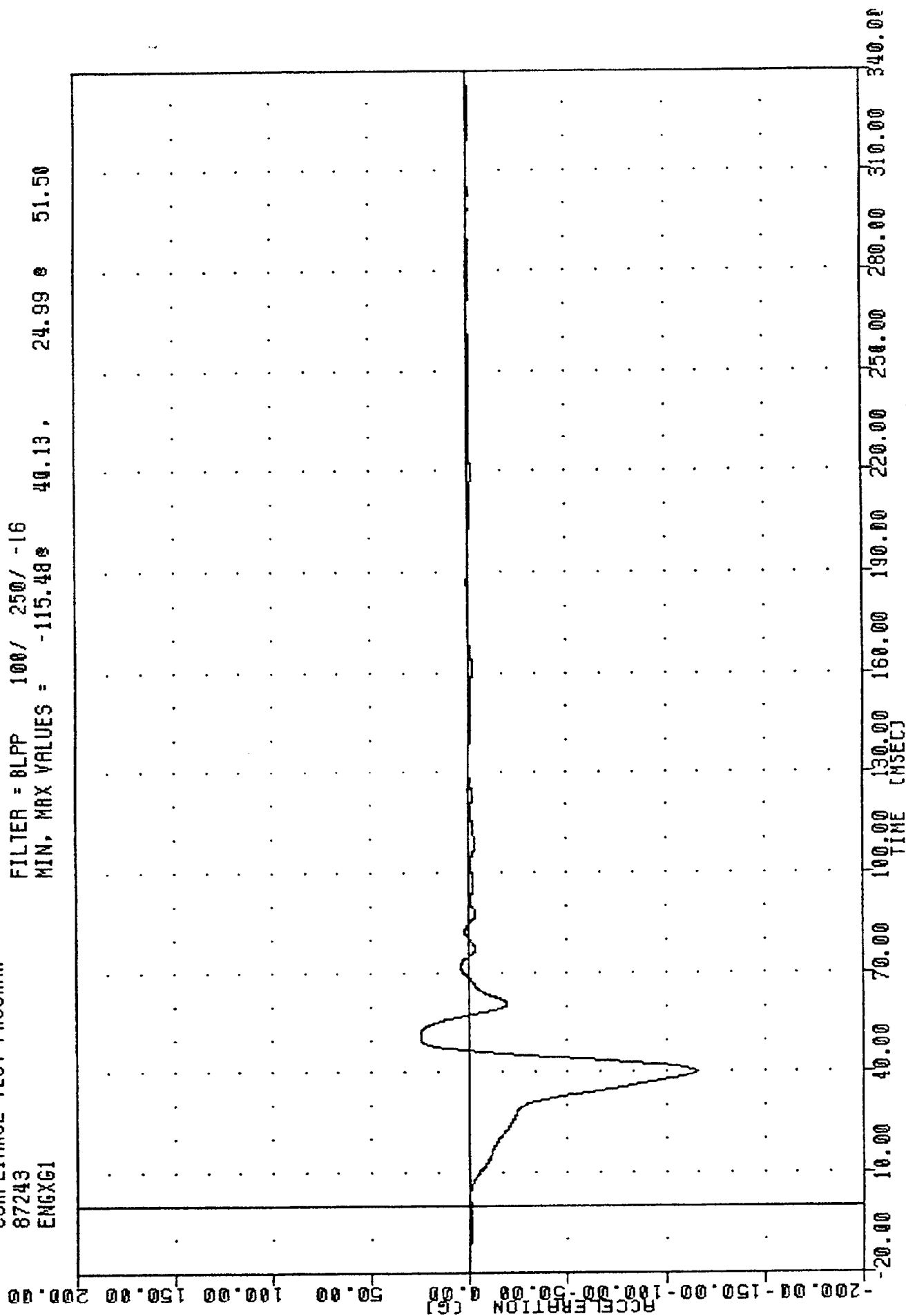


SUBARU XT INTO FRONTAL BARRIER
RIGHT REAR SEAT X AXIS ACCELERATION

TRC
COMPLIANCE TEST PROGRAM
87243
ENGXG1

, 870831

FILTER = 8LPP 100/ 250/ -16
MIN. MAX VALUES = -115.48 40.13, 24.99 51.50

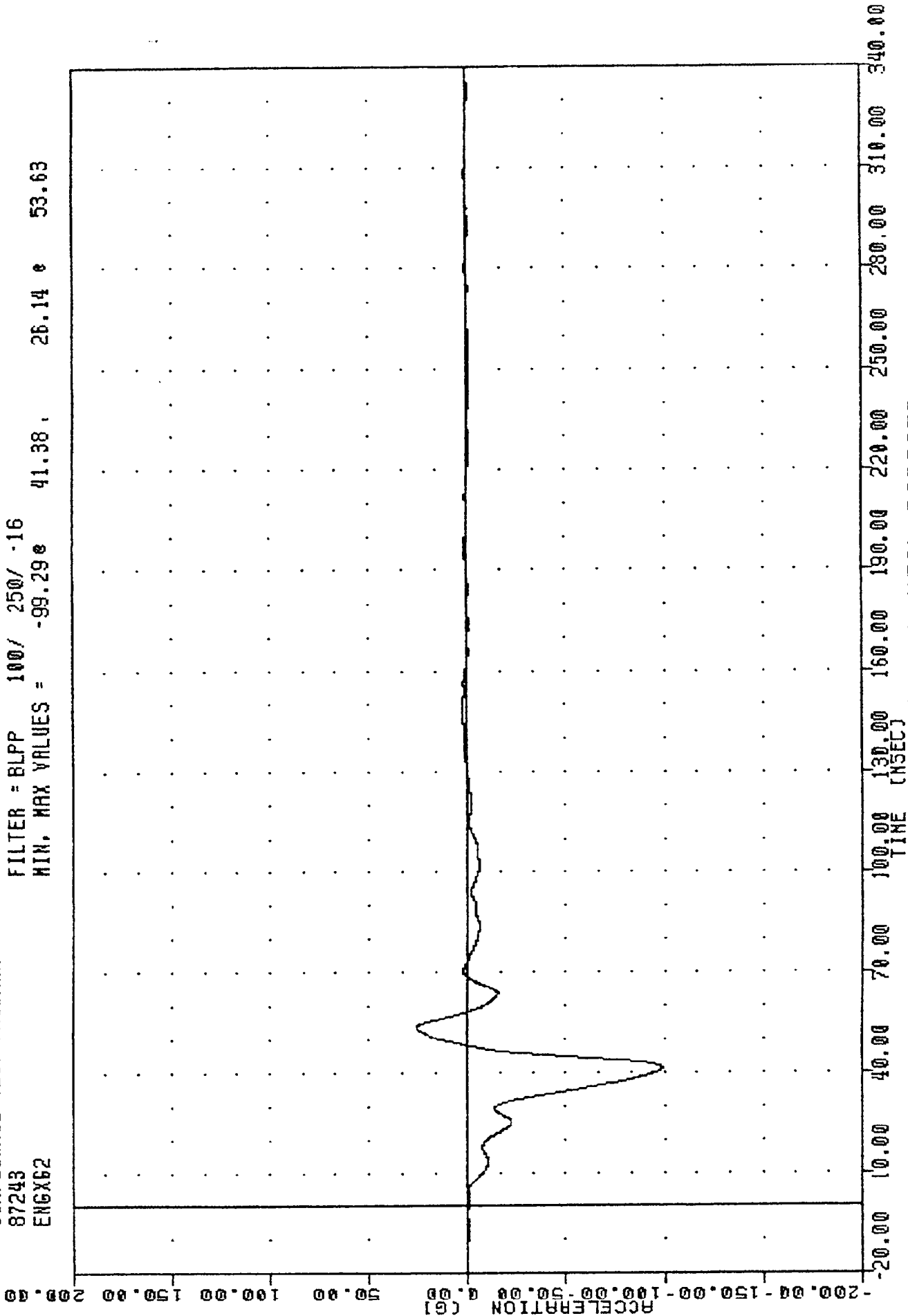


SUBARU XT INTO FRONTAL BARRIER
ENGINE UPPER BLOCK X AXIS ACCELERATION

TAC
COMPLIANCE TEST PROGRAM
87243
ENGX62

870831

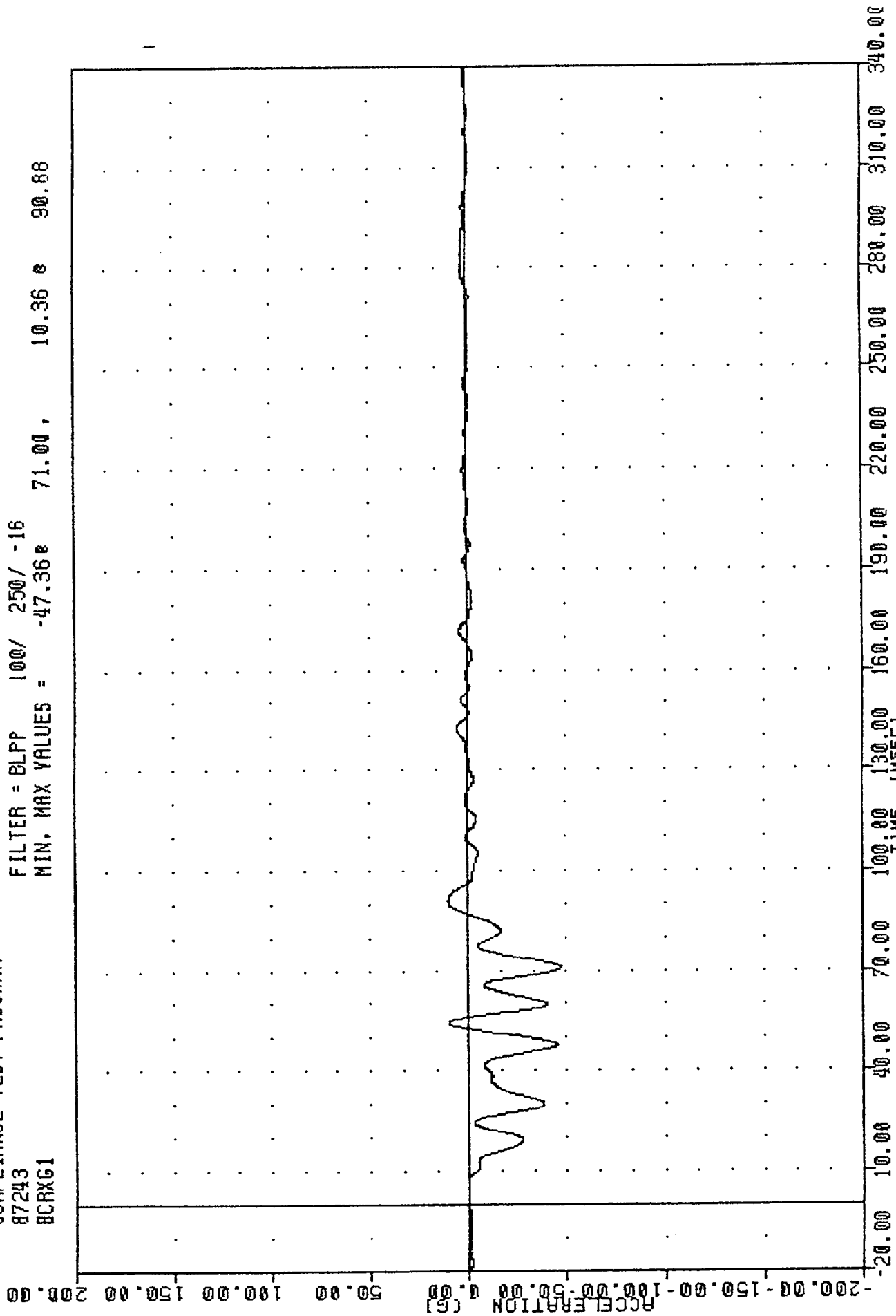
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -99.29e 41.38e 26.14e 53.63



TRC
COMPLIANCE TEST PROGRAM
87243
BCRXG1

, 870831

FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -47.36 71.00, 10.36 90.88

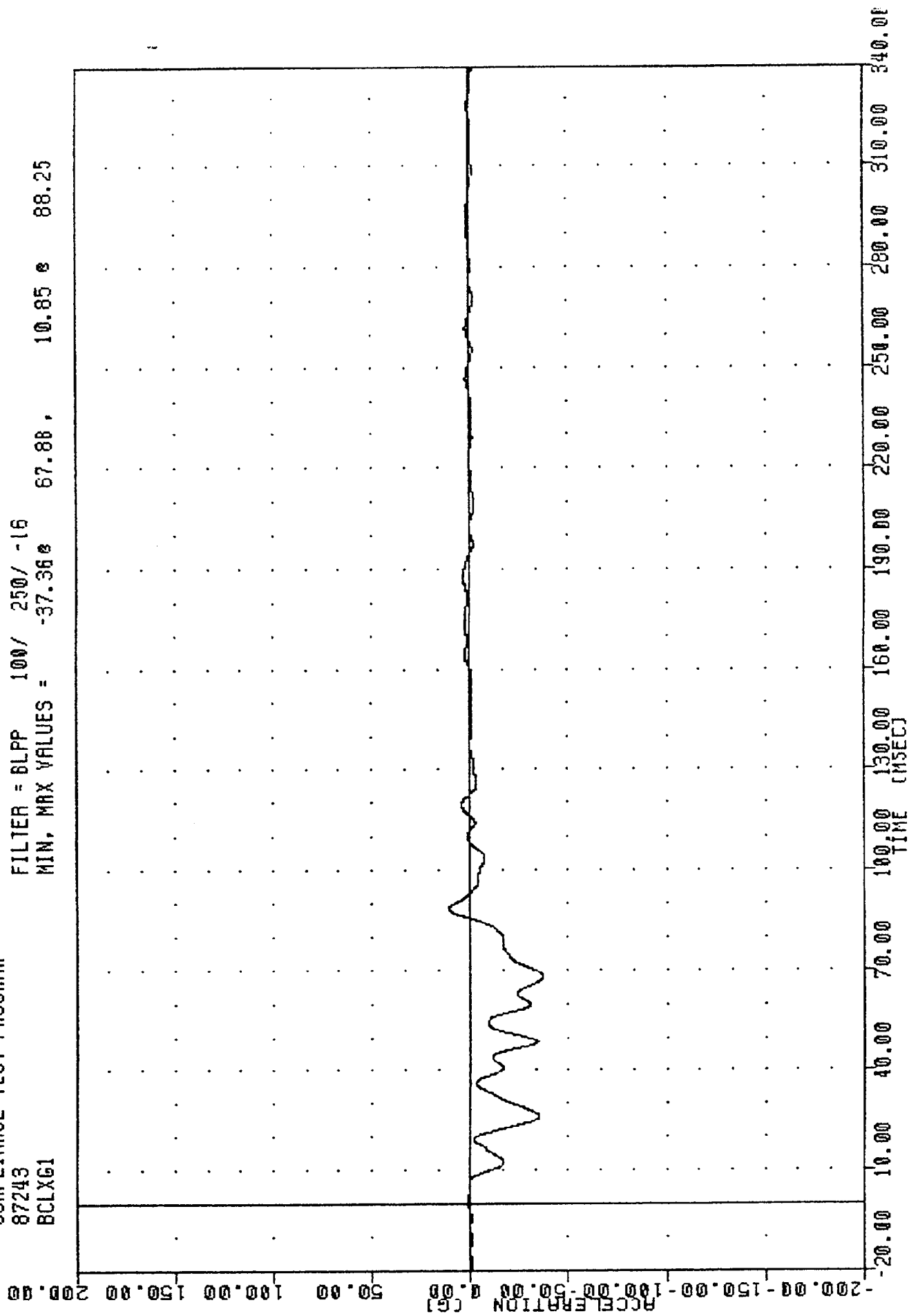


SUBARU XT INTO FRONTAL BARRIER
RIGHT BRAKE CALIPER X AXIS ACCELERATION

TRC
COMPLIANCE TEST PROGRAM
87243
BCLXG1

, 870831

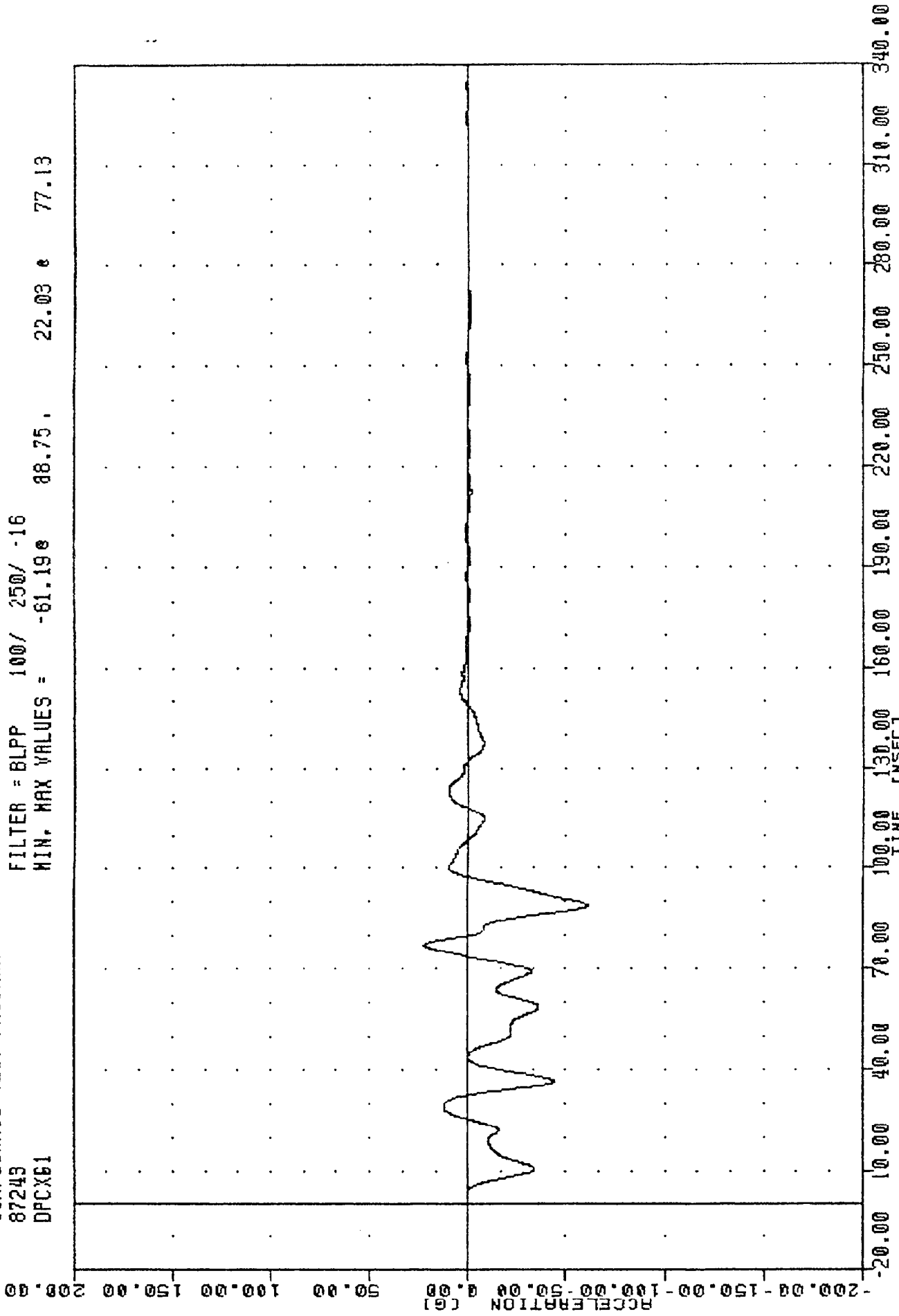
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -37.36 67.86, 10.85 88.25



TRC
 COMPLIANCE TEST PROGRAM
 87243
 DPCX61

, 870831

FILTER = BLPP 100/ 250/ -16
 MIN. MAX VALUES = -61.19 88.75 22.03 77.13



SUBARU XT INTO FRONTAL BARRIER
 DASH PANEL CENTER X AXIS ACCELERATION