REPORT NO. TRC-90-N04

NEW CAR ASSESSMENT PROGRAM (NCAP)

FRONTAL BARRIER IMPACT TEST

MITSUBISHI MOTORS CORPORATION

1991 MITSUBISHI GALANT

4-DOOR SEDAN

NHTSA NO. MM5600

TRC TEST NO. 910117

PREPARED BY:

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FINAL REPORT

PREPARED FOR:

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15. Supplementary Notes

16. Abstract

A 35 mph frontal load cell barrier impact test was conducted on a 1991 Mitsubishi Galant 4-door sedan, NHTSA No. MM5600, at the Transportation Research Center of Ohio on January 17,1991. This test was conducted to obtain new car assessment and research data indicant of FMVSS No. 208 performance. The barrier impact velocity was 35.0 mph. The vehicle's maximum crush was 23.8 inches. The ambient temperature was 73° F.

The driver's head injury criteria (HIC) was 1024. The driver's maximum chest deceleration over three (3) milliseconds was 60.6 g. The driver's maximum left and right femur forces were 1243 pounds and 1395 pounds, respectively.

The passenger's head injury criteria (HIC) was 711. The passenger's maximum chest deceleration over three (3) milliseconds was 52.6 g. (See DATA ACQUISITION EXPLANATIONS). The passenger's maximum left and right femur forces were 906 pounds and 1232 pounds, respectively.

17. Key Words	18. Distribution Statement
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SECTION 1.0

PURPOSE AND TEST PROCEDURE

PURPOSE

This 35 mph frontal barrier impact test is part of the New Car Assessment Program (NCAP) conducted for the National Highway Traffic Safety Administration's (NHTSA) Office of Market Incentives by the Transportation Research Center of Ohio (TRC) under Contract No. DTNH22-90-D-22121.

The purpose of this test was to obtain new car assessment and research data for vehicle crashworthiness and occupant restraint system performance for the subject vehicle, a 1991 Mitsubishi Galant 4-door sedan, NHTSA No. MM5600, at an impact speed in excess of the current 30 mph FMVSS 208 requirements.

TEST PROCEDURE

This test was conducted in accordance with NHTSA's Laboratory Indicant Test Procedure, New Car Assessment Program, dated January 1, 1990. Data was obtained indicant of FMVSS 208, "Occupant Crash Protection" performance.

The test vehicle was instrumented with seven (7) accelerometers to measure longitudinal axis accelerations and two (2) accelerometers to measure vertical axis accelerations. The driver's and passenger's restraint systems were instrumented with four (4) seat belt load cells to measure lap belt tension and shoulder belt tension, two (2) string potentiometers to measure shoulder belt displacement, and two (2) linear potentiometers to measure shoulder belt stretch. The vehicle impacted a frontal load cell barrier instrumented with thirty-six (36) barrier face load cells. The vehicle's specified impact velocity range was 34.5 to 35.5 mph.

The test vehicle contained two (2) Part 572 B 50th percentile adult male anthropomorphic test devices (dummies). The dummies were positioned in the front outboard designated seating positions according to the dummy placement procedures specified in Appendices VII and VIII of the Laboratory Indicant Test Procedures.

Both dummies were instrumented with head and chest accelerometers to measure longitudinal, lateral, and vertical accelerations, and with left and right femur load cells to measure axial forces.

The sixty-nine (69) data channels were multiplexed and recorded on two (2) 14-track tape drives. The data was digitally sampled at 8000 samples per second and processed per section IP11 of the Laboratory Indicant Test Procedure.

The crash event was recorded by one (1) real-time panning motion picture camera and sixteen (16) high-speed motion picture cameras. The pre-test and post-test conditions were recorded by one (1) real-time motion picture camera.

The vehicle, occupant, and load cell barrier data are presented in Section 2.0. The vehicle, occupant, and camera measurements are presented in Section 3.0. Appendix A contains the still photographic prints. Appendix B contains the dummy, vehicle, and load cell barrier data plots. Appendix C contains the dummy certification data. Appendix D contains miscellaneous test information. Appendix E contains the restraint system instructions from the owner's manual.

SECTION 2.0

FRONTAL BARRIER IMPACT TEST SUMMARY

TEST RESULTS SUMMARY

This frontal load cell barrier test was conducted at TRC on January 17, 1991.

The test vehicle, a 1991 Mitsubishi Galant 4-door sedan, NHTSA No. MM5600, was equipped with a 2.0 liter transverse engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 3236 pounds. The vehicle's impact speed was 35.0 mph. The vehicle's maximum crush was 23.8 inches.

The driver's head injury criteria (HIC) was 1024. The driver's maximum chest resultant acceleration over three (3) milliseconds was 60.6 g. The driver's maximum left and right femur forces were 1243 pounds and 1395 pounds, respectively.

The passenger's HIC was 711. The passenger's maximum chest resultant acceleration over three (3) milliseconds was 52.6 g, (See DATA ACQUISITION EXPLANATIONS). The passenger's maximum left and right femur forces were 906 pounds and 1232 pounds, respectively.

No fluid spilled from the vehicle's fuel system following the crash test event.

The right front passenger's head Z-axis acceleration data channel, HEDZG2, recorded a questionable data spike at 27.0 milliseconds. The right front passenger's head resultant acceleration calculation, HEDRG2, was affected by this spike. The right front passenger's Head Injury Criteria, HIC, calculation was calculated excluding the first thirty milliseconds of data to eliminate this spike.

The right front passenger's chest Y-axis acceleration data channel, CSTYG2, recorded questionable data including large spikes at 18 and 126 milliseconds. The passenger's chest resultant acceleration calculation, CSTRG2, was affected by these spikes. The passenger's resultant chest acceleration over 3 milliseconds was calculated excluding the first 30 milliseconds of data to eliminate the largest spike.

The vehicle rear center Z-axis accelerometer, RDKZG, recorded data spikes from 95 to 210 milliseconds, possibly due to the rear vehicle towing attachment hardware impacting the vehicle's rear underbody. The vehicle rear center Z-axis velocity and displacement calculations, RDKZV and RDKZD, were affected by these data spikes.

TABLE 1 CRASH TEST SUMMARY

NHTSA NO.: MM5600 TEST TYPE: Frontal Load Cell Barrier

TEST DATE: 01/17/91 TEST TIME: 1424 AMBIENT TEMP. (°F): 73

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1991/Mitsubishi/Galant/4-door sedan

VEHICLE TEST WEIGHT (LBS): 3236

IMPACT ANGLE (DEG)*: 0

IMPACT VELOCITY (MPH)**: PRIMARY = 35.0 SECONDARY = 35.1

MAXIMUM STATIC CRUSH (IN): 23.8

AVERAGE REBOUND (IN): 33.9

DUMMIES:	Driver #826	Passenger #713
TYPE:	Part 572 B	Part 572 B
LOCATION:	Left front	Right front
RESTRAINT:	2-point passive belt & manual lap belt	2-point passive belt & manual lap belt

NUMBER OF DATA CHANNELS: 69

NUMBER OF CAMERAS: HIGH-SPEED 16 REAL-TIME 2

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

TABLE 2 TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Mitsubishi Motors Corporation

MAKE/MODEL: Mitsubishi Galant VIN: JA3CR46VXMZ011603

BODY STYLE: 4-door sedan MODEL YEAR: 1991

NHTSA NO.: MM5600 COLOR: White

ENGINE DATA: TYPE: Transverse CYLINDERS: 4 DISPLACEMENT: 2.0 liter

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

DATE VEHICLE RECEIVED: 12/19/90 ODOMETER READING: 104.0

DEALER'S NAME AND ADDRESS: Joseph Mitsubishi, Inc.
5190 Salem Avenue
Dayton, OH 45426

ACCESSORIES:

POWER STEERING	Yes	AUTOMATIC TRANSMISSION	Yes
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	No
POWER SEATS	No	TILTING STEERING WHEEL	Yes
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	Fog lights		
	Mud guards		

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

CERTIFICATION DATA FROM VEHICLE'S LABEL:

VEHICLE MANUFACTURED BY: Mitsubishi Motors Corporation

DATE OF MANUFACTURE: 08/90 VIN: JA3CR46VXMZ011603

GVWR: 3747 LBS

GAWR: FRONT: 1984 LBS., REAR: 1763 LBS.

TABLE 2 TEST VEHICLE INFORMATION CONT'D

TIRES ON VEHICLE (MFR., LINE, SIZE): Yokohama P185/75R14

TIRE PRESSURE WITH MAXIMUM CAPACITY VEHICLE LOAD: FRONT: 35 PSI
REAR: 35 PSI

SPARE TIRE (MFR., LINE, SIZE): Yokohama T125/70D15

TYPE OF SEATS: FRONT: Bucket
REAR: Bench

TYPE OF FRONT SEAT BACKS: Adjustable

MAXIMUM WIDTH: 66.2 INCHES

WHEELBASE: 102.2 INCHES

LOCATION OF LABEL STATING TIRE & CAPACITY DATA:

The label was located on the driver's door.

TIRE & CAPACITY DATA FROM VEHICLE'S LABEL:

RECOMMENDED TIRE SIZE: P185/70R14

RECOMMENDED COLD TIRE PRESSURE: FRONT: 29 PSI; REAR: 26 PSI

DESIGNATED SEATING CAPACITY: 2 FRONT 3 REAR 5 TOTAL

VEHICLE CAPACITY WEIGHT: 827 LBS.

TEST VEHICLE ATTITUDE (ALL MEASUREMENTS ARE IN INCHES):

DELIVERED ATTITUDE:	LF	27.2;	RF	27.2;	LR	26.8;	RR 26.9
PRE-TEST ATTITUDE:	LF	26.0;	RF	25.9;	LR	24.5;	RR 24.2
POST-TEST ATTITUDE:	LF	30.2;	RF	27.4;	LR	24.4;	RR 24.1

TABLE 2 TEST VEHICLE INFORMATION CONT'D

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

RIGHT FRONT	872 LBS.	RIGHT REAR	537 LBS.
LEFT FRONT	880 LBS.	LEFT REAR	549 LBS.
TOTAL FRONT WEIGHT	1752 LBS.	(61.7% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1086 LBS.	(38.3% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT	2838 LBS.		

CALCULATION OF TEST VEHICLE'S TARGET TEST WEIGHT:

RCLW = RATED CARGO AND LUGGAGE WEIGHT*

UDW = UNLOADED DELIVERED WEIGHT (2838 LBS)

VCW = VEHICLE CAPACITY WEIGHT (827 LBS)

DSC = DESIGNATED SEATING CAPACITY (5)

RCLW*= VCW - 150 (DSC) = 827 - 150(5) = 77

TARGET TEST WEIGHT = UDW + RCLW* + (NO. OF HYBRID II DUMMIES X 164 LBS/DUMMY)

TARGET TEST WEIGHT = 2838 + 77 + 328

TARGET TEST WEIGHT = 3243 LBS

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 70 LBS. OF CARGO WEIGHT:

RIGHT FRONT	949 LBS.	RIGHT REAR	681 LBS.
LEFT FRONT	950 LBS.	LEFT REAR	656 LBS.
TOTAL FRONT WEIGHT	1899 LBS.	(58.7% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1337 LBS.	(41.3% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	3236 LBS.	(0.2% UNDER TARGET TEST WEIGHT)	

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

COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: Rear bumper, muffler, taillights, rear interior trim, rear door glasses, and trunk lid.

CG = 42.2 INCHES REARWARD OF FRONT WHEEL CENTERLINE

*Cargo weight for multi-purpose passenger vehicles, trucks, and buses is the vehicle's rated cargo and luggage weight from the vehicle's label or 300 pounds, whichever is less.

TABLE 3 POST-IMPACT DATA

TEST NUMBER: 910117 NHTSA NO.: MM5600

TEST DATE: 01/17/91 TEST TIME: 1424

TEST TYPE: Frontal load cell barrier IMPACT ANGLE: 0°

AMBIENT TEMPERATURE AT IMPACT AREA: 73° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 68° F

IMPACT VELOCITY: PRIMARY = 35.0 MPH SECONDARY = 35.1 MPH

(SPECIFIED RANGE = 34.5 TO 35.5 MPH)

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

EXITING VELOCITY TRAP = 2.0 IN.

TEST VEHICLE STATIC CRUSH (ALL MEASUREMENTS ARE IN INCHES):

OVERALL LENGTH OF TEST VEHICLE: PRE-TEST: L 177.0; C 184.0; R 177.2

POST-TEST: L 155.0; C 160.2; R 155.2

TOTAL CRUSH: L 22.0; C 23.8; R 22.0

AVERAGE CRUSH: 22.6

TEST VEHICLE REBOUND FROM FLAT BARRIER (ALL MEASUREMENTS ARE IN INCHES):

DISTANCE FROM TEST VEHICLE TO BARRIER: L 36.2; C 30.6; R 34.8; AVG. 33.9

TABLE 4 FUEL SYSTEM DATA

MAKE/MODEL: Mitsubishi Galant NHTSA NO.: MM5600

FUEL SYSTEM CAPACITY: 15.9 GALLONS (FROM OWNER'S MANUAL)

USABLE CAPACITY: 15.9 GALLONS (FURNISHED BY COTR)

TEST VOLUME RANGE: 14.6 GALLONS TO 14.9 GALLONS (92-94% OF USABLE)

ACTUAL TEST VOLUME: 14.8 GALLONS (WITH ENTIRE FUEL SYSTEM FILLED)

TEST FLUID TYPE: STODDARD SOLVENT

SPECIFIC GRAVITY: 0.764

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

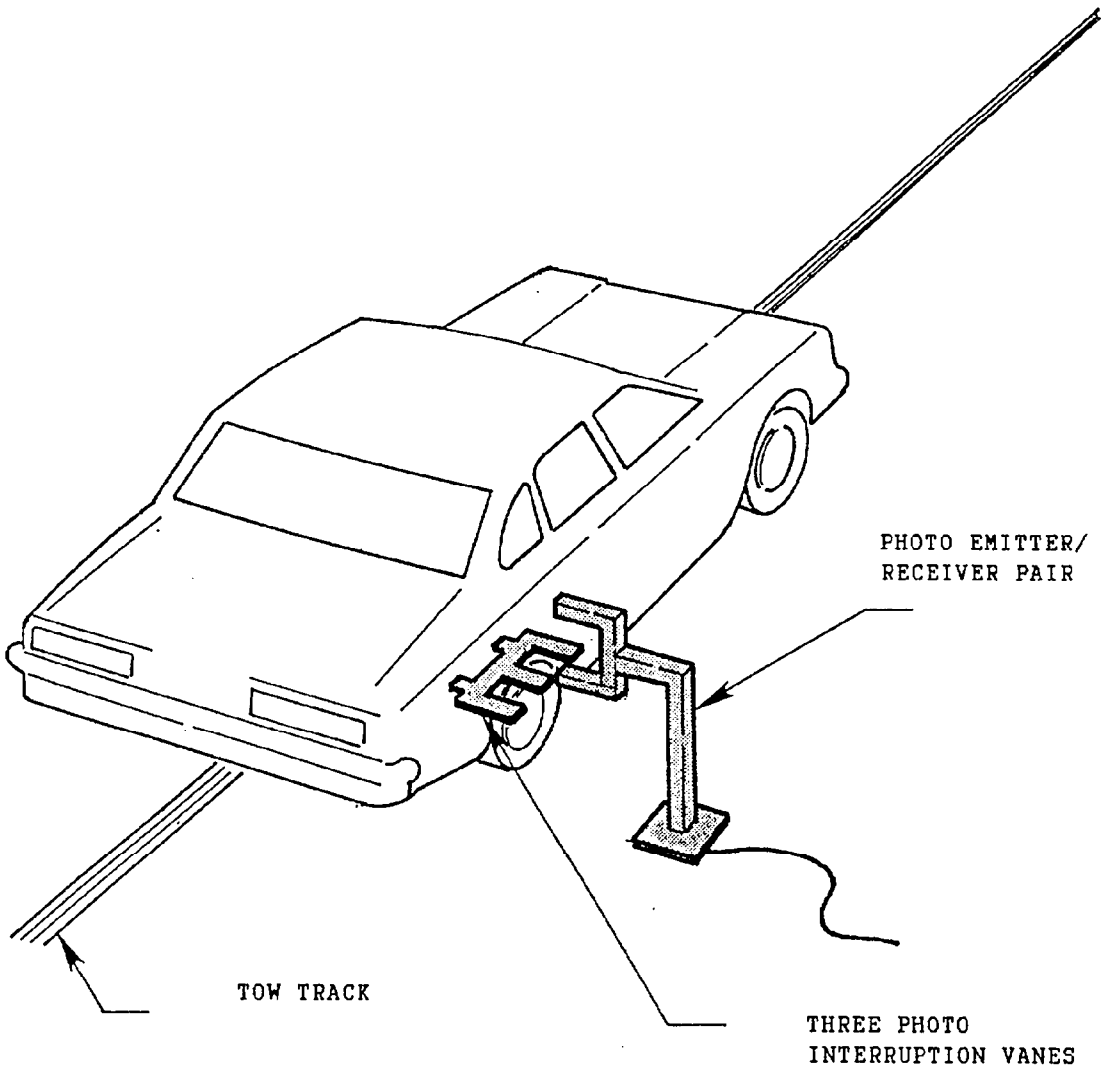
TEST FLUID COLOR: PURPLE

DETAILS OF FUEL SYSTEM: The fuel tank was located in front of the rear axle. The fuel filler neck was located on the left side. The fuel lines run along the left frame rail to the front.

ELECTRIC FUEL PUMP: Yes FUEL INJECTION: Yes

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

FIGURE 1 IMPACT VELOCITY MEASUREMENT SYSTEM



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

The vanes have one foot spacing.

FIGURE 2 ACCIDENT INVESTIGATION DIVISION DATA
FOR 35 MPH FRONTAL BARRIER IMPACT

VEHICLE MAKE/MODEL/BODY STYLE: Mitsubishi/Galant/4-door sedan

VEHICLE NHTSA NO.: MM5600 ; VIN: JA3CR46VXMZ011603

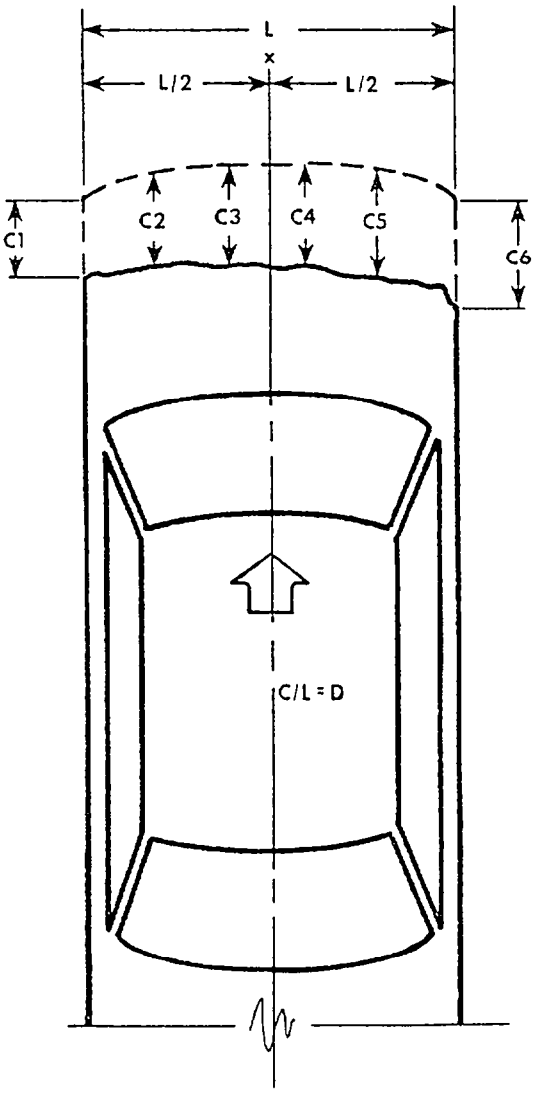
MODEL YEAR: 1991 ; BUILD DATE: 08/90 ; TEST DATE: 01/17/91

VEHICLE SIZE CATEGORY: Compact ; TEST WEIGHT: 3236 LBS.

VEHICLE WHEELBASE: 102.2 INCHES

MAXIMUM WIDTH: 66.2 INCHES

FRONT OVERHANG: 38.4 INCHES



COLLISION DEFORMATION
CLASSIFICATION (CDC) CODE: 12FDEW3

CRUSH DEPTH MEASUREMENTS:

C1 = 22.0 INCHES

C2 = 23.2 INCHES

C3 = 23.3 INCHES

C4 = 23.3 INCHES

C5 = 22.4 INCHES

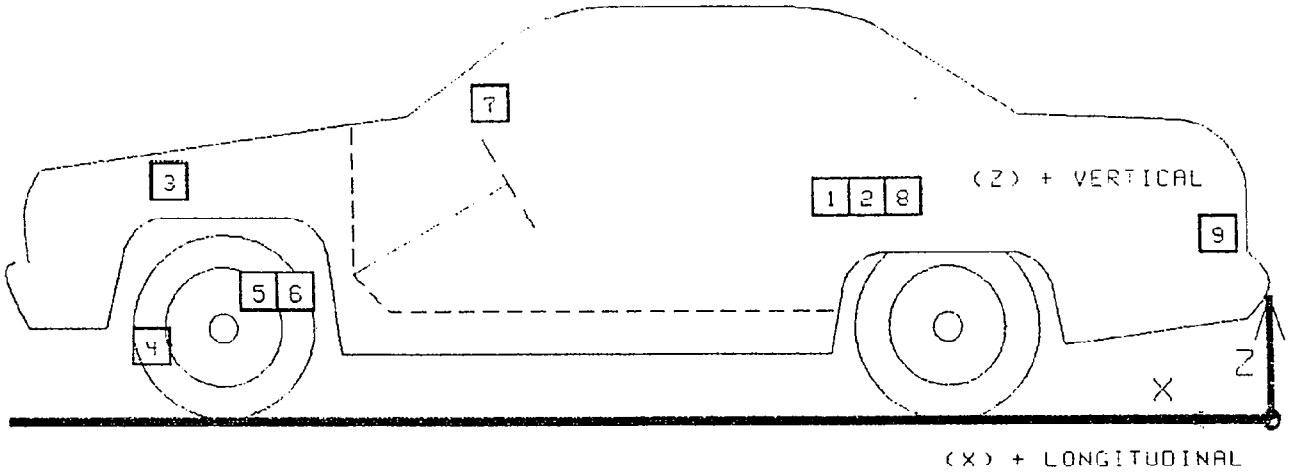
C6 = 22.0 INCHES

MIDPOINT OF DAMAGE: D = VEHICLE CENTERLINE (LONGITUDINAL)

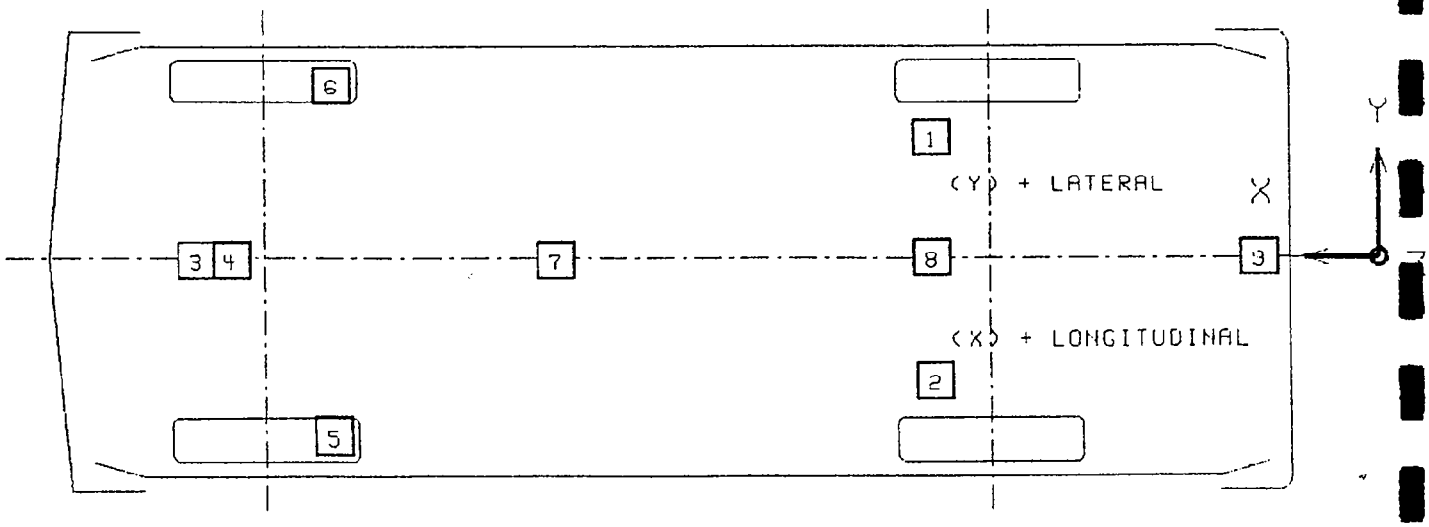
LENGTH OF DAMAGED REGION: L = 63.0 INCHES

FIGURE 3

VEHICLE ACCELEROMETER PLACEMENT



SIDE VIEW



BOTTOM VIEW

TABLE 5

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 910117

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
1	LEFT REAR SEAT CROSSMEMBER	116.1	13.9	16.2				
	LONGITUDINAL				5.8	138.9	42.2	65.8
2	RIGHT REAR SEAT CROSSMEMBER	116.2	-14.2	16.2				
	LONGITUDINAL				4.7	135.3	41.7	45.8
3	ENGINE TOP	27.0	4.5	30.6				
	LONGITUDINAL				35.2	45.4	117.2	33.5
4	ENGINE BOTTOM	31.8	10.2	6.6				
	LONGITUDINAL				58.8	40.8	145.7	29.3
5	RIGHT BRAKE CALIPER	35.0	-24.7	11.5				
	LONGITUDINAL				35.7	65.0	108.6	39.1
6	LEFT BRAKE CALIPER	35.2	25.1	11.5				
	LONGITUDINAL				45.7	58.5	103.3	43.1
7	INSTRUMENT PANEL CENTER	63.5	1.0	32.5				
	LONGITUDINAL				5.1	28.1	47.3	61.1
8	REAR SEAT CROSSMEMBER CENTER	116.2	0.0	16.1				
	VERTICAL				14.9	40.8	19.6	46.9
9	VEHICLE REAR CENTER	174.2	-1.0	15.9				
	VERTICAL				14.0	109.4 γ	44.7	104.0 γ

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES. X-AXIS LOCATIONS ARE MEASURED REARWARD FROM THE FRONT BUMPER.

REFERENCE: X: + FORWARD ACCELERATION
Y: + LEFT FROM VEHICLE CENTERLINE
Z: + UP FROM GROUND LEVEL

γ See DATA ACQUISITION EXPLANATIONS

TABLE 6 POST-IMPACT DUMMY/VEHICLE DATA

VISIBLE DUMMY CONTACT POINTS:

	DRIVER #826	PASSENGER #713
HEAD	Upper steering wheel rim & hub	Chest
CHEST	Lower steering wheel rim	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	None
REAR	NA	NA

GLAZING DAMAGE:

The entire windshield was cracked upon impact.

OTHER NOTABLE IMPACT EFFECTS:

None

TABLE 7 FMVSS 208 DATA SUMMARY

VEH. YR./MAKE/MODEL/BODY STYLE: 1991/Mitsubishi/Galant/4-door sedan

VEH. NHTSA NO.: MM5600 ; TEST DATE: 01/17/91

MAXIMUM ACCELERATIONS (G):	DRIVER DUMMY #826	PASSENGER DUMMY #713
HEAD X-AXIS	189.0	-26.4
HEAD Y-AXIS	14.0	-14.3
HEAD Z-AXIS	-65.6	-67.1γ
HEAD RESULTANT	197.9	68.6γ
CHEST X-AXIS	-60.9	-54.1
CHEST Y-AXIS	-16.5	28.0γ
CHEST Z-AXIS	7.6	10.4
CHEST RESULTANT*	60.6	52.6γ
CHEST RESULTANT TIME INTERVAL (SEC.)*	.003	.003
HEAD INJURY CRITERIA (HIC) VALUES:		
HIC**	1024	711 γ
HIC STARTING TIME (SEC.)	0.070	0.073
HIC ENDING TIME (SEC.)	0.106	0.109
AVG. HEAD RESULTANT ACCEL. DURING HIC TIME INTERVAL (G)	60.4	52.2γ
MAXIMUM CHEST DEFLECTIONS (IN):		
CHEST X-AXIS	NA	NA
MAXIMUM CHEST DEFLECTION TIME (SEC.)	NA	NA
MAXIMUM FEMUR FORCES (LBS):		
LEFT FEMUR	-1243	-906
RIGHT FEMUR	-1395	-1232
MAXIMUM SEAT BELT FORCES (LBS):		
LAP BELT	724	666
SHOULDER BELT	1932	2021

NOTE: ALL VALUES LISTED MUST BE OCCURRING DURING PRIMARY IMPACT EVENT. (HEAD ACCELERATIONS LISTED MUST BE DURING HIC TIME INTERVAL.)

*0.003 SEC. MINIMUM DURATION.

**THE MAXIMUM HIC TIME INTERVAL IS 36 MILLISECONDS.

γ See DATA ACQUISITION EXPLANATIONS

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 rotated forward impacting into the upper steering wheel rim and hub. The dummy's chest impacted the lower steering wheel rim as the dummy's torso was restrained by the two-point passive belt and manual lap belt. The dummy's head rotated rearward into the head restraint as the dummy rebounded into the seat back. The dummy came to rest seated in the driver's seat, restrained by the two-point passive belt and manual lap 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 dummy's head rotated forward, contacting the dummy's chest, as the dummy's torso was restrained by the two-point passive belt and manual lap belt. The dummy's head rotated rearward into the head restraint as the dummy rebounded into the seat back. The dummy came to rest seated in the right front passenger's seat, restrained by the two-point passive belt and manual lap belt.

TABLE 8 SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

	DRIVER	PASSENGER
BELT LENGTH DATA:		
BELT LENGTH FROM TRIM PANEL EXIT TO BOLT HOLE ANCHOR POINT FOR CONTINUOUS WEBBING SYSTEMS.	49.5	53.8
SHOULDER BELT LENGTH AS MEASURED ON PART 572 DUMMY.	39.5	40.4
LAP BELT LENGTH AS MEASURED ON PART 572 DUMMY.	35.2	36.5
SHOULDER BELT SPOOL-OFF LENGTH:		
AS DETERMINED BY FILM ANALYSIS	2.5	3.2
AS DETERMINED MECHANICALLY	4.0	5.1
AS DETERMINED ELECTRONICALLY	3.8	4.6
BELT STRETCH LENGTH (IN/FT):		
AS MEASURED MECHANICALLY	NA*	0.29
AS MEASURED ELECTRONICALLY	0.80	1.28
RETRACTOR LOCK-UP TIME (MS):		
AS DETERMINED BY SHOULDER BELT SPOOL-OFF	76	84

ALL MEASUREMENTS ARE IN INCHES UNLESS OTHERWISE NOTED.

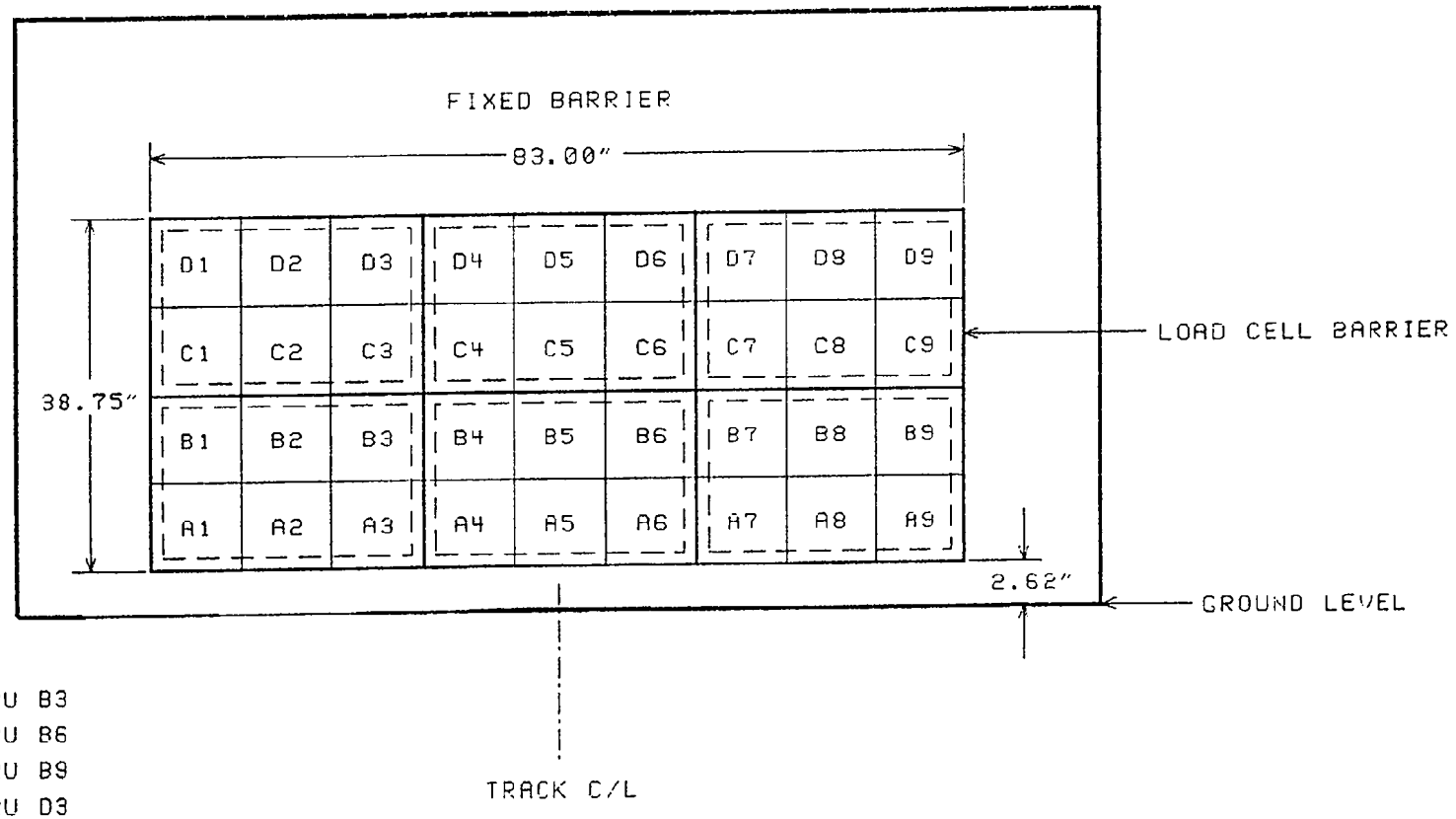
*THE STRING SEWN INTO THE DRIVER'S SEAT BELT TO MEASURE SEAT BELT STRETCH BROKE UPON IMPACT.

FIGURE 4

LOAD CELL BARRIER CONFIGURATION

FRONT VIEW

36 LOAD CELLS
4 ROWS
9 COLUMNS



GROUP 1: A1 THRU B3
GROUP 2: A4 THRU B6
GROUP 3: A7 THRU B9
GROUP 4: C1 THRU D3
GROUP 5: C4 THRU D6
GROUP 6: C7 THRU D9

TABLE 9

LOAD CELL BARRIER DATA SUMMARY

TEST NUMBER 910117

LOCATION	POSITIVE DIRECTION LB	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION LB	NEGATIVE DIRECTION MSEC
TOTAL GROUP 1	384	208.3	33039	29.9
TOTAL GROUP 2	388	207.6	46399	32.3
TOTAL GROUP 3	203	250.4	20134	11.6
TOTAL GROUP 4	383	6.4	5482	28.5
TOTAL GROUP 5	401	5.1	10697	60.6
TOTAL GROUP 6	298	207.0	6497	61.6
TOTAL LOAD CELL FORCE	1786	207.4	105989	30.8

TENSION IS POSITIVE
COMPRESSION IS NEGATIVE

SECTION 3.0

VEHICLE, OCCUPANT, AND CAMERA MEASUREMENTS

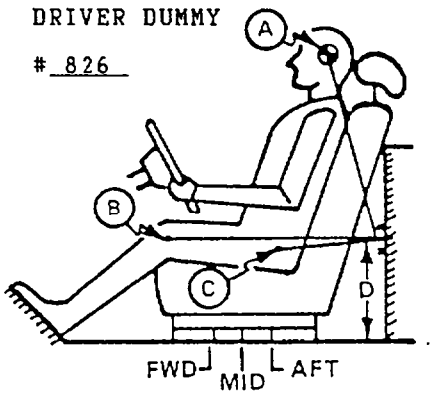
FIGURE 5 DUMMY AND SEAT POSITIONING DATA

TEST NO.: 910117 ; VEHICLE: 1991 Mitsubishi Galant

SEAT TYPE:	ADJUSTER TYPE:	FRONT SEAT BACK TYPE:
_____ BENCH	__X__ MANUAL	_____ NON-ADJUSTABLE
__X__ BUCKET	_____ POWER	__X__ ADJUSTABLE RECLINING
_____ SPLIT BENCH		

DRIVER DUMMY

826

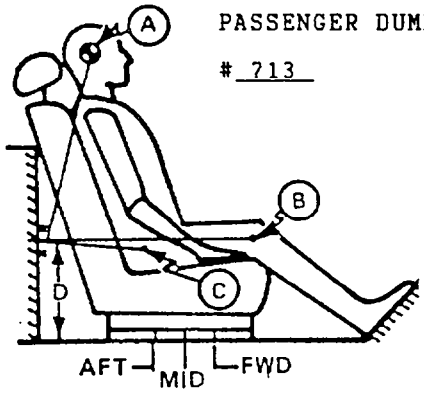


MEASUREMENT LOCATION

A - HEAD TARGET
B - KNEE JOINT
C - APPROXIMATE 'H' POINT
D - SILL TO DOOR STRIKER REFERENCE POINT

PASSENGER DUMMY

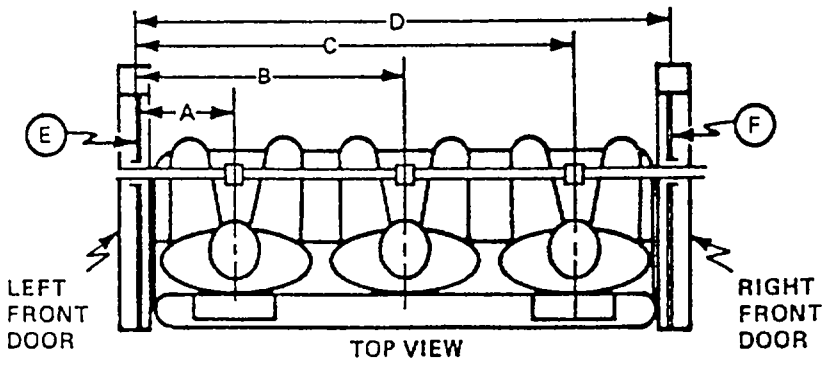
713



A =	21.8 IN.	2 DEGREES	A =	21.9 IN.	2 DEGREES
B =	24.5 IN.	91 DEGREES	B =	23.5 IN.	92 DEGREES
C =	8.6 IN.	107 DEGREES	C =	8.8 IN.	115 DEGREES
D =	11.0 IN.		D =	11.0 IN.	

SEAT TRACK REARWARD: 10 NOTCHES

SEAT TRACK REARWARD: 12 NOTCHES

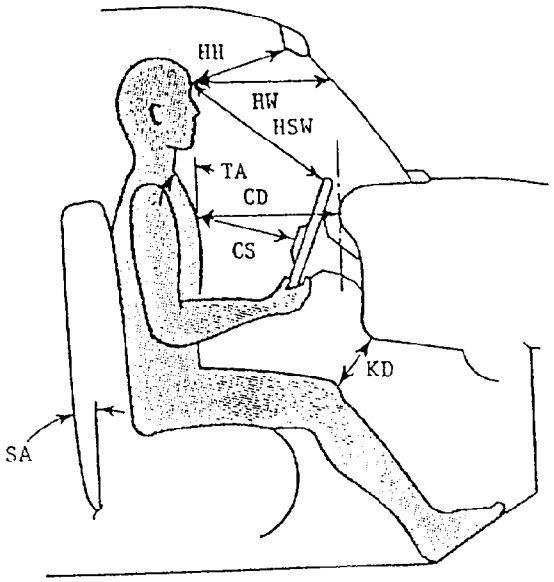


A = LEFT DOOR TO DRIVER CENTERLINE	12.3	IN.
B = LEFT DOOR TO CENTER PASSENGER CENTERLINE	NA	IN.
C = LEFT DOOR TO RIGHT PASSENGER CENTELRINE	41.0	IN.
D = LEFT DOOR TO RIGHT DOOR	52.5	IN.
E,F = WINDOW GLASS HEIGHT (RIGHT AND LEFT MUST BE EQUAL)	10.5	IN.

ALL ANGLES ARE RELATIVE TO VERTICAL PLANE THROUGH DOOR STRIKER.

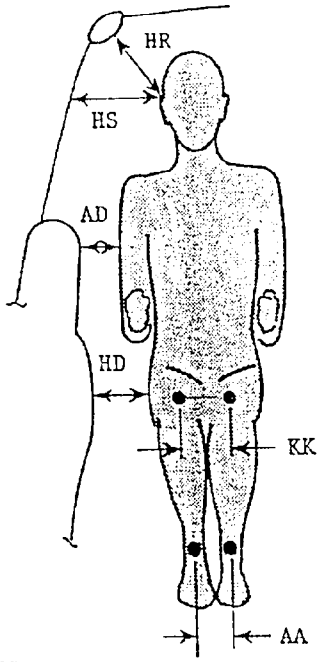
FIGURE 6 DUMMY IN-VEHICLE POSITIONING DATA

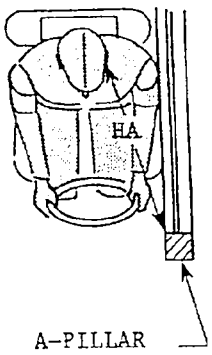
	DRIVER	PASSENGER
HH	13.7	11.6
HW	18.5	16.7
CD	22.0	21.1
CS	15.4	NA
KDL	3.9	4.0
KDR	4.4	3.5
TA	24°	24°
SA	21°	21°
HSW	20.2	NA



	DRIVER	PASSENGER
HR	6.1	4.9
HS	9.4	8.9
AD	4.1	3.9
HD	5.5	5.8
KK	9.8	8.1
AA	11.0	7.0
HA	20.8	18.4

KNEE OUTER BOLT HEAD TO OUTER BOLT HEAD SPACING:
DRIVER = 14.5
PASSENGER = 11.8



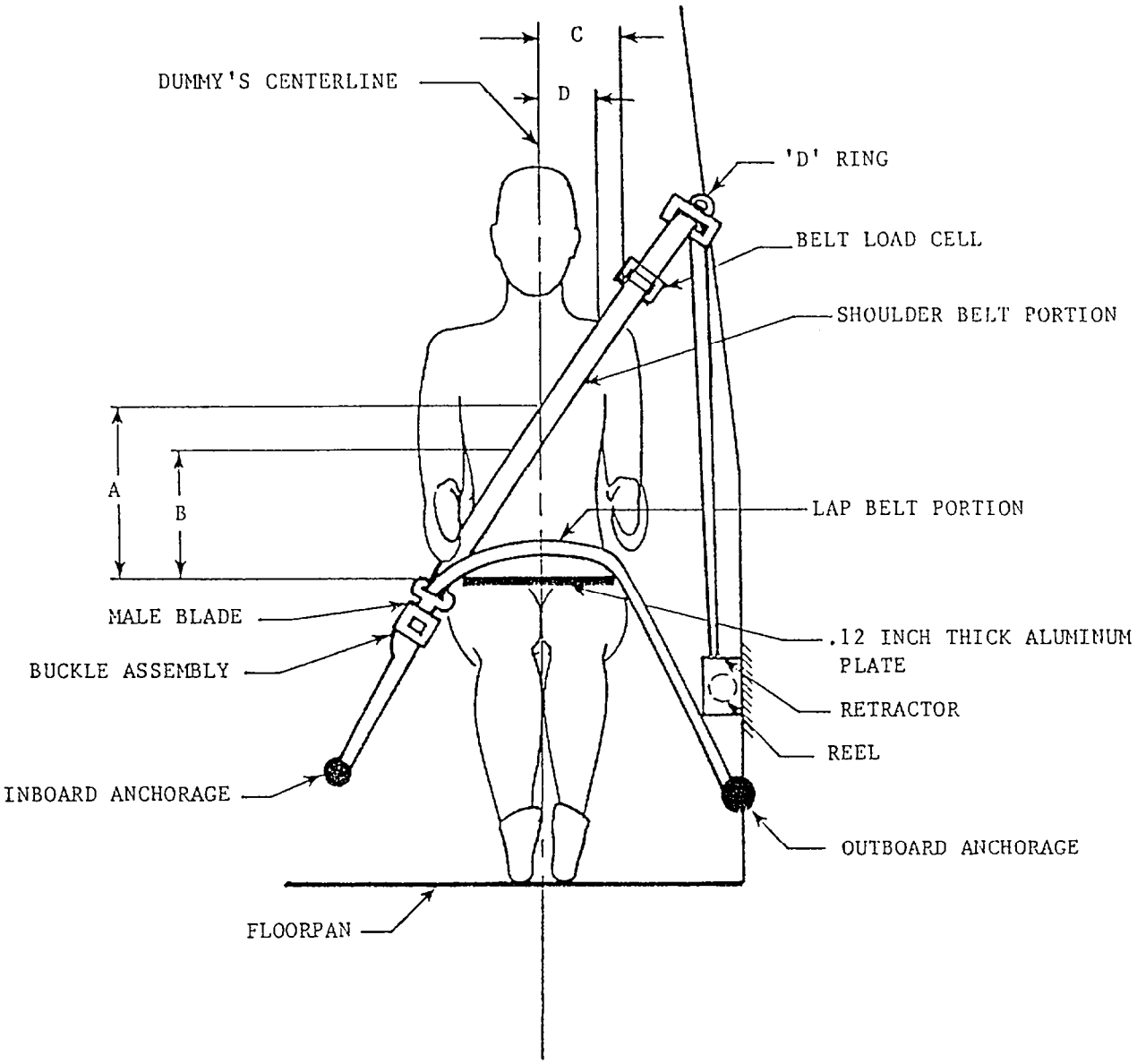


HH = HEAD TO WINDSHIELD HEADER
HW = HEAD TO WINDSHIELD
CD = CHEST TO DASH
CS = CHEST TO STEERING WHEEL
KD = KNEE TO DASH
TA = TORSO ANGLE
SA = SEAT BACK ANGLE
HSW= HEAD TO STEERING WHEEL

HR = HEAD C.G. TARGET TO SIDE ROOF HEADER
HS = HEAD C.G. TARGET TO SIDE WINDOW
AD = ARM TO DOOR
HD = HIP TO DOOR
KK = KNEE TO KNEE
AA = ANKLE TO ANKLE
HA = HEAD C.G. TARGET TO A-PILLAR

TORSO AND SEAT BACK ANGLES ARE RELATIVE TO VERTICAL.
ALL DISTANCE MEASUREMENTS ARE IN INCHES.

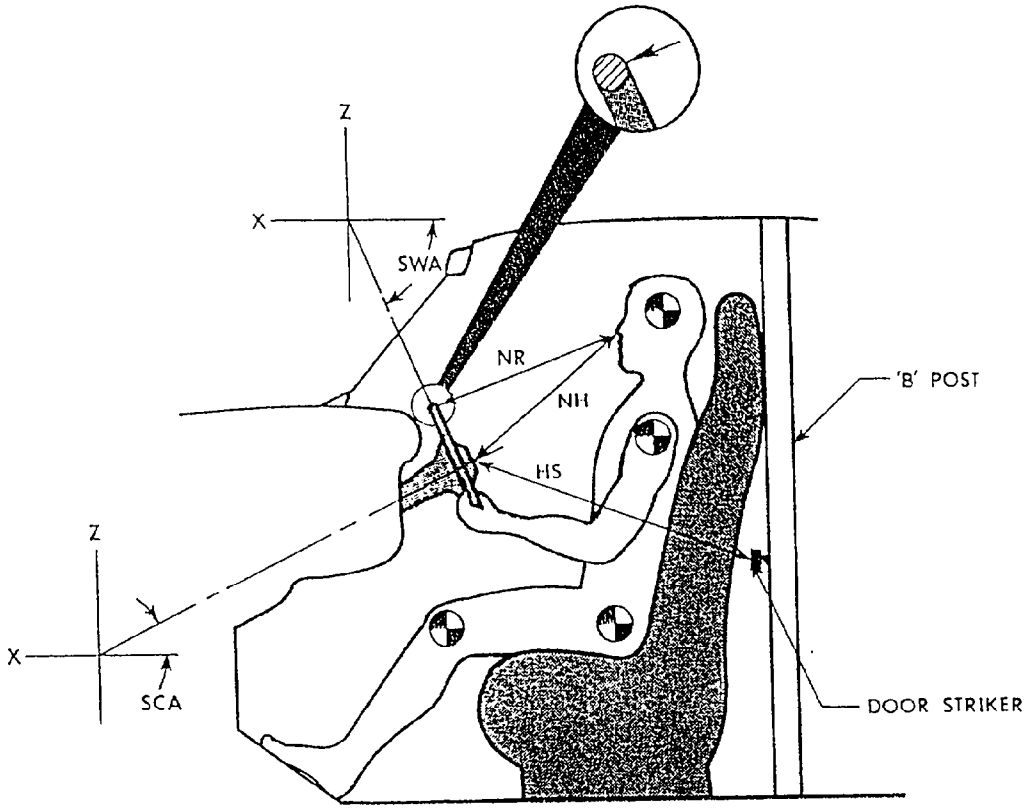
FIGURE 7 SEAT BELT POSITIONING DATA



	DRIVER DUMMY	PASSENGER DUMMY
A - TOP SURFACE OF ALUMINUM PLATE TO BELT UPPER EDGE	14.1	13.8
B - TOP SURFACE OF ALUMINUM PLATE TO BELT LOWER EDGE	11.0	10.5
C - DUMMY CENTERLINE TO OUTER EDGE OF BELT AT CHEST FLESH TOP	6.2	6.0
D - DUMMY CENTERLINE TO INNER EDGE OF BELT AT CHEST FLESH TOP	4.0	3.8

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

FIGURE 8 DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSEMBLY DATA



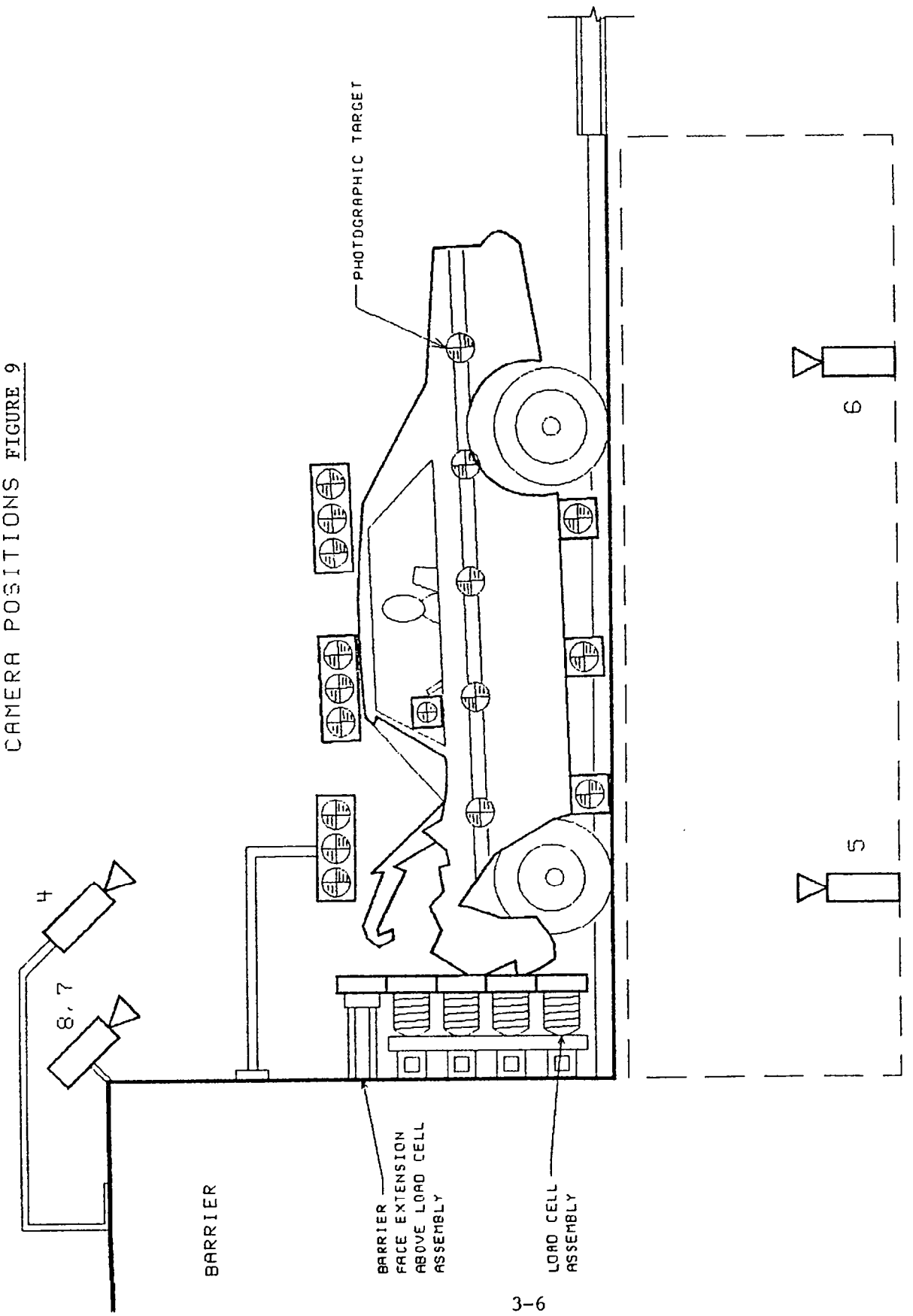
POSITION OF STEERING COLUMN TILTING AND TELESCOPING ADJUSTMENTS, IF ANY:

The steering column was latched at the midpoint of the infinitely-adjustable tilt range.

	MEASUREMENTS
NR - DISTANCE FROM TIP OF DUMMY'S NOSE TO TOP REAR SURFACE OF STEERING WHEEL RIM.	18.0
NH - DISTANCE FROM TIP OF DUMMY'S NOSE TO CENTER OF STEERING COLUMN HUB.	19.2
HS - DISTANCE FROM CENTER OF STEERING COLUMN HUB TO THE FORWARD SURFACE OF THE DOOR LOCK STRIKER PIN.	22.0
SCA - ANGLE OF STEERING COLUMN RELATIVE TO THE HORIZONTAL X AXIS	24.4°
SWA - ANGLE OF STEERING WHEEL RELATIVE TO THE HORIZONTAL X AXIS	65.6°

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

CAMERA POSITIONS FIGURE 9



CAMERA POSITIONS, CONTINUED FIGURE 9

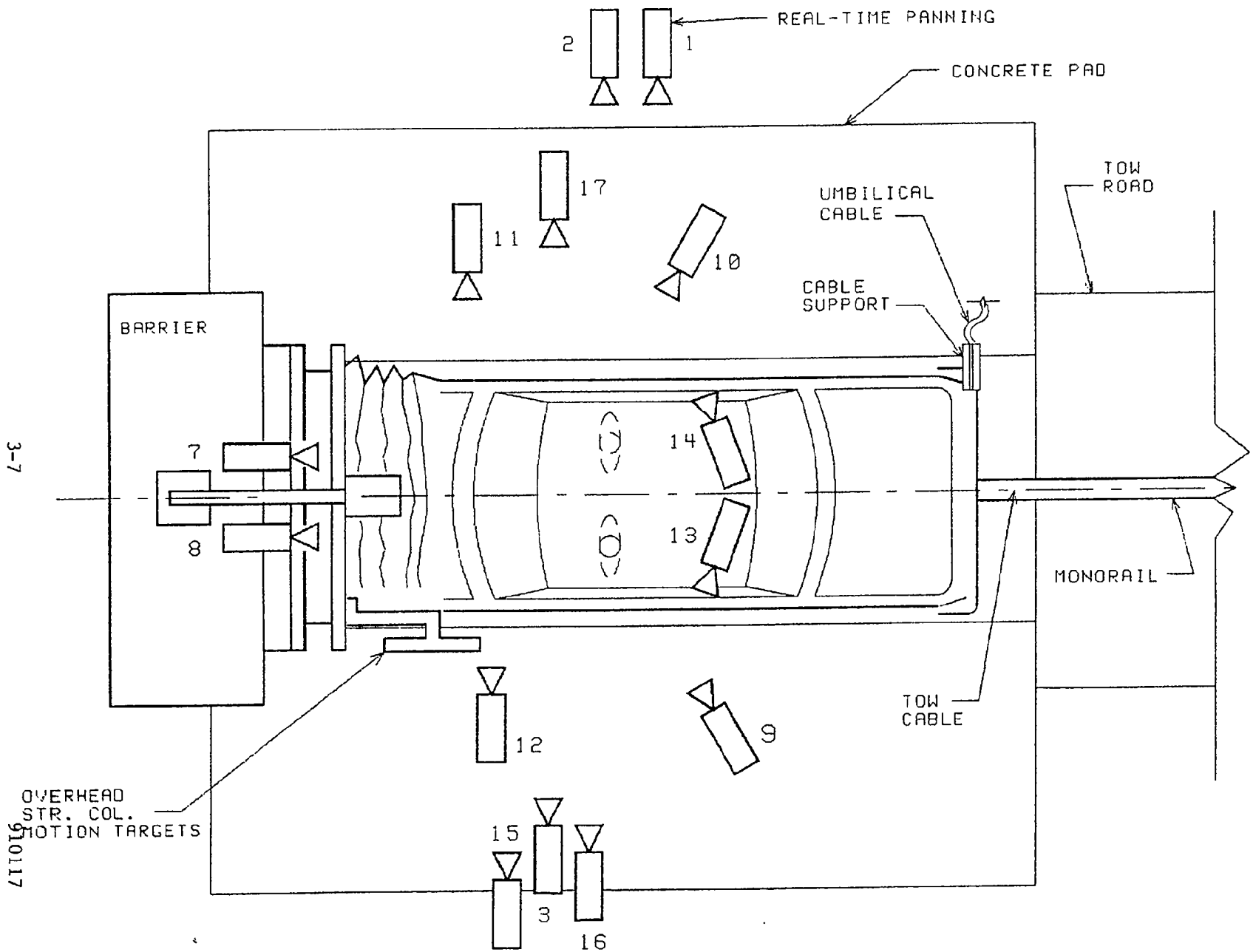


TABLE 10 MOTION PICTURE CAMERA LOCATIONS

TEST NO.: 910117 VEHICLE: 1991 Mitsubishi Galant 4-door sedan

CAMERA NO.	VIEW	CAMERA POSITIONS (IN)* X	Y	Z	ANGLE** (DEG)	FILM PLANE TO HEAD TARGET (IN)	LENS (MM)	FILM SPEED (FPS)
1	Real-time panning	-142.0	-504.0	61.0	NA	NA	16	24
2	Right side	-81.3	-266.4	37.1	-2	NA	13	490
3	Left side	-41.5	295.0	44.0	-12	224.0	25	500
4	Overhead	-36.4	0.0	98.0	-40	NA	8.5	502
5	Pit - engine	-50.5	0.0	-92.4	90	NA	13	1000
6	Pit - fuel tank	-99.3	0.0	-99.0	90	NA	13	1000
7	Front - passenger	-4.5	-13.8	85.0	-40	NA	17	592
8	Front - driver	-6.8	14.5	85.0	-41	NA	17	498
9	Left side - driver	-180.0	73.0	102.0	-27	93.0	25	498
10	Right side - passenger	-184.0	-74.0	100.0	-26	81.0	25	500
11	Right side - A-pillar	-38.1	-306.1	44.0	0	NA	50	500
12	Left side - A-pillar	-53.0	309.4	42.3	0	NA	50	500
13	Onboard - left side	NA	NA	NA	NA	NA	13	500
14	Onboard - right side	NA	NA	NA	NA	NA	13	498
15	Left side - steering column	-100.0	286.0	103.0	-14	NA	25	498
16	Left side - steering column	-100.0	286.0	75.1	-9	NA	25	500
17	Right side - passenger	-38.8	-210.8	45.3	7	250.0	25	492

*+X = Film plane forward of barrier face

+Y = Film plane to left of monorail centerline

+Z = Film plane above ground level

**+Angle = Film plane angled upward from horizontal plane

FIGURE 10

VEHICLE TARGET LOCATIONS

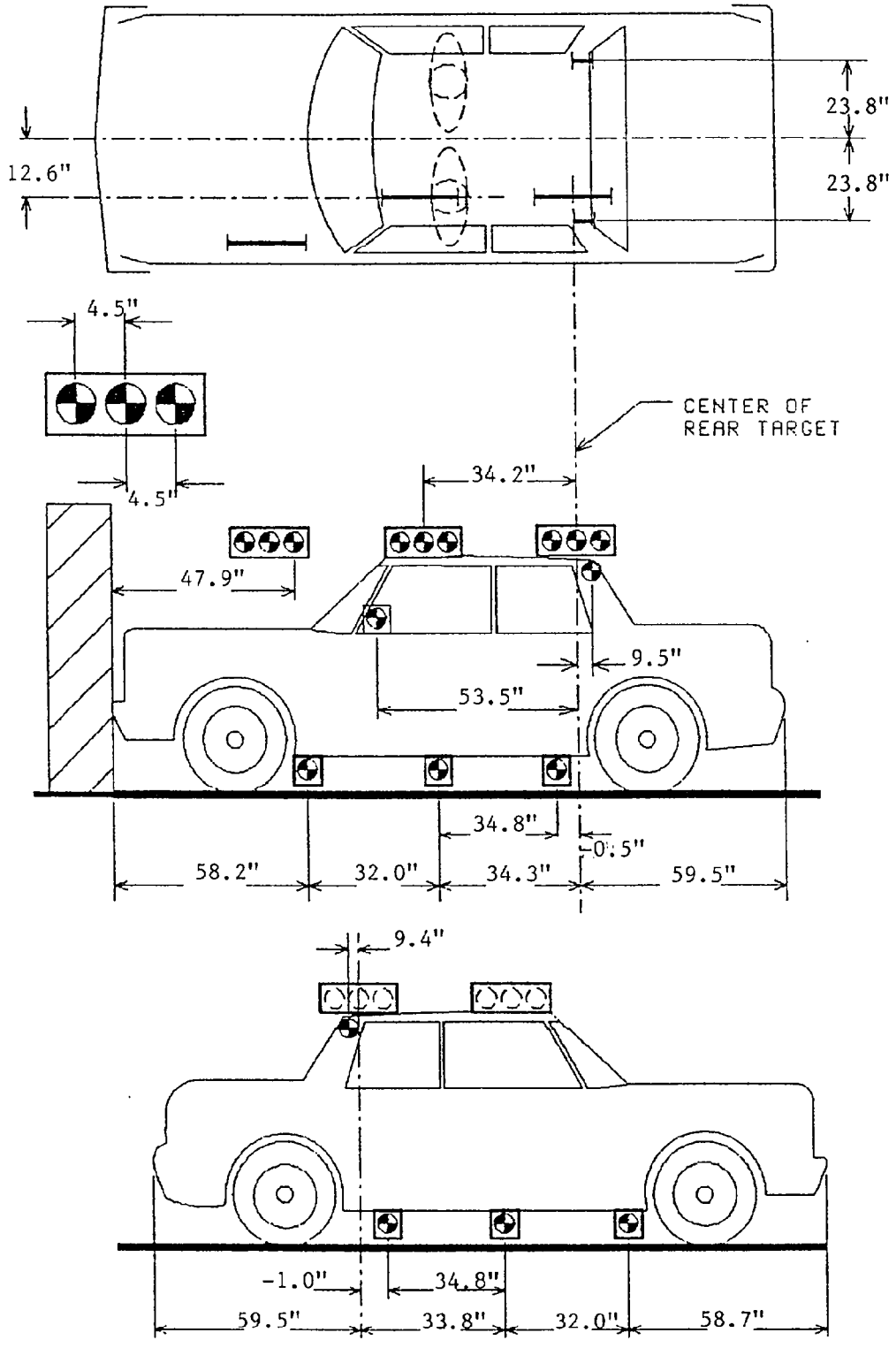


FIGURE 11

PRE-TEST AND POST-TEST MEASUREMENT POINTS

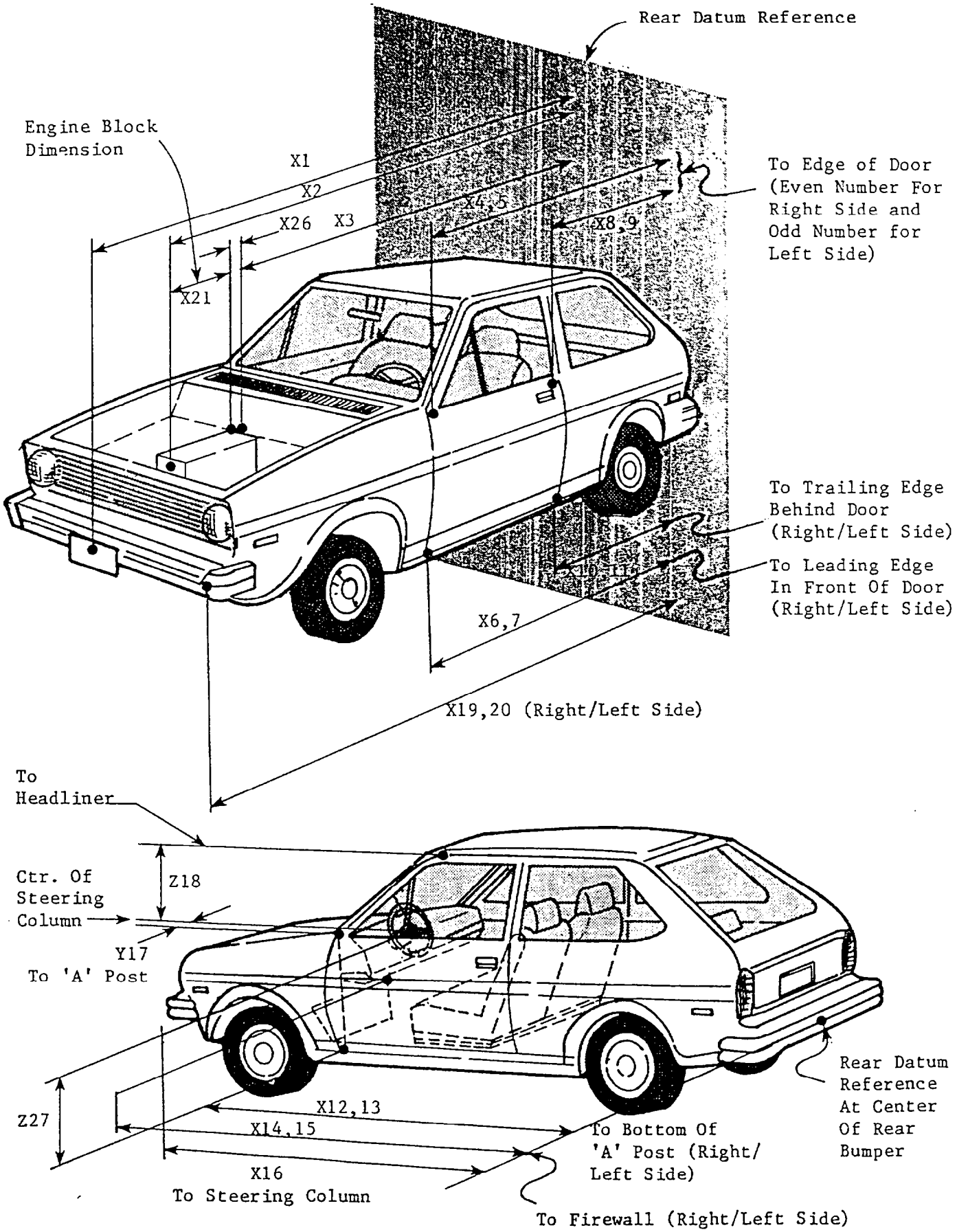


TABLE 11 IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Mitsubishi/Galant TEST NUMBER: 910117

ALL MEASUREMENTS ARE IN INCHES

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	184.0	160.2	23.8
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	159.8	148.2	11.6
X3	REAR SURFACE OF VEHICLE TO FIREWALL	136.8	131.9	4.9
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	124.1	124.1	0.0
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	124.1	123.6	0.5
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	124.9	124.6	0.3
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	125.2	124.8	0.4
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	83.8	83.9	-0.1
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	84.1	83.4	0.7
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	84.2	84.2	0.0
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	84.8	84.0	0.8
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	127.0	124.2	2.8
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	127.2	124.0	3.2
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	135.0	133.2	1.8
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	134.2	131.9	2.3
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	106.0	106.0	0.0
X17	CENTER OF STEERING COLUMN TO "A" POST	15.2	15.0	0.2
X18	CENTER OF STEERING COLUMN TO HEADLINER	18.0	16.9	1.1
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	177.2	155.2	22.0
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	177.0	155.0	22.0
X21	LENGTH OF ENGINE BLOCK	18.5	18.5	0.0

APPENDIX A

PHOTOGRAPHS

Figure A-1. PRE-TEST FRONT VIEW

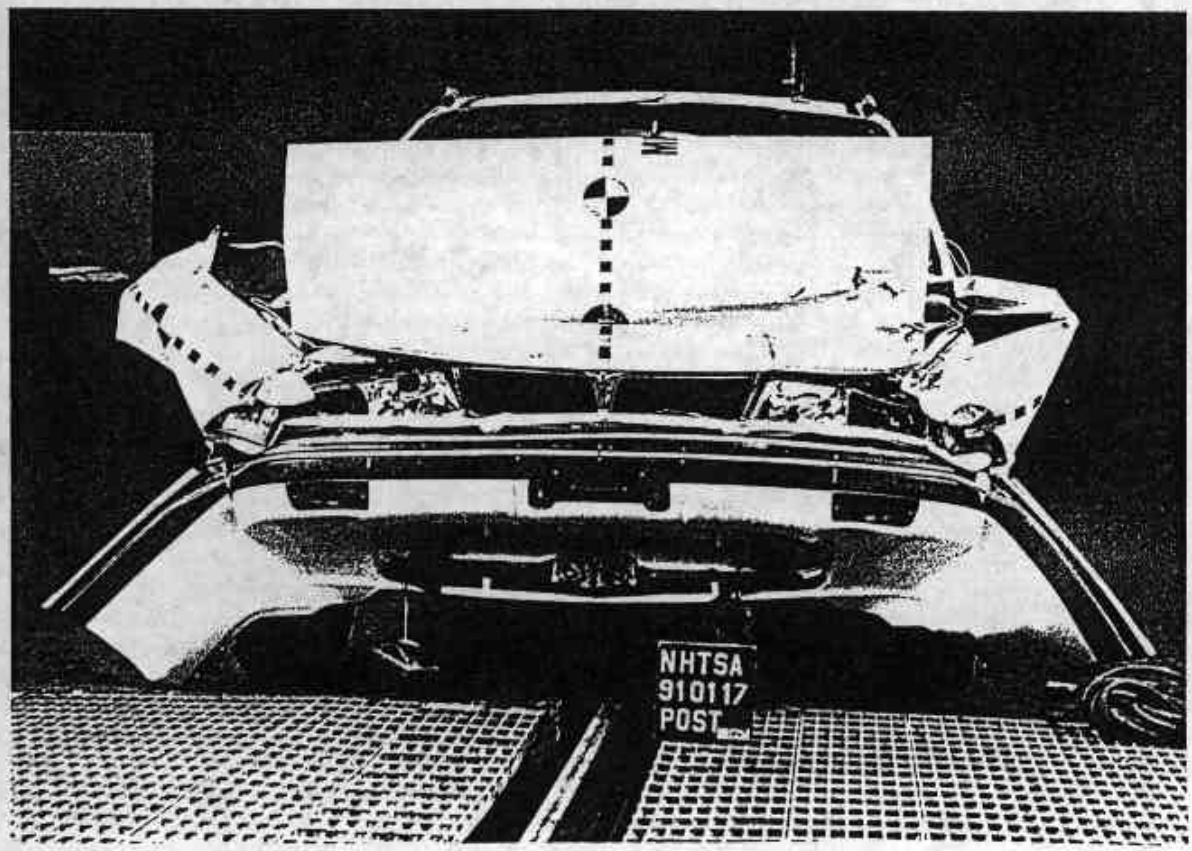


Figure A-2. POST-TEST FRONT VIEW

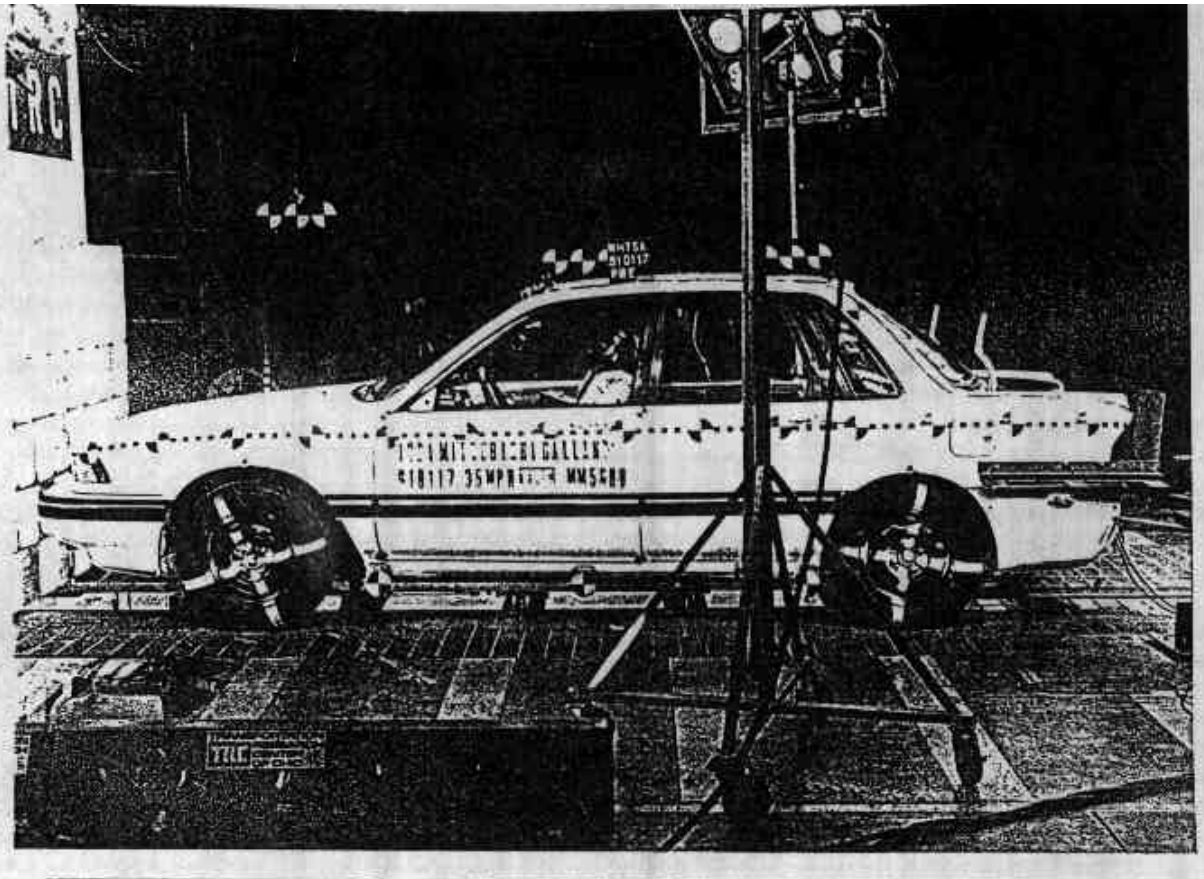


Figure A-3. PRE-TEST LEFT SIDE VIEW

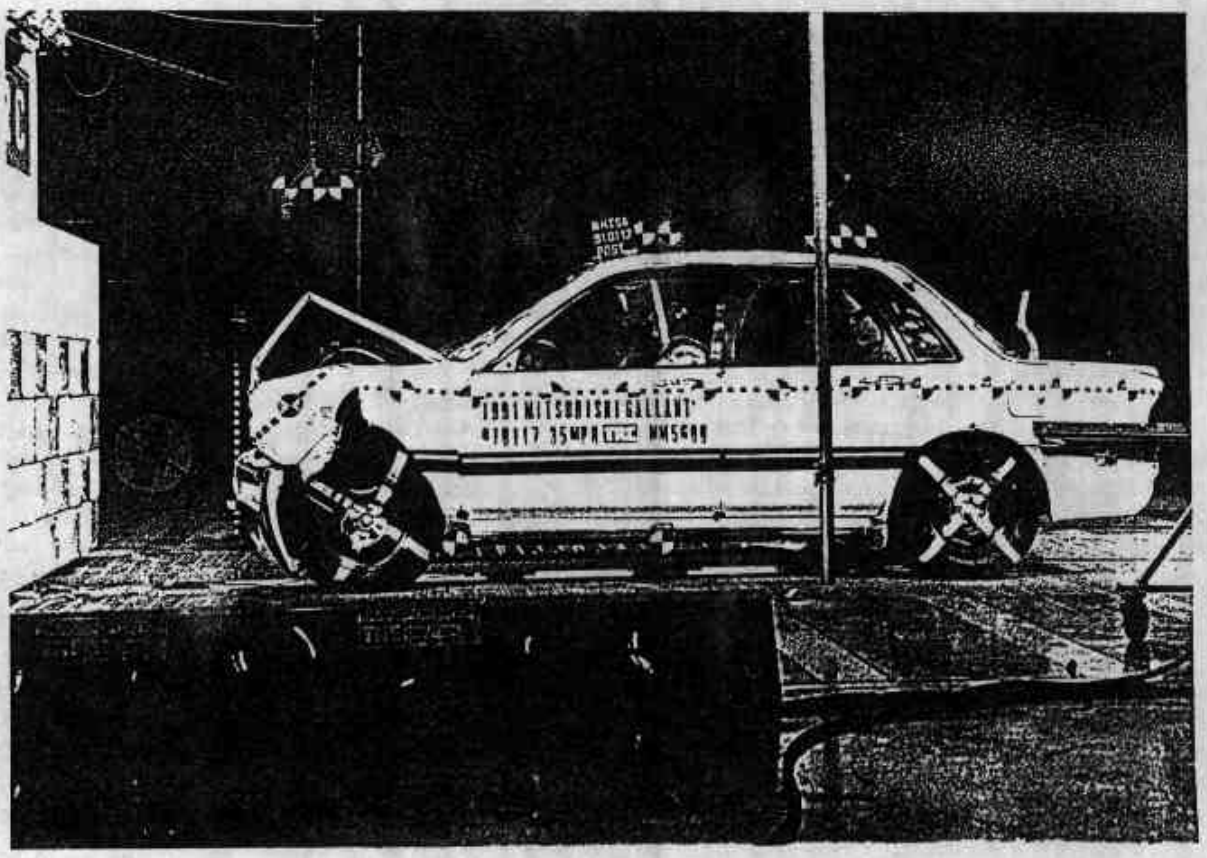


Figure A-4. POST-TEST LEFT SIDE VIEW

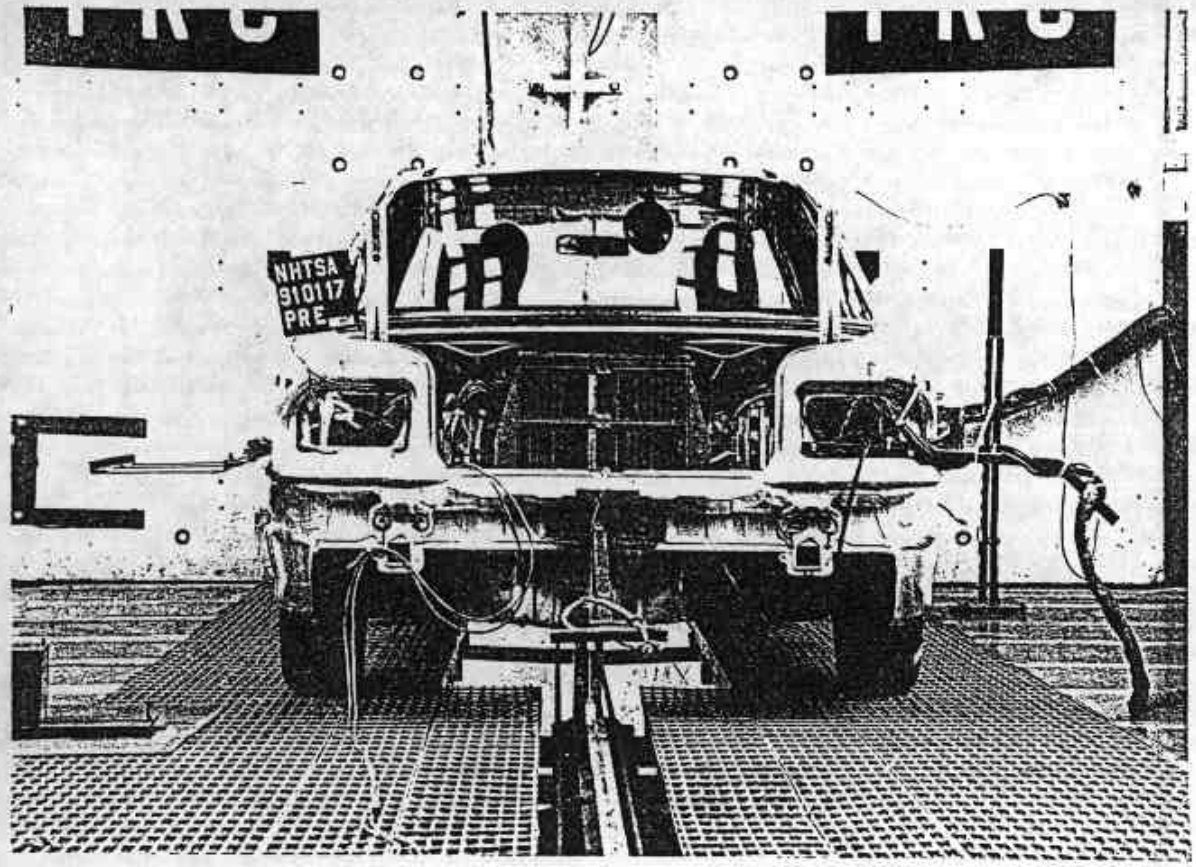


Figure A-5. PRE-TEST REAR VIEW

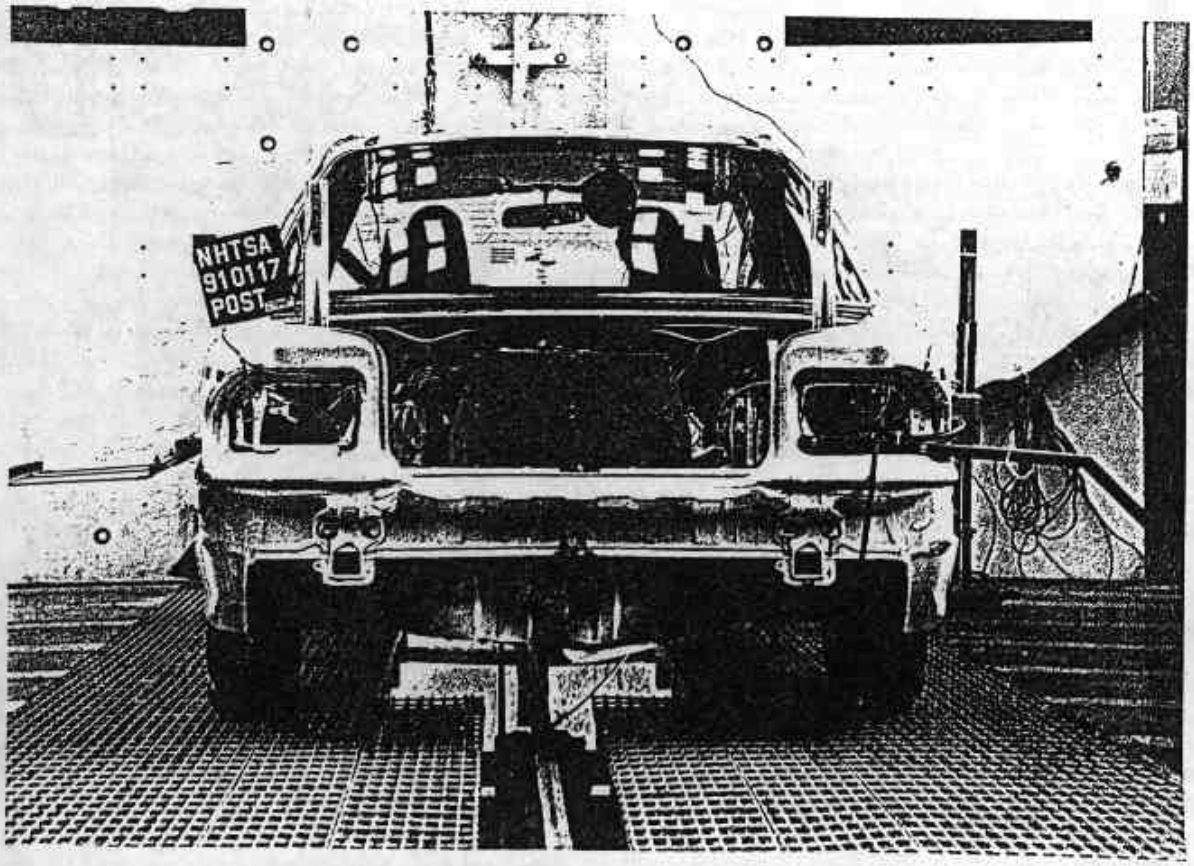


Figure A-6. POST-TEST REAR VIEW

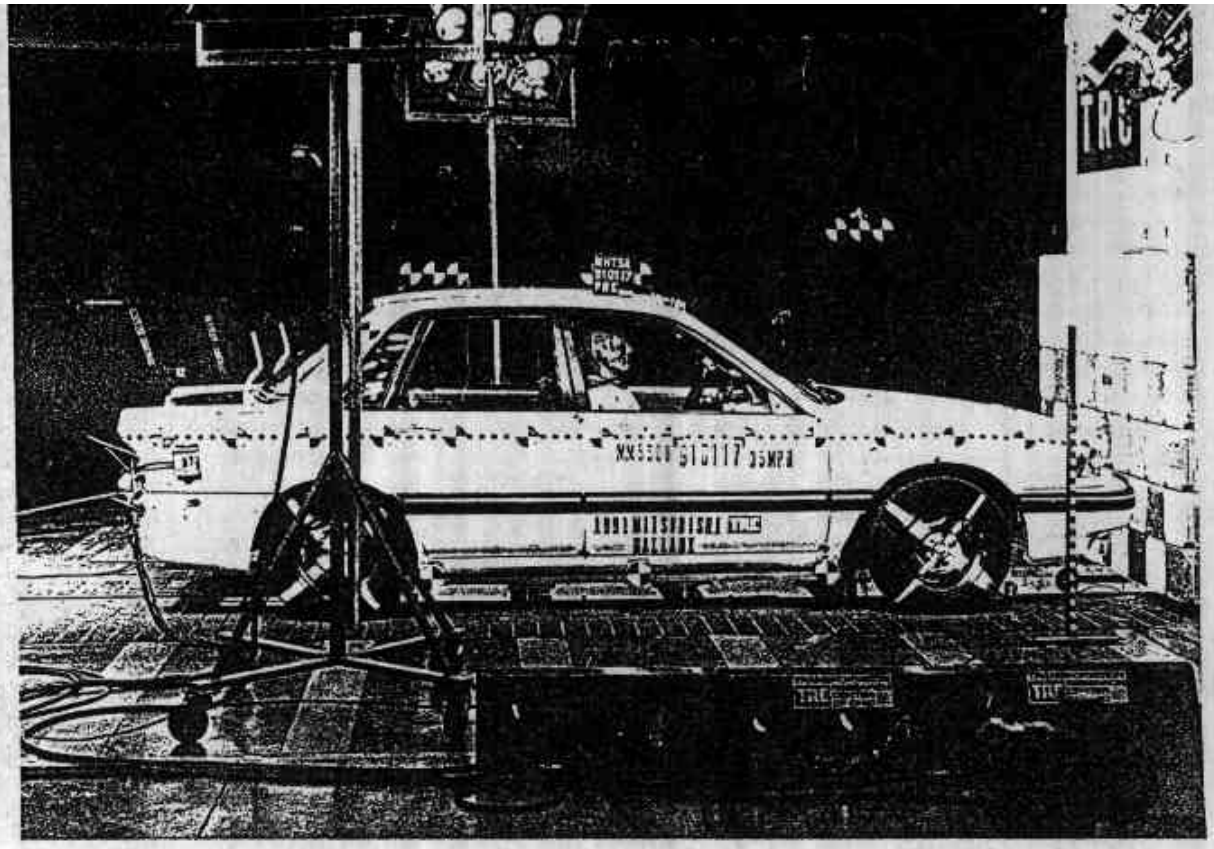


Figure A-7. PRE-TEST RIGHT SIDE VIEW

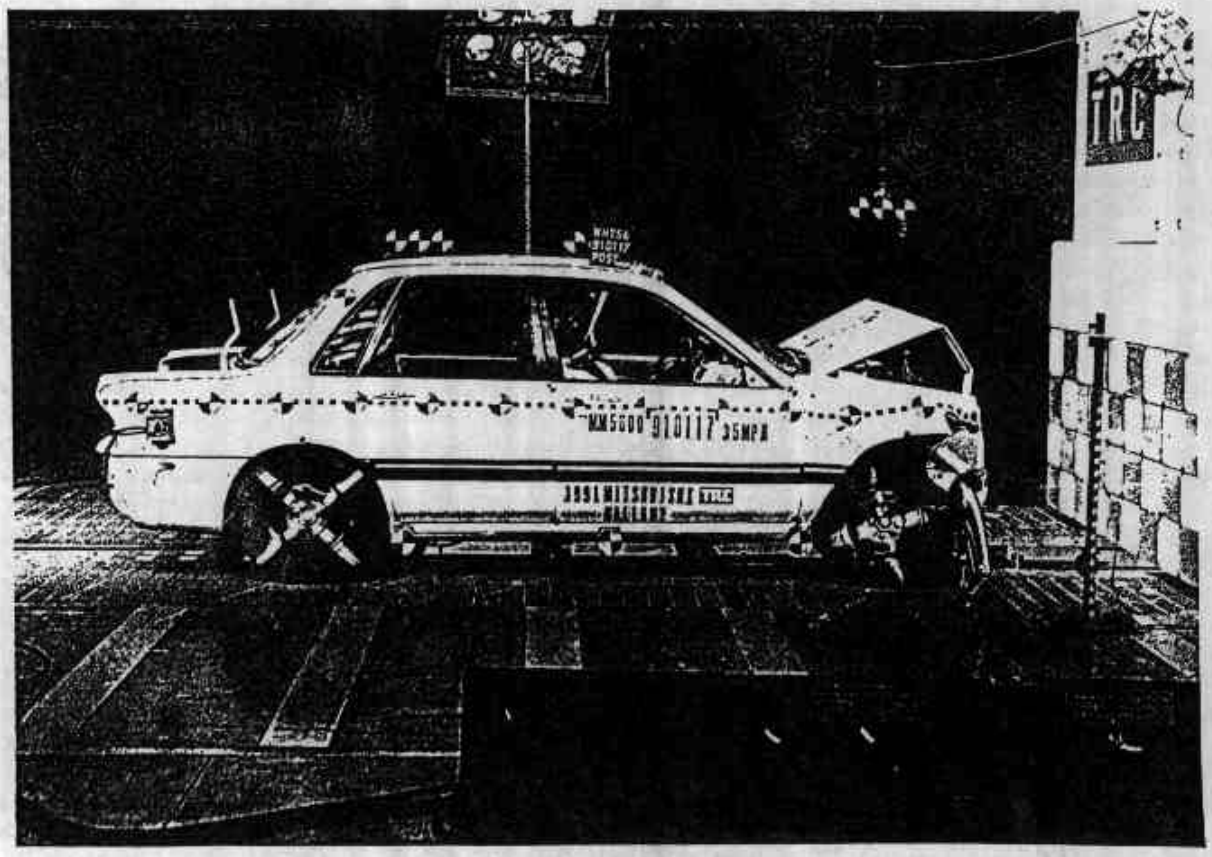


Figure A-8. POST-TEST RIGHT SIDE VIEW

Figure A-9. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

Figure A-10. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

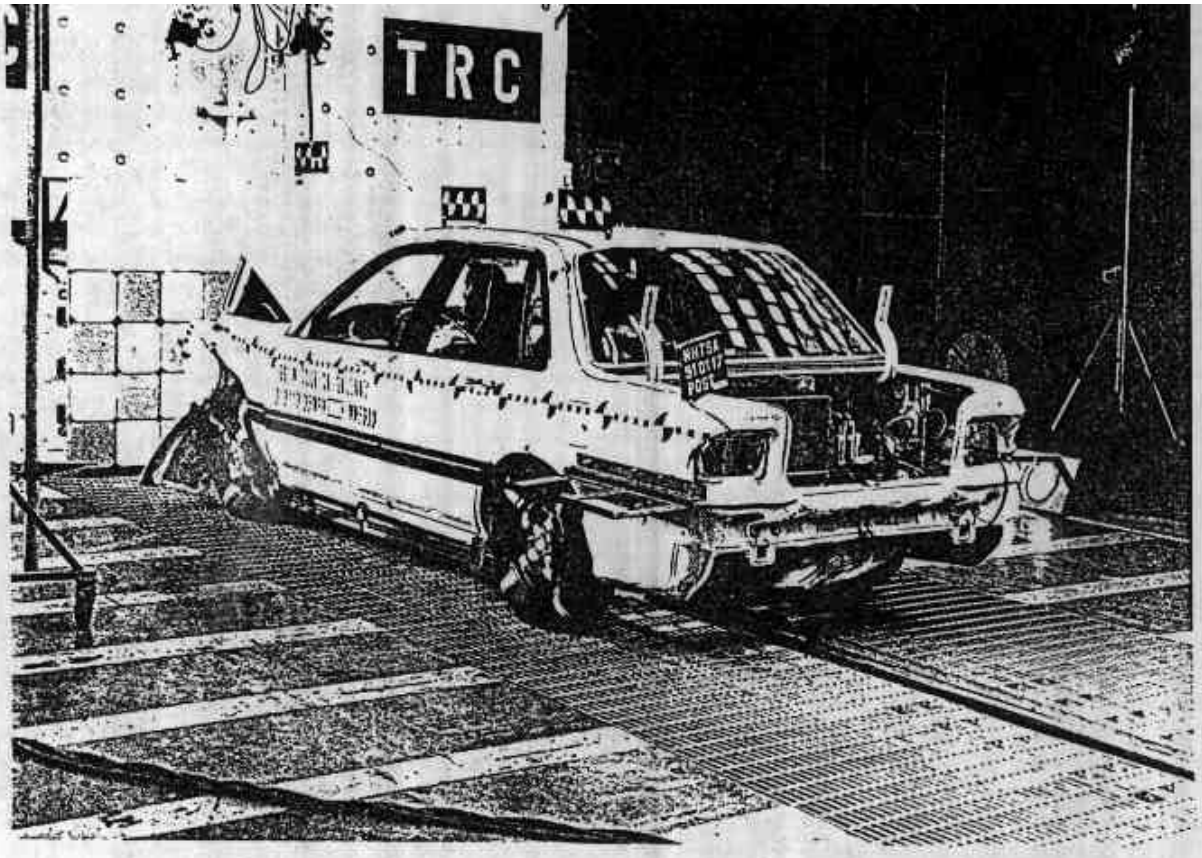


Figure A-11. POST-TEST LEFT REAR THREE-QUARTER VIEW

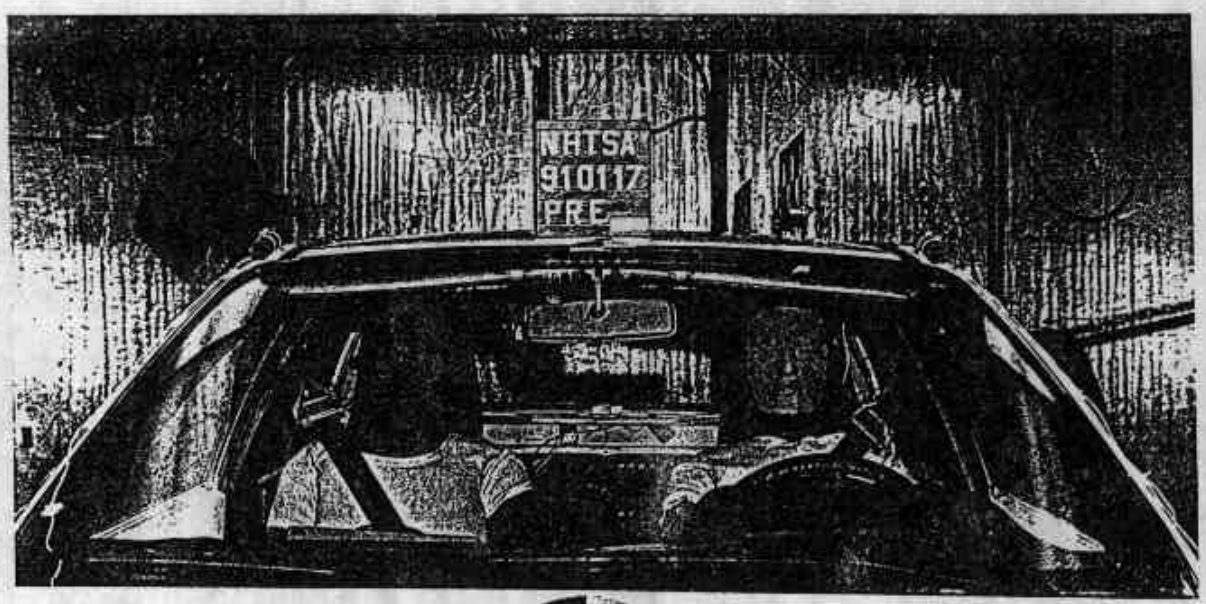


Figure A-12. PRE-TEST WINDSHIELD VIEW

Figure A-13. POST-TEST WINDSHIELD VIEW

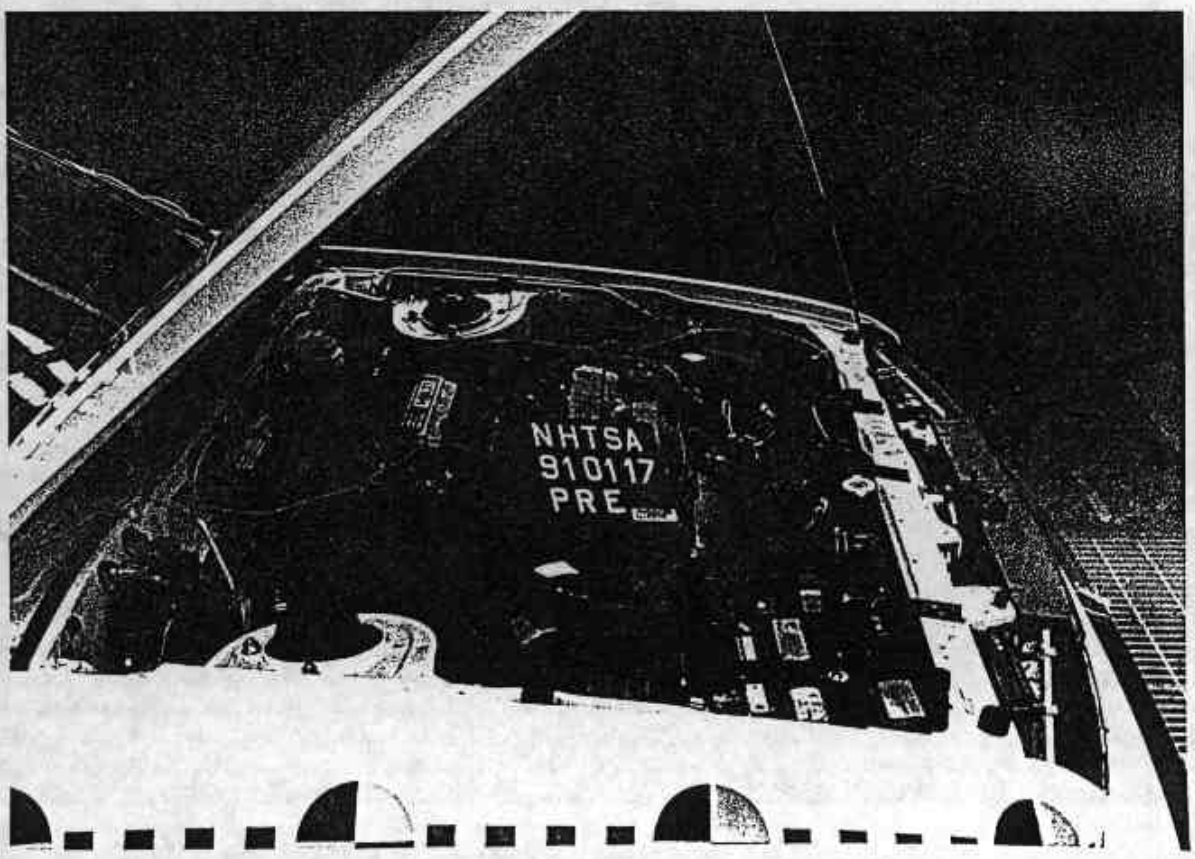


Figure A-14. PRE-TEST ENGINE COMPARTMENT VIEW

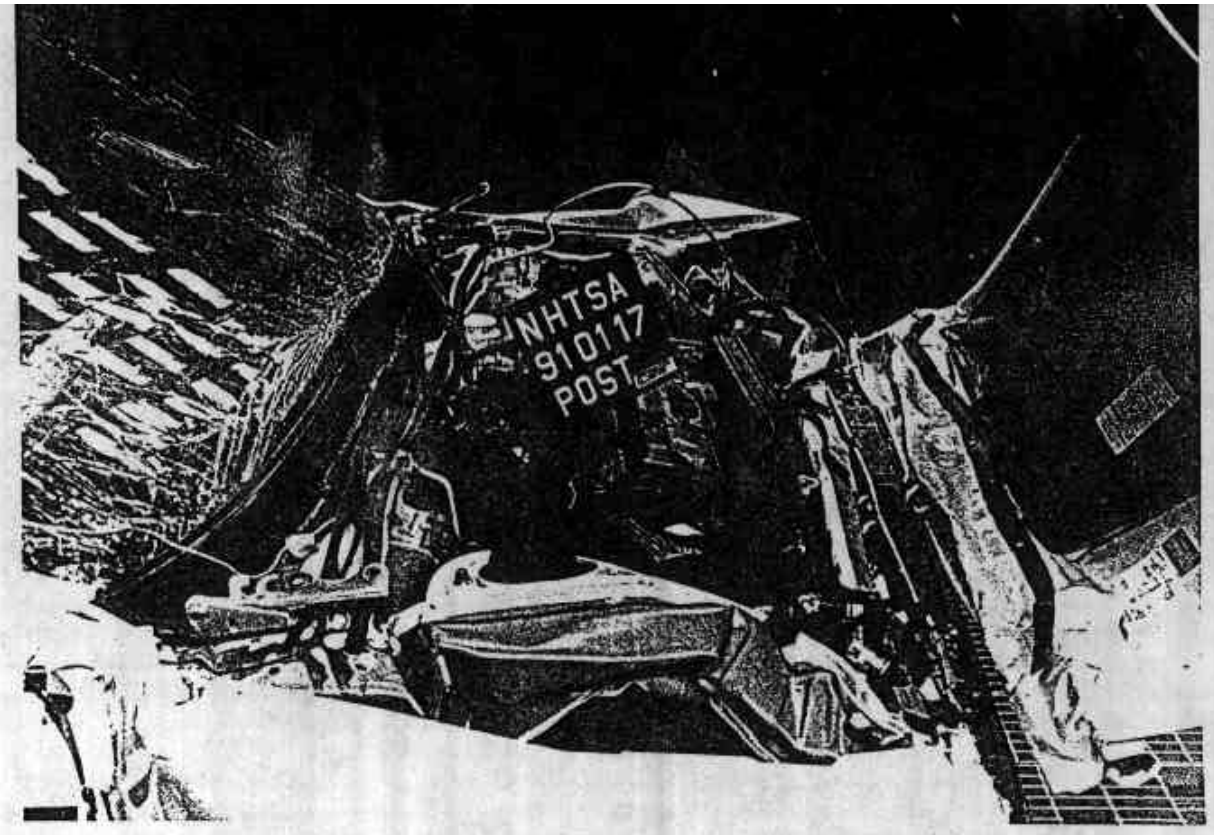


Figure A-15. POST-TEST ENGINE COMPARTMENT VIEW

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

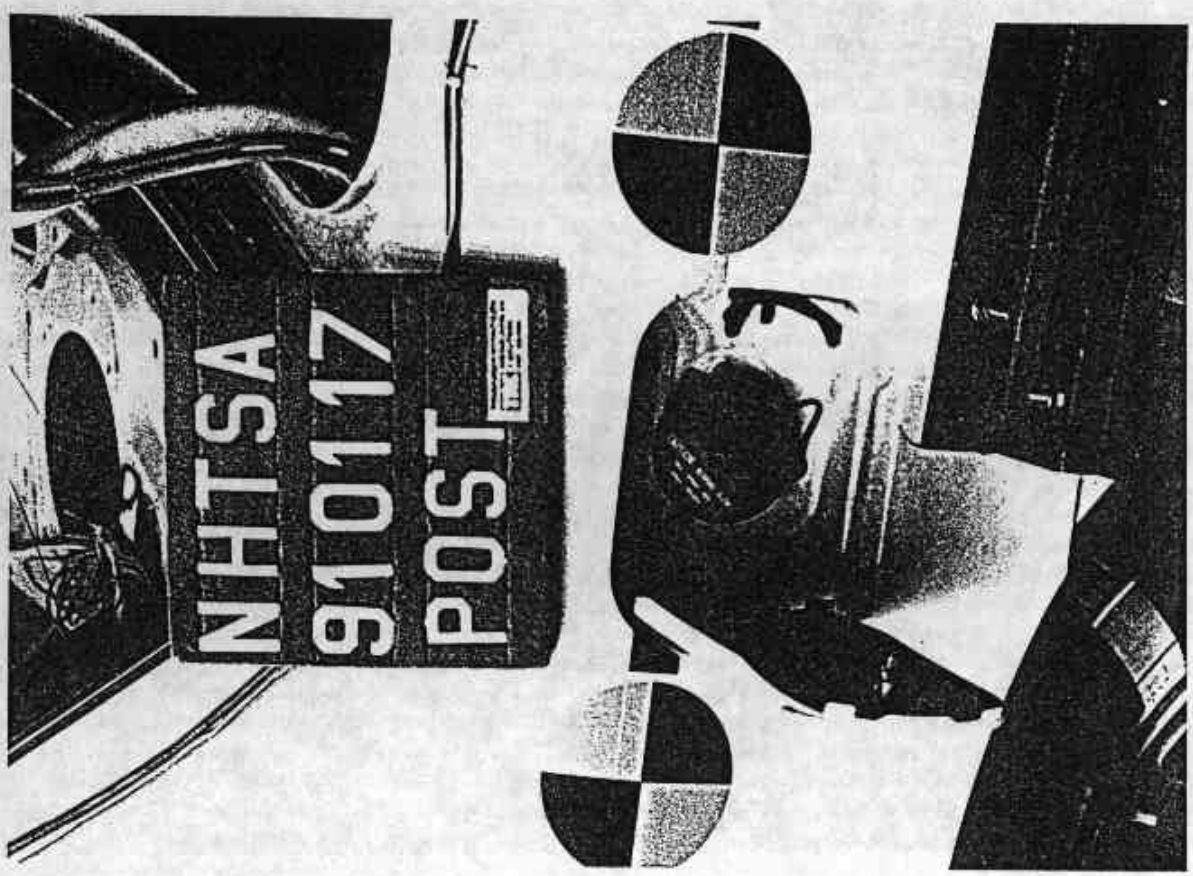


Figure A-17. POST-TEST FUEL FILLER CAP VIEW

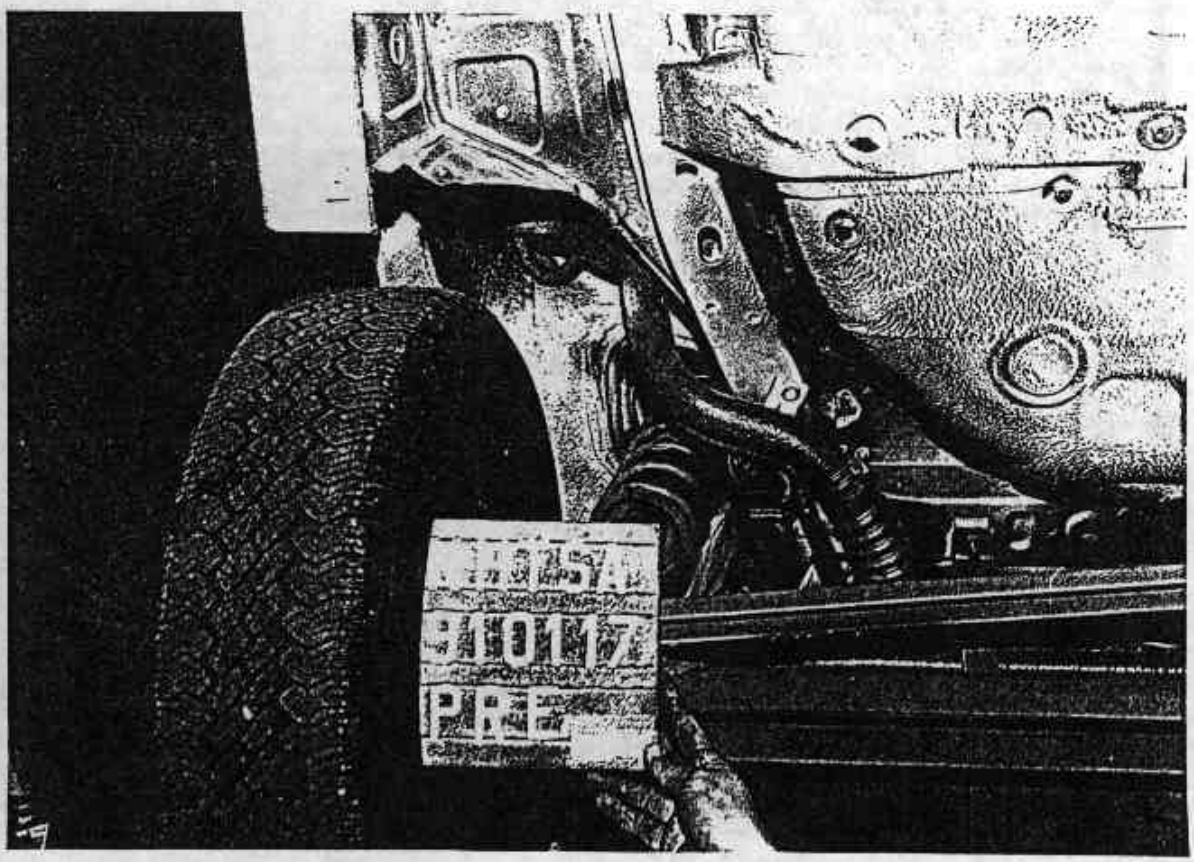


Figure A-18. PRE-TEST FUEL FILLER NECK VIEW

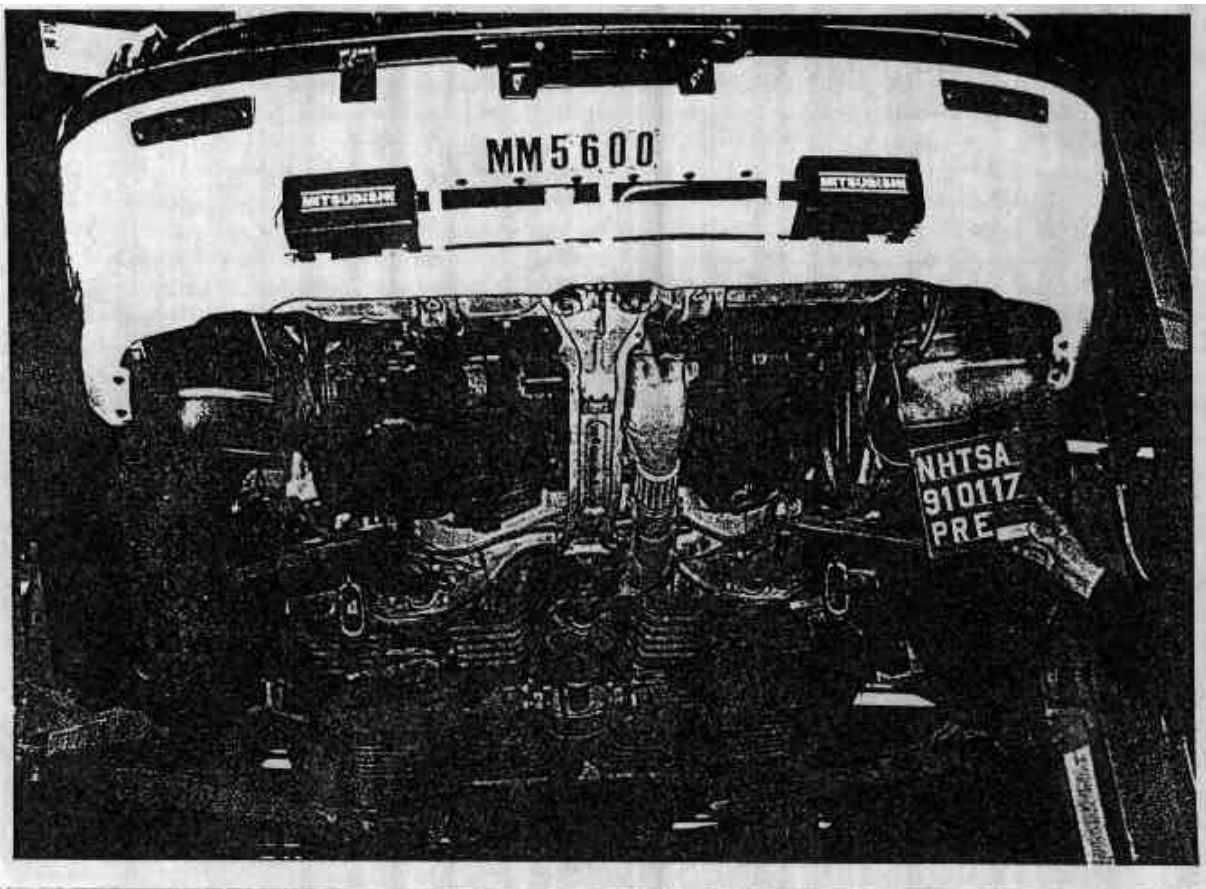


Figure A-19. PRE-TEST FRONT UNDERBODY VIEW

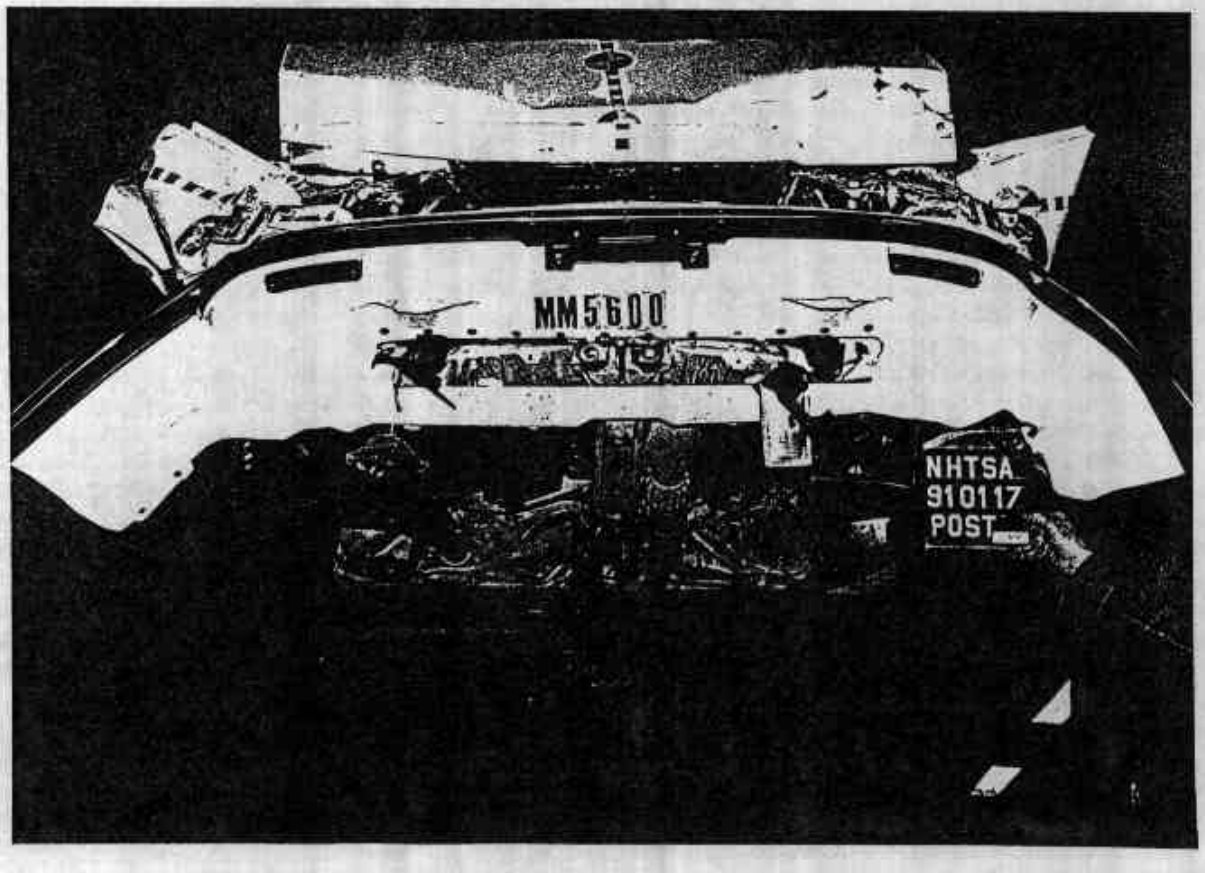


Figure A-20. POST-TEST FRONT UNDERBODY VIEW

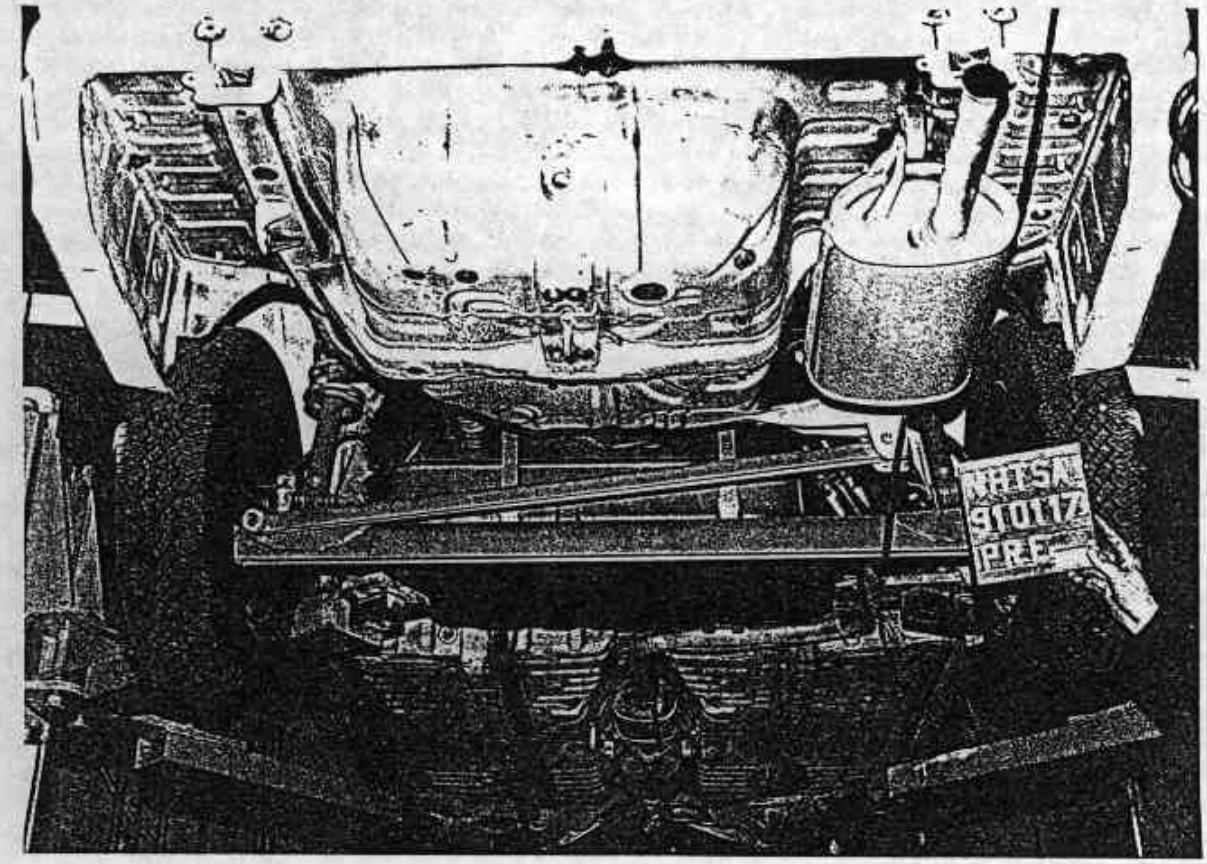


Figure A-21. PRE-TEST REAR UNDERBODY VIEW

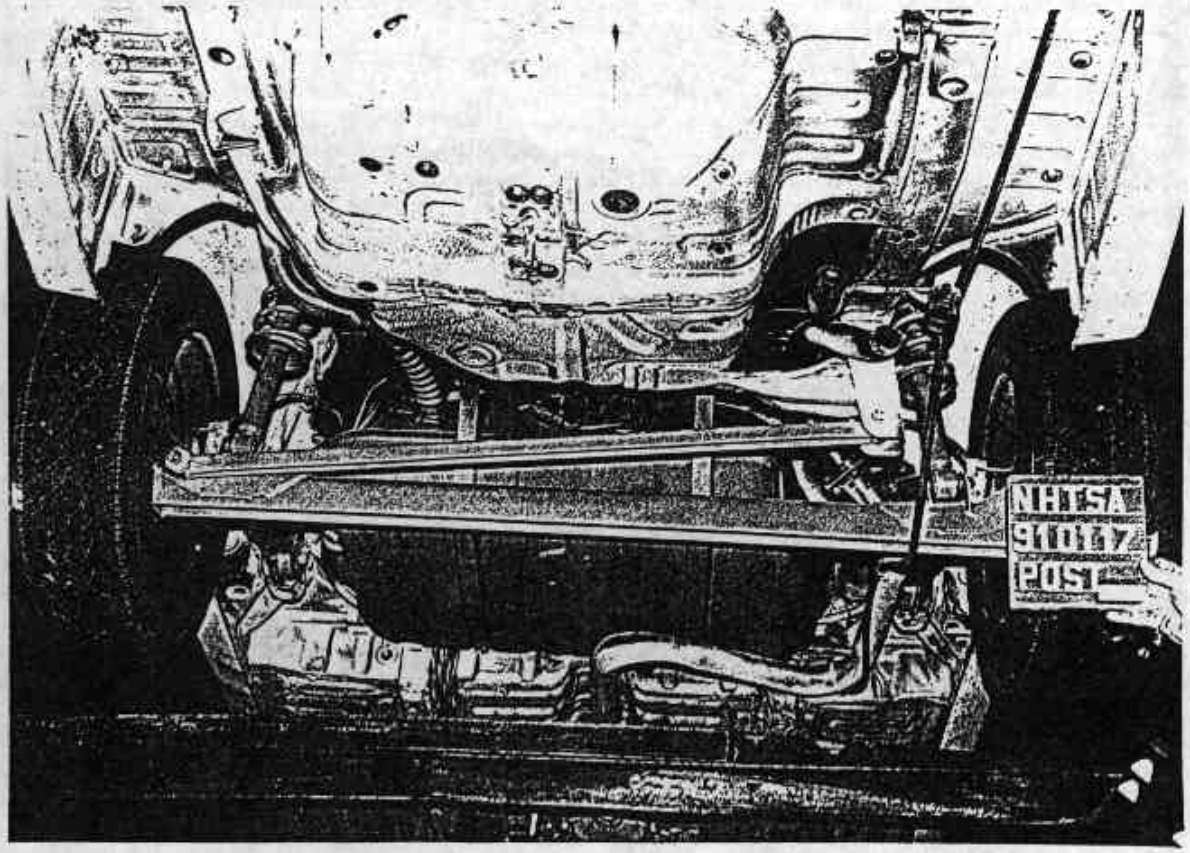


Figure A-22. POST-TEST REAR UNDERBODY VIEW

Figure A-23. PRE-TEST DRIVER DUMMY POSITION VIEW

Figure A-24. POST-TEST DRIVER DUMMY POSITION VIEW

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

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

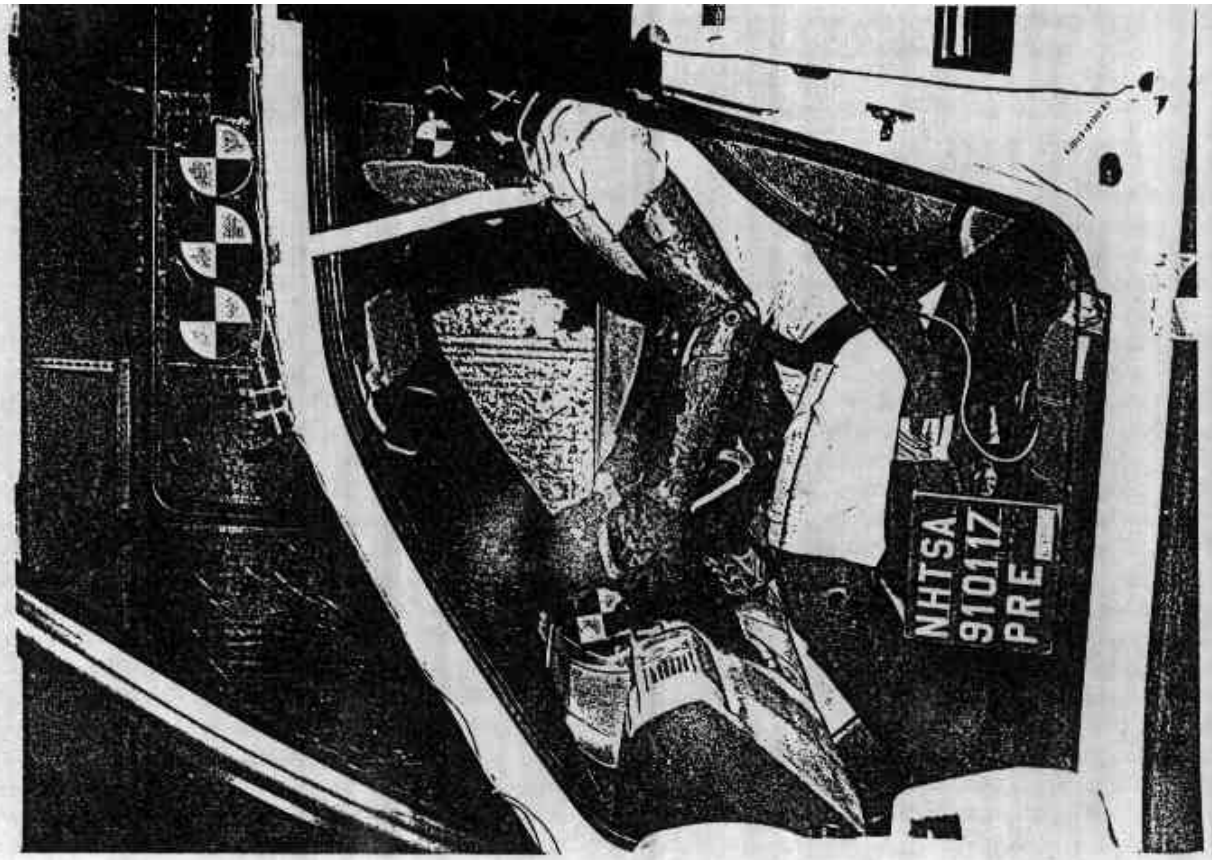


Figure A-27. PRE-TEST DRIVER DUMMY AND VEHICLE INTERIOR - VIEW 1

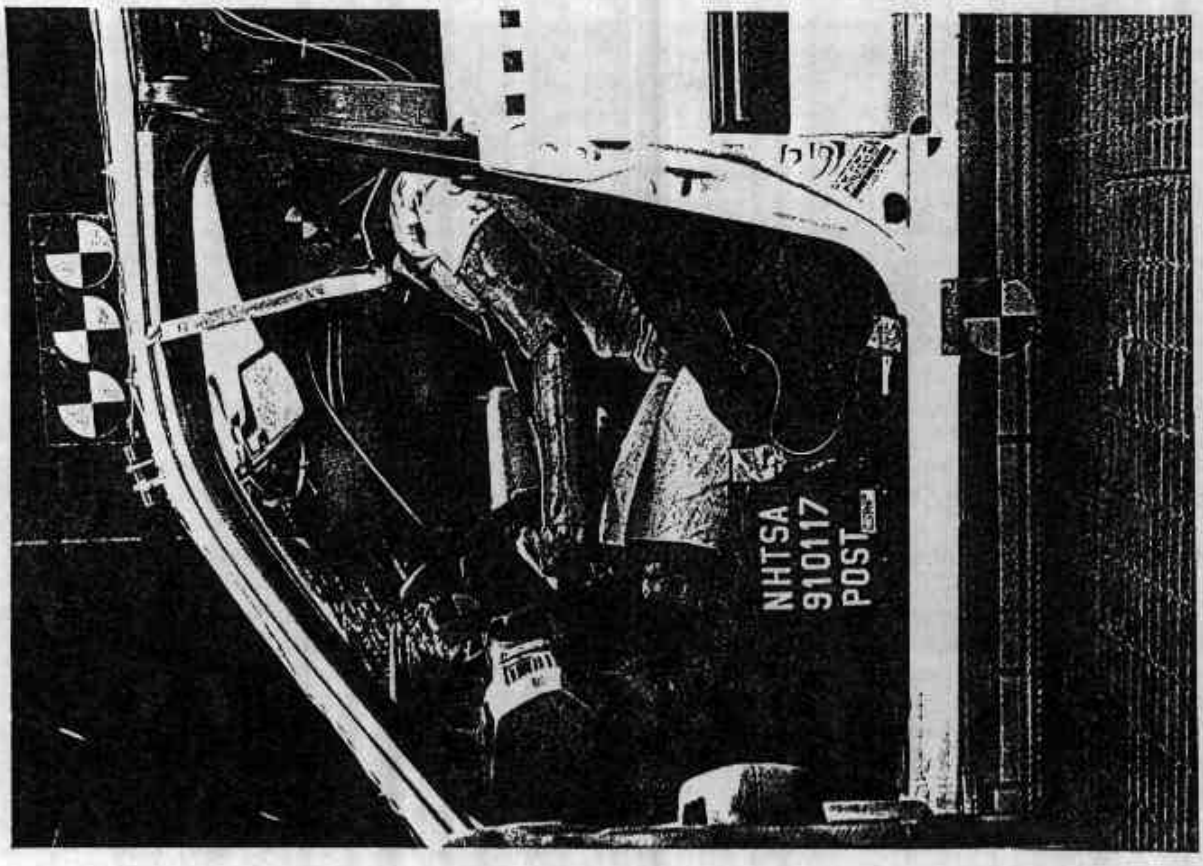


Figure A-28. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

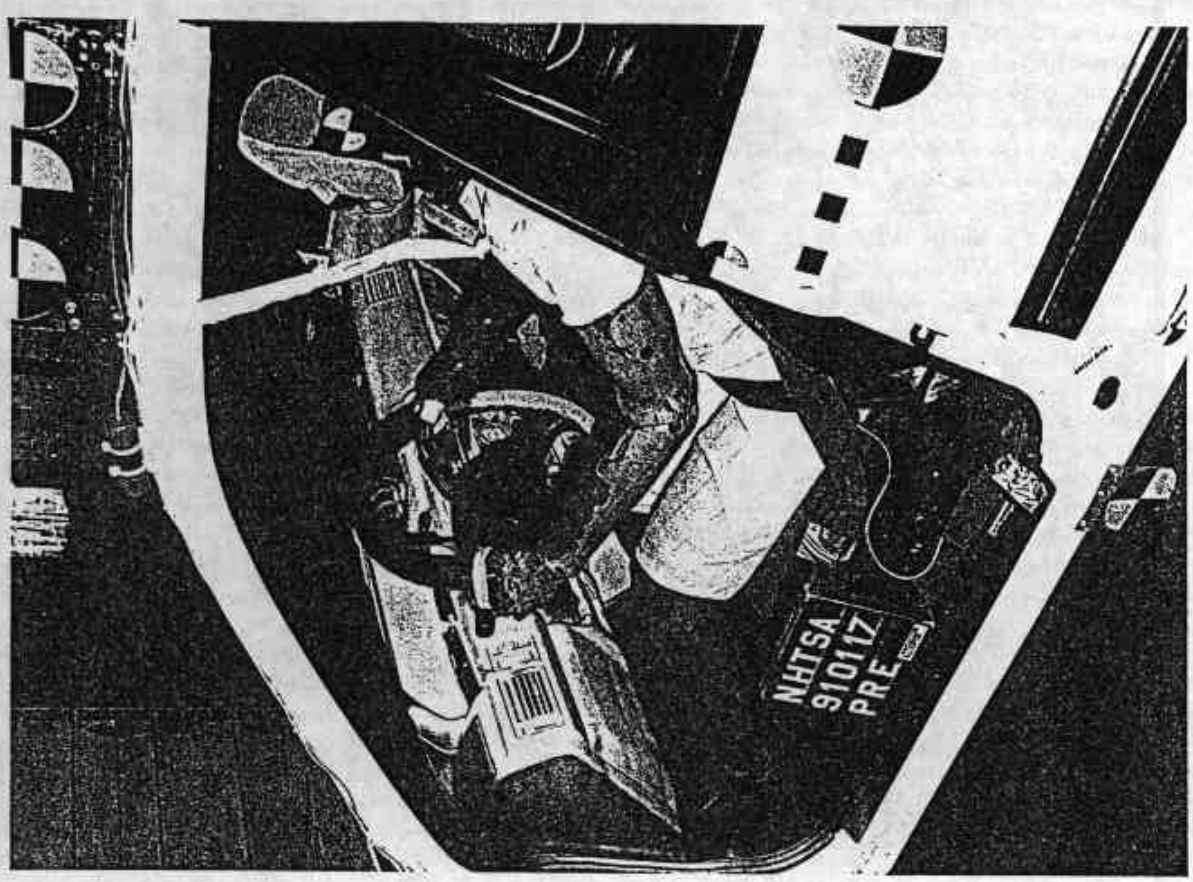


Figure A-29. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

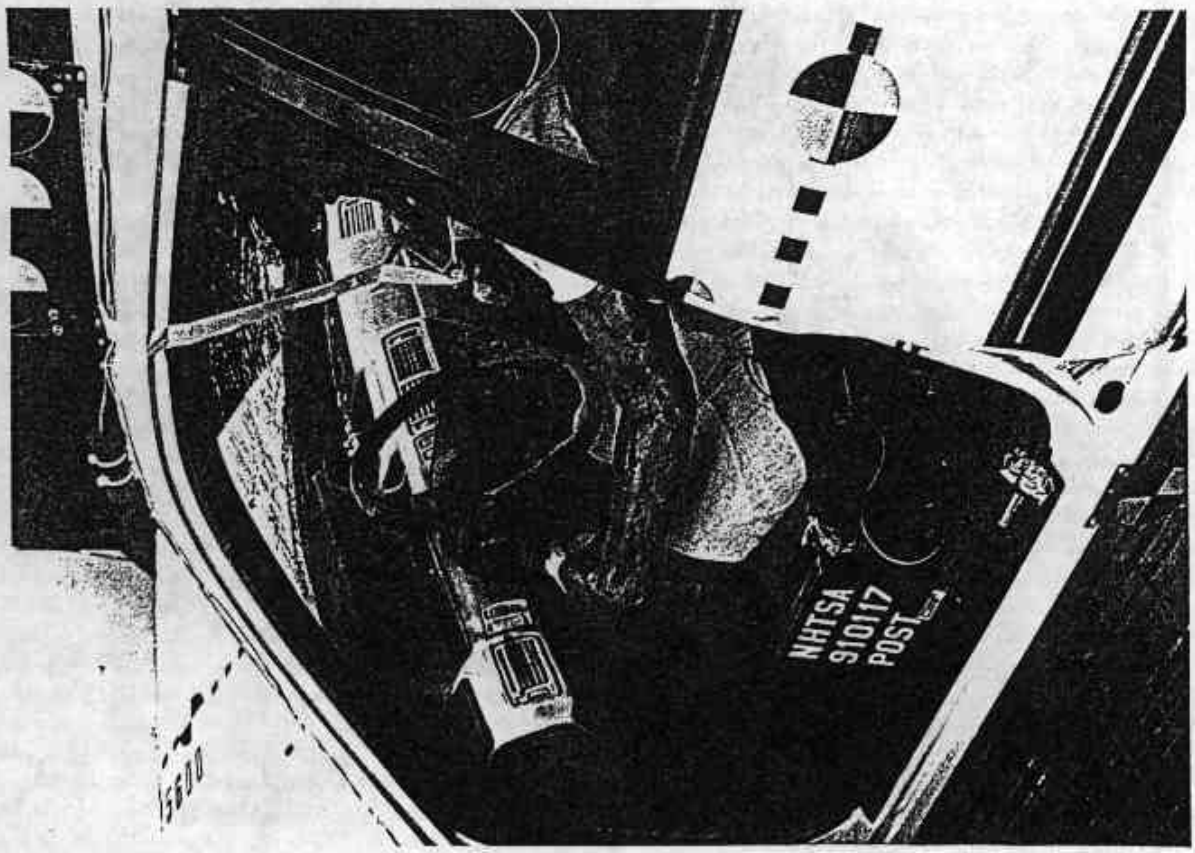


Figure A-30. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

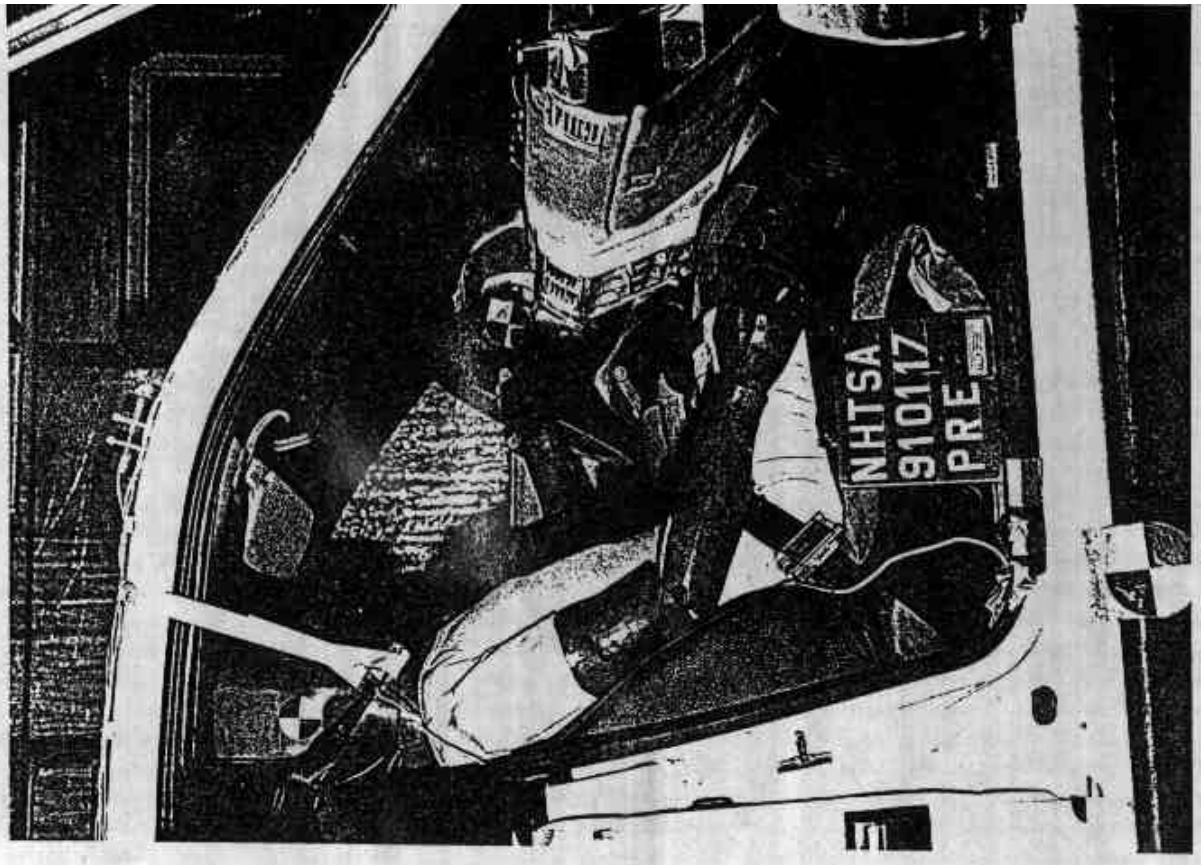


Figure A-31. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1

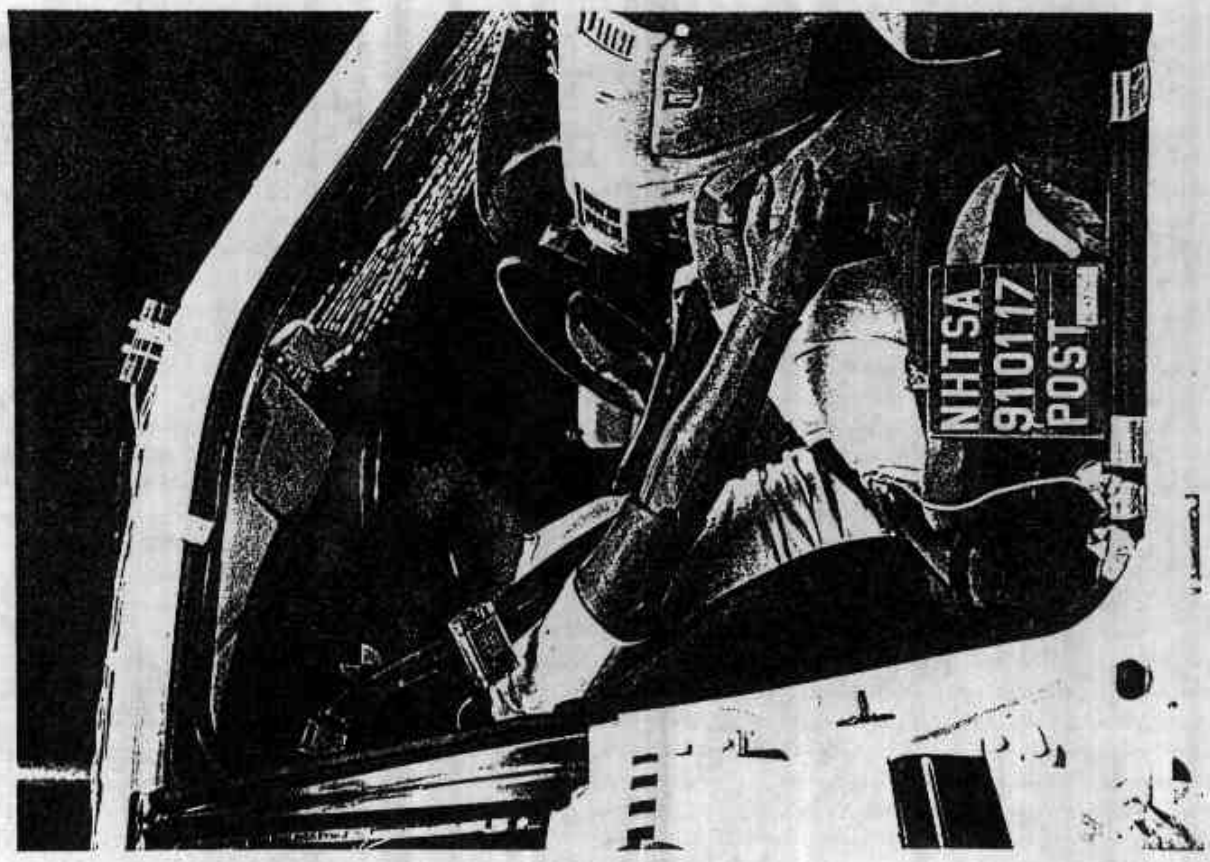


Figure A-32. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1

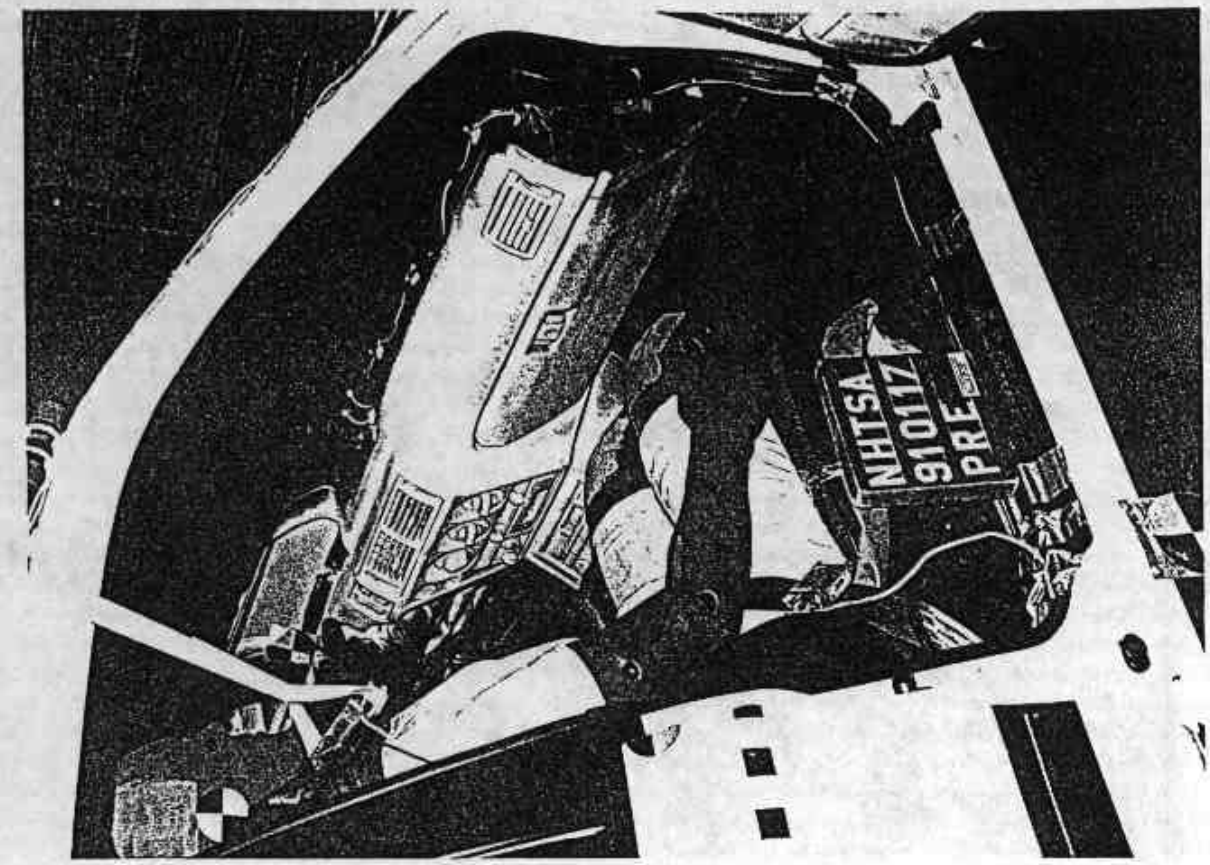


Figure A-33. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

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

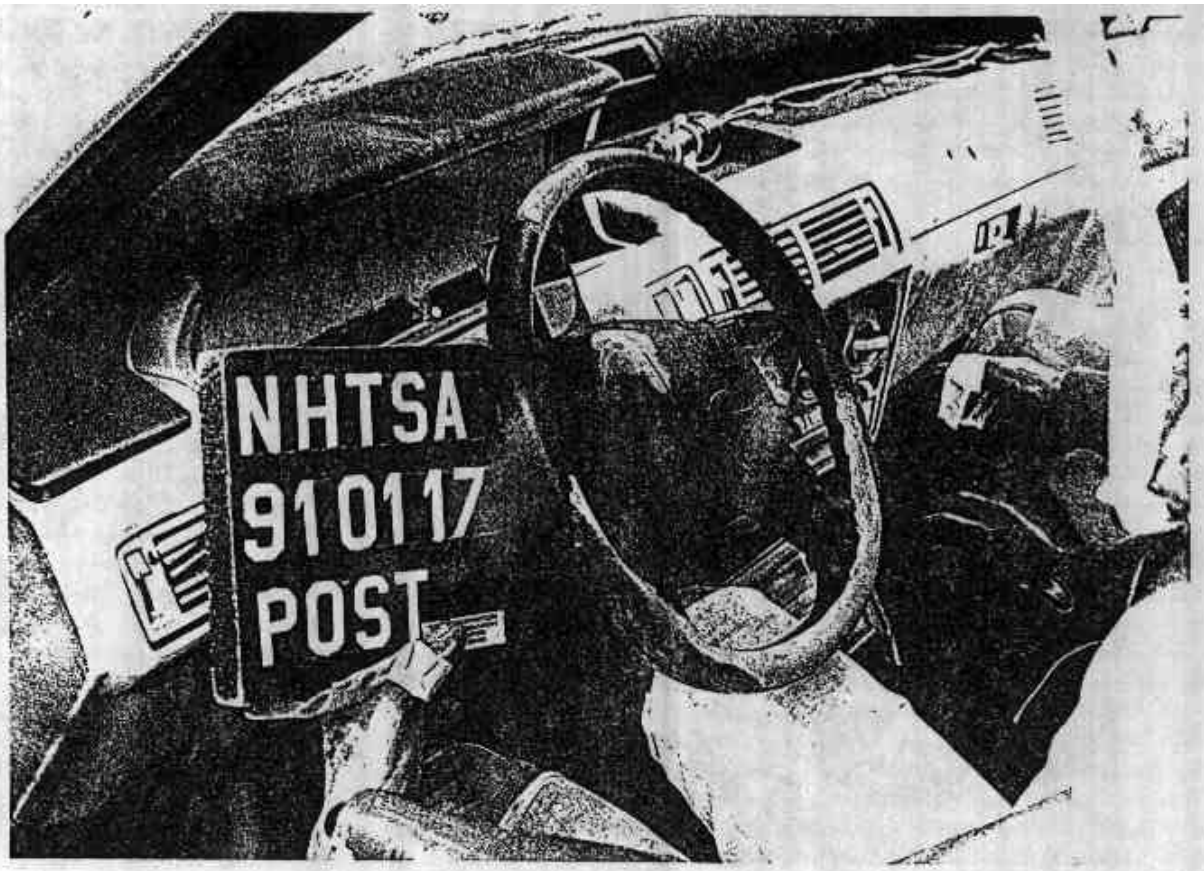


Figure A-35. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 1

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

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

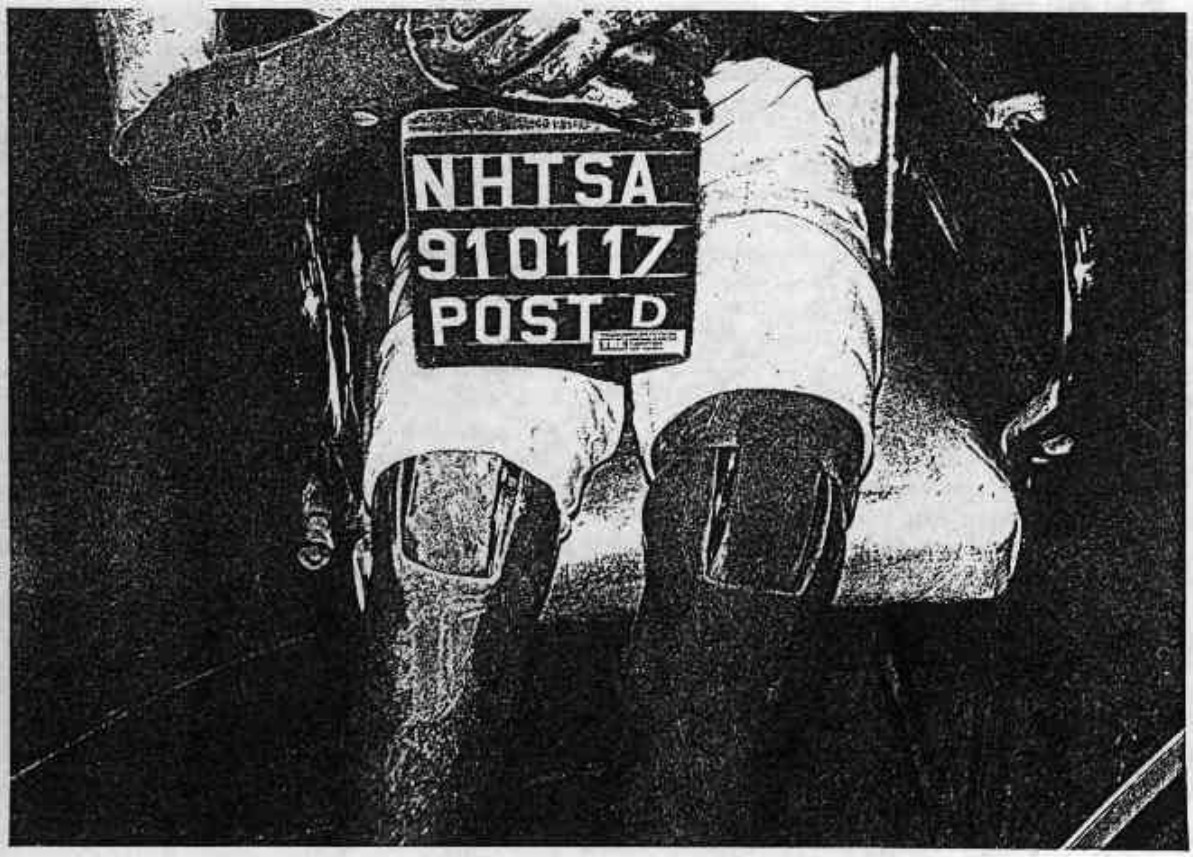


Figure A-38. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 2

Figure A-39. POST-TEST PASSENGER DUMMY HEAD CONTACT VIEW

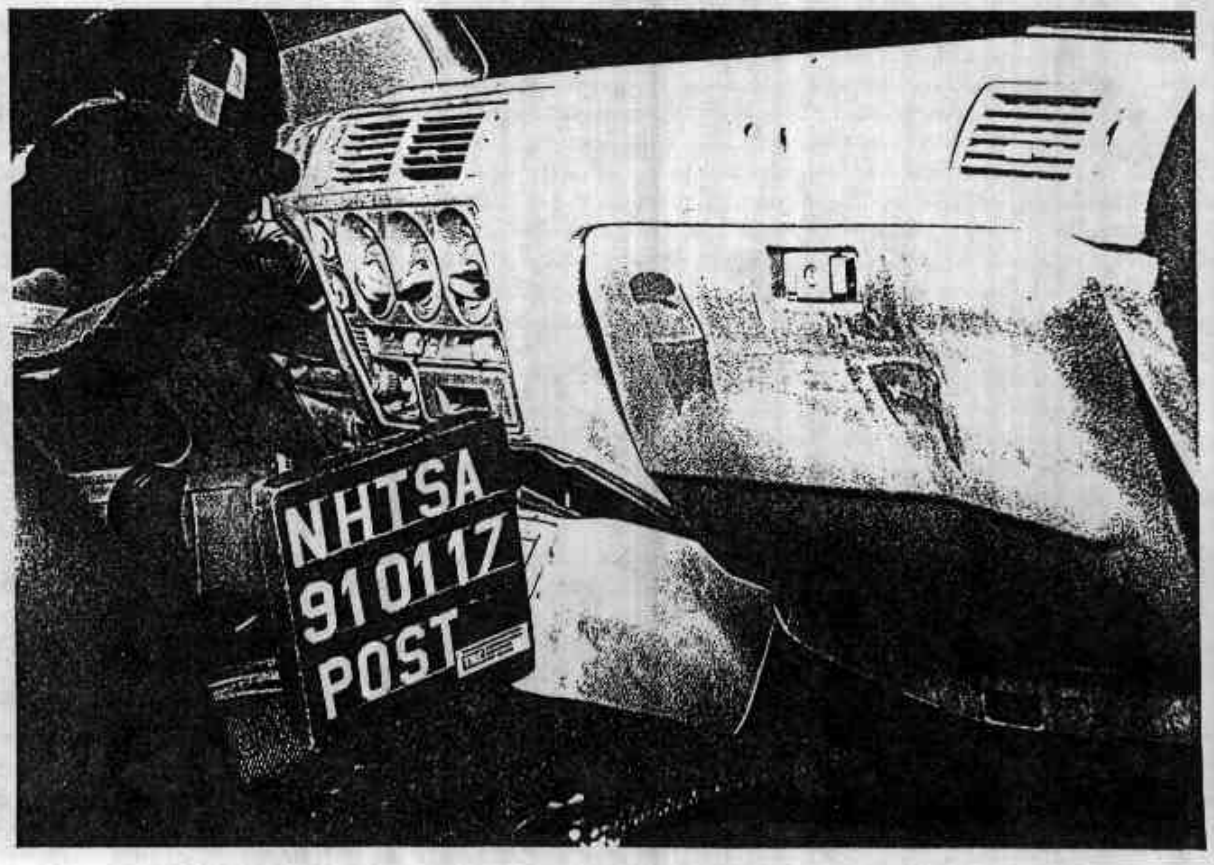


Figure A-40. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 1

Figure A-41. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 2

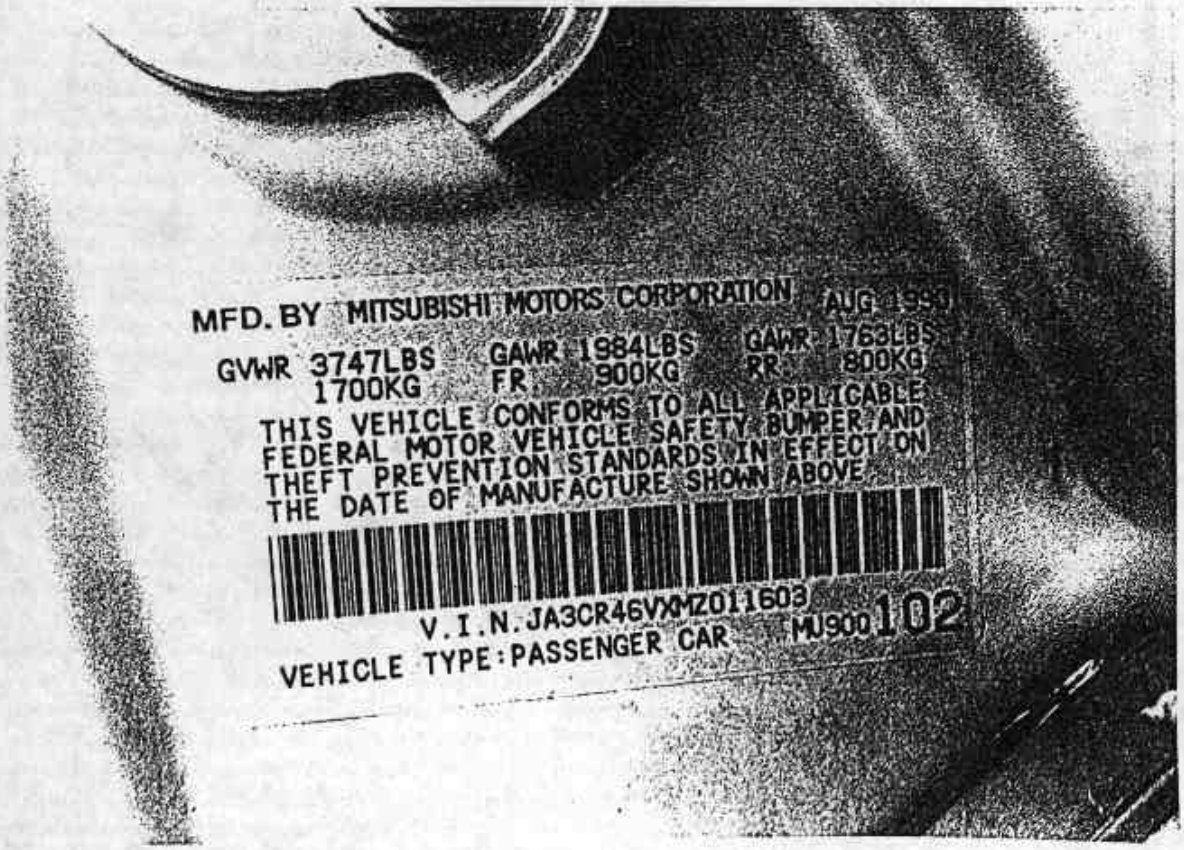


Figure A-42. PRE-TEST VEHICLE CERTIFICATION PRESSURE LABEL VIEW

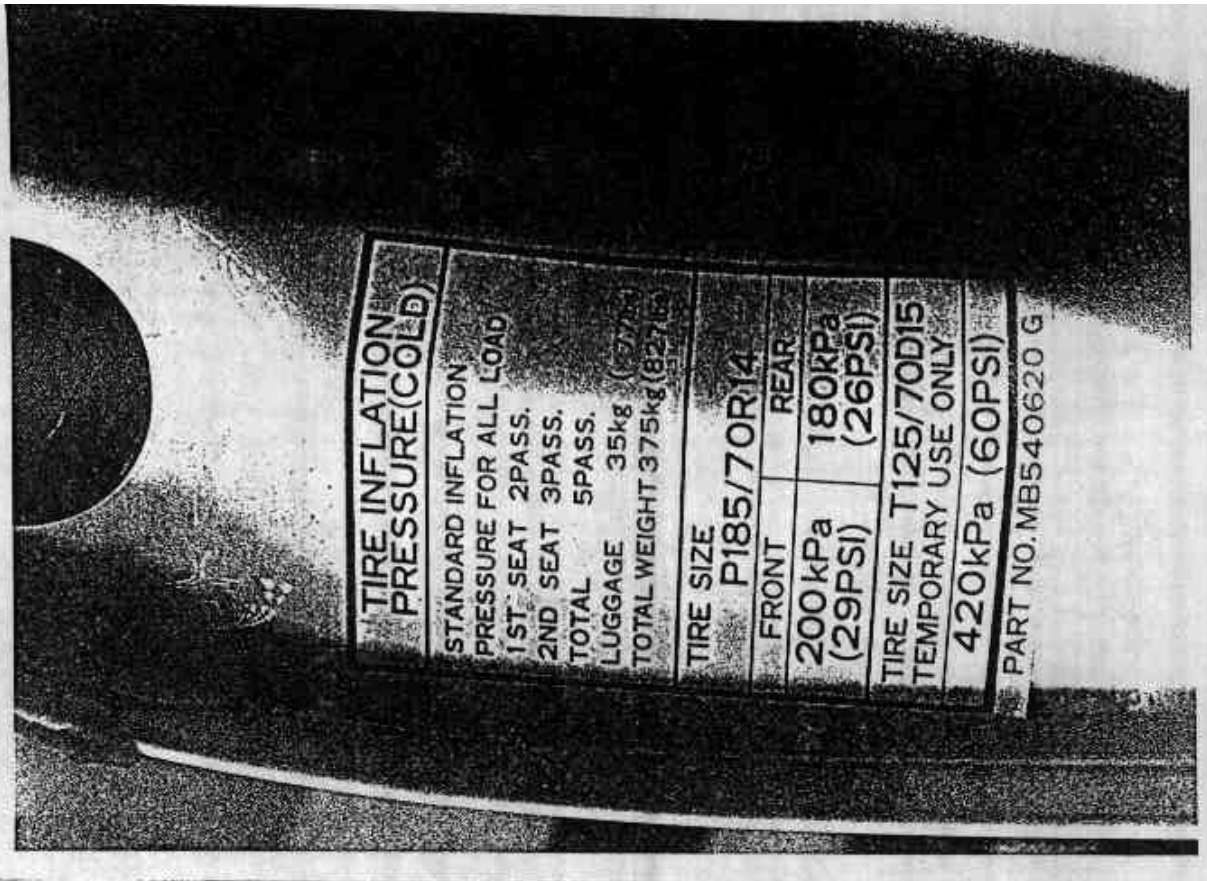
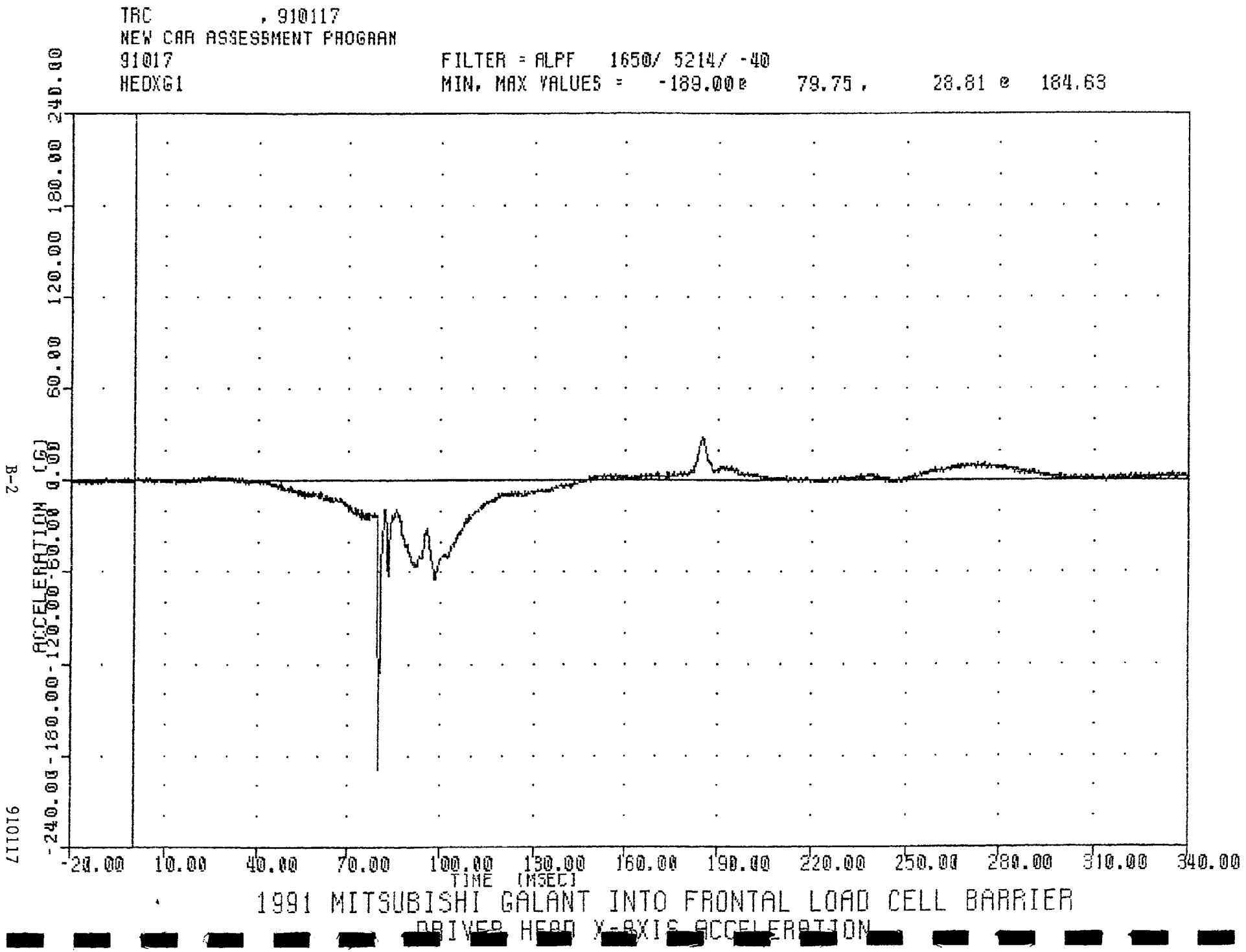


Figure A-43. PRE-TEST VEHICLE RECOMMENDED TIRE PRESSURE LABEL VIEW

APPENDIX B

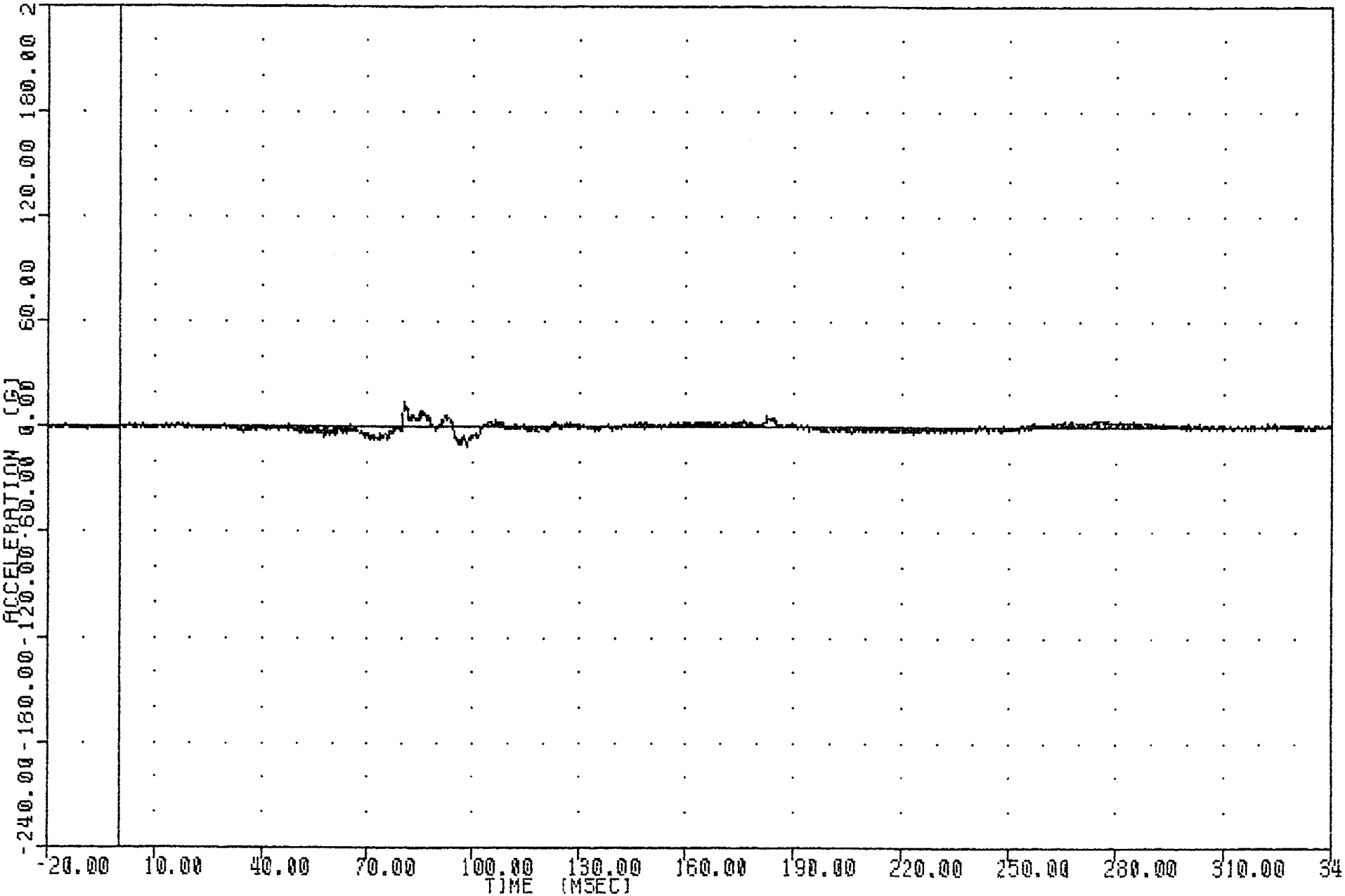
DATA PLOTS



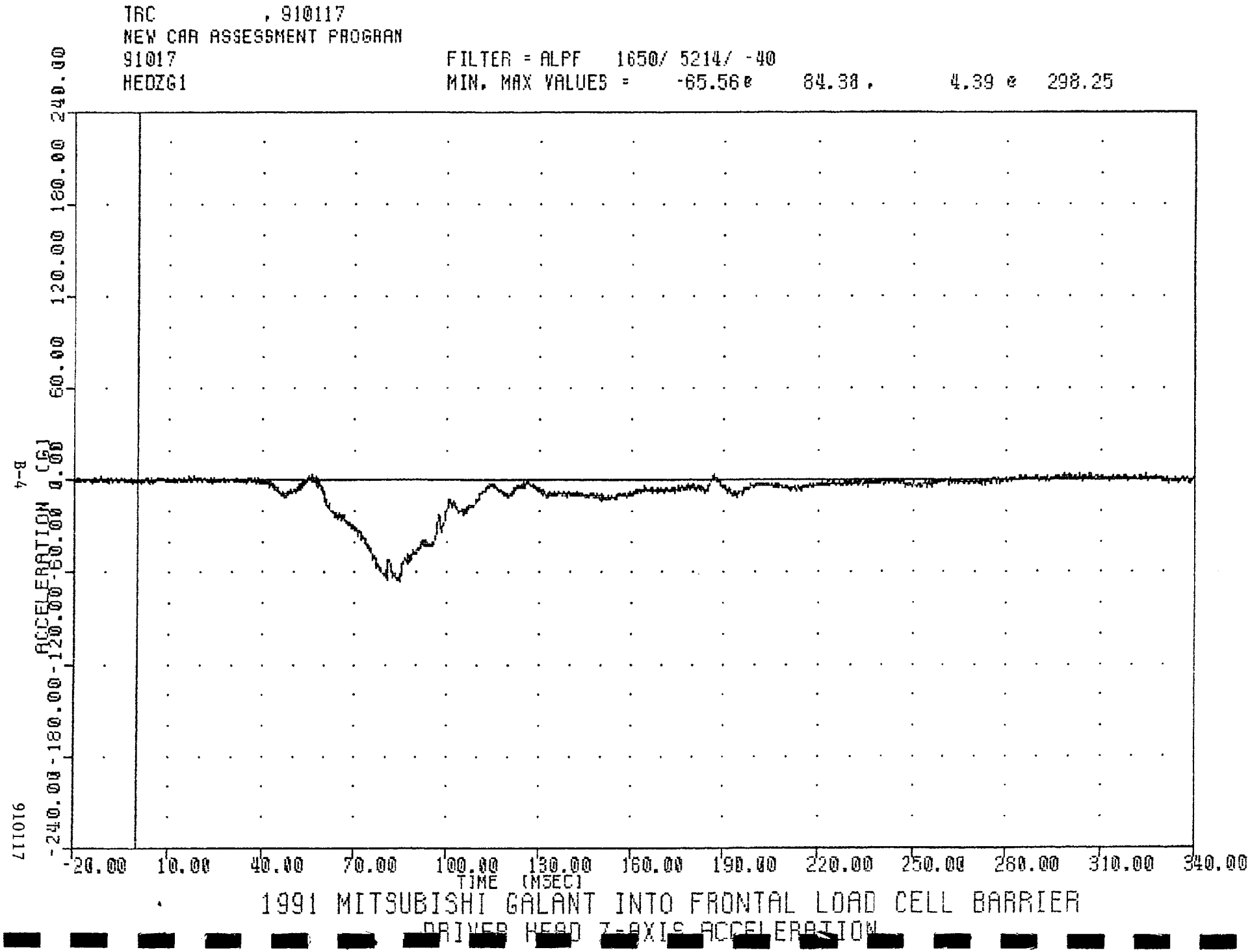
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER

DRIVER HEAD X-AXIS ACCELERATION

NEW CAR ASSESSMENT PROGRAM
91017
HEDYG1
FILTER = CFC 60 / CFC 180 / CFC 1000
MIN, MAX VALUES = -10.75 @ 98.13 , 14.03 @ 80.50

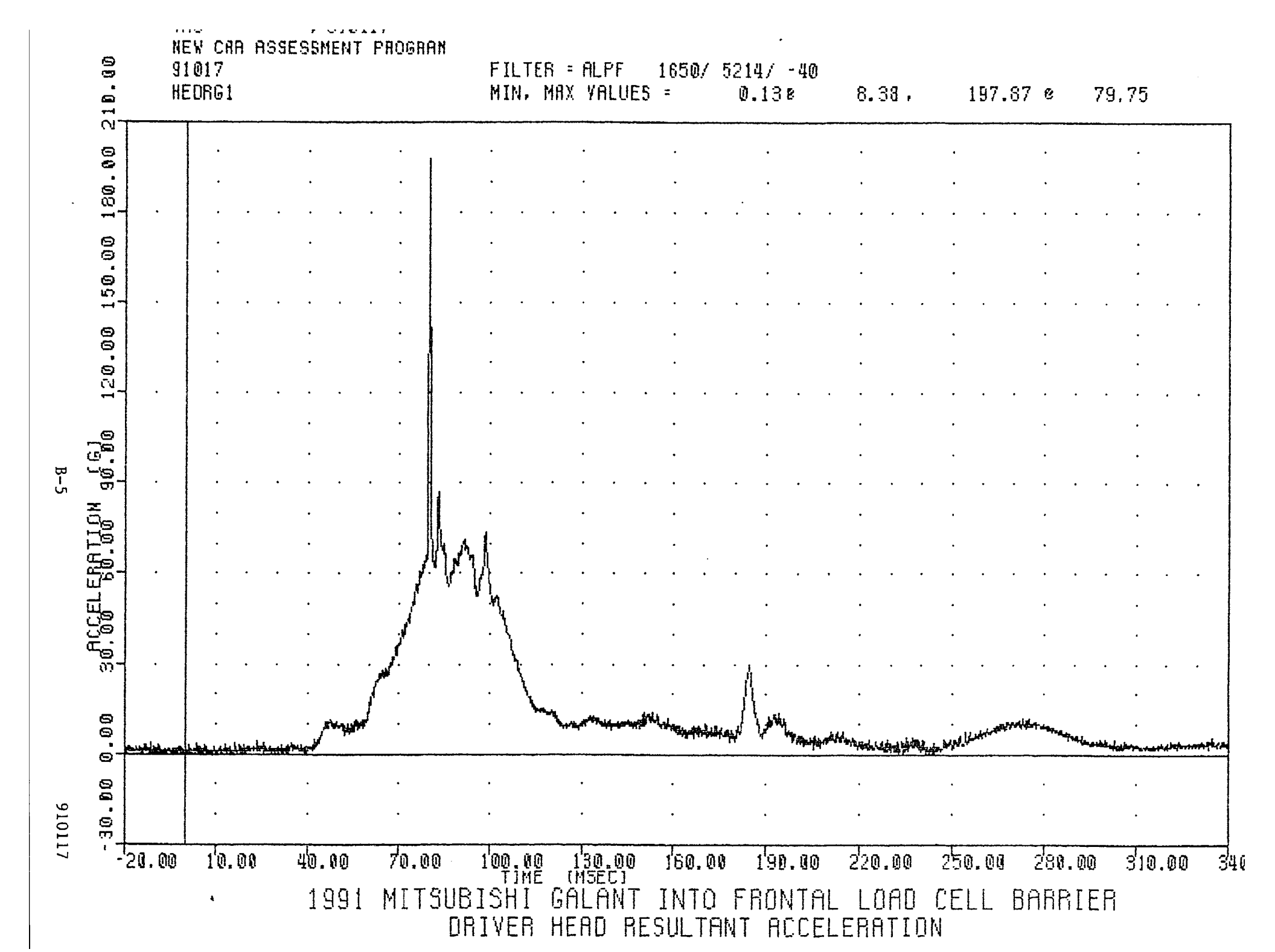


1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Y-AXIS ACCELERATION

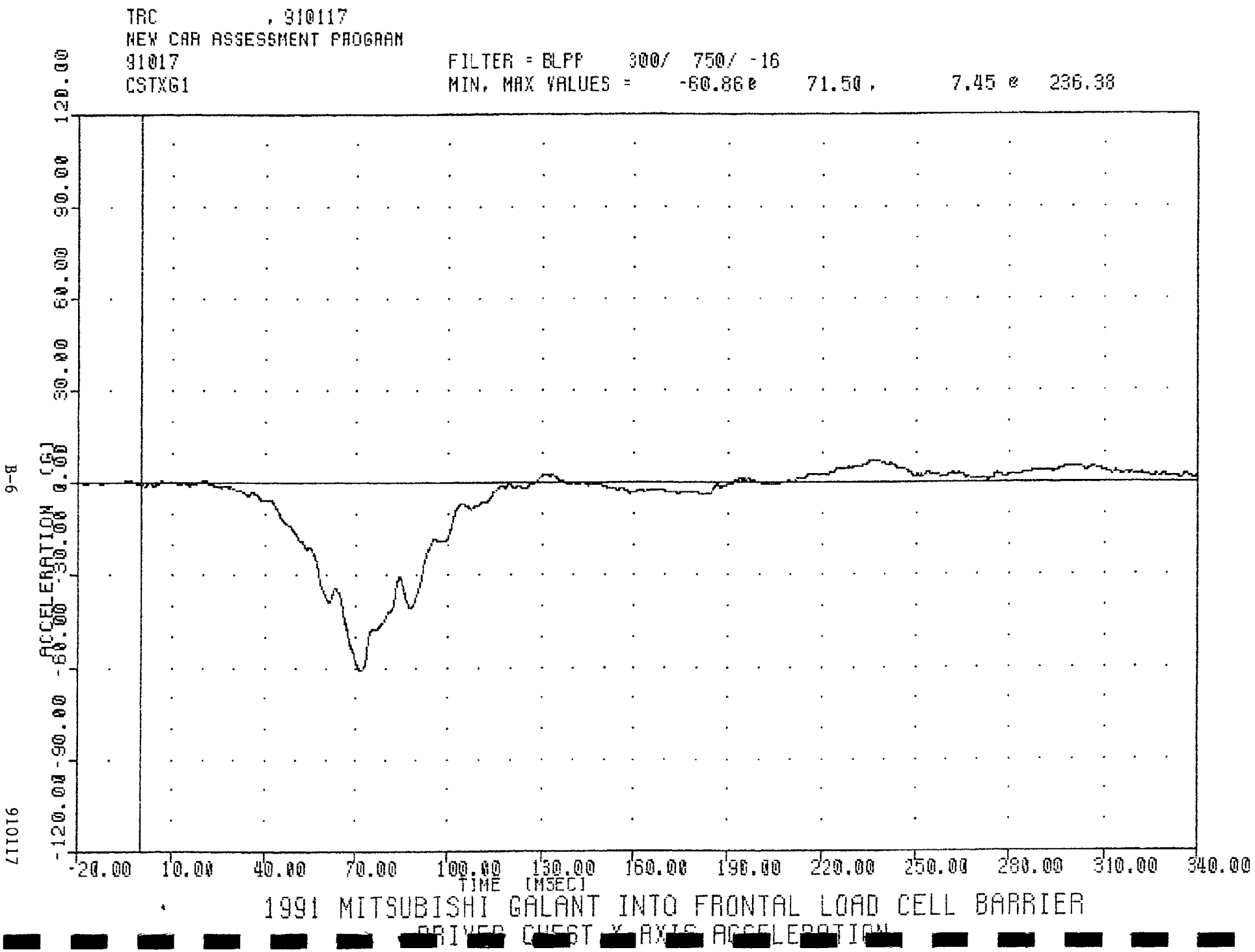


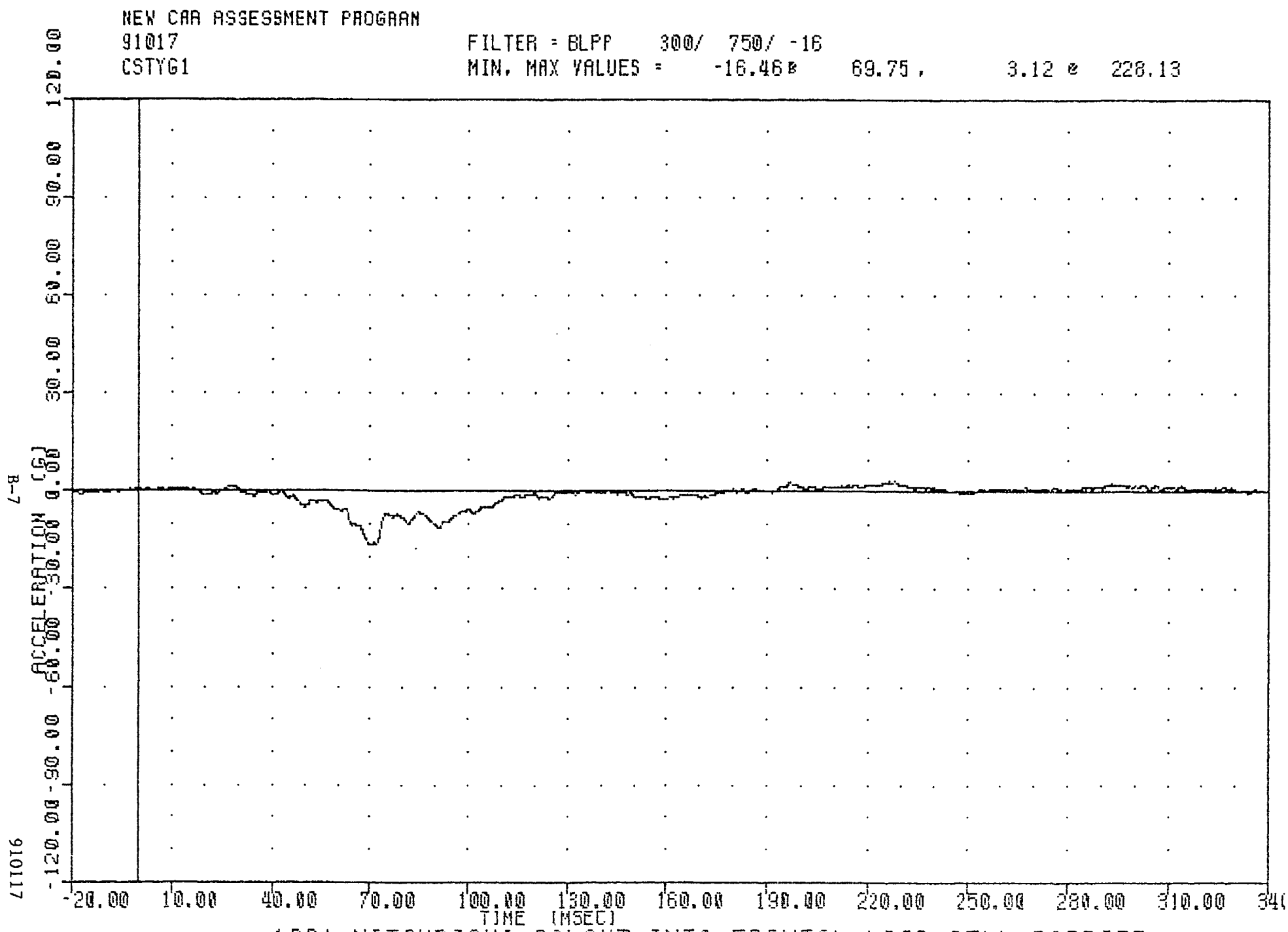
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER

DRIVER HEAD Z-AXIS ACCELERATION



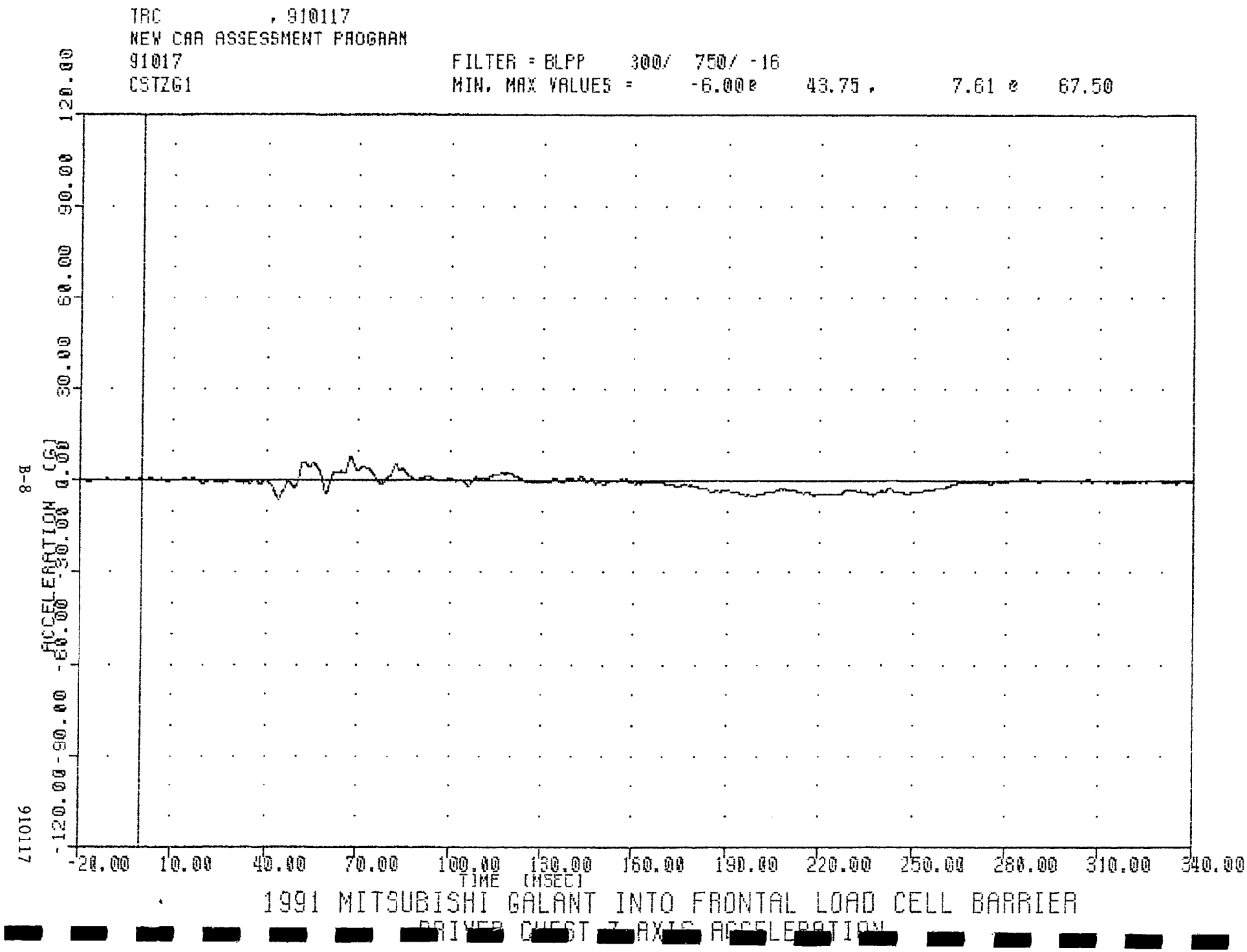
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD RESULTANT ACCELERATION

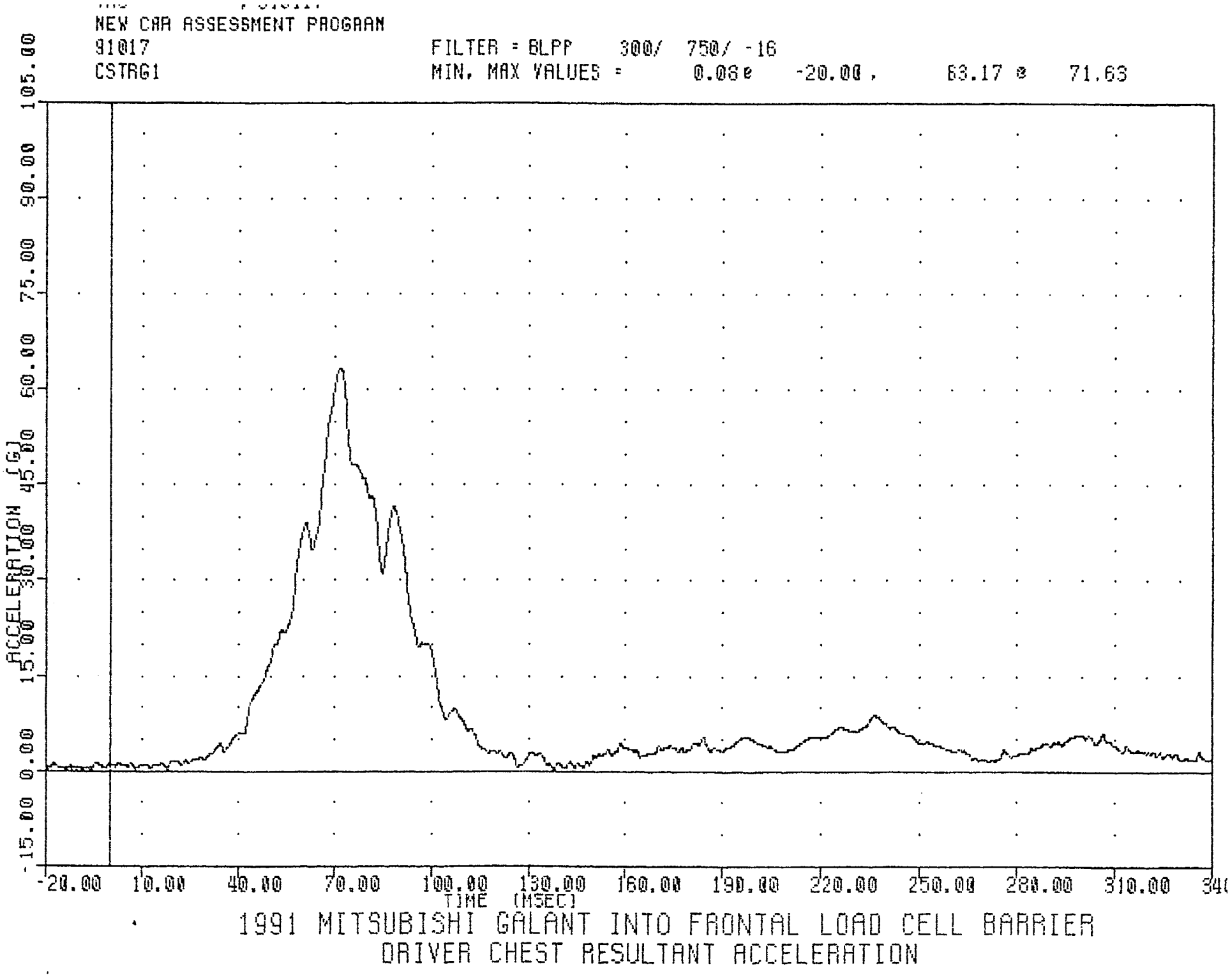

TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
CSTXG1
FILTER = BLPF 300/ 750/ -16
MIN, MAX VALUES = -60.86 @ 71.50 , 7.45 @ 236.38
120.00
90.00
60.00
30.00
0.00
-30.00
-60.00
-90.00
-120.00
ACCELERATION (G)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST X AXIS ACCELERATION

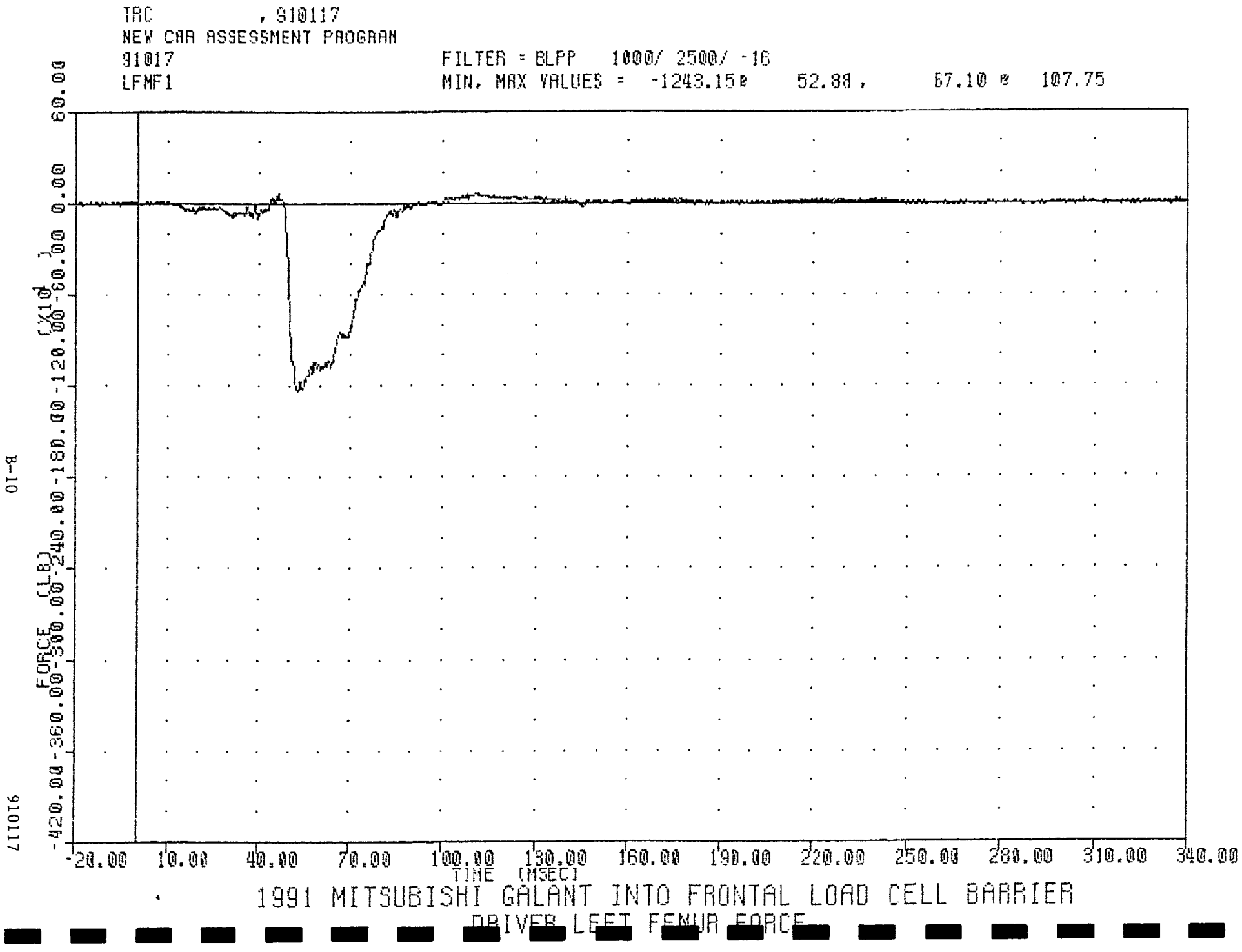


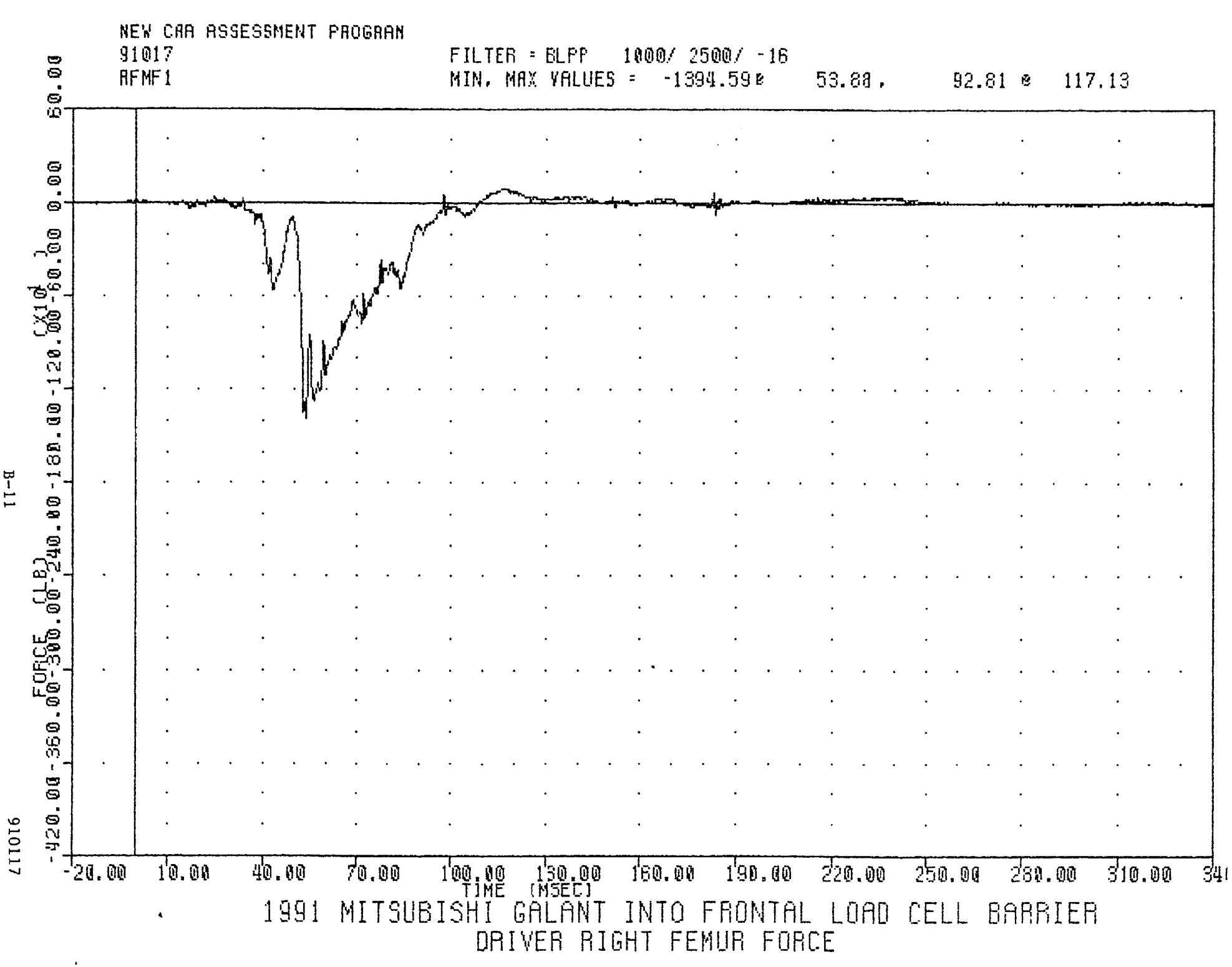
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Y-AXIS ACCELERATION

91011

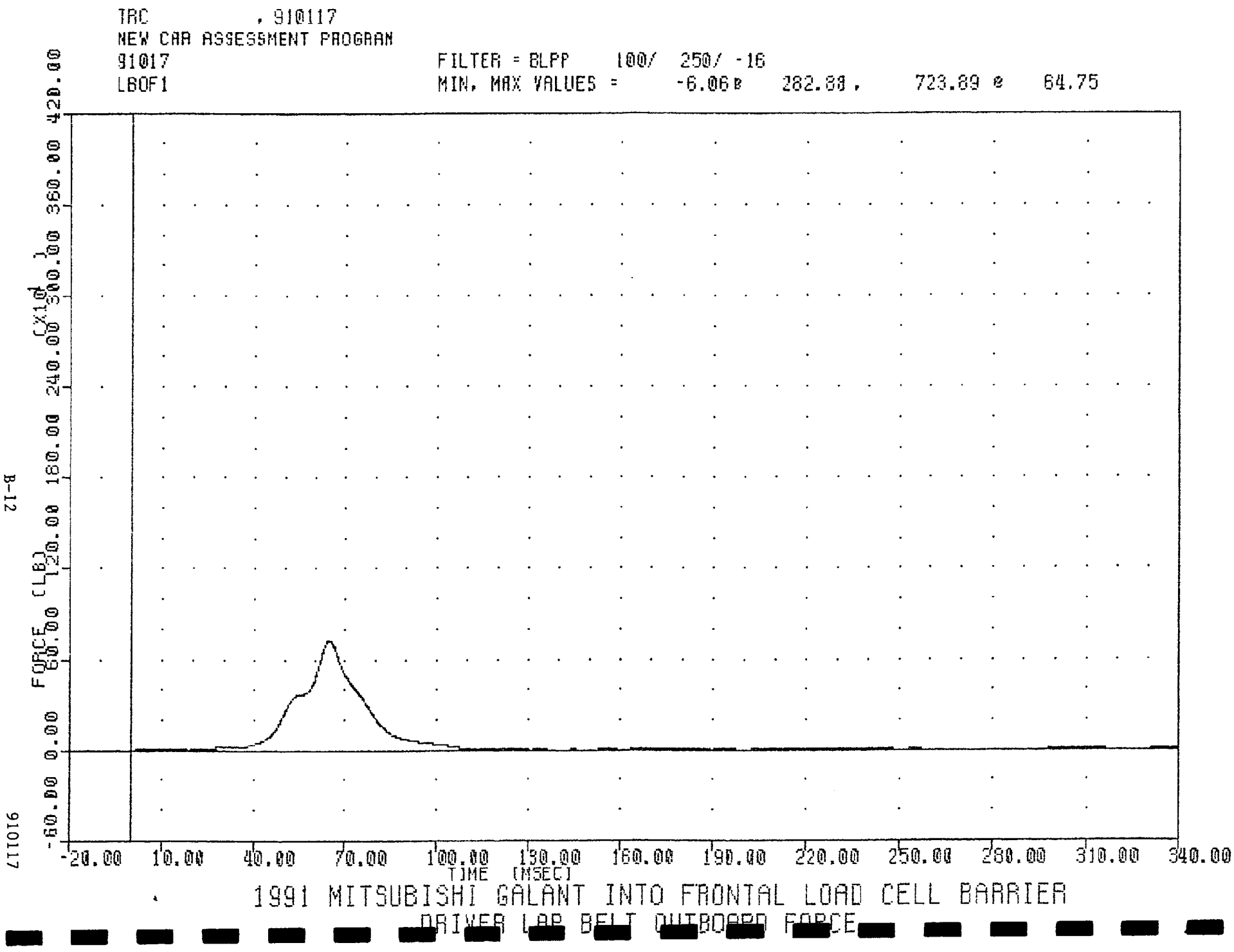

TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
CSTZG1
FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -6.00 @ 43.75 , 7.61 @ 67.50
120.00
90.00
60.00
30.00
0.00
-30.00
-60.00
-90.00
-120.00
ACCELERATION (G)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Z AXIS ACCELERATION


NEW CAR ASSESSMENT PROGRAM
91017
CSTRG1
FILTER = BLPF 300/ 750/ -16
MIN, MAX VALUES = 0.06 @ -20.00 , 63.17 @ 71.63
ACCELERATION [G]
105.00
90.00
75.00
60.00
45.00
30.00
15.00
0.00
-15.00
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST RESULTANT ACCELERATION

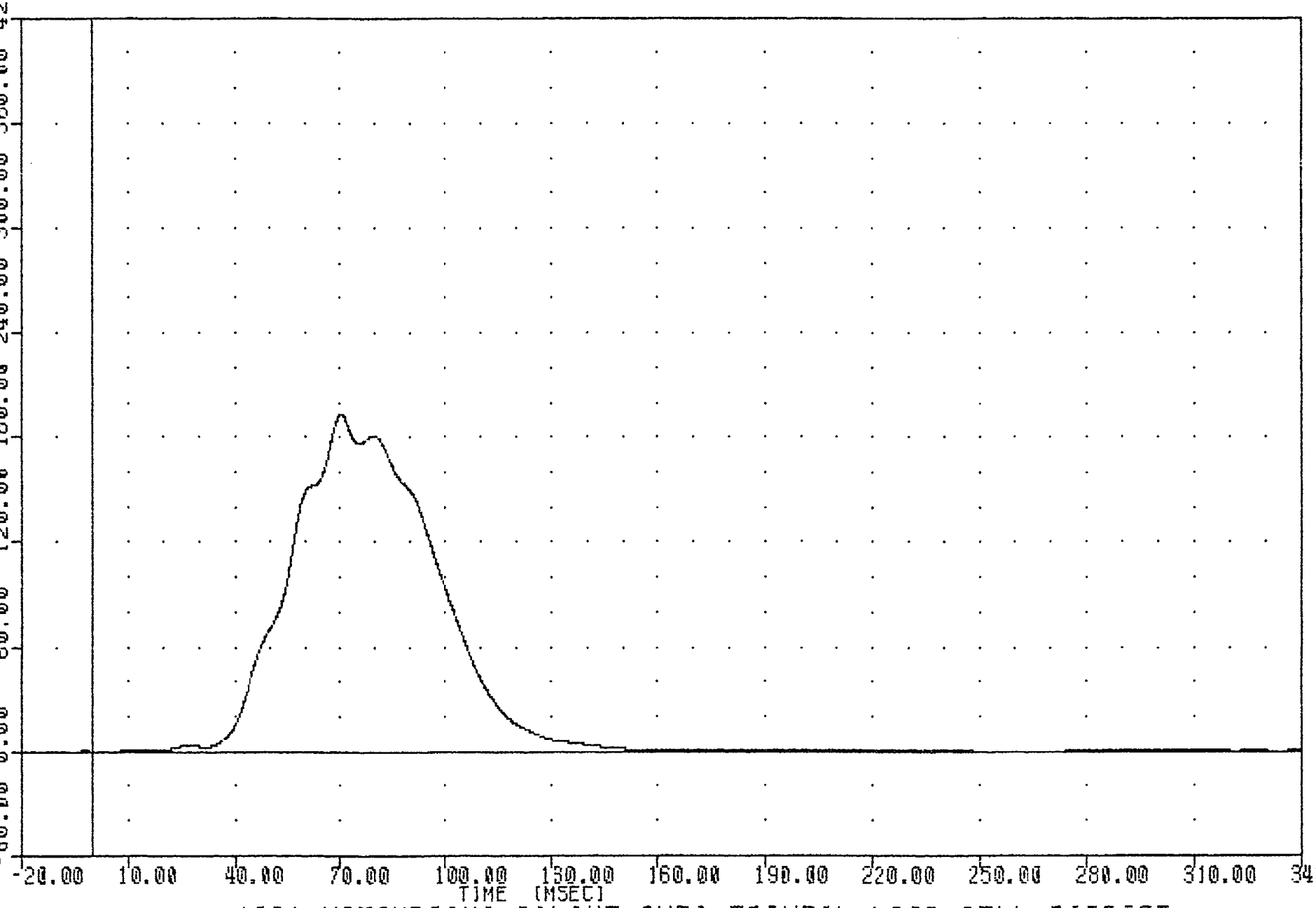

TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
LFMF1
FILTER = BLPP 1000/ 2500/ -16
MIN, MAX VALUES = -1243.15@ 52.88 , 67.10 @ 107.75
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
FORCE (LB)
(X10)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT FEMUR FORCE
B-10
910117



1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FEMUR FORCE

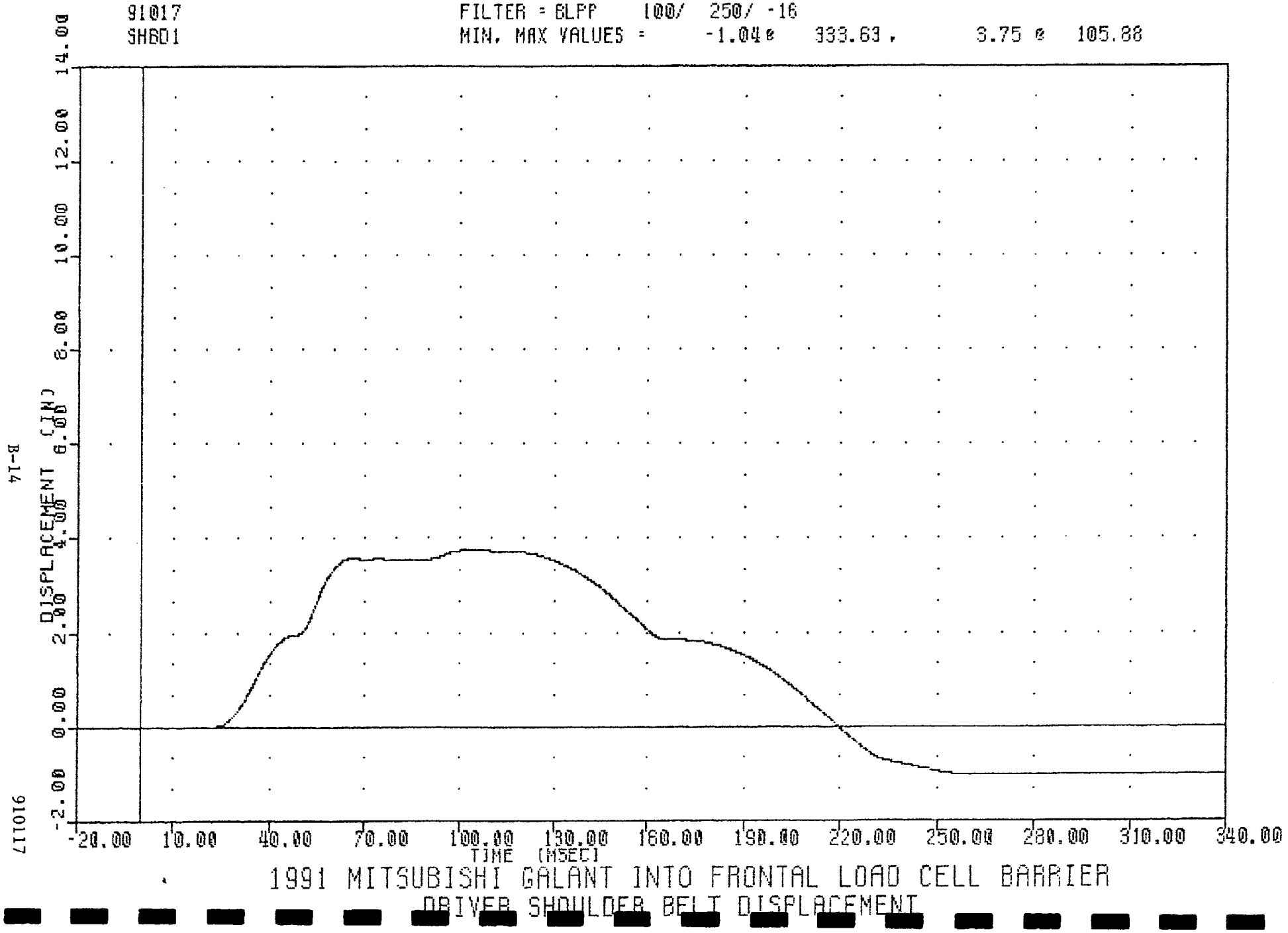

TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
LBOF1
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -6.06 @ 282.88 , 723.89 @ 64.75
FORCE (LB) (X10)
420.00
360.00
300.00
240.00
180.00
120.00
60.00
0.00
-60.00
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
DRIVER LAP BELT OUTBOARD FORCE

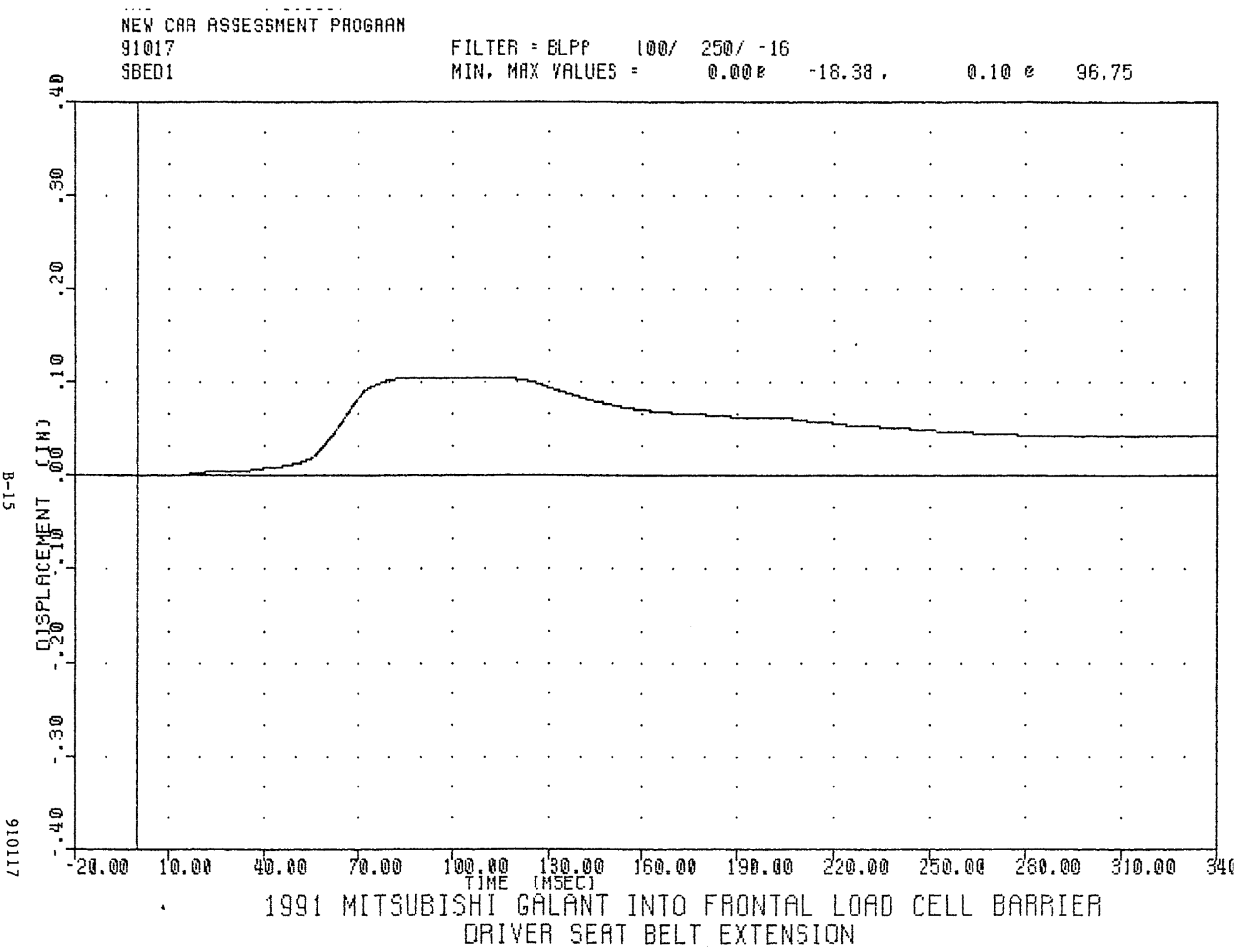
NEW CAR ASSESSMENT PROGRAM
91017
SHBF1
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -1.67 @ -17.13 , 1932.22 @ 70.25



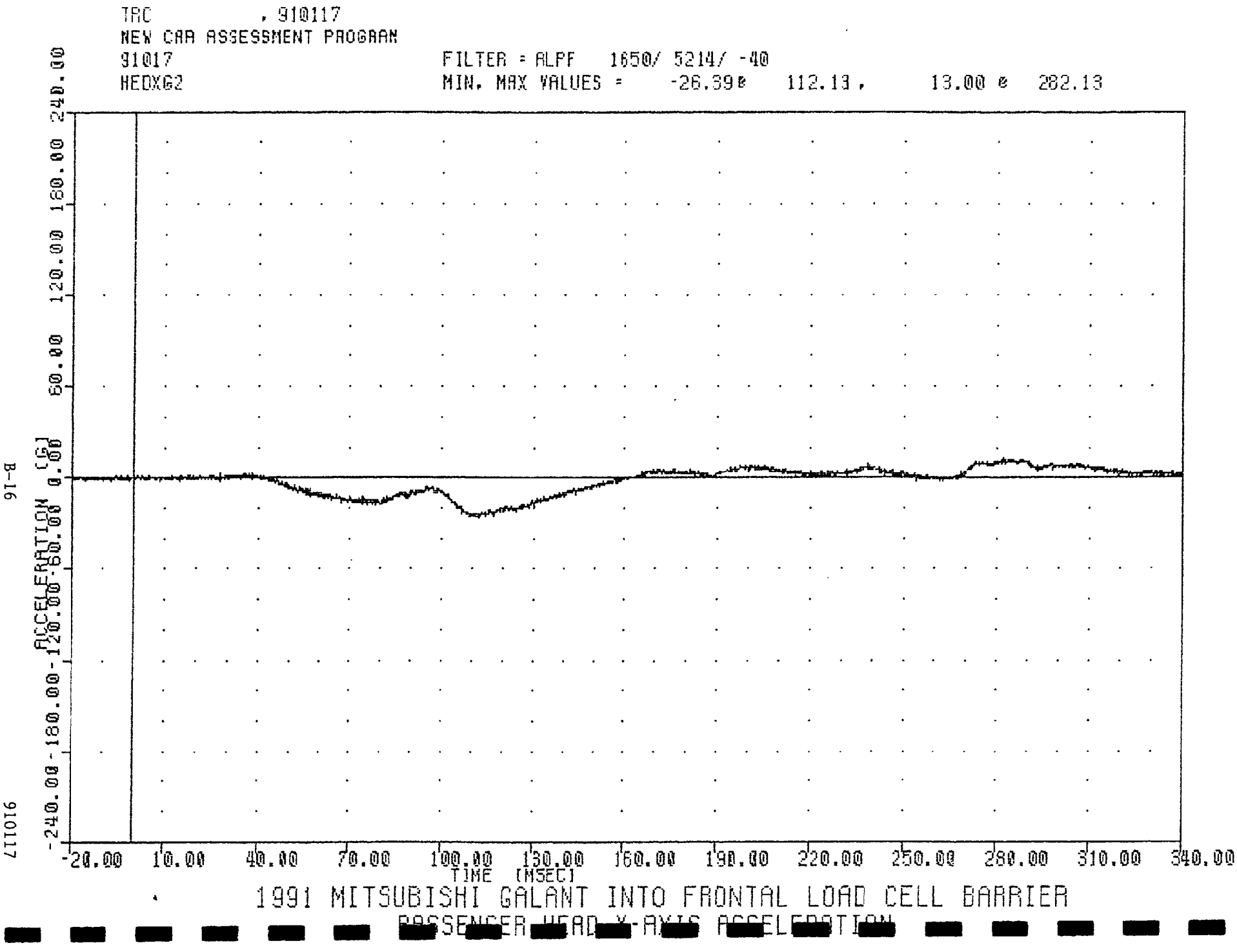
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
DRIVER SHOULDER BELT FORCE

91017


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
SHB01
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -1.04 @ 333.63 , 3.75 @ 105.88
DISPLACEMENT (IN)
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
-2.00
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
DRIVER SHOULDER BELT DISPLACEMENT



1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
DRIVER SEAT BELT EXTENSION

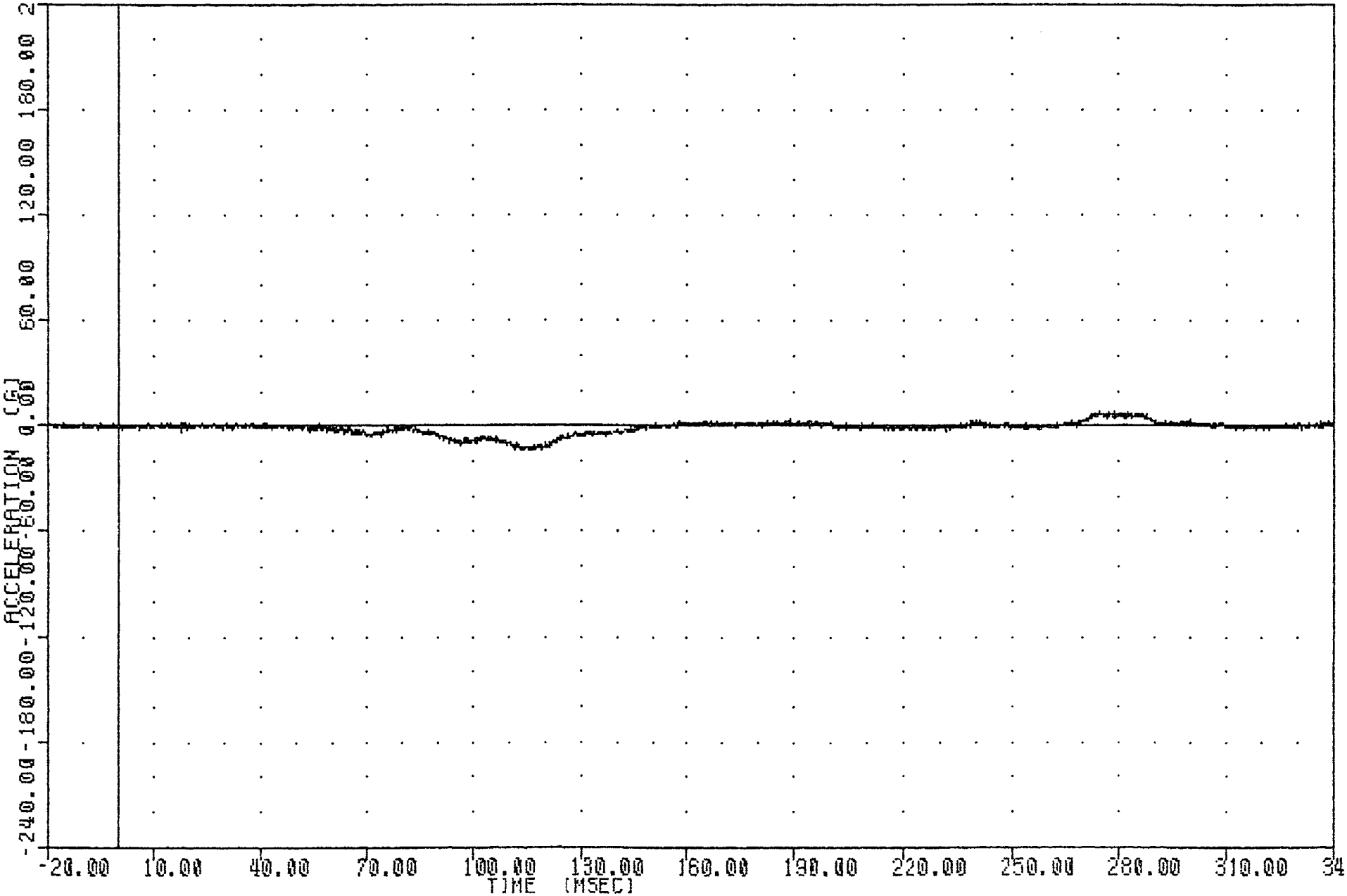


1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER

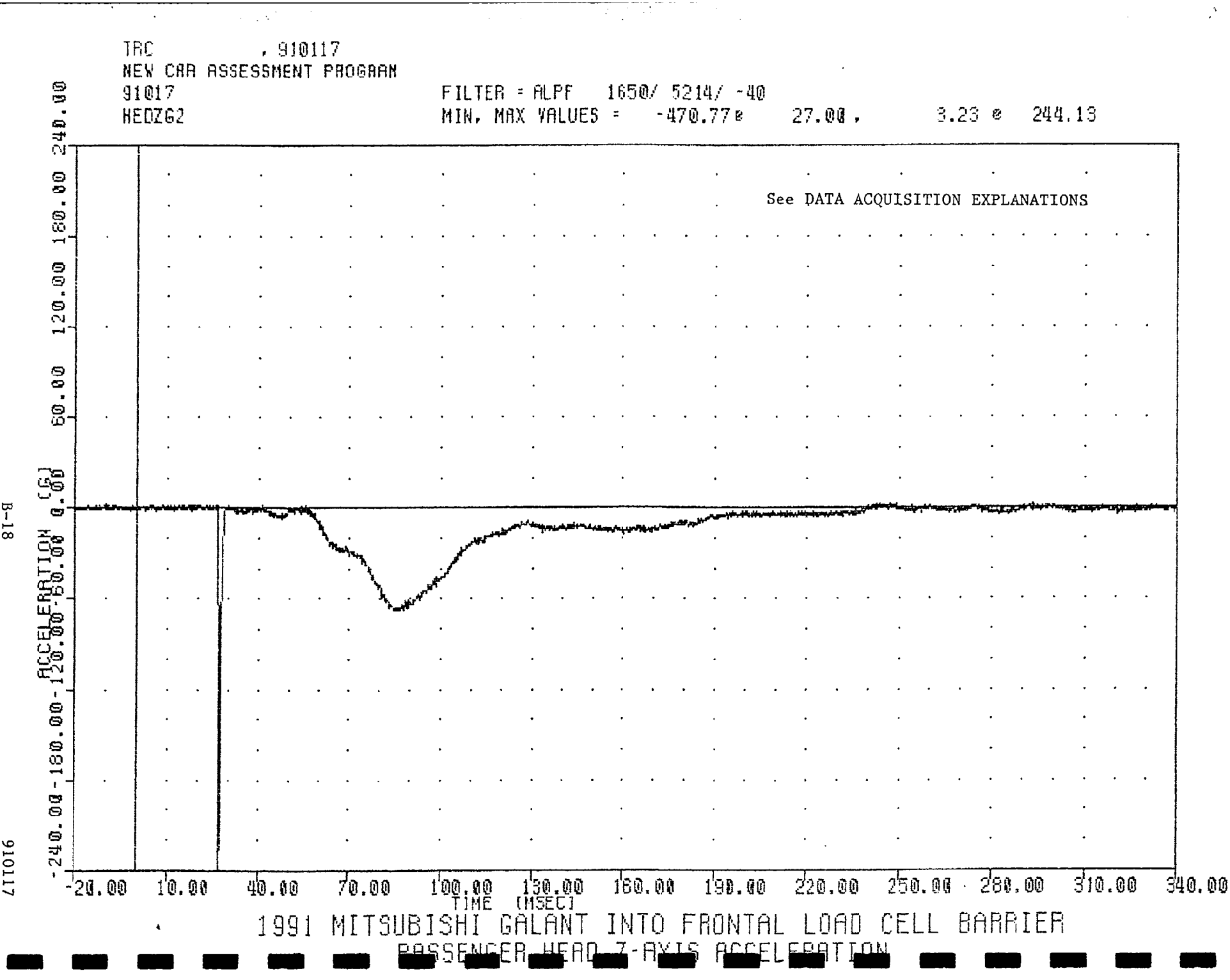
PASSENGER HEAD X-AXIS ACCELERATION

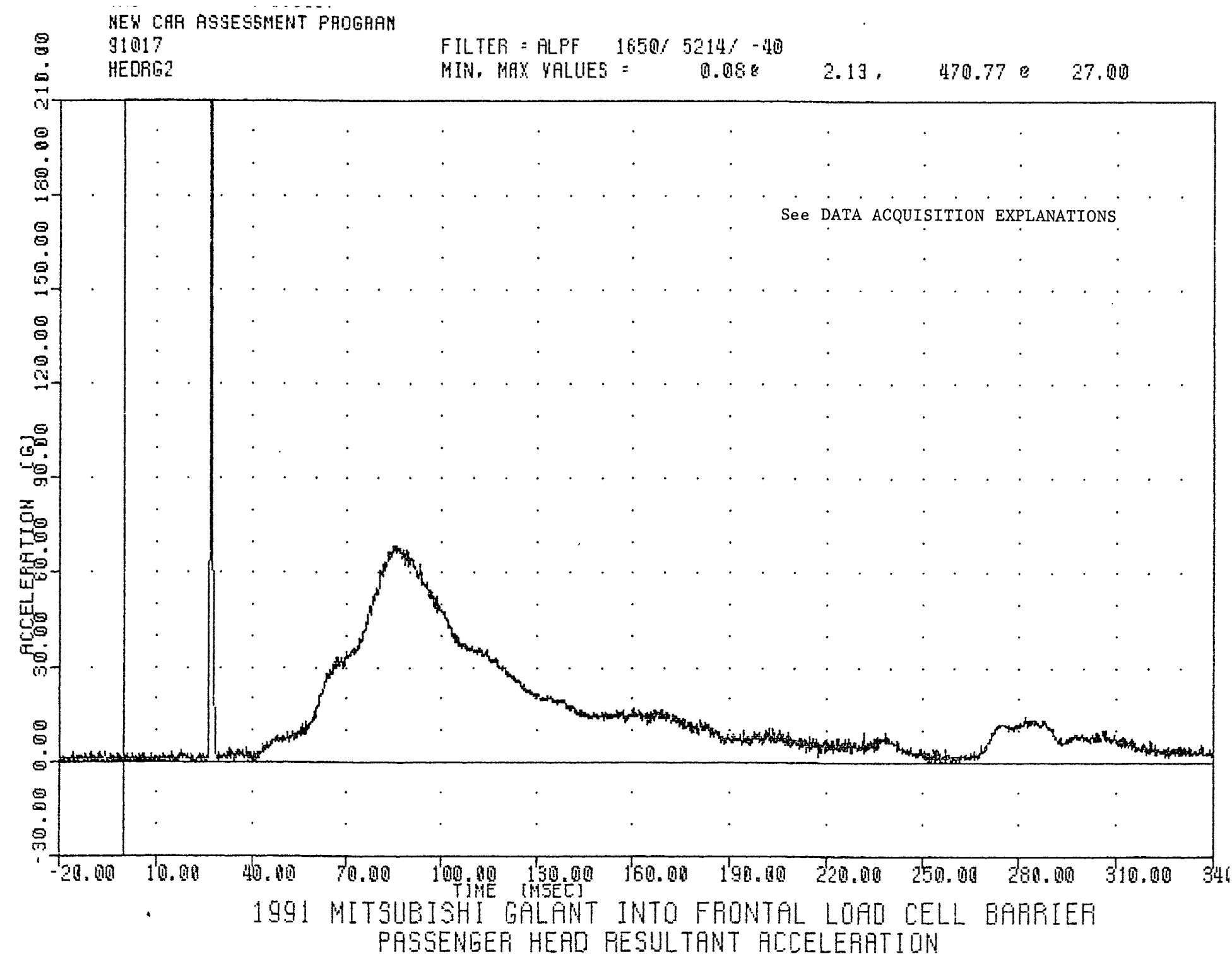
NEW CAR ASSESSMENT PROGRAM
91017
HEDYG2

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -14.27@ 116.38, 8.23 @ 278.63

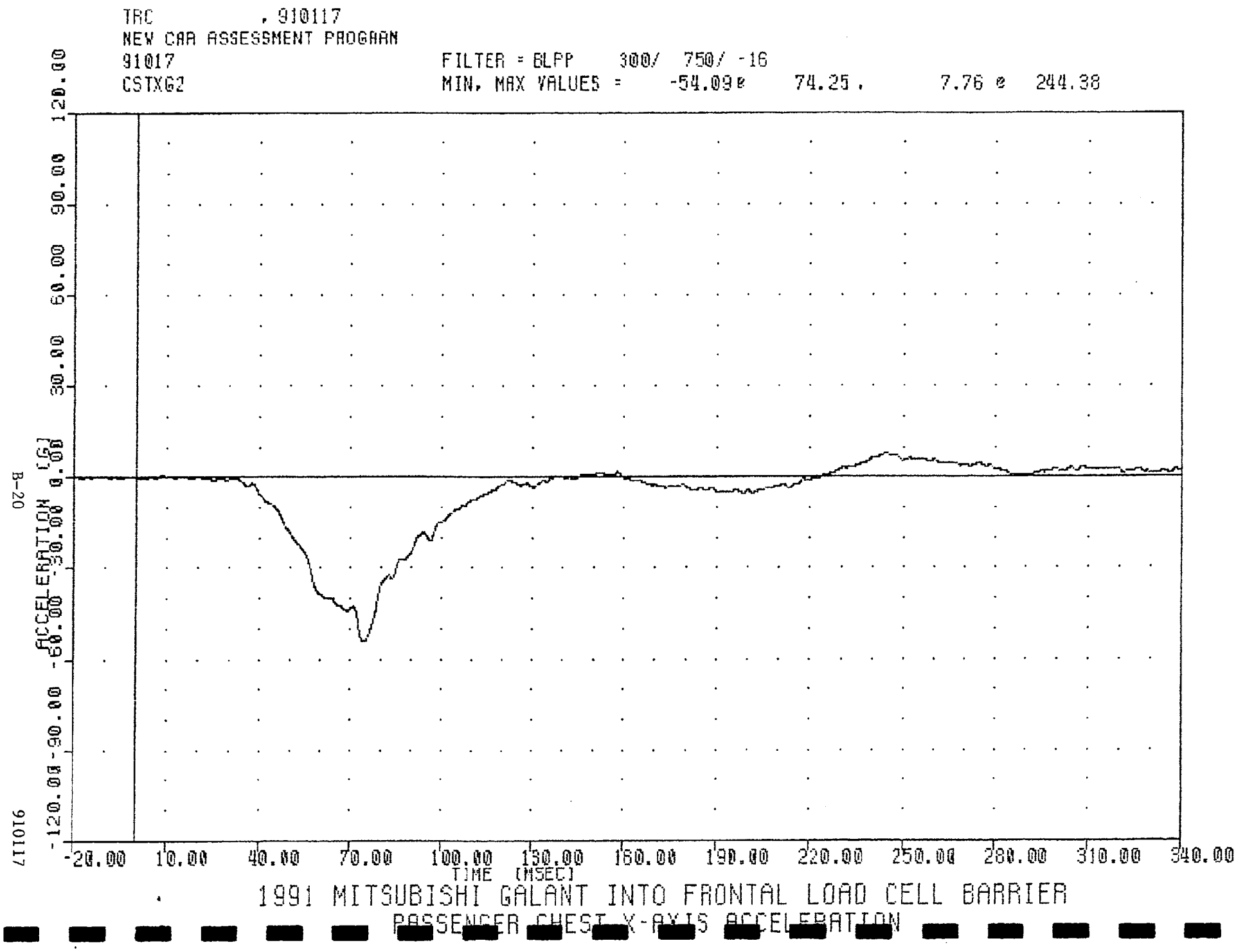


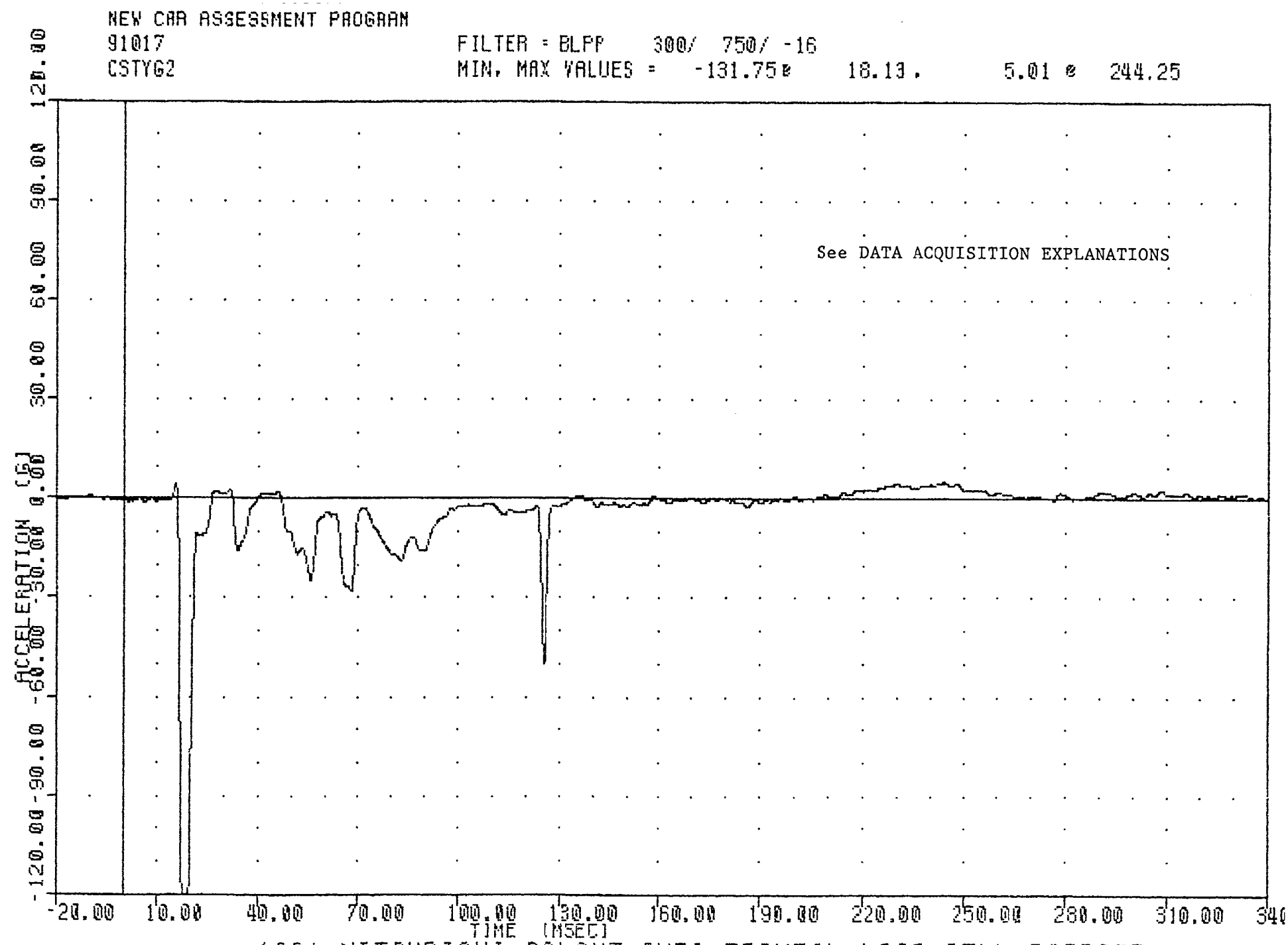
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Y-AXIS ACCELERATION


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
HEDZG2
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -470.77 @ 27.00 , 3.23 @ 244.13
See DATA ACQUISITION EXPLANATIONS
240.00
180.00
120.00
60.00
0.00
-60.00
-120.00
-180.00
-240.00
ACCELERATION (G)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Z-AXIS ACCELERATION

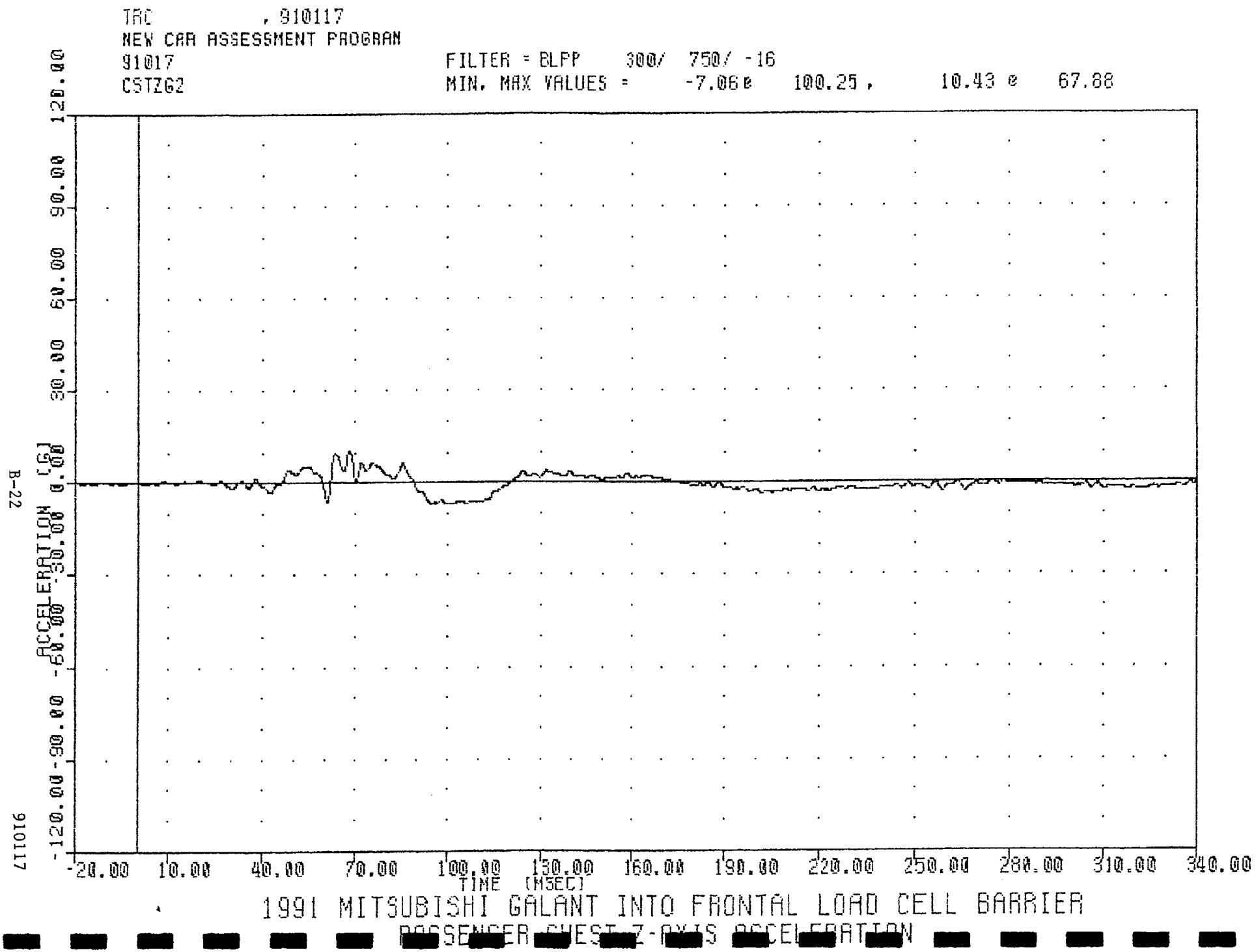


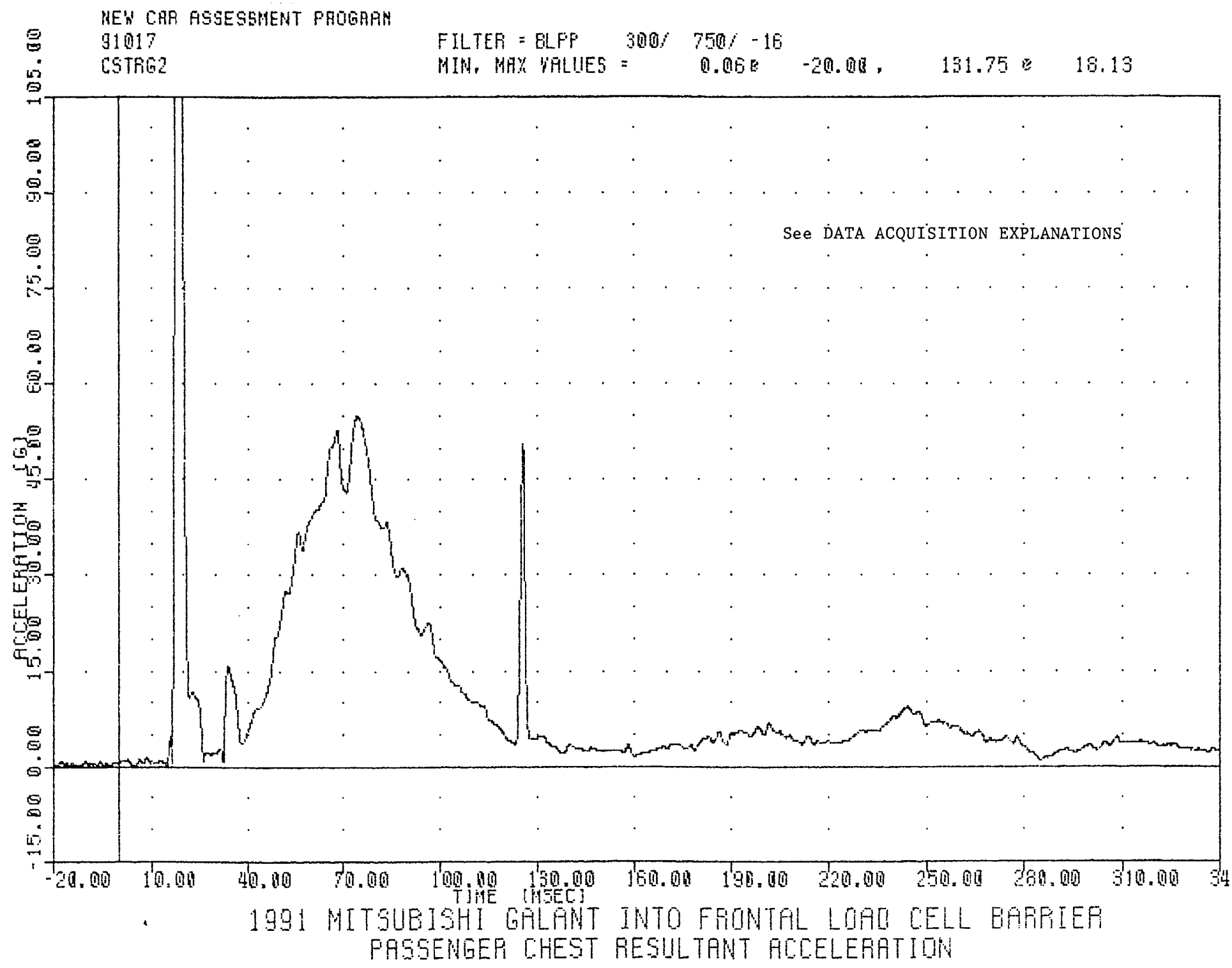
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
CSTXG2
FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -54.09 @ 74.25 , 7.76 @ 244.38
120.00
90.00
60.00
30.00
0.00
-30.00
-60.00
-90.00
-120.00
ACCELERATION [G]
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST X-AXIS ACCELERATION

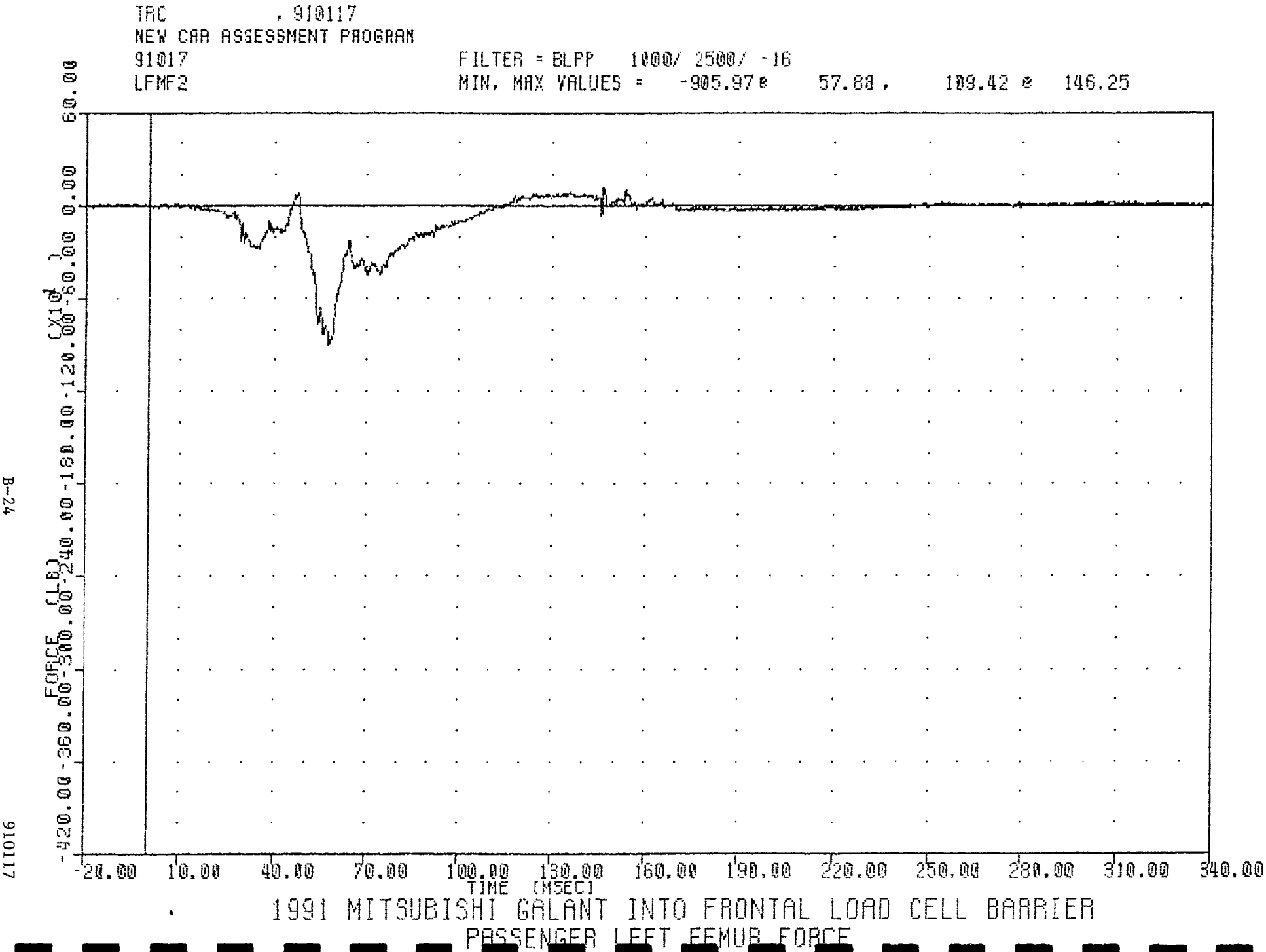


1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Y-AXIS ACCELERATION

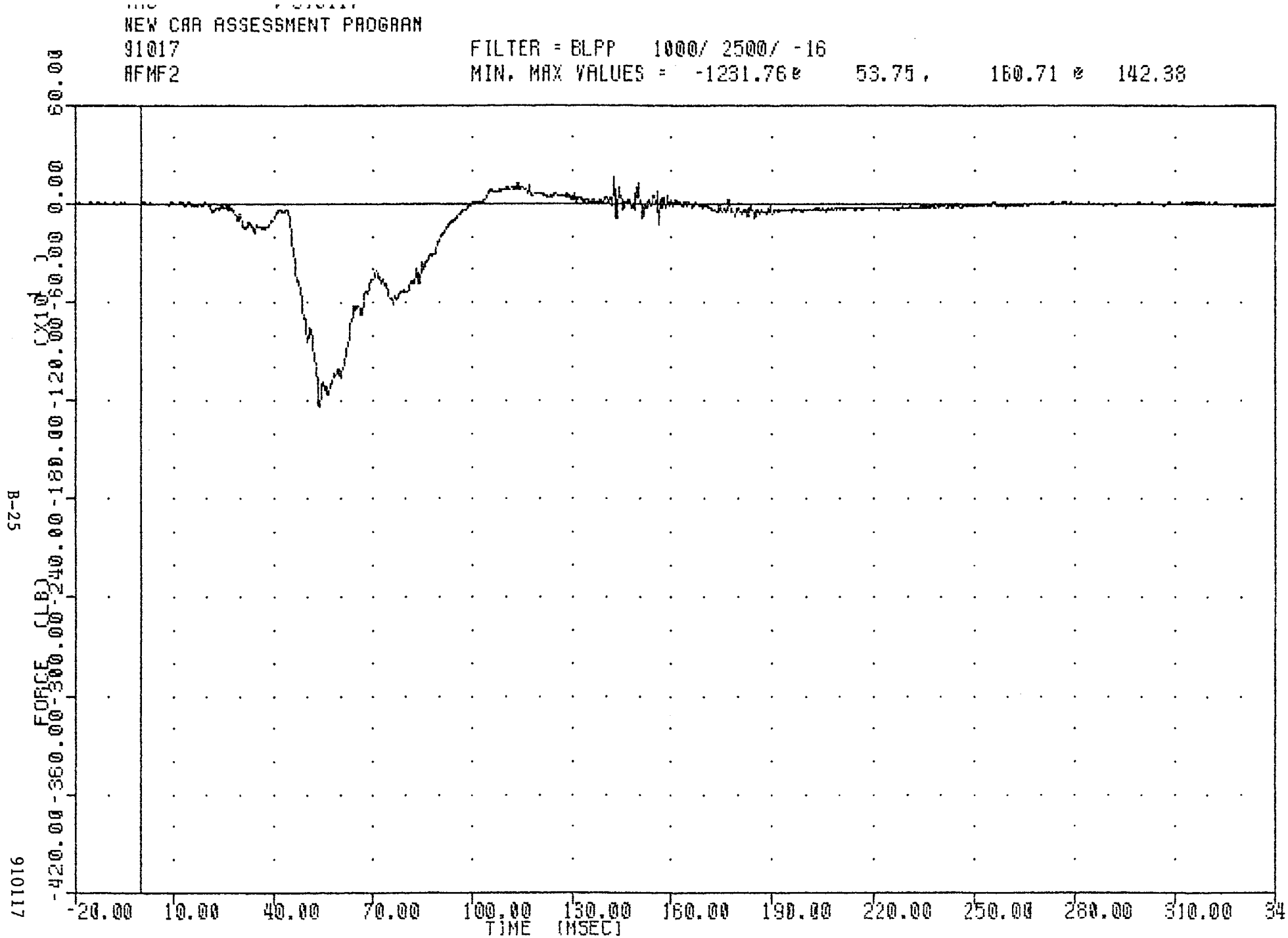

TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
CSTZG2
FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -7.06 @ 100.25 , 10.43 @ 67.88
120.00
90.00
60.00
30.00
0.00
-30.00
-60.00
-90.00
-120.00
ACCELERATION (G)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Z-AXIS ACCELERATION
B-22
910117



1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST RESULTANT ACCELERATION

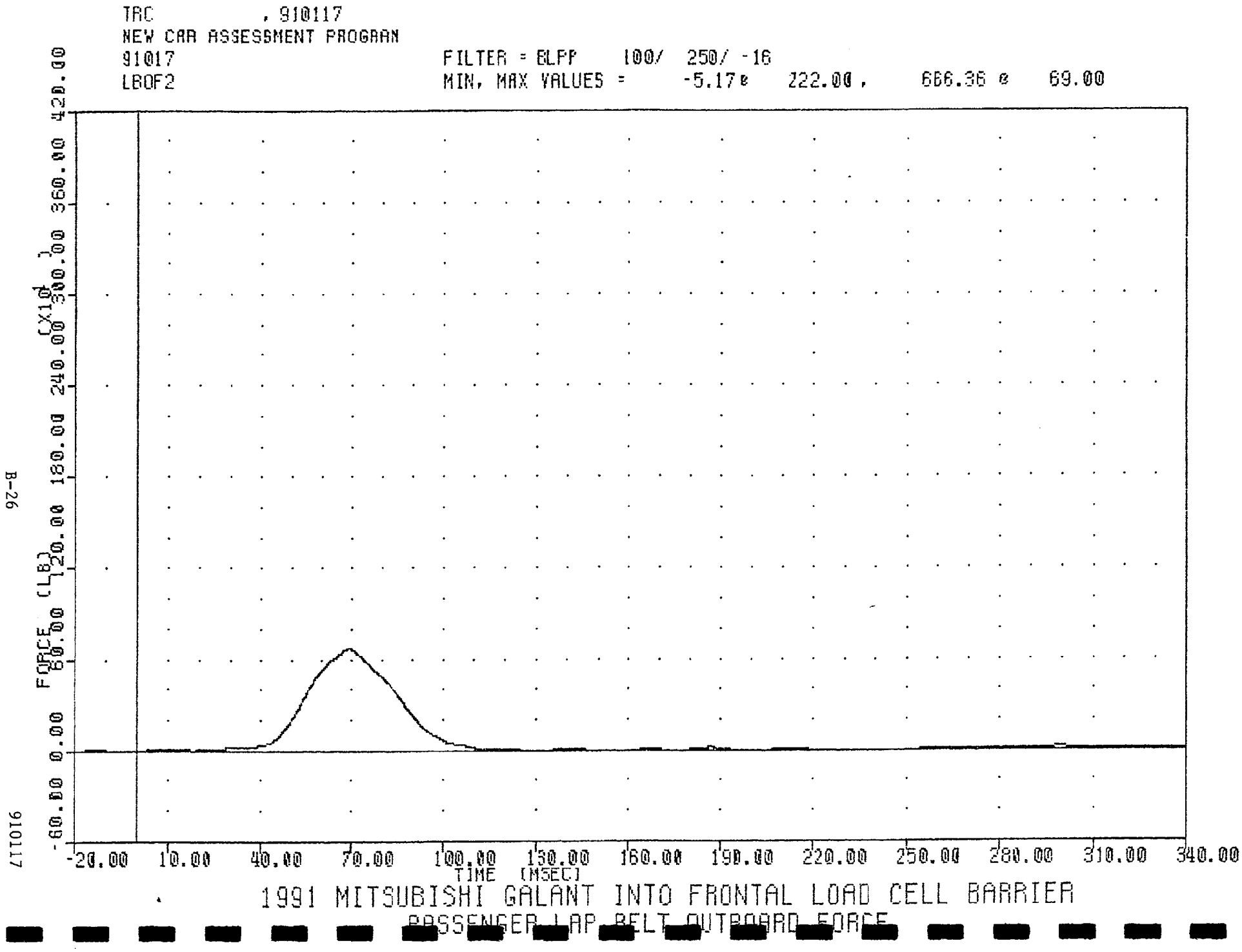


1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FEMUR FORCE



1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FEMUR FORCE

91017



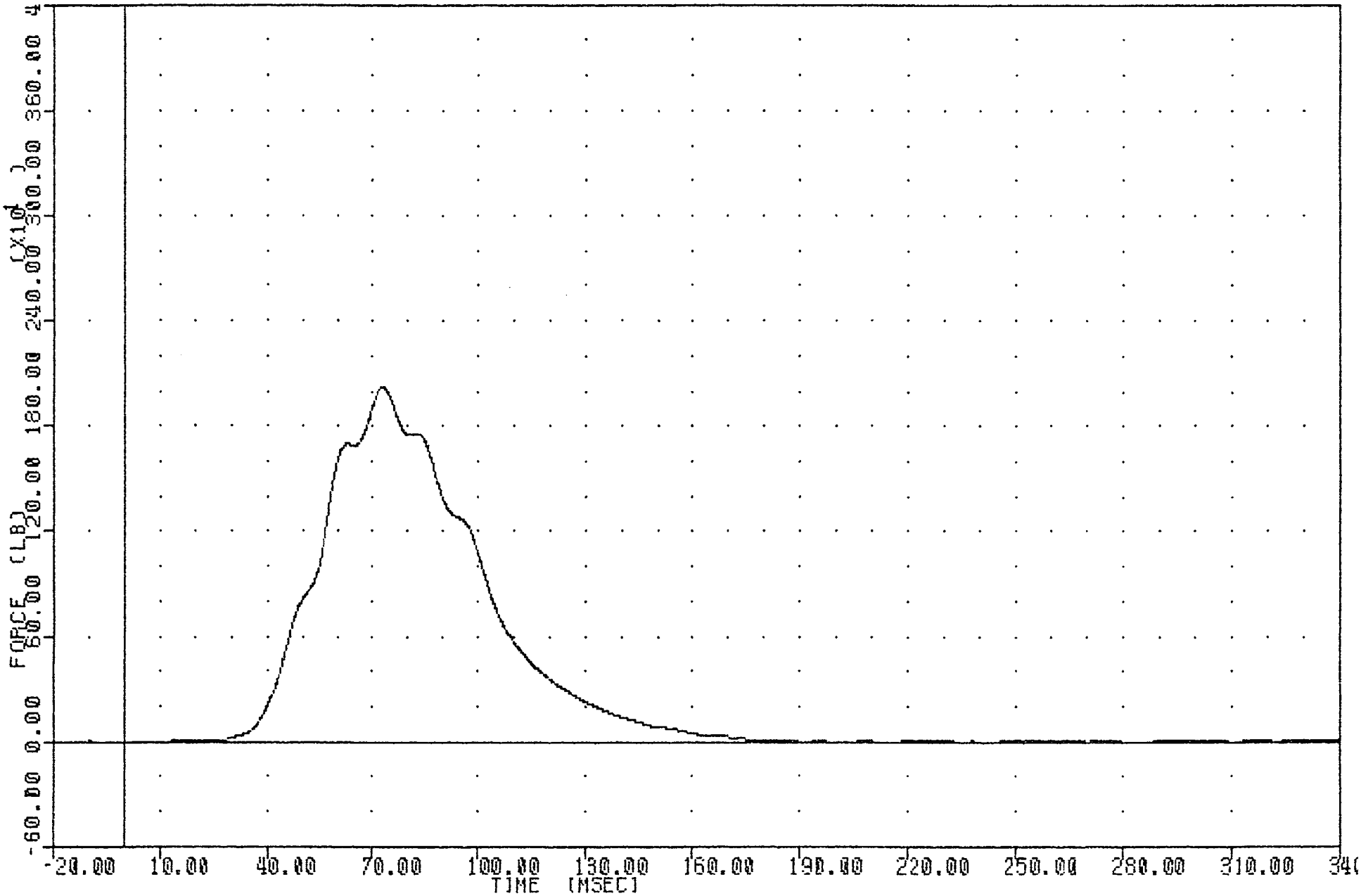
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER

PASSENGER LAP BELT OUTBOARD FORCE

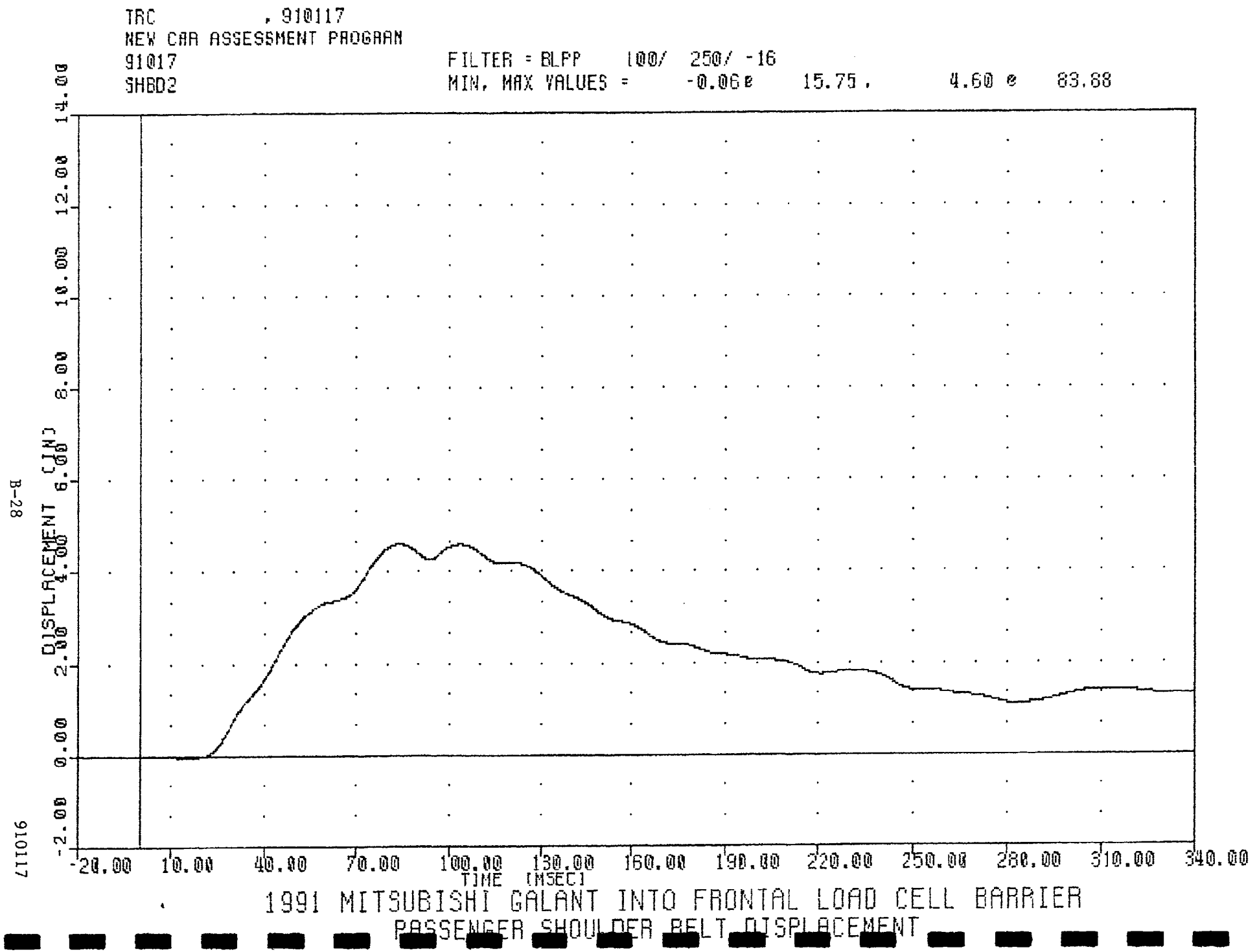
910117

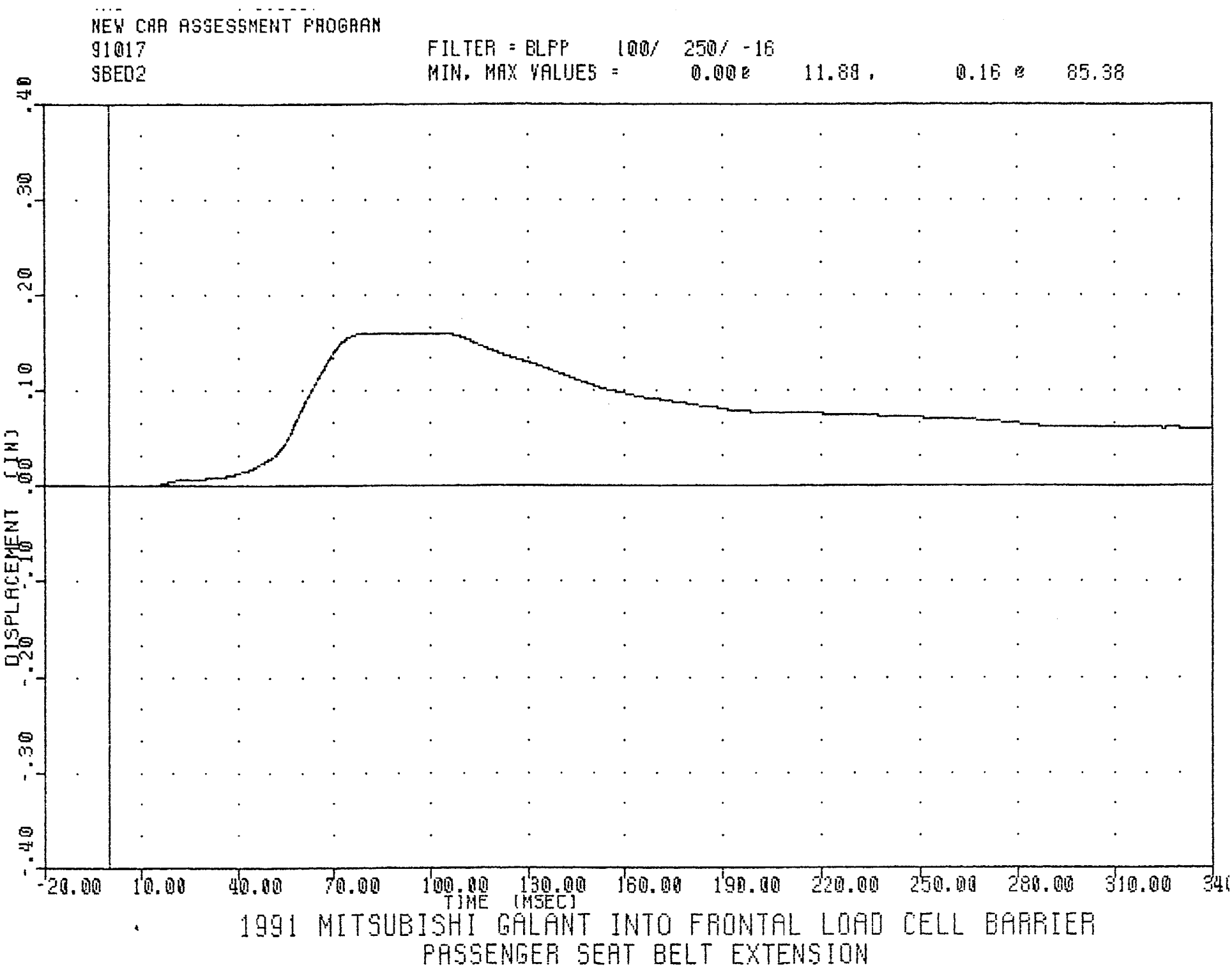
NEW CAR ASSESSMENT PROGRAM
91017
SHBF2

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -2.19 @ 9.63 , 2021.35 @ 72.88

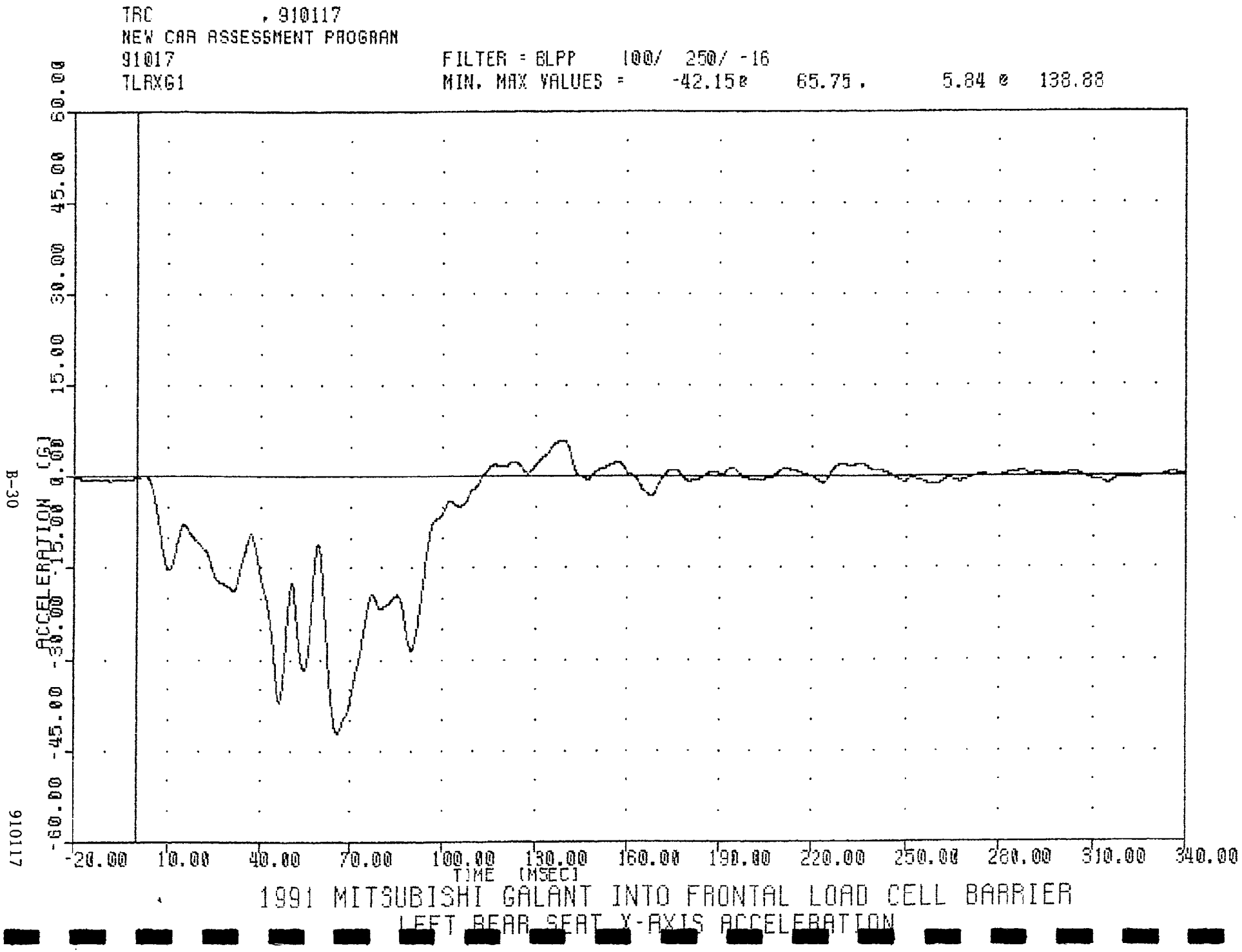


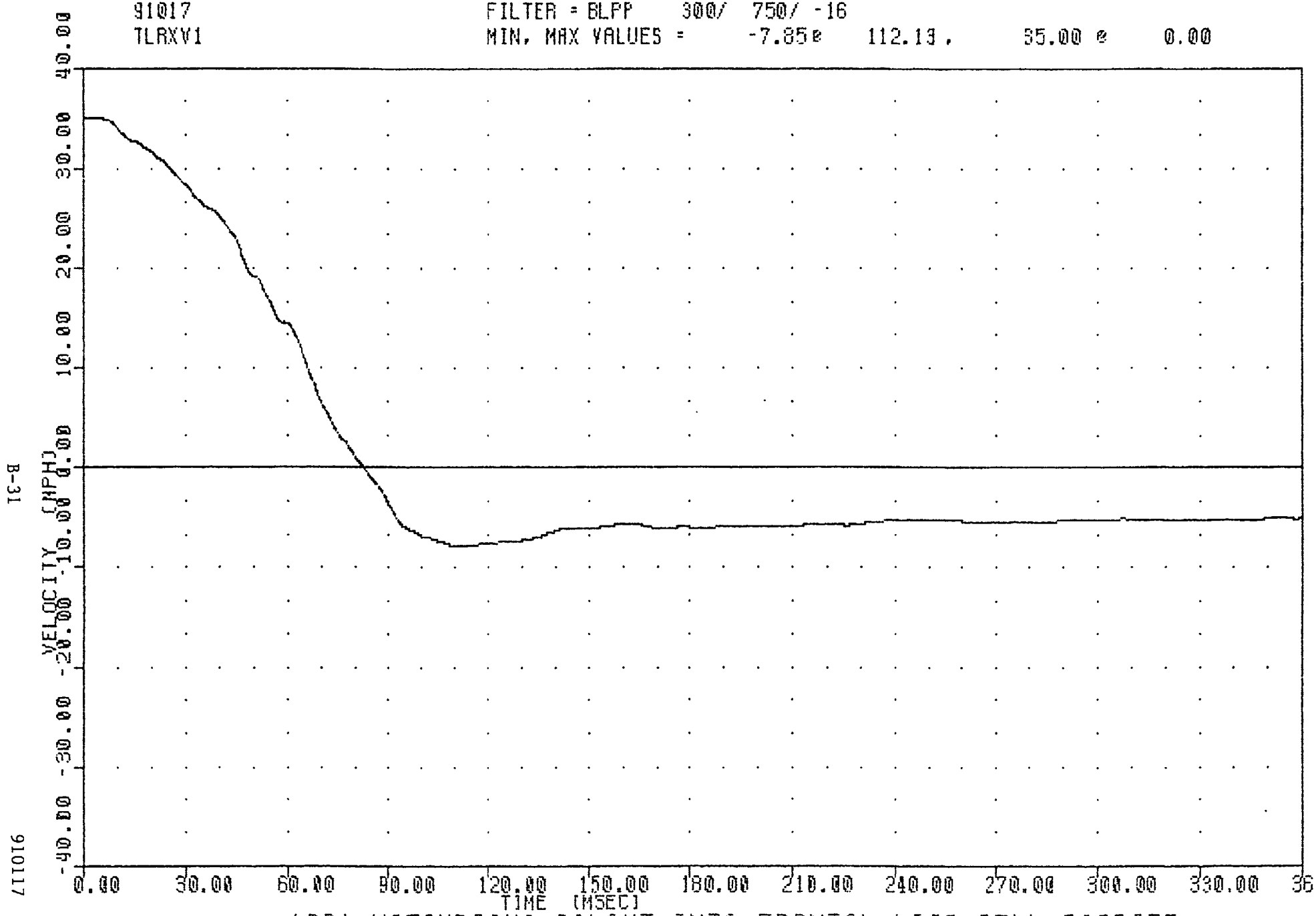
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT FORCE


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
SHBD2
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -0.06 @ 15.75 , 4.60 @ 83.88
DISPLACEMENT (IN)
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
-2.00
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT DISPLACEMENT

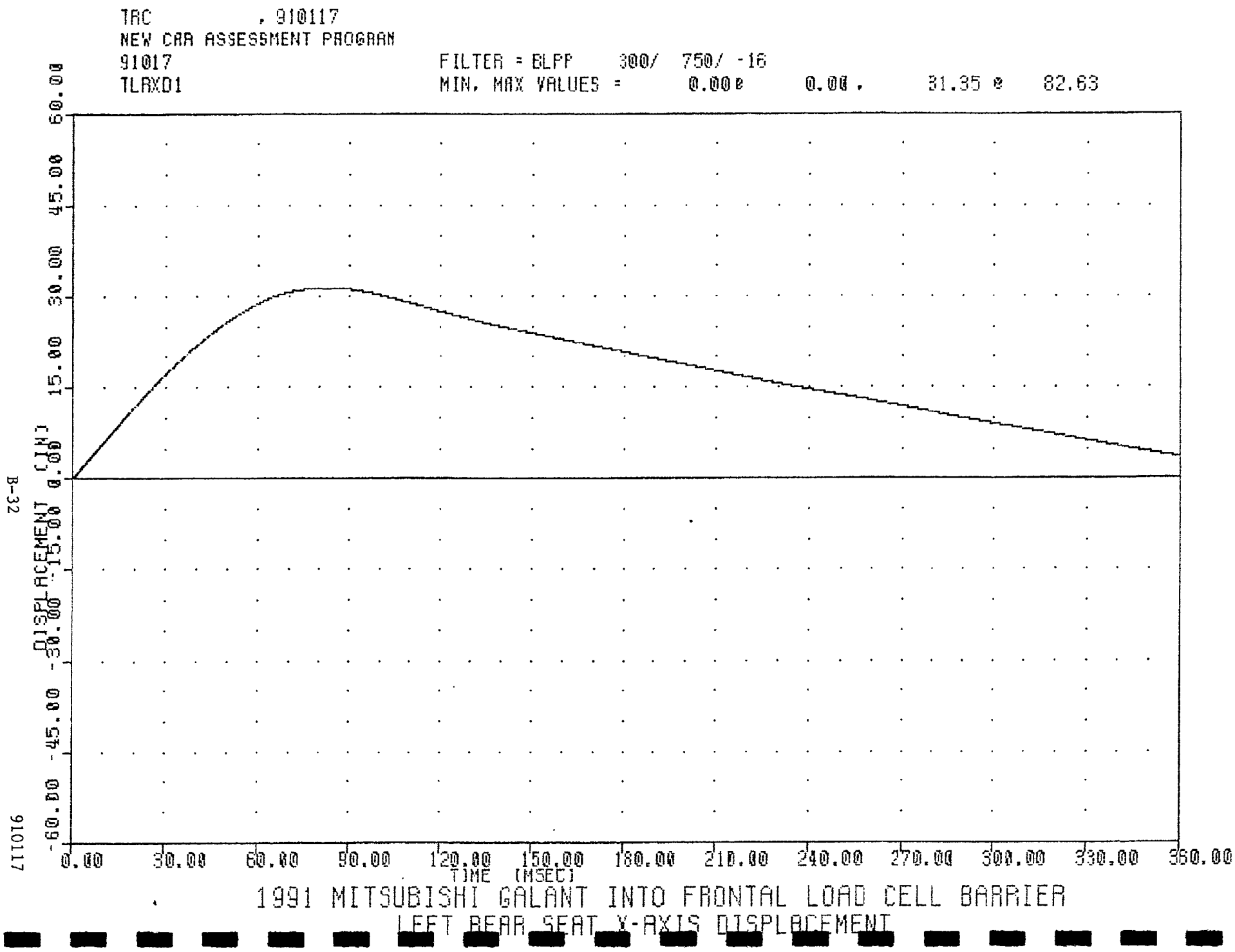


1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
PASSENGER SEAT BELT EXTENSION


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
TLRXG1
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -42.15 @ 65.75 , 5.84 @ 138.88
60.00
45.00
30.00
15.00
0.00
-15.00
-30.00
-45.00
-60.00
ACCELERATION (G)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT Y-AXIS ACCELERATION

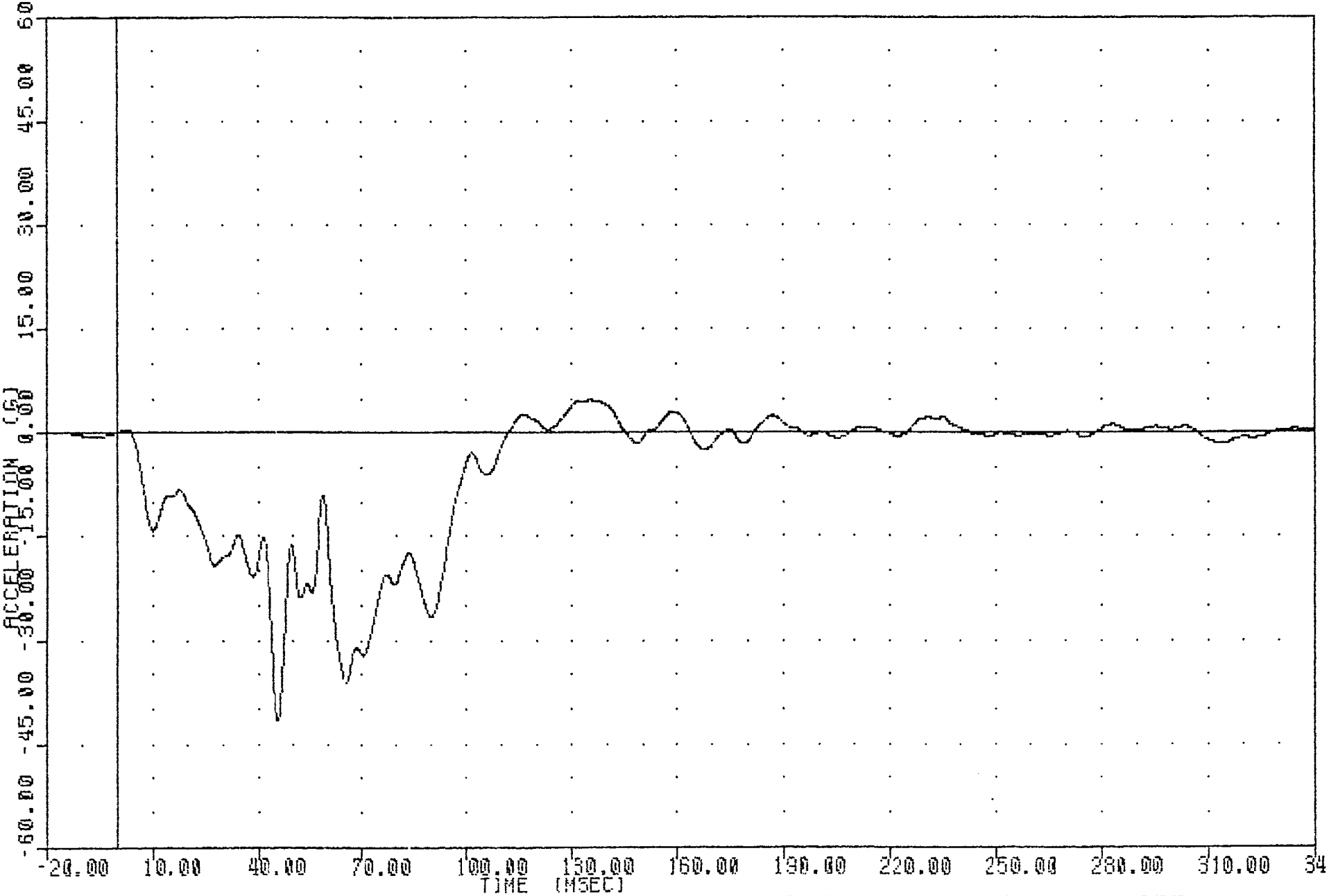


1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS VELOCITY

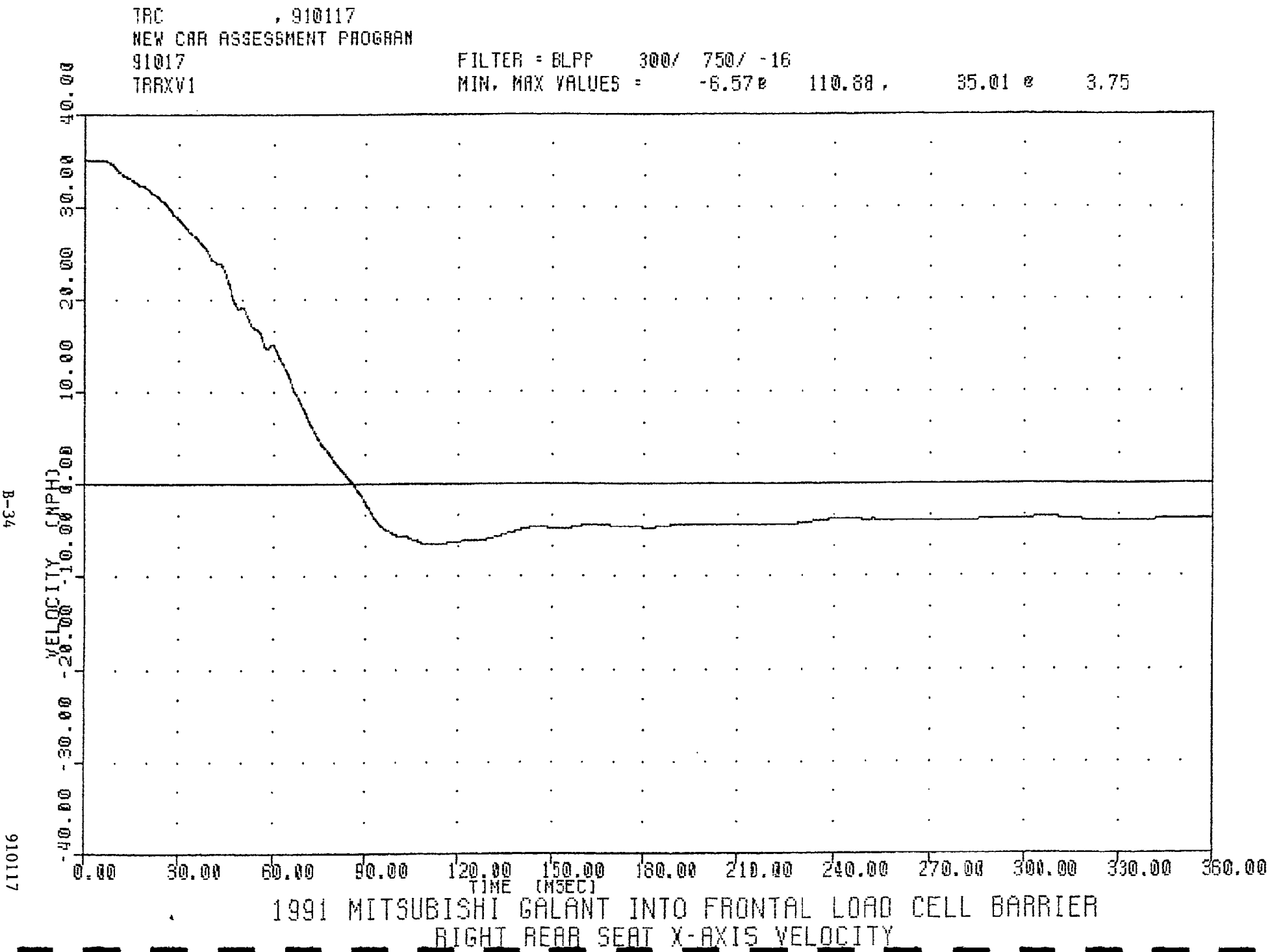

TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
TLRXD1
FILTER = BLPF 300/ 750/ -16
MIN, MAX VALUES = 0.000 0.00 , 31.35 @ 82.63
60.00
45.00
30.00
15.00
0.00
-15.00
-30.00
-45.00
-60.00
DISPLACEMENT (IN)
0.00
30.00
60.00
90.00
120.00
150.00
180.00
210.00
240.00
270.00
300.00
330.00
360.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS DISPLACEMENT

NEW CAR ASSESSMENT PROGRAM
91017
TRRXG1

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -41.72@ 45.75, 4.73 @ 135.25

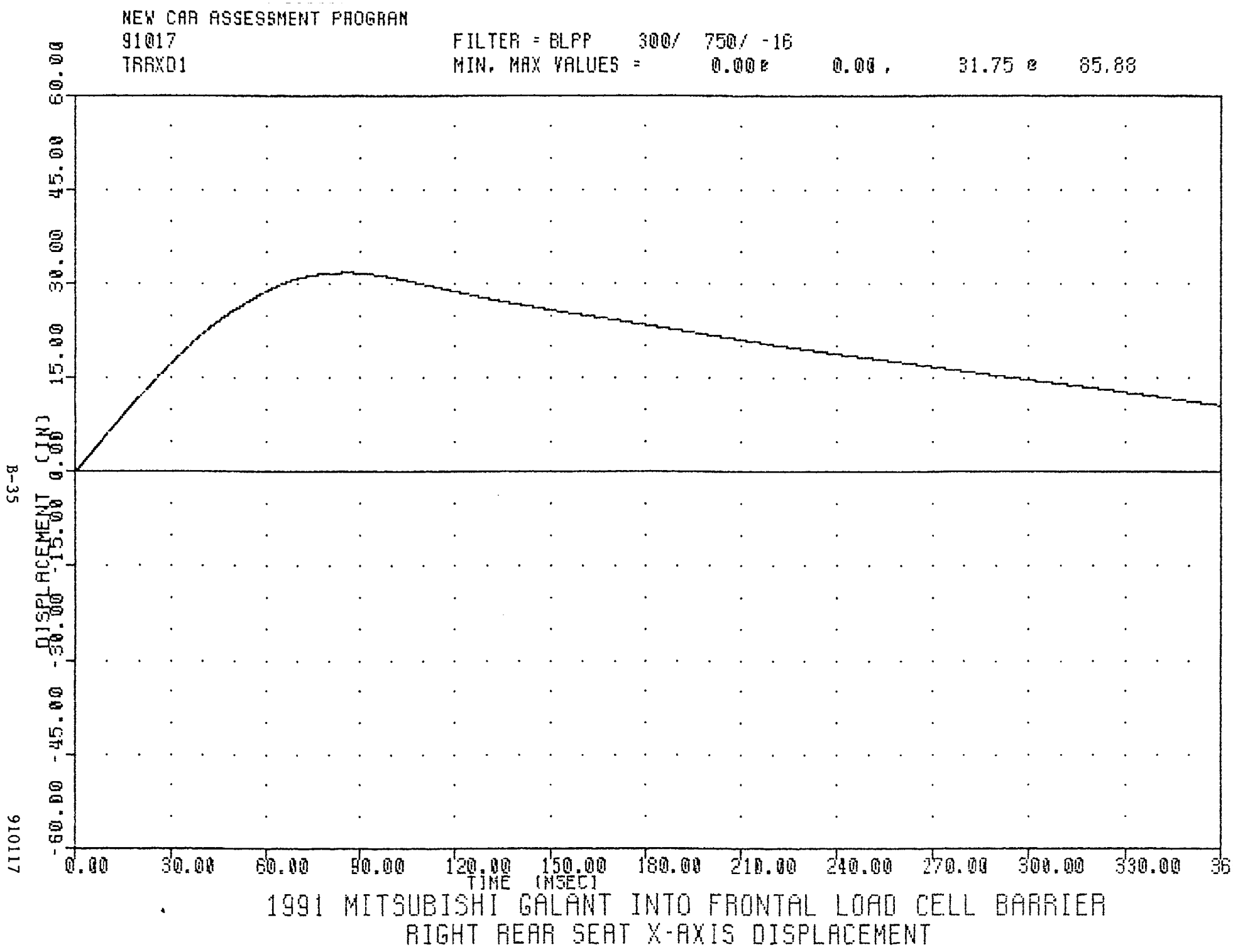


199: MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS ACCELERATION

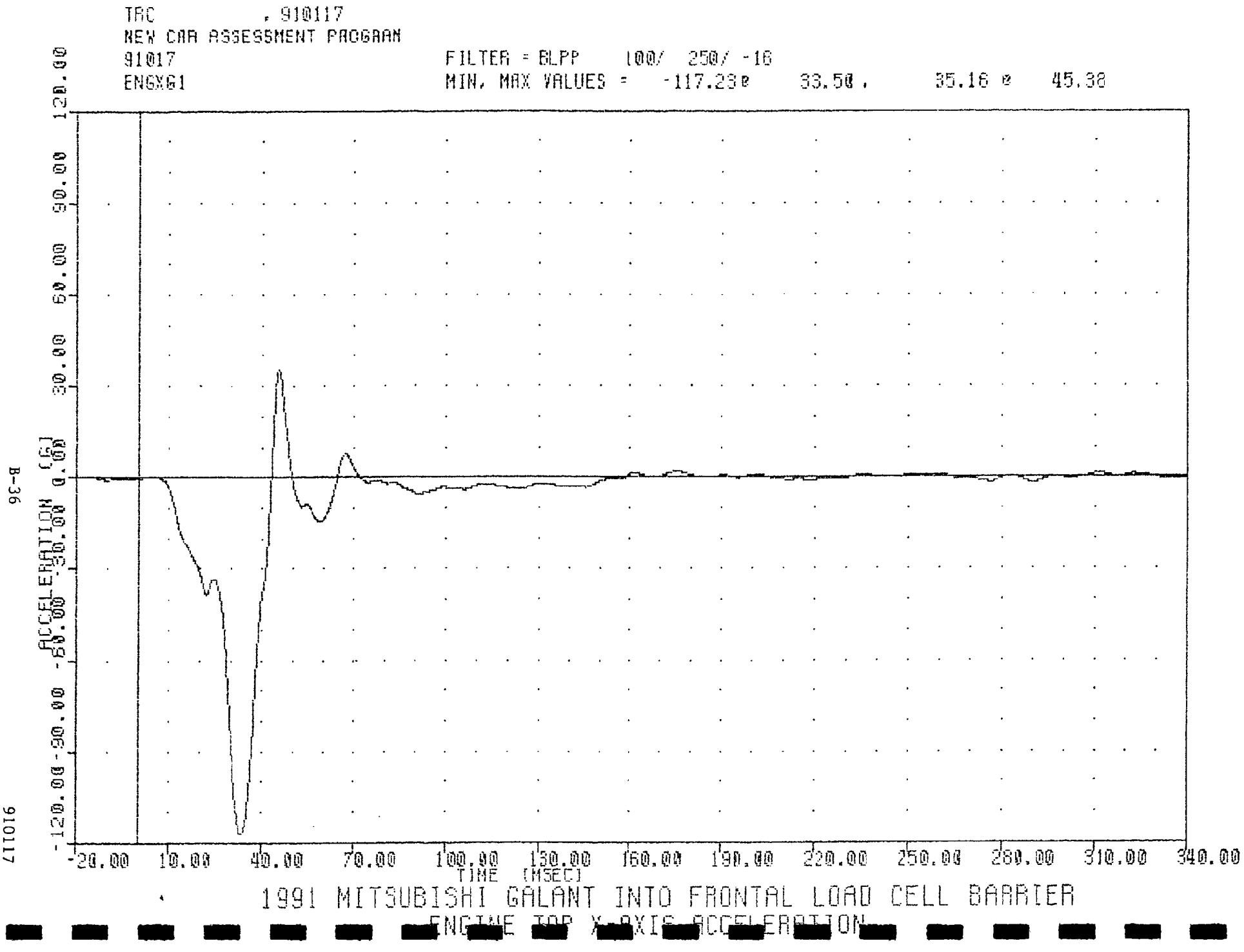


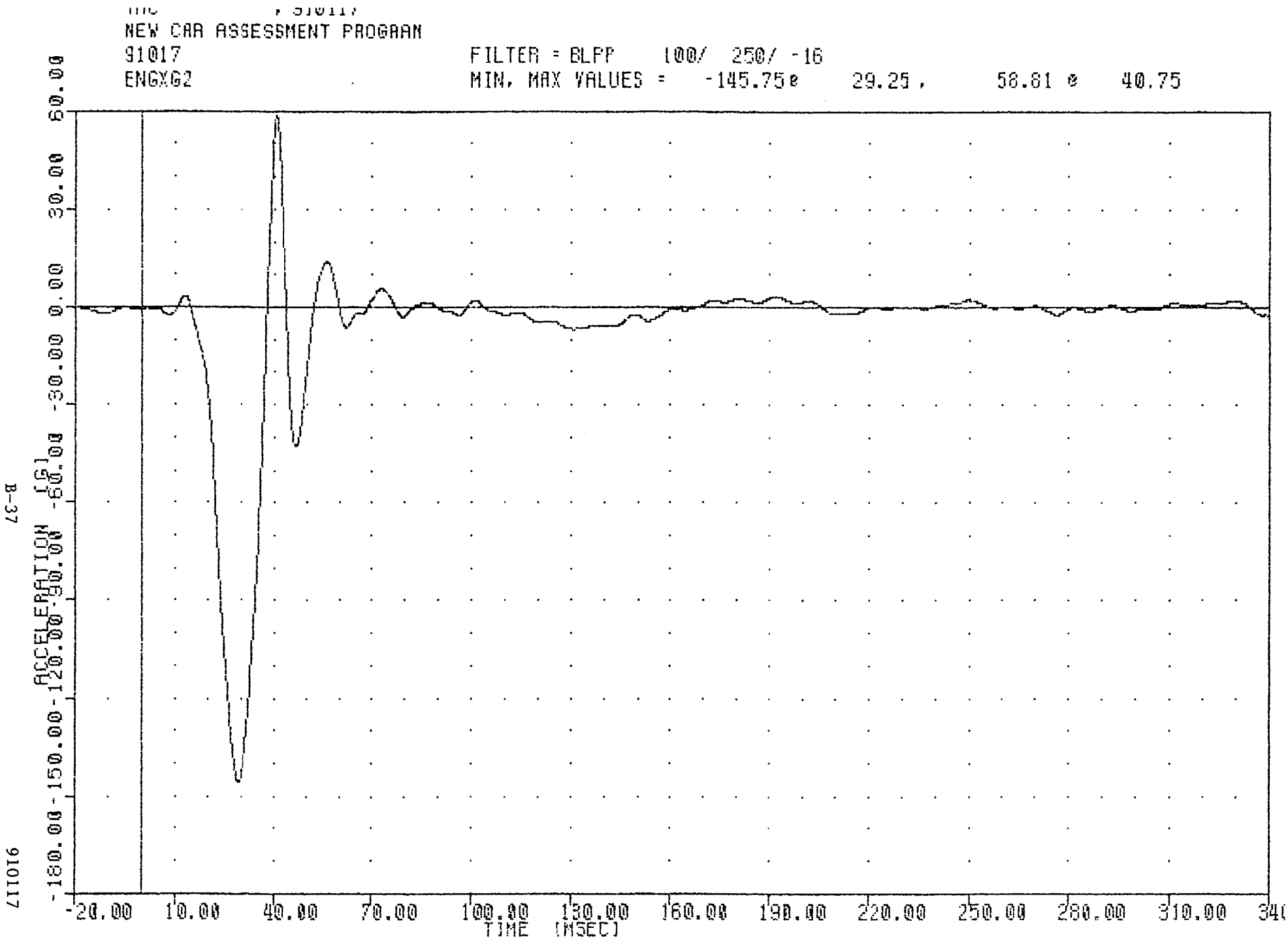
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS VELOCITY

910117

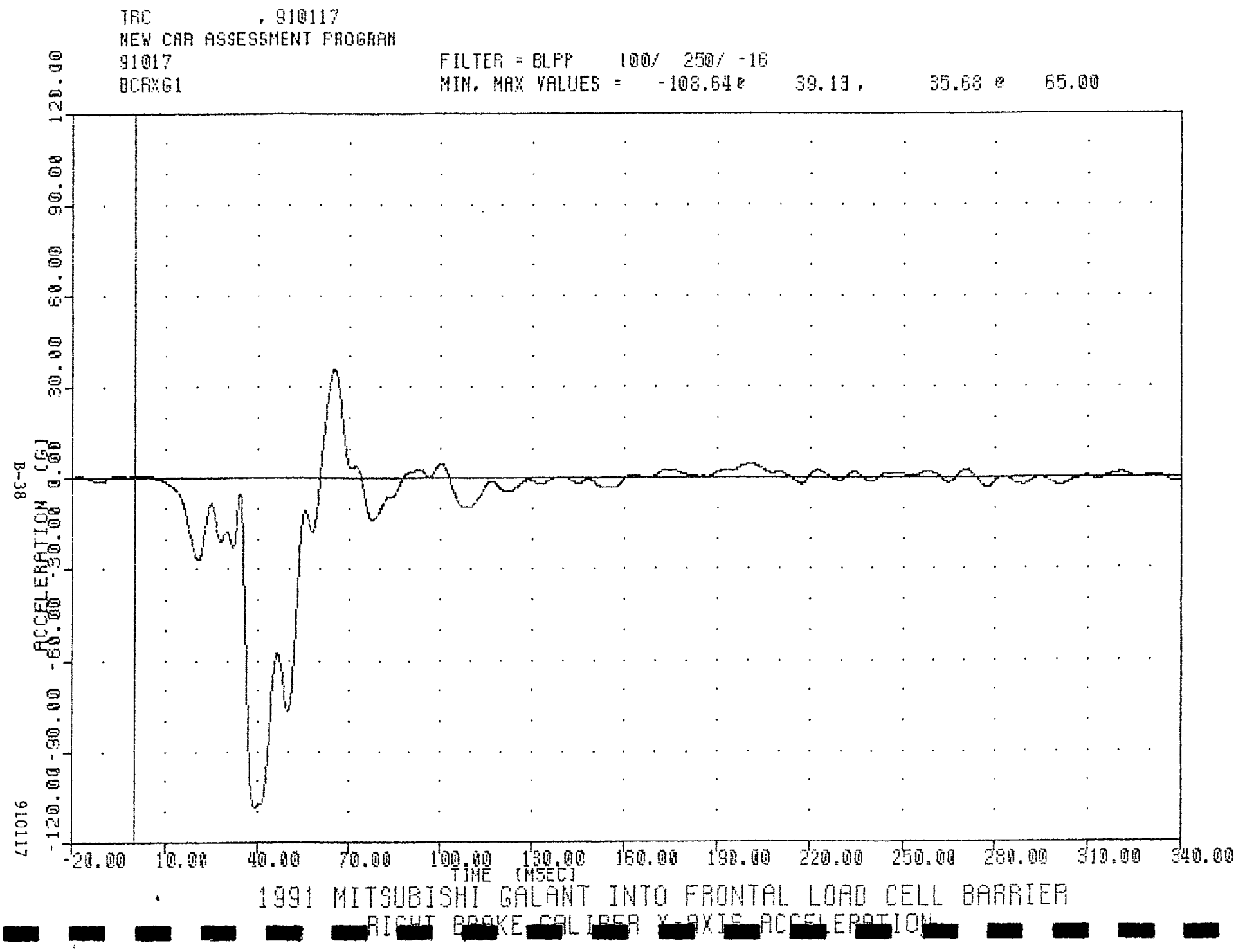


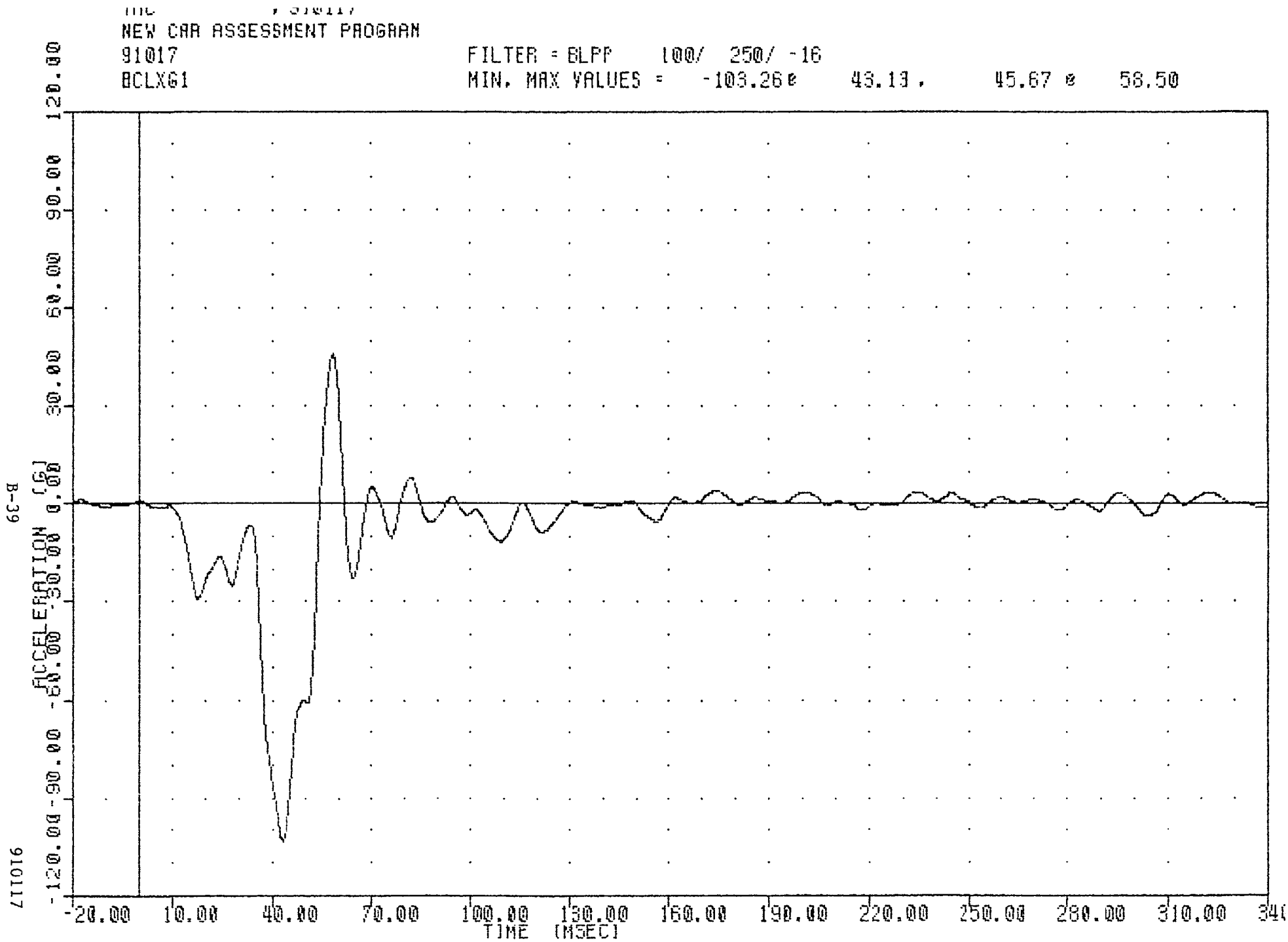
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS DISPLACEMENT


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
ENGXG1
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -117.23@ 33.50 , 35.16 @ 45.38
120.00
90.00
60.00
30.00
0.00
-30.00
-60.00
-90.00
-120.00
ACCELERATION (G)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
ENGINE TOP X-AXIS ACCELERATION



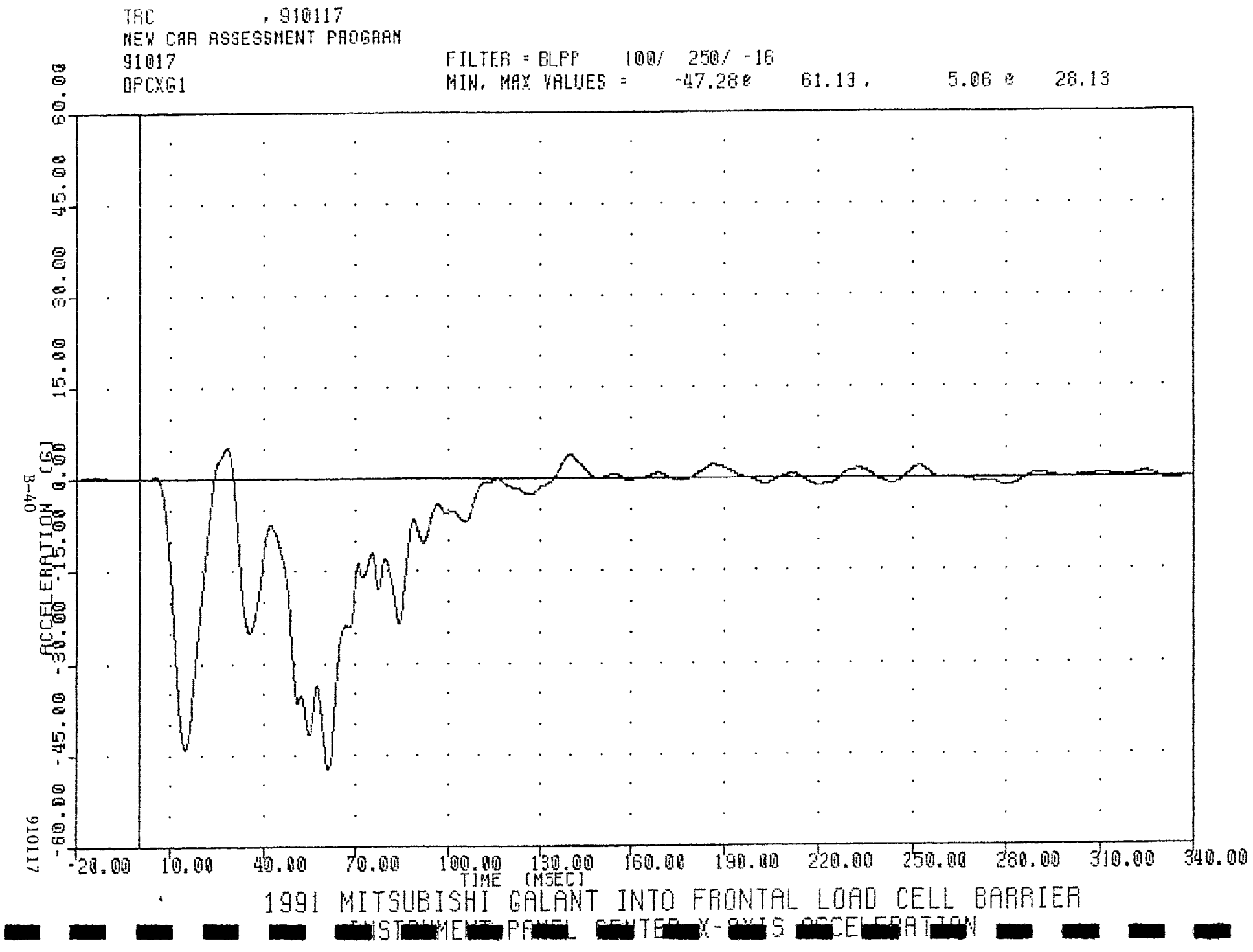
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
ENGINE BOTTOM X-AXIS ACCELERATION

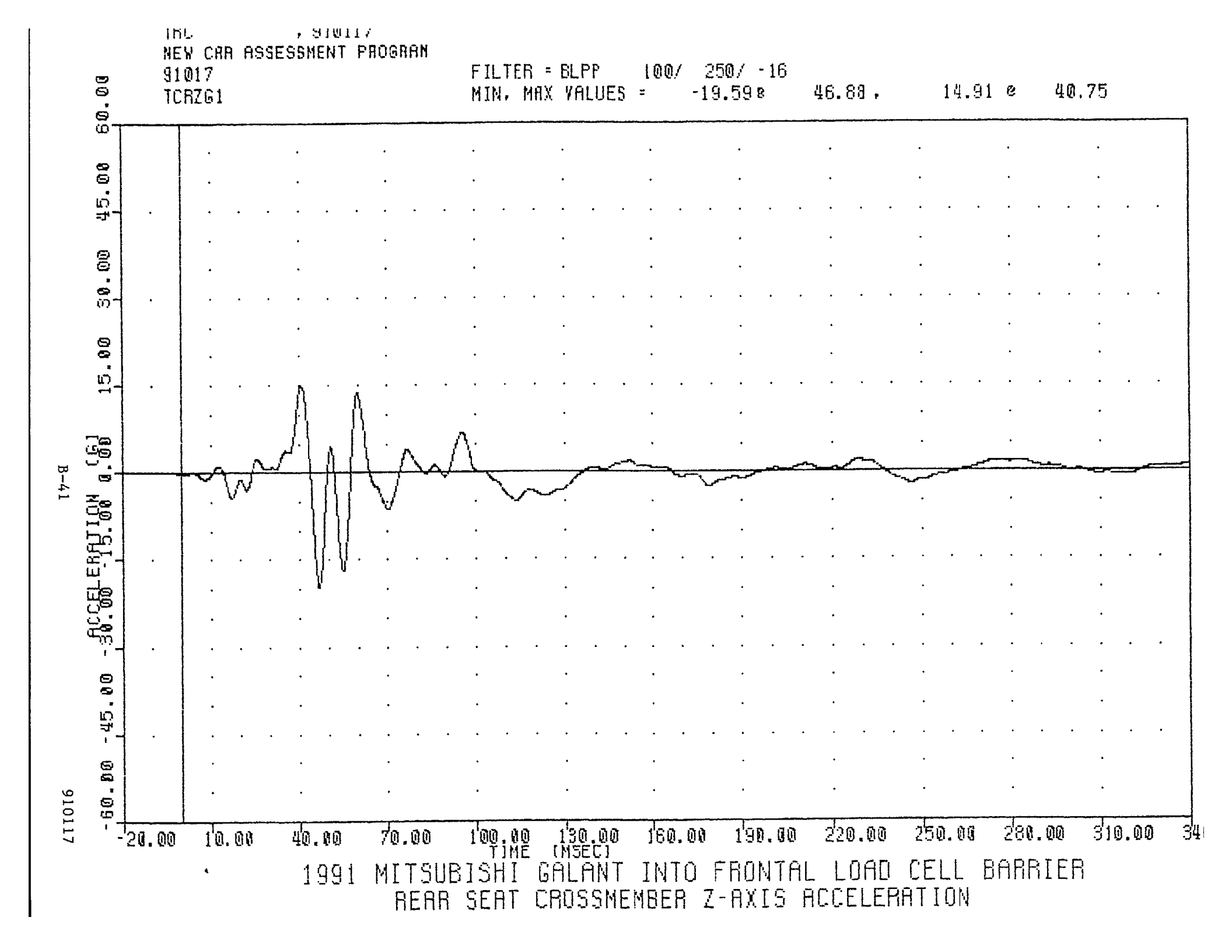

TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
BCRXG1
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -108.64 @ 39.13 , 35.68 @ 65.00
120.00
90.00
60.00
30.00
0.00
-30.00
-60.00
-90.00
-120.00
ACCELERATION (G)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
RIGHT BRAKE CALIPER X-AXIS ACCELERATION

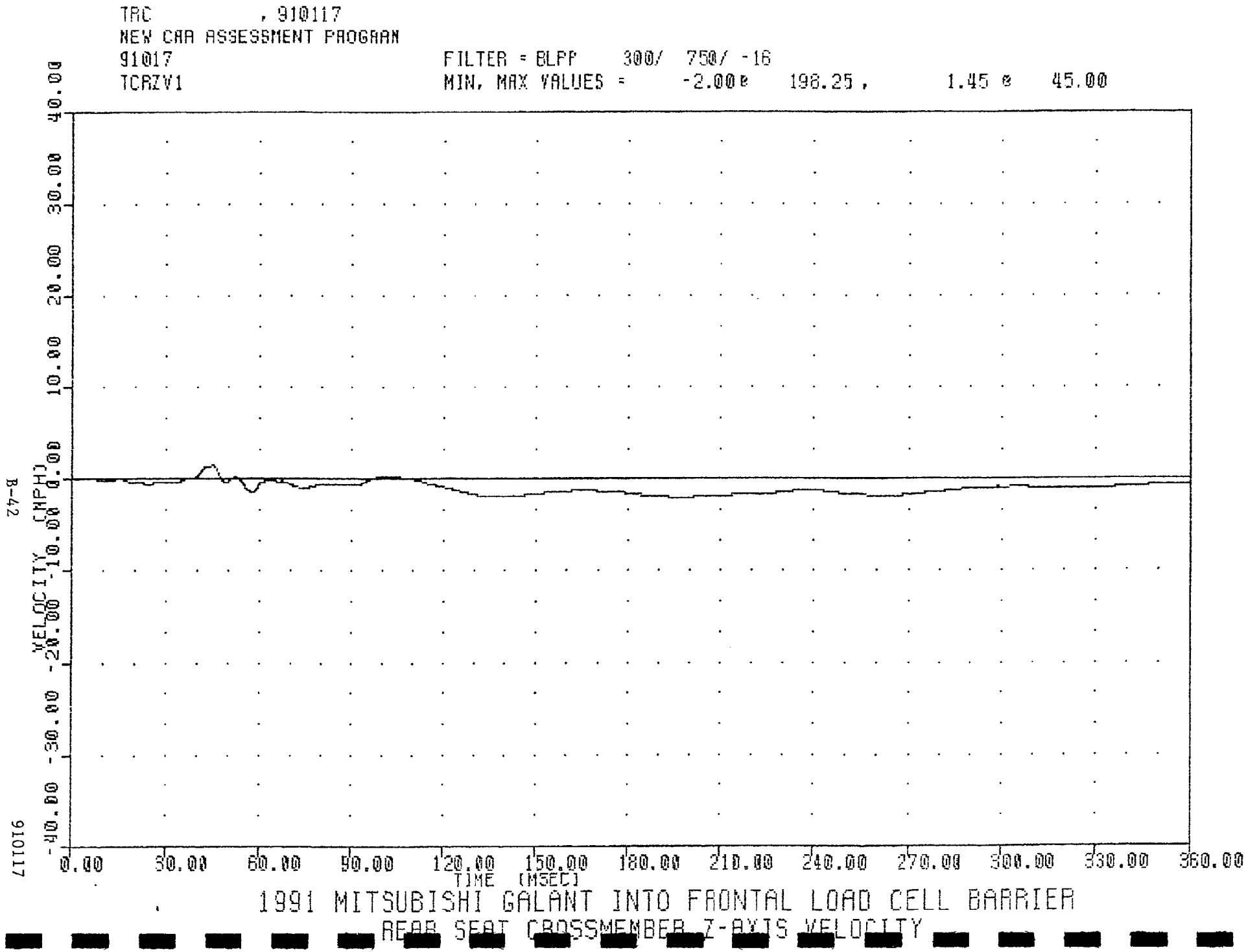


1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION

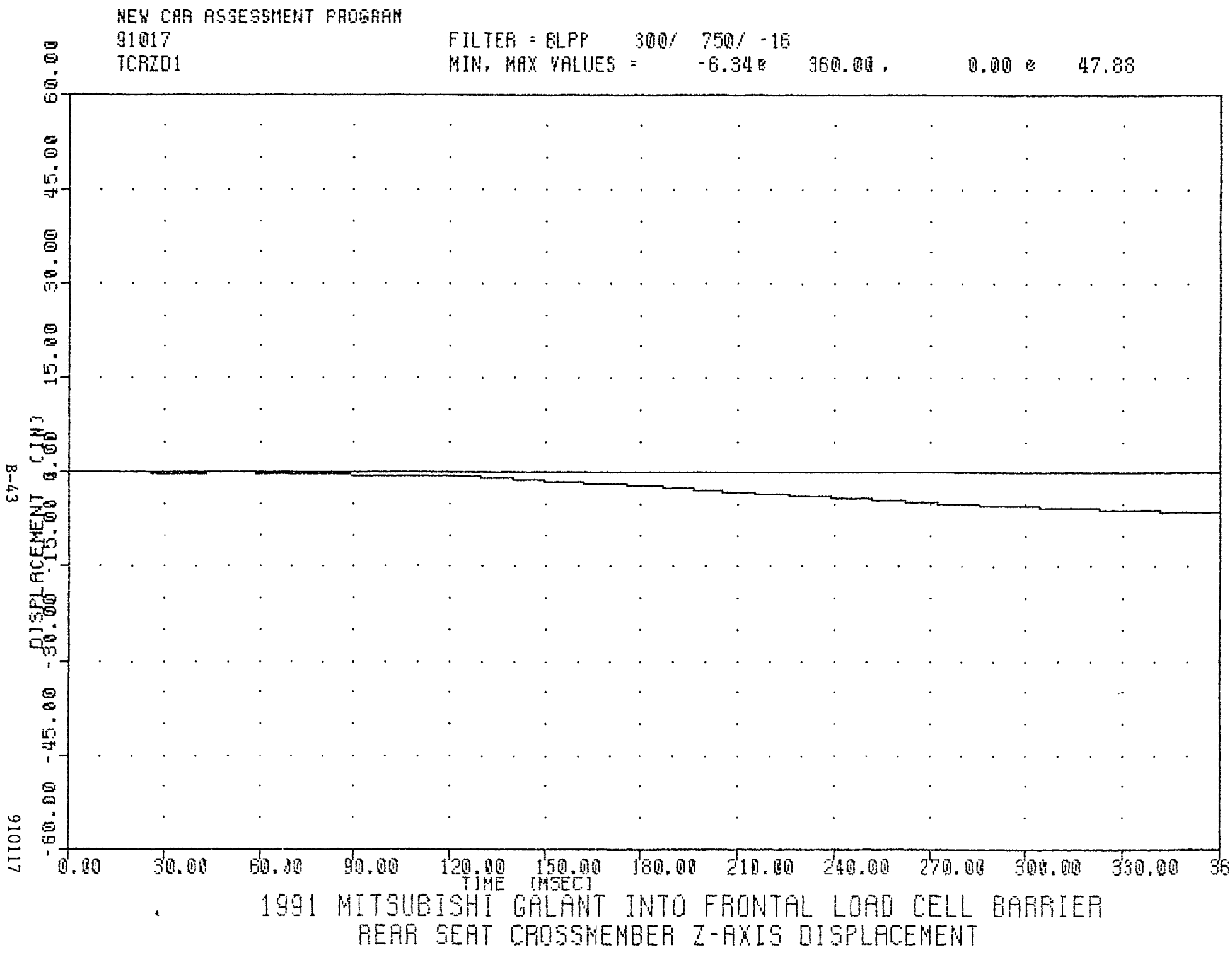
91017

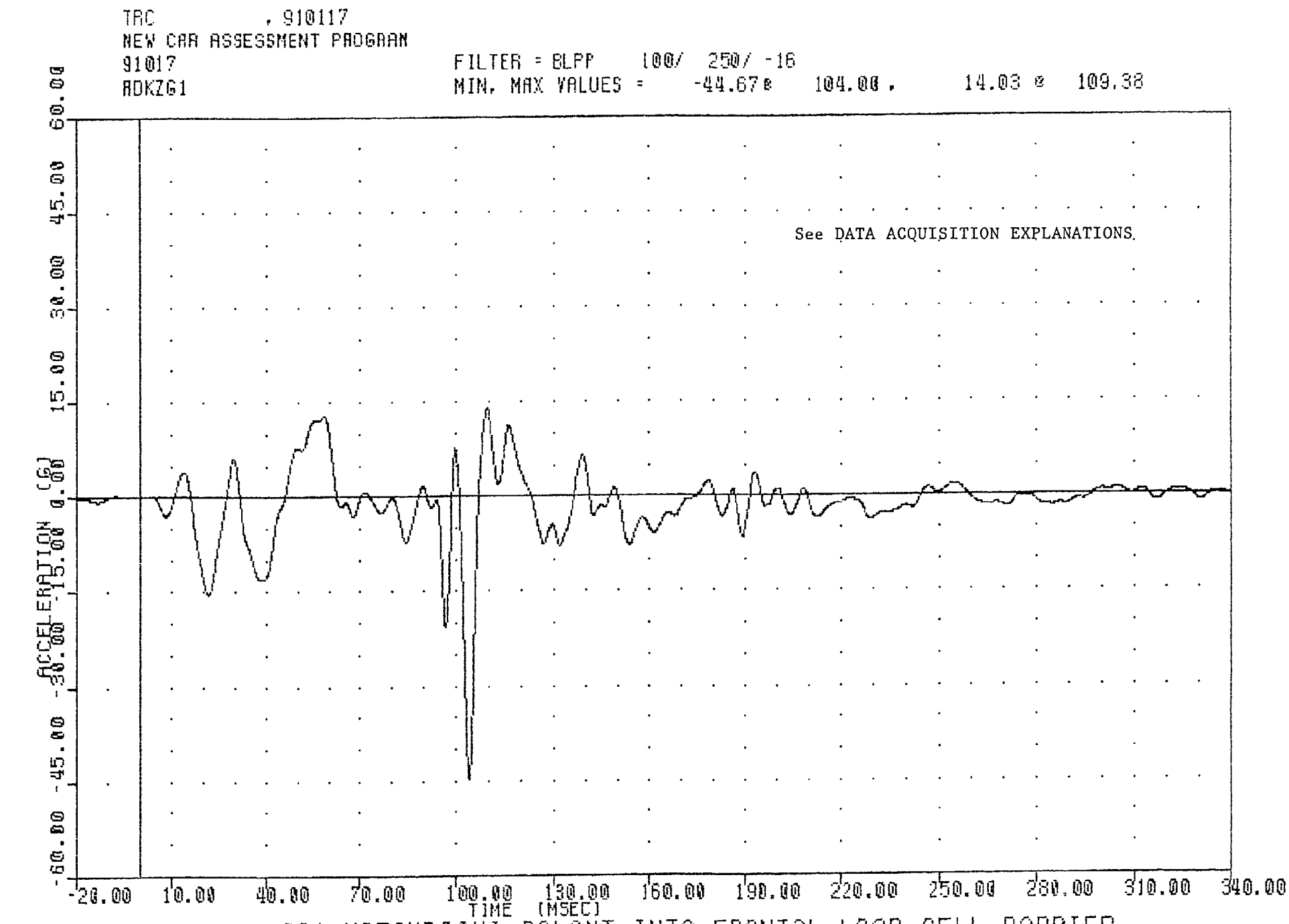

TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
OPCXG1
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -47.28@ 61.13, 5.06 @ 28.13
60.00
45.00
30.00
15.00
0.00
-15.00
-30.00
-45.00
-60.00
ACCELERATION (G)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
INSTRUMENT PANEL CENTER X-AXIS ACCELERATION
B-40
91017

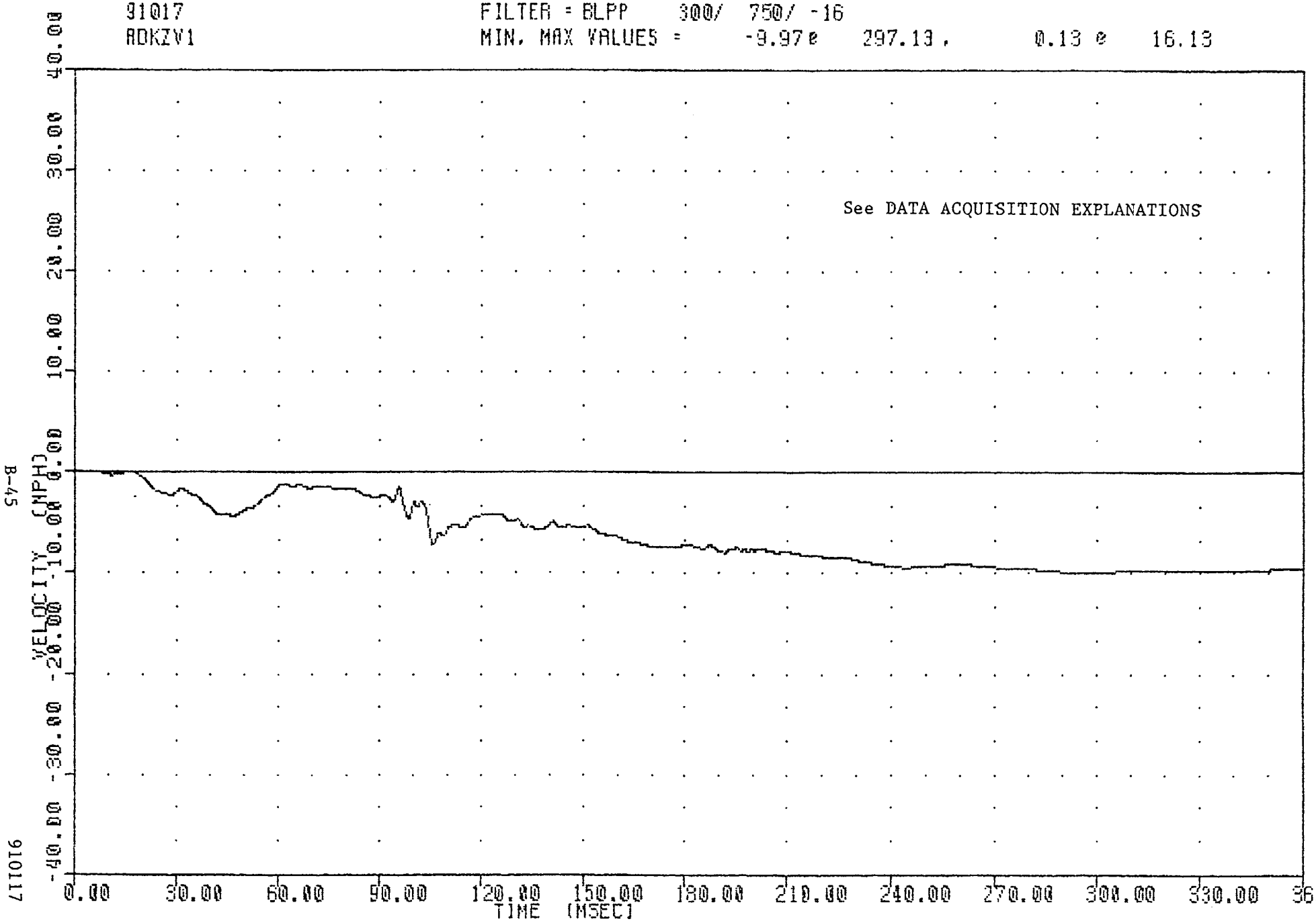

INL , 910117
NEW CAR ASSESSMENT PROGRAM
91017
TCRZG1
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -19.59 @ 46.88 , 14.91 @ 40.75
60.00
45.00
30.00
15.00
0.00
-15.00
-30.00
-45.00
-60.00
ACCELERATION [G]
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
REAR SEAT CROSSMEMBER Z-AXIS ACCELERATION


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
TCRZV1
FILTER = BLPF 300/ 750/ -16
MIN, MAX VALUES = -2.00 @ 198.25 , 1.45 @ 45.00
40.00
30.00
20.00
10.00
0.00
-10.00
-20.00
-30.00
-40.00
VELOCITY (MPH)
0.00
30.00
60.00
90.00
120.00
150.00
180.00
210.00
240.00
270.00
300.00
330.00
360.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
REAR SEAT CROSSMEMBER Z-AXIS VELOCITY

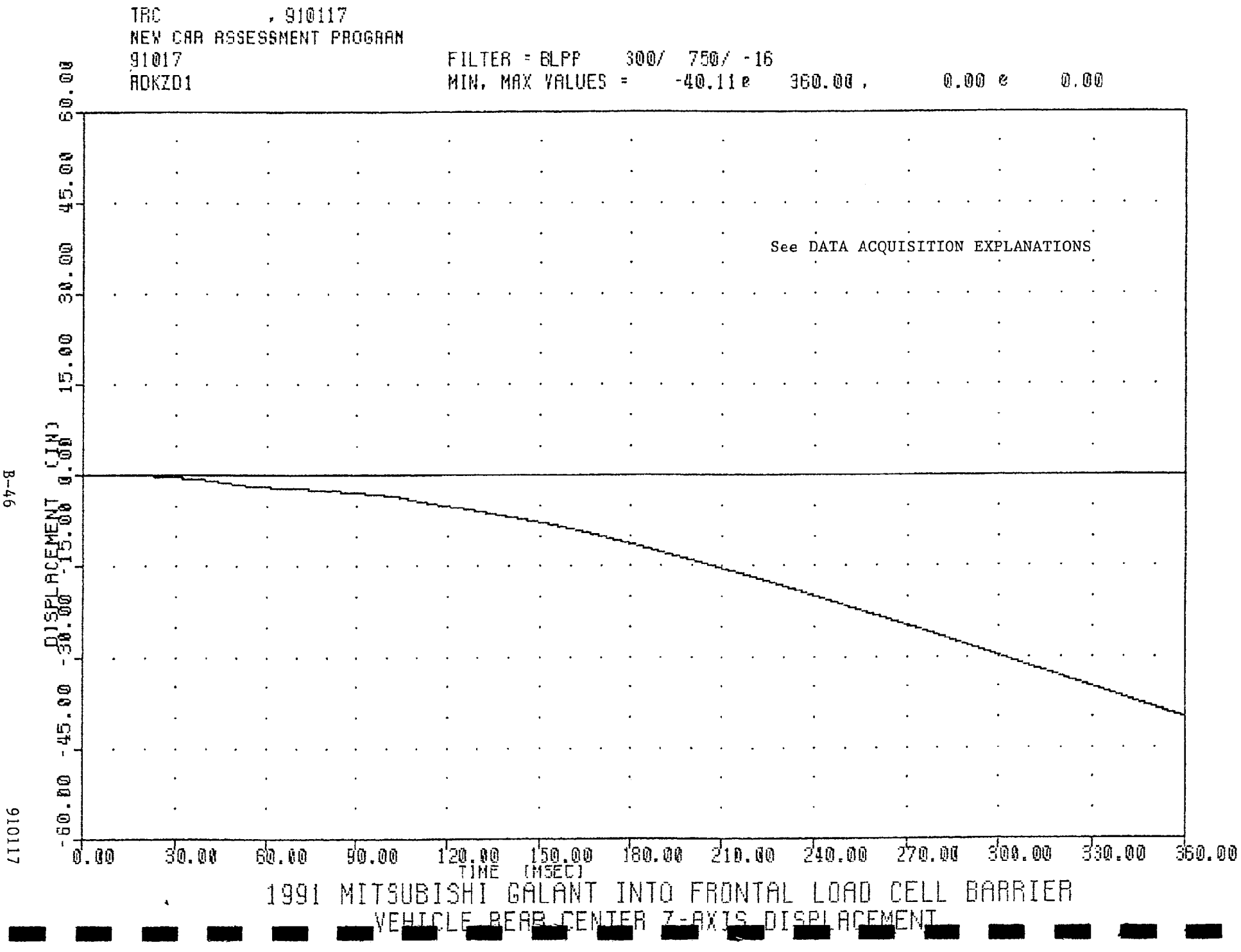
910117

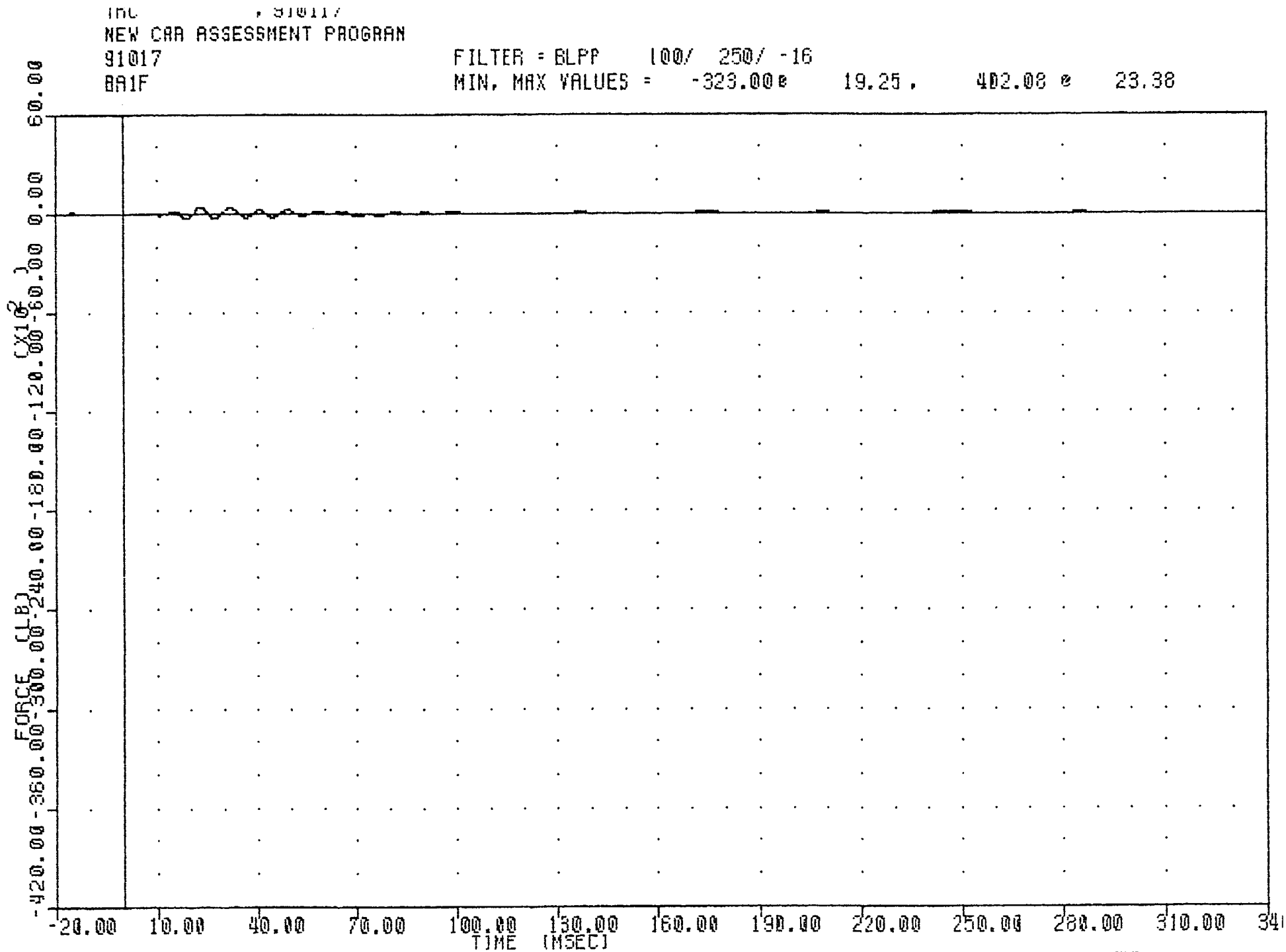

NEW CAR ASSESSMENT PROGRAM
91017
TCRZD1
FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -6.34 @ 360.00 , 0.00 @ 47.88
60.00
45.00
30.00
15.00
0.00
-15.00
-30.00
-45.00
-60.00
DISPLACEMENT (IN)
0.00
30.00
60.00
90.00
120.00
150.00
180.00
210.00
240.00
270.00
300.00
330.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
REAR SEAT CROSSMEMBER Z-AXIS DISPLACEMENT


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
RDKZG1
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -44.67 @ 104.00 , 14.03 @ 109.38
See DATA ACQUISITION EXPLANATIONS.
ACCELERATION (G)
60.00
45.00
30.00
15.00
0.00
-15.00
-30.00
-45.00
-60.00
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
VEHICLE REAR CENTER Z AXIS ACCELERATION

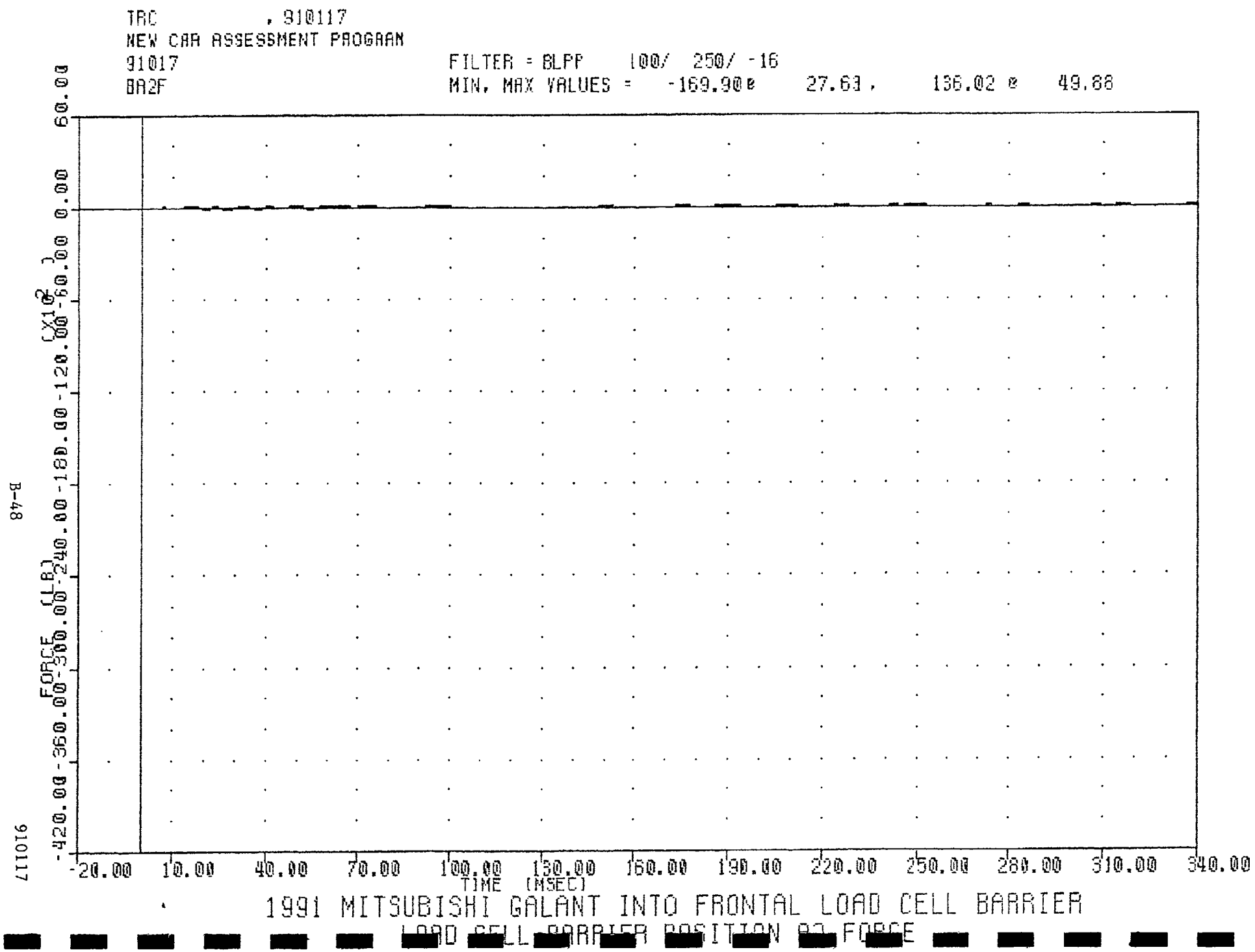


1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
VEHICLE REAR CENTER Z-AXIS VELOCITY


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
RDKZD1
FILTER = BLPF 300/ 750/ -16
MIN, MAX VALUES = -40.11 @ 360.00 , 0.00 @ 0.00
See DATA ACQUISITION EXPLANATIONS
DISPLACEMENT (IN)
60.00
45.00
30.00
15.00
0.00
-15.00
-30.00
-45.00
-60.00
0.00
30.00
60.00
90.00
120.00
150.00
180.00
210.00
240.00
270.00
300.00
330.00
360.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
VEHICLE REAR CENTER Z-AXIS DISPLACEMENT

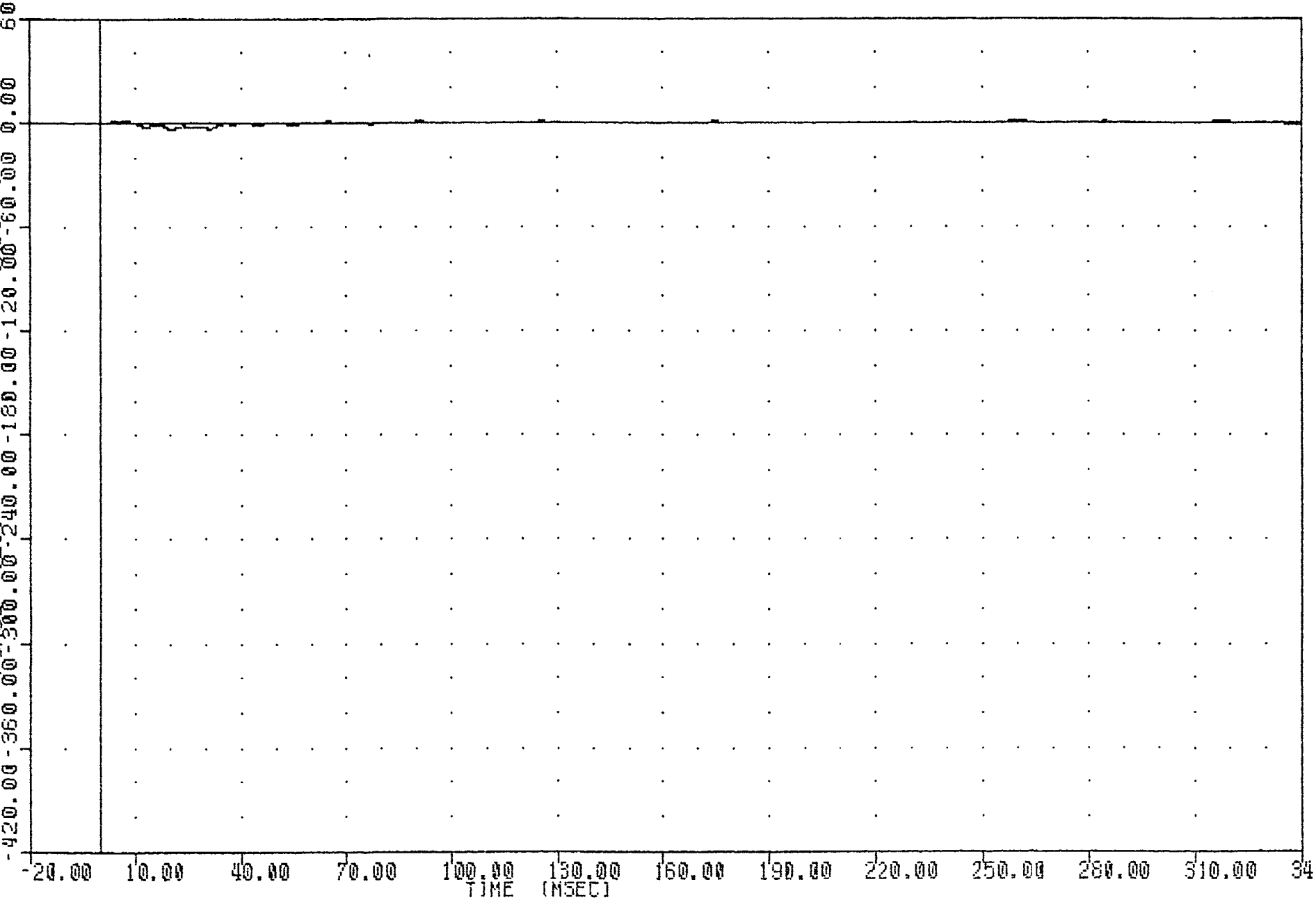


1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A1 FORCE


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
BR2F
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -169.90@ 27.63, 136.02@ 49.68
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
FORCE (LB) (X10^2)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION R2 FORCE

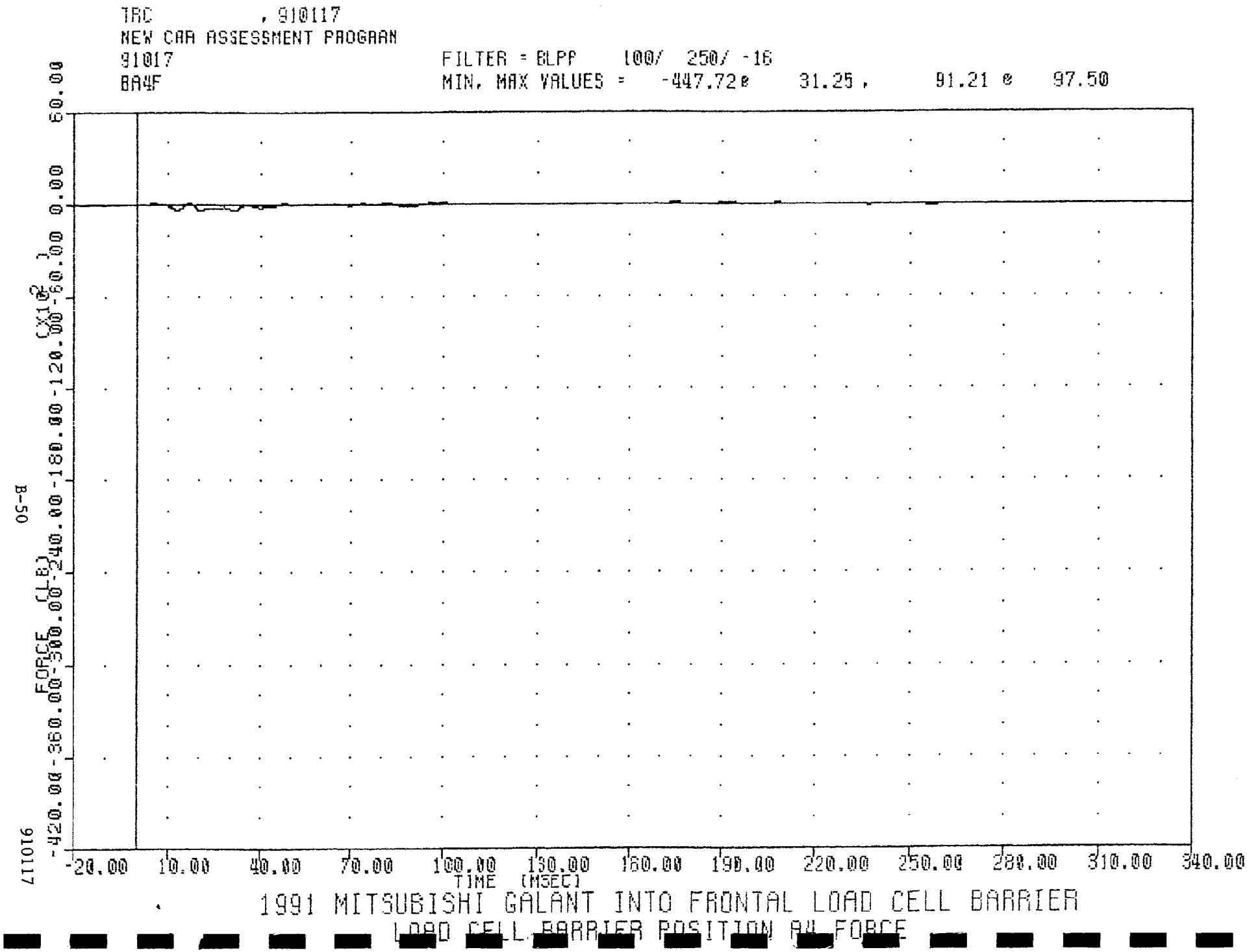
NEW CAR ASSESSMENT PROGRAM
91017
BA3F

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -390.22 @ 20.38 , 99.70 @ 5.63



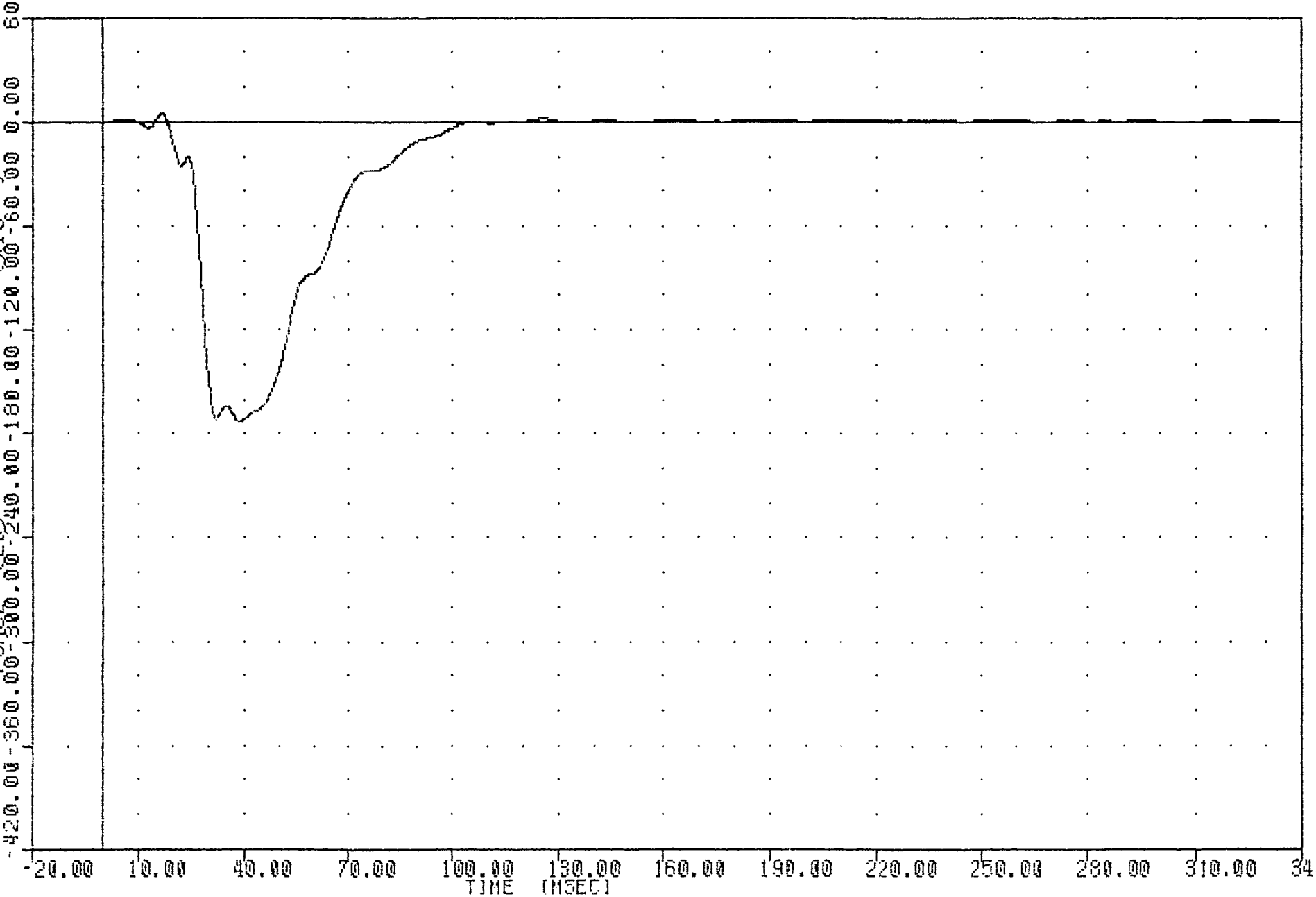
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A3 FORCE

91017

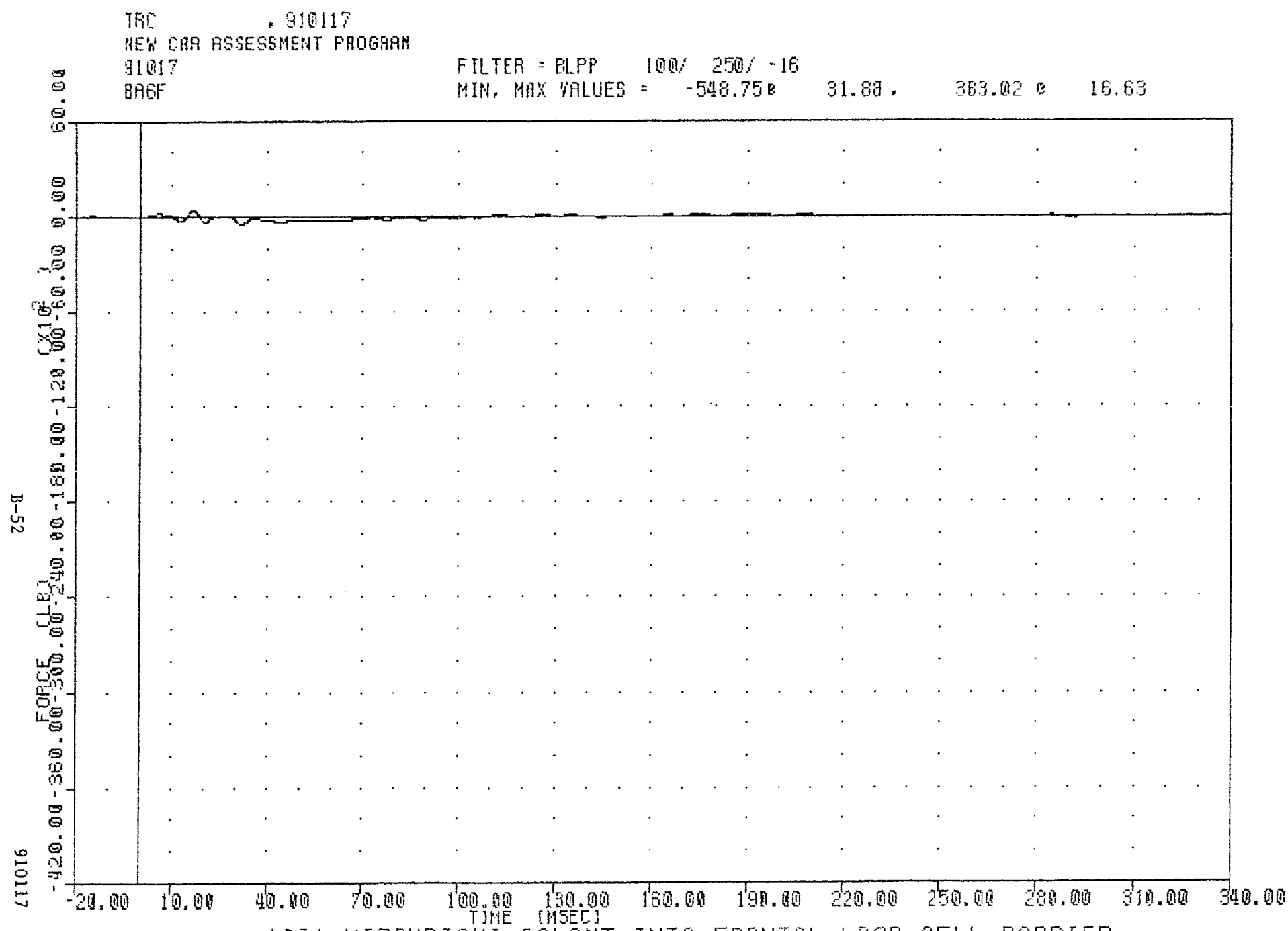

TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
BA4F
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -447.72@ 31.25 , 91.21 @ 97.50
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
FORCE (LB) (X10^2)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
B-50
910117
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION AW FORCE

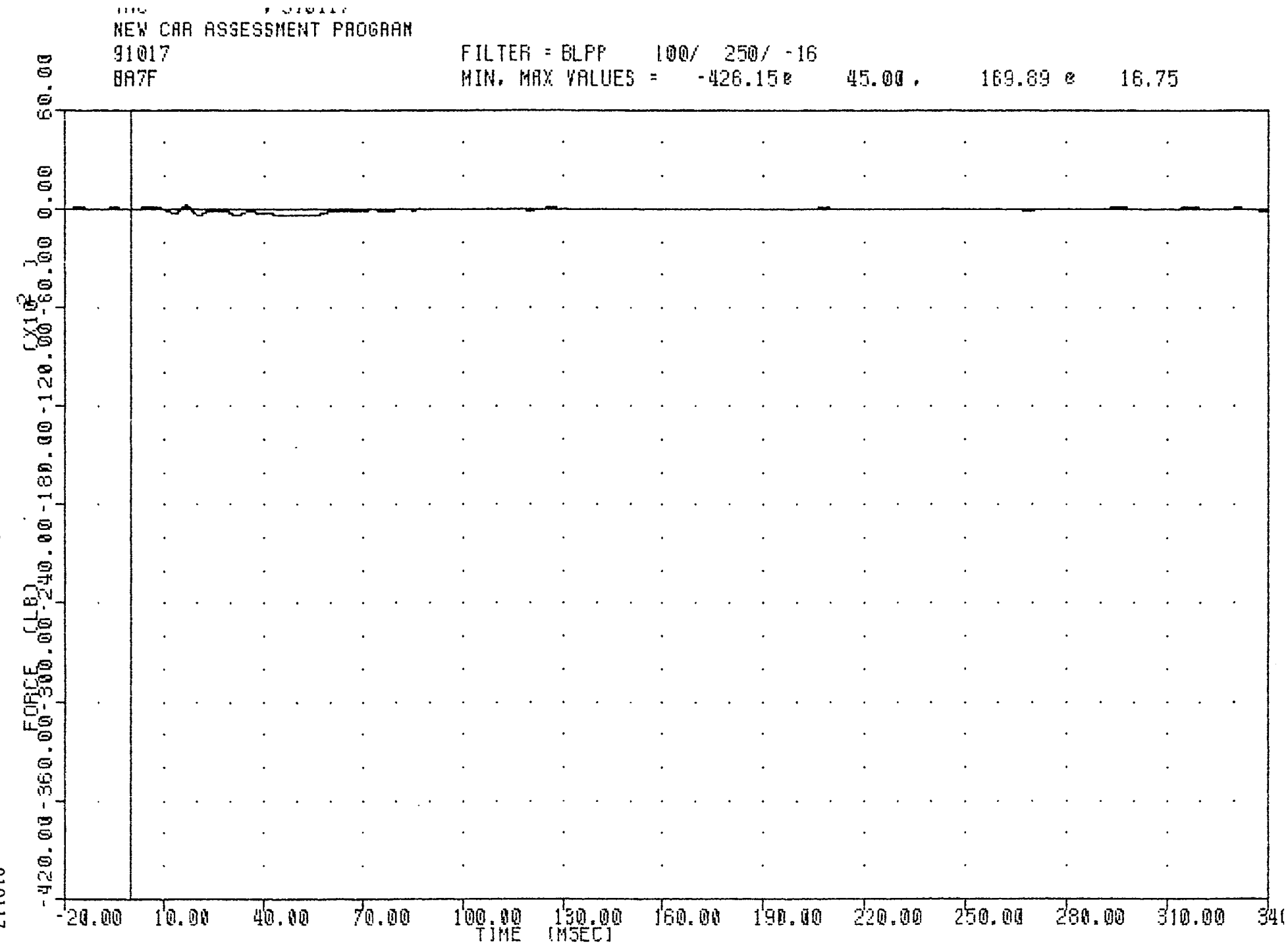
NEW CAR ASSESSMENT PROGRAM
91017
8A5F

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -17341.48 @ 39.00 , 483.56 @ 16.75



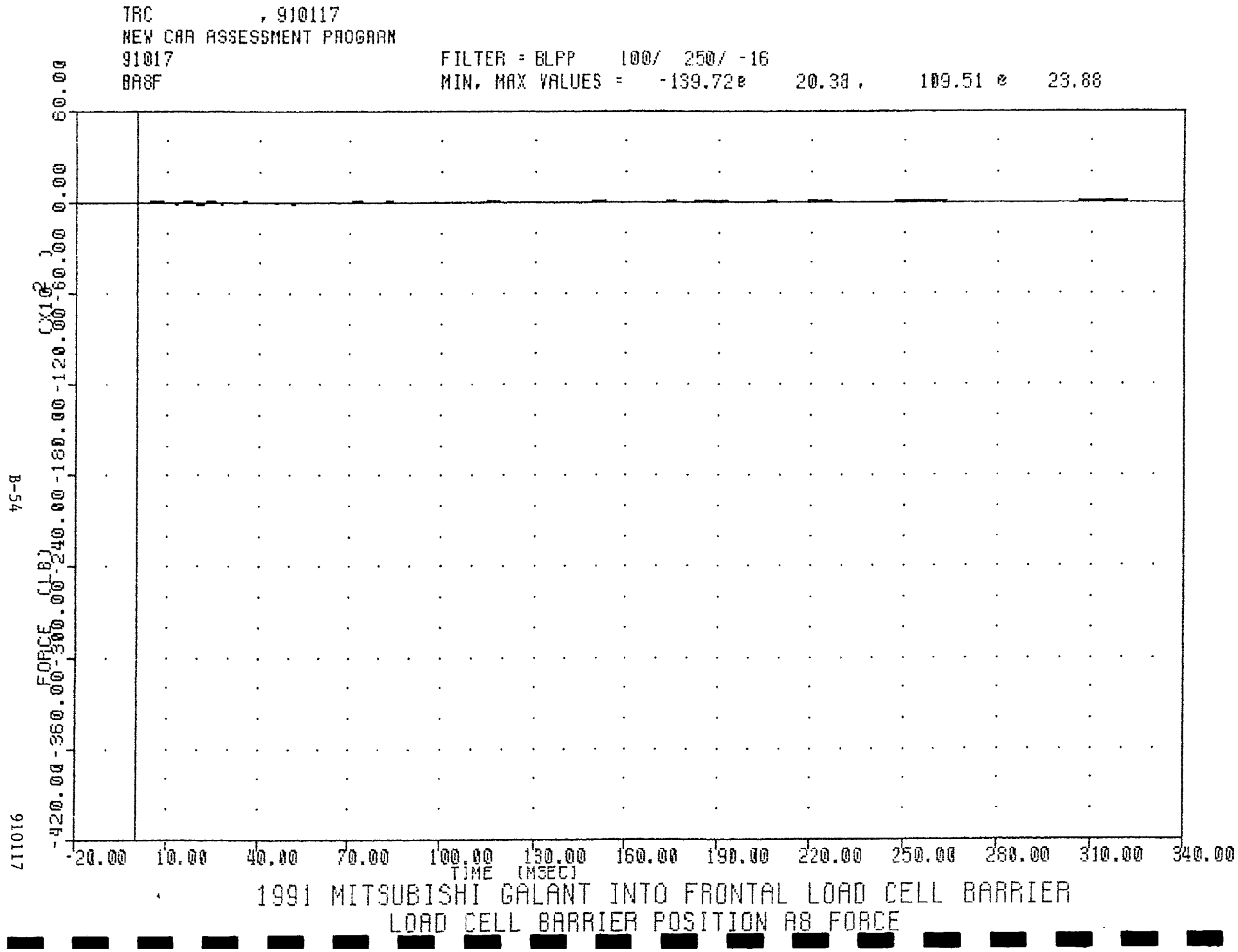
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION AS FORCE

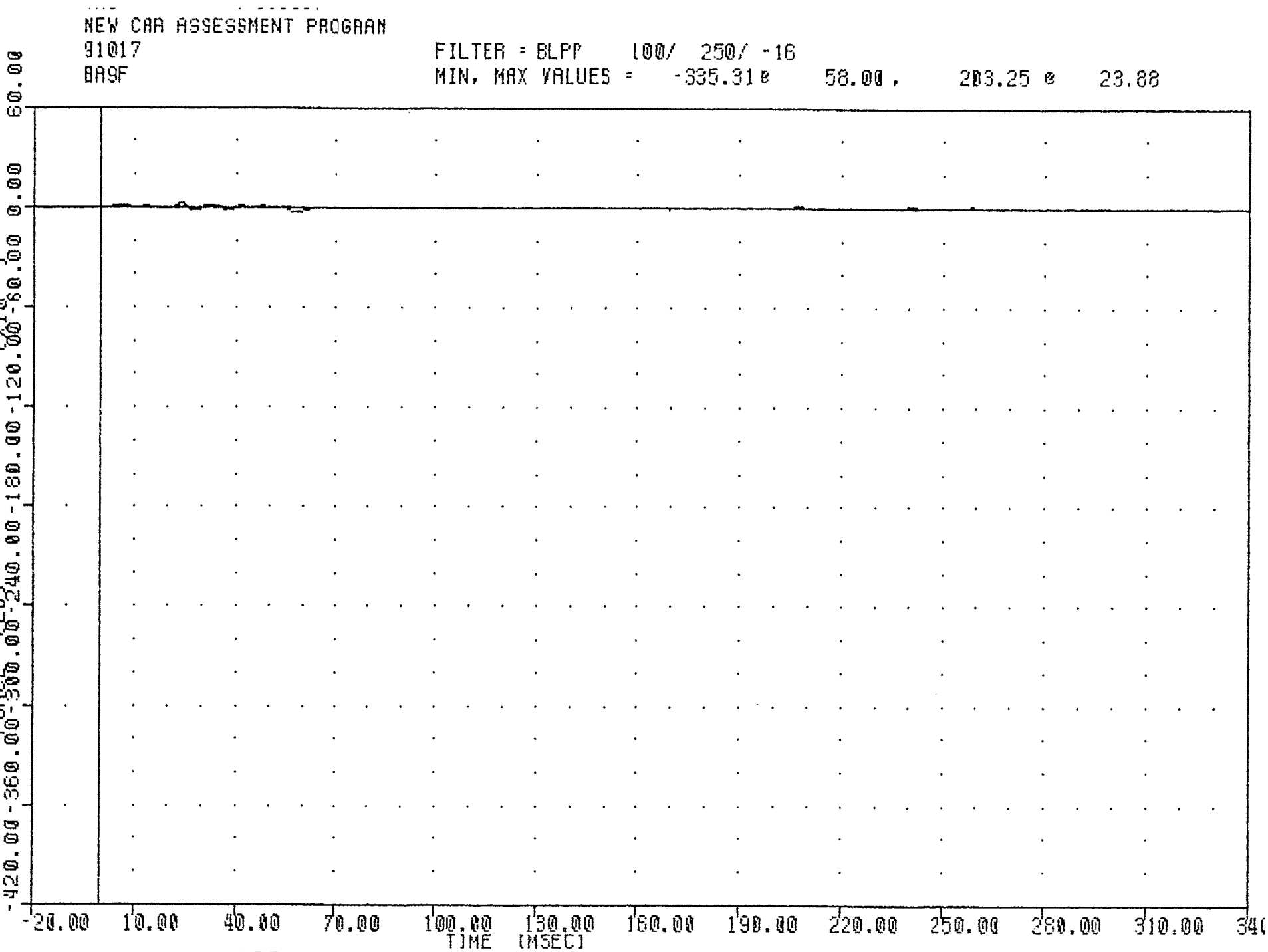

TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
BA6F
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -548.75 @ 31.88 , 383.02 @ 16.63
FORCE (LB) (X10^2)
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION RS FORCE



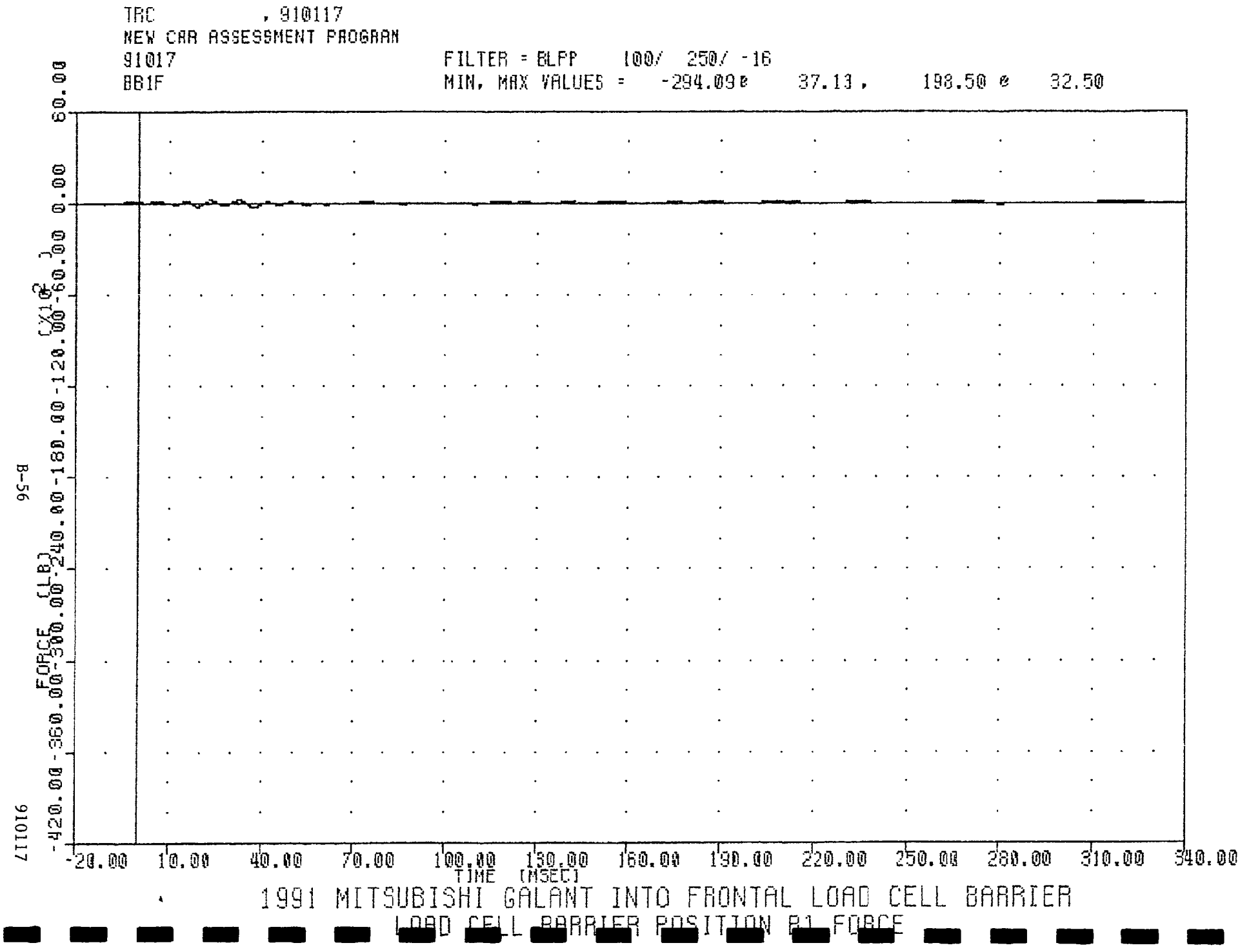
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A7 FORCE

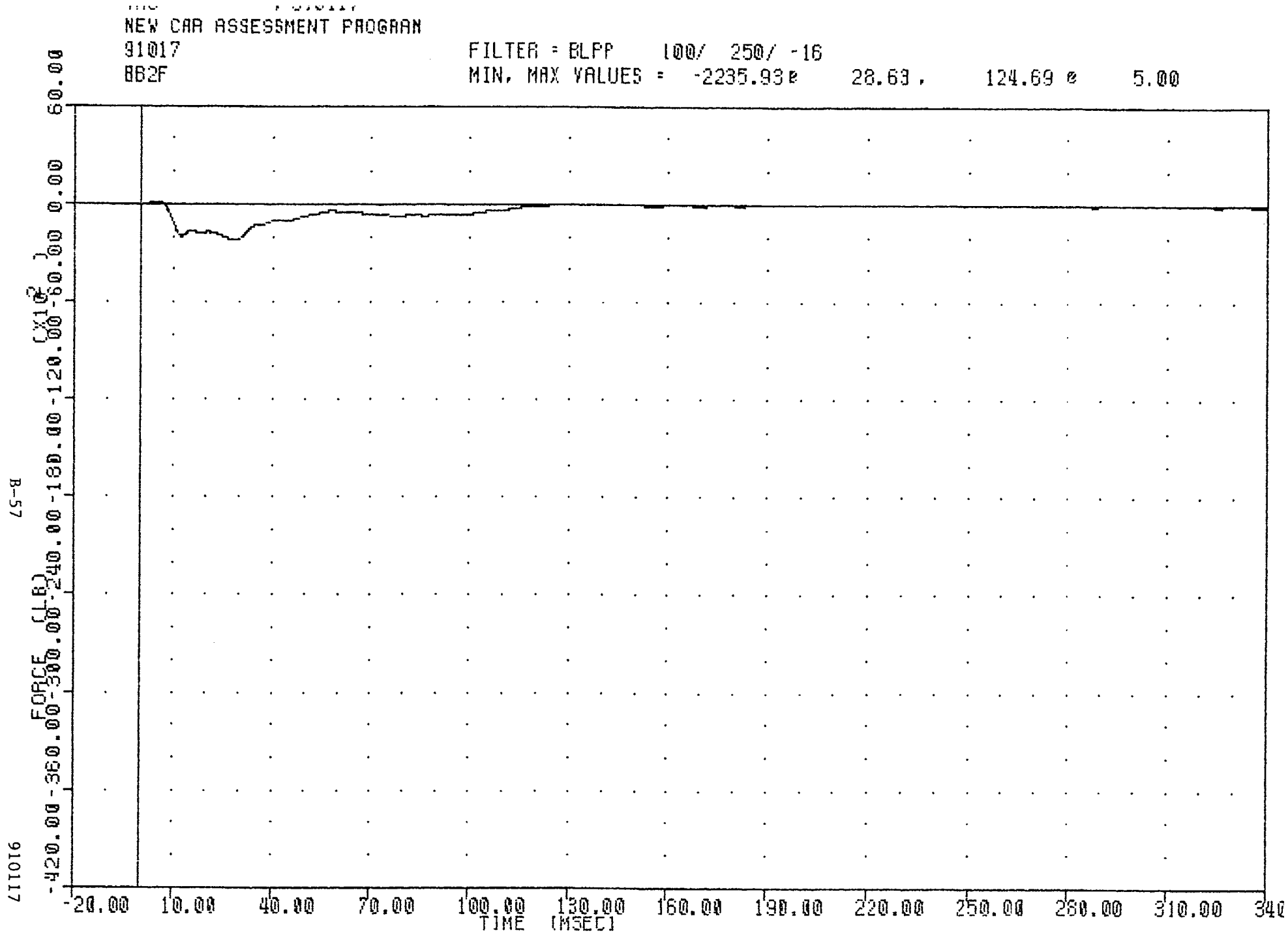
91017


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
BA8F
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -139.72 @ 20.38 , 109.51 @ 23.88
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
FORCE (LB) (X10^2)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION AS FORCE



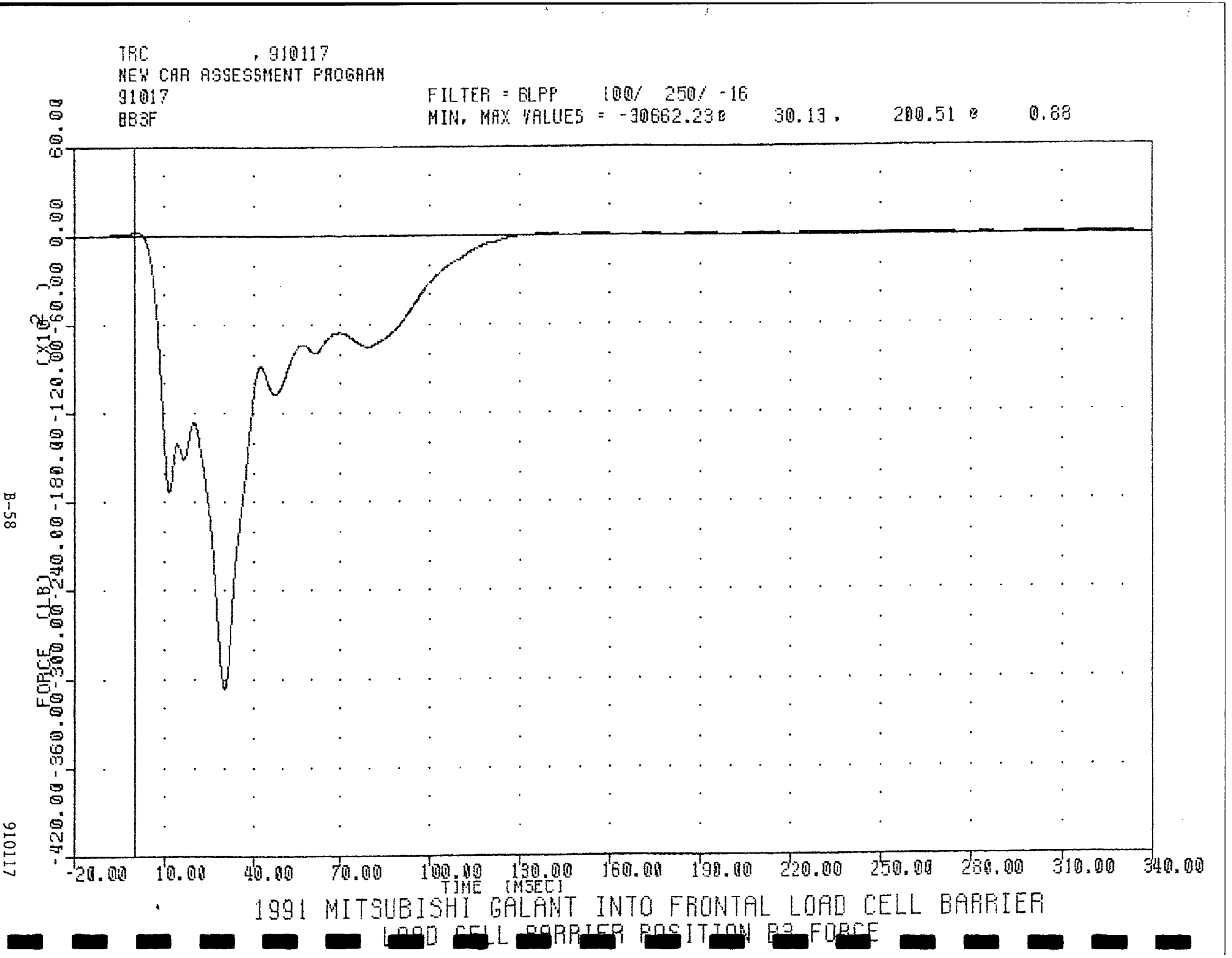
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A9 FORCE

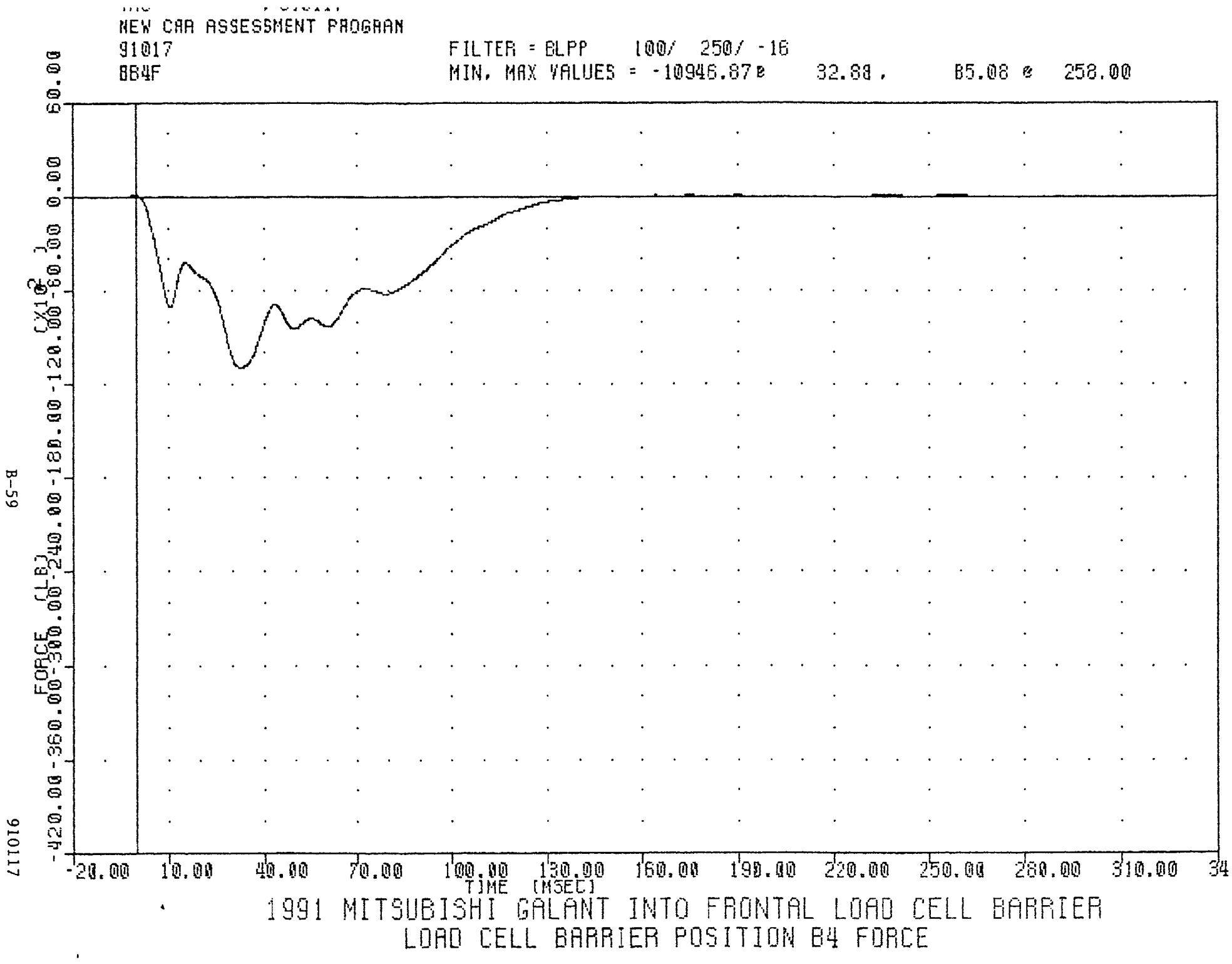

TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
BB1F
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -294.09 @ 37.13 , 198.50 @ 32.50
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
FORCE (LB) (X10^2)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B1 FORCE

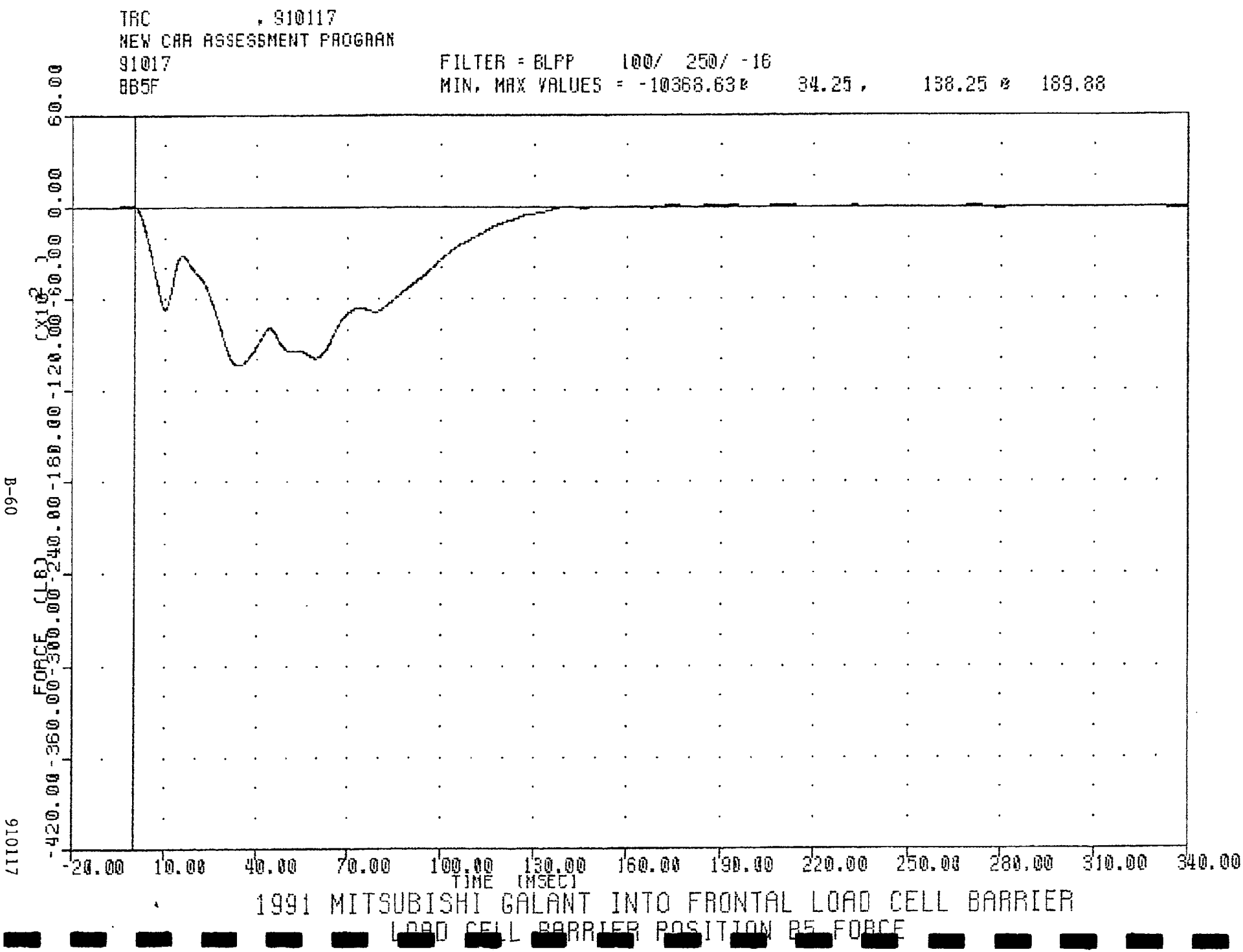


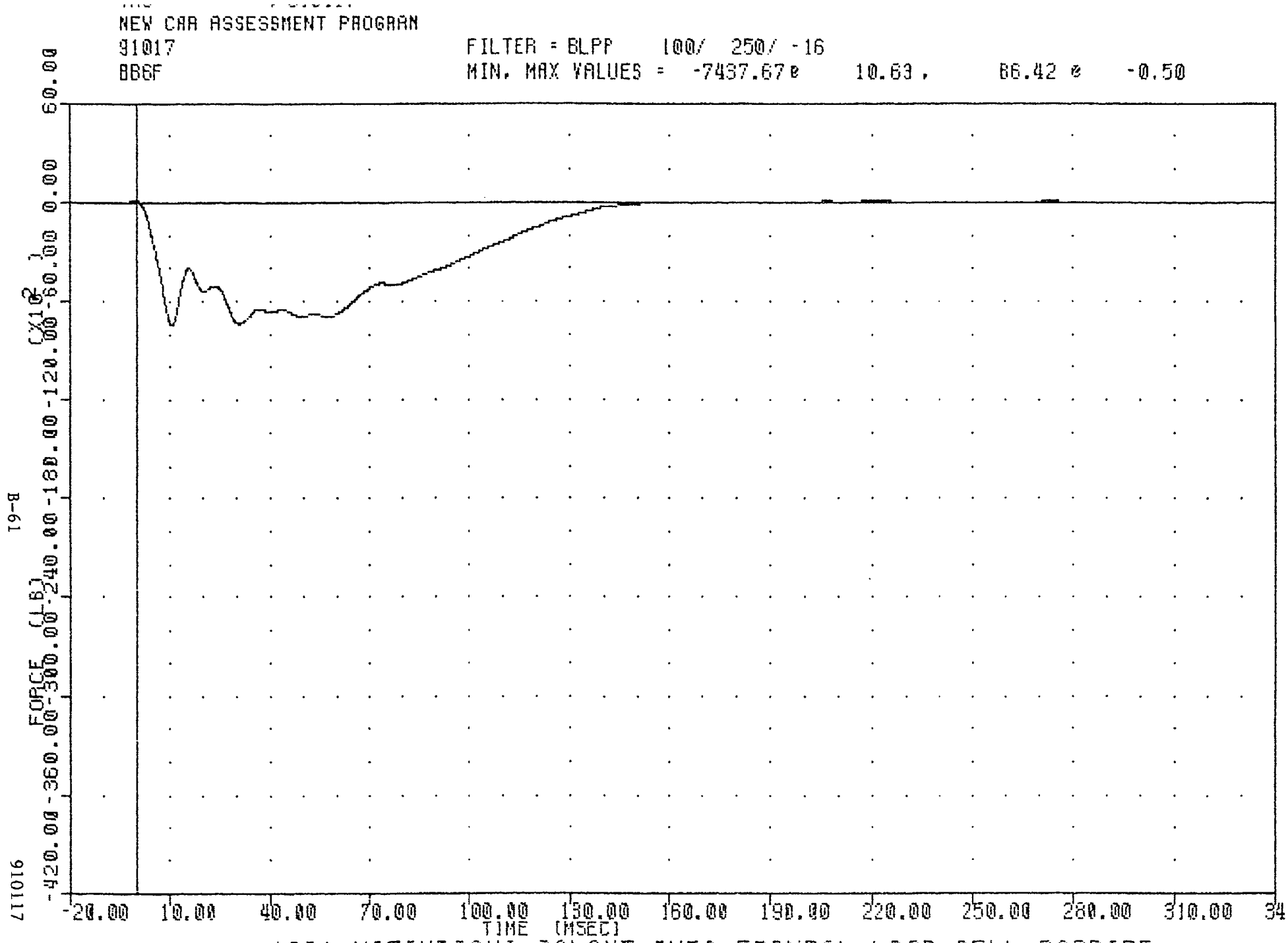
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B2 FORCE

91017

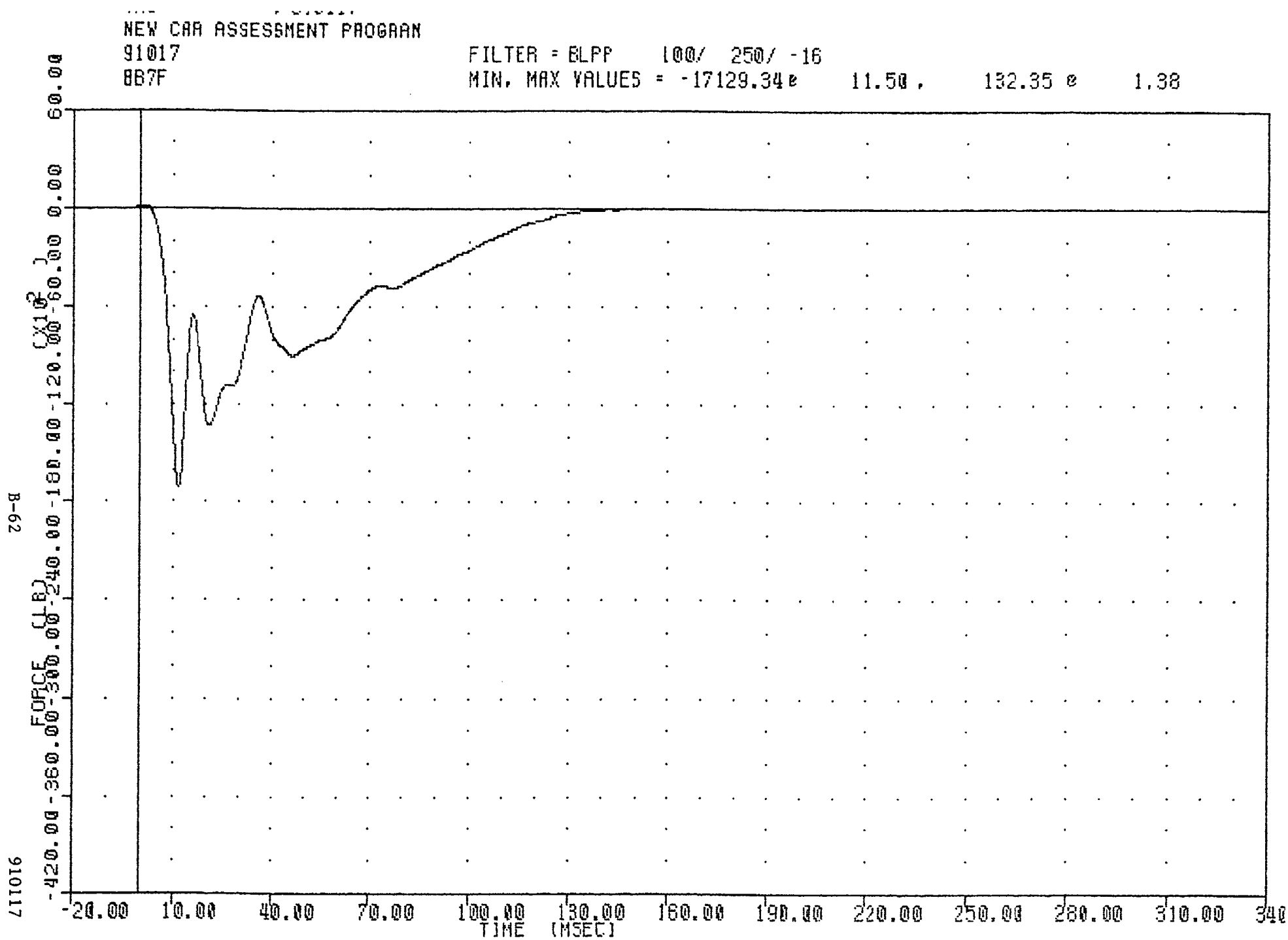

TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
BB3F
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -30662.23 @ 30.13 , 200.51 @ 0.88
FORCE (LB) (X10^2)
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION P3 FORCE


NEW CAR ASSESSMENT PROGRAM
91017
B64F
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -10946.87@ 32.88, 85.08@ 258.00
FORCE (LBS)
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
(X10^2)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B4 FORCE


TRC . 910117
NEW CAR ASSESSMENT PROGRAM
91017
BB5F
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -10368.63@ 34.25 , 138.25 @ 189.88
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
FORCE (LB) (X10^2)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B5 FORCE
B-60
910117

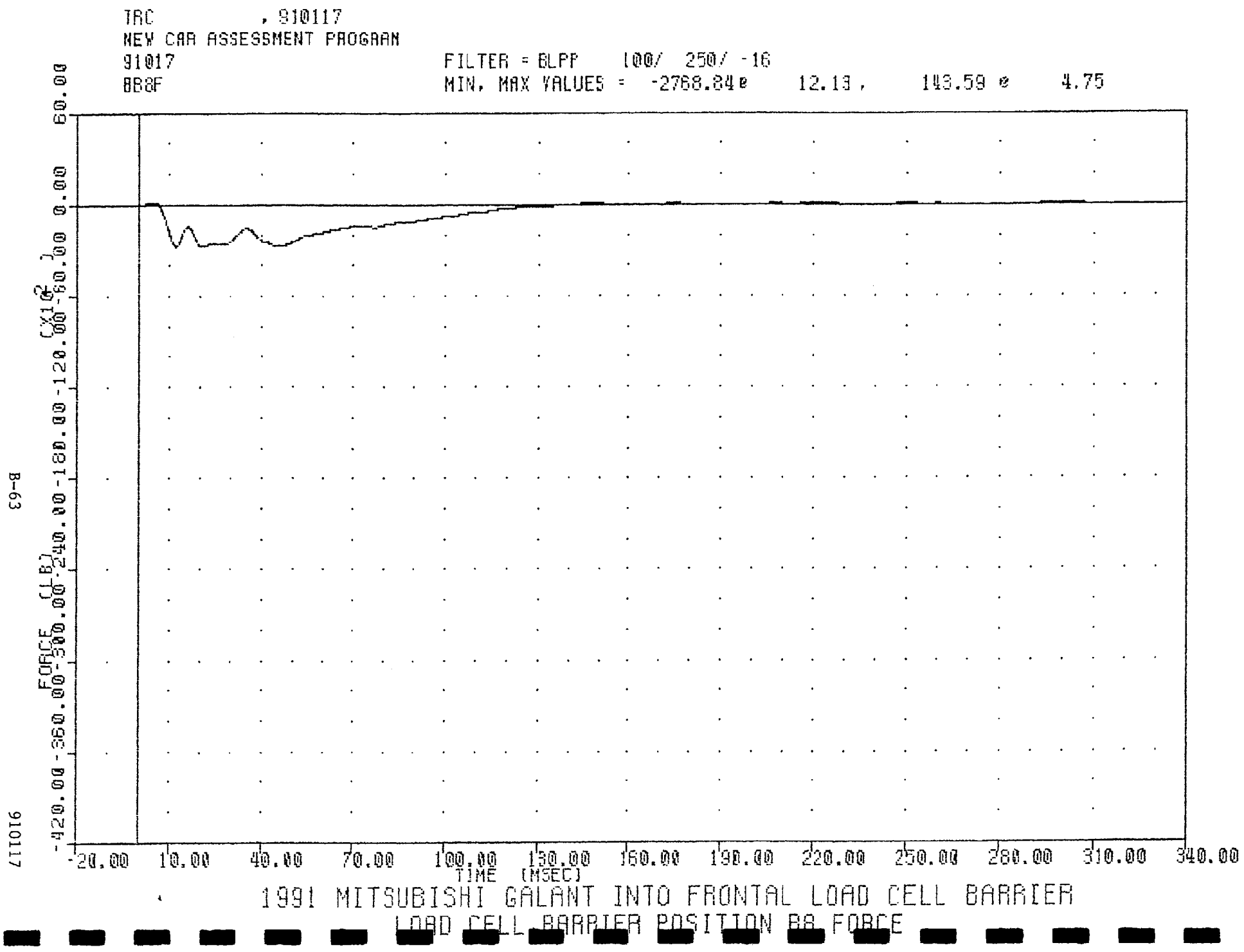


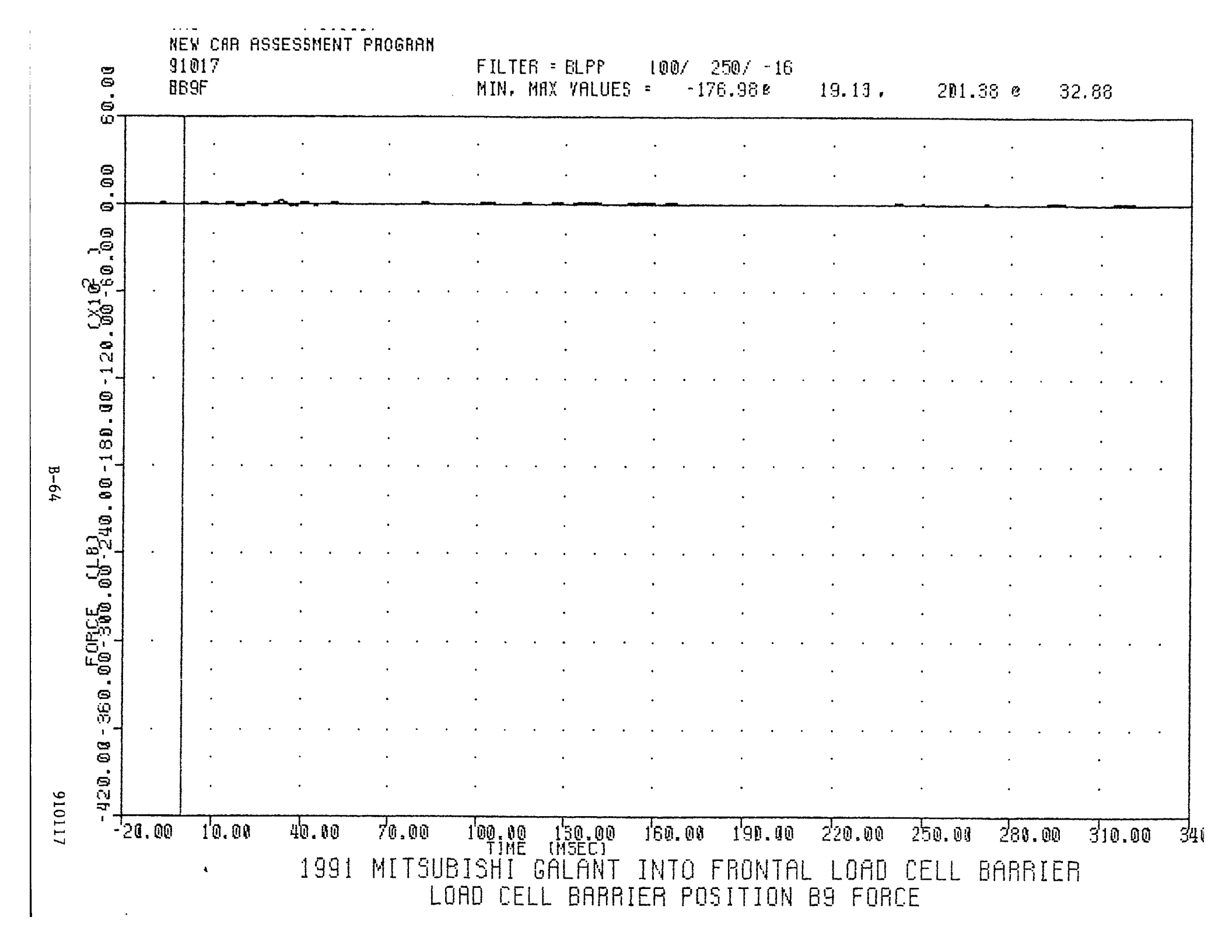
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B6 FORCE



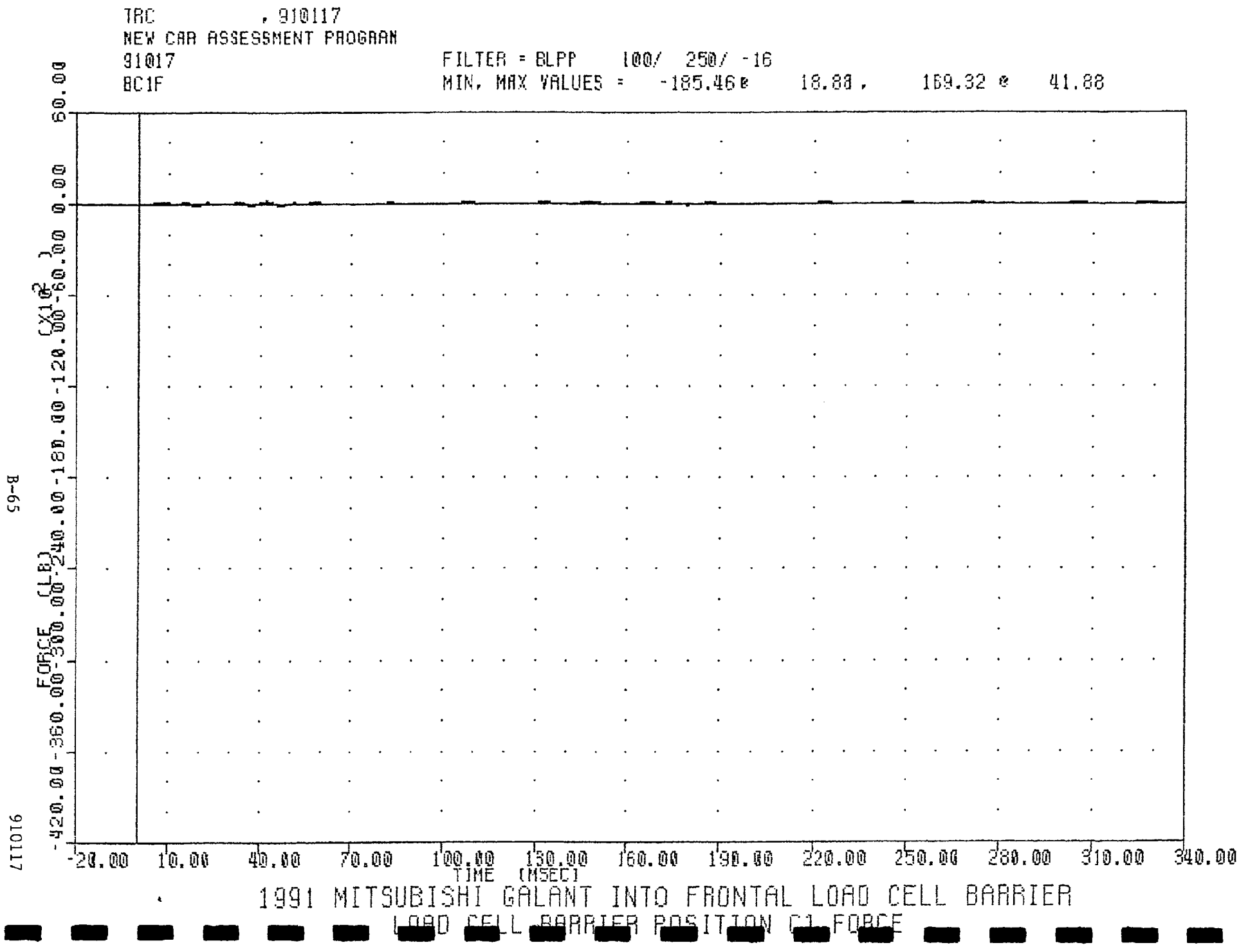
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER

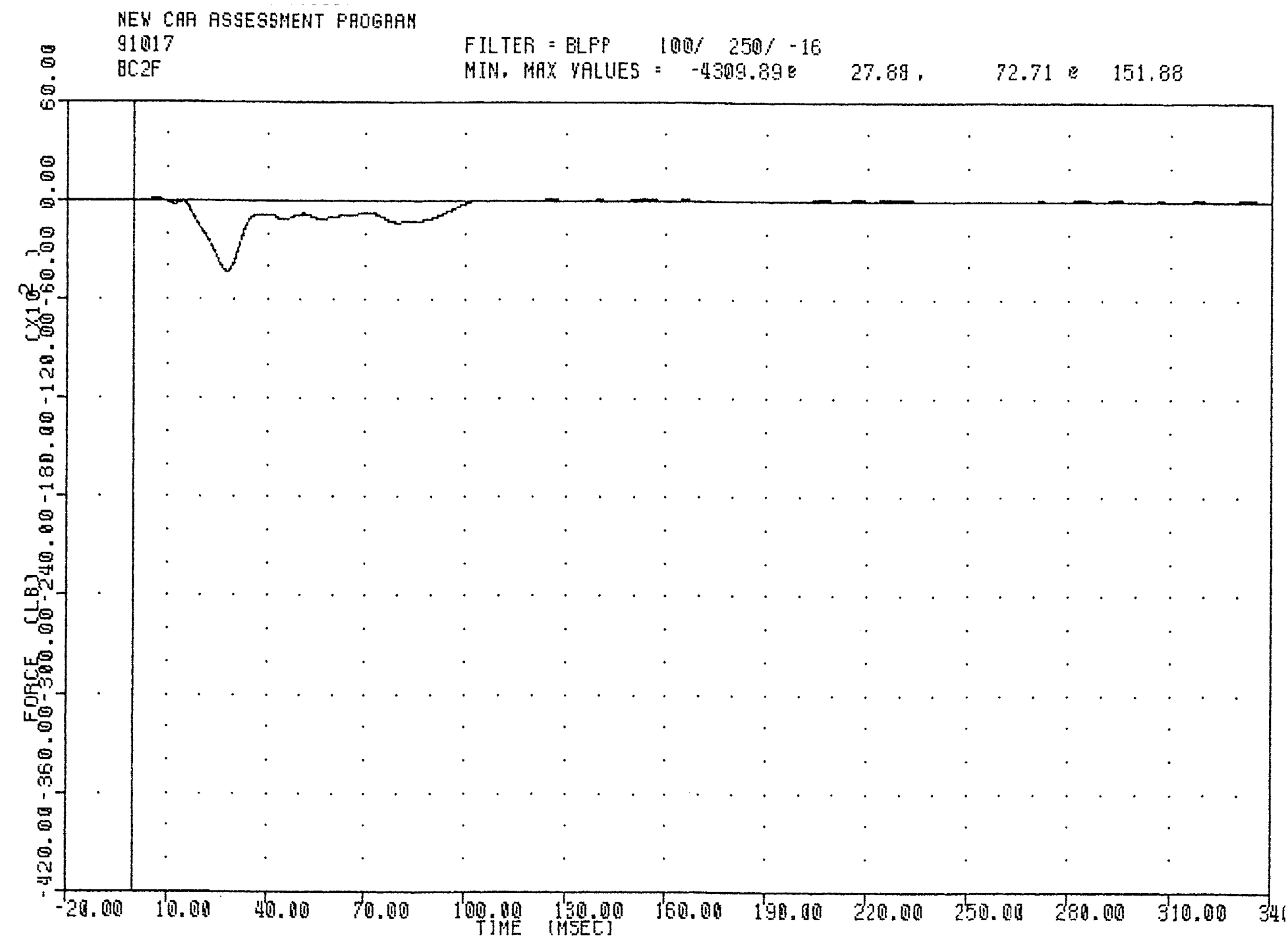
LOAD CELL BARRIER POSITION B7 FORCE


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
BB8F
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -2768.84 @ 12.13 , 143.59 @ 4.75
FORCE (LB)
(X10^2)
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION BB FORCE

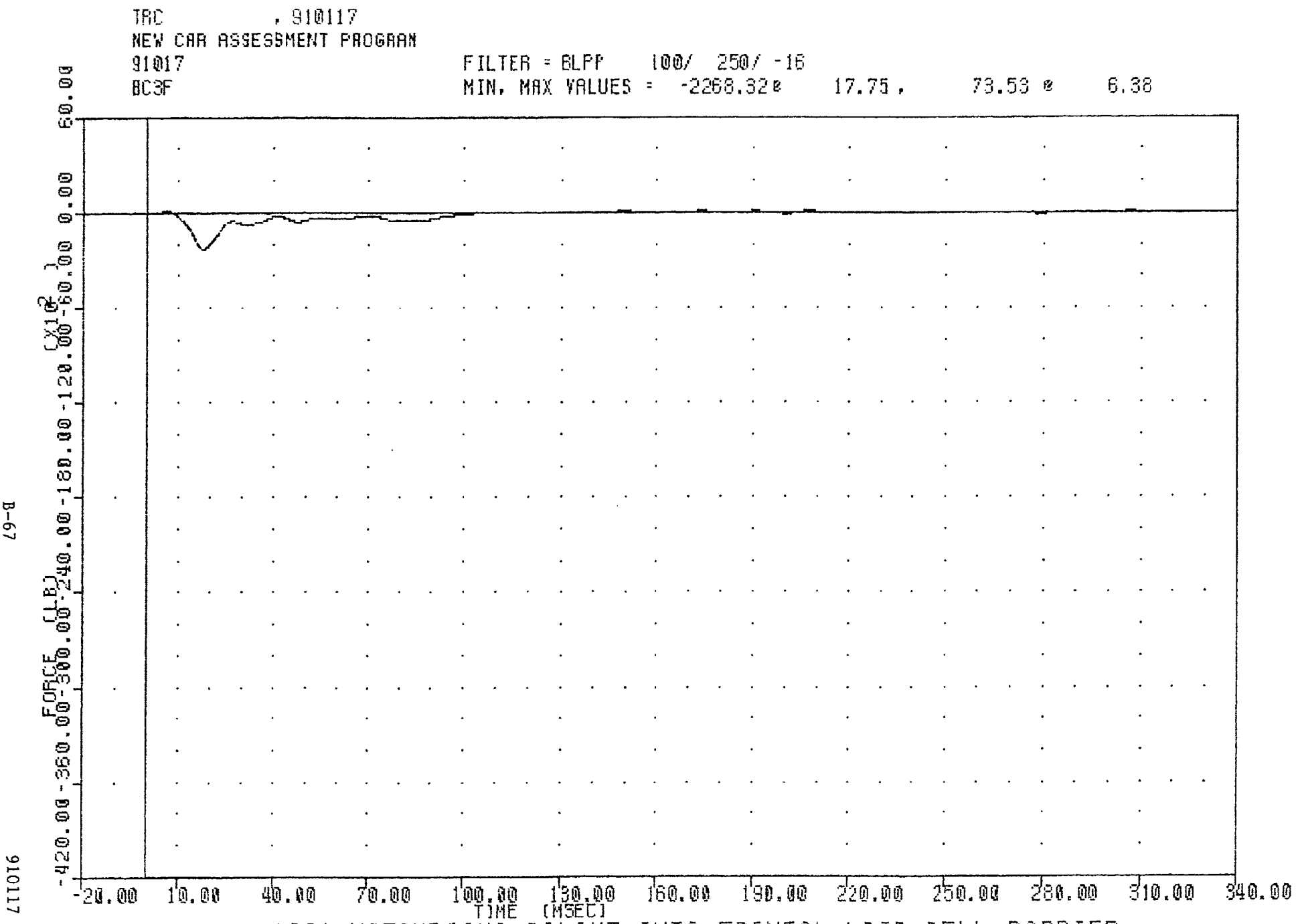


1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B9 FORCE


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
BC1F
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -185.46 @ 18.88 , 159.32 @ 41.88
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
FORCE (LB) (X10^2)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C1 FORCE

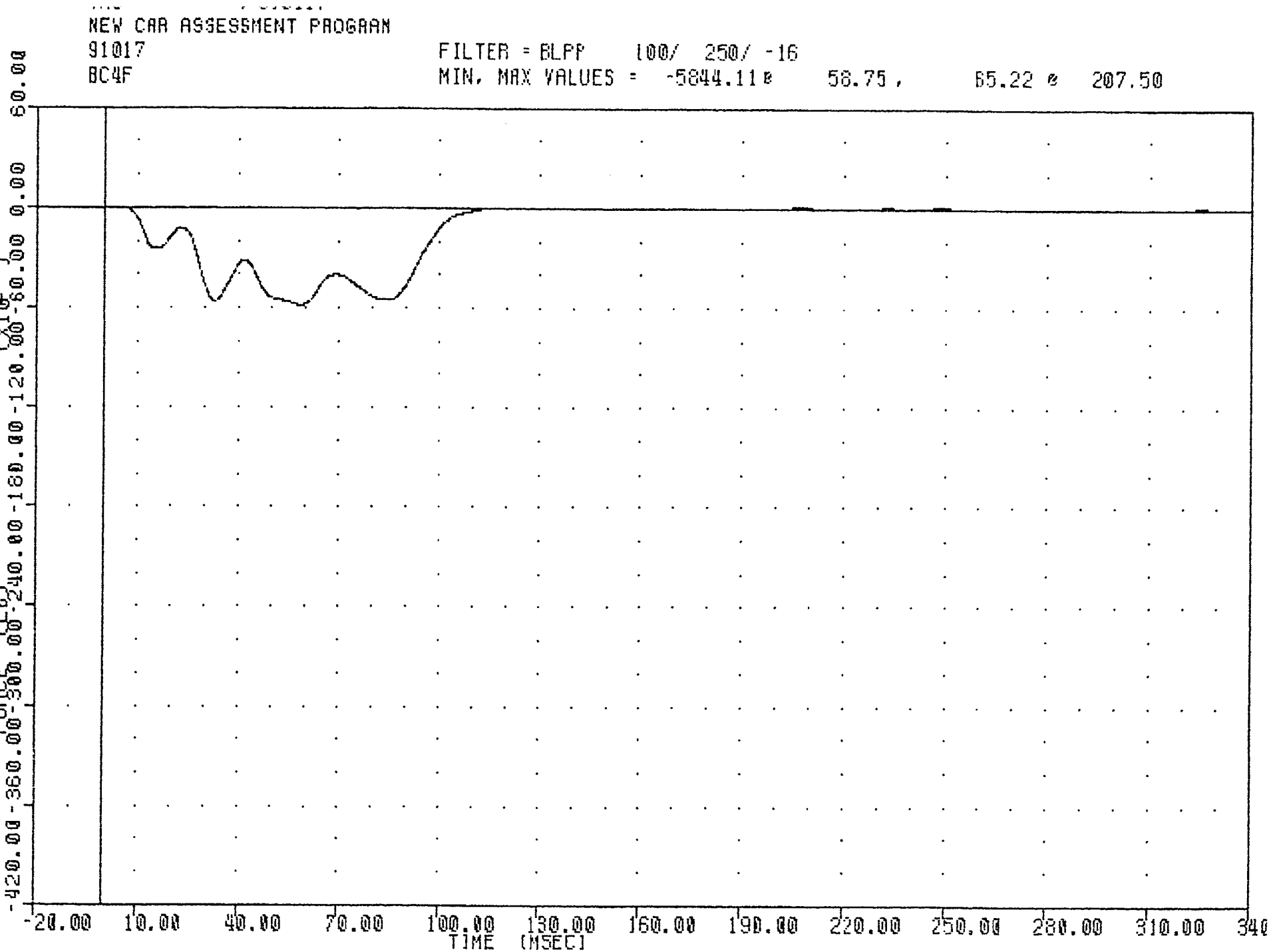


1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C2 FORCE

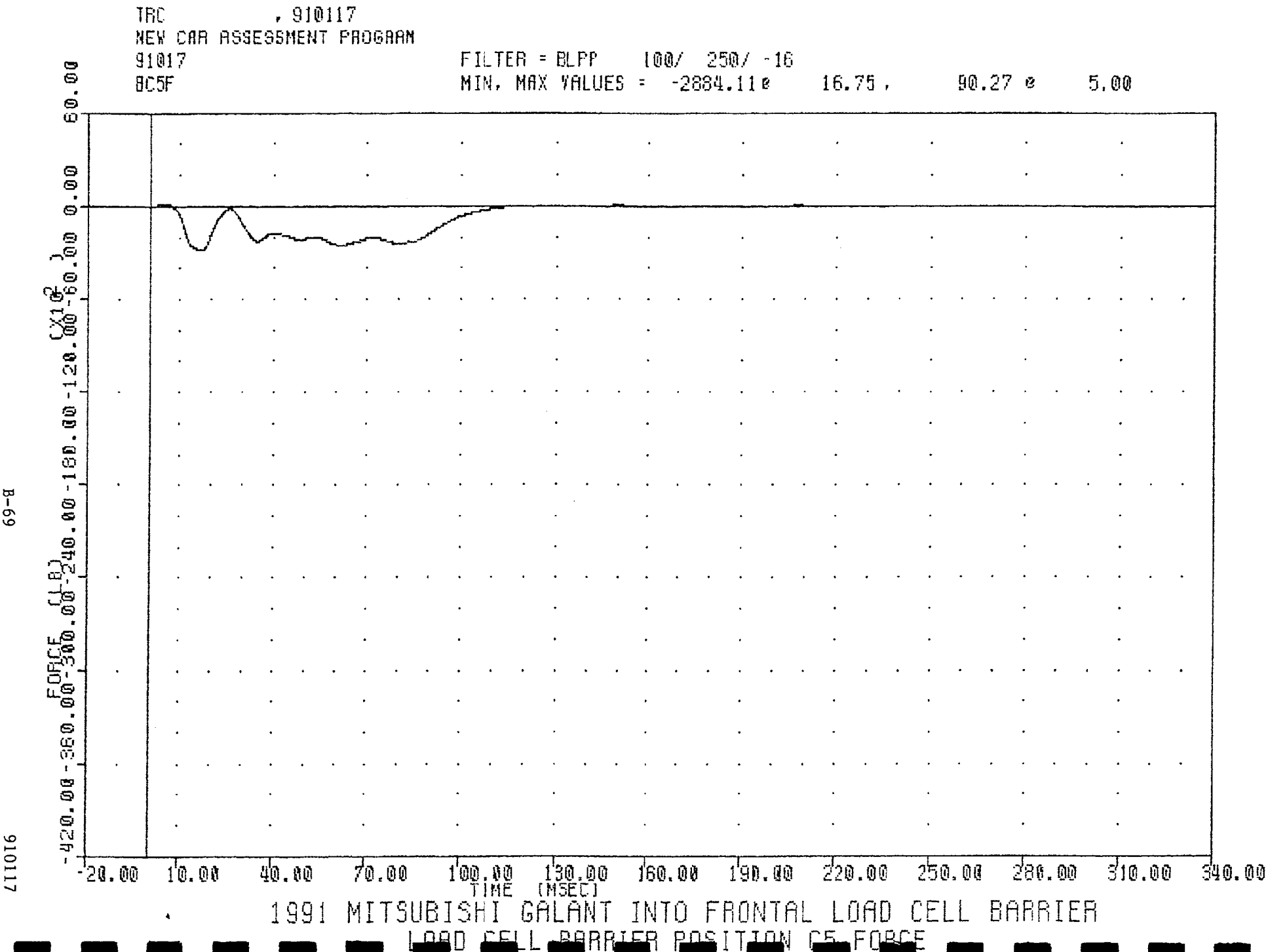


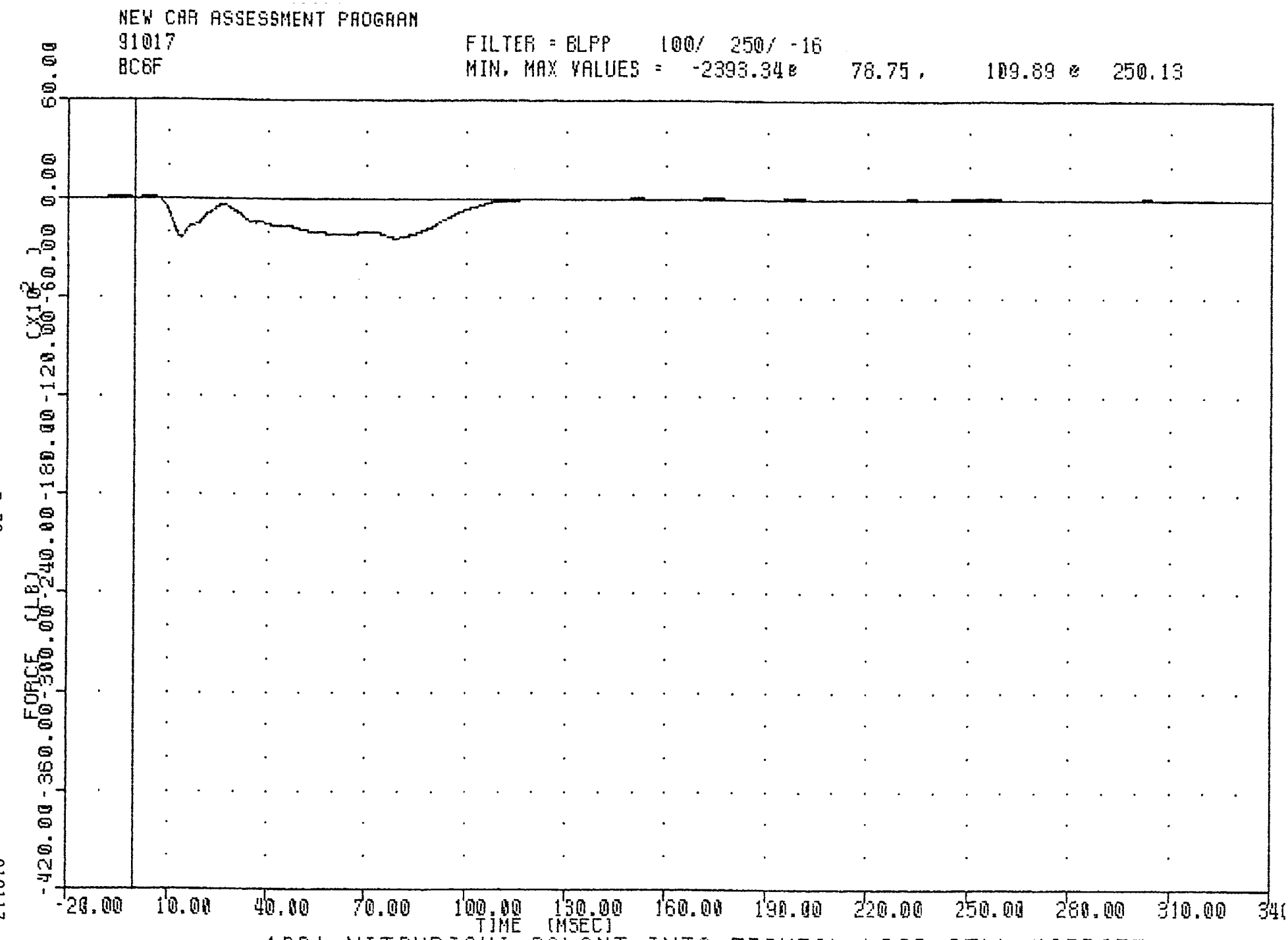
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION C3 FORCE

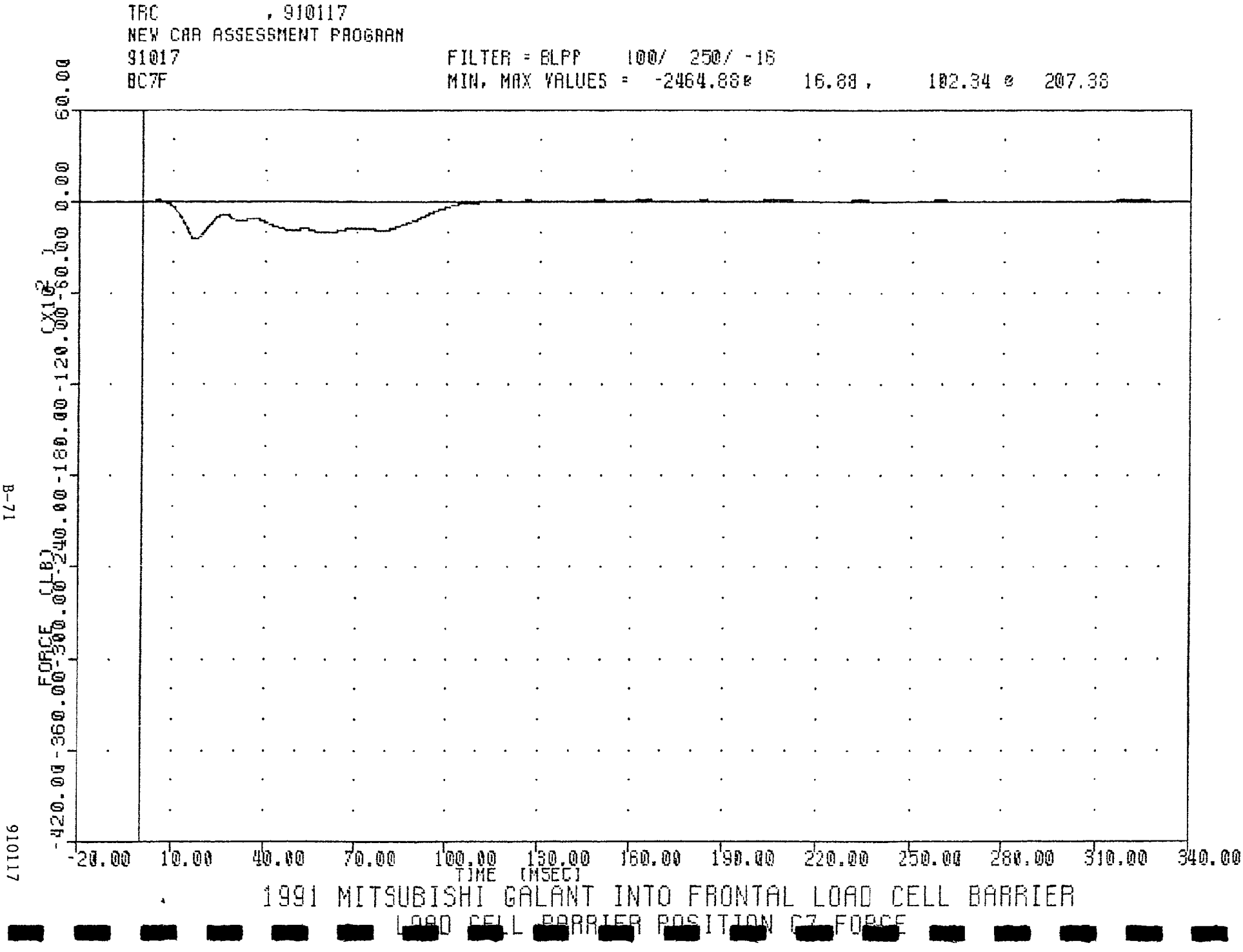


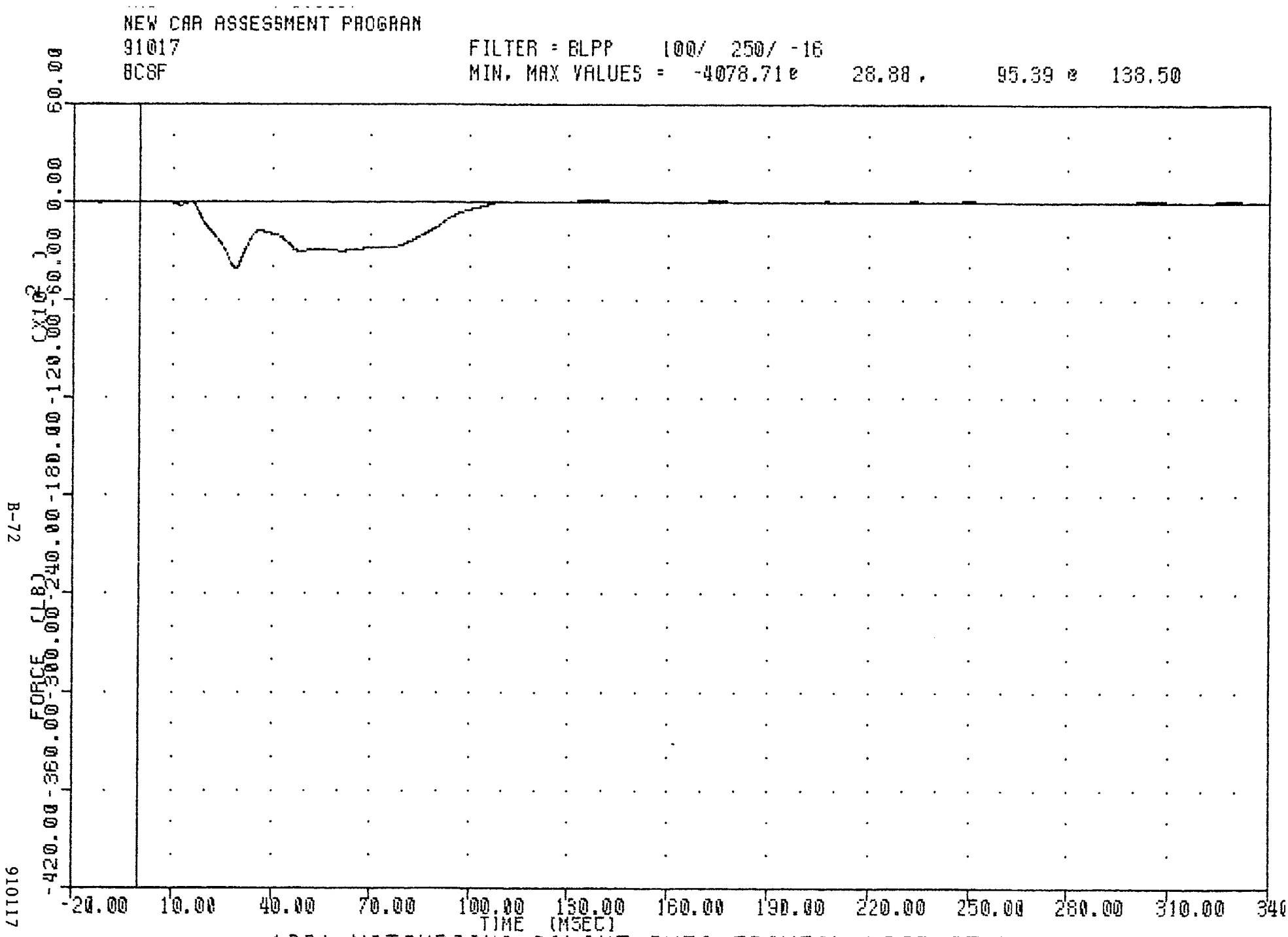
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C4 FORCE


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
8C5F
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -2884.11 @ 16.75 , 90.27 @ 5.00
FORCE (LB) (X1 0^2)
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION CF FORCE

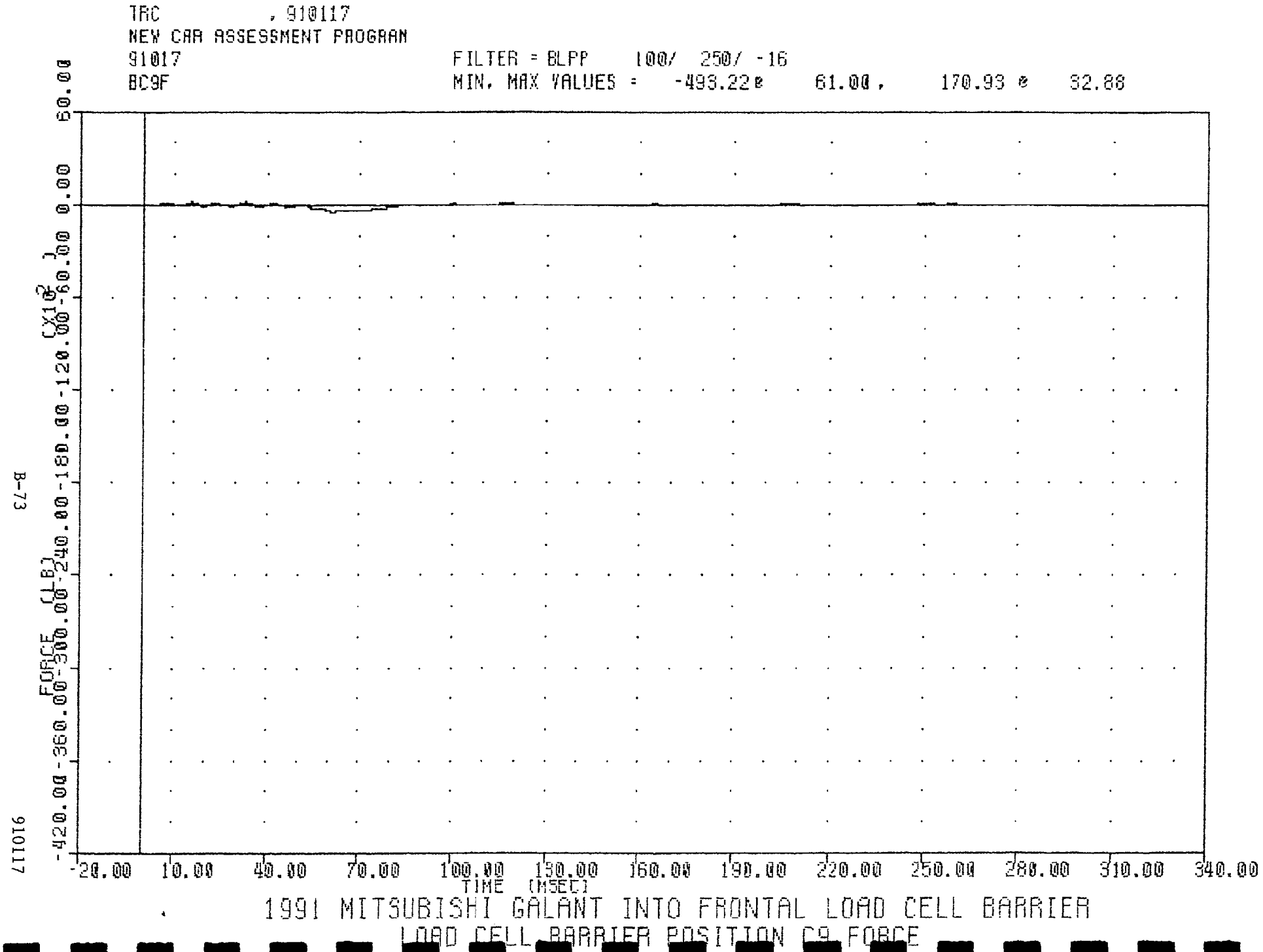


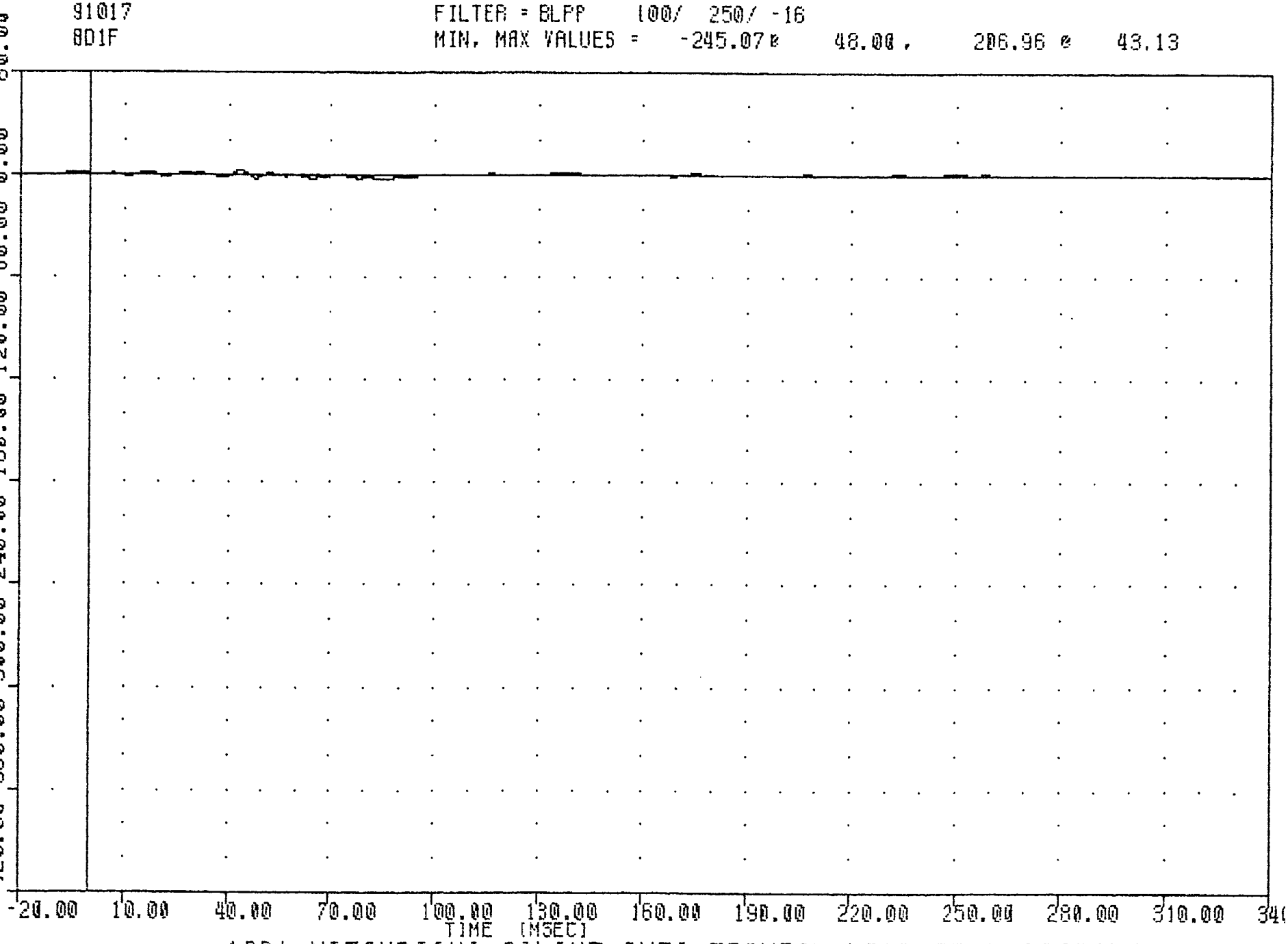
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C6 FORCE


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
BC7F
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -2464.88@ 16.88 , 102.34 @ 207.38
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
FORCE (LB) (X10^2)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C7 FORCE

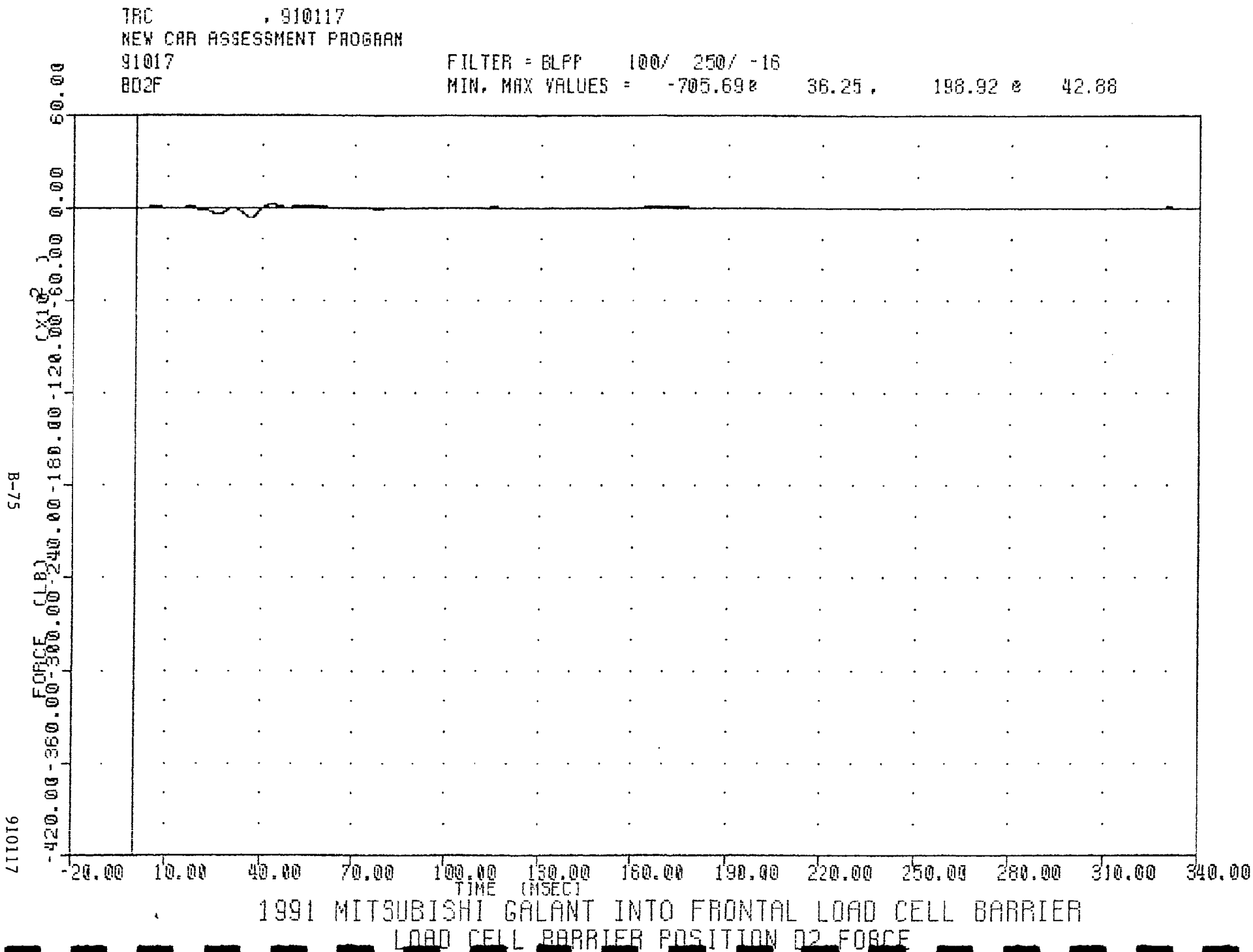


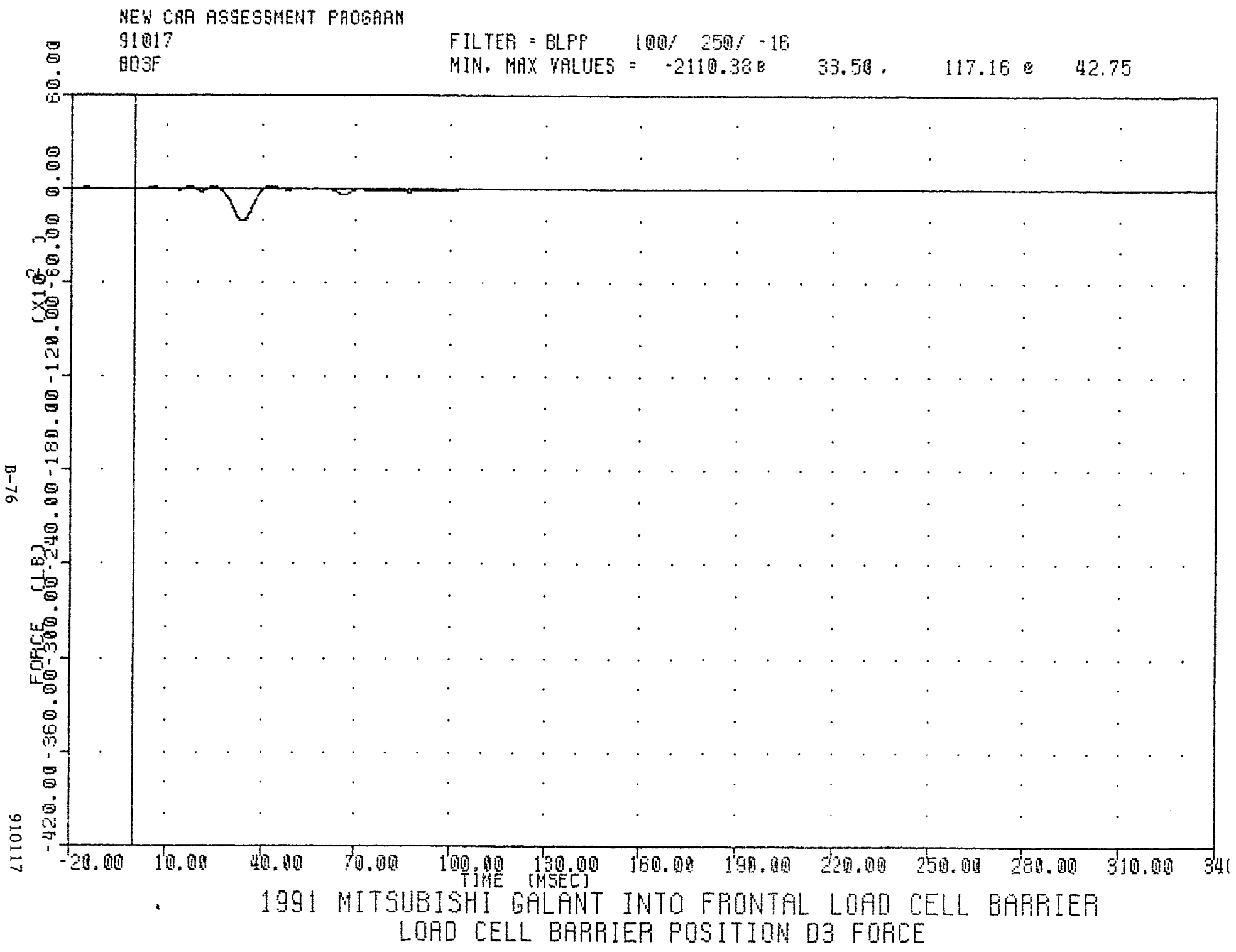
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C8 FORCE


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
BC9F
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -493.22@ 61.00, 170.93 @ 92.88
FORCE (LB)
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
(X10^2)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION CG FORCE



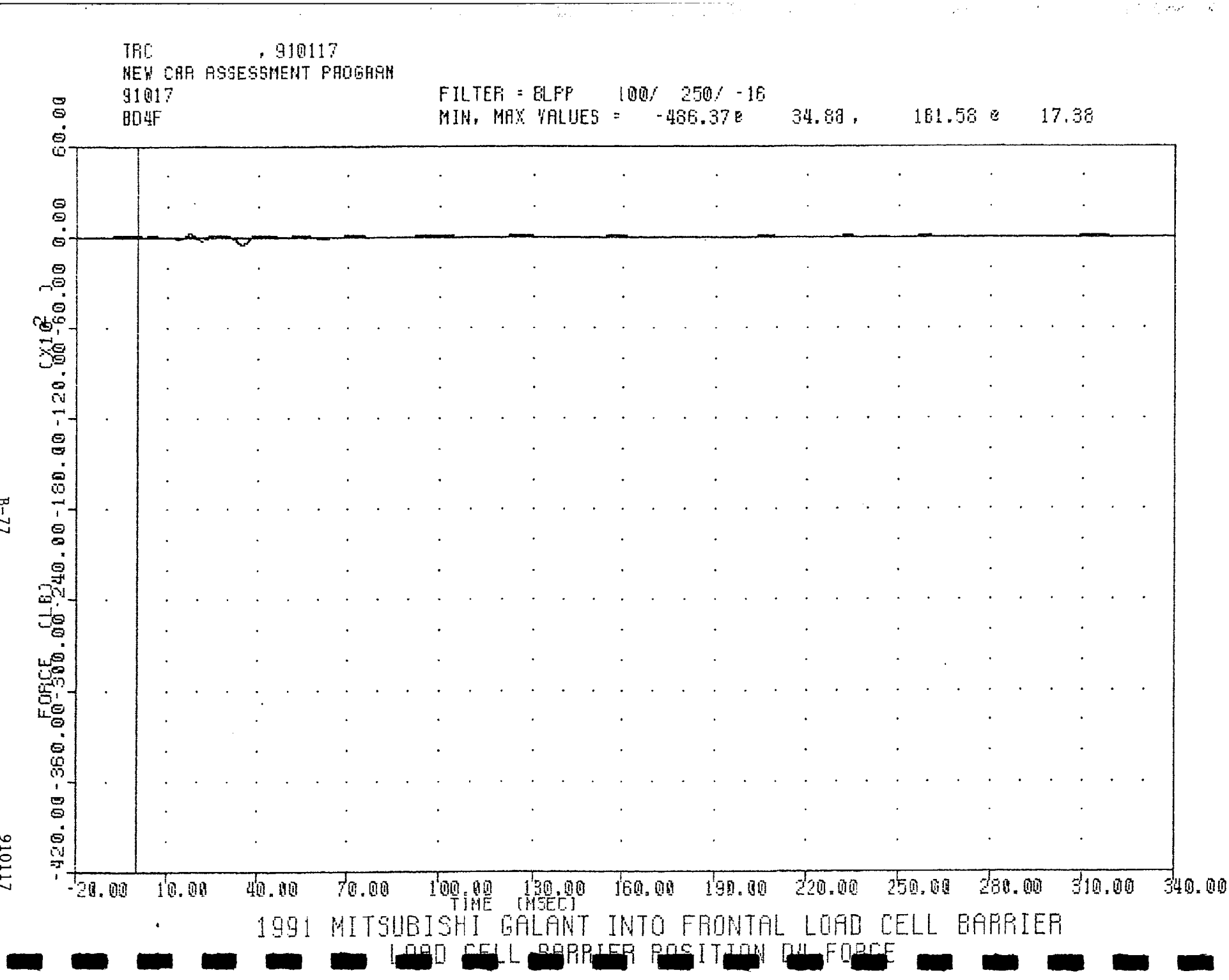
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D1 FORCE


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
BD2F
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -705.69 @ 36.25 , 198.92 @ 42.88
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
FORCE (LB)
(X10^2)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D2 FORCE



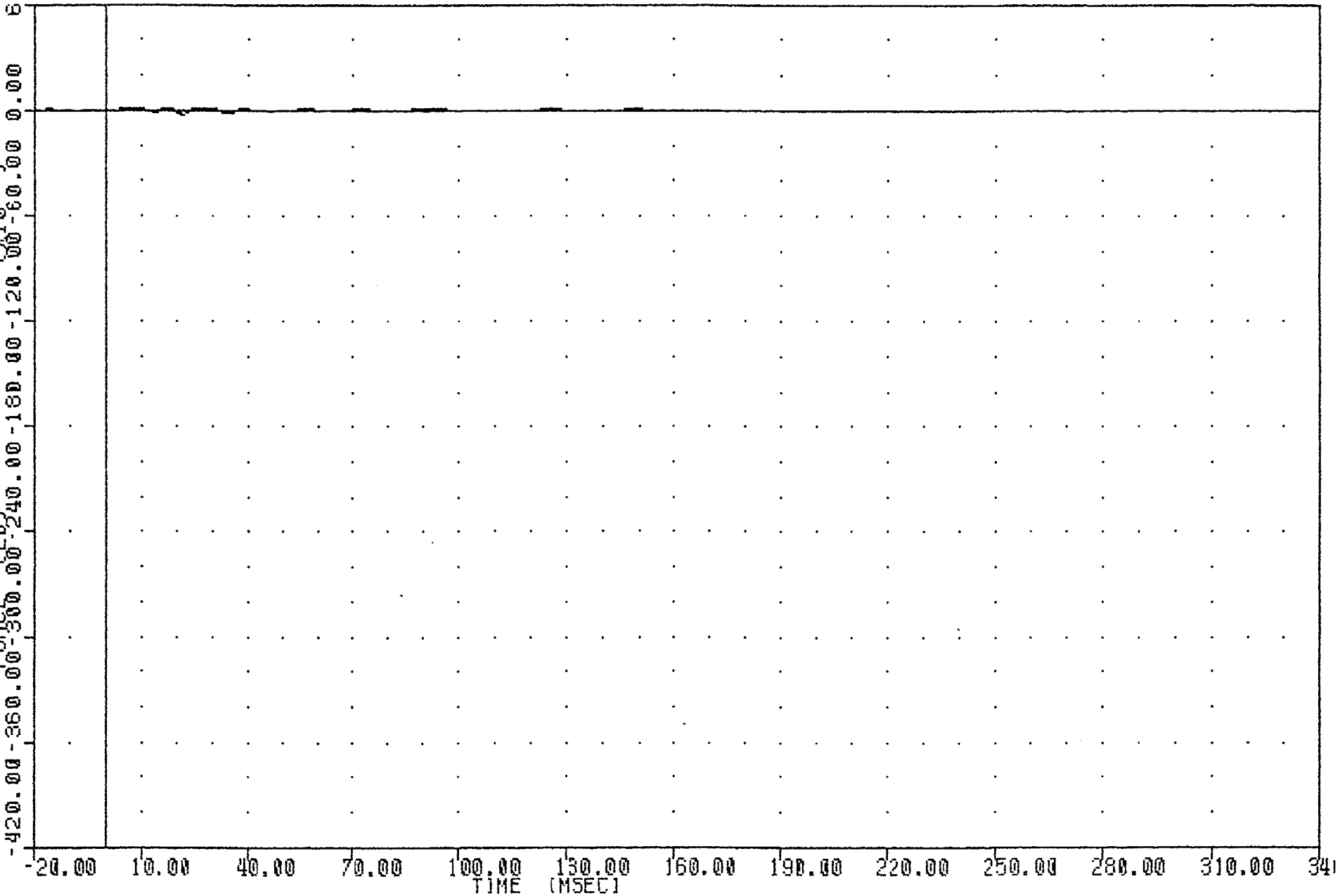
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D3 FORCE

91017


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
BD4F
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -486.37@ 34.88 , 181.56 @ 17.38
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
FORCE (LB)
(X10^2)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION DW FORCE

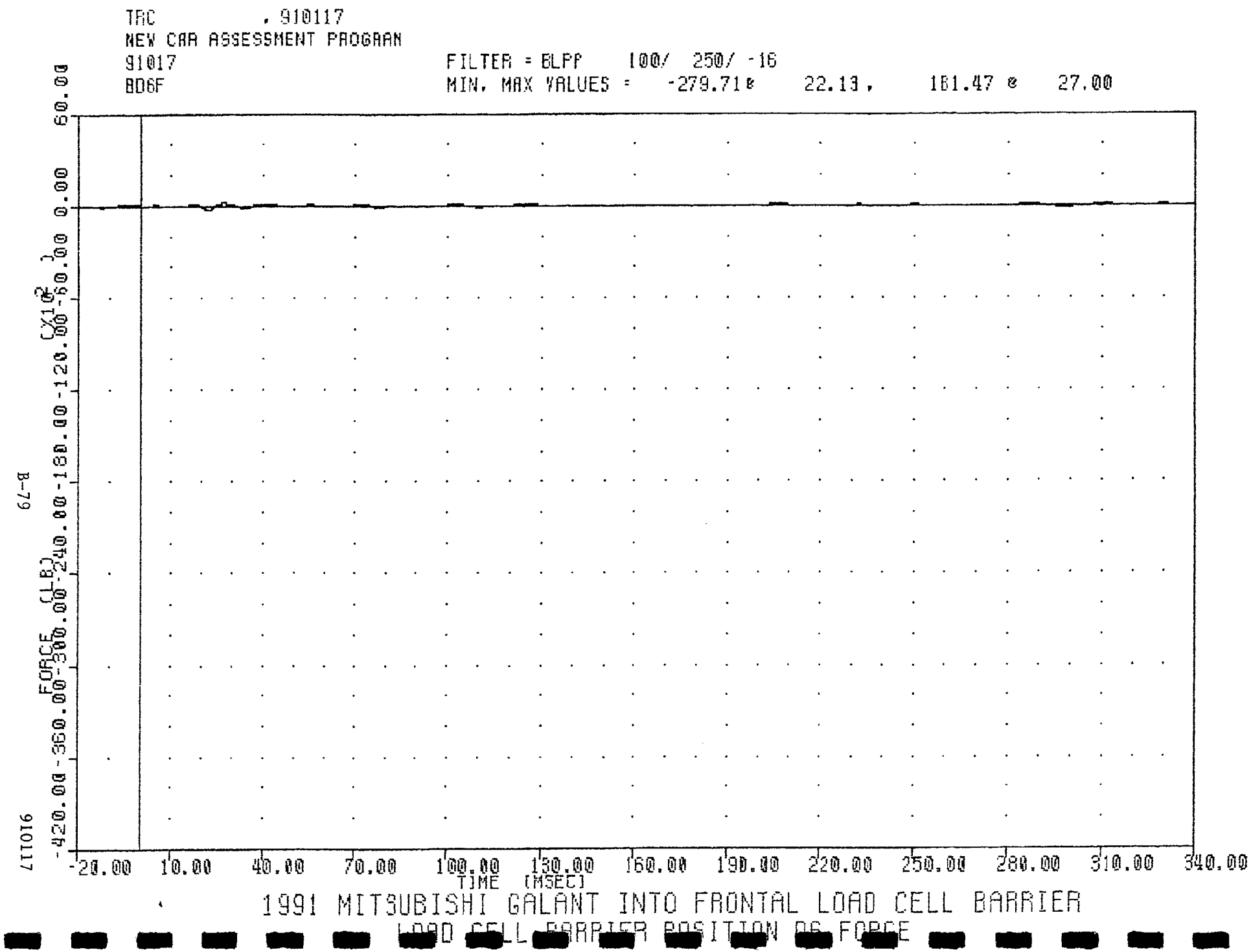
NEW CAR ASSESSMENT PROGRAM
91017
805F

FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -250.79@ 21.75 , 163.89 @ 17.38



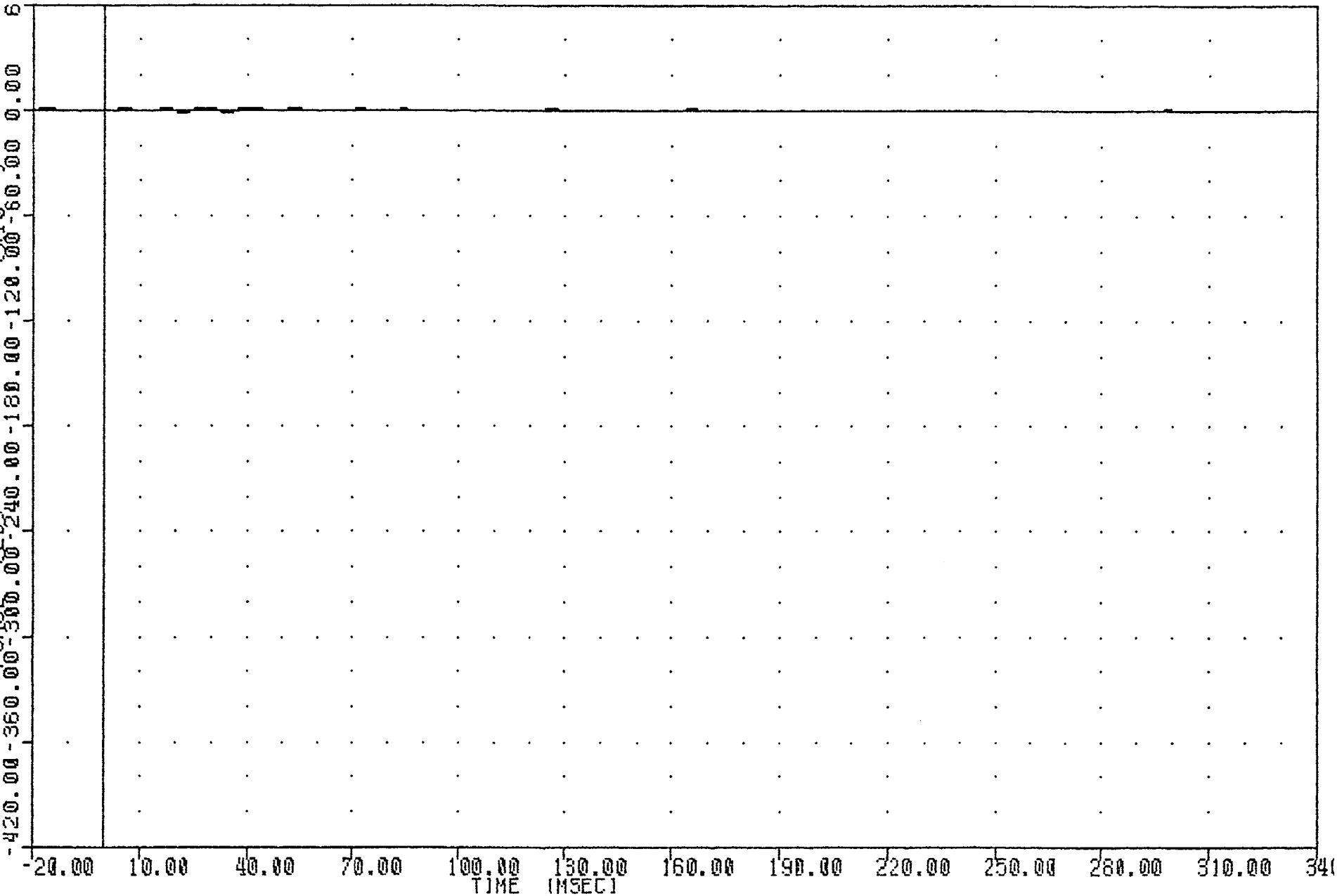
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION 05 FORCE

91017

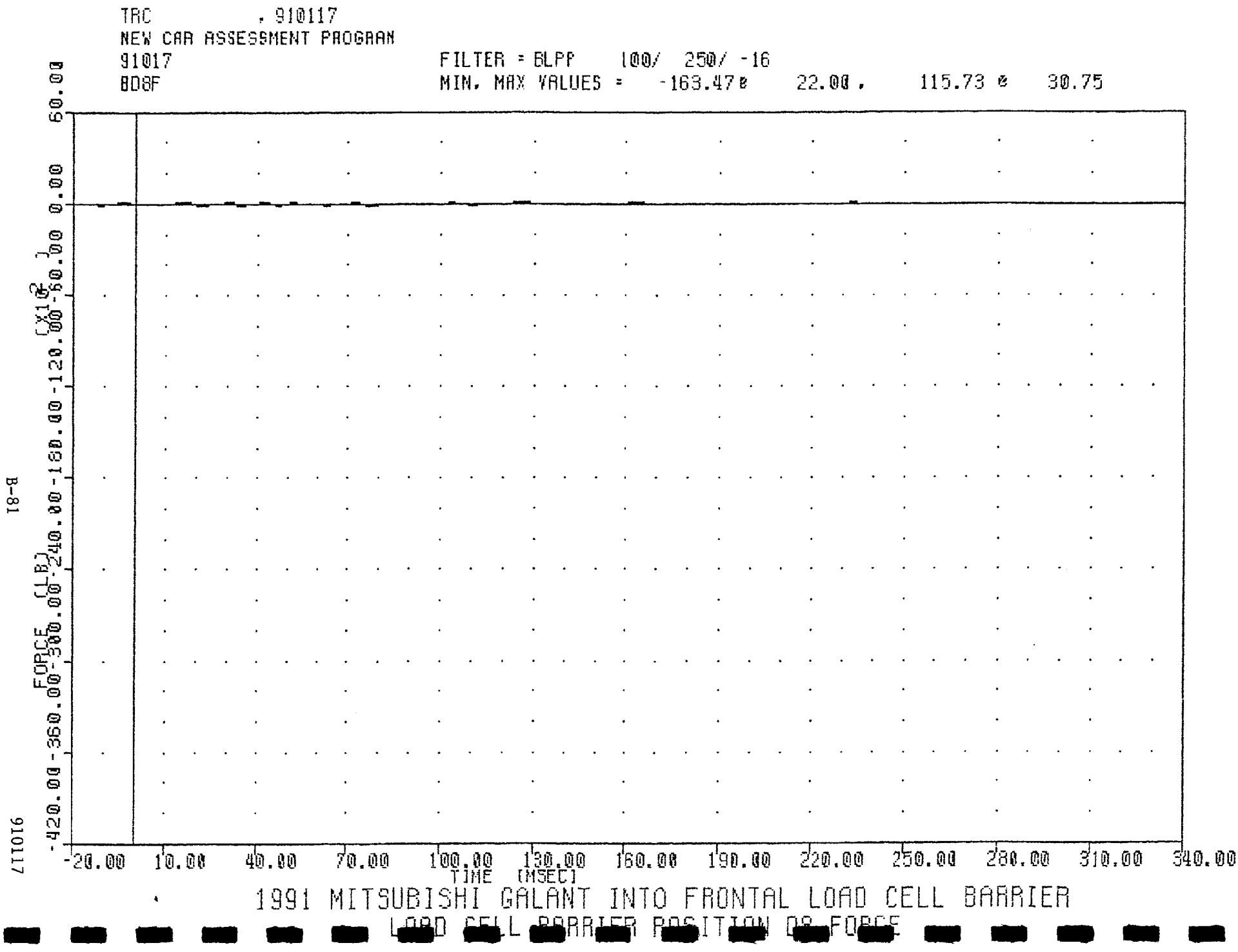

TRC . 910117
NEW CAR ASSESSMENT PROGRAM
91017
BD6F
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -279.71 @ 22.13 , 181.47 @ 27.00
FORCE (LB)
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION DC FORCE

NEW CAR ASSESSMENT PROGRAM
91017
BD7F

FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -194.73 @ 34.38 , 100.44 @ 17.38

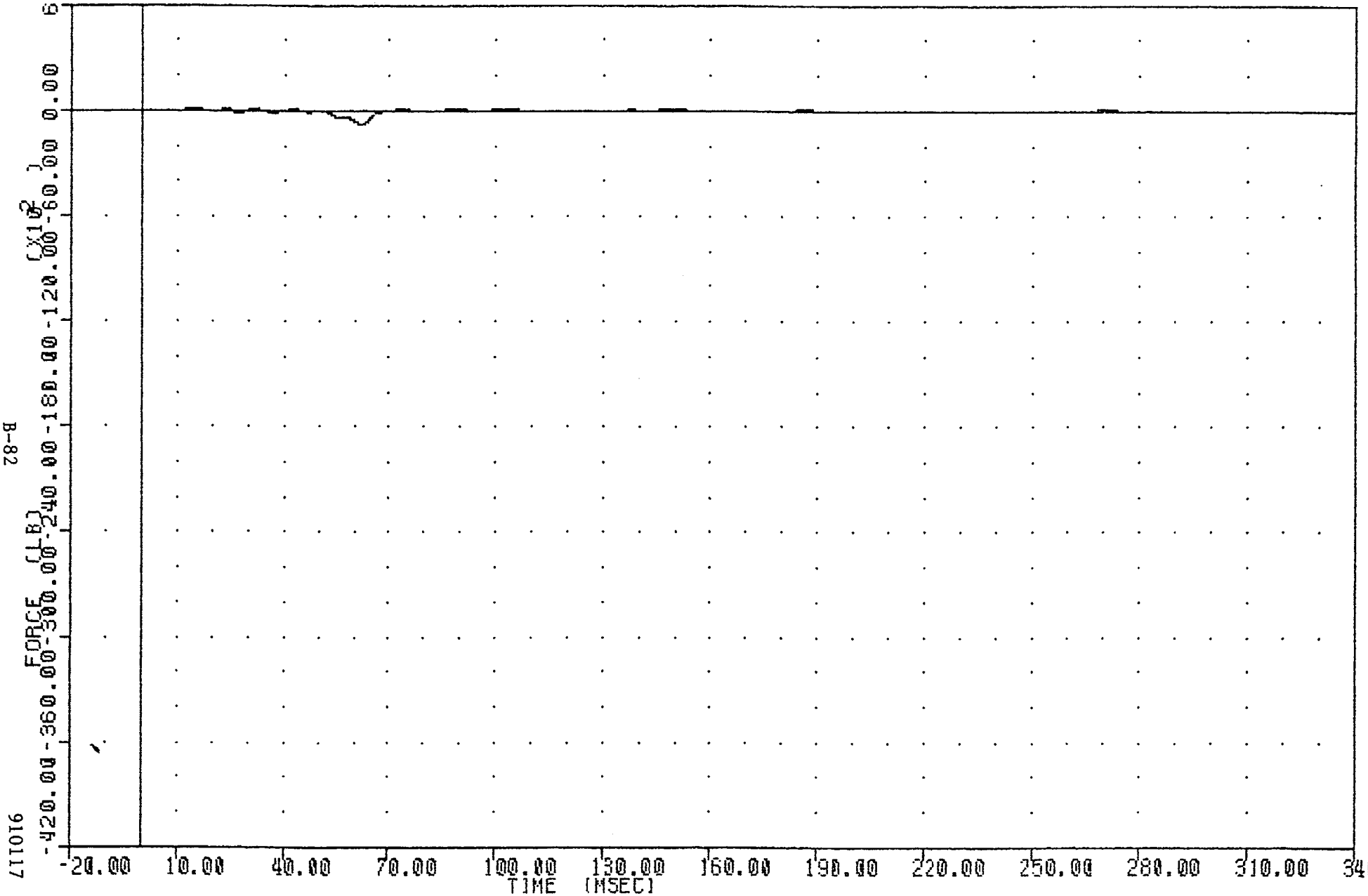


1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D7 FORCE


TRC . 910117
NEW CAR ASSESSMENT PROGRAM
91017
BD8F
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -163.47@ 22.00 , 115.73 @ 30.75
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
FORCE (LB) [X10^2]
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION OR FORCE

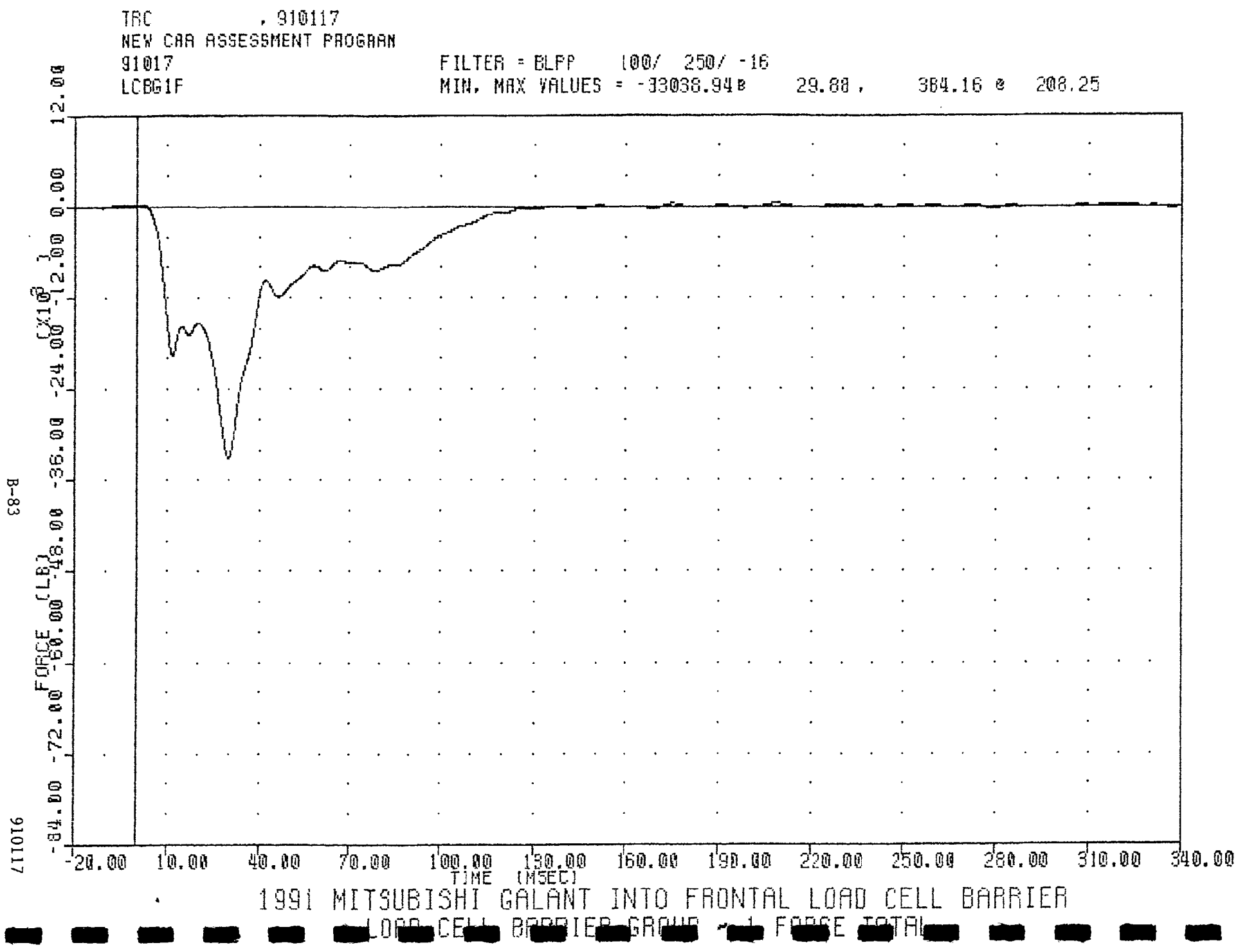
NEW CAR ASSESSMENT PROGRAM
91017
BD9F

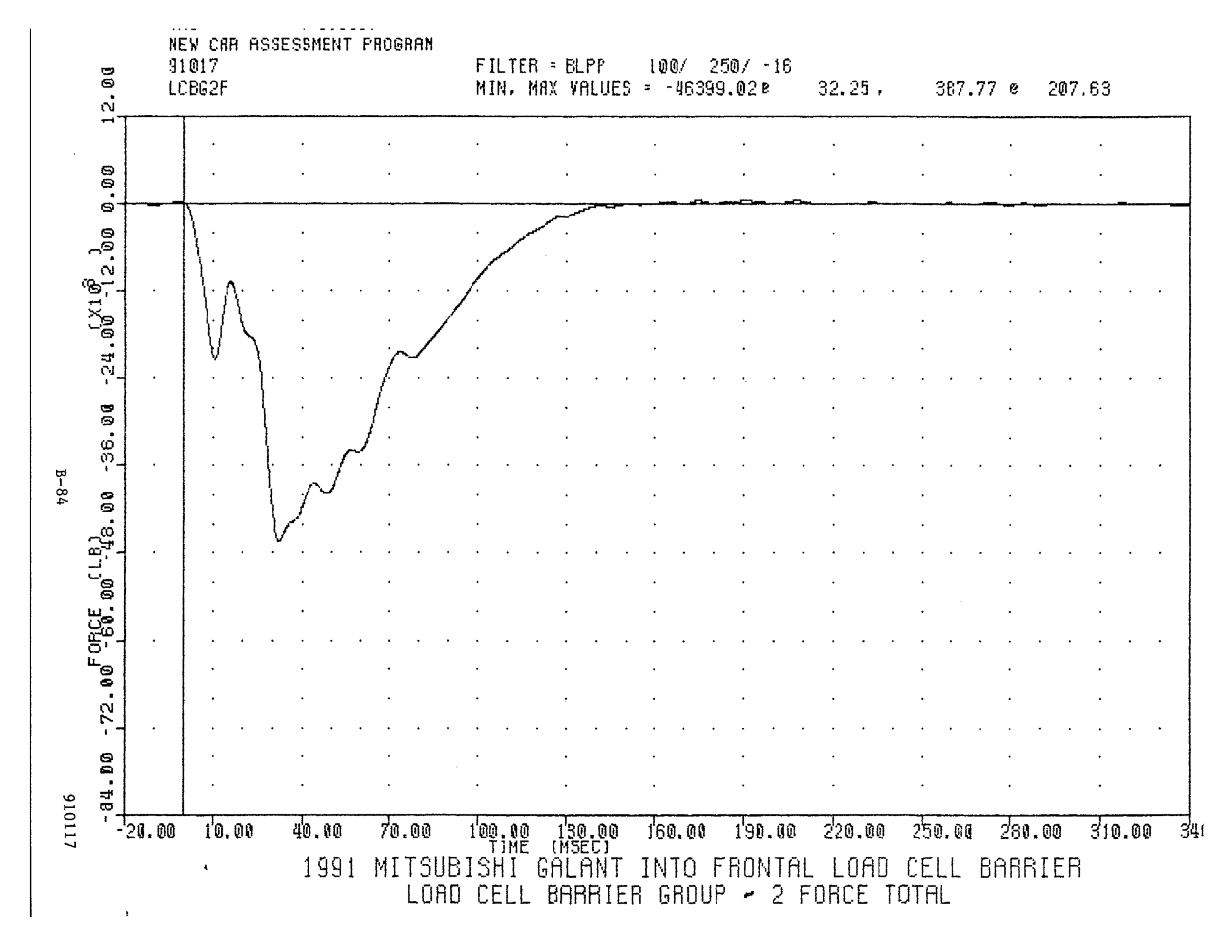
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -804.26 @ 61.88 , 140.85 @ 14.13



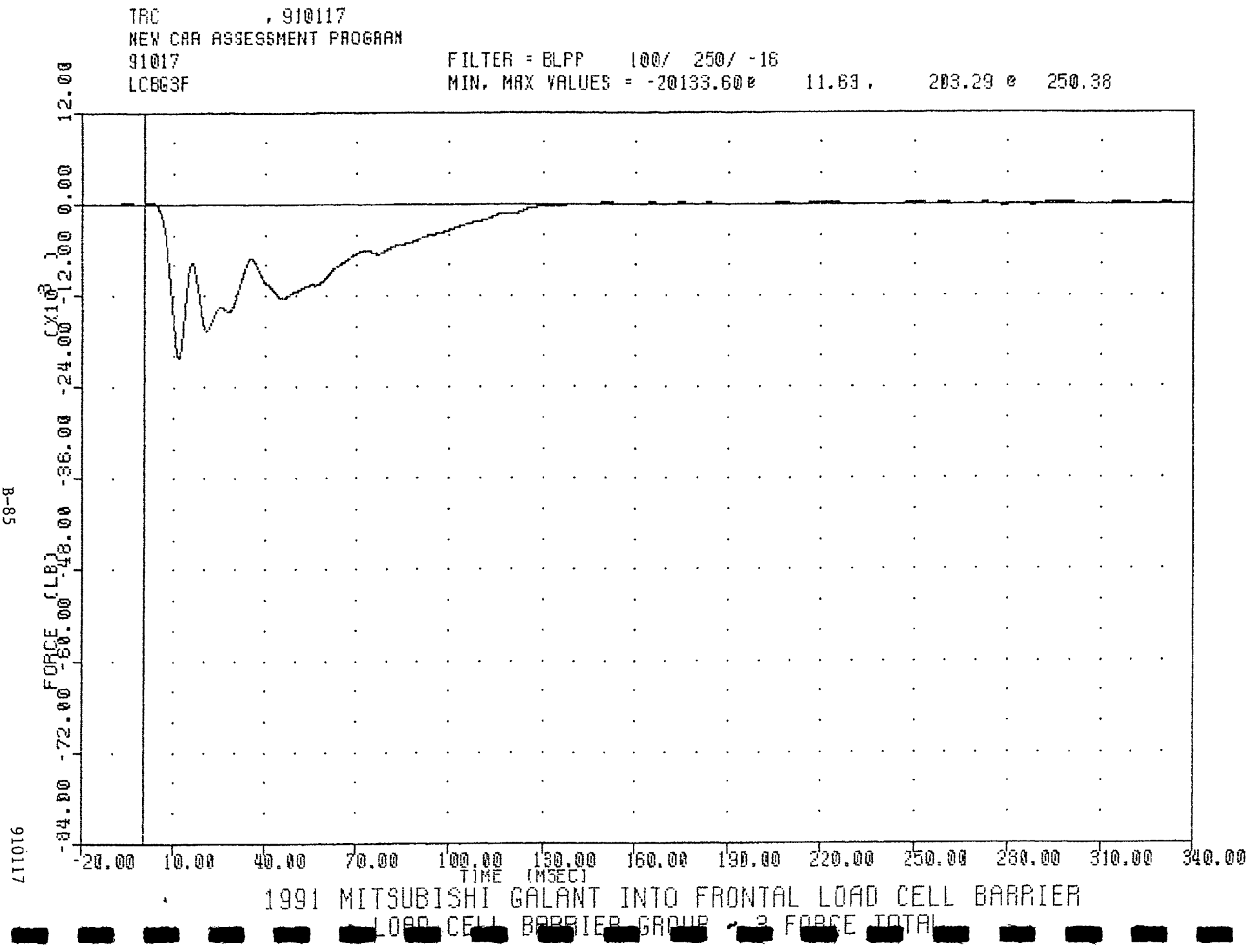
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D9 FORCE

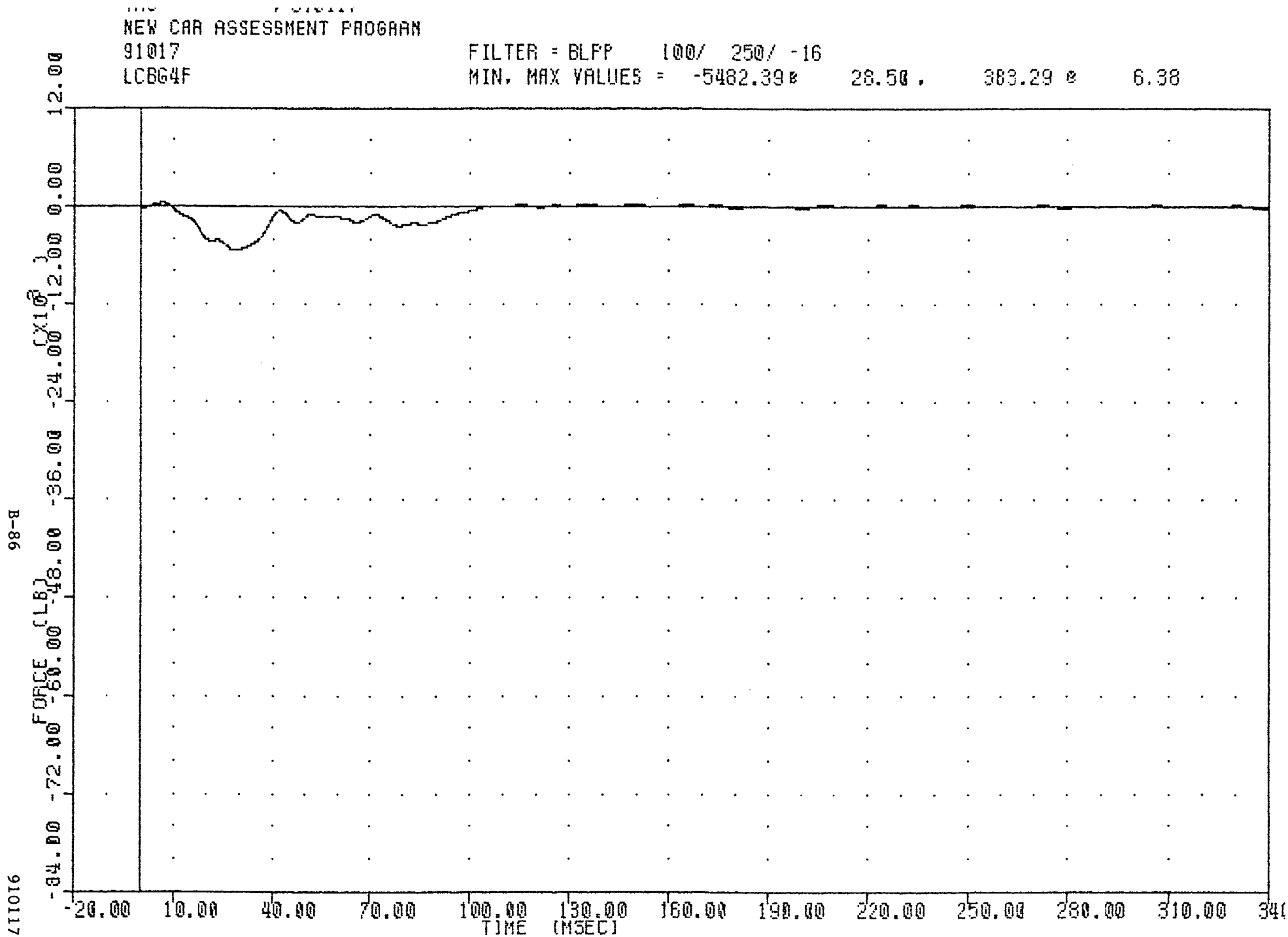
91017


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
LCBG1F
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -33038.94@ 29.88 , 384.16 @ 208.25
12.00
0.00
-12.00
-24.00
-36.00
-48.00
-60.00
-72.00
-84.00
FORCE (LB) X10^3
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP - 1 FORCE TOTAL



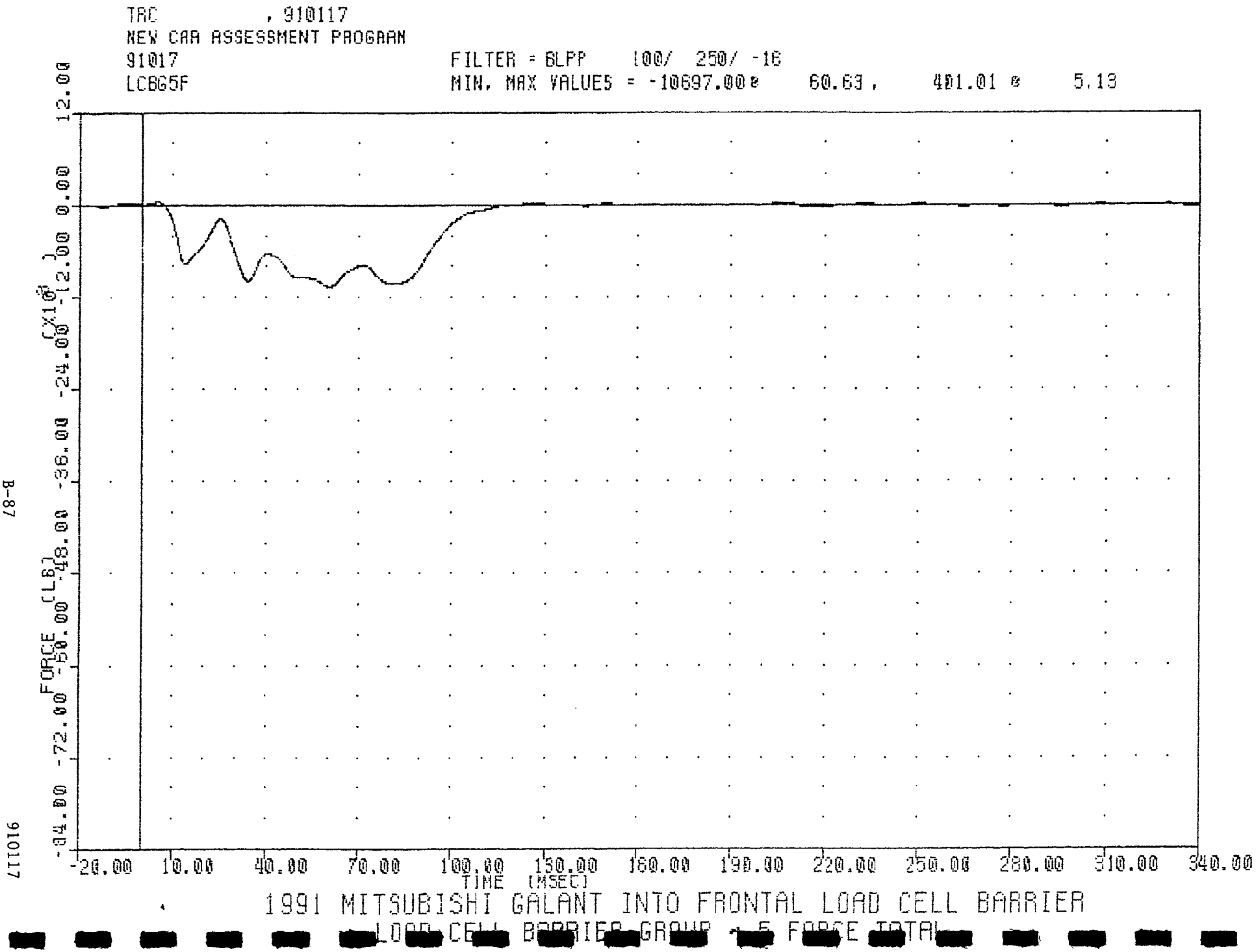
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP - 2 FORCE TOTAL

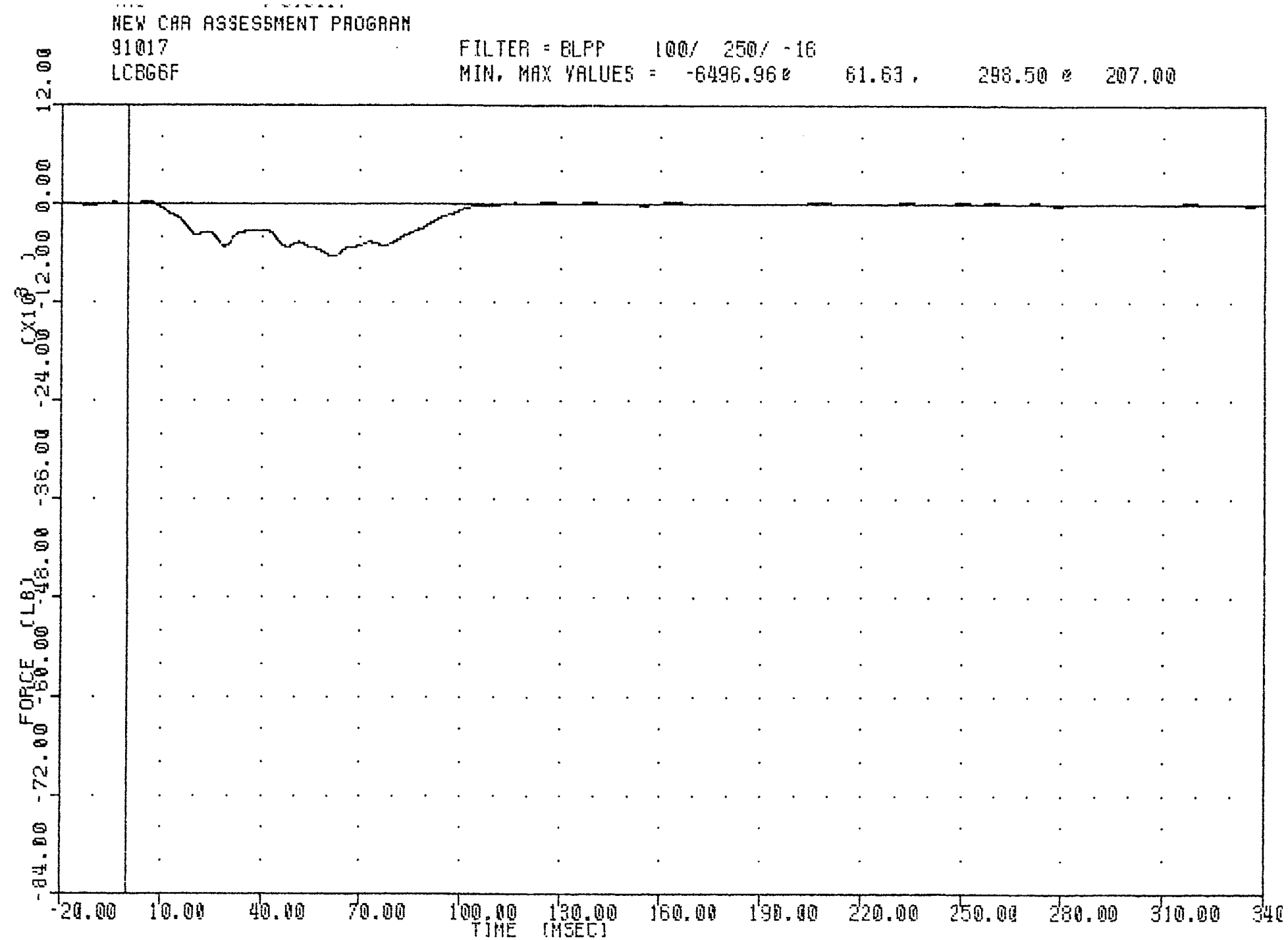

TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
LCBG3F
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -20133.60@ 11.63, 203.29 @ 250.38
12.00
0.00
-12.00
-24.00
-36.00
-48.00
-60.00
-72.00
-84.00
FORCE (LB) (X10^3)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP - 3 FORCE TOTAL



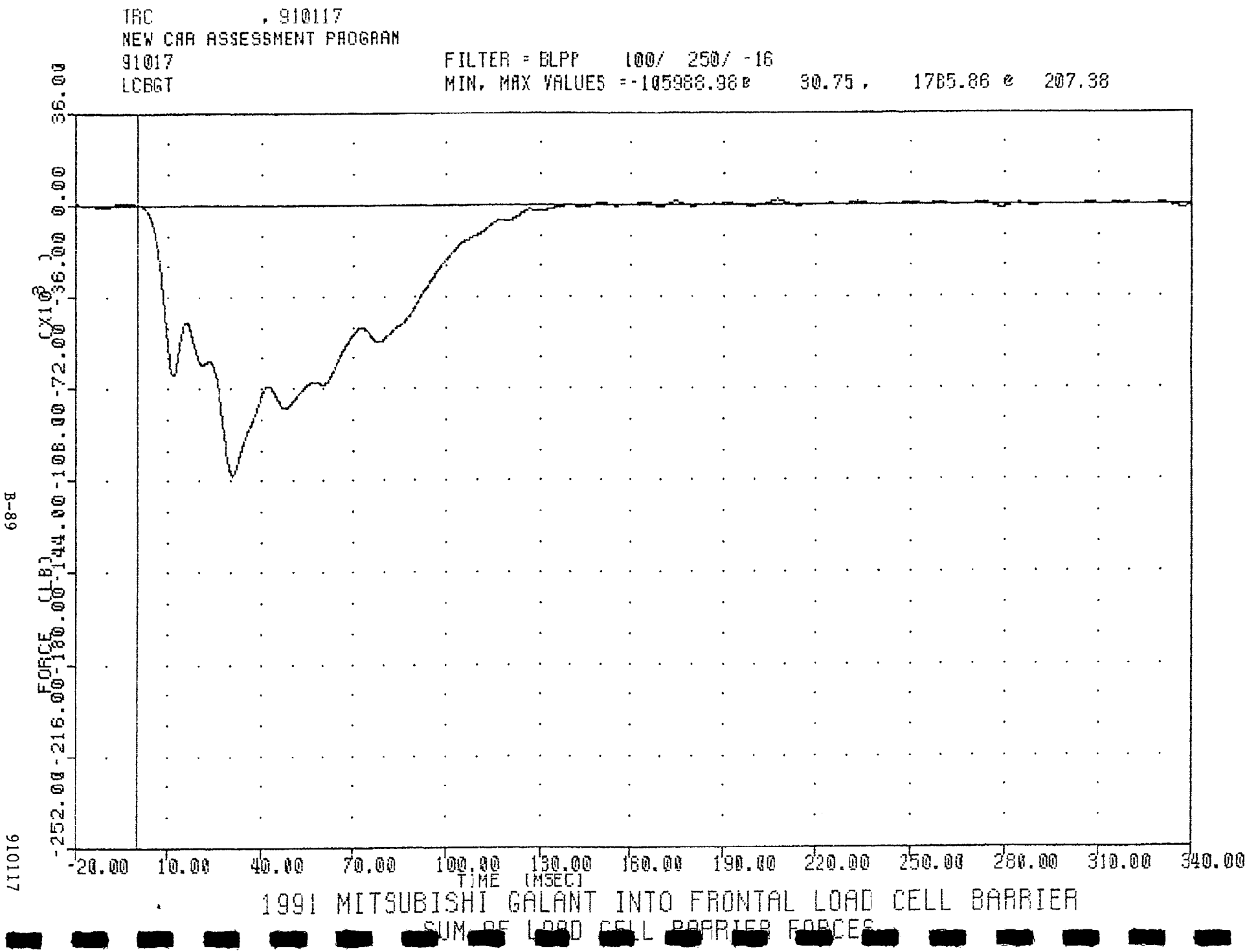
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP = 4 FORCE TOTAL

91017


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
LCBG5F
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -10697.00 @ 60.63 , 401.01 @ 5.13
12.00
0.00
-12.00
-24.00
-36.00
-48.00
-60.00
-72.00
-84.00
FORCE (LB) (X10)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP - F FORCE TOTAL



1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP - 6 FORCE TOTAL


TRC , 910117
NEW CAR ASSESSMENT PROGRAM
91017
LCBGT
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES =-105988.98@ 30.75 , 1785.86 @ 207.38
36.00
0.00
-36.00
-72.00
-108.00
-144.00
-180.00
-216.00
-252.00
FORCE (LB) (X10^3)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1991 MITSUBISHI GALANT INTO FRONTAL LOAD CELL BARRIER
SUM OF LOAD CELL BARRIER FORCES
B-89
910117

APPENDIX C

DUMMY CERTIFICATION DATA

PRE-TEST CERTIFICATION DATA

DRIVER DUMMY S/N: 826

TRANSPORTATION RESEARCH CENTER OF OHIO

EXTERNAL DIMENSIONS

PART 572 08-NOV-90

TEMPERATURE 74 F RELATIVE HUMIDITY 33 %
NHTSA EDS2626 572B SN826 EXT. DIMENSION CAL26

DESCRIPTION SN 826 HUMANOID	SPECIFICATION	TEST RESULTS
Sitting Height	35.6 - 35.8 IN	35.7 IN
Shoulder Pivot Height	21.8 - 22.4 IN	22.3 IN
Hip Pivot Height	3.9 IN (ref)	3.9 IN
Hip Pivot From Backline	4.8 IN (ref)	4.8 IN
Knee Pivot From Backline	20.1 - 20.7 IN	20.4 IN
Rear of Head From Backline	1.7 IN (ref)	1.7 IN
Chest Depth	9.1 - 9.6 IN	9.4 IN
Shoulder Width	17.8 - 18.4 IN	18.1 IN
Chest Circumference Over Nipples	36.8 - 40.0 IN	37.7 IN
Waist Circumference at Min. Girth	31.4 - 32.6 IN	32.4 IN
Hip Width	14.0 - 15.4 IN	14.5 IN
Knee Pivot From Floor	19.3 - 19.9 IN	19.5 IN

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas Middlet

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

PART 572 14-Nov-90

TEMPERATURE 73 F RELATIVE HUMIDITY 32 %
NHTSA HD82626 572B SN 826 HEAD DROP CAL 26

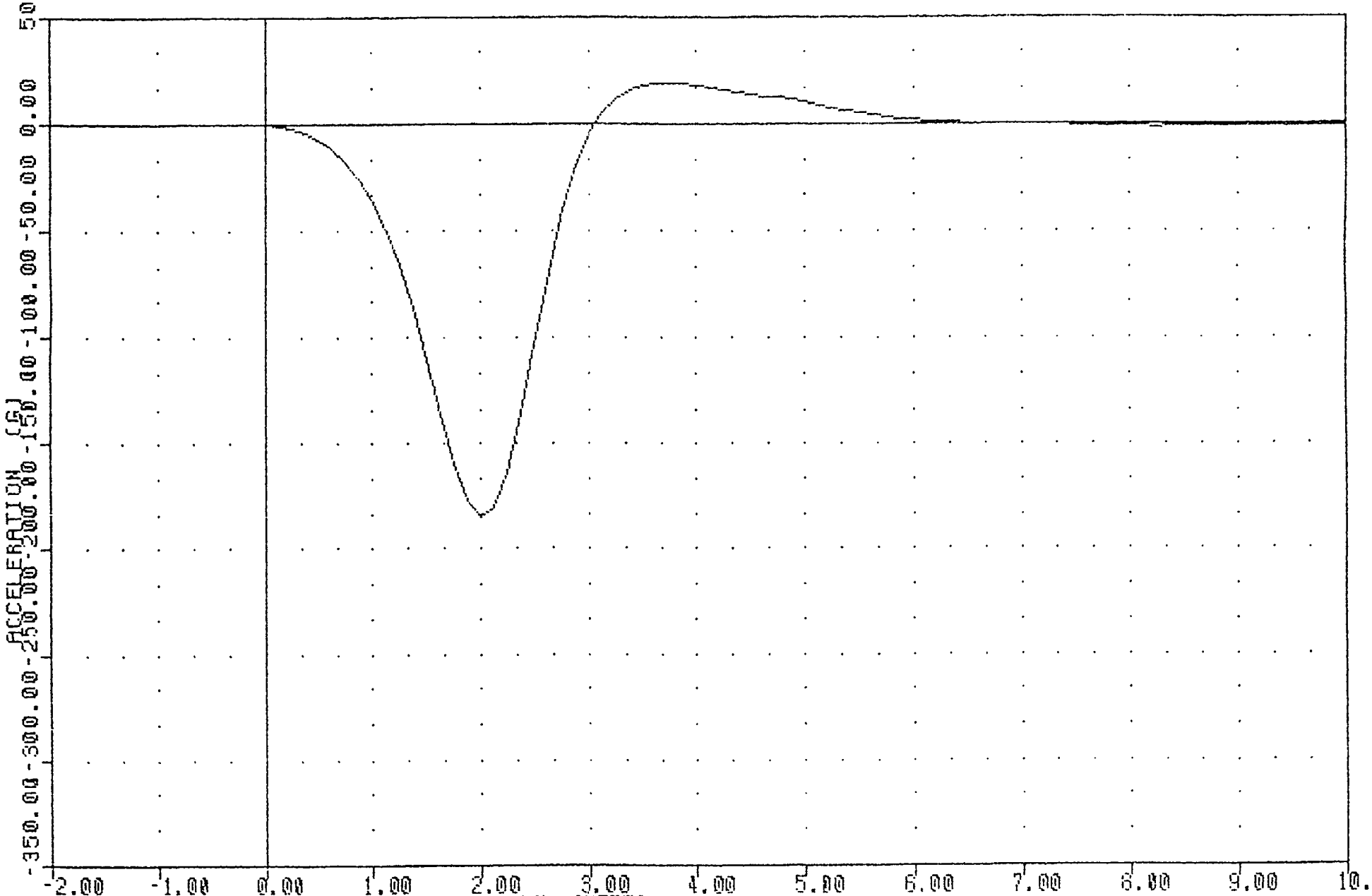
TEST PARAMETER	SPECIFICATION	TEST RESULTS
PEAK RESULTANT ACCELERATION	210 - 260 G	231.40 G
TIME ABOVE 100 G LEVEL	0.9 - 1.5 MSEC	1.25 MSEC
PEAK LATERAL ACCELERATION	10 G MAX	3.52 G
IS ACCELERATION CURVE UNIMODAL?		YES

DUMMY MEETS SPECIFICATIONS

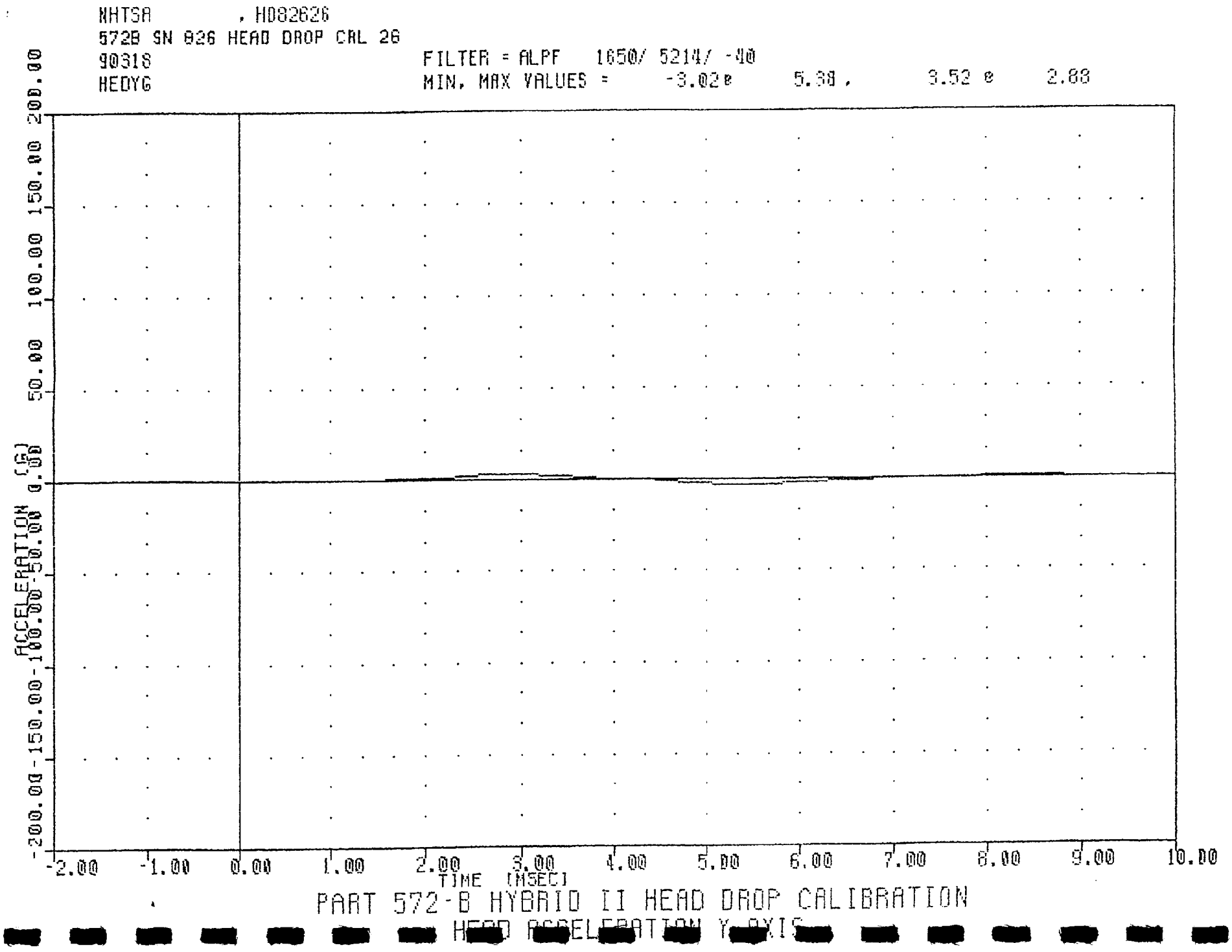
TECHNICIAN Chas. Middleton

572B SN 826 HEAD DROP CAL 26
90318
HEDXG

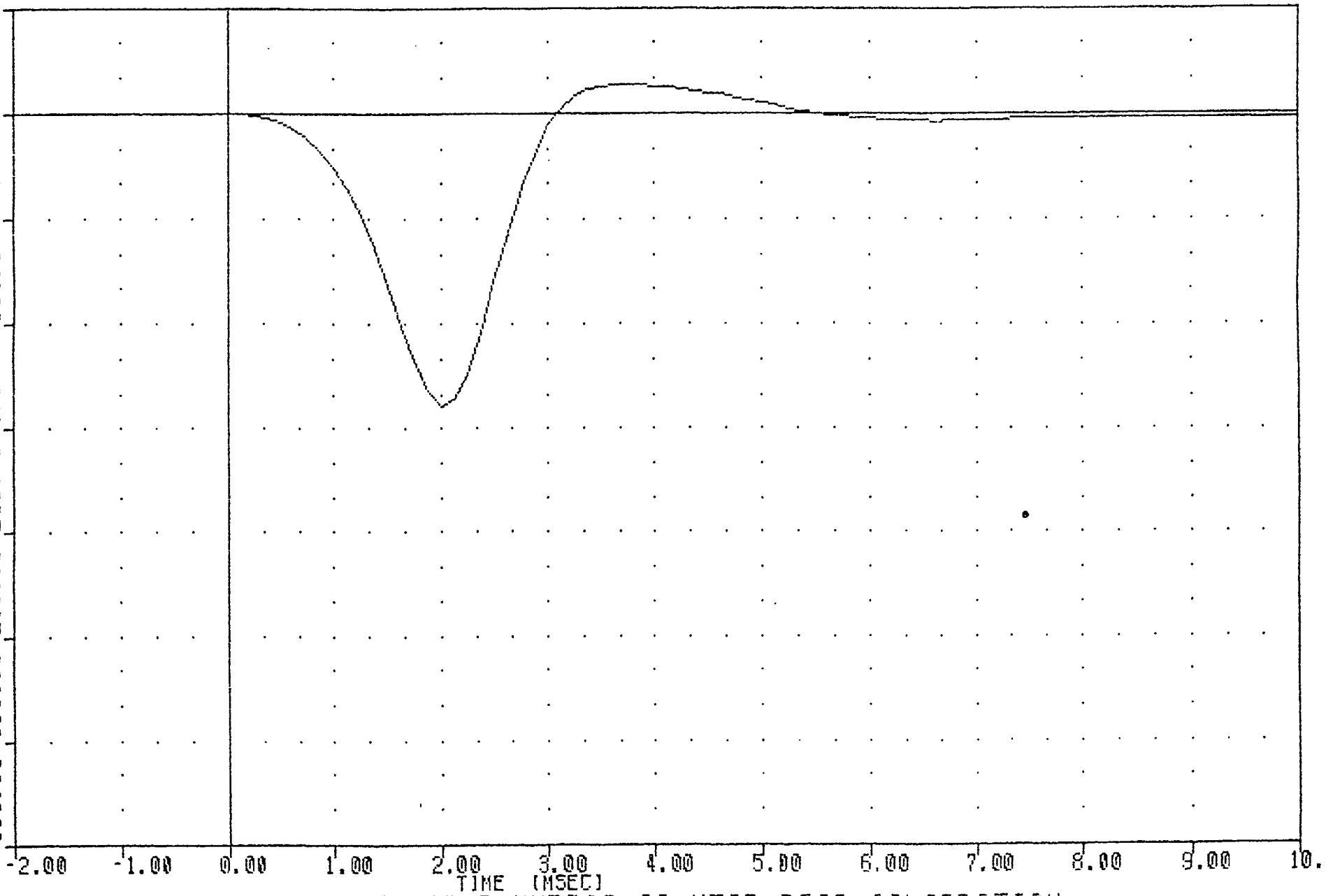
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -185.20 @ 2.00 , 18.72 @ 3.75



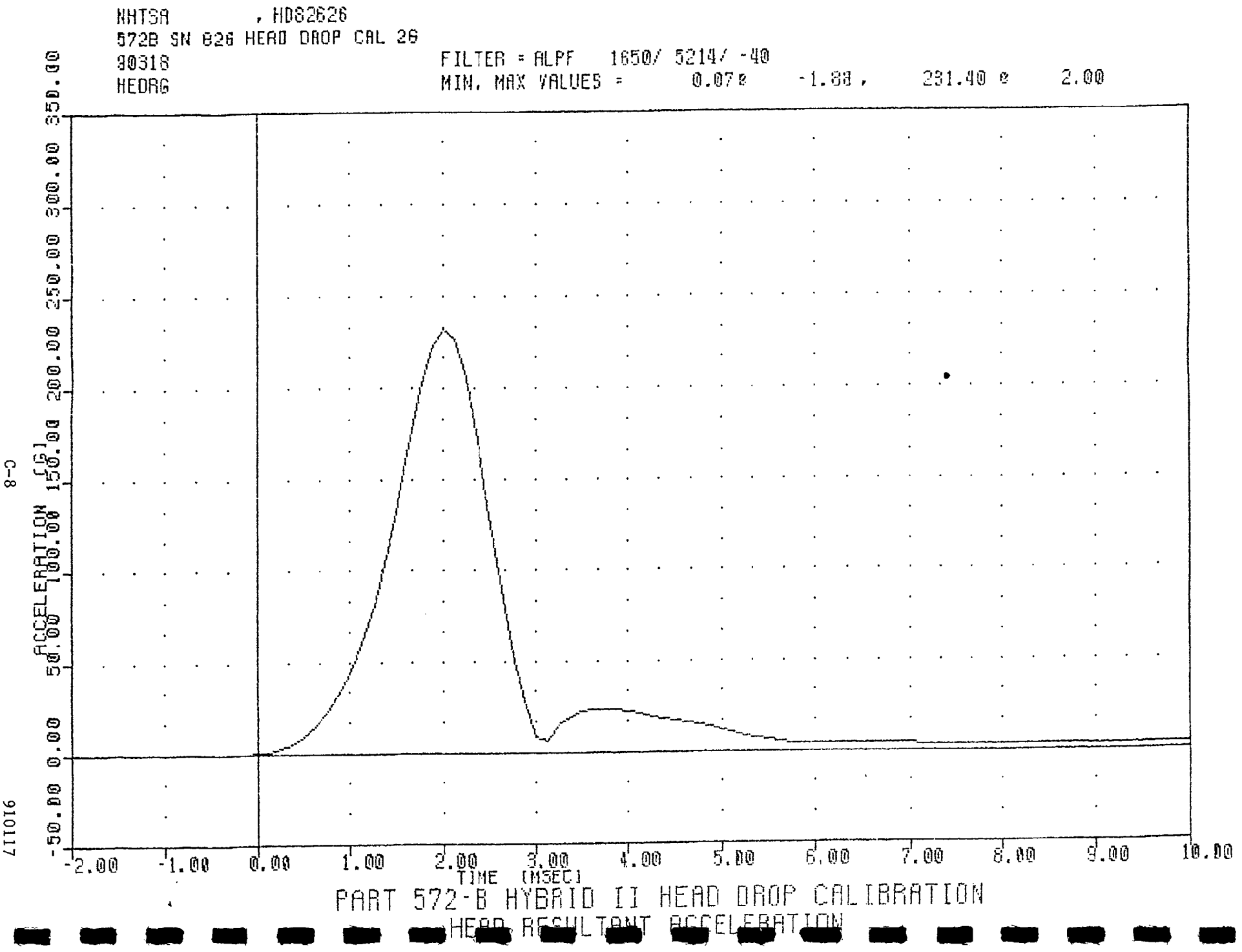
PART 572-B HYBRID II HEAD DROP CALIBRATION
HEAD ACCELERATION X AXIS


NHTSA , H082626
572B SN 026 HEAD DROP CAL 26
90318
HEDYG
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -3.02 @ 5.38 , 3.52 @ 2.88
ACCELERATION (G)
200.00
150.00
100.00
50.00
0.00
-50.00
-100.00
-150.00
-200.00
-2.00
-1.00
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
TIME (MSEC)
PART 572-B HYBRID II HEAD DROP CALIBRATION
HEAD ACCELERATION Y AXIS

572B SN 826 HEAD DROP CAL 26
90318
HEDZG
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -138.74 @ 2.00 , 13.90 @ 3.75



PART 572-B HYBRID II HEAD DROP CALIBRATION
HEAD ACCELERATION Z AXIS


NHTSA , HD82626
572B SN 826 HEAD DROP CAL 26
90318
HEDRG
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = 0.07@ -1.88 , 231.40 @ 2.00
ACCELERATION (G)
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
-50.00
-2.00
-1.00
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
TIME (MSEC)
PART 572-B HYBRID II HEAD DROP CALIBRATION
HEAD RESULTANT ACCELERATION

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK PENDULUM TEST

PART 572 09-Nov-90

TEMPERATURE 71 F RELATIVE HUMIDITY 36 %
NHTSA HN82626 572B SN 826 HEAD/NECK CAL 26

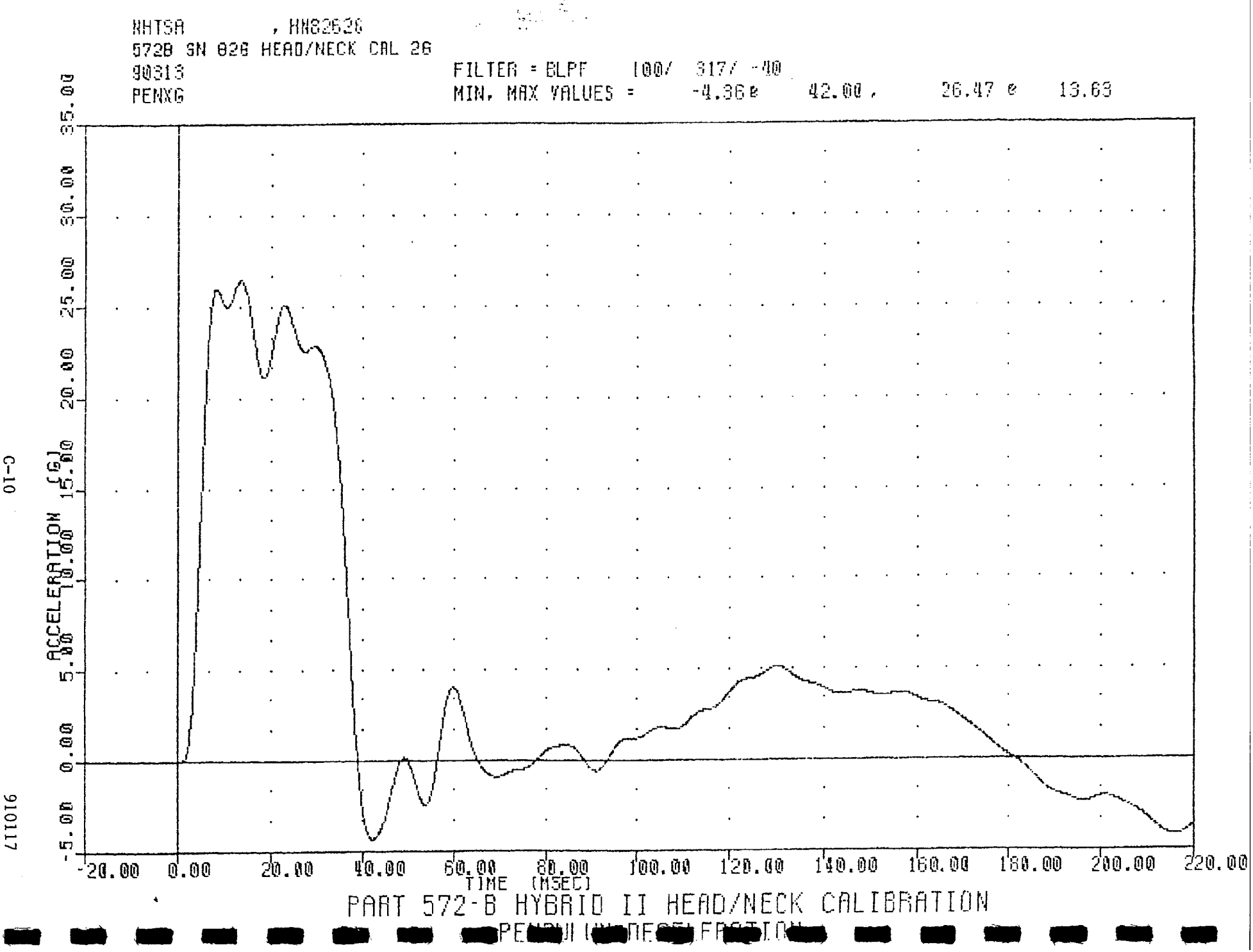
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Pendulum velocity	21.5 to 25.5 ft/sec	23.76 ft/sec
Pendulum Deceleration:		
T1 - T2: 5 - 20 G	3 msec max	2.38 msec
T2 - T3: 20 - 20 G	25 - 30 msec	27.46 msec
T3 - T4: 20 - 5 G	10 msec max	4.11 msec
Avg. G level T2 - T3	20 - 24 G	23.73 G
Maximum Rotation Angle	63 - 73 deg	67.40 deg
Peak Head Resultant Accel	26 G max	25.54 G

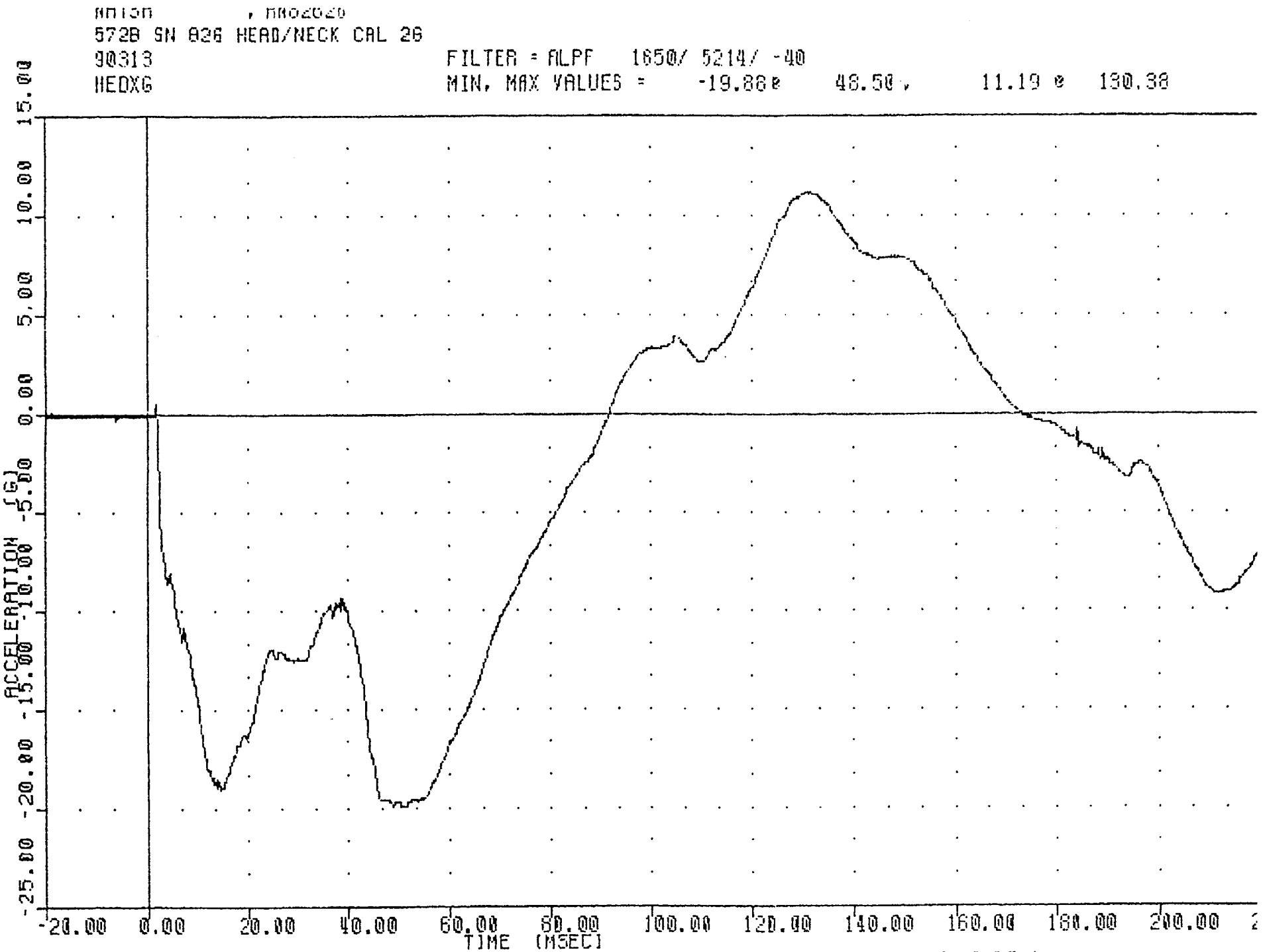
Test Parameter	Specification				Test Results	
Rotation Angle (degrees)	Time (msec)		Chordal Disp. (in)		Time (msec)	Chordal Disp. (in)
0	-2.0 -	+2.0	-0.5 -	+0.5	1.38	0.00
30	25.6 -	34.4	2.1 -	3.1	30.47	2.46
60	40.3 -	51.7	4.3 -	5.3	46.39	4.46
max	53.2 -	66.8	5.0 -	6.0	60.63	5.11
60	67.0 -	83.0	4.3 -	5.3	73.96	4.54
30	85.4 -	104.6	2.1 -	3.1	92.30	2.27
0	101.0 -	123.0	-0.5 -	+0.5	106.57	0.15

SND: 5.95 in

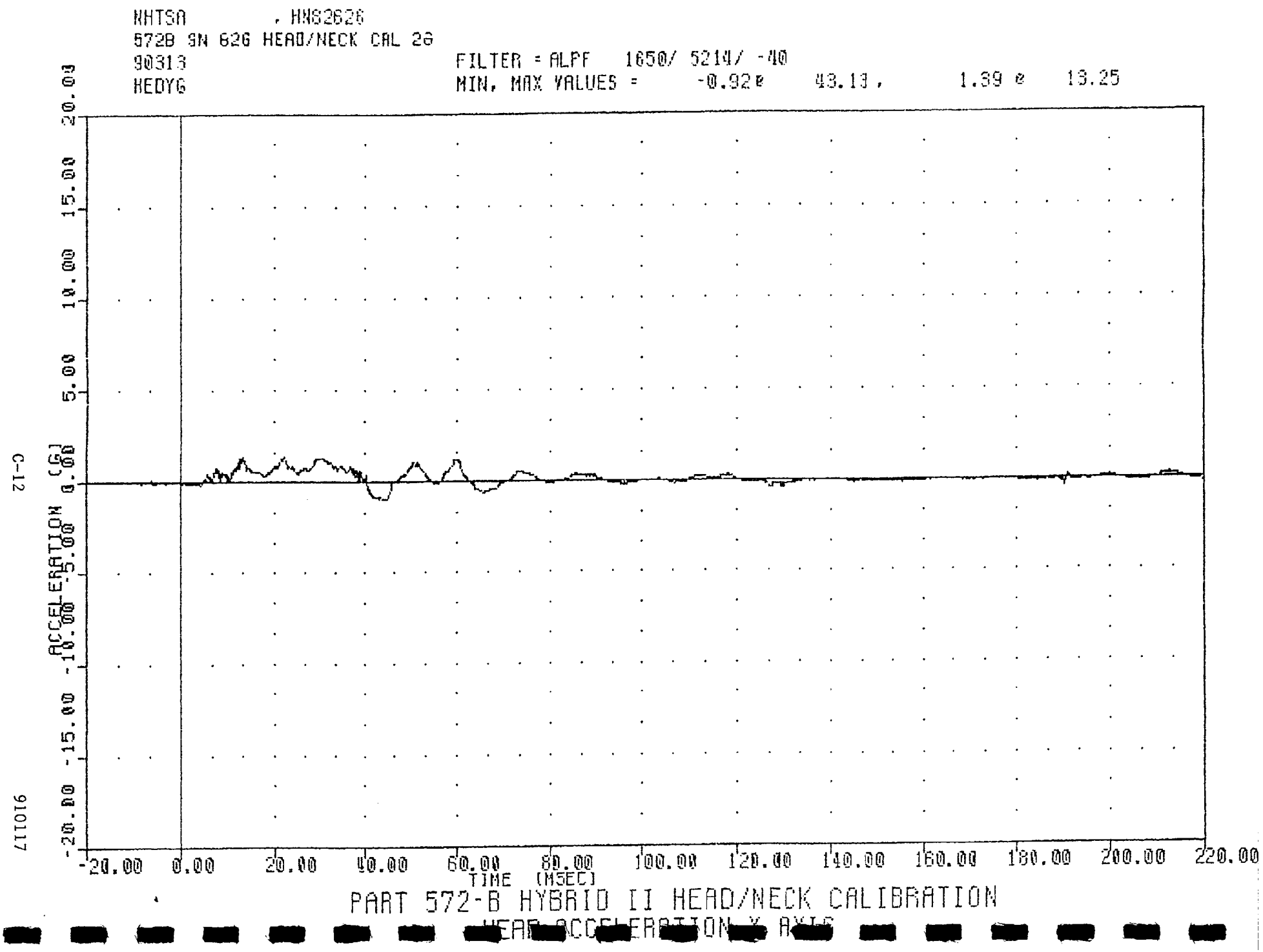
DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton


NHTSA , NN82526
572B SN 026 HEAD/NECK CAL 26
90313
PENXG
FILTER = BLPF 100/ 317/ -40
MIN, MAX VALUES = -4.36 @ 42.00 , 26.47 @ 13.63
ACCELERATION (G)
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
-5.00
-20.00
0.00
20.00
40.00
60.00
80.00
100.00
120.00
140.00
160.00
180.00
200.00
220.00
TIME (MSEC)
PART 572-B HYBRID II HEAD/NECK CALIBRATION
PENDULUM DECELERATION

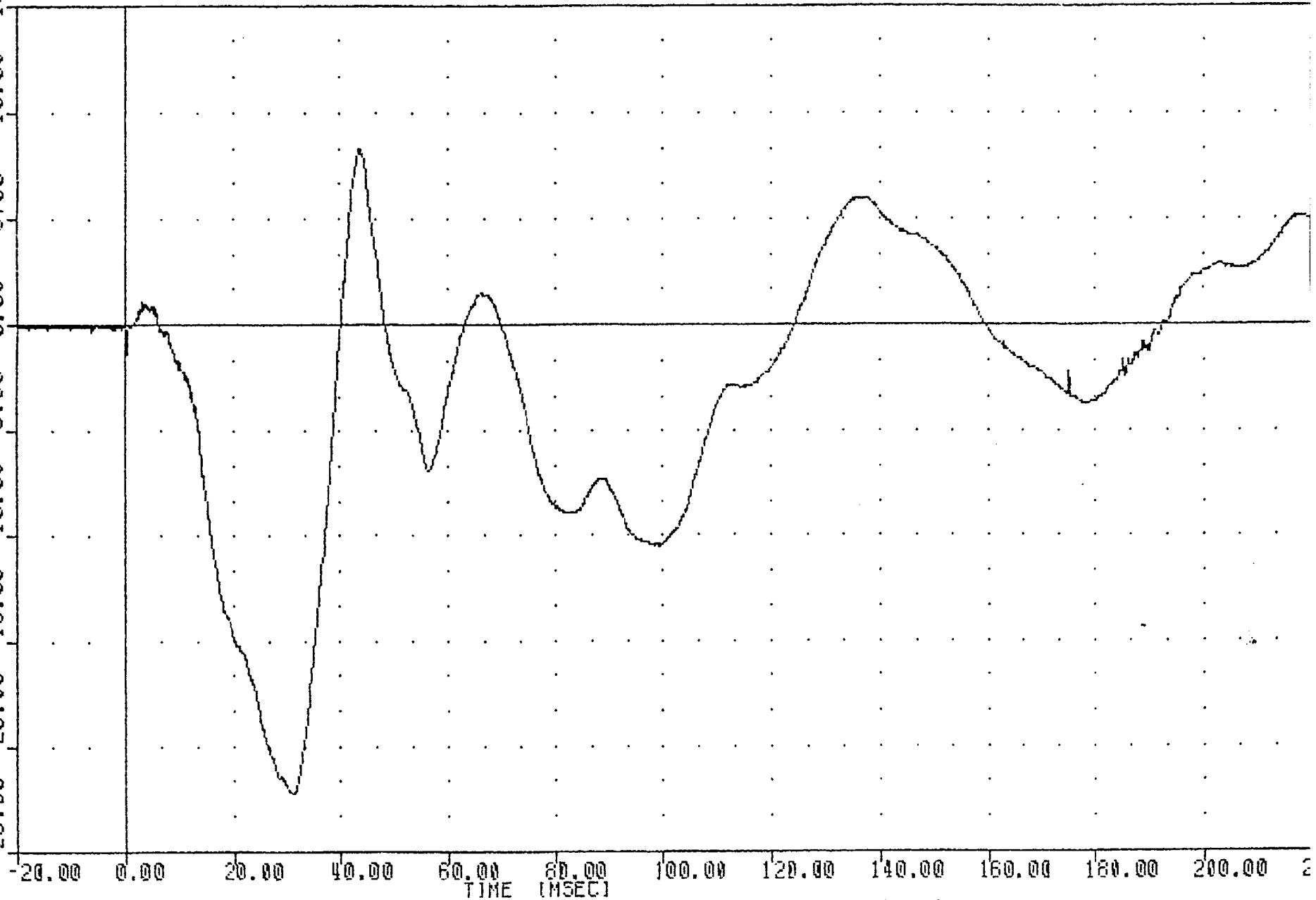


PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD ACCELERATION X AXIS


NHTSA , NNS2626
572B SN 626 HEAD/NECK CAL 26
90313
HEDY6
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -0.92 @ 43.13 , 1.39 @ 13.25
20.00
15.00
10.00
5.00
0.00
-5.00
-10.00
-15.00
-20.00
ACCELERATION (G)
-20.00
0.00
20.00
40.00
60.00
80.00
100.00
120.00
140.00
160.00
180.00
200.00
220.00
TIME (MSEC)
PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD ACCELERATION X AXIS

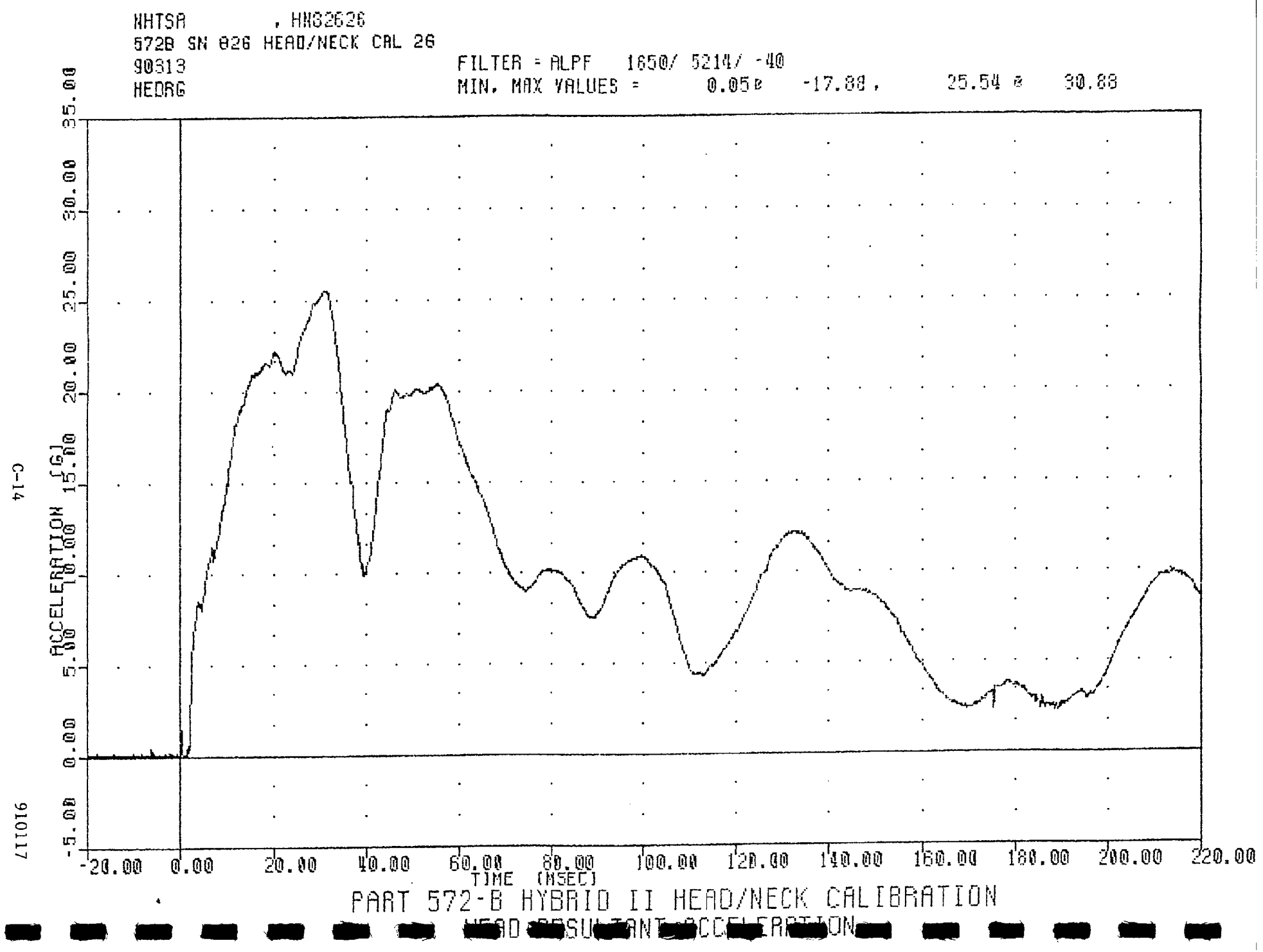
572B SN 826 HEAD/NECK CAL 26
90313
HEDZG

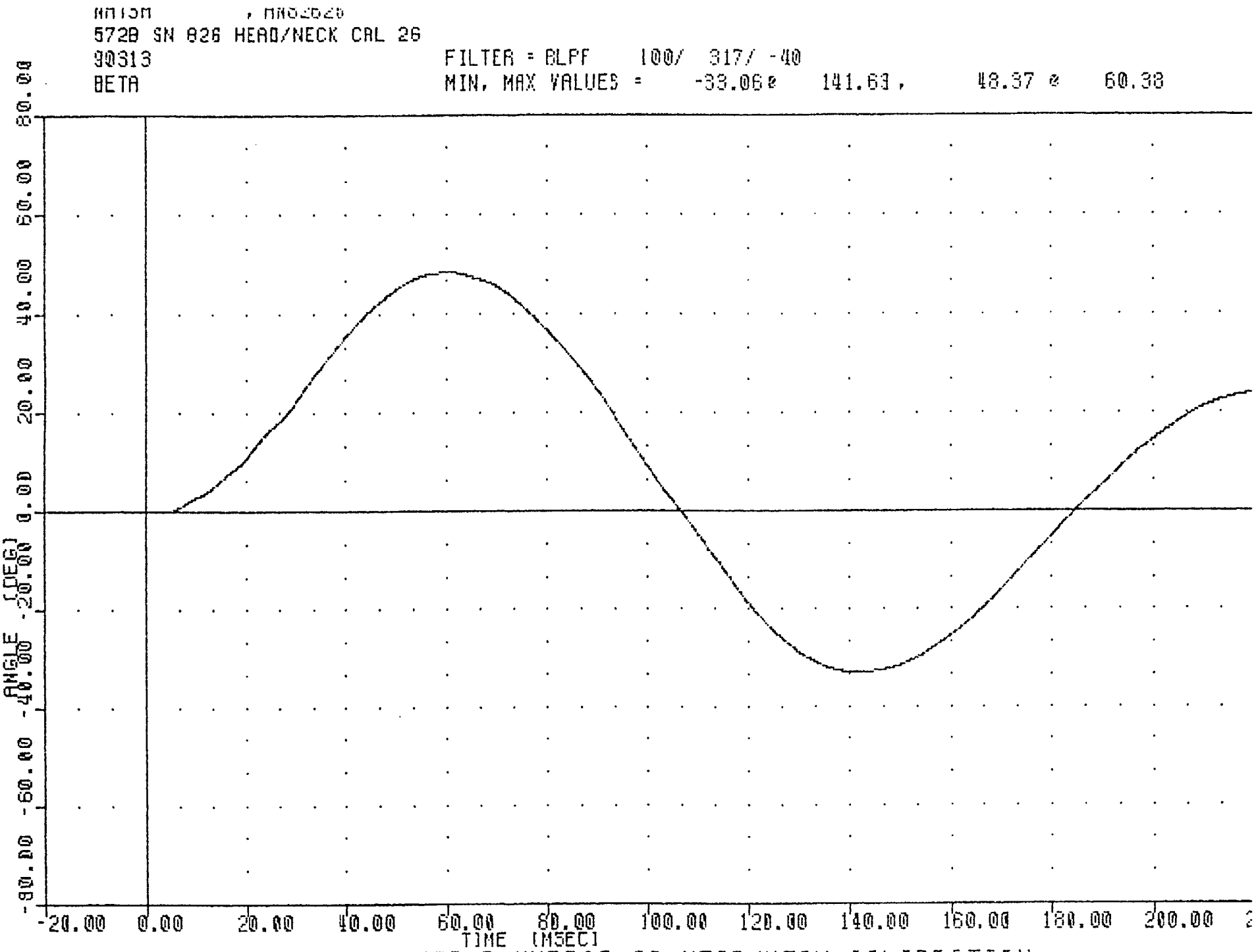
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -22.26 @ 30.88 , 8.24 @ 43.38



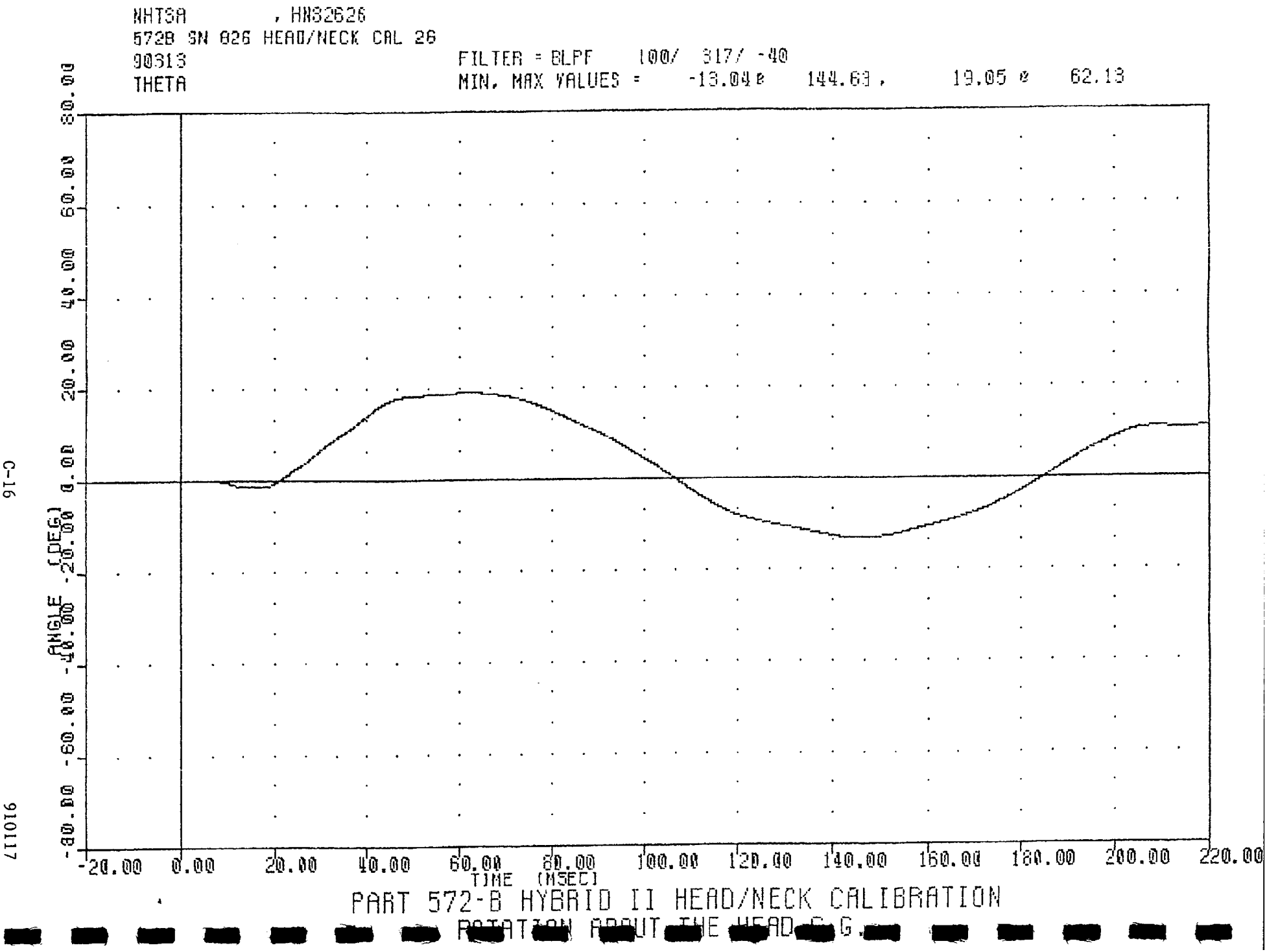
PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD ACCELERATION Z AXIS

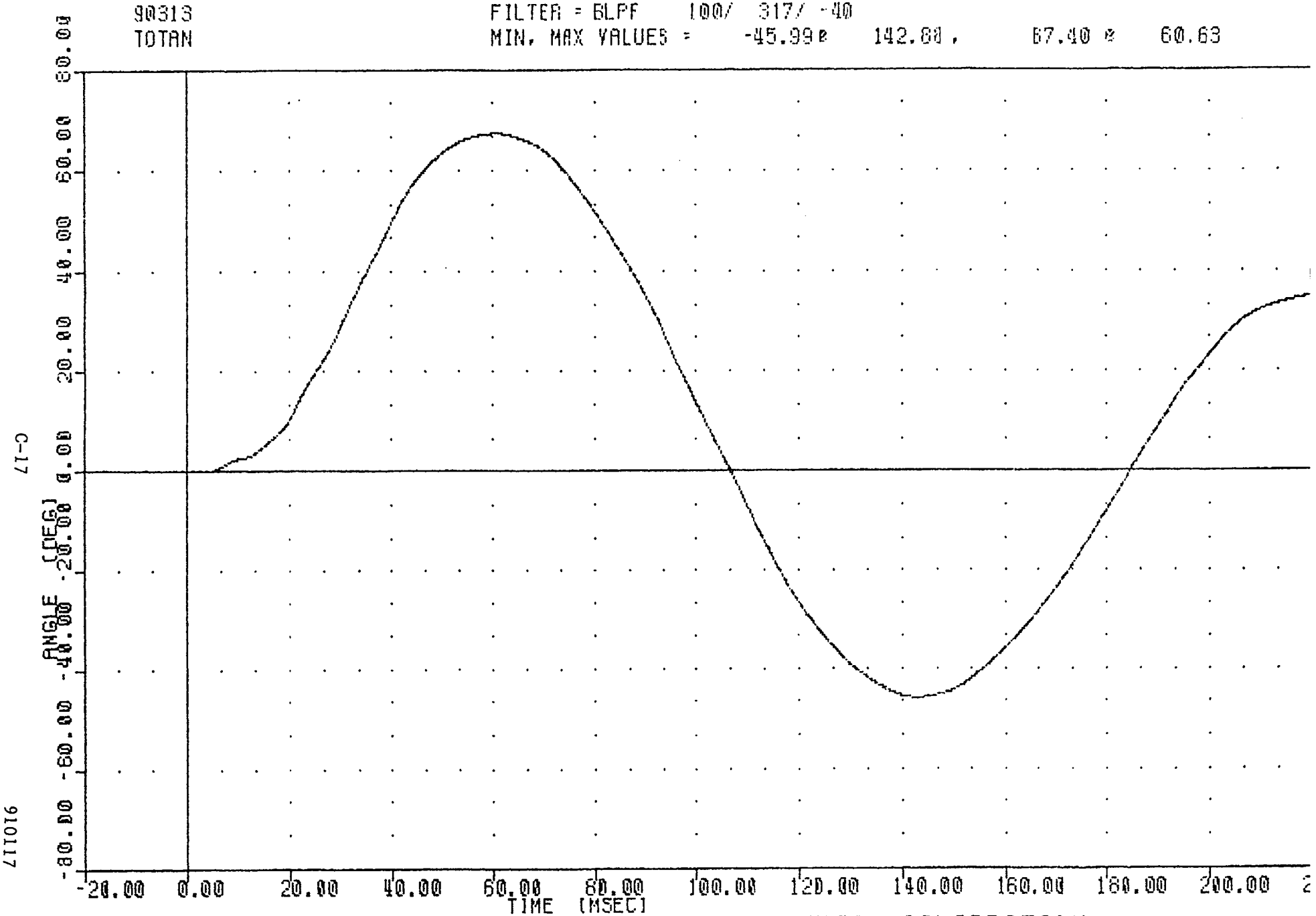
91017


NHTSA , HN82626
572B SN 026 HEAD/NECK CAL 26
90313
HEDRG
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = 0.05@ -17.08, 25.54 @ 30.88
ACCELERATION [G]
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
-5.00
-20.00
0.00
20.00
40.00
60.00
80.00
100.00
120.00
140.00
160.00
180.00
200.00
220.00
TIME (MSEC)
PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD RESULTANT ACCELERATION

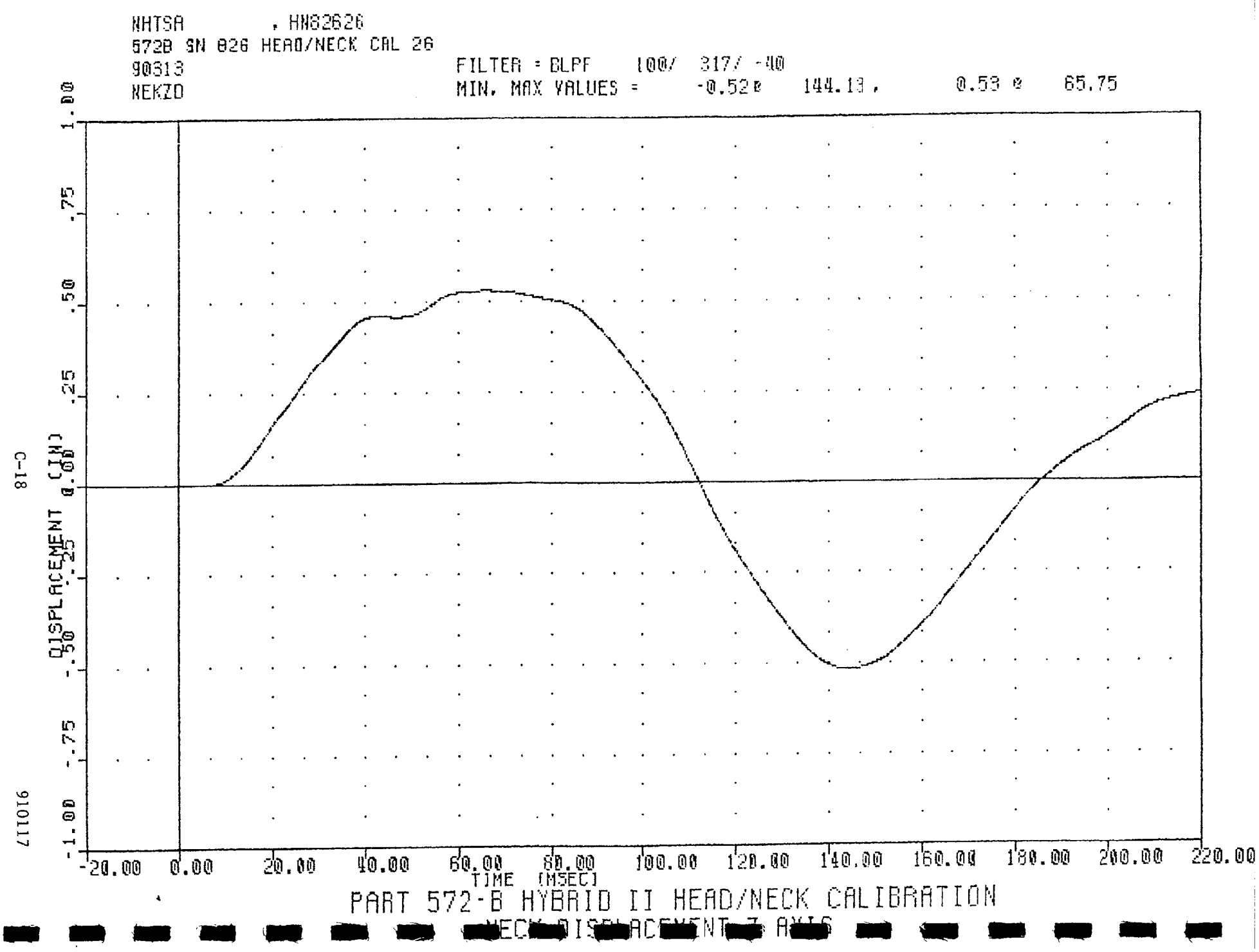


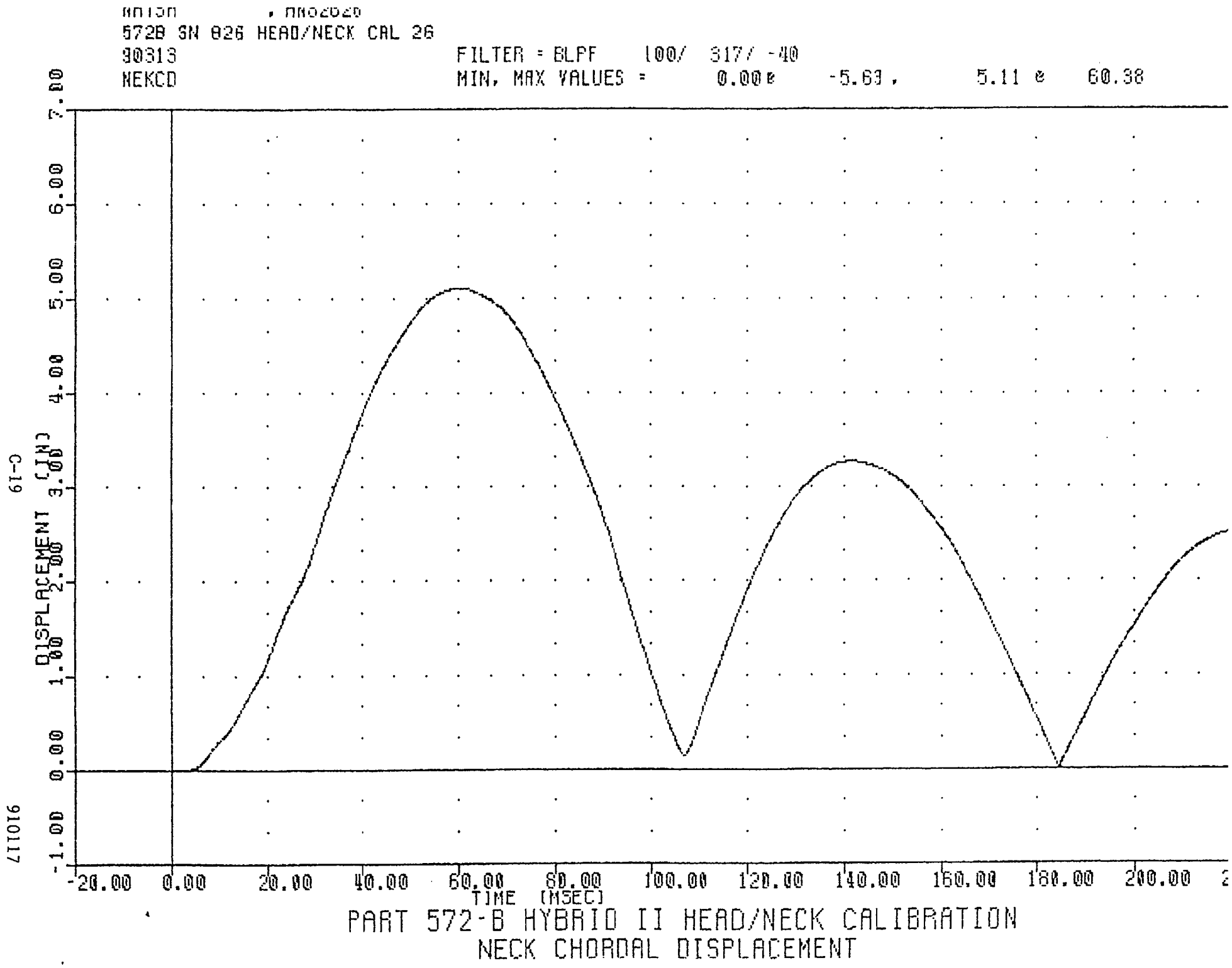
PART 572-B HYBRID II HEAD/NECK CALIBRATION
ROTATION ABOUT THE BASE OF THE NECK


NHTSA , HNS2626
572B SN 026 HEAD/NECK CAL 26
90313
THETA
FILTER = BLPF 100/ 317/ -40
MIN, MAX VALUES = -13.04 @ 144.63 , 19.05 @ 62.13
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
-60.00
-80.00
ANGLE (DEG)
-20.00
0.00
20.00
40.00
60.00
80.00
100.00
120.00
140.00
160.00
180.00
200.00
220.00
TIME (MSEC)
PART 572-B HYBRID II HEAD/NECK CALIBRATION
ROTATION ABOUT THE HEAD C.G.



PART 572-B HYBRID II HEAD/NECK CALIBRATION
TOTAL ROTATION


NHTSA , HN82626
572B SN 826 HEAD/NECK CAL 26
90313
NEKZD
FILTER = BLPF 100/ 317/ -40
MIN, MAX VALUES = -0.52 @ 144.13 , 0.53 @ 65.75
1.00
.75
.50
.25
0.00
-.25
-.50
-.75
-1.00
DISPLACEMENT (IN)
-20.00
0.00
20.00
40.00
60.00
80.00
100.00
120.00
140.00
160.00
180.00
200.00
220.00
TIME (MSEC)
PART 572-B HYBRID II HEAD/NECK CALIBRATION
NECK DISPLACEMENT Z AXIS



PART 572-B HYBRID II HEAD/NECK CALIBRATION
NECK CHORDAL DISPLACEMENT

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572 13-Nov-90

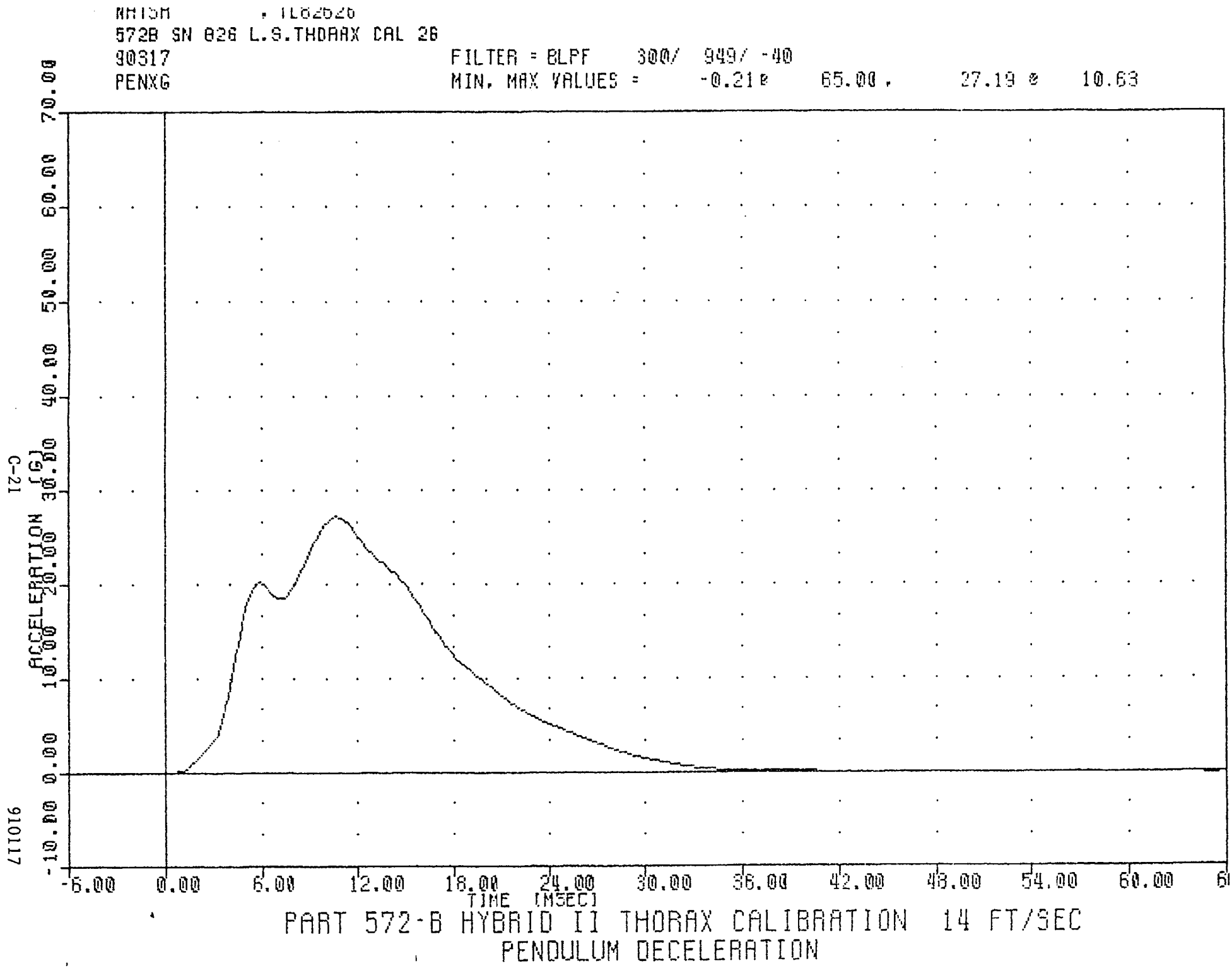
TEMPERATURE 71 F RELATIVE HUMIDITY 34 %
NHTSA TL82626 572B SN 826 L.S.THORAX CAL 26

TEST PARAMETER	LOW SPEED TEST SPECIFICATION	TEST RESULTS
PENDULUM VELOCITY	13.86-14.14 FT/SEC	14.04 FT/SEC
PEAK DEFLECTION	1.1 IN max.	0.98 IN
PEAK RESISTIVE FORCE	1,450. LB max.	1401. LB
INTERNAL HYSTERESIS	50% - 70%	67.2%

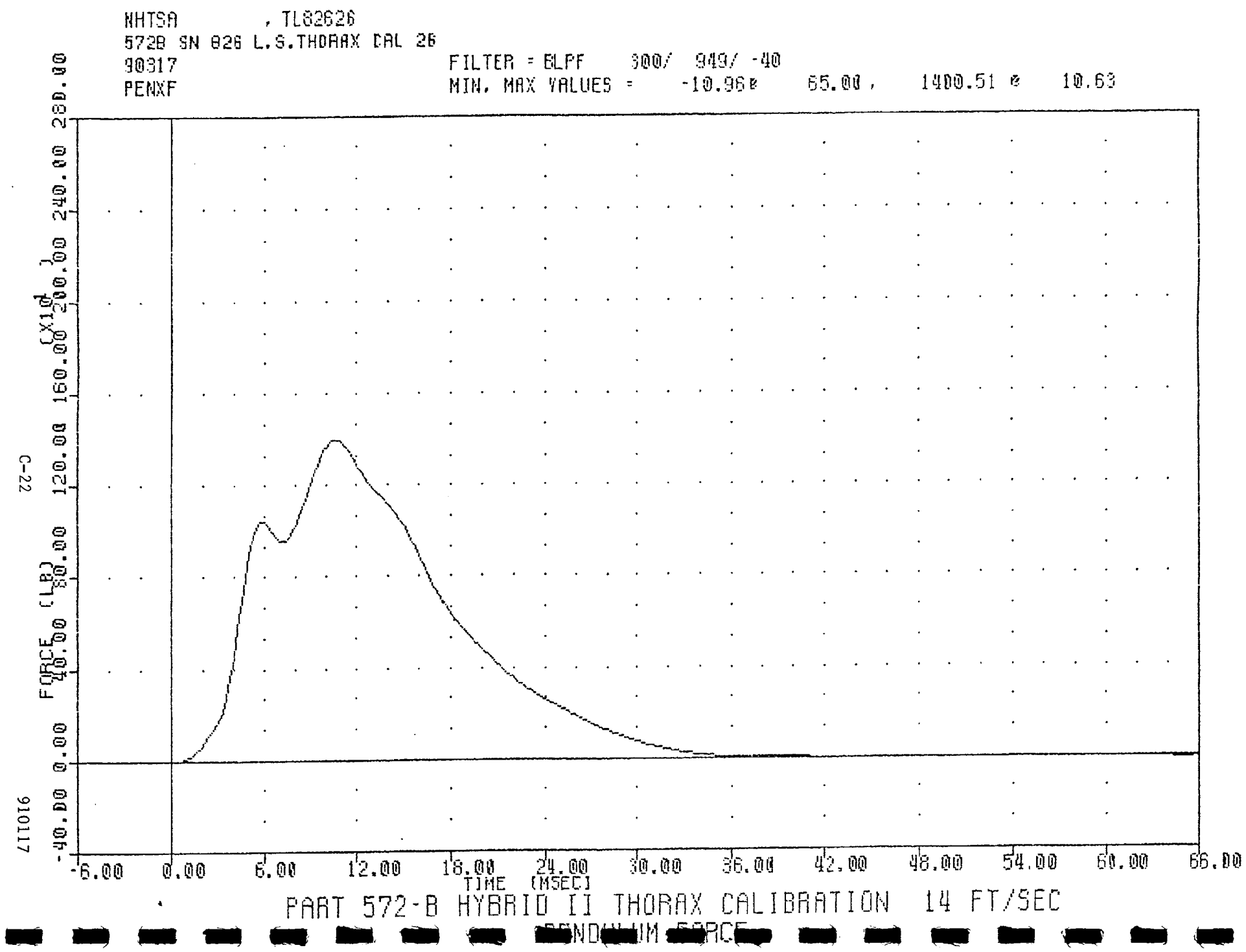
SCD: 2.20 IN

DUMMY MEETS SPECIFICATIONS

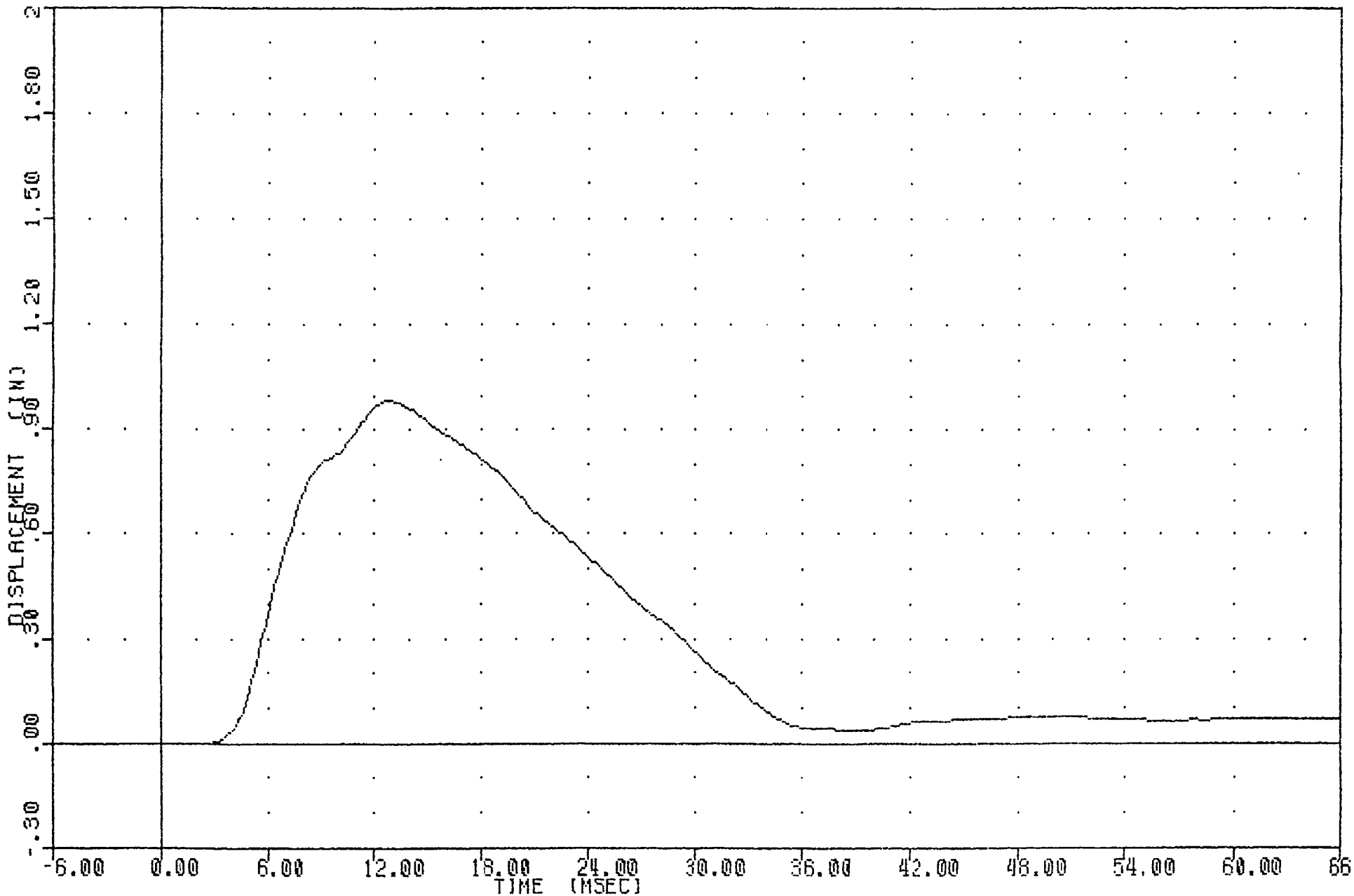
TECHNICIAN Chas. Middlet



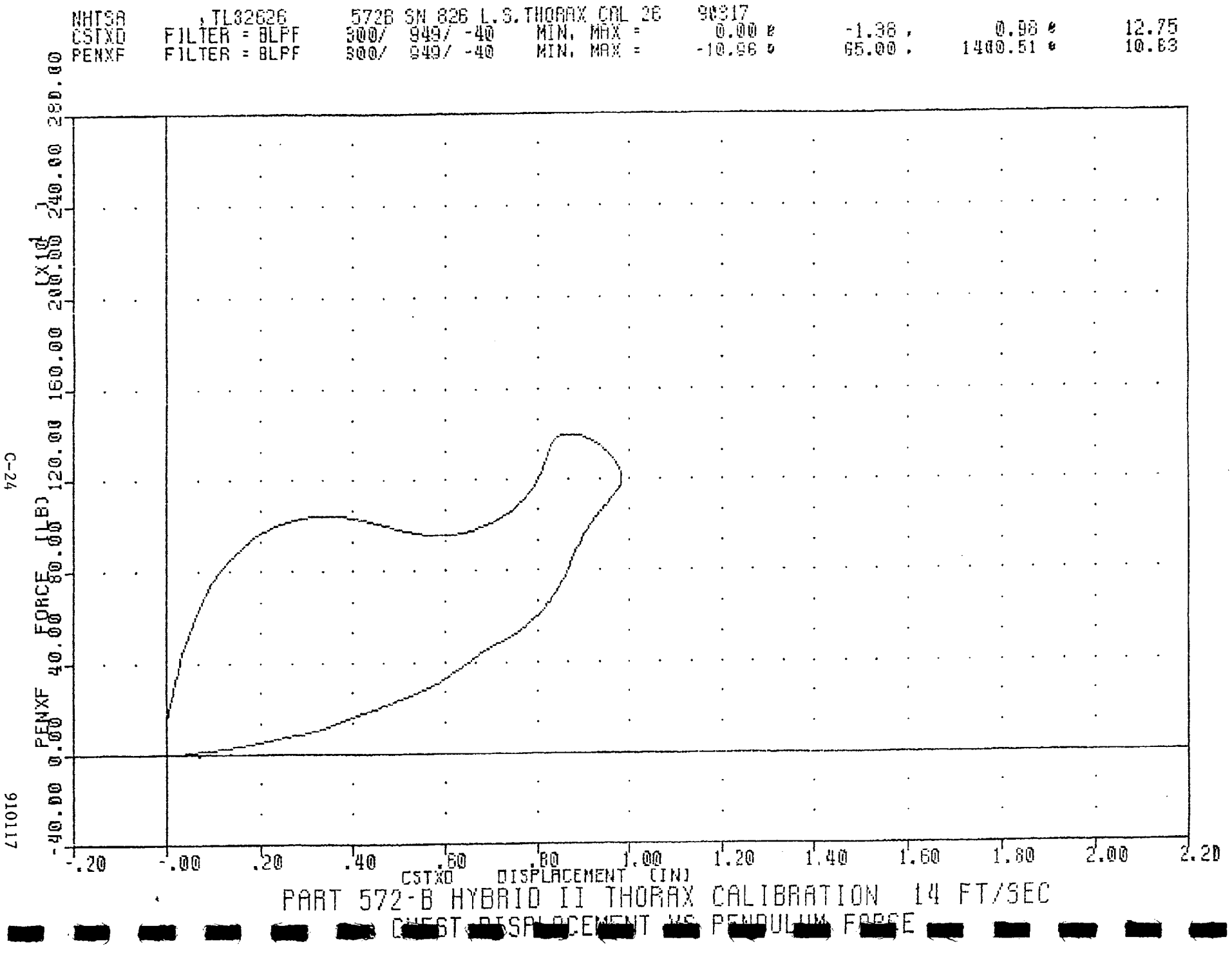
PART 572-B HYBRID II THORAX CALIBRATION 14 FT/SEC
PENDULUM DECELERATION


NHTSA , TL82626
572B SN 826 L.S.THORAX CAL 26
90317
PENXF
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -10.96@ 65.00 , 1400.51 @ 10.63
FORCE (LB) (X10)
280.00
240.00
200.00
160.00
120.00
80.00
40.00
0.00
-40.00
-6.00
0.00
6.00
12.00
18.00
24.00
30.00
36.00
42.00
48.00
54.00
60.00
66.00
TIME (MSEC)
C-22
910117
PART 572-B HYBRID II THORAX CALIBRATION 14 FT/SEC
PENDULUM FORCE

572B SN 826 L.S.THORAX CAL 26
90317
CSTXD
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 0.00 @ -1.38 , 0.98 @ 12.75



PART 572-B HYBRID II THORAX CALIBRATION 14 FT/SEC
STERNUM DISPLACEMENT


NHTSA ,TL82626 572B SN 826 L.S.THORAX CAL 26 90317
CSTXD FILTER = BLPF 300/ 949/ -40 MIN, MAX = 0.00 @ -1.36 , 0.90 @ 12.75
PENXF FILTER = BLPF 300/ 949/ -40 MIN, MAX = -10.96 @ 65.00 , 1480.51 @ 10.63
PENXF FORCE (LB) [X 10]
280.00
240.00
200.00
160.00
120.00
80.00
40.00
0.00
-40.00
-.20
-.00
.20
.40
.60
.80
1.00
1.20
1.40
1.60
1.80
2.00
2.20
CSTXD DISPLACEMENT (IN)
PART 572-B HYBRID II THORAX CALIBRATION 14 FT/SEC
CHEST DISPLACEMENT VS PENDULUM FORCE

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572 13-Nov-90

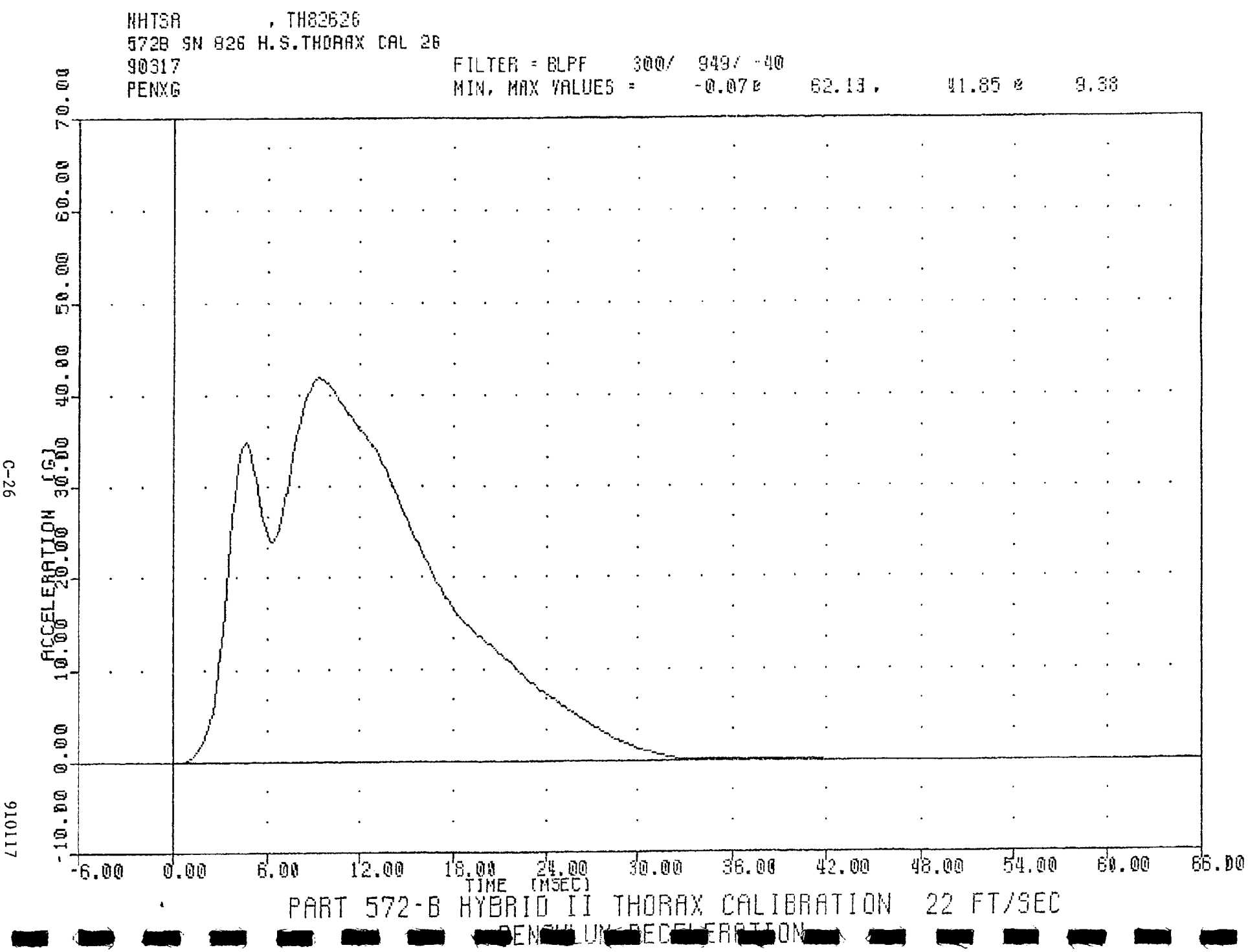
TEMPERATURE 71 F RELATIVE HUMIDITY 33 %
NHTSA TH82626 572B SN 826 H.S.THORAX CAL 26

TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
PENDULUM VELOCITY	21.78-22.22 FT/SEC	21.92 FT/SEC
PEAK DEFLECTION	1.7 IN max.	1.49 IN
PEAK RESISTIVE FORCE	2,250. LB max.	2155. LB
INTERNAL HYSTERESIS	50% - 70%	65.0%

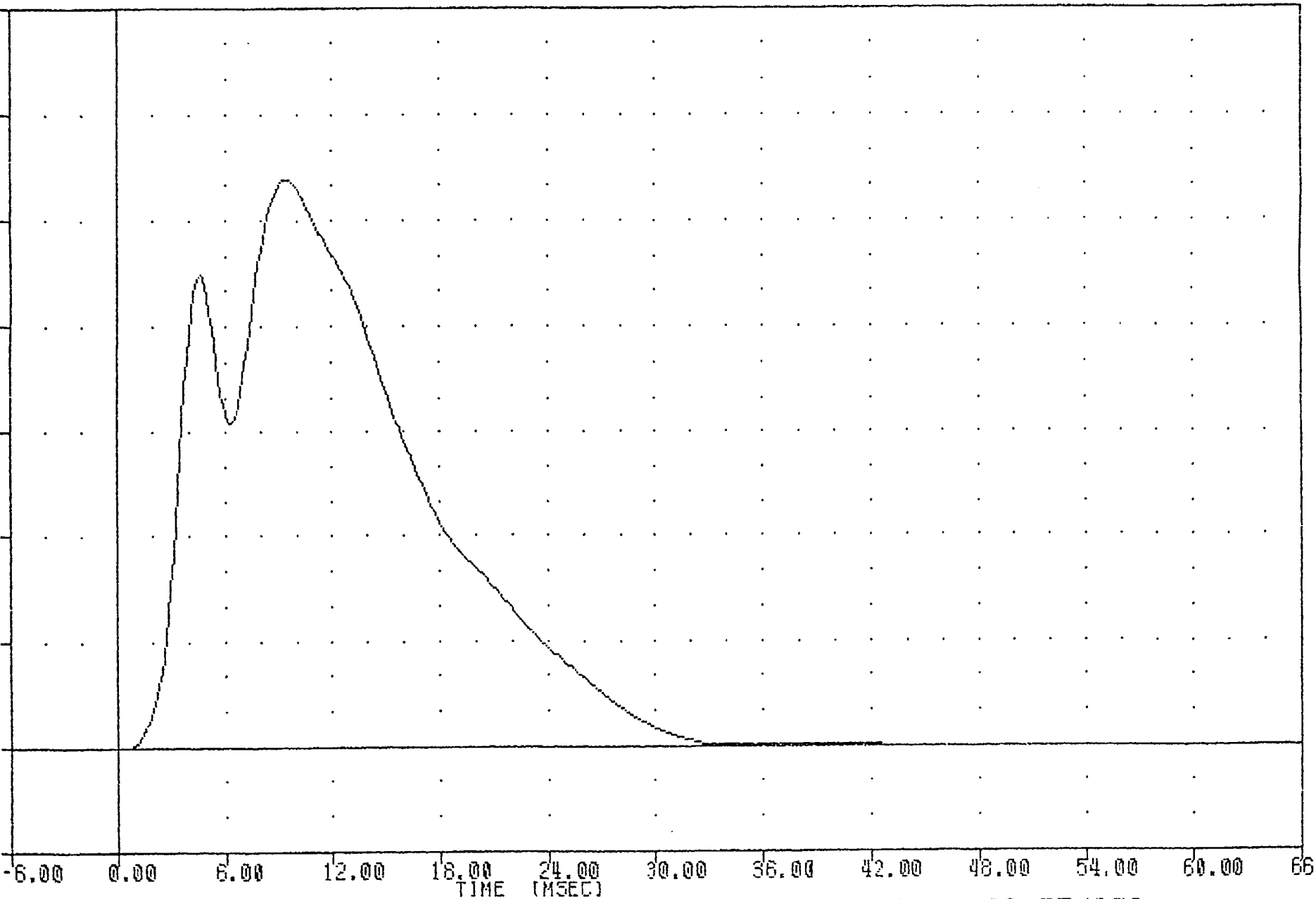
SCD: 2.20 IN

DUMMY MEETS SPECIFICATIONS

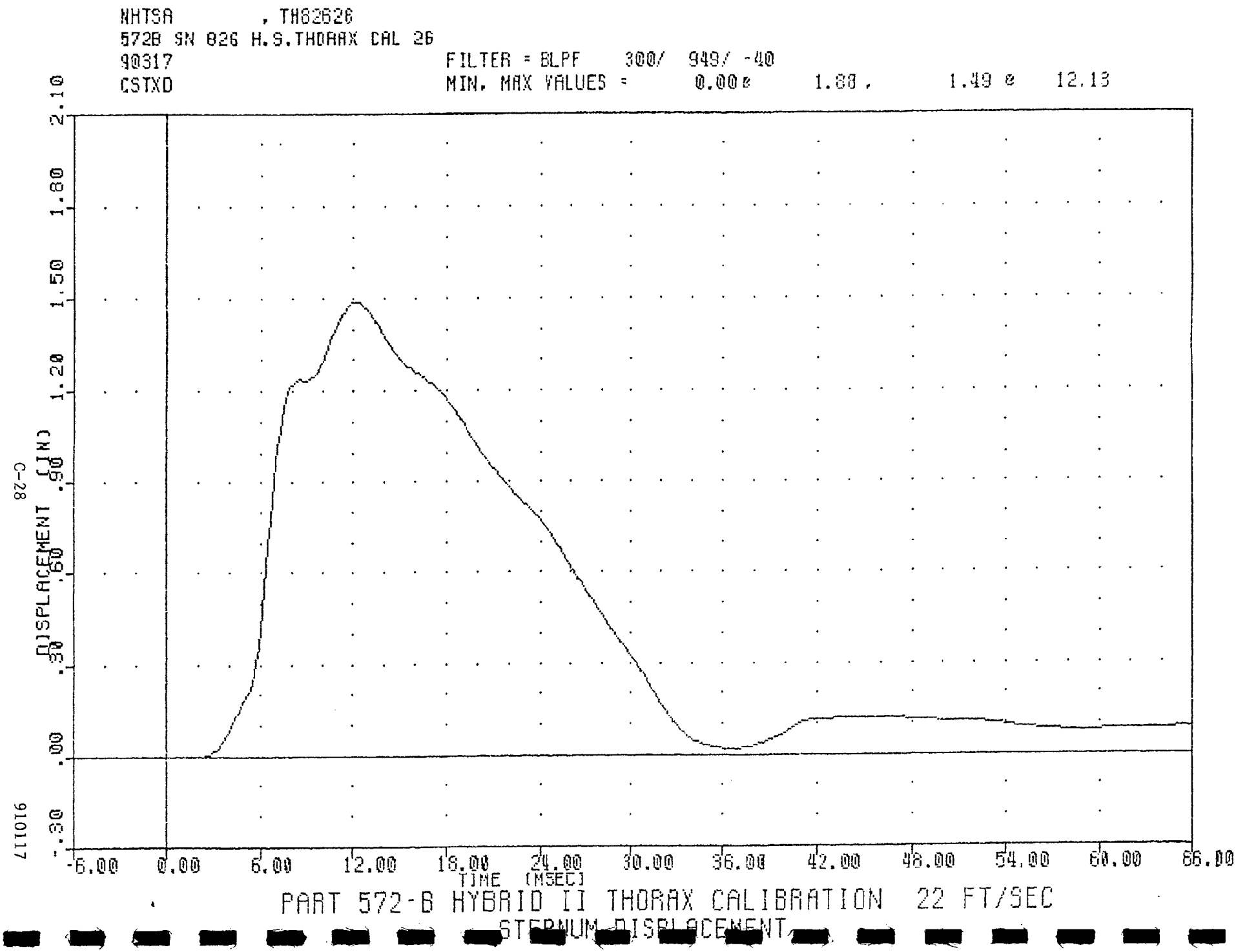
TECHNICIAN Chas. Middlet

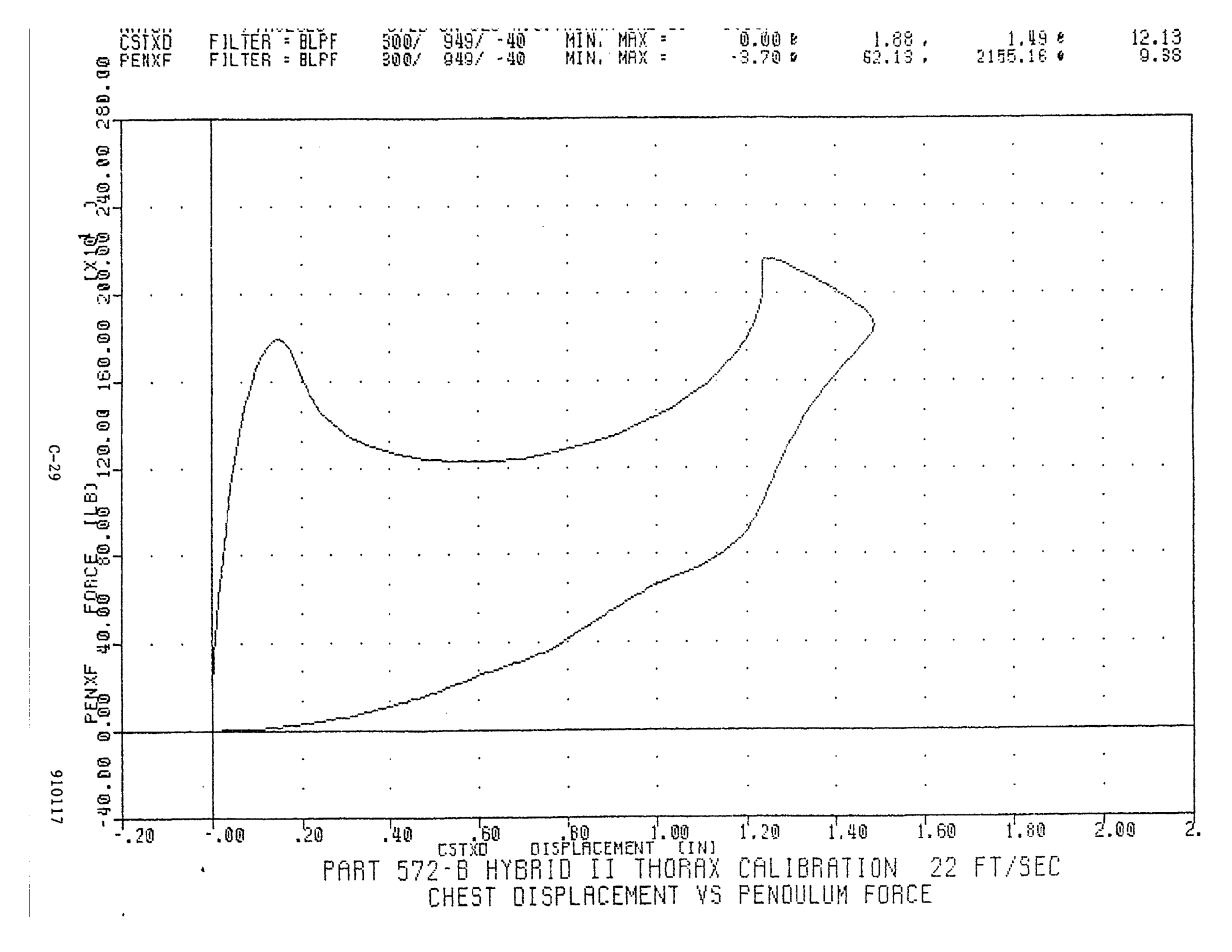

NHTSA , TH82626
5728 SN 826 H.S.THORAX CAL 26
90317
PENXG
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.07@ 62.13, 41.85 @ 9.38
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
ACCELERATION (G)
-6.00
0.00
6.00
12.00
18.00
24.00
30.00
36.00
42.00
48.00
54.00
60.00
66.00
TIME (MSEC)
PART 572-B HYBRID II THORAX CALIBRATION 22 FT/SEC
PENDULUM DECELERATION

572B SN 826 H.S.THORAX CAL 26
90317
PENXF
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -3.70@ 62.13, 2155.16@ 9.38



PART 572-B HYBRID II THORAX CALIBRATION 22 FT/SEC
PENDULUM FORCE


NHTSA , TH82626
572B SN 826 H.S.THORAX CAL 26
90317
CSTXD
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 0.00@ 1.88, 1.49@ 12.13
2.10
1.80
1.50
1.20
.90
.60
.30
.00
-.30
DISPLACEMENT (IN)
-6.00
0.00
6.00
12.00
18.00
24.00
30.00
36.00
42.00
48.00
54.00
60.00
66.00
TIME (MSEC)
C-28
910117
PART 572-B HYBRID II THORAX CALIBRATION 22 FT/SEC
STERNUM DISPLACEMENT


CSTXD FILTER = BLPF 500/ 949/ -40 MIN, MAX = 0.00 @ 1.88 , 1.49 @ 12.13
PENXF FILTER = BLPF 300/ 949/ -40 MIN, MAX = -3.70 @ 62.13 , 2155.16 @ 9.58
PENXF FORCE (LB) (X10)
280.00
240.00
200.00
160.00
120.00
80.00
40.00
0.00
-40.00
-.20
-.00
.20
.40
.60
.80
1.00
1.20
1.40
1.60
1.80
2.00
2.
CSTXD DISPLACEMENT (IN)
PART 572-B HYBRID II THORAX CALIBRATION 22 FT/SEC
CHEST DISPLACEMENT VS PENDULUM FORCE

TRANSPORTATION RESEARCH CENTER OF OHIO

ABDOMINAL COMPRESSION TEST

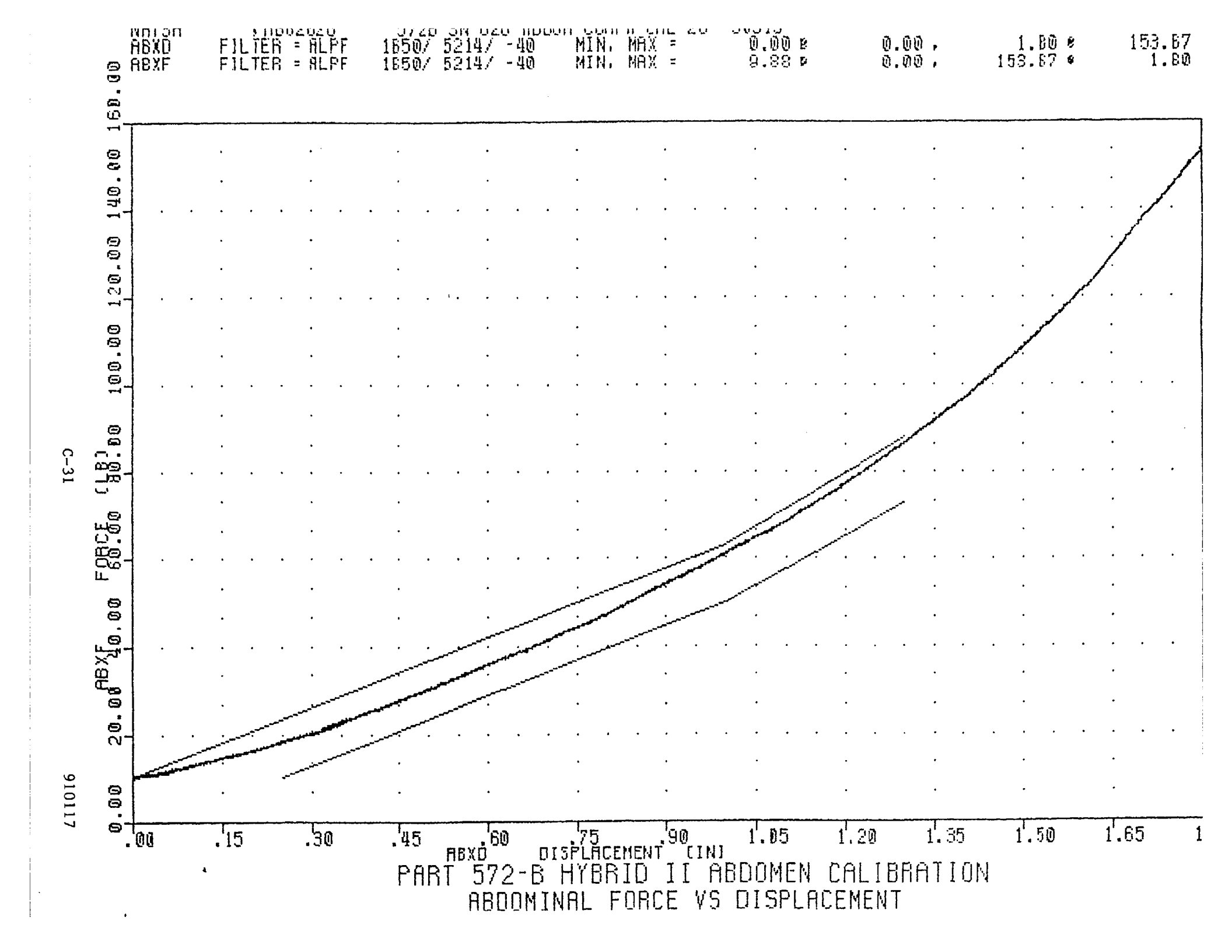
PART 572 09-Nov-90

TEMPERATURE 74 F RELATIVE HUMIDITY 36 %
NHTSA AB82626 572B SN 826 ABDOM COMPR CAL 26

TEST CORRIDORS		
DISPLACEMENT	FORCE	TEST RESULTS
0.00 IN	10.00 LBS	10.00 LBS
0.50 IN	23.00 - 36.00 LBS	30.16 LBS
0.75 IN	36.00 - 50.00 LBS	44.13 LBS
1.00 IN	50.00 - 63.00 LBS	61.39 LBS
1.30 IN	73.00 - 88.00 LBS	86.77 LBS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet


ABXD FILTER = ALPF 1650/ 5214/ -40 MIN, MAX = 0.00 @ 0.00 , 1.80 @ 153.67
ABXF FILTER = ALPF 1650/ 5214/ -40 MIN, MAX = 9.88 @ 0.00 , 153.67 @ 1.80
ABXF FORCE (LB)
0.00
20.00
40.00
60.00
80.00
100.00
120.00
140.00
160.00
.00
.15
.30
.45
.60
.75
.90
1.05
1.20
1.35
1.50
1.65
1
ABXD DISPLACEMENT (IN)
PART 572-B HYBRID II ABDOMEN CALIBRATION
ABDOMINAL FORCE VS DISPLACEMENT

TRANSPORTATION RESEARCH CENTER OF OHIO

LUMBAR FLEXION TEST

PART 572 09-NOV-90

TEMPERATURE 74 F RELATIVE HUMIDITY 36 %
NHTSA LF82626 572B SN826 LUMBAR FLEX CAL26

DEFLECTION	SPECIFICATION	TEST RESULTS
0 DEG	0 LB	0.00 LB
20 DEG	22.00 - 34.00 LB	26.00 LB
30 DEG	34.00 - 46.00 LB	40.00 LB
40 DEG	46.00 - 58.00 LB	53.00 LB
NET RETURN ANGLE	< 12 DEG	3.50 DEG

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas Middlet

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

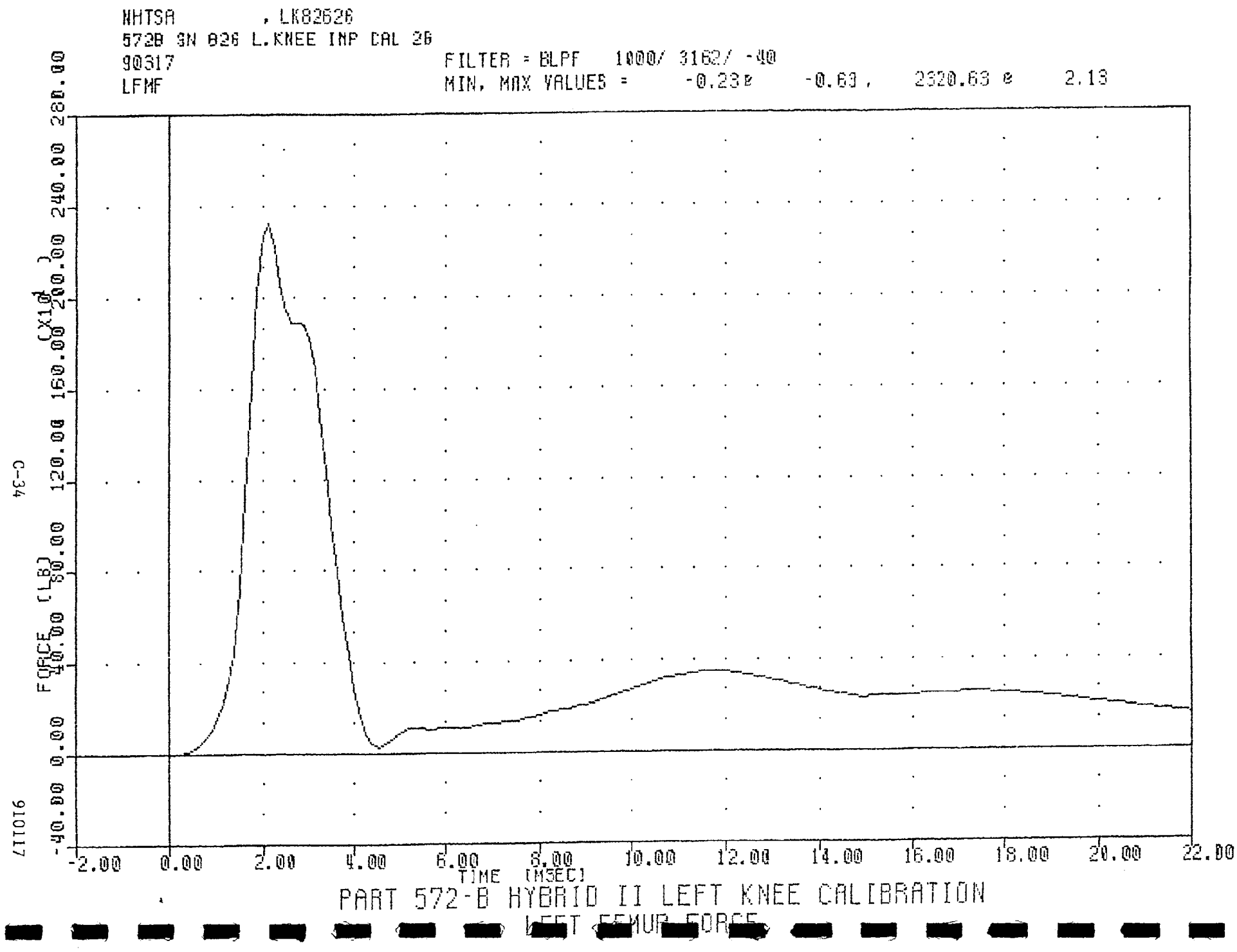
PART 572 13-Nov-90

TEMPERATURE 72 F RELATIVE HUMIDITY 33 %
LEFT KNEE
NHTSA LKB2626 572B SN 826 L.KNEE IMP CAL 26

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	6.93 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LB	2320.63 LB
DURATION ABOVE 1000 LB	>=1.7 MSEC	1.92 MSEC

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet


NHTSA , LK82626
572B SN 826 L.KNEE INP CAL 26
90317
LFMF
FILTER = BLPF 1000/ 3162/ -40
MIN, MAX VALUES = -0.23@ -0.63 , 2320.63 @ 2.13
FORCE (LB) (X10)
-40.00 0.00 40.00 80.00 120.00 160.00 200.00 240.00 280.00
-2.00 0.00 2.00 4.00 6.00 8.00 10.00 12.00 14.00 16.00 18.00 20.00 22.00
TIME (MSEC)
PART 572-B HYBRID II LEFT KNEE CALIBRATION
LEFT FEMUR FORCE

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

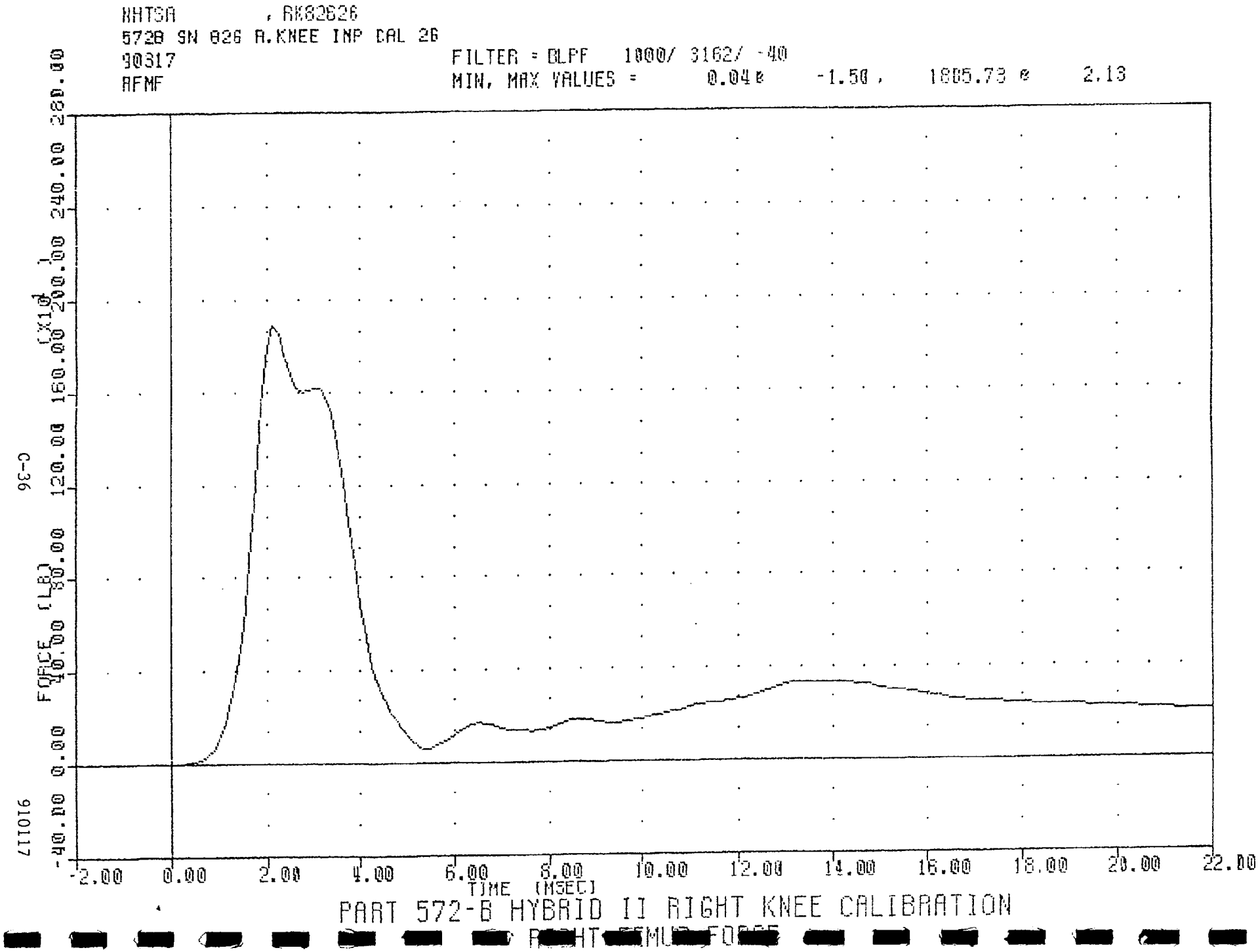
PART 572 13-Nov-90

TEMPERATURE 72 F RELATIVE HUMIDITY 32 %
RIGHT KNEE
NHTSA RK82626 572B SN 826 R.KNEE IMP CAL 26

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	6.91 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LB	1885.73 LB
DURATION ABOVE 1000 LB	>=1.7 MSEC	2.11 MSEC

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet


NHTSA , RK82626
572B SN 026 R.KNEE INP CAL 26
90317
RFMF
FILTER = BLPF 1000/ 3162/ -40
MIN, MAX VALUES = 0.04 @ -1.50 , 1885.73 @ 2.13
FORCE (LB) (X10)
280.00
240.00
200.00
160.00
120.00
80.00
40.00
0.00
-40.00
-2.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
18.00
20.00
22.00
TIME (MSEC)
C-36
910117
PART 572-B HYBRID II RIGHT KNEE CALIBRATION
RIGHT KNEE FORCE

PRE-TEST CERTIFICATION DATA

PASSENGER DUMMY S/N: 713

TRANSPORTATION RESEARCH CENTER OF OHIO

EXTERNAL DIMENSIONS

PART 572 08-NOV-90

TEMPERATURE 74 F RELATIVE HUMIDITY 33 %
NHTSA ED7130i 572B SN713 EXT. DIMENSION CAL01

DESCRIPTION SN 713 HUMANOID	SPECIFICATION	TEST RESULTS
Sitting Height	35.6 - 35.8 IN	35.6 IN
Shoulder Pivot Height	21.8 - 22.4 IN	22.2 IN
Hip Pivot Height	3.9 IN (ref)	3.9 IN
Hip Pivot From Backline	4.8 IN (ref)	4.8 IN
Knee Pivot From Backline	20.1 - 20.7 IN	20.3 IN
Rear of Head From Backline	1.7 IN (ref)	1.7 IN
Chest Depth	9.1 - 9.6 IN	9.2 IN
Shoulder Width	17.8 - 18.4 IN	17.9 IN
Chest Circumference Over Nipples	36.8 - 40.0 IN	37.7 IN
Waist Circumference at Min. Girth	31.4 - 32.6 IN	32.3 IN
Hip Width	14.0 - 15.4 IN	14.9 IN
Knee Pivot From Floor	19.3 - 19.9 IN	19.5 IN

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas Middleton

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

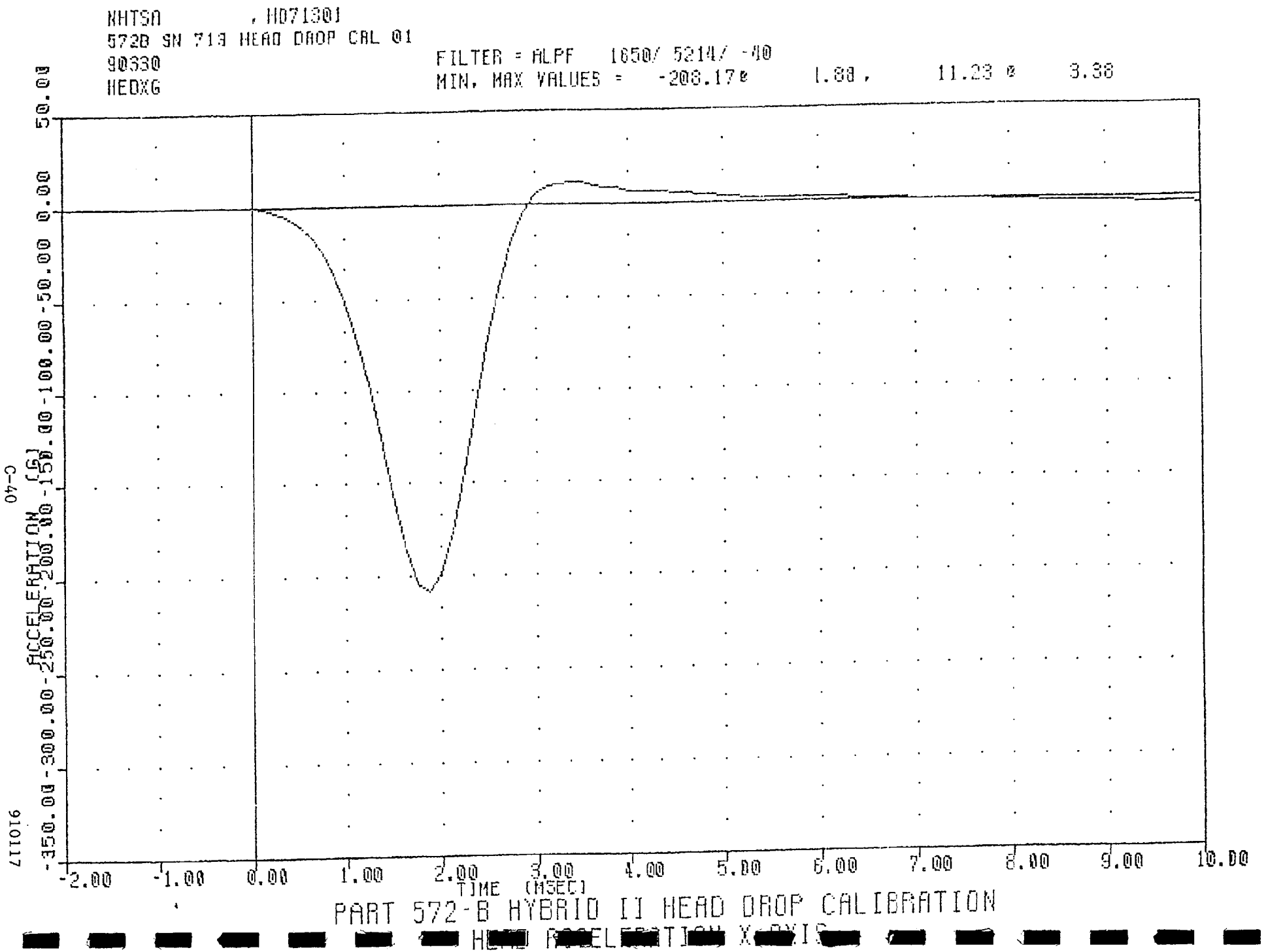
PART 572 26-Nov-90

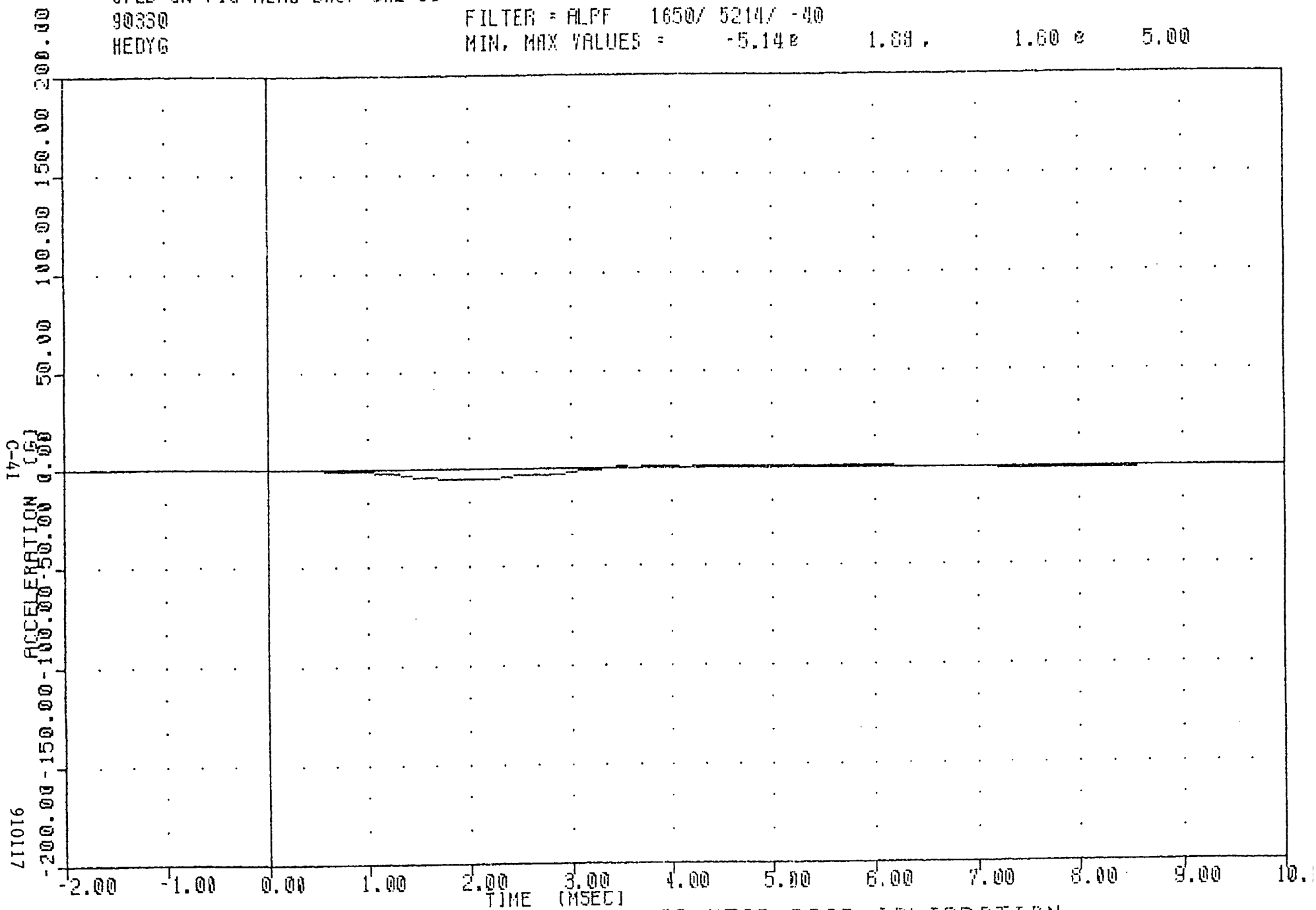
TEMPERATURE 72 F RELATIVE HUMIDITY 43 %
NHTSA HD71301 572B SN 713 HEAD DROP CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PEAK RESULTANT ACCELERATION	210 - 260 G	248.06 G
TIME ABOVE 100 G LEVEL	0.9 - 1.5 MSEC	1.28 MSEC
PEAK LATERAL ACCELERATION	10 G MAX	-5.14 G
IS ACCELERATION CURVE UNIMODAL?		YES

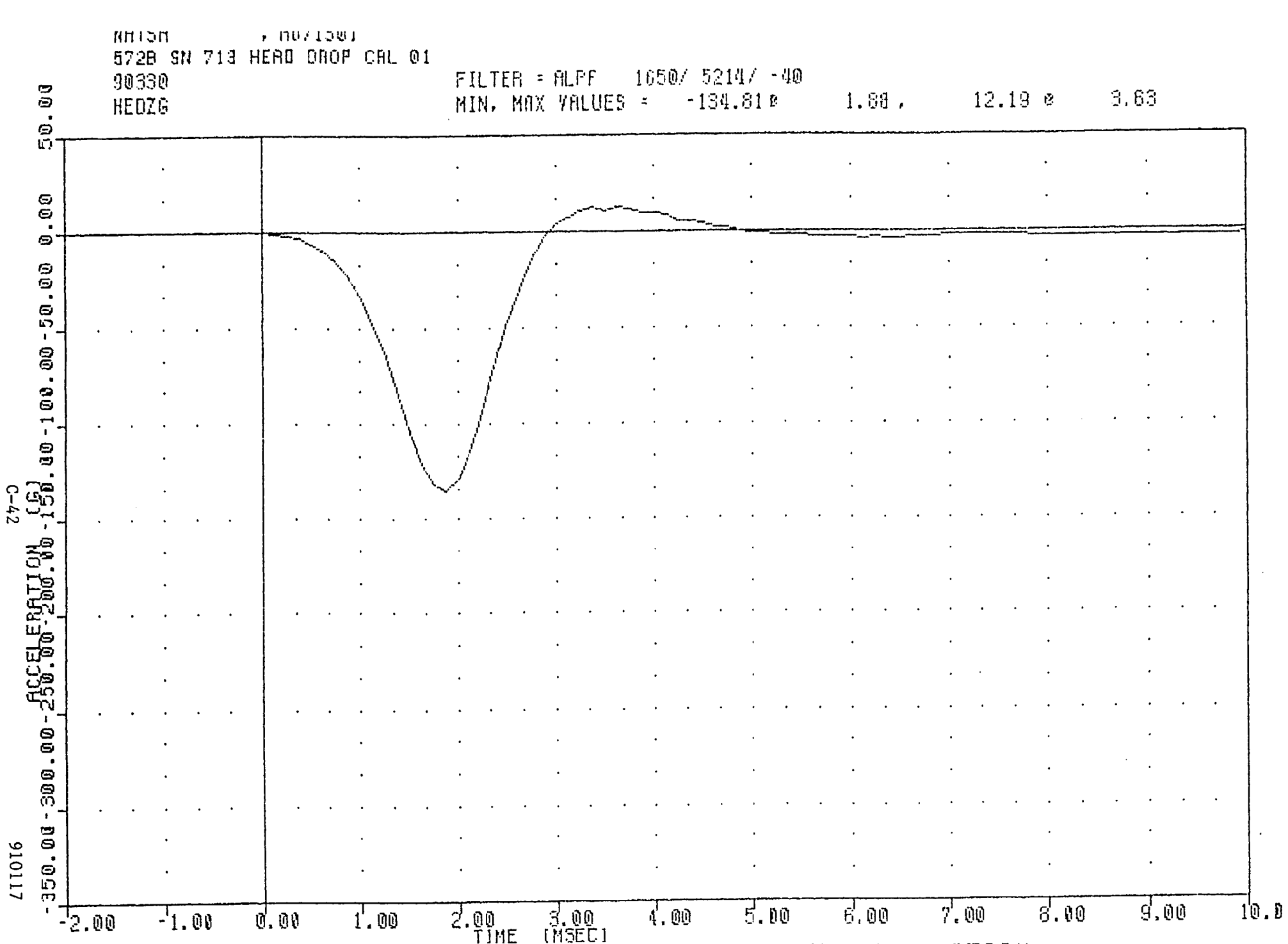
DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet

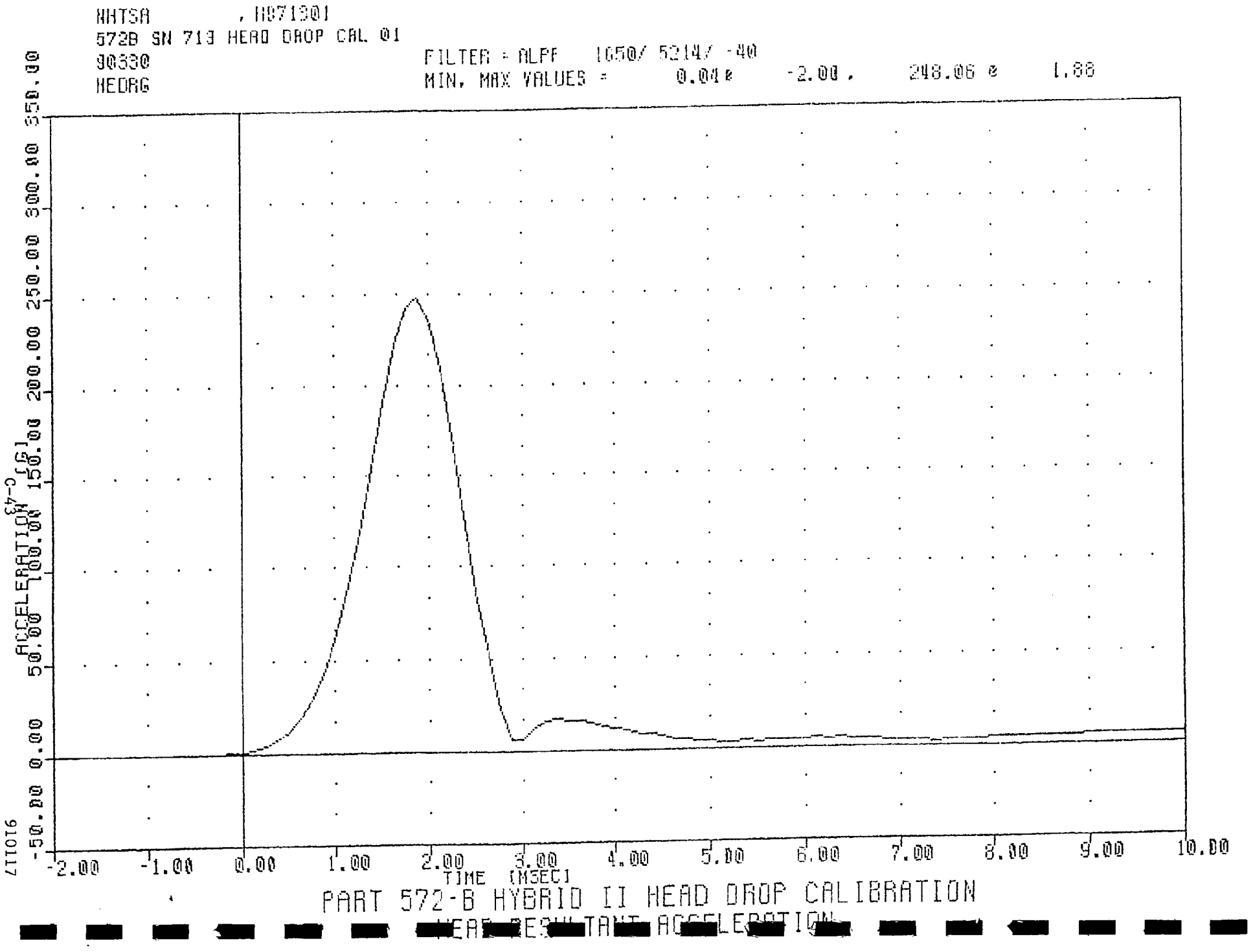

NHTSA , HD71301
572B SN 713 HEAD DROP CAL 01
90330
HEDXG
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -208.17@ 1.88 , 11.23 @ 3.38
ACCELERATION (G)
50.00
0.00
-50.00
-100.00
-150.00
-200.00
-250.00
-300.00
-350.00
-2.00
-1.00
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
TIME (MSEC)
PART 572-B HYBRID II HEAD DROP CALIBRATION
HEAD ACCELERATION X-AXIS
C-40
910117



PART 572-B HYBRID II HEAD DROP CALIBRATION
HEAD ACCELERATION Y AXIS



PART 572-B HYBRID II HEAD DROP CALIBRATION
HEAD ACCELERATION Z AXIS


NHTSA , NB71301
572B SN 713 HEAD DROP CAL 01
90330
HEDRG
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = 0.04@ -2.00 , 248.06 @ 1.88
ACCELERATION [G]
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
-50.00
-2.00
-1.00
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
TIME [MSEC]
C-43
910117
PART 572-B HYBRID II HEAD DROP CALIBRATION
HEAD RESULTANT ACCELERATION

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK PENDULUM TEST

PART 572 28-Nov-90

TEMPERATURE 75 F RELATIVE HUMIDITY 50 %
NHTSA HN71301 572B SN 713 HEAD/NECK CAL 01

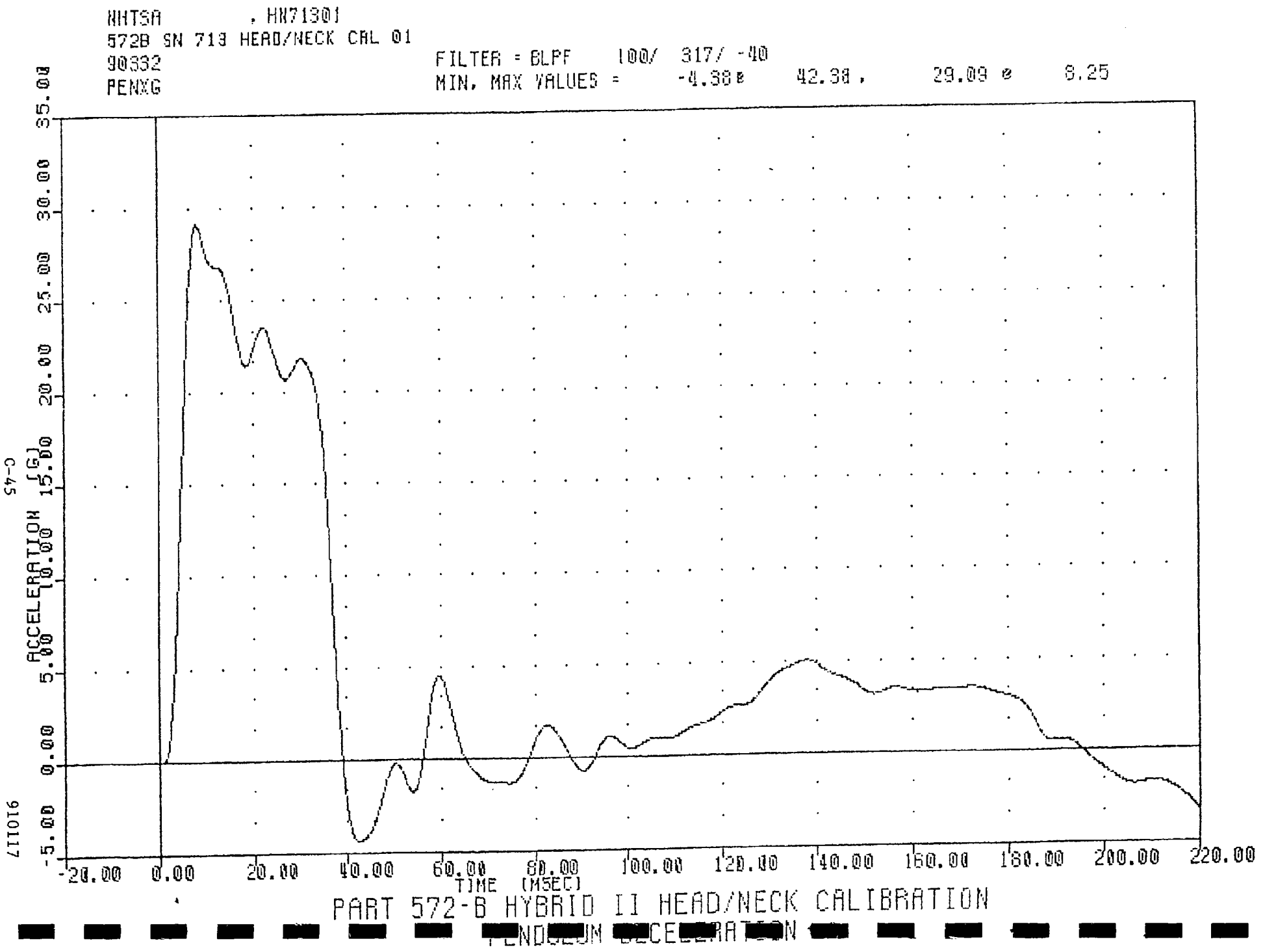
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Pendulum velocity	21.5 to 25.5 ft/sec	23.53 ft/sec
Pendulum Deceleration:		
T1 - T2: 5 - 20 G	3 msec max	2.19 msec
T2 - T3: 20 - 20 G	25 - 30 msec	28.12 msec
T3 - T4: 20 - 5 G	10 msec max	4.14 msec
Avg. G level T2 - T3	20 - 24 G	23.65 G
Maximum Rotation Angle	63 - 73 deg	71.96 deg
Peak Head Resultant Accel	26 G max	22.60 G

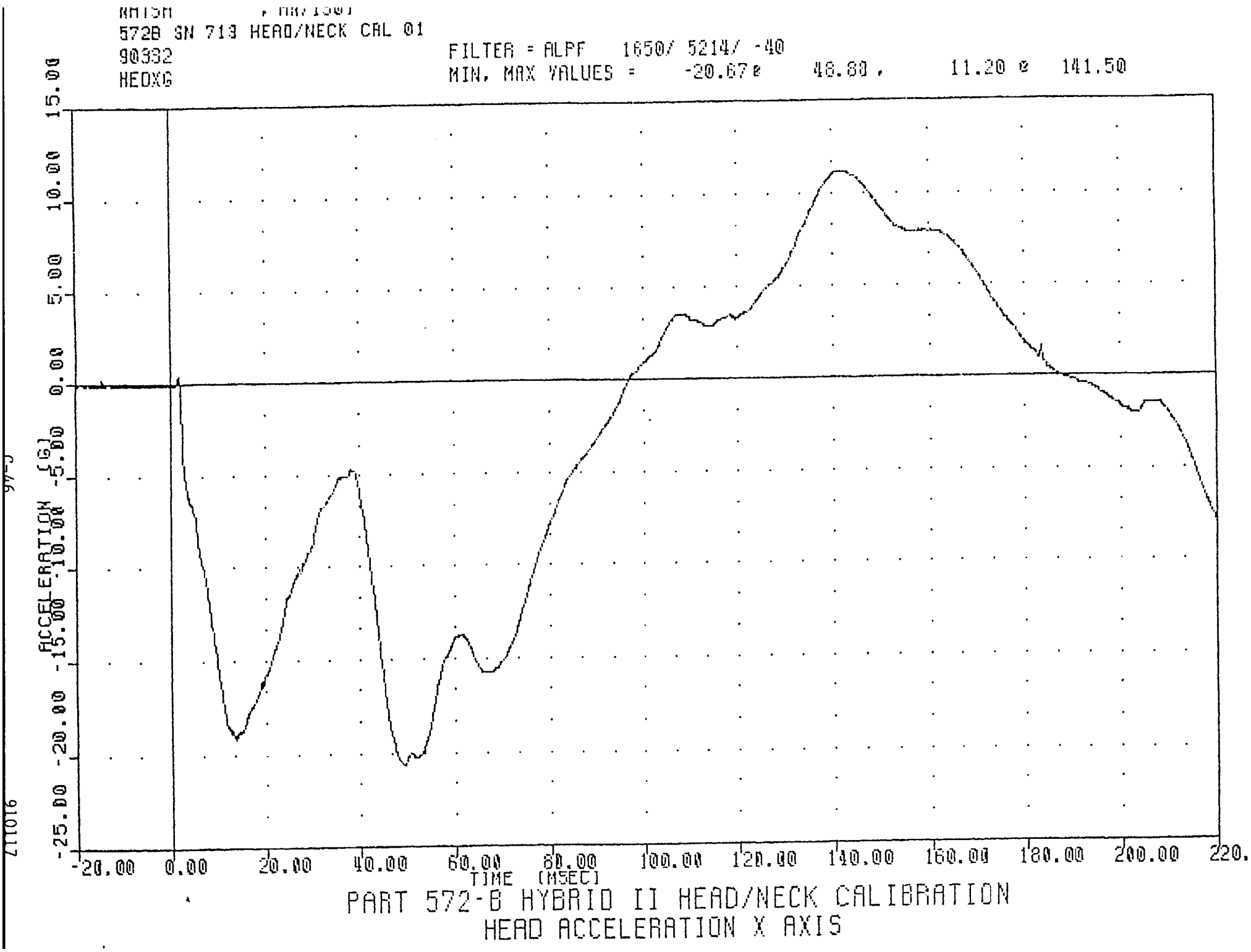
Test Parameter	Specification		Test Results	
Rotation Angle (degrees)	Time (msec)	Chordal Disp. (in)	Time (msec)	Chordal Disp. (in)
0	-2.0 - +2.0	-0.5 - +0.5	1.25	0.01
30	25.6 - 34.4	2.1 - 3.1	30.72	2.48
60	40.3 - 51.7	4.3 - 5.3	45.07	4.52
max	53.2 - 66.8	5.0 - 6.0	65.75	5.63
60	67.0 - 83.0	4.3 - 5.3	82.74	4.73
30	85.4 - 104.6	2.1 - 3.1	100.28	2.33
0	101.0 - 123.0	-0.5 - +0.5	114.25	0.18

SND: 5.95 in

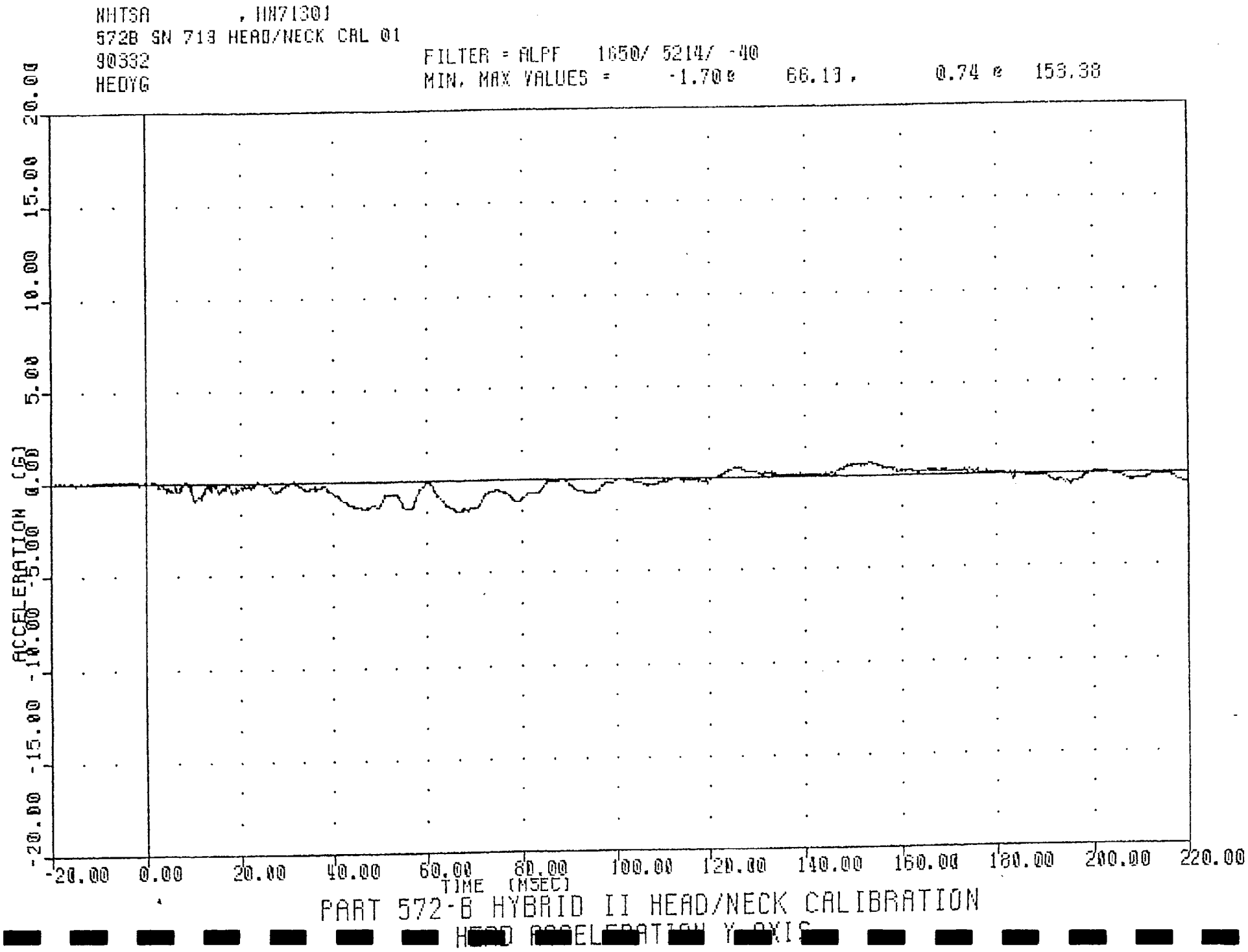
DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet


NHTSA , HN71301
572B SN 713 HEAD/NECK CAL 01
90332
PENXG
FILTER = BLPF 100/ 317/ -40
MIN, MAX VALUES = -4.38 @ 42.38 , 29.09 @ 8.25
ACCELERATION (G)
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
-5.00
-20.00
0.00
20.00
40.00
60.00
80.00
100.00
120.00
140.00
160.00
180.00
200.00
220.00
TIME (MSEC)
C-45
91011.7
PART 572-B HYBRID II HEAD/NECK CALIBRATION
PENDULUM ACCELERATION

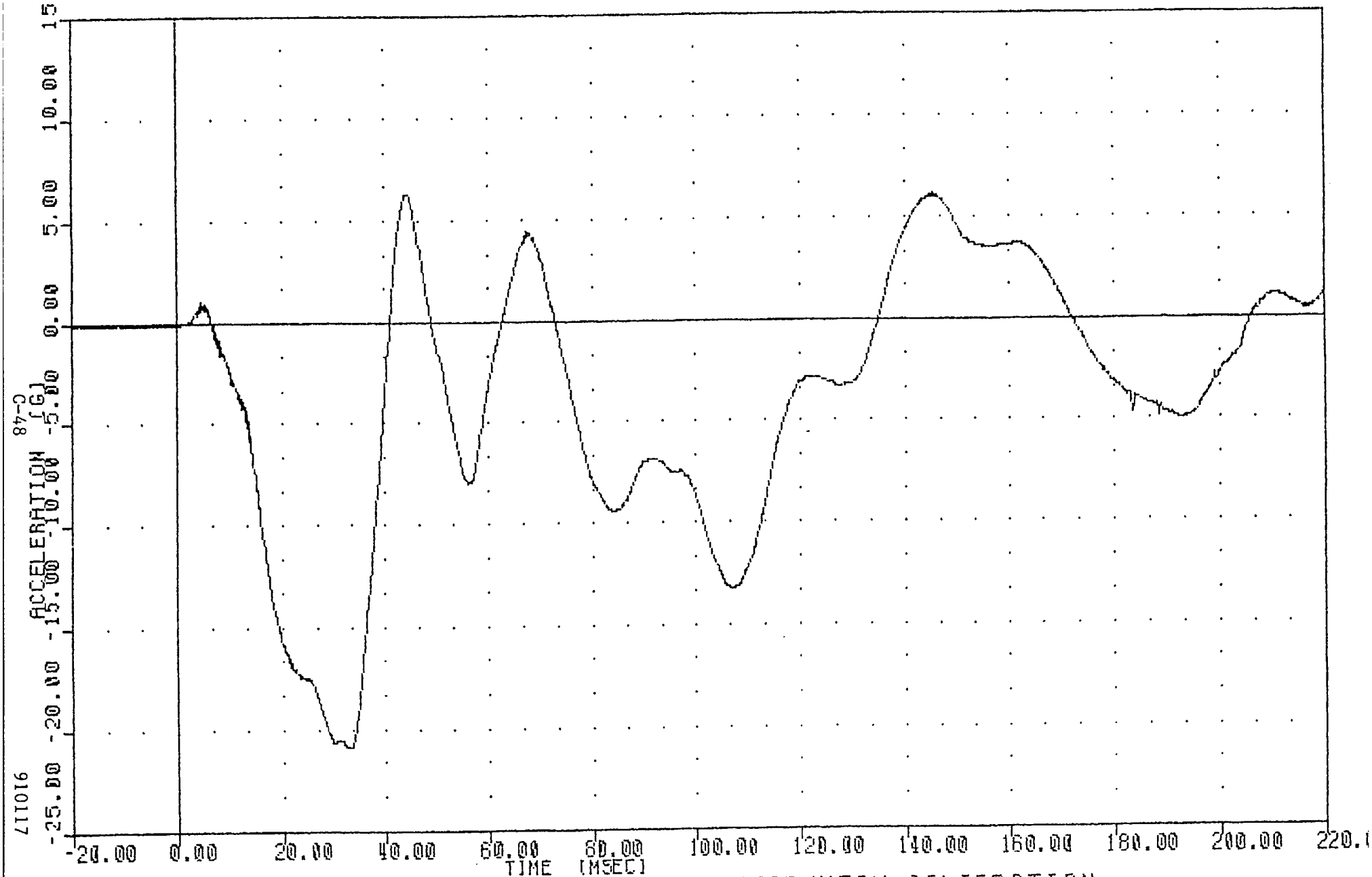


PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD ACCELERATION X AXIS


NHTSA , NN71301
572B SN 713 HEAD/NECK CAL 01
90332
HEDYG
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -1.70 @ 66.13 , 0.74 @ 153.38
ACCELERATION (G)
20.00
15.00
10.00
5.00
0.00
-5.00
-10.00
-15.00
-20.00
-20.00
0.00
20.00
40.00
60.00
80.00
100.00
120.00
140.00
160.00
180.00
200.00
220.00
TIME (MSEC)
PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD ACCELERATION Y AXIS

572B SN 713 HEAD/NECK CAL 01
90332
HEDZG

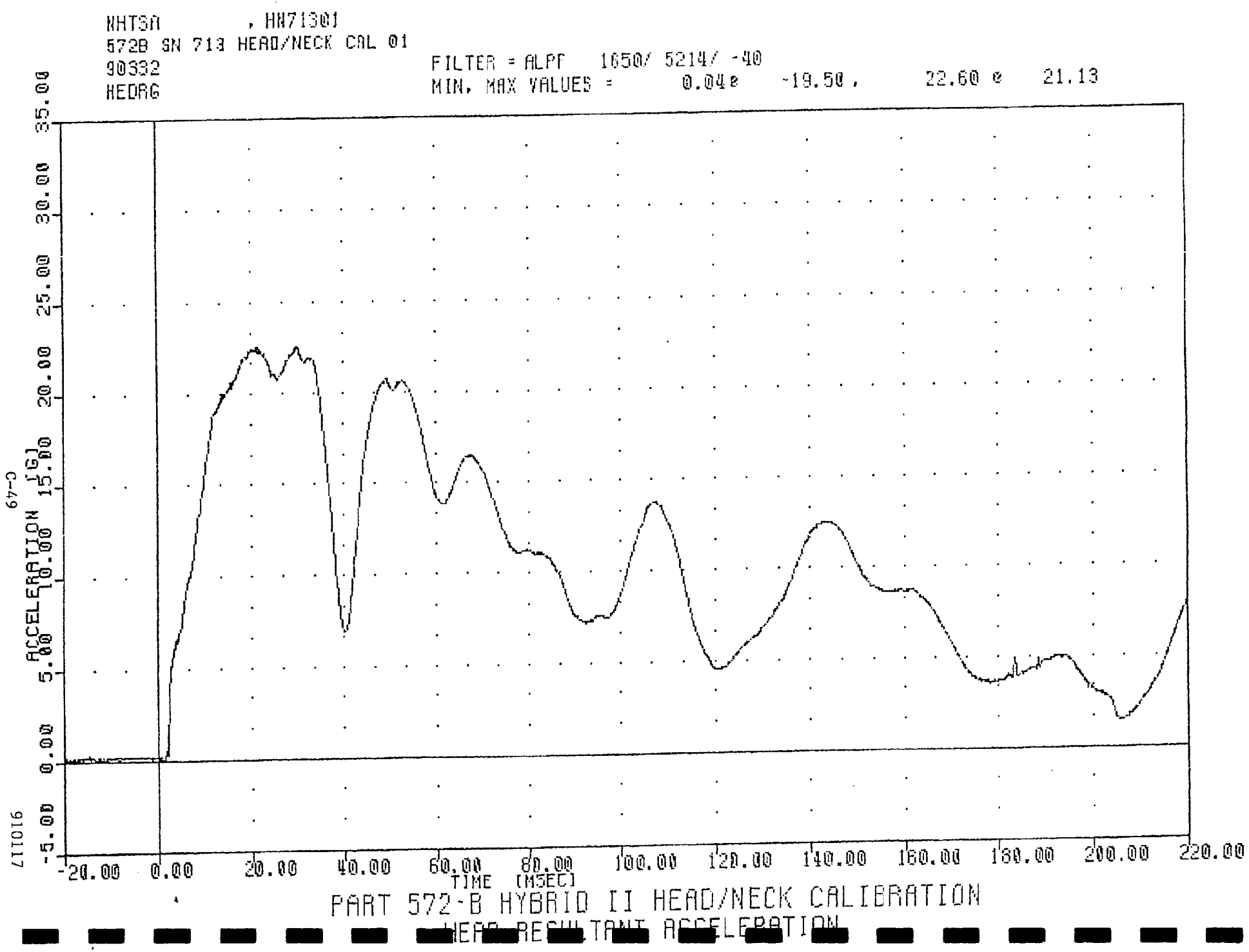
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -20.93 @ 32.75 , 6.30 @ 44.00

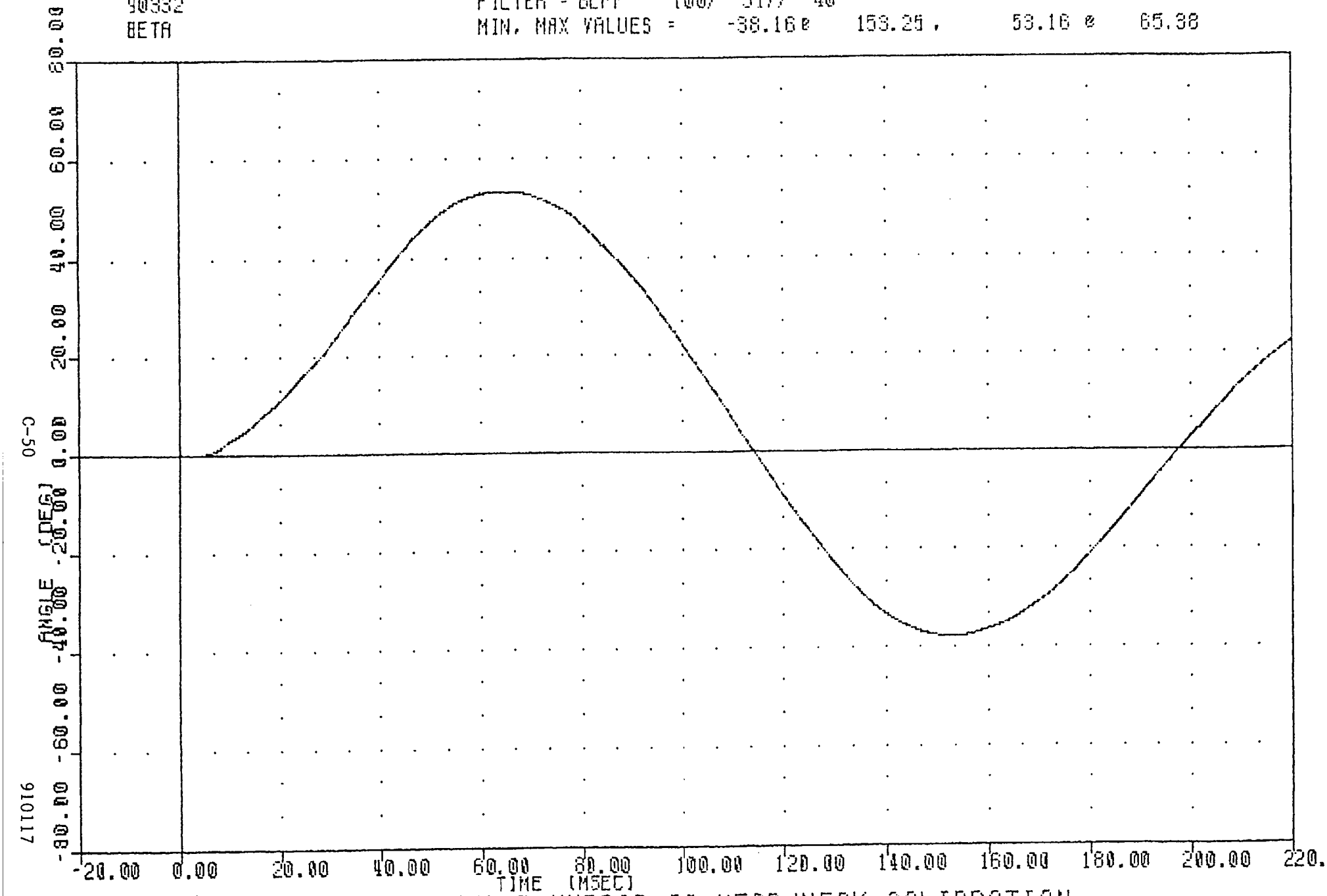


PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD ACCELERATION Z AXIS

C-48

91017

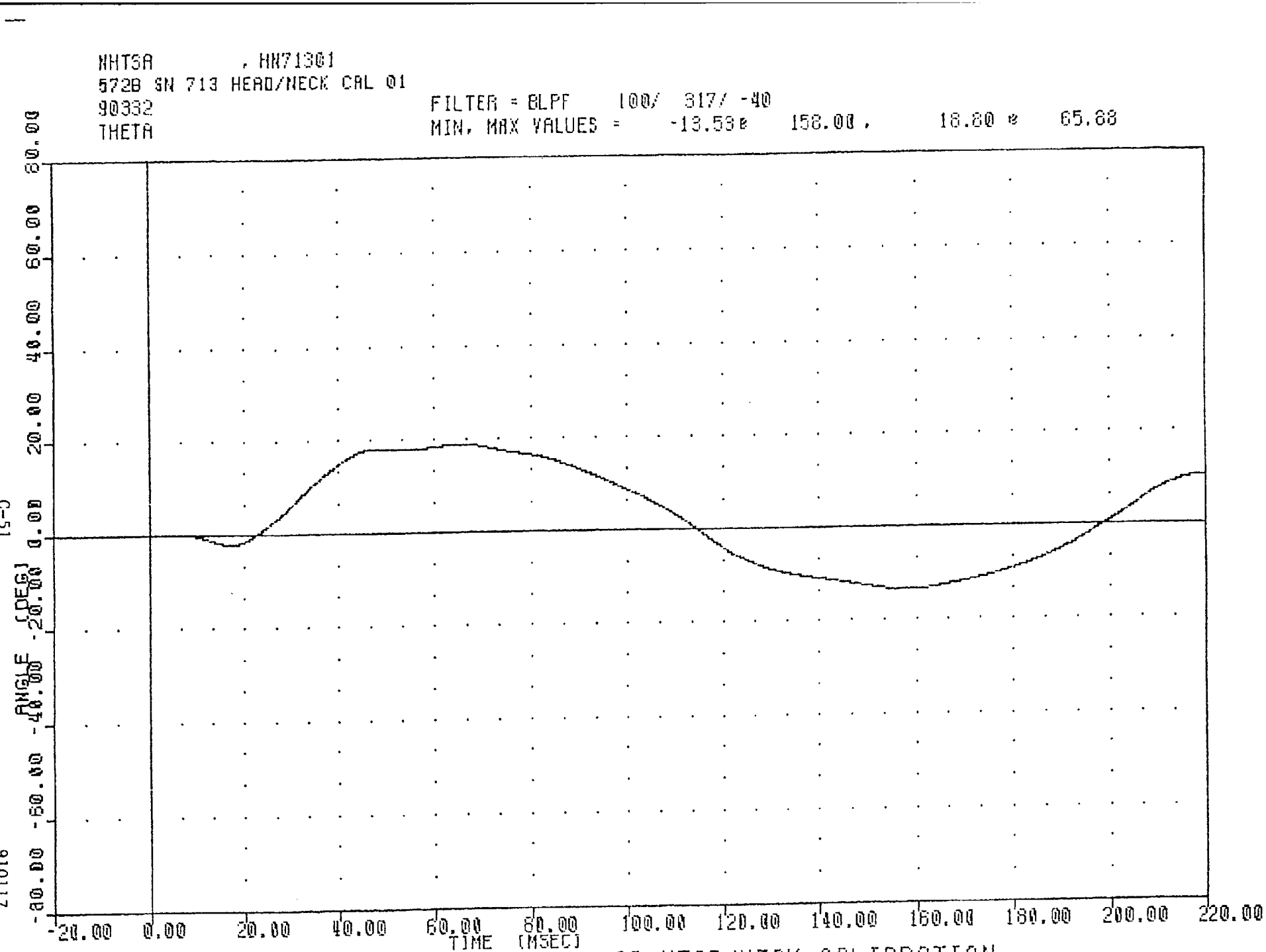

NHTSA , NH71301
572B SN 713 HEAD/NECK CAL 01
90332
HEDRG
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = 0.04@ -19.50 , 22.60 @ 21.13
ACCELERATION [G]
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
-5.00
-20.00
0.00
20.00
40.00
60.00
80.00
100.00
120.00
140.00
160.00
180.00
200.00
220.00
TIME [MSEC]
C-49
91011?
PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD RESULTANT ACCELERATION



C-50

910117

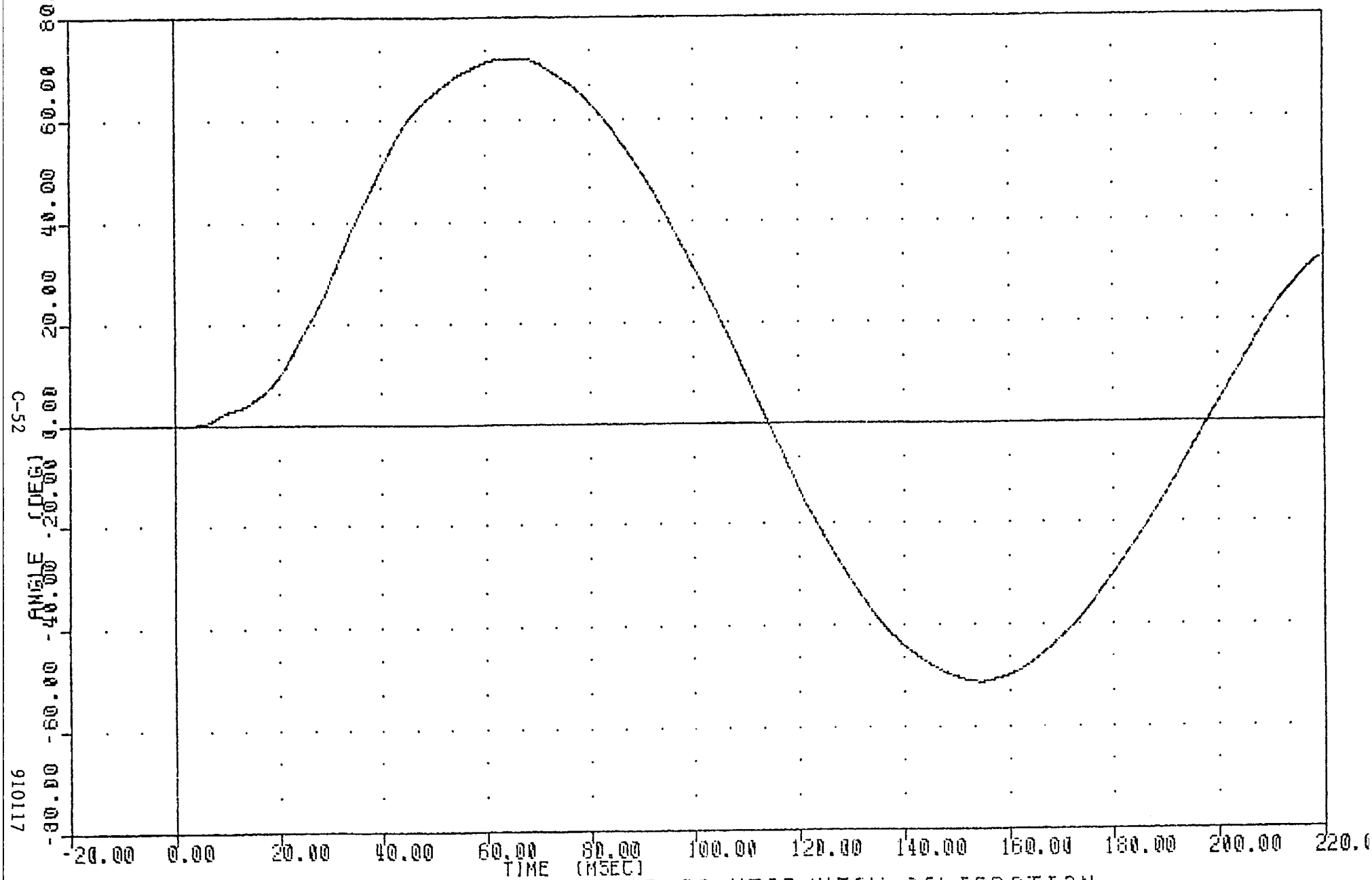
PART 572-B HYBRID II HEAD/NECK CALIBRATION
ROTATION ABOUT THE BASE OF THE NECK



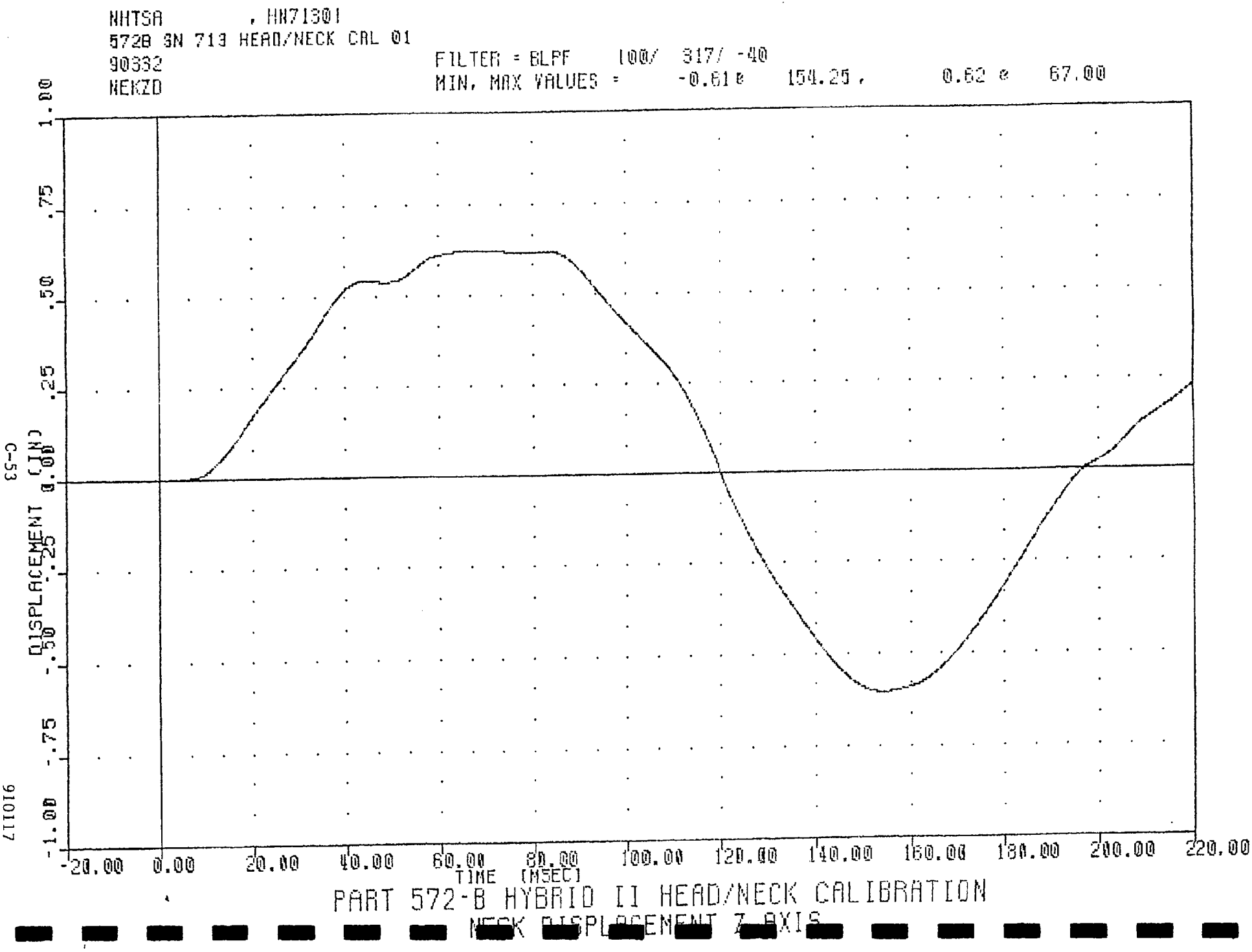
PART 572-B HYBRID II HEAD/NECK CALIBRATION

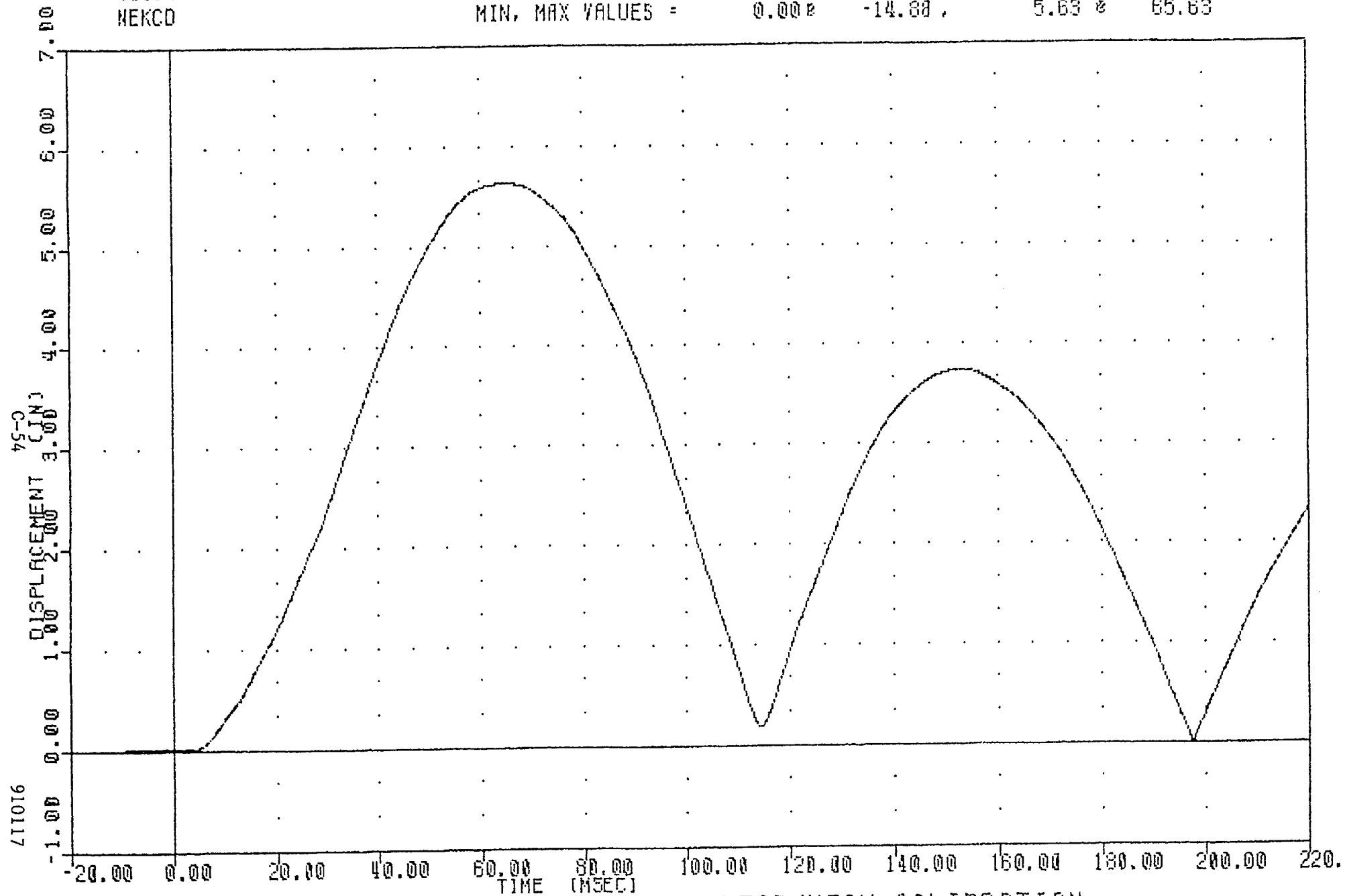
[redacted]

572B SN 713 HEAD/NECK CAL 01
90332
TOTAN
FILTER = BLPF 100/ 317/ -40
MIN, MAX VALUES = -51.45 @ 154.63 , 71.96 @ 65.75



PART 572-B HYBRID II HEAD/NECK CALIBRATION
TOTAL ROTATION


NHTSA , HN71301
572B SN 713 HEAD/NECK CAL 01
90332
NEKZD
FILTER = BLPF 100/ 317/ -40
MIN, MAX VALUES = -0.61 @ 154.25 , 0.62 @ 67.00
1.00
.75
.50
.25
0.00
-.25
-.50
-.75
-1.00
DISPLACEMENT (IN)
-20.00
0.00
20.00
40.00
60.00
80.00
100.00
120.00
140.00
160.00
180.00
200.00
220.00
TIME (MSEC)
PART 572-B HYBRID II HEAD/NECK CALIBRATION
NECK DISPLACEMENT Z AXIS



PART 572-B HYBRID II HEAD/NECK CALIBRATION
NECK CHORDAL DISPLACEMENT

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572 12-Nov-90

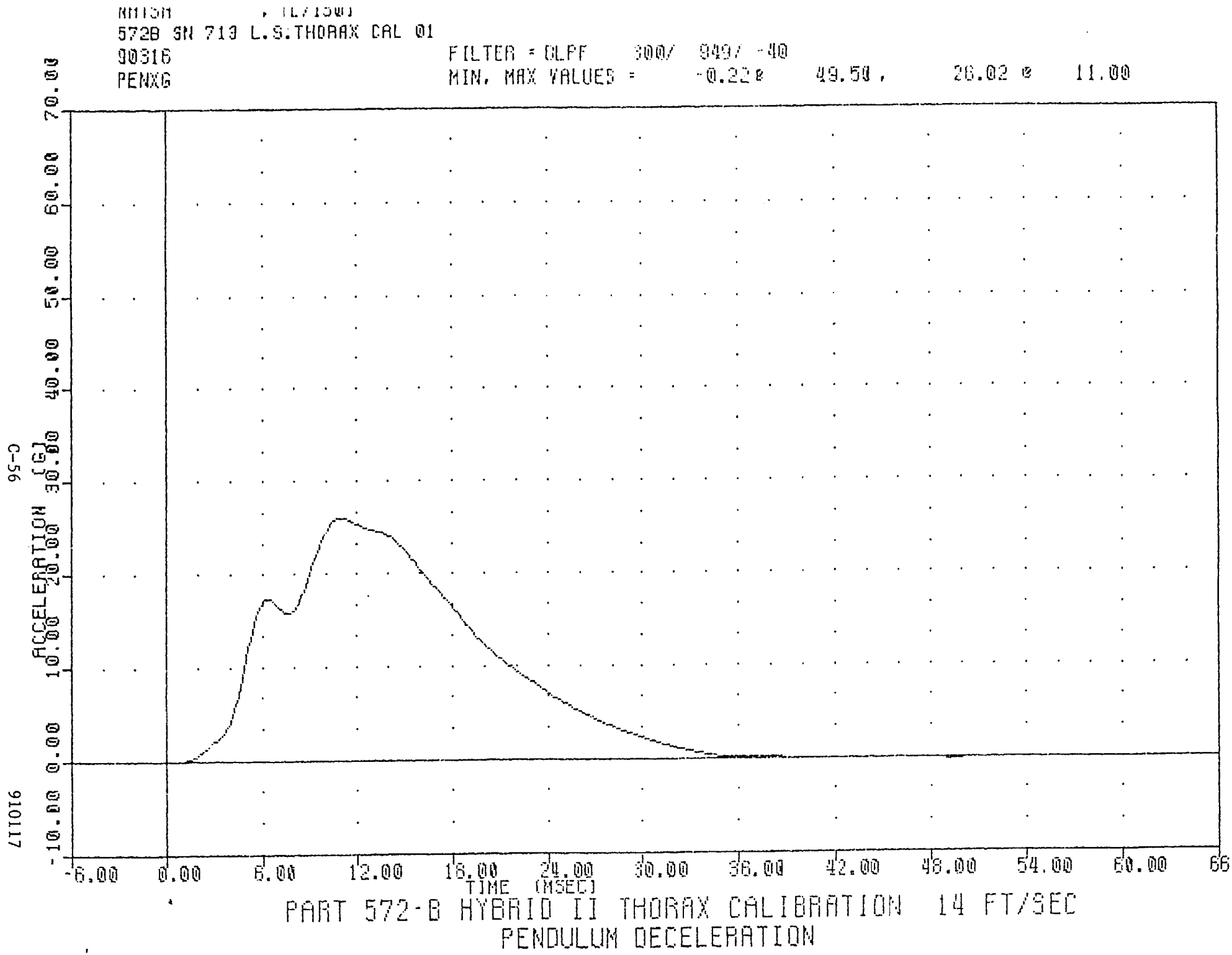
TEMPERATURE 73 F RELATIVE HUMIDITY 34 %
NHTSA TL71301 572B SN 713 L.S.THORAX CAL 01

TEST PARAMETER	LOW SPEED TEST SPECIFICATION	TEST RESULTS
PENDULUM VELOCITY	13.86-14.14 FT/SEC	14.10 FT/SEC
PEAK DEFLECTION	1.1 IN max.	0.87 IN
PEAK RESISTIVE FORCE	1,450. LB max.	1340. LB
INTERNAL HYSTERESIS	50% - 70%	57.8%

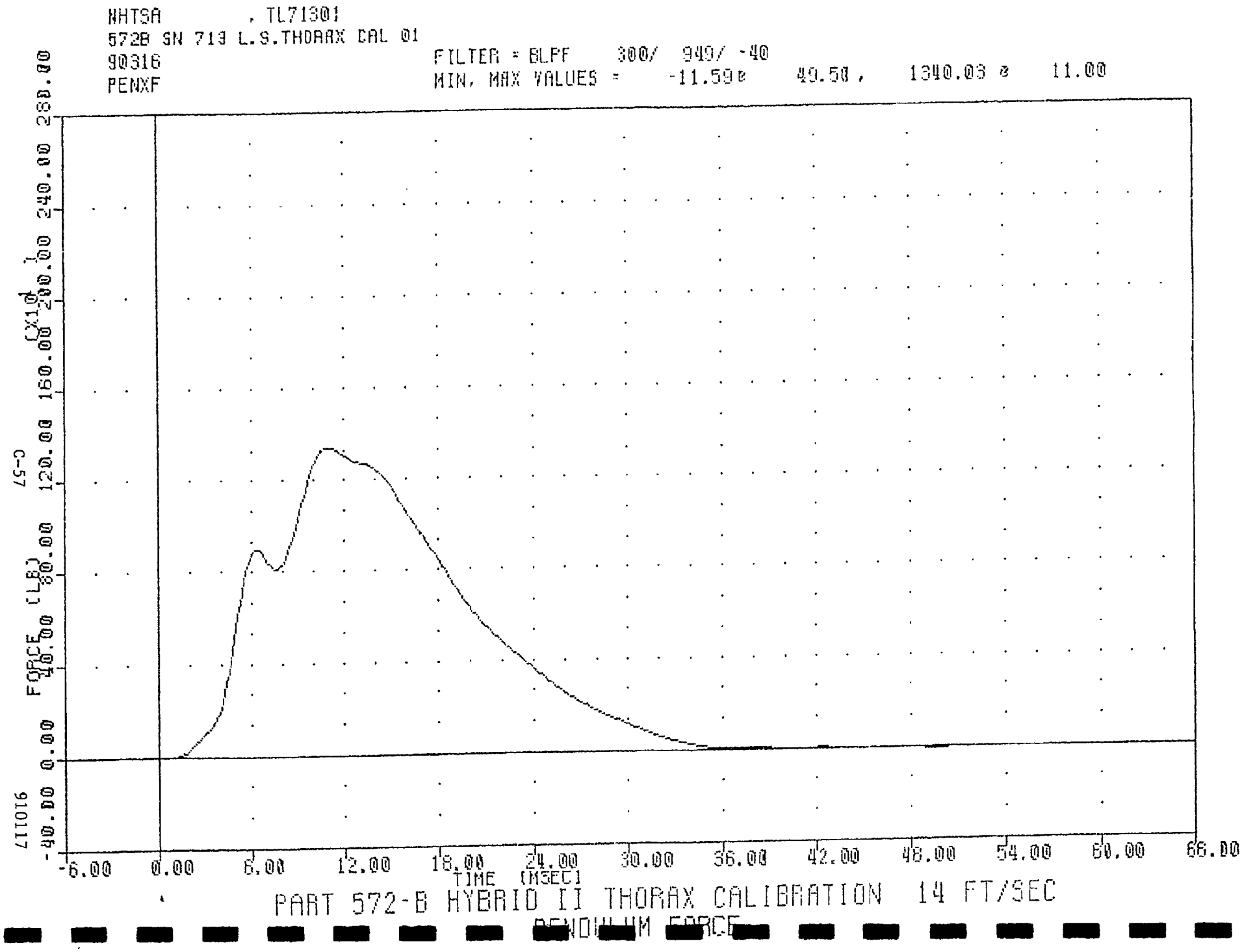
SCD: 2.25 IN

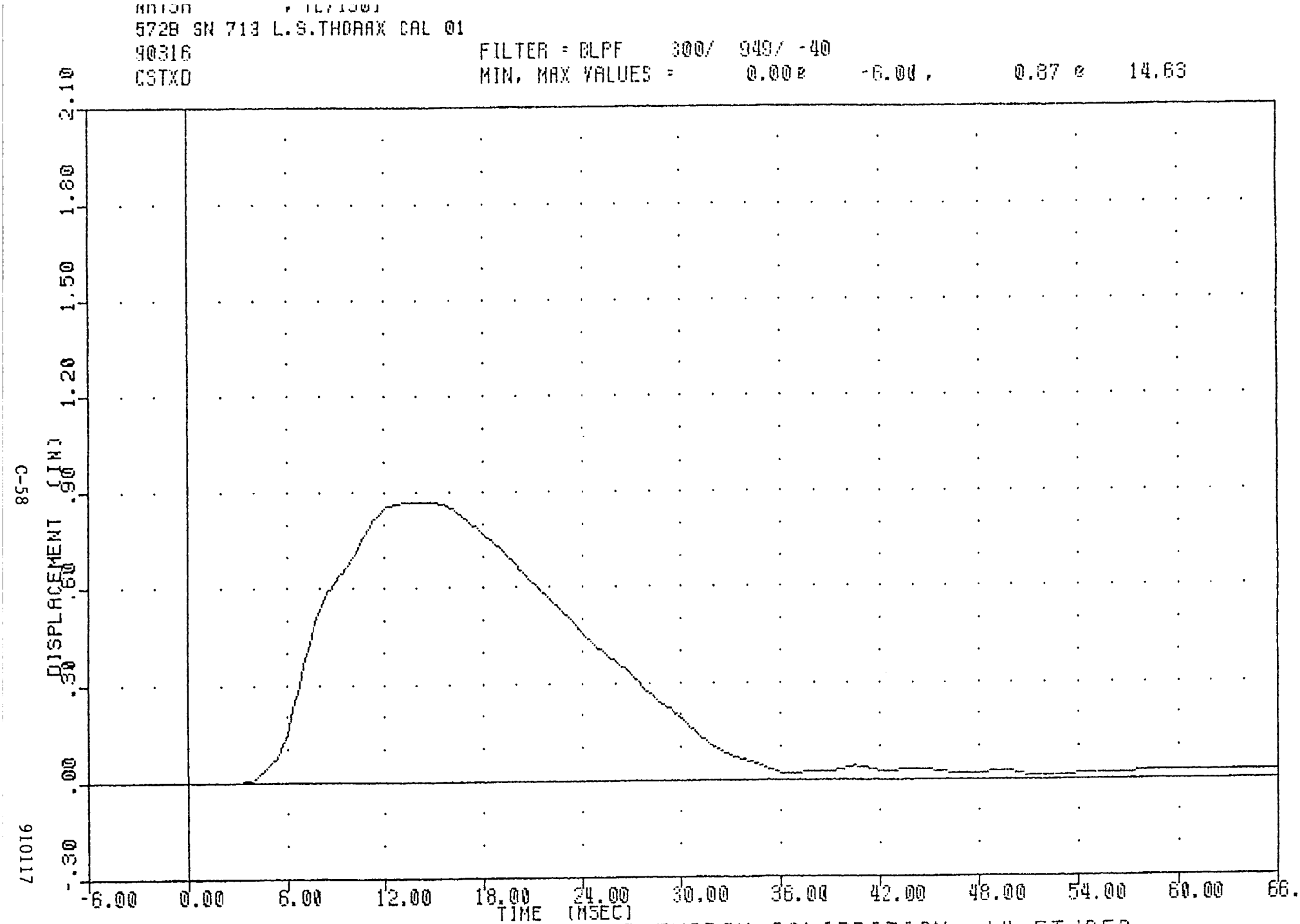
DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet

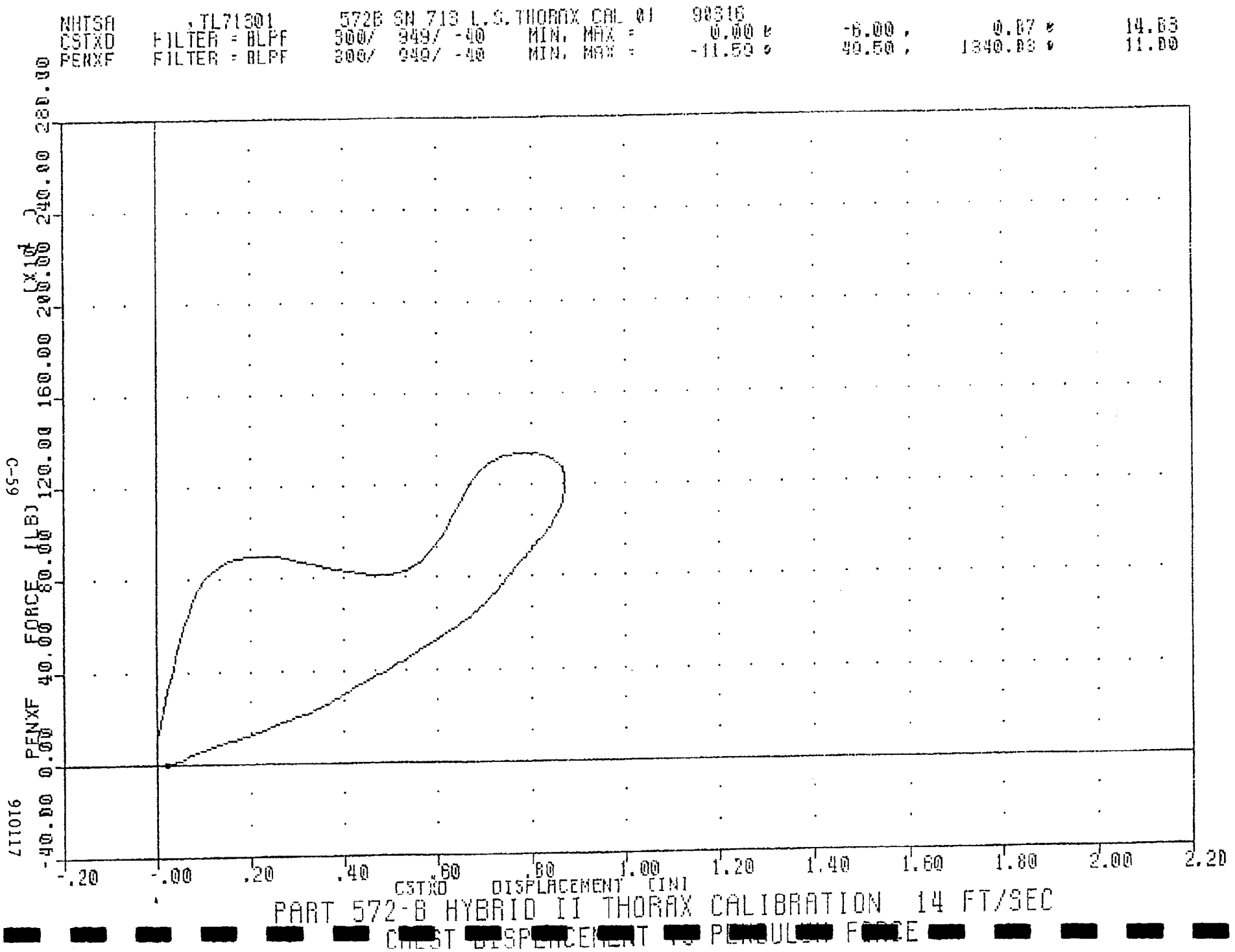


PART 572-B HYBRID II THORAX CALIBRATION 14 FT/SEC
PENDULUM DECELERATION


NHTSA , TL71301
572B SN 713 L.S.THORAX CAL 01
90316
PENXF
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -11.59@ 49.50 , 1340.03 @ 11.00
FORCE (LB) (X10)
280.00
240.00
200.00
160.00
120.00
80.00
40.00
0.00
-40.00
-6.00
0.00
6.00
12.00
18.00
24.00
30.00
36.00
42.00
48.00
54.00
60.00
66.00
TIME (MSEC)
C-57
910117
PART 572-B HYBRID II THORAX CALIBRATION 14 FT/SEC
PENDULUM FORCE



PART 572-B HYBRID II THORAX CALIBRATION 14 FT/SEC
STERNUM DISPLACEMENT


NHTSA .TL71301 572B SN 713 L.S.THORAX CAL 01 90315
CSTXD FILTER = BLPF 300/ 949/ -40 MIN, MAX = 0.00 -6.00 0.67 14.63
PENXF FILTER = BLPF 300/ 949/ -40 MIN, MAX = -11.59 40.50 1340.83 11.00
PENXF FORCE (LBS) (X10)
-40.00 0.00 40.00 80.00 120.00 160.00 200.00 240.00 280.00
-.20 -.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20
CSTXD DISPLACEMENT (IN)
PART 572-B HYBRID II THORAX CALIBRATION 14 FT/SEC
CHEST DISPLACEMENT VS PENDULUM FORCE
C-59
910117

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572 12-Nov-90

TEMPERATURE 73 F
NHTSA TH71301

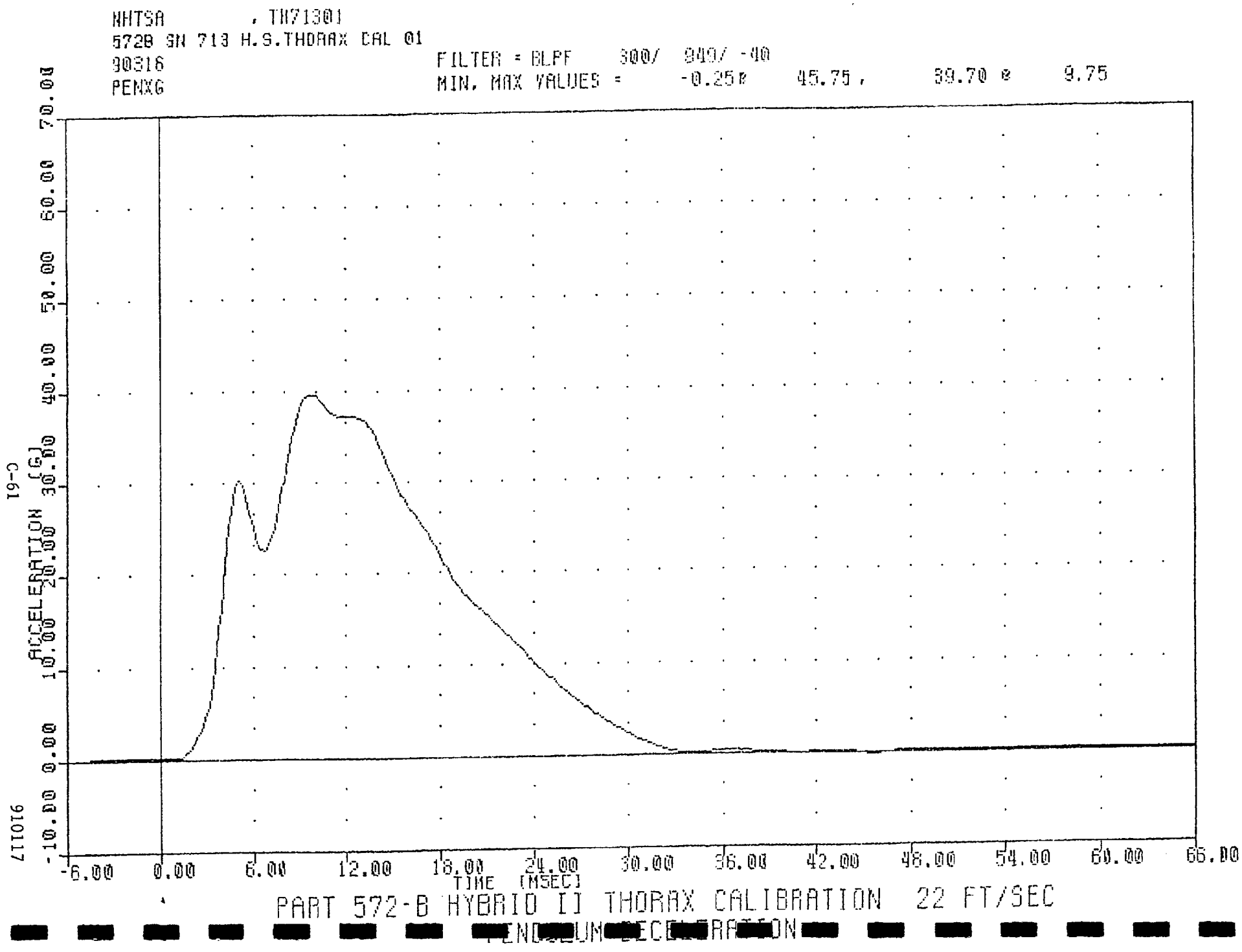
RELATIVE HUMIDITY 34 %
572B SN 713 H.S.THORAX CAL 01

TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
PENDULUM VELOCITY	21.78-22.22 FT/SEC	21.92 FT/SEC
PEAK DEFLECTION	1.7 IN max.	1.40 IN
PEAK RESISTIVE FORCE	2,250. LB max.	2044. LB
INTERNAL HYSTERESIS	50% - 70%	60.5%

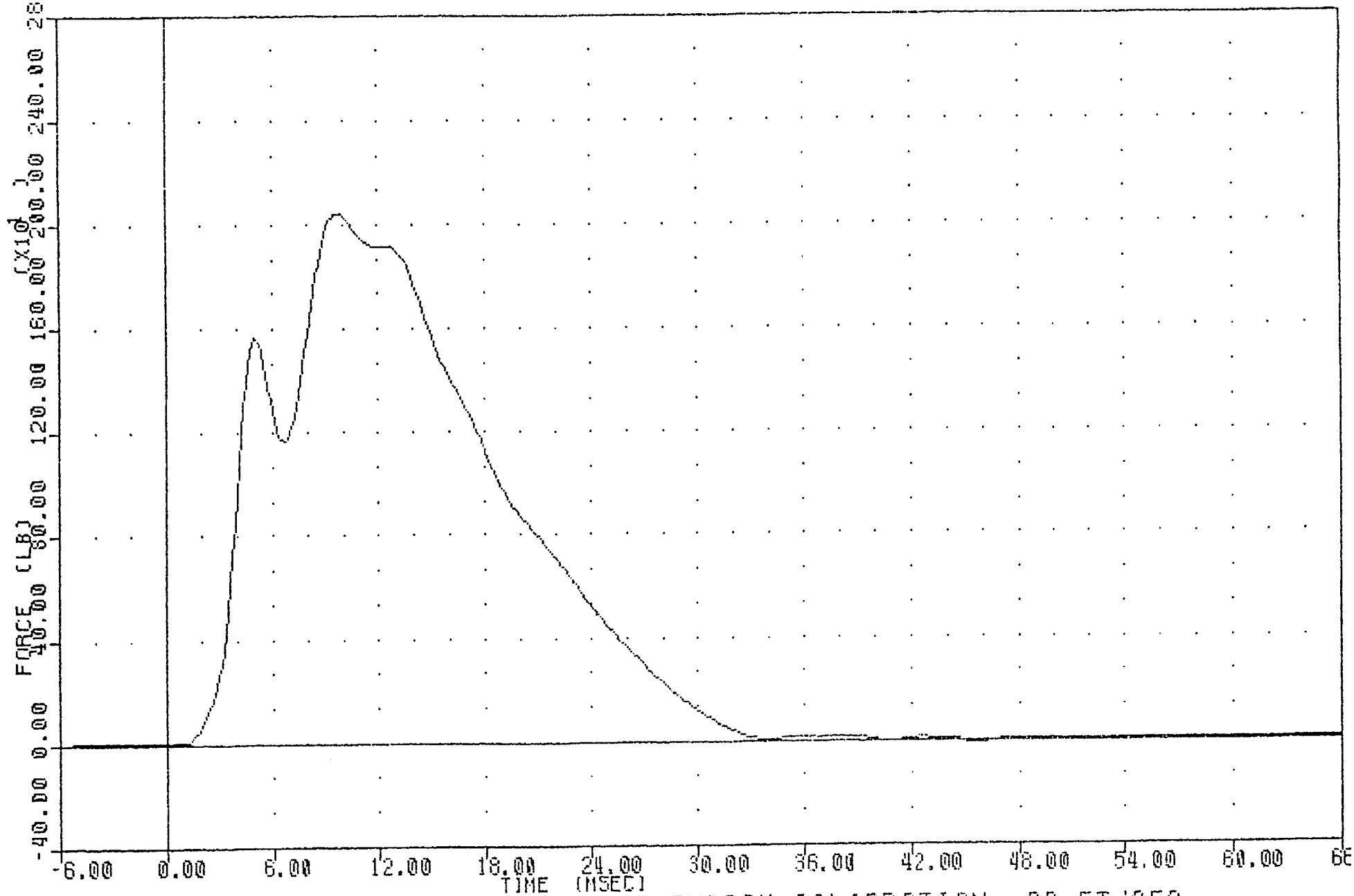
SCD: 2.25 IN

DUMMY MEETS SPECIFICATIONS

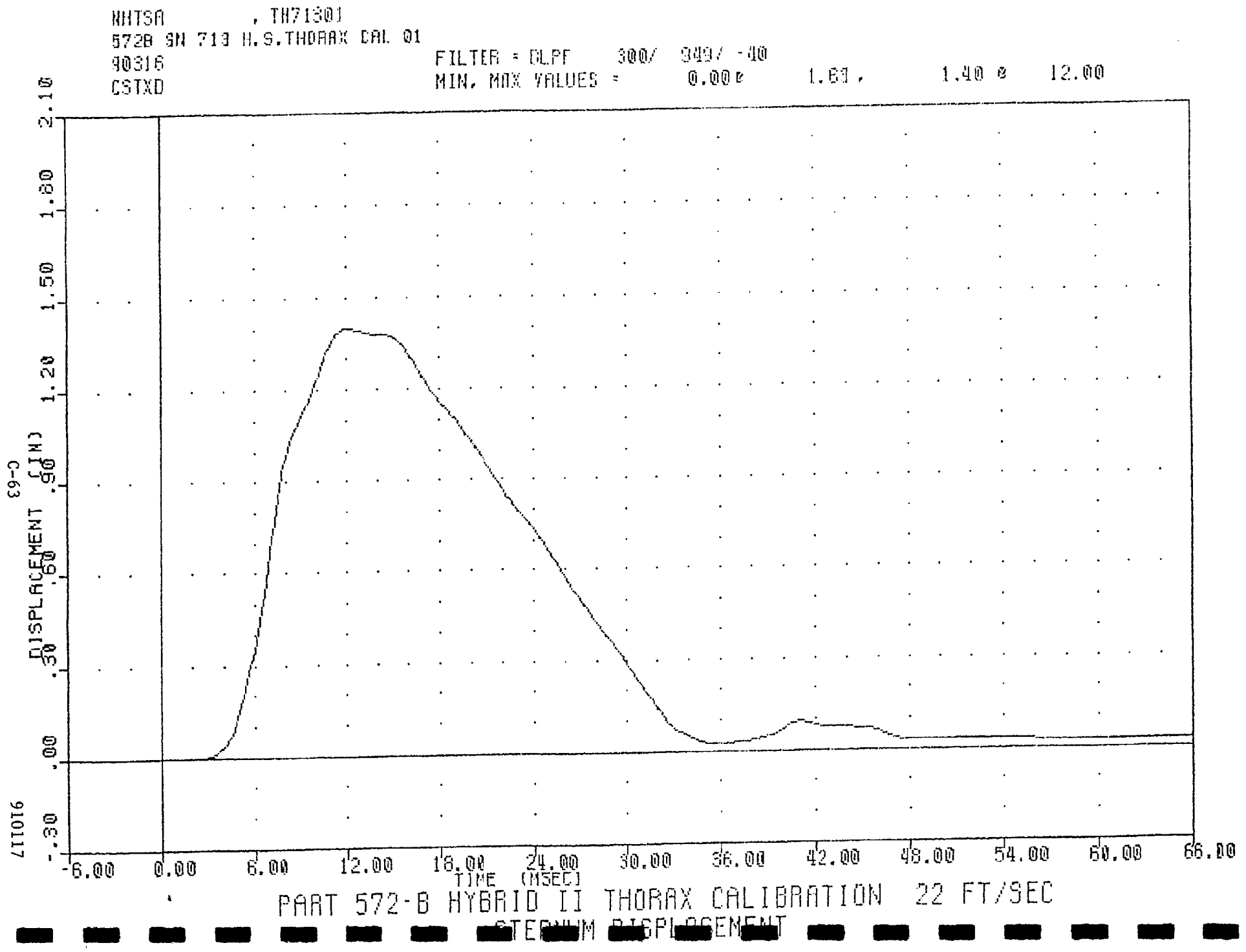
TECHNICIAN Chas. Middlet

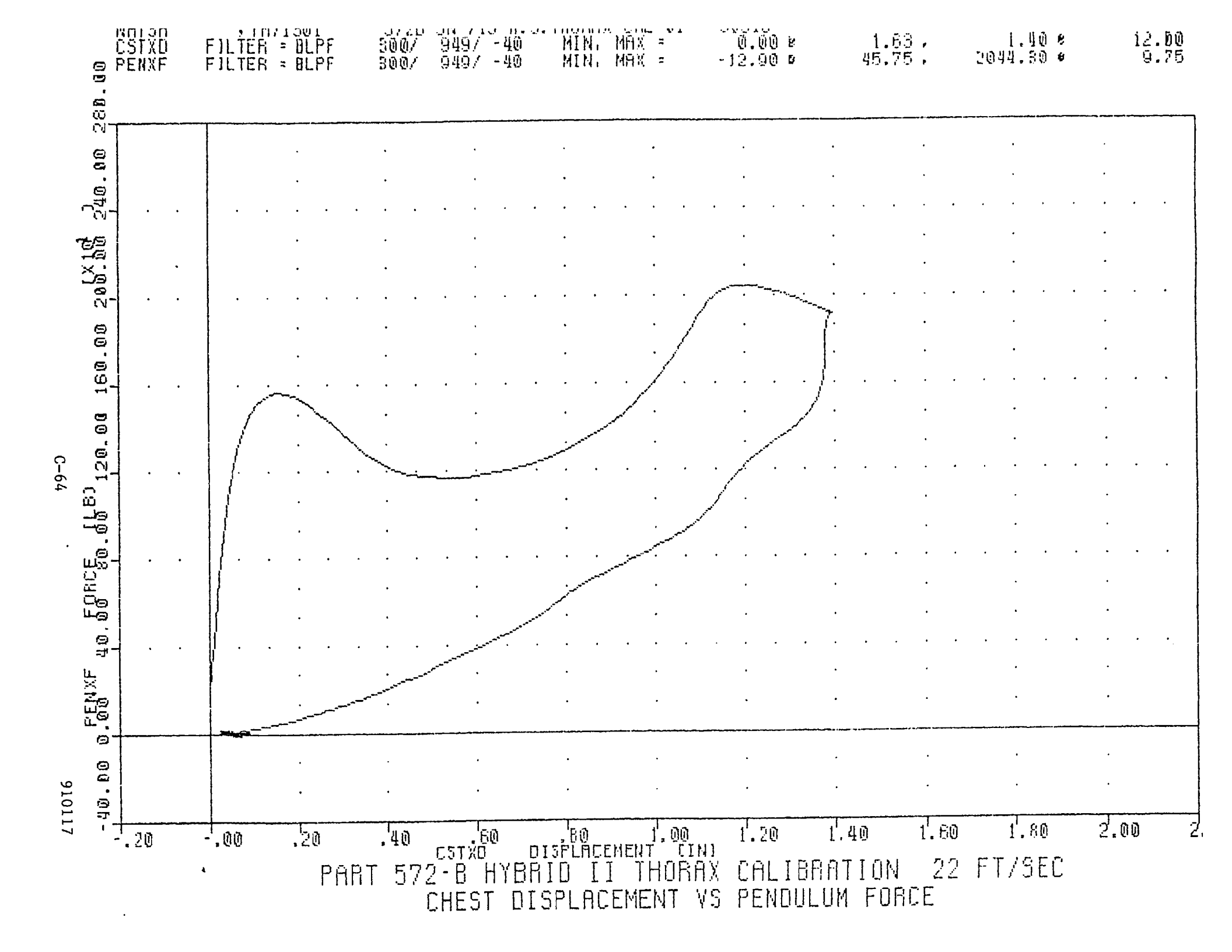

NHTSA , TR71301
572B SN 713 H.S.THORAX CAL 01
90316
PENXG
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.25@ 45.75 , 39.70 @ 9.75
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
ACCELERATION (G)
C-61
91011?
-6.00
0.00
6.00
12.00
18.00
24.00
30.00
36.00
42.00
48.00
54.00
60.00
66.00
TIME (MSEC)
PART 572-B HYBRID II THORAX CALIBRATION 22 FT/SEC

572B SN 713 H.S.THORAX CAL 01
90316
PENXF
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -12.90 @ 45.75 , 2044.30 @ 9.75



PART 572-B HYBRID II THORAX CALIBRATION 22 FT/SEC
PENDULUM FORCE


NHTSA , TH71301
572B SN 713 H.S.THORAX CAL 01
90316
CSTXD
FILTER = CLPF 300/ 349/ -40
MIN, MAX VALUES = 0.00 @ 1.81 , 1.40 @ 12.00
DISPLACEMENT (IN)
2.10
1.80
1.50
1.20
.90
.60
.30
.00
-.30
-6.00
0.00
6.00
12.00
18.00
24.00
30.00
36.00
42.00
48.00
54.00
60.00
66.00
TIME (MSEC)
PART 572-B HYBRID II THORAX CALIBRATION 22 FT/SEC
STERNUM DISPLACEMENT
C-63
91011?


CSTXD FILTER = BLPF 300/ 949/ -40 MIN, MAX = 0.00 1.63 1.40 12.00
PENXF FILTER = BLPF 300/ 949/ -40 MIN, MAX = -12.90 45.75 2044.80 9.75
PENXF FORCE [LB]
-40.00 0.00 40.00 80.00 120.00 160.00 200.00 240.00 280.00 [X10]
-.20 -.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00
CSTXD DISPLACEMENT [IN]
PART 572-B HYBRID II THORAX CALIBRATION 22 FT/SEC
CHEST DISPLACEMENT VS PENDULUM FORCE

TRANSPORTATION RESEARCH CENTER OF OHIO

ABDOMINAL COMPRESSION TEST

PART 572 08-Nov-90

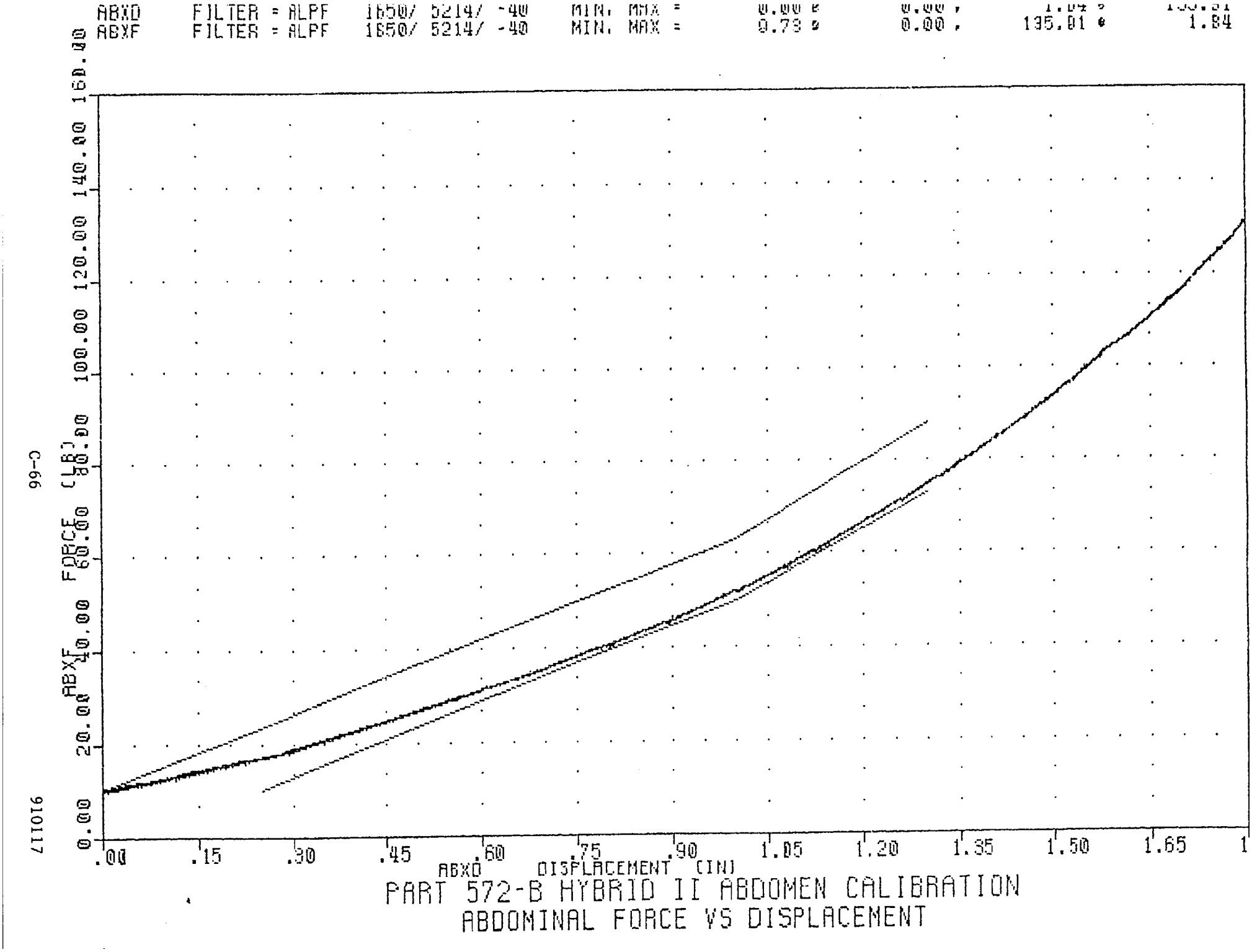
TEMPERATURE 74 F
NHTSA AB71301

RELATIVE HUMIDITY 33 %
572B SN 713 ABDOM COMPR CAL 01

TEST CORRIDORS		
DISPLACEMENT	FORCE	TEST RESULTS
0.00 IN	10.00 LBS	10.00 LBS
0.50 IN	23.00 - 36.00 LBS	26.65 LBS
0.75 IN	36.00 - 50.00 LBS	37.88 LBS
1.00 IN	50.00 - 63.00 LBS	51.65 LBS
1.30 IN	73.00 - 88.00 LBS	74.79 LBS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet


ABXD FILTER = ALPF 1650/ 5214/ -40 MIN, MAX = 0.00 @ 0.00 , 135.81 @ 1.84
ABXF FILTER = ALPF 1650/ 5214/ -40 MIN, MAX = 0.79 @ 0.00 , 135.81 @ 1.84
ABXF FORCE (LB)
0.00
20.00
40.00
60.00
80.00
100.00
120.00
140.00
160.00
.00
.15
.30
.45
.60
.75
.90
1.05
1.20
1.35
1.50
1.65
ABXD DISPLACEMENT (IN)
PART 572-B HYBRID II ABDOMEN CALIBRATION
ABDOMINAL FORCE VS DISPLACEMENT

TRANSPORTATION RESEARCH CENTER OF OHIO

LUMBAR FLEXION TEST

PART 572 08-NOV-90

TEMPERATURE 74 F RELATIVE HUMIDITY 33 %
NHTSA LF71301 572B SN713 LUMBAR FLEX CAL01

DEFLECTION	SPECIFICATION	TEST RESULTS
0 DEG	0 LB	0.00 LB
20 DEG	22.00 - 34.00 LB	26.00 LB
30 DEG	34.00 - 46.00 LB	35.00 LB
40 DEG	46.00 - 58.00 LB	50.00 LB
NET RETURN ANGLE	< 12 DEG	0.60 DEG

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

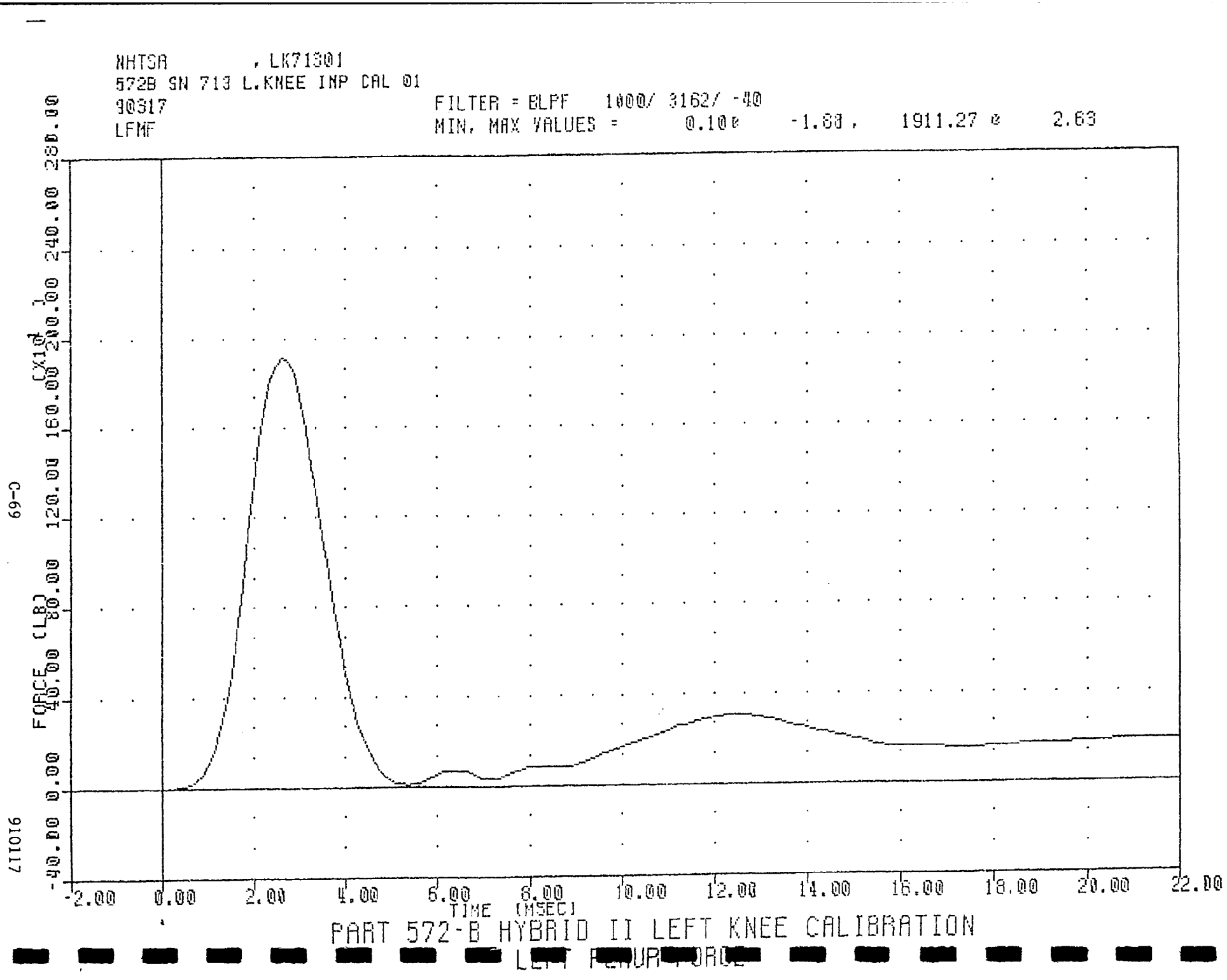
PART 572 13-Nov-90

TEMPERATURE 73 F RELATIVE HUMIDITY 32 %
LEFT KNEE
NHTSA LK71301 572B SN 713 L.KNEE IMP CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	6.94 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LB	1911.27 LB
DURATION ABOVE 1000 LB	>=1.7 MSEC	1.79 MSEC

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton


NHTSA , LK71301
572B SN 713 L.KNEE INP CAL 01
90317
LFMF
FILTER = BLPF 1000/ 3162/ -40
MIN, MAX VALUES = 0.10 @ -1.68 , 1911.27 @ 2.63
FORCE (LB) (X10^1)
280.00
240.00
200.00
160.00
120.00
80.00
40.00
0.00
-40.00
-2.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
18.00
20.00
22.00
TIME (MSEC)
PART 572-B HYBRID II LEFT KNEE CALIBRATION
C-69
91011

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

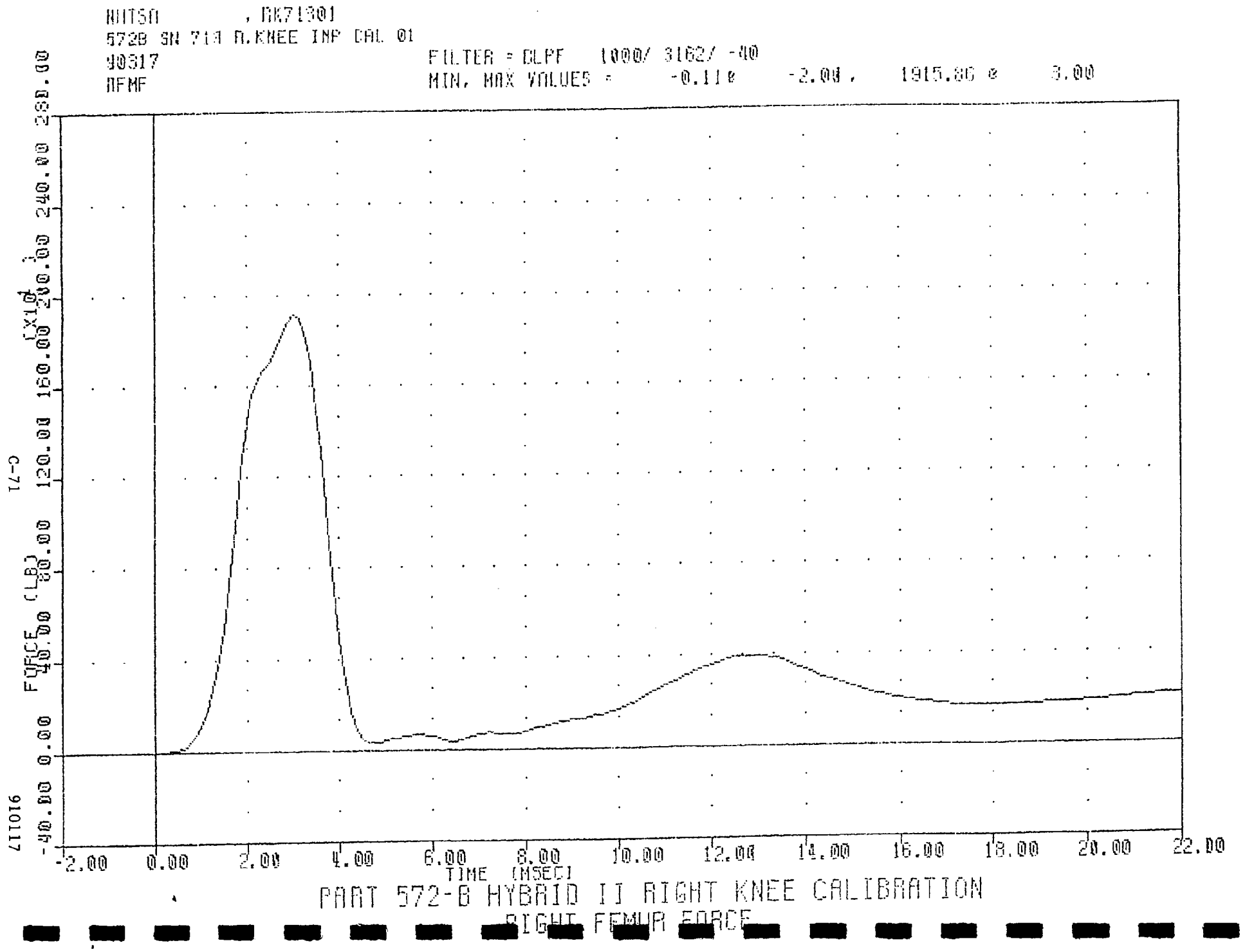
PART 572 13-Nov-90

TEMPERATURE 73 F RELATIVE HUMIDITY 32 %
RIGHT KNEE
NHTSA RK71301 572B SN 713 R.KNEE IMP CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	6.96 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LB	1915.86 LB
DURATION ABOVE 1000 LB	>=1.7 MSEC	1.98 MSEC

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet



PART 572-B HYBRID II RIGHT KNEE CALIBRATION

RIGHT FEMUR FORCE

APPENDIX D

MISCELLANEOUS TEST INFORMATION

DUMMY INSTRUMENT CALIBRATIONS

DRIVER DUMMY #826

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE LAST	DUE
HEAD X-AXIS ACCEL.	CY31H	7264	ENDEVCO	11/05/90	05/05/91
Y-AXIS ACCEL.	CC11H	7264	ENDEVCO	11/14/90	05/14/91
Z-AXIS ACCEL.	CL95H	7264	ENDEVCO	11/14/90	05/14/91
CHEST X-AXIS ACCEL.	DB74H	7264	ENDEVCO	11/05/90	05/05/91
Y-AXIS ACCEL.	DW12J	7264	ENDEVCO	11/05/90	05/05/91
Z-AXIS ACCEL.	CH67H	7264	ENDEVCO	11/05/90	05/05/91
LEFT FEMUR FORCE LOAD CELL	292	2430	GSE	11/08/90	05/08/91
RIGHT FEMUR FORCE LOAD CELL	880	2430	GSE	11/08/90	05/08/91
LAP BELT FORCE LOAD CELL	236	3419	LEBOW	01/11/91	07/11/91
SHOULDER BELT FORCE LOAD CELL	130	3419	LEBOW	11/28/90	05/28/91
SHOULDER BELT SPOOL-OUT POTENTIOMETER	A12899	PT-101-40A	CELESCO	01/16/91	07/16/91
SHOULDER BELT STRETCH POTENTIOMETER	2087	2051414101	BOURNES	01/16/91	07/16/91

DUMMY INSTRUMENT CALIBRATIONS

PASSENGER DUMMY #713

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE LAST	DUE
HEAD X-AXIS ACCEL.	CA57H	7264	ENDEVCO	11/07/90	05/07/91
Y-AXIS ACCEL.	CT22H	7264	ENDEVCO	11/07/90	05/07/91
Z-AXIS ACCEL.	CY32H	7264	ENDEVCO	11/05/90	05/05/91
CHEST X-AXIS ACCEL.	CR78H	7264	ENDEVCO	11/07/90	05/07/91
Y-AXIS ACCEL.	CP34H	7264	ENDEVCO	11/05/90	05/05/91
Z-AXIS ACCEL.	CM46H	7264	ENDEVCO	11/05/90	05/05/91
LEFT FEMUR FORCE LOAD CELL	889	2430	GSE	11/08/90	05/08/91
RIGHT FEMUR FORCE LOAD CELL	901	2430	GSE	11/08/90	05/08/91
LAP BELT FORCE LOAD CELL	571	3419	LEBOW	01/11/91	07/11/91
SHOULDER BELT FORCE LOAD CELL	606	3419	LEBOW	11/28/90	05/28/91
SHOULDER BELT SPOOL-OUT POTENTIOMETER	0586135	PT-101-40A	CELESCO	01/16/91	07/16/91
SHOULDER BELT STRETCH POTENTIOMETER	5089	2051414101	BOURNES	01/16/91	07/16/91

VEHICLE AND CALIBRATION LABORATORY INSTRUMENT CALIBRATIONS

VEHICLE ACCELEROMETERS

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE LAST	CALIBRATION DATE DUE
LEFT SEAT REAR CROSSMEMBER X-AXIS	CW37H	7264	ENDEVCO	12/21/90	06/21/91
RIGHT REAR SEAT CROSSMEMBER X-AXIS	CH13H	7264	ENDEVCO	10/12/90	04/12/91
ENGINE TOP X-AXIS	CK39H	7264	ENDEVCO	10/23/90	04/23/91
ENGINE BOTTOM X-AXIS	BY03J	7264	ENDEVCO	12/11/90	06/11/91
RIGHT BRAKE CALIPER X-AXIS	CJ04H	7264	ENDEVCO	08/23/90	02/23/91
LEFT BRAKE CALIPER X-AXIS	CG16H	7264	ENDEVCO	10/19/90	04/19/91
INSTRUMENT PANEL CENTER X-AXIS	CY23H	7264	ENDEVCO	10/24/90	04/24/91
REAR SEAT CROSSMEMBER CENTER Z-AXIS	CK09H	7264	ENDEVCO	12/21/90	06/21/91
VEHICLE REAR CENTER Z-AXIS	CR66H	7264	ENDEVCO	11/13/90	05/13/91

CALIBRATION LABORATORY INSTRUMENTS

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE LAST	CALIBRATION DATE DUE
NECK BENDING PENDULUM ACCEL.	CC59	7232	ENDEVCO	10/09/90	04/09/91
NECK BENDING ROTARY POTENTIOMETER	NA	35435-1-102	BOURNES	MFR. SPECIFICATION	
NECK BENDING LINEAR POTENTIOMETER	NA	5184-2051846003	BOURNES	10/10/90	04/10/91
FEMUR/CHEST/THORAX PENDULUM ACCEL.	CC64	7232	ENDEVCO	10/16/90	04/16/91
LUMBAR FLEXION FORCE GAUGE	NA	DPPH-50	CHATILLON	05/03/89	REPAIRED
LUMBAR FLEXION ROTATION GAUGE	CP17-0601-1	7020	HUMPHREY	MFR. SPECIFICATION	
ABDOMEN COMPRESSION DISPL. GAUGE	4075-172	80294-2051941504	BOURNES	10/01/90	04/01/91
ABDOMEN COMPRESSION FORCE GAUGE	1261	3167	LEBOW	10/17/90	04/17/91

SIGN CONVENTION

ACCELEROMETERS:

+X: FORWARD

+Y: LEFTWARD

+Z: UPWARD

POTENTIOMETERS:

+CHEST DISPLACEMENT: OUTWARD

+SEAT BELT DISPLACEMENT: OUTWARD

+SEAT BELT EXTENSION: ENLONGATION

LOAD CELLS:

+FEMUR FORCE: TENSION

+SEAT BELT FORCE: TENSION

+BARRIER FORCE: TENSION

NECK LOAD CELLS:

+X FORCE: HEAD FORWARD

+Y FORCE: HEAD RIGHTWARD

+Z FORCE: HEAD UPWARD (TENSION ON NECK)

+X MOMENT: RIGHT EAR TO RIGHT SHOULDER

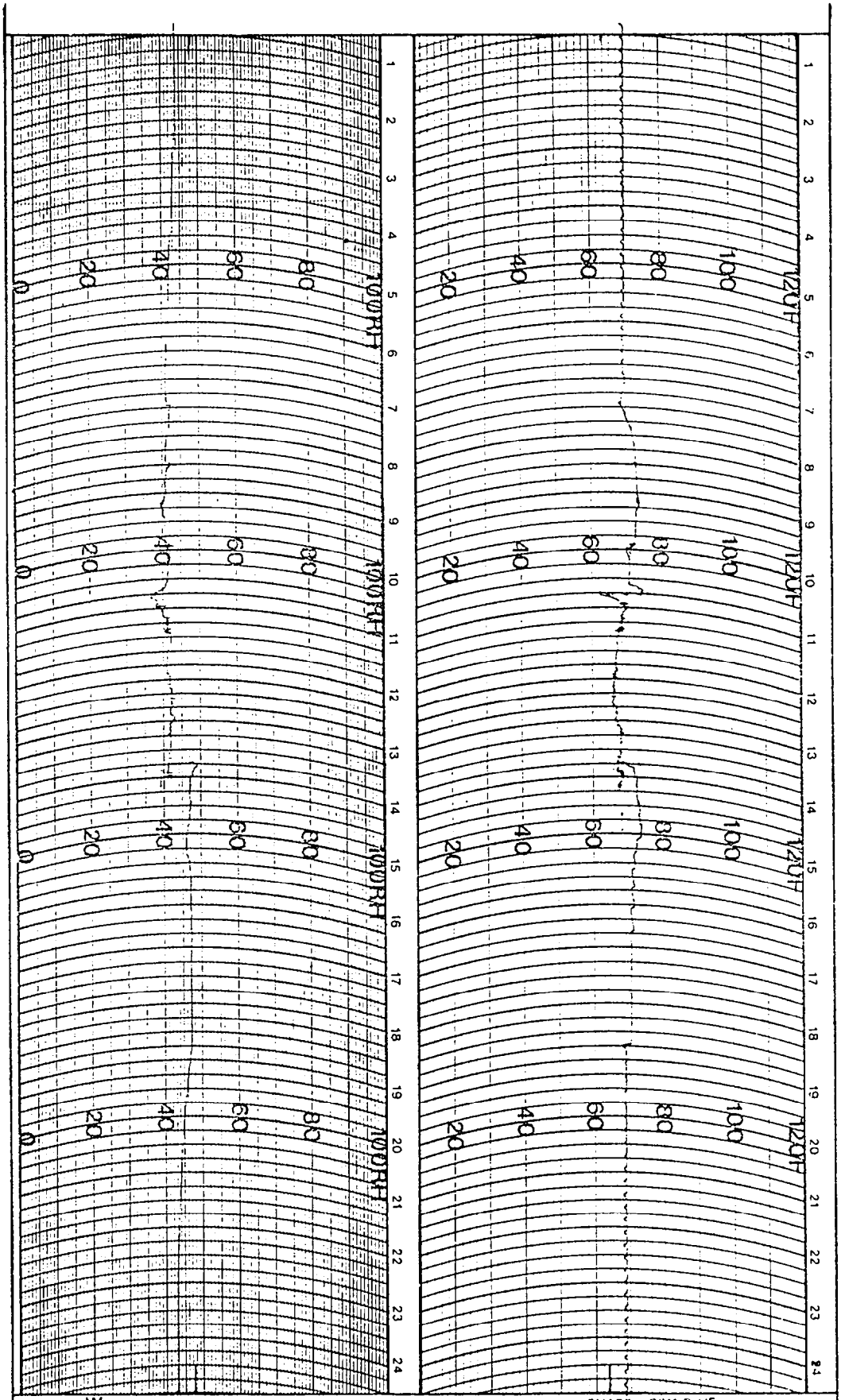
+Y MOMENT: HEAD ROTATING FORWARD

+Z MOMENT: HEAD ROTATING LEFTWARD

FREQUENCY RESPONSE CLASSES

SAE J211 OCT88

TYPICAL TEST MEASUREMENTS	CHANNEL CLASS
Vehicle Structural Accelerations for use in:	
Total vehicle comparison	60
Collision simulation input	60
Component analysis	600
Integration for velocity or displacement	180
Barrier Face Forces	60
Belt Restraint System Loads	60
Anthropomorphic Test Device	
Head accelerations (linear and angular)	1000
Neck	
Forces	1000
Moments	600
Thorax	
Spine accelerations	180
Rib accelerations	1000
Sternum accelerations	1000
Deflections	180
Lumbar	
Forces	1000
Moments	1000
Pelvis	
Accelerations	1000
Forces	1000
Moments	1000
Femur/Knee/Tibia/Ankle	
Forces	600
Moments	600
Displacements	180
Sled Accelerations	60
Steering Column Loads	600
Headform Accelerations	1000



WEATHER MEASURE
PO BOX 41257
SACRAMENTO, CA. 95841
PHONE (916) 481-7565

HYGROTHERMOGRAPH
1 DAY

CHART # C311 D HF
PART # 699123

STATION Gilroy, Visitors DATE ON 1/16/21 DATE OFF 1/17/21

910117

APPENDIX E

RESTRAINT SYSTEM INSTRUCTIONS FROM OWNER'S MANUAL

Pregnant Women Restraint

ND06G-B3

WARNING

Mitsubishi Motor Sales of America, Inc. recommends that pregnant women use the available seat belts. This will reduce the likelihood of injury to both the woman and the unborn child. The lap belt should be worn across the thighs and as snug against the hips as possible, but not across the waist.

Maintenance and Inspection of Seat Belts

ND06H-Cc

The webbing used in belts may be cleaned with a hydrocarbon dry cleaner or with soap or detergent in water.
Do not attempt to bleach or re-dye belts. The resulting color may rub off and webbing strength could be affected.
Regularly check lap belt buckles and release mechanisms for positive action. Check that the anchor mounting bolts are tight. If the seat belt webbing shows obvious cuts, protruding broken fibers causing a local increase in webbing thickness, or severe fading which indicates weakening by exposure to sunlight, the seat belt should be replaced.

The lap belt portion of the driver's seat has on it a sleeve inside which the seat belt webbing is folded back over itself in a loop so as to absorb the energy of a shock by pulling loose and releasing slack. In the event that the loop inside the sleeve has come loose, replace the seat belt.

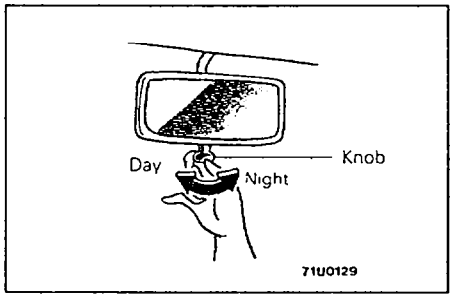
WARNING

All seat belt assemblies including retractors and attaching hardware should be inspected by an authorized dealer after any collision. We recommend that seat belt assemblies in use during a collision be replaced unless the collision was minor and the belts show no damage and continue to operate properly.

Rearview Mirrors

ND07A-B3

Adjust the rearview mirrors after making seat adjustments so that the proper view can be obtained.
Adjusting the rearview mirrors while driving can be dangerous. Be sure to adjust the mirrors before driving.



Inside Day/Night Type Mirror

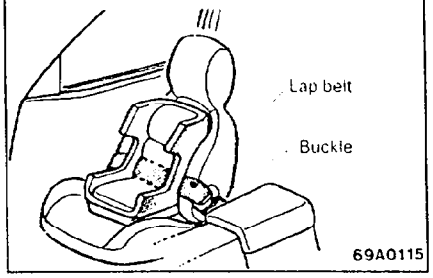
Adjust the inside mirror to maximize the view through the rear window.
Make this adjustment while the day/night knob is in the daytime position.
To reduce glare from other vehicle's headlights, switch the lever to the night position.

Convert the retractor function from

ELR
(emergency locking retractor)

to

ALR
(automatic locking retractor)



2. Pull the lap belt to it's fully extended position. Hold the belt taut (extended), then pass the lap belt through the infant carrier and insert the latch plate into the buckle. When the belt is released, it will be in the proper ALR position. When the infant carrier is removed and the belt released to its retracted position, it will automatically revent back to ELR.

WARNING

(1) **Be absolutely sure to make the conversion of the retractor from the ELR function to the ALR function. By doing so, the infant carrier is always tightly secured to the front passenger seat by the automatic lock. If the conversion to ALR is not made, the infant carrier or child seat will move forward in the event of sudden braking or an accident.**

(2) **Follow the infant carrier manufacturer's installation instructions for attaching the infant carrier to the seat belt.**

(3) **Be sure the lap belt is not twisted.**

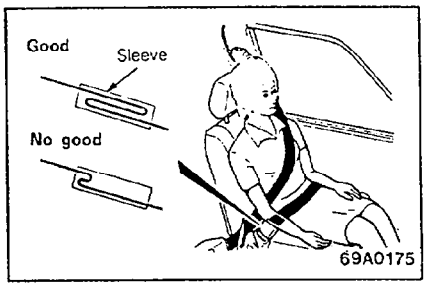
Children who have outgrown child restraint

Children who have outgrown child restraint system should be seated in the rear seat and wear combination lap shoulder belt.

If the shoulder belt crosses the face or neck, place the child closer to the center of car or use the lap belt at the center of the rear seat. The lap belt should be snug and positioned low on the abdomen so that it is below the top of the hip-bone. Otherwise, the belt could intrude into the child's abdomen during an accident and cause personal injury.

WARNING

A child should never be left unattended in your car.



anchor bracket.

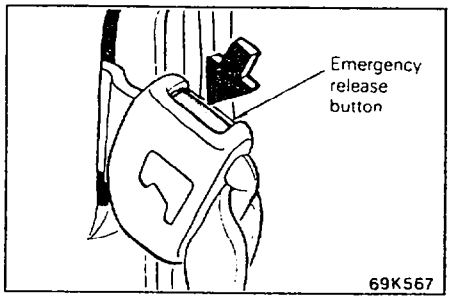
NOTE
(1) The bolt provided with the child restraint system may not be a metric type. You can damage the anchor nuts on your car if you force bolts with different thread into the anchor nuts.
(2) Anchorage hardware (anchor bracket, metric bolt and spacer) and installation instructions are available from authorized dealers.

Hook the top strap to the anchor bracket and tighten the top strap.

WARNING
After installation, shake the child seat back and forth, and side to side to see that it is positively secured.
If the child restraint system is not restrained securely, it may cause injury to the child in case of car accident and sudden stops.

Installing an infant carrier to the Front Passenger's Seat – Cars Equipped With Automatic shoulder belts

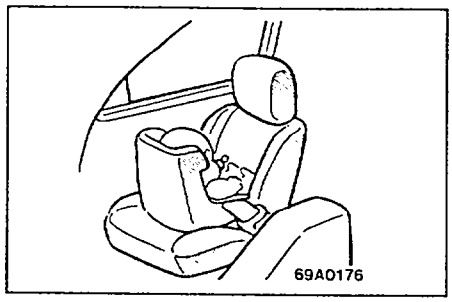
Accident statistics indicate that children are safer when properly restrained in the rear seat of a car rather than in the front seat. For this reason, Mitsubishi Motor Sales of America, Inc. recommends the child be restrained in the rear seat. Mitsubishi Motor Sales of America, Inc. also recommends that an adult be seated adjacent to an infant who is in an infant carrier. Therefore, if the driver is the only adult in the car, the infant may be placed in the front seat and properly restrained.



Install the infant carrier after detaching the automatic shoulder belt:

Push the emergency release button to detach the shoulder belt, and allow it to retract. This belt is not used with child restraint systems.

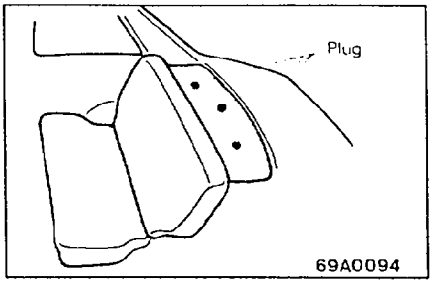
WARNING
Do not use the automatic shoulder belt when installing an infant carrier.



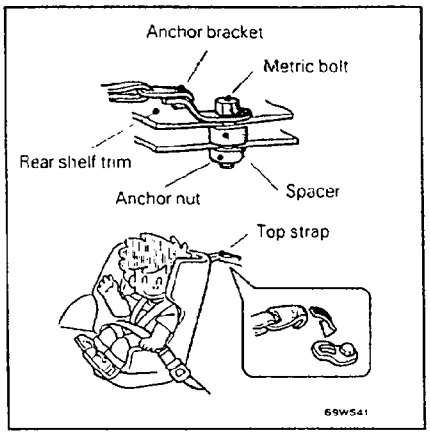
Use the lap belt as described below.
Installation:
1. Slide the seat all the way to the rear position and place the infant carrier onto the seat.

   WARNING
   For safety, an infant carrier should be face backward.

WARNING
To help avoid personal injury during a collision or sudden maneuver, always thread both the lap and shoulder belt through the locking clip when securing a child restraint to a UNIBELT.
If the locking clip is not used or not installed properly, the child restraint may move or tip over and may result in severe injury to your child in the event of an accident.



Anchors for the child restraint system
If you choose to use a top-strap-equipped child restraint in the rear seat, ask your dealer how to attach it.
Your car is provided with anchors to secure the top strap of a child restraint system.
The anchor nuts are welded to the back of the sheet metal of the rear shelf and concealed by the plugs on the rear shelf trim.



Installing a Child Restraint System to the Rear Center Seat

Installation:

1. Fasten the center lap belt to secure the child restraint system.

   WARNING
   For safety, an infant carrier should face backward; a child seat should face forward.

2. Pull the excess webbing through the belt's adjustment feature.
3. Push and pull the child restraint in all directions to be sure it is secure.

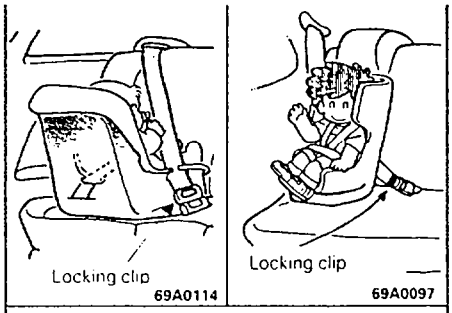
If your child restraint system requires the use of a top strap, refer to "Anchors for the child restraint system" on page 28.

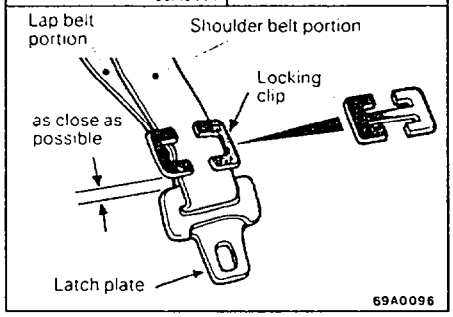
Installing a Child Restraint System to a UNIBELT (Combination lap/shoulder belt)

USE A LOCKING CLIP WHEN INSTALLING A CHILD RESTRAINT SYSTEM TO A UNIBELT.

If a locking clip has not been supplied with your child restraint system, it may be purchased from your authorized dealer.

To use the locking clip, install the child restraint system according to the instruction that comes with the child restraint system/locking clip.





Installation:

1. Place the child restraint system on the seating position as shown in the illustration.

   WARNING
   For safety, an infant carrier should face backward; a child seat should face forward.

2. Fasten the seat belt around or through the child restraint system according to the restraint manufacturer's instructions.
3. Buckle the seat belt and keep all slack out of the lap portion of the belt.
4. Grasp the lap and shoulder portions of the seat belt as close to the latch plate as possible and unbuckle the seat belt.
5. Thread both the lap and shoulder belt portions through the locking clip.
6. Buckle the seat belt again and check that the seat belt is snug against the child restraint system.

When your child restraint is not installed, remove the locking clip to permit normal use of the combination lap shoulder belt.

Keep the locking clip in the glove box to help prevent its loss.

Child Restraint

ND06FHWc

When transporting children in your car, some type of child restraint system should be used according to the size of the child. This is required by law in most states.

WARNING

(1) Accident statistics indicates that children are safer when properly restrained in the rear seat rather than in the front seat. Accordingly, Mitsubishi Motor Sales of America, Inc. recommends the child be restrained in the rear seat.

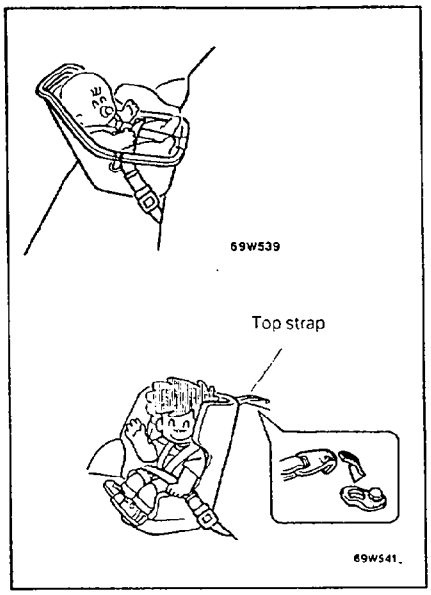
(2) Holding a child in your arms is no substitute for a restraint system. Failure to use a proper restraint system can result in severe or fatal injury to your child.

Infants and Small Children

For infants unable to sit up alone and small enough for infants seats, an infant carrier should be used. For small children, a child seat should be used. Both types of seats are available from your authorized dealer.

The child restraint system should be appropriate for your child's weight and height and properly fit the car seat. For a higher degree of safety, THE CHILD RESTRAINT SYSTEM SHOULD BE INSTALLED IN THE REAR SEAT.

When installing a child restraint system, refer to the instructions provided by the manufacturer of the restraint system and follow the directions listed under the following illustrations. Failure to do so can result in severe or fatal injury to your child. When not in use, keep your child or infant seat secured with the seat belt or remove it from the car in order to prevent injury to your child.

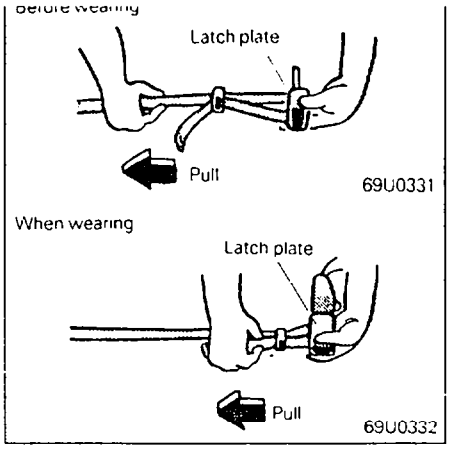


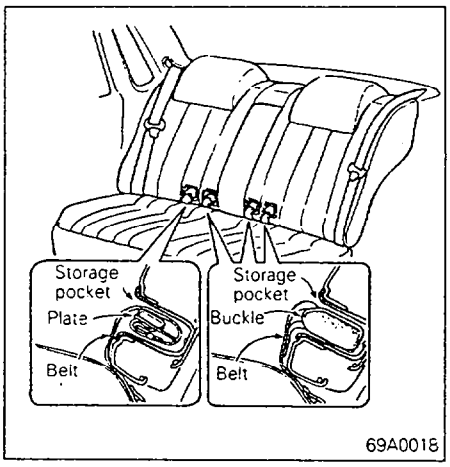
use; therefore, you can set it once for safe, comfortable snugness.

WARNING
Be sure the lap belt portion is fitted snugly and as low as possible around the hips, not around the waist.
Failure to do so may increase the chance of injury in the event of a collision.

5. Check the belt slackness. The belt will retain the small amount of slack necessary for comfort when you return to your normal seating position. If the belt is still too tight, pull out 6" or 8" of webbing, let it return to your chest, and repeat the above motion.
6. The shoulder belt will allow unrestricted movement under normal conditions. The belt will lock in the event of an accident.
   To release the belt, push the button on the buckle. To return the belt to its stowed position, pull the shoulder belt down slightly and release immediately.

WARNING
Be sure to lock all doors before driving. Locking the doors and using the seat belts provided will minimize the risk of injury or ejection in an accident.



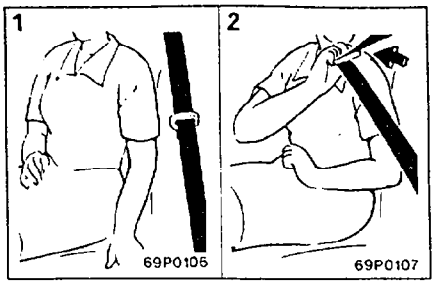


CENTER BELT
The center belt should be adjusted by holding the belt and latch plate at right angles to each other, and then pulling the belt as illustrated above to a snug fit around the occupant.
NEVER USE THE SAME LAP BELT ON MORE THAN ONE PERSON AT A TIME.

NOTE
The buckle and plate of the center lap belt are marked with "CENTER". Be sure to check the marking before wearing the center lap belt.
The outboard restraint system buckle and center restraint system tongue are not compatible and will not engage with one another.

Rear Seat Belt Pocket (if so equipped) NDC6-A

When the seat belt is not in use, store it in the storage pocket.
For compact storage of the plate side seat belt, coil it around the plate.

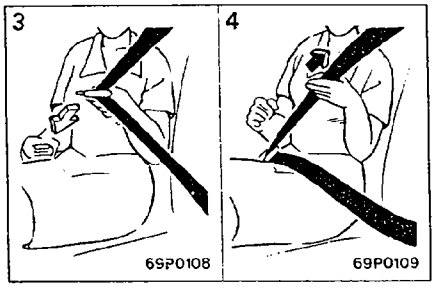


Unibelt Instructions ND06D-Ad

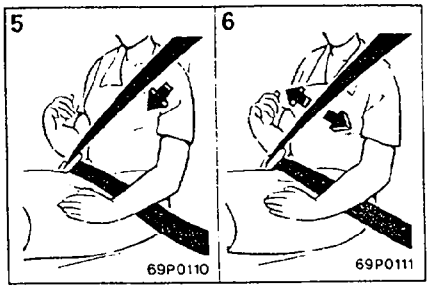
1. Get in the car and sit in the normal correct posture.

   WARNING
   To minimize risk of personal injury in event of a collision or sudden stop both the driver and passenger seatbacks should always be in a nearly upright position while the car is in motion. The protection provided by the seat belts may be reduced significantly when the seatback is reclined. There is greater risk that the passenger will slide under the belt resulting in serious injury when the seatback is reclined.

2. Grasp the movable latch plate and slide it up the webbing as far as necessary so that it will be easy to pull across your body.
   After a couple of tries, this will become an automatic one-handed operation.

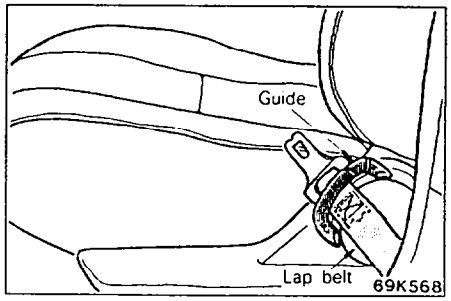


3. Pull the webbing, and move the movable latch plate toward the buckle. This system will not lock up if you stop or hesitate, so relax and continue to "buckle-up".
   Push the latch plate into the buckle until a "click" is heard.
4. Pull up on the shoulder belt to insure that there is no slack in the lap belt.



1. Remove the cap on the center pillar.

2. Fit the wrench (included with the car's tools) into the trim hole; turn the wrench counterclockwise so as to move the sliding anchor to the installation position.



NOTE

(1) If the movement of the sliding anchor of the shoulder belt is not smooth (if, for example, dirt or other foreign material increases the sliding resistance of the sliding anchor, etc.), or if it stops before its movement is complete, request an authorized dealer to check the belt; if the problem cannot be resolved, the shoulder belt must be replaced as a complete assembly.

(2) If the outside air temperature is low, the time required for the operation of the sliding anchor will become longer; this is not a malfunction, if the temperature increases, this time will become shorter.

(3) In order to maintain smooth operation of the lap belt, be sure that the latch plate is at the stowed position. If the belt does not fully retract, pull it out and check for kinks or twists. Then make sure that it remains untwisted as it retracts.

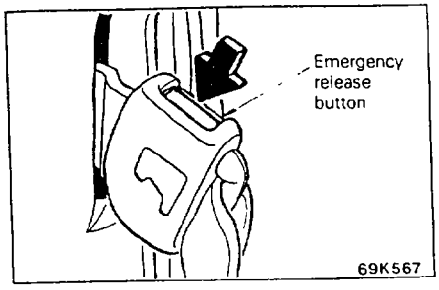
(4) If the shoulder belt and/or lap belt become scarred or otherwise damaged, replace the belts as a complete assembly.

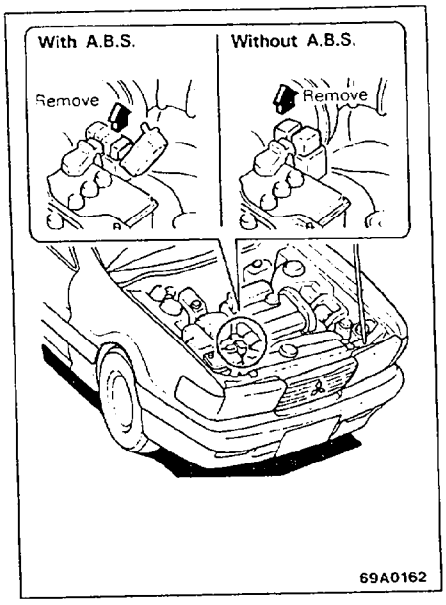
Seat Unibelt Restraint System

ND066-a

Both sides of the rear seat are equipped with a UNIBELT system which uses a single belt and an emergency locking retractor.

This system is designed to provide comfort and safety by permitting full extension and automatic retraction of the belts during normal car operation. A sensing device inside the belt retractor is designed to lock the retractor in the event of an abrupt change in car motion.





Emergency Release Button

If the shoulder belt sliding anchor is locked in an emergency, push the emergency release button to release the shoulder belt. Use this button only when the shoulder belt prevents you from leaving the car in an accident.

CAUTION

Do not press the emergency release button except in an emergency in order to maintain the normal shoulder belt restraint.

MANUAL INSTALLATION OF AUTOMATIC SHOULDER BELTS

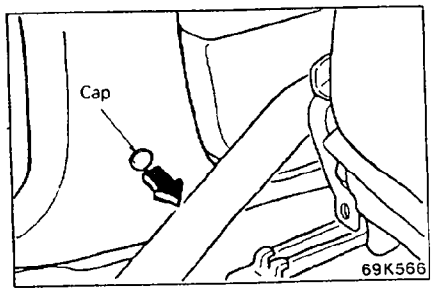
If the automatic shoulder belt sliding anchor stops before its movement is complete and does not move farther, follow the steps below to turn the motor manually, move the sliding anchor to the installation position, and then attach the shoulder belt to the buckle.

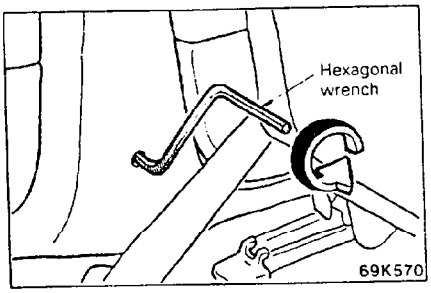
Before driving, be sure your belt is properly fastened.

When the motor is turned manually, remove the fusible link in the relay box.

CAUTION

If the fusible is not removed, an injury may result when the motor starts.





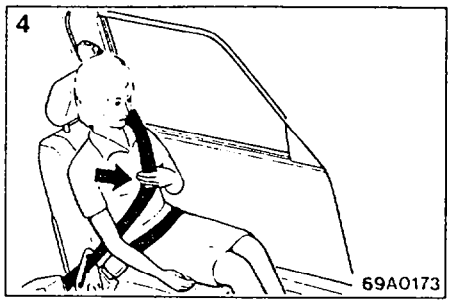
The protection provided by the seat belts may be reduced significantly when the seatback is reclined. There is greater risk that the passenger will slide under the belt resulting in serious injury when the seatback is reclined.

2. Grasp the lap belt latch plate and pull the webbing, then push the latch into the buckle until a "click" is heard.

WARNING
(1) Always position the lap portion of belt as low on the hip bones as possible.
(2) The seat belts must not be twisted when worn.

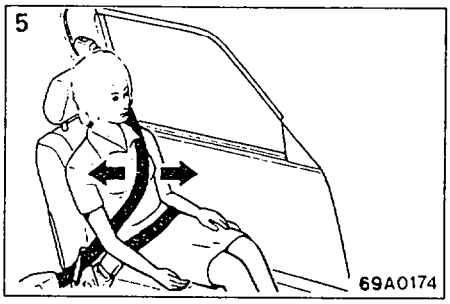
3. Turn the ignition key to the "ON" position; the shoulder belt will move automatically to the set position (fasten).

CAUTION
Be careful that the driver's or a passenger's finger are not caught and pinched by the shoulder belt sliding anchor while it is moving. Be careful that the shoulder and lap belts do not cross. If they do, the lap belt could injure the abdomen in the event of sudden braking or a collision.



4. Pull the shoulder belt and lap belt slightly to be sure that there is no excess slack or tightness in the belts.
The belts will retain a small amount of looseness necessary for comfort during driving. If a belt is too tight, pull it slightly and let it return. The belts will not tighten during normal use; therefore you can set them once for safe, comfortable snugness.

WARNING
Be sure the lap belt portion is fitted snugly and as low as possible around the hips, not around the waist.
Failure to do so may increase the chance of injury in the event of a collision.



5. The belts will allow unrestricted movement under normal conditions. The belts will lock in the event of an accident.

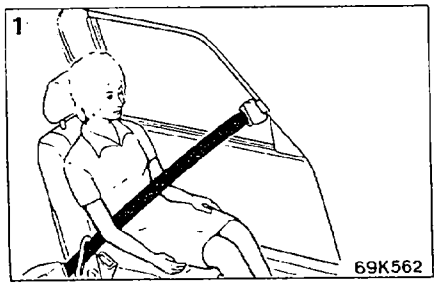
WARNING
Be sure to lock all doors before driving way. Locking the doors, and using the seat belts provided, will minimize the risk of injury or ejection in an accident.

(3) SHOULDER BELT RELEASE REMINDER
When the door is opened and the sliding anchor begins to move to release the shoulder belt, the buzzer sounds for about 1 second.

<Warning Function>

(1) SHOULDER BELT WARNING
If the release button for the belt at the driver's seat side is accidentally pressed, the buzzer will sound for about 6 seconds and the warning light will also blink on and off continuously for about 1 minute; for the belt at the passenger seat side, the warning light will illuminate for about 1 minute.
If this happens, again buckle the shoulder belt. The buzzer will stop when the belt buckled, and the warning light will stop.

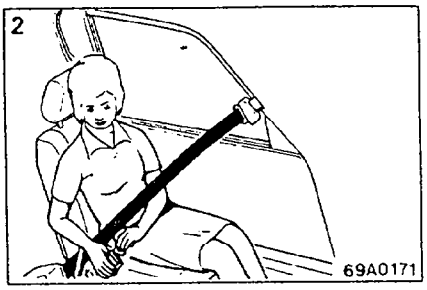
(2) LAP BELT WARNING
(Driver's side)
If the driver does not fasten his/her lap belt, the buzzer will sound for about 6 seconds intermittently.
The buzzer will immediately stop sounding, however, when the lap belt is fastened.

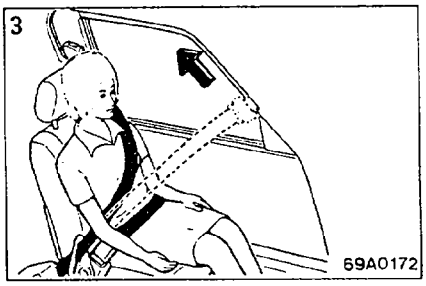


Front Seat Belt Instructions

1. Get in the car, close the door and adjust the seat position.

WARNING
To minimize risk of personal injury in event of a collision or sudden stop both the driver and passenger seatbacks should always be in a nearly upright position while the car is in motion.



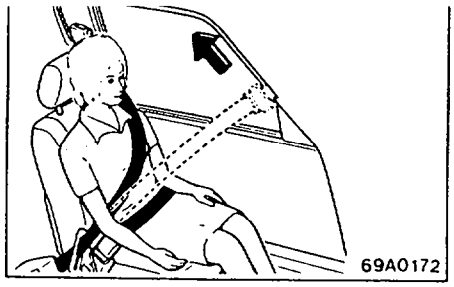


and Manual Lap Belt Restraint System

ND06B-Gb

The front seat belt restraint system consists of the automatic shoulder belt and the manual lap belt. This system is designed to provide comfort and safety by automatic fastening and unfastening of the shoulder belt as well as automatic retraction of the belts during normal car operation.
Sensing devices inside the belt retractors (for shoulder and lap belts) are designed to lock the retractors in the event of an abrupt change in car motion.

CAUTION
For full restraint, the manual lap belt and the automatic shoulder belt must be securely fastened.
Adjust the front seat position so that the front passenger's shoe soles may touch the toeboard when he or she sits up straight and well back in the seat.
Failure to follow these instructions could increase the chance and/or the severity of injury in accident.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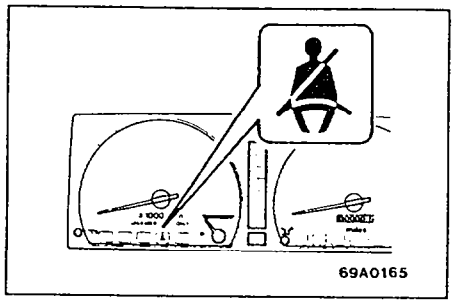
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Automatic Shoulder Belt

ND06D-Jh

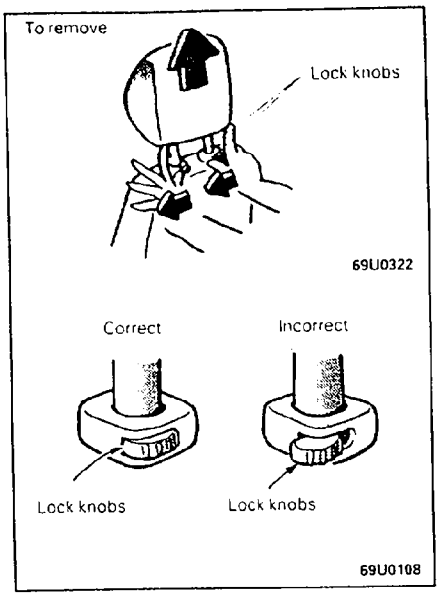
The shoulder belt moves automatically to the set position (fasten) when a door is closed and the ignition key is turned to the "ON" position. When the door is opened, the shoulder belt automatically moves to the set-off (unfastened) position. For the driver's seat, the shoulder belt automatically moves to the set-off position when the ignition key is removed from the ignition switch.

Seat Belt Warning Light and Buzzer
The seat belt warning light in the instrument cluster will illuminate or blink on and off and/or the buzzer will sound in the following instances.

<Reminder Function>

(1) LAP BELT REMINDER
When the ignition key is turned to the "ON" position, the reminder light will illuminate for about 6 seconds.

(2) SHOULDER BELT INSTALLATION REMINDER
While the shoulder belt moves automatically to the set position (fasten), when the door is closed and the ignition key is turned to the "ON" position, the shoulder belt reminder light will blink on and off during that time.



Removal of the Head Restraints

ND05B-Ad

To remove the head restraints, press the lock knobs in the direction indicated by the arrows and pull the head restraints up.
To remount the head restraints, first confirm that they are facing the correct direction, and then insert them into the seatback and push down until they lock. Confirm that the lock knobs are correct as shown in the illustration, and also pull the head restraints up to confirm that they do not come out of the seatback.

WARNING
Driving with the head restraints removed is dangerous. Always have them mounted when operating the car. Failure to having them properly mounted may increase the chance of injury in the event of a collision.

Seat Belts

ND06A-Ab

Seat belts are installed in your car for the protection of the driver and passengers. Use the seat belts. In the event of an accident, injury to the driver and passengers may be reduced if seat belts are properly used.
The following pages contain the recommended procedure for fastening, adjusting, and wearing of belts for comfort and safety.

WARNING
(1) Never use a seat belt for more than one occupant.
(2) Never wear the shoulder portion of the seat belt under the arm or other out of position location.
(3) Do not make any modifications that could change the effectiveness of the seat belts.
(4) Never attempt to repair the seat belt assemblies on your own. All repairs should be made by an authorized dealer.

NOTE
Legislation in your state may require seat belt usage.