V1700

REPORT NO. TRC-91-N08

NEW CAR ASSESSMENT PROGRAM (NCAP)

FRONTAL BARRIER IMPACT TEST

MITSUBISHI MOTORS CORPORATION

1992 MITSUBISHI MIGHTY MAX PICKUP

NHTSA NO. MN5601

TRC TEST NO. 920311

PREPARED BY:

TRANSPORTATION RESEARCH CENTER INC.

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APRIL 3, 1992

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION

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16. Abstract

A 35 mph frontal load cell barrier impact test was conducted on a 1992 Mitsubishi Mighty Max Pickup, NHTSA No. MN5601, at the Transportation Research Center Inc. on March 11, 1992. This test was conducted to obtain new car assessment and research data indicant of FMVSS No. 208 performance. The barrier impact velocity was 35.2 mph. The vehicle's maximum crush was 19.5 inches. The ambient temperature was 69° F.

The driver's head injury criteria (HIC) was 980. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 48.0 g. The driver's left and right femur maximum axial forces were 760 pounds and 546 pounds, respectively.

The passenger's head injury criteria (HIC) was 777. The passenger's chest maximum resultant accceleration with three (3) milliseconds minimum duration was 52.7 g. The passenger's left and right femur maximum axial forces were 517 pounds and 225 pounds, respectively.

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METRIC CONVERSION FACTORS

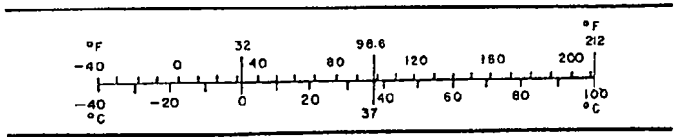
Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.

Approximate Conversions from Metric Measures

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



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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 Inc. (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 1992 Mitsubishi Mighty Max pickup, NHTSA No. MN5601, 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 572B 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 Procedure.

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- 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 occupant, camera, and vehicle 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 March 11, 1992.

The test vehicle, a 1992 Mitsubishi Mighty Max pickup, NHTSA No. MN5601, was equipped with a 2.4 liter inline engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 3347 pounds. The vehicle's impact speed was 35.2 mph. The vehicle sustained 19.5 inches of static crush during the impact.

The driver's head injury criteria (HIC) was 980. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 48.0 g. The driver's left and right femur maximum axial forces were 760 pounds and 546 pounds, respectively.

The passenger's HIC was 777. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 52.7 g. The passenger's left and right femur maximum axial forces were 517 pounds and 225 pounds, respectively.

DATA ACQUISITION EXPLANATIONS

The engine top X-axis accelerometer, ENGXG1, data was lost from 10 milliseconds on due to the accelerometer's cable being cut by the vehicle's crush upon impact.

The center rear seat crossmember accelerometer was oriented in the longitudinal direction instead of the normal vertical direction.

TABLE 1 CRASH TEST SUMMARY

NHTSA NO.: MN5601 TEST TYPE: Frontal Load Cell Barrier

TEST DATE: 03/11/92 TEST TIME: 1524 AMBIENT TEMP. (°F): 69

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1992/Mitsubishi/Mighty Max/Pickup

VEHICLE TEST WEIGHT (LBS): 3347

IMPACT ANGLE (DEG)*: 0

IMPACT VELOCITY (MPH)**: PRIMARY = 35.2 SECONDARY = 35.2

MAXIMUM STATIC CRUSH (IN): 19.5

AVERAGE REBOUND (IN): 10.9

DUMMIES:	Driver #826	Passenger #713
TYPE:	Part 572 B	Part 572 B
LOCATION:	Left front	Right front
RESTRAINT:	3-point Unibelt	3-point Unibelt

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/Mighty Max VIN: JA7FL24W2NP011914

BODY STYLE: Pickup MODEL YEAR: 1992

NHTSA NO.: MN5601 COLOR: Silver

ENGINE DATA: TYPE: inline CYLINDERS: 4 DISPLACEMENT: 2.4 liter

TRANSMISSION DATA: 3 SPEED, ___MANUAL, X AUTOMATIC, ___FWD, X RWD, ___4WD

DATE VEHICLE RECEIVED: 03/03/92 ODOMETER READING: 204.0

DEALER'S NAME AND ADDRESS: Mentor Mitsubishi
Mentor Imports, Inc.
9090 Mentor Avenue
Mentor, OH 44060-6464

ACCESSORIES:

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

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: 10/91 VIN: JA7FL24W2NP011914

GVWR: 4165 LBS

GAWR: FRONT: 2000 LBS., REAR: 2540 LBS.

TABLE 2 TEST VEHICLE INFORMATION CONT'D

TIRES ON VEHICLE (MFR., LINE, SIZE): Toya 2 Radial Traction Tread/P195/75R14

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

SPARE TIRE (MFR., LINE, SIZE): Firestone LT 195/75T14

TYPE OF SEATS: FRONT: Bench
REAR: NA

TYPE OF FRONT SEAT BACKS: Non-adjustable

MAXIMUM WIDTH: 65.2 INCHES

WHEELBASE: 105.2 INCHES

LOCATION OF LABEL STATING TIRE DATA:

The label was located on the left B-pillar.

TIRE & CAPACITY DATA FROM VEHICLE'S LABEL:

RECOMMENDED TIRE SIZE: P195/75R14

RECOMMENDED COLD TIRE PRESSURE: FRONT: 26 PSI; REAR: 35 PSI

DESIGNATED SEATING CAPACITY: NA FRONT NA REAR NA TOTAL

VEHICLE CAPACITY WEIGHT: NA LBS.

TEST VEHICLE ATTITUDE (ALL MEASUREMENTS ARE IN INCHES):

DELIVERED ATTITUDE:	LF	29.0;	RF	29.3;	LR	31.4;	RR 31.6
PRE-TEST ATTITUDE:	LF	28.5;	RF	28.6;	LR	30.0;	RR 29.9
POST-TEST ATTITUDE:	LF	29.9;	RF	26.2;	LR	32.0;	RR 28.1

*The vehicle did not contain a label stating capacity data.

TABLE 2 TEST VEHICLE INFORMATION CONT'D

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

RIGHT FRONT	733 LBS.	RIGHT REAR	582 LBS.
LEFT FRONT	854 LBS.	LEFT REAR	562 LBS.
TOTAL FRONT WEIGHT	1587 LBS.	(58.1% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1144 LBS.	(41.9% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT	2731 LBS.		

CALCULATION OF TEST VEHICLE'S TARGET TEST WEIGHT:

RCLW = RATED CARGO AND LUGGAGE WEIGHT*

UDW = UNLOADED DELIVERED WEIGHT (2731 LBS)

VCW = VEHICLE CAPACITY WEIGHT (NA LBS) *

DSC = DESIGNATED SEATING CAPACITY (NA) *

RCLW*= VCW - 150 (DSC) = NA LBS

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

TARGET TEST WEIGHT = 2731 + 300* + 328

TARGET TEST WEIGHT = 3359 LBS

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 288 LBS. OF CARGO WEIGHT:

RIGHT FRONT	825 LBS.	RIGHT REAR	787 LBS.
LEFT FRONT	924 LBS.	LEFT REAR	811 LBS.
TOTAL FRONT WEIGHT	1749 LBS.	(52.3% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1598 LBS.	(47.7% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	3347 LBS.	(0.4% UNDER TARGET TEST WEIGHT)	

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

COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: Spare tire

CG = 50.2 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: 920311 NHTSA NO.: MN5601

TEST DATE: 03/11/92 TEST TIME: 1524

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

AMBIENT TEMPERATURE AT IMPACT AREA: 69° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 66° F

IMPACT VELOCITY: PRIMARY = 35.2 MPH SECONDARY = 35.2 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 175.2; C 177.0; R 175.2

POST-TEST: L 158.3; C 157.7; R 156.9

TOTAL CRUSH: L 16.9; C 19.3; R 18.3

AVERAGE CRUSH: 18.2

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

DISTANCE FROM TEST VEHICLE TO BARRIER: L 10.5; C 11.1; R 11.0; AVG. 10.9

TABLE 4 FUEL SYSTEM DATA

MAKE/MODEL: Mitsubishi/Mighty Max

NHTSA NO.: MN5601

FUEL SYSTEM CAPACITY: 13.7 GALLONS (FROM OWNER'S MANUAL)

USABLE CAPACITY: 13.7 GALLONS (FURNISHED BY COTR)

TEST VOLUME RANGE: 12.6 GALLONS TO 12.9 GALLONS (92-94% OF USABLE)

ACTUAL TEST VOLUME: 12.6 GALLONS (WITH ENTIRE FUEL SYSTEM FILLED)

TEST FLUID TYPE: STODDARD SOLVENT

SPECIFIC GRAVITY: 0.764

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

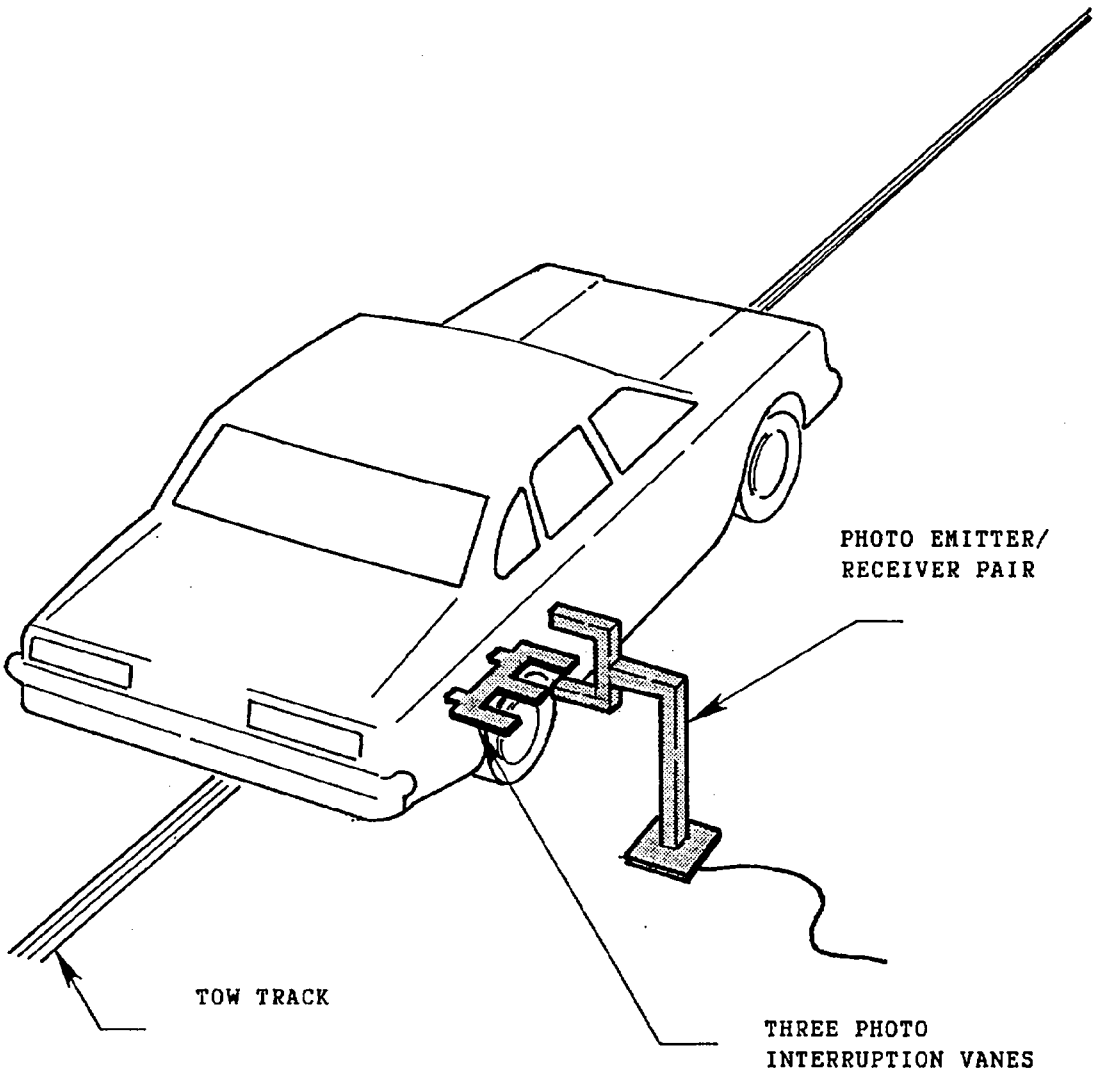
TEST FLUID COLOR: PURPLE

DETAILS OF FUEL SYSTEM: The fuel filler is on the left side. The fuel tank is in front of the rear axle. 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/Mighty Max/pickup

VEHICLE NHTSA NO.: MN5601 ; VIN: JA7FL24W2NP011914

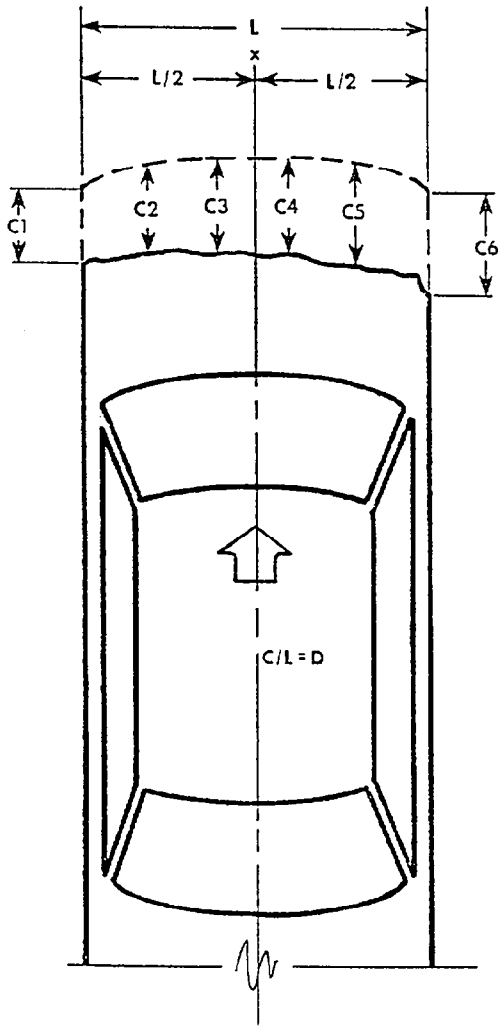
MODEL YEAR: 1992 ; BUILD DATE: 10/91 ; TEST DATE: 03/11/92

VEHICLE SIZE CATEGORY: Small pickup truck ; TEST WEIGHT: 3347 LBS.

VEHICLE WHEELBASE: 105.2 INCHES

MAXIMUM WIDTH: 65.2 INCHES

FRONT OVERHANG: 29.9 INCHES



COLLISION DEFORMATION
CLASSIFICATION (CDC) CODE: 12FDEW3

CRUSH DEPTH
MEASUREMENTS:

C1 = 16.9 INCHES

C2 = 18.2 INCHES

C3 = 19.1 INCHES

C4 = 19.5 INCHES

C5 = 19.3 INCHES

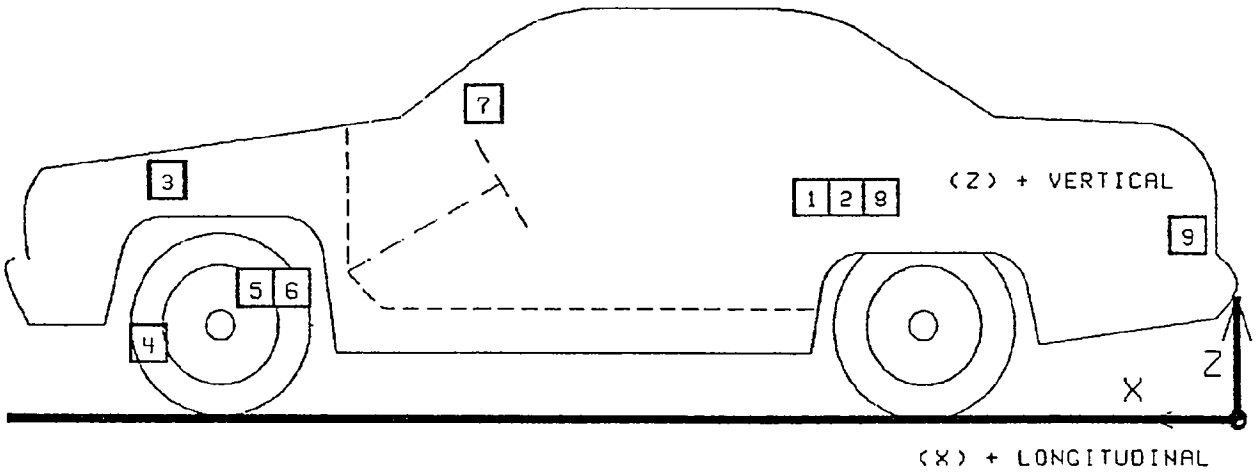
C6 = 18.3 INCHES

MIDPOINT OF DAMAGE: D = VEHICLE CENTERLINE (LONGITUDINAL)

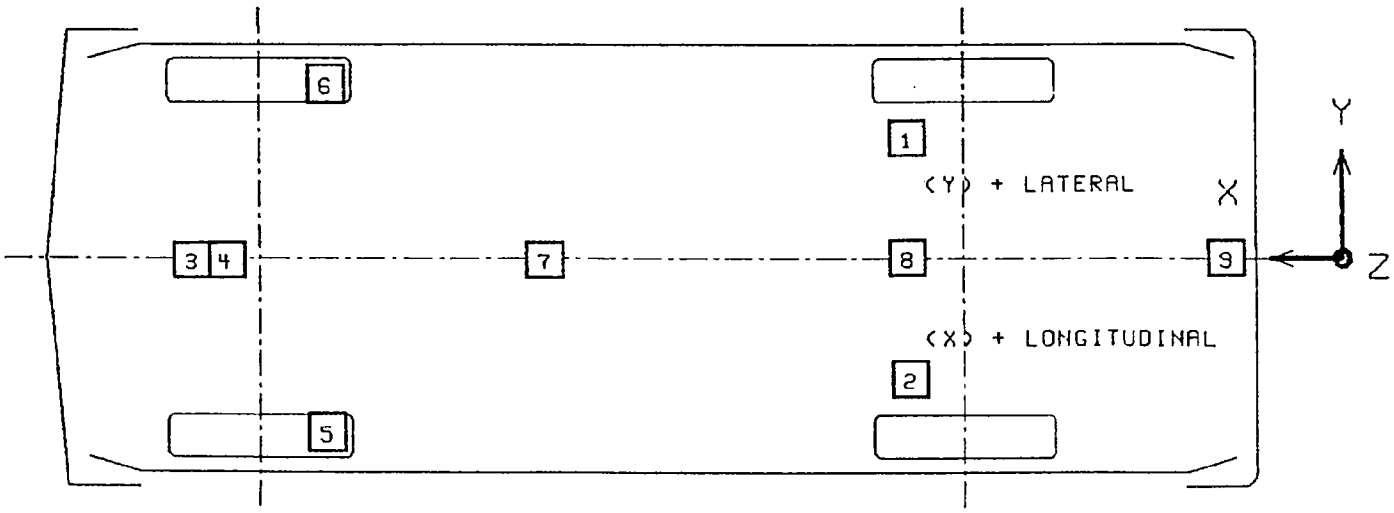
LENGTH OF DAMAGED
REGION: L = 57.0 INCHES

FIGURE 3

VEHICLE ACCELEROMETER PLACEMENT



SIDE VIEW



BOTTOM VIEW

TABLE 5

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 920311

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
1	LEFT REAR SEAT CROSSMEMBER LONGITUDINAL	91.1	21.0	14.8	3.1	93.4	72.0	14.9
2	RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL	91.1	-21.4	14.8	3.0	95.4	75.7	15.0
3	ENGINE TOP LONGITUDINAL	27.0	0.8	33.0	---	---γ	---	---γ
4	ENGINE BOTTOM LONGITUDINAL	32.2	0.0	12.6	67.9	39.6	150.1	31.5
5	RIGHT BRAKE CALIPER LONGITUDINAL	33.5	-22.4	14.0	18.6	50.8	82.9	15.6
6	LEFT BRAKE CALIPER LONGITUDINAL	33.4	22.4	14.1	17.9	50.0	76.1	14.1
7	INSTRUMENT PANEL CENTER LONGITUDINAL	51.5	0.0	41.6	7.5	93.3	51.5	24.5
8	REAR SEAT CROSSMEMBER CENTER LONGITUDINAL	92.6	0.0	17.5	84.1	14.9γ	4.2	21.9γ
9	VEHICLE REAR CENTER VERTICAL	167.5	0.0	24.0	59.2	12.9	32.5	20.5

* 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	Steering wheel hub	Chest & right thigh
CHEST	Steering wheel lower 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	NA	NA

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
FRONT	None	None
REAR	NA	NA

GLAZING DAMAGE:

None

OTHER NOTABLE IMPACT EFFECTS:

The right front tire was punctured on impact.

TABLE 7 FMVSS 208 DATA SUMMARY

VEH. YR./MAKE/MODEL/BODY STYLE: 1992/Mitsubishi/Mighty Max/Pickup

VEH. NHTSA NO.: MN5601 ; TEST DATE: 03/11/92

MAXIMUM ACCELERATIONS (G):	DRIVER DUMMY #826	PASSENGER DUMMY #713
HEAD X-AXIS	-88.2	-25.3
HEAD Y-AXIS	16.2	-14.6
HEAD Z-AXIS	-77.4	-60.9
HEAD RESULTANT	113.0	63.0
CHEST X-AXIS	-49.7	-53.2
CHEST Y-AXIS	37.4	-15.2
CHEST Z-AXIS	15.5	-14.0
CHEST RESULTANT*	48.0	52.7
CHEST RESULTANT TIME INTERVAL (SEC.)*	.003	.003
HEAD INJURY CRITERIA (HIC) VALUES:		
HIC**	980	777
HIC STARTING TIME (SEC.)	.066	.054
HIC ENDING TIME (SEC.)	.080	.090
AVG. HEAD RESULTANT ACCEL. DURING HIC TIME INTERVAL (G)	86.7	54.1
MAXIMUM CHEST DEFLECTIONS (IN):		
CHEST X-AXIS	NA	NA
MAXIMUM CHEST DEFLECTION TIME (SEC.)	NA	NA
MAXIMUM COMPRESSIVE FEMUR FORCES (LBS):		
LEFT FEMUR	760	517
RIGHT FEMUR	546	225
MAXIMUM SEAT BELT FORCES (LBS):		
LAP BELT	856	731
SHOULDER BELT	2000	2070

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.

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 chest then impacted the lower steering wheel rim followed by the dummy's head rotating downward impacting the steering wheel hub. The driver dummy was restrained by the three-point unibelt. The dummy then rebounded rearward into the seat back as the dummy's head rotated rearward into the head restraint. The driver dummy came to rest in the driver's seat restrained by the three-point unibelt.

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 upper torso rotated slightly downward as the dummy's head rotated downward contacting the dummy's chest and right thigh. The right front passenger dummy was restrained by the three-point unibelt and lap belt. The dummy then rebounded rearward and upward into the seat back with the dummy's head contacting the header. The right front passenger came to rest in the right front passenger's seat restrained by the three-point unibelt.

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.	120.2	120.2
SHOULDER BELT LENGTH AS MEASURED ON PART 572 DUMMY.	36.7	35.7
LAP BELT LENGTH AS MEASURED ON PART 572 DUMMY.	35.4	32.6
SHOULDER BELT SPOOL-OFF LENGTH:		
AS DETERMINED BY FILM ANALYSIS	NA *	NA *
AS DETERMINED MECHANICALLY	1.5	1.2
AS DETERMINED ELECTRONICALLY	2.6	3.7
BELT STRETCH LENGTH (IN/FT):		
AS MEASURED MECHANICALLY	0.1	0.0
AS MEASURED ELECTRONICALLY	0.0	0.4
RETRACTOR LOCK-UP TIME (MS):		
AS DETERMINED BY SHOULDER BELT SPOOL-OFF	NA *	54

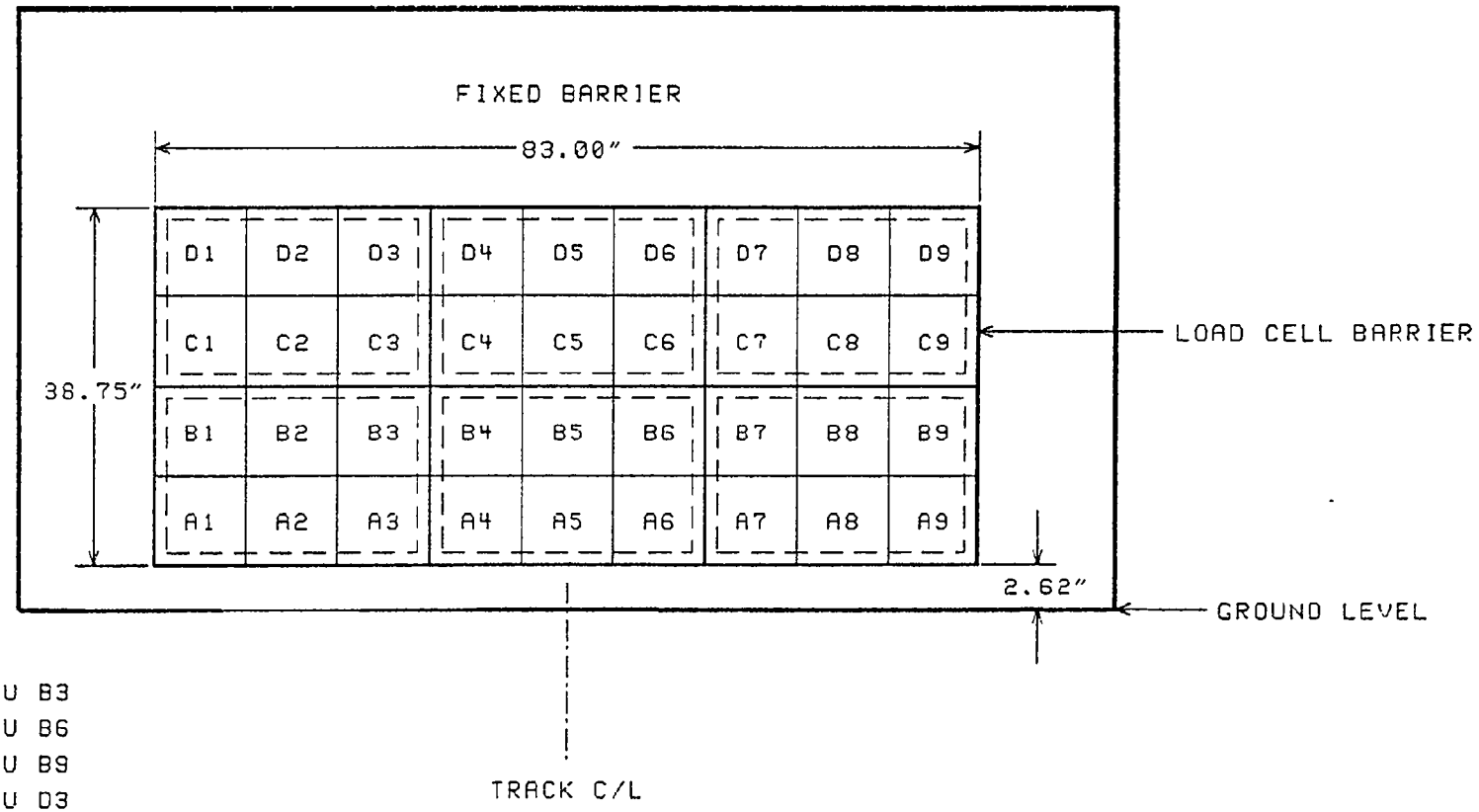
ALL MEASUREMENTS ARE IN INCHES UNLESS OTHERWISE NOTED.
*The vehicle's deformation obscurred the onboard camera views during portions of the impact event.

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 920311

LOCATION	POSITIVE DIRECTION LB	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION LB	NEGATIVE DIRECTION MSEC
TOTAL GROUP 1	544	207.6	29829	13.5
TOTAL GROUP 2	759	155.0	65870	32.1
TOTAL GROUP 3	180	155.0	32338	14.1
TOTAL GROUP 4	772	155.9	11766	13.6
TOTAL GROUP 5	1394	40.5	52845	31.9
TOTAL GROUP 6	653	154.1	11331	12.5
TOTAL LOAD CELL FORCE	400	154.9	157073	31.6

TENSION IS POSITIVE
COMPRESSION IS NEGATIVE

SECTION 3.0

OCCUPANT, CAMERA, & VEHICLE MEASUREMENTS

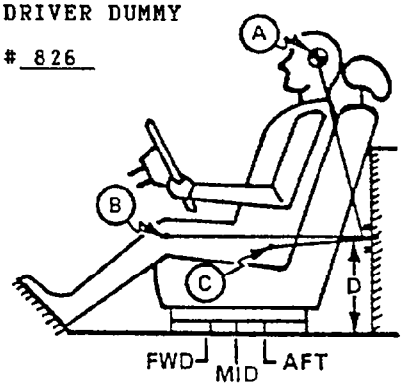
FIGURE 5 DUMMY AND SEAT POSITIONING DATA

TEST NO.: 920311 ; VEHICLE: 1992 Mitsubishi Mighty Max

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

DRIVER DUMMY

826

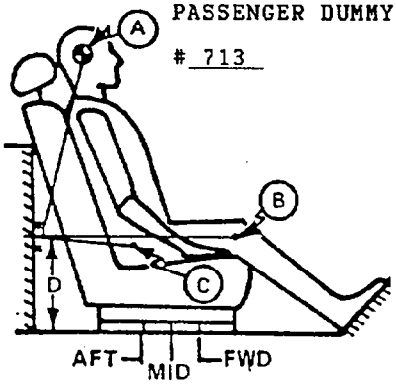


MEASUREMENT LOCATION

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

PASSENGER DUMMY

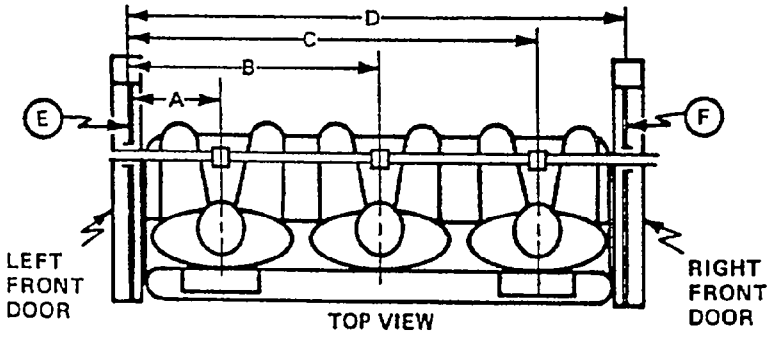
713



A =	22.1 IN.	2 DEGREES	A =	22.8 IN.	3 DEGREES
B =	23.0 IN.	85 DEGREES	B =	22.6 IN.	92 DEGREES
C =	8.6 IN.	103 DEGREES	C =	7.2 IN.	116 DEGREES
D =	13.7 IN.		D =	13.7 IN.	

SEAT TRACK REARWARD: 10 NOTCHES

SEAT TRACK REARWARD: 10 NOTCHES



A = LEFT DOOR TO DRIVER CENTERLINE	12.7	IN.
B = LEFT DOOR TO CENTER PASSENGER CENTERLINE	NA	IN.
C = LEFT DOOR TO RIGHT PASSENGER CENTERLINE	39.8	IN.
D = LEFT DOOR TO RIGHT DOOR	52.4	IN.
E,F = WINDOW GLASS HEIGHT (RIGHT AND LEFT MUST BE EQUAL)	13.4	IN.

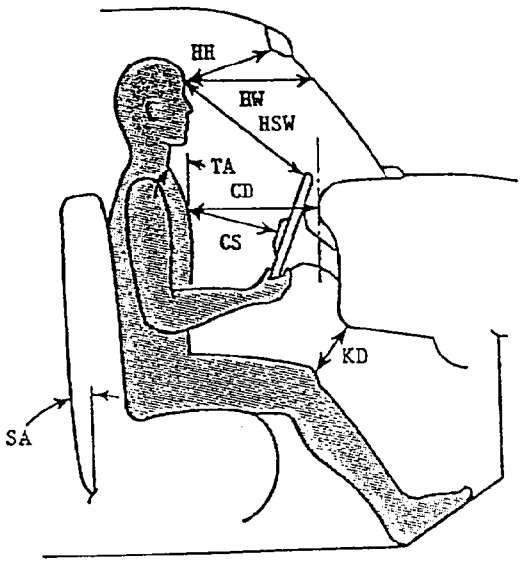
ALL ANGLES ARE RELATIVE TO VERTICAL PLANE THROUGH DOOR STRIKER.

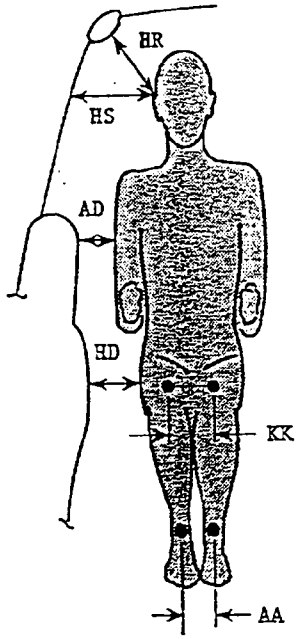
FIGURE 6 DUMMY IN-VEHICLE POSITIONING DATA

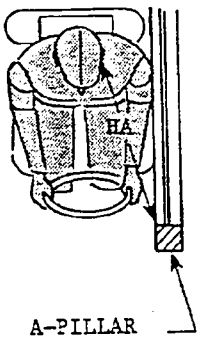
	DRIVER	PASSENGER
HH	17.6	17.5
HW	21.2	21.4
CD	23.8	22.2
CS	13.0	NA
KDL	5.1	5.5
KDR	5.8	6.2
TA	20°	20°
SA	24°	24°
HSW	19.6	NA

	DRIVER	PASSENGER
HR	7.4	7.1
HS	8.2	7.6
AD	4.9	5.2
HD	7.4	7.1
KK	10.1	8.0
AA	10.8	8.2
HA	24.5	23.0

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





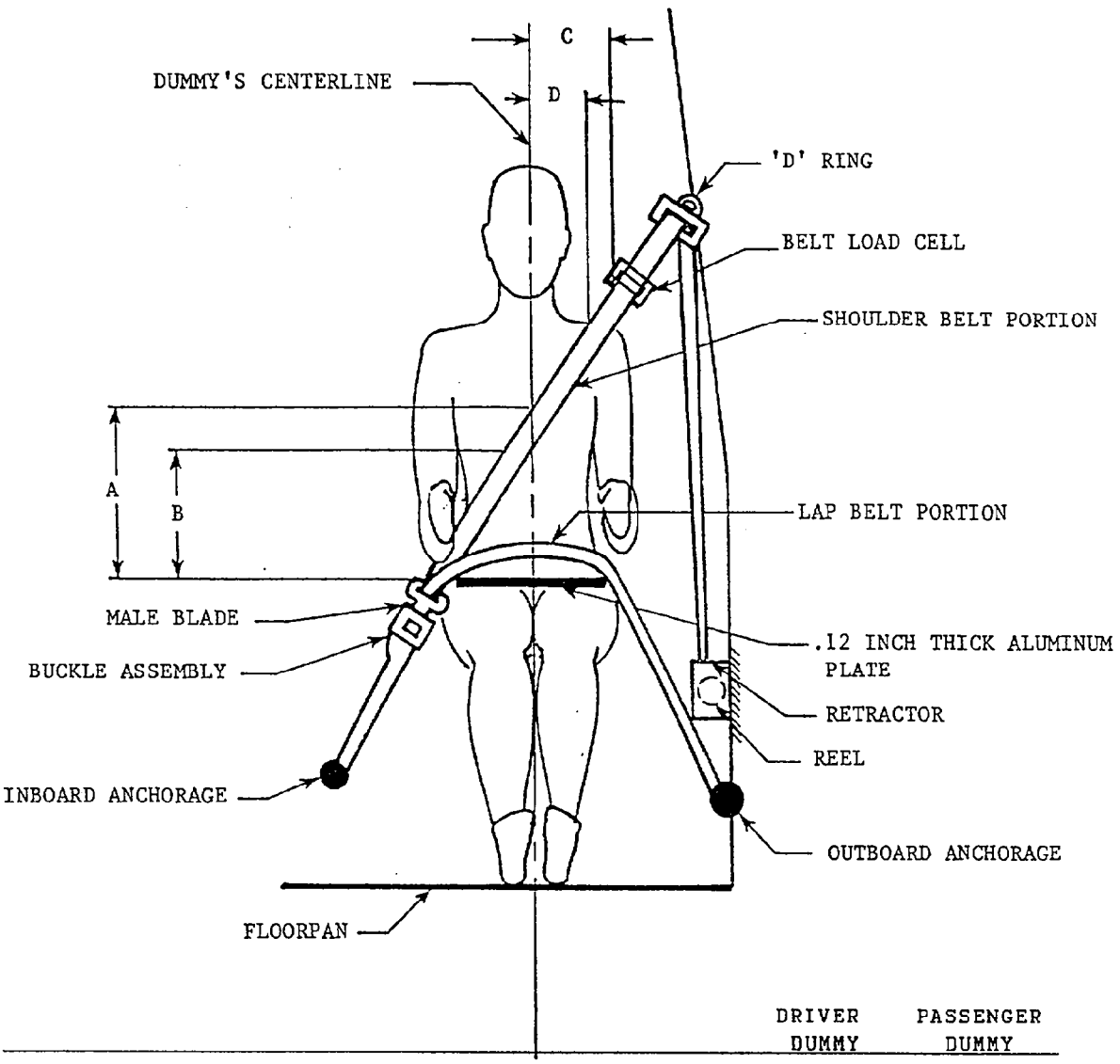


HH = HEAD TO WINDSHIELD HEADER
HW = HEAD TO WINDSHIELD
CD = CHEST TO DASH
CS = CHEST TO STEERING WHEEL
KD = KNEE TO DASH
TA = TORSO ANGLE
SA = SEAT BACK ANGLE
HSW= HEAD TO STEERING WHEEL

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.

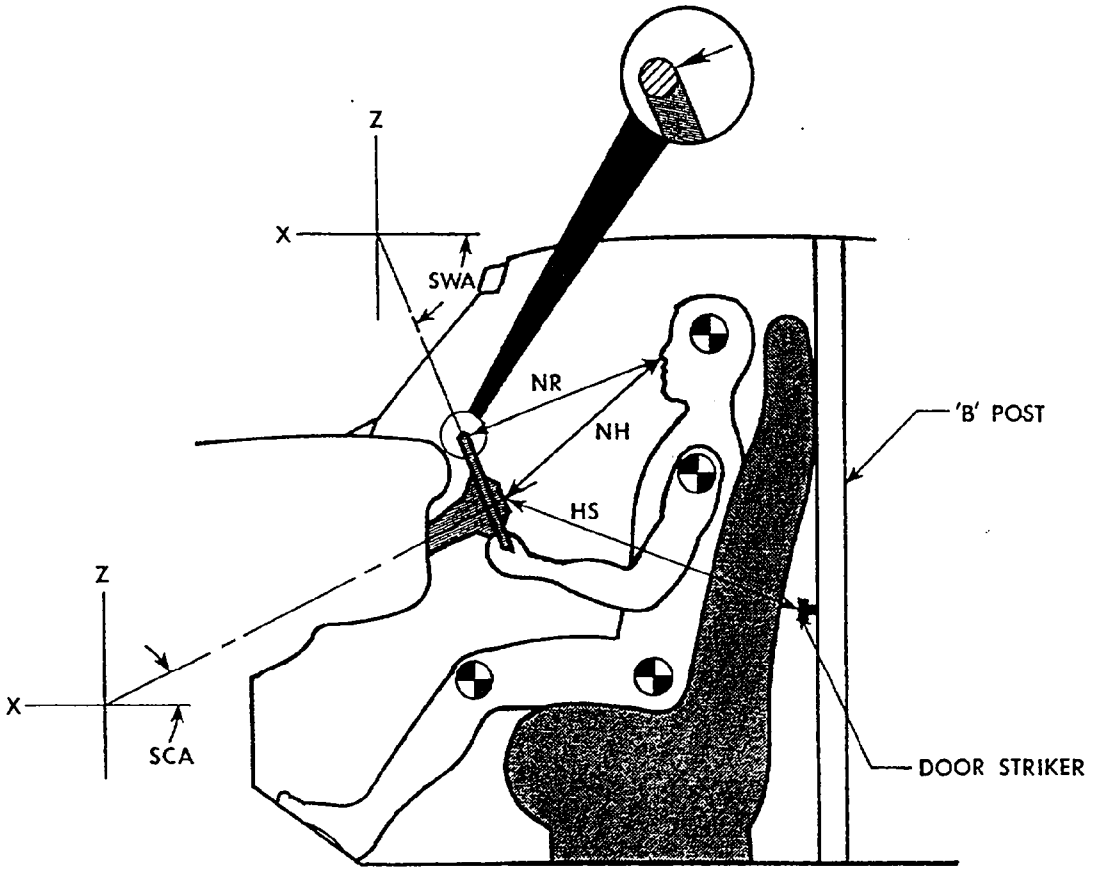
FIGURE 7 SEAT BELT POSITIONING DATA



	DRIVER DUMMY	PASSENGER DUMMY
A - TOP SURFACE OF ALUMINUM PLATE TO BELT UPPER EDGE	14.1	16.7
B - TOP SURFACE OF ALUMINUM PLATE TO BELT LOWER EDGE	11.0	13.3
C - DUMMY CENTERLINE TO OUTER EDGE OF BELT AT CHEST FLESH TOP	5.8	4.9
D - DUMMY CENTERLINE TO INNER EDGE OF BELT AT CHEST FLESH TOP	3.1	2.2
LAP BELT TENSION (LBS)	4	4
SHOULDER BELT TENSION (LBS)	4	3

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 placed in mid-position of the possible range of adjustment.

	MEASUREMENTS
NR - DISTANCE FROM TIP OF DUMMY'S NOSE TO TOP REAR SURFACE OF STEERING WHEEL RIM.	17.2
NH - DISTANCE FROM TIP OF DUMMY'S NOSE TO CENTER OF STEERING COLUMN HUB.	17.9
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	28°
SWA - ANGLE OF STEERING WHEEL RELATIVE TO THE HORIZONTAL X AXIS	62°

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

FIGURE 9

CAMERA POSITIONS

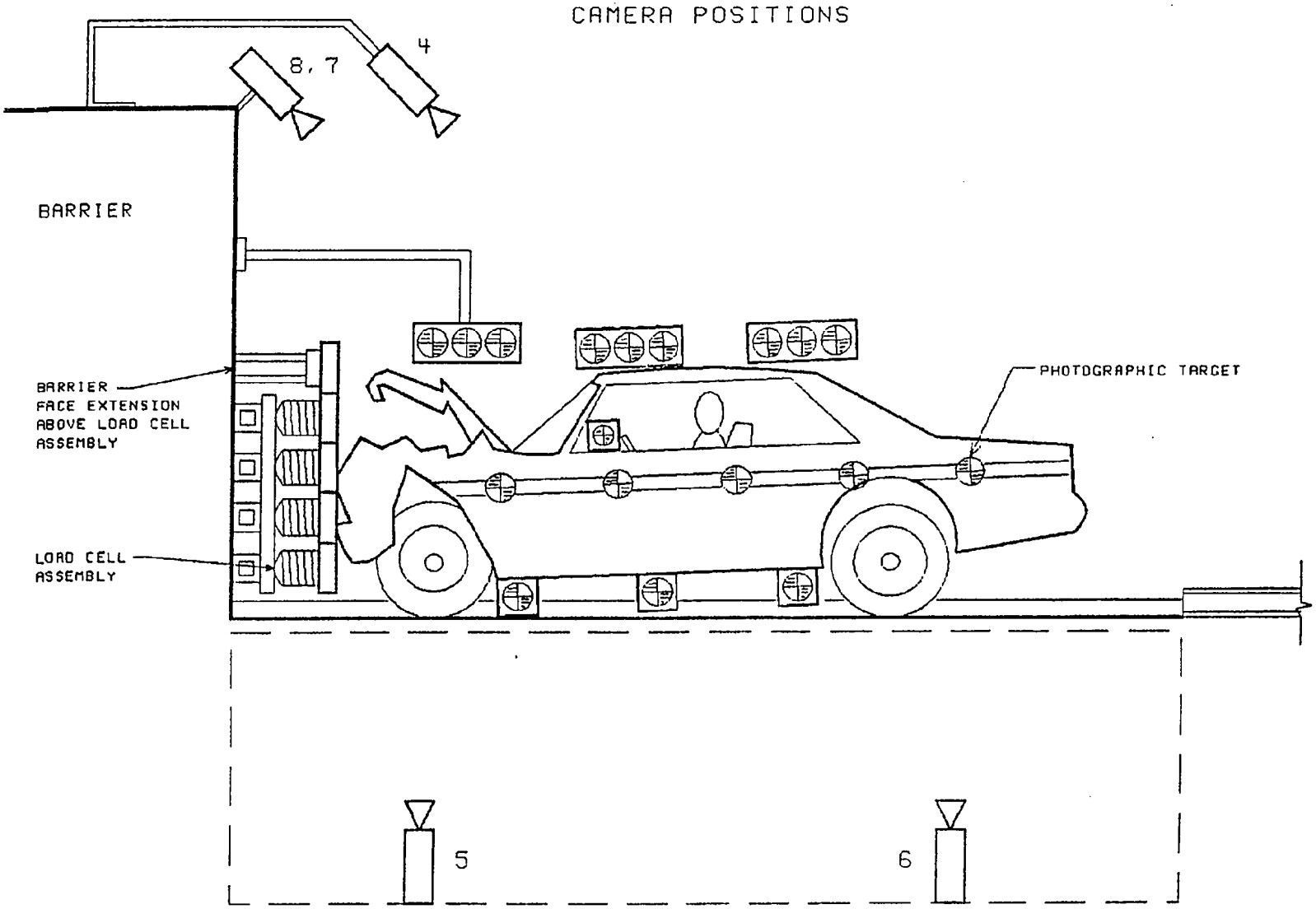


FIGURE 9

CAMERA POSITIONS, CONTINUED

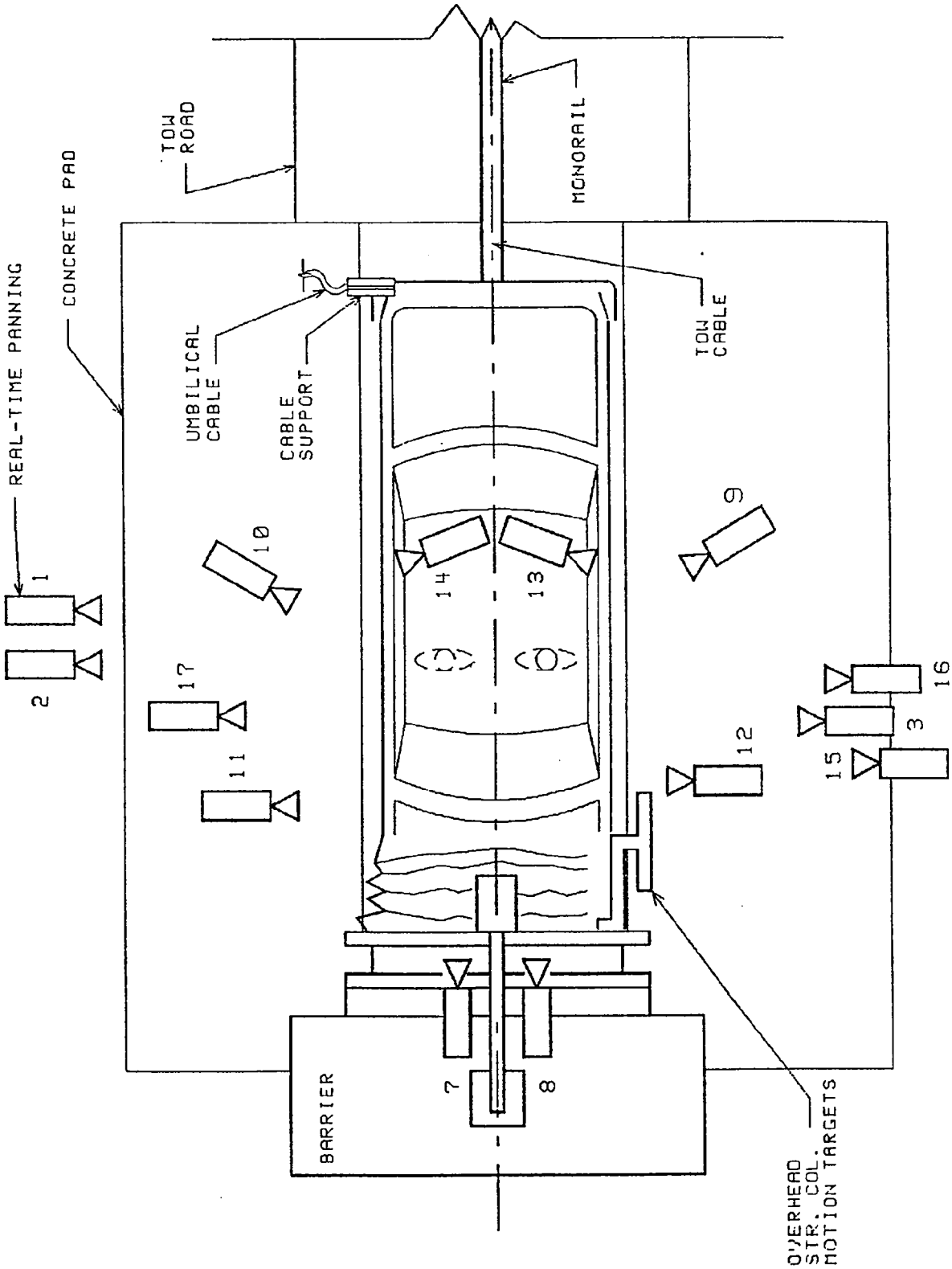


TABLE 10 MOTION PICTURE CAMERA LOCATIONS

TEST NO.: 920311 VEHICLE: 1992 Mitsubishi Mighty Max Pickup

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	Vehicle crush	-81.3	-266.4	37.1	-2	NA	13	500
3	Dummy kinematics	-41.5	295.0	44.0	-12	206.0	25	980
4	Windshield damage	-36.4	0.0	98.0	-40	NA	13	498
5	Crush & fluid spillage	-50.5	0.0	-92.4	90	NA	13	1000
6	Fluid spillage	-99.3	0.0	-99.0	90	NA	13	1000
7	Passenger kinematics	-4.5	-13.8	85.0	-40	NA	17	498
8	Driver kinematics	-6.8	14.5	85.0	-41	NA	17	498
9	Driver kinematics	-180.0	73.0	102.0	-27	84.0	25	500
10	Passenger kinematics	-184.0	-74.0	100.0	-26	84.0	25	500
11	Windshield intrusion	-38.1	-306.1	44.0	0	NA	50	500
12	Windshield intrusion	-53.0	309.4	42.3	0	NA	50	495
13	Driver seatbelt movement	NA	NA	NA	NA	NA	13	498
14	Passenger seatbelt movement	NA	NA	NA	NA	NA	13	502
15	Column movement	-144.0	286.0	103.0	-14	NA	25	500
16	Column movement	-144.0	286.0	75.1	-9	NA	25	500
17	Passenger kinematics	-38.8	-210.8	45.3	7	220.0	25	1000

*+X = Film plane forward of barrier face

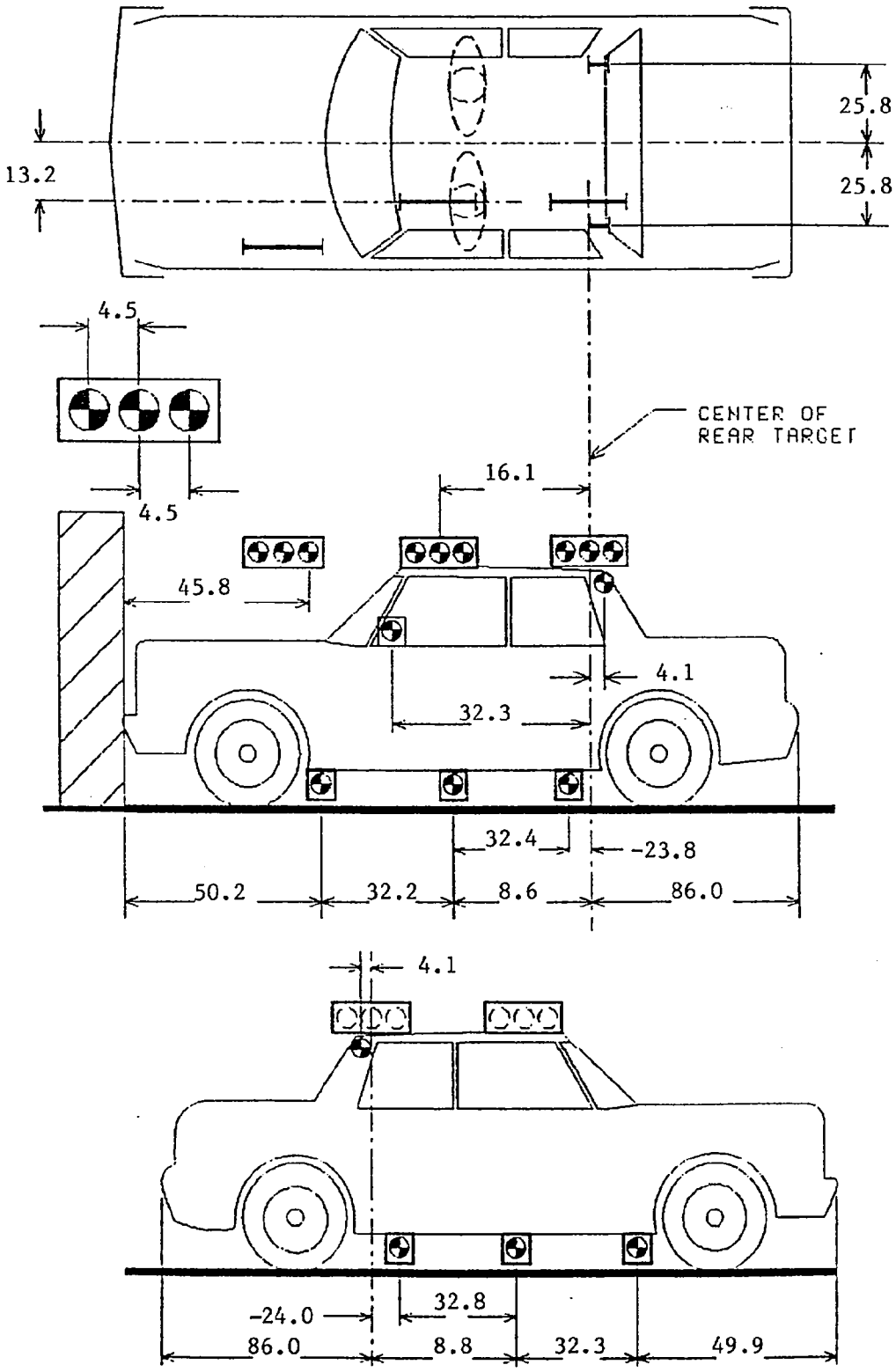
+Y = Film plane to left of monorail centerline

+Z = Film plane above ground level

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

FIGURE 10

VEHICLE TARGET LOCATIONS



ALL DISTANCE MEASUREMENTS ARE IN INCHES.

FIGURE 11

PRE-TEST AND POST-TEST MEASUREMENT POINTS

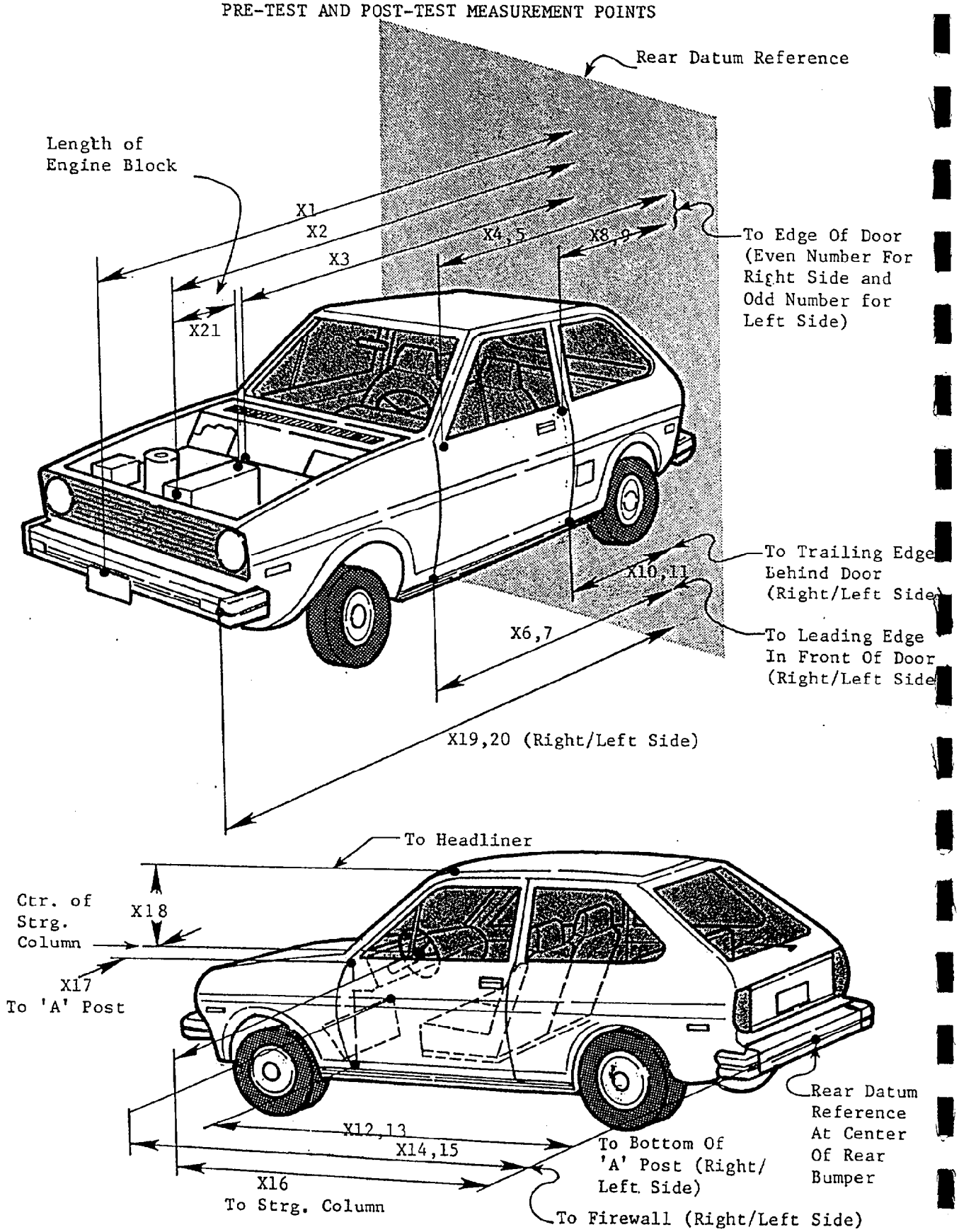


TABLE 11 IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Mitsubishi Mighty Max TEST NUMBER: 920311

ALL MEASUREMENTS ARE IN INCHES

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	177.0	157.7	19.3
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	156.8	152.4	4.4
X3	REAR SURFACE OF VEHICLE TO FIREWALL	137.2	136.2	1.0
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	126.6	124.5	2.1
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	126.3	125.2	1.1
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	126.4	123.8	2.6
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	126.3	124.8	1.5
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	86.8	84.9	1.9
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	86.7	85.8	0.9
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	86.6	84.1	2.5
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	86.5	85.1	1.4
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	125.4	123.9	1.5
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	125.3	124.0	1.3
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	136.9	134.1	2.8
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	136.9	134.3	2.6
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	108.8	105.1	3.7
X17	CENTER OF STEERING COLUMN TO "A" POST	11.5	10.6	0.9
X18	CENTER OF STEERING COLUMN TO HEADLINER	18.8	18.8	0.0
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	175.2	156.9	18.3
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	175.2	158.3	16.9
X21	LENGTH OF ENGINE BLOCK	17.5	17.5	0.0

APPENDIX A

PHOTOGRAPHS

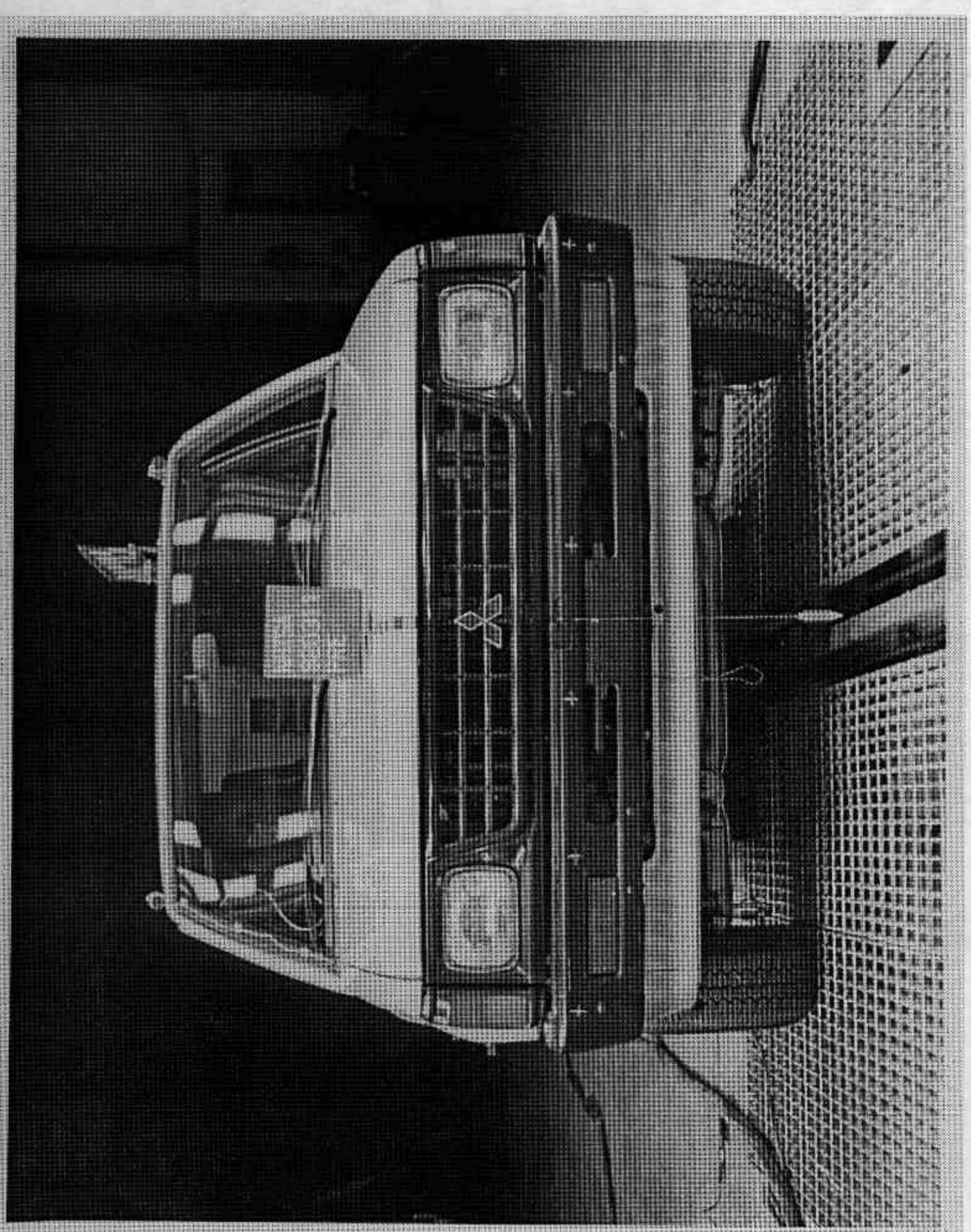


FIGURE A-1. PRE-TEST FRONT VIEW

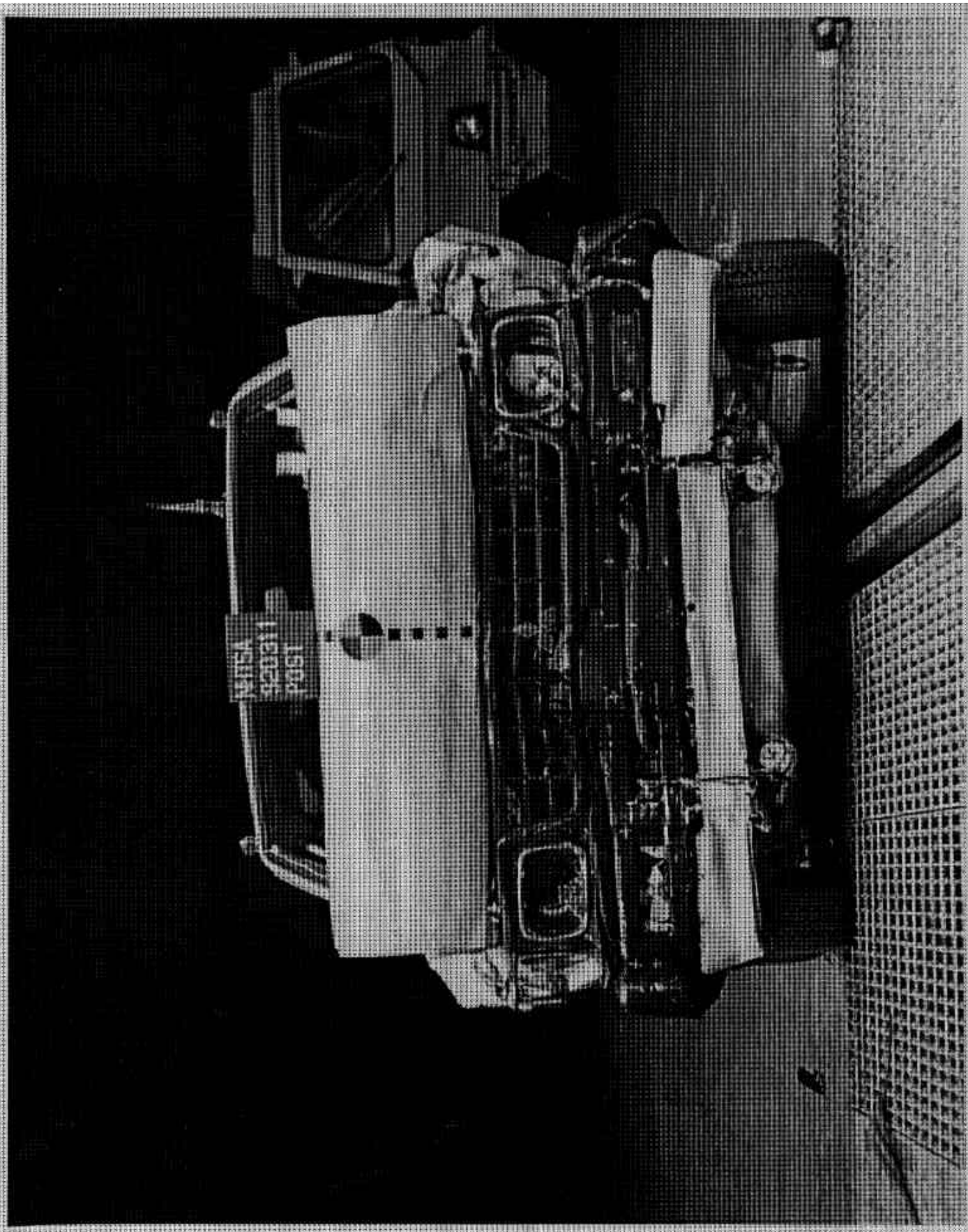


FIGURE A-2. POST-TEST FRONT VIEW

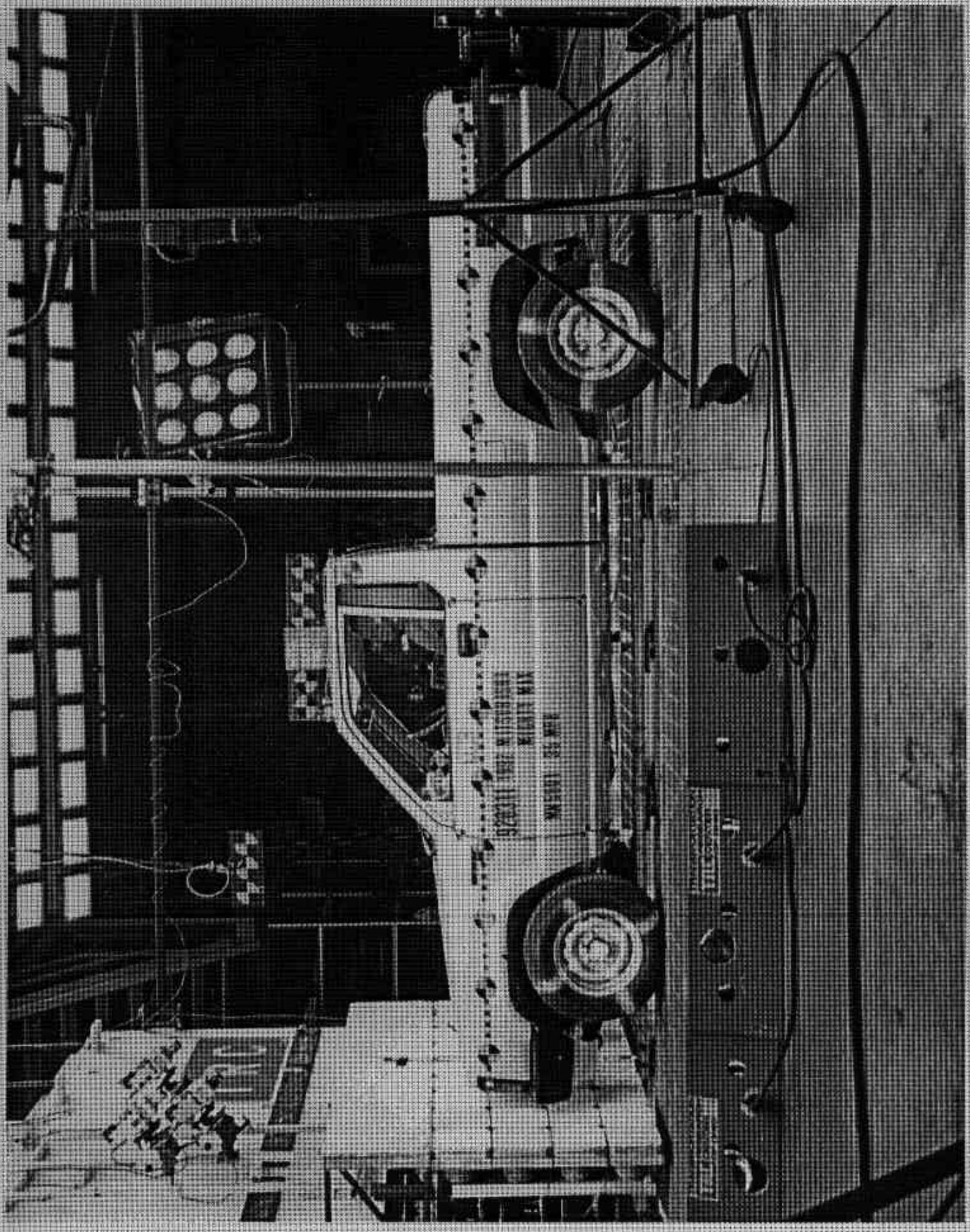


FIGURE A-3. PRE-TEST LEFT SIDE VIEW

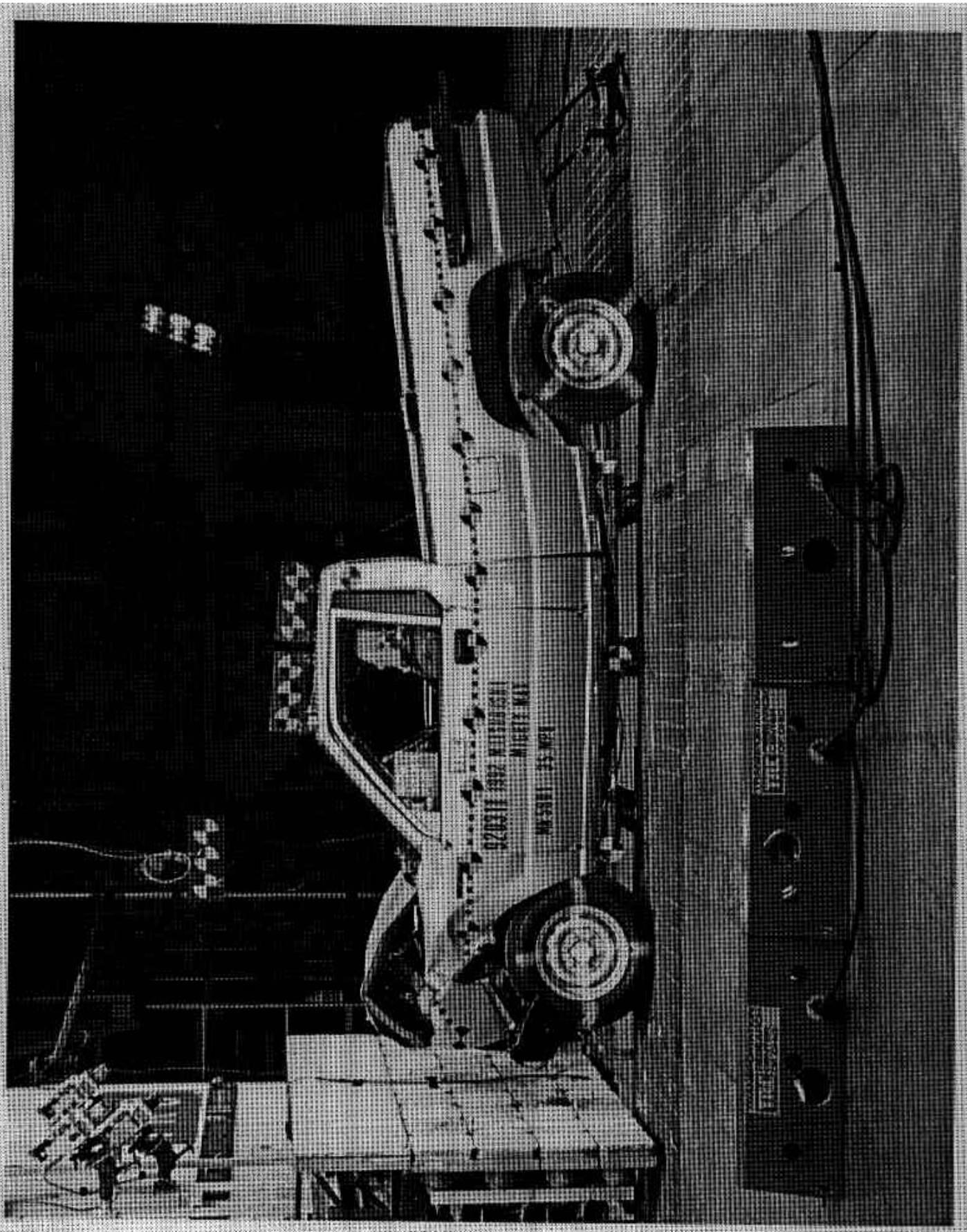


FIGURE A-4. POST-TEST LEFT SIDE VIEW

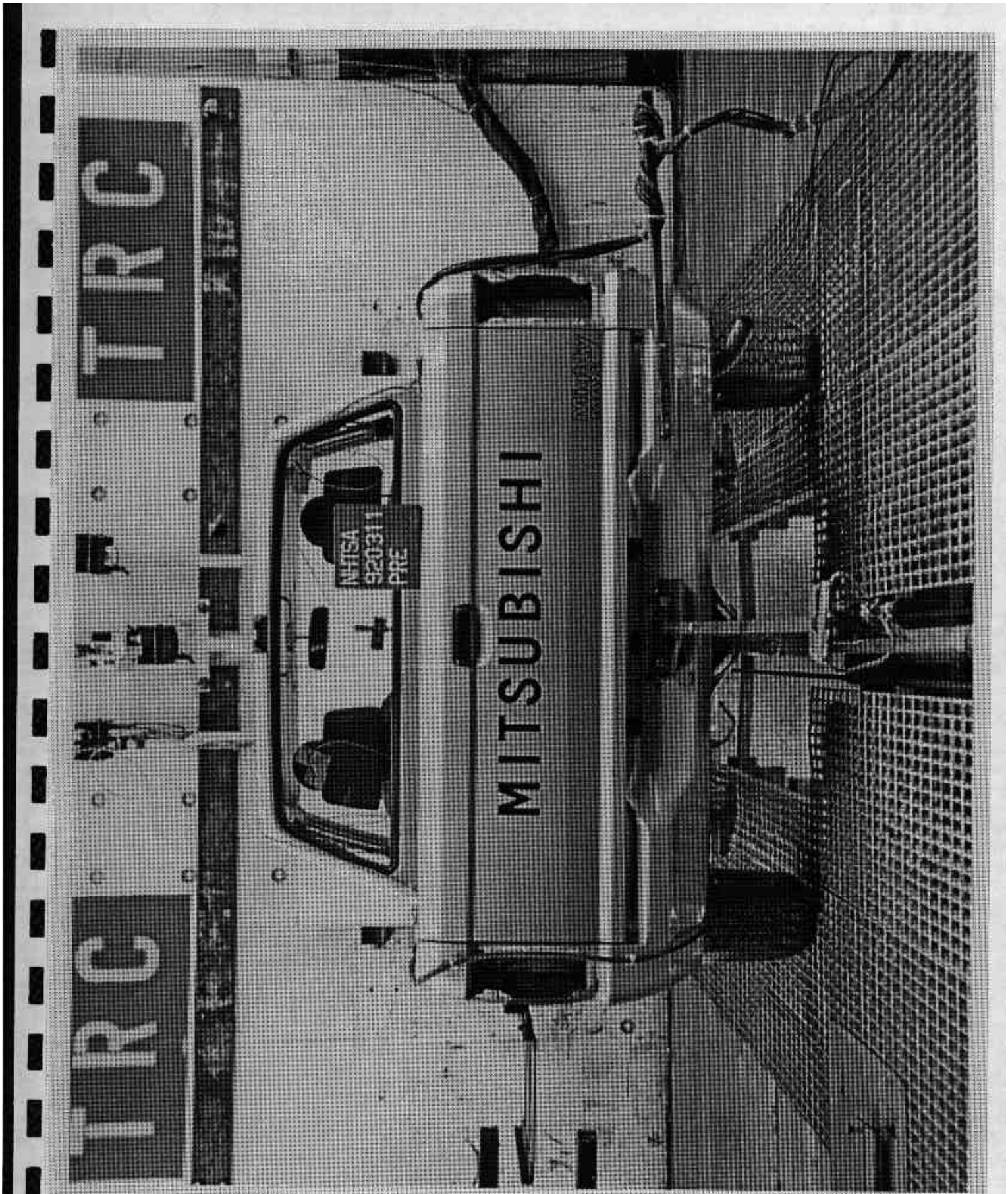


FIGURE A-5. PRE-TEST REAR VIEW

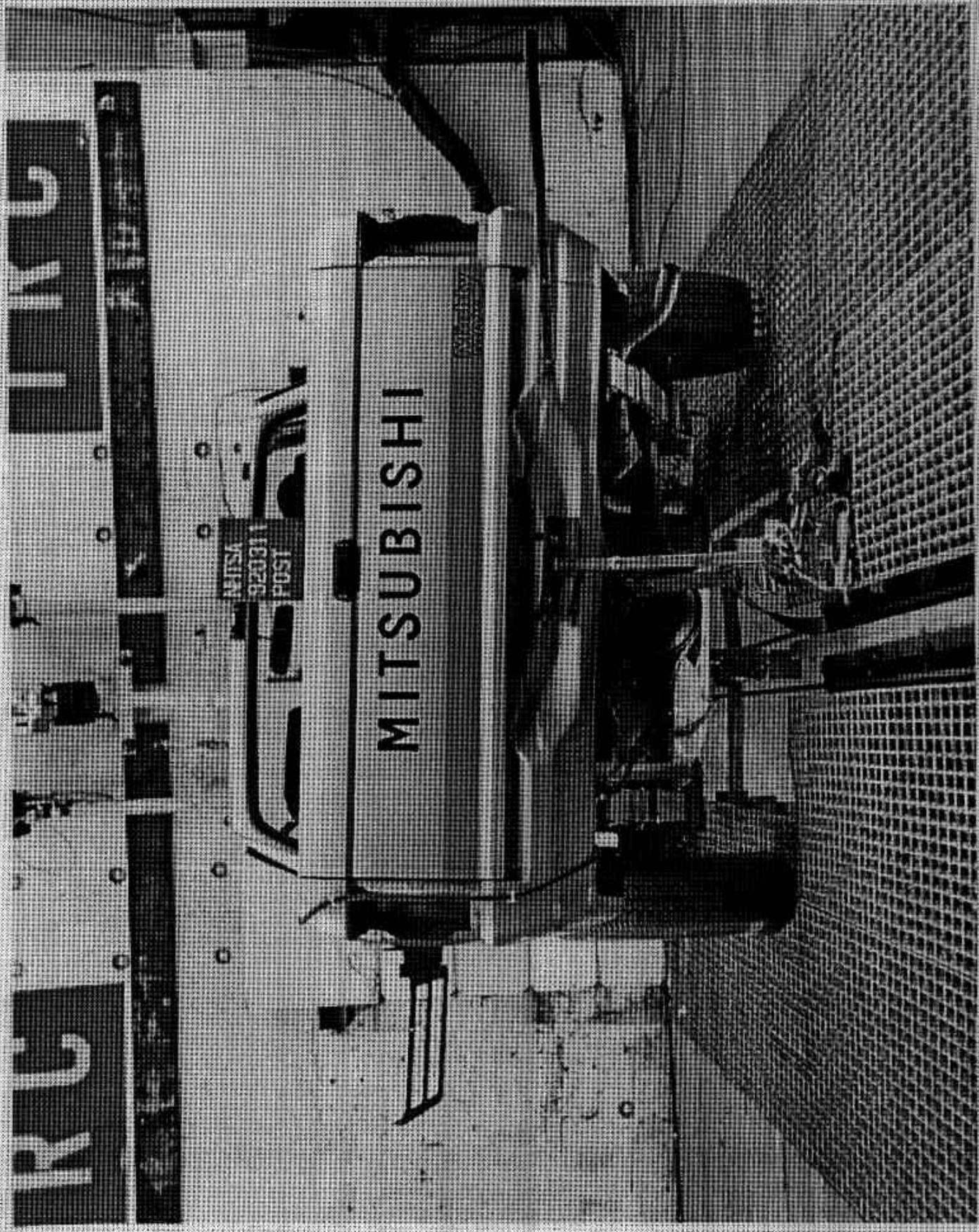


FIGURE A-6. POST-TEST REAR VIEW

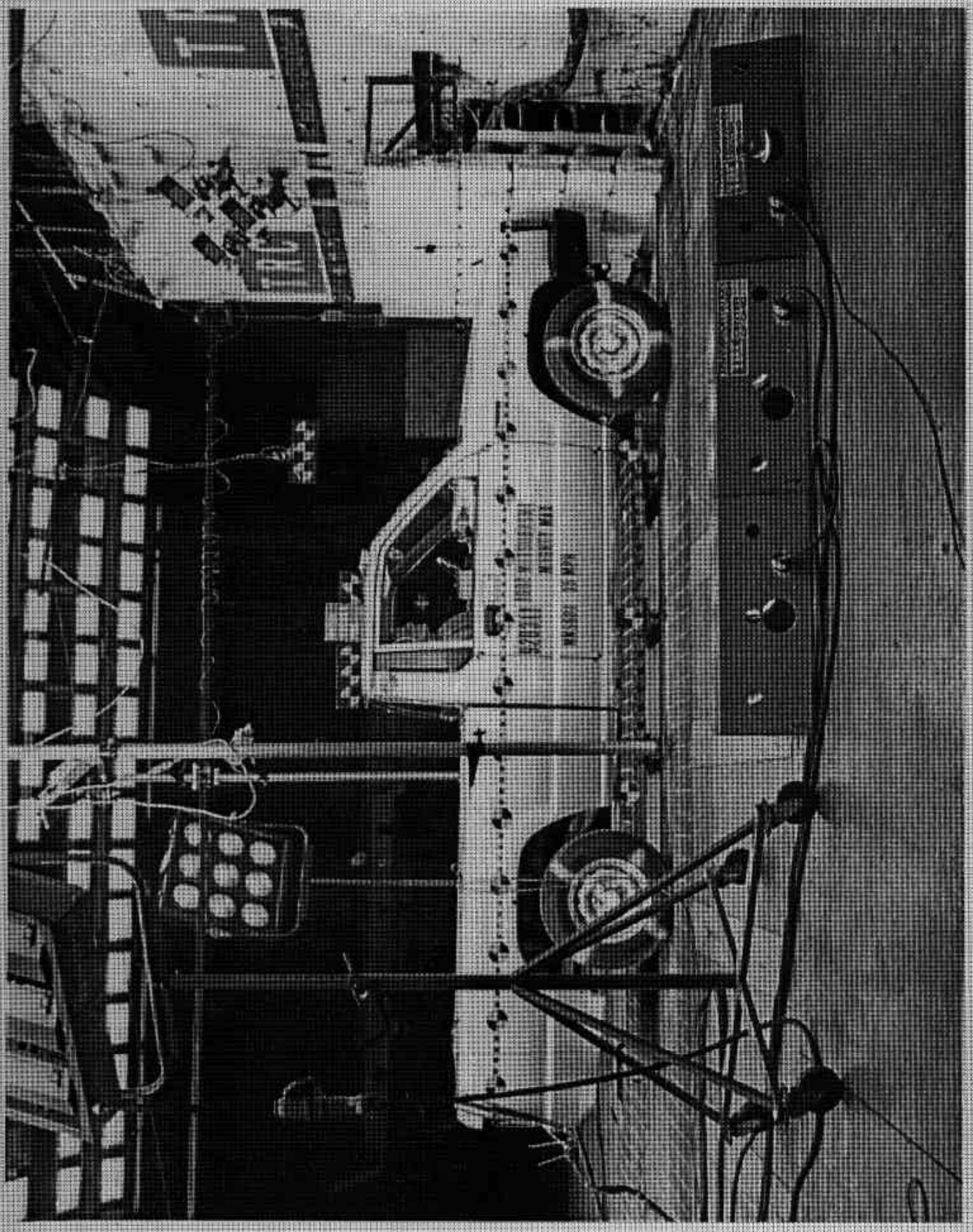


FIGURE A-7. PRE-TEST RIGHT SIDE VIEW

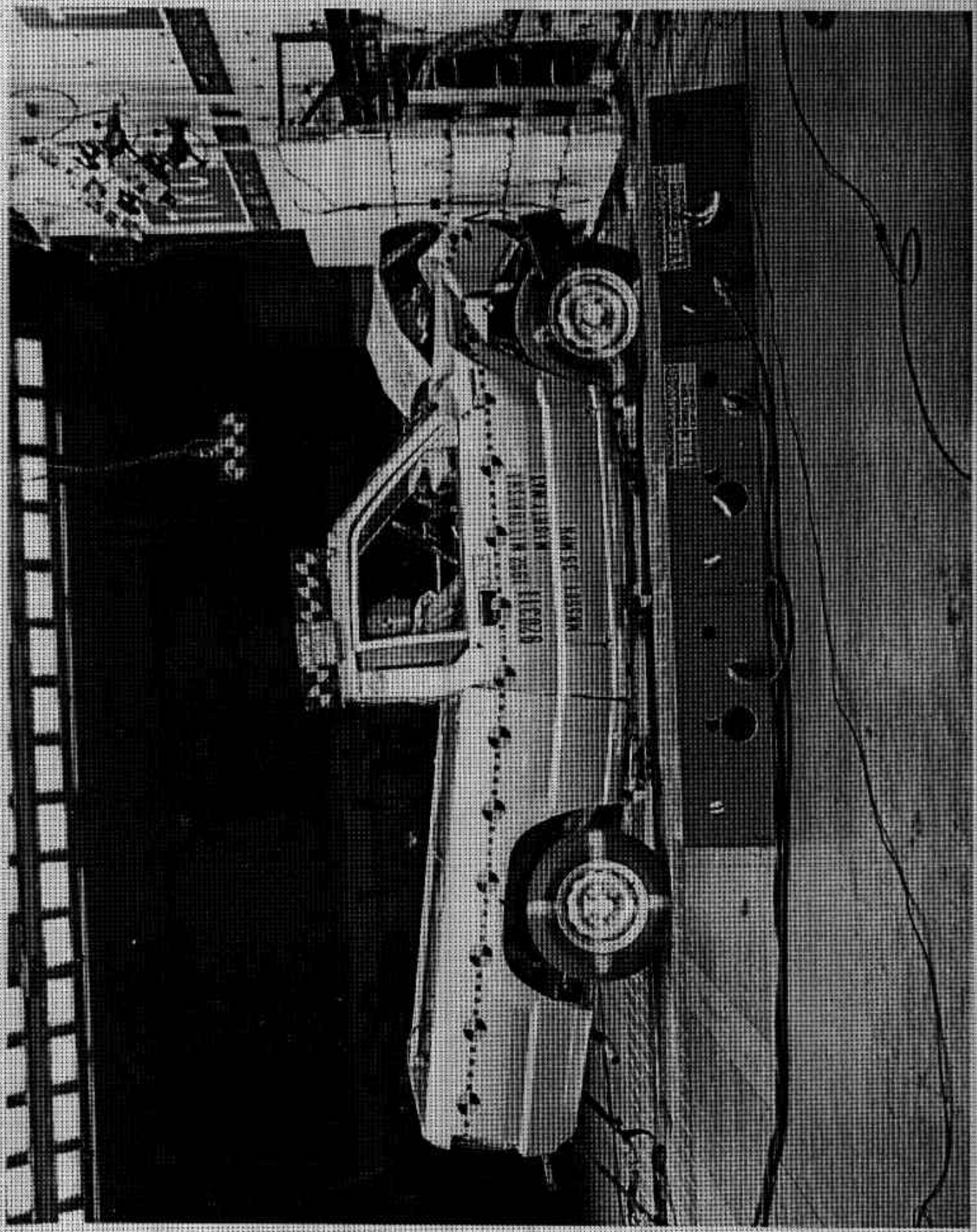


FIGURE A-8. POST-TEST RIGHT SIDE VIEW

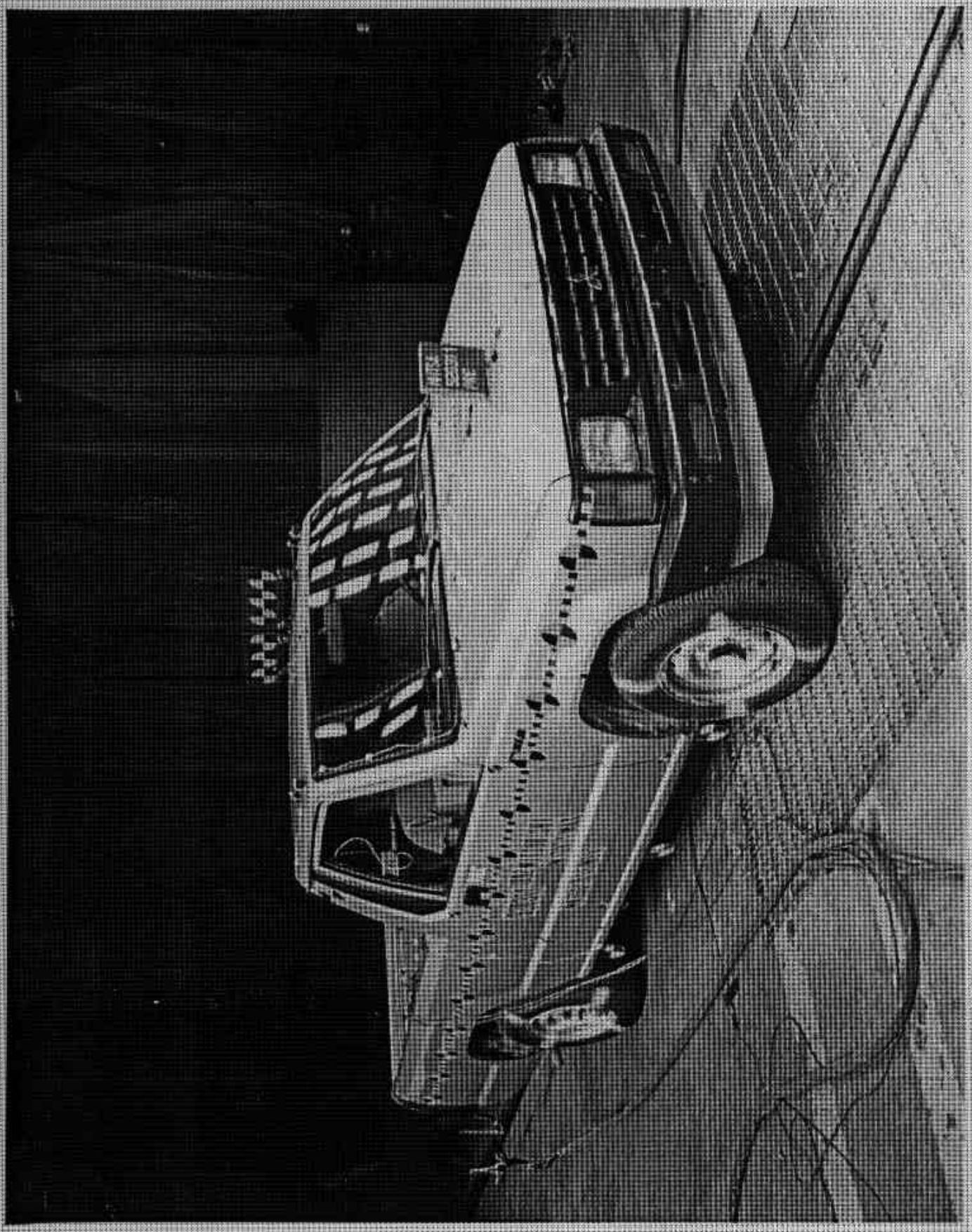


FIGURE A-9. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

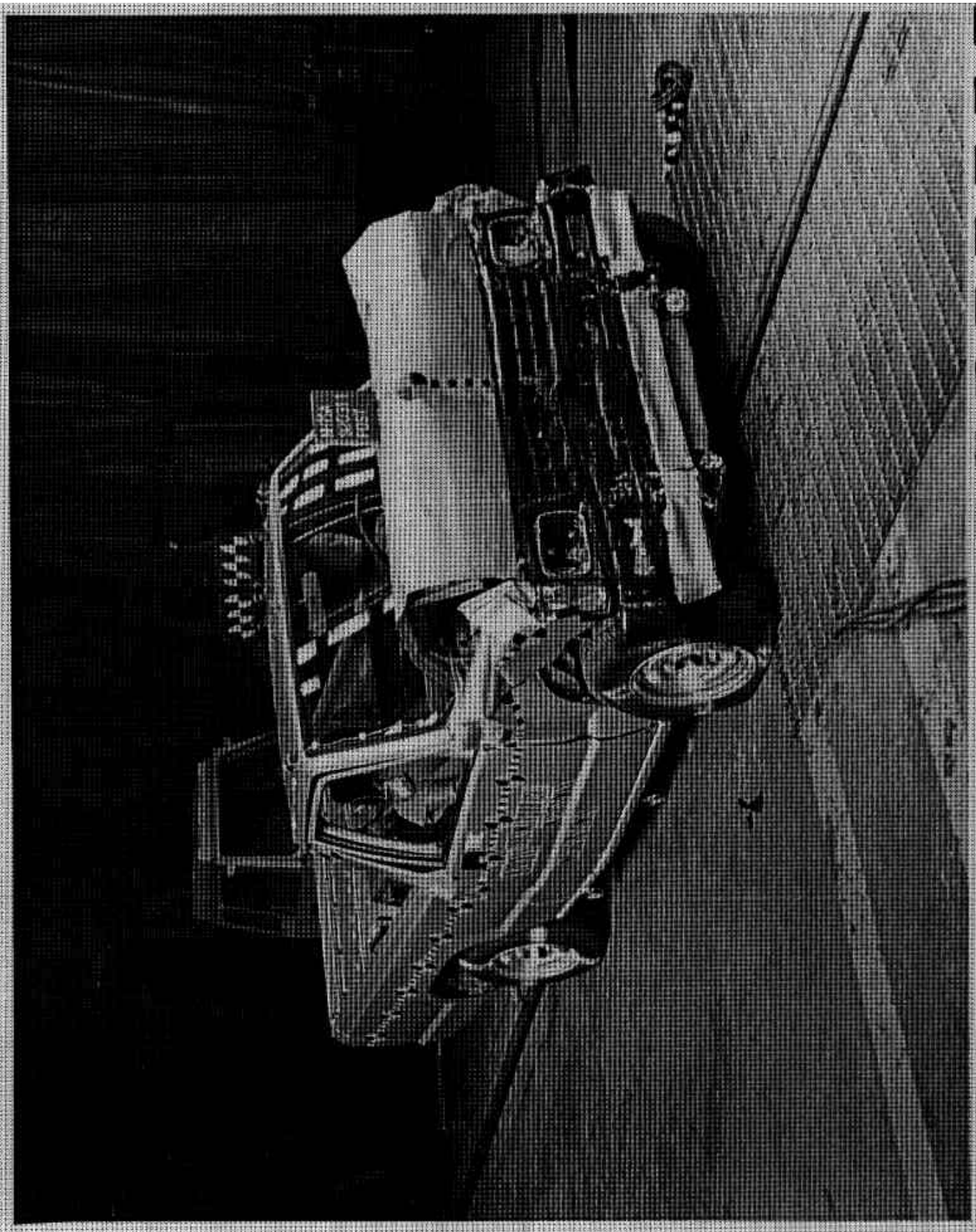


FIGURE A-10. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

FIGURE A-11. PRE-TEST LEFT REAR THREE-QUARTER VIEW

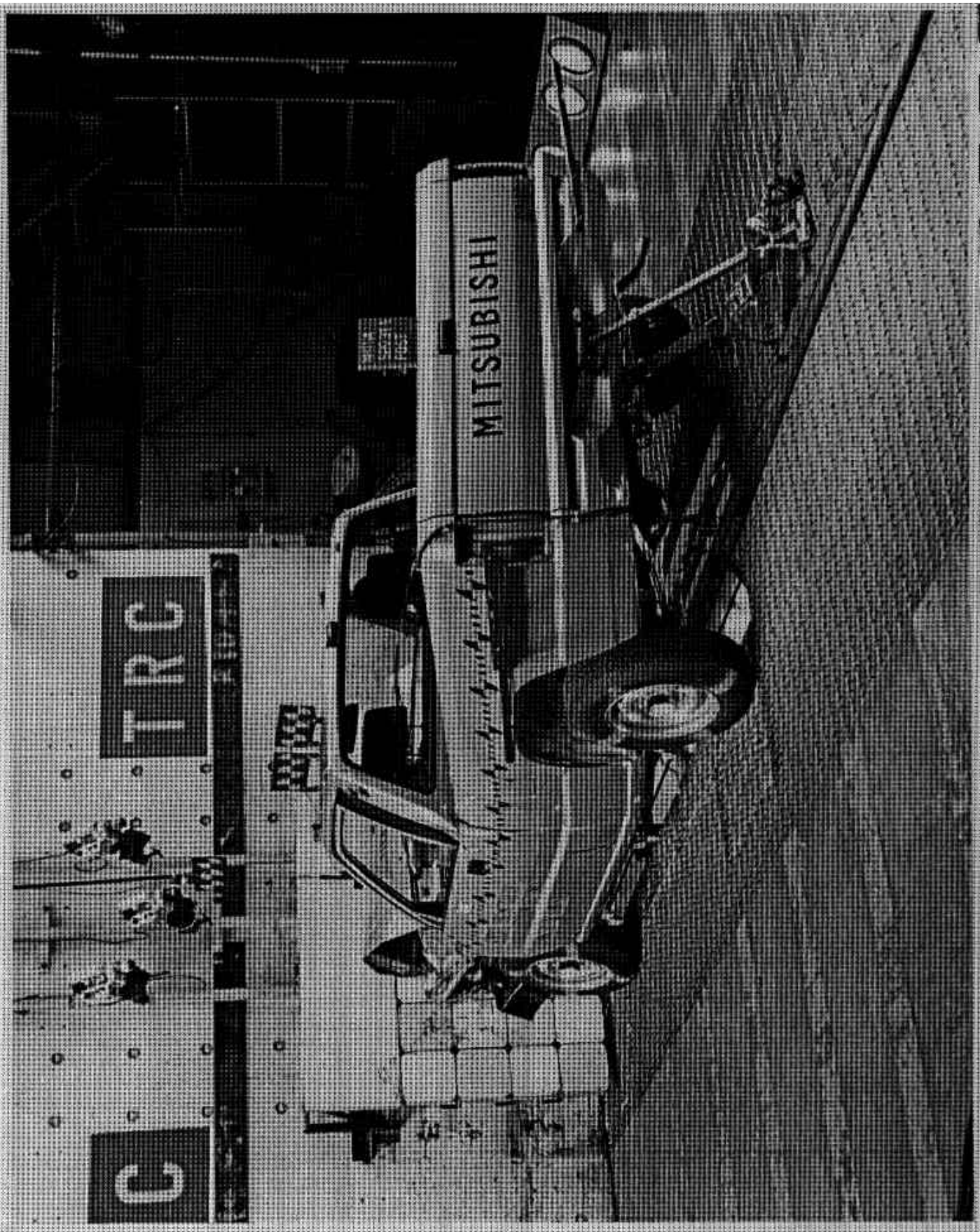


FIGURE A-12. POST-TEST LEFT REAR THREE-QUARTER VIEW

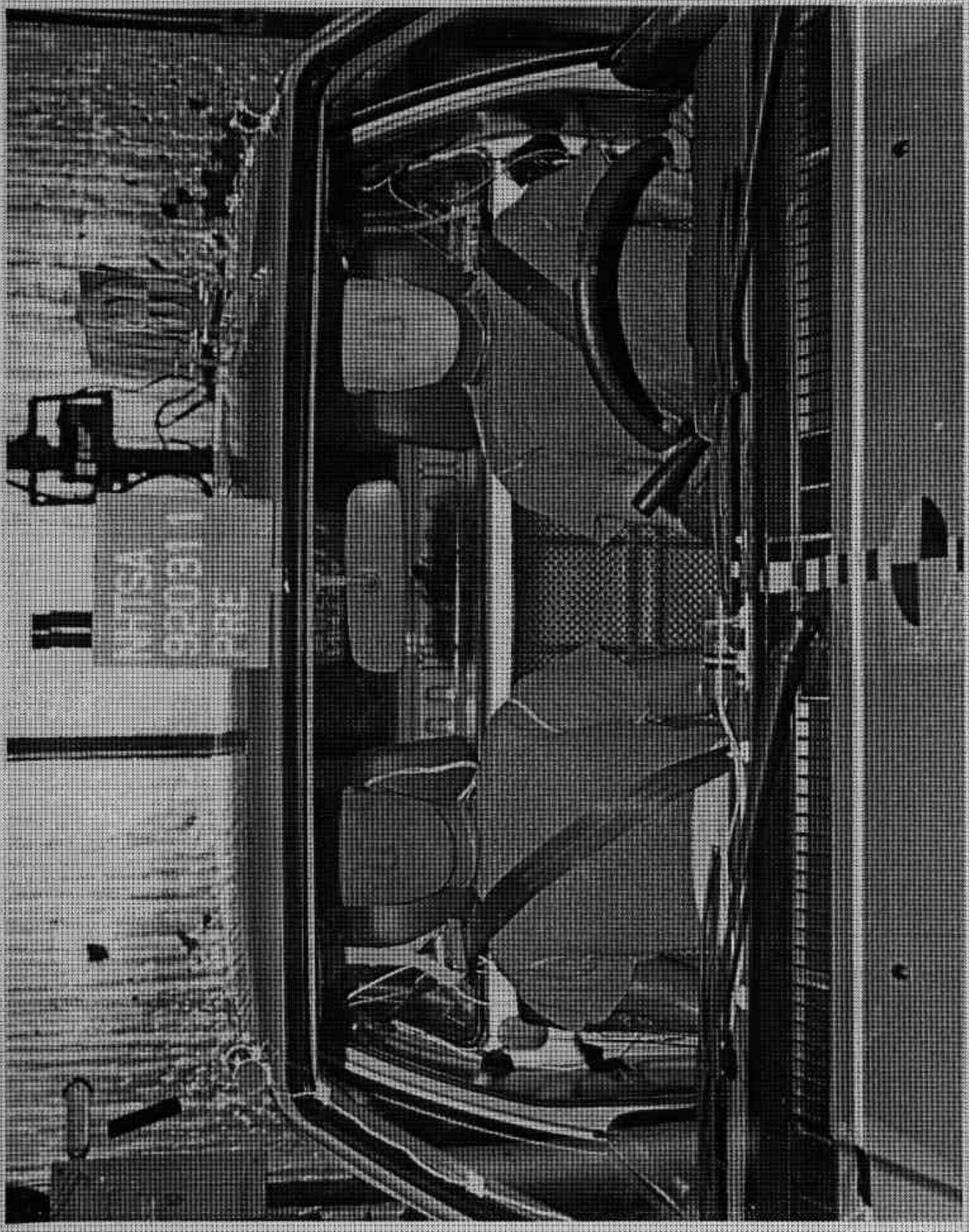


FIGURE A-13. PRE-TEST WINDSHIELD VIEW

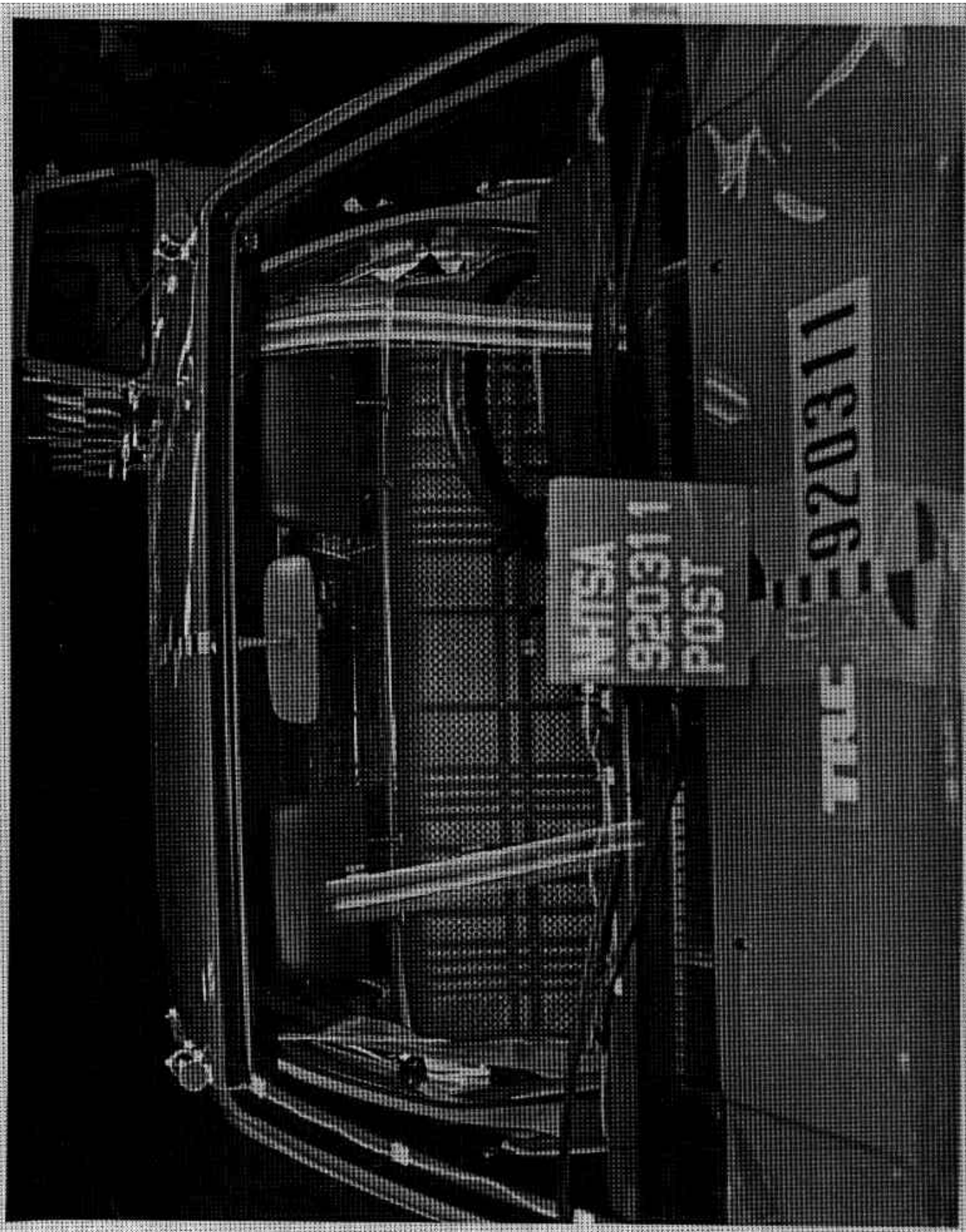


FIGURE A-14. POST-TEST WINDSHIELD VIEW

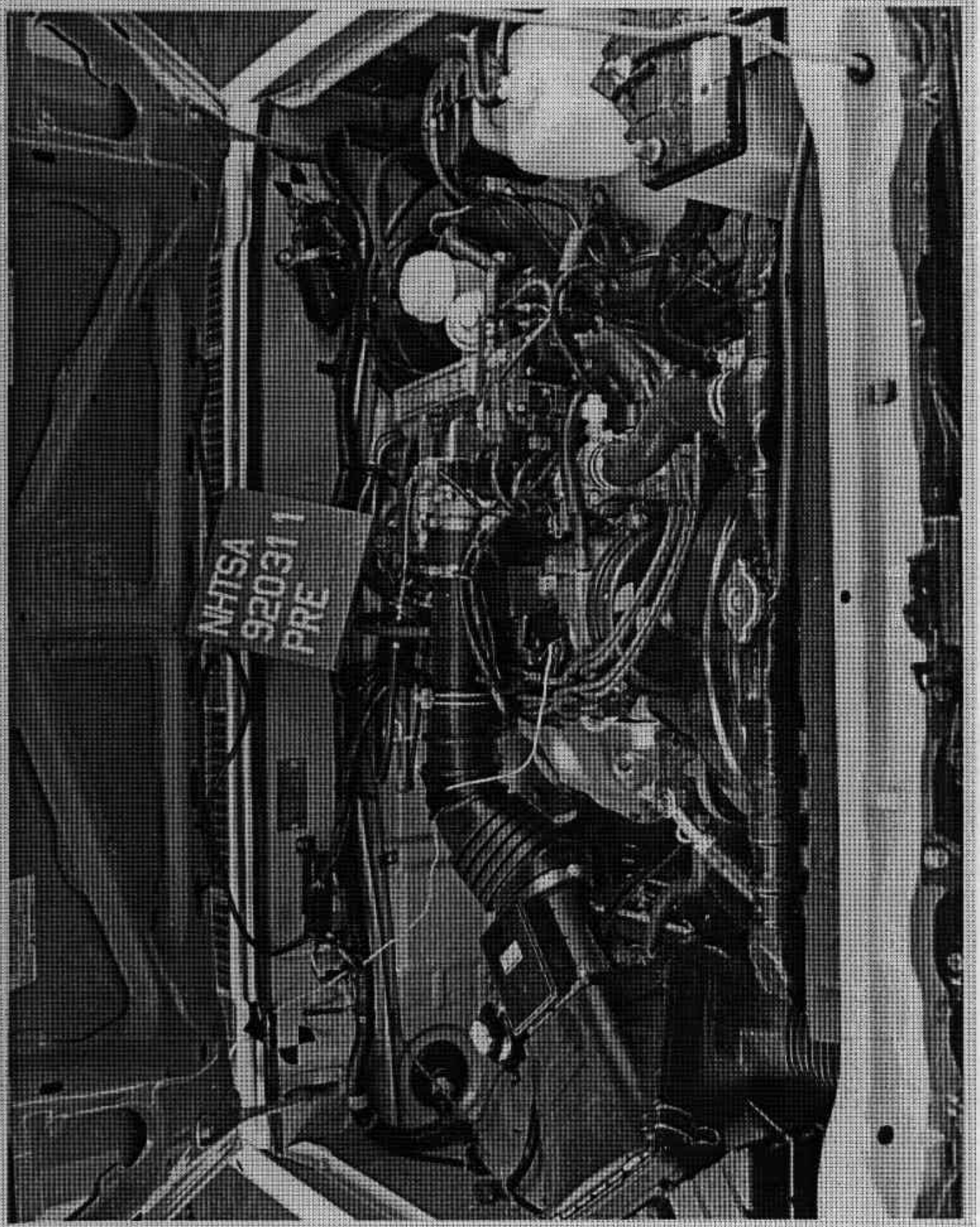


FIGURE A-15. PRE-TEST ENGINE COMPARTMENT VIEW

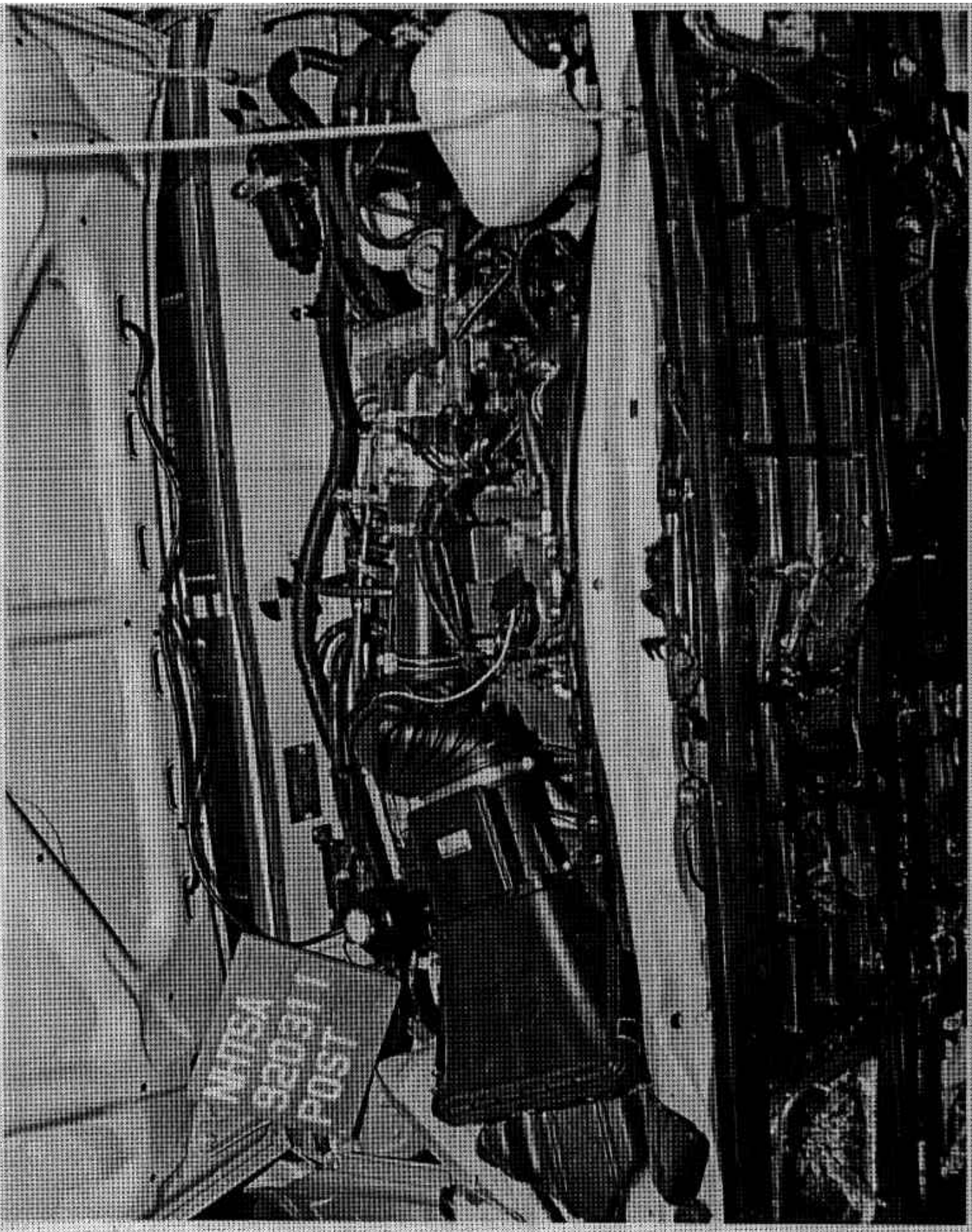


FIGURE A-16. POST-TEST ENGINE COMPARTMENT VIEW

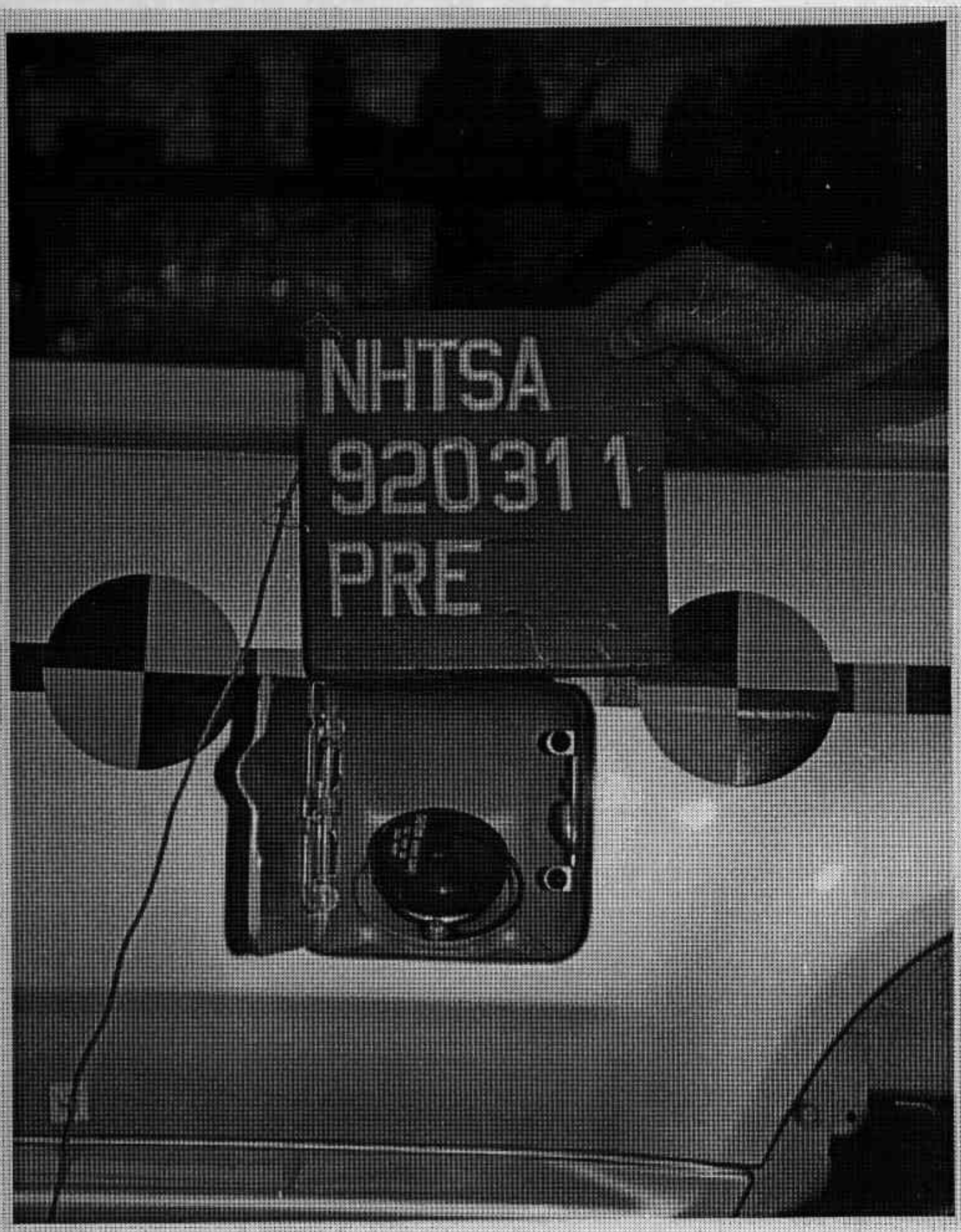


FIGURE A-17. PRE-TEST FUEL FILLER CAP VIEW

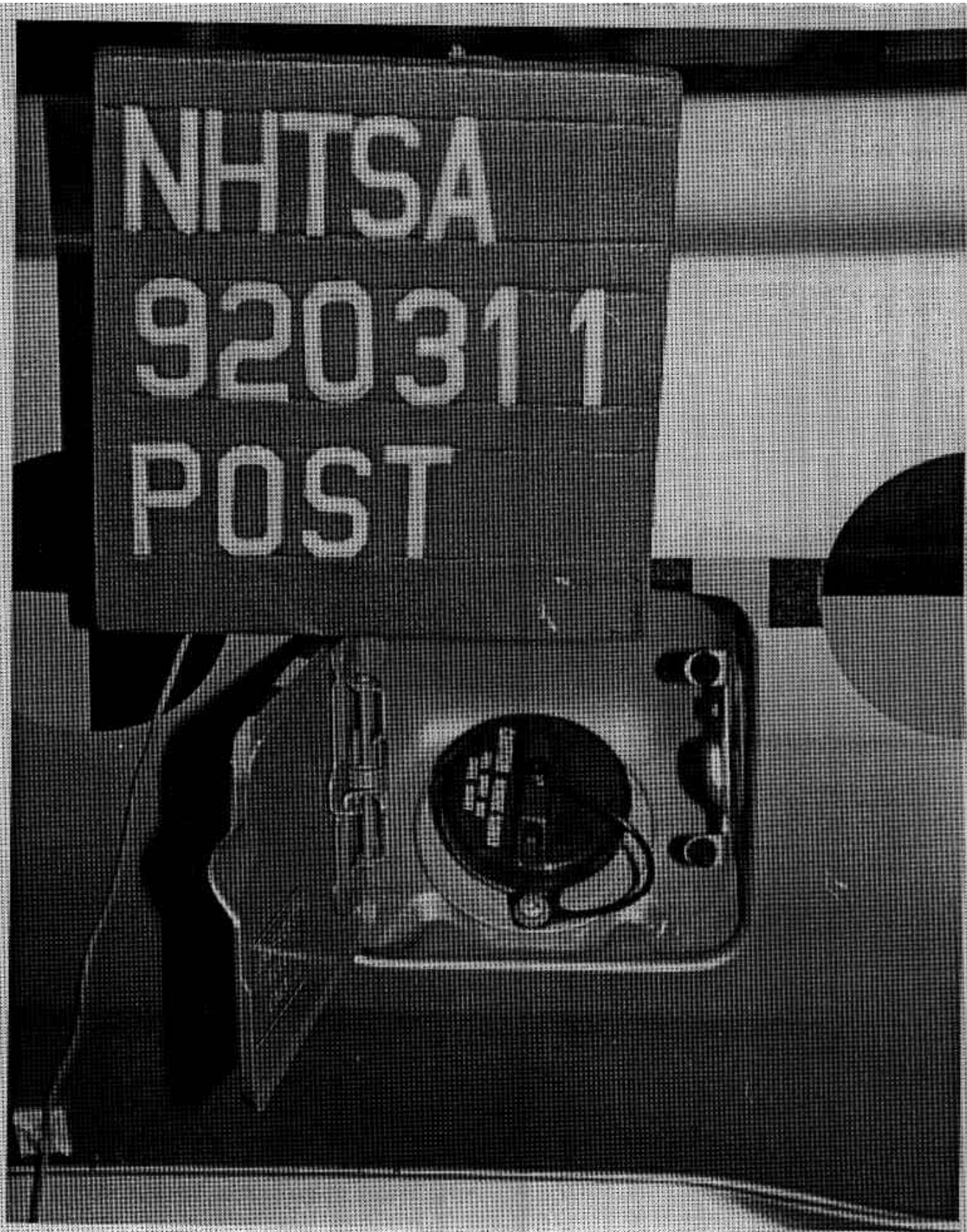


FIGURE A-18. POST-TEST FUEL FILLER CAP VIEW

FIGURE A-19. PRE-TEST FUEL FILLER NECK VIEW

FIGURE A-20. POST-TEST FUEL FILLER NECK VIEW

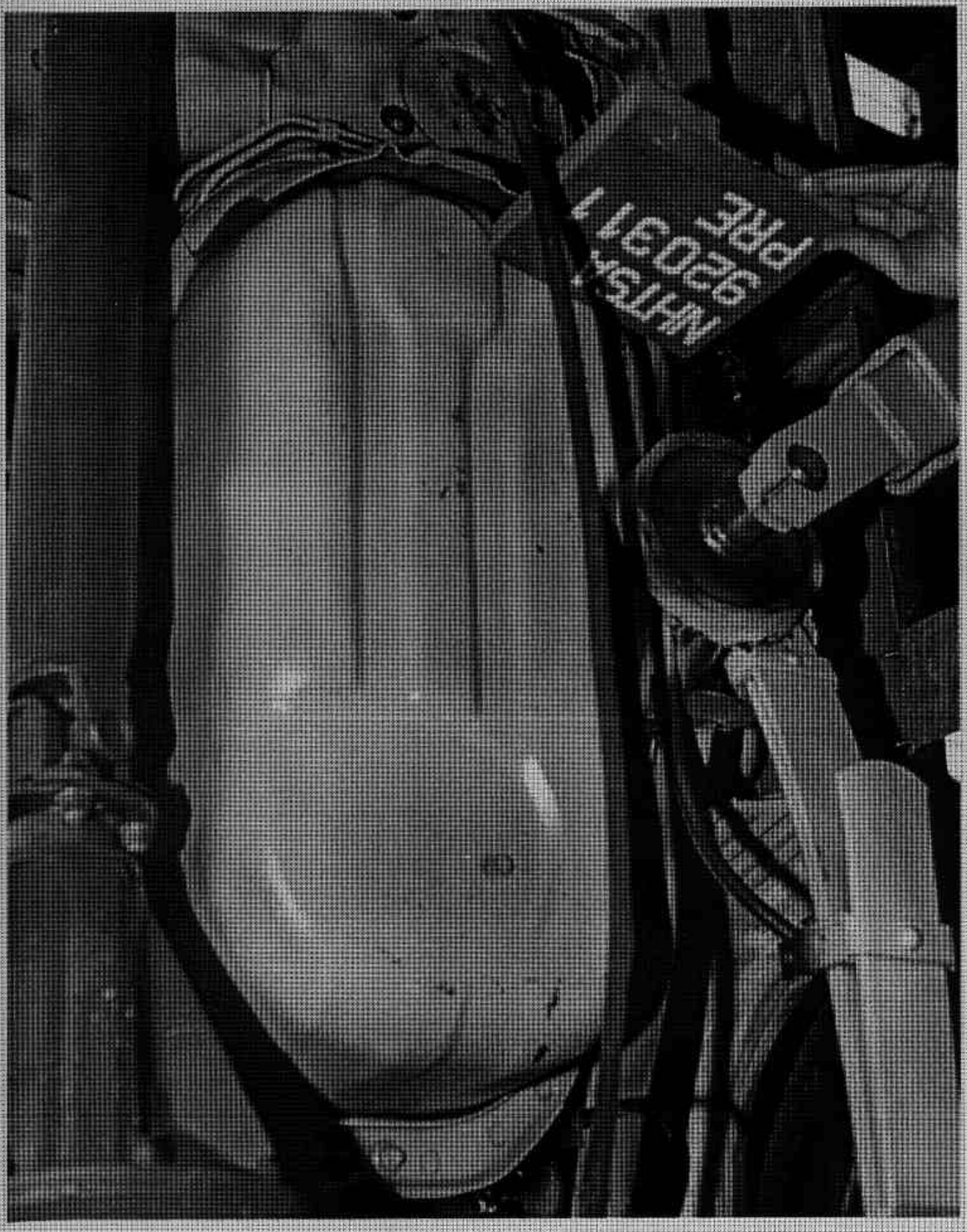


FIGURE A-21. PRE-TEST FUEL TANK VIEW

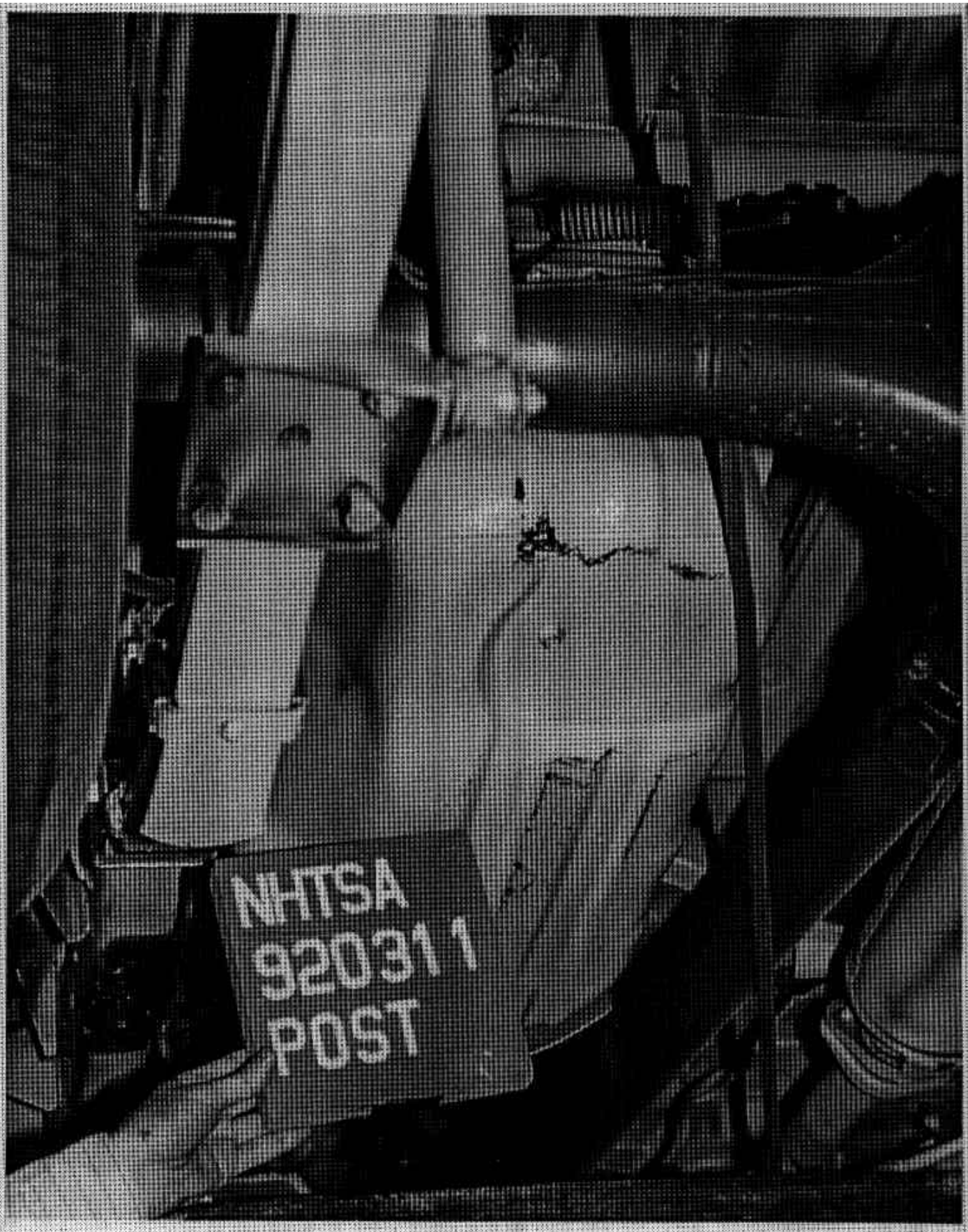


FIGURE A-22. POST-TEST FUEL TANK VIEW

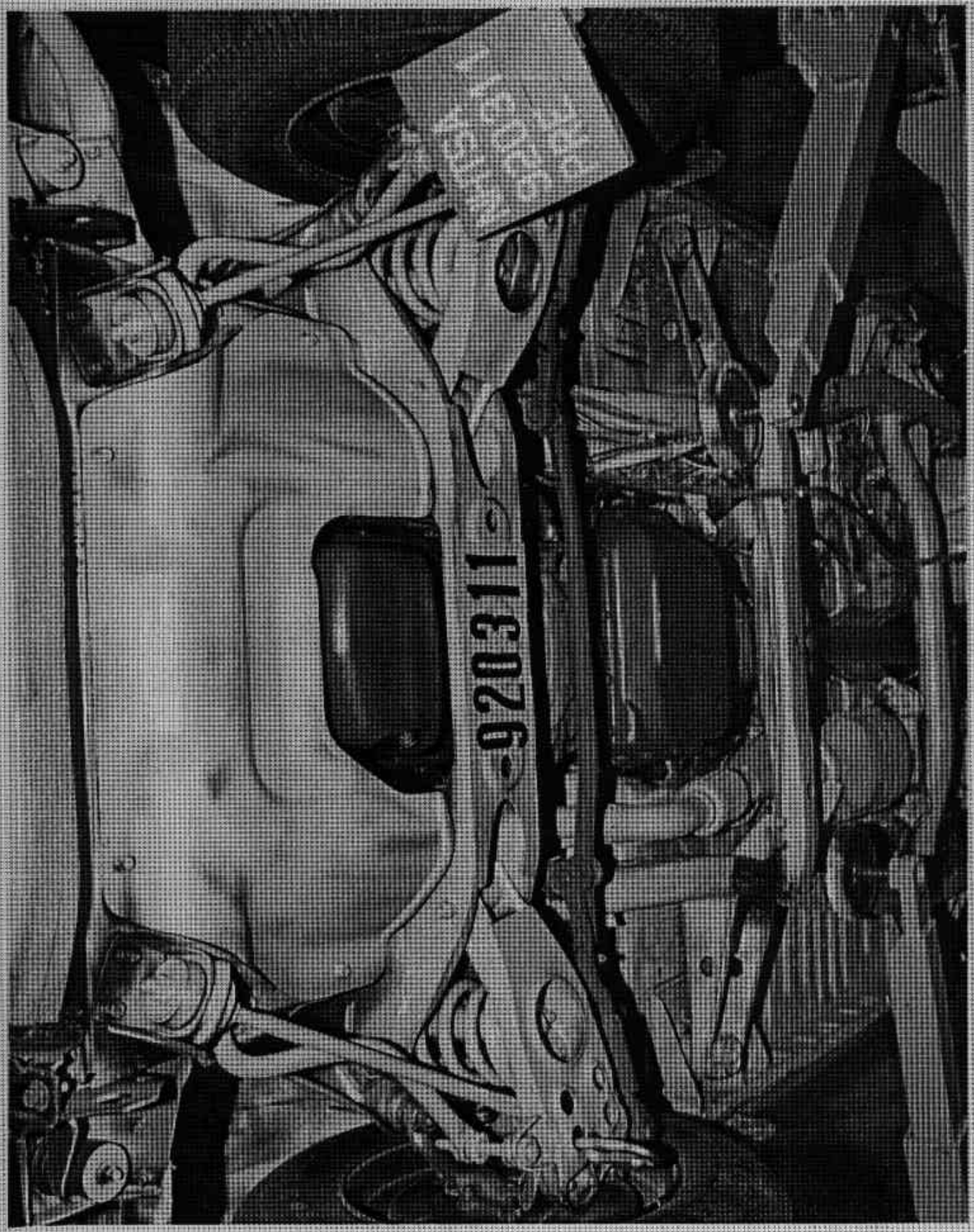


FIGURE A-23. PRE-TEST FRONT UNDERBODY VIEW

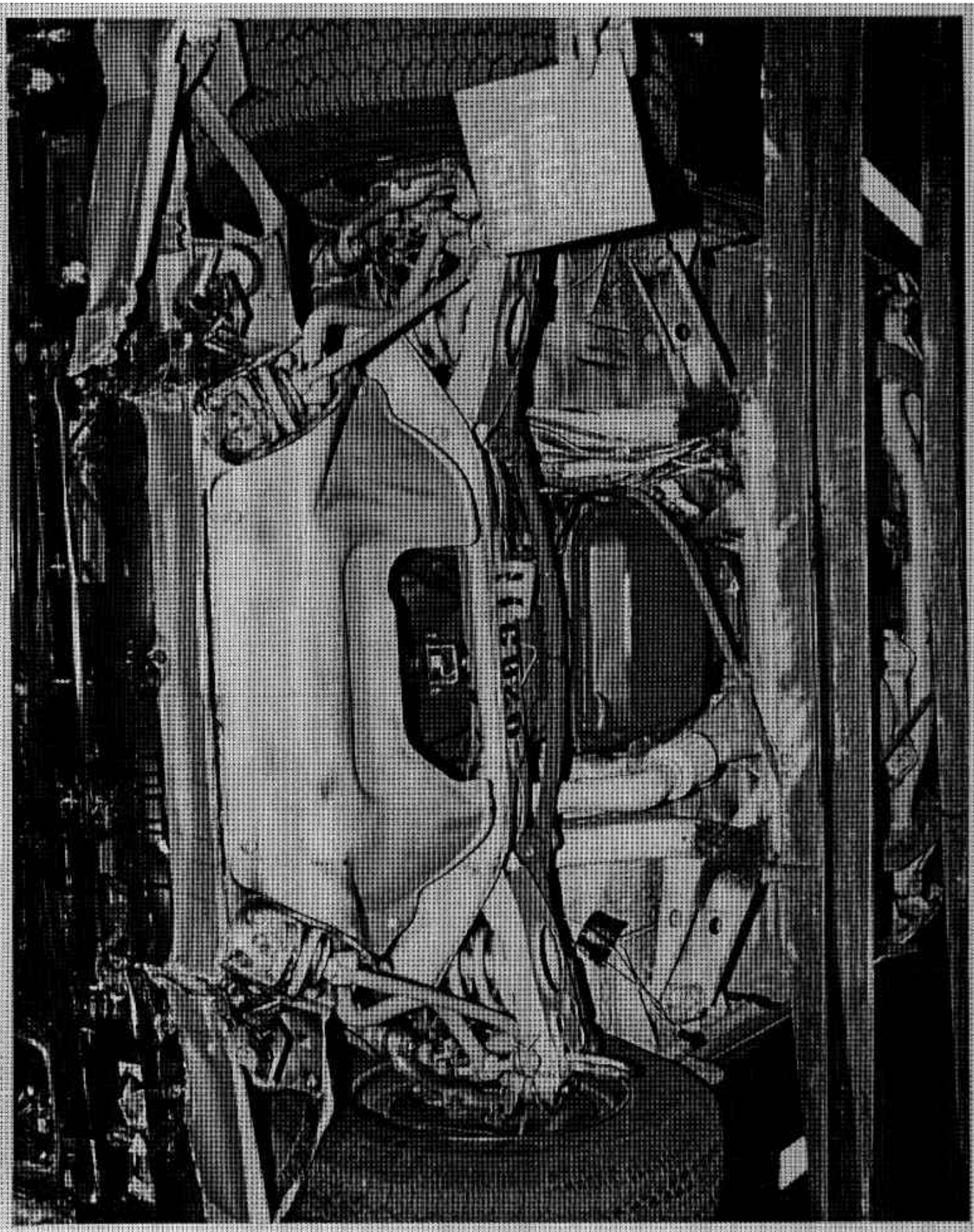


FIGURE A-24. POST-TEST FRONT UNDERBODY VIEW

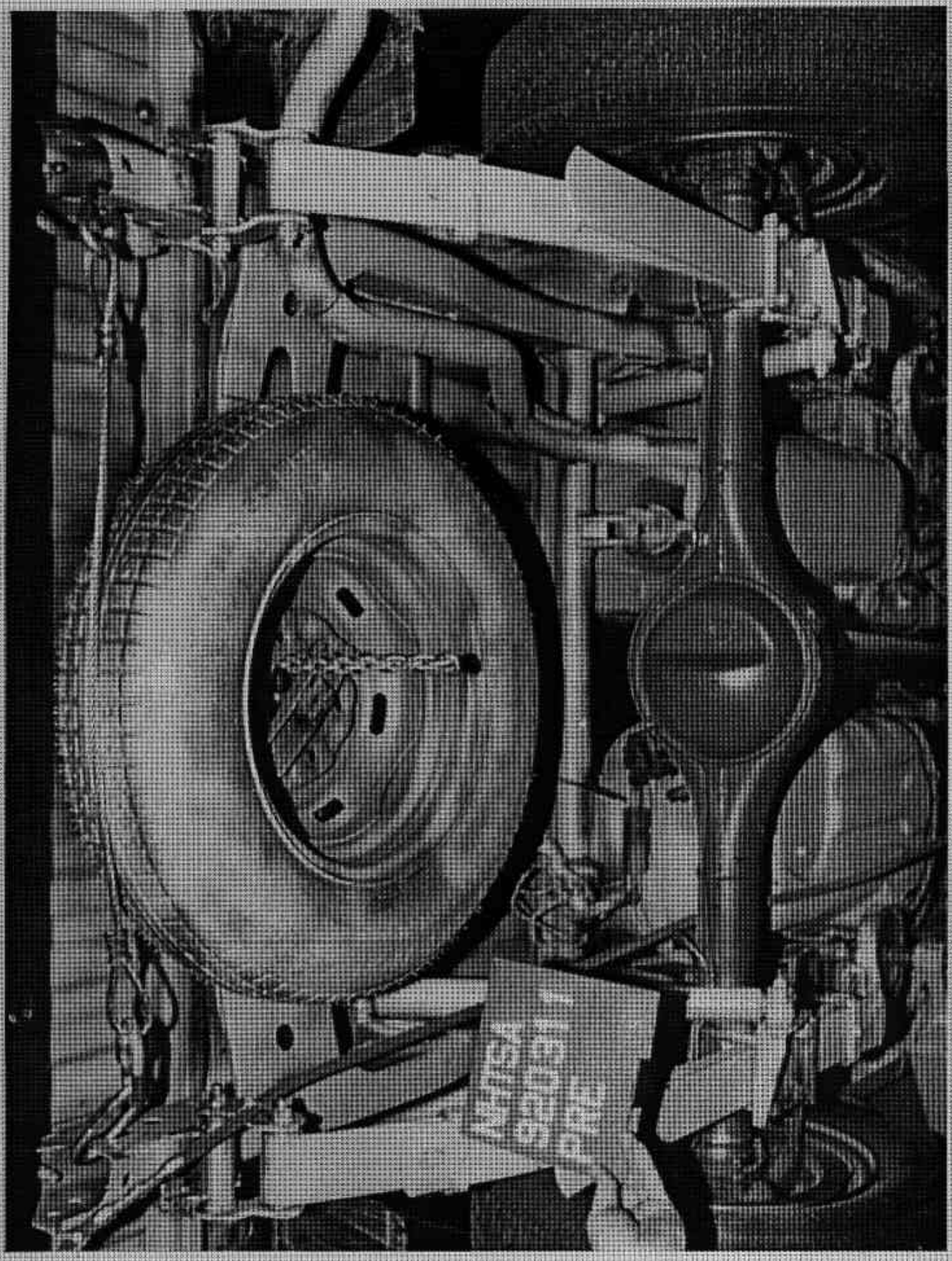


FIGURE A-25. PRE-TEST REAR UNDERBODY VIEW

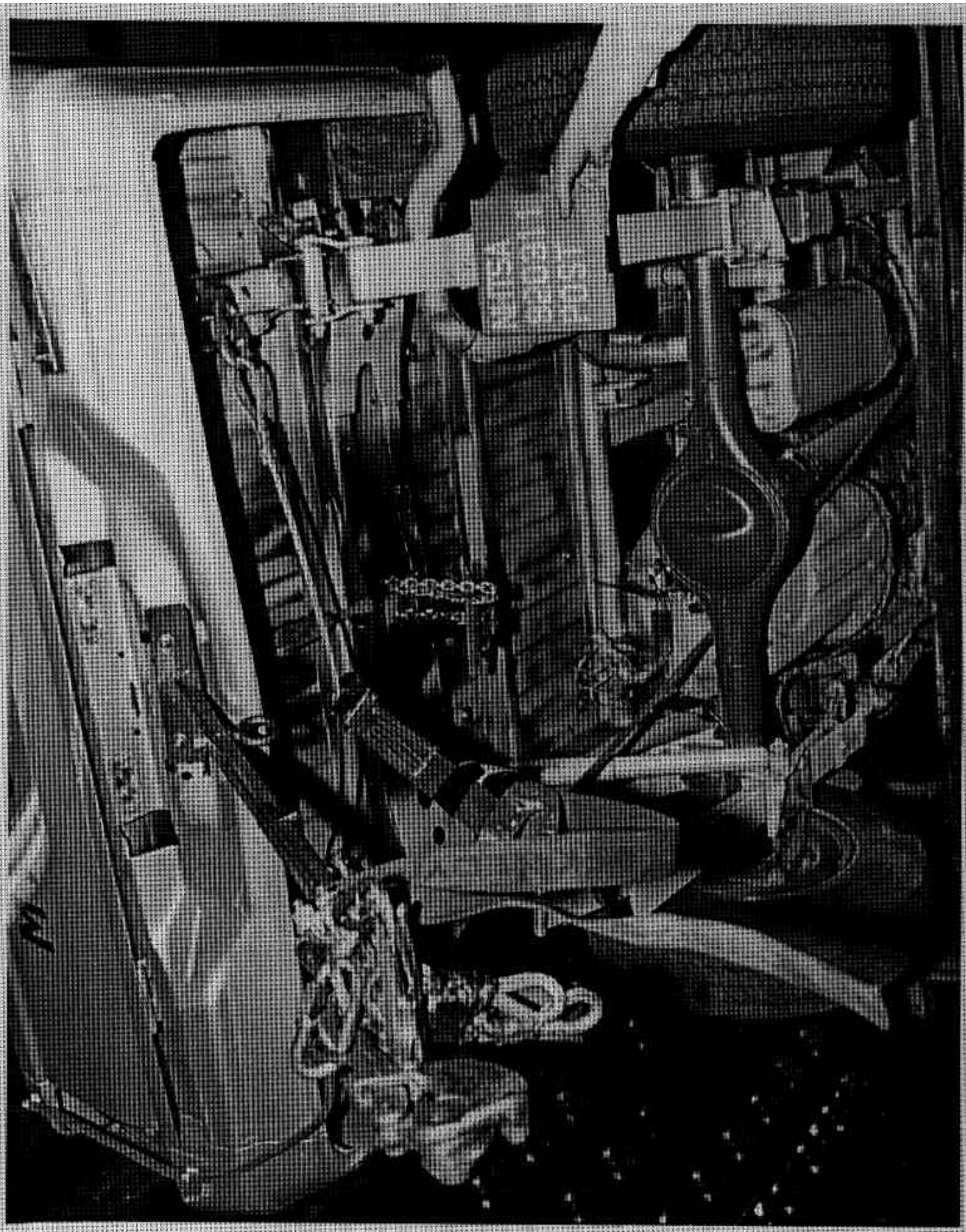


FIGURE A-26. POST-TEST REAR UNDERBODY VIEW

FIGURE A-27. PRE-TEST DRIVER DUMMY POSITION VIEW

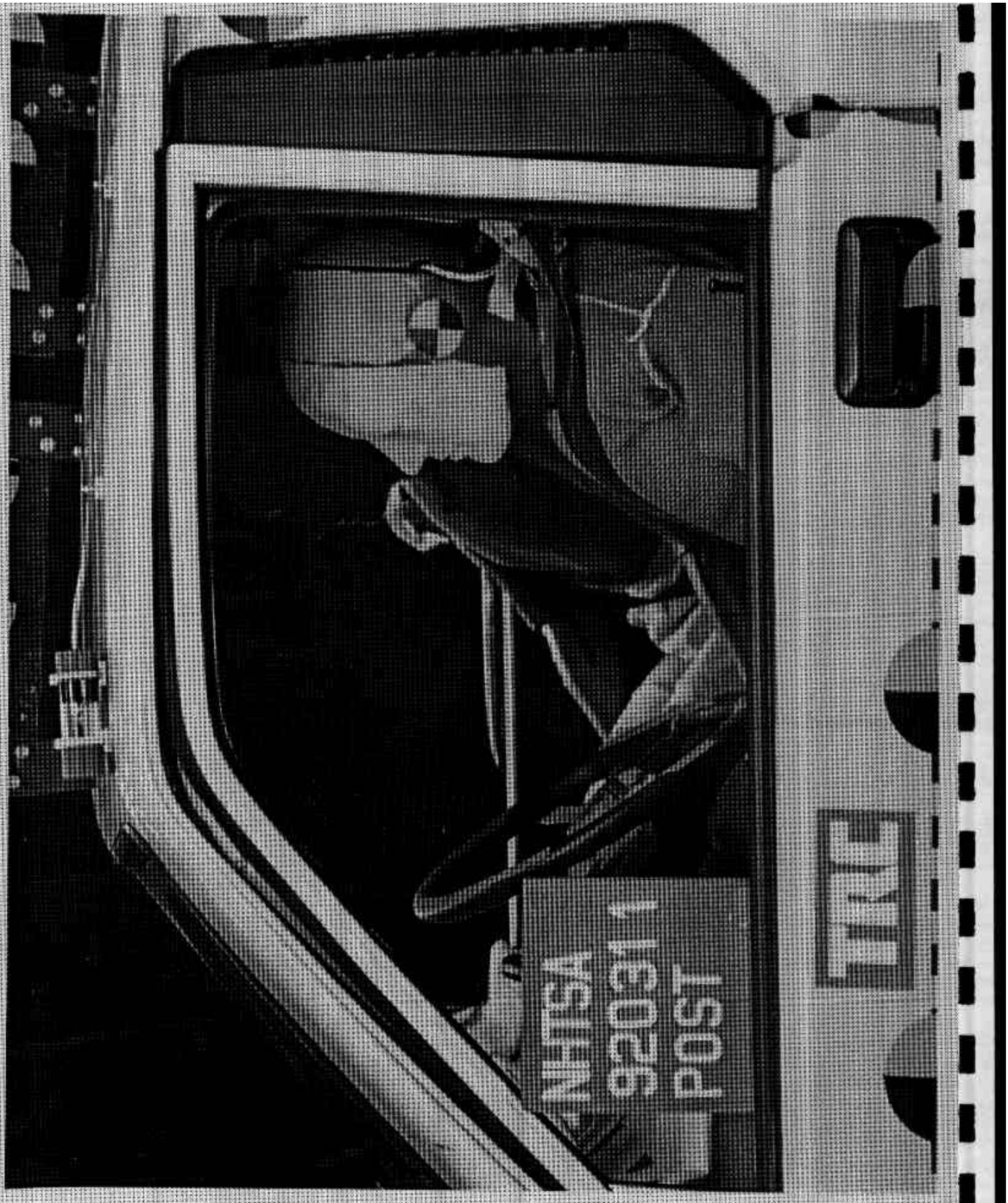


FIGURE A-28. POST-TEST DRIVER DUMMY POSITION VIEW

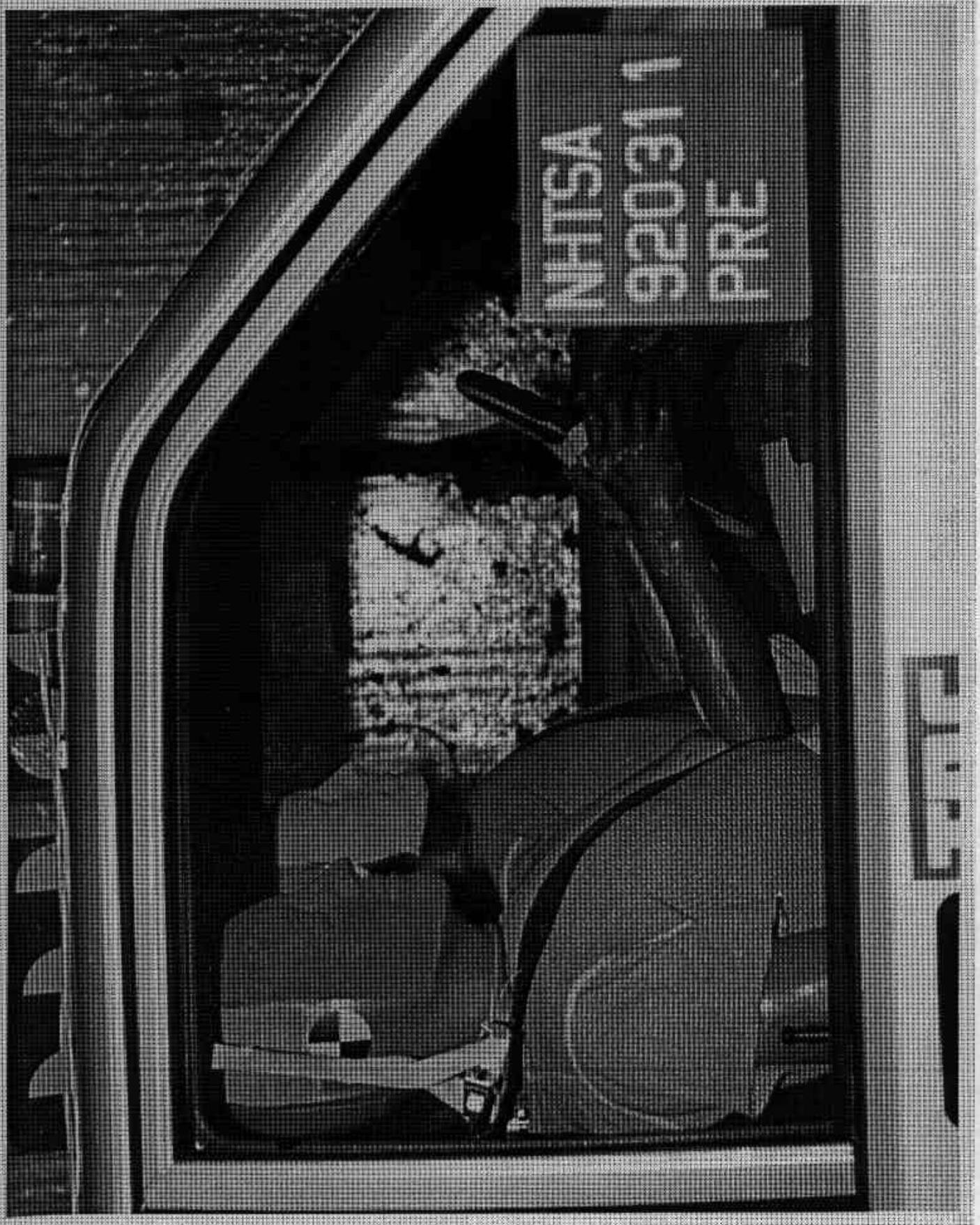


FIGURE A-29. PRE-TEST PASSENGER DUMMY POSITION VIEW

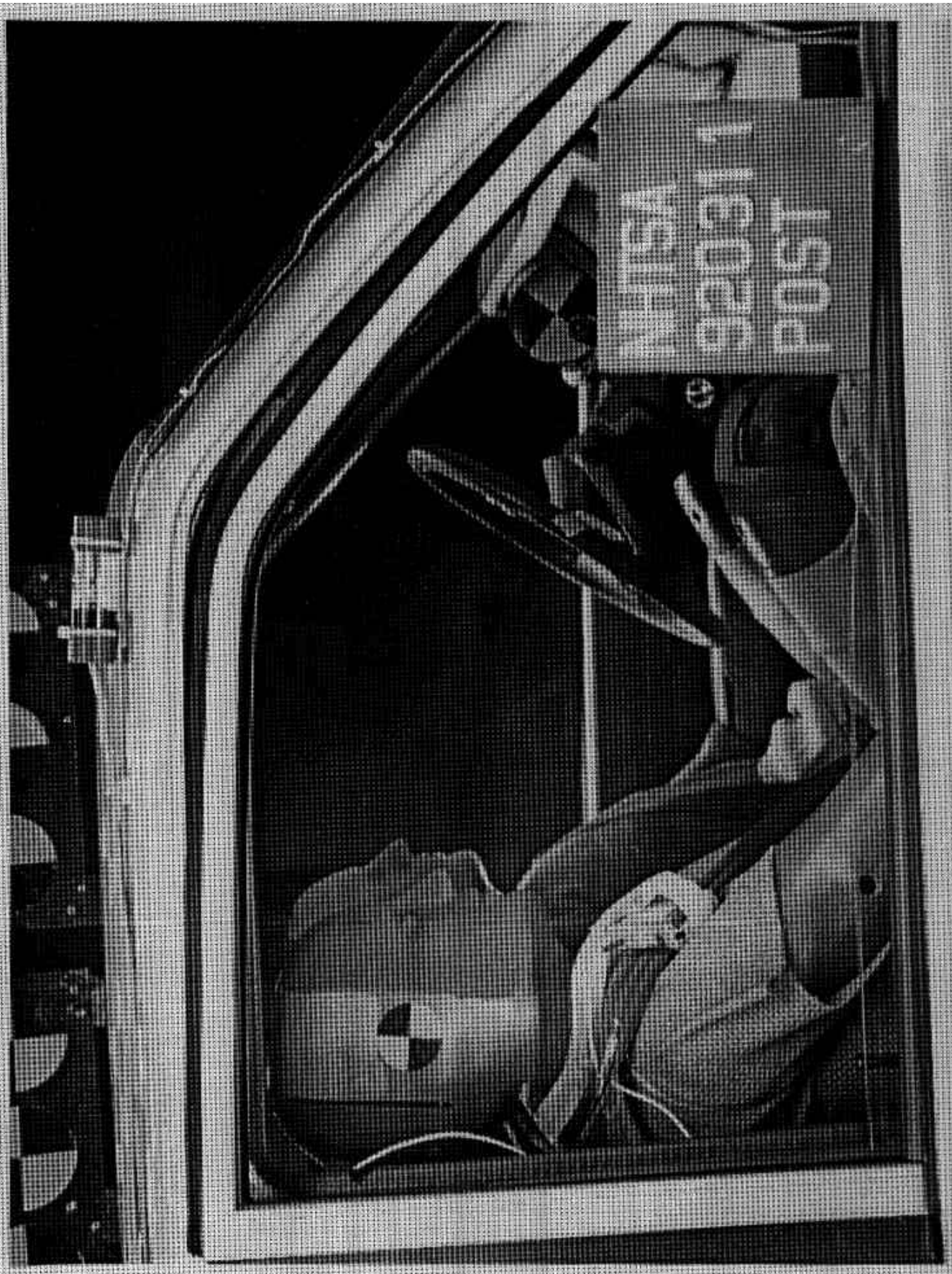


FIGURE A-30. POST-TEST PASSENGER DUMMY POSITION VIEW

FIGURE A-31. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

FIGURE A-32. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

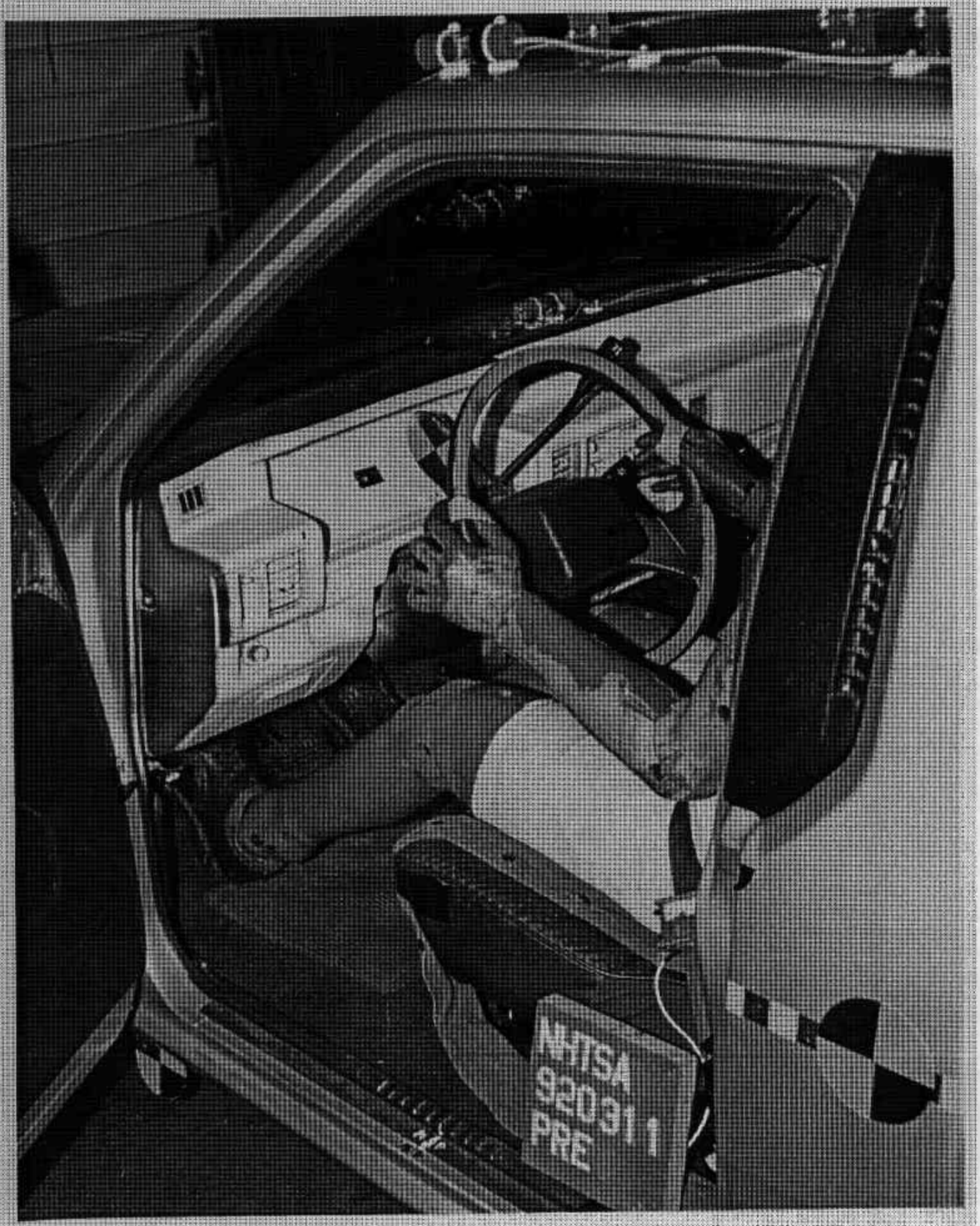


FIGURE A-33. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

FIGURE A-34. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

FIGURE A-35. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1

FIGURE A-36. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1

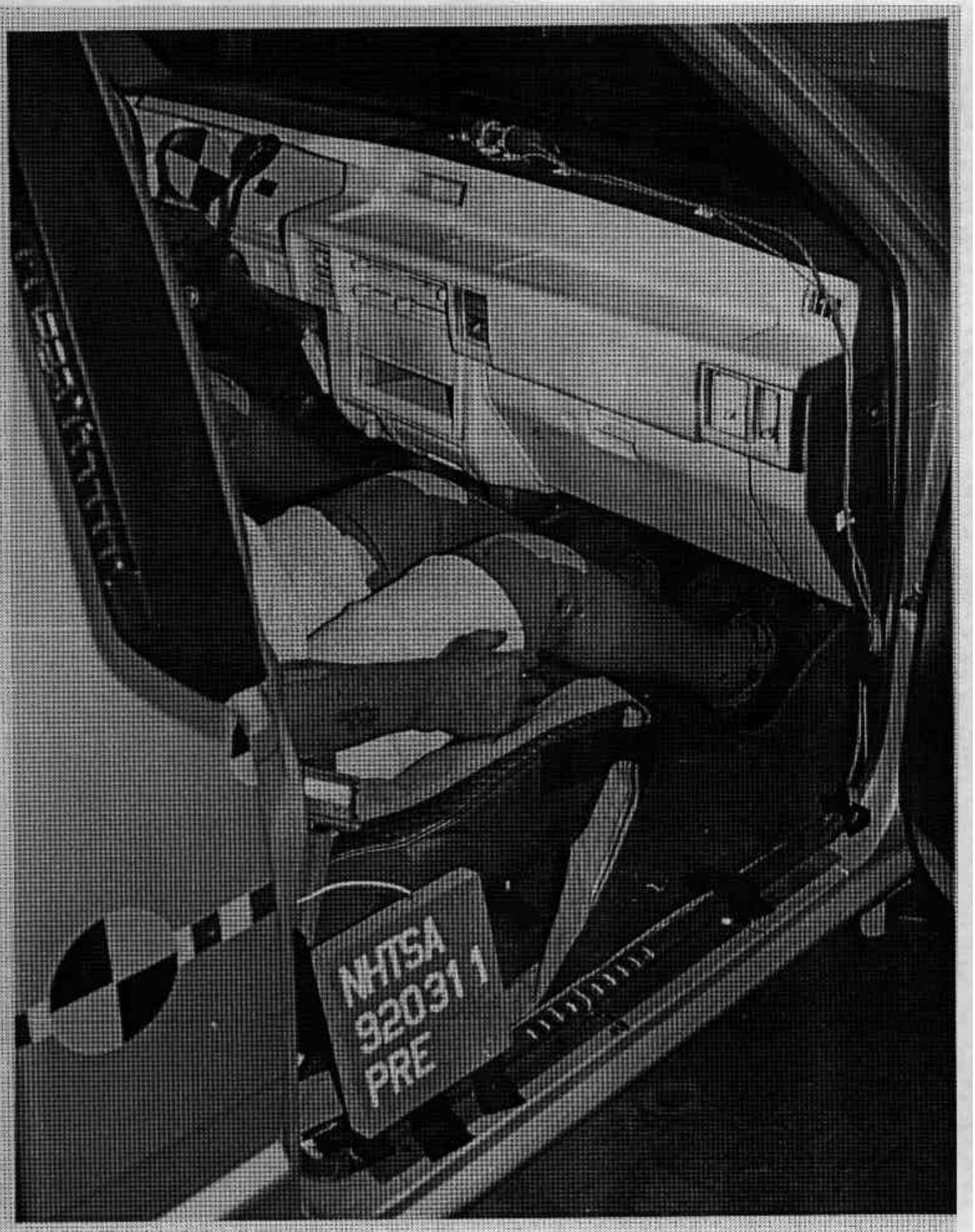


FIGURE A-37. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

FIGURE A-38. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

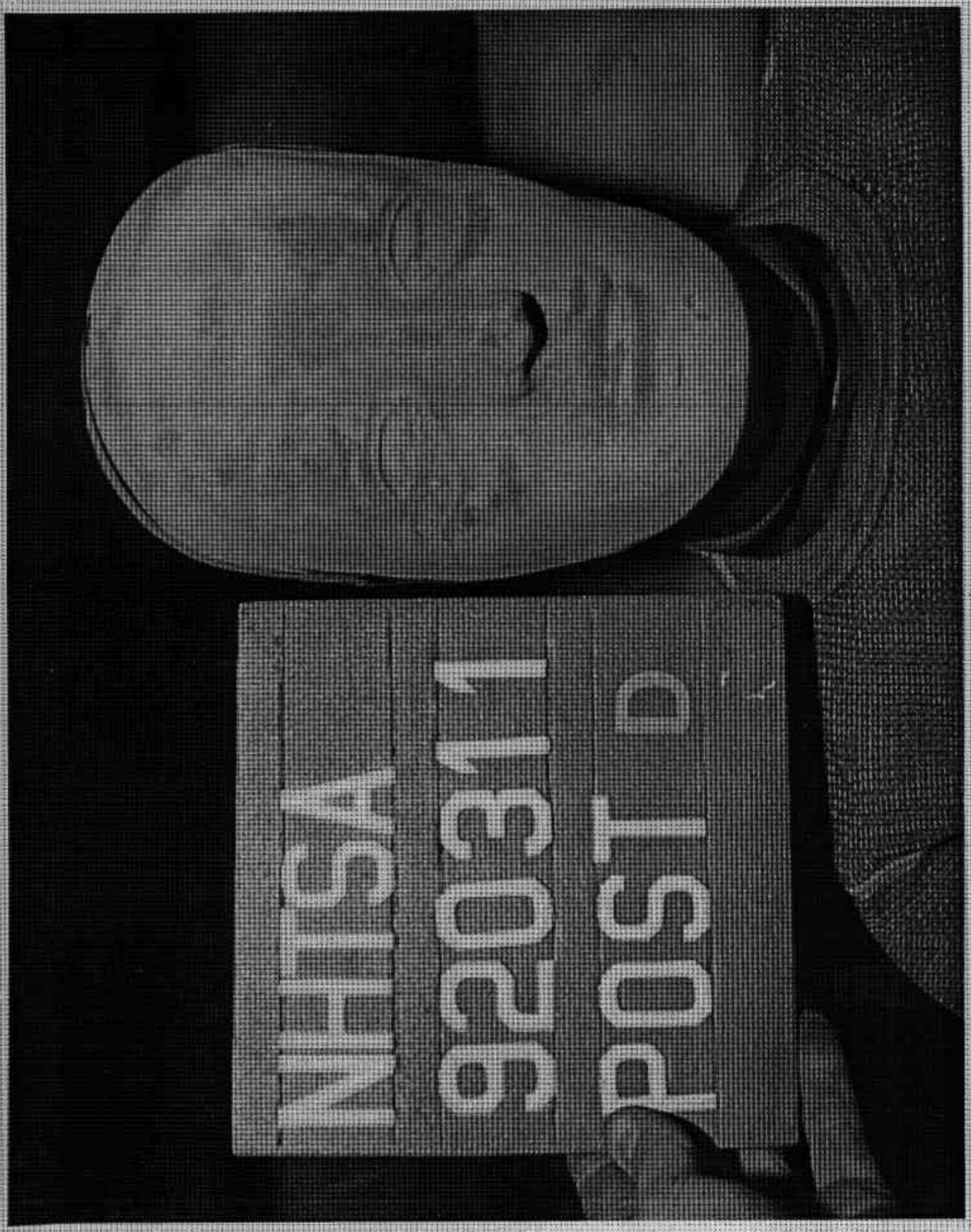


FIGURE A-39. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 1

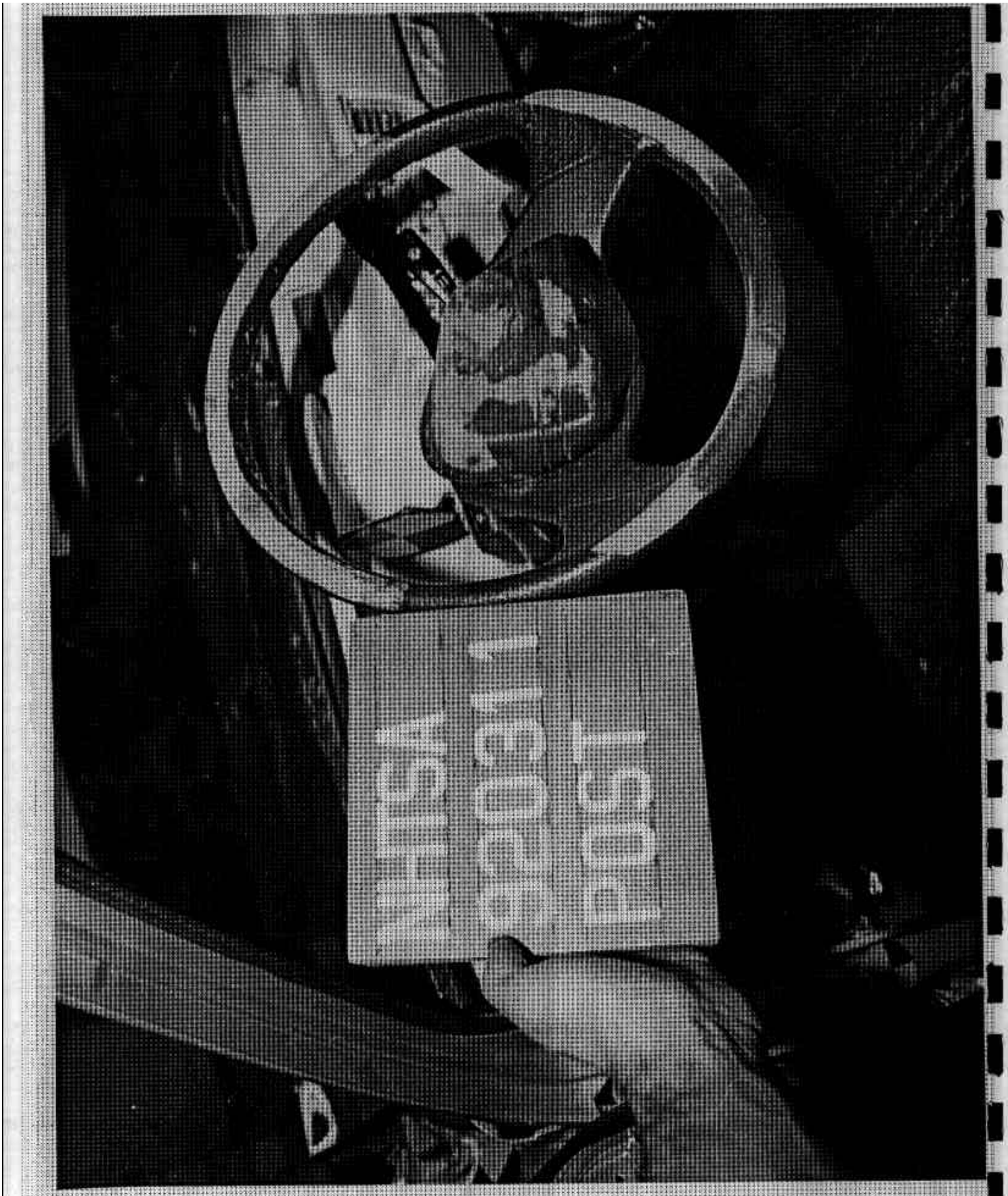


FIGURE A-40. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 2

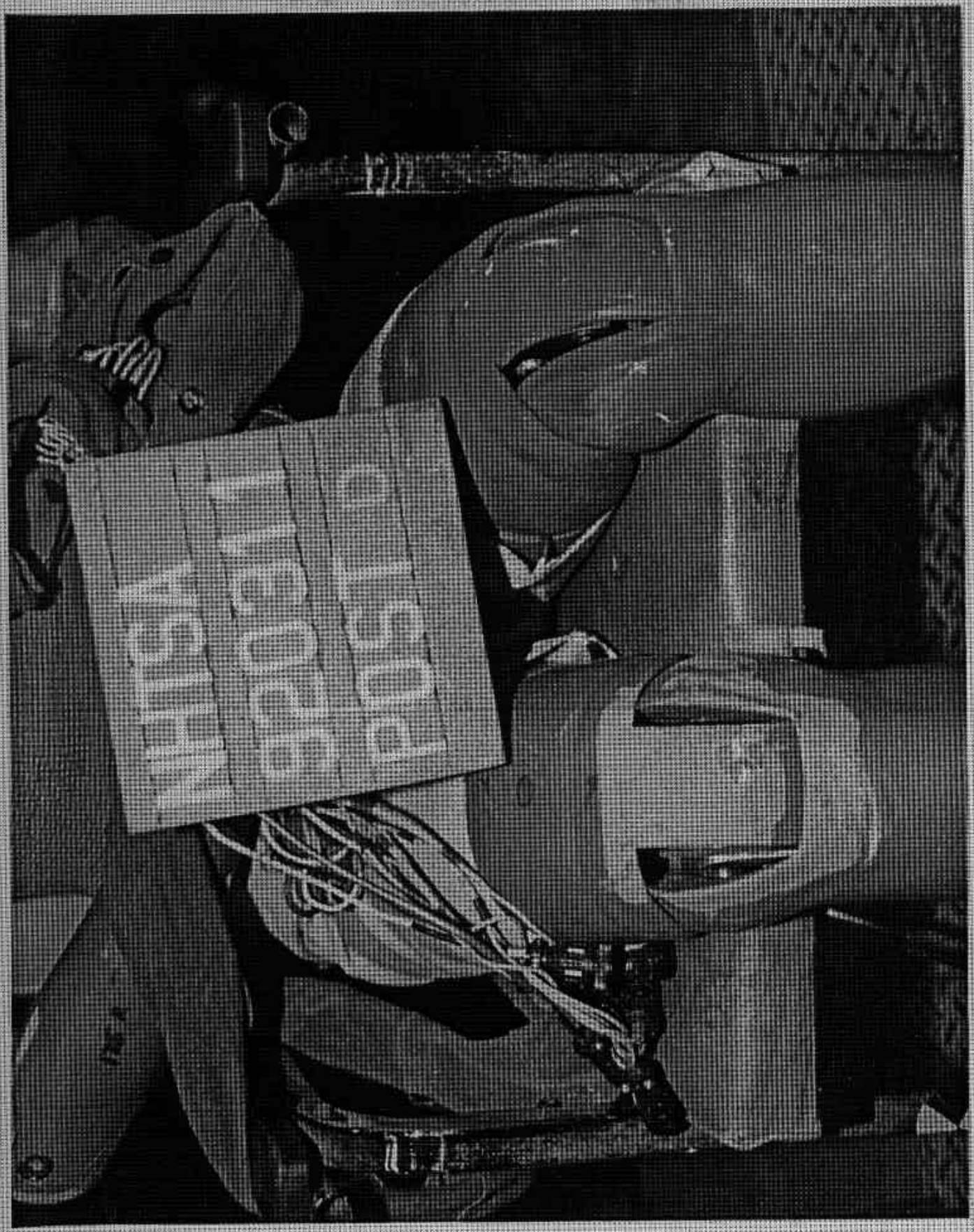


FIGURE A-41. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 1

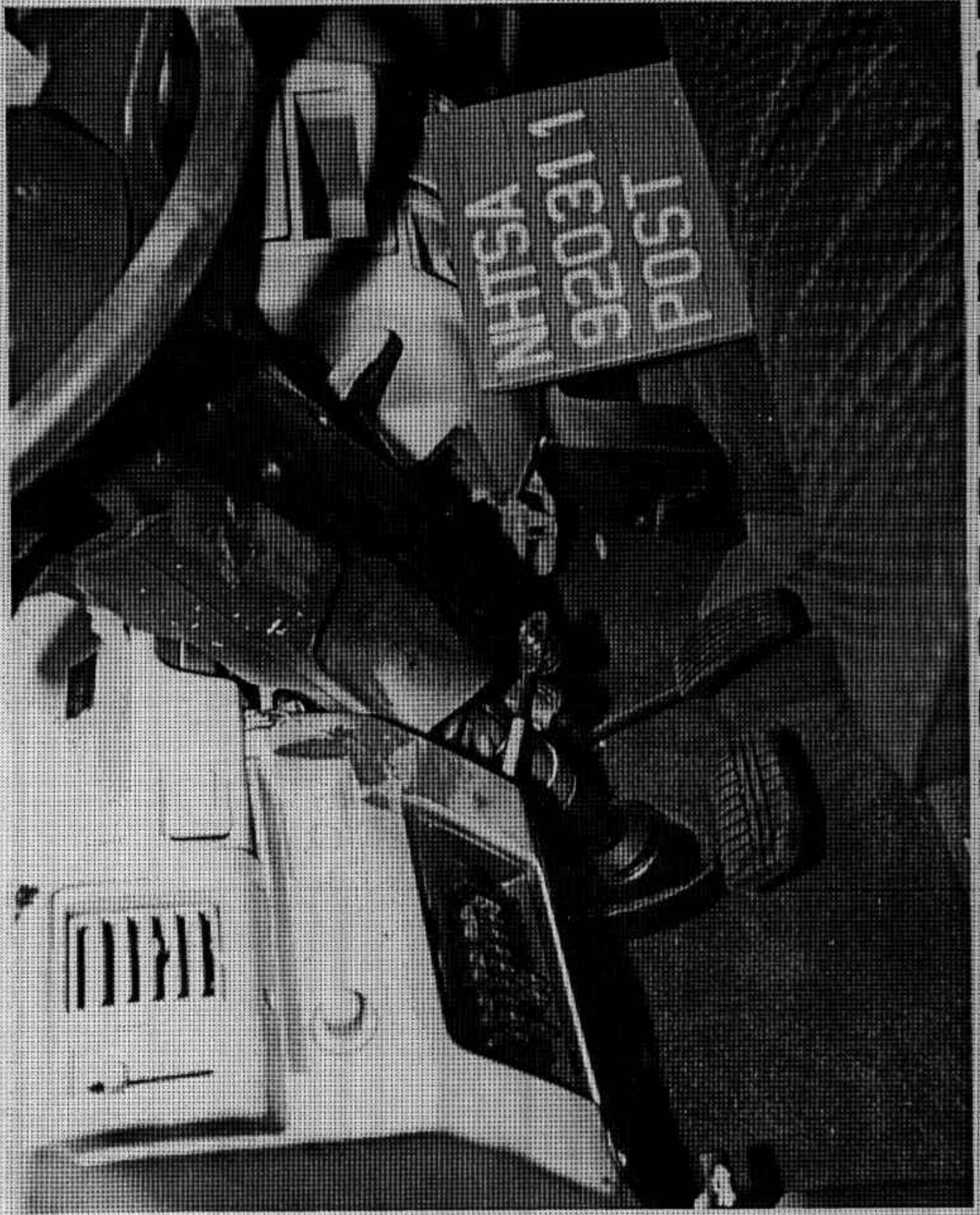


FIGURE A-42. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 2

FIGURE A-43. POST-TEST PASSENGER DUMMY HEAD CONTACT - VIEW 1

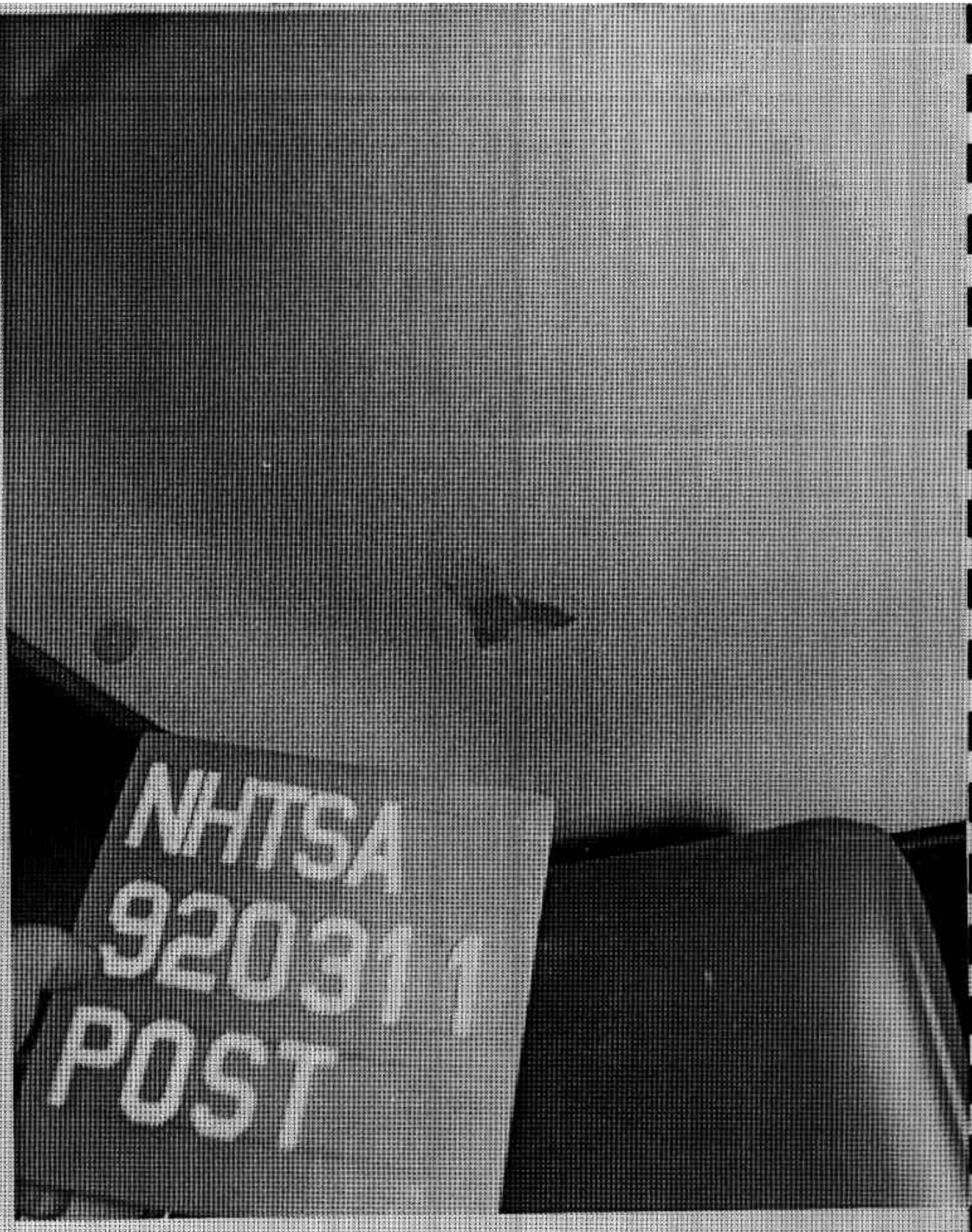


FIGURE A-44. POST-TEST PASSENGER DUMMY HEAD CONTACT - VIEW 2

FIGURE A-45. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 1

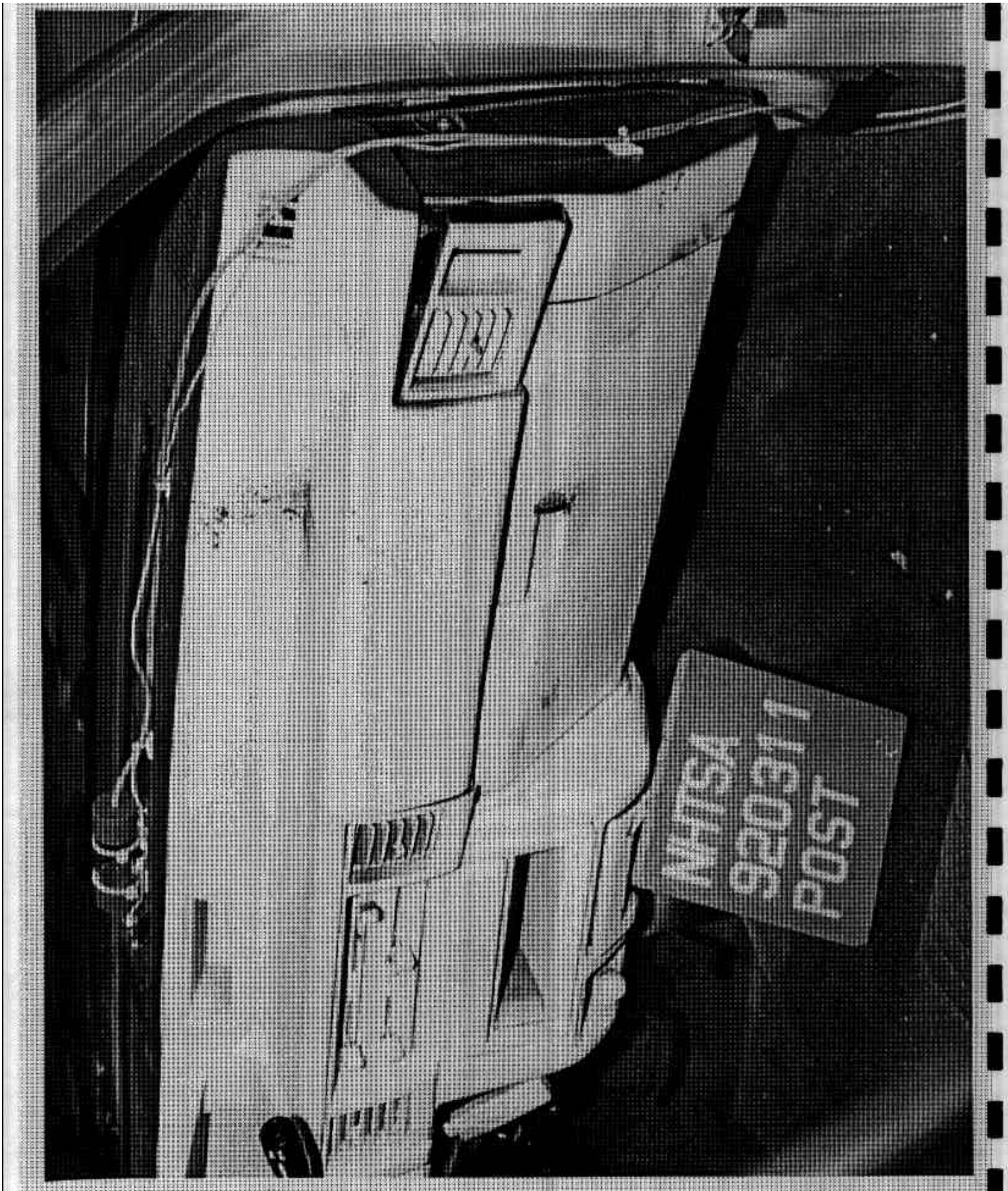


FIGURE A-46. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 2

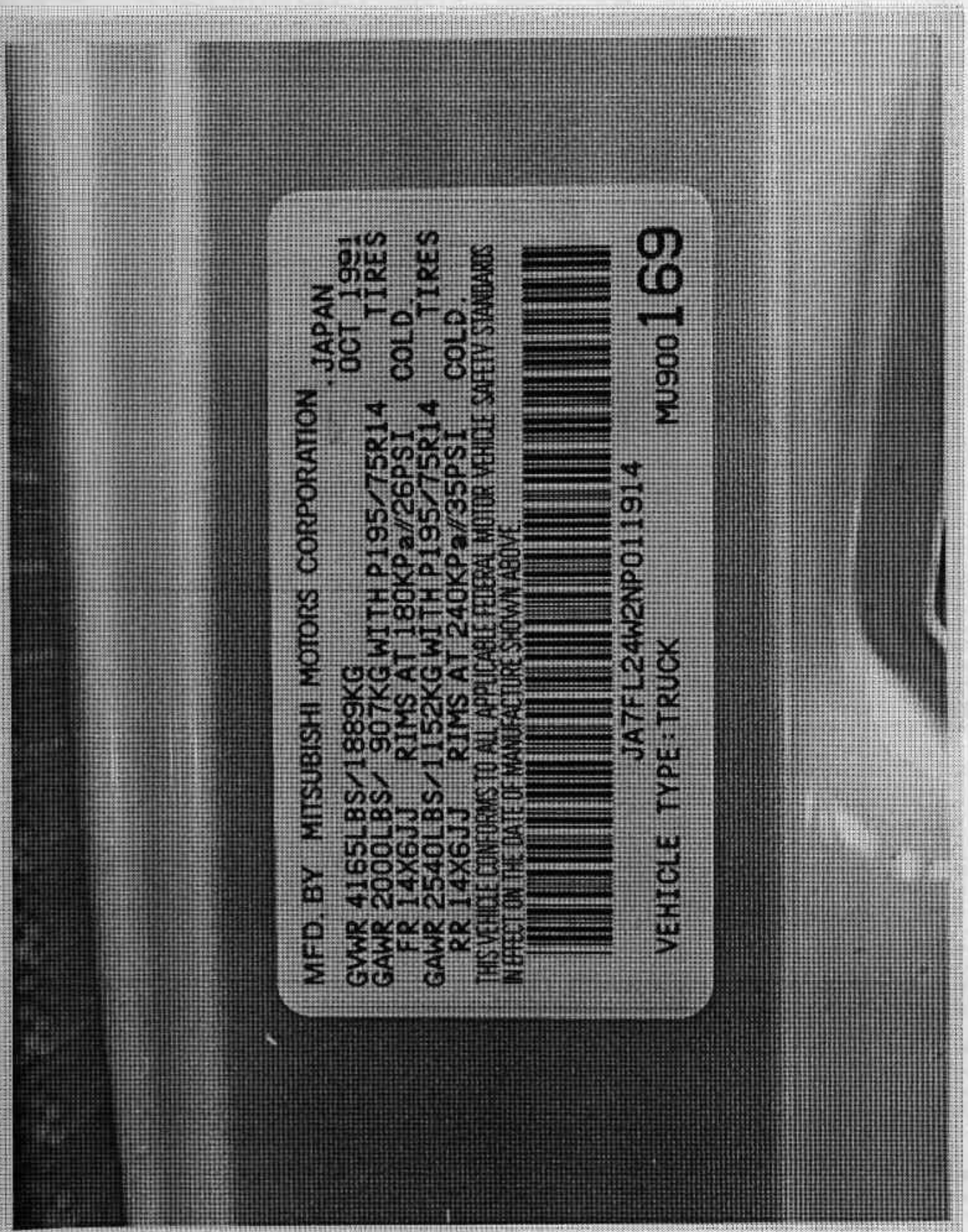
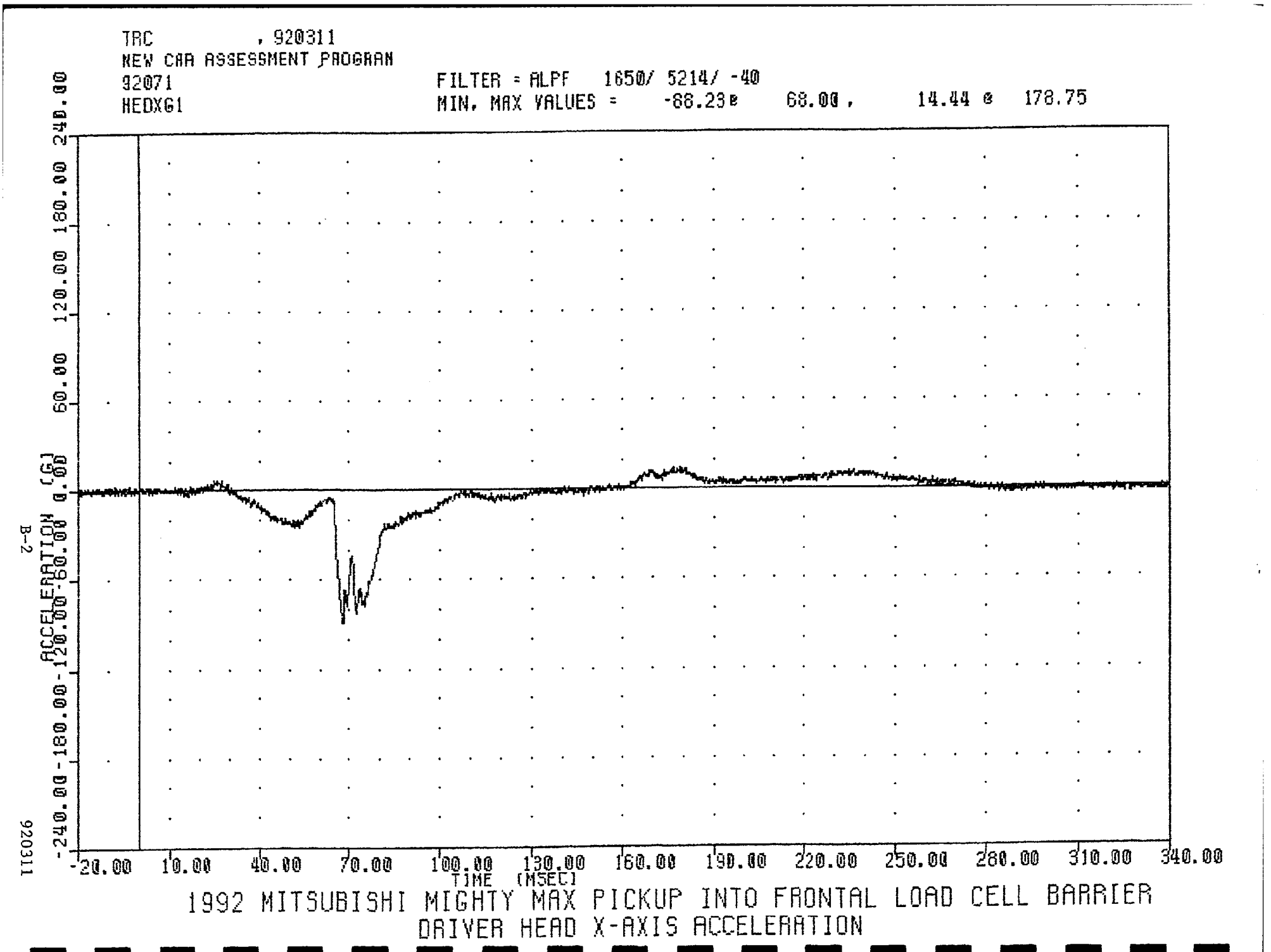


FIGURE A-47. PRE-TEST VEHICLE CERT. & RECOMMENDED TIRE PRES. LABEL

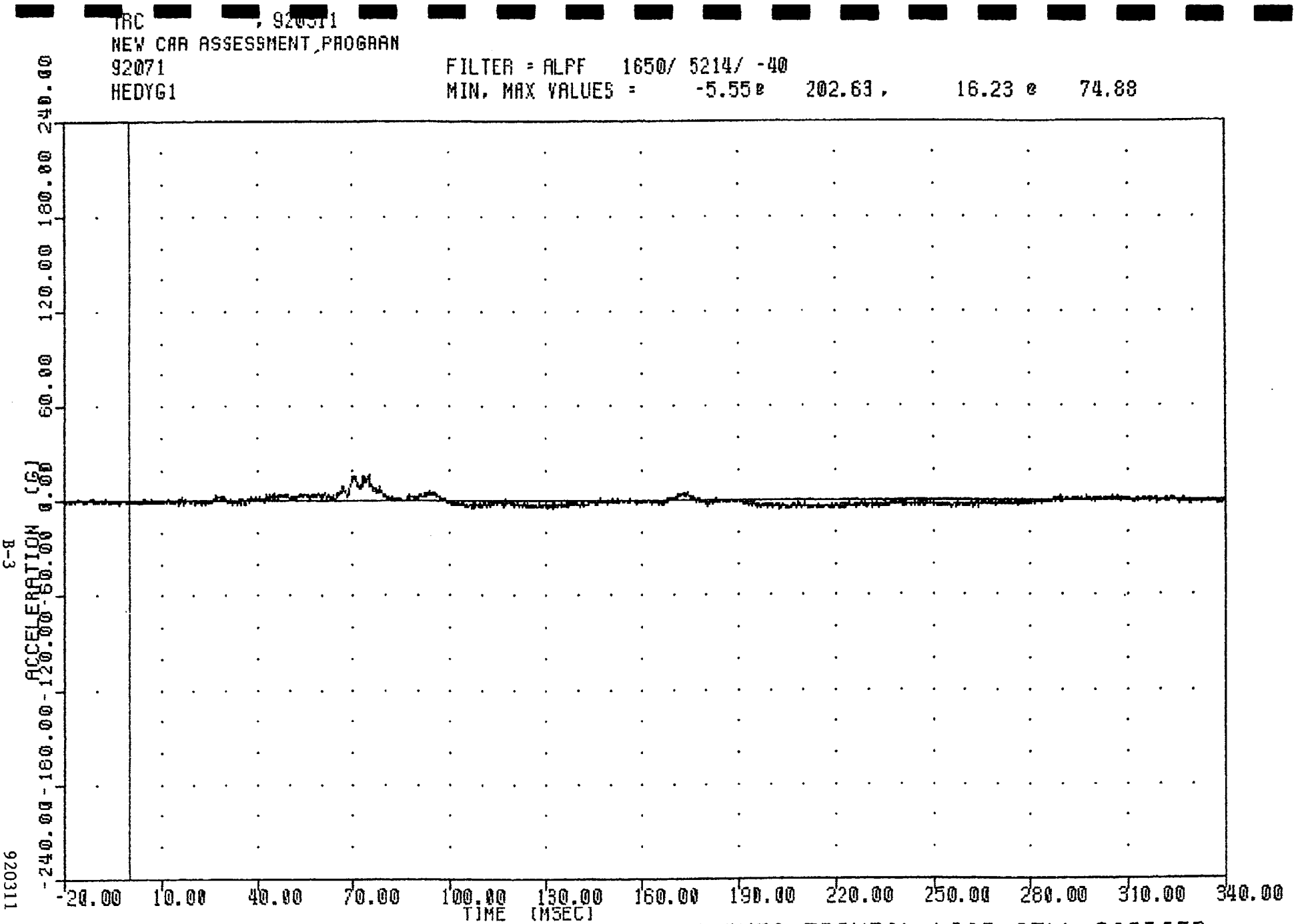
Intentionally Left Blank

APPENDIX B

DATA PLOTS

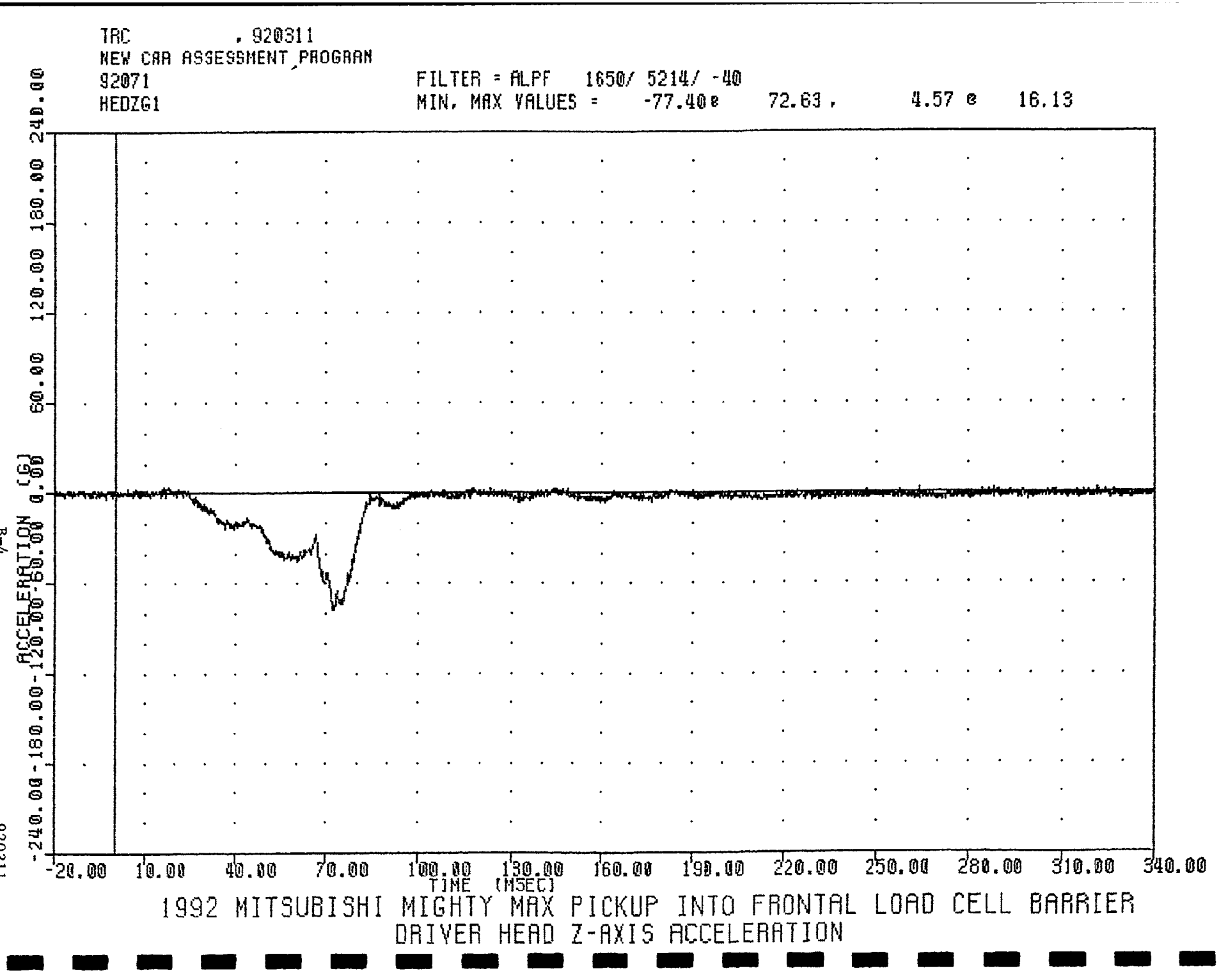


1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD X-AXIS ACCELERATION

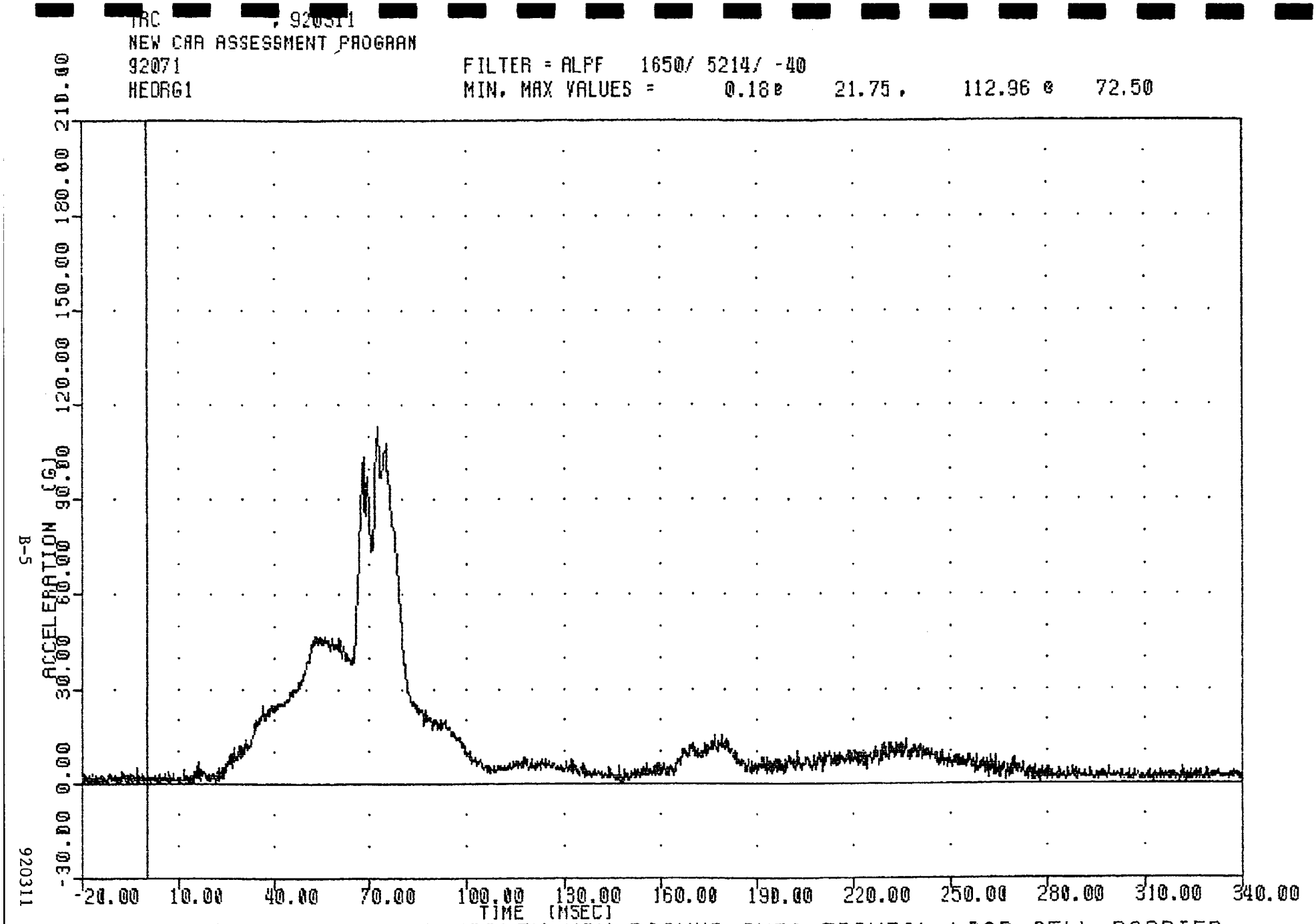


1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Y-AXIS ACCELERATION

920311

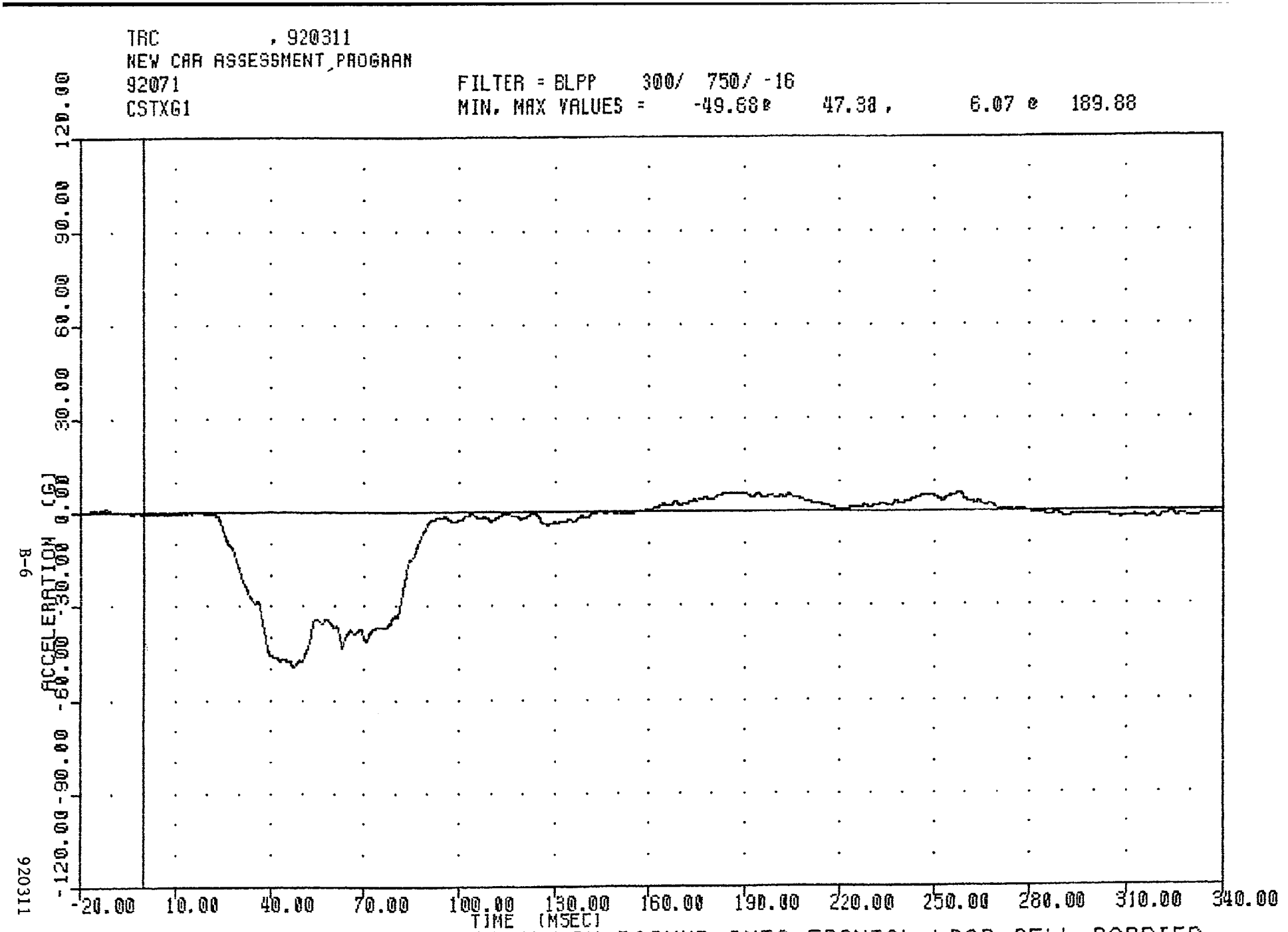


1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Z-AXIS ACCELERATION



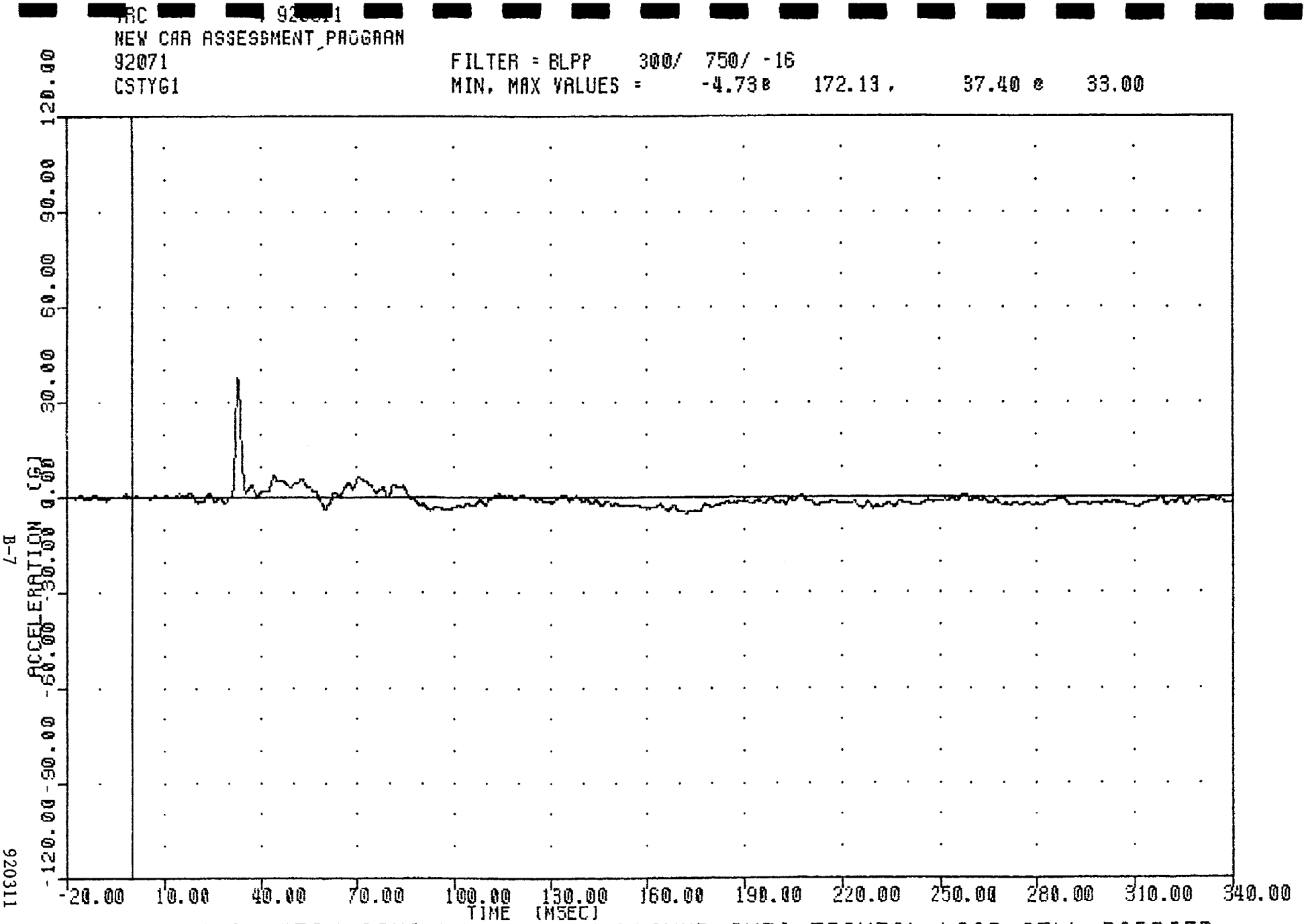
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD RESULTANT ACCELERATION

920311



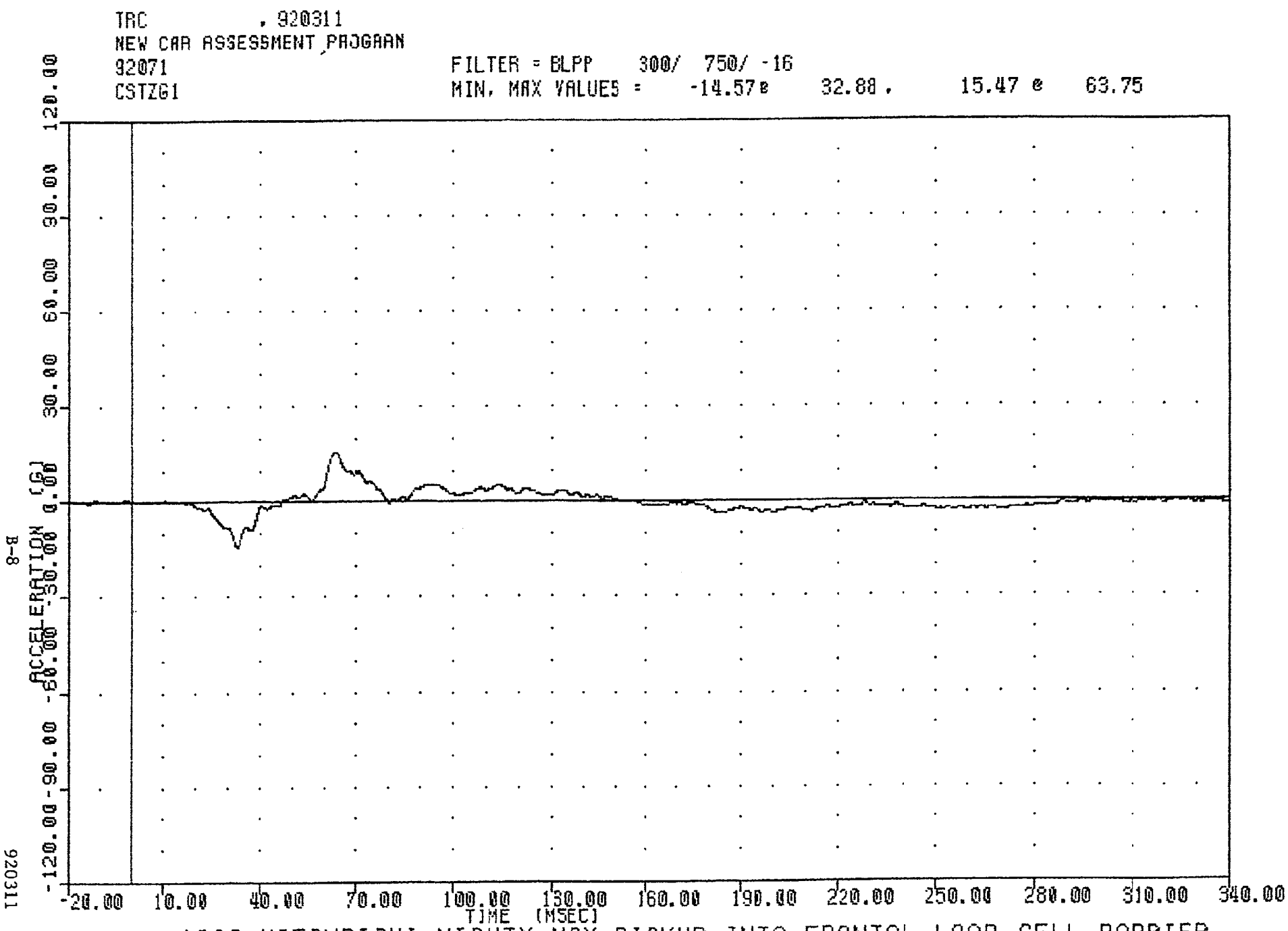
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST X-AXIS ACCELERATION

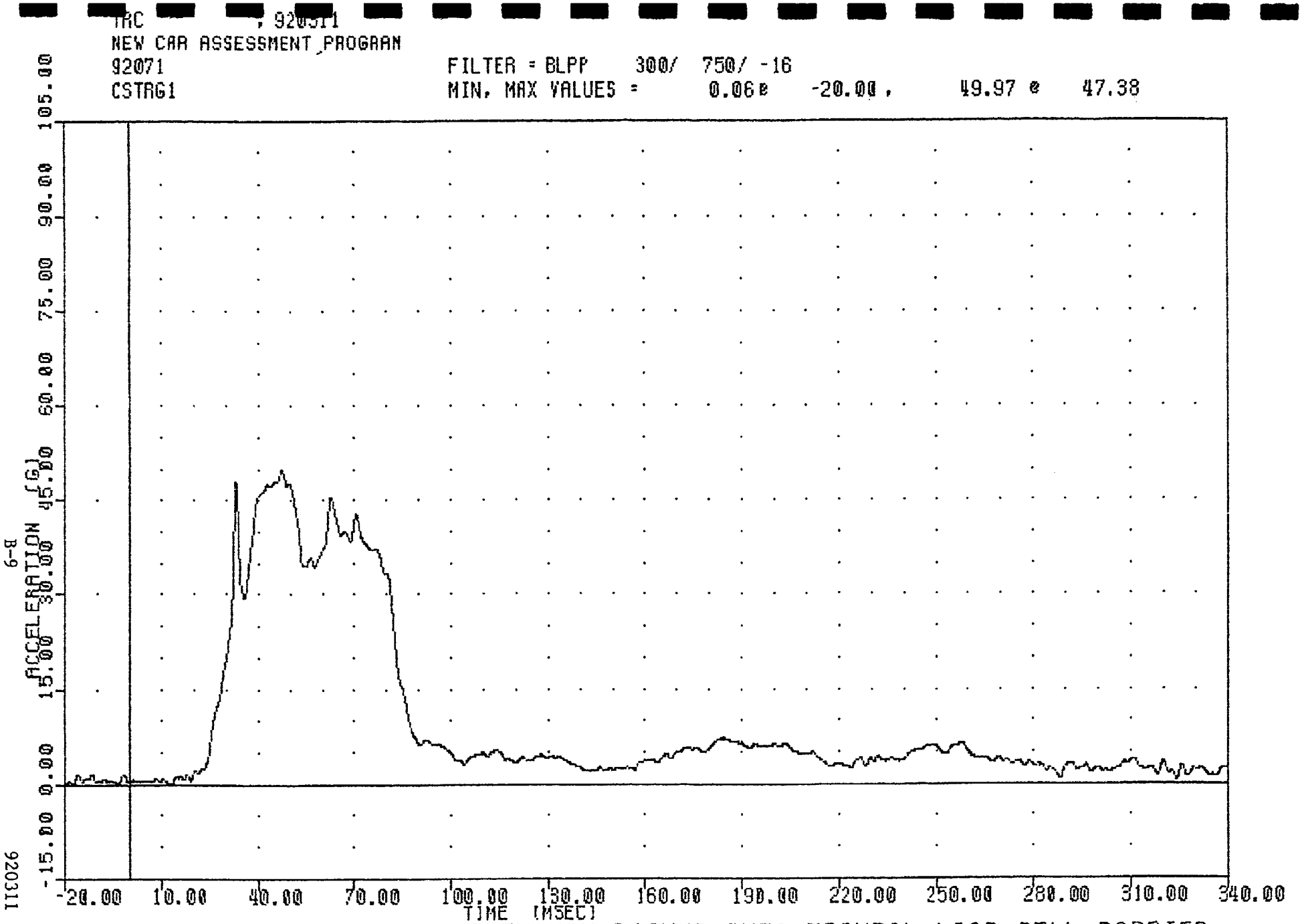
920311



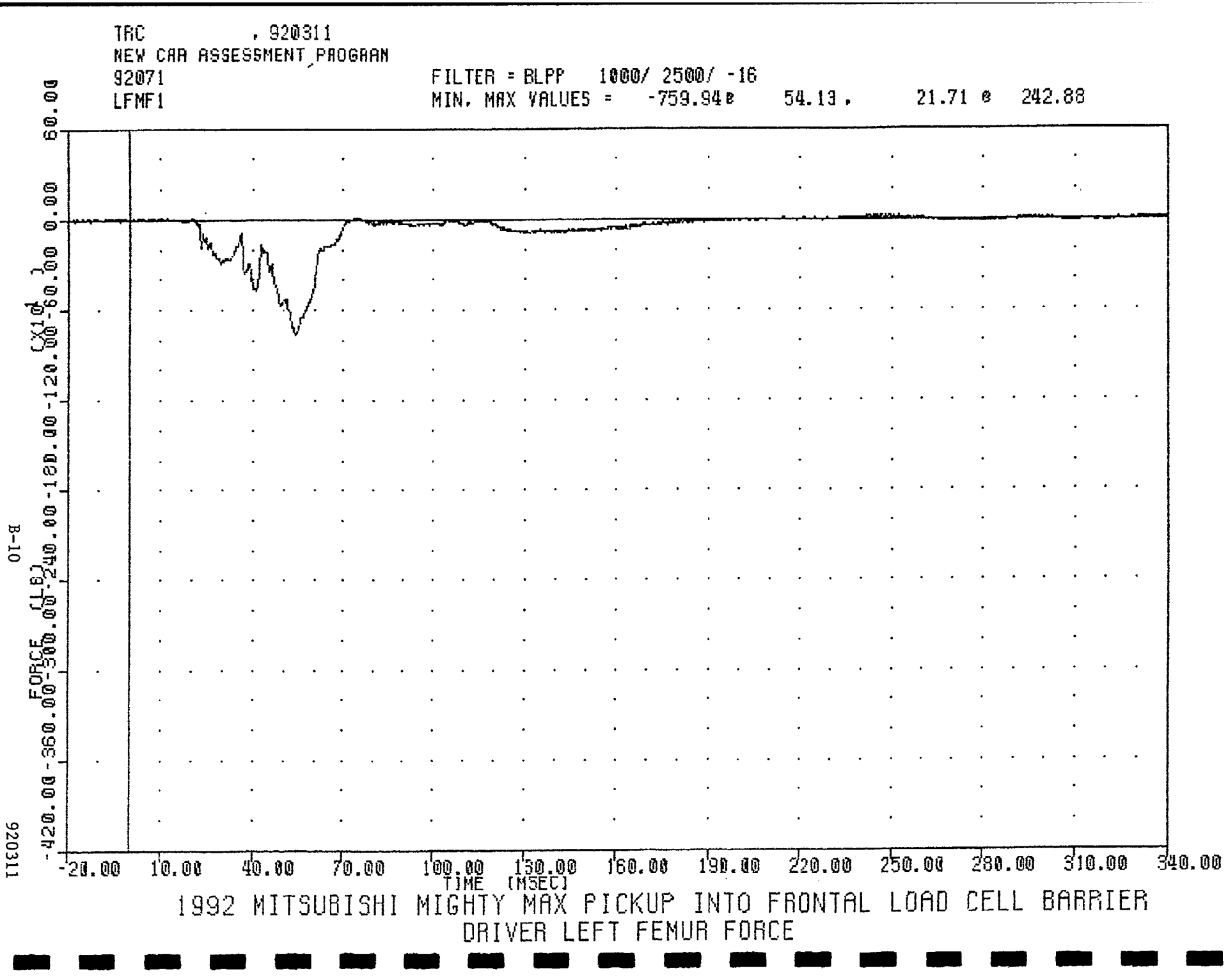
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Y-AXIS ACCELERATION

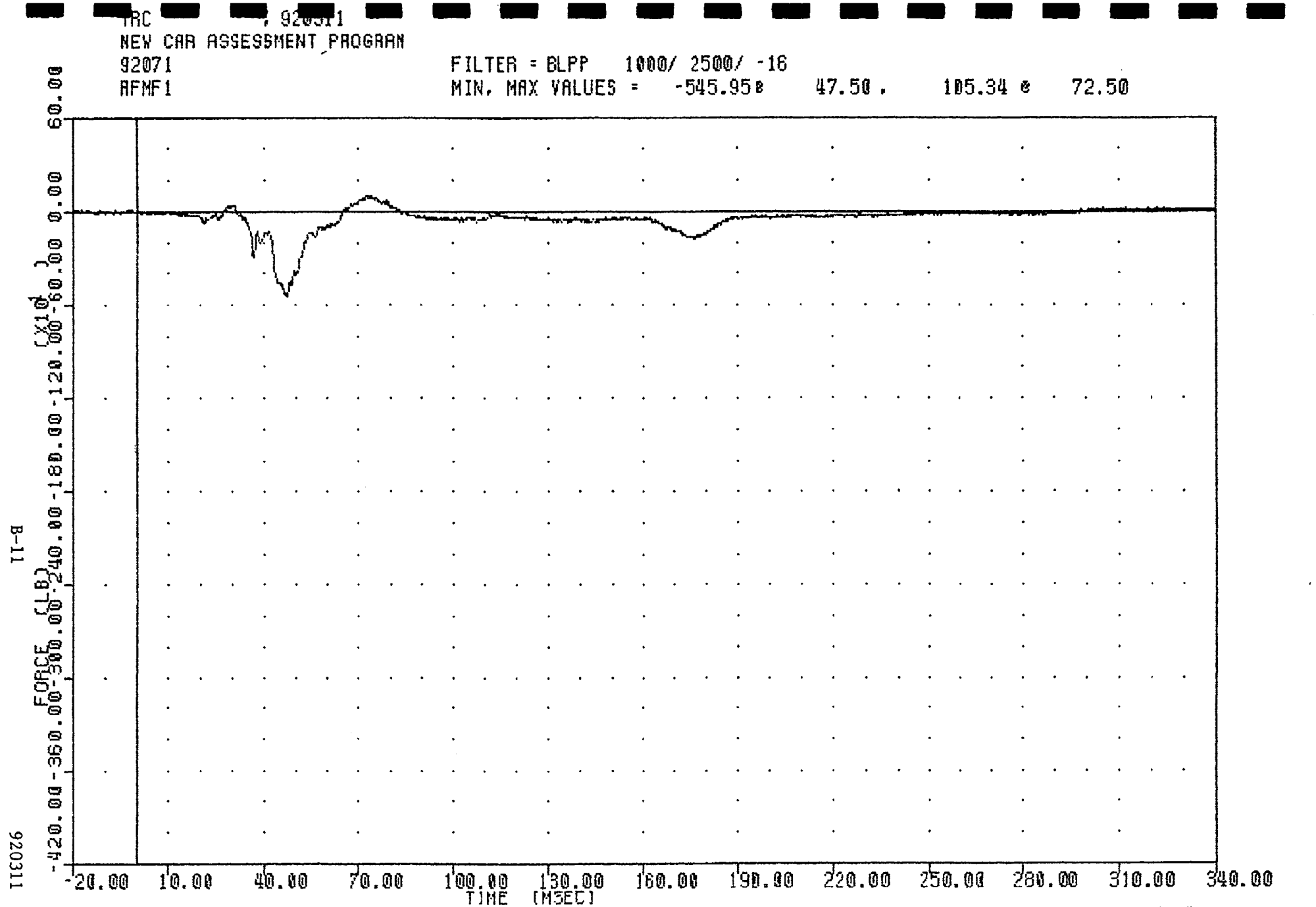
920311


TRC , 920311
NEW CAR ASSESSMENT PROGRAM
92071
CSTZG1
FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -14.57 @ 32.88 , 15.47 @ 63.75
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)
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Z-AXIS ACCELERATION

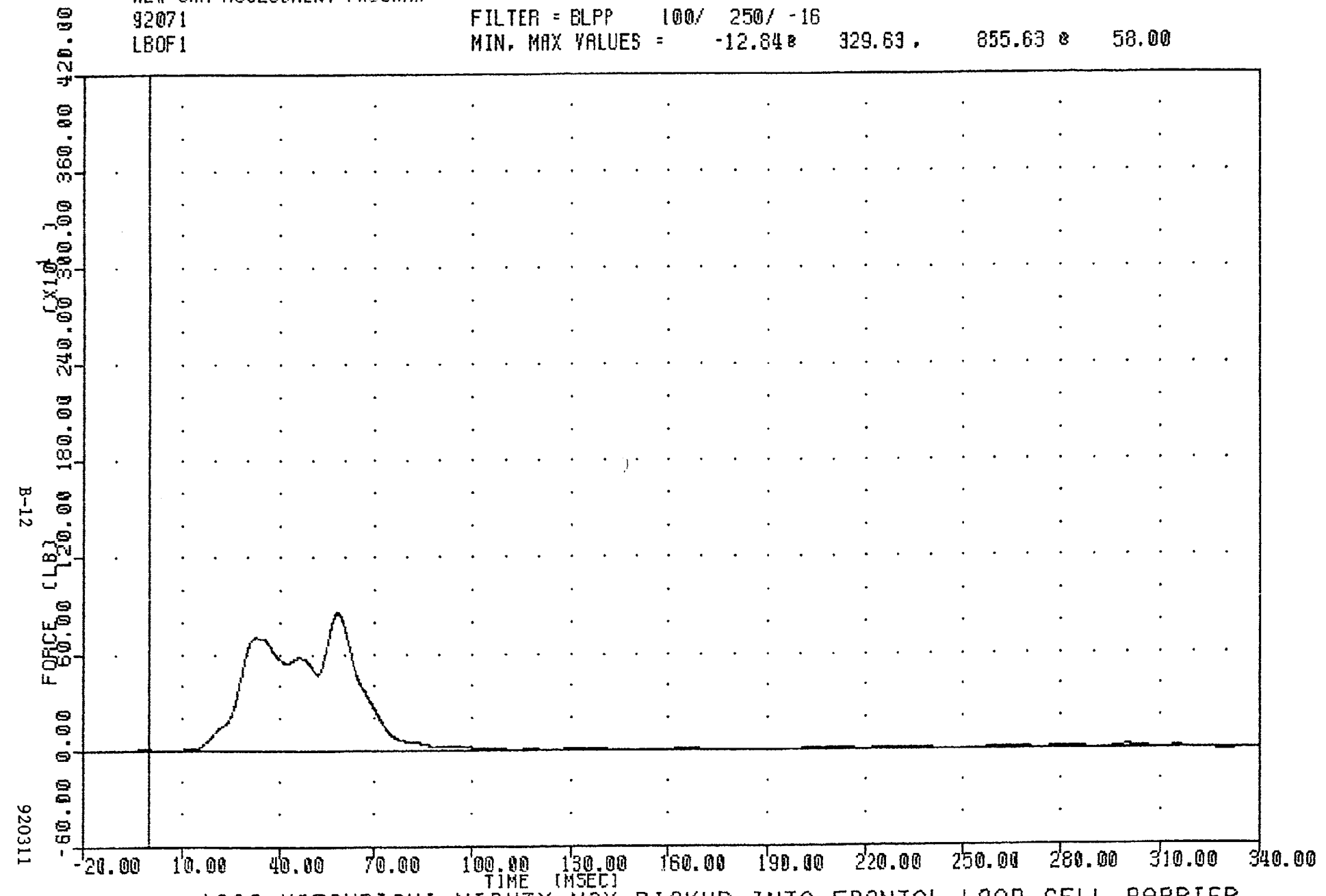


1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST RESULTANT ACCELERATION


TRC , 920311
NEW CAR ASSESSMENT PROGRAM
92071
LFMF1
FILTER = BLPP 1000/ 2500/ -16
MIN. MAX VALUES = -759.94 @ 54.13 , 21.71 @ 242.88
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
FORCE (LB) (X10^1)
-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)
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT FEMUR FORCE

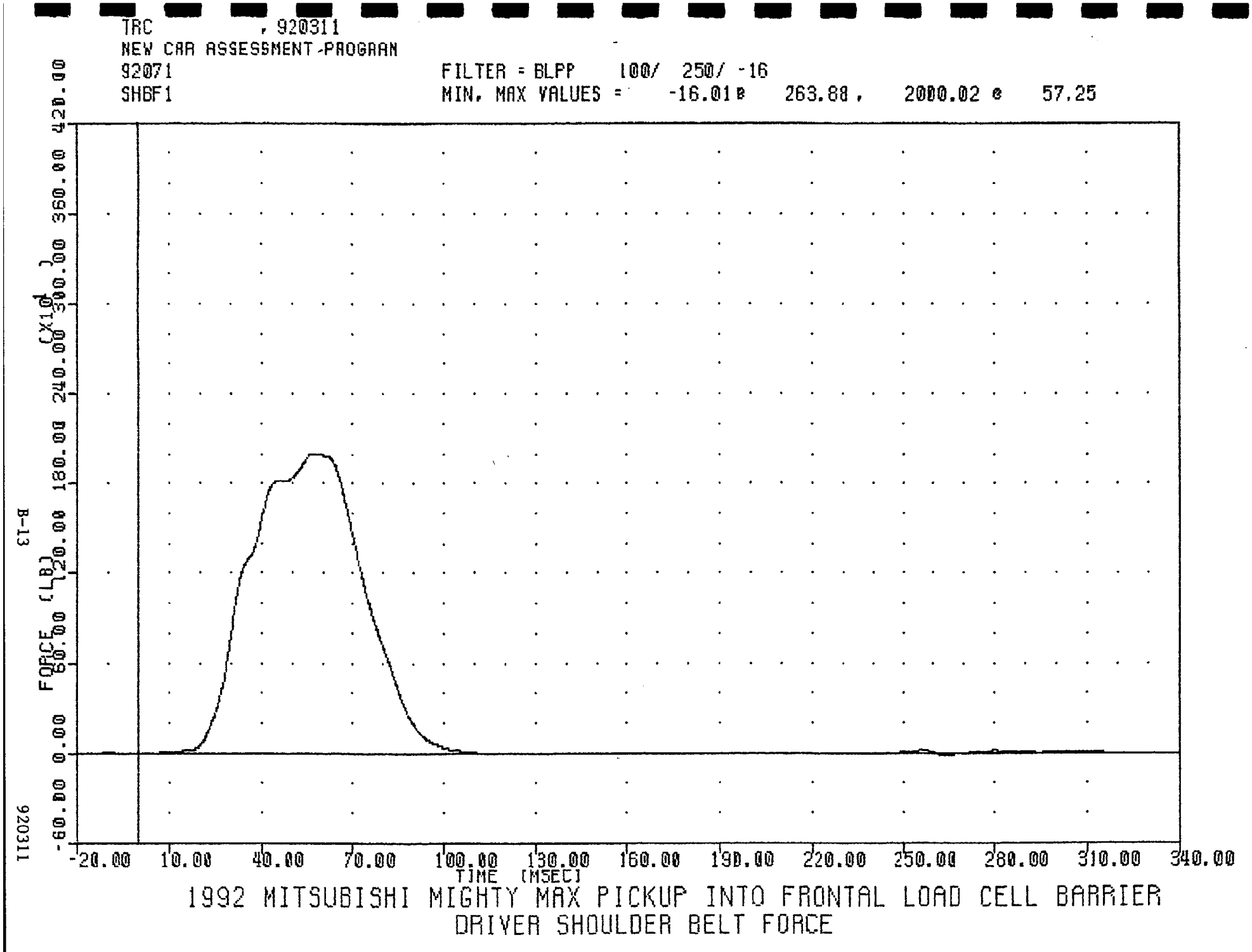


1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FEMUR FORCE

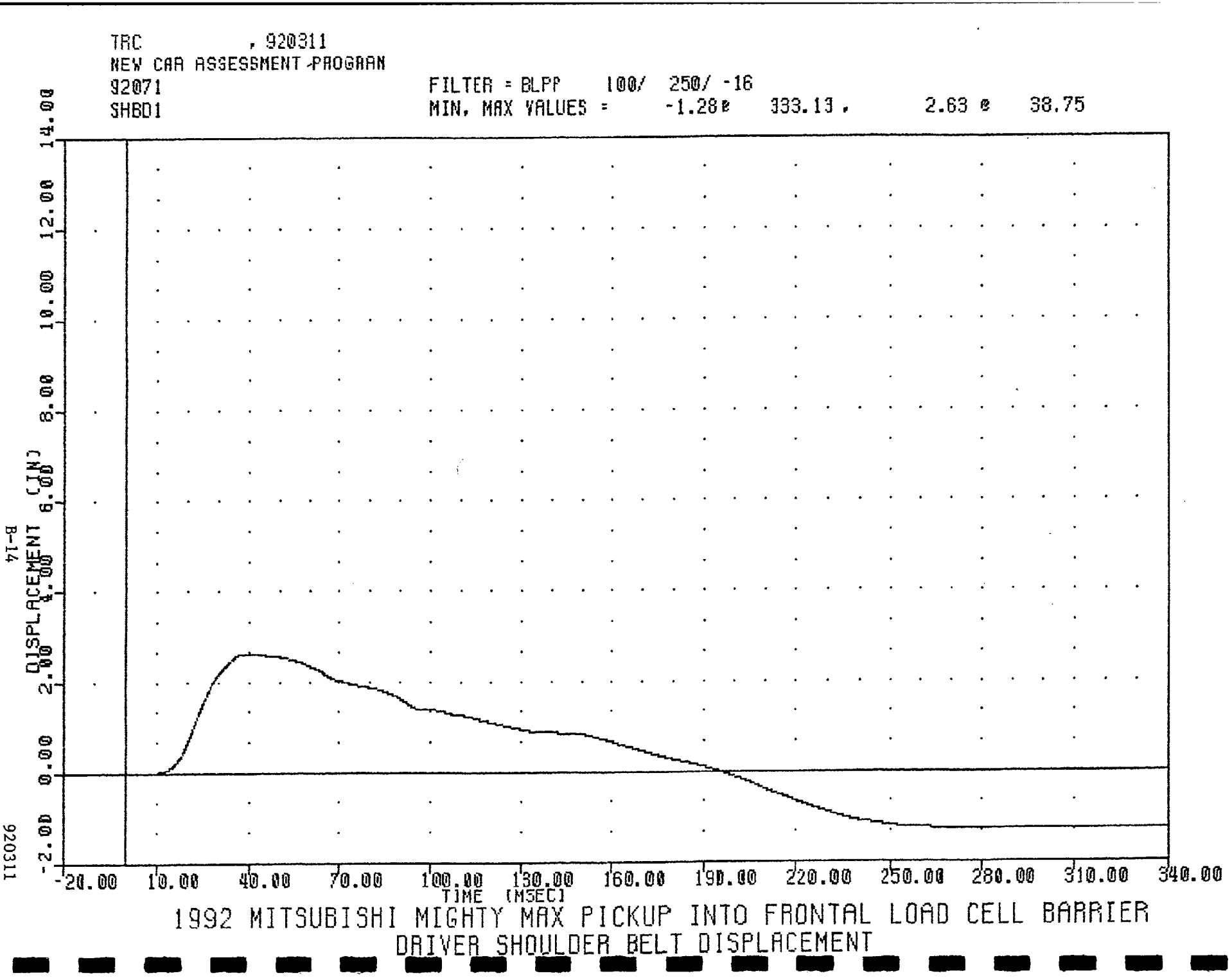


1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
DRIVER LAP BELT OUTBOARD FORCE

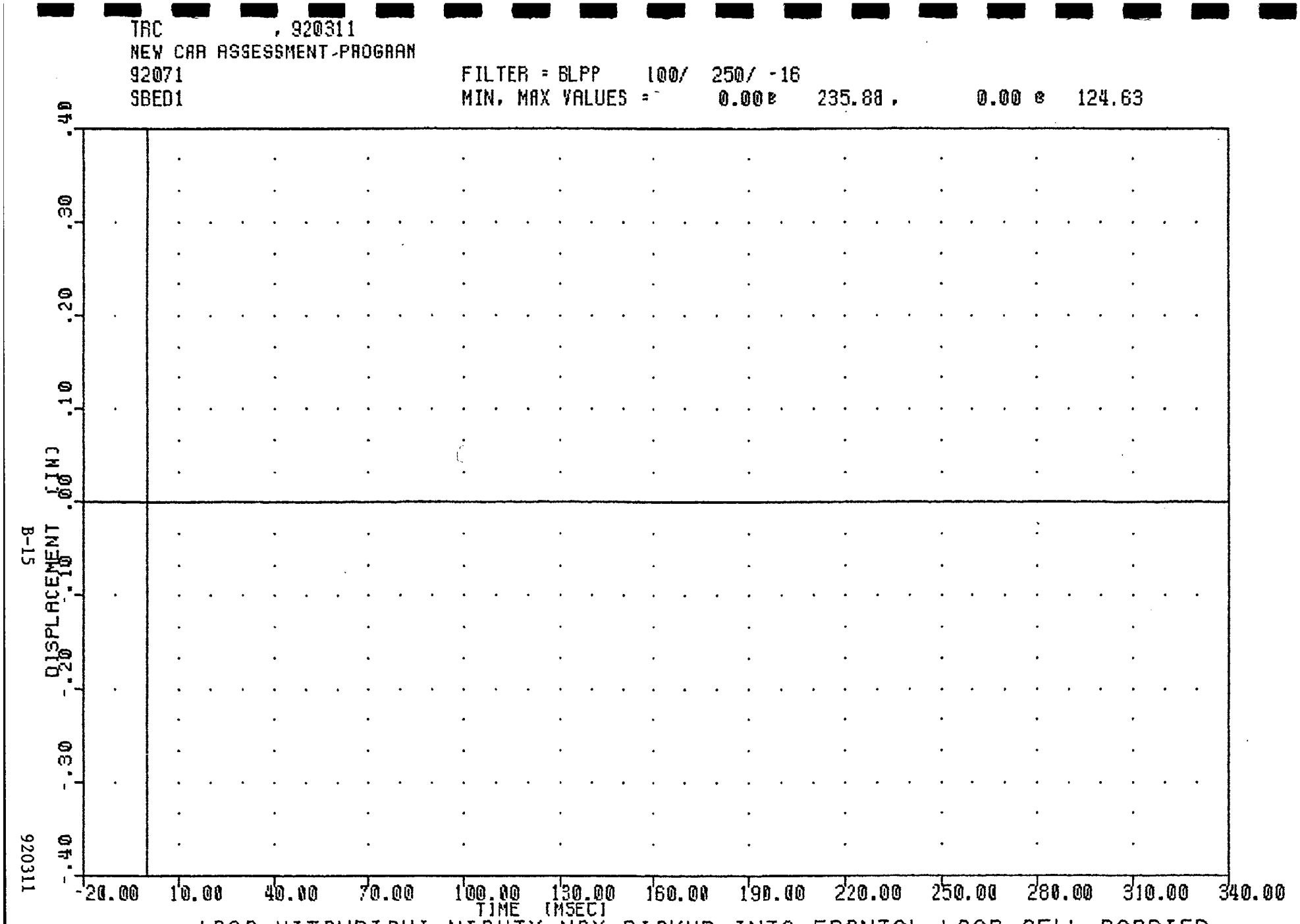
920311



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
DRIVER SHOULDER BELT FORCE

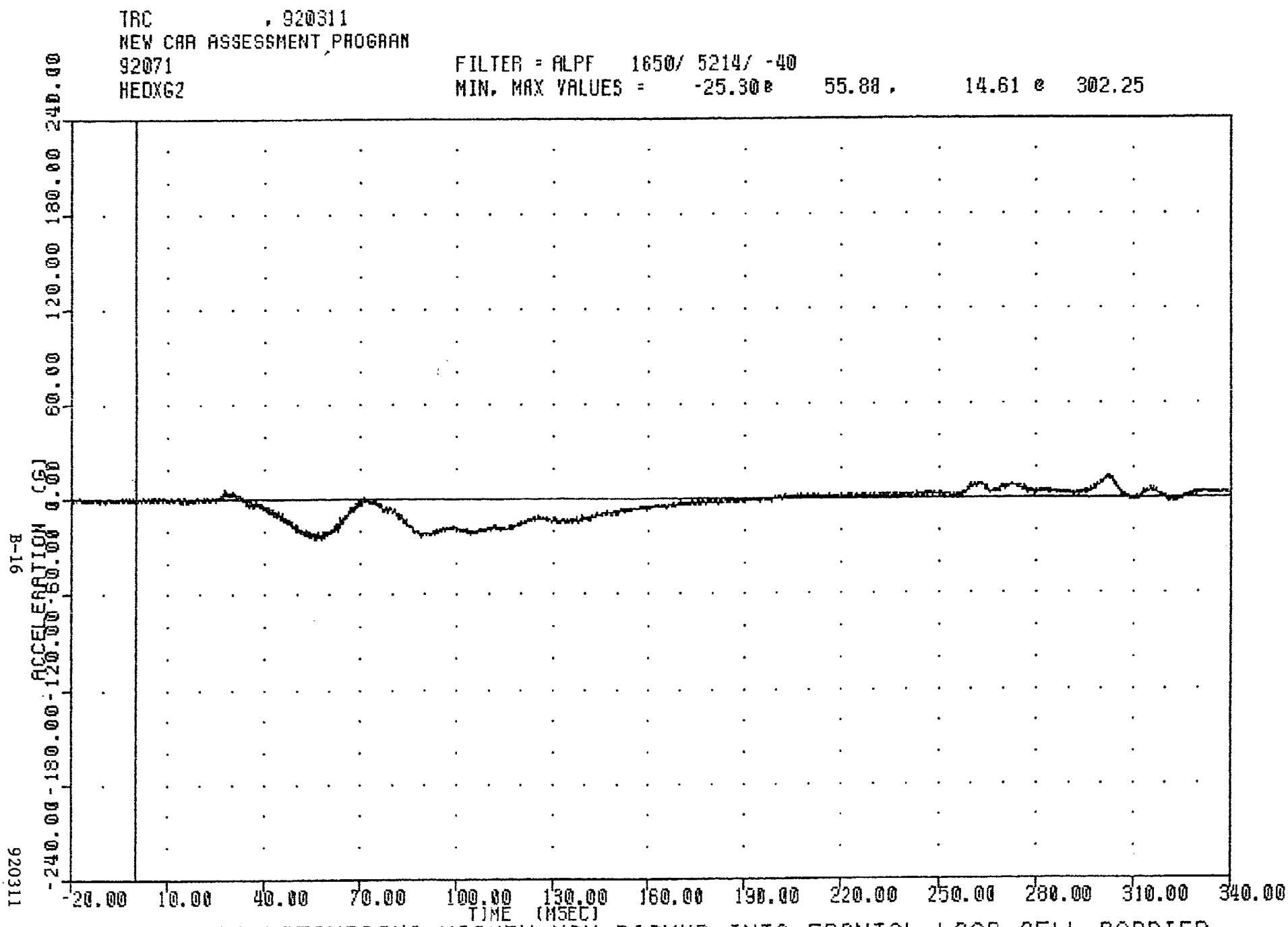

TRC , 920311
NEW CAR ASSESSMENT PROGRAM
92071
SHBD1
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -1.28 @ 333.13 , 2.63 @ 38.75
DISPLACEMENT (IN)
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
-2.00
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
DRIVER SHOULDER BELT DISPLACEMENT

920311



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
DRIVER SEAT BELT EXTENSION

920311



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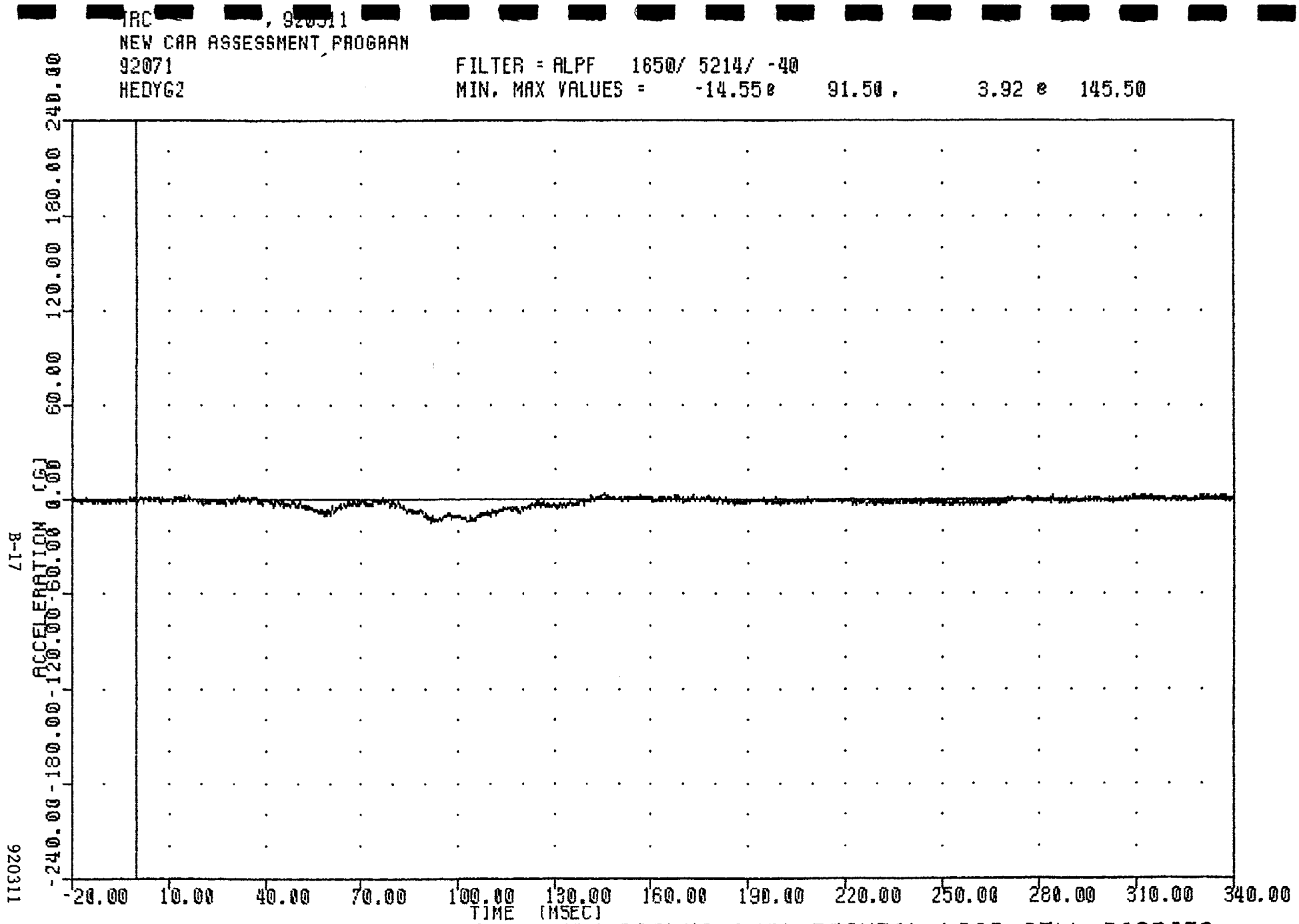
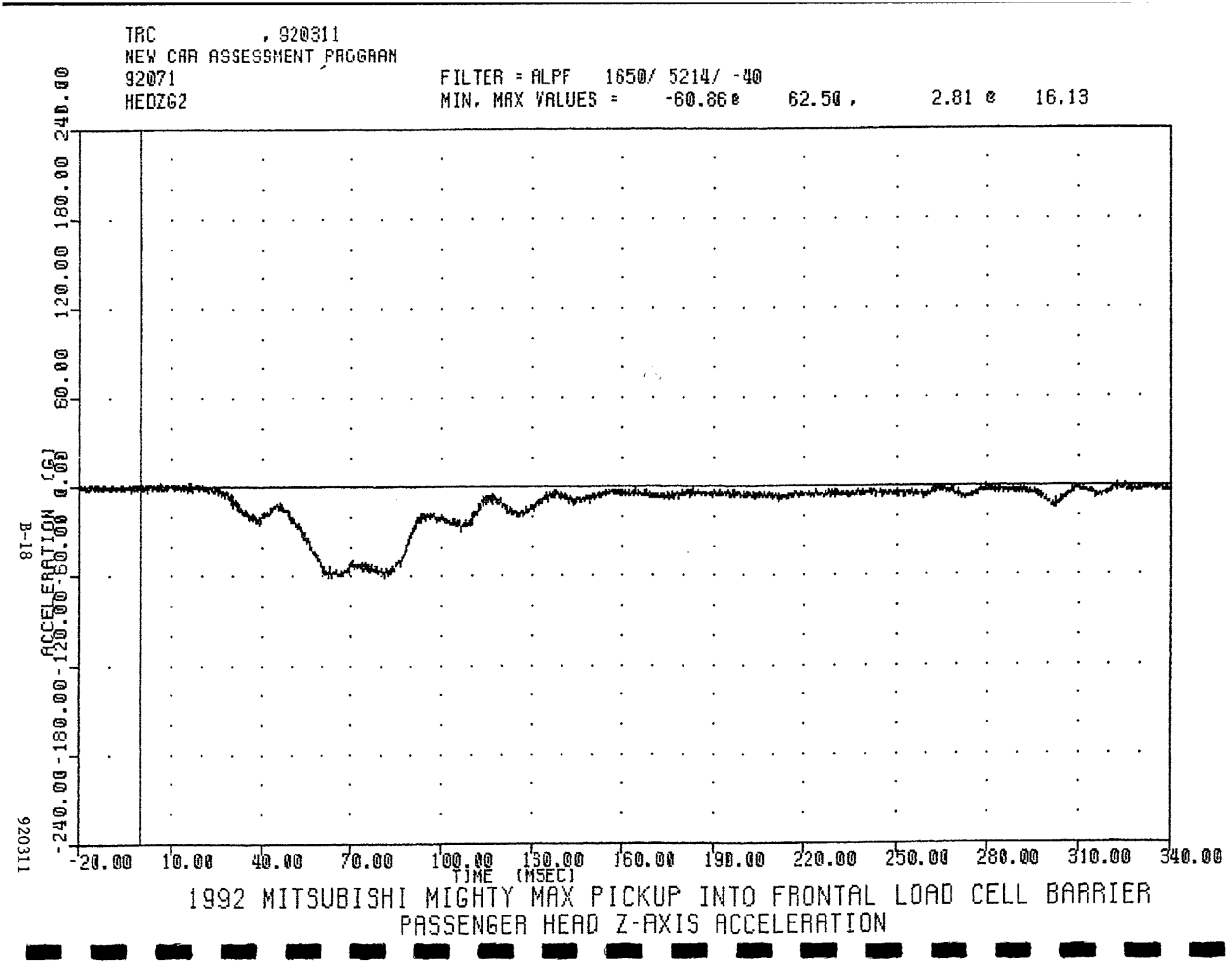
920311

1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

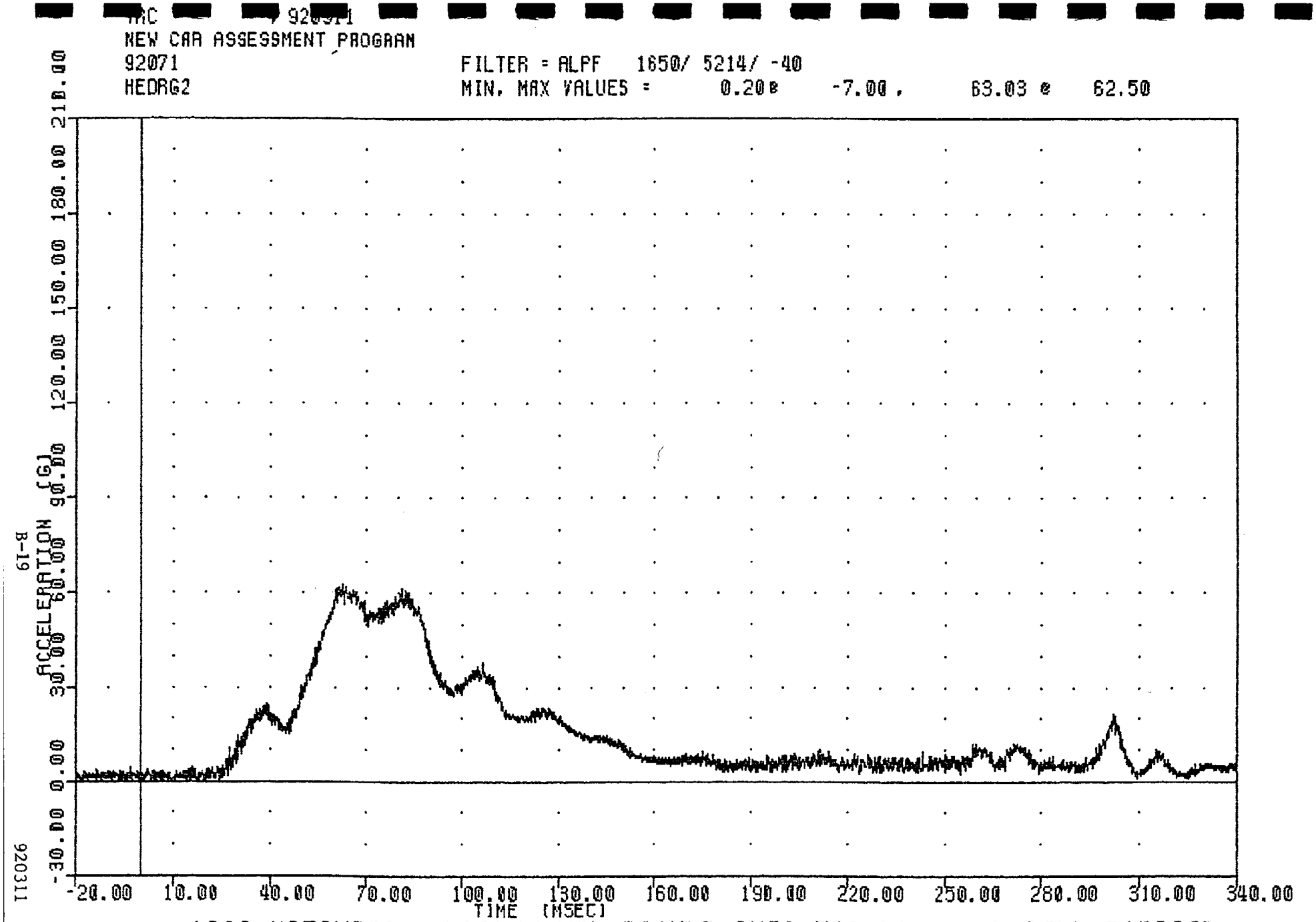
PASSENGER HEAD X-AXIS ACCELERATION



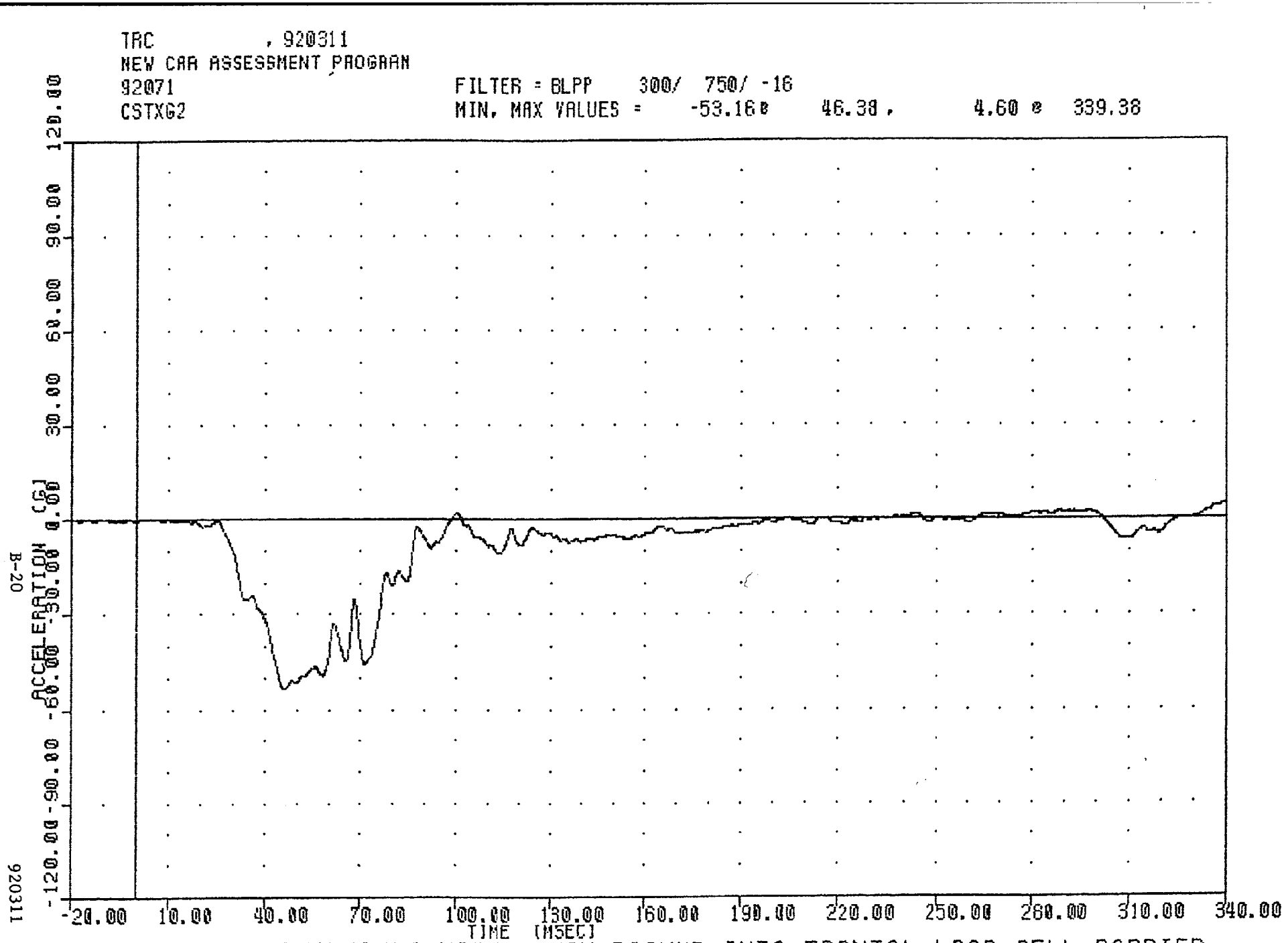
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Y-AXIS ACCELERATION



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Z-AXIS ACCELERATION

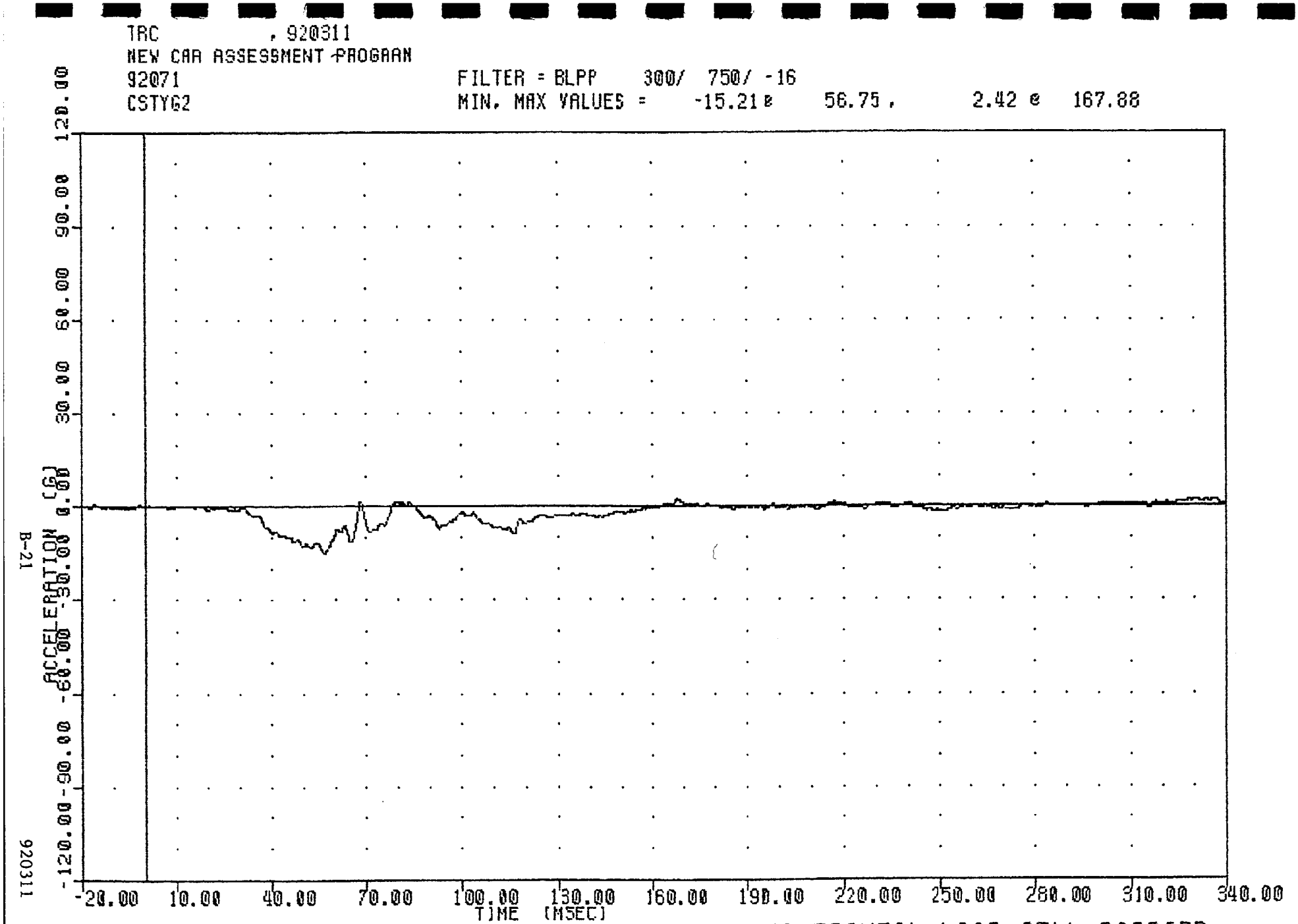


1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

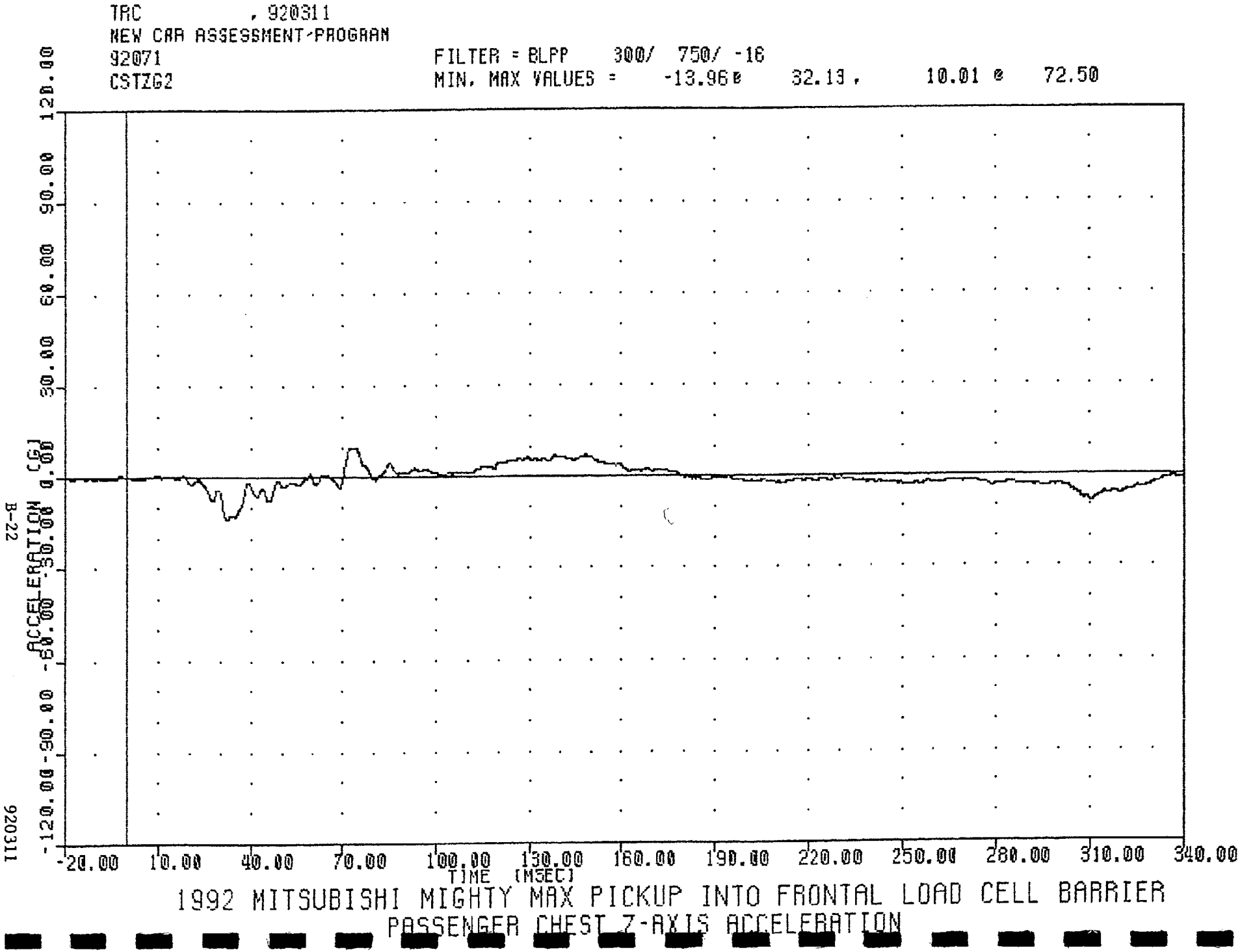
PASSENGER CHEST X-AXIS ACCELERATION



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Y-AXIS ACCELERATION

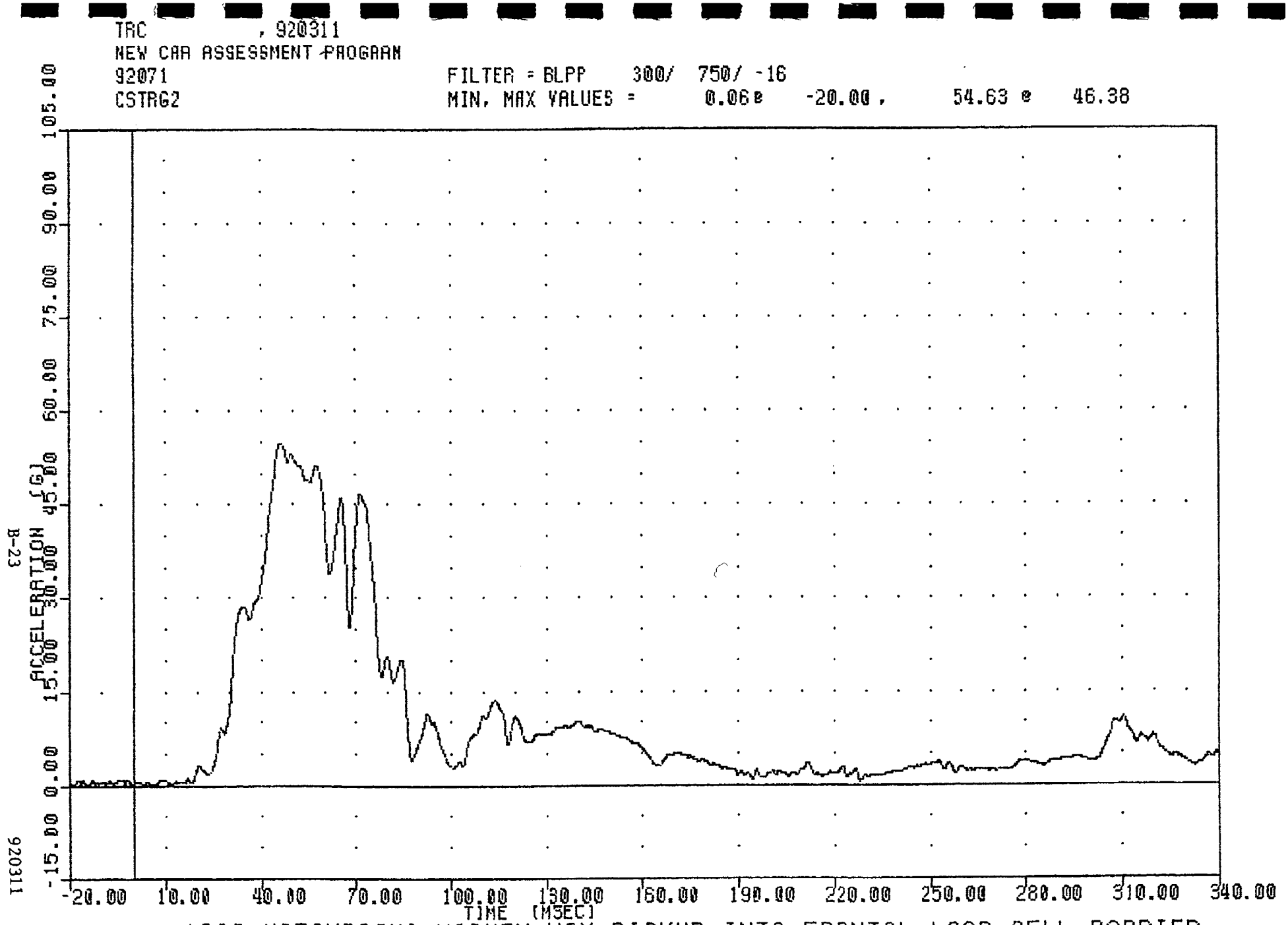
B-21

920311

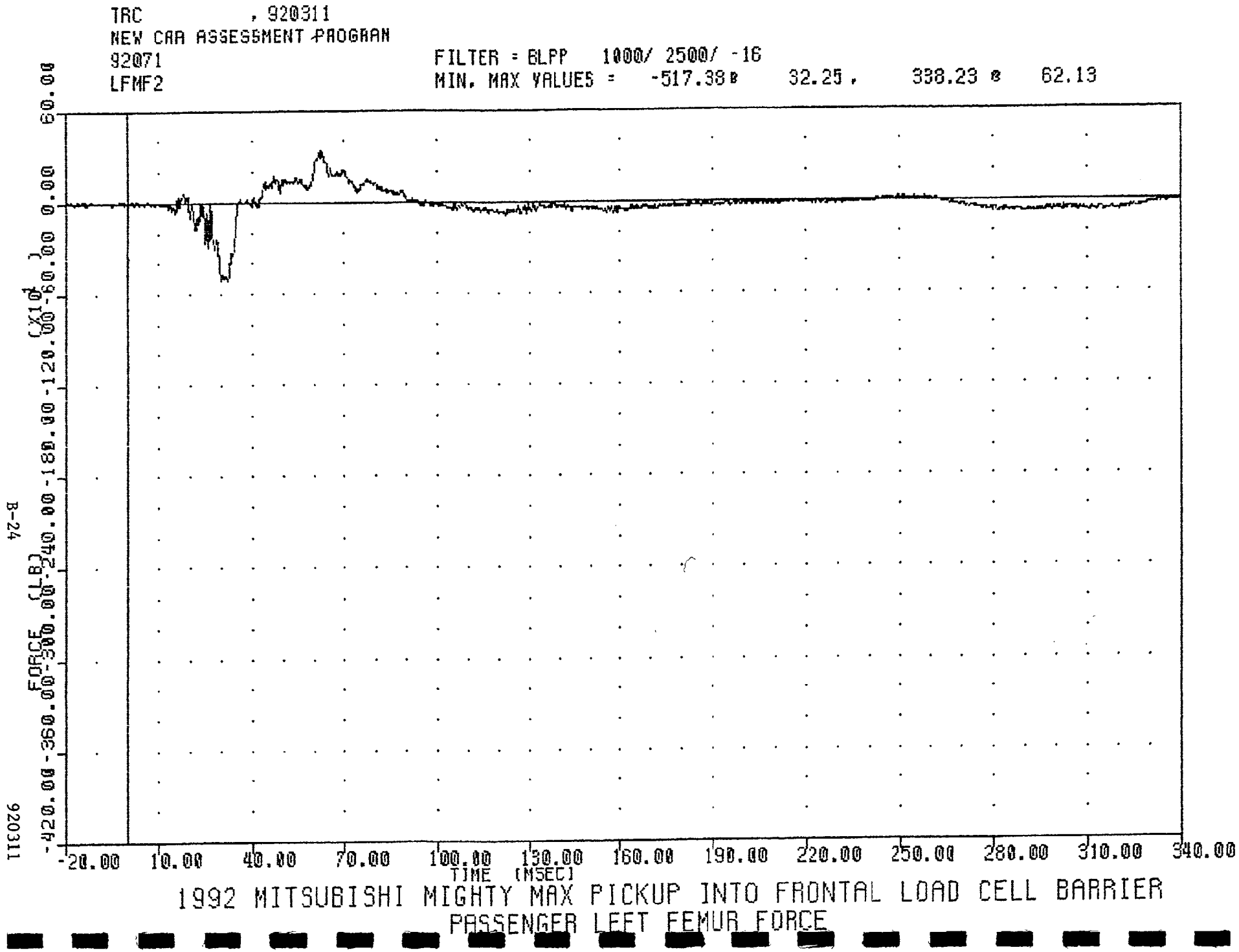


1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

PASSENGER CHEST Z-AXIS ACCELERATION



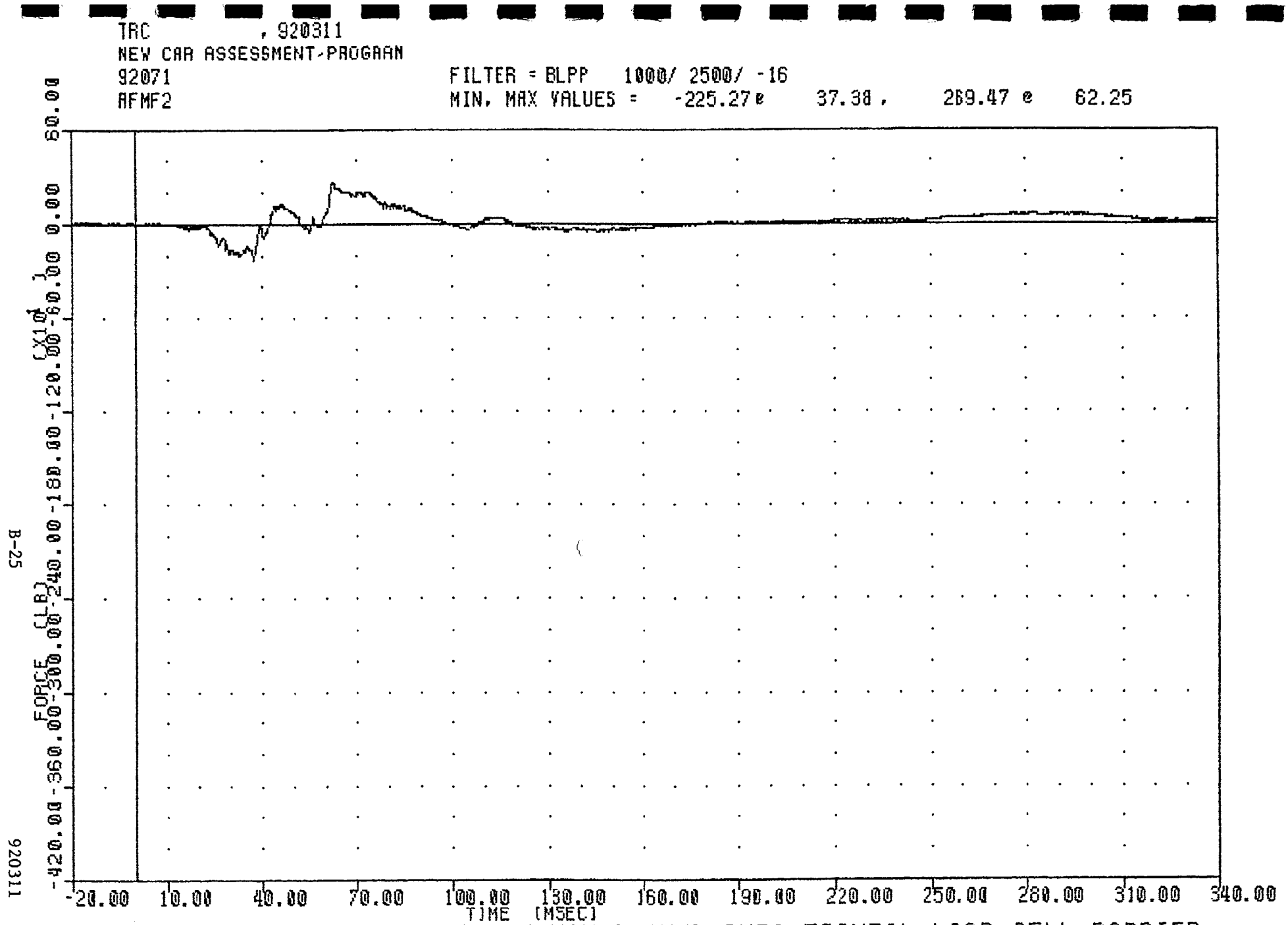
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST RESULTANT ACCELERATION



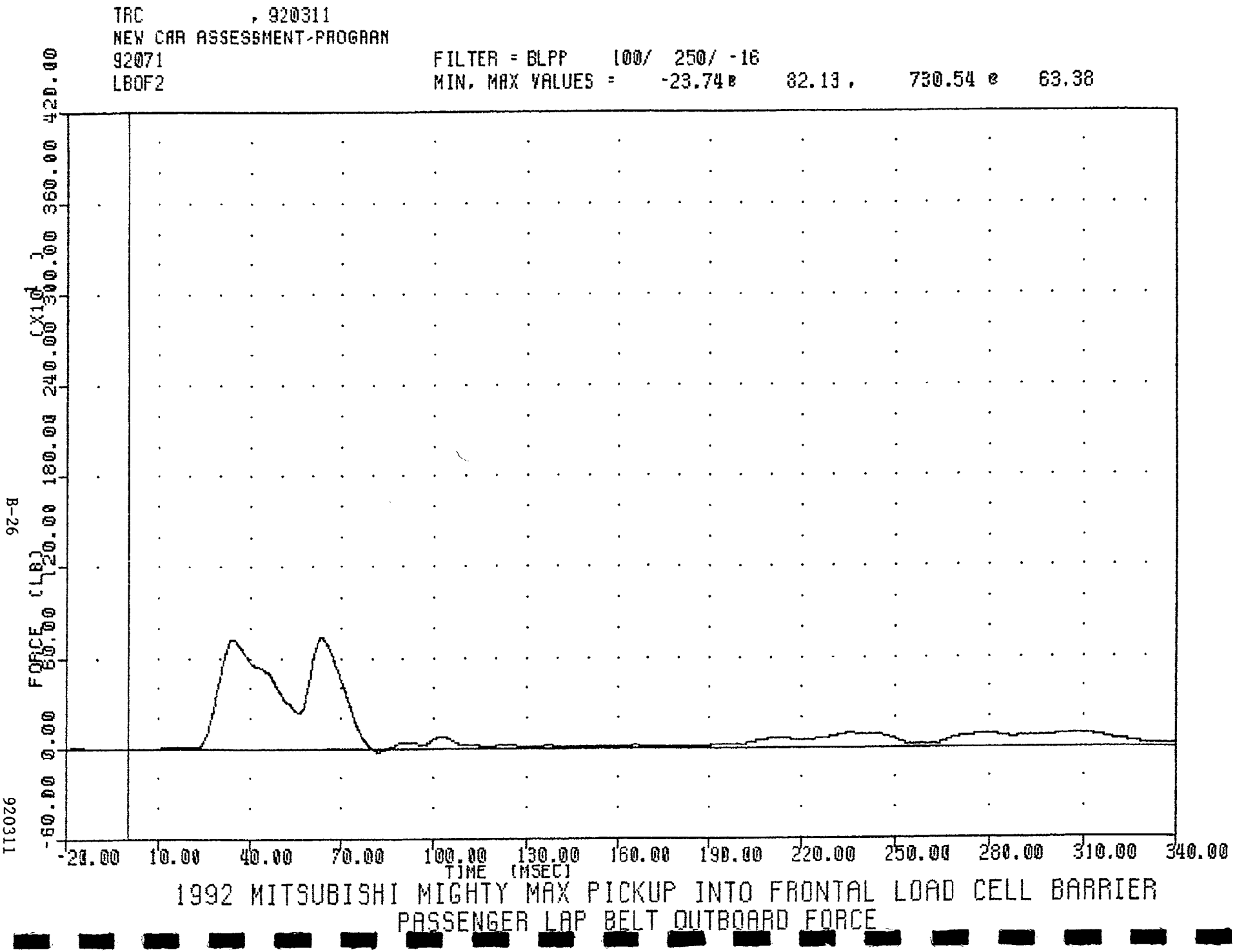
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

PASSENGER LEFT FEMUR FORCE

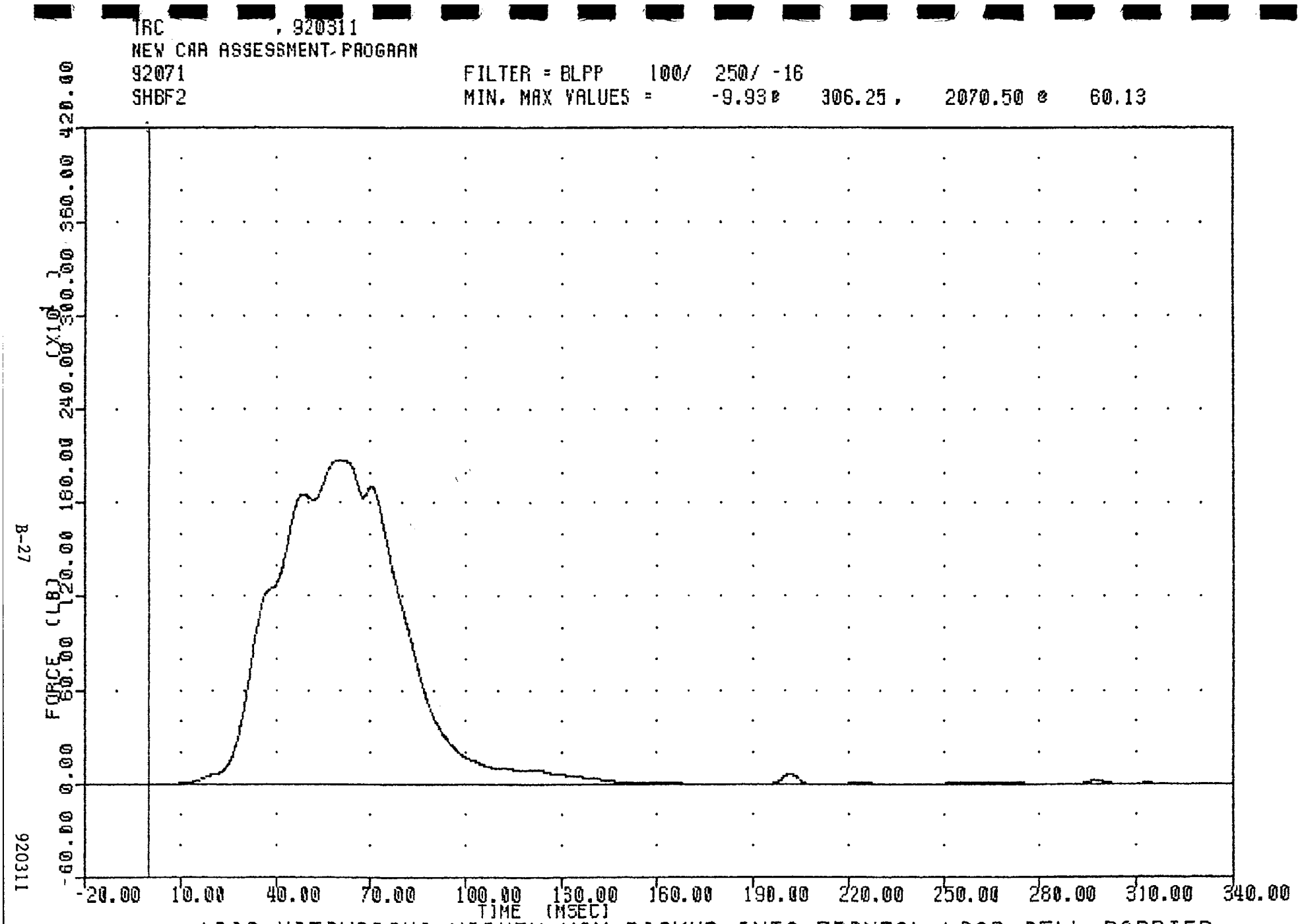
920311



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FEMUR FORCE

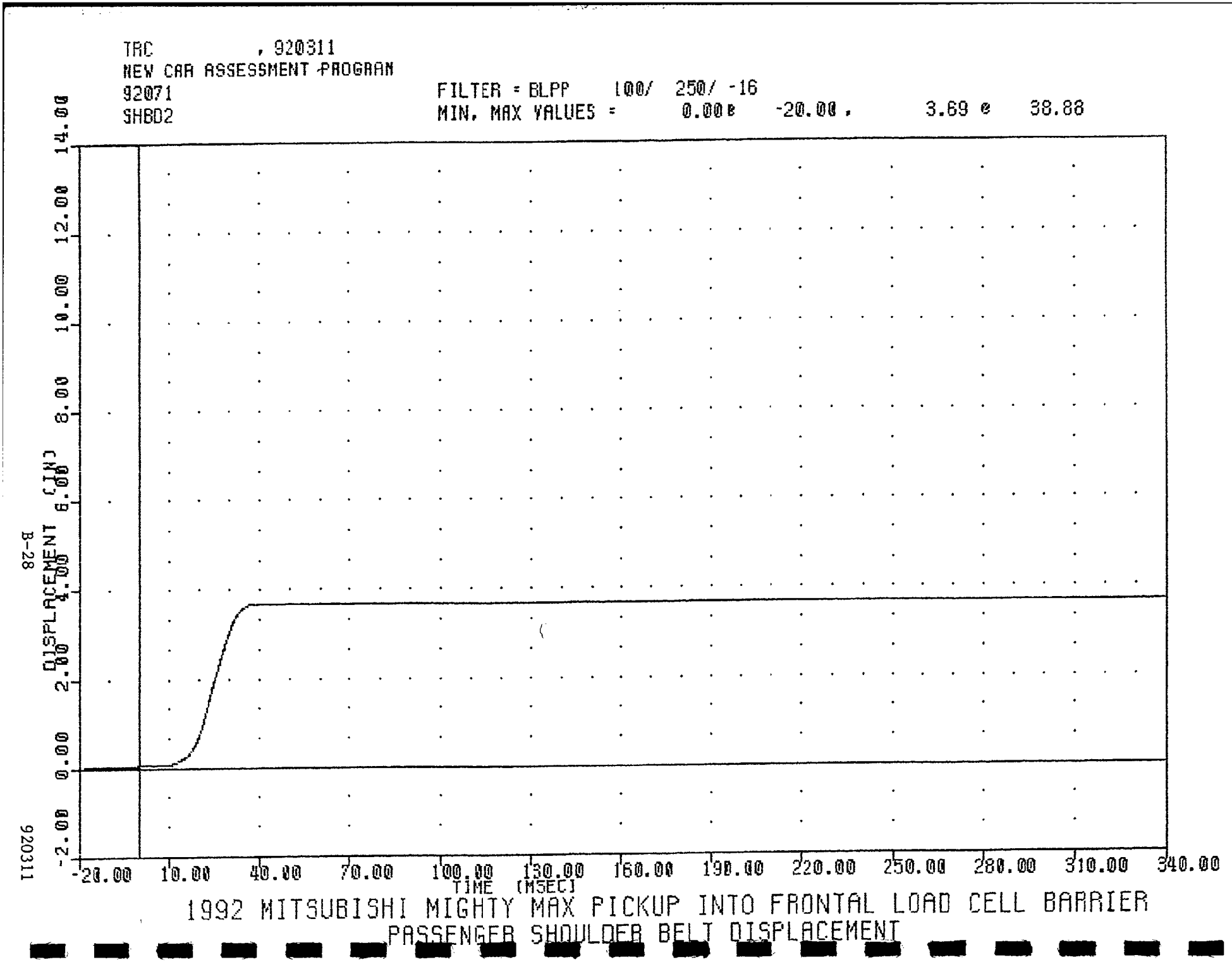

TRC , 920311
NEW CAR ASSESSMENT-PROGRAM
92071
LBOF2
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -23.74 @ 82.13 , 730.54 @ 63.38
FORCE (LB) (X10^1)
420.00
360.00
300.00
240.00
180.00
120.00
60.00
0.00
-60.00
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
PASSENGER LAP BELT OUTBOARD FORCE

920311



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT FORCE

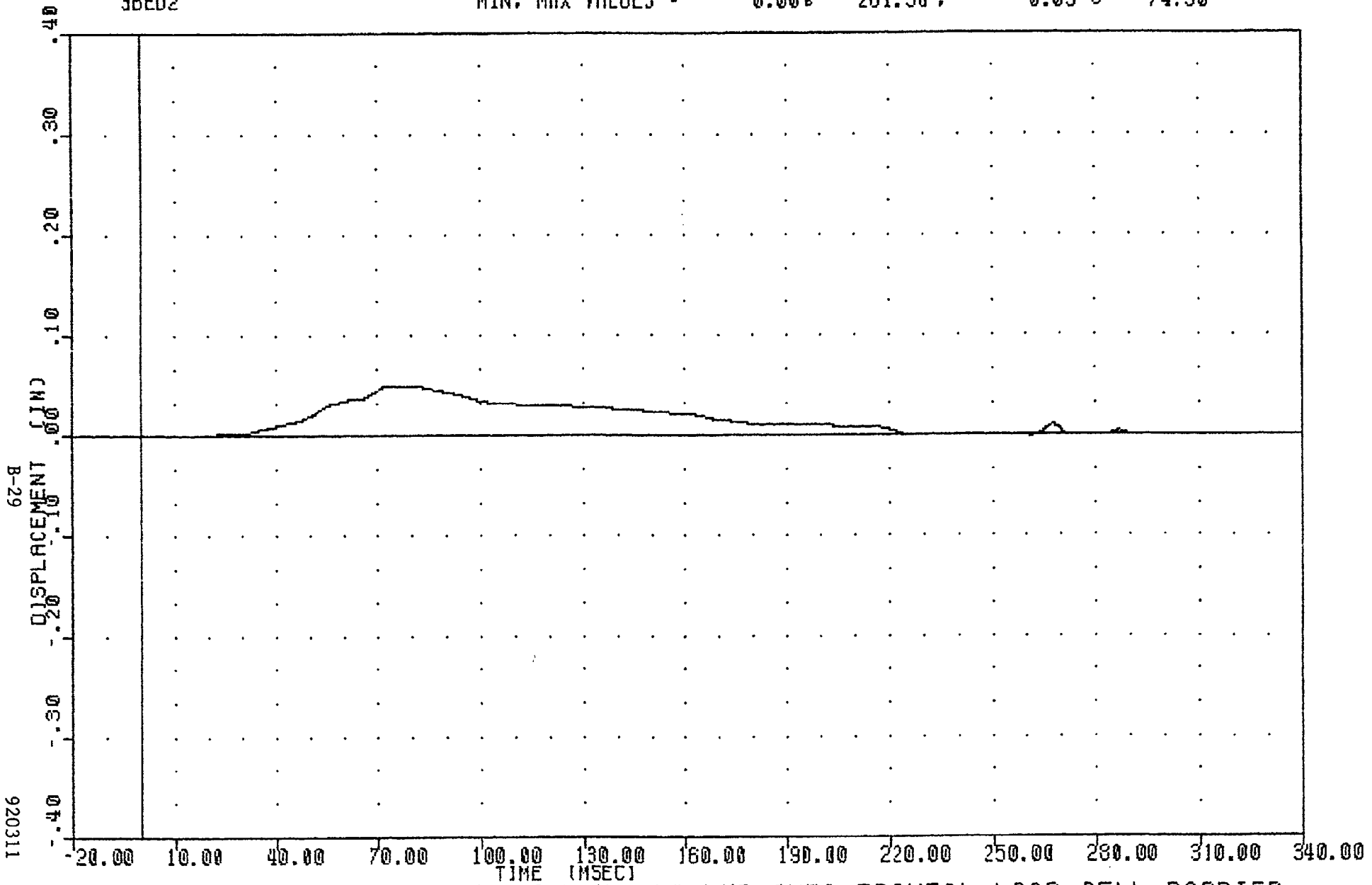
920311



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT DISPLACEMENT

TRC . 920311
NEW CAR ASSESSMENT-PROGRAM
92071
SBED2

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = 0.00 @ 261.38 , 0.05 @ 74.50



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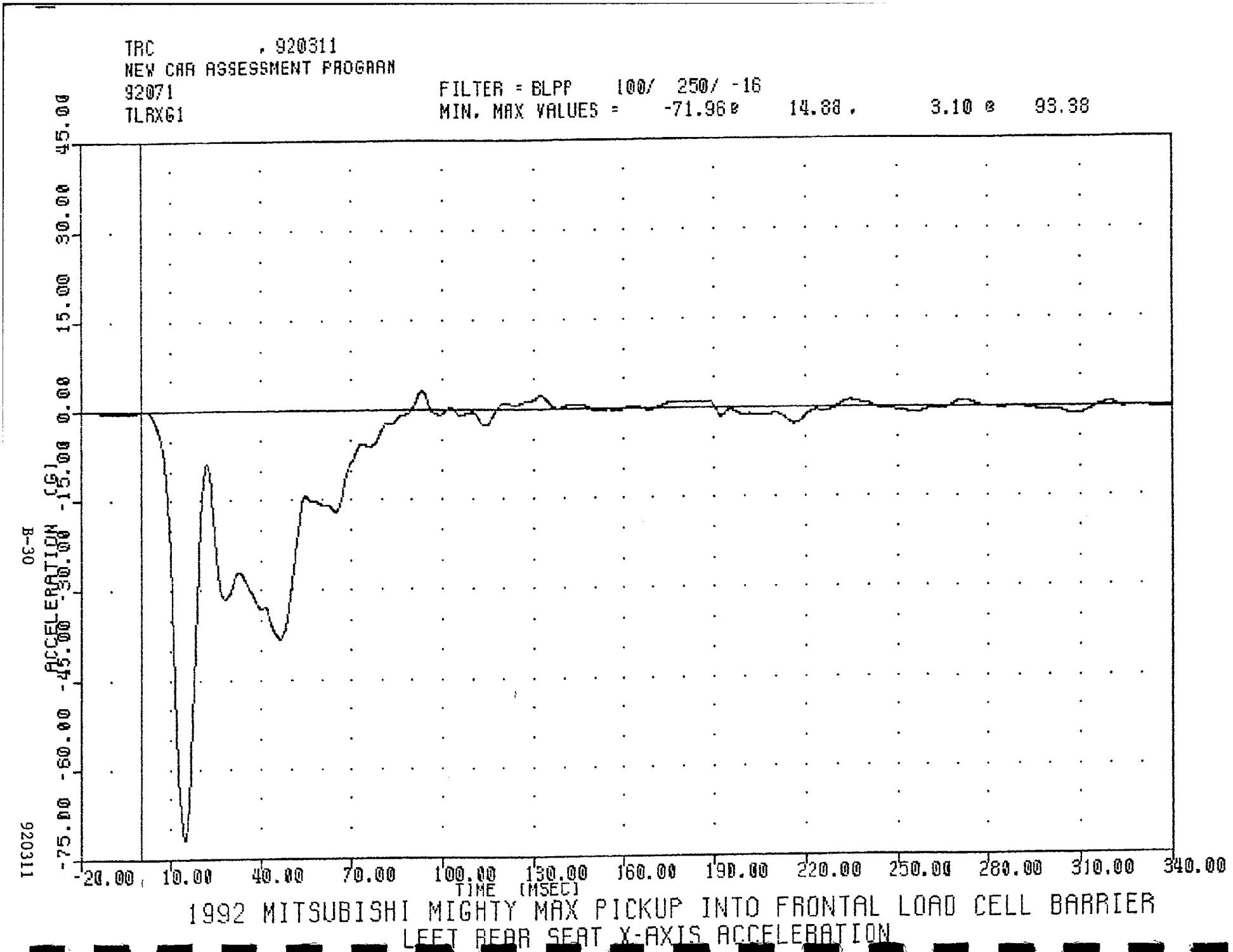
920311

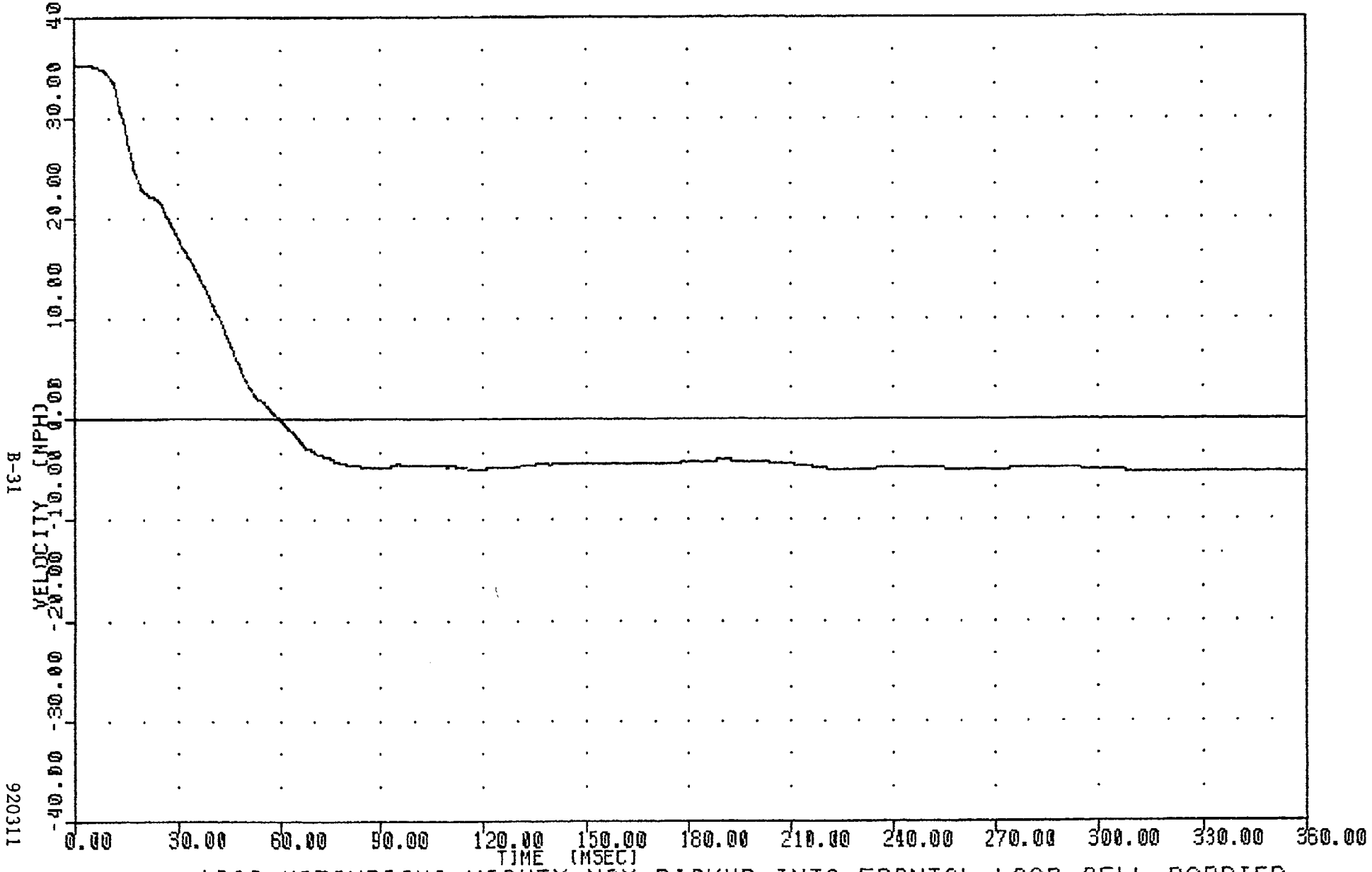
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
PASSENGER SEAT BELT EXTENSION



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

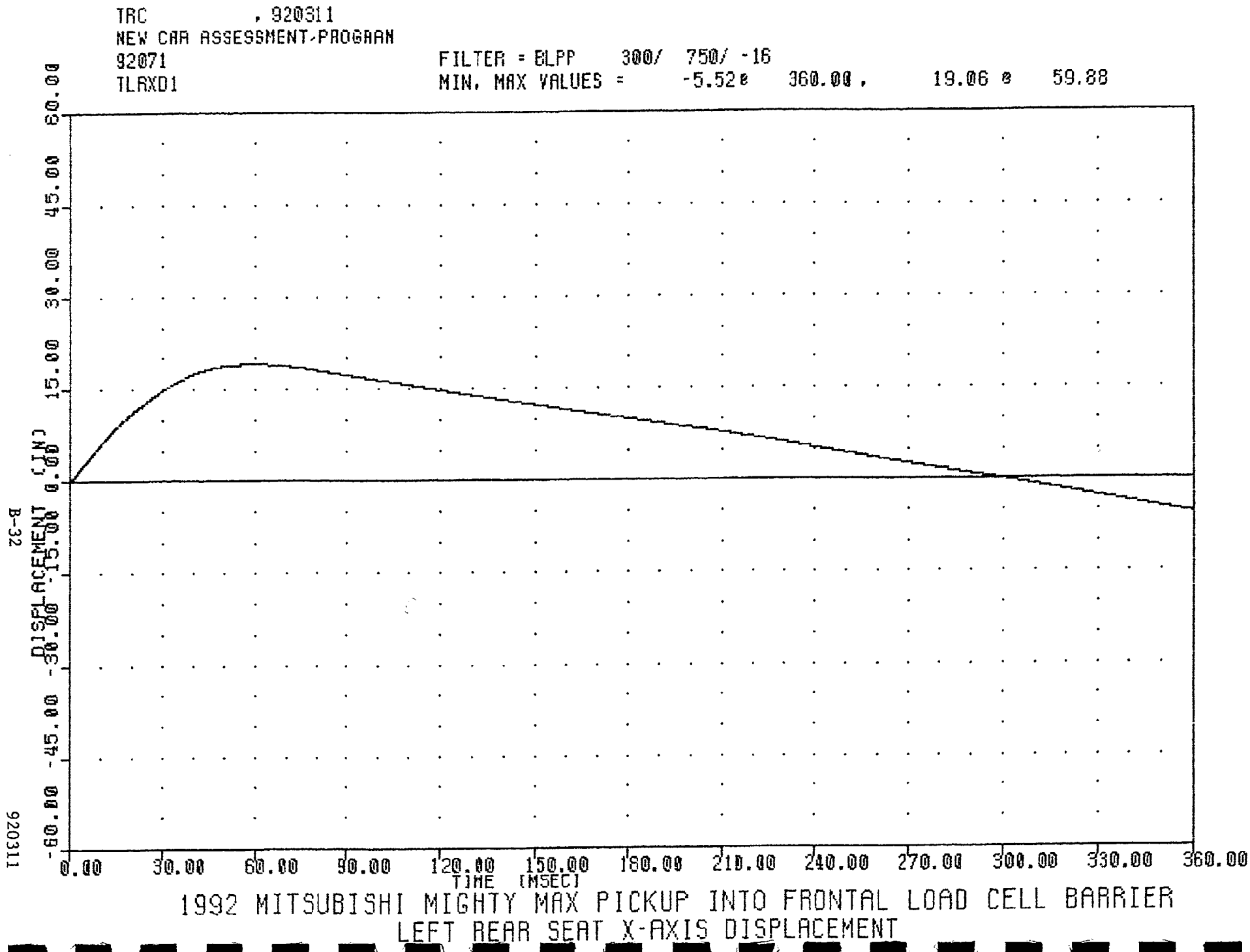
LEFT REAR SEAT X-AXIS ACCELERATION

TRC , 920311
NEW CAR ASSESSMENT-PROGRAM
92071 FILTER = BLPP 300/ 750/ -16
TLRXV1 MIN, MAX VALUES = -5.29 @ 349.88 , 35.20 @ 2.50



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS VELOCITY

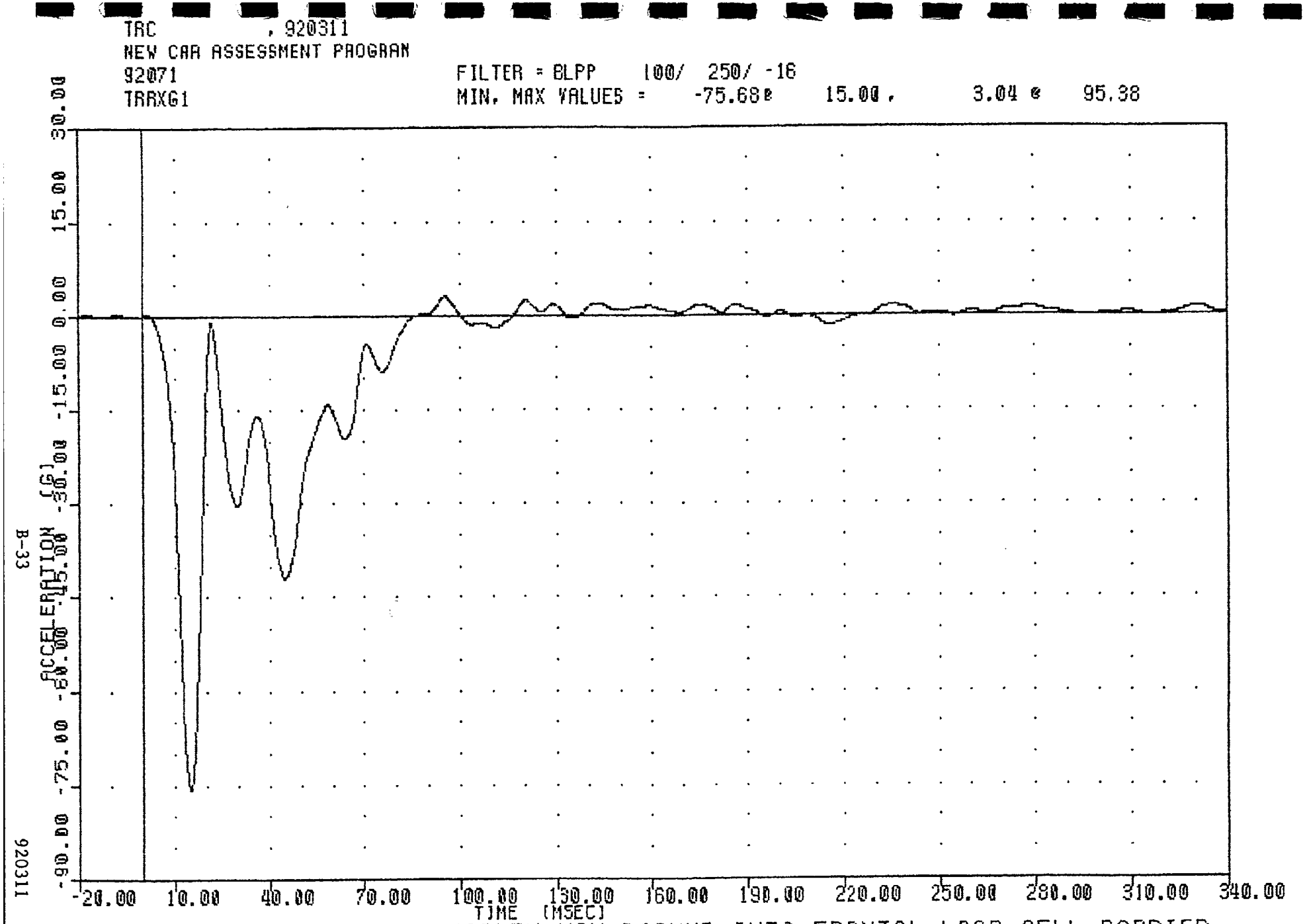
920311



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

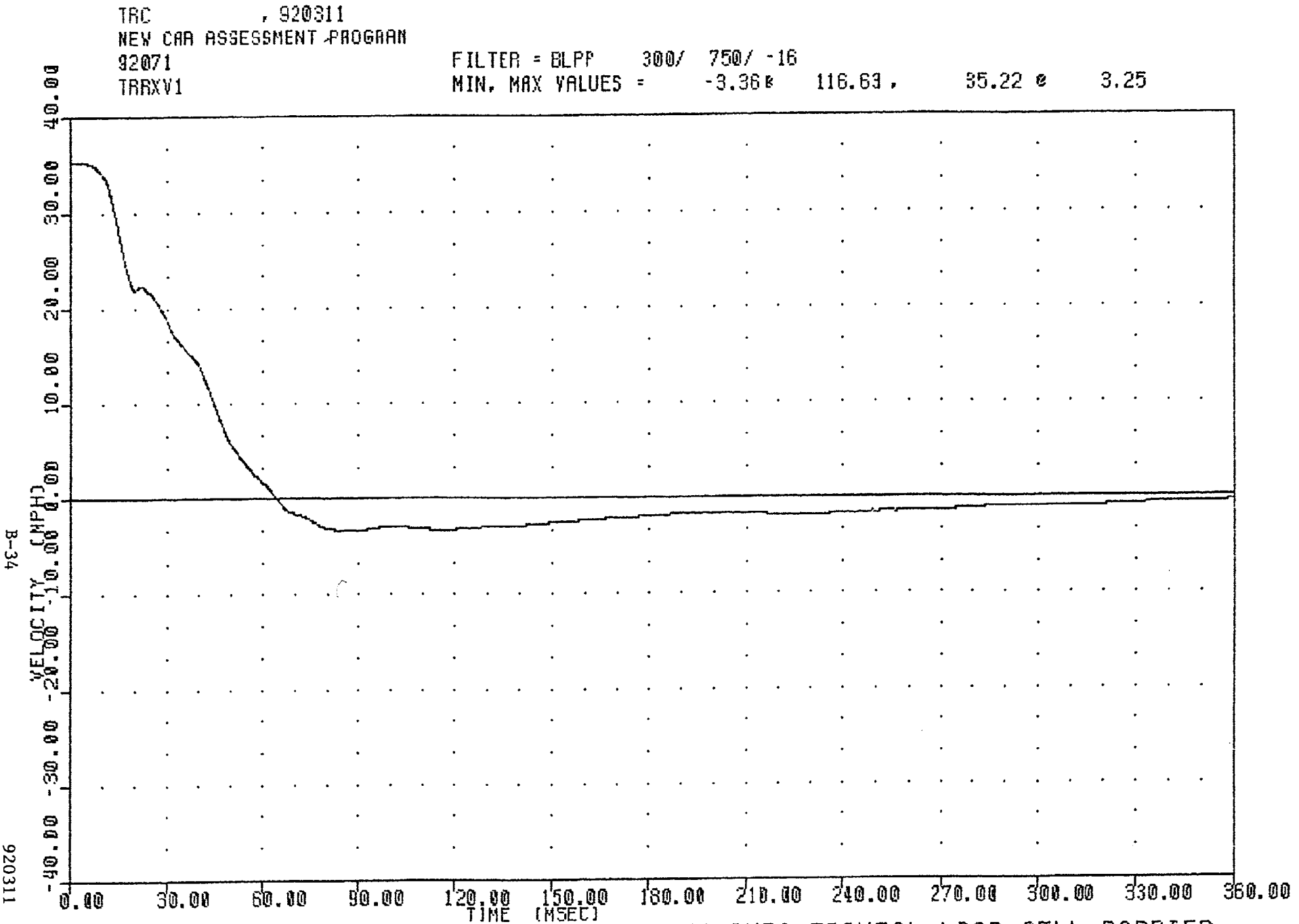
LEFT REAR SEAT X-AXIS DISPLACEMENT

920311



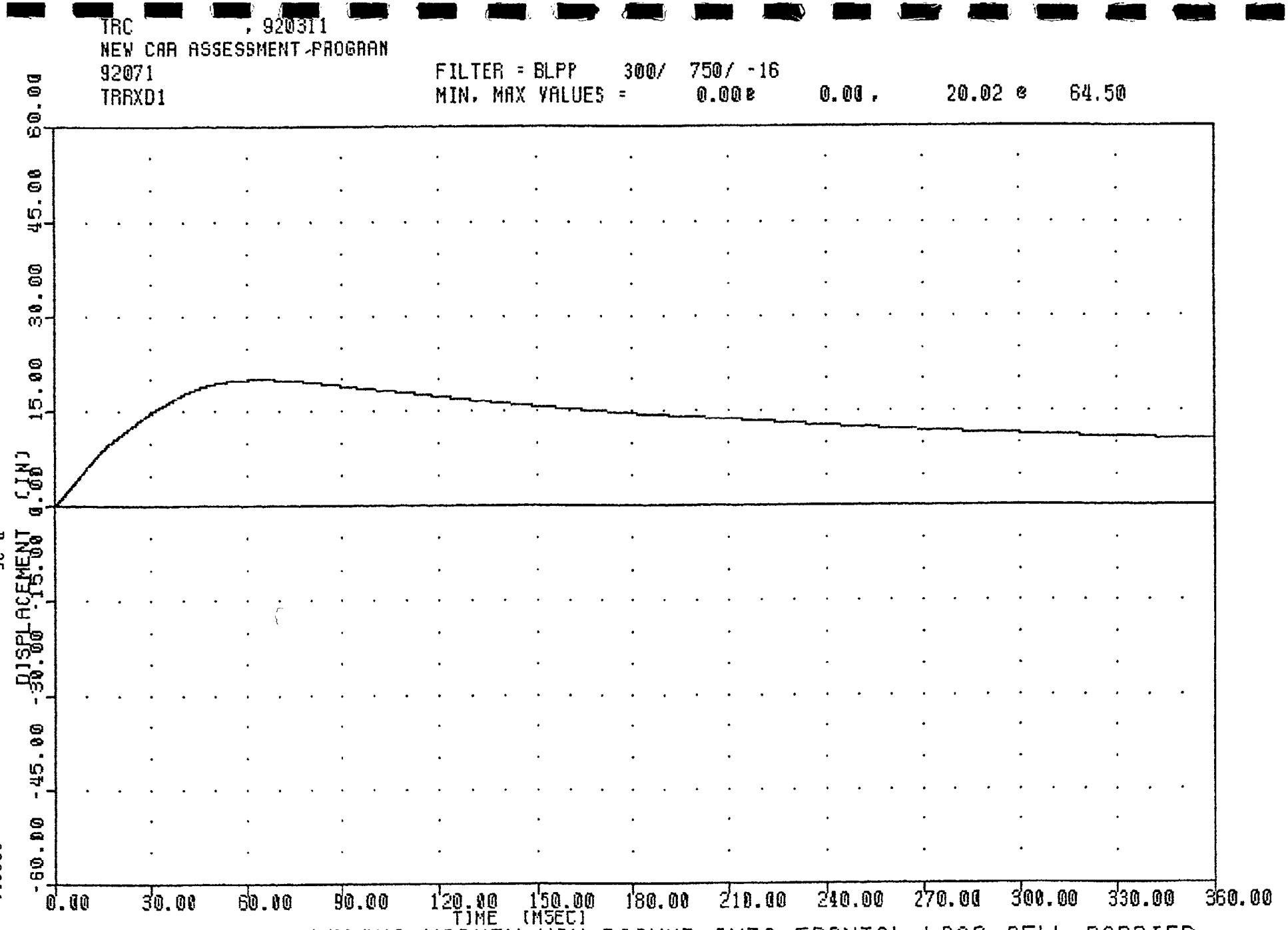
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS ACCELERATION

920311



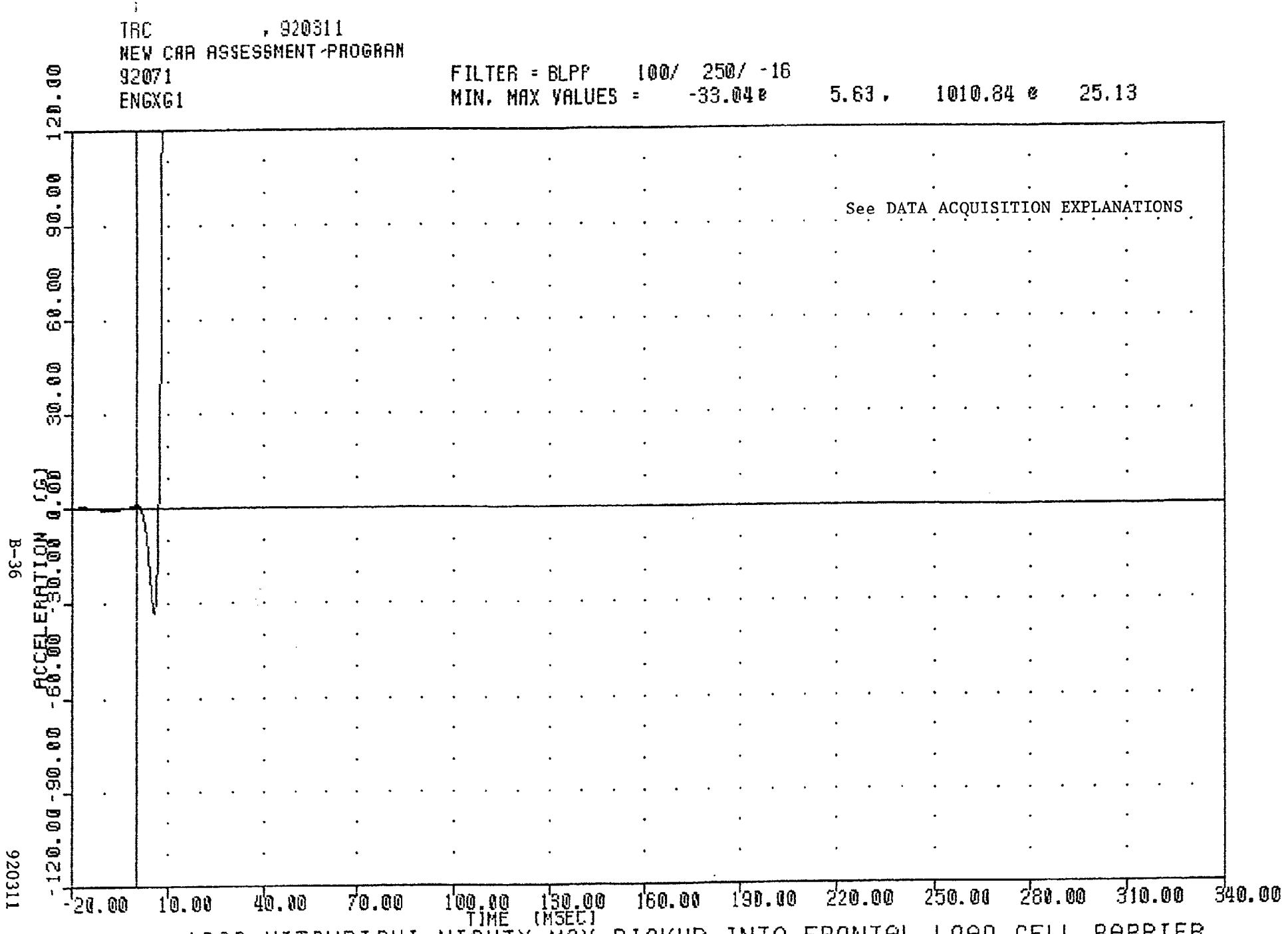
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS VELOCITY

920311

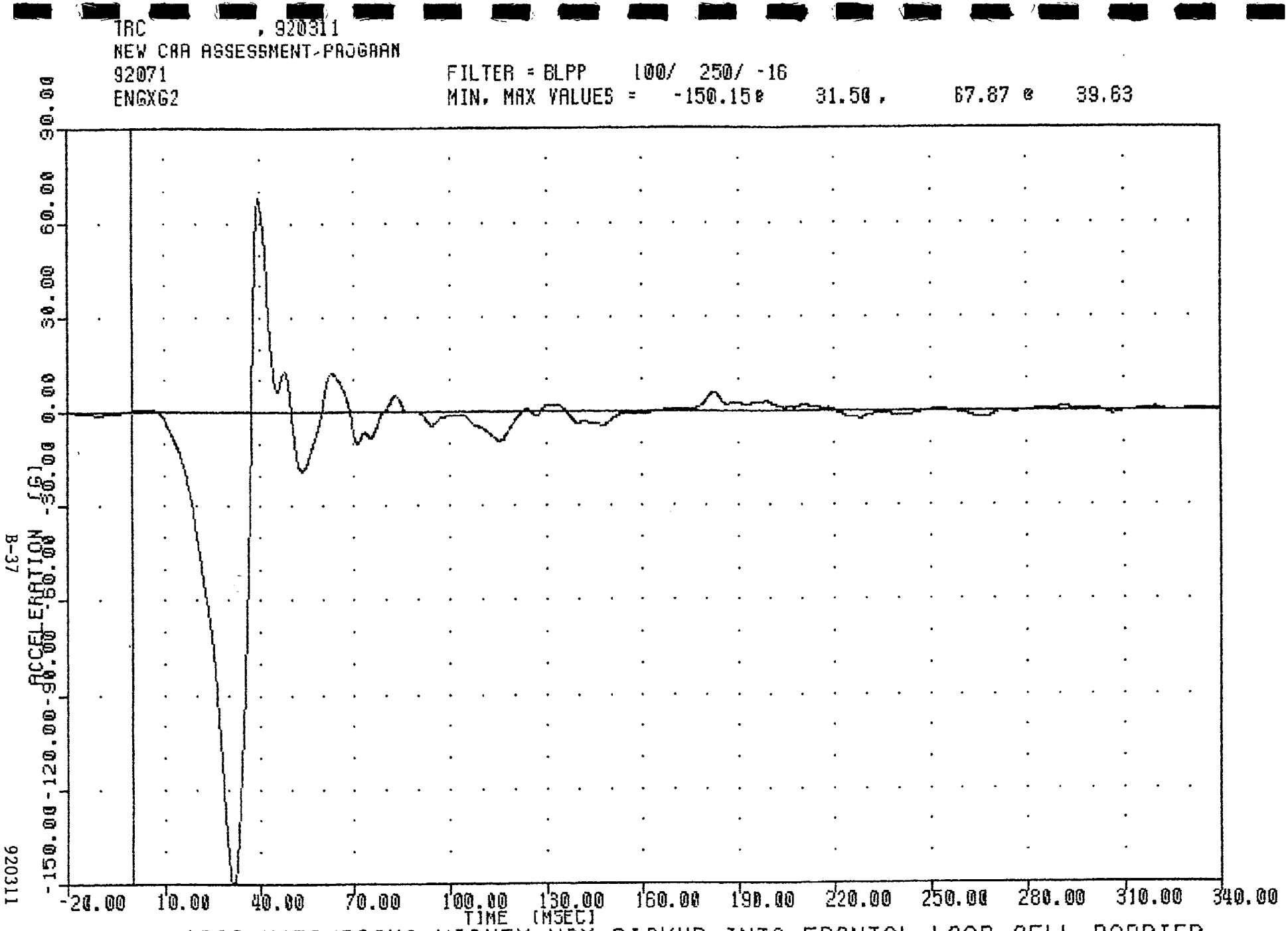


1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS DISPLACEMENT

920311

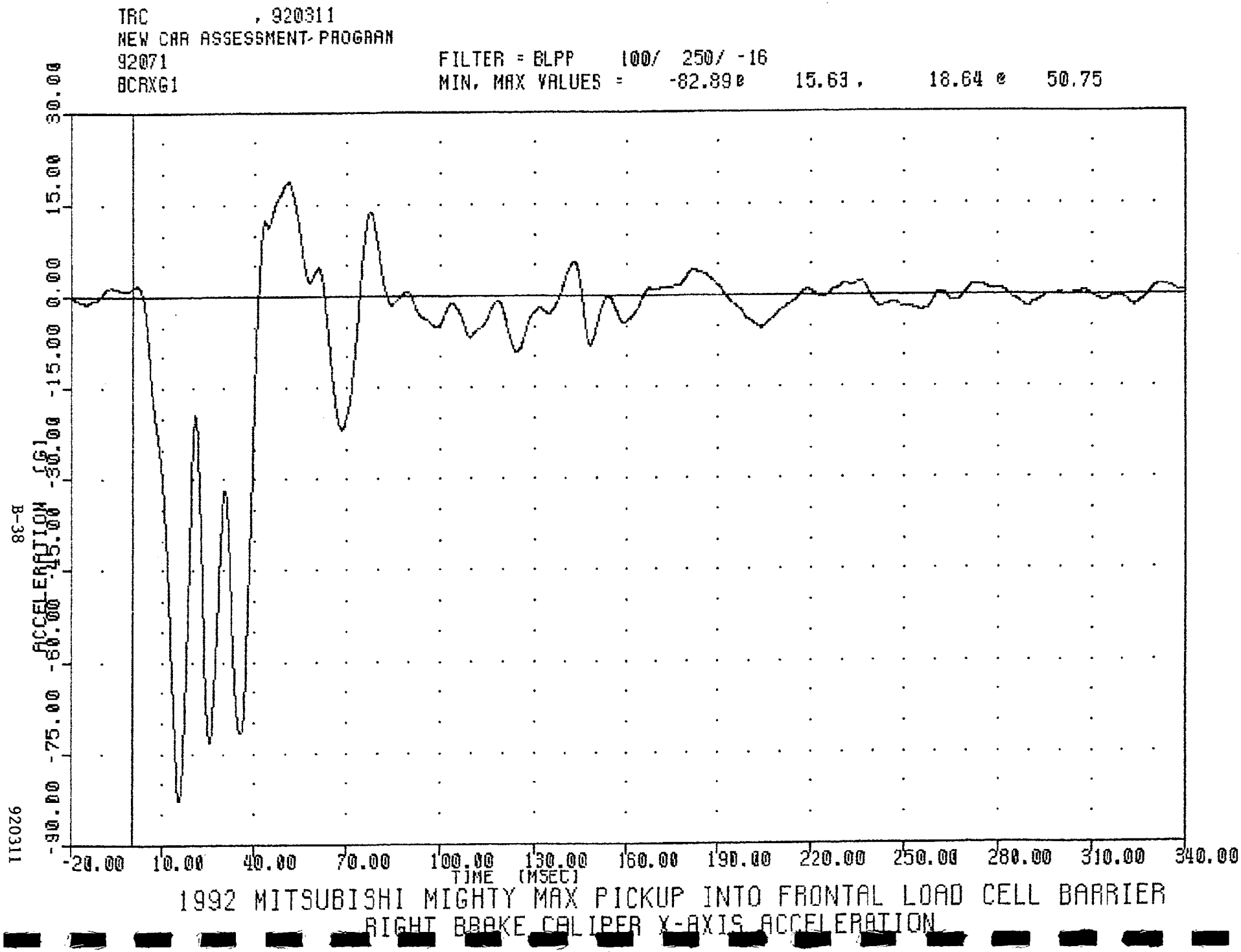


1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
ENGINE TOP X-AXIS ACCELERATION



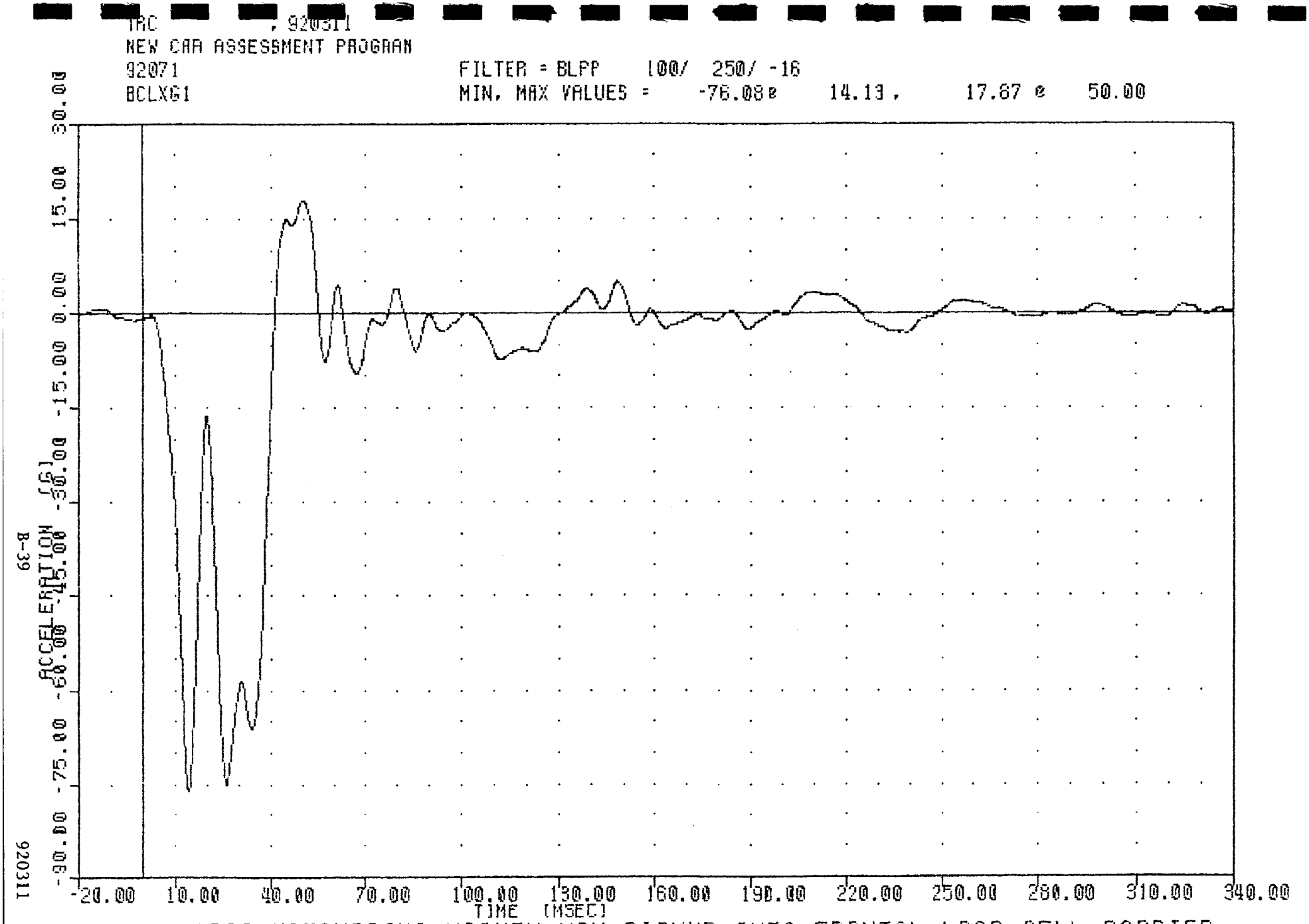
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
ENGINE BOTTOM X-AXIS ACCELERATION

920311



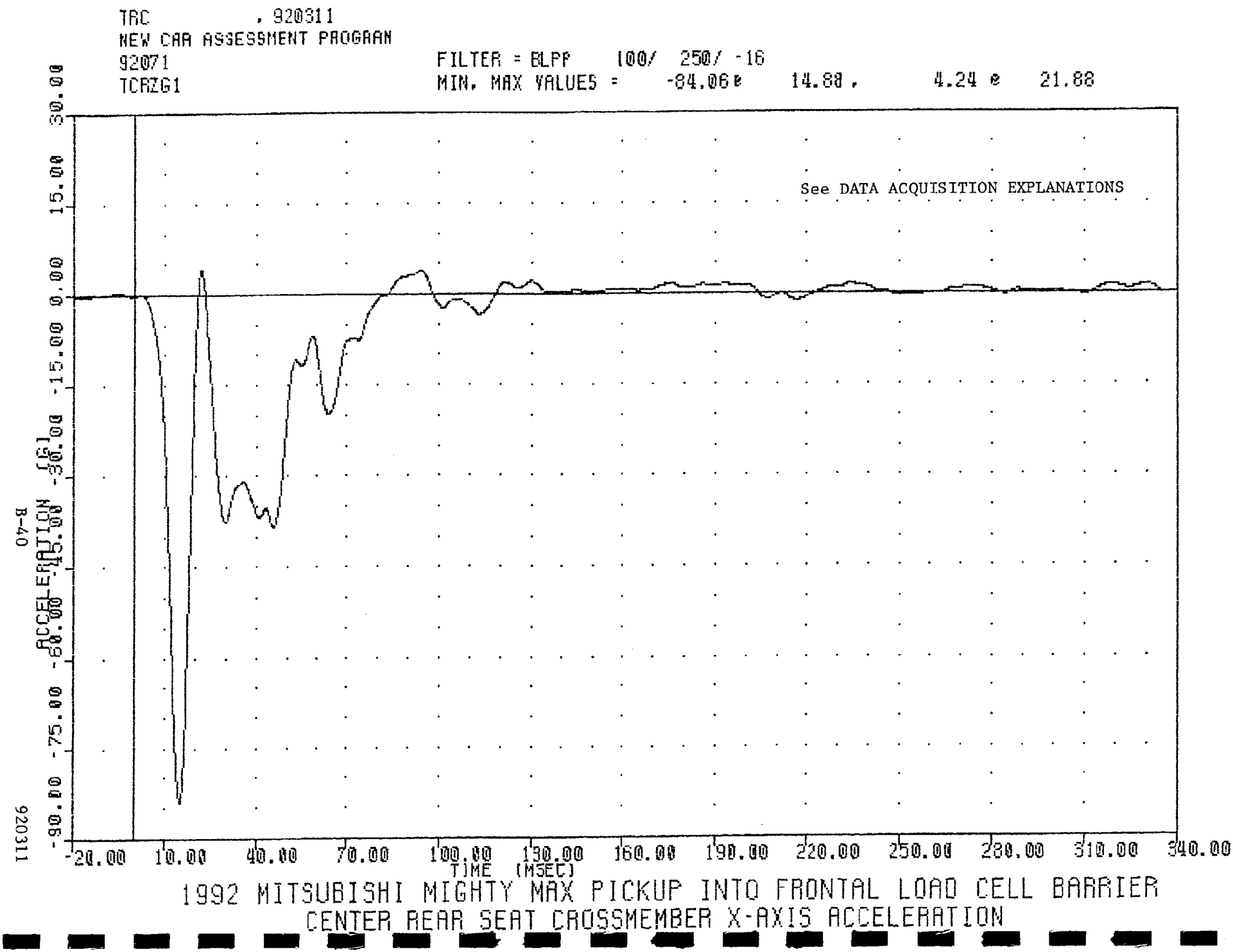
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
RIGHT BRAKE CALIPER X-AXIS ACCELERATION

920311

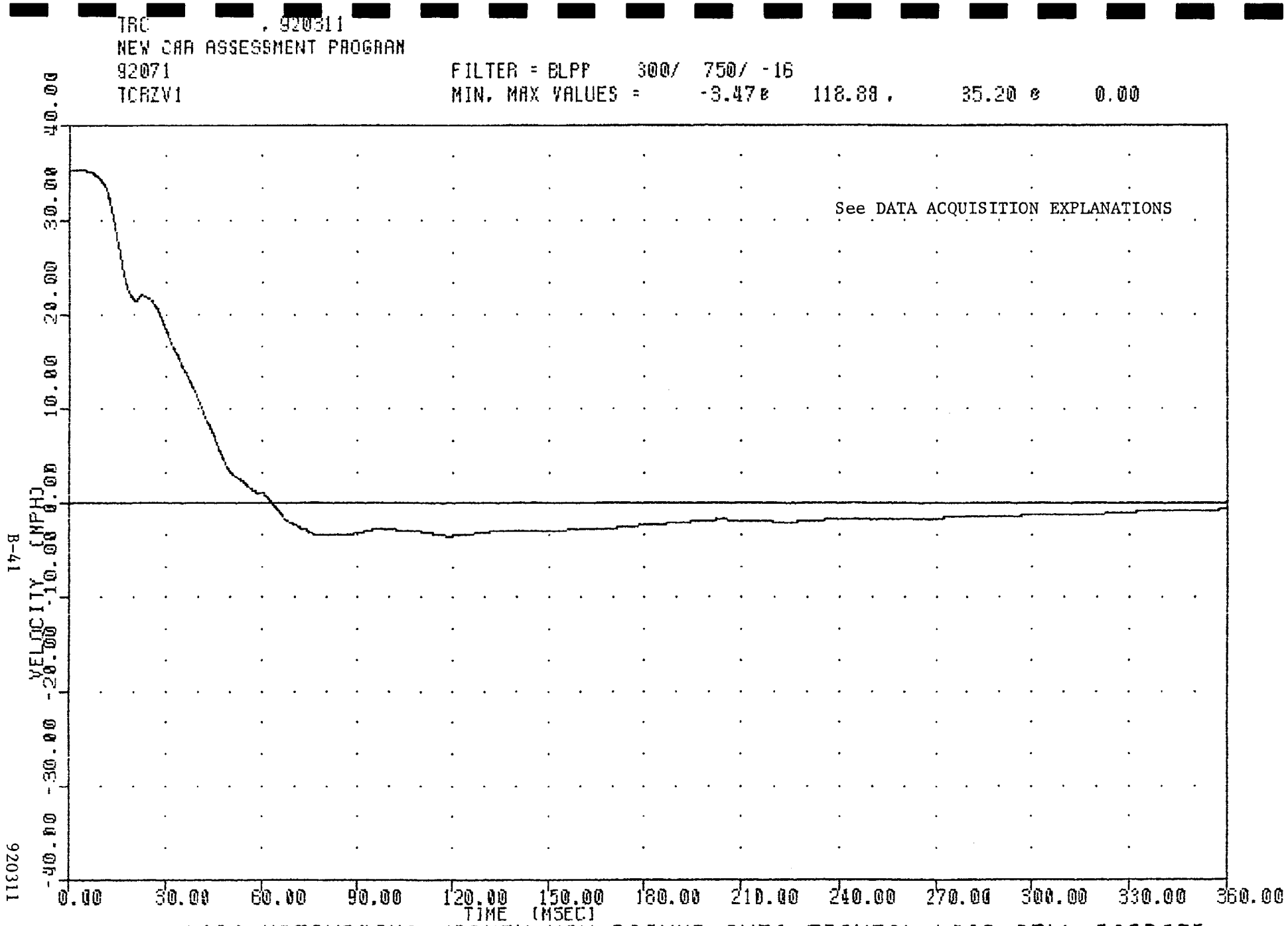


1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION

920311

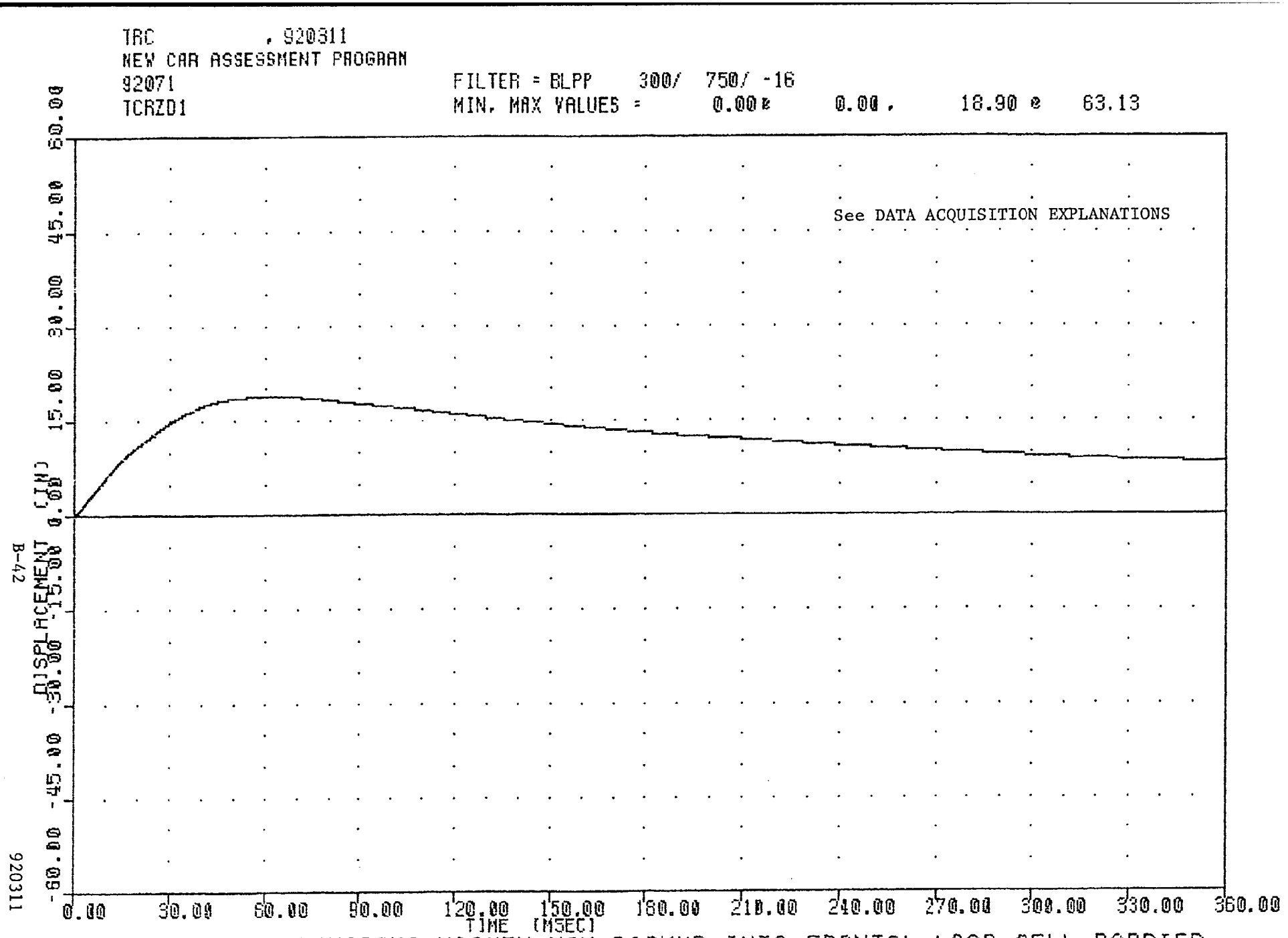


1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
CENTER REAR SEAT CROSSMEMBER X-AXIS ACCELERATION



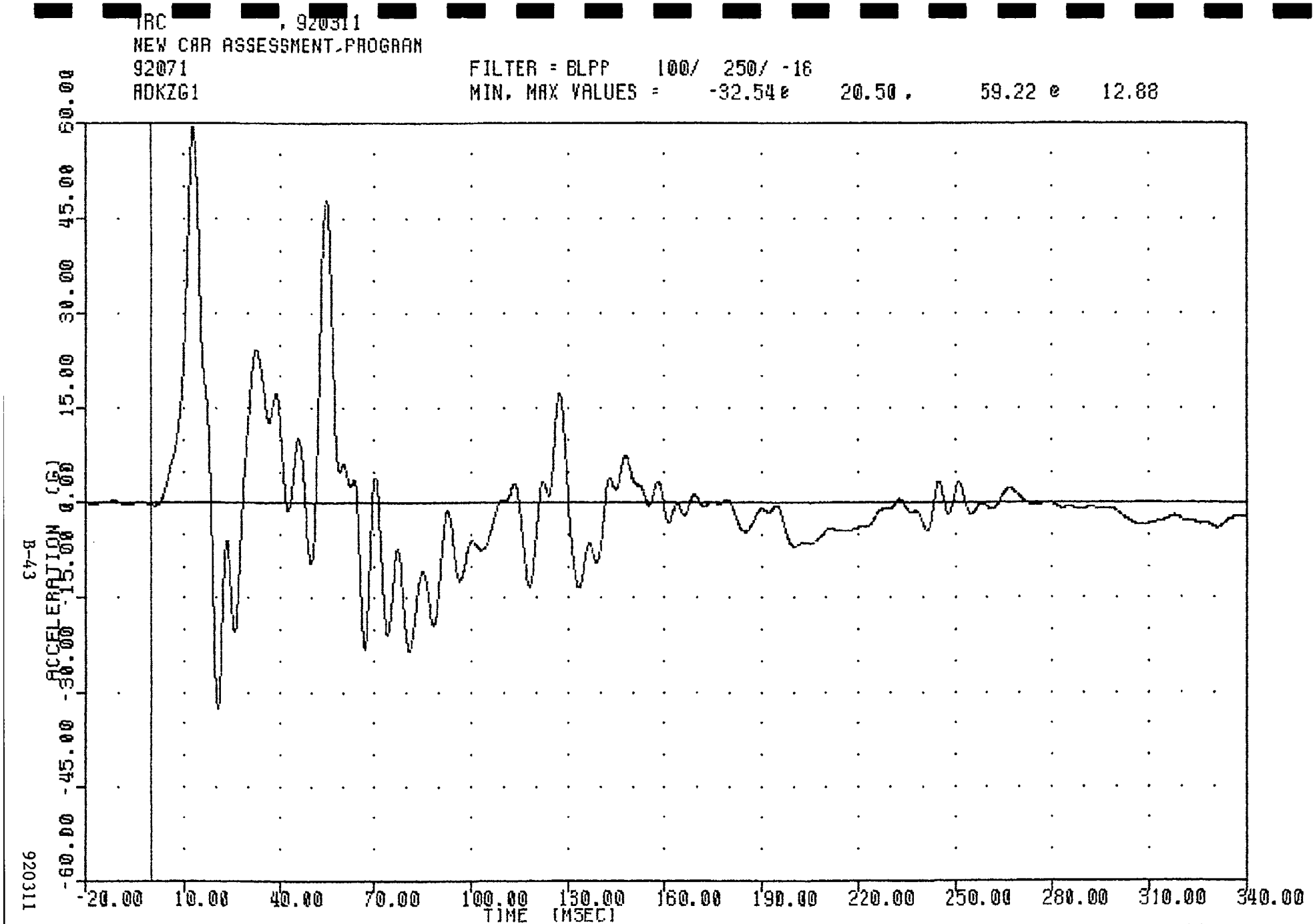
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
CENTER REAR SEAT CROSSMEMBER X-AXIS VELOCITY

920311



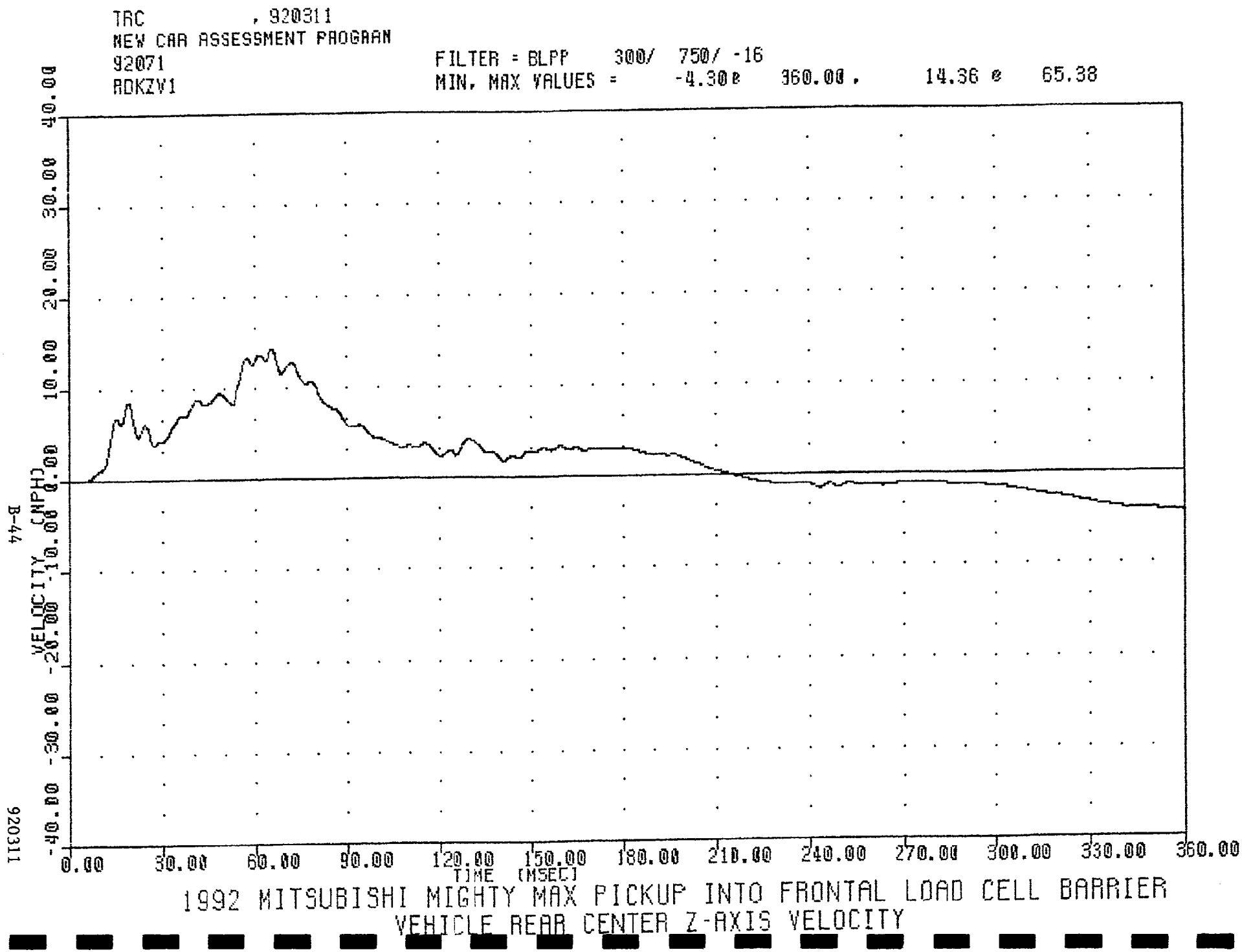
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
CENTER REAR SEAT CROSSMEMBER X-AXIS DISPLACEMENT

920311



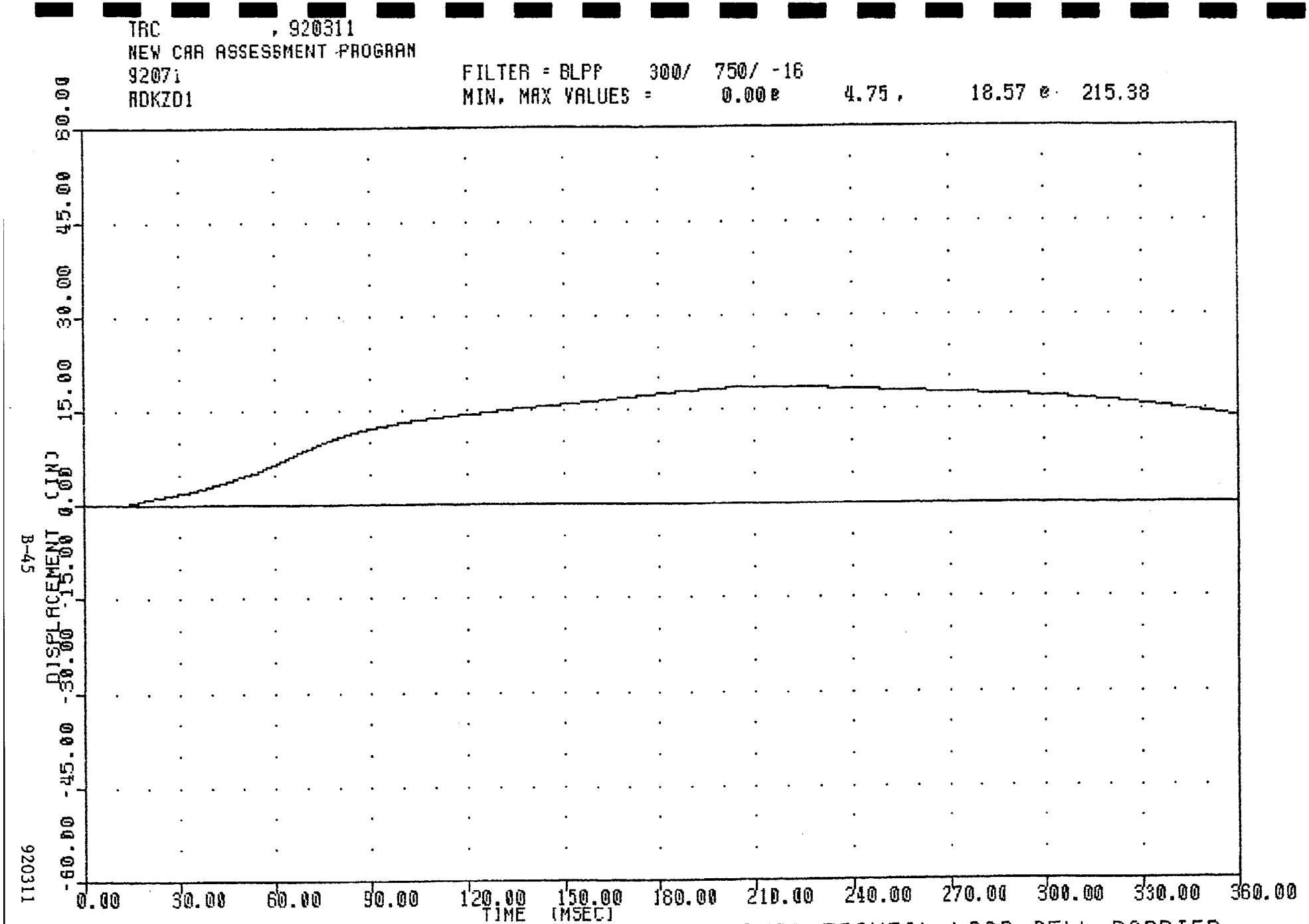
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
VEHICLE REAR CENTER Z-AXIS ACCELERATION

920311



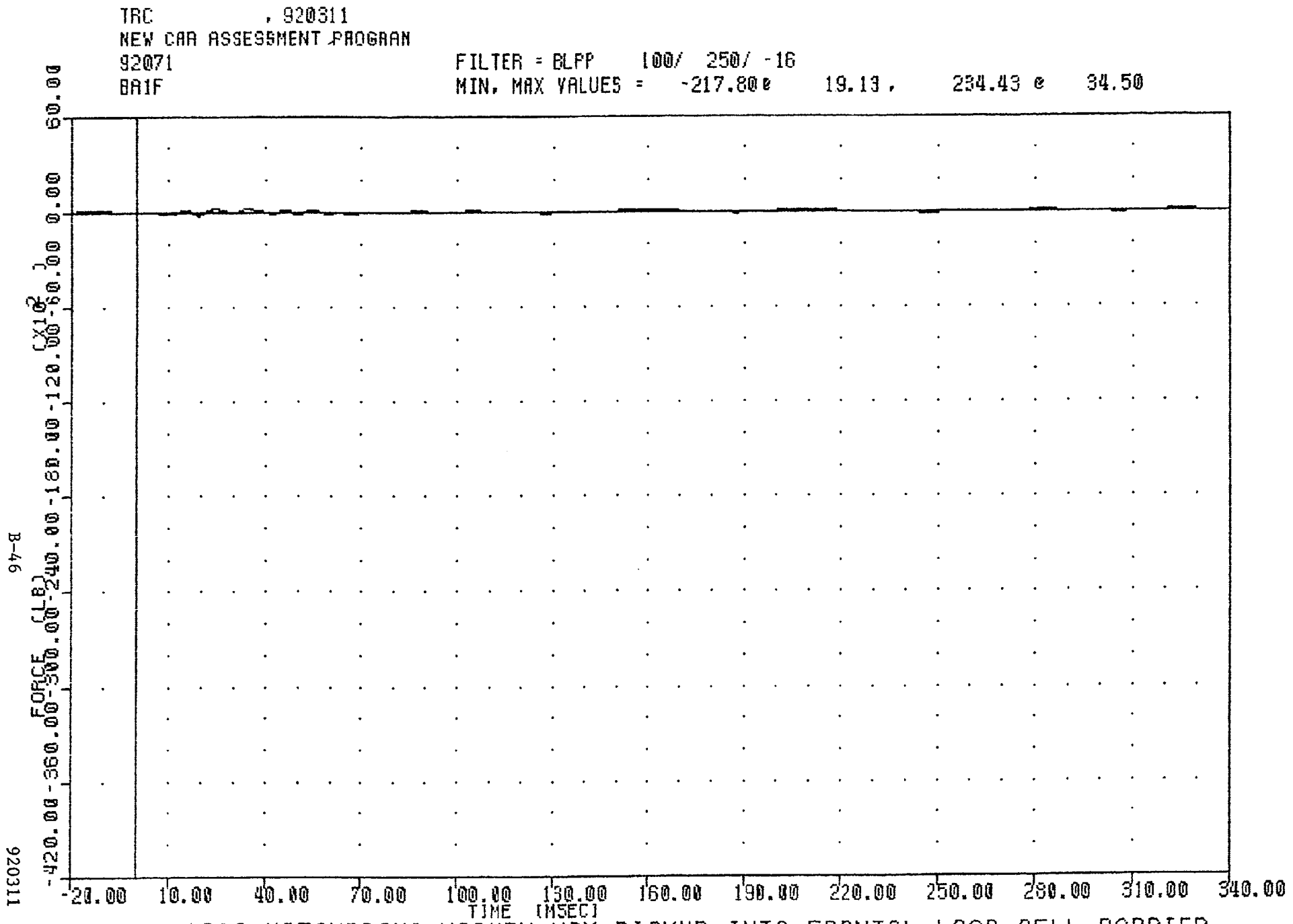
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
VEHICLE REAR CENTER Z-AXIS VELOCITY

920311



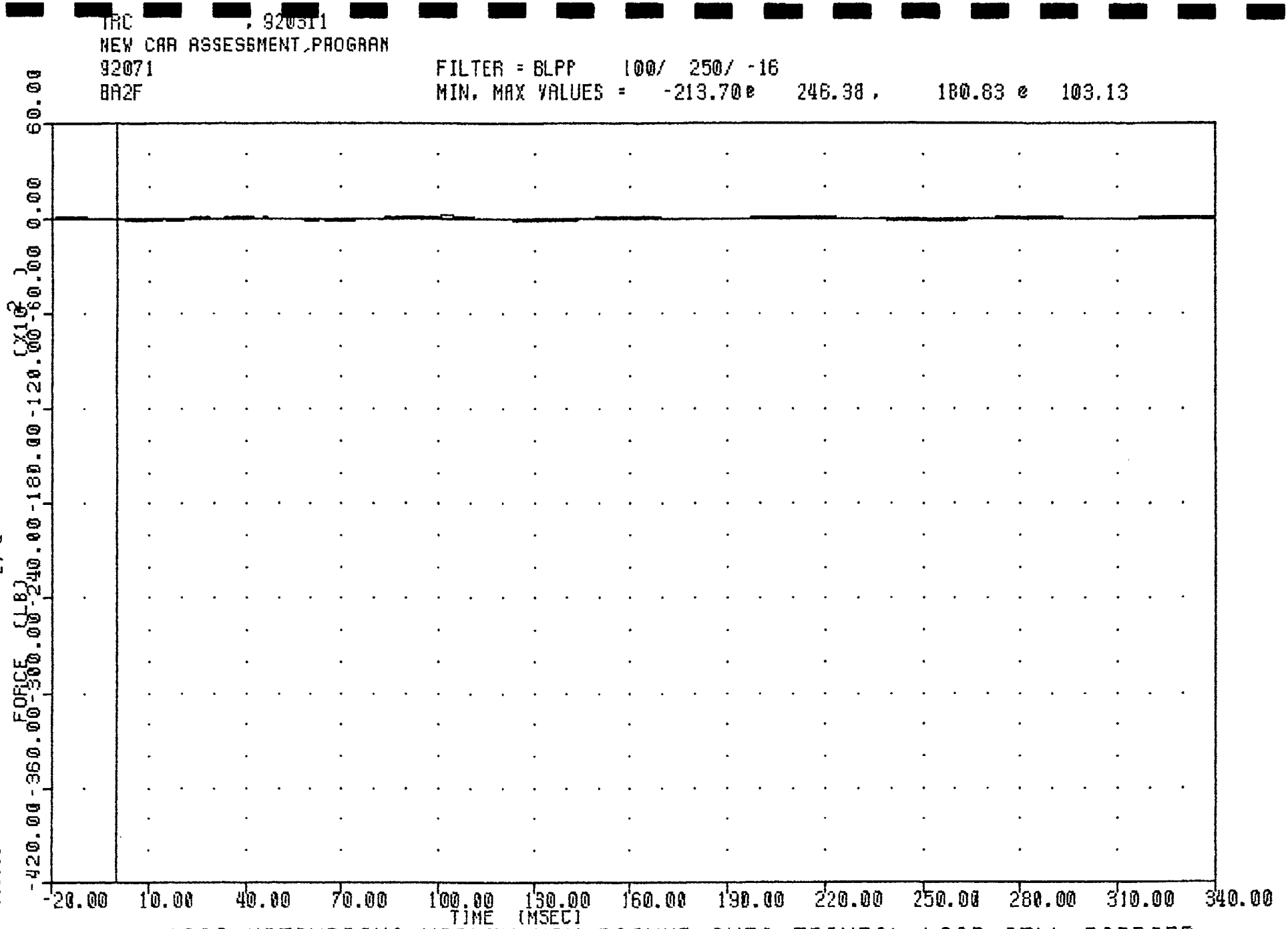
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
VEHICLE REAR CENTER Z-AXIS DISPLACEMENT

920311



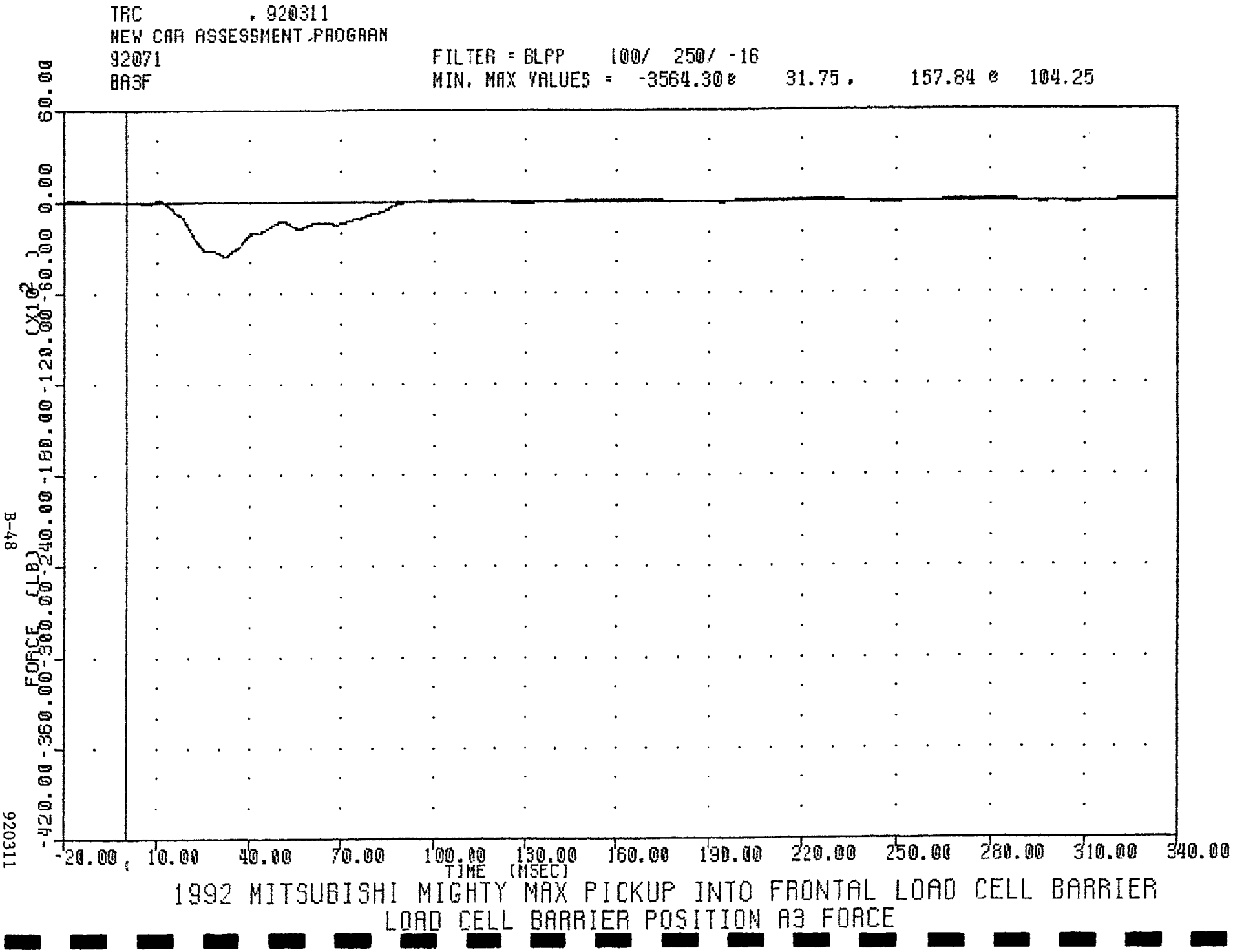
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION A1 FORCE



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A2 FORCE

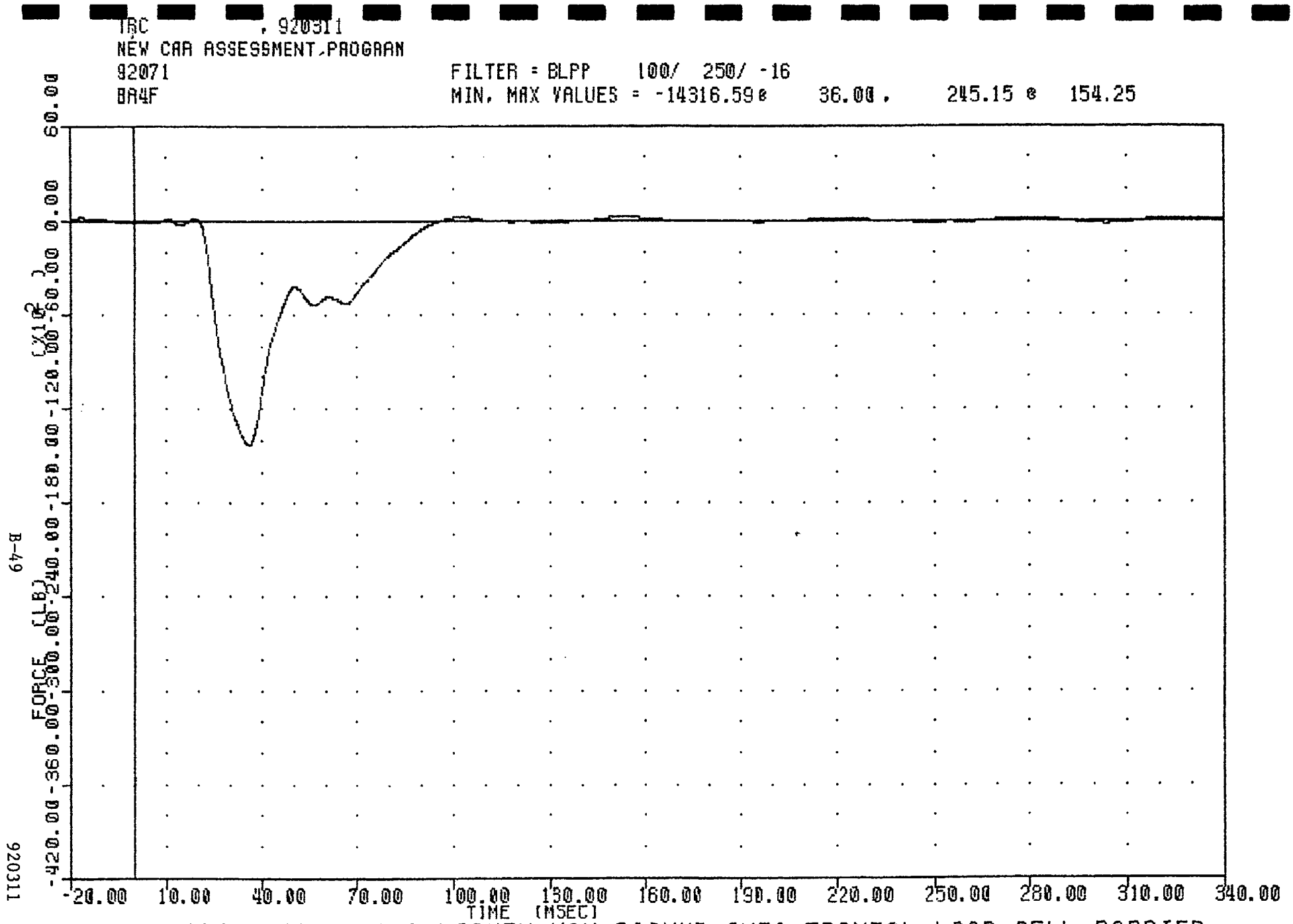
920311



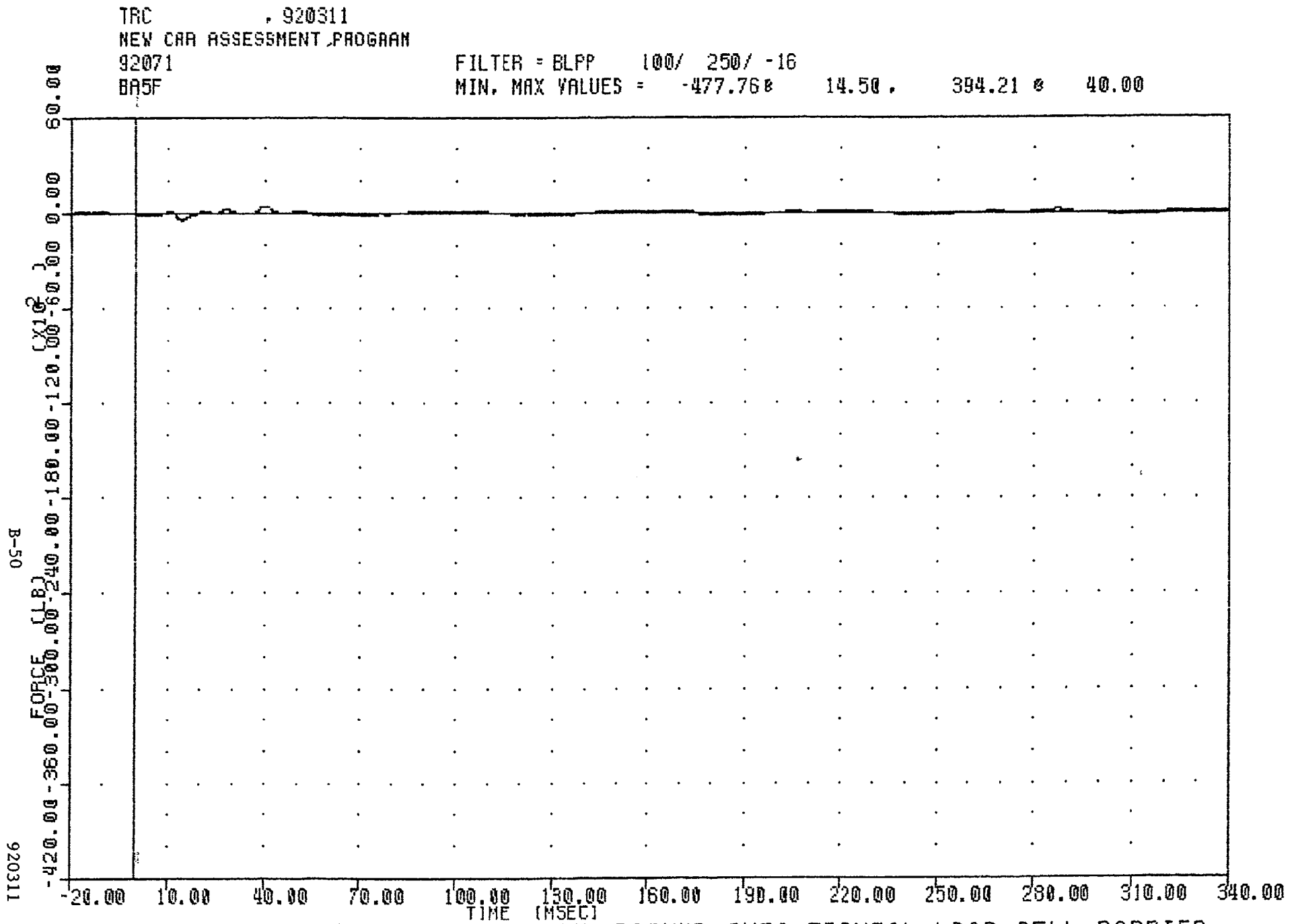
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION A3 FORCE

920311



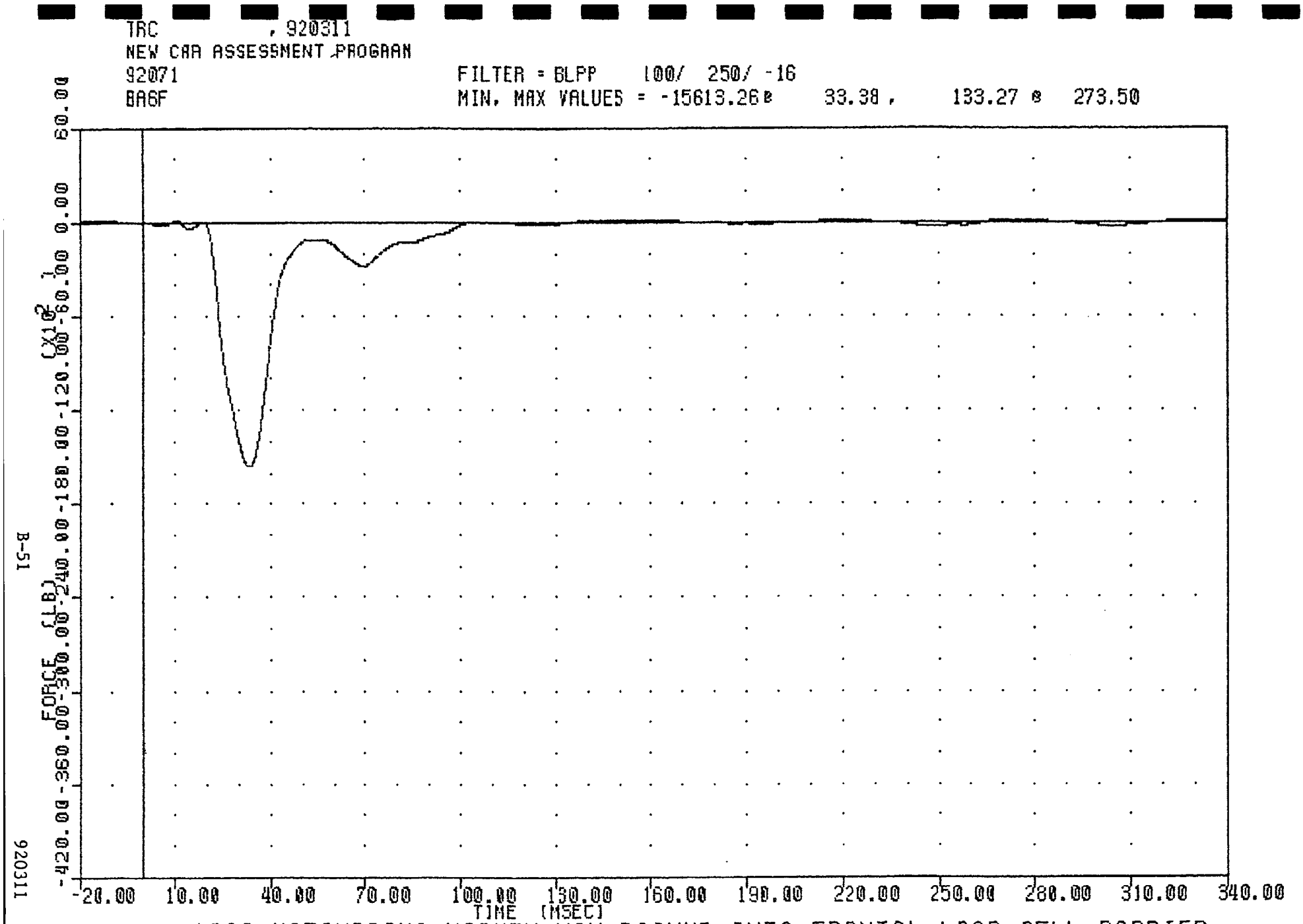
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A4 FORCE



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

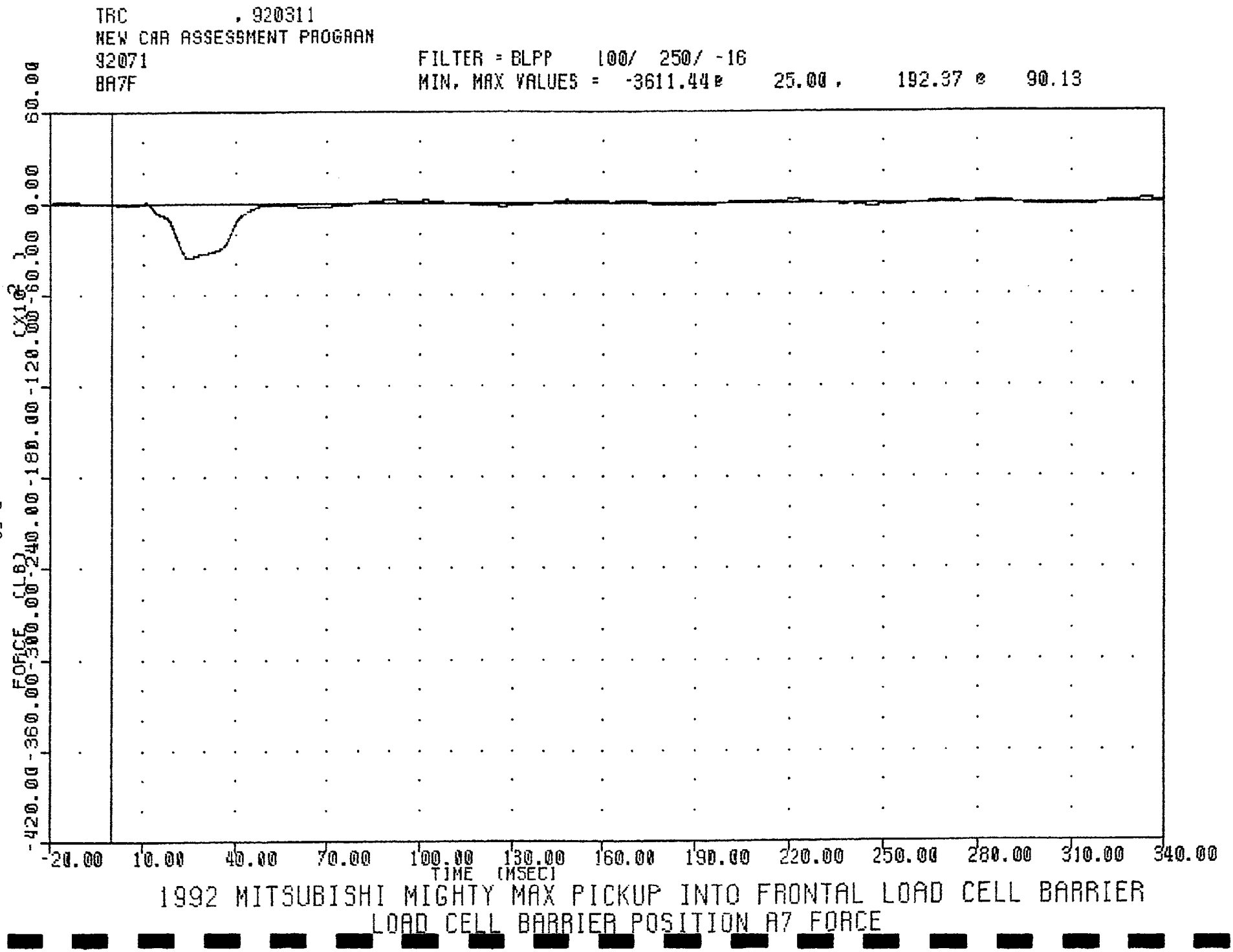
LOAD CELL BARRIER POSITION A5 FORCE

920311



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A6 FORCE

920311



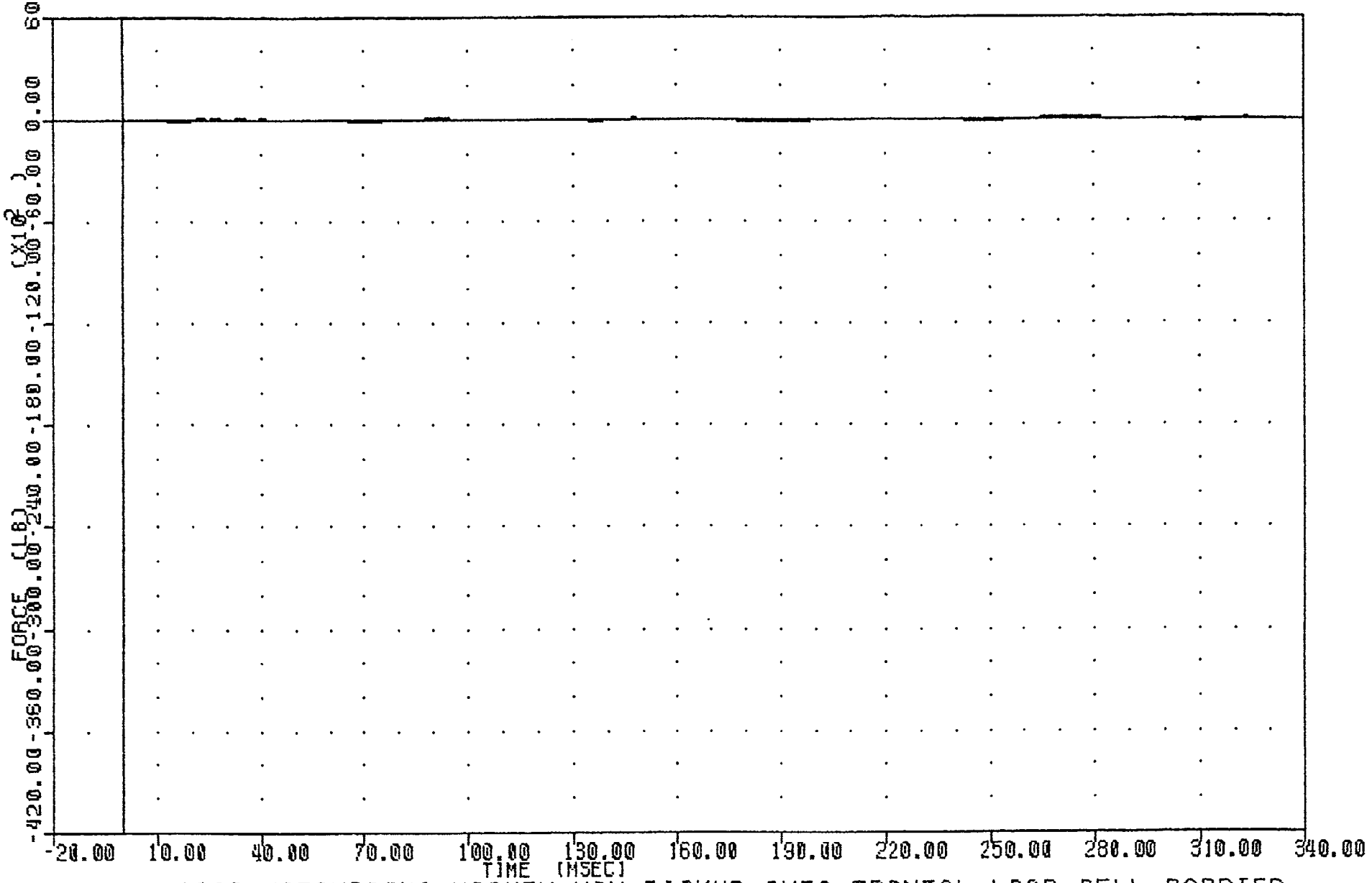
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION A7 FORCE

920311

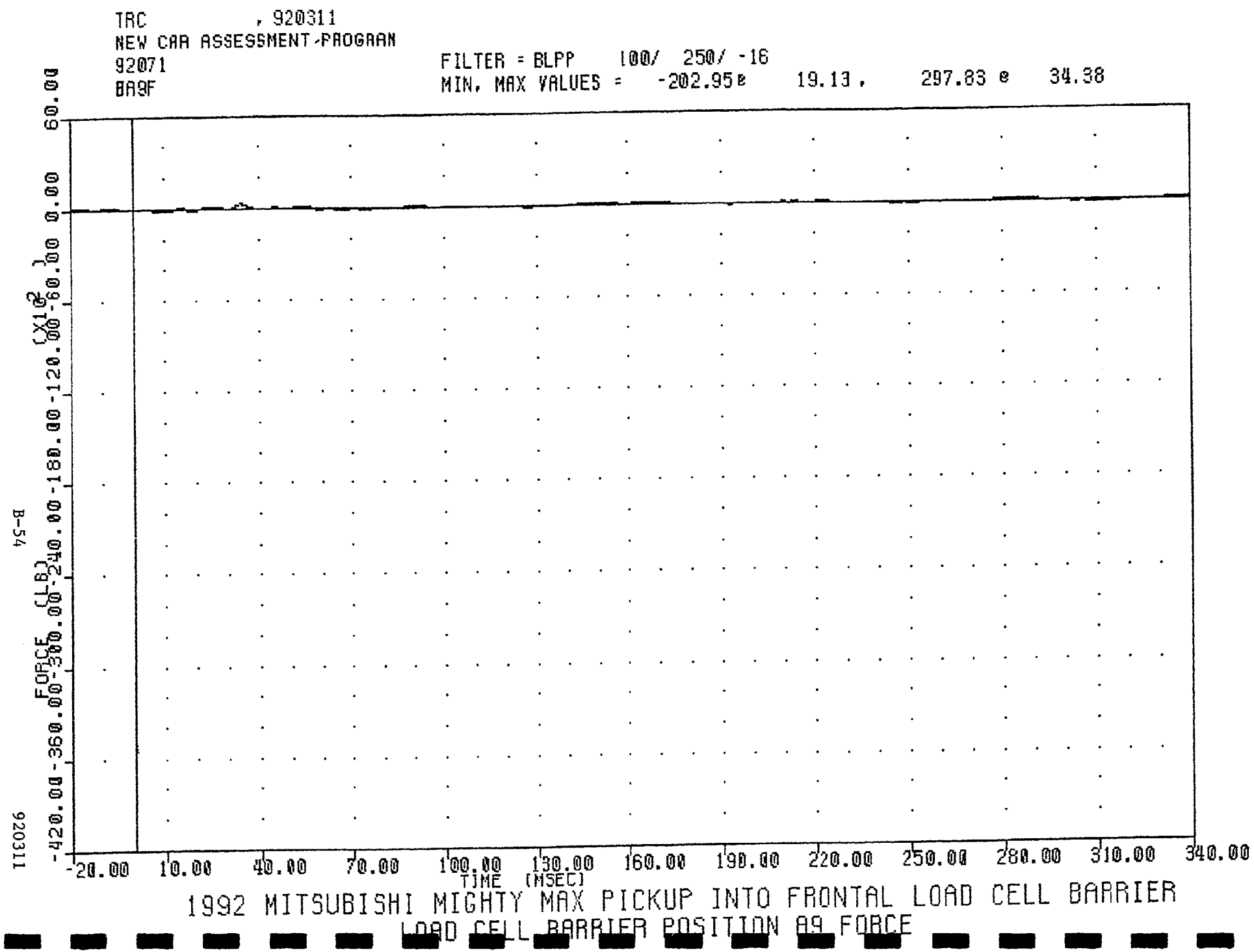
TRC , 920311
NEW CAR ASSESSMENT-PROGRAM
92071
BA8F

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -168.46 @ 70.25 , 101.31 @ 272.75



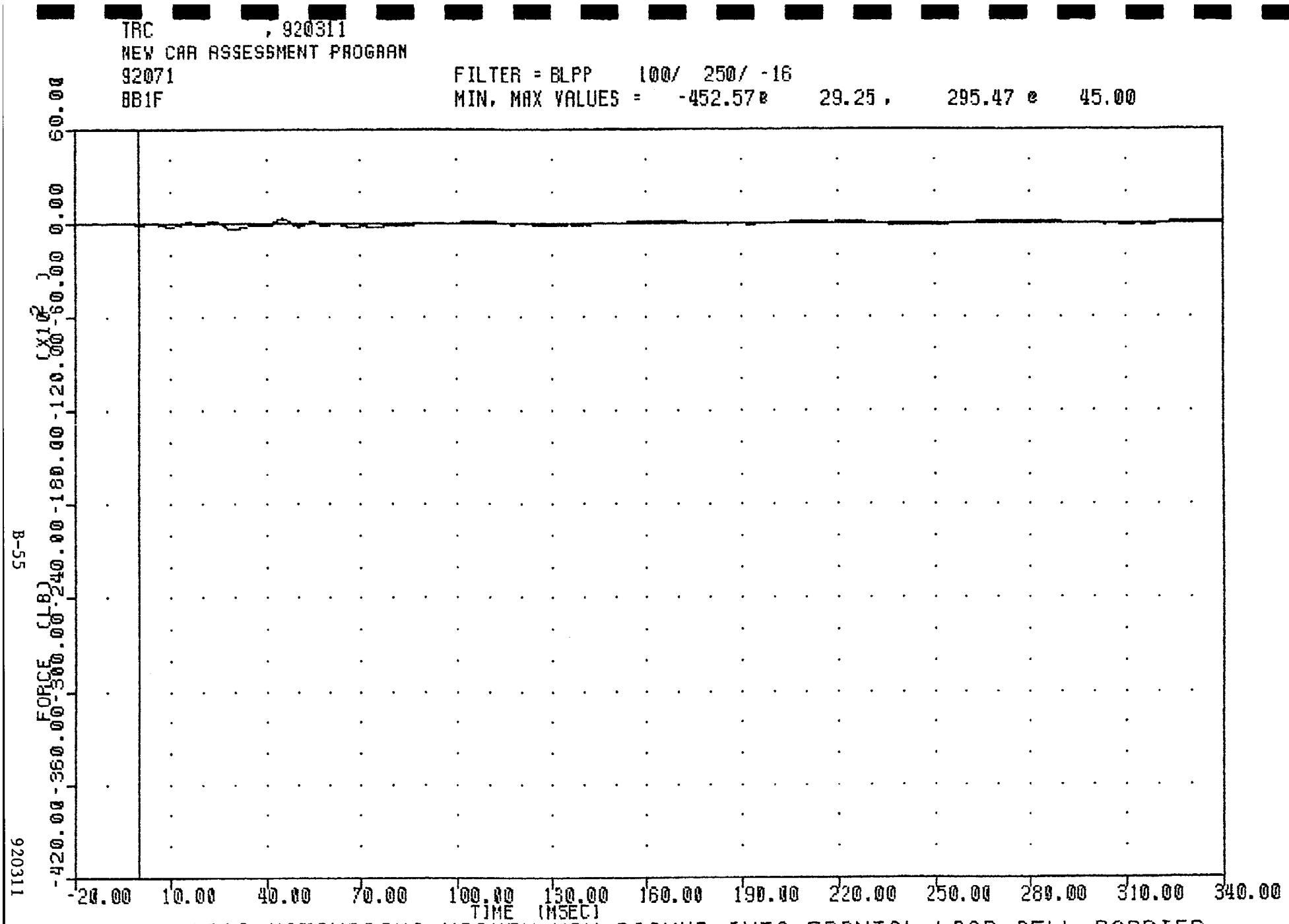
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A8 FORCE

920311



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

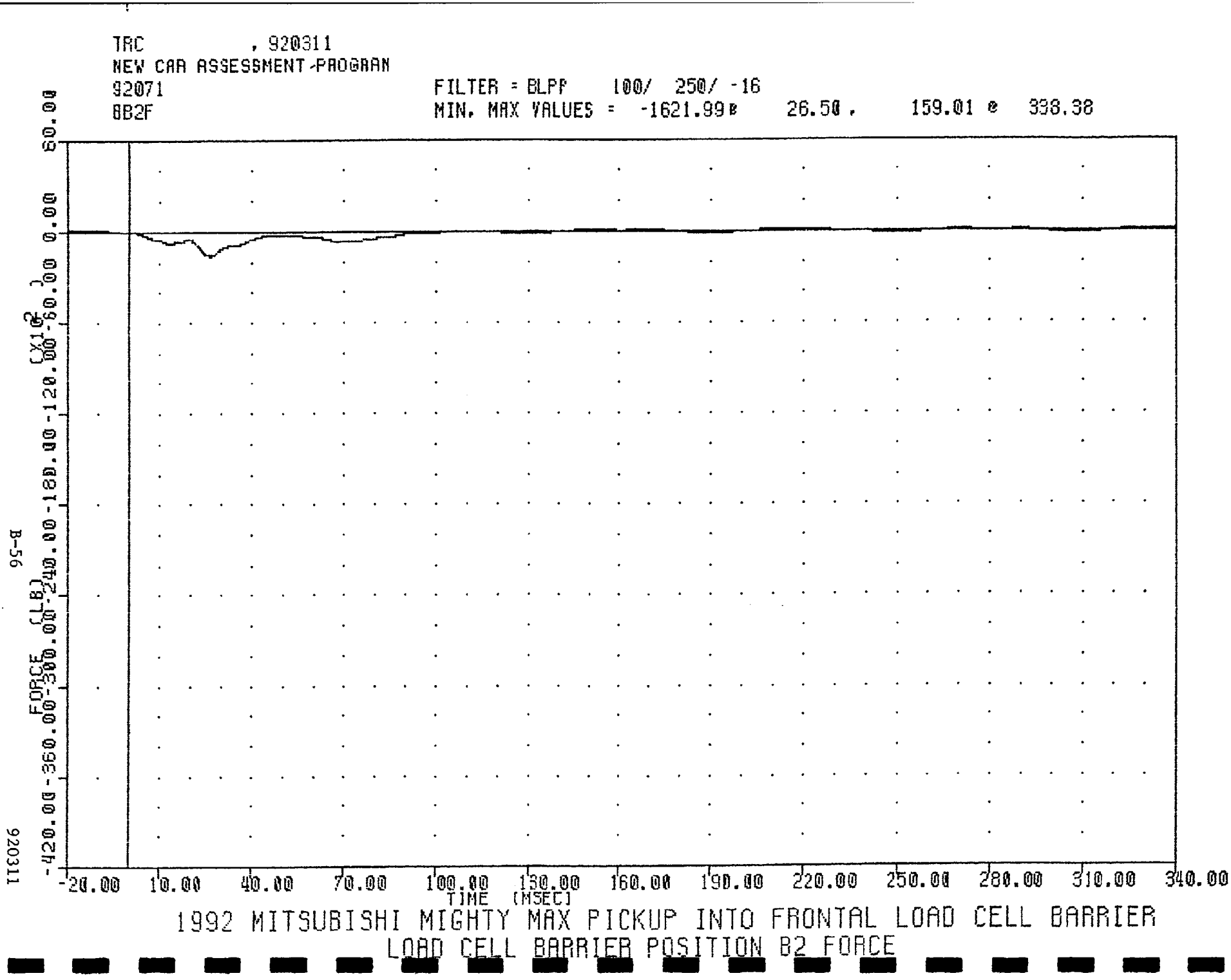
LOAD CELL BARRIER POSITION A9 FORCE



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION B1 FORCE

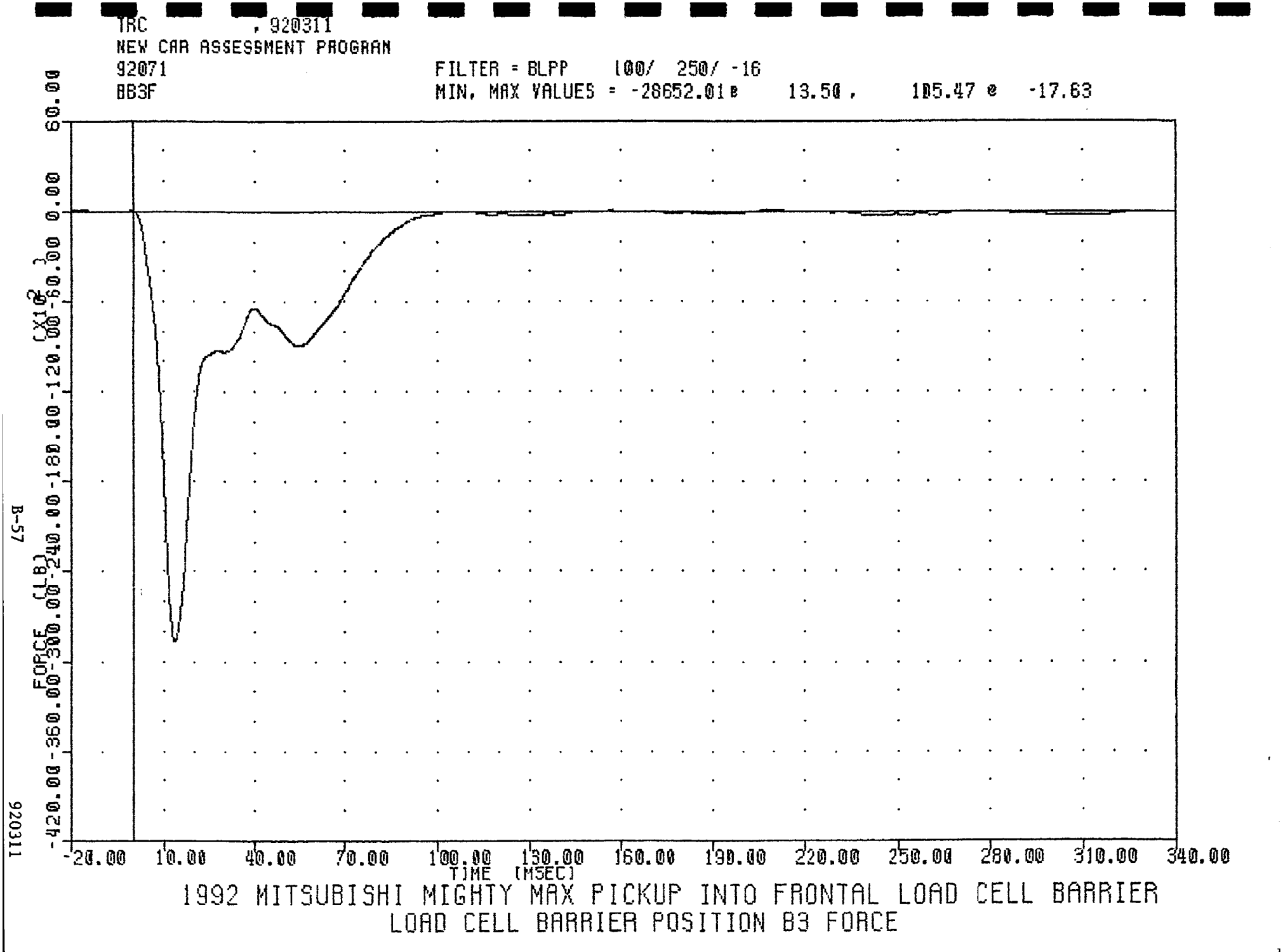
920311



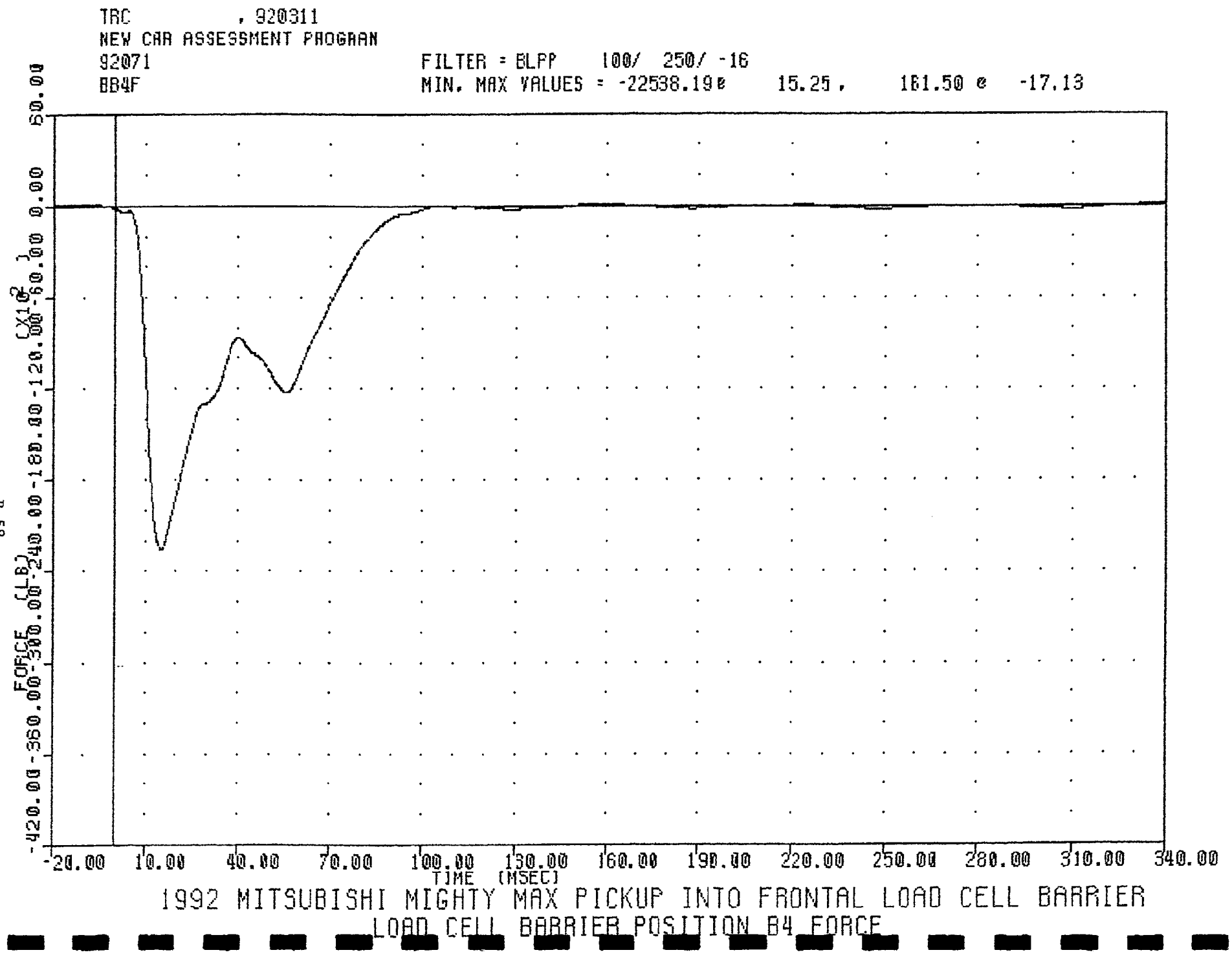
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION B2 FORCE

920311



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B3 FORCE

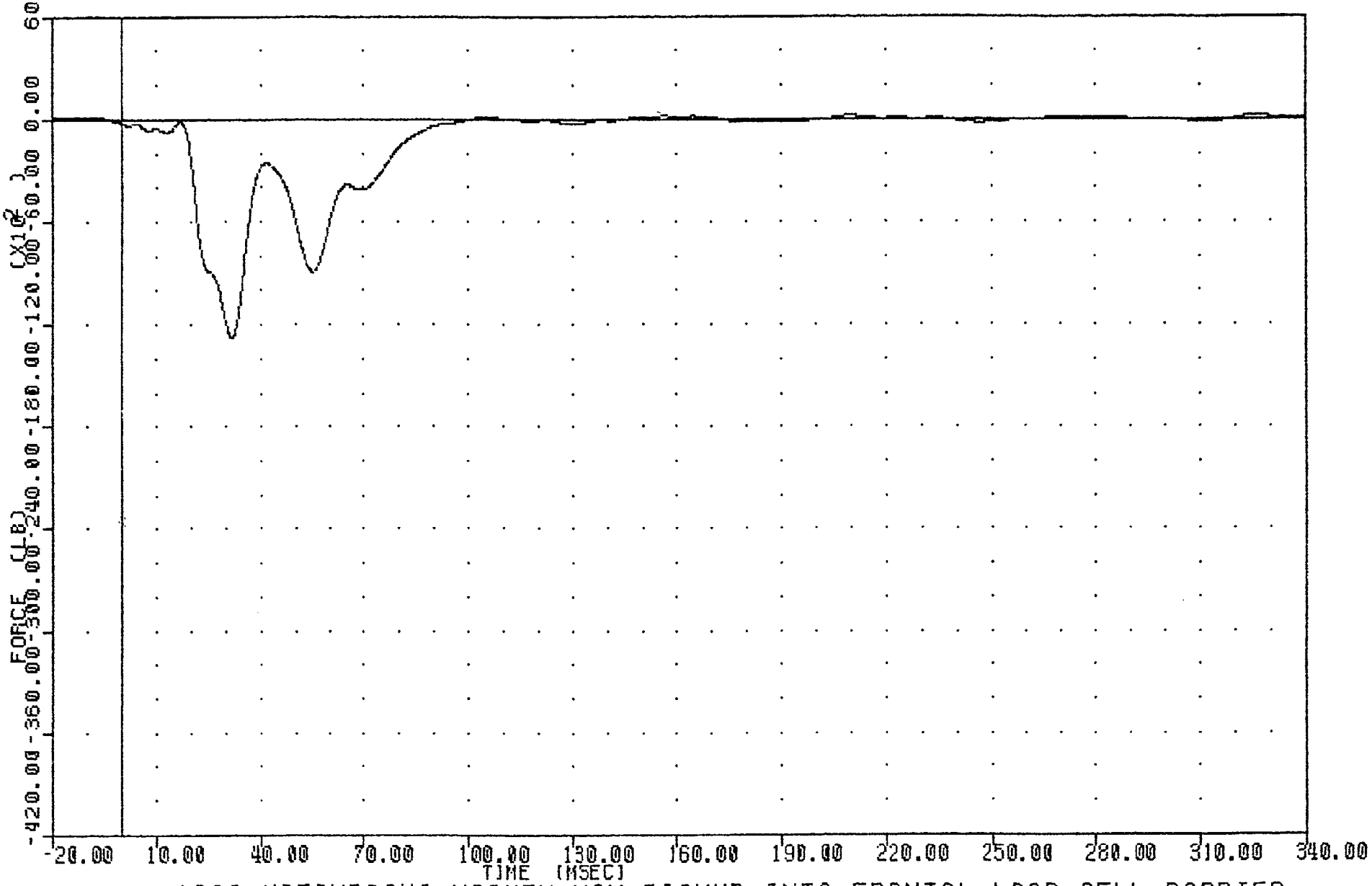


1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION B4 FORCE

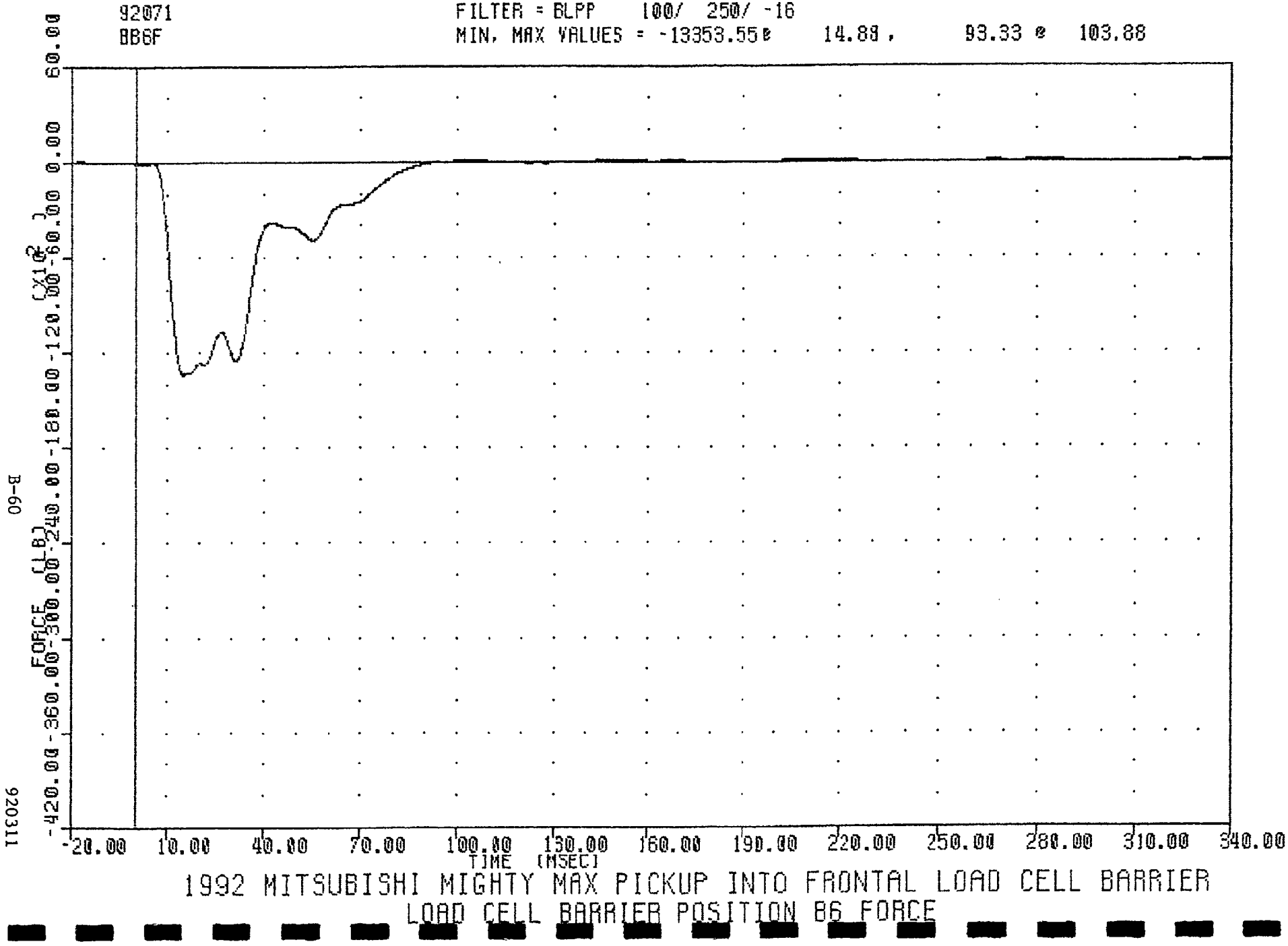
920311

TRC , 920311
NEW CAR ASSESSMENT PROGRAM
92071
8B5F
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -12761.56 @ 31.88 , 230.99 @ 326.63



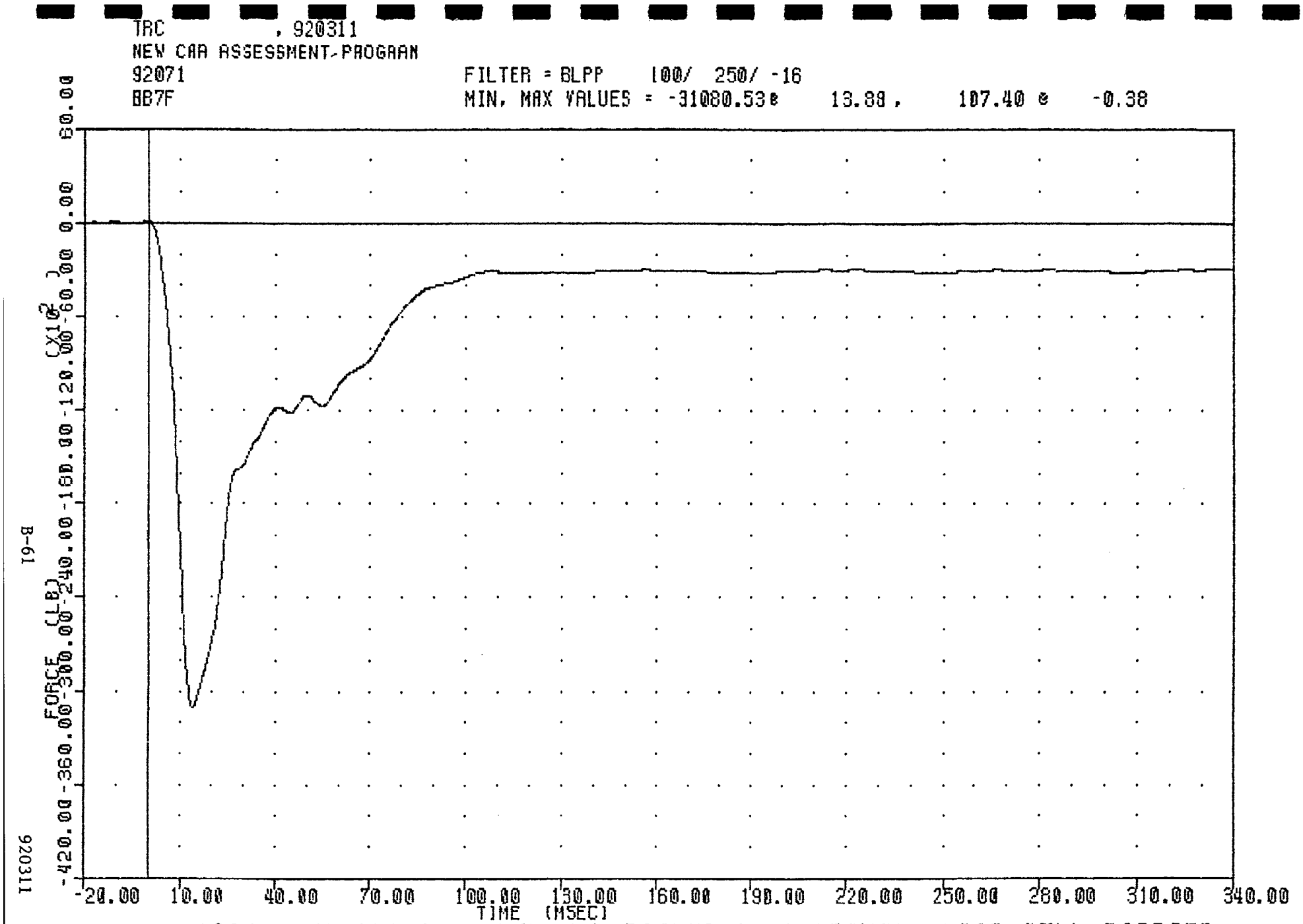
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B5 FORCE

920311



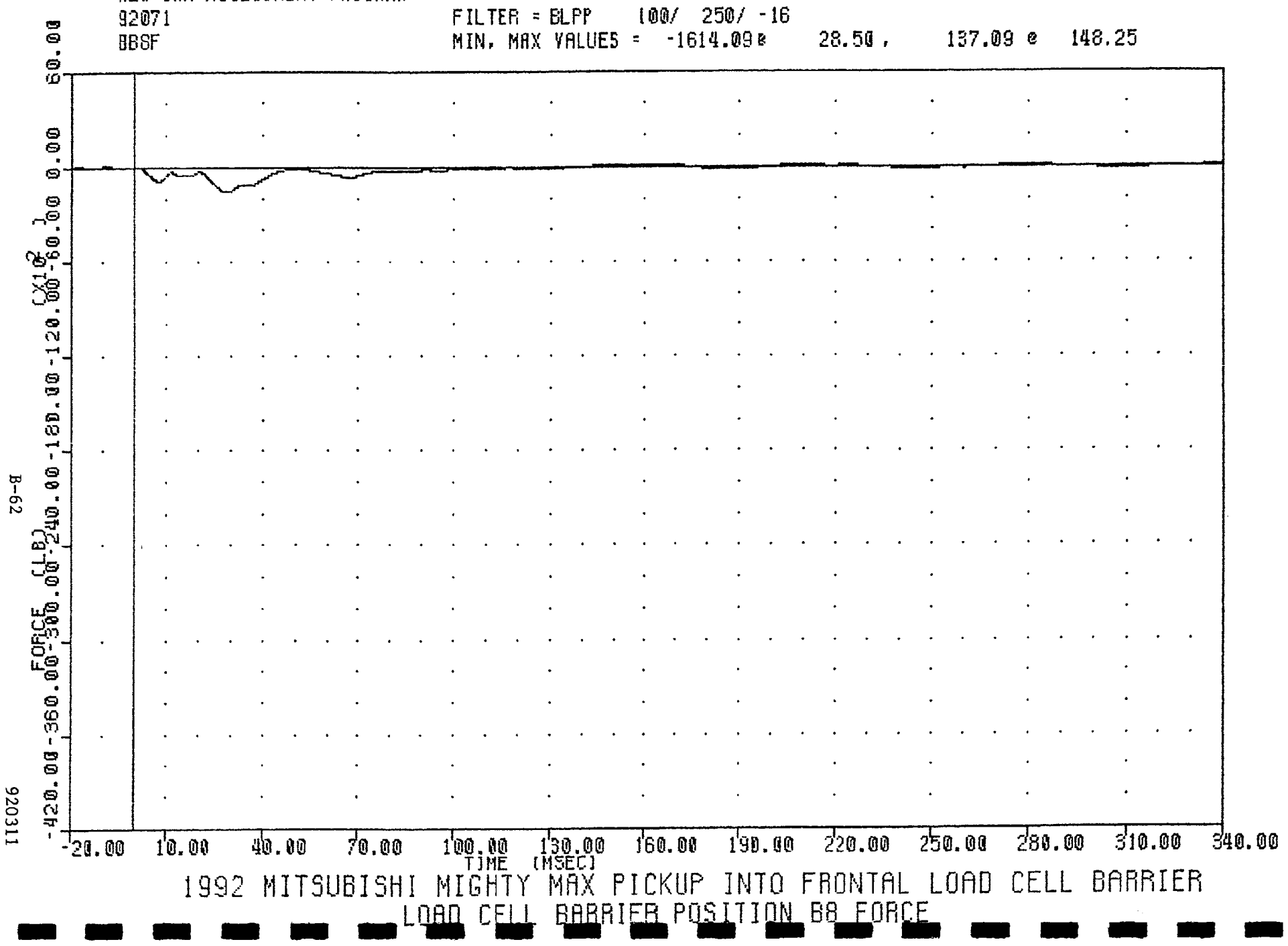
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION B6 FORCE



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B7 FORCE

920311

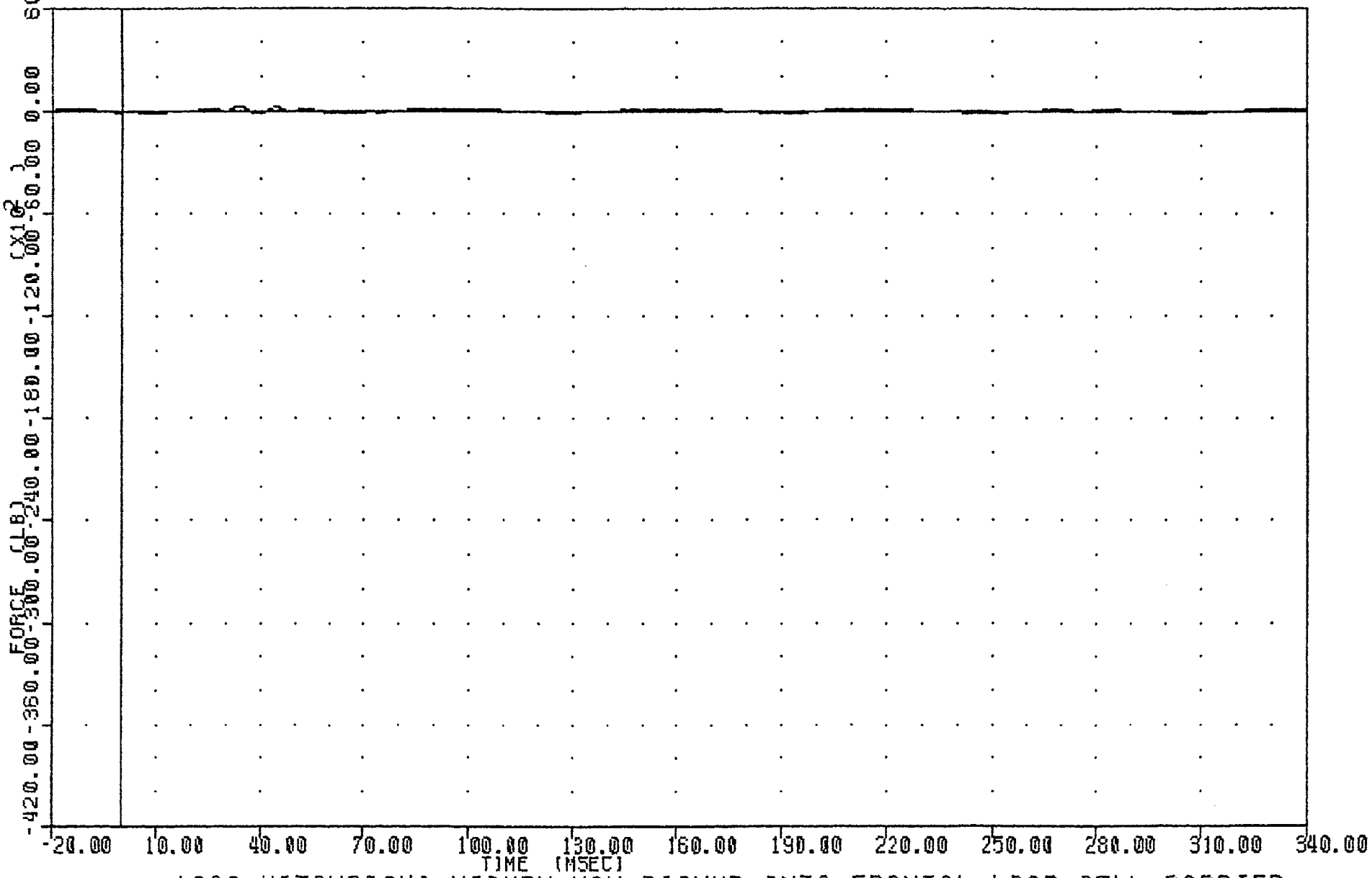


1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION BB FORCE

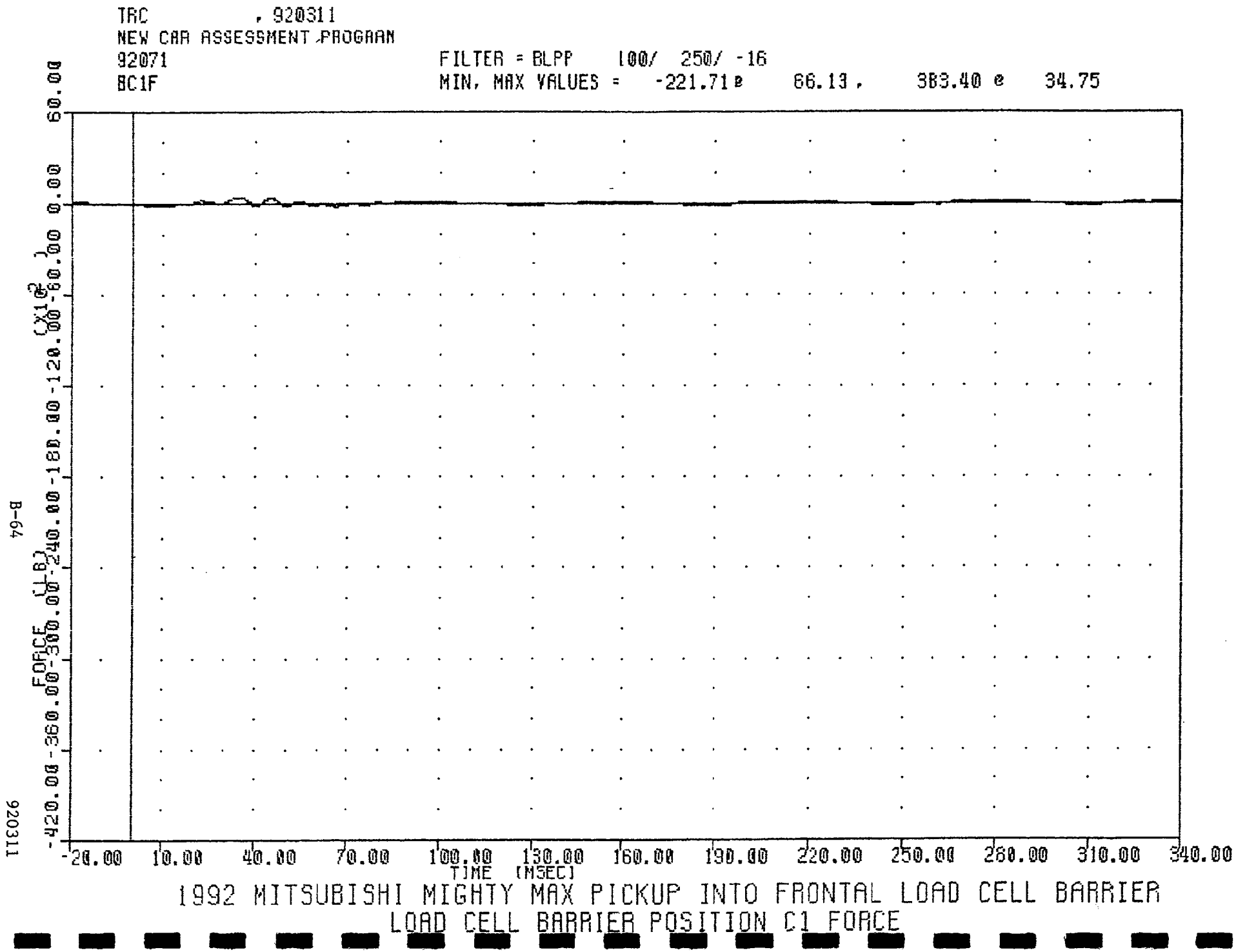
920311

TRC , 920311
NEW CAR ASSESSMENT PROGRAM
92071
BB9F
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -215.20 @ 39.63 , 278.62 @ 34.00



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B9 FORCE

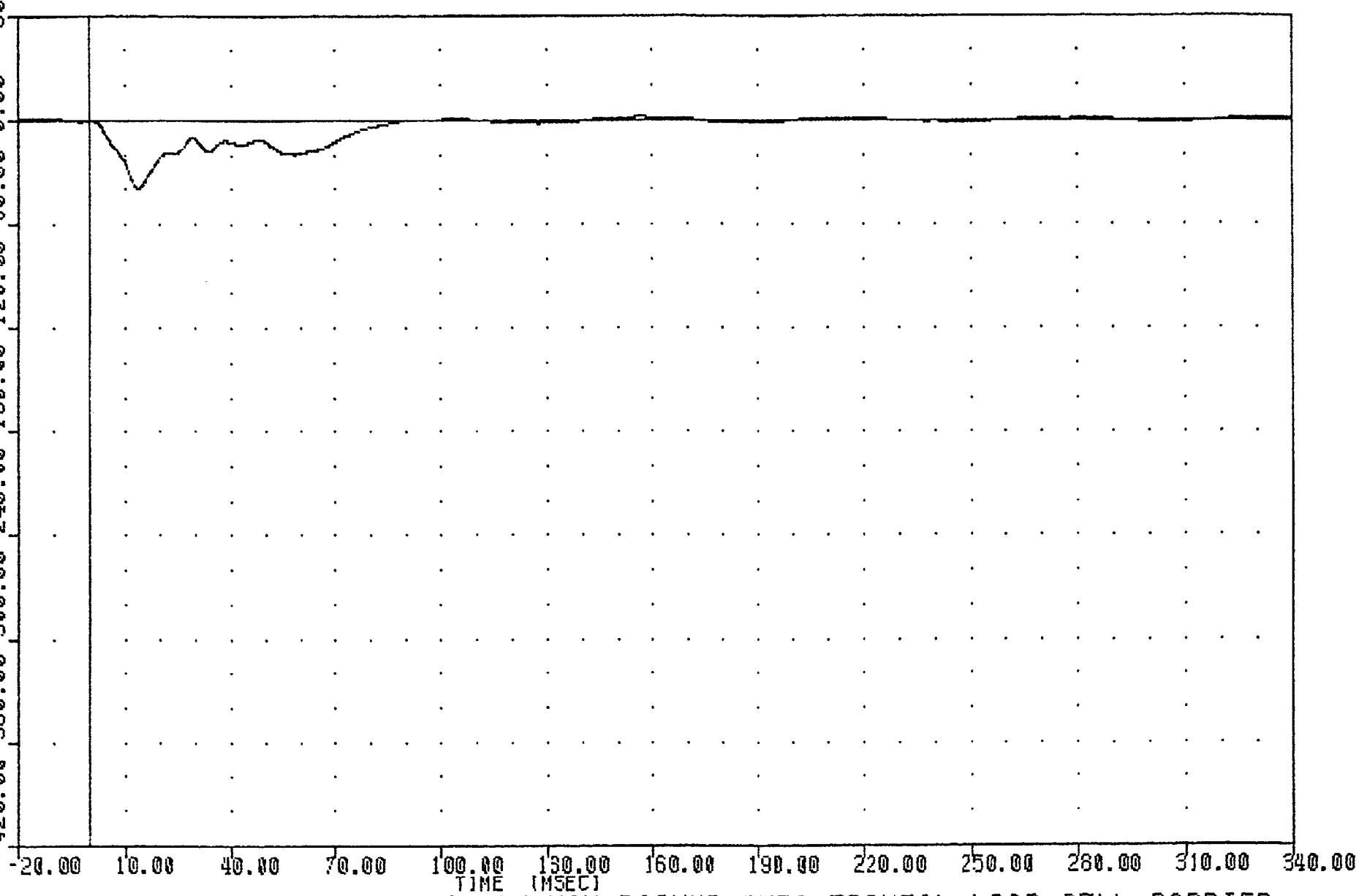
920311



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

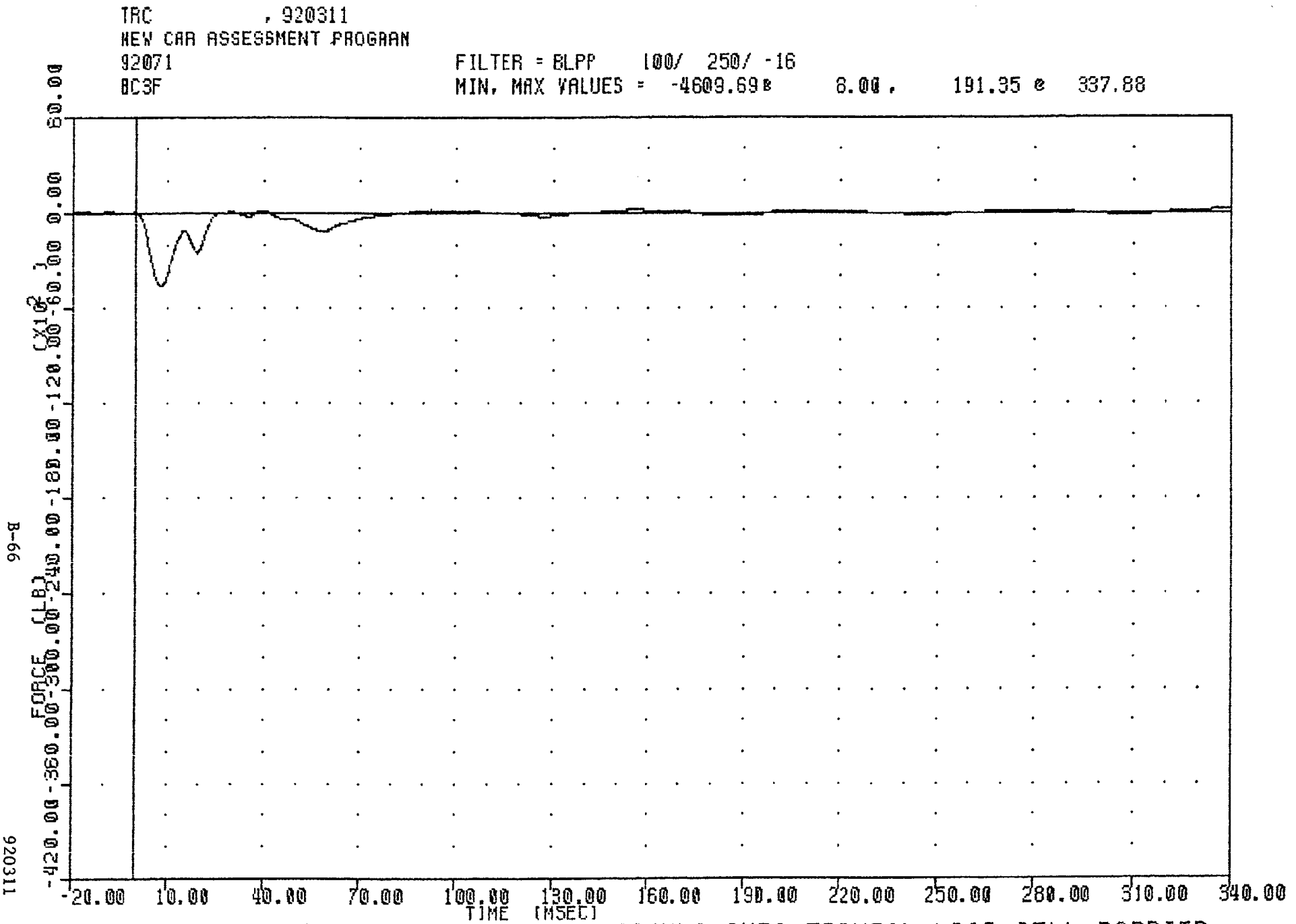
LOAD CELL BARRIER POSITION C1 FORCE

TRC , 920311
NEW CAR ASSESSMENT PROGRAM
92071 FILTER = BLPP (00/ 250/ -16
BC2F MIN, MAX VALUES = -3946.61 @ 13.63 , 179.65 @ 156.75



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C2 FORCE

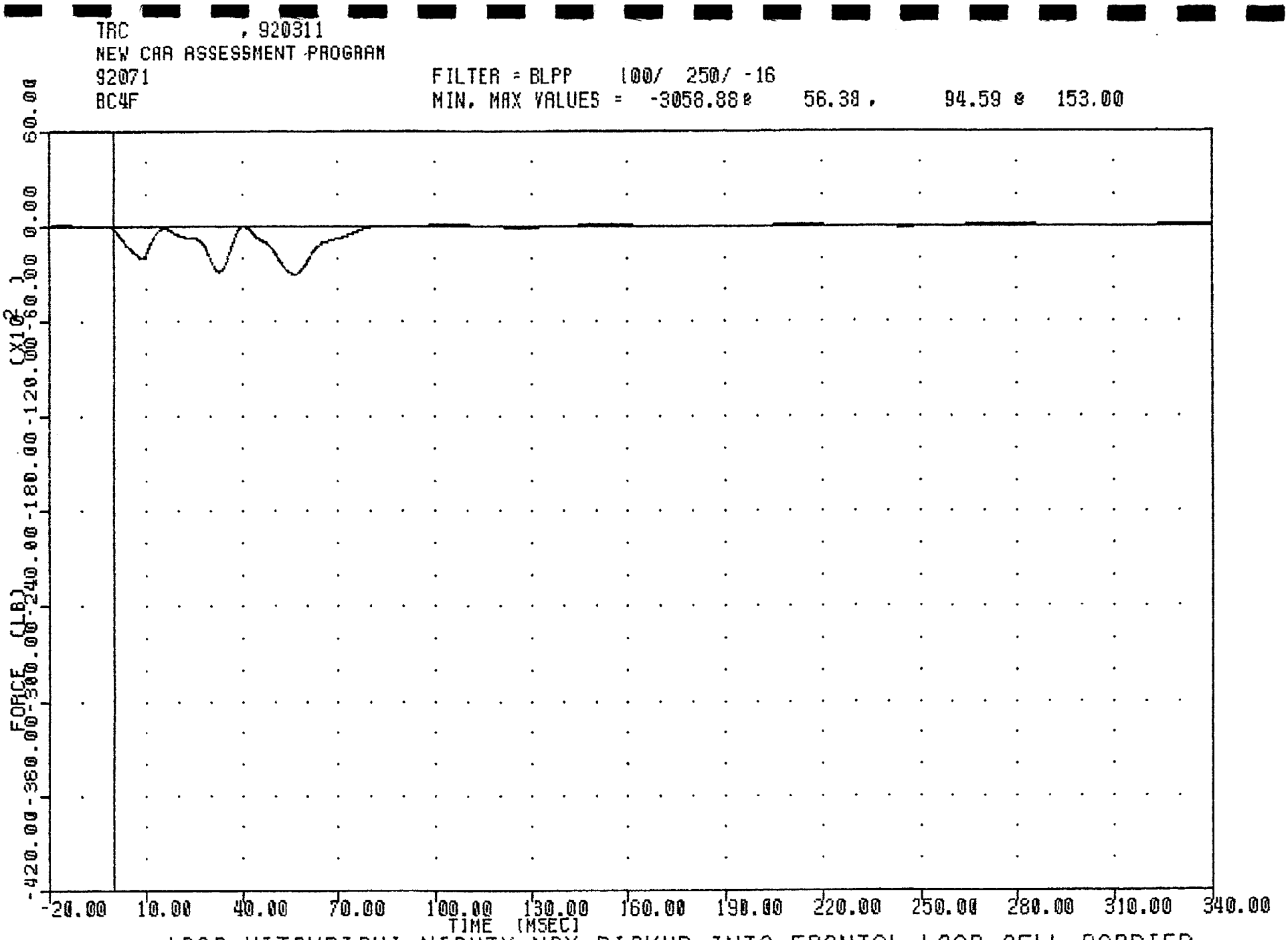
920311



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION C3 FORCE

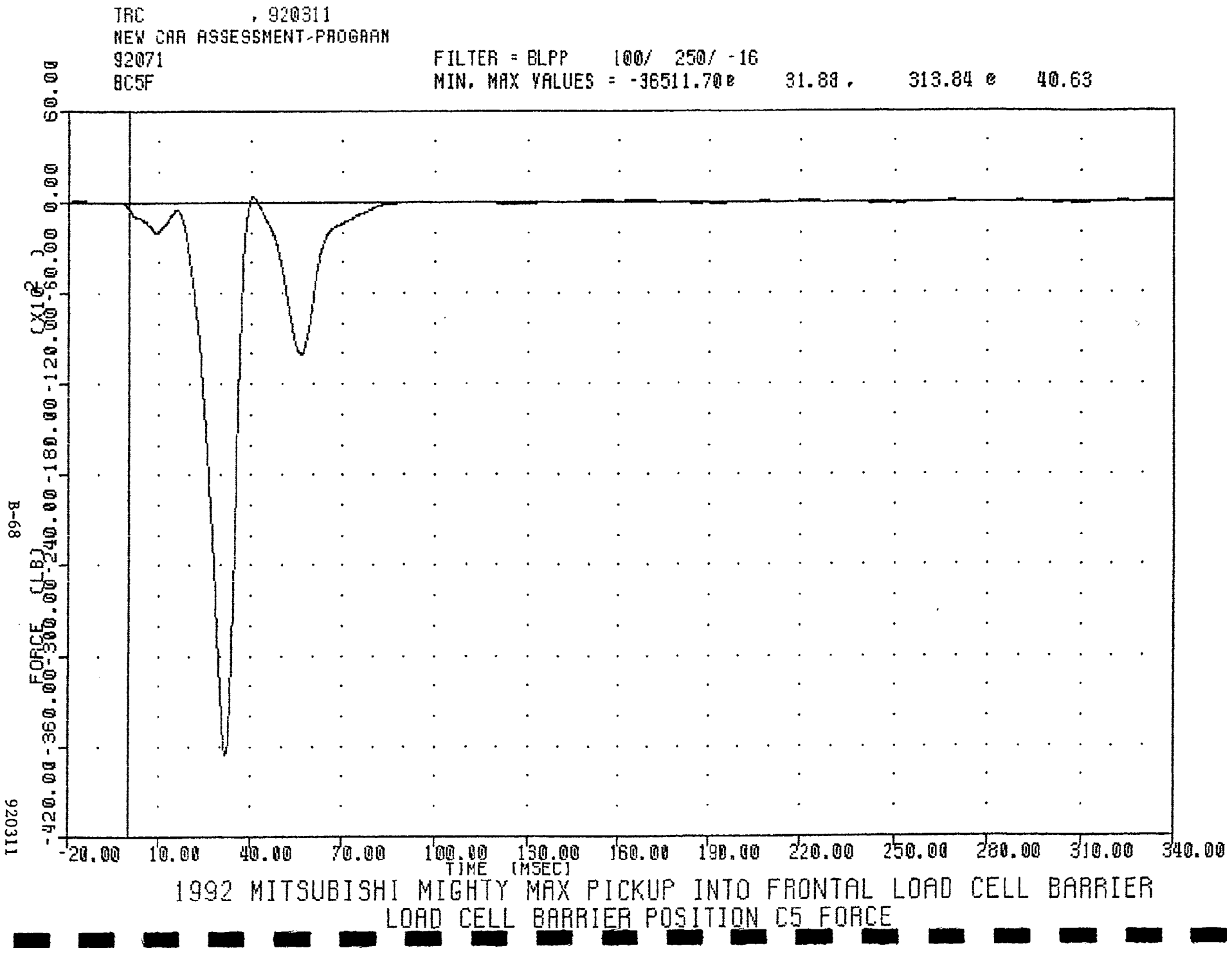
920311



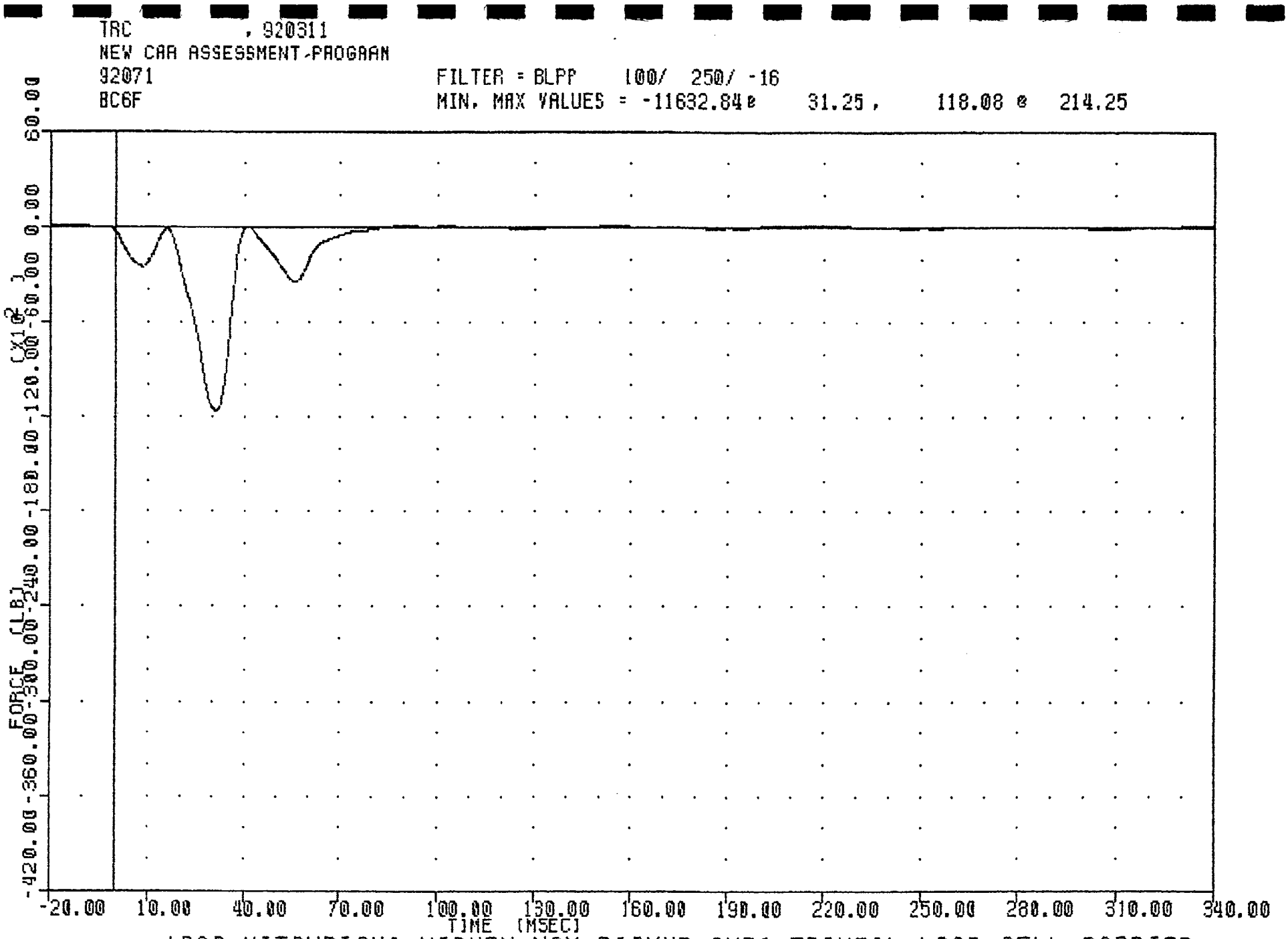
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION C4 FORCE

920311

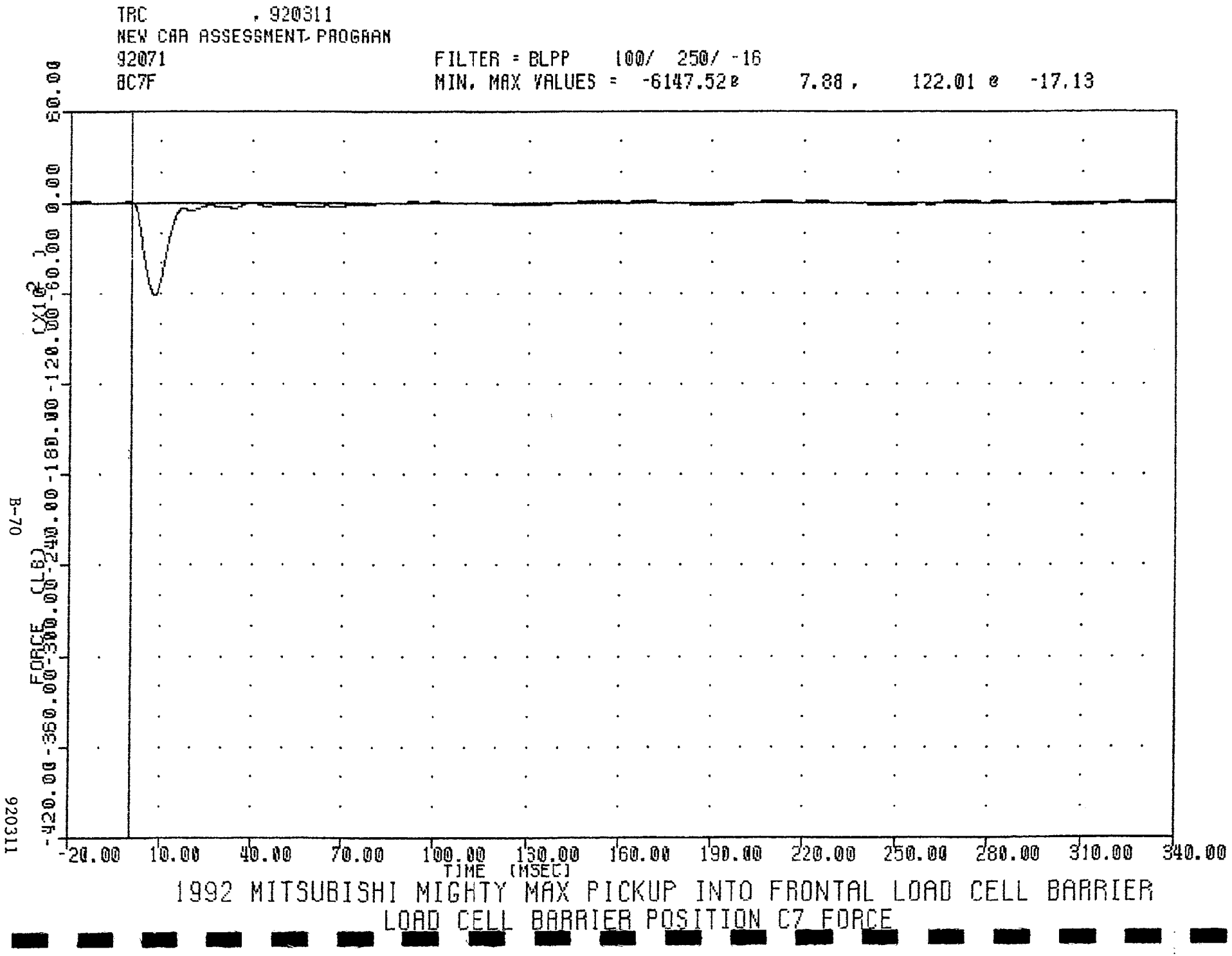

TRC , 920311
NEW CAR ASSESSMENT-PROGRAM
92071
BC5F
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -36511.70@ 31.88, 313.84@ 40.63
FORCE (LBJ (X10^2)
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C5 FORCE

920311



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C6 FORCE

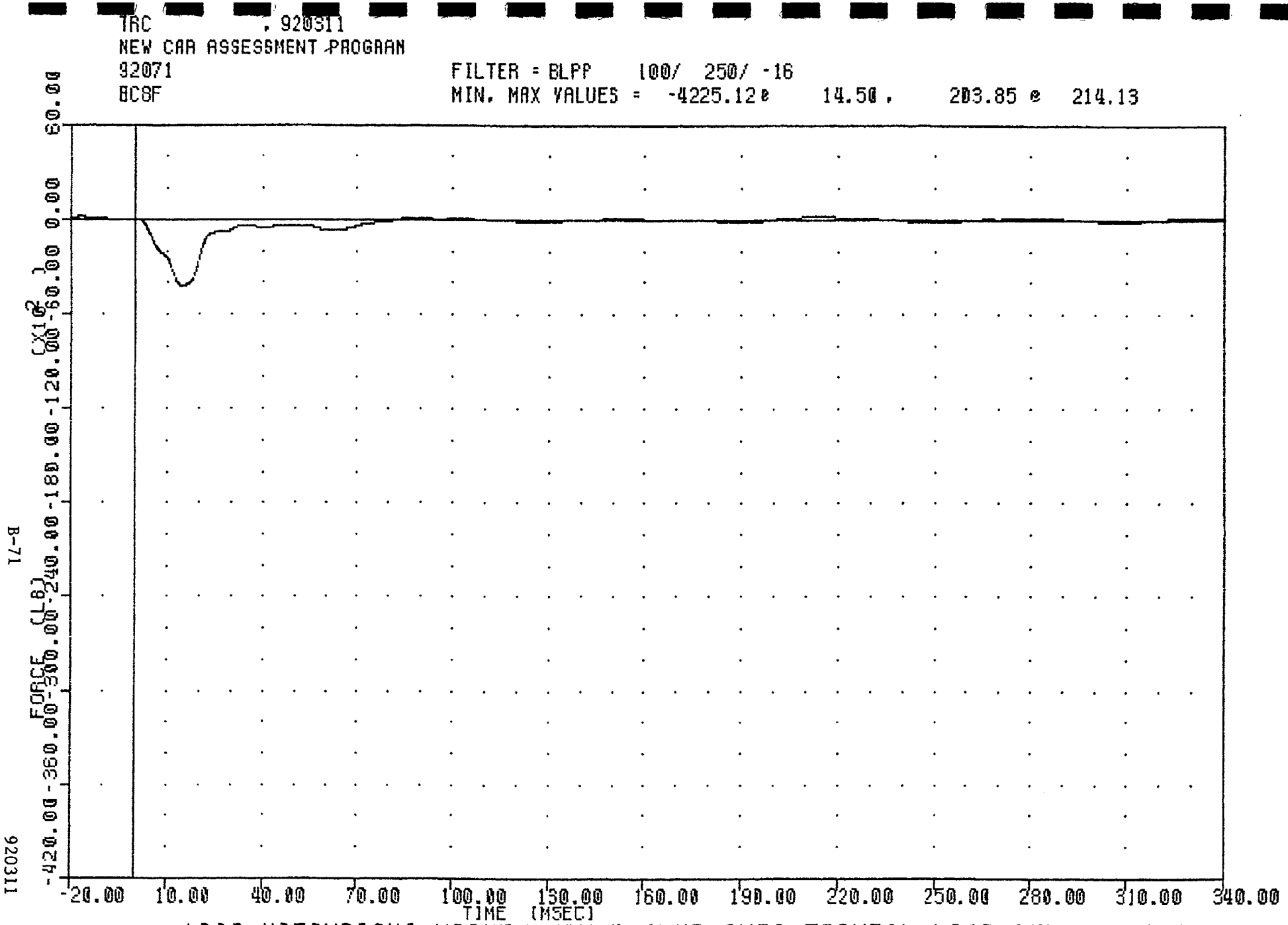
920311



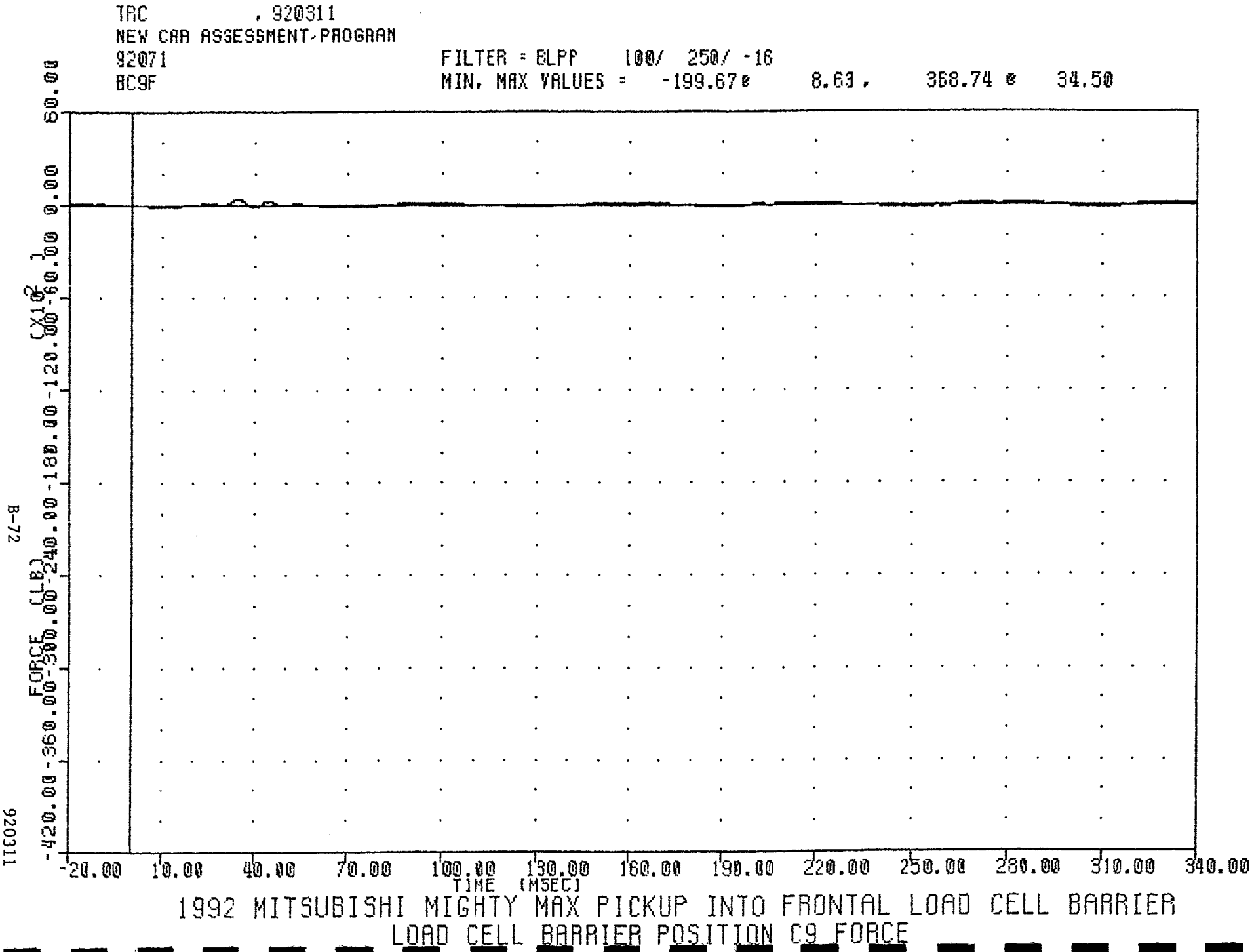
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION C7 FORCE

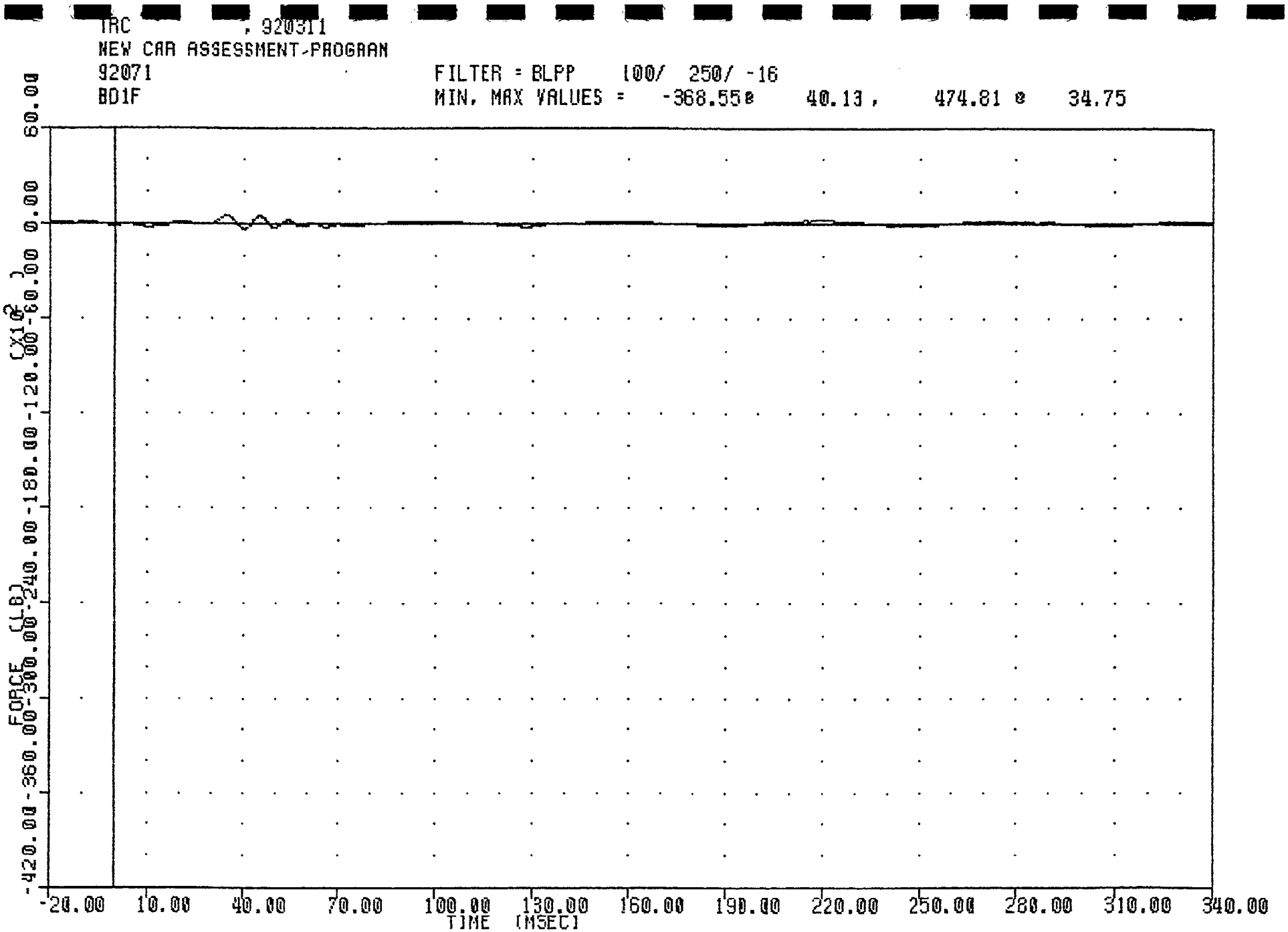
920311



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C8 FORCE

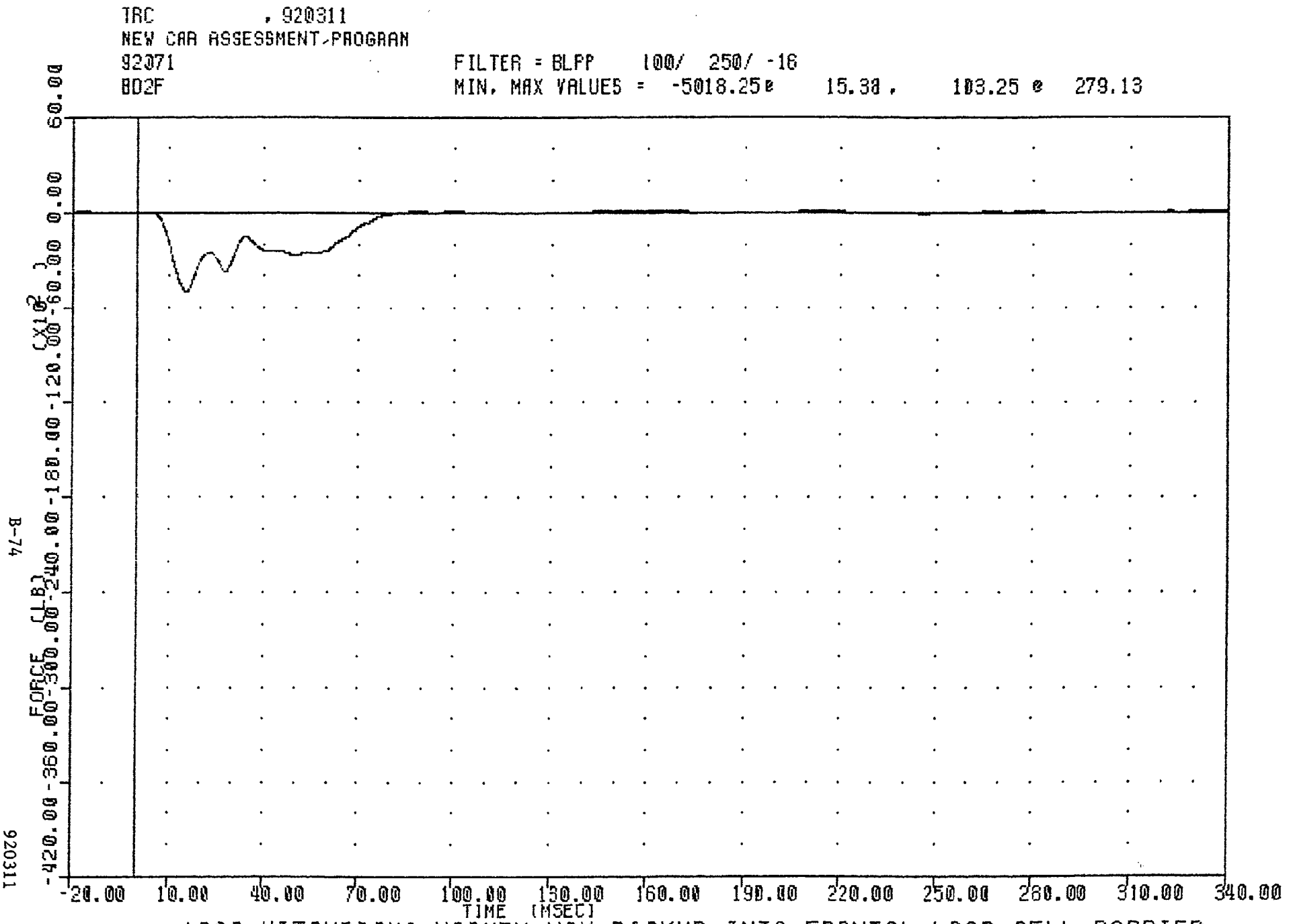

TRC , 920311
NEW CAR ASSESSMENT-PROGRAM
92071
BC9F
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -199.67@ 8.63, 368.74 @ 34.50
FORCE (LB) (X10^2)
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C9 FORCE

920311



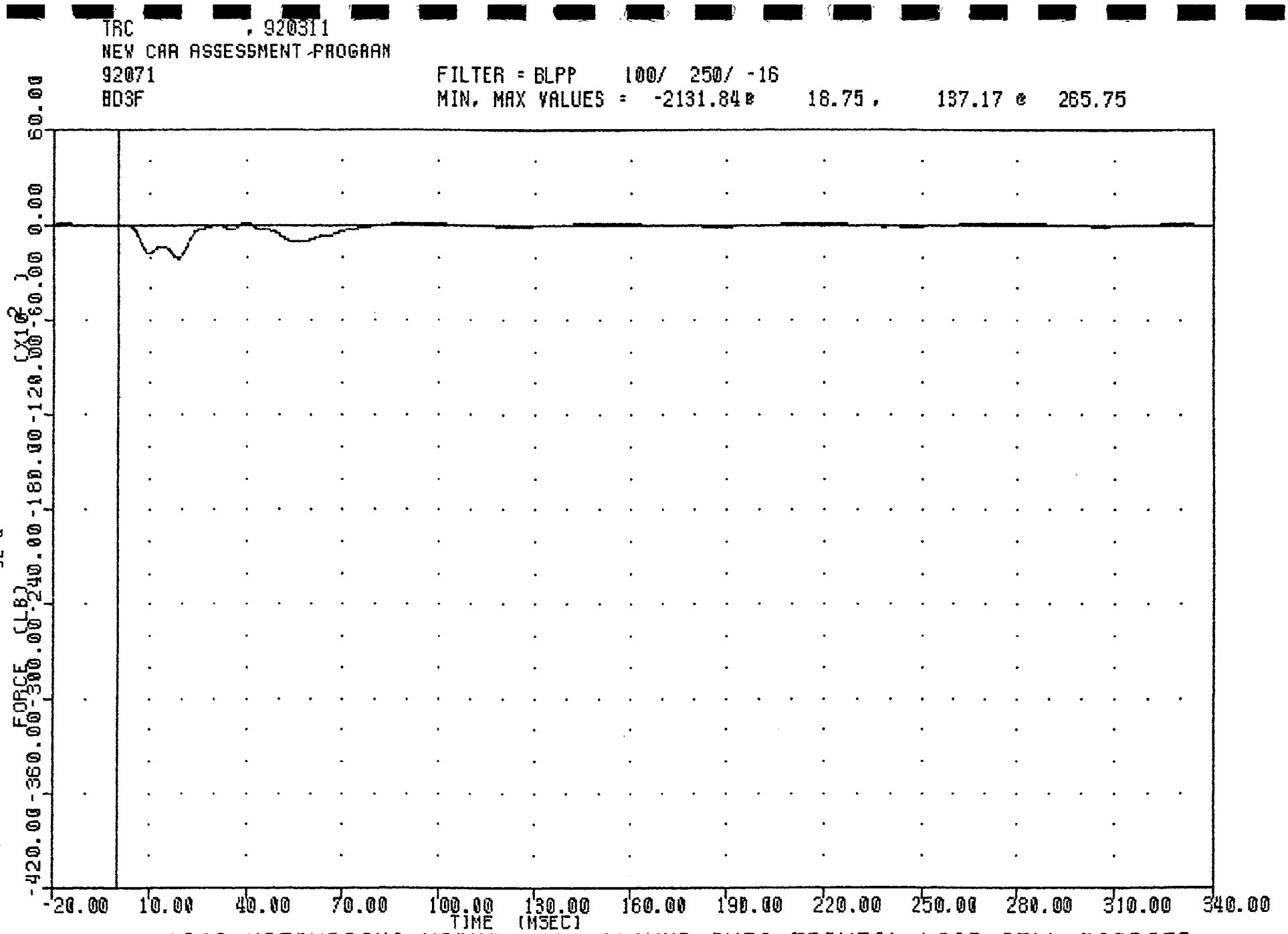
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D1 FORCE

920311



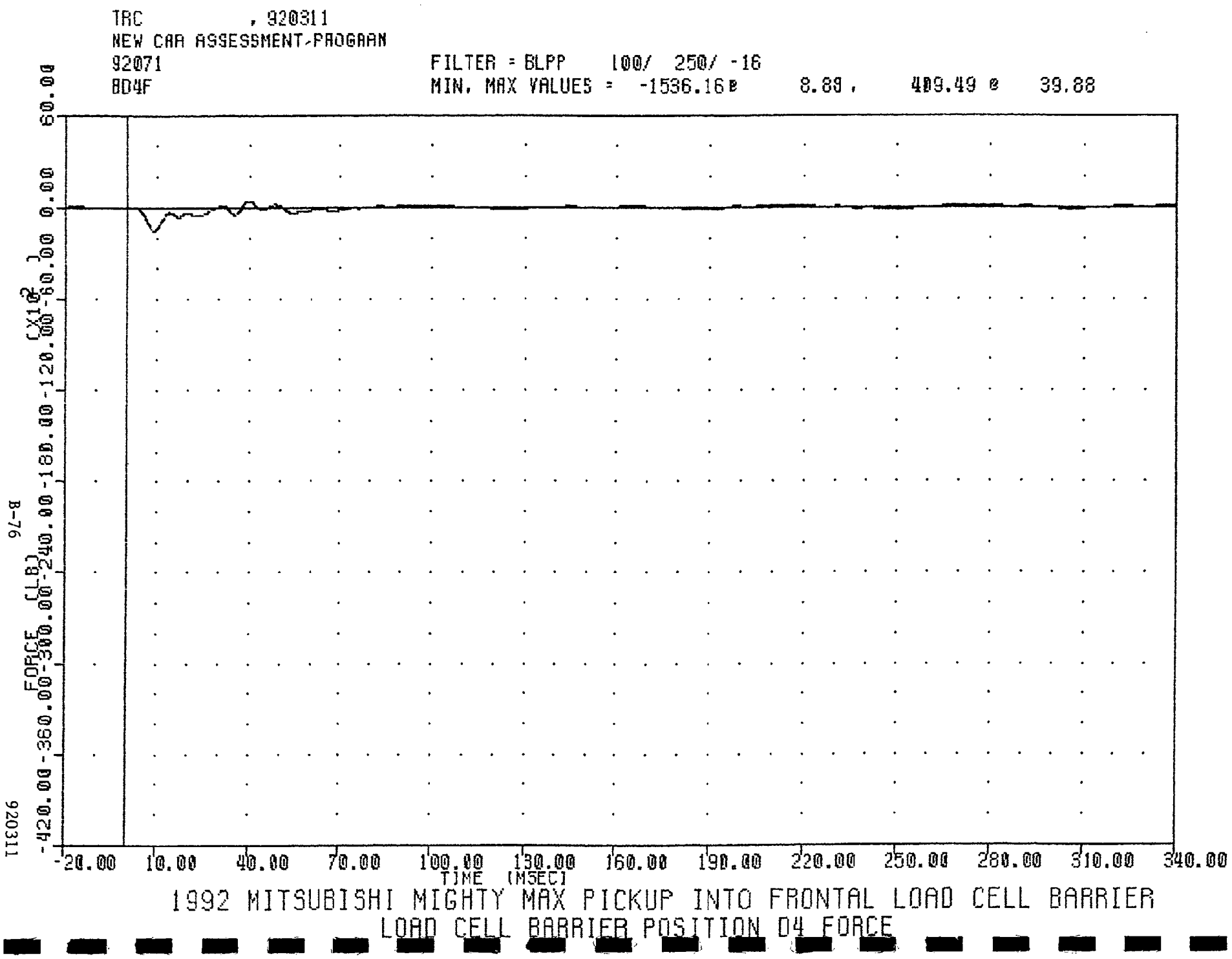
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

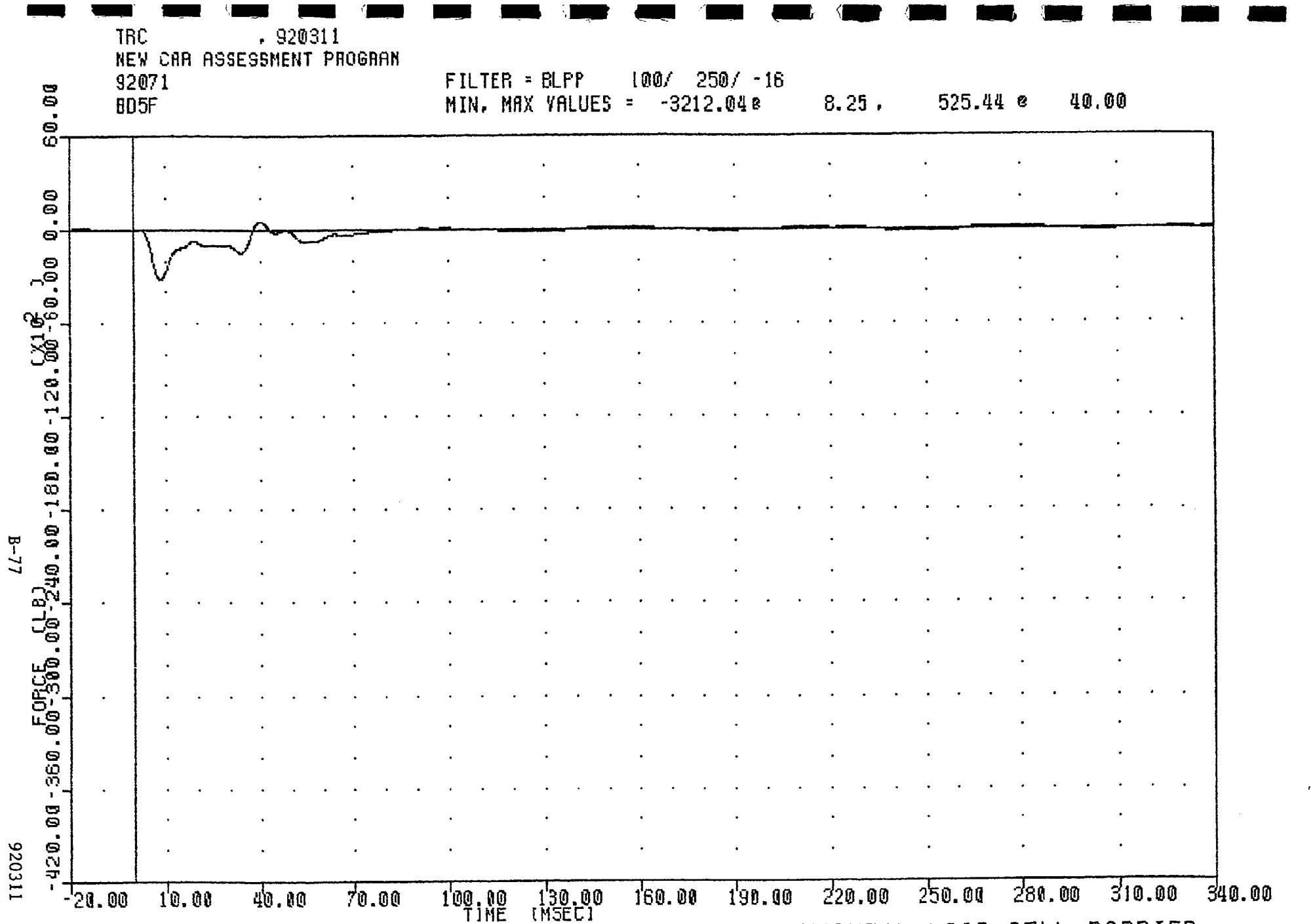
LOAD CELL BARRIER POSITION D2 FORCE



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D3 FORCE

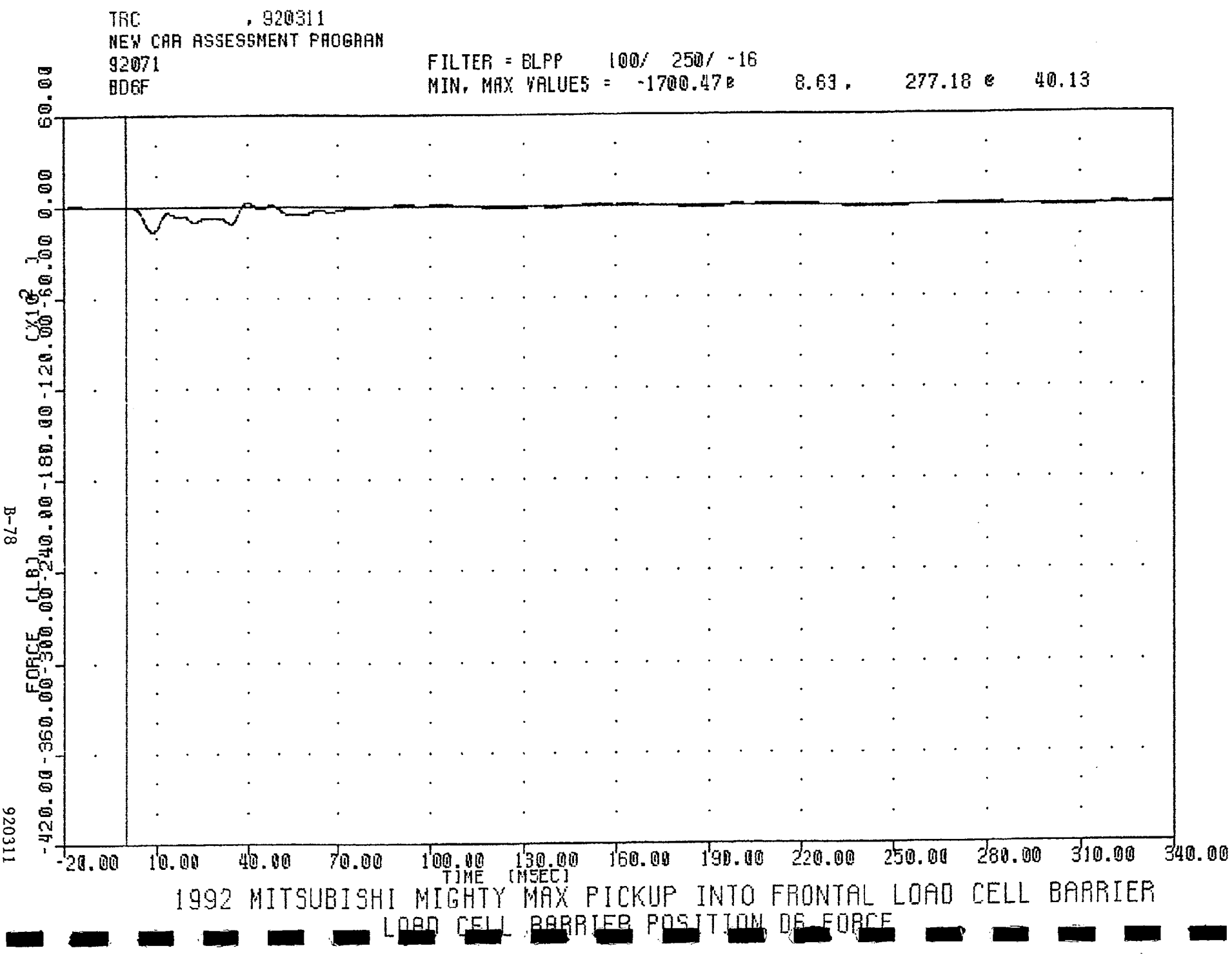
920311


TRC , 920311
NEW CAR ASSESSMENT-PROGRAM
92071
BD4F
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -1536.16 @ 8.88 , 409.49 @ 39.88
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)
920311
B-76
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION 04 FORCE



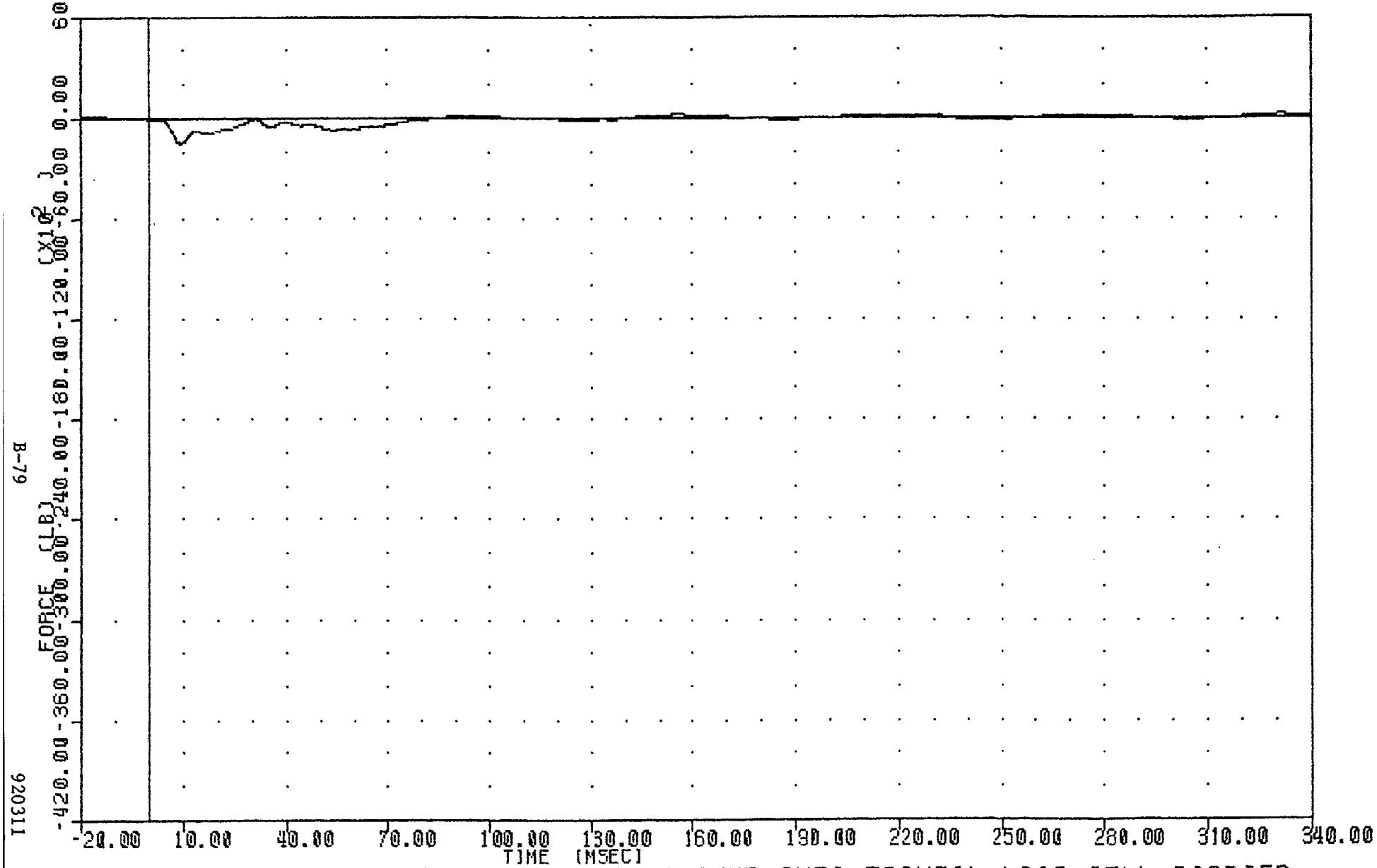
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D5 FORCE

920311


TRC , 920311
NEW CAR ASSESSMENT PROGRAM
92071
BD6F
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -1700.47 @ 8.63 , 277.18 @ 40.13
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)
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION DE FORCE

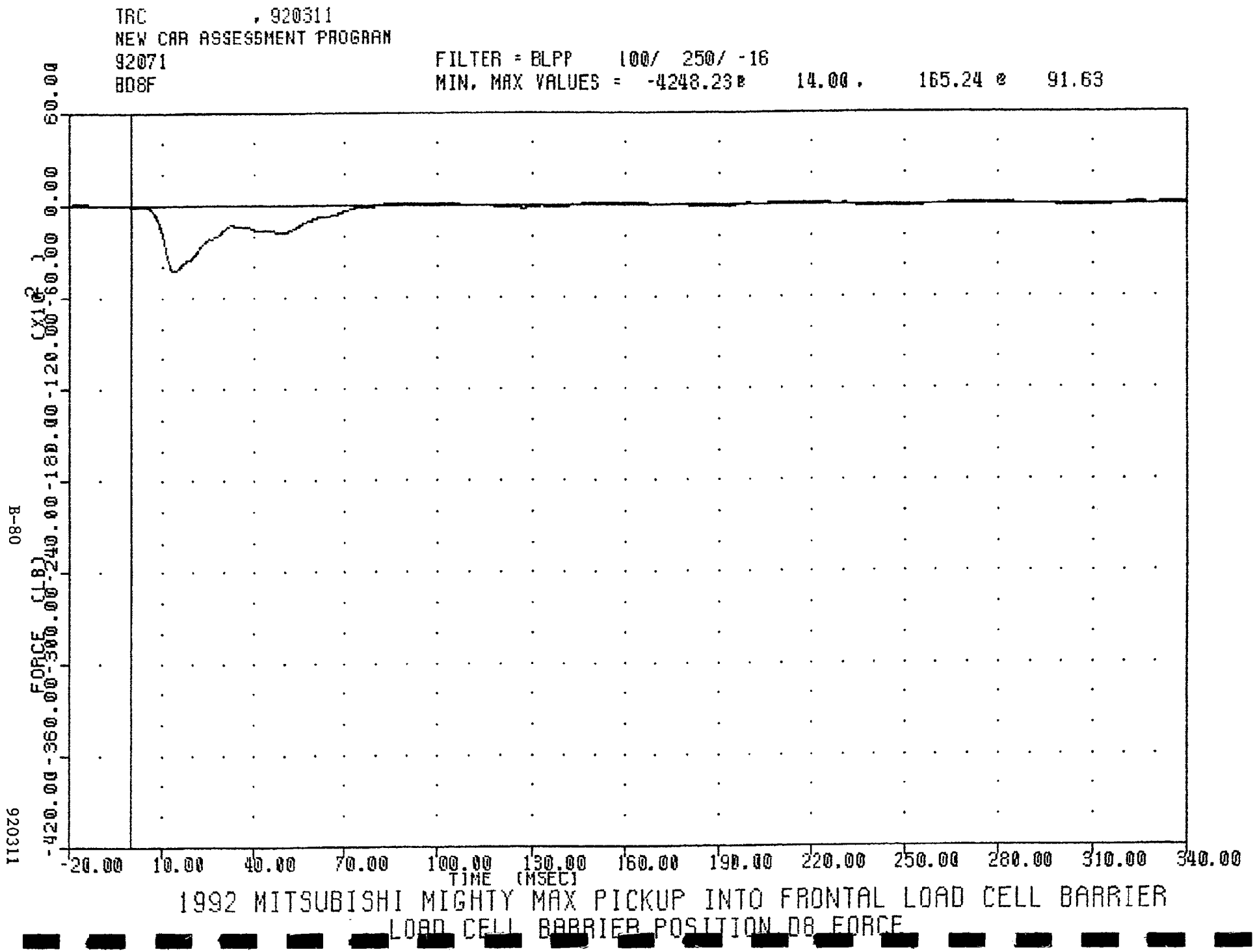
920311

TRC , 920311
NEW CAR ASSESSMENT PROGRAM
92071 FILTER = BLPP 100/ 250/ -16
BD7F MIN, MAX VALUES = -1507.52 @ 9.25 , 171.16 @ 331.63

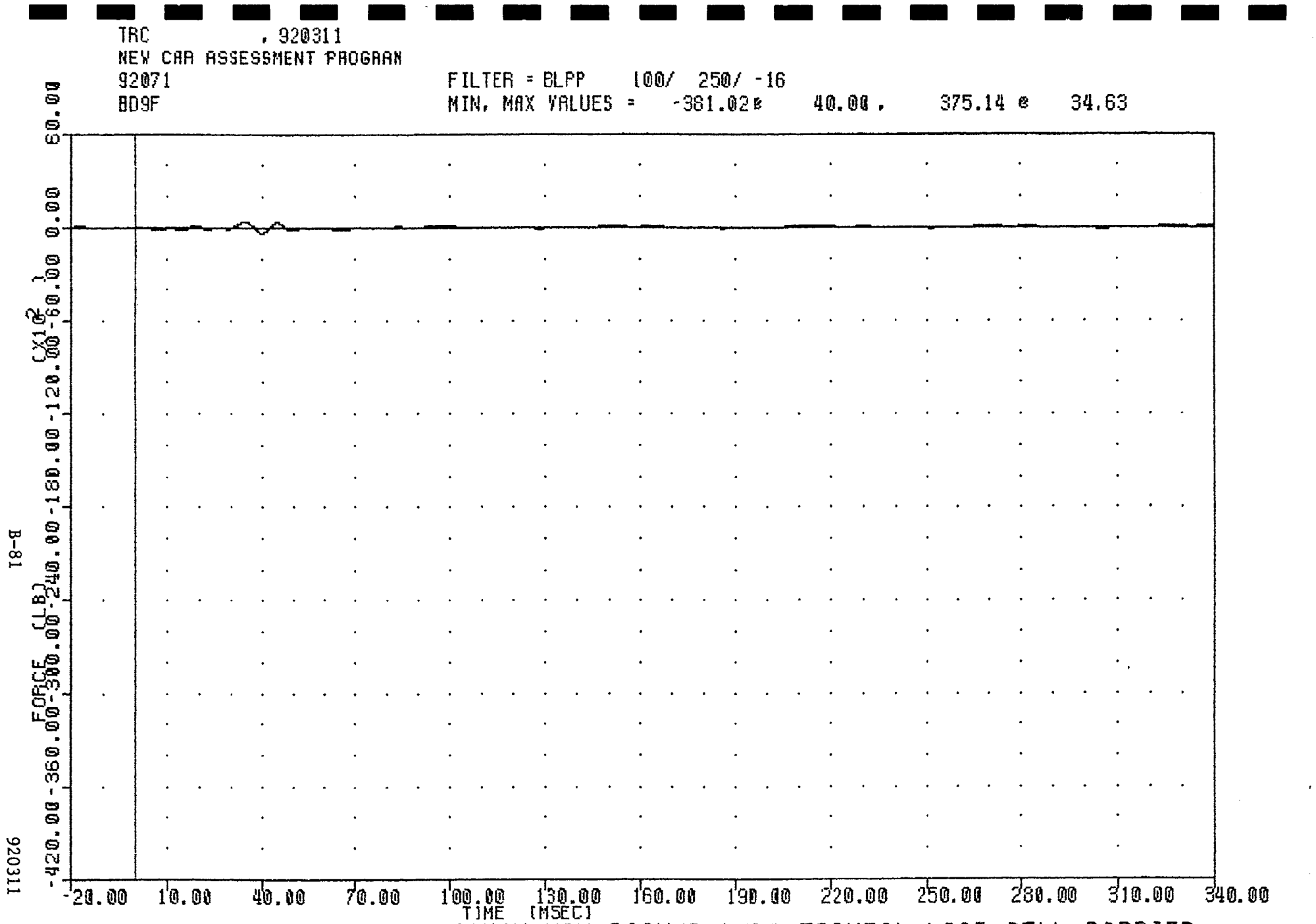


1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D7 FORCE

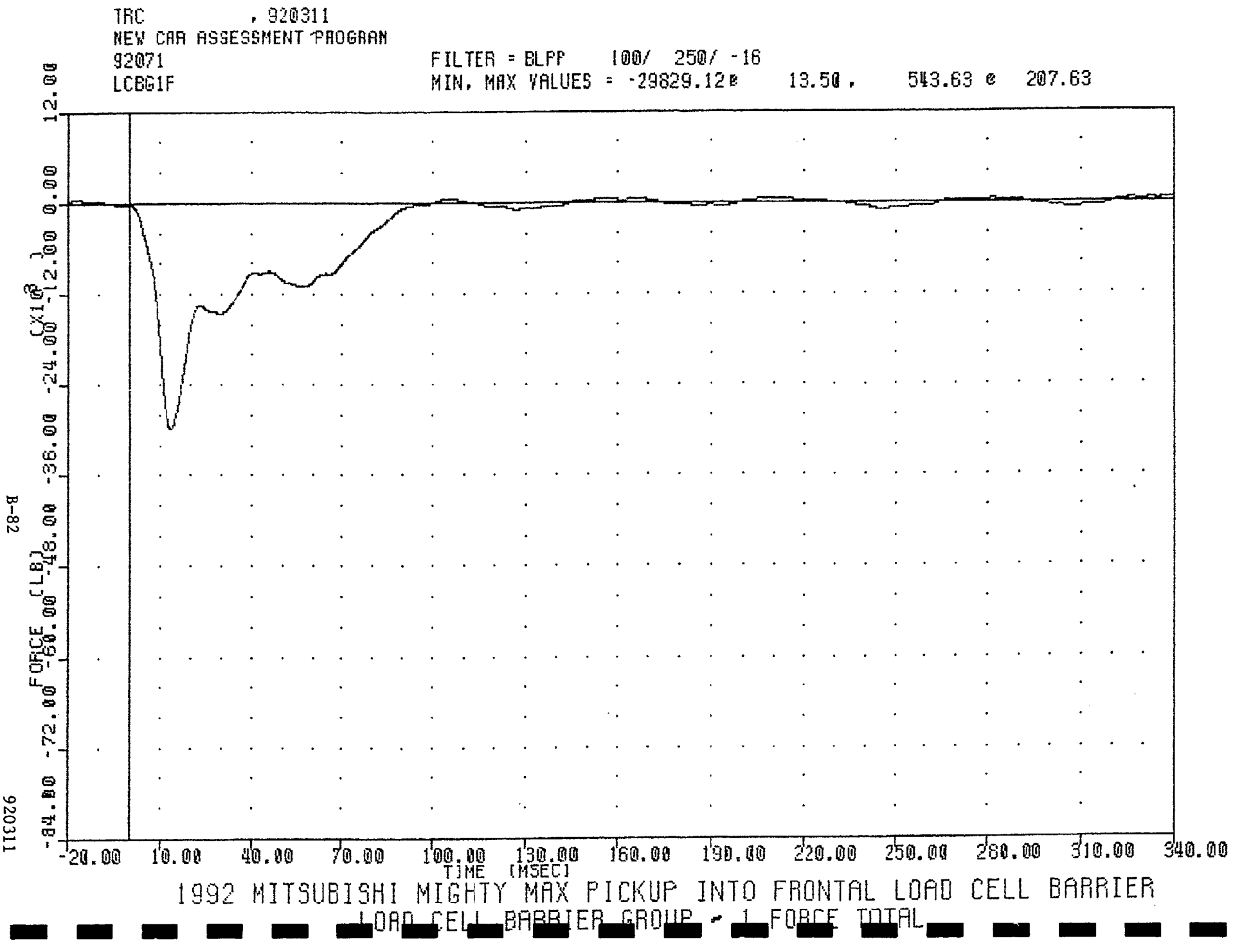
920311


TRC , 920311
NEW CAR ASSESSMENT PROGRAM
92071
B08F
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -4248.23 @ 14.00 , 165.24 @ 91.63
60.00
0.00
-60.00
-120.00
-180.00
-240.00
-300.00
-360.00
-420.00
FORCE (LB) (X1@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)
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D8 FORCE

920311

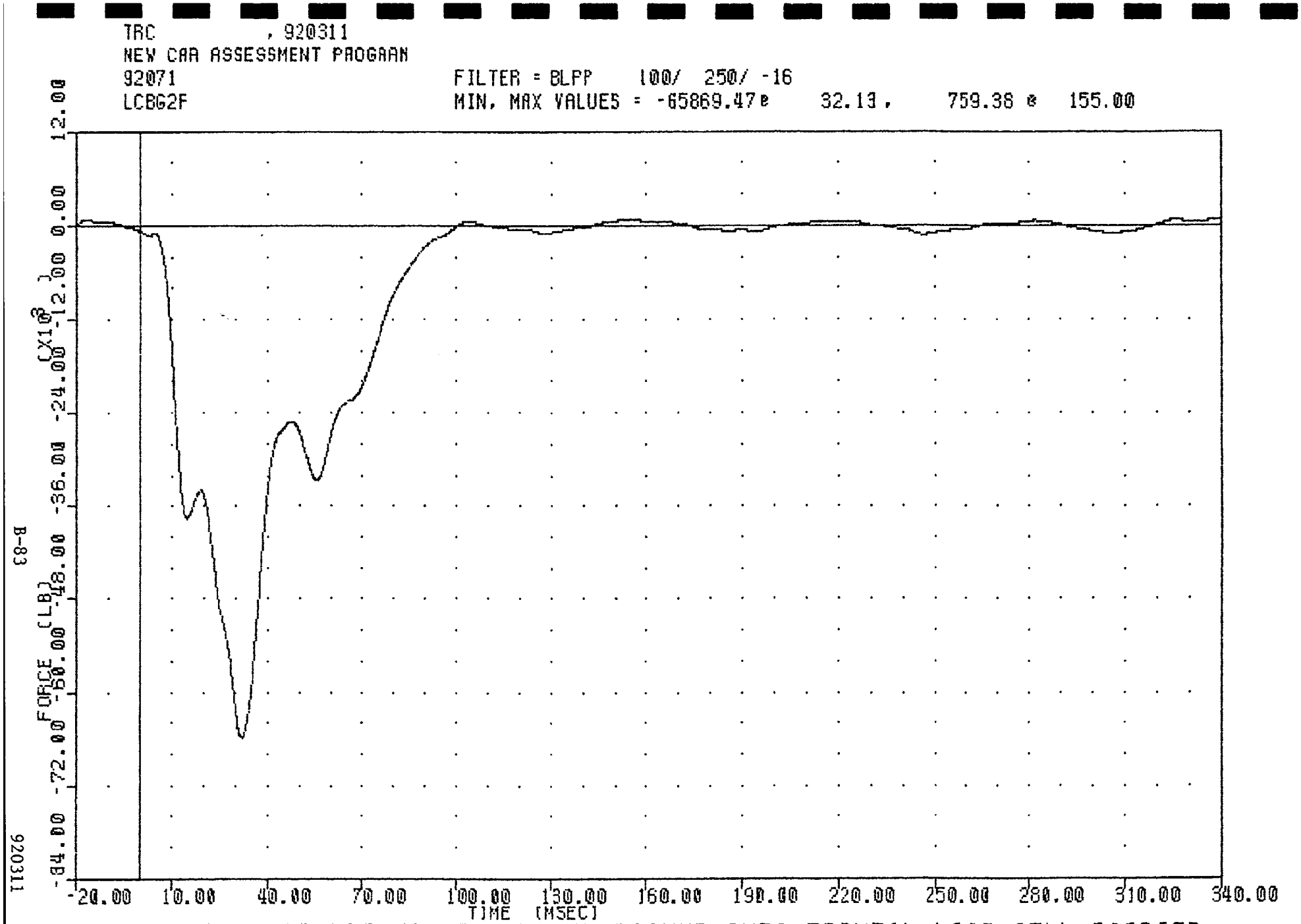


1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D9 FORCE



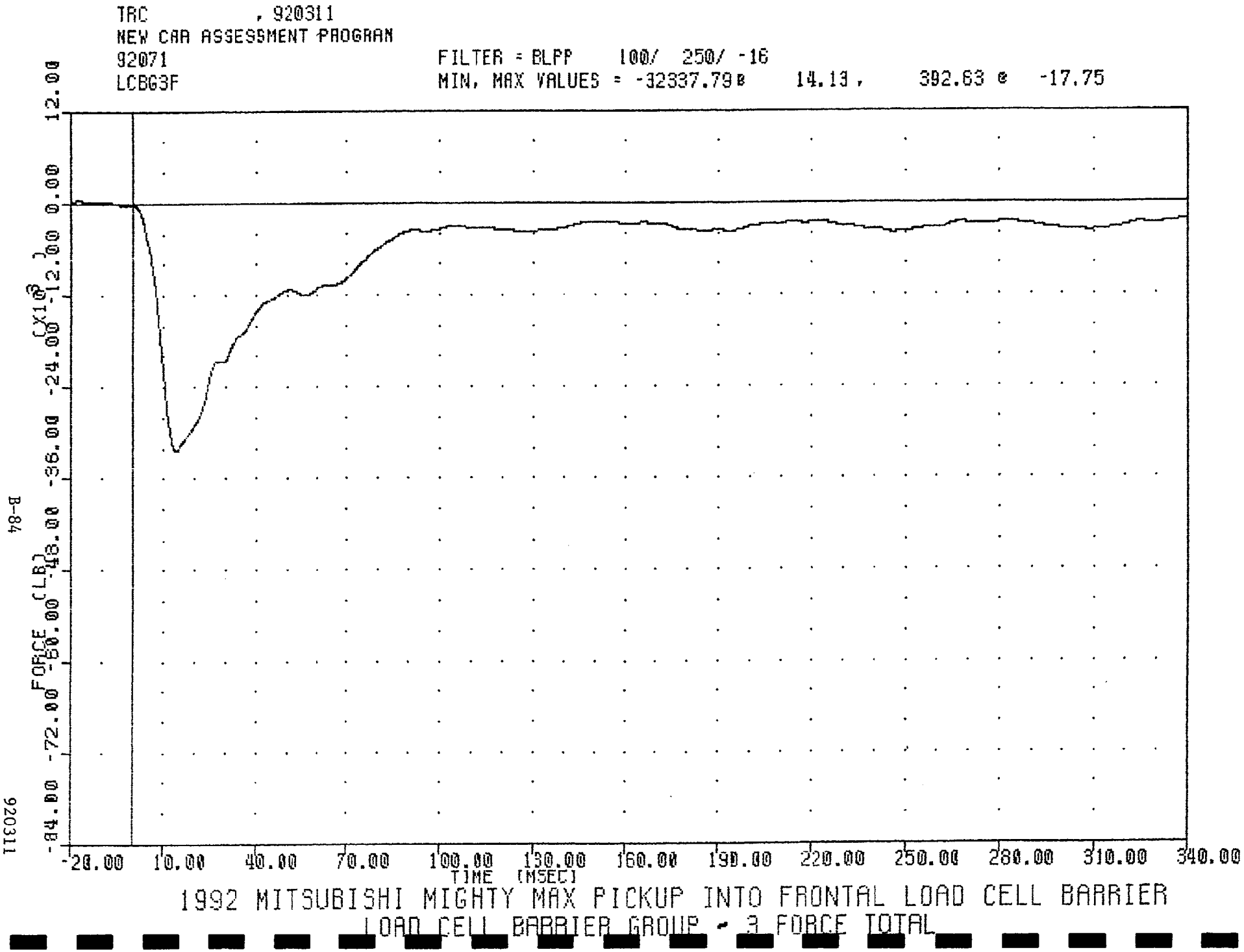
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER GROUP - 1 FORCE TOTAL



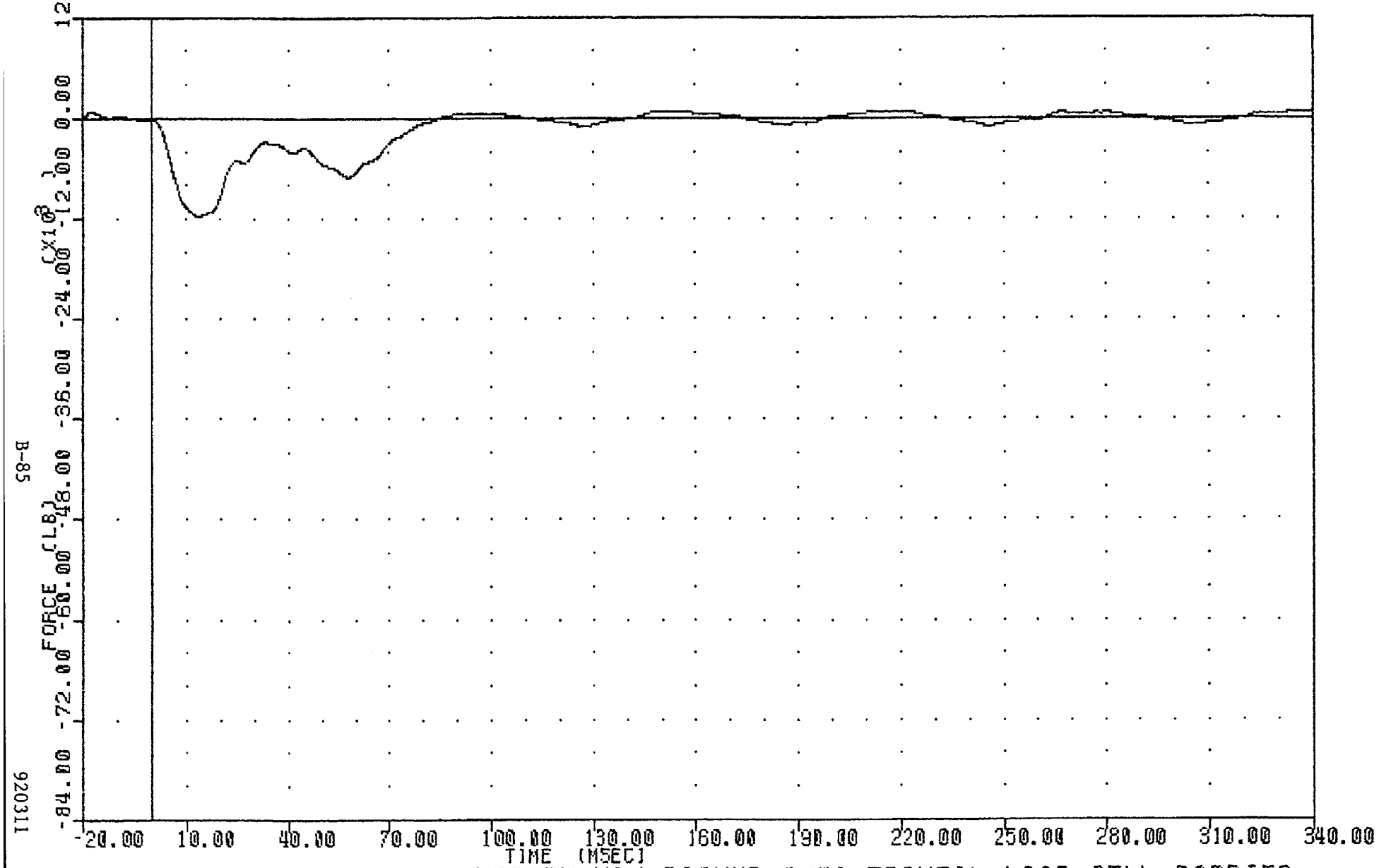
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP - 2 FORCE TOTAL

920311


TRC , 920311
NEW CAR ASSESSMENT PROGRAM
92071
LCBG3F
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -32337.79 @ 14.13 , 392.63 @ -17.75
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)
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP - 3 FORCE TOTAL

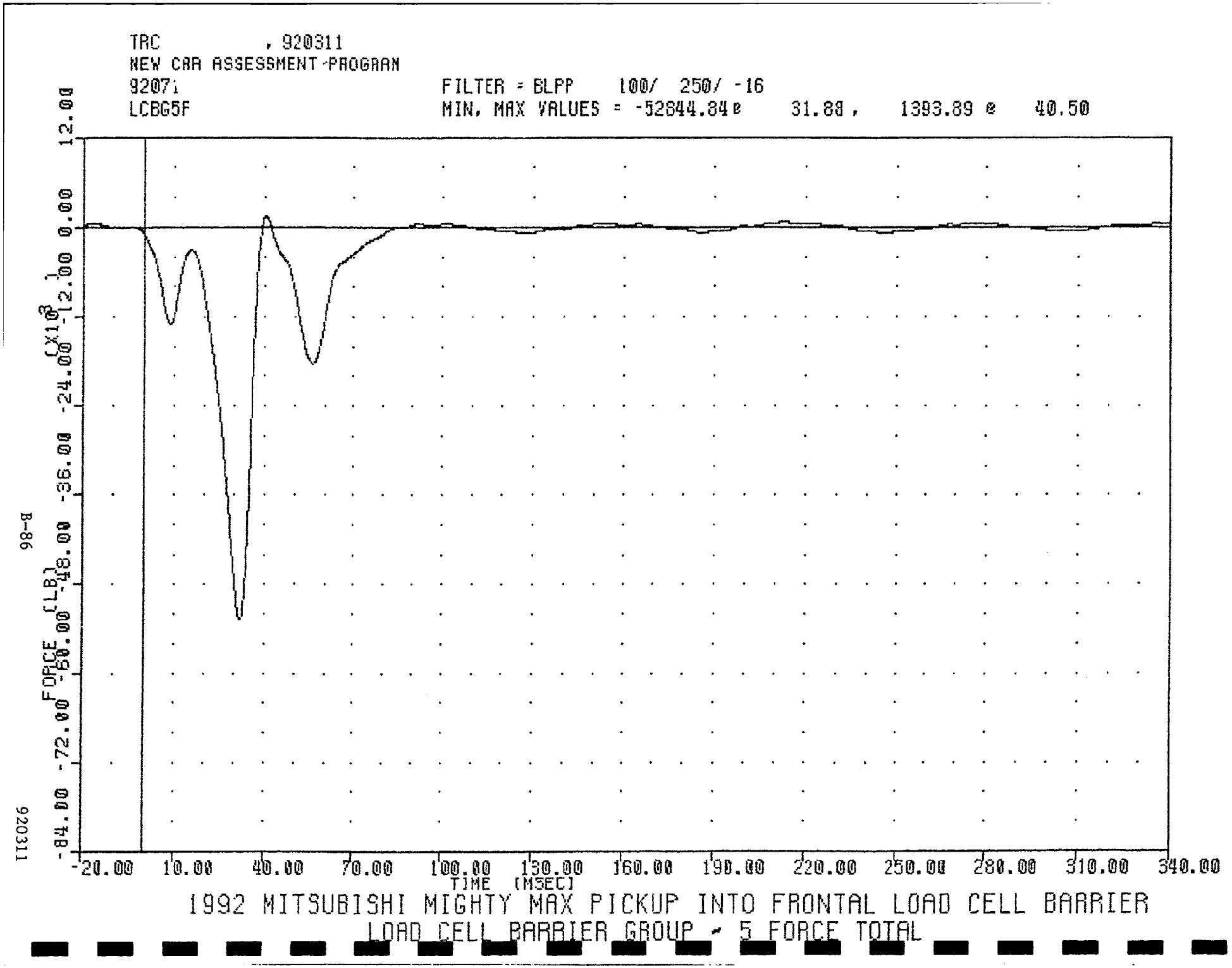
920311

TRC , 920311
NEW CAR ASSESSMENT PROGRAM
92071 FILTER = BLPP 100/ 250/ -16
LCBG4F MIN, MAX VALUES = -11766.24 @ 13.63 , 771.74 @ 155.88

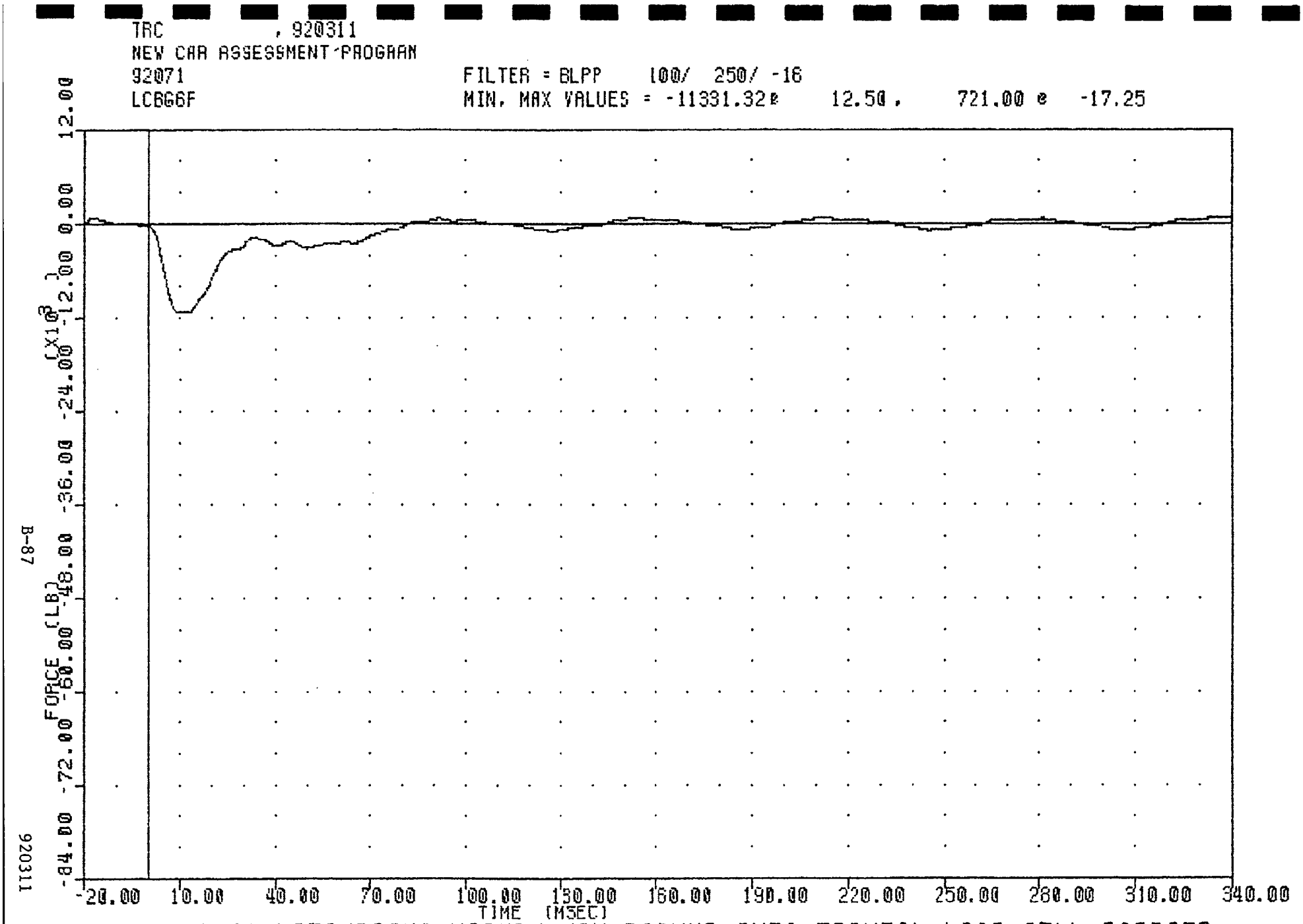


1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP - 4 FORCE TOTAL

920311

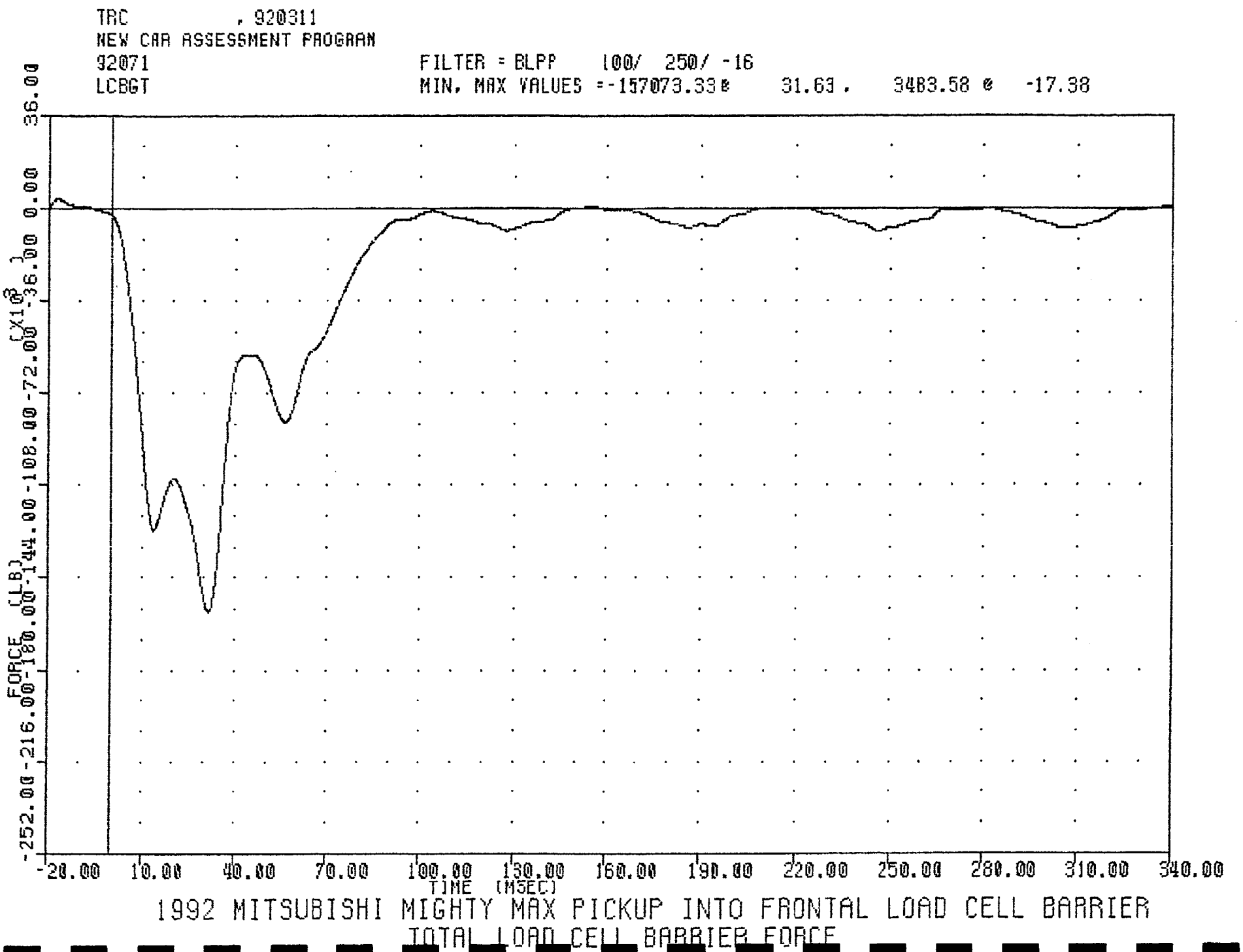

TRC , 920311
NEW CAR ASSESSMENT PROGRAM
92071
LCBG5F
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -52844.84 @ 31.88 , 1393.89 @ 40.50
12.00
0.00
-12.00
-24.00
-36.00
-48.00
-60.00
-72.00
-84.00
FORCE (LB) (X10^3)
-20.00
10.00
40.00
70.00
100.00
130.00
160.00
190.00
220.00
250.00
280.00
310.00
340.00
TIME (MSEC)
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP - 5 FORCE TOTAL

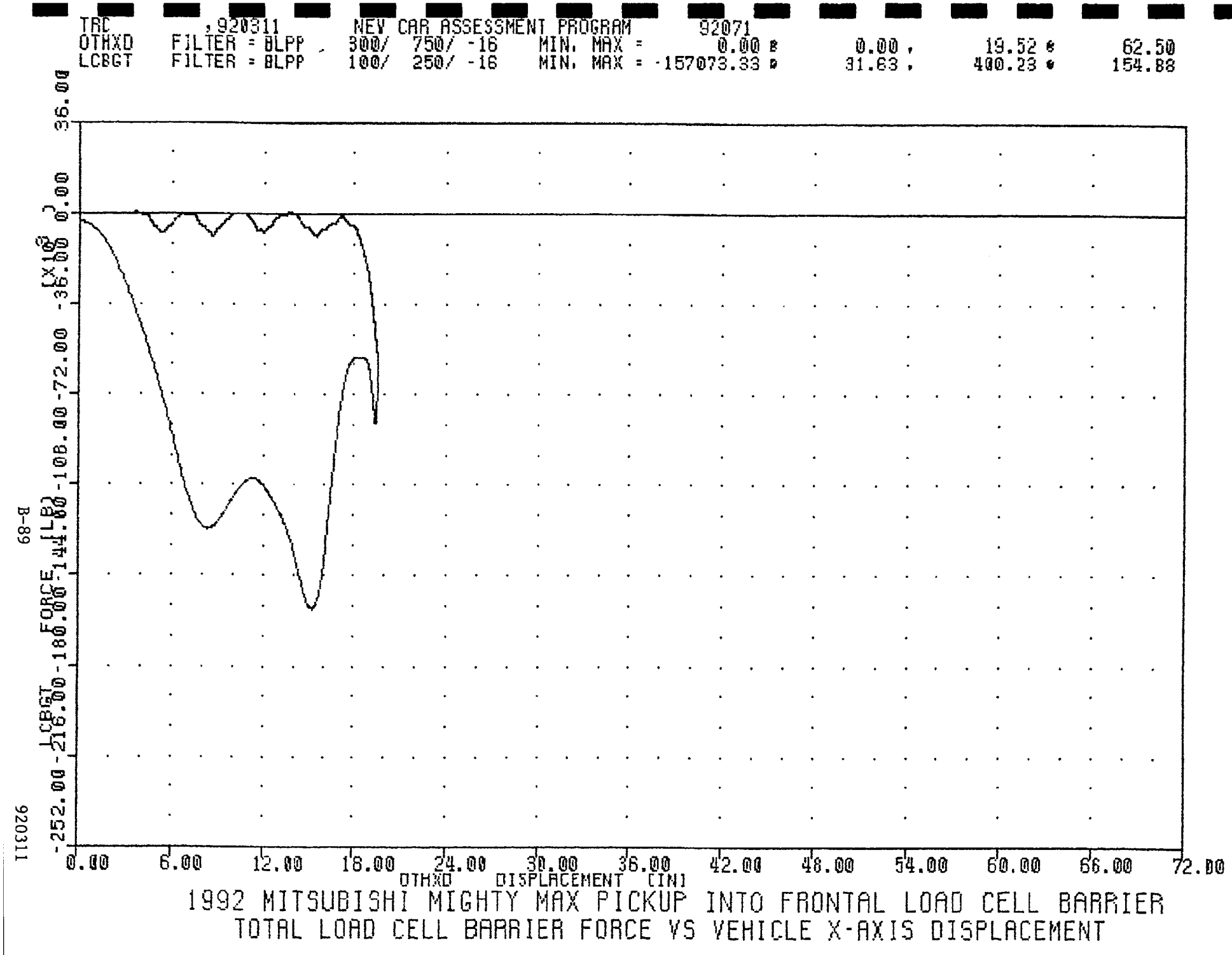
920311



1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP - 6 FORCE TOTAL

920311


TRC , 920311
NEW CAR ASSESSMENT PROGRAM
92071
LCBGT
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES =-157073.33 @ 31.63 , 3483.58 @ -17.38
FORCE (LB) (X10^3)
36.00
0.00
-36.00
-72.00
-108.00
-144.00
-180.00
-216.00
-252.00
-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)
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
TOTAL LOAD CELL BARRIER FORCE


TRC ,920311 NEW CAR ASSESSMENT PROGRAM 92071
OTHXD FILTER = BLPP 300/ 750/ -16 MIN, MAX = 0.00 @ 0.00 , 19.52 @ 62.50
LCBGT FILTER = BLPP 100/ 250/ -16 MIN, MAX = -157073.33 @ 31.83 , 400.23 @ 154.88
36.00
0.00
-36.00
-72.00
-108.00
-144.00
-180.00
-216.00
-252.00
LCBGT FORCE (LB) (X10^3)
0.00
6.00
12.00
18.00
24.00
30.00
36.00
42.00
48.00
54.00
60.00
66.00
72.00
OTHXD DISPLACEMENT (IN)
B-89
920311
1992 MITSUBISHI MIGHTY MAX PICKUP INTO FRONTAL LOAD CELL BARRIER
TOTAL LOAD CELL BARRIER FORCE VS VEHICLE X-AXIS DISPLACEMENT

APPENDIX C

DUMMY CERTIFICATION DATA

PRE-TEST CERTIFICATION DATA

DRIVER DUMMY S/N: 826

TRANSPORTATION RESEARCH CENTER OF OHIO

EXTERNAL DIMENSIONS

PART 572 27-FEB-92

TEMPERATURE 71 F RELATIVE HUMIDITY 48 %
TRC ED82629 572B SN826 EXT. DIMENSION CAL29

DESCRIPTION SN 826 HUMANOID	SPECIFICATION	TEST RESULTS
Sitting Height	35.6 - 35.8 IN	35.8 IN
Shoulder Pivot Height	21.8 - 22.4 IN	22.4 IN
Hip Pivot Height	3.9 IN	REFERENCE
Hip Pivot From Backline	4.8 IN	REFERENCE
Knee Pivot From Backline	20.1 - 20.7 IN	20.4 IN
Rear of Head From Backline	1.7 IN	REFERENCE
Chest Depth	9.1 - 9.6 IN	9.4 IN
Shoulder Width	17.8 - 18.4 IN	18.0 IN
Chest Circumference Over Nipples	36.8 - 40.0 IN	37.6 IN
Waist Circumference at Min. Girth	31.4 - 32.6 IN	32.5 IN
Hip Width	14.0 - 15.4 IN	14.7 IN
Knee Pivot From Floor	19.3 - 19.9 IN	19.3 IN

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas Middlet

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

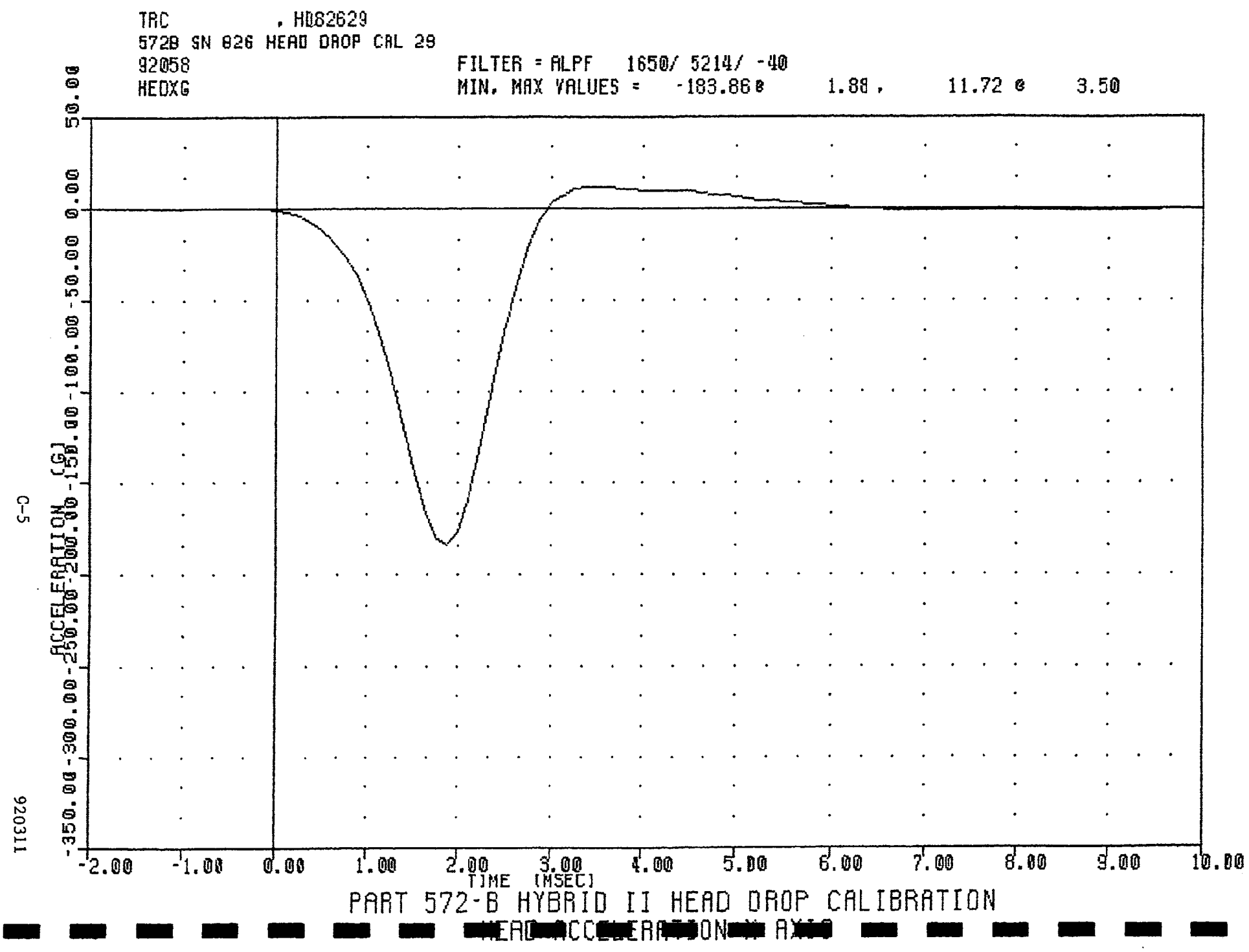
PART 572 27-Feb-92

TEMPERATURE 71 F RELATIVE HUMIDITY 48 %
TRC HD82629 572B SN 826 HEAD DROP CAL 29

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PEAK RESULTANT ACCELERATION	210 - 260 G	224.09 G
TIME ABOVE 100 G LEVEL	0.9 - 1.5 MSEC	1.23 MSEC
PEAK LATERAL ACCELERATION	10 G MAX	-3.88 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

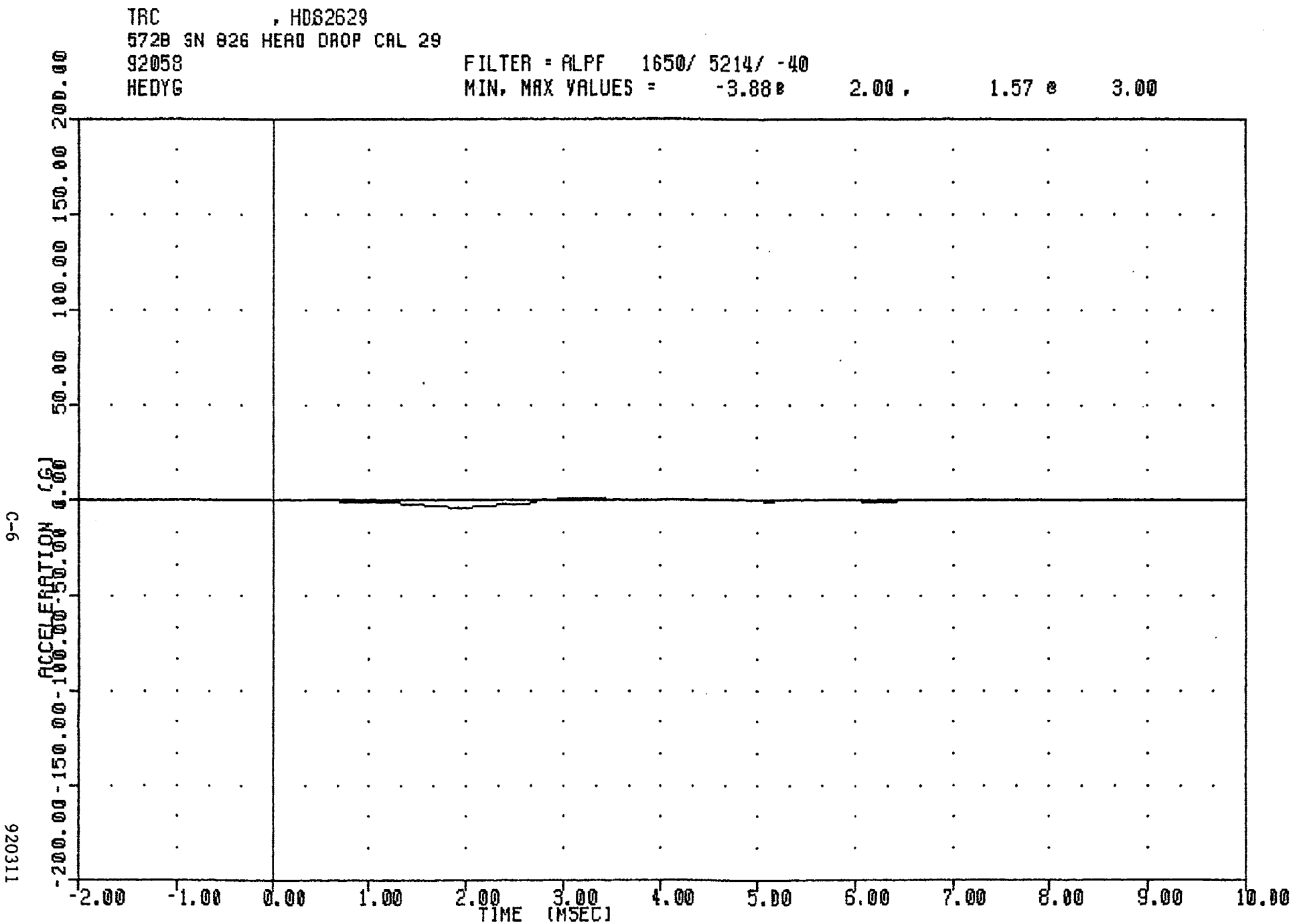
DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet

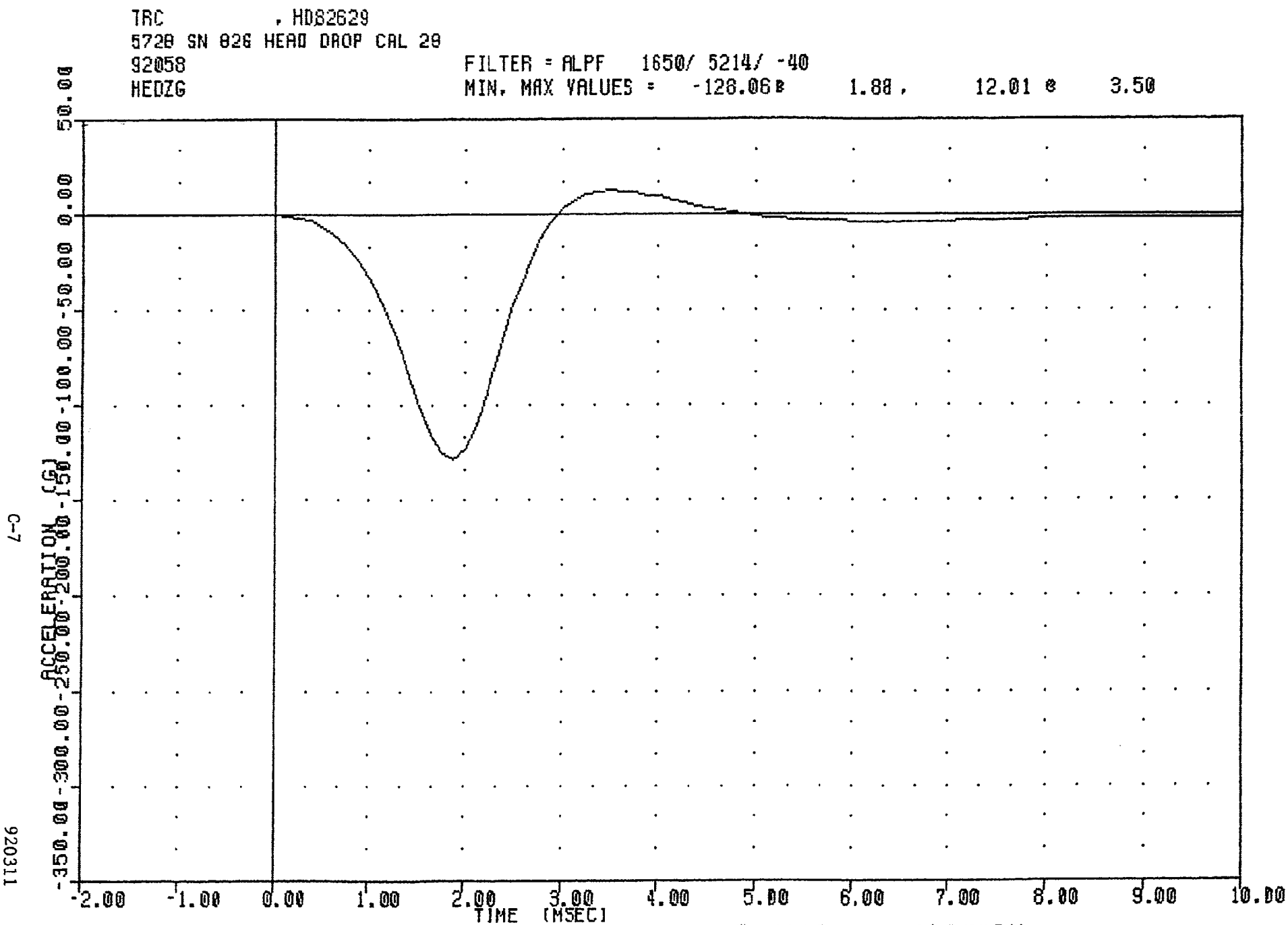


PART 572-B HYBRID II HEAD DROP CALIBRATION

HEAD ACCELERATION X AXIS

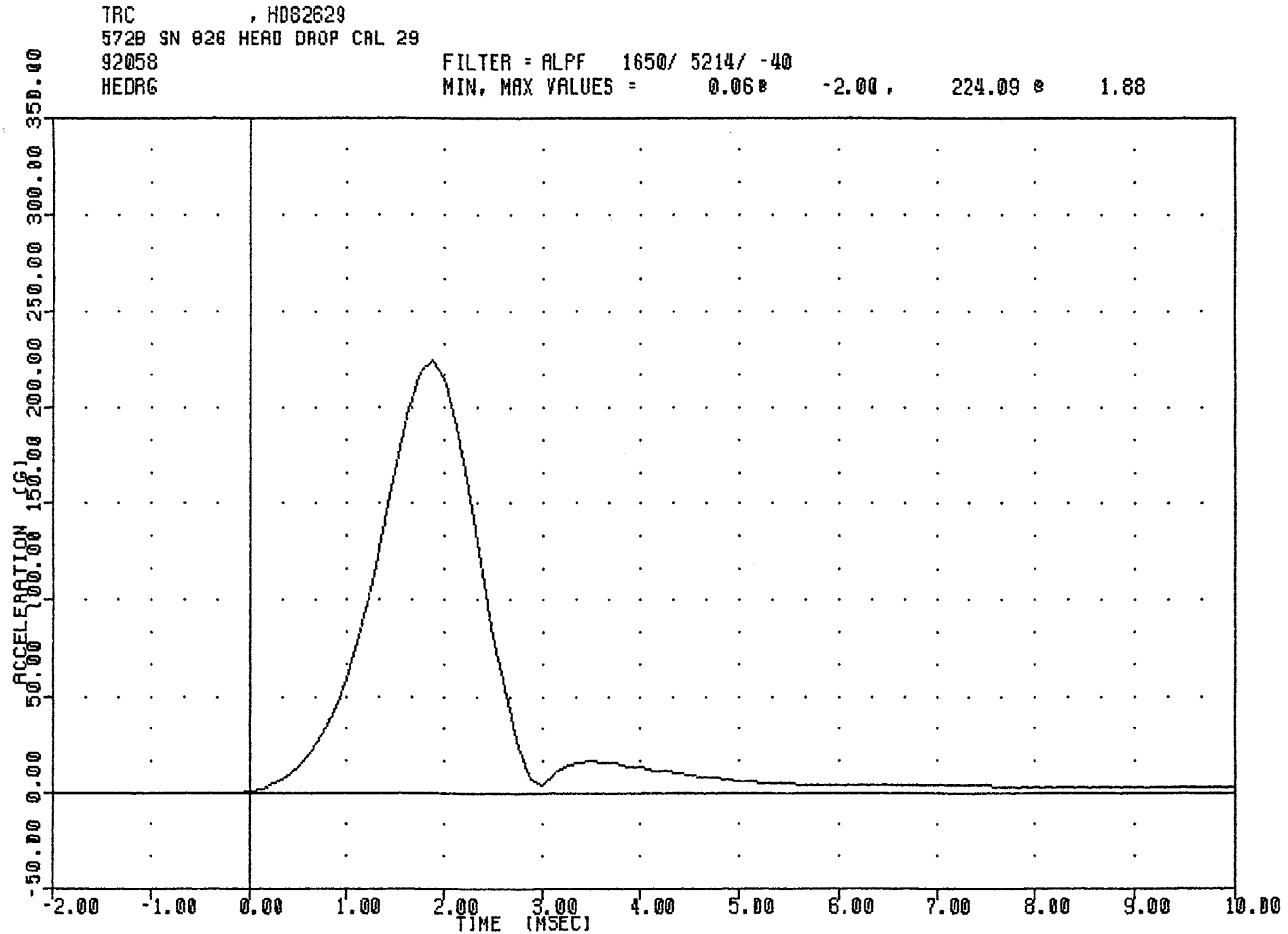


PART 572-B HYBRID II HEAD DROP CALIBRATION
HEAD ACCELERATION Y AXIS



PART 572-B HYBRID II HEAD DROP CALIBRATION

[redacted]



PART 572-B HYBRID II HEAD DROP CALIBRATION
HEAD RESULTANT ACCELERATION

920311

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK PENDULUM TEST

PART 572 28-Feb-92

TEMPERATURE 70 F RELATIVE HUMIDITY 49 %
TRC HNB2629 572B SN 826 HEAD/NECK CAL 29

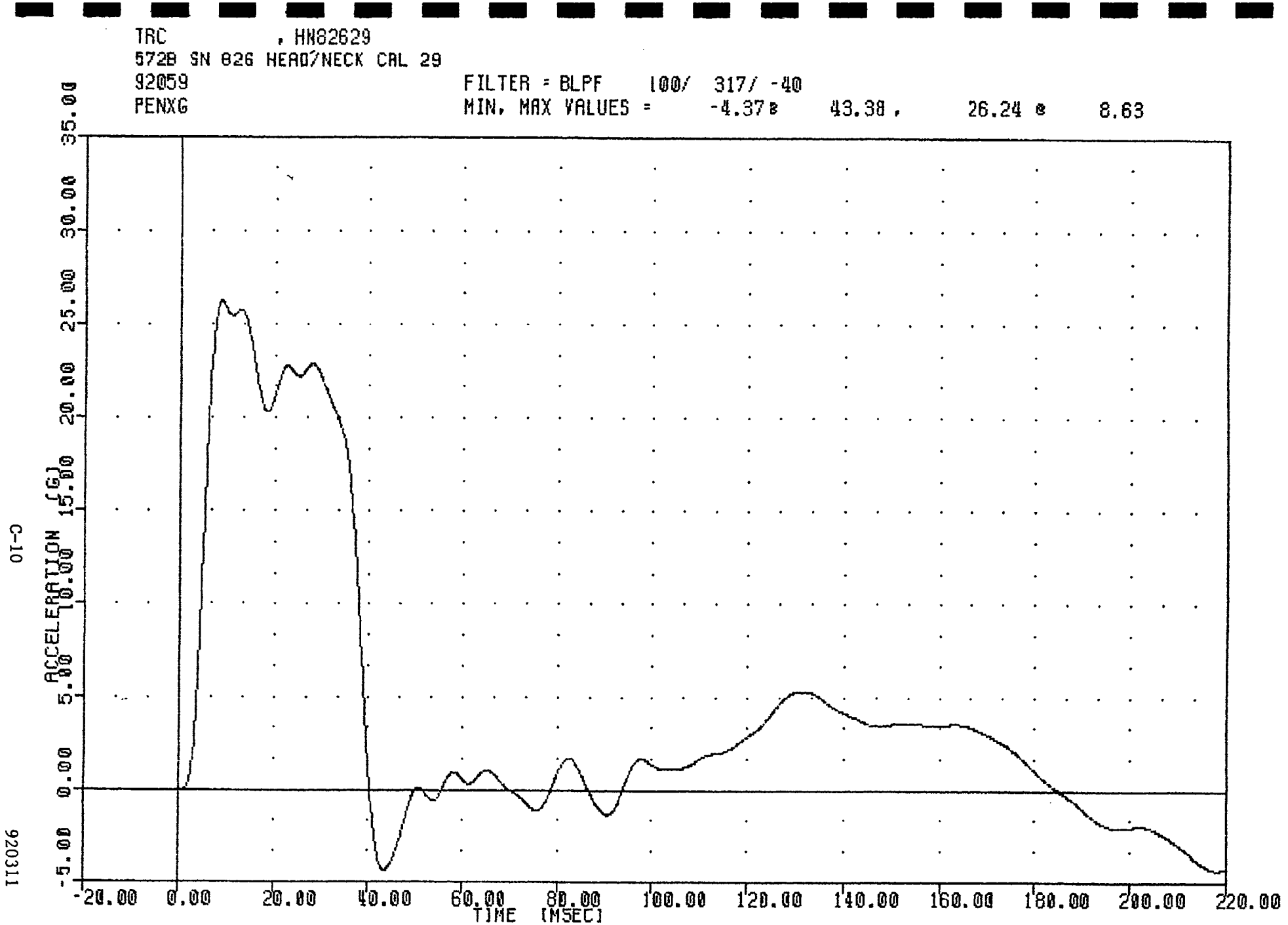
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Pendulum velocity	21.5 to 25.5 ft/sec	23.76 ft/sec
Pendulum Deceleration:		
T1 - T2: 5 - 20 G	3 msec max	2.44 msec
T2 - T3: 20 - 20 G	25 - 30 msec	27.11 msec
T3 - T4: 20 - 5 G	10 msec max	5.74 msec
Avg. G level T2 - T3	20 - 24 G	22.96 G
Maximum Rotation Angle	63 - 73 deg	66.36 deg
Peak Head Resultant Accel	26 G max	23.56 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	1.50	0.00
30	25.6 - 34.4	2.1 - 3.1	31.48	2.29
60	40.3 - 51.7	4.3 - 5.3	48.68	4.54
max	53.2 - 66.8	5.0 - 6.0	62.50	5.09
60	67.0 - 83.0	4.3 - 5.3	74.39	4.61
30	85.4 - 104.6	2.1 - 3.1	94.35	2.20
0	101.0 - 123.0	-0.5 - +0.5	108.77	0.16

SND: 5.95 in

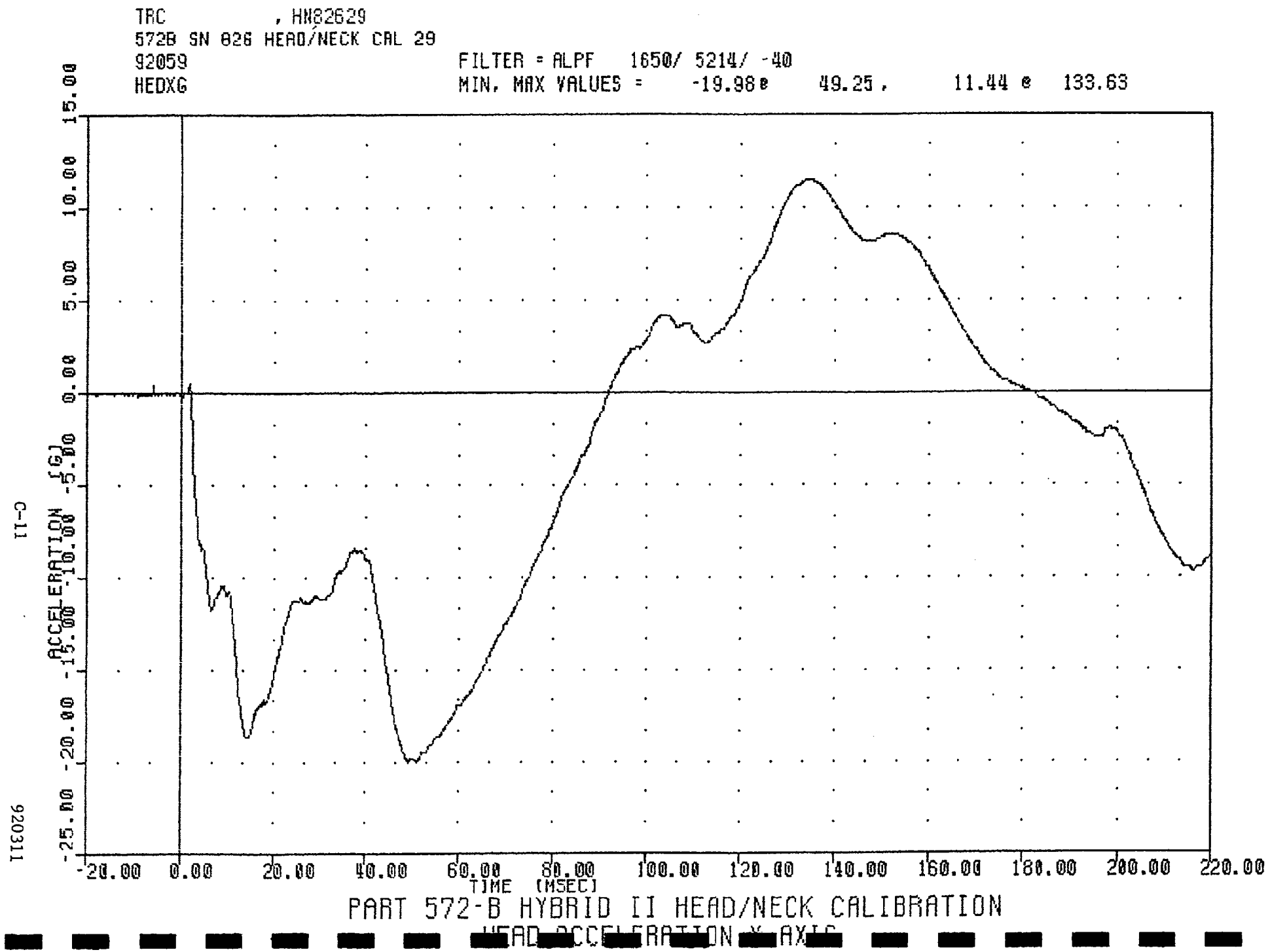
DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet



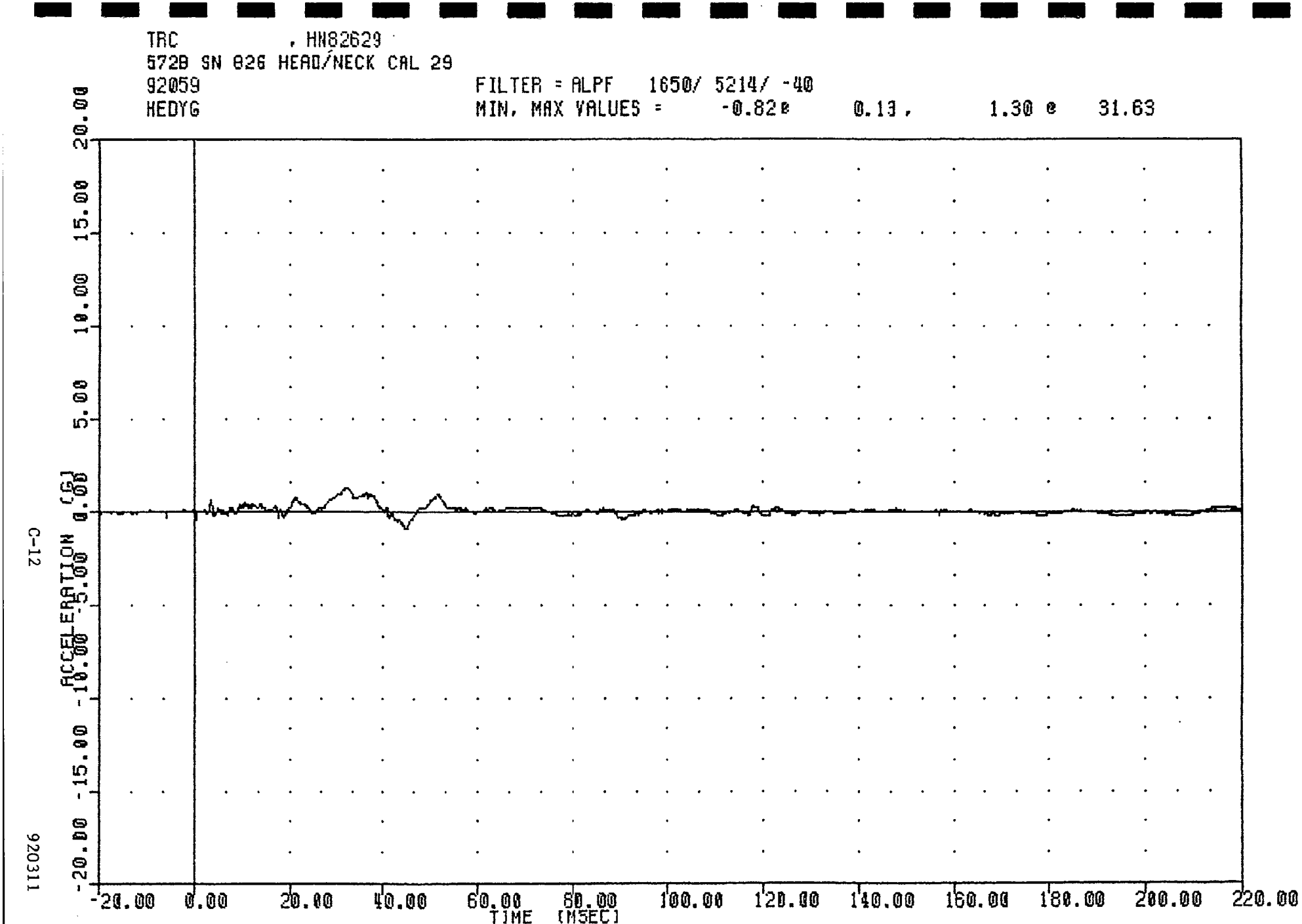
PART 572-B HYBRID II HEAD/NECK CALIBRATION
PENDULUM DECELERATION

920311

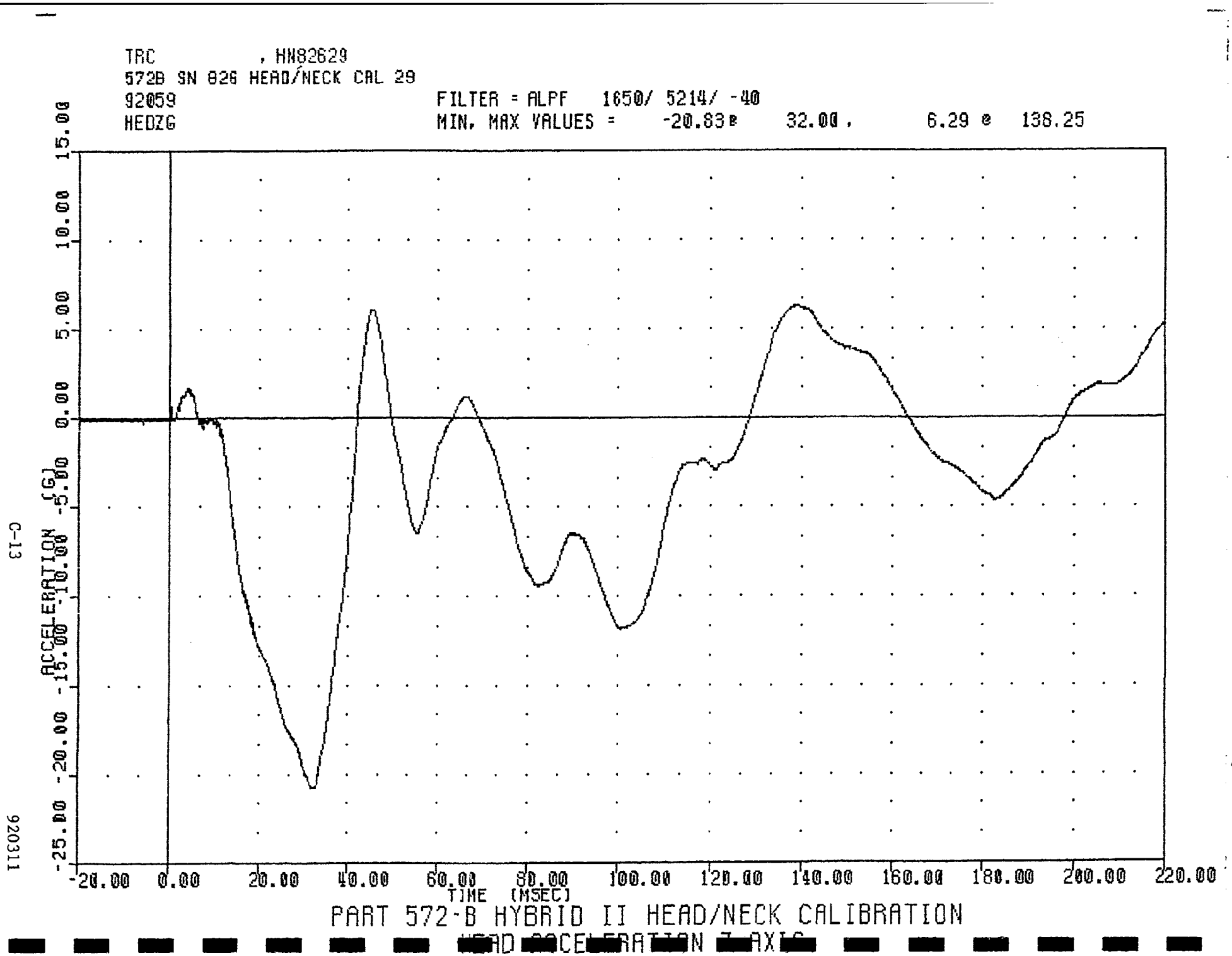

TRC , HN82629
572B SN 826 HEAD/NECK CAL 29
92059
HEDXG
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -19.98 @ 49.25 , 11.44 @ 133.63
15.00
10.00
5.00
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
ACCELERATION (G)
-20.00
0.00
20.00
40.00
60.00
80.00
100.00
120.00
140.00
160.00
180.00
200.00
220.00
TIME (MSEC)
PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD ACCELERATION X AXIS

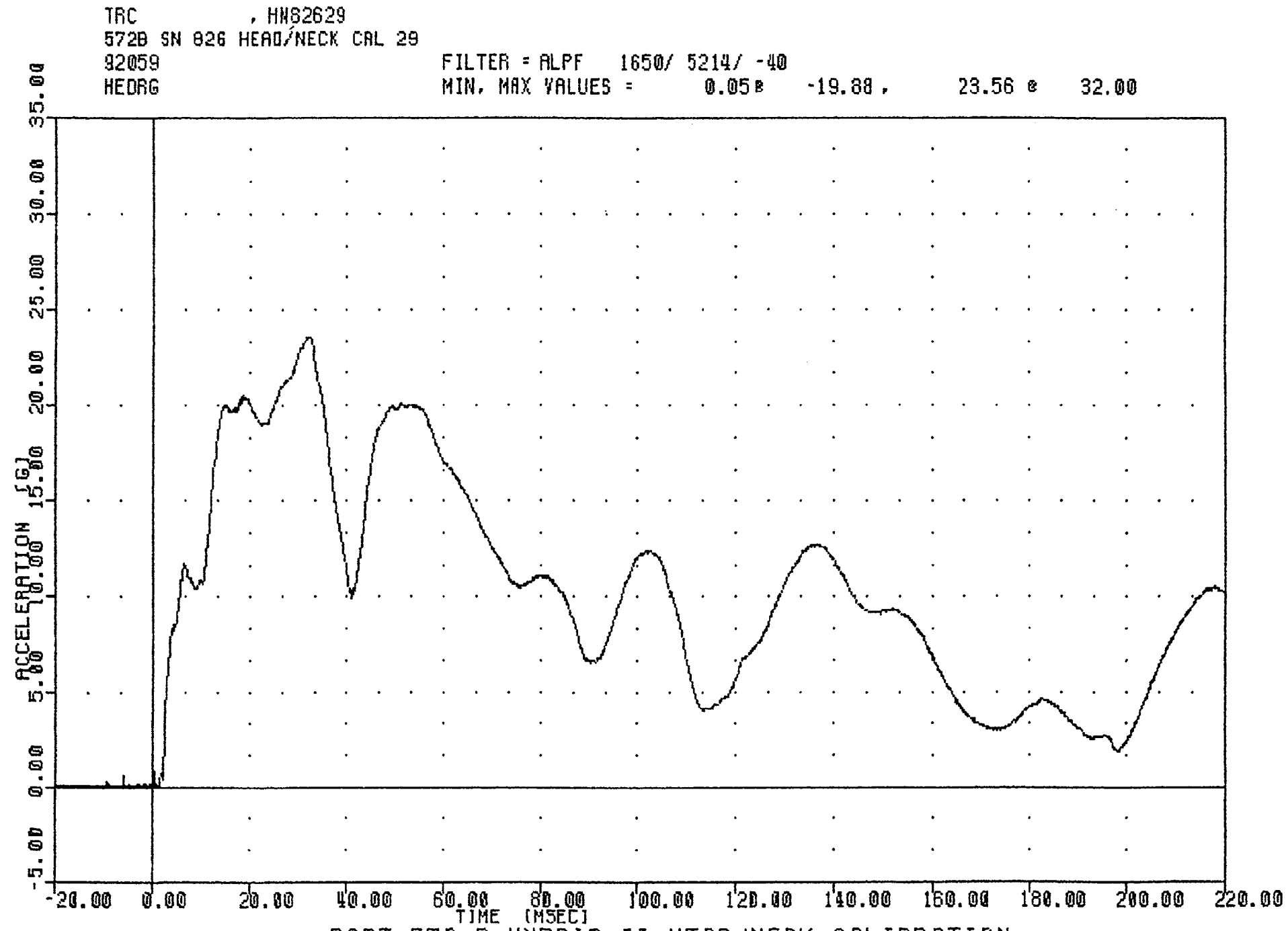
C-11

920311

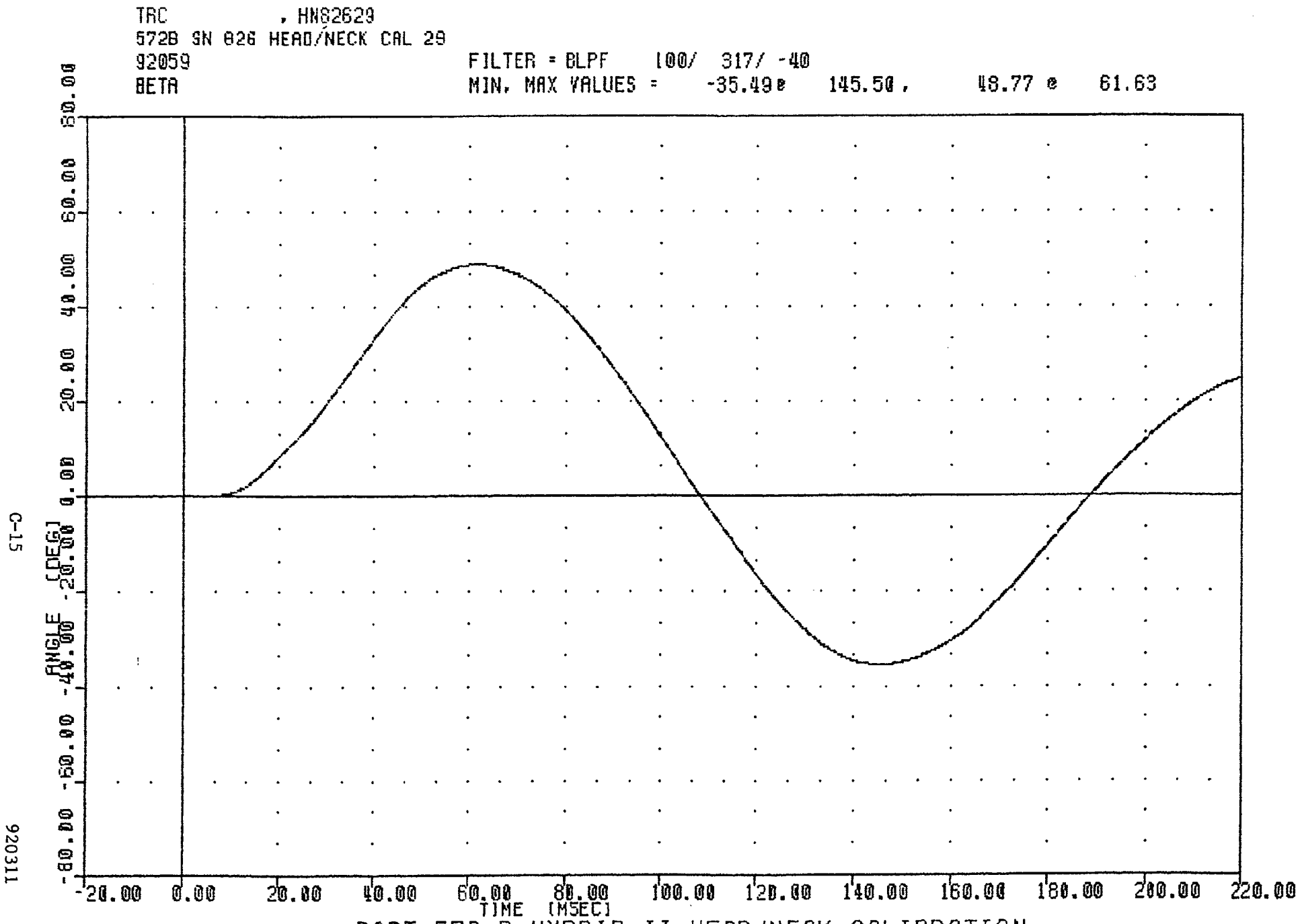


PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD ACCELERATION Y AXIS


TRC , HN82629
572B SN 826 HEAD/NECK CAL 29
92059
HEDZG
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -20.83 @ 32.00 , 6.29 @ 138.25
15.00
10.00
5.00
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
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 Z AXIS

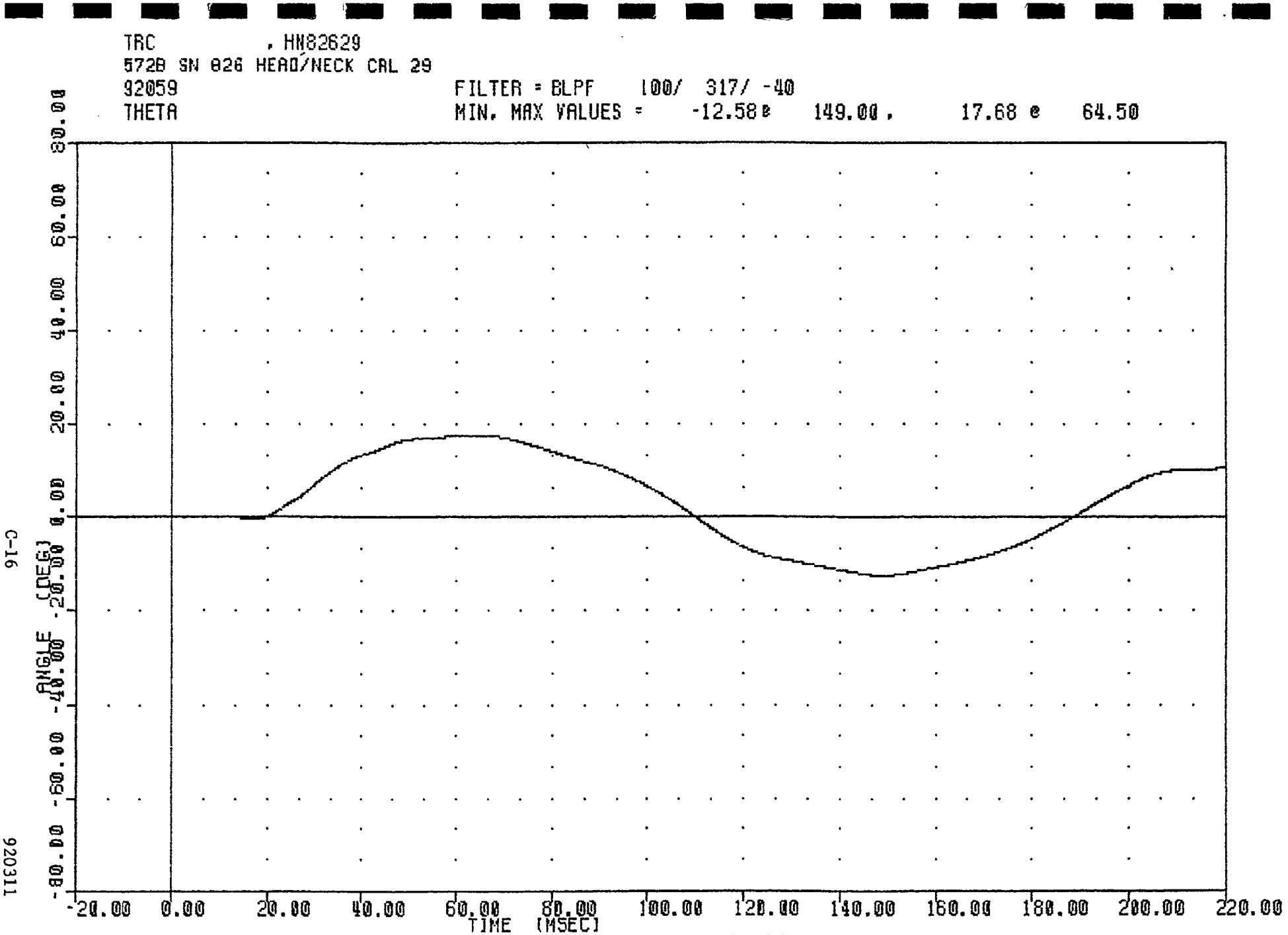


PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD RESULTANT ACCELERATION



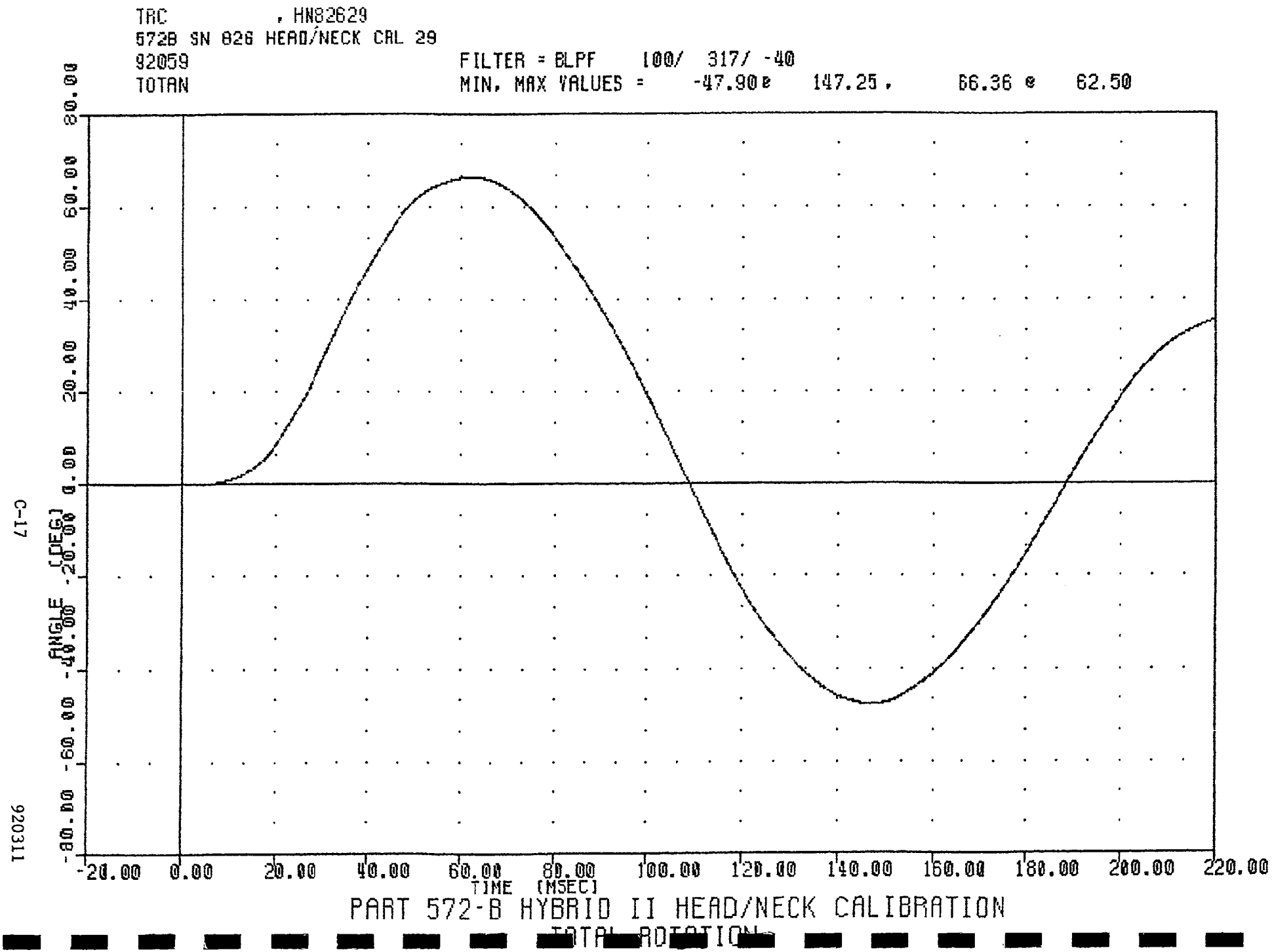
PART 572-B HYBRID II HEAD/NECK CALIBRATION

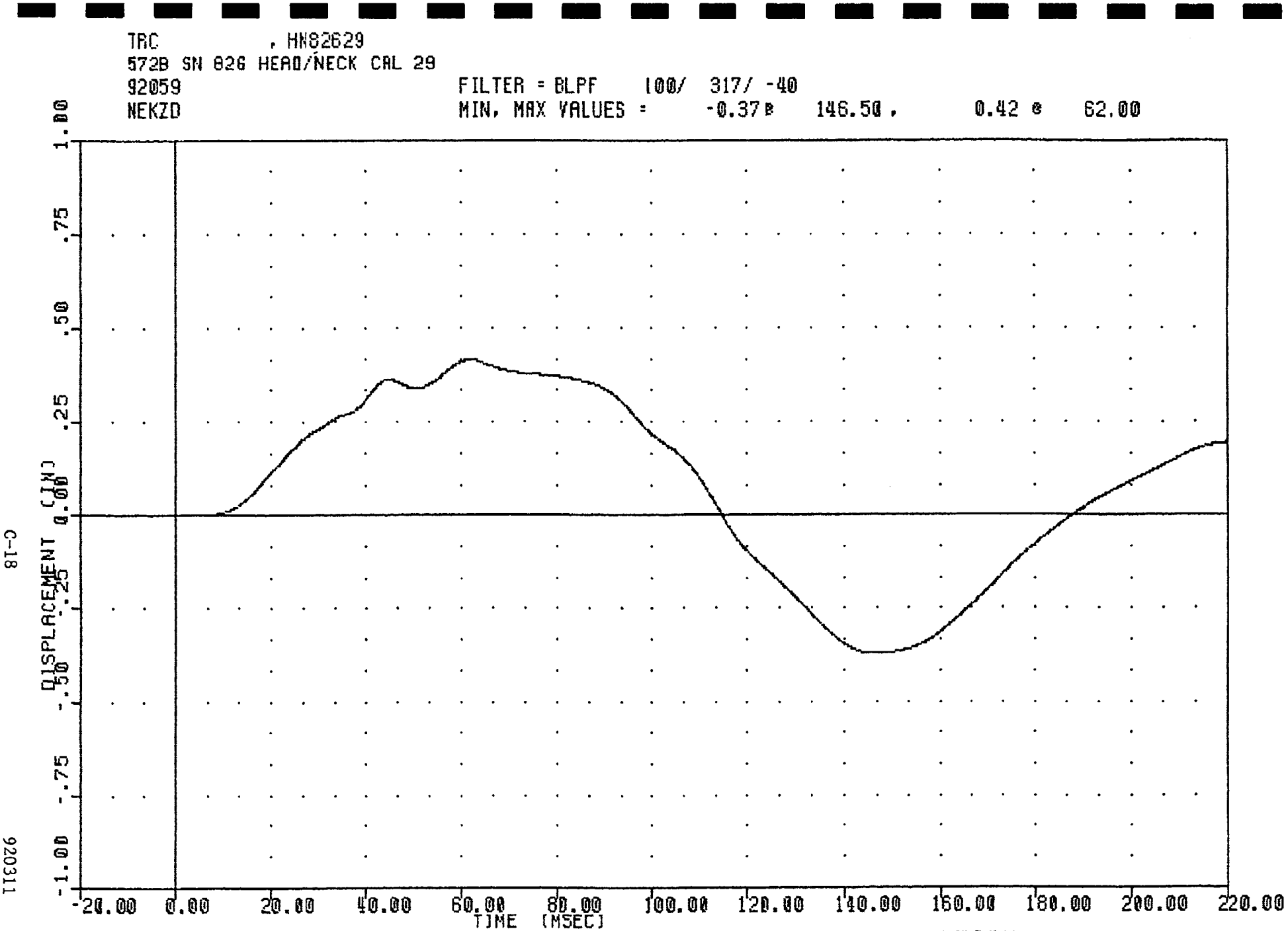
ROTATION ABOUT THE BASE OF THE NECK



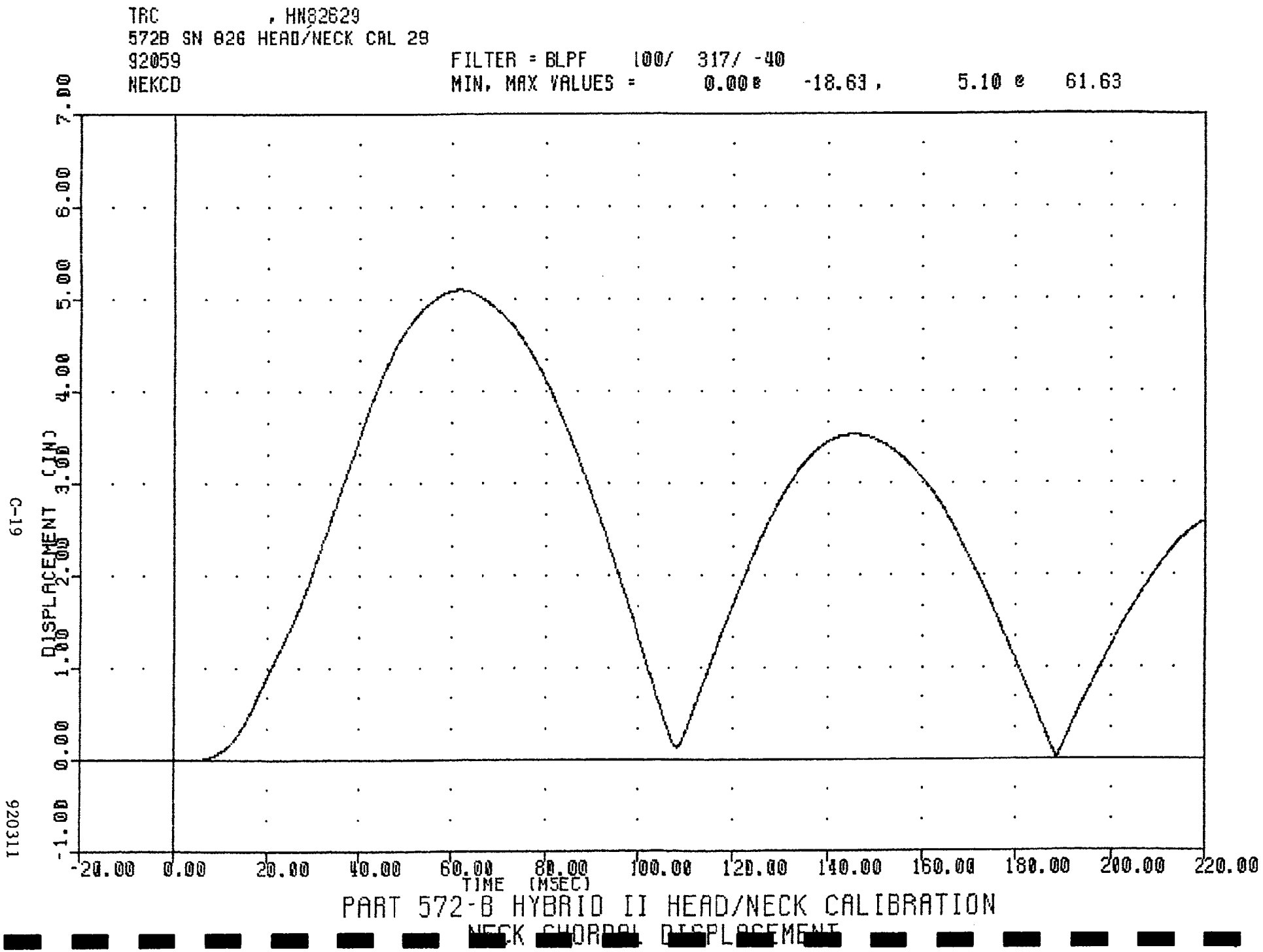
PART 572-B HYBRID II HEAD/NECK CALIBRATION
ROTATION ABOUT THE HEAD C.G.

920311


TRC , HN82629
572B SN 026 HEAD/NECK CAL 29
92059
TOTAN
FILTER = BLPF 100/ 317/ -40
MIN, MAX VALUES = -47.90 @ 147.25 , 66.36 @ 62.50
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
TOTAL ROTATION



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



PART 572-B HYBRID II HEAD/NECK CALIBRATION

NECK CHORDAL DISPLACEMENT

920311

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572 28-Feb-92

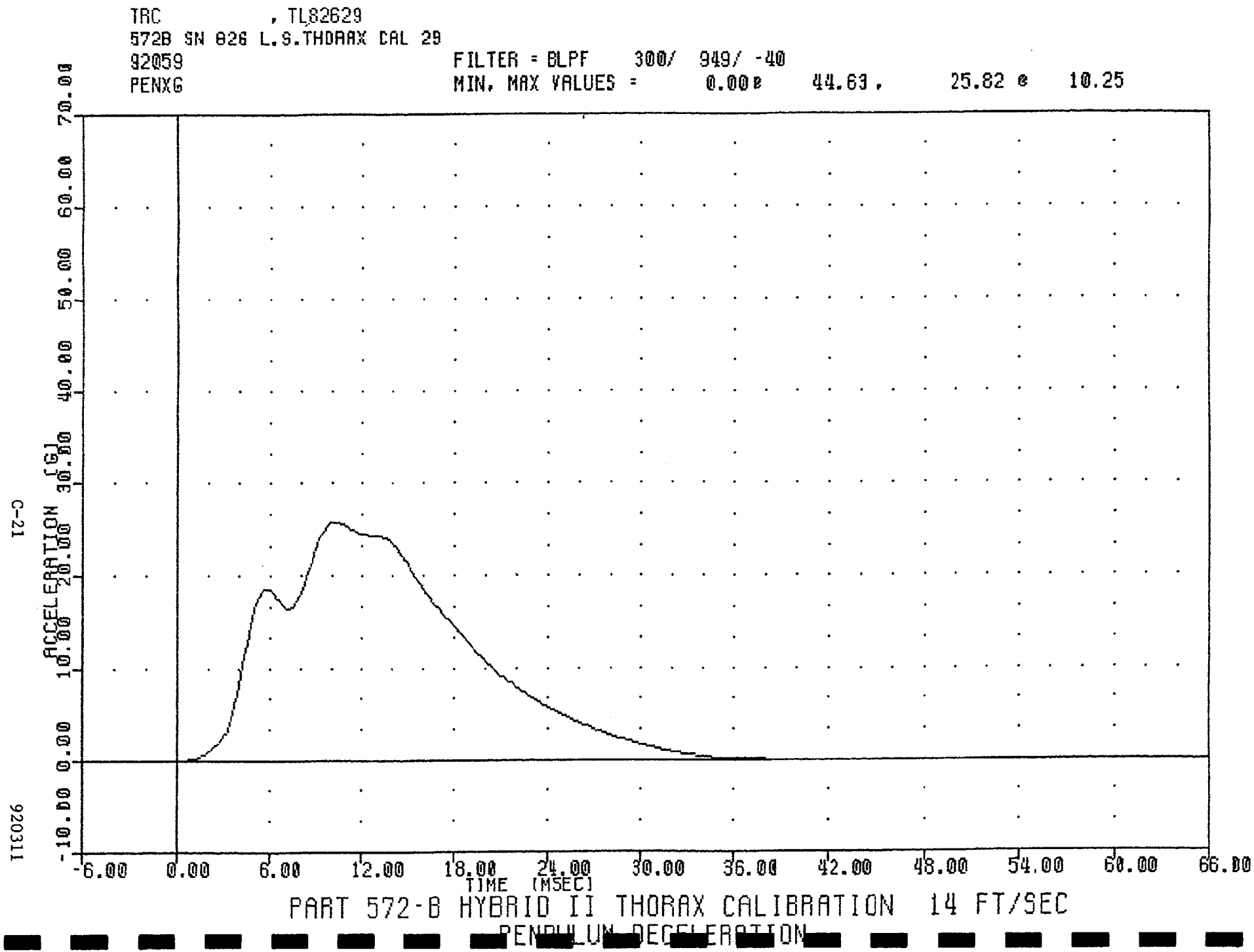
TEMPERATURE 69 F RELATIVE HUMIDITY 49 %
TRC TL82629 572B SN 826 L.S.THORAX CAL 29

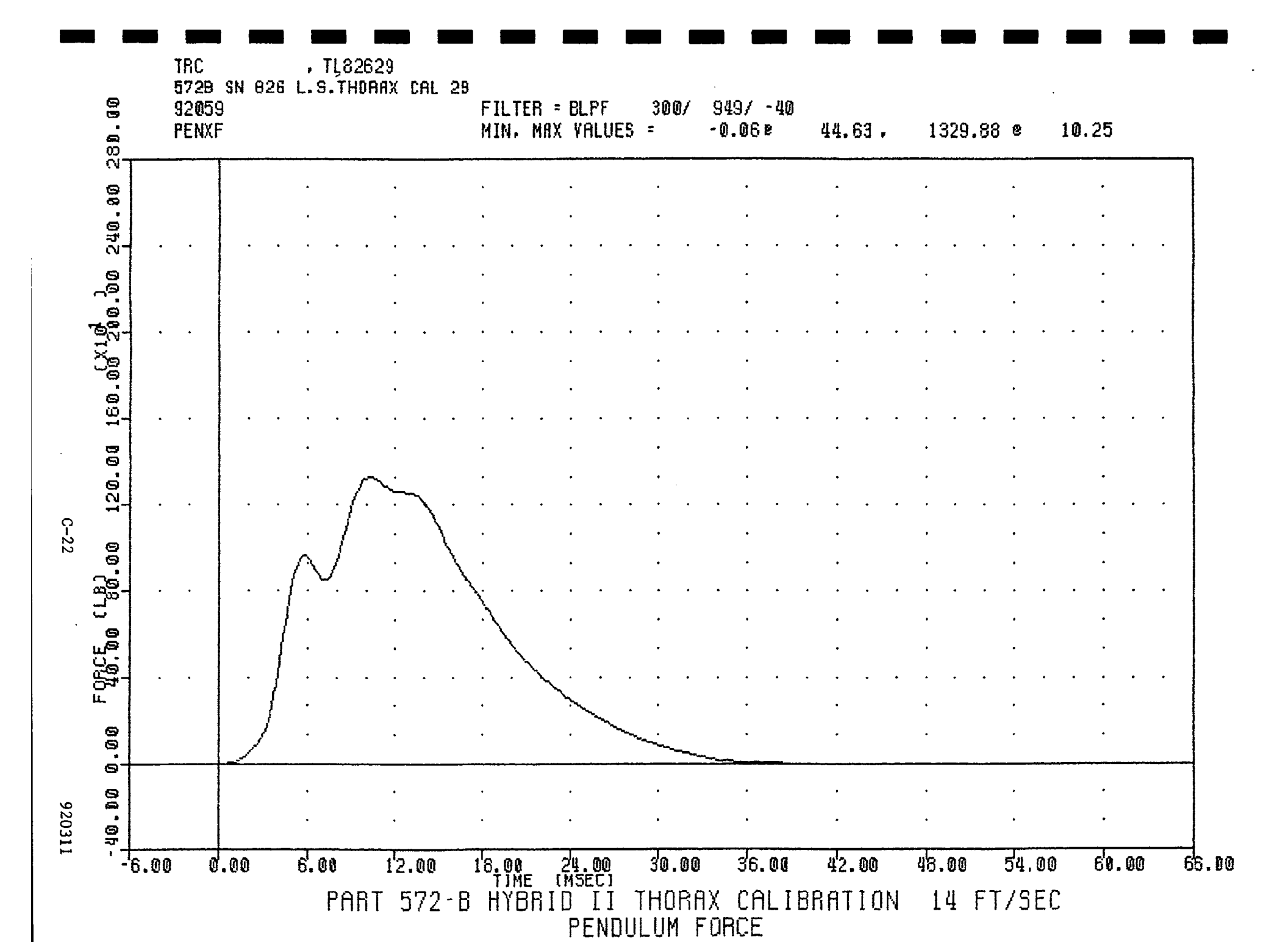
TEST PARAMETER	LOW SPEED TEST SPECIFICATION	TEST RESULTS
PENDULUM VELOCITY	13.86-14.14 FT/SEC	13.97 FT/SEC
PEAK DEFLECTION	1.1 IN max.	0.97 IN
PEAK RESISTIVE FORCE	1,450. LB max.	1330. LB
INTERNAL HYSTERESIS	50% - 70%	68.8%

SCD: 2.25 IN

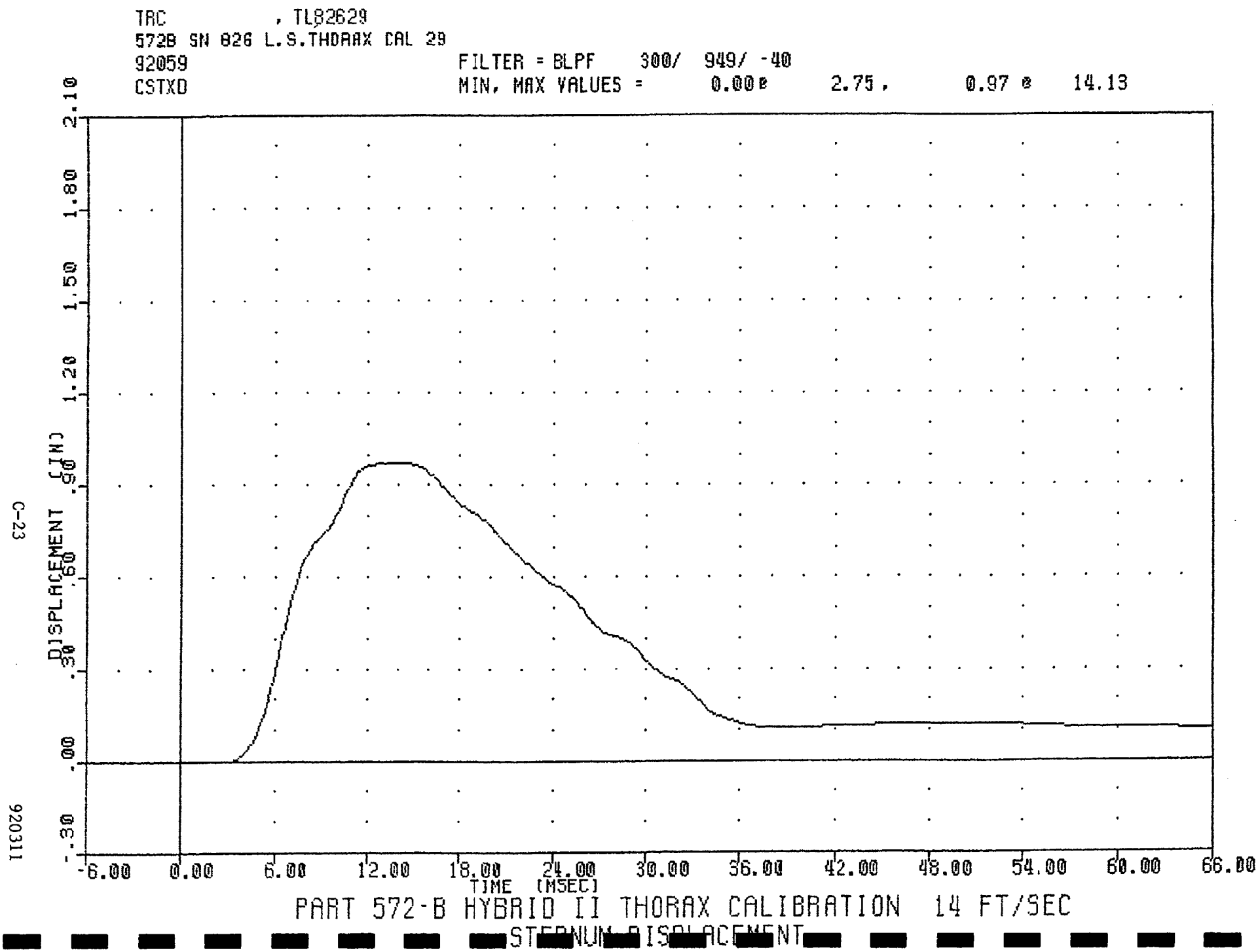
DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet

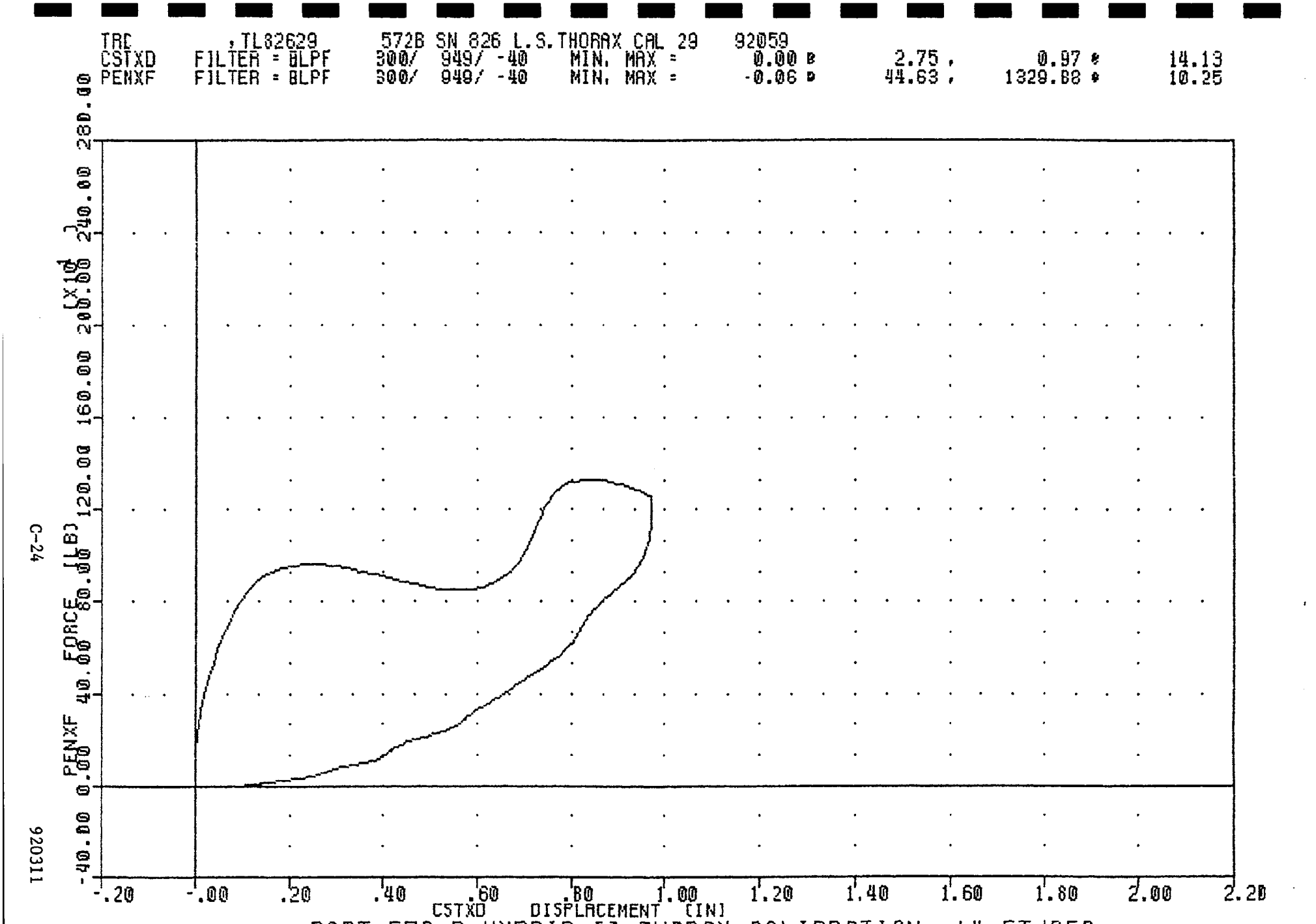

TRC , TL82629
572B SN 626 L.S.THORAX CAL 29
92059
PENXG
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 0.00 @ 44.63 , 25.82 @ 10.25
ACCELERATION [G]
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
-6.00
0.00
6.00
12.00
18.00
24.00
30.00
36.00
42.00
48.00
54.00
60.00
66.00
TIME (MSEC)
PART 572-B HYBRID II THORAX CALIBRATION 14 FT/SEC
PENDULUM DECELERATION



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


TRC , TL82629
572B SN 826 L.S.THORAX CAL 29
92059
CSTXD
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 0.00 @ 2.75 , 0.97 @ 14.13
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 14 FT/SEC
STERNUM DISPLACEMENT

920311



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 28-Feb-92

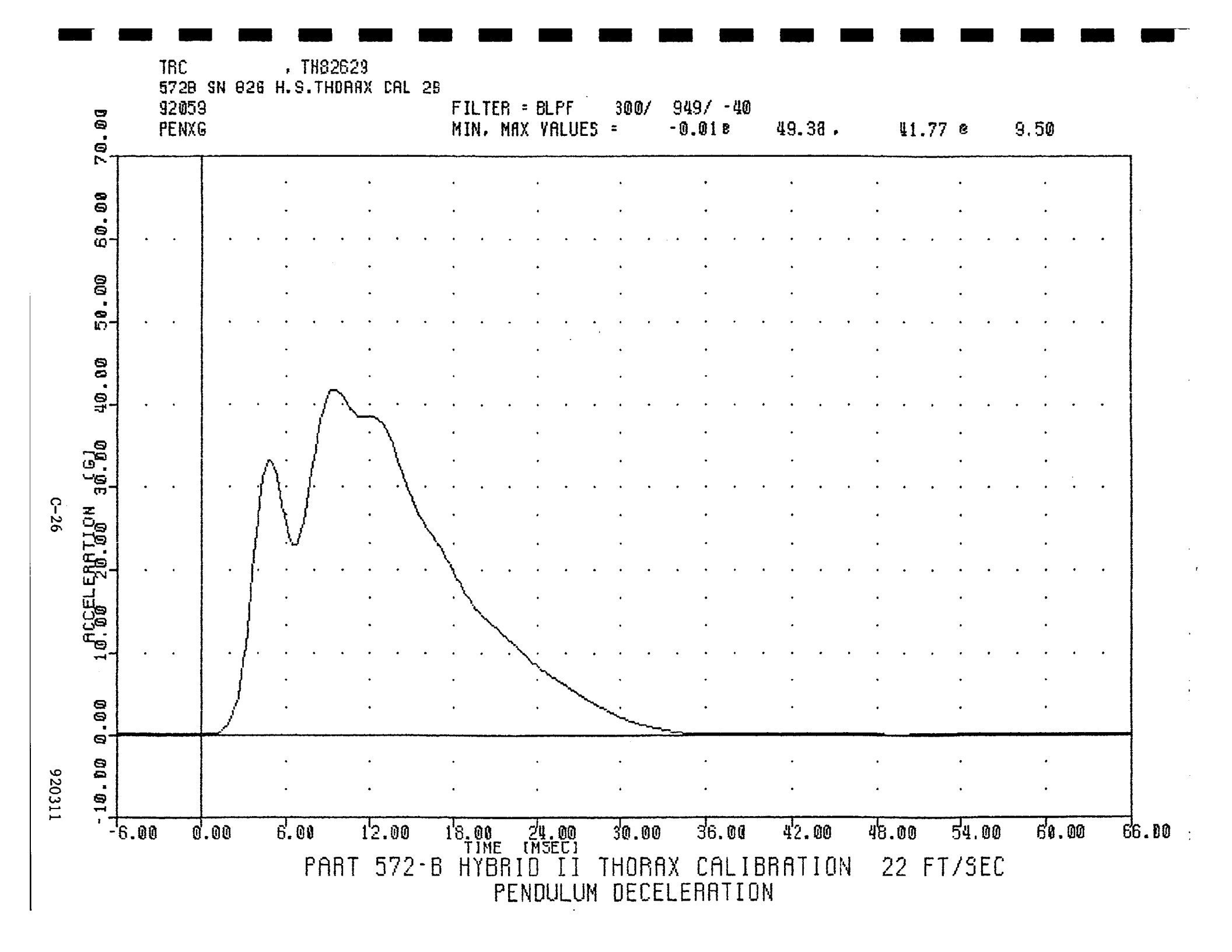
TEMPERATURE 69 F RELATIVE HUMIDITY 48 %
TRC TH82629 572B SN 826 H.S.THORAX CAL 29

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.	1.53 IN
PEAK RESISTIVE FORCE	2,250. LB max.	2151. LB
INTERNAL HYSTERESIS	50% - 70%	68.1%

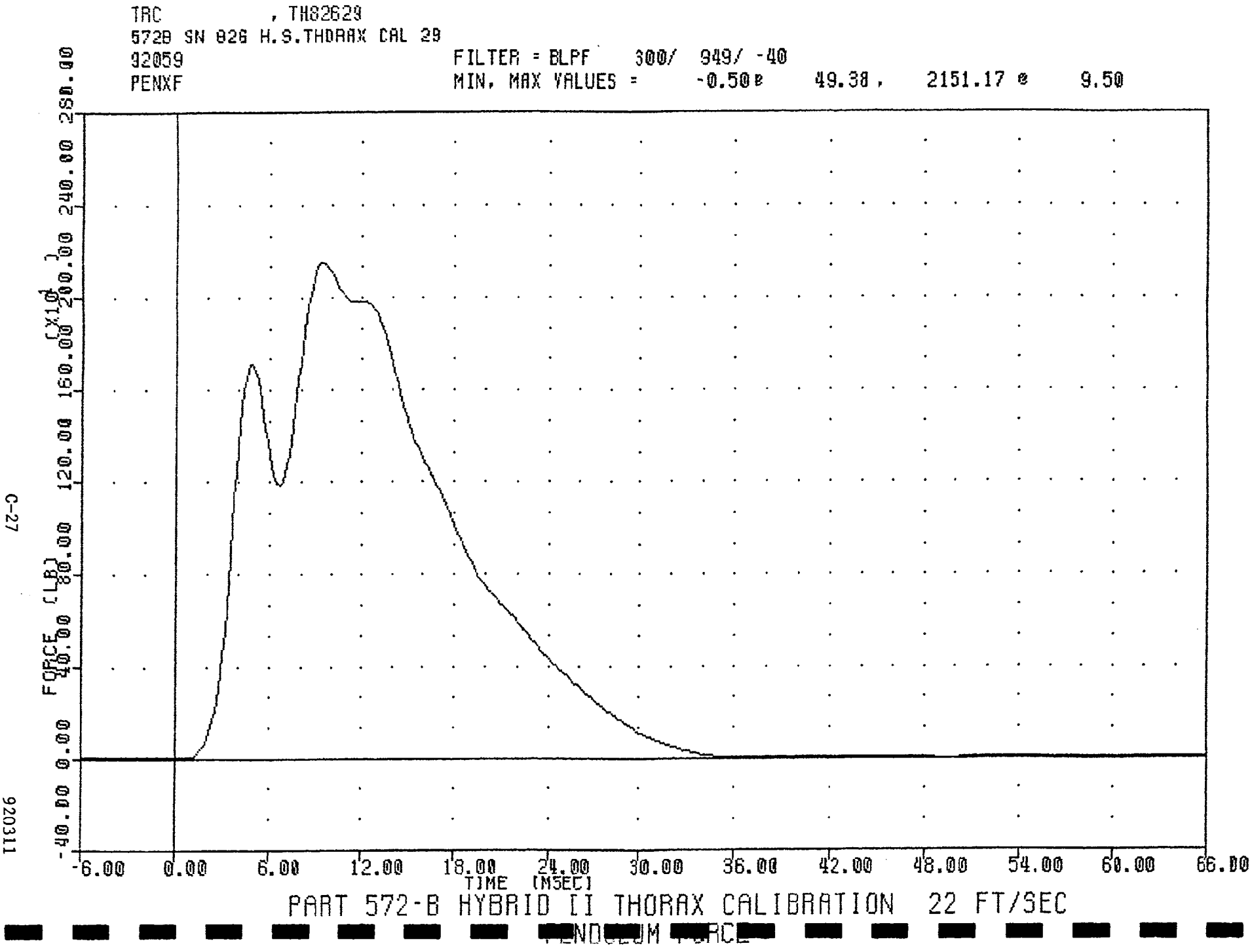
SCD: 2.25 IN

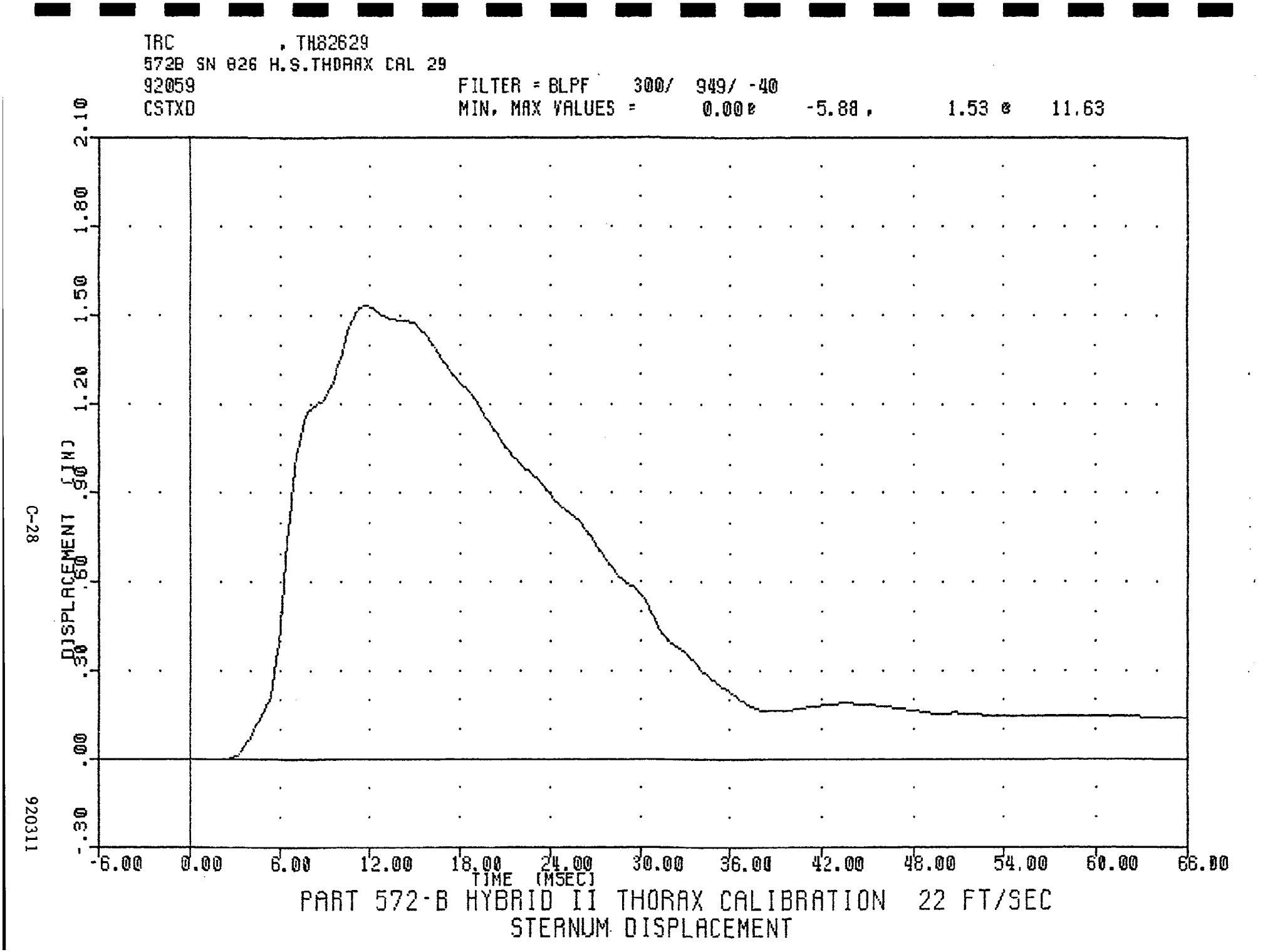
DUMMY MEETS SPECIFICATIONS

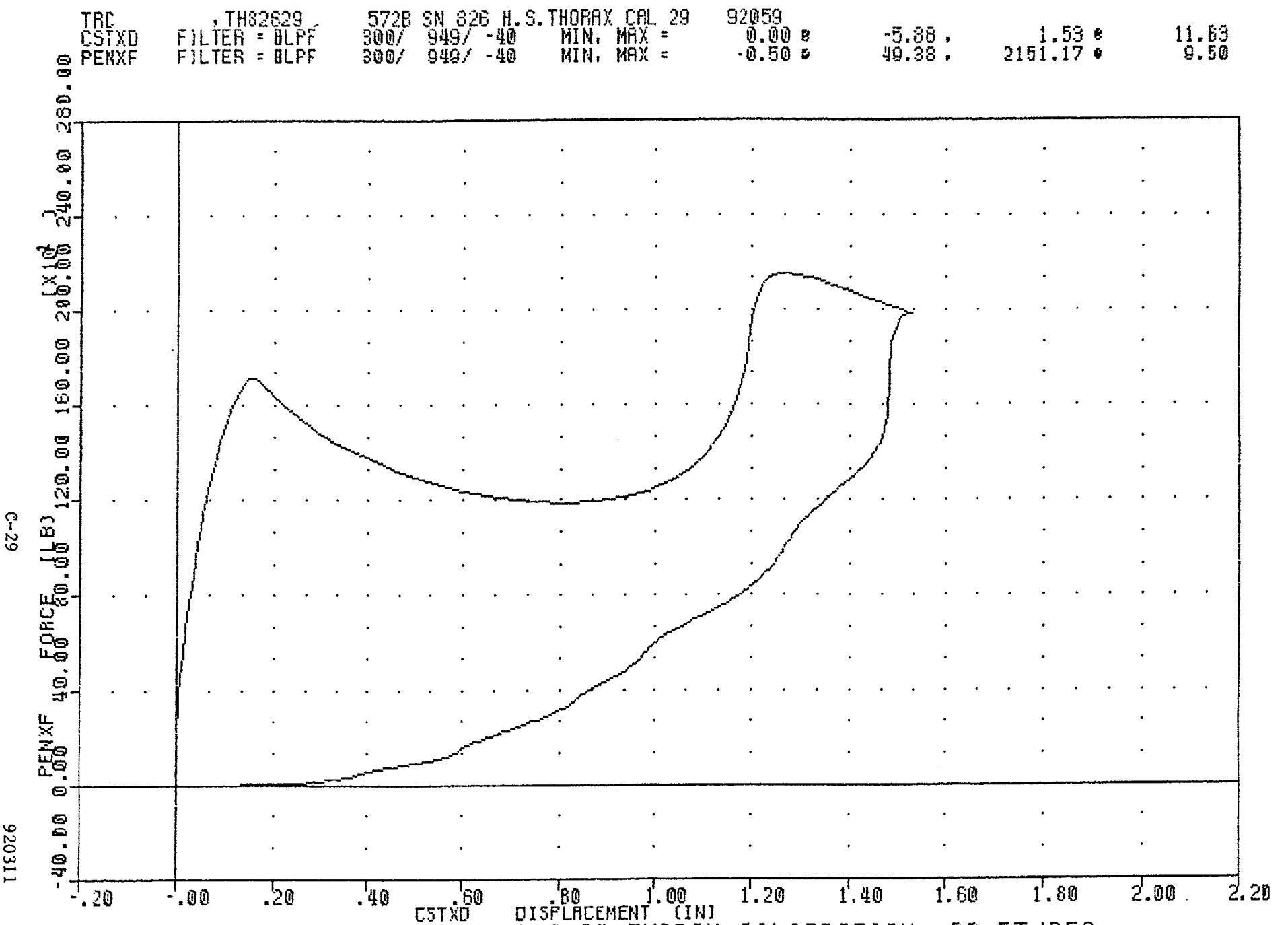
TECHNICIAN Chas. Middleton



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


TRC , TH82629
5728 SN 826 H.S.THORAX CAL 29
92059
PENXF
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -0.50 @ 49.38 , 2151.17 @ 9.50
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)
PART 572-B HYBRID II THORAX CALIBRATION 22 FT/SEC
PENDULUM FORCE


TRC , TH82629
572B SN 826 H.S.THORAX CAL 29
92059
CSTXD
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 0.00 @ -5.88 , 1.53 @ 11.63
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



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

CHEST DISPLACEMENT VS PENDULUM FORCE

TRANSPORTATION RESEARCH CENTER OF OHIO

ABDOMEN COMPRESSION TEST

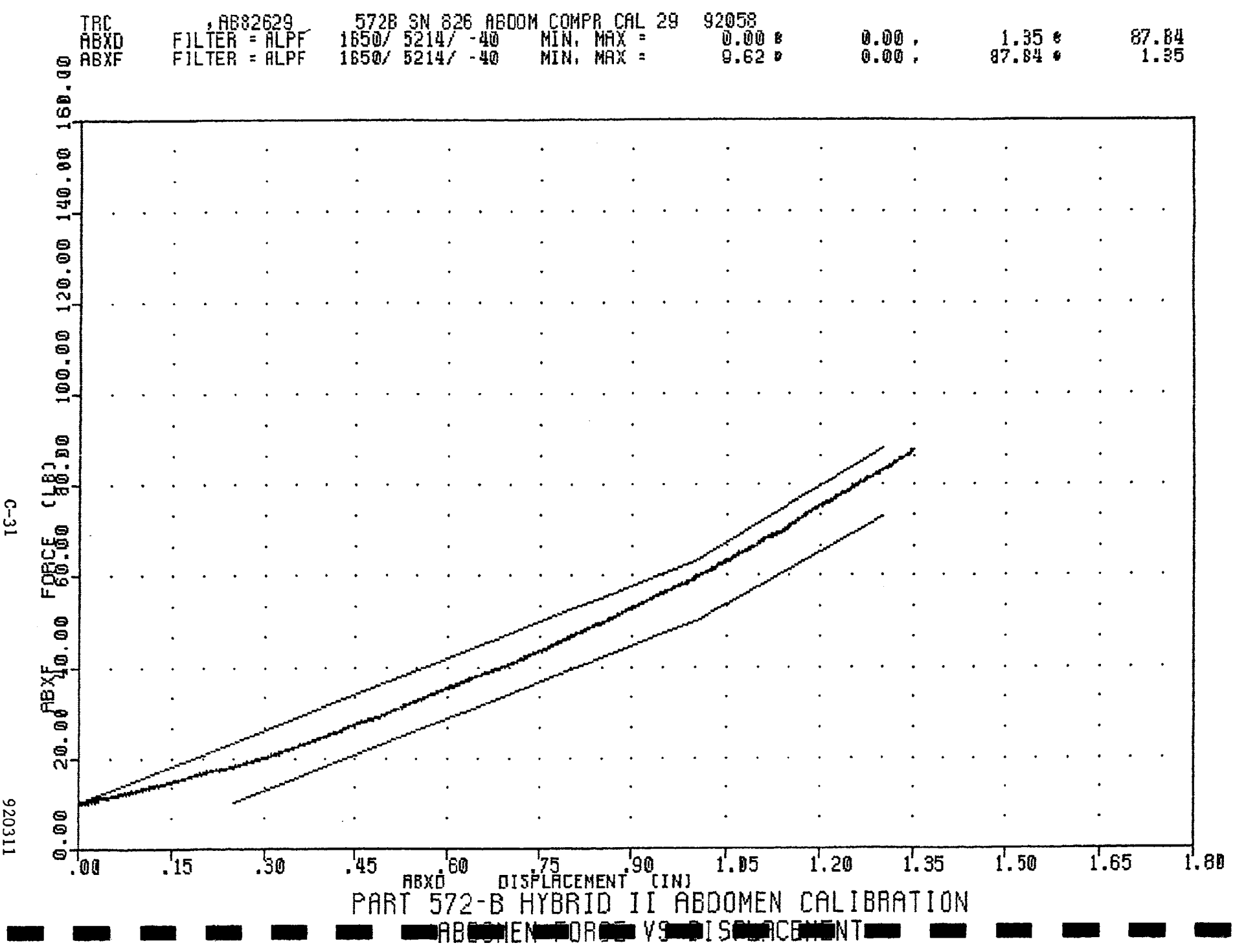
PART 572 27-Feb-92

TEMPERATURE 70 F RELATIVE HUMIDITY 49 %
TRC ABS2629 572B SN 826 ABDOM COMPR CAL 29

TEST CORRIDORS		
DISPLACEMENT	FORCE	TEST RESULTS
0.00 IN	10.00 LBS	10.00 LBS
0.50 IN	23.00 - 36.00 LBS	29.88 LBS
0.75 IN	36.00 - 50.00 LBS	43.51 LBS
1.00 IN	50.00 - 63.00 LBS	59.60 LBS
1.30 IN	73.00 - 88.00 LBS	82.92 LBS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet


TRC ,AB82629 572B SN 626 ABDOM COMPR CAL 29 92058
ABXD FILTER = ALPF 1650/ 5214/ -40 MIN, MAX = 0.00 @ 0.00 , 1.35 @ 87.84
ABXF FILTER = ALPF 1650/ 5214/ -40 MIN, MAX = 9.62 @ 0.00 , 87.84 @ 1.35
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
1.80
ABXD DISPLACEMENT (IN)
PART 572-B HYBRID II ABDOMEN CALIBRATION
ABDOMEN FORCE VS DISPLACEMENT

TRANSPORTATION RESEARCH CENTER OF OHIO

LUMBAR FLEXION TEST

PART 572 27-FEB-92

TEMPERATURE 69 F RELATIVE HUMIDITY 49 %
TRC LF82629 572B SN826 LUMBAR FLEX CAL29

DEFLECTION	SPECIFICATION	TEST RESULTS
0 DEG	0 LB	0.00 LB
20 DEG	22.00 - 34.00 LB	30.00 LB
30 DEG	34.00 - 46.00 LB	40.00 LB
40 DEG	46.00 - 58.00 LB	55.00 LB
NET RETURN ANGLE	< 12 DEG	0.00 DEG

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

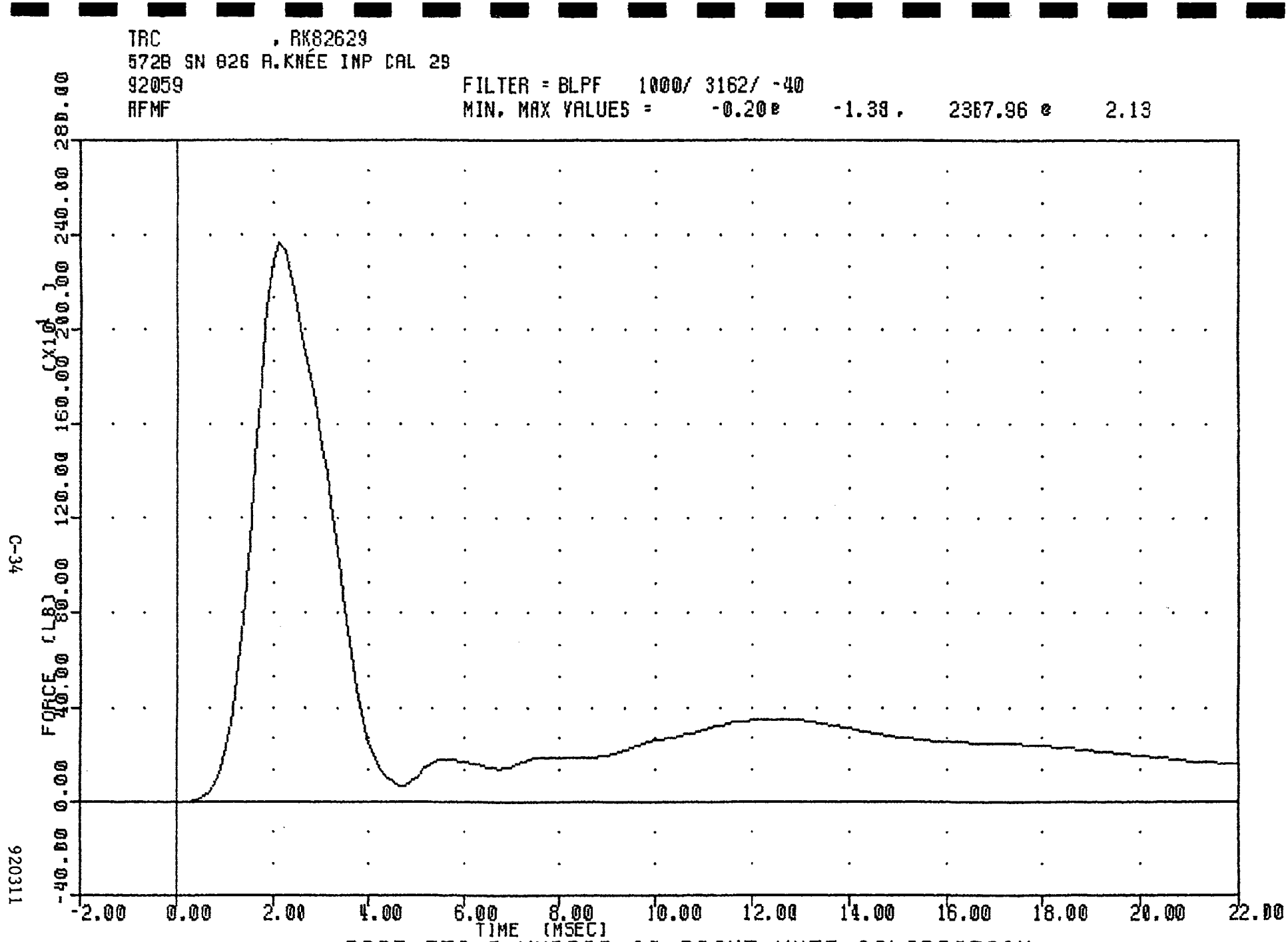
PART 572 28-Feb-92

TEMPERATURE 69 F RELATIVE HUMIDITY 49 %
RIGHT KNEE
TRC RK82629 572B SN 826 R.KNEE IMP CAL 29

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	7.00 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LB	2367.96 LB
DURATION ABOVE 1000 LB	>=1.7 MSEC	1.93 MSEC

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet



PART 572-B HYBRID II RIGHT KNEE CALIBRATION
RIGHT FEMUR FORCE

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

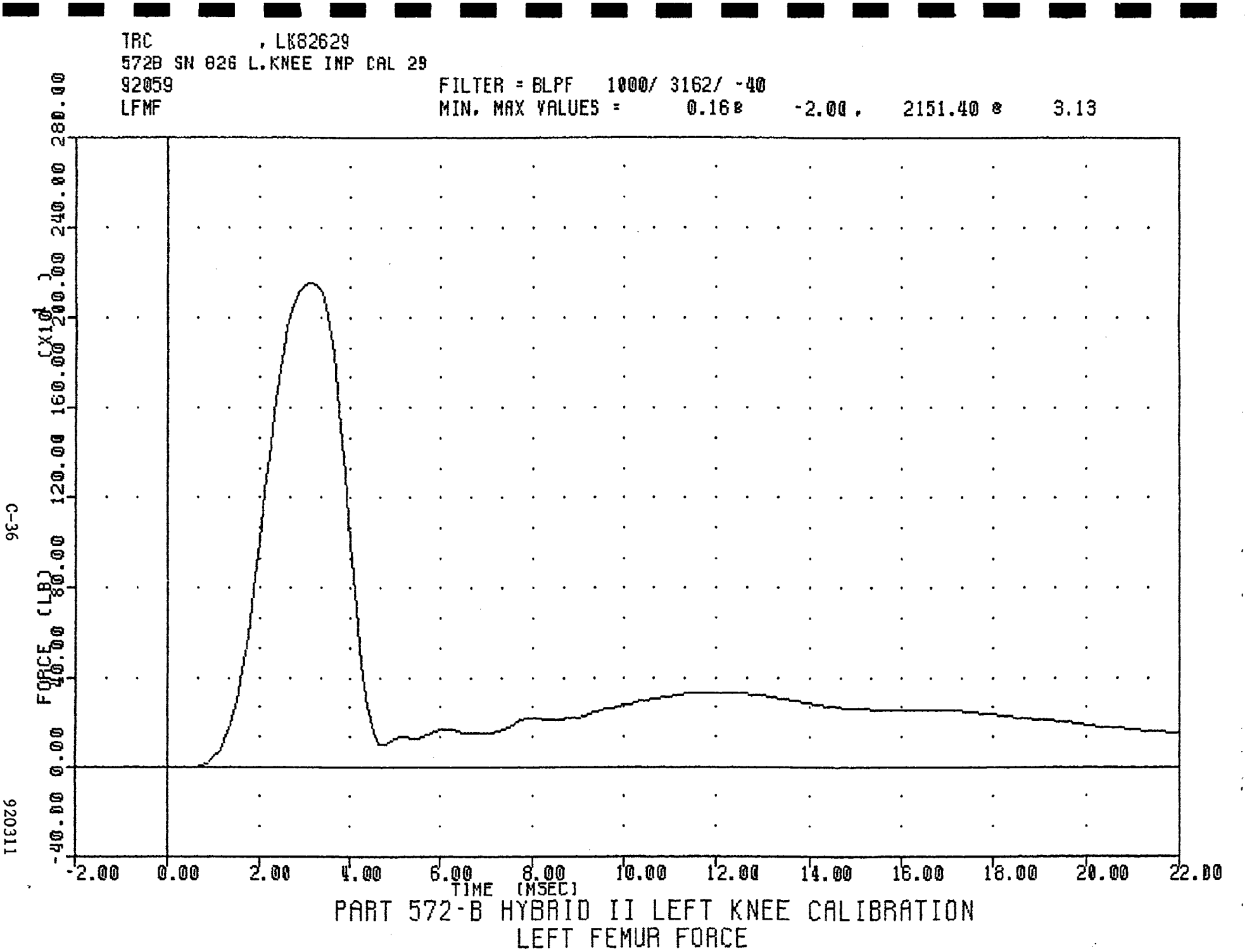
PART 572 28-Feb-92

TEMPERATURE 69 F RELATIVE HUMIDITY 49 %
LEFT KNEE
TRC LK82629 572B SN 826 L.KNEE IMP CAL 29

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	7.00 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LB	2151.40 LB
DURATION ABOVE 1000 LB	>=1.7 MSEC	2.00 MSEC

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet



PART 572-B HYBRID II LEFT KNEE CALIBRATION
LEFT FEMUR FORCE

PRE-TEST CERTIFICATION DATA

PASSENGER DUMMY S/N: 713

TRANSPORTATION RESEARCH CENTER OF OHIO

EXTERNAL DIMENSIONS

PART 572 27-FEB-92

TEMPERATURE 71 F RELATIVE HUMIDITY 48 %
TRC ED71303 572B SN713 EXT. DIMENSION CAL03

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	22.1 IN
Hip Pivot Height	3.9 IN	REFERENCE
Hip Pivot From Backline	4.8 IN	REFERENCE
Knee Pivot From Backline	20.1 - 20.7 IN	20.5 IN
Rear of Head From Backline	1.7 IN	REFERENCE
Chest Depth	9.1 - 9.6 IN	9.4 IN
Shoulder Width	17.8 - 18.4 IN	17.9 IN
Chest Circumference Over Nipples	36.8 - 40.0 IN	37.6 IN
Waist Circumference at Min. Girth	31.4 - 32.6 IN	32.5 IN
Hip Width	14.0 - 15.4 IN	14.6 IN
Knee Pivot From Floor	19.3 - 19.9 IN	19.6 IN

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas Middleton

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

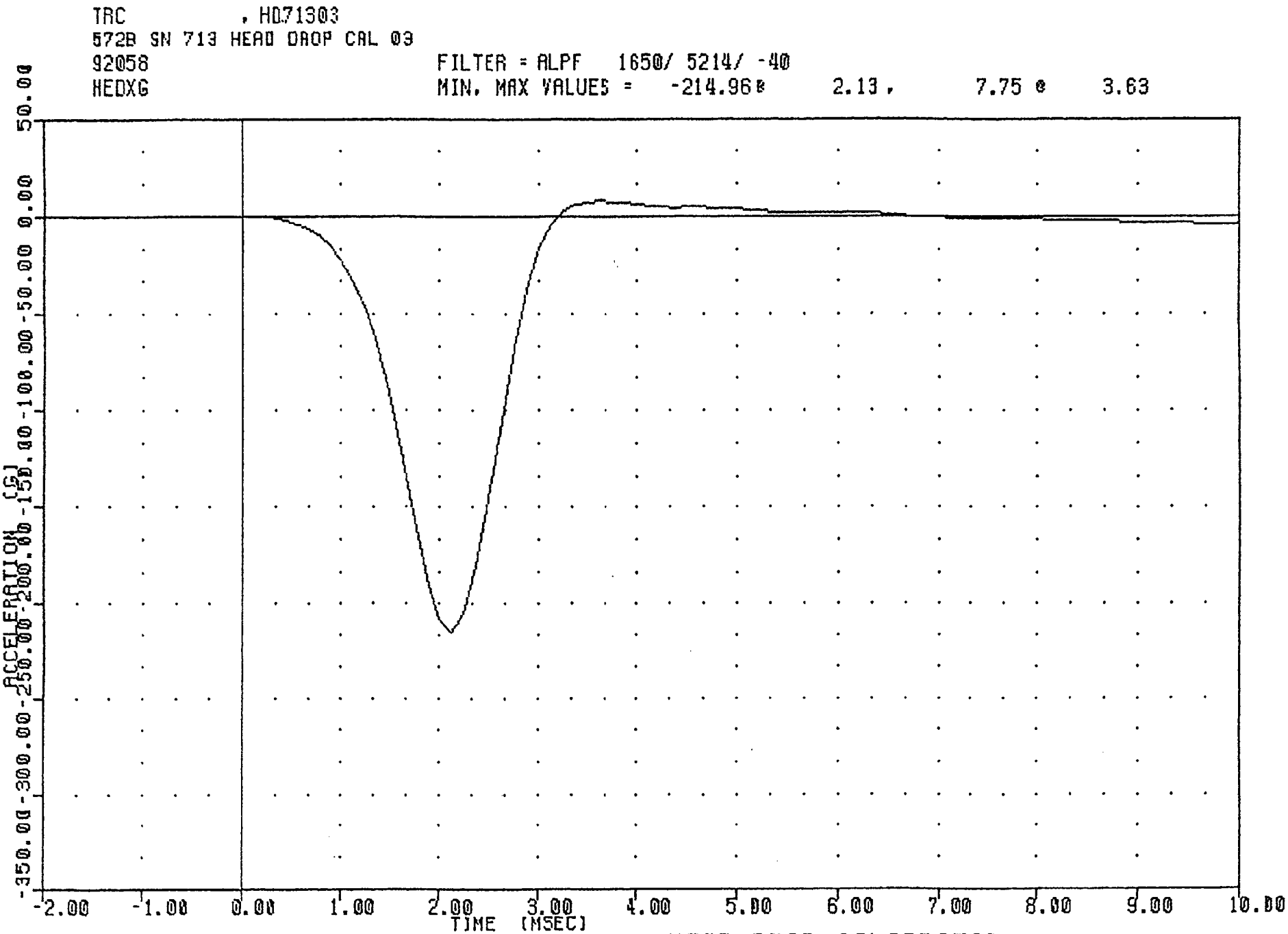
PART 572 27-Feb-92

TEMPERATURE 71 F RELATIVE HUMIDITY 48 %
TRC HD71303 572B SN 713 HEAD DROP CAL 03

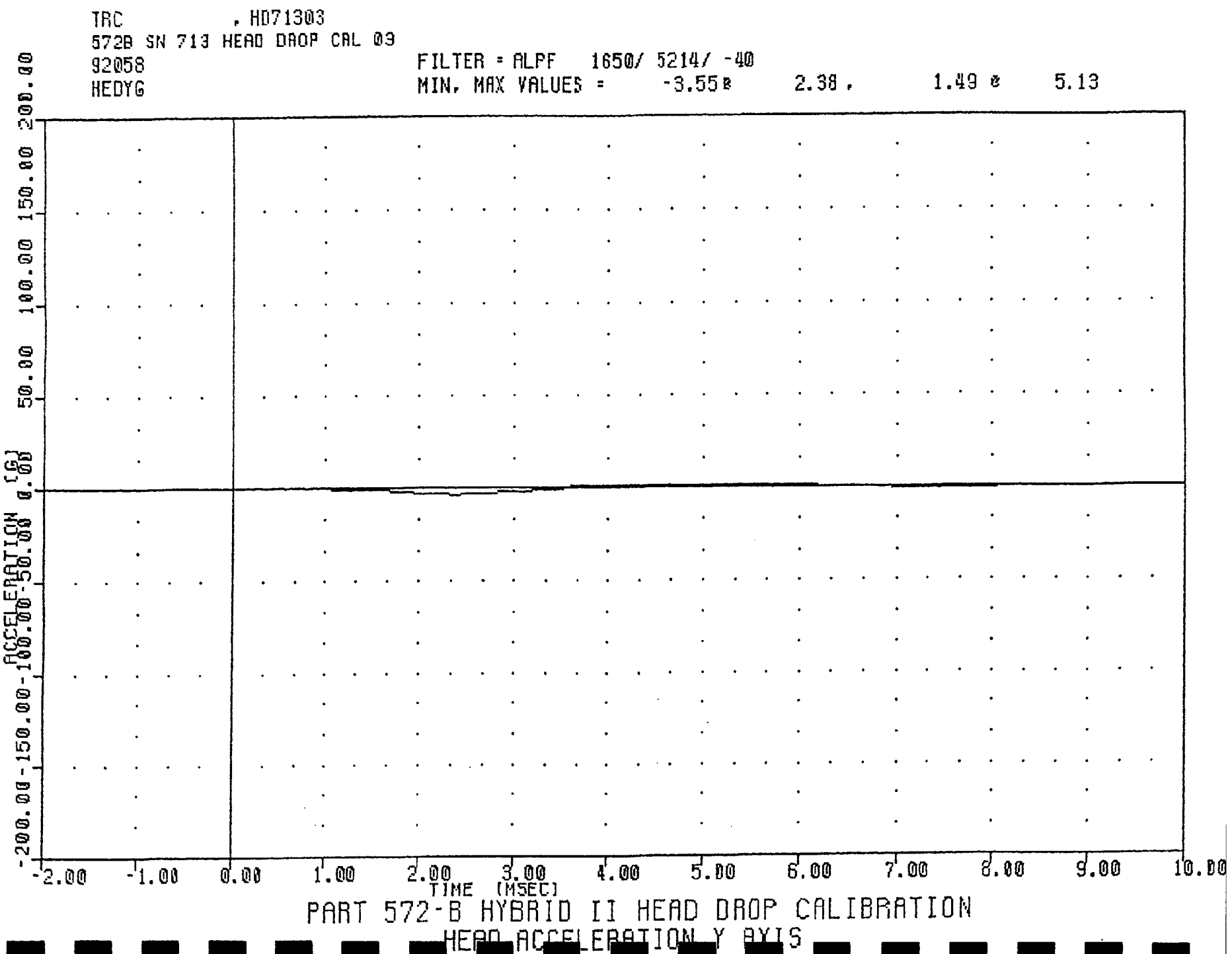
TEST PARAMETER	SPECIFICATION	TEST RESULTS
PEAK RESULTANT ACCELERATION	210 - 260 G	255.23 G
TIME ABOVE 100 G LEVEL	0.9 - 1.5 MSEC	1.25 MSEC
PEAK LATERAL ACCELERATION	10 G MAX	-3.55 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas Middlet

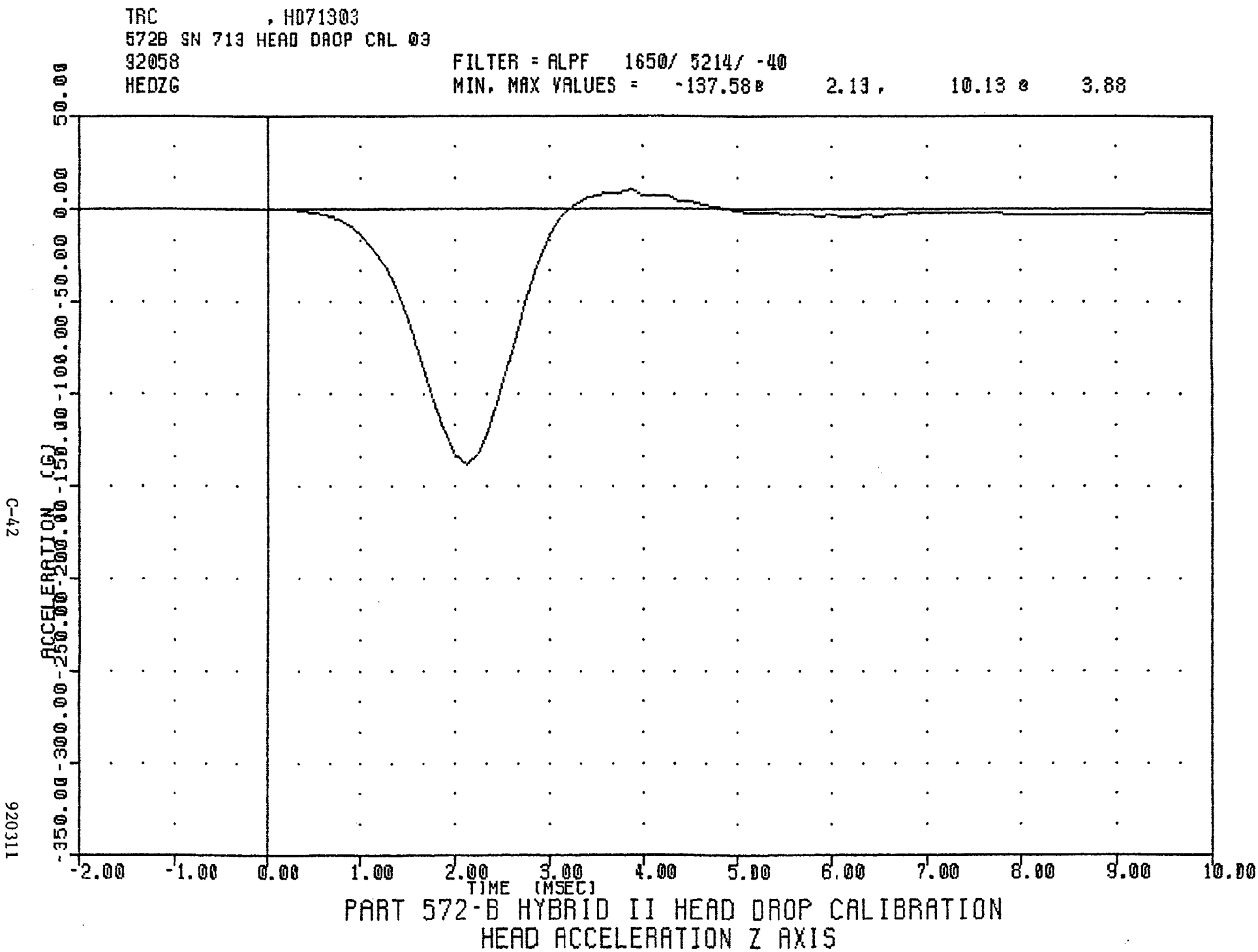


PART 572-B HYBRID II HEAD DROP CALIBRATION
HEAD ACCELERATION X AXIS



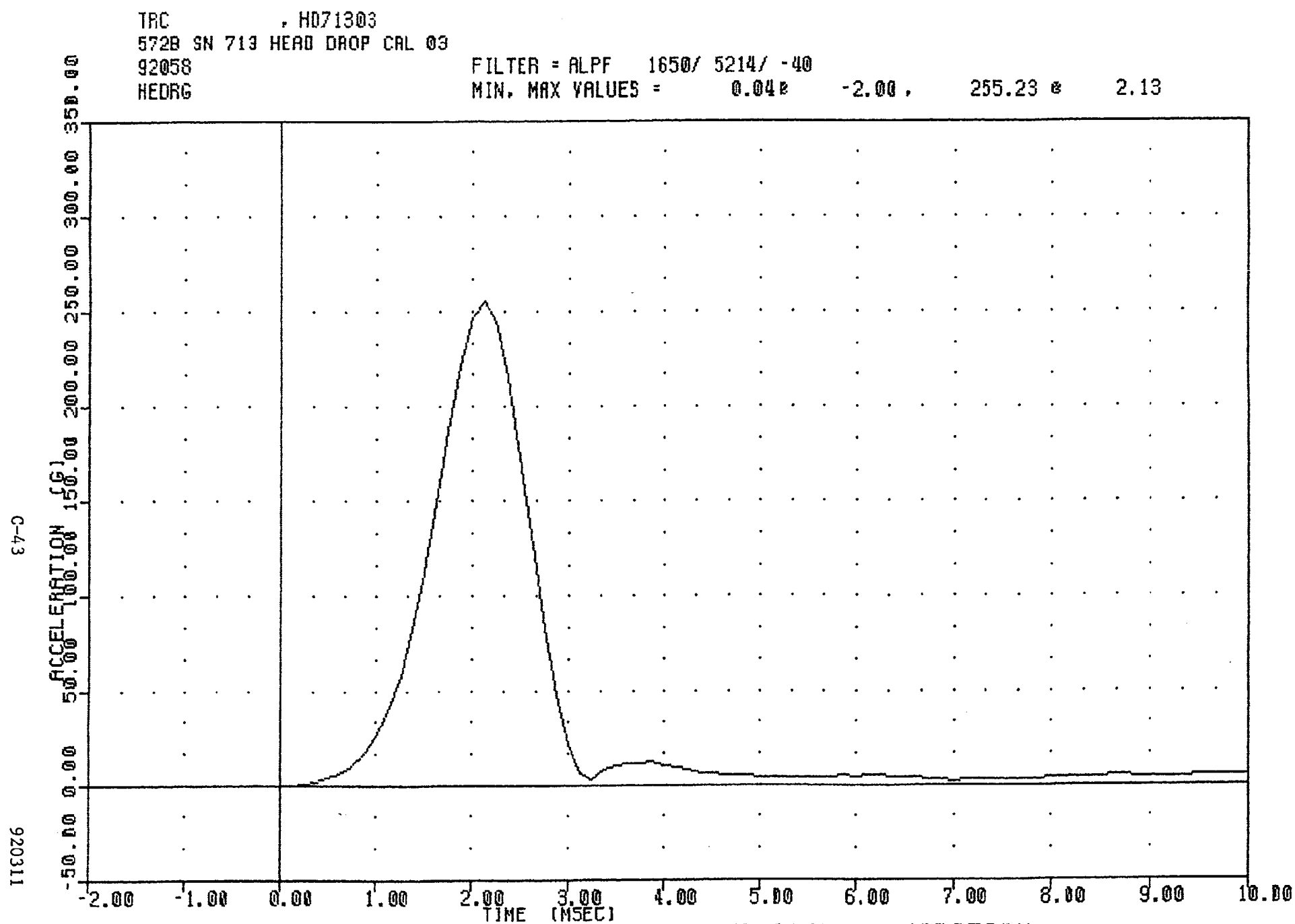
PART 572-B HYBRID II HEAD DROP CALIBRATION

HEAD ACCELERATION Y AXIS



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

920311



PART 572-B HYBRID II HEAD DROP CALIBRATION

[redacted]

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK PENDULUM TEST

PART 572 28-Feb-92

TEMPERATURE 69 F RELATIVE HUMIDITY 49 %
TRC HN71303 572B SN 713 HEAD/NECK CAL 03

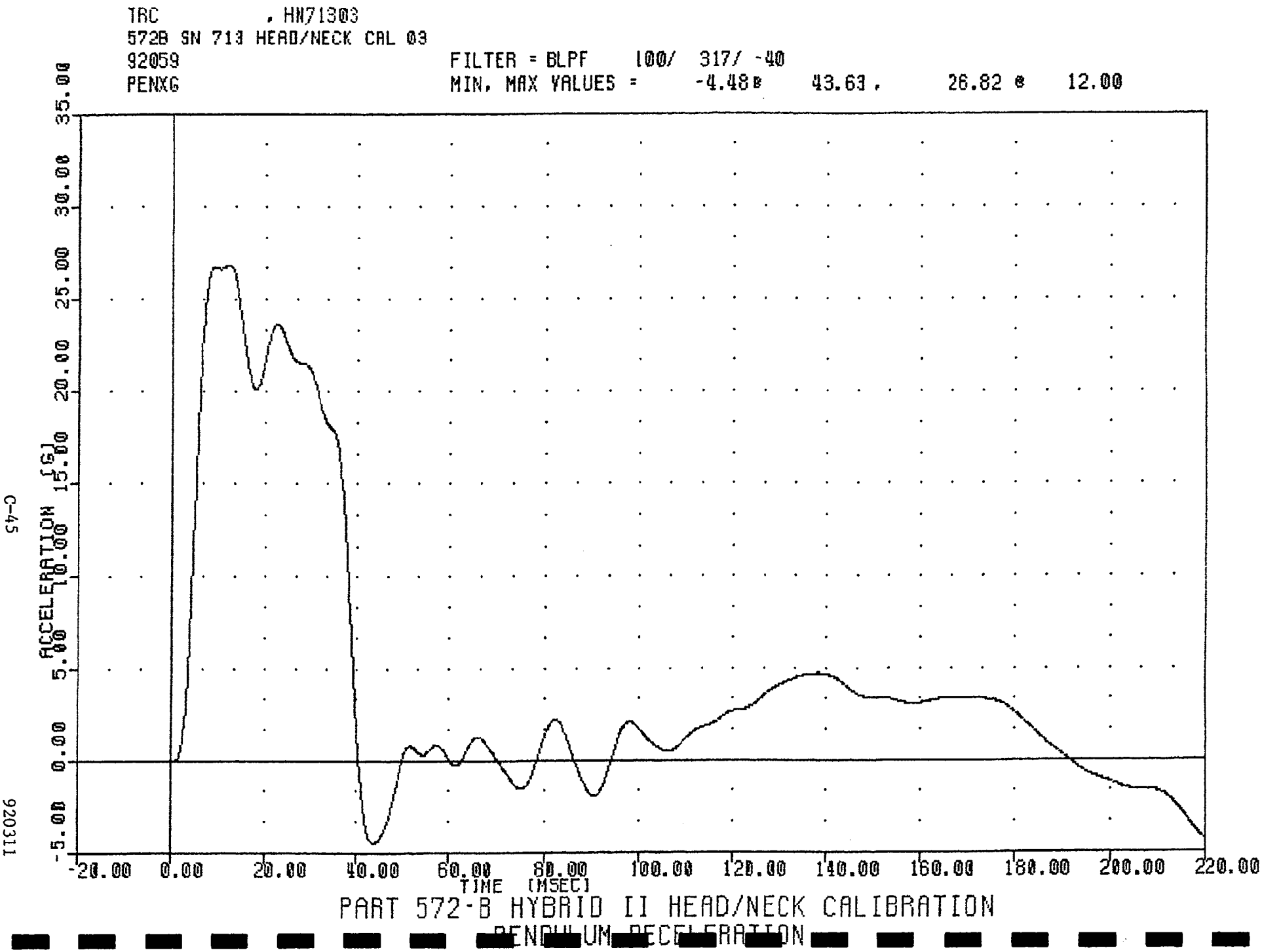
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Pendulum velocity	21.5 to 25.5 ft/sec	23.76 ft/sec
Pendulum Deceleration:		
T1 - T2: 5 - 20 G	3 msec max	2.46 msec
T2 - T3: 20 - 20 G	25 - 30 msec	25.32 msec
T3 - T4: 20 - 5 G	10 msec max	7.77 msec
Avg. G level T2 - T3	20 - 24 G	23.31 G
Maximum Rotation Angle	63 - 73 deg	70.28 deg
Peak Head Resultant Accel	26 G max	21.93 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	31.15	2.59
60	40.3 - 51.7	4.3 - 5.3	47.22	4.86
max	53.2 - 66.8	5.0 - 6.0	63.38	5.66
60	67.0 - 83.0	4.3 - 5.3	79.62	4.76
30	85.4 - 104.6	2.1 - 3.1	98.54	2.27
0	101.0 - 123.0	-0.5 - +0.5	112.86	0.08

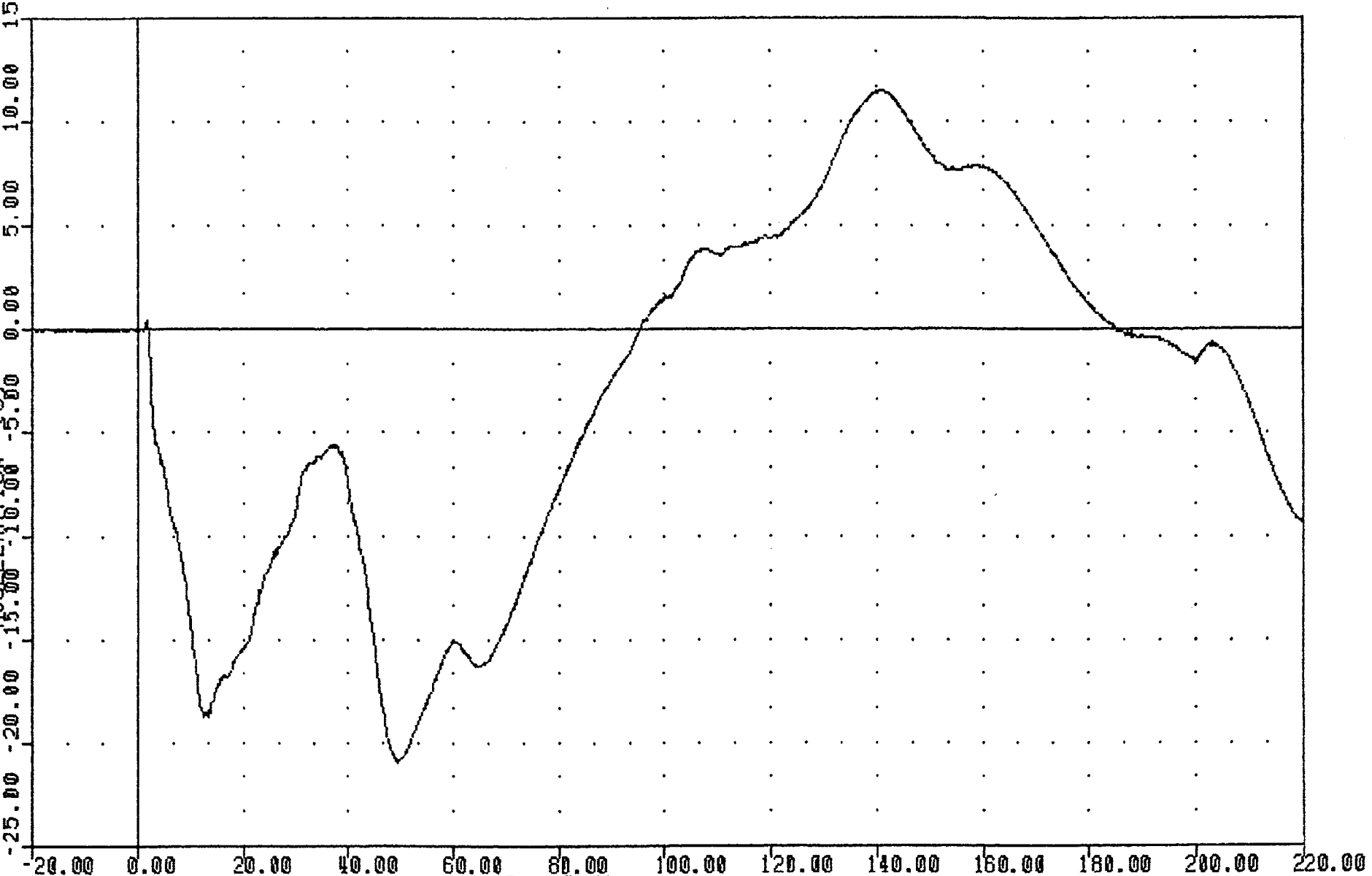
SND: 5.95 in

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet

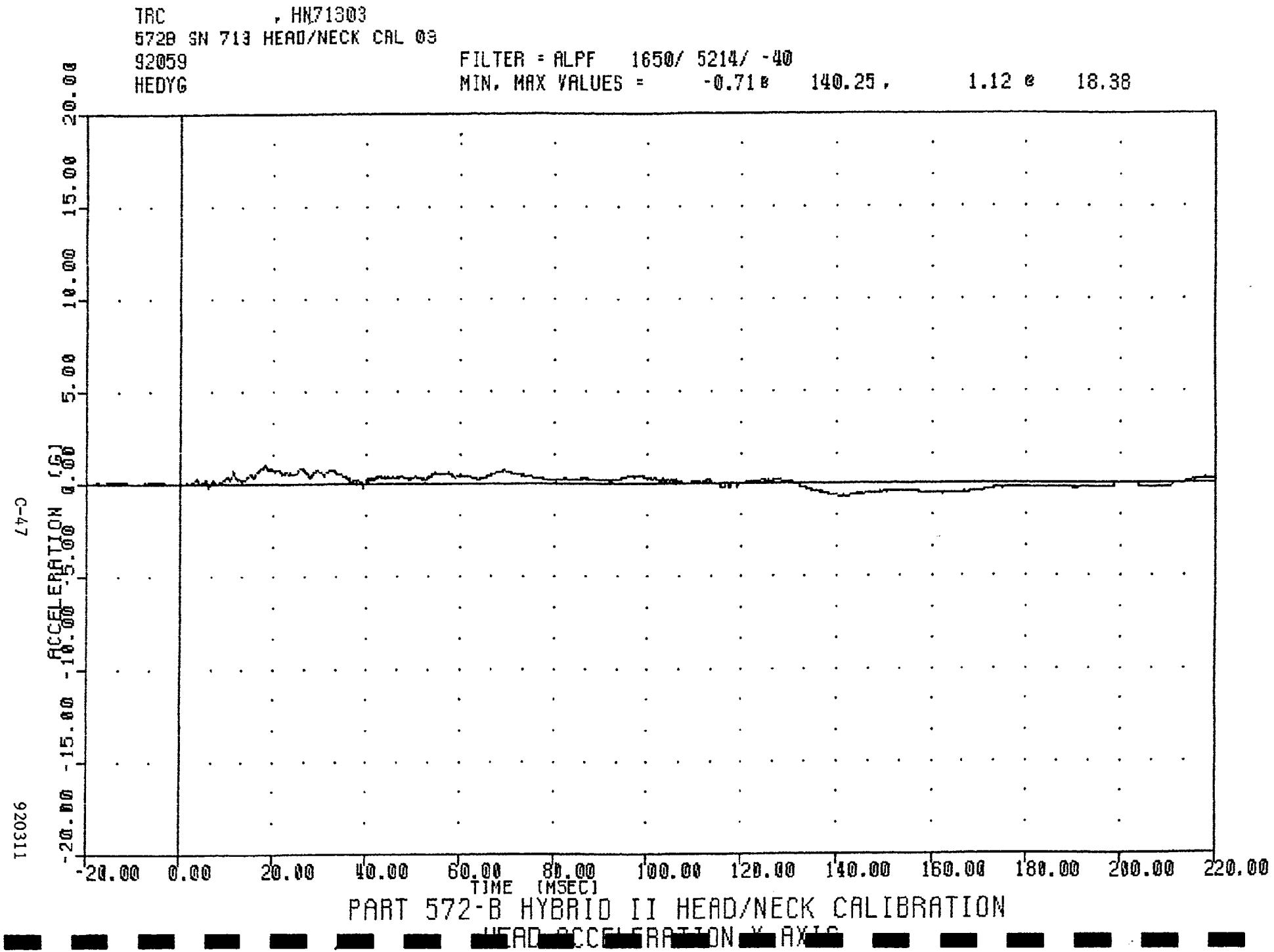

TRC , HN71303
572B SN 713 HEAD/NECK CAL 03
92059
PENXG
FILTER = BLPF 100/ 317/ -40
MIN, MAX VALUES = -4.48 @ 43.63 , 26.82 @ 12.00
ACCELERATION [G]
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
-5.00
-20.00
0.00
20.00
40.00
60.00
80.00
100.00
120.00
140.00
160.00
180.00
200.00
220.00
TIME [MSEC]
PART 572-B HYBRID II HEAD/NECK CALIBRATION
PENDULUM DECELERATION

TRC , HN71303
572B SN 713 HEAD/NECK CAL 03
92059 FILTER = ALPF 1650/ 5214/ -40
HEDXG MIN, MAX VALUES = -20.96 @ 49.25 , 11.49 @ 140.13



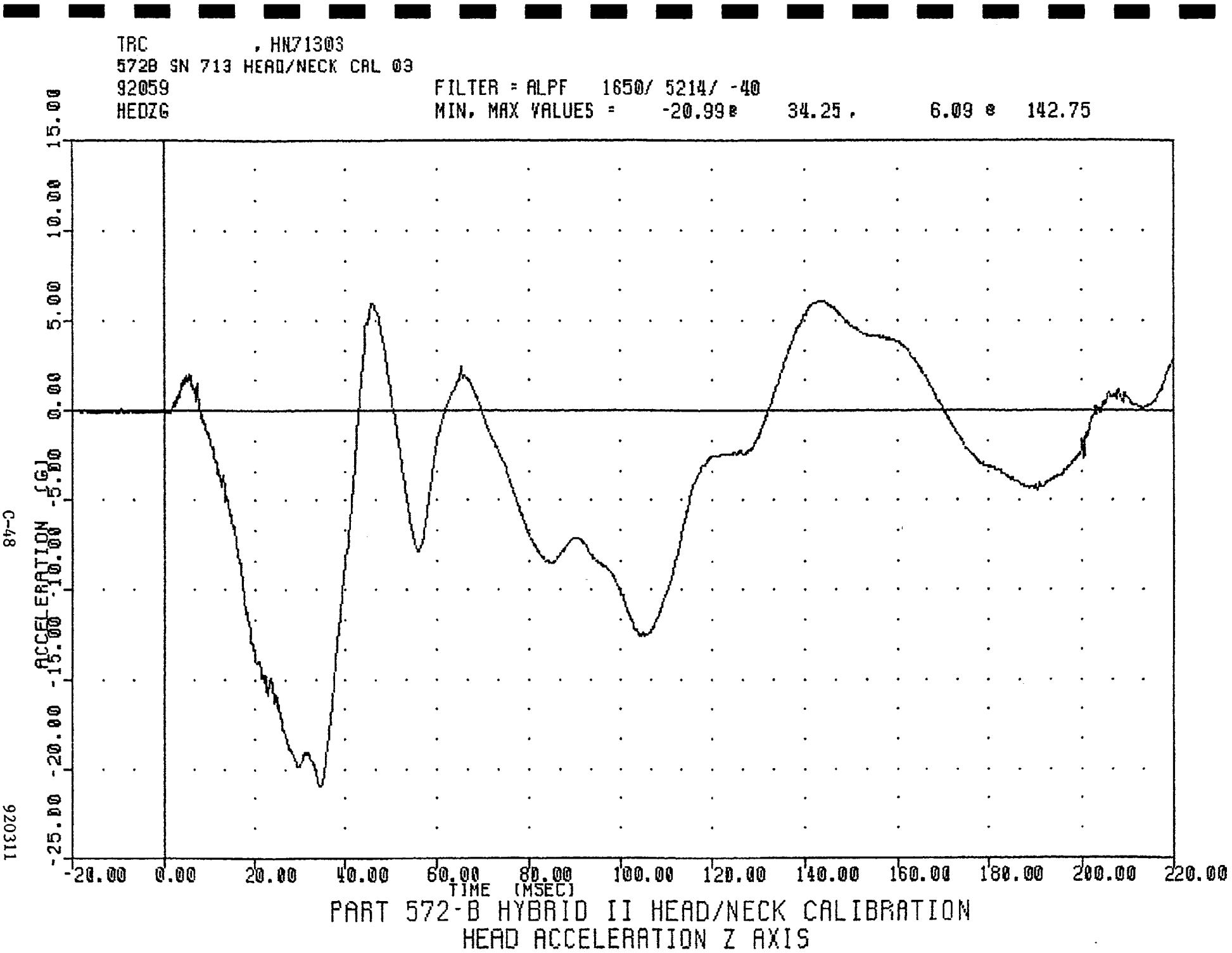
PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD ACCELERATION X AXIS

920311



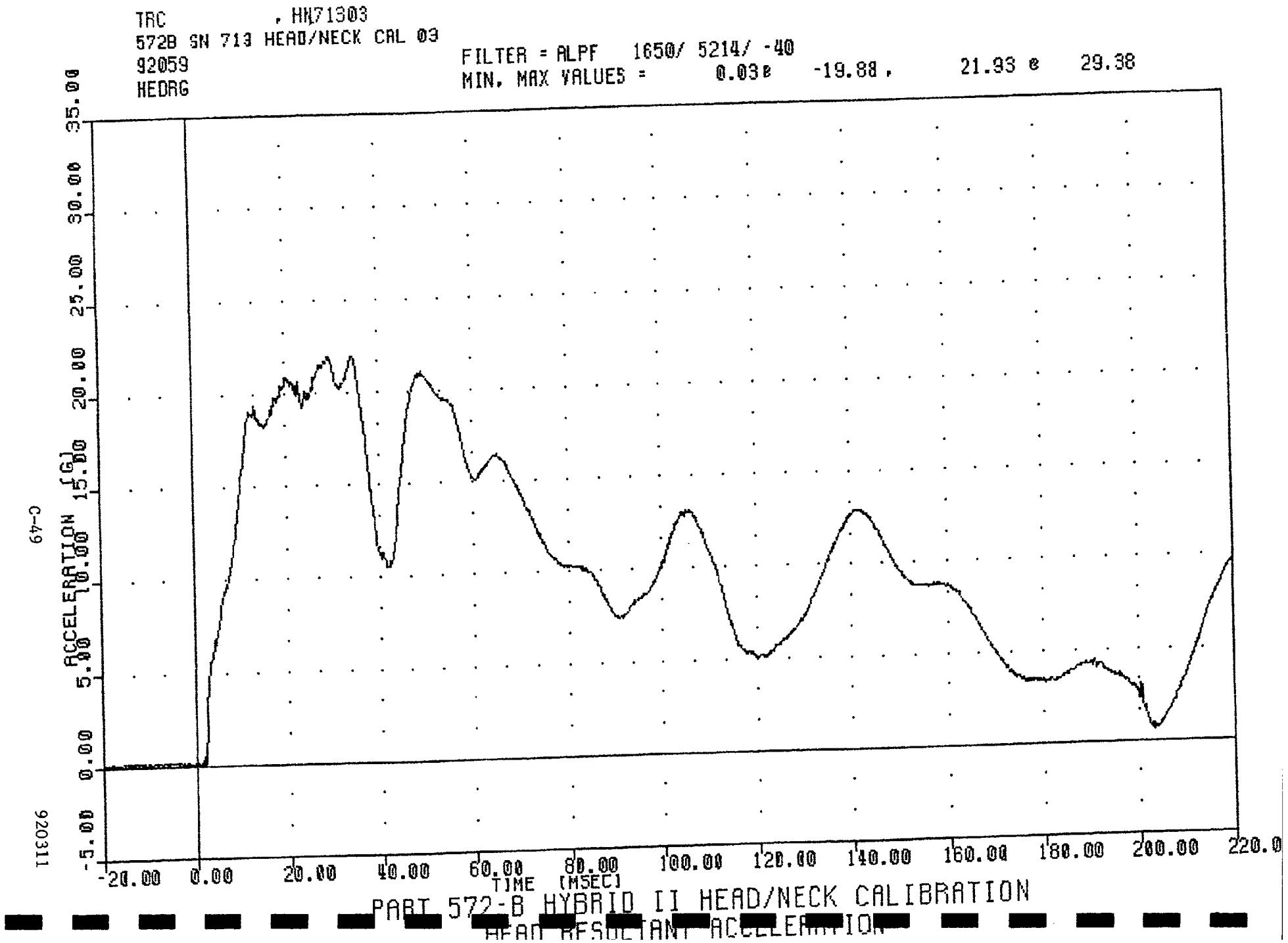
PART 572-B HYBRID II HEAD/NECK CALIBRATION

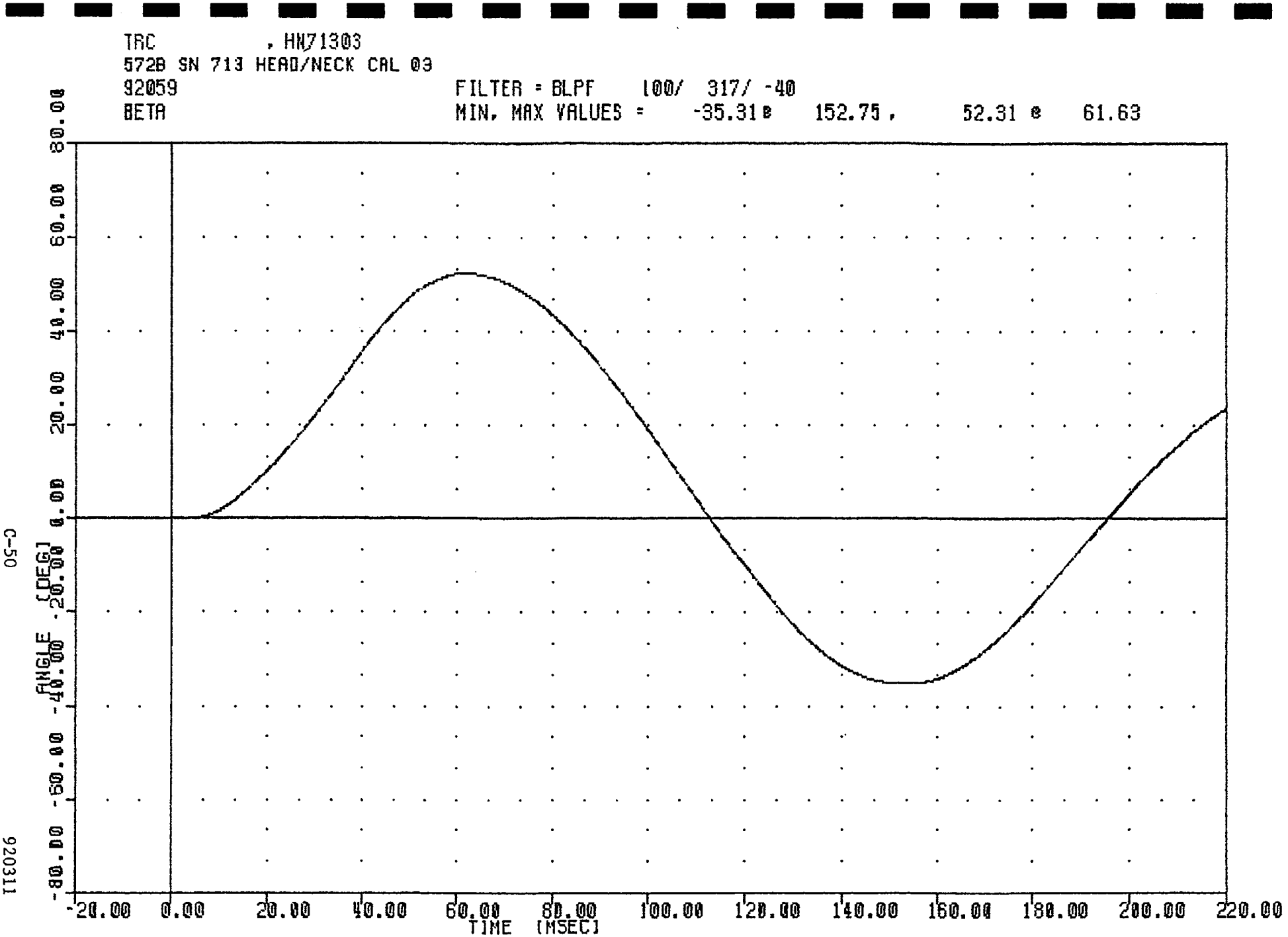
HEAD ACCELERATION X AXIS



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

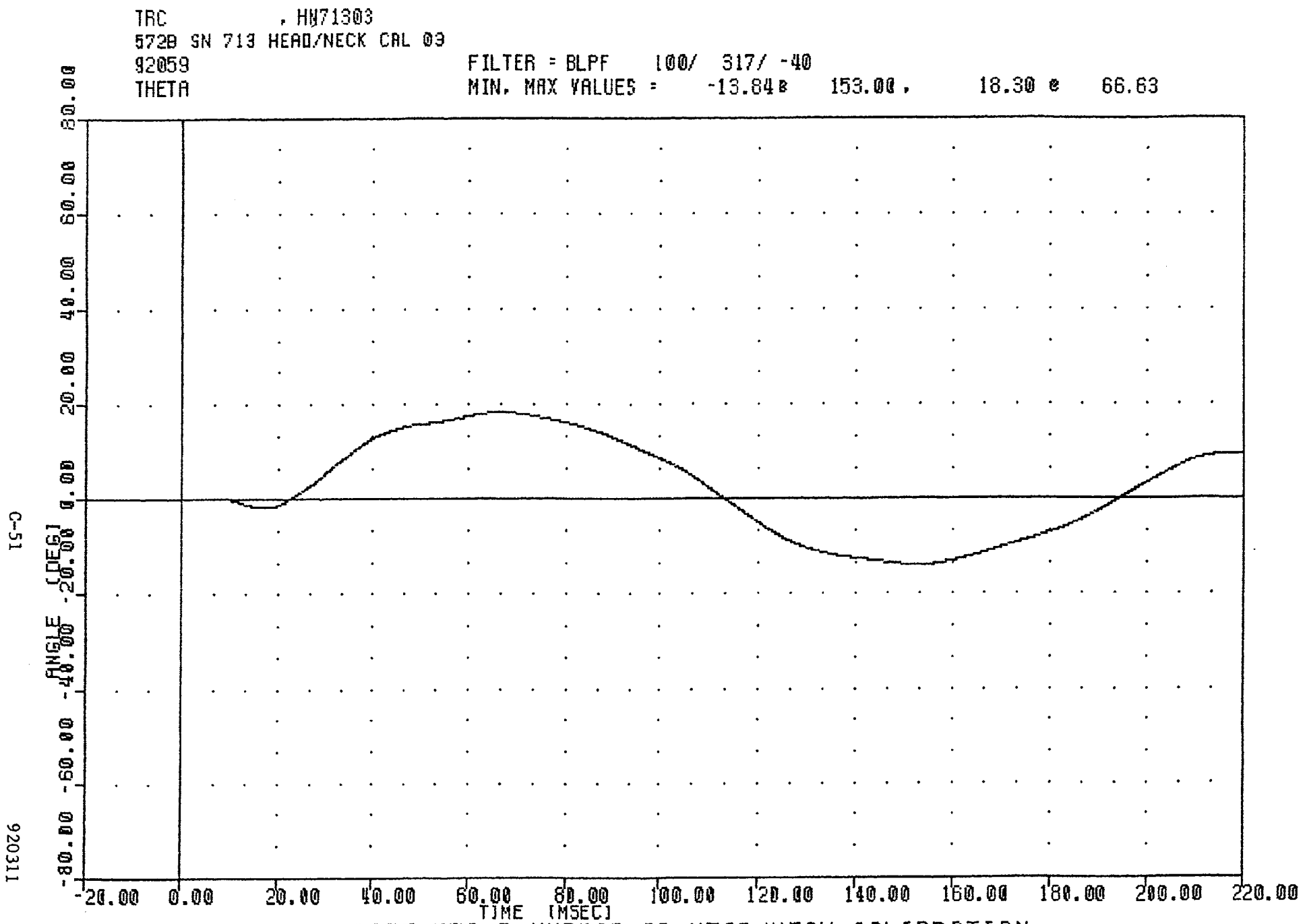
920311


TRC , HN71303
572B SN 713 HEAD/NECK CAL 03
92059
HEDRG
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = 0.03@ -19.88 , 21.93 @ 29.38
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
220.0
TIME (MSEC)
PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD RESULTANT ACCELERATION



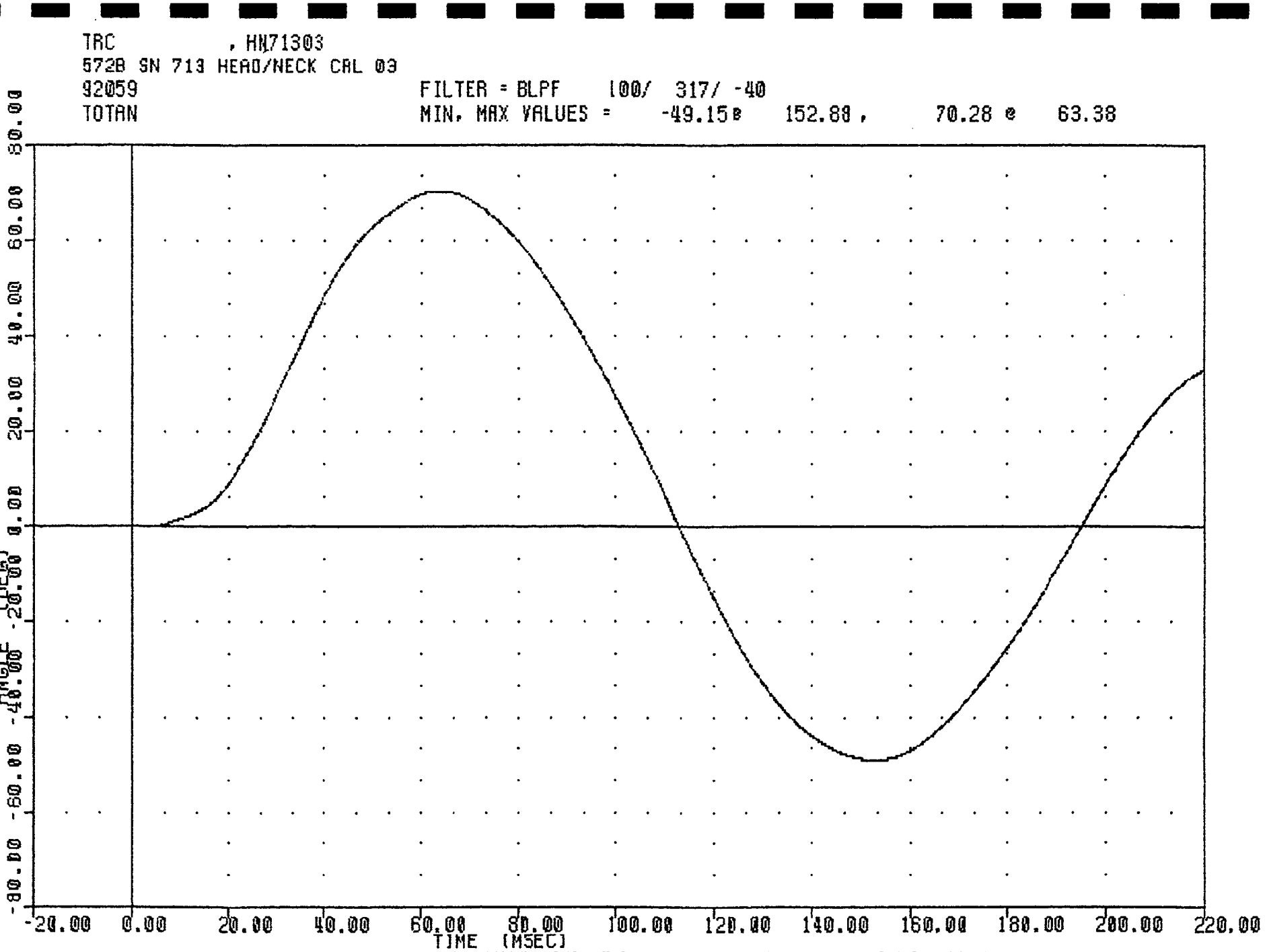
PART 572-B HYBRID II HEAD/NECK CALIBRATION
ROTATION ABOUT THE BASE OF THE NECK

920311



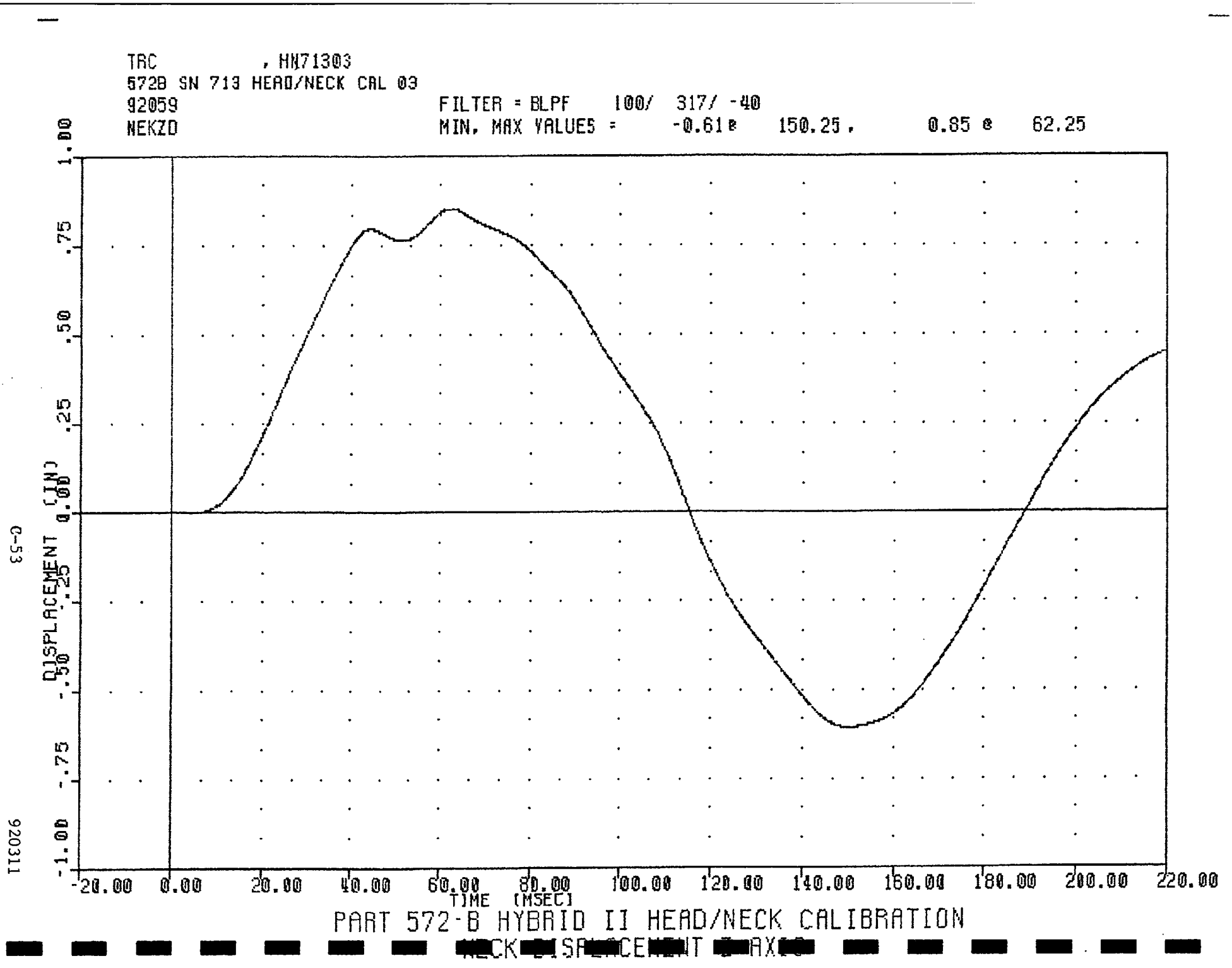
PART 572-B HYBRID II HEAD/NECK CALIBRATION

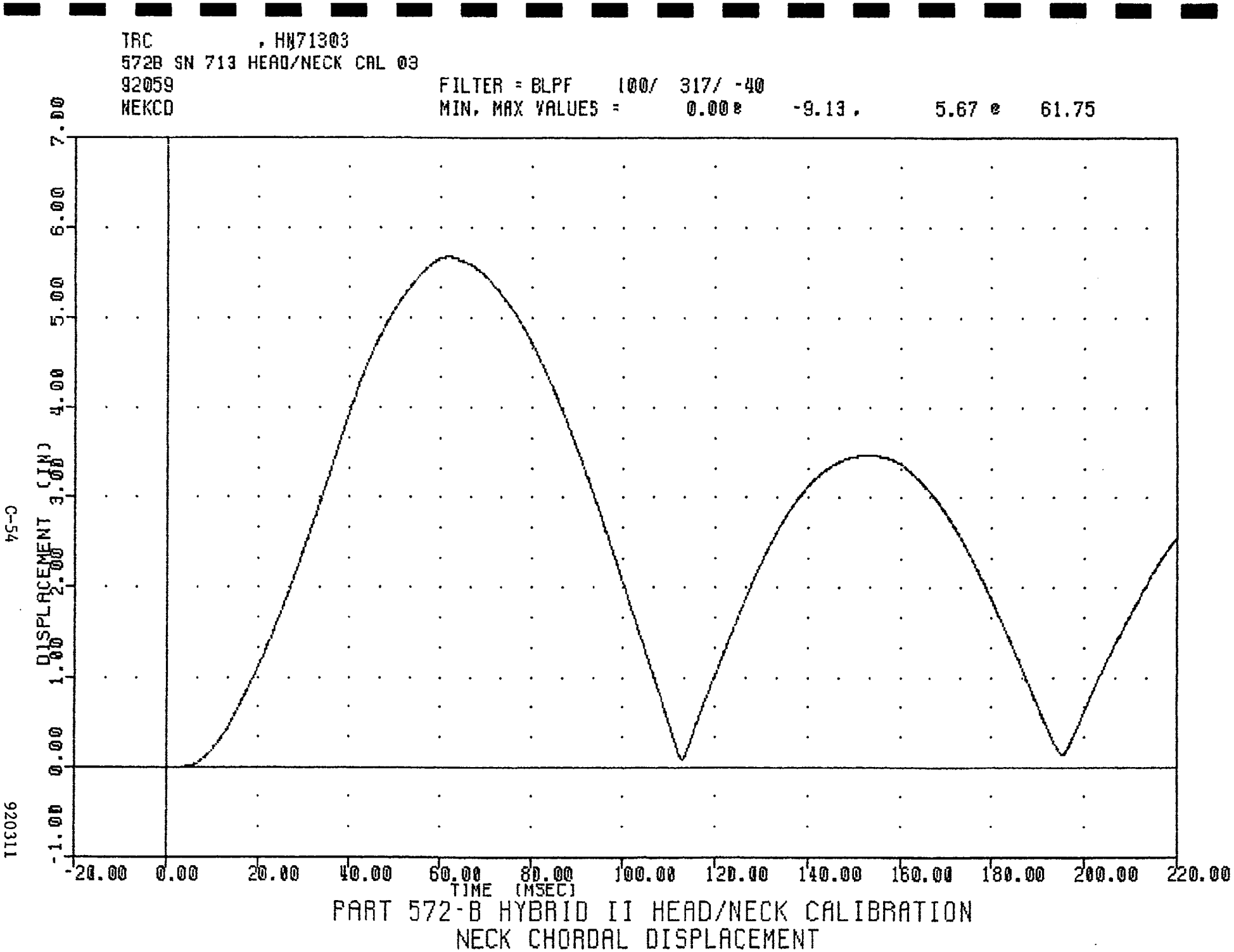
ROTATION ABOUT THE HEAD C.G.



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

920311


TRC , HN71303
572B SN 713 HEAD/NECK CAL 03
92059
NEKZD
FILTER = BLPF 100/ 317/ -40
MIN, MAX VALUES = -0.61 @ 150.25 , 0.85 @ 62.25
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)
C-53
920311
PART 572-B HYBRID II HEAD/NECK CALIBRATION
NECK DISPLACEMENT MAX



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

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572 01-Mar-92

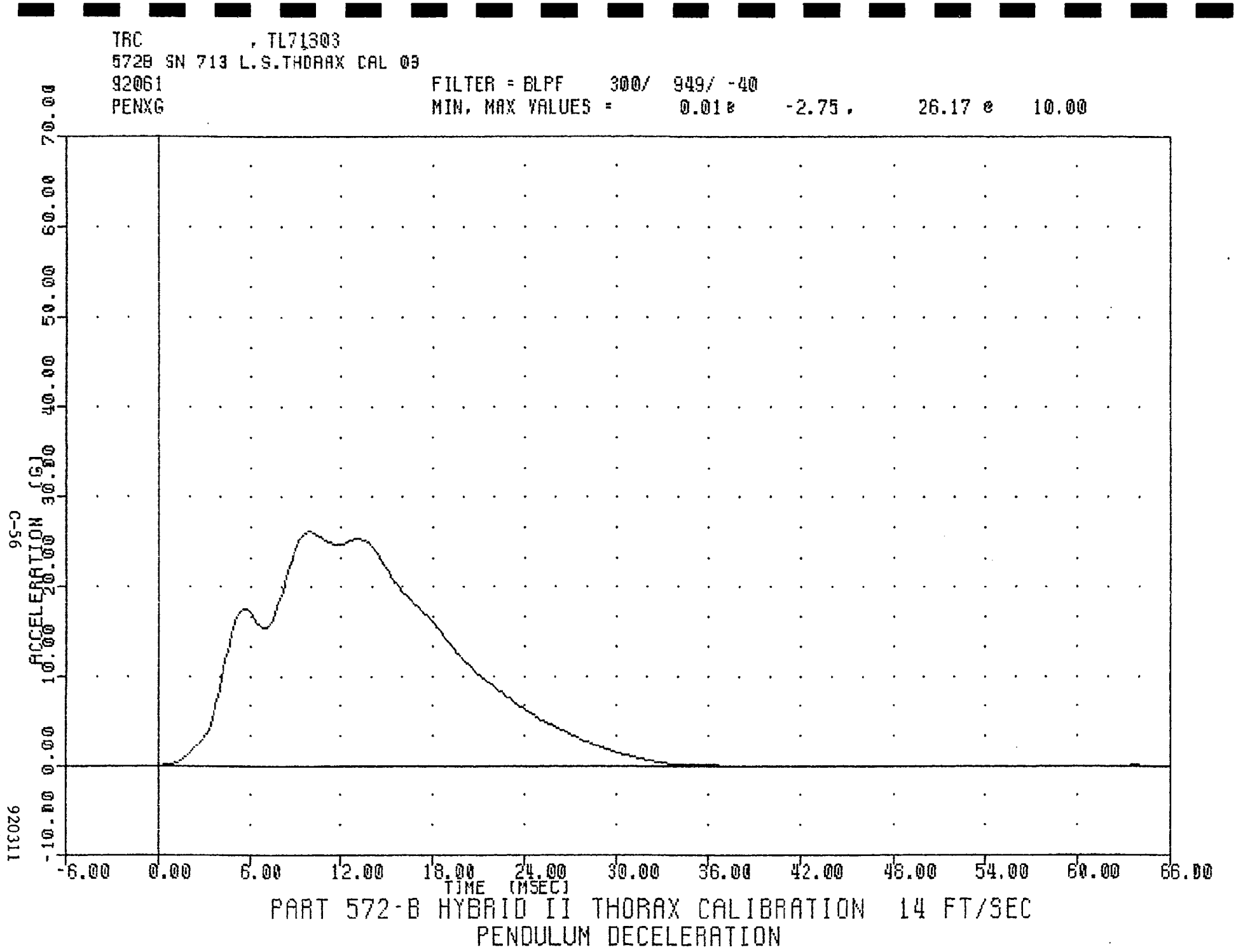
TEMPERATURE 69 F RELATIVE HUMIDITY 50 %
TRC TL71303 572B SN 713 L.S.THORAX CAL 03

TEST PARAMETER	LOW SPEED TEST SPECIFICATION	TEST RESULTS
PENDULUM VELOCITY	13.86-14.14 FT/SEC	13.97 FT/SEC
PEAK DEFLECTION	1.1 IN max.	0.95 IN
PEAK RESISTIVE FORCE	1,450. LB max.	1348. LB
INTERNAL HYSTERESIS	50% - 70%	64.6%

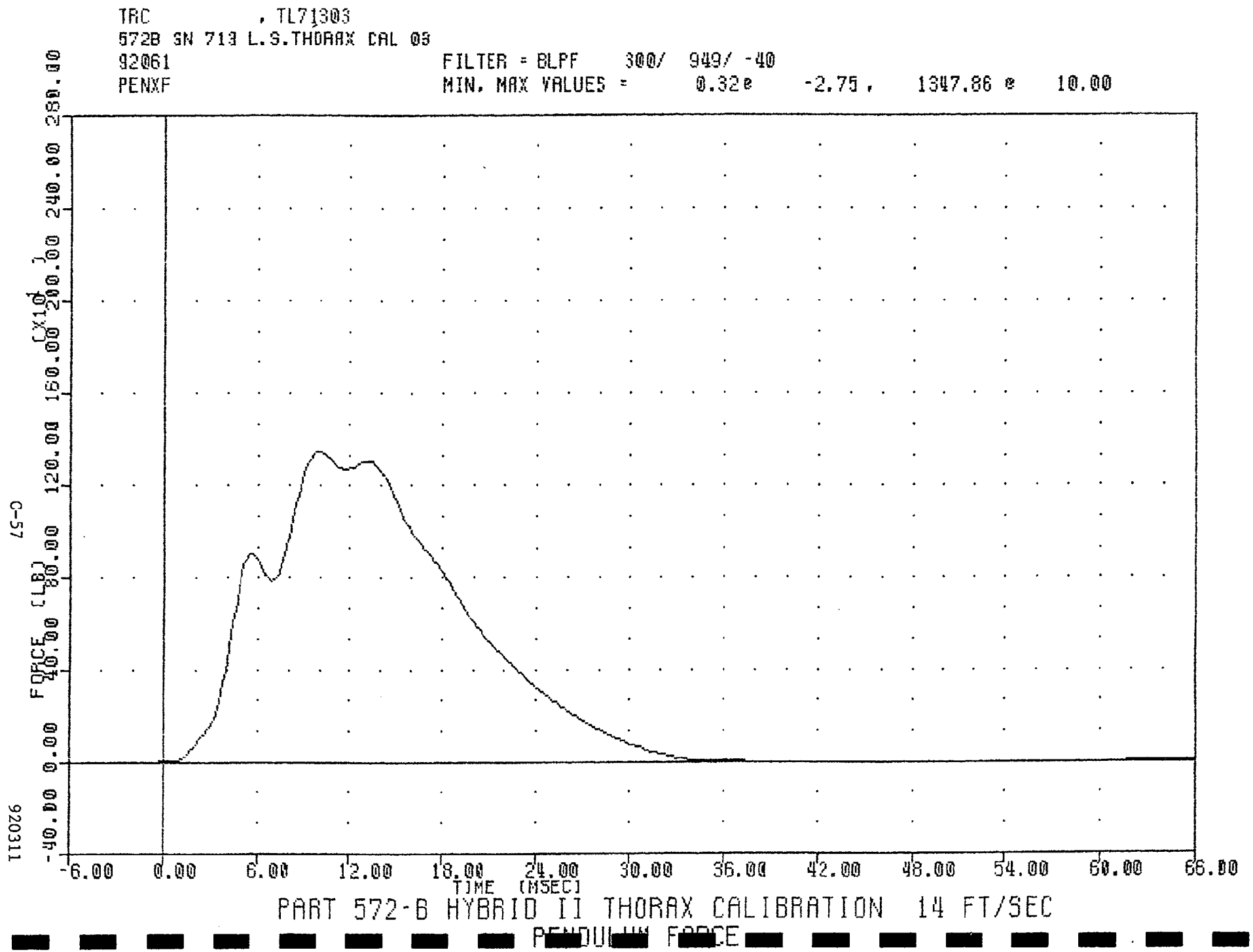
SCD: 2.25 IN

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

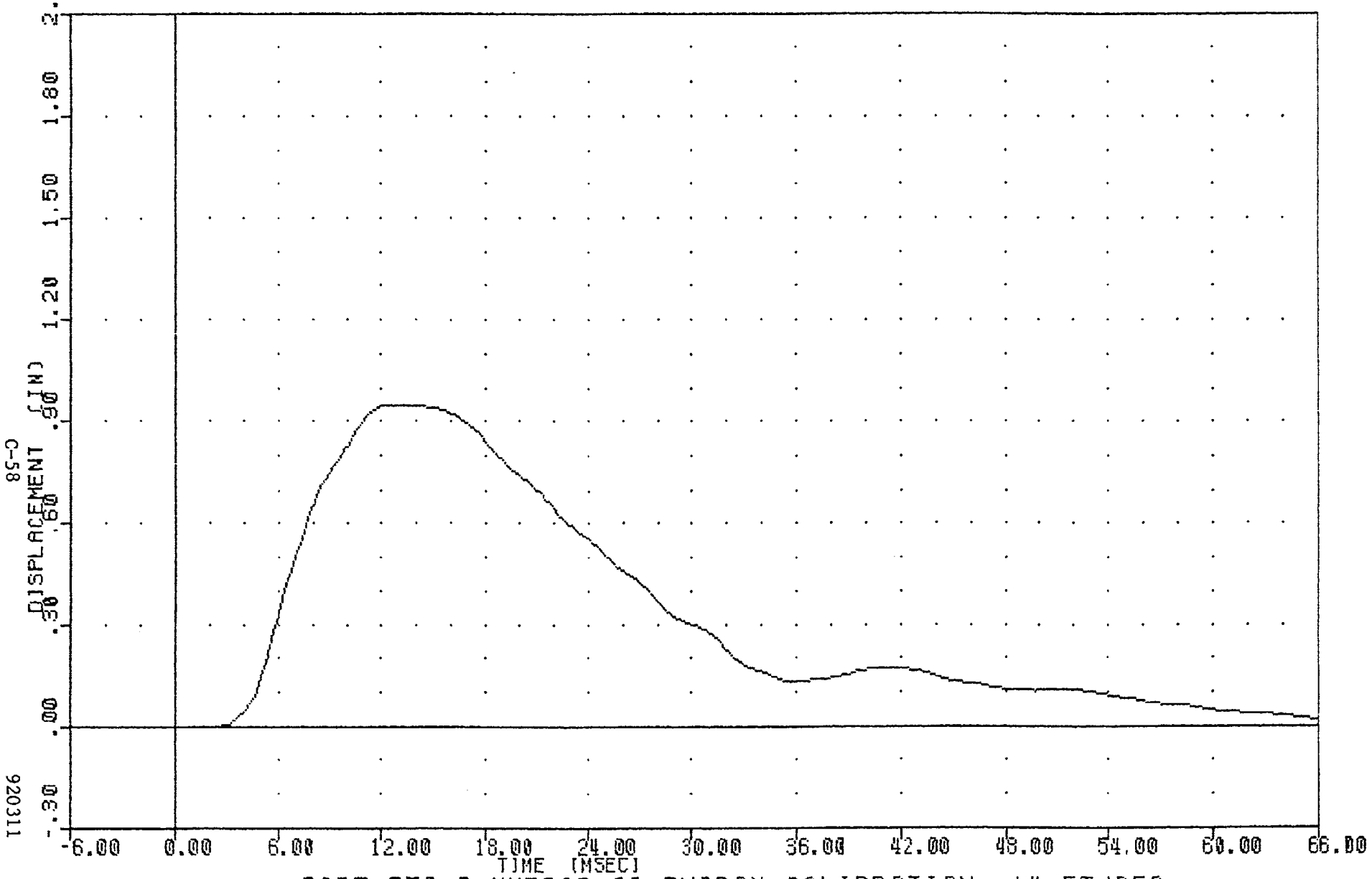


PART 572-B HYBRID II THORAX CALIBRATION 14 FT/SEC
PENDULUM DECELERATION


TRC , TL71303
572B SN 713 L.S.THORAX CAL 03
92061
PENXF
FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 0.32@ -2.75 , 1347.86 @ 10.00
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)
PART 572-B HYBRID II THORAX CALIBRATION 14 FT/SEC
PENDULUM FORCE

920311

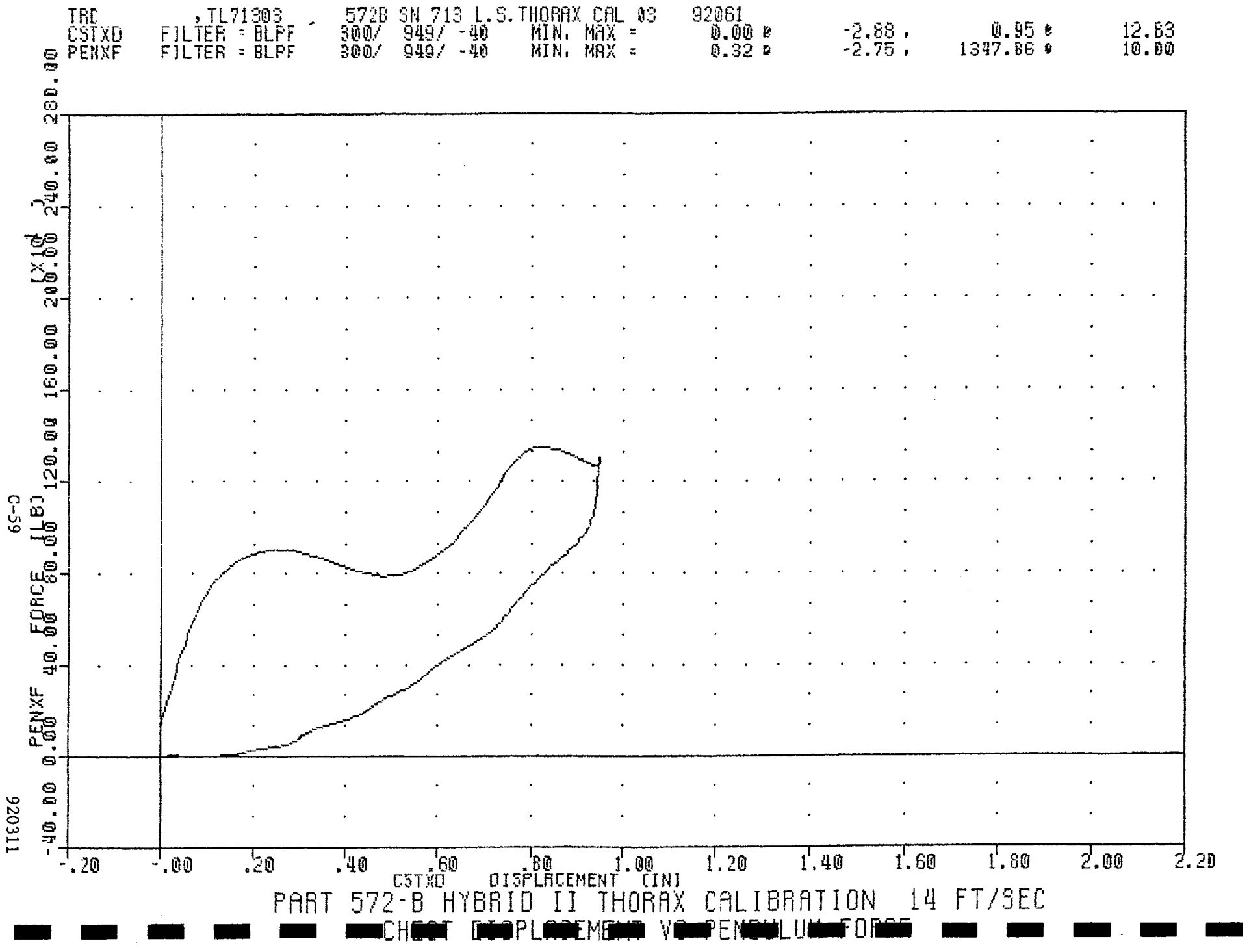
TRC , TL71303
572B SN 713 L.S.THORAX CAL 09
92061 FILTER = BLPF 300/ 949/ -40
CSTXD MIN, MAX VALUES = 0.00 @ -2.88 , 0.95 @ 12.63



C-58

920311

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


TRC ,TL71303 572B SN 713 L.S.THORAX CAL 03 92061
CSTXD FILTER = BLPF 300/ 949/ -40 MIN, MAX = 0.00 -2.88 0.95 12.63
PENXF FILTER = BLPF 300/ 949/ -40 MIN, MAX = 0.32 -2.75 1347.86 10.00
280.00
240.00
200.00
160.00
120.00
80.00
40.00
0.00
-40.00
PENXF FORCE (LB) (X10)
-.20
-.00
.20
.40
.60
.80
1.00
1.20
1.40
1.60
1.80
2.00
2.20
CSTXD DISPLACEMENT (IN)
C-59
920311
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 01-Mar-92

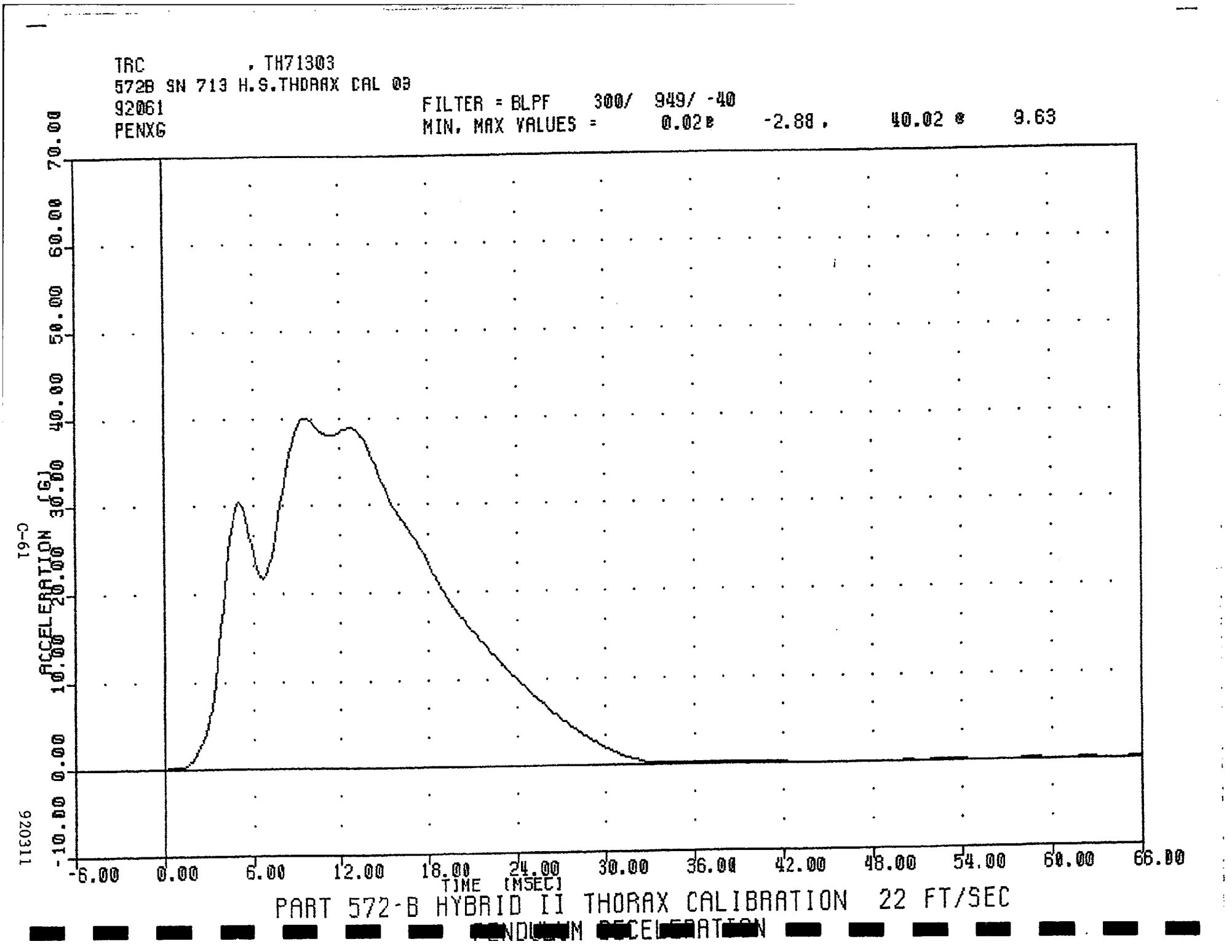
TEMPERATURE 69 F RELATIVE HUMIDITY 50 %
TRC TH71303 572B SN 713 H.S.THORAX CAL 03

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.	1.48 IN
PEAK RESISTIVE FORCE	2,250. LB max.	2061. LB
INTERNAL HYSTERESIS	50% - 70%	65.6%

SCD: 2.25 IN

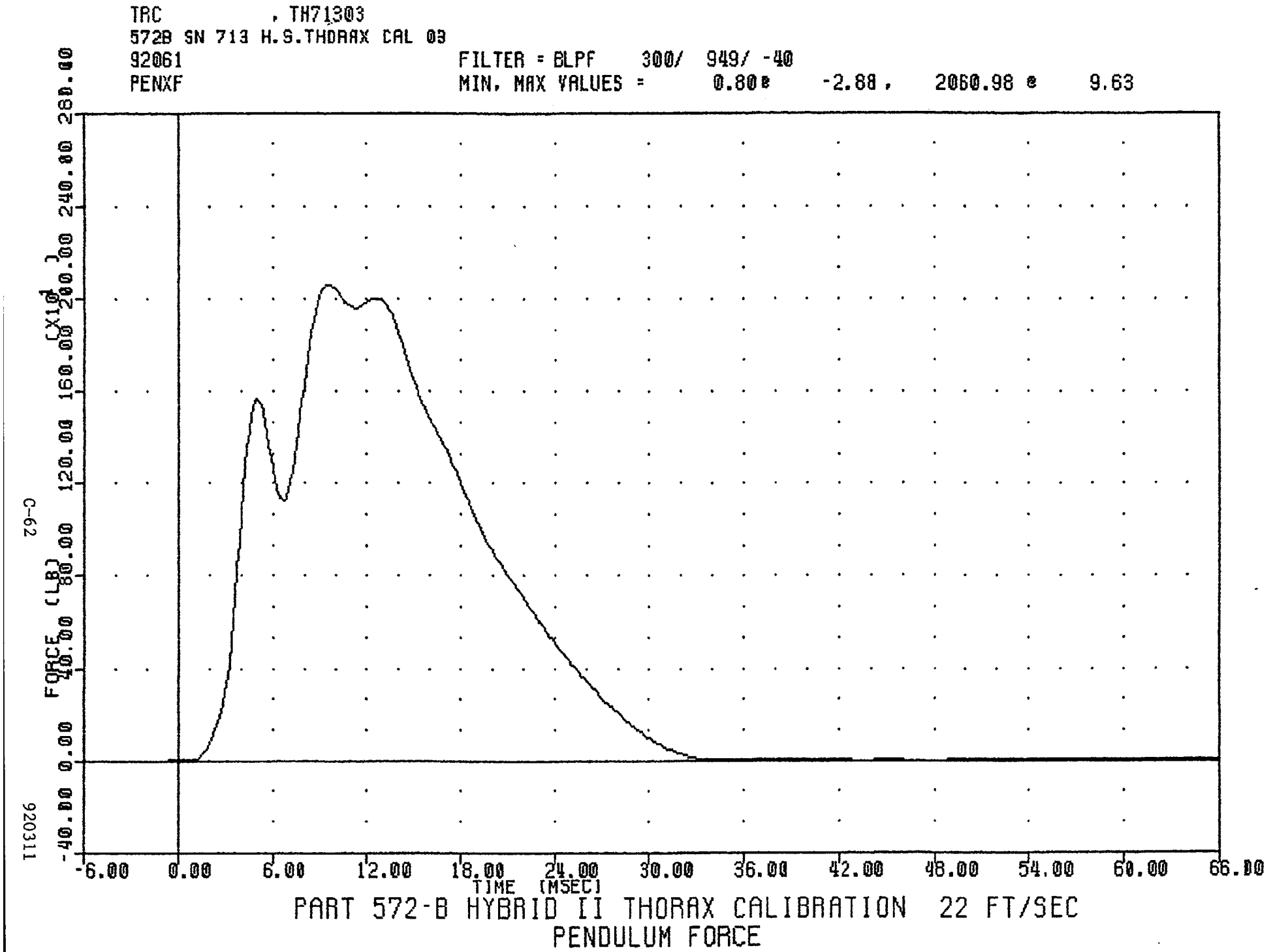
DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas Middlet



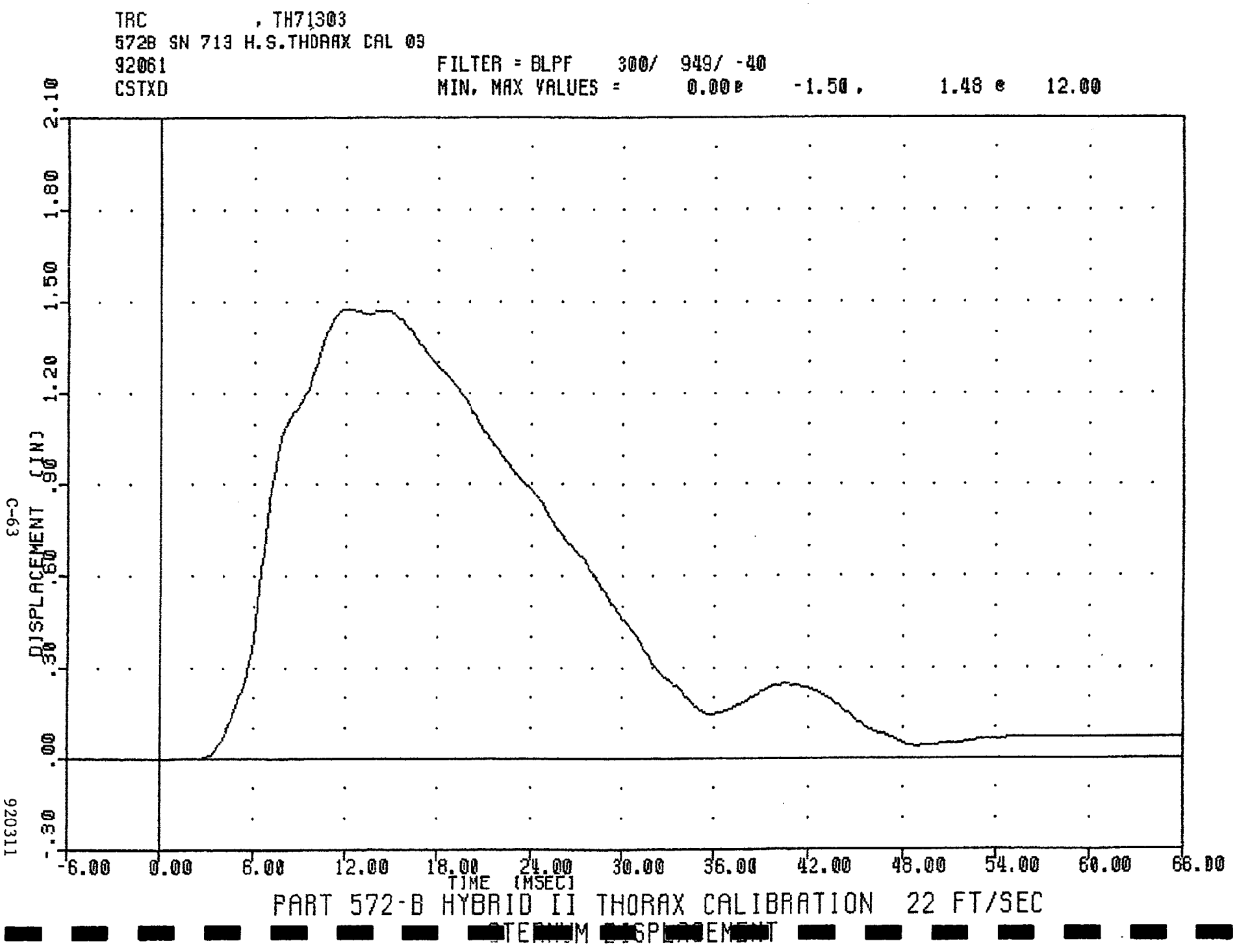
PART 572-B HYBRID II THORAX CALIBRATION 22 FT/SEC

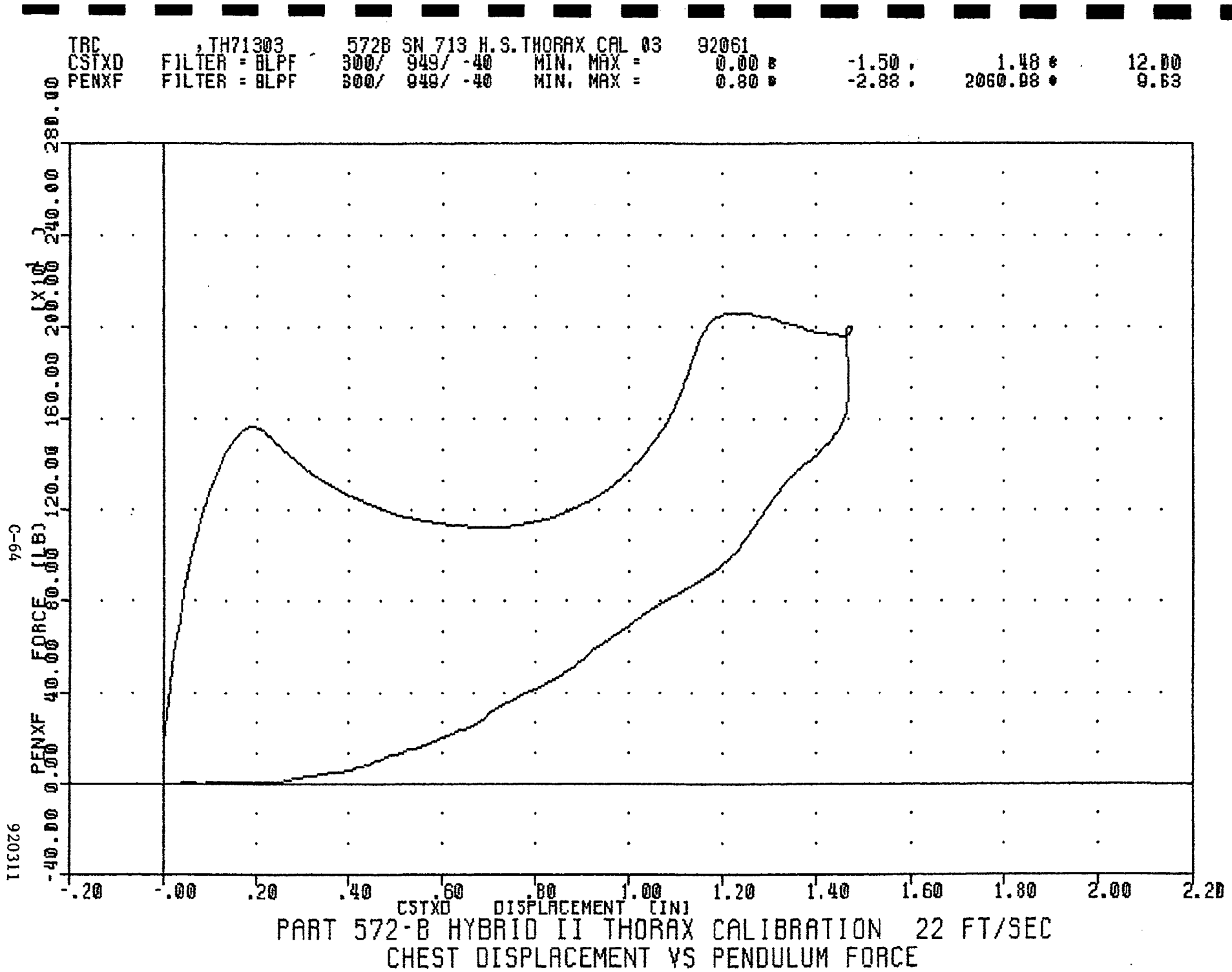
PENDULUM DECELERATION



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

920311


TRC , TH71303
572B SN 713 H.S.THORAX CAL 09
92061
CSTXD
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 0.00 @ -1.50 , 1.48 @ 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
C-63
920311



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

TRANSPORTATION RESEARCH CENTER OF OHIO

ABDOMEN COMPRESSION TEST

PART 572 27-Feb-92

TEMPERATURE 69 F RELATIVE HUMIDITY 49 %
TRC AB71303 572B SN 713 ABDOM COMPR CAL 03

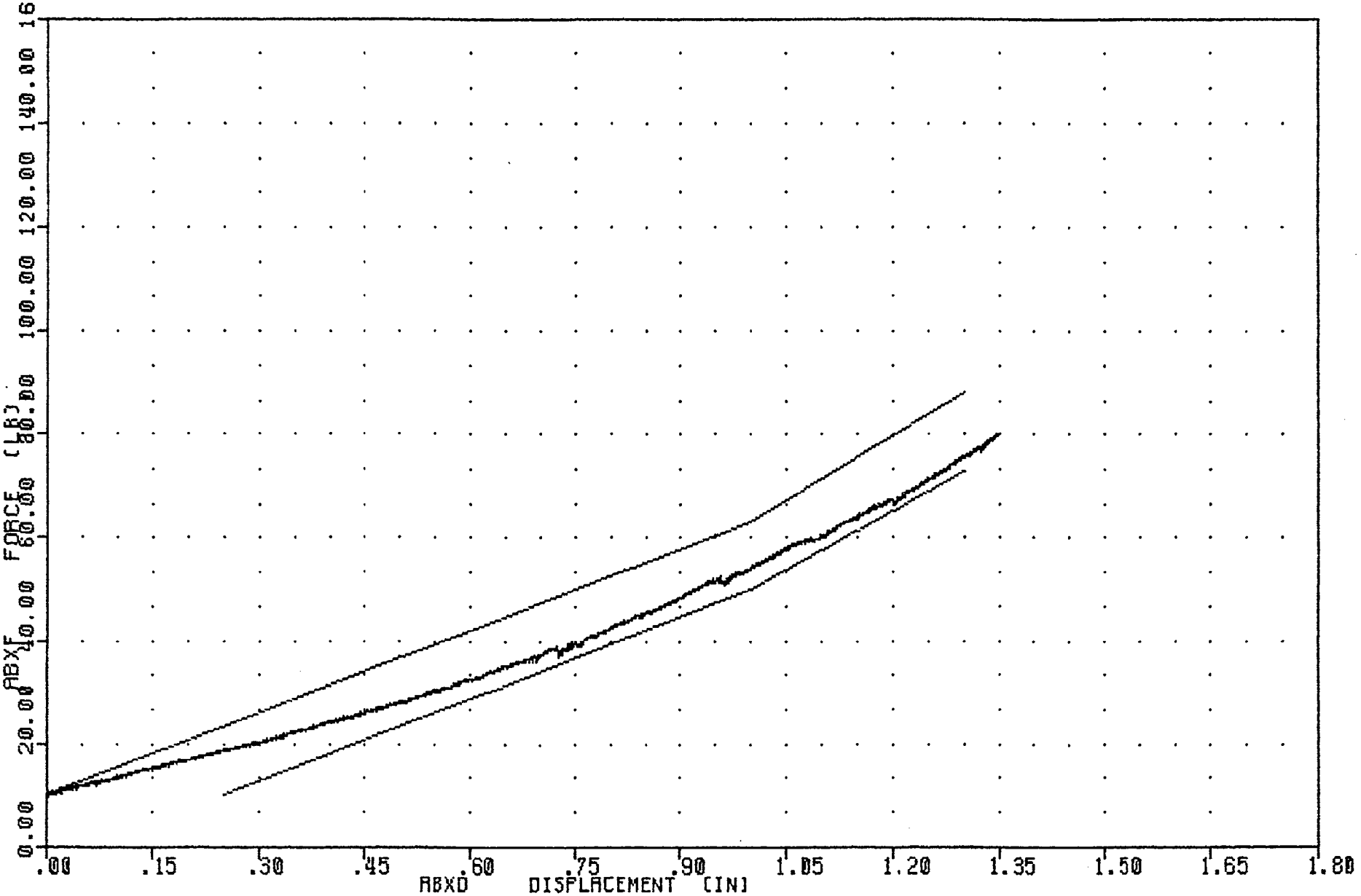
TEST CORRIDORS		
DISPLACEMENT	FORCE	TEST RESULTS
0.00 IN	10.00 LBS	10.00 LBS
0.50 IN	23.00 - 36.00 LBS	28.19 LBS
0.75 IN	36.00 - 50.00 LBS	39.28 LBS
1.00 IN	50.00 - 63.00 LBS	54.27 LBS
1.30 IN	73.00 - 88.00 LBS	75.46 LBS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas Middlet

TRC ,AB71303, 572B SN 713 ABDOM COMPR CAL 03 92058

ABXD	FILTER = ALPF	1650/ 5214/ -40	MIN, MAX =	0.00 @	0.00 ,	1.35 @	80.22
ABXF	FILTER = ALPF	1650/ 5214/ -40	MIN, MAX =	9.76 @	0.00 ,	80.26 @	1.35



PART 572-B HYBRID II ABDOMEN CALIBRATION
ABDOMEN FORCE VS DISPLACEMENT

TRANSPORTATION RESEARCH CENTER OF OHIO

LUMBAR FLEXION TEST

PART 572 27-FEB-92

TEMPERATURE 69 F RELATIVE HUMIDITY 49 %
TRC LF71303 572B SN713 LUMBAR FLEX CAL03

DEFLECTION	SPECIFICATION	TEST RESULTS
0 DEG	0 LB	0.00 LB
20 DEG	22.00 - 34.00 LB	25.00 LB
30 DEG	34.00 - 46.00 LB	36.00 LB
40 DEG	46.00 - 58.00 LB	47.00 LB
NET RETURN ANGLE	< 12 DEG	9.00 DEG

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

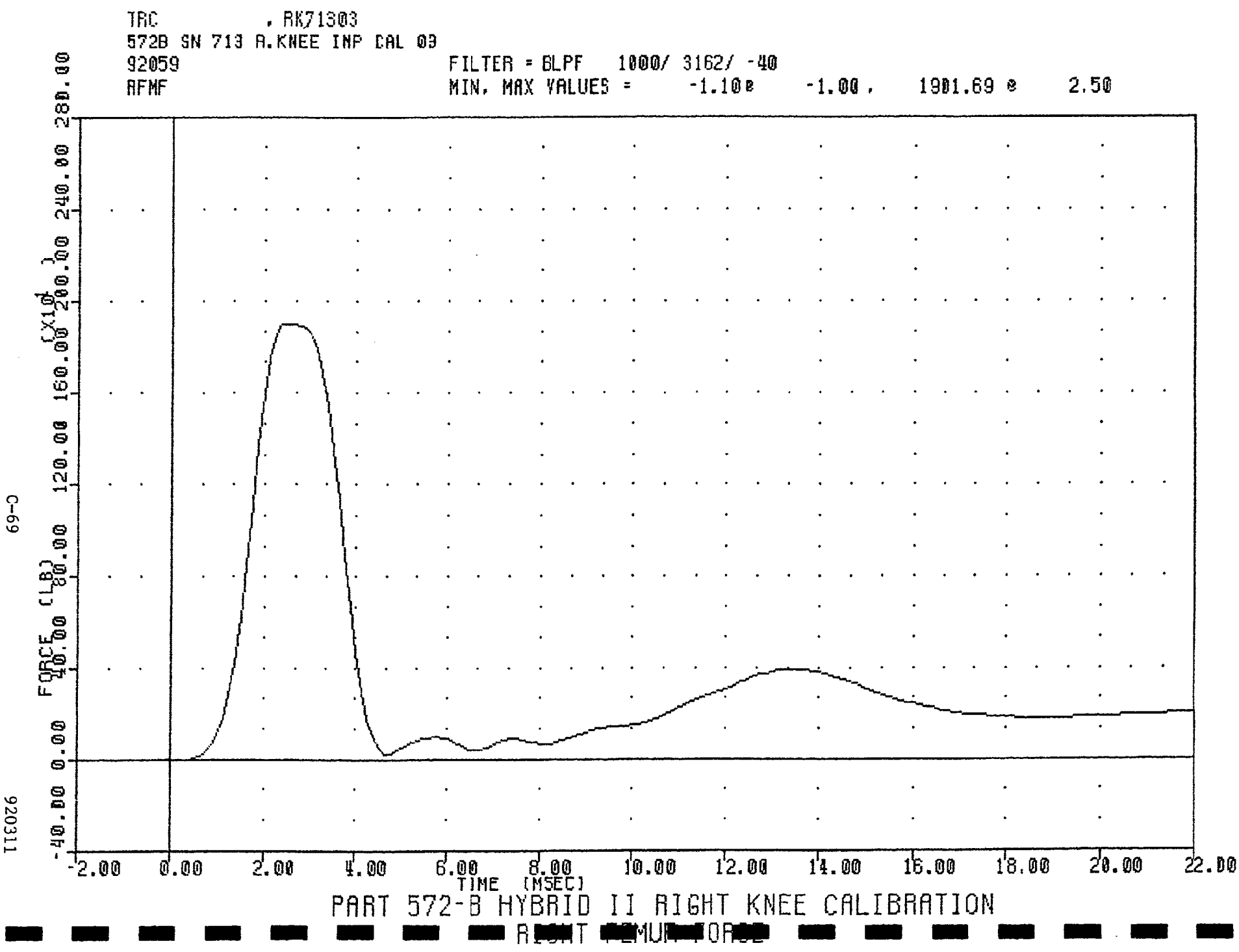
PART 572 28-Feb-92

TEMPERATURE 69 F RELATIVE HUMIDITY 49 %
RIGHT KNEE
TRC RK71303 572B SN 713 R.KNEE IMP CAL 03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	6.99 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LB	1901.69 LB
DURATION ABOVE 1000 LB	>=1.7 MSEC	2.00 MSEC

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet


TRC , RK71303
572B SN 713 R.KNEE INP CAL 03
92059
RFMF
FILTER = BLPF 1000/ 3162/ -40
MIN, MAX VALUES = -1.10 @ -1.00 , 1901.69 @ 2.50
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 RIGHT KNEE CALIBRATION
RIGHT FEMUR FORCE

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

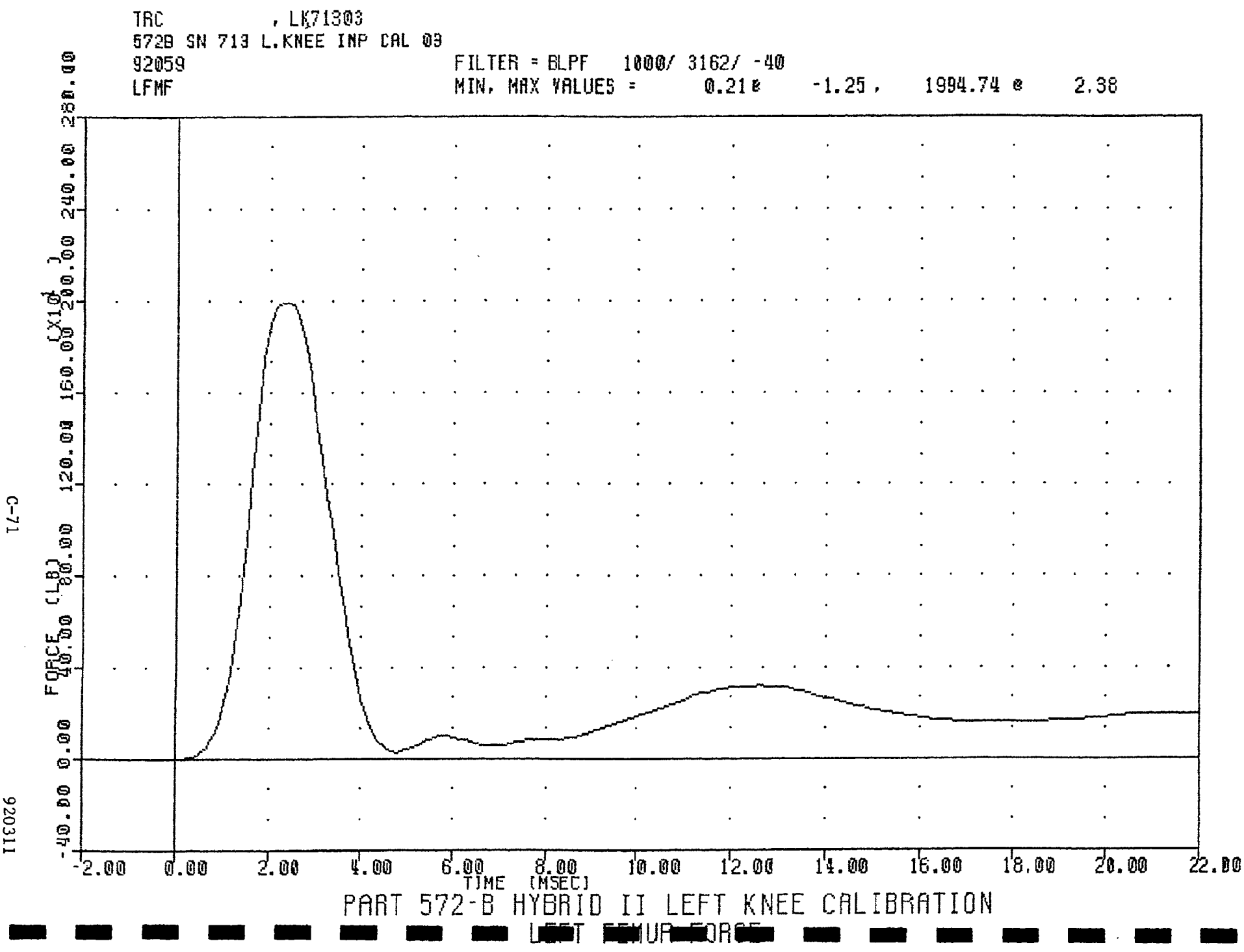
PART 572 28-Feb-92

TEMPERATURE 69 F RELATIVE HUMIDITY 49 %
LEFT KNEE
TRC LK71303 572B SN 713 L.KNEE IMP CAL 03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	7.00 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LB	1994.74 LB
DURATION ABOVE 1000 LB	>=1.7 MSEC	1.85 MSEC

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet


TRC , LK71303
572B SN 713 L.KNEE INP CAL 03
92059
LFMF
FILTER = BLPF 1000/ 3162/ -40
MIN, MAX VALUES = 0.21 @ -1.25 , 1994.74 @ 2.38
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
LEFT 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.	CL95H	7264	ENDEVCO	01/08/92	07/08/92
Y-AXIS ACCEL.	DW12JC	7264	ENDEVCO	01/08/92	07/08/92
Z-AXIS ACCEL.	CC11H	7264	ENDEVCO	01/08/92	07/08/92
CHEST X-AXIS ACCEL.	DB74H	7264	ENDEVCO	01/08/92	07/08/92
Y-AXIS ACCEL.	CY31H	7264	ENDEVCO	01/08/92	07/08/92
Z-AXIS ACCEL.	CH67H	7264	ENDEVCO	01/08/92	07/08/92
LEFT FEMUR FORCE LOAD CELL	880	2430	GSE	01/09/92	07/09/92
RIGHT FEMUR FORCE LOAD CELL	898	2430	GSE	01/09/92	07/09/92
*NECK X-AXIS FORCE LOAD CELL	NA				
Y-AXIS FORCE LOAD CELL	NA				
X-AXIS FORCE LOAD CELL	NA				
*NECK MOMENT ABOUT X-AXIS LOAD CELL	NA				
MOMENT ABOUT Y-AXIS LOAD CELL	NA				
MOMENT ABOUT Z-AXIS LOAD CELL	NA				
*CHEST DEFLECTION POTENTIOMETER	NA				
LAP BELT FORCE LOAD CELL	571	3419	LEBOW	09/12/91	03/12/92
SHOULDER BELT FORCE LOAD CELL	616	3419	LEBOW	09/12/91	03/12/92
SHOULDER BELT SPOOL-OUT POTENTIOMETER	A12899	PT-101-40A	CELESCO	11/27/91	05/27/92
SHOULDER BELT STRETCH POTENTIOMETER	2087	2051414101	BOURNES	11/27/91	05/27/92

*HYBRID III USE ONLY.

DUMMY INSTRUMENT CALIBRATIONS

PASSENGER DUMMY #713

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE LAST	DUE
HEAD X-AXIS ACCEL.	CW96H	7264	ENDEVCO	01/08/92	07/08/92
Y-AXIS ACCEL.	DN99JC	7264	ENDEVCO	01/08/92	07/08/92
Z-AXIS ACCEL.	CR78H	7264	ENDEVCO	01/08/92	07/08/92
CHEST X-AXIS ACCEL.	CC71H	7264	ENDEVCO	01/08/92	07/08/92
Y-AXIS ACCEL.	CY32H	7264	ENDEVCO	01/08/92	07/08/92
Z-AXIS ACCEL.	CG13H	7264	ENDEVCO	01/08/92	07/08/92
LEFT FEMUR FORCE LOAD CELL	901	2430	GSE	01/09/92	07/09/92
RIGHT FEMUR FORCE LOAD CELL	902	2430	GSE	01/09/92	07/09/92
*NECK X-AXIS FORCE LOAD CELL	NA				
Y-AXIS FORCE LOAD CELL	NA				
Z-AXIS FORCE LOAD CELL	NA				
*NECK MOMENT ABOUT X-AXIS LOAD CELL	NA				
MOMENT ABOUT Y-AXIS LOAD CELL	NA				
MOMENT ABOUT Z-AXIS LOAD CELL	NA				
*CHEST DEFLECTION POTENTIOMETER	NA				
LAP BELT FORCE LOAD CELL	236	3419	LEBOW	10/19/91	04/19/92
SHOULDER BELT FORCE LOAD CELL	615	3419	LEBOW	09/12/91	03/12/92
SHOULDER BELT SPOOL-OUT POTENTIOMETER	0586135	PT-101-40A	CELESCO	11/27/91	05/27/92
SHOULDER BELT STRETCH POTENTIOMETER	NA	2051414101	BOURNES	11/27/91	05/27/92

*HYBRID III USE ONLY.

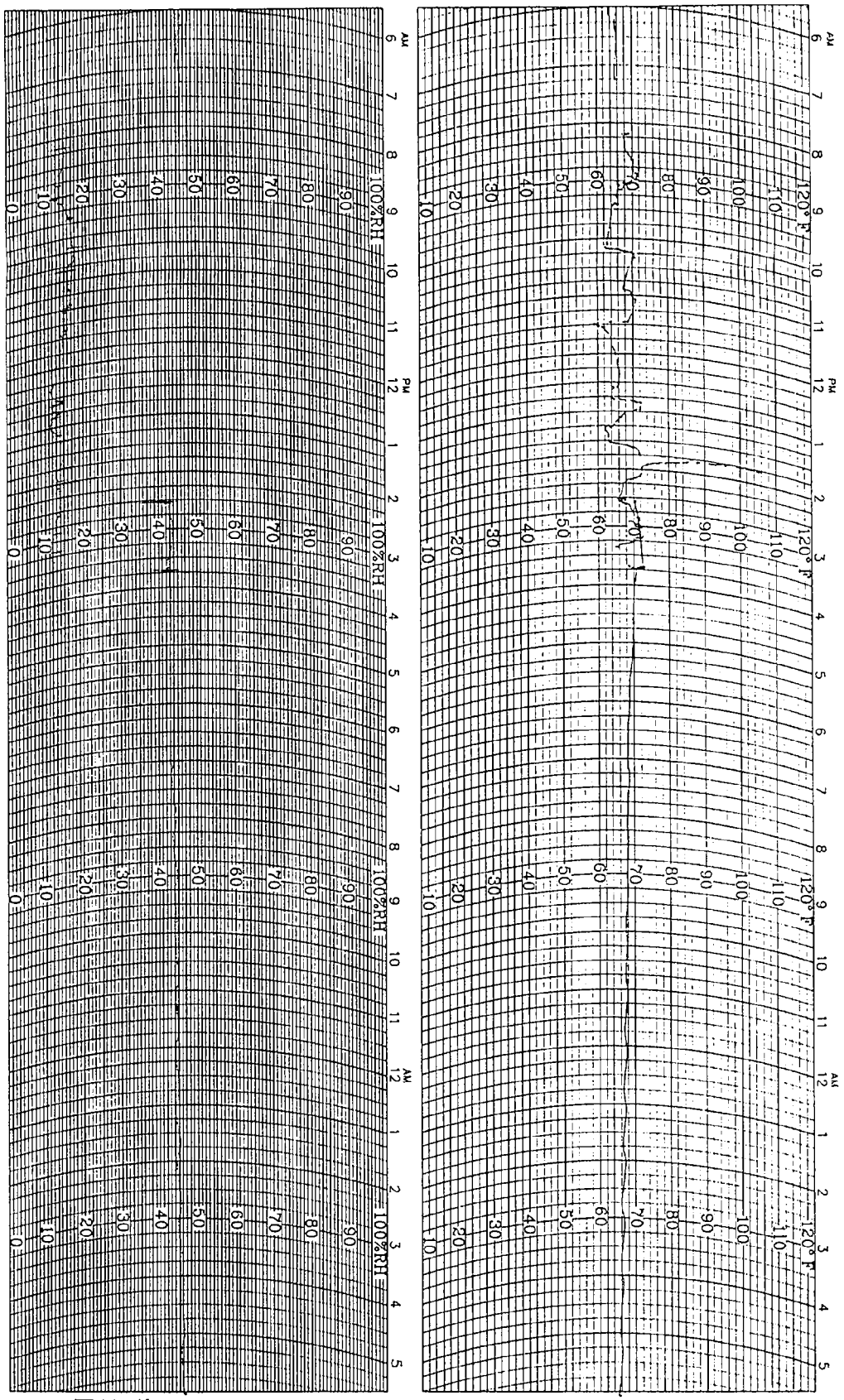
VEHICLE AND CALIBRATION LABORATORY INSTRUMENT CALIBRATIONS

VEHICLE ACCELEROMETERS

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE LAST	DUE
LEFT SEAT REAR CROSSMEMBER X-AXIS	CK87H	7264	ENDEVCO	01/15/92	07/15/92
RIGHT REAR SEAT CROSSMEMBER X-AXIS	CT68H	7264	ENDEVCO	09/18/91	03/18/92
ENGINE TOP X-AXIS	CL83H	7264	ENDEVCO	01/15/92	07/15/92
ENGINE BOTTOM X-AXIS	CC02H	7264	ENDEVCO	01/15/92	07/15/92
RIGHT BRAKE CALIPER X-AXIS	CJ21H	7264	ENDEVCO	12/02/91	06/02/92
LEFT BRAKE CALIPER X-AXIS	CH24H	7264	ENDEVCO	12/02/91	06/02/92
INSTRUMENT PANEL CENTER X-AXIS	CR83H	7264	ENDEVCO	12/18/91	06/18/92
REAR SEAT CROSSMEMBER CENTER Z-AXIS	CJ37H	7264	ENDEVCO	09/15/91	03/15/92
VEHICLE REAR CENTER Z-AXIS	CK16H	7264	ENDEVCO	01/12/92	07/12/92

CALIBRATION LABORATORY INSTRUMENTS

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE LAST	DUE
NECK BENDING PENDULUM ACCEL.	CC59	7232	ENDEVCO	10/08/91	04/08/92
NECK BENDING ROTARY POTENTIOMETER	NA	35435-1-102	BOURNES	MFR. SPECIFICATION	
NECK BENDING LINEAR POTENTIOMETER	NA	5184-2051846003	BOURNES	10/08/91	04/08/92
THORAX/HYBRID II FEMUR PEND. ACCEL.	CC64	7232	ENDEVCO	10/08/91	04/08/92
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	10/08/91	04/08/92
ABDOMEN COMPRESSION FORCE GAUGE	1261	3167	LEBOW	10/08/91	04/08/92
HYBRID III FEMUR PEND. ACCEL.	CG83	7232	ENDEVCO	10/08/91	04/08/92



WeatherMeasure
WEATHERtronics
Division of QUALIMETRICS, Inc.
P.O. BOX 41039
SACRAMENTO, CA 95841
PHONE: (916) 923-0055

HYGROTHERMOGRAPH
1 DAY

CHART NO. M699123
CJ11-D-HF
ECN 2717
6-9-87

STATION_____DATE ON_____DATE OFF_____

SIGN CONVENTION

NHTSA DATA TAPE REFERENCE GUIDE

ACCELEROMETERS:

+X: FORWARD

+Y: LEFTWARD

+Z: UPWARD

POTENTIOMETERS:

+CHEST LONGITUDINAL DEFLECTION:	OUTWARD
+CHEST LATERAL DEFLECTION:	LEFTWARD
+SEAT BELT DISPLACEMENT:	OUTWARD
+SEAT BELT EXTENSION:	ENLONGATION
+KNEE SLIDER DISPLACEMENT:	DISTANCE BETWEEN FEMUR AND TIBIA INCREASED (IN RELATION TO A SEATED DUMMY)

LOAD CELLS:

+FEMUR FORCE: TENSION

+SEAT BELT FORCE: TENSION

+BARRIER FORCE: TENSION

NECK LOAD CELLS:

+X FORCE: HEAD PUSHED FORWARD

+Y FORCE: HEAD PUSHED LEFTWARD

+Z FORCE: HEAD PULLED UPWARD (TENSION ON NECK)

+X MOMENT: RIGHT EAR ROTATING TOWARD RIGHT SHOULDER

+Y MOMENT: CHIN ROTATING TOWARD CHEST

+Z MOMENT: CHIN ROTATING TOWARD LEFT SHOULDER

TIBIA LOAD CELLS:

+X FORCE: TENSION

+Y FORCE: TENSION

+Z FORCE: TENSION

+X MOMENT: BOTTOM OF TIBIA MOVING LEFTWARD

+Y MOMENT: BOTTOM OF TIBIA MOVING REARWARD

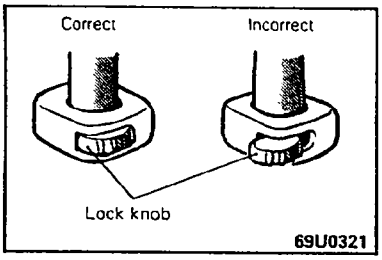
FREQUENCY RESPONSE CLASSES

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

APPENDIX E

RESTRAINT SYSTEM INSTRUCTIONS FROM OWNER'S MANUAL



Confirm that the lock knob is correct as shown in the illustration, and also pull up on the head restraints to confirm that they do not come out of the seatback.

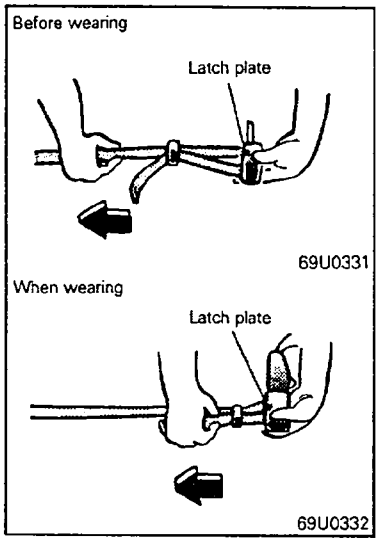
WARNING
Driving with the read restraints removed is dangerous, always have them mounted when operating the truck. Failure to having them properly mounted may increase the chance of injury in the event of a collision.

Seat belts ND06A-Cb

Seat belts are installed in your truck 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.



Front Seat Unibelt Restraint System ND06B-A

Both front seats are equipped with a UNIBELT system which uses a single belt and an emergency locking retractor.
This system is designed to provide maximum comfort and safety by permitting full extension and automatic retraction of the belts during normal vehicle operation.
A sensing device inside the belt retractor is designed to lock the retractor in the event of an abrupt change in vehicle motion.

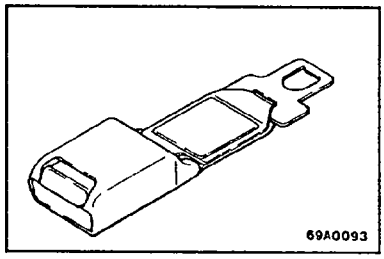
Front Seat Center Belt (Bench Seat) ND06C-La

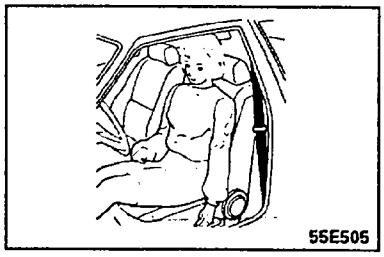
The center belt should be adjusted by holding the belt and latch plate at right angles to each other, and then pulling the belt as illustrated above to a snug fit around the occupant.

NEVER USE THE SAME CENTER BELT ON MORE THAN ONE PERSON AT A TIME.

NOTE
The center lap belt's buckle is indicated by the word "CENTER" on its plate. Be absolutely sure to check to be sure that the correct buckle is used for the center belt.

WARNING
The outboard restraint system buckle and center restraint system tongue are not compatible and will not engage with one another.





Seat Belt Extender ND06J-Aa

If the seat belt is too short, even when fully extended, a seat belt extender is available from your dealer. The extender may be used for either front seating position.
This extender should only be used if the existing belt is not long enough. When not required, it must be removed and stowed because the use of the extender when not required may deactivate the seat belt locking mechanism.

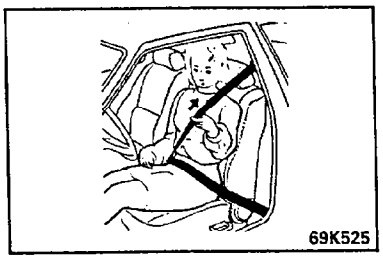
WARNING
Persons who can use the standard seat belt should not use an extender. Such unnecessary use could result in serious personal injury in the event of an accident.

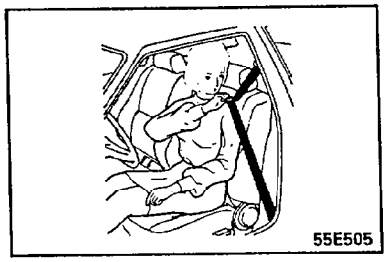
Unibelt Instructions ND06D-Ca

1. Get in the truck and adjust the seat.

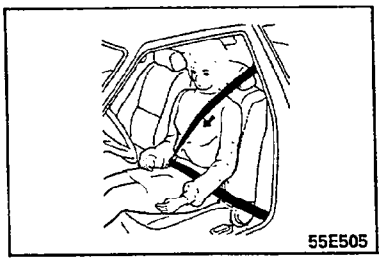
WARNING
To minimize risk of personal injury in the event of a collision or sudden stop both the driver and passenger seatbacks should always be in a nearly upright position while the vehicle is in motion.

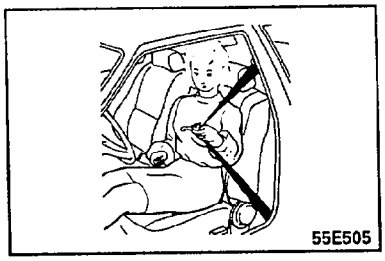
The protection provided by the seat belts may be reduced significantly when the seatback is reclined. There is greater risk that the passenger will slide under the belt resulting in serious injury when the seatback is reclined.



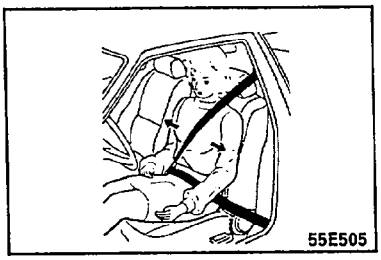


2. Grasp the movable latch plate and slide it up the webbing as far as necessary so that it will be easy to pull across your body.
   After a couple of tries this will become an automatic one-handed operation.





3. Pull the webbing, and move the movalbe 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. The lap belt will not tighten during use; therefore you can set it right now to 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 away.
Locking the doors, and using the seat belts provided, will minimize the risk of injury or ejection in an accident.

Child Restraint

ND06FPW

When transporting children in your truck, 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
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.

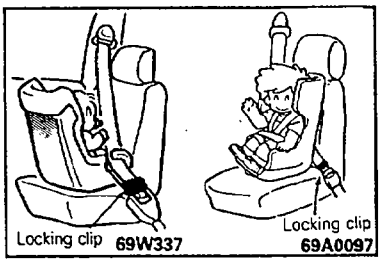
Infants and Small Children
For infants unable to sit up alone and small enough for infants seats, an infant carrier should be used. For small children, a child seat should be used. Both types of seats are available from your authorized dealer.
The child restraint system should be appropriate for your child's weight and height and properly fit the truck 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 truck in order to prevent injury to your child.

Installing a child Restraint System to the Center Seat

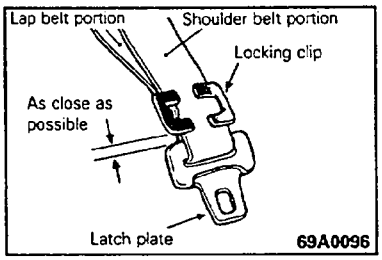
INSTALLATION
1. Fasten the center lap belt to secure the child restraint system.

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.



Installing a Child Restraint System with 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.

CAUTION
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 compartment to help prevent its loss.

WARNING
To help avoid personal lujury during a collision or sudden maneuver, always thread both the lap and shoulder belt through the locking clip when sccuring a child restraint with 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.

Children who have outgrown child restraint
Children who have outgrown child restraint system wear the combination UNIBELT.
If the shoulder belt crosses the face or neck, a child restraint system should be used accoring to the size of the child.

WARNING
A child should never be left unattended in your truck.

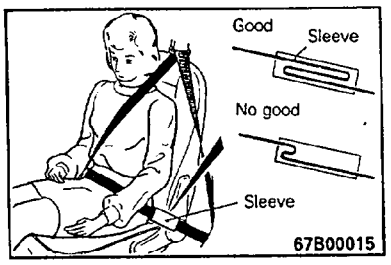
Pregnant Woman Restraint ND06G-B

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.

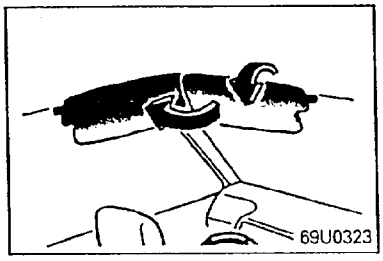
Maintenance and Inspection of Seat Belts ND06H-Bb

The webbing used in belts may be cleaned with a hydrocarbon dry cleaner or 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 and automatic locking retractors for positive engagement.
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.

WARNING
All seat belt assemblies including retractors and attaching hardware should be inspected by an authorized dealer after any collisions. We recommend that all 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. Seat belt systems not in use during a either damage or improper operation is noted.

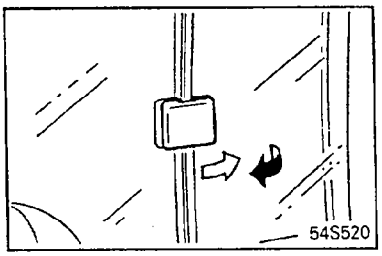


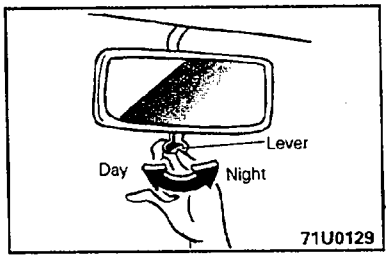
CAUTION
The seat belt has on it a sleeve inside which the seat belt webbing is folded back over itself in a loop so as to absorb the energy of a shock by pulling loose and releasing slack . In the event that the loop inside the sleeve has come loose, replace the seat belt.



Rearview Mirrors ND07A-C

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 (if so equipped)

Adjust the inside mirror to center on the view through the rear window.
Make this adjustment while the day/night lever is in the daytime position.
To reduce glare from the headlights, simply switch the lever to the night position.