

REPORT NOS. 208-TRC-87-003
212-TRC-87-003
301-TRC-87-003

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

VOLKSWAGEN OF AMERICA, INC
1987 VOLKSWAGEN GOLF
5-DOOR HATCHBACK
NHTSA NO. CH5801
TRC TEST NO. 870720

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



AUGUST 10, 1987

FINAL REPORT

PREPARED FOR:
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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	short tons	0.9	metric ton	t
(2000 lb)				
VOLUME				
1 sp	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	5/9 (after subtracting 32)	degrees Celsius	°C

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	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

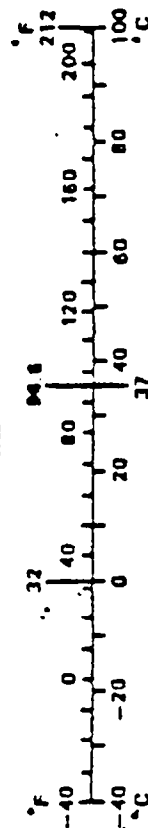


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SECTION 1.0

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 Volkswagen Golf 5-door hatchback, NHTSA No. CH5801, 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 Volkswagen Golf 5-door hatchback, NHTSA No. CH5801, was equipped with a four-cylinder transverse engine, five-speed manual transmission and power brakes. The test weight of the vehicle was 2716 pounds. The test vehicle appeared to comply with the performance requirements of FMVSS 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 2250 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 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 July 20, 1987. The test vehicle's impact speed was 29.5 mph. The vehicle sustained 19.1 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

TEST NO. CH5801 PROJECT: 30 MPH FRONTAL
BARRIER IMPACT TEST

DATE: July 20, 1987 TIME: 1342 TEMP: 92°F

VEHICLE: 1987 Volkswagen Golf 5-Door Hatchback

TEST WEIGHT (LBS): 2716

IMPACT ANGLE (DEG)*: 0

IMPACT VELOCITY (MPH)**: PRIMARY = 29.5 SECONDARY = 29.5

MAX CRUSH (IN) STATIC: 19.1

VEHICLE REBOUND (IN): 3.9

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

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% accuracy).

TABLE 2

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Volkswagen of America, Inc.

MAKE/MODEL: Volkswagen Golf

VIN: 1VWFA9177HV028753

BODY STYLE: 5 door hatchback

MODEL YEAR: 1987

NHTSA NO.: CH5801

COLOR: White

ENGINE DATA: TYPE: transverse CYLINDERS: 4

DISPLACEMENT: 1.8 liter

 X GAS, DIESEL, TURBOCHARGE

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

DATE VEHICLE RECEIVED: 7/14/87

ODOMETER READING: 184

ACCESSORIES:

POWER STEERING	No	AUTOMATIC TRANSMISSION	No
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	No
POWER SEATS	No	TILTING STEERING WHEEL	No
POWER WINDOWS	No	TELESCOPING STEERING WHEEL	No
TINTED GLASS	No	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: Volkswagen of America, Inc.,

CERTIFICATION DATE: 12/86

GVWR: 3175 LBS.,

GAWR: FRONT 1800 LBS., REAR 1540 LBS.

TABLE 2, CONT'D.

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

VEHICLE LOAD (UP TO CAPACITY): FRONT 29 psi cold; REAR 35 psi cold

RECOMMENDED TIRE SIZE: P175/70R13 LOAD RANGE X B, C, D

TIRES ON VEHICLE (MFR., LINE, SIZE): Michelin MXL 175/70R13

IS SPARE TIRE A "SPACE SAVER": Yes

IS SPARE TIRE STANDARD EQUIPMENT: Yes

VEHICLE CAPACITY: TYPES OF SEATS Front - Bucket
Rear - Bench

TYPE OF FRONT SEAT BACKS: MANUAL ADJUSTABLE

NUMBER OF OCCUPANTS 2 FRONT 3 REAR 5 TOTAL

CARGO LOAD 150 LBS. TOTAL 900 LBS.

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

RIGHT FRONT 679 LBS. RIGHT REAR 435 LBS.

LEFT FRONT 674 LBS. LEFT REAR 470 LBS.

TOTAL FRONT WEIGHT 1353 LBS. (59.9% OF TOTAL VEHICLE WEIGHT)

TOTAL REAR WEIGHT 905 LBS. (40.1% OF TOTAL VEHICLE WEIGHT)

TOTAL DELIVERED WEIGHT 2258 LBS.

CALCULATION FOR TARGET TEST WEIGHT:

RCLW = RATED CARGO AND LUGGAGE WEIGHT

UDW = UNLOADED DELIVERED WEIGHT (2258 LBS)

VCW = VEHICLE CAPACITY WEIGHT (900 LBS)

DSC = DESIGNATED SEATING CAPACITY (5)

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

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

= 2258 + 150 + 328 LBS

TARGET TEST WEIGHT = 2736 LBS .

TABLE 2, CONT'D.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 130 LBS. CARGO:

RIGHT FRONT	746 LBS.	RIGHT REAR	573 LBS.
LEFT FRONT	769 LBS.	LEFT REAR	628 LBS.
TOTAL FRONT WEIGHT	1515 LBS.	(55.8% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1201 LBS.	(44.2% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	2716 LBS.	(0.7% UNDER TARGET WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE TRUNK AREA: 22 LBS.

COMPONENTS REMOVED TO MEET TARGET WEIGHT: Rear bumper

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	LF 24.4	;RF 24.6	;LR 24.2	;RR 24.4
PRE-TEST ATTITUDE:	LF 24.2	;RF 24.6	;LR 23.1	;RR 23.2
POST-TEST ATTITUDE:	LF 26.1	;RF 25.5	;LR 22.1	;RR 22.7

WHEELBASE: 97.2 INCHES

MAXIMUM WIDTH: 65.2 INCHES

CG = 43.0 INCHES REARWARD OF FRONT WHEEL CENTERLINE

TABLE 3

TEST CONDITIONS

TEST NUMBER: 870720

DATE OF TEST: July 20, 1987

TIME OF TEST: 1342

TYPE OF TEST: Frontal Barrier

IMPACT ANGLE: 0 °

AMBIENT TEMPERATURE AT IMPACT AREA:

92°F

TEMPERATURE IN OCCUPANT COMPARTMENT:

74°F

IMPACT VELOCITY: PRIMARY = 29.5 MPH

SECONDARY = 29.5 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 155.2 ;C 156.4 ;R 154.9

POST-TEST: L 137.5 ;C 137.3 ;R 137.6

TOTAL CRUSH: L 17.7 ;C 19.1 ;R 17.3

FOR FRONTAL IMPACTS, DISTANCE FROM FRONT OF TEST VEHICLE TO BARRIER AFTER
IMPACT: L: 4.5 ;C: 3.9 ;R: 3.4; AVG: 3.9

FIGURE 1

VEHICLE ACCELEROMETER LOCATIONS

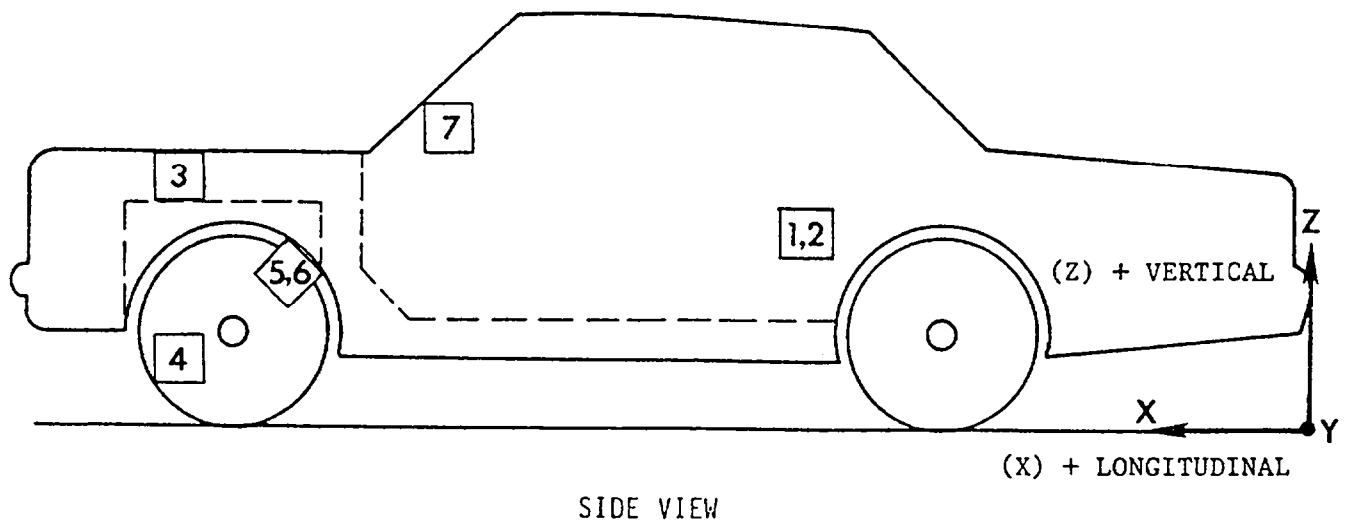
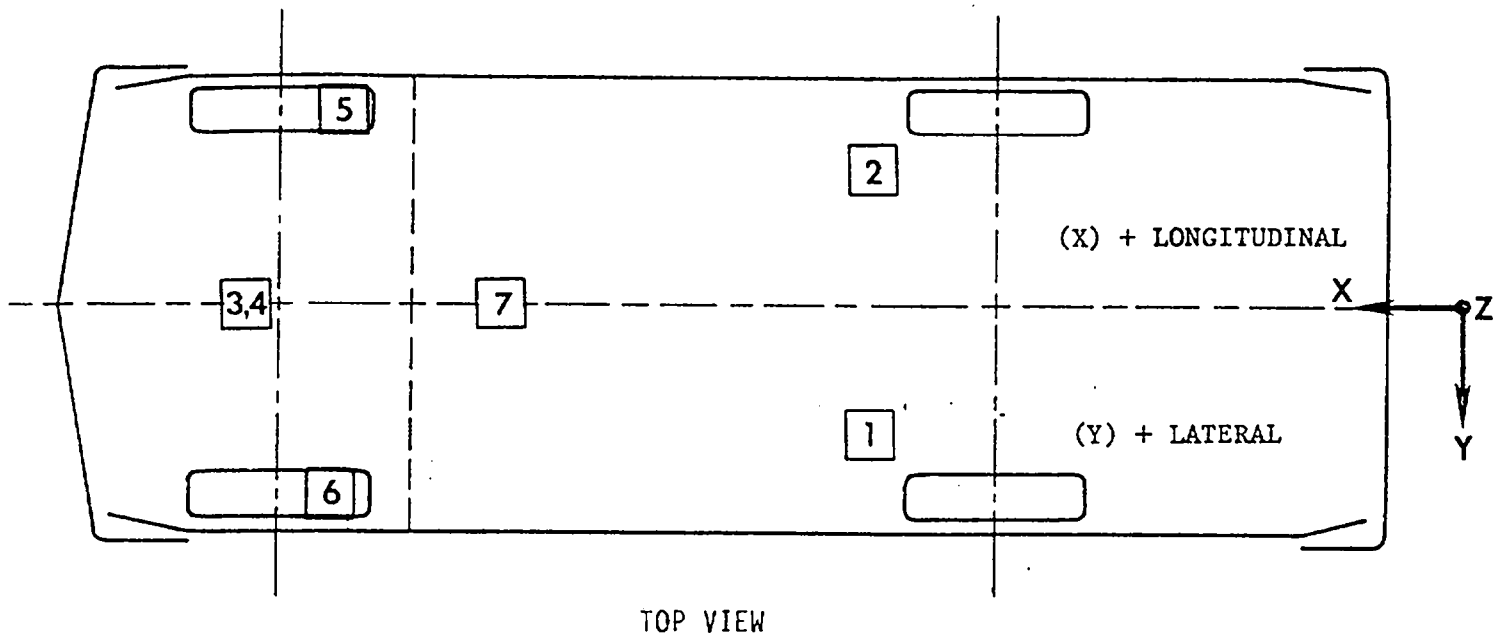


TABLE 4

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: 55.0	15.8	16.9				
	LONGITUDINAL	POST: 55.5	15.8	18.0	4.0	106.9	33.8	60.1
2	REAR SEAT X-MEMBER AT RIGHT SIDE	PRE: 55.0	-15.8	16.9				
	LONGITUDINAL	POST: 55.8	-15.9	17.4	4.6	117.5	35.0	47.0
3	TOP OF ENGINE BLOCK	PRE: 132.9	2.8	27.2				
	LONGITUDINAL	POST: 128.9	2.8	26.4	21.2	49.9	120.0	34.6
4	BOTTOM OF ENGINE BLOCK	PRE: 134.9	-3.2	6.8				
	LONGITUDINAL	POST: 127.2	-3.5	5.8	41.7	41.8	80.4	31.2
5	BRAKE CALIPER AT RIGHT SIDE	PRE: 132.5	-24.1	10.8				
	LONGITUDINAL	POST: 129.0	-25.0	8.1	51.0	67.1	80.5	54.2
6	BRAKE CALIPER AT LEFT SIDE	PRE: 132.6	24.1	10.8				
	LONGITUDINAL	POST: 129.8	24.2	10.6	12.3	61.6	71.0	47.9
7	DASH PANEL	PRE: 101.5	-0.8	39.6				
	LONGITUDINAL	POST: 103.8	-0.6	41.6	20.9	32.1	42.4	17.1

**

POSITIVENEGATIVE

*X + Forward from rear bumper
 Y + Left from vehicle centerline
 Z + Up from ground

LONGITUDINAL:
 LATERAL:
 VERTICAL:

FORWARD
 LEFTWARD
 UPWARD

REARWARD
 RIGHTWARD
 DOWNWARD

DISTANCE MEASUREMENTS IN INCHES

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

VEHICLE MAKE/MODEL/BODY STYLE: Volkswagen/Golf
VEH. NHTSA NO.: CH5801; VIN: 1VWFA9177HV028753
MODEL YEAR: 1987; BUILD DATE: 12/86; TEST DATE 7/20/87
VEH. SIZE CATEGORY: Compact; TEST WEIGHT: 2716
VEH. WHEELBASE: 97.2 FRONT OVERHANG: 30.5 OVERALL WIDTH: 65.2

COLLISION DEFORMATION CLASSIFICATION (CDC) CODE: 12FDEW2

F (Frontal)

CRUSH DEPTH DIMENSIONS:

C1 =	<u>17.7</u>	inches
C2 =	<u>18.5</u>	inches
C3 =	<u>18.8</u>	inches
C4 =	<u>19.1</u>	inches
C5 =	<u>18.3</u>	inches
C6 =	<u>17.3</u>	inches

MIDPOINT OF DAMAGE: D = Vehicle Centerline (Longitudinal)

LENGTH OF DAMAGED REGION: L = 55.5 inches

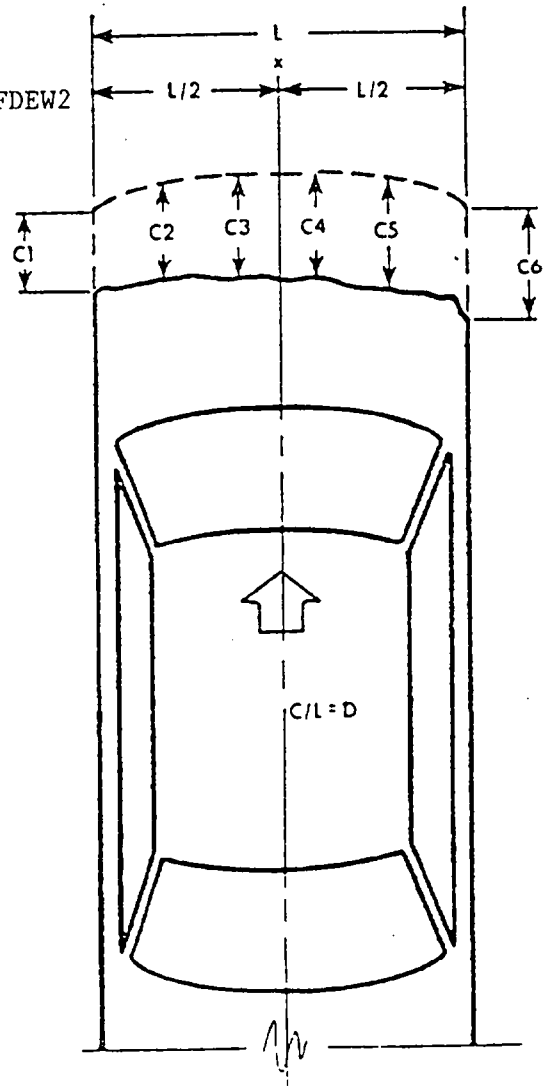
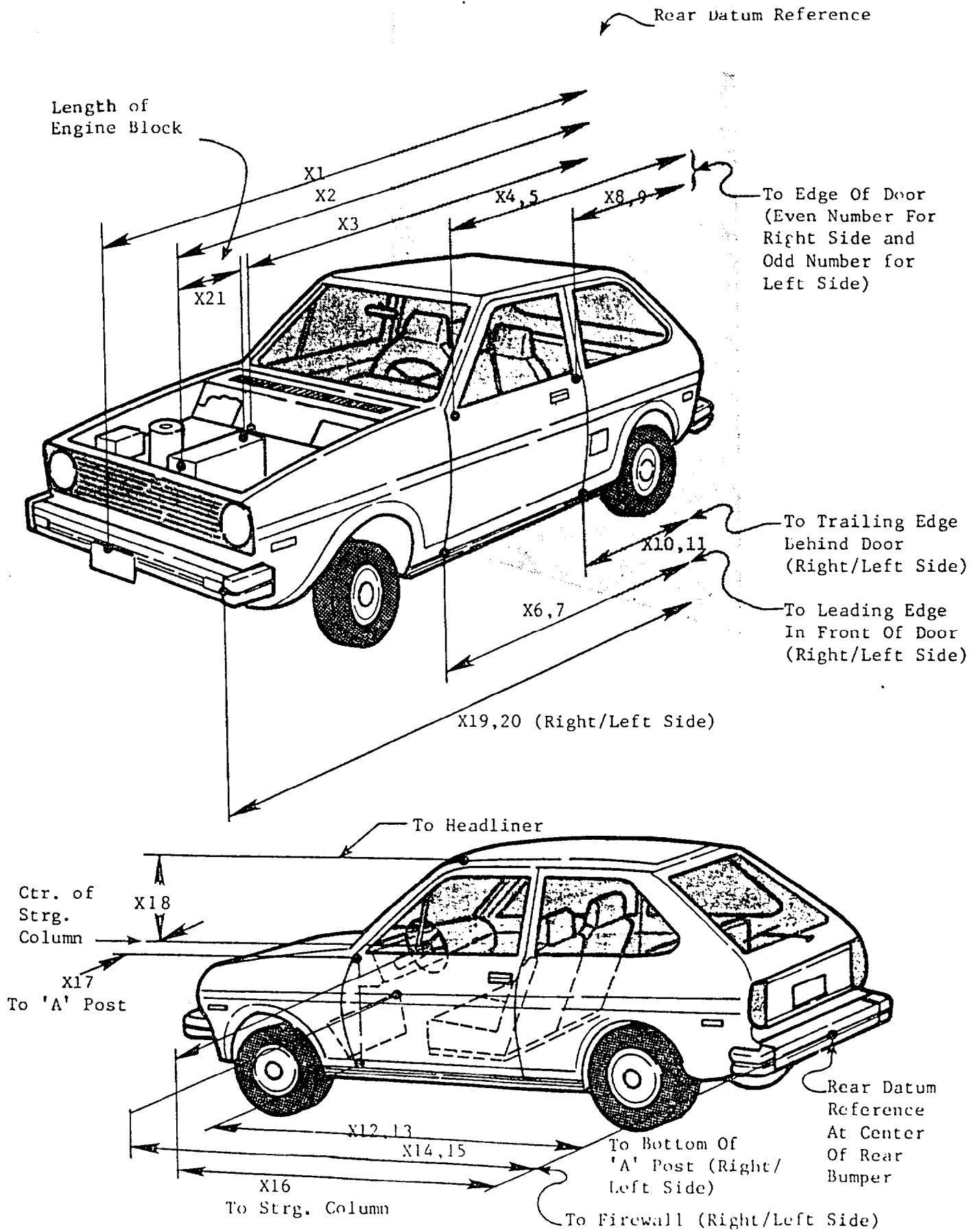


FIGURE 3

PRE-TEST AND POST-TEST MEASUREMENT POINTS



IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL Volkswagen Golf

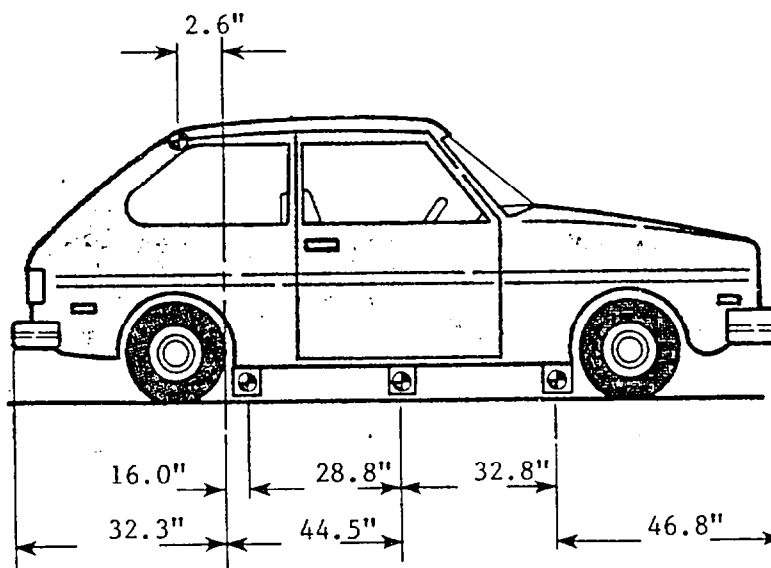
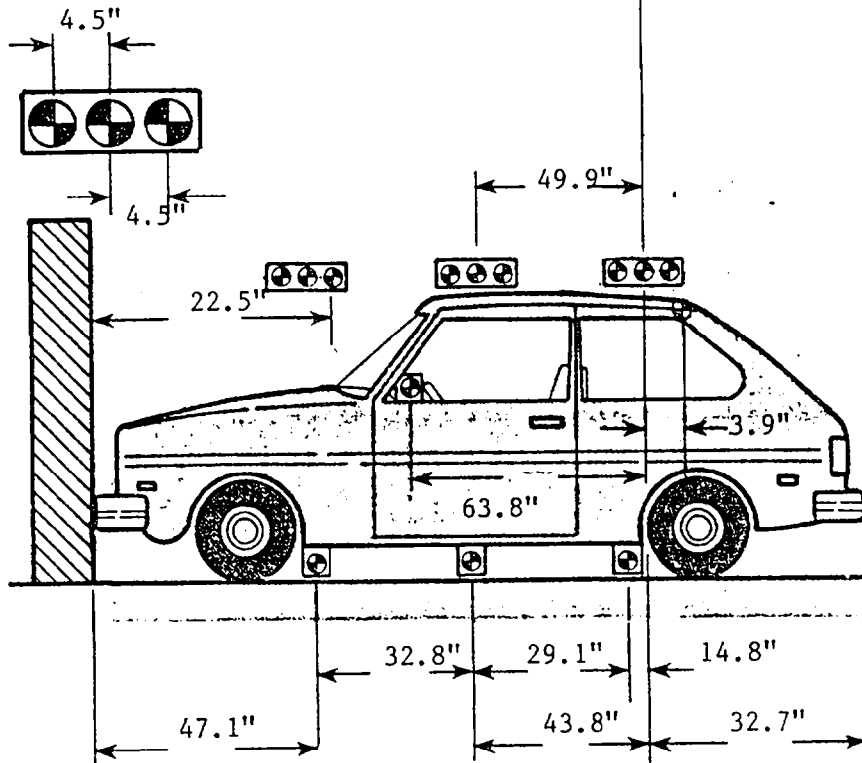
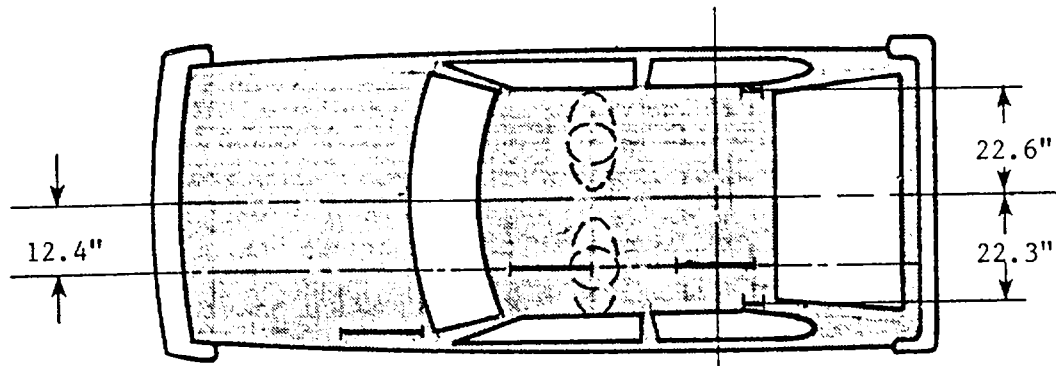
TEST NUMBER 870720

		DIMENSIONS IN INCHES		
NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X 1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	156.4	137.3	19.1
X 2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	131.4	127.3	4.1
X 3	REAR SURFACE OF VEHICLE TO FIREWALL	116.4	114.8	1.6
X 4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	106.1	105.6	0.5
X 5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	105.8	105.8	0.0
X 6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	106.1	105.4	0.7
X 7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	106.0	105.5	0.5
X 8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	67.1	66.8	0.3
X 9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	67.1	67.0	0.1
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	67.8	66.9	0.9
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE ON LEFT DOOR	67.8	67.1	0.7
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	105.3	104.9	0.4
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	105.2	104.9	0.3
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	120.2	119.1	1.1
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	120.2	119.4	0.8
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	90.3	89.8	0.5
X17	CENTER OF STEERING COLUMN TO "A" POST	15.8	17.8	-2.0

IMPACTED VEHICLE MEASUREMENTS CONTD

VEHICLE MAKE/MODEL Volkswagen Golf		TEST NUMBER 870720	DIMENSIONS IN INCHES		
NO.	TYPE OF MEASUREMENT		PRE-TEST	POST-TEST	DIFF.
X18	REAR OF WINDSHIELD HEADER TO STEERING WHEEL CENTER		17.5	18.2	-0.7
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER		154.9	137.6	17.3
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER		155.2	137.5	17.7
X21	LENGTH OF ENGINE BLOCK		14.8	14.8	0.0

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 vehicle, a 1987 Volkswagen Golf 5-door hatchback, NHTSA No. CH5801, appeared to comply with the requirements of FMVSS Nos, 208, 212, 219 (partial), and 301.

The driver's Head Injury Criteria (HIC) was 883. The driver's maximum chest deceleration over three milliseconds was 43.9 g. The driver's right and left femur loads were 847 pounds and 1291 pounds, respectively.

The right front passenger's Head Injury Criteria (HIC) was 406. The right front passenger's maximum chest deceleration over three milliseconds was 40.7 g. The right front passenger's right and left femur loads were 1066 pounds and 1222 pounds, respectively.

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 portion of the static rollover test.

TABLE 6

DUMMY INJURY CRITERIA

MAXIMUM ACCELERATION ('G')

	<u>HEAD</u>				<u>CHEST</u>			
	X	Y	Z	R	X	Y	Z	R*
DRIVER	80.9	16.9	-65.7	84.7	-44.1	7.6	-8.5	43.9
PASSENGER	-22.6	-16.6	-57.6	59.2	-42.9	-12.3	8.6	40.7

MAXIMUM FORCE-FEMUR LOAD (LBS)

	<u>RIGHT FEMUR</u>	<u>LEFT FEMUR</u>
DRIVER	847	1291
PASSENGER	1066	1222

HEAD INJURY CRITERIA**

	HIC	TIME t_1	TIME t_2
		(MSEC)	(MSEC)
DRIVER	883	74.5	110.5
PASSENGER	406	71.1	107.1

*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 instrument panel. The driver's head and chest rotated forward, contacting the steering wheel as the dummy's chest was restrained by the two-point passive belt. The dummy rebounded into the seat back and the dummy's head rotated rearward into the head restraint. The dummy came to rest seated upright in the driver's seat, restrained by the two-point passive belt.

RIGHT FRONT PASSENGER DUMMY

Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the instrument panel. The passenger's head rotated forward and the passenger's torso rotated to the right as the dummy's chest was restrained by the two-point passive belt. The dummy rebounded into the seatback and the dummy's head rotated rearward into the head restraint. The dummy came to rest seated in the right front passenger's seat, restrained by the two-point passive belt.

VISIBLE DUMMY CONTACT POINTS:

	DRIVER	PASSENGER
Head	<u>Steering wheel rim</u>	<u>None</u>
Chest	<u>Steering wheel</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>Difficult, tools required</u>	<u>Difficult, no tools required</u>
Rear	<u>Difficult, no tools required</u>	<u>Difficult, no tools required</u>

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
Front	<u>None</u>	<u>Passenger's seat shifted forward one notch</u>
Rear	<u>NA</u>	<u>NA</u>

GLAZING DAMAGE:

Crack on right side of windshield.

OTHER NOTABLE IMPACT EFFECTS:

None

30 MPH FRONTAL BARRIER IMPACT TEST

PRE-IMPACT DATA:

Make/Model: Volkswagen/Golf
Body Style: 5-door Hatchback Model Year: 1987
NETSA No.: CH5801 Color: White

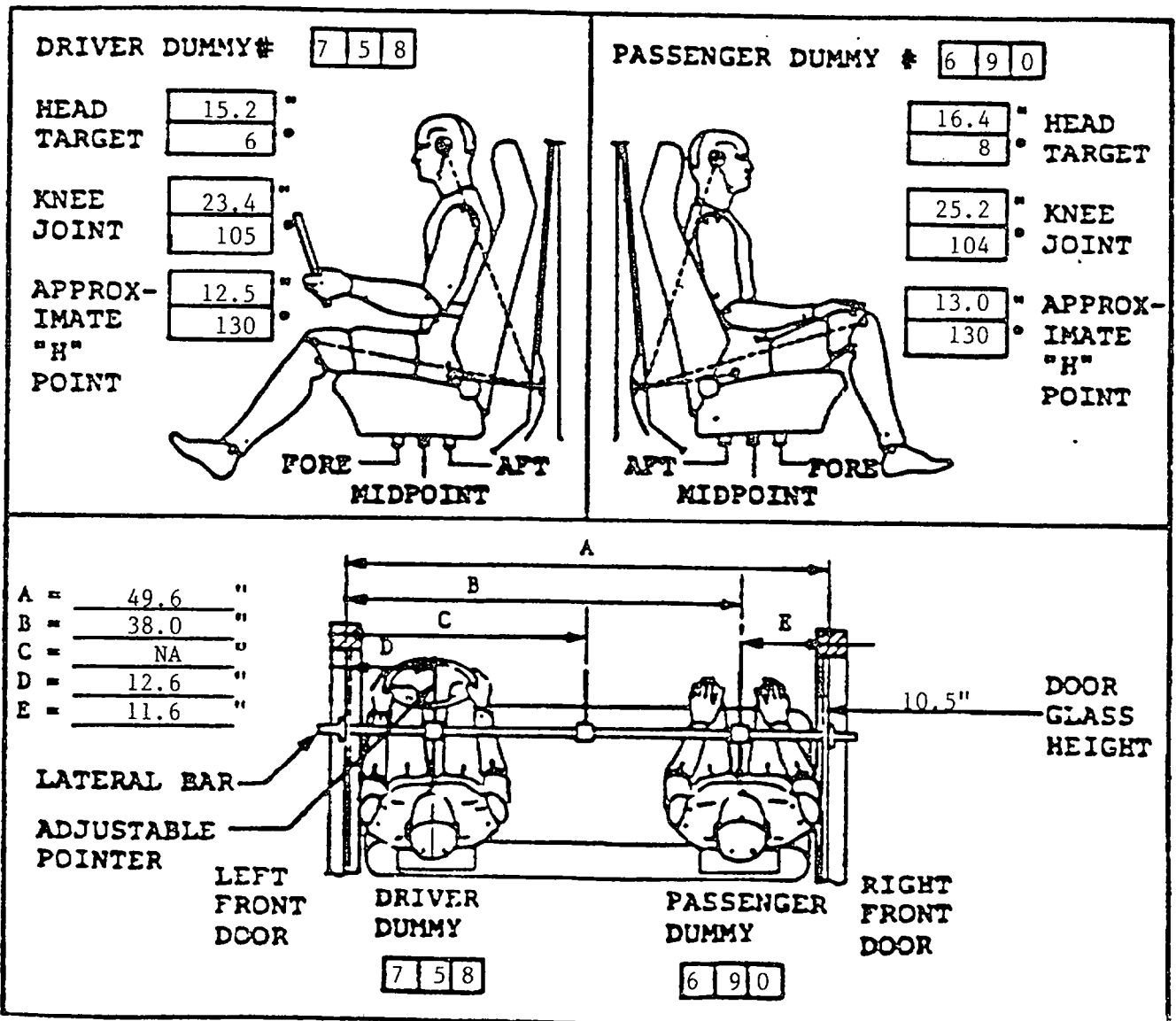
DATA FROM CERTIFICATION LABEL:

Vehicle Manufacturer: Volkswagen of America, Inc.
Date of Manufacture: 12/86; VIN: 1VWFA9177HV028753
GVWR: 3175 lb; GAWR: Front = 1800 lb; Rear = 1540 lb

POST-IMPACT DATA:

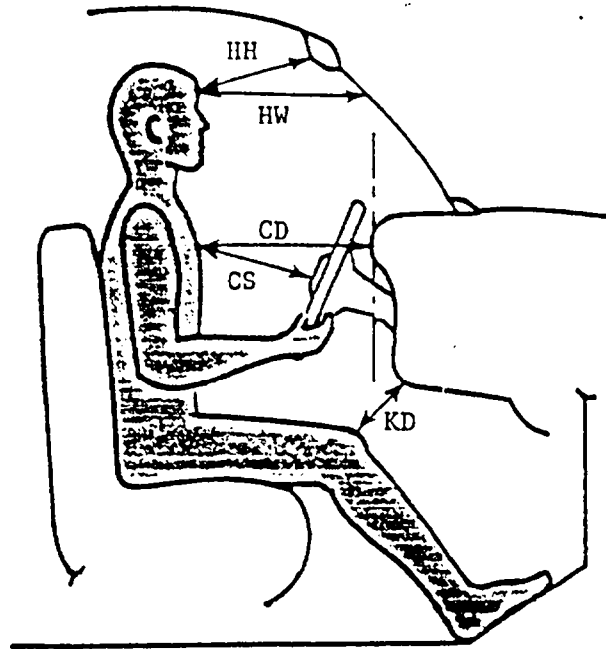
Date of Test: 7/20/87 Time: 1342 Temperature 92 °F
Required Impact Velocity Range: 28.9 to 29.9 mph
Impact Velocity: Primary = 29.5 mph. Secondary = 29.5 mph
Seat Type: Bucket Adjuster Type: Manual
Bucket Seat Back Type: Manual adjustable

Technicians:



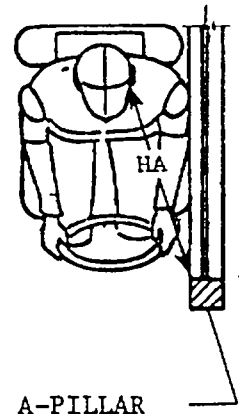
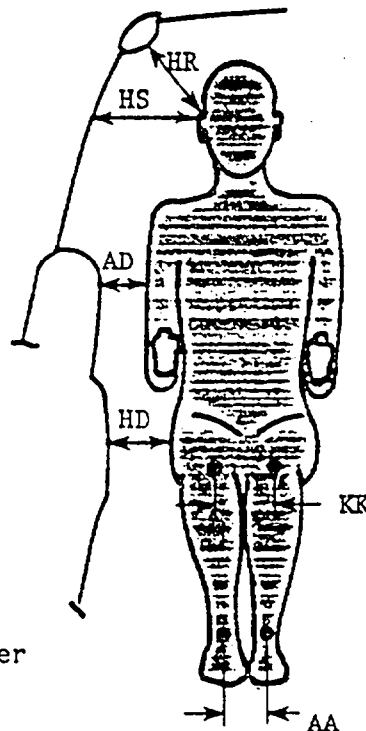
DRIVER 758 PASSENGER 690

HH	18.7	18.6
HW	22.8	22.6
CD	24.4	22.9
CS	15.8	NA
KDL	4.7	3.6
KDR	4.8	3.9
TA	25°	25°
SA	27°	27°
HA	25.8	24.9



DRIVER 758 PASSENGER 690

HR	6.6	6.1
HS	9.5	8.8
AD	4.4	4.4
HD	5.7	6.1
KK	10.2	7.5
AA	12.4	7.6



Knee outer bolt head to outer bolt head spacing:

Driver = 14.5

Passenger = 11.8

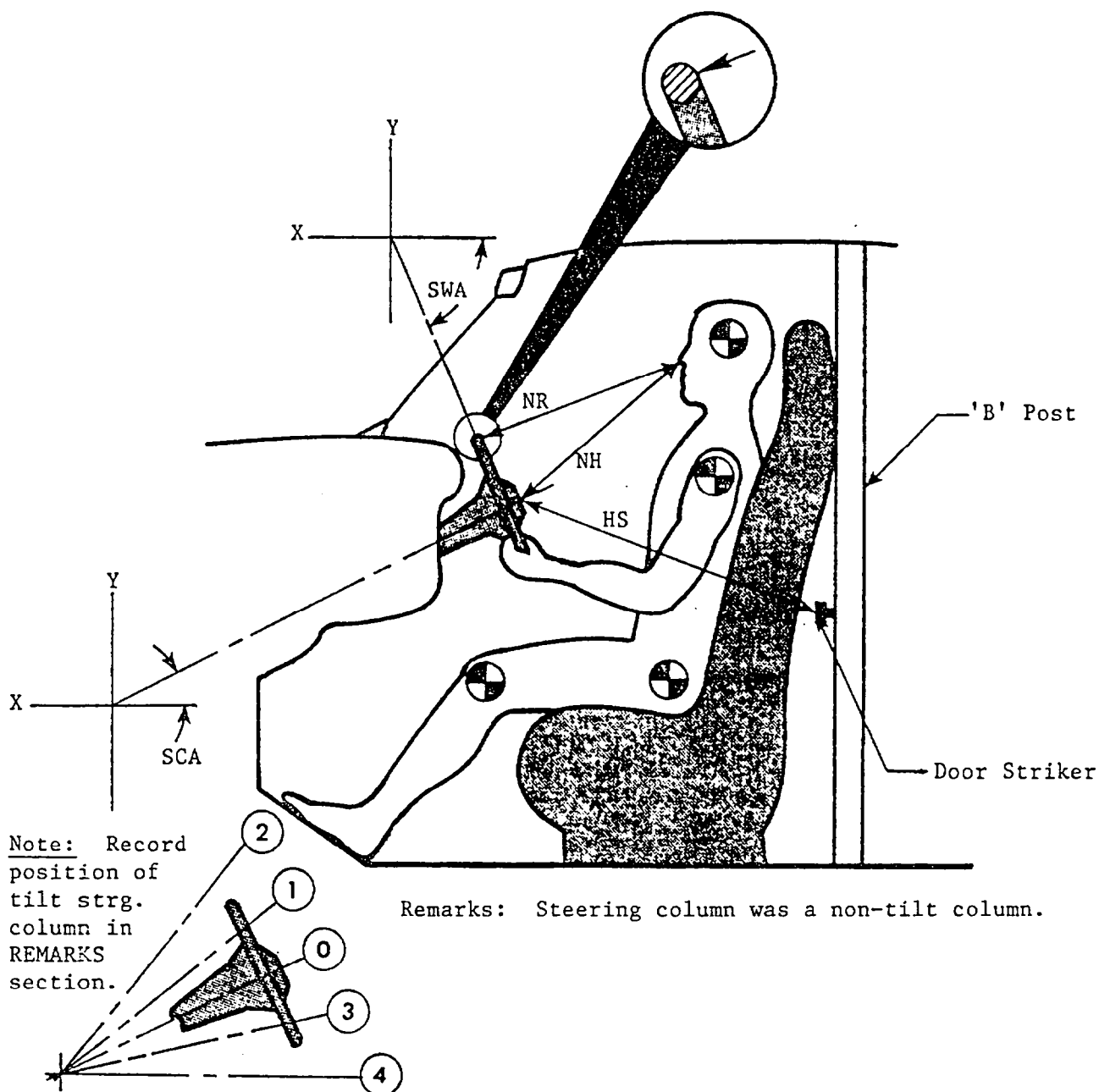
HH = Head to Windshield Header
 HW = Head to Windshield
 CD = Chest to Dash
 CS = Chest to Steering Wheel
 KD = Knee to Dash
 TA = Torso Angle
 SA = Seat Back Angle

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.

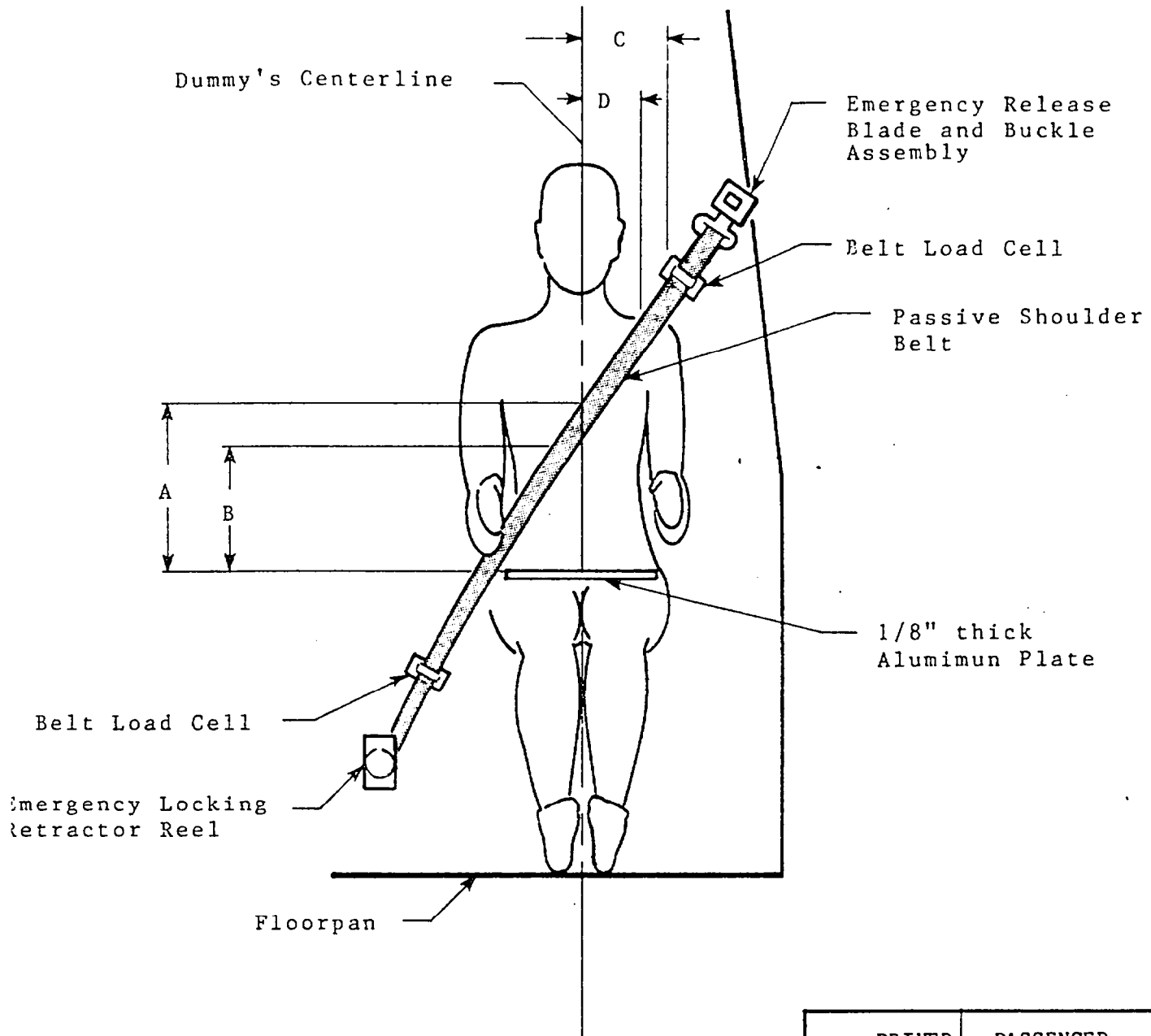
ALL DISTANCE MEASUREMENTS IN INCHES

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.	20.0
NH - Distance from tip of dummy's nose to center of steering column hub.	20.3
HS - Distance from center of steering column hub to the forward surface of the door lock striker pin.	22.8
SCA - Angle of steering column relative to the horizontal X axis.	22°
SWA - Angle of steering wheel relative to the horizontal X axis.	65°

SEAT BELT POSITIONING DATA



	DRIVER DUMMY	PASSENGER DUMMY
A - Top surface of alum. plate to belt upper edge (in)	12.1	12.5
B - Top surface of alum. plate to belt lower edge (in)	9.1	9.6
C - Dummy centerline to outer edge of belt at chest flesh top (in)	5.8	5.7
D - Dummy centerline to inner edge of belt at chest flesh top (in)	3.0	3.2

TABLE 7

FMVSS 208 COMFORT AND CONVENIENCE DATA

VEHICLE VIN NO: 1VWFA9177HV028753 NHTSA NO: CH5801
MAKE: Volkswagen MODEL: Golf
VEHICLE CERTIFICATION DATE: 12/86 VEHICLE TYPE: 5-door Hatchback
FRONT OUTBOARD SEATING POSITIONS SEAT BELT TYPE:
(check one): X Automatic belts
 Type 2 lap/shoulder belts
 Other

CONVENIENCE HOOKS: Note: Vehicle's restraint system did 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:

.2 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 = 9 sec.

Duration of reminder light operation = continuous 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 contain 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. Note: Vehicle did not contain a crash-deployed occupant protection system.

TABLE 11

SUMMARY OF FMVSS NO. 301 DATA

PRE-IMPACT DATA

MAKE/MODEL: Volkswagen Golf

BODY STYLE: 4-door hatchback

MODEL YEAR: 1987

NHTSA NO.: CH5801

COLOR: white

DATA FROM CERTIFICATION LABEL

VEHICLE MANUFACTURER: Volkswagen of America, Inc

CERTIFICATION DATE: 12/86

VIN: 1VWFA9177HV028753

GWR: 3175 LBS., GAWR: FRONT 1800 LBS., REAR 1540 LBS.

POST-IMPACT DATA

TYPE OF TEST: Frontal Barrier Impact

DATE OF TEST: 7/20/87

TIME: 1342

TEMP: 92°F

REQUIRED IMPACT VELOCITY RANGE: 28.9 MPH TO 29.9 MPH

IMPACT VELOCITY: PRIMARY = 29.5 MPH

SECONDARY = 29.5 MPH

TEST WEIGHT = 2716 LBS., STATIC CRUSH MAX. = 19.1 IN., REBOUND = 3.9 IN.

FUEL SYSTEM DATA

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

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

"USEABLE" CAPACITY*: 14.5 GALLONS (FURNISHED BY CTM)

TEST VOLUME: 13.4 GALLONS (92-94% OF USEABLE)

FUEL SYSTEM CAPACITY (DATA FROM OWNERS MANUAL): 14.5 GALLONS

DETAILS OF FUEL SYSTEM: Fuel tank was located behind rear axle. Fuel
filler neck was on right side. Fuel lines ran along right side of vehicle.

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.:

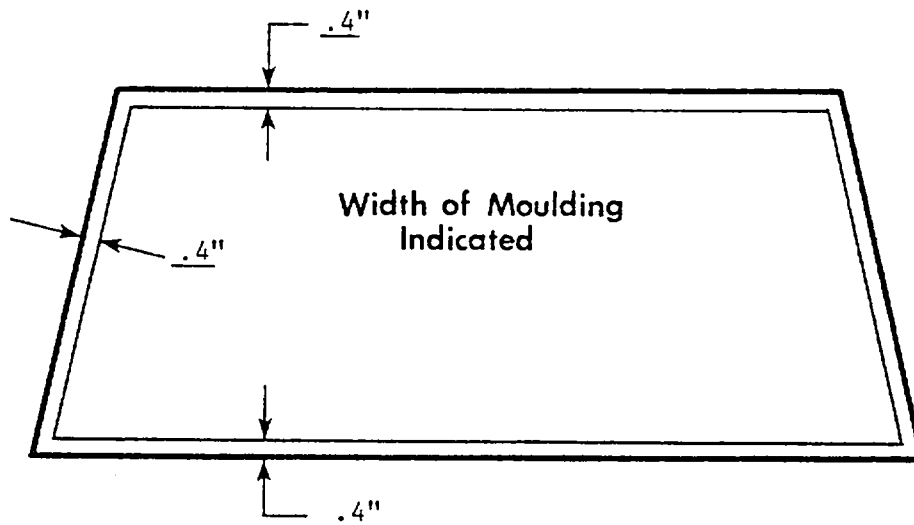
FMVSS 212 REQUIREMENTS: The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of windshield for vehicles equipped with automatic restraint systems for front occupants.

FMVSS 212 TEST DATA:

WINDSHIELD PERIPHERY

	PRE-TEST (in.)	POST-TEST (in.)	PERCENT RETENTION
RIGHT SIDE	71.9	71.9	100%
LEFT SIDE	71.9	71.9	100%
TOTAL	143.8	143.8	100%

AREA OF RETENTION FAILURE:

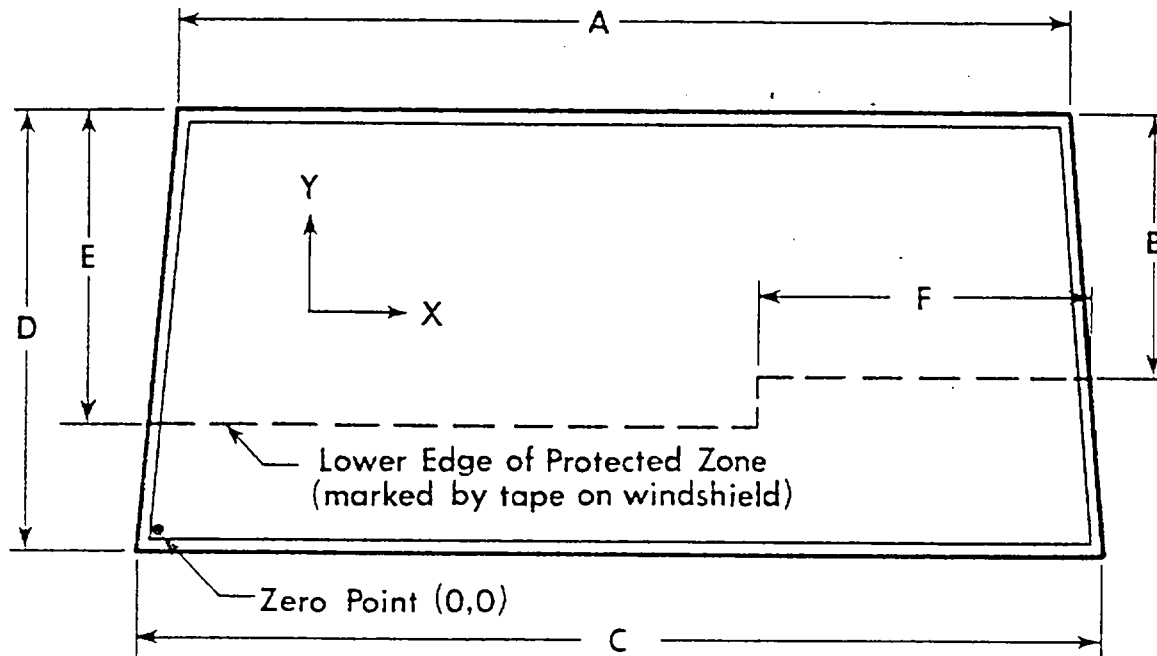


TEST VEHICLE TEMPERATURE: 71°F

FAILURE DETAILS: None

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 = 42.5

C = 54.2

E = 16.8

B = 15.5

D = 25.8

F = 31.5

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

COORDINATES
X Y

None

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

TABLE 12

FUEL SYSTEM INTEGRITY" POST-IMPACT

TEST DATA, FMVSS NO. 301

TEST VEHICLE NHTSA NO.: CH5801 ; TEST DATE: July 20, 1987

VEH. MFR./MAKE/MODEL Volkswagen of America, Inc/Volkswagen/Golf

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 ^o barrier face
first contacting (driver/pass.) side.
 Rear Moving Barrier (30 mph)
 Lateral Moving Barrier (20 mph)

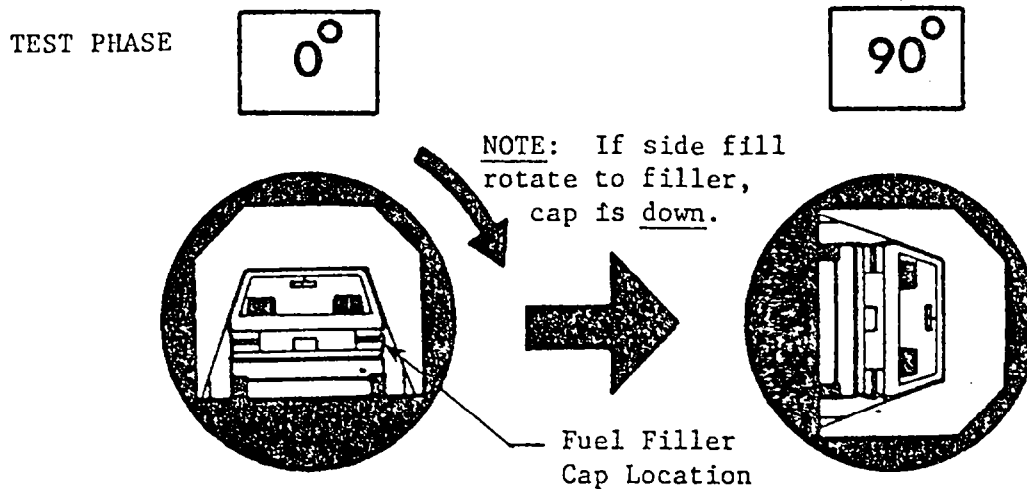
FUEL SPILLAGE MEASUREMENT:

	<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:

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

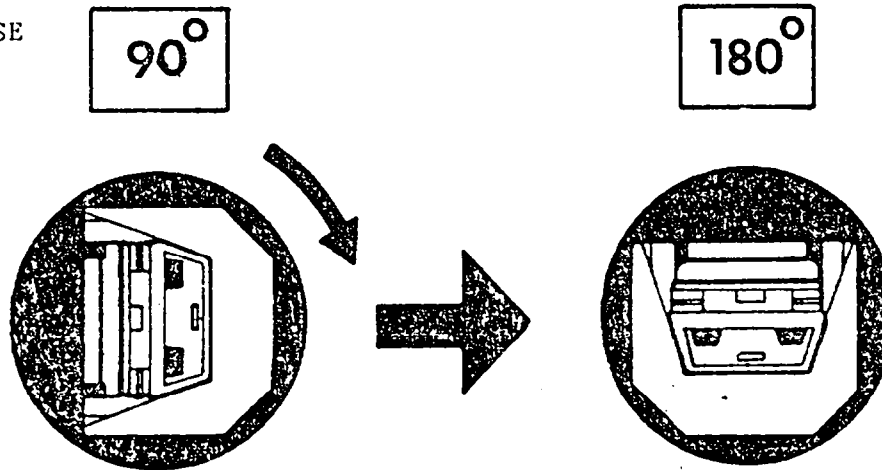
	First 5 Minutes FROM ONSET OF ROTATION	6th Minute	7th Minute
Maximum Allowable Solvent Spillage - -	5 oz.	1 oz.	1 oz.
0 to 90° (filler cap down) - - - - -	0 oz.	0 oz.	0 oz.

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

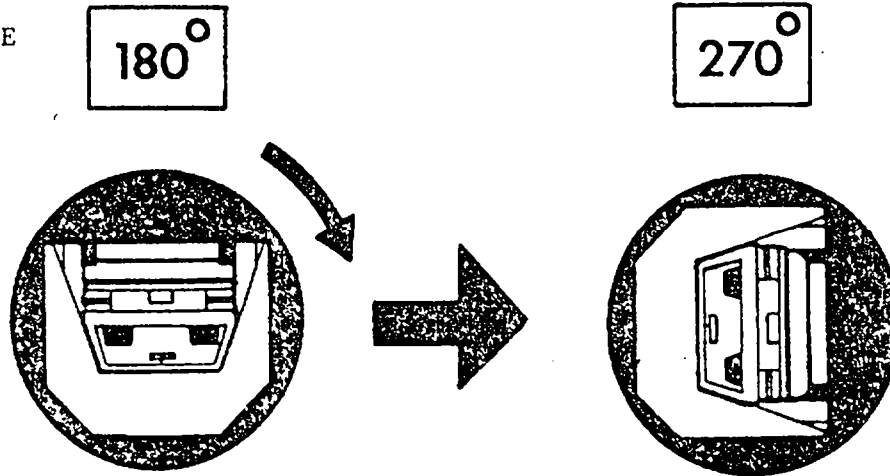
	First 5 Minutes FROM ONSET OF ROTATION	6th Minute	7th Minute
Maximum Allowable Solvent Spillage -	5 oz.	1 oz.	1 oz.
90° to 180° - - - - -	0 oz.	0 oz.	0 oz.

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

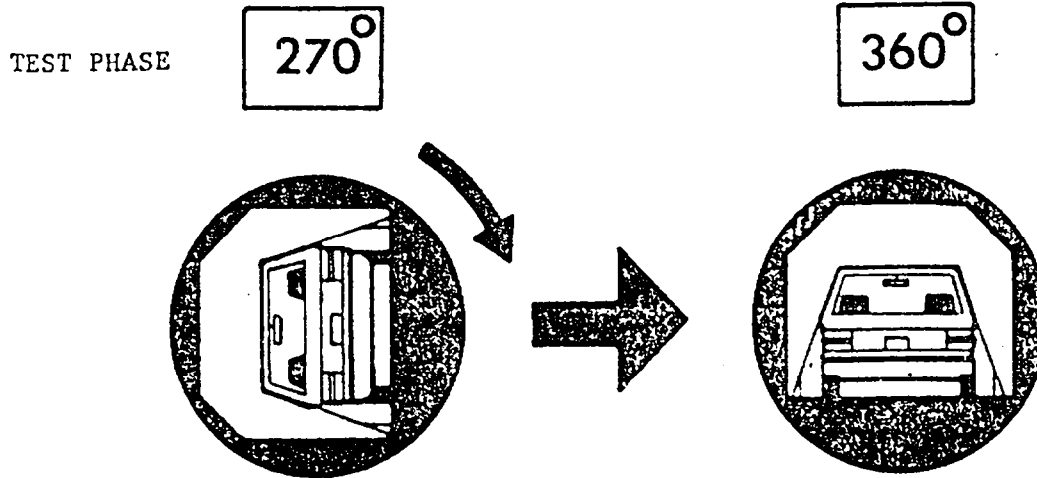
FMVSS 301 REQUIREMENTS

	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

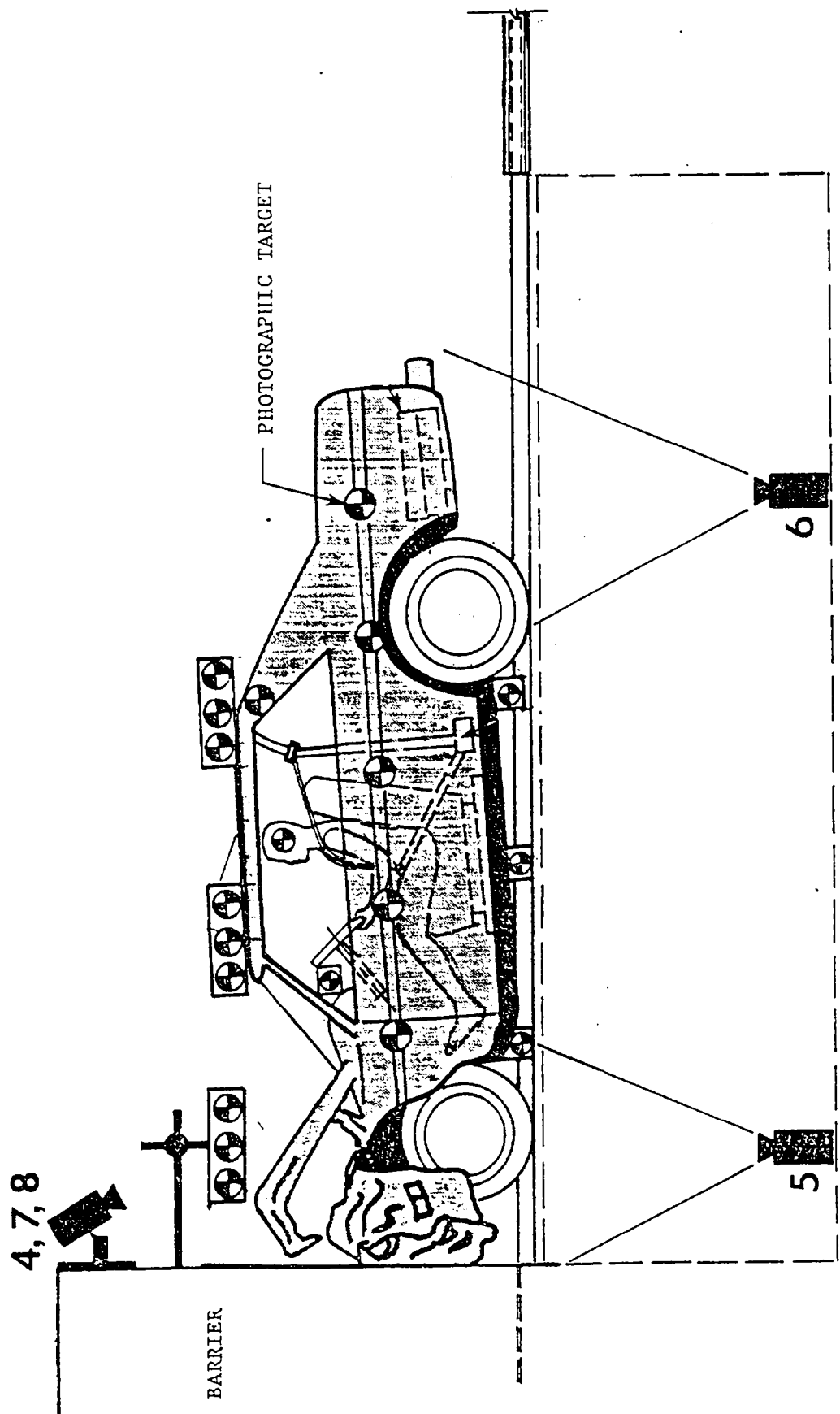


FIGURE 12 CONT'D

CAMERA POSITIONS

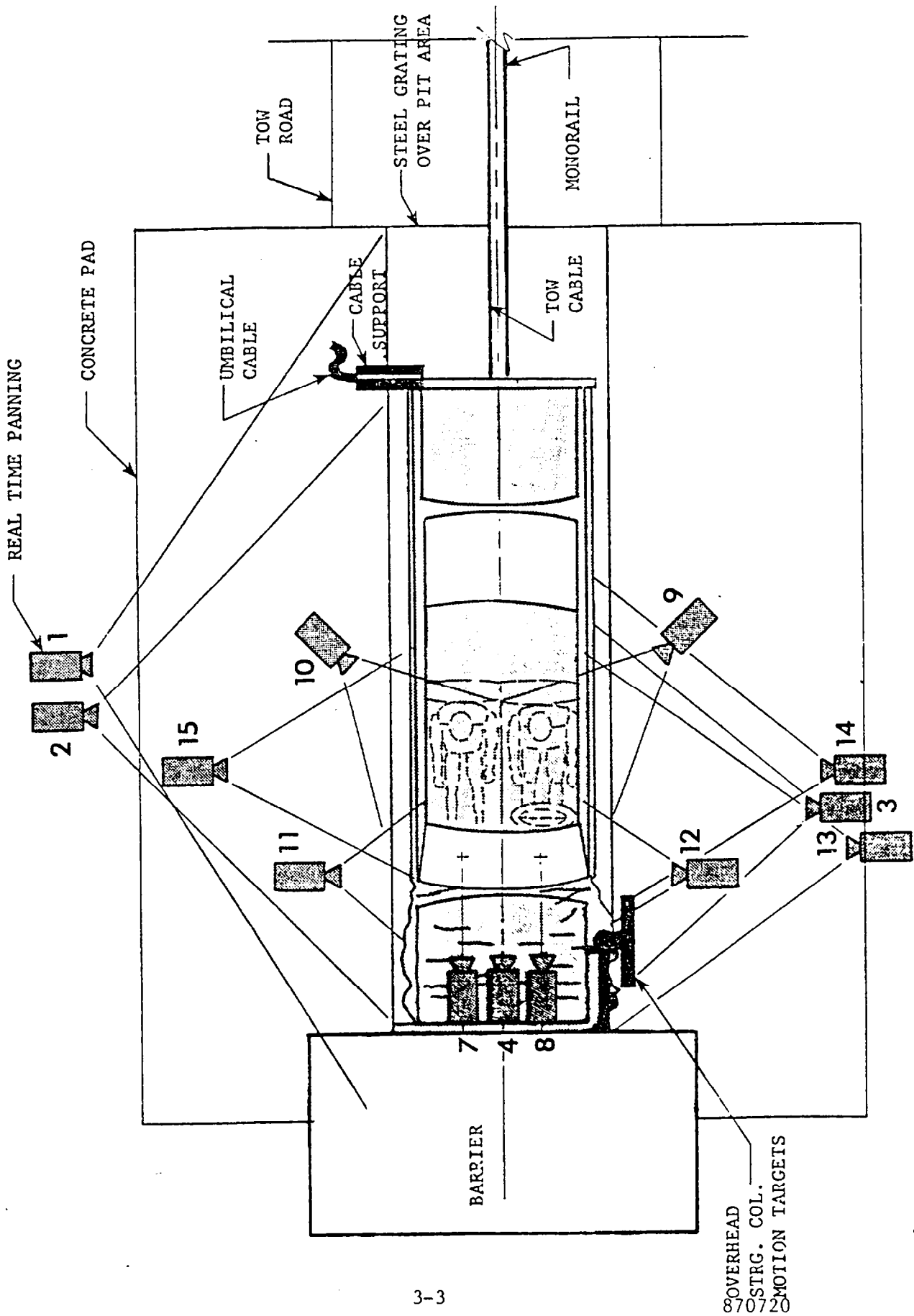


TABLE 13

HIGH SPEED CAMERA LOCATIONS

TEST NO.: 870720 VEHICLE: Volkswagen Golf 5-door Hatchback

CAMERA NO.	VIEW	CAMERA POSITIONS (IN)*			ANGLE ** (DEG)	FILM PLANE TO HEAD TARGET	LENS (MM)	SPEED (FPS)
		X	Y	Z				
1	Real time panning	-142.0	504.0	61.0	NA	NA	16	24
2	Vehicle crush	-81.3	266.4	37.1	-2	NA	13	498
3	Dummy kinematics	-41.5	-295.0	44.0	-4	242.0	25	520
4	Windshield damage	-6.0	0.0	88.0	-45	NA	13	495
5	Crush & fluid spillage	-50.5	0.0	-92.4	90	NA	13	999
6	Fluid spillage	-99.3	0.0	-99.0	90	NA	13	1002
7	Passenger kinematics	-4.5	13.8	93.0	-50	NA	17	499
8	Driver kinematics	-6.8	-14.5	93.0	-50	NA	17	495
9	Driver kinematics	-157.3	-116.0	87.0	-27	122.5	25	498
10	Passenger kinematics	-152.1	116.0	87.0	-26	107.0	25	495
11	Windshield intrusion	-38.1	306.1	44.0	0	NA	50	498
12	Windshield intrusion	-53.0	-309.4	42.3	0	NA	50	499
13	Column movement	-68.0	-286.0	103.0	-14	NA	25	495
14	Column movement	-68.0	-286.0	75.1	-9	NA	25	495
15	Passenger kinematics	-38.8	293.0	45.3	-4	251.0	25	520

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

APPENDIX A

PHOTOGRAPHS CONTINUED

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. PRE-TEST VEHICLE CERTIFICATION LABEL VIEW
42. PRE-TEST VEHICLE TIRE LOAD LABEL VIEW
43. PRE-TEST VEHICLE BALLAST VIEW
44. POST-TEST VEHICLE ON STATIC ROLLOVER MACHINE VIEW



Figure 1. PRE-TEST FRONT VIEW



Figure 2. POST-TEST FRONT VIEW
A-3

870720



Figure 3. PRE-TEST LEFT SIDE VIEW



Figure 4. POST-TEST LEFT SIDE VIEW

A-4

870720



Figure 5. PRE-TEST RIGHT SIDE VIEW



Figure 6. POST-TEST RIGHT SIDE VIEW
A-5

870720



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



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



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

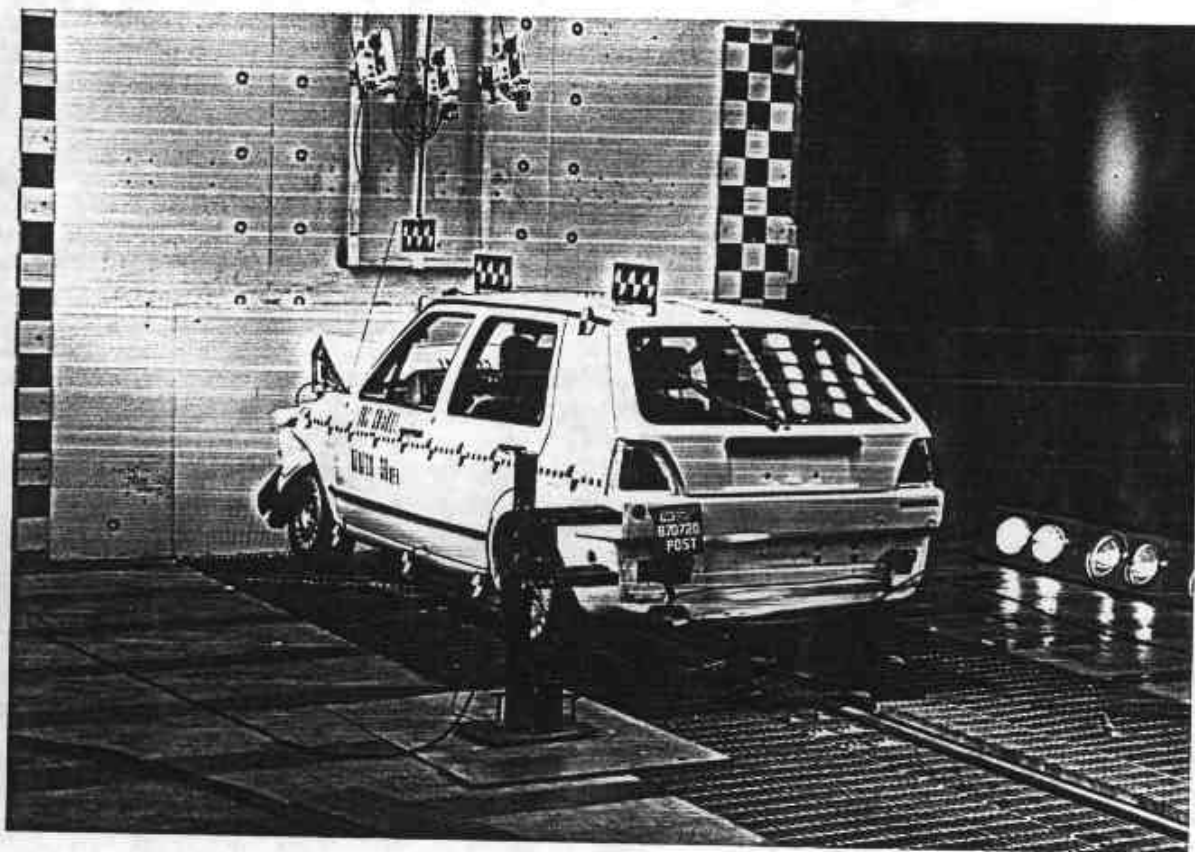


Figure 10. POST-TEST LEFT REAR THREE-QUARTER VIEW
A-6

870720



Figure 11. PRE-TEST REAR VIEW



Figure 12. POST-TEST REAR VIEW



Figure 13. PRE-TEST WINDSHIELD VIEW



Figure 14. POST-TEST WINDSHIELD VIEW
A-R

870720

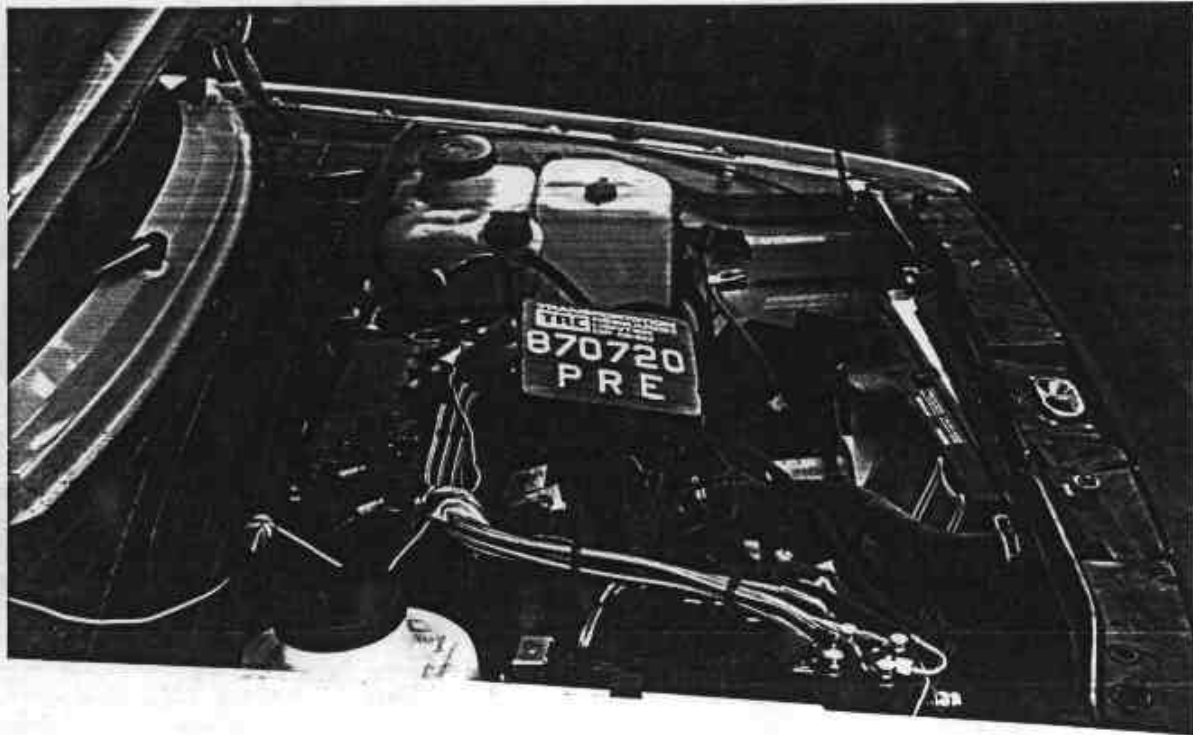


Figure 15. PRE-TEST ENGINE COMPARTMENT VIEW

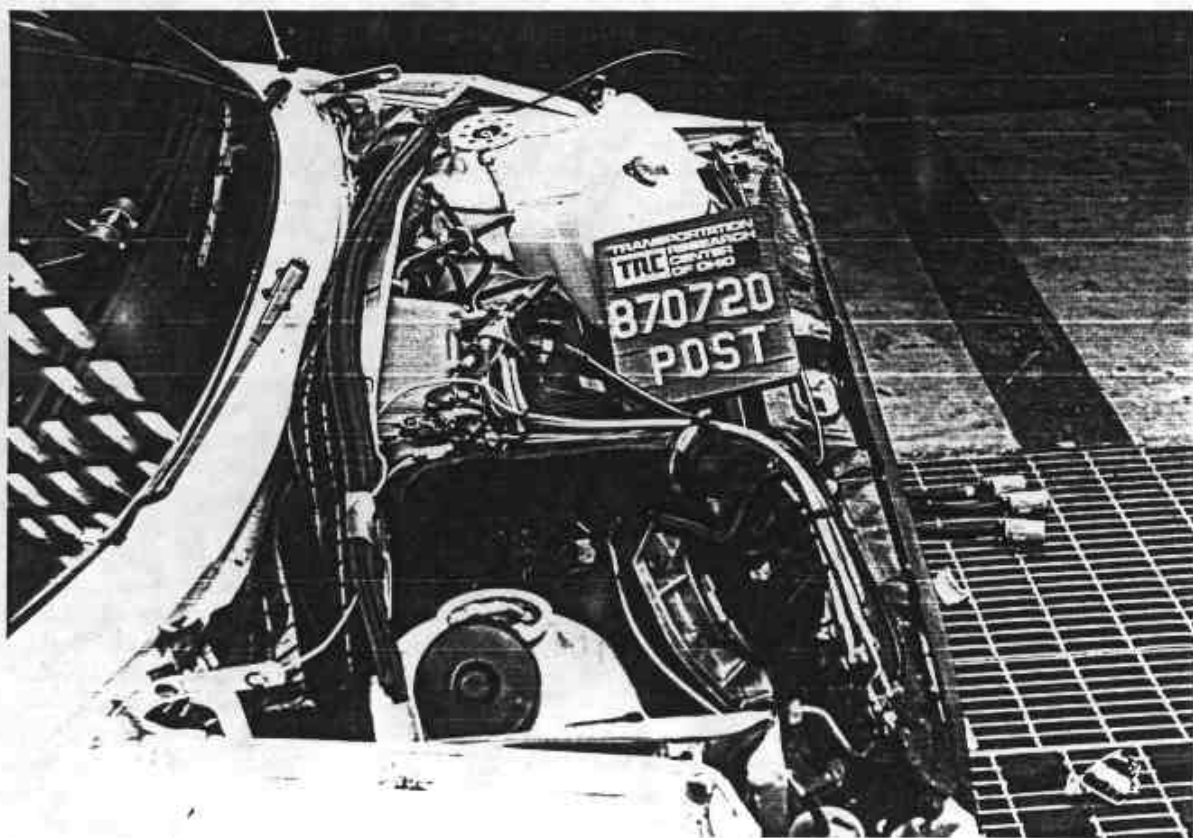


Figure 16. POST-TEST ENGINE COMPARTMENT VIEW

A-9

870720

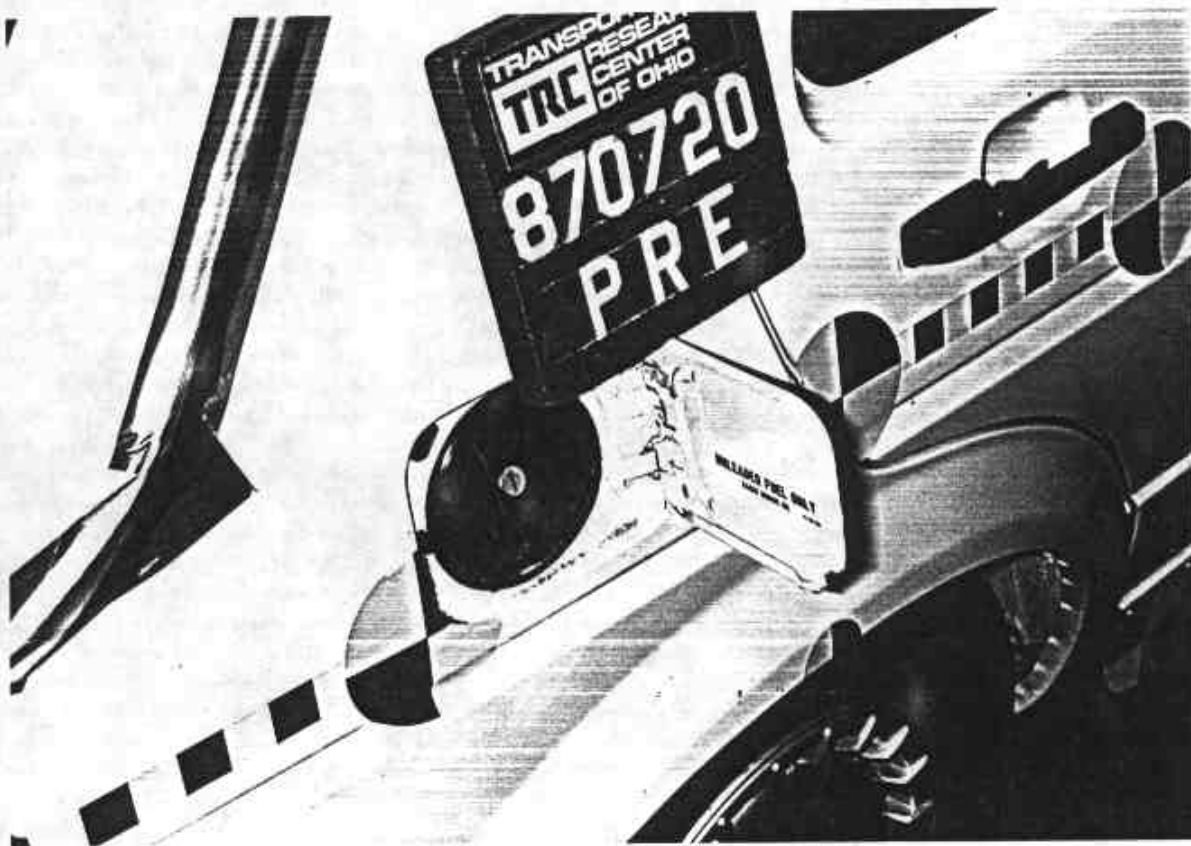


Figure 17. PRE-TEST FUEL FILLER CAP VIEW

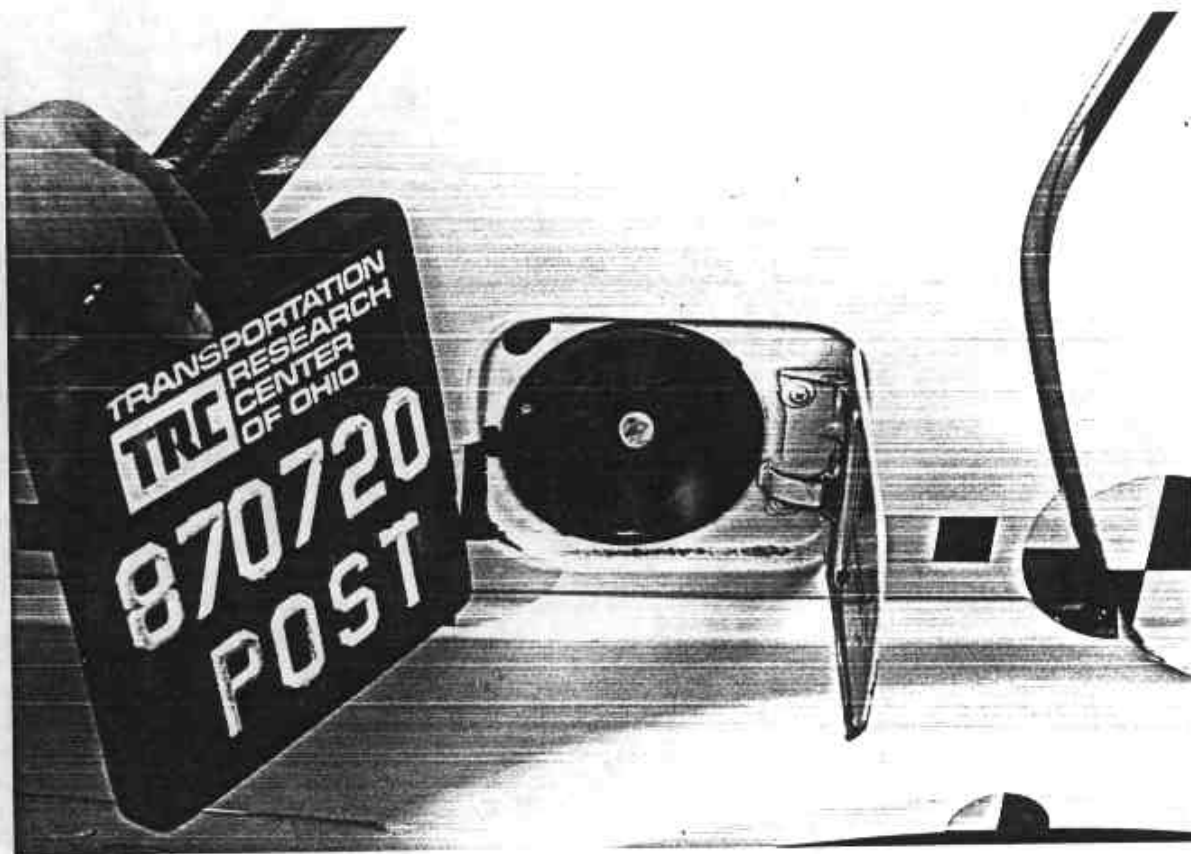


Figure 18. POST-TEST FUEL FILLER CAP VIEW

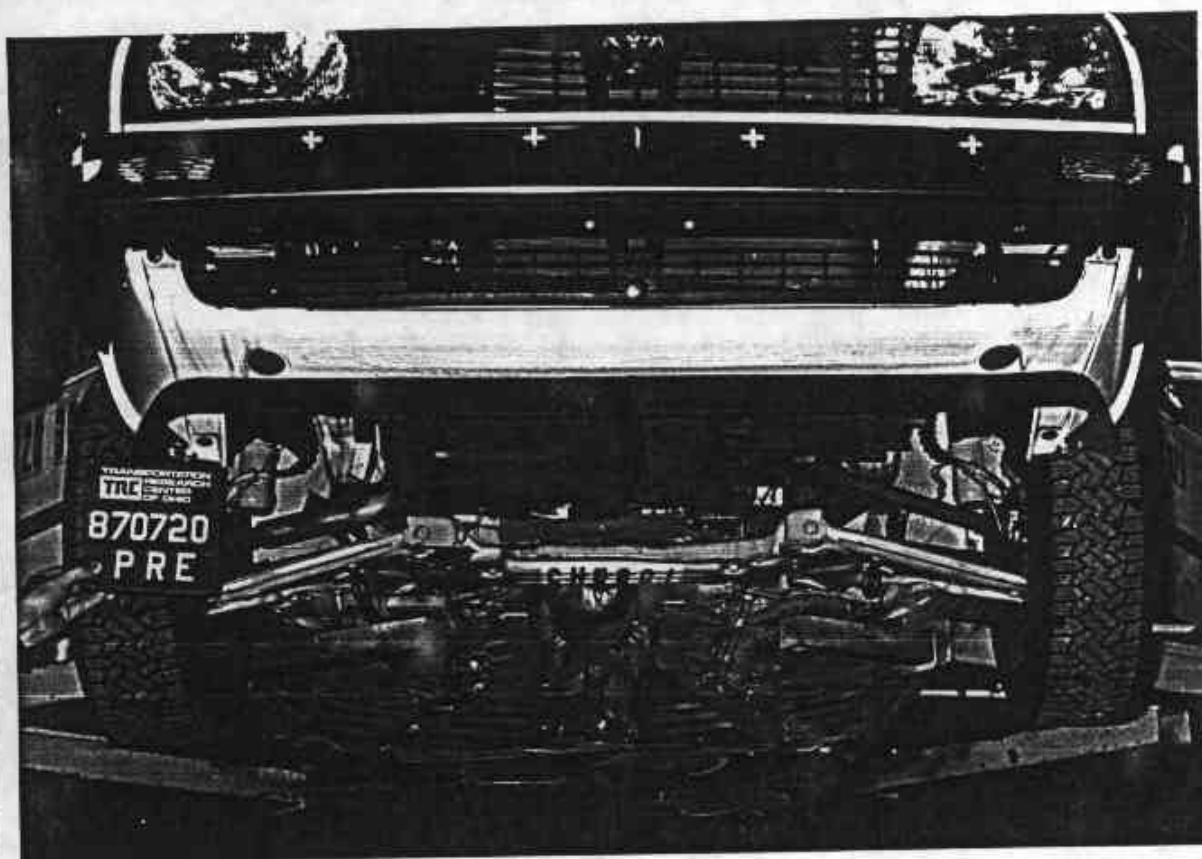


Figure 19. PRE-TEST FRONT UNDERBODY VIEW

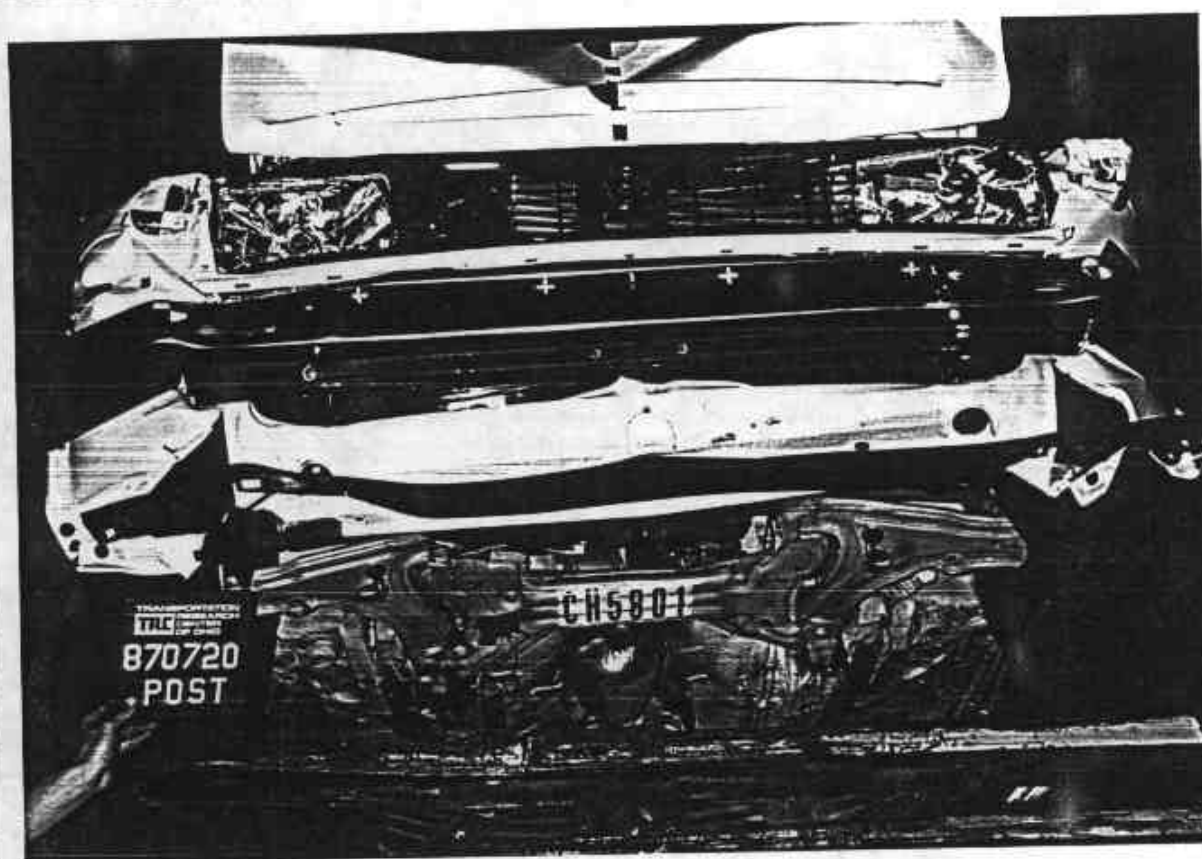


Figure 20. POST-TEST FRONT UNDERBODY VIEW

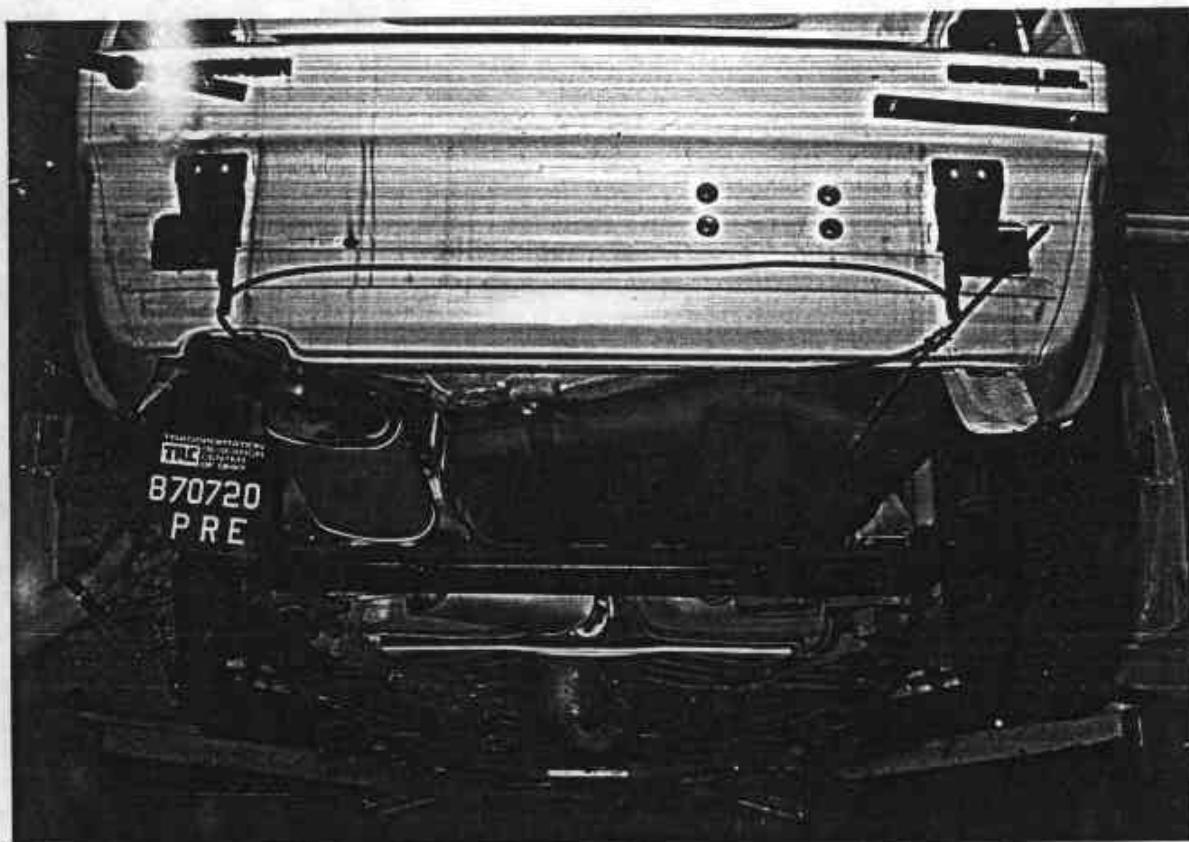


Figure 21. PRE-TEST REAR UNDERBODY VIEW

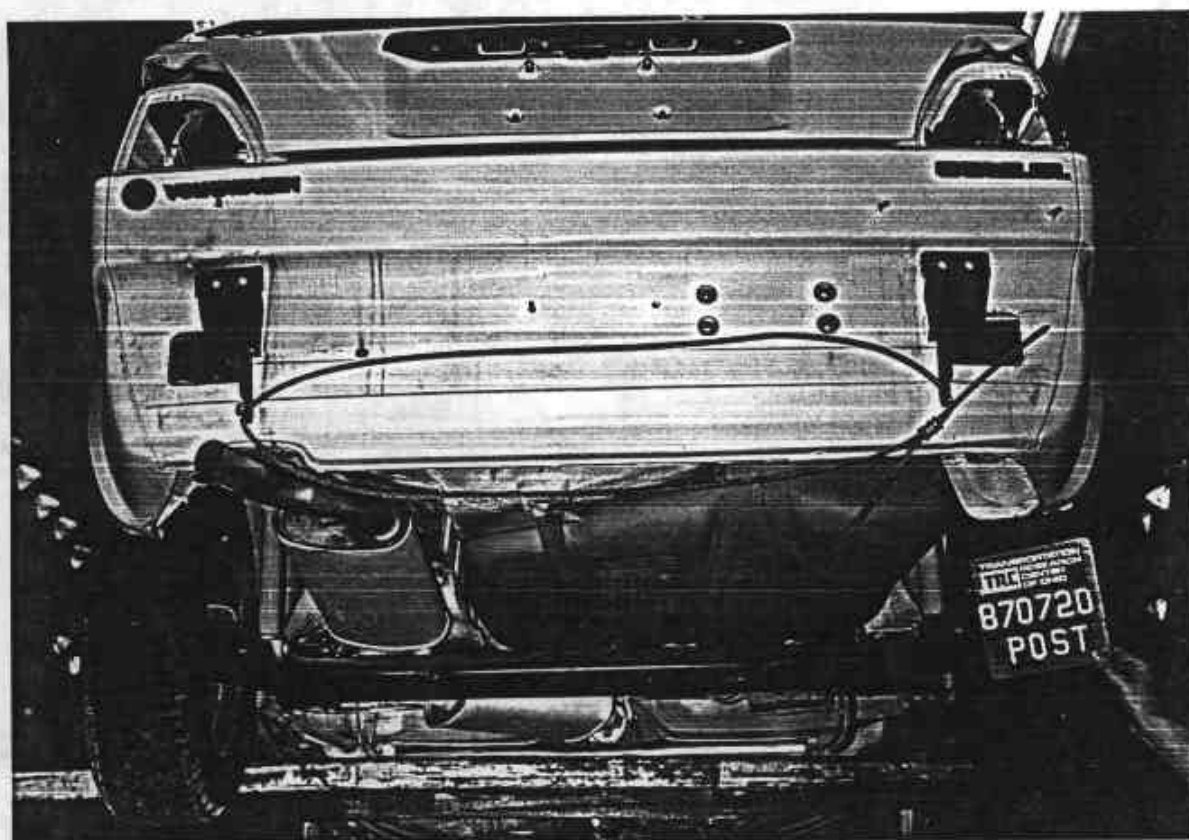


Figure 22. POST-TEST REAR UNDERBODY VIEW

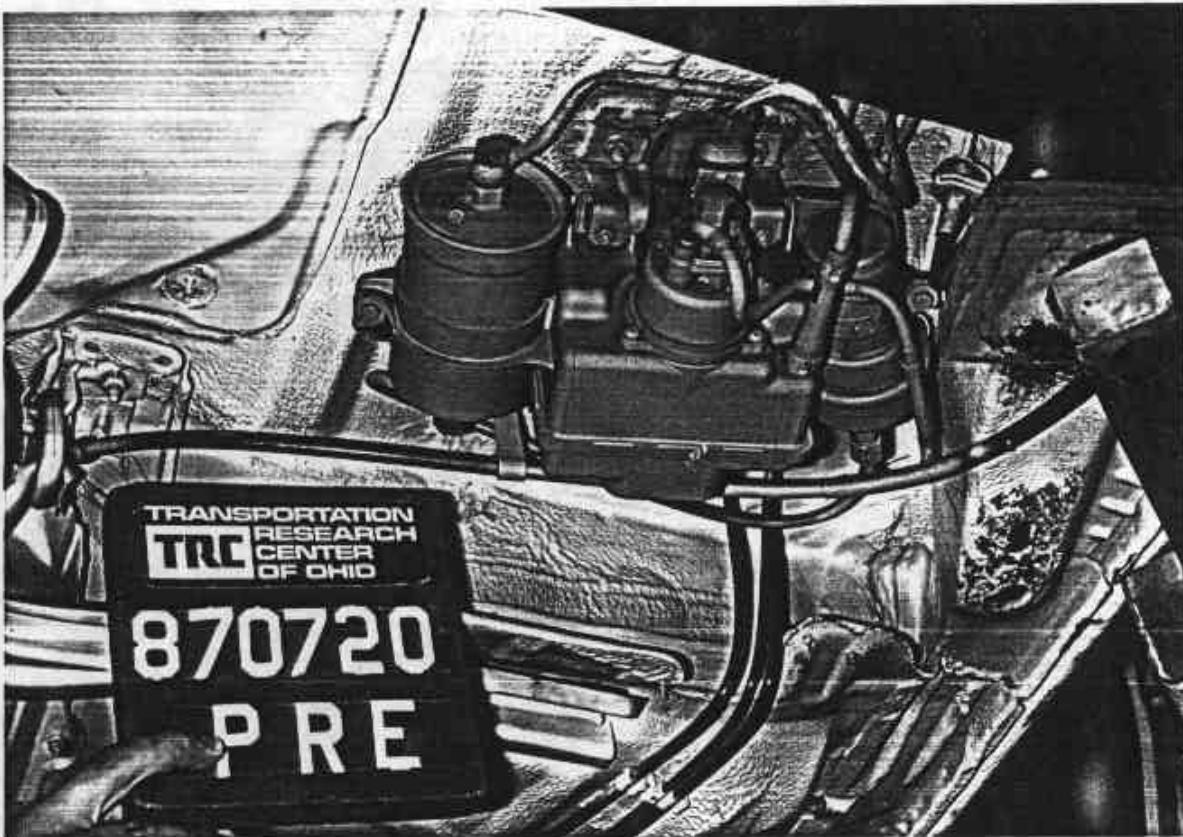


Figure 23. PRE-TEST FUEL LINES - VIEW 1

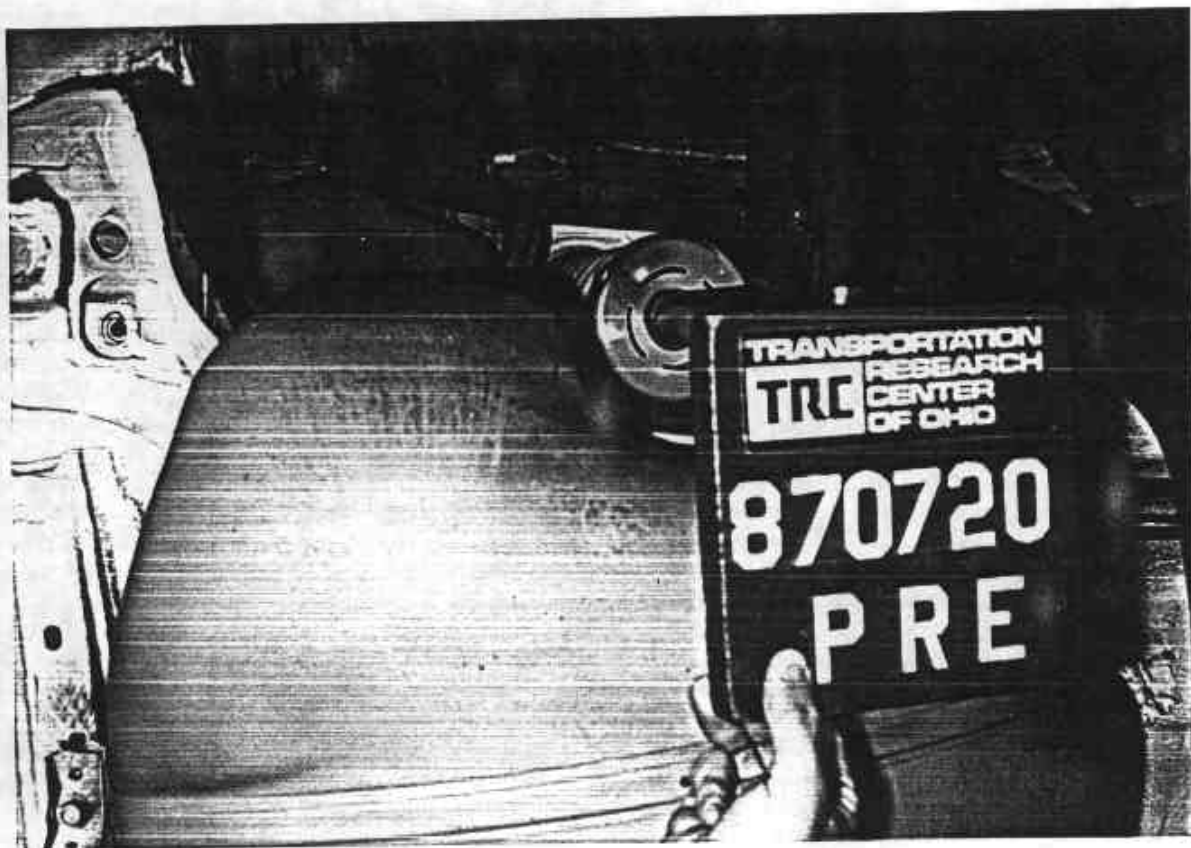


Figure 24. PRE-TEST FUEL LINES - VIEW 2

870720

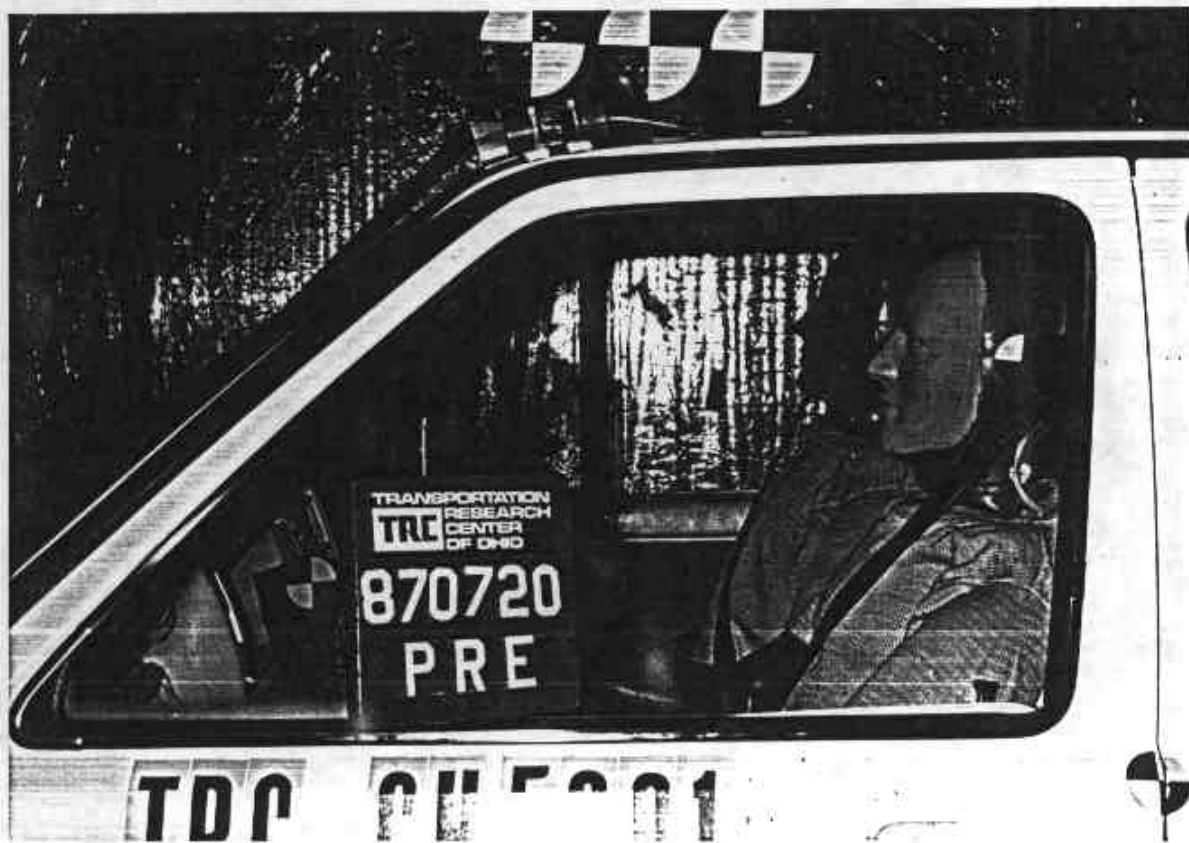


Figure 25. PRE-TEST DRIVER DUMMY POSITION VIEW



Figure 26. POST-TEST DRIVER DUMMY POSITION VIEW

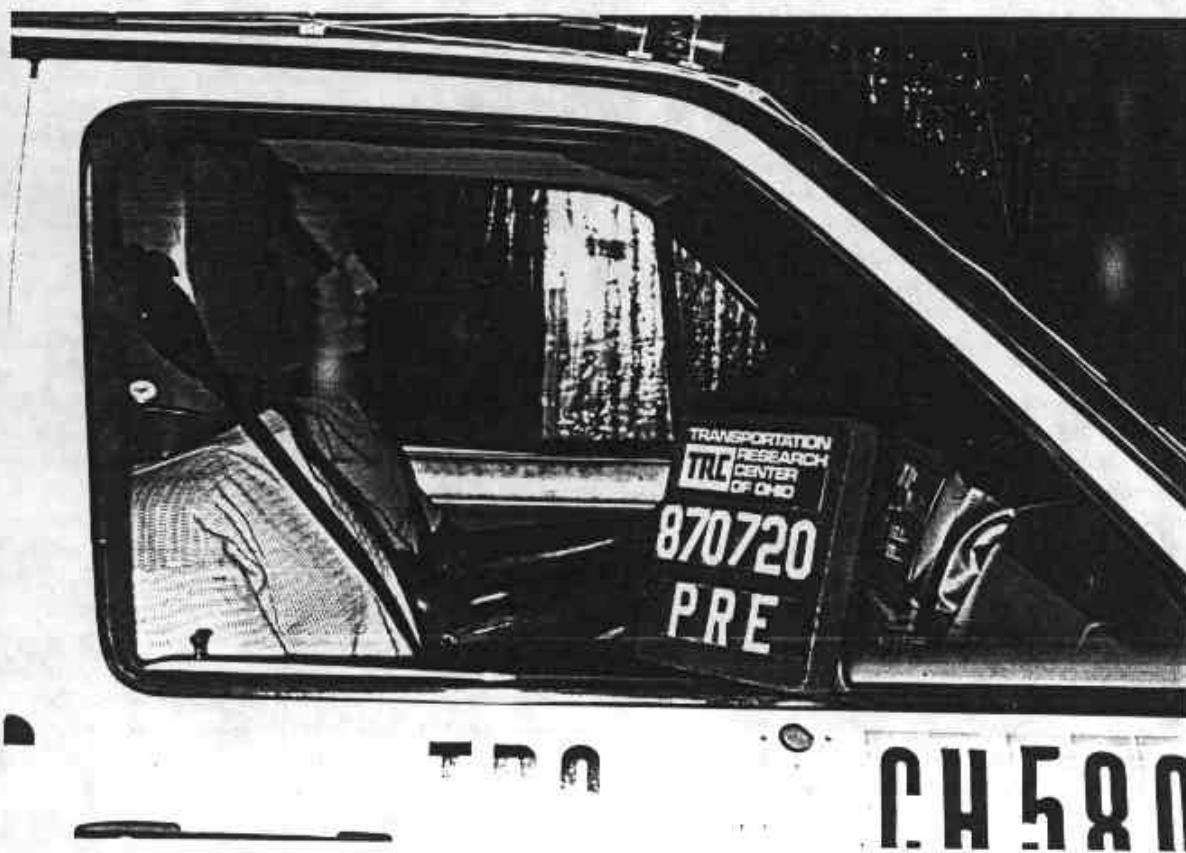


Figure 27. PRE-TEST PASSENGER DUMMY POSITION VIEW



Figure 28. POST-TEST PASSENGER DUMMY POSITION VIEW

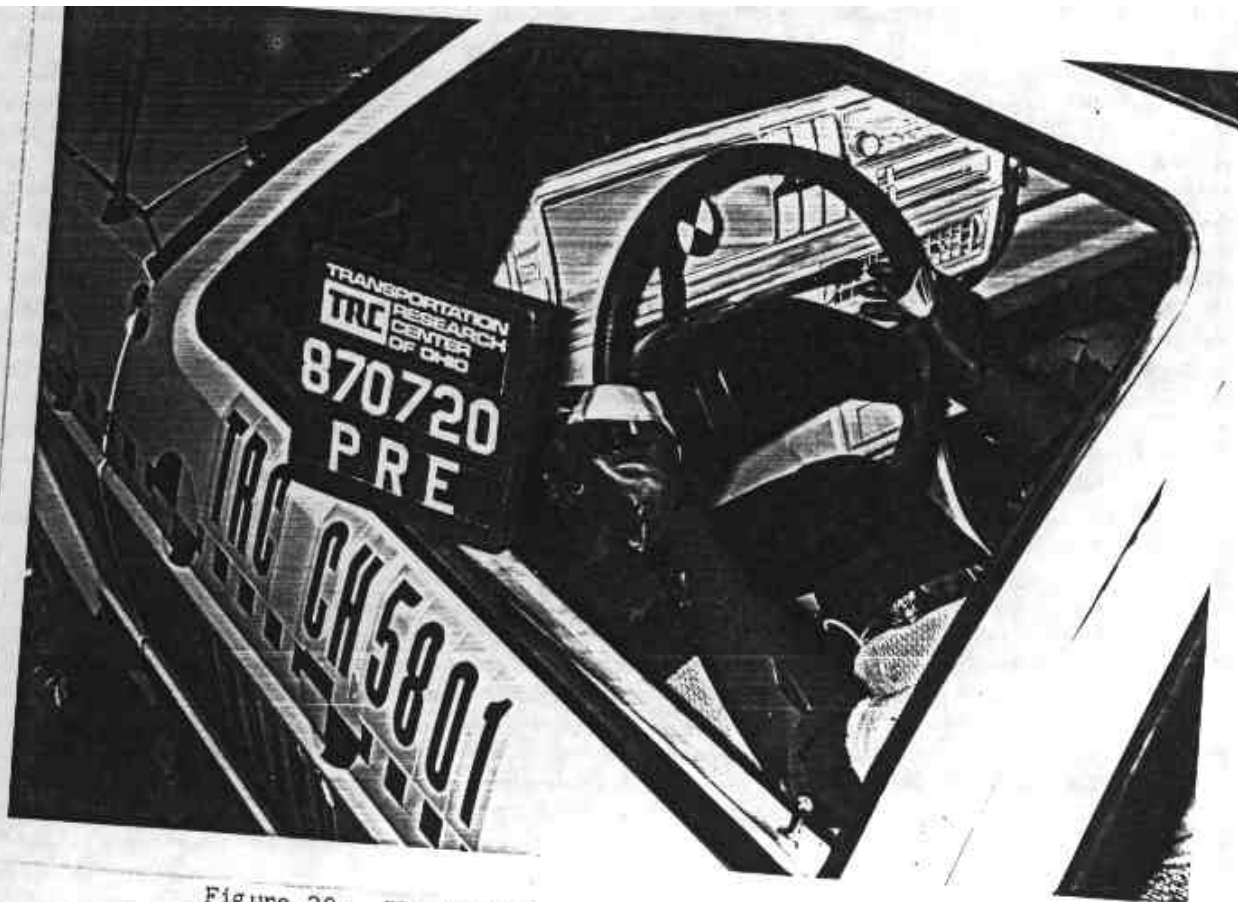


Figure 29. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW



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

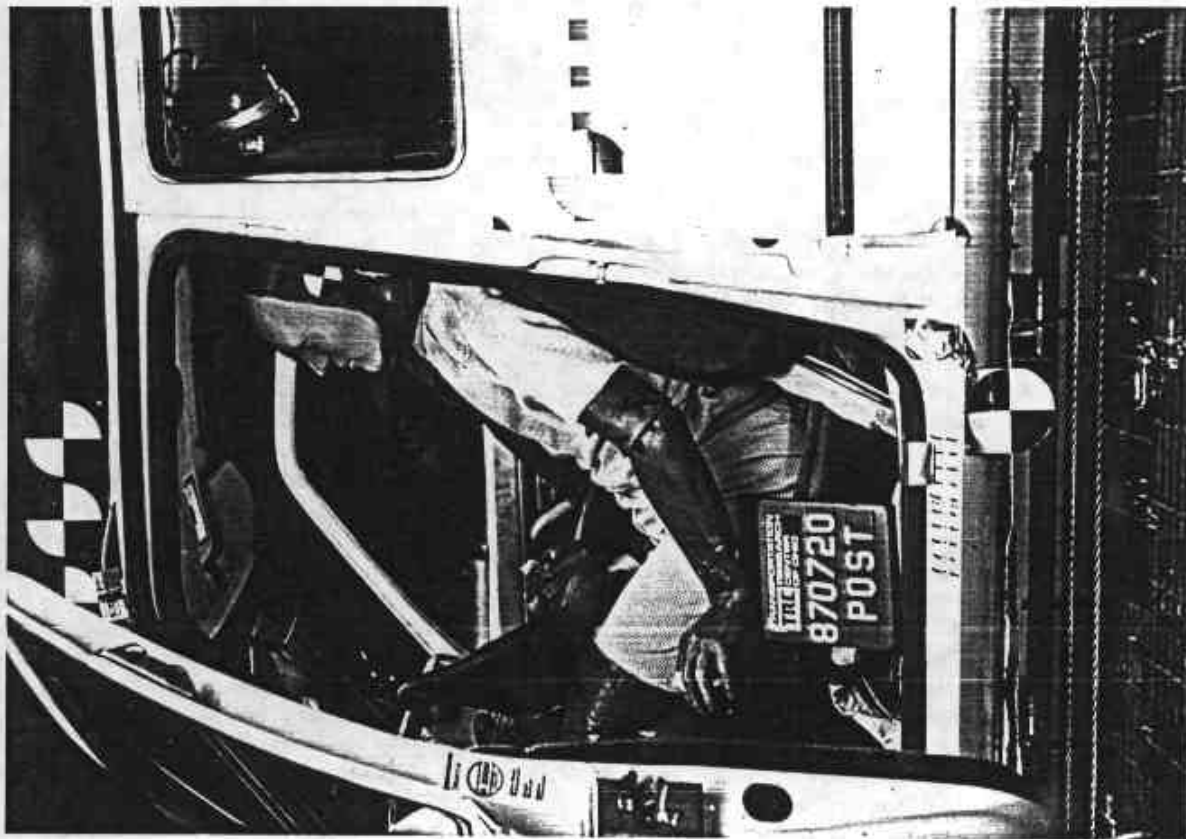


Figure 31. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2



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

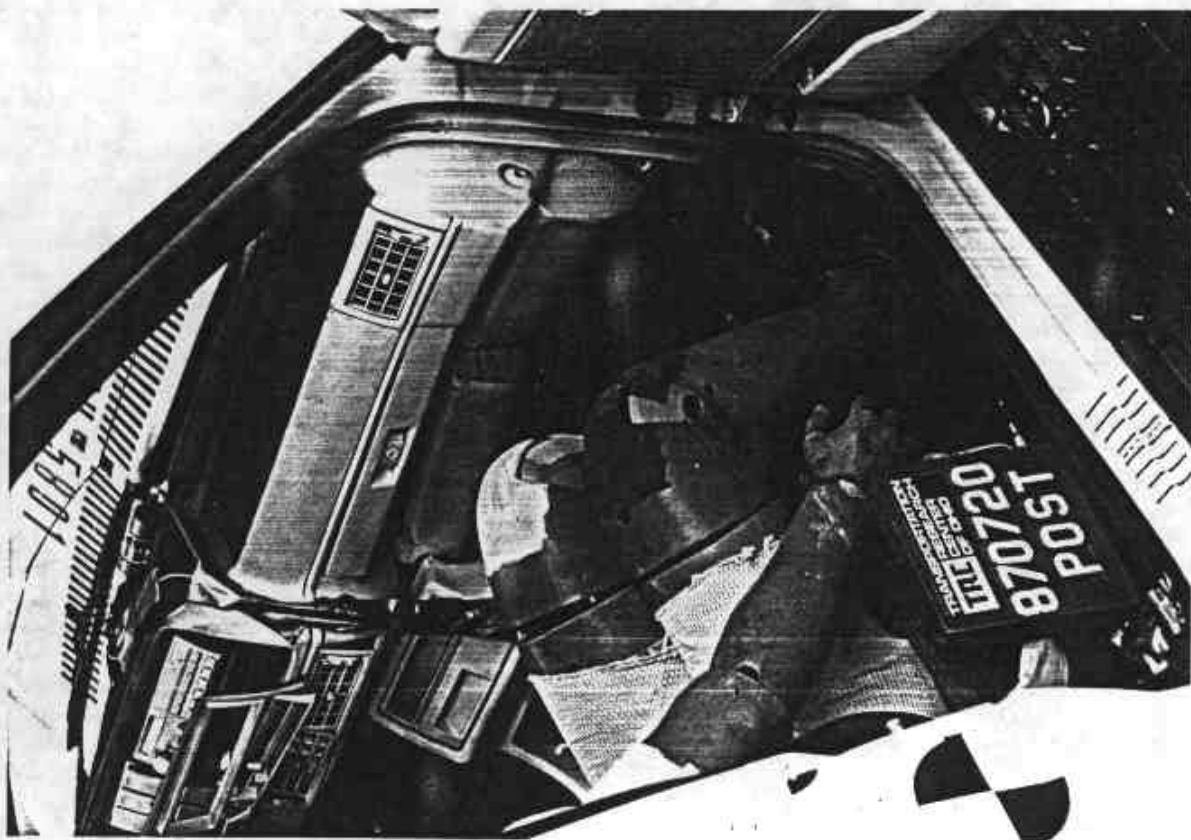


Figure 33. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1



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



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

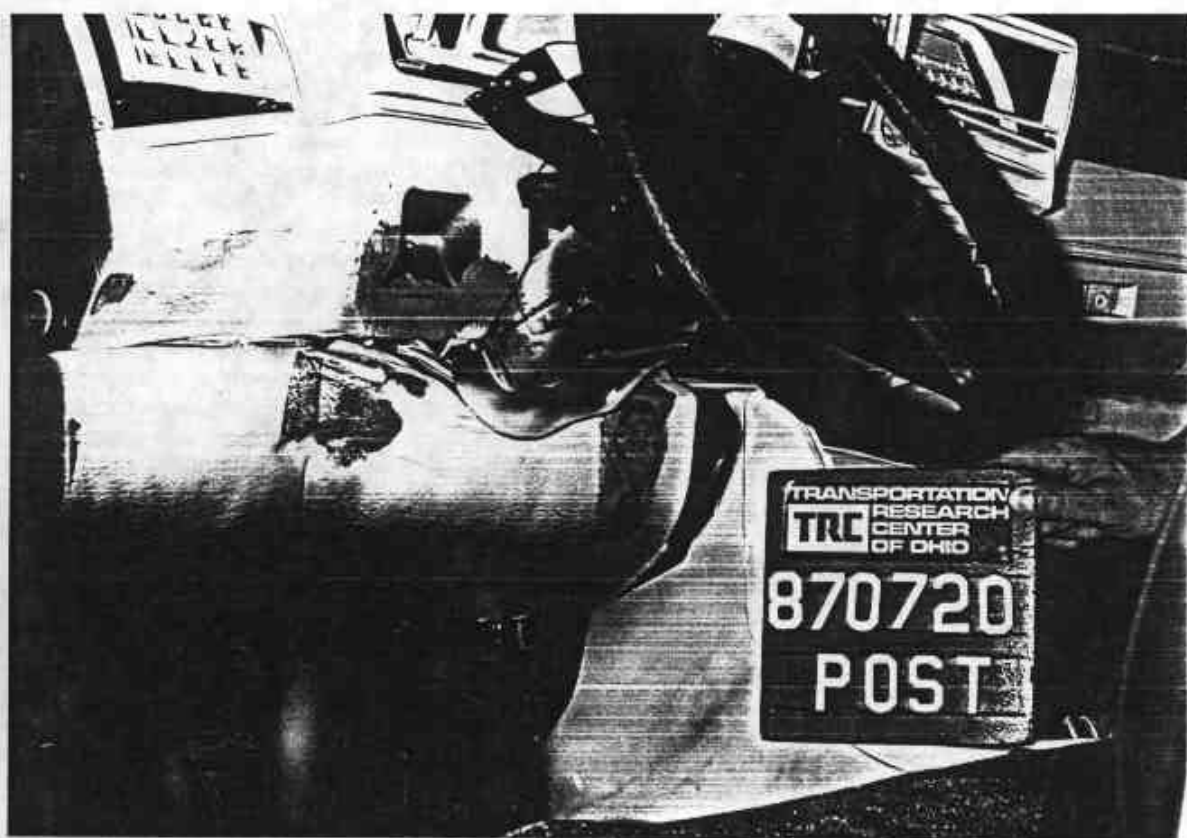


Figure 36. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 2



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



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

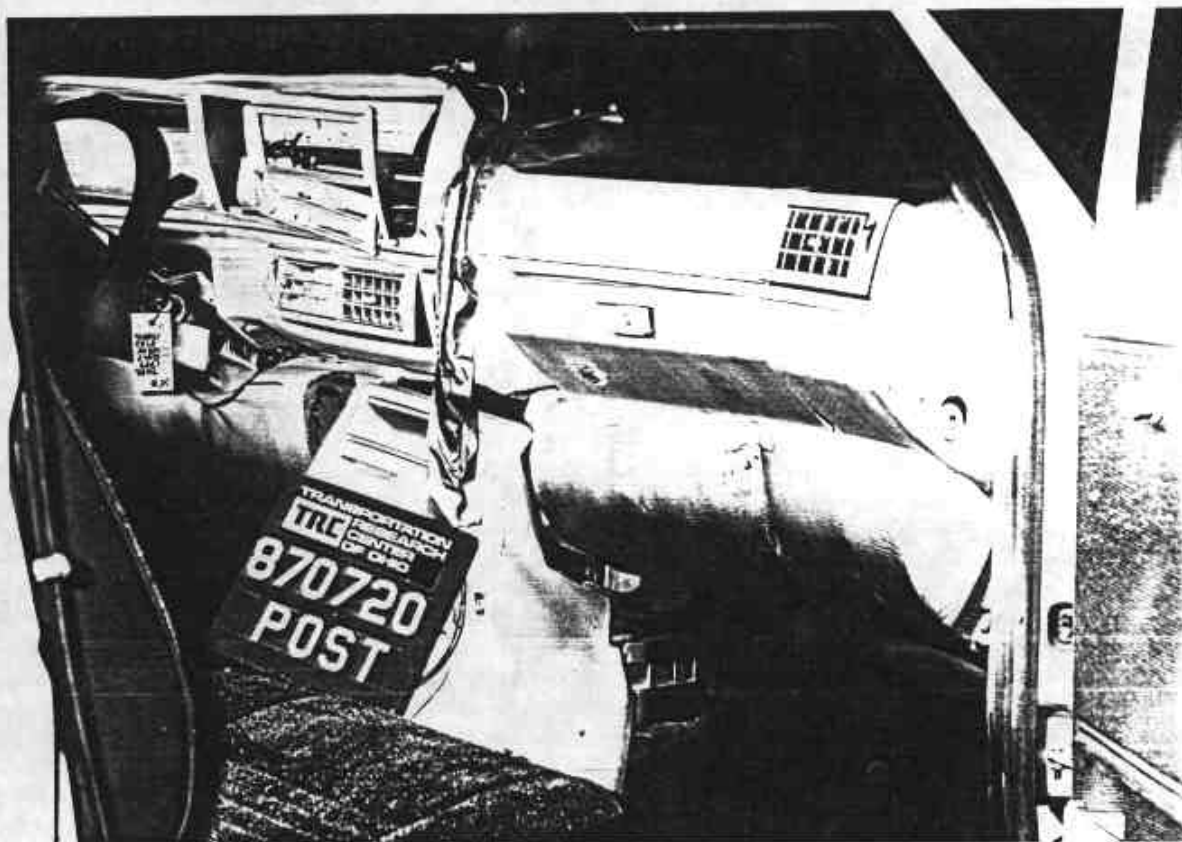


Figure 39. POST-TEST PASSENGER DUMMY HEAD/KNEE CONTACT - VIEW 1



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

A-21

870720

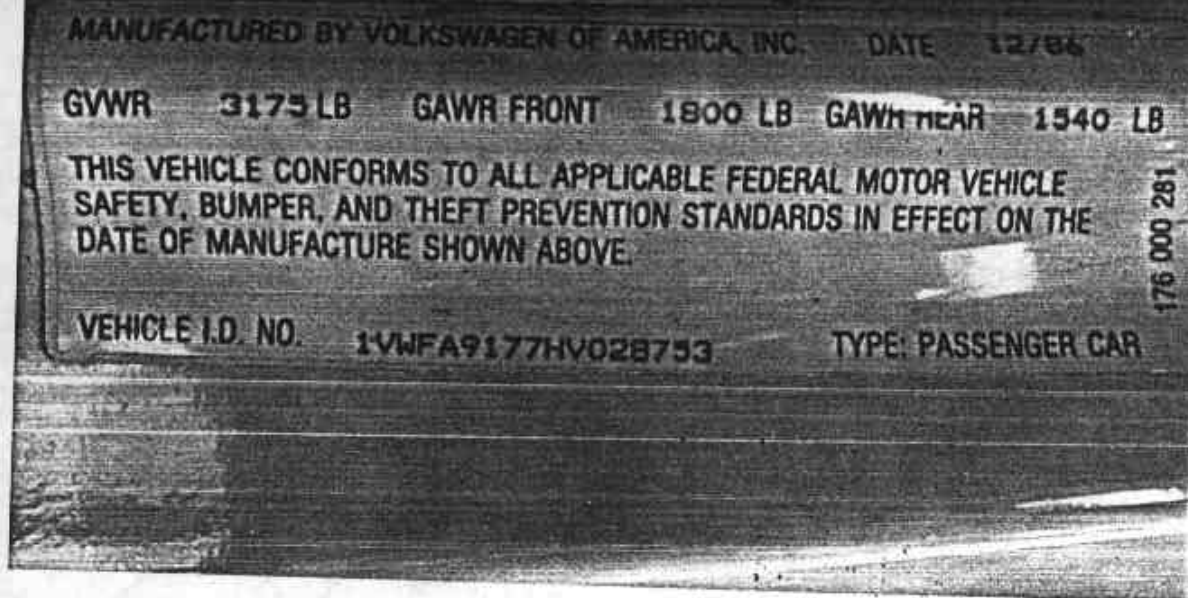


Figure 41. PRE-TEST VEHICLE CERTIFICATION LABEL VIEW

176 000 281 B MAX LOAD (VEHICLE CAPACITY WEIGHT - LBS)					CHARGE MAXIMUM (CAPACITE DE CHARGE - LBS) DE LA VEHICULE, en LBS				
DESIGNATED SEATING CAPACITY 5, 2 front/3 rear					SIEGES DESIGNES POUR 5 PERSONNES, 2 en 2 et 3 en 3				
2 DOORS		4 DOORS			2 PORTES		4 PORTES		
	MANUAL	AUTO	MANUAL	AUTO		MAN	AUTO	MAN	AUTO
AC	860	840	840	800	CLIMATISEE OUI	390	380	380	385
NON AC	920	900	900	860	CLIMATISEE NON	420	410	410	390
COLD TIRE INFLATION PRESSURE IN PSI		RECOMMENDED TIRE - RIM SIZES			PRESSION PRECONSEE DES PNEUS FROIDS EN KPA			DIMENSIONS RECOMMENDEES PNEUS ET JANTES	
HALF LOAD	FRONT	29	GOLF P175/70 R13: 5-1/2 J13 185/60 HR14: 6 J14		DEMI-CHARGE	TV	200	PNEUS RECOMME 5.0-13 185/60 HR14: 6 J14	
	REAR	25				APR	170		
FULL LOAD	FRONT	29	GTI 185/60 HR14: 6 J14		CHARGE MAX	AV	200		
	REAR	35				ARR	240		
TEMPORARY SPARE TIRE T105/70 R14		65 ± 5			POUR DE SECOURS TEMPORAIRE T105/70 R14				

Figure 42. PRE-TEST VEHICLE TIRE LOAD LABEL VIEW



Figure 43. PRE-TEST VEHICLE BALLAST VIEW

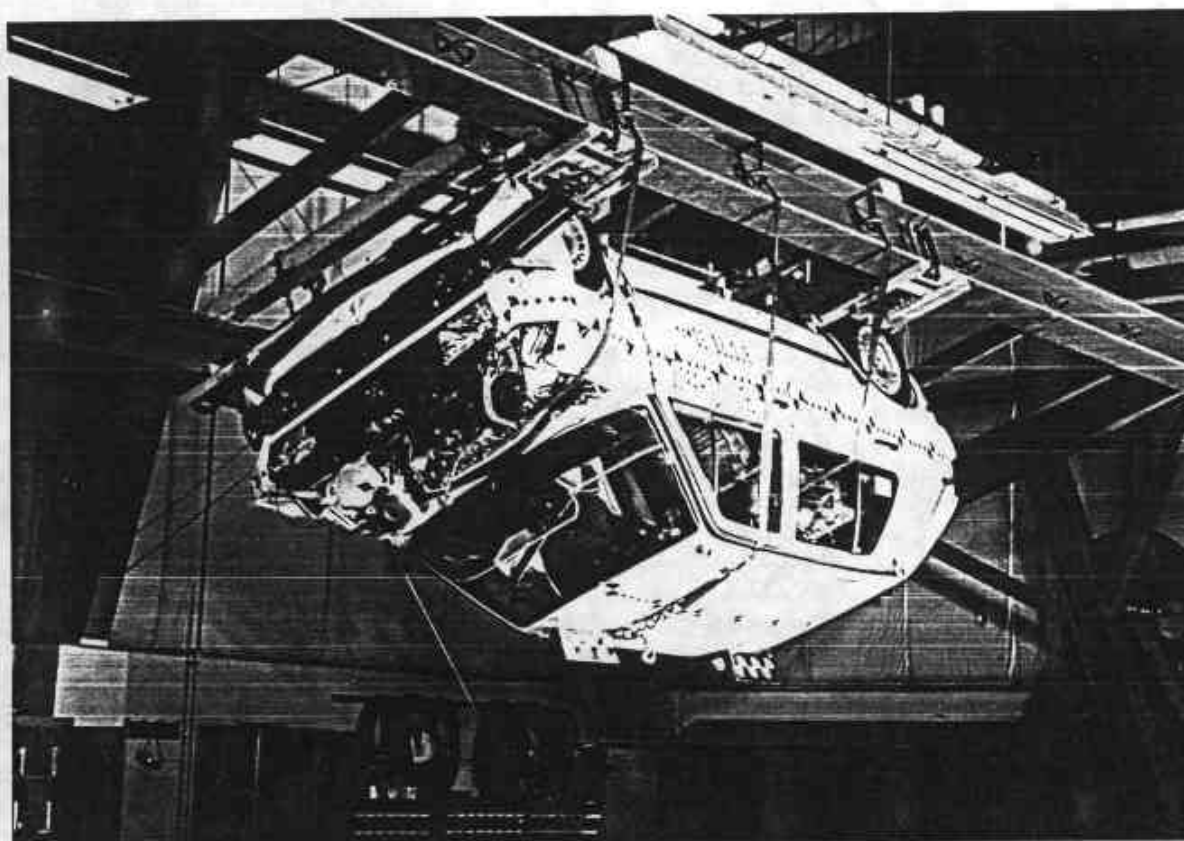


Figure 44. POST-TEST VEHICLE ON STATIC ROLLOVER MACHINE VIEW

A-23

870720

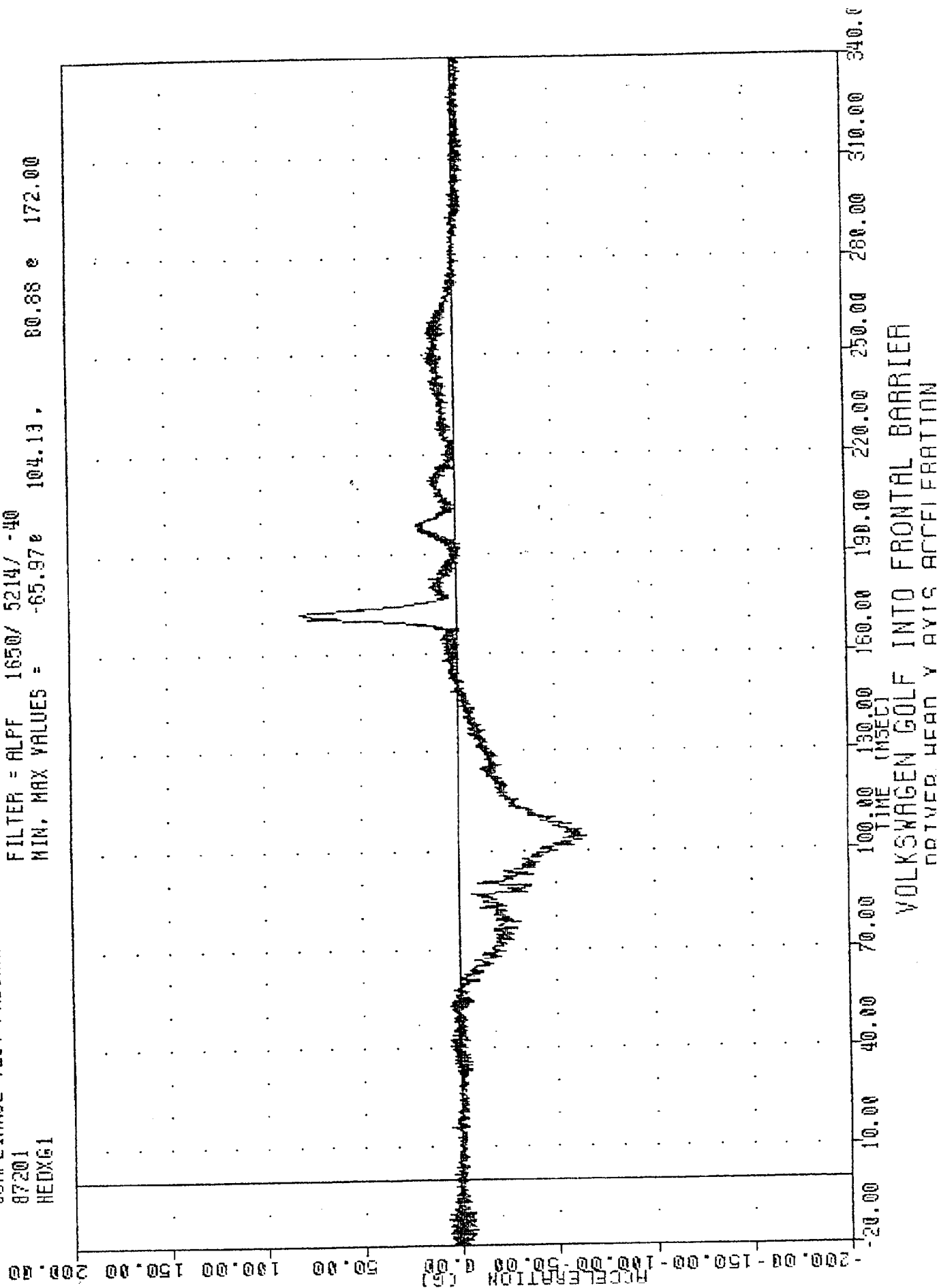
APPENDIX B

DATA PLOTS

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

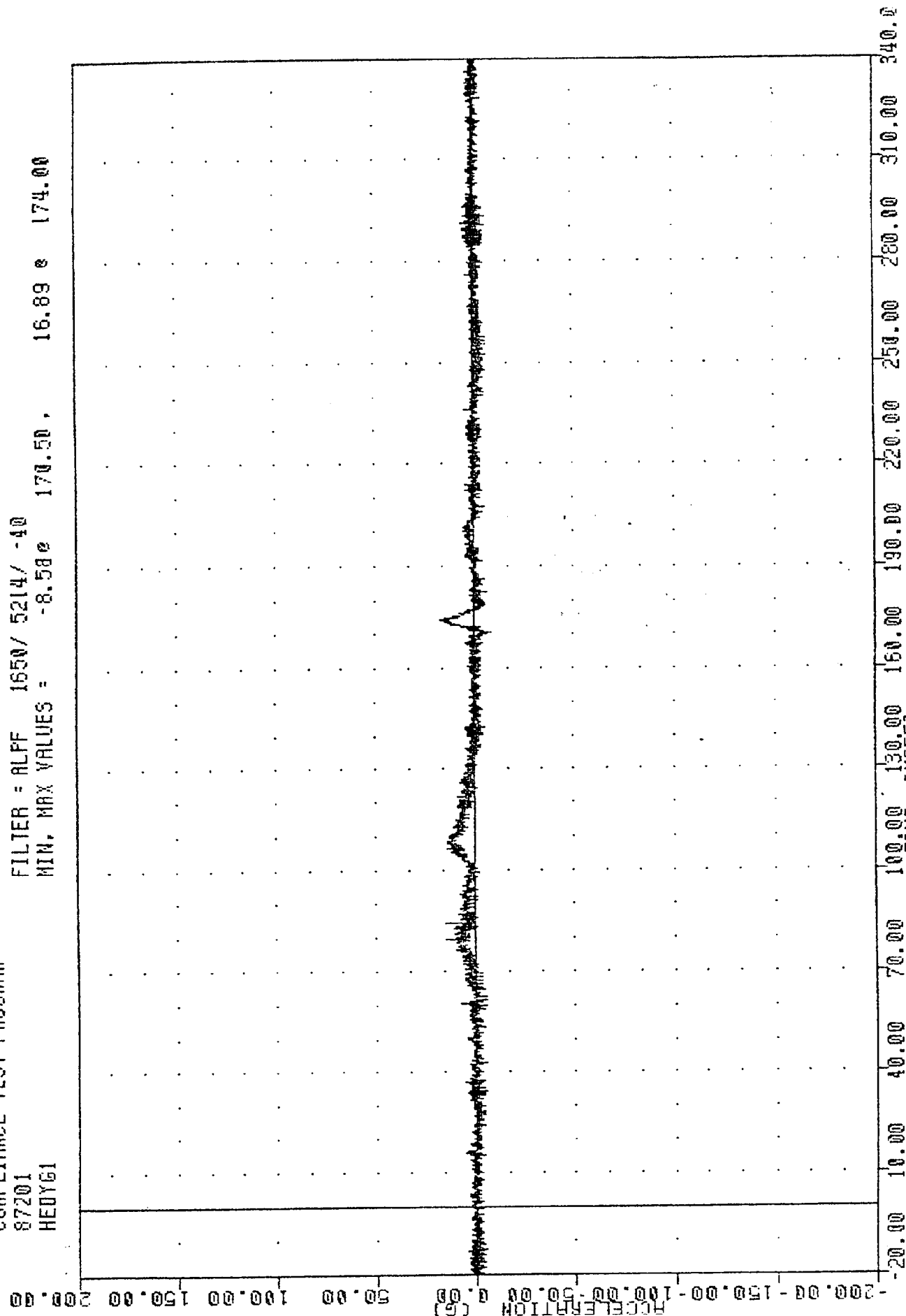
TRC
COMPLIANCE TEST PROGRAM
87201
HEDXG1

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -65.97e 80.88 e 172.00



TRC
COMPLIANCE TEST PROGRAM
87201
HEUYG1

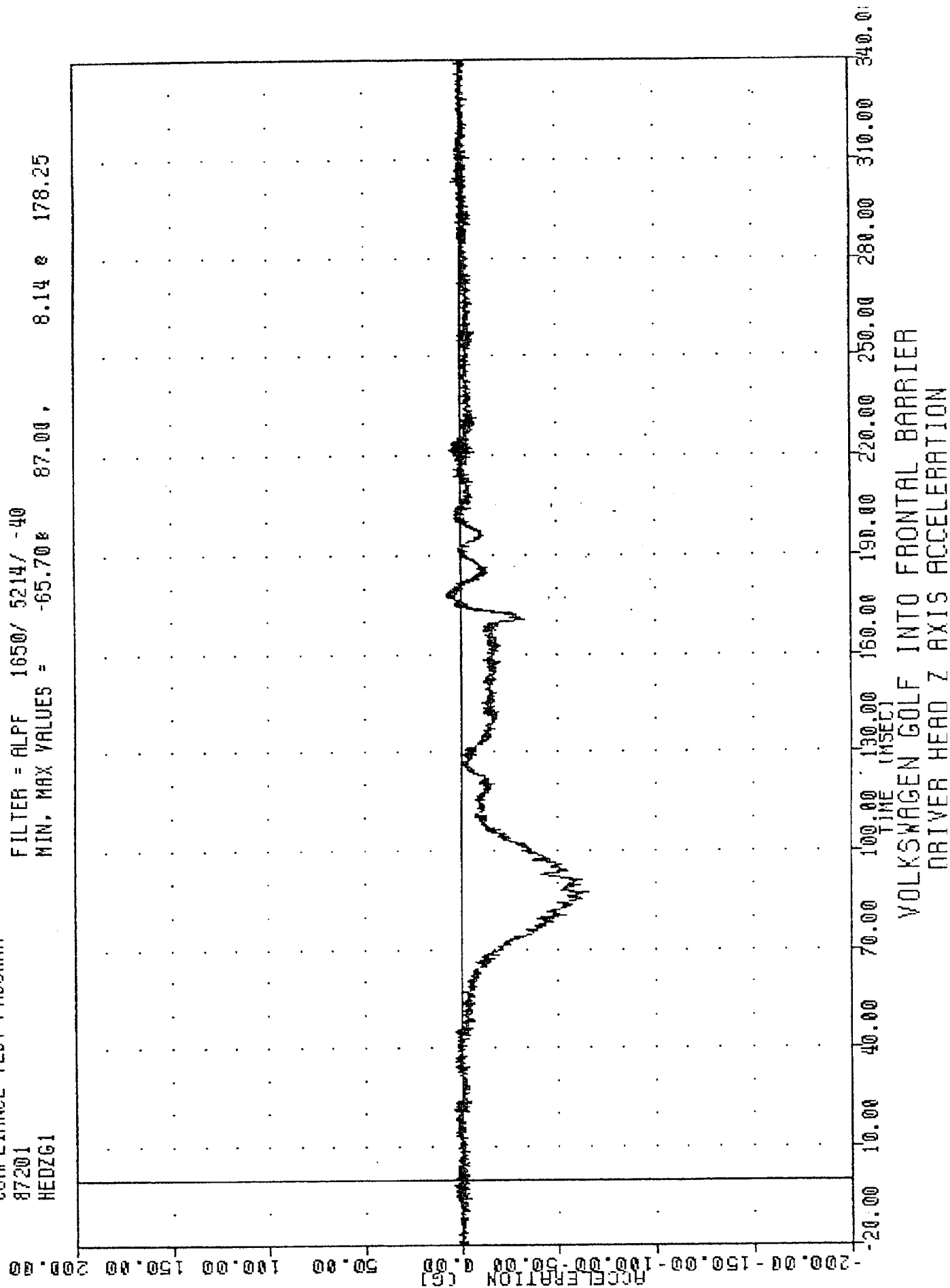
FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -8.580 170.50, 16.89 s 174.00



TRC
COMPLIANCE TEST PROGRAM
87201
HEDZG1

, 870720

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -65.70% 87.00, 8.14 e 178.25



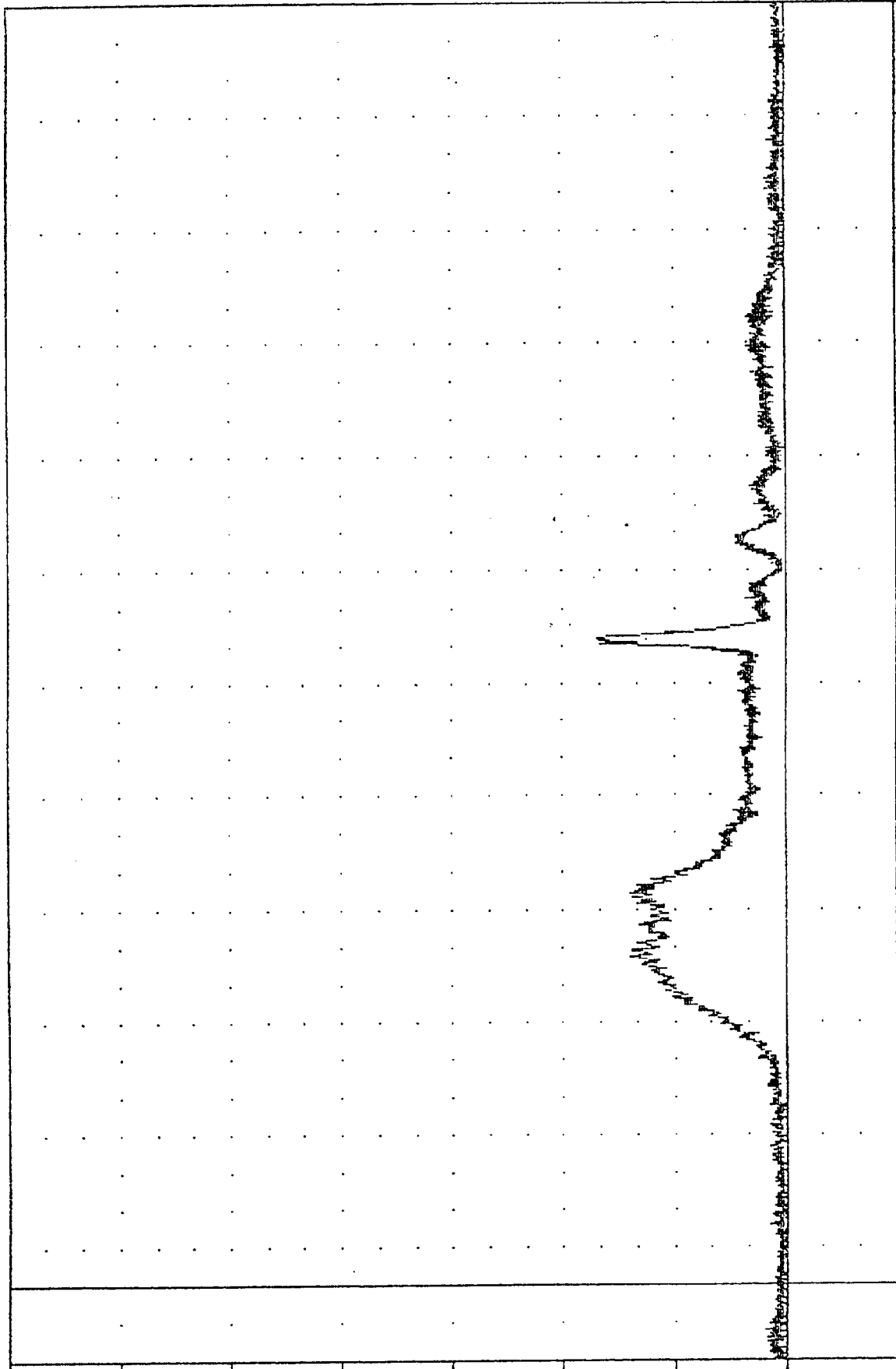
TRC
COMPLIANCE TEST PROGRAM
87201
HEOR61

, 870720

FILTER = ALPF 1650/ 5214/ -40

MIN. MAX VALUES = 0.238 2.75, 84.74 0 172.00

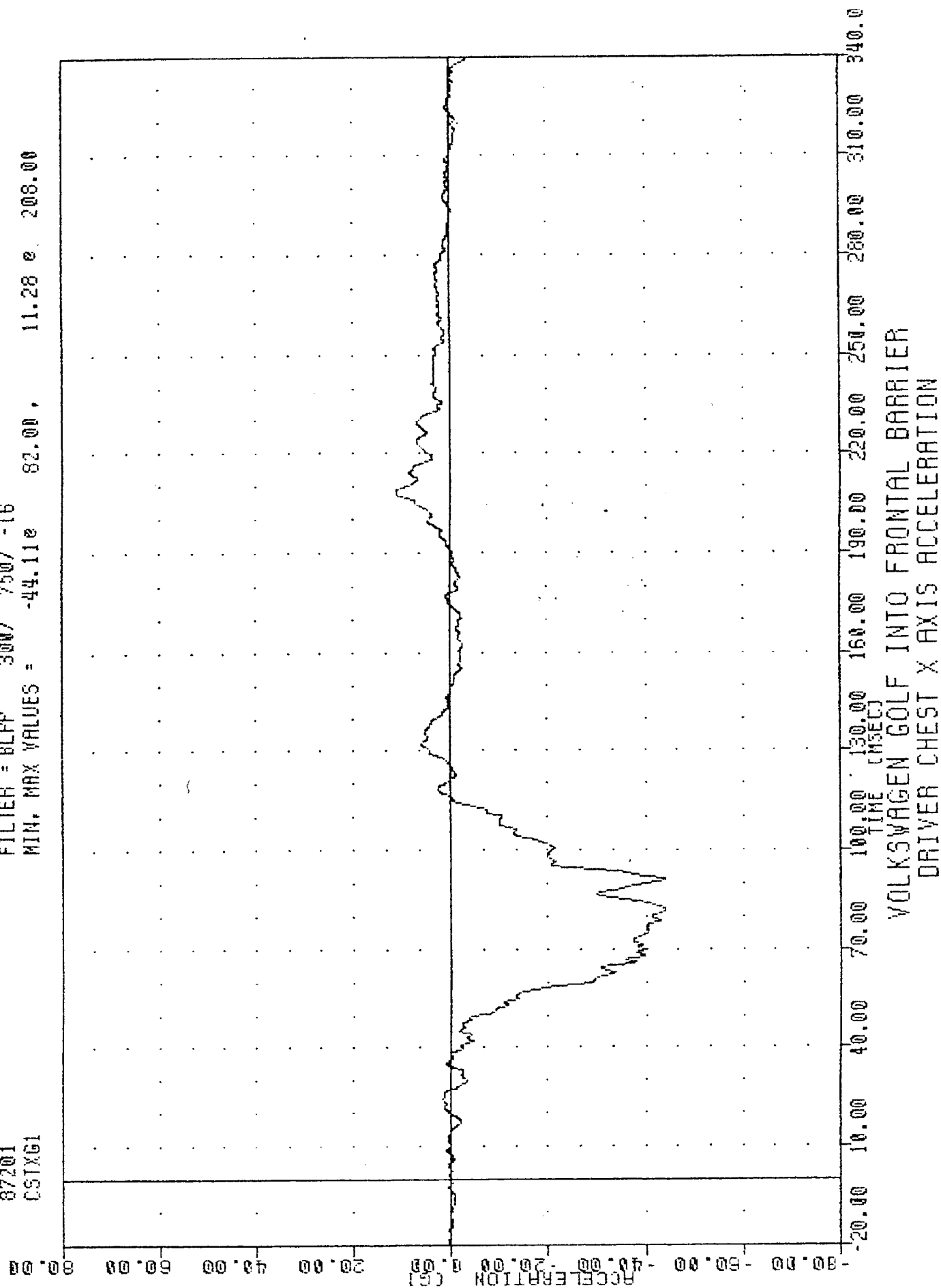
ACCELERATION (G)



TIME (MSEC)
VOLKSWAGEN GOLF INTO FRONTAL BARRIER
DRIVER HEAD RESULTANT ACCELERATION

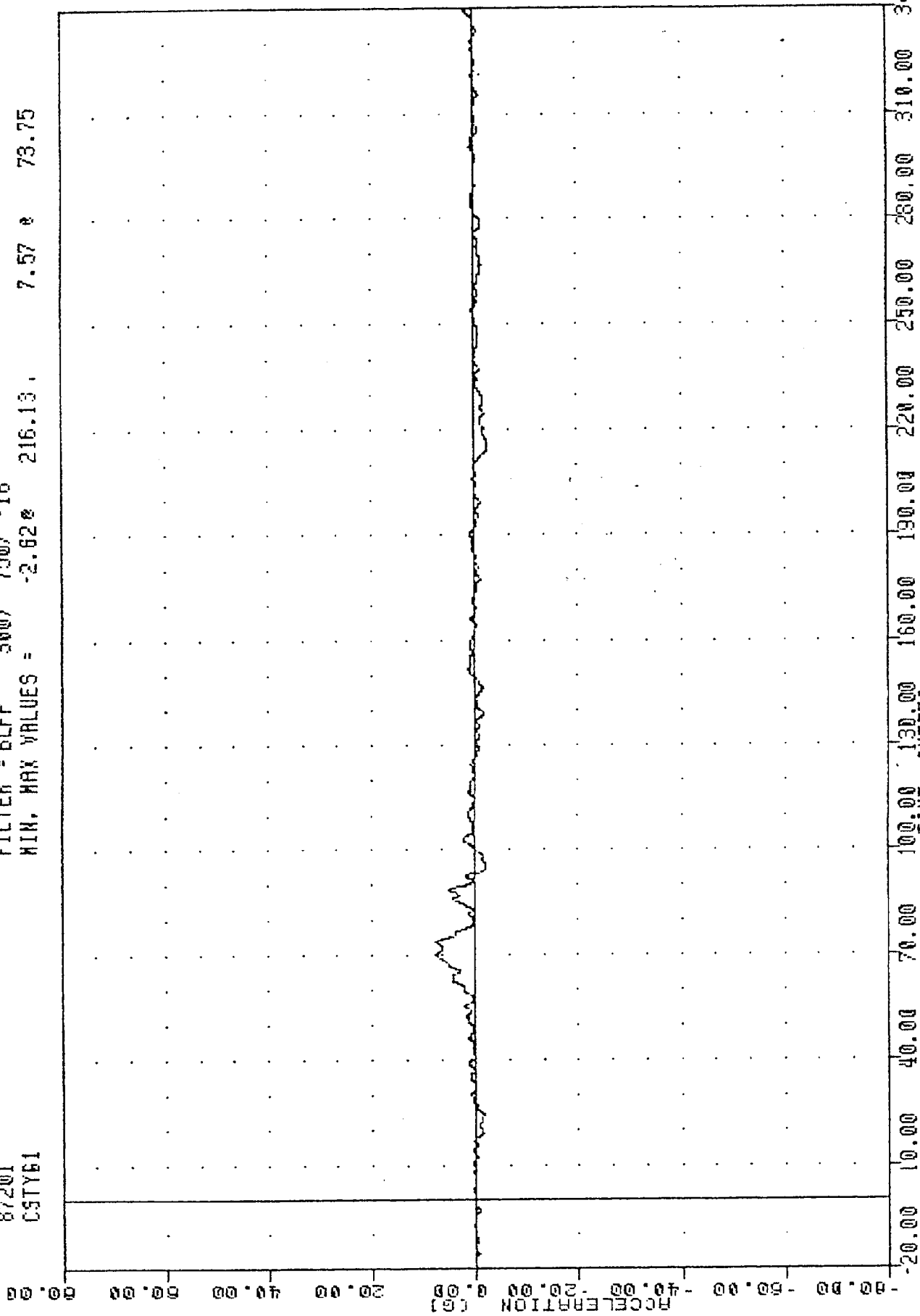
TAC
COMPLIANCE TEST PROGRAM
87201
CSTXG1

FILTER = BLFF 300/ 750/ -16
MIN. MAX VALUES = -44.11e 82.00, 11.28 e 208.00



TAC
COMPLIANCE TEST PROGRAM
87201
CSTY61

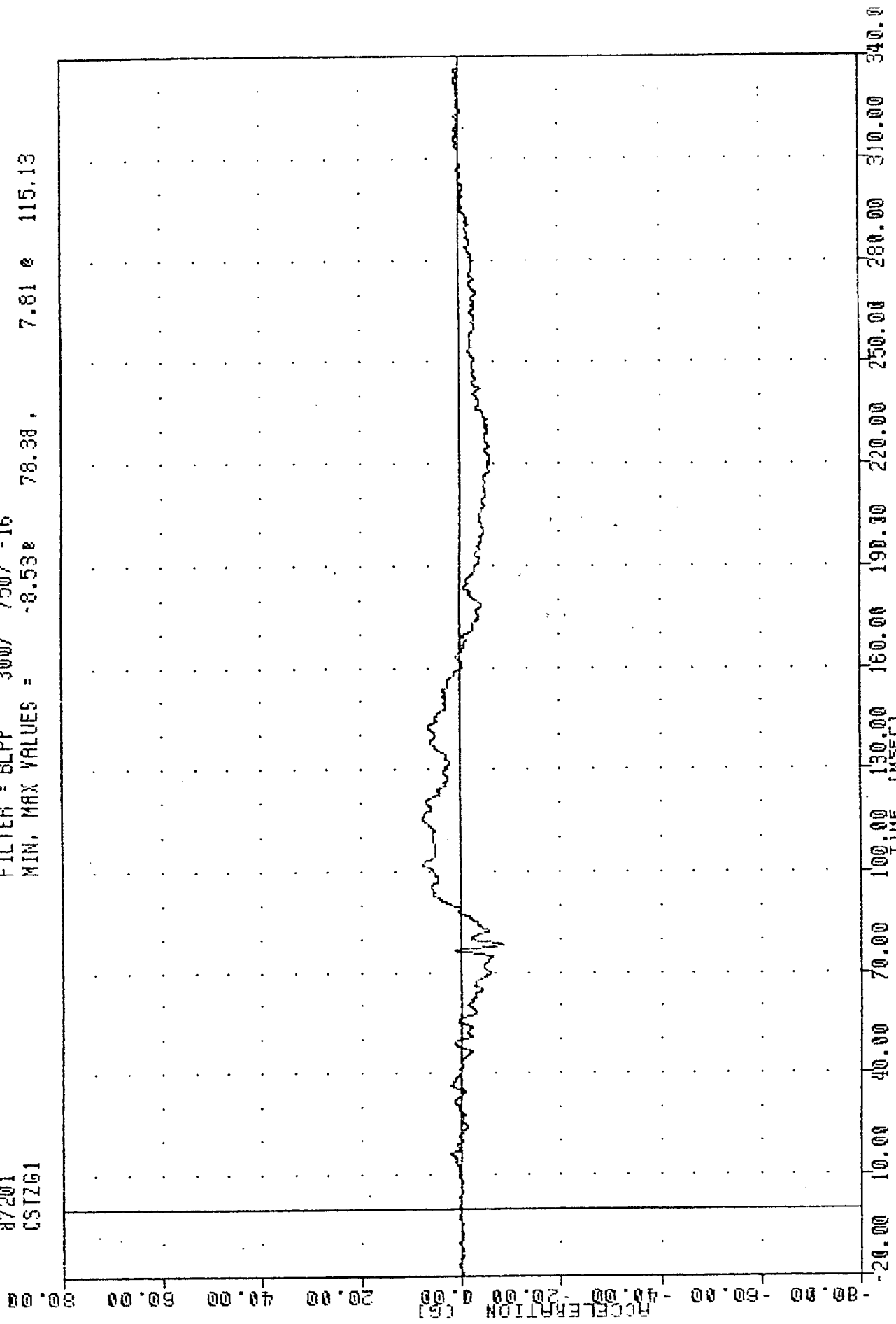
FILTER = BLFP 300/ 750/ -16
MIN. MAX VALUES = -2.62 216.13 7.57 73.75



VOLKSWAGEN GOLF INTO FRONTAL BARRIER
DRIVER CHEST Y AXIS ACCELERATION

TRC
COMPLIANCE TEST PROGRAM
87201
CSTZG1

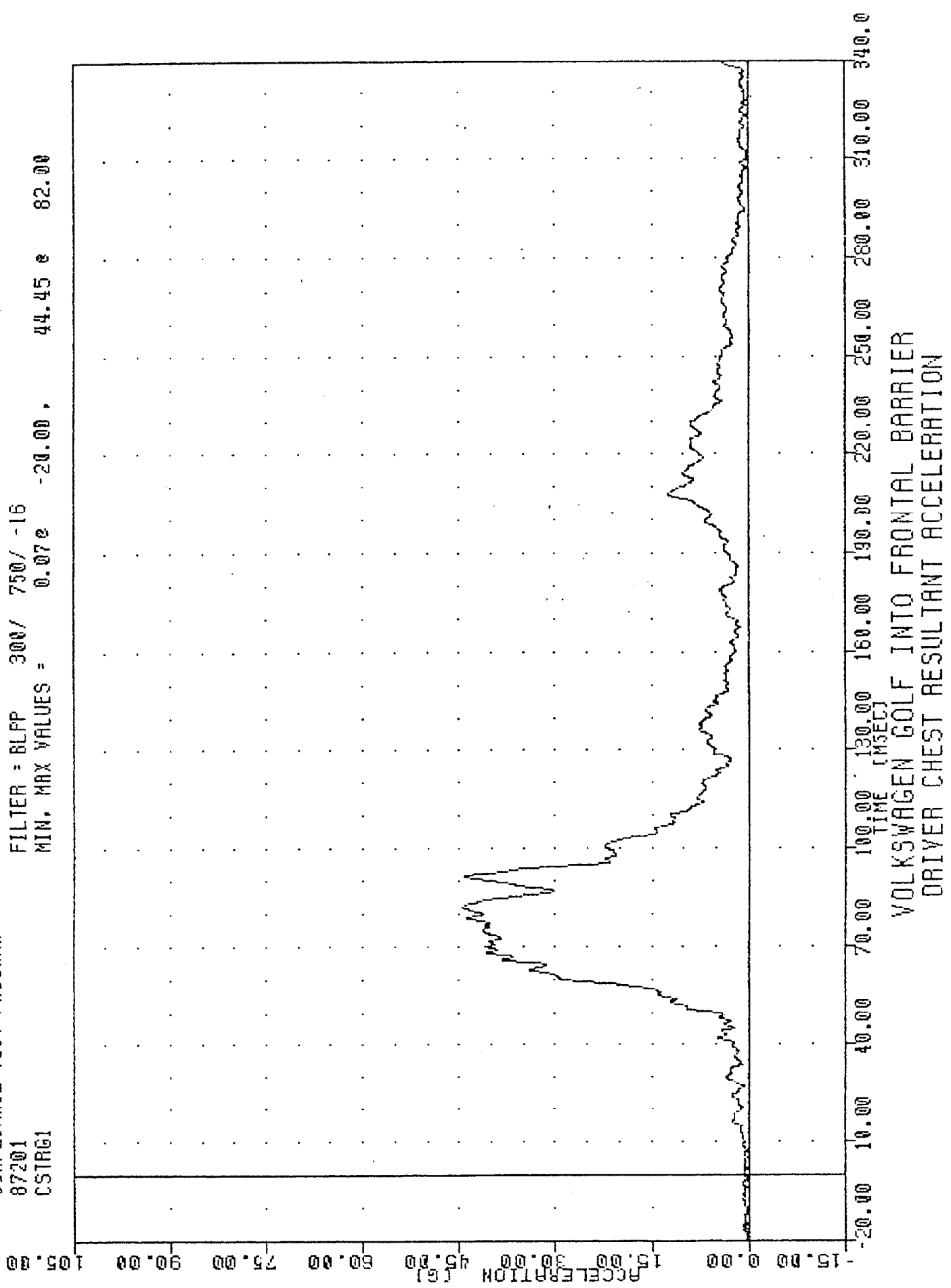
FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -8.53e 78.38. 7.81 e 115.13



VOLKSWAGEN GOLF INTO FRONTAL BARRIER
DRIVER CHEST 7 AXIS ACCELERATION

TRC
COMPLIANCE TEST PROGRAM
87201
CSTR61

FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = 0.072 -20.00, 44.45 & 82.00

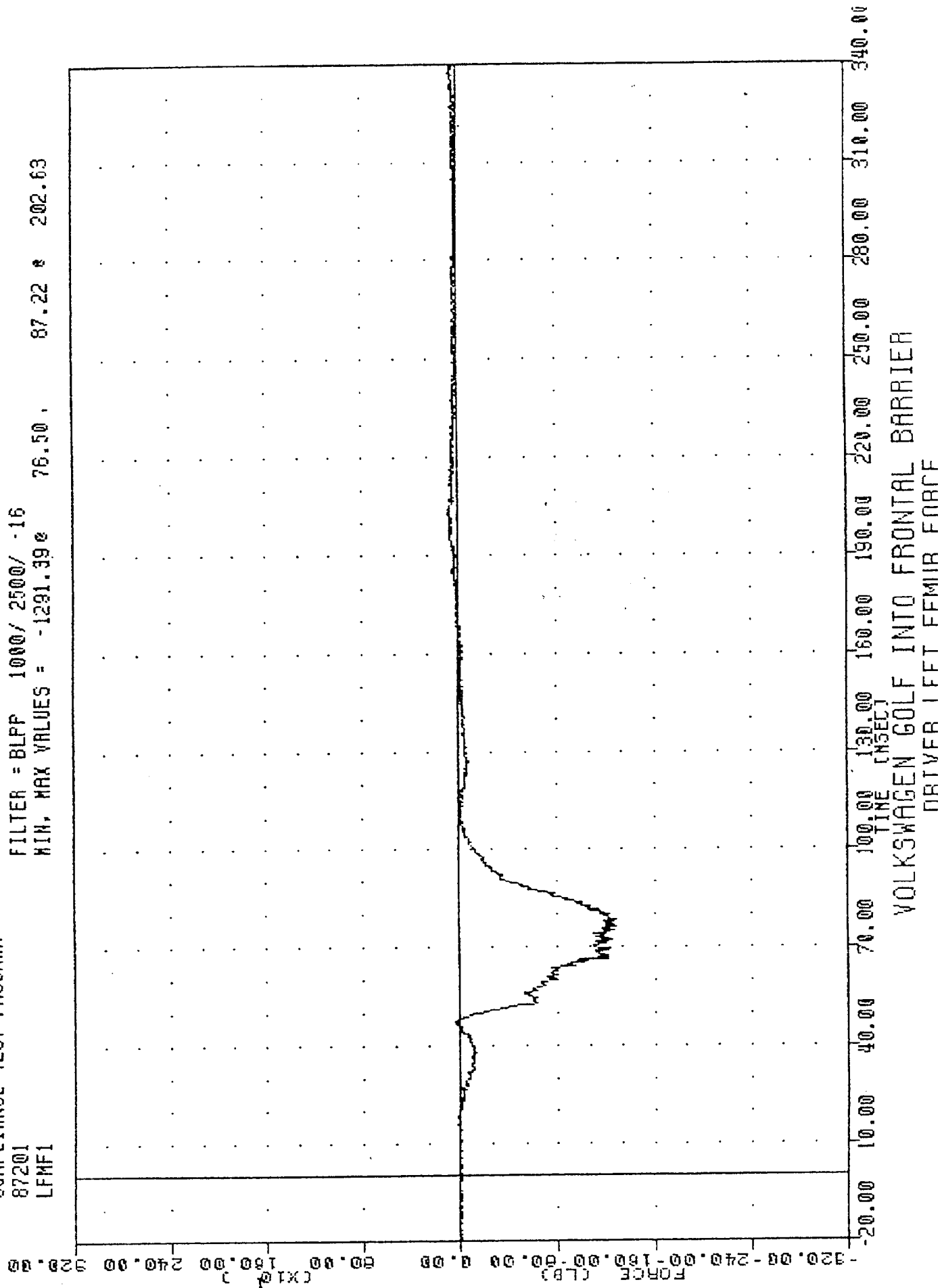


VOLKSWAGEN GOLF INTO FRONTAL BARRIER
DRIVER CHEST RESULTANT ACCELERATION

TAC
COMPLIANCE TEST PROGRAM
87201
LFMF1

870720

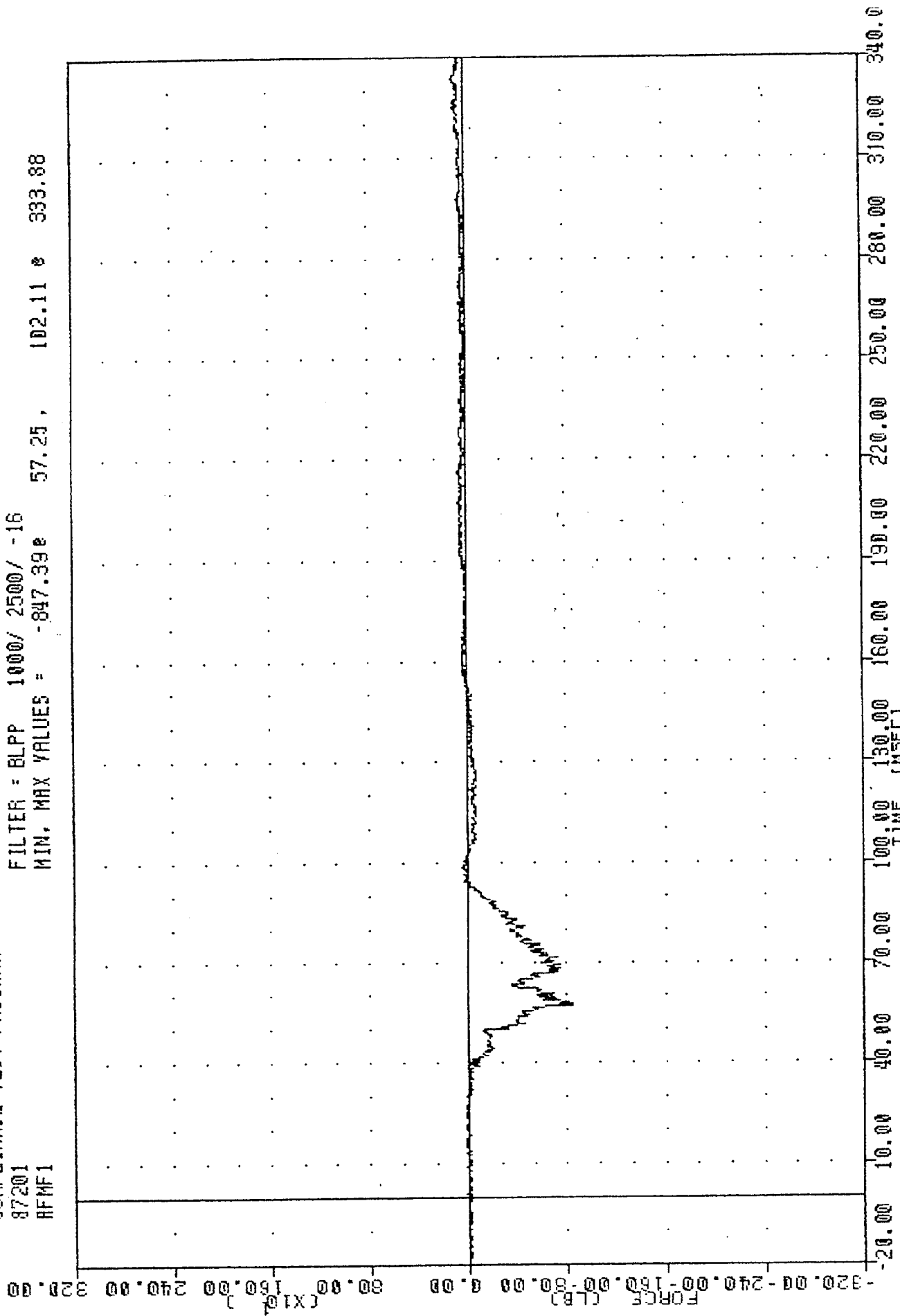
FILTER = BLPP 1000/ 2500/ -16
MIN. MAX VALUES = -1291.39 76.50 87.22 202.63



TRC
COMPLIANCE TEST PROGRAM
87201
AFMF1

, 870720

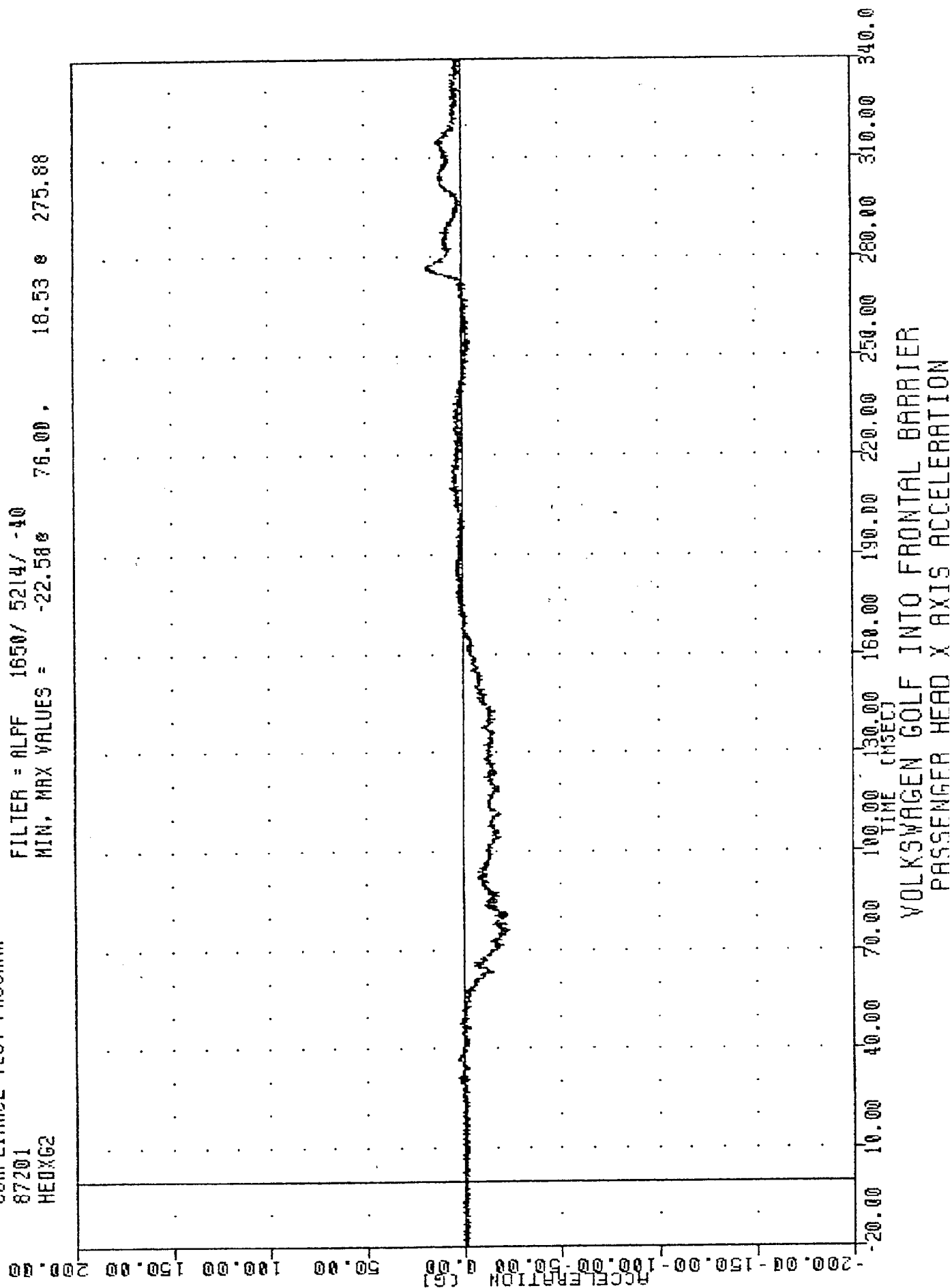
FILTER = BLPP 1000/ 2500/ -16
MIN. MAX VALUES = -847.39e 57.25, 102.11 e 333.88



VOLKSWAGEN GOLF INTO FRONTAL BARRIER
DRIVER RIGHT FEMUR FORCE

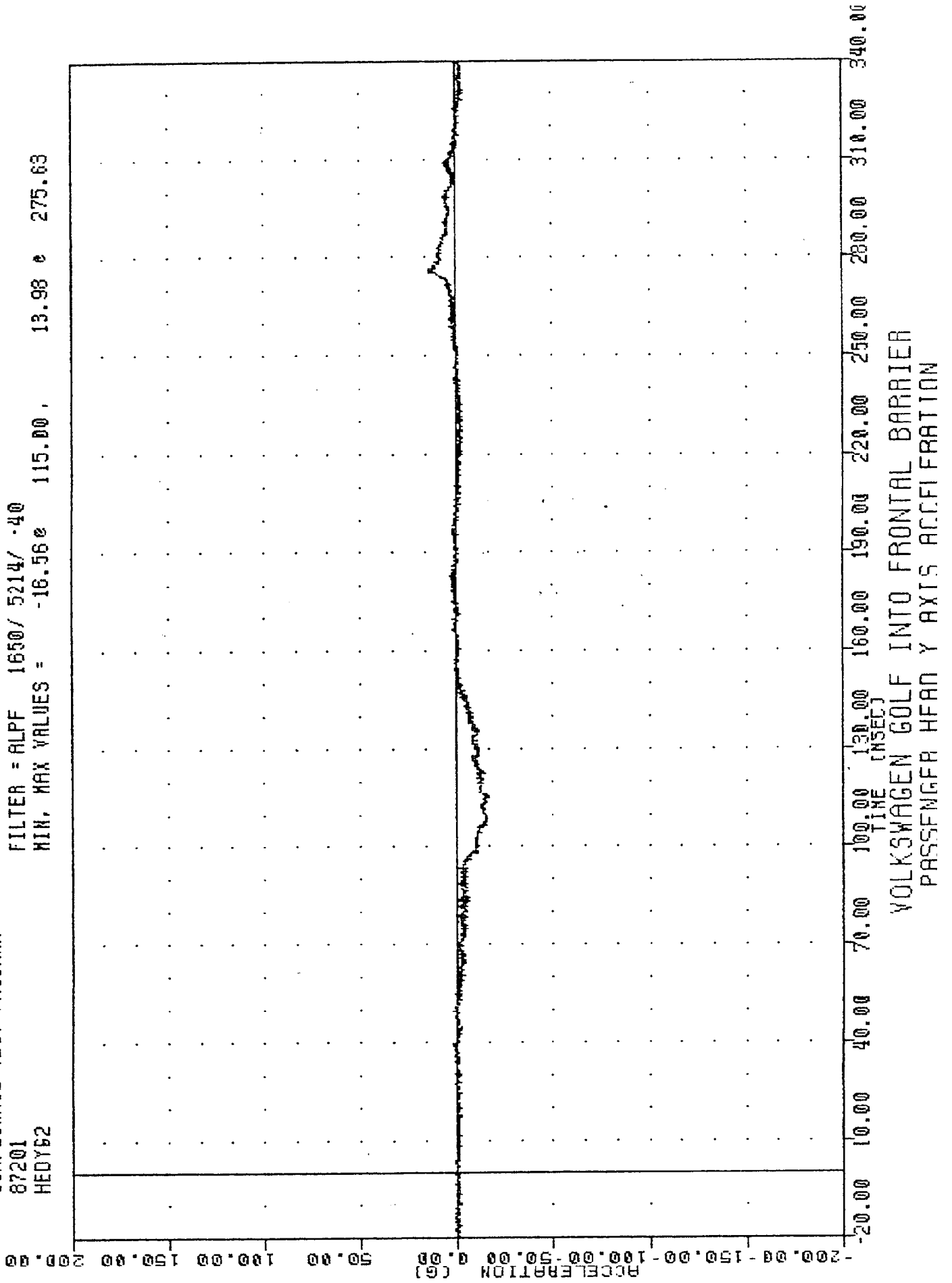
TRC
COMPLIANCE TEST PROGRAM
87201
HEXG2

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -22.588 76.00, 18.53 275.88



TAC
COMPLIANCE TEST PROGRAM
87201
HEDY62

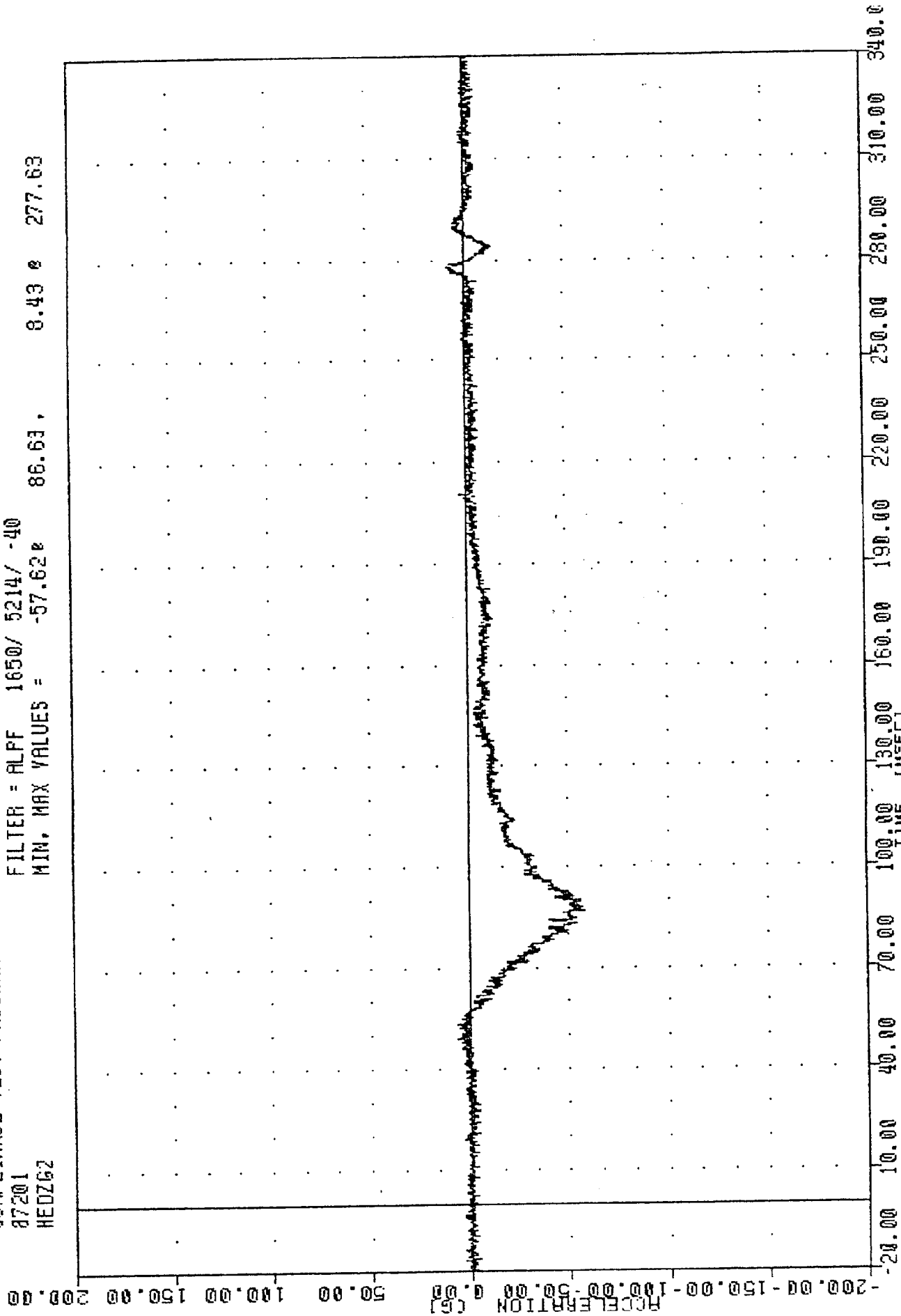
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -16.56e 115.00, 13.98 e 275.63



VOLKSWAGEN GOLF INTO FRONTAL BARRIER
PASSENGER HEAD Y AXIS ACCELERATION

TRC , 870720
 COMPLIANCE TEST PROGRAM
 87201
 HEDZ62

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -57.62 86.63 , 8.43 277.63

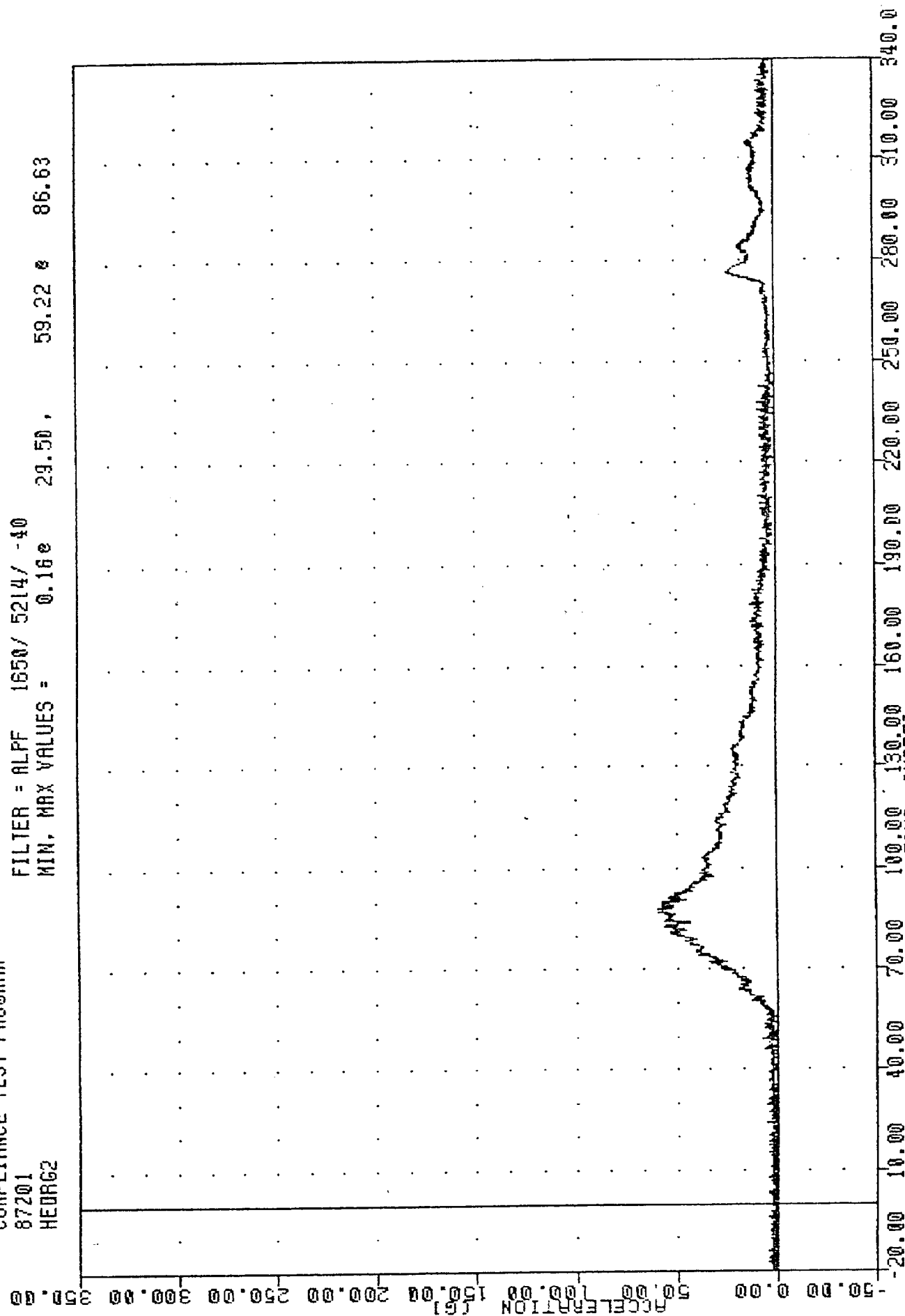


VOLKSWAGEN GOLF INTO FRONTAL BARRIER
 PASSENGER HEAD 7 AXIS ACCELERATION

TRC
COMPLIANCE TEST PROGRAM
87201
HEOR62

, 870720

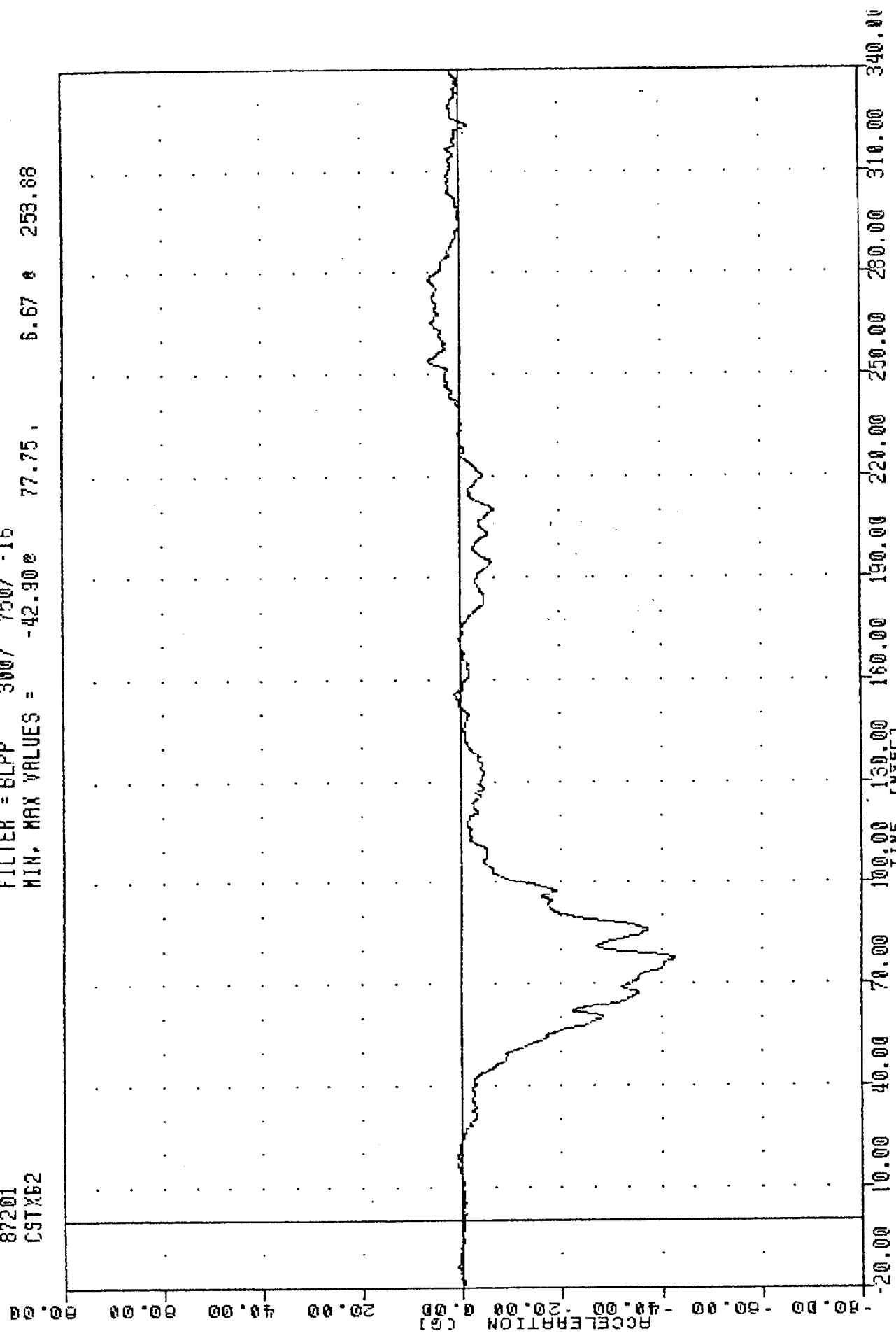
FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = 0.16e 29.50, 59.22 e 86.63



TAC
COMPLIANCE TEST PROGRAM
87201
CSTX62

, 870720

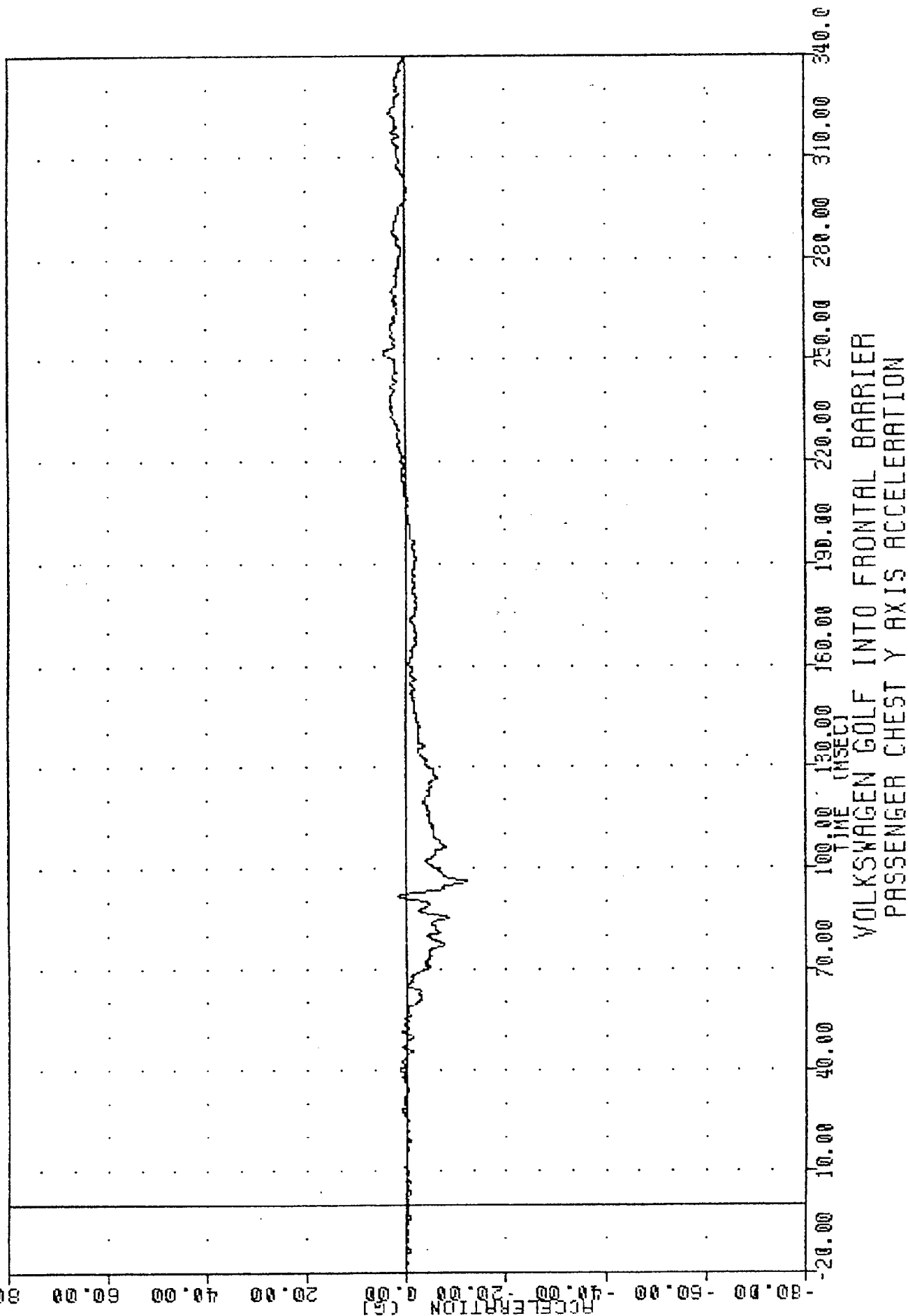
FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -42.90e 77.75, 6.67 e 253.68



VOLKSWAGEN GOLF INTO FRONTAL BARRIER
PASSENGER CHEST X AXIS ACCELERATION

TRC
COMPLIANCE TEST PROGRAM
87201
CSTYG2

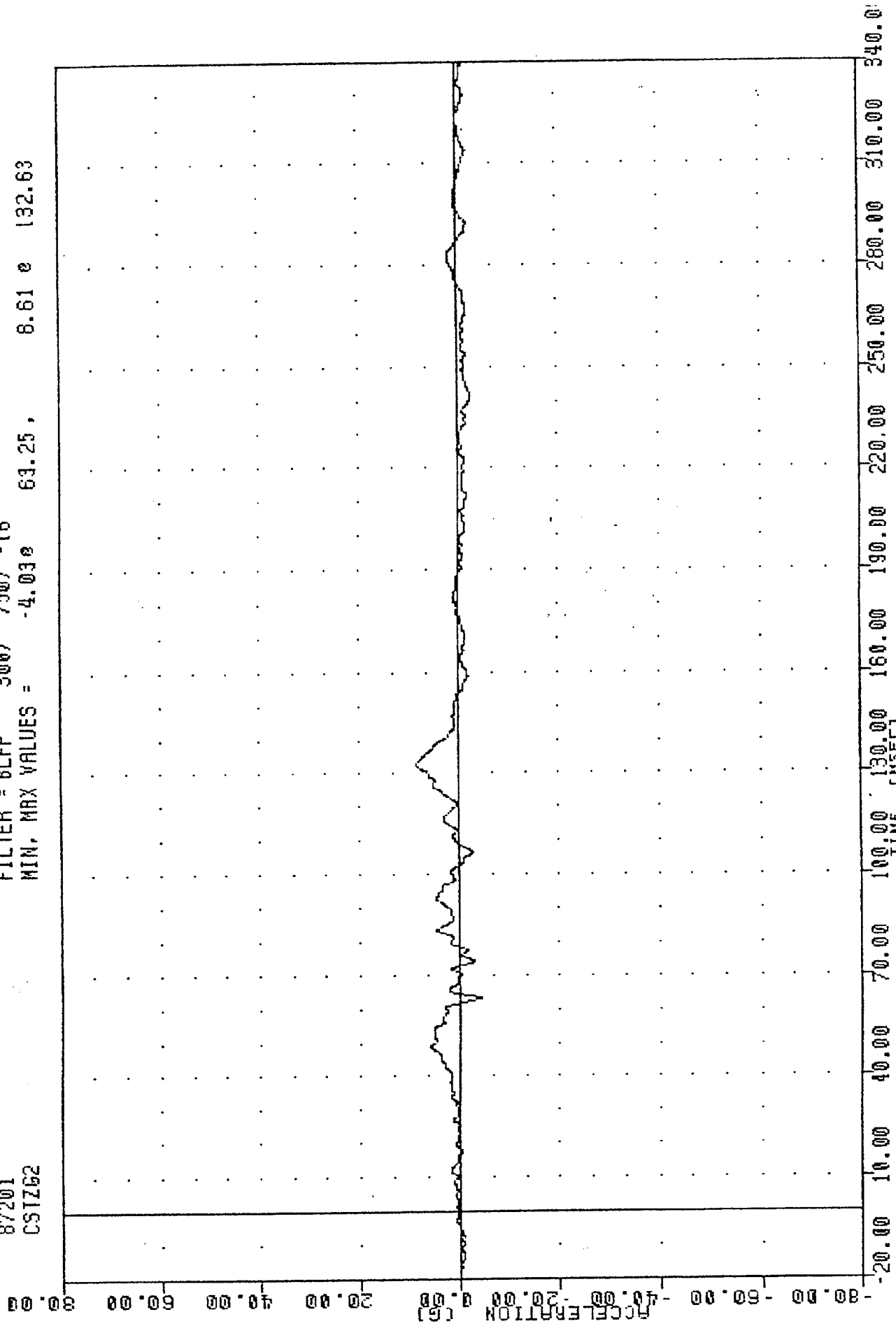
FILTER = BLPP 300/ 750/ -18
MIN, MAX VALUES = -12.348 95.75, 4.56 252.25



TRC
COMPLIANCE TEST PROGRAM
87201
CSTZ62

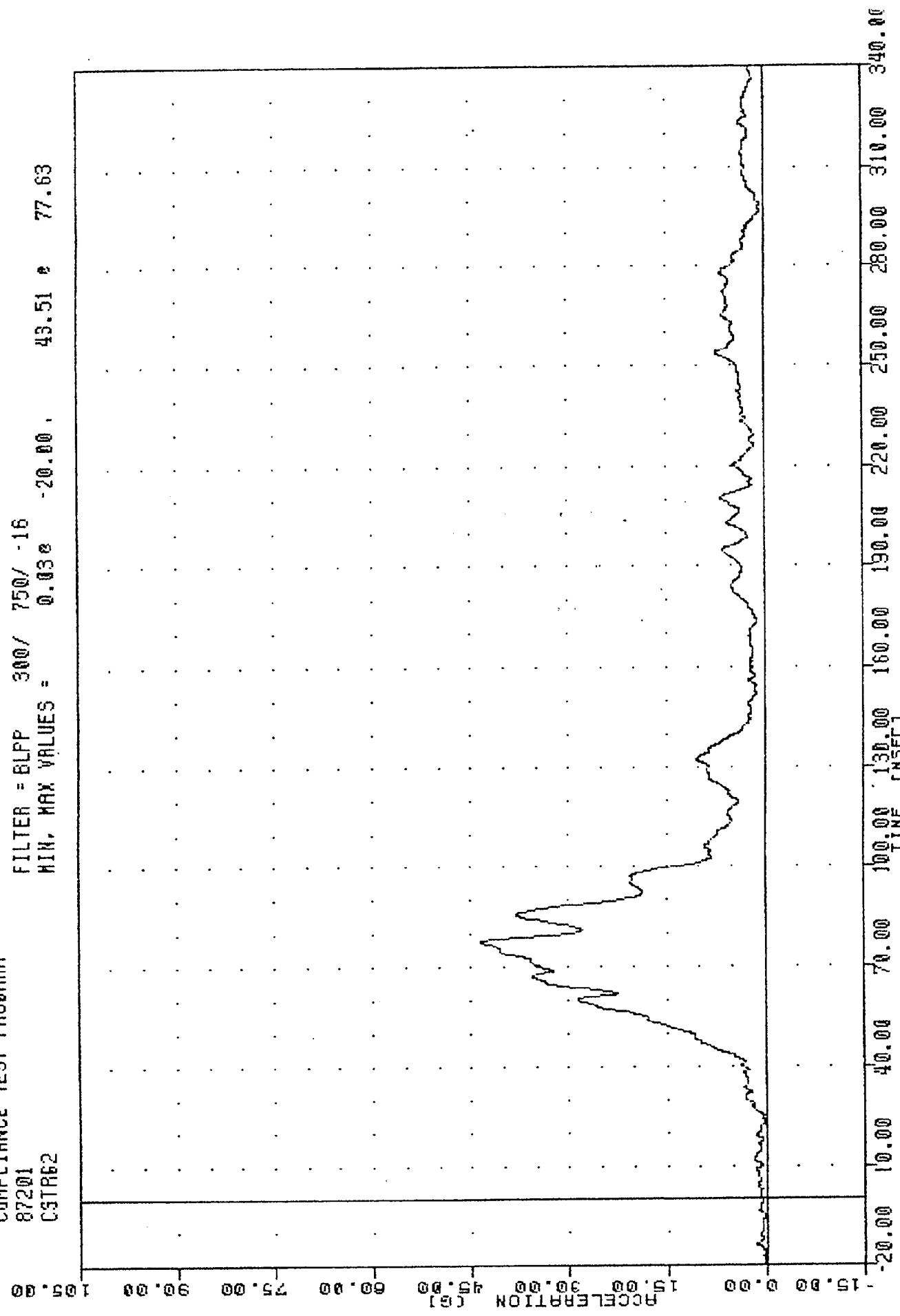
, 870720

FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -4.038 63.25, 8.61 e 132.63



TAC
 COMPLIANCE TEST PROGRAM
 87201
 C3TR62

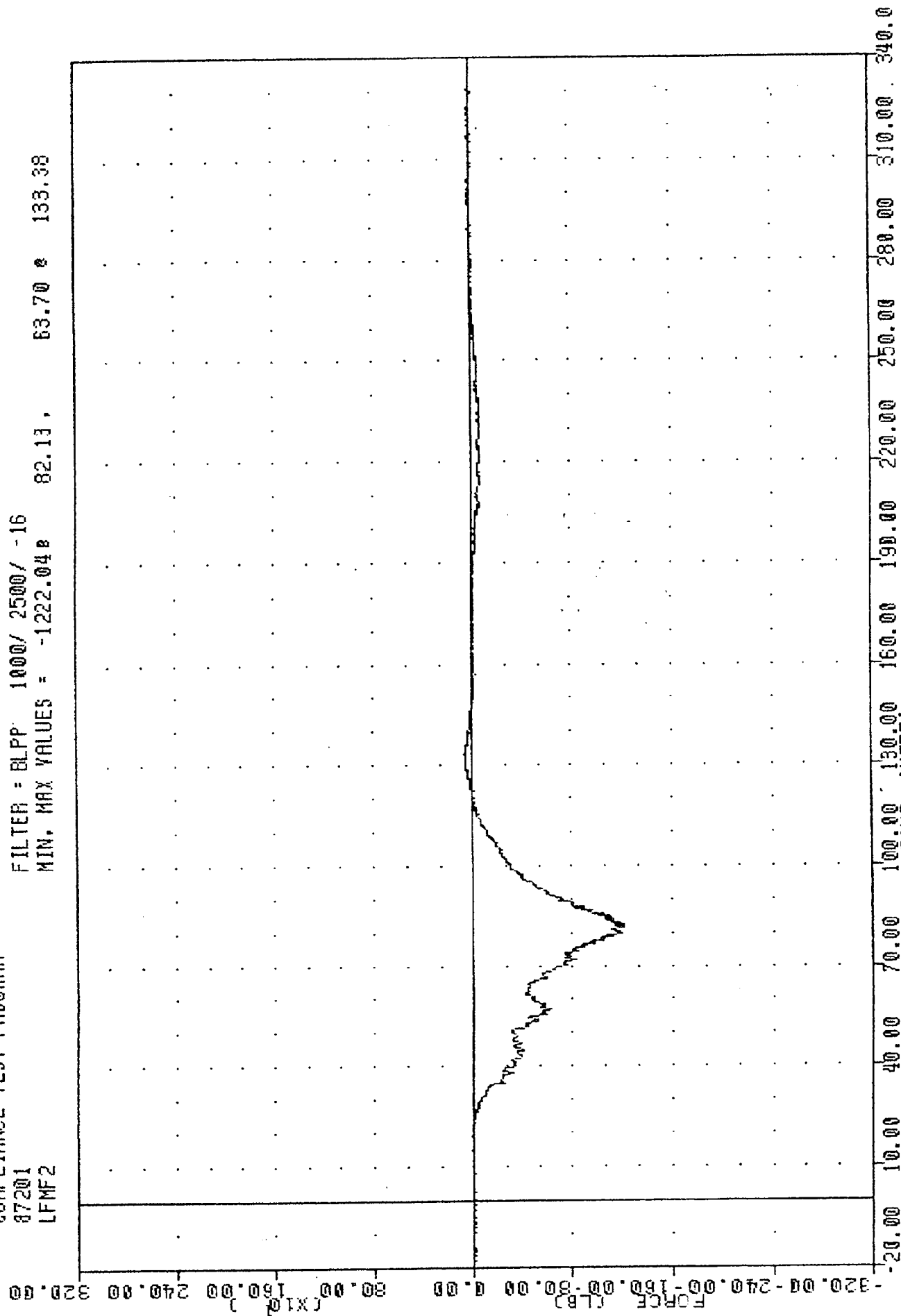
FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = 0.03e -20.00, 43.51 e 77.63



VOLKSWAGEN GOLF INTO FRONTAL BARRIER
 PASSENGER CHEST RESULTANT ACCELERATION

TRC
COMPLIANCE TEST PROGRAM
87201
LFMF2

FILTER = BLPP 1000/ 2500/ -16
MIN. MAX VALUES = -1222.048 82.13, 63.70 133.38



VOLKSWAGEN GOLF INTO FRONTAL BARRIER
PASSENGER LEFT FEMUR FORCE

TRC
COMPLIANCE TEST PROGRAM

87201

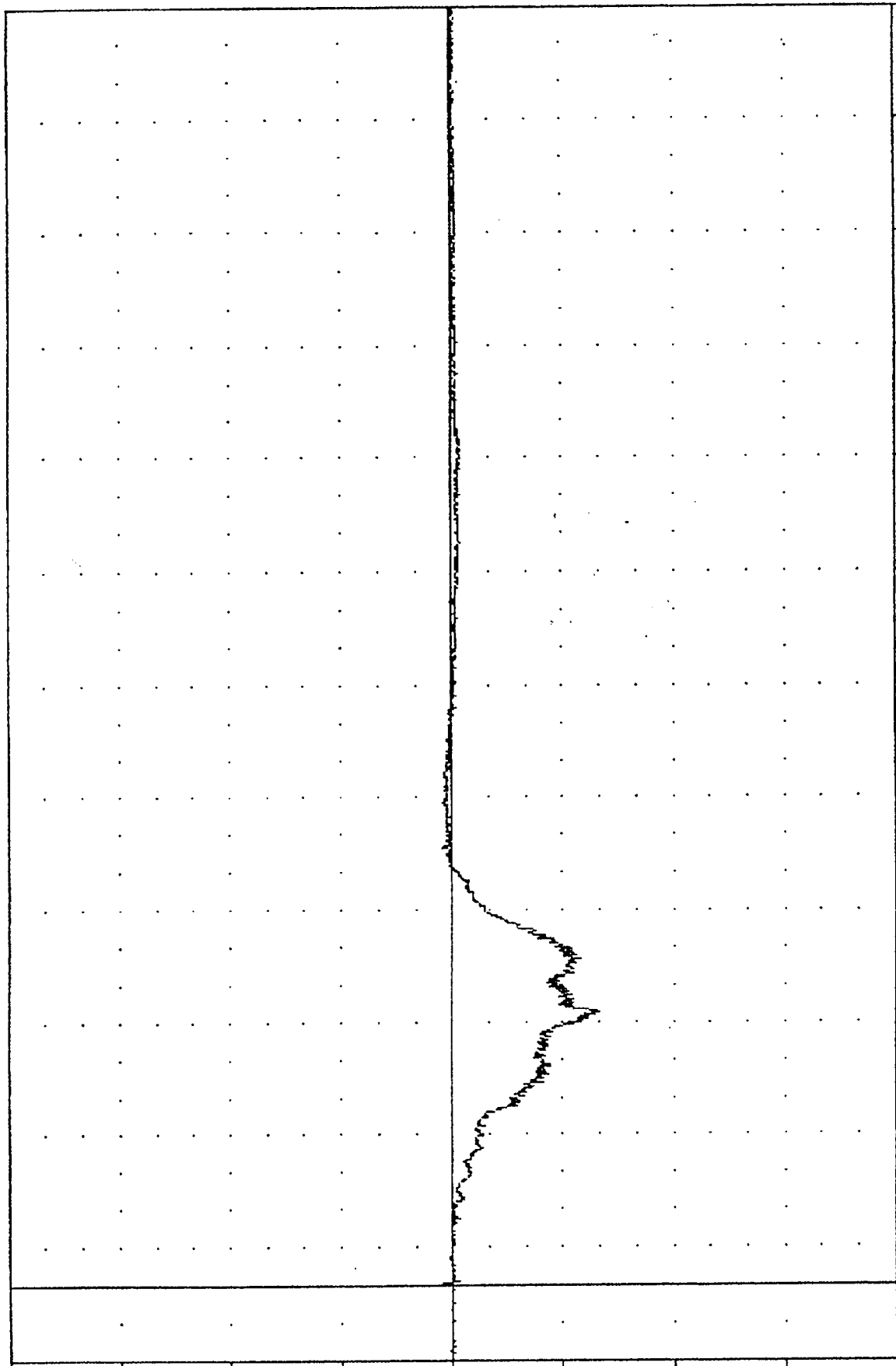
RFMF2

, 870720

FILTER = BLPP 1000/ 2500/ -16

MIN. MAX VALUES = -1065.64 72.75, 79.47 0 0.50

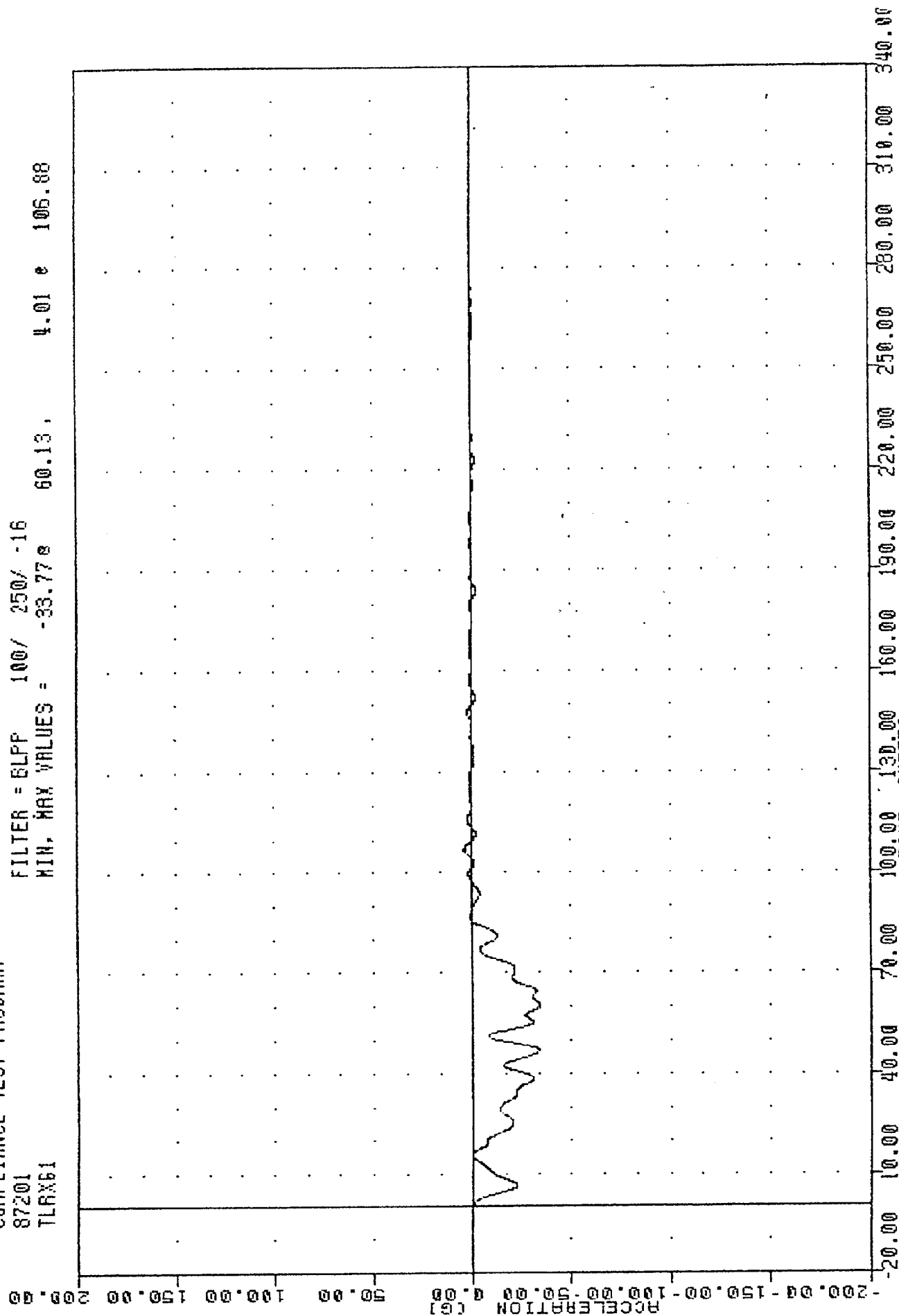
FORCE (LB)
TIME (MSEC)



VOLKSWAGEN GOLF INTO FRONTAL BARRIER
PASSENGER RIGHT FEMUR FORCE

TAC
COMPLIANCE TEST PROGRAM
87201
TLRX61

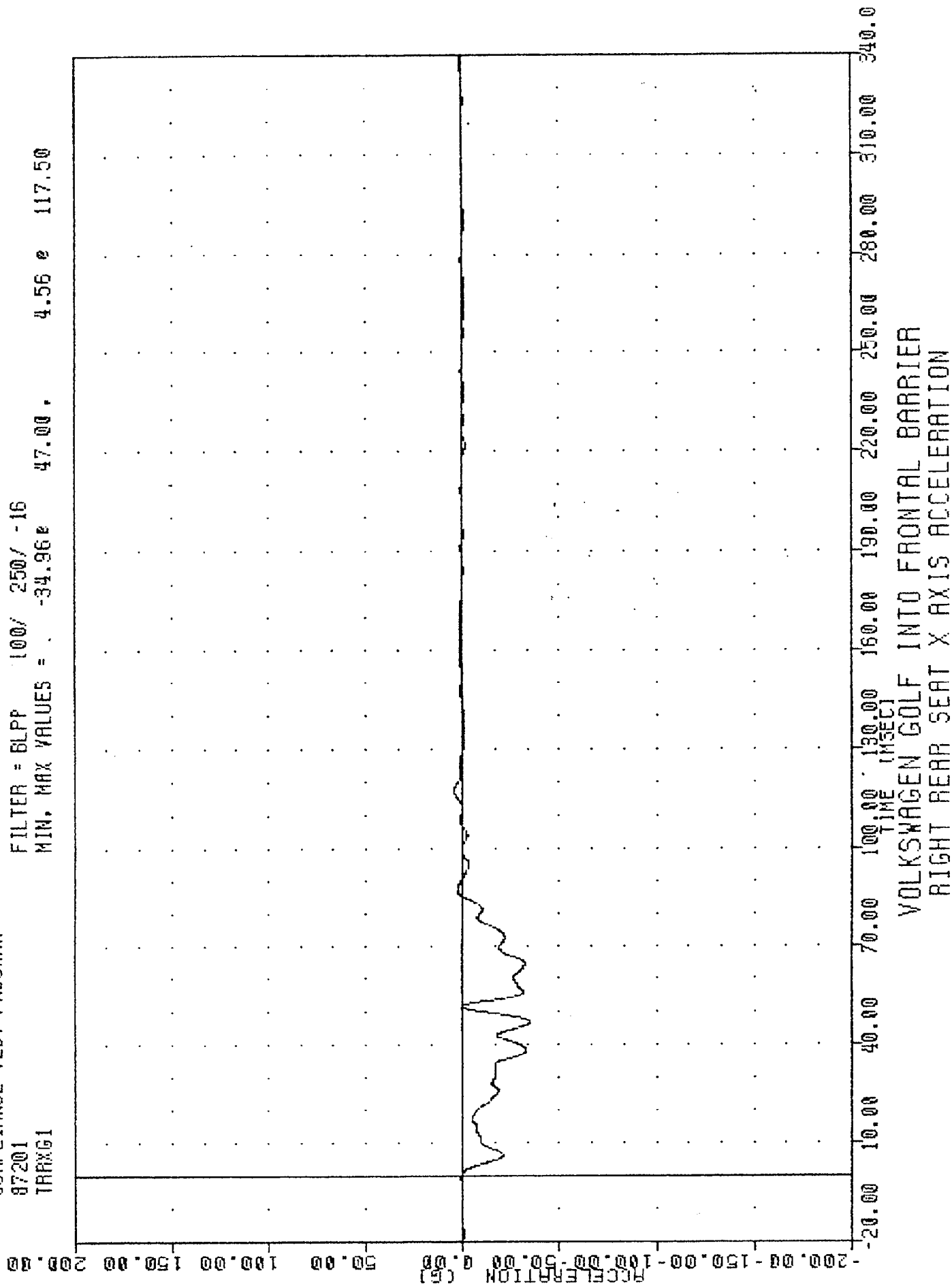
FILTER = 6LPP 100/ 250/ -16
MIN. MAX VALUES = -33.77s 60.13, 4.01 e 105.88



VOLKSWAGEN GOLF INTO FRONTAL BARRIER
LEFT REAR SEAT X AXIS ACCELERATION

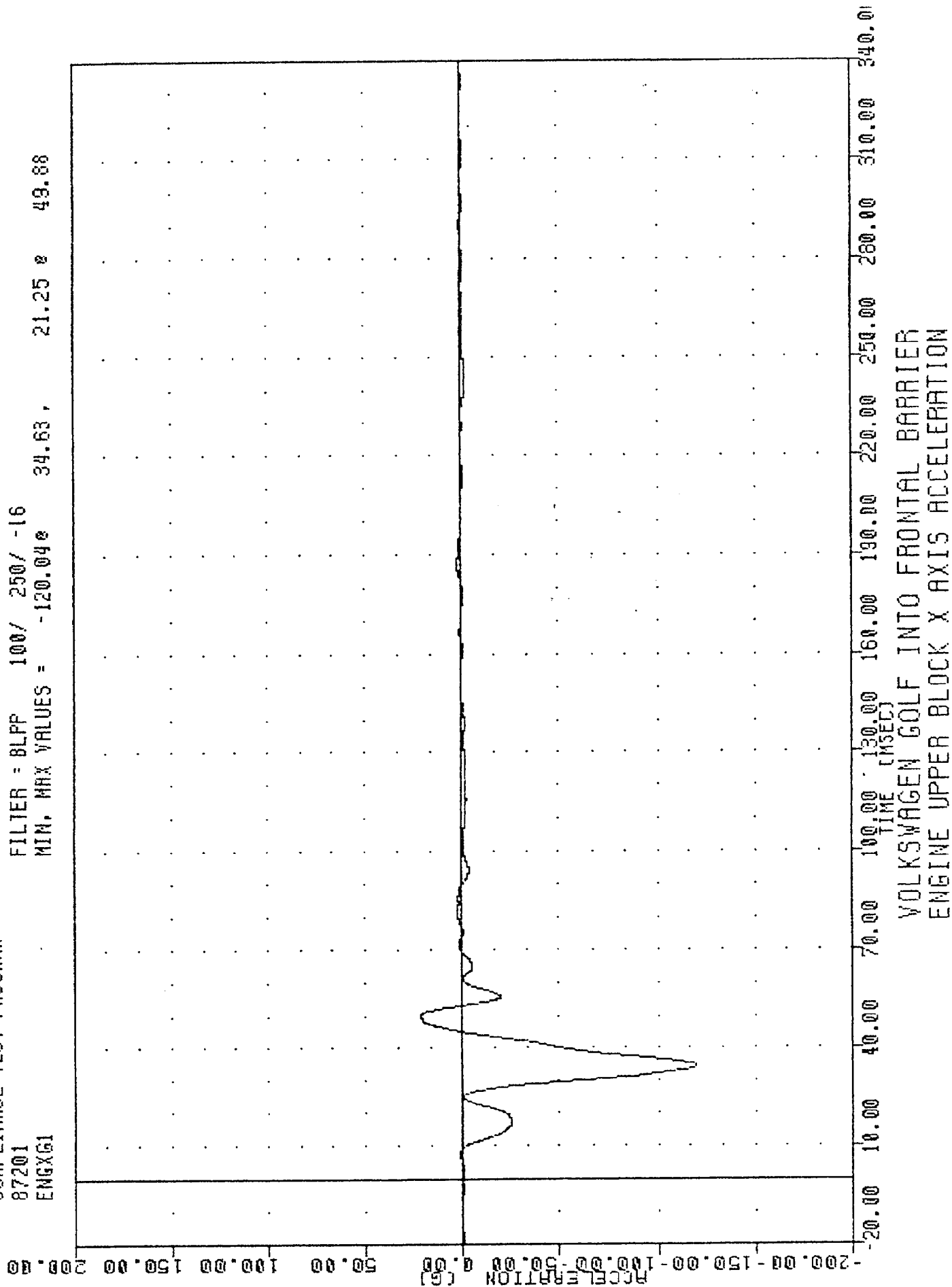
TRC
COMPLIANCE TEST PROGRAM
87201
TRXG1

FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -34.96e 47.00, 4.56 e 117.50



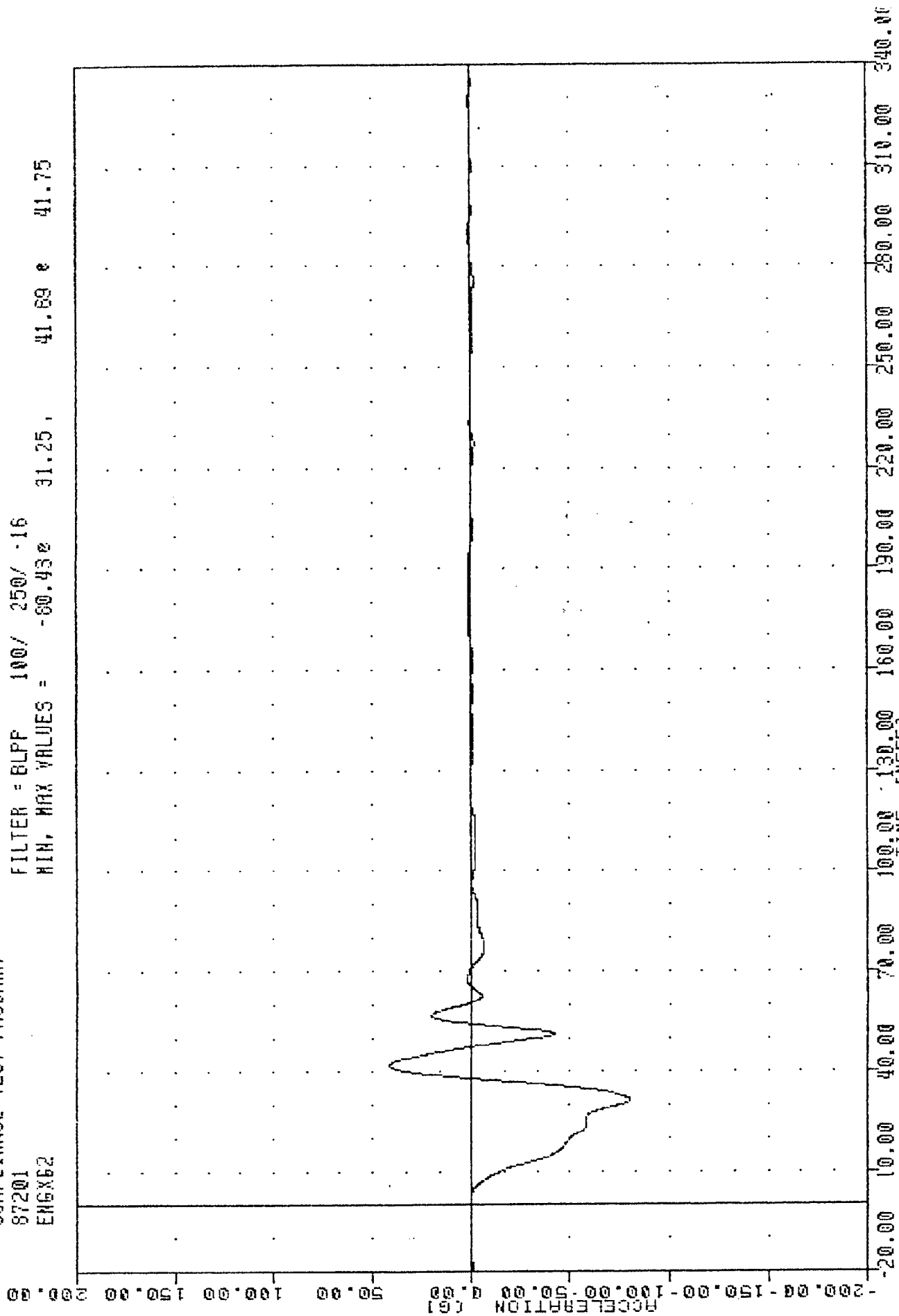
TRC
COMPLIANCE TEST PROGRAM
87201
ENGXG1

FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -120.04e 34.63, 21.25 e 49.88



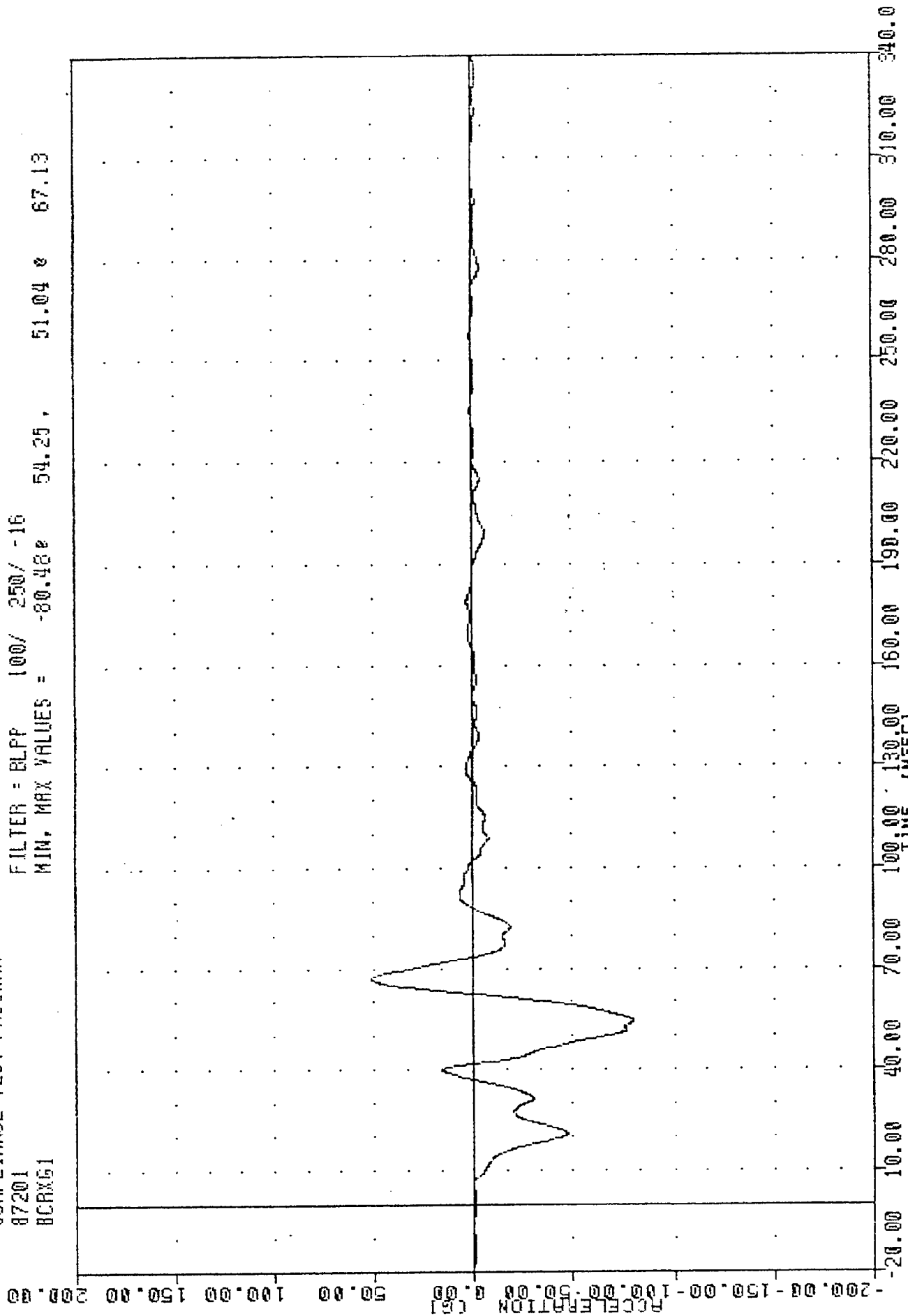
TAC
COMPLIANCE TEST PROGRAM
87201
ENGX62

FILTER = BLPP 100/ 250/ .16
MIN, MAX VALUES = -80.432 31.25, 41.69 e 41.75



TRC
COMPLIANCE TEST PROGRAM
87201
BCRXG1

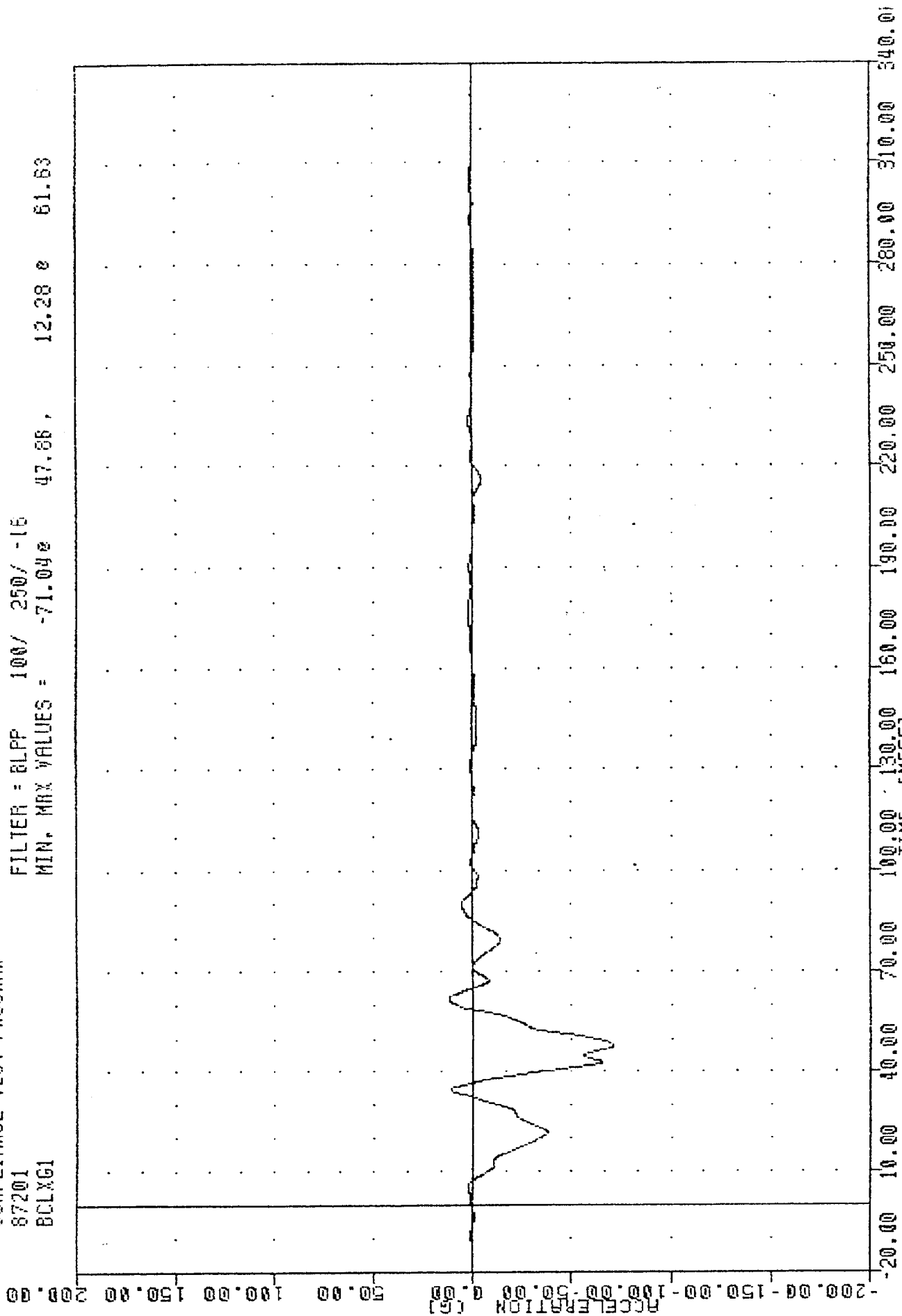
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -80.48e 54.25, 51.04 e 67.13



VOLKSWAGEN GOLF INTO FRONTAL BARRIER
RIGHT BRAKE CALIPER X AXIS ACCELERATION

TRC
COMPLIANCE TEST PROGRAM
87201
BCLXG1

FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -71.042 47.88 12.28 61.83



VOLKSWAGEN GOLF INTO FRONTAL BARRIER
LEFT BRAKE CALIPER X AXIS ACCELERATION

THC

870720

COMPLIANCE TEST PROGRAM

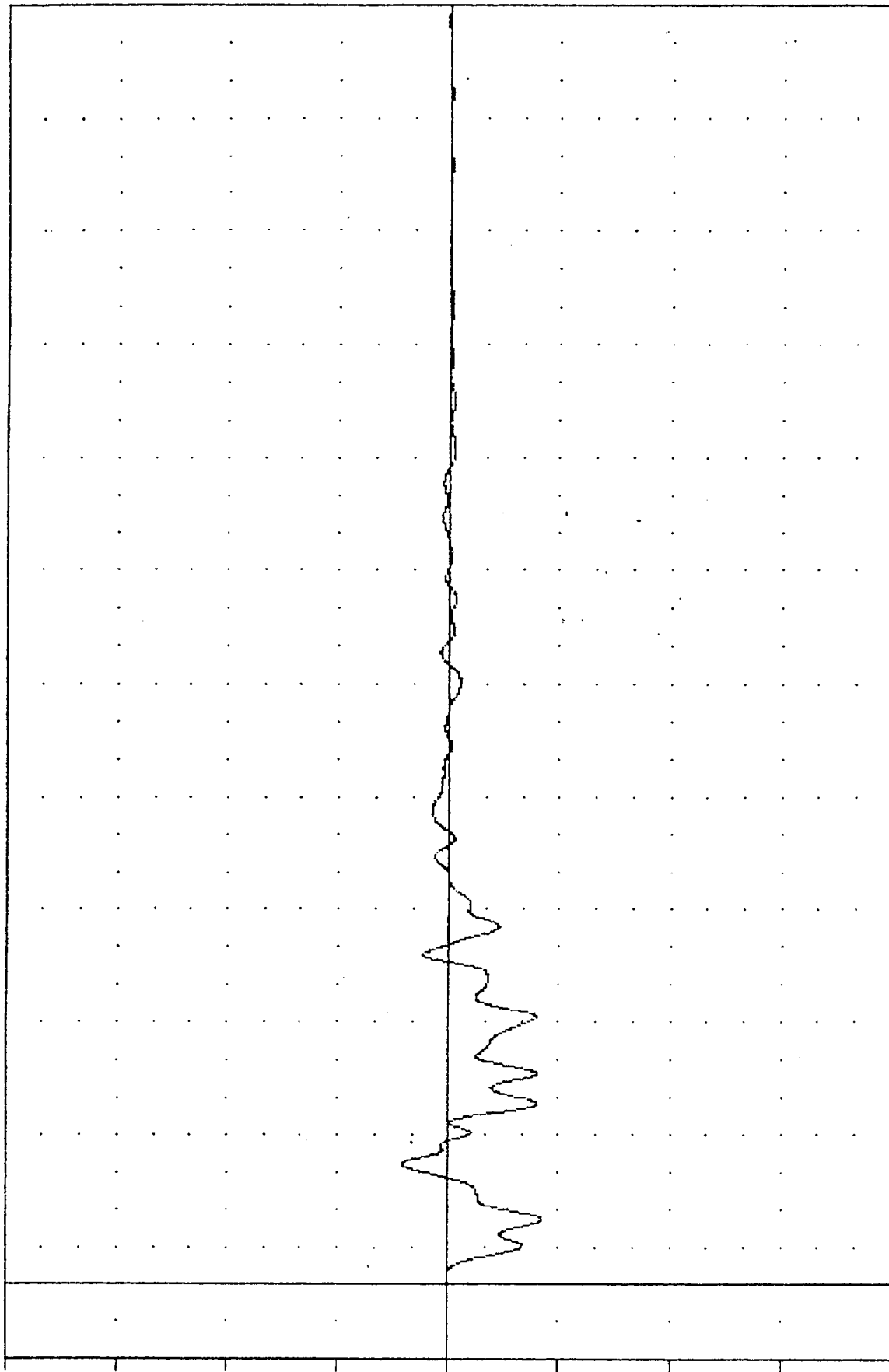
87201

DPCXBI

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -42.448 17.13 20.94 32.13

ACCELERATION G



TIME (MSEC)

VOLKSWAGEN GOLF INTO FRONTAL BARRIER
DASH PANEL CENTER X AXIS ACCELERATION