REPORT NOS. 208-TRC-88-006

212-TRC-88-006

301-TRC-88-006

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

FORD MOTOR COMPANY

1988 FORD TEMPO

4-DOOR SEDAN

NHTSA NO. CJ0207

TRC TEST NO. 881003

THE TRANSPORTATION RESEARCH CENTER OF OHIO

U.S. RT. 33, LOGAN COUNTY

EAST LIBERTY, OHIO 43319

OCTOBER 20, 1988

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

OFFICE OF VEHICLE SAFETY COMPLIANCE

400 SEVENTH STREET, S.W.

ROOM NO. 6115 (NEF-31)

WASHINGTON, DC 20590

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REPORT PREPARED BY:

_____ Date 12/20/88

J.W. Sankey, Supervisor, Laboratory Engineering
Transportation Research Center of Ohio

REPORT APPROVED BY:

_____ Date 12-24-88

C.K. Latimer, Project Manager
Transportation Research Center of Ohio

FINAL REPORT ACCEPTED BY:

_____ Date 12-1-88

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

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15. Supplementary Notes

16. Abstract

A 30 mph flat frontal barrier impact compliance test was conducted on a 1988 Ford Tempo 4-door sedan, VIN 1FACP36X0JK184334, NHTSA No. CJ0207, at the Transportation Research Center of Ohio on October 3, 1988. This test was conducted to determine compliance with Federal Motor Vehicle Safety Standards:

FMVSS No. 208, "Occupant Crash Protection"
FMVSS No. 212, "Windshield Mounting"
FMVSS No. 219, (Partial), "Windshield Zone Intrusion"
FMVSS No. 301, "Fuel System Integrity"

The barrier impact velocity was 29.3 mph.
The ambient temperature was 55° F
The vehicle appears to comply with the applicable requirements of FMVSS Nos. 208, 212, 219 (partial), and 301.

17. Key Words	18. Distribution Statement
Frontal Impact 30 mph Vehicle Safety Compliance Testing FMVSS 208, "Occupant Crash Protection" FMVSS 212, "Windshield Mounting" FMVSS 219, "Windshield Zone Intrusion" FMVSS 301, "Fuel System Integrity"	Available from: Technical Reference Division National Highway Traffic Safety Admin Nassif Building, Room 5108 400 Seventh Street, SW Washington, DC 20590

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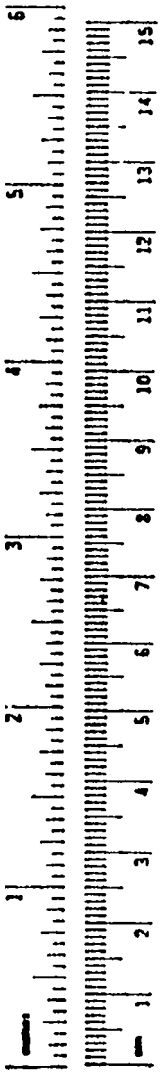
METRIC CONVERSION FACTORS

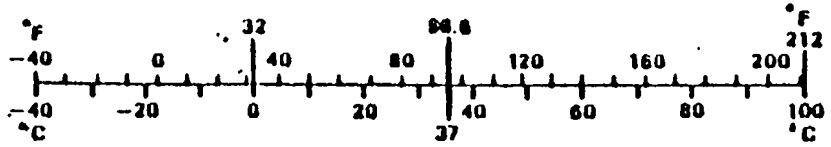
Approximate Conversions to Metric Measures

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	0.4	hectares	ha
	MASS (weight)			
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	metric ton	t
	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	5/9 (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 (10 000 m^2)	2.5	acres	
	MASS (weight)			
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	metric ton (1000 kg)	1.1	short tons	
	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



881003

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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. DTNH22-88-C-11038. The purpose of this test was to determine if the subject vehicle, a 1988 Ford Tempo 4-door sedan, NHTSA No. CJ0207, 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-208-07.

TEST SUMMARY

The 1988 Ford Tempo 4-door sedan, NHTSA No. CJ0207, was equipped with a 2.3 liter, transverse engine, automatic transmission, power steering, and power brakes. The test weight of the vehicle was 3138 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 spillage from the fuel system following the impact. The post-impact static rollover test was not conducted per the COTR's instructions.

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-208-07.

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 3000 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 October 3, 1988. The test vehicle's impact speed was 29.3 mph. The vehicle sustained 15.2 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.: CJ0207 PROJECT: 208 Compliance

DATE: 10/03/88 TIME: 1302 TEMP: 55° F

VEHICLE: 1988 Ford Tempo 4-door sedan

TEST WEIGHT (LBS): 3138

IMPACT ANGLE (DEG)*: 0°

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

MAXIMUM STATIC CRUSH (IN): 15.2

VEHICLE REBOUND (IN): 12.4

DUMMIES:	Driver #354	Passenger #353
TYPE:	Part 572 B	Part 572 B
LOCATION:	Left front	Right front
RESTRAINT:	Airbag	3-point unibelt

NUMBER OF DATA CHANNELS: 23

NUMBER OF HIGH SPEED CAMERAS: 14

*With respect to tow track centerline.
**Speed trap measurement (± .05 mph accuracy)

TABLE 2 TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Ford Motor Company

MAKE/MODEL: Ford Tempo VIN: 1FACP36X0JK184334

BODY STYLE: 4-door sedan MODEL YEAR: 1988

NHTSA NO.: [illegible] COLOR: red

ENGINE DATA: TYPE: transverse CYLINDERS: 4 DISPLACEMENT: 2.3 liter

TRANSMISSION DATA: _3_SPEED, ___MANUAL, _X_AUTOMATIC, _X_FWD, ___RWD, ___4WD

DATE VEHICLE RECEIVED: 4/22/88 ODOMETER READING: 116.0

DEALER'S NAME AND ADDRESS: Bob Chapman Ford/Mercury
1255 Industrial Parkway
Marysville, OH 43040

ACCESSORIES:

POWER STEERING Yes	AUTOMATIC TRANSMISSION Yes
POWER BRAKES Yes	AUTOMATIC SPEED CONTROL No
POWER SEATS No	TILTING STEERING WHEEL No
POWER WINDOWS No	TELESCOPING STEERING WHEEL No
TINTED GLASS Yes	AIR CONDITIONING Yes
RADIO Yes	ANTI-SKID BRAKE No
CLOCK Yes	REAR WINDOW DEFROSTER Yes
OTHER Airbag	

REMARKS:

1. IS THE VEHICLE STOCK THROUGHOUT? Yes
2. DOES VEHICLE SHOW EVIDENCE OF PRIOR ACCIDENT HISTORY? No
3. DOES VEHICLE SHOW ANY SIGNIFICANT CORROSION? No
4. CONDITION OF THE FRONT/REAR BUMPER AND FRAME: Good

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

VEHICLE MANUFACTURED BY: Ford Motor Company

DATE OF MANUFACTURE: 3/88

GVWR: 3682 LBS

GAWR: FRONT 1999 LBS., REAR 1812 LBS.

TABLE 2 TEST VEHICLE INFORMATION CONT'D

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

VEHICLE LOAD (UP TO CAPACITY): FRONT 30 psi; REAR 30 psi

RECOMMENDED TIRE SIZE: P185/70R14 LOAD RANGE X B. ____C, ____D

TIRES ON VEHICLE (MFR., LINE, SIZE): Goodyear Invicta P185/70R14

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 100 LBS. TOTAL 850 LBS.

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

RIGHT FRONT	856 lbs.	RIGHT REAR	526 lbs.
LEFT FRONT	841 lbs.	LEFT REAR	498 lbs.

TOTAL FRONT WEIGHT 1697 lbs. (62.4% OF TOTAL VEHICLE WEIGHT)

TOTAL REAR WEIGHT 1024 lbs. (37.6% OF TOTAL VEHICLE WEIGHT)

TOTAL DELIVERED WEIGHT 2721 lbs.

CALCULATION FOR TARGET TEST WEIGHT:

RCLW = RATED CARGO AND LUGGAGE WEIGHT

UDW = UNLOADED DELIVERED WEIGHT (2721 LBS)

VCW = VEHICLE CAPACITY WEIGHT (850 LBS)

DSC = DESIGNATED SEATING CAPACITY (5)

RCLW = VCW - 150 (DCS) = 850 - 150(5) = 100 LBS

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

= 2721 + 100 + 328 LBS

TARGET TEST WEIGHT = 3149 LBS

TABLE 2 TEST VEHICLE INFORMATION CONT'D

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 89 LBS. CARGO

RIGHT FRONT	860 lbs.	RIGHT REAR	636 lbs.
LEFT FRONT	943 lbs.	LEFT REAR	699 lbs.
TOTAL FRONT WEIGHT	1803 lbs.	(57.4% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1335 lbs.	(42.6% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	3138 lbs.	(0.3% UNDER TARGET WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE TRUNK AREA: 0 LBS.

COMPONENTS REMOVED TO MEET TARGET WEIGHT: None

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	LF	26.2;	RF	26.2;	LR	25.5;	RR 25.3
PRE-TEST ATTITUDE:	LF	25.9;	RF	25.9;	LR	24.0;	RR 23.9
POST-TEST ATTITUDE:	LF	27.9;	RF	27.2;	LR	23.1;	RR 23.4

WHEELBASE: 100.2 INCHES

CG = 42.6 INCHES REARWARD OF FRONT WHEEL CENTERLINE

TABLE 3 TEST CONDITIONS

TEST NUMBER: 881003

DATE OF TEST: 10/3/88 TIME OF TEST: 1302

TYPE OF TEST: Frontal barrier impact IMPACT ANGLE: 0°

AMBIENT TEMPERATURE AT IMPACT AREA: 55° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 70° F

IMPACT VELOCITY: PRIMARY = 29.3 MPH SECONDARY = 29.3 MPH

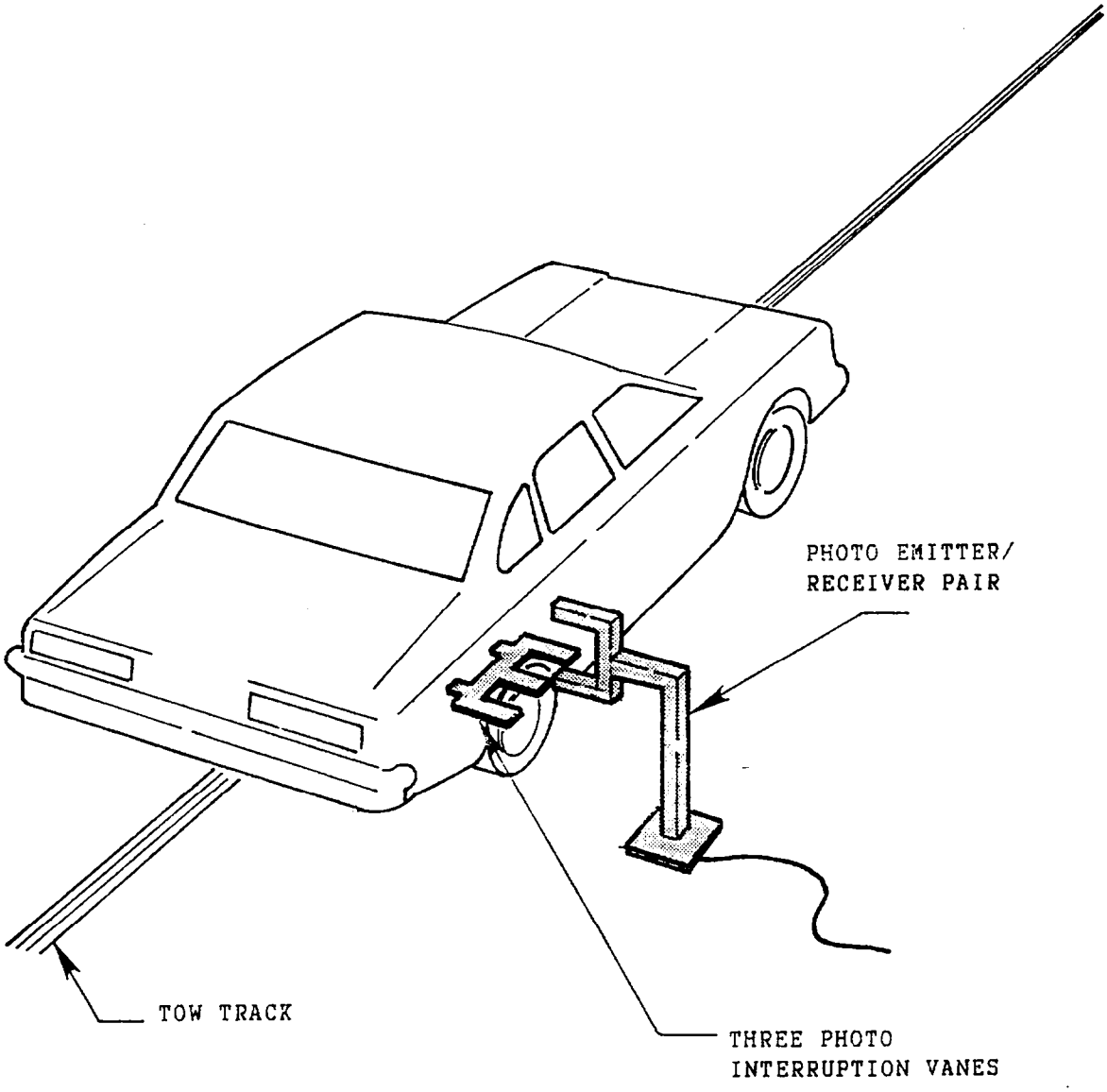
(SPECIFIED RANGE = 28.9 TO 29.9 MPH)

VEHICLE REBOUND AND CRUSH (ALL DIMENSIONS IN INCHES):

OVERALL LENGTH OF TEST VEHICLE:	PRE-TEST:	L	173.1;	C	176.4;	R	173.8
	POST-TEST:	L	159.1;	C	161.7;	R	158.7
	TOTAL CRUSH:	L	14.0;	C	14.7;	R	15.1

FOR FRONTAL IMPACTS, DISTANCE FROM FRONT OF TEST VEHICLE TO BARRIER AFTER IMPACT: L: 13.2; C: 11.1; R: 12.9; AVG: 12.4

FIGURE 1 IMPACT VELOCITY MEASUREMENT SYSTEM

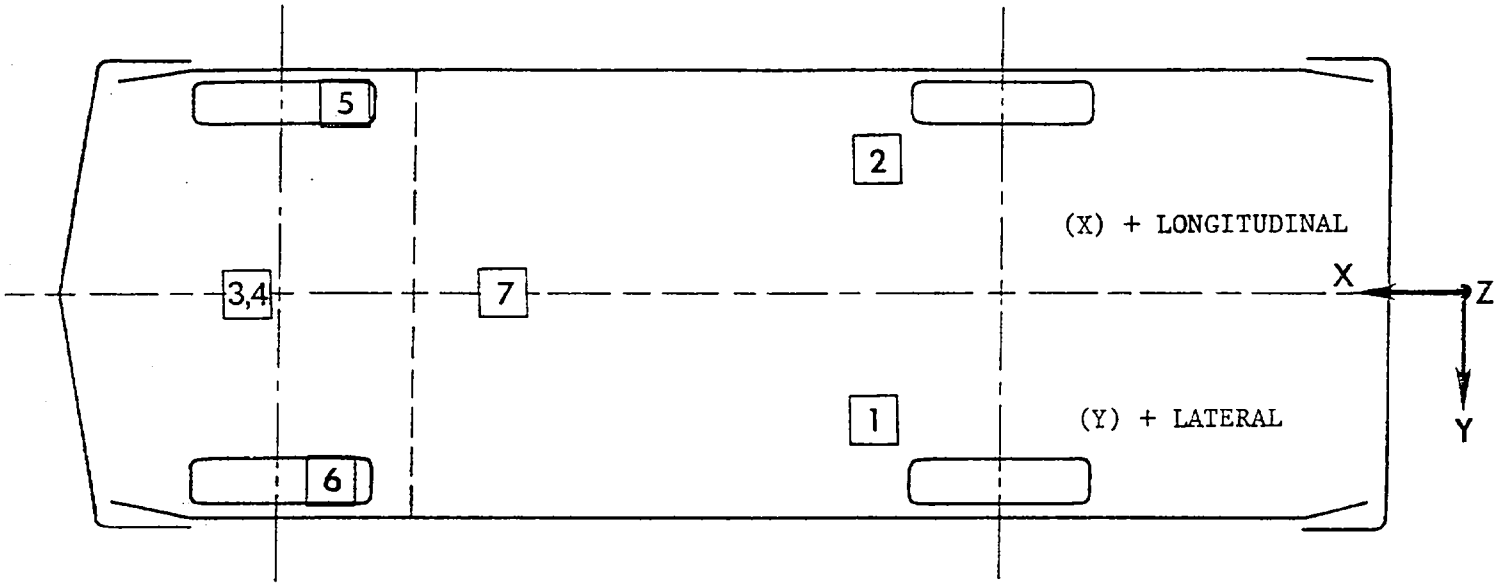


The final vane clears emitter/receiver two inches before impact.

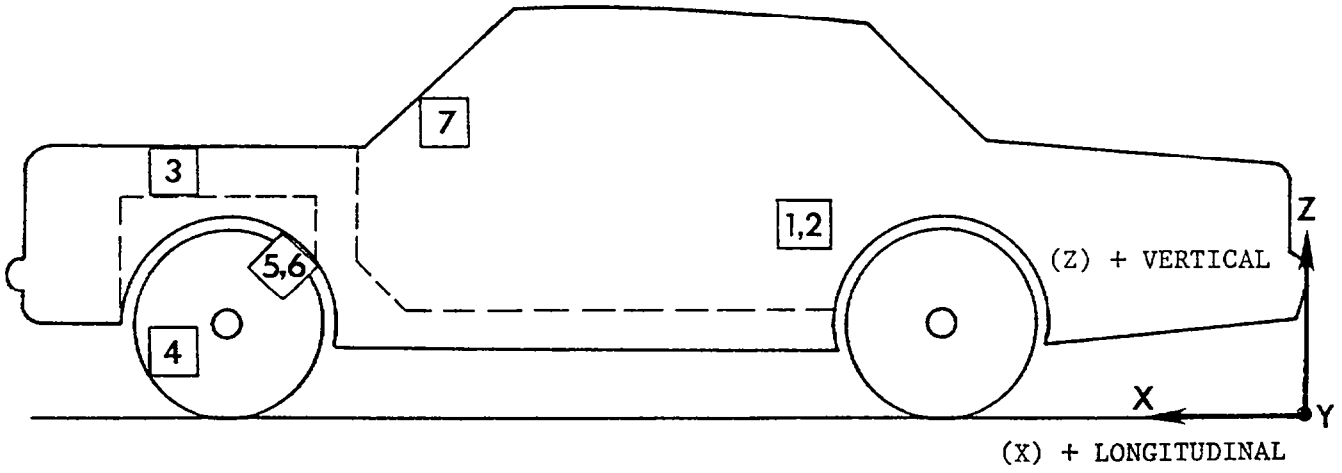
The vanes have one foot spacing.

FIGURE 2

VEHICLE ACCELEROMETER LOCATIONS



TOP VIEW



SIDE VIEW

TEST NUMBER 881003

TABLE 4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

No.	LOCATION		X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
1	REAR SEAT CROSSMEMBER	PRE	70.0	21.6	13.0				
	AT LEFT SIDE	POST	70.6	21.6	14.4				
	LONGITUDINAL					1.2	191.9	35.9	37.3
2	REAR SEAT CROSSMEMBER	PRE	70.0	-22.0	12.8				
	AT RIGHT SIDE	POST	70.6	-22.0	14.8				
	LONGITUDINAL					1.8	142.3	38.8	39.5
3	TOP OF ENGINE BLOCK	PRE	150.5	0.2	31.1				
		POST	144.4	1.0	32.0				
	LONGITUDINAL					56.1	43.1	122.5	33.4
4	BOTTOM OF ENGINE BLOCK	PRE	145.1	-9.5	7.4				
		POST	139.6	-8.4	7.2				
	LONGITUDINAL					42.1	38.8	120.3	32.3
5	BRAKE CALIPER	PRE	146.0	-23.2	11.4				
	AT RIGHT SIDE	POST	142.5	-24.0	10.4				
	LONGITUDINAL					29.2	56.0	67.7	33.6
6	BRAKE CALIPER	PRE	146.0	23.0	11.4				
	AT LEFT SIDE	POST	141.5	24.0	10.8				
	LONGITUDINAL					31.7	53.9	82.5	29.3
7	DASH PANEL	PRE	118.9	-2.2	33.0				
		POST	118.4	-2.2	34.8				
	LONGITUDINAL					6.8	99.8	46.1	42.3

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: + FORWARD FROM REAR BUMPER
Y: + LEFTWARD FROM VEHICLE CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

FIGURE 3 ACCIDENT INVESTIGATION DIVISION DATA
FOR 30 MPH FRONTAL BARRIER IMPACT

VEHICLE MAKE/MODEL/BODY STYLE: Ford/Tempo/4-door sedan

VEH. NHTSA NO.: CJ0207 ; VIN: 1FACP36X0JK184334

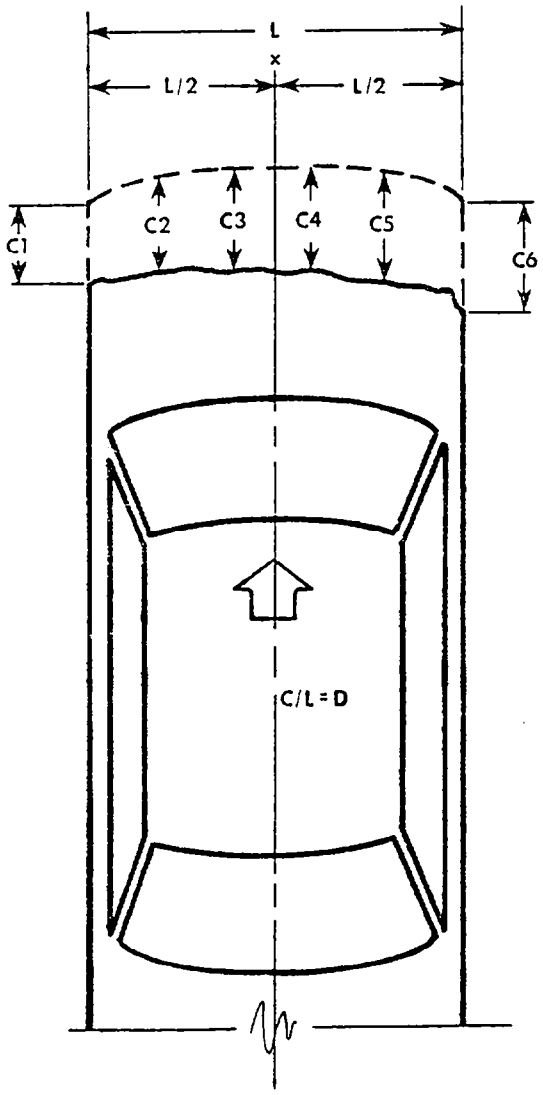
MODEL YEAR: 1988 ; BUILD DATE: 3/88 ; TEST DATE: 10/3/88

VEH. SIZE CATEGORY: Compact ; TEST WEIGHT: 3138

VEH. WHEELBASE: 100.2

MAX. WIDTH: 68.5

FRONT OVERHANG: 34.1



COLLISION DEFORMATION
CLASSIFICATION (CDC) CODE: 12FDEW2

F (Frontal)

CRUSH DEPTH DIMENSIONS:

C1 = 14.0 inches

C2 = 14.7 inches

C3 = 14.8 inches

C4 = 14.8 inches

C5 = 15.2 inches

C6 = 15.1 inches

MIDPOINT OF DAMAGE: D = Vehicle Centerline (Longitudinal)

LENGTH OF DAMAGED REGION: L = 56.1 inches

FIGURE 4

PRE-TEST AND POST-TEST MEASUREMENT POINTS

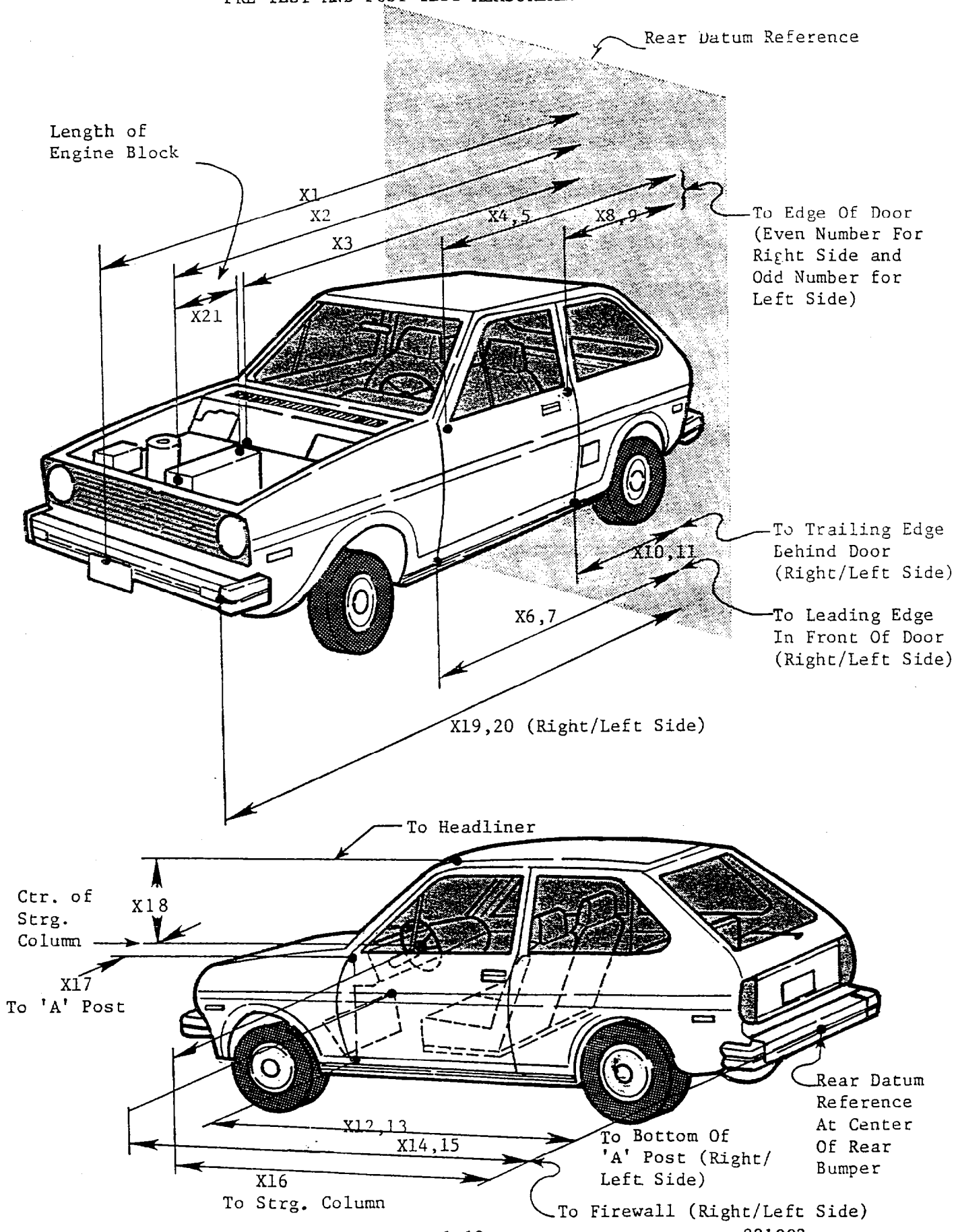
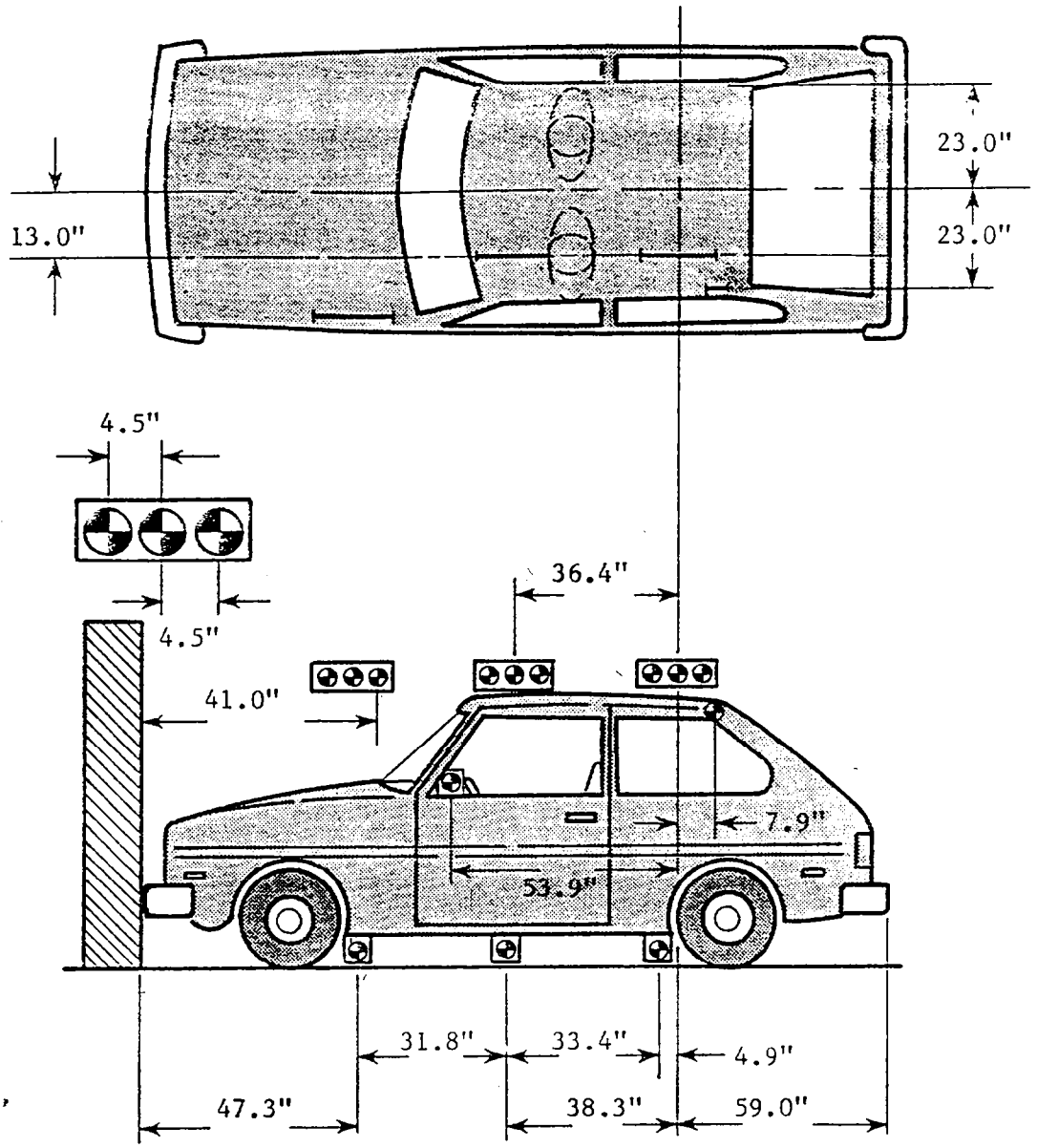


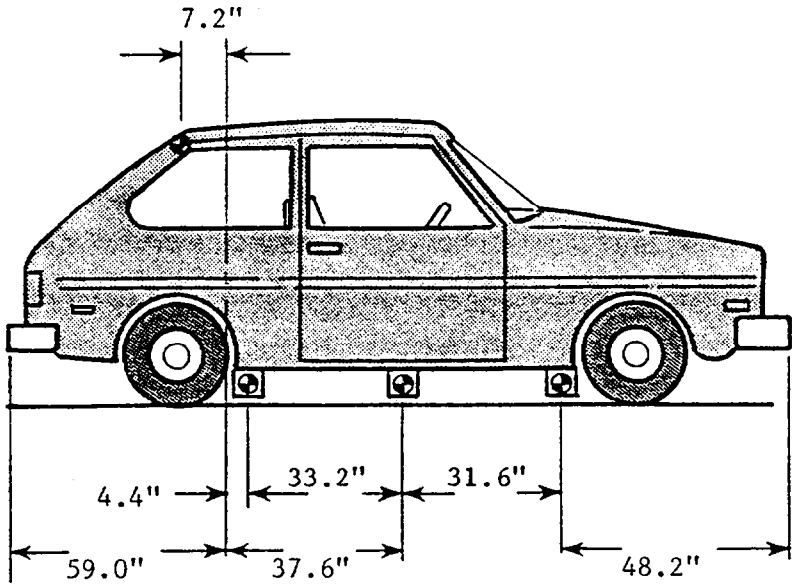
TABLE 5 IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Ford/Tempo TEST NUMBER: 881003

NO.	TYPE OF MEASUREMENT	DIMENSIONS IN INCHES PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	176.4	161.7	14.7
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	152.2	144.6	7.6
X3	REAR SURFACE OF VEHICLE TO FIREWALL	136.9	135.1	1.8
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	122.9	122.1	0.8
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	122.8	122.3	0.5
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	121.4	120.6	0.8
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	121.6	121.4	0.2
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	83.6	83.1	0.5
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	83.4	83.3	0.1
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	83.9	83.1	0.8
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	83.9	83.4	0.5
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	120.6	119.5	1.1
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	120.2	120.1	0.1
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	138.0	134.8	3.2
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	138.5	134.3	4.2
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	103.4	105.9	-2.5
X17	CENTER OF STEERING COLUMN TO "A" POST	15.9	14.9	1.0
X18	CENTER OF STEERING COLUMN TO HEADLINING	17.0	15.9	1.1
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	173.8	158.7	15.1
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	173.1	159.1	14.0
X21	LENGTH OF ENGINE BLOCK	17.0	17.0	0.0

VEHICLE TARGET LOCATION





881003

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 1988 Ford Tempo 4-door sedan, NHTSA No. CJ0207 appeared to comply with the requirements of FMVSS Nos. 208, 212, 219 (partial), and 301.

The driver's Head Injury Criteria (HIC) was 456. The driver's maximum chest deceleration over three milliseconds was 43.5 g. The driver's right and left compressive femur loads were 1209 pounds and 1144 pounds, respectively.

The right front passenger's Head Injury Criteria (HIC) was 561. The right front passenger's maximum chest deceleration over three milliseconds was 44.7 g. The right front passenger's right and left compressive femur loads were 521 pounds and 668 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 spillage following the crash test event. The post-impact static rollover test was not conducted per the COTR's instruction.

TABLE 6 DUMMY INJURY CRITERIA

MAXIMUM ACCELERATION ('G')

	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
DRIVER	-66.5	-21.6	108.2	110.1	-43.4	-5.0	-13.3	43.5
PASSENGER	-18.8	-33.5	-51.6	53.1	-44.8	-19.0	-16.3	44.7

MAXIMUM FORCE-FEMUR LOAD (LBS)

	LEFT FEMUR	RIGHT FEMUR
DRIVER	1144	1209
PASSENGER	668	521

HEAD INJURY CRITERIA**

	HIC	TIME t_1 (MSEC)	TIME t_2 (MSEC)
DRIVER	456	65.4	96.9
PASSENGER	561	74.5	110.5

*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 dummy's head and chest contacted the airbag. As forward motion continued the driver's head impacted the windshield and rotated forward. Upon rebound, the driver's head contacted the headliner and sunvisor and rotated rearward as the dummy rebounded into the seat back. The dummy came to rest seated upright in the driver's seat.

RIGHT FRONT PASSENGER DUMMY

Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head rotated forward, contacting the dummy's chest as the chest was restrained by the three-point unibelt. The dummy's head rotated rearward as the dummy rebounded into the seatback. The dummy came to rest seated upright in the right front passenger's seat, restrained by the three-point unibelt.

VISIBLE DUMMY CONTACT POINTS:

	DRIVER #353	PASSENGER #354
Head	Sunvisor, windshield header airbag, windshield	Chest
Chest	Airbag	None
Abdomen	None	None
Left knee	Instrument panel	Instrument panel
Right knee	Instrument panel	Instrument panel

DOOR OPENING:

	LEFT	RIGHT
Front	Easy	Easy
Rear	Easy	Easy

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
Front	None	Passenger's seat shifted forward 1 notch
Rear	NA	NA

GLAZING DAMAGE:

The windshield was cracked upon impact.

OTHER NOTABLE IMPACT EFFECTS:

None

FIGURE 6 DUMMY POSITIONING DATA FOR 30 MPH FRONTAL BARRIER IMPACT TEST

PRE-IMPACT DATA:

Make/Model: Ford/Tempo
Body Style: 4-door sedan Model Year: 1988
NHTSA No.: CJ0207 Color: Red

DATA FROM CERTIFICATION LABEL:

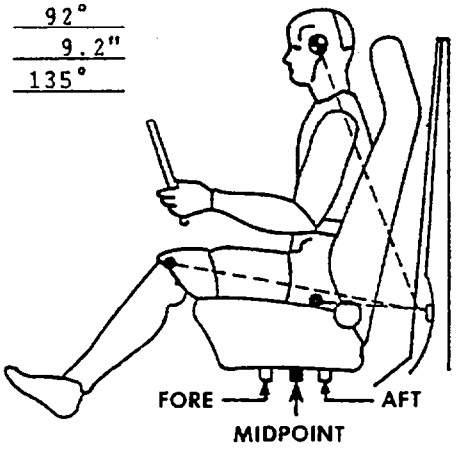
Vehicle Manufacturer: Ford Motor Company
Date of Manufacture: 3/88 VIN: 1FACP36X0JK184334
GVWR: 3682 lb; GAWR: Front = 1999 lb; Rear = 1812 lb

POST-IMPACT DATA:

Date of Test: 10/3/88 Time: 1302 Temperature: 55 ° F
Required Impact Velocity Range: 28.9 to 29.9 mph
Impact Velocity: Primary = 29.3 mph Secondary = 29.3 mph
Seat Type: Bucket Adjuster Type: Manual
Bucket Seat Back Type: Manual adjustable
Technicians: P. Cummins, D. Carpenter, & N. Kinney

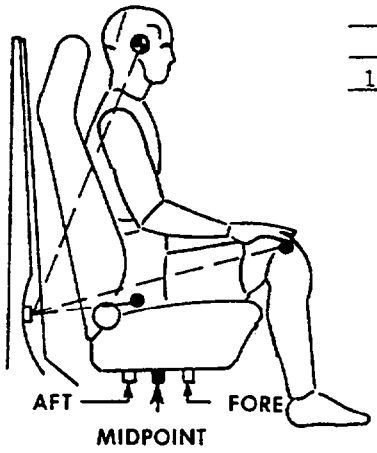
DRIVER DUMMY # 354 TYPE: HII

Head	20.1"
Target	2°
Knee	21.4
Joint	92°
Approx-imate "H" Point	9.2" 135°

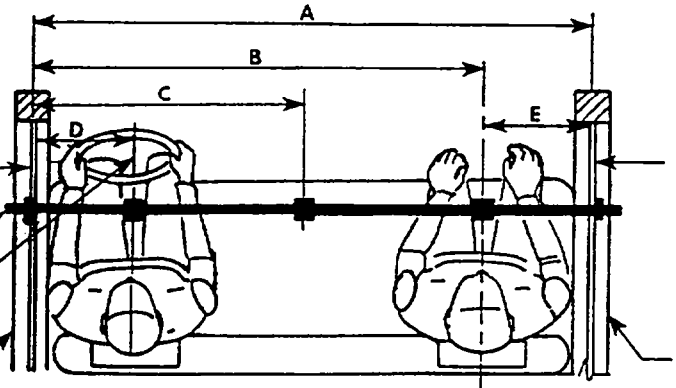


PASSENGER DUMMY # 353 TYPE: HII

19.2"	Head
5°	Target
22.0"	Knee
94°	Joint
8.5" 147°	Approx-imate "H" Point



A = 50.8"
B = 38.7"
C = 25.4"
D = 11.5"
E = 12.1"
DOOR GLASS HEIGHT = 10.2"



DOOR GLASS HEIGHT = 10.2"

LATERAL BAR

ADJUSTABLE POINTER

LEFT FRONT DOOR

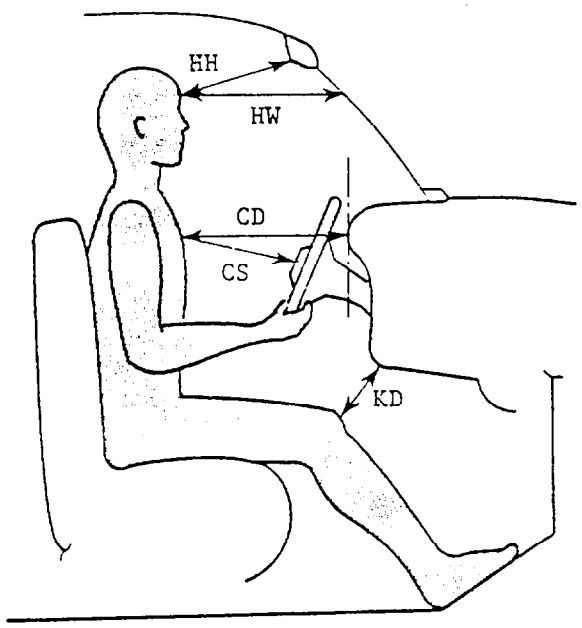
DRIVER DUMMY

PASSENGER DUMMY

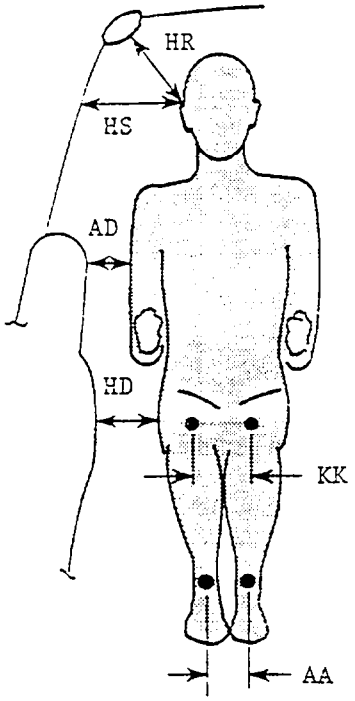
RIGHT FRONT DOOR

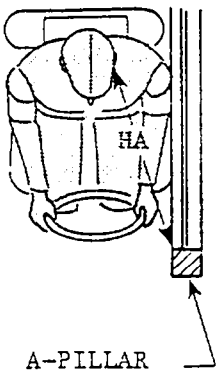
FIGURE 7 DUMMY IN-VEHICLE POSITION RECORDING SHEET

	DRIVER	PASSENGER
HH	10.9	11.6
HW	14.2	18.1
CD	21.6	20.6
CS	11.1	NA
KDL	3.5	2.9
KDR	3.8	3.5
TA	13°	19°
SA	20°	20°
HA	11.9	12.7



	DRIVER	PASSENGER
HR	5.2	5.9
HS	8.2	9.1
AD	4.1	4.9
HD	4.4	5.2
KK	10.0	8.0
AA	11.4	6.8





Knee outer bolt head to outer bolt head spacing:
Driver = 14.5
Passenger = 11.8

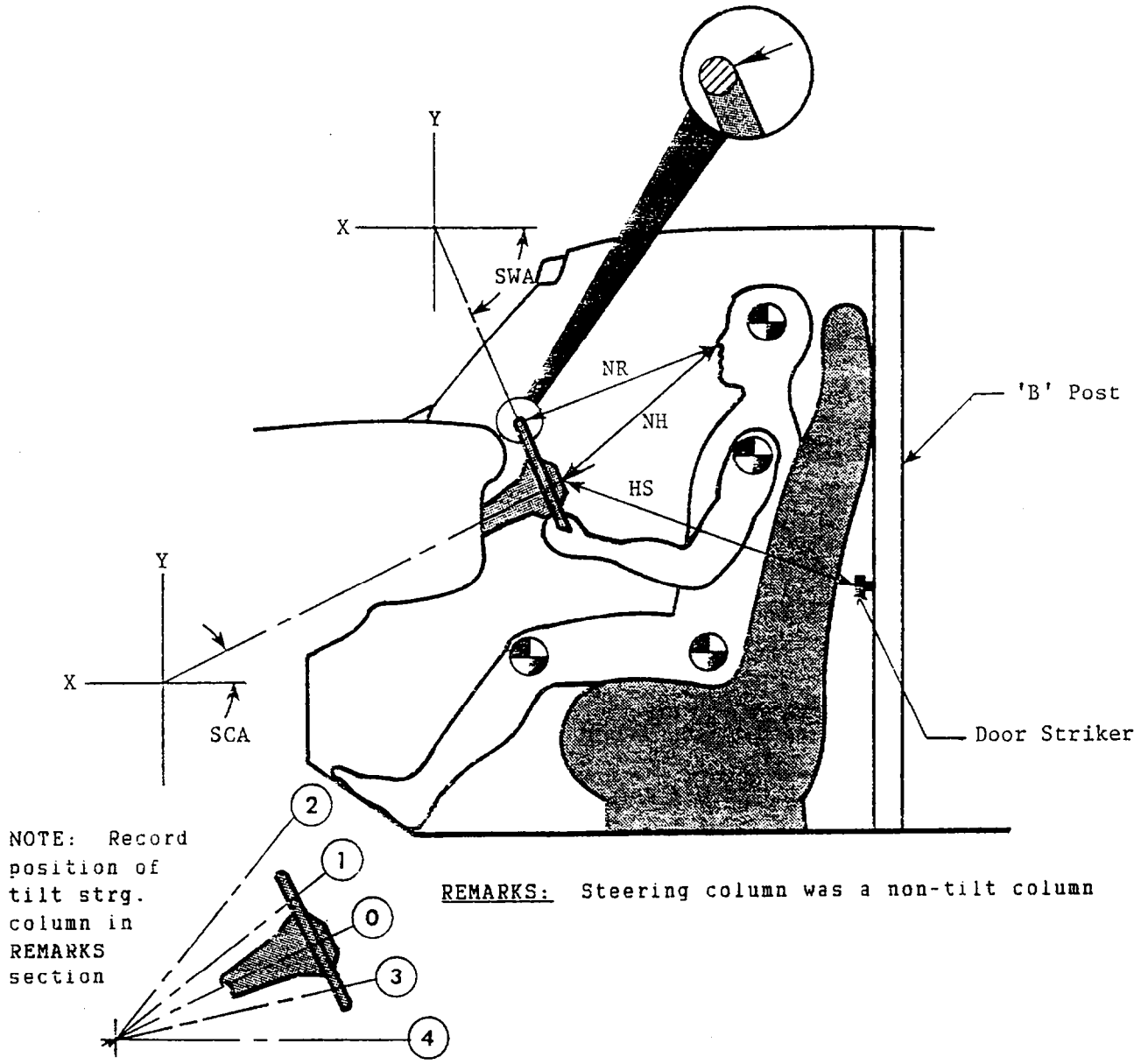
HH = Head to Windshield Header
HW = Head to Windshield
CD = Chest to Dash
CS = Chest to Steering Wheel
KD = Knee to Dash
TA = Torso Angle
SA = Seat Back Angle

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 ARE IN INCHES.

FIGURE 8 DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS

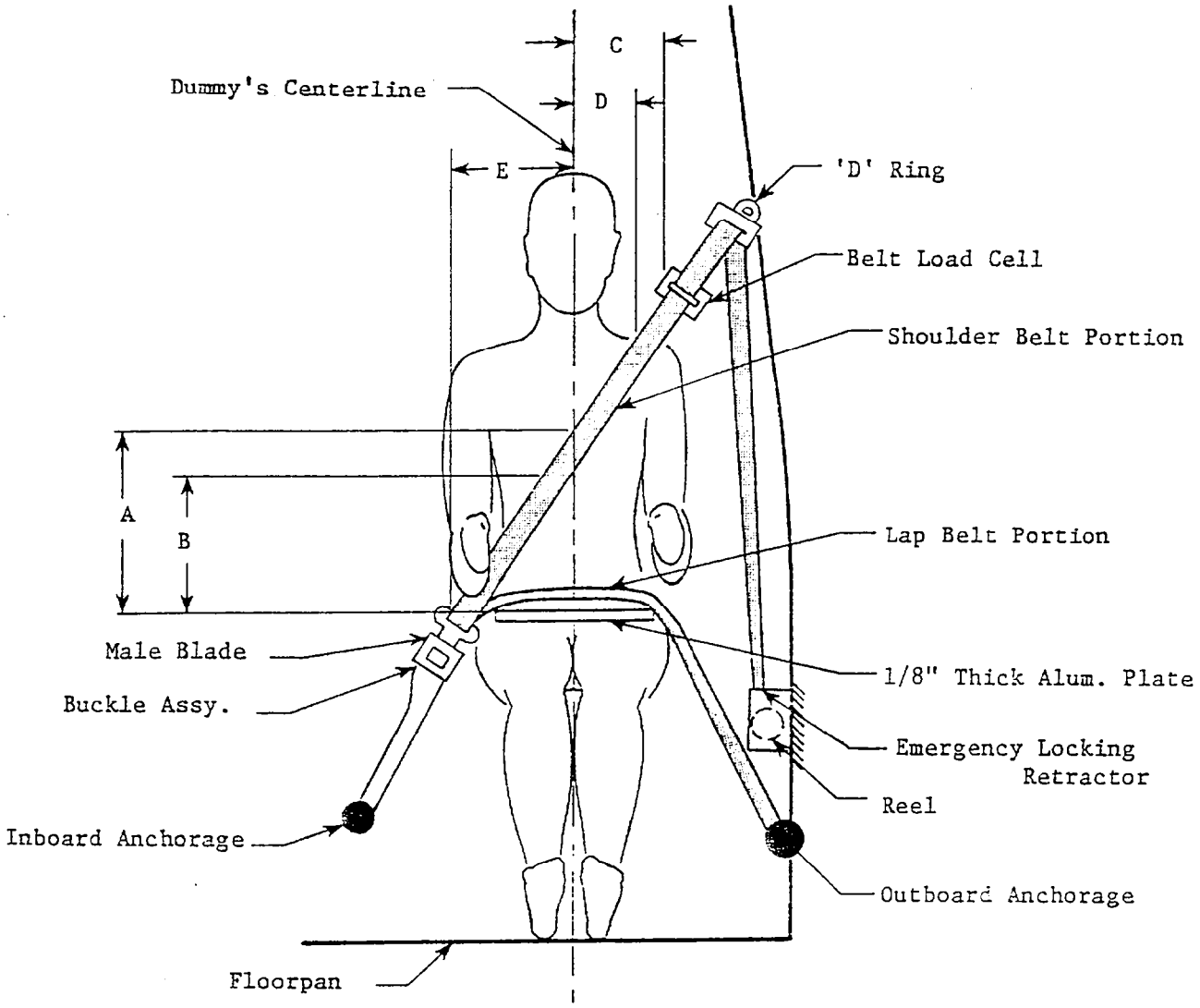


NOTE: Record position of tilt strg. column in REMARKS section

REMARKS: Steering column was a non-tilt column

	MEASUREMENTS
NR - Distance from tip of dummy's nose to top rear surface of steering wheel rim. (in.)	16.4
NH - Distance from tip of dummy's nose to center of steering column hub. (in.)	16.8
HS - Distance from center of steering column hub to the forward surface of the door lock striker pin. (in.)	19.1
SCA - Angle of steering column relative to the horizontal X axis	26°
SWA - Angle of steering wheel relative to the horizontal X axis	64°

FIGURE 9 SEAT BELT POSITIONING DATA



	PASSENGER DUMMY
A - Top surface of alum. plate to belt upper edge (in)	11.2
B - Top surface of alum. plate to belt lower edge (in)	8.0
C - Dummy centerline to outer edge of belt at chest flesh top (in)	5.0
D - Dummy centerline to inner edge of belt at chest flesh top (in)	2.5
E - Dummy centerline to intersection of upper torso belt and lap belt (in)	8.0

TABLE 7 FMVSS 208 COMFORT AND CONVENIENCE DATA

VEHICLE VIN: 1FACP36X0JK194334 NHTSA NO: CJ0207

MAKE: Ford MODEL: Tempo

VEHICLE BUILD DATE: 3/88 VEHICLE TYPE: 4-door sedan

FRONT OUTBOARD SEATING POSITIONS SEAT BELT TYPE:

(check one): _____ Automatic belts

__X__ Type 2 lap/shoulder belts

_____ Other

CONVENIENCE HOOKS:

DEVICE AUTOMATICALLY RELEASES WHEN IGNITION IS TURNED TO "ON" OR "START" AND (check one):

_____ Vehicle's drivetrain is engaged

_____ Vehicle's parking brake is in the released mode

__X__ Not applicable, vehicle's restraint system does not include convenience hooks

WEBBING TENSION - RELIEVING DEVICE:

DO OUTBOARD SEATING POSITON BELTS HAVE TENSION - RELIEVING DEVICES?

Yes

MAXIMUM SLACK RECOMMENDED IN OWNER"S MANUAL: 1.5 INCHES.

DOES OWNER'S MANUAL WARN THAT INTRODUCING SLACK BEYOND THE AMOUNT SPECIFIED CAN SIGNIFICANTLY REDUCE THE EFFECTIVENESS OF THE SHOULDER BELT? Yes

IF NO, EXPLAIN:

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

MANUAL BELTS: THE TENSION - RELIEVING DEVICE IS CANCELLED WHEN

(check one): __X__ The adjacent door is opened

_____ The latch plate is released from the buckle

OPEN-BODY VEHICLE: DOES THE MANUAL MEANS TO CANCEL THE TENSION-RELIEVING DEVICE OPERATE PROPERLY? NA

IF NO, EXPLAIN:

TABLE 7 FMVSS 208 COMFORT AND CONVENIENCE DATA CONTINUED

VEHICLE VIN: 1FACP36X0JK184334 NHTSA NO: CJ0207

MAKE: Ford MODEL: Tempo

VEHICLE BUILD DATE: 3/88 VEHICLE TYPE: 4-door sedan

FRONT OUTBOARD SEATING POSITIONS SEAT BELT TYPE:

(check one): _____ Automatic belts

__X__ Type 2 lap/shoulder belts

_____ Other

BELT CONTACT FORCE:

FOR BELTS WITHOUT TENSION-RELIEVING DEVICES: BELT CONTACT FORCE:

_____ POUNDS

__X__ NOT APPLICABLE, VEHICLE'S RESTRAINT SYSTEM INCLUDED A BELT TENSION-RELIEVING DEVICE.

LATCHPLATE ACCESS:

ARE SEATBELT LATCHPLATES WITHIN REACH ENVELOPE? Yes

DOES CLEARANCE TEST BLOCK MOVE UNHINDERED TO LATCHPLATE OR BUCKLE?

Yes

RETRACTION:

SEATBELT AUTOMATICALLY RETRACTS WHEN

(check one): __X__ Adjacent vehicle door is open and seatbelt latchplate is released

_____ Seatbelt latchplate is released

ARE THE STOWED WEBBING AND HARDWARE PINCHED WHEN THE DOOR IS CLOSED?

No

OPEN-BODY VEHICLE: DOES BELT SYSTEM FULLY RETRACT WHEN THE TENSION-RELIEVING DEVICE IS MANUALLY DEACTIVATED? NA

TABLE 7 FMVSS 208 COMFORT AND CONVENIENCE DATA CONTINUED

VEHICLE VIN: 1FACP36X0JK184334 NHTSA NO: CJ0207

MAKE: Ford MODEL: Tempo

VEHICLE BUILD DATE: 3/88 VEHICLE TYPE: 4-door sedan

FRONT OUTBOARD SEATING POSITIONS SEAT BELT TYPE:

(check one): _____ Automatic belts

__X__ Type 2 lap/shoulder belts

_____ Other

ACCESSIBILITY:

IS SEAT CUSHION REMOVABLE SO THE SEATBACK SERVES A FUNCTION OTHER THAN SEATING? No

IS SEAT REMOVABLE? No

IS SEAT MOVABLE SO THE SPACE CAN BE USED FOR A SECONDARY FUNCTION? No

IF WEBBING IS DESIGNED TO PASS THRU THE SEAT CUSHION OR BETWEEN THE CUSHION AND SEAT BACK ARE ONE OF THE FOLLOWING PARTS NORMALLY ON TOP OF OR ABOVE THE SEAT CUSHION: LATCHPLATE, BUCKLE, WEBBING? NA; webbing does not pass through the seat cushion or between the cushion and the seat back.

ARE THE REMAINING TWO PARTS ACCESSIBLE UNDER NORMAL CONDITIONS? Yes

DO THE LATCHPLATE AND BUCKLE PASS THRU THE GUIDES PROVIDED AND FALL BEHIND THE SEAT WHEN THE BELT IS COMPLETELY RETRACTED (OR UNATTACHED IF NONRETRACTABLE); THE SEAT IS MOVED TO ANY POSITION; AND THE SEAT BACK, IF FOLDABLE, IS FOLDED FORWARD AS FAR AS POSSIBLE AND THEN MOVED BACKWARD INTO POSITION? No

IS THE INBOARD RECEPTACLE END ACCESSIBLE WITH THE CENTER ARM REST IN ANY POSITION TO WHICH IT CAN BE ADJUSTED WITHOUT MOVING THE ARMREST FOR ACCESS? Yes

TABLE 7 FMVSS 208 COMFORT AND CONVENIENCE DATA CONTINUED

VEHICLE VIN: 1FACP36X0JK184334 NHTSA NO: CJ0207

MAKE: Ford MODEL: Tempo

VEHICLE BUILD DATE: 3/88 VEHICLE TYPE: 4-door sedan

FRONT OUTBOARD SEATING POSITIONS SEAT BELT TYPE:

(check one): _____ Automatic belts

__X__ Type 2 lap/shoulder belts

_____ Other

LATCH MECHANISM:

ARE LATCH MECHANISM COMPONENTS ACCESSIBLE TO A SEATED OCCUPANT IN THE STOWED AND OPERATIONAL POSITIONS? Yes

DOES LATCH MECHANISM RELEASE BOTH TORSO AND LAP BELTS SIMULTANEOUSLY?

Yes

DOES LATCH MECHANISM RELEASE AT A SINGLE POINT BY A PUSH BUTTON ACTION?

Yes

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 = 6 sec.

Duration of reminder light operation = 6 sec.

WITH OCCUPANT IN DRIVER'S POSITION AND 3-POINT UNIBELT 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 = 6 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 PROTECTON SYSTEM:

The label was located on the right side of the inside of the glove box door.

THE MANUFACTURER'S RECOMMENDED SCHEDULE IS TO: (check one)*

replace _____ or repair _____ this system: (check one)

a. by _____ month, _____ year

b. by _____ miles

c. or after a time interval of _____months or _____ years.

*Label states that regular maintenance is not required.

WERE APPROPRIATE INSTRUCTIONS CONCERNING MAINTENANCE AND/OR REPLACEMENT OF THIS SYSTEM PROVIDED? Yes

WAS A DESCRIPTION OF THE FUNCTIONAL OPERATION OF THE SYSTEM PROVIDED? Yes

IS THERE A REFERENCE TO THE INSTRUCTIONS AND DESCRIPTION OF THE SYSTEM ON THE LABEL? Yes

WAS AN OWNER'S MANUAL PROVIDED? Yes

DID THE OWNER'S MANUAL CONTAIN APPROPRIATE INFORMATION CONCERNING MAINTENANCE AND/OR REPLACEMENT AND A DESCRIPTION OF THE FUNCTIONAL OPERATION OF THE SYSTEMS? Yes, in the "Airbag Owner Guide Supplement".

ASG A255 ON-SITE EMPLOYEES

NAME	ROOM#	EXTENSION
JOE ANSHIEN	5240	366-4767
MACK CAMPBELL	5326	-5230
REGINA CARROLL	2403	-6211
EDDIE CHEUNG	2403	-6214
OSCAR CRINER	5240	-3421
WEYNCHET DEMESSIE	2403	-6216
GUY DIVITA	2403	-6212
STEVE EDWARDS	6221	-4712
RICK GAULT	6222	-4708
MIKE GHODS	5240	-3421
BARBARA GOODWIN	5401	-5383
JEANETTE GREENFIELD	6210	-5665
HANK HEYMAN	5240	-4784
PATRICK HUDSON	2403	-6209
BUKOLA IBIKUNLE	5326	-5197
NATALIE JACKSON	6208	-5928
JOCELYN KENNEDY	6220	-5668
SYDNEY MARCH	5326	-5225
JILL MORGANWALP	6222	-4715
LINDA MUNDY	6221	-4718
SANDRA PATEL	6221	-4711
ANNETTE POSTELL	6208	-5928
ROGER SMART	2403	-6213
JAN FIELDER-SYERS	2403	-6210

REVISED 12/12/88

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.

Is the system totally mechanical? No

IF NO:

Describe the location of the readiness indicator:

The indicator light was located on the right side of the instrument panel below the fuel gage.

Is the readiness indicator clearly visible to the driver? Yes

Is a list of the elements in the occupant restraint system, being monitored by the readiness indicator, provided? No

TABLE 11 SUMMARY OF FMVSS 301 DATA

PRE-IMPACT DATA

MAKE/MODEL: Ford/Tempo

BODY STYLE: 4-door sedan MODEL YEAR: 1988

NHTSA NO.: CJ0207 COLOR: red

DATA FROM CERTIFICATION LABEL

VEHICLE MANUFACTURER: Ford Motor Company

DATE OF MANUFACTURE: 3/88 VIN: 1FACP36X0JK184334

GVWR: 3682 LBS., GAWR: FRONT 1999 LBS., REAR 1812 LBS.

POST-IMPACT DATA

TYPE OF TEST: Frontal Barrier Impact

DATE OF TEST: 10/3/88 TIME: 1302 TEMP: 55° F

REQUIRED IMPACT VELOCITY RANGE: 28.9 MPH TO 29.9 MPH

IMPACT VELOCITY: PRIMARY = 29.3 MPH, SECONDARY = 29.3 MPH

TEST WEIGHT = 3138 LBS., STATIC CRUSH MAX. = 15.2 IN.. REBOUND = 12.4 IN.

FUEL SYSTEM DATA

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

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

"USEABLE" CAPACITY*: 15.4 GALLONS (FURNISHED BY COTR)

TEST VOLUME: 14.2 GALLONS (92-94% OF USEABLE)

FUEL SYSTEM CAPACITY (DATA FROM OWNERS MANUAL): 15.4 GALLONS

DETAILS OF FUEL SYSTEM: Fuel tank is located in front of the rear axle. The fuel filler neck is located on right side and enters the right rear corner of the fuel tank.

ELECTRIC FUEL PUMP: Yes FUEL INJECTON: Yes

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

*WITH ENTIRE FUEL SYSTEM FILLED.

FIGURE 10 FMVSS NO. 212, "WINDSHIELD MOUNTING", DATA SHEET

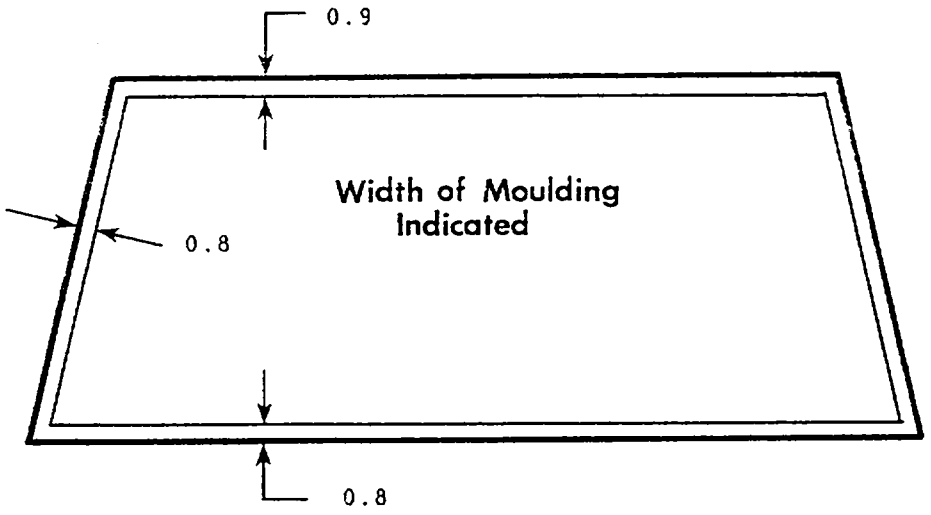
Details of windshield mounting such as retention method, trim type, etc.:

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	74.6	74.6	100%
LEFT SIDE	74.6	74.6	100%
TOTAL	149.2	149.2	100%

AREA OF RETENTION FAILURE:



FAILURE DETAILS: None

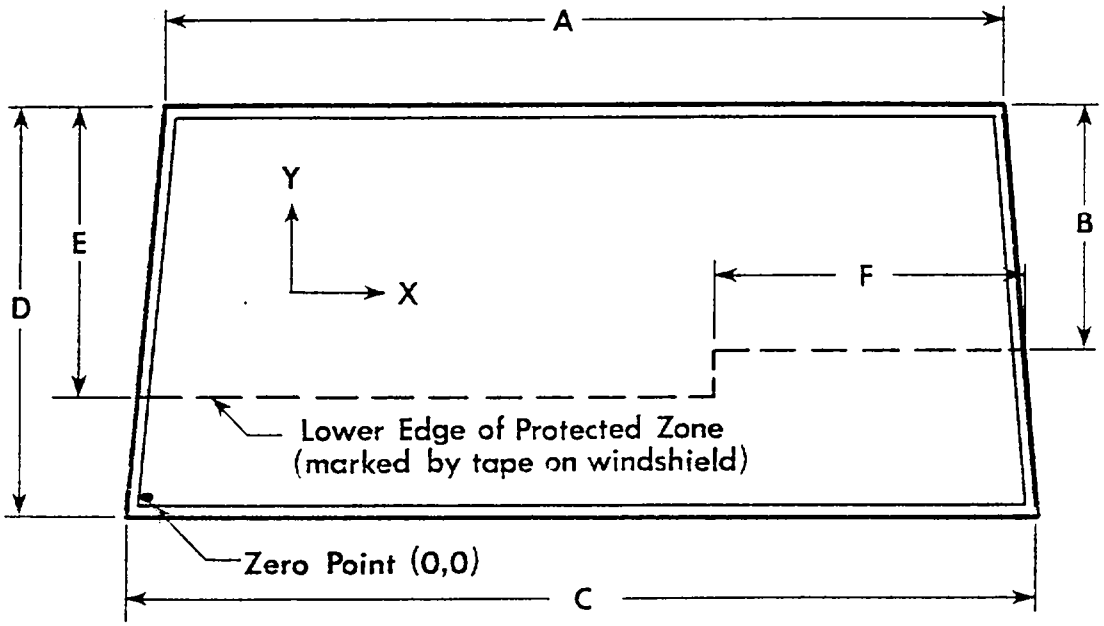
Windshield Temperature: 70° F

FIGURE 11 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" 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 = 44.0 C = 56.6 E = 20.2

B = 16.7 D = 26.8 F = 17.4

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

COORDINATES X Y

None

1.

2.

3.

4.

ALL MEASUREMENTS ARE IN INCHES.

TABLE 12 "FUEL SYSTEM INTEGRITY" POST-IMPACT

TEST DATA, FMVSS NO. 30.

TEST VEHICLE NHTSA NO.: CJ0207 ; TEST DATE: 10/3/88

VEH. MFR./MAKE/MODEL: Ford Motor Company/Ford/Tempo

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:

	ACTUAL	MAX. ALLOW.
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:

None

SECTION 3.0

CAMERA INFORMATION

FIGURE 12 CAMERA POSITIONS

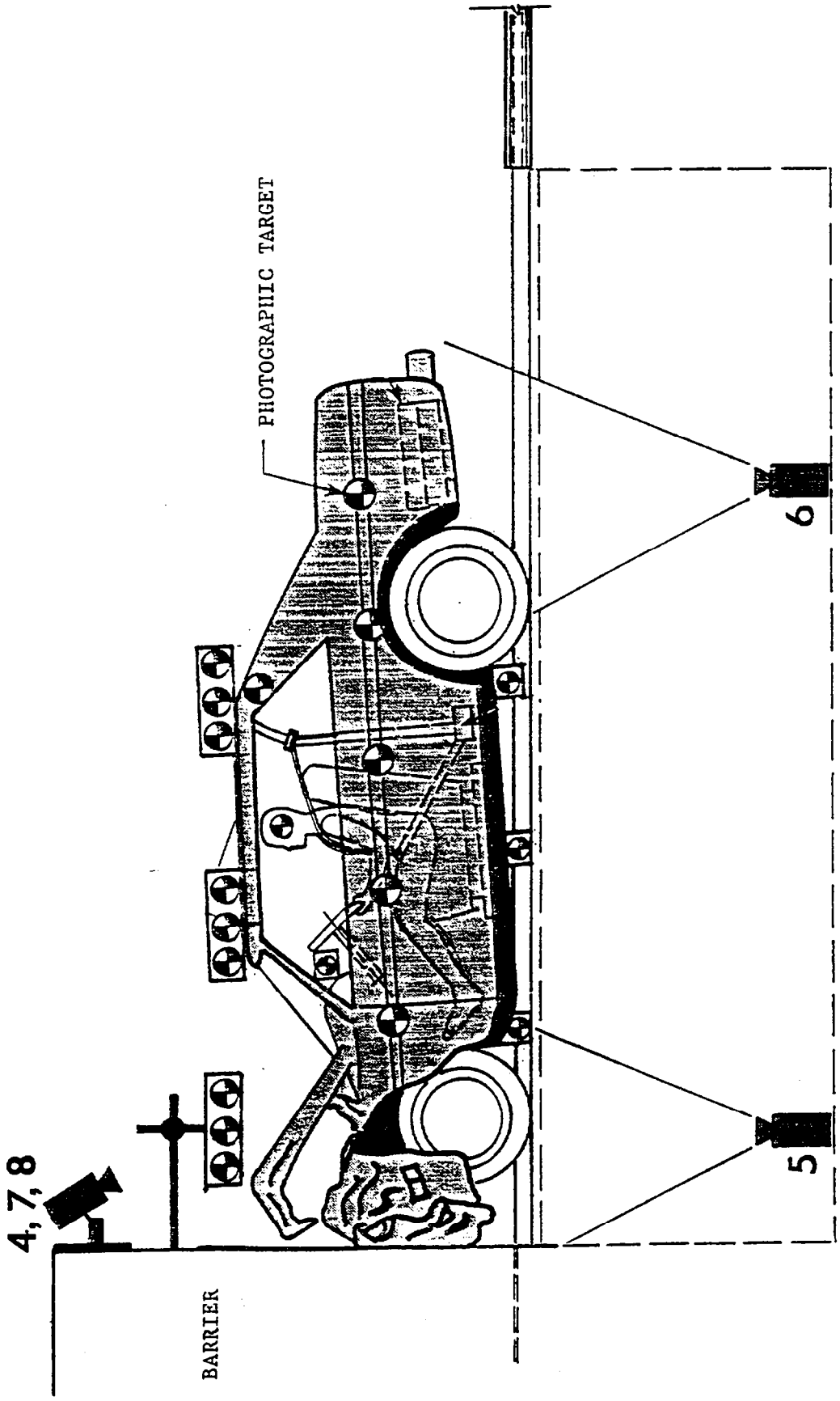


FIGURE 12 CAMERA POSITIONS CONTINUED

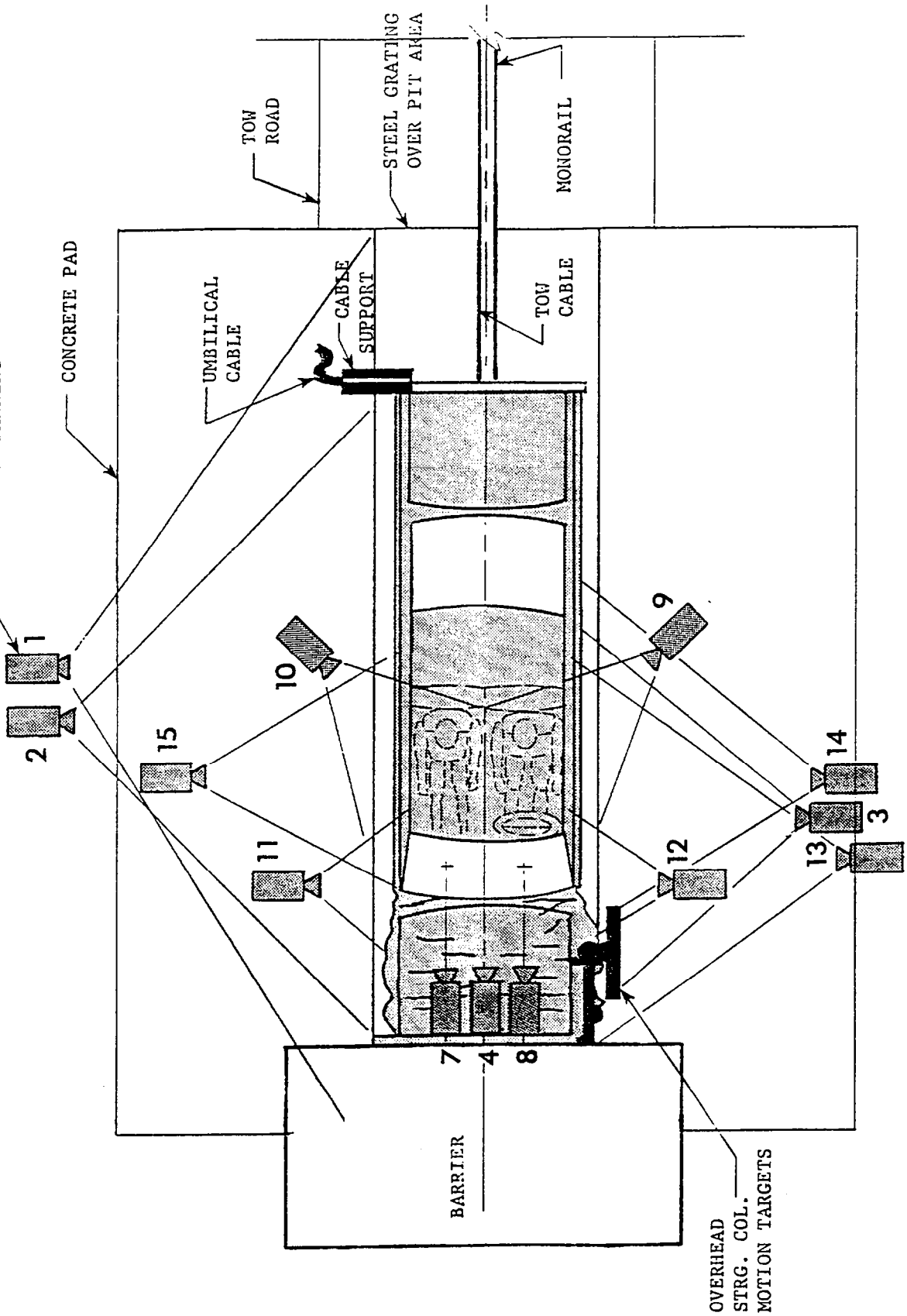


TABLE 13 HIGH SPEED CAMERA LOCATIONS

TEST NO.: 881003 VEHICLE: Ford Tempo 4-door sedan

CAMERA NO.	VIEW	CAMERA POSITIONS (IN)* X	Y	Z	ANGLE** (DEG)	FILM PLANE TO HEAD TARGET	LENS (MM)	SPEED (FPS)
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	497
3	Dummy kinematics	-41.5	-295.0	44.0	-4	263.0	25	517
4	Windshield damage	-6.0	0.0	89.0	-40	NA	13	495
5	Crush & fluid spillage	-50.5	0.0	-92.4	90	NA	13	1000
6	Fluid spillage	-99.3	0.0	-99.0	90	NA	13	998
7	Passenger kinematics	-4.5	13.8	93.0	-50	NA	17	498
8	Driver kinematics	-6.8	-14.5	93.0	-50	NA	17	497
9	Driver kinematics	-157.3	-116.0	87.0	-27	107.0	25	500
10	Passenger kinematics	-152.1	116.0	87.0	-26	98.0	25	502
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	505
13	Column movement	-71.0	-286.0	103.0	-14	NA	25	502
14	Column movement	-71.0	-286.0	75.1	-9	NA	25	498
15	Passenger kinematics	-38.8	293.0	45.3	-4	268.0	25	527

*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. PRE-TEST ENGINE COMPARTMENT VIEW
15. POST-TEST ENGINE COMPARTMENT VIEW
16. PRE-TEST FUEL FILLER CAP VIEW
17. POST-TEST FUEL FILLER CAP VIEW
18. PRE-TEST FRONT UNDERBODY VIEW
19. POST-TEST FRONT UNDERBODY VIEW
20. PRE-TEST REAR UNDERBODY VIEW
21. POST-TEST REAR UNDERBODY VIEW
22. PRE-TEST FUEL TANK VIEW
23. PRE-TEST FUEL LINES VIEW
24. PRE-TEST FUEL FILLER NECK VIEW
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 1
30. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1
31. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2
32. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

PHOTOGRAPHS, CONT'D

33. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
34. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
35. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2
36. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2
37. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 1
38. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 2
39. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 3
40. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 4
41. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 5
42. POST-TEST PASSENGER DUMMY HEAD/KNEE CONTACT - VIEW 1
43. POST-TEST PASSENGER DUMMY HEAD/KNEE CONTACT - VIEW 2
44. POST-TEST PASSENGER DUMMY HEAD/KNEE CONTACT - VIEW 3
45. PRE-TEST VEHICLE CERTIFICATION LABEL VIEW
46. PRE-TEST VEHICLE TIRE LOAD LABEL VIEW

Figure A-1. PRE-TEST FRONT VIEW

Figure A-2. POST-TEST FRONT VIEW

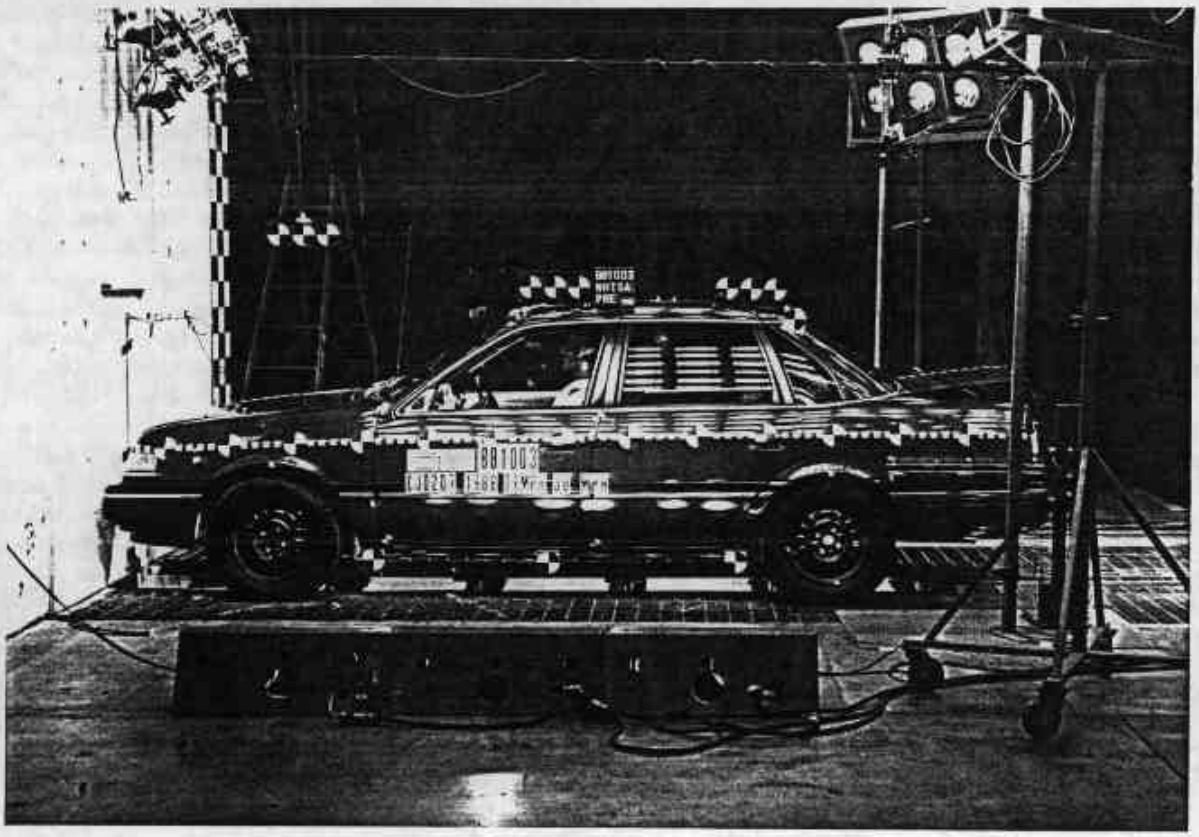


Figure A-3. PRE-TEST LEFT SIDE VIEW

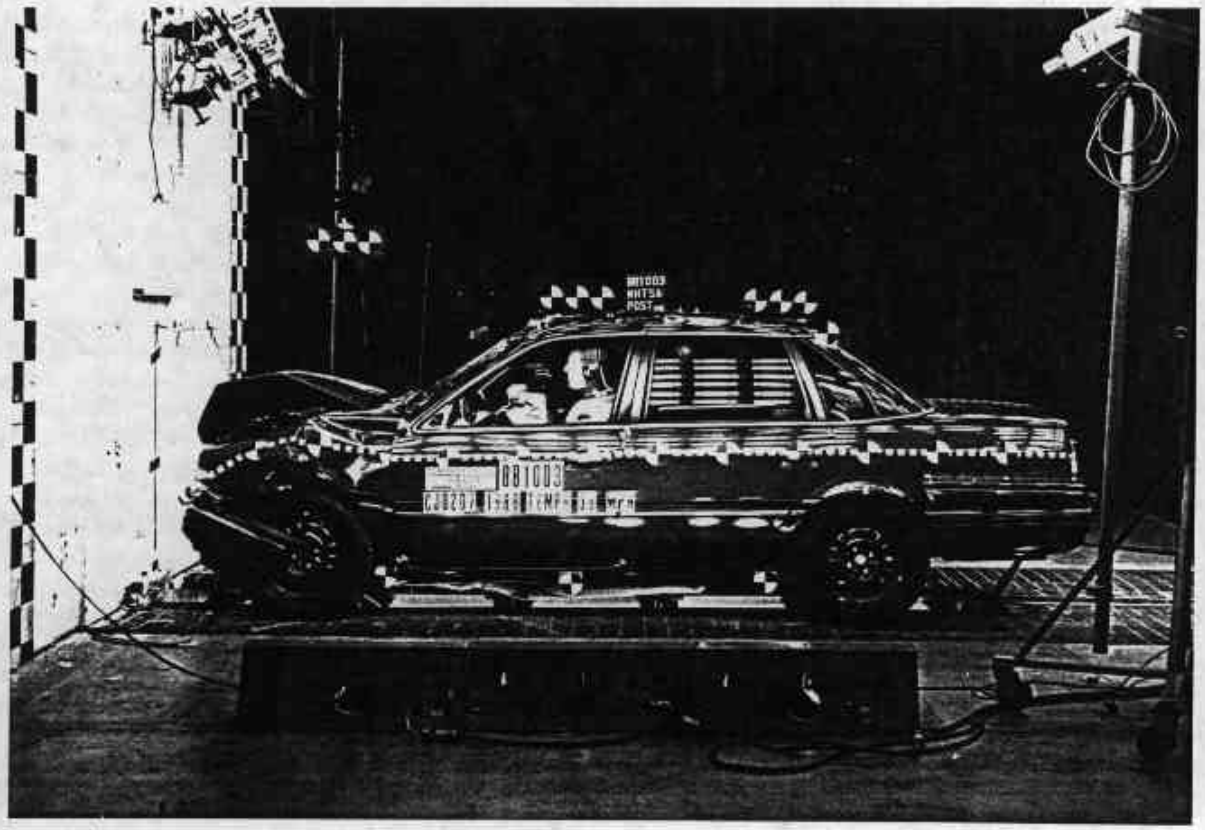


Figure A-4. POST-TEST LEFT SIDE VIEW

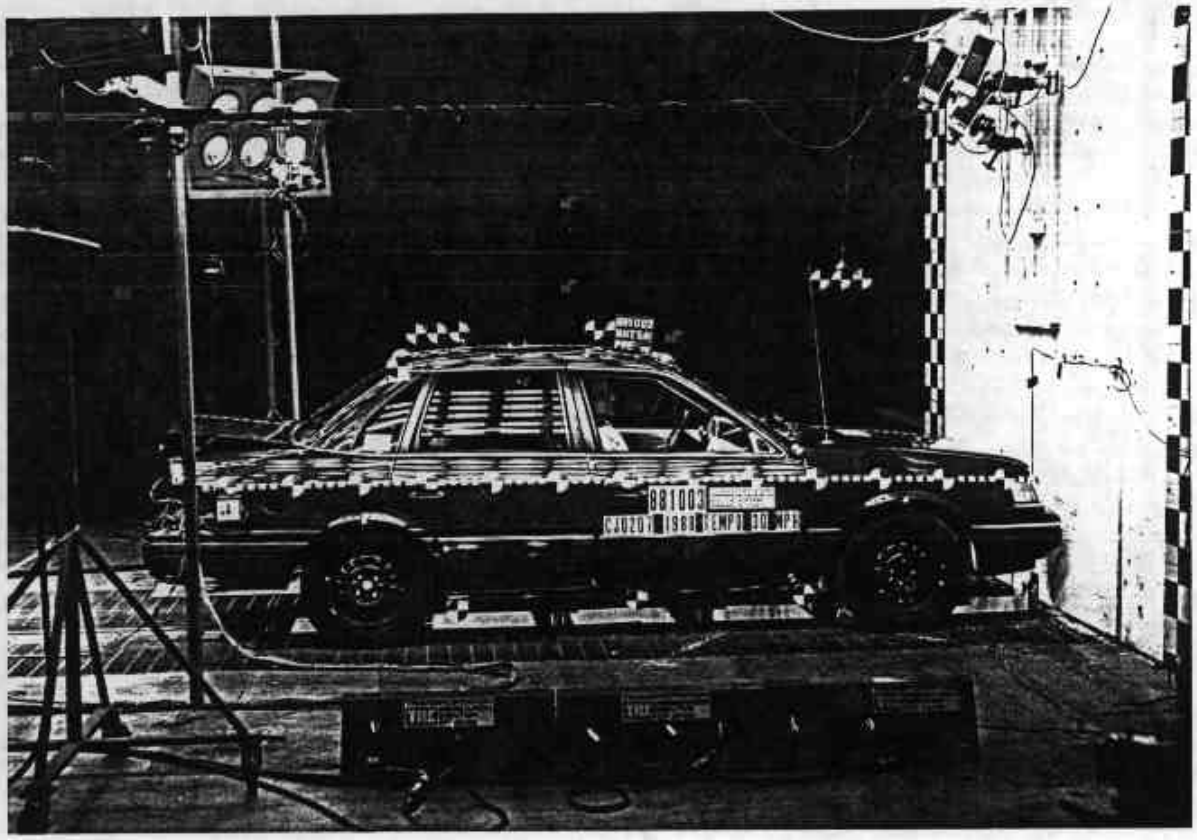


Figure A-5. PRE-TEST RIGHT SIDE VIEW

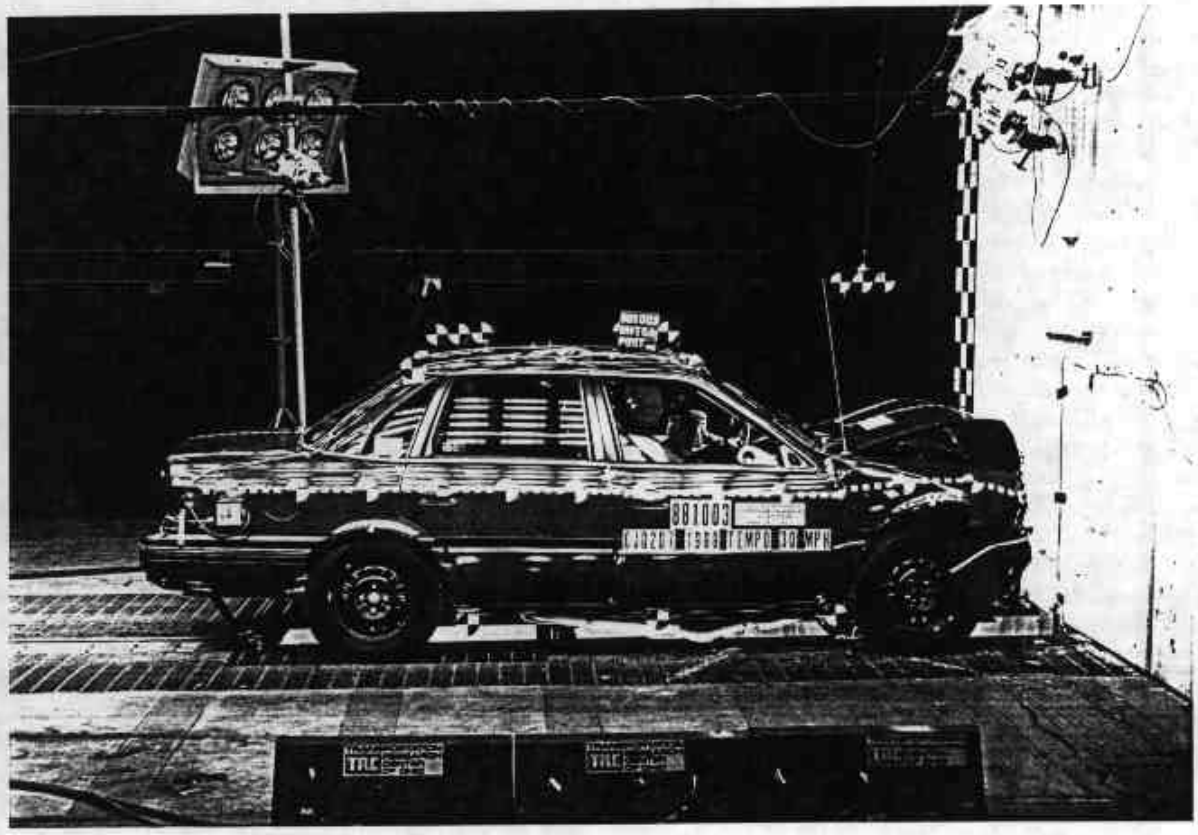


Figure A-6. POST-TEST RIGHT SIDE VIEW

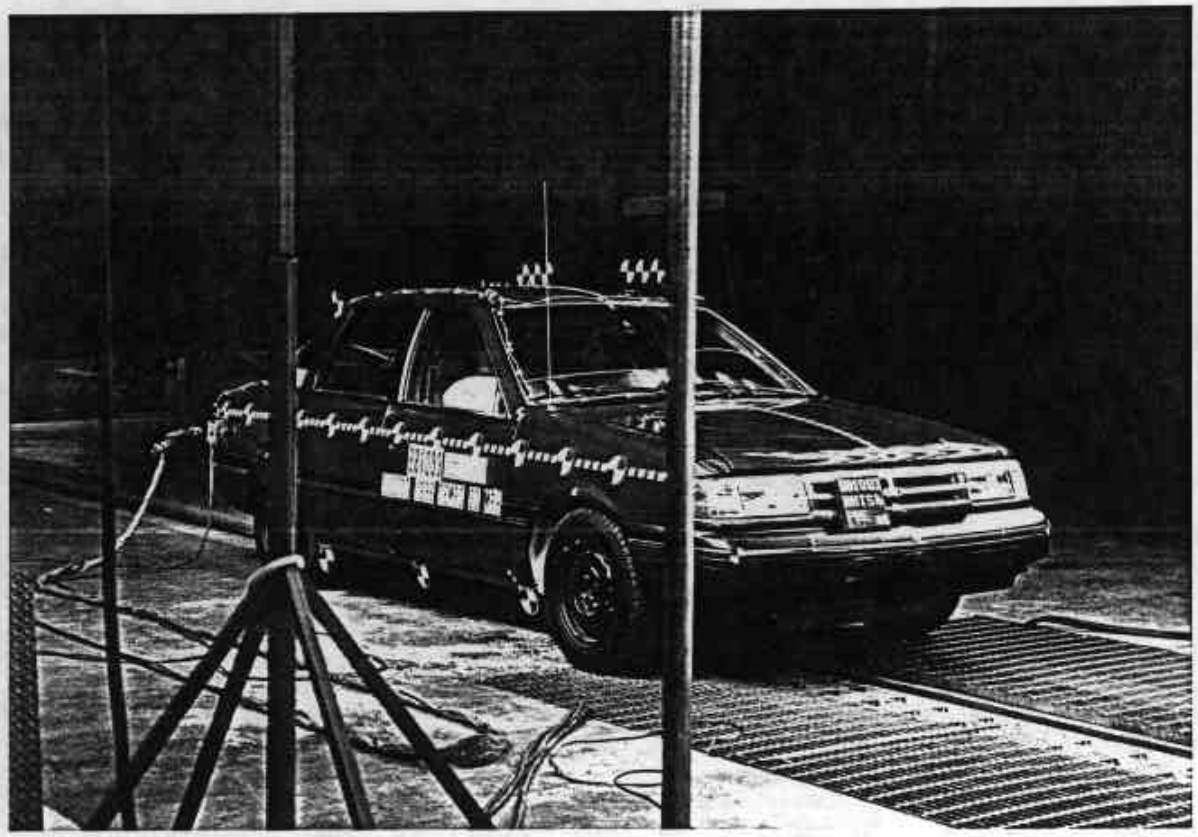


Figure A-7. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

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

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

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

Figure A-11. PRE-TEST REAR VIEW

Figure A-12. POST-TEST REAR VIEW

Figure A-13. PRE-TEST WINDSHIELD VIEW

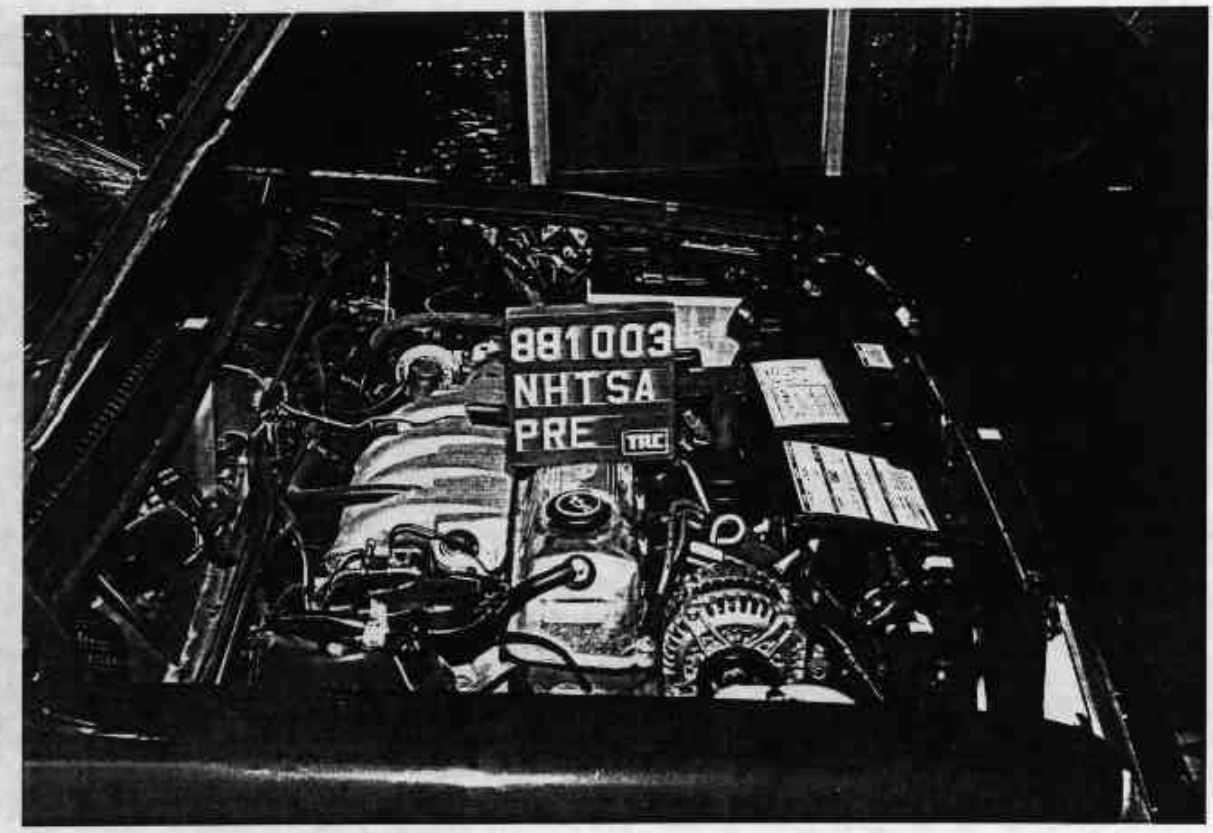


Figure A-14. PRE-TEST ENGINE COMPARTMENT VIEW

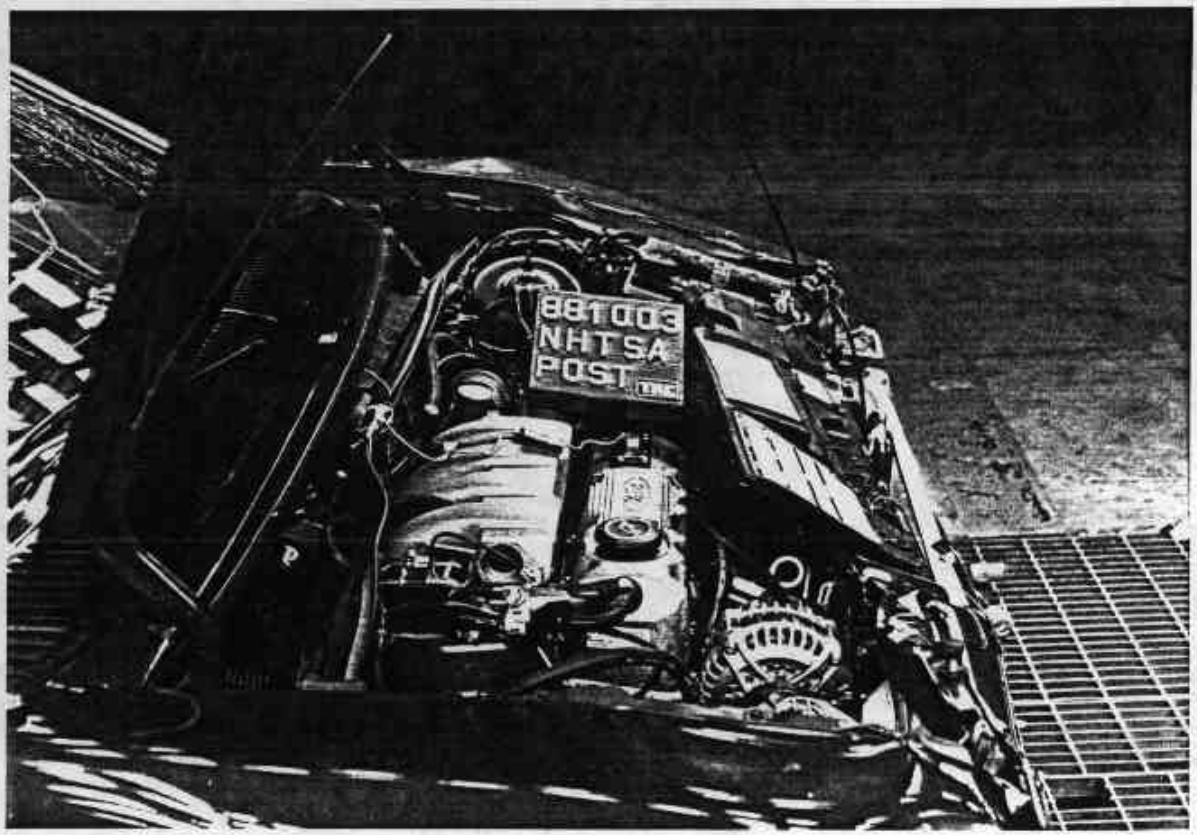


Figure A-15. POST-TEST ENGINE COMPARTMENT VIEW

Figure A-16. PRE-TEST FUEL FILLER CAP VIEW

Figure A-17. POST-TEST FUEL FILLER CAP VIEW

Figure A-18. PRE-TEST FRONT UNDERBODY VIEW

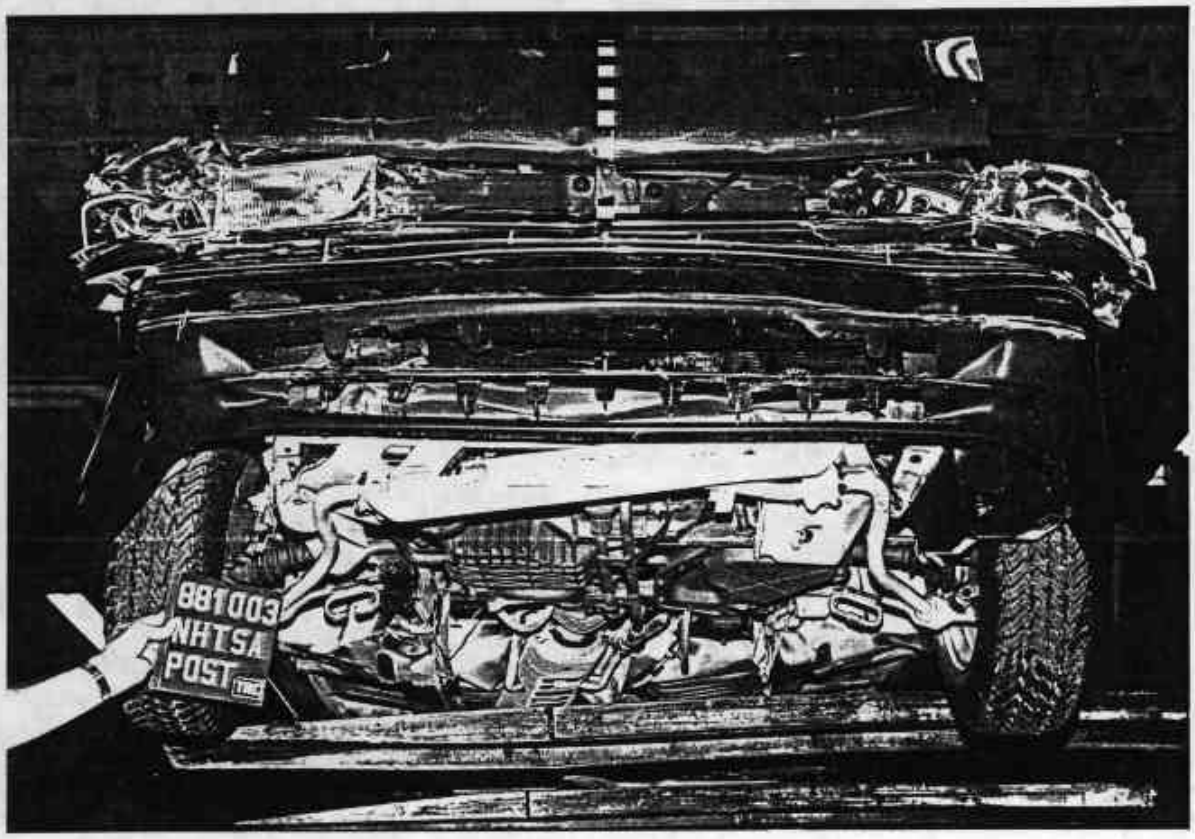


Figure A-19. POST-TEST FRONT UNDERBODY VIEW

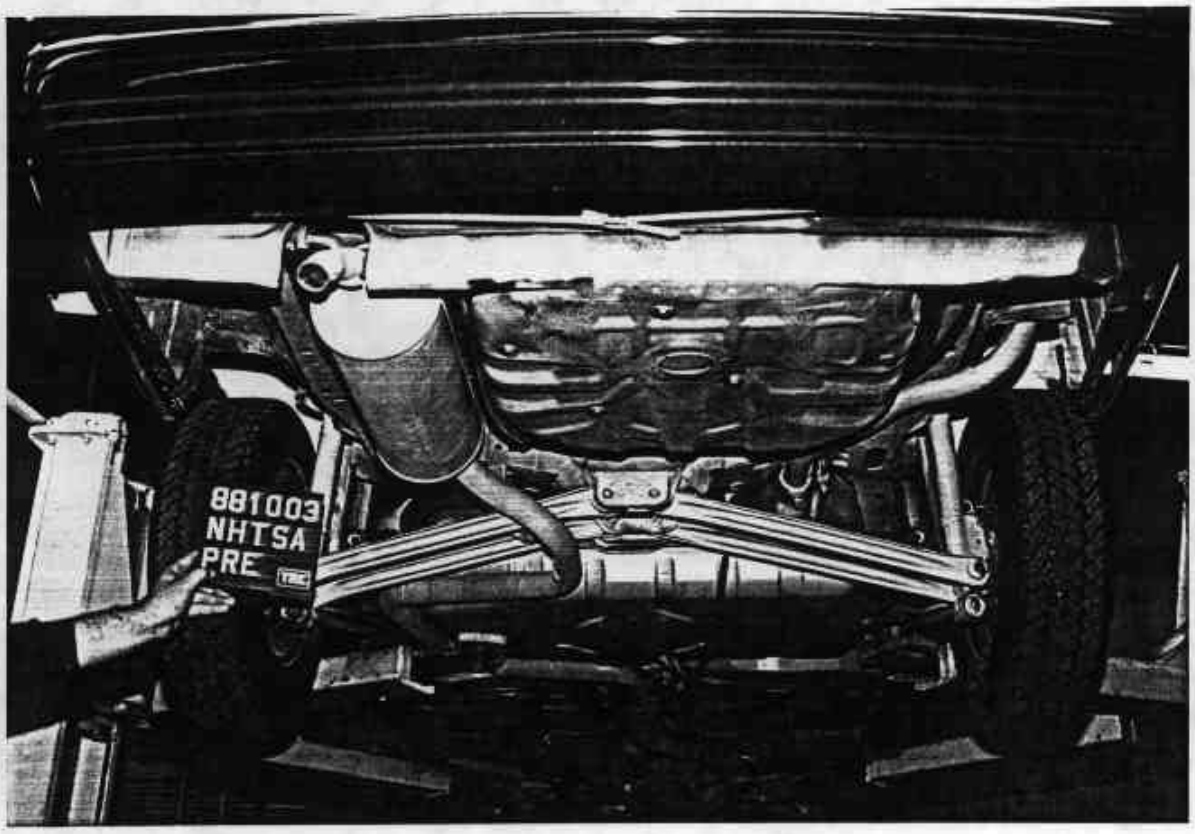


Figure A-20. PRE-TEST REAR UNDERBODY VIEW

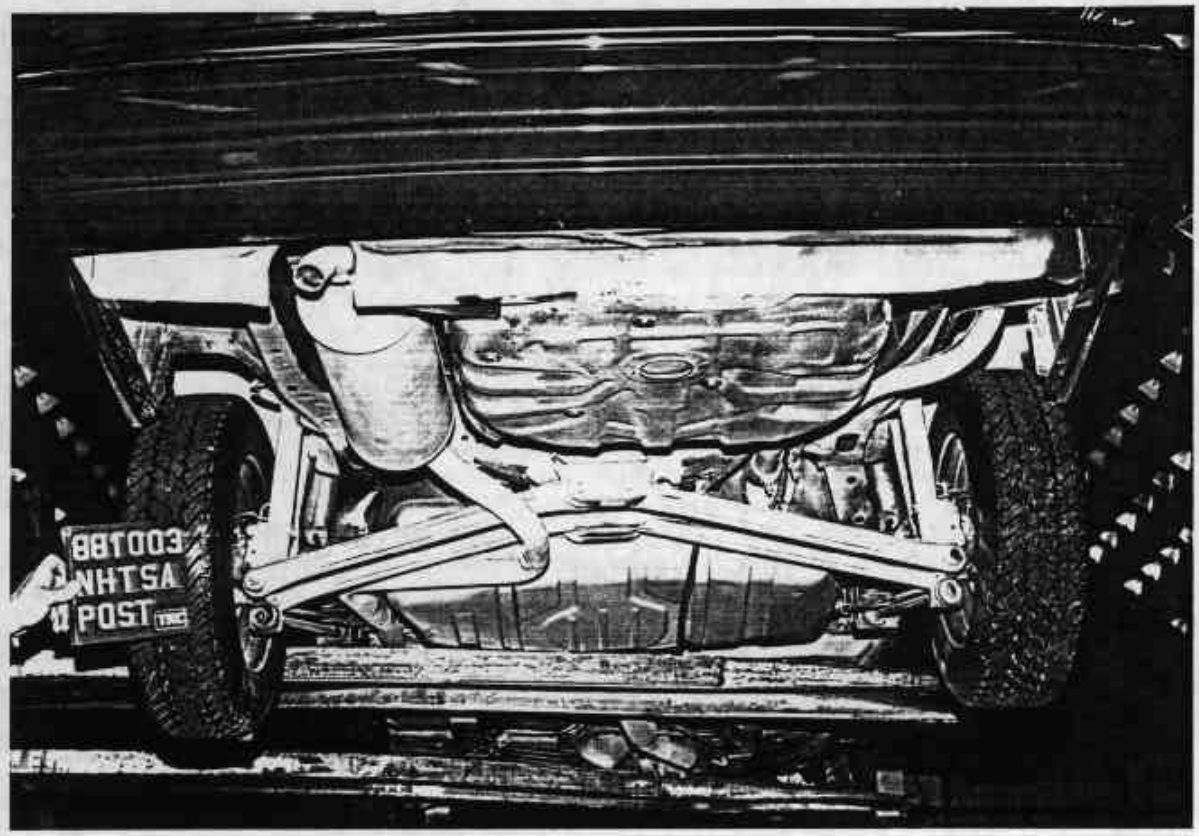


Figure A-21. POST-TEST REAR UNDERBODY VIEW

Figure A-22. PRE-TEST FUEL TANK VIEW

Figure A-23. PRE-TEST FUEL LINES VIEW

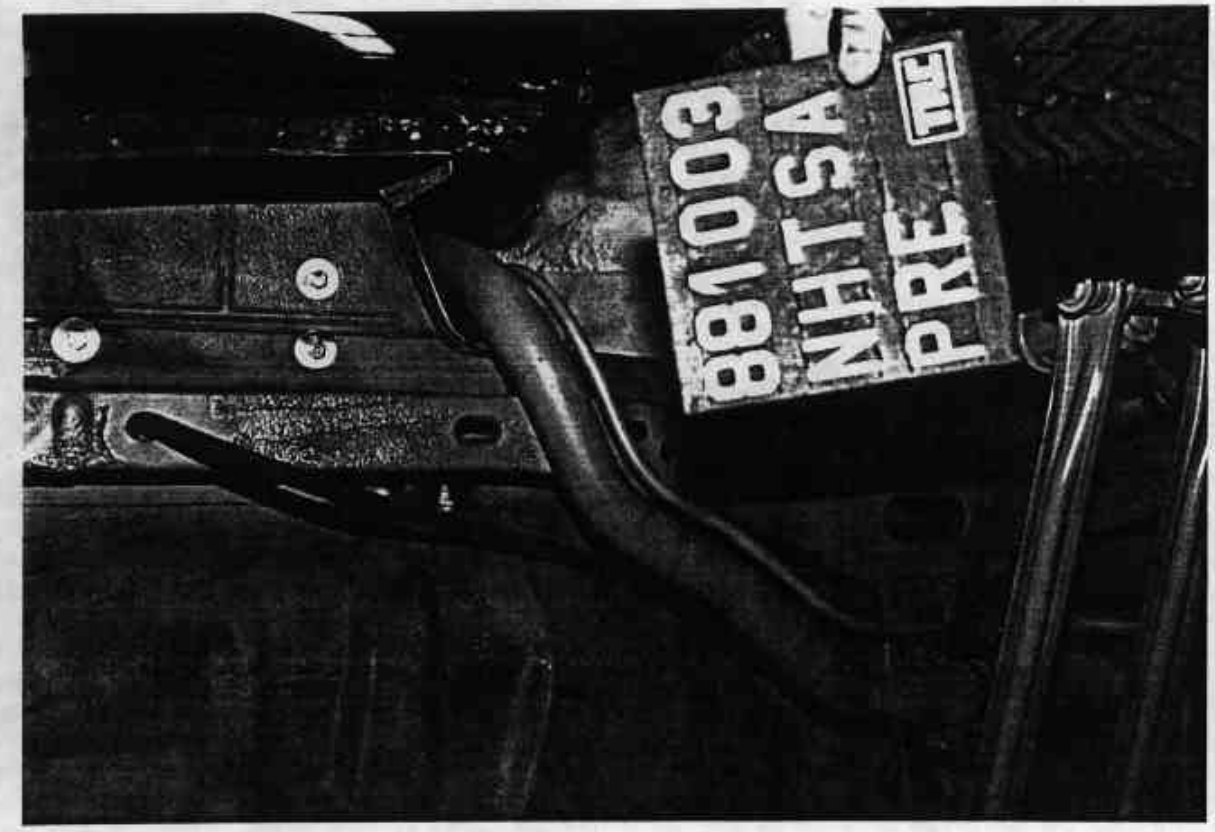


Figure A-24. PRE-TEST FUEL FILLER NECK VIEW

Figure A-25. PRE-TEST DRIVER DUMMY POSITION VIEW

Figure A-26. POST-TEST DRIVER DUMMY POSITION VIEW

Figure A-27. PRE-TEST PASSENGER DUMMY POSITION VIEW

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

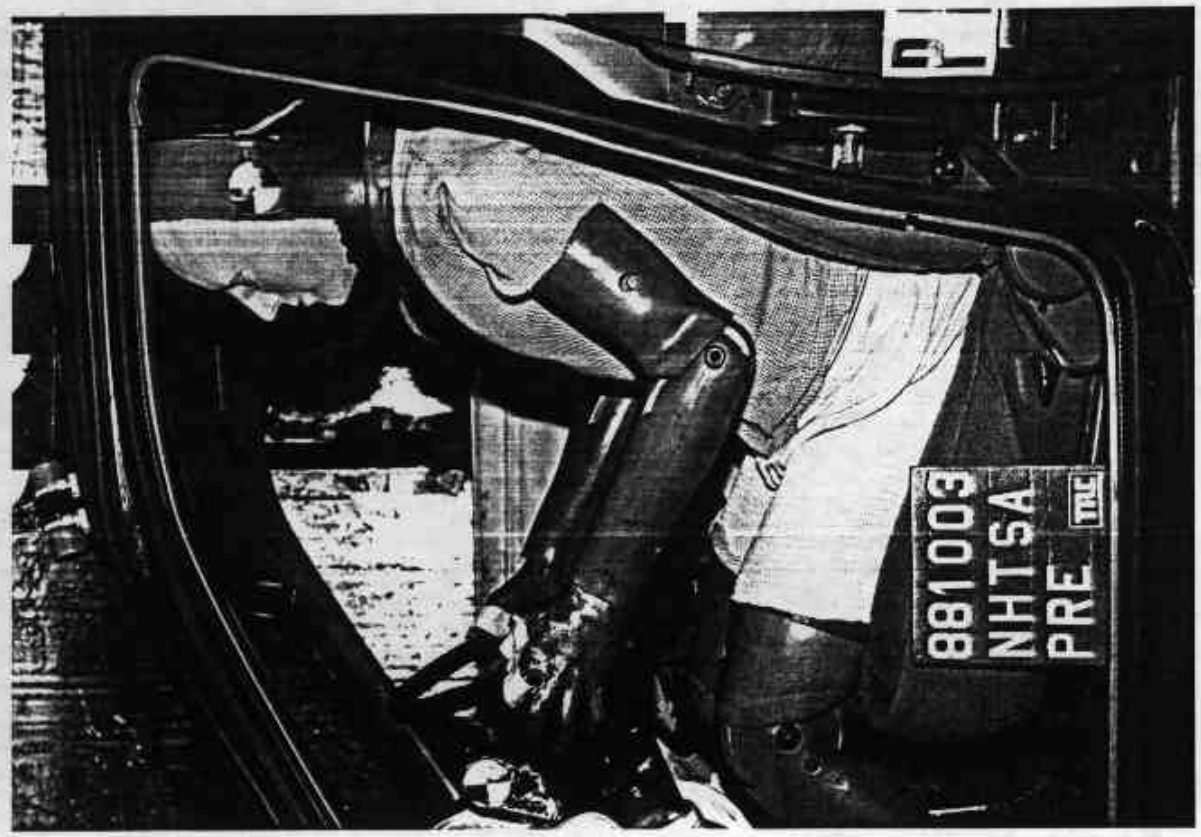


Figure A-29. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

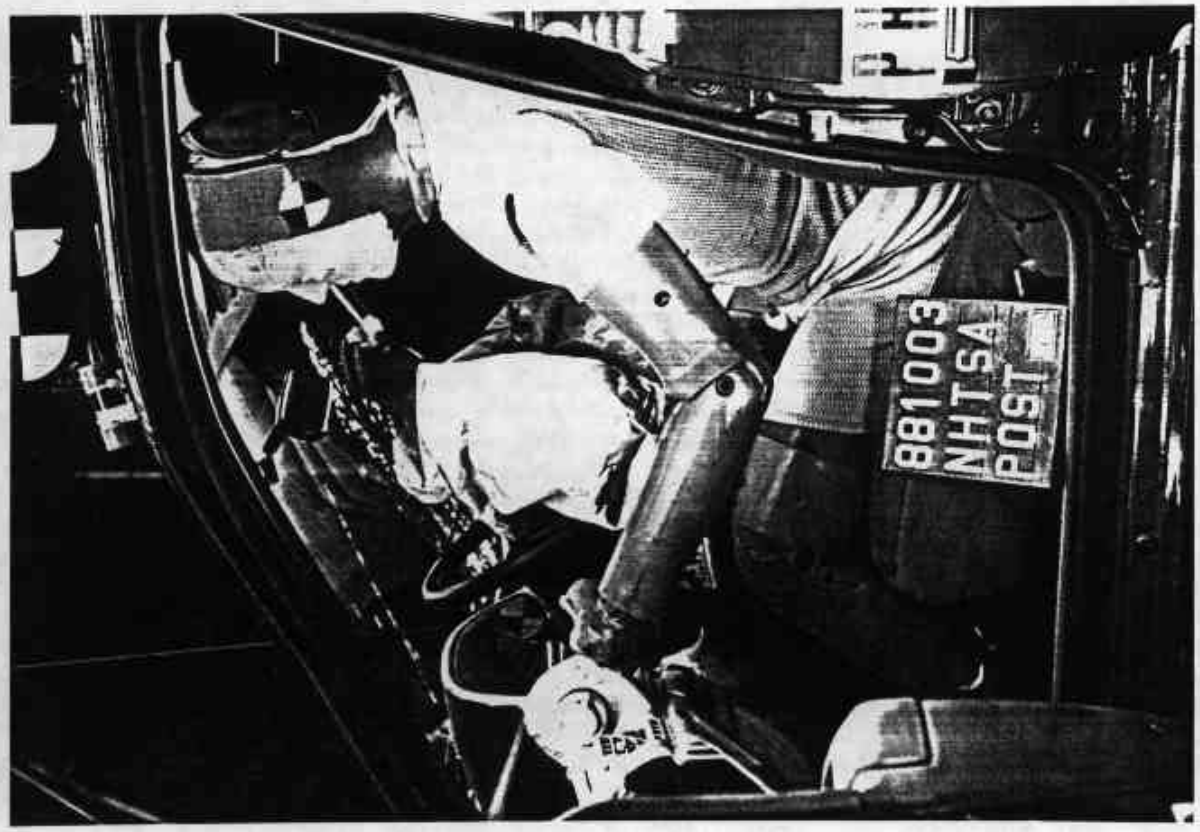


Figure A-30. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

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

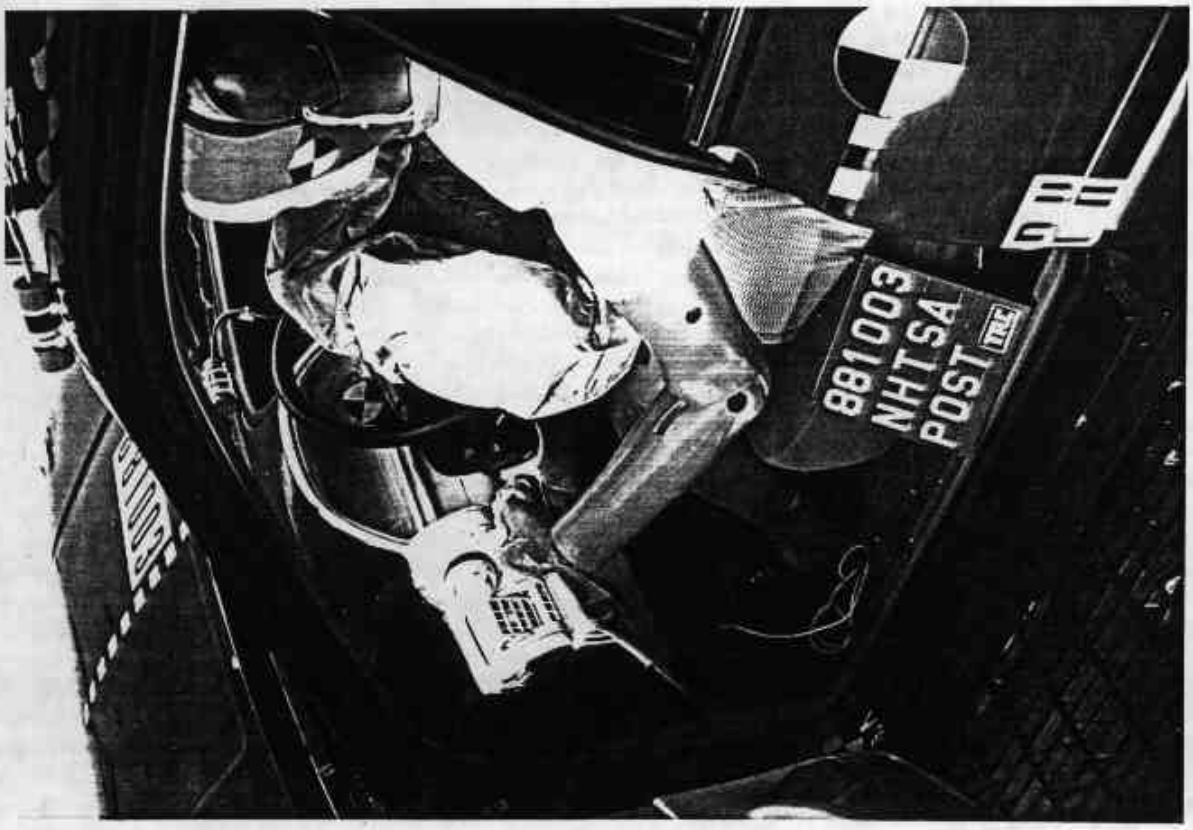


Figure A-32. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

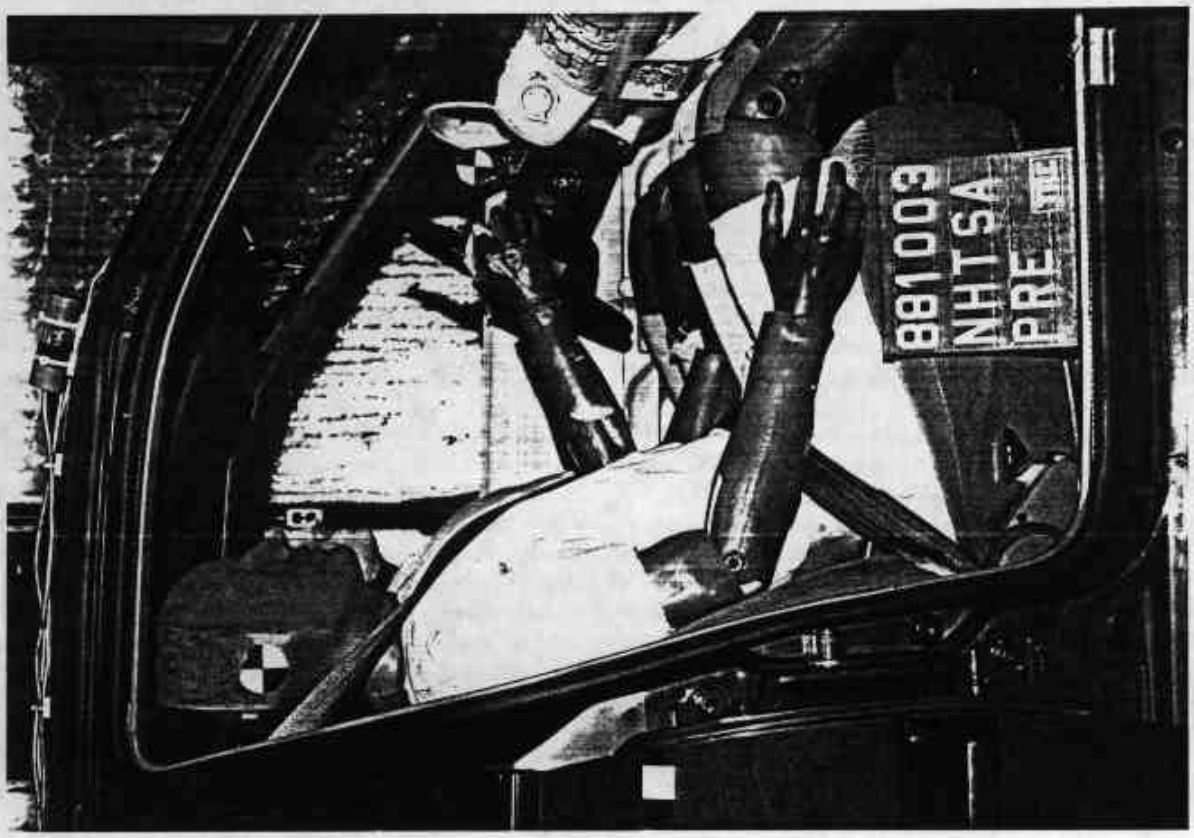


Figure A-33. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1

Figure A-34. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1

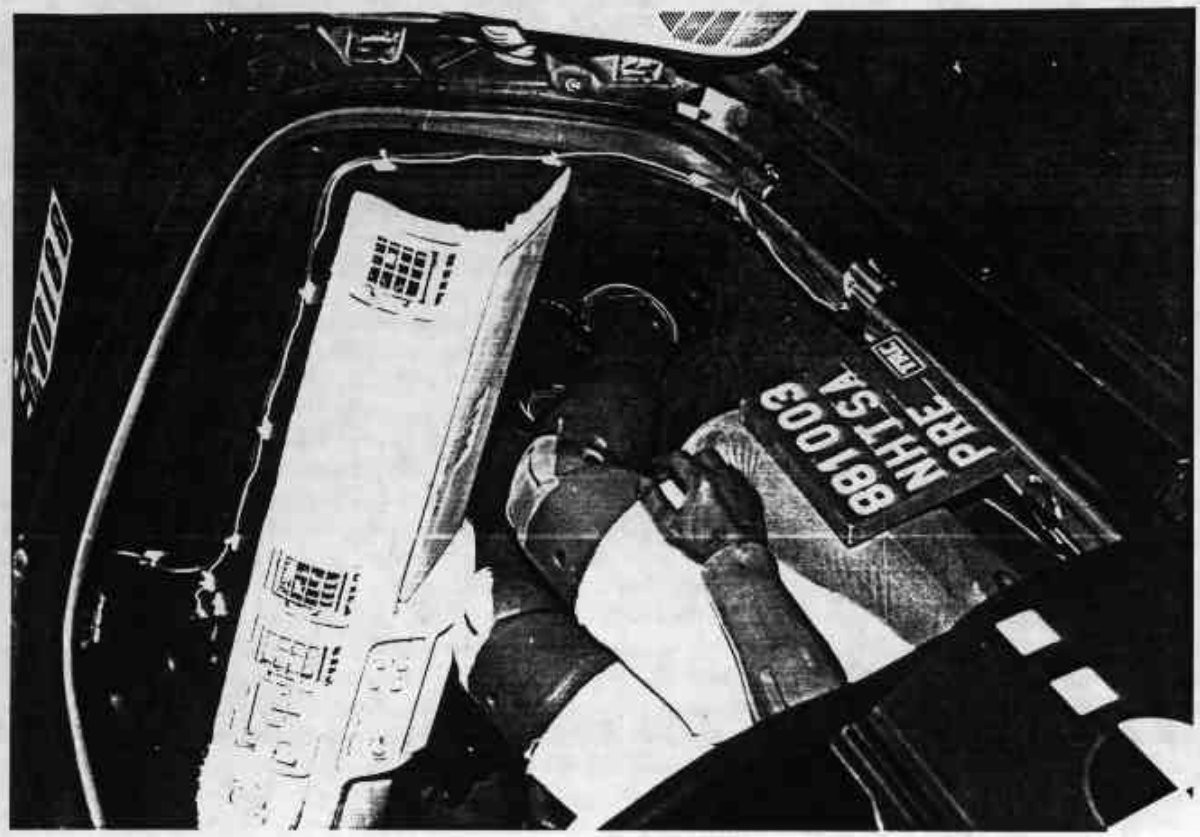


Figure A-35. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

Figure A-36. POST-TEST PASSENGER DUMMY & VEHICLE INTERIRO - VIEW 2

Figure A-37. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 1

Figure A-38. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 2

Figure A-39. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 3

Figure A-40. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 4

Figure A-41. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 5

Figure A-42. POST-TEST PASSENGER DUMMY HEAD/KNEE CONTACT - VIEW 1

Figure A-43. POST-TEST PASSENGER DUMMY HEAD/KNEE CONTACT - VIEW 2

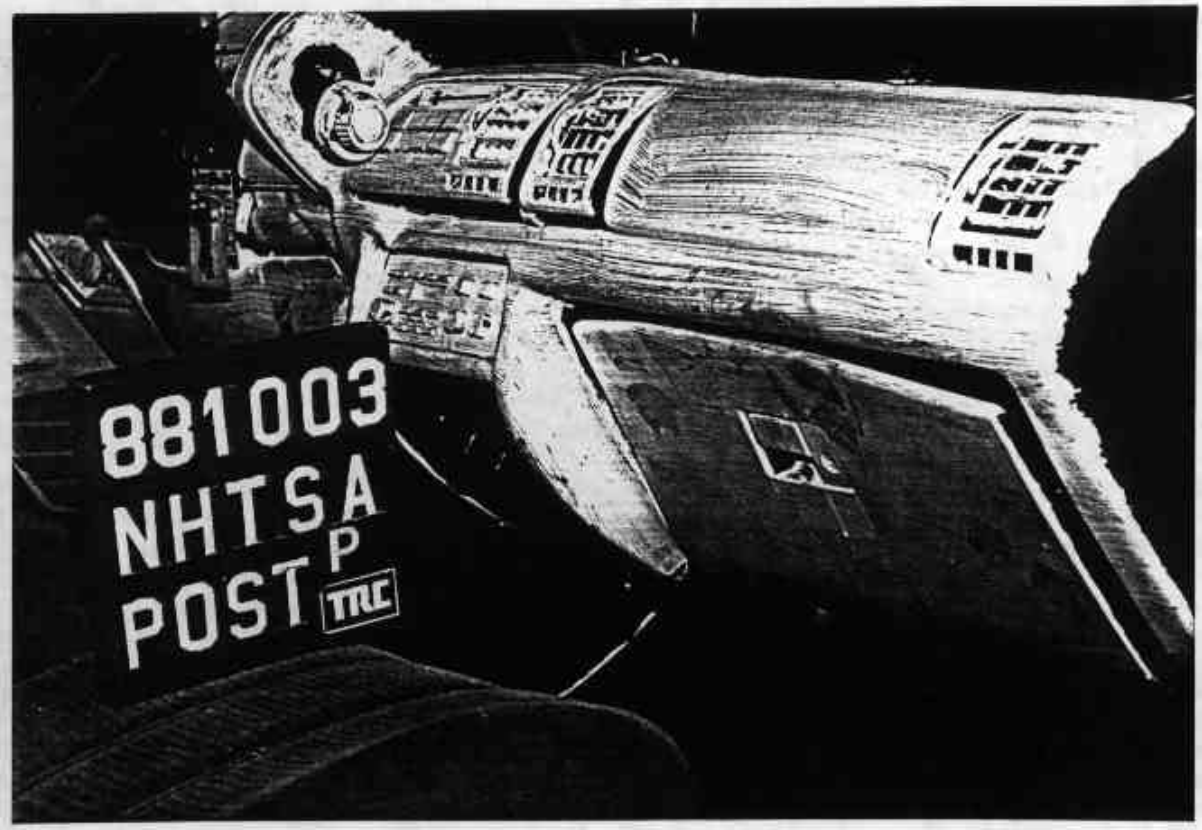


Figure A-44. POST-TEST PASSENGER DUMMY HEAD/KNEE CONTACT - VIEW 3

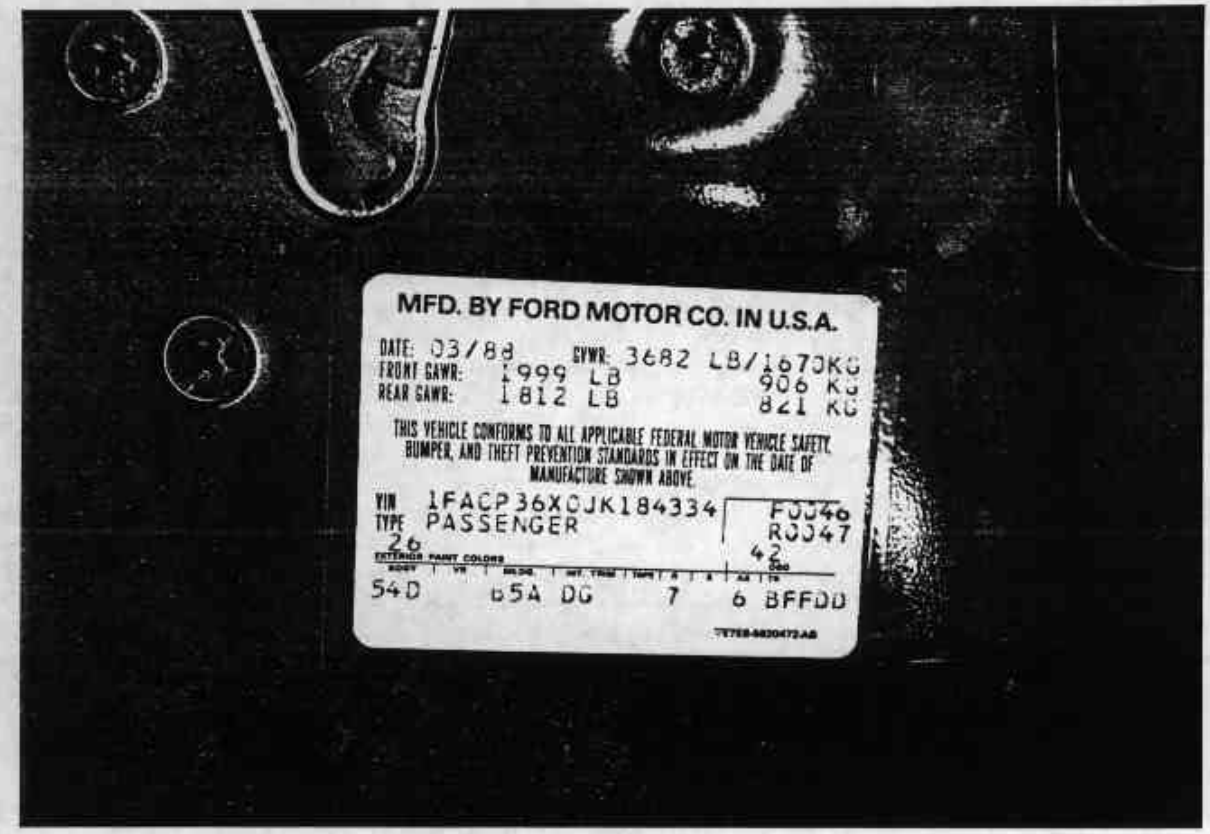


Figure A-45. PRE-TEST VEHICLE CERTIFICATION LABEL VIEW

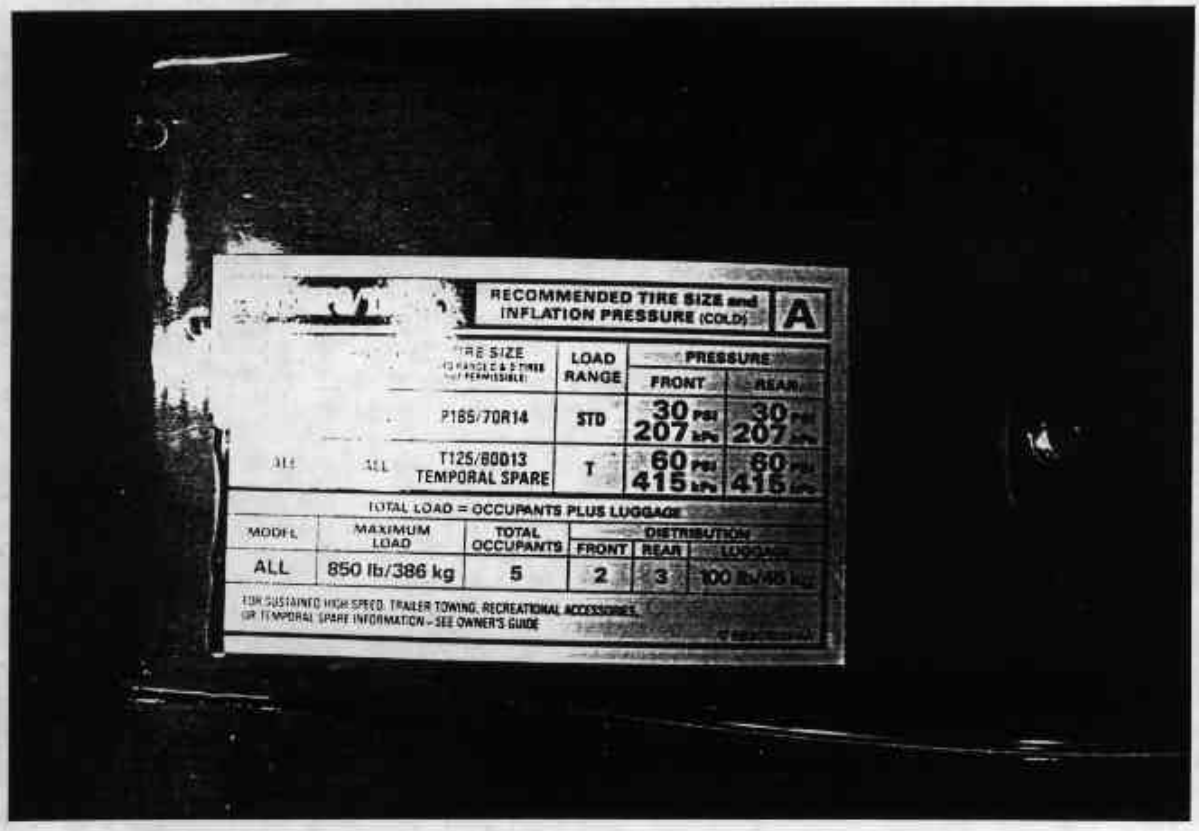


Figure A-46. PRE-TEST VEHICLE TIRE LOAD LAVEL VIEW

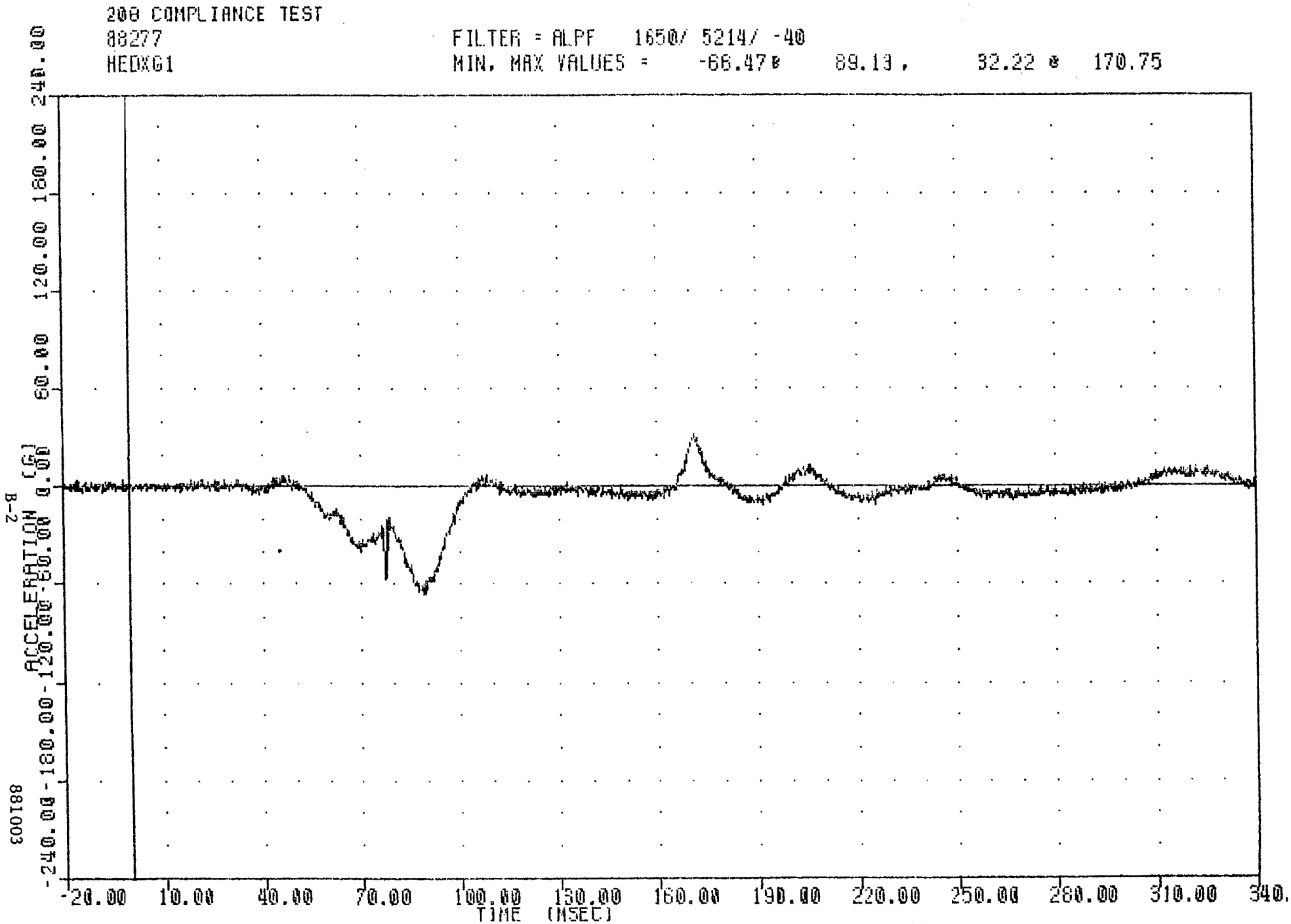
APPENDIX B

DATA PLOTS

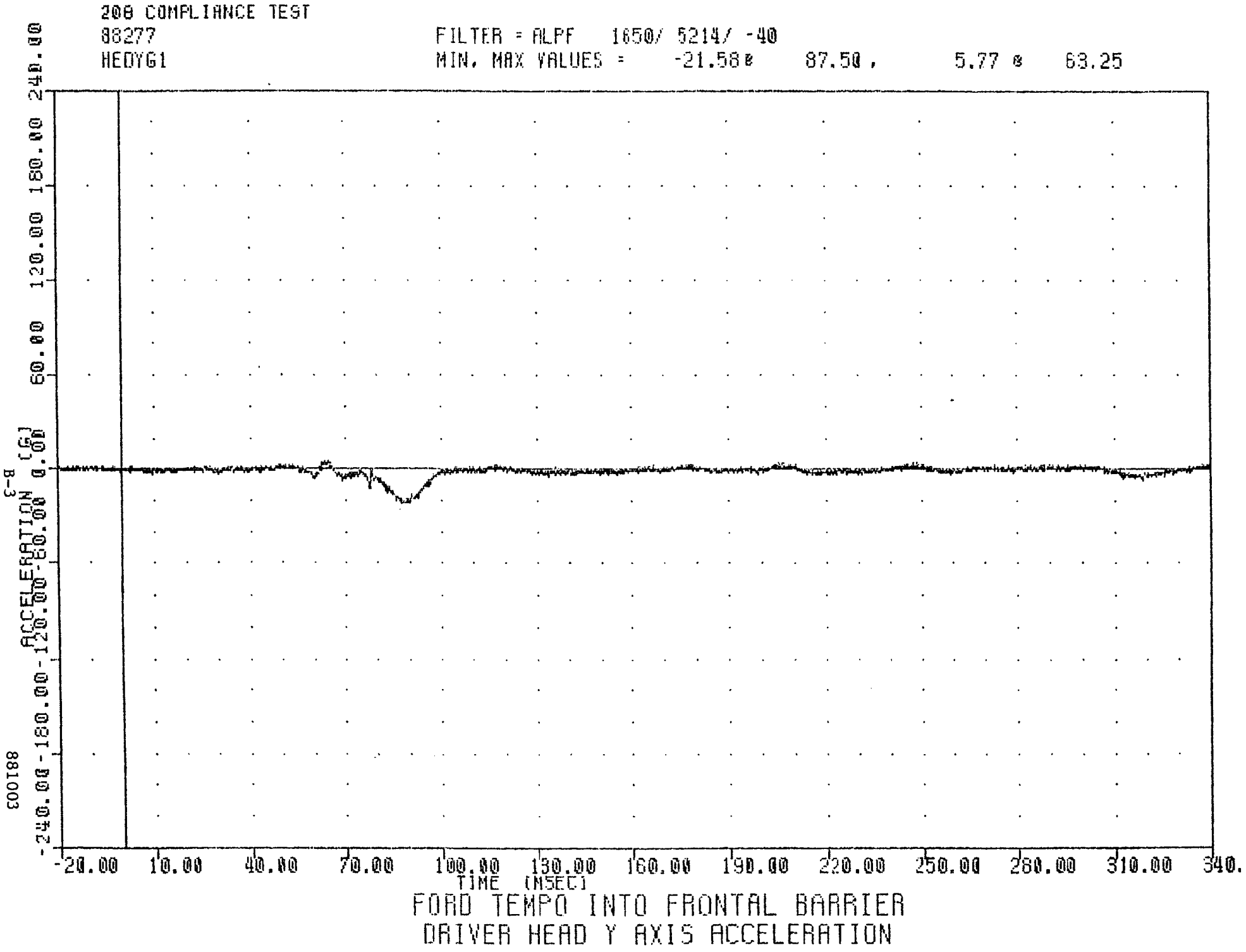
DUMMY AND VEHICLE AXES: X: FRONT/REAR

Y: LEFT/RIGHT

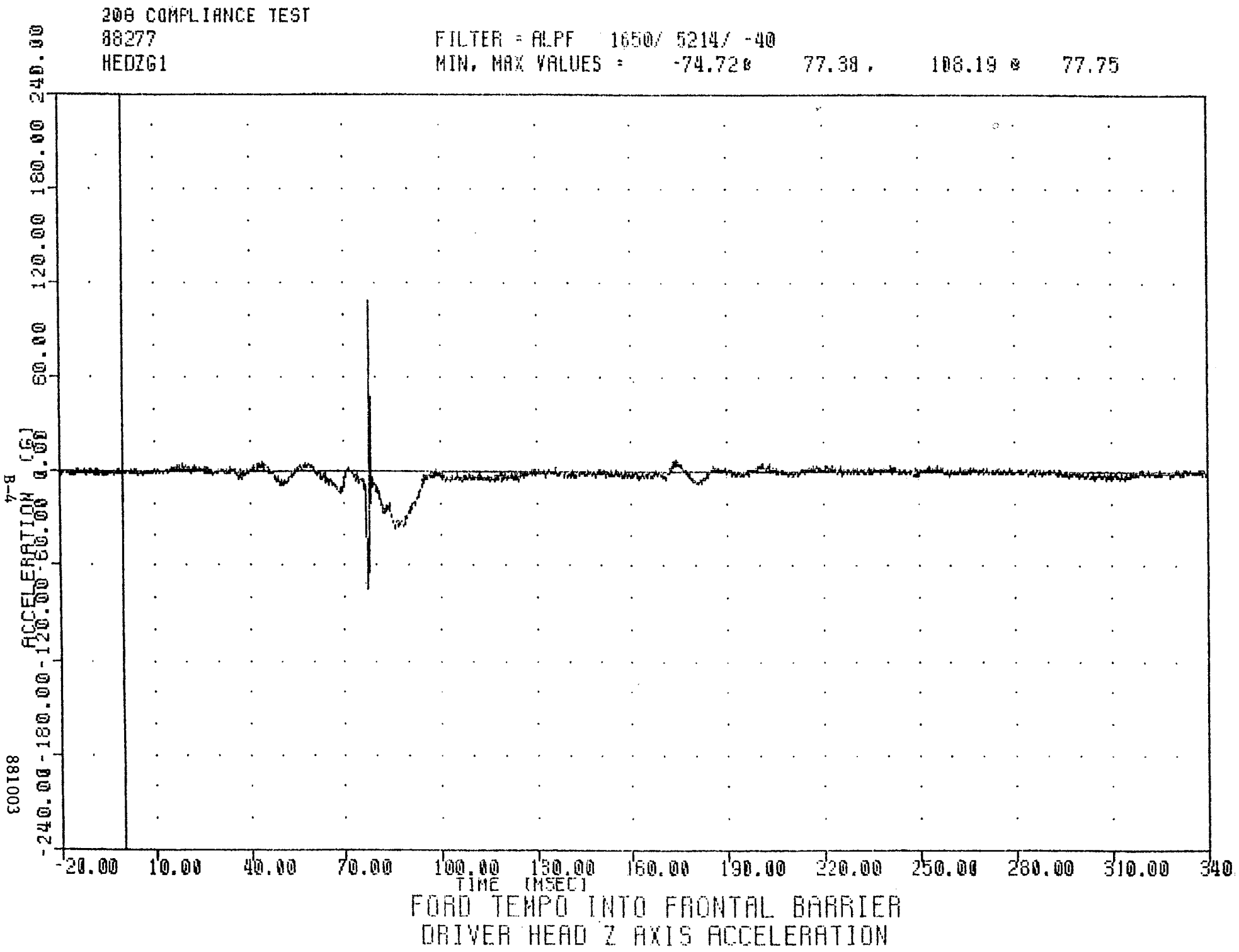
Z: UP/DOWN



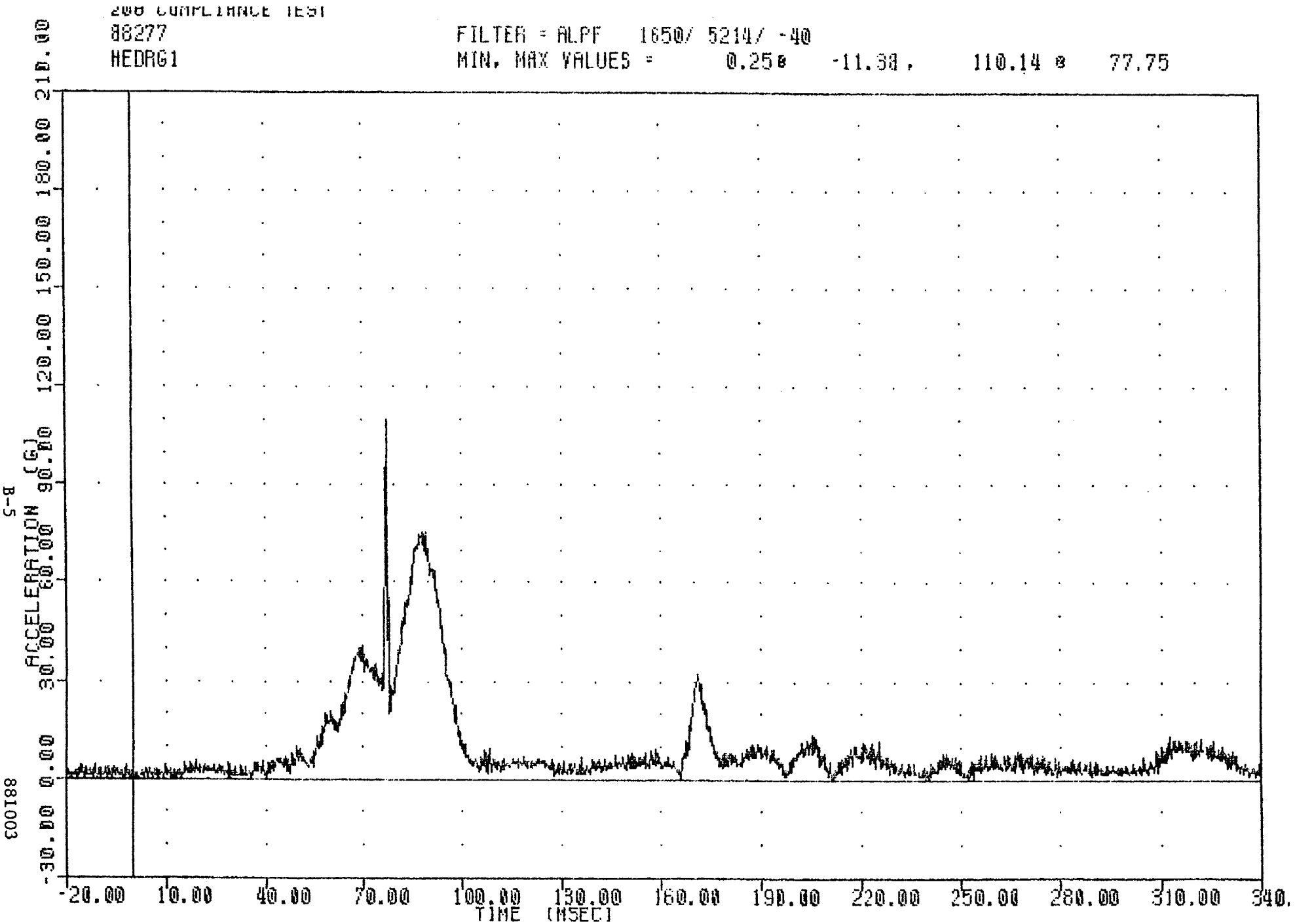
FORD TEMPO INTO FRONTAL BARRIER
DRIVER HEAD X AXIS ACCELERATION



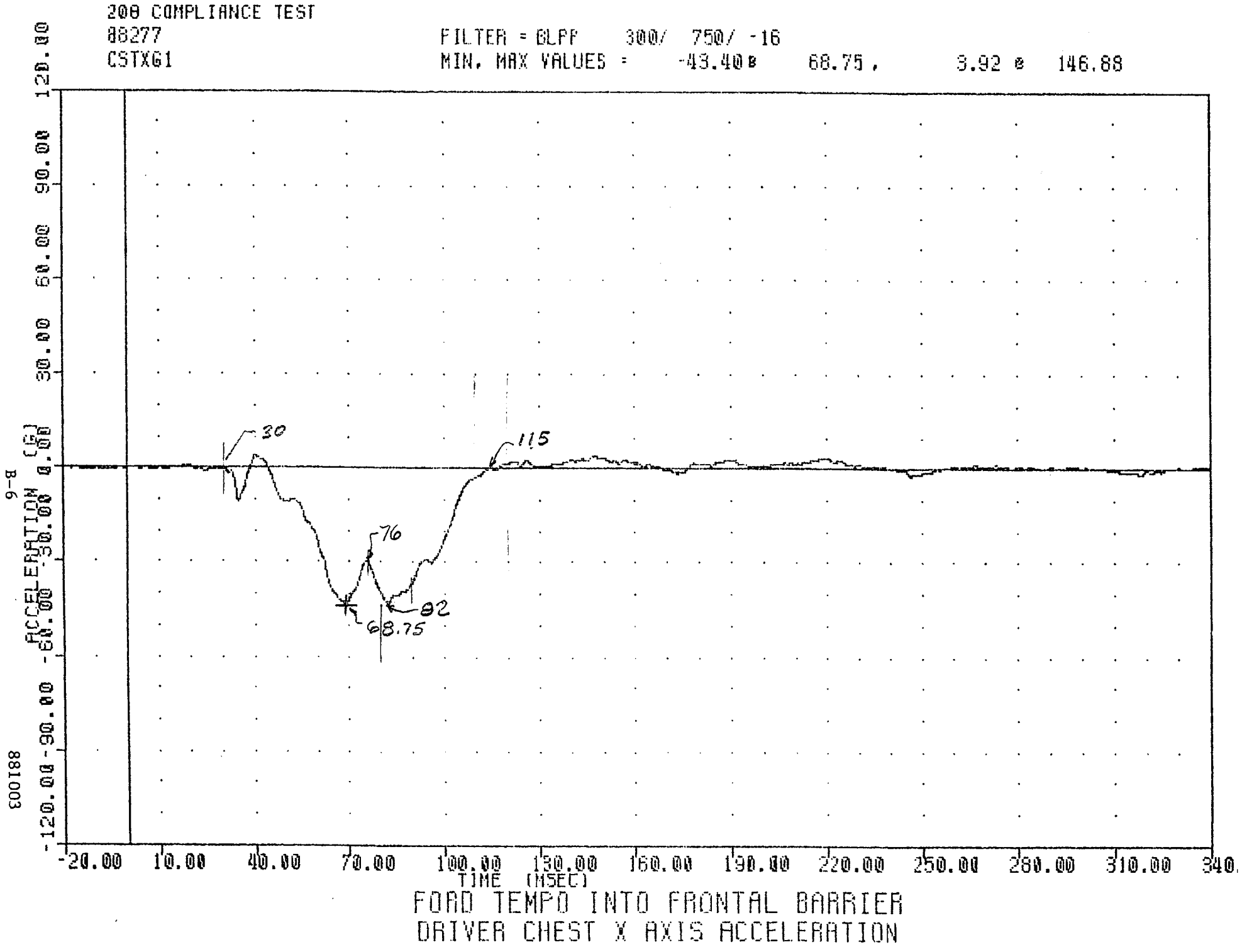
FORD TEMPO INTO FRONTAL BARRIER
DRIVER HEAD Y AXIS ACCELERATION



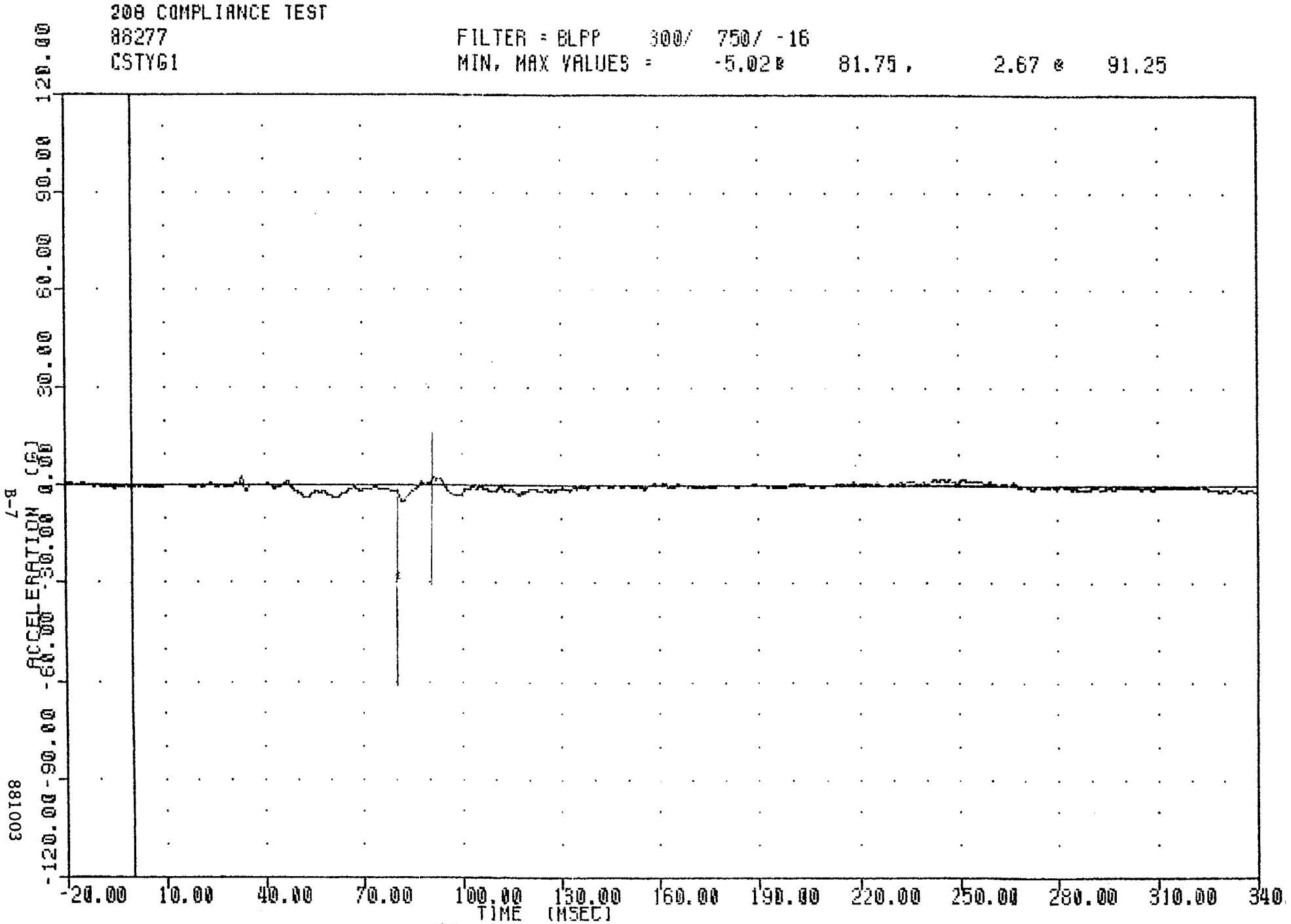
FORD TEMPO INTO FRONTAL BARRIER
DRIVER HEAD Z AXIS ACCELERATION



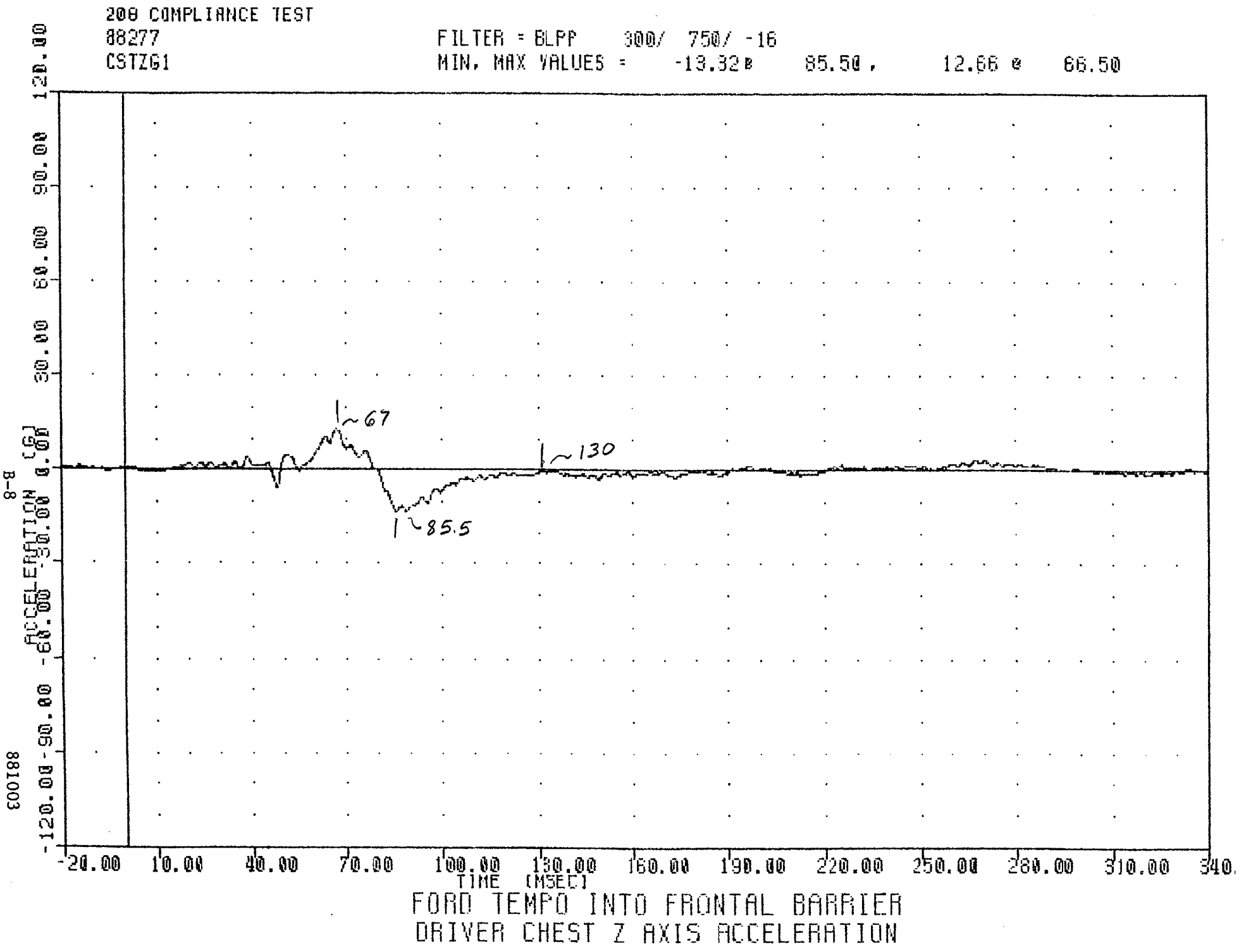
FORD TEMPO INTO FRONTAL BARRIER
DRIVER HEAD RESULTANT ACCELERATION



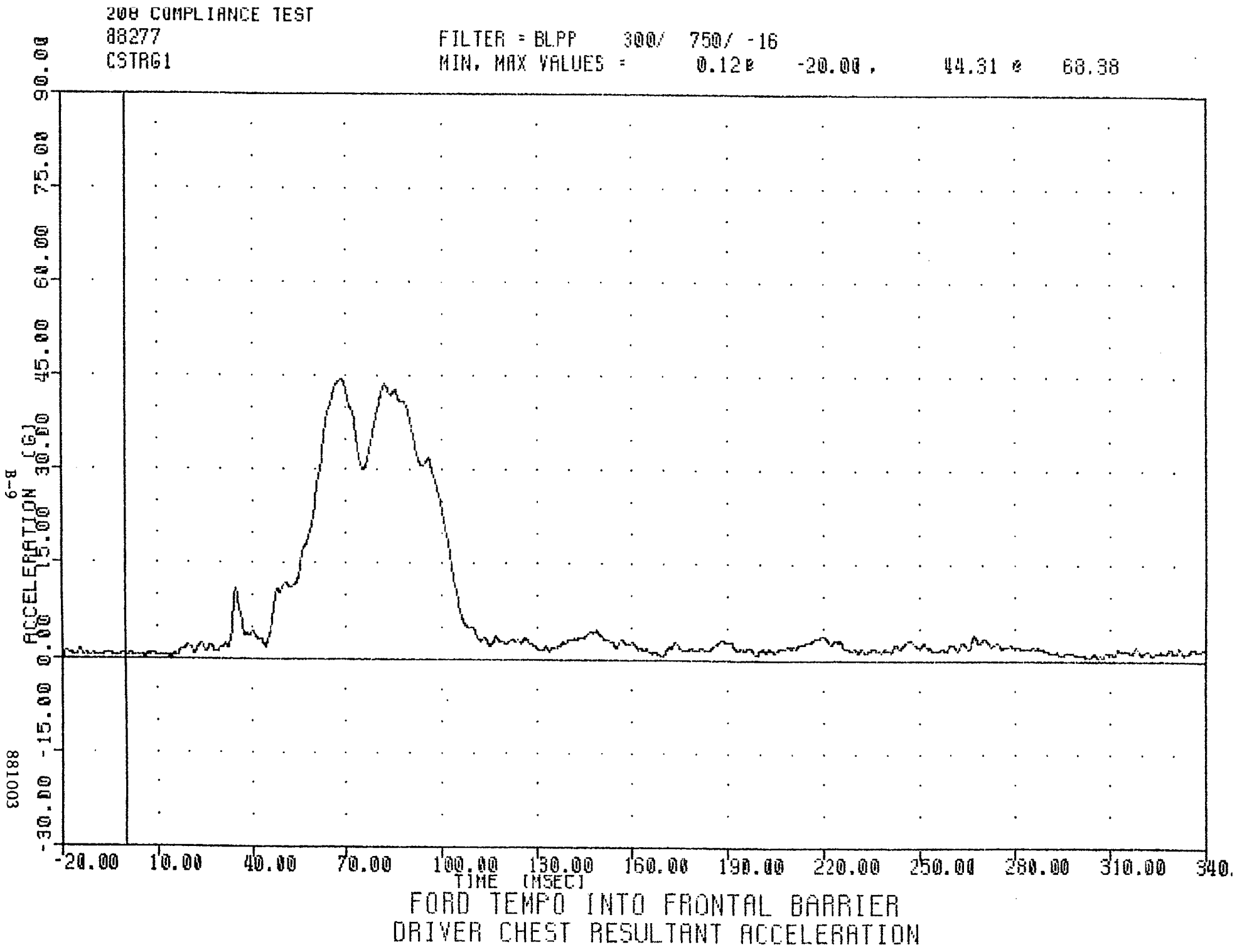
FORD TEMPO INTO FRONTAL BARRIER
DRIVER CHEST X AXIS ACCELERATION

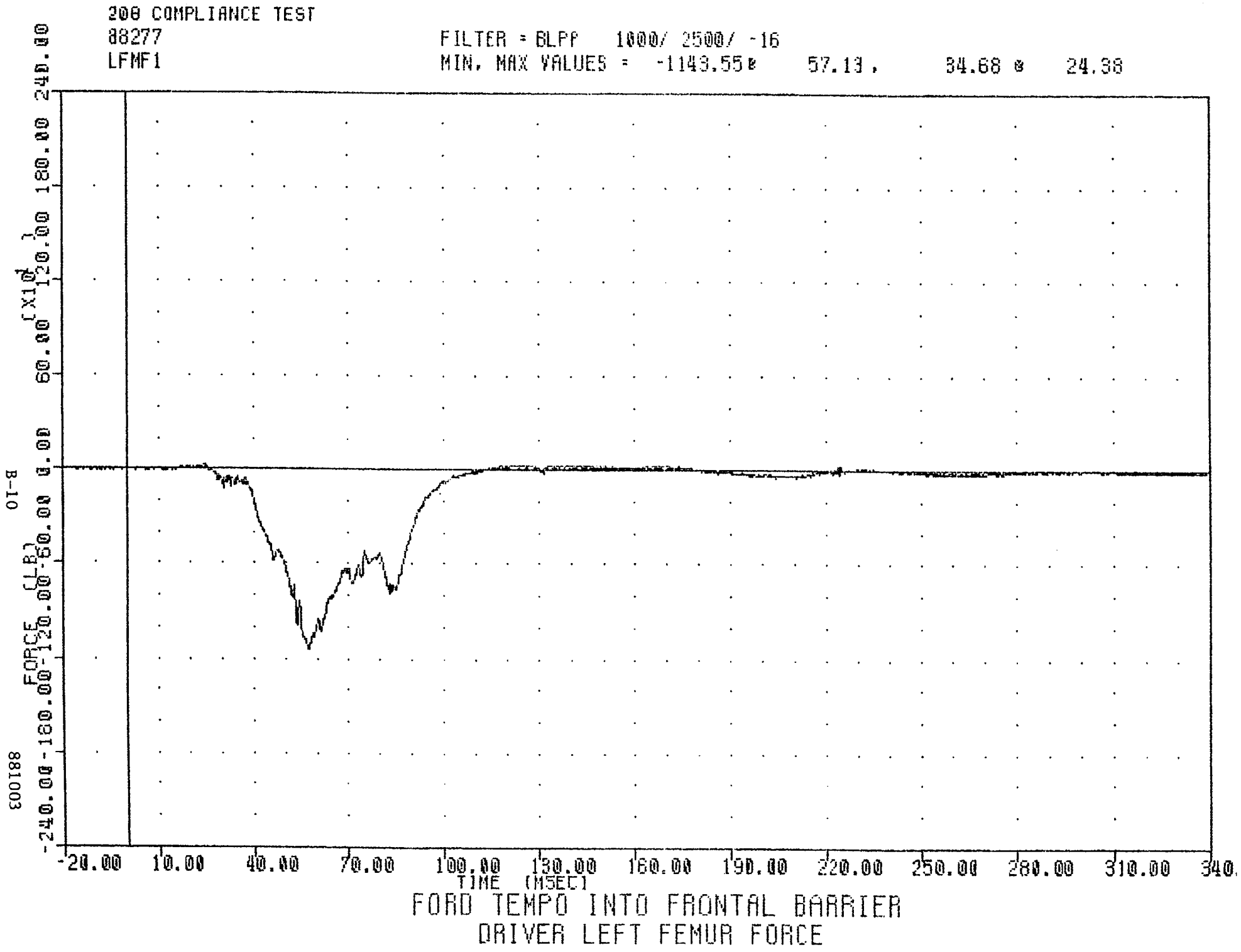


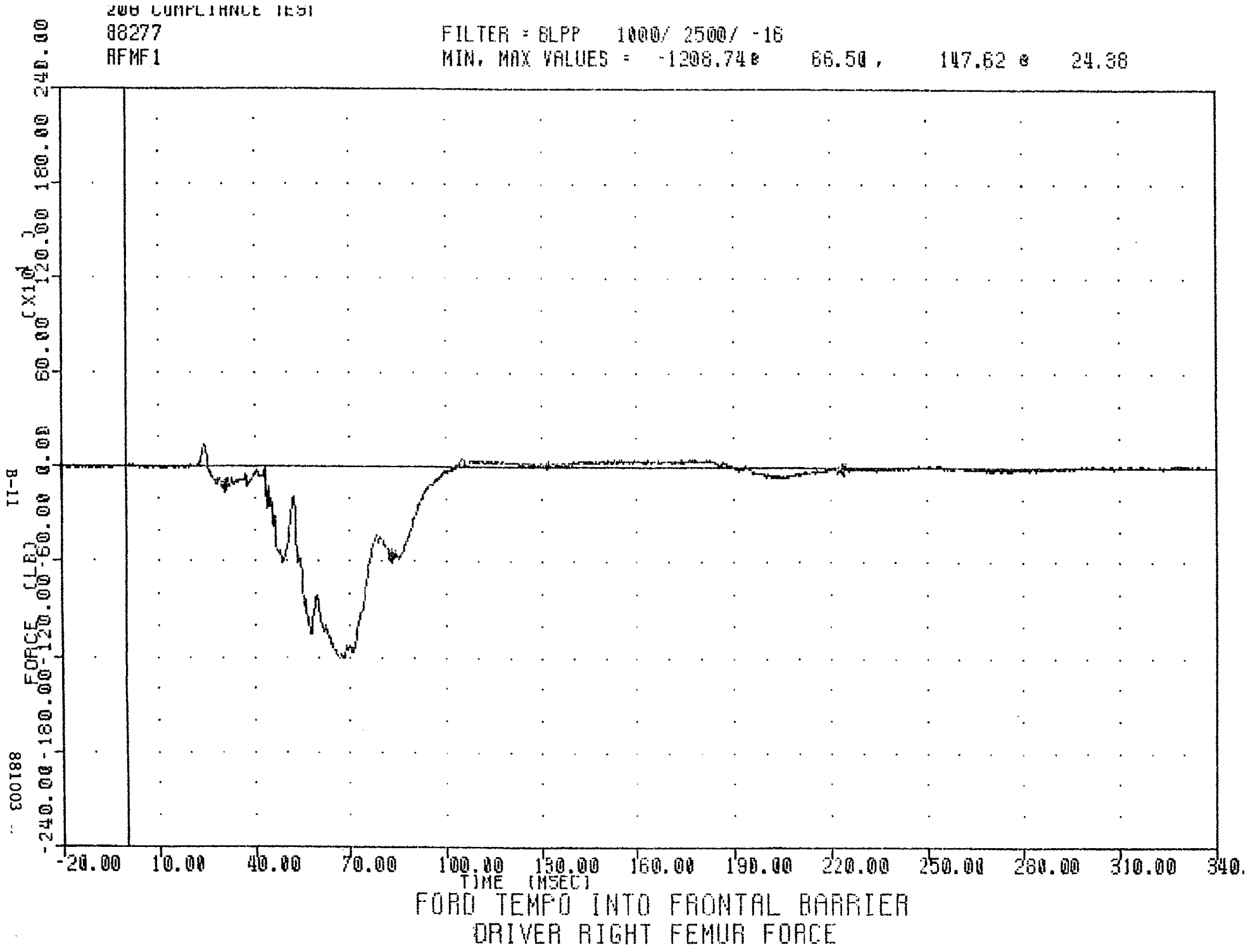
FORD TEMPO INTO FRONTAL BARRIER
DRIVER CHEST Y AXIS ACCELERATION



FORD TEMPO INTO FRONTAL BARRIER
DRIVER CHEST Z AXIS ACCELERATION

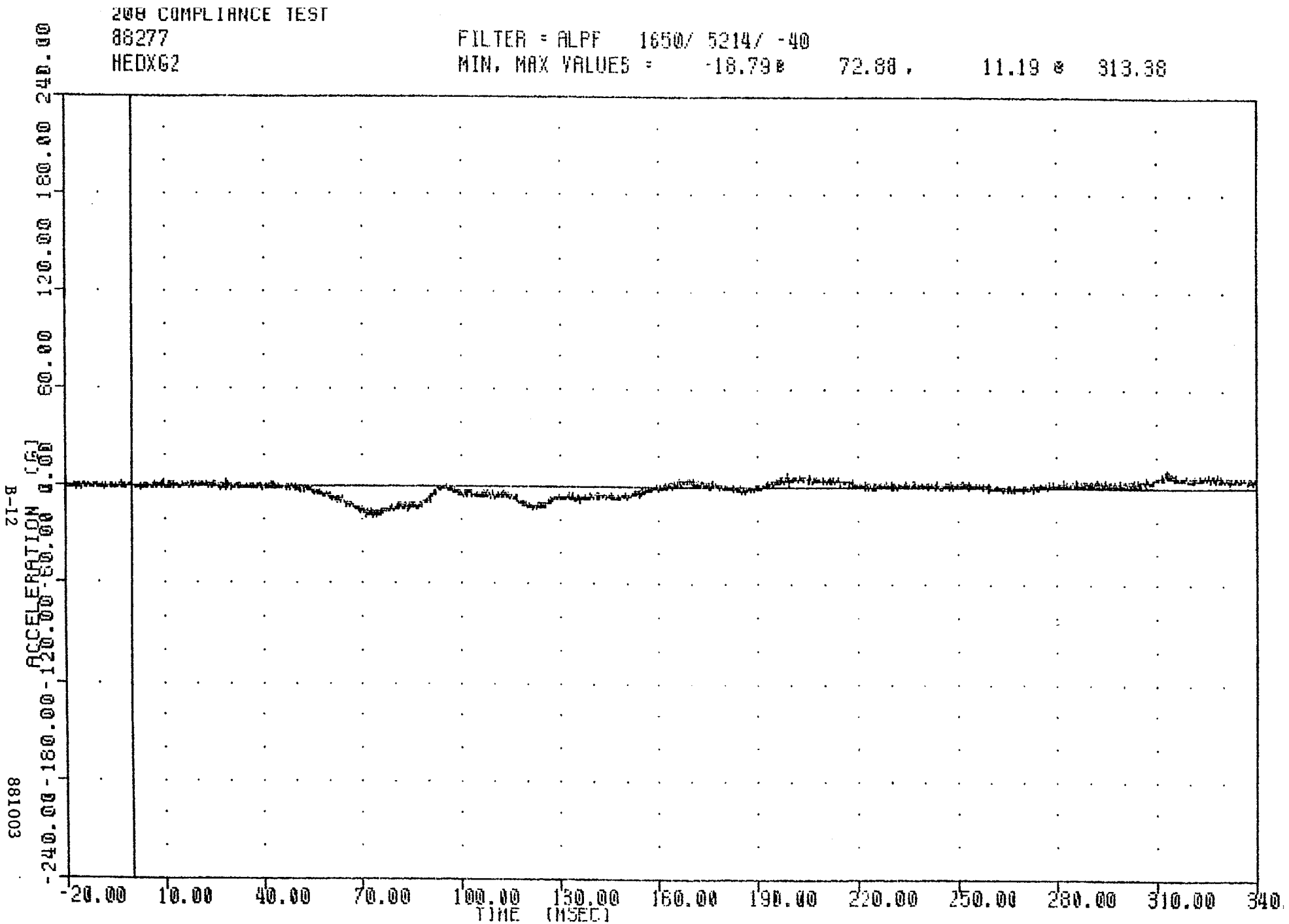

208 COMPLIANCE TEST
88277
CSTRG1
FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = 0.12 @ -20.00 , 44.31 @ 68.38
90.00
75.00
60.00
45.00
30.00
15.00
0.00
-15.00
-30.00
ACCELERATION (G)
B-9
881003
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.
TIME (MSEC)
FORD TEMPO INTO FRONTAL BARRIER
DRIVER CHEST RESULTANT ACCELERATION


208 COMPLIANCE TEST
88277
LFMF1
FILTER = BLPF 1000/ 2500/ -16
MIN, MAX VALUES = -1143.55 @ 57.13 , 34.68 @ 24.38
240.00
180.00
120.00
60.00
0.00
-60.00
-120.00
-180.00
-240.00
FORCE (LB) (X10)
B-10
881003
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.
TIME (MSEC)
FORD TEMPO INTO FRONTAL BARRIER
DRIVER LEFT FEMUR FORCE



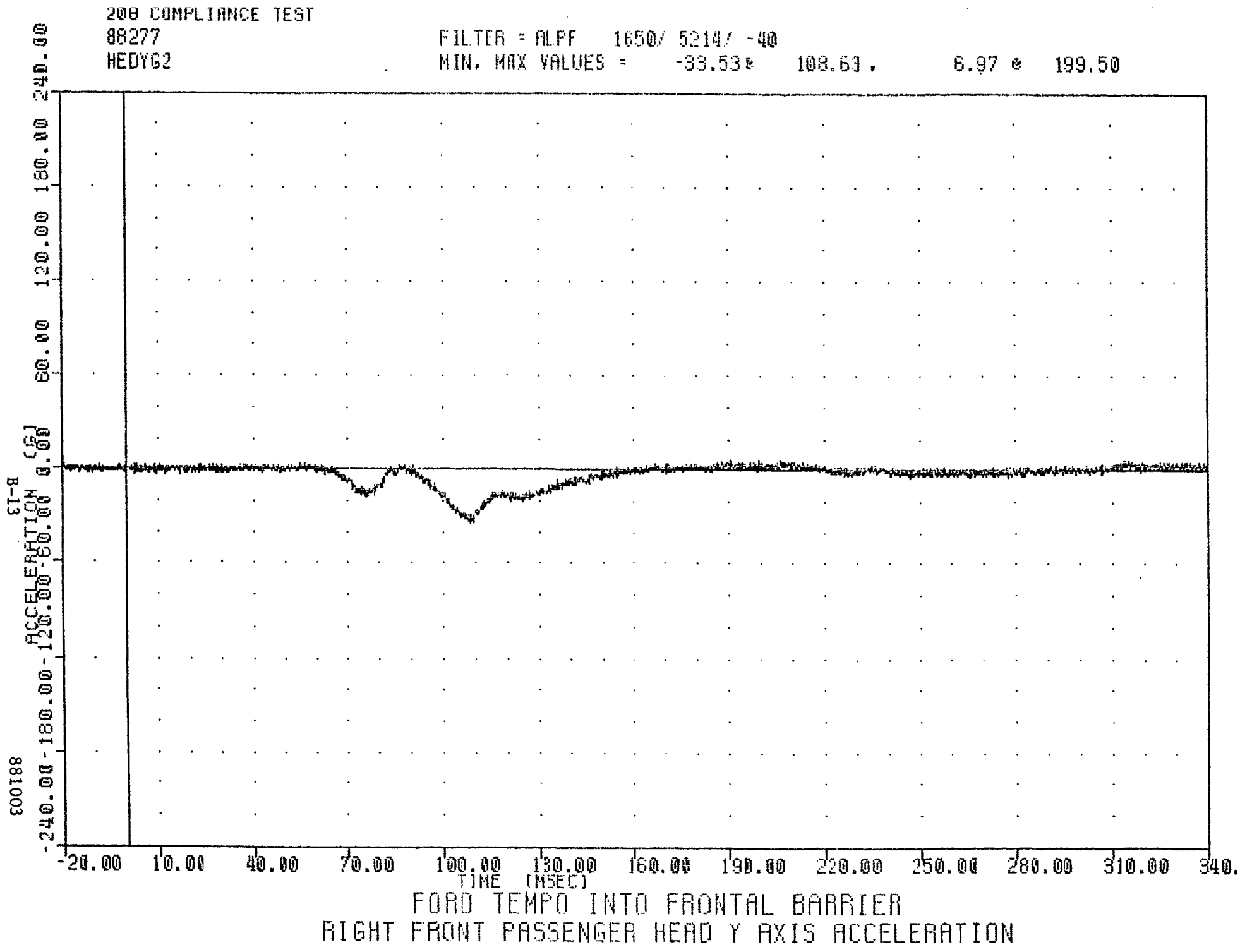
FORD TEMPO INTO FRONTAL BARRIER
DRIVER RIGHT FEMUR FORCE

881003

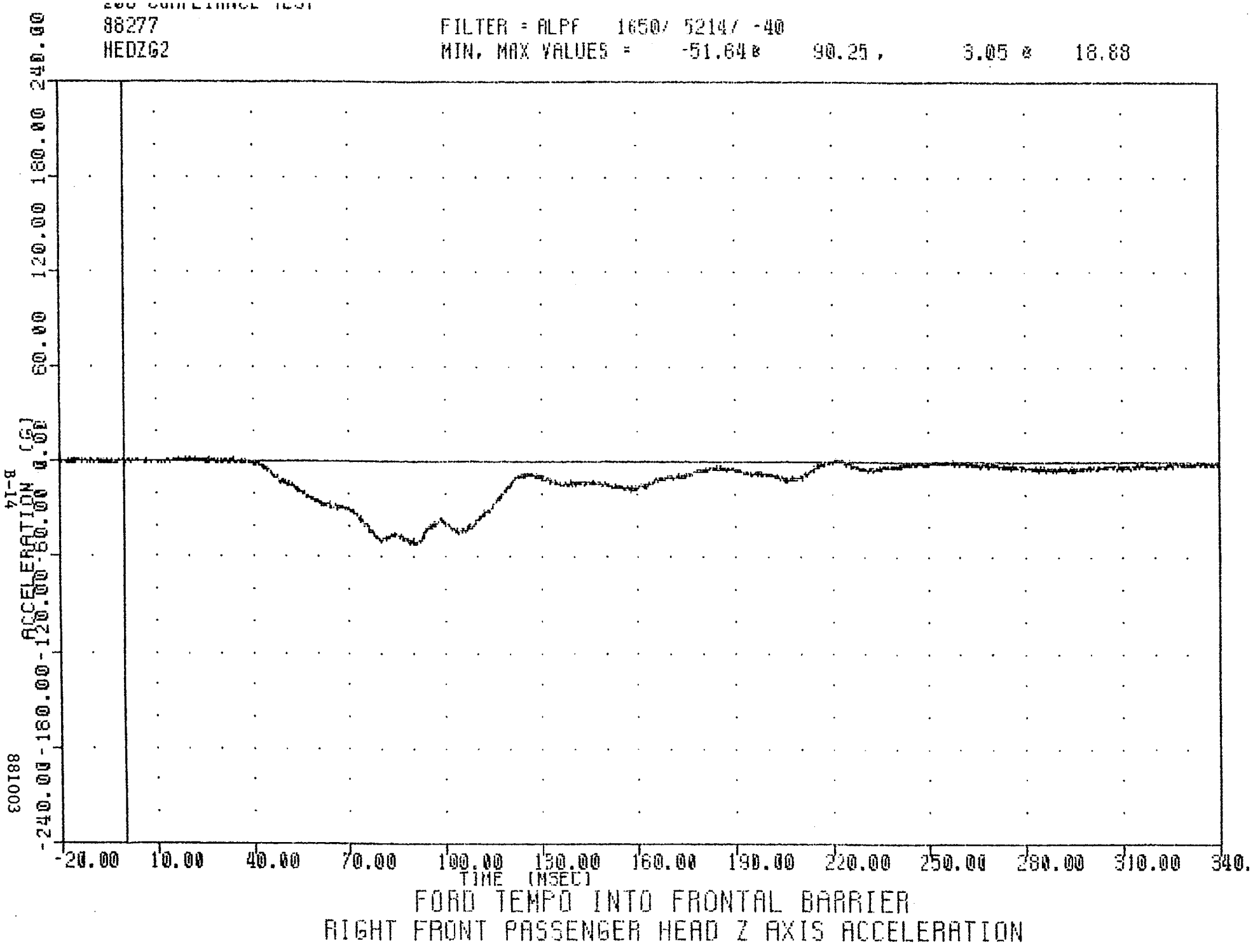


FORD TEMPO INTO FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD X AXIS ACCELERATION

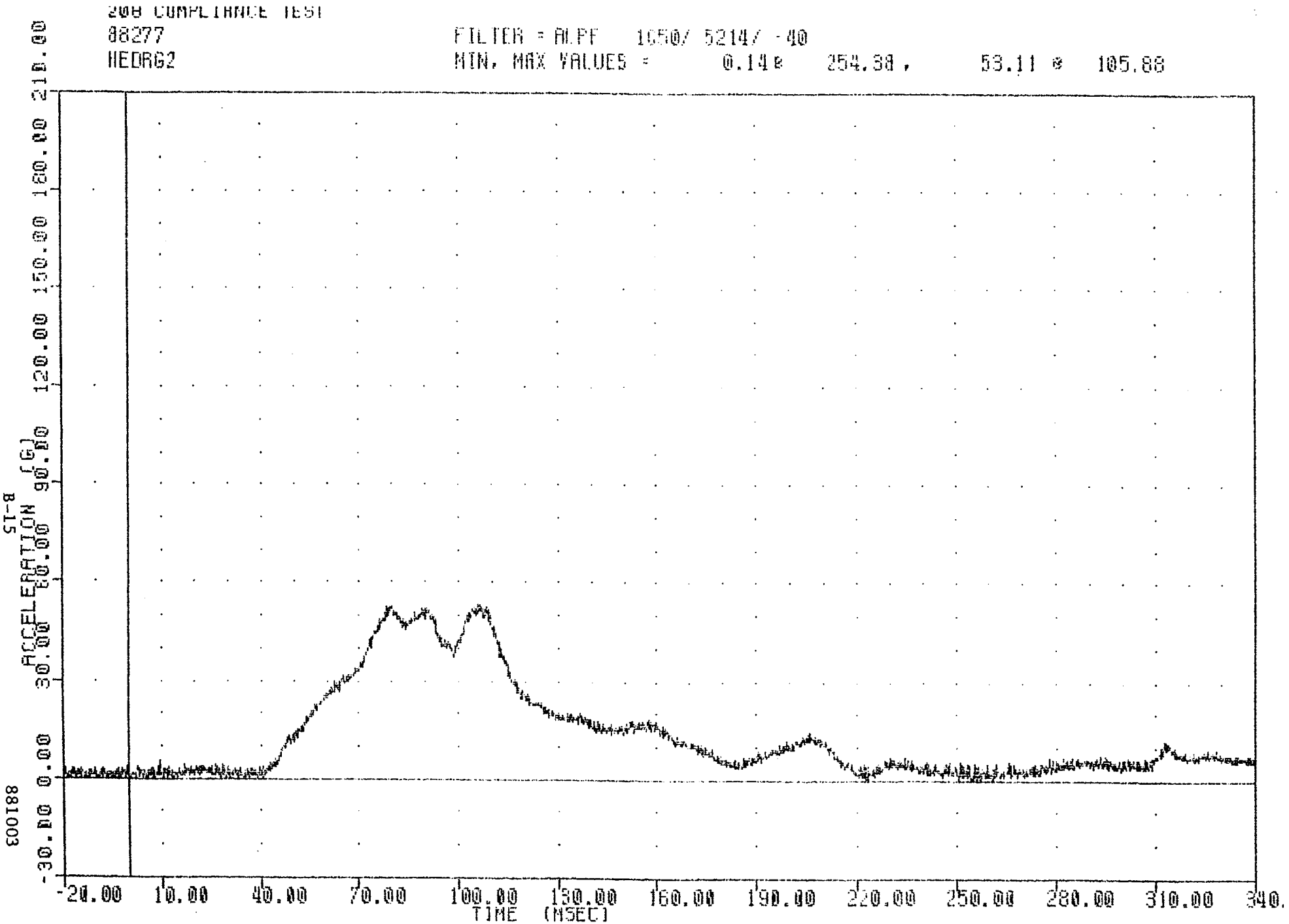
881003



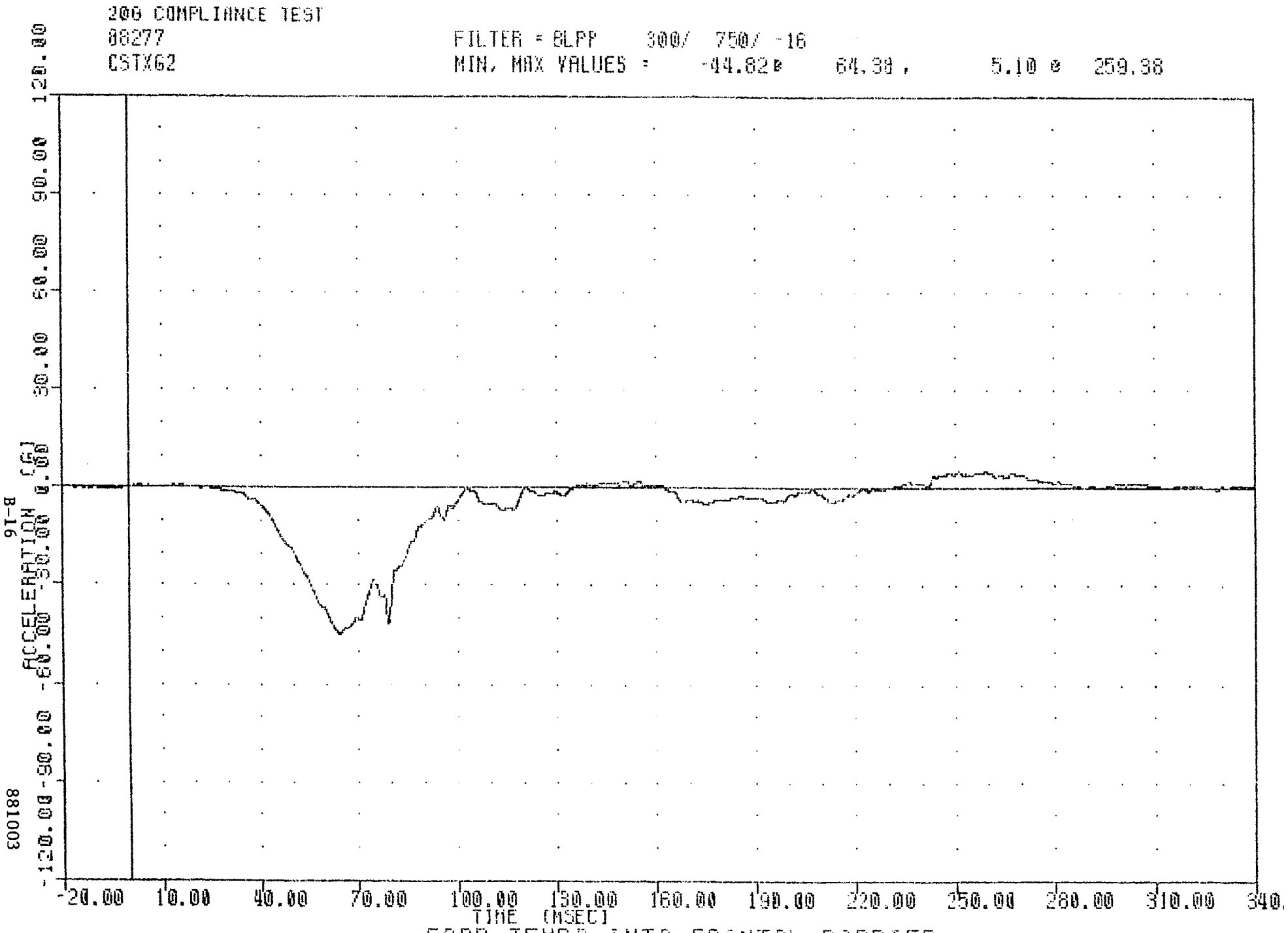
FORD TEMPO INTO FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD Y AXIS ACCELERATION



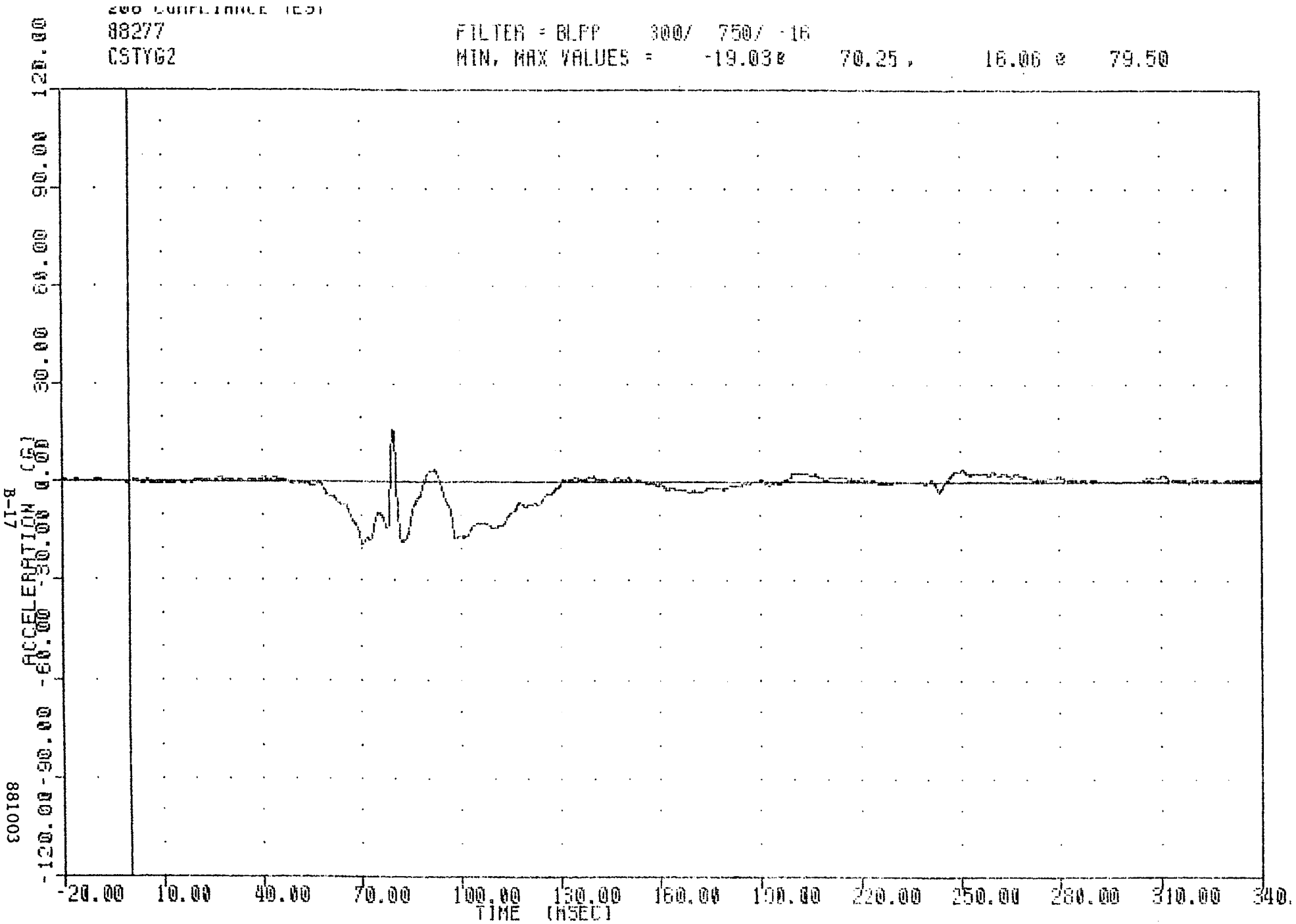
FORD TEMPO INTO FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD Z AXIS ACCELERATION



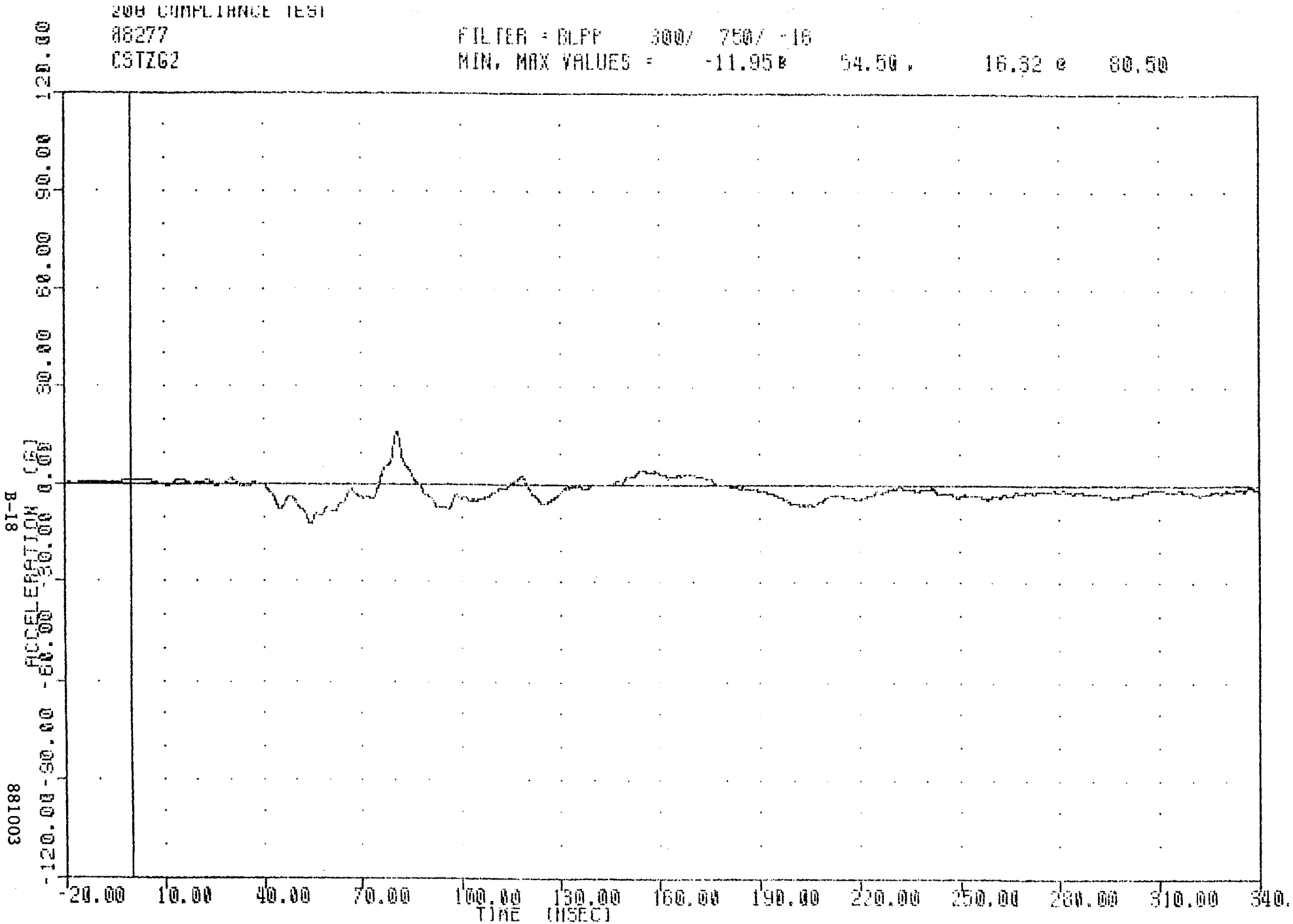
FORD TEMPO INTO FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD.RESULTANT ACCELERATION



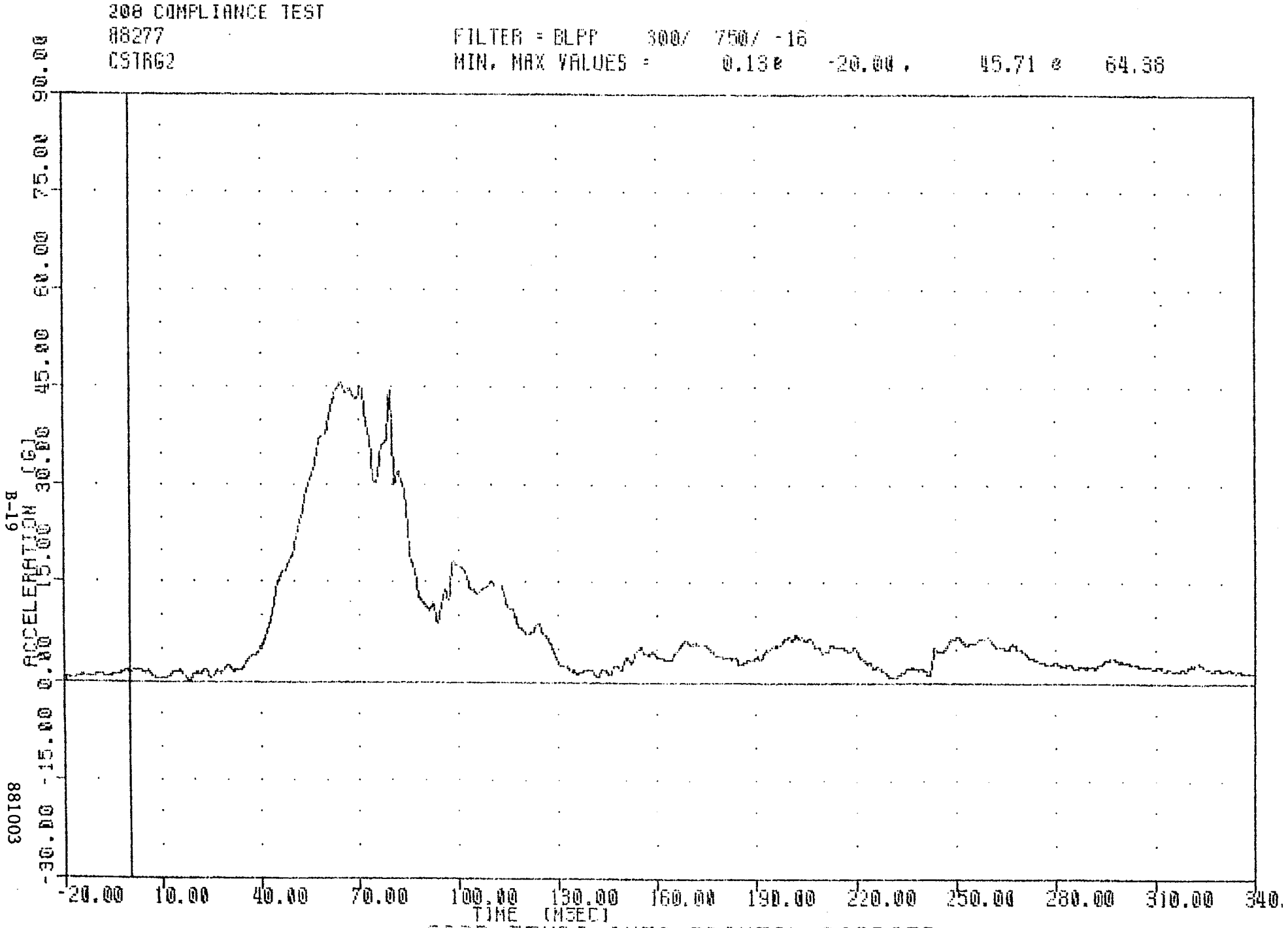
FORD TEMPO INTO FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST X AXIS ACCELERATION



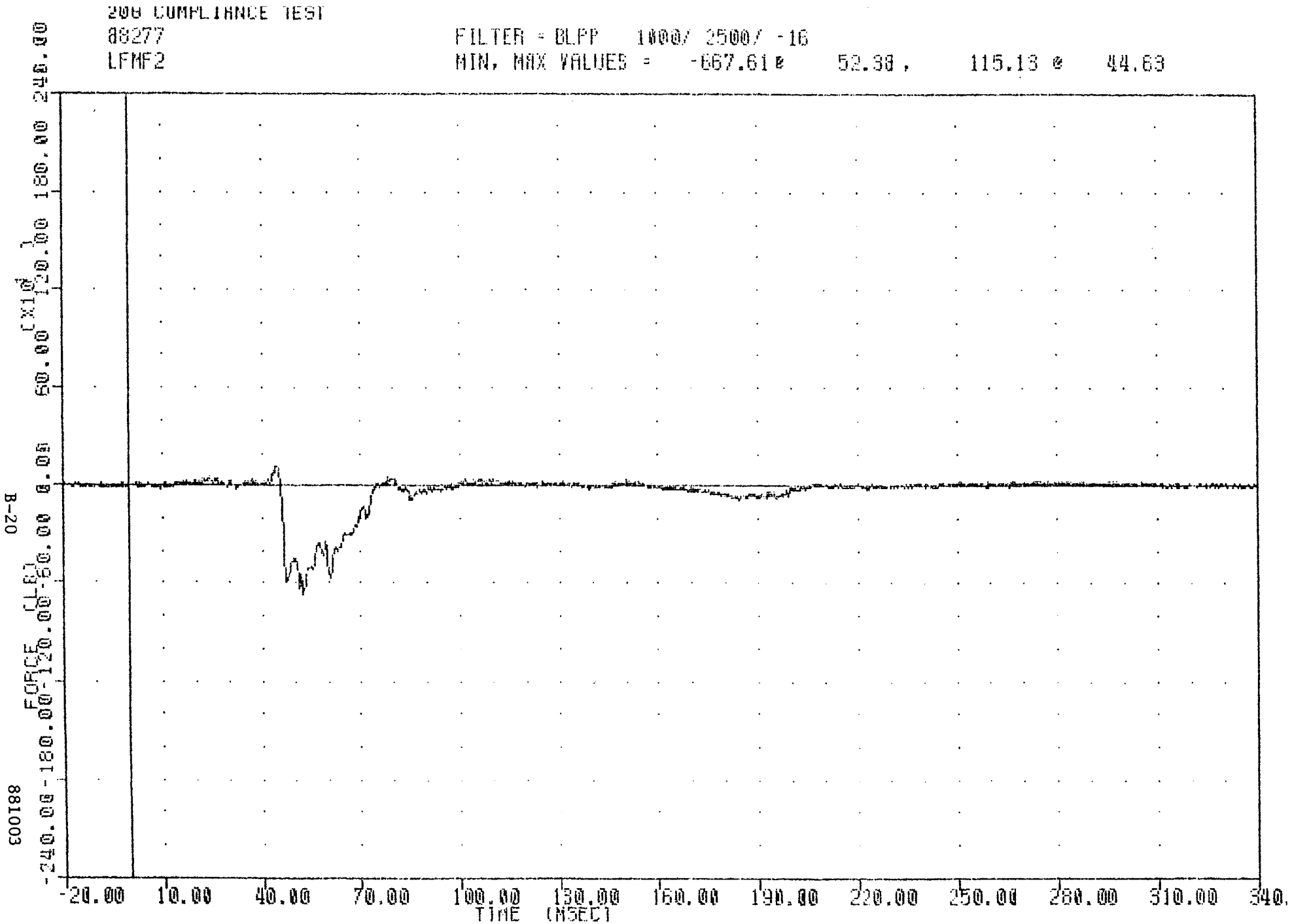
FORD TEMPO INTO FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST Y AXIS ACCELERATION



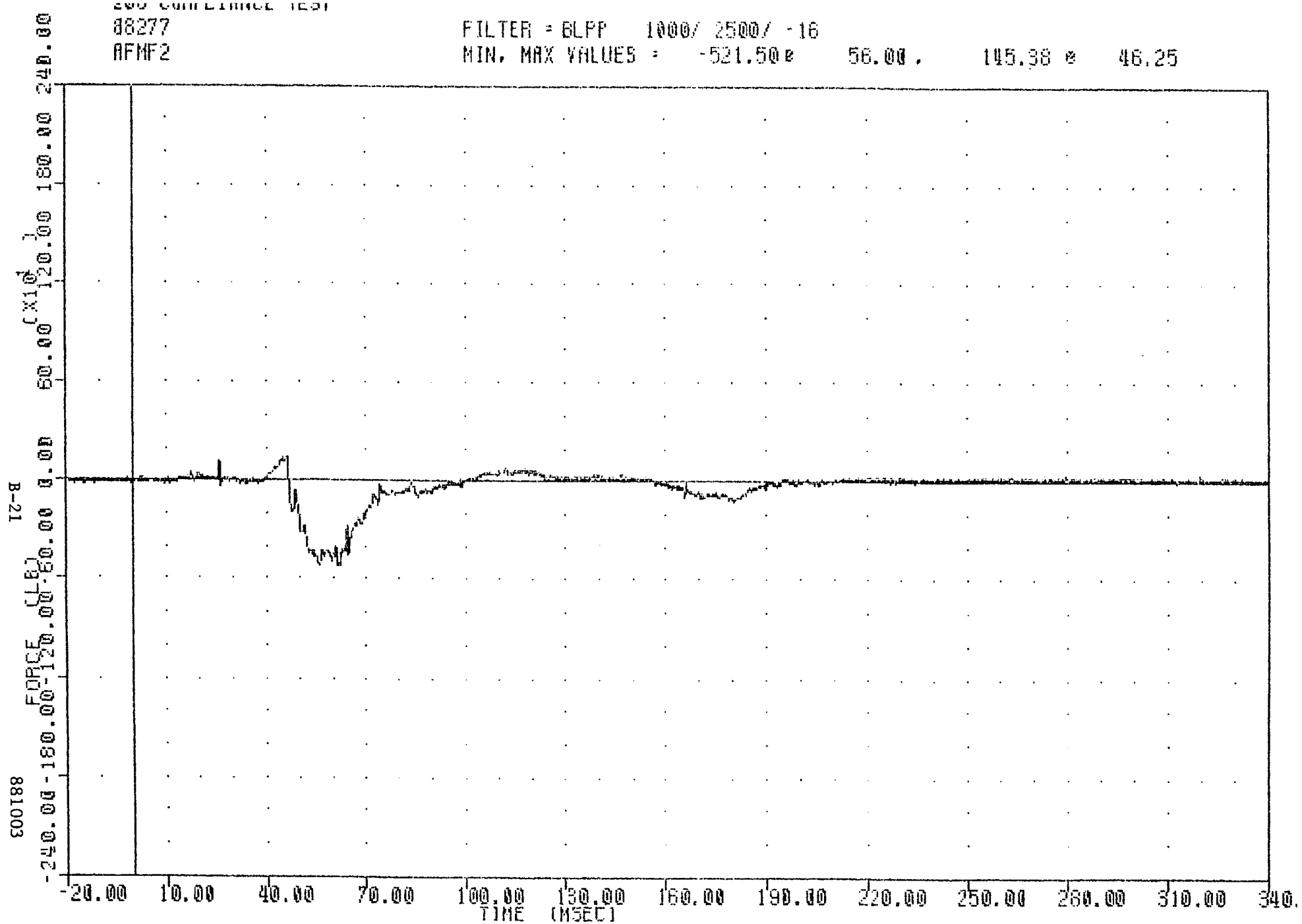
FORD TEMPO INTO FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST Z AXIS ACCELERATION



FORD TEMPO INTO FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST RESULTANT ACCELERATION

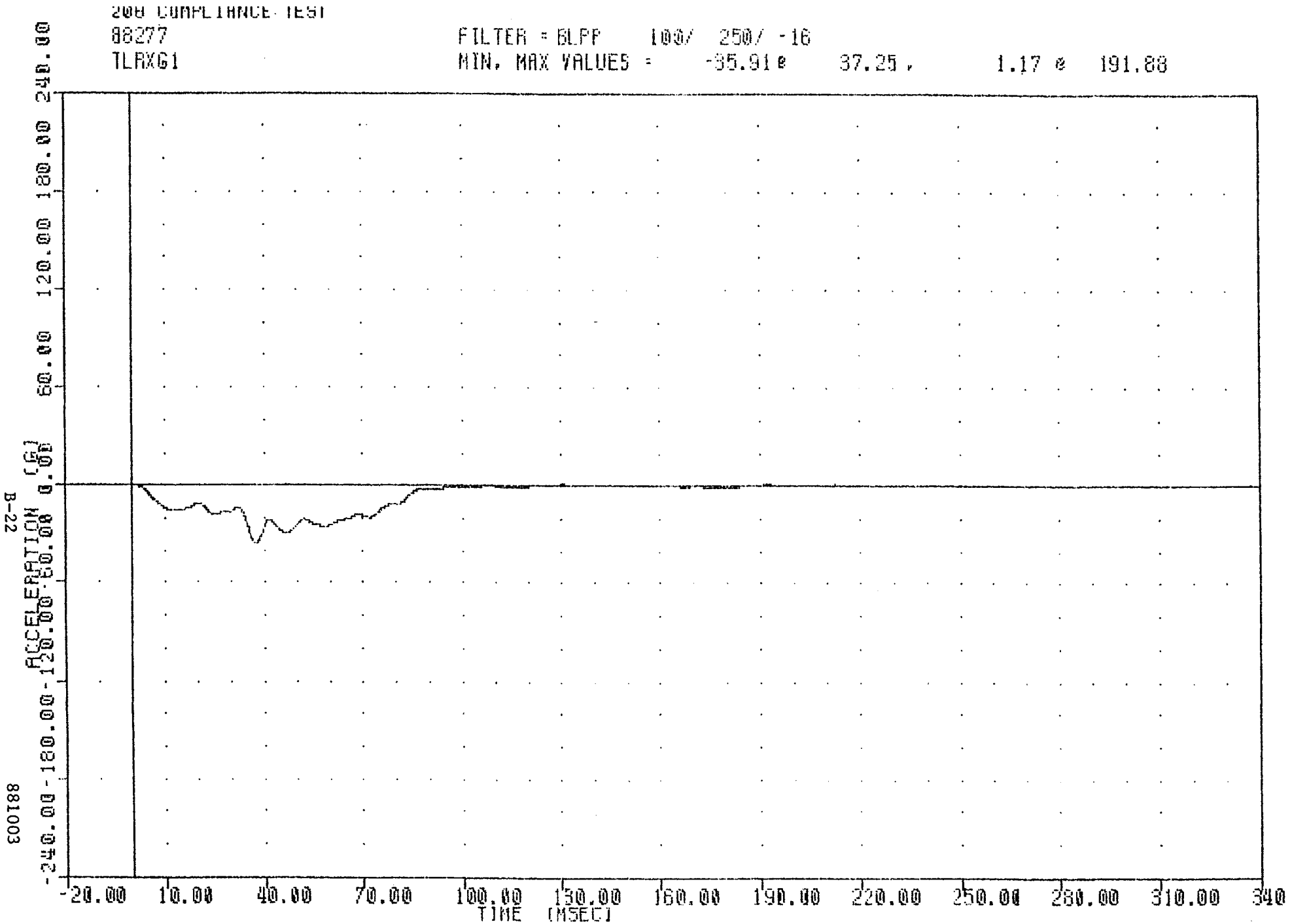


FORD TEMPO INTO FRONTAL BARRIER
RIGHT FRONT PASSENGER LEFT FEMUR FORCE

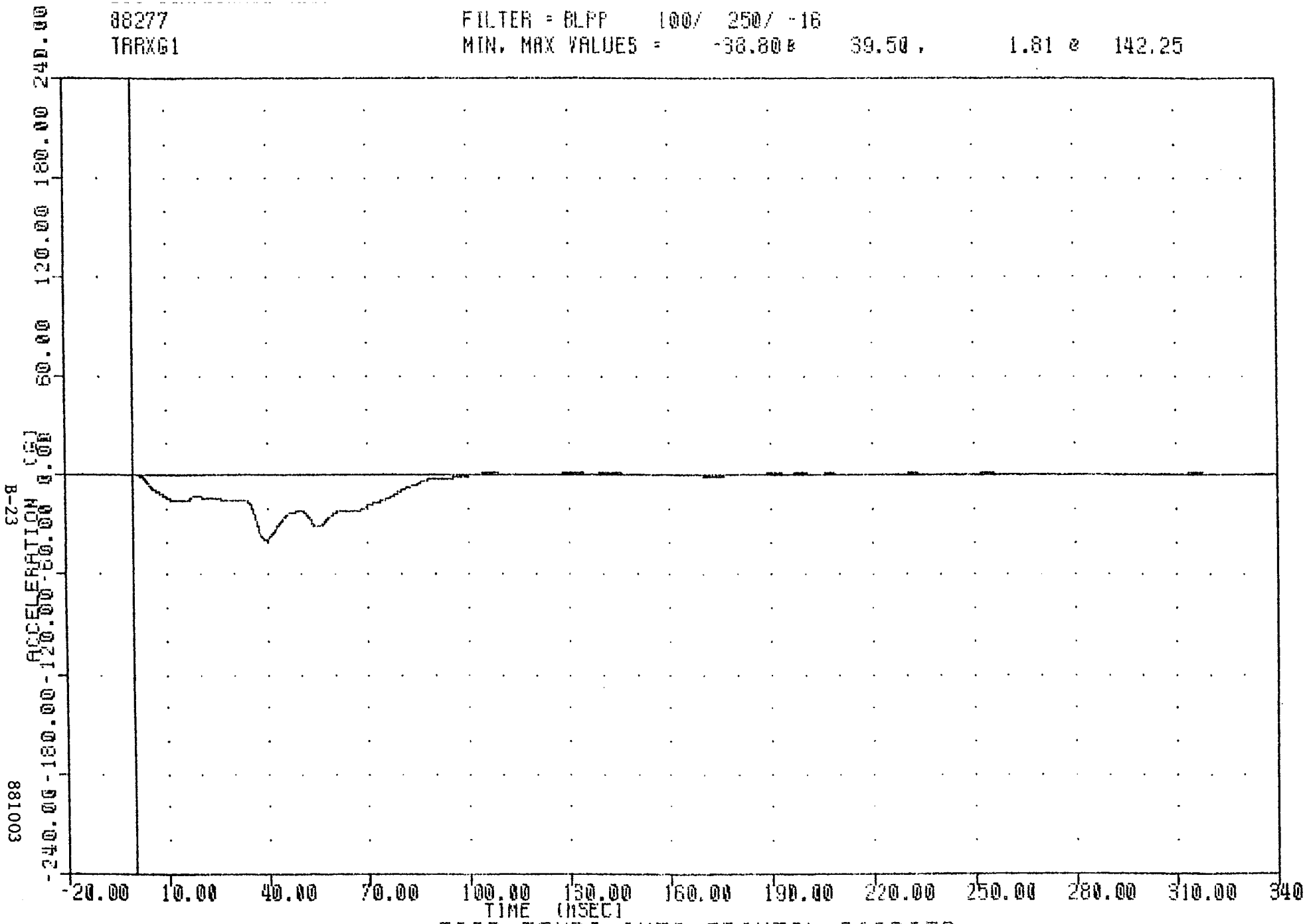


FORD TEMPO INTO FRONTAL BARRIER
RIGHT FRONT PASSENGER RIGHT FEMUR FORCE

881003

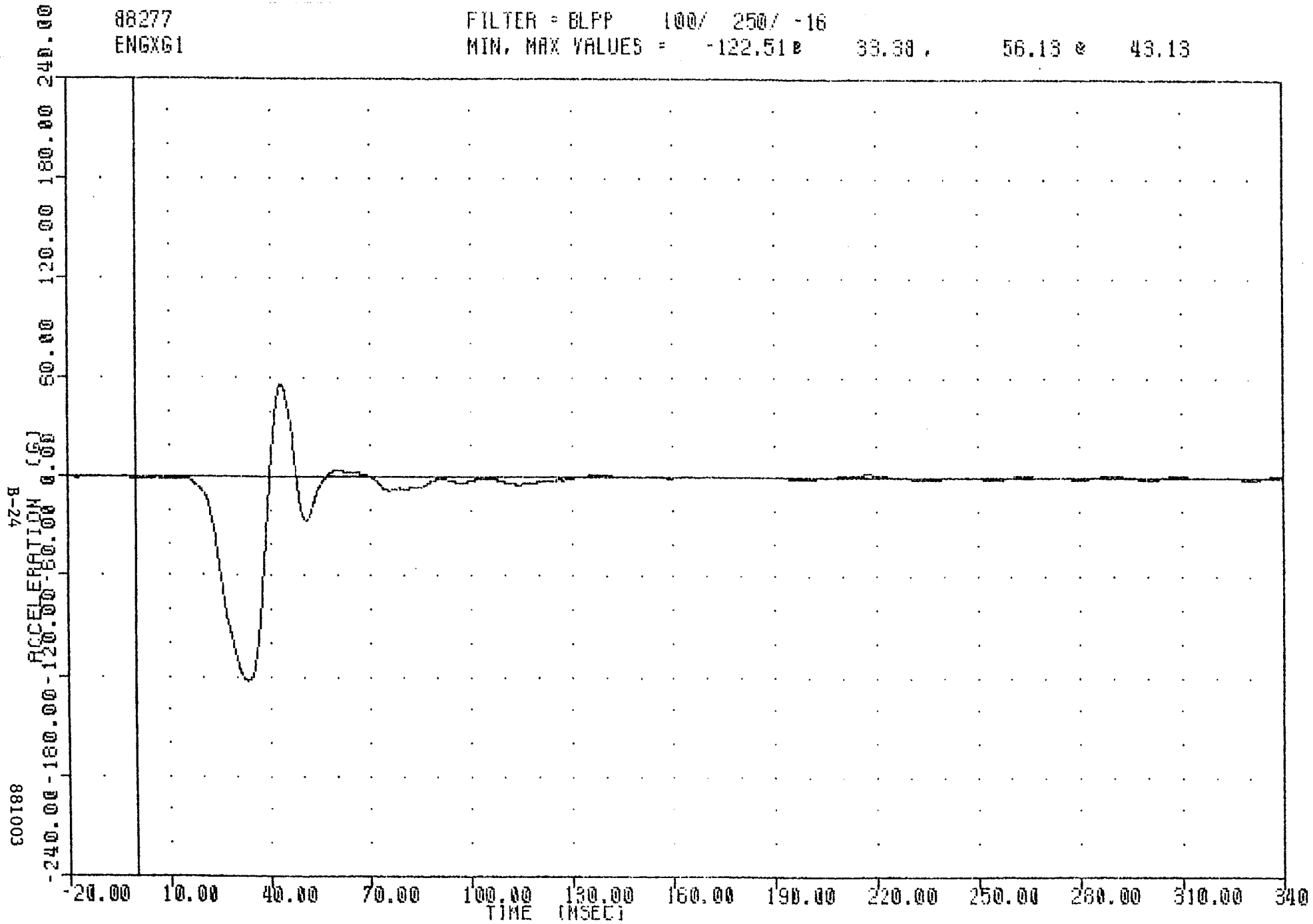


FORD TEMPO INTO FRONTAL BARRIER
LEFT REAR SEAT X AXIS ACCELERATION

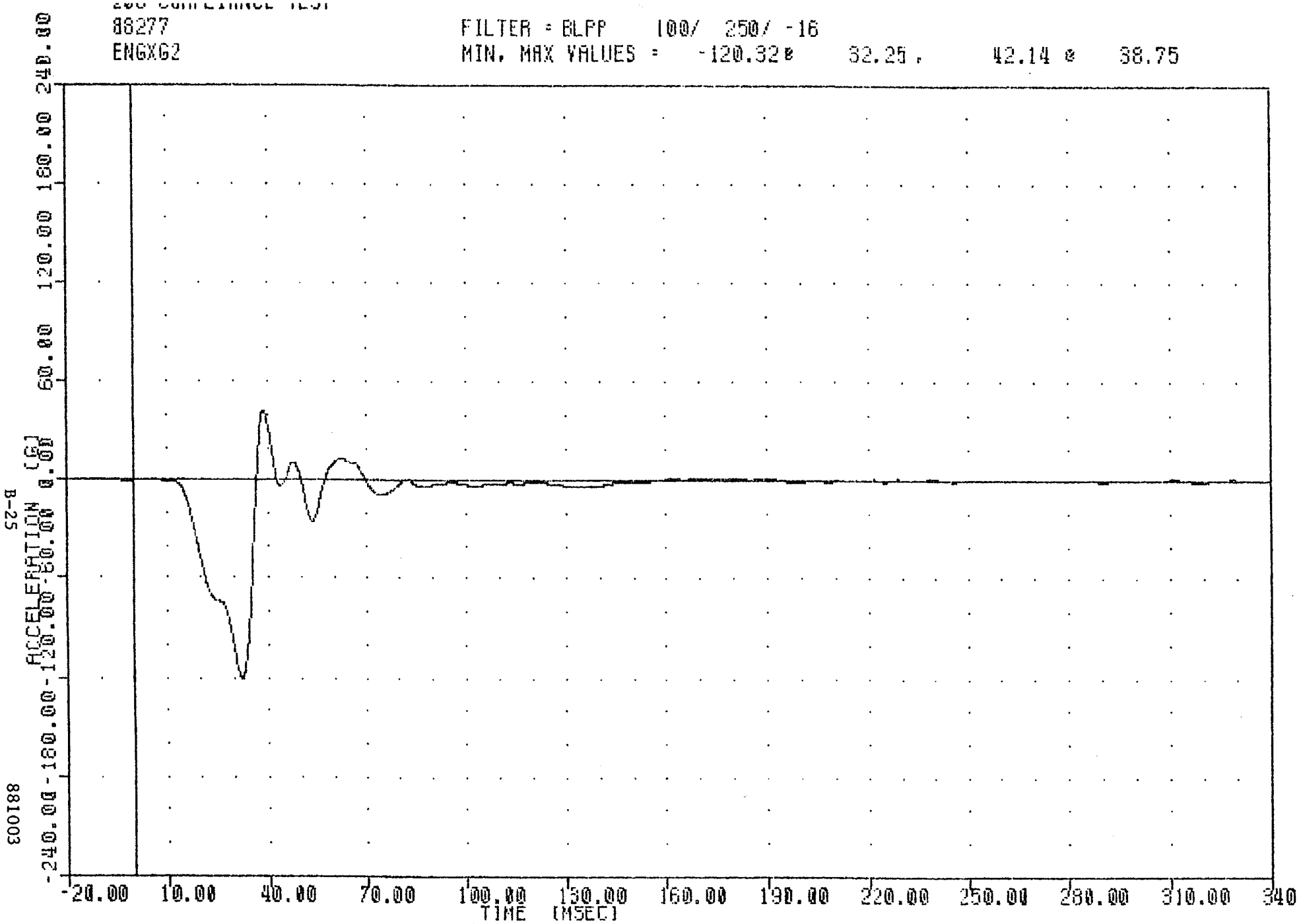


FORD TEMPO INTO FRONTAL BARRIER
RIGHT REAR SEAT X AXIS ACCELERATION

881003

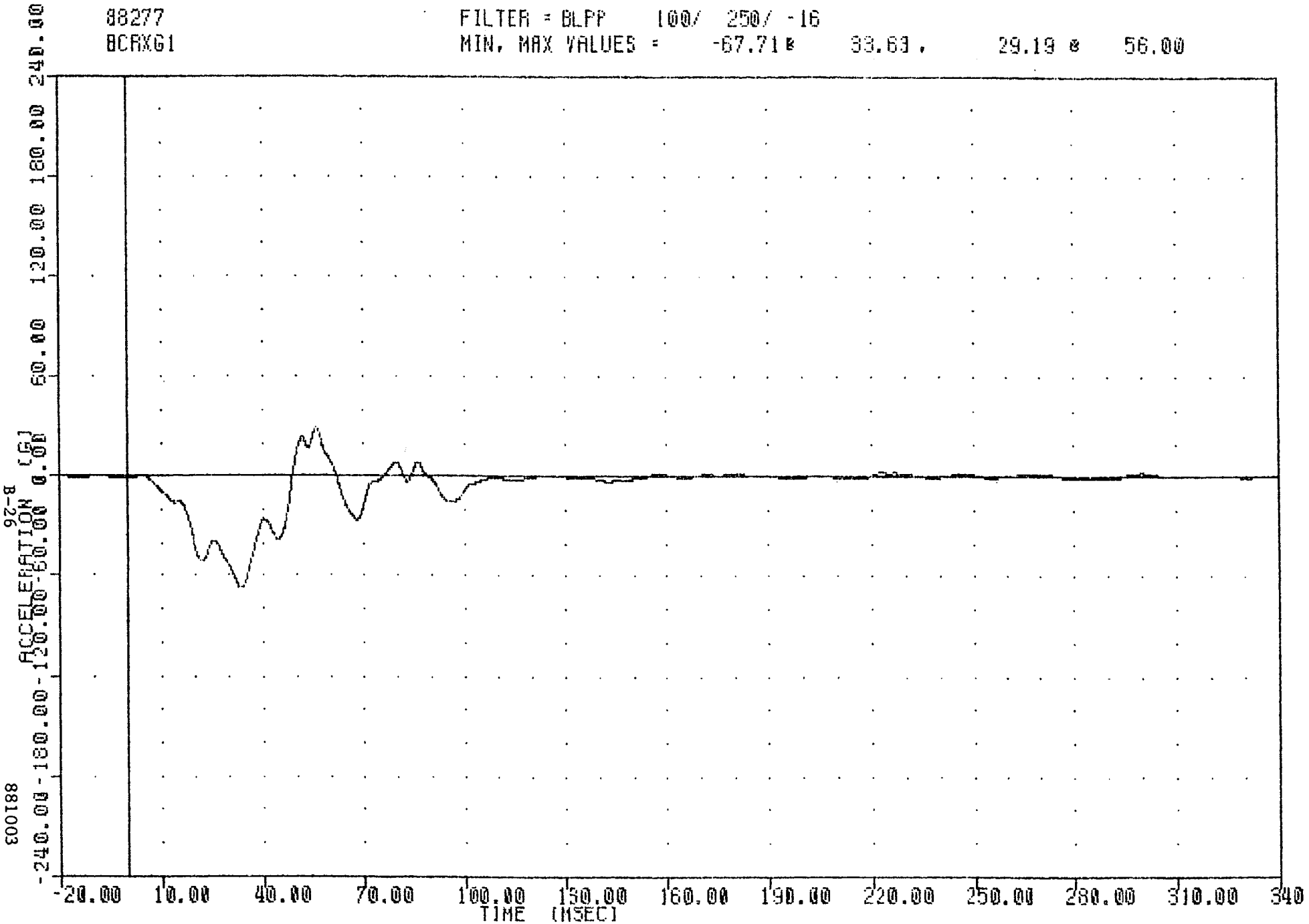


FORD TEMPO INTO FRONTAL BARRIER
ENGINE UPPER BLOCK X AXIS ACCELERATION



FORD TEMPO INTO FRONTAL BARRIER
ENGINE BOTTOM BLOCK X AXIS ACCELERATION

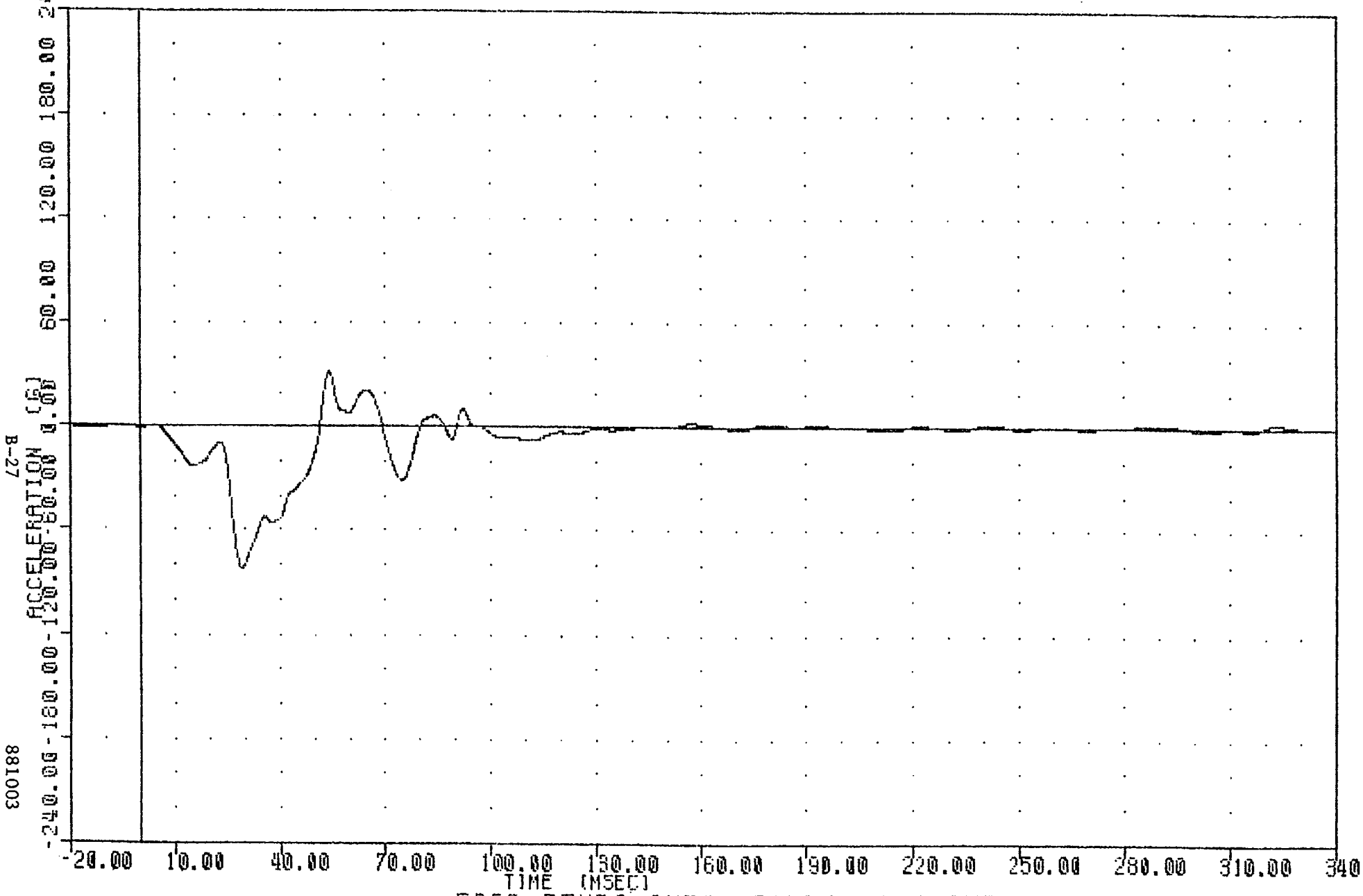
881003



FORD TEMPO INTO FRONTAL BARRIER
RIGHT BRAKE CALIPER X AXIS ACCELERATION

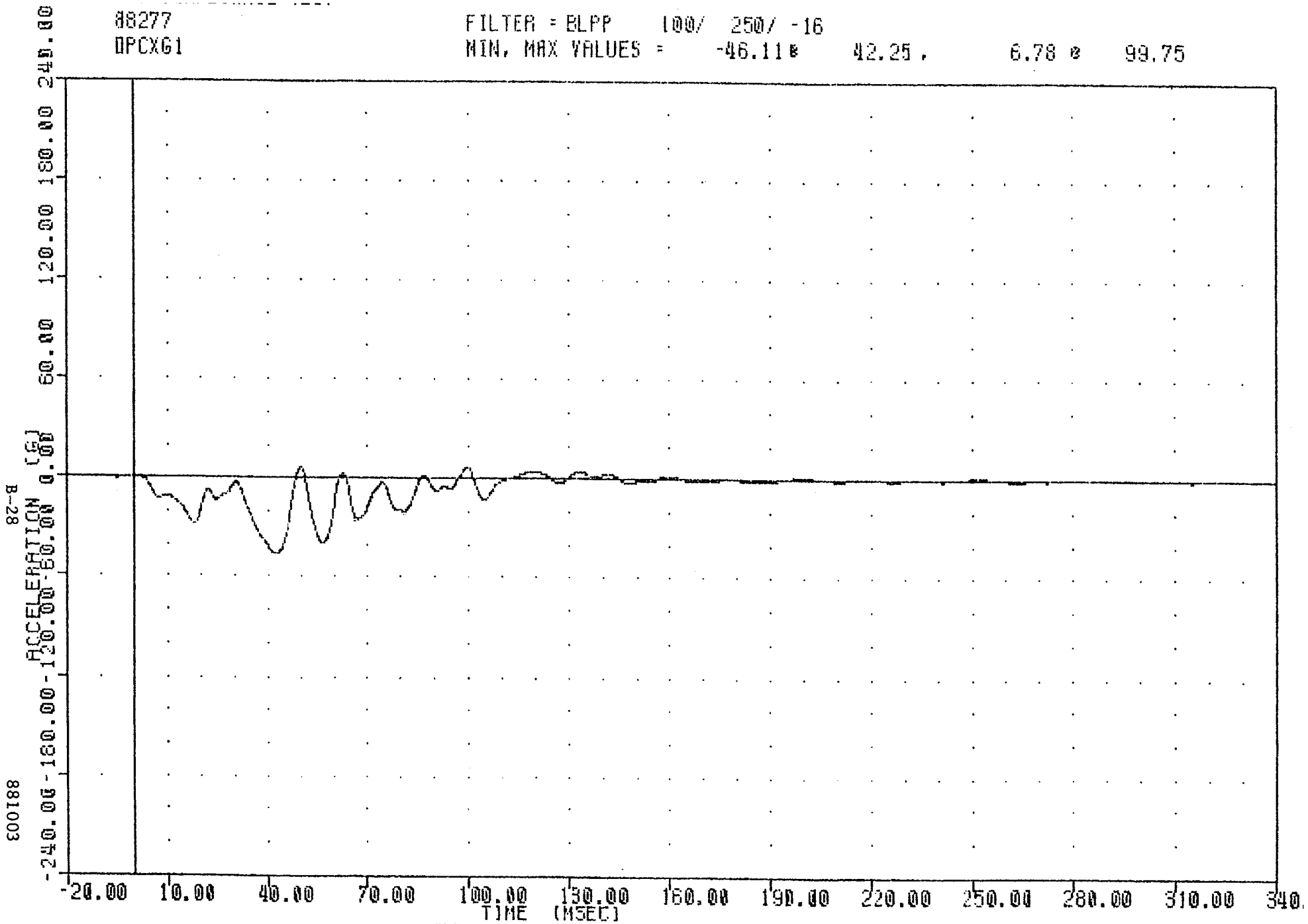
88277
BCLXG1

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -82.45 @ 29.25 , 31.74 @ 53.88



FORD TEMPO INTO FRONTAL BARRIER
LEFT BRAKE CALIPER X AXIS ACCELERATION

881003



FORD TEMPO INTO FRONTAL BARRIER
DASH PANEL CENTER X AXIS ACCELERATION