

REPORT NO. 208-MGA-2001-005

**SAFETY COMPLIANCE SLED TESTING FOR FMVSS 208  
OCCUPANT CRASH PROTECTION**

Saab Cars USA, Inc.  
2001 Saab 9-5 4 Door  
NHTSA NO. C10507

MGA RESEARCH CORPORATION  
5000 WARREN ROAD  
BURLINGTON, WI 53105



Test Date: April 19, 2001

Report Date May 4, 2001

**FINAL REPORT**

Prepared For:  
**U.S. DEPARTMENT OF TRANSPORTATION**  
**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**  
**SAFETY ASSURANCE**  
**OFFICE OF VEHICLE SAFETY COMPLIANCE**  
MAIL CODE: NSA-30  
400 SEVENTH STREET, S.W., ROOM 6115  
WASHINGTON, D.C. 20590

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

PREPARED BY: Chad Gadberry  
Chad Gadberry, Project Engineer  
MGA Research Corporation

DATE: 5/14/01

APPROVED BY: David Winkelbauer  
Facility Director, David Winkelbauer  
MGA Research Corporation

DATE: 5/14/01

Technicians: Alan Arttus  
Tammy Brausch  
Ben Marx  
Tim Michnay  
Doug Miller  
Chris Novak  
Kurt Range

Secretary: Donna M. Janovicz

FINAL REPORT ACCEPTED BY:

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

8/9/01  
Date of Report Acceptance

# TECHNICAL REPORT STANDARD TITLE PAGE

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                       |                                                                                                                                                                                                                      |          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 1 Report No<br>208-MGA-2001-005                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2 Government Accession No                             | 3 Recipient's Catalog No                                                                                                                                                                                             |          |
| 4 Title and Subtitle<br><br>Final Report for FMVSS 208 Compliance Sled Testing of a<br>2001 Saab 9-5 4 Door<br>NHTSA No C10507                                                                                                                                                                                                                                                                                                                                                                             |                                                       | 5 Report Date<br>May 4, 2001                                                                                                                                                                                         |          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                       | 6 Performing Organization Code<br>MGA                                                                                                                                                                                |          |
| 7 Author(s)<br>Chad Gadberry, Project Engineer                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                       | 8 Performing Organization Report No<br>208-MGA-2001-005                                                                                                                                                              |          |
| 9 Performing Organization Name and Address<br>MGA Research Corporation<br>5000 Warren Road<br>Burlington, WI 53105                                                                                                                                                                                                                                                                                                                                                                                         |                                                       | 10 Work Unit No                                                                                                                                                                                                      |          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                       | 11 Contract or Grant No<br>DTNH22-98-D-11055                                                                                                                                                                         |          |
| 12 Sponsoring Agency Name and Address<br><br>U S Department of Transportation<br>National Highway Traffic Safety Administration<br>Office of Vehicle Safety Compliance (Mail Code NSA-30)<br>400 Seventh St , S W , Room 6115<br>Washington, D C 20590                                                                                                                                                                                                                                                     |                                                       | 13 Type of Report and Period Covered<br>Final Report<br>April 19 to May 4, 2001                                                                                                                                      |          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                       | 14 Sponsoring Agency Code<br><br>NSA-30                                                                                                                                                                              |          |
| 15 Supplementary Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                                      |          |
| 16 Abstract<br><br>A compliance test (sled test) was conducted on the subject 2001 Saab 9-5 4 Door in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No TP208S-01 for the determination of FMVSS 208 compliance Test failures identified were as follows<br><br>- The sunvisor airbag warning label is not permanently affixed to the sunvisor<br>- The belt contact force of the left and right rear seating position is greater than the maximum allowable |                                                       |                                                                                                                                                                                                                      |          |
| 17 Key Words<br><br>Compliance Testing<br>Safety Engineering<br>FMVSS 208S<br>Sled Test                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                       | 18 Distribution Statement<br><br>Copies of this report are available from NHTSA Technical Reference Division, Room 5108, (NAD-40)<br>400 Seventh Street, S W<br>Washington, D C 20590<br>Telephone No (202) 366-4946 |          |
| 19 Security Classif<br>(of this report)<br>Unclassified                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 20 Security Classif<br>(of this page)<br>Unclassified | 21 No of Pages<br><br>168                                                                                                                                                                                            | 22 Price |

TABLE OF CONTENTS

| <u>DESCRIPTION</u>                                           | <u>PAGE NO.</u> |
|--------------------------------------------------------------|-----------------|
| Purpose                                                      | 1               |
| Test Procedure                                               | 2               |
| Test Results Summary                                         | 3               |
| Sled Test Summary                                            | 5               |
| General Test and Vehicle Parameter Data                      | 6               |
| Post Test Data                                               | 9               |
| Seat and Steering Column Positioning Data                    | 10              |
| Dummy Positioning Measurement Table                          | 11              |
| Vehicle Targeting Measurements                               | 16              |
| Vehicle Accelerometer Placement and Data Summary             | 17              |
| Vehicle Accelerometer Location Measurements and Data Summary | 18              |
| Camera Positions                                             | 19              |
| Camera Location Measurements                                 | 20              |
| Occupant Injury Data                                         | 21              |
| Seat Belt Warning System Data                                | 23              |
| Readiness Indicator                                          | 24              |
| Airbag Labels Data                                           | 25              |
| Rear Outboard Seating Position Seat Belt Data                | 32              |
| Lap Belt Lockability Data                                    | 33              |
| Seat Belt Comfort and Convenience Data                       | 45              |
| <br>Appendix A - Photographs                                 |                 |
| <br>Appendix B - Data Plots                                  |                 |
| <br>Appendix C - Manufacturer Provided Test Information      |                 |

### Purpose

This FMVSS 208 compliance sled test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 208 compliance test program conducted for the National Highway Traffic Safety Administration (NHTSA) by MGA Research Corporation (MGA) under Contract No. DTNH22-98-D-11055. The purpose of this test was to determine if the subject vehicle, a 2001 Saab 9-5 4 Door, NHTSA No. C10507, meets the performance requirements of FMVSS 208, "Occupant Crash Protection," in the impact simulation sled test mode.

### Test Procedure

This test was conducted in accordance with NHTSA's Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure No. TP-208S-01 dated January 15, 1998. Data was obtained relative to FMVSS 208, "Occupant Crash Protection," performance.

The test vehicle was instrumented with four (4) accelerometers to measure longitudinal axis accelerations.

The test vehicle contained two (2) Part 572 E 50th percentile adult male anthropomorphic test devices (dummies). The dummies were positioned in the front outboard seating positions according to the dummy placement procedures specified in Appendix B of the Laboratory Test Procedure. The dummies were not restrained by seat belts.

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

The thirty-eight (38) data channels were digitally sampled at 10,000 samples per second and processed per Sections 11.7 through 11.9 of the Laboratory Test Procedure.

The crash event was recorded by one (1) real-time motion picture camera and six (6) high-speed motion picture cameras. The pre-test and post-test conditions were recorded by one (1) real-time motion picture camera.

### Test Results Summary

This FMVSS 208 compliance sled test was conducted at MGA Research Corporation on April 19, 2001

The test vehicle, a 2001 Saab 9-5 4 Door, NHTSA No. C10507, appeared to comply with the performance requirements of FMVSS 208 in the impact simulation sled test mode as measured by Hybrid III 50th percentile male dummies

|                    | FMVSS 208 Max Allowable<br>Injury Assessment Values | Driver<br>(Serial #401) | Passenger<br>(Serial #403) |
|--------------------|-----------------------------------------------------|-------------------------|----------------------------|
| HIC                | 1000                                                | 372                     | 169                        |
| Chest g            | 60 g                                                | 37.8 g                  | 38.2 g                     |
| Chest displacement | 3 in.                                               | 1.2 in                  | 0.6 in.                    |
| Left Femur         | 2250 lb                                             | 1173 lb                 | 1670 lb                    |
| Right Femur        | 2250 lb                                             | 1349 lb                 | 1096 lb                    |
| Neck Extension     | 57 Nm                                               | 4.7 Nm                  | 13.6 Nm                    |
| Neck Flexion       | 190 Nm                                              | 73.1 Nm                 | 87.3 Nm                    |
| Neck Tension       | 3300 N                                              | 702 N                   | 560 N                      |
| Neck Compression   | 4000 N                                              | 2313 N                  | 723 N                      |
| Neck Shear         | 3100 N                                              | 1347 N                  | 1563 N                     |

The vehicle also appears to meet the other FMVSS 208 requirements for which it was tested, with the exception of: (1) the requirement that the sunvisor airbag warning label be permanently affixed to the sunvisor, and (2) the belt contact force of the left and right rear seating position is greater than the maximum allowable. These results are shown in the data sheets that are included in this report.

The test vehicle was equipped with air bags at the driver and passenger seating positions. The dummies were not restrained by seat belts. The sled carriage was accelerated to 17.6 g with an integrated velocity change of 30.5 mph. After filtering the acceleration signal to Channel Class 60, the airbag system was triggered 20.2 milliseconds after 0.5 g acceleration.

INCLUDE DISCUSSION OF LOST CHANNELS OR OTHER TEST ISSUES.

- No valid data was collected from the Passenger Neck Moment X channel.

### Sled Test Summary

Vehicle NHTSA No.: C10507    Test Mode. FMVSS 208 SLED TEST

Vehicle Yr/Make/Model/Body Style: 2001/Saab/9-5/4 Door

Test Date: April 19, 2001    Time 12:55 p m    Temp. 71°F

Vehicle Test Weight 4028 lbs

#### **DUMMY INFO.**

Dummy Type

#### **DRIVER**

Part 572E

#### **PASSENGER**

Part 572E

Serial Number

401

403

Restraint System

Frontal airbag

Frontal airbag

No. Data Channels

15

15

Number of Cameras:

1 Real Time

6 High Speed

Door Opening Data:

yes Left Front

yes Right Front

#### **FRONT SEAT(S) DATA**

#### **DRIVER**

#### **PASSENGER**

Seat Track Failure -

0.0 inches shift,

0.0 inches shift

Seat Back Failure -

no

no

#### **VISIBLE DUMMY CONTACT POINTS:**

#### **DRIVER**

#### **PASSENGER**

Head

Airbag/windshield/  
sunvisor/roof

Airbag/sunvisor

Chest

Airbag

Airbag

Left Knee

Knee bolster

Glove box

Right Knee

Knee bolster

Glove box

General Test And Vehicle Parameter DataVehicle Yr/Make/Model/Body Style: 2001/Saab/9-5/4 DoorVehicle NHTSA No : C10507 VIN: YS3ED48E513027091 Color: Black

## Engine Data

No. Cylinders: 4; CID:       ; Liters: 2.3; CCs:       Placement: Longitudinal/Inline:       ; Transverse/Lateral: X

## Transmission Data:

Speeds: 4; Manual:       , Automatic: X; Overdrive       

## Final Drive

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

## Major Options:

A/C X; Pwr. Strg.: X; Pwr. Brakes: X; Pwr. Windows: XPwr. Dr. Locks: X; Other: Tilt wheel, cruise control, rear defogger, moon roofDate Received: 1/26/01; Odometer Reading: 38 milesSelling Dealer: Bell Saab, 6940 Washington Avenue, Racine, WI 53406REMARKS: None

General Test And Vehicle Parameter Data (Cont.)

## DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: Saab Cars USA, Inc.Date of Manufacture: 12/00; VIN. YS3ED48E513027091GVWR: 4530 lbs; GAWR Front: 2500 lbs.GAWR Rear: 2310 lbs.

## DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:

FRONT: 39 psi REAR: 39 psiRecommended Tire Size: P215/55VR16;

Recommended Cold Tire Pressure:

FRONT: 39 psi REAR: 39 psiSize of Tires on Test Vehicle: P215/55R16Type of Spare Tire: T115/70R16; Space Saver: X; Standard:       

## Vehicle Capacity Data:

Type of Front Seats: X Bucket;    Bench;    Split BenchNumber of Occupants: 2 Front; 3 Rear;    3rd Seat; 5 TOTAL

REMARKS: None

VEHICLE CAPACITY WEIGHT (VCW) = 920 lbs.No. Of Occupants x 150 lbs = 750 lbsRated Cargo/Luggage Weight (RCWL) = 170 lbs (Difference)

General Test And Vehicle Parameter Data (Cont.)

WEIGHT OF TEST VEHICLE AS RECEIVED AT LABORATORY: (with maximum fluids)

|                                           |                  |                  |                  |
|-------------------------------------------|------------------|------------------|------------------|
| Right Front =                             | <u>1057</u> lbs. | Right Rear =     | <u>681</u> lbs.  |
| Left Front =                              | <u>1091</u> lbs. | Left Rear =      | <u>685</u> lbs.  |
| TOTAL FRONT =                             | <u>2148</u> lbs. | TOTAL REAR =     | <u>1366</u> lbs. |
| % Total Weight =                          | <u>61.1</u> %    | % Total Weight = | <u>38.9</u> %    |
| TOTAL DELIVERED WEIGHT = <u>3514</u> lbs. |                  |                  |                  |

WEIGHT OF FULLY LOADED TEST VEHICLE WITH TWO DUMMIES (344 LB) AND 170 POUNDS OF CARGO WEIGHT

|                                 |                  |                  |                  |
|---------------------------------|------------------|------------------|------------------|
| Right Front =                   | <u>1130</u> lbs. | Right Rear =     | <u>873</u> lbs.  |
| Left Front =                    | <u>1154</u> lbs. | Left Rear =      | <u>871</u> lbs.  |
| TOTAL FRONT =                   | <u>2284</u> lbs. | TOTAL REAR =     | <u>1744</u> lbs. |
| % Total Weight =                | <u>56.7</u> %    | % Total Weight = | <u>43.3</u> %    |
| TOTAL WEIGHT = <u>4028</u> lbs. |                  |                  |                  |

TEST VEHICLE ATTITUDE: (all measurements in degrees)

|                               |                       |
|-------------------------------|-----------------------|
| AS DELIVERED DOOR SILL ANGLE: | <u>0.4° nose down</u> |
| AS TESTED DOOR SILL ANGLE:    | <u>0.2° nose down</u> |
| FULLY LOADED DOOR SILL ANGLE: | <u>0.3° nose up</u>   |

FUEL SYSTEM DATA

Fuel System Capacity From Owner's Manual = 19.8 gallons  
 Usable Capacity Figure Furnished by COTR = 19.8 gallons

REMARKS None

Post-Impact Data

Test number: HT01041901

NHTSA number C10507

Test date: April 19, 2001

Test time: 12:55 p.m.

Test type: FMVSS 208 Compliance Sled Test

Impact angle: 0°

Ambient Temperature  
at Impact Area: 71°F

Temperature in  
Occupant Compartment: 71°F

Impact Velocity:

Integrated velocity from the integration of the entire sled acceleration. 30.5 mph

Specified integrated velocity range: 28 to 30 mph

Sled Carriage Acceleration:

Acceleration: 17.6 g

Specified Acceleration Range: 16.0 - 18.2 g

Sled Carriage Acceleration Duration:

Time from T-0 (-0.5 g) to 0.0 g: 125.9 msec

Specified Acceleration Duration. 120.0 to 130.0 msec

The sled acceleration corridor was achieved.

## Seat and Steering Column Positioning Data

Vehicle Yr/Make/Model/Body Style 2001/Saab/9-5/4 Door

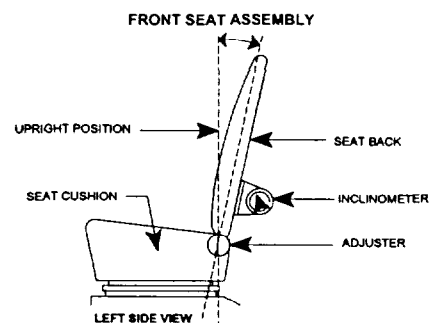
Vehicle NHTSA No.: C10507 Test Date: April 19, 2001

### NOMINAL DESIGN RIDING POSITION:

Driver Seat: Seat Back Angle\* = 18.0°

Passenger Seat: Seat Back Angle\* = 18.0°

\* Corresponds to 25° back angle on H-Point machine.



### SEAT FORE AND AFT POSITIONS:

Driver Seat: The seat track had a total continuous movement of 204 mm and was positioned 102 mm rearward from the foremost position with the forward most position as zero.

Passenger Seat: The seat track had a total continuous movement of 204 mm and was positioned 102 mm rearward from the foremost position with the forward most position as zero.

### STEERING COLUMN ADJUSTMENTS:

The steering column was placed in the mid position of its telescoping motion (15 of 30 mm) and angle (23 1°)

Dummy Positioning Measurement Table

Vehicle Year/Make/Model/Body Style: 2001/Saab/9-5/4 Door

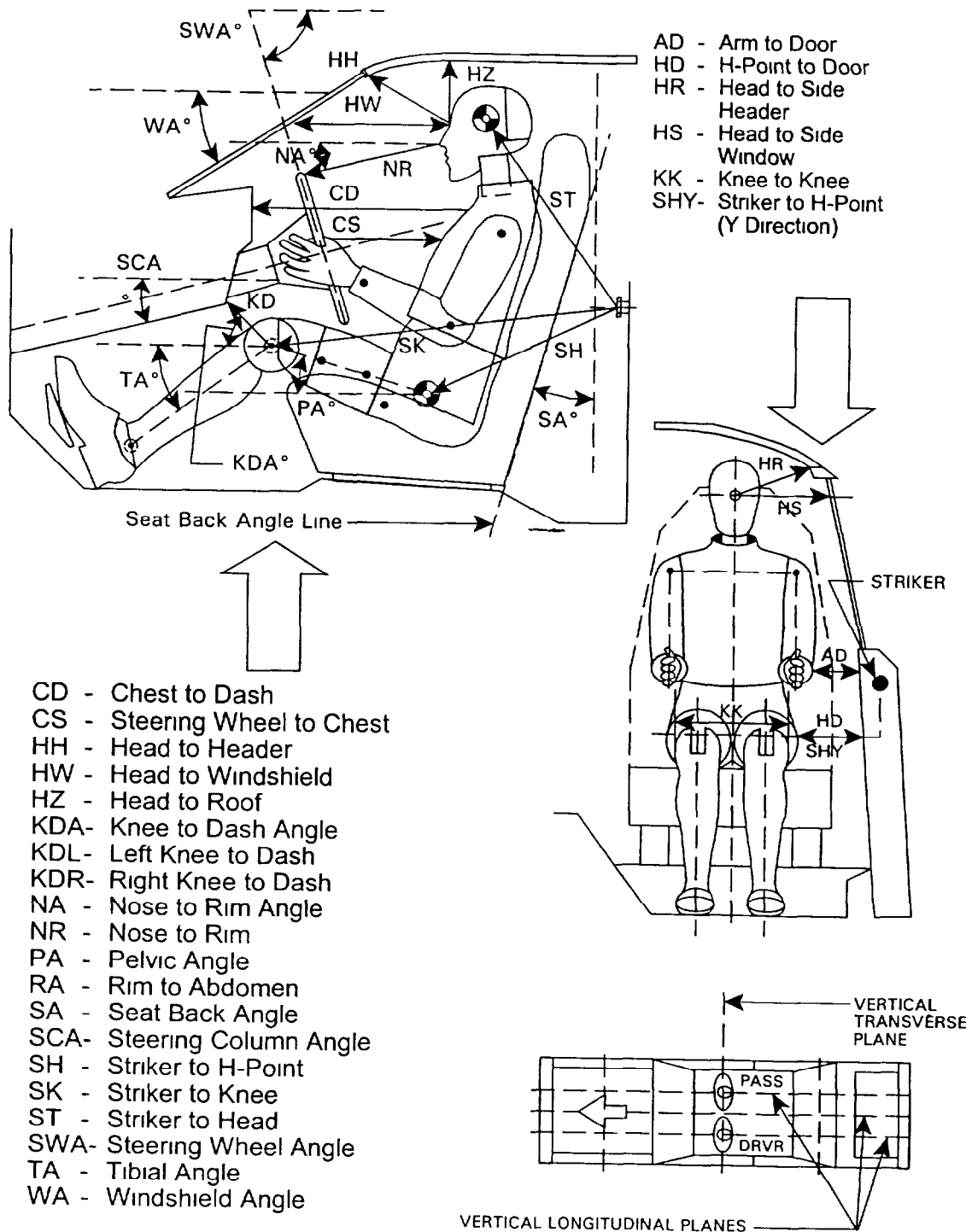
Vehicle NHTSA No.: C10507      Test Date: April 19, 2001

|      | DRIVER (Serial #401)  | PASSENGER (Serial #403) |
|------|-----------------------|-------------------------|
| WA°  | 30.5°                 |                         |
| SWA° | 23.1°                 |                         |
| SCA° | 23.5°                 |                         |
| SA°* | 2.0°                  | 1.6°                    |
| HZ   | 7.5                   | 7.2                     |
| HH   | 14.7                  | 15.4                    |
| HW   | 24.9                  | 25.3                    |
| HR   | 9.3                   | 9.0                     |
| NR   | 17.2 Angle (NA°) 8 5° |                         |
| CD   | 21.7                  | 21.6                    |
| CS   | 13.3                  |                         |
| RA   | 8.9                   |                         |
| KDL  | 7.1 Angle (KDA°) 5.4° | 6.5                     |
| KDR  | 7.2                   | 7.3 Angle (KDA°) 31.4°  |
| PA°  | 23.6°                 | 24.5°                   |
| TA°  | 34.9°                 | 37.6°                   |
| KK   | 13.1                  | 10.5                    |
| ST   | 21.6 Angle 3 2°       | 21 2 Angle 4.2°         |
| SK   | 23.0 Angle 92.8°      | 23 5 Angle 90 4°        |
| SH   | 8.1 Angle 116 2°      | 8.1 Angle 113.0°        |
| SHY  | 10.5                  | 10.5                    |
| HS   | 12.0                  | 11.9                    |
| HD   | 6.4                   | 6.2                     |
| AD   | 4.9                   | 5 3                     |

\* measured at headrest post

# Dummy Positioning Measurement Locations

## DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



### Description of Dummy Measurements

When a level is to be used, it is to ensure that the line containing the two points described is either parallel or perpendicular to the ground. If a measurement to be made is less than 10 inches ignore the directions to use a level and approximate a level measurement. Also, when a measurement is to be taken to or from the center of a bolt on the dummy, take the measurement from the center of the bolt hole if the bolt is recessed.

**The following measurements are to be made within a vertical longitudinal plane.**

- \* HH Head to Header, taken from the point where the dummy's nose meets his forehead (between his eyes) to the furthest point forward on the header.
- \* HW Head to Windshield, taken from the point where the dummy's nose meets his forehead (between his eyes) to a point on the windshield. Use a level
- HZ Head to Roof, taken from the point where the dummy's nose meets his forehead (between his eyes) to the point on the roof directly above it. Use a level.
- \* CS Steering Wheel to Chest, taken from the center of the steering wheel hub to the dummy's chest. Use a level.
- \* CD Chest to Dash, place a tape measure on the tip of the dummy's chin and rotate five inches of it downward toward the dummy to the point of contact on the transverse center of the dummy's chest. Then measure from this point to the closest point on the dashboard either between the upper part of the steering wheel between the hub and the rim, or measure to the dashboard placing the tape measure above the rim, whichever is a shorter measurement. See photograph.
- RA Steering Wheel Rim to Abdomen, taken from the bottommost point of the steering wheel rim horizontally rearward to the dummy. Use a level
- NR Nose to Rim, taken from the tip of the dummy's nose to the closest point on the top of the steering wheel rim. Also indicate the angle this line makes with respect to the horizontal (NA).
- \*<sup>1</sup> KDL, KDR Left and Right Knees to Dashboard, taken from the center of the knee pivot bolt's outer surface to the closest point forward acquired by swinging the tape measure in continually larger arcs until it contacts the dashboard. Also reference the angle of this measurement with respect to the horizontal for the outboard knee (KDA). See photograph.

\* Measurement used in Data Tape Reference Guide

<sup>1</sup> Only outboard measurement is referenced in Data Tape Reference Guide

### Description of Dummy Measurements (Cont.)

SH, SK, ST Striker to Hip, Knee, and Head, these measurements are to be taken in the X-Z plane measured from the forward most center point on the striker to the center of the H-point, outer knee bolt, and head target. When taking this measurement a firm device that can be rigidly connected to the striker should be used. Use a level. The angles of these measurements with respect to the horizontal should also be recorded. The measurement in the Y (transverse) direction from the striker to the H-point should also be taken (SHY) See photograph.

**The following measurements are to be made within a vertical transverse plane.**

|      |                                                                                                                                                                                                                                                                                                                                         |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| HS   | Head to Side Window, taken from the point where the dummy's nose meets his forehead (between his eyes) to the outside of the side window. In order to make this measurement, roll the window down to the exact height which allows a level measurement. Use a level. See photograph.                                                    |
| * AD | Arm to Door, taken from the outer surface of the elbow pivot bolt on a Hybrid II dummy to the first point it hits on the door. In the case of a Hybrid III dummy, measure from the bolt on the outer biceps. When a SID is used make the measurement from the center of the bottom of the arm segment where it meets the dummy's torso. |
| * HD | H-point to Door, taken from the H-point on the dummy to the closest point on the door. Use a level.                                                                                                                                                                                                                                     |
| * HR | Head to Side Header, measure the shortest distance from the point where the dummy's nose meets his forehead (between his eyes) to the side edge of the header just above the window frame, directly adjacent to the dummy.                                                                                                              |
| SHY  | Striker to H-point, taken from a rod rigidly connected to the forward most center point on the striker to the H-point. Use a level. See photograph.                                                                                                                                                                                     |
| KK   | Knee to Knee, for Hybrid II dummies measure the distance between knee pivot bolt head outer surfaces. For Hybrid III dummies measure the distance between the outboard knee clevis flange surfaces. (This measurement may not be exactly transverse)                                                                                    |

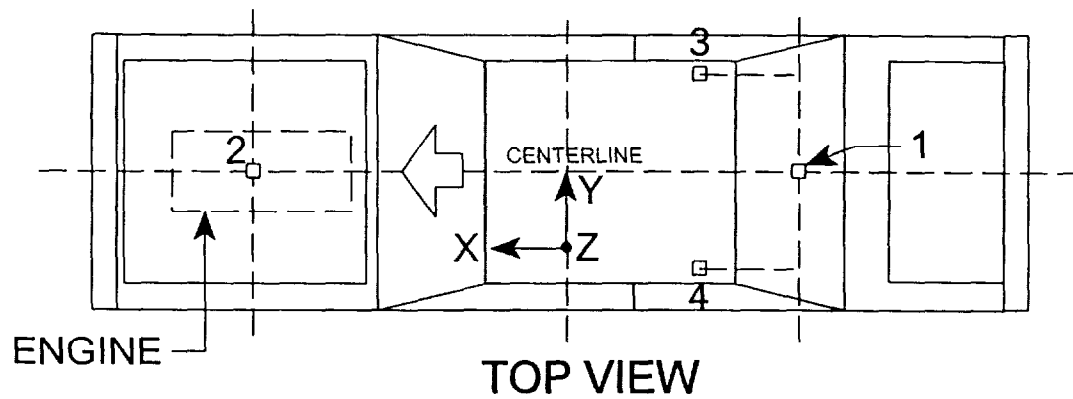
\* Measurement used in Data Tape Reference Guide

## Description of Dummy Measurements (Cont.)

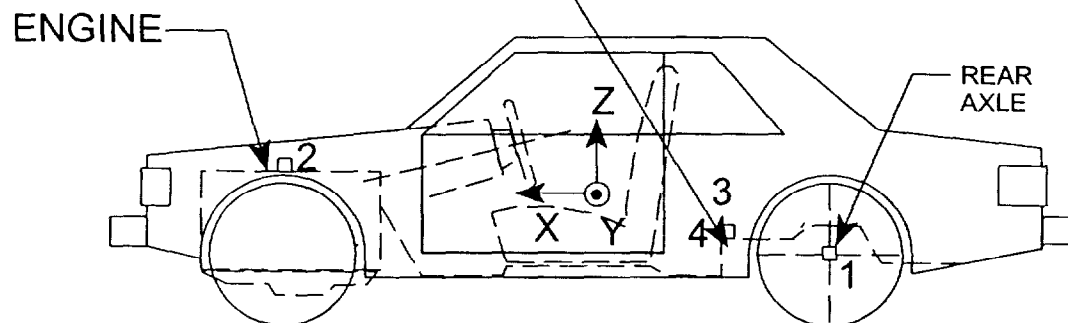
### **Angles**

|     |                                                                                                                                                                                                                                                                                                                                                                      |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SA  | Seat Back Angle, find this angle using the instructions provided by the manufacturer. If the manufacturer doesn't provide clear instructions contact the COTR.                                                                                                                                                                                                       |
| PA  | Pelvic or Femur Angle, taken by inserting the pelvic angle gauge into the H-point gauging hole on the SID or the Hybrid III dummies and taking this angle with respect to the horizontal. Measure the angle of the line connecting the H-point hole and the outer knee pivot bolt hole on a Hybrid II dummy with respect to the horizontal, to find the femur angle. |
| SWA | Steering Wheel Angle, find this by placing a straight edge against the steering wheel rim along the longitudinal plane. Then measure the acute angle of the straight edge with respect to the horizontal.                                                                                                                                                            |
| SCA | Steering Column Angle, measured with respect to the horizontal by placing an inclinometer on the center of the underside of the steering column.                                                                                                                                                                                                                     |
| NA  | Measure the angle made when taking the measurement NR with respect to the horizontal.                                                                                                                                                                                                                                                                                |
| KDA | Knee to Dash Angle, the angle that the measurement KD is taken at with respect to the horizontal. Only get this angle for the outboard knee. See photograph.                                                                                                                                                                                                         |
| WA  | Windshield Angle, place an inclinometer along the transverse center of the windshield exterior (measurement is made with respect to horizontal)                                                                                                                                                                                                                      |
| TA  | Tibial Angle, use a straight edge to connect the dummy's knee and ankle bolts. Then place an inclinometer on the straight edge and measure the angle with respect to the horizontal.                                                                                                                                                                                 |



Vehicle Accelerometer Placement and Data SummaryVehicle Year/Make/Model/Body Style 2001/Saab/9-5/4 DoorVehicle NHTSA No.: C10507 Test Date: April 19, 2001

REAR SEAT CUSHION  
ASSY. FRONT ATTACHMENT  
BRACKET SUPPORT



LEFT SIDE VIEW

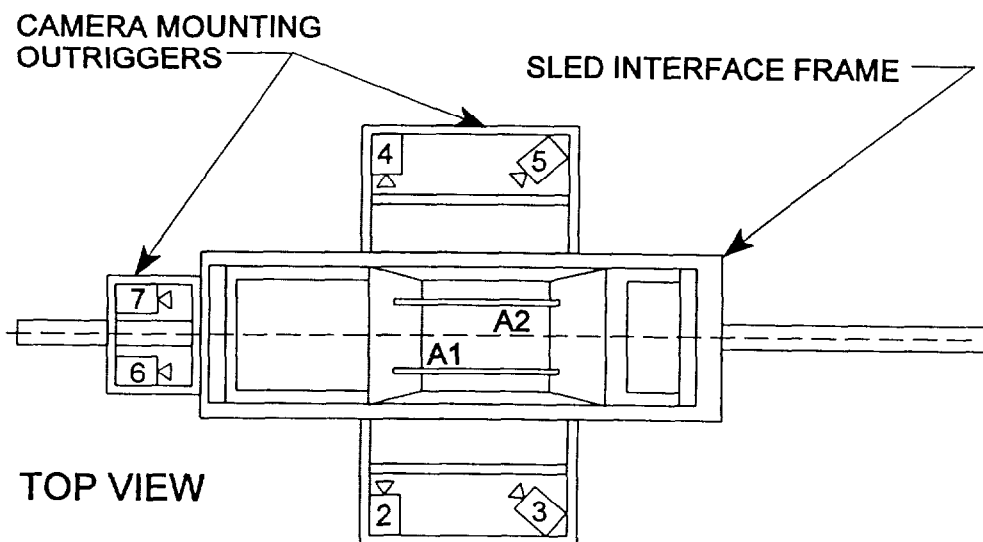
Vehicle Accelerometer Location Measurements and Data Summary

Vehicle Year/Make/Model/Body Style: 2001/Saab/9-5/4 Door

Vehicle NHTSA No C10507 Test Date: April 19, 2001

| No. | Location                               | X (in) | Y (in) | Positive Direction |             | Negative Direction |             |
|-----|----------------------------------------|--------|--------|--------------------|-------------|--------------------|-------------|
|     |                                        |        |        | Value              | Time (msec) | Value              | Time (msec) |
|     | Sled Primary Longitudinal              | 67.0   | 0      | 17.6 g             | 68          | -1.2 g             | 129         |
|     | Sled Redundant Longitudinal            | 67.0   | 6.0    | 17.7 g             | 68          | -1.2 g             | 129         |
|     | Sled Velocity<br>Measured Integrated   | 67.0   | 0      | 30.48 mph          | 126         | --                 | --          |
| 1   | Rear Axle Longitudinal                 | 54.0   | 0      | 22.7 g             | 60          | -1.9 g             | 130         |
| 2   | Top Engine Longitudinal                | 160.5  | 0      | 20.1 g             | 54          | -3.3 g             | 135         |
| 3   | Right Rear Seat Member<br>Longitudinal | 74.0   | 13.5   | 19.1 g             | 50          | -1.7 g             | 150         |
| 4   | Left Rear Seat Member<br>Longitudinal  | 74.0   | 13.5   | 18.6 g             | 49          | -1.3 g             | 166         |

## Camera Positions



**TOP VIEW**

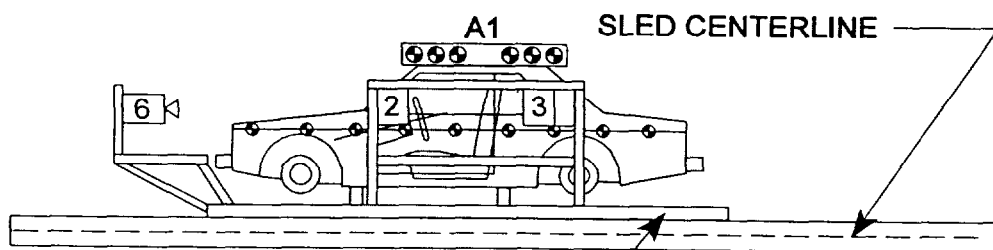
### **CAMERA FRAME RATES:**

**#1 = 24 fps**

**All Others = 1,000 fps**



**REAL TIME CAMERA**



**SLED INTERFACE FRAME**

**LEFT SIDE VIEW**

Camera Location Measurements

| Camera No | VIEW                         | Camera Positions (inches)* |      |      | Angle (deg) | Film Plane To Head Target | Lens (mm) | Speed (fps) |
|-----------|------------------------------|----------------------------|------|------|-------------|---------------------------|-----------|-------------|
|           |                              | X                          | Y    | Z    |             |                           |           |             |
| 1         | Real-Time (Pre and Post)     |                            |      |      |             |                           | 10        | 24          |
| 2         | Onboard Driver               | 70.6                       | 88.6 | 38.4 | 90          | 67.1                      | 13        | 1000        |
| 3         | Onboard Driver Angle         | 150.9                      | 91.1 | 47.8 |             |                           | 13        | 1000        |
| 4         | Onboard Passenger            | 71.8                       | 89.6 | 38.5 | 90          | 70.1                      | 13        | 990         |
| 5         | Onboard Passenger Angle      | 146.7                      | 88.5 | 47.9 |             |                           | 13        | 803         |
| 6         | Onboard Windshield Driver    | 18.3                       | 14.1 | 47.5 |             |                           | 13        | 1010        |
| 7         | Onboard Windshield Passenger | 18.3                       | 13.9 | 47.5 |             |                           | 13        | 873         |

Reference\* X = Front of sled carriage  
Y = Center of sled carriage  
Z = Top of sled carriage

### Occupant Injury Data

Vehicle Year/Make/Model/Body Style: 2001/Saab/9-5/4 Door

Vehicle NHTSA No.: C10507      Test Date: April 19, 2001

| MAXIMUM ACCELERATION<br>VALUES: (g's) | DRIVER<br>DUMMY #401 | PASSENGER<br>DUMMY #403 |
|---------------------------------------|----------------------|-------------------------|
| Head Channel X                        | -56.2                | -32.7                   |
| Head Channel Y                        | 16.5                 | -19.1                   |
| Head Channel Z                        | 31.7                 | 23.7                    |
| HEAD RESULTANT                        | 58.6                 | 43.8                    |
| Chest Channel X                       | -36.9                | -32.7                   |
| Chest Channel Y                       | -7.1                 | -5.5                    |
| Chest Channel Z                       | 16.1                 | 23.8                    |
| CHEST RESULTANT                       | 38.0                 | 39.1                    |

#### HEAD INJURY CRITERIA (HIC) VALUES:

|                |       |       |
|----------------|-------|-------|
| HIC            | 372   | 169   |
| $t_1 =$ (msec) | 92.3  | 84.3  |
| $t_2 =$ (msec) | 128.3 | 114.0 |

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

#### CHEST INJURY CRITERIA (CLIP) VALUES (g's)

|                       |      |       |
|-----------------------|------|-------|
| CLIP                  | 37.8 | 38.2  |
| $t_1 =$ (msec)        | 96.7 | 99.9  |
| $t_2 =$ (msec)        | 99.7 | 102.9 |
| CHEST DEFLECTION (in) | 1.2  | 0.6   |

Occupant Injury Data (Cont.)

| MAX COMPRESSIVE FEMUR FORCES: | DRIVER<br>DUMMY #401 | PASSENGER<br>DUMMY #403 |
|-------------------------------|----------------------|-------------------------|
| Left Side (lbs)               | 1173                 | 1670                    |
| Right Side (lbs)              | 1349                 | 1096                    |

NECK INJURY CRITERIA:

|                                                                 |      |      |
|-----------------------------------------------------------------|------|------|
| Peak Flexion Bending Moment about the Occipital Condyle (N-m)   | 73.1 | 87.3 |
| Peak Extension Bending Moment about the Occipital Condyle (N-m) | 4.7  | 13.6 |
| Peak Axial Tension (N)                                          | 702  | 560  |
| Peak Axial Compression (N)                                      | 2313 | 723  |
| Peak Fore Shear (N)                                             | 1347 | 1563 |
| Peak Aft Shear (N)                                              | 146  | 93   |

Seat Belt Warning System Data

Vehicle Year/Make/Model/Body Style 2001/Saab/9-5/4 Door

NHTSA No.: C10507 ; Technician: Chad Gadberry; Date: March 22, 2001

Complete the following to determine which seat belt warning system option (S7.3(a)(1) or S7.3(a)(2)) is used. (Manufacturers may use either option.)

A With occupant in driver's position and lap belt in stowed position and ignition switch placed in "Start/On" position:

A.1 S7.3(a)(1)

Time duration of audible warning signal = 6 seconds  
(4 to 8 seconds)

Time duration of reminder light operation = >60 seconds  
(no less than 60 seconds)

A.2 S7.3(a)(2)

Time duration of audible warning signal =      seconds  
(4 to 8 seconds)(see 49 USCS @ 30124)

Time duration of reminder light operation =      seconds  
(4 to 8 seconds)

B. With occupant in driver's position and lap belt in use and ignition switch placed in "Start/On" position:

B.1 S7.3(a)(1)

Time duration of audible warning signal = 0 seconds  
(audible warning not required)

Time duration of reminder light operation = 0 seconds  
(reminder light not required)

B.2 S7.3(a)(2)

Time duration of audible warning signal =      seconds  
(audible warning not required)

Time duration of reminder light operation =      seconds  
(4 to 8 seconds)

C Note wording of visual warning

Fasten seat belt

Fasten Belt

Symbol 101

X

X

Readiness IndicatorVehicle Year/Make/Model/Body Style. 2001/Saab/9-5/4 DoorNHTSA No : C10507 ; Technician: Chad Gadberry ; Date: March 22, 2001

An occupant restraint system that deploys in the event of a crash shall have a monitoring system with a readiness indicator. A totally mechanical system is exempt from this requirement (11/8/94 legal interpretation)

- 1 Is the system totally mechanical? ( )Yes (X)No  
**(If YES this Data Sheet is complete.)**
- 2 Describe the location of the readiness indicator. Right side of instrument panel  
\_\_\_\_\_
3. Is the readiness indicator clearly visible to the driver?  
(X)Yes-Pass ( )No-FAIL
4. Is a list of the elements in the occupant restraint system, being monitored by the readiness indicator, provided?  
(X)Yes-Pass ( )No-FAIL

### Air Bag Labels Data

Vehicle Year/Make/Model/Body Style: 2001/Saab/9-5/4 Door

NHTSA No C10507 ; Technician: Chad Gadberry ; Date: March 22, 2001

1. Air bag maintenance label and owner's manual instructions (S4.5 1(a)):
  - 1.1. Does the manufacturer recommend periodic maintenance or replacement of the airbag? ☐ Yes, go to 1.2 ☒ No, go to 2
  - 1.2. Does the vehicle have a maintenance or replacement label? ☐ Yes-Pass ☐ No-FAIL
  - 1.3. Does the label contain one of the following? ☐ Yes-Pass ☐ No-FAIL
    - ☐ Schedule on label specifies month and year (Date: \_\_\_\_\_)
    - ☐ Schedule on label specifies vehicle mileage (Mileage: \_\_\_\_\_)
    - ☐ Schedule on label specifies interval measured from date on certification label (Date \_\_\_\_\_)
  - 1.4. Is the label permanently affixed within the passenger compartment? ☐ Yes-Pass ☐ No-FAIL
  - 1.5. Is the label lettered in English? ☐ Yes-Pass ☐ No-FAIL
  - 1.6. Is the label in block capitals and numerals? ☐ Yes-Pass ☐ No-FAIL
  - 1.7. Are the letters and numerals at least 3/32 inches high? ☐ Yes-Pass ☐ No-FAIL
  - 1.8. Does the owner's manual set forth the recommended schedule for maintenance or replacement? ☐ Yes-Pass ☐ No-FAIL
2. Does the owner's manual (S4.5.1(f)):
  - 2.1. Include a description of the vehicle's airbag system in an easily understandable format? ☒ Yes-Pass ☐ No-FAIL
  - 2.2. Include a statement that the vehicle is equipped with an airbag and a lap/shoulder belt at the front outboard seating positions? ☒ Yes-Pass ☐ No-FAIL

Air Bag Labels Data (Cont.)

- 2.3 Include a statement that the air bag is a supplemental restraint at the front outboard seating positions?  
(X)Yes-Pass ( ) No-FAIL
- 2.4 Emphasize that all occupants, including the driver, should always wear their seat belts whether or not an airbag is also provided at their seating positions to minimize the risk of severe injury or death in the event of a crash?  
(X)Yes-Pass ( ) No-FAIL
- 2.5 Provide any necessary precautions regarding the proper positioning of occupants, including children, at seating positions equipped with air bags to insure maximum safety protection for those occupants?  
(X)Yes-Pass ( ) No-FAIL
- 2.6 Explain that no objects should be placed over or near the air bag on the steering wheel or on the instrument panel, because any such objects could cause harm if the vehicle is in a crash severe enough to cause the air bag to inflate?  
(X)Yes-Pass ( ) No-FAIL

3 Does the vehicle:

- 3.1. Provide an automatic means to ensure that the airbag does not deploy when a child seat or child with a total mass of 30 kg or less is present on the front outboard passenger?  
( )Yes (X) No
- 3.2 Incorporate sensors, other than or in addition to weight sensors, which automatically prevent the passenger air bag from deploying in situations in which it might have an adverse effect on infants in rear-facing child seats, and unbelted or improperly belted children?  
( )Yes (X) No
- 3.3 Have a passenger air bag designed to deploy in a manner that does not create a risk of serious injury to infants in rear-facing child seats, and unbelted or improperly belted children?  
( )Yes (X) No

If yes to 3.1, or 3.2, or 3.3, the vehicle is not required to have a sunvisor warning label (S4.5.1(6)), an airbag alert label (S4.5.1(c)) or a label on the dash (S4.5.2(e)) and this check sheet is complete (S4.5.1). If no to 3.1, 3.2, and 3.3, go to 4.

4 Sun Visor Warning Label

- 4.1 Is the label permanently affixed (may be permanent marking or molding) to either side of the sunvisor at each front outboard seating position with an airbag?  
(S4.5.1(b)(2))
- |                  |              |             |
|------------------|--------------|-------------|
| Driver Side -    | ( ) Yes-Pass | (X) No-FAIL |
| Passenger Side - | ( ) N/A      | (X) No-FAIL |

Air Bag Labels Data (Cont.)

- 4.2. Does the label conform in content (vehicles without back seats may omit the statement: "The back seat is the safest place for children.") (S4.5.1(b)(2)(v))) to either label shown on the next page as appropriate at each front outboard seating position with an air bag? (S4.5.1(b)(2))

4.2.1 **Dual air bags:**      ☐ Not Applicable  
                                          Driver Side -            ☒ Yes-Pass            ☐ **No-FAIL**  
                                          Passenger Side -      ☒ Yes-Pass            ☐ **No-FAIL**

4.2.2 **Vehicle with driver air bag ONLY - either 4.2.2.1 or 4.2.2.2 is applicable, not both.** (S4.5.1(b)(2)(iv))

4.2.2.1            Does the label conform in content to either label shown on the following page as appropriate?  
                                  ☒ Not Applicable  
                                  Driver Side -            ☐ Yes-Pass            ☐ **No-FAIL**

4.2.2.2            Does the label conform in content to the first label shown on the following page where the label can be modified to omit the pictogram and the message text may read:

DEATH or SERIOUS INJURY can occur.

- Sit as far back as possible from the air bag.
- ALWAYS use SEAT BELTS and CHILD RESTRAINTS
- The BACK SEAT is the SAFEST place for children.

☒ Not Applicable  
                                  Driver Side -            ☐ Yes-Pass            ☐ **No-FAIL**

### Air Bag Labels Data (Cont )

#### SUN VISOR LABEL VISIBLE WHEN VISOR IS IN DOWN POSITION

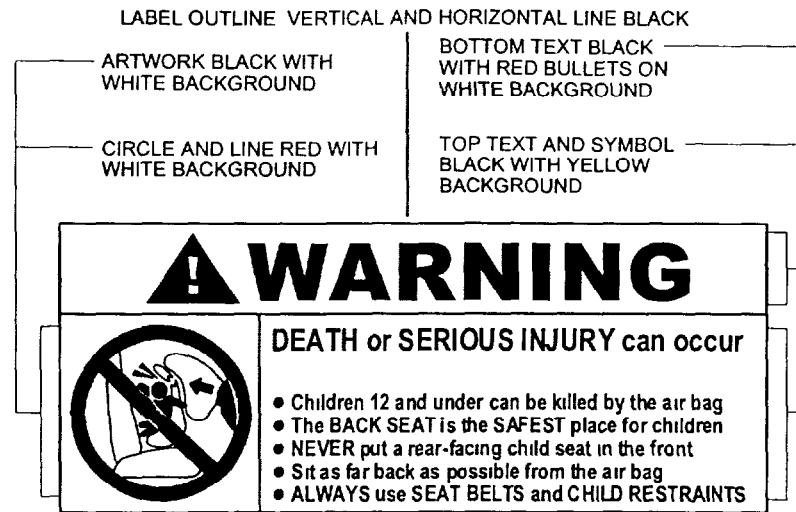


Figure 6a (S4.5.1(b)(2))

#### SUN VISOR LABEL VISIBLE WHEN VISOR IS IN DOWN POSITION

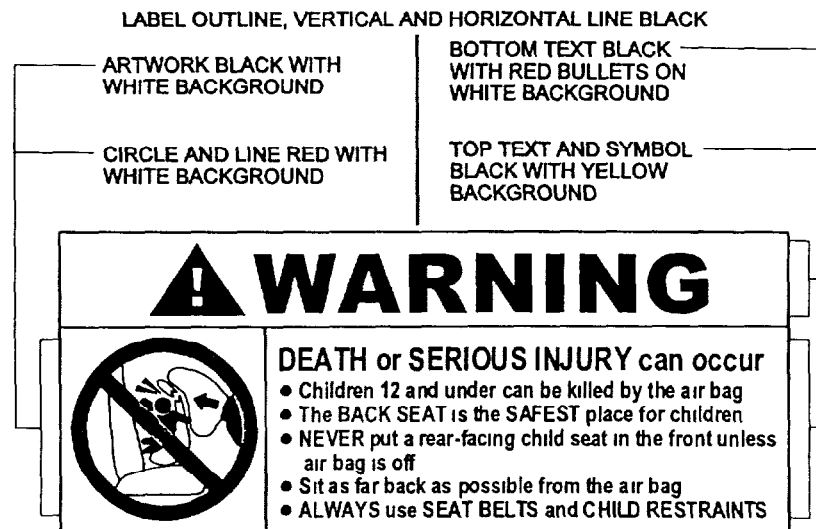


Figure 6b (S4.5.1(b)(2))

- 4.3 Is the label heading area yellow with the word "warning" and the alert symbol in black? (S4.5.1(b)(2)(i))
- |                  |                |                          |
|------------------|----------------|--------------------------|
| Driver Side -    | (X) Yes-Pass   | ( ) No-FAIL              |
| Passenger Side - | ( ) No air bag | (X) Yes-Pass ( ) No-FAIL |
- 4.4 Is the message white with black text? (S4.5.1(b)(2)(ii))
- |                  |                |                          |
|------------------|----------------|--------------------------|
| Driver Side -    | (X) Yes-Pass   | ( ) No-FAIL              |
| Passenger Side - | ( ) No air bag | (X) Yes-Pass ( ) No-FAIL |

Air Bag Labels Data (Cont.)

- 4.5 Is the message area at least 30 cm<sup>2</sup>? (S4.5.1(b)(2)(ii))  
Actual message area: 63 cm<sup>2</sup>
- |                                 |             |             |
|---------------------------------|-------------|-------------|
| Driver Side -                   | (X)Yes-Pass | ( ) No-FAIL |
| Passenger Side - ( ) No air bag | (X)Yes-Pass | ( ) No-FAIL |
- 4.6 Is the pictogram black with a red circle and slash on a white background?  
(S4.5.1(b)(2)(iii) & (S4.5.1(b)(2)(iv)))
- For vehicles with driver side air bag ONLY ( ) Not Applicable
- |                                 |             |             |
|---------------------------------|-------------|-------------|
| Driver Side -                   | (X)Yes-Pass | ( ) No-FAIL |
| Passenger Side - ( ) No air bag | (X)Yes-Pass | ( ) No-FAIL |
- 4.7 Is the pictogram at least 30 mm in diameter? (S4.5.1(b)(2)(iii))  
Actual diameter: 30 mm
- For vehicles with driver side air bag ONLY ( ) Not Applicable
- |                                 |             |             |
|---------------------------------|-------------|-------------|
| Driver Side -                   | (X)Yes-Pass | ( ) No-FAIL |
| Passenger Side - ( ) No air bag | (X)Yes-Pass | ( ) No-FAIL |
- 4.8 Is the same side of the sun visor to which the sun visor label is affixed free of other information with the exception of an air bag maintenance label?  
(S4.5.1(b)(3))
- |                                 |             |             |
|---------------------------------|-------------|-------------|
| Driver Side -                   | (X)Yes-Pass | ( ) No-FAIL |
| Passenger Side - ( ) No air bag | (X)Yes-Pass | ( ) No-FAIL |
- 4.9 Is the sun visor free of other information about air bags or the need to wear seat belts with the exception of the air bag alert label or the utility vehicle label?  
(S4.5.1(b)(3))
- |                                 |             |             |
|---------------------------------|-------------|-------------|
| Driver Side -                   | (X)Yes-Pass | ( ) No-FAIL |
| Passenger Side - ( ) No air bag | (X)Yes-Pass | ( ) No-FAIL |
- 5 Air Bag Alert Label
- 5.1 Is the Sun Visor Warning Label visible when the sunvisor is in the stowed position?
- |                                 |                 |        |        |
|---------------------------------|-----------------|--------|--------|
| Driver Side -                   | ( )Yes, go to 6 | (X) No |        |
| Passenger Side - ( ) No air bag | ( )Yes          |        | (X) No |
- 5.2 Does the label conform in content to the label shown below? (S4.5.1(c)(2))
- |                                 |             |             |
|---------------------------------|-------------|-------------|
| Driver Side -                   | (X)Yes-Pass | ( ) No-FAIL |
| Passenger Side - ( ) No air bag | (X)Yes-Pass | ( ) No-FAIL |
- 5.3 Is the message area black with yellow text? (S4.5.1(c)(2)(i))
- |                                 |             |             |
|---------------------------------|-------------|-------------|
| Driver Side -                   | (X)Yes-Pass | ( ) No-FAIL |
| Passenger Side - ( ) No air bag | (X)Yes-Pass | ( ) No-FAIL |

Air Bag Labels Data (Cont.)

- 5.4 Is the message area at least 20 cm<sup>2</sup>? (S4.5.1(c)(2)(i))  
 Actual message area: 21 cm<sup>2</sup>  
     Driver Side - (X)Yes-Pass ( ) No-FAIL  
     Passenger Side - ( ) No air bag (X)Yes-Pass ( ) No-FAIL
- 5.5 Is the pictogram black with a red circle and slash on a white background?  
 (S4.5.1(c)(2)(ii))  
     For vehicles with driver side air bag ONLY ( ) Not Applicable  
     (X)Yes-Pass ( ) No-FAIL
- 5.6 Is the pictogram at least 20 mm in diameter? (S4.5.1(c)(2)(iii))  
 Actual diameter 30 mm  
     For vehicles with driver side air bag ONLY ( ) Not Applicable  
     (X)Yes-Pass ( ) No-FAIL

**SUN VISOR LABEL VISIBLE WHEN VISOR IS IN UP POSITION**

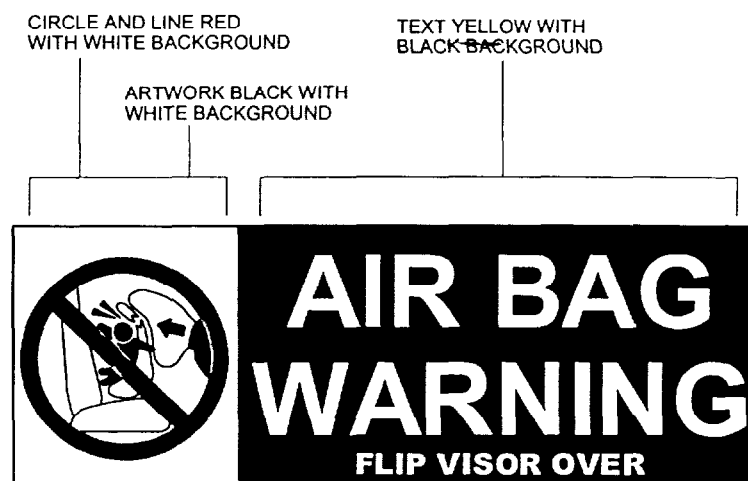


Figure 6c (S4.5.1(c)(2))

- 6 Label On the Dash
- 6.1 Does the vehicle have a passenger side air bag?  
     (X)Yes ( ) No, check sheet is complete
- 6.2 Does the vehicle have a label on the dash or steering wheel hub? (S4.5.1(e))  
     (X)Yes-Pass ( ) No-FAIL
- 6.3 Does the label conform in content (vehicles without back seats may omit the statement "The back seat is the safest place for children 12 and under." (S4.5.1(e)(iii)) to the label shown below. (S4.5.1(e))  
     (X)Yes-Pass ( ) No-FAIL

Air Bag Labels Data (Cont.)

- 6.4 Is the heading area yellow with the word "warning" and the alert symbol in black?  
(S4.5.1(e)(i)) (X)Yes-Pass ( ) No-FAIL
- 6.5 Is the message white with black text? (S4.5.1(e)(ii))  
(X)Yes-Pass ( ) No-FAIL
- 6.6 Is the message area at least 30 cm<sup>2</sup>? (S4.5.1(e)(ii))  
Actual message area: 42 cm<sup>2</sup> (X)Yes-Pass ( ) No-FAIL



Figure 7 (S4.5.1(e))

Rear Outboard Seating Position Seat Belt DataVehicle Year/Make/Model/Body Style: 2001/Saab/9-5/4 DoorNHTSA No.: C10507 ; Technician: Chad Gadberry ; Date: March 22, 2001

Do all rear outboard seating positions have type 2 seat belts?

☒ Yes☐ No

If NO, describe the seat belt installed, the seat location, and any other information about the seat that would explain why a type 2 belt was not installed.

---

---

Lap Belt Lockability Data

Vehicle Year/Make/Model/Body Style: 2001/Saab/9-5/4 Door

NHTSA No : C10507 ; Technician: Chad Gadberry ; Date: March 22, 2001

Passenger cars, trucks, buses, and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less (S7.1.1.5)

Complete one of these forms for **each** designated seating position with forward-facing seats, other than the driver's seat, or seats that can be adjusted to forward-facing and that has seat belt retractors that are not automatic locking retractors. (S7.1.1.5(c))

Designated Seating Position (DSP): Right Front

1. Record the seating position. Fully rearward  
(S7.1.1.5(c)(1))  
(Any position is acceptable.)
2. Buckle the seat belt. (S7.1.1.5(c)(1))
3. Complete any procedures recommended in the vehicle owner's manual to activate any locking feature. (S7.1.1.5(c)(1))
4. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT have to be attached by the vehicle user to the seat belt webbing, retractor, or any other part of the vehicle (S7.1.1.5(a))  

(X)Yes-Pass      ( ) No-FAIL
5. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT require inverting, twisting or deforming of the belt webbing. (S7.1.1.5(a))  

(X)Yes-Pass      ( ) No-FAIL
6. Does the vehicle user need to take some action to activate the locking feature on the lap belt portion of the seat belt in any forward-facing seat or seat that can be adjusted to forward-facing?  

(X)Yes, go to 6.1      ( ) No, go to 7.

  - 6.1 Does the vehicle owner's manual include a description in words and/or diagrams describing how to activate the locking feature so that the seat belt assembly can tightly secure a child restraint system and how to deactivate the locking feature to remove the child restraint system (S7.1.1.5(b))  

(X)Yes-Pass      ( ) No-FAIL
7. Locate a reference point A on the seat belt buckle (S7.1.1.5(c)(2))

### Lap Belt Lockability Data (Cont )

8. Locate a reference point B on the attachment hardware or retractor assembly at the other end of the lap belt or lap belt portion of the seat belt assembly. (S7.1.1.5(c)(2))
9. Adjust the lap belt or lap belt portion of the seat belt assembly according to any procedures recommended in the vehicle owner's manual to activate any locking feature so that the webbing between points A and B is at the maximum length allowed by the belt system. (S7.1.1.5(c)(2))
10. Measure and record the distance between points A and B along the longitudinal centerline of the webbing for the lap belt or lap belt portion of the seat belt assembly. (S7.1.1.5(c)(2))

Measured distance between A and B is 53.0 inches.

11. Readjust the belt system so that the webbing between points A and B is at any length that is 5 inches or more shorter than the maximum length of the webbing. (S7.1.1.5(c)(3))
12. To the lap belt or lap belt portion of the seat belt assembly, apply a preload of 10 pounds using the webbing tension pull device. Apply the load in a vertical plane parallel to the longitudinal axis of the vehicle and passing through the seating reference point of the designated seating position. Apply the preload in a horizontal direction toward the front of the vehicle with a force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal. (S7.1.1.5(c)(4))

The measured force application angle = 10 (spec. 5-15 degrees)

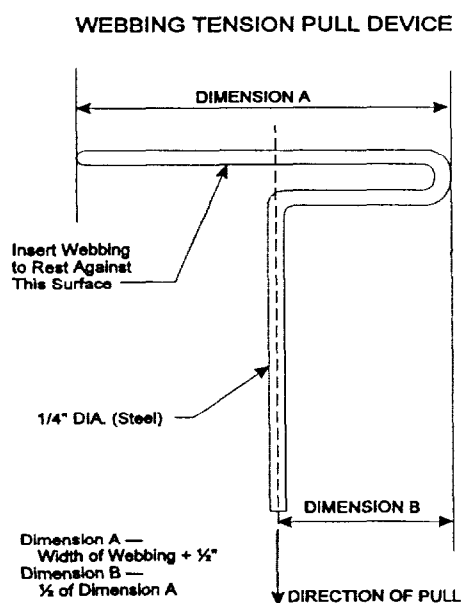


Figure 5 (S7.1.1.5(c)(4))

Lap Belt Lockability Data (Cont.)

13. Measure the length between points A and B along the longitudinal centerline of the webbing while the preload is being applied. (S7.1.1.5(c)(4))

Measured distance between A and B is 15.0 inches.

14. Increase the load to 50 pounds at a rate of no more than 50 pounds per second. Attain the load in not more than 5 seconds. (If webbing sensitive emergency locking retractors are installed as part of the lap belt or lap belt portion of the seat belt assembly, apply the load at a rate less than the threshold value for lock-up specified by the manufacturer.) Maintain the load for at least 5 seconds. Measure and record the distance between points A and B along the longitudinal centerline of the webbing. (S7.1.1.5(c)(5))

Record onset rate: 10 lb/sec (Spec. 10 to 50 lb/sec)

Measure distance between points A and B 15.3 inches (S7.1.1.5(c)(6))

15. Subtract the measurement in 13 from the measurement in 14. Is the difference 2 inches or less? (S7.1.1.5(c)(7))

14-13 = 0.3 inches

(X)Yes-Pass

( ) No-FAIL

16. Subtract the measurement in 14 from the measurement in 10. Is the difference 3 inches or more?

10-14 = 37.7 inches

(X)Yes-Pass

( ) No-FAIL

REMARKS: None

Lap Belt Lockability Data (Cont )

Vehicle Year/Make/Model/Body Style: 2001/Saab/9-5/4 Door

NHTSA No.: C10507 ; Technician: Chad Gadberry ; Date March 22, 2001

Passenger cars, trucks, buses, and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less. (S7.1.1.5)

Complete one of these forms for **each** designated seating position with forward-facing seats, other than the driver's seat, or seats that can be adjusted to forward-facing **and** that has seat belt retractors that are not automatic locking retractors. (S7.1.1.5(c))

Designated Seating Position (DSP): Left Rear

1. Record the seating position. Non-adjustable  
(S7.1.1.5(c)(1))  
(Any position is acceptable.)
2. Buckle the seat belt. (S7.1.1.5(c)(1))
3. Complete any procedures recommended in the vehicle owner's manual to activate any locking feature. (S7.1.1.5(c)(1))
4. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT have to be attached by the vehicle user to the seat belt webbing, retractor, or any other part of the vehicle. (S7.1.1.5(a))  

(X)Yes-Pass      ( ) No-FAIL
5. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT require inverting, twisting or deforming of the belt webbing. (S7.1.1.5(a))  

(X)Yes-Pass      ( ) No-FAIL
6. Does the vehicle user need to take some action to activate the locking feature on the lap belt portion of the seat belt in any forward-facing seat or seat that can be adjusted to forward-facing? (X)Yes, go to 6.1      ( ) No, go to 7
  - 6.1 Does the vehicle owner's manual include a description in words and/or diagrams describing how to activate the locking feature so that the seat belt assembly can tightly secure a child restraint system and how to deactivate the locking feature to remove the child restraint system. (S7.1.1.5(b))  

(X)Yes-Pass      ( ) No-FAIL
7. Locate a reference point A on the seat belt buckle (S7.1.1.5(c)(2))

### Lap Belt Lockability Data (Cont )

8. Locate a reference point B on the attachment hardware or retractor assembly at the other end of the lap belt or lap belt portion of the seat belt assembly. (S7.1.1.5(c)(2))
9. Adjust the lap belt or lap belt portion of the seat belt assembly according to any procedures recommended in the vehicle owner's manual to activate any locking feature so that the webbing between points A and B is at the maximum length allowed by the belt system. (S7.1.1.5(c)(2))
10. Measure and record the distance between points A and B along the longitudinal centerline of the webbing for the lap belt or lap belt portion of the seat belt assembly. (S7.1.1.5(c)(2))

Measured distance between A and B is 55.0 inches

11. Readjust the belt system so that the webbing between points A and B is at any length that is 5 inches or more shorter than the maximum length of the webbing. (S7.1.1.5(c)(3))
12. To the lap belt or lap belt portion of the seat belt assembly, apply a preload of 10 pounds using the webbing tension pull device. Apply the load in a vertical plane parallel to the longitudinal axis of the vehicle and passing through the seating reference point of the designated seating position. Apply the preload in a horizontal direction toward the front of the vehicle with a force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal. (S7.1.1.5(c)(4))

The measured force application angle = 10 (spec. 5-15 degrees)

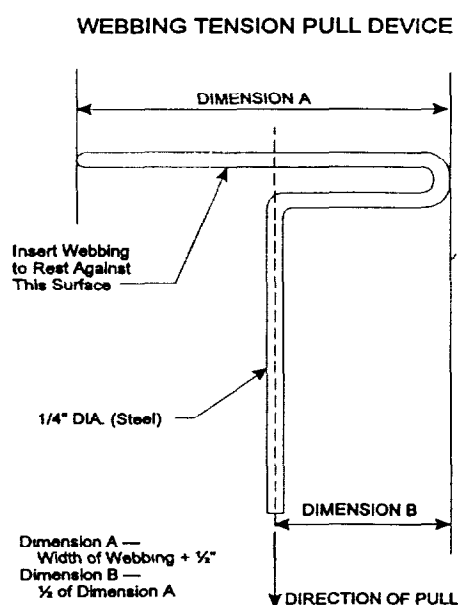


Figure 5 (S7 1.1.5(c)(4))

Lap Belt Lockability Data (Cont.)

13. Measure the length between points A and B along the longitudinal centerline of the webbing while the preload is being applied. (S7.1.1.5(c)(4))

Measured distance between A and B is 17.0 inches

14. Increase the load to 50 pounds at a rate of no more than 50 pounds per second. Attain the load in not more than 5 seconds (If webbing sensitive emergency locking retractors are installed as part of the lap belt or lap belt portion of the seat belt assembly, apply the load at a rate less than the threshold value for lock-up specified by the manufacturer.) Maintain the load for at least 5 seconds Measure and record the distance between points A and B along the longitudinal centerline of the webbing (S7.1.1.5(c)(5))

Record onset rate: 10 lb/sec (Spec. 10 to 50 lb/sec)

Measure distance between points A and B 17.9 inches (S7.1.1.5(c)(6))

15. Subtract the measurement in 13 from the measurement in 14. Is the difference 2 inches or less? (S7.1.1.5(c)(7))

14-13 = 0.9 inches

(X)Yes-Pass

( ) No-FAIL

- 16 Subtract the measurement in 14 from the measurement in 10. Is the difference 3 inches or more?

10-14 = 37.1 inches

(X)Yes-Pass

( ) No-FAIL

REMARKS: None

Lap Belt Lockability Data (Cont.)Vehicle Year/Make/Model/Body Style: 2001/Saab/9-5/4 DoorNHTSA No.: C10507; Technician: Chad Gadberry; Date: March 22, 2001

Passenger cars, trucks, buses, and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less. (S7.1.1.5)

Complete one of these forms for **each** designated seating position with forward-facing seats, other than the driver's seat, or seats that can be adjusted to forward-facing **and** that has seat belt retractors that are not automatic locking retractors. (S7.1.1.5(c))

Designated Seating Position (DSP): Center Rear

1. Record the seating position. Non-adjustable  
(S7.1.1.5(c)(1))  
(Any position is acceptable.)
2. Buckle the seat belt. (S7.1.1.5(c)(1))
3. Complete any procedures recommended in the vehicle owner's manual to activate any locking feature. (S7.1.1.5(c)(1))
4. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT have to be attached by the vehicle user to the seat belt webbing, retractor, or any other part of the vehicle. (S7.1.1.5(a))  

(X)Yes-Pass      ( ) No-FAIL
5. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT require inverting, twisting or deforming of the belt webbing (S7.1.1.5(a))  

(X)Yes-Pass      ( ) No-FAIL
6. Does the vehicle user need to take some action to activate the locking feature on the lap belt portion of the seat belt in any forward-facing seat or seat that can be adjusted to forward-facing?  

(X)Yes, go to 6.1      ( ) No, go to 7
- 6.1 Does the vehicle owner's manual include a description in words and/or diagrams describing how to activate the locking feature so that the seat belt assembly can tightly secure a child restraint system and how to deactivate the locking feature to remove the child restraint system (S7.1.1.5(b))  

(X)Yes-Pass      ( ) No-FAIL
7. Locate a reference point A on the seat belt buckle (S7.1.1.5(c)(2))

### Lap Belt Lockability Data (Cont.)

8. Locate a reference point B on the attachment hardware or retractor assembly at the other end of the lap belt or lap belt portion of the seat belt assembly. (S7 1.1.5(c)(2))
9. Adjust the lap belt or lap belt portion of the seat belt assembly according to any procedures recommended in the vehicle owner's manual to activate any locking feature so that the webbing between points A and B is at the maximum length allowed by the belt system. (S7.1.1.5(c)(2))
10. Measure and record the distance between points A and B along the longitudinal centerline of the webbing for the lap belt or lap belt portion of the seat belt assembly. (S7.1.1.5(c)(2))

Measured distance between A and B is 69.0 inches.

11. Readjust the belt system so that the webbing between points A and B is at any length that is 5 inches or more shorter than the maximum length of the webbing. (S7.1.1.5(c)(3))
12. To the lap belt or lap belt portion of the seat belt assembly, apply a preload of 10 pounds using the webbing tension pull device. Apply the load in a vertical plane parallel to the longitudinal axis of the vehicle and passing through the seating reference point of the designated seating position. Apply the preload in a horizontal direction toward the front of the vehicle with a force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal (S7.1.1.5(c)(4))

The measured force application angle = 10 (spec. 5-15 degrees)

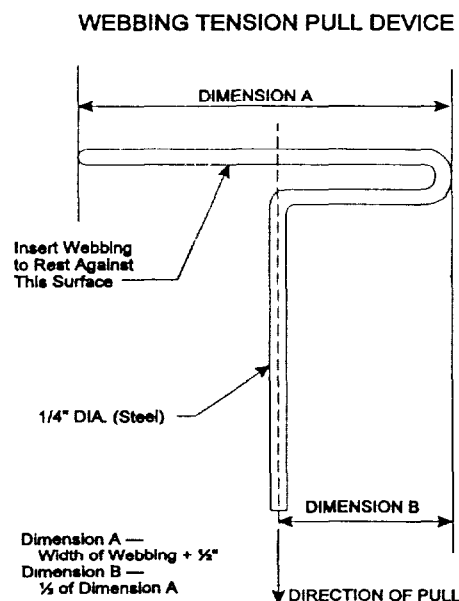


Figure 5 (S7 1 1.5(c)(4))

Lap Belt Lockability Data (Cont.)

13. Measure the length between points A and B along the longitudinal centerline of the webbing while the preload is being applied. (S7.1.1.5(c)(4))

Measured distance between A and B is 13.5 inches.

14. Increase the load to 50 pounds at a rate of no more than 50 pounds per second. Attain the load in not more than 5 seconds. (If webbing sensitive emergency locking retractors are installed as part of the lap belt or lap belt portion of the seat belt assembly, apply the load at a rate less than the threshold value for lock-up specified by the manufacturer.) Maintain the load for at least 5 seconds. Measure and record the distance between points A and B along the longitudinal centerline of the webbing. (S7.1.1.5(c)(5))

Record onset rate 10 lb/sec (Spec. 10 to 50 lb/sec)

Measure distance between points A and B 14.1 inches (S7.1.1.5(c)(6))

15. Subtract the measurement in 13 from the measurement in 14. Is the difference 2 inches or less? (S7.1.1.5(c)(7))

14-13 = 0.6 inches

(X)Yes-Pass

( ) No-FAIL

16. Subtract the measurement in 14 from the measurement in 10. Is the difference 3 inches or more?

10-14 = 54.9 inches

(X)Yes-Pass

( ) No-FAIL

REMARKS: None

Lap Belt Lockability Data (Cont.)Vehicle Year/Make/Model/Body Style: 2001/Saab/9-5/4 DoorNHTSA No.: C10507 ; Technician: Chad Gadberry ; Date: March 22, 2001

Passenger cars, trucks, buses, and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less. (S7.1.1.5)

Complete one of these forms for **each** designated seating position with forward-facing seats, other than the driver's seat, or seats that can be adjusted to forward-facing **and** that has seat belt retractors that are not automatic locking retractors. (S7.1.1.5(c))

Designated Seating Position (DSP): Right Rear

1. Record the seating position. Non-adjustable  
(S7.1.1.5(c)(1))  
(Any position is acceptable.)
2. Buckle the seat belt. (S7.1.1.5(c)(1))
3. Complete any procedures recommended in the vehicle owner's manual to activate any locking feature. (S7.1.1.5(c)(1))
4. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT have to be attached by the vehicle user to the seat belt webbing, retractor, or any other part of the vehicle. (S7.1.1.5(a))  

(X) Yes-Pass      ( ) No-FAIL
5. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT require inverting, twisting or deforming of the belt webbing. (S7.1.1.5(a))  

(X) Yes-Pass      ( ) No-FAIL
6. Does the vehicle user need to take some action to activate the locking feature on the lap belt portion of the seat belt in any forward-facing seat or seat that can be adjusted to forward-facing?  

(X) Yes, go to 6.1      ( ) No, go to 7.
- 6.1 Does the vehicle owner's manual include a description in words and/or diagrams describing how to activate the locking feature so that the seat belt assembly can tightly secure a child restraint system and how to deactivate the locking feature to remove the child restraint system. (S7.1.1.5(b))  

(X) Yes-Pass      ( ) No-FAIL
7. Locate a reference point A on the seat belt buckle (S7.1.1.5(c)(2))

### Lap Belt Lockability Data (Cont.)

8. Locate a reference point B on the attachment hardware or retractor assembly at the other end of the lap belt or lap belt portion of the seat belt assembly. (S7.1.1.5(c)(2))
9. Adjust the lap belt or lap belt portion of the seat belt assembly according to any procedures recommended in the vehicle owner's manual to activate any locking feature so that the webbing between points A and B is at the maximum length allowed by the belt system. (S7.1.1.5(c)(2))
10. Measure and record the distance between points A and B along the longitudinal centerline of the webbing for the lap belt or lap belt portion of the seat belt assembly. (S7.1.1.5(c)(2))

Measured distance between A and B is 55.0 inches.

11. Readjust the belt system so that the webbing between points A and B is at any length that is 5 inches or more shorter than the maximum length of the webbing. (S7.1.1.5(c)(3))
12. To the lap belt or lap belt portion of the seat belt assembly, apply a preload of 10 pounds using the webbing tension pull device. Apply the load in a vertical plane parallel to the longitudinal axis of the vehicle and passing through the seating reference point of the designated seating position. Apply the preload in a horizontal direction toward the front of the vehicle with a force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal. (S7.1.1.5(c)(4))

The measured force application angle = 10 (spec. 5-15 degrees)

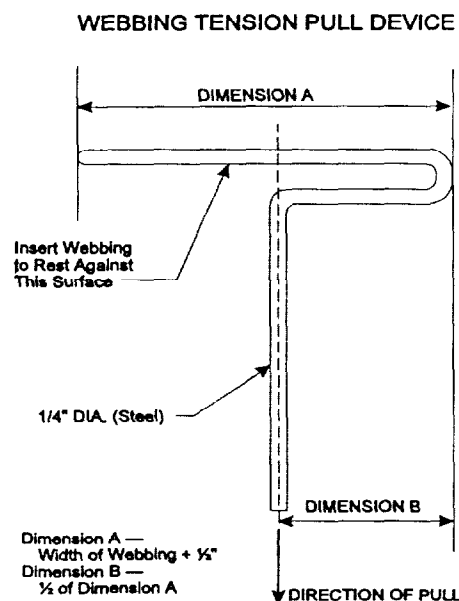


Figure 5 (S7 1 1 5(c)(4))

Lap Belt Lockability Data (Cont.)

13. Measure the length between points A and B along the longitudinal centerline of the webbing while the preload is being applied. (S7.1.1.5(c)(4))

Measured distance between A and B is 17.0 inches.

14. Increase the load to 50 pounds at a rate of no more than 50 pounds per second. Attain the load in not more than 5 seconds. (If webbing sensitive emergency locking retractors are installed as part of the lap belt or lap belt portion of the seat belt assembly, apply the load at a rate less than the threshold value for lock-up specified by the manufacturer.) Maintain the load for at least 5 seconds. Measure and record the distance between points A and B along the longitudinal centerline of the webbing. (S7.1.1.5(c)(5))

Record onset rate: 10 lb/sec (Spec. 10 to 50 lb/sec)

Measure distance between points A and B 17.9 inches (S7.1.1.5(c)(6))

15. Subtract the measurement in 13 from the measurement in 14. Is the difference 2 inches or less? (S7.1.1.5(c)(7))

14-13 = 0.9 inches

(X)Yes-Pass

( ) No-FAIL

16. Subtract the measurement in 14 from the measurement in 10. Is the difference 3 inches or more?

10-14 = 37.1 inches

(X)Yes-Pass

( ) No-FAIL

REMARKS: None

### Seat Belt Comfort and Convenience Data

#### 1. **BELT CONTACT FORCE (S7.4.3)**

Test Vehicle NHTSA No : C10507

Vehicle Model Year/Make/Model/Body Style: 2001/Saab/9-5/4 Door

Designated Seating Position Tested: Left Rear

Date of Comfort/Convenience Check March 22, 2001

Technician Performing Check: Chad Gadberry

GVWR: 4530 lb

Test all Type 2 seat belts other than those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars. Complete a form for each applicable seat belt.

##### 1.1 Does the vehicle incorporate a webbing tension-relieving device?

( ) Yes - go to latchplate access

(X) No - continue with this check sheet

##### 1.2 Adjustable seats are in adjustment position midway between the forward most and rearmost positions. If an adjustment position does not exist midway between the forward most and rearmost positions, the next closest adjustment position to the rear of the midpoint is used (S8.1.2)

( ) Check

(X) N/A

##### 1.3 If separately adjustable in a vertical direction, the seats are at the lowest position

( ) Check

(X) N/A

##### 1.4 Place adjustable seat backs in the manufacturer's nominal design riding position in the manner specified by the manufacturer.

( ) Check

(X) N/A

##### 1.5 Place any adjustable anchorages at the manufacturer's nominal design position for a 50th percentile adult male (50M) occupant. This information will be furnished by the COTR.

( ) Check

(X) N/A

##### 1.6 Place each adjustable head restraint in its highest adjustment position

(X) Check

( ) N/A

### Seat Belt Comfort and Convenience Data (Cont.)

-

Seat Belt Comfort and Convenience Data (Cont.)**1 BELT CONTACT FORCE (S7.4.3)**Test Vehicle NHTSA No.: C10507Vehicle Model Year/Make/Model/Body Style: 2001/Saab/9-5/4 DoorDesignated Seating Position Tested: Center RearDate of Comfort/Convenience Check: March 22, 2001Technician Performing Check: Chad GadberryGVWR: 4530 lb

Test all Type 2 seat belts other than those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars. Complete a form for each applicable seat belt.

- 1.1 Does the vehicle incorporate a webbing tension-relieving device?  
( ) Yes - go to latchplate access  
(X) No - continue with this check sheet
- 1.2 Adjustable seats are in adjustment position midway between the forward most and rearmost positions. If an adjustment position does not exist midway between the forward most and rearmost positions, the next closest adjustment position to the rear of the midpoint is used. (S8.1.2)  
( ) Check  
(X) N/A
- 1.3 If separately adjustable in a vertical direction, the seats are at the lowest position.  
( ) Check  
(X) N/A
- 1.4 Place adjustable seat backs in the manufacturer's nominal design riding position in the manner specified by the manufacturer.  
( ) Check  
(X) N/A
- 1.5 Place any adjustable anchorages at the manufacturer's nominal design position for a 50th percentile adult male (50M) occupant. This information will be furnished by the COTR  
( ) Check  
(X) N/A
- 1.6 Place each adjustable head restraint in its highest adjustment position.  
( ) Check  
(X) N/A

Seat Belt Comfort and Convenience Data (Cont.)

- 1.7 Adjustable lumbar supports are positioned so that the lumbar support is in its lowest adjustment position. (S8.1.3)  
       ☐ Check  
       ☒ N/A
- 1.8 Position the test dummies according to dummy position placement instructions in Appendix B.  
       ☒ Check
- 1.9 Fasten the seat belt latch. Pull either 12 inches of belt webbing or the maximum available amount of belt webbing, whichever is less, from the retractor and then release it, allowing the belt webbing to return to the dummy's chest. Locate the point where the centerline of the upper torso belt webbing crosses the midsagittal line on the dummy's chest. At that point, pull the belt webbing out 3 inches from the dummy's chest and release until it is within one inch from the dummy's chest. (S10.8) Measure the contact force exerted by the belt webbing on the dummy's chest. Contact the COTR if the contact force exceeds 0.7 pounds.  
     Contact Force 0.7 lb. ☒ 0.0 to 0.7 pounds - Pass  
     ☐ greater than 0.7 pounds - FAIL\*
- \* If the seat belts are voluntarily installed by the manufacturer they do not have to comply.

Seat Belt Comfort and Convenience Data (Cont.)

**1. BELT CONTACT FORCE (S7.4.3)**

Test Vehicle NHTSA No.: C10507

Vehicle Model Year/Make/Model/Body Style: 2001/Saab/9-5/4 Door

Designated Seating Position Tested: Right Rear

Date of Comfort/Convenience Check: March 22, 2001

Technician Performing Check: Chad Gadberry

GVWR: 4530 lb

Test all Type 2 seat belts other than those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars. Complete a form for each applicable seat belt.

- 1.1 Does the vehicle incorporate a webbing tension-relieving device?  
☐ Yes - go to latchplate access  
☒ No - continue with this check sheet
- 1.2 Adjustable seats are in adjustment position midway between the forward most and rearmost positions. If an adjustment position does not exist midway between the forward most and rearmost positions, the next closest adjustment position to the rear of the midpoint is used (S8.1.2)  
☐ Check  
☒ N/A
- 1.3 If separately adjustable in a vertical direction, the seats are at the lowest position  
☐ Check  
☒ N/A
- 1.4 Place adjustable seat backs in the manufacturer's nominal design riding position in the manner specified by the manufacturer.  
☐ Check  
☒ N/A
- 1.5 Place any adjustable anchorages at the manufacturer's nominal design position for a 50th percentile adult male (50M) occupant. This information will be furnished by the COTR  
☐ Check  
☒ N/A
- 1.6 Place each adjustable head restraint in its highest adjustment position.  
☒ Check  
☐ N/A

### Seat Belt Comfort and Convenience Data (Cont )

- 1.7 Adjustable lumbar supports are positioned so that the lumbar support is in its lowest adjustment position. (S8.1 3)  
☐ Check  
☒ N/A
- 1.8 Position the test dummies according to dummy position placement instructions in Appendix B.  
☒ Check
- 1.9 Fasten the seat belt latch. Pull either 12 inches of belt webbing or the maximum available amount of belt webbing, whichever is less, from the retractor and then release it, allowing the belt webbing to return to the dummy's chest. Locate the point where the centerline of the upper torso belt webbing crosses the midsagittal line on the dummy's chest. At that point, pull the belt webbing out 3 inches from the dummy's chest and release until it is within one inch from the dummy's chest. (S10.8) Measure the contact force exerted by the belt webbing on the dummy's chest. Contact the COTR if the contact force exceeds 0.7 pounds.
- Contact Force 1.0 lb.                      ☐ 0.0 to 0.7 pounds - Pass  
                                                               ☒ greater than 0.7 pounds - FAIL\*

\* If the seat belts are voluntarily installed by the manufacturer they do not have to comply.

Seat Belt Comfort and Convenience Data (Cont.)

2. **LATCHPLATE ACCESS (S7.4.4)**

Test Vehicle NHTSA No. C10507

Vehicle Model Year/Make/Model/Body Style: 2001/Saab/9-5/4 Door

Designated Seating Position Tested: **Not applicable - passenger car**

Date of Comfort/Convenience Check: \_\_\_\_\_

Technician Performing Check: \_\_\_\_\_

GVWR: \_\_\_\_\_

Test all front outboard seat belts other than those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars. Complete a form for each applicable seat belt.

- 2.1 Position the seat in its forward most adjustment position.  
( ) Check
- 2.2 Position the test dummy using the procedures in Appendix B. (Some modifications to the positioning procedure may need to be made because the seat is in its forward most position.)  
( ) Check
- 2.3 Position the adjustable seat belt anchorage in the manufacturer's nominal design position for a 50th percentile adult male occupant.  
( ) Check
- 2.4 Attach the inboard and outboard reach string following the instructions on Figure 1C.  
( ) Check
- 2 5 Place the latch plate in the stowed position.  
( ) Check
- 2 6 Extend each line backward and outboard to generate arcs of the reach envelop of the test dummy's arms. Is the latch plate within the reach envelope?  
( ) Yes-Pass ( ) **No-FAIL**
- 2.7 Using the clearance test block, specified in Figure 2C, is there sufficient clearance between the vehicle seat and the side of vehicle interior to allow the test block to move unhindered to the latch plate or buckle?  
( ) Yes-Pass ( ) **No-FAIL**

Test Vehicle NHTSA No.:C10507

Vehicle Model Year/Make/Model/Body Style: 2001/Saab/9-5/4 Door

Designated Seating Position Tested: **Not applicable - passenger car**

Date of Comfort/Convenience Check \_\_\_\_\_

Technician Performing Check: \_\_\_\_\_

GVWR: \_\_\_\_\_

Test all front outboard seat belts other than those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars. Complete a form for each applicable seat belt.

- 3.1 Is the vehicle a passenger car or walk-in van-type vehicle?  
( ) Yes If yes, go to seat belt guides and hardware.  
( ) No
- 3.2 Adjustable seats are in the adjustment position midway between the forward most and rearmost positions. If an adjustment position does not exist midway between the forward most and rearmost positions, the next closest adjustment position to the rear of the midpoint is used. (S8.1.2)  
( ) Check
- 3.3 If separately adjustable in a vertical direction, the seats are at the lowest position.  
( ) Check
- 3.4 Place adjustable seat backs in the manufacturer's nominal design riding position in the manner specified by the manufacturer.  
( ) Check
- 3.5 Place any adjustable anchorages at the manufacturer's nominal design position for a 50th percentile adult male (50M) occupant. This information will be furnished by the COTR  
( ) Check
- 3.6 Place each adjustable head restraint in its highest adjustment position.  
( ) Check
- 3.7 Adjustable lumbar supports are positioned so that the lumbar support is in its lowest adjustment position (S8.1.3)  
( ) Check

Seat Belt Comfort and Convenience Data (Cont.)

- 3.8 Use anthropomorphic test dummies whose arms have been removed and position the dummies in the front outboard designated seating positions according to instructions in Appendix B  
( ) Check
- 3.9 Restrain the dummies using the belt systems for the position being tested.  
( ) Check
- 3.10 Stow outboard armrests which are capable of being stowed.  
( ) Check
- 3.11 Check the statement that applies to this test vehicle:
- (A) The torso and lap belt webbing of the seat belt system automatically retracts to a stowed position when the adjacent vehicle door is in an open position and the seat belt latch plate is released.  
( ) Pass
- (B) The torso and lap belt webbing of the seat belt system automatically retracts when the seat belt latch plate is released.  
( ) Pass
- (C) Neither A or B apply.  
( ) **FAIL**
- 3.12 With the webbing and hardware in the stowed position are the webbing and hardware prevented from being pinched when the door is closed?  
( ) Yes - Pass  
( ) **No - FAIL**
- 3.13 If this test vehicle has an open body (without doors) and has a seat belt system with a tension-relieving device, does the belt system fully retract when the tension-relieving device is deactivated?  
( ) N/A  
( ) Yes - Pass  
( ) **No - FAIL**

Seat Belt Comfort and Convenience Data (Cont.)**4. SEAT BELT GUIDES AND HARDWARE (S7.4.6)**

Test Vehicle NHTSA No.: C10507

Vehicle Model Year/Make/Model/Body Style: 2001/Saab/9-5/4 Door

Designated Seating Position Tested: Left/Center/Right Rear - Not applicable, see requirement "A" below

Date of Comfort/Convenience Check: March 22, 2001

Technician Performing Check: Chad Gadberry

GVWR: 4530 lb

Test seat belts except those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars. Complete a form for each applicable seat belt.

The requirements for accessibility **DO NOT APPLY** to:

- A. Seats whose seat cushions are movable so that the seat back serves a function other than seating (S7.4.6.1(b))
- B. Seats which are removable.
- C. Seats which are movable so that the space formerly occupied by the seat can be used for a secondary function.

If the seats in this vehicle are different than the criteria above determine the following:

- 4.1 Is the webbing designed to pass through the seat cushion or between the seat cushion and seat back?

( ) Yes - Go to 4.2.  
( ) No - this form is complete

- 4.2 Does one of the following three parts, the seat belt latch plate, the buckle, or the seat belt webbing, stay on top of or above the seat cushion under normal conditions (i.e., conditions other than when belt hardware is intentionally pushed behind the seat by a vehicle occupant)?

( ) Yes - Pass  
( ) No - FAIL

- 4.3 Are the remaining two seat belt parts accessible under normal conditions?

( ) Yes - Pass  
( ) No - FAIL

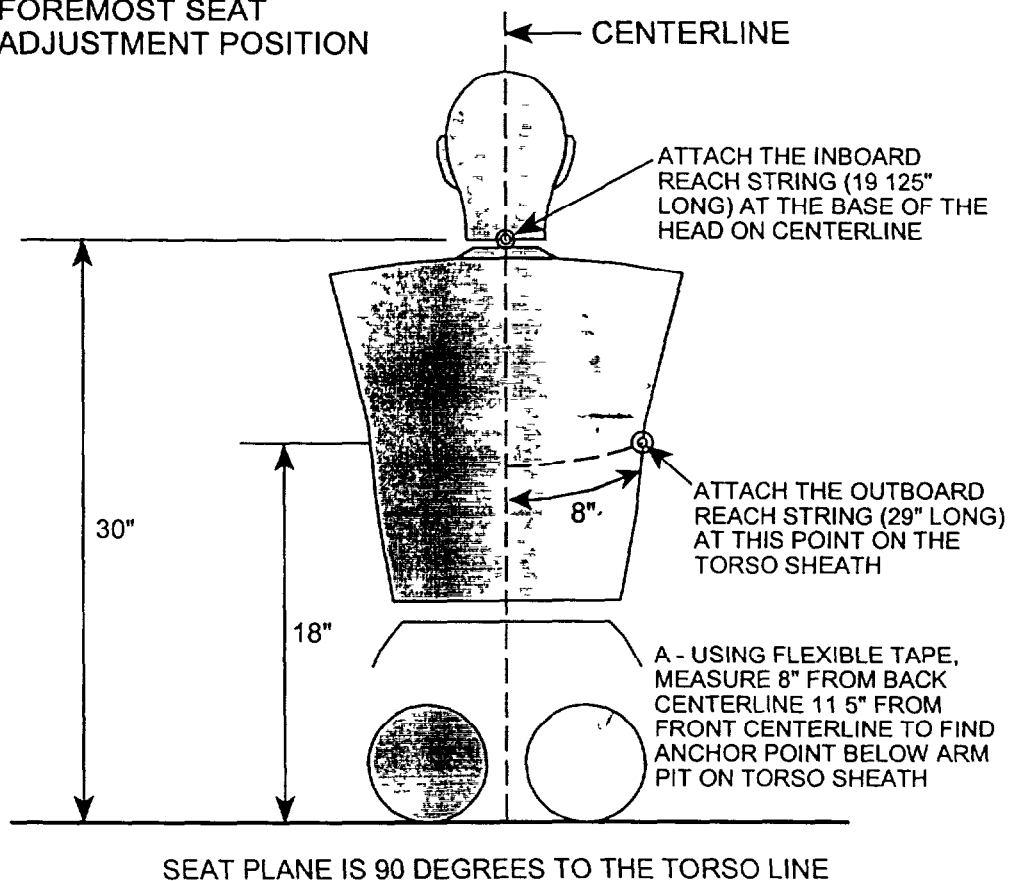
Seat Belt Comfort and Convenience Data (Cont.)

- 4.4 The buckle and latch plate do not pass through the guides or conduits provided and fall behind the seat when the following events occur in order:
- (A) The belt is completely retracted or, if the belt is nonretractable, the belt is unlatched. ☐ Check
  - (B) The seat is moved to any position to which it is designed to be adjusted. ☐ Check
  - (C) The seat back, if foldable, is folded forward as far as possible and then moved backward into position. ☐ Check
- ☐ Yes - Pass  
☐ No - **FAIL**
- 4 5 Is the inboard receptacle end of the seat belt assembly, installed in the outboard designated seating position, accessible with the center arm rest in any position to which it can be adjusted (without moving the armrest)?
- ☐ Yes - Pass  
☐ No - **FAIL**

# LOCATION OF ANCHORING POINTS FOR LATCHPLATE REACH LIMITING CHAINS OR STRINGS TO TEST FOR LATCHPLATE ACCESSIBILITY

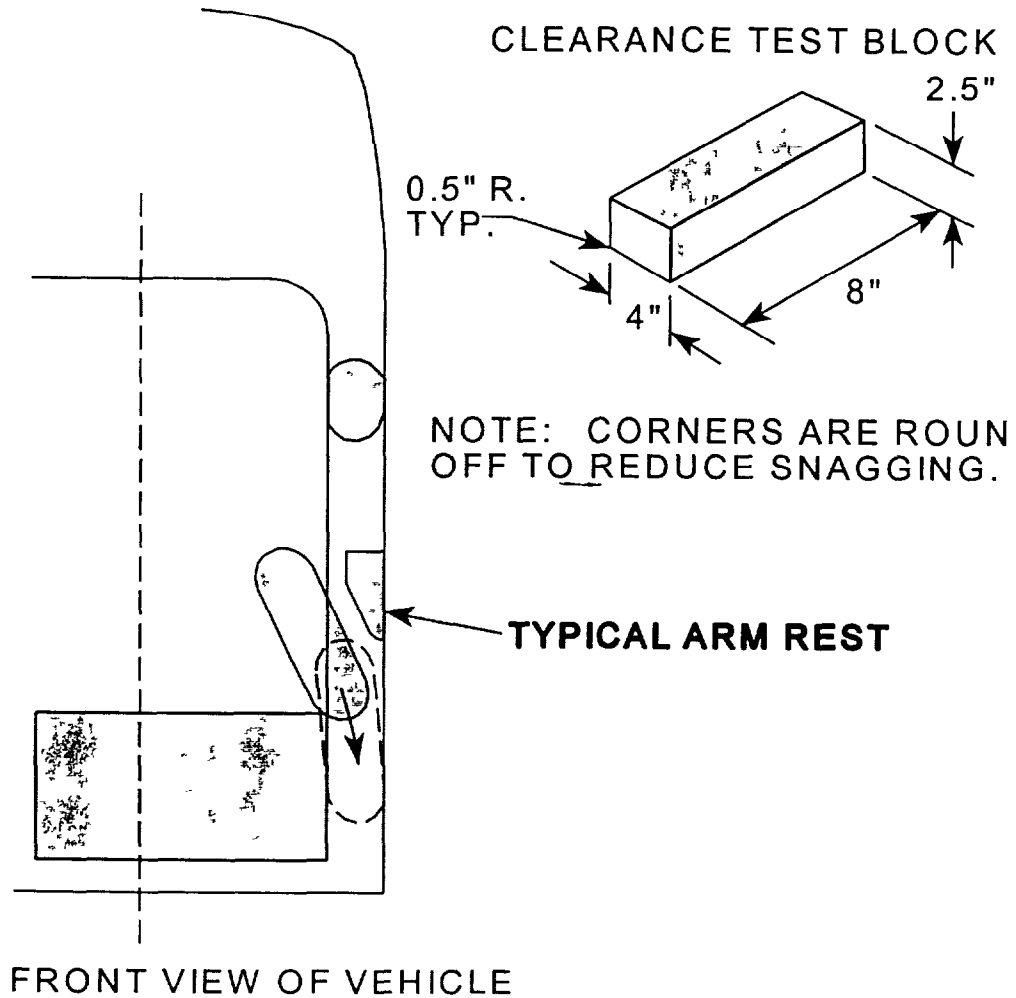
## PART 572E DUMMY

50TH PERCENTILE  
DUMMY SEATED IN  
FOREMOST SEAT  
ADJUSTMENT POSITION



REAR VIEW

## USE OF CLEARANCE TEST BLOCK TO DETERMINE HAND/ARM ACCESS



APPENDIX A  
PHOTOGRAPHS

## TABLE OF PHOTOGRAPHS

| <u>Description</u>                                                   | <u>Page No.</u> |
|----------------------------------------------------------------------|-----------------|
| Photo No. A-1 - Pre-Test Frontal View                                | A-1             |
| Photo No. A-2 - Pre-Test Left Side View                              | A-2             |
| Photo No. A-3 - Pre-Test Right Side View                             | A-3             |
| Photo No. A-4 - Pre-Test Windshield View                             | A-4             |
| Photo No. A-5 - Post-Test Windshield View                            | A-5             |
| Photo No. A-6 - Pre-Test Driver Dummy Position View (Door Open)      | A-6             |
| Photo No. A-7 - Post-Test Driver Dummy Position View (Door Open)     | A-7             |
| Photo No. A-8 - Pre-Test Driver Dummy Position View                  | A-8             |
| Photo No. A-9 - Post-Test Driver Dummy Position View                 | A-9             |
| Photo No. A-10 - Pre-Test Passenger Dummy Position View (Door Open)  | A-10            |
| Photo No. A-11 - Post-Test Passenger Dummy Position View (Door Open) | A-11            |
| Photo No. A-12 - Pre-Test Passenger Dummy Position View              | A-12            |
| Photo No. A-13 - Post-Test Passenger Dummy Position View             | A-13            |
| Photo No. A-14 - Post-Test Driver Airbag View                        | A-14            |
| Photo No. A-15 - Post-Test Driver Head Contact (side header)         | A-15            |
| Photo No. A-16 - Post-Test Driver Head Contact (windshield)          | A-16            |
| Photo No. A-17 - Post-Test Driver Head Contact View (visor)          | A-17            |
| Photo No. A-18 - Post-Test Passenger Dummy Airbag View               | A-18            |
| Photo No. A-19 - Post-Test Passenger Head Contact View (visor)       | A-19            |
| Photo No. A-20 - Pre-Test Driver Knee Bolster View                   | A-20            |
| Photo No. A-21 - Post-Test Driver Knee Bolster View                  | A-21            |
| Photo No. A-22 - Pre-Test Passenger Knee Bolster View                | A-22            |
| Photo No. A-23 - Post-Test Passenger Knee Bolster View               | A-23            |
| Photo No. A-24 - Pre-Test Driver Seat Position View                  | A-24            |
| Photo No. A-25 - Post-Test Driver Seat Position View                 | A-25            |
| Photo No. A-26 - Pre-Test Passenger Seat Position View               | A-26            |
| Photo No. A-27 - Post-Test Passenger Seat Position View              | A-27            |
| Photo No. A-28 - Vehicle Certification Label                         | A-28            |
| Photo No. A-29 - FMVSS 110 Label                                     | A-29            |

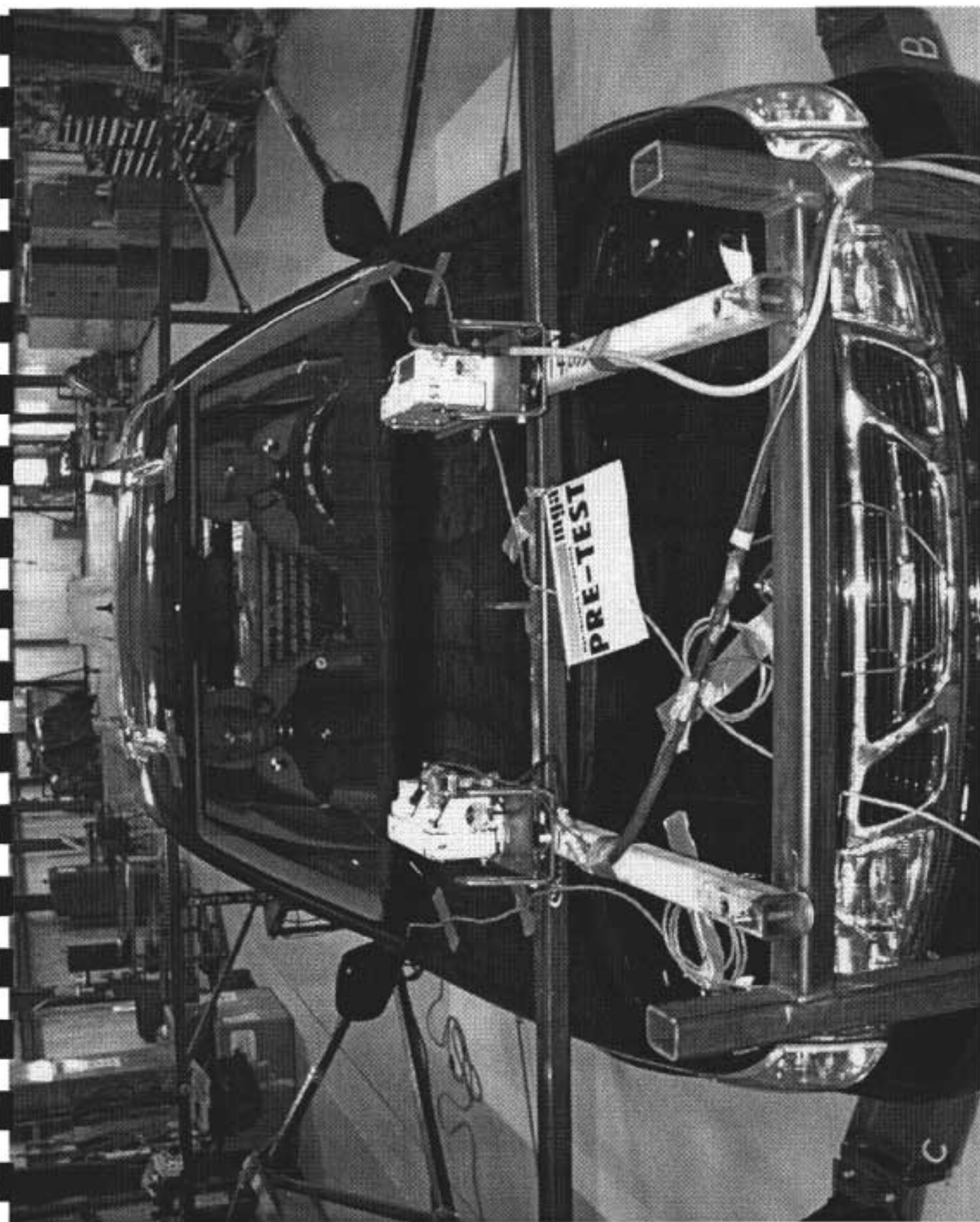


Photo No. A-1 - Pre-Test Frontal View

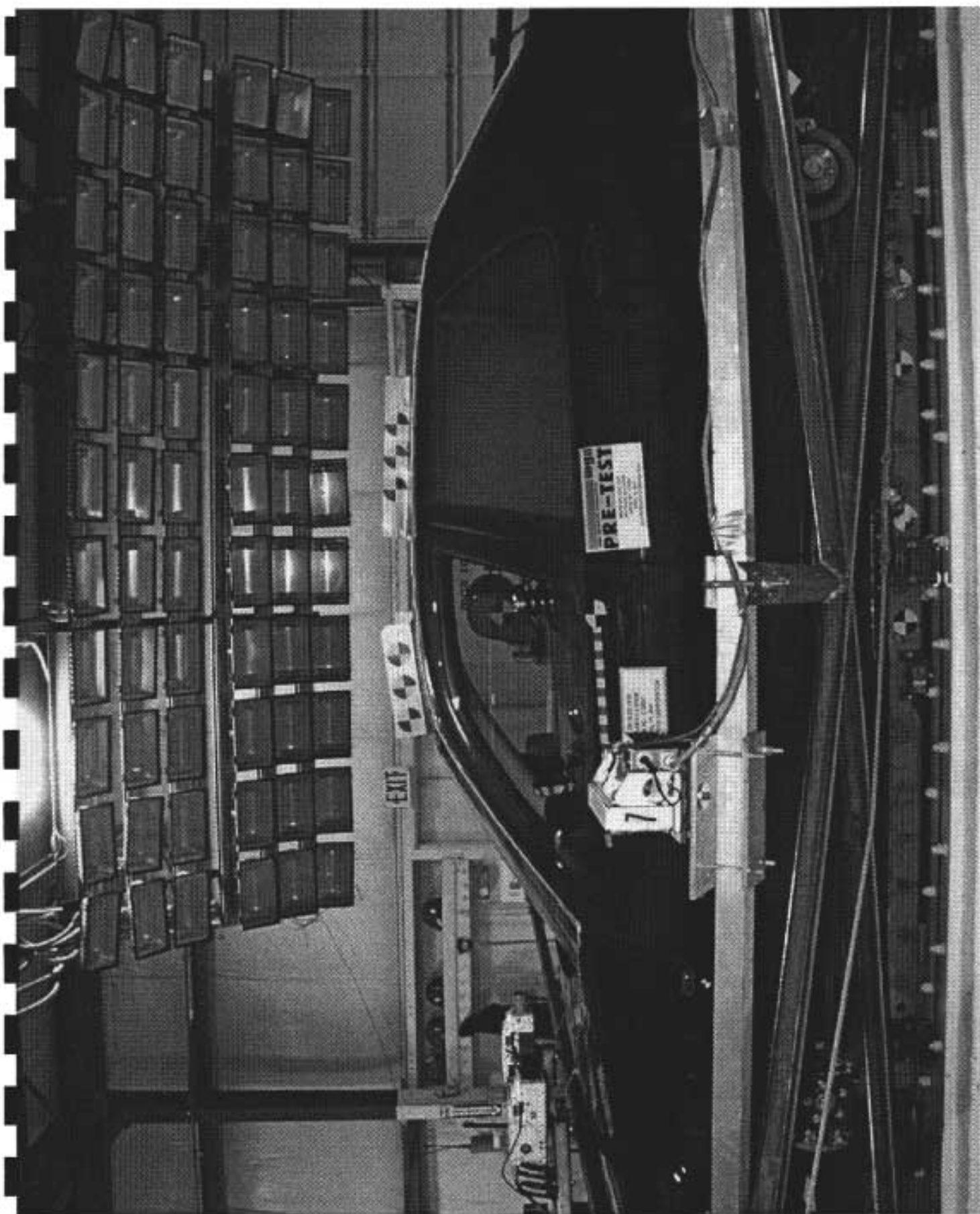


Photo No. A-2 - Pre-Test Left Side View

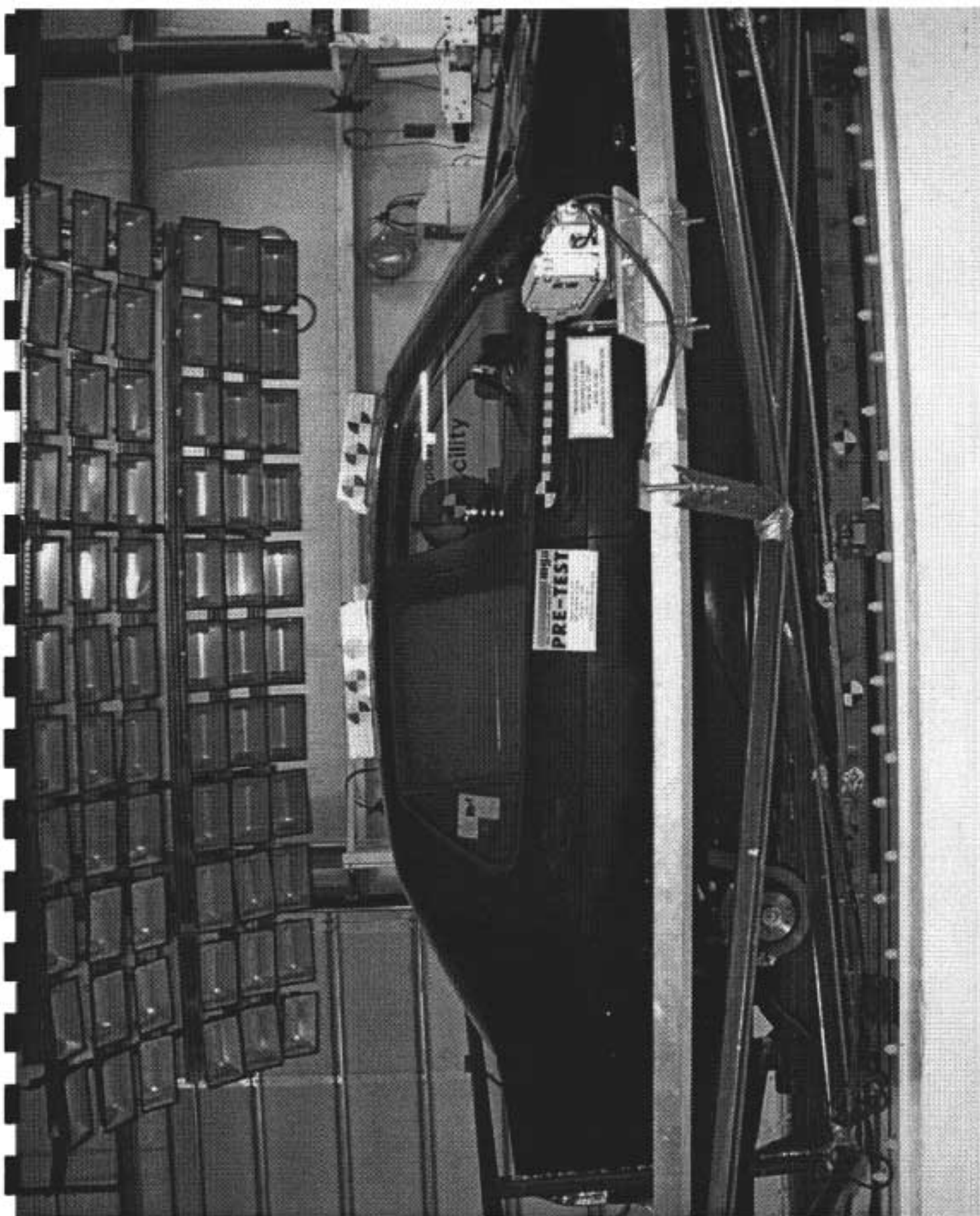


Photo No. A-3 - Pre-Test Right Side View

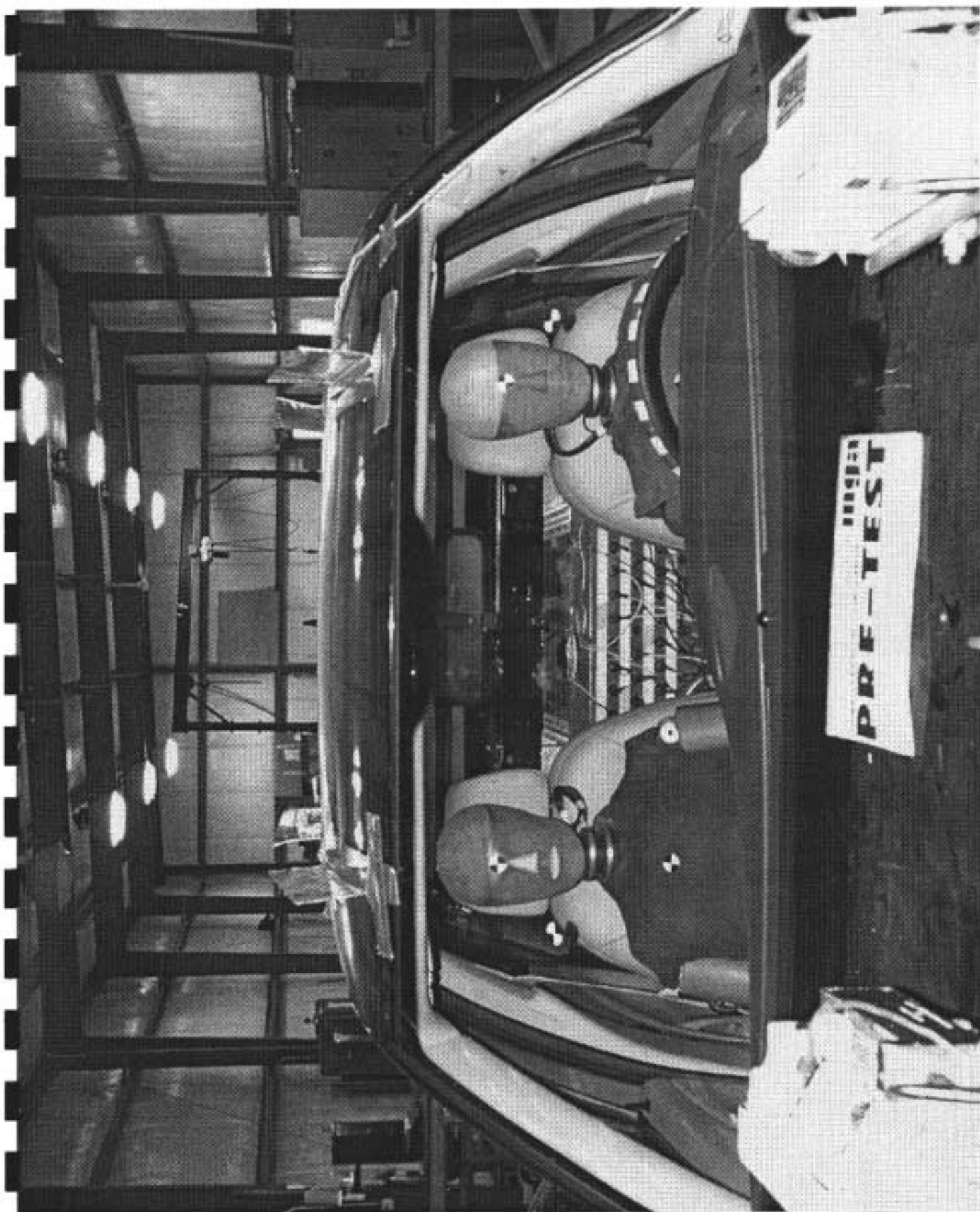


Photo No. A-4 - Pre-Test Windshield View



Photo No. A-5 - Post-Test Windshield View

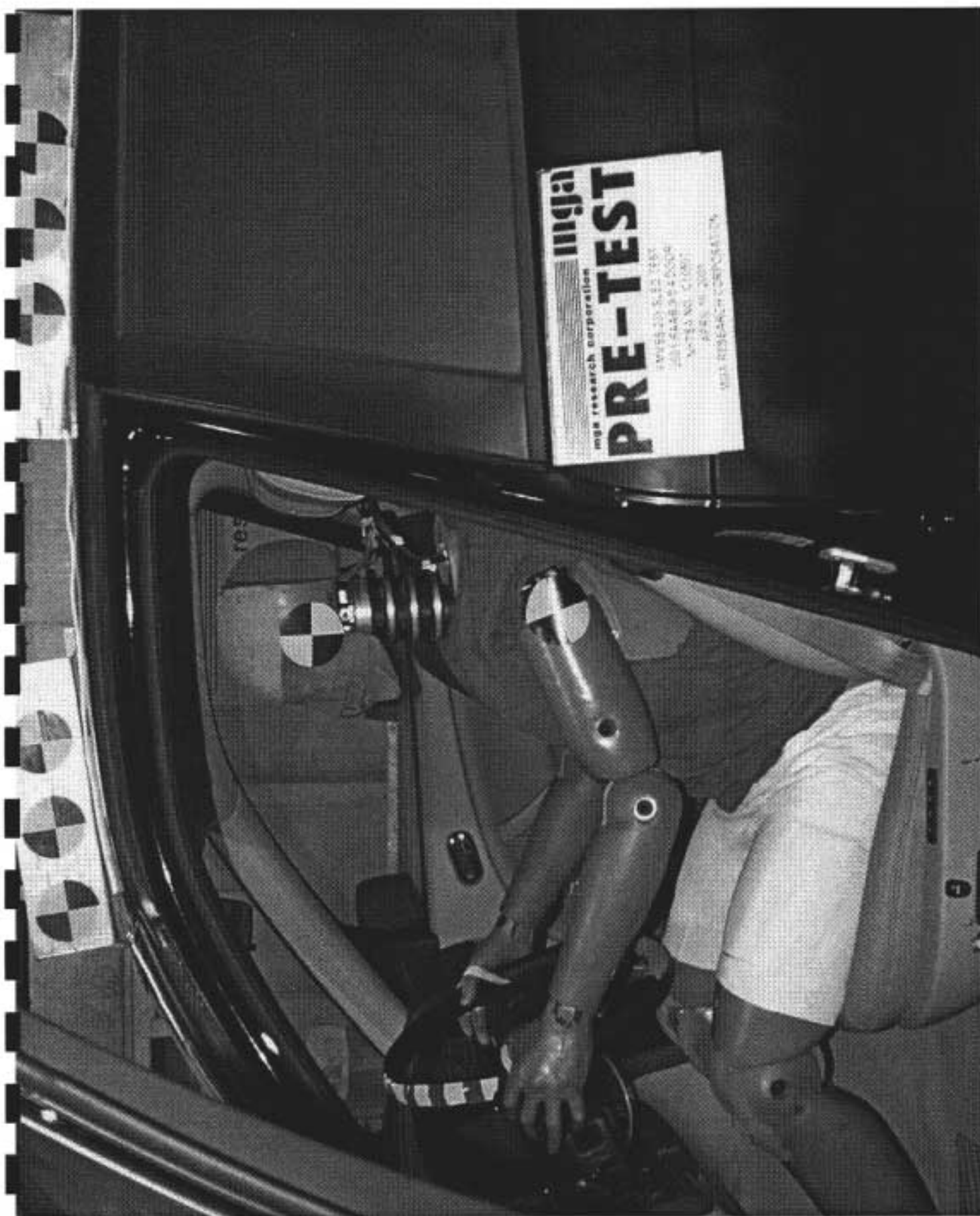


Photo No. A-6 - Pre-Test Driver Dummy Position View (Door Open)



Photo No. A-7 - Post-Test Driver Dummy Position View (Door Open)



Photo No. A-8 - Pre-Test Driver Dummy Position View



Photo No. A-9 - Post-Test Driver Dummy Position View



Photo No. A-10 - Pre-Test Passenger Dummy Position View (Door Open)



Photo No. A-11 - Post-Test Passenger Dummy Position View (Door Open)



Photo No. A-12 - Pre-Test Passenger Dummy Position View

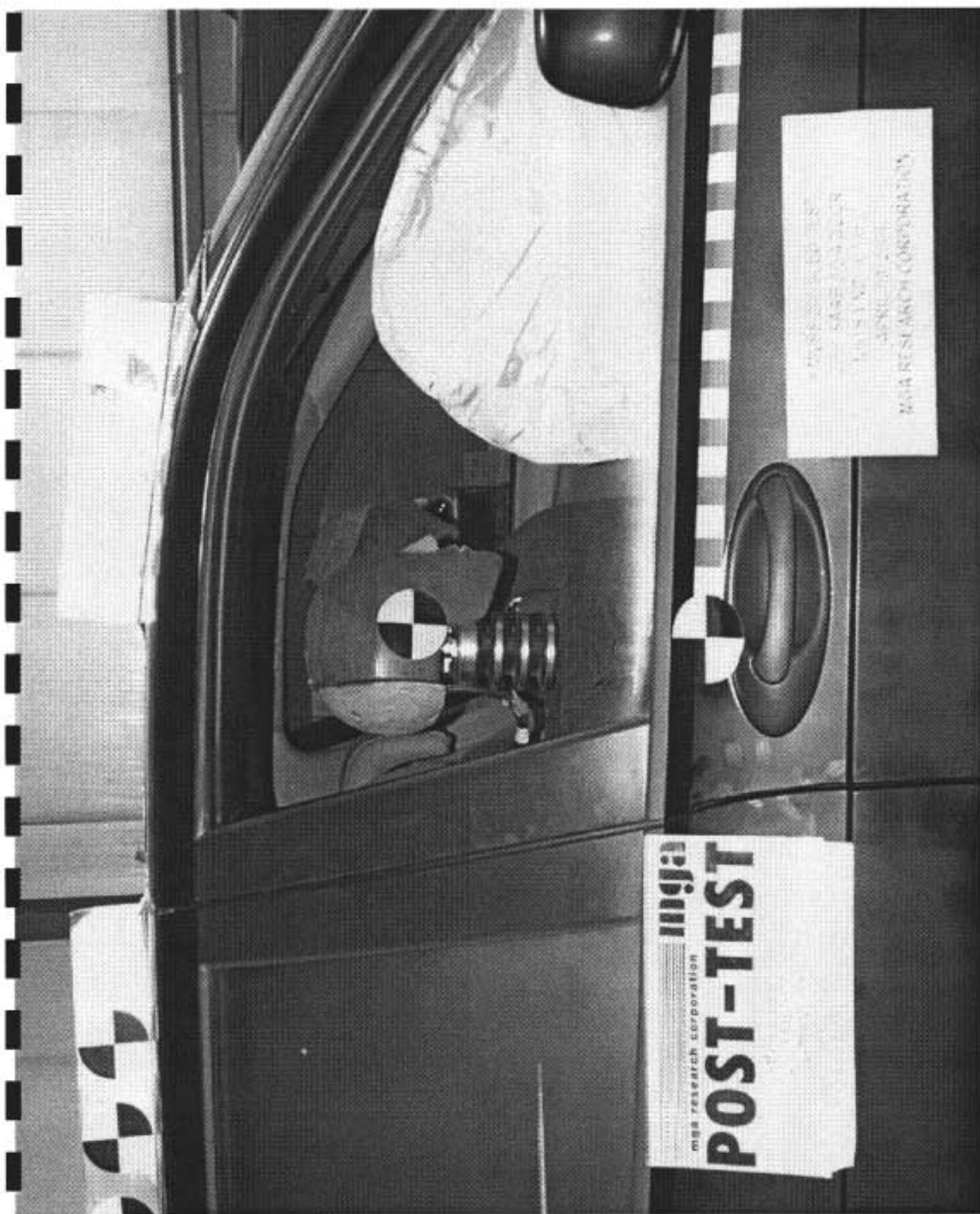


Photo No. A-13 - Post-Test Passenger Dummy Position View



Photo No. A-14 - Post-Test Driver Airbag View



Photo No. A-15 - Post-Test Driver Head Contact (side header)



Photo No. A-16 - Post-Test Driver Head Contact (windshield)



Photo No. A-17 - Post-Test Driver Head Contact View (visor)

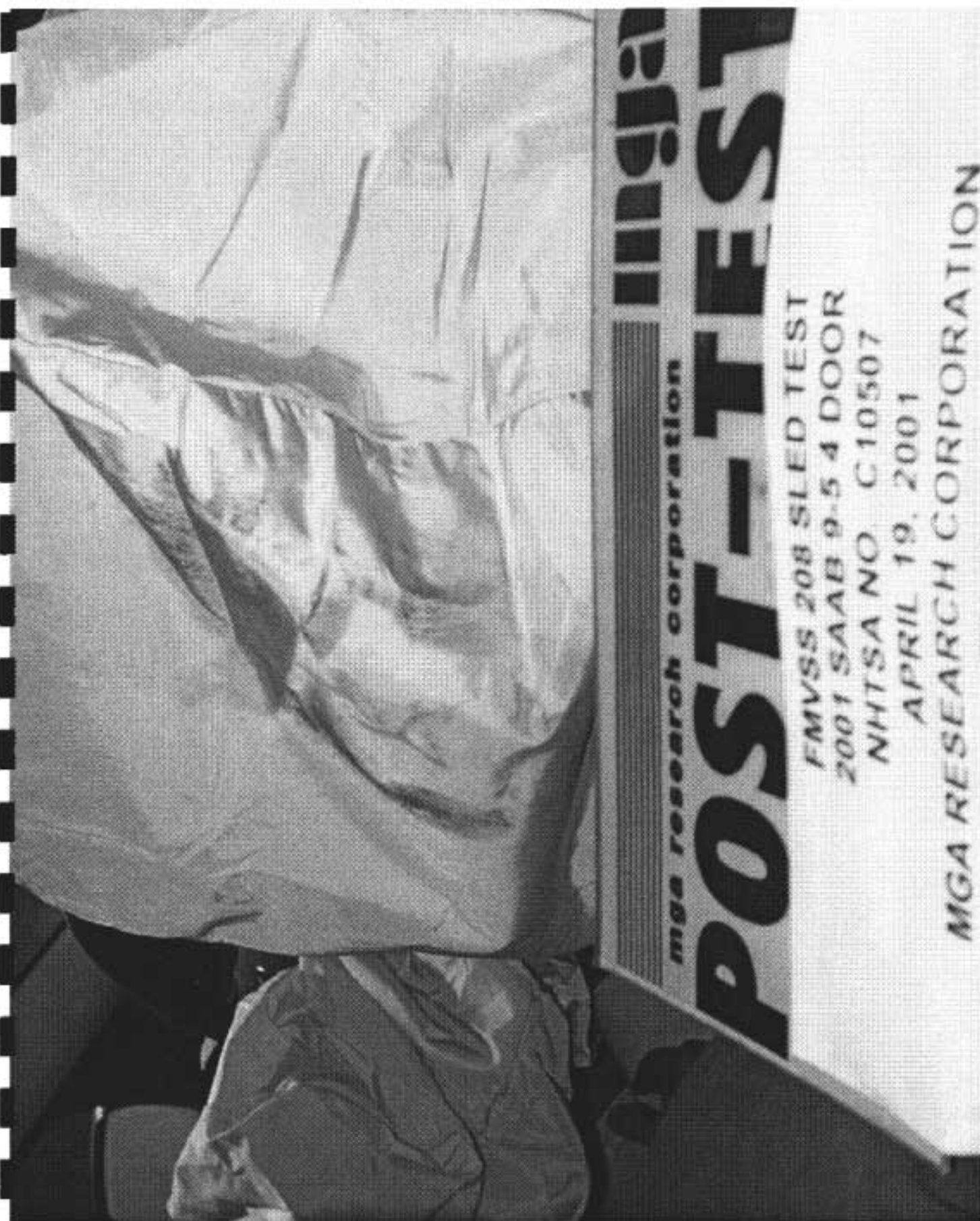


Photo No. A-18 - Post-Test Passenger Dummy Airbag View

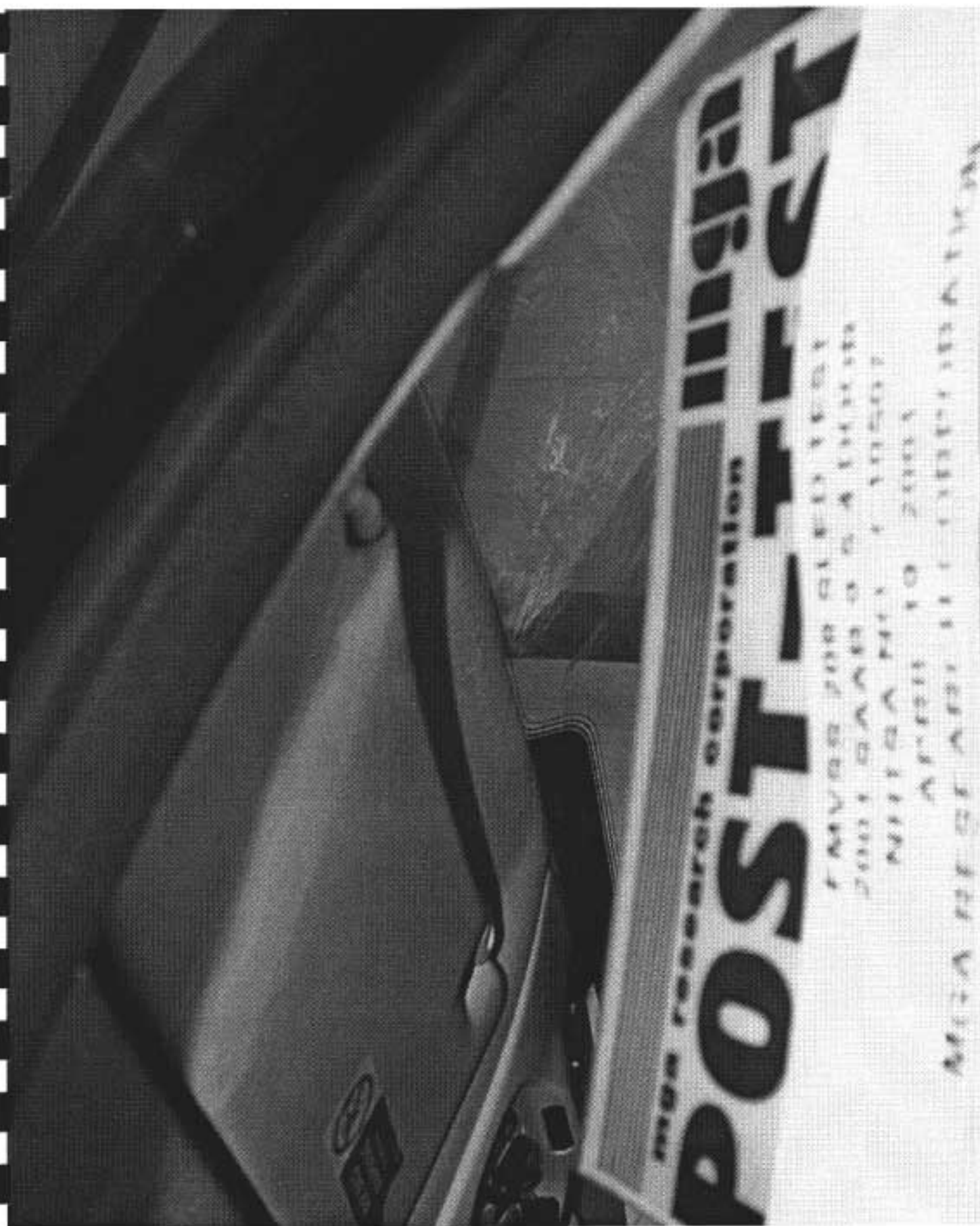


Photo No. A-19 - Post-Test Passenger Head Contact View (visor)



Photo No. A-20 - Pre-Test Driver Knee Bolster View

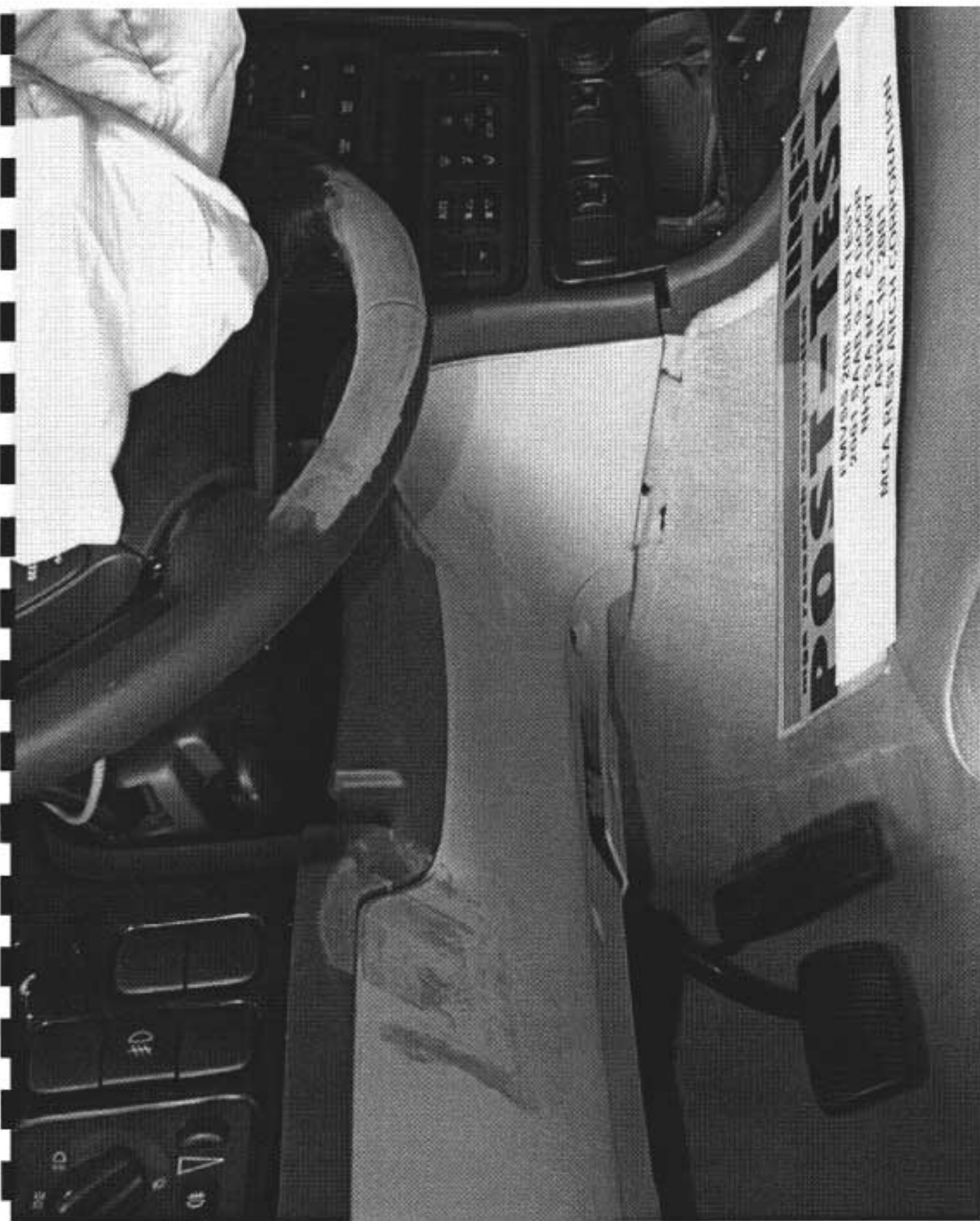


Photo No. A-21 - Post-Test Driver Knee Bolster View

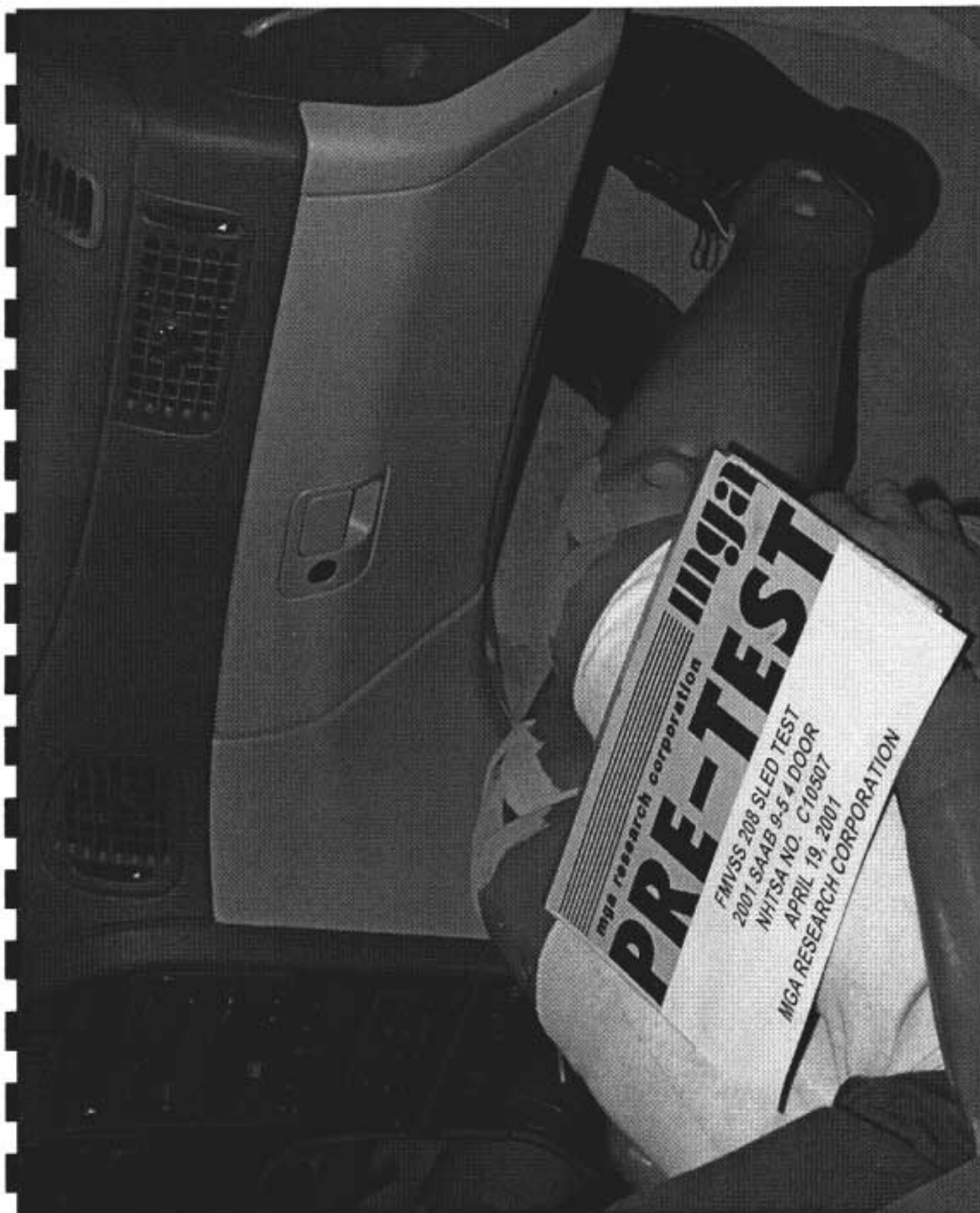


Photo No. A-22 - Pre-Test Passenger Knee Bolster View

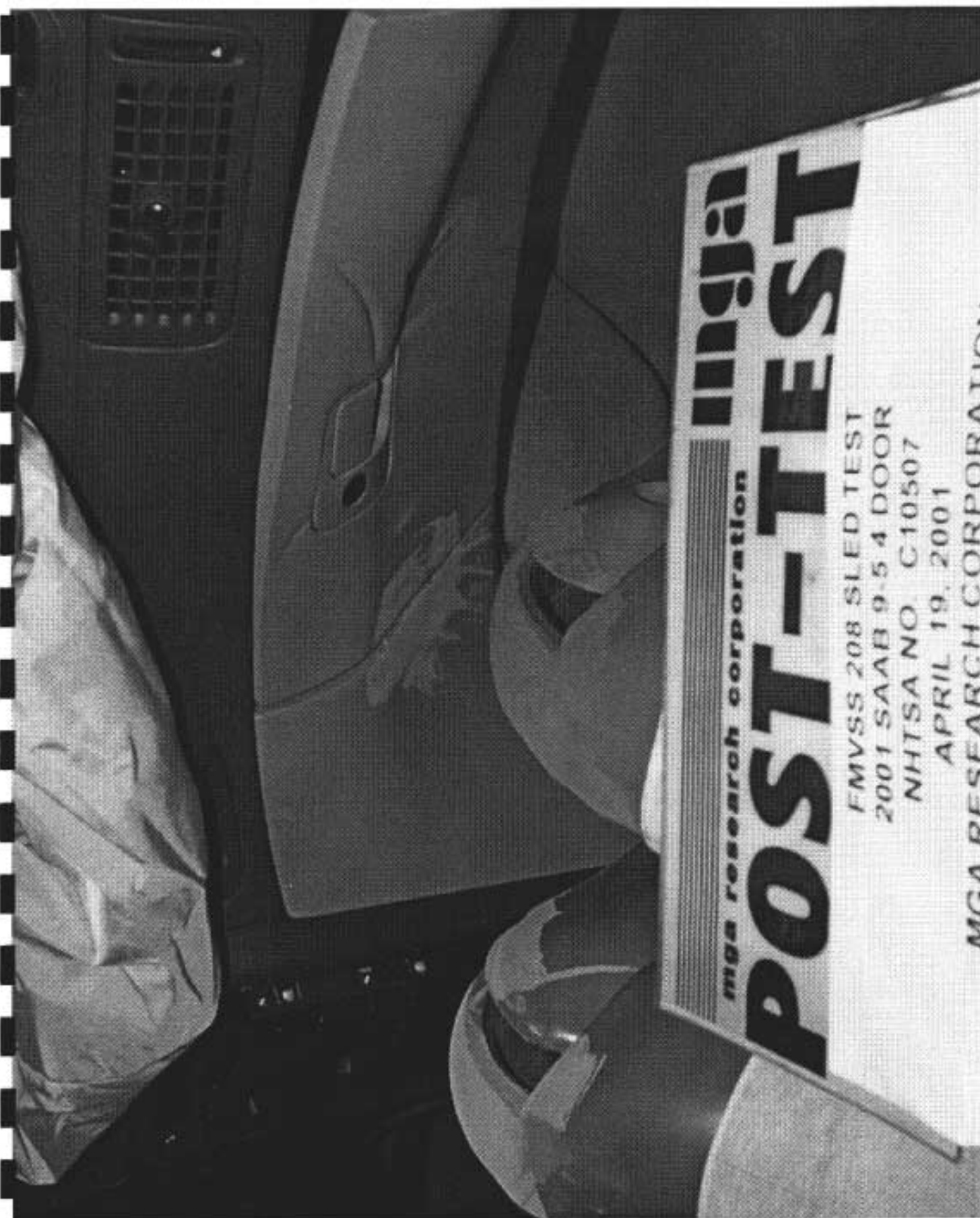


Photo No. A-23 - Post-Test Passenger Knee Bolster View

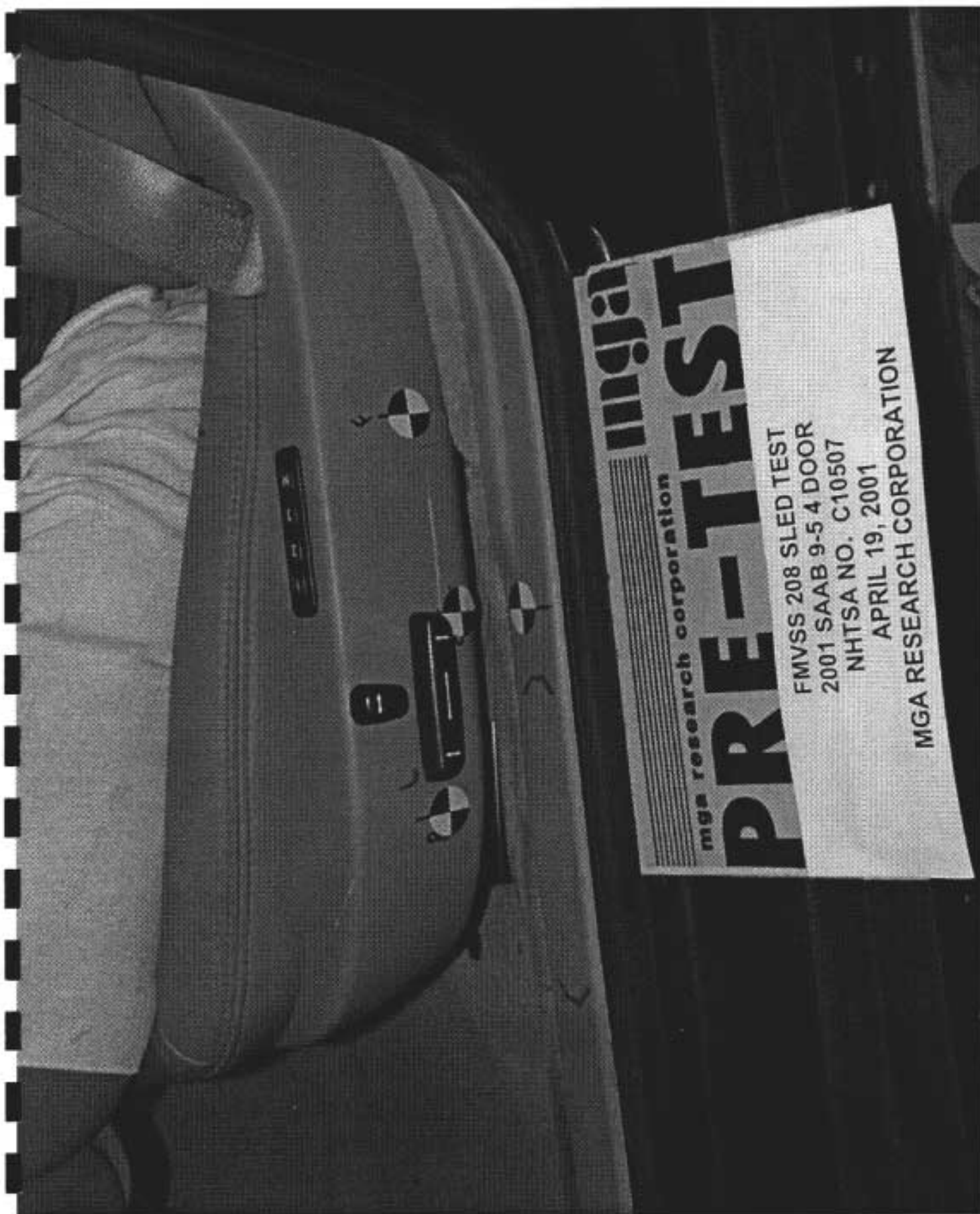


Photo No. A-24 - Pre-Test Driver Seat Position View



Photo No. A-25 - Post-Test Driver Seat Position View

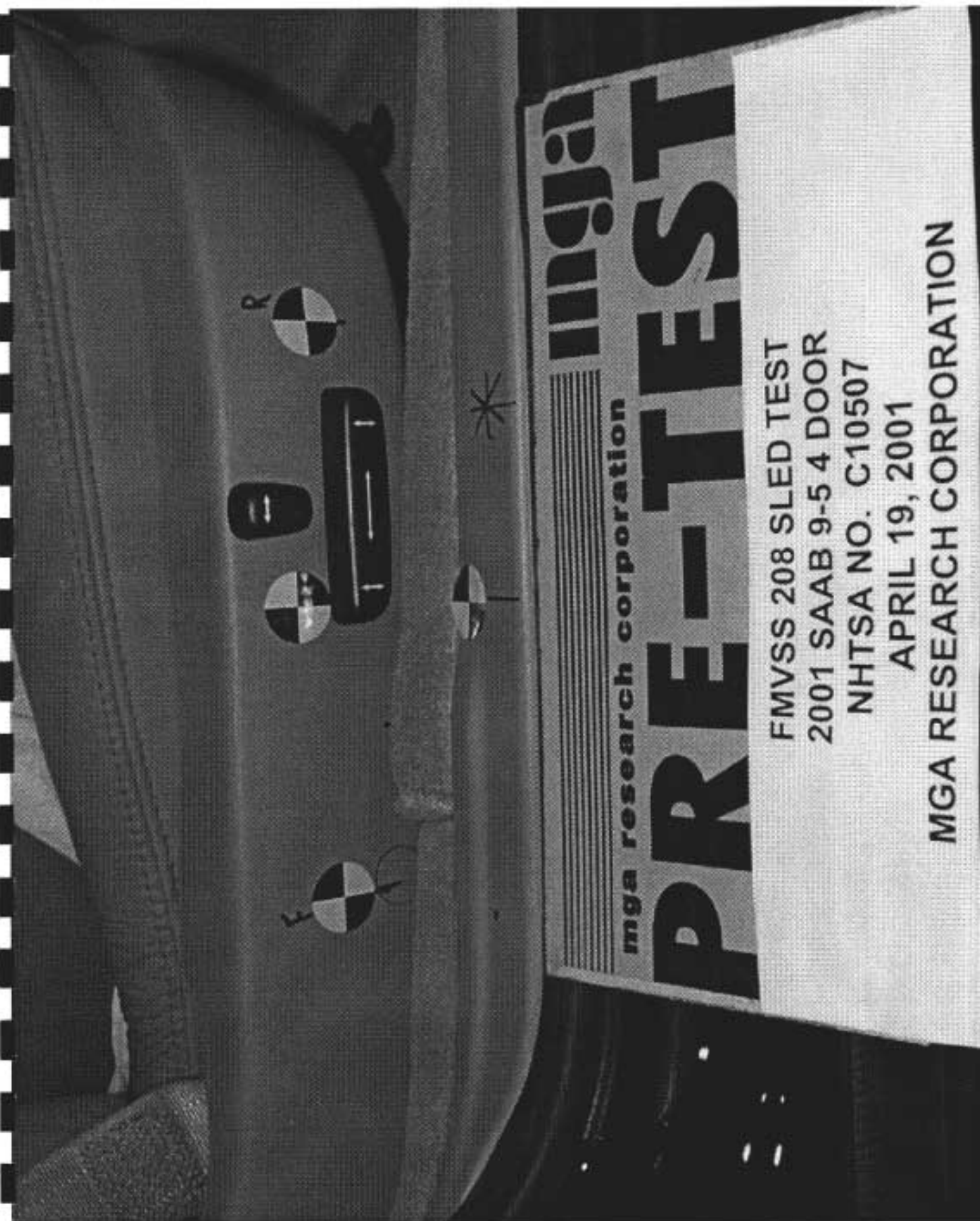


Photo No. A-26 - Pre-Test Passenger Seat Position View



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

DATE: G.V.W.R. G.A.W.R.FRONT G.A.W.R.REAR  
12/00 4530 LB 2500 LB 2310 LB

THIS VEHICLE CONFORMS TO ALL APPLICABLE  
FEDERAL MOTOR VEHICLE SAFETY BUMPER AND  
THEFT PREVENTION STANDARDS IN EFFECT ON  
THE DATE OF MANUFACTURE SHOWN ABOVE.

YS3ED48E613027091



VIN YS3ED48E613027091 PASS. CAR

MFD BY SAAB AUTOMOBILE AB 47 26 412

3 PASS.  
2 PASS.  
TOTAL  
5 PASS.

|              |     |     |     |
|--------------|-----|-----|-----|
| 1-3          | 32  | 32  | 32  |
| 0-160 km/h   | 220 | 220 | 220 |
| 0-100 mph    | 2.2 | 2.2 | 2.2 |
| 4-5          | 39  | 39  | 39  |
| 0-160 km/h   | 270 | 270 | 270 |
| 0-100 mph    | 2.7 | 2.7 | 2.7 |
| 1-5          | 39  | 39  | 39  |
| 160-MAX km/h | 270 | 270 | 270 |
| 100-MAX mph  | 2.7 | 2.7 | 2.7 |

VEHICLE CAPACITY WEIGHT  
CHARGE UTILE  
MAX 421 KG - 920 LBS  
TYRE SIZE 215/55V R16  
RIM SIZE 6.5 X 16

50 60 561  
420 kPa  
60 psi  
4.2 Bar

BODY COLOUR 170 BASESOLID  
TRIM COLOUR L10 CAR NO 27091  
sold by South Automobiles AB

## APPENDIX B

### DATA PLOTS

## TABLE OF DATA PLOTS

| <u>Description</u>                                               | <u>Page No</u> |
|------------------------------------------------------------------|----------------|
| Figure B-1 - Sled X Acceleration vs Time                         | B-1            |
| Figure B-2 - Sled X Velocity vs. Time                            | B-2            |
| Figure B-3 - Sled X Displacement vs. Time                        | B-3            |
| Figure B-4 - 1 Meter Sled Displacement                           | B-4            |
| Figure B-5 - Airbag Timing vs. Time                              | B-5            |
| Figure B-6 - Left Rear Seat Crossmember X Acceleration vs Time   | B-6            |
| Figure B-7 - Right Rear Seat Crossmember X Acceleration vs. Time | B-7            |
| Figure B-8 - Top of Engine X Acceleration vs. Time               | B-8            |
| Figure B-9 - Rear Axle X Acceleration vs. Time                   | B-9            |
| Figure B-10 - Driver Head X Acceleration vs. Time                | B-10           |
| Figure B-11 - Driver Head Y Acceleration vs. Time                | B-11           |
| Figure B-12 - Driver Head Z Acceleration vs. Time                | B-12           |
| Figure B-13 - Driver Head Resultant Acceleration vs. Time        | B-13           |
| Figure B-14 - Driver Neck Force X vs. Time                       | B-14           |
| Figure B-15 - Driver Neck Force Y vs. Time                       | B-15           |
| Figure B-16 - Driver Neck Force Z vs. Time                       | B-16           |
| Figure B-17 - Driver Neck Moment X vs. Time                      | B-17           |
| Figure B-18 - Driver Neck Moment Y vs. Time                      | B-18           |
| Figure B-19 - Driver Neck Moment Z vs Time                       | B-19           |
| Figure B-20 - Driver Occipital Condyle Moment Y vs. Time         | B-20           |
| Figure B-21 - Driver Chest X Acceleration vs. Time               | B-21           |
| Figure B-22 - Driver Chest Y Acceleration vs Time                | B-22           |
| Figure B-23 - Driver Chest Z Acceleration vs. Time               | B-23           |
| Figure B-24 - Driver Chest Resultant Acceleration vs. Time       | B-24           |
| Figure B-25 - Driver Chest Compression vs Time                   | B-25           |
| Figure B-26 - Driver Left Femur Force vs. Time                   | B-26           |
| Figure B-27 - Driver Right Femur Force vs Time                   | B-27           |
| Figure B-28 - Passenger Head X Acceleration vs. Time             | B-28           |
| Figure B-29 - Passenger Head Y Acceleration vs. Time             | B-29           |
| Figure B-30 - Passenger Head Z Acceleration vs. Time             | B-30           |

## TABLE OF DATA PLOTS (Cont.)

| <u>Description</u>                                           | <u>Page No</u> |
|--------------------------------------------------------------|----------------|
| Figure B-31 - Passenger Head Resultant Acceleration vs. Time | B-31           |
| Figure B-32 - Passenger Neck Force X vs. Time                | B-32           |
| Figure B-33 - Passenger Neck Force Y vs. Time                | B-33           |
| Figure B-34 - Passenger Neck Force Z vs. Time                | B-34           |
| Figure B-35 - Passenger Neck Moment X vs. Time*              | B-35           |
| Figure B-36 - Passenger Neck Moment Y vs. Time               | B-36           |
| Figure B-37 - Passenger Neck Moment Z vs. Time               | B-37           |
| Figure B-38 - Passenger Occipital Condyle Moment Y vs. Time  | B-38           |
| Figure B-39 - Passenger Chest X Acceleration vs. Time        | B-39           |
| Figure B-40 - Passenger Chest Y Acceleration vs. Time        | B-40           |
| Figure B-41 - Passenger Chest Z Acceleration vs. Time        | B-41           |
| Figure B-42 - Passenger Chest Resultant Acceleration vs Time | B-42           |
| Figure B-43 - Passenger Chest Compression vs. Time           | B-43           |
| Figure B-44 - Passenger Left Femur Force vs. Time            | B-44           |
| Figure B-45 - Passenger Right Femur Force vs. Time           | B-45           |

\* No Valid Data Collected

TEST FMVSS 208 SLED (H01060) TEST DATE 04-19-2001

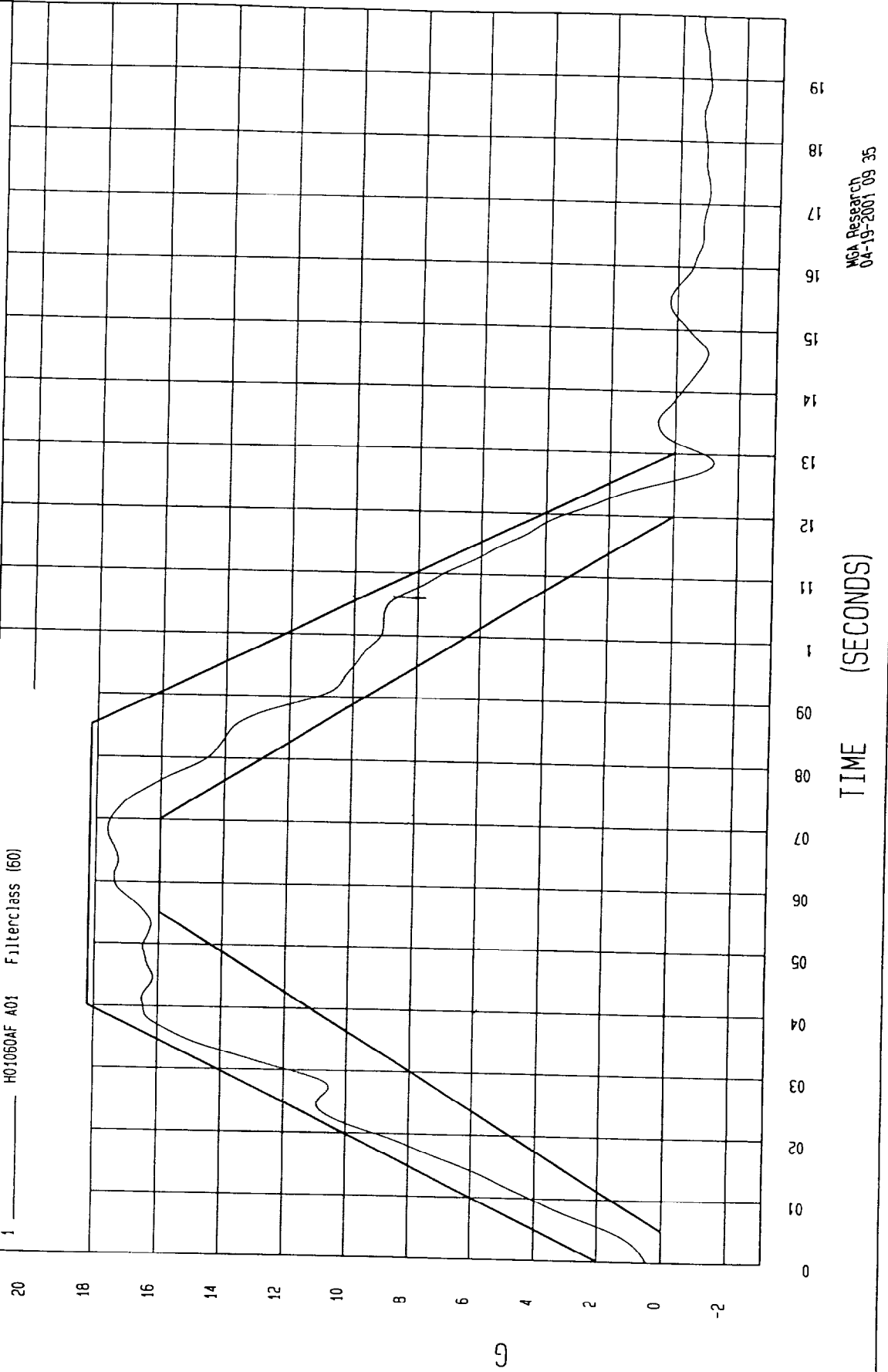
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -1.23 G at 128.7 msec

Maximum = 17.63 G at 68.4 msec

SLED X ACCELERATION

1 ——— H01060AF A01 Filterclass (60)



TIME Seconds

0 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19

MPH

SLED X VELOCITY

1 ——— H01060AI V01 Filterclass (180)

Minimum = 0 MPH at 0 msec

Maximum = 30 48 MPH at 126 msec

TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

TIME Seconds

TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

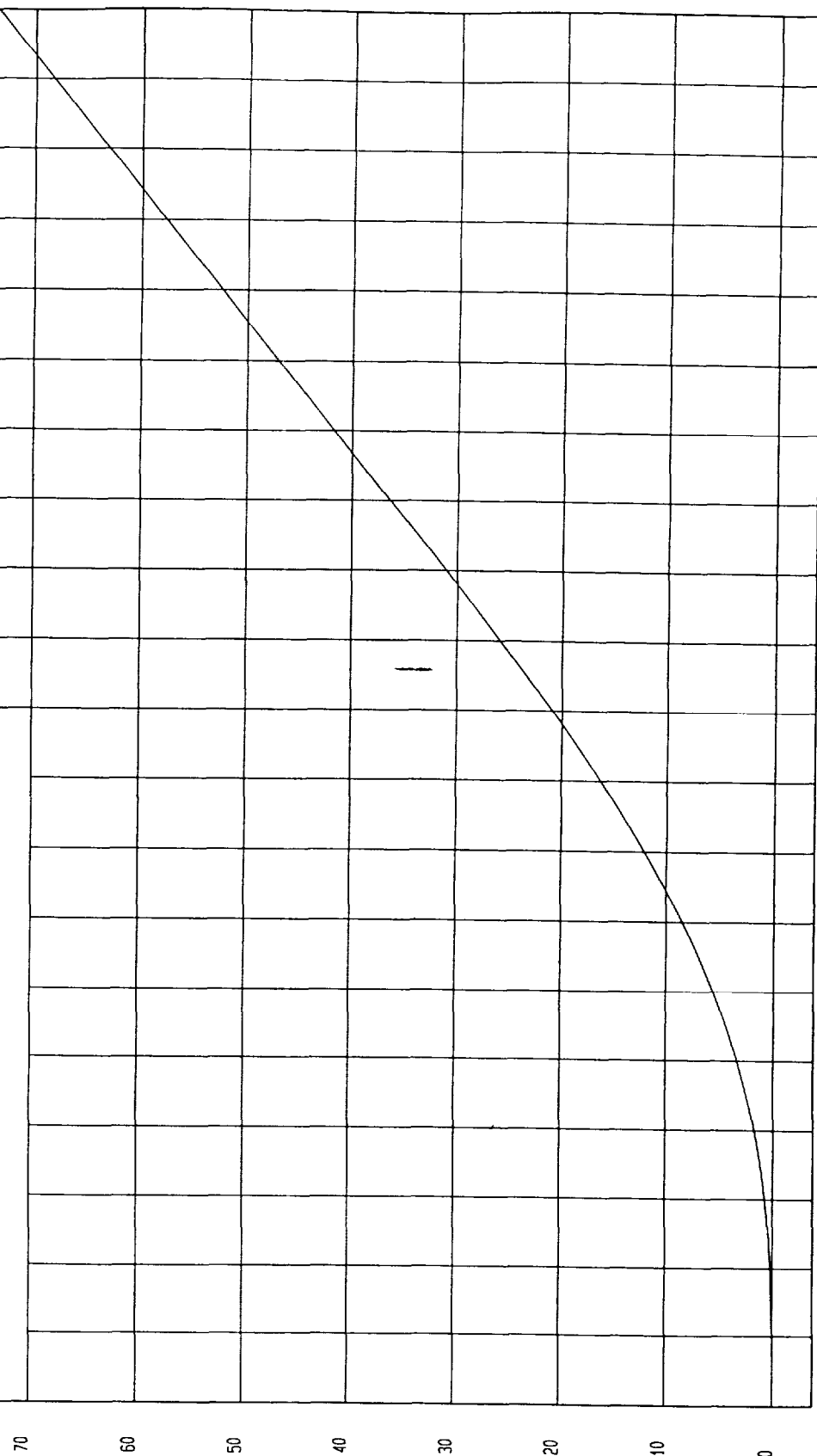
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = 0 IN at 0 msec

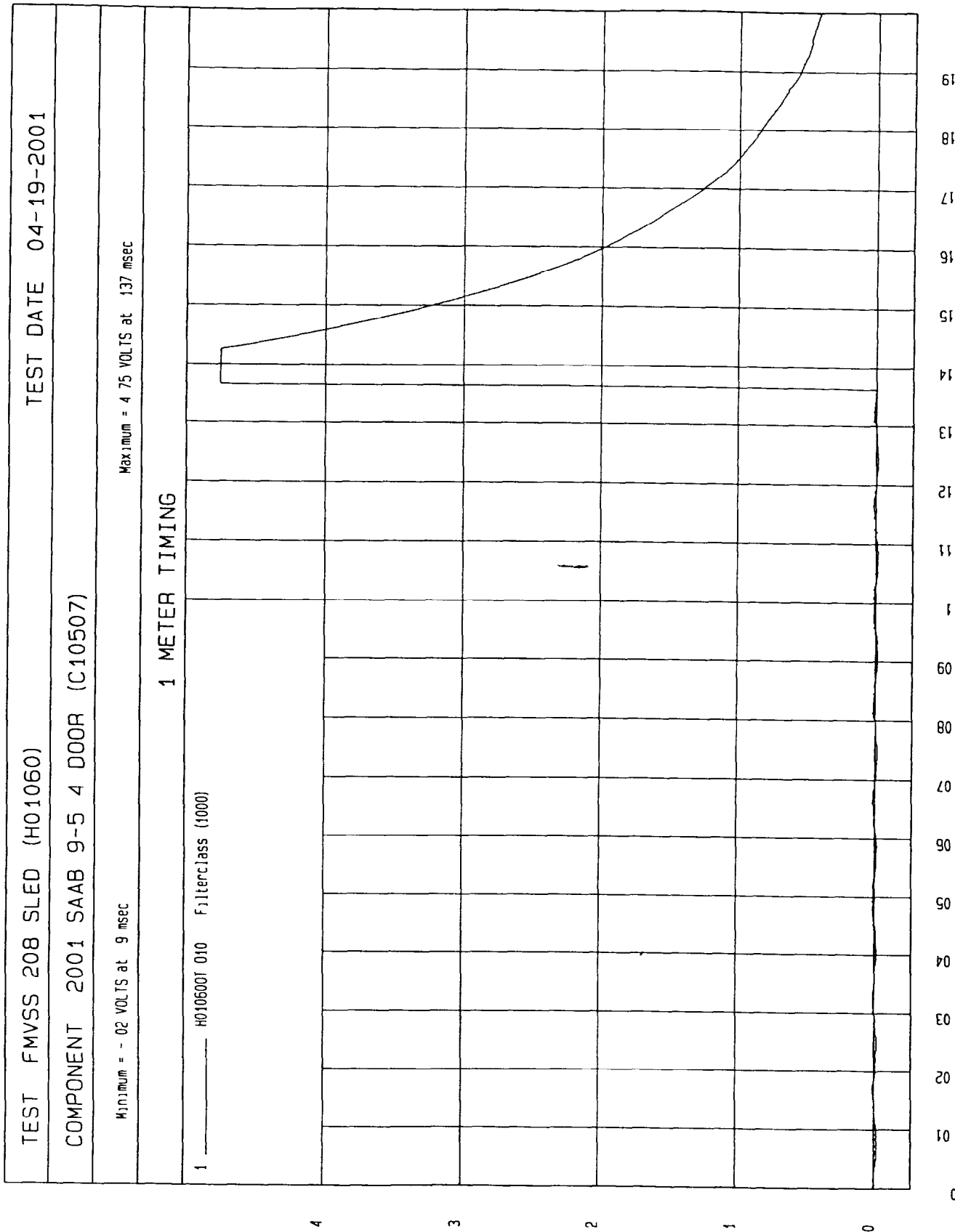
Maximum = 73.42 IN at 200 msec

SLED X DISPLACEMENT

1 ——— H01060A1 001 Filterclass (180)



NI



19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

VOLTS

AIRBAG TIMING

1 \_\_\_\_\_ H010600T 047 Filterclass (1000)

Maximum = 5 02 VOLTS at 20 msec

Minimum - 1 VOLTS at 1 msec

TEST FMVSS 208 SLED (H01060)

COMPONENT 2001 SAAB 9-5 4 D00R (C10507)

TEST DATE 04-19-2001

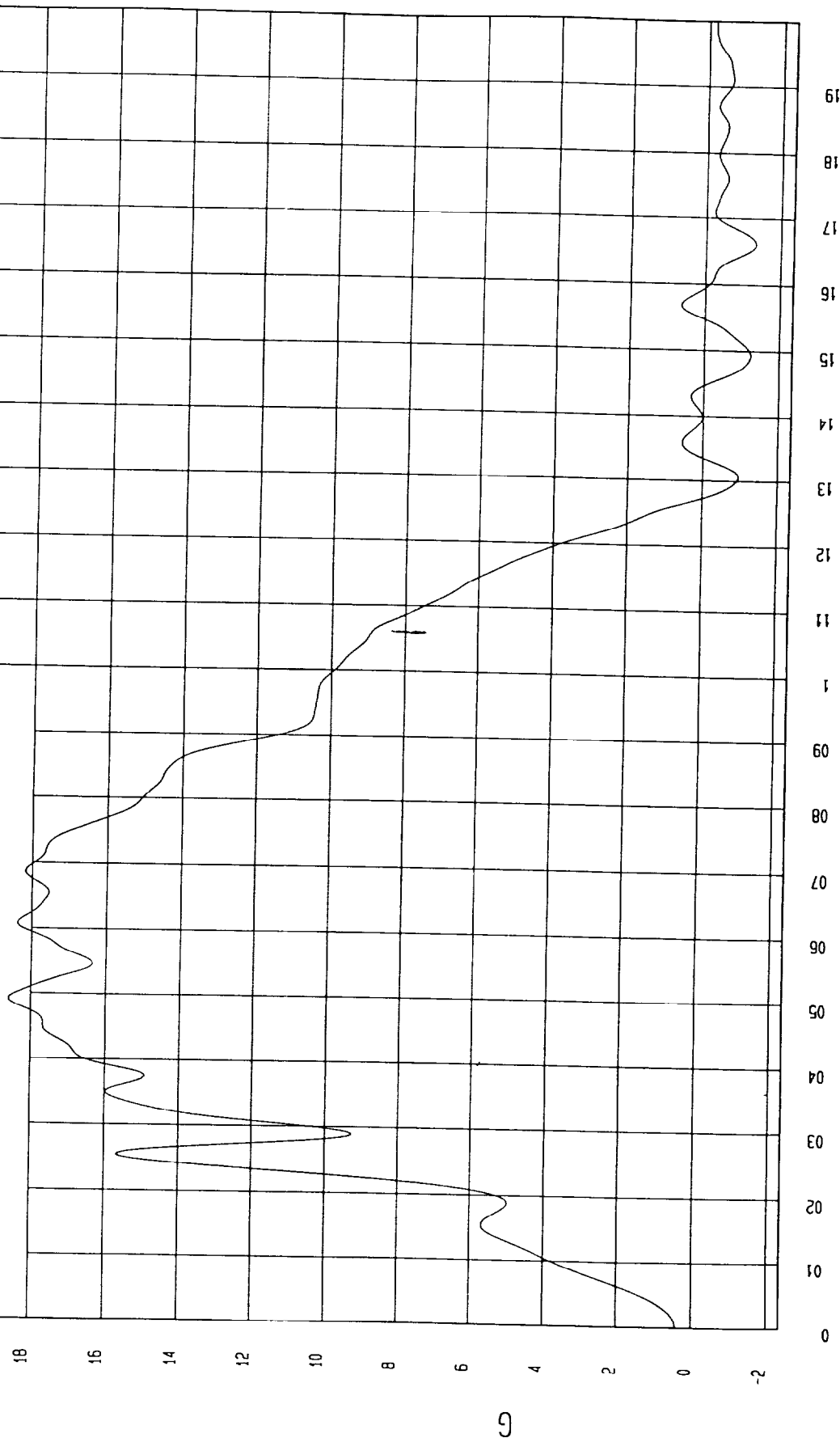
TEST DATE 04-19-2001

|           |                               |
|-----------|-------------------------------|
| COMPONENT | 2001 SAAB 9-5 4 DOOR (C10507) |
|-----------|-------------------------------|

Minimum = -134 G at 166 msec

Maximum = 18.6 G at 49 msec

## LEFT REAR SEAT CROSSMEMBER X ACCELERATION

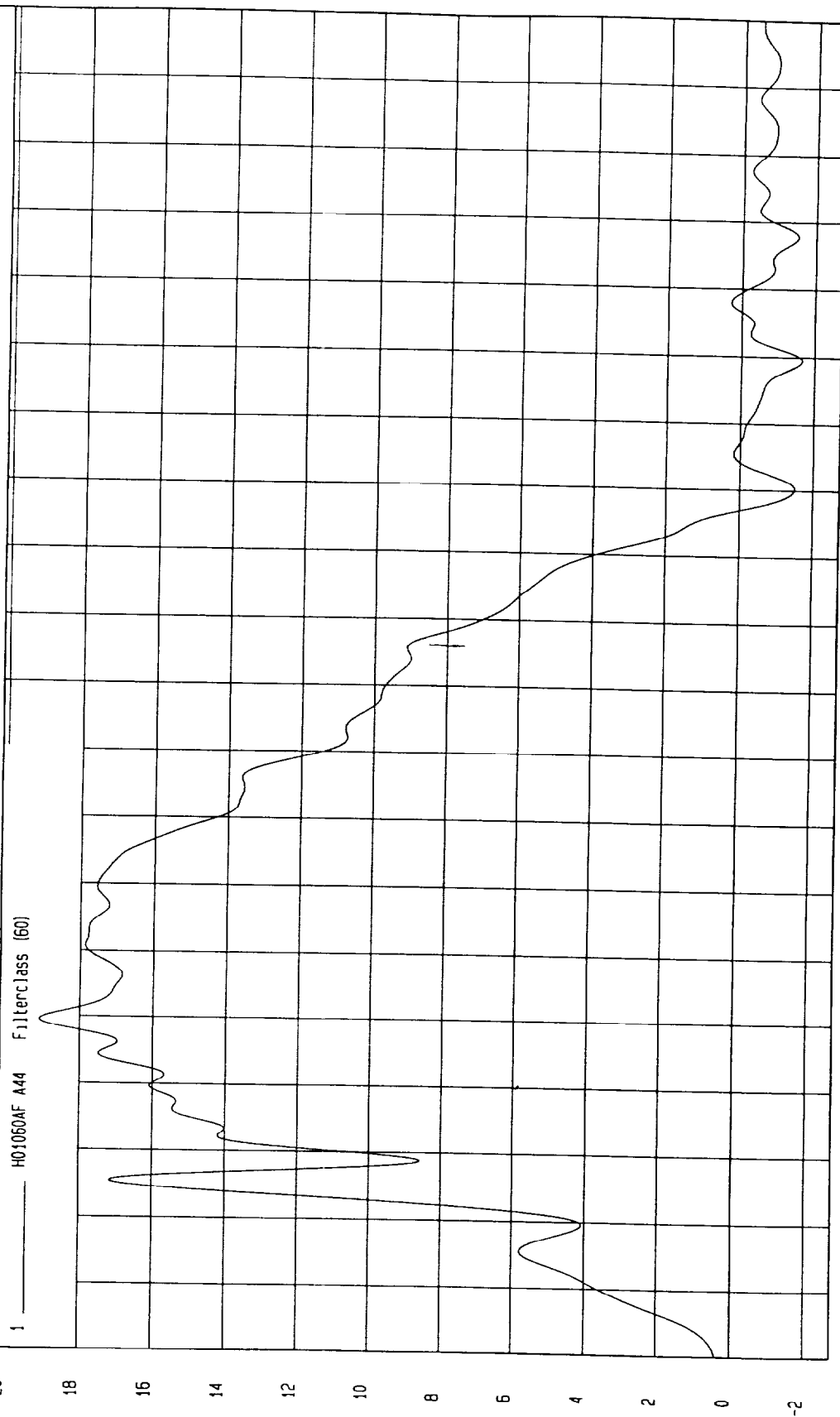


TIME (SECONDS)

TIME (SECONDS)

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9

G



RIGHT REAR SEAT CROSSMEMBER X ACCELERATION

Minimum = -1.66 G at 150 msec

Maximum = 19.11 G at 50 msec

COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

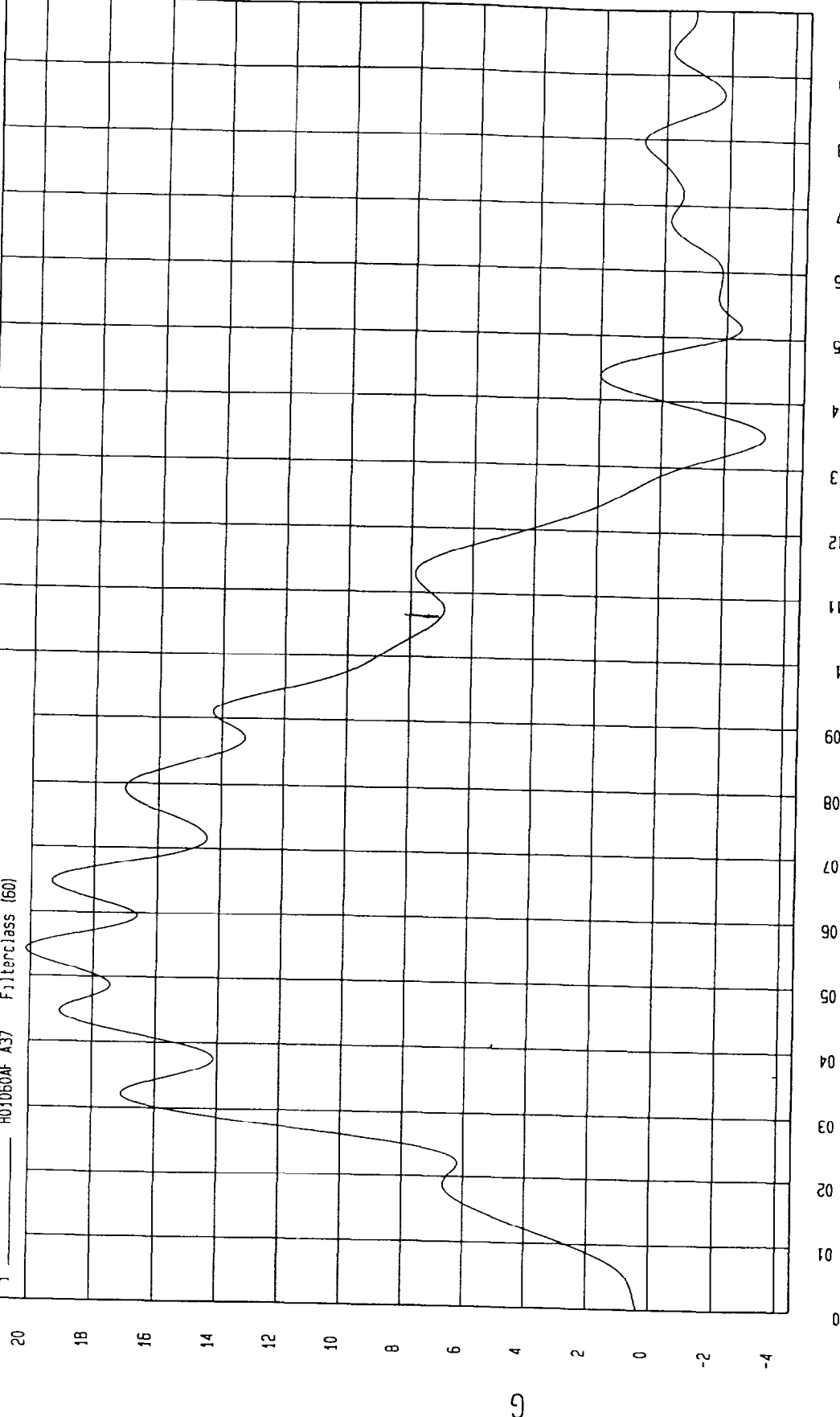
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -3.29 G at 135 msec

Maximum = 20.14 G at 54 msec

TOP OF ENGINE X ACCELERATION

1 H01060AF A37 Filterclass (60)



TIME (SECONDS)

WCA Research  
04-18-2001 13:44

TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

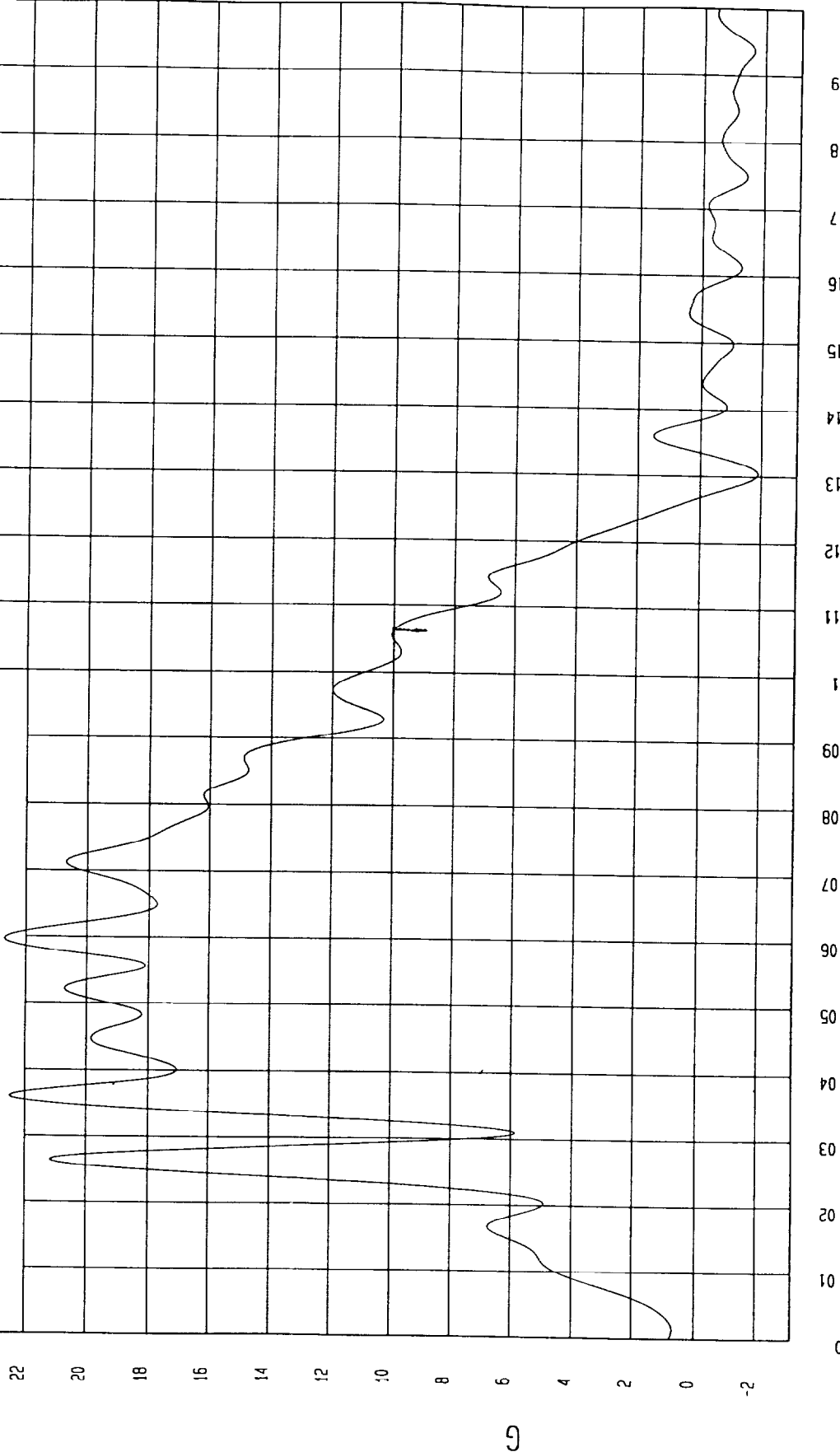
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -1.89 G at 130 msec

Maximum = 22.69 G at 50 msec

REAR AXLE X ACCELERATION

1 ——— H01060AF A41 Filterclass (60)



TIME (SECONDS)

G

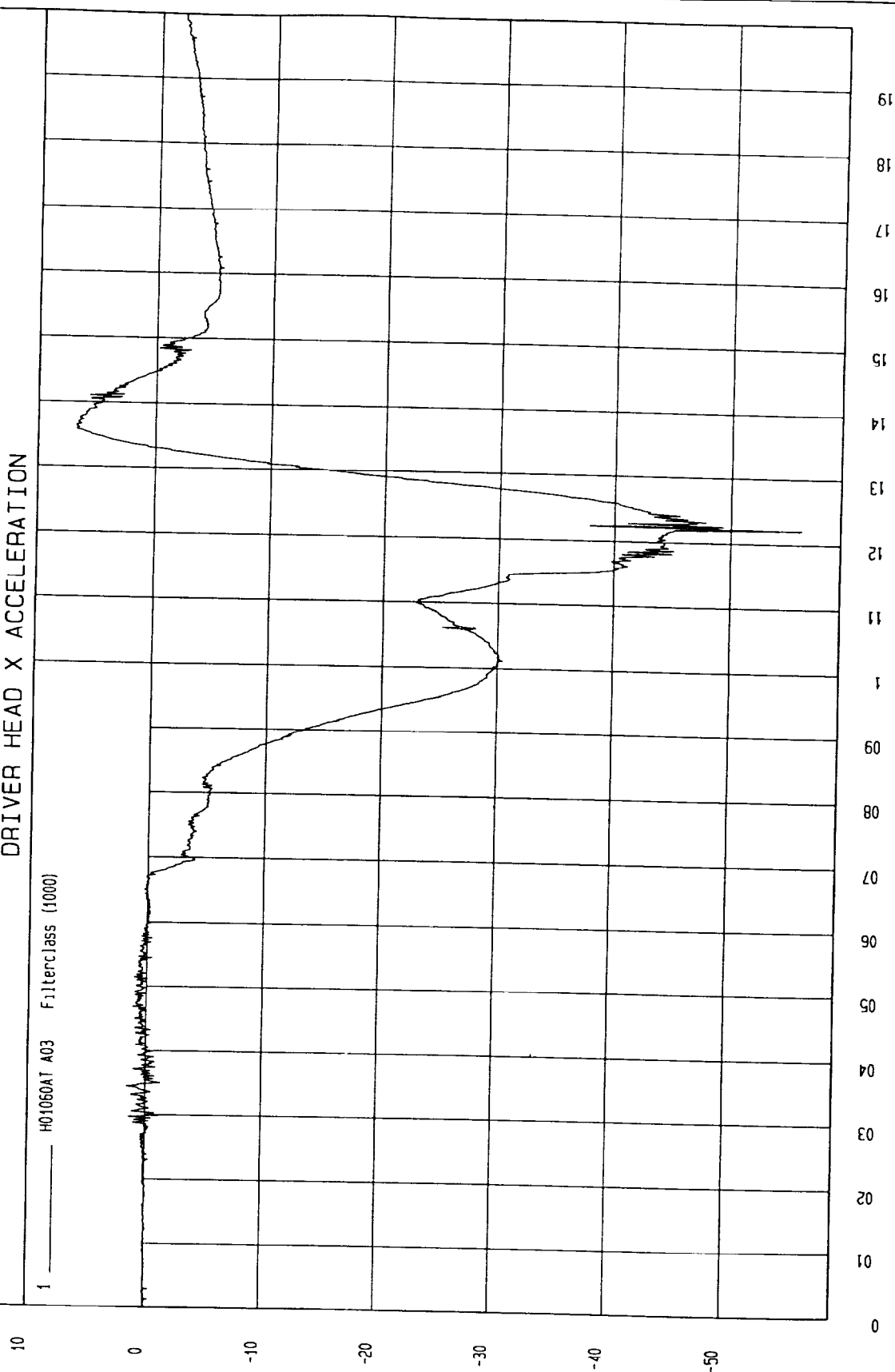
TEST FMVSS 208 SLED (H01060) TEST DATE 04-19-2001

COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -56.16 G at 122 msec Maximum = 6.87 G at 136 msec

DRIVER HEAD X ACCELERATION

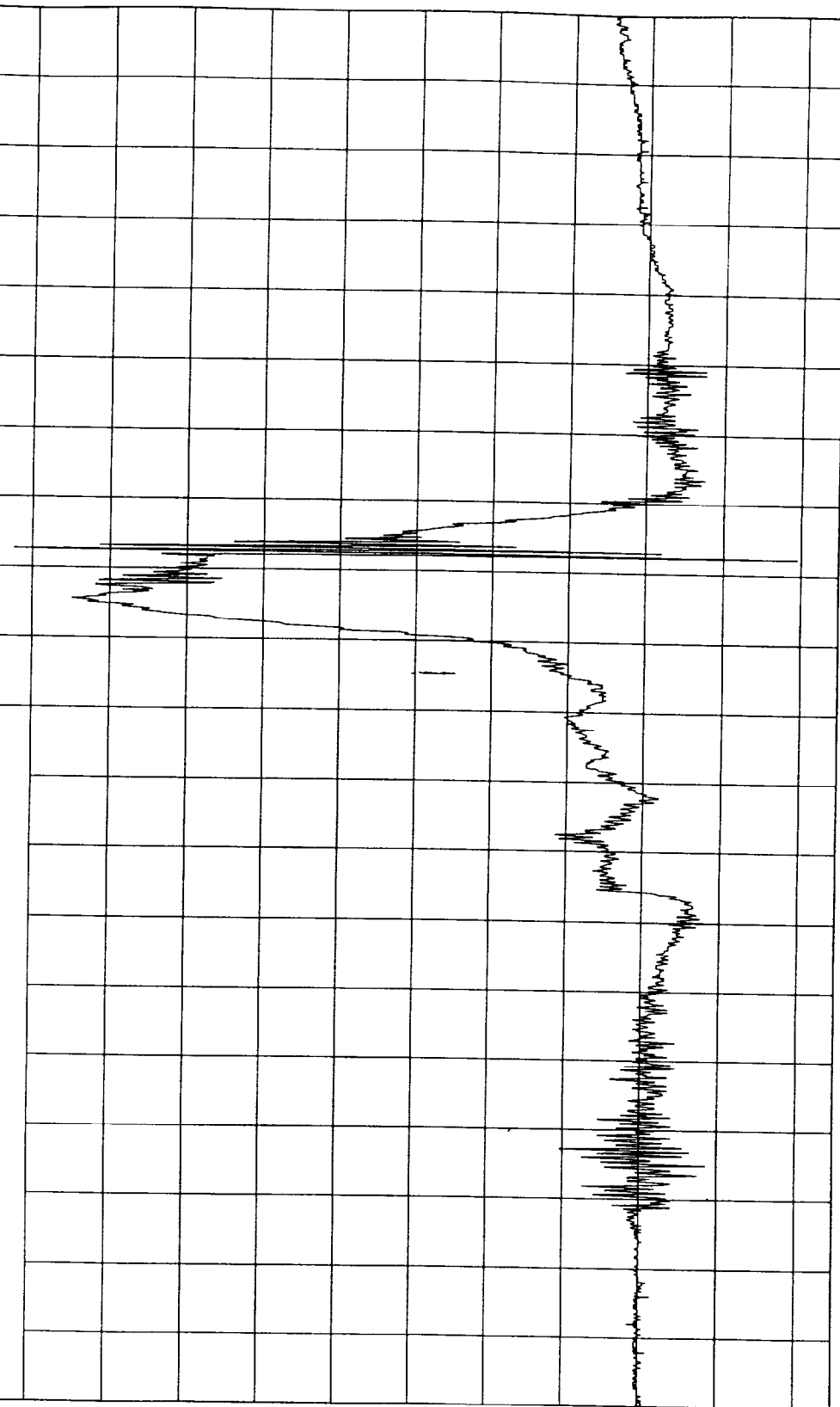
1 H01060AT A03 Filterclass (1000)



TIME (SECONDS)

TIME (SECONDS)

19 18 17 16 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 0



1 H01050AT A05 Filterclass (1000)

DRIVER HEAD Y ACCELERATION

Maximum = 16.48 G at 123 msec

Minimum = -3.91 G at 122 msec

COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

TEST FMVSS 208 SLED (H01060) TEST DATE 04-19-2001

TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

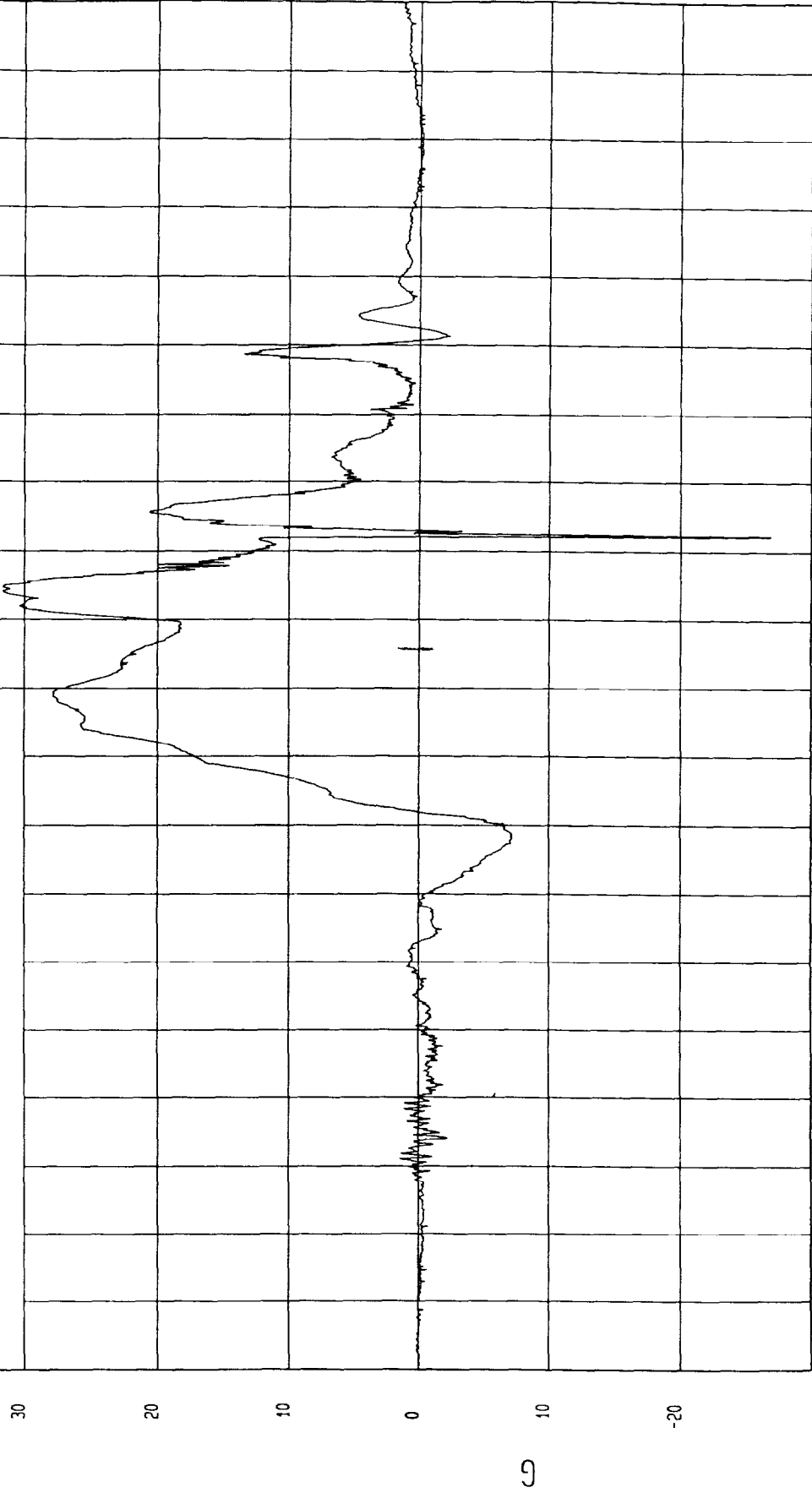
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum - -26.86 G at 122 msec

Maximum - 31.66 G at 114 msec

DRIVER HEAD Z ACCELERATION

1 H01060AT A06 Filterclass (1000)



MGA Research  
04-18-2001 13 43

TIME (SECONDS)

19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

60 50 40 30 20 10 0

G

1

H01060AV A03 Filterclass (1000)

DRIVER HEAD RESULTANT ACCELERATION

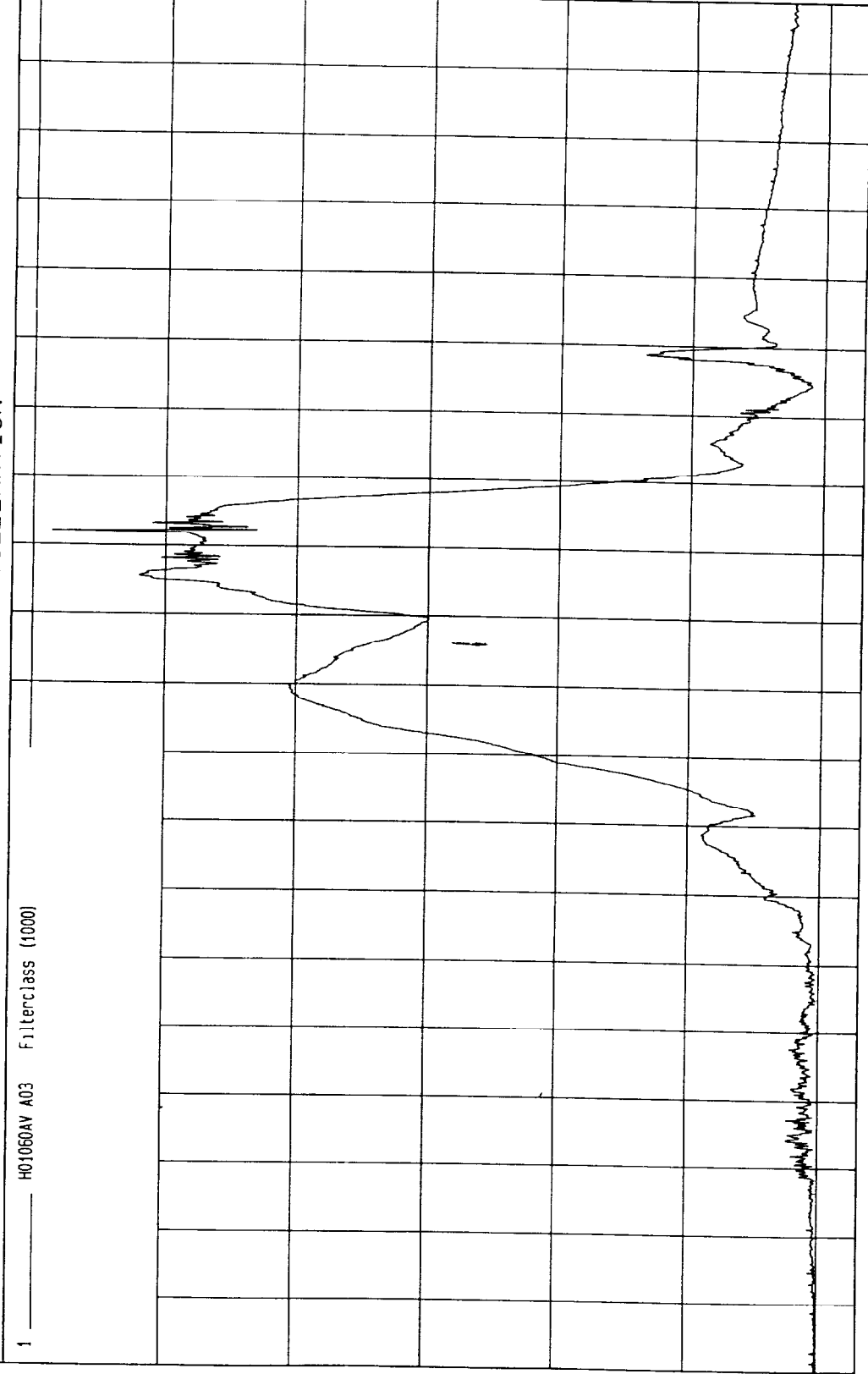
Minimum = 2.14E-02 G at 2 msec

Maximum = 58.6 G at 122 msec

COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001



TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

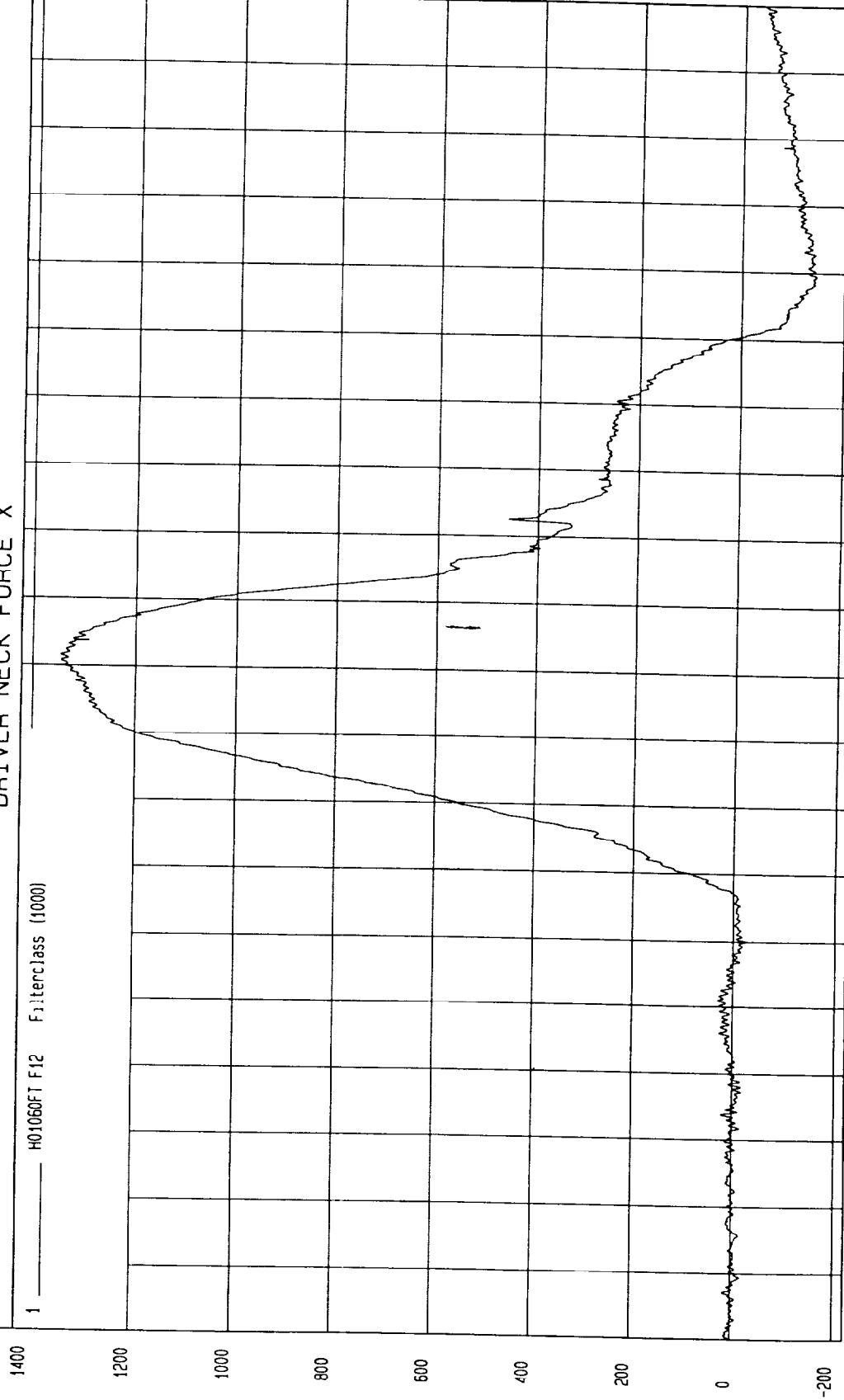
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -145 89 N at 159 msec

Maximum = 1347 34 N at 102 msec

DRIVER NECK FORCE X

1 ——— H01060FT F12 Filterclass (1000)



TIME (SECONDS)

N

TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum -50 lB N at 199 msec

Maximum - 275 68 N at 129 msec

DRIVER NECK FORCE Y

1 ——— H01060FT F13 Filterclass (1000)

280

260

240

220

200

180

160

140

120

100

80

60

40

20

0

-20

-40

-60

N

0

01

02

03

04

05

06

07

08

09

10

11

12

13

14

15

16

17

18

19

TIME (SECONDS)

TIME (SECONDS)

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9

DRIVER NECK FORCE Z

1 ——— H01060FT F14 Filterclass (1000)

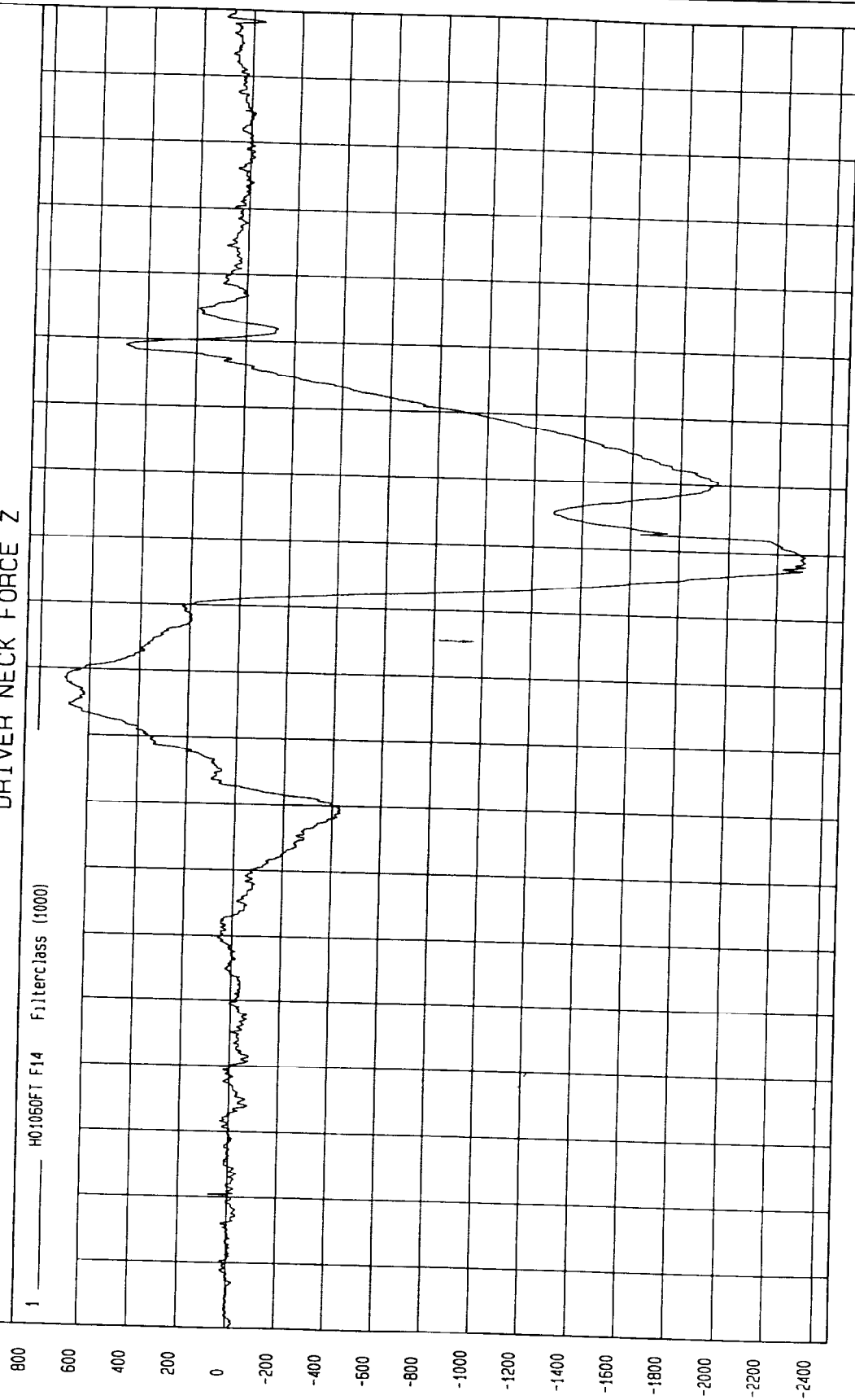
Maximum = 701.74 N at 99 msec

Minimum = -2313.3 N at 118 msec

TEST FMVSS 208 SLED (H01060)

COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

TEST DATE 04-19-2001



N

TIME (SECONDS)

19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

Nm

DRIVER NECK MOMENT X

Maximum = 15.16 Nm at 13.1 msec

Minimum = -6.43 Nm at 78 msec

1 H01050MF M15 Filterclass (500)

TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

16

14

12

10

8

6

4

2

0

-2

-4

-6

0

01

02

03

04

05

06

07

08

09

1

11

12

13

14

15

16

17

18

19

TEST FMVSS 208 SLED (H01060)

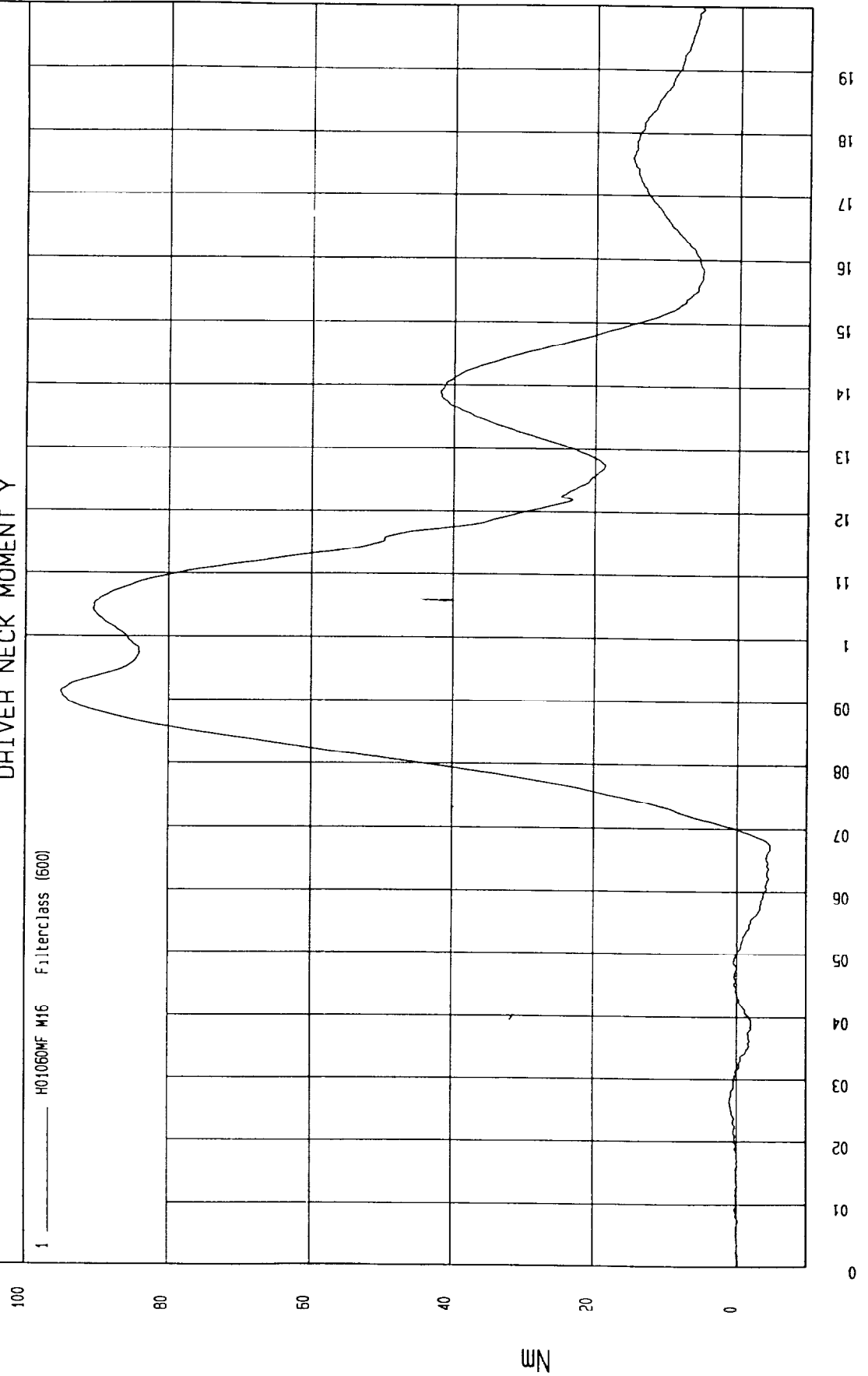
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -4.61 Nm at 67 msec

Maximum = 95.04 Nm at 91 msec

DRIVER NECK MOMENT Y

1 \_\_\_\_\_ H01060MF M16 Filterclass (600)

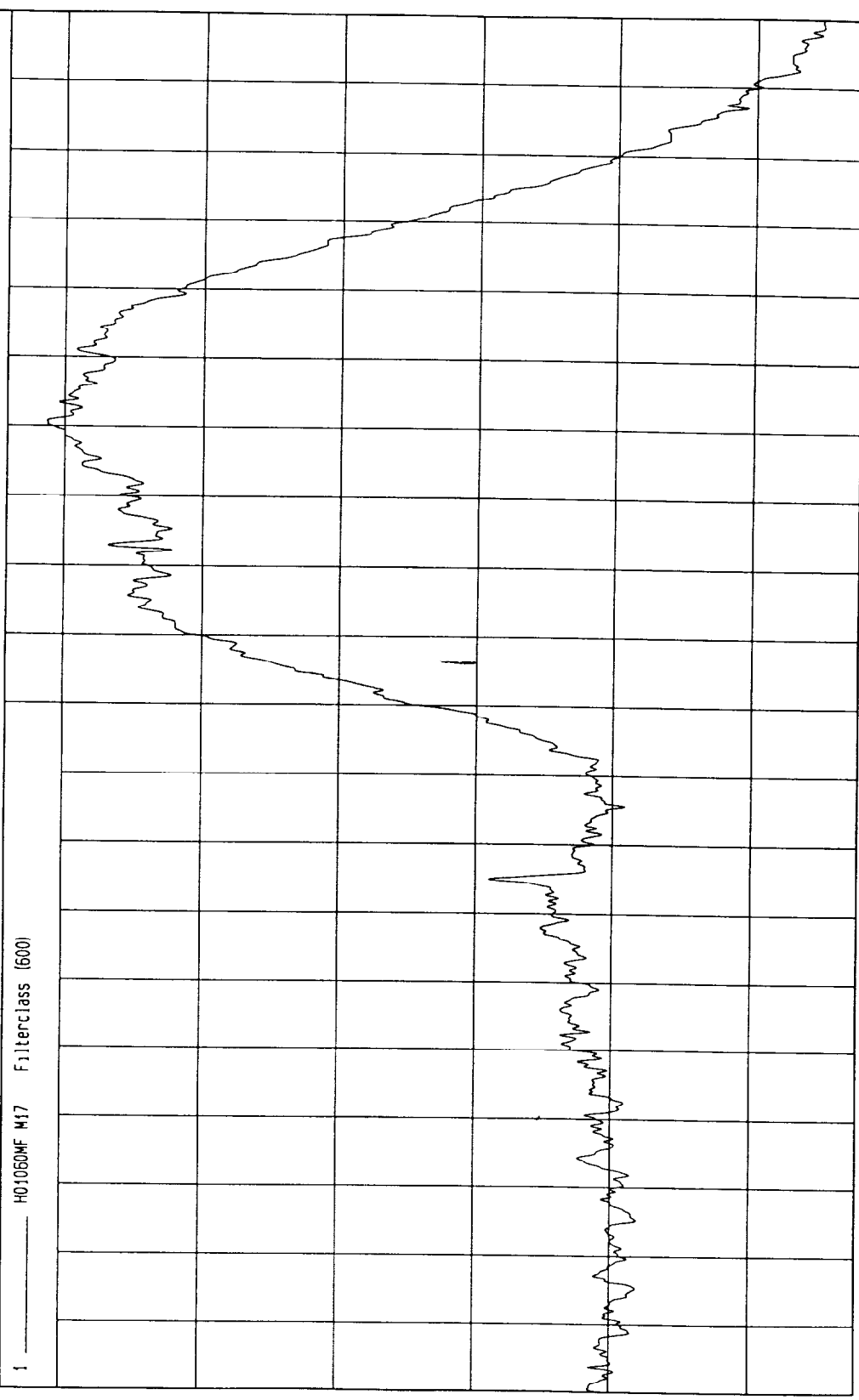


TEST FMVSS 208 SLED (H01060) TEST DATE 04-19-2001

COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -2.95 Nm at 199 msec Maximum = 8.25 Nm at 141 msec

DRIVER NECK MOMENT Z



MCA Research  
04-19-2001 08 59

TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

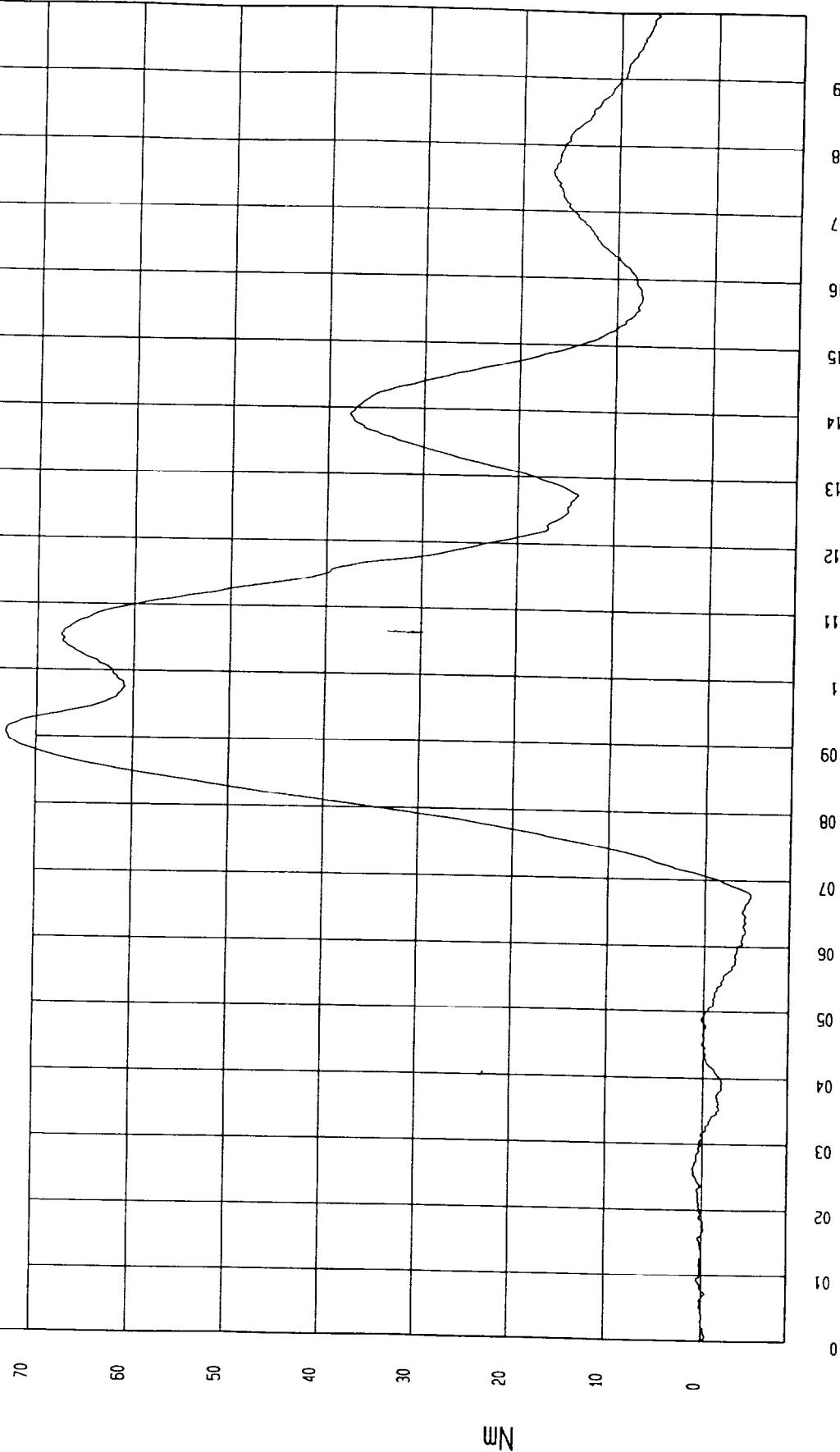
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -4 74 Nm at 68 msec

Maximum = 73 09 Nm at 91 msec

DRIVER OCCIPITAL CONDYLE MOMENT Y

1 — H01060M0 M16 Filterclass (600)



TIME (SECONDS)

Nm

TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

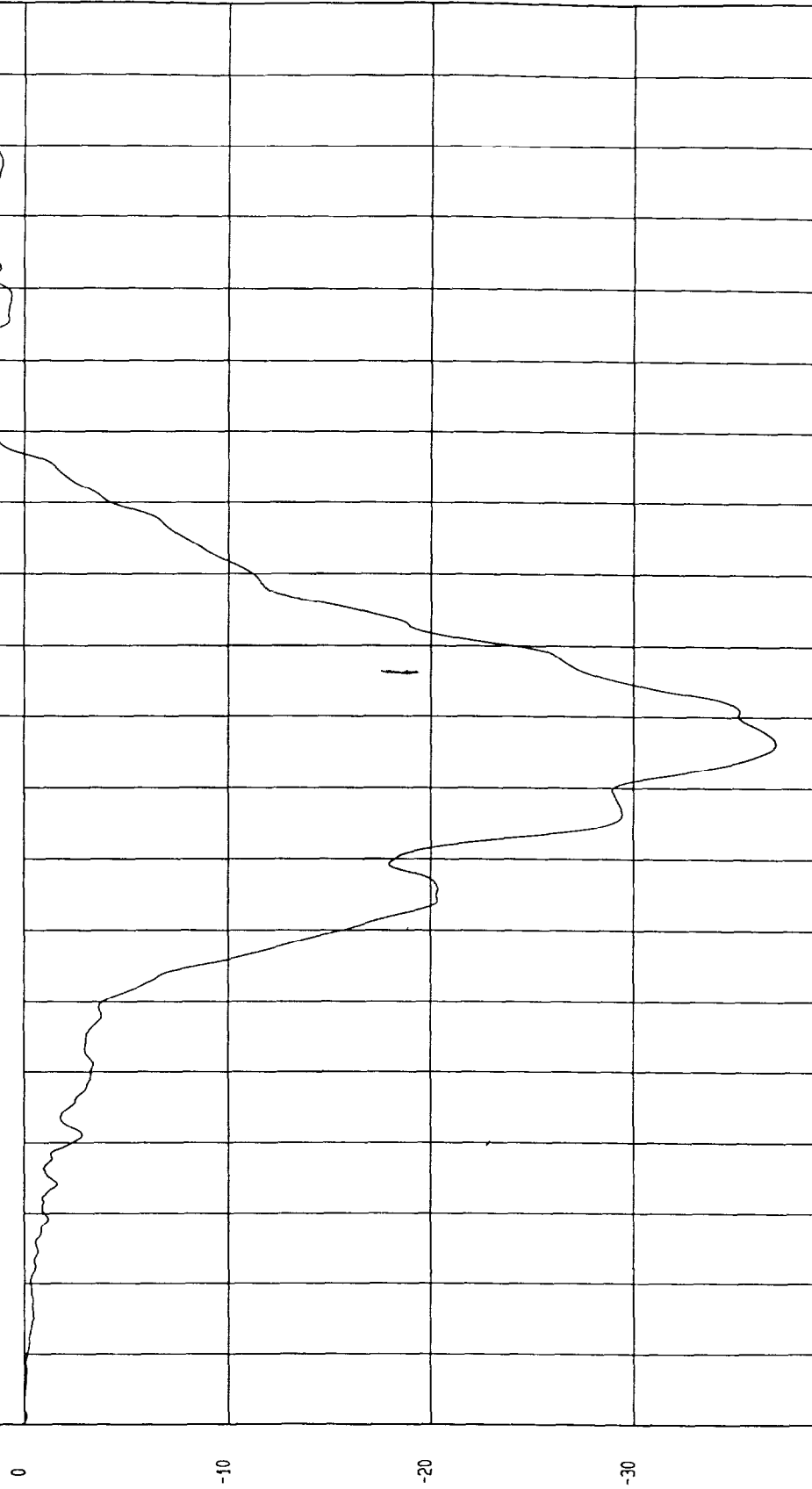
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -36.94 G at 96 msec

Maximum = 2.21 G at 198 msec

DRIVER CHEST X ACCELERATION

1 H01060AF A21 FilterClass (180)



TIME (SECONDS)

0 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19

G

-7 -6 -5 -4 -3 -2 -1 0 1 2

1 — H01060AF A22 Filterclass (180)

## DRIVER CHEST Y ACCELERATION

Minimum = -7.08 G at 79 msec

Maximum = 1.78 G at 113 msec

COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

TEST FMVSS 208 SLED (H01060) TEST DATE 04-19-2001

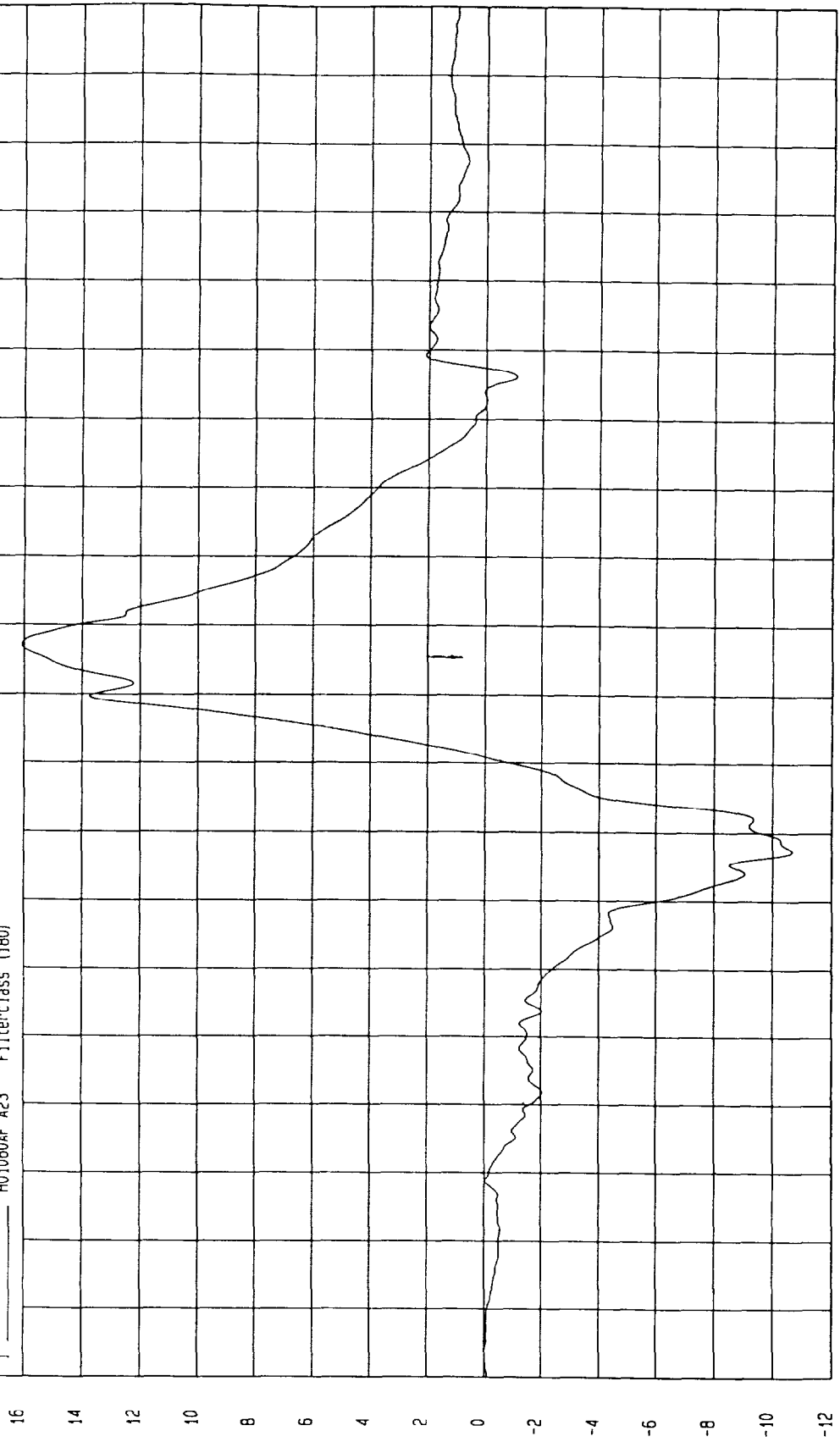
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -10.67 G at 77 msec

Maximum = 16.07 G at 107 msec

DRIVER CHEST Z ACCELERATION

1 H01060AF A23 Filterclass (180)



16  
14  
12  
10  
8  
6  
4  
2  
0  
-2  
-4  
-6  
-8  
-10  
-12

0 01 02 03 04 05 06 07 08 09 1 11 12 13 14 15 16 17 18 19

TIME (SECONDS)

TEST FMVSS 208 SLED (H01060) TEST DATE 04-19-2001

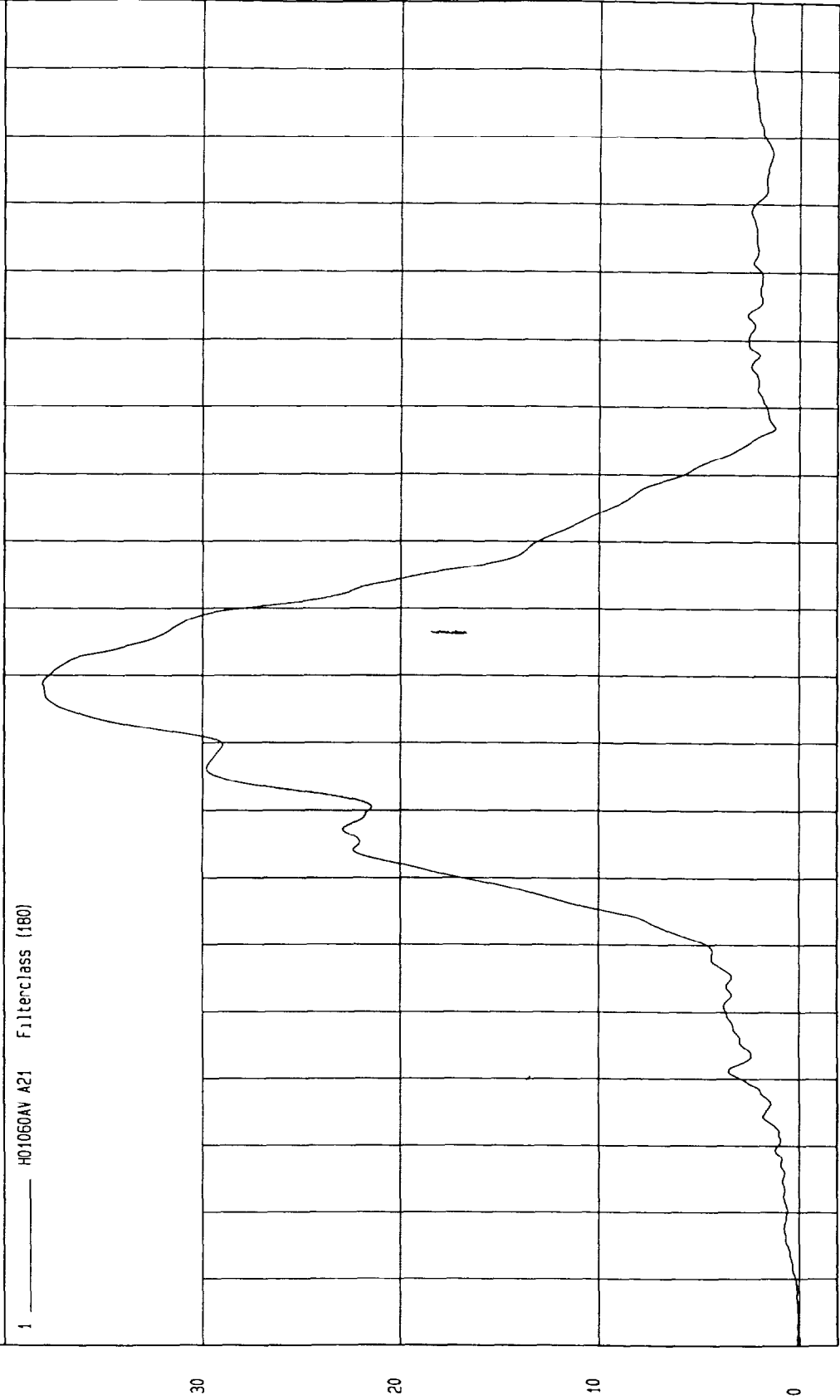
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum - 4 24E-02 G at 4 msec

Maximum = 38 G at 99 msec

DRIVER CHEST RESULTANT ACCELERATION

1 H01060AV A21 Filterclass (180)



TEST FMVSS 208 SLED (H01060)

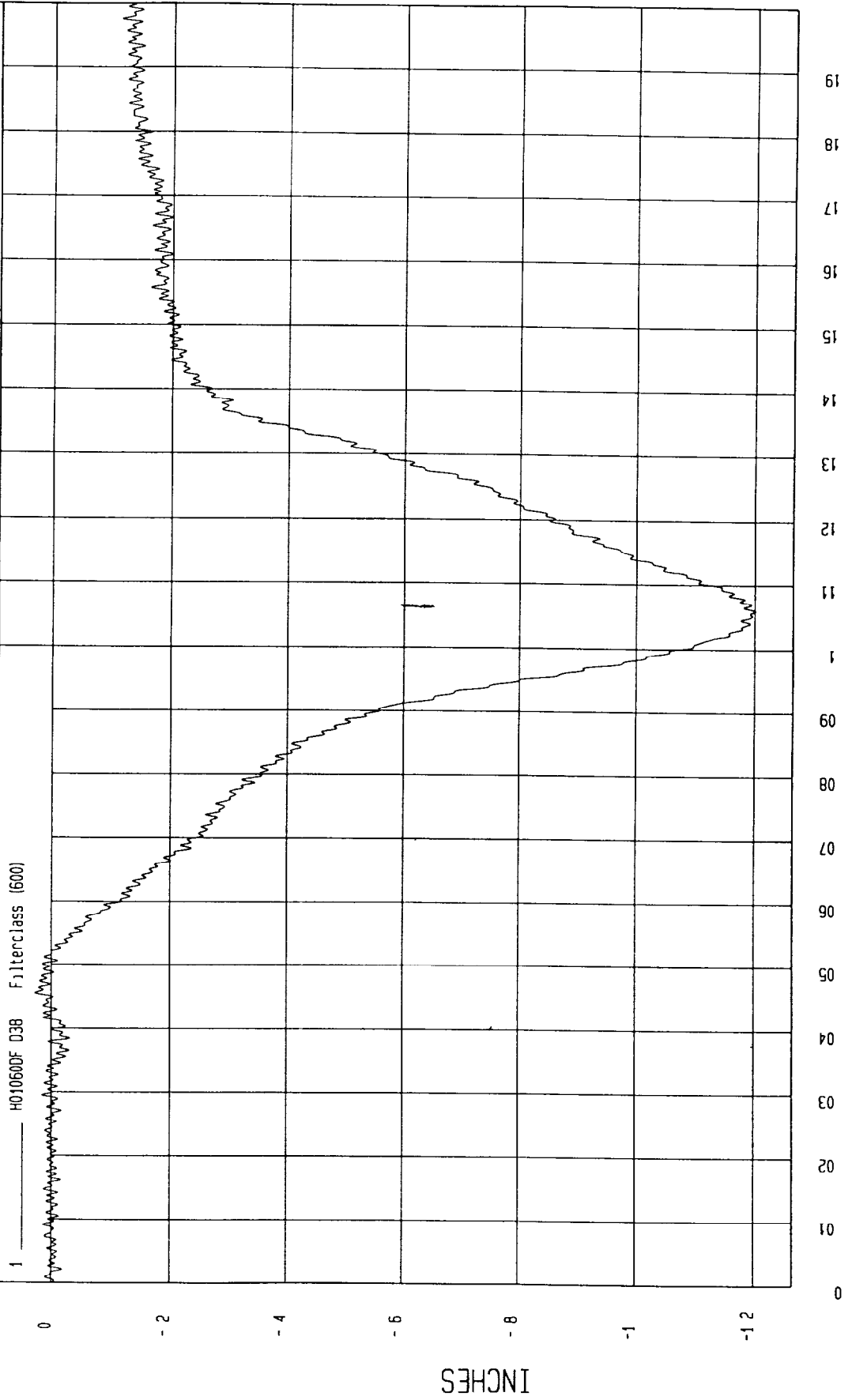
TEST DATE 04-19-2001

COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -1.2 INCHES at 106 msec

Maximum = 2.82E-02 INCHES at 46 msec

DRIVER CHEST COMPRESSION



TIME SECONDS

TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

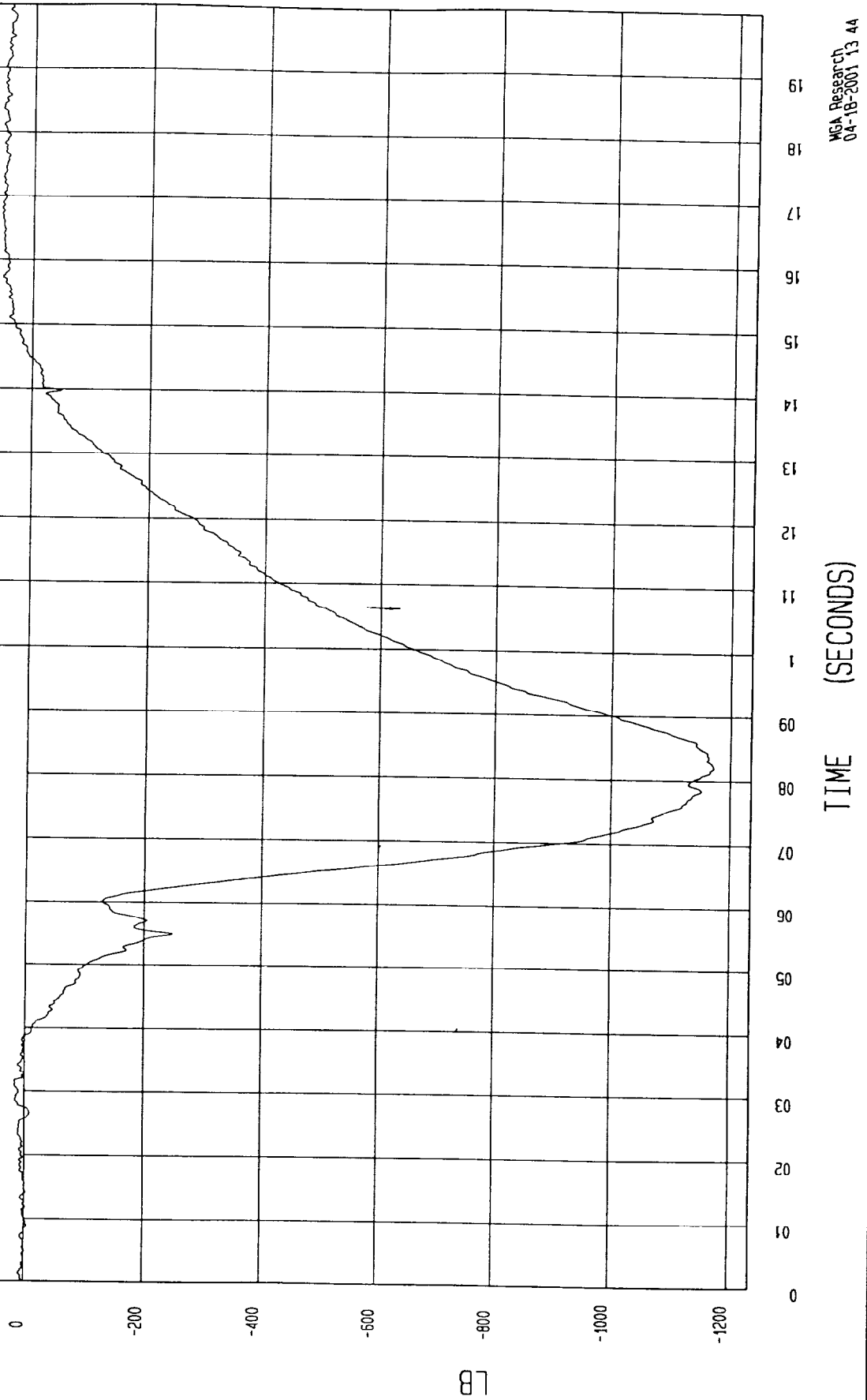
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -1172 71 LB at 82 msec

Maximum = 53 LB at 168 msec

DRIVER LEFT FEMUR FORCE

1 — H01060FF F08 Filterclass (600)



TEST FMVSS 208 SLED (H01060) TEST DATE 04-19-2001

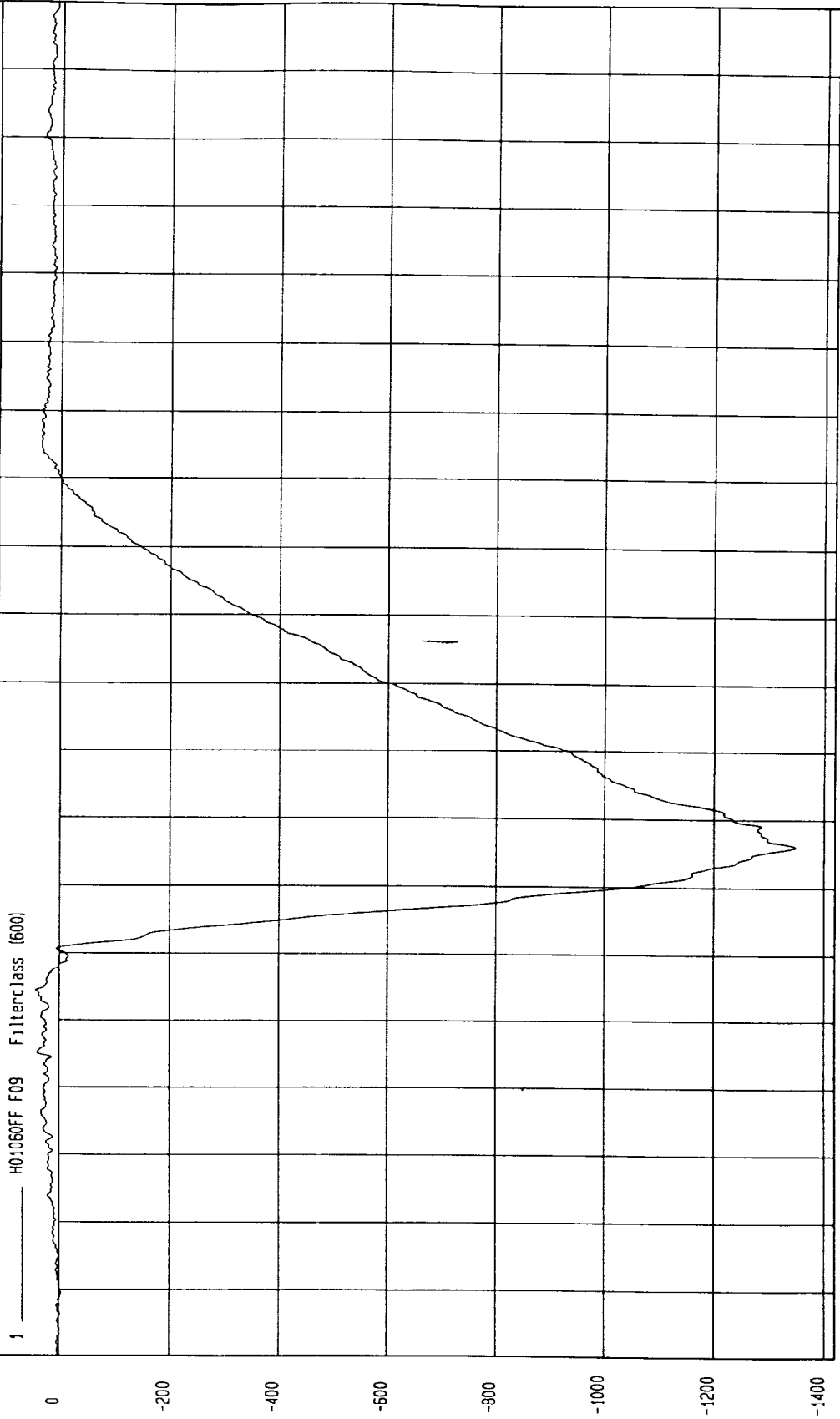
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -1349 LB at 76 msec

Maximum = 43 99 LB at 54 msec

DRIVER RIGHT FEMUR FORCE

1 H01060FF F09 Filterclass (500)



TIME (SECONDS)

LB

TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

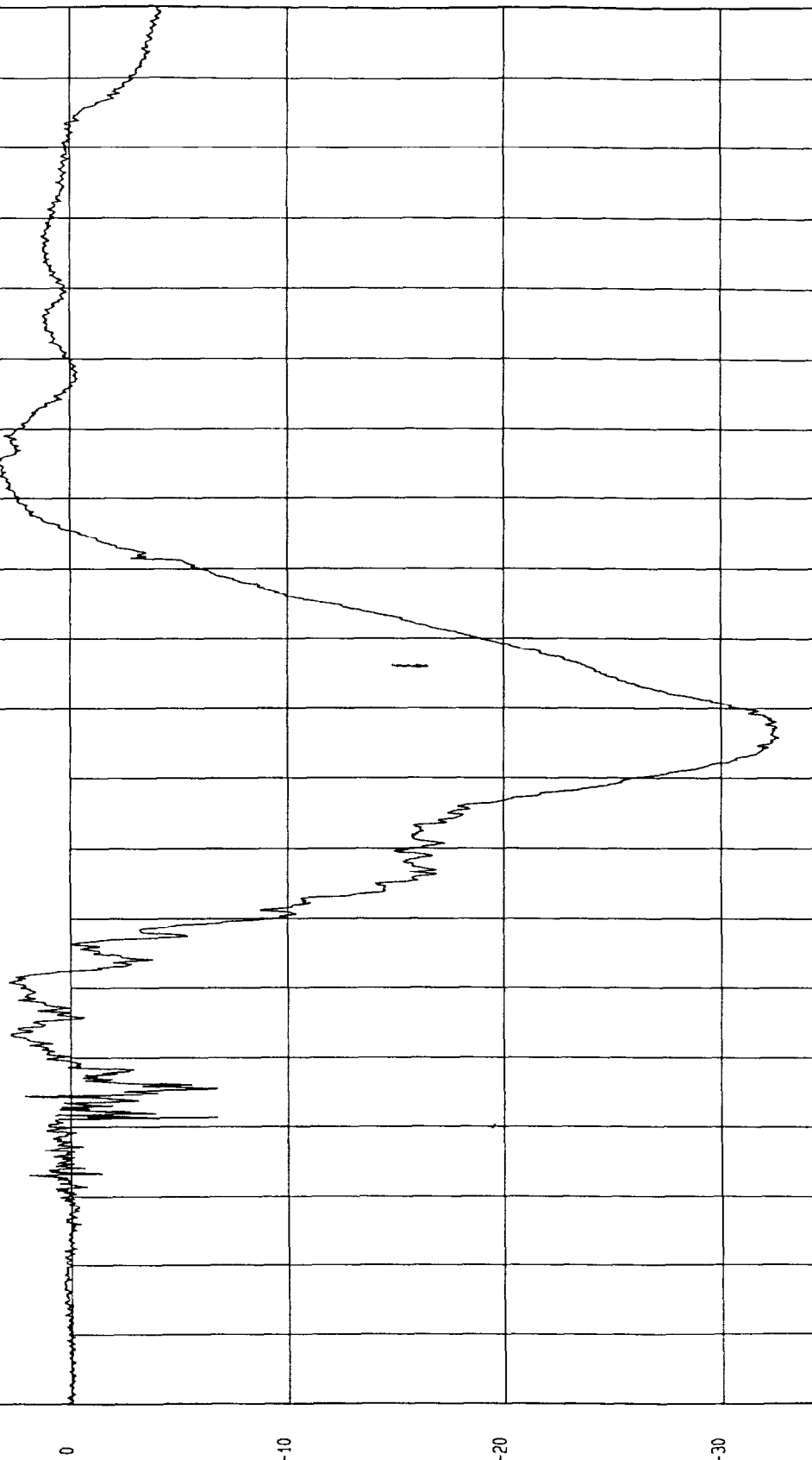
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -32.65 G at 96 msec

Maximum = 3.4 G at 135 msec

PASSENGER HEAD X ACCELERATION

1 H01060AT A24 Filterclass (1000)

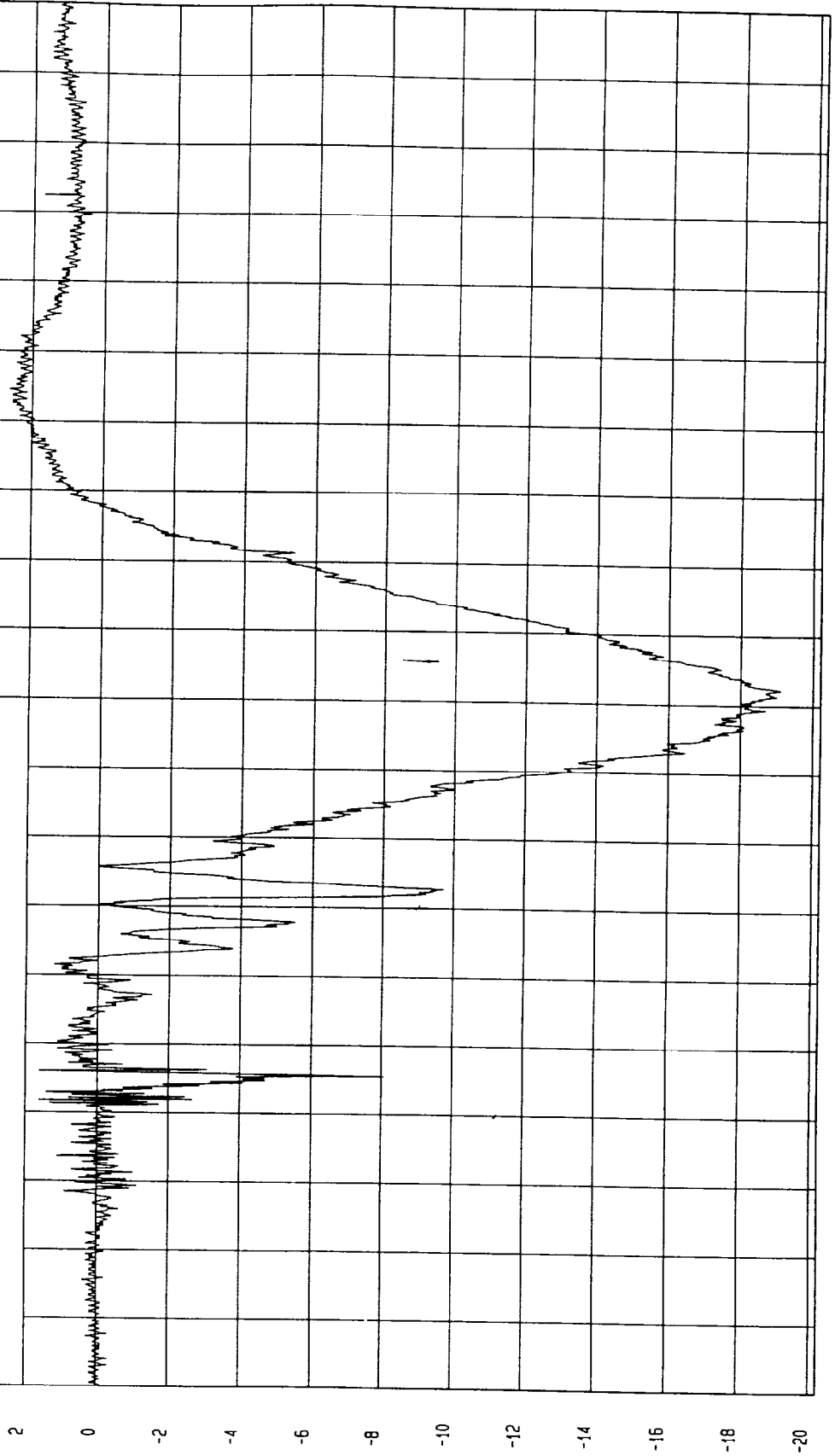


TIME (SECONDS)

WCA Research  
04-19-2001 09 02

TIME (SECONDS)

19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0



1 ——— H01050AT A25 Filterclass (1000)

PASSENGER HEAD Y ACCELERATION

Minimum = -19.11 G at 102 msec

Maximum = 2.65 G at 144 msec

COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

TEST FMVSS 208 SLED (H01060) TEST DATE 04-19-2001

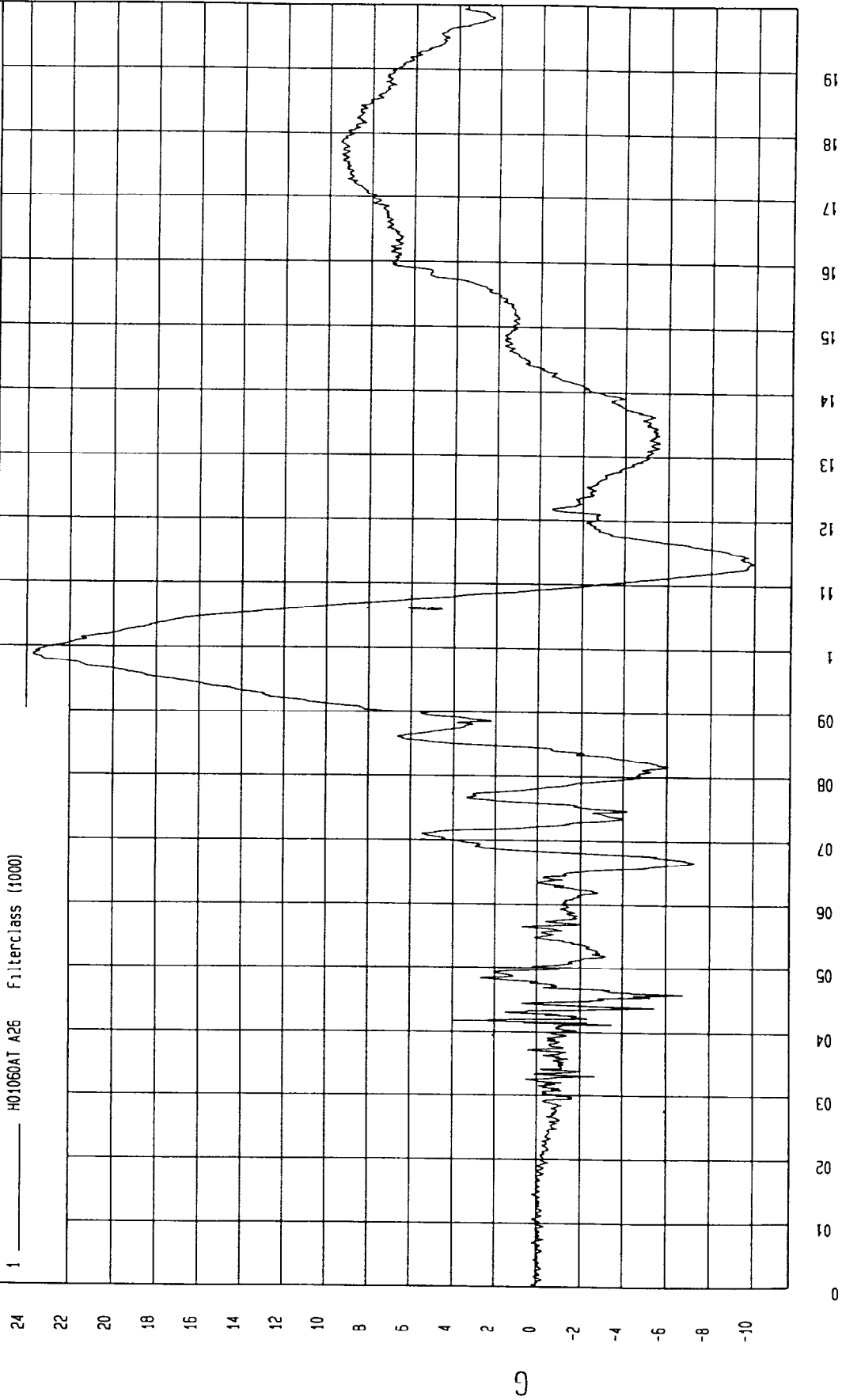
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -9.93 G at 113 msec

Maximum = 23.67 G at 99 msec

PASSENGER HEAD Z ACCELERATION

1 H01060AT A26 Filterclass (1000)



TIME (SECONDS)

TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

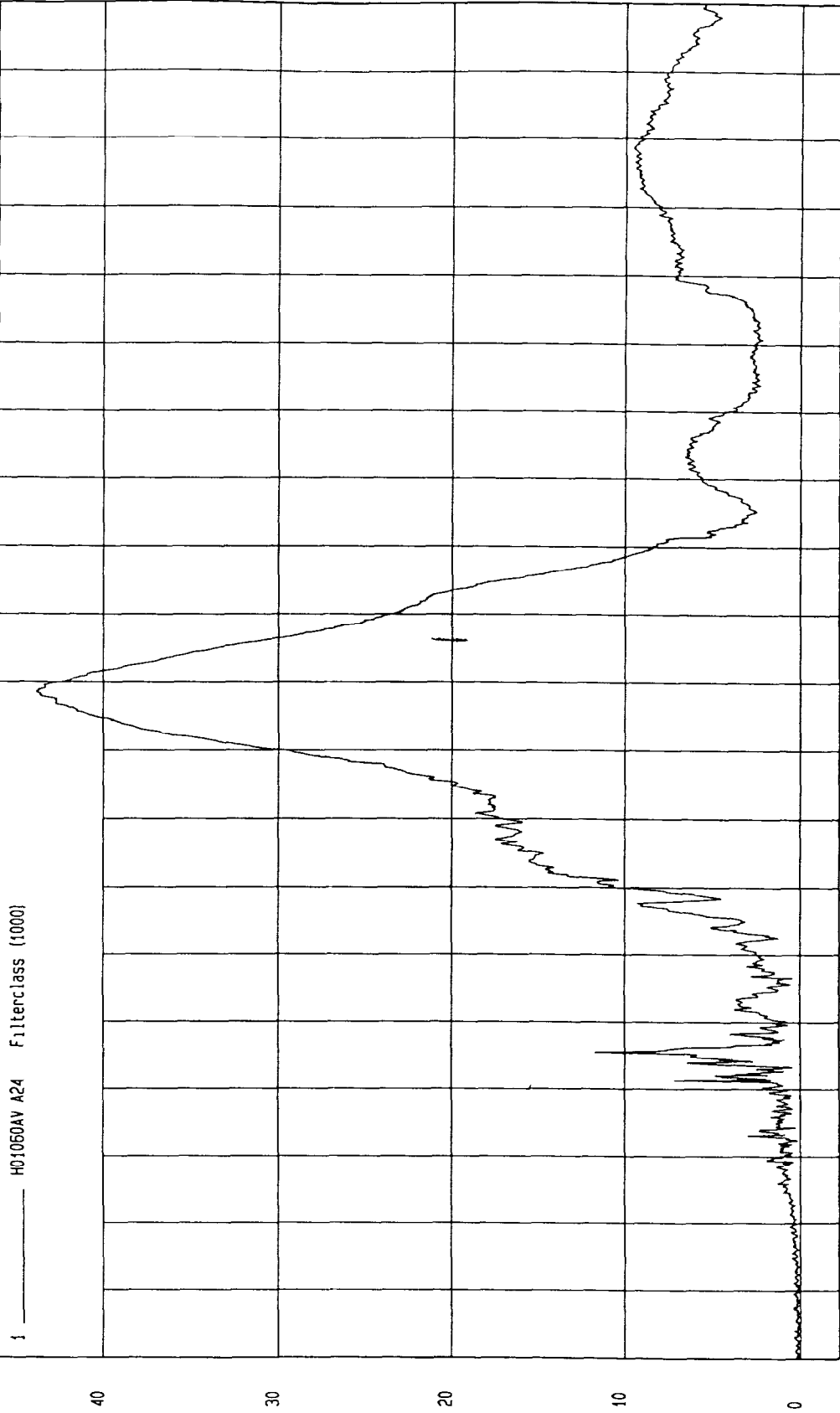
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum - 5 53E-02 G at 4 msec

Maximum = 43 82 G at 99 msec

PASSENGER HEAD RESULTANT ACCELERATION

1 H01060AV A24 Filterclass (1000)



TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

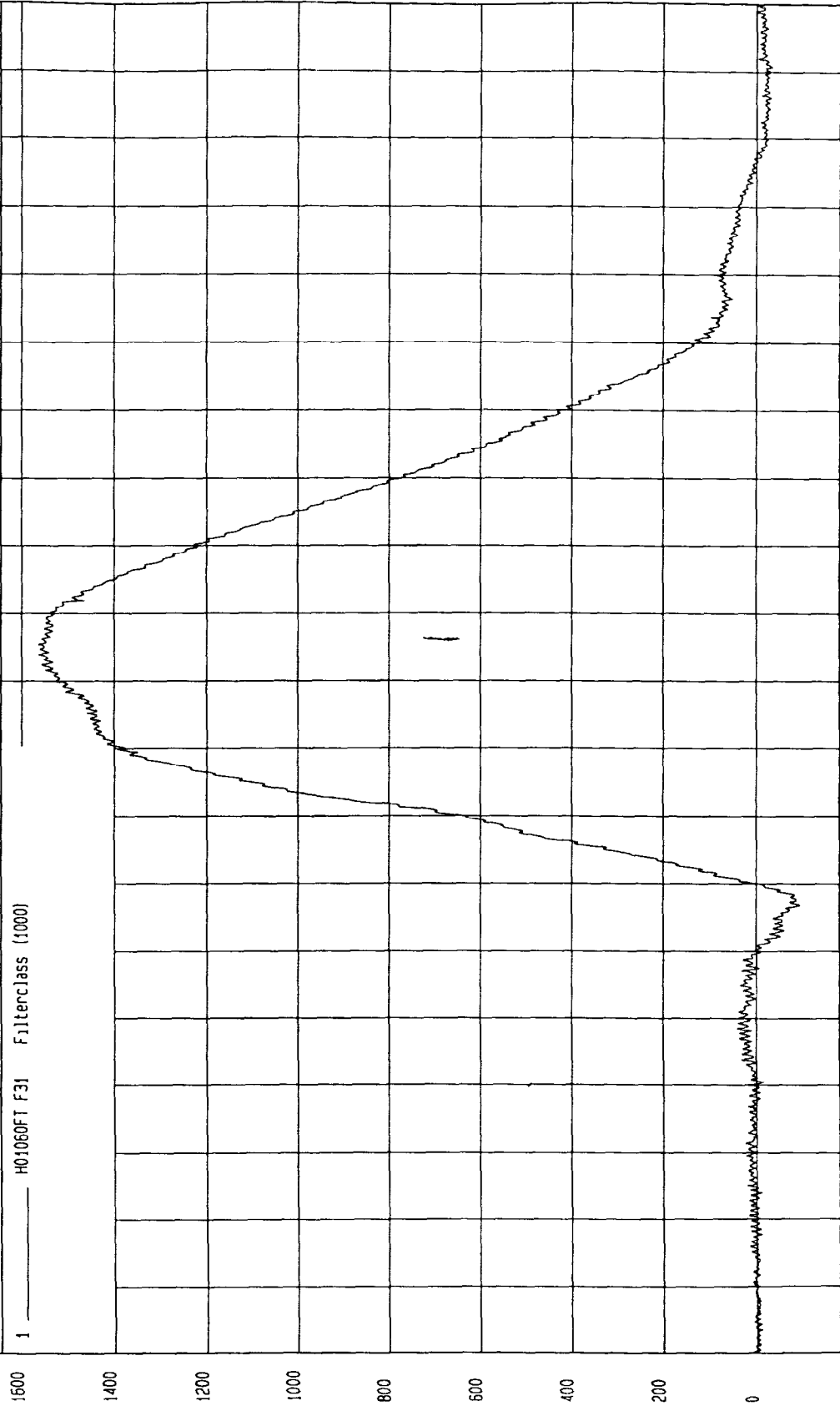
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -93.04 N at 67 msec

Maximum = 1562.7 N at 104 msec

PASSENGER NECK FORCE X

1 H01060FT F31 Filterclass (1000)



MGA Research  
04-25-2001 16 17

TIME (SECONDS)

TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

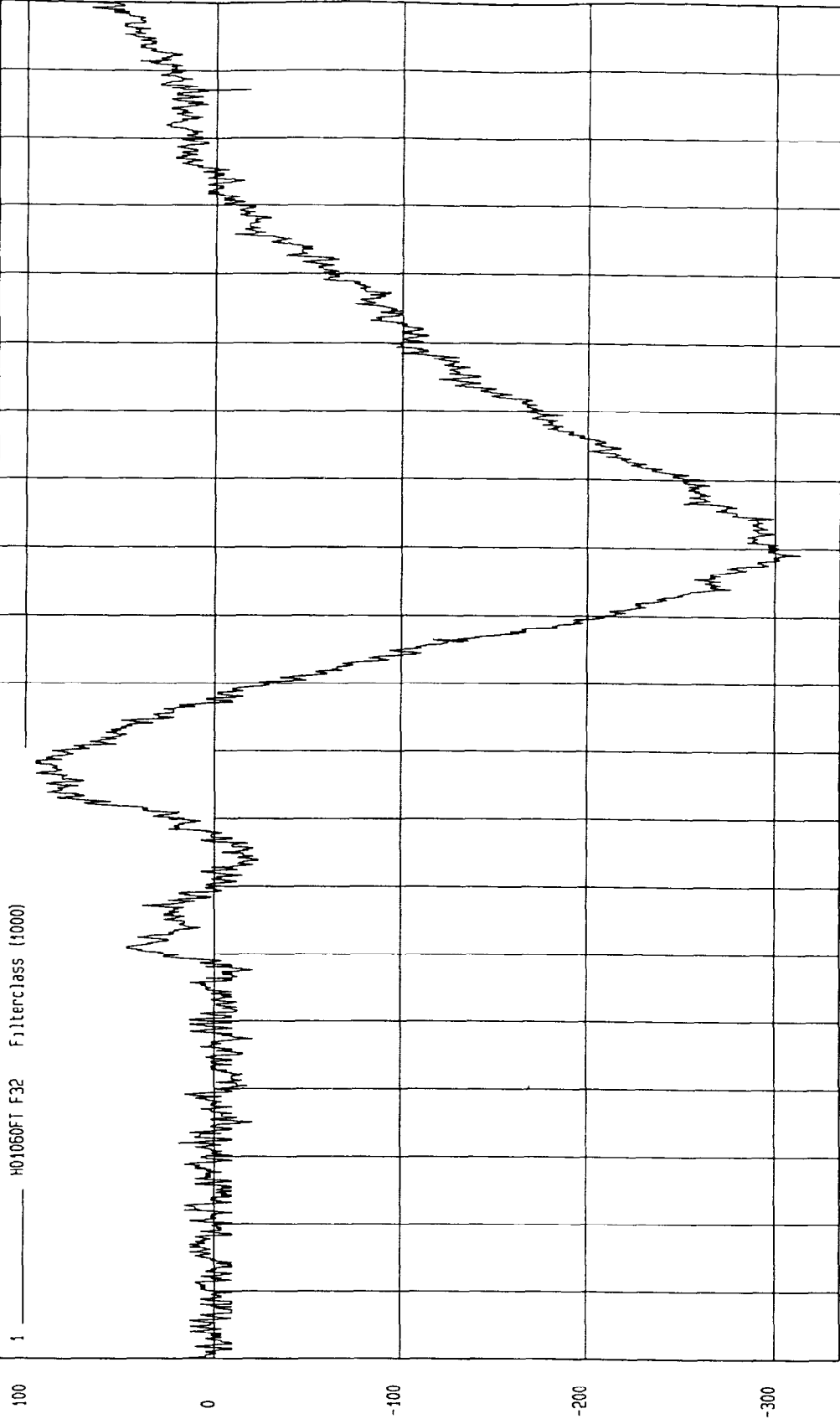
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -313 22 N at 119 msec

Maximum = 94 55 N at 87 msec

PASSENGER NECK FORCE Y

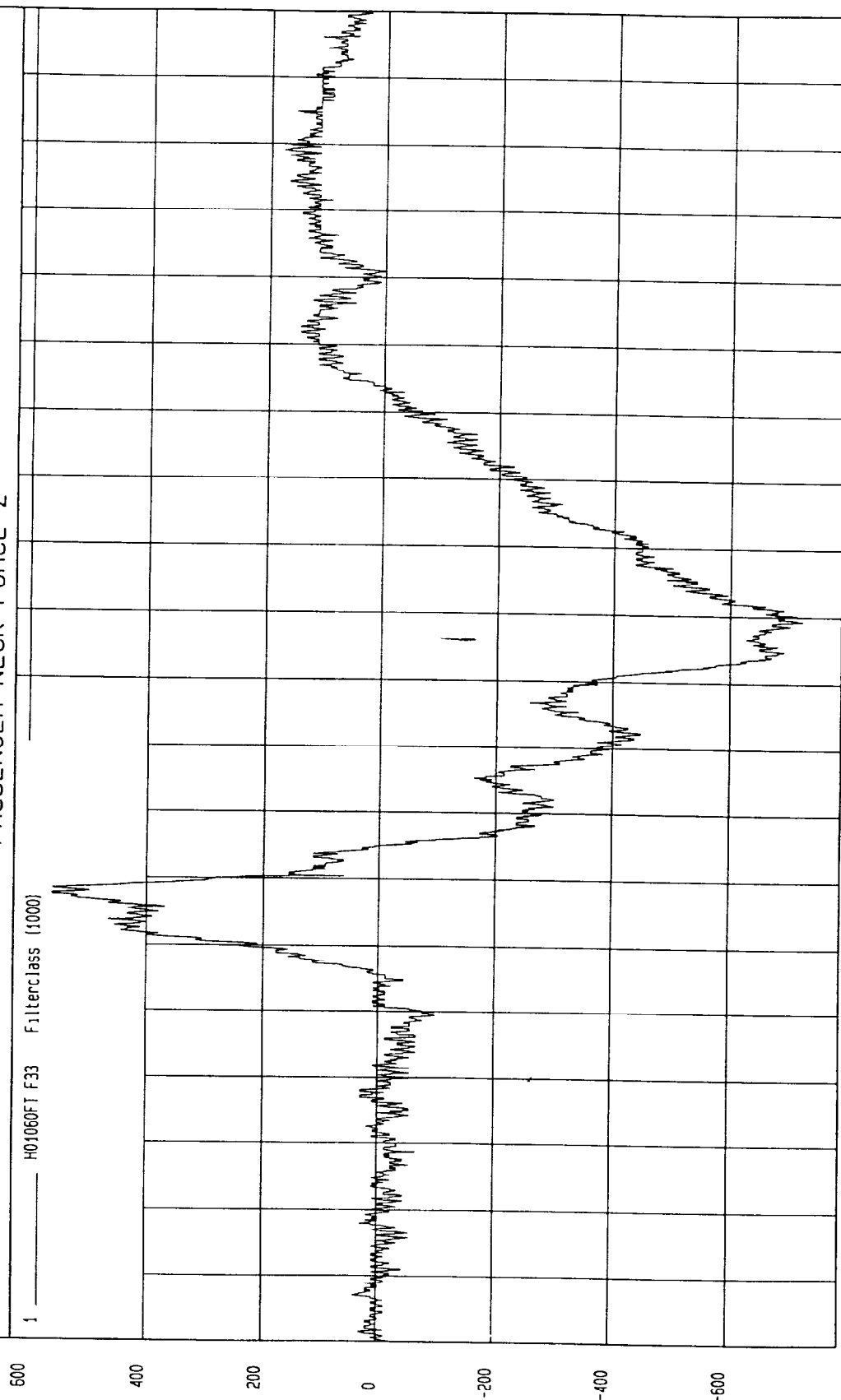
1 H01060FT F32 Filterclass (1000)



TIME (SECONDS)

0 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19

N



PASSENGER NECK FORCE Z

Minimum = -722 g N at 109 msec

Maximum = 559 g N at 68 msec

COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

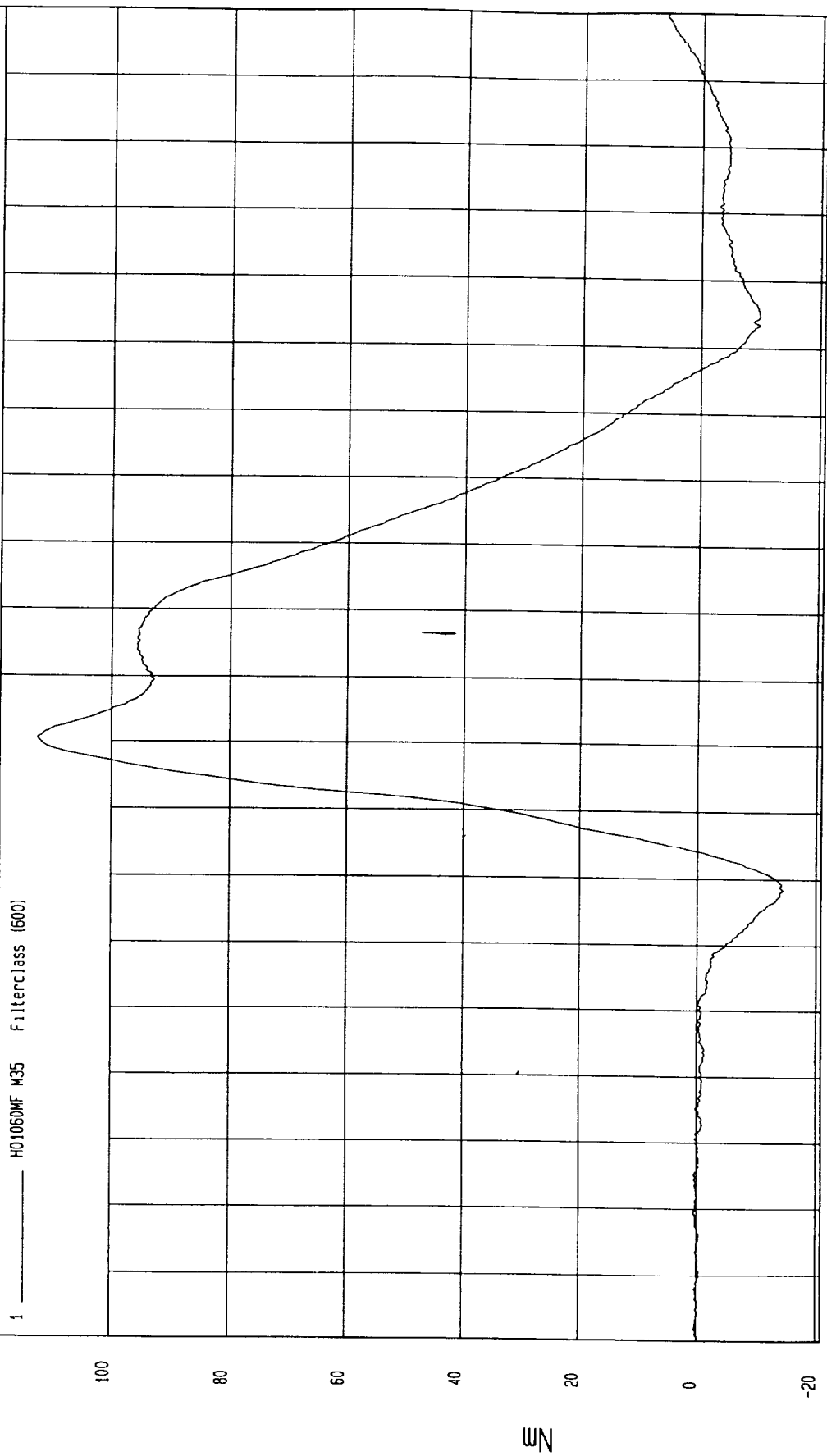
TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

PASSENGER NECK MOMENT X VS. TIME  
NO VALID DATA COLLECTED

1

|                                         |                                |
|-----------------------------------------|--------------------------------|
| TEST FMVSS 208 SLED (H01060)            | TEST DATE 04-19-2001           |
| COMPONENT 2001 SAAB 9-5 4 DOOR (C10507) |                                |
| Minimum = -14 45 Nm at 68 msec          | Maximum = 112 32 Nm at 91 msec |
| PASSENGER NECK MOMENT Y                 |                                |



TEST FMVSS 208 SLED (H01060) TEST DATE 04-19-2001

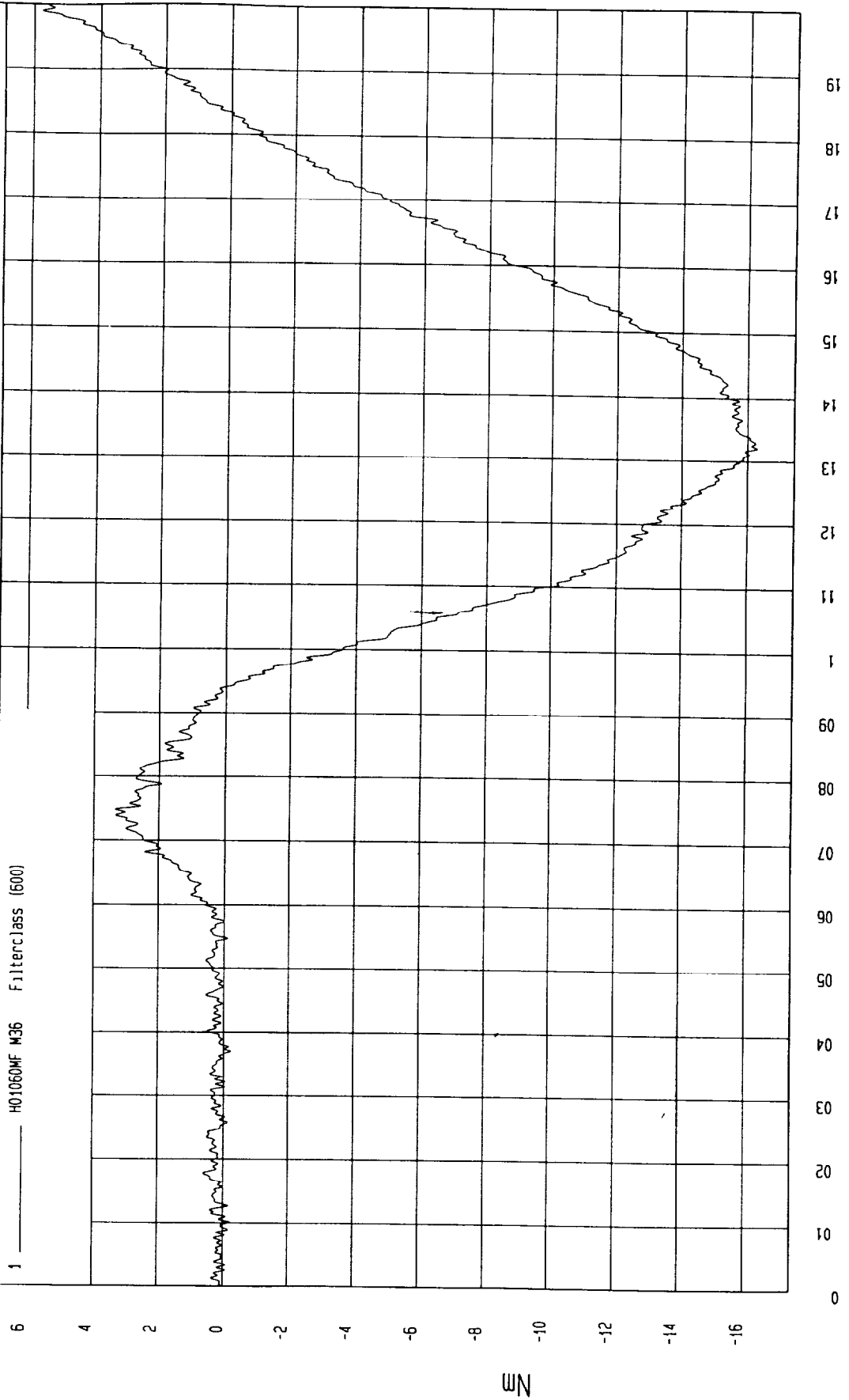
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -16.29 Nm at 132 msec

Maximum = 5.76 Nm at 199 msec

PASSENGER NECK MOMENT Z

1 H01060MF M36 Filterclass (600)



TIME (SECONDS)

TEST FMVSS 208 SLED (H01060) TEST DATE 04-19-2001

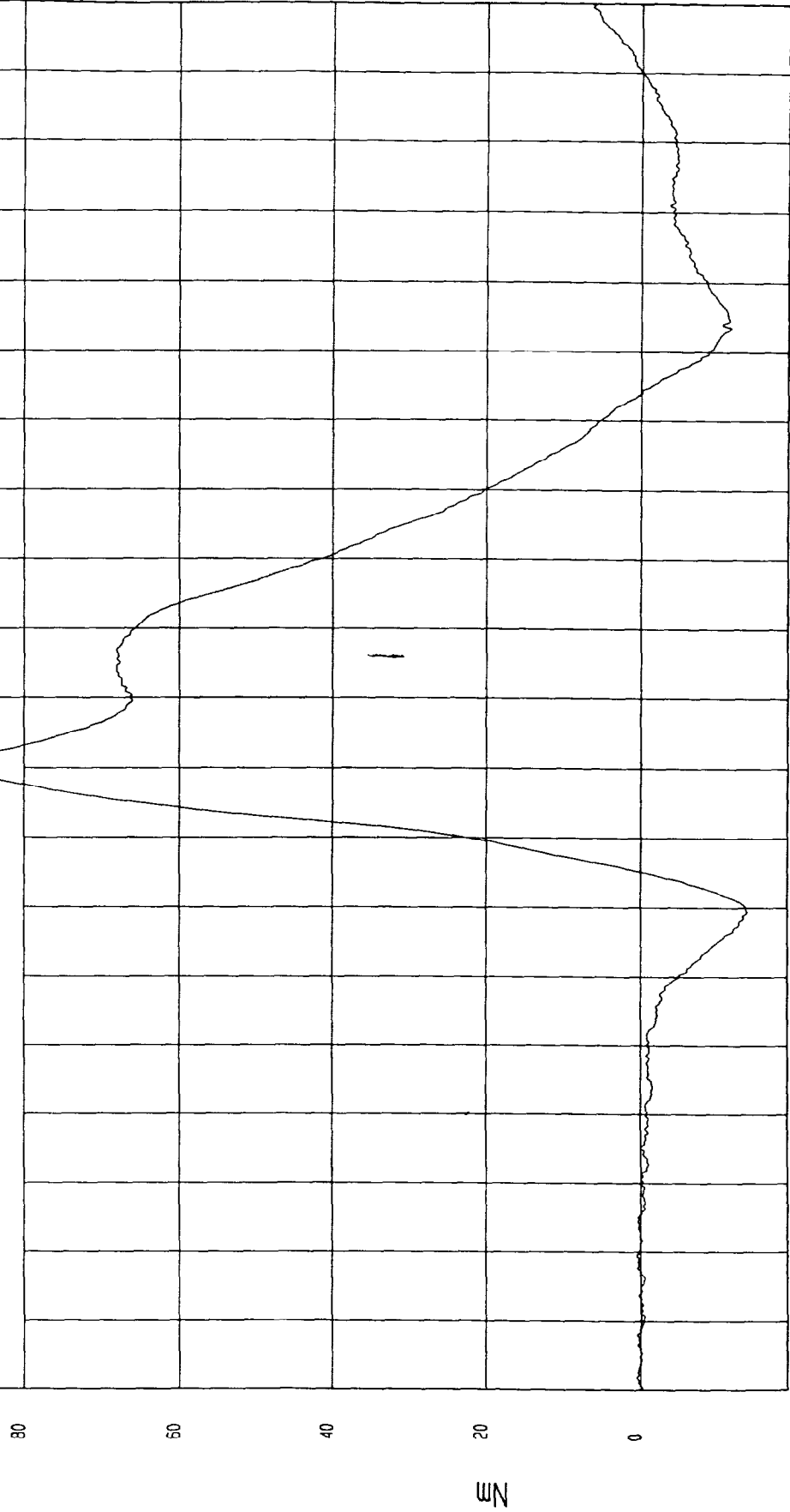
COMPONENT 2001 SAAB 9-5 4 D00R (C10507)

Minimum = -13 55 Nm at 69 msec

Maximum = 87 26 Nm at 90 msec

PASSENGER OCCIPITAL CONDYLE MOMENT Y

1 H01060M0 M35 Filterclass (500)



TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

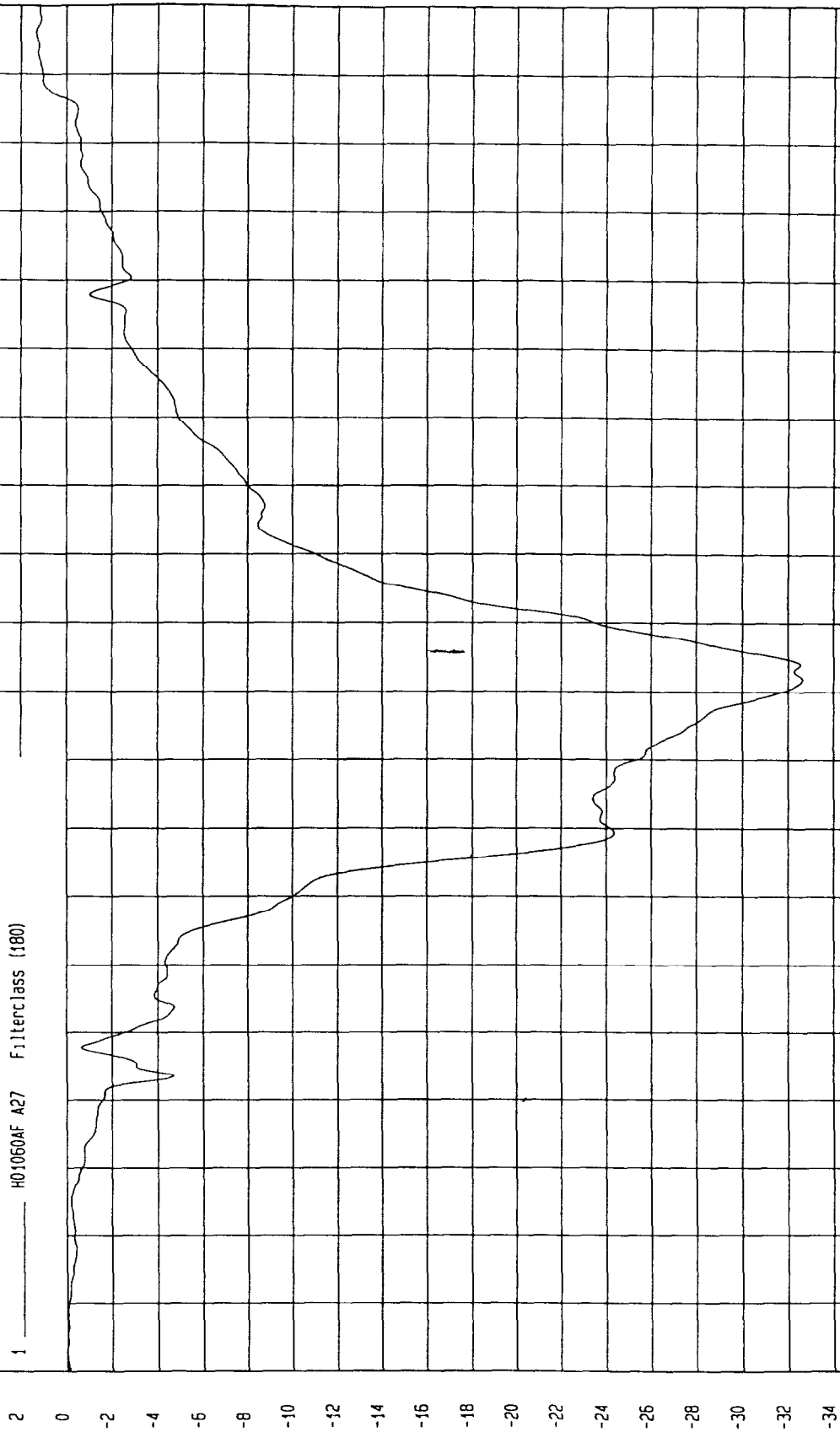
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -32.65 G at 102 msec

Maximum = 1.33 G at 196 msec

PASSENGER CHEST X ACCELERATION

1 H01060AF A27 Filterclass (180)



TIME (SECONDS)

WGA Research  
04-19-2001 09:02

TEST FMVSS 208 SLED (H01060) TEST DATE 04-19-2001

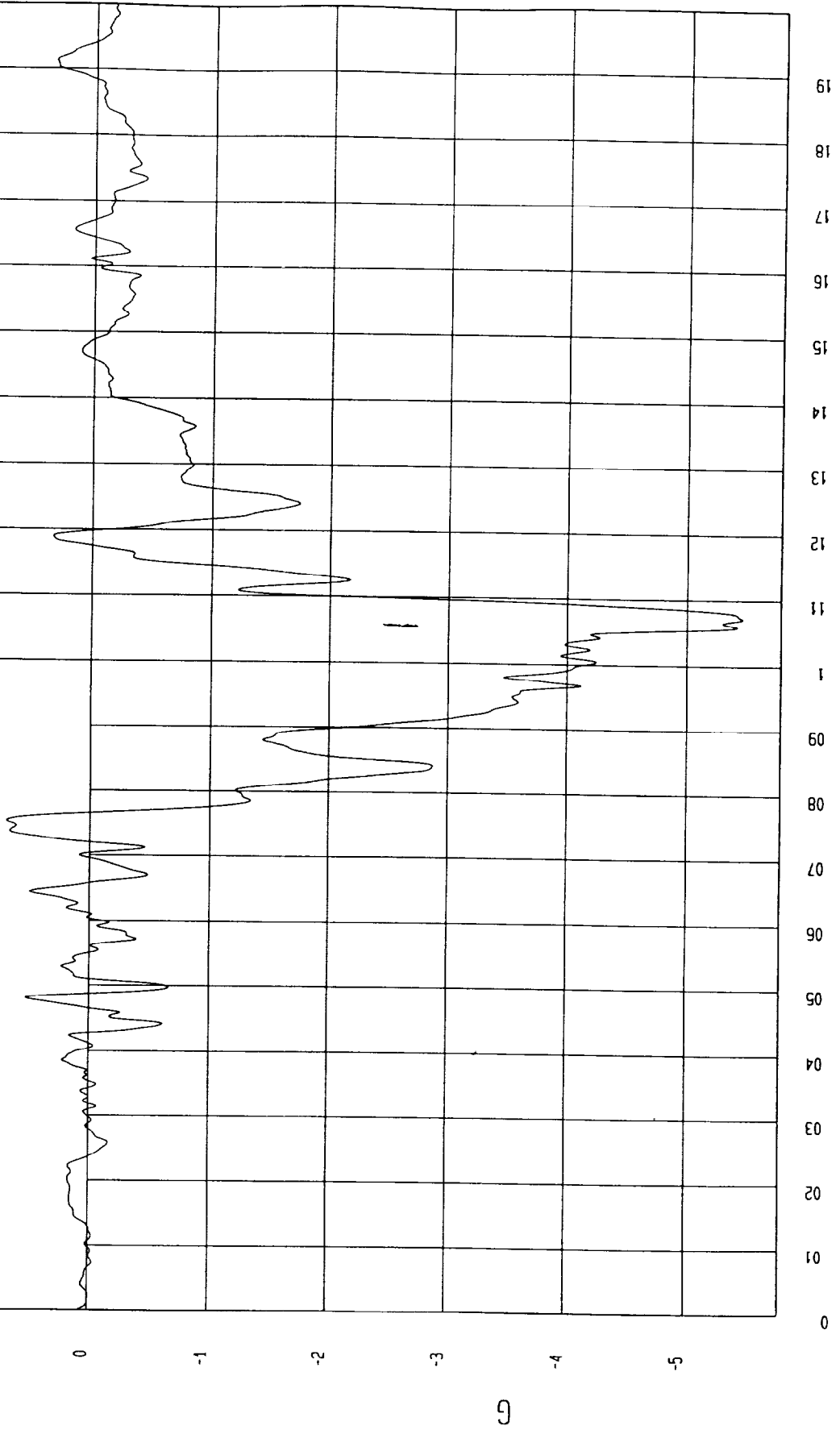
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -5.47 G at 107 msec

Maximum = 7.6 at 75 msec

PASSENGER CHEST Y ACCELERATION

1 ——— H01060AF A2B Filterclass (180)



TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

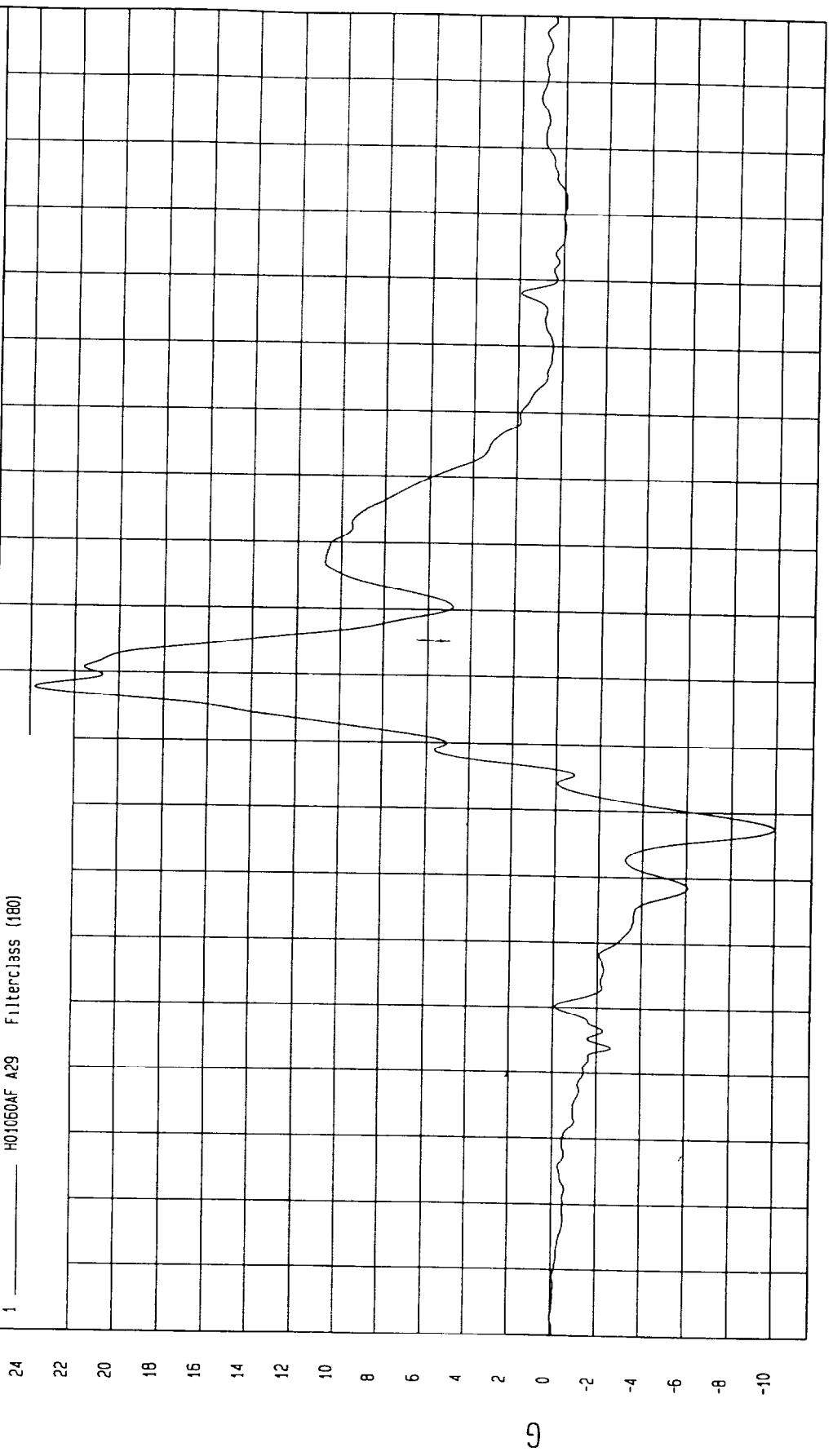
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -9.96 G at 78 msec

Maximum = 23.8 G at 98 msec

PASSENGER CHEST Z ACCELERATION

1 H01060AF A29 Filterclass (180)



TEST FMVSS 208 SLED (H01060) TEST DATE 04-19-2001

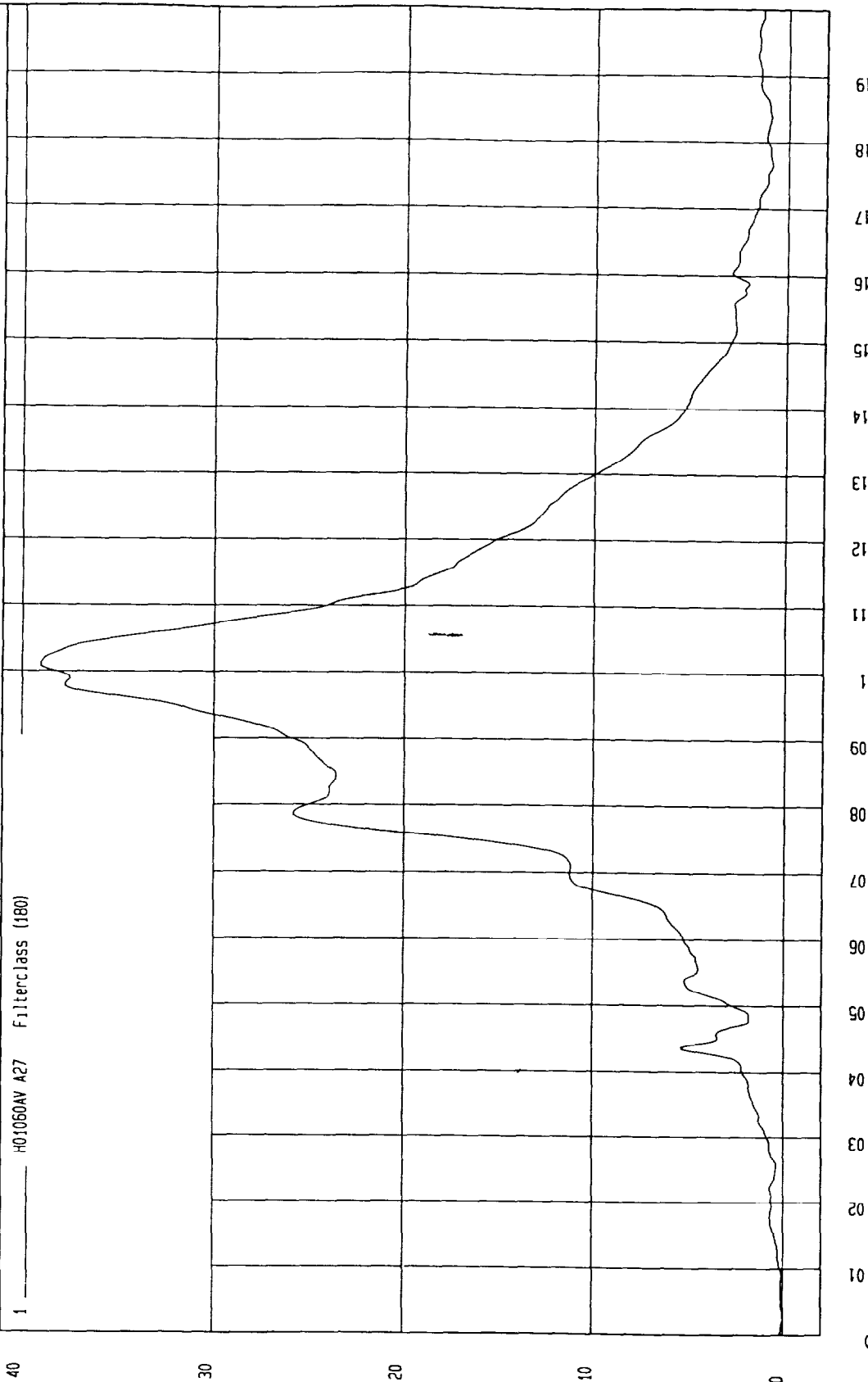
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = 2.37E-02 G at 2 msec

Maximum = 39.07 G at 101 msec

PASSENGER CHEST RESULTANT ACCELERATION

1 H01060AV A27 Filterclass (180)



TEST FMVSS 208 SLED (H01060)

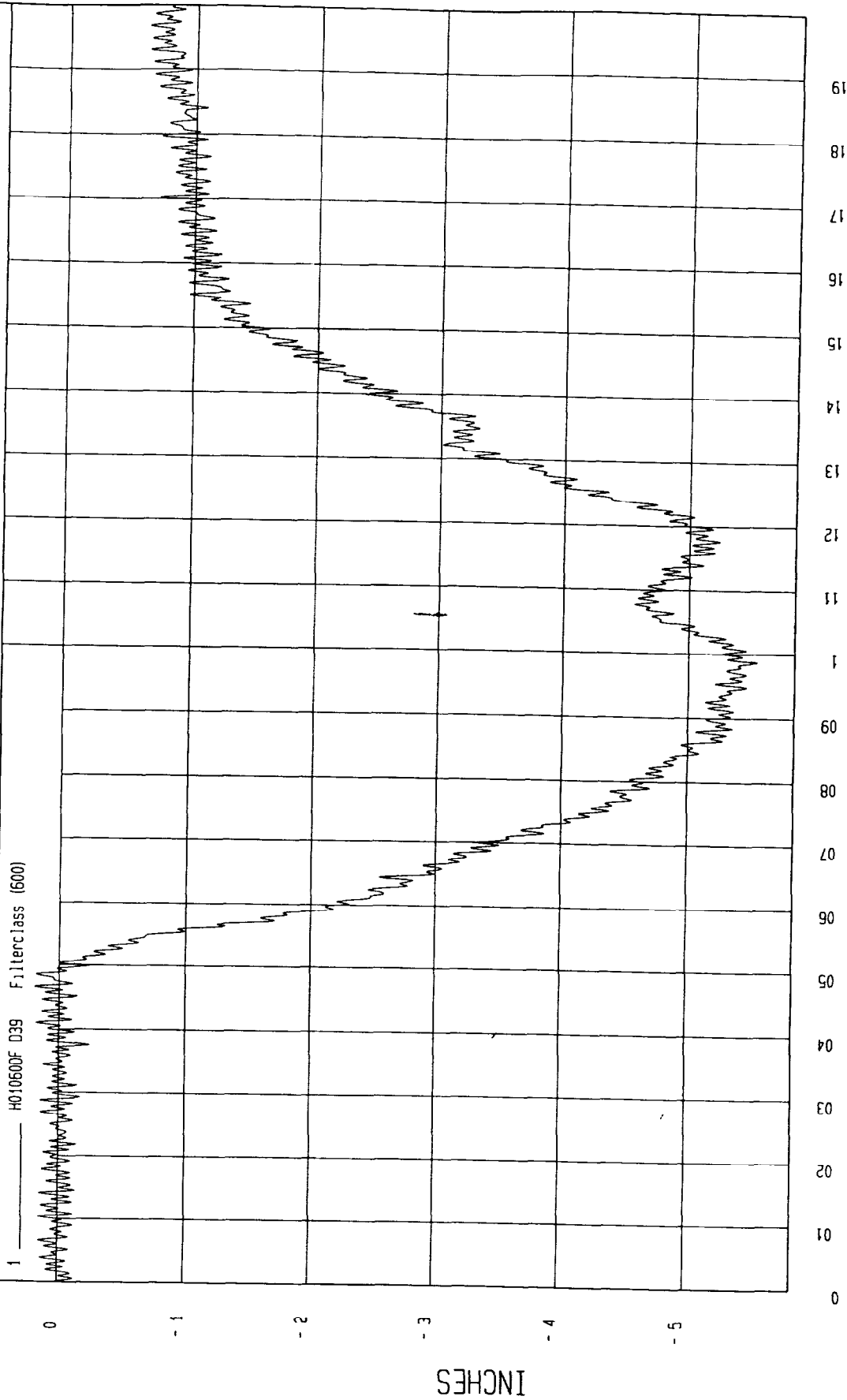
TEST DATE 04-19-2001

COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = 55 INCHES at 99 msec

Maximum = 2 01E-02 INCHES at 47 msec

PASSENGER CHEST COMPRESSION



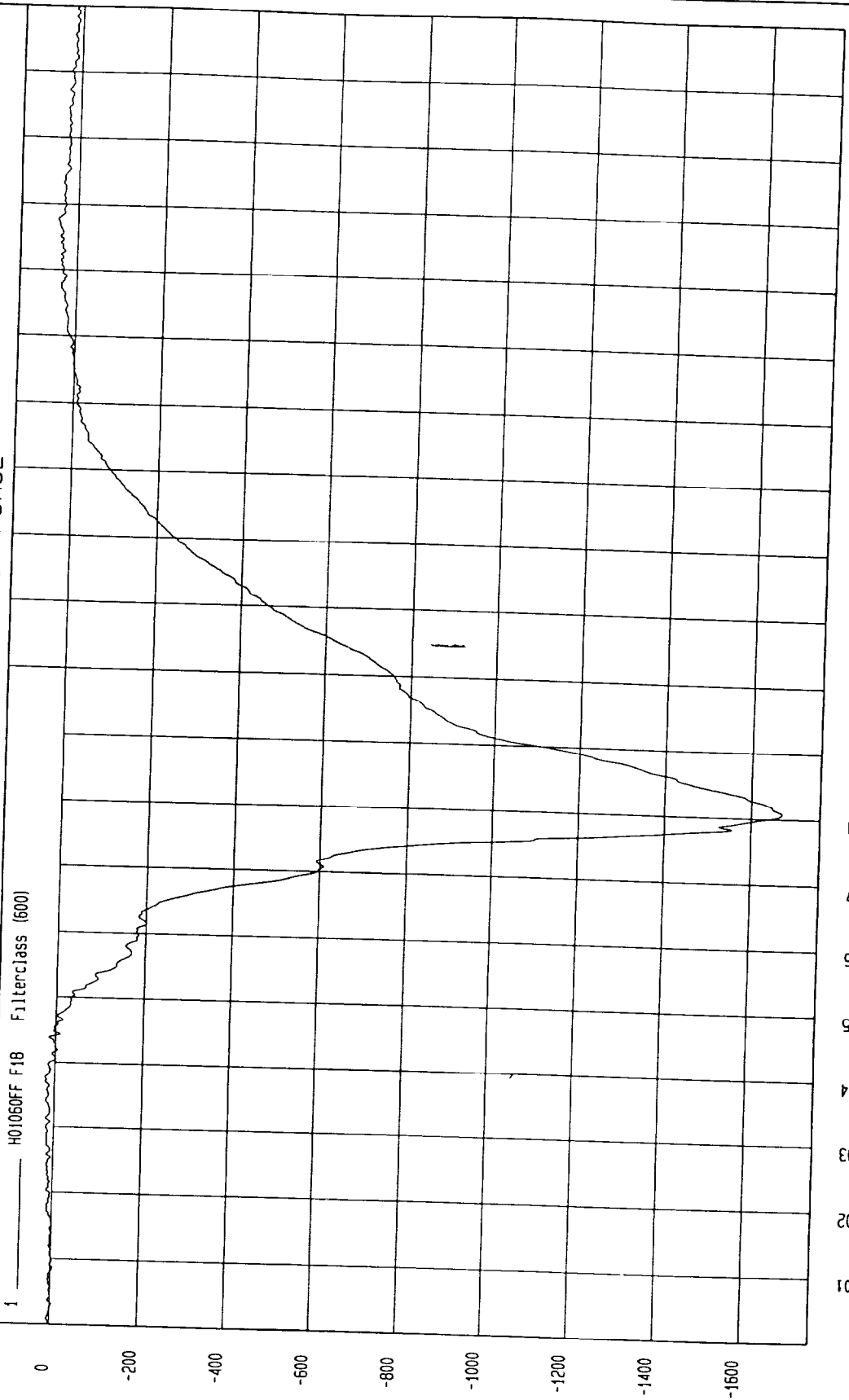
TIME SECONDS

INCHES

TIME (SECONDS)

19 18 17 16 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 0

LB



PASSENGER LEFT FEMUR FORCE

Maximum = 46 23 LB at 168 msec

Minimum = -1670 LB at 81 msec

COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

TEST FMVSS 208 SLED (H01060)

TEST DATE 04-19-2001

1 H01060FF F18 Filterclass (600)

TEST FMVSS 208 SLED (H01060) TEST DATE 04-19-2001

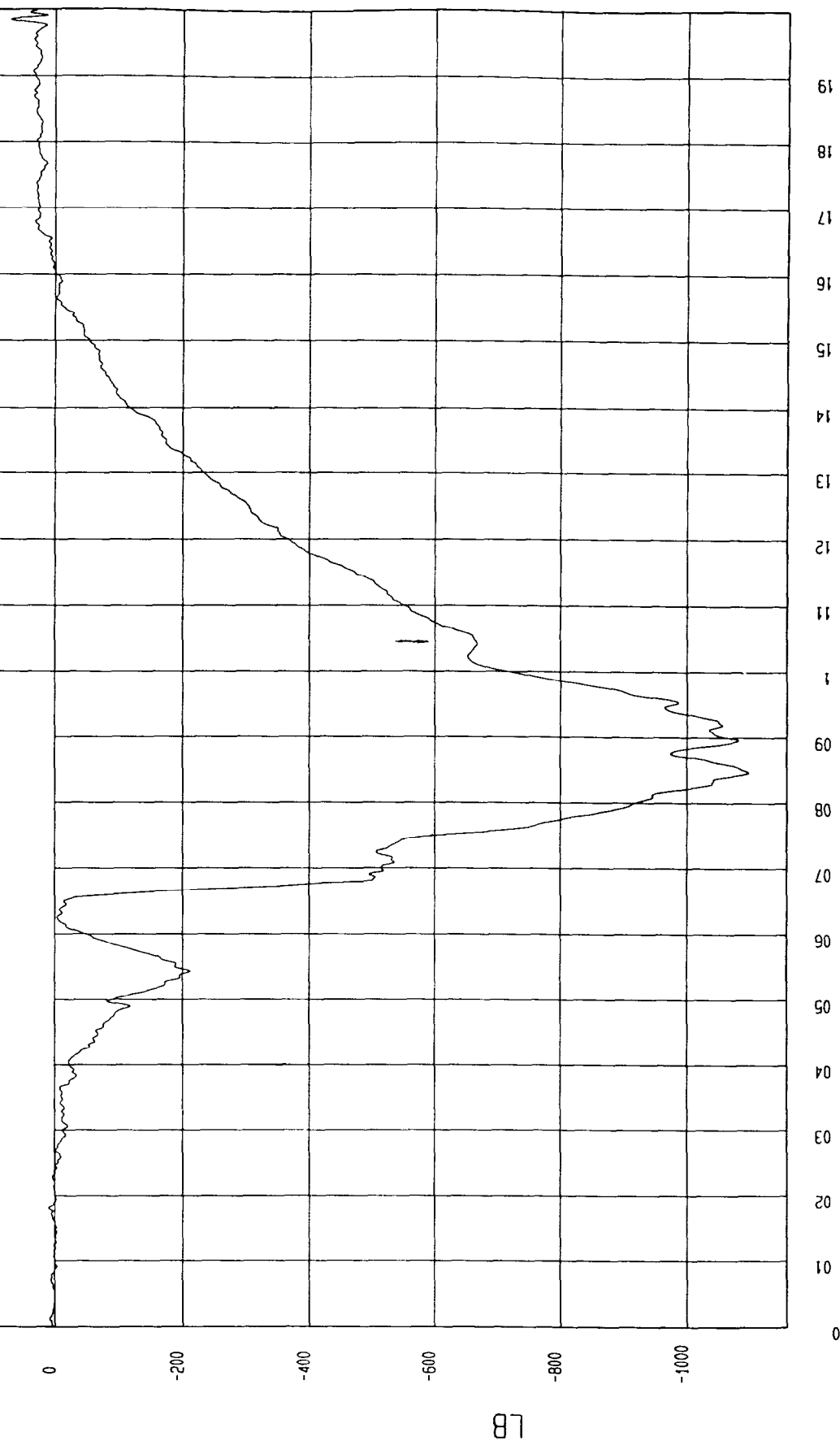
COMPONENT 2001 SAAB 9-5 4 DOOR (C10507)

Minimum = -1096 29 LB at 85 msec

Maximum = 71 32 LB at 198 msec

## PASSENGER RIGHT FEMUR FORCE

1 ——— H01060FF F45 Filterclass (600)

MCA Research  
04-18-2001 13 44

APPENDIX C  
MANUFACTURER'S VEHICLE INFORMATION



SAAB CARS USA, INC

December 1, 2000

Sent Via Certified Mail

Marilynne Jacobs, Director  
Office of Vehicle Safety Compliance  
National Highway Traffic Safety Administration  
400 Seventh St , S W  
Washington, D C. 20590

**RE: OA-208-001018Q, 2001 Saab 9-5, FMVSS 208 Compliance Testing**

Dear Ms Jacobs,

This letter and attachments are Saab's response to your request for information related to a potential FMVSS 208 compliance test of a 2001 model year Saab 9-5. The individual information requests from your Oct 3, 2000 letter are repeated below in bold.

**1. Please inform OVSC if the air bag restraint system is certified to meet the requirements of S4.1.5.1(a)(1) or S13.**

Saab is certified to meet the requirements of S13. Attachment 1 contains a copy of Saab test number S3670 [Saab Reg no. TVA-UR-2029] conducted June 8, 1999 at the Millbrook Proving Ground with unbelted dummies. Attachment 2 contains three belted dummy tests. Saab test numbers K2275 [Reg no. TVA-99-2019] and K2272 [Reg No TVA-99-2021] are 30 mph 30° right/left angled barrier tests. Saab test number K2271 [Reg no TVA-99-2008] is a 35 mph 0° frontal barrier test.

**2. Provide the following: (1) describe the difference between the MY2001 air bag system and the MY2000 air bag system, (2) explain what other restraint changes have been made, (3) explain what other vehicle changes have been made that might have affected FMVSS 208 performance, and (4) describe any features that might affect performance with respect to children and out of position occupants.**

With regard to (1), (2) and (3) above, no changes have been made from MY2000 to MY2001. With regard to (4), there have been no other changes since the introduction of the S13 option allowing the use of reduced force air bags

**3. If the vehicle was certified with unrestrained dummies to meet the requirements of S13, describe how to disconnect the air bags from the vehicle sensors and connect them to the triggering mechanism used in the sled test. Describe the method used in certification to determine when to trigger the air bag and the system used to trigger the air bag.**

Page 2

To disconnect the air bags from the sensors and connect them to the triggering mechanism, cut the air bag connector wiring cable approximately 150-250 mm from the connection to the air bag. The ends of the wires from the air bag are striped and a connector block with screw terminals is used to connect them to the extension cable to the air bag firing connector box on the sled carriage.

To determine when and how to trigger the air bag, the sled was equipped with a 25g accelerometer with a high over-range capacity. The unfiltered output from this accelerometer is sent to an electronic control module via one channel in the data acquisition system. This module, or "firing box", processes the input acceleration signal from the sled to determine the air bag deployment time. The threshold for the firing box to begin its processing is 1g. 1g is used in preference to 0.5g as it makes the firing time more stable.

The output from the air bag firing box is adjustable in increments of 0.1 millisecond. After the set time delay, the firing box connects a 12-volt power source to deploy the air bags. The firing signal for each air bag is monitored and sent to the air bag module via a second data channel in the data acquisition system.

T-zero for the data is set at 6.0 milliseconds prior to the 1g trigger threshold so as to best align the pulse with the corridor. The air bag firing time delay is set to 16 milliseconds from the 1g trigger threshold and, hence, 22 milliseconds from T-zero. The data are processed and the time taken to reach 0.5g measured. This is then subtracted from the air bag firing time to give the firing time relative to 0.5g. For test S3670, the actual time was 19.8 milliseconds relative to 0.5g.

No MY2001 Saab 9-5's have dual or multistage inflators

**4. State for any safety belt system in this vehicle whether or not it is equipped with a tension-relieving device. Provide a copy of the information furnished in accordance with S7.4.2 if the tension-relieving device is used.**

No MY2001 Saab 9-5 utilizes a tension-relieving device

**5. FMVSS No. 208, S8.1.5 allows the manufacturer the option of having movable vehicle windows and vents placed in the closed position. State whether the vehicle's movable windows and vents were opened or closed for the certification tests.**

During the Saab tests, all side windows have been closed

Page 3

6. **Submit dummy placement measurements, including diagrams or photographs which show exactly where each measurement was taken. Enclosed is a diagram of some of the OVSC's dummy measurements. Where possible, use each dimension shown in the diagram to provide the individual dummy placement measurements. State whether the vehicle has a foot rest for the driver.**

Because Saab's dummy positioning measurements do not correspond with the sample OVSC template, please see Attachment 3. This Attachment contains the Saab "Dummy Positioning Protocol" [Reg no. TKA-98-1054] This Protocol provides positioning measurements and photographs for both the driver and passenger side dummies. Yes, the Saab 9-5 has a foot rest for the driver.

7. **Provide the seat positioning, steering column positioning, and fuel tank data on the enclosed form. If more than one front seating, steering column or fuel tank configuration are available on this vehicle, provide separate information for each. In addition, provide the seating reference point for each seat for the lockable seat belt requirement in S7.1.1.5.**

A completed copy of the "Enclosure 3" form is included as Attachment 4. There is only one front seat, steering column and fuel tank configuration. The Saab document Reg no TKA-98-1054, photo 12, referenced in the response to 1. is found in Attachment 3. The Saab document Reg. No. TKA-00-1321 referenced in the response to 4. is also included in Attachment 4.

Attachment 4 also includes seating reference points for the front and rear seats for the 9-5 Sedan and the 9-5 Wagon.

8. **If the vehicle is equipped with adjustable seat belt anchorages, provide the manufacturer's nominal design position for a 50<sup>th</sup> percentile adult male occupant.**

Please see Attachment 5 for a copy of Saab "Belt Position" protocol [Reg No TVA-00-1320] on the Saab 9-5.

9. **For barrier tests provide the speed at impact, vehicle test weight, and resulting injury criteria (i.e., HIC, chest acceleration, chest compression, and femur loads) recorded for all certification tests conducted to meet the requirements of S4.1.5.1(a)(1). For sled tests, provide the resulting injury criteria (i.e., HIC, chest acceleration, chest compression, femur loads, and neck moments and forces) recorded for all certification tests conducted to meet the requirements of S13.**

Please test reports for Saab tests K2271, K2272, and K2275 in Attachment 2 and Saab test S3670 in Attachment 1 for all of the above requested data.

Page 4

**10. When vehicle components must be removed to obtain the proper test weight for the barrier test, what components do you recommend for removal and in what priority order do you recommend removal?**

Saab recommends removal of the following in this order 1 Spare tire 2. Trunk lid. 3 Rear bumper 4 Rear seat 5. Rear exhaust system/muffler.

**11. If the vehicle uses a pressure vessel to inflate the air bag, provide a copy of the test reports or engineering analysis to demonstrate that it meets all the requirements of S9.1.**

Please see Attachment 6 with Autoliv test report ER-003733, Revision A.

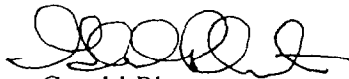
**12. If the vehicle uses an explosive device to inflate the air bag, provide a copy of the test report or engineering analysis to demonstrate that it meets all the requirements of S9.2.**

Unfortunately, Saab has not yet been able to obtain a copy of the actual Autoliv test report As soon as it becomes available, I will forward it in a separate follow-up letter.

Saab does not consider any of this submission to be confidential business information under the terms of 49 CFR 512

If there are any questions, please feel free to contact me directly at (770) 279-6377 If a compliance test is scheduled, we would appreciate knowing the date and location as early as possible so we can send a representative We also appreciate the flexibility extended by Mr Case on the submission timetable

Sincerely,



Gerald Plante

Manager, Compliance & Technical Liaison

cc Torbjorn Svensson, Saab Automobile AB  
Paul Eichbrecht, General Motors Corporation

Enclosures

## ATTACHMENT #3

Saab Response OA-208-001018Q, 2001 Saab 9-5, FMVSS 208 Compliance Test

Infoklass/Info Class

Sida/Page  
1 (5)

For kännedom/For Information

This positioning protocol is based on the instructions in FMVSS 208

|                          |                                     |                           |
|--------------------------|-------------------------------------|---------------------------|
| Crash test number _____  | Date _____                          | Positioning made by _____ |
| Type of crash test _____ | Velocity _____                      |                           |
| Type of car _____        | Angle sill - horizontal plane _____ |                           |

[illegible]

**SAAB**Dokumentnamn/Document Name  
Dummy positioning protocolC-7  
Info klass/Info Class  
IGodkänd/Approved By  
A17-1 TVAA Per Lenhoff  
Utfärdare (intern postadress namn)/Issued by  
A17-1 TVAAB Elisabet KarlssonTelefax  
78310  
Telefon/Phone  
78435Lagtningsdata/File  
98105402  
Datum/Date  
1998 05 26Reg nr/Reg no  
TKA 98 1054  
Utgåva/Issue  
2  
Sida/Page  
2 (5)

Driver, dummy name: \_\_\_\_\_

Type of seat ☐ electrical  
☐ manualSteering wheel in its mid position  
(both horizontal and vertical) : ☐Upholstery ☐ textile  
☐ leather

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Desired Position         | Actual Position |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------|
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 50%                      |                 |
| <b>Seat positioning:</b>  | <b>Longitudinal:</b> Mid position, or for a manual seat at the first notch rearwards of mid position. Verify correct position with measurements on inner/outer seat rail<br>Electrical<br>Manual                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 45/3 mm<br>70/30 mm      |                 |
|                           | <b>Vertical:</b> Lowest position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                          |                 |
|                           | <b>Seat back inclination:</b> Corresponds to 25° back inclination of H-point machine. Verify with measurements (angle from a vertical plane)<br>On head restraint<br>On back of seat frame                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0°<br>18°                |                 |
|                           | <b>Seat base tilt:</b> Lowest position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                          |                 |
|                           | <b>Lumbar support:</b> Rearmost position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                          |                 |
|                           | <b>Head restraint:</b> Highest position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                          |                 |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                          |                 |
| <b>Dummy positioning:</b> | Position the dummy, so that the dummy's back is in contact with the seat back and the centre line of the dummy is lined up with the centre line of the seat. The upper legs of the dummy shall be in contact with the seat cushion and the legs should be in vertical longitudinal planes as far as possible. The driver dummy's right foot shall rest on the undepressed accelerator pedal with the heel on the floor. The left foot shall be placed as flat as possible on the toeboard parallel to the centre line of the vehicle. If the car is provided with a foot-rest, position the left foot on this rest. The driver's upper arms shall be adjacent to the torso as far as possible. The hands shall have their palms placed against the steering wheel at a position of quarter to three |                          |                 |
|                           | <b>H-point - A-pillar</b> (x direction)<br>Electrical<br>Manual                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 713 ± 5 mm<br>713 ± 5 mm |                 |
|                           | <b>H-point - sill</b> (z direction)<br>Electrical<br>Manual                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 137 ± 5 mm<br>135 ± 5 mm |                 |
|                           | <b>Neck - steering wheel rim</b> (from point on the neck at chest flesh edge)<br>Electrical<br>Manual                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 520 ± 5 mm<br>520 ± 5 mm |                 |
|                           | <b>Head</b> The transverse instrumentation platform of the head (the D plane) in level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                          |                 |
|                           | <b>Knees</b> Right knee casting outer surface edge of centre console (y direction)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 70 mm                    |                 |
|                           | <b>Knees</b> Distance between the knee casting outer surfaces                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 320 mm                   |                 |
|                           | <b>Elbows</b> Distance between elbows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 370 ± 5 mm               |                 |
|                           | <b>Hands</b> Distance between hands                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 390 ± 5 mm               |                 |
|                           | <b>Pelvic angle</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 22,5° ± 2,5°             |                 |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                          |                 |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                          |                 |

**SAAB**

Dokumentname/Document Name  
Dummy positioning protocol

Infoklass/Info Class  
1

Godkänd/Approved By  
A17-1 TVAA Per Lenhoff  
Utfärdare (intern postadress namn)/Issued by  
A17-1 TVAAB Elisabet Karlsson

Telefax  
78310  
Telefon/Phone  
78435

Lagningsdata/File  
98105402  
Datum/Date  
1998-05-26

Reg nr/Reg no  
TKA-98 1054  
Utgåva/Issue  
2

Sida/Page  
3 (5)

Colour mark: ☐ yes ☐ no

**Seat belt positioning:**

|                                                    |        |                |
|----------------------------------------------------|--------|----------------|
| Distance from tip of the nose to seat belt webbing | 190 mm | Measured _____ |
|----------------------------------------------------|--------|----------------|

**SAAB**
 Dokumentnamn/Document Name  
 Dummy positioning protocol

 Infoklass/Info Class  
 I

Godkänd/Approved By

A17-1 TVAA Per Lenhoff

Telefax

78310

Lagningsdata/File

98105402

Reg nr/Reg no

TKA 98 1054

Utfärdare (intern postadress namn)/Issued by

A17-1 TVAAB Elisabet Karlsson

Telefon/Phone

78435

Datum/Date

1998-05 26

Utgåva/Issue

2

Sida/Page

4 (5)

Passenger, dummy name: \_\_\_\_\_

 Type of seat ☐ electrical  
☐ manual

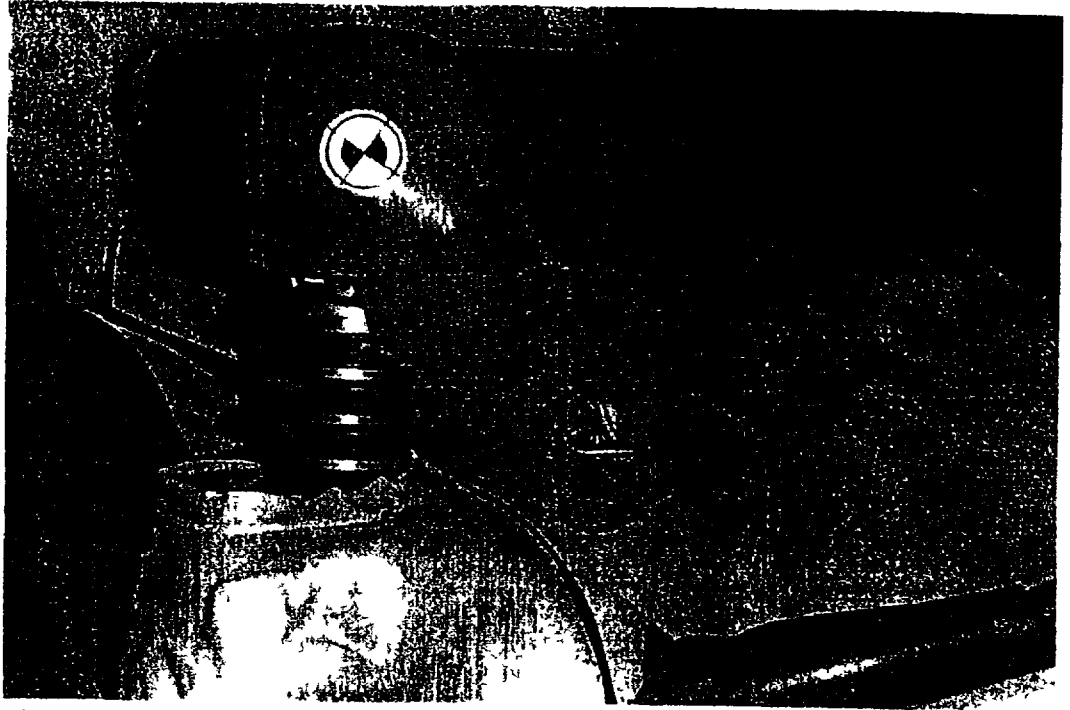
 Steering wheel in its mid position  
 (both horizontal and vertical) : ☐

 Upholstery ☐ textile  
☐ leather

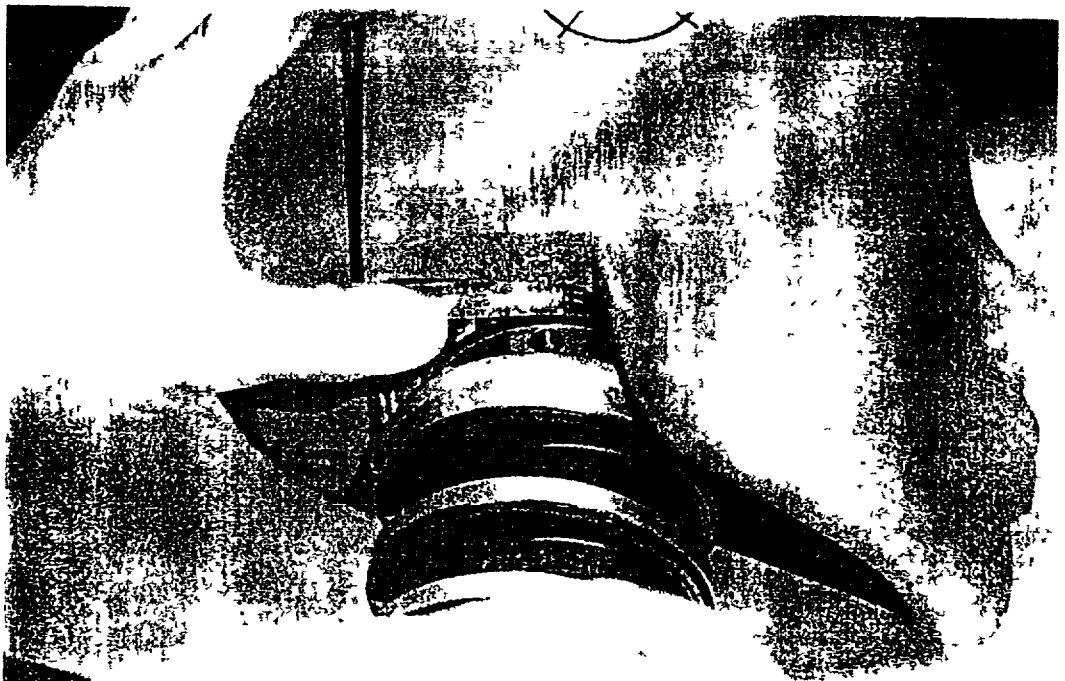
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Desired Position         | Actual Position |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------|
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 50%                      |                 |
| <b>Seat positioning:</b>  | <b>Longitudinal:</b> Mid position, or for a manual seat at the first notch rearwards of mid position Verify correct position with measurements on inner/outer seat rail<br>Electrical<br>Manual                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 45/3 mm<br>70/30 mm      |                 |
|                           | <b>Vertical:</b> Lowest position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                          |                 |
|                           | <b>Seat back inclination:</b> Corresponds to 25° back inclination of H-point machine Verify with measurements (angle from a vertical plane)<br>On head restraint<br>On back of seat frame                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0°<br>18°                |                 |
|                           | <b>Seat base tilt:</b> Lowest position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                          |                 |
|                           | <b>Lumbar support:</b> Rearmost position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                          |                 |
|                           | <b>Head restraint:</b> Highest position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                          |                 |
| <b>Dummy positioning:</b> | Position the dummy, so that the dummy's back is in contact with the seat back and the centre line of the dummy is lined up with the centre line of the seat The upper legs of the dummy shall be in contact with the seat cushion and the legs should be in vertical longitudinal planes as far as possible The passenger dummy's feet shall be placed with the heel as far forwards as possible and the feet as flat as possible Both feet shall be parallel to the centre line of the vehicle The passenger's upper arms shall be adjacent to the torso and in contact with the seat back The hands shall be placed with the palms in contact with the outside of the legs and the little finger in contact with the seat cushion |                          |                 |
|                           | <b>H-point - A-pillar</b> (x direction)<br>Electrical<br>Manual                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 713 ± 5 mm<br>713 ± 5 mm |                 |
|                           | <b>H-point - sill</b> (z direction)<br>Electrical<br>Manual                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 137 ± 5 mm<br>135 ± 5 mm |                 |
|                           | <b>Neck - dash assembly</b> (from point on the neck at chest flesh edge)<br>Electrical<br>Manual                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 655 ± 5 mm<br>655 ± 5 mm |                 |
|                           | <b>Head</b> The transverse instrumentation platform of the head (the D plane) in level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                          |                 |
|                           | <b>Knees</b> Left knee casting outer surface - edge of centre console (y-direction)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 110 ± 5 mm               |                 |
|                           | <b>Knees:</b> Distance between the knee casting outer surfaces (270 ± 10 mm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 240 mm                   |                 |
|                           | <b>Pelvic angle</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 22,5° ± 2,5°             |                 |

**SAAB**Dokumentnamn/Document Name  
Dummy positioning protocolInfo/Class/Info Class  
1Godkänd/Approved By  
A17-1 TVAA Per Lenhoff  
Utfärdare (intern postadress namn)/Issued by  
A17-1 TVAA Elisabeth KarlssonTelefax  
78310  
Telefon/Phone  
78435Lagningsdata/File  
98105402  
Datum/Date  
1998 05 26Reg nr/Reg no  
TKA-98-1054  
Utgåva/Issue  
2Sida/Page  
5 (5)Colour mark: ☐ yes ☐ no**Seat belt positioning:**

Distance from tip of the nose to seat belt webbing 190 mm Measured \_\_\_\_\_



1.

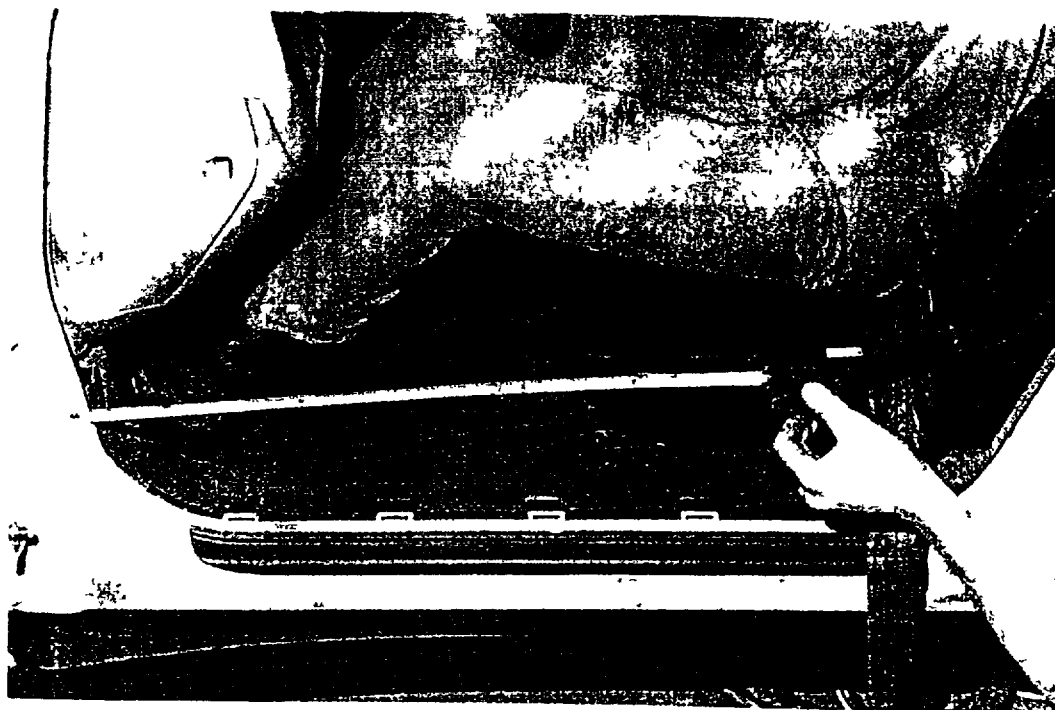


2

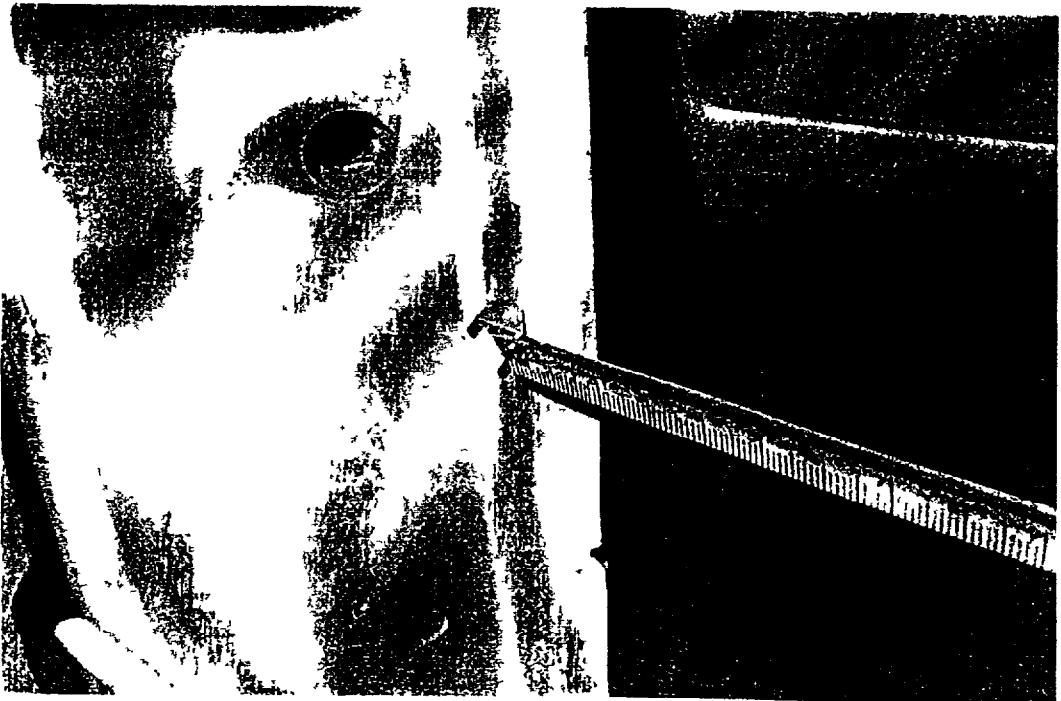


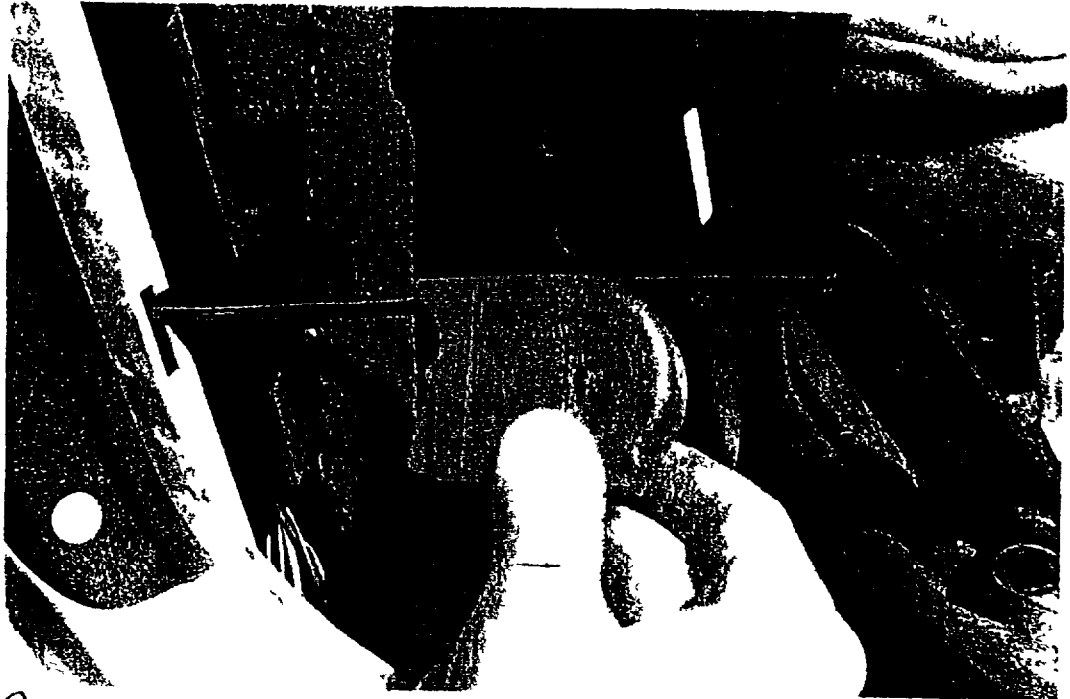


4.



7

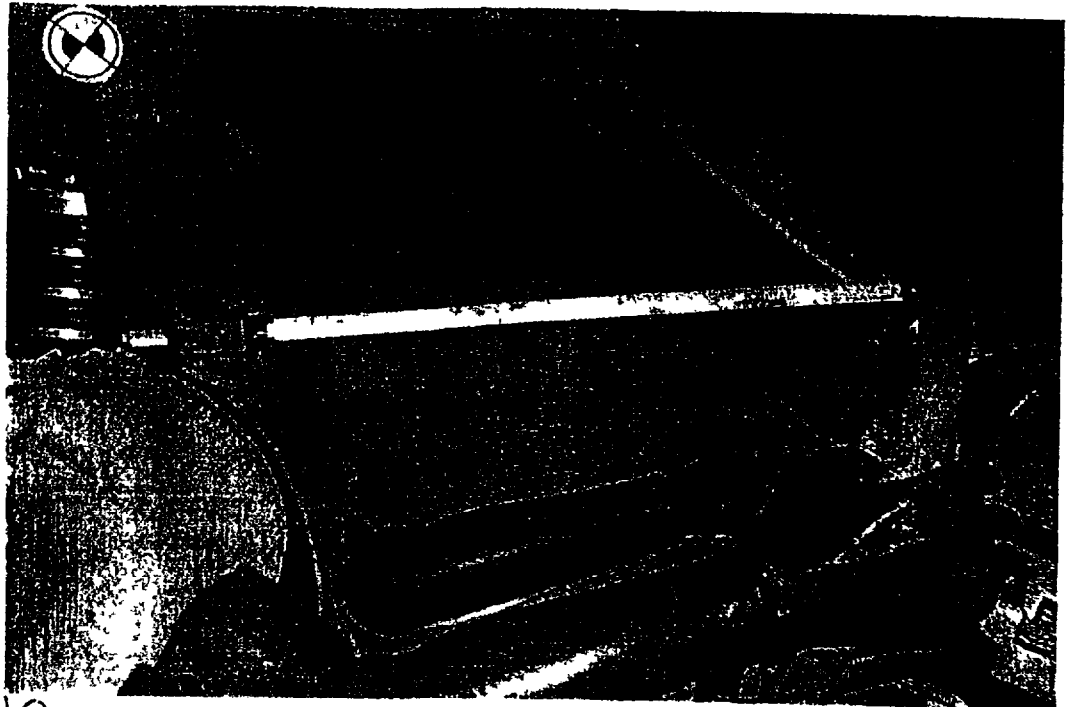




8



9.





## ATTACHMENT #4



Dokumentnamn/Document Name  
Test vehicle information

Infoklass/Info Class

Godkänd/Approved By

TVAA Lars Nilsson

Utfärdare (intern postadress namn)/Issued by

TVAAE Camilla Warås

Telefax

0520 - 783 10

Telefon/Phone

0520 - 854 38

Lagningsdata/File

00133001

Datum/Date

2000-11-10

Reg nr/Reg no

TVA-00-1330

Utgåva/Issue

1

Sida/Page

1 (2)

Fördelning/To

För k nedom/For Information

## TEST VEHICLE INFORMATION

Vehicle Model Year & Make MY01 Saab

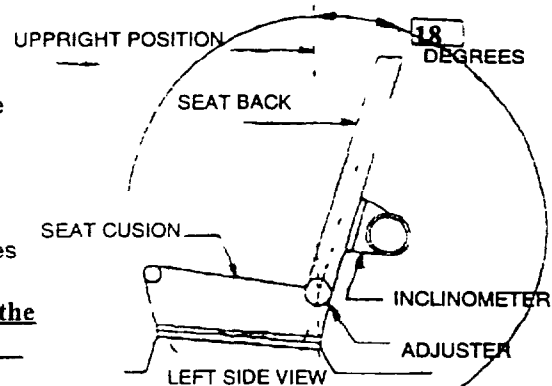
Vehicle Model & Body Style 9-5

### 1 NOMINAL DESIGN RIDING POSITION

For adjustable driver and passenger seat backs  
Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent if applicable. Indicate, if applicable, how the detents are numbered (Is the first detents "0" or "1"2) Indicate if the seat back angle is measured with the dummy in the seat

Seat back angle for driver's seat = 18 degrees  
Measurement Instructions.

**Measure the seat back angle with an inclinometer on the back of the seat frame see attached document TKA-98-1054 and photos number 12.**



Seat back angle for passenger's seat = 18 degrees  
Measurement instructions

**Same as for the drivers seat.**

### 2 SEAT FORE AND AFTER POSITIONS

Provide instructions for positioning the driver and front outboard passenger seat(s) in the centre of fore and after travel. For example, indicate how the detents are numbered (Is the first detents "0" or "1"2) Provide information to locate the detent in which the seat track is to be locked

Positioning of the driver seat

**Electrical: 45/3 mm inner/outer seat rail left and right.**

Positioning of the passenger seat

**Electrical: 45/3 mm inner/outer seat rail left and right.**



Dokumentnamn/Document Name  
Test vehicle information

Infoklass/info Class

Godkänd/Approved By

TVAA Lars Nilsson

Utfärdare (intern postadress namn)/Issued by

TVAAE Camilla Warås

Telefax

0520 - 783 10

Telefon/Phone

0520 - 854 38

Lagningsdata/File

00133001

Datum/Date

2000-11-10

Reg nr/Reg no

TVA-00-1330

Utgåva/Issue

1

Sida/Page

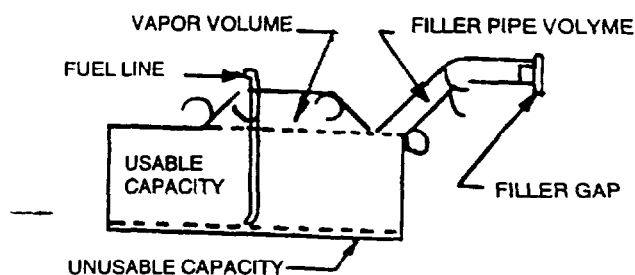
2 (2)

### 3 FUEL TANK CAPACITY DATA

A "Usable Capacity" of standard equipment fuel tank = 19,8 gallons

B "Usable Capacity" of optional equipment fuel tank = \_\_\_\_\_ gallons

C "Usable Capacity" of vehicle(s) used for certification testing to requirements of FMVSS 301 = 18,3 - 18,6 gallons



Operational instructions

3 2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 18,3 gallons.

3 3 Is vehicle equipped with electric fuel pump? ☒ YES ☐ NO

If YES, explain the vehicle operation conditions under which the fuel pump will pump fuel

Fuel pump operating before and after test.

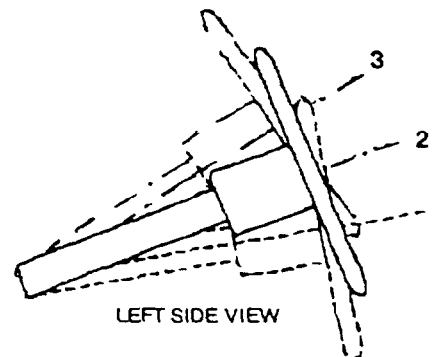
### 4 STEERING COLUMN ADJUSTMENTS

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric centre of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine the geometric centre?

Operational Instructions

The steering wheel/column shall be in the midposition.

See attached document TKA-00-1321



STEERING COLUMN ASSEMBLY



Dokumentnamn/Document Name  
Adjustment steering column

Infoklass/Info Class

Godkänd/Approved By

TVAÄ Lars Nilsson  
Utfärdare (intern postadress namn)/Issued by

TVAÄ Camilla Warås

Telefax

0520 - 783 10

Telefon/Phone

0520 - 854 38

Lagningsdata/File

00132001

Datum/Date

2000-11-10

Reg nr/Reg no

TVA-00-1321

Utgåva/Issue

1

Sida/Page

1 (2)

Fördelning/To

Förkunedom/For Information

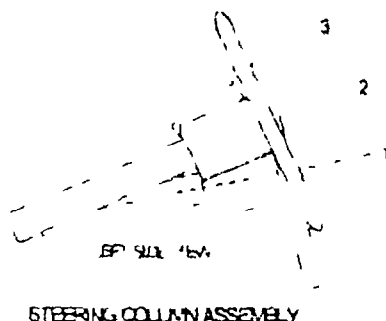
## Steering column adjustment

### HYBRID III 50% IN SAAB 9-5 FRONTAL SEATS

for crash tests according to FMVSS208, US-NCAP and other full with barrier impacts.

Valid from 1998-02-23

Procedure to determine the geometric centre:



2.



3.



4.

- 1 Release the steering column's adjustment lever

#### Telescope:

- 2 Adjust the column in the most forward position and mark clearly the position
- 3 Adjust the column in the most rearward position and mark clearly the position
- 4 Determine the mid position from this two points and mark it clearly



Dokumentnamn/Document Name  
Adjustment steering column

Infoklass/Info Class

Godkänd/Approved By

TVAA Lars Nilsson

Utfärdare (intern postadress namn)/Issued by

TVAAE Camilla Warås

Telefax

0520 - 783 10

Telefon/Phone

0520 - 854 38

Lagtningsdata/File

00132001

Datum/Date

2000-11-10

Reg nr/Reg no

TVA-00-1321

Utgåva/Issue

1

Sida/Page

2 (2)

#### Rake:

1. Adjust the column to the highest position and mark clearly the position
2. Adjust the column to the lowest position and mark clearly the position
3. Determine the mid-position from the two points and mark it clearly



1.



2.



3.

Adjust the column to the two midpoints and check the steeringwheels angle (Shall be  $22,5^{\circ} \pm 0,5^{\circ}$ )



# SRP: 9-5 Sedan & Wagon

## Front Seat.

LEFT: X= 3111

Y= -360

Z= 474

Torso = 25°

Right: X= 3111

Y= +360

Z= 474

Torso = 25°



## SRP: 9-5 Sedan

### Rear Seat.

LEFT

X= 3959

Y= -370

Z= 480

Torso = 28°

MIDDLE

X= 3947

Y= 0

Z=520

Torso = 23°

Right

X= 3959

Y= +370

Z= 480

Torso = 28°



## SRP: 9-5 Wagon

### Rear Seat.

LEFT

X= 3959

Y= -370

Z= 480

Torso = 28°

MIDDLE

X= 3932

Y= 0

Z=520

Torso = 23°

Right

X= 3959

Y= +370

Z= 480

Torso = 28°

## ATTACHMENT #5

、 Saab Response OA-208-001018Q, 2001 Saab 9-5, FMVSS 208 Compliance Test



Godkänd/Approved By

TVAA Lars Nilsson

Utfärdare (intern postadress, namn)/Issued by

TVAE Camilla Warås

Telefax

0520 - 783 10

Telefon/Phone

0520 - 854 38

Lagringsdata/File

00132001

Datum/Date

2000-11-22

Reg nr/Reg no

TVA-00-1320

Utgåva/Issue

1

Sida/Page

1 (1)

Fördelning/To

For kännedom/For Information

## Belt position

### HYBRID III 50% IN SAAB 9-5 FRONTAL SEATS

for crash tests according to FMVSS208, US-NCAP and other full with barrier impacts.

Valid from 1998-02-23

This instruction is based on results from actual positioning of the 9-5 belt in real life.

#### Instructions:

1. Buckle the belt.
2. Pull out all webbing from the retractor.
3. Roll in all webbing at the upper part of the retractor
4. Pull out 300 mm of the webbing again and let it fall over the lower part of the retractor.
5. The distance between the tip of the dummies nose and the upper edge of the diagonal webbing shall be 190 mm.

