V2911

NEW CAR ASSESSMENT PROGRAM (NCAP)

FRONTAL BARRIER IMPACT TEST

1998 AUDI A8 4 DOOR

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105

Test Date: August 12, 1998

Report Date: August 18, 1998

FINAL REPORT

Prepared For:

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
SAFETY PERFORMANCE STANDARDS
OFFICE OF CRASHWORTHINESS STANDARDS
MAIL CODE NPS-10
400 SEVENTH STREET, SW, ROOM 5313
WASHINGTON, D.C. 20590

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. MGA-98-N01	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle NHTSA New Car Assessment Program (NCAP) Testing of a 1998 Audi A8		5. Report Date August 18, 1998 6. Performing Organization Code MGA
7. Author(s) Enoch Narh		8. Performing Organization Report No. MGA-DOT-01
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105		10. Work Unit No. 11. Contract or Grant No. Optional NCAP
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (Mail Code: NPS-10) 400 Seventh St., S.W., Room 5313 Washington, D.C. 20590		13. Type of Report and Period Covered Final Report August 12 - August 18, 1998 14. Sponsoring Agency Code NRM-10

15. Supplementary Notes

16. Abstract

A 56 kph (35 mph) frontal barrier impact using a rigid barrier was conducted on a 1998 Audi A8 in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure No. TP-NCAP090196 for the determination of vehicle crashworthiness on August 12, 1998.

The barrier impact velocity was 56.6 kph (35.2 mph), and the ambient temperature at the time of impact was 21.1°C. The post-test maximum static crush was 538 mm.

The test vehicle appeared to comply with the requirements of the following Federal Motor Vehicle Safety Standards:

1. FMVSS 212, "Windshield Mounting"
2. FMVSS 219 (partial), "Windshield Zone Intrusion"
3. FMVSS 301, "Fuel System Integrity"

With regard to "Occupant Crash Protection" injury criteria, the driver's HIC was 384 and the 3 msec. Clip (Chest g's) was 44.4 g's. The left and right femur loads for the driver were 4824 and 3118 Newtons, respectively. The passenger's HIC was 384 and the 3 msec Clip was 38.7 g's. The left and right femur maximum loads were 1241 and 3620 Newtons.

17. Key Words	18. Distribution Statement
35 mph Frontal Barrier Impact Test New Car Assessment Program (NCAP) FMVSS 212 Indicant Testing FMVSS 219 (partial) Indicant Testing FMVSS 301 Indicant Testing	Copies of this report are available from: Technical Ref. Division, NHTSA, NASSIF Building, Room 5108 400 Seventh Street, S.W. Washington, D.C. 20590

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified		

Form DOT F 1700.7 (8-69)

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This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, as an Optional NCAP test. The United States Government assumes no liability for its contents or use thereof.

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SECTION	DESCRIPTION	PAGE NO.
1	Purpose and Summary of NCAP Test	1-1
2	Occupant and Vehicle Information/Data Sheets	2-1
APPENDIX A	Photographs	
APPENDIX B	Vehicle and Dummy Response Data	
APPENDIX C	Dummy Configuration & Performance Verification Data	
APPENDIX D	Test Equipment and Instrument Calibration	
APPENDIX E	Vehicle Owner's Occupant Restraint System Instructions	

DATA SHEET LISTING

DATA SHEET NO.	DESCRIPTION	PAGE NO.
1	Crash Test Summary	2-1
2	General Test and Vehicle Parameter Data	2-2
3	Post Impact Data	2-5
4	Test Vehicle Information	2-6
5	Summary of FMVSS 212 Data	2-7
6	Windshield Zone Intrusion FMVSS 219 Data	2-8
7	FMVSS 301 Fuel System Integrity Data	2-9
8	FMVSS 301 Static Rollover Data	2-10
9	Dummy Injury Criteria Values	2-14
10	Dummy Positioning in Vehicle	2-16
11	Seat Belt Positioning Data	2-19
12	Camera Data	2-21
13	Vehicle Target Locations	2-23
14	Load Cell Locations on Fixed Barrier	2-24
15	Vehicle Accelerometer Location and Data Summary	2-25
16	Post Test Air Bag Data	2-26
17	Test Vehicle Measurements	2-27
18	Accident Investigation Division Data	2-34

SECTION 1

PURPOSE AND SUMMARY OF NCAP TEST

This 35 mph frontal barrier impact test was conducted as an optional NCAP test. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 48 kph (30 mph) FMVSS 208/212/219/301-75 requirements.

The 56 kph (35 mph) frontal barrier impact test was conducted in accordance with the National Highway Traffic Safety Administration (NHTSA) Indicant Test Procedure for New Car Assessment Program (NCAP) dated January 1, 1990. Data for FMVSS No. 212, "Windshield Mounting", FMVSS No. 219 (Partial), "Windshield Zone Intrusion", FMVSS No. 301-75, "Fuel System Integrity," as well as occupant performance data are provided herein.

A flat concrete load cell barrier covered with 3/4" plywood was impacted by a 1998 Audi A8 at a velocity of 56.6 kph (35.2 mph). The test was performed at the MGA Proving Grounds and Crash Test Center on August 12, 1998. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The frontal barrier impact event was documented by one real-time camera and 14 high speed cameras. Camera locations and other pertinent camera information can be found in this report.

Two Part 572E, 50th percentile male anthropomorphic test devices (ATDs) were placed in the driver and right-front passenger seating positions according to dummy placement instructions specified in the Laboratory Indicant Test Procedure.

Both ATDs were instrumented with head and chest primary and redundant triaxial accelerometers, pelvis triaxial accelerometers, a chest displacement transducer, a six axis neck load cell, right/left femur load cells, right/left lower leg sensors, and right/left foot accelerometers. Seat belt load cells were also placed on the driver and passenger shoulder and lap belts to measure dummy torso and pelvic section loading. Calibrated ATDs, driver (Serial

No. 306), and the right front passenger (Serial No. 307), were used for this test. Certification details, along with instrument calibration data, can be found in Appendices C and D.

The 109 channels of data were recorded on 10 computers. Appendix B contains the vehicle and dummy response data traces.

The driver's head struck the inflated airbag. The driver's HIC was 384 and the maximum chest (CLIP) deceleration over 3 milliseconds was 44.4 g's. The maximum chest compression was 29 mm. The left and right femur loads were 4824 and 3118 Newtons respectively.

The right front passenger's head struck the inflated airbag. The passenger's HIC was 384 and maximum chest (CLIP) deceleration over 3 milliseconds was 38.7 g's. The maximum chest compression was 32 mm. The left and right femur loads were 1241 and 3620 Newtons respectively.

SECTION 2

OCCUPANT AND VEHICLE

INFORMATION/DATA SHEETS

DATA SHEET NO. 1

CRASH TEST SUMMARY

Vehicle Yr/Make/Model/Body Style: 1998/Audi/A8/4 Door

VIN.: WAUAF34D7WN011202

Vehicle Test Weight: 2058.0 kgs.

Impact Velocity: 56.6 kph Maximum Static Crush: 538 mm

Vehicle Rebound: 271 mm

DUMMIES:	DRIVER	PASSENGER
Serial Number:	306	307
Restraint System:	Airbag and type II belt	Airbag and type II belt
No. Data Channels:	42	42

Number of Cameras: 1 Real Time

14 High Speed

Door Opening Data: Opened LF Opened RF Opened LR Opened RR
(without use of tools)

FRONT SEAT(S) DATA	DRIVER	FRONT PASSENGER
Seat Shift:	7 mm forward;	5 mm forward
Seat Back Movement:	None	None

VISIBLE DUMMY CONTACT POINTS:

	DRIVER	PASSENGER
Head	to airbag & headrest	to airbag
Chest	to airbag	to airbag
Left Knee	to steering column & dash panel	to glovebox & airbag
Right Knee	to center console & dash panel	to glovebox & airbag

DATA SHEET NO. 2

GENERAL TEST AND VEHICLE PARAMETER DATA

Vehicle Yr/Make/Model/Body Style: 1998/Audi/A8/4 Door

VIN.: WAUAF34D7WN011202

Body color: Cream Date of Manufacture: 4/98

Engine: 8 Cylinders; ___ C.I.D.; 3.7 Liters;

X Gas; ___ Diesel; ___Turbocharged

X Longitudinal; ___Transverse

Transmission: 4 Speed; ___ Manual; X Automatic; X Overdrive

Final Drive: X Front Wheel; ___ Rear Wheel; ___ Four Wheel

Odometer Reading: 212.5 miles

Major Option:

X A/C; X P/S; X P/B; X P/wdo;

X P/locks; X Tilt Wheel; X Cruise Control; X ABS

Other: Power side mirrors

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 290 kPa (42 Psi) Rear 290 kPa (42 Psi)

Recommended Tire Size: 225/60R16

Recommended Cold Tire Pressure: Front 207 kPa (30 Psi) Rear 207 kPa (30 Psi)

Tires on Vehicle: 225/60R16 Manufacturer: Goodyear

Number of Occupants: 2 Front; 3 Rear; ___ 3rd Seat; 5 TOTAL

Type of Front Seats: X Bucket; ___ Bench; ___Split Bench

Type of Front Seat Back: ___Fixed; X Adj. With; X Power; ___ Lever

Vehicle Capacity Weight (VCW) = 550.0 kg. (A)

No. of Occupants x 68.0 kg. = 340.0 kg. (B)

Rated Cargo Weight (RCW) A-B = 210.0 kg.

GVWR 2219.9 kg. GAWR: Front 1220.2 kg.; Rear 1149.9 kg.

GENERAL TEST AND VEHICLE PARAMETER DATA (Cont'd)

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

Right Front = 523.9 kg Right Rear = 335.7 kg

Left Front = 519.8 kg Left Rear = 321.6 kg

TOTAL FRONT WEIGHT = 1043.7 kg (61.4 % of Total Vehicle Weight)

TOTAL REAR WEIGHT = 657.3 kg (38.6 % of Total Vehicle Weight)

TOTAL UNLOADED DELIVERED WEIGHT (UDW) = 1701.0 kg

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight 1701.0 kg

VCW = Vehicle Capacity Weight 550.0 kg

DSC = Designated Seating Capacity 5

RCW = VCW - 68 (DSC) = 210.0 kg*

Target Test Weight = UDW + RCW + (2 dummies x 78.0 kg/dummy)

Target Test Weight = 2067.0 kg

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND CARGO:

Right Front = 579.7 kg Right Rear = 468.6 kg

Left Front = 558.8 kg Left Rear = 450.9 kg

TOTAL FRONT WEIGHT = 1138.5 kg (55.3 % of Total Vehicle Weight)

TOTAL REAR WEIGHT = 919.5 kg (44.7 % of Total Vehicle Weight)

TOTAL TEST WEIGHT = 2058.0 kg

Weight of ballast secured in vehicle trunk area = 186.0 kg

Vehicle components removed to meet target weight: Trunk carpeting & molding, spare tire, and rear seat

VEHICLE ATTITUDE (all dimensions in mm):

Delivered Attitude:	RF 737	LF 733	RR 708	LR 715
Test Attitude:	RF 713	LF 713	RR 660	LR 666
Post Test	RF 813	LF 798	RR 656	LR 679

Wheel Base: 2888 mm; C.G. = 1290 mm rearward of front wheel C/L

* light trucks and MPVs RCW is 136 kgs or manufacturer's value, whichever is less

GENERAL TEST AND VEHICLE PARAMETER DATA (Cont'd)

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 90 liters

Usable Capacity Figure Furnished by COTR = 89.9 liters

Test Volume Range (92 to 94% of Usable Capacity) = 82.7 to 84.5 liters

ACTUAL TEST VOLUME = 82.7 liters

Test Fluid Type: Stoddard Solvent; Spec. Grav. = 0.77

Kinematic Viscosity = 1.788 centistrokes; Color = Purple

Type of Fuel Pump; Electric X; Mechanical _____

Does Electric Pump operate with ignition switch "ON" & engine "Off"?

Yes X No _____

DATA SHEET NO. 3

POST-IMPACT DATA

Vehicle Yr/Make/Model/Body Style: 1998/Audi/A8/4 Door

VIN.: WAUAF34D7WN011202

Type of Test: 35 mph Frontal Impact Impact Angle: 0°

Date of Test: August 12, 1998 Time of Test: 2:41 p.m.

Ambient Temperature: 21.1°C (70°F) (Spec. Range = 18.8 to 25.6°C)

Temperature in Occupant Compartment: 21.1° C

Windshield Molding Temperature: 21.1° C

Required Impact Velocity Range: 55.5 to 57.1 kph

Impact Velocity: primary = 56.6 kph; secondary = 55.8 kph

Distance From Front Bumper to Barrier Face When

Entering Speed Trap: 1305 mm

Exiting Speed Trap: 305 mm

VEHICLE REBOUND AND CRUSH (mm):

Vehicle Length:	Pre-test:	Right	4769	C/L	4990	Left 4768
	Post-test:	Right	4389	C/L	4452	Left 4469
	Crush:	Right	380	C/L	538	Left 299

Distance from front of test vehicle to point of impact (rebound):

Right 280 mm C/L 262 mm Left 270 mm

Average = 271 mm

DATA SHEET NO. 4

TEST VEHICLE INFORMATION

	Front		Rear	
Post-Test Door Opening	Left	Right	Left	Right
(without use of tools)	Opened	Opened	Opened	Opened

	Front		Rear	
Seat Movement	Left	Right	Left	Right
Seat Back Movement	None	None	N/A	N/A
Seat Shift	7 mm forward	5 mm forward		

Glazing Damage

Backlight/Windshield Windshield cracked

Other Notable Impact Effects: Frontal airbags deployed on impact

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

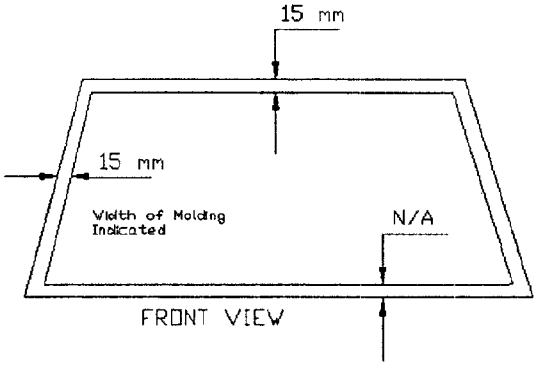
Details of windshield mounting such as retention method, trim type, etc.:
Windshield set in rubber molding with glue

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

FMVSS 212 TEST DATA:

	WINDSHIELD PERIPHERY		
	PRE-TEST (mm)	POST-TEST (mm)	PERCENT RETENTION
RIGHT SIDE	2139	2139	100%
LEFT SIDE	2131	2131	100%
TOTAL	4270	4270	100%

AREA OF RETENTION FAILURE: None



FAILURE DETAILS: None

DATA SHEET 6

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

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 6.5" dia. rigid sphere weighing 15 pounds in a position such that it simultaneously contacts the inner surface of the windshield and the surface of the instrument panel, including padding, and drawing the locus of points on the inner surface of the windshield contactable by the sphere across the width of the instrument panel. From the outermost contact points, extend the locus line horizontally to the edges of the windshield, and then draw a line on the inner surface of the windshield below and ½" distant from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection onto the outer surface of the windshield of this line.

FMVSS 219 TEST DATA:

A= 1218 mm

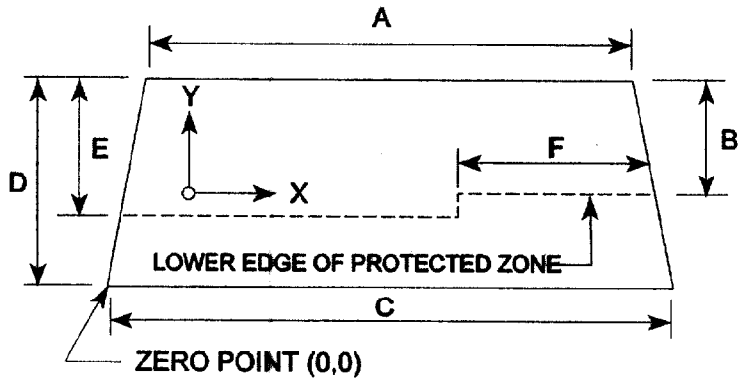
B= 423 mm

C= 1620 mm

D= 716 mm

E= 405 mm

F= 549 mm



DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 1/4":

(Show location of penetration)

NONE

DATA SHEET 7

FMVSS NO. 301-75, FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

FMVSS NO. 301

Test Date: August 12, 1998

Vehicle Mfgr./Make/Model: Volkswagen/Audi/A8/4 Door

Usable Capacity of Vehicle's Fuel Tank: 89.9 Liters
(figure furnished by vehicle manufacturer)

TEST REQUIREMENTS:

Drain the test vehicle's fuel system and operate the engine until the fuel system is dry. Add Stoddard solvent, which has been dyed purple, until 92-94% of the stated usable capacity is reached. Operate the engine to assure the Stoddard solvent is present throughout the entire fuel system.

AMOUNT OF STODDARD SOLVENT ADDED TO VEHICLE'S FUEL TANK:

82.7 Liters which is 92 % of the stated USABLE CAPACITY.

TEST VEHICLE IMPACT TYPE: X Frontal (35 mph)

___ Oblique (30 mph) with __° barrier face first contacting (driver/passenger) side

___ Rear Moving Barrier (30 mph)

___ Side Impact MDB (33.2 mph)

FUEL SPILLAGE MEASUREMENT:

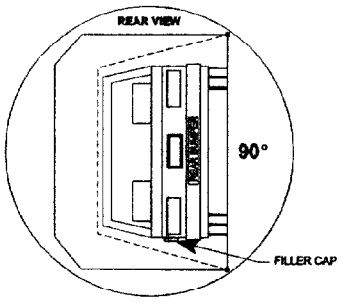
	ACTUAL	MAX ALLOWED
1. From impact until vehicle motion ceases	0	1 OZ
2. For 5 minute period after vehicle motion ceases	0	5 OZ
3. For next 25 minutes	0	1 oz./1 MIN

SOLVENT SPILLAGE DETAILS: None

DATA SHEET 8

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: 0° - 90°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time __2__ minutes __52__ seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + __5__ minutes __0__ seconds

TOTAL __7__ minutes __52__ seconds

Next whole minute interval __8__ minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min FROM onset of rotation	6th min.	7th min.	8th min. if reqd.

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0

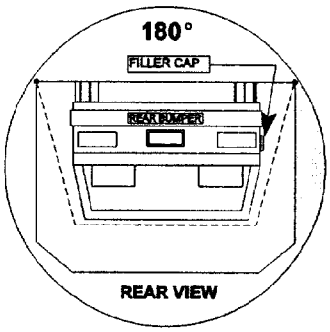
Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

DATA SHEET 8

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (Cont'd)

TEST PHASE: 90°- 180°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time __2__ minutes __31__ seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + __5__ minutes __0__ seconds

TOTAL __7__ minutes __31__ seconds

Next whole minute interval __8__ minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min FROM onset of rotation	6th min.	7th min.	8th min. if reqd.

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0

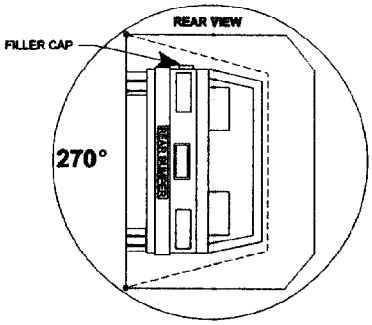
Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

DATA SHEET 8

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (Cont'd)

TEST PHASE: 180° - 270°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 10 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 10 seconds

Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min FROM onset of rotation	6th min.	7th min.	8th min. if reqd.

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0

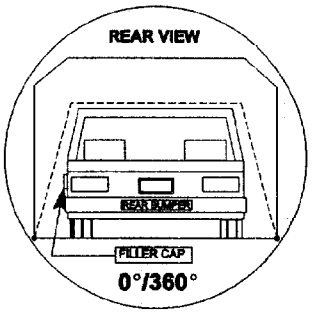
Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

DATA SHEET 8

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (Cont'd)

TEST PHASE: 270° - 360°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 39 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 39 seconds

Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min FROM onset of rotation	6th min.	7th min.	8th min. if reqd.

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0

Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

DATA SHEET 9

DUMMY INJURY CRITERIA VALUES DATA SHEET

Vehicle Year/Make/Model/Body Style: 1998/Audi/A8/4 Door

Test Date: August 12, 1998

ACCELERATION VALUES: (g's)	DRIVER # 306				PASSENGER # 307			
	Min.	Time	Max.	Time	Min.	Time	Max.	Time
Head Channel X	-58.4	72 msec.	4.5	199 msec.	-50.6	79 msec.	1.8	197 msec.
Head Channel Y	-7.8	75 msec.	8.2	17 msec.	-6.2	56 msec.	13.5	87 msec.
Head Channel Z	-22.5	43 msec.	17.7	75 msec.	-20.3	40 msec.	2.8	134 msec.
HEAD RESULTANT	58.9		72 msec.		52.5		79 msec.	
Chest Channel X	-45.5	75 msec.	3.3	191 msec.	-39.1	74 msec.	2.7	143 msec.
Chest Channel Y	-8.0	98 msec.	4.6	68 msec.	-2.4	37 msec.	6.5	72 msec.
Chest Channel Z	-13.7	41 msec.	5.2	78 msec.	-13.0	39 msec.	4.9	74 msec.
CLIP	44.4				38.7			
TIME INTERVAL (msec) [3. msec. minimum]	$t_1 = 73.5$ $t_2 = 76.6$				$t_1 = 72.9$ $t_2 = 76.0$			

HEAD INJURY CRITERIA (HIC) VALUES:

HIC	384	384
t_1 = (msec)	47.2	55.9
t_2 = (msec)	83.2	91.9
Avg. Accel. t_1 to t_2 (g's)	40.9	40.9
$t_2 - t_1$ (msec)	36.0	36.0

[The maximum time interval from t_1 to t_2 is 36 milliseconds.]

FEMUR FORCES:

Left Side (N)	-4824	48 msec.	430	43 msec.	-1241	56 msec.	916	34 msec.
Right Side (N)	-3118	47 msec.	465	43 msec.	-3620	50 msec.	467	48 msec.

SEAT BELT FORCES:

Lap Belt (N)	6173	50 msec.	5620	56 msec.
Shoulder Belt (N)	6069	75 msec.	5862	74 msec.

DATA SHEET 9

DUMMY INJURY CRITERIA VALUES DATA SHEET (Cont'd)

HYBRID III NECK, CHEST AND PELVIS DATA SHEET

	DRIVER DUMMY #306				PASSENGER DUMMY #307			
	Min.	Time	Max.	Time	Min.	Time	Max.	Time
Neck Load X (N)	-436	43 msec.	798	76 msec.	-357	48 msec.	310	74 msec.
Neck Load Y (N)	-146	153 msec.	222	75 msec.	-121	57 msec.	258	95 msec.
Neck Load Z (N)	-1984	40 msec.	242	128 msec.	-938	40 msec.	163	133 msec.
Neck Load Resultant	1996		40 msec.		982		40 msec.	
Neck Moment X (Nm)	-13.3	87 msec.	11.8	48 msec.	-15.4	59 msec.	19.7	85 msec.
Neck Moment Y (Nm)	-35.1	59 msec.	23.6	45 msec.	-37.1	64 msec.	23.9	89 msec.
Neck Moment Z (Nm)	-9.0	39 msec.	7.8	54 msec.	-6.3	87 msec.	3.7	145 msec.
Neck Moment Resultant	36.1		59 msec.		38.0		63 msec.	
Chest Deflection (mm)	29		48 msec.		32		77 msec.	
Pelvis X Acceleration (g's)	-74.9	47 msec.	2.7	172 msec.	-55.5	50 msec.	3.8	120 msec.
Pelvis Y Acceleration (g's)	-1.7	91 msec.	1.9	157 msec.	-5.2	89 msec.	15.4	59 msec.
Pelvis Z Acceleration (g's)	-5.3	37 msec.	25.2	57 msec.	-9.7	33 msec.	30.3	54 msec.
Pelvis Resultant (g's)	75.3		47 msec.		58.8		50 msec.	

DATA SHEET 10

DUMMY POSITIONING IN VEHICLE

Vehicle: 1998/Audi/A8/4 Door

SEAT TYPE:	ADJUSTER TYPE:		BUCKET SEAT BACK TYPE:
____Bench	Driver:	____ Manual	____Fixed
_X_ Bucket		_X_ Power	_X_ Adjustable Reclining
____Split Bench			
	Passenger:	____ Manual	____Fixed
		_X_ Power	_X_ Adjustable Reclining

DRIVER SEAT POSITION

Middle position

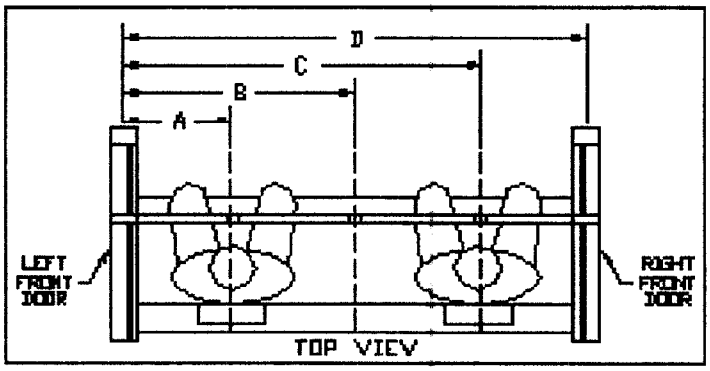
Seat back angle: 13.0°

PASSENGER SEAT POSITION

Middle position

Seat back angle: 13.0°

Steering column position: Middle, at 20.7°



306 DUMMY ID 307

A	= Left Door to Driver Centerline	420 mm
B	= Left Door to Vehicle Centerline	790 mm
C	= Left Door to Right Passenger Centerline	1169 mm
D	= Left Door to Right Door	1580 mm

DATA SHEET 10

DUMMY POSITIONING IN VEHICLE (Cont'd)

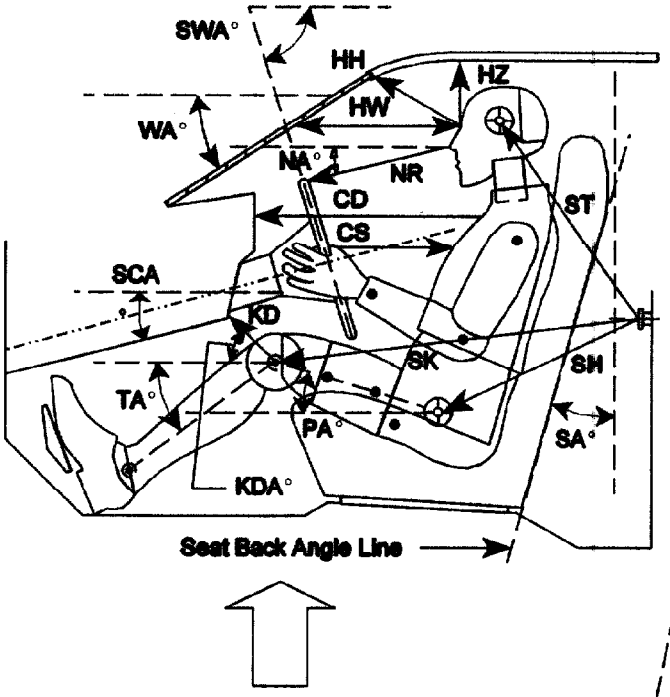
Units (mm)

	DRIVER (Serial #306)	PASSENGER (Serial #307)
WA°	29.2°	
SWA°	18.6	N/A
SCA°	20.7°	N/A
SA°	13.0°	13.0°
HZ	180	170
HH	353	355
HW	613	584
HR	267	235
NR	379 Angle 8.4°	N/A
CD	498	545
CS	312	N/A
RA	199	N/A
KDL	187 Angle 16.5°	212
KDR	183	206 Angle 33.2°
PA°	23.9°	21.4°
TA°	41.3°	39.5°
KK	322	251
ST*	450 Angle 14.2°	450 Angle 12.3°
SK*	630 Angle 97.5°	635 Angle 98.4°
SH*	320 Angle 127.3°	319 Angle 128.7°
SHY	289	276
HS	330	293
HD	138	138
AD	129	121

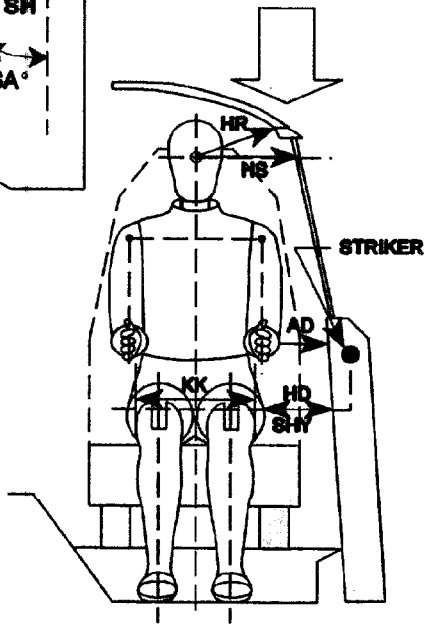
N/A = Not Applicable

* Angle measured with respect to vertical.

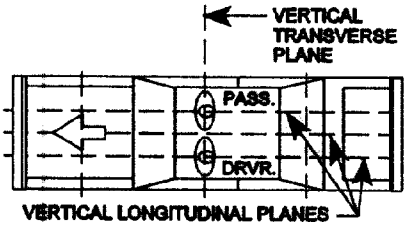
DUMMY MEASUREMENT FOR FRONT SEAT OCCUPANTS



AD - Arm to Door
HD - H-Point to Door
HR - Head to Side Header
HS - Head to Side Window
KK - Knee to Knee
SHY- Striker to H-Point (Y Direction)

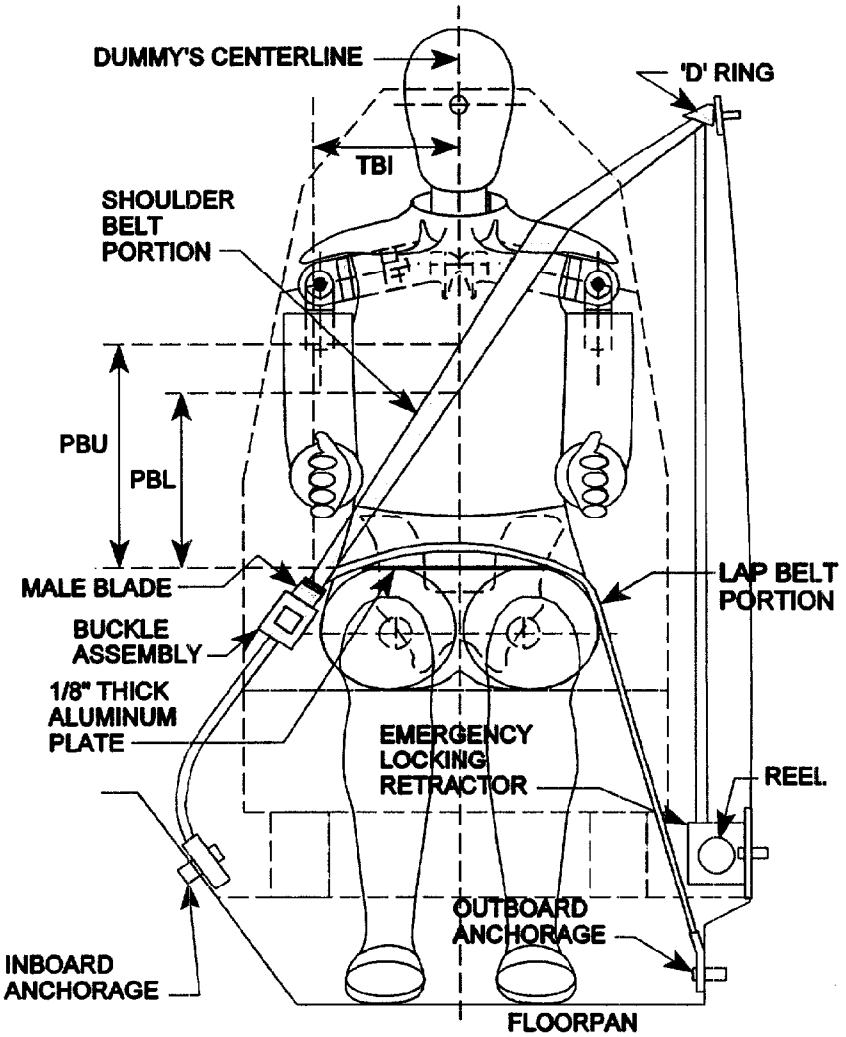


CD - Chest to Dash
CS - Steering Wheel to Chest
HH - Head to Header
HW - Head to Windshield
HZ - Head to Roof
KDA - Knee to Dash Angle
KDL- Left Knee to Dash
KDR - Right Knee to Dash
NA - Nose to Rim Angle
NR - Nose to Rim
PA - Pelvic Angle
RA - Rim to Abdomen
SA - Seat Back Angle
SCA - Steering Column Angle
SH - Striker to H-Point
SK - Striker to Knee
ST - Striker to Head
SWA- Steering Wheel Angle
TA - Tibial Angle



DATA SHEET 11

SEAT BELT POSITIONING DATA



FRONT VIEW OF DUMMY

(illustration)

Dimension = mm

	DRIVER DUMMY	PASSENGER DUMMY
PBU – Top surface of alum. plate to upper edge	347	345
PBL -- Top surface of alum. plate to belt lower edge	265	260

DATA SHEET 11

DATA SHEET 11

SEAT BELT POSITIONING DATA (Cont'd)

BELT LENGTH DATA:	Driver	Passenger
Length from trim above retractor reel to "D" ring as measured on dummy.	N/A	N/A
Shoulder belt length as measured on Part 572 Dummy.	940 mm	931 mm
Lap belt length as measured on Part 572 Dummy.	635 mm	621 mm

DATA SHEET 12

CAMERA LOCATIONS

Test Date: August 12, 1998

VehicleYear/Make/Model/Body Style: 1998/Audi/A8/4 Door

CAMERA POSITION NO.	VIEW	CAMERA POSITIONS (mm.)*			ANGLE (deg)	FILM PLANE TO HEAD TARGET (mm)	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Left Side View	-	-	-	-	-	18	32
2	Left Front View	1120	-8000	1510	90	7545	25	1005
3	Steering Column Top	2170	-7720	1550	90	7265	25	952
4	Steering Column Bottom	2150	-7710	1030	90	7255	25	1099
5	Driver Close-up	1640	-10830	1410	90	10375	75	909
6	Driver Angle	5360	-5450	2000			50	971
7	Onboard Driver**							
8	Onboard Passenger**							
9	Right Overall	2310	7360	1240	90	6890	13	1010
10	Right Passenger Half	1370	7600	1210	90	7130	25	943
11	Right Close-up	1840	10260	1140	90	10150	75	893
12	Right Angle	5220	5500	1990			50	1064
13	Windshield	-380	0	2750			13	1053
14	Top Driver	90	-450	1615			13	1020
15	Top Passenger	100	465	1615			13	893
16	Pit Front	1255	0	-3195			13	952
17	Pit Rear	3075	0	-3185			13	1010

* COORDINATES:

+X = film plane rearward of barrier

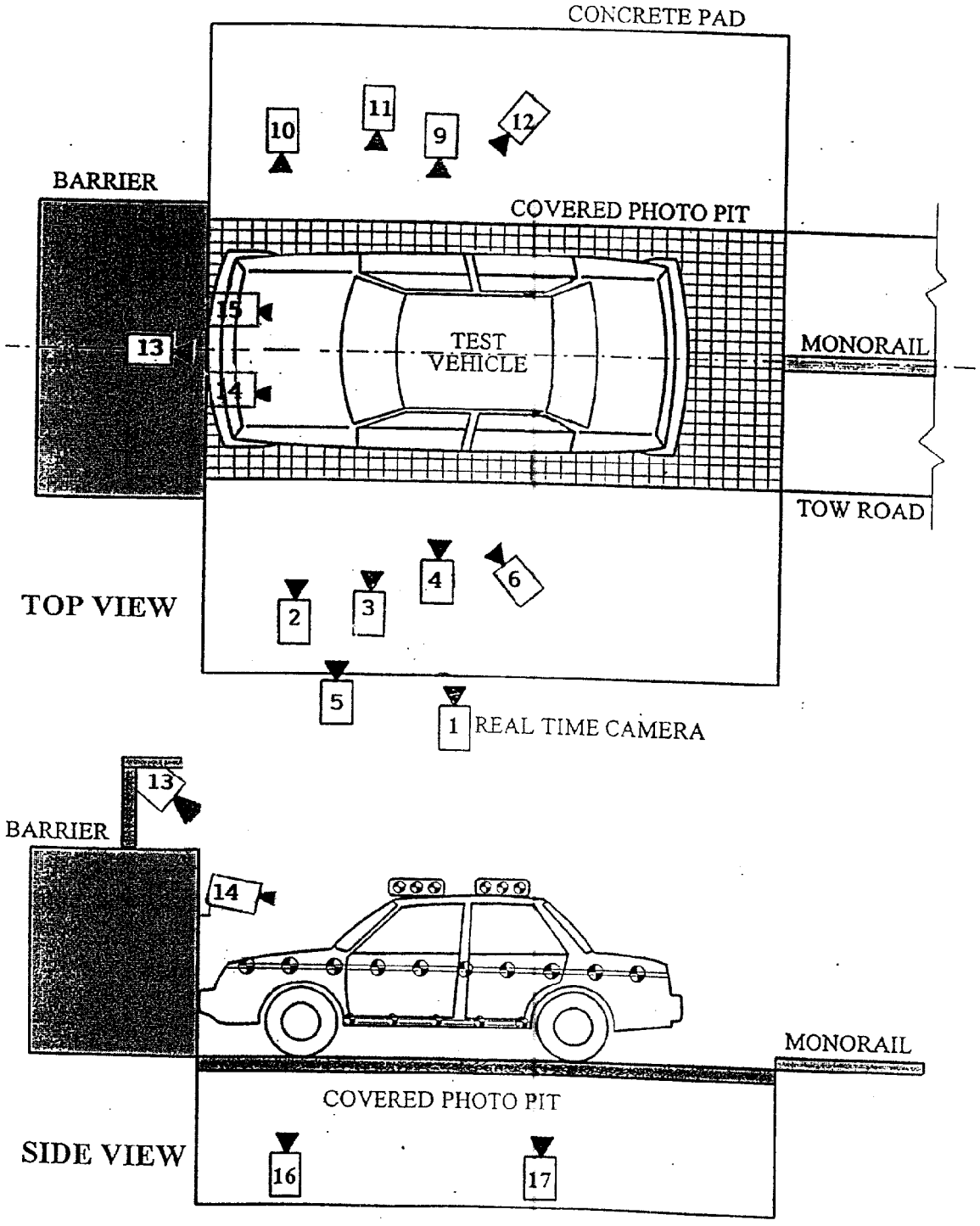
+Y = film plane to right of monorail centerline

+Z = film plane to above ground level

ORIGIN: For X and Y it is the Impact Point. For Z it is the Floor.

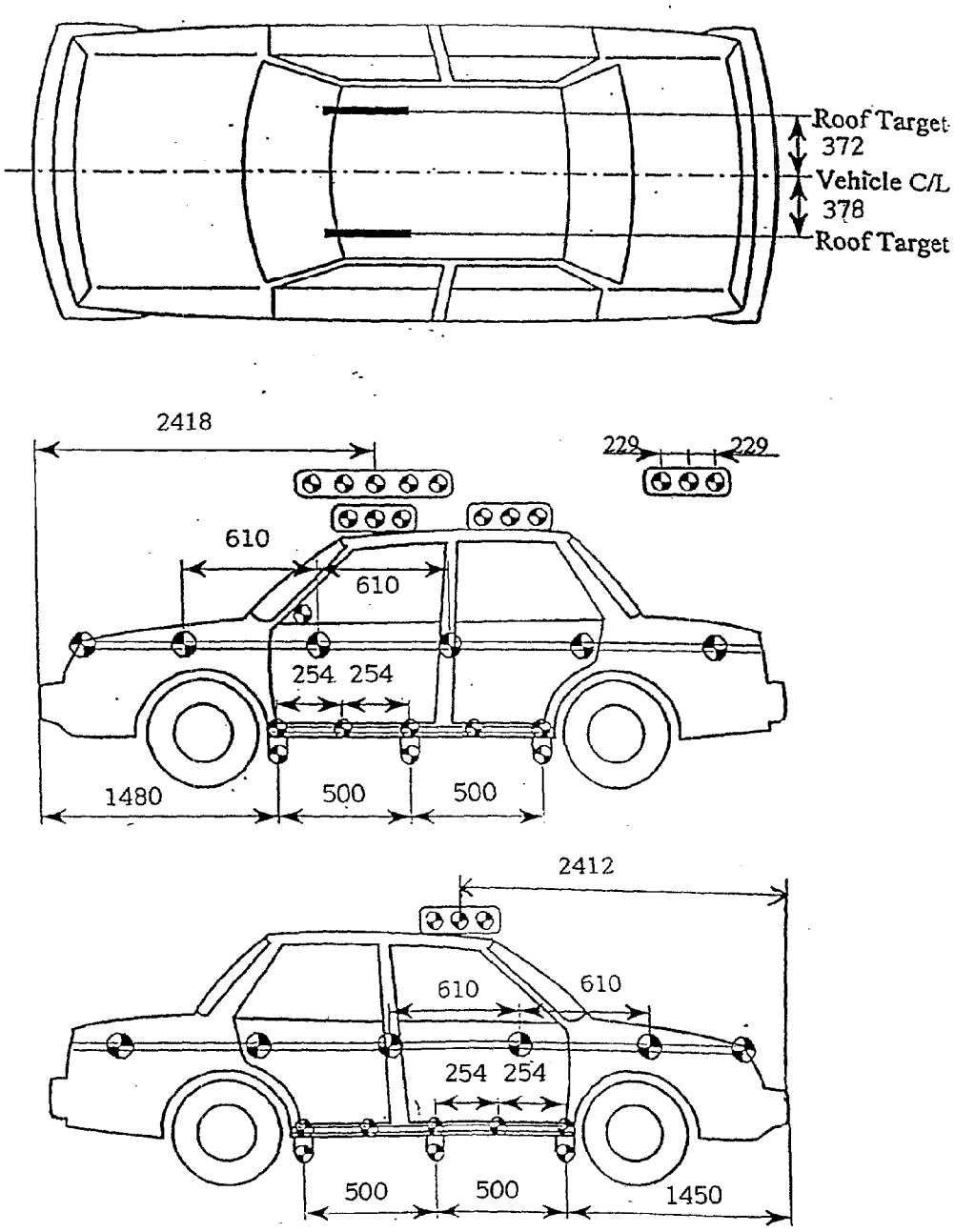
** Not used in this test

CAMERA LOCATIONS (Cont'd)



DATA SHEET 13

VEHICLE TARGET LOCATIONS



(DIMENSIONS IN MM)

DATA SHEET 14

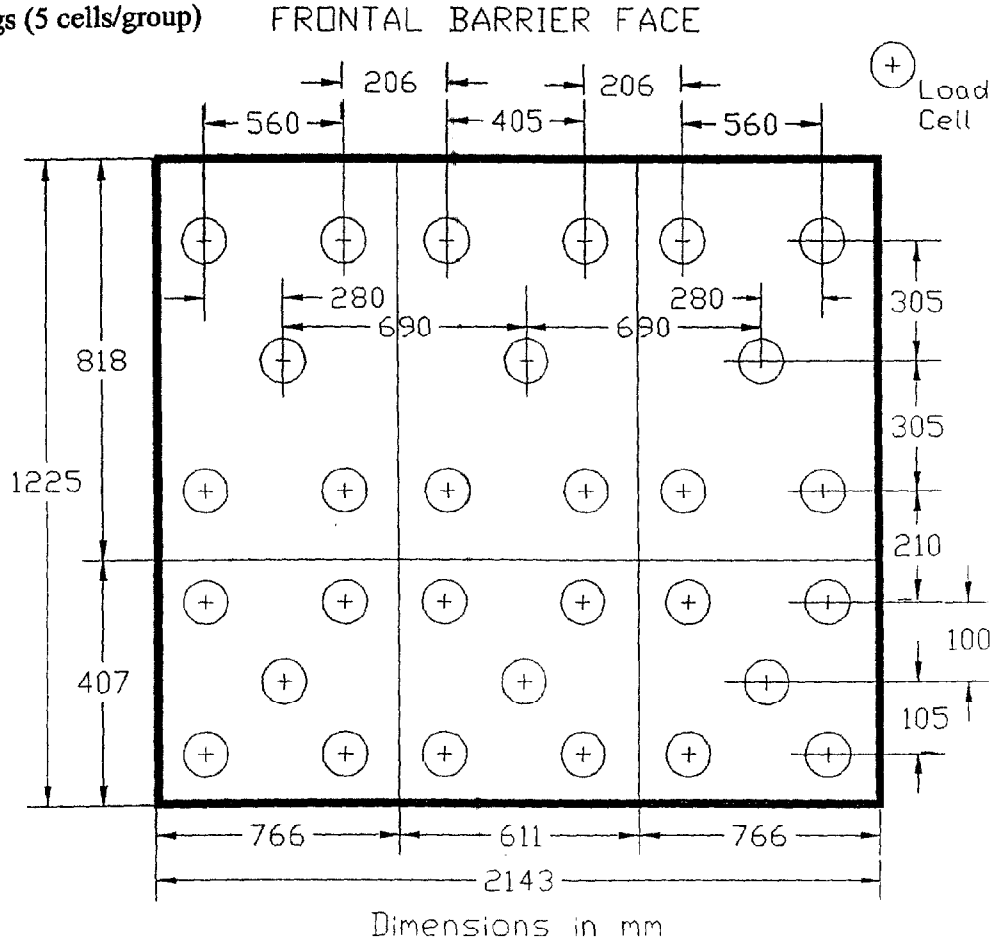
LOAD CELL LOCATIONS ON FIXED BARRIER

30 Load Cells

6 Rows

9 Columns

6 Groupings (5 cells/group)



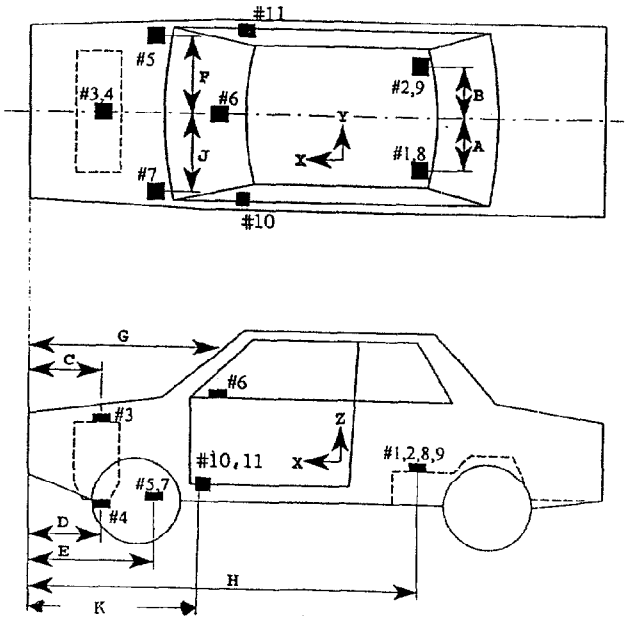
The following data is presented in Appendix B:

(1) Total or Sum of 30 individual load cells

(2) Data from 6 Groupings shown above (5 cells/group)

DATA SHEET 15

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



Units: (mm)

Dimension	Length
A	521
B	521
C	699
D	518
E	1098
F	706
G	1592
H	3073
J	706
K	1558

ACCEL. NO.	ACCELEROMETER	DIRECTION
1 and 8	Left Rear Seat Crossmember	X
2 and 9	Right Rear Seat Crossmember	X
3	Top of Engine	X
4	Bottom of Engine	X
5	Right Side Brake Caliper	X
6	Instrument Panel	X
7	Left Side Brake Caliper	X
10 and 11	Left/Right Front Rocker	X

DATA SHEET 16

POST TEST AIRBAG DATA

A. Number of Vent Holes: Driver 1 ; Passenger 2

B. Size of Vent Holes: Driver 50 mm dia;. Passenger 67 mm dia;

C. Total Vent Area; Driver 19.6 cm^2 Passenger 70.5 cm^2

D. Deflated Airbag Length and Width Dimensions or, if Round, Diameter

Driver; Length____mm, Width____mm, Diameter 735 mm

Passenger; Length 572 mm, Width 489 mm, Diameter ____ mm

E. Is the Airbag Tethered?

Driver; X Yes; __ No; If yes, record length of tether 270 mm

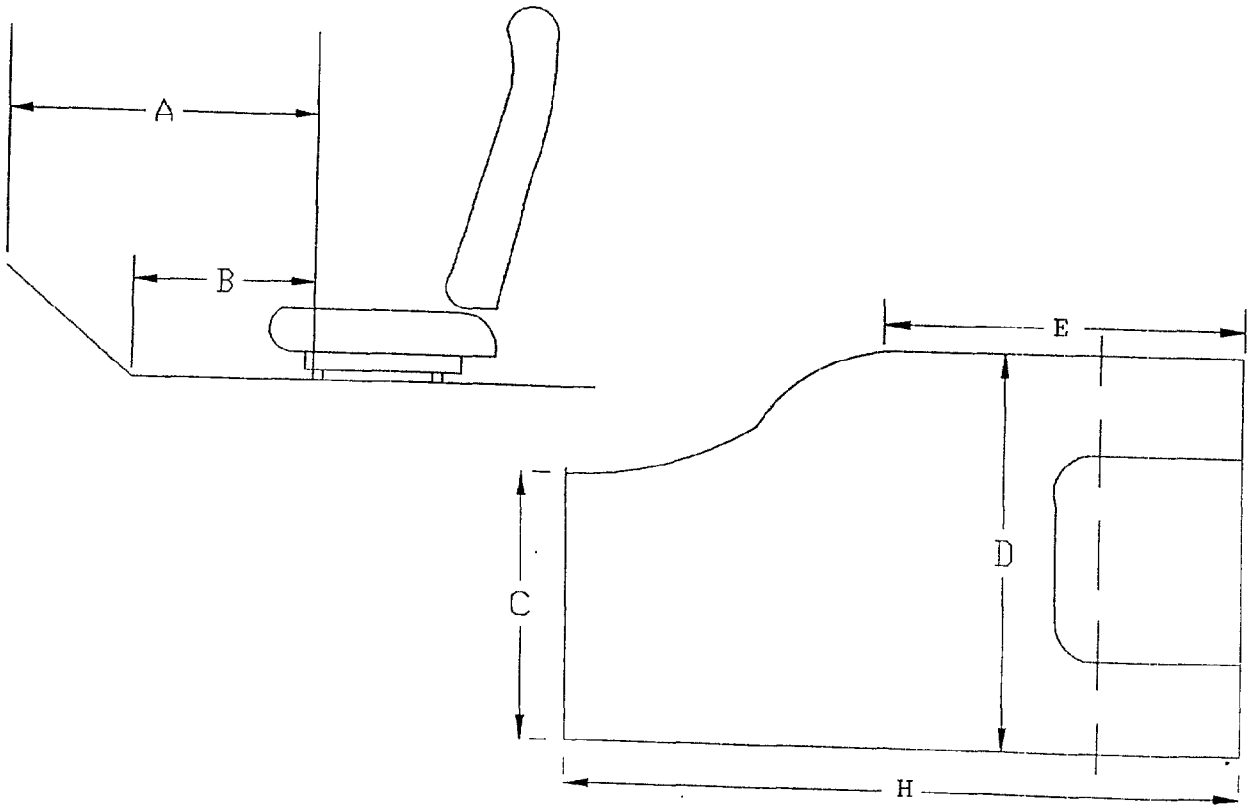
Passenger; __ Yes; X No, If yes, record length of tether____mm

DATA SHEET 17

TEST VEHICLE MEASUREMENTS

STATIC FOOTWELL DEFORMATION

Driver's Side



Units = mm

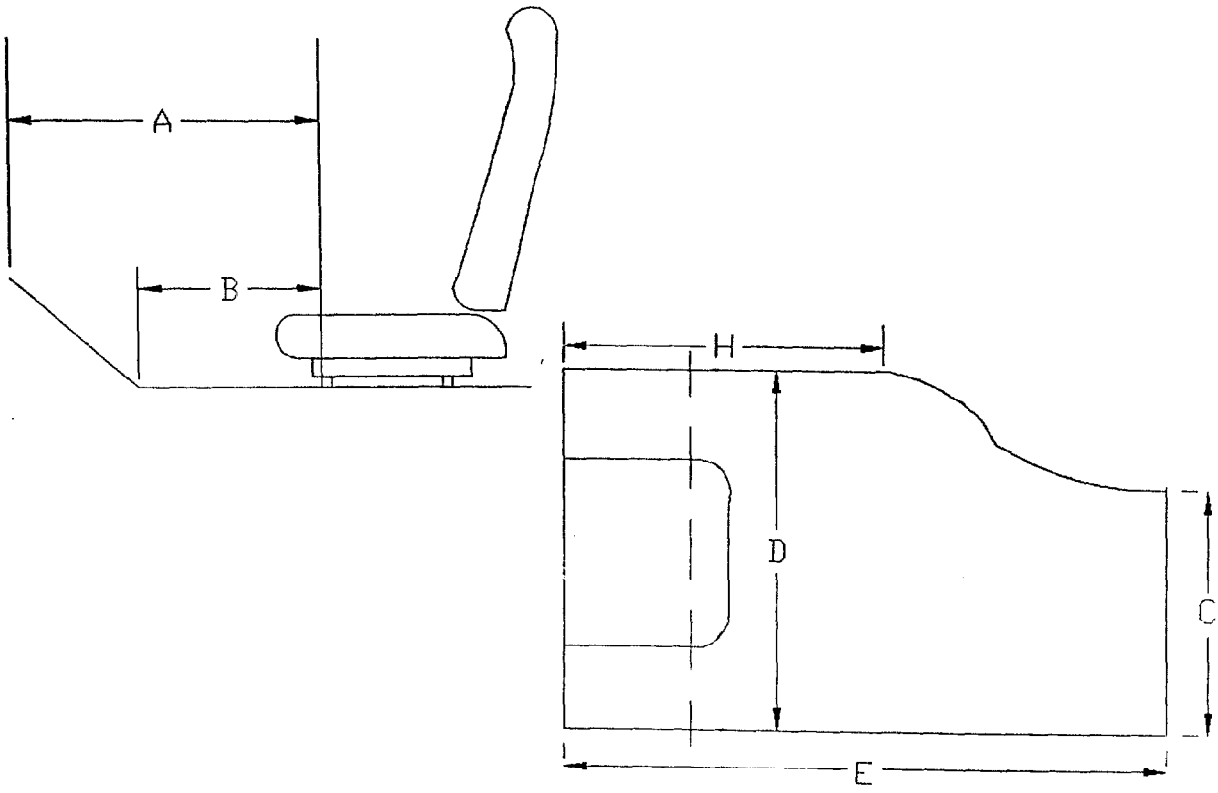
MEASUREMENT	PRE TEST	POST TEST	DIFFERENCE
A	2216	2084	132
B	1980	1958	22
C	357	357	0
D	360	362	-2
E	1880	1854	26
H	1911	1892	19

DATA SHEET 17

TEST VEHICLE MEASUREMENTS (Cont'd)

STATIC FOOTWELL DEFORMATION

Passenger's Side



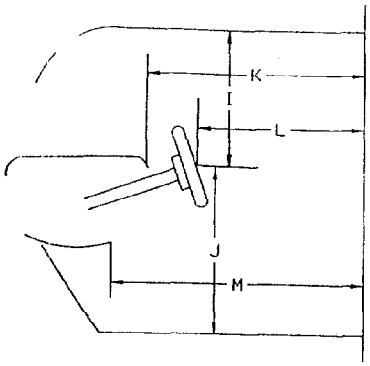
Units = mm

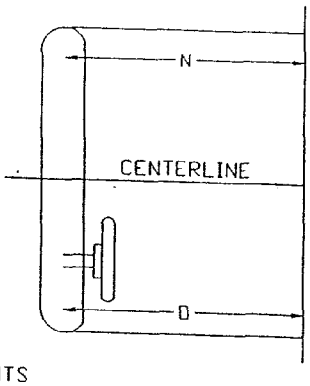
MEASUREMENT	PRE TEST	POST TEST	DIFFERENCE
A	2158	2026	132
B	1984	1950	34
C	272	259	13
D	381	385	-4
E	1949	1938	11
H	1782	1722	60

DATA SHEET 17

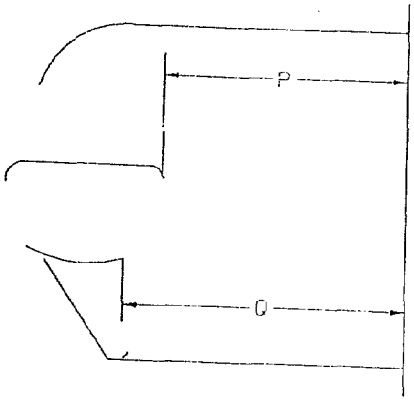
TEST VEHICLE MEASUREMENTS (Cont'd)

STATIC PASSENGER COMPARTMENT INTRUSION





MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE



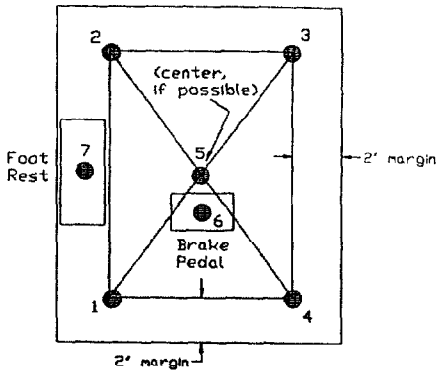
Units = mm

MEASUREMENT	PRE TEST	POST TEST	DIFFERENCE
I	400	303	97
J	663	828	-165
K	1615	1616	-1
L	1447	1472	-25
M	1741	1710	31
N	1942	1922	20
O	1915	1886	29
P	1686	1664	22
Q	1798	1735	63

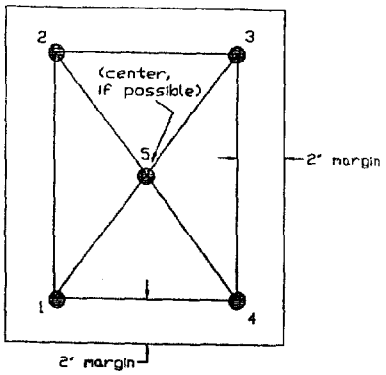
DATA SHEET 17

TEST VEHICLE MEASUREMENTS (Cont'd)

TOE PAN MEASUREMENTS



DRIVER



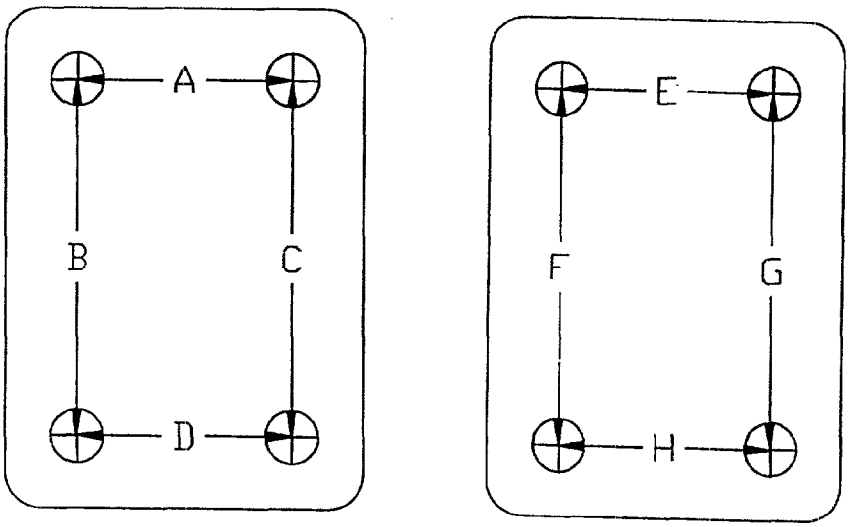
PASSENGER

Driver						
Location	X			Z		
	Pre-Test	Post-Test	Def.	Pre-Test	Post-Test	Def.
1	540	540	0	-48	-54	6
2	710	648	62	222	231	9
3	802	625	177	152	148	4
4	579	571	8	-66	-96	30
5	714	602	112	48	48	0
6	538	509	29	119	196	77
7	598	572	26	102	100	2
Passenger						
Location	X			Z		
	Pre-Test	Post-Test	Def.	Pre-Test	Post-Test	Def.
1	595	451	144	-38	-28	10
2	757	609	148	244	242	2
3	722	659	63	181	155	26
4	579	554	25	-59	-62	3
5	686	523	163	122	117	5

DATA SHEET 17
TEST VEHICLE MEASUREMENTS (Cont'd)

UNDERBODY FLOORBOARD DEFORMATION

DRIVER'S SIDE **PASSENGER'S SIDE**



MEASUREMENT	PRE TEST	POST TEST	DIFFERENCE
A	280	291	-11
B	308	304	4
C	323	323	0
D	290	276	14
E	292	293	-1
F	322	322	0
G	314	310	4
H	292	291	1

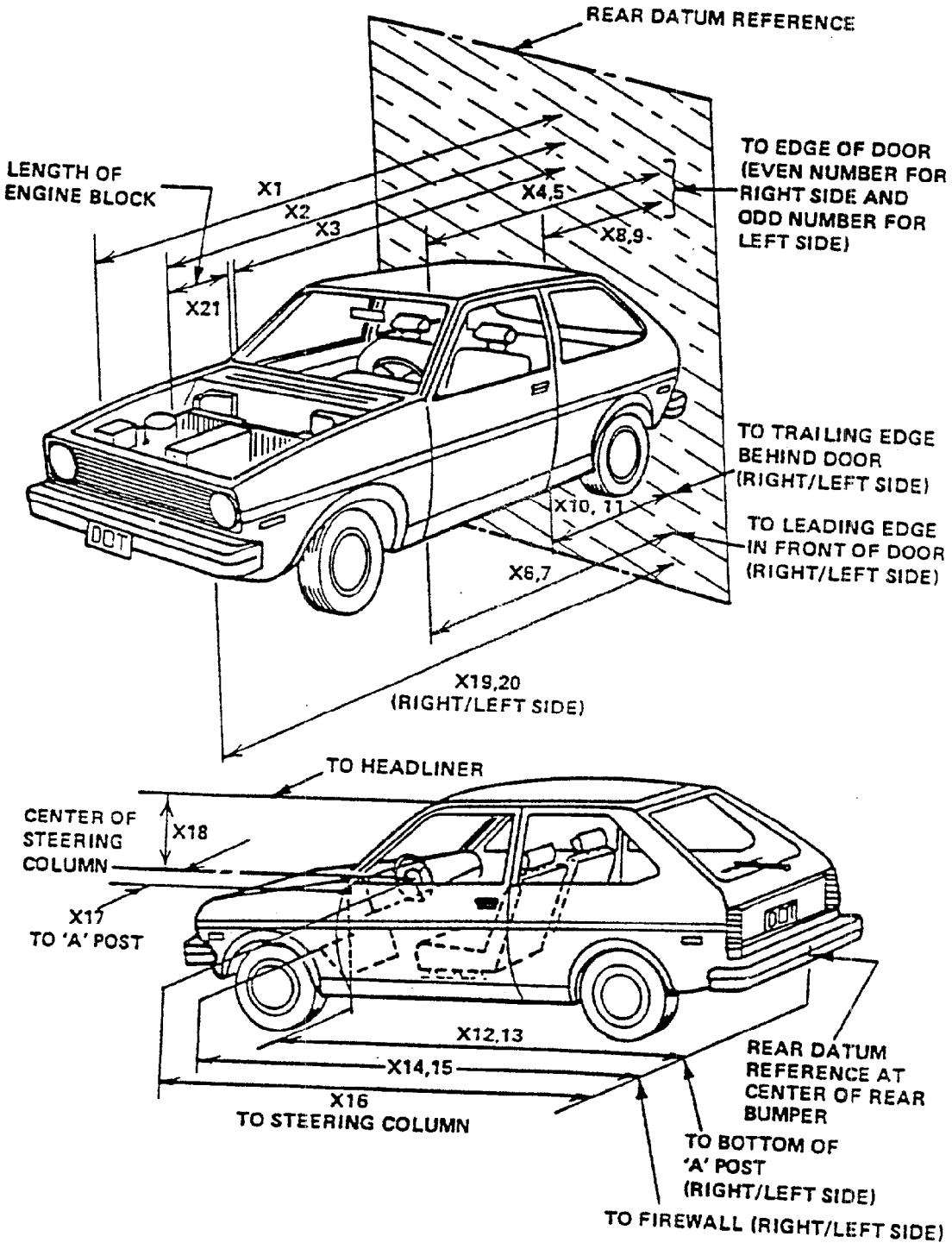
DATA SHEET 17

TEST VEHICLE MEASUREMENTS (Cont'd)

No.	MEASUREMENT DESCRIPTION:	Pre-Test (mm)	Post-Test (mm)	Diff. (mm)
X1	Total Length of Test Vehicle at Centerline	4990	4452	538
X2	Rear Surface of Vehicle to Front of Engine	4520	4167	353
X3	Rear Surface of Vehicle to Firewall	4015	3762	253
X4	Rear Surface to Upr. Leading Edge of Rt. Door	3383	3368	15
X5	Rear Surface to Upr. Leading Edge of Left Door	3377	3390	-13
X6	Rear Surface to Lwr. Leading Edge of Rt. Door	3454	3436	18
X7	Rear Surface to Lwr. Leading Edge of Left Door	3452	3461	-9
X8	Rear Surface to Upr. Trailing Edge of Rt. Door	2322	2312	10
X9	Rear Surface to Upr. Trailing Edge of Left Door	2325	2328	-3
X10	Rear Surface to Lwr. Trailing Edge of Rt. Door	2336	2320	16
X11	Rear Surface to Lwr. Trailing Edge of Left Door	2331	2342	-11
X12	Rear Surface to Bottom of A-Post on Rt. Side	3467	3469	-2
X13	Rear Surface to Bottom of A-Post on Left Side	3438	3449	-11
X14	Rear Surface to Firewall on Right Side	4080	3940	140
X15	Rear Surface to Firewall on Left Side	4081	4009	72
X16	Rear Surface to Steering Column	2958	3014	-56
X17	Center of Steering Column to A-Post	351	277	74
X18	Center of Steering Column to Headlining	400	302	98
X19	Rear Surface to Right Side of Front Bumper	4769	4389	380
X20	Rear Surface to Left Side of Front Bumper	4768	4469	299
X21	Length of Engine Block	465	465	0

DATA SHEET 17

TEST VEHICLE MEASUREMENTS (Cont'd)



DATA SHEET 18

ACCIDENT INVESTIGATION DIVISION DATA

FOR 35 MPH FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: 1998/Audi/A8/4 Door

VIN: WAUAF34D7WN011202

Model Year: 1998 ; Build Date: 4/98 ; Test Date: August 12 , 1998

Veh. Size Category: Full ; TEST WEIGHT: 2058.0 kg

Veh. Wheelbase: 2888 mm; Front Overhang: 965 mm; Overall Width: 1892 mm

ACCELEROMETER DATA:

Location: As per measurements on pages 2-25

Calibration Procedure: As per MGA Calibration Procedure

Linearity: >99.9% ; Integration Algorithm: Trapezoidal

Veh: Impact Speed: 56.6 kph ; Time Of Separation: 125 msec

Velocity Change: 69.3 kph

Collision Deformation Classification (CDC) Code: F (Frontal)

Crush Depth Dimensions: C1 = 299 mm

C2 = 407 mm

C3 = 519 mm

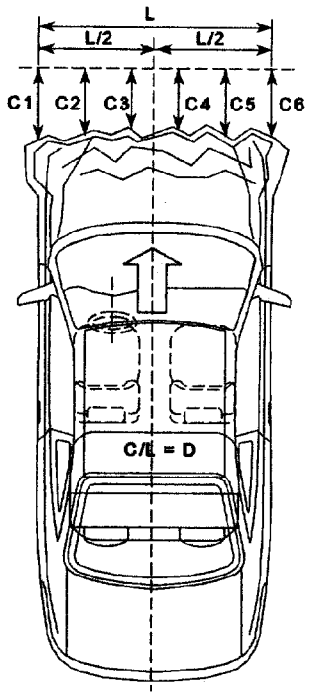
C4 = 531 mm

C5 = 457 mm

C6 = 380 mm

Midpoint Of Damage D = Vehicle Centerline (Longitude)

Length Of Damaged Region: L = 1575 mm



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

	Page No.
Photo No. A-1 - Pre-Test Front View of Test Vehicle	A-1
Photo No. A-2 - Post-Test Front View of Test Vehicle	A-2
Photo No. A-3 - Pre-Test Rear View of Test Vehicle	A-3
Photo No. A-4 - Post-Test Rear View of Test Vehicle	A-4
Photo No. A-5 - Pre-Test Left Side View of Test Vehicle	A-5
Photo No. A-6 - Post-Test Left Side View of Test Vehicle	A-6
Photo No. A-7 - Pre-Test Left Rear Three-Quarter View of Test Vehicle	A-7
Photo No. A-8 - Post-Test Left Rear Three-Quarter View of Test Vehicle	A-8
Photo No. A-9 - Pre-Test Right Side View of Test Vehicle	A-9
Photo No. A-10 - Post-Test Right Side View of Test Vehicle	A-10
Photo No. A-11 - Pre-Test Right Front Three-Quarter View of Test Vehicle	A-11
Photo No. A-12 - Post-Test Right Front Three-Quarter View of Test Vehicle	A-12
Photo No. A-13 - Pre-Test Fuel Filler Cap View	A-13
Photo No. A-14 - Pre-Test Engine Compartment View	A-14
Photo No. A-15 - Post-Test Engine Compartment View	A-15
Photo No. A-16 - Pre-Test Front Underbody View	A-16
Photo No. A-17 - Post-Test Front Underbody View	A-17
Photo No. A-18 - Pre-Test Rear Underbody View	A-18
Photo No. A-19 - Post-Test Rear Underbody View	A-19
Photo No. A-20 - Pre-Test Windshield View	A-20
Photo No. A-21 - Post-Test Windshield View	A-21
Photo No. A-22 - Pre-Test Driver Dummy Position Left Side View	A-22
Photo No. A-23 - Post-Test Driver Dummy Position Left Side View	A-23
Photo No. A-24 - Pre-Test Driver Dummy Position Left Side View (Door Open)	A-24
Photo No. A-25 - Post-Test Driver Dummy Position Left Side View (Door Open)	A-25
Photo No. A-26 - Pre-Test Driver Seat Position View	A-26
Photo No. A-27 - Post-Test Driver Seat Position View	A-27

TABLE OF PHOTOGRAPHS (Cont'd)

	Page No.
Photo No. A-28 - Pre-Test Driver Dummy Knee Position	A-28
Photo No. A-29 - Post-Test Driver Dummy Knee Position	A-29
Photo No. A-30 - Post-Test Driver Airbag Contact	A-30
Photo No. A-31 - Post-Test Driver Knee Contact View	A-31
Photo No. A-32 - Post-Test Driver Head Contact View	A-32
Photo No. A-33 - Pre-Test Passenger Dummy Position Right Side View	A-33
Photo No. A-34 - Post-Test Passenger Dummy Position Right Side View	A-34
Photo No. A-35 - Pre-Test Passenger Dummy Position Right Side View (Door Open)	A-35
Photo No. A-36 - Post-Test Passenger Dummy Position Right Side View (Door Open)	A-36
Photo No. A-37 - Pre-Test Passenger Seat Position View	A-37
Photo No. A-38 - Post-Test Passenger Seat Position View	A-38
Photo No. A-39 - Pre-Test Passenger Dummy Knee Position	A-39
Photo No. A-40 - Post-Test Passenger Dummy Knee Position	A-40
Photo No. A-41 - Post-Test Passenger Airbag Contact	A-41
Photo No. A-42 - Post-Test Passenger Knee Contact View	A-42
Photo No. A-43 - Vehicle Certification Label	A-43
Photo No. A-44 - Tire Placard	A-44
Photo No. A-45 - Vehicle Impact	A-45
Photo No. A-46 - Rollover 90°	A-46
Photo No. A-47 - Rollover 180°	A-47
Photo No. A-48 - Rollover 270°	A-48
Photo No. A-49 - Rollover 360°	A-49

Photo No. A-1 - Pre-Test Front View of Test Vehicle

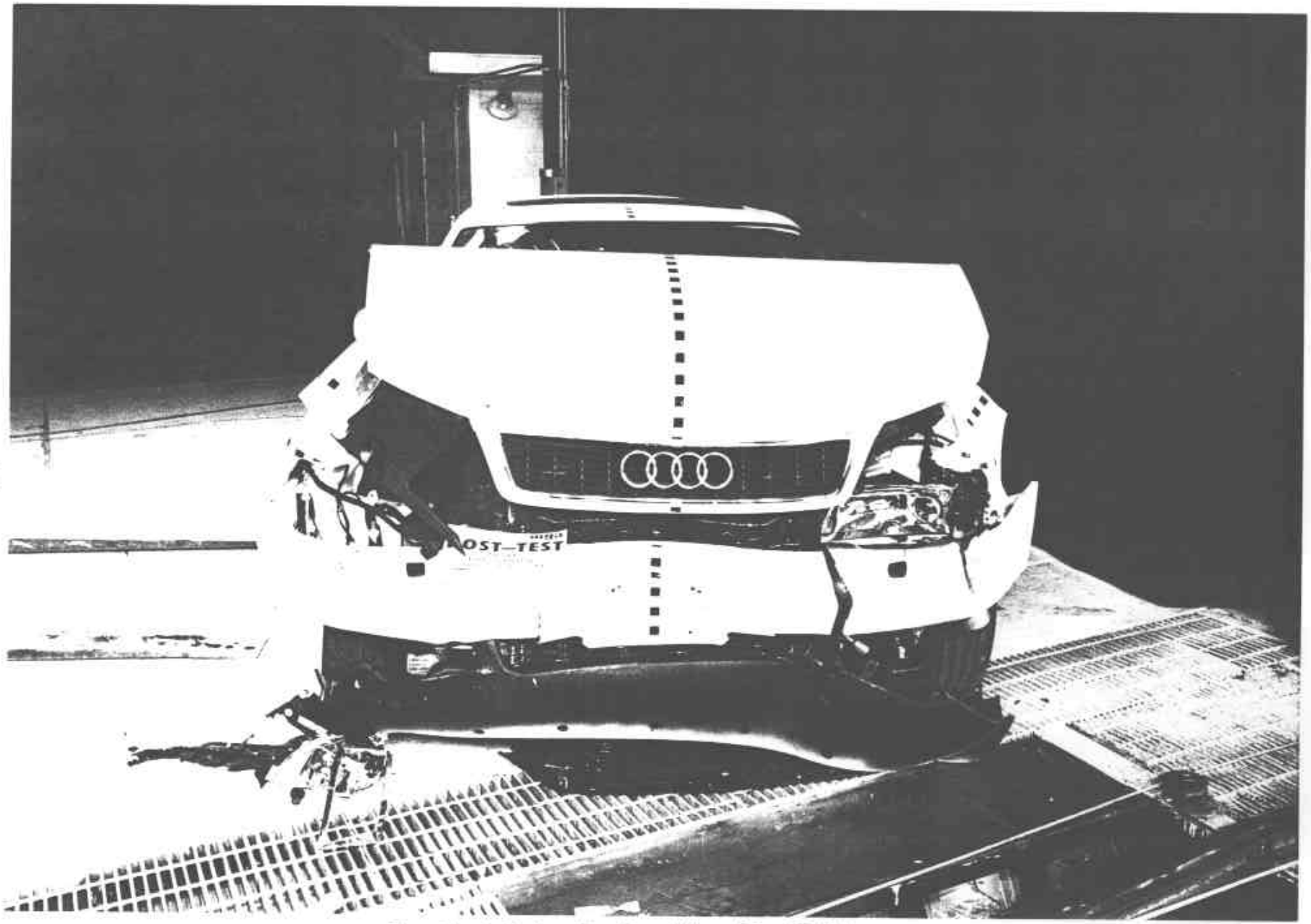


Photo No. A-2 - Post-Test Front View of Test Vehicle

Photo No. A-3 - Pre-Test Rear View of Test Vehicle

Photo No. A-4 - Post-Test Rear View of Test Vehicle

Photo No. A-5 - Pre-Test Left Side View of Test Vehicle

Photo No. A-6 - Post-Test Left Side View of Test Vehicle

Photo No. A-7 - Pre-Test Left Rear Three-Quarter View of Test Vehicle

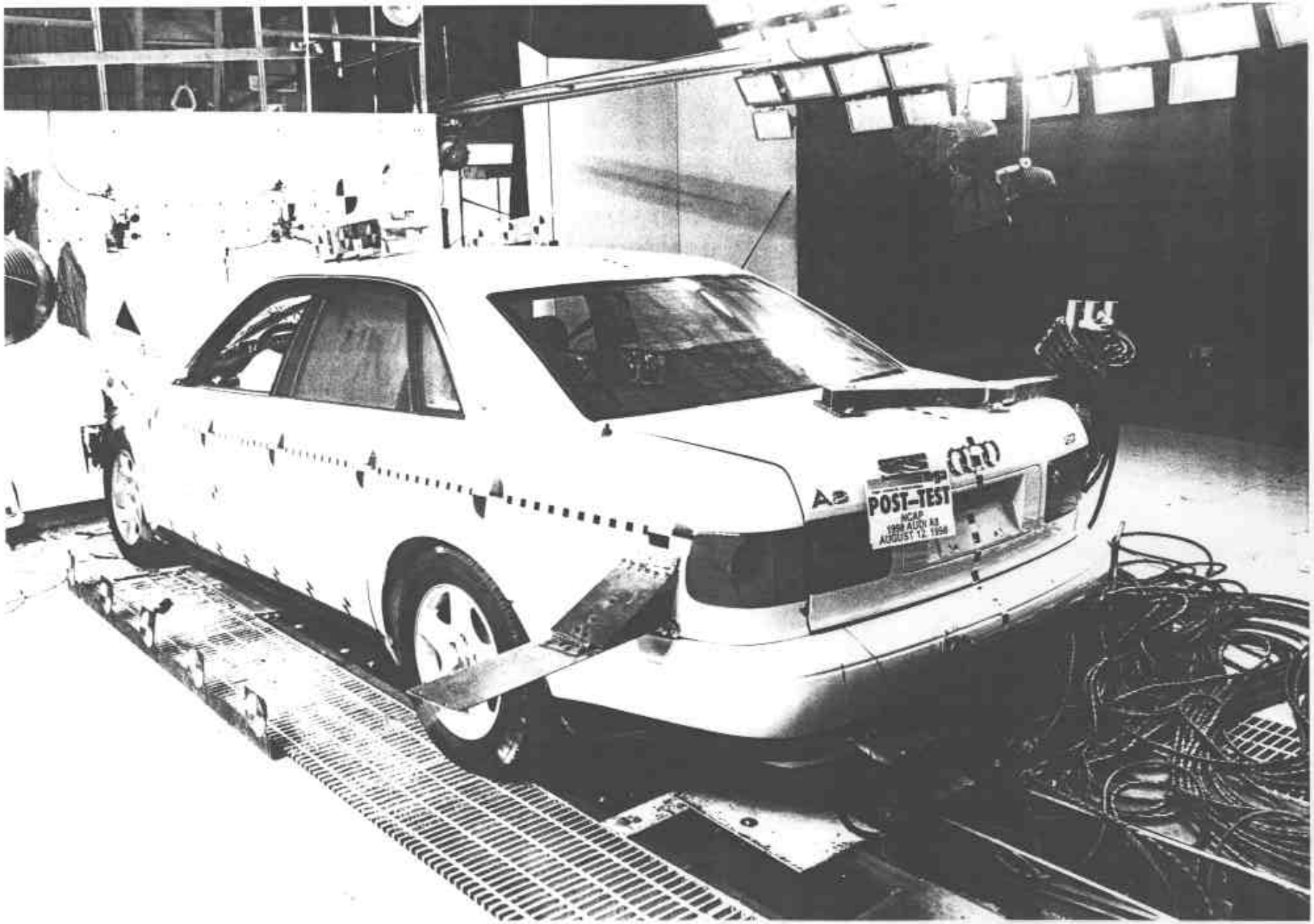


Photo No. A-8 - Post-Test Left Rear Three-Quarter View of Test Vehicle

Photo No. A-9 - Pre-Test Right Side View of Test Vehicle

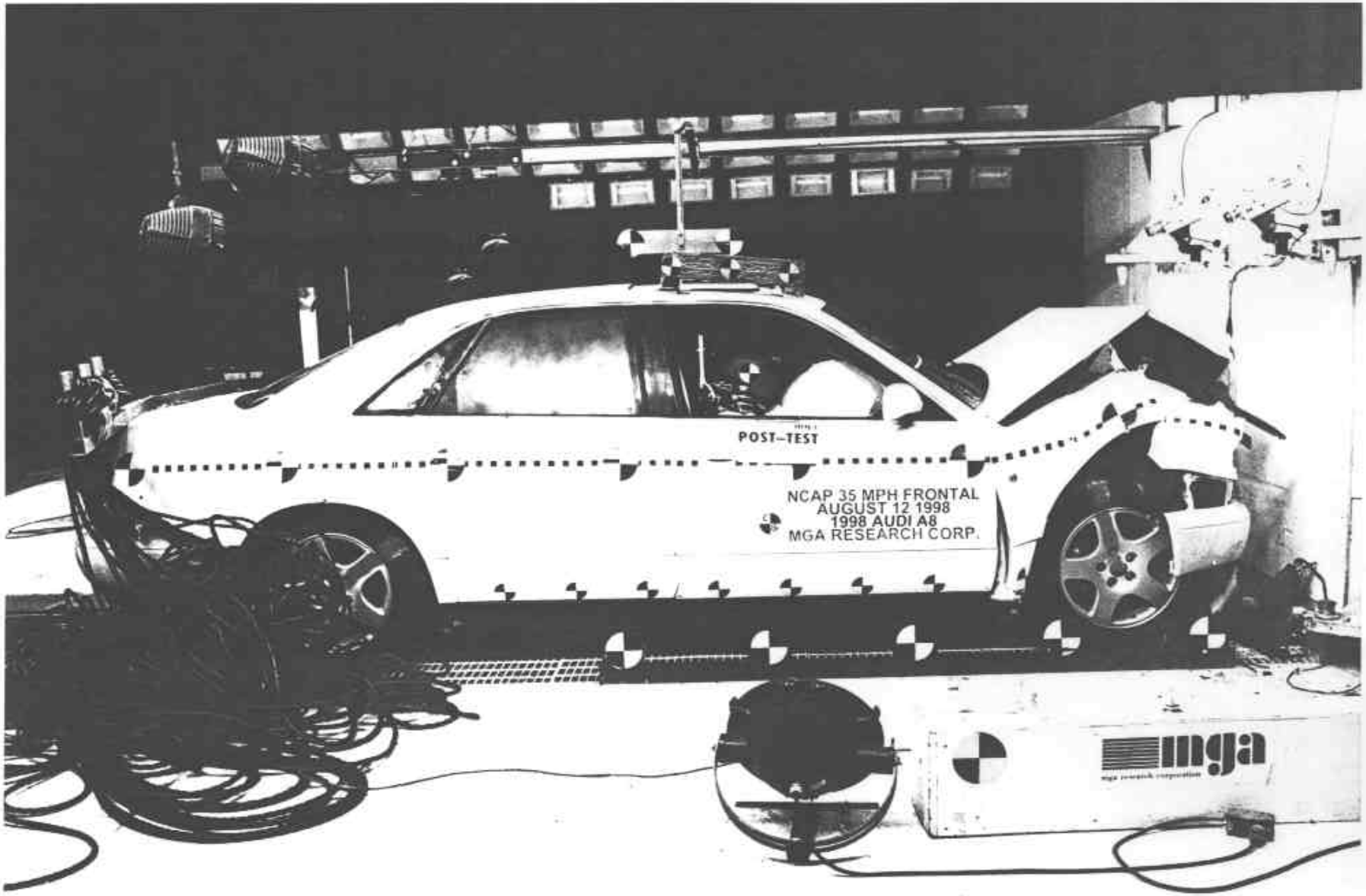


Photo No. A-10 - Post-Test Right Side View of Test Vehicle

Photo No. A-11 - Pre-Test Right Front Three-Quarter View of Test Vehicle

Photo No. A-12 - Post-Test Right Front Three-Quarter View of Test Vehicle

Photo No. A-13 - Pre-Test Fuel Filler Cap View

Photo No. A-14 - Pre-Test Engine Compartment View

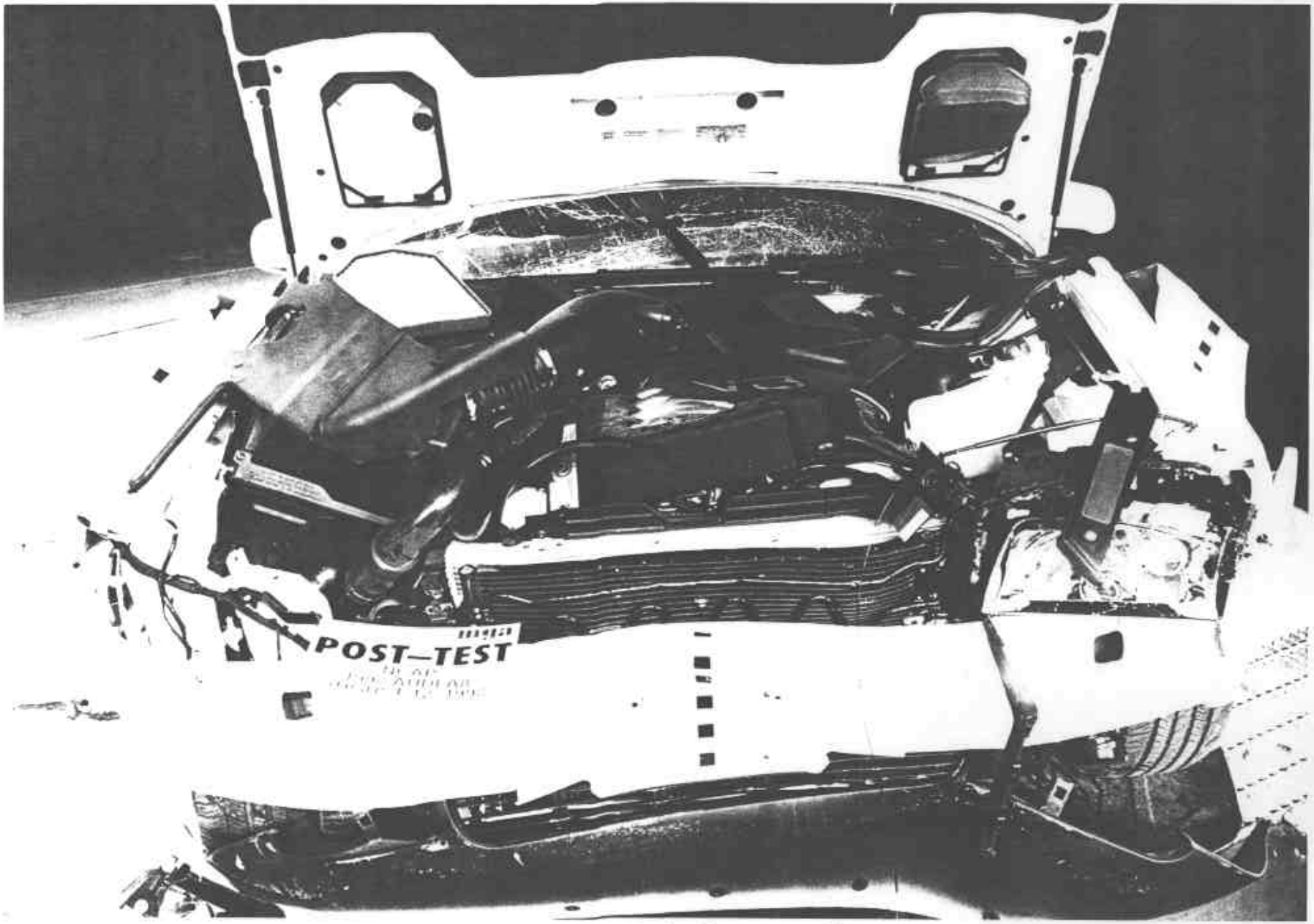


Photo No. A-15 - Post-Test Engine Compartment View

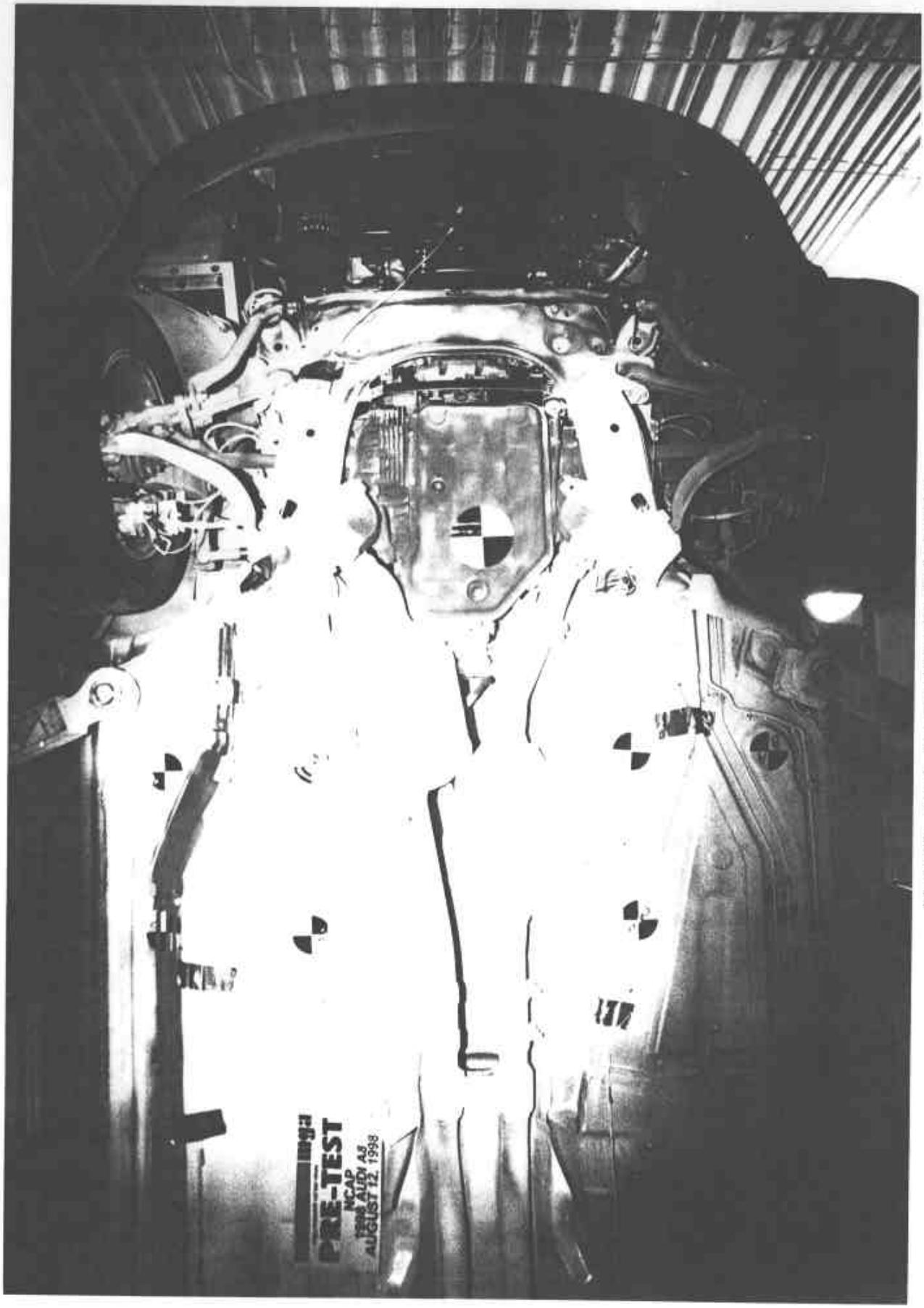
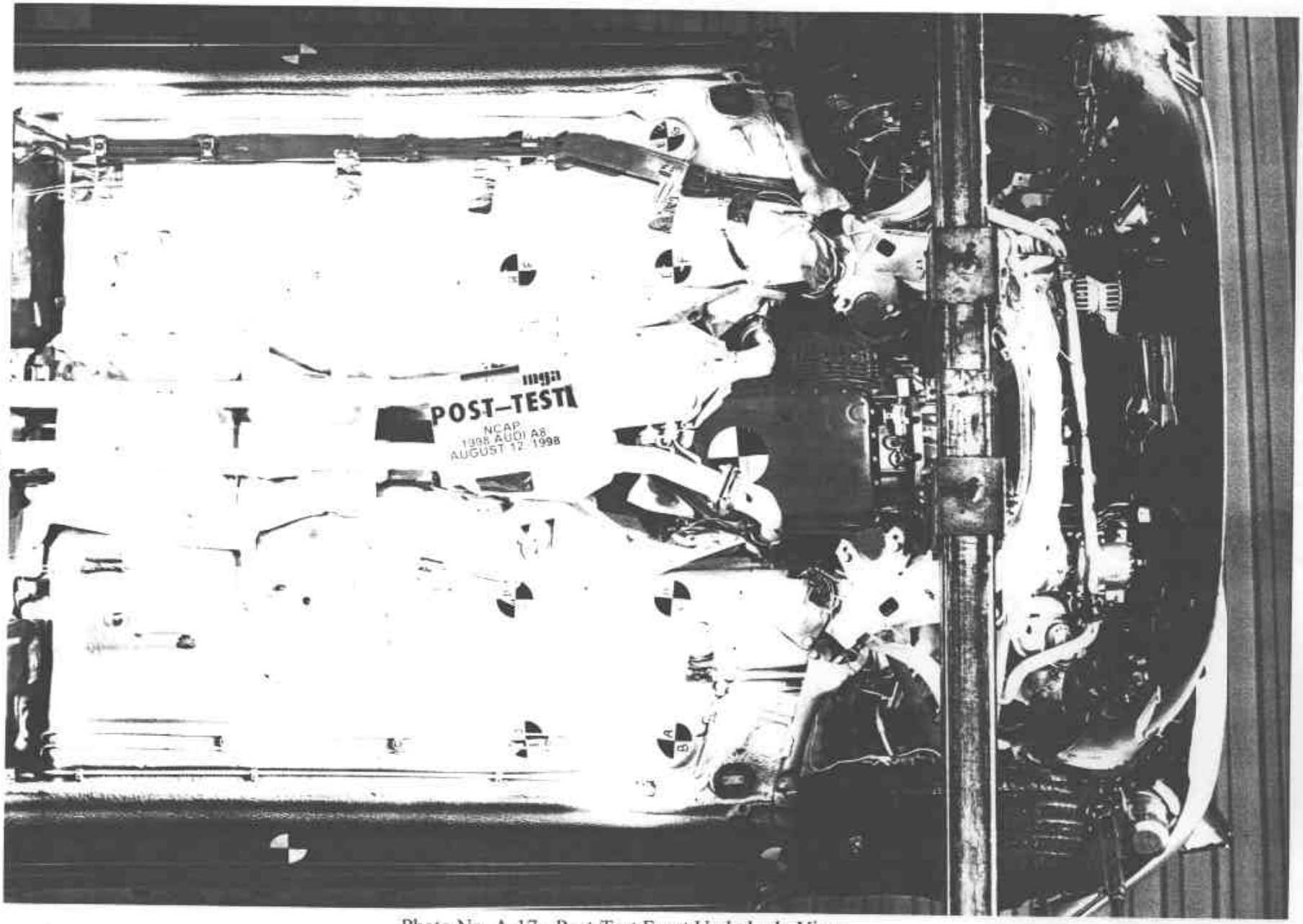


Photo No. A-16 - Pre-Test Front Underbody View



A-17

Photo No. A-17 - Post-Test Front Underbody View

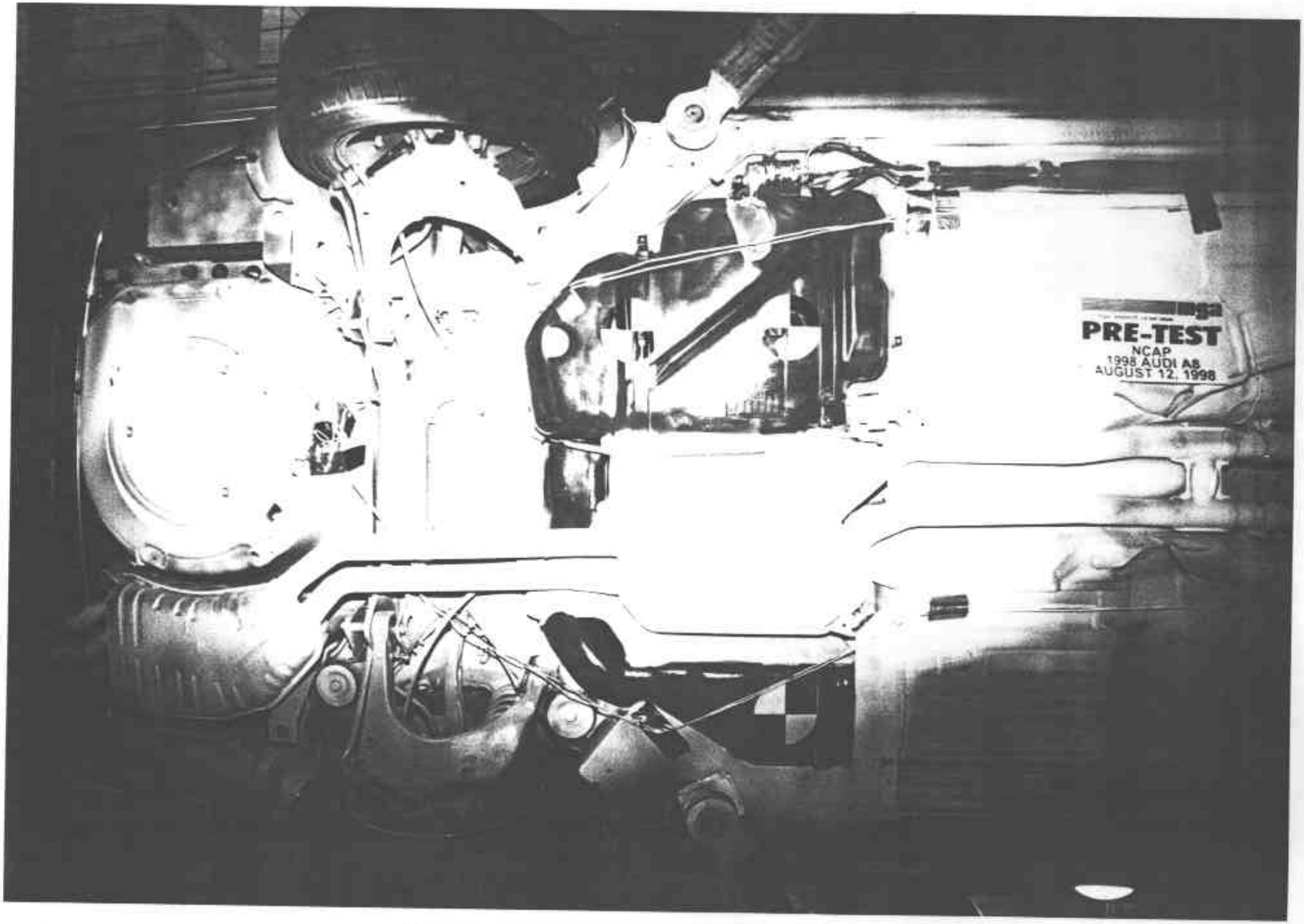


Photo No. A-18 - Pre-Test Rear Underbody View

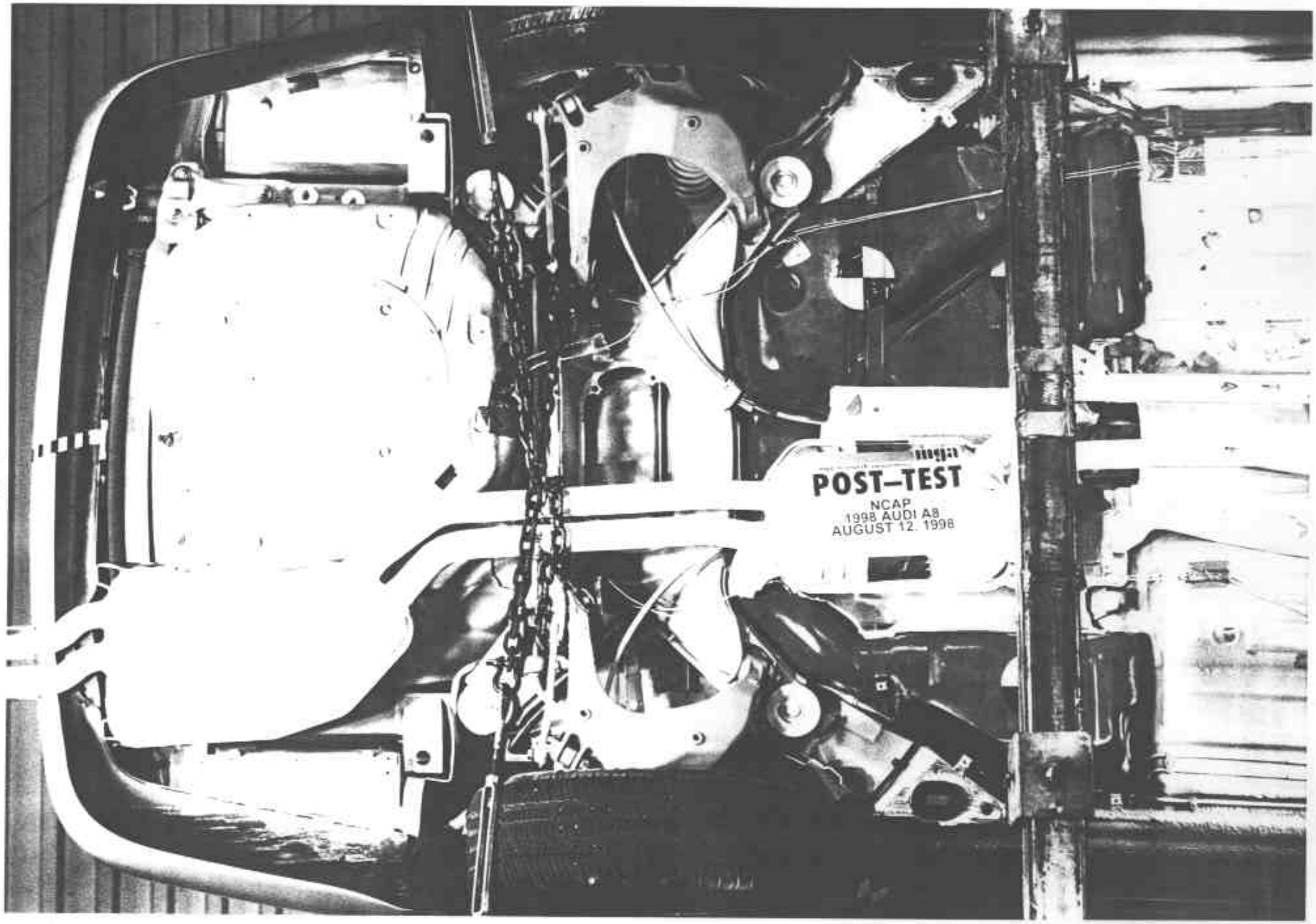


Photo No. A-19 - Post-Test Rear Underbody View

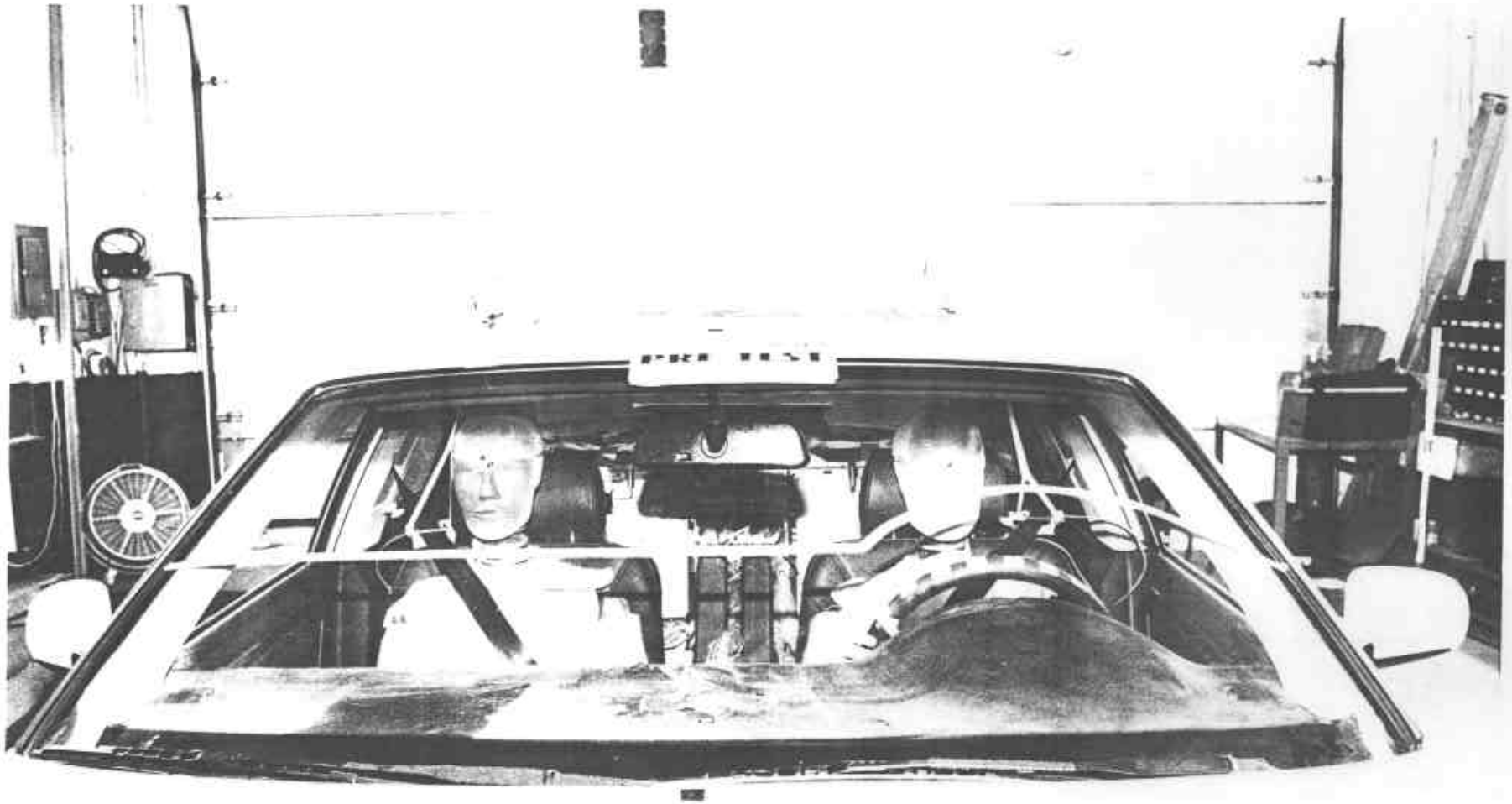


Photo No. A-20 - Pre-Test Windshield View

Photo No. A-21 - Post-Test Windshield View

A-22

Photo No. A-22 - Pre-Test Driver Dummy Position Left Side View

A-23

Photo No. A-23 - Post-Test Driver Dummy Position Left Side View

Photo No. A-24 - Pre-Test Driver Dummy Position Left Side View (Door Open)

Photo No. A-25 - Post-Test Driver Dummy Position Left Side View (Door Open)

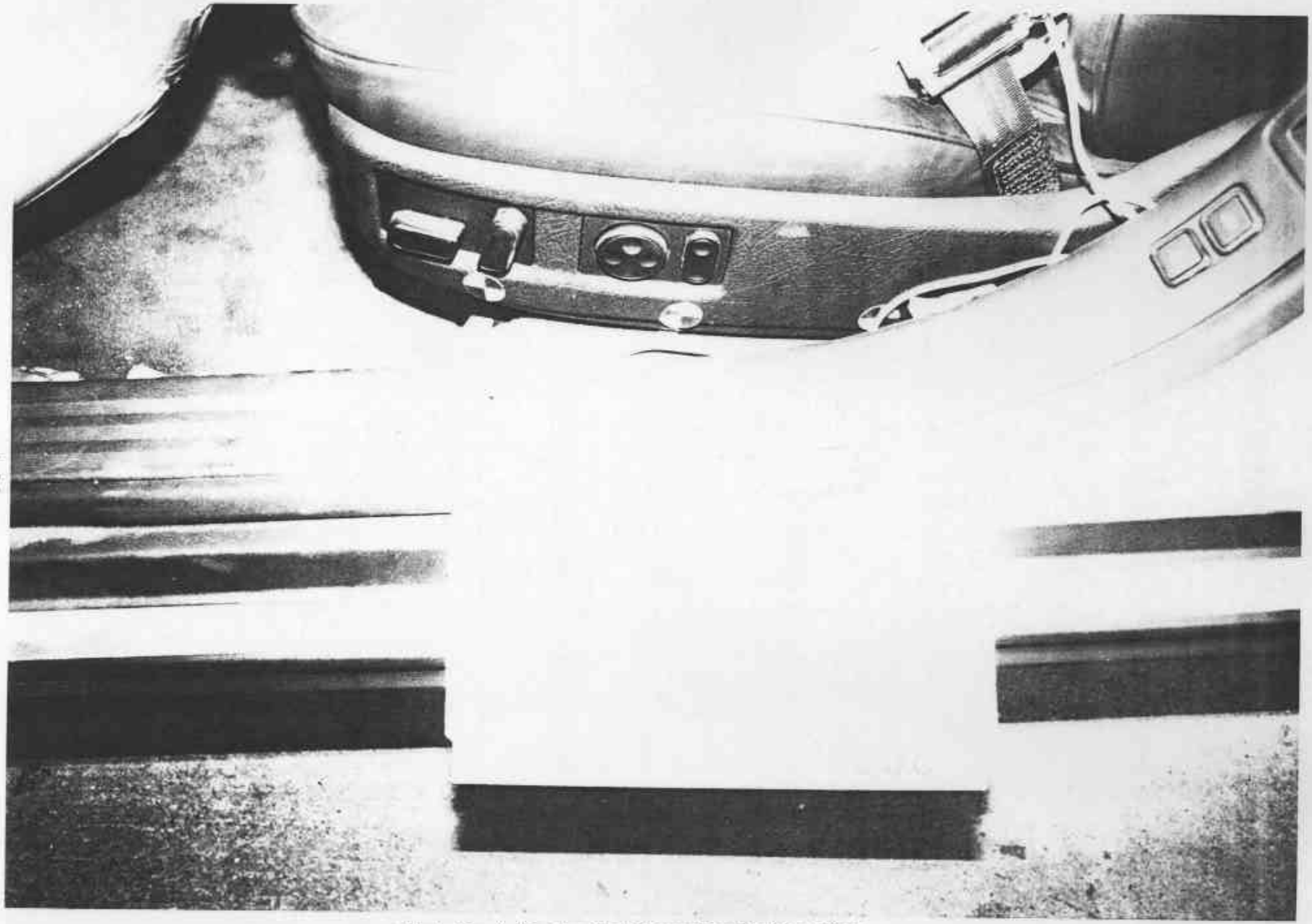


Photo No. A-26 - Pre-Test Driver Seat Position View

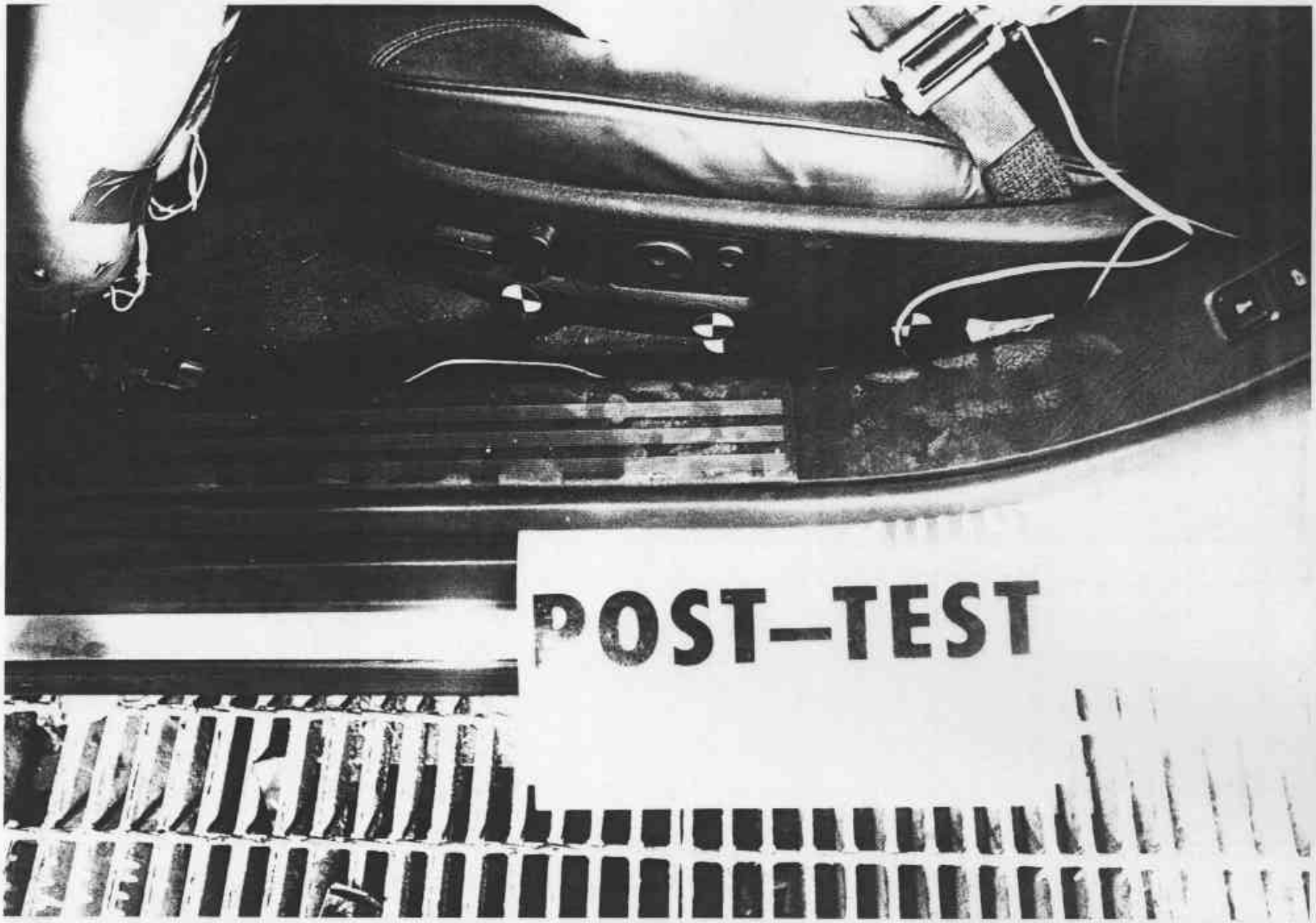


Photo No. A-27 - Post-Test Driver Seat Position View

Photo No. A-28 - Pre-Test Driver Dummy Knee Position

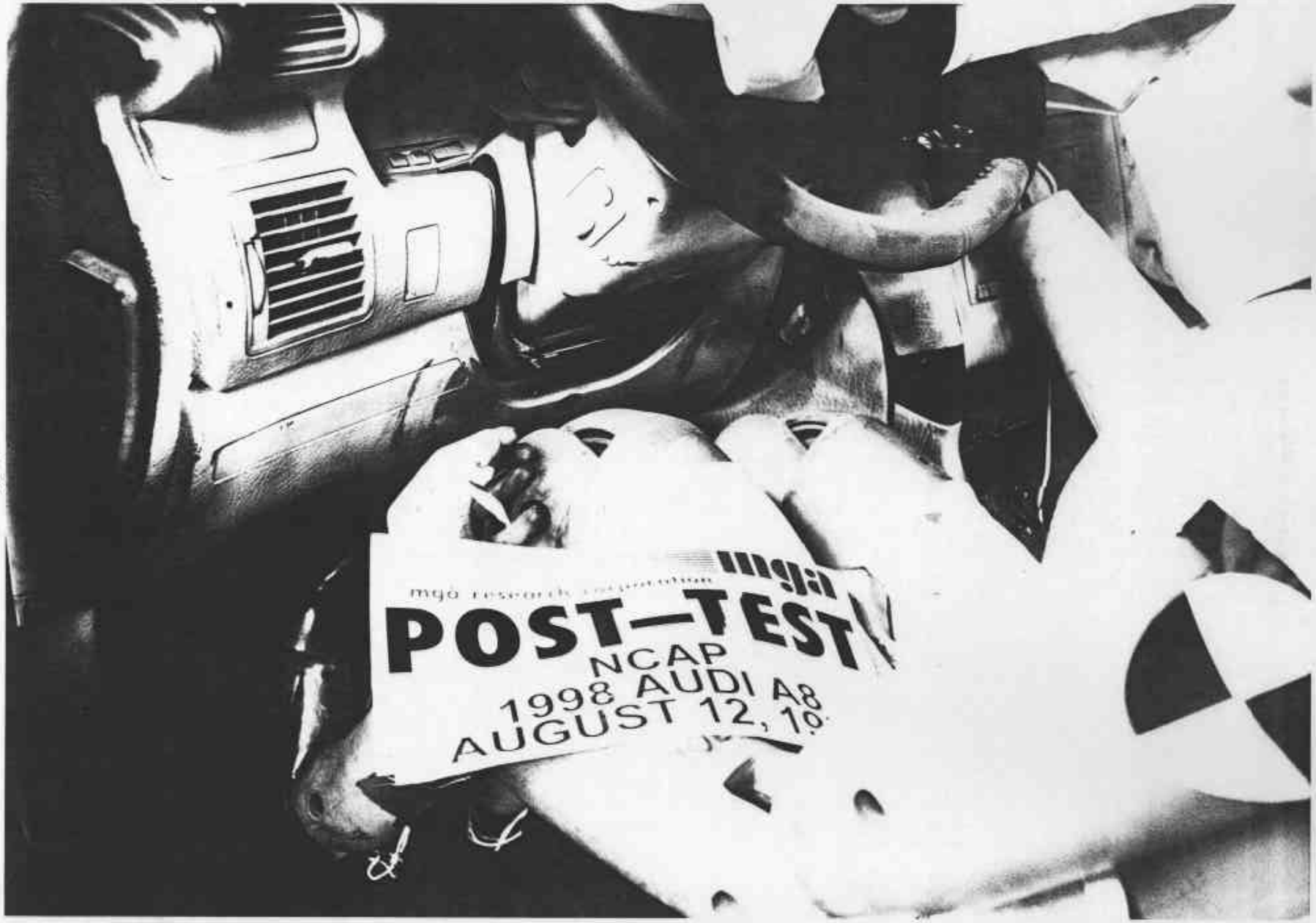


Photo No. A-29 - Post-Test Driver Dummy Knee Position

A-30

Photo No. A-30 - Post-Test Driver Airbag Contact

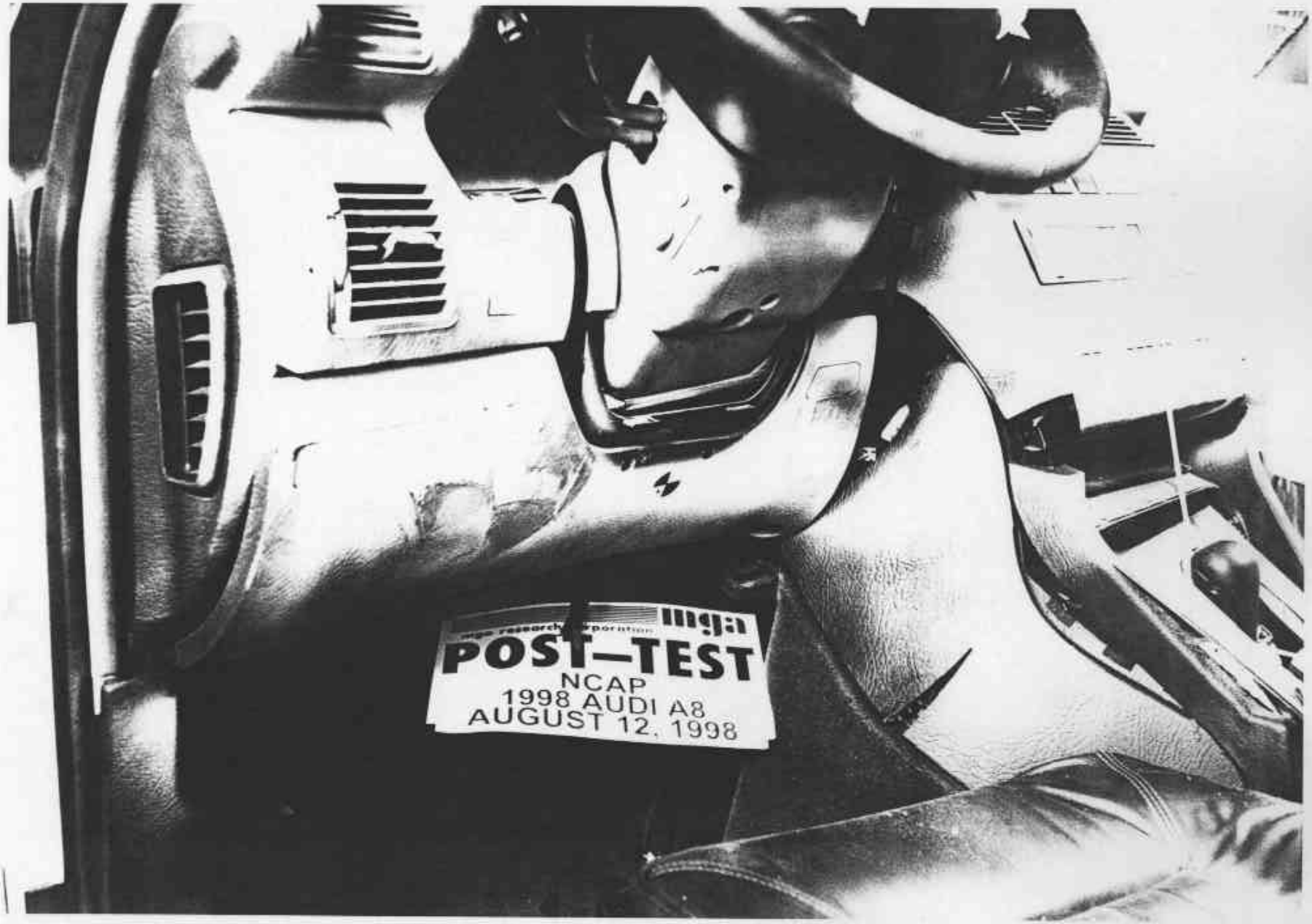


Photo No. A-31 - Post-Test Driver Knee Contact View

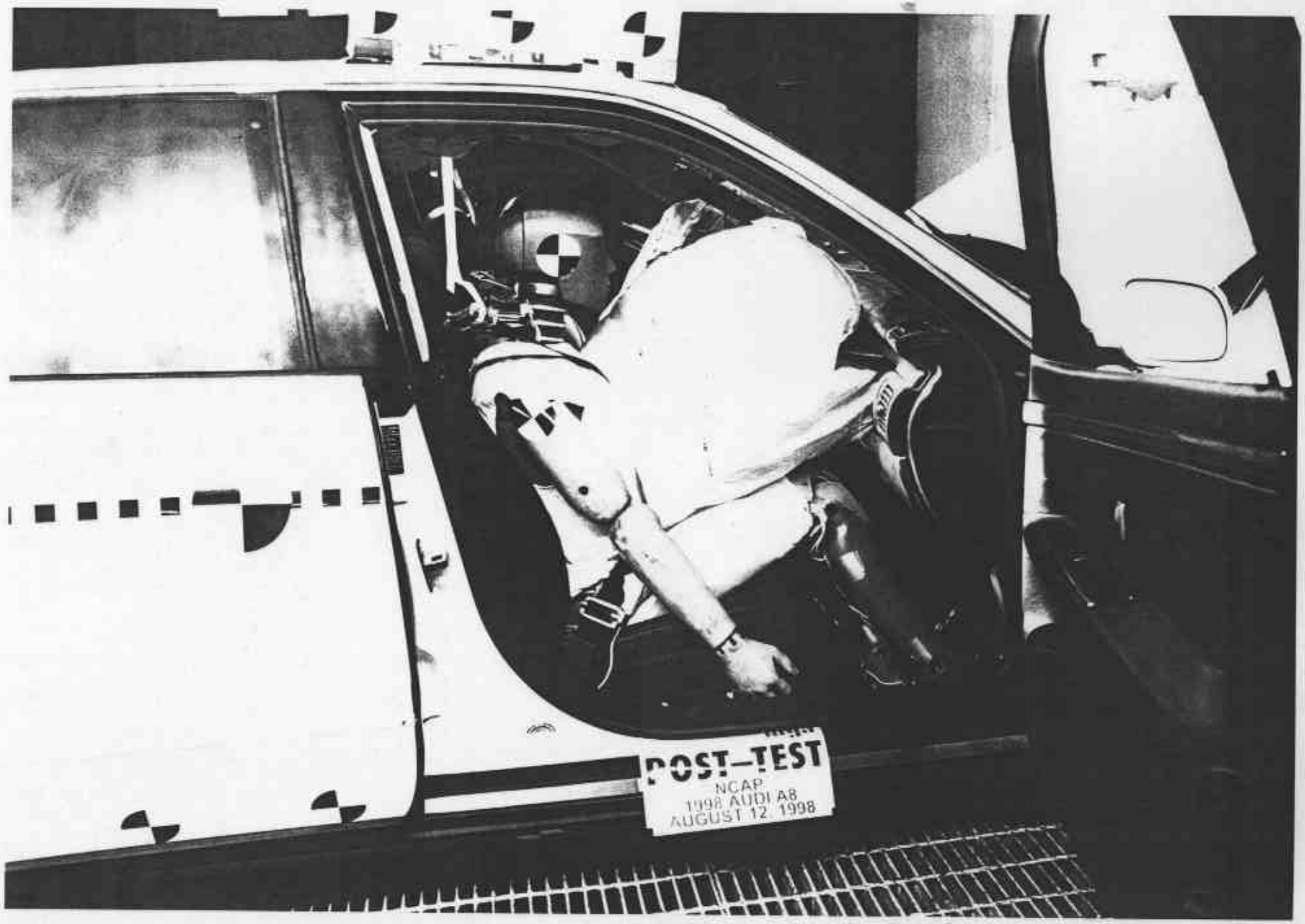
Photo No. A-32 - Post-Test Driver Head Contact View

Photo No. A-33 - Pre-Test Passenger Dummy Position Right Side View

Photo No. A-34 - Post-Test Passenger Dummy Position Right Side View

A-35

Photo No. A-35 - Pre-Test Passenger Dummy Position Right Side View (Door Open)



A-36

Photo No. A-36 - Post-Test Passenger Dummy Position Right Side View (Door Open)

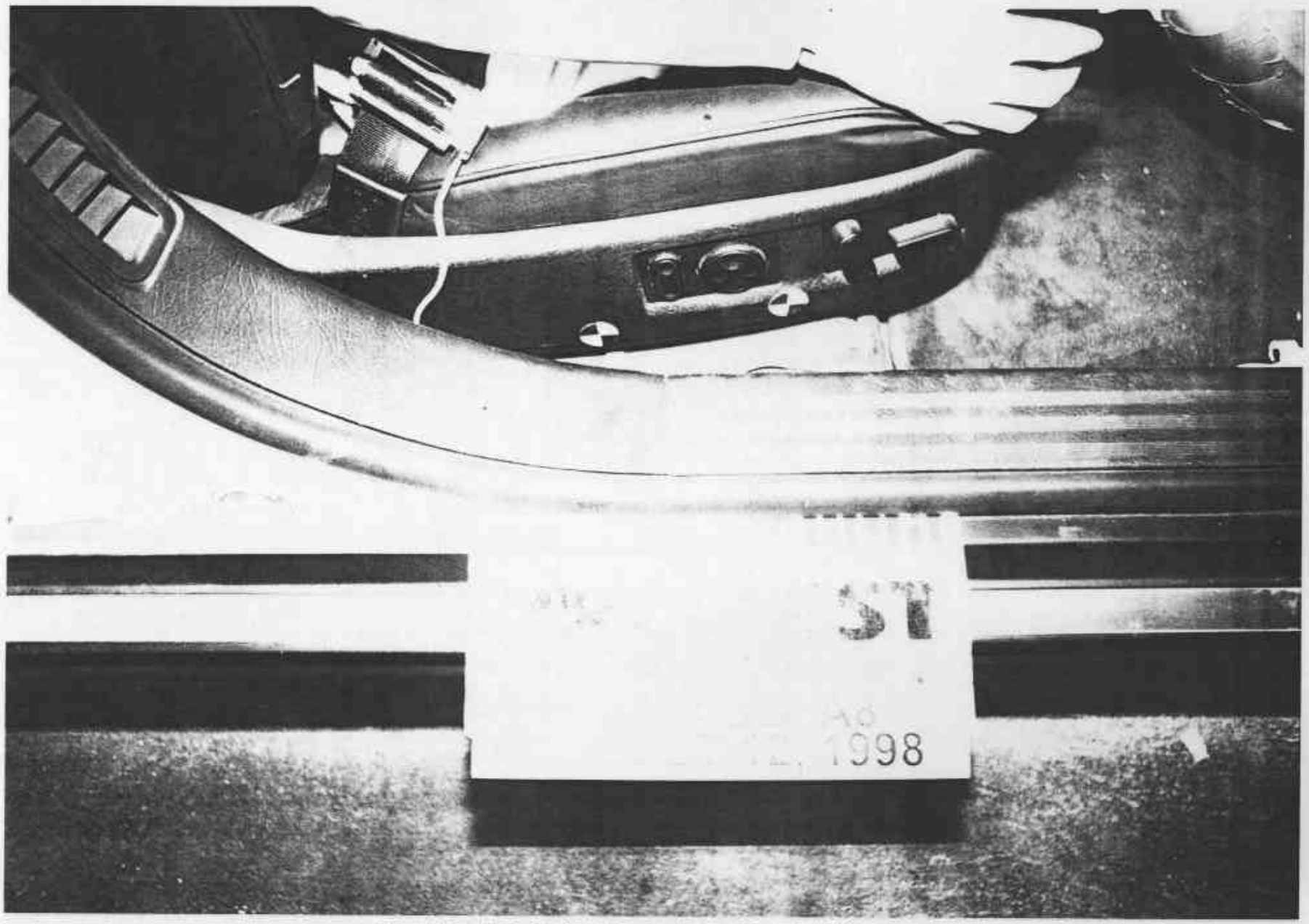


Photo No. A-37 - Pre-Test Passenger Seat Position View

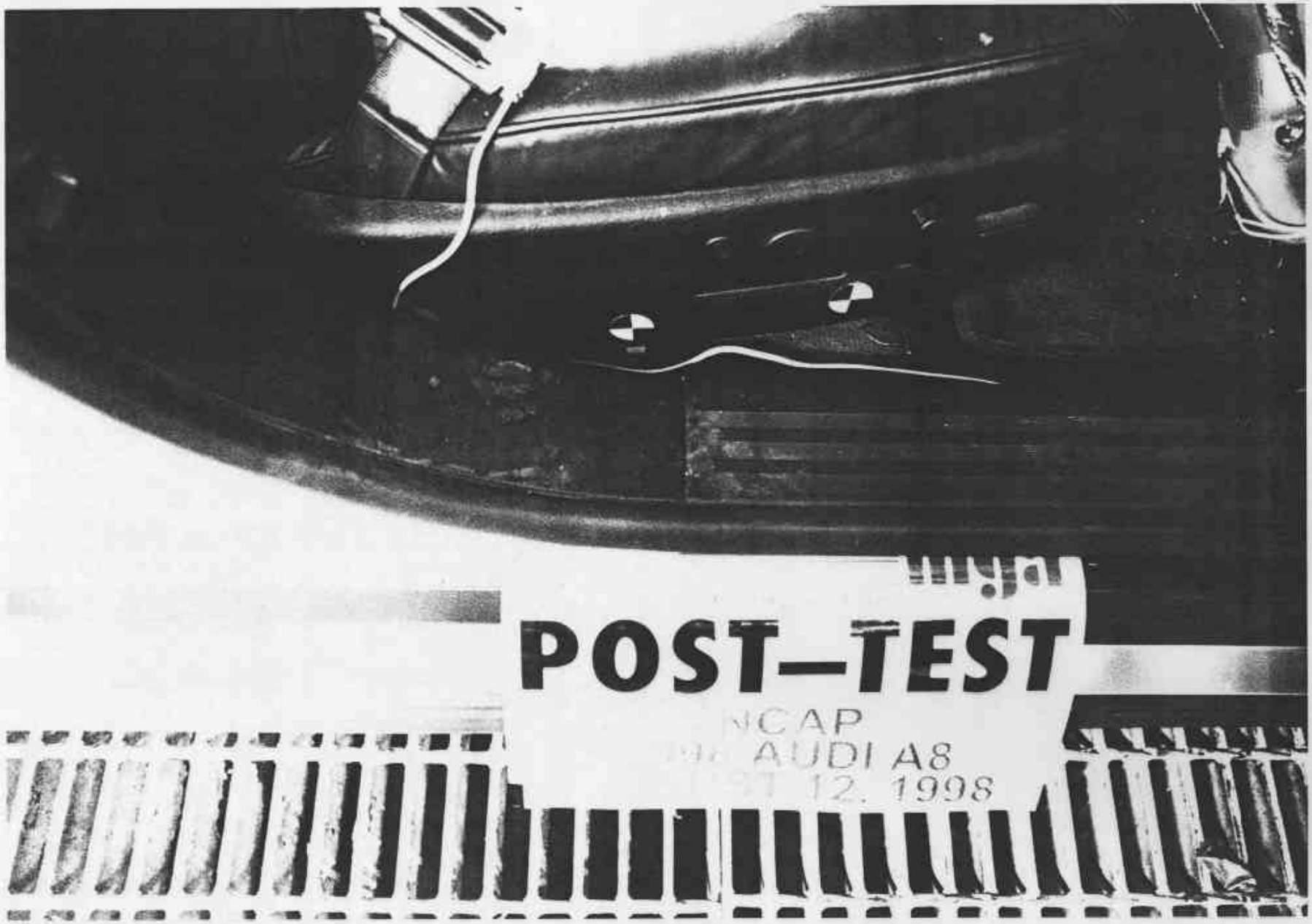


Photo No. A-38 - Post-Test Passenger Seat Position View

Photo No. A-39 - Pre-Test Passenger Dummy Knee Position

Photo No. A-40 - Post-Test Passenger Dummy Knee Position

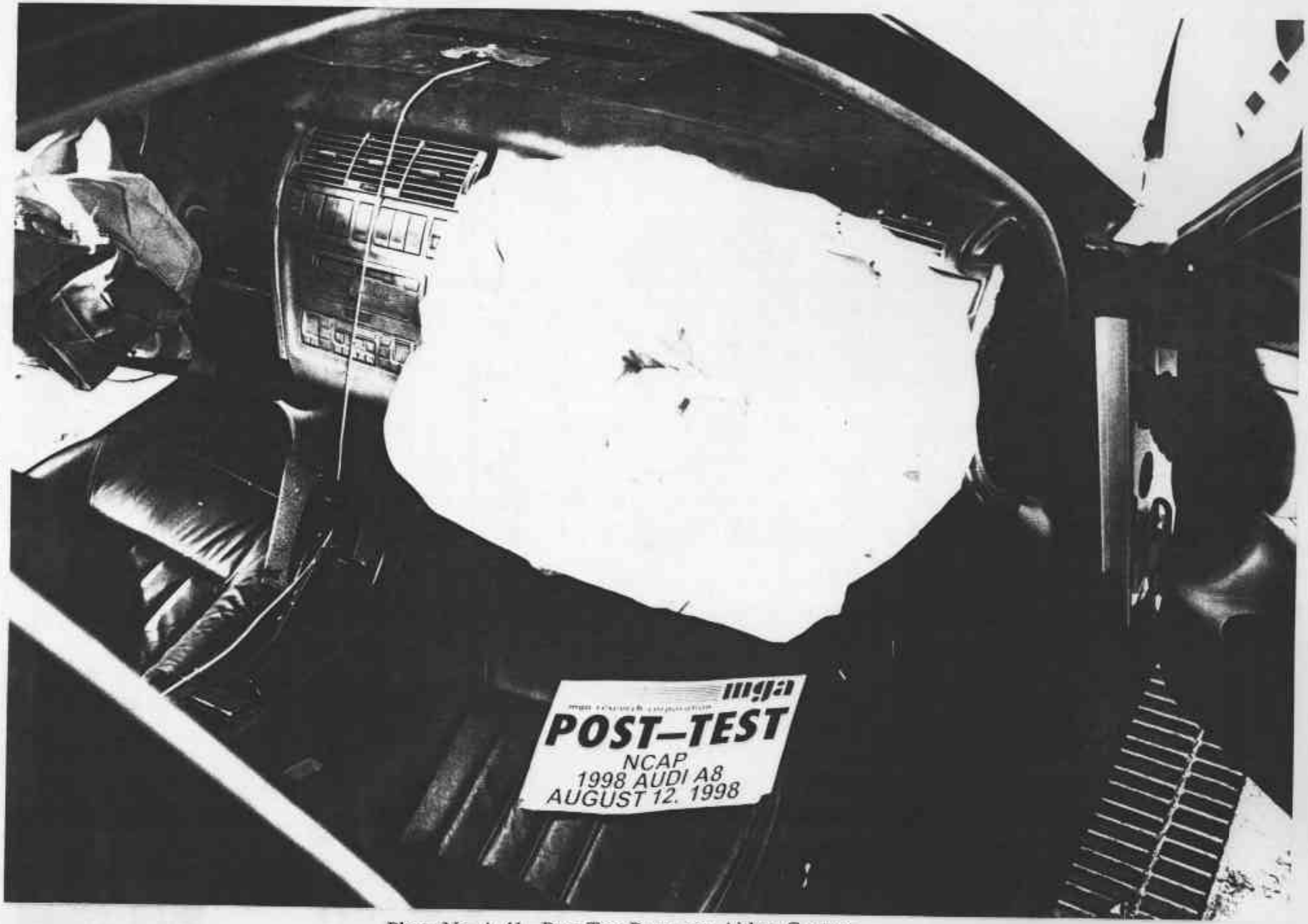


Photo No. A-41 - Post-Test Passenger Airbag Contact

Photo No. A-42 - Post-Test Passenger Knee Contact View

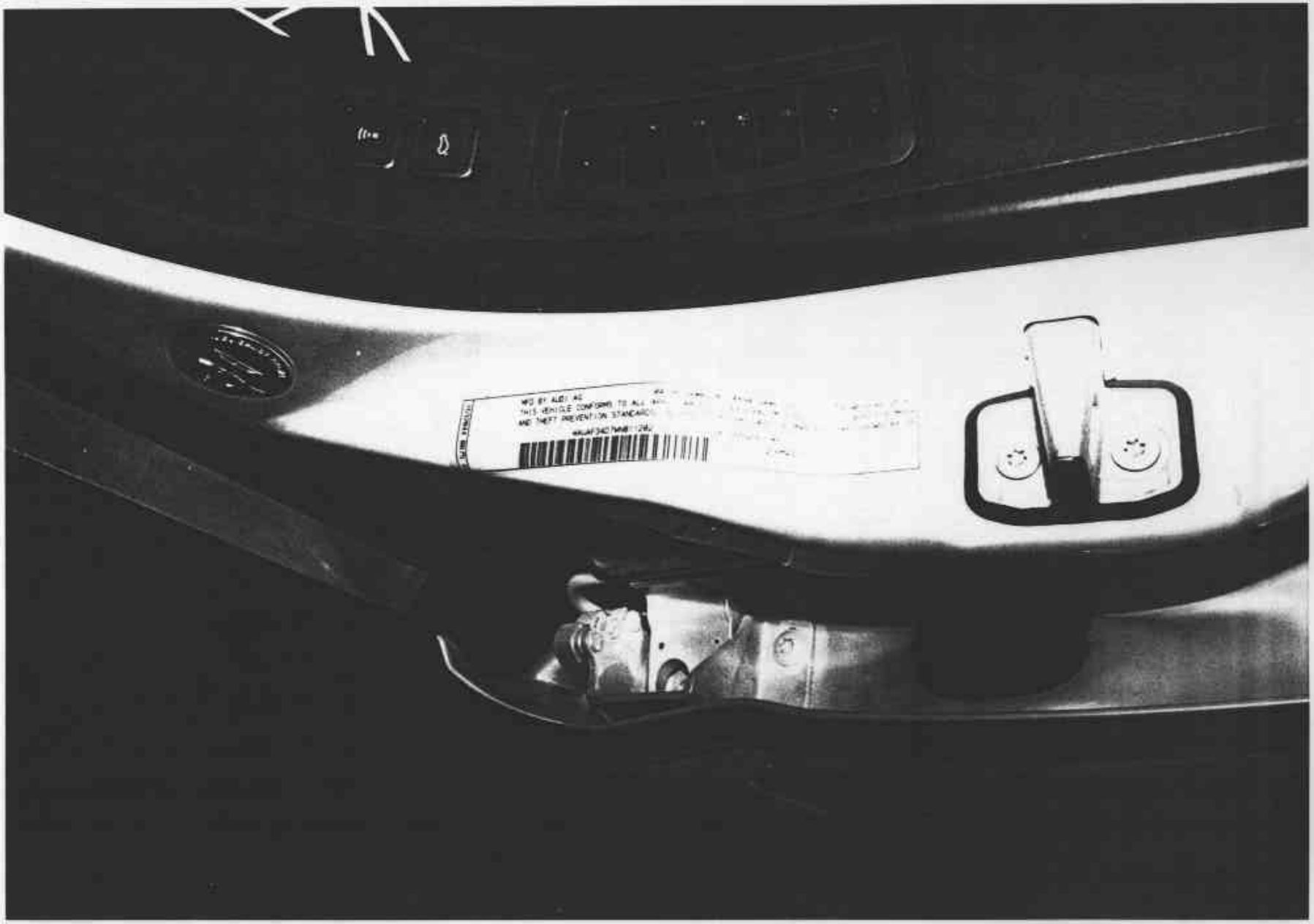


Photo No. A-43 - Vehicle Certification Label

Photo No. A-44 - Tire Placard

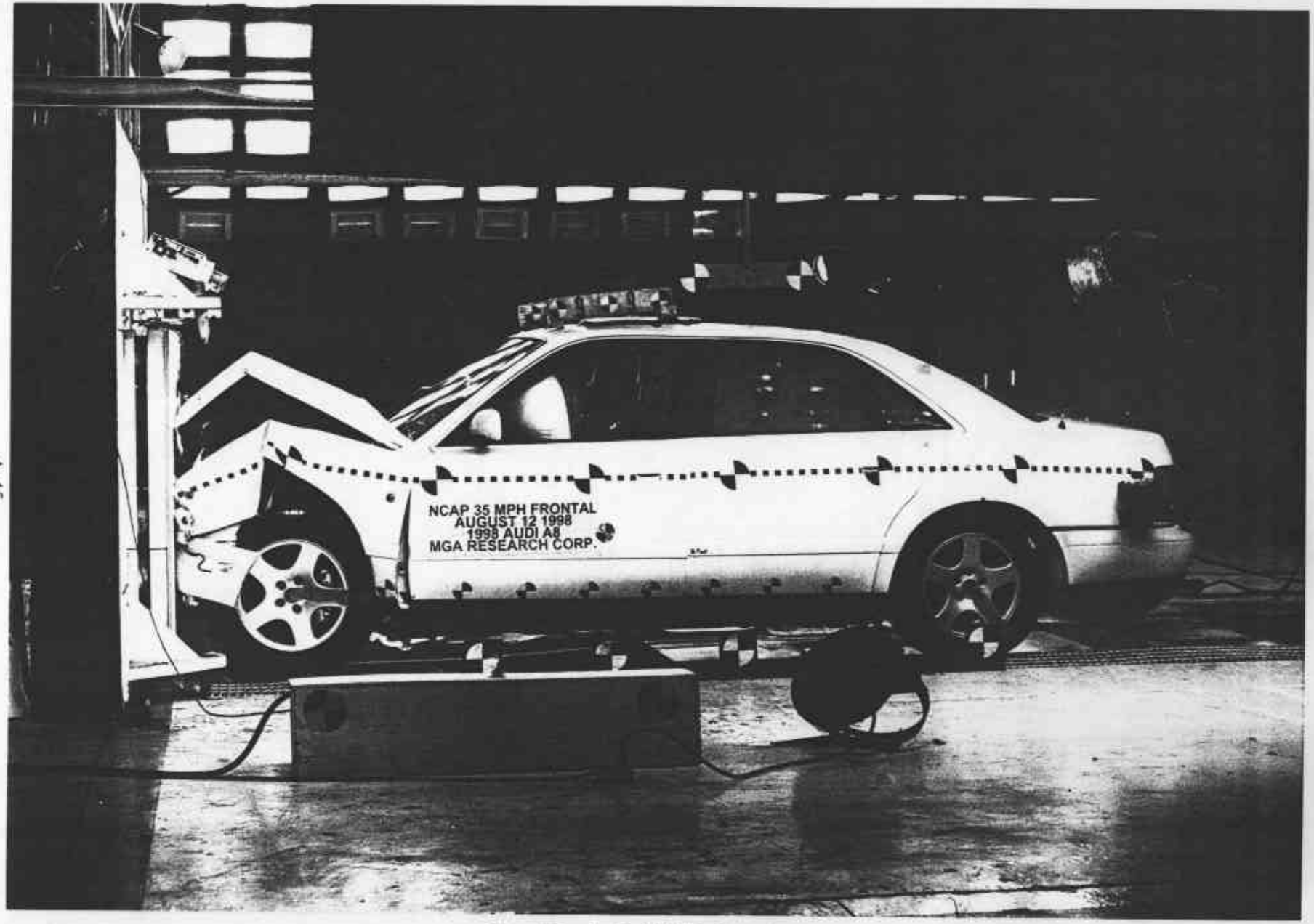


Photo No. A-45 - Vehicle Impact

Photo No. A-46 - Rollover 90°

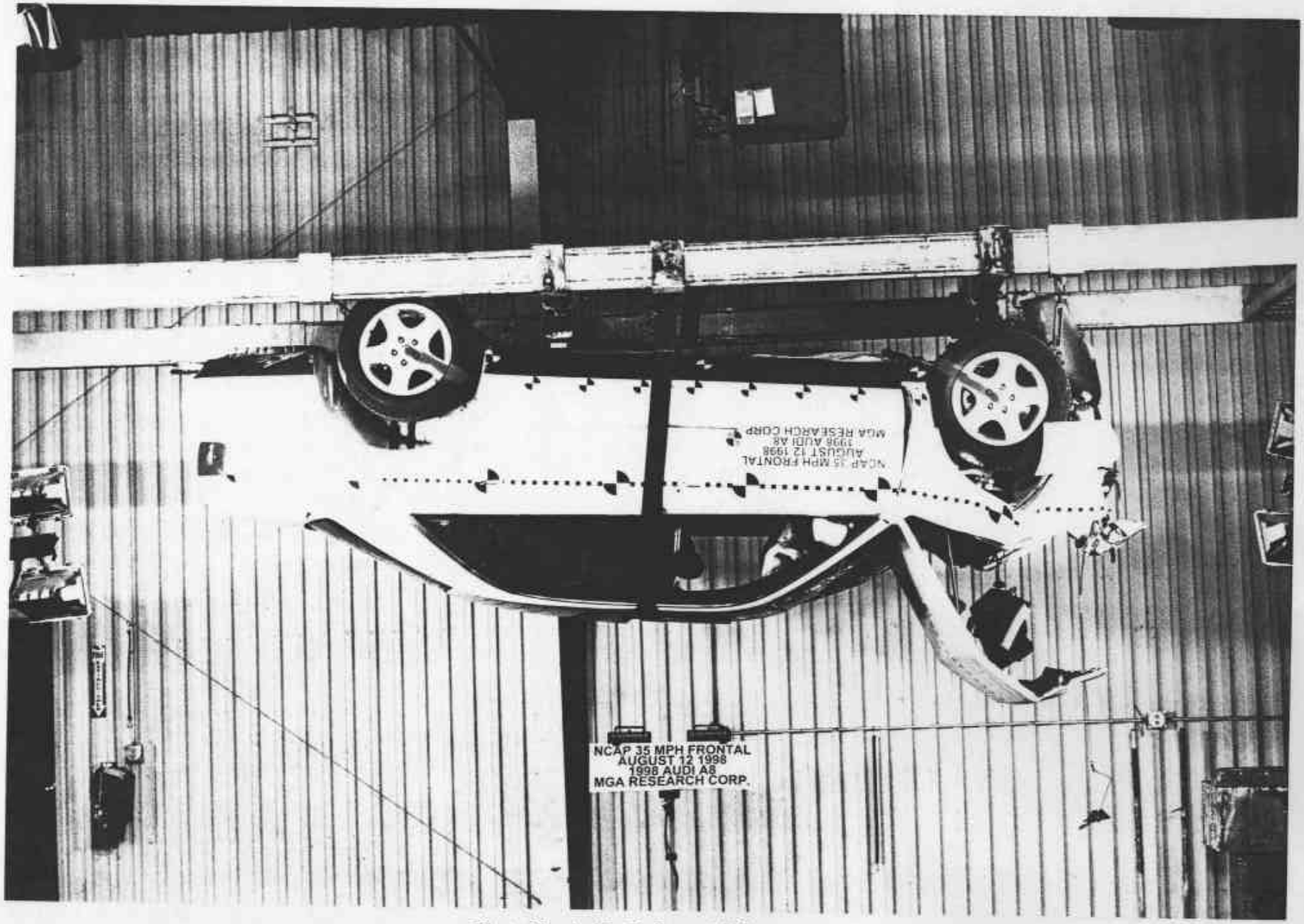


Photo No. A-47 - Rollover 180°

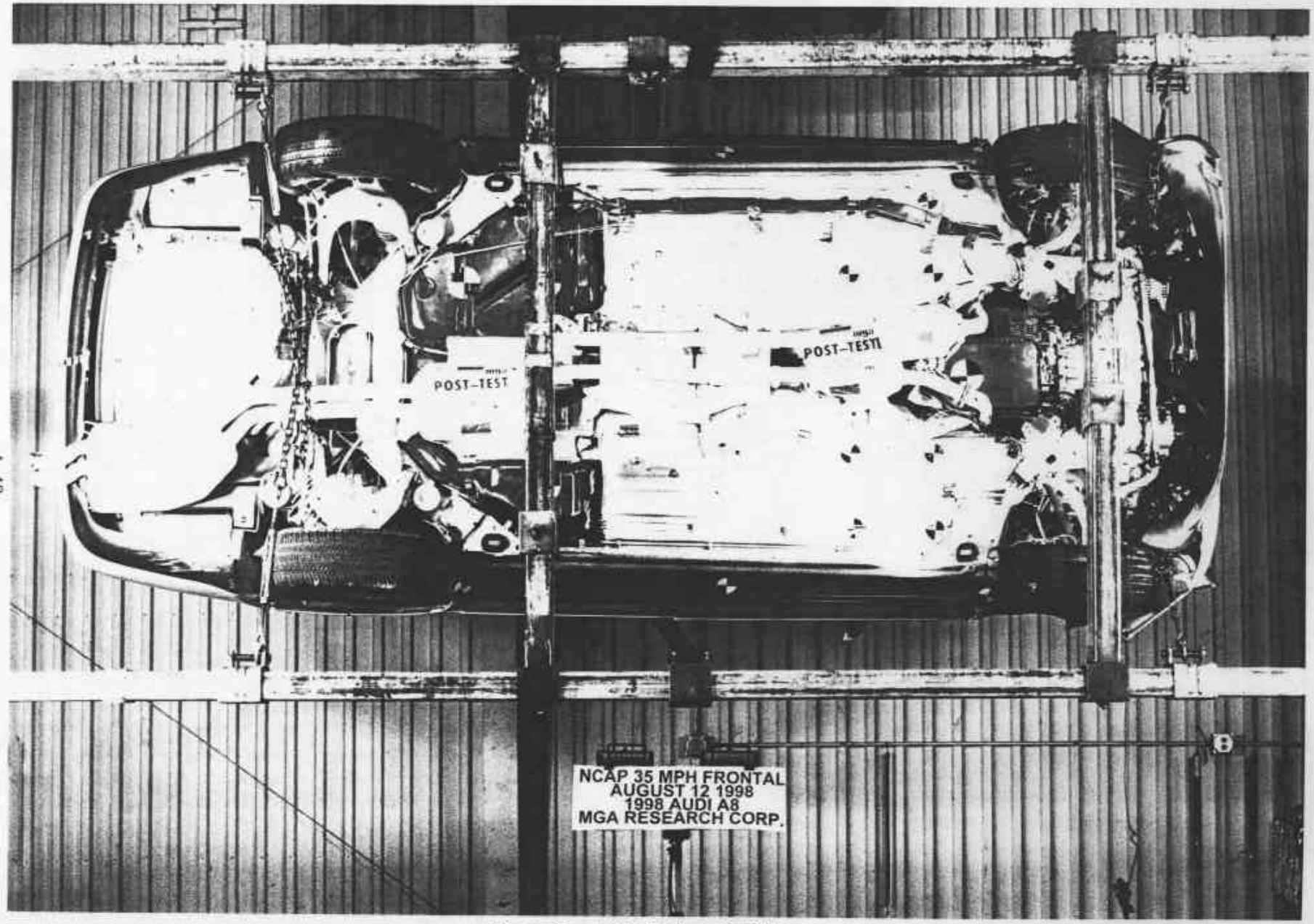


Photo No. A-48 - Rollover 270°

Photo No. A-49 - Rollover 360°

APPENDIX B

VEHICLE, LOAD CELL BARRIER AND DUMMY RESPONSE DATA

1998 Audi A8 4 Door

VEHICLE DATA FILTER CHANNEL CLASS

Head Accelerations 1000 (1650 Hz)

Chest Accelerations 180 (300 Hz)

Vehicle Accelerations 60 (100 Hz)

Barrier Load Cells 60 (100 Hz)

Femur Load Cells 600 (1000 Hz)

Lap and Torso Belts 60 (100 Hz)

Occupant Data	Page No.
Figure B-1 - Driver Head X Acceleration vs. Time	B-1
Figure B-2 - Driver Head Y Acceleration vs. Time	B-2
Figure B-3 - Driver Head Z Acceleration vs. Time	B-3
Figure B-4 - Driver Head Resultant Acceleration vs. Time	B-4
Figure B-5 - Driver Head X Velocity vs. Time	B-5
Figure B-6 - Driver Head Redundant X Acceleration vs. Time	B-6
Figure B-7 - Driver Head Redundant Y Acceleration vs. Time	B-7
Figure B-8 - Driver Head Redundant Z Acceleration vs. Time	B-8
Figure B-9 - Driver Head Redundant Resultant Acceleration vs. Time	B-9
Figure B-10 - Driver Head Redundant X Velocity vs. Time	B-10
Figure B-11 - Driver Neck Force X vs. Time	B-11
Figure B-12 - Driver Neck Force Y vs. Time	B-12
Figure B-13 - Driver Neck Force Z vs. Time	B-13
Figure B-14 - Driver Neck Force Resultant vs. Time	B-14
Figure B-15 - Driver Neck Moment X vs. Time	B-15
Figure B-16 - Driver Neck Moment Y vs. Time	B-16
Figure B-17 - Driver Neck Moment Z vs. Time	B-17
Figure B-18 - Driver Neck Moment Resultant vs. Time	B-18
Figure B-19 - Driver Occipital Condyle Moment Y Acceleration vs. Time	B-19
Figure B-20 - Driver Chest X Acceleration vs. Time	B-20
Figure B-21 - Driver Chest Y Acceleration vs. Time	B-21
Figure B-22 - Driver Chest Z Acceleration vs. Time	B-22

Occupant Data: (Cont'd) Page No.
Figure B-23 - Driver Chest Resultant Acceleration vs. Time B-23
Figure B-24 - Driver Chest X Velocity vs. Time B-24
Figure B-25 - Driver Chest Redundant X Acceleration vs. Time B-25
Figure B-26 - Driver Chest Redundant Y Acceleration vs. Time B-26
Figure B-27 - Driver Chest Redundant Z Acceleration vs. Time B-27
Figure B-28 - Driver Chest Redundant Resultant Acceleration vs. Time B-28
Figure B-29 - Driver Chest Redundant X Velocity vs. Time B-29
Figure B-30 - Driver Chest Compression vs. Time B-30
Figure B-31 - Driver Pelvis X Acceleration vs. Time B-31
Figure B-32 - Driver Pelvis Y Acceleration vs. Time B-32
Figure B-33 - Driver Pelvis Z Acceleration vs. Time B-33
Figure B-34 - Driver Pelvis Resultant Acceleration vs. Time B-34
Figure B-35 - Driver Pelvis X Velocity vs. Time B-35
Figure B-36 - Driver Left Femur Force vs. Time B-36
Figure B-37 - Driver Right Femur Force vs. Time B-37
Figure B-38 - Driver Left Upper Tibia Moment X vs. Time B-38
Figure B-39 - Driver Left Upper Tibia Moment Y vs. Time B-39
Figure B-40 - Driver Left Lower Tibia Force X vs. Time B-40
Figure B-41 - Driver Left Lower Tibia Force Z vs. Time B-41
Figure B-42 - Driver Left Lower Tibia Moment Y vs. Time B-42
Figure B-43 - Driver Right Upper Tibia Moment X vs. Time B-43
Figure B-44 - Driver Right Upper Tibia Moment Y vs. Time B-44
Figure B-45 - Driver Right Lower Tibia Force X vs. Time B-45
Figure B-46 - Driver Right Lower Tibia Force Z vs. Time B-46
Figure B-47 - Driver Right Lower Tibia Moment Y vs. Time B-47
Figure B-48 - Driver Left Foot Ball Z Acceleration vs. Time B-48
Figure B-49 - Driver Left Heel X Acceleration vs. Time B-49
Figure B-50 - Driver Left Heel Z Acceleration vs. Time B-50
Figure B-51 - Driver Right Foot Ball Z Acceleration vs. Time B-51
Figure B-52 - Driver Right Heel X Acceleration vs. Time B-52
Figure B-53 - Driver Right Heel Z Acceleration vs. Time B-53
Figure B-54 - Driver Lap Belt Force vs. Time B-54

Occupant Data: (Cont'd)	Page No.
Figure B-55 - Driver Shoulder Belt Force vs. Time	B-55
Figure B-56 - Passenger Head X Acceleration vs. Time	B-56
Figure B-57 - Passenger Head Y Acceleration vs. Time	B-57
Figure B-58 - Passenger Head Z Acceleration vs. Time	B-58
Figure B-59 - Passenger Head Resultant Acceleration vs. Time	B-59
Figure B-60 - Passenger Head X Velocity vs. Time	B-60
Figure B-61 - Passenger Head Redundant X Acceleration vs. Time	B-61
Figure B-62 - Passenger Head Redundant Y Acceleration vs. Time	B-62
Figure B-63- Passenger Head Redundant Z Acceleration vs. Time	B-63
Figure B-64 - Passenger Head Redundant Resultant Acceleration vs. Time	B-64
Figure B-65 - Passenger Head Redundant X Velocity vs. Time	B-65
Figure B-66 - Passenger Neck Force X vs. Time	B-66
Figure B-67 - Passenger Neck Force Y vs. Time	B-67
Figure B-68 - Passenger Neck Force Z vs. Time	B-68
Figure B-69 - Passenger Neck Force Resultant vs. Time	B-69
Figure B-70 - Passenger Neck Moment X vs. Time	B-70
Figure B-71 - Passenger Neck Moment Y vs. Time	B-71
Figure B-72 - Passenger Neck Moment Z vs. Time	B-72
Figure B-73 - Passenger Neck Moment Resultant vs. Time	B-73
Figure B-74 - Passenger Occipital Condyle Moment Y Acceleration vs. Time	B-74
Figure B-75 - Passenger Chest X Acceleration vs. Time	B-75
Figure B-76 - Passenger Chest Y Acceleration vs. Time	B-76
Figure B-77 - Passenger Chest Z Acceleration vs. Time	B-77
Figure B-78 - Passenger Chest Resultant Acceleration vs. Time	B-78
Figure B-79 - Passenger Chest X Velocity vs. Time	B-79
Figure B-80 - Passenger Chest Redundant X Acceleration vs. Time	B-80
Figure B-81 - Passenger Chest Redundant Y Acceleration vs. Time	B-81
Figure B-82 - Passenger Chest Redundant Z Acceleration vs. Time	B-82
Figure B-83 - Passenger Chest Redundant Resultant Acceleration vs. Time	B-83
Figure B-84 - Passenger Chest Redundant X Velocity vs. Time	B-84
Figure B-85 - Passenger Chest Compression vs. Time	B-85
Figure B-86 - Passenger Pelvis X Acceleration vs. Time	B-86

Occupant Data: (Cont'd) Page No.

Figure B-87 - Passenger Pelvis Y Acceleration vs. Time B-87

Figure B-88 - Passenger Pelvis Z Acceleration vs. Time B-88

Figure B-89 - Passenger Pelvis Resultant Acceleration vs. Time B-89

Figure B-90 - Passenger Pelvis X Velocity vs. Time B-90

Figure B-91 - Passenger Left Femur Force vs. Time B-91

Figure B-92 - Passenger Right Femur Force vs. Time B-92

Figure B-93 - Passenger Left Upper Tibia Moment X vs. Time B-93

Figure B-94 - Passenger Left Upper Tibia Moment Y vs. Time B-94

Figure B-95 - Passenger Left Lower Tibia Force X vs. Time B-95

Figure B-96 - Passenger Left Lower Tibia Force Z vs. Time B-96

Figure B-97 - Passenger Left Lower Tibia Moment Y vs. Time B-97

Figure B-98 - Passenger Right Upper Tibia Moment X vs. Time B-98

Figure B-99 - Passenger Right Upper Tibia Moment Y vs. Time B-99

Figure B-100 - Passenger Right Lower Tibia Force X vs. Time B-100

Figure B-101 - Passenger Right Lower Tibia Force Z vs. Time B-101

Figure B-102 - Passenger Right Lower Tibia Moment Y vs. Time B-102

Figure B-103 - Passenger Left Foot Ball Z Acceleration vs. Time B-103

Figure B-104 - Passenger Left Heel X Acceleration vs. Time B-104

Figure B-105 - Passenger Left Heel Z Acceleration vs. Time B-105

Figure B-106 - Passenger Right Foot Ball Z Acceleration vs. Time B-106

Figure B-107 - Passenger Right Heel X Acceleration vs. Time B-107

Figure B-108 - Passenger Right Heel Z Acceleration vs. Time B-108

Figure B-109 - Passenger Lap Belt Force vs. Time B-109

Figure B-110 - Passenger Shoulder Belt Force vs. Time B-110

Figure B-111- Left Rear Seat Crossmember X Acceleration vs. Time B-111

Figure B-112 - Left Rear Seat Crossmember X Velocity vs. Time B-112

Figure B-113 - Left Rear Seat Crossmember X Displacement vs. Time B-113

Figure B-114 - Right Rear Seat Crossmember X Acceleration vs. Time B-114

Figure B-115- Right Rear Seat Crossmember X Velocity vs. Time B-115

Figure B-116 - Right Rear Seat Crossmember X Displacement vs. Time B-116

Figure B-117 - Top of Engine Block X Acceleration vs. Time B-117

Figure B-118 - Top of Engine Block X Velocity vs. Time B-118

Vehicle and Barrier Data:

Figure B-119 - Top of Engine Block X Displacement vs. Time B-119

Figure B-120 - Bottom of Engine X Acceleration vs. Time B-120

Figure B-121 - Bottom of Engine X Velocity vs. Time B-121

Figure B-122 - Bottom of Engine X Displacement vs. Time B-122

Figure B-123 - Left Front Brake Caliper X Acceleration vs. Time B-123

Figure B-124 - Left Front Brake Caliper X Velocity vs. Time B-124

Figure B-125 - Left Front Brake Caliper X Displacement vs. Time B-125

Figure B-126 - Right Front Brake Caliper X Acceleration vs. Time B-126

Figure B-127 - Right Front Brake Caliper X Velocity vs. Time B-127

Figure B-128 - Right Front Brake Caliper X Displacement vs. Time B-128

Figure B-129 - Instrument Panel X Acceleration vs. Time B-129

Figure B-130 - Instrument Panel X Velocity vs. Time B-130

Figure B-131 - Instrument Panel X Displacement vs. Time B-131

Figure B-132 - Left Front Rocker X Acceleration vs. Time B-132

Figure B-133 - Left Front Rocker X Velocity vs. Time B-133

Figure B-134 - Left Front Rocker X Displacement vs. Time B-134

Figure B-135 - Right Front Rocker X Acceleration vs. Time B-135

Figure B-136 - Right Front Rocker X Velocity vs. Time B-136

Figure B-137 - Right Front Rocker X Displacement vs. Time B-137

Figure B-138 - Left Rear Seat Crossmember Redundant X Acceleration vs. Time B-138

Figure B-139 - Left Rear Seat Crossmember Redundant X Velocity vs. Time B-139

Figure B-140 - Left Rear Seat Crossmember Redundant X Displacement vs. Time B-140

Figure B-141 - Right Rear Seat Crossmember Redundant X Acceleration vs. Time B-141

Figure B-142 - Right Rear Seat Crossmember Redundant X Velocity vs. Time B-142

Figure B-143 - Right Rear Seat Crossmember Redundant X Displacement vs. Time B-143

Figure B-144 - Upper Left Barrier Force vs. Time B-144

Figure B-145 - Upper Center Barrier Force vs. Time B-145

Figure B-146 - Upper Right Barrier Force vs. Time B-146

Figure B-147 - Lower Left Barrier Force vs. Time B-147

Figure B-148 - Lower Center Barrier Force vs. Time B-148

Figure B-149 - Lower Right Barrier Force vs. Time B-149

Figure B-150 - Sum of Left Barrier Forces vs. Time B-150

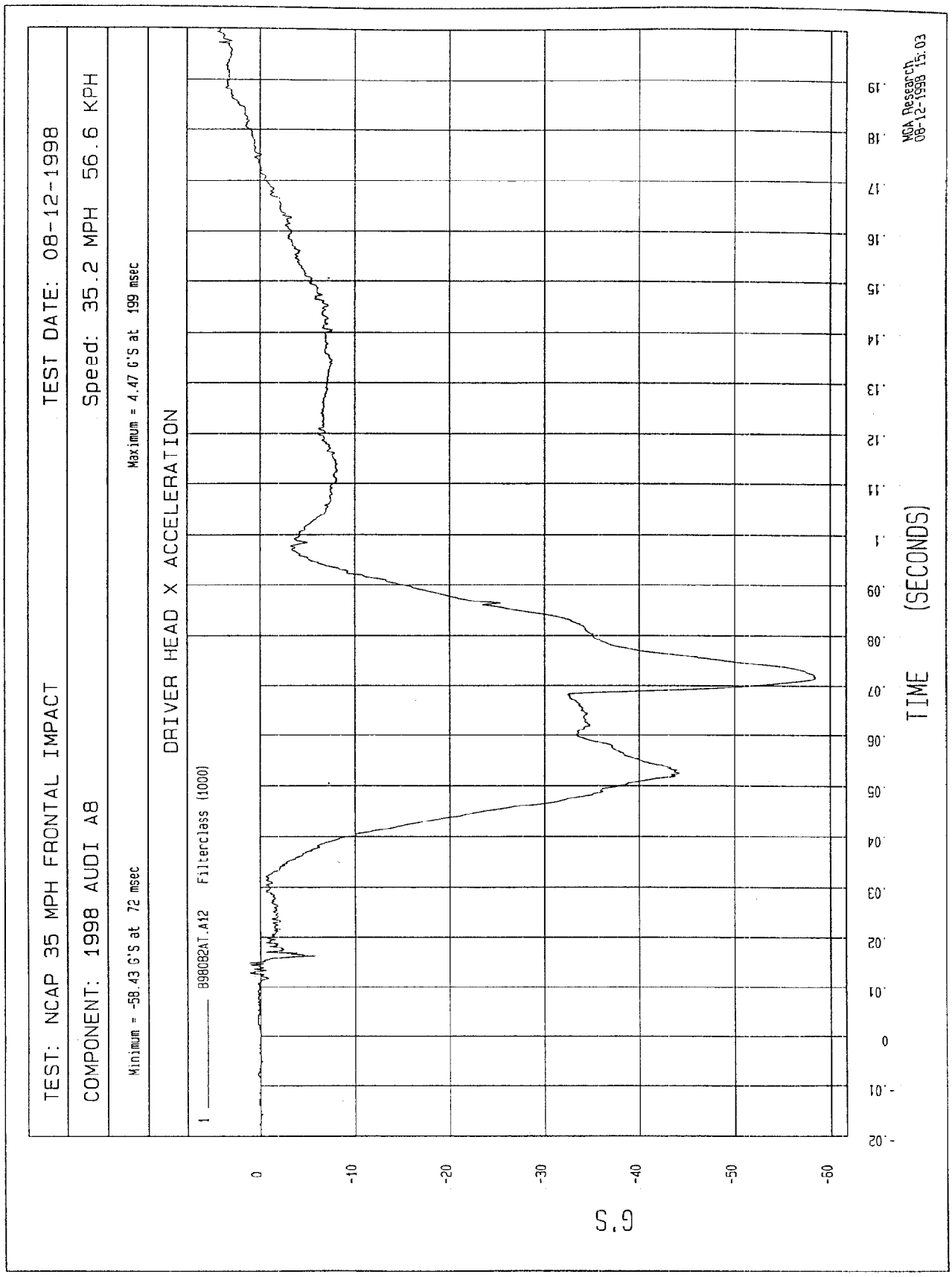
Vehicle and Barrier Data:

Figure B-151 - Sum of Center Barrier Forces vs. Time B-151

Figure B-152 - Sum of Right Barrier Forces vs. Time B-152

Figure B-153 - Sum of Barrier Forces vs. Time B-153

Figure B-154 - Barrier Force vs. Average Rear Crossmember Displacement B-154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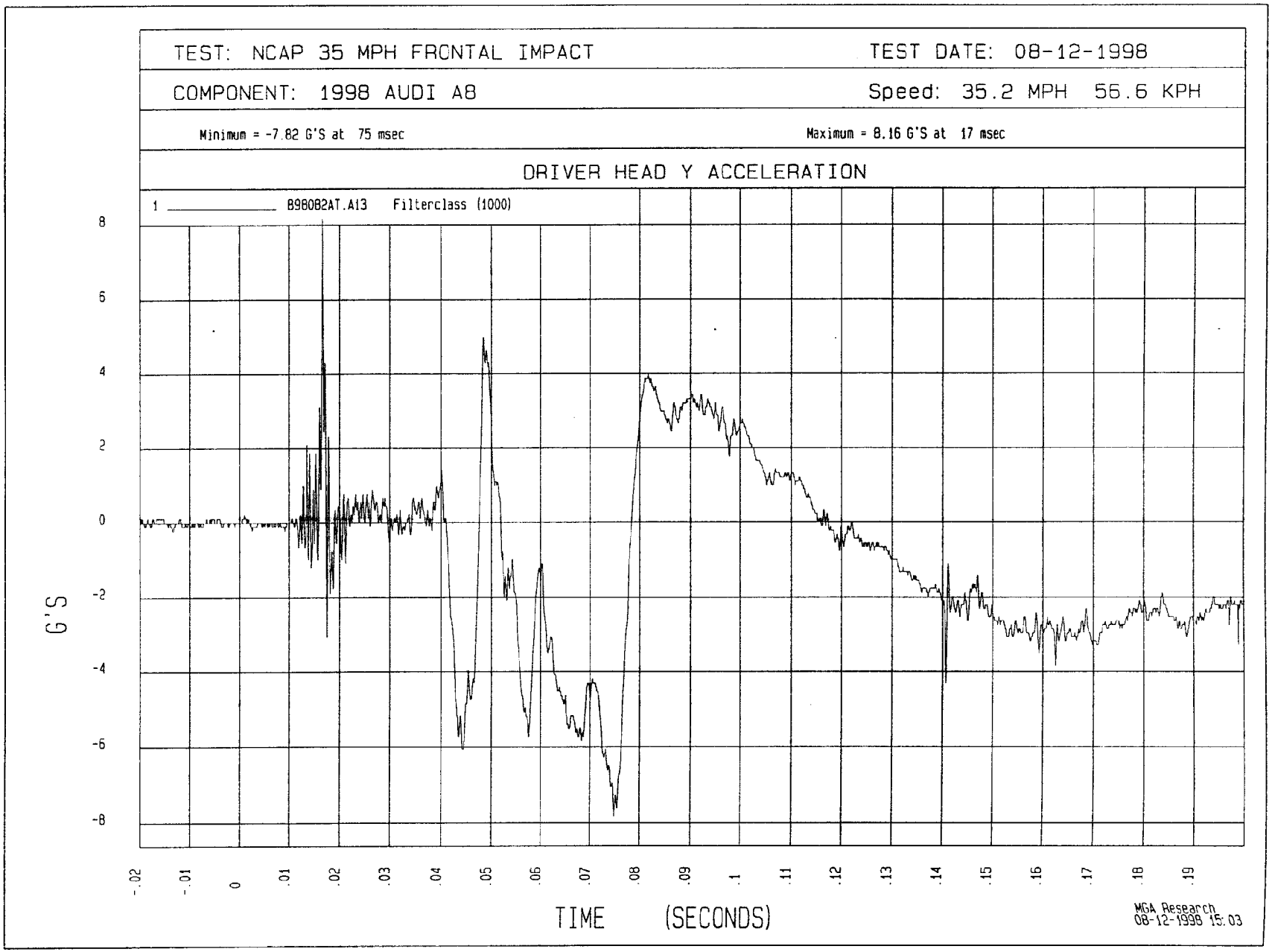
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -58.43 G'S at 72 msec
Maximum = 4.47 G'S at 199 msec
DRIVER HEAD X ACCELERATION
1 ——— 980082AT.A12 Filterclass (1000)
0
-10
-20
-30
-40
-50
-60
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:03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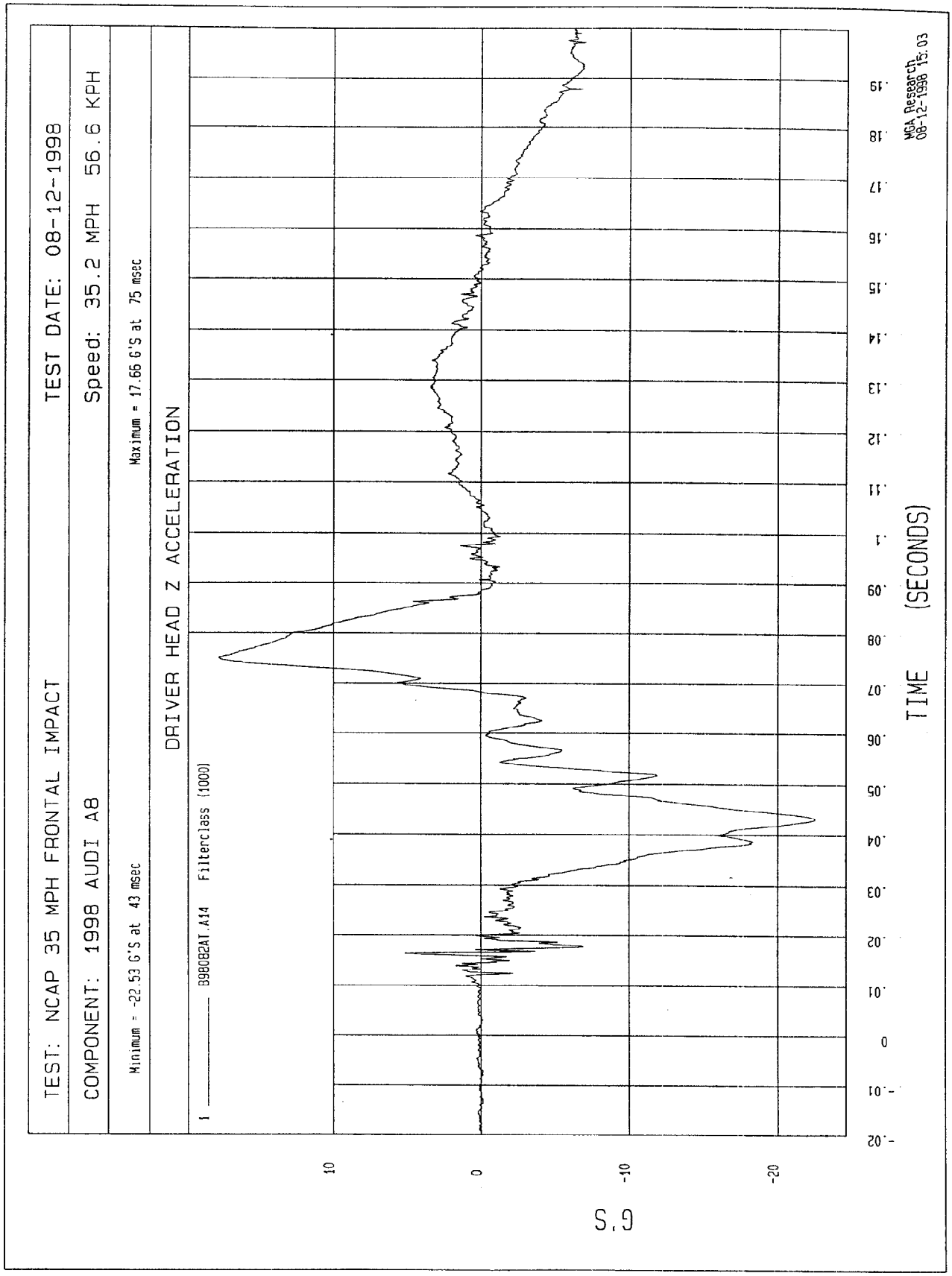
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -7.82 G'S at 75 msec
Maximum = 8.16 G'S at 17 msec
DRIVER HEAD Y ACCELERATION
1 B98082AT.A13 Filterclass (1000)
8
6
4
2
0
-2
-4
-6
-8
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:03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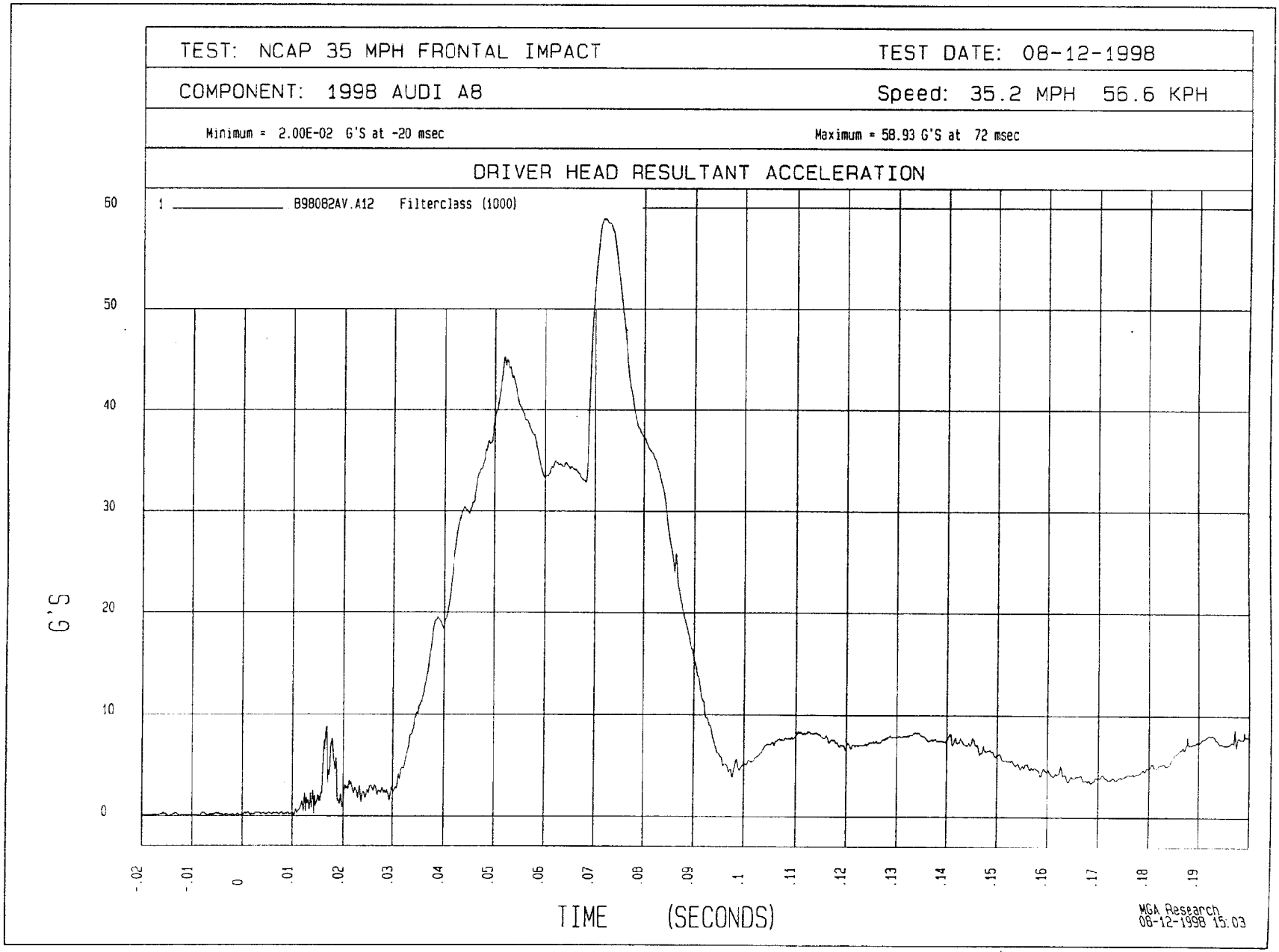
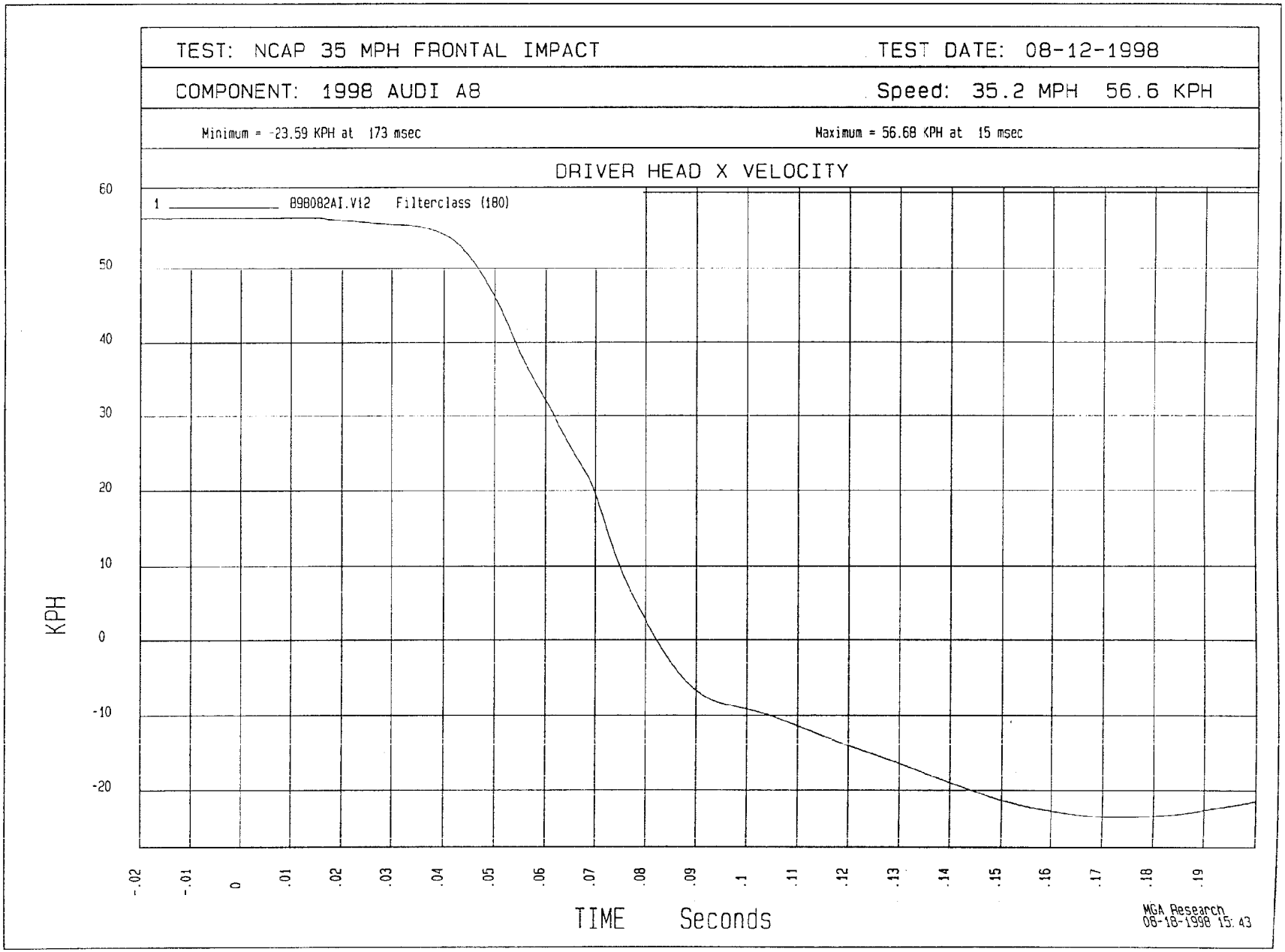
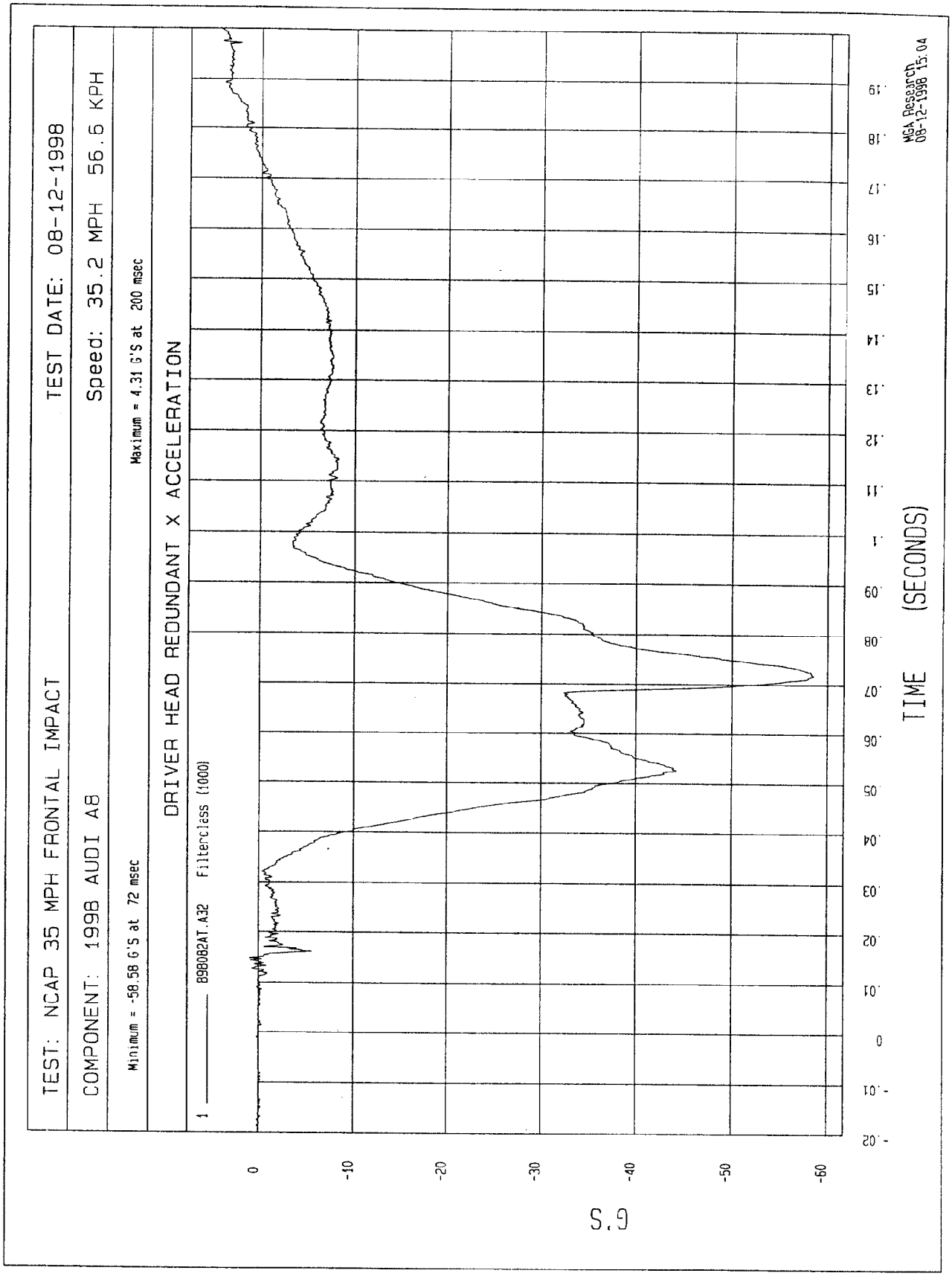
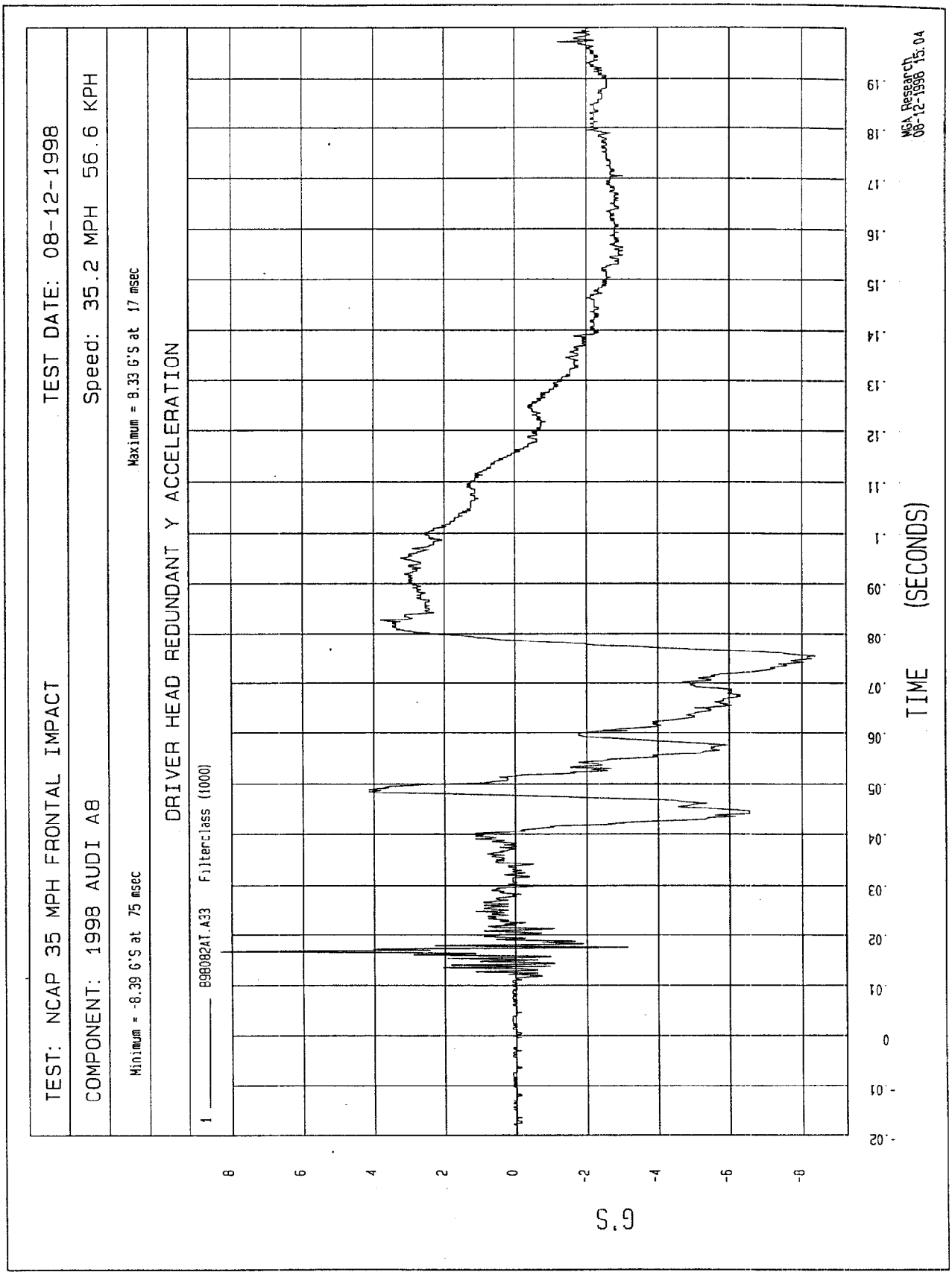
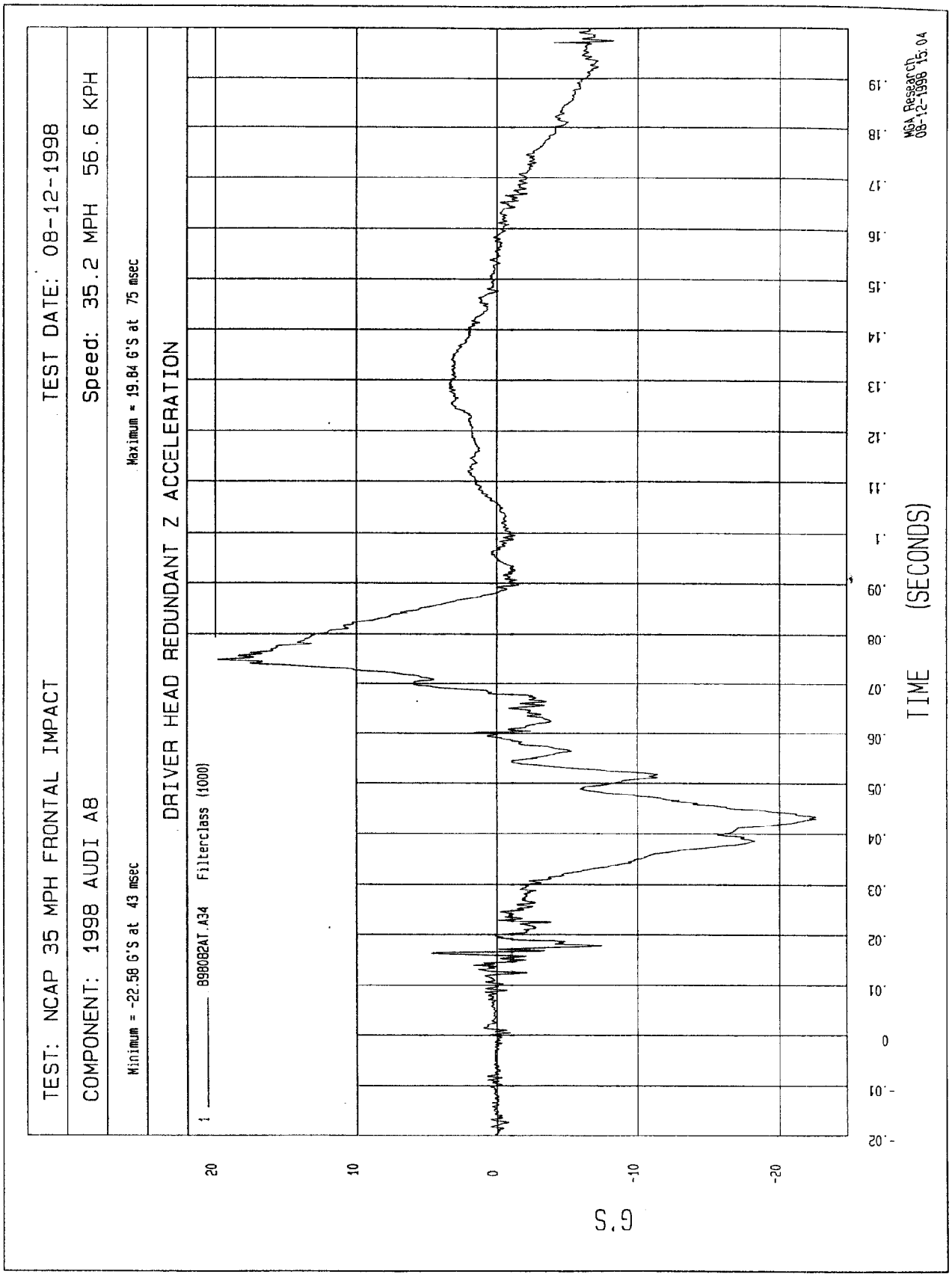
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -22.53 G'S at 43 msec
Maximum = 17.66 G'S at 75 msec
DRIVER HEAD Z ACCELERATION
1 _____ B980802AT.A14 Filterclass (1000)
10
0
-10
-20
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:03

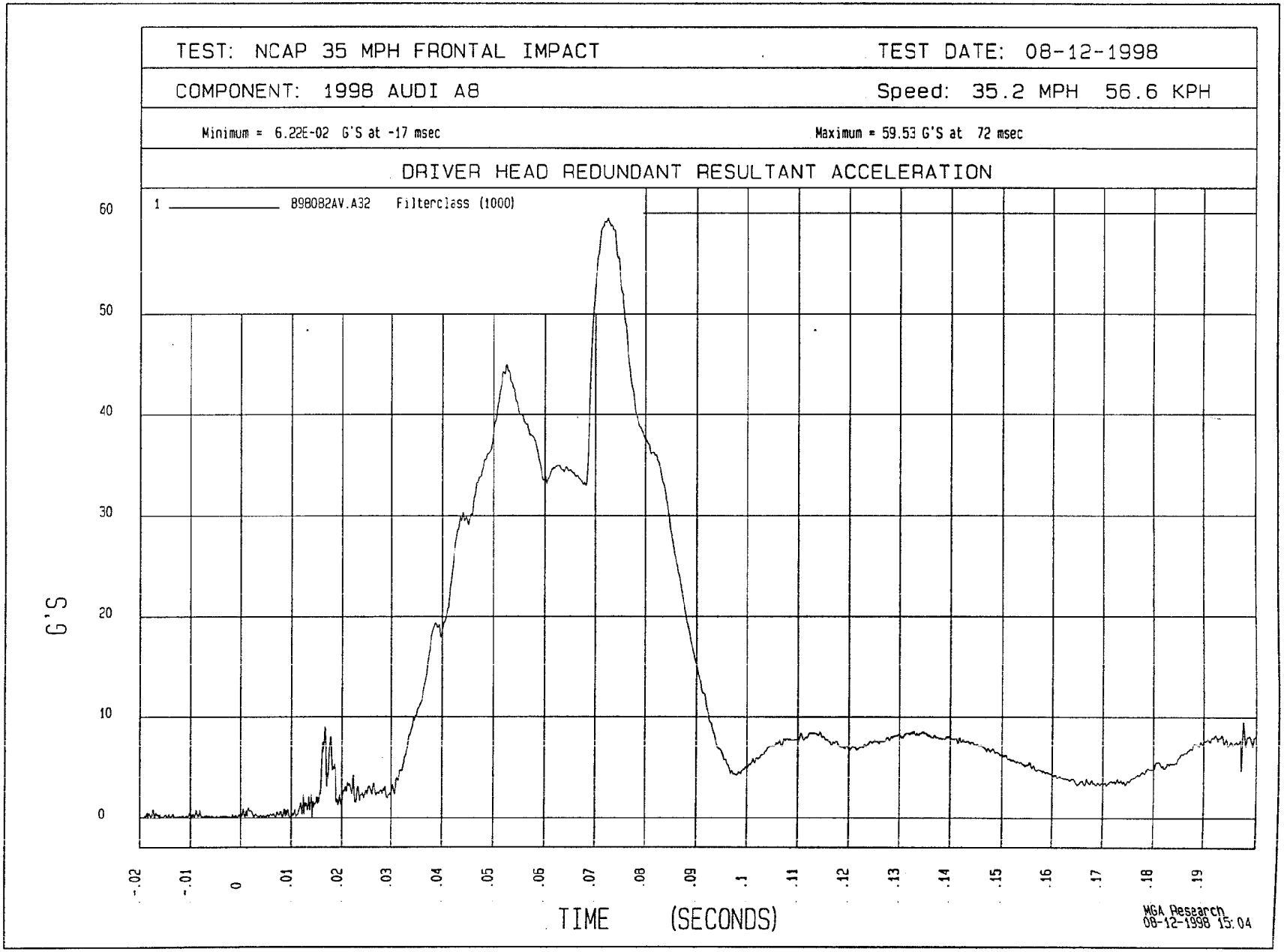

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 2.00E-02 G'S at -20 msec
Maximum = 58.93 G'S at 72 msec
DRIVER HEAD RESULTANT ACCELERATION
1 B98082AV.A12 Filterclass (1000)
60
50
40
30
20
10
0
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:03

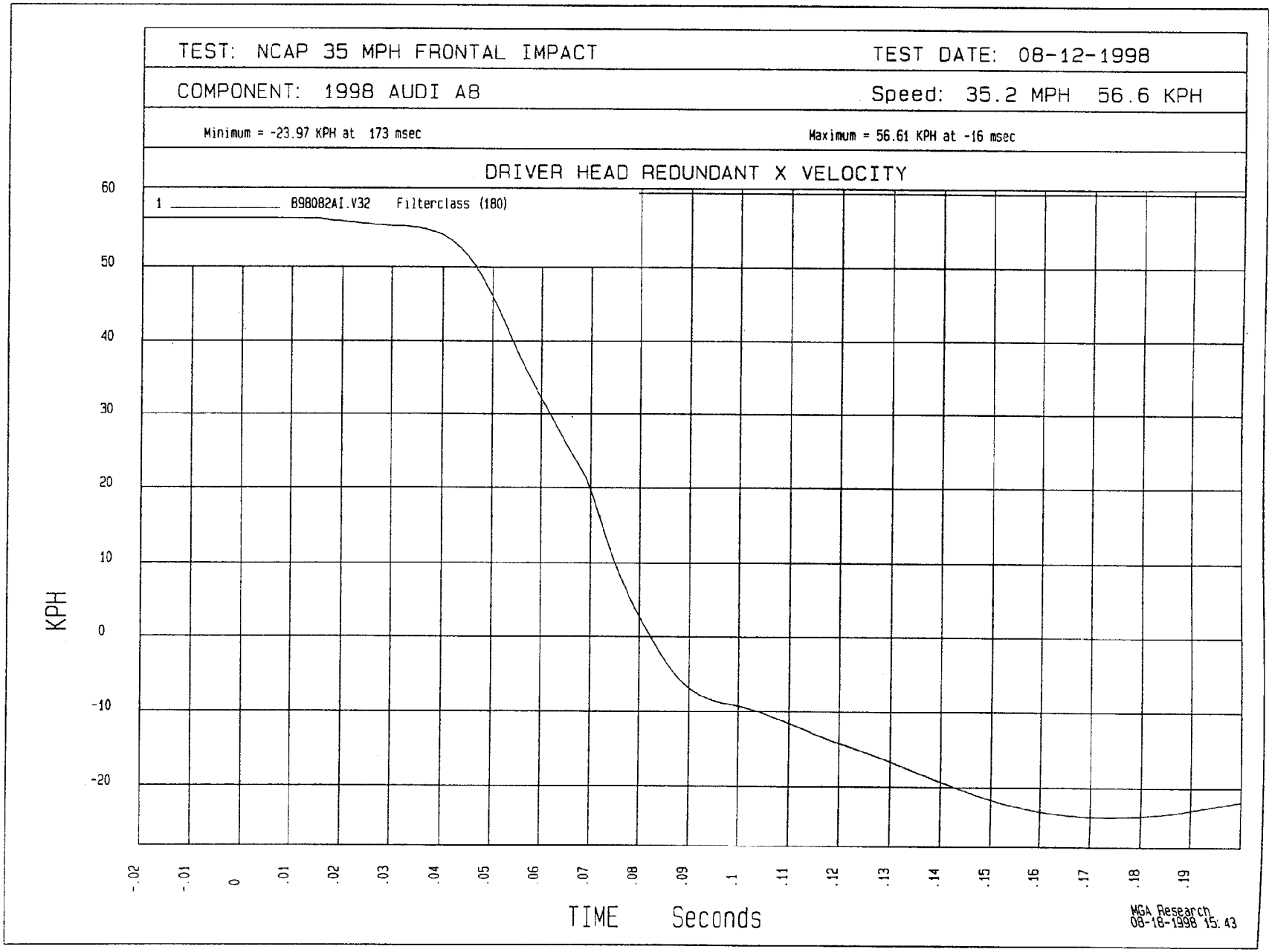

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -23.59 KPH at 173 msec
Maximum = 56.68 KPH at 15 msec
DRIVER HEAD X VELOCITY
1 _____ 898082AI.V12 Filterclass (180)
KPH
60
50
40
30
20
10
0
-10
-20
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME Seconds
MGA Research
08-18-1998 15:43

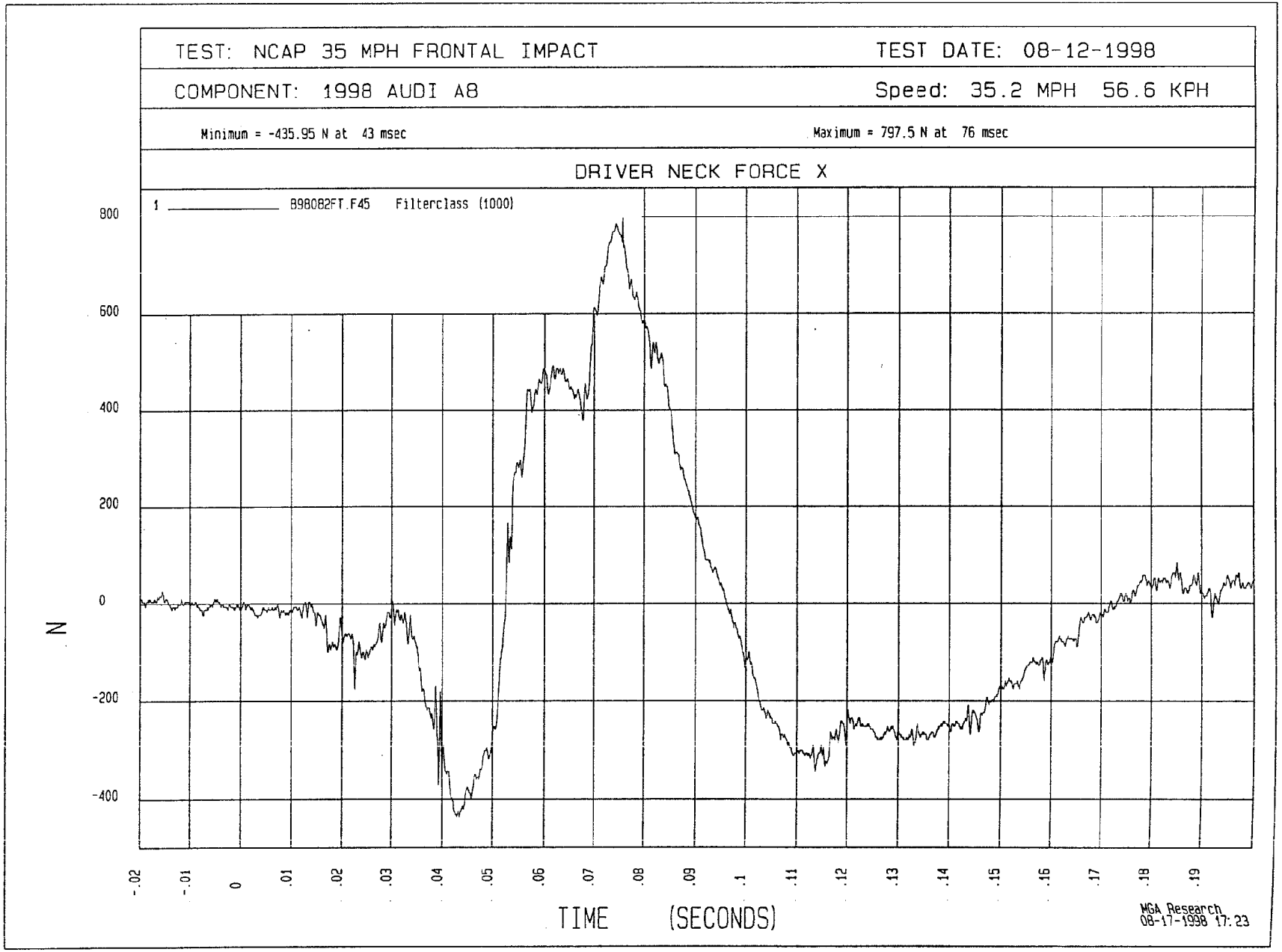

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -58.58 G'S at 72 msec
Maximum = 4.31 G'S at 200 msec
DRIVER HEAD REDUNDANT X ACCELERATION
1 B98082AT.A32 Filterclass (1000)
0
-10
-20
-30
-40
-50
-60
G'S
.02
.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
NHTSA Research
08-12-1998 15:04

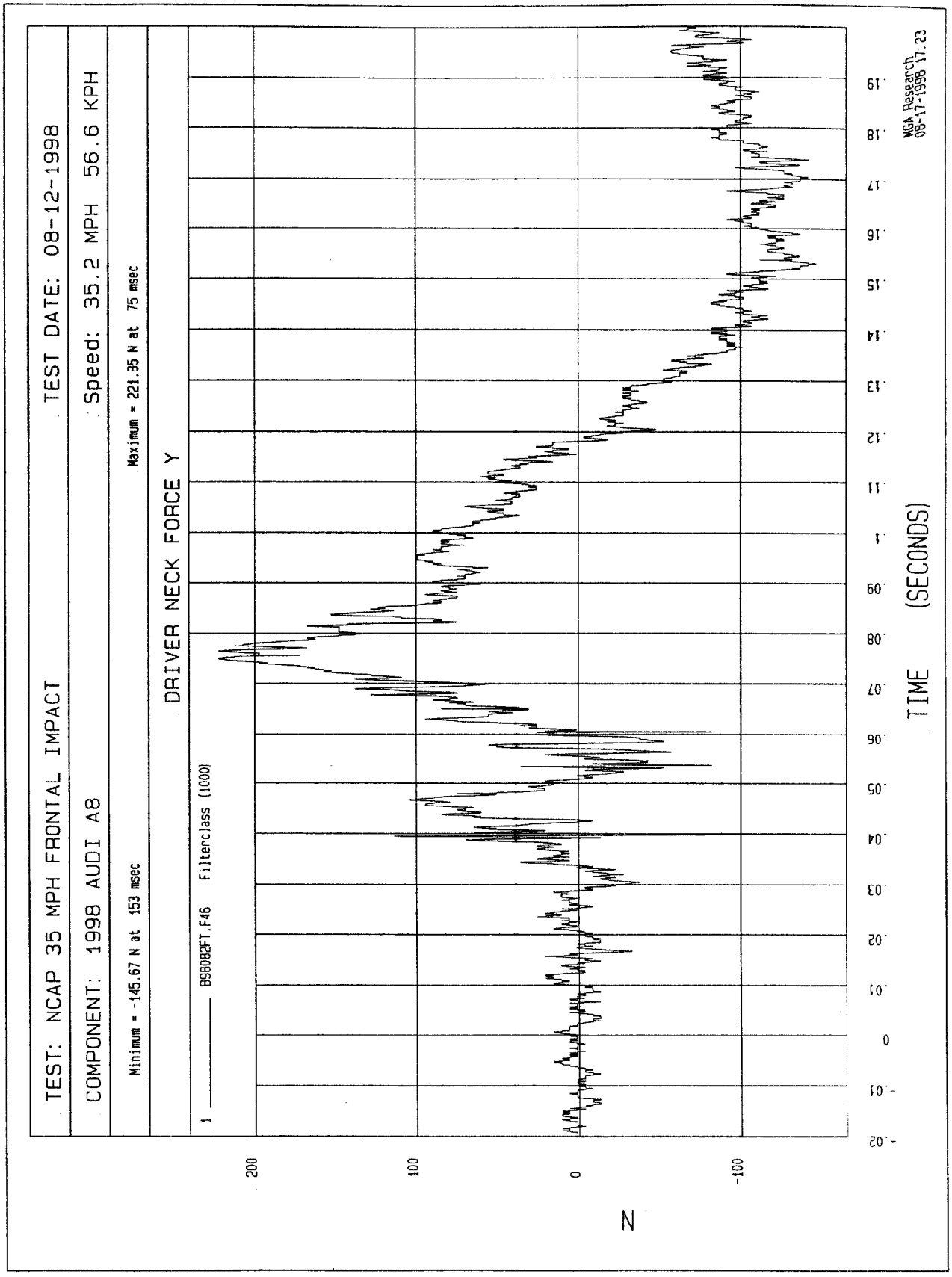

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -8.39 G'S at 75 msec
Maximum = 8.33 G'S at 17 msec
DRIVER HEAD REDUNDANT Y ACCELERATION
1 B98002AT.A33 Filterclass (1000)
8
6
4
2
0
-2
-4
-6
-8
G'S
.02
.01
0
.01
.09
.08
.07
.06
.05
.04
.03
.02
.01
1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:04

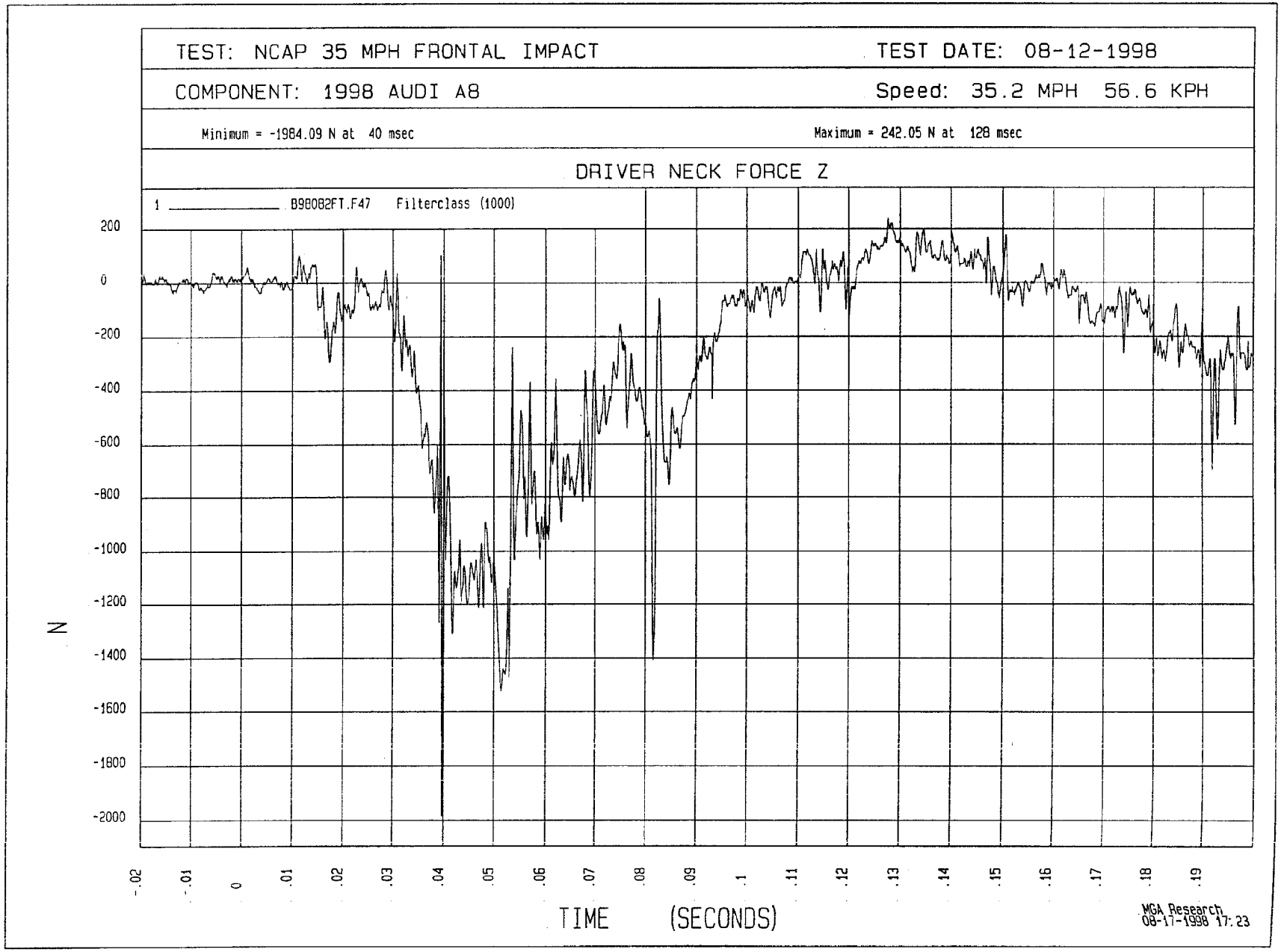

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -22.58 G'S at 43 msec
Maximum = 19.84 G'S at 75 msec
DRIVER HEAD REDUNDANT Z ACCELERATION
1 _____ 898082AT.A34 Filterclass (1000)
MGA Research
08-12-1998 15:04
20
10
0
-10
-20
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)

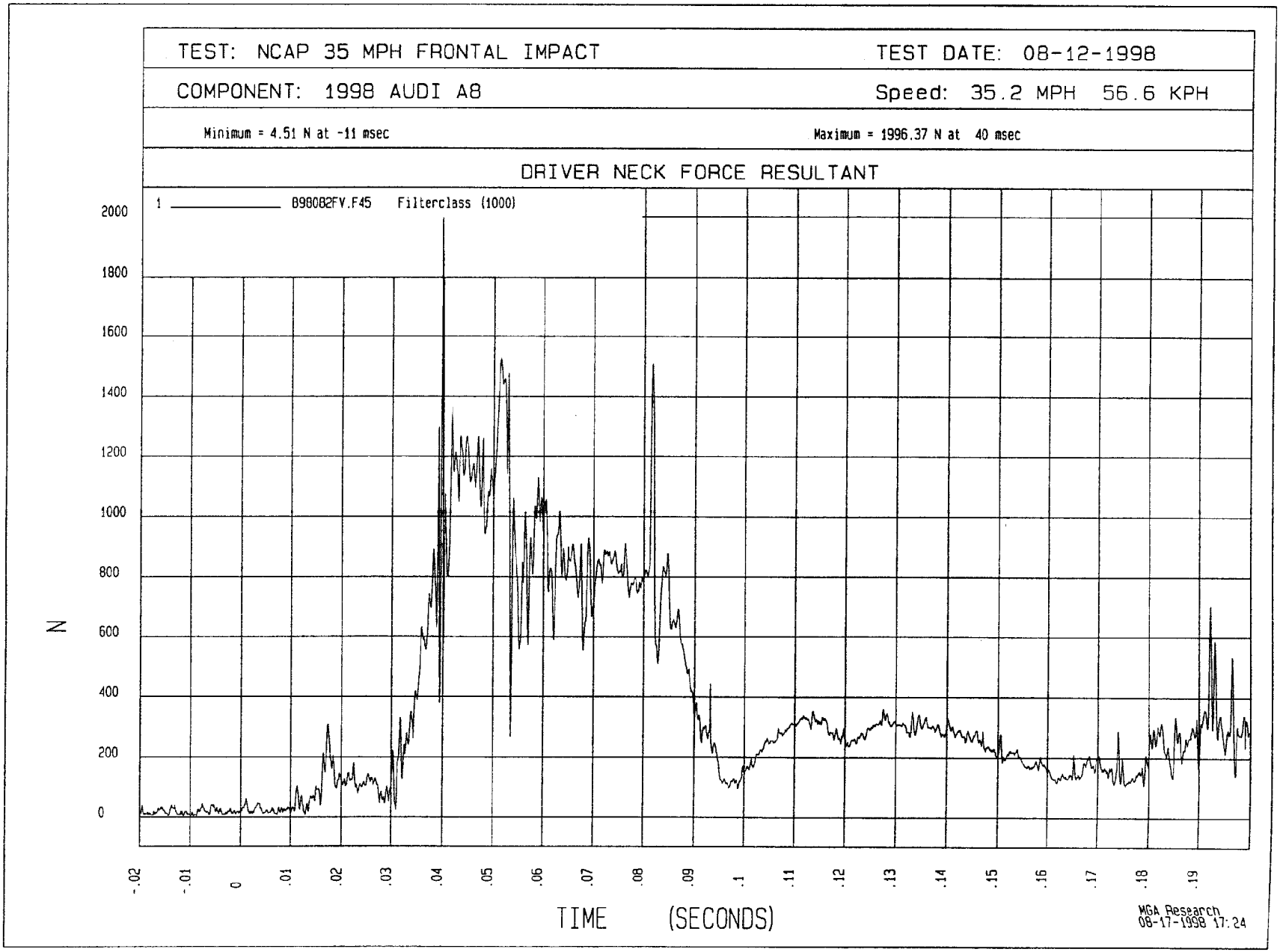

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 6.22E-02 G'S at -17 msec
Maximum = 59.53 G'S at 72 msec
DRIVER HEAD REDUNDANT RESULTANT ACCELERATION
1 898082AV.A32 Filterclass (1000)
G'S
60
50
40
30
20
10
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:04

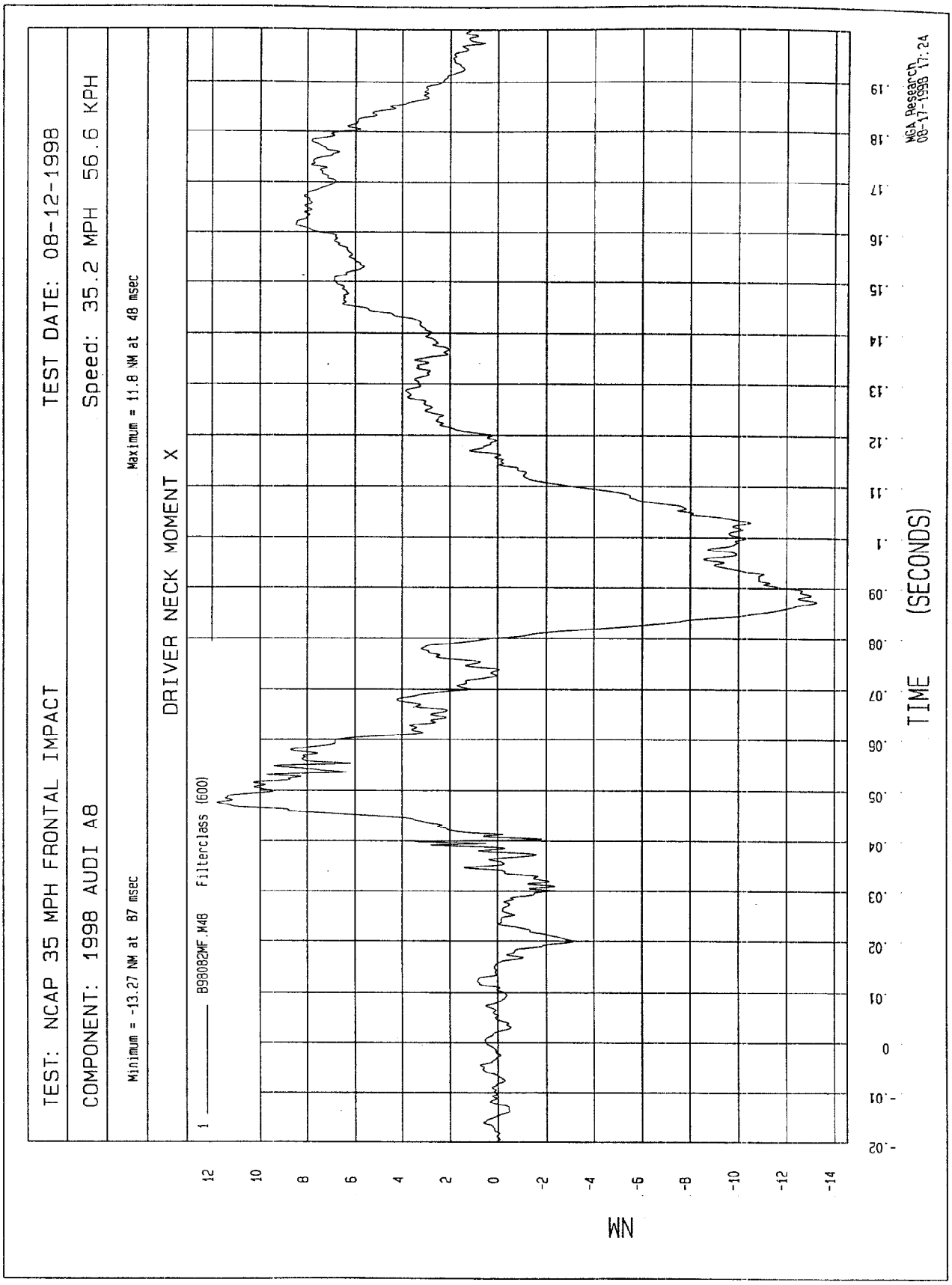

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -23.97 KPH at 173 msec
Maximum = 56.61 KPH at -16 msec
DRIVER HEAD REDUNDANT X VELOCITY
1 B98082AI.V32 Filterclass (180)
60
50
40
30
20
10
0
-10
-20
KPH
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME Seconds
MGA Research
08-18-1998 15:43

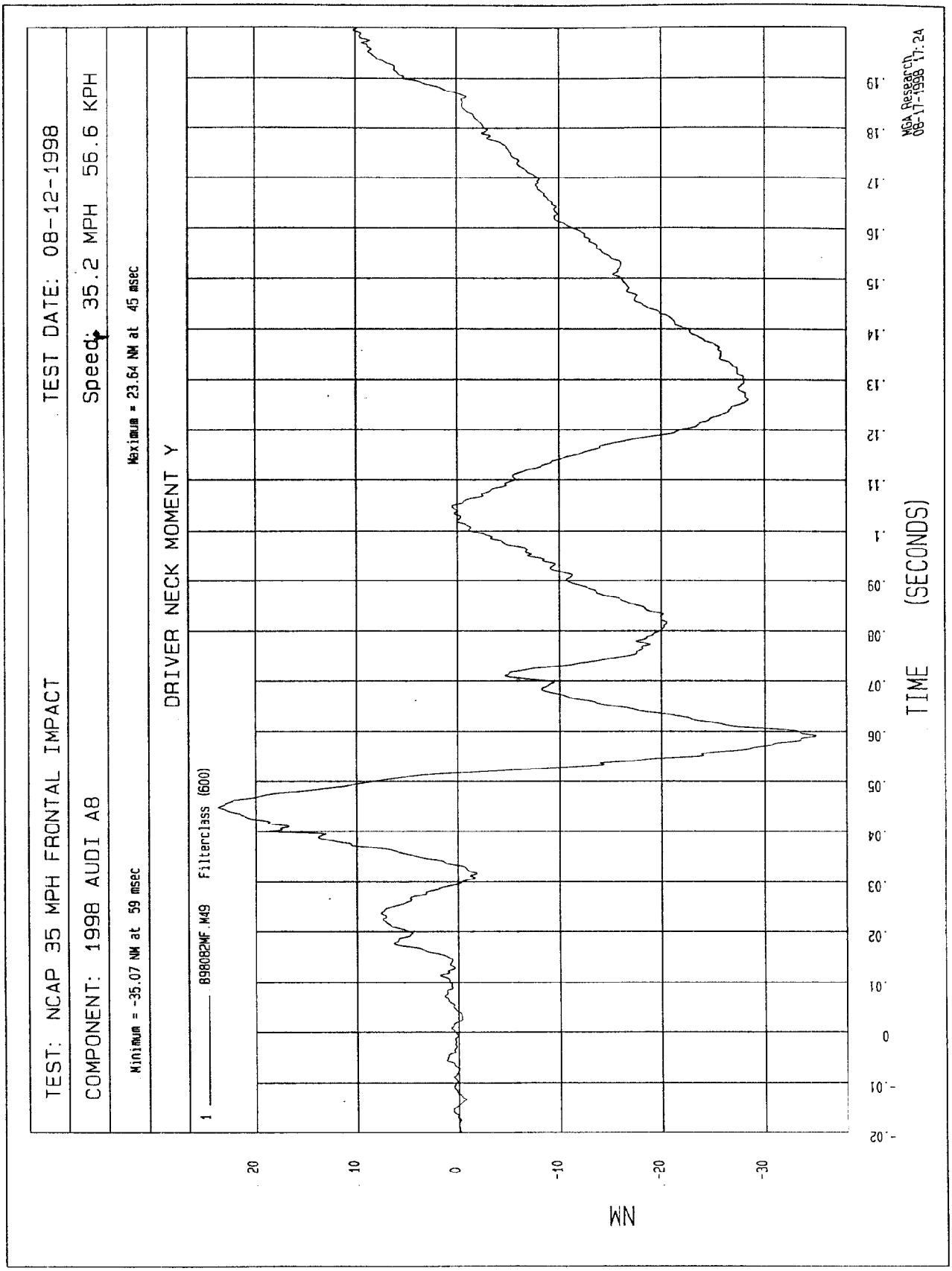

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -435.95 N at 43 msec
Maximum = 797.5 N at 76 msec
DRIVER NECK FORCE X
1 898082FT.F45 Filterclass (1000)
800
600
400
200
0
-200
-400
N
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:23

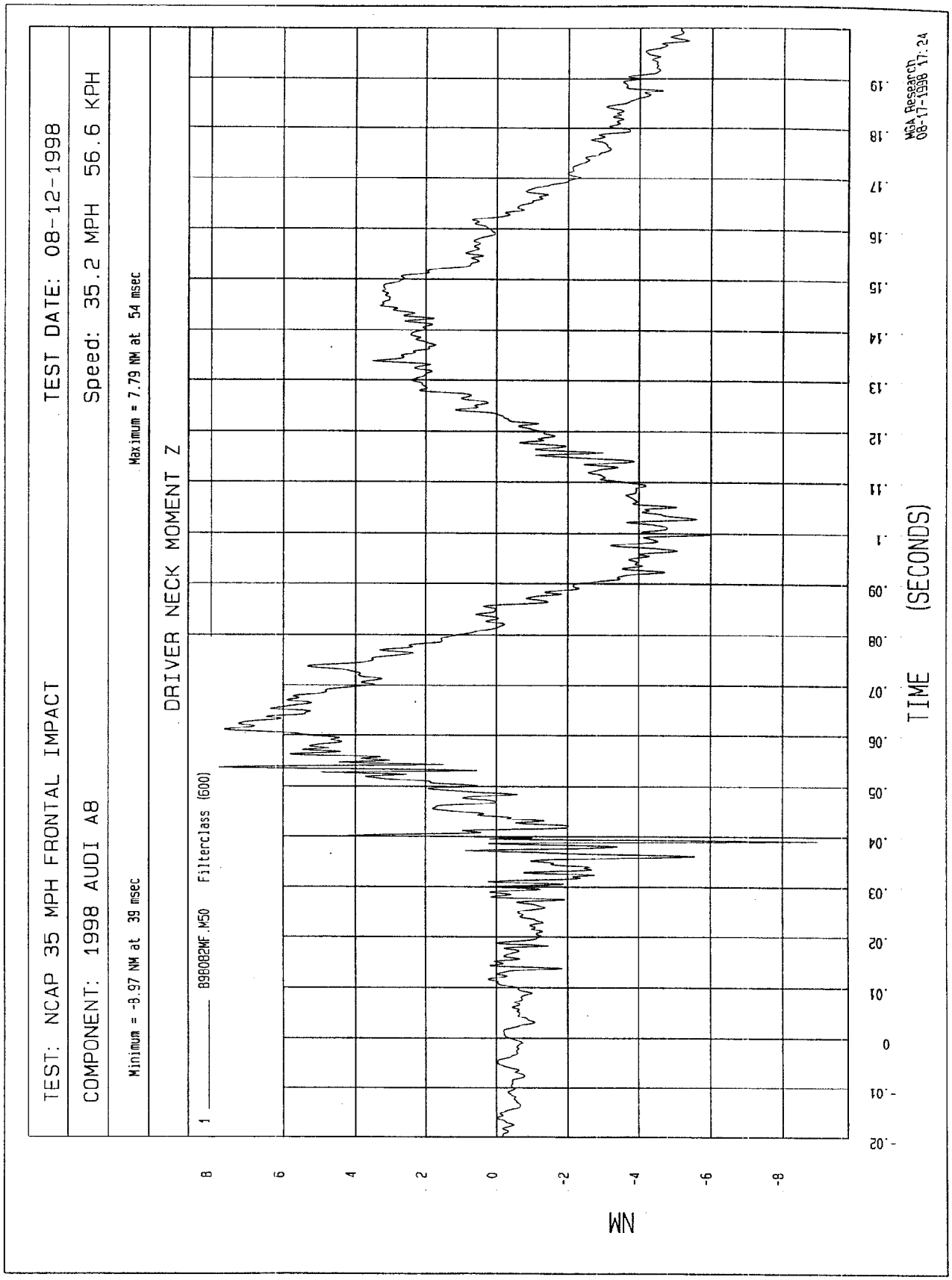

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -145.67 N at 153 msec
Maximum = 221.85 N at 75 msec
DRIVER NECK FORCE Y
1 B98082FT.F46 Filterclass (1000)
200
100
0
-100
N
TIME (SECONDS)
MGA Research
08-17-1998 17:23

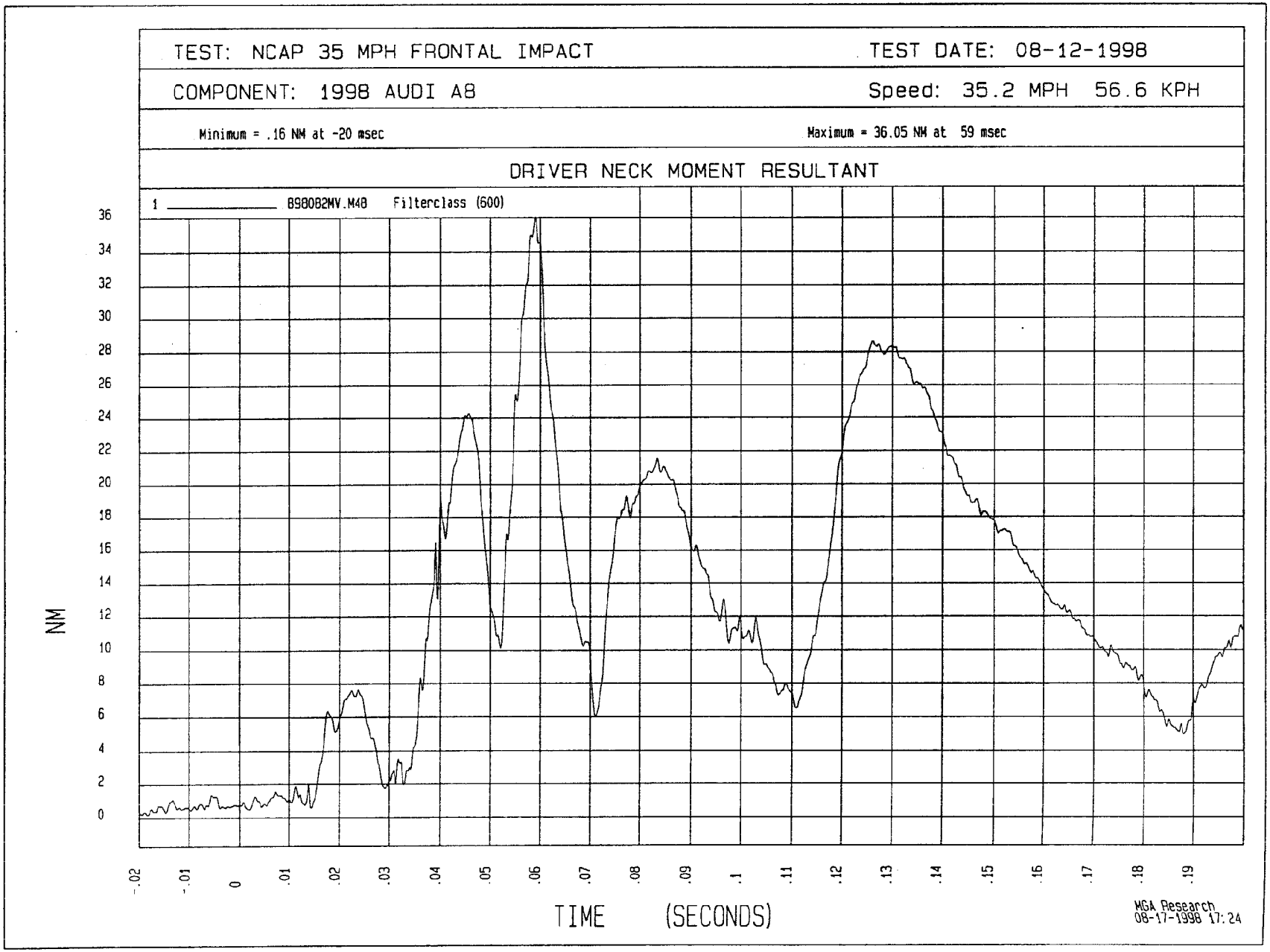

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -1984.09 N at 40 msec
Maximum = 242.05 N at 128 msec
DRIVER NECK FORCE Z
1 B98082FT.F47 Filterclass (1000)
200
0
-200
-400
-600
-800
-1000
-1200
-1400
-1600
-1800
-2000
N
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:23

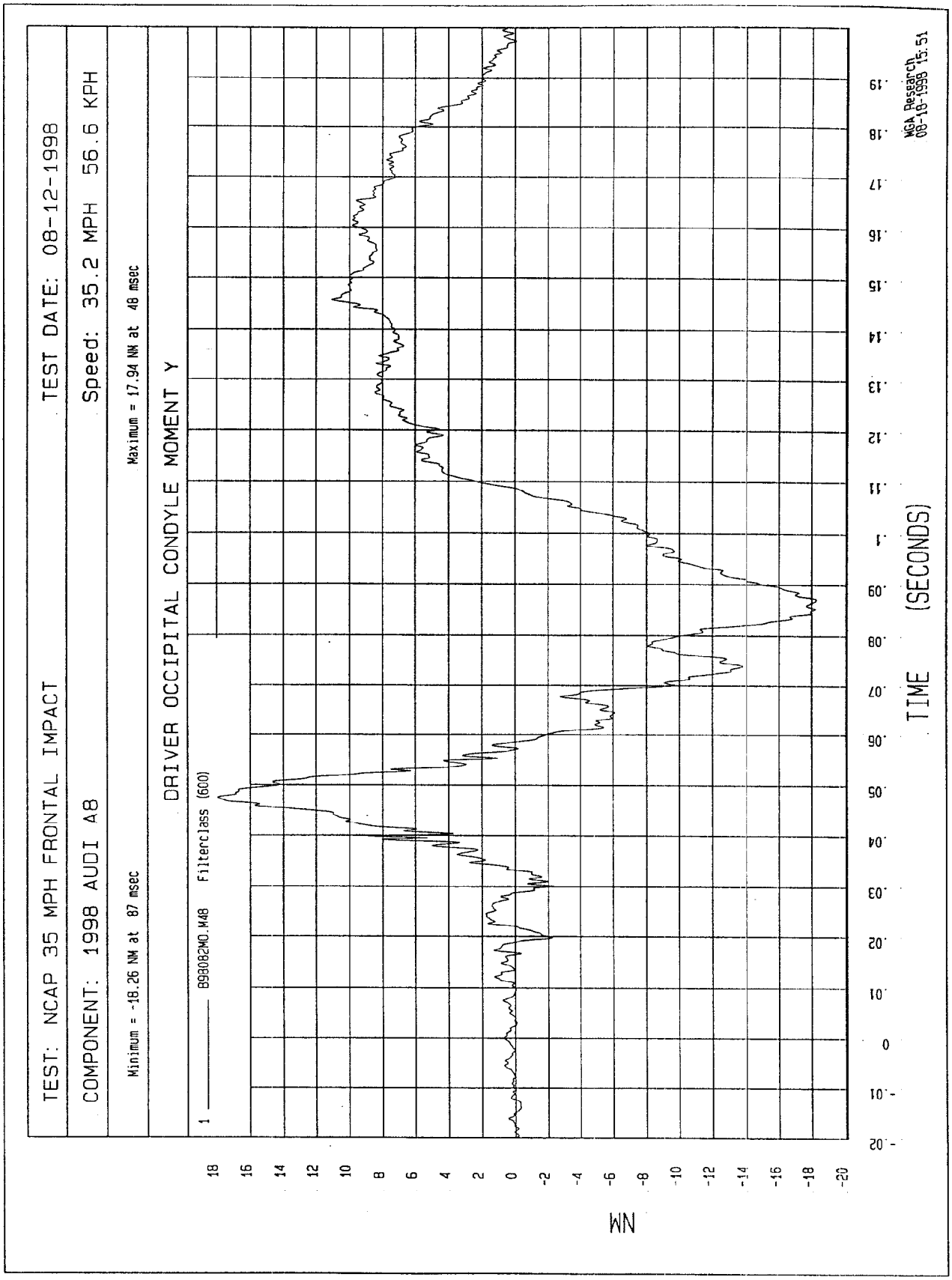

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 4.51 N at -11 msec
Maximum = 1996.37 N at 40 msec
DRIVER NECK FORCE RESULTANT
1 B98082FV.F45 Filterclass (1000)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
N
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:24

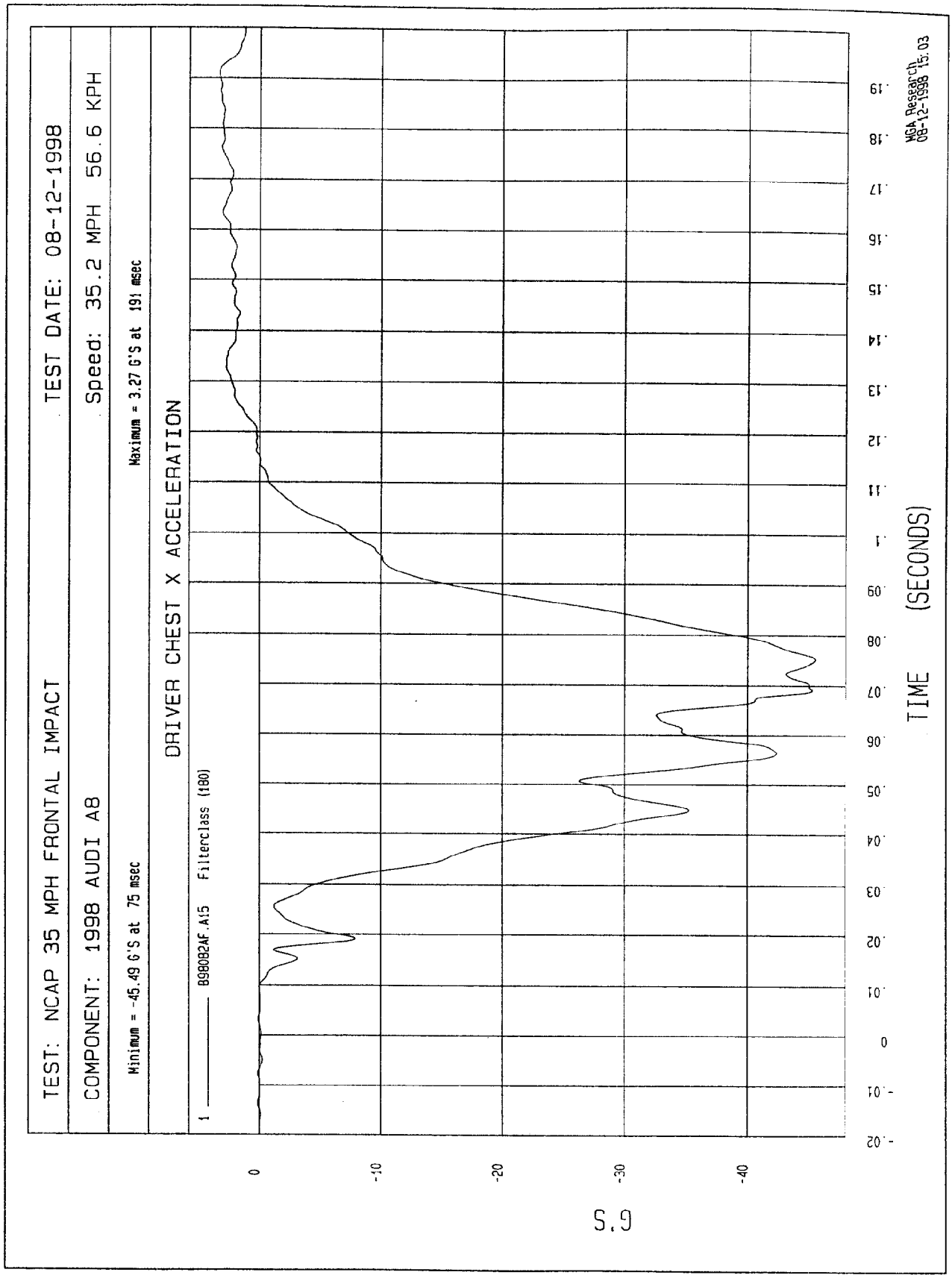

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -13.27 NM at 87 msec
Maximum = 11.8 NM at 48 msec
DRIVER NECK MOMENT X
1 B9808MF.M48 Filterclass (600)
NM
TIME (SECONDS)
MGA Research
08-17-1998 17:24

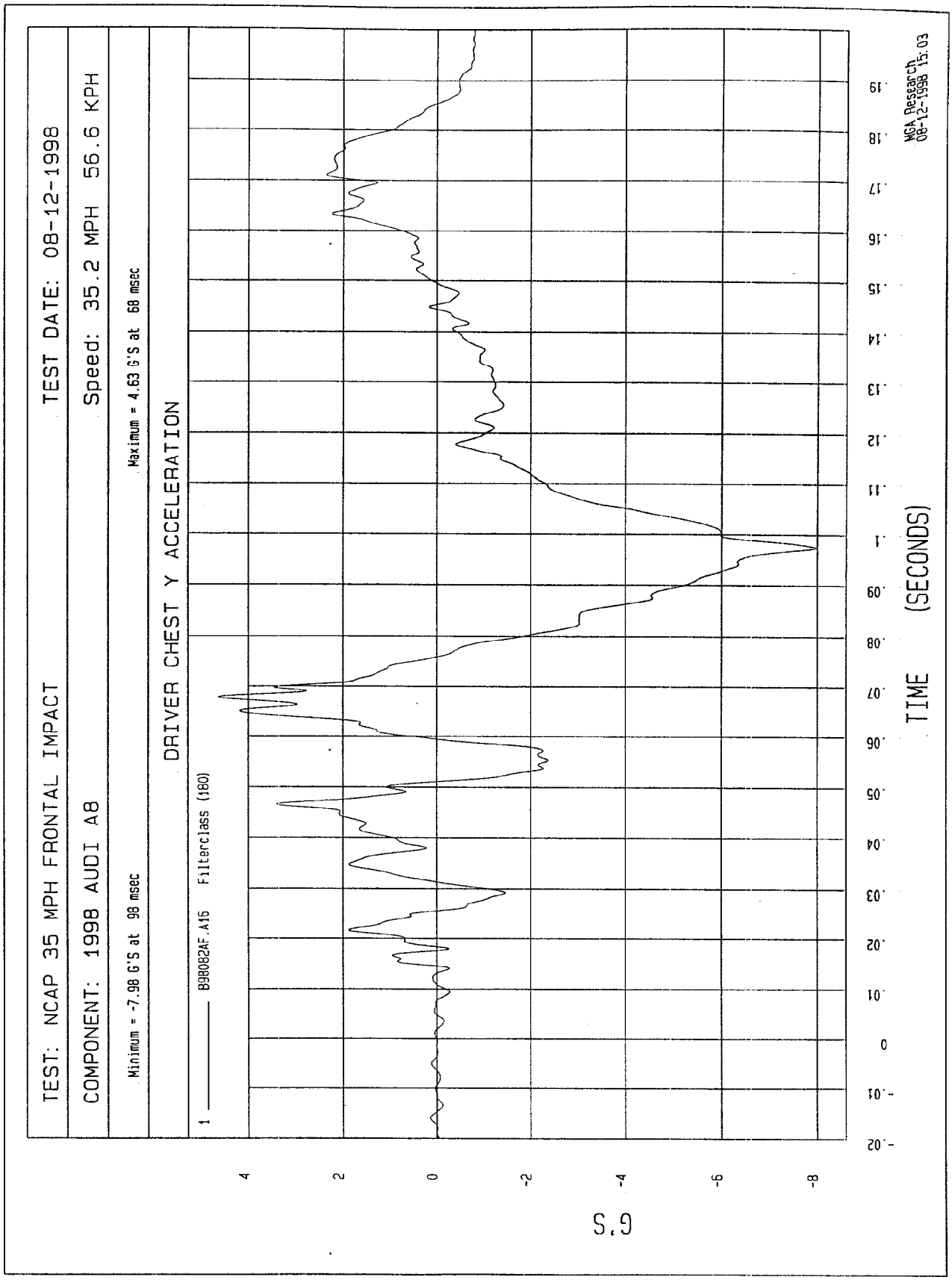

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -35.07 NM at 59 msec
Maximum = 23.64 NM at 45 msec
DRIVER NECK MOMENT Y
1 B98082MF.M49 Filterclass (600)
NM
TIME (SECONDS)
MGA Research
08-17-1998 17:24

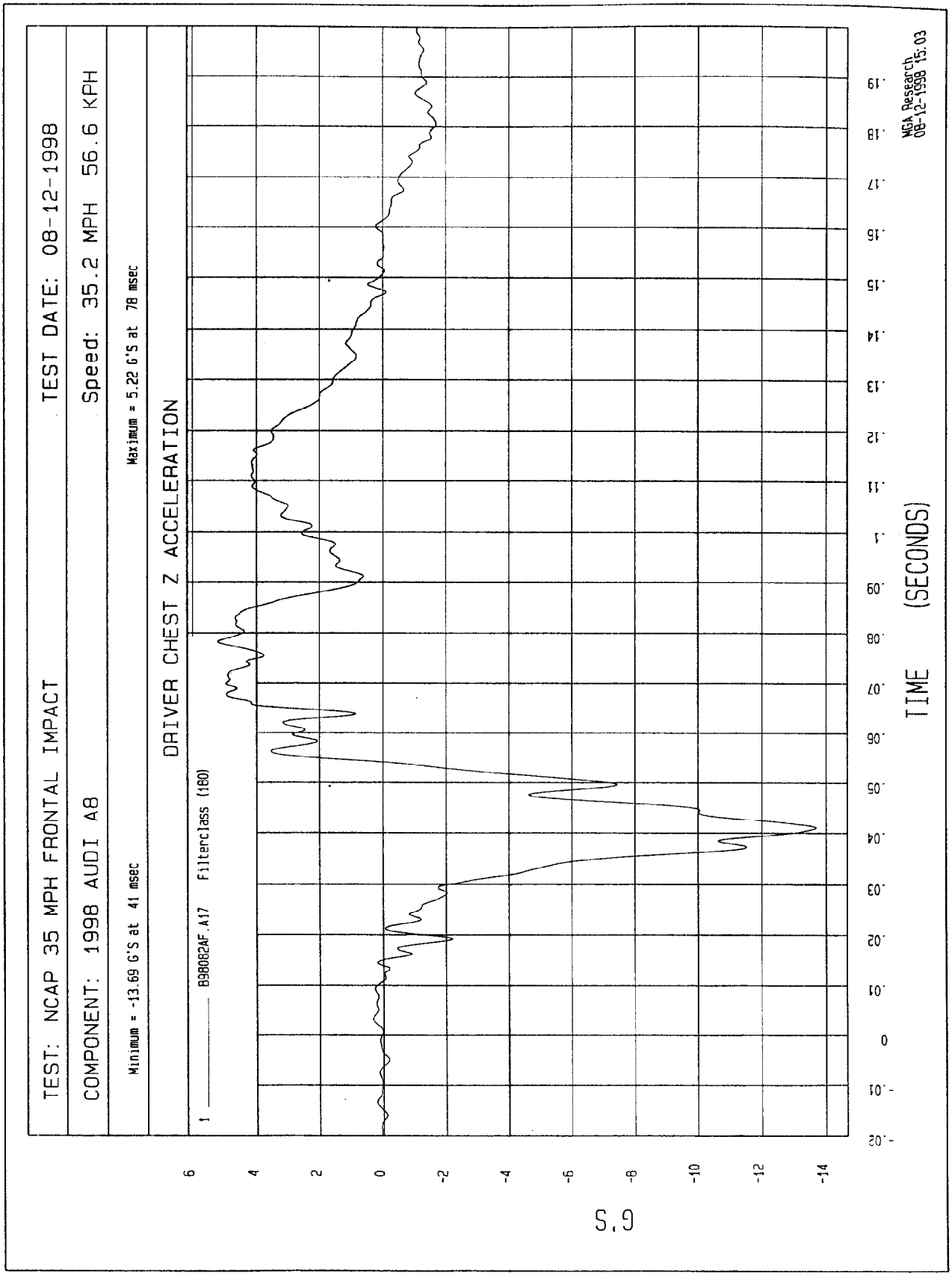

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -8.97 NM at 39 msec
Maximum = 7.79 NM at 54 msec
DRIVER NECK MOMENT Z
1 B98008MF.M50 Filterclass (600)
NM
TIME (SECONDS)
MGA Research
08-17-1998 17:24

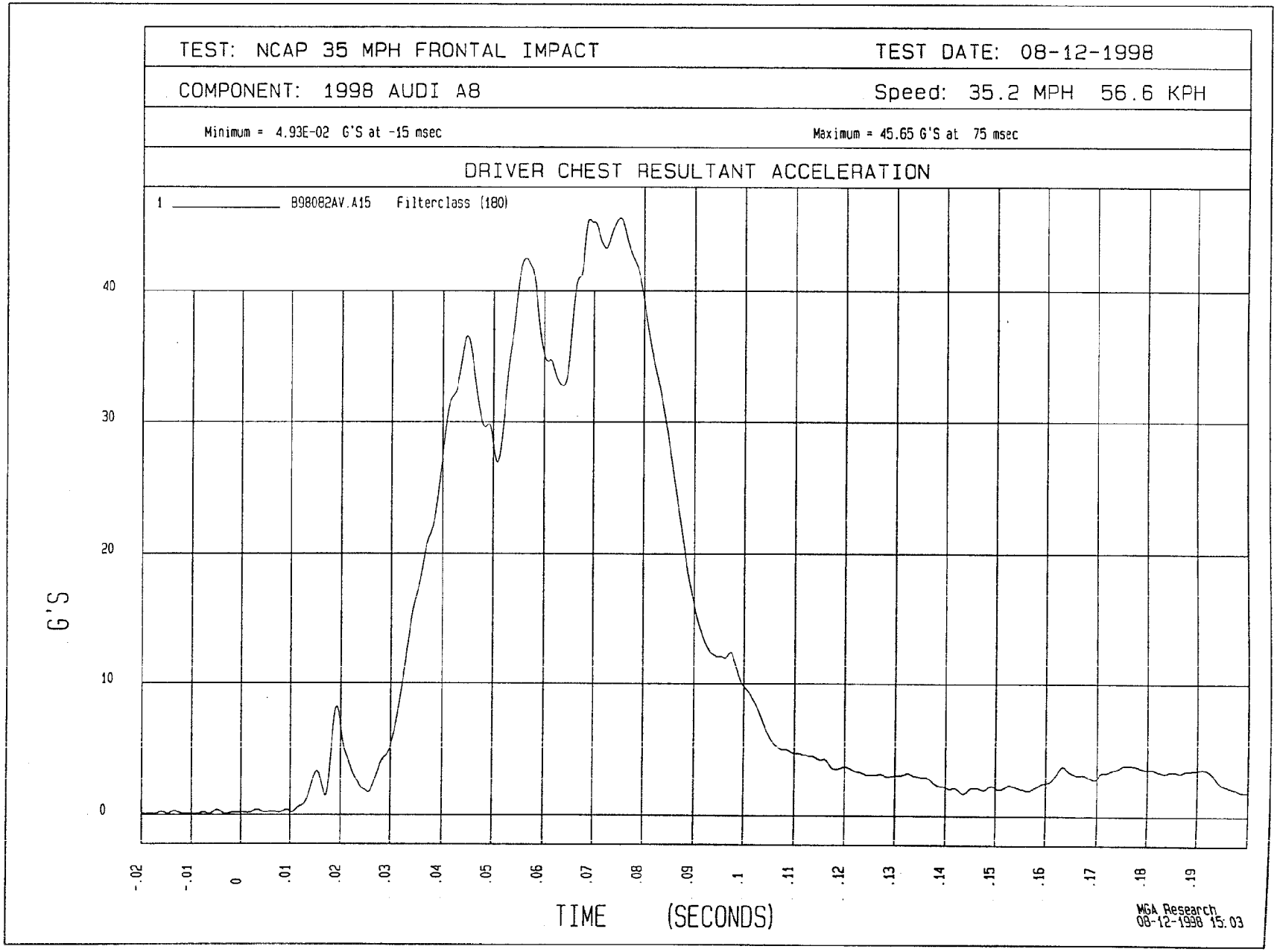

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = .16 NM at -20 msec
Maximum = 36.05 NM at 59 msec
DRIVER NECK MOMENT RESULTANT
1 B98082MV.M48 Filterclass (600)
NM
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:24

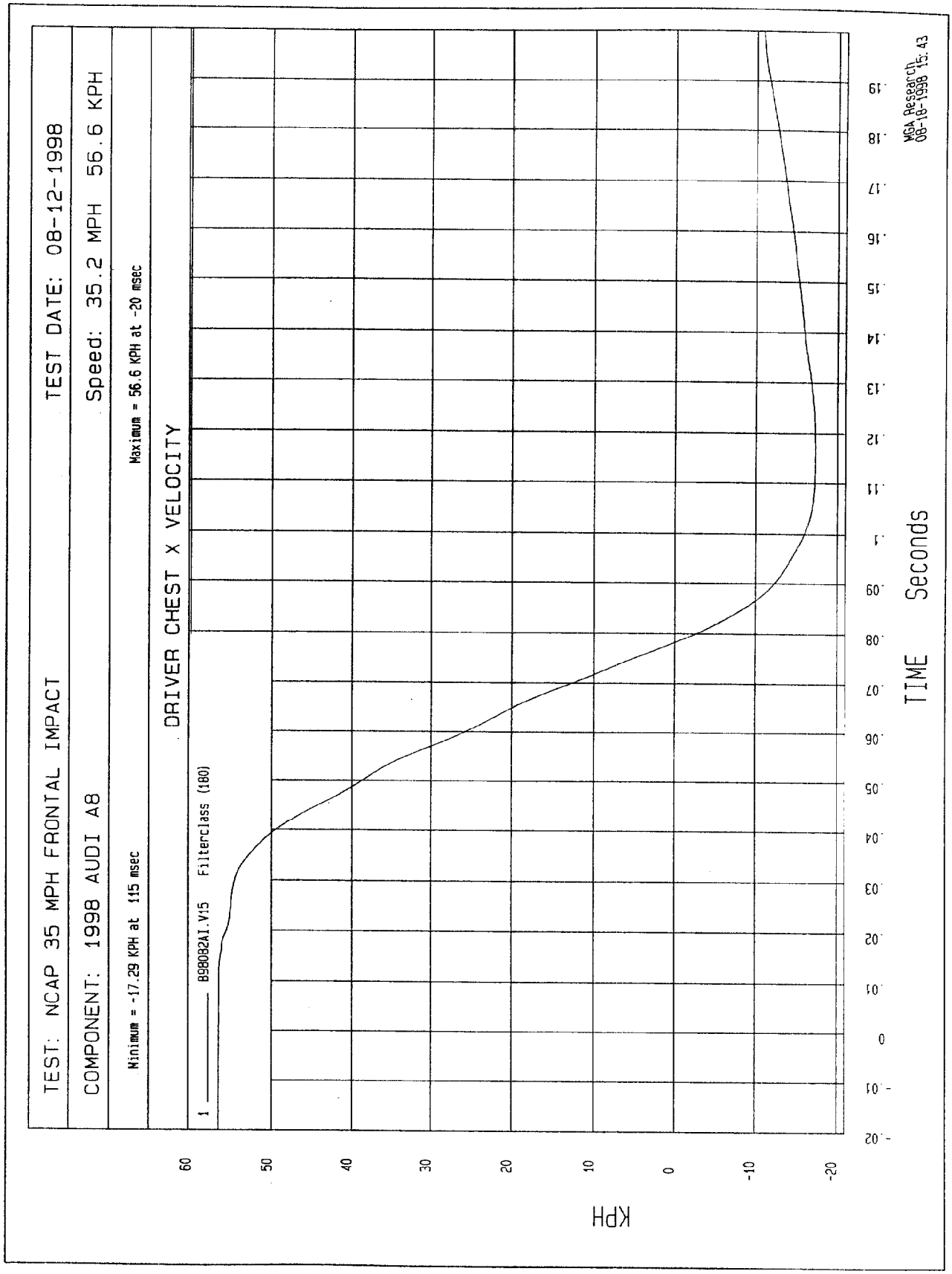

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -18.26 NM at 87 msec
Maximum = 17.94 NM at 48 msec
DRIVER OCCIPITAL CONDYLE MOMENT Y
1 B98082MO.M48 Filterclass (600)
NM
TIME (SECONDS)
NGA Research
08-10-1998 15:51

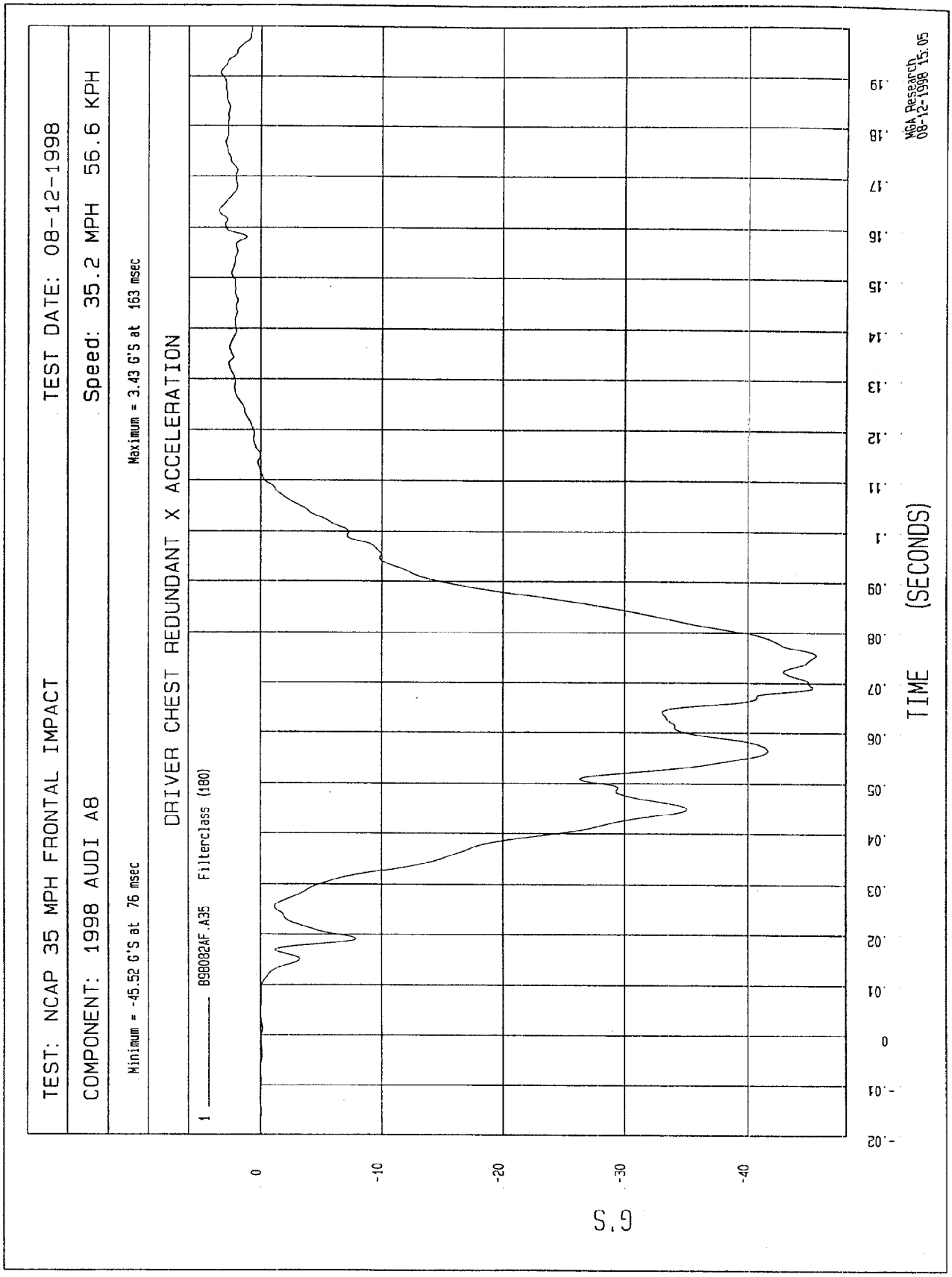

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -45.49 G'S at 75 msec
Maximum = 3.27 G'S at 191 msec
DRIVER CHEST X ACCELERATION
1 B98082AF.A15 Filterclass (180)
0
-10
-20
-30
-40
TIME (SECONDS)
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
MGA Research
08-12-1998 15:03
S.9

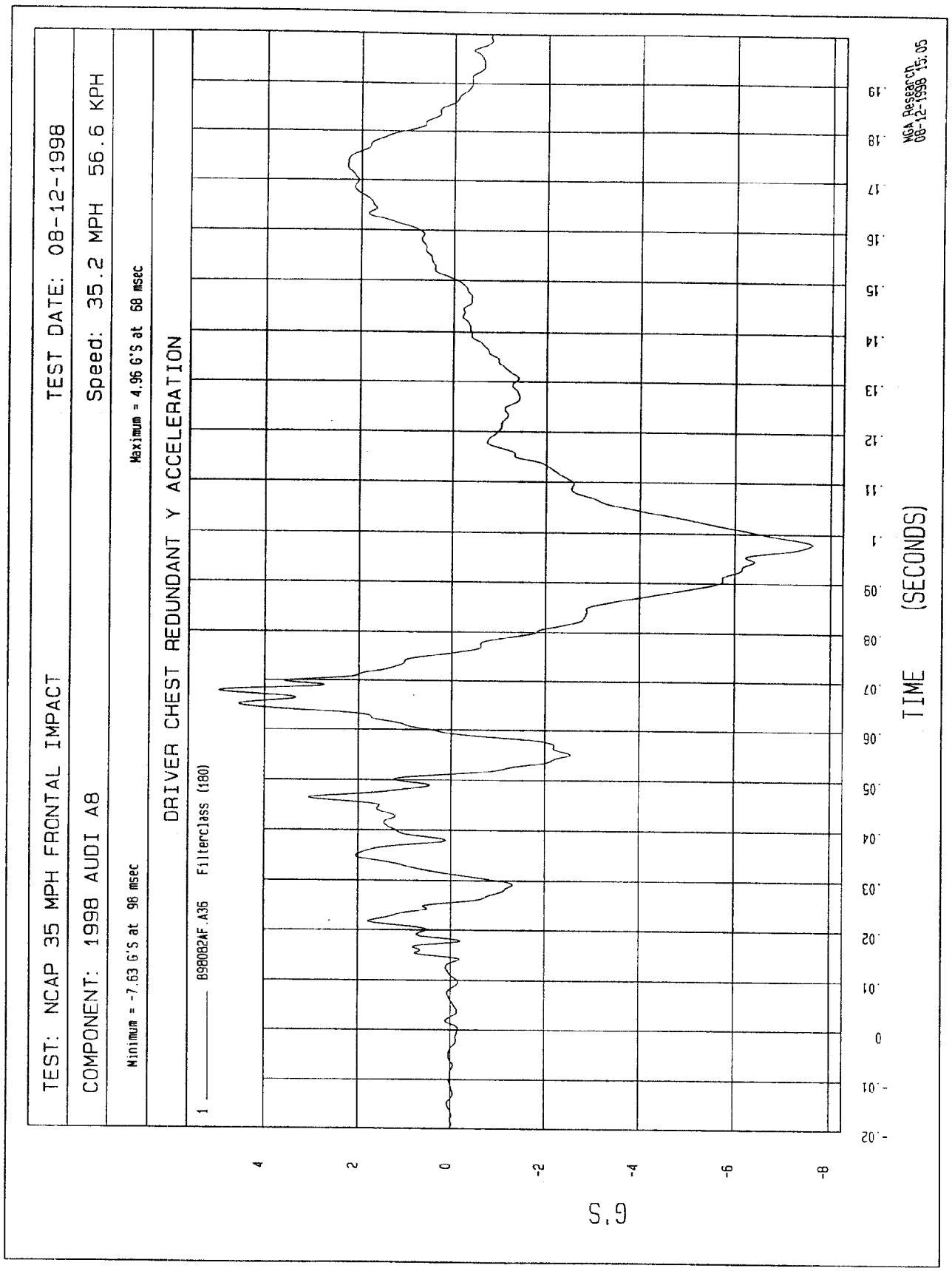

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -7.98 G'S at 98 msec
Maximum = 4.63 G'S at 68 msec
DRIVER CHEST Y ACCELERATION
1 B980802AF.A16 Filterclass (180)
4
2
0
-2
-4
-6
-8
G's
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:03

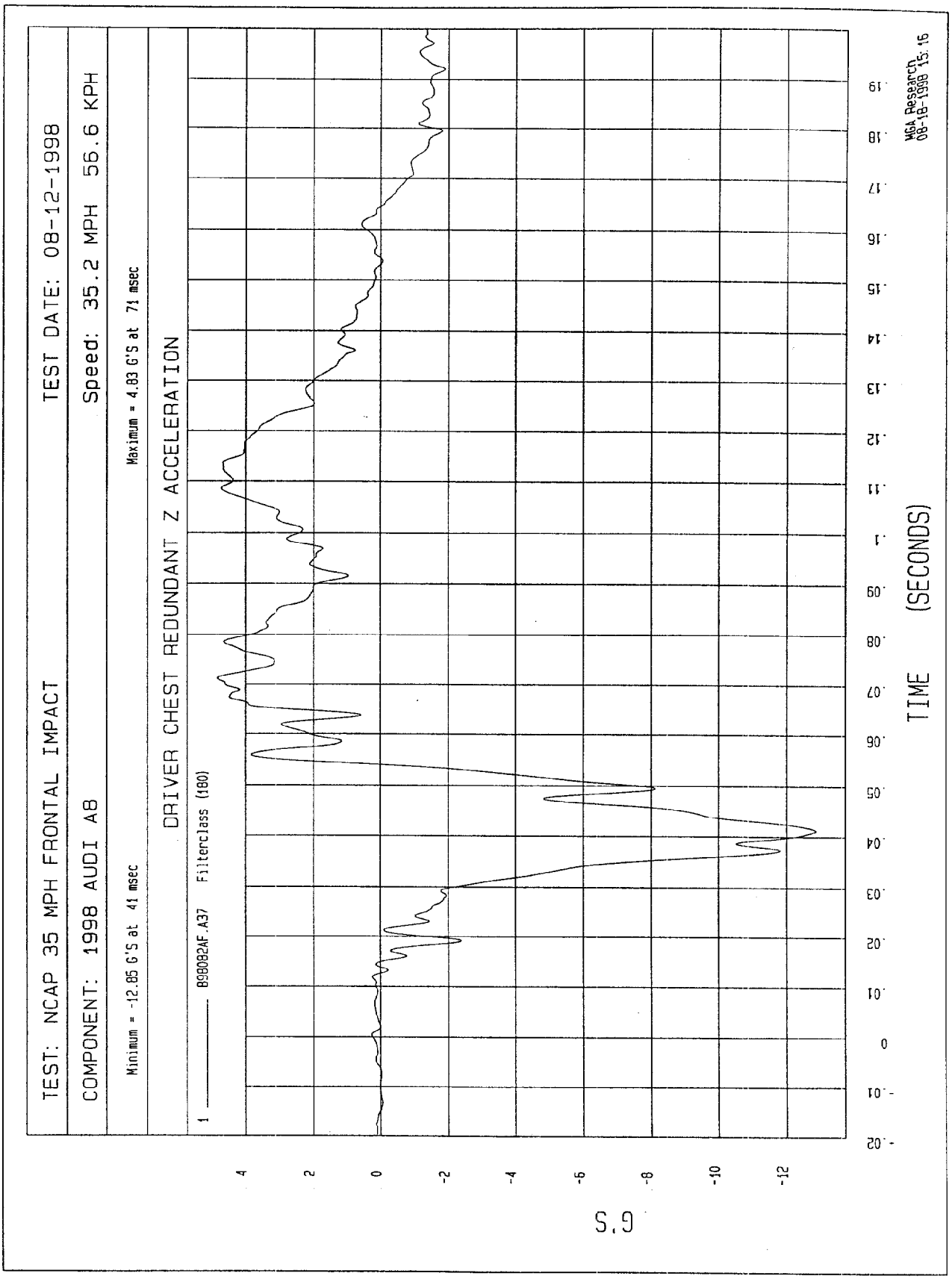

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -13.69 G'S at 41 msec
Maximum = 5.22 G'S at 78 msec
DRIVER CHEST Z ACCELERATION
1 B98002AF.A17 Filterclass (180)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
.19
.18
.17
.16
.15
.14
.13
.12
.11
.1
.09
.08
.07
.06
.05
.04
.03
.02
.01
0
-.01
-.02
TIME (SECONDS)
MGA Research
08-12-1998 15:03
S.9
6'S

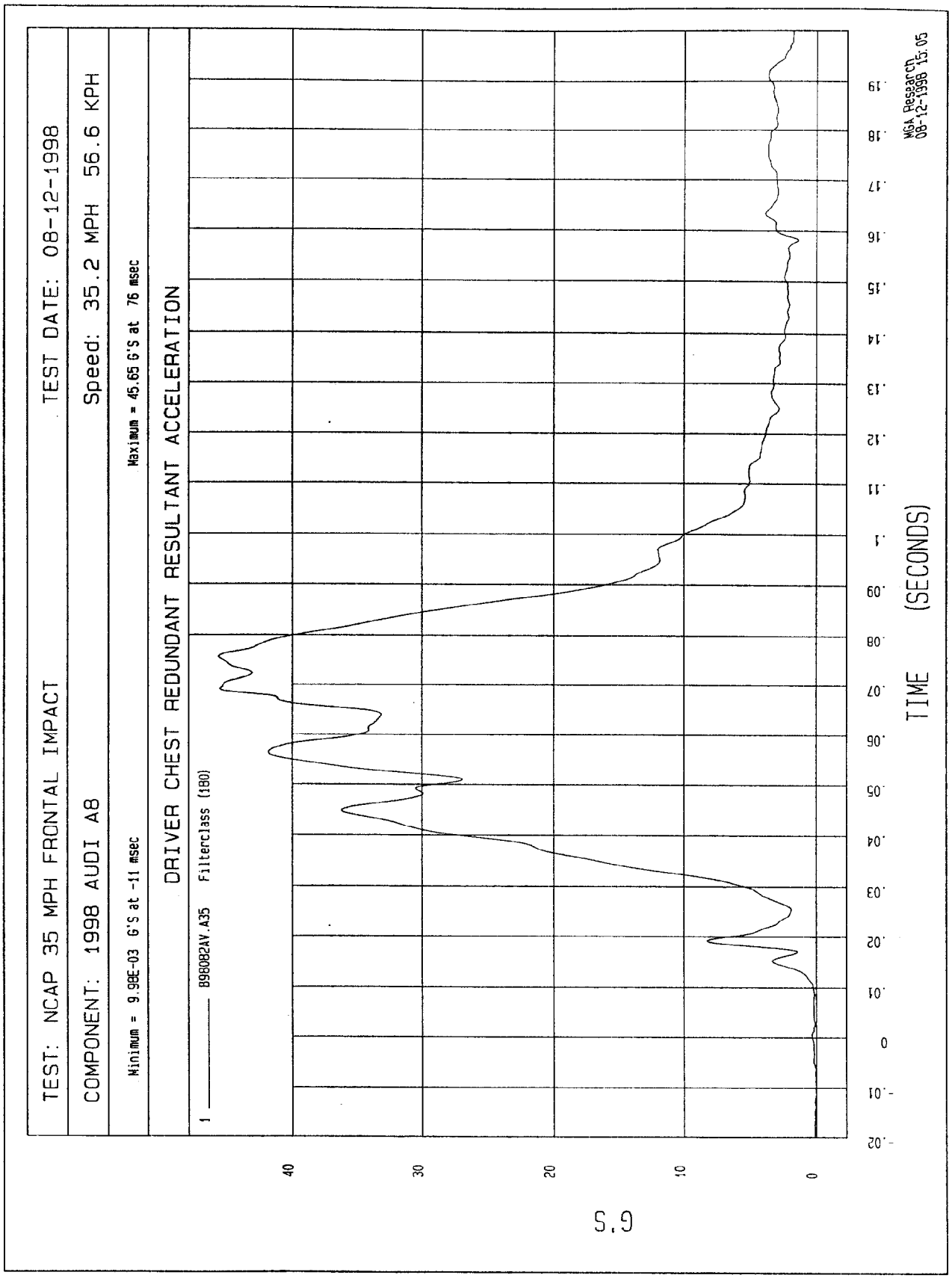

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 4.93E-02 G'S at -15 msec
Maximum = 45.65 G'S at 75 msec
DRIVER CHEST RESULTANT ACCELERATION
1 B98082AV.A15 Filterclass (180)
G'S
40
30
20
10
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:03

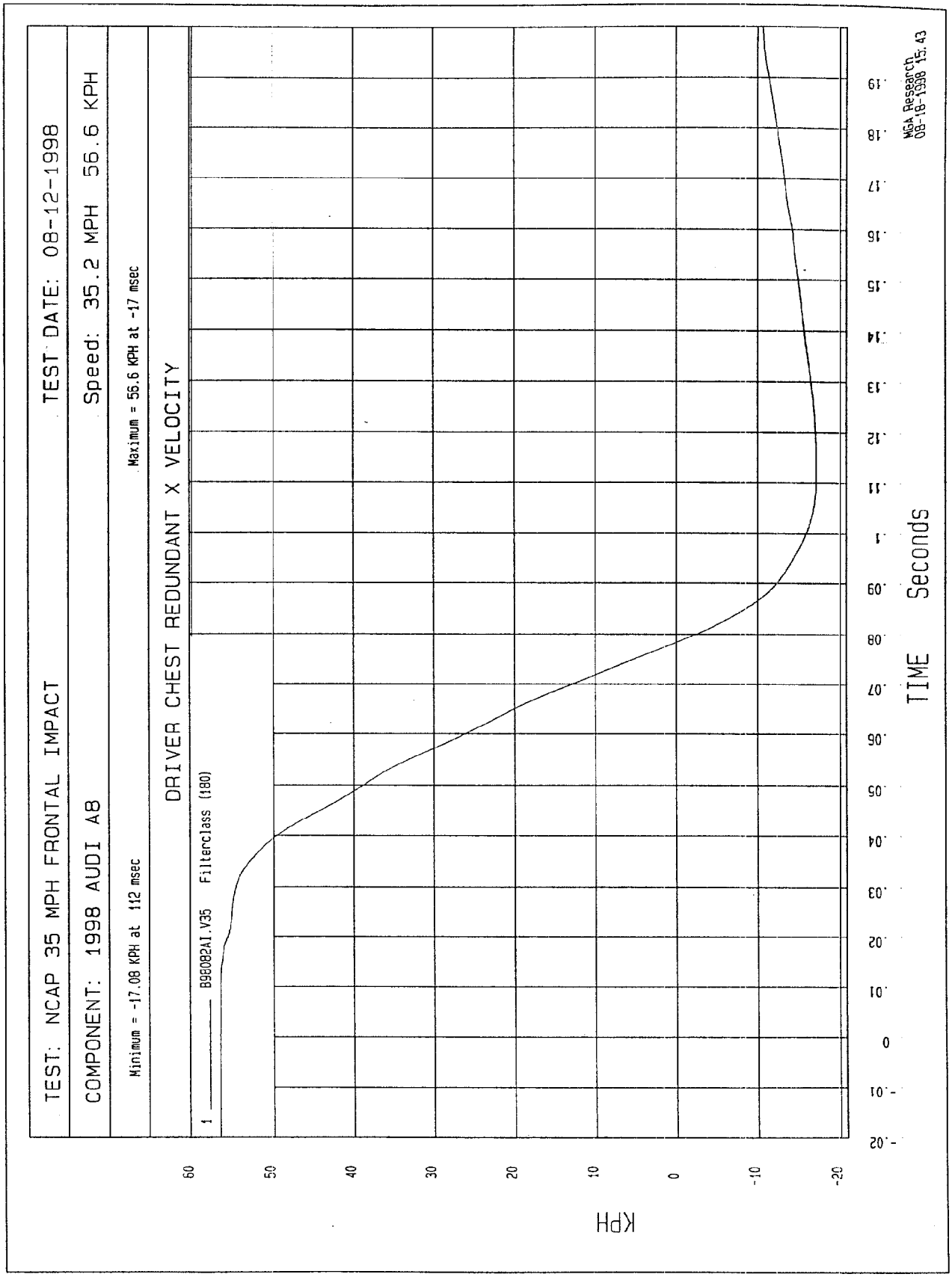

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -17.29 KPH at 115 msec
Maximum = 56.6 KPH at -20 msec
DRIVER CHEST X VELOCITY
1 B98082AI.V15 Filterclass (180)
KPH
TIME Seconds
MGA Research
08-18-1998 15:43

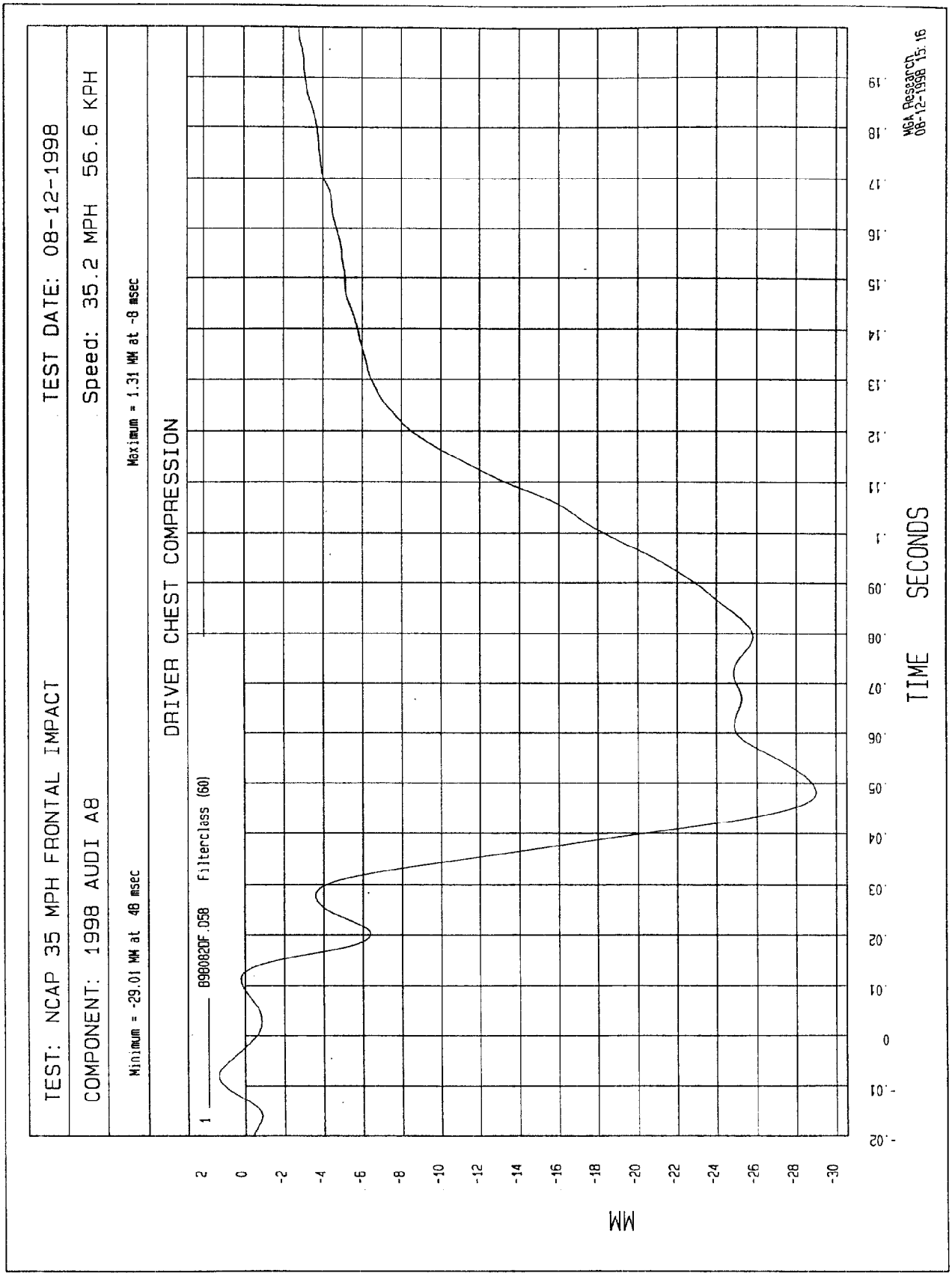

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -45.52 G'S at 76 msec
Maximum = 3.43 G'S at 163 msec
DRIVER CHEST REDUNDANT X ACCELERATION
1 _____ B98082AF.A35 Filterclass (180)
MGA Research
08-12-1998 15:05
0
-10
-20
-30
-40
G'S
.02
.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)

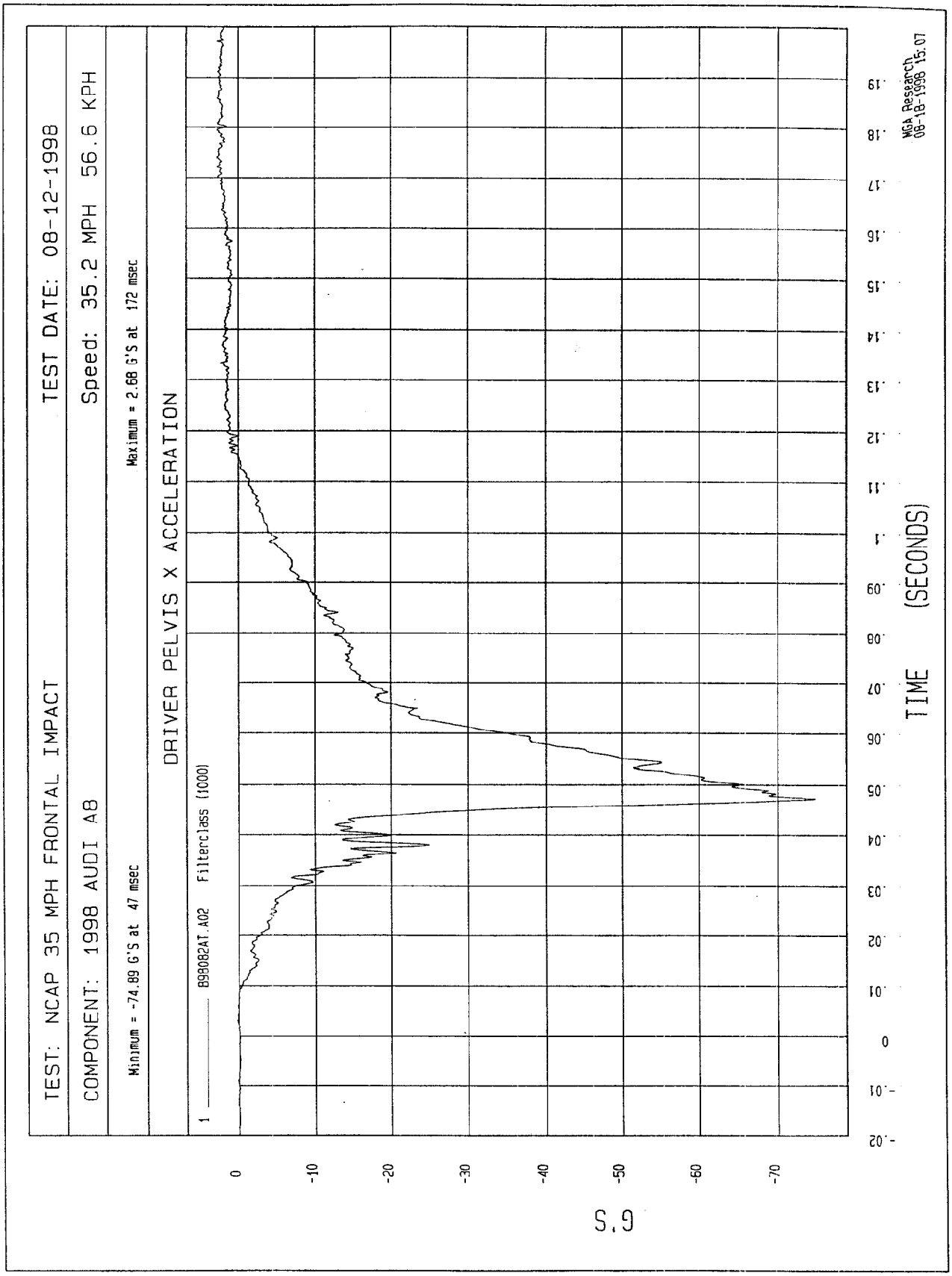

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -7.63 G'S at 98 msec
Maximum = 4.96 G'S at 68 msec
DRIVER CHEST REDUNDANT Y ACCELERATION
1 B98002AF.A36 Filterclass (180)
MGA Research
08-12-1998 15:05
TIME (SECONDS)
G'S

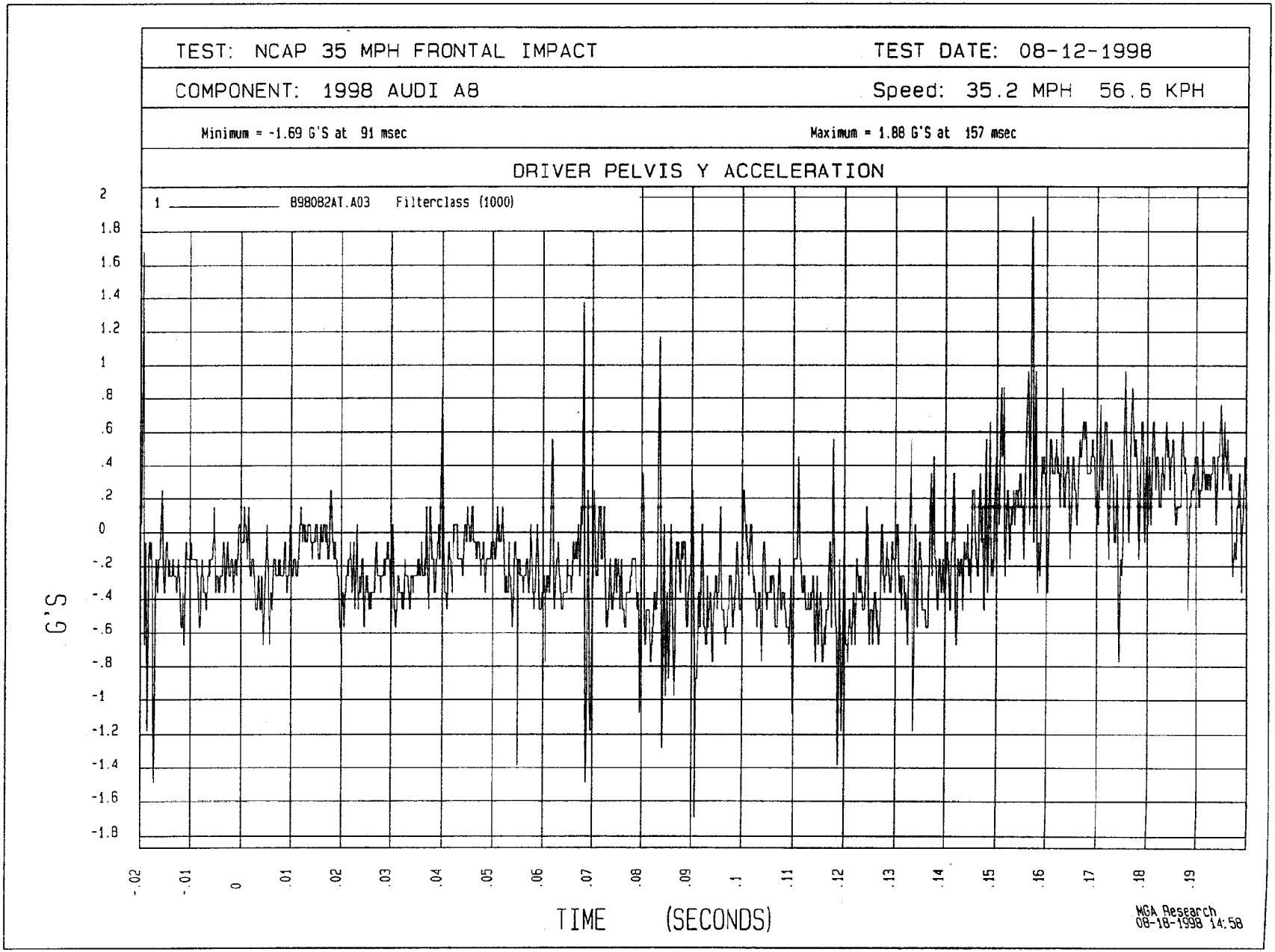

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -12.85 G'S at 41 msec
Maximum = 4.83 G'S at 71 msec
DRIVER CHEST REDUNDANT Z ACCELERATION
1 B98082AF.A37 Filterclass (180)
G'S
TIME (SECONDS)
MGA Research
08-18-1998 15:16

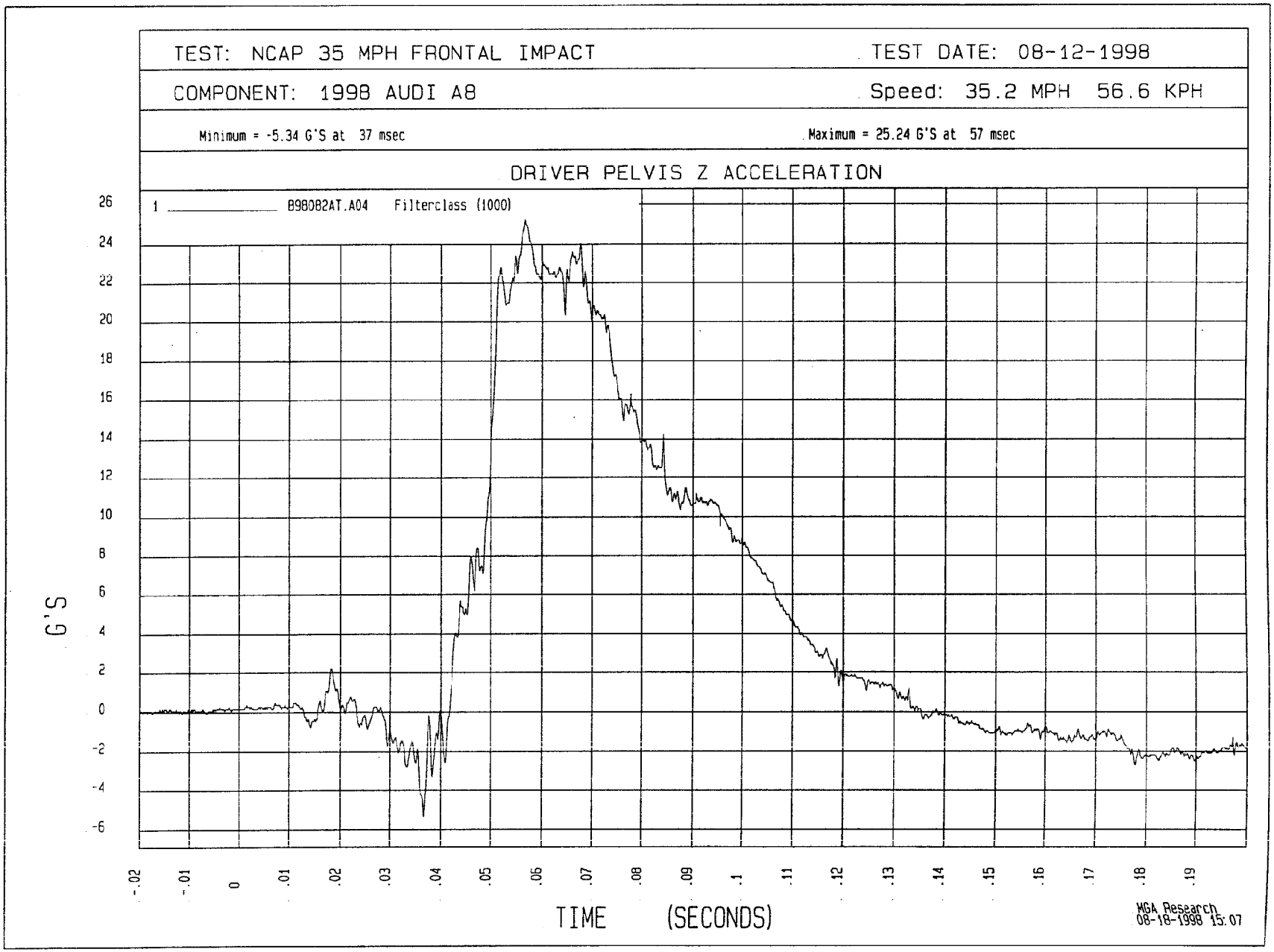

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 9.98E-03 G'S at -11 msec
Maximum = 45.65 G'S at 76 msec
DRIVER CHEST REDUNDANT RESULTANT ACCELERATION
1 B98082AV.A35 Filterclass (180)
40
30
20
10
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:05

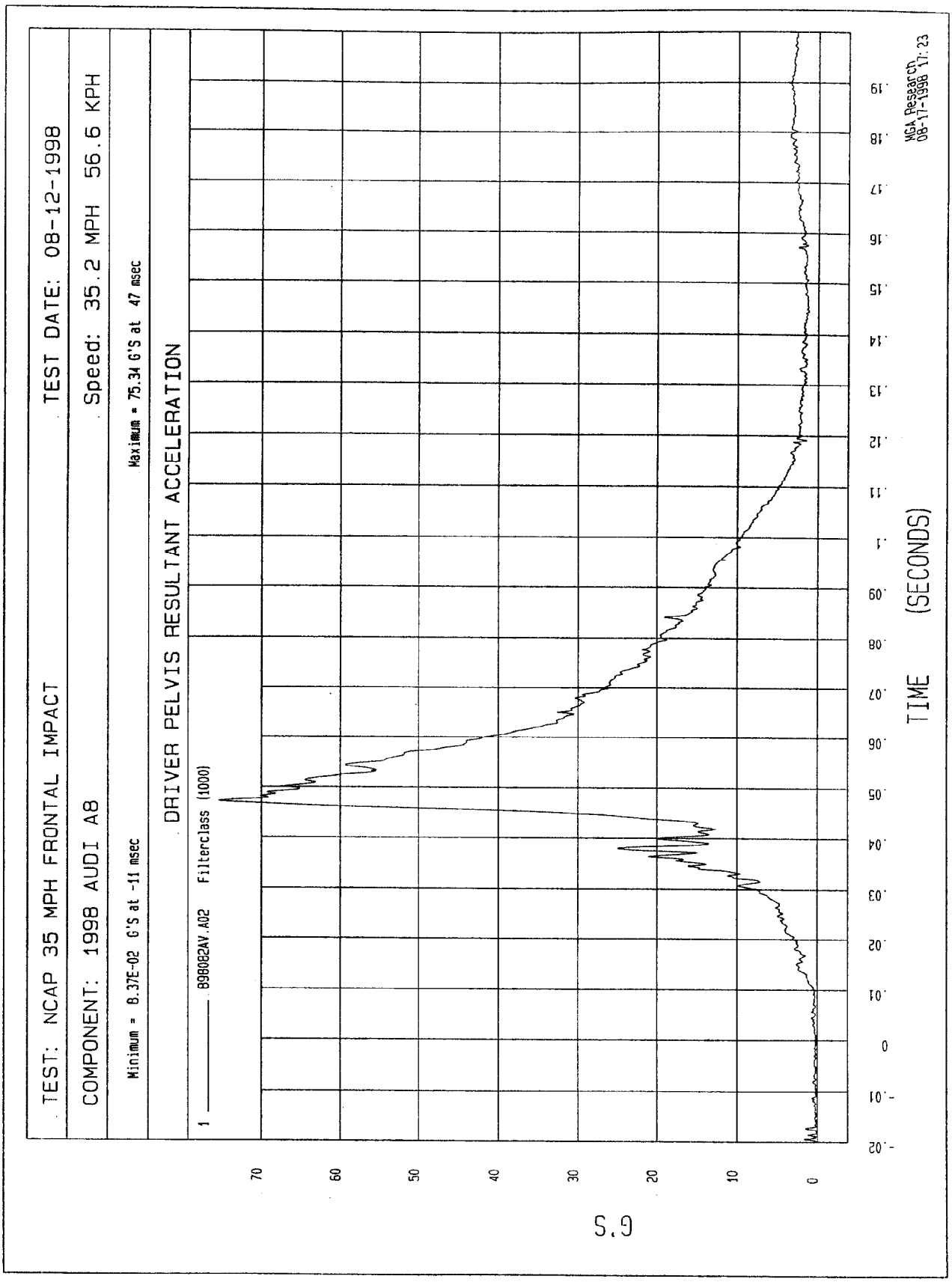

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -17.08 KPH at 112 msec
Maximum = 56.6 KPH at -17 msec
DRIVER CHEST REDUNDANT X VELOCITY
1 B98082AI.V35 Filterclass (180)
KPH
TIME Seconds
MGA Research
08-18-1998 15:43

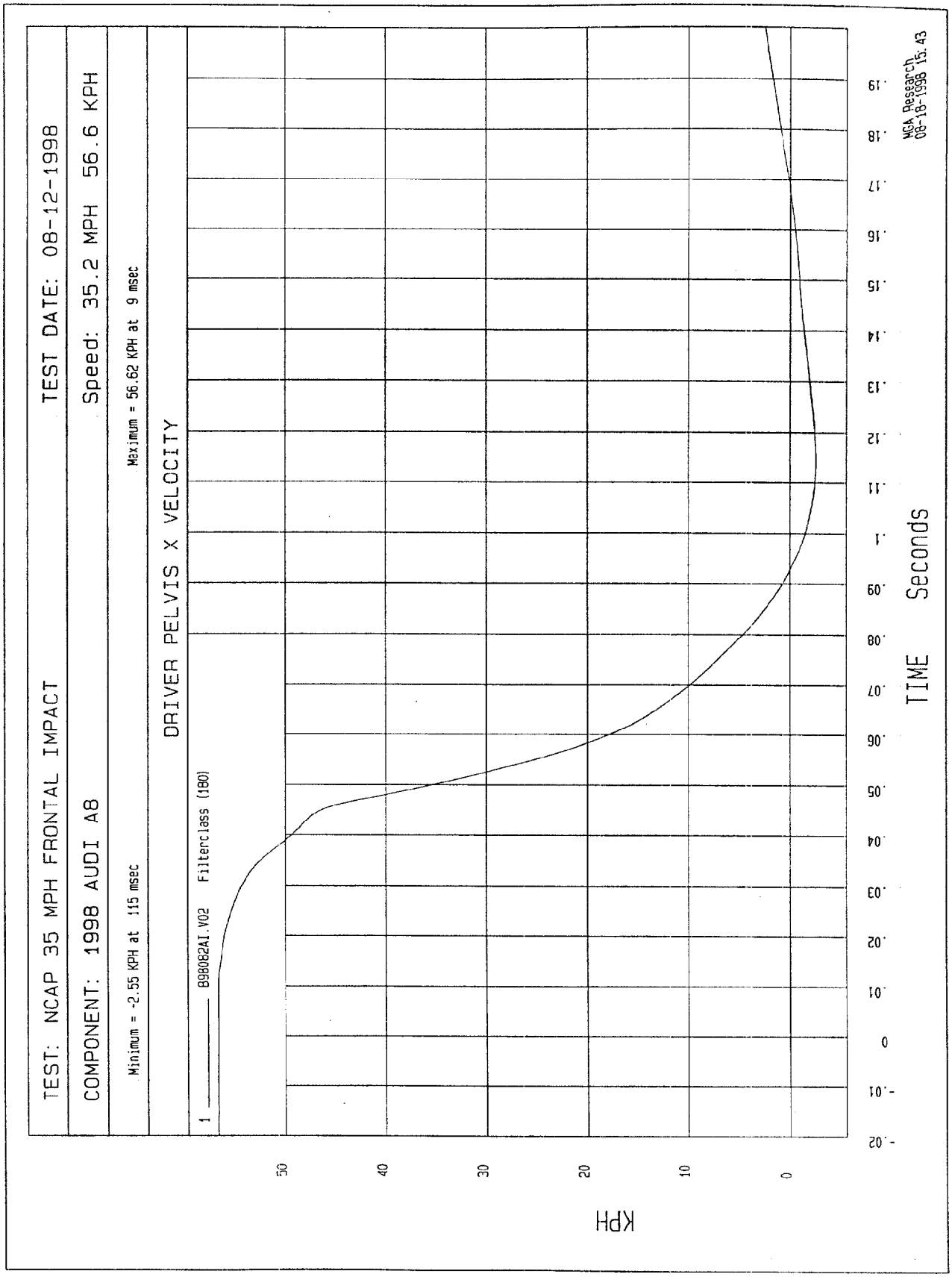

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -29.01 MM at 48 msec
Maximum = 1.31 MM at -8 msec
DRIVER CHEST COMPRESSION
1 B980820F.058 Filterclass (60)
MM
TIME SECONDS
MGA Research
08-12-1998 15:16

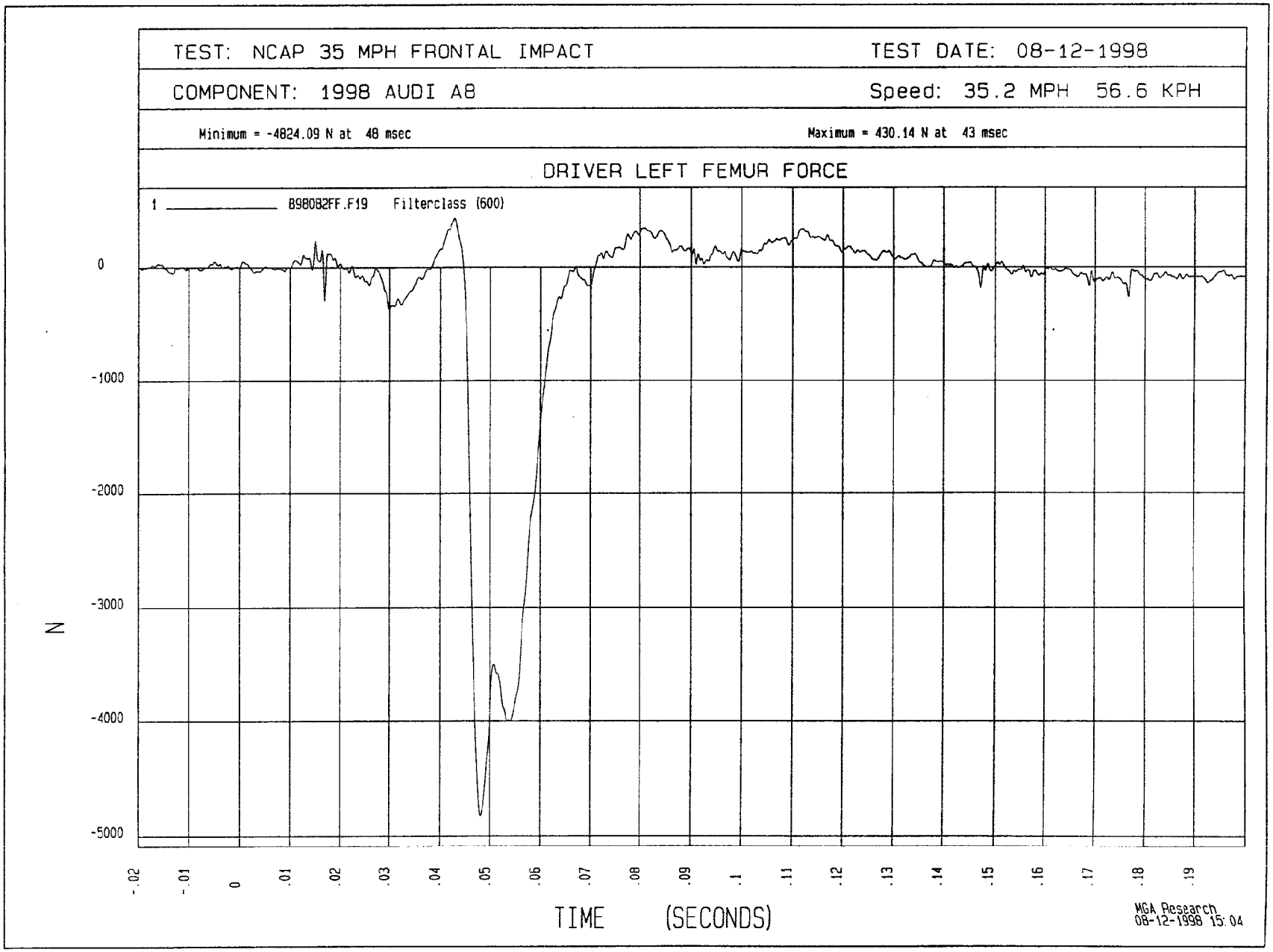

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -74.89 G'S at 47 msec
Maximum = 2.68 G'S at 172 msec
DRIVER PELVIS X ACCELERATION
1 _____ B98082AT.A02 Filterclass (1000)
MGA Research
08-18-1998 15:07
TIME (SECONDS)
0
-10
-20
-30
-40
-50
-60
-70
.19
.18
.17
.16
.15
.14
.13
.12
.11
.1
.09
.08
.07
.06
.05
.04
.03
.02
.01
0
-.01
-.02
S.9
6'S

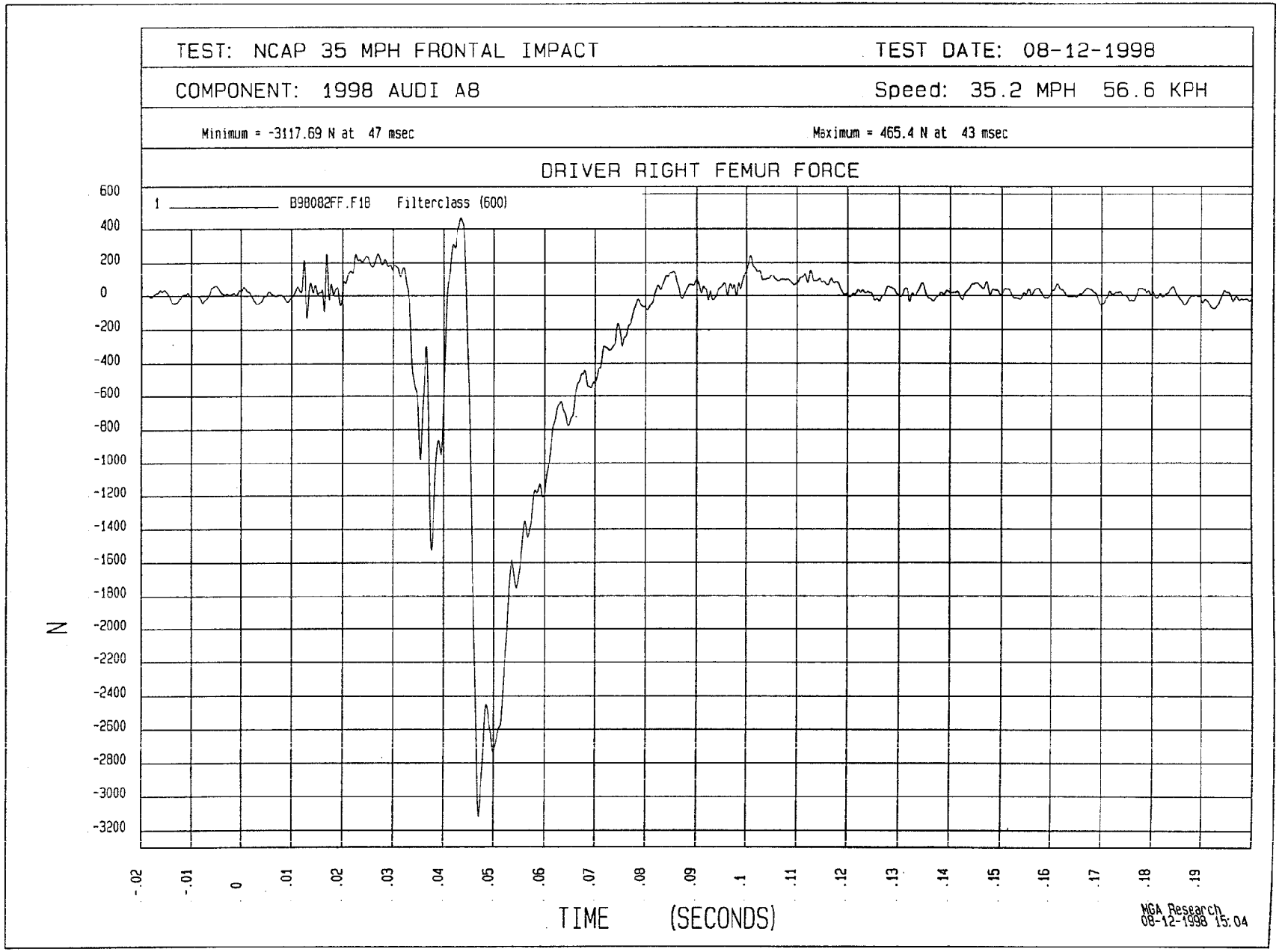

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -1.69 G'S at 91 msec
Maximum = 1.88 G'S at 157 msec
DRIVER PELVIS Y ACCELERATION
1 B980824T.A03 Filterclass (1000)
2
1.8
1.6
1.4
1.2
1
.8
.6
.4
.2
0
-.2
-.4
-.6
-.8
-1
-1.2
-1.4
-1.6
-1.8
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
NGA Research
08-18-1998 14:58

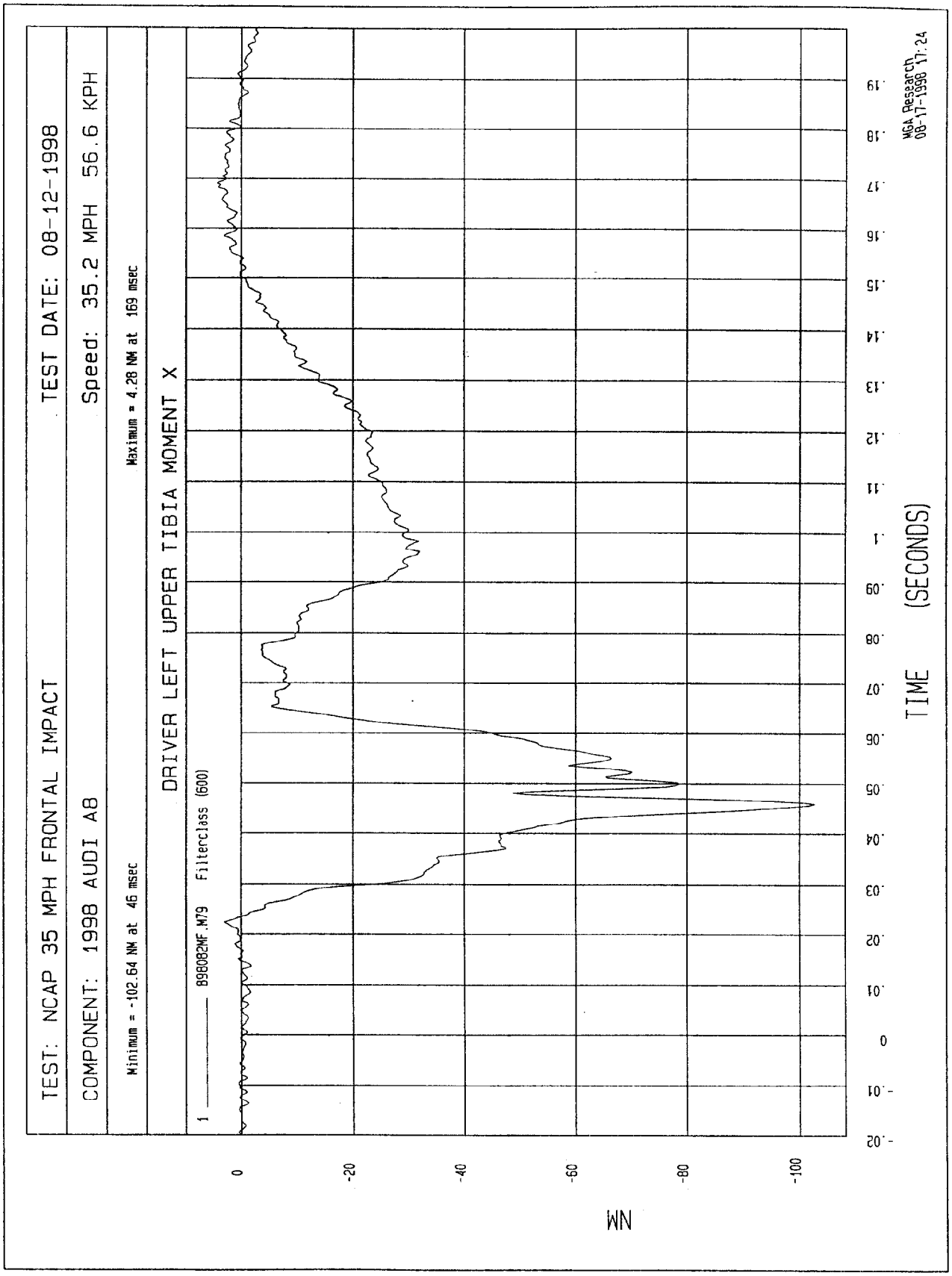

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -5.34 G'S at 37 msec
Maximum = 25.24 G'S at 57 msec
DRIVER PELVIS Z ACCELERATION
1 B98082AT.A04 Filterclass (1000)
G'S
26
24
22
20
18
16
14
12
10
8
6
4
2
0
-2
-4
-6
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-18-1998 15:07

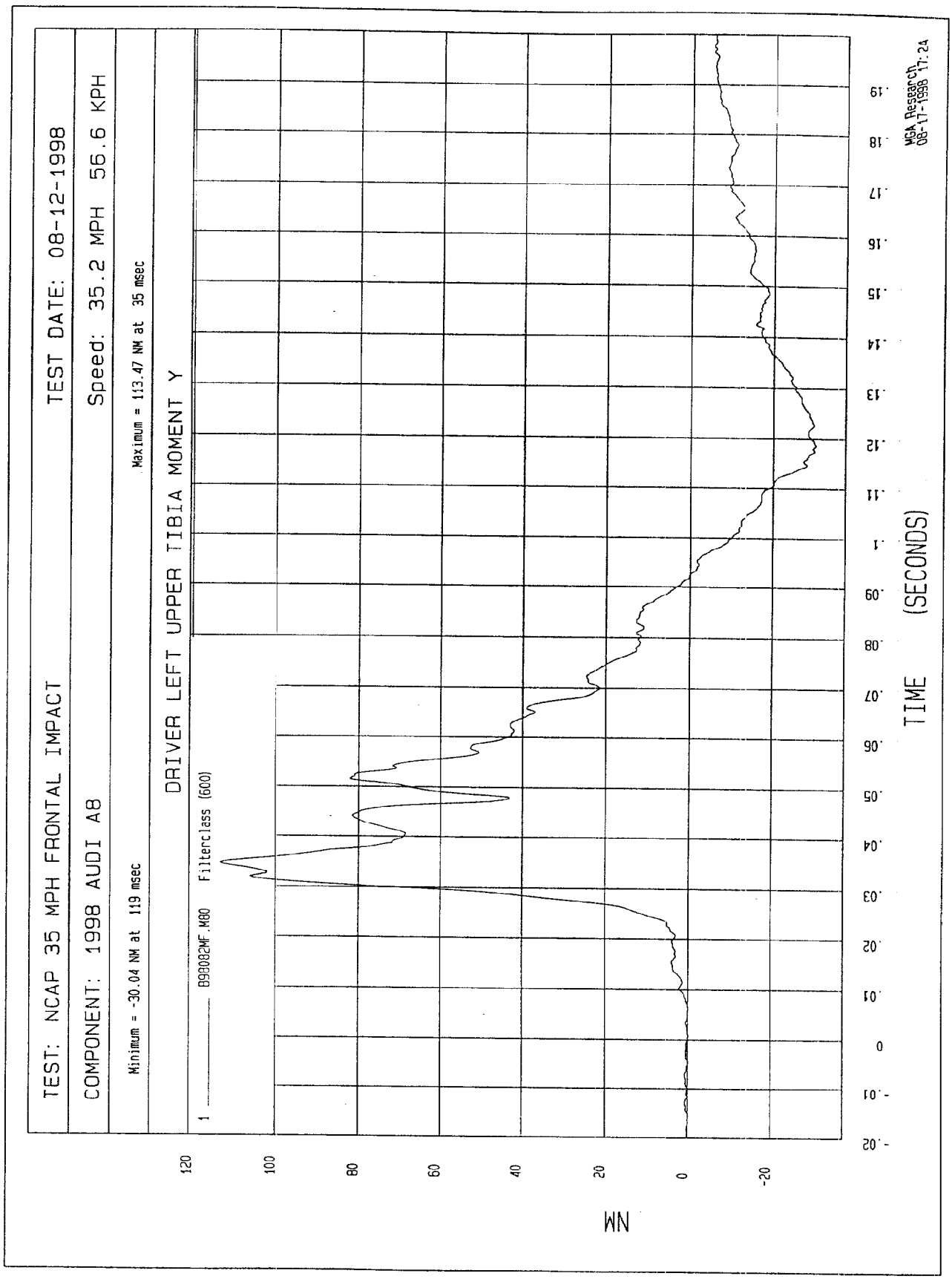

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 8.37E-02 G'S at -11 msec
Maximum = 75.34 G'S at 47 msec
DRIVER PELVIS RESULTANT ACCELERATION
1 B98082AV.A02 Filterclass (1000)
G's
TIME (SECONDS)
MGA Research
08-17-1998 17:23

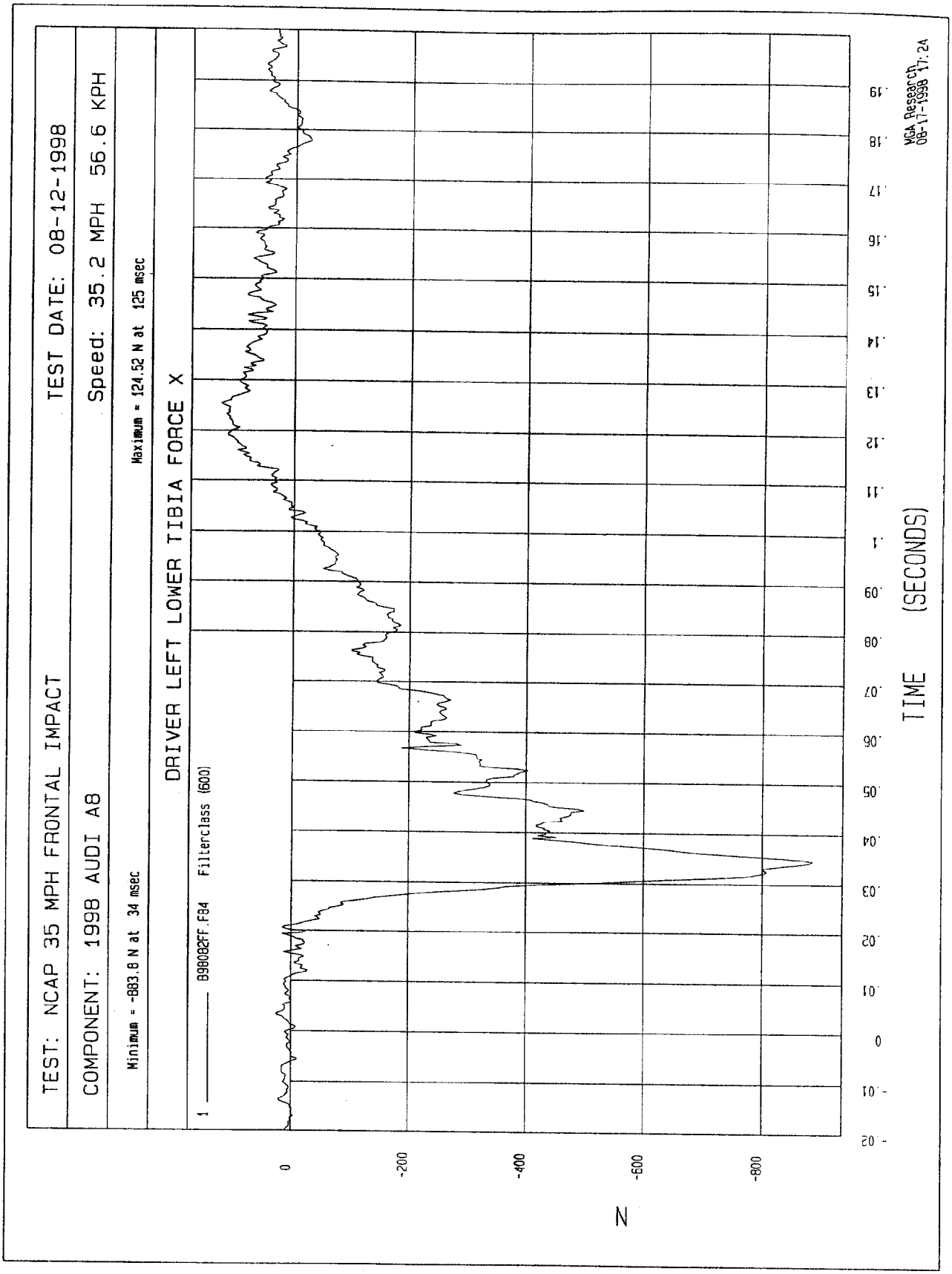

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -2.55 KPH at 115 msec
Maximum = 56.62 KPH at 9 msec
DRIVER PELVIS X VELOCITY
1 B980802AI.V02 Filterclass (180)
KPH
50
40
30
20
10
0
-02
-01
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
TIME Seconds
MGA Research
08-18-1998 15:43

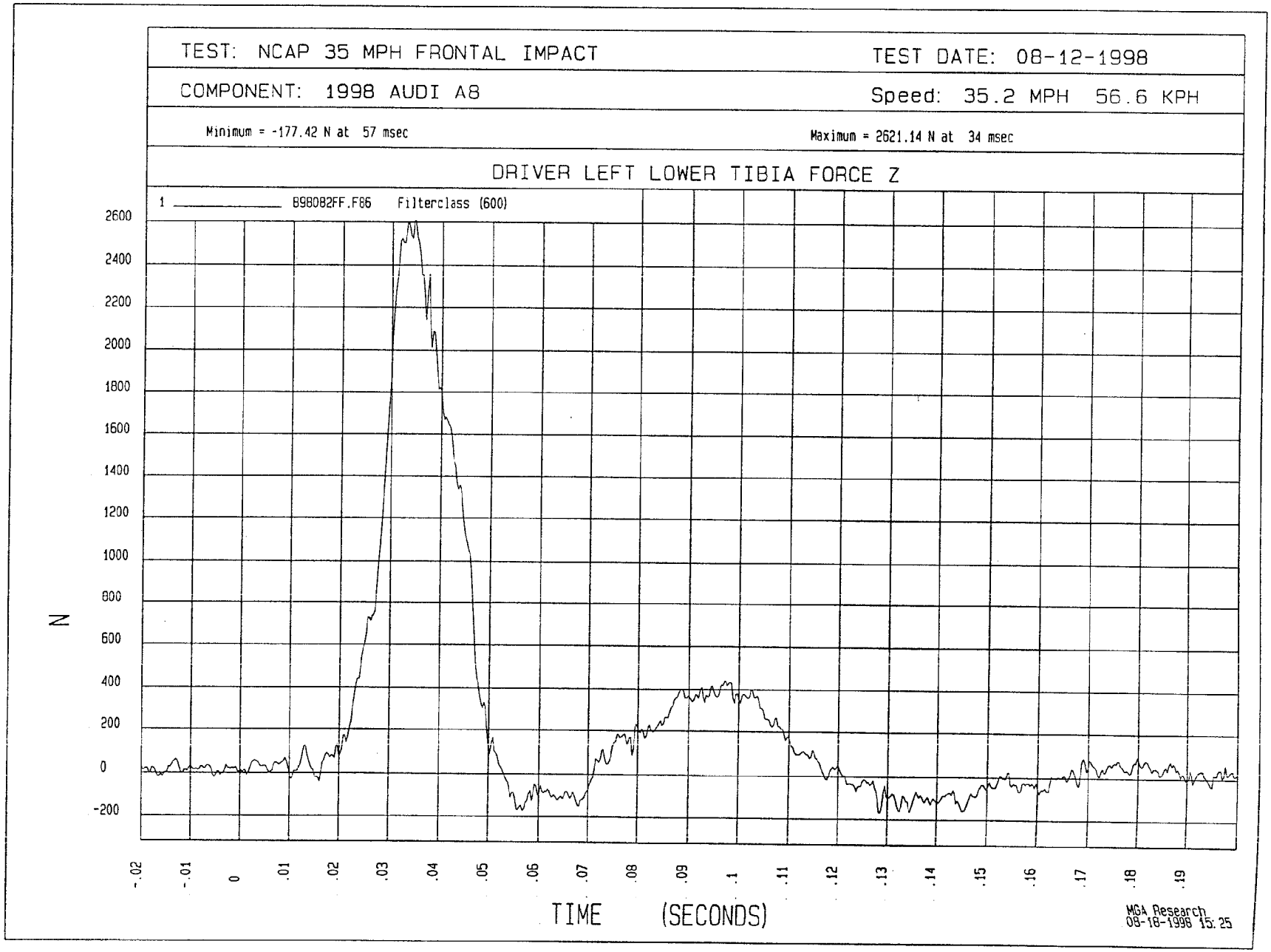

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -4824.09 N at 48 msec
Maximum = 430.14 N at 43 msec
DRIVER LEFT FEMUR FORCE
1 B98082FF.F19 Filterclass (600)
0
-1000
-2000
-3000
-4000
-5000
N
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:04

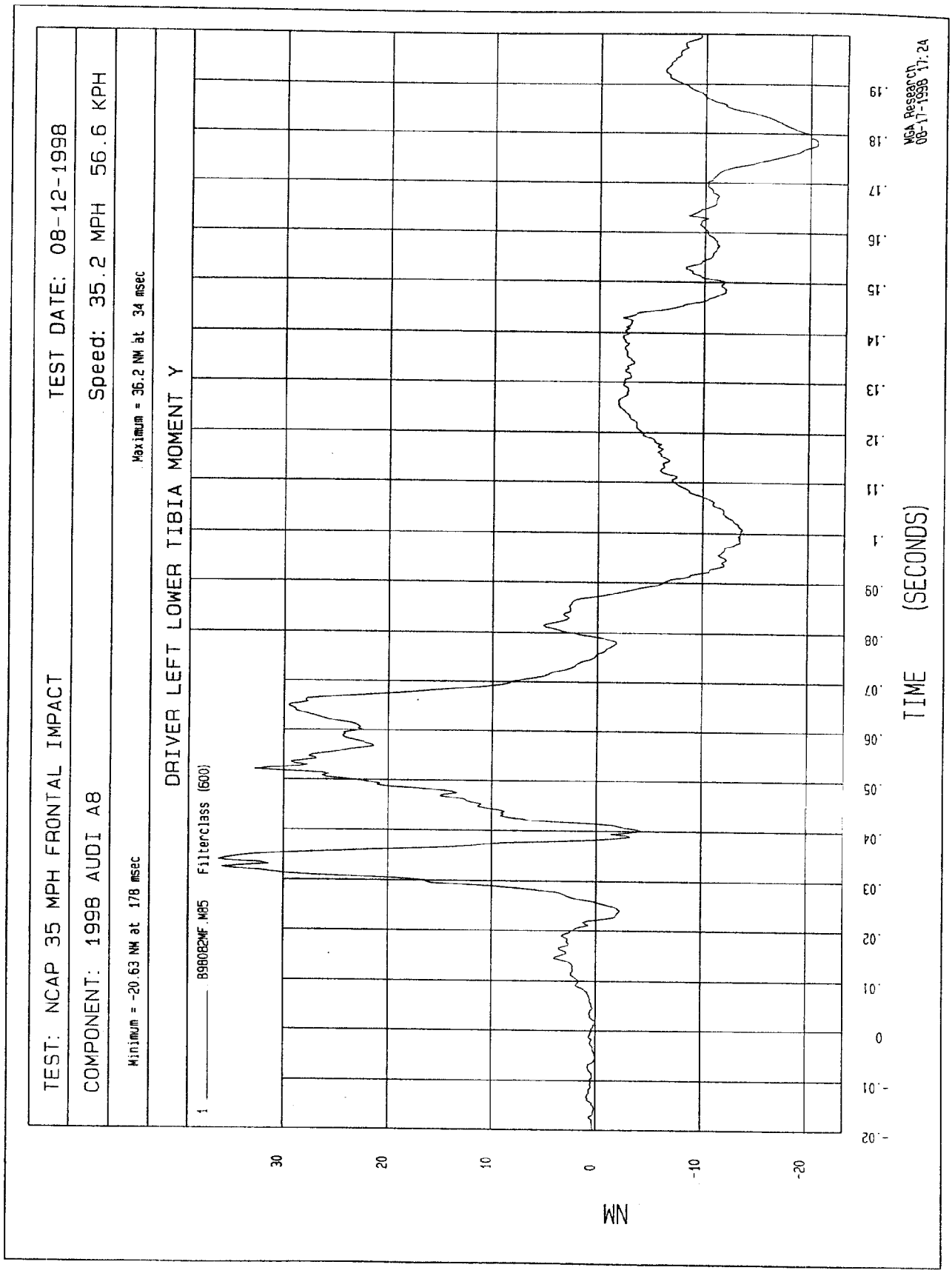

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -3117.69 N at 47 msec
Maximum = 465.4 N at 43 msec
DRIVER RIGHT FEMUR FORCE
1 B98082FF.F18 Filterclass (600)
600
400
200
0
-200
-400
-600
-800
-1000
-1200
-1400
-1600
-1800
-2000
-2200
-2400
-2600
-2800
-3000
-3200
N
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:04

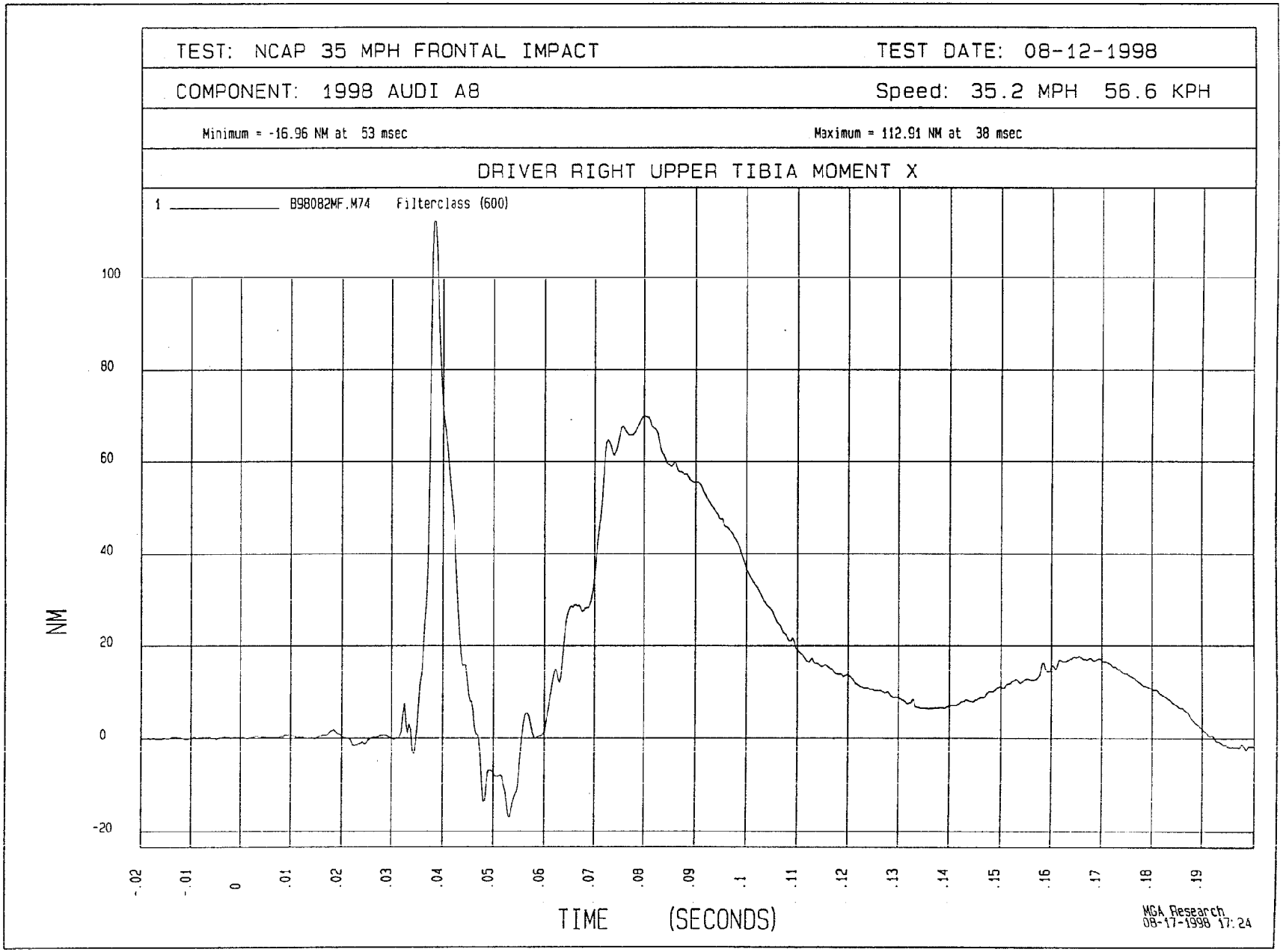

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -102.64 NM at 46 msec
Maximum = 4.28 NM at 169 msec
DRIVER LEFT UPPER TIBIA MOMENT X
1 _____ B98082NF.M79 Filterclass (600)
NM
0
-20
-40
-60
-80
-100
TIME (SECONDS)
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
MGA Research
08-17-1998 17:24

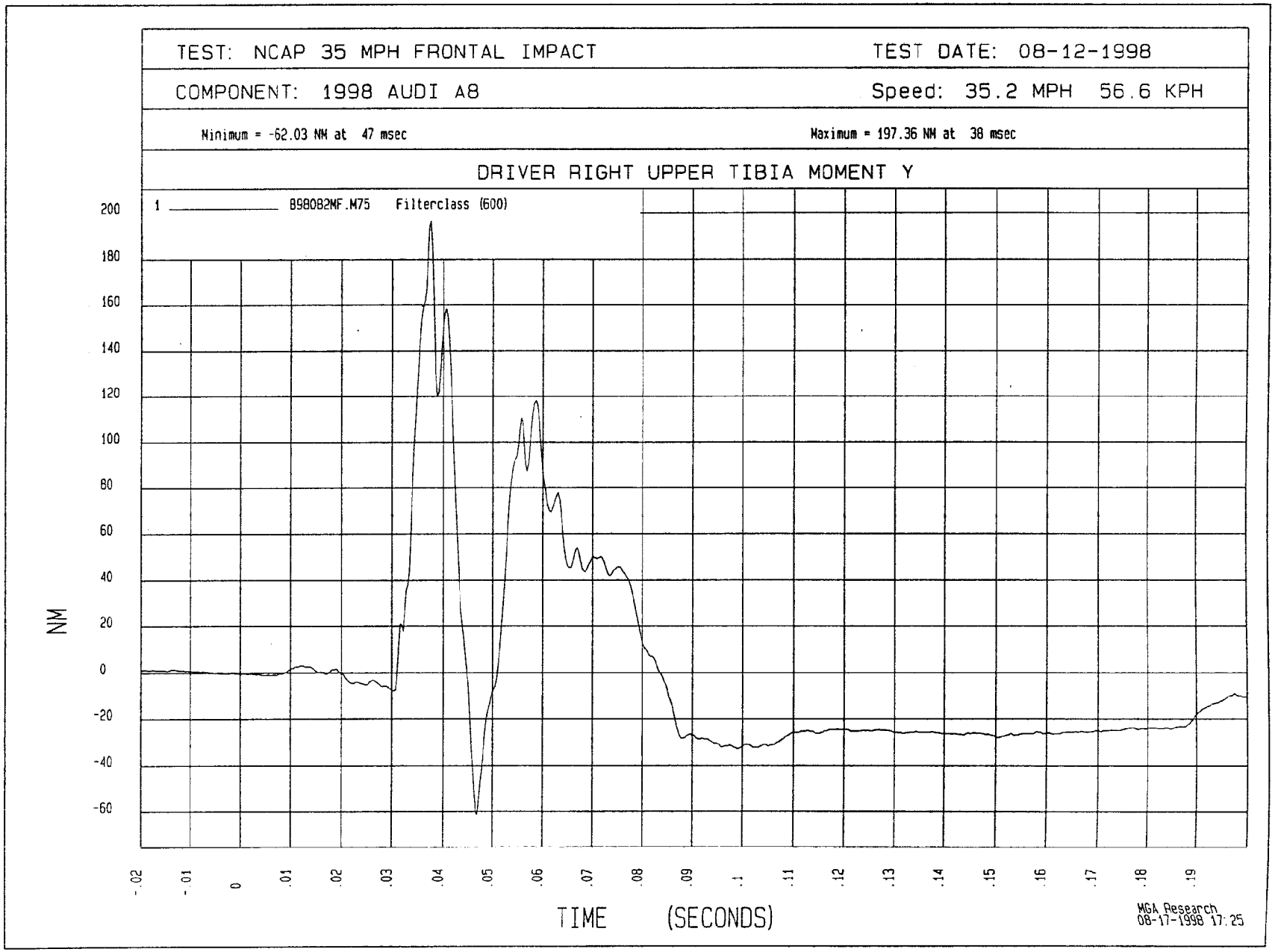

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -30.04 NM at 119 msec
Maximum = 113.47 NM at 35 msec
DRIVER LEFT UPPER TIBIA MOMENT Y
1 B9808ZMF.M80 Filterclass (600)
NM
TIME (SECONDS)
MGA Research
08-17-1998 17:24

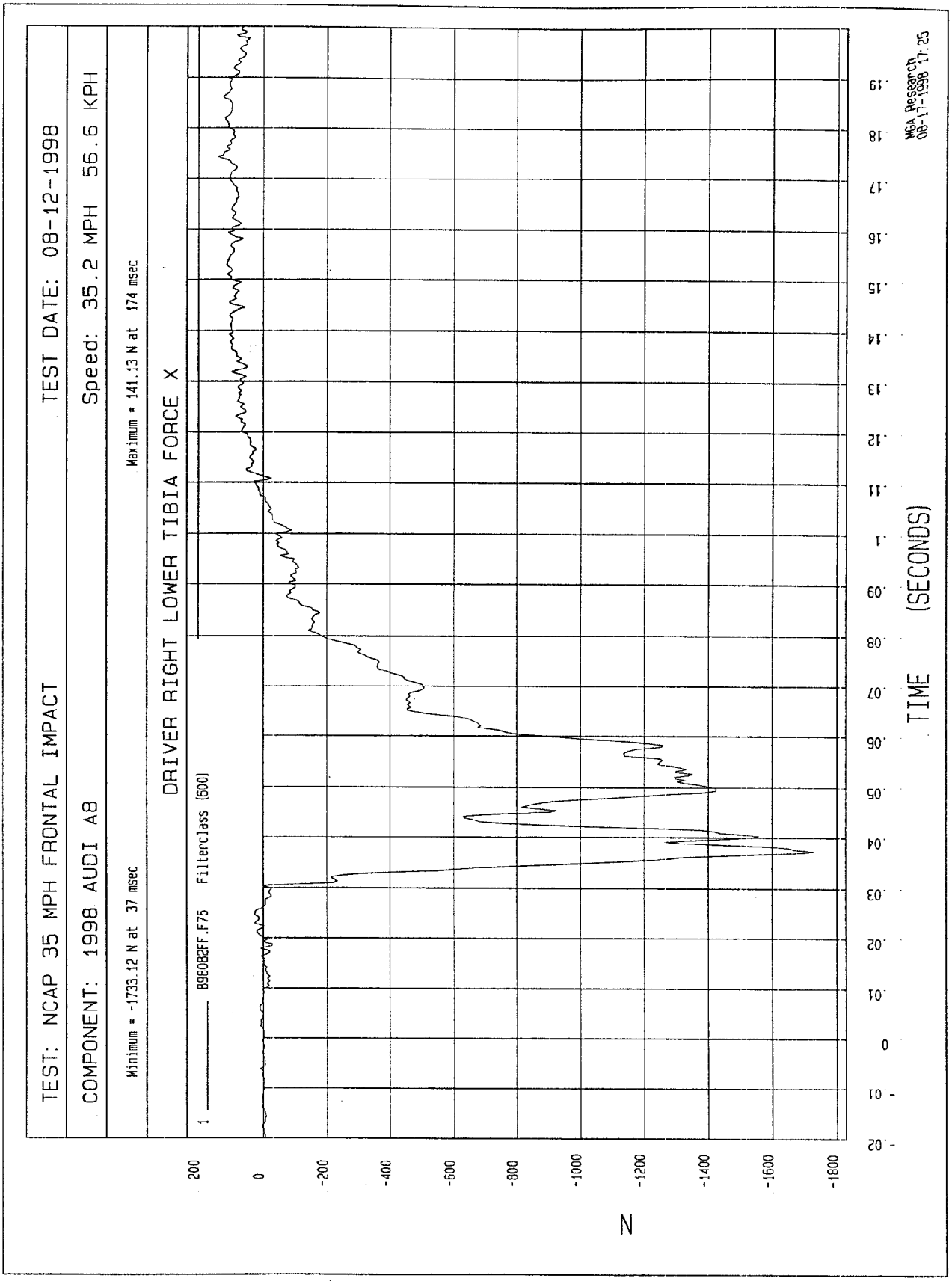

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -883.8 N at 34 msec
Maximum = 124.52 N at 125 msec
DRIVER LEFT LOWER TIBIA FORCE X
1 B98082FF.F84 Filterclass (600)
0
-200
-400
-600
-800
N
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:24

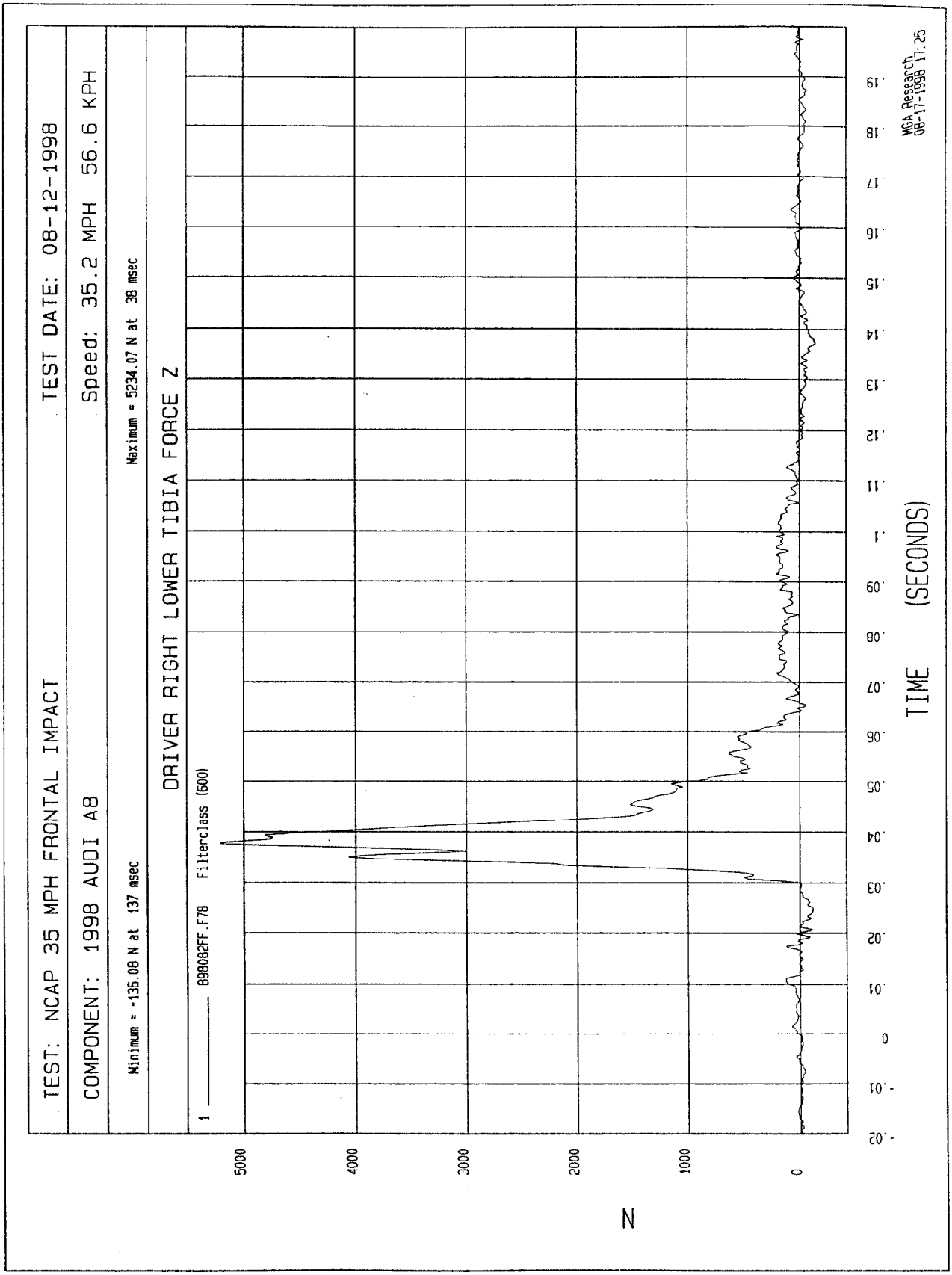

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -177.42 N at 57 msec
Maximum = 2621.14 N at 34 msec
DRIVER LEFT LOWER TIBIA FORCE Z
1 B98082FF.F86 Filterclass (600)
N
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
-200
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-18-1998 15:25

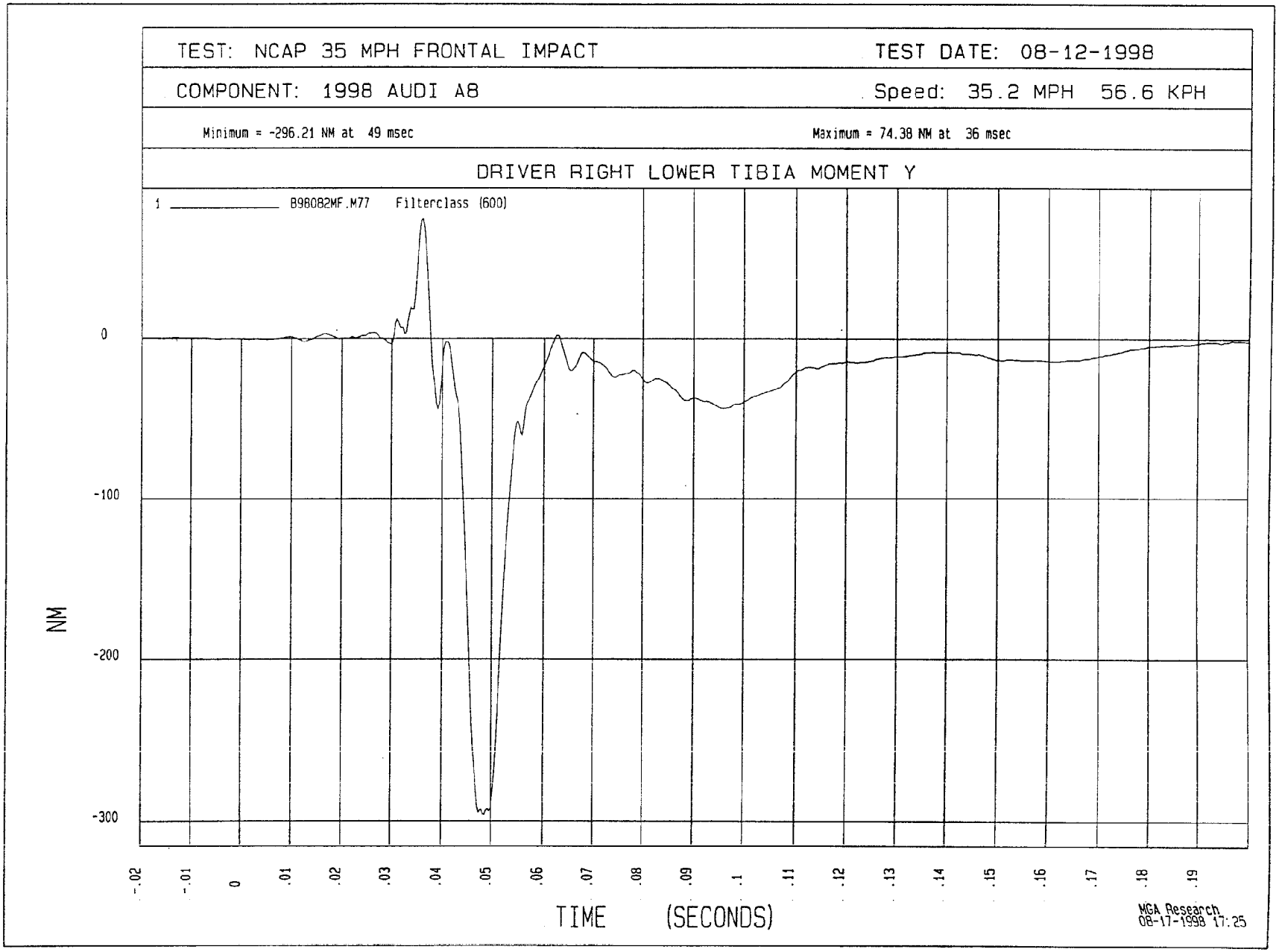

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -20.63 NM at 178 msec
Maximum = 36.2 NM at 34 msec
DRIVER LEFT LOWER TIBIA MOMENT Y
1 B98082MF M85 Filterclass (600)
NM
30
20
10
0
-10
-20
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:24

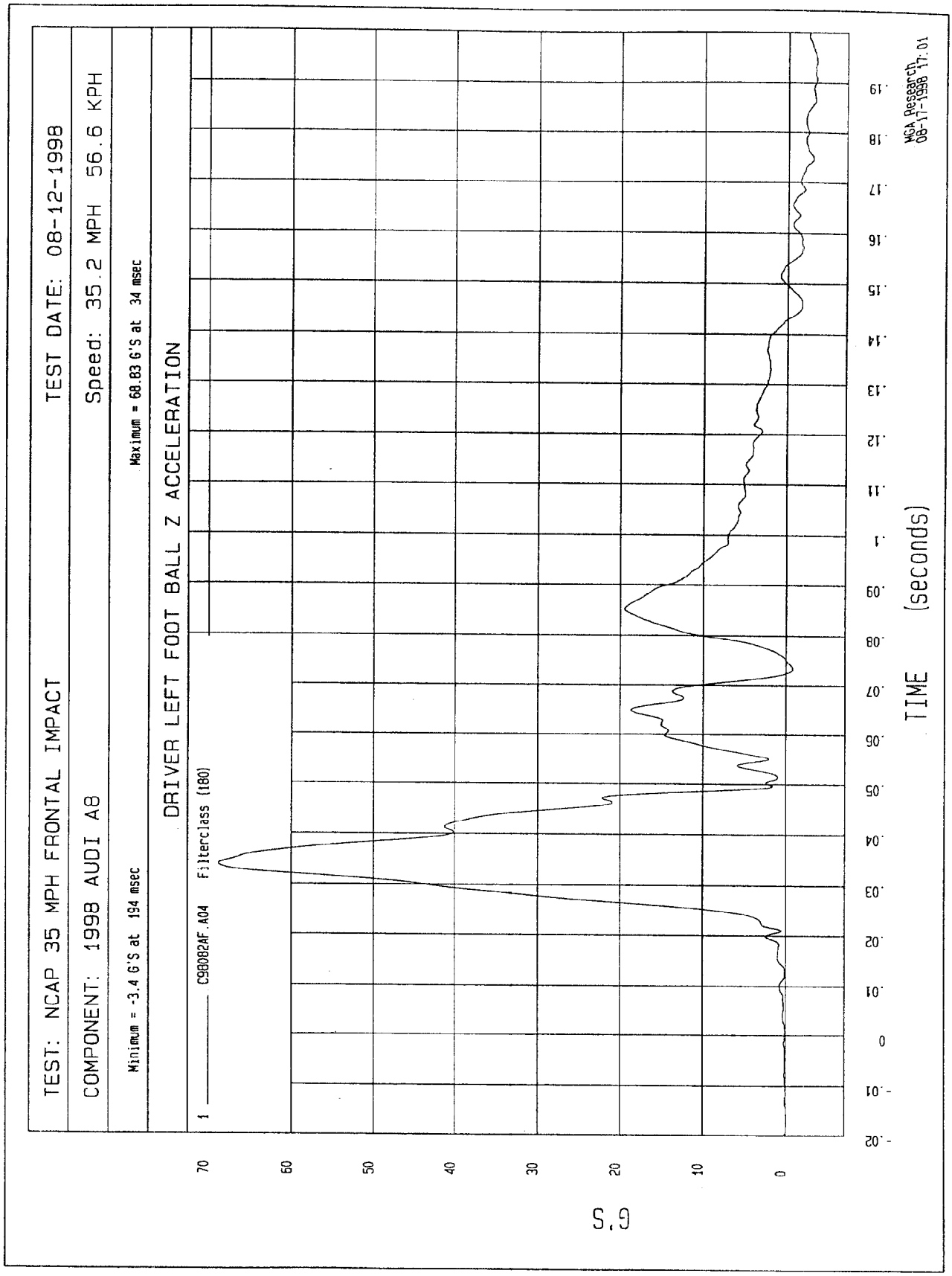

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -16.96 NM at 53 msec
Maximum = 112.91 NM at 38 msec
DRIVER RIGHT UPPER TIBIA MOMENT X
1 B98082MF.M74 Filterclass (600)
NM
100
80
60
40
20
0
-20
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:24

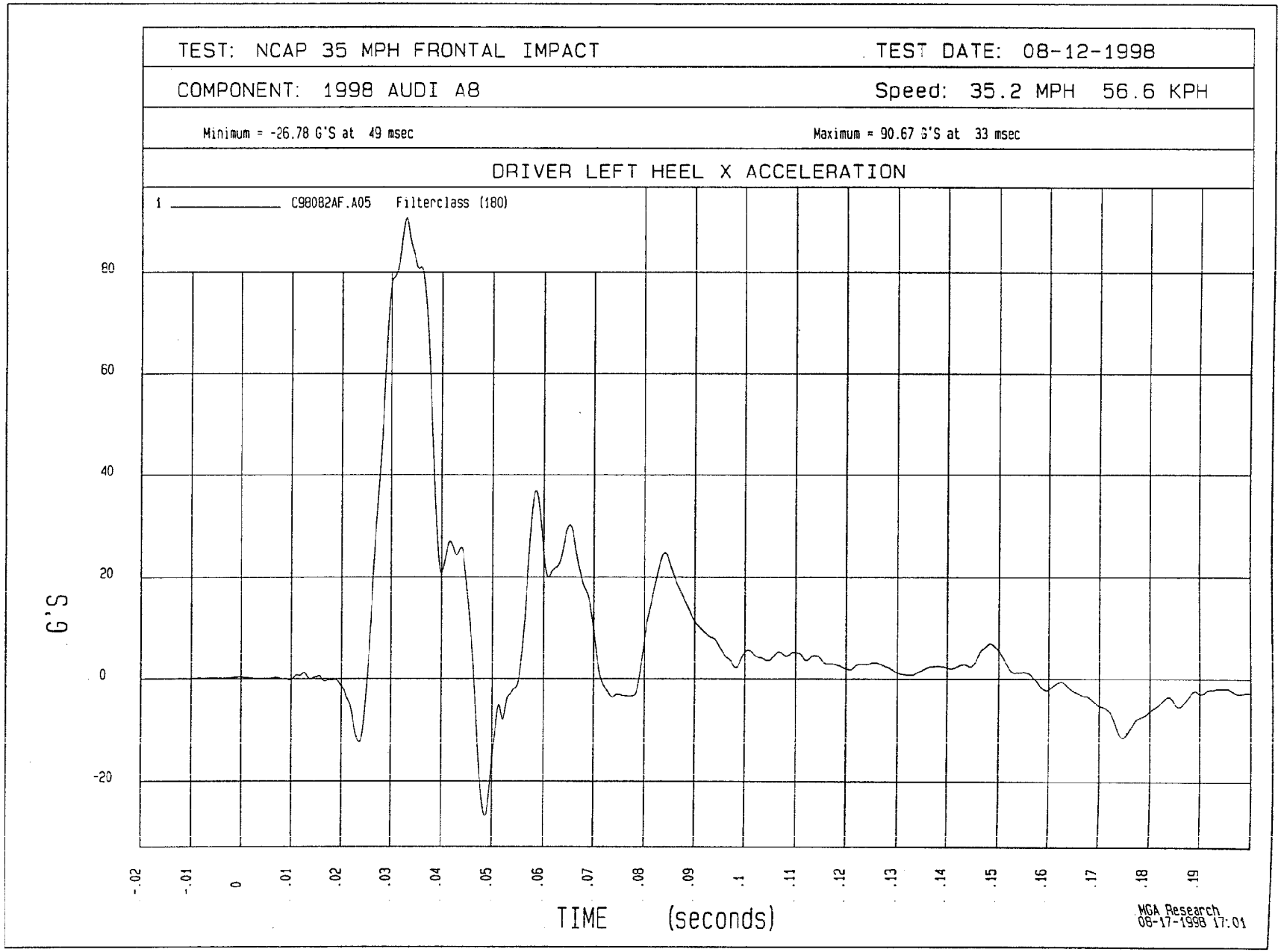

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -62.03 NM at 47 msec
Maximum = 197.36 NM at 38 msec
DRIVER RIGHT UPPER TIBIA MOMENT Y
1 B98082MF.M75 Filterclass (600)
NM
200
180
160
140
120
100
80
60
40
20
0
-20
-40
-60
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:25

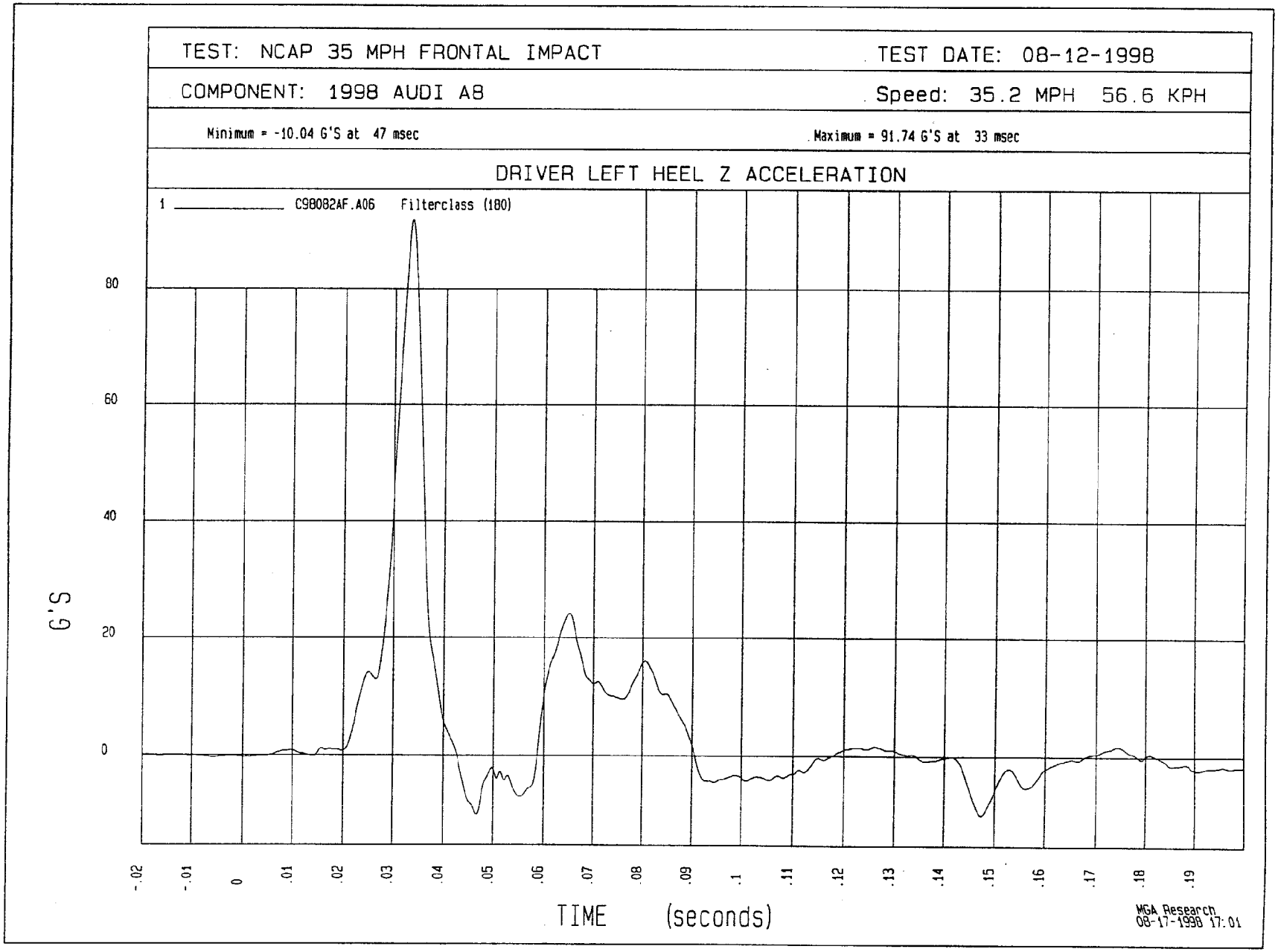

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -1733.12 N at 37 msec
Maximum = 141.13 N at 174 msec
DRIVER RIGHT LOWER TIBIA FORCE X
1 B9808ZFF.F75 Filterclass (600)
200
0
-200
-400
-600
-800
-1000
-1200
-1400
-1600
-1800
N
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:25

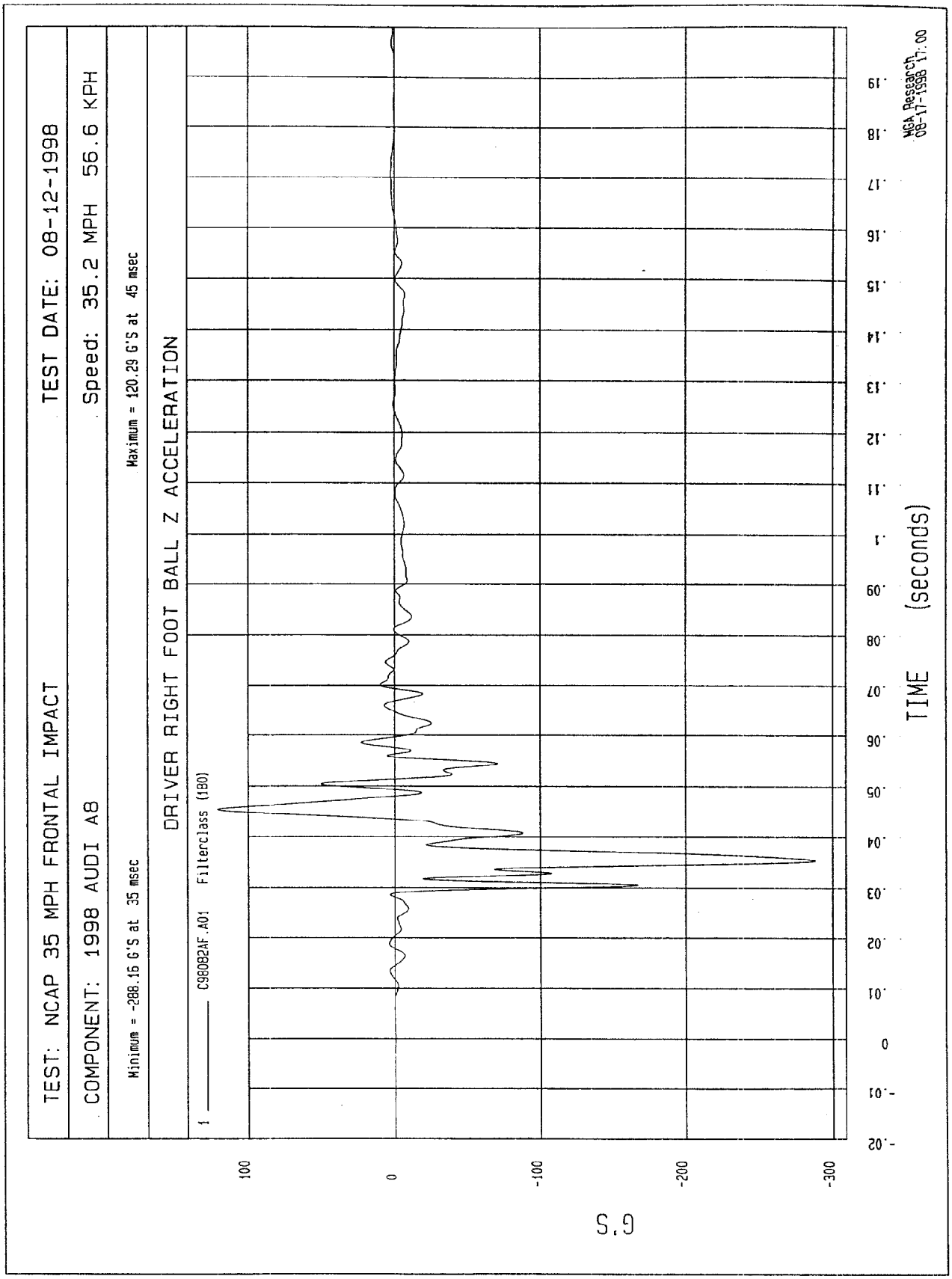

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -136.08 N at 137 msec
Maximum = 5234.07 N at 38 msec
DRIVER RIGHT LOWER TIBIA FORCE Z
1 B98082FF.F78 Filterclass (600)
5000
4000
3000
2000
1000
0
N
.02
.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:25

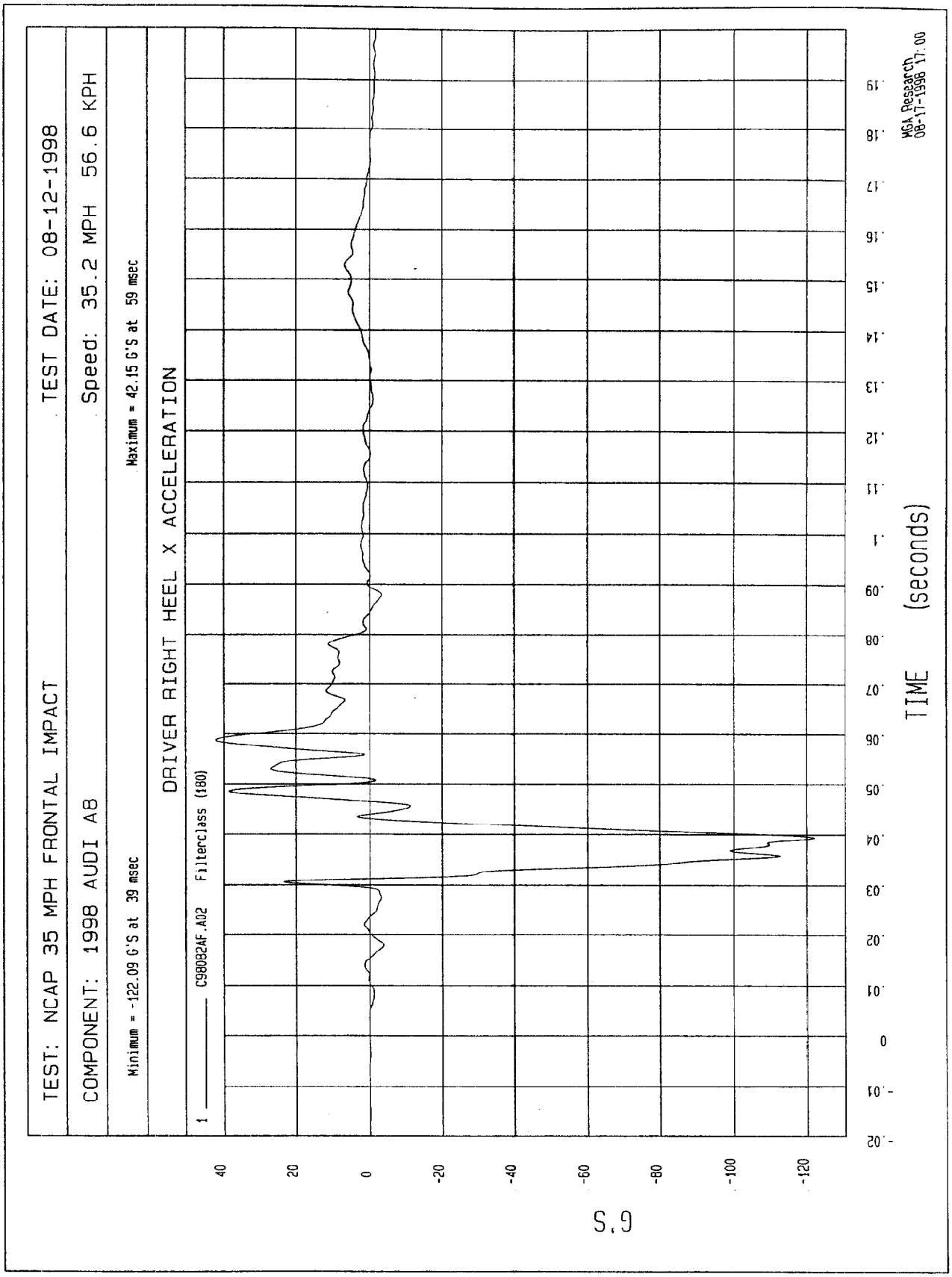

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -296.21 NM at 49 msec
Maximum = 74.38 NM at 36 msec
DRIVER RIGHT LOWER TIBIA MOMENT Y
1 B98082MF.M77 Filterclass (600)
0
-100
-200
-300
NM
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:25

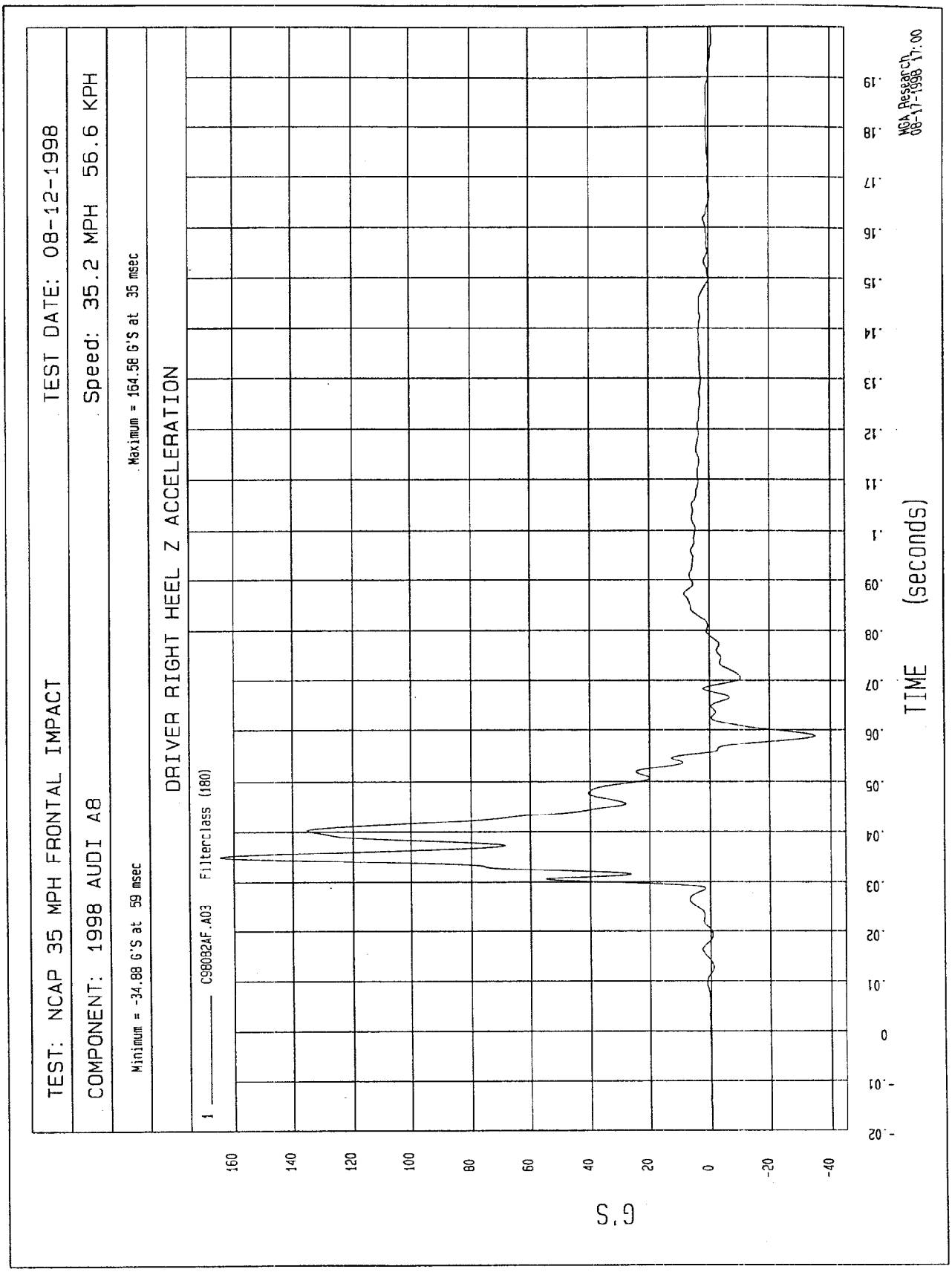

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -3.4 G'S at 194 msec
Maximum = 68.83 G'S at 34 msec
DRIVER LEFT FOOT BALL Z ACCELERATION
1 C980B2AF.A04 Filterclass (180)
MGA Research
08-17-1998 17:01
TIME (seconds)
G'S
70
60
50
40
30
20
10
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19

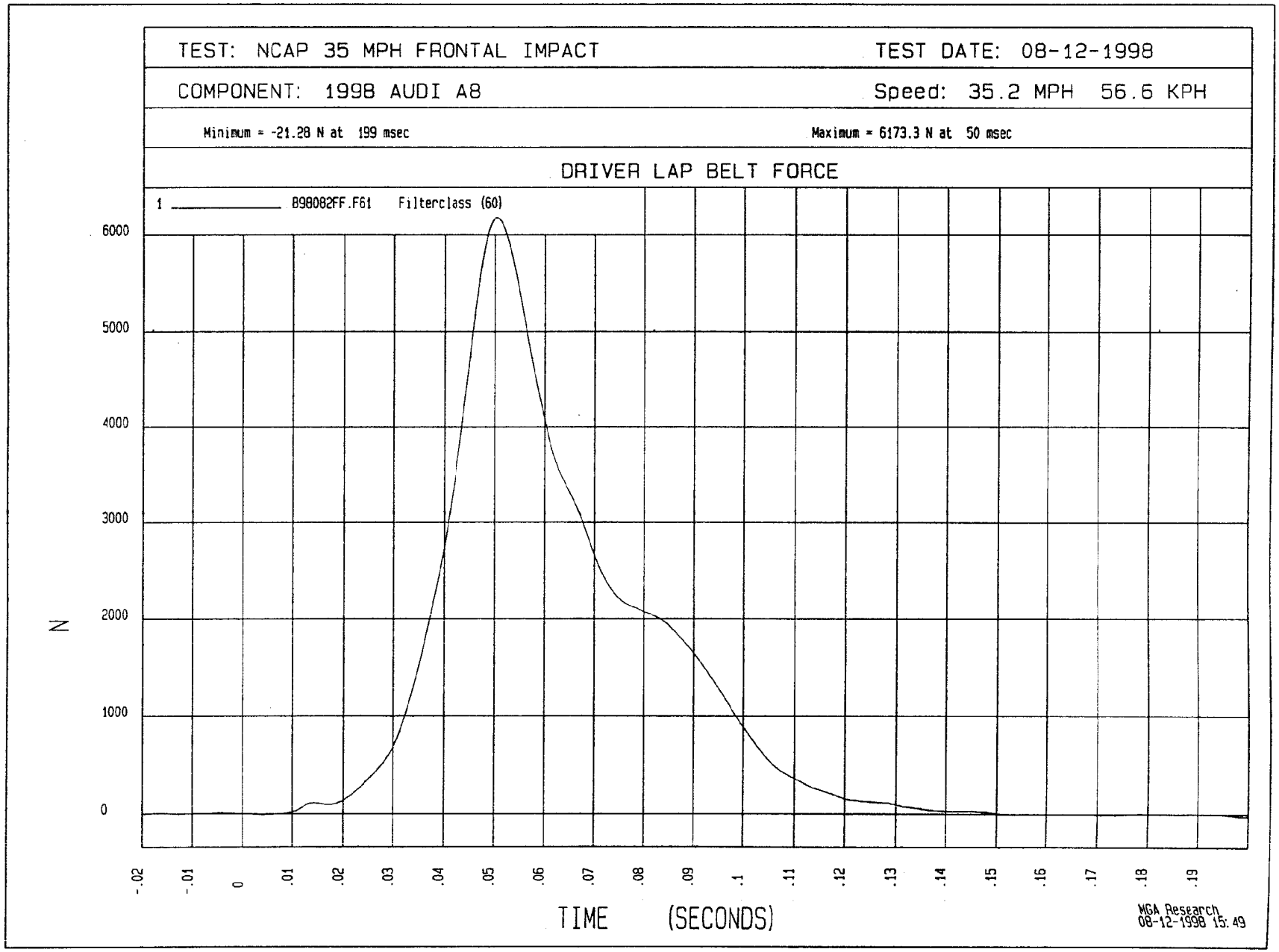

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -26.78 G'S at 49 msec
Maximum = 90.67 G'S at 33 msec
DRIVER LEFT HEEL X ACCELERATION
1 C980B2AF.A05 Filterclass (180)
80
60
40
20
0
-20
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (seconds)
MGA Research
08-17-1998 17:01

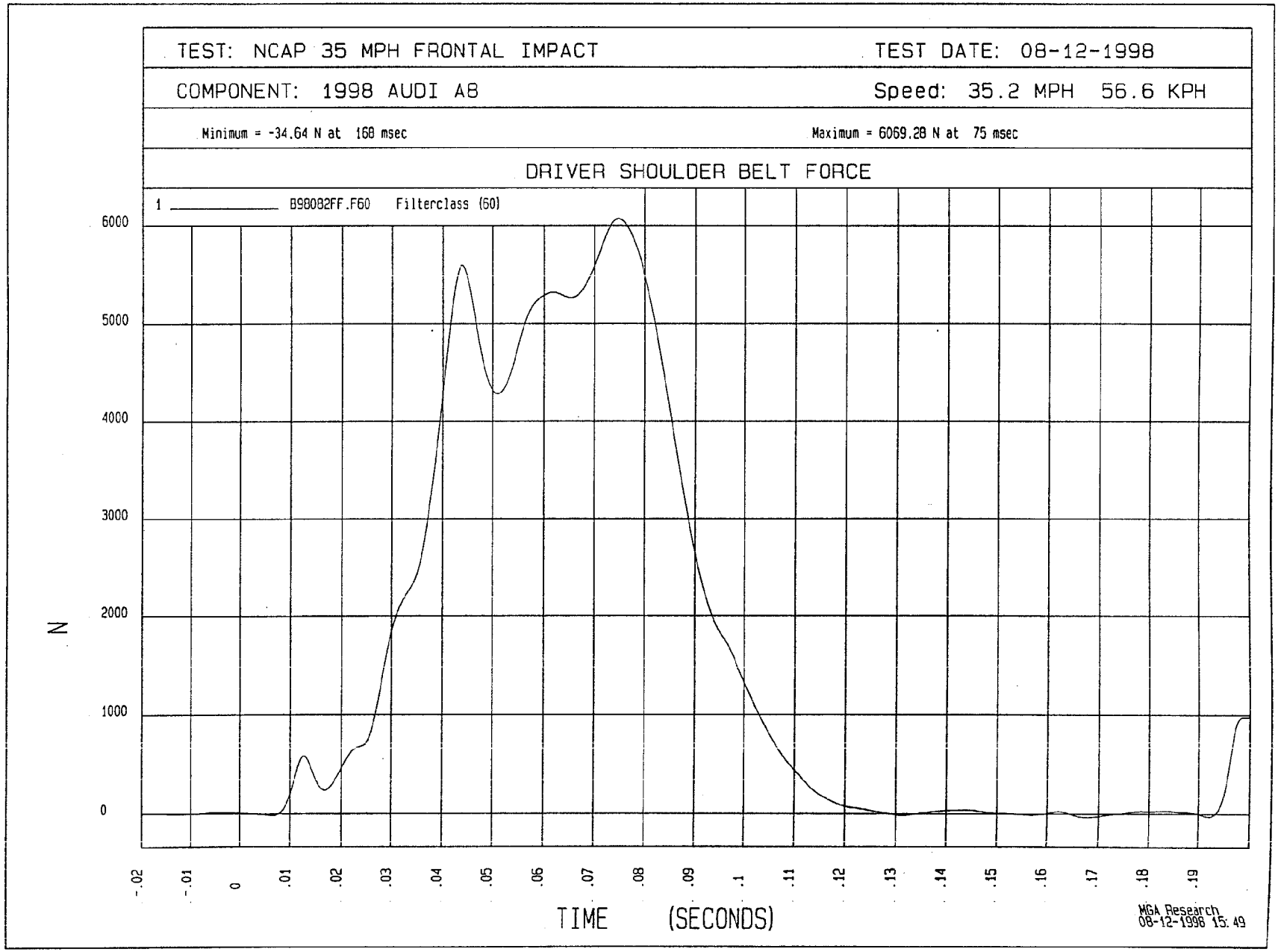

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -10.04 G'S at 47 msec
Maximum = 91.74 G'S at 33 msec
DRIVER LEFT HEEL Z ACCELERATION
1 C98082AF.A06 Filterclass (180)
80
60
40
20
0
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (seconds)
MGA Research
08-17-1998 17:01

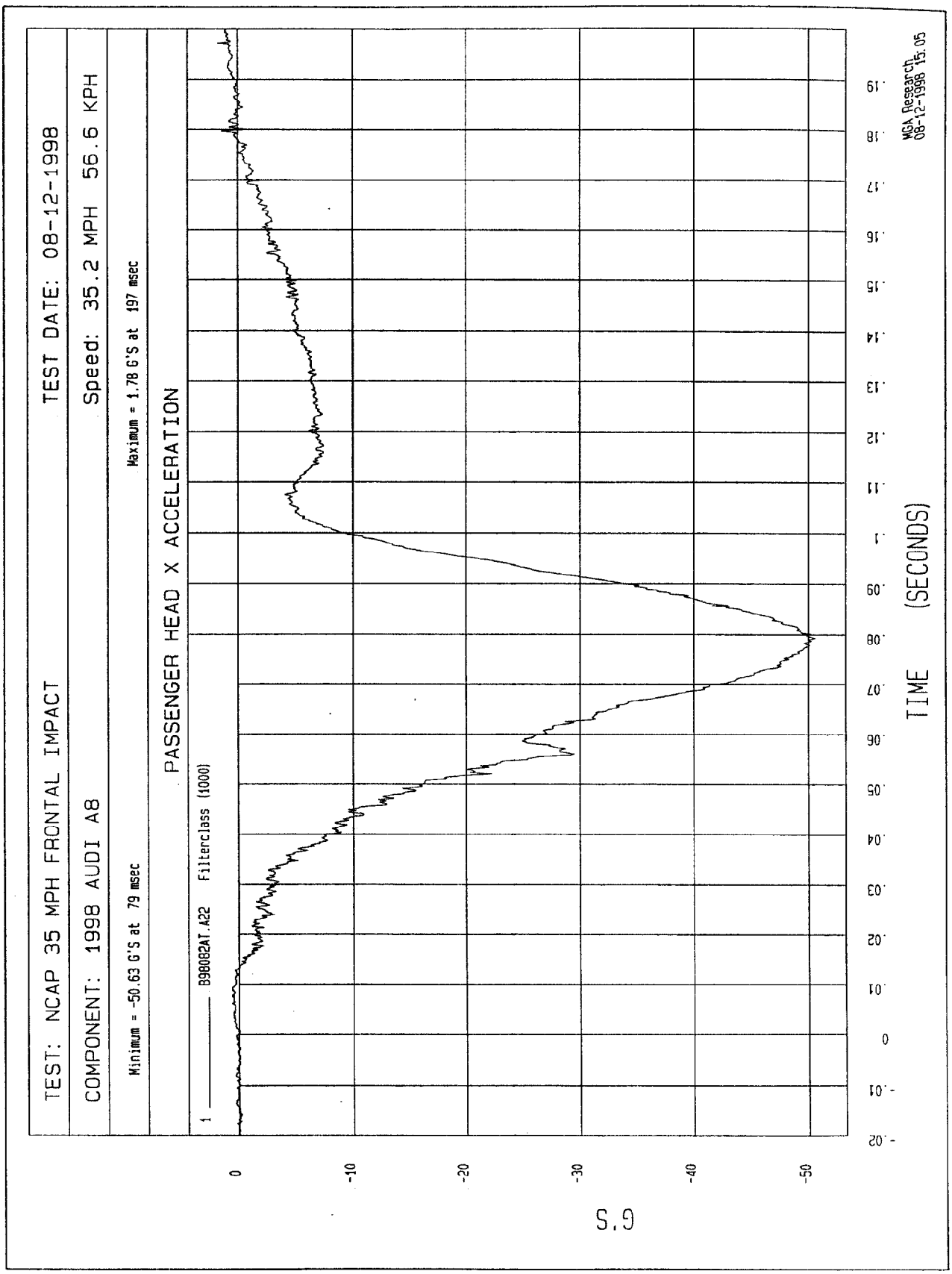

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -288.16 G'S at 35 msec
Maximum = 120.29 G'S at 45 msec
DRIVER RIGHT FOOT BALL Z ACCELERATION
1 _____ C980B2AF.A01 Filterclass (180)
100
0
-100
-200
-300
G's
TIME (seconds)
.19
.18
.17
.16
.15
.14
.13
.12
.11
1
.09
.08
.07
.06
.05
.04
.03
.02
.01
0
-.01
-.02
MGA Research
08-17-1998 17:00

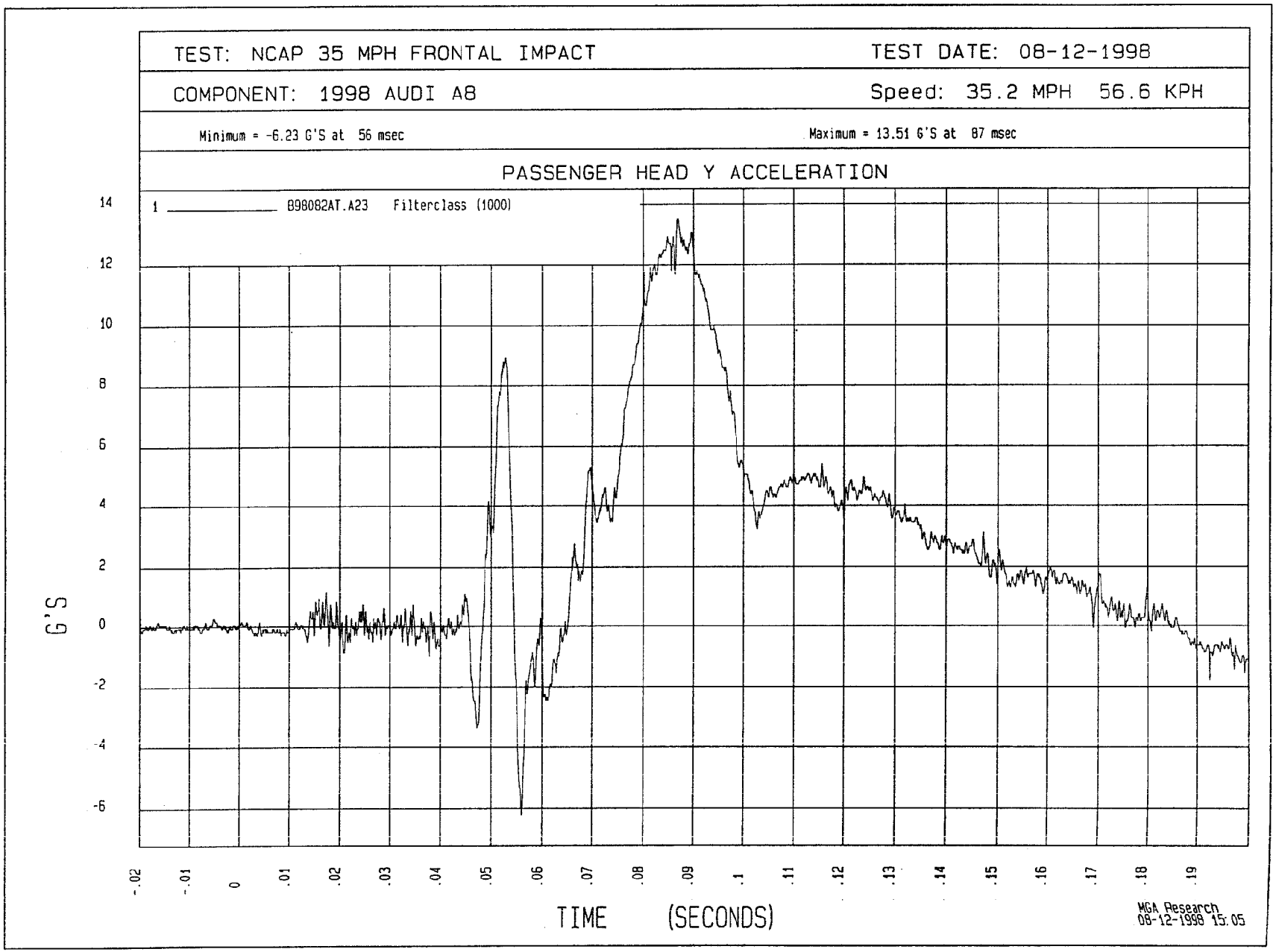

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -122.09 G'S at 39 msec
Maximum = 42.15 G'S at 59 msec
DRIVER RIGHT HEEL X ACCELERATION
1 C98082AF.A02 Filterclass (180)
40
20
0
-20
-40
-60
-80
-100
-120
G's
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (seconds)
MGA Research
08-17-1998 17:00

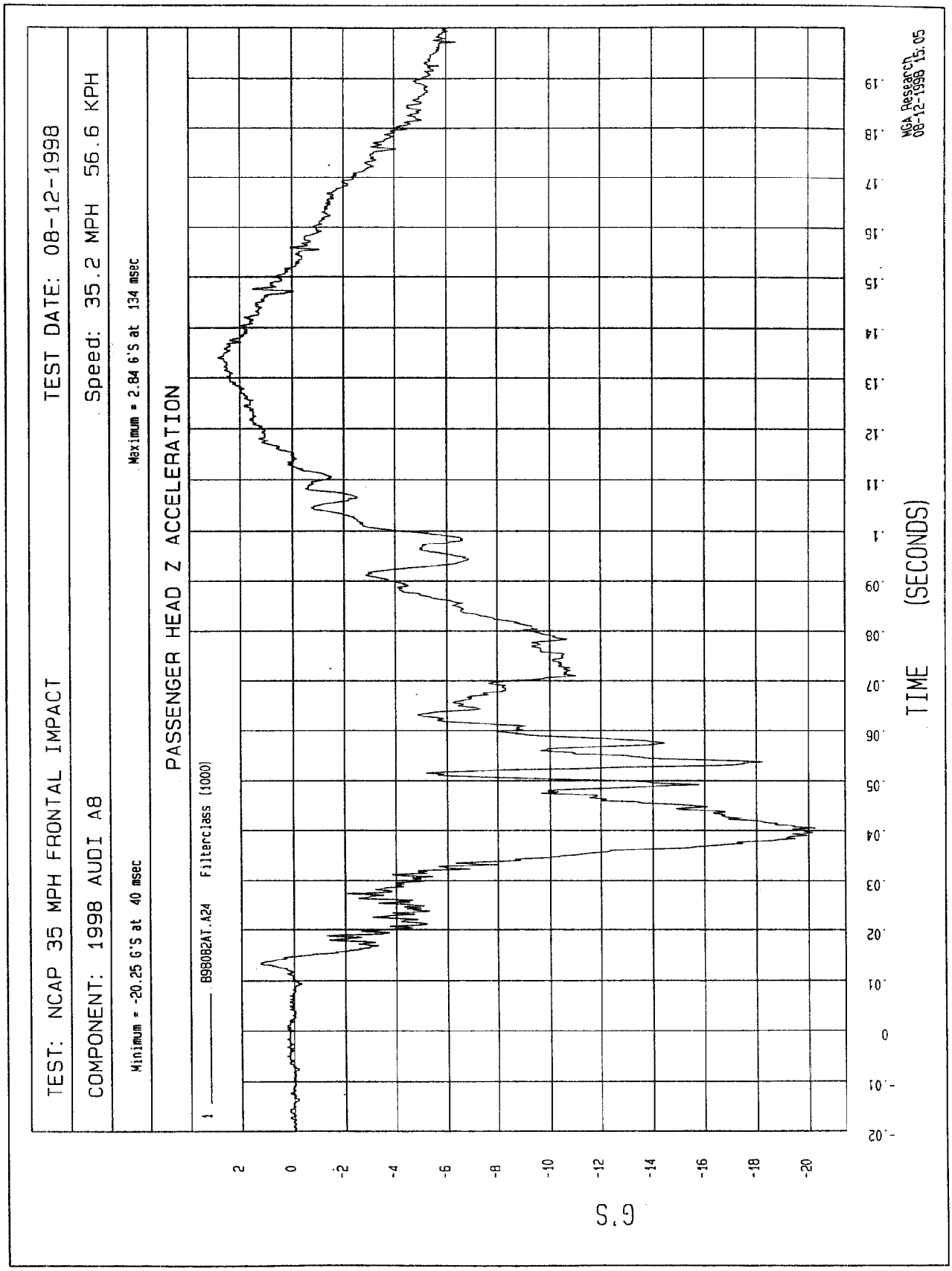

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -34.88 G'S at 59 msec
Maximum = 164.58 G'S at 35 msec
DRIVER RIGHT HEEL Z ACCELERATION
1 C980B2AF.A03 Filterclass (180)
160
140
120
100
80
60
40
20
0
-20
-40
G's
.02
.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (seconds)
MGA Research
08-17-1998 17:00

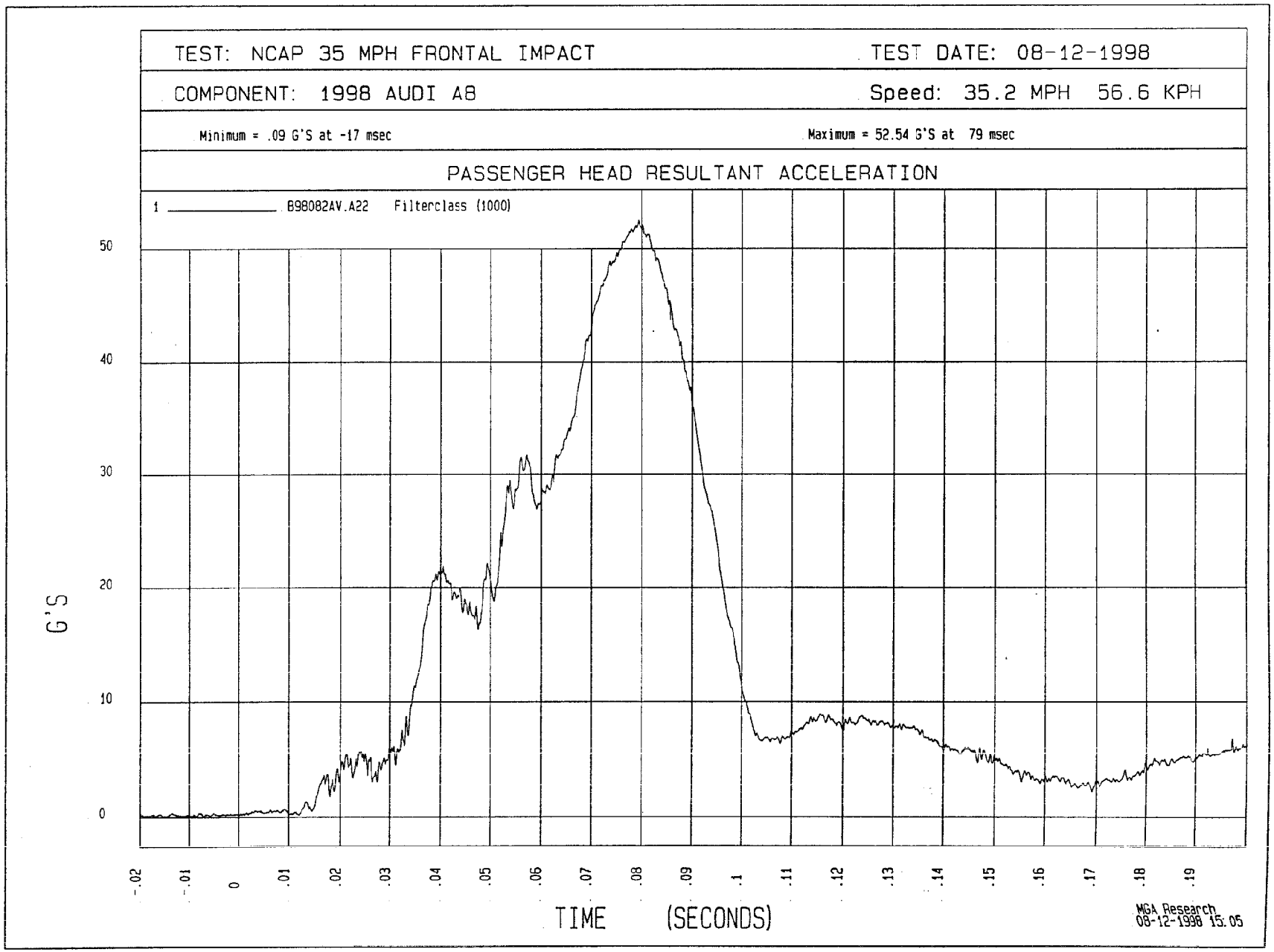

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -21.28 N at 199 msec
Maximum = 6173.3 N at 50 msec
DRIVER LAP BELT FORCE
1 B98082FF.F61 Filterclass (60)
6000
5000
4000
3000
2000
1000
0
N
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:49

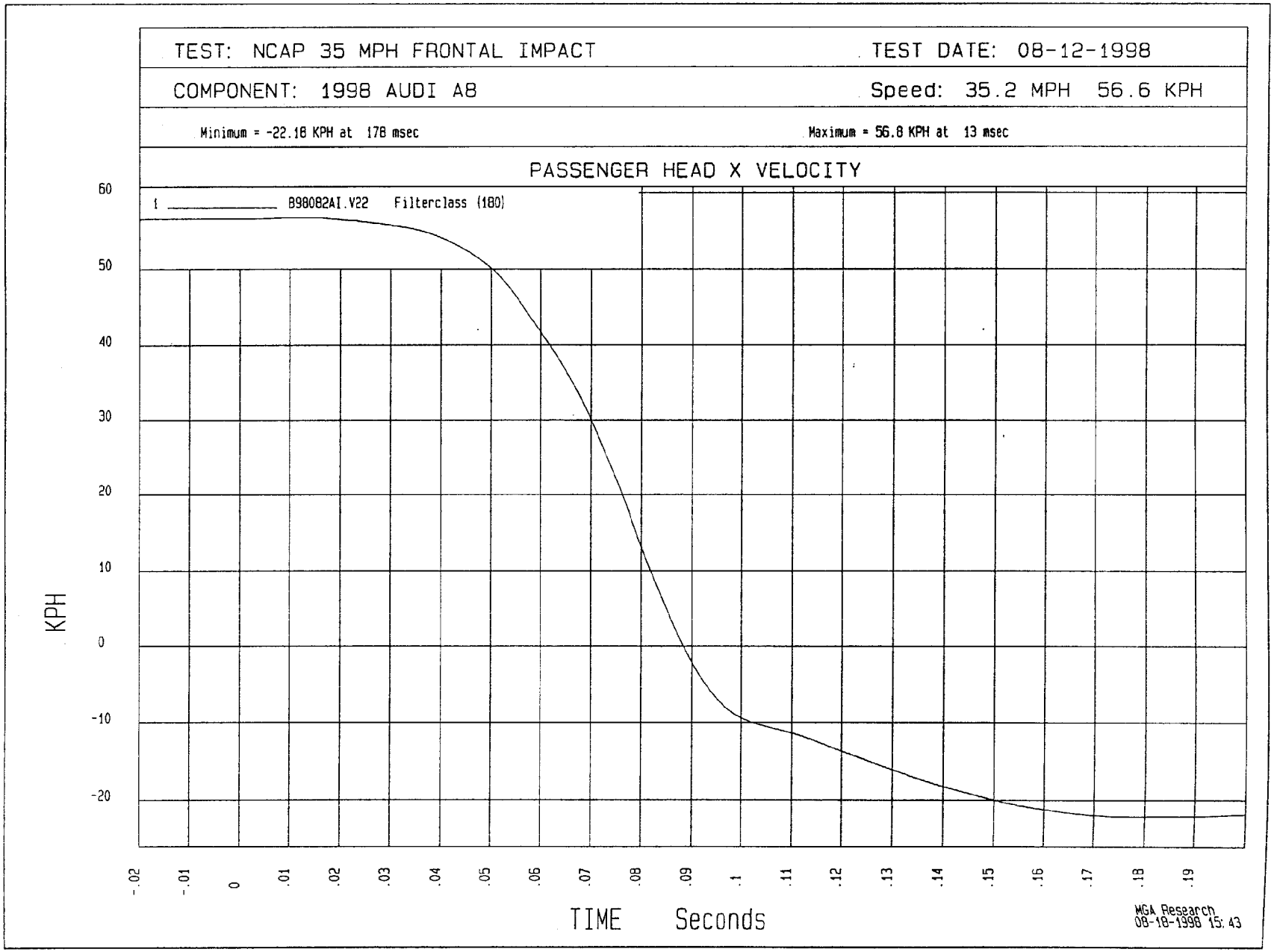

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -34.64 N at 168 msec
Maximum = 6069.28 N at 75 msec
DRIVER SHOULDER BELT FORCE
1 B98082FF.F60 Filterclass (60)
6000
5000
4000
3000
2000
1000
0
N
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:49

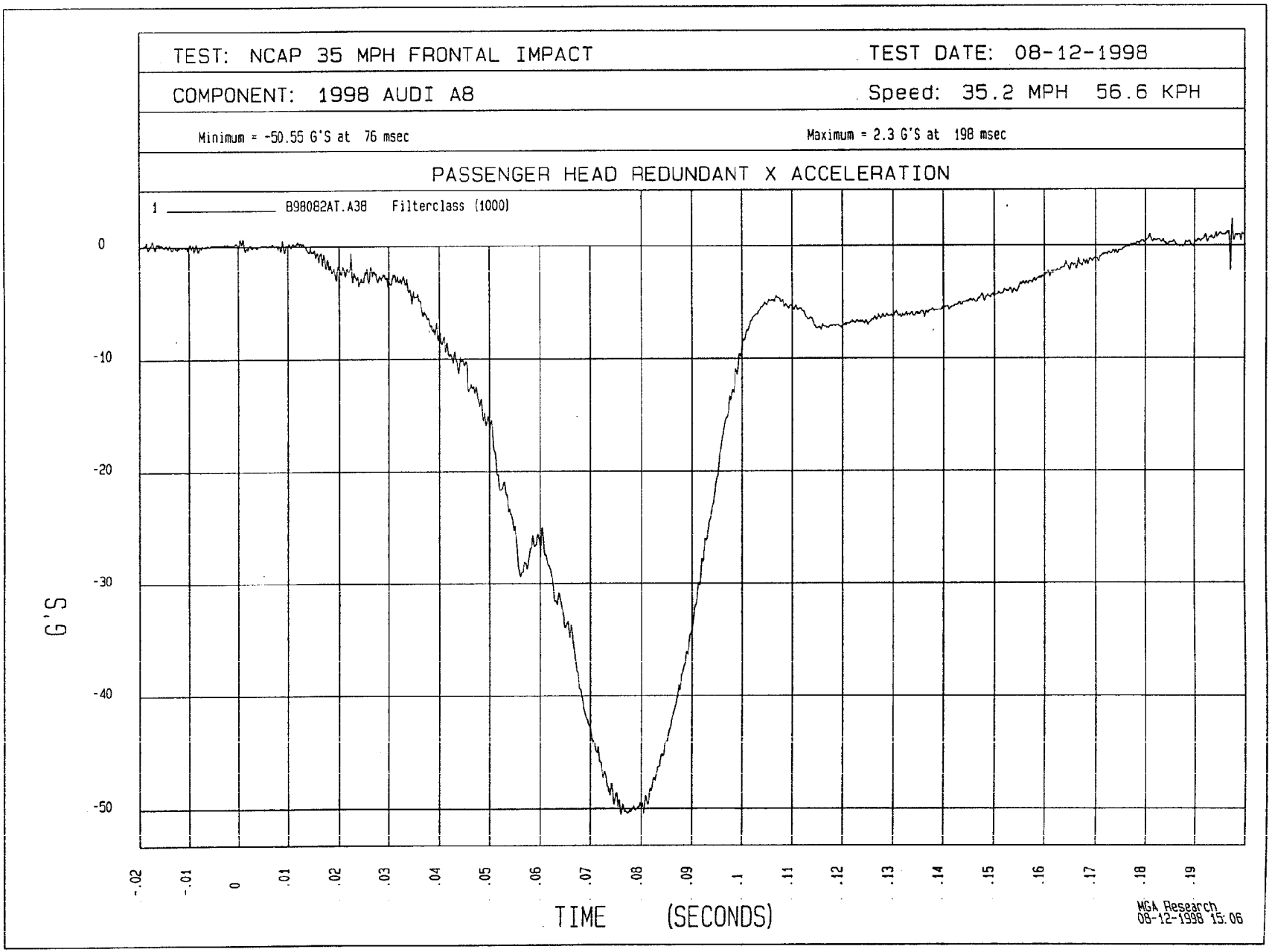

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -50.63 G'S at 79 msec
Maximum = 1.78 G'S at 197 msec
PASSENGER HEAD X ACCELERATION
1 B98082AT.A22 Filterclass (1000)
MGA Research
08-12-1998 15:05
G'S
TIME (SECONDS)

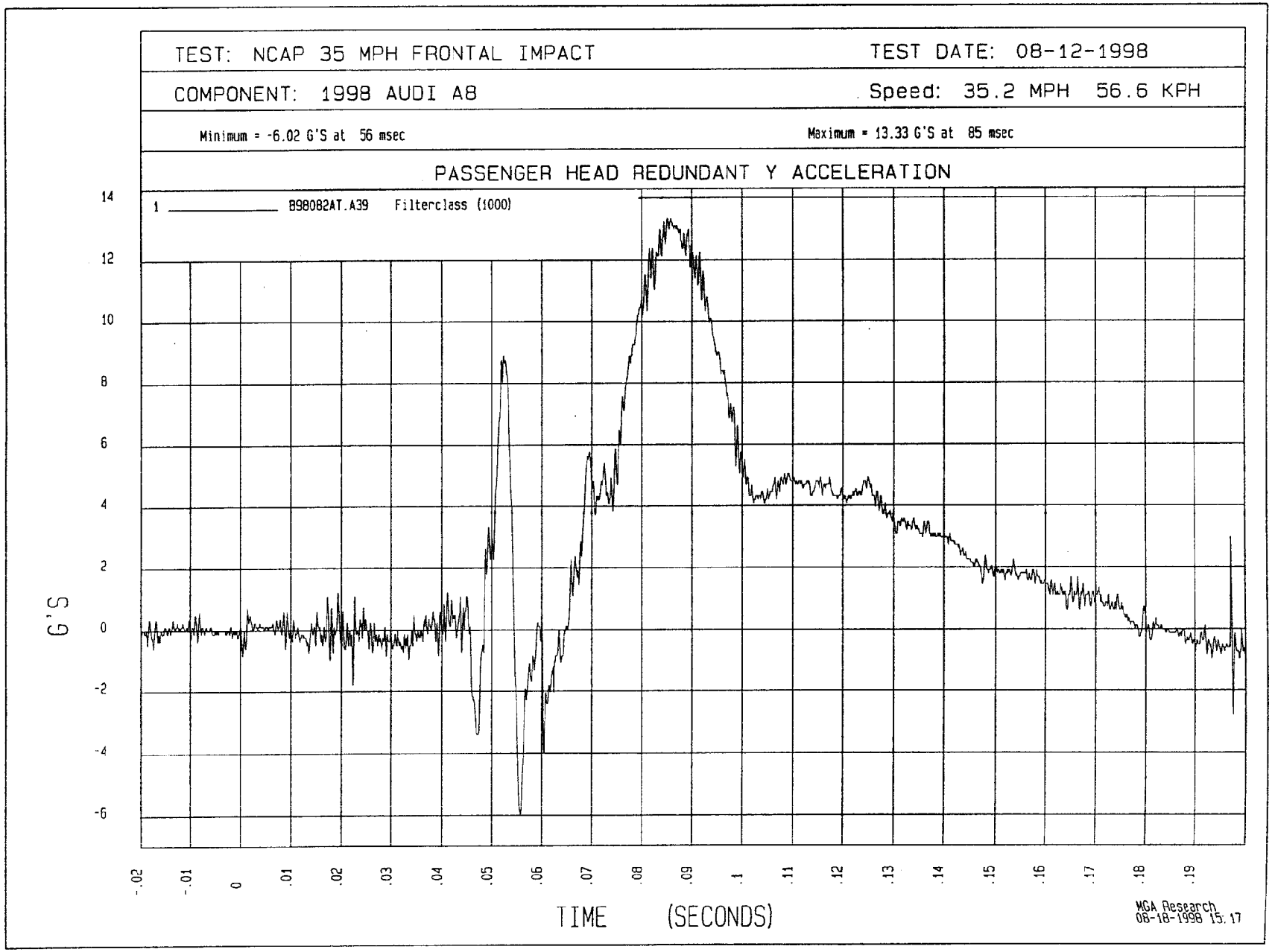

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -6.23 G'S at 56 msec
Maximum = 13.51 G'S at 87 msec
PASSENGER HEAD Y ACCELERATION
1 B98082AT.A23 Filterclass (1000)
G'S
14
12
10
8
6
4
2
0
-2
-4
-6
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:05

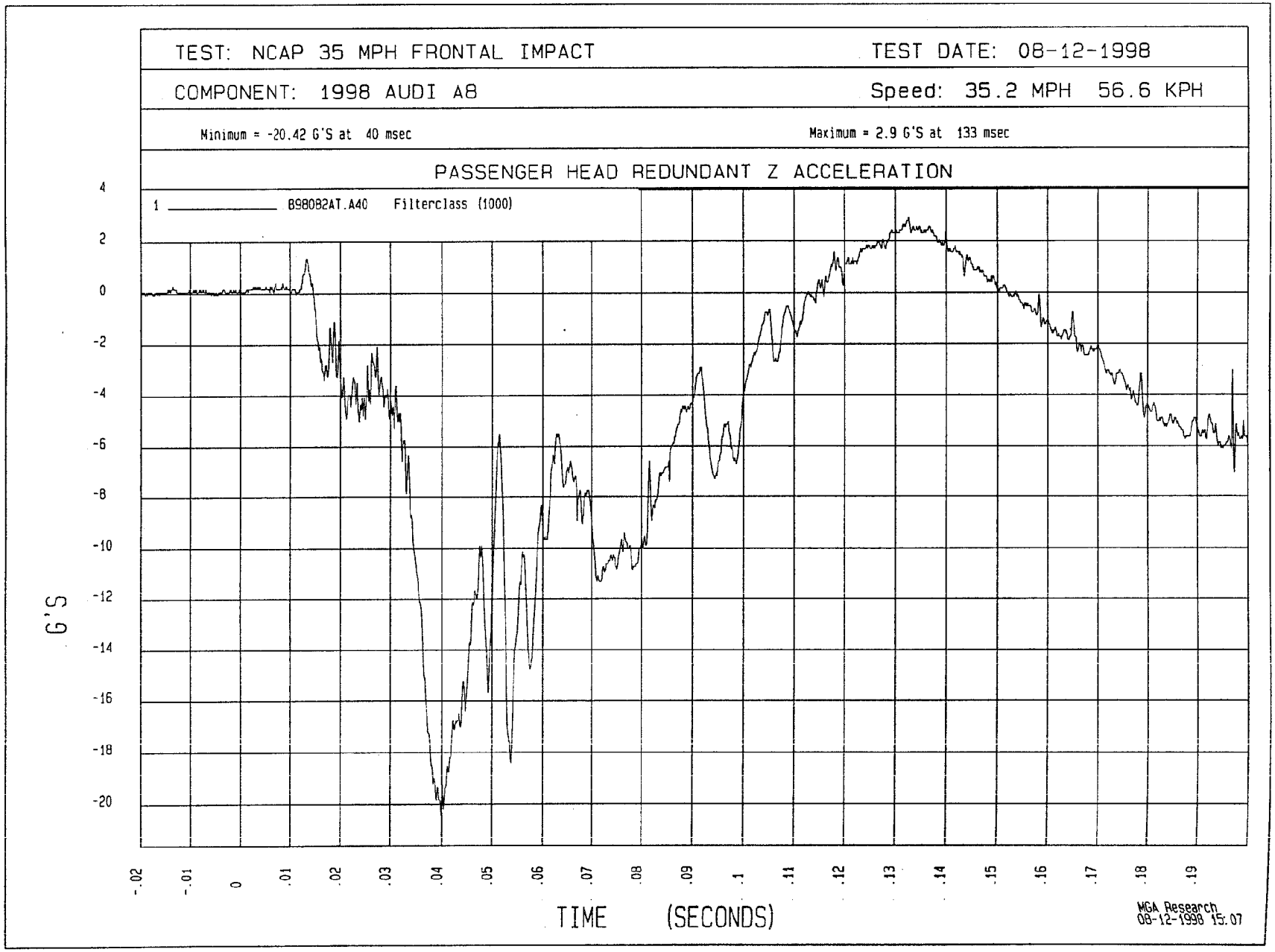

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -20.25 G'S at 40 msec
Maximum = 2.84 G'S at 134 msec
PASSENGER HEAD Z ACCELERATION
1 B98082AT.A24 Filterclass (1000)
MGA Research
08-12-1998 15:05
TIME (SECONDS)
G'S

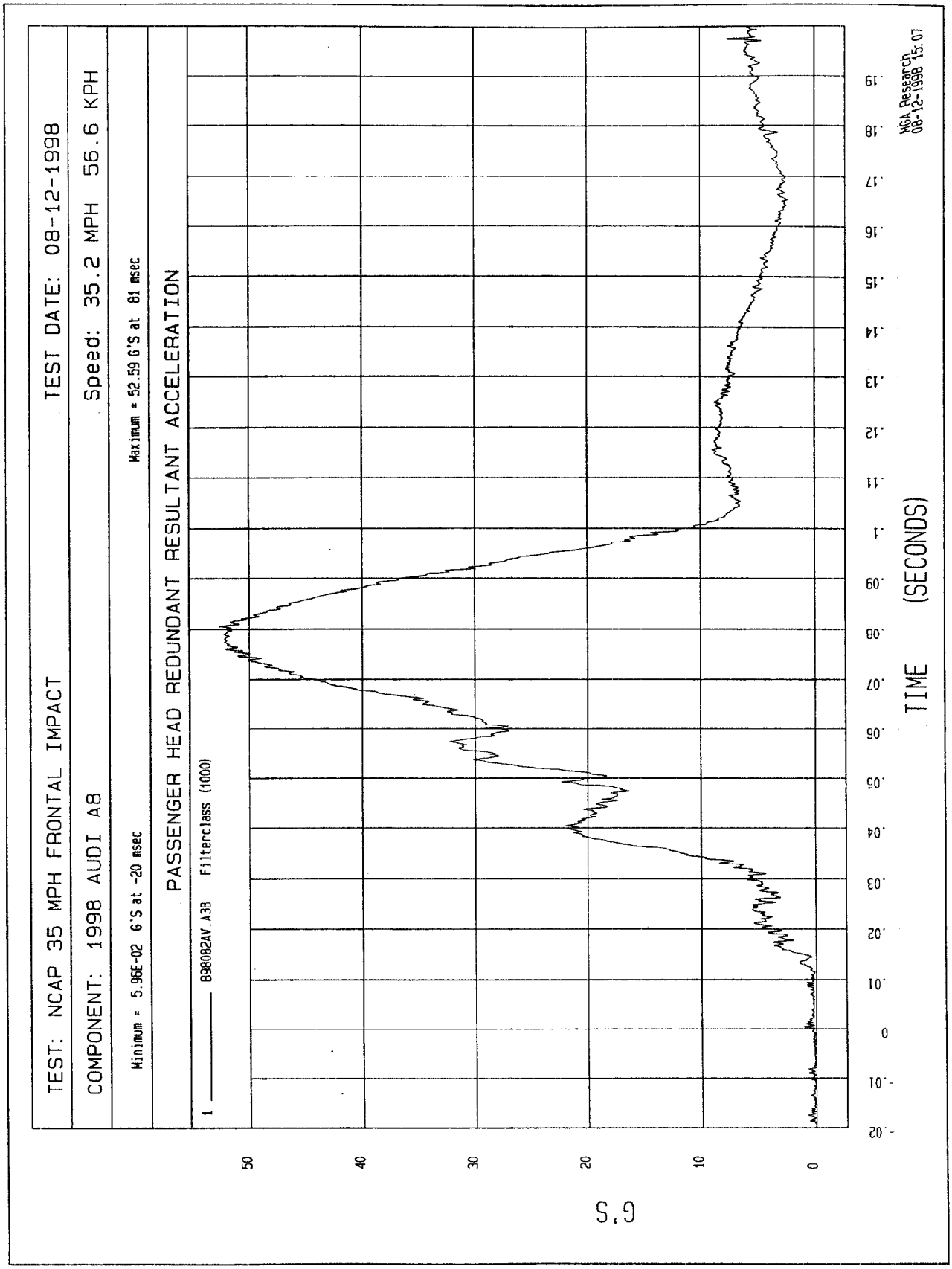

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = .09 G'S at -17 msec
Maximum = 52.54 G'S at 79 msec
PASSENGER HEAD RESULTANT ACCELERATION
1 B98082AV.A22 Filterclass (1000)
G'S
50
40
30
20
10
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:05

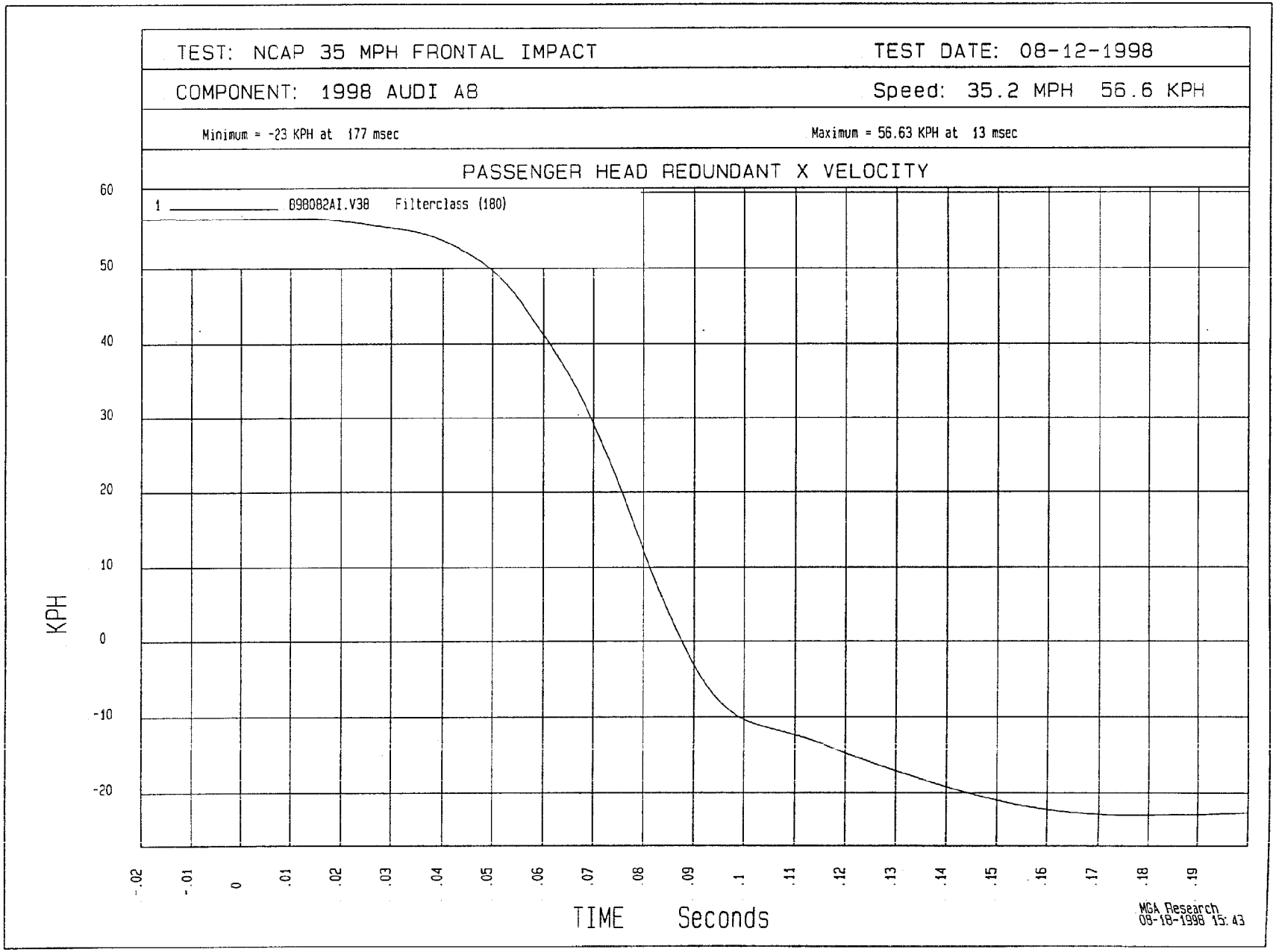

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -22.18 KPH at 178 msec
Maximum = 56.8 KPH at 13 msec
PASSENGER HEAD X VELOCITY
1 B98082AI.V22 Filterclass (180)
60
50
40
30
20
10
0
-10
-20
KPH
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME Seconds
MGA Research
08-18-1998 15:43

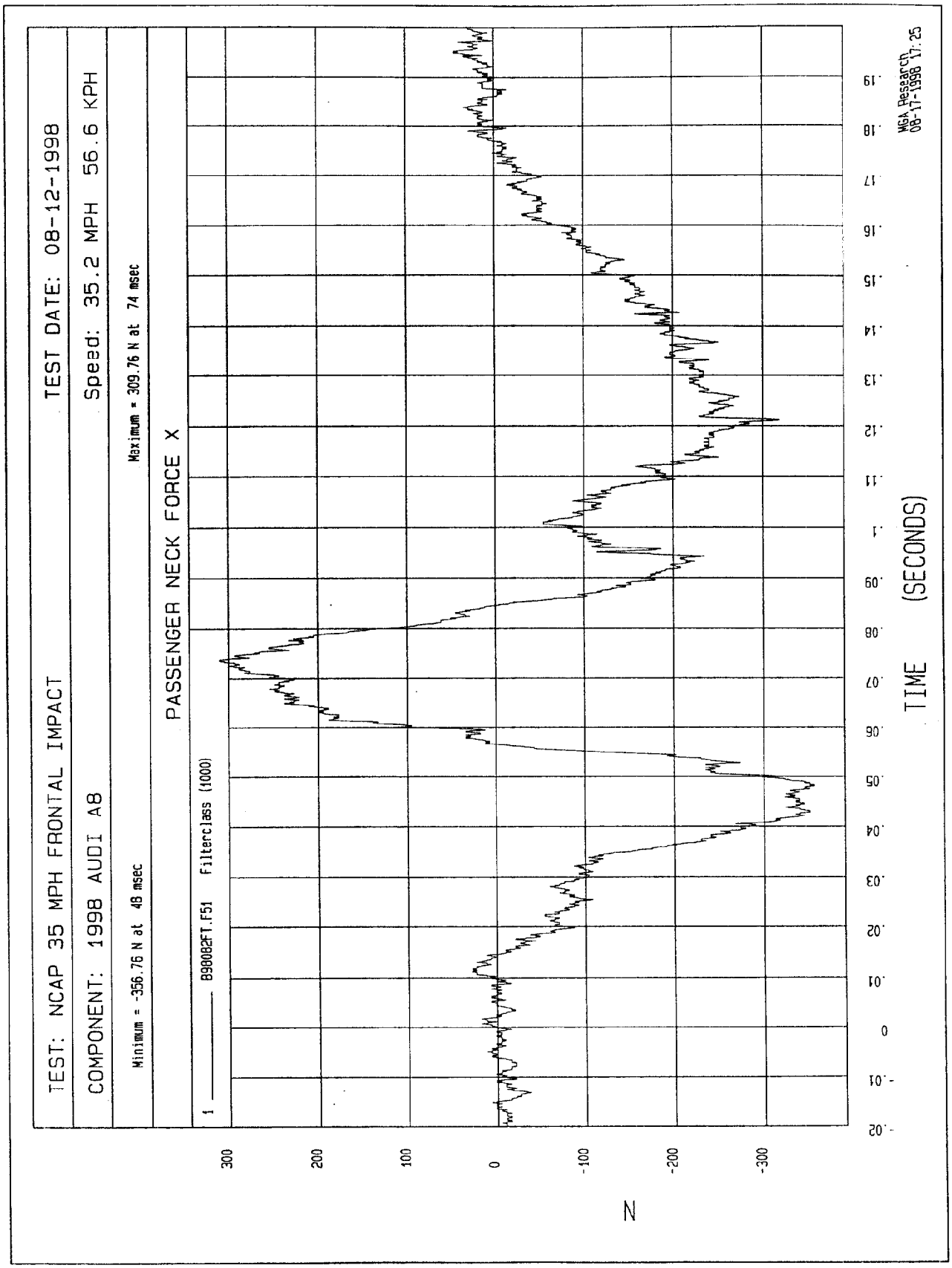

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -50.55 G'S at 76 msec
Maximum = 2.3 G'S at 198 msec
PASSENGER HEAD REDUNDANT X ACCELERATION
1 B98082AT.A38 Filterclass (1000)
0
-10
-20
-30
-40
-50
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:06

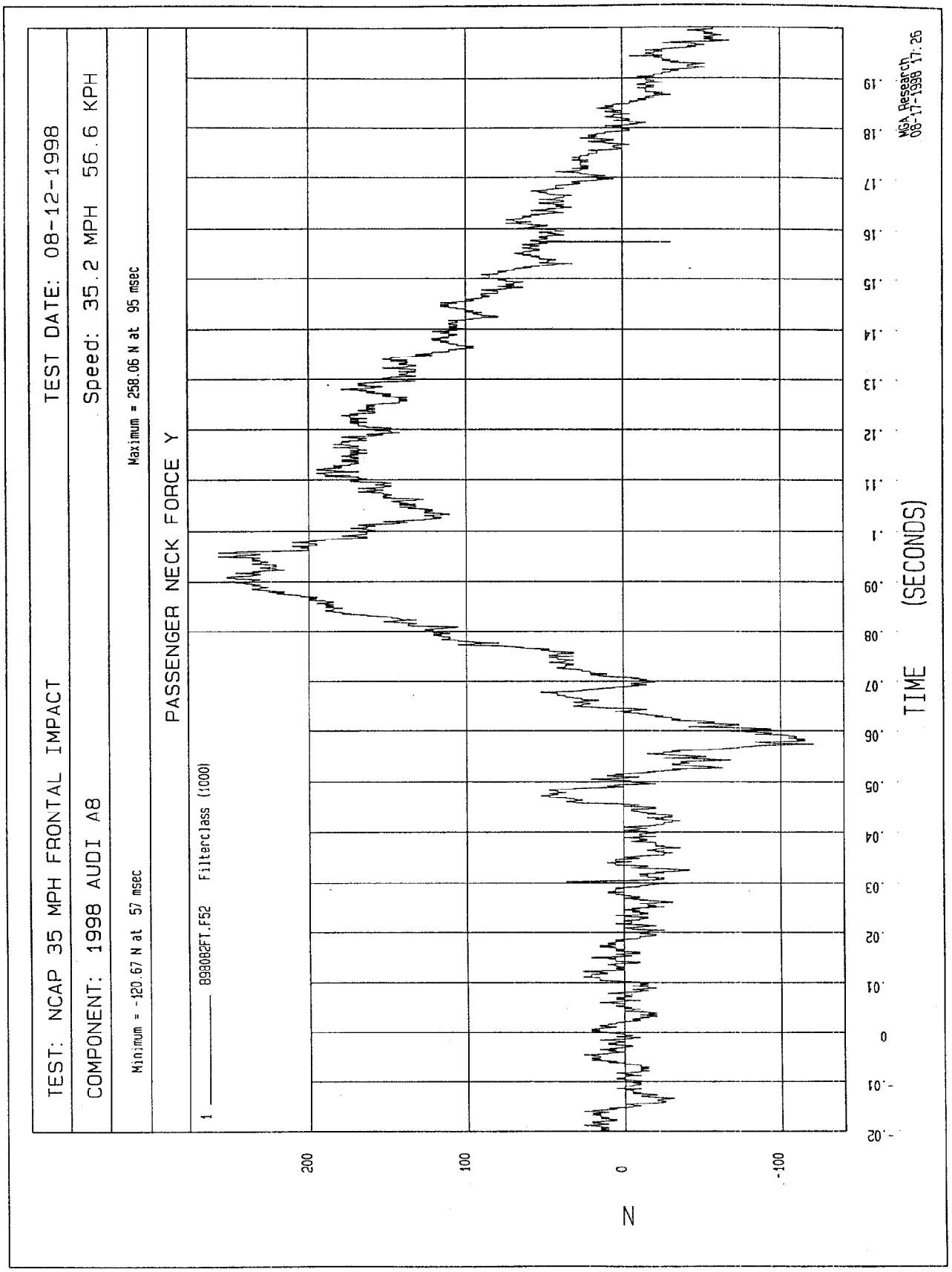

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -6.02 G'S at 56 msec
Maximum = 13.33 G'S at 85 msec
PASSENGER HEAD REDUNDANT Y ACCELERATION
1 B98082AT.A39 Filterclass (1000)
14
12
10
8
6
4
2
0
-2
-4
-6
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-18-1998 15:17

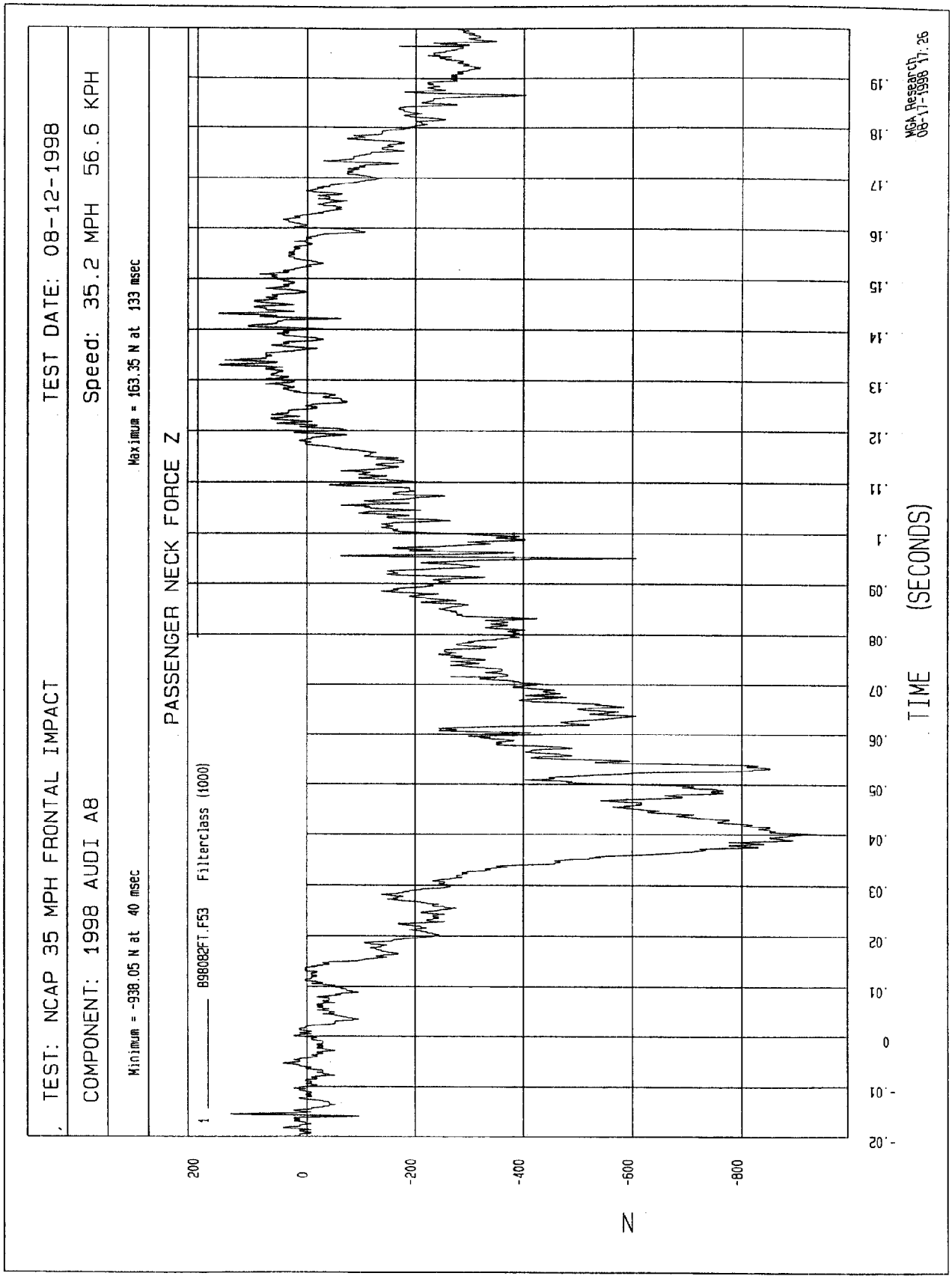

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -20.42 G'S at 40 msec
Maximum = 2.9 G'S at 133 msec
PASSENGER HEAD REDUNDANT Z ACCELERATION
1 B98082AT.A40 Filterclass (1000)
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:07

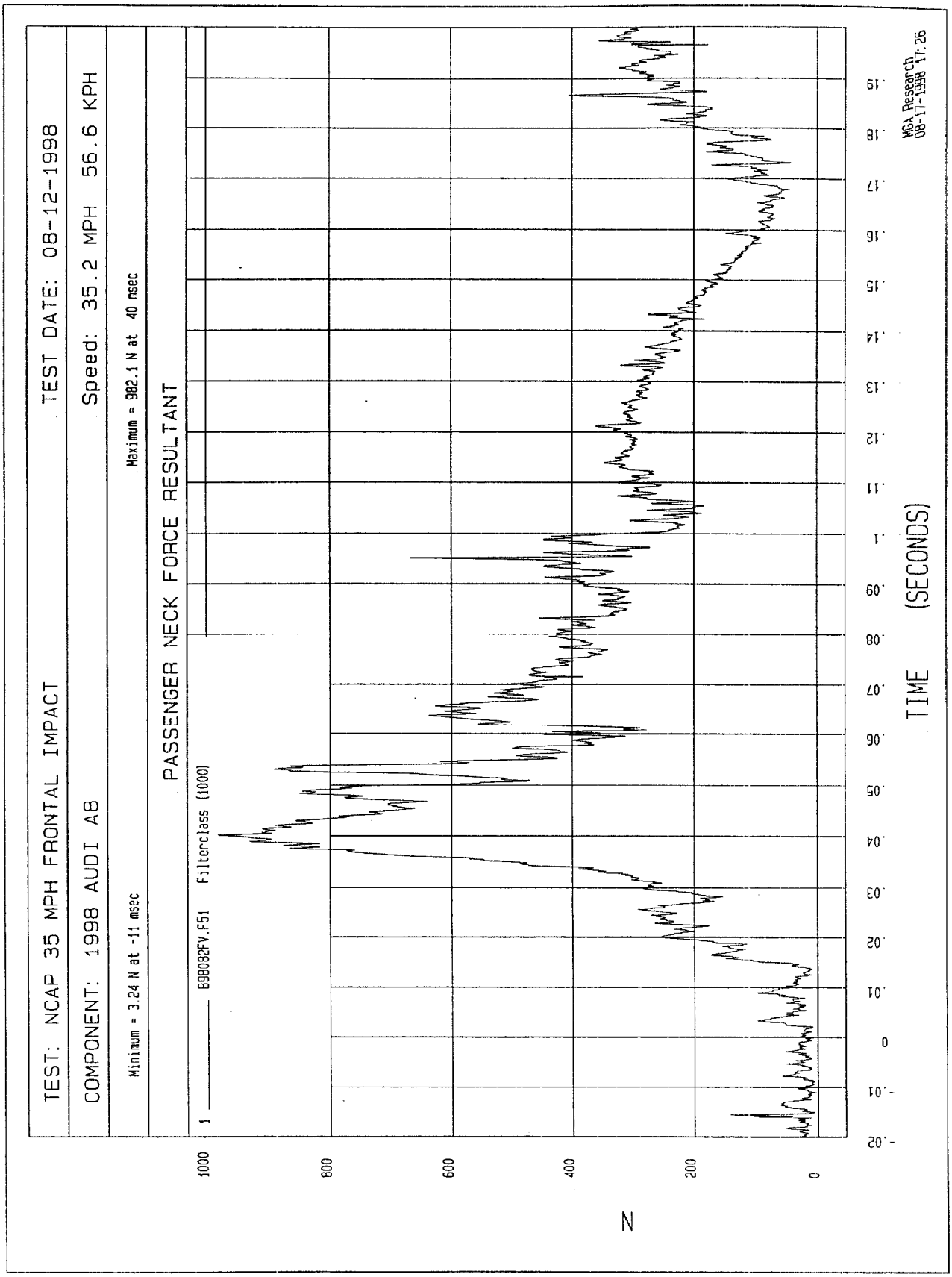

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 5.96E-02 G'S at -20 msec
Maximum = 52.59 G'S at 81 msec
PASSENGER HEAD REDUNDANT RESULTANT ACCELERATION
1 B98082AV.A3B Filterclass (1000)
MGA Research
08-12-1998 15:07
G'S
TIME (SECONDS)

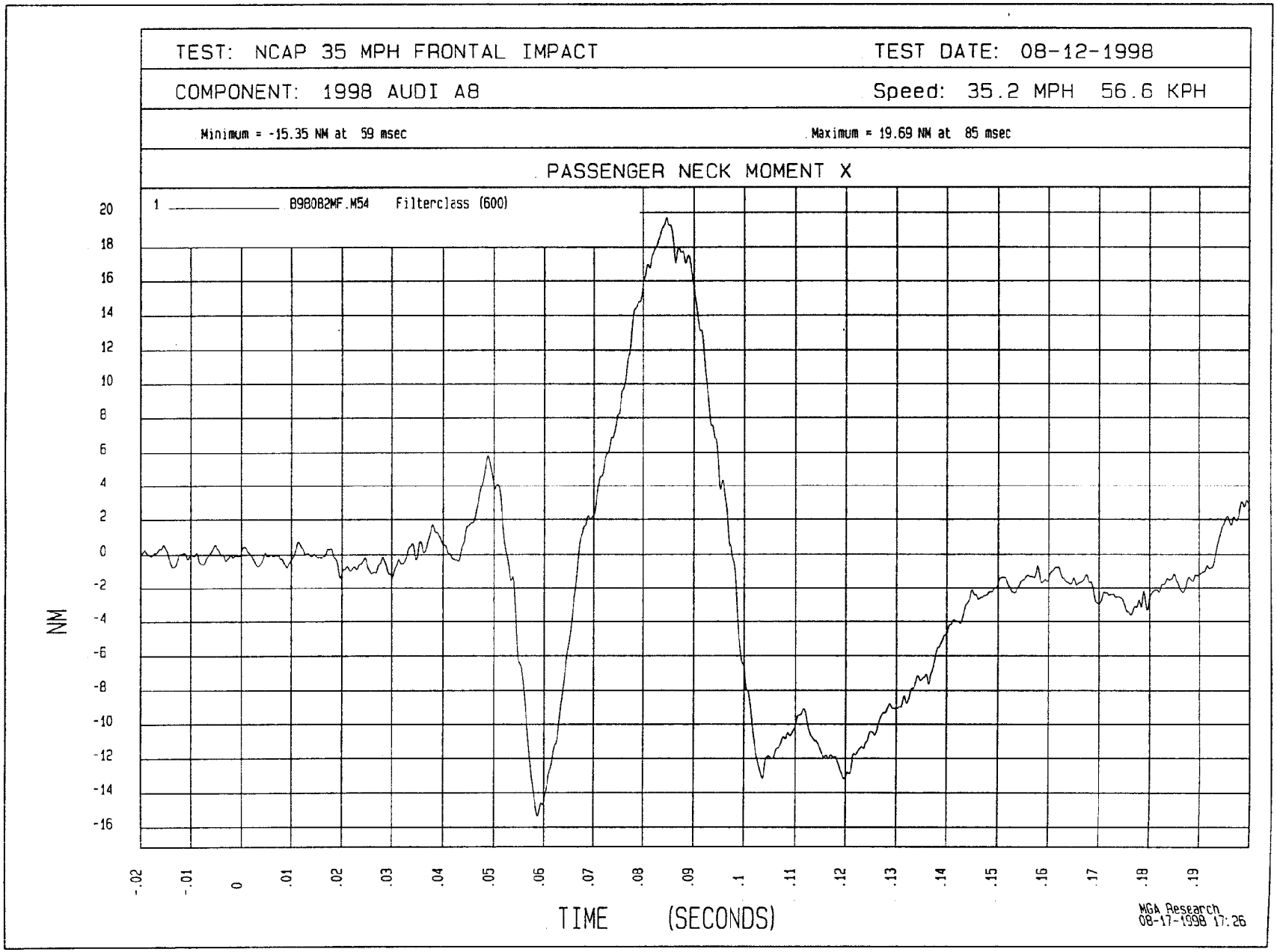

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -23 KPH at 177 msec
Maximum = 56.63 KPH at 13 msec
PASSENGER HEAD REDUNDANT X VELOCITY
1 B98082AI.V38 Filterclass (180)
KPH
60
50
40
30
20
10
0
-10
-20
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME Seconds
MGA Research
09-18-1998 15:43

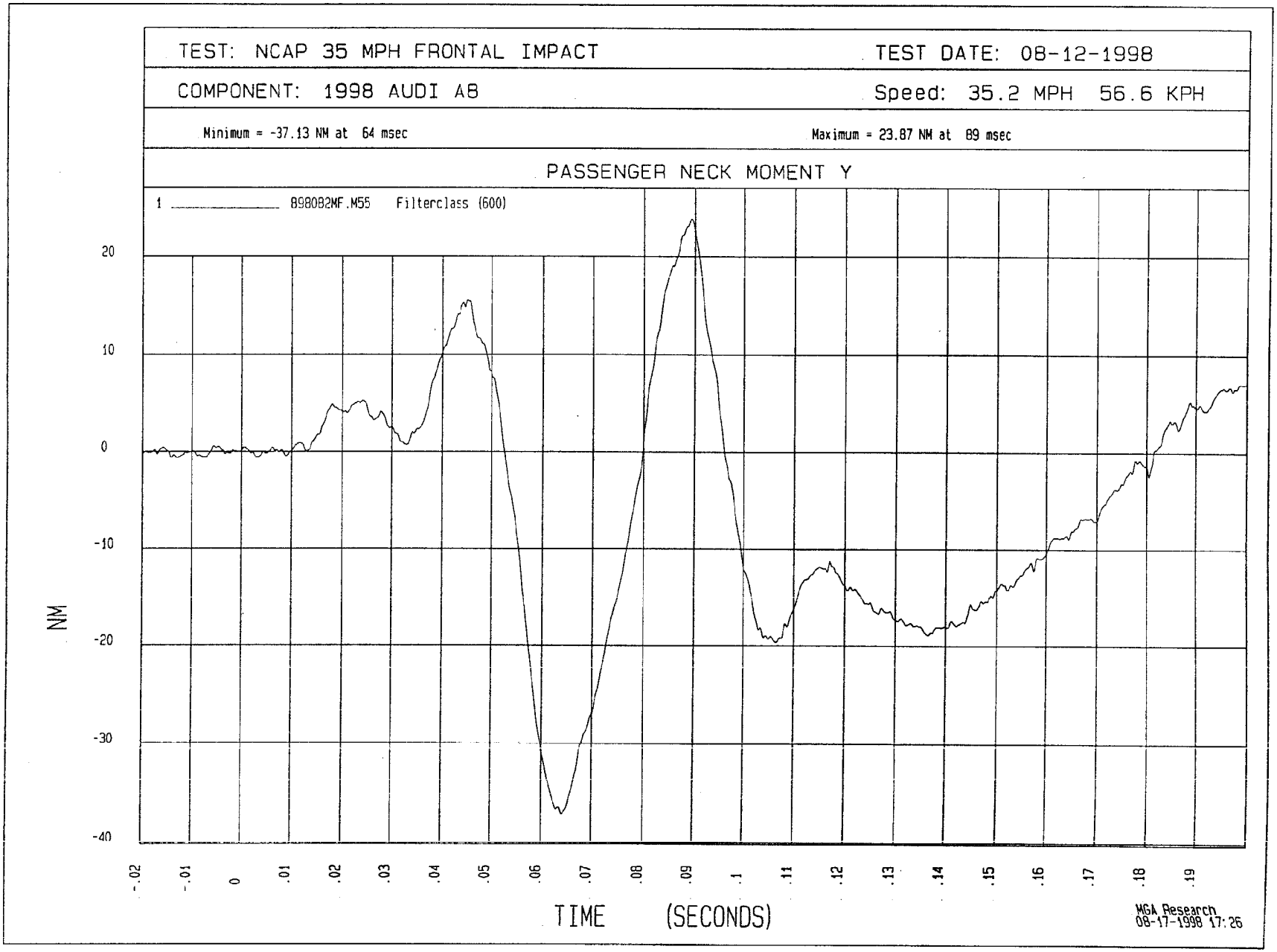

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -356.76 N at 48 msec
Maximum = 309.76 N at 74 msec
PASSENGER NECK FORCE X
1 B9808ZFT.F51 Filterclass (1000)
300
200
100
0
-100
-200
-300
N
.19
.18
.17
.16
.15
.14
.13
.12
.11
.1
.09
.08
.07
.06
.05
.04
.03
.02
.01
0
-.01
-.02
TIME (SECONDS)
MGA Research
08-17-1998 17:25

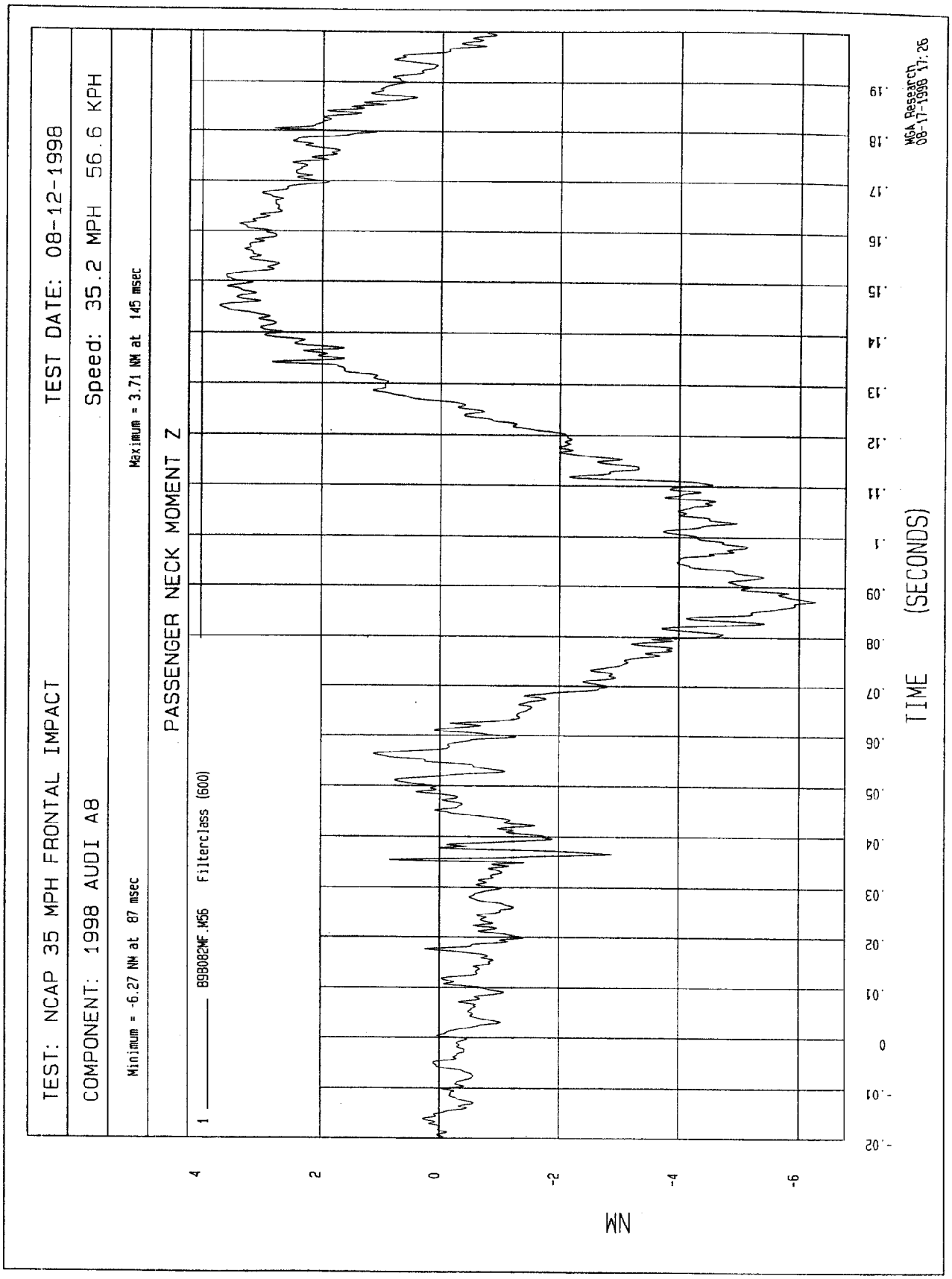

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -120.67 N at 57 msec
Maximum = 258.06 N at 95 msec
PASSENGER NECK FORCE Y
1 B98082FT.FS2 Filterclass (1000)
200
100
0
-100
N
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:25

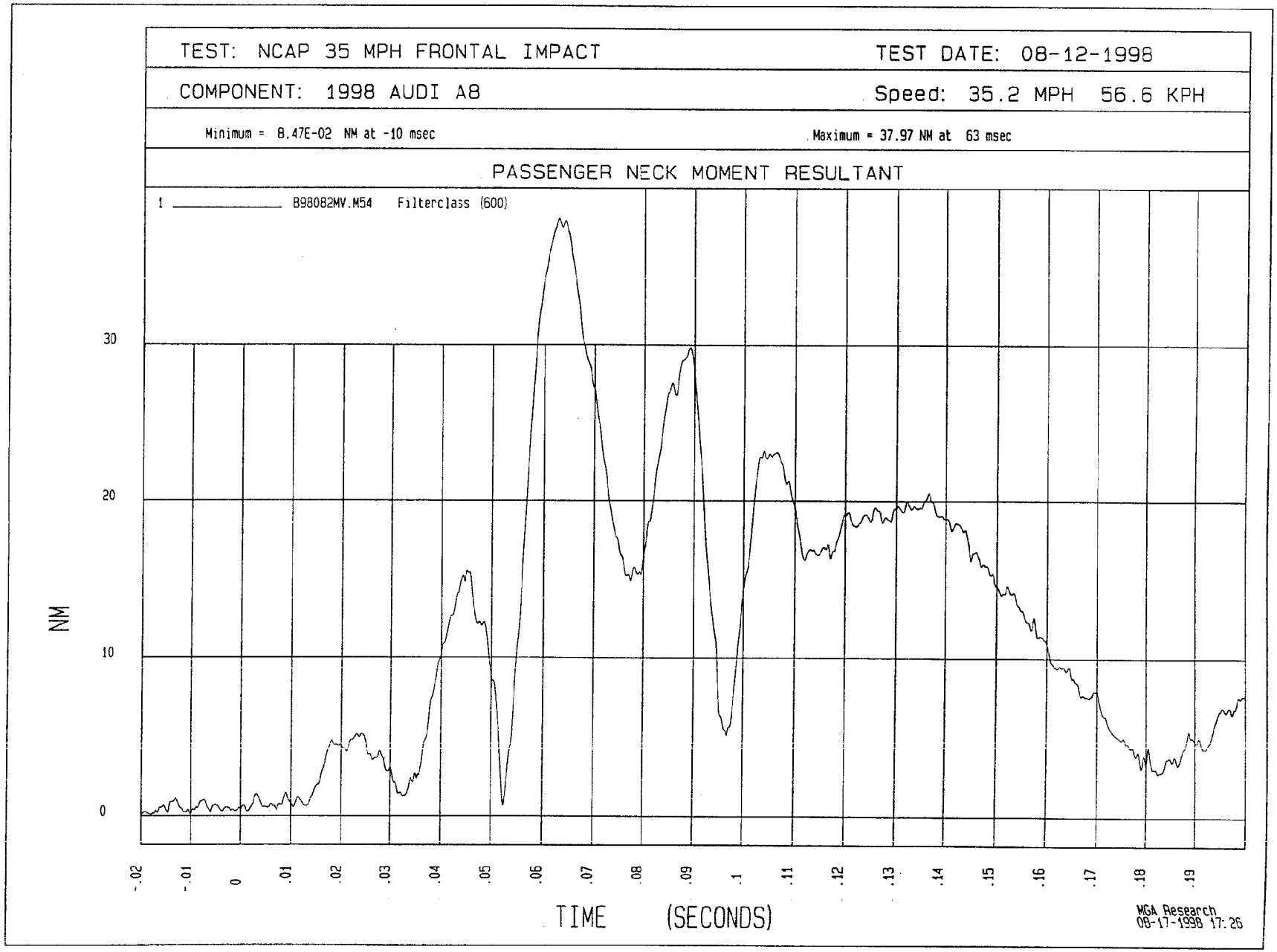

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -938.05 N at 40 msec
Maximum = 163.35 N at 133 msec
PASSENGER NECK FORCE Z
1 B98082FT.F53 Filterclass (1000)
200
0
-200
-400
-600
-800
N
.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:26

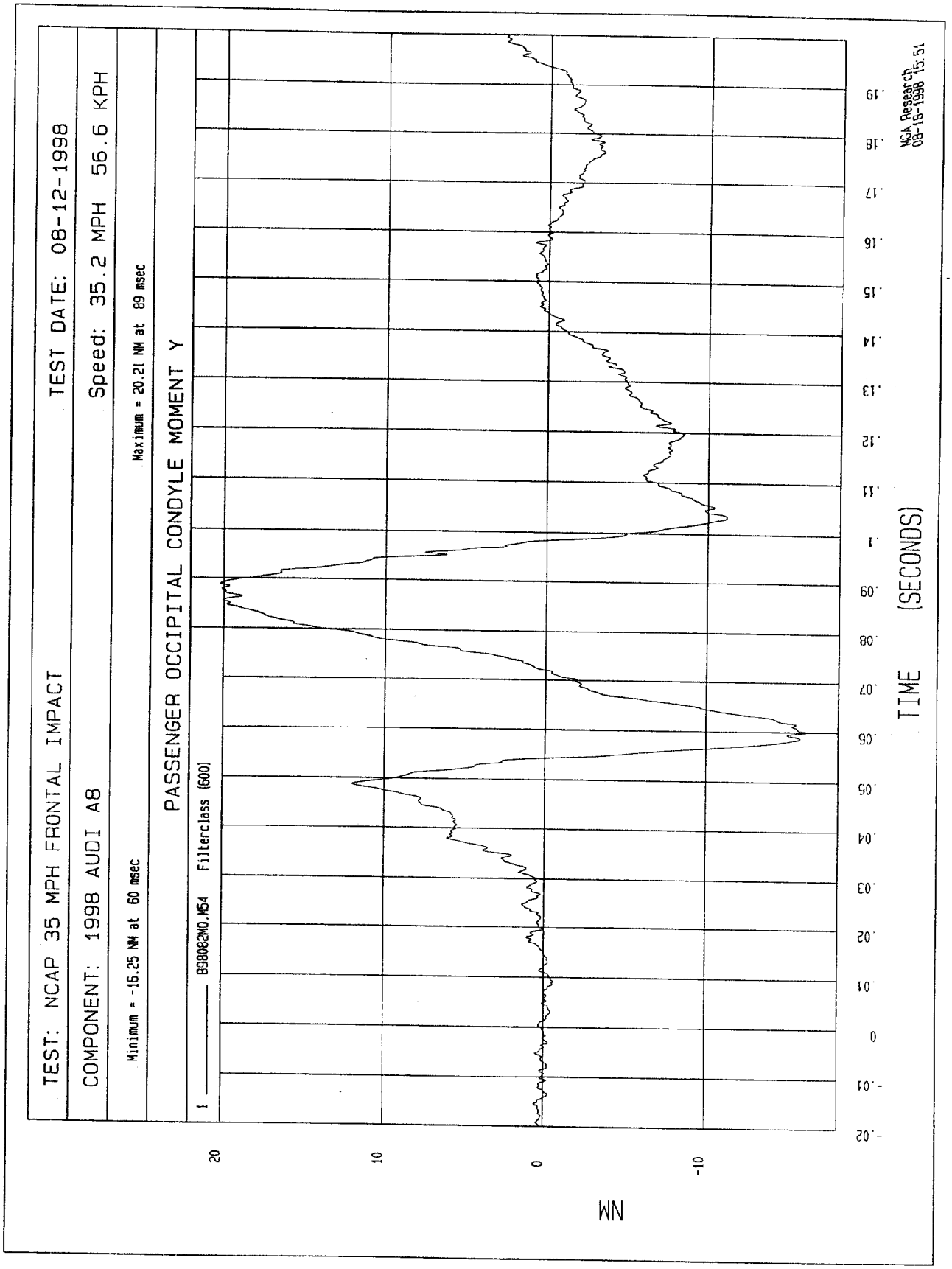

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 3.24 N at -11 msec
Maximum = 982.1 N at 40 msec
PASSENGER NECK FORCE RESULTANT
1 B98082FV.F51 Filterclass (1000)
1000
800
600
400
200
0
N
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:26

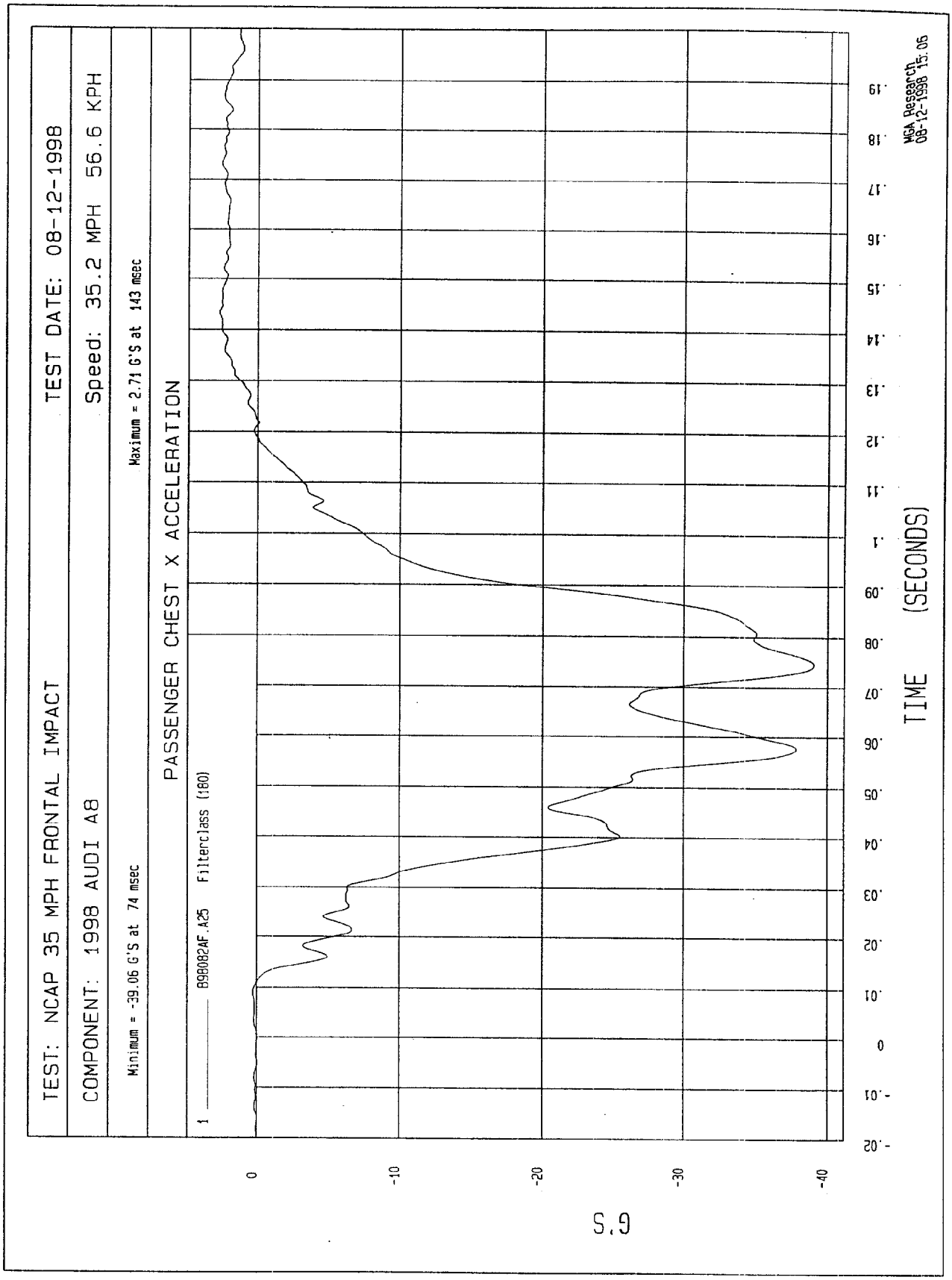

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -15.35 NM at 59 msec
Maximum = 19.69 NM at 85 msec
PASSENGER NECK MOMENT X
1 B98082MF.M54 Filterclass (600)
NM
20
18
16
14
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:26

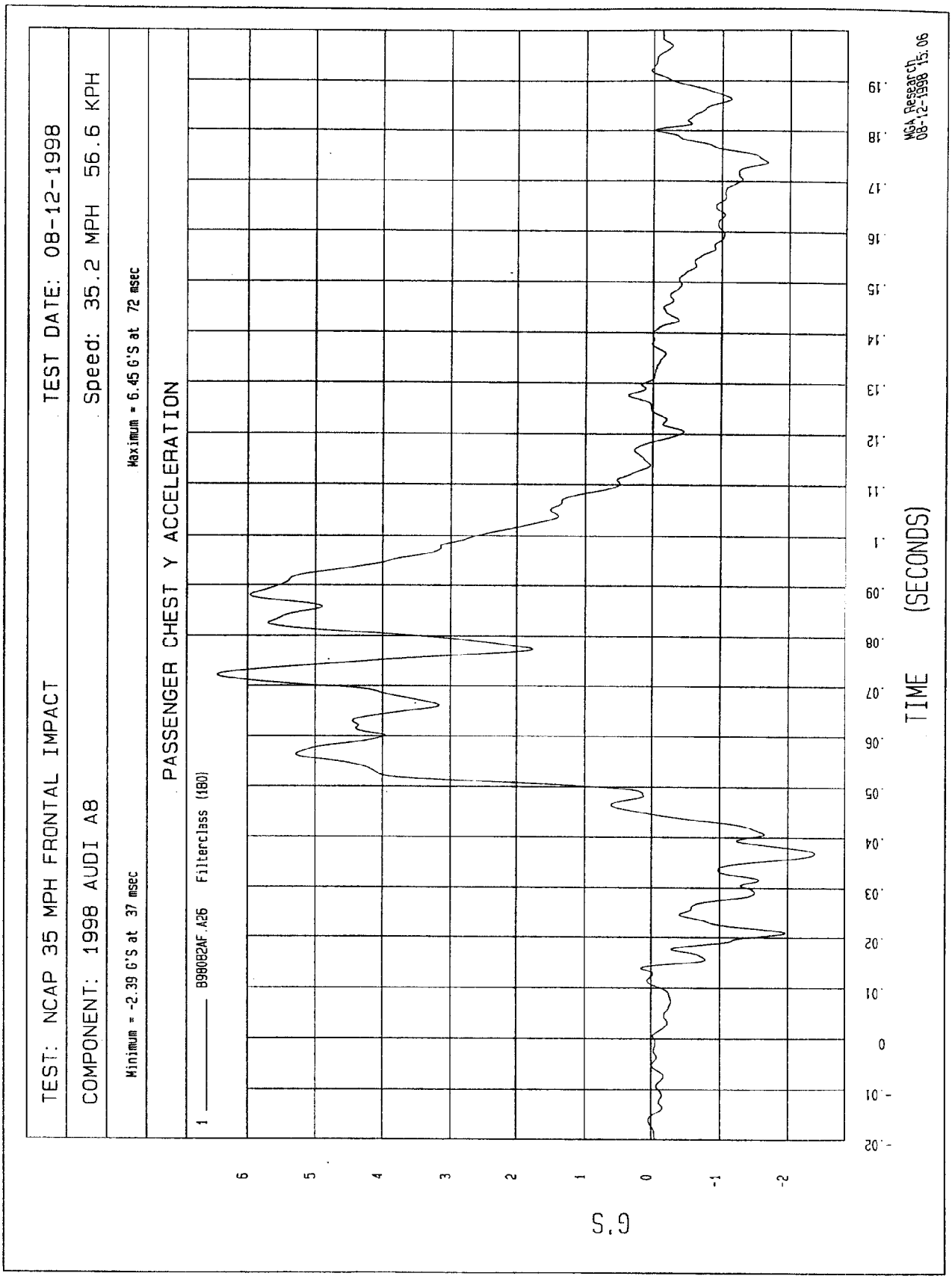

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -37.13 NM at 64 msec
Maximum = 23.87 NM at 89 msec
PASSENGER NECK MOMENT Y
1 _____ 898082MF.M55 Filterclass (600)
NM
20
10
0
-10
-20
-30
-40
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:26

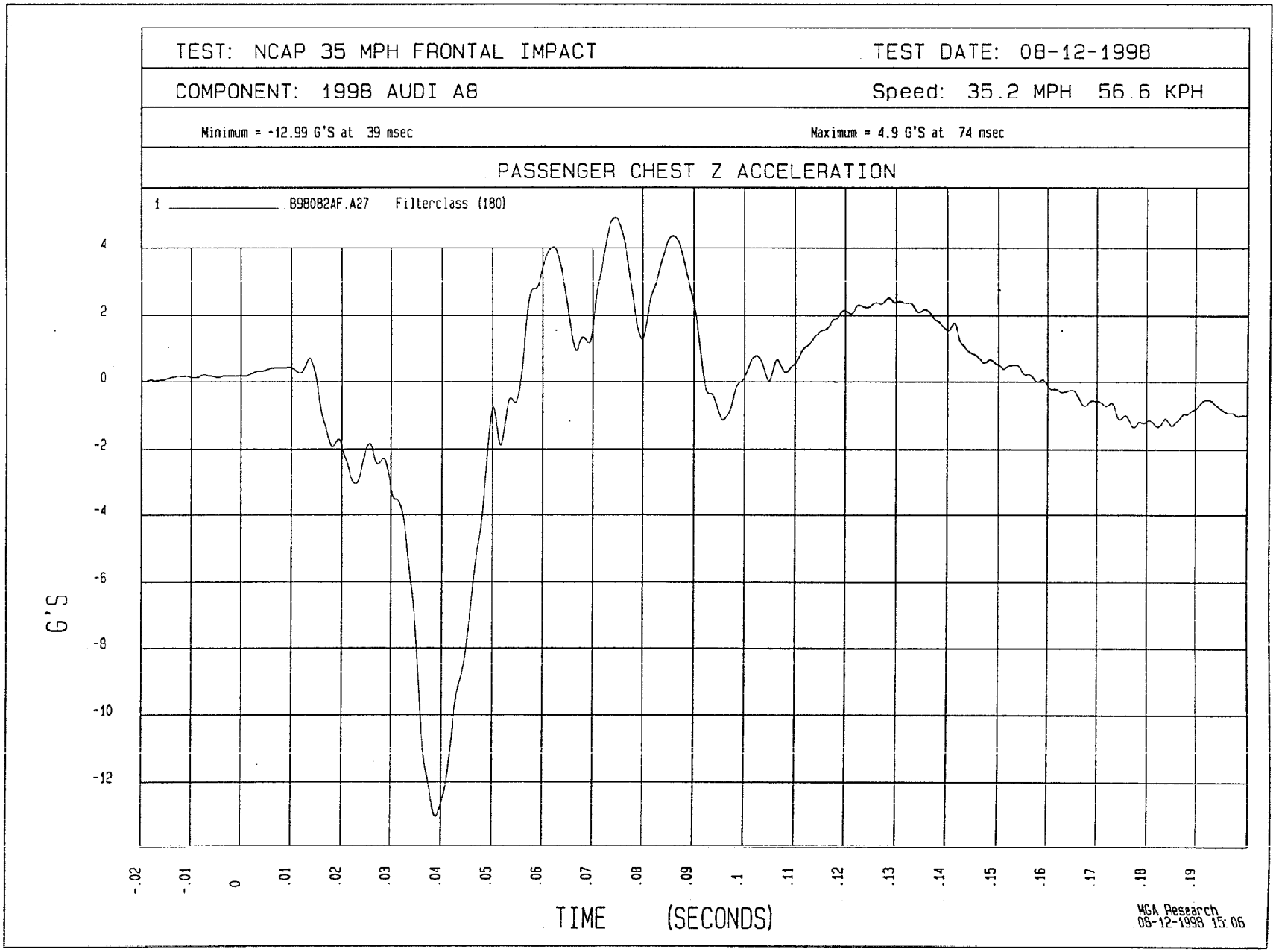

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -6.27 NM at 87 msec
Maximum = 3.71 NM at 145 msec
PASSENGER NECK MOMENT Z
1 B9B082MF.M56 Filterclass (600)
NM
TIME (SECONDS)
MGA Research
08-17-1998 17:26

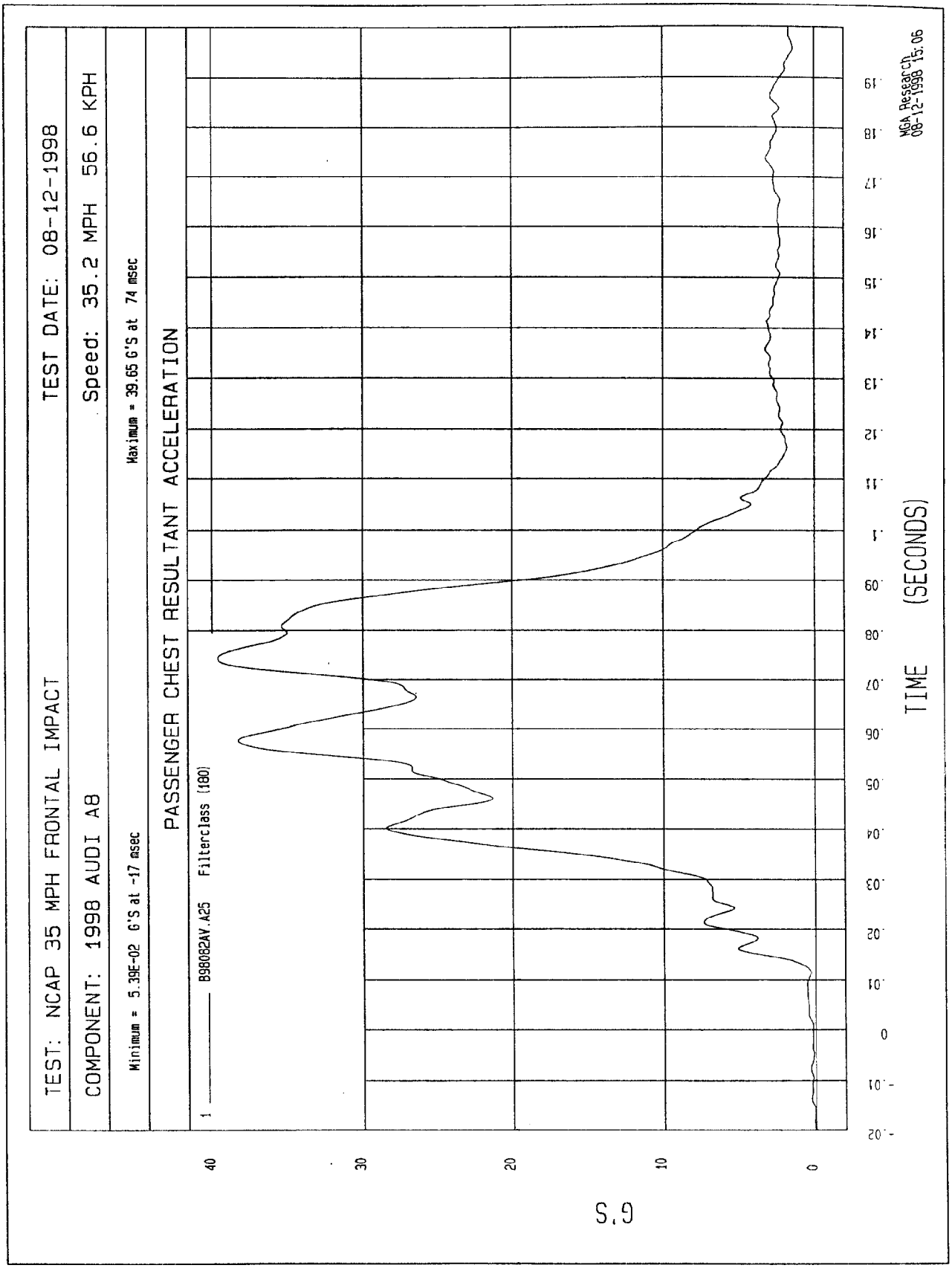

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 8.47E-02 NM at -10 msec
Maximum = 37.97 NM at 63 msec
PASSENGER NECK MOMENT RESULTANT
1 B98082MV.M54 Filterclass (600)
NM
30
20
10
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:26

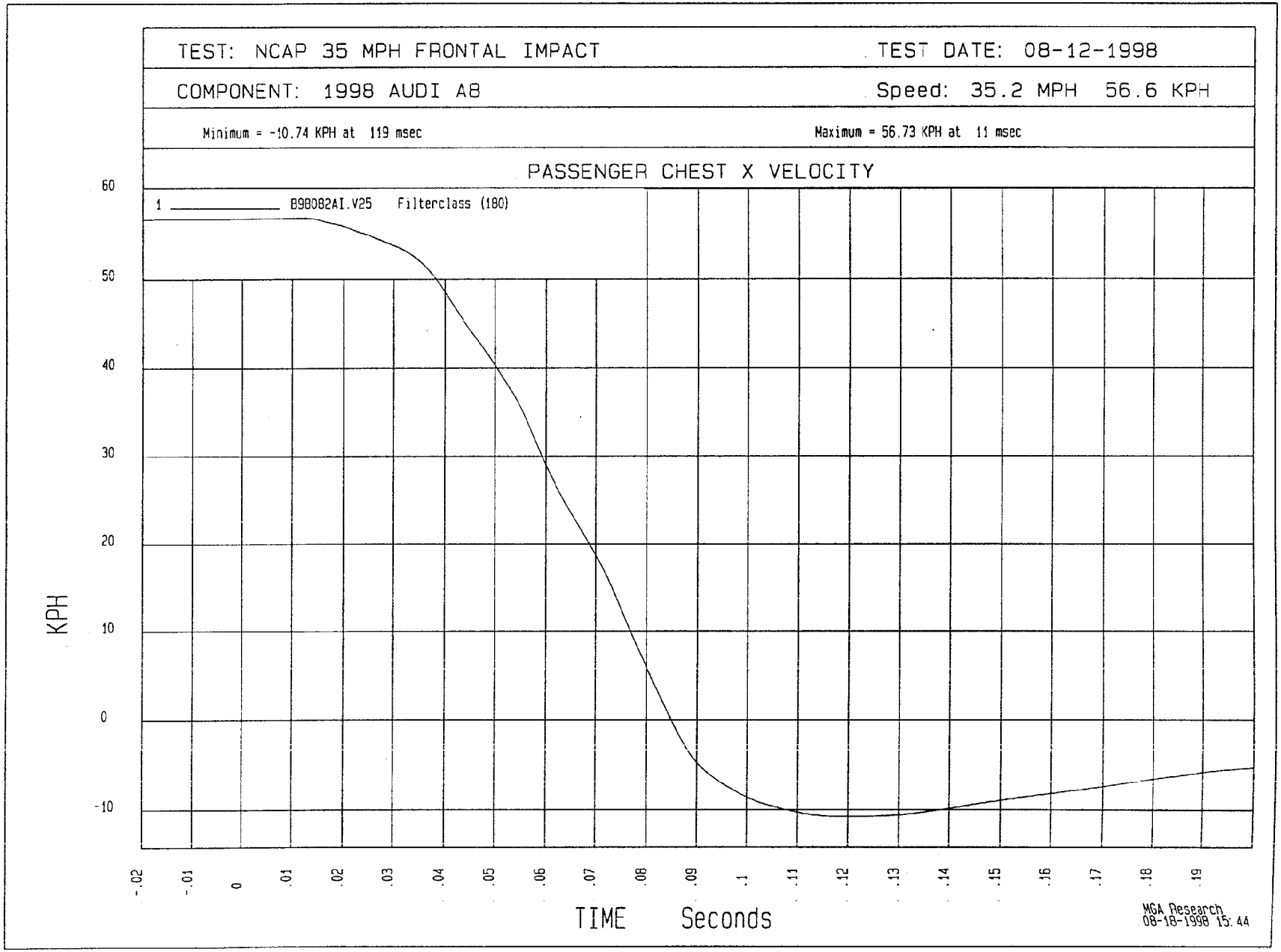

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -16.25 NM at 60 msec
Maximum = 20.21 NM at 89 msec
PASSENGER OCCIPITAL CONDYLE MOMENT Y
1 B98082NO.M54 Filterclass (600)
NM
20
10
0
-10
TIME (SECONDS)
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
MGA Research
08-16-1998 15:51

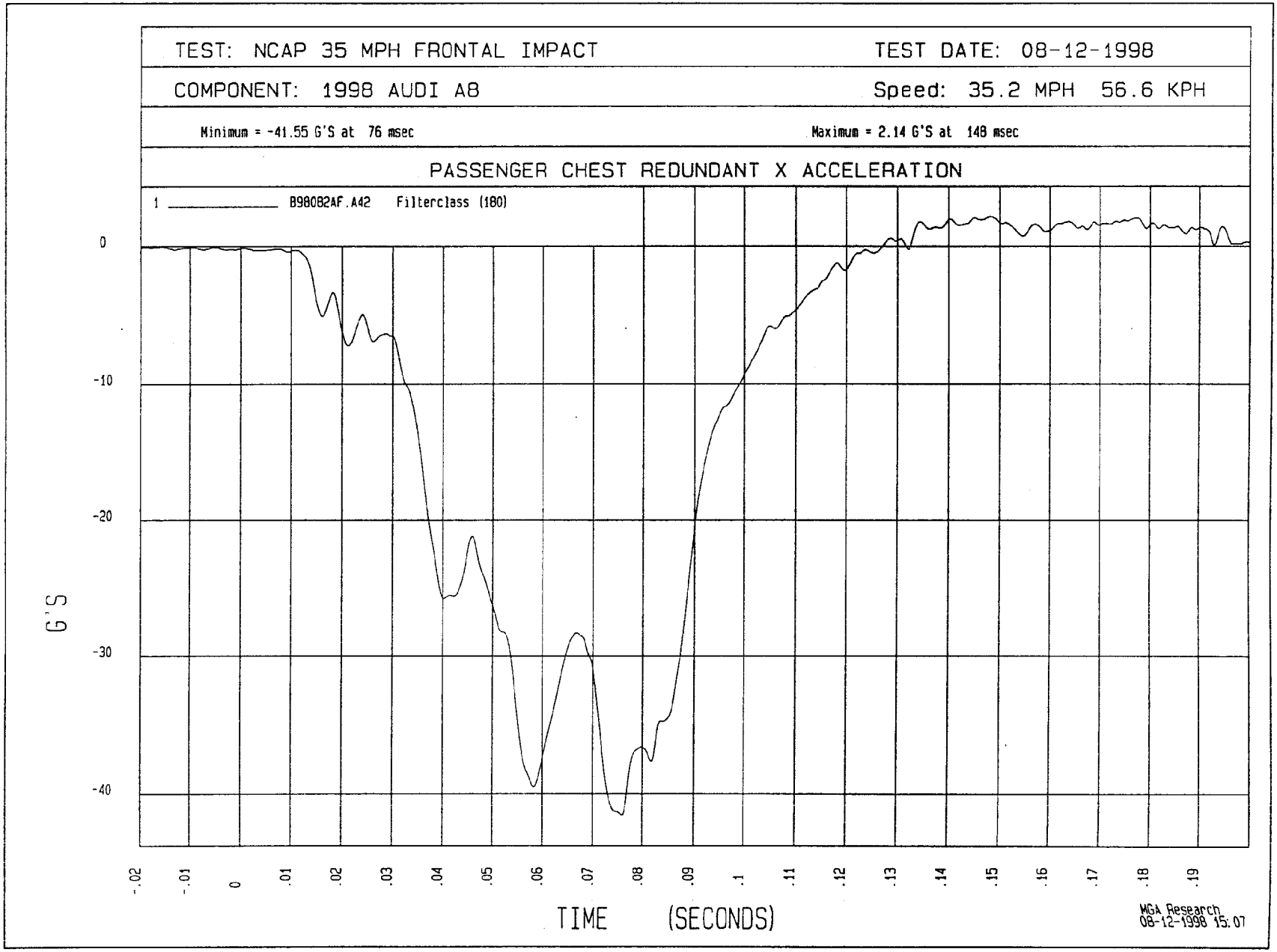

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -39.06 G'S at 74 msec
Maximum = 2.71 G'S at 143 msec
PASSENGER CHEST X ACCELERATION
1 _____ B980824F.A25 Filterclass (180)
0
-10
-20
-30
-40
G'S
.02
.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:06

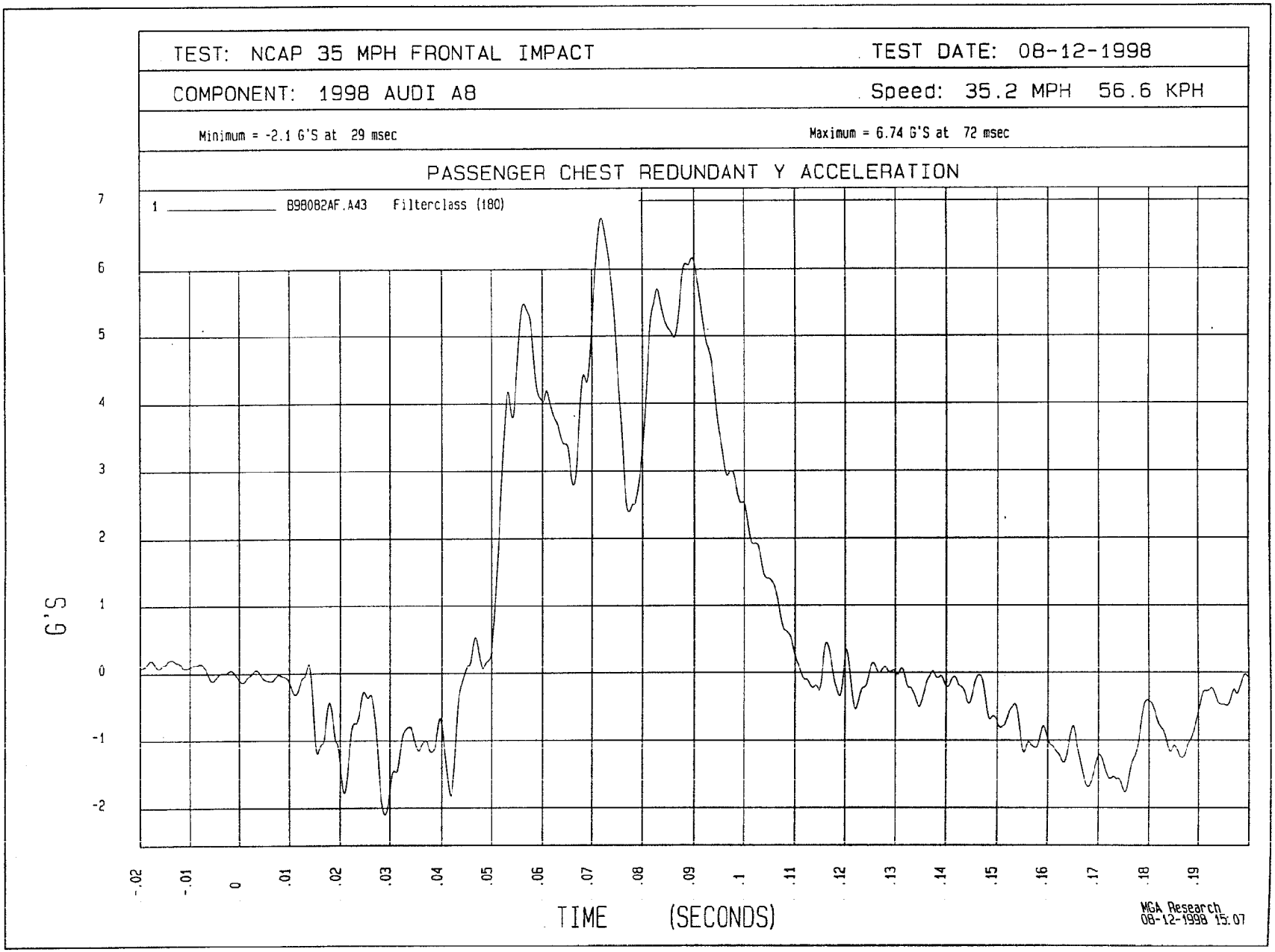

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -2.39 G'S at 37 msec
Maximum = 6.45 G'S at 72 msec
PASSENGER CHEST Y ACCELERATION
1 B98082AF.A26 Filterclass (180)
TIME (SECONDS)
MGA Research
08-12-1998 15:06
G's

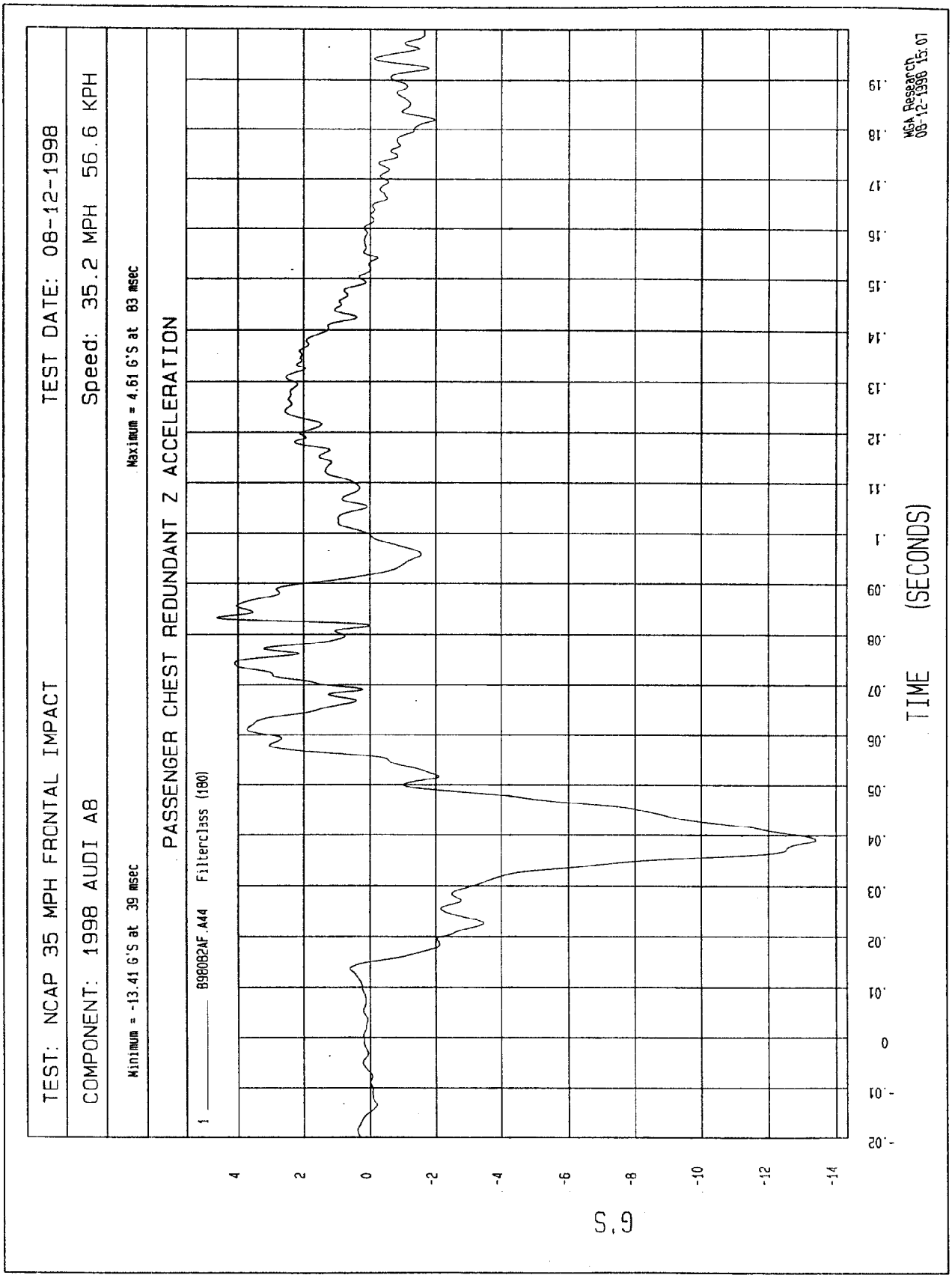

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -12.99 G'S at 39 msec
Maximum = 4.9 G'S at 74 msec
PASSENGER CHEST Z ACCELERATION
1 B98082AF.A27 Filterclass (180)
4
2
0
-2
-4
-6
-8
-10
-12
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:06

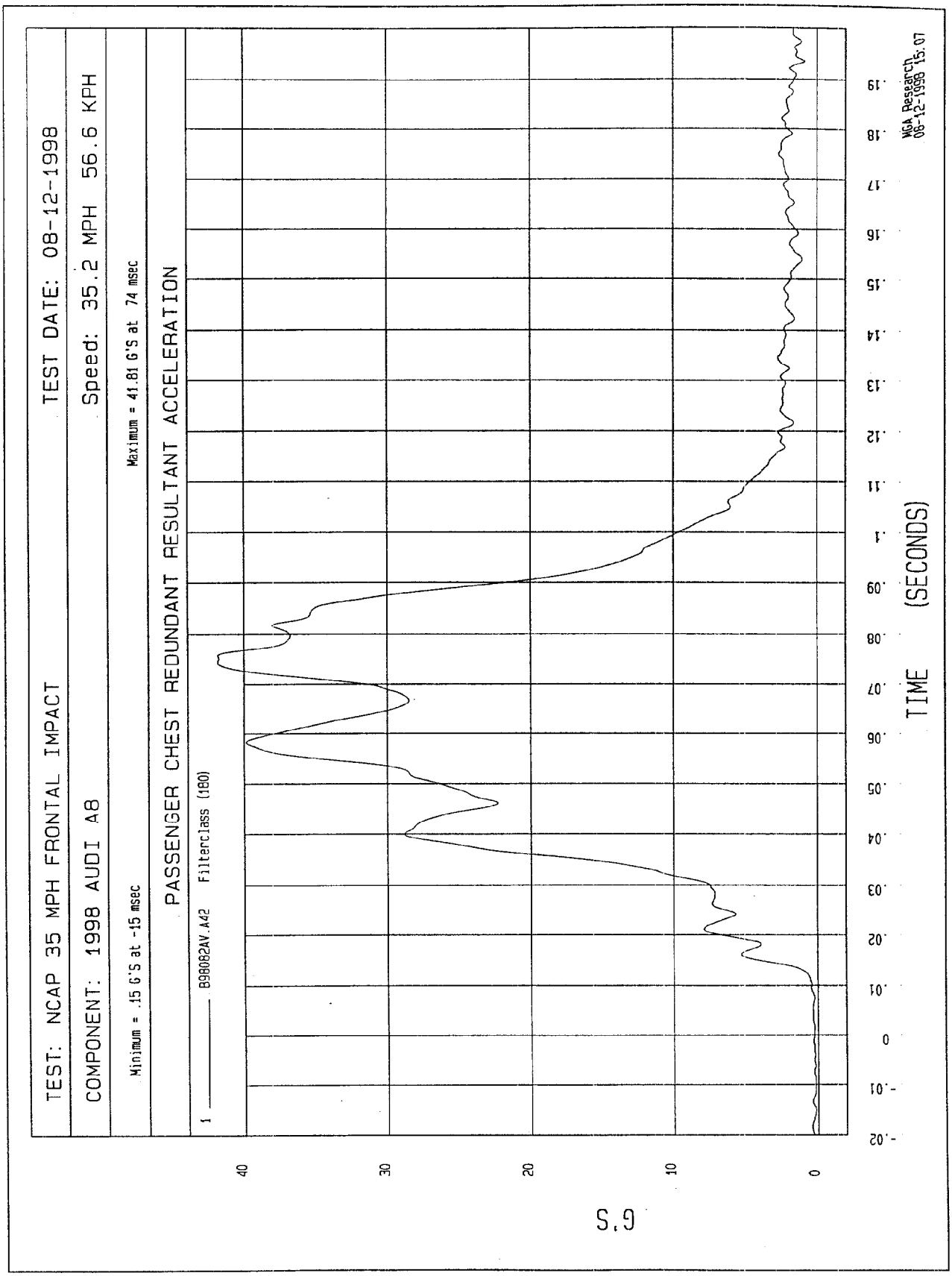

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 5.39E-02 G'S at -17 msec
Maximum = 39.65 G'S at 74 msec
PASSENGER CHEST RESULTANT ACCELERATION
1 B98002AV.A25 Filterclass (180)
MGA Research
08-12-1998 15:06
G'S
TIME (SECONDS)

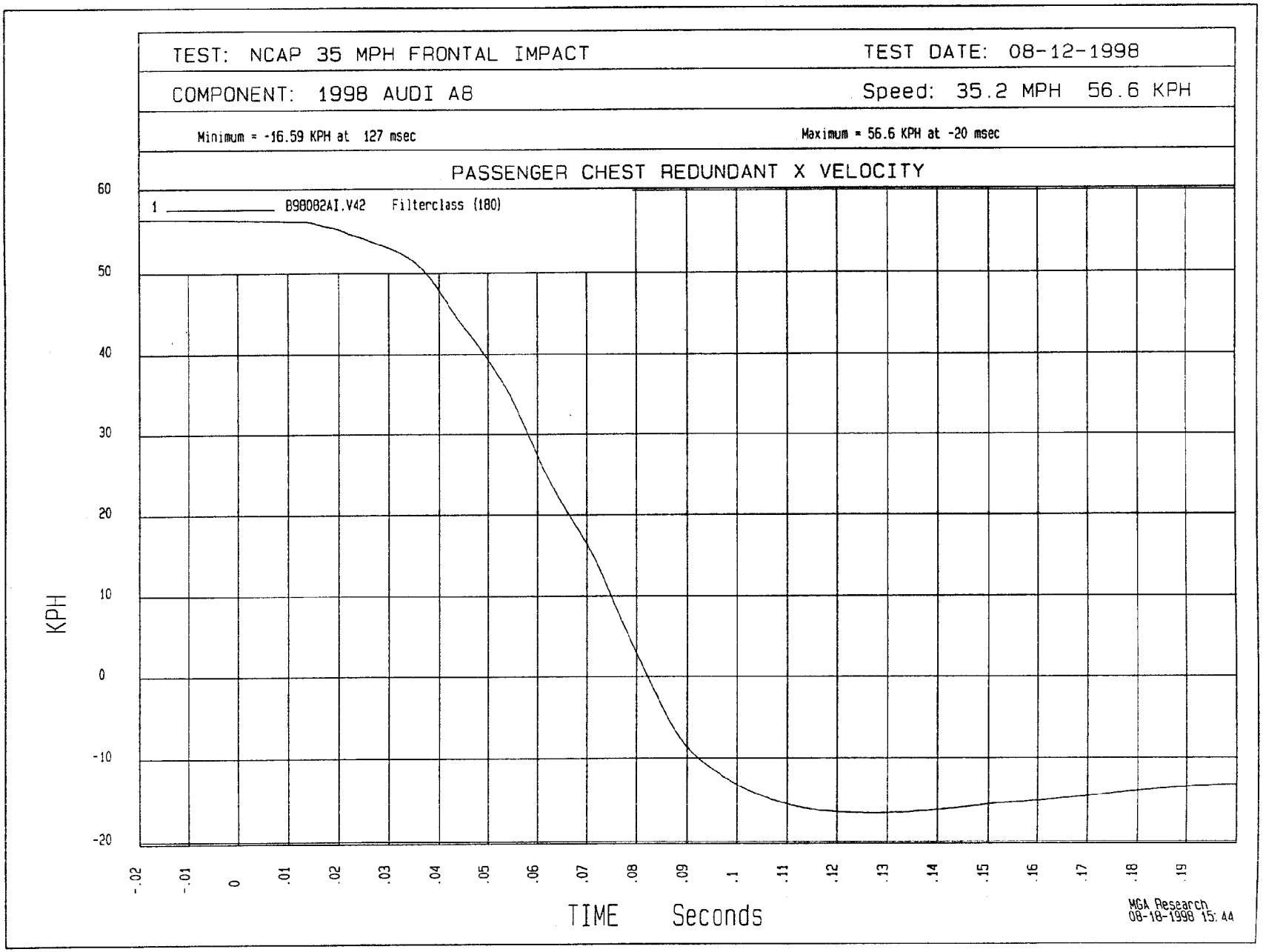

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -10.74 KPH at 119 msec
Maximum = 56.73 KPH at 11 msec
PASSENGER CHEST X VELOCITY
1 B98082AI.V25 Filterclass (180)
KPH
60
50
40
30
20
10
0
-10
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME Seconds
MGA Research
08-18-1998 15:44

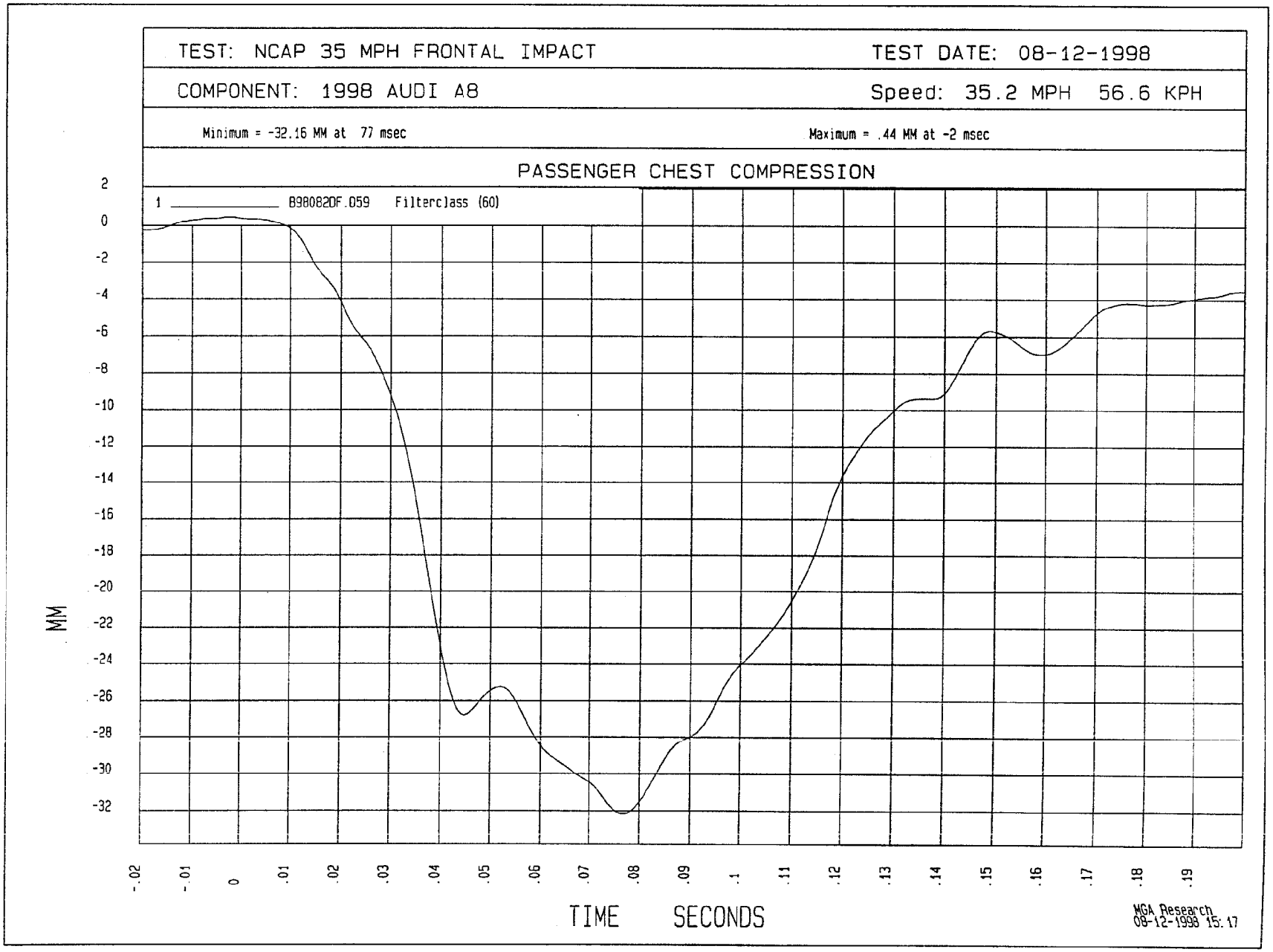

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -41.55 G'S at 76 msec
Maximum = 2.14 G'S at 148 msec
PASSENGER CHEST REDUNDANT X ACCELERATION
1 B980B2AF.A42 Filterclass (180)
0
-10
-20
-30
-40
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:07

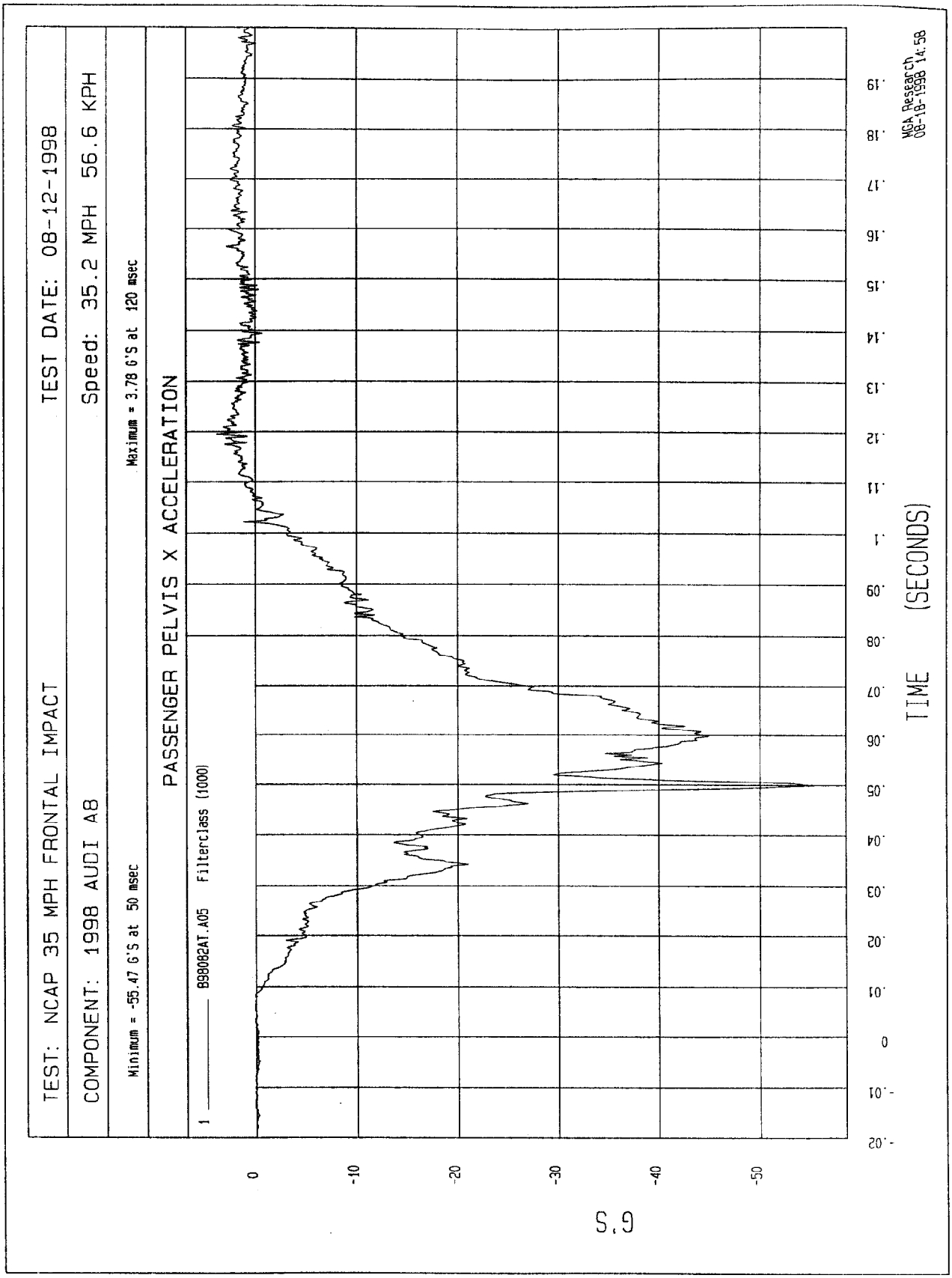

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -2.1 G'S at 29 msec
Maximum = 6.74 G'S at 72 msec
PASSENGER CHEST REDUNDANT Y ACCELERATION
1 B98082AF.A43 Filterclass (180)
7
6
5
4
3
2
1
0
-1
-2
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:07

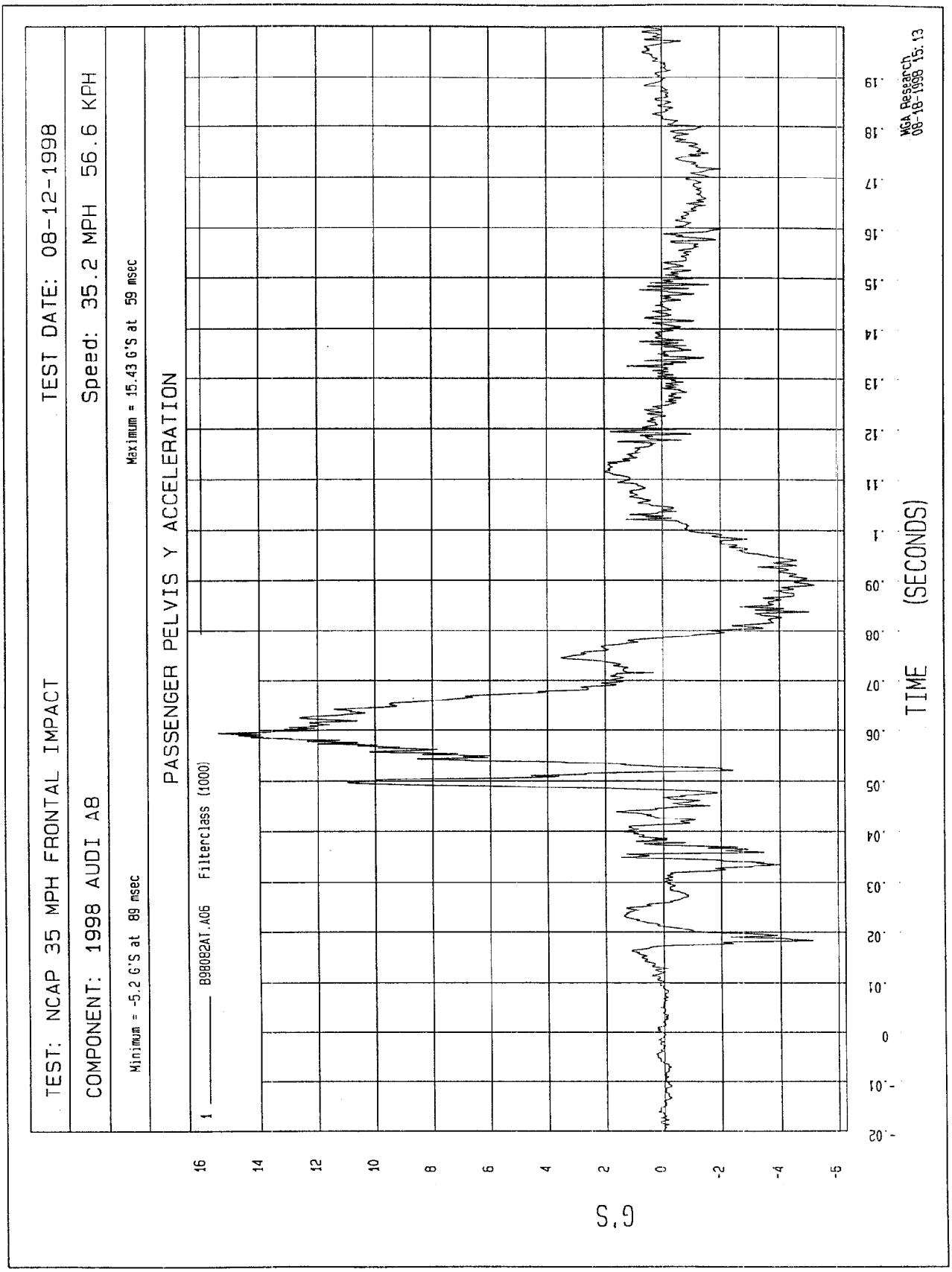

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -13.41 G'S at 39 msec
Maximum = 4.61 G'S at 83 msec
PASSENGER CHEST REDUNDANT Z ACCELERATION
1 B980824F.A44 Filterclass (180)
MGA Research
08-12-1998 15:07
G's
TIME (SECONDS)

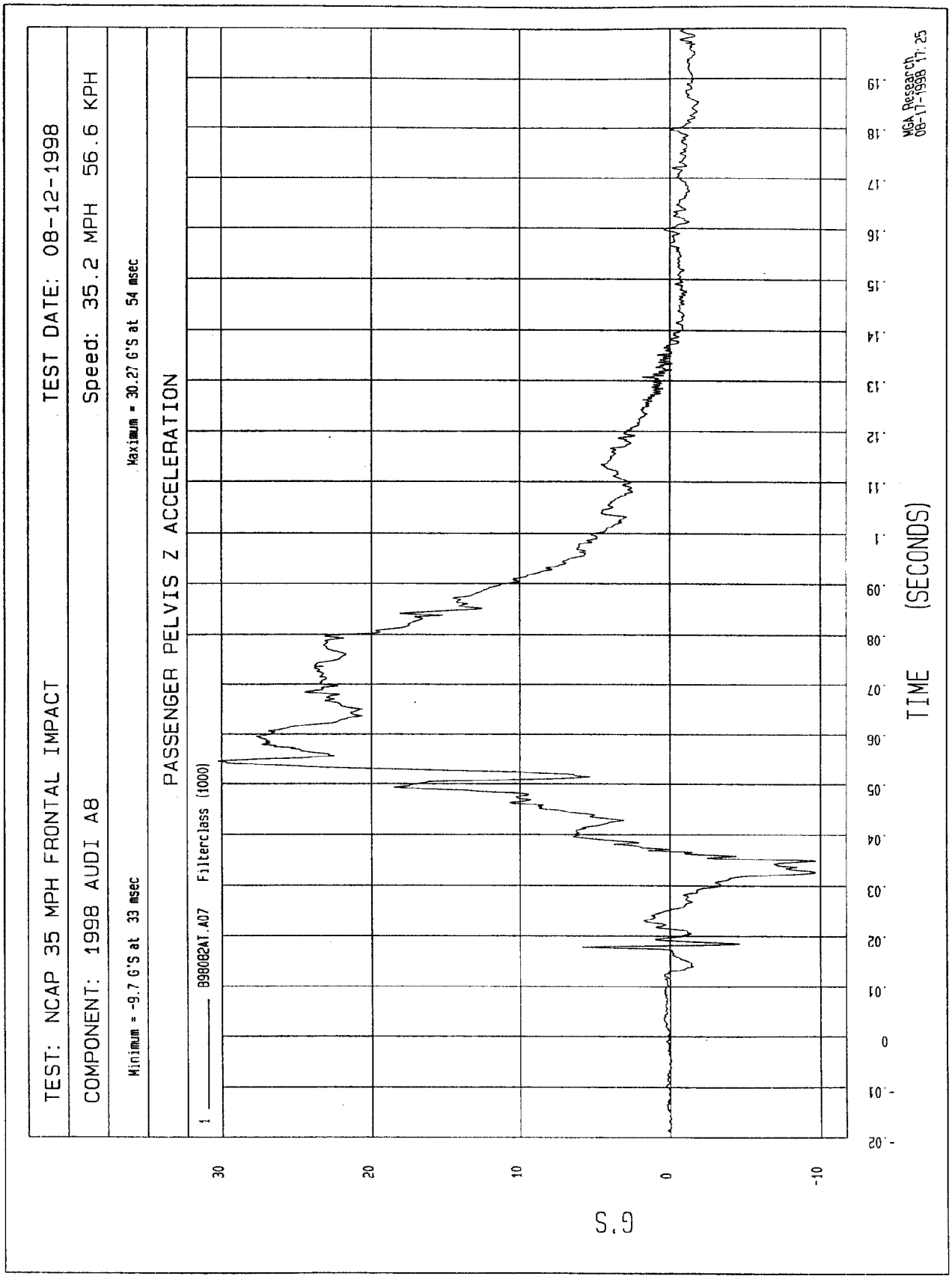

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = .15 G'S at -15 msec
Maximum = 41.81 G'S at 74 msec
PASSENGER CHEST REDUNDANT RESULTANT ACCELERATION
1 B98082AV.A42 Filterclass (180)
40
30
20
10
0
G'S
.19
.18
.17
.16
.15
.14
.13
.12
.11
.1
.09
.08
.07
.06
.05
.04
.03
.02
.01
0
-.01
-.02
TIME (SECONDS)
MGA Research
08-12-1998 15:07

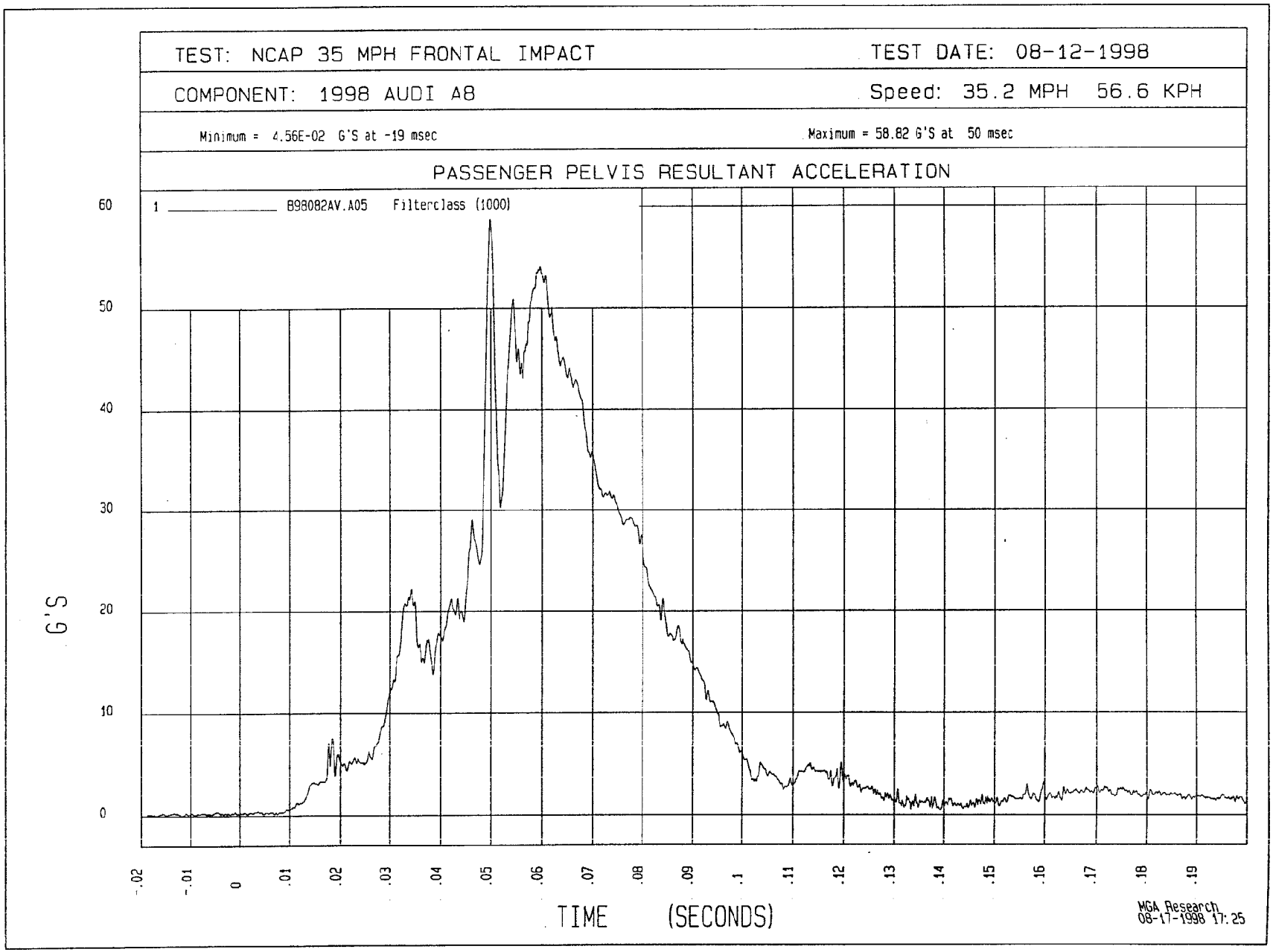

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -16.59 KPH at 127 msec
Maximum = 56.6 KPH at -20 msec
PASSENGER CHEST REDUNDANT X VELOCITY
1 B98082AI.V42 Filterclass (180)
KPH
60
50
40
30
20
10
0
-10
-20
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME Seconds
MGA Research
08-18-1998 15:44

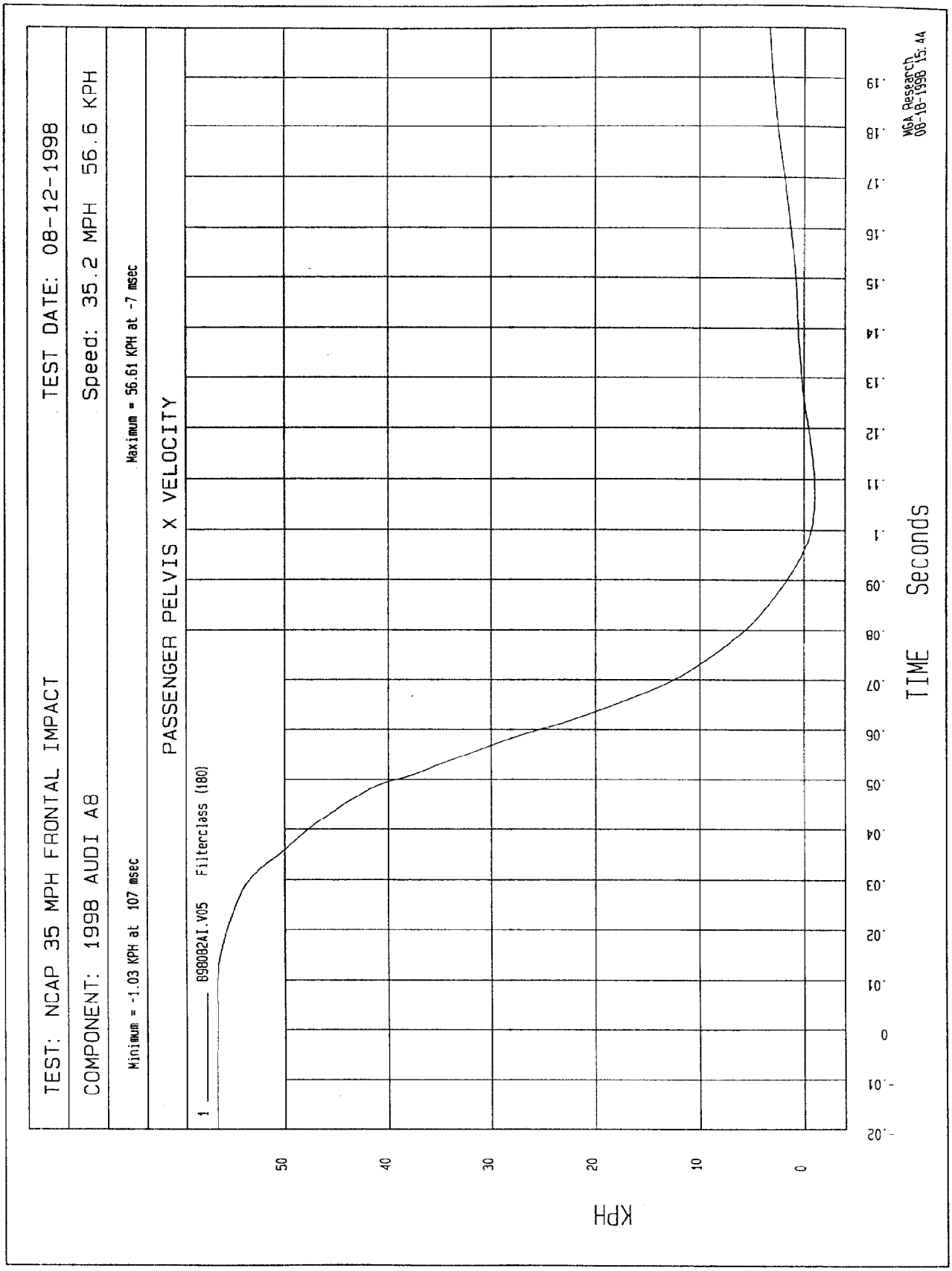

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -32.16 MM at 77 msec
Maximum = .44 MM at -2 msec
PASSENGER CHEST COMPRESSION
1 B980820F.059 Filterclass (60)
MM
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME SECONDS
MGA Research
08-12-1998 15:17

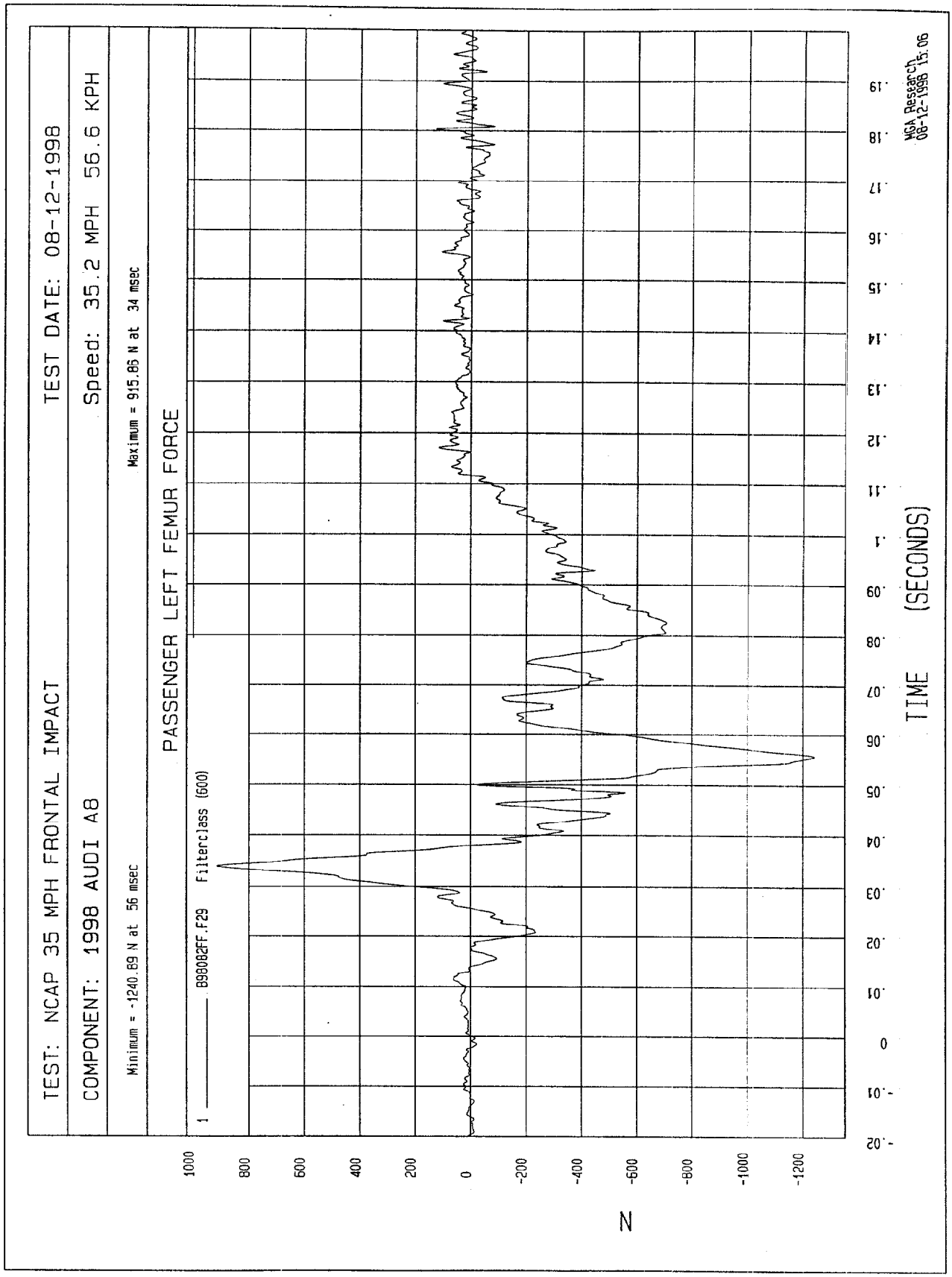

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -55.47 G'S at 50 msec
Maximum = 3.78 G'S at 120 msec
PASSENGER PELVIS X ACCELERATION
1 B98082AT.A05 Filterclass (1000)
MGA Research
08-18-1998 14:58
G'S
TIME (SECONDS)
0
-10
-20
-30
-40
-50
.19
.18
.17
.16
.15
.14
.13
.12
.11
.1
.09
.08
.07
.06
.05
.04
.03
.02
.01
0
-.01
-.02

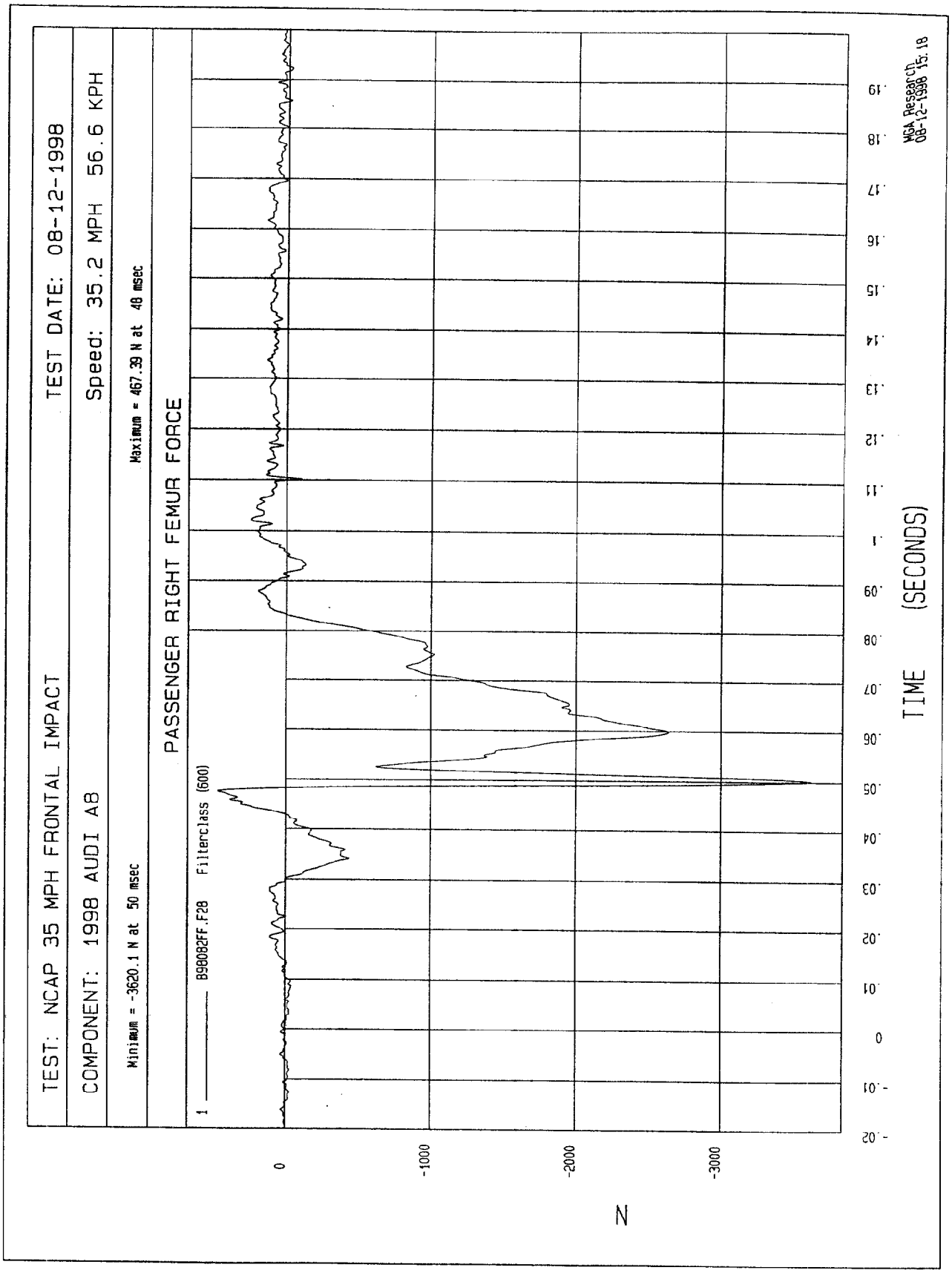

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -5.2 G'S at 89 msec
Maximum = 15.43 G'S at 59 msec
PASSENGER PELVIS Y ACCELERATION
1 B98082AT.A06 Filterclass (1000)
16
14
12
10
8
6
4
2
0
-2
-4
-5
G'S
.02
.01
0
-.01
-.02
.06
.05
.04
.03
.02
.01
0
-.01
-.02
.07
.08
.09
1
11
12
13
14
15
16
17
18
19
TIME (SECONDS)
MGA Research
08-18-1998 15:13

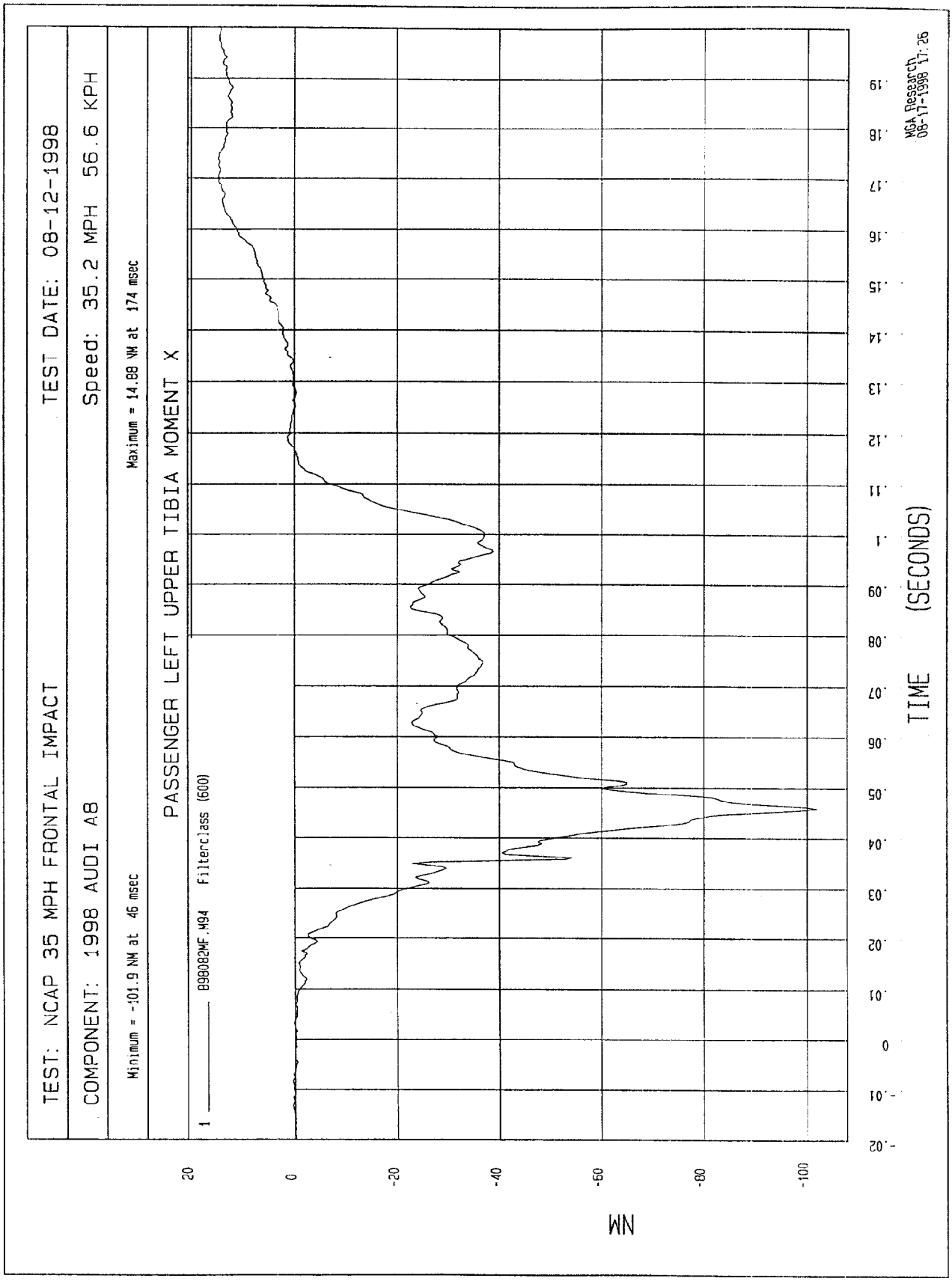

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -9.7 G'S at 33 msec
Maximum = 30.27 G'S at 54 msec
PASSENGER PELVIS Z ACCELERATION
1 B980B2AT.A07 Filterclass (1000)
30
20
10
0
-10
G'S
.20
.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:25

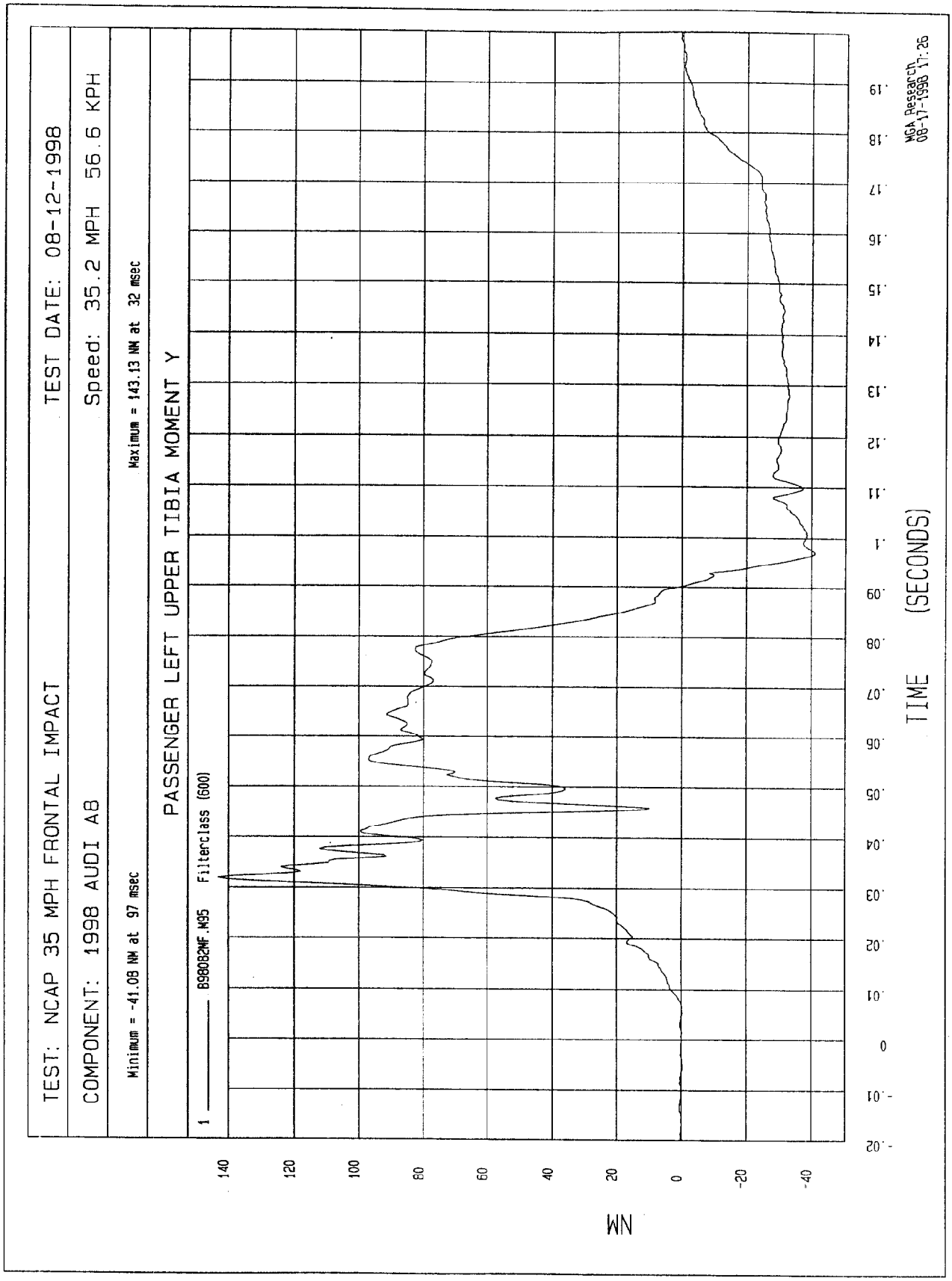

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 4.56E-02 G'S at -19 msec
Maximum = 58.82 G'S at 50 msec
PASSENGER PELVIS RESULTANT ACCELERATION
1 B98082AV.A05 Filterclass (1000)
G'S
60
50
40
30
20
10
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:25

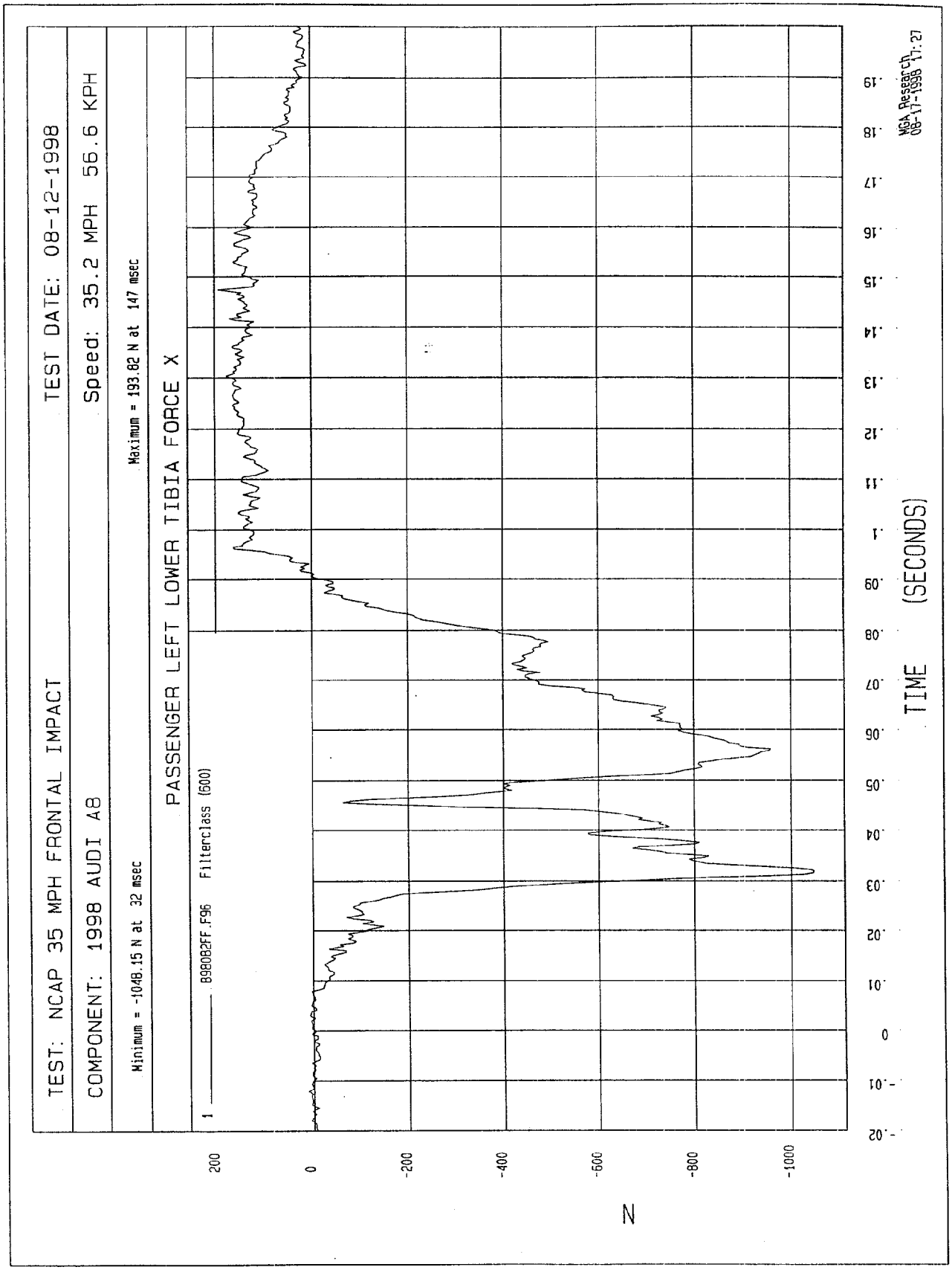

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -1.03 KPH at 107 msec
Maximum = 56.61 KPH at -7 msec
PASSENGER PELVIS X VELOCITY
1 B980802AI.V05 Filterclass (180)
KPH
50
40
30
20
10
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME Seconds
MGA Research
08-18-1998 15:44

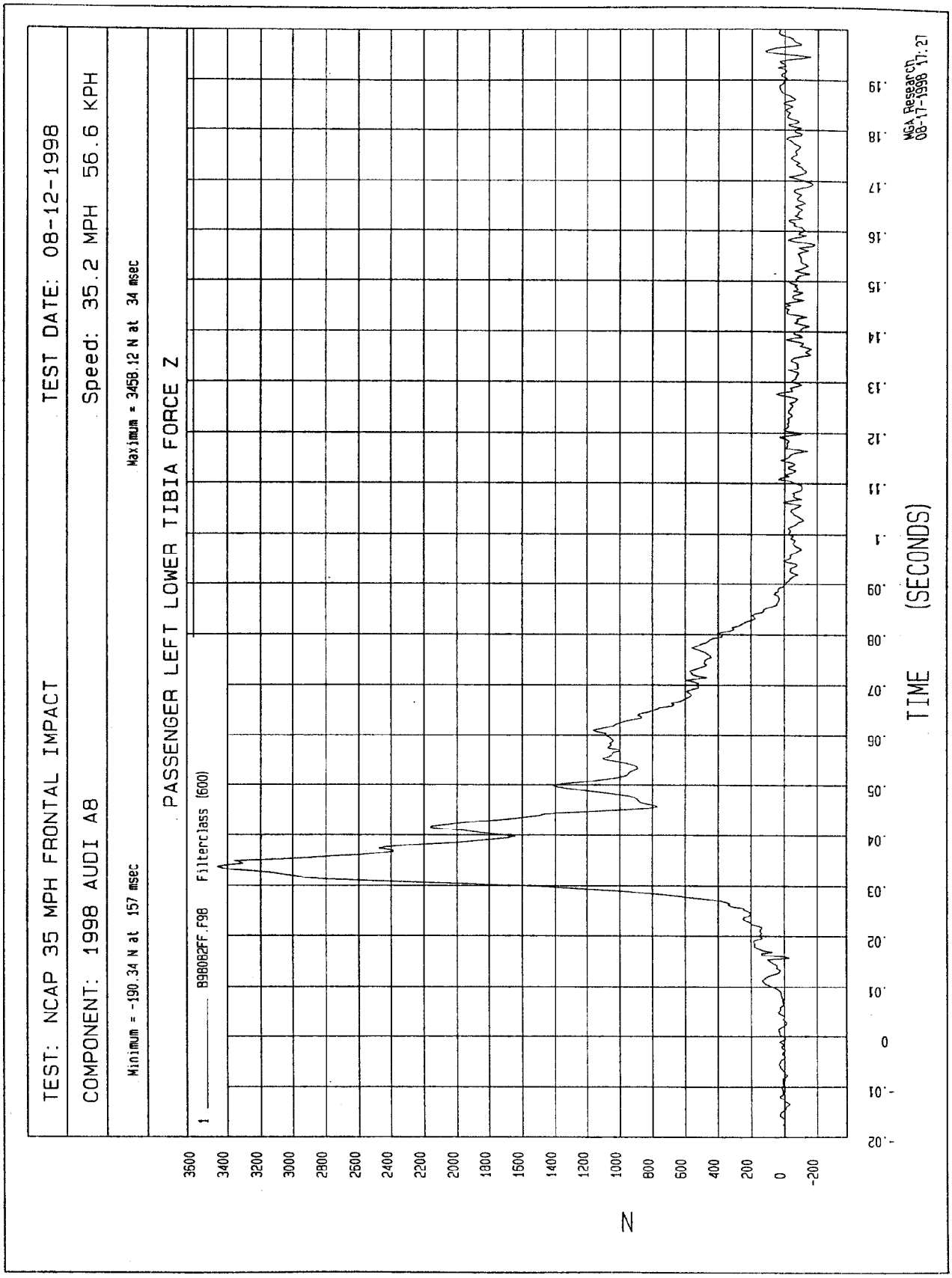

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -1240.69 N at 56 msec
Maximum = 915.85 N at 34 msec
PASSENGER LEFT FEMUR FORCE
1 B98002FF.F29 Filterclass (600)
1000
800
600
400
200
0
-200
-400
-600
-800
-1000
-1200
N
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:06

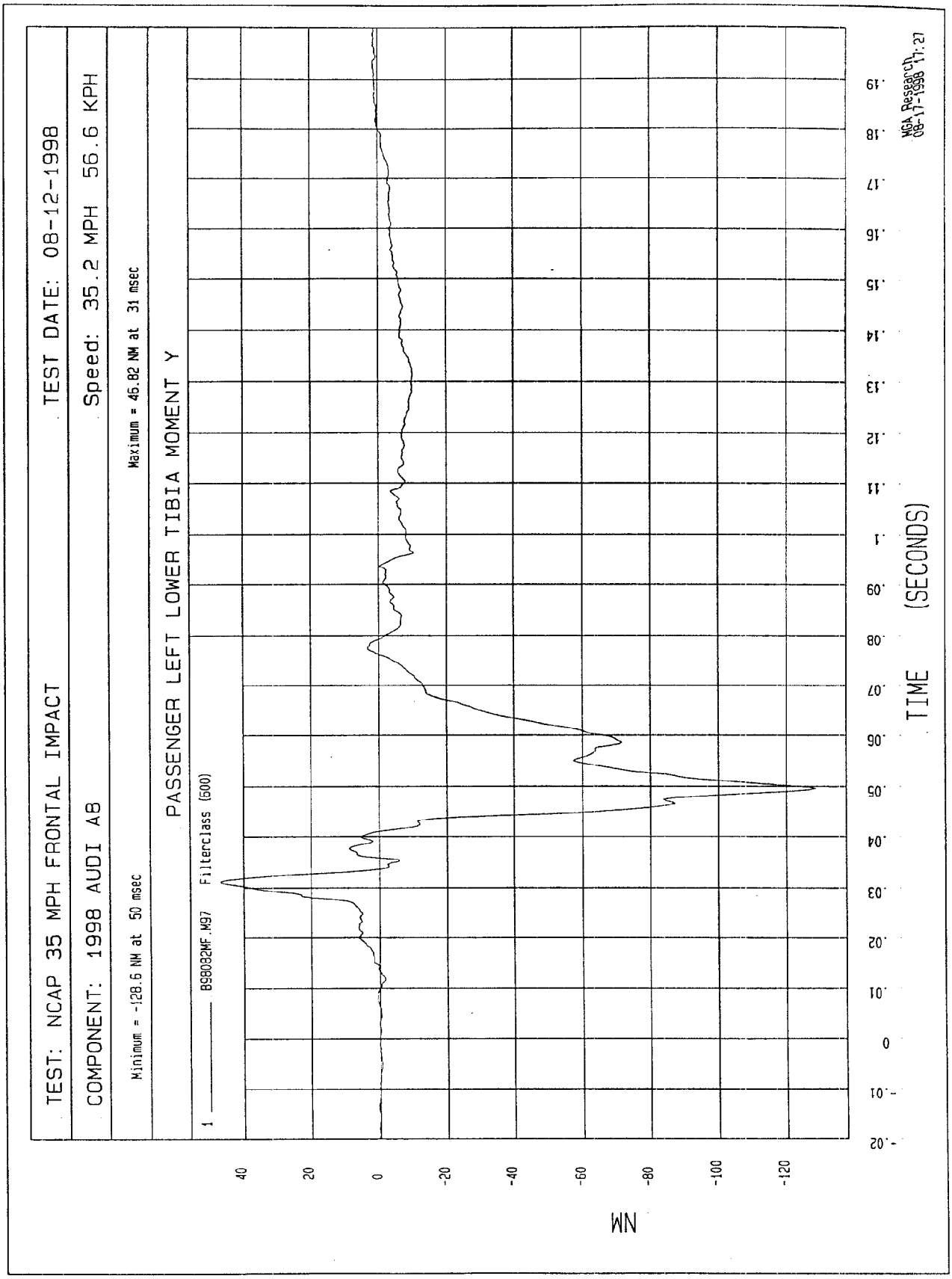

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -3620.1 N at 50 msec
Maximum = 467.39 N at 48 msec
PASSENGER RIGHT FEMUR FORCE
1 B98002FF.F28 Filterclass (600)
0
-1000
-2000
-3000
N
TIME (SECONDS)
MGA Research
08-12-1998 15:18

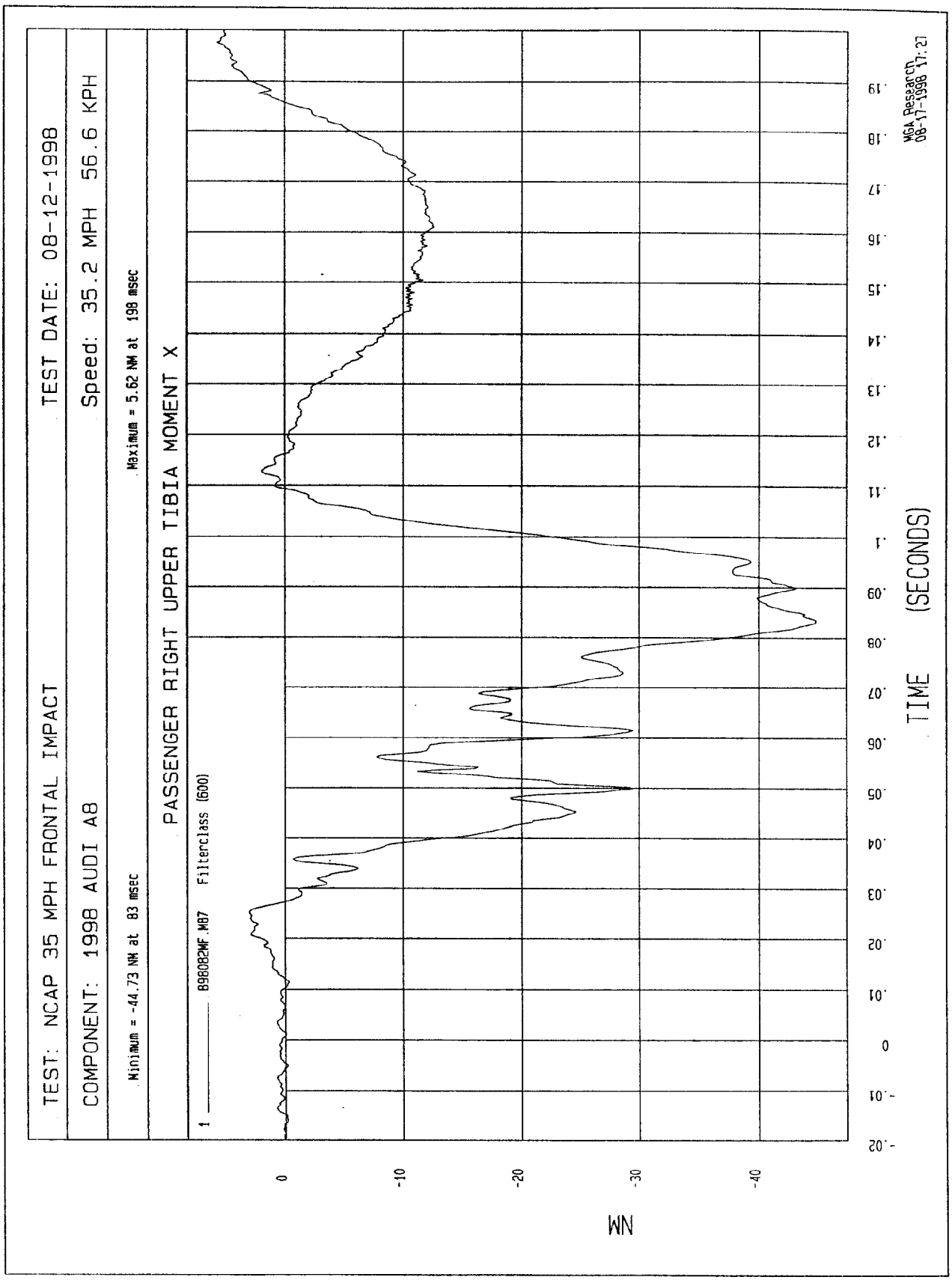

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -101.9 NM at 46 msec
Maximum = 14.88 NM at 174 msec
PASSENGER LEFT UPPER TIBIA MOMENT X
1 B98082WF.M94 Filterclass (600)
NM
TIME (SECONDS)
MGA Research
08-17-1998 17:26

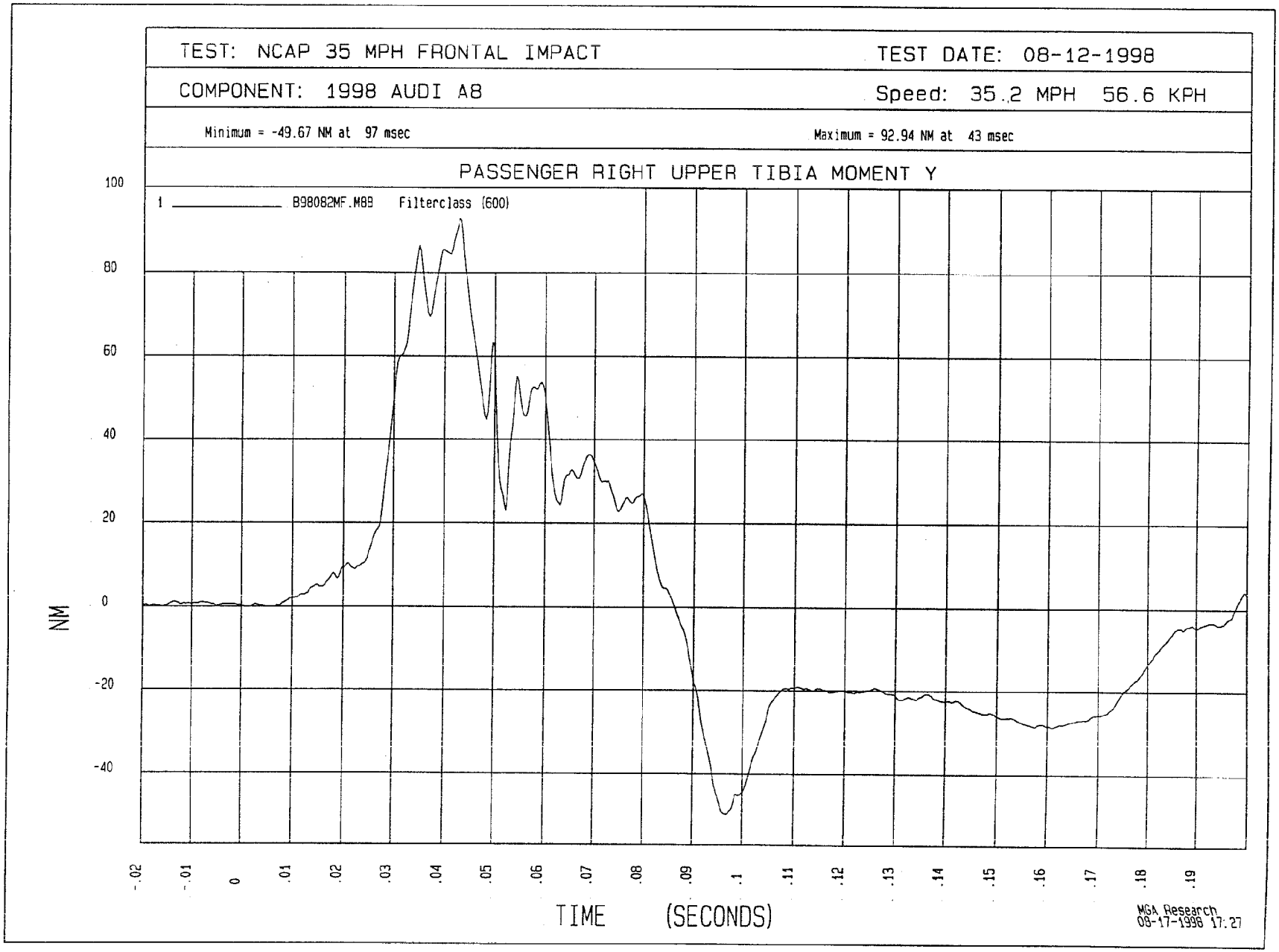

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -41.08 NM at 97 msec
Maximum = 143.13 NM at 32 msec
PASSENGER LEFT UPPER TIBIA MOMENT Y
1 B9808ZNF.M95 Filterclass (600)
NM
TIME (SECONDS)
MGA Research
08-17-1998 11:26

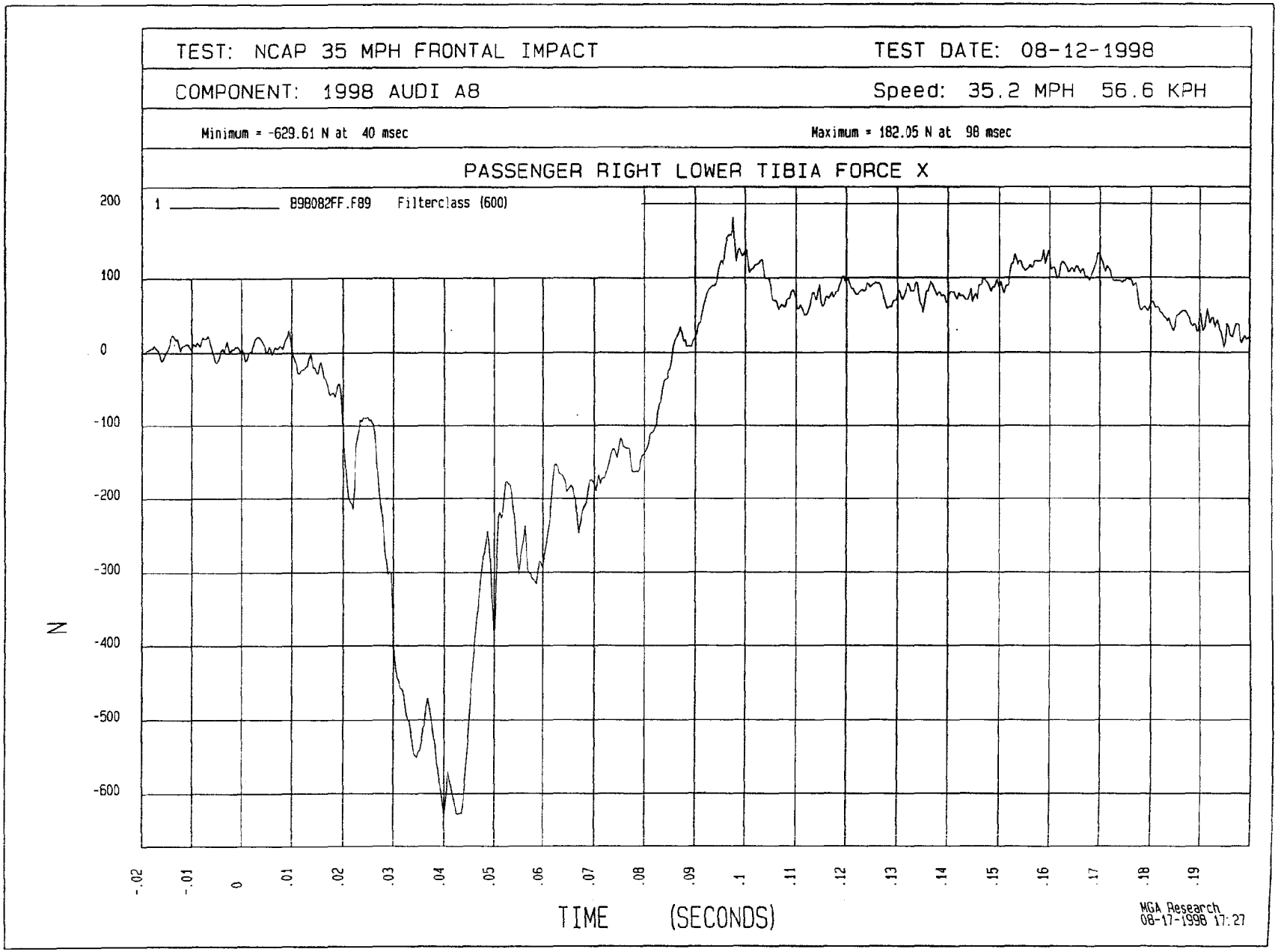

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -1048.15 N at 32 msec
Maximum = 193.82 N at 147 msec
PASSENGER LEFT LOWER TIBIA FORCE X
1 B980B2FF.F96 Filterclass (600)
200
0
-200
-400
-600
-800
-1000
N
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:27

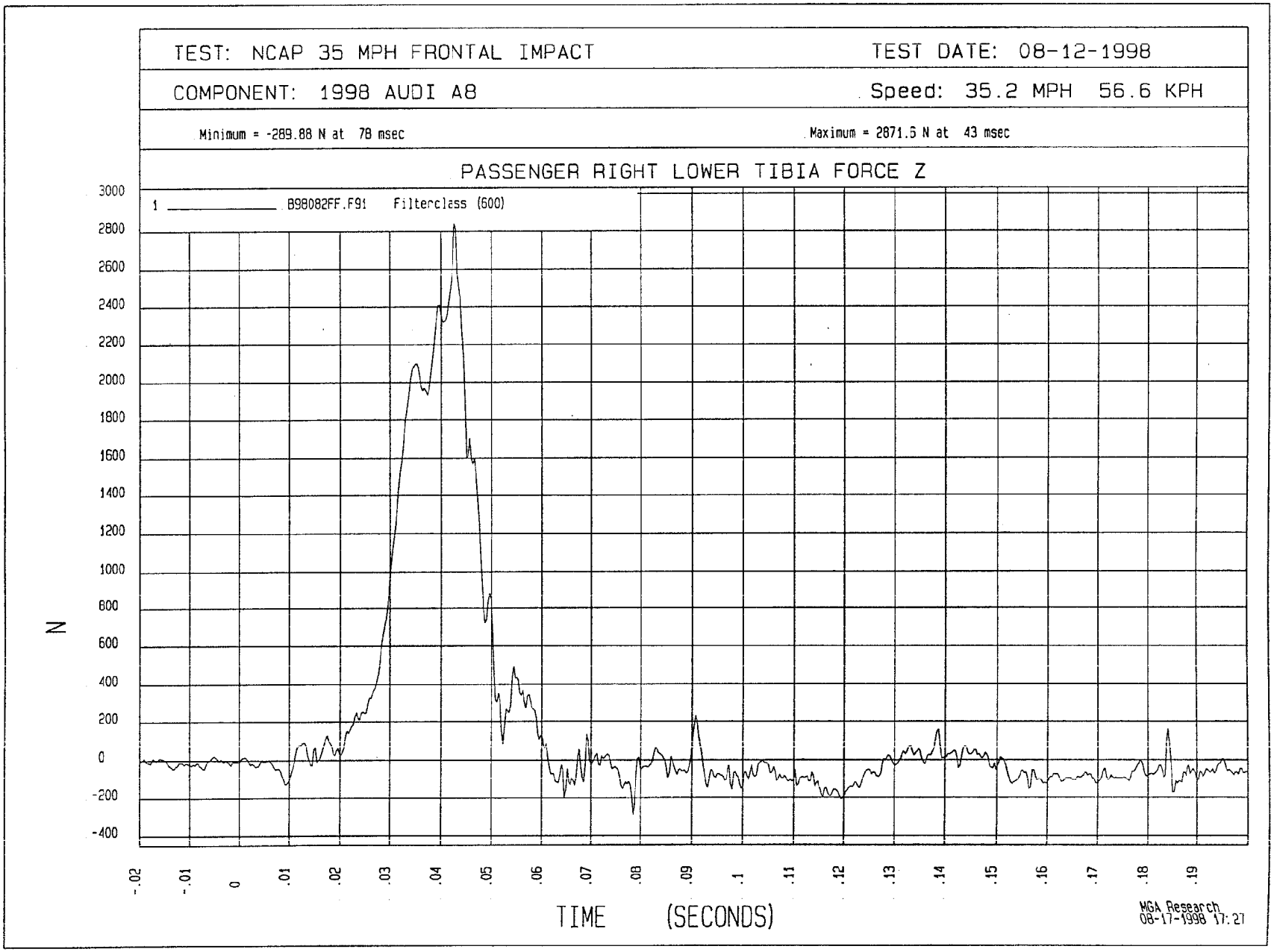

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -190.34 N at 157 msec
Maximum = 3458.12 N at 34 msec
PASSENGER LEFT LOWER TIBIA FORCE Z
1 B9800ZPF.F98 Filterclass (600)
N
TIME (SECONDS)
MGA Research
08-17-1998 17:27

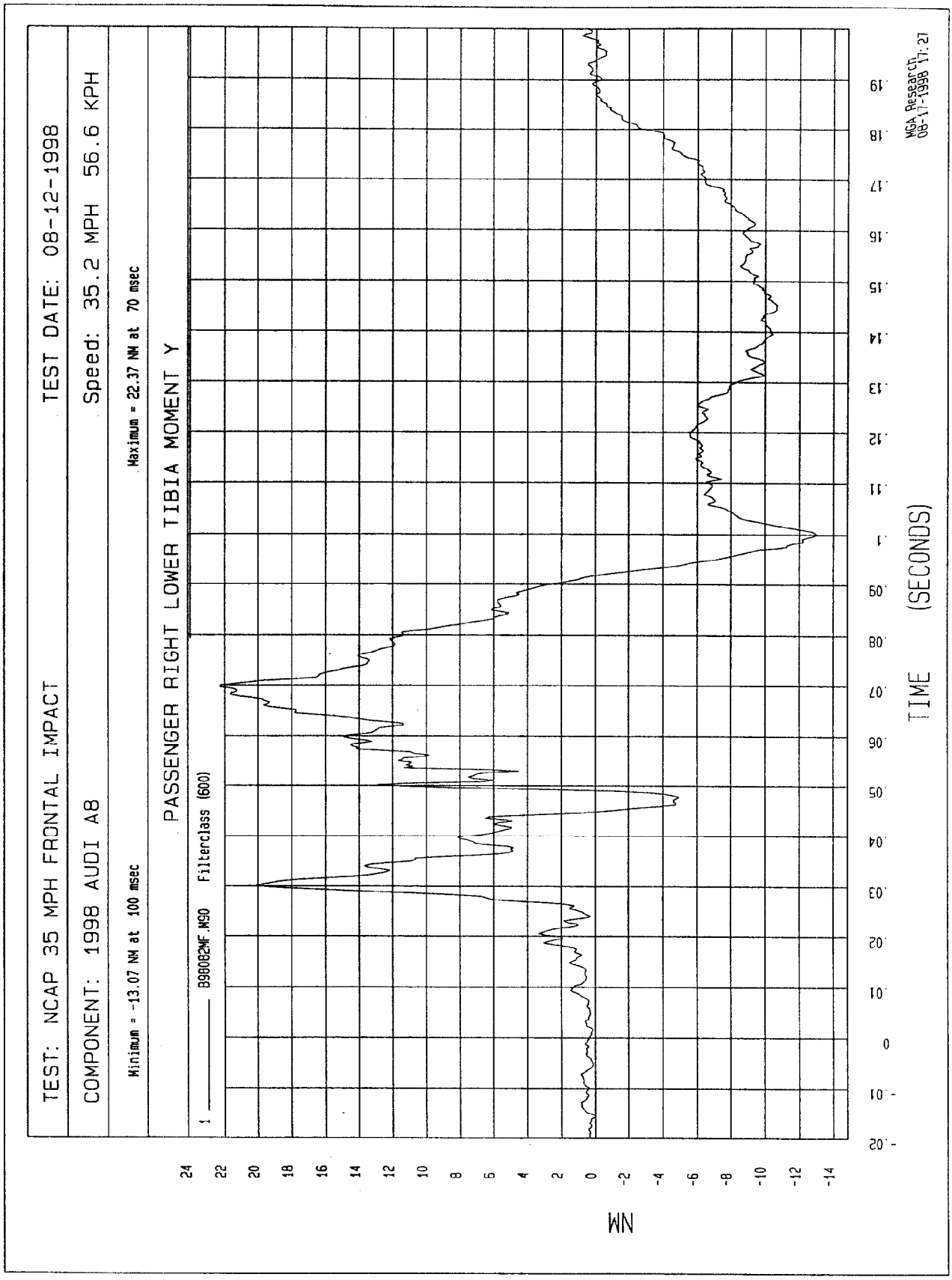

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -128.6 NM at 50 msec
Maximum = 45.82 NM at 31 msec
PASSENGER LEFT LOWER TIBIA MOMENT Y
1 B98083MF.M97 Filterclass (600)
NM
TIME (SECONDS)
MGA Research
09-17-1998 11:27

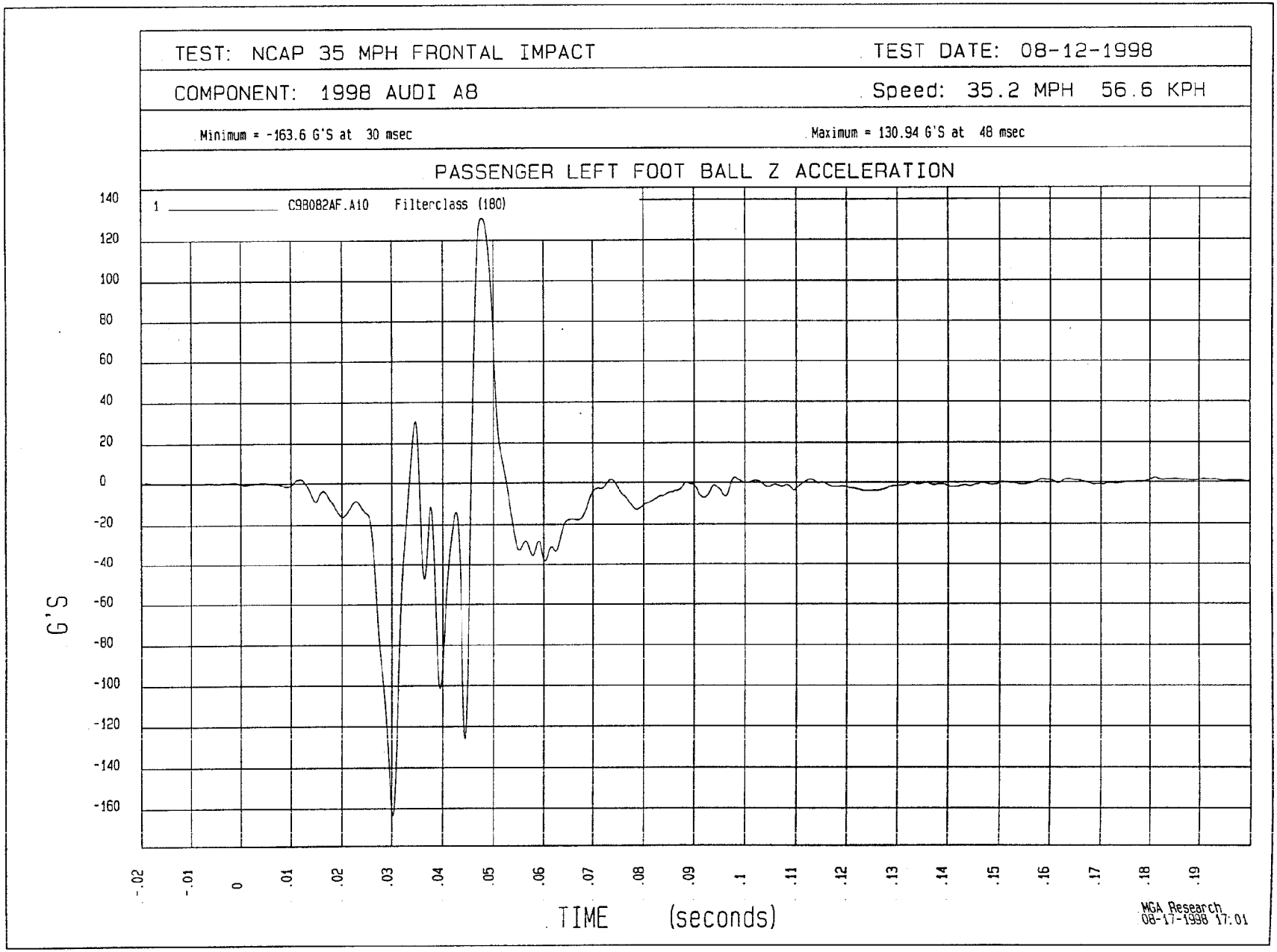

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -44.73 NM at 83 msec
Maximum = 5.62 NM at 198 msec
PASSENGER RIGHT UPPER TIBIA MOMENT X
1 B98082MF.M87 Filterclass (600)
NM
0
-10
-20
-30
-40
TIME (SECONDS)
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
MGA Research
08-17-1998 17:27

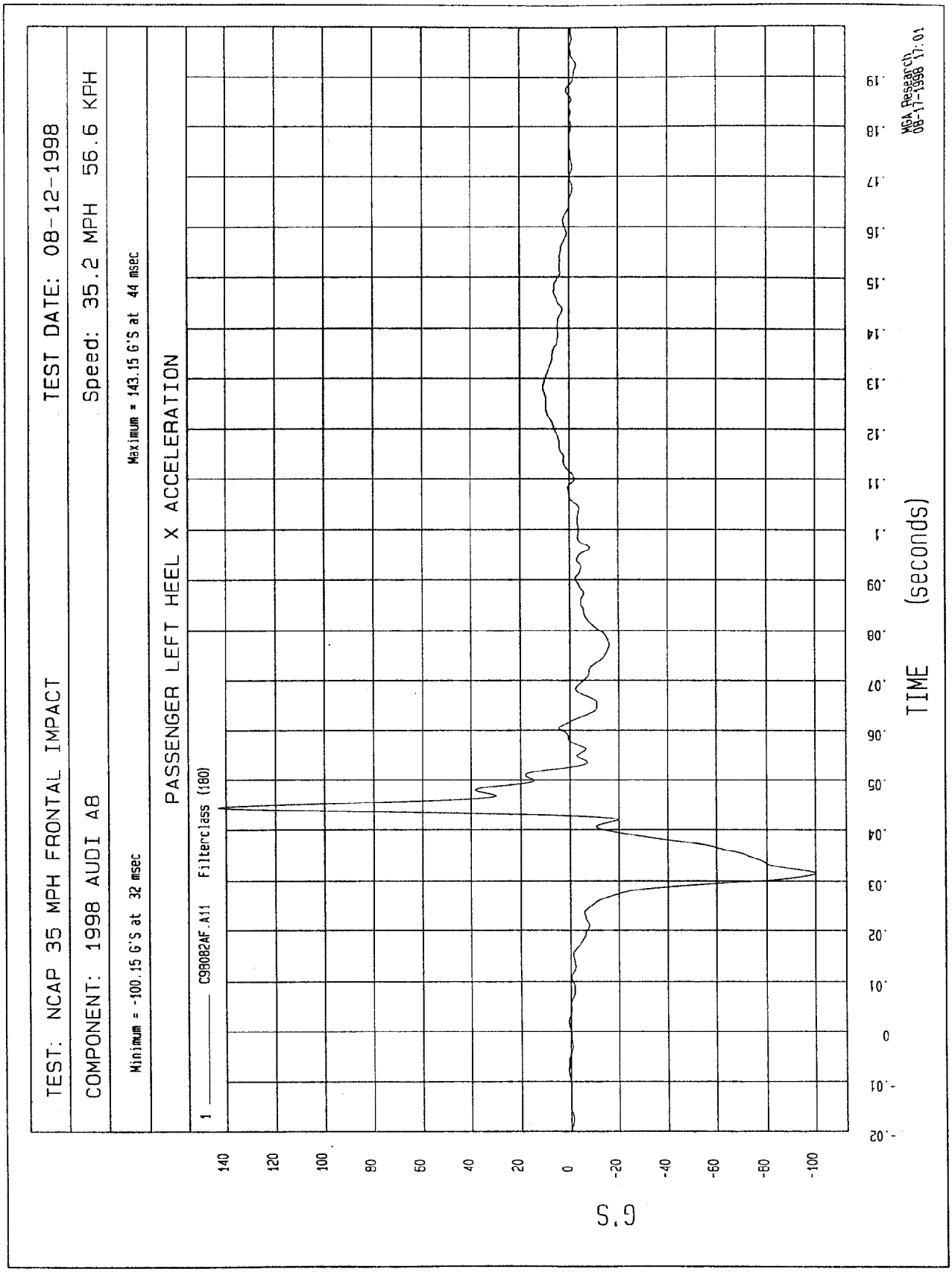

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -49.67 NM at 97 msec
Maximum = 92.94 NM at 43 msec
PASSENGER RIGHT UPPER TIBIA MOMENT Y
1 B98082MF.M88 Filterclass (600)
NM
100
80
60
40
20
0
-20
-40
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:27

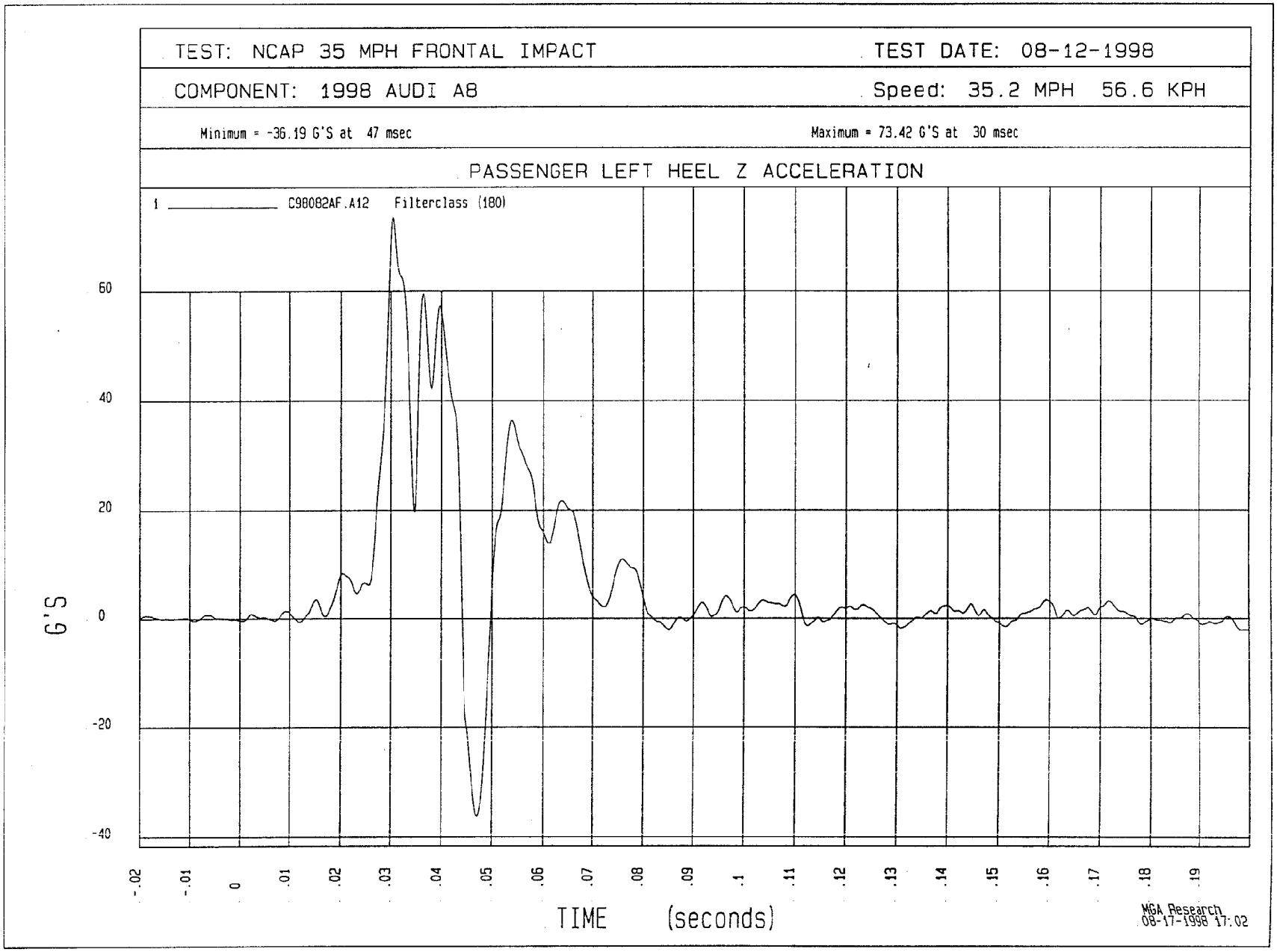

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -629.61 N at 40 msec
Maximum = 182.05 N at 98 msec
PASSENGER RIGHT LOWER TIBIA FORCE X
1 898082FF.F89 Filterclass (600)
200
100
0
-100
-200
-300
-400
-500
-600
N
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:27

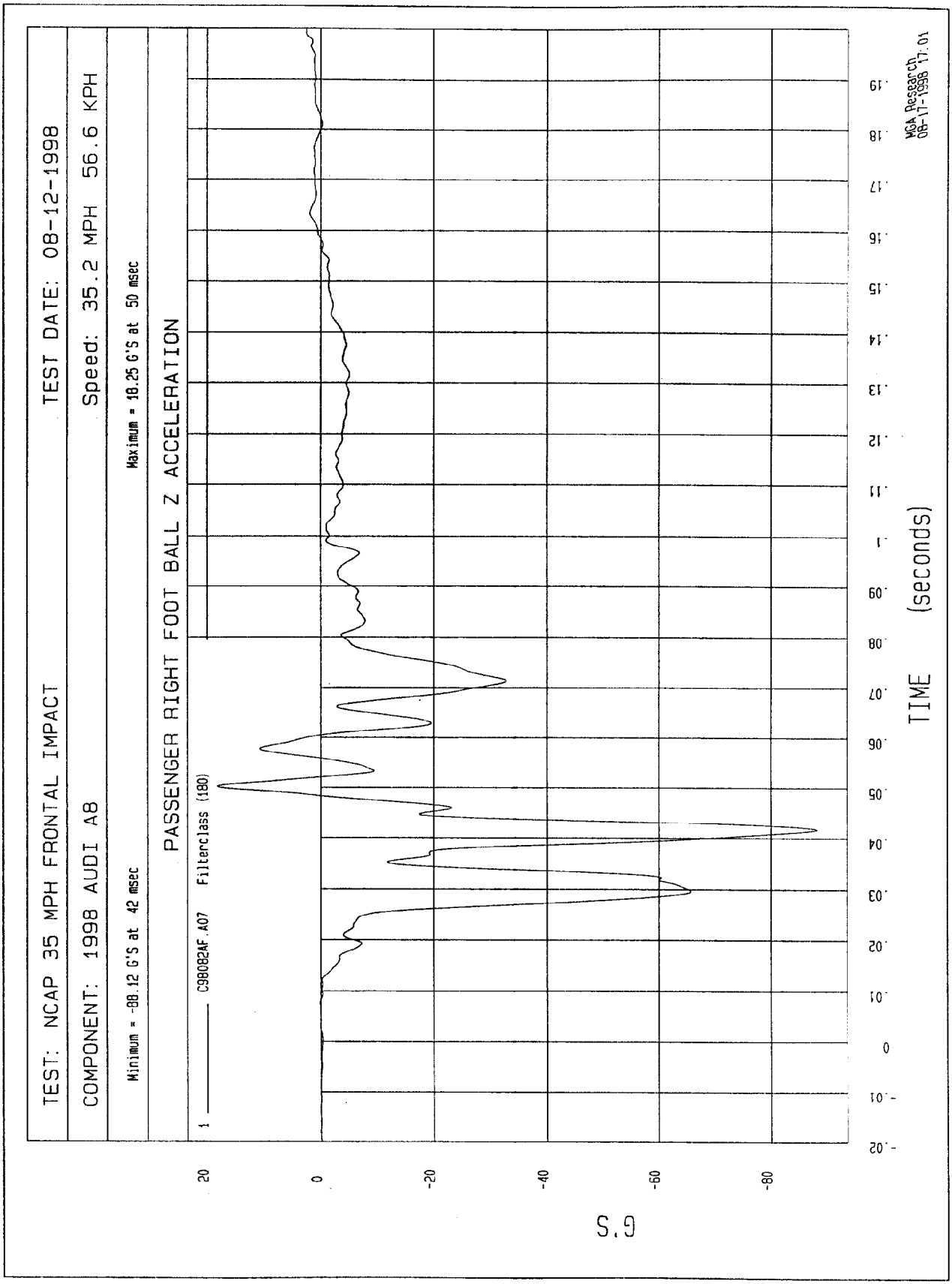

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -289.88 N at 78 msec
Maximum = 2871.5 N at 43 msec
PASSENGER RIGHT LOWER TIBIA FORCE Z
1 B98082FF.F91 Filterclass (600)
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
-200
-400
N
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:27

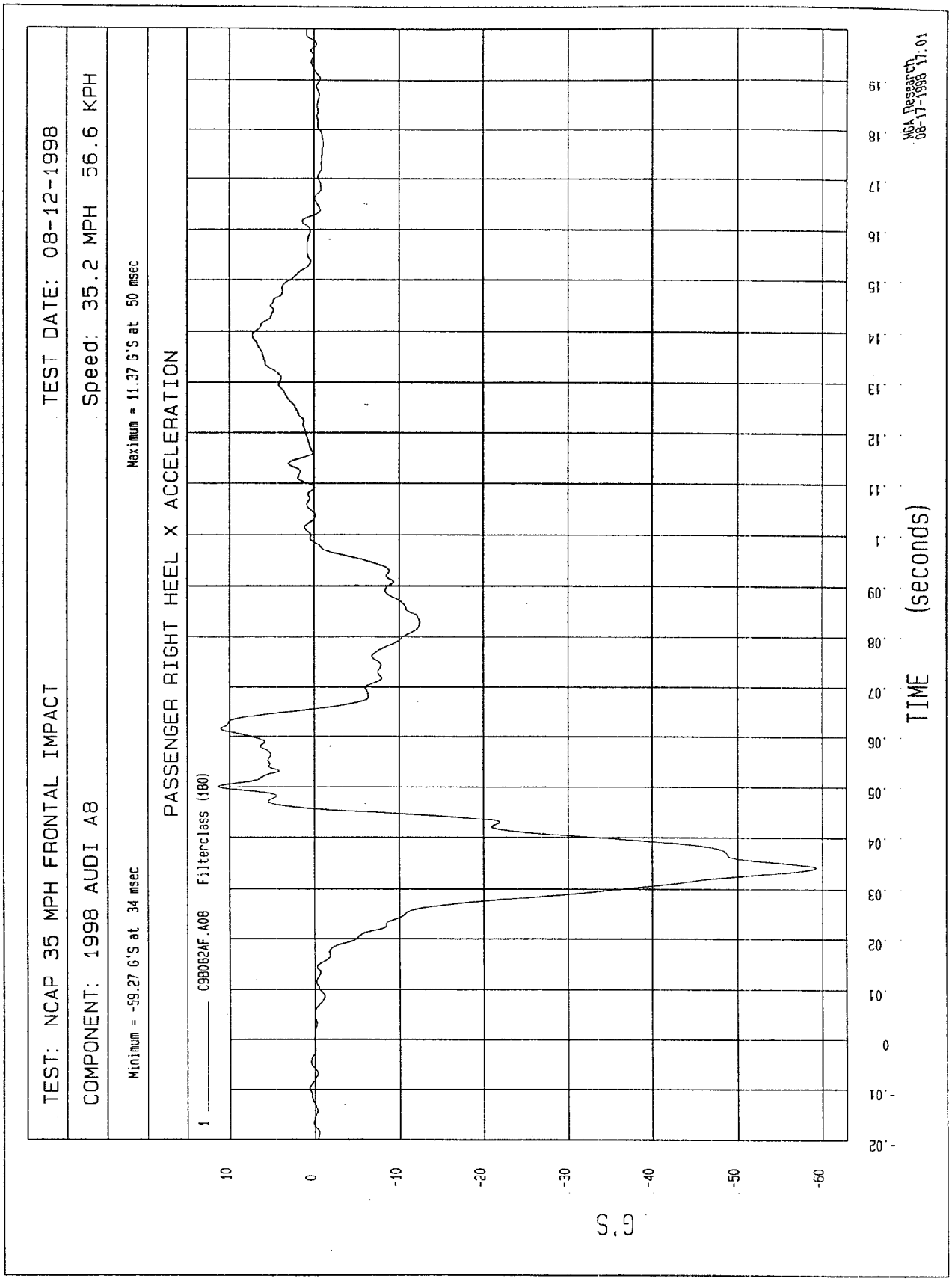

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -13.07 NM at 100 msec
Maximum = 22.37 NM at 70 msec
PASSENGER RIGHT LOWER TIBIA MOMENT Y
1 B98082MF.M90 Filterclass (600)
NM
TIME (SECONDS)
MGA Research
08-17-1998 17:27

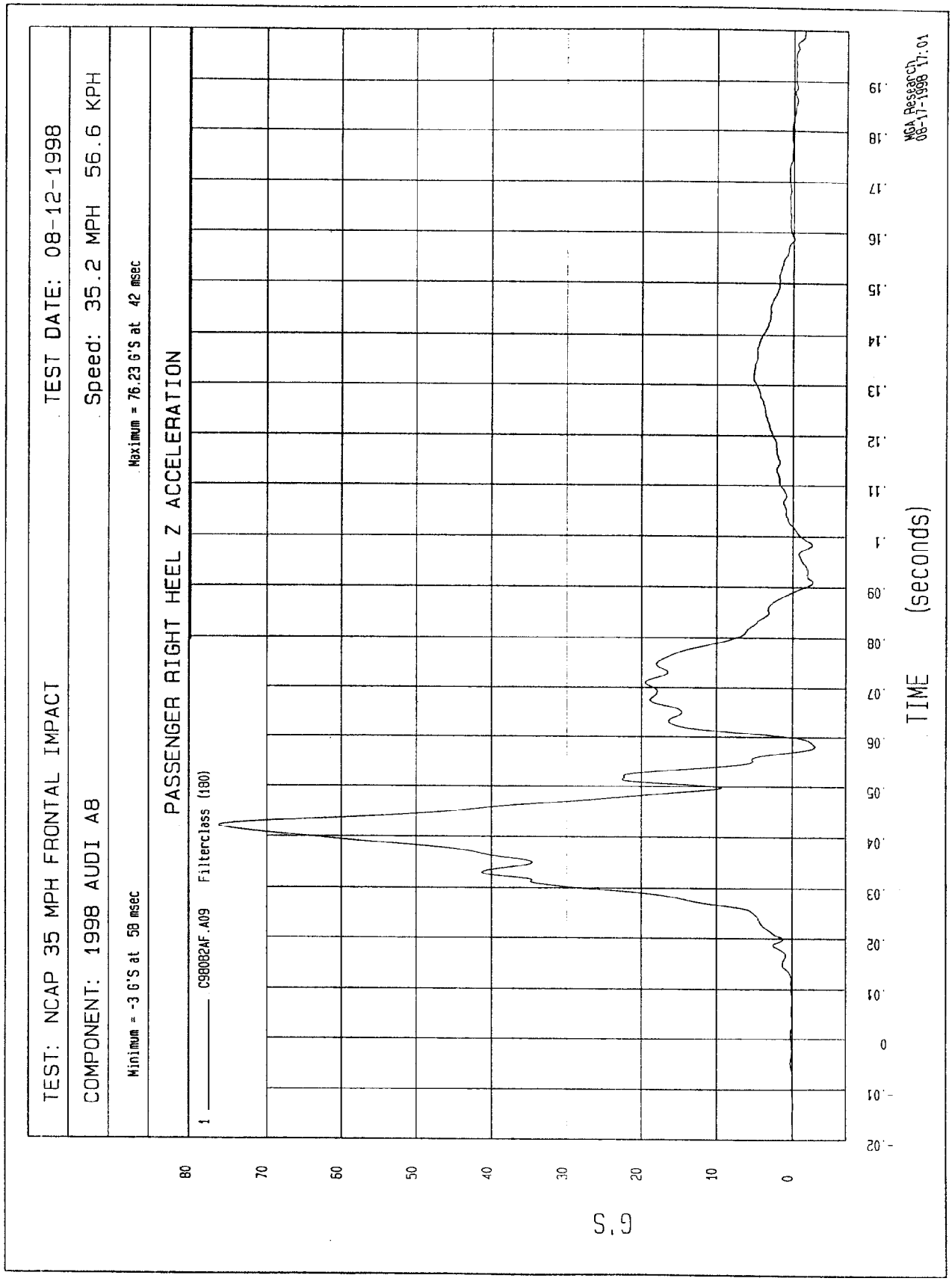

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -163.6 G'S at 30 msec
Maximum = 130.94 G'S at 48 msec
PASSENGER LEFT FOOT BALL Z ACCELERATION
1 C98082AF.A10 Filterclass (180)
140
120
100
80
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
-160
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (seconds)
MGA Research
08-17-1998 17:01

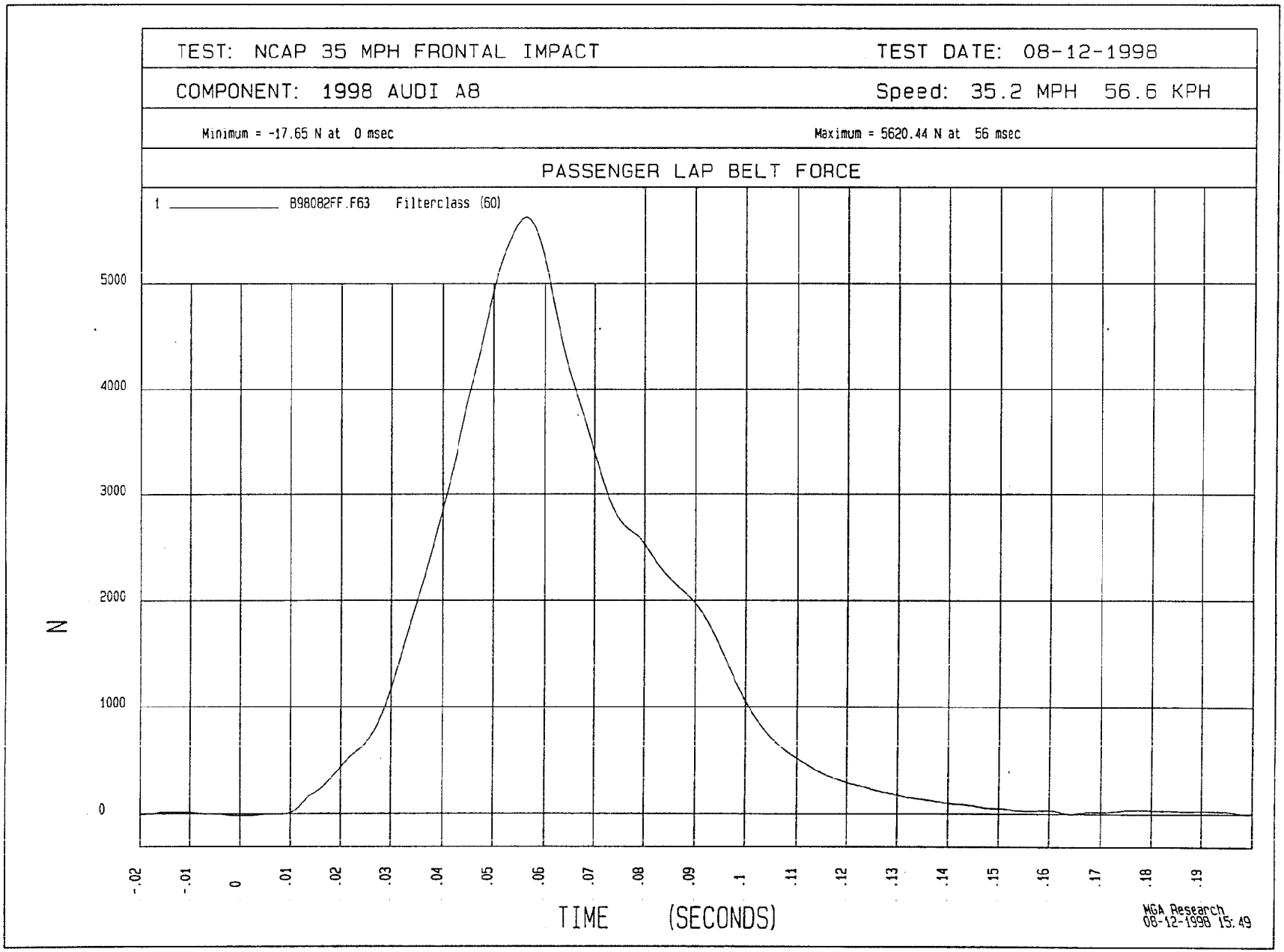

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -100.15 G'S at 32 msec
Maximum = 143.15 G'S at 44 msec
PASSENGER LEFT HEEL X ACCELERATION
1 C98082AF.A11 Filterclass (180)
140
120
100
80
60
40
20
0
-20
-40
-60
-80
-100
.19
.18
.17
.16
.15
.14
.13
.12
.11
.1
.09
.08
.07
.06
.05
.04
.03
.02
.01
0
-.01
-.02
TIME (seconds)
MGA Research
08-17-1998 17:01
S.9

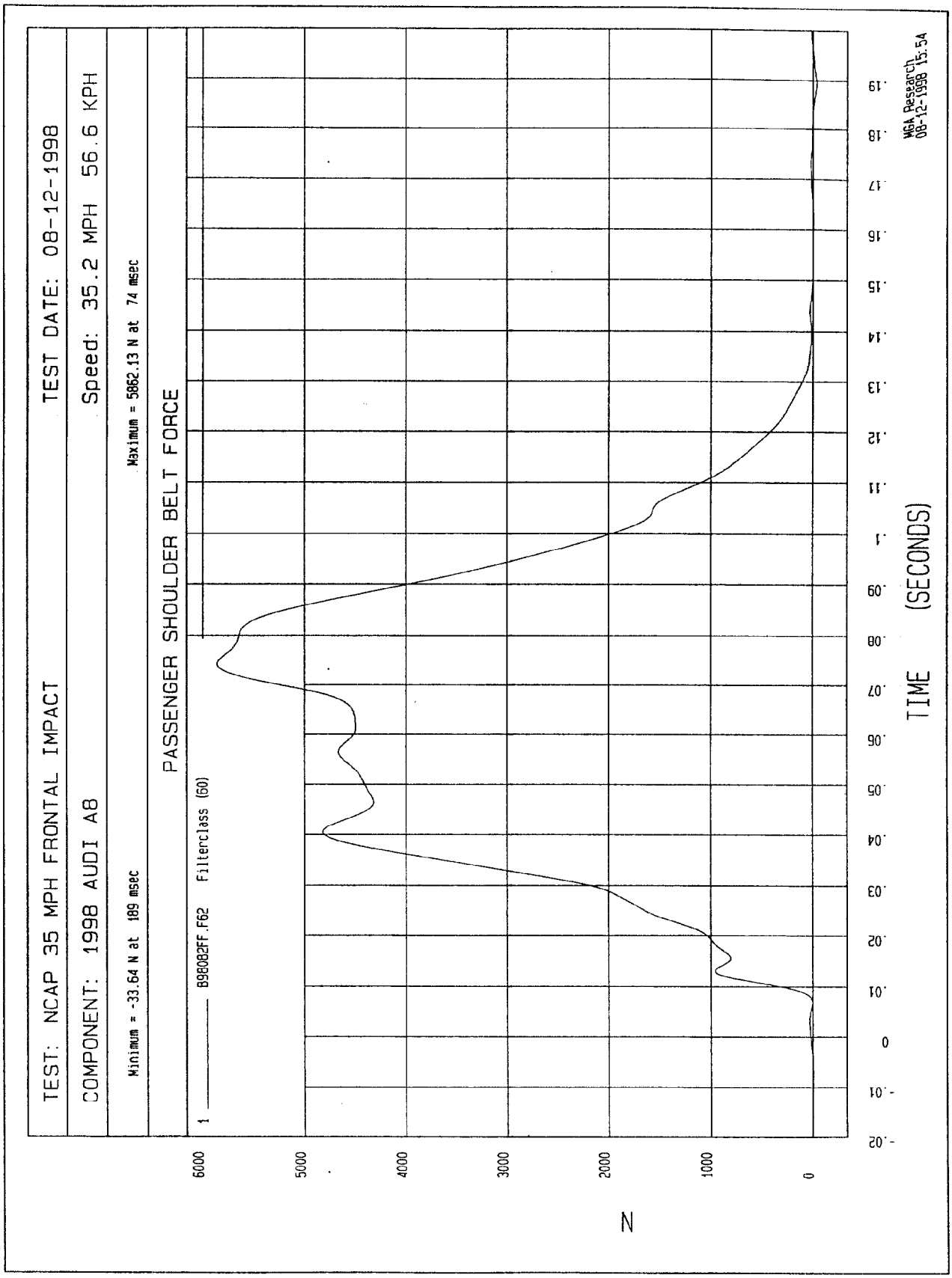

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -36.19 G'S at 47 msec
Maximum = 73.42 G'S at 30 msec
PASSENGER LEFT HEEL Z ACCELERATION
1 C980B2AF.A12 Filterclass (180)
60
40
20
0
-20
-40
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (seconds)
MGA Research
08-17-1998 17:02

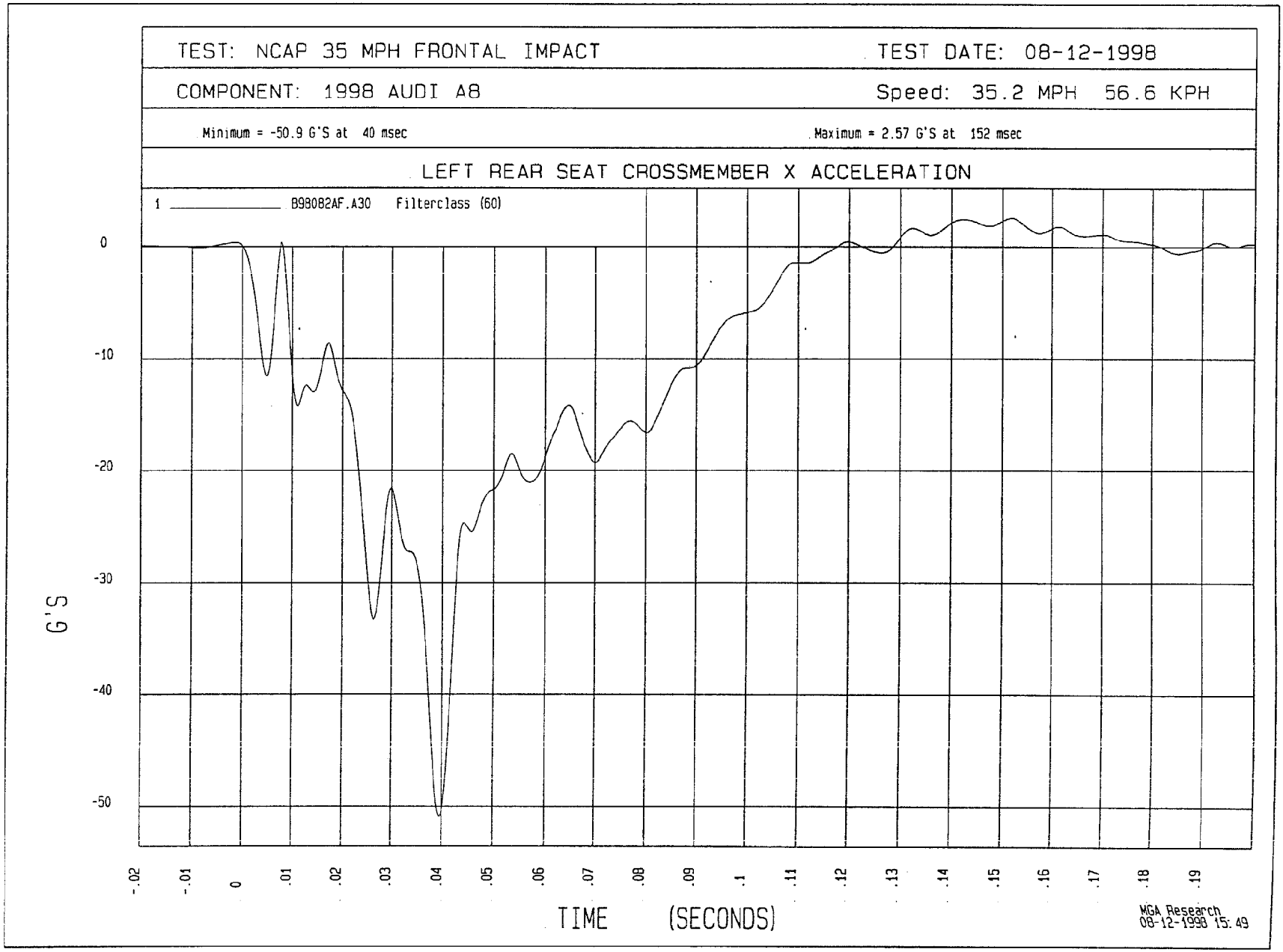

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -88.12 G'S at 42 msec
Maximum = 18.25 G'S at 50 msec
PASSENGER RIGHT FOOT BALL Z ACCELERATION
1 C98082AF.A07 Filterclass (180)
MGA Research 08-17-1998 17:01
TIME (seconds)
G's

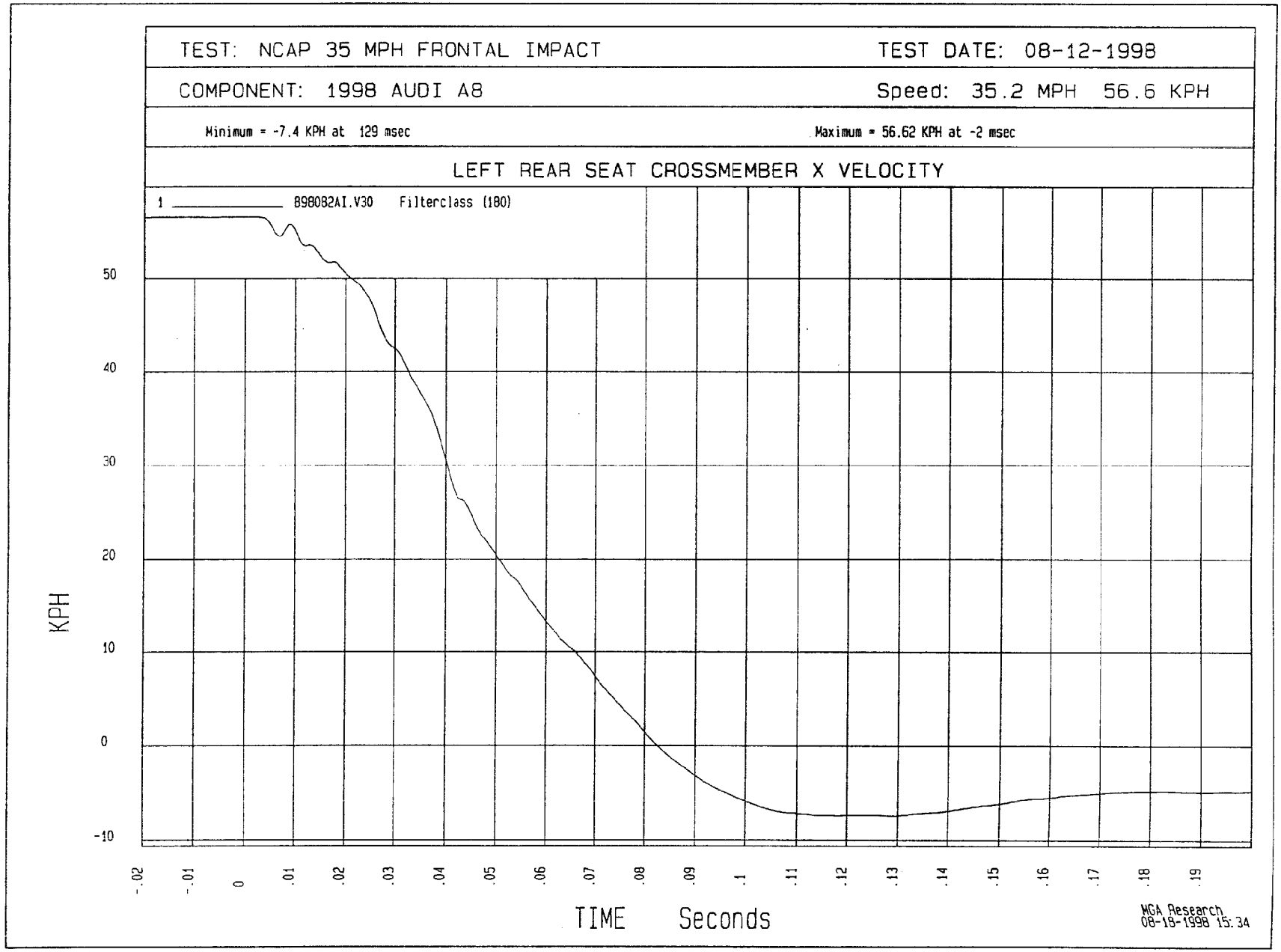

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -59.27 G'S at 34 msec
Maximum = 11.37 G'S at 50 msec
PASSENGER RIGHT HEEL X ACCELERATION
1 C98OB2AF.A08 Filterclass (180)
10
0
-10
-20
-30
-40
-50
-60
G'S
.02
.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (seconds)
MGA Research
08-17-1998 17:01

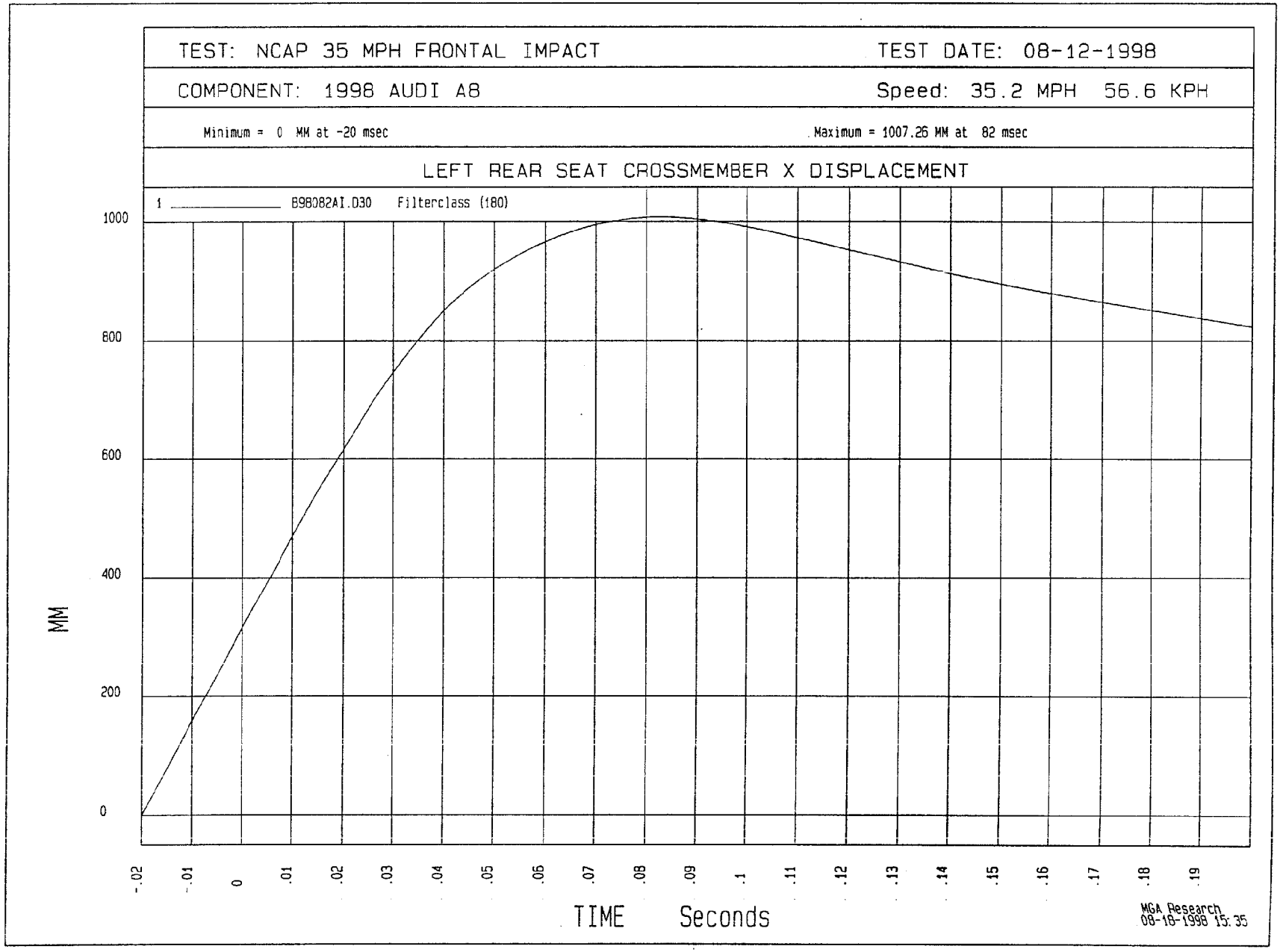

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -3 G'S at 58 msec
Maximum = 76.23 G'S at 42 msec
PASSENGER RIGHT HEEL Z ACCELERATION
1 C980B2AF.A09 Filterclass (180)
80
70
60
50
40
30
20
10
0
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (seconds)
MGA Research
08-17-1998 17:01
G's

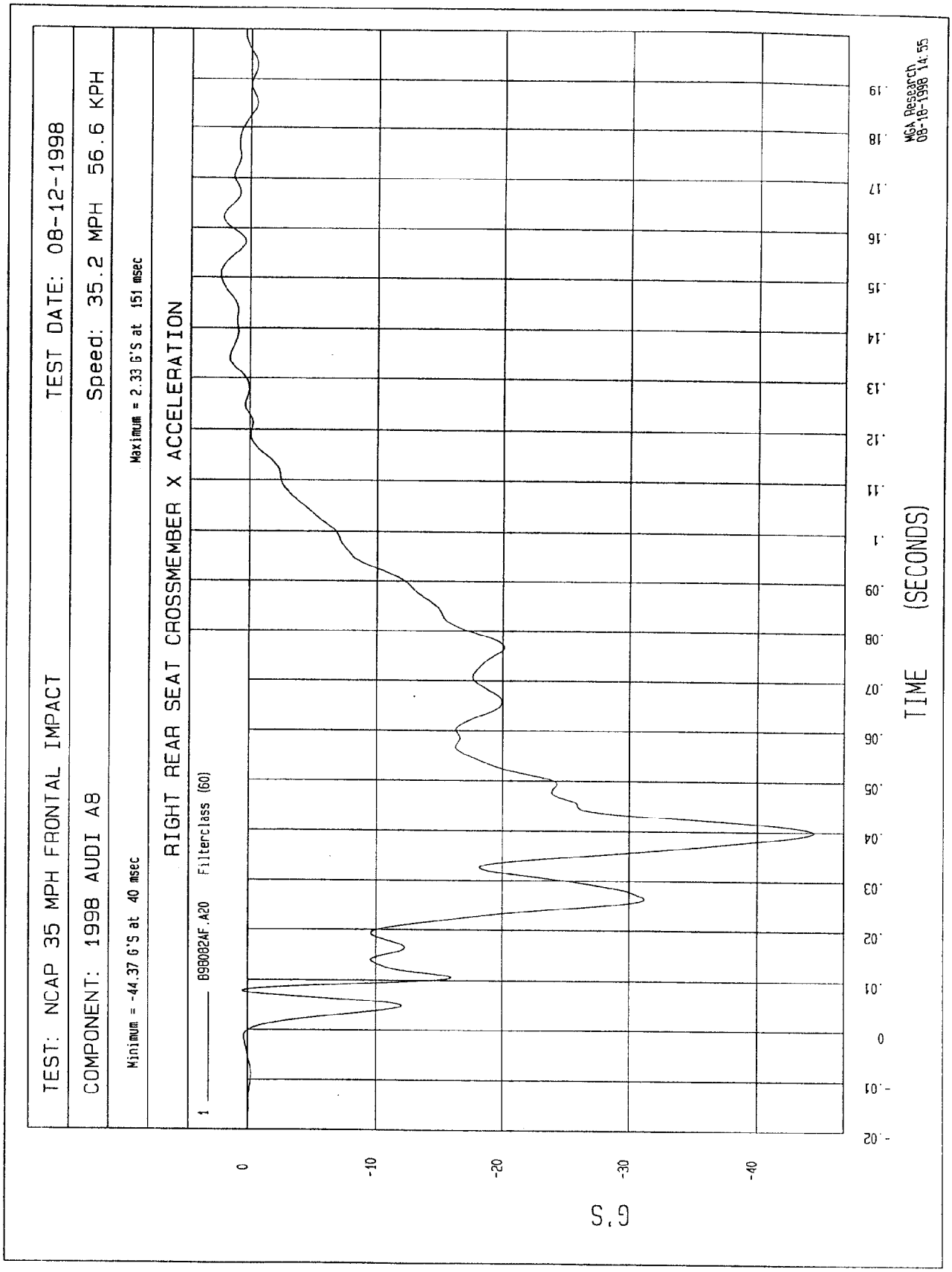

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -17.65 N at 0 msec
Maximum = 5620.44 N at 56 msec
PASSENGER LAP BELT FORCE
1 B98082FF.F63 Filterclass (60)
5000
4000
3000
2000
1000
0
N
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:49

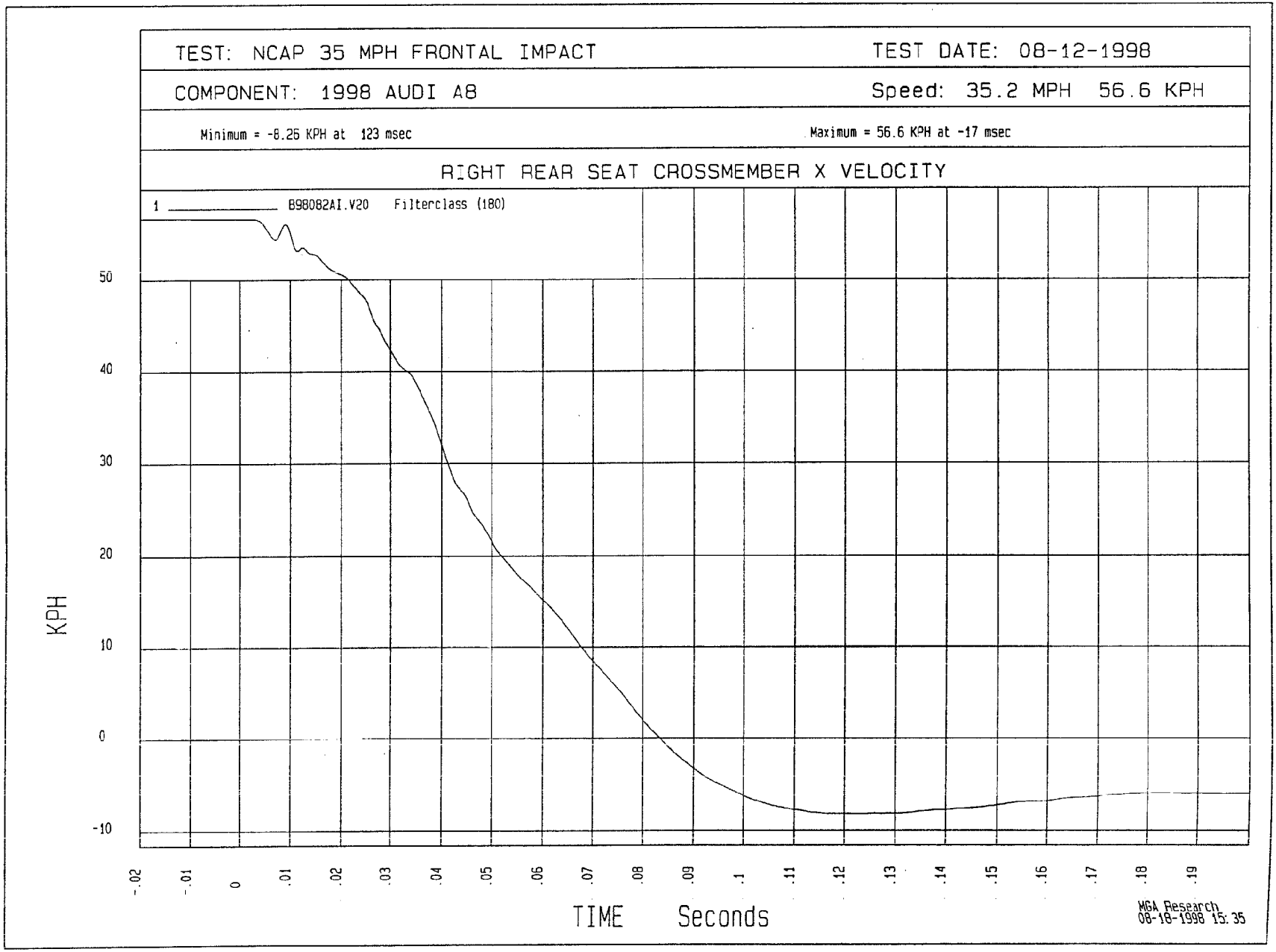

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -33.64 N at 189 msec
Maximum = 5862.13 N at 74 msec
PASSENGER SHOULDER BELT FORCE
1 B98002FF.F62 Filterclass (60)
6000
5000
4000
3000
2000
1000
0
N
.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:54

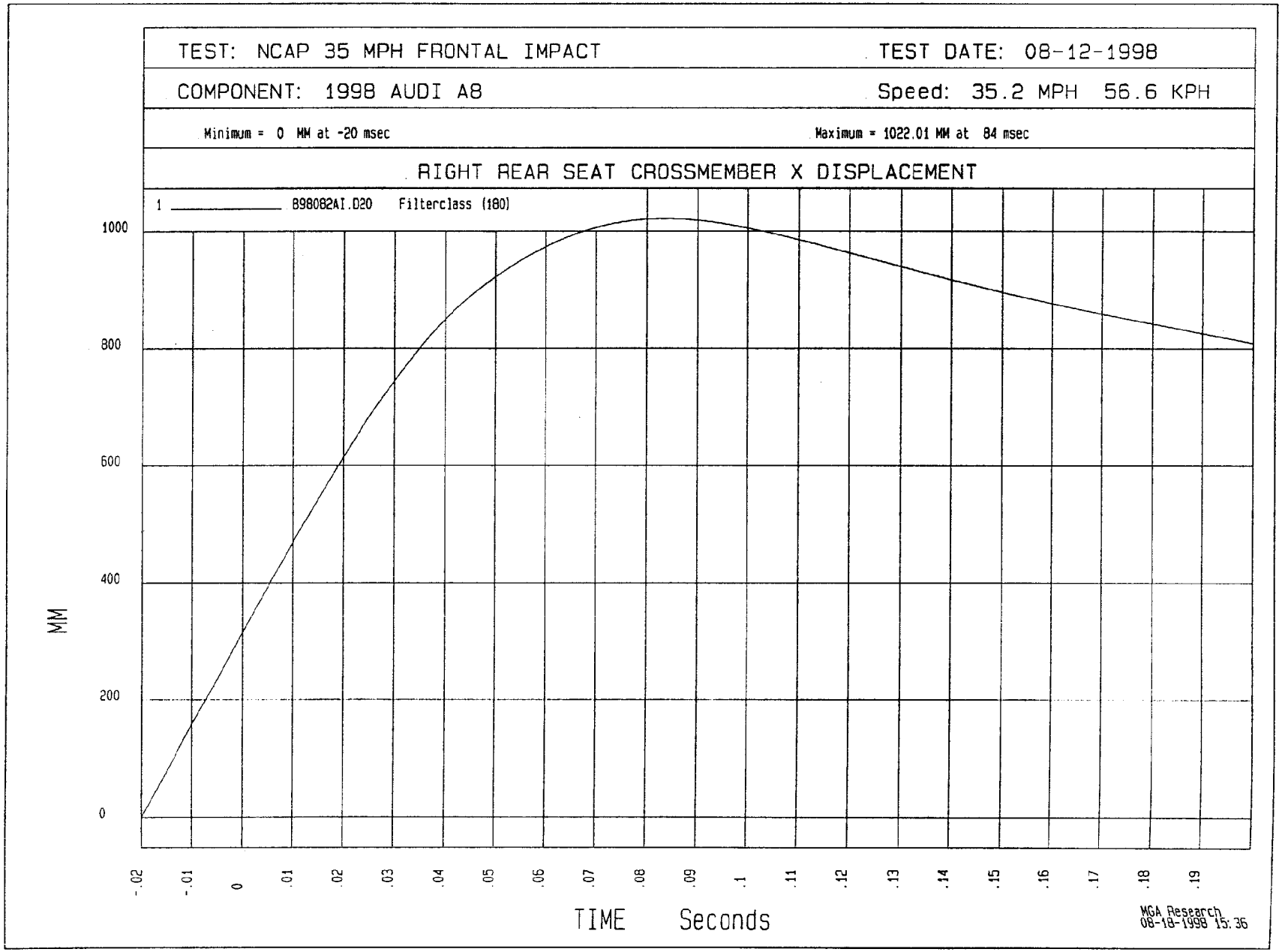

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -50.9 G'S at 40 msec
Maximum = 2.57 G'S at 152 msec
LEFT REAR SEAT CROSSMEMBER X ACCELERATION
1 B98082AF.A30 Filterclass (60)
0
-10
-20
-30
-40
-50
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:49

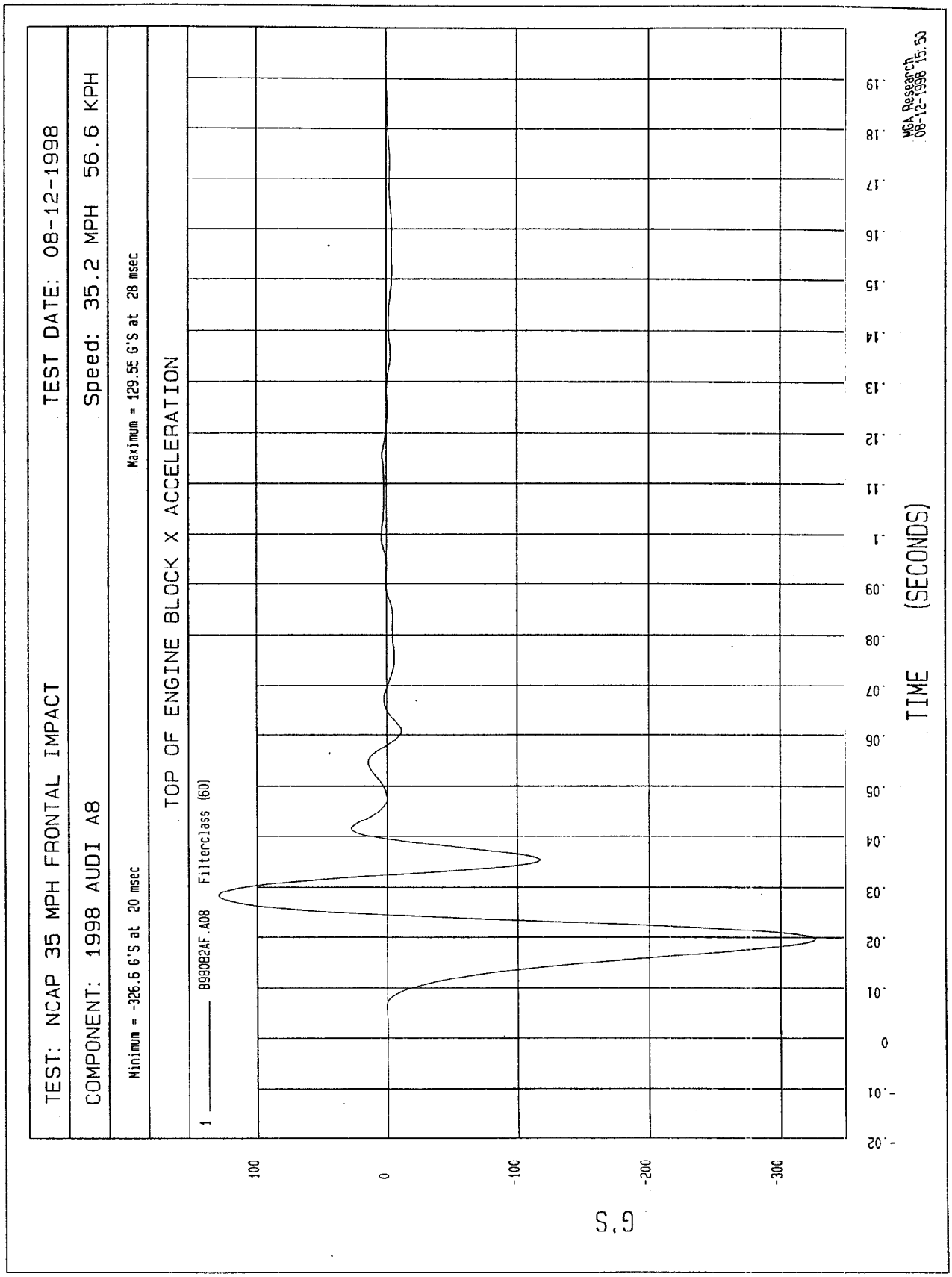

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -7.4 KPH at 129 msec
Maximum = 56.62 KPH at -2 msec
LEFT REAR SEAT CROSSMEMBER X VELOCITY
1 B98082AI.V30 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME Seconds
NGA Research
08-18-1998 15:34

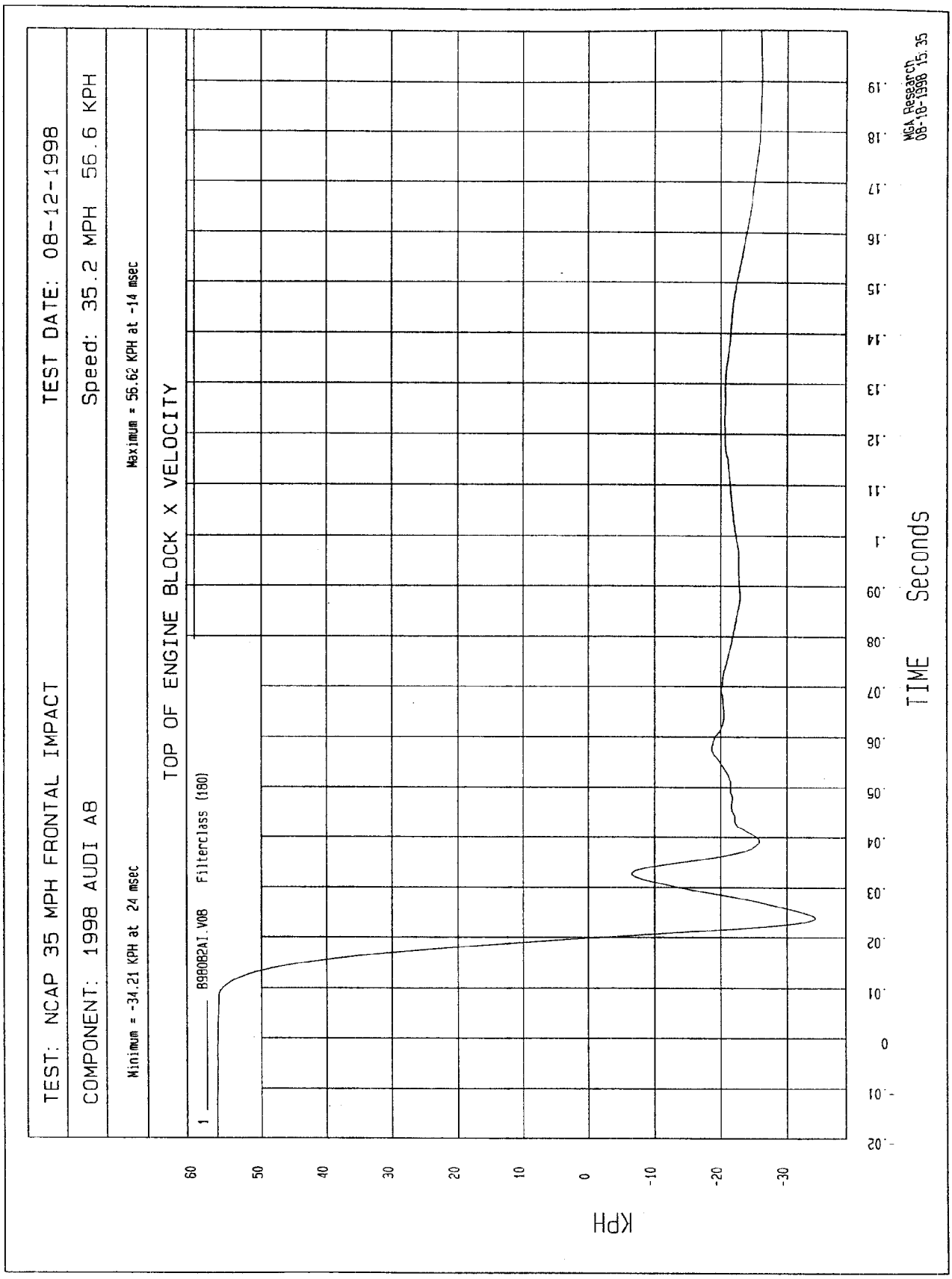

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 0 MM at -20 msec
Maximum = 1007.26 MM at 82 msec
LEFT REAR SEAT CROSSMEMBER X DISPLACEMENT
1 B98082AI.D30 Filterclass (180)
MM
1000
800
600
400
200
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME Seconds
MGA Research
08-18-1998 15:35

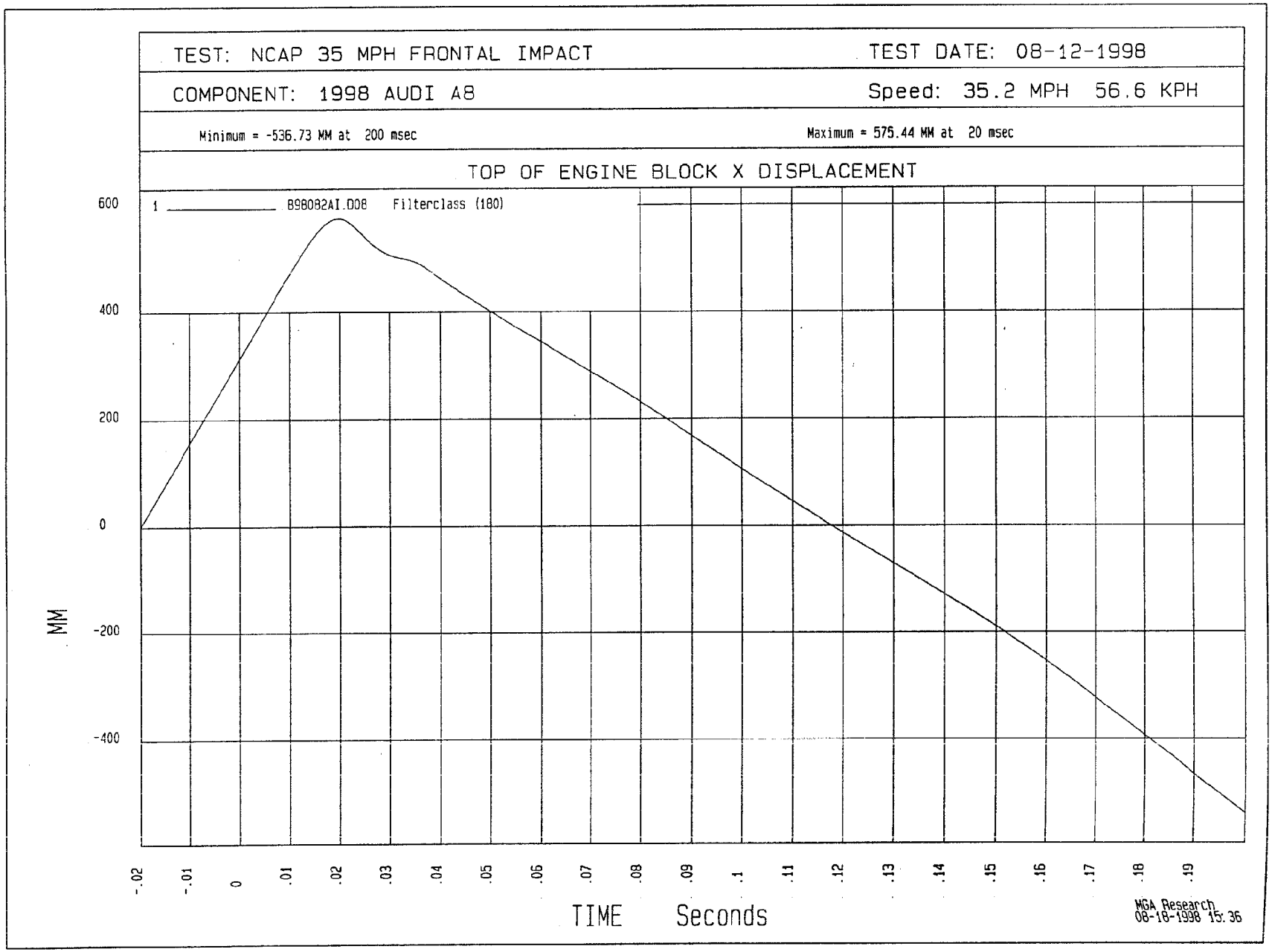

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -44.37 G'S at 40 msec
Maximum = 2.33 G'S at 151 msec
RIGHT REAR SEAT CROSSMEMBER X ACCELERATION
1 B98002AF.A20 Filterclass (60)
MGA Research
08-18-1998 14:55
TIME (SECONDS)
G'S
0
-10
-20
-30
-40
.19
.18
.17
.16
.15
.14
.13
.12
.11
.1
.09
.08
.07
.06
.05
.04
.03
.02
.01
0
-.01
-.02

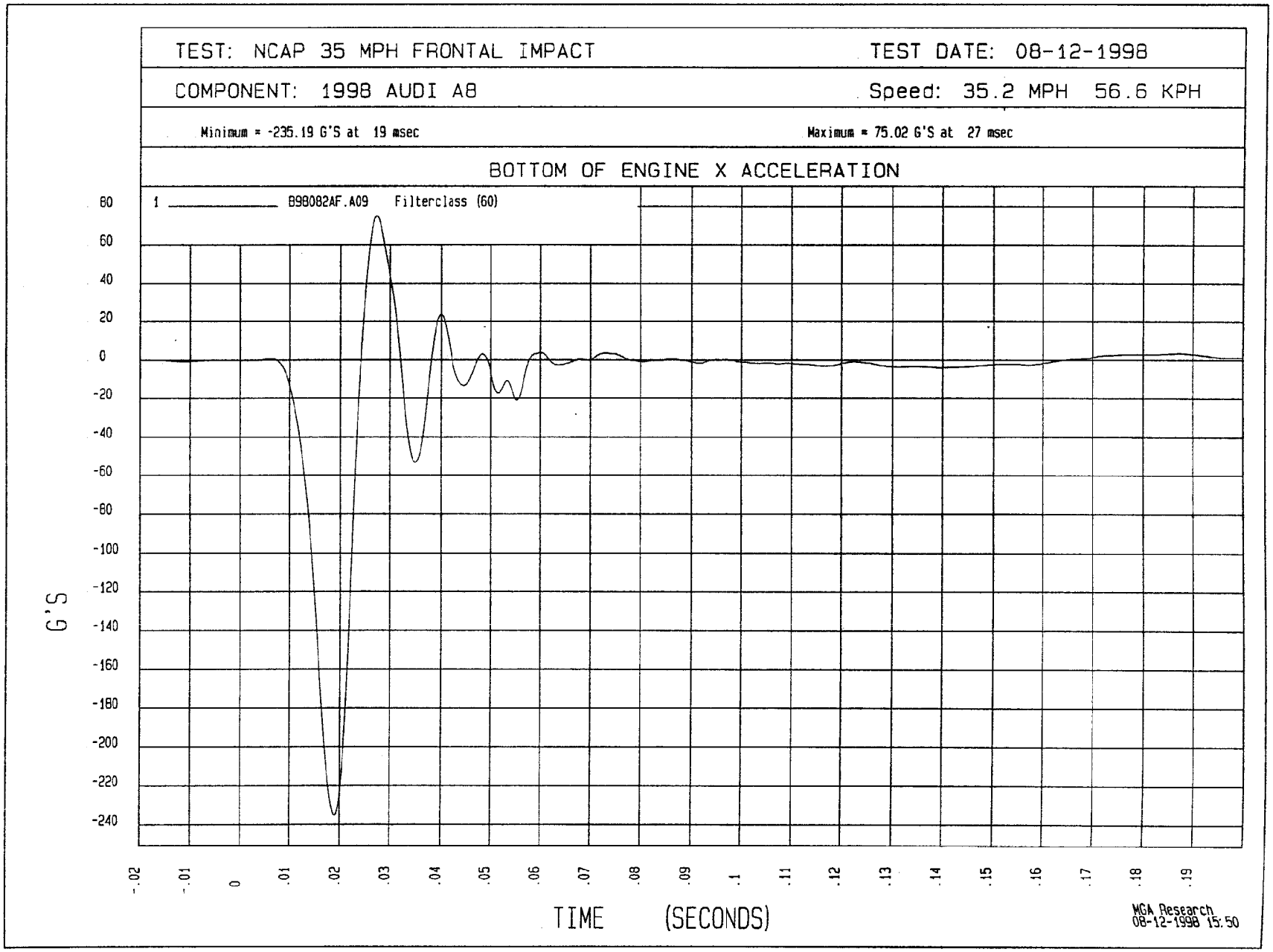

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -8.26 KPH at 123 msec
Maximum = 56.6 KPH at -17 msec
RIGHT REAR SEAT CROSSMEMBER X VELOCITY
1 B98082AI.V20 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME Seconds
MGA Research
08-18-1998 15:35

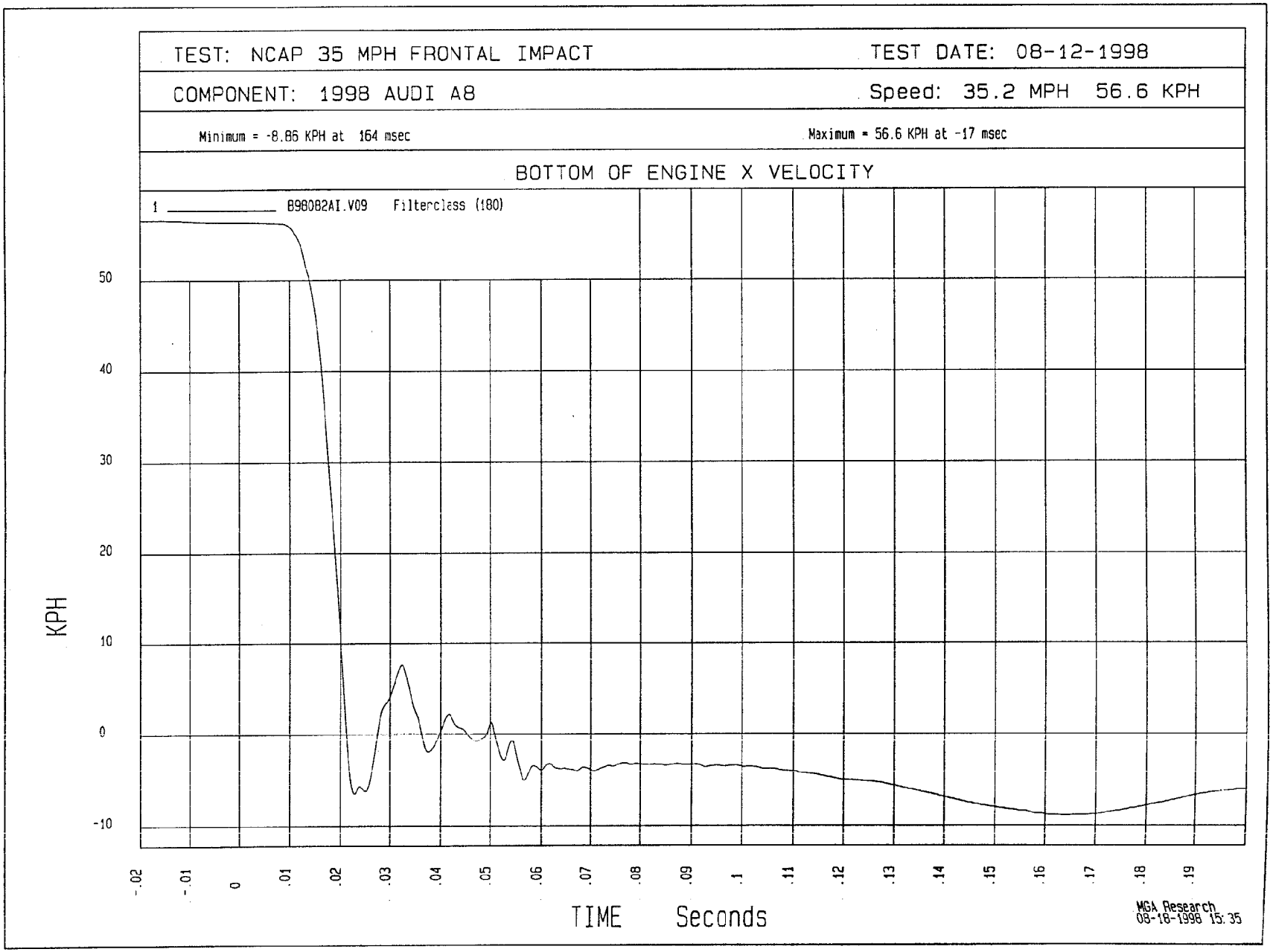

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 0 MM at -20 msec
Maximum = 1022.01 MM at 84 msec
RIGHT REAR SEAT CROSSMEMBER X DISPLACEMENT
1 B98082AI.D20 Filterclass (180)
MM
1000
800
600
400
200
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME Seconds
MGA Research
08-18-1998 15:36


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -326.6 G'S at 20 msec
Maximum = 129.55 G'S at 28 msec
TOP OF ENGINE BLOCK X ACCELERATION
1 B98082AF.A08 Filterclass (60)
MGA Research
08-12-1998 15:50
100
0
-100
-200
-300
G'S
.19
.18
.17
.16
.15
.14
.13
.12
.11
.1
.09
.08
.07
.06
.05
.04
.03
.02
.01
0
-.01
-.02
TIME (SECONDS)


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -34.21 KPH at 24 msec
Maximum = 56.62 KPH at -14 msec
TOP OF ENGINE BLOCK X VELOCITY
1 B9808201.V08 Filterclass (180)
KPH
60
50
40
30
20
10
0
-10
-20
-30
TIME Seconds
20
10
0
10
19
18
17
16
15
14
13
12
11
1
09
08
07
06
05
04
03
02
01
MGA Research
08-10-1998 15:35


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -536.73 MM at 200 msec
Maximum = 575.44 MM at 20 msec
TOP OF ENGINE BLOCK X DISPLACEMENT
1 B98082AI.D08 Filterclass (180)
600
400
200
0
-200
-400
MM
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME Seconds
MGA Research
08-18-1998 15:36


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -235.19 G'S at 19 msec
Maximum = 75.02 G'S at 27 msec
BOTTOM OF ENGINE X ACCELERATION
1 B98082AF.A09 Filterclass (60)
80
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
-160
-180
-200
-220
-240
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-12-1998 15:50


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -8.86 KPH at 164 msec
Maximum = 56.6 KPH at -17 msec
BOTTOM OF ENGINE X VELOCITY
1 B98082AI.V09 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.02
-.01
0
.01
.02
.03
.04
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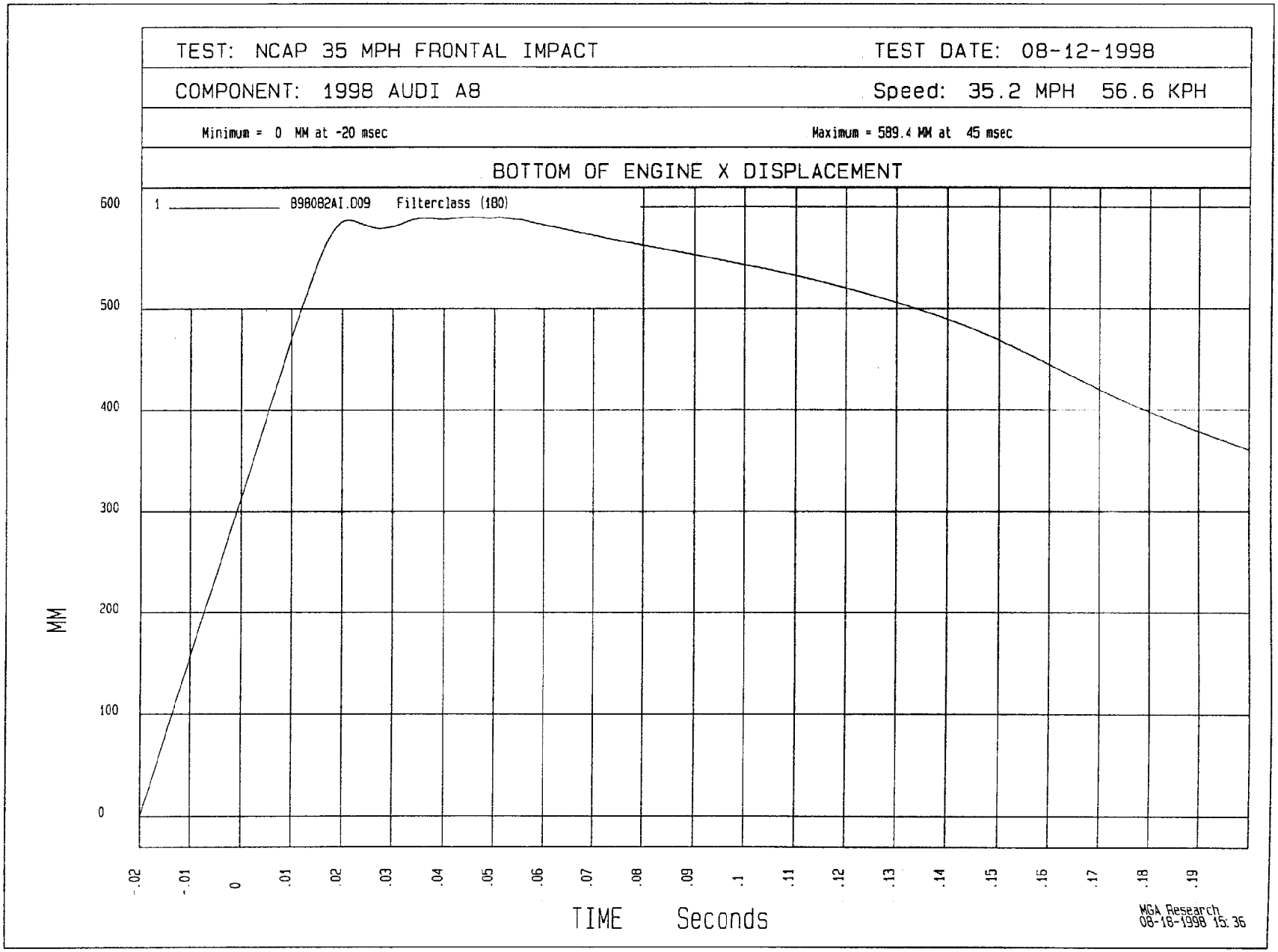
TIME Seconds
MGA Research
08-18-1998 15:35


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 0 MM at -20 msec
Maximum = 589.4 MM at 45 msec
BOTTOM OF ENGINE X DISPLACEMENT
1 B98082AI.009 Filterclass (180)
MM
600
500
400
300
200
100
0
-.02
-.01
0
.01
.02
.03
.04
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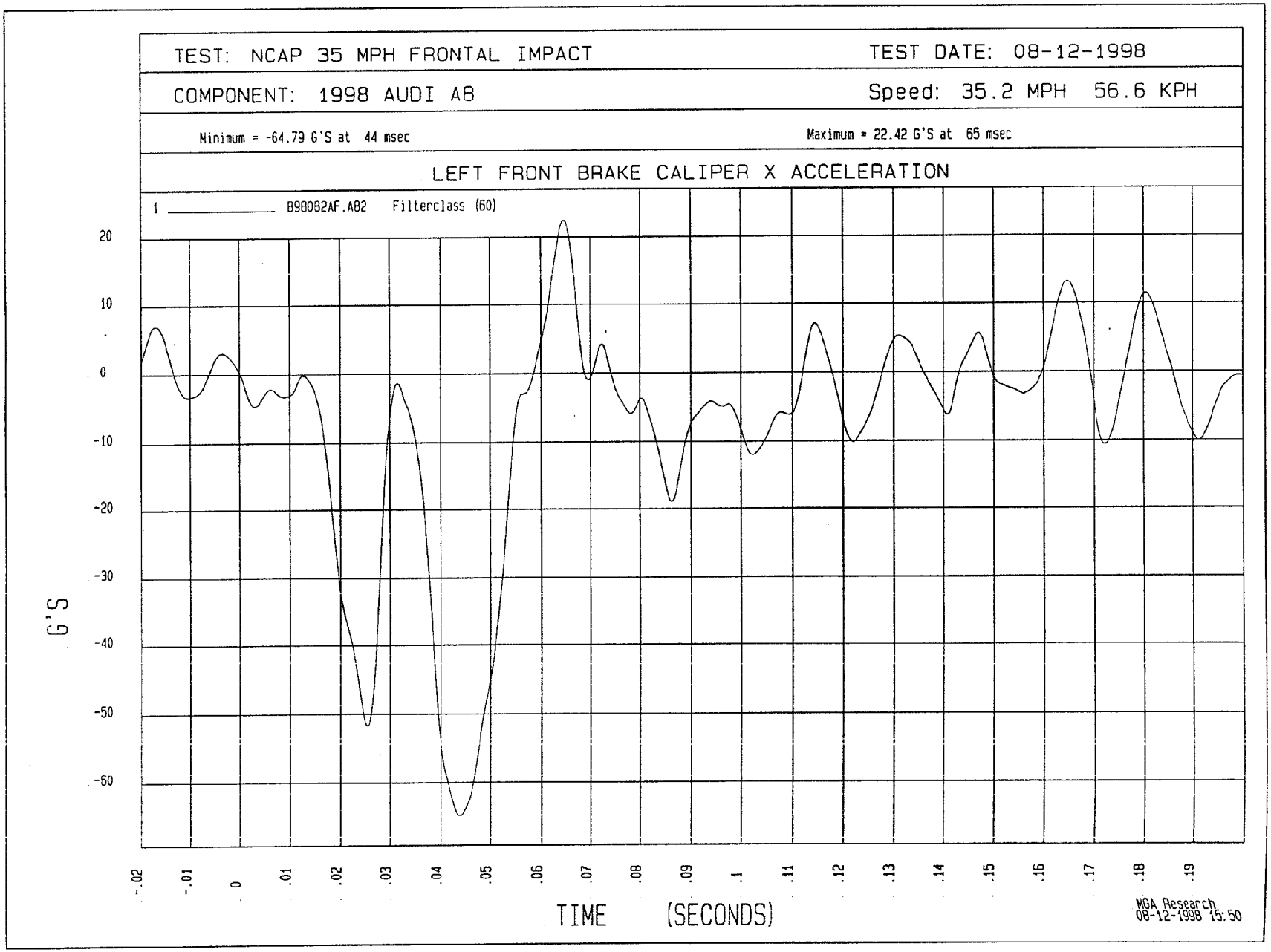
TIME Seconds
MGA Research
08-18-1998 15:36


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -64.79 G'S at 44 msec
Maximum = 22.42 G'S at 65 msec
LEFT FRONT BRAKE CALIPER X ACCELERATION
1 B98082AF.A82 Filterclass (60)
20
10
0
-10
-20
-30
-40
-50
-60
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
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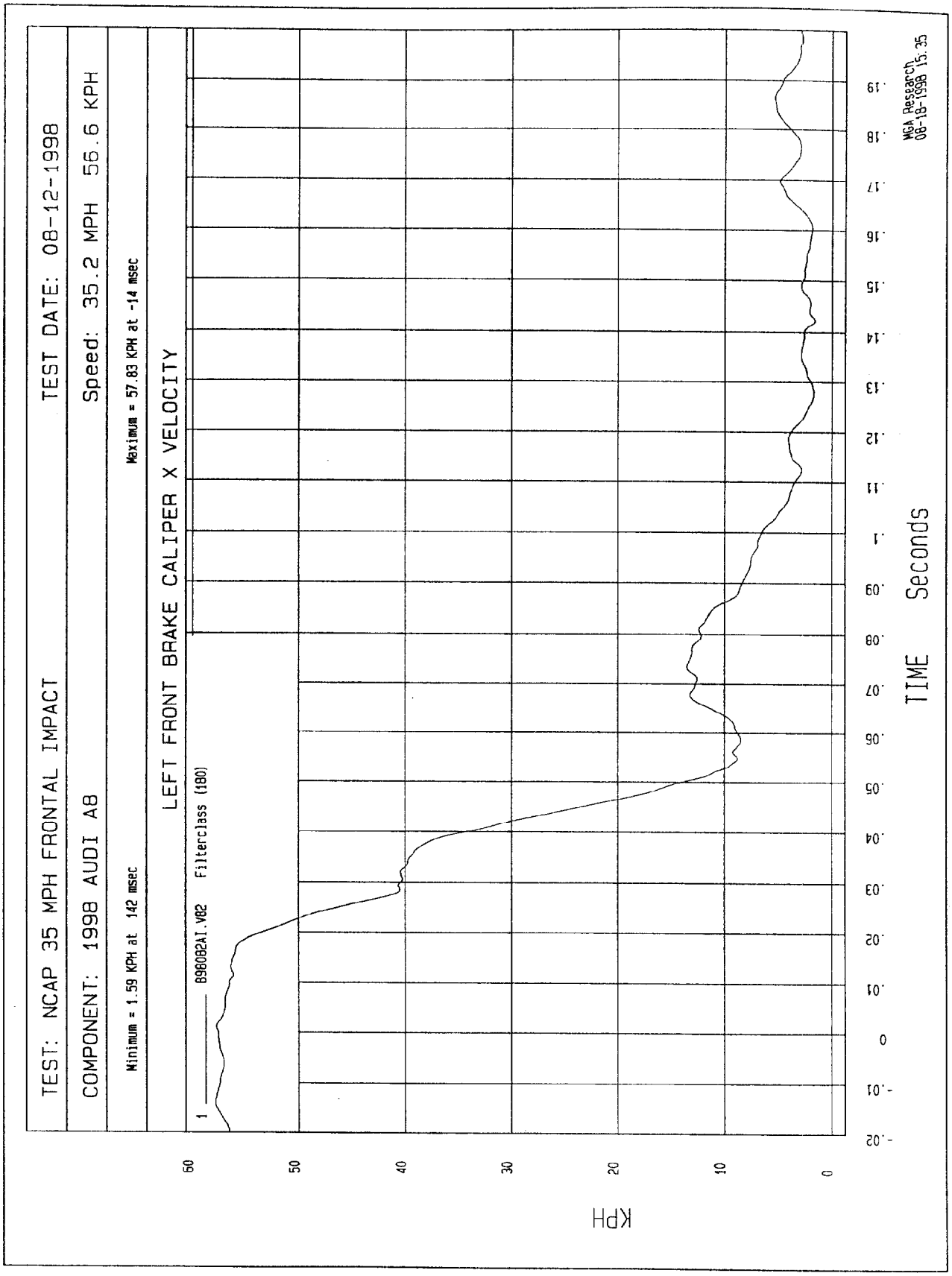
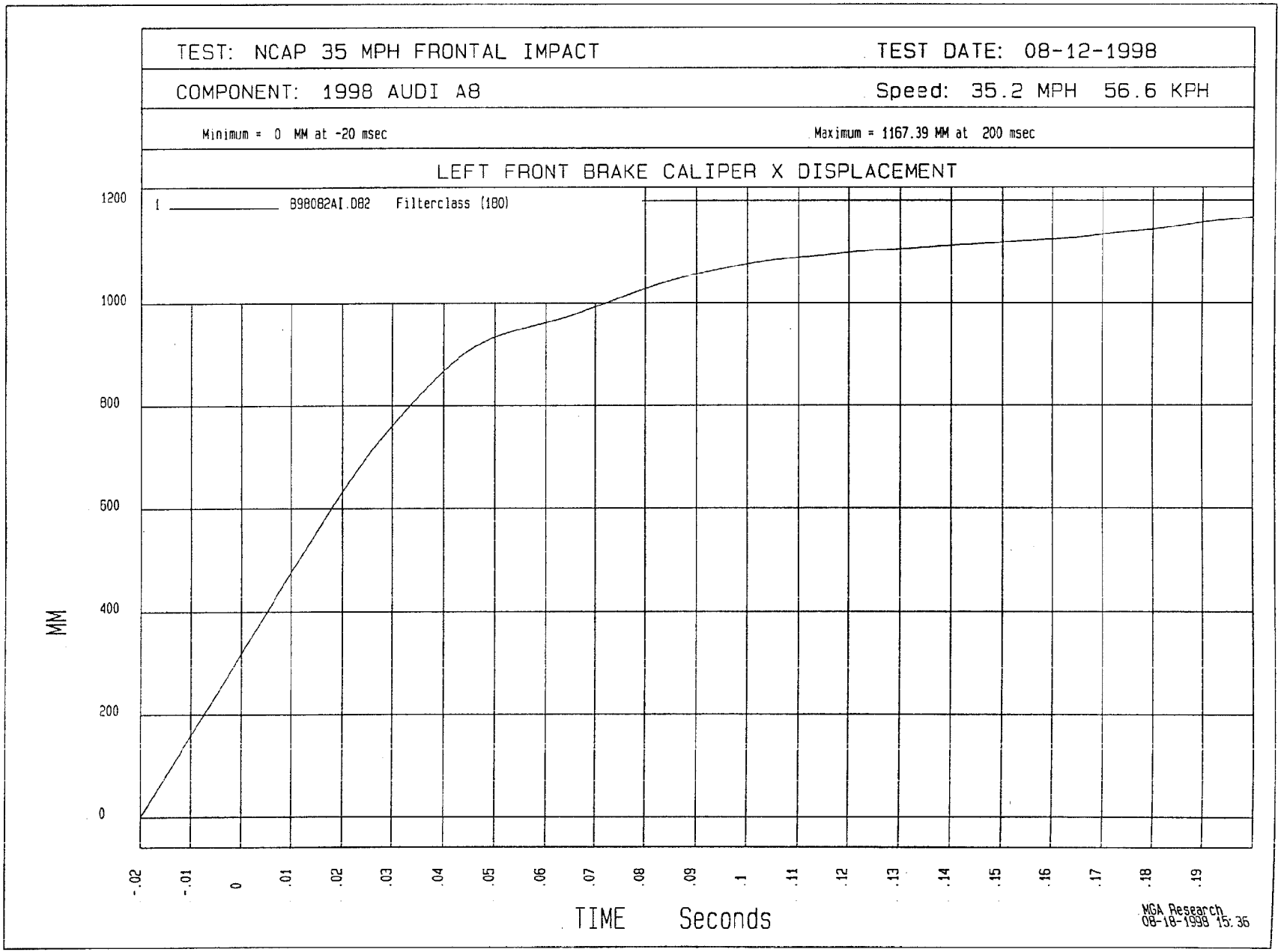
TIME (SECONDS)
MGA Research
08-12-1998 15:50


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 1.59 KPH at 142 msec
Maximum = 57.83 KPH at -14 msec
LEFT FRONT BRAKE CALIPER X VELOCITY
1 B9808ZAI.V82 Filterclass (180)
KPH
TIME Seconds
MGA Research
08-18-1998 15:35


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 0 MM at -20 msec
Maximum = 1167.39 MM at 200 msec
LEFT FRONT BRAKE CALIPER X DISPLACEMENT
1 _____ 898082AI.D82 Filterclass (180)
MM
1200
1000
800
600
400
200
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
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.17
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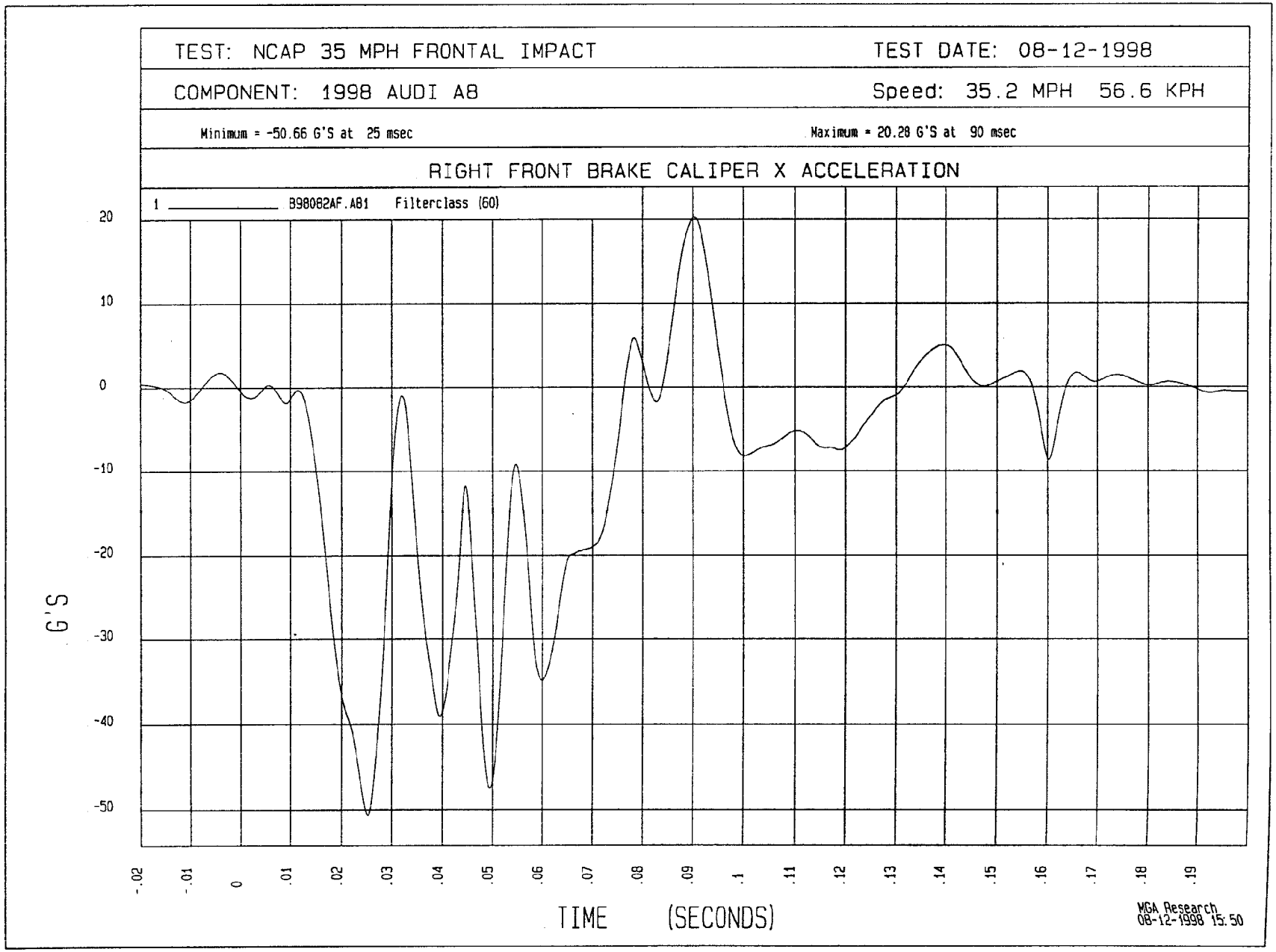
TIME Seconds
MGA Research
08-18-1999 15:36


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -50.66 G'S at 25 msec
Maximum = 20.28 G'S at 90 msec
RIGHT FRONT BRAKE CALIPER X ACCELERATION
1 B98082AF.A81 Filterclass (60)
20
10
0
-10
-20
-30
-40
-50
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
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.14
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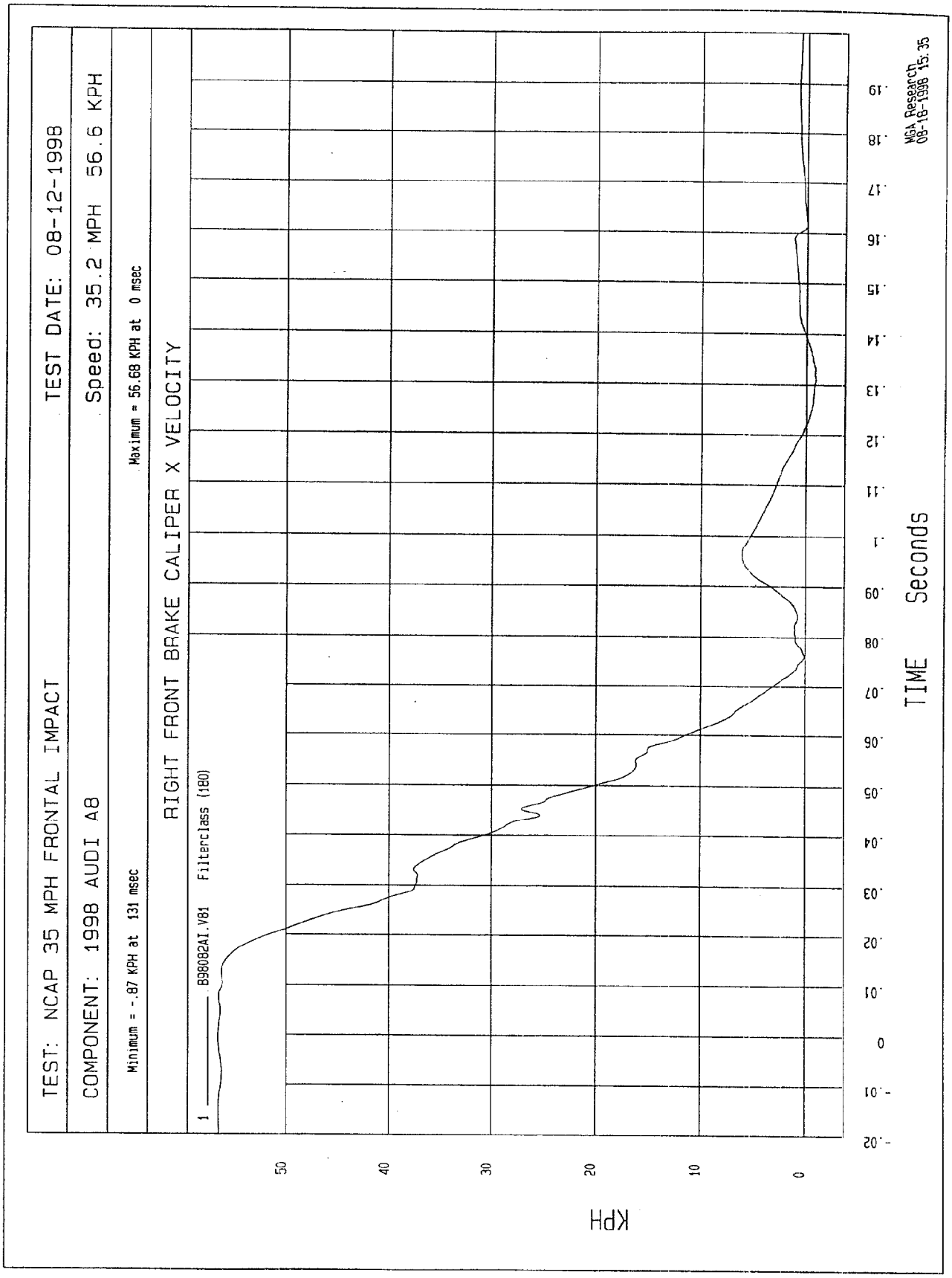
TIME (SECONDS)
MGA Research
08-12-1998 15:50


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -.87 KPH at 131 msec
Maximum = 56.68 KPH at 0 msec
RIGHT FRONT BRAKE CALIPER X VELOCITY
1 B98002AI.V81 Filterclass (180)
KPH
50
40
30
20
10
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
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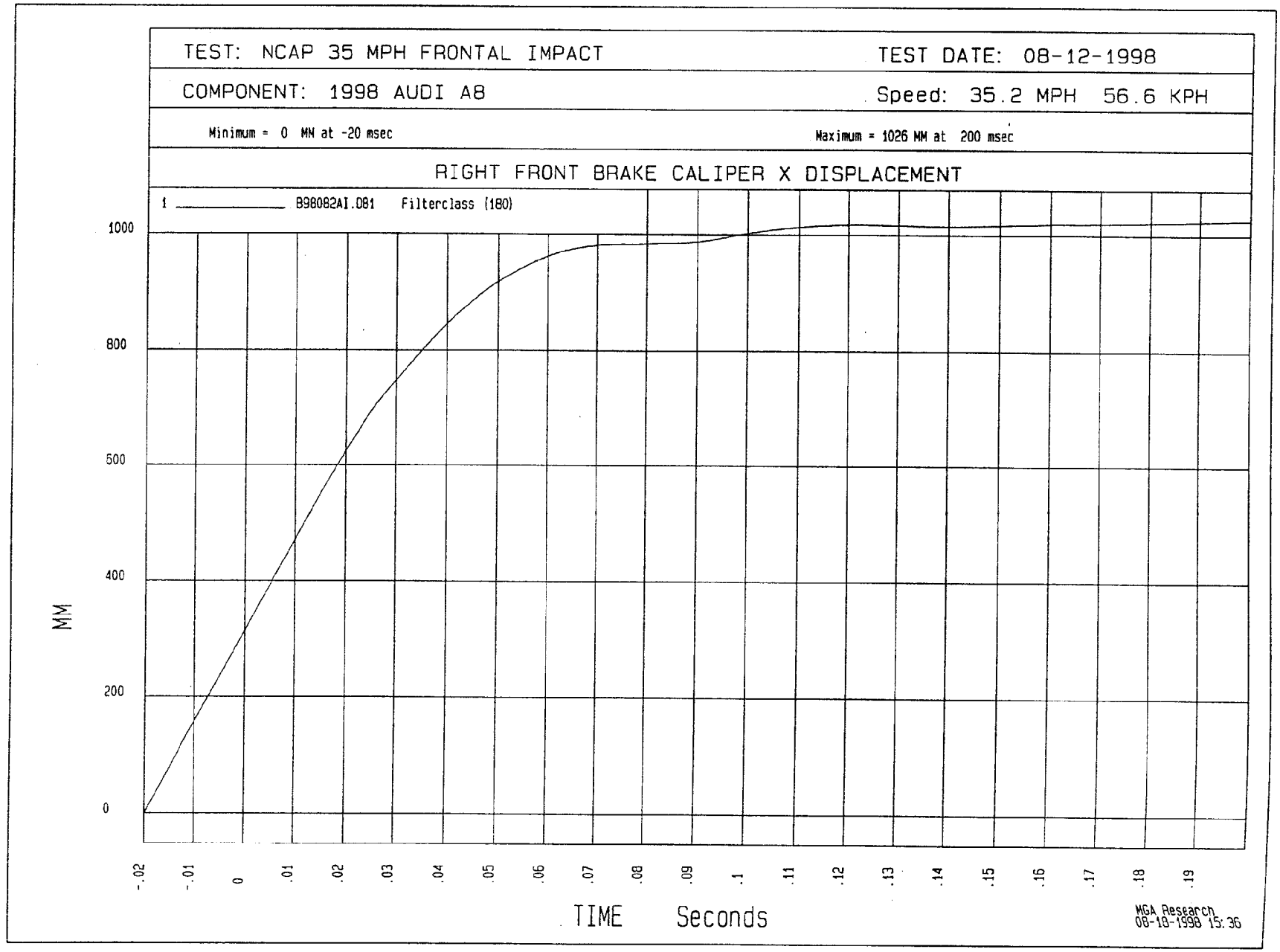
TIME Seconds
MGA Research
08-18-1998 15:35


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 0 MM at -20 msec
Maximum = 1026 MM at 200 msec
RIGHT FRONT BRAKE CALIPER X DISPLACEMENT
1 B98082AI.081 Filterclass (180)
MM
1000
800
600
400
200
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
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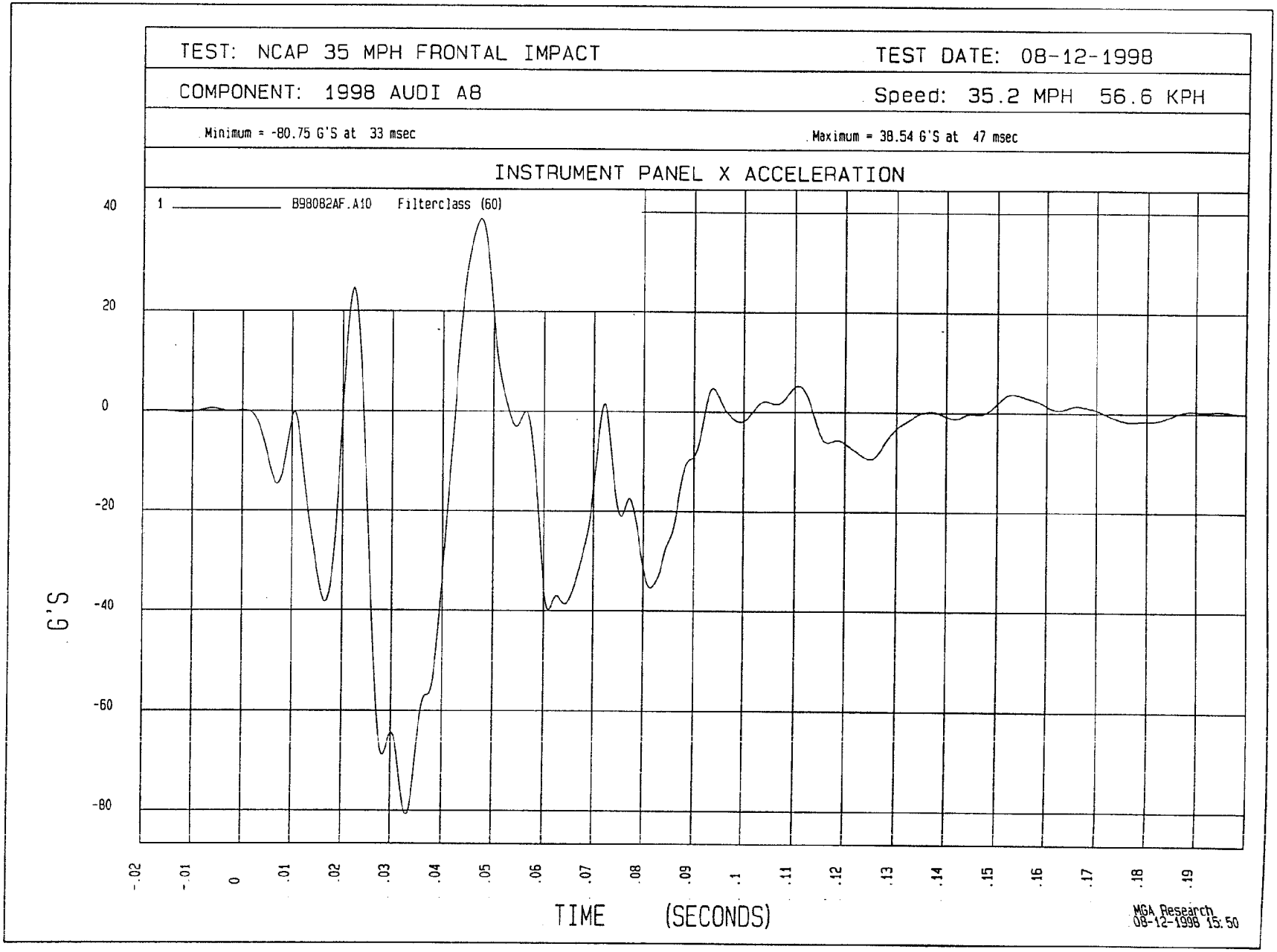
TIME Seconds
MGA Research
08-19-1998 15:36


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -80.75 G'S at 33 msec
Maximum = 38.54 G'S at 47 msec
INSTRUMENT PANEL X ACCELERATION
1 B98082AF.A10 Filterclass (60)
40
20
0
-20
-40
-60
-80
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
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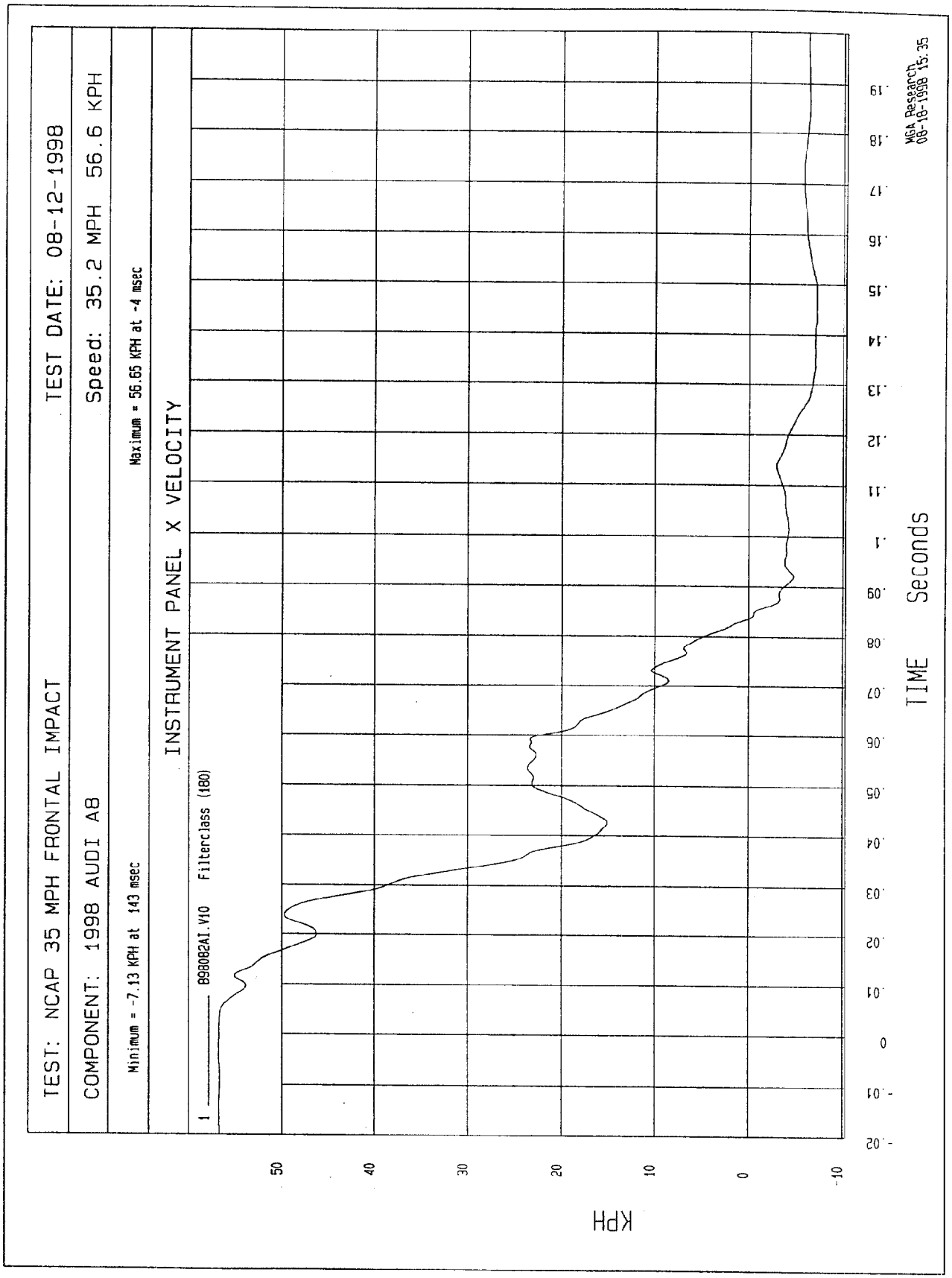
TIME (SECONDS)
MGA Research
08-12-1998 15:50


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -7.13 KPH at 143 msec
Maximum = 56.65 KPH at -4 msec
INSTRUMENT PANEL X VELOCITY
1 B98082AI.V10 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
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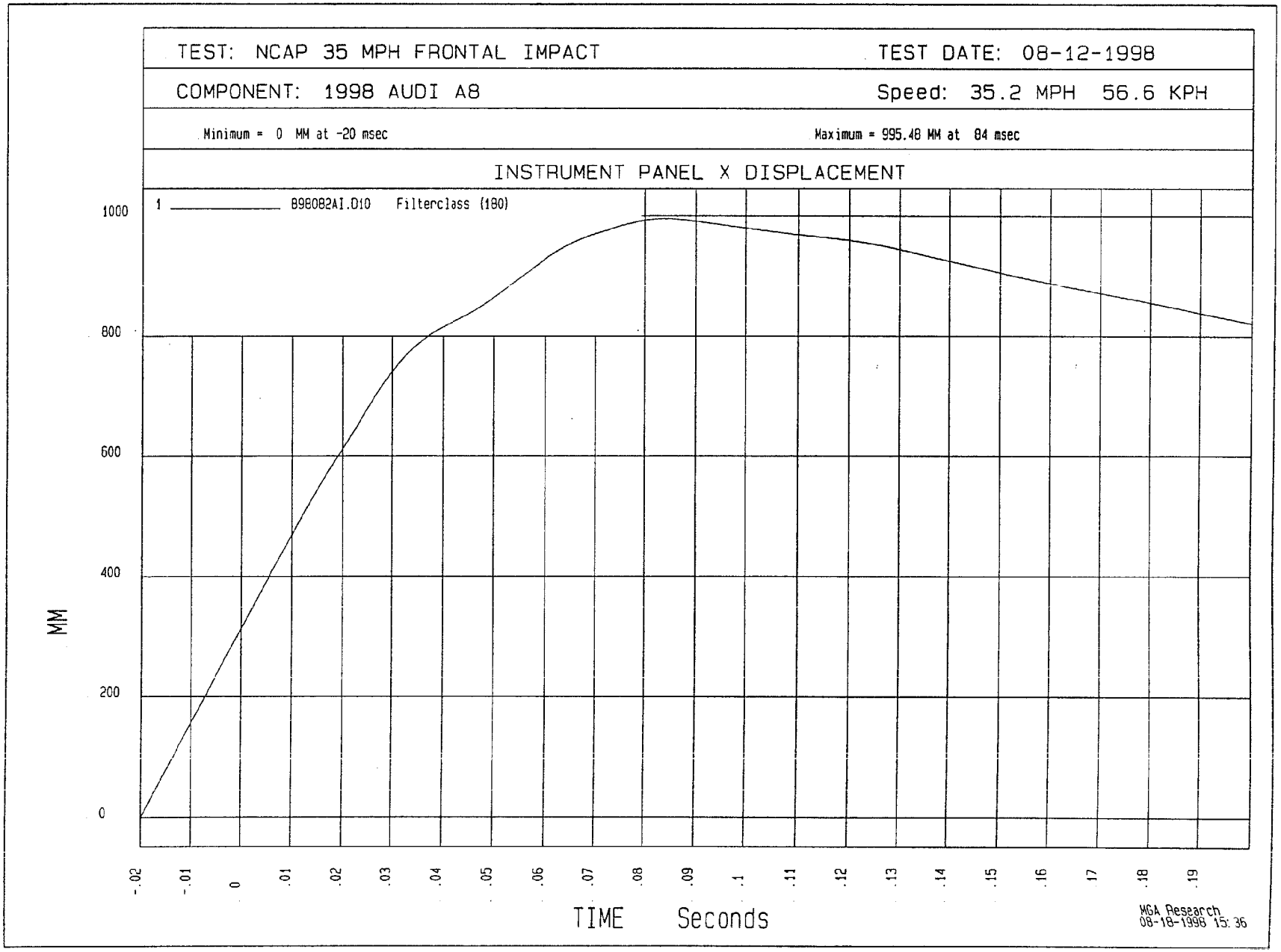
TIME Seconds
MGA Research
08-10-1998 15:35


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 0 MM at -20 msec
Maximum = 995.48 MM at 84 msec
INSTRUMENT PANEL X DISPLACEMENT
1 B98082AI.D10 Filterclass (180)
MM
1000
800
600
400
200
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
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.09
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.14
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.17
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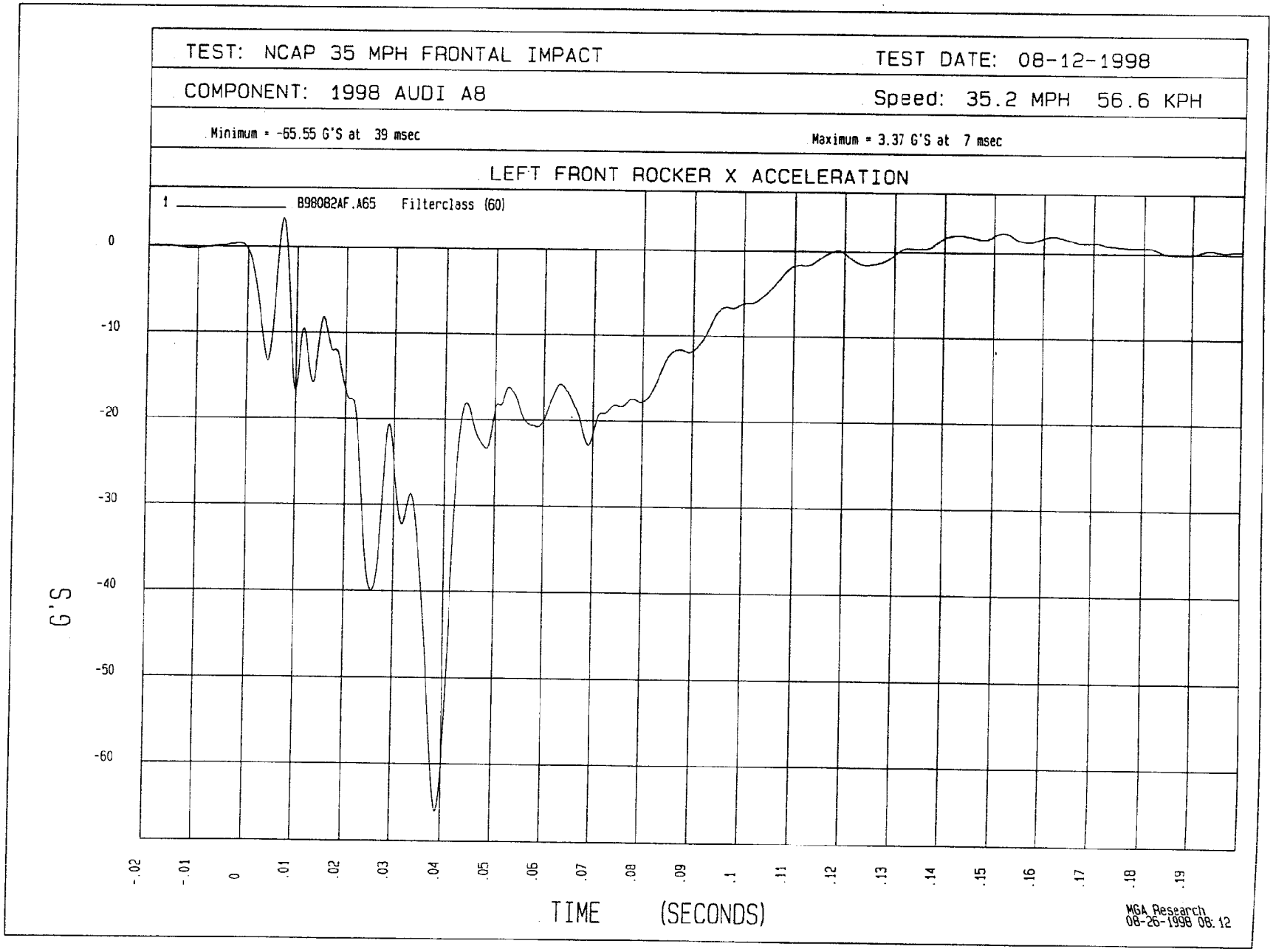
TIME Seconds
MGA Research
08-18-1998 15:36


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -65.55 G'S at 39 msec
Maximum = 3.37 G'S at 7 msec
LEFT FRONT ROCKER X ACCELERATION
1 B98082AF.A65 Filterclass (60)
0
-10
-20
-30
-40
-50
-60
G'S
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
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.15
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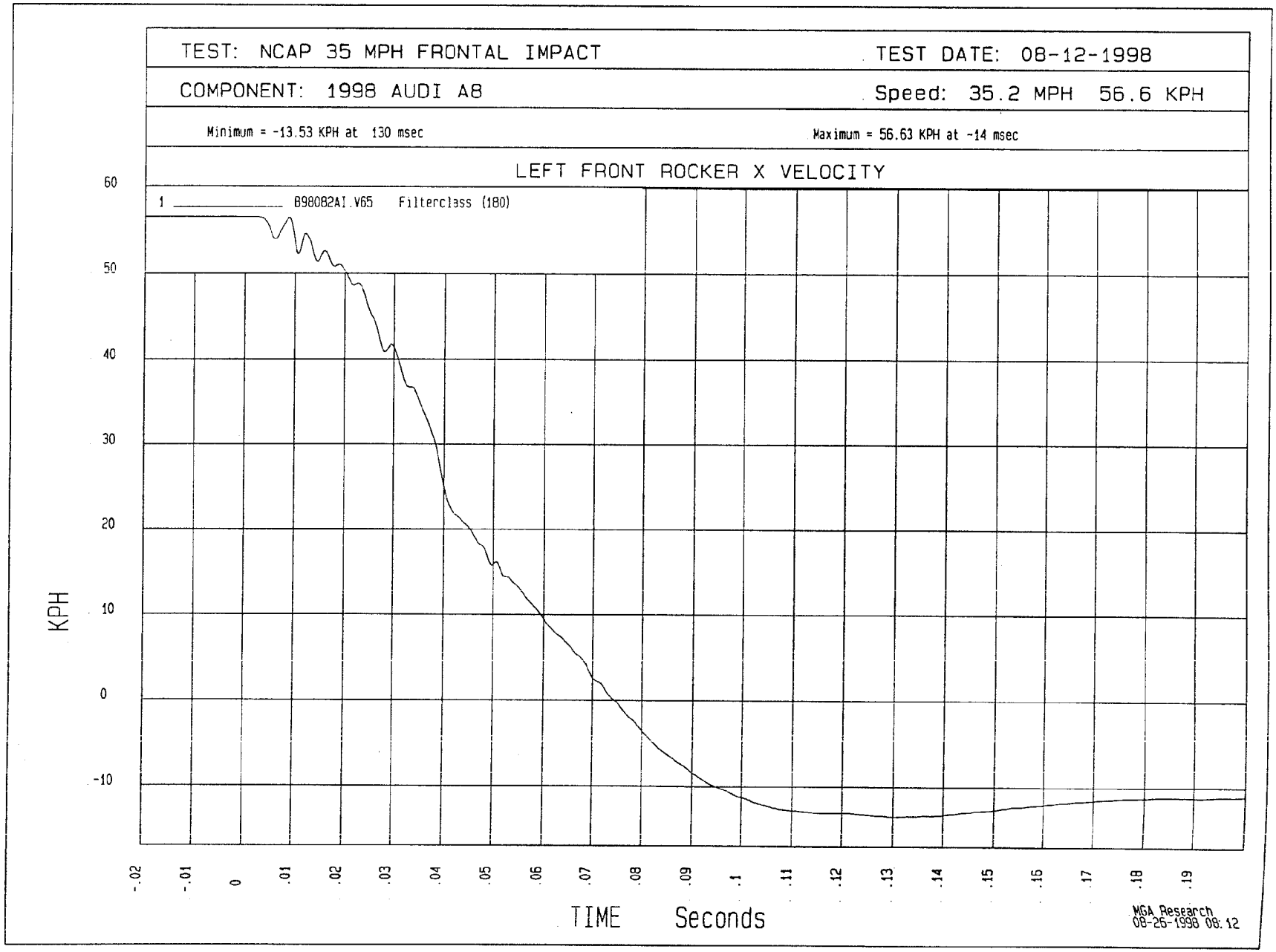
TIME (SECONDS)
MGA Research
08-26-1998 08:12


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -13.53 KPH at 130 msec
Maximum = 56.63 KPH at -14 msec
LEFT FRONT ROCKER X VELOCITY
1 B98082AI.V65 Filterclass (180)
KPH
60
50
40
30
20
10
0
-10
-.02
-.01
0
.01
.02
.03
.04
.05
.06
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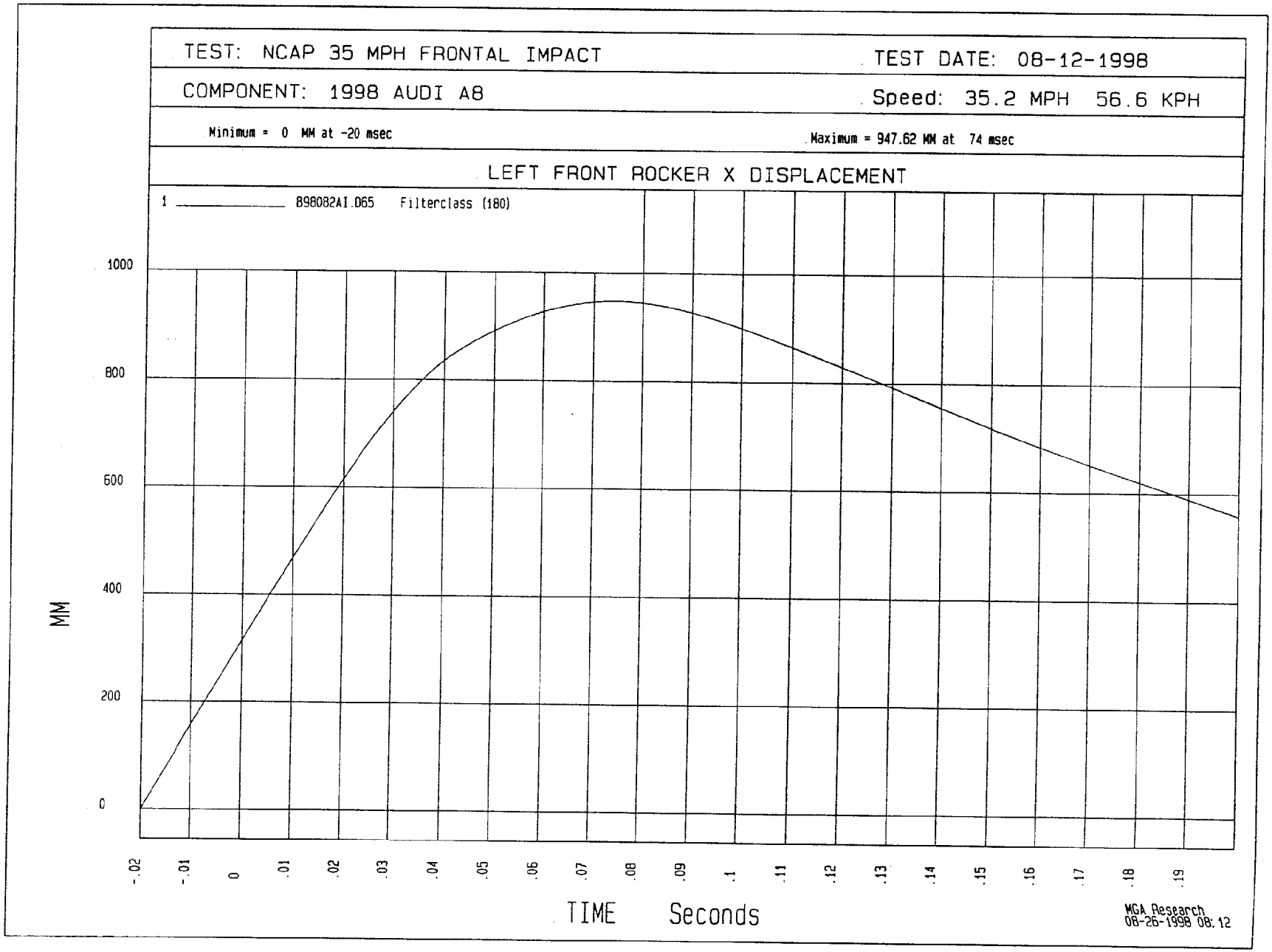
TIME Seconds
MGA Research
08-25-1998 08:12


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 0 MM at -20 msec
Maximum = 947.62 MM at 74 msec
LEFT FRONT ROCKER X DISPLACEMENT
1 B98082AI.065 Filterclass (180)
MM
1000
800
600
400
200
0
-.02
-.01
0
.01
.02
.03
.04
.05
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.08
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.17
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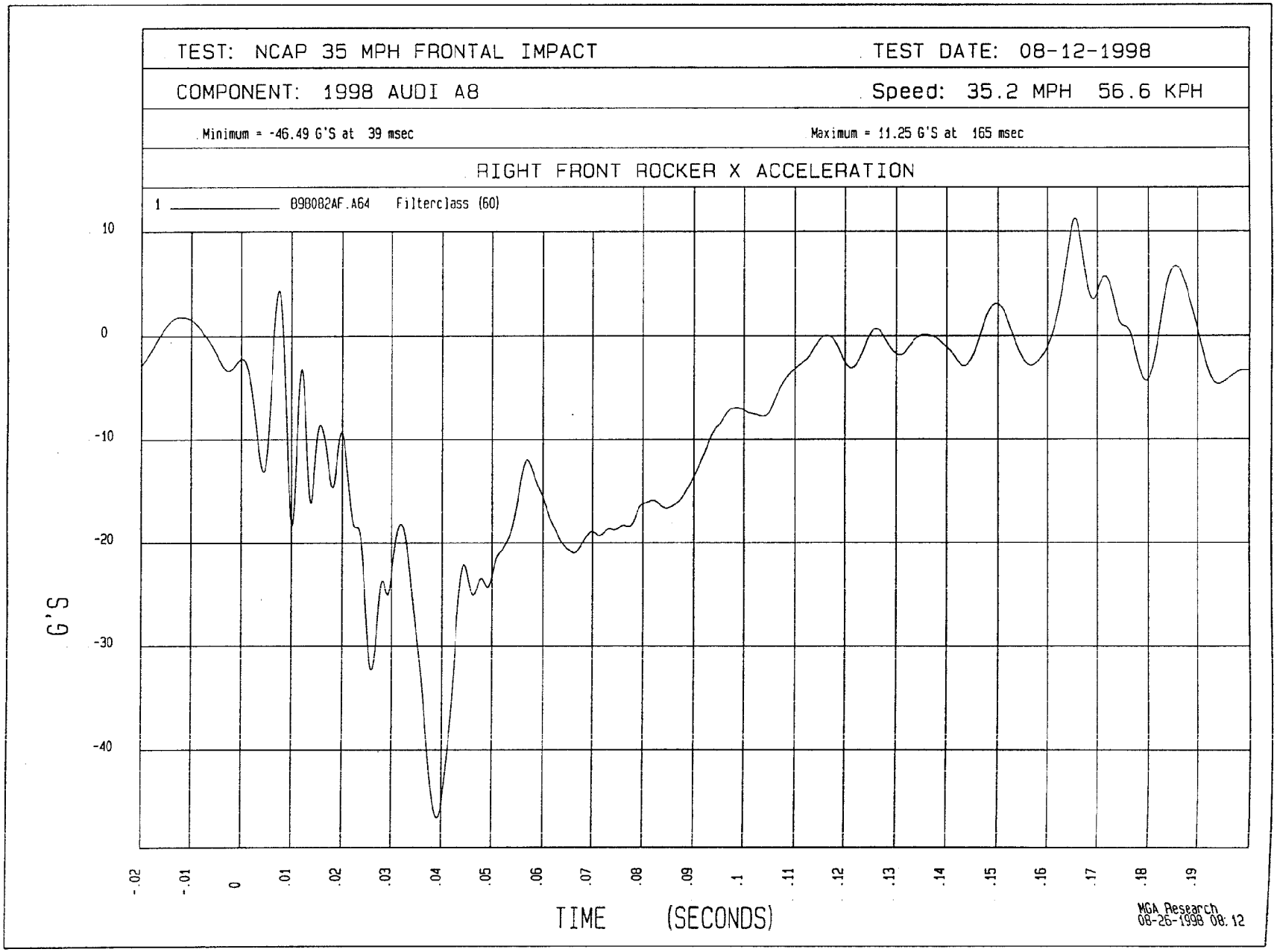
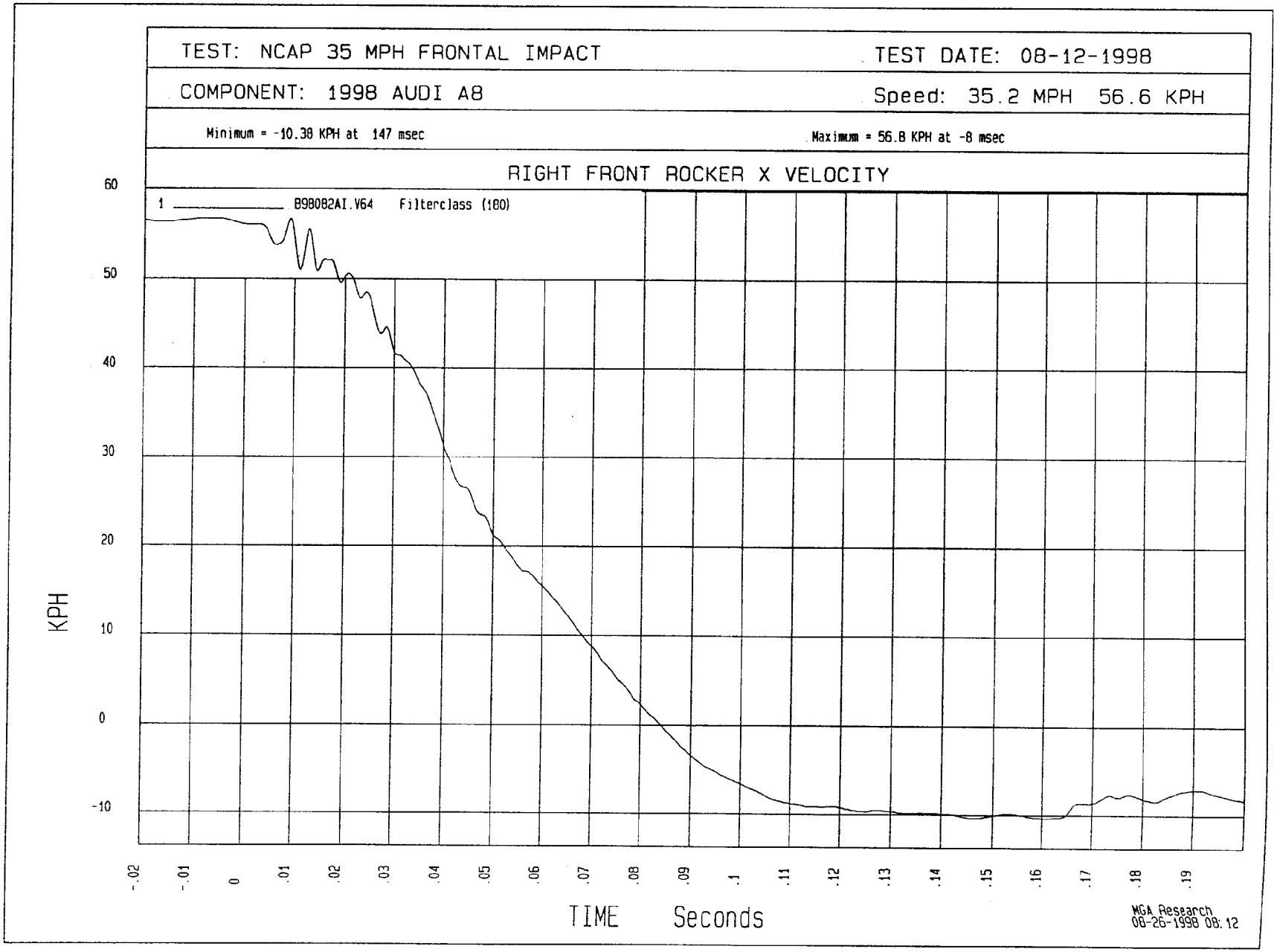
.19
TIME Seconds
MGA Research
08-26-1998 08:12


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -46.49 G'S at 39 msec
Maximum = 11.25 G'S at 165 msec
RIGHT FRONT ROCKER X ACCELERATION
1 B98082AF.A64 Filterclass (60)
10
0
-10
-20
-30
-40
G's
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-26-1998 08:12


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -10.38 KPH at 147 msec
Maximum = 56.8 KPH at -8 msec
RIGHT FRONT ROCKER X VELOCITY
1 B98082AI.V64 Filterclass (180)
KPH
60
50
40
30
20
10
0
-10
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
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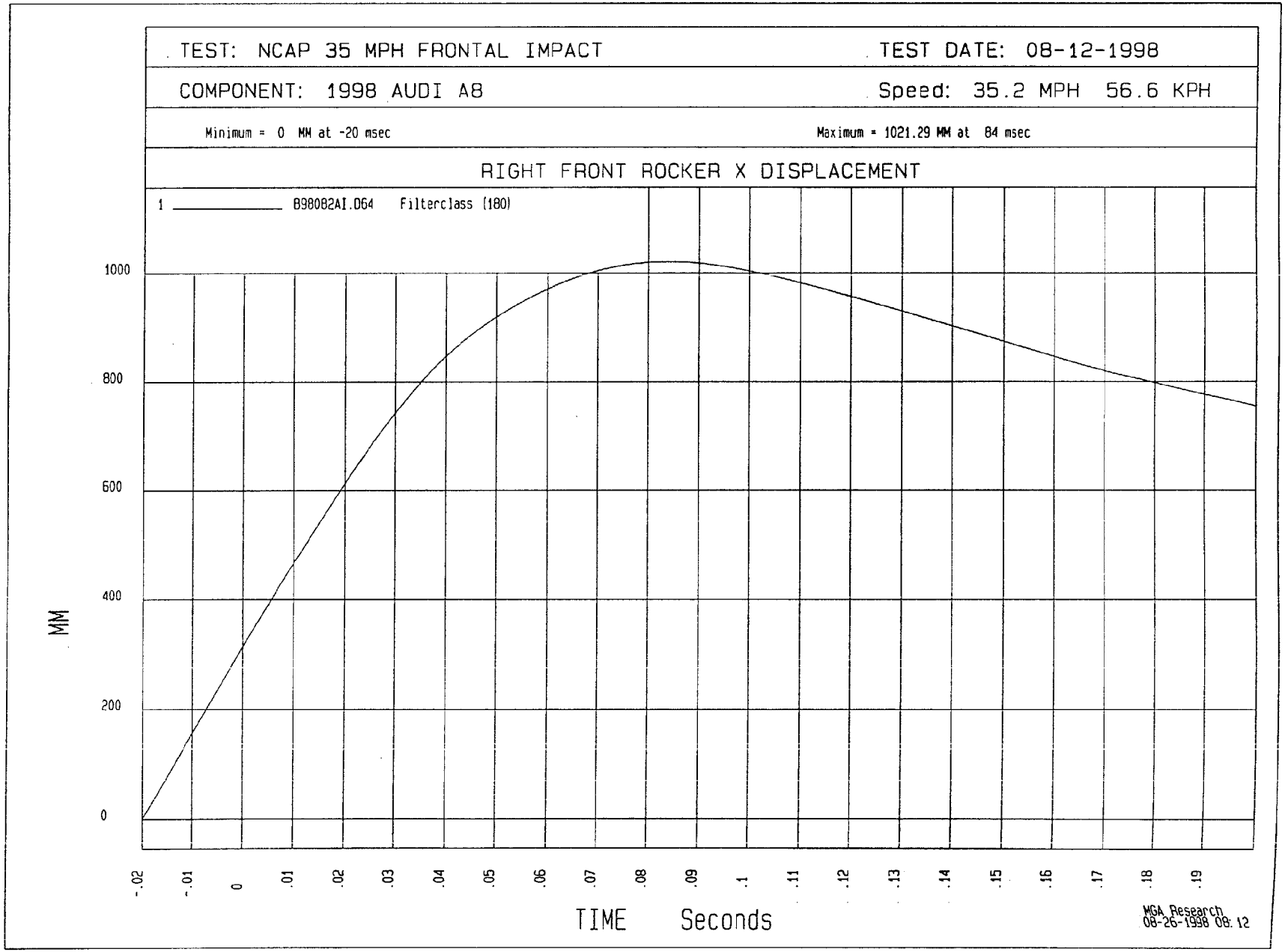
TIME Seconds
MGA Research
08-26-1998 08:12


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 0 MM at -20 msec
Maximum = 1021.29 MM at 84 msec
RIGHT FRONT ROCKER X DISPLACEMENT
1 B98082AI.D64 Filterclass (180)
MM
1000
800
600
400
200
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
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.08
.09
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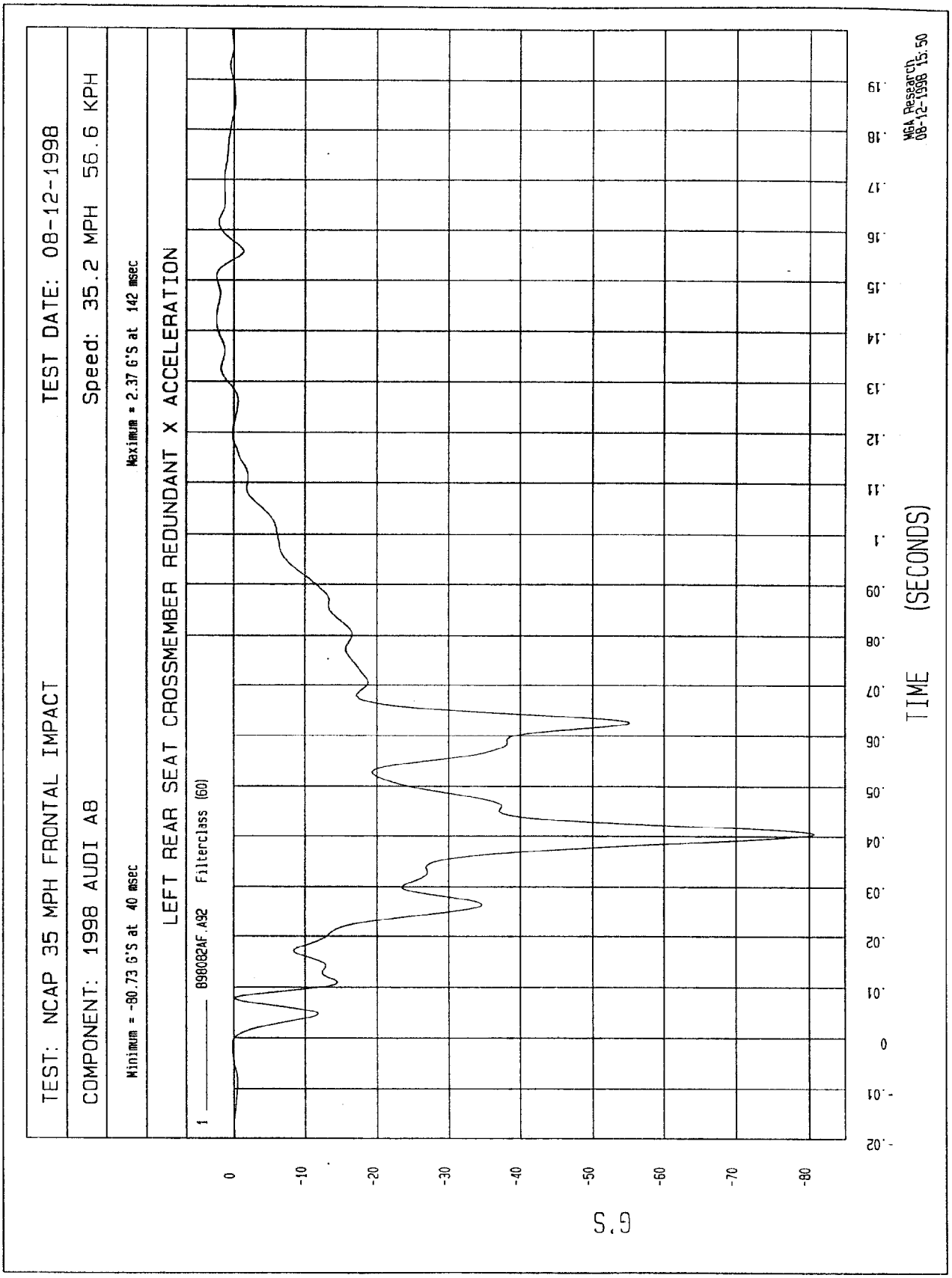
TIME Seconds
MGA Research
08-26-1998 08:12


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -80.73 G'S at 40 msec
Maximum = 2.37 G'S at 142 msec
LEFT REAR SEAT CROSSMEMBER REDUNDANT X ACCELERATION
1 _____ 898082AF.A92 Filterclass (60)
0
-10
-20
-30
-40
-50
-60
-70
-80
G'S
.02
.01
0
.01
.02
.03
.04
.05
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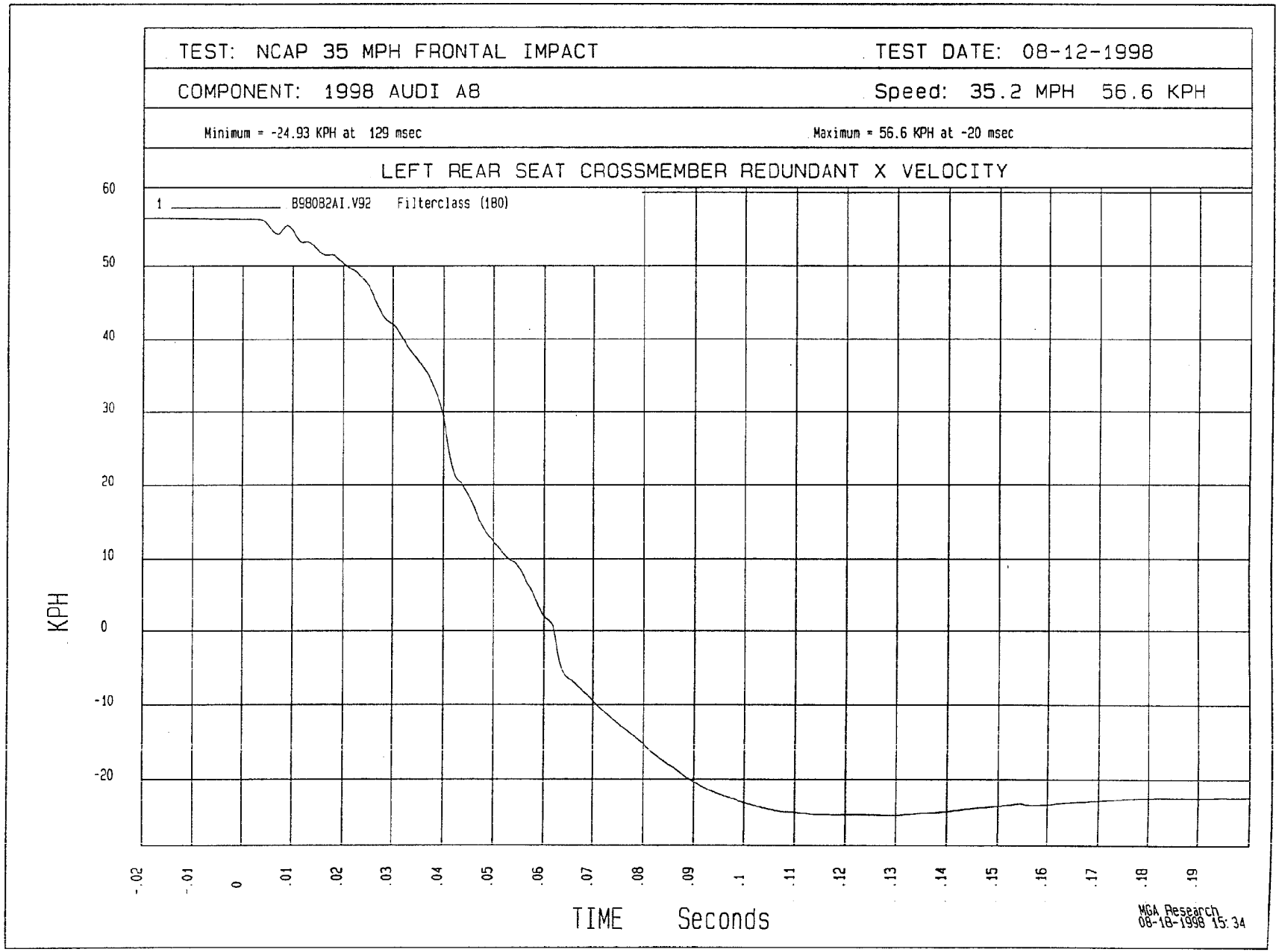
TIME (SECONDS)
MGA Research
08-12-1998 15:50


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -24.93 KPH at 129 msec
Maximum = 56.6 KPH at -20 msec
LEFT REAR SEAT CROSSMEMBER REDUNDANT X VELOCITY
1 B980B2AI.V92 Filterclass (180)
KPH
60
50
40
30
20
10
0
-10
-20
-.02
-.01
0
.01
.02
.03
.04
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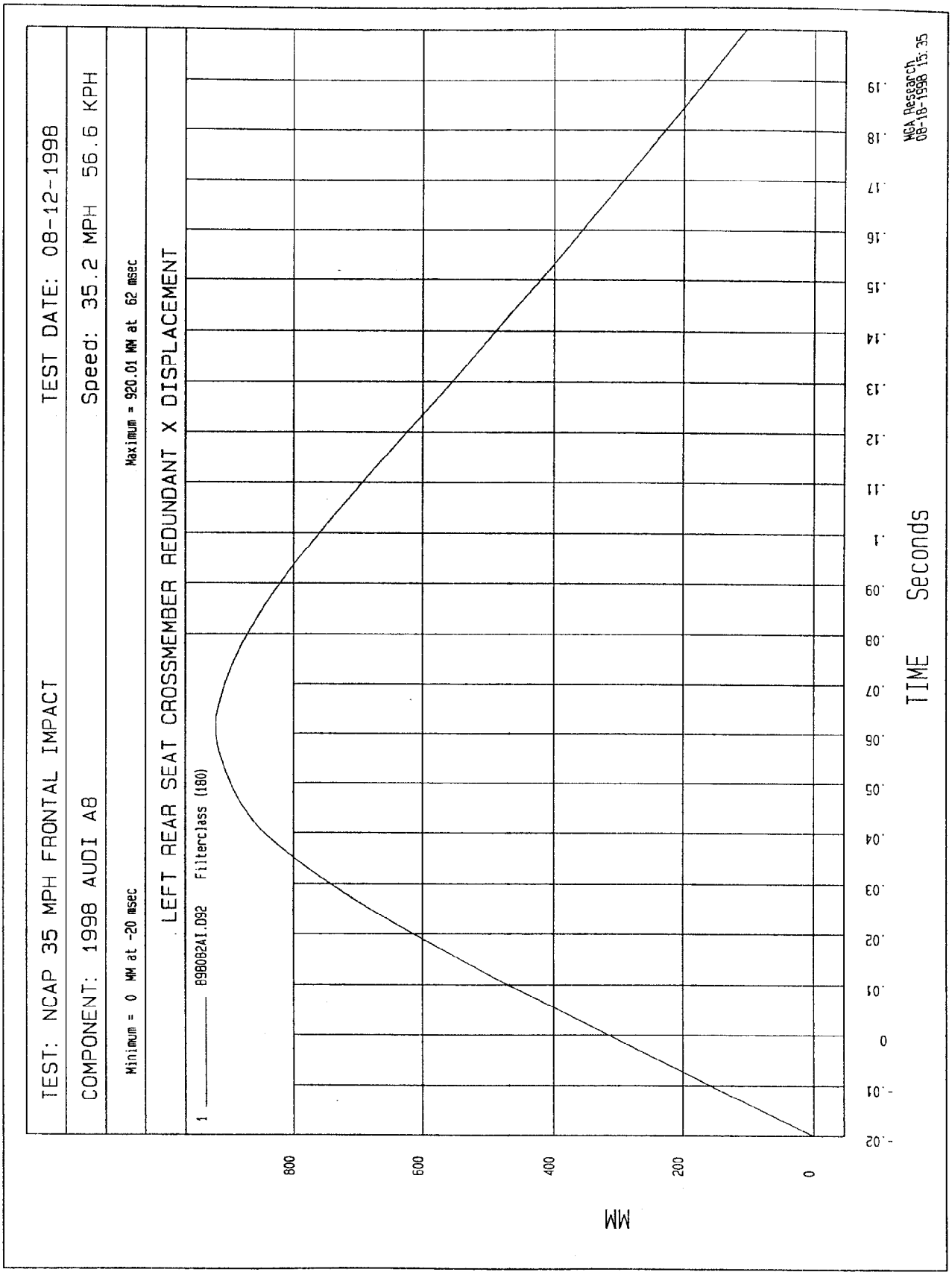
TIME Seconds
MGA Research
08-18-1998 15:34


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 0 MM at -20 msec
Maximum = 920.01 MM at 62 msec
LEFT REAR SEAT CROSSMEMBER REDUNDANT X DISPLACEMENT
1 _____ B98002AI.002 Filterclass (180)
MM
800
600
400
200
0
TIME Seconds
-.02
-.01
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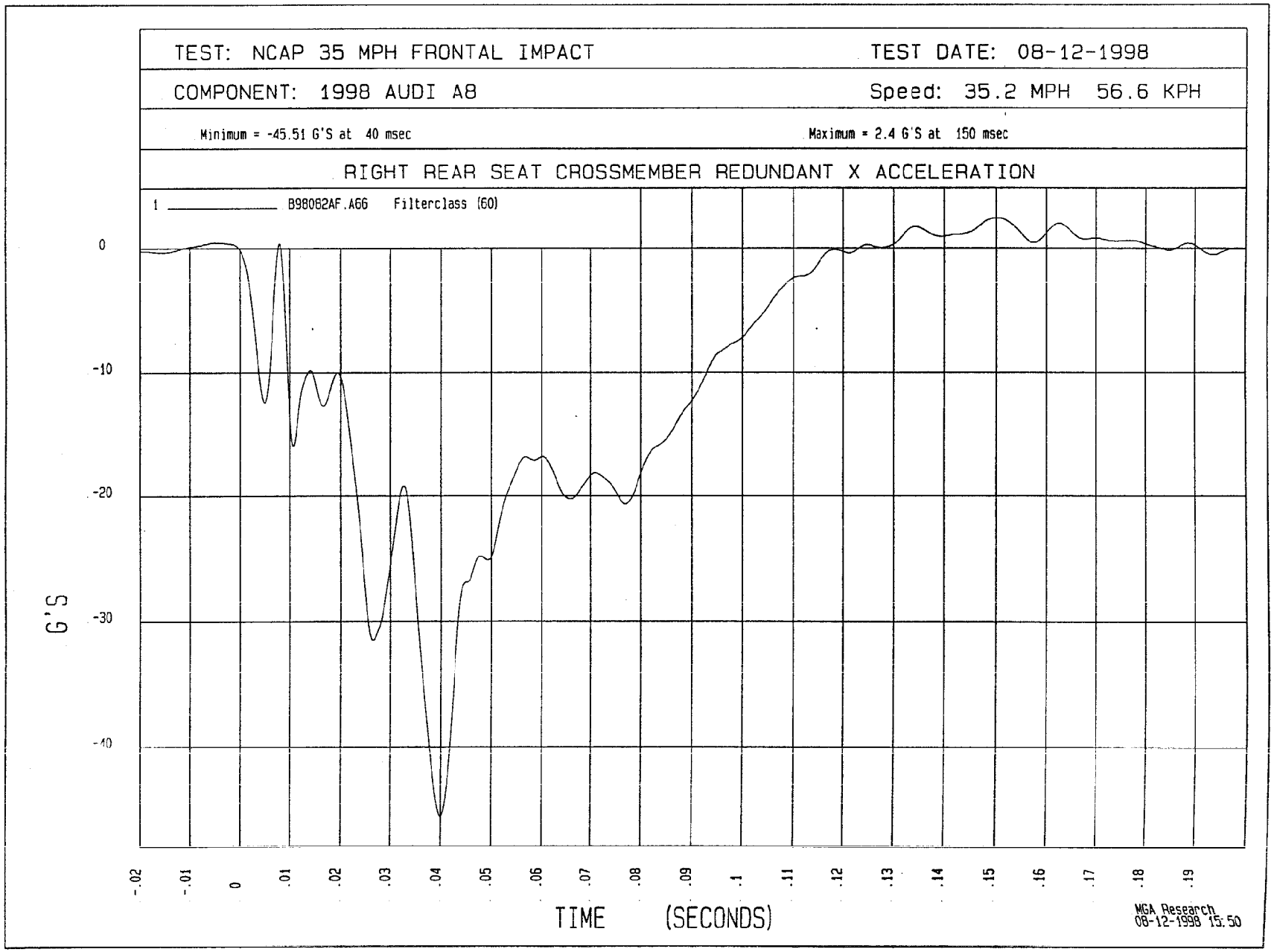
MGA Research
08-18-1998 15:35


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -45.51 G'S at 40 msec
Maximum = 2.4 G'S at 150 msec
RIGHT REAR SEAT CROSSMEMBER REDUNDANT X ACCELERATION
1 B98082AF.A66 Filterclass (60)
0
-10
-20
-30
-40
G'S
-.02
-.01
0
.01
.02
.03
.04
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.07
.08
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.18
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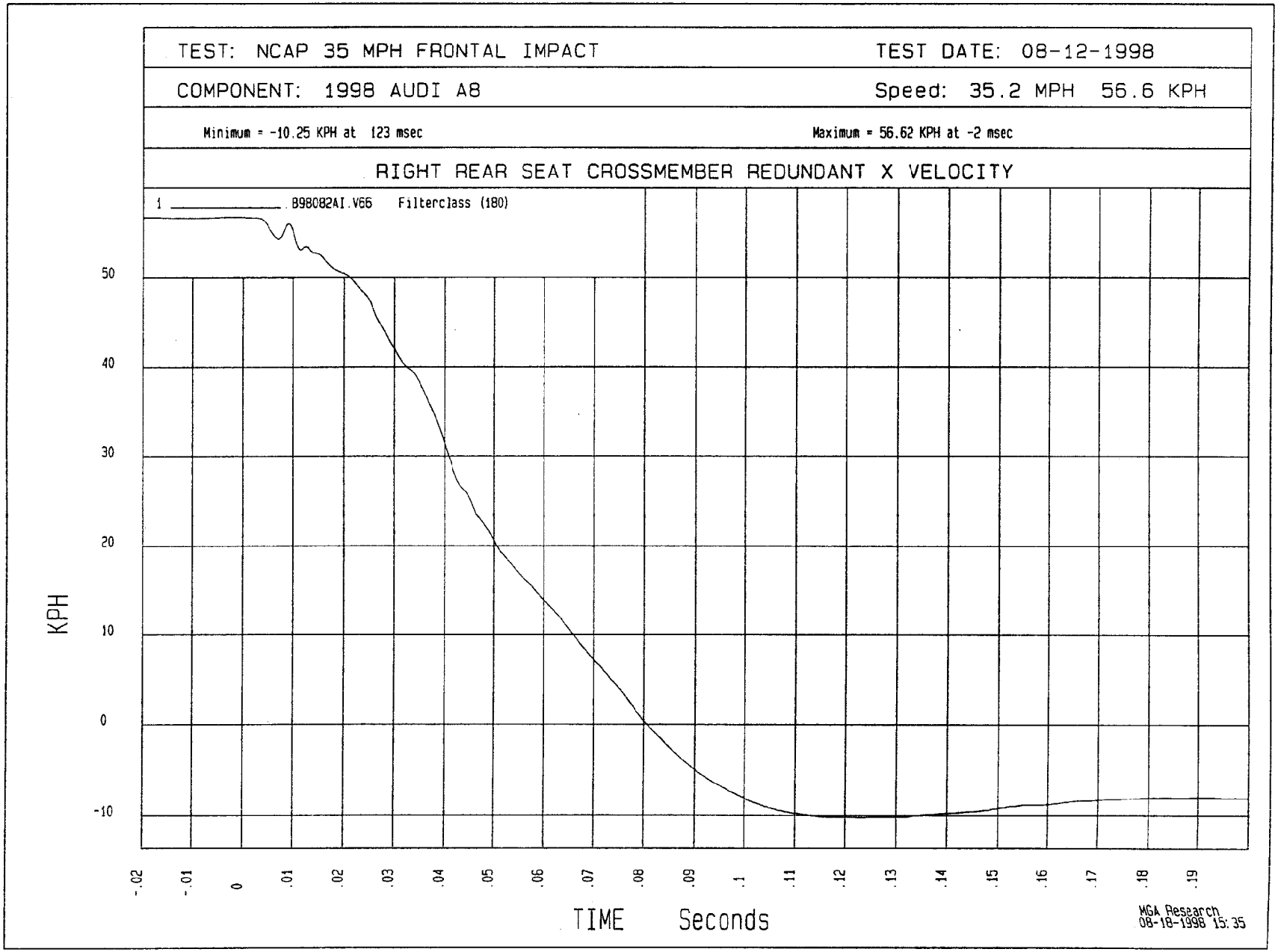
TIME (SECONDS)
MGA Research
08-12-1998 15:50


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -10.25 KPH at 123 msec
Maximum = 56.62 KPH at -2 msec
RIGHT REAR SEAT CROSSMEMBER REDUNDANT X VELOCITY
1 B98082AI.V66 Filterclass (180)
KPH
50
40
30
20
10
0
-10
-.02
-.01
0
.01
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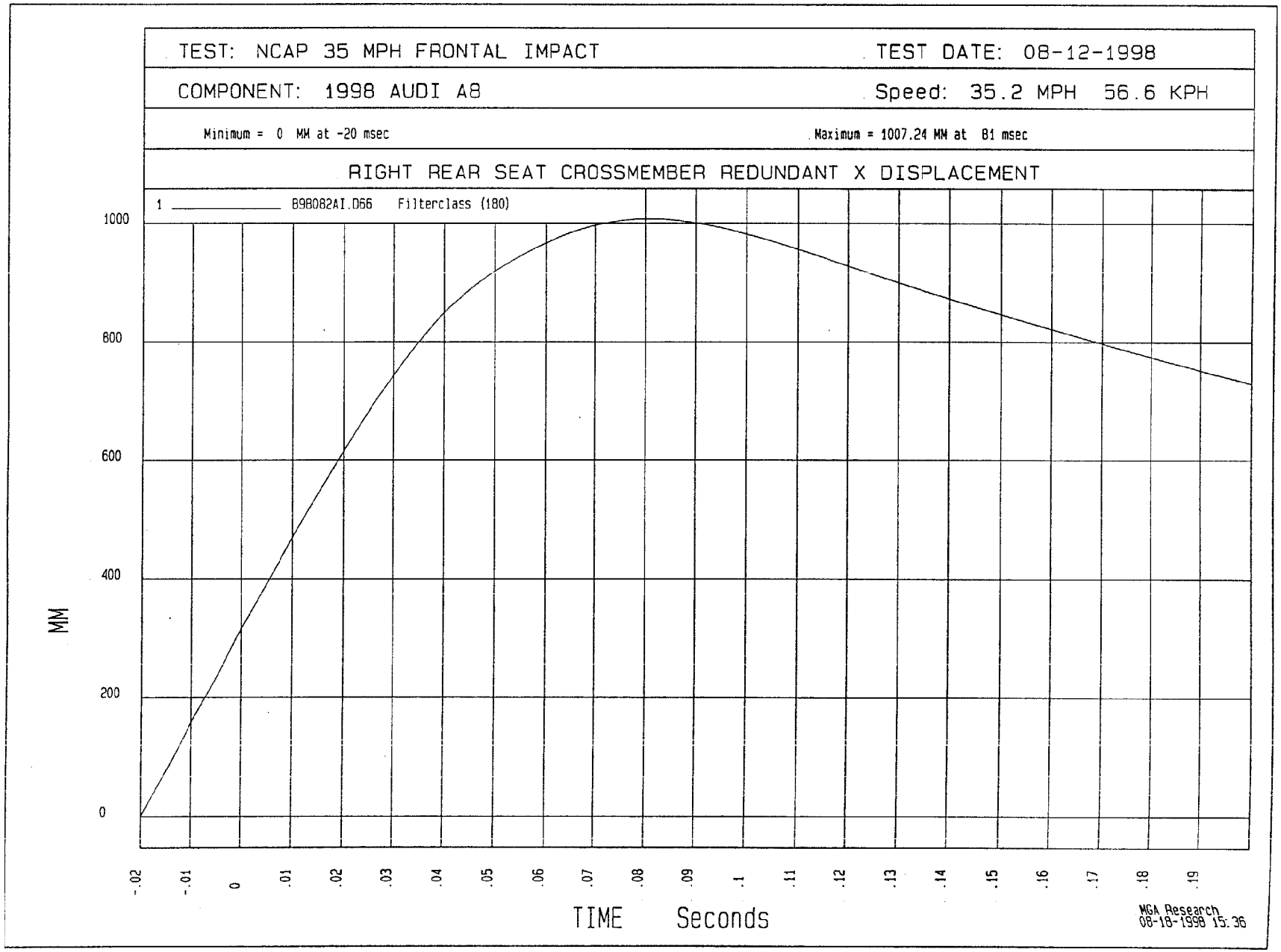
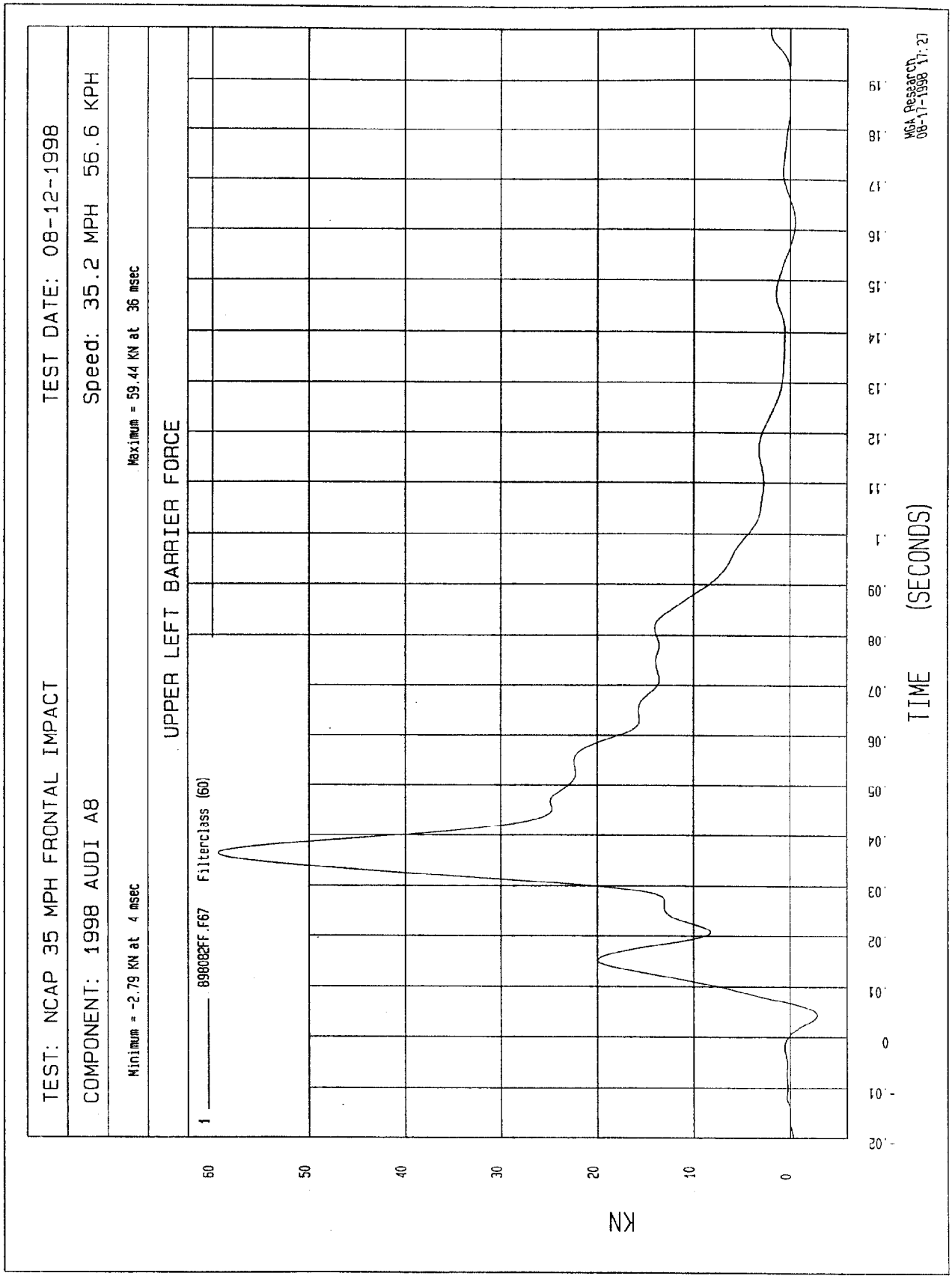
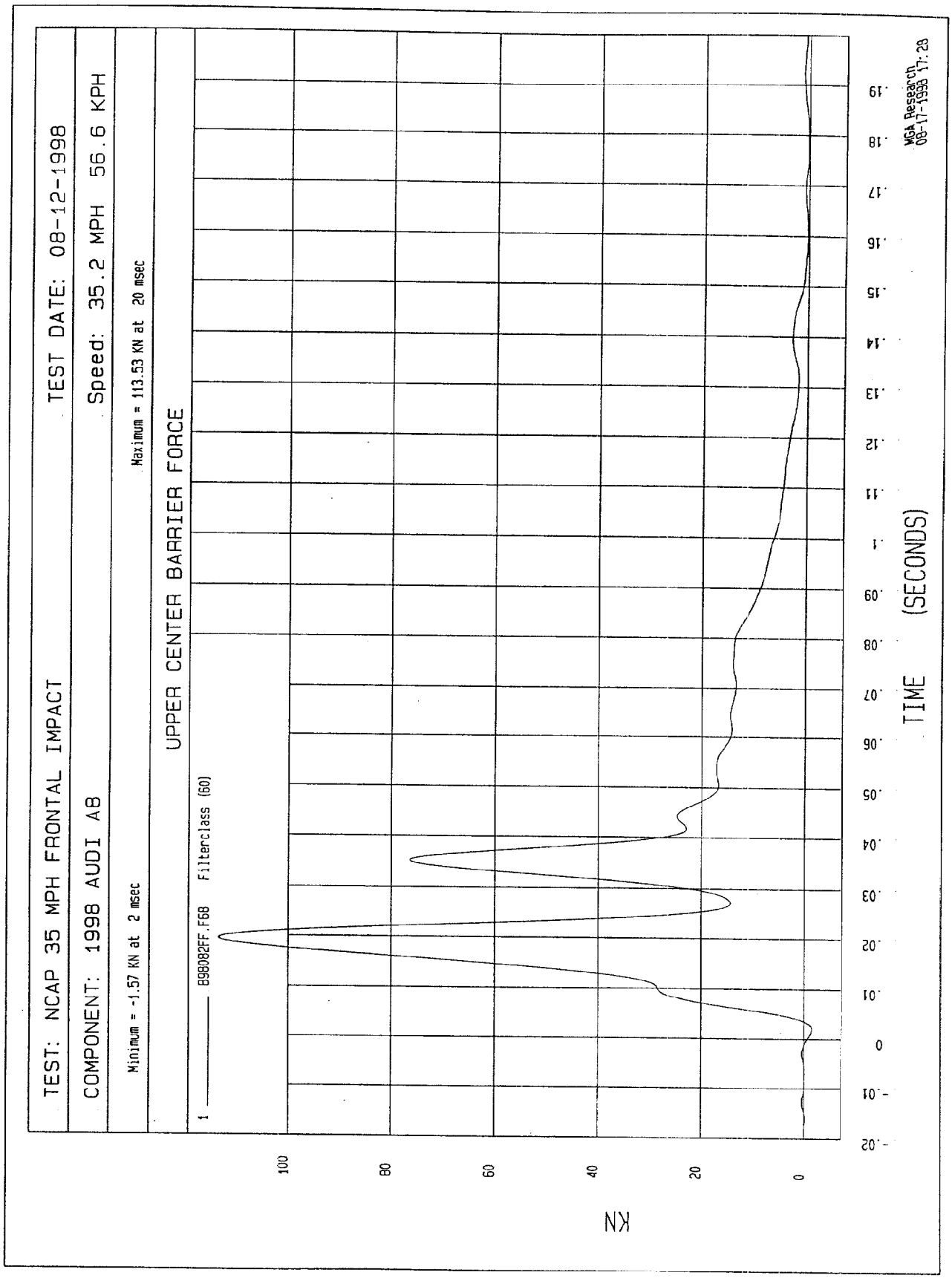
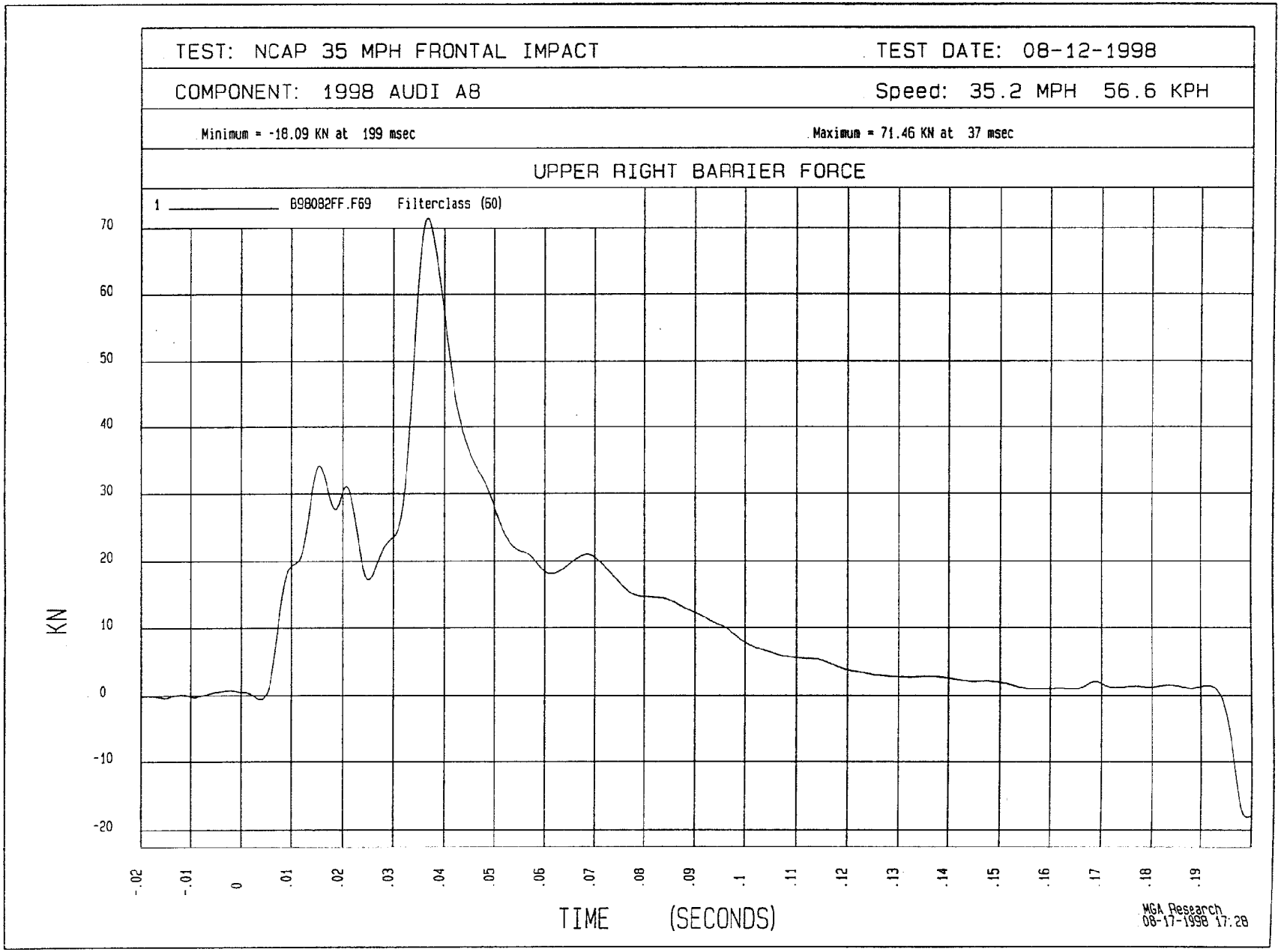
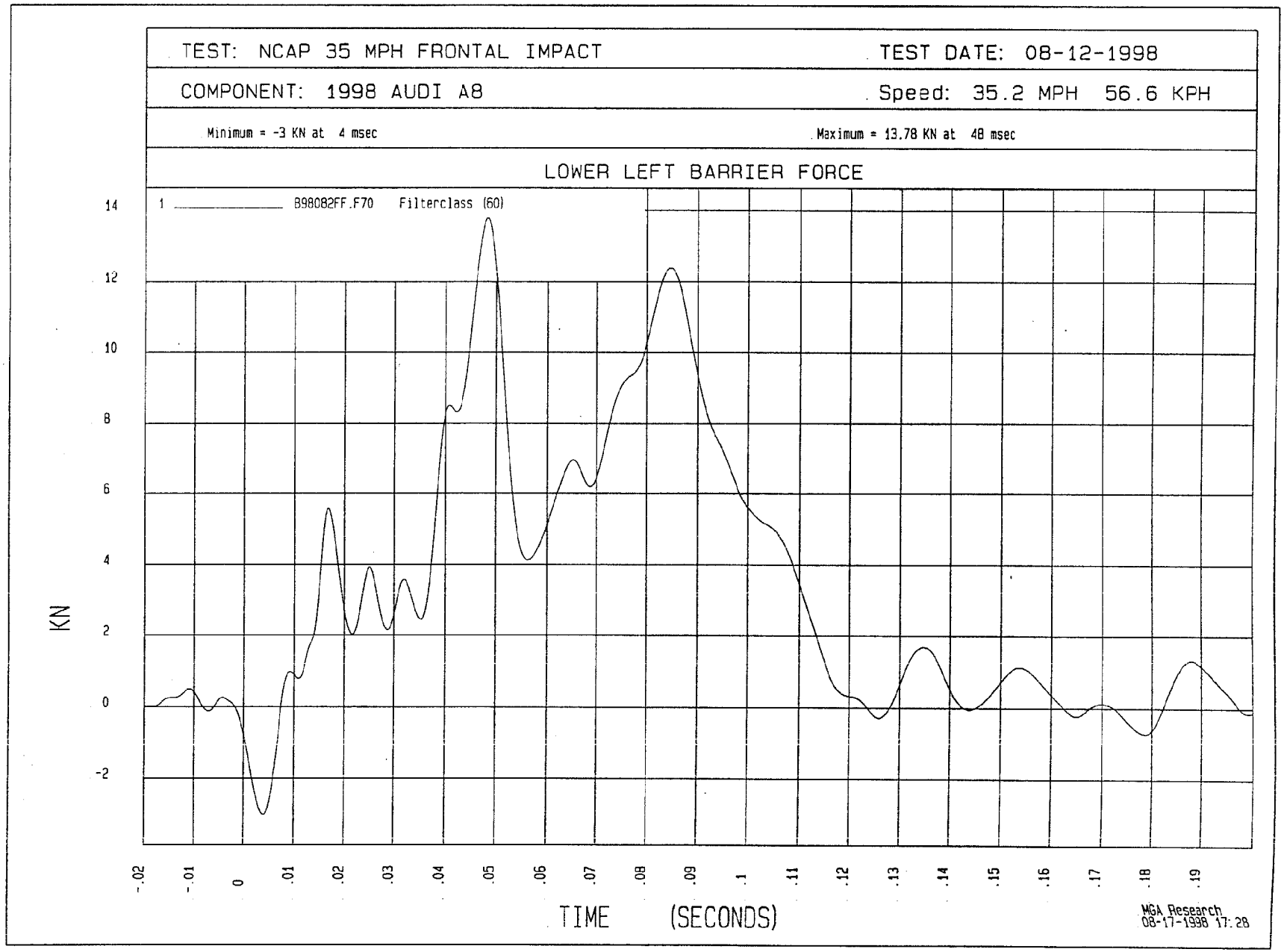
TIME Seconds
MGA Research
08-18-1998 15:35

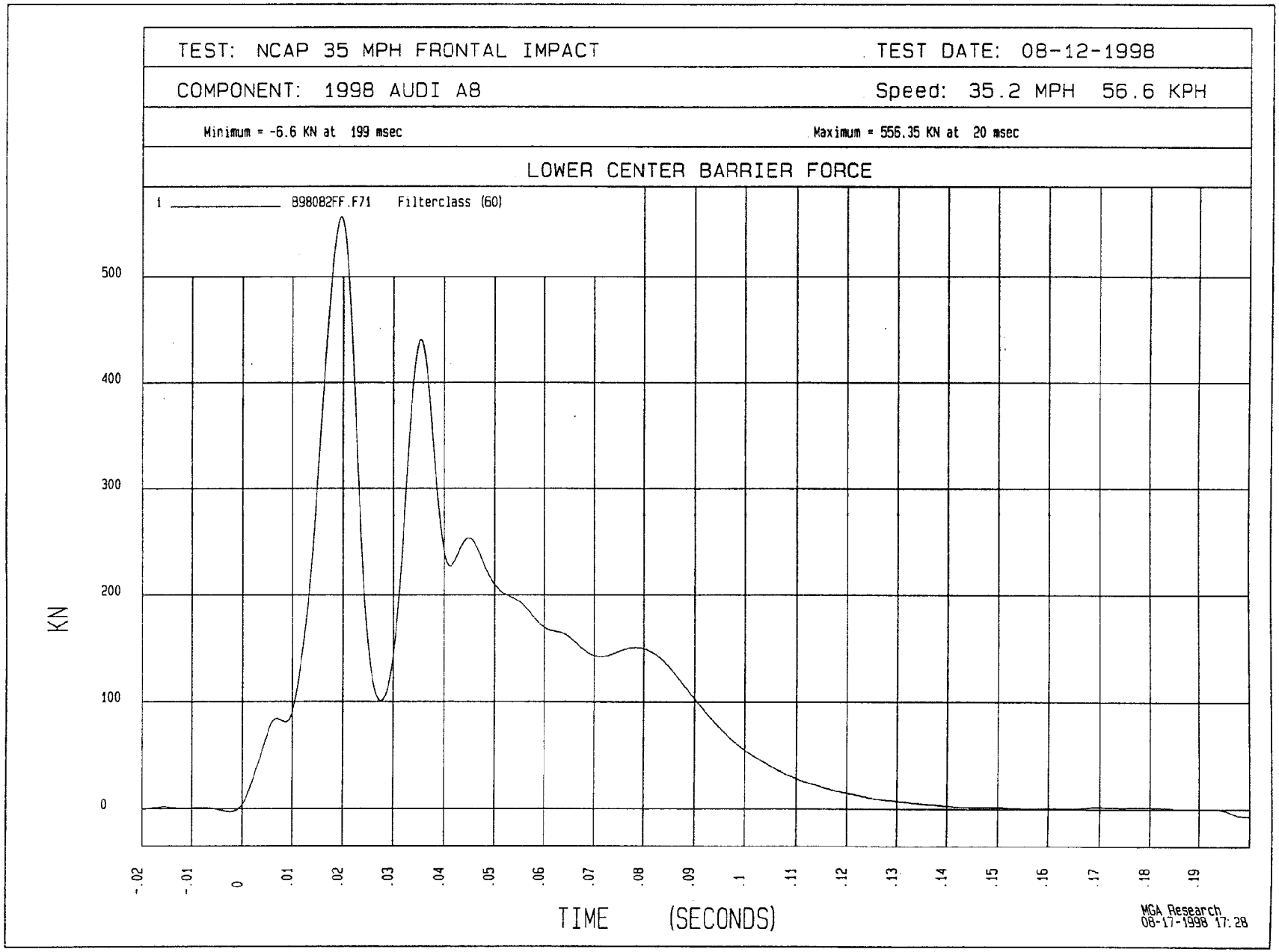

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = 0 MM at -20 msec
Maximum = 1007.24 MM at 81 msec
RIGHT REAR SEAT CROSSMEMBER REDUNDANT X DISPLACEMENT
1 B98082AI.D66 Filterclass (180)
MM
1000
800
600
400
200
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME Seconds
MGA Research
08-18-1998 15:36

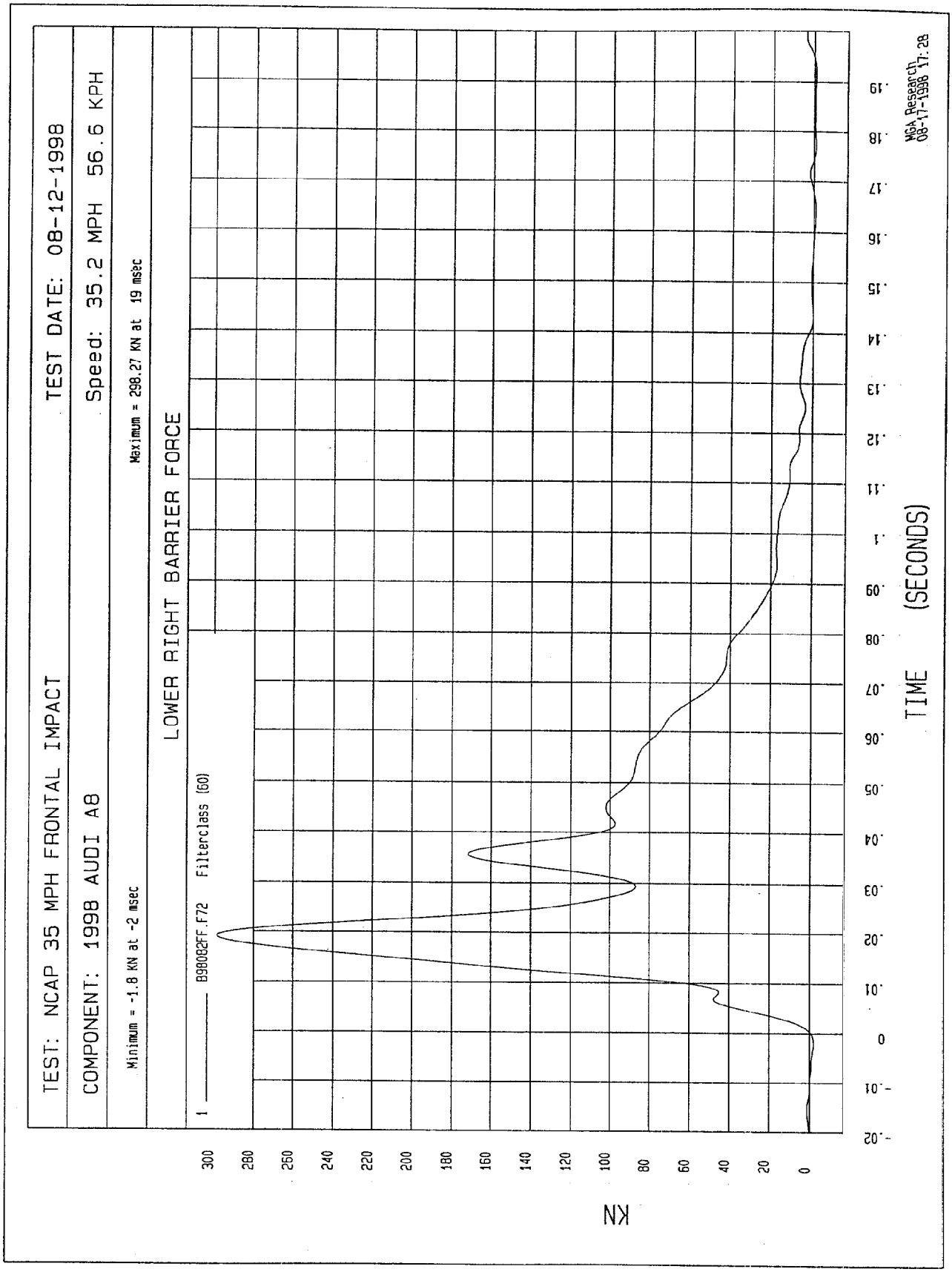

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -2.79 KN at 4 msec
Maximum = 59.44 KN at 36 msec
UPPER LEFT BARRIER FORCE
1 _____ 898082FF.F67 Filterclass (60)
KN
TIME (SECONDS)
MGA Research
08-17-1998 17:27

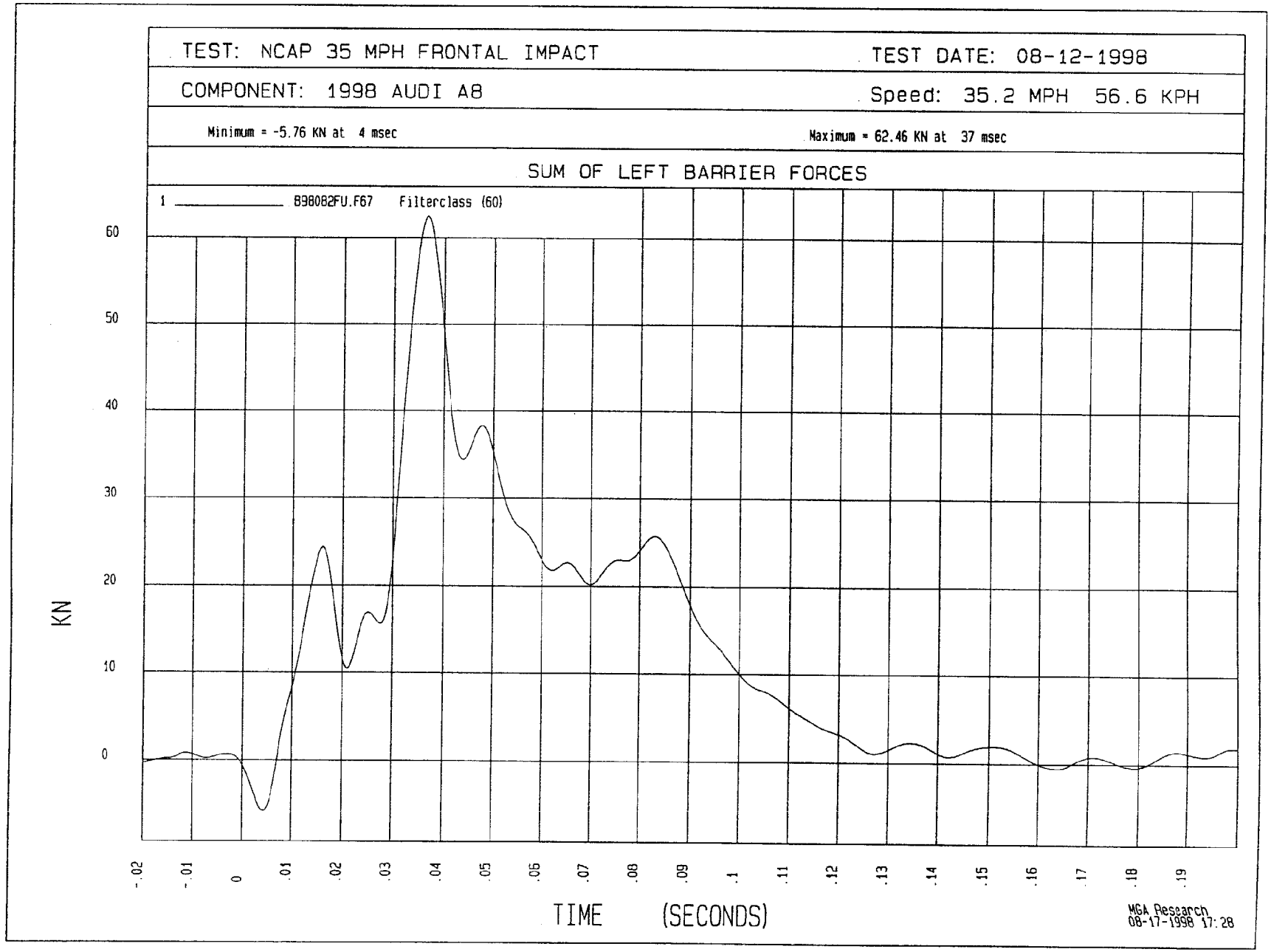

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -1.57 KN at 2 msec
Maximum = 113.53 KN at 20 msec
UPPER CENTER BARRIER FORCE
1 B98082FF.F6B Filterclass (60)
KN
100
80
60
40
20
0
-20
-01
0
01
02
03
04
05
06
07
08
09
10
11
12
13
14
15
16
17
18
19
TIME (SECONDS)
MGA Research
08-17-1998 17:28

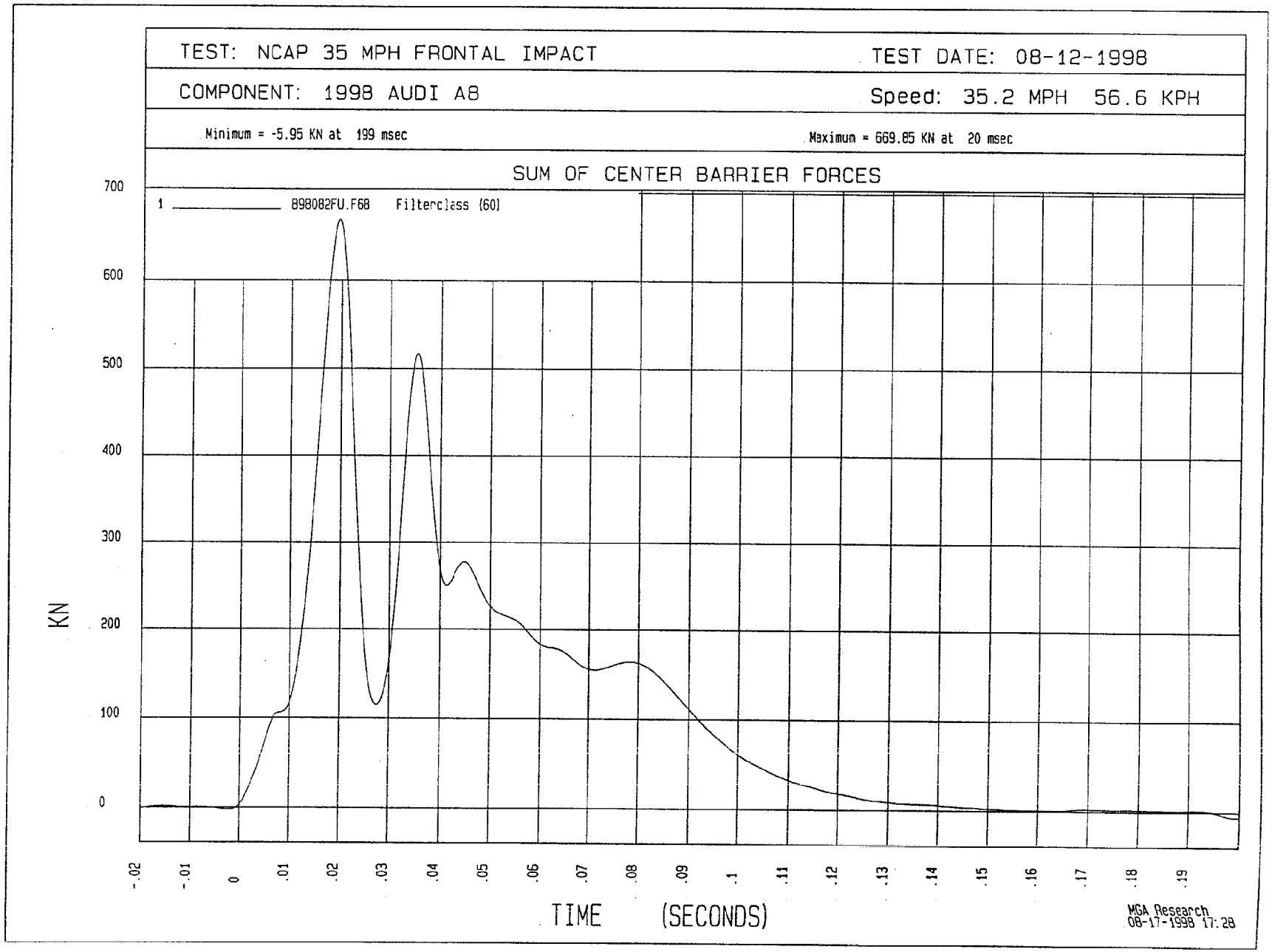

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -18.09 KN at 199 msec
Maximum = 71.46 KN at 37 msec
UPPER RIGHT BARRIER FORCE
1 B98082FF.F69 Filterclass (60)
KN
70
60
50
40
30
20
10
0
-10
-20
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:28

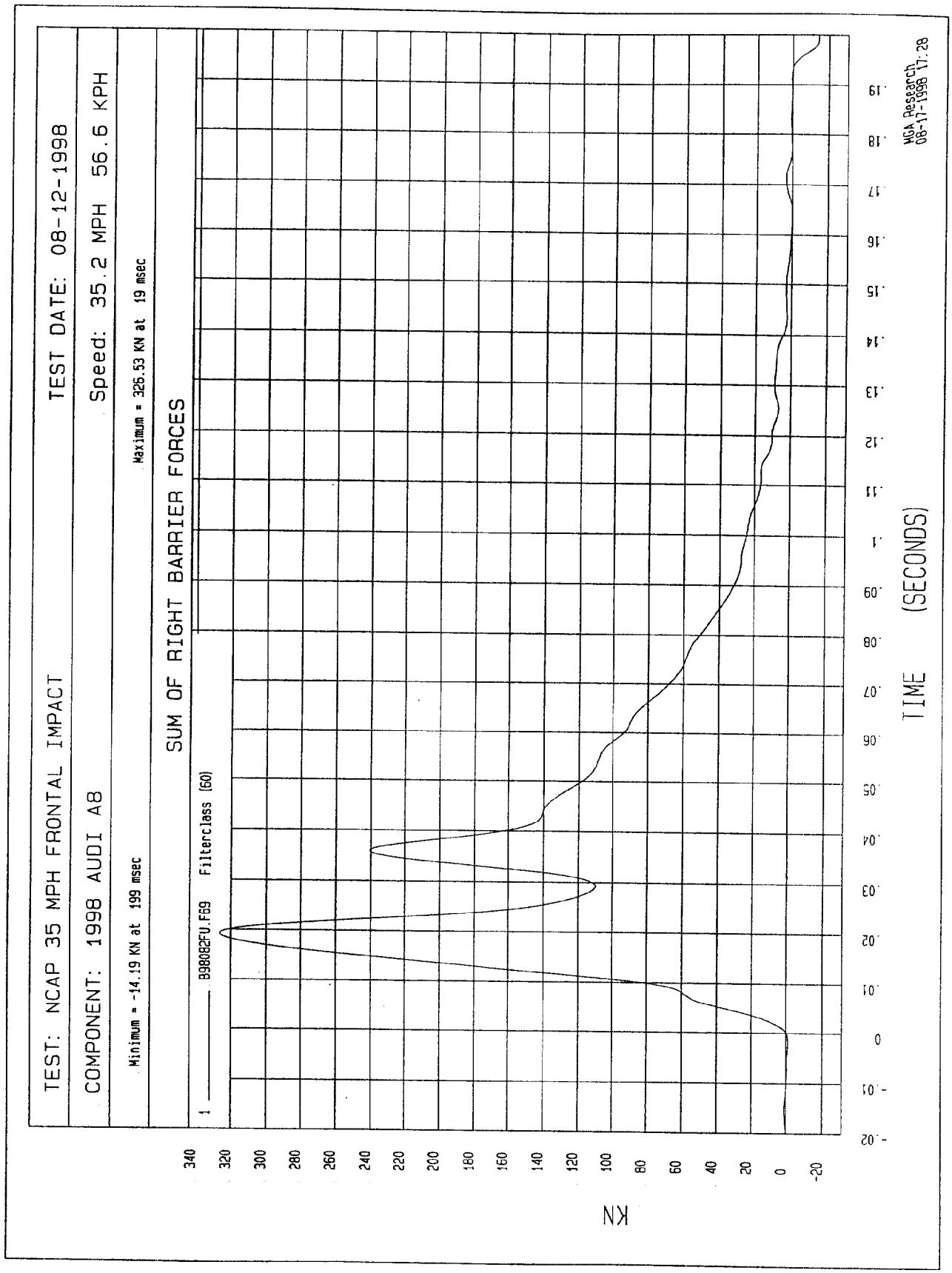

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -3 KN at 4 msec
Maximum = 13.78 KN at 48 msec
LOWER LEFT BARRIER FORCE
1 B98082FF.F70 Filterclass (60)
KN
14
12
10
8
6
4
2
0
-2
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:28

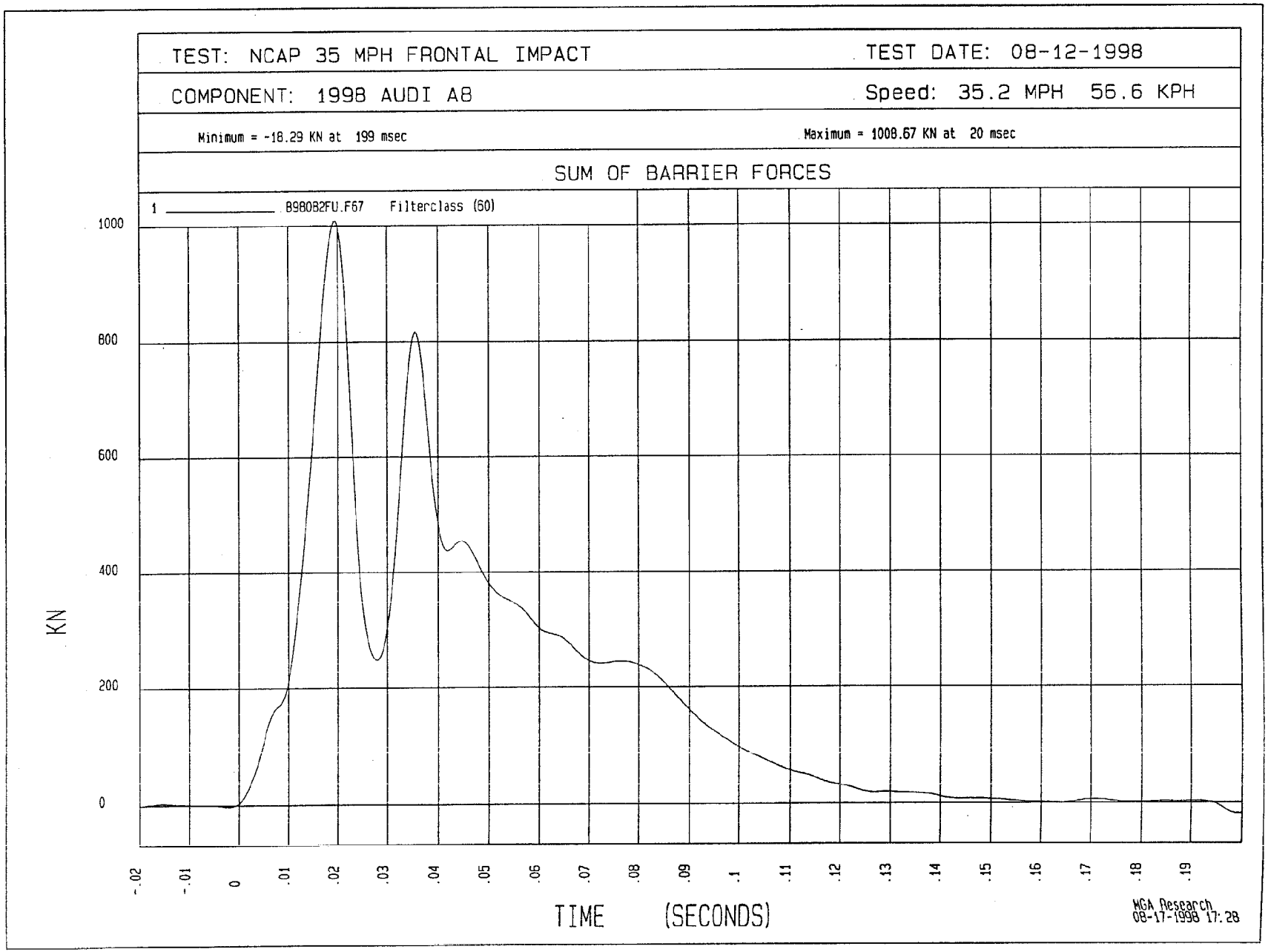

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -6.6 KN at 199 msec
Maximum = 556.35 KN at 20 msec
LOWER CENTER BARRIER FORCE
1 B98082FF.F71 Filterclass (60)
KN
500
400
300
200
100
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:28

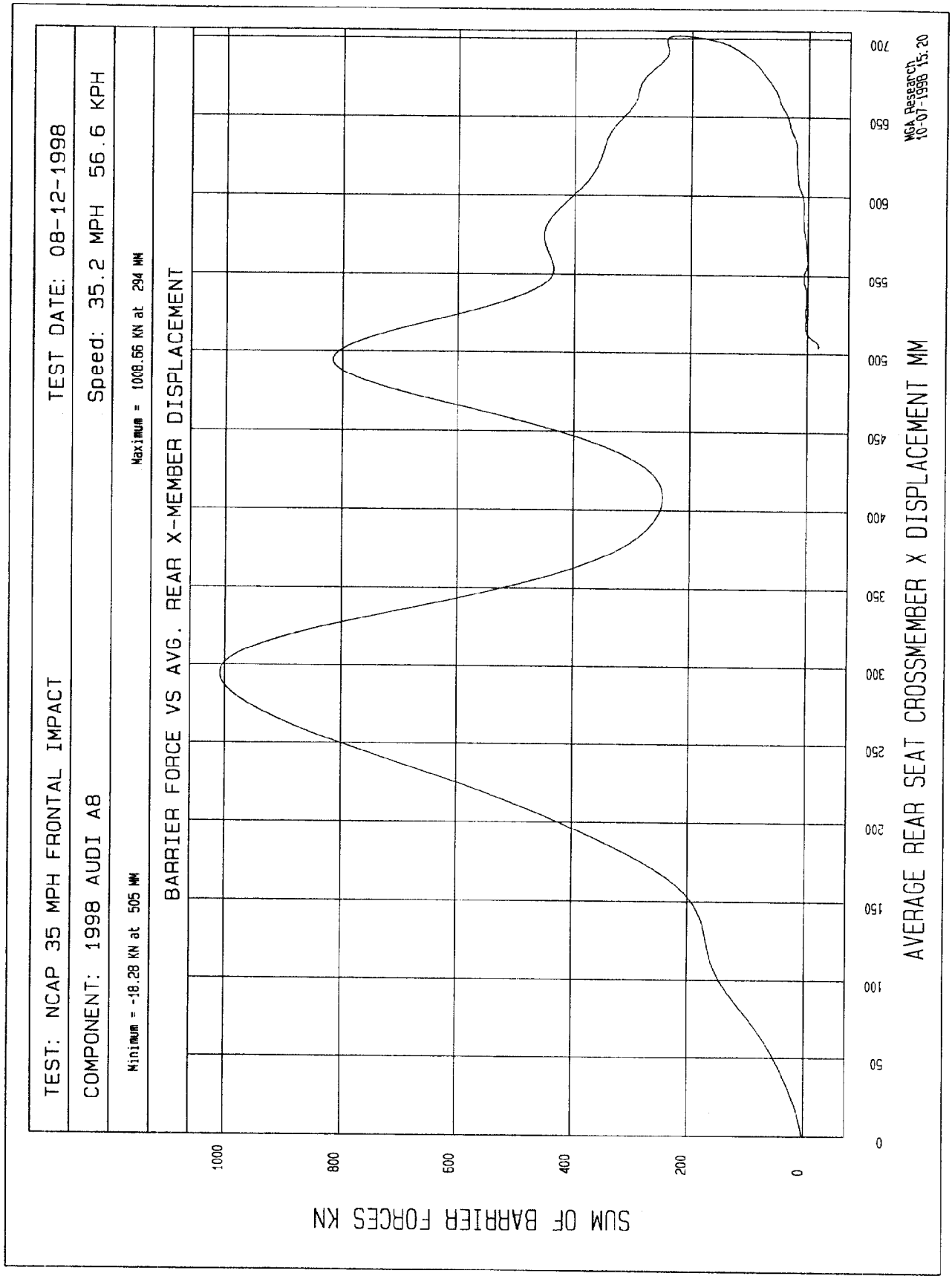

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -1.8 KN at -2 msec
Maximum = 298.27 KN at 19 msec
LOWER RIGHT BARRIER FORCE
1 B98002FF.F72 Filterclass (60)
KN
TIME (SECONDS)
MGA Research
08-17-1998 17:28


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -5.76 KN at 4 msec
Maximum = 62.46 KN at 37 msec
SUM OF LEFT BARRIER FORCES
1 B98082FU.F67 Filterclass (60)
KN
60
50
40
30
20
10
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:28


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -5.95 KN at 199 msec
Maximum = 669.85 KN at 20 msec
SUM OF CENTER BARRIER FORCES
1 B98082FU.F68 Filterclass (60)
KN
700
600
500
400
300
200
100
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:28


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -14.19 KN at 199 msec
Maximum = 326.53 KN at 19 msec
SUM OF RIGHT BARRIER FORCES
1 B98082FU.F69 Filterclass (60)
KN
TIME (SECONDS)
MGA Research
08-17-1998 17:28


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -18.29 KN at 199 msec
Maximum = 1008.67 KN at 20 msec
SUM OF BARRIER FORCES
1 B98082FU.F67 Filterclass (60)
KN
1000
800
600
400
200
0
-.02
-.01
0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15
.16
.17
.18
.19
TIME (SECONDS)
MGA Research
08-17-1998 17:28


TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 08-12-1998
COMPONENT: 1998 AUDI A8
Speed: 35.2 MPH 56.6 KPH
Minimum = -18.28 KN at 505 MM
Maximum = 1008.66 KN at 294 MM
BARRIER FORCE VS AVG. REAR X-MEMBER DISPLACEMENT
SUM OF BARRIER FORCES KN
1000
800
600
400
200
0
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
AVERAGE REAR SEAT CROSSMEMBER X DISPLACEMENT MM
MGA Research
10-07-1998 15:20

APPENDIX C

DUMMY CONFIGURATION & PERFORMANCE VERIFICATION DATA

HYBRID III DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 306 DUMMY CALIBRATION BY: Tim Michnay

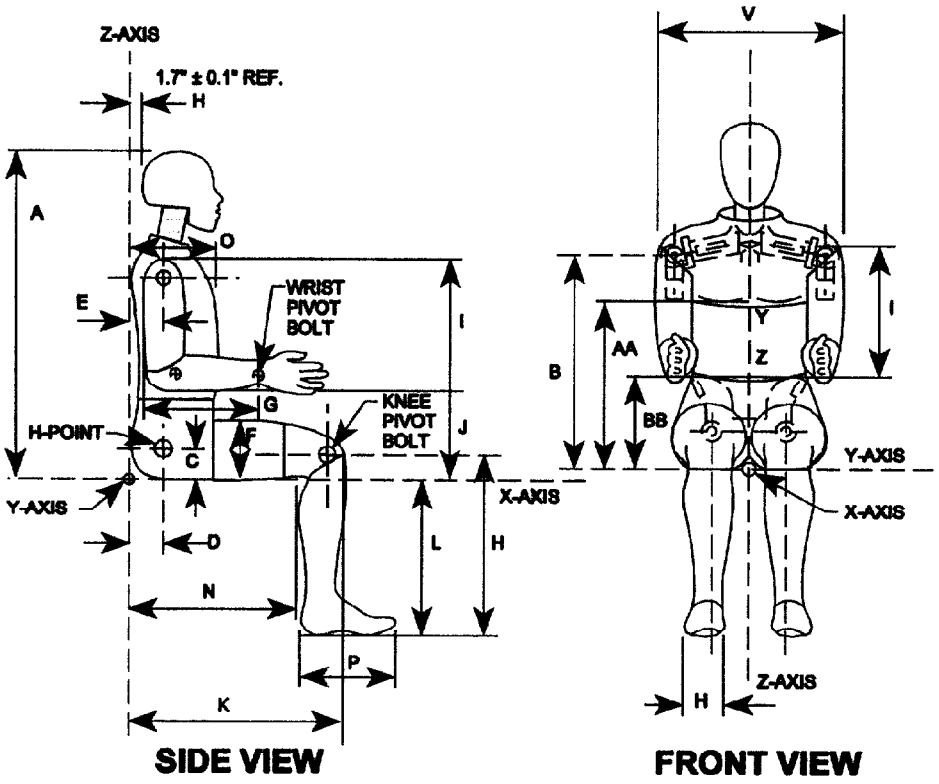
I. CONFIGURATION VERIFICATION DATA

DATE OF VERIFICATION: August 5, 1998

DESCRIPTION	SPECIFICATION (Inches)	ACTUAL MEASUREMENT (inches)
A - Total Sitting Height	34.6 - 35.0	34.7
B - Shoulder Pivot Height	19.9 - 20.5	20.1
C - "H" Point Height	3.3 - 3.5	3.4
D - "H" Point from Seat Back	5.3 - 5.5	5.4
E - Shoulder Pivot From Backline	3.3 - 3.7	3.6
F - Thigh Clearance	5.5 - 6.1	5.9
G - Back of Elbow to Wrist Pivot	11.4 - 12.0	11.6
H - Skull Cap Skin to Backline	1.6 - 1.8	1.7
I - Shoulder Elbow Length	13.0 - 13.6	13.2
J - Elbow Rest Height	7.5 - 8.3	8.1
K - Buttock Knee Length	22.8 - 23.8	23.2
L - Popliteal Height	16.9 - 17.9	17.5
M - Knee Pivot Height	19.1 - 19.9	19.4
N - Buttock Popliteal Length	17.8 - 18.8	17.9
O - Chest Depth at 3rd Rib	8.4 - 9.0	8.7
P - Foot Length	9.9 - 10.5	10.4
V - Shoulder Breadth	16.6 - 17.2	16.8
W - Foot Breadth	3.5 - 4.2	4.0
Y - Chest Circumference	38.2 - 39.4	39.2
Z - Waist Circumference	32.9 - 34.1	33.1

Note: (See next page for external dimensions)

HYBRID III EXTERNAL DIMENSIONS



Note: Figure is referenced to the erect seated position. The curved lumbar does not allow the hybrid III to be positioned in a perfect erect attitude.

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET

DUMMY NO.: 306 DUMMY CALIBRATION BY: Tim Michnay

VERIFICATION DATE: August 5, 1998

VERIFICATION LABORATORY TEMPERATURE (66° - 78°): 70°

1.0 HEAD DROP TEST

	SPECIFICATION	MEASUREMENT
Peak Resultant Acceleration	225 - 275 G	234
Peak Lateral Acceleration	±15 G. MAX	-6
Is Acceleration Curve Unimodel	within 10% of peak	Yes

2.0 NECK FLEXION TEST

		SPECIFICATION	MEASUREMENT
Pendulum Speed		22.6 - 23.4 FT/SEC	23.3
Pendulum Deceleration	10 MS	22.50 - 27.50 G	23.29
	20 MS	17.60 - 22.60 G	19.27
	30 MS	12.50 - 18.50 G	14.59
Max. Pendulum G Above 30 MS		29.0 G MAX	14.6
Deceleration - Time Curve Decay Time to 5 G		34 - 42 MS	37
D Plane Rotation	MAX	64 - 78 DEG.	72
	TIME	57 - 64 MS	59
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 MS	114
Moment About Occipital Condyle	MAX.	65 - 80 FT. LBS	68
	TIME	47 - 58 MS	51
Positive Moment - Time Curve Decay Time to Zero		97 - 107 MS	102

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

3.0 NECK EXTENSION TEST

		SPECIFICATION	MEASUREMENT
Pendulum Speed		19.50 - 20.30 F/S	20.17
Pendulum Deceleration	10 MS	17.20 - 21.20 G	17.88
	20 MS	14.00 - 19.00 G	15.55
	30 MS	11.00 - 16.00 G	13.22
Max. Pendulum G Above 30 MS		22 G Max	13
Deceleration - Time Curve Decay Time to 5 G		38 - 46 MS	43
D Plane Rotation	MAX	81 - 106 DEG.	91
	TIME	72 - 82 MS	75
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 MS	154
Moment About Occipital Condyle	MIN.	-59.0/-39.0 FT LBS	-47.0
	TIME	65 - 79 MS	72
Positive Moment - Time Curve Decay Time to Zero		120 - 148 MS	138

4.0 CHEST IMPACT TESTS

	SPECIFICATION	MEASUREMENT
Probe Speed	21.6 to 22.4 F/S	22.0
Peak Deflection	2.50 to 2.86 IN.	2.73
Peak Resistive Force	1160 to 1325 LBS.	1298
Internal Hysteresis	69 to 85%	71

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

5.0 KNEE IMPACT TESTS

RIGHT KNEE	SPECIFICATION	MEASUREMENT
Probe Speed	6.8 to 7.0 F/S	6.9
Maximum Force	1060 - 1300 LBS.	1232

LEFT KNEE	SPECIFICATION	MEASUREMENT
Probe Speed	6.8 to 7.0 F/S	6.9
Maximum Force	1060 - 1300 LBS.	1271

6.0 HIP JOINT-FEMUR FLEXION TEST

LEFT KNEE	SPECIFICATION	MEASUREMENT	
		LEFT	RIGHT
Relative Humidity	10 - 70%	60%	
Rotation Rate	5-10 DEG/SEC.	Yes	Yes
30 DEGREE MAX. ROTATION	70 FT-LBF	67	64
150 FT-LBF	40-50 DEGREE MAX. ROTATION	40	41

HYBRID III DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 307 DUMMY CALIBRATION BY: Tim Michnay

I. CONFIGURATION VERIFICATION DATA

DATE OF VERIFICATION: August 5, 1998

DESCRIPTION	SPECIFICATION (inches)	ACTUAL MEASUREMENT (inches)
A - Total Sitting Height	34.6 - 35.0	34.8
B - Shoulder Pivot Height	19.9 - 20.5	20.3
C - "H" Point Height	3.3 - 3.5	3.4
D - "H" Point from Seat Back	5.3 - 5.5	5.4
E - Shoulder Pivot From Backline	3.3 - 3.7	3.4
F - Thigh Clearance	5.5 - 6.1	5.6
G - Back of Elbow to Wrist Pivot	11.4 - 12.0	11.7
H - Skull Cap Skin to Backline	1.6 - 1.8	1.7
I - Shoulder - Elbow Length	13.0 - 13.6	13.4
J - Elbow Rest Height	7.5 - 8.3	7.9
K - Buttock to Knee Length	22.8 - 23.8	23.4
L - Popliteal Height	16.9 - 17.9	17.3
M - Knee Pivot Height	19.1 - 19.9	19.3
N - Buttock Popliteal Length	17.8 - 18.8	18.1
O - Chest Depth at 3rd Rib	8.4 - 9.0	8.6
P - Foot Length	9.9 - 10.5	10.4
V - Shoulder Breadth	16.6 - 17.2	16.9
W - Foot Breadth	3.6 - 4.2	4.0
Y - Chest Circumference	38.2 - 39.4	38.9
Z - Waist Circumference	32.9 - 34.1	33.5

Note: (See next page C-2 for external dimensions)

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

DUMMY NO.: 307 DUMMY CALIBRATION BY: Tim Michnay

VERIFICATION DATE: August 5, 1998

VERIFICATION LABORATORY TEMPERATURE (66° - 78°): 70°

1.0 HEAD DROP TEST

	SPECIFICATION	MEASUREMENT
Peak Resultant Acceleration	225 - 275 G	273
Peak Lateral Acceleration	±15 G. MAX	-9
Is Acceleration Curve Unimodal	within 10% of peak	Yes

2.0 NECK FLEXION TEST

		SPECIFICATION	MEASUREMENT
Pendulum Speed		22.6 - 23.4 FT/SEC	23.0
Pendulum Deceleration	10 MS	22.50 - 27.50 G	24.20
	20 MS	17.60 - 22.60 G	19.42
	30 MS	12.50 - 18.50 G	13.66
Max. Pendulum G Above 30 MS		29.0 G MAX	13.6
Deceleration - Time Curve Decay Time to 5 G		34 - 42 MS	37
D Plane Rotation	MAX	64 - 78 DEG.	73
	TIME	57 - 64 MS	59
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 MS	116
Moment About Occipital Condyle	MAX.	65 - 80 FT. LBS	65
	TIME	47 - 58 MS	51
Positive Moment - Time Curve Decay Time to Zero		97 - 107 MS	100

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

3.0 NECK EXTENSION TEST

		SPECIFICATION	MEASUREMENT
Pendulum Speed		19.50 - 20.30 F/S	19.64
Pendulum Deceleration	10 MS	17.20 - 21.20 G	18.47
	20 MS	14.00 - 19.00 G	15.78
	30 MS	11.00 - 16.00 G	12.28
Max. Pendulum G Above 30 MS		22 G Max	12
Deceleration - Time Curve Decay Time to 5 G		38 - 46 MS	42
D Plane Rotation	MAX	81 - 106 DEG.	99
	TIME	72 - 82 MS	77
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 MS	160
Moment About Occipital Condyle	MIN.	-59.0/-39.0 FT LBS	-48.2
	TIME	65 - 79 MS	73
Positive Moment - Time Curve Decay Time to Zero		120 - 148 MS	144

4.0 CHEST IMPACT TESTS

	SPECIFICATION	MEASUREMENT
Probe Speed	21.6 to 22.4 F/S	21.9
Peak Deflection	2.50 to 2.86 IN.	2.82
Peak Resistive Force	1160 to 1325 LBS.	1219
Internal Hysteresis	69 to 85%	72

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

5.0 KNEE IMPACT TESTS

RIGHT KNEE	SPECIFICATION	MEASUREMENT
Probe Speed	6.8 to 7.0 F/S	6.9
Maximum Force	1060 - 1300 LBS.	1161

LEFT KNEE	SPECIFICATION	MEASUREMENT
Probe Speed	6.8 to 7.0 F/S	6.9
Maximum Force	1060 - 1300 LBS.	1182

6.0 HIP JOINT-FEMUR FLEXION TEST

LEFT KNEE	SPECIFICATION	MEASUREMENT	
		LEFT	RIGHT
Relative Humidity	10 - 70%	54%	
Rotation Rate	5-10 DEG/SEC.	Yes	Yes
30 DEGREE ROTATION	70 FT-LBF	58	47
40-50 DEGREE MAX. ROTATION	150 FT-LBF	42	46

APPENDIX D

TEST EQUIPMENT & INSTRUMENT CALIBRATION

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 306

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	J12439	Endevco	June 9, 1998
Head Y	J12471	Endevco	June 9, 1998
Head Z	J12423	Endevco	June 9, 1998
Head X Redundant	J12425	Endevco	June 9, 1998
Head Y Redundant	J12462	Endevco	June 9, 1998
Head Z Redundant	J12449	Endevco	June 9, 1998
Chest X	J13941	Endevco	June 9, 1998
Chest Y	J13984	Endevco	June 9, 1998
Chest Z	J13927	Endevco	June 9, 1998
Chest X Redundant	J13772	Endevco	June 9, 1998
Chest Y Redundant	J14008	Endevco	June 9, 1998
Chest Z Redundant	J14028	Endevco	June 9, 1998
Right Femur Load Cell	150	GSE	June 9, 1998
Left Femur Load Cell	957	GSE	June 9, 1998
Pelvis X	J11625	Endevco	June 8, 1998
Pelvis Y	J10730	Endevco	June 8, 1998
Pelvis Z	J11014	Endevco	June 8, 1998

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 306

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Neck Load Cell X	376	Denton	June 1, 1998
Neck Load Cell Y	376	Denton	June 1, 1998
Neck Load Cell Z	376	Denton	June 1, 1998
Neck Moment X	376	Denton	June 1, 1998
Neck Moment Y	376	Denton	June 1, 1998
Neck Moment Z	376	Denton	June 1, 1998
Chest Deflection Gauge	306	Servo	March 9, 1998
Lap Belt Load Cell	167	Denton	March 23, 1998
Torso Belt Load Cell	762	Lebow	March 16, 1998

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 306

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Right Tibia Moment X	437	Denton	March 17, 1998
Upper Right Tibia Moment Y	437	Denton	March 17, 1998
Lower Right Tibia Moment Y	425	Denton	March 16, 1998
Lower Right Tibia Force X	425	Denton	March 16, 1998
Lower Right Tibia Force Z	425	Denton	March 16, 1998
Upper Left Tibia Moment X	439	Denton	March 17, 1998
Upper Left Tibia Moment Y	439	Denton	March 17, 1998
Lower Left Tibia Moment Y	427	Denton	March 16, 1998
Lower Left Tibia Force X	427	Denton	March 16, 1998
Lower Left Tibia Force Z	427	Denton	March 16, 1998
Right Heel X	AK956	Endevco	July 23, 1998
Right Heel Z	AK972	Endevco	July 23, 1998
Right Toe Z	ALFP5	Endevco	July 23, 1998
Left Heel X	AGRC7	Endevco	July 23, 1998
Left Heel Z	AHT13	Endevco	July 23, 1998
Left Toe Z	ADAB3	Endevco	July 23, 1998

INSTRUMENTS FOR DUMMY NO. 307

	PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	AHTN3	Endevco	June 22, 1998
Head Y	AHT12	Endevco	June 22, 1998
Head Z	AH0C3	Endevco	June 22, 1998
Head X Redundant	J14896	Endevco	June 22, 1998
Head Y Redundant	J14771	Endevco	June 22, 1998
Head Z Redundant	J14774	Endevco	June 22, 1998
Chest X	AMP44	Endevco	June 22, 1998
Chest Y	AMRR4	Endevco	June 22, 1998
Chest Z	ALCR0	Endevco	June 22, 1998
Chest X Redundant	AMTG3	Endevco	June 22, 1998
Chest Y Redundant	AMTL6	Endevco	June 22, 1998
Chest Z Redundant	ALC37	Endevco	June 22, 1998
Right Femur Load Cell	9427	GSE	February 26, 1998
Left Femur Load Cell	9428	GSE	February 26, 1998
Pelvis X	ALA07	Endevco	June 22, 1998
Pelvis Y	J14103	Endevco	June 22, 1998
Pelvis Z	AHTW4	Endevco	June 22, 1998

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 307

	PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Neck Load Cell X	606	Denton	February 26, 1998
Neck Load Cell Y	606	Denton	February 26, 1998
Neck Load Cell Z	606	Denton	February 26, 1998
Neck Moment X	606	Denton	February 26, 1998
Neck Moment Y	606	Denton	February 26, 1998
Neck Moment Z	606	Denton	February 26, 1998
Chest Deflection Gauge	307	Servo	March 10, 1998
Lap Belt Load Cell	166	Denton	March 23, 1998
Torso Belt Load Cell	690	Lebow	July 14, 1998

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 307

	PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Right Tibia Moment X	436	Denton	March 17, 1998
Upper Right Tibia Moment Y	436	Denton	March 17, 1998
Lower Right Tibia Moment Y	424	Denton	March 16, 1998
Lower Right Tibia Force X	424	Denton	March 16, 1998
Lower Right Tibia Force Z	424	Denton	March 16, 1998
Upper Left Tibia Moment X	438	Denton	March 17, 1998
Upper Left Tibia Moment Y	438	Denton	March 17, 1998
Lower Left Tibia Moment Y	426	Denton	March 16, 1998
Lower Left Tibia Force X	426	Denton	March 16, 1998
Lower Left Tibia Force Z	426	Denton	March 16, 1998
Right Heel X	AP0T3	Endevco	July 22, 1998
Right Heel Z	AP122	Endevco	July 22, 1998
Right Toe Z	AP0P6	Endevco	July 22, 1998
Left Heel X	AJ837	Endevco	July 22, 1998
Left Heel Z	AH0A2	Endevco	July 22, 1998
Left Toe Z	AGMT2	Endevco	July 22, 1998

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Rear Seat Crossmember X	F07-A14	Entran	June 16, 1998
Right Rear Seat Crossmember X	F10-D04	Entran	February 13, 1998
Top of Engine Block X	I26-D19	Entran	February 13, 1998
Bottom of Engine X	G13-B01	Entran	June 16, 1998
Left Brake Caliper X	F20-G12	Entran	January 30, 1998
Right Brake Caliper X	I18-E18	Entran	February 13, 1998
Instrument Panel X	I25-I19	Entran	February 13, 1998
Redundant Left Rear Seat Crossmember X	J10-E14	Entran	June 16, 1998
Redundant Right Rear Seat Crossmember X	C05-Z13	Entran	February 13, 1998
Left Front Rocker	F10-D07	Entran	April 1, 1998
Right Front Rocker	G01-J02	Entran	June 17, 1998

	LABORATORY INSTRUMENTS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Neck Bending Pendulum Accelerometer	C12871	Endevco	June 9, 1998
Neck Bending Head Rotary Potentiometer	018	Spectrol	August 5, 1998
Neck Bending Pendulum Rotary Potentiometer	019	Spectrol	August 5, 1998
Chest Probe Accelerometer	J13780	Endevco	March 20, 1998
Knee Impact Accelerometer	ALCH7	Endevco	April 1, 1998

APPENDIX E

VEHICLE OWNER'S OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

Safety belts

Always wear your safety belts!

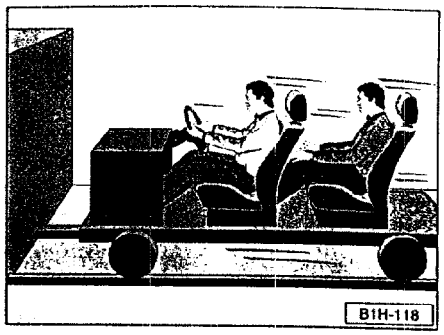
WARNING

Safety belts have been shown to be the single most effective means available for reducing the potential for serious injury and death in automobile accidents. Therefore, for your own protection as well as that of your passengers, always properly wear safety belts when the vehicle is in motion.

Pregnant women, injured or physically impaired persons should also use safety belts. Like all vehicle occupants, they are more likely to be seriously injured if they do not wear safety belts. The best way to protect the fetus is to protect the mother.

Why safety belts work and how to wear them properly is explained in this chapter. Read all the information given and always observe the following instructions and warnings pertaining to the use of the safety belts installed in your vehicle.

For information on child safety see page 43.

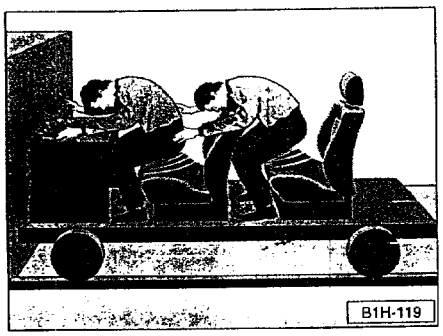


Why safety belts work

Safety belts can't work unless they are worn and worn properly.

The illustration above shows the passengers on a "vehicle" which is headed for a brick wall. They are not using safety belts.

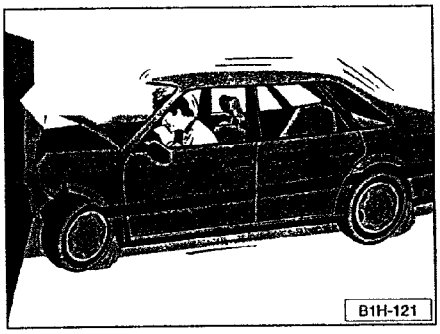
The physical principles involved are simple. Both the vehicle and the passengers possess energy which varies with vehicle speed and body weight. Engineers call this energy "kinetic energy".



The higher the speed of the vehicle and the greater the passenger's weight, the more kinetic energy there is and the more energy which must be "absorbed" in an accident.

Vehicle speed is, however, the most significant factor. If the speed doubles from 15 to 30 mph (25 to 50 km/h), for example, the kinetic energy increases 4 times!

Because these passengers are not using safety belts, their kinetic energy remains unchanged. They will keep moving at the same speed the vehicle was moving just before the crash, until something gets in the way – here, the wall.



The same physical principles apply to people sitting in a passenger car which is involved in a frontal collision.

Even when driving at city speeds of 20 to 30 mph (30–50 km/h), the forces acting on the body can reach one ton (2000 lb/1000 kg) or more. At greater speeds these forces are even higher.

People who do not use safety belts are also not attached to their car. In a frontal collision they will also continue to move forward at the speed their car was travelling just before the impact.

Unable to resist the tremendous forces arising at impact, they will slam violently into the steering wheel, dashboard, windshield or whatever else is in the way. Their impact with the vehicle interior takes place with all of the kinetic energy they had just before their car crashed. Those who do not use safety belts can also be thrown out of their car where even more severe or fatal injuries can occur.

Nobody is strong enough to overcome the forces of an accident by holding tight or bracing themselves against the dashboard. Safety belts can help to reduce the risk of injury caused by uncontrolled impact with the vehicle and the possibility of ejection.

Passengers sitting in the rear seats who do not use safety belts endanger not only themselves but also front seat passengers. In a frontal collision they will also move forward where they can hit and injure the driver or front seat passenger.

Safety belts protect

Safety belts used properly can make a big difference. Safety belts help to keep passengers in their seats, reduce energy levels applied to the body in an accident gradually and help prevent the uncontrolled movement which can cause serious injuries. Safety belts also help to keep passengers in their seats.

Safety belts attach passengers to the car and give them the benefit of being slowed down more gently or "softly" through the give in the safety belts, crumple zones and other safety features engineered into today's cars. By reducing the kinetic energy over a longer period of time, the forces on the body become more "tolerable" and less likely to produce injury.

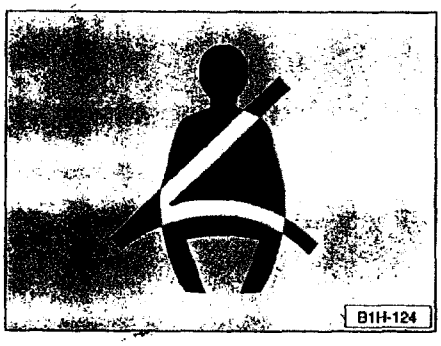
In addition, safety belts reduce the danger of being thrown out of the car.

Although these examples are based on a frontal collision, safety belts can also substantially reduce the risk of injury in other types of accidents. So, regardless of whether you are on a long trip or just going to the corner store, always buckle up and make sure others do too.

The following pages provide important instructions which will enable you to use safety belts properly. Be sure to read and follow the instructions carefully and heed all warnings.

To further increase the safety for the front passengers, the vehicle is equipped with a supplemental airbag system. See page 36.

The safety belts provided must nevertheless be worn because the airbags are activated only by severe frontal collisions. The airbags are not activated by minor frontal collisions, side and rear collisions, by a roll over or by cases where there is no considerable impact on the front of the vehicle.



Belt warning system

Your vehicle has a warning light to remind you to wear your safety belt.

If you do not put on your safety belt after switching on the ignition, the warning light in the instrument cluster will come on along with a chime for approximately 6 seconds.

Fasten your safety belt now and make sure that your passengers also properly put on their safety belts.

How to wear safety belts properly

On the previous pages, you have seen how safety belts offer protection in accidents. Accident statistics show that passengers properly wearing safety belts have a lower risk of being injured and a much better chance of surviving an accident. For this reason, wearing a safety belt is legally required in most countries and in much of the United States and Canada.

WARNING

Always fasten your safety belts before driving off. Always make sure your passengers are properly restrained – even those sitting in the rear.

Safety belts can only work when used properly. Always observe the following precautions:

• Never wear belts twisted.

• Never strap in more than one person, including small children, with each belt. It is especially dangerous to place a safety belt over a child sitting on your lap.

• Never place your feet on the instrument panel or on the seat. Always keep both feet on the floor in front of the seat.

• Never wear belts over rigid or breakable objects in or on your clothing, such as eye glasses, pens, keys, etc. as these may cause injury.

- **Never wear safety belts in any other way than illustrated and described in this chapter. For instance, do not wear shoulder part of belt under your arm or otherwise out of position. This would increase the risk of serious injury in case of an accident.**
- **Several layers of heavy clothing may interfere with proper positioning of belts and reduce the overall effectiveness of the system.**
- **Never allow safety belts to become damaged by being caught in door or seat hardware. Always keep belt buckles free of any obstruction that may prevent secure locking.**
- **Never use comfort clips or devices which create slack in the shoulder belt portion and can increase the risk of injury in an accident. However, such clips may be required in the proper use of some child restraint systems.**
- **Inspect your belts periodically. If belts show damage to webbing, bindings, buckles or retractors, they must be replaced.**
- **The belts must be kept clean as otherwise the retractors may not work properly (see also "Vehicle Care").**
- **Safety belts that have been worn and loaded in an accident must be replaced by an authorized Audi Dealer.**
- **Never modify, disassemble or attempt to repair the safety belts in your vehicle.**

Your Audi has 5 seating positions. Two in the front and three in the rear. Each seating position has been provided with a safety belt, which must be used in the interests of safety whenever the vehicle is in motion.

Lap-shoulder belt

The front seats are equipped with three-point safety belts.

The rear seat outside passenger positions are also equipped with three-point safety belts.

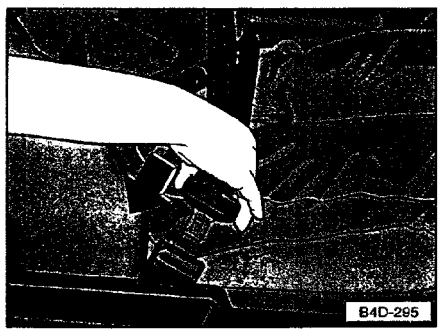
The combination lap-shoulder belts have locking retractors. The system adjusts automatically to your size and movements as long as the pull on the belt is slow.

Hard braking or a collision locks the belt. The belt will also lock when you drive up or down a steep hill or in a sharp curve.

The higher the speed of the vehicle and the greater the passenger's weight, the more kinetic energy there is and the more energy which must be "absorbed" in an accident.

Fastening the safety belt

- **Before fastening the safety belt, first adjust your seat – see page 51.**



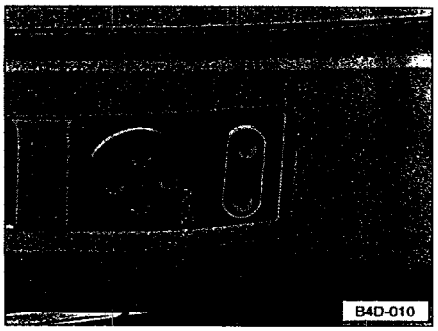
WARNING

Safety belts only offer optimum protection when the seat back is upright and belts are properly positioned on the body. Improperly positioned safety belts can cause serious personal injury in an accident.

- To fasten, grasp belt tongue and pull belt in continuous slow motion across your chest and lap.
- Insert belt tongue into buckle on inboard side of seat. Push down until it is securely locked with an audible click. Pull belt to check.

WARNING

Always make certain that the safety belt tongue is inserted into the safety belt buckle associated with the corresponding seat. Attaching the safety belt to the buckle for another seat could reduce safety belt effectiveness and cause injury.



Adjusting shoulder seat belt

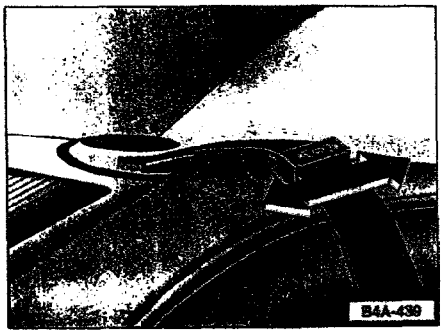
Belt height adjustment

To adjust, press the upper or lower part of the switch until the belt is in the correct position.

Memory for belt height

The desired position of the driver's safety belt is automatically stored in the memory for the driver's seat adjustment together with the seat position. See page 54.

The driver's seat should be adjusted first. Then adjust the belt height to match the new position.



The **outer rear seats** are equipped with a **lateral shoulder belt adjustment.**

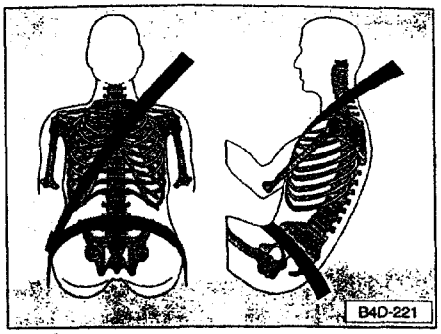
To adjust, move the belt guide towards the center of the vehicle for taller occupants, or towards the outside for shorter occupants. See symbols on the belt guide.

Note

Wearing your safety belt properly – see page 29.

The shoulder belt must be positioned over the shoulder – **it must never rest against the neck and must fit against your body.**

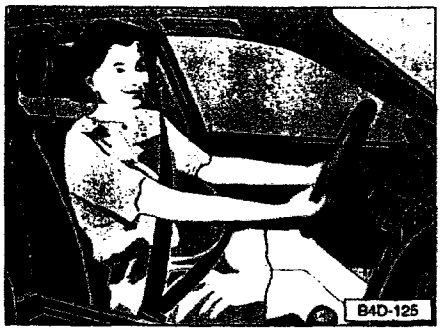
The lap belt must be worn low and tight across the pelvis. Pull belt tight if necessary.



WARNING

• Always position safety belts properly over the body for maximum levels of safety. Improperly positioned safety belts can cause serious personal injury in case of an accident.

• Safety belts worn too loose will allow too much forward movement of your body in a crash. This will increase the risk of personal injury.



WARNING

Pregnant women should especially make sure to wear the lap portion of the safety belt as low as possible across the pelvis so that there is no pressure on the abdomen.

Convertible Locking Retractor (CLR)

The convertible locking retractor is necessary to secure child restraint systems.

The retractors for the front passenger's seat and the outer rear seat three-point safety belts are equipped with an automatic locking feature in addition to the emergency locking feature.

If you need to install a child restraint system at the front passenger's seat or an outer seating position of the rear seat, it must be secured by use of the belt after activating the locking feature – see page 49.

Activating the locking retractor

- Slowly pull the belt all the way out.
- Insert the belt tongue into the buckle for that seating position (pull on it to check!) and guide the rest of the belt with your hand back in place; while doing this you should hear a clicking sound. This sound signals that the locking retractor has been activated.

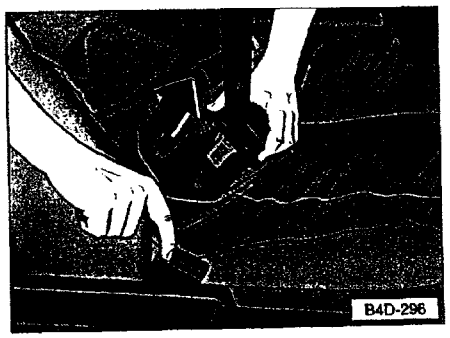
Deactivating the locking retractor

The locking retractor is deactivated by unfastening the safety belt and allowing the safety belt to retract completely to its stowed position. The safety belt can now be used as an ordinary three-point safety belt without the additional locking feature.

If a person sitting in the passenger seat or rear wearing the safety belt should activate the locking retractor, then the safety belt must be unfastened in order to deactivate the locking retractor.

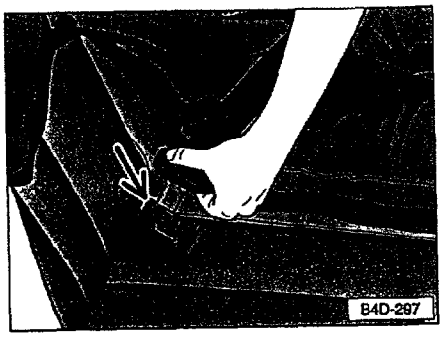
WARNING

Never unfasten the safety belt to deactivate the locking retractor while the vehicle is in motion.



Unfastening the safety belt

- Push the red release button on the buckle. The belt tongue will spring out of the buckle.
- Allow belt to wind up on retractor as you guide belt tongue to its stowed position.



Lap belt

The rear center seating position is equipped with a lap belt.

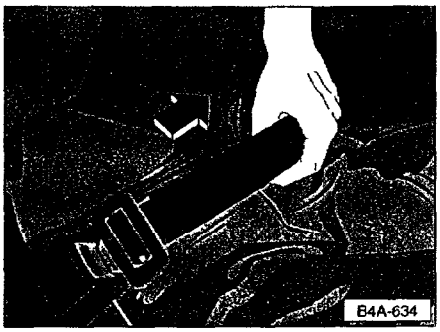
The belt incorporates an automatic retractor. The retractor will lock the lap belt when your passenger has buckled up, and the remaining slack has been retracted.

- To fasten lap belt, grasp belt tongue and slowly and evenly pull across the pelvis. Insert belt tongue into the respective buckle and push down until it is securely locked with an audible click. Pull belt to check and make sure that any slack is wound on the retractor.

Note

If the belt locks up while pulling it out of the retractor, let the belt rewind **completely** and then pull it out again.

- Then, make sure the belt is positioned low and tightly across the pelvis. If necessary, pull the belt toward the retractor and let it roll up.



WARNING

To reduce the risk of injury in an accident, position the lap belt tight and as low as possible across the pelvis.

Pregnant women should especially make sure to wear the lap portion of the safety belt as low as possible across the pelvis so that there is no pressure on the abdomen.

- To unfasten belt, push in the red release button on buckle and let the belt roll up.

Belt tensioner

The safety of the driver, the front passenger and the passengers on the outer rear seats **wearing their safety belts** has been increased not only by the airbag system but also by a special safety belt retractor for the three-point automatic safety belts.

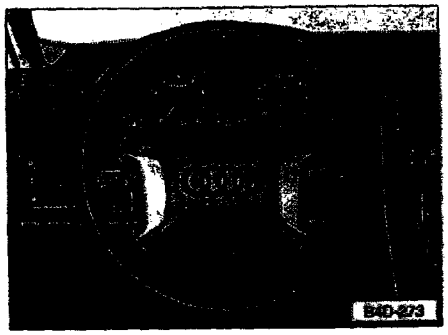
The system is activated by sensors of the airbag system in the case of a serious front collision. A fine dust will be released from each belt tensioner. The safety belts will automatically be tensioned.

The belt tensioner will not activate in the event of light frontal, side or rear collisions.

Notes

- Due to special repair procedures, any work on the system, as well as the removal and installation of any components of the system, must be performed by an authorized Audi Dealer only.
- When the safety belt tensioner is activated, a fine dust is released. This is normal and is not caused by a fire in the vehicle.
- The belt tensioner system works for **one** accident only. If the belt tensioners have been activated, then the system must be replaced.
- Observe all safety regulations if the vehicle or individual parts of the system are to be scrapped. Your authorized Audi Dealers are familiar with theses regulations and can perform this service for you.
- **If you should sell your vehicle, be sure to give the purchaser this Owner's Manual.**

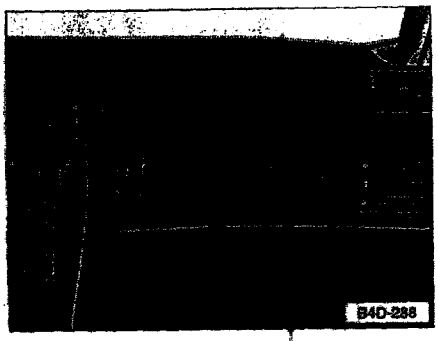
Airbag system



Your vehicle is equipped with **two front and four side airbags,** one front and side airbag for each front occupant and one side airbag for each left and right rear seat passenger.

The airbags are intended to supplement the three-point safety belts. When the safety belts are properly worn, the supplemental airbag restraints can provide additional protection for the chest and face of the driver and the front seat passenger in a severe frontal collision.

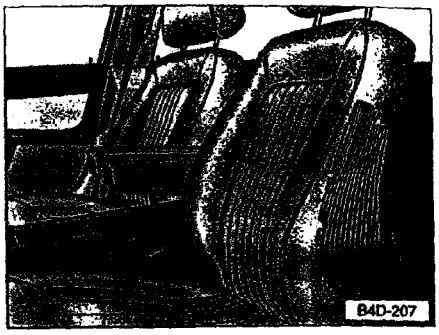
In the event of a severe side collision the side airbags reduce the risk of injury to the occupants in the areas of the body facing the impact.



The airbag is not a substitute for the safety belt, but rather a part of the overall passive vehicle safety system. Bear in mind that the airbag system works most effectively when used in conjunction with the safety belts provided.

It is therefore most important to wear the safety belts at all times. See pages 26 to 35.

The **front airbags** for the driver and front passenger are located in the padded hub of the steering wheel and on the right side of the instrument panel above the glove compartment. See left-hand and center illustrations.



The **side airbags** are located in the backrest padding for the front seats (see illustration) and in the seatback padding for the rear left and right seating position of the rear seat bench. The installation points are marked with the word "AIRBAG".

WARNING

To ensure that the function of the side airbags is not impaired, do not place protective covers over the seatback and do not use extra cushions on the seats covering the area where the side airbag inflates.

System components

The airbag system consists of the following components:

- an electronic control / monitoring unit (control unit)
- the two front airbags
  - for the driver
  - for the front passenger
- the four side airbags
  - one for each front seat occupant
  - one for each outboard passenger on the rear seat bench
- the seat occupancy indicator for the front passenger seat and the left and right seats of the rear seat bench
- the driver and the front passenger belt lock reading
- the belt indicator (three point belts – rear seats)
- the three-point safety belt tensioners
- an indicator light in the instrument cluster (see page 82).

In addition to this your vehicle is also equipped with a kneebar for extra protection.

The airbag indicator light in the instrument cluster (readiness light) will light up for a few seconds each time the ignition is switched on.

The light monitors the electric control/monitoring unit, ignitor sensor circuits, and system wiring.

The airbag system must be inspected if the indicator light:

- does not come on when the ignition is switched on;
- does not go out after a few seconds after the ignition is switched on, or;
- comes on while driving.

In the event of a system malfunction, the indicator light will stay on continuously to serve as a constant reminder to have the system repaired.

WARNING

If any of these conditions occur, have the system inspected immediately by your authorized Audi Dealer. Otherwise, the airbag may not function properly.

When are the airbags triggered?

The airbag system is designed so that in a severe **frontal collision** the driver and front passenger airbags are triggered.

In **severe side collisions** the side airbags on the impact side of the vehicle are triggered.

Both the front and side airbags may be triggered together in certain types of accidents.

The airbags for the front passenger seat and the left and right seats of the rear seat bench will only be triggered if these seats are occupied.

The airbag system is **not triggered in minor** frontal or side collisions or in rear collisions or if the car overturns. In such situations the occupants are protected in the normal way by the safety belts.

It is not possible to define an airbag triggering range that will cover every possible angle of impact, since the circumstances will vary considerably between one accident and another.

Important factors include, for example, the nature (hard or soft) of the object which the car hits, the angle of impact, vehicle speed and etc.

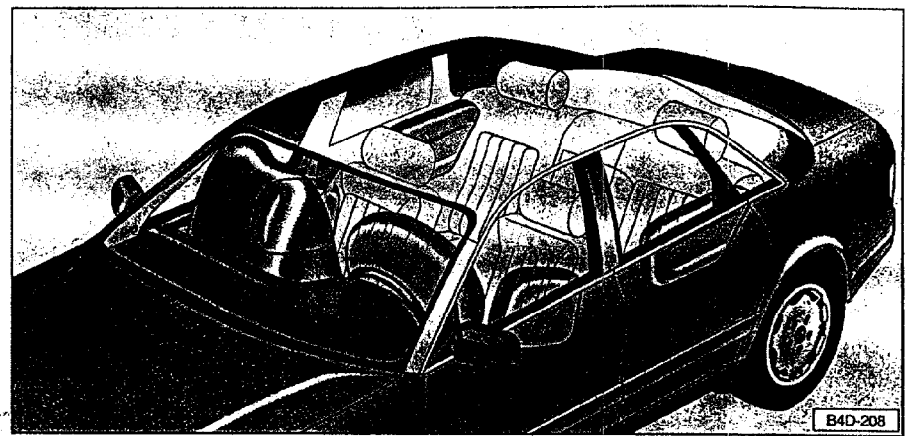
The triggering of the airbag system depends on the vehicle deceleration rate induced by the collision and registered by the control unit. If this rate is below the reference value programmed into the control unit the airbags will not be triggered, even though the car may be badly damaged as a result of the accident.

How the airbag system works

Front airbags

When the system is activated, both airbags fill with a propellant gas, break open their covers and inflate as shown in the illustration on this page[1].

[1] The illustration depicts all the airbags in their inflated condition in order to show their range of effectiveness. However, it is very unlikely that they will all be triggered at once in an accident.



The airbags inflate within a fraction of a second and with considerable amount of force in order to provide additional protection in an accident.

Fully inflated airbags in combination with properly worn safety belts slow down and limit the occupant's forward movement and help to reduce the risk of injury to the head and upper torso.

Openings in the airbags allow the gas to escape. This controlled escape of gas ensures gradual cushioning of the occupant to minimize injury. The airbag will deflate sufficiently, enabling the front occupants to see forward once the impact has been absorbed.

When the airbag system is activated, fine dust is released. This is normal and is not caused by a fire in the vehicle.

This dust is mostly made up of a powder used to lubricate the airbags as they deploy and could irritate the skin.

WARNING

If you have been in an accident in which the airbags have deployed, be sure to wash your hands and face with mild soap and water before eating. Be careful not to get the dust into your eyes or into any cuts or scratches. If the residue should get into your eyes, flush them with water.

Side airbags

In a lateral collision the side airbags reduce the risk of injury to the upper part of the body along the side facing the door similarly to the front airbags.

In order to assure this additional protection, the side airbag must inflate within milli-seconds during a collision.

When the airbag is activated, it breaks through a seam on the side of the seatback identified by the AIRBAG label, and inflates between the passenger and side trim panel at very high speed. When this happens, the airbag inflates with such a high force, that it could injure you if your seating position is not proper upright, or if items are positioned in the area where the side airbag inflates. This applies especially to children.

See page 50 for further details.

Importance of proper seating position

WARNING

In order to help the airbag to do its job, it is important, both as a driver and as a passenger to maintain a proper seating position – see page 51.

In a collision airbags must inflate within a fraction of a second and with a considerable amount of force in order to provide additional protection for the driver and front seat passenger. Do not sit any closer than necessary to the steering wheel and instrument panel. By keeping room between your body and the front of the passenger compartment, the airbag can inflate fully and completely as intended and do its job more effectively.

Always heed WARNINGS on next page.

Be sure to always

- Adjust the driver's seat properly, consistent with your size. See also page 51.
- Make sure that the passenger's seat is no closer than necessary to the instrument panel.
- Maintain an upright seating position with your back against the backrest of your seat.

WARNING

• Sitting too close to the steering wheel or dashboard will decrease the effectiveness of the airbags and can increase the risk of personal injury in an accident. Always wear safety belts properly and sit upright with the seat no closer to the steering wheel or instrument panel than necessary. If you are unrestrained, leaning forward, sitting sideways or out of position in any way, you are at greater risk of injury in a crash and may also receive serious injuries from the airbag if you are up against it when it inflates.

• In order to allow the side airbags to inflate fully and provide maximum protection, always maintain the position defined by the safety belts when driving.

• Objects between you and the airbag can increase the risk of injury in an accident by interfering with the way the airbag unfolds or by being pushed into you as the airbag inflates.

• Never place objects over or near the area identifying the airbag by the word "Airbag" on the steering wheel and the instrument panel or between the area where the airbag is stored and yourself. These objects could cause injury especially in a crash severe enough to cause the airbag to inflate.

Never hold objects in your hands or on your lap when the vehicle is in use.

Do not affix any accessories (e.g. drinks holders) to the doors. Never place objects near the area identifying the side airbags by the word "Airbag" on the backrest.

• The built-in coat hooks must only be used for lightweight clothing. Do not leave any heavy or sharp-edged objects in the pockets which may interfere with side airbag deployment and can cause personal injury in an accident.

Never let children ride unrestrained in the vehicle.

Children may be severely injured or killed when the airbags inflates if they are not properly restrained.