HS631295

REPORT NUMBER: 201-VER-04-02

SAFETY COMPLIANCE TESTING FOR FMVSS 201
OCCUPANT PROTECTION IN INTERIOR IMPACT

MITSUBISHI MOTORS NORTH AMERICA, INC.
2004 MITSUBISHI ENDEAVOR LS 4-DOOR

NHTSA NUMBER: C45601

GD TEST NUMBER: 8655-F201-25

ADVANCED INFORMATION ENGINEERING SERVICES
A GENERAL DYNAMICS COMPANY
TRANSPORTATION SCIENCES CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225

Test Date: July 15, 2004

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance
Mail Code: NVS-220, Room 6111
400 Seventh Street, SW
Washington, DC 20590

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NHTSA, Office of Vehicle Safety Compliance

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Date of Report Acceptance

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7. *Author(s)* David J. Travale, Program Manager James Czarnecki, Project Engineer		8. *Performing Organization Report No.* 8655-F201-25
9. *Performing Organization Name and Address* Advanced Information Engineering Services A General Dynamics Company 4455 Genesee Street Buffalo, New York 14225		10. *Work Unit No.* 11. *Contract or Grant No.* DTNH22-01-C-01025
12. *Sponsoring Agency Name and Address* U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance Mail Code: NVS-220 400 Seventh, SW, Room 6111 Washington, D.C. 20590		13. *Type of Report and Period Covered* Final Report July 2004 14. *Sponsoring Agency Code* NVS-220
15. *Supplementary Notes*		

16. *Abstract*

Compliance tests were conducted on the subject vehicle, a 2004 Mitsubishi Endeavor LS, 4-door, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure TP-201-02 for determination of FMVSS 201 compliance.

Test failures identified were as follows: None

17. *Key Words* Compliance Testing Safety Engineering FMVSS 201	18. *Distribution Statement* Copies of this report are available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW Washington, DC 20590		
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Form DOT F1700.7 (8-69)

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LIST OF DATA SHEETS

SECTION 1

PURPOSE AND TEST PROCEDURE

This head impact compliance test is part of the FMVSS 201 Occupant Protection in Interior Impact Test Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-01-C-01025. The purpose of this impact compliance test was to determine whether the subject vehicle, a 2004 Mitsubishi Endeavor LS 4-door, NHTSA No. C45601, meets the performance requirements of FMVSS 201, Occupant Protection in Interior Impact. The compliance test was conducted using the requirements found in the OVSC Laboratory Test Procedure No. TP-201-02 dated March 3, 1989.

SECTION 2

SUMMARY OF OCCUPANT PROTECTION IN INTERIOR IMPACTS

A 2004 Mitsubishi Endeavor LS, 4-door, NHTSA No. C45601, was impacted at various locations throughout its instrument cluster/dash panel and seat back area by a 15 lb, 6.5 inch diameter steel headform. A total of four (4) impacts were performed in this test series. The four (4) chosen impact points were:

Seat Back / Head Restraint Area

Instrument Panel Cluster Area

Airbag Cover / Dash Panel Area (2 impacts)

The selected impact areas on the test vehicle appeared to comply with the performance requirements of FMVSS 201.

The 6.5 inch diameter steel headform weighed 15 lb and had an accelerometer mounted along its centerline.

One (1) channel of data for each target impact test was recorded on a Keyser-Threde data acquisition system. Data plots can be found in Appendix C. Still photographs can be found in Appendix A of this report.

TEST VEHICLE RECEIVING INSPECTION DATA SHEET

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Mitsubishi Endeavor LS 4-door
NHTSA NO.:	C45601
VIN:	4A4MM21S44E034123
DATE OF MANUFACTURE:	08/03 (SEE CERTIFICATION LABEL)
COLOR:	Silver
ODOMETER READING:	117 miles
LABORATORY:	GD Engineering
TEST DATE:	July 15, 2004

NUMBER OF SEATING POSITIONS:

FRONT: 2 REAR: 3

INSTRUMENT PANEL:

NOTE UNUSUAL FEATURES: None

TYPE OF FRONT SEATS:

BENCH: - BUCKET: X SPLIT BACKS: -

TYPE OF HEAD RESTRAINTS:

FIXED: - ADJUSTABLE: X

VEHICLE EQUIPPED WITH ARMRESTS?

NO: - YES: X NUMBER: 4

LOCATION: Front and rear door panels, rear seat center fold down arm rest and center console arm rest

VEHICLE EQUIPPED WITH SUN VISORS?

NO: - YES: X

VEHICLE EQUIPPED WITH INTERIOR DOOR LATCHES?

NO: - YES: X NUMBER: 2

LOCATION: Glove Box and Center Console Armrest

HEADFORM IMPACT TEST RESULTS
INSTRUMENT PANEL

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Mitsubishi Endeavor LS 4-door
NHTSA NO.:	C45601
VIN:	4A4MM21S44E034123
DATE OF MANUFACTURE:	08/03 (SEE CERTIFICATION LABEL)
COLOR:	Silver
ODOMETER READING:	117 miles
LABORATORY:	GD Engineering
TEST DATE:	July 15, 2004

IMPACT LOCATION AND NUMBER					VELOCITY (mph)	PEAK ACCELERATION (3 ms Clip) Gs
NUMBER		X (inches)	Y (inches)	ANGLE (degrees)		
1	Dash Cluster	28.25	1.5	-11	11.4	40.14
2	Left Side of Airbag Cover	27.5	9.75	-73	11.3	54.72
3	Right Side of Airbag Cover	26.75	21.8	-63	11.5	58.70

REFERENCE POINT: Seating Reference Position (SGRP) on front passenger side is the reference point (x positive forward from SGRP and y positive to the right of the Vehicle centerline).

REMARKS:

HEADFORM IMPACT TEST RESULTS
SEAT BACKS

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Mitsubishi Endeavor LS 4-door
NHTSA NO.:	C45601
VIN:	4A4MM21S44E034123
DATE OF MANUFACTURE:	08/03 (SEE CERTIFICATION LABEL)
COLOR:	Silver
ODOMETER READING:	117 miles
LABORATORY:	GD Engineering
TEST DATE:	June 11, 2004

IMPACT LOCATION AND NUMBER				VELOCITY (mph)	PEAK ACCELERATION (3 ms Clip) Gs
NUMBER	X (inches)	Y (inches)	ANGLE (degrees)		
Seat Back	-16.25	0	58	14.5	30.55

REFERENCE POINT: SGRP on rear passenger side is the reference point (x positive forward from SGRP and y positive to the right of the seat centerline).

SUNVISOR AND ARMREST EVALUATION

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Mitsubishi Endeavor LS 4-door
NHTSA NO.:	C45601
VIN:	4A4MM21S44E034123
DATE OF MANUFACTURE:	08/03 (SEE CERTIFICATION LABEL)
COLOR:	Silver
ODOMETER READING:	117 miles
LABORATORY:	Veridian Engineering
TEST DATE:	July15,2004

SUN VISOR INFORMATION:

1. Are sun visors constructed of or covered with energy absorbing material?

   YES (PASS): X NO (FAIL): -

2. Are any edges statically contactable by a spherical 6.5 inch diameter headform of radius less than 0.125 inch?

   YES (FAIL): - NO (PASS): X

ARMREST INFORMATION:

A. FIXED ARMREST

1. Is it constructed of energy absorbing material with the capability of laterally deflecting 2 inches without contacting any underlying rigid material?

   YES: N/A NO: N/A

2. Is it constructed of energy absorbing material that deflects or collapses within 1.25 inches of the rigid test panel surface without contacting underlying rigid material between 0.50 and 1.25 inches from the panel which has a vertical height of less than 1 inch?

   YES: N/A NO: N/A

3. Does it provide adequate pelvic area impact protection?

   YES: X NO: -

4. Does it meet at least one of the criteria No. 1 to 3?

   YES (PASS): X NO (FAIL): -

B. FOLDING ARMREST

Is it made of or covered with energy absorbing material? Or does it meet at least one of the criteria No. 1 to 3?

YES (PASS): X NO (FAIL): -

DOOR LATCH EVALUATION

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Mitsubishi Endeavor LS 4-door
NHTSA NO.:	C45601
VIN:	4A4MM21S44E034123
DATE OF MANUFACTURE:	08/03 (SEE CERTIFICATION LABEL)
COLOR:	Silver
ODOMETER READING:	117 miles
LABORATORY:	GD Engineering
TEST DATE:	July 15, 2004

LATCH ENGAGEMENT INTERFERENCE

DESCRIPTION OF LATCH LOCATION	NO LOAD	10G HORIZONTAL TRANSVERSE	10G VERTICAL	30G HORIZONTAL LONGITUDINAL
Glove Box	Pass	Pass	Pass	Pass
Center Console Arm Rest	Pass	Pass	Pass	Pass

(APPENDIX B CONTAINS CALCULATION SHEETS WHICH ARE BASED ON MANUFACTURER'S DATA)

SUMMARY OF RESULTS

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Mitsubishi Endeavor LS 4-door
NHTSA NO.:	C45601
VIN:	4A4MM21S44E034123
DATE OF MANUFACTURE:	08/03 (SEE CERTIFICATION LABEL)
COLOR:	Silver
ODOMETER READING:	117 miles
LABORATORY:	GD Engineering
TEST DATE:	July 15, 2004

	NUMBER OF IMPACTS	PASS/FAIL
INSTRUMENT PANEL	3	Pass
SEAT BACK	1	Pass
SUN VISORS	n/a	Pass
ARMRESTS	n/a	Pass
INTERIOR COMPARTMENT DOORS	n/a	Pass

REMARKS:

APPENDIX A

PHOTOGRAPHS

PHOTOGRAPHS

FIGURE	VIEW
A-1	LEFT SIDE VIEW OF VEHICLE
A-2	RIGHT SIDE VIEW OF VEHICLE
A-3	3/4 FRONTAL VIEW FROM LEFT SIDE OF VEHICLE
A-4	3/4 REAR VIEW FROM RIGHT SIDE OF VEHICLE
A-5	VEHICLE'S CERTIFICATION LABEL
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A-8	ARMREST LEFT FRONT DOOR
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A-13	DELINEATED INSTRUMENT PANEL IMPACT ZONE PRE-TEST
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A-15	INSTRUMENT PANEL LEFT SIDE AIRBAG COVER IMPACT POST-TEST
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A-20	HEAD RESTRAINT
A-21	HEAD RESTRAINT IMPACT AREA PRE-TEST
A-22	HEAD RESTRAINT IMPACT AREA POST-TEST

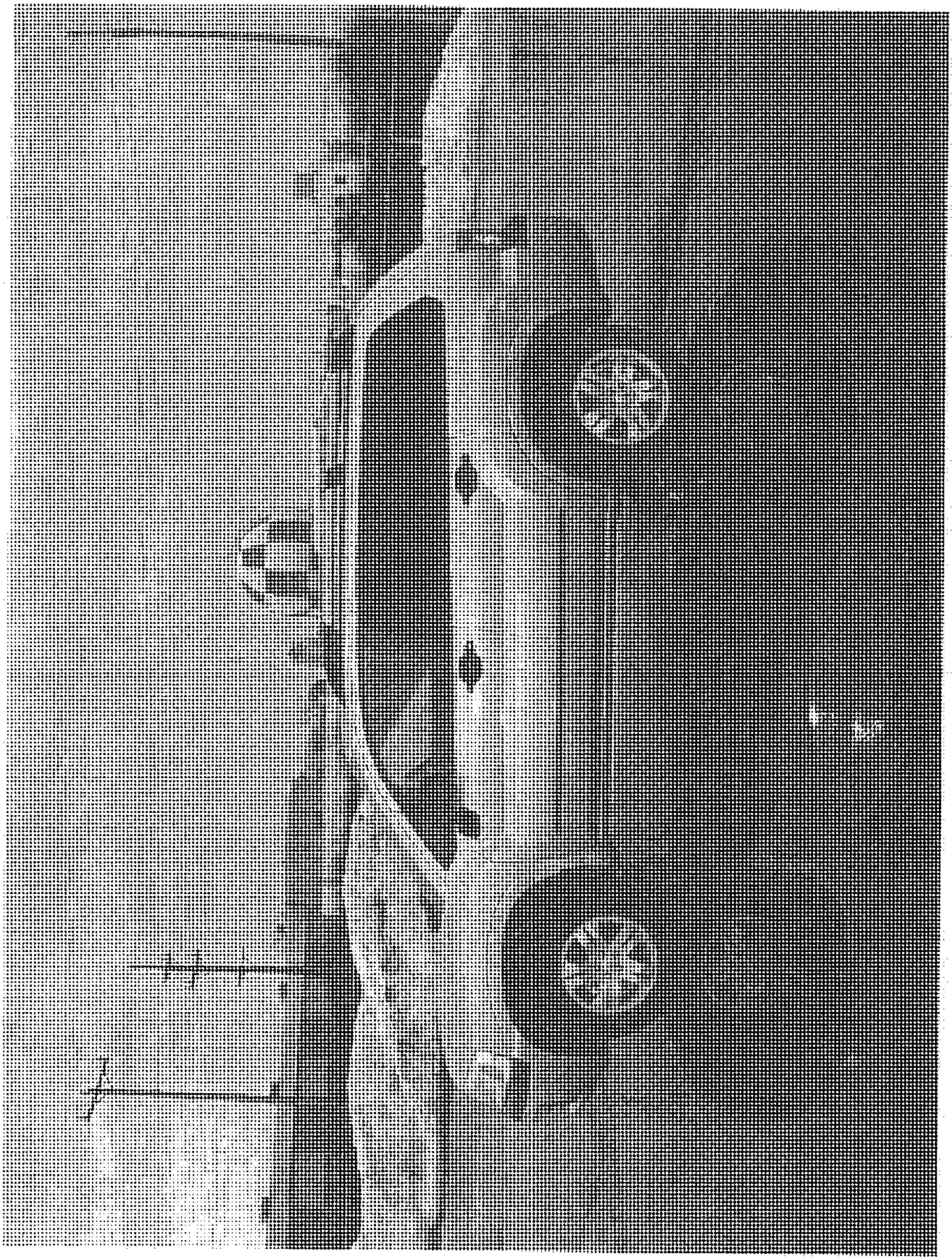


Figure A-1 : LEFT SIDE VIEW OF VEHICLE

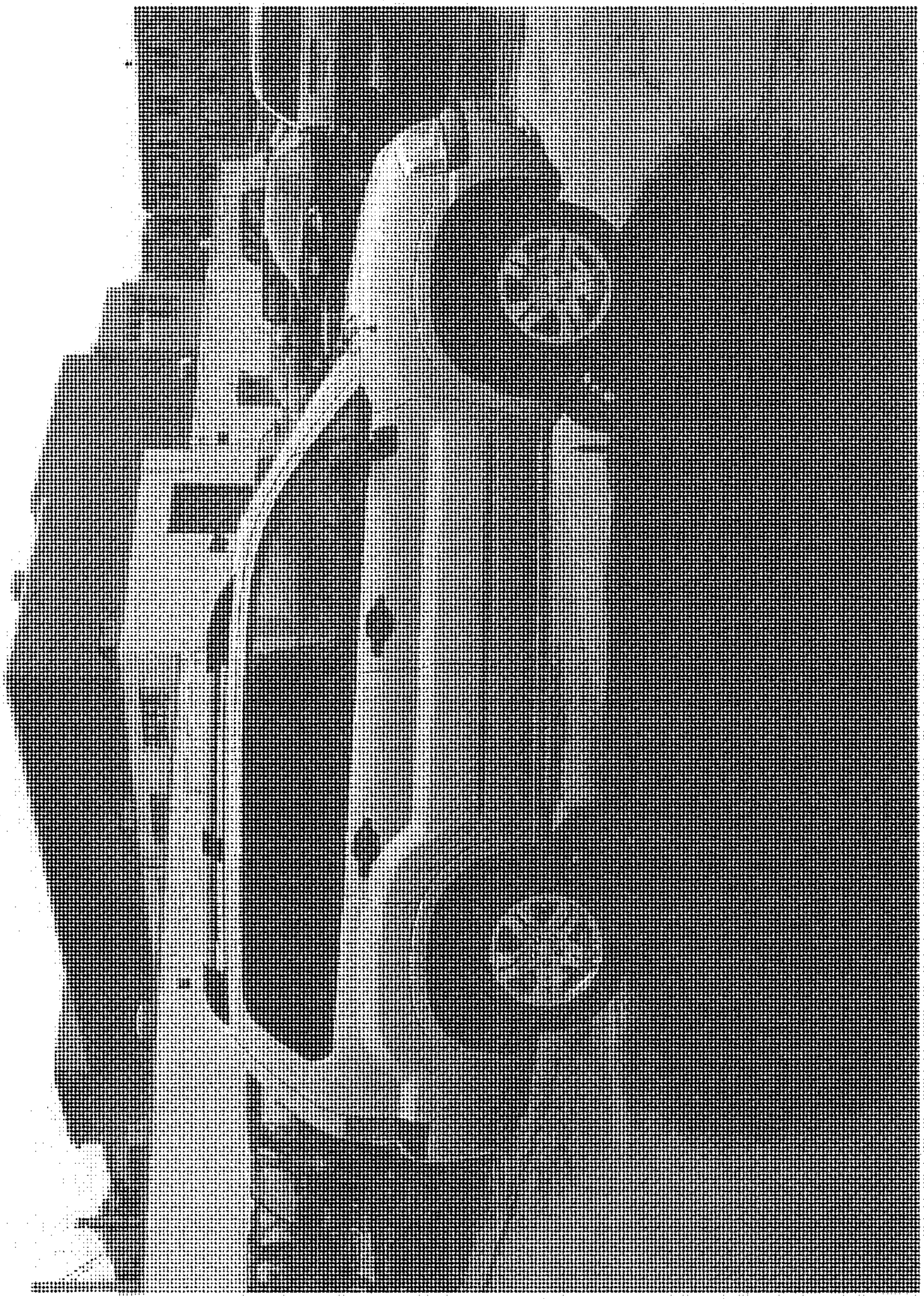


Figure A-2. RIGHT SIDE VIEW OF VEHICLE

Figure A-3 : 3/4 FRONTAL VIEW FROM LEFT SIDE OF VEHICLE

Figure A-4 : 3/4 REAR VIEW FROM RIGHT SIDE OF VEHICLE

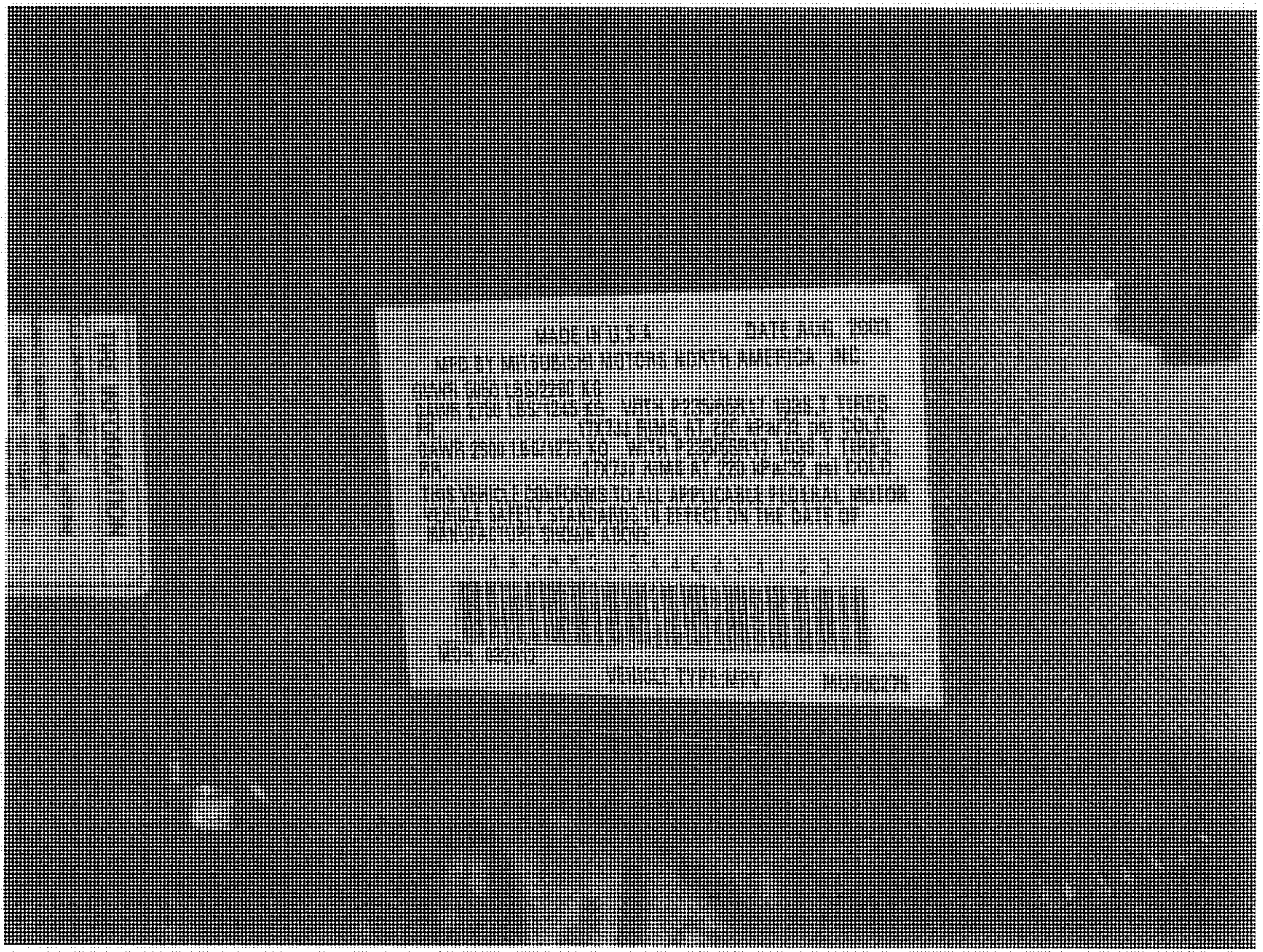


Figure A-5 : VEHICLE'S CERTIFICATION LABEL

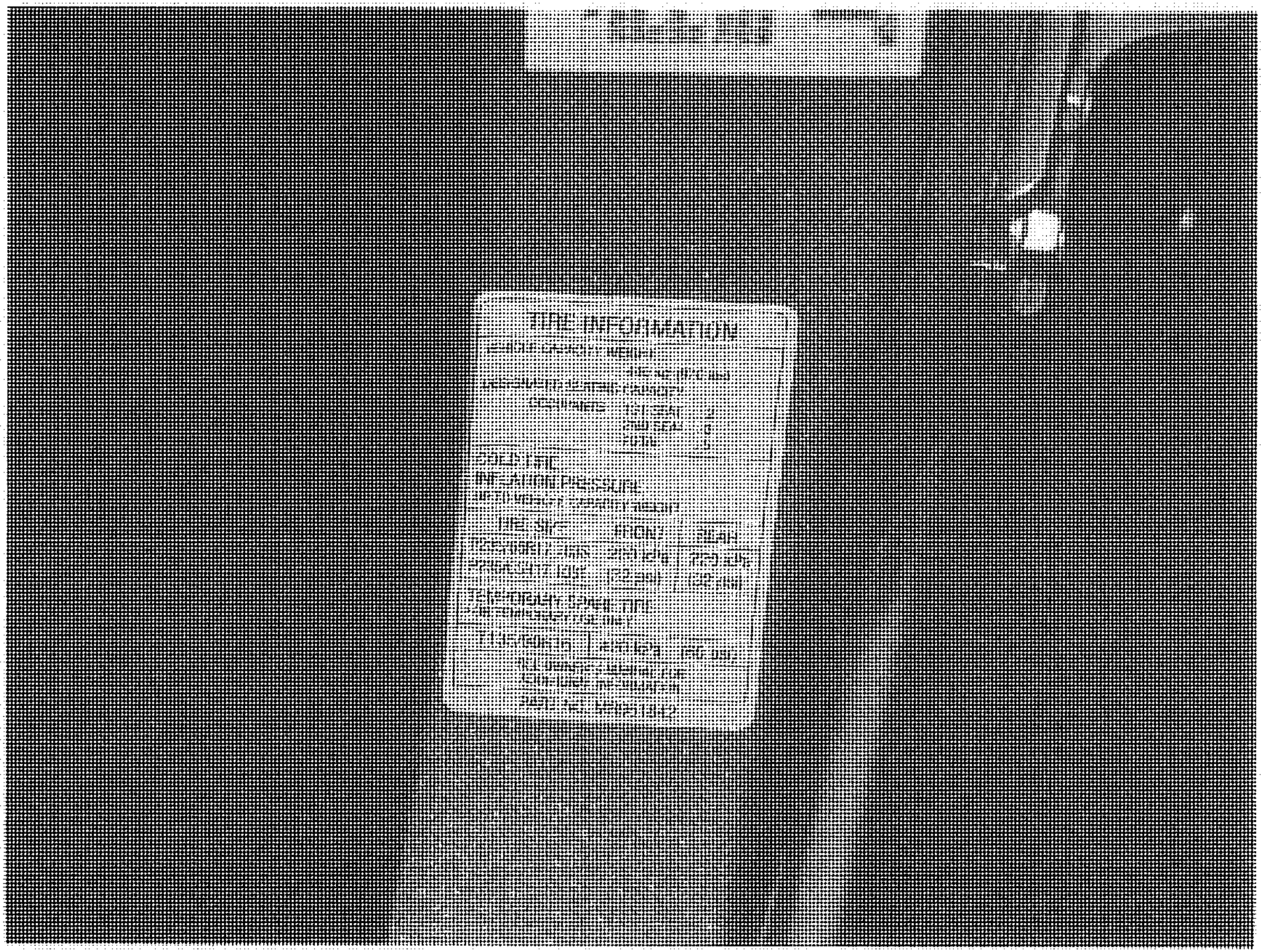


Figure A-6 : VEHICLE'S TIRE INFORMATION LABEL

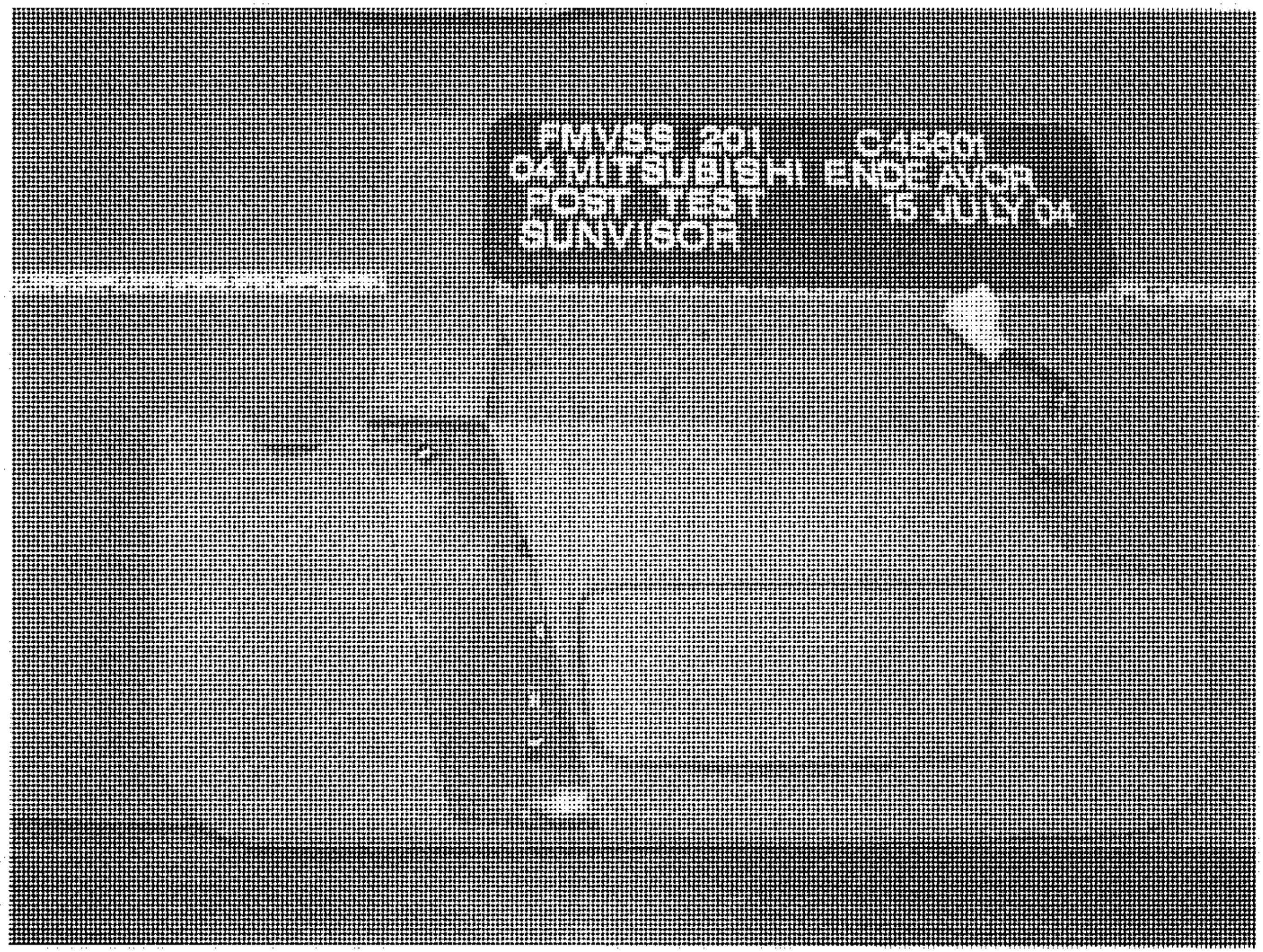


Figure A-7 : SUNVISOR CONSTRUCTION

Figure A-3 : ARMREST LEFT FRONT DOOR

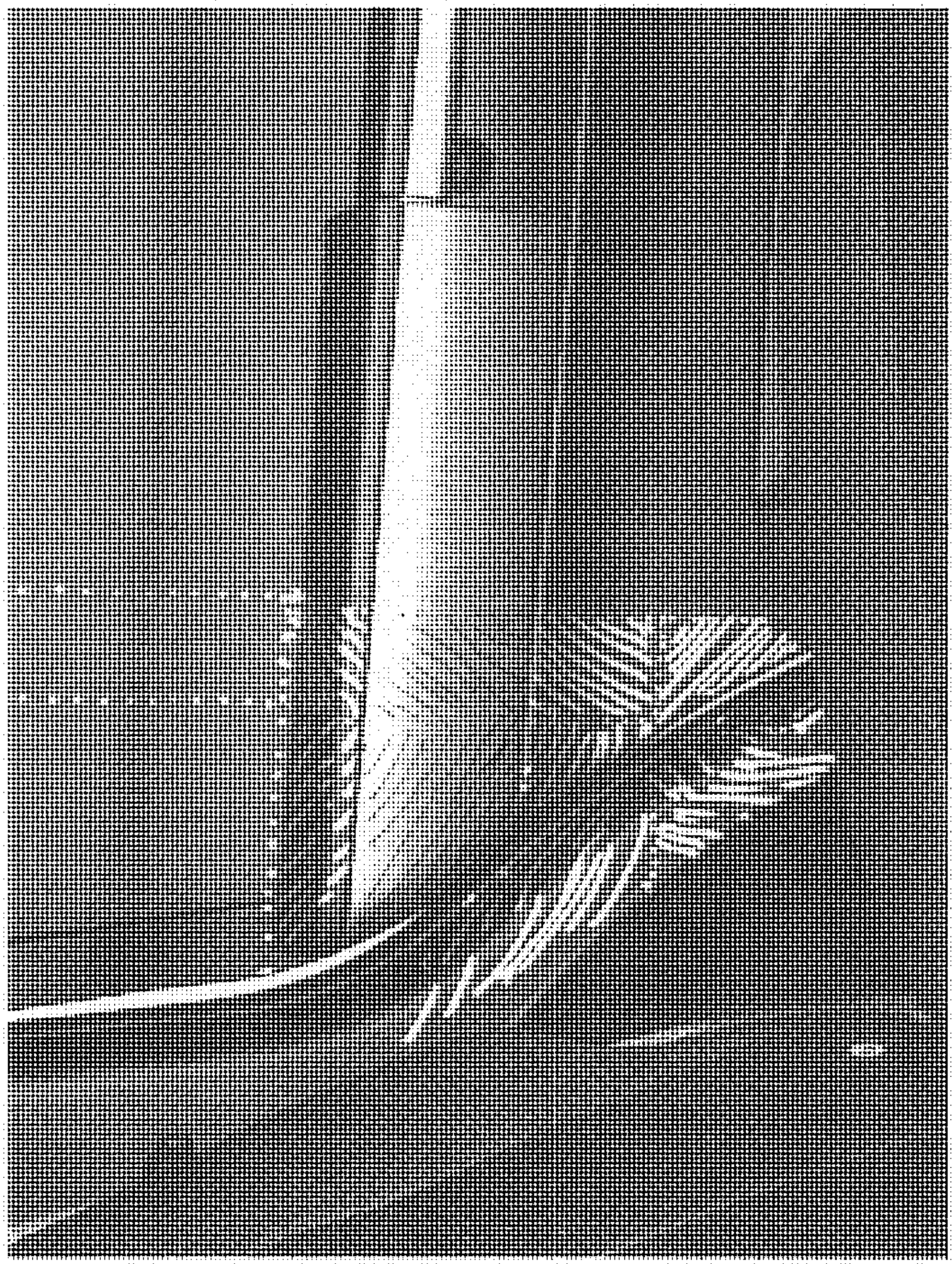


Figure A-9 : ARMREST LEFT REAR DOOR

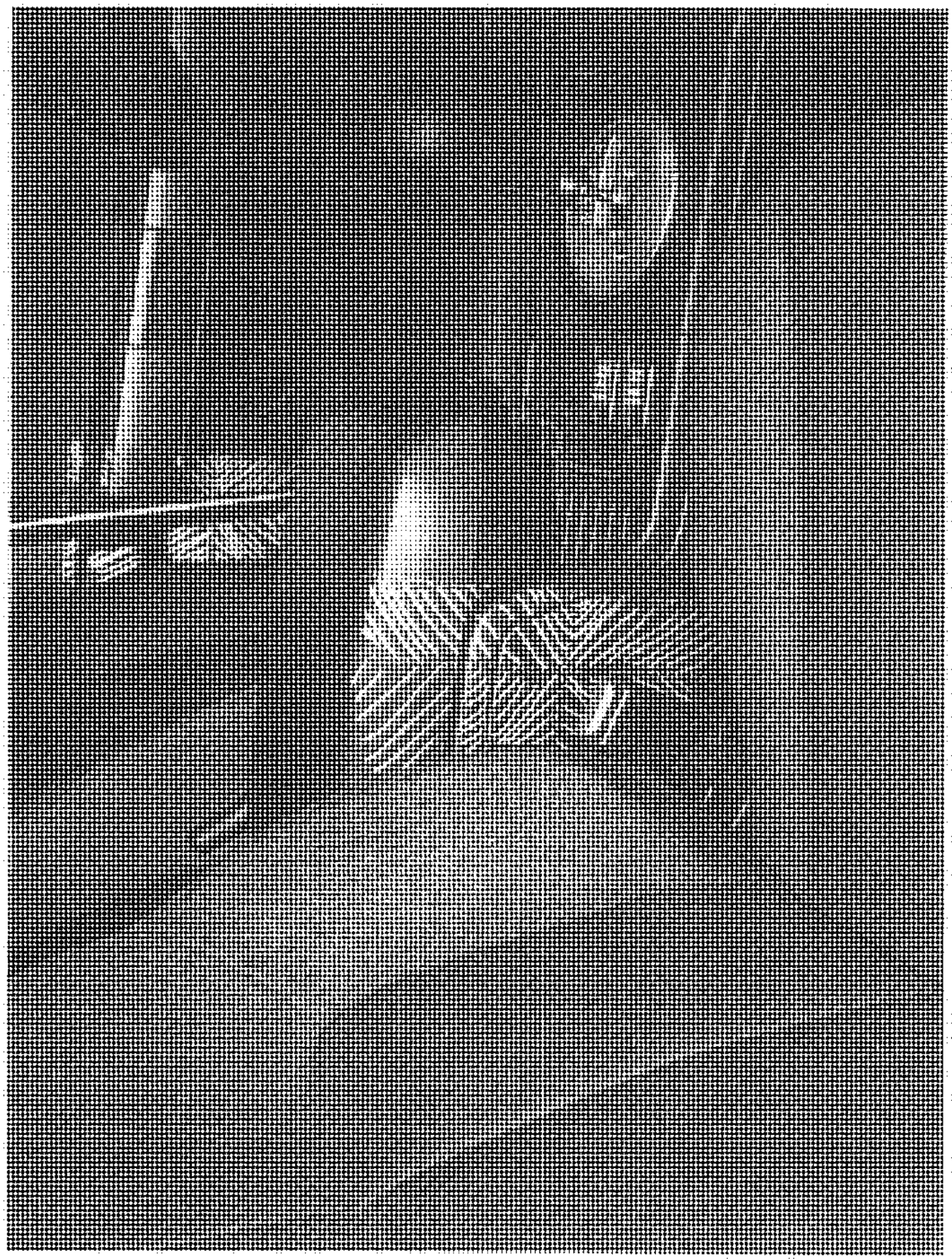


Figure A-10 : CONSOLE ARMREST

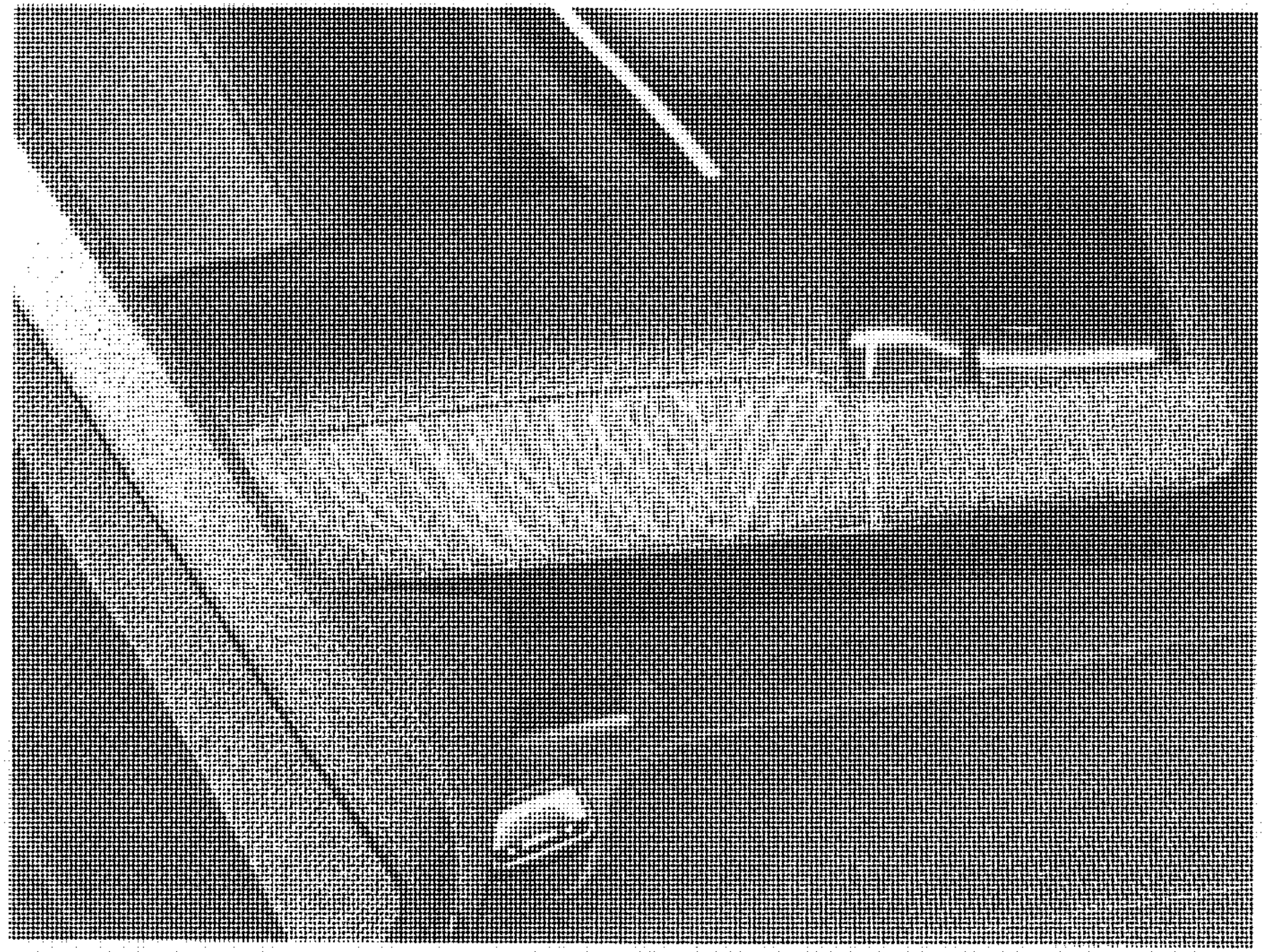


Figure A-11 : REAR SEAT CENTER ARMREST

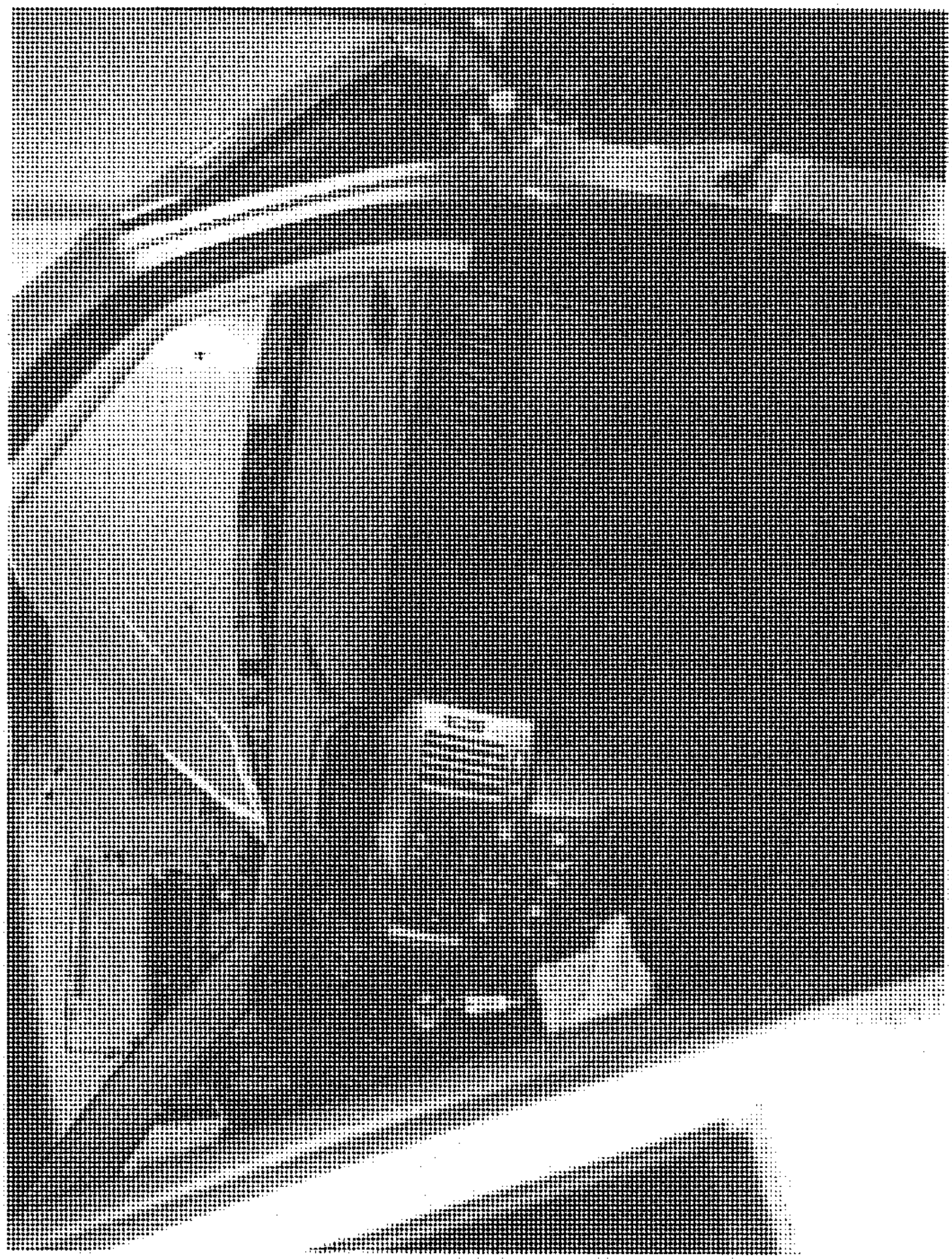


Figure A-12 : INSTRUMENT PANEL

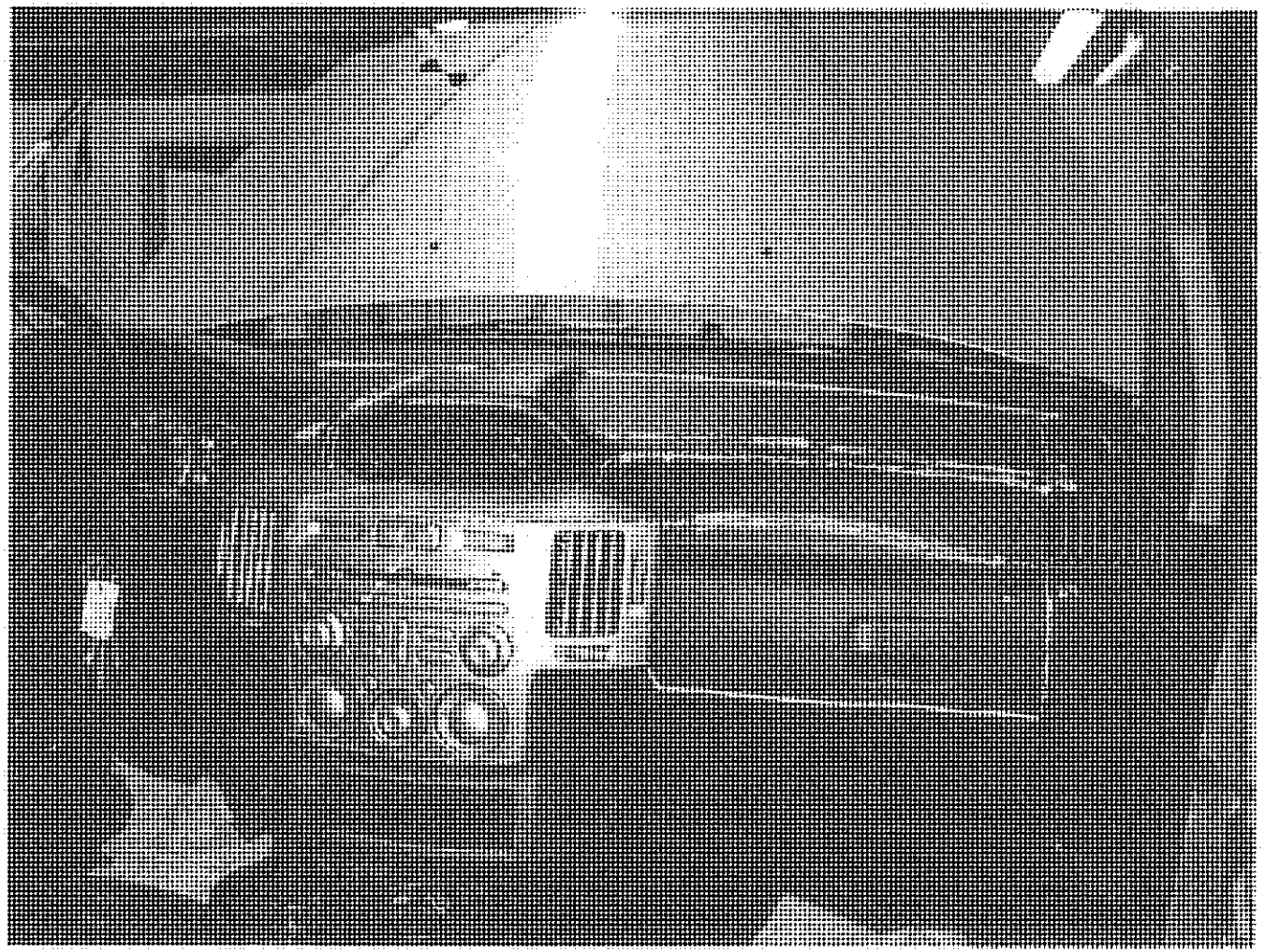


Figure A-13 : DELINEATED INSTRUMENT PANEL IMPACT ZONE PRE-TEST

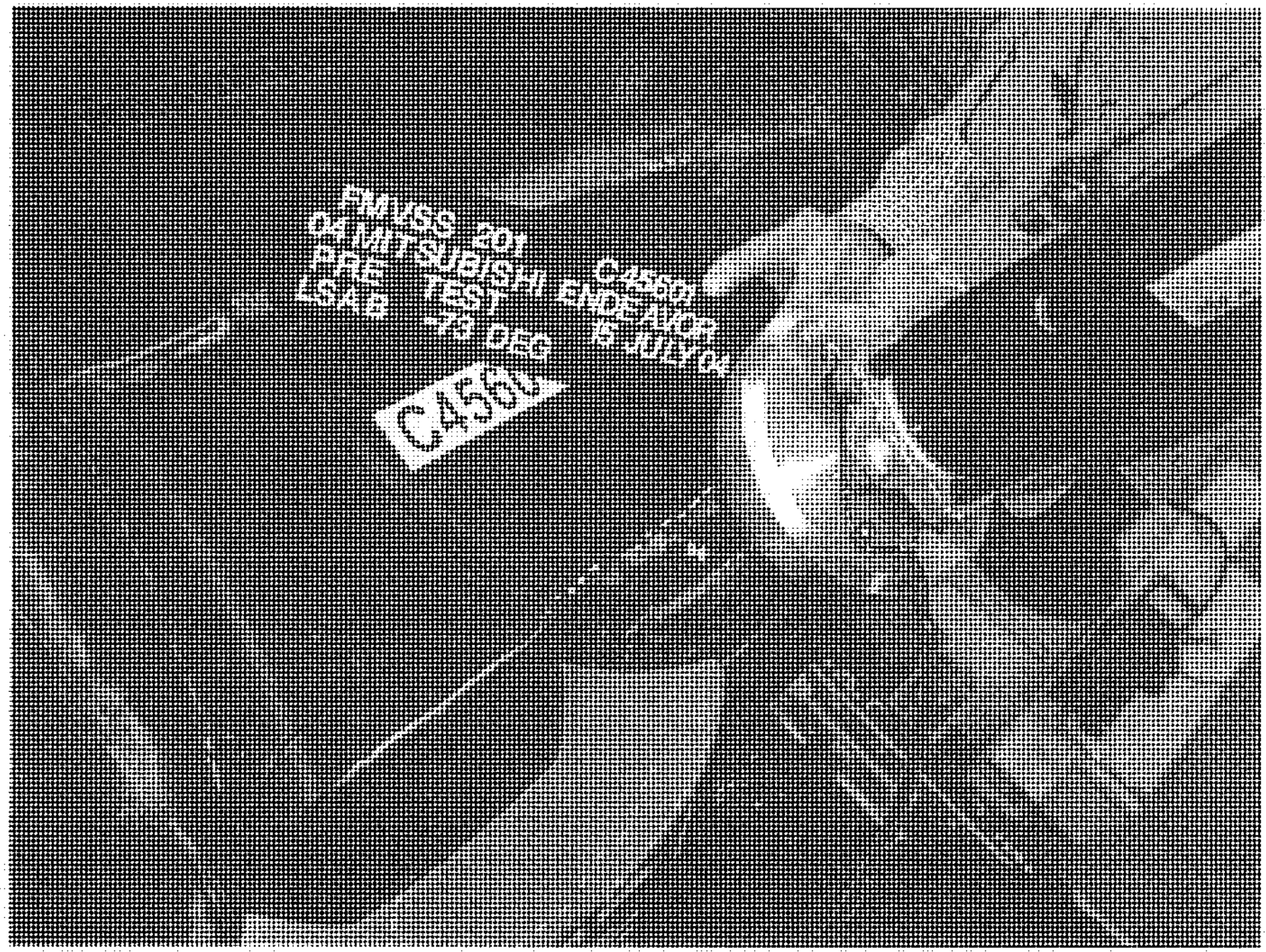


Figure A-14 : INSTRUMENT PANEL LEFT SIDE AIRBAG COVER IMPACT PRE-TEST

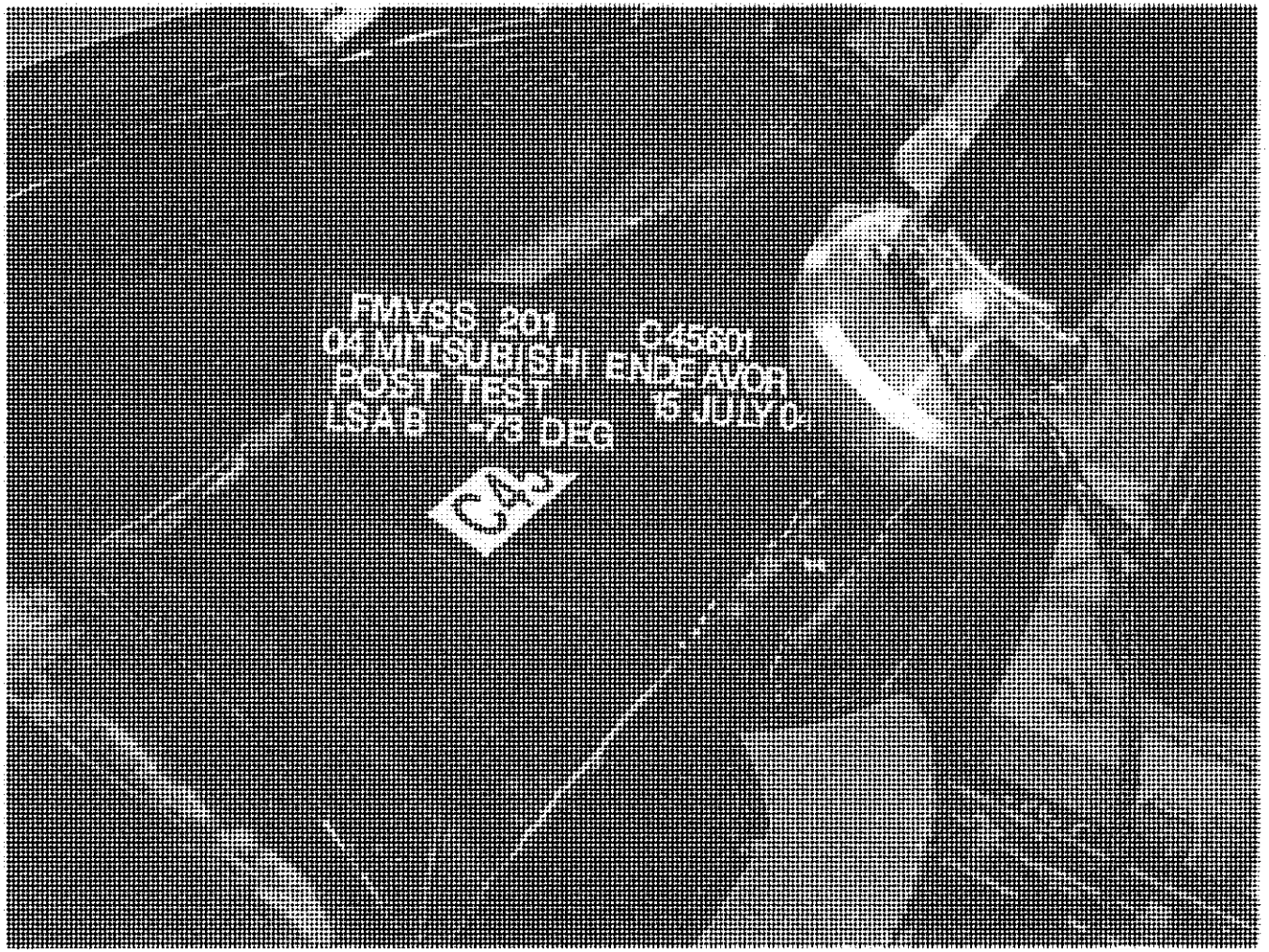


Figure A-15 : INSTRUMENT PANEL LEFT SIDE AIRBAG COVER IMPACT POST-TEST

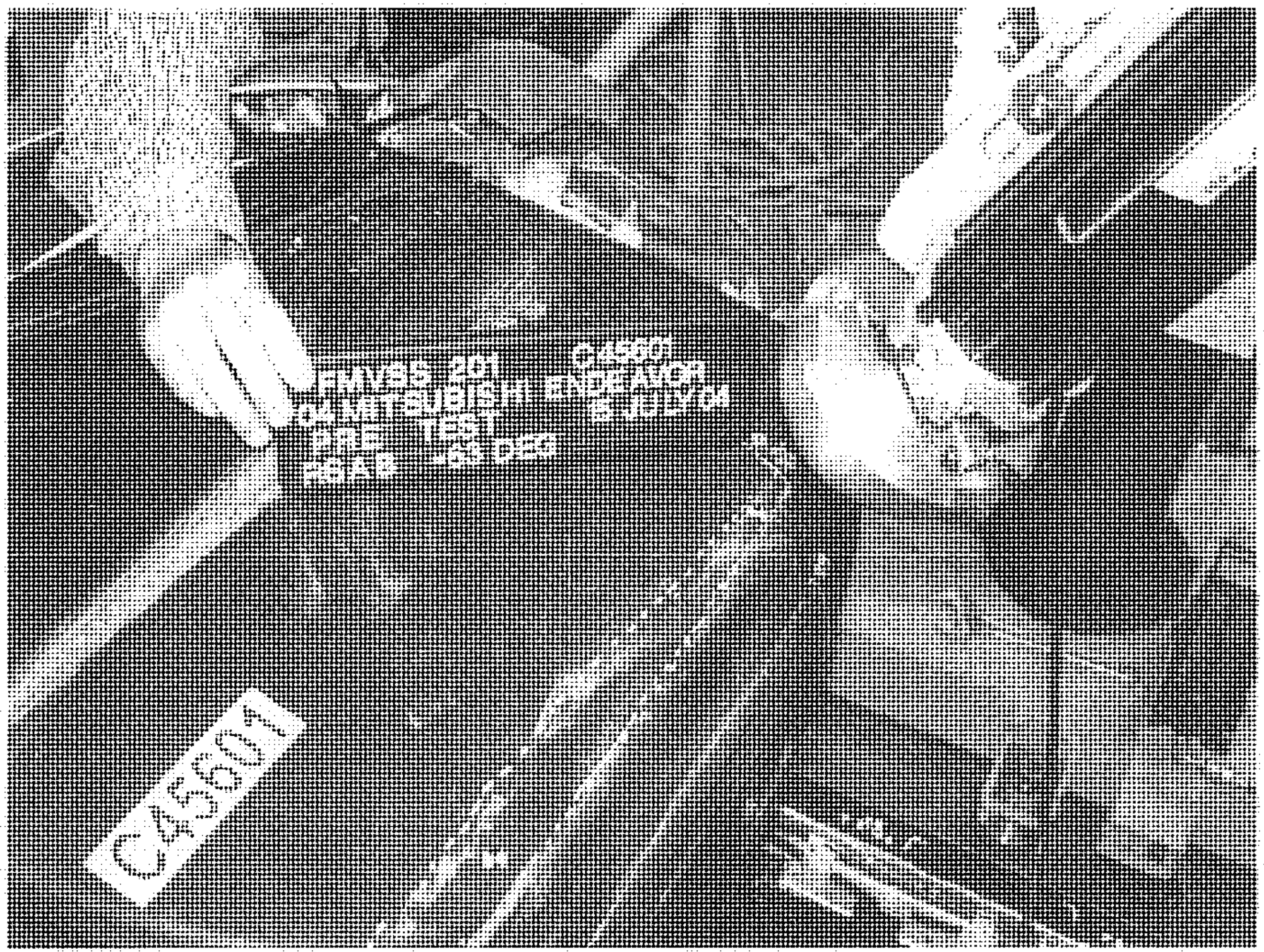


Figure A-16 : INSTRUMENT PANEL RIGHT SIDE AIRBAG COVER IMPACT PRE-TEST

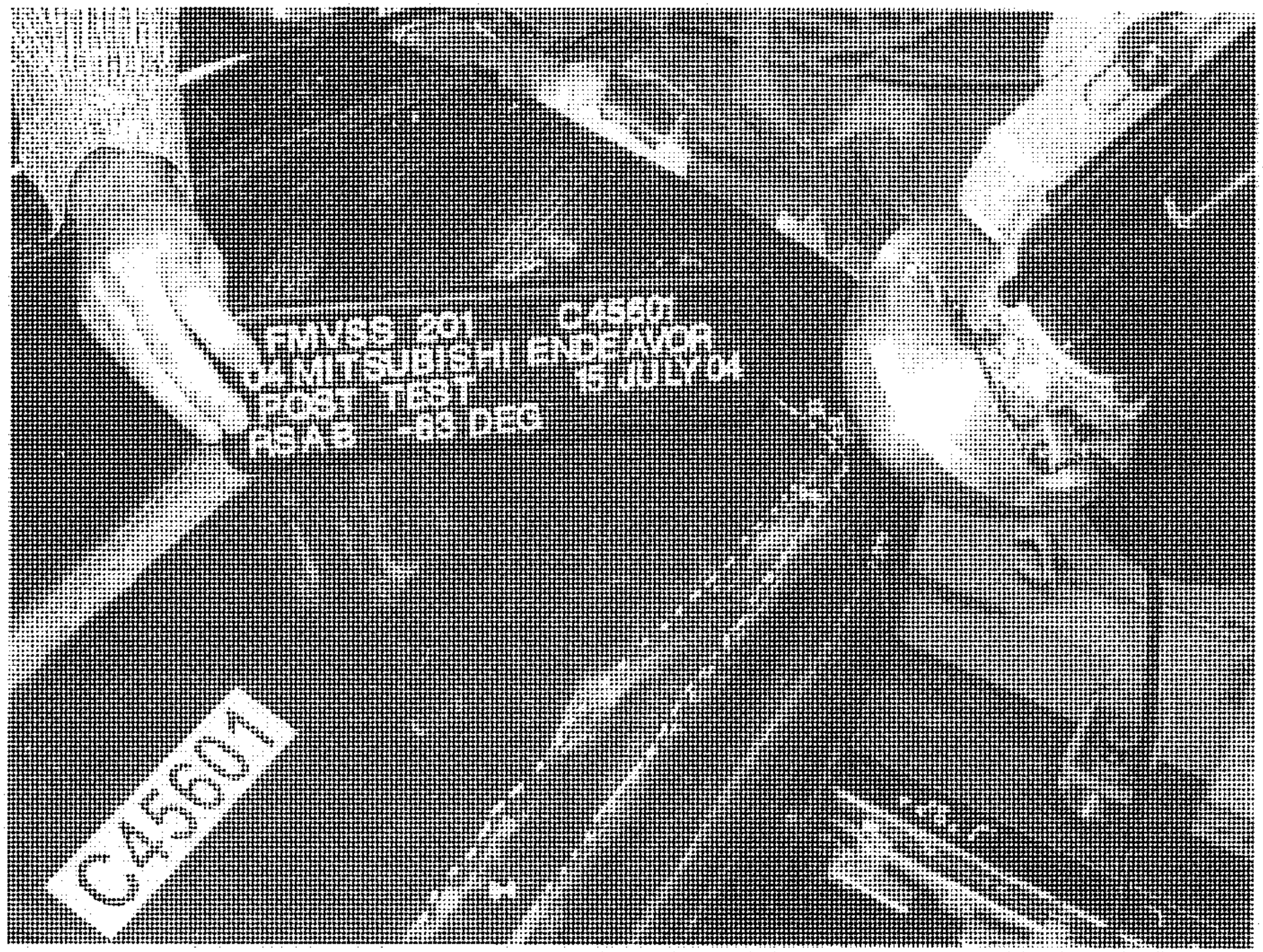


Figure A-17 : INSTRUMENT PANEL RIGHT SIDE AIRBAG COVER IMPACT POST-TEST

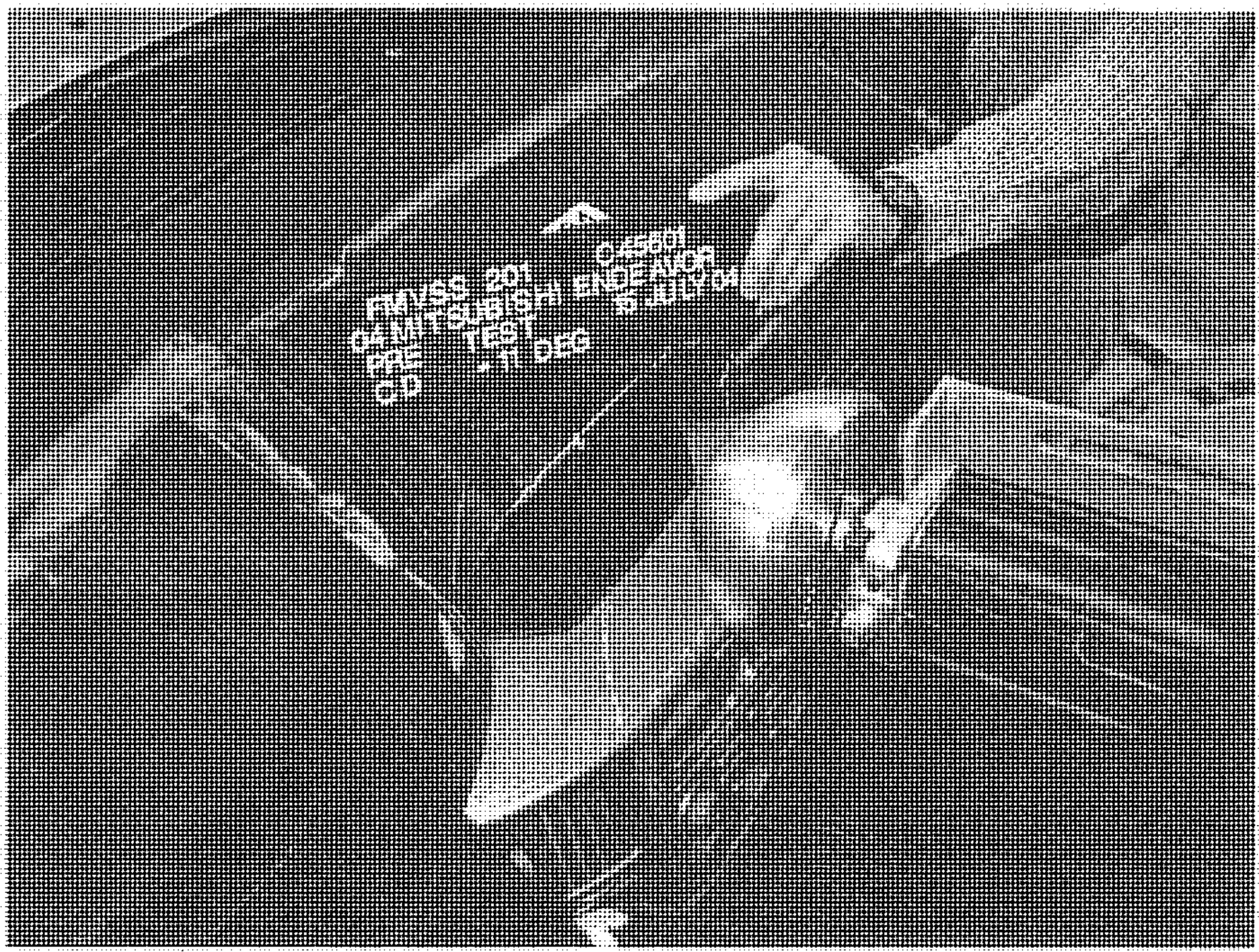


Figure A-13: INSTRUMENT PANEL DASH CONSOLE IMPACT PRE-TEST

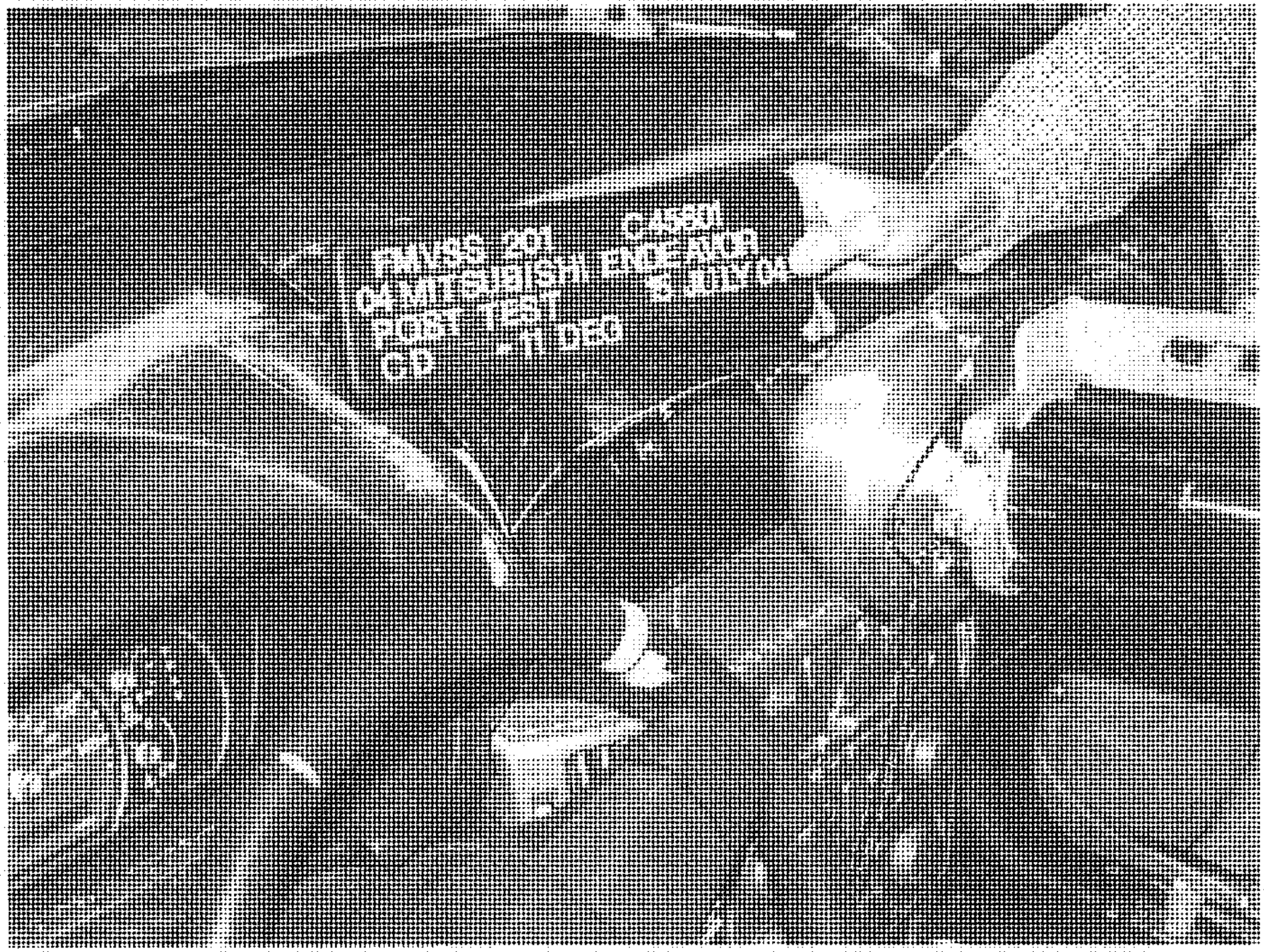


Figure A-19   INSTRUMENT PANEL DASH CONSOLE IMPACT POST-TEST

Figure A-20   HEAD RESTRAINT

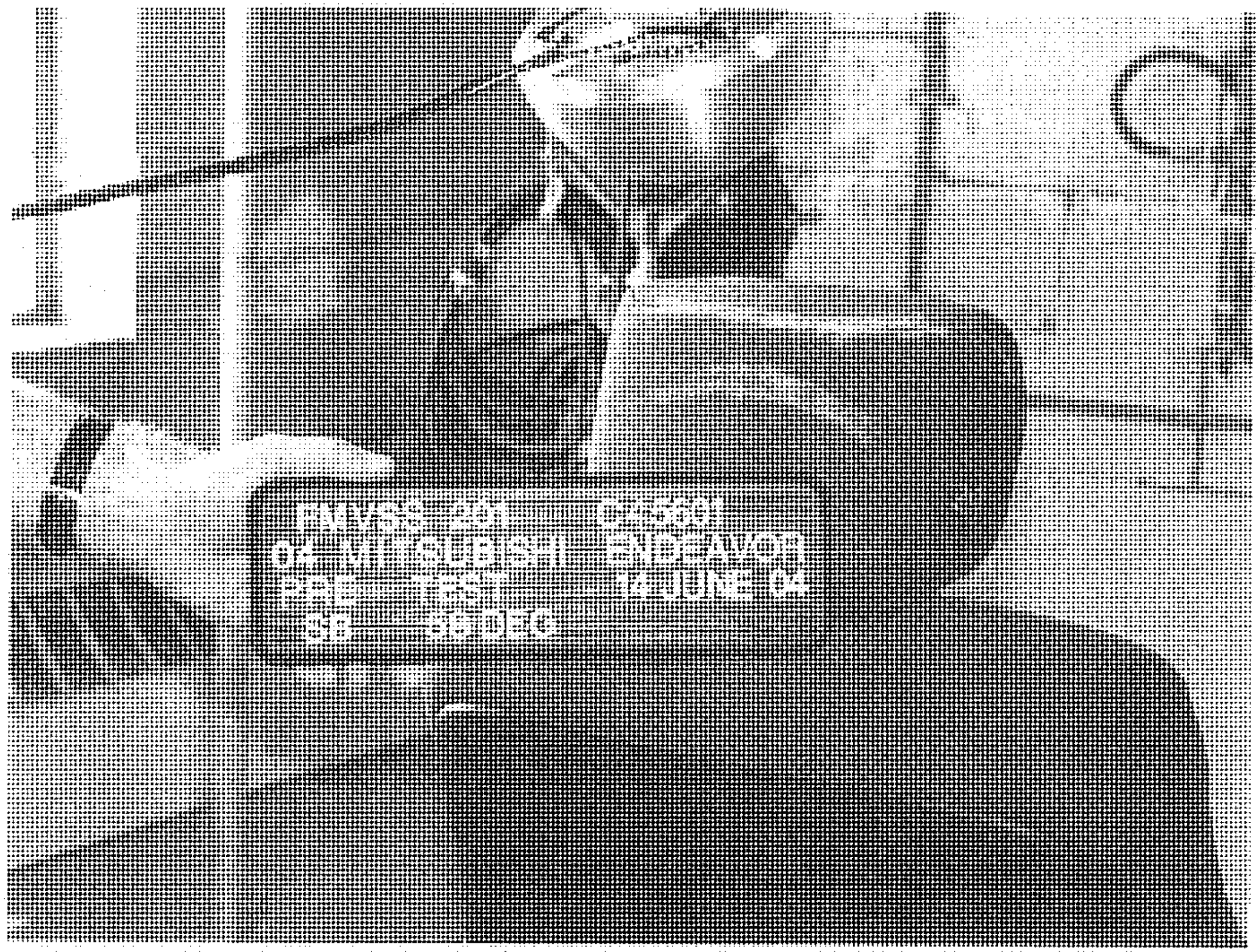


Figure A-21 : HEAD RESTRAINT IMPACT AREA PRE-TEST

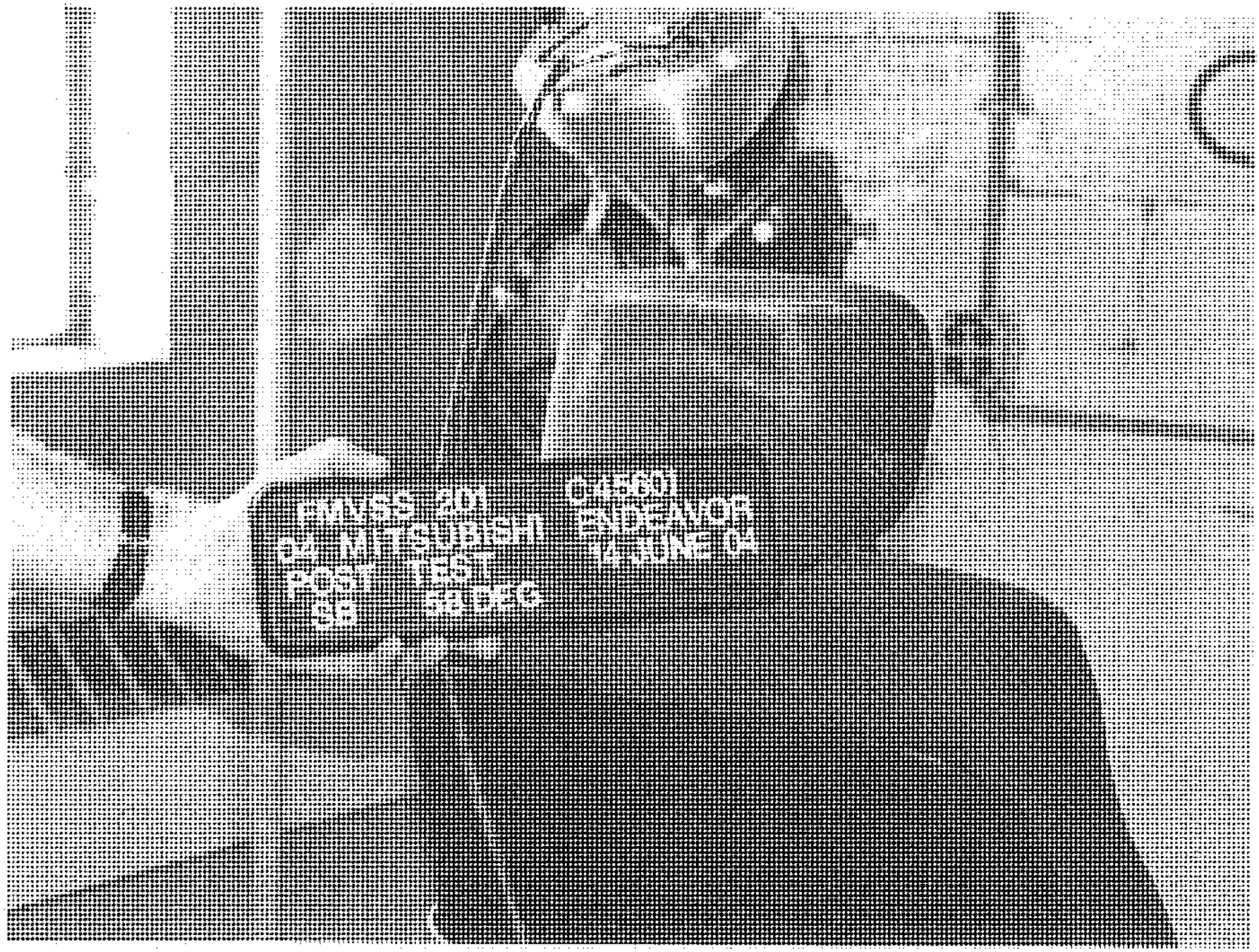


Figure A-22 : HEAD RESTRAINT IMPACT AREA POST-TEST

APPENDIX B

INTERIOR COMPARTMENT DOOR CALCULATIONS

FORM 5

FMVSS No. 201
Latch Component Analysis Information

Latch component inertial analysis information for each interior compartment door assembly located in an instrument panel, console assembly, seat back, or side panel adjacent to a designated seating position in accordance with the procedure described in section 5 of SAE Recommended Practice J839b, "Passenger Car Side Door Latch Systems."

Such data shall include:

1. Geometric details of the latch/lock configuration.

   Refer to attachments.(XHF0-170038 for G/BOX Lock and XHF0-170039 for Floor Console Lid)

2. Mass data for each element in the linkage.

   Refer to attachments.(XHF0-170038 for G/BOX Lock and XHF0-170039 for Floor Console Lid)

3. Spring rates for each spring element in the configuration.

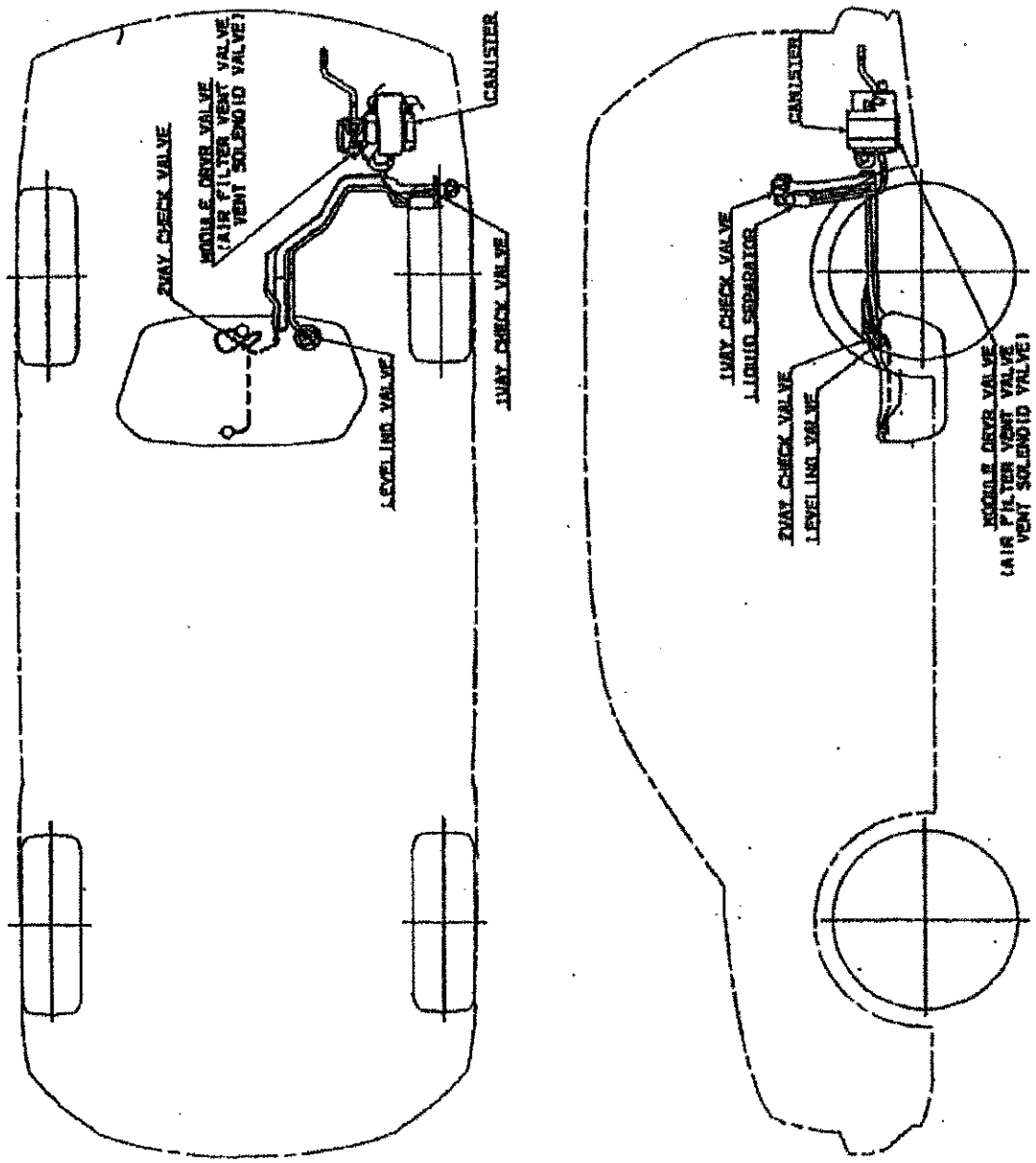
   Refer to attachments.(XHF0-170038 for G/BOX Lock and XHF0-170039 for Floor Console Lid)

4. Any additional details unique to the design yet necessary for the calculations.

   No

Attachment 6

Endeavor



Attachment 7

FMVSS 201 Information

1/10

題名

Endeavor Interior Compartment Resistance to Inertial Load Calculation(G/BOX LOCK)

基準区分 | 機 | 基 | 装 | 社外基

1. Standard

Horizontal longitudinal direction: G/BOX is not released under a load of 30G.

Horizontal traverse direction: G/ BOX is not released under a load of 30G.

Vertical direction: G/ BOX is not released under a load of 30G.

2. LOCK calculation

The calculation assumes that there is a load of 30G in the direction of the bolt pushing down to release the lock and the turning (pull-up) direction of the handle.

(If the worst condition, 30G, is cleared, the lock is not released.)

(2-1) 30G load in the direction pushing down on the BOLT

BOLT SPRING load (striker locked condition) is 0.35±10%=0.315kgf

BOLT mass: 0.0025kg , PLATE mass 0.0032kg

In case 30G load: (0.0025+0.0032)×30G=0.171kgf

Since 0.171<0.315 the lock is not released.

(2-2) 30G load in the rotation direction of the HANDLE (LOCK release direction)

HANDLE mass:0.0115kg

Applied to the HANDLE edge (PLATE contact area) when a load of 30G is applied to the HANDLE.

Mass moment P1is taken from the attachment

(0.0115×30G)×8.95=P1×14.15 P1=0.22kgf

Force P2 input to the BOLT after transferring from HANDLE to PLATE.

0.22×3.62=P2×46.75 P2=0.17kgf

Since 0.17<0.315, less than BOLT SPRING load, the LOCK is not released.

3. G/BOX ASSY Calculation

G/BOX ASSY mass :2.2kgf

Taking the moment ratio on the attachment:

310.6÷178.1×2.2×30G=115.1kgf

Therefore, a mass moment of 115.1kgf is applied to the striker locking area.

キーワード
又は概要

C/A 改訂年月日	改訂理由	D/B 改訂年月日	改訂理由

承認	点検	氏名 山崎泰伸	原紙 A4 x 4 枚	資料番号
		作成 02 年 6 月 1 日	写真 枚	XHF0-170038
			本刃 枚	

計 部

The following are calculations taken when there is a load applied in the direction from A to D referenced on the attachment.

Load in direction of A : The shearing force to the BOLT is 38.6 × 5.4=208.4kg.

Since 115.1<208.4, the G/BOX is not released.

Load in direction of B : The shearing force to the BOLT is 88.3 × 8.5=750.6kg.

Since 115.1<750.6, the G/BOX is not released.

Load in direction of C : The shearing force to the BOLT is 85.3 × 8.5=725.1kg.

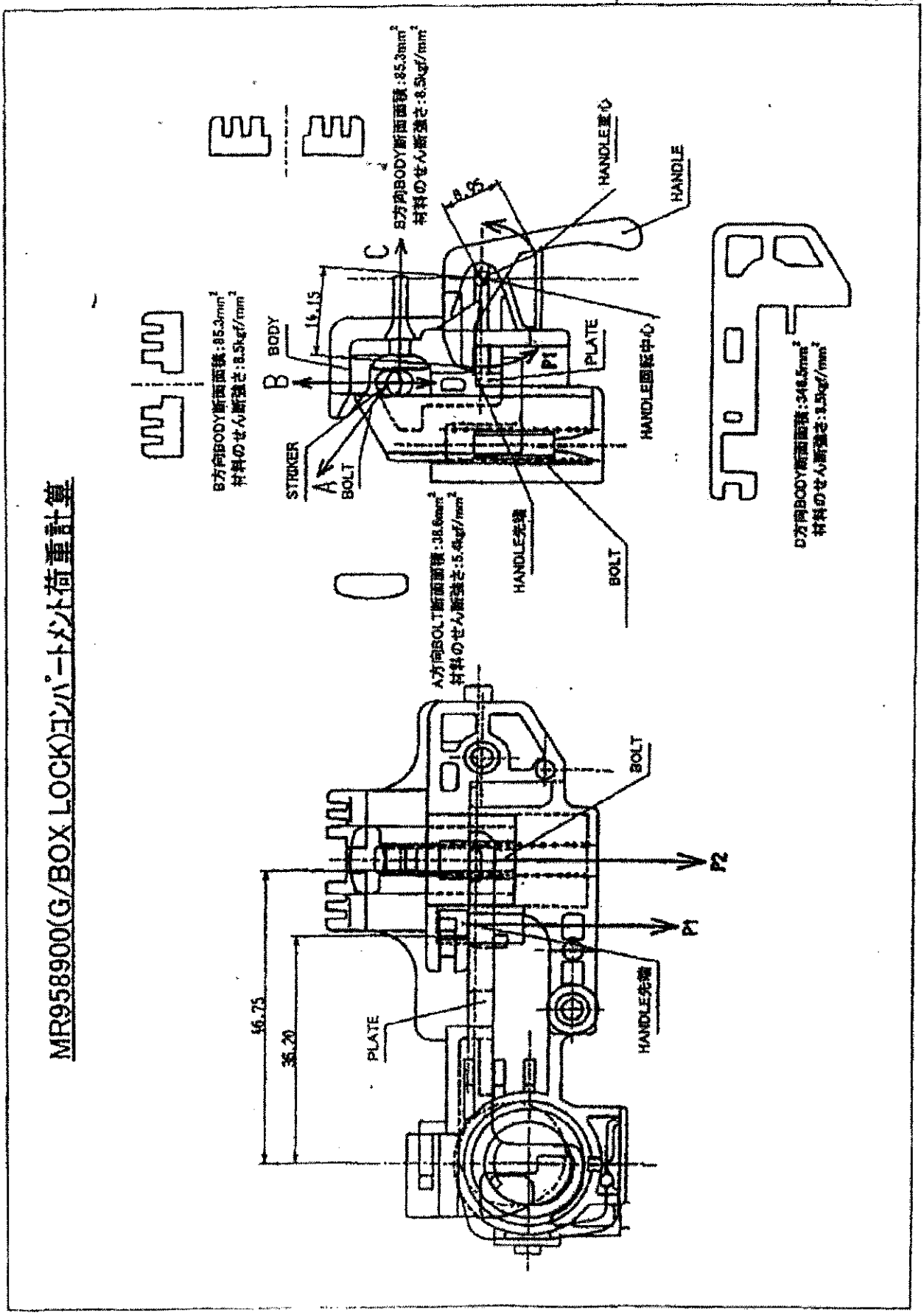
Since 115.1<725.1, the G/BOX is not released.

Load in direction of D : The shearing force to the BOLT is 346.5 × 8.5=2945kg.

Since 115.1<2945, the G/BOX is not released.

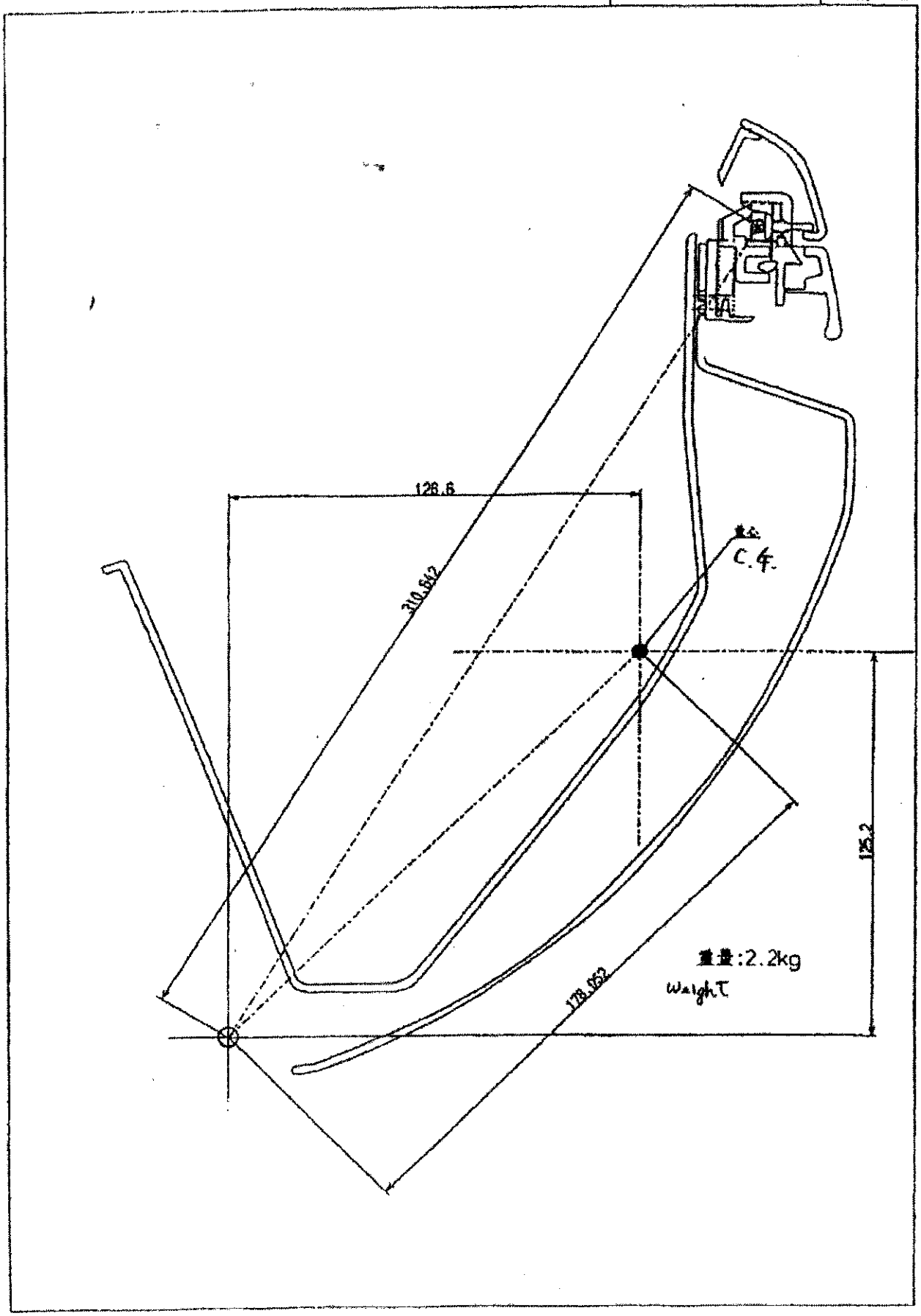
XHFD-170038 3/4

MR958900(G/BOX LOCK)ユニバーサルアセンブリ荷重計算



4 4/4

XHF0-170038



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Endeavor Interior Compartment Resistance to Inertial Load Calculation(Floor console lid)

2003.5 Mitsubishi PSU Floor Console
FMVSS 201 Requirements

Synopsis:

Calculations were done to evaluate the Console Lid and Latch for conformance to FMVSS 201 standards.

1. 10g Upward Event

For the 10g upward event, the failure modes most at risk were assumed to be:

1. Latch Hook fails in shear
2. Latch disengages
3. Latch Pin fails in shear

Failure Mode 1:

Shear stress on the Latch Hook due to 10g upward acceleration was calculated to be 1.51MPa. Since the yield shear stress for Acetal is 30MPa, the calculated shear stress is significantly below yield stress.

Failure Mode 2:

The Torque exerted on the Latch Hook under a 10g upward acceleration is in opposite direction to the torque needed to release the Latch. Therefore the Latch will not disengage under this event.

Failure Mode 3:

The shear stress on the Latch Pivot was calculated to be 2.8MPa. Since the yield shear stress for Acetal is 30MPa, the shear stress on the Latch Pivot is significantly below the yield stress.

2. 30g Frontal Event

For the 30g Frontal acceleration event the likely failure mode was assumed to be the Latch disengaging from the Console Box.

The Torque about the Latch Pivot to prevent unlatching under a 30g Frontal acceleration was calculated to be 984.8Nmm. The minimum Latch Effort at this Torque level was calculated to be 7.8N.

The minimum force exerted by the Latch Spring to prevent unlatching is 12.3N. The Latch Spring provides a pre-load of 19N based on calculation, 1.5 times greater than that needed to retain the Latch under this condition.

キーワード
又は概要

改訂年月日	改訂理由	改訂年月日	改訂理由
承認 Masaki	点検	氏名 山崎泰伸 ( ) 作成 02年6月1日	原紙 A4x6 枚 / 写真 枚 / 木刀 枚	資料番号 XHF0-170039

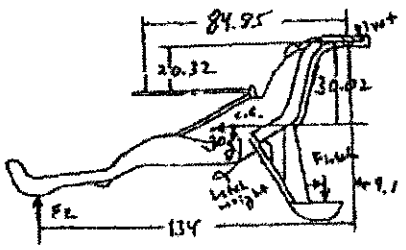
3. 10g Lateral Event

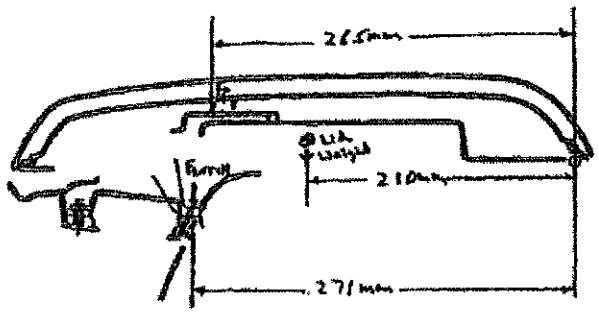
By inspection, the Console Lid will not release under a 10g lateral load and this is also confirmed by load testing per ES-X33021 sec 11.5.

4. 30g Rearward Event

By inspection, the Console Lid will not release under a 30g rearward event since the Latch is forced further into engagement under this condition.

1. 10g Upward Acceleration





Given: Lid Weight = 12.37N
Latch Weight = 1.16N
Force distributed to 2 Latch Hooks
Force distributed to 2 Latch Pivots
Acetal Shear Strength = 30Mpa
10g Force = 10x13.53N = 135N
Pivot Cylinder Area =18.6mm^2

Calculations:

A. Shear Stress on Latch Hook due to Lid weight:

$\Sigma M_{Hinge} = 135Nx210mm - F_{Latch} x\ 271mm = 0$

$F_{Latch} = \frac{135Nx210mm}{271mm}$

$F_{Latch} = 105N$

$F_{Hook} = \frac{F_{Latch}}{2}$

$F_{Hook} = 53N$

Hook Area = 5mm x 7mm = 35mm^2

$\tau = \frac{53N}{35mm^2}$

$\tau = 1.51MPa$

Safety Factor = 30Mpa ÷ 1.51Mpa = 19
Latch hook will not fail in shear under 10g upward acceleration.

B. Torque exerted on Latch:

$\Sigma M_{pivot} = 9.1mm \times F_{Latch} - 51mm \times 10 \times \text{Latch Weight}$

$\Sigma M_{pivot} = 9.1mm \times 105N - 51mm \times 10 \times 1.16N$

$\Sigma M_{pivot} = 364Nmm$

Torque will not cause Latch to disengage.

C. Force on Latch Pivot Pin:

$\Sigma M_{hinge} = F_{pivot} \times 265mm - 135N \times 210mm = 0$

$F_{pivot} = \frac{135N \times 210mm}{265mm}$

$F_{pivot} = 107N$

2 Pivots, therefore, Force seen by cylinder of Pivot Pin is:

$F_{cylinder} = \frac{107N}{2}$

$F_{cylinder} = 54N$

Shear Stress $\tau = \frac{54N}{19.6mm^2}$

$\tau = 2.8Mpa$

Safety Factor = 30Mpa ÷ 2.8Mpa = 10

Latch Pivot will not fail in shear under 10g upward acceleration.

8

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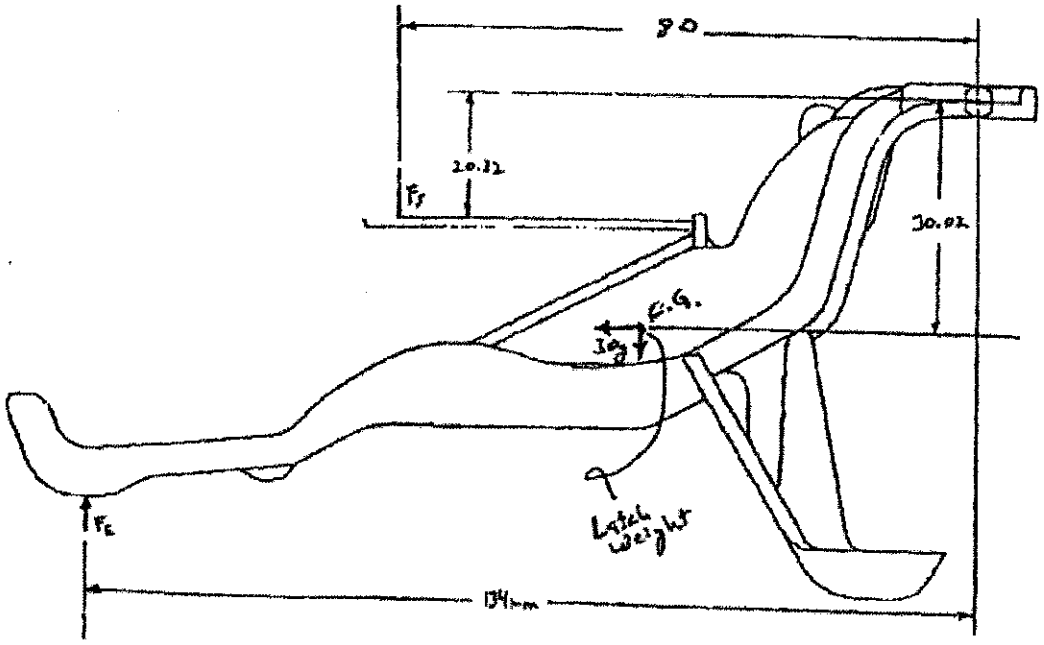
30g Frontal Acceleration



Given: Latch Weight = 1.16N
30g Force = 30 x 1.16N = 34.8N

Calculations:

A. Minimum Torque to prevent Latch from unlatching under 30g frontal acceleration:

$$\Sigma M_{pivot} = 34.8N \times 30mm - 1.16N \times 51mm - T = 0$$

$$T = 984.8Nmm$$

B. Effort to overcome 30g frontal torque and Latch weight at handle:

$$\Sigma M_{pivot} = F_E \times 134mm - 1.16N \times 51mm - T = 0$$

$$F_E = \frac{1.16N \times 51mm + 984.8Nmm}{134mm}$$

$F_E = 7.8N$

Minimum Latch effort to prevent unlatching at 30g is 7.8N.

C. Min Spring Force (Fs):

$$Fs = \frac{984.8 Nmm}{80mm}$$

$Fs = 12.3N$

Latch Spring at Pre-Load is deflected 5mm. The force, Fs, thus generated is:

$I_{spring} = 1/12(25.4mm \times 0.0005^3)$

$I_{spring} = 2.65 \times 10^{-10} m^4$

$$Fs = \frac{3 \times 2.07^{11} N/m^2 \times 2.64 \times 10^{-13} m^4 \times .005m}{.035^3 m}$$

$Fs = 19.1N$

Safety Factor = 19.1/12.3 = 1.5
Latch will not release under 30g Frontal acceleration.

By Inspection, Console Lid will not release under 10g lateral acceleration and 30g rearward acceleration. In the 10g lateral case, the Console Lid is retained by ribs off of Liner and the Hinge which resists lateral motion. In the 30g rearward case, the Latch is forced further into the latched position and there is no reason to suspect that the latch would rebound sufficiently to release.

10/10

XHF0-170039 6/6

JOHNSON CONTROLS

Interiors
Automotive Systems Group
Holland, MI

(seat, customer, vehicle, product)

HM-PLUS-FR-18-01-01-E
Rev. 03, 3/16/01
Product Test Data Sheet

Product Name:	PBU Floor Console	**Test ID:**	A-1
Project # / Child #:	17320	**Test Method:**	FMVSS 201
Test Series #:	WC-1412	**Spec & Sec(s):**	ES-X93021 3.0 (Rev 8F)
Test Name:	FMVSS 201	**Cust Dwg(s):**	F/C Assm w/o HVAC VM1749A; F/C Assm with HVAC tbd Shift Bezel VL7586A; C/H VL7597A; E/C w/o HVAC VL7597A; E/C HVAC VL7600A; IP S/P RH VL7609A; IP S/P LH VL7606A

Test Description: Subject all covered storage doors to a 30G deceleration in the fore/aft axis, 10G deceleration in the vertical and lateral axis. Test may be done by engineering calculations. See below for physical test set-up.

Acceptance Criteria: Latch must remain closed under 30G fore/aft deceleration, 10G vertical & lateral deceleration.

Reason for Test: DV Testing

V:\VALIDAT\Bottom Down Testing\Floor Consoles\PBU\Datasets\1412-a1.xls)A-1 DV April 02

Check One for Test Phase:

- ☐ ED - Engineering Design
- ☑ DV - Design Verification
- ☐ PV - Product Validation
- ☐ CCT - Cont Conformance Testing

Check One for Test Code:

- ☐ RC - Retest Customer
- ☐ RD - Retest Design
- ☐ RI - Retest Improvement
- ☐ EX - Experimental
- ☐ RM - Retest Manufacturing
- ☐ RS - Retest Supplier
- ☐ RT - Retest Testing
- ☐ WA - Warranty Analysis
- ☐ SC - Special Cost
- ☐ SD - Special Development
- ☐ SQ - Special Quality

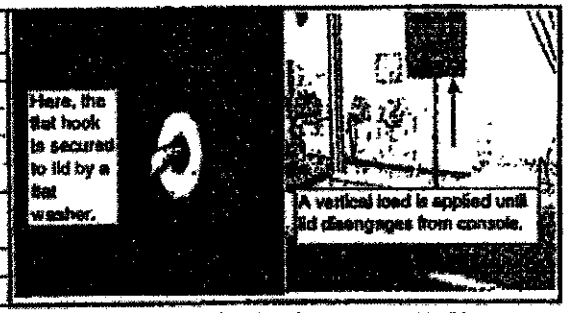
Est'd Comp Date:	05/03/02	**Test Start Date:**	04/22/02	**Test Compl Date:**	04/23/02
Sample Build Date:	04/17/02	**Quantity Planned:**	2	**Quantity Tested:**	2
		Test Location:	PC Lab	**Subgroup/Sequence:**	1/5

Sample Description: 2 consoles, first shots off of production tooling, one HVAC and one non-HVAC

Instrument Name	ID#	Cal. Due
Digital Calipers	191	03/01/03
EG-100 Digital Force Gauge	5589	06/04/02

Verify that gauge accuracy matches that used for ANOVA *.

Ambient lab conditions available upon request.



Test Set-Up:

The sample was mounted to the representative loading plate and a hole was drilled through the lid 203 mm back from the front center of the lid.

An extension attached to the force gauge was inserted through the hole and then the flat tip with a large washer was attached to the end.

The force gauge was then pulled upward applying a load to the underside of the lid until the lid became unlatched from the console.

Post Observations:

Both samples exceeded the minimum breakaway force allowed of 32 Lbs. Actually, both exceeded the gauge capability to measure force.

Sample #	Vertical Load Requirement - Lbs	Vertical Load Exceeded - Lbs	Lid Release Y or N
1	Yes - 32 Lbs	Yes - 100 Lbs	N
2	Yes - 32 Lbs	Yes - 100 Lbs	N

Conclusion:

After having followed the specified requirements and having met the acceptance criteria called out for this test, it is ruled: CONFORMING.

Disposition: ☑ PASS ☐ FAIL ☐ EVALUATION ONLY

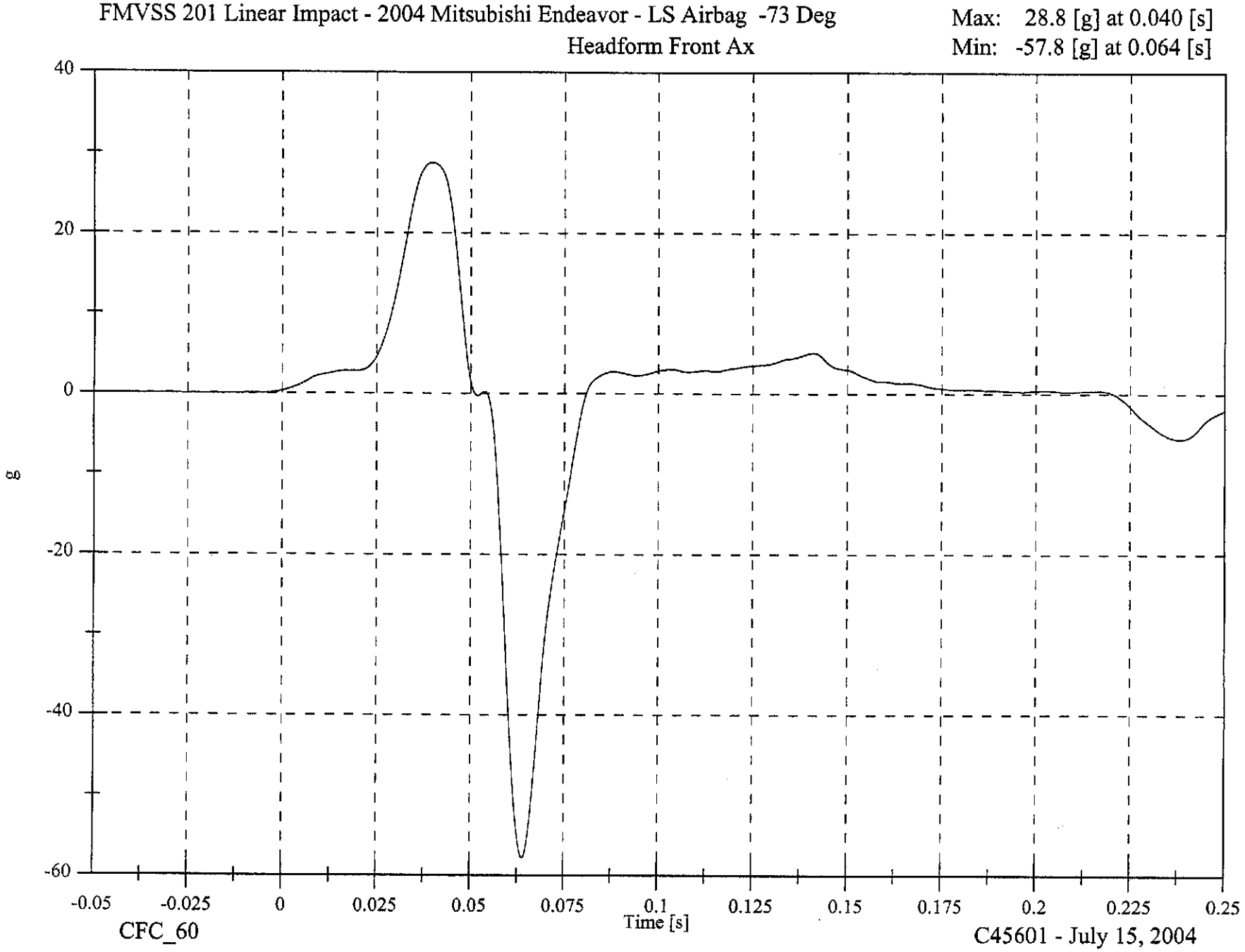
Test Engineer: Rod Denholl Initials: _____ **Lab Technician:** Jes Weise Initials: _____

This form is recommended, but not required. Alternate forms, including prior revisions of this form are acceptable.

* If applicable

APPENDIX C

DATA PLOTS



C45601 Left Side of Airbag Cover Impact Plot #1

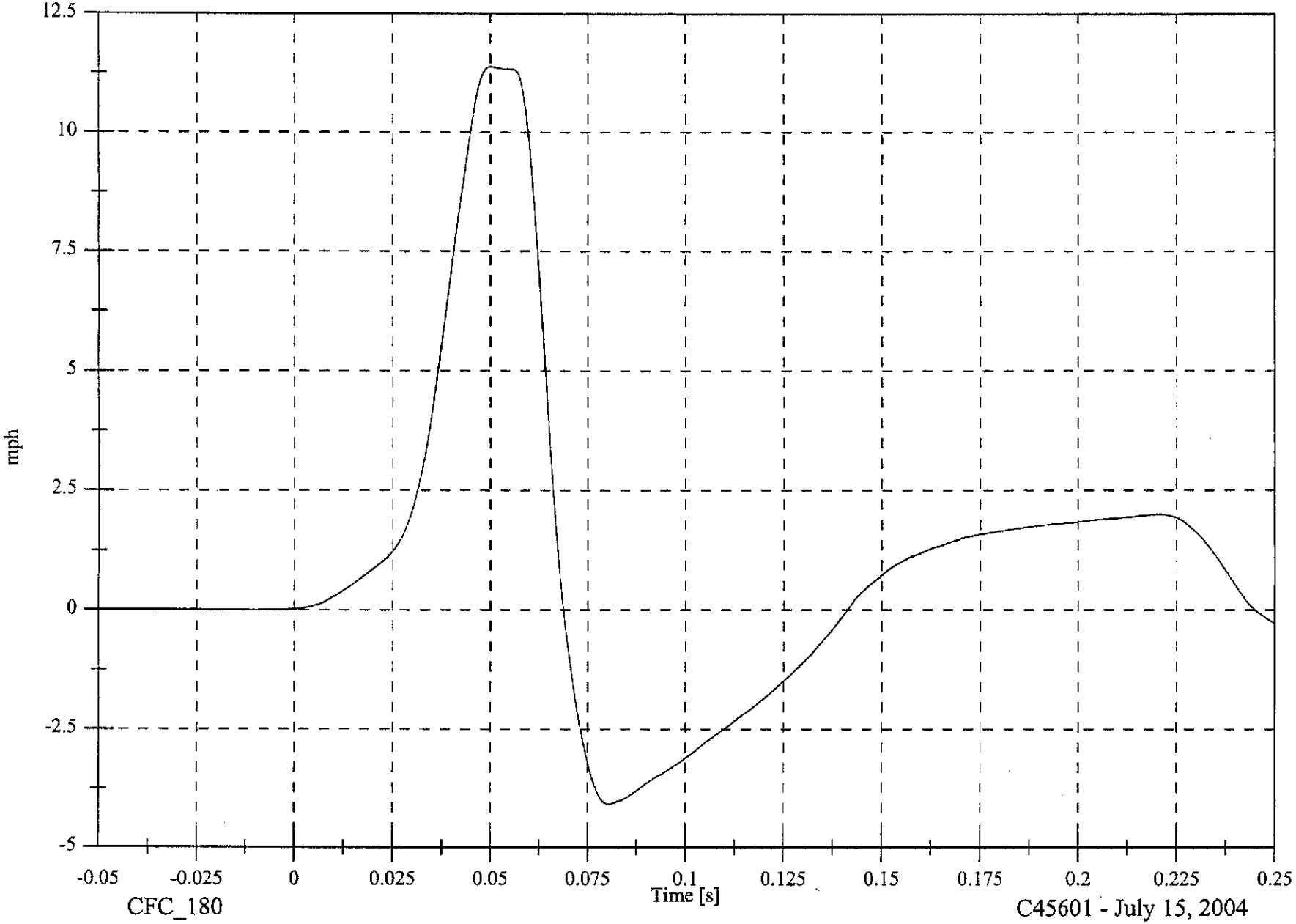
8655-F201-25

FMVSS 201 Linear Impact - 2004 Mitsubishi Endeavor - LS Airbag -73 Deg

Headform Front Ax Velocity

Max: 11.4 [mph] at 0.050 [s]

Min: -4.1 [mph] at 0.080 [s]

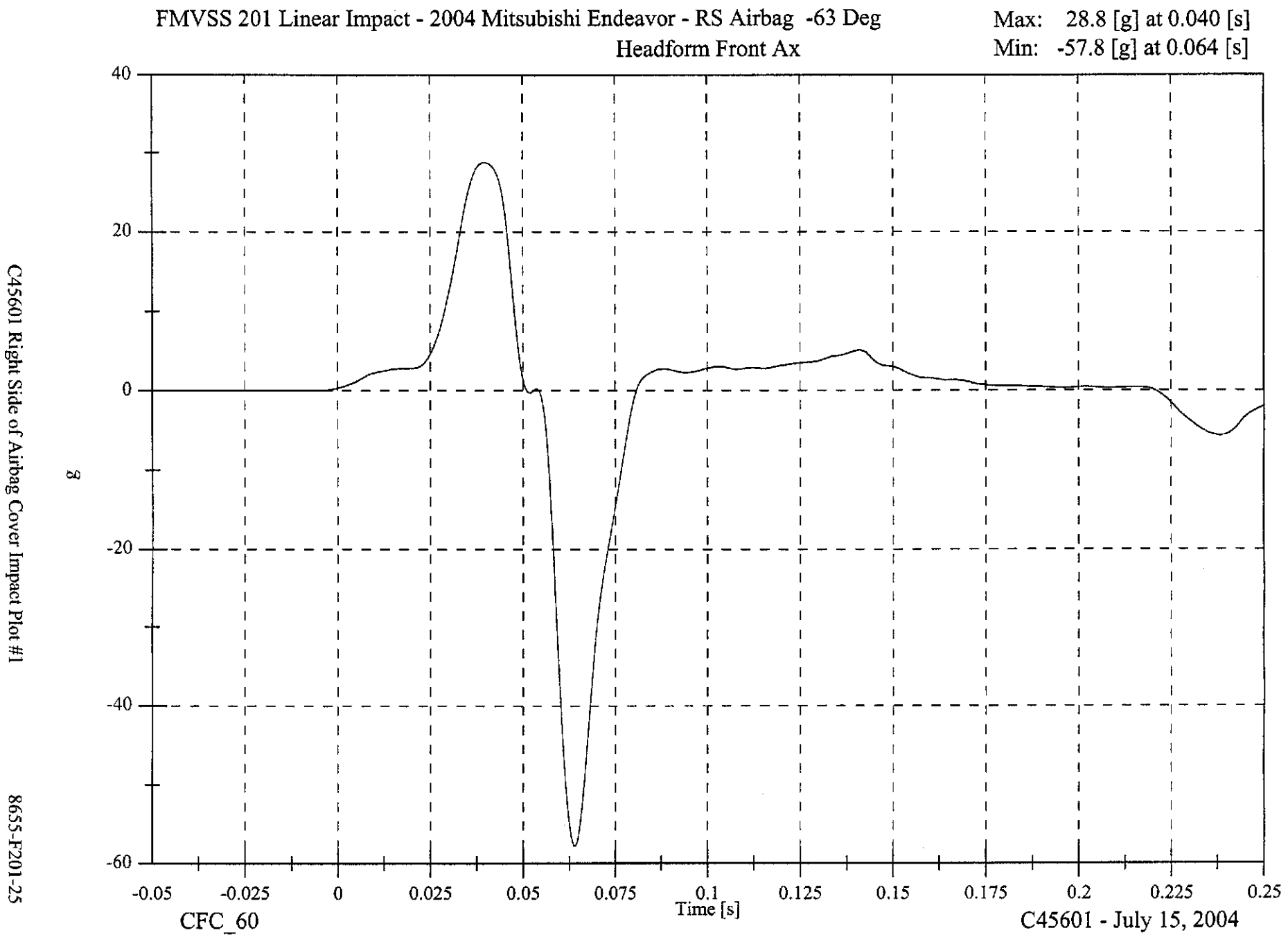


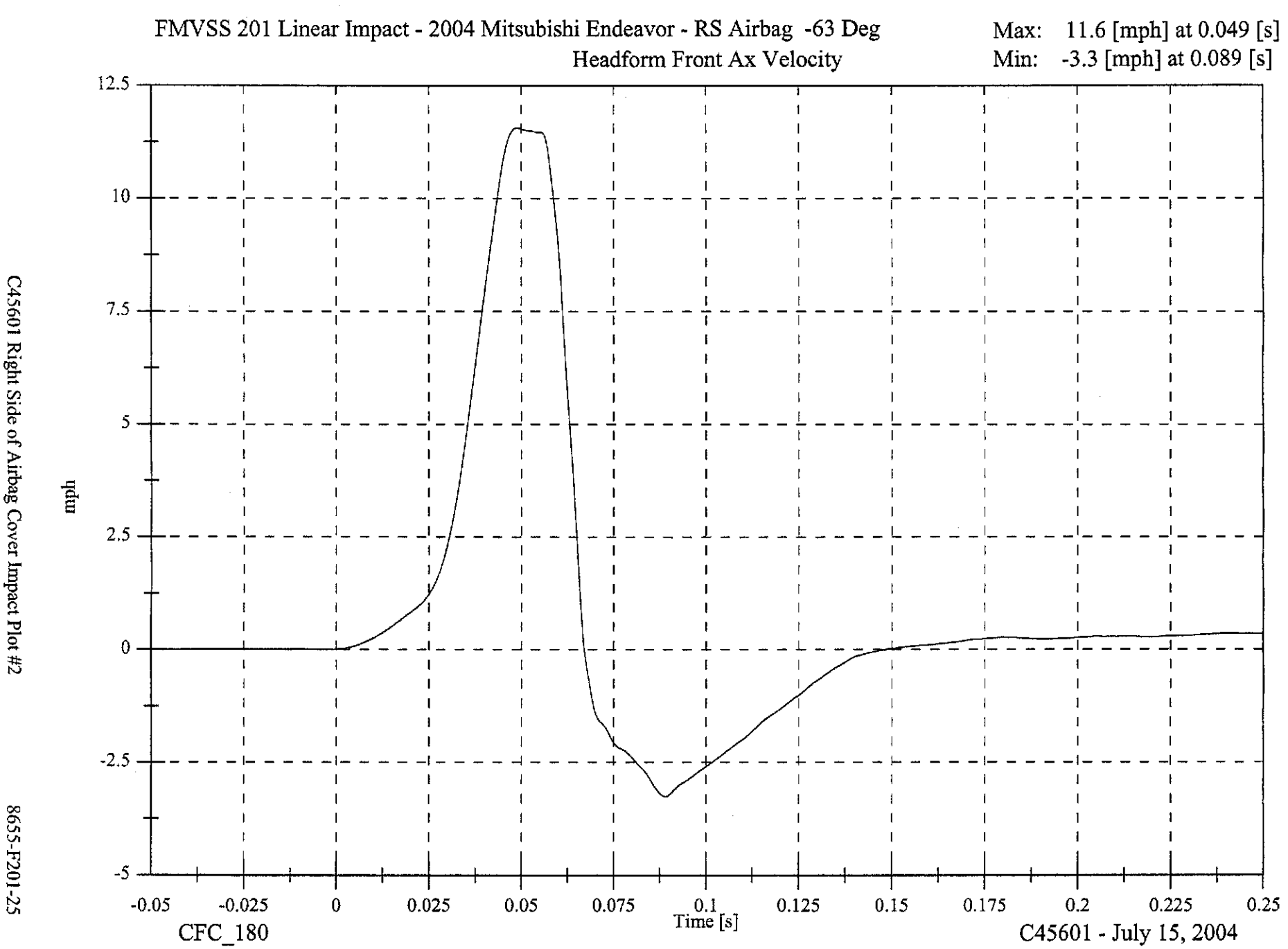
CFC_180

C45601 - July 15, 2004

C45601 Left Side of Airbag Cover Impact Plot #2

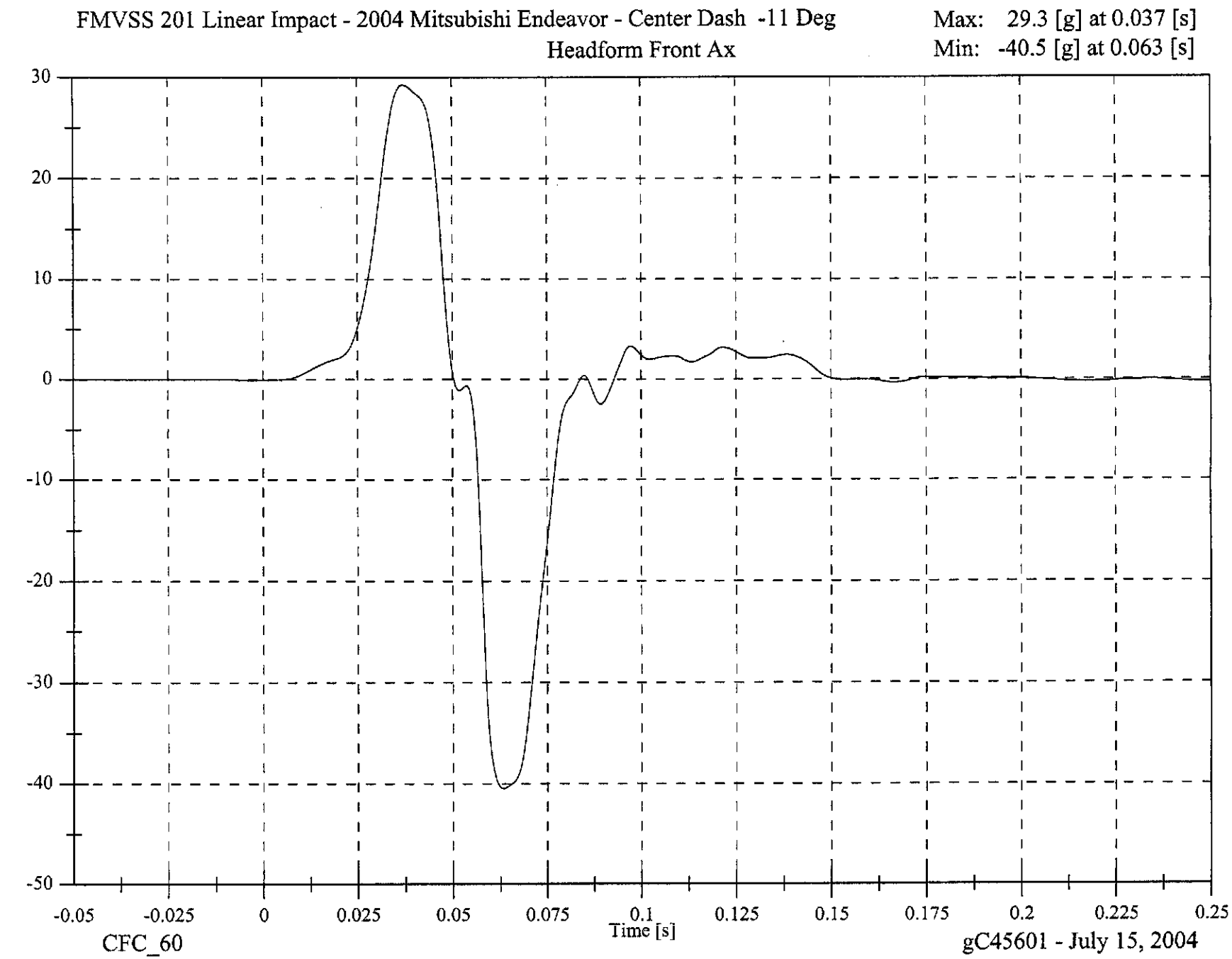
8655-F201-25


FMVSS 201 Linear Impact - 2004 Mitsubishi Endeavor - RS Airbag -63 Deg
Headform Front Ax
Max: 28.8 [g] at 0.040 [s]
Min: -57.8 [g] at 0.064 [s]
40
20
0
-20
-40
-60
g
-0.05
-0.025
0
0.025
0.05
0.075
0.1
0.125
0.15
0.175
0.2
0.225
0.25
Time [s]
CFC_60
C45601 - July 15, 2004
C45601 Right Side of Airbag Cover Impact Plot #1
8655-F201-25



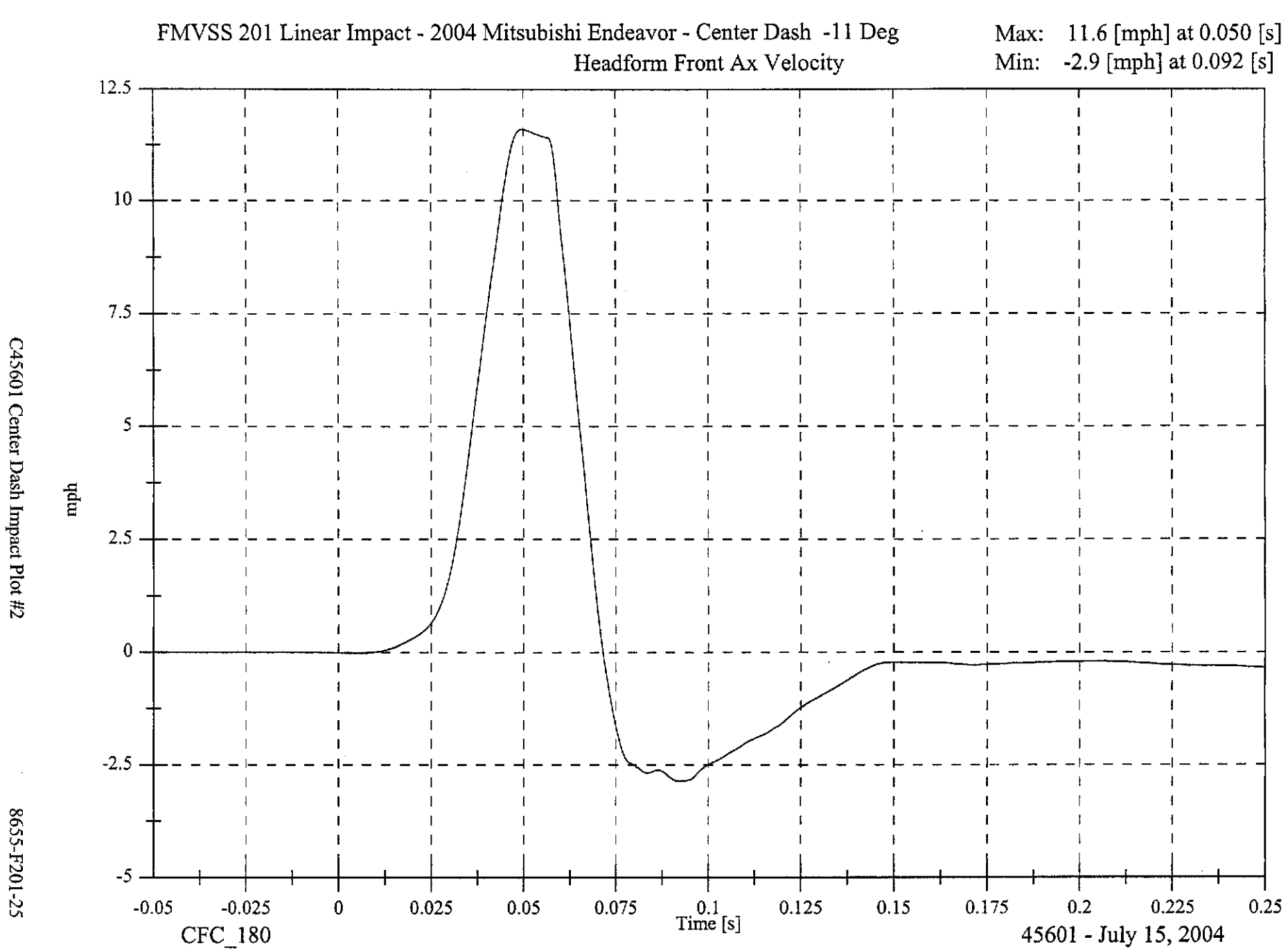
C45601 Right Side of Airbag Cover Impact Plot #2

8655-F201-25



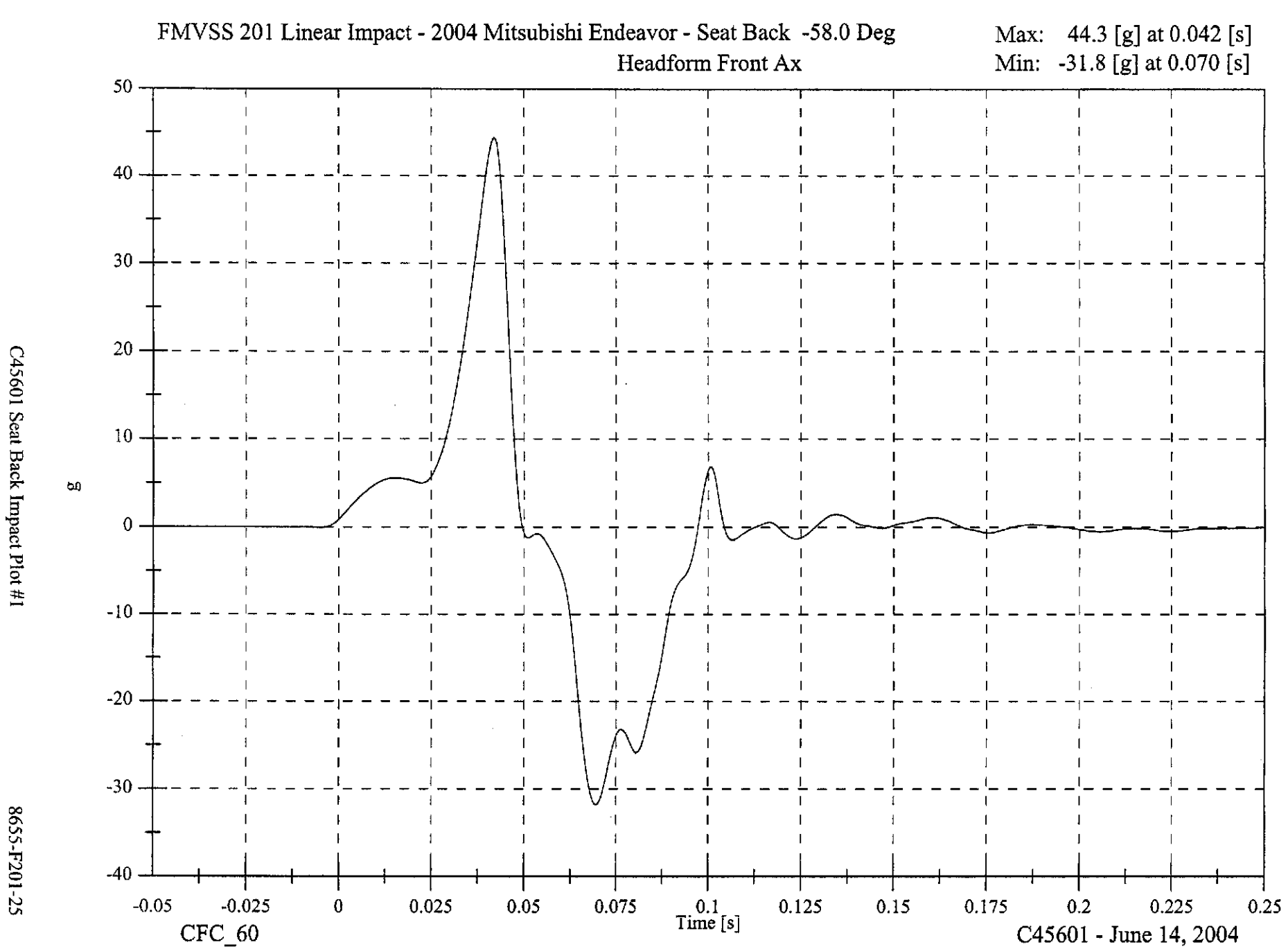
C45601 Center Dash Impact Plot #1

8655-F201-25



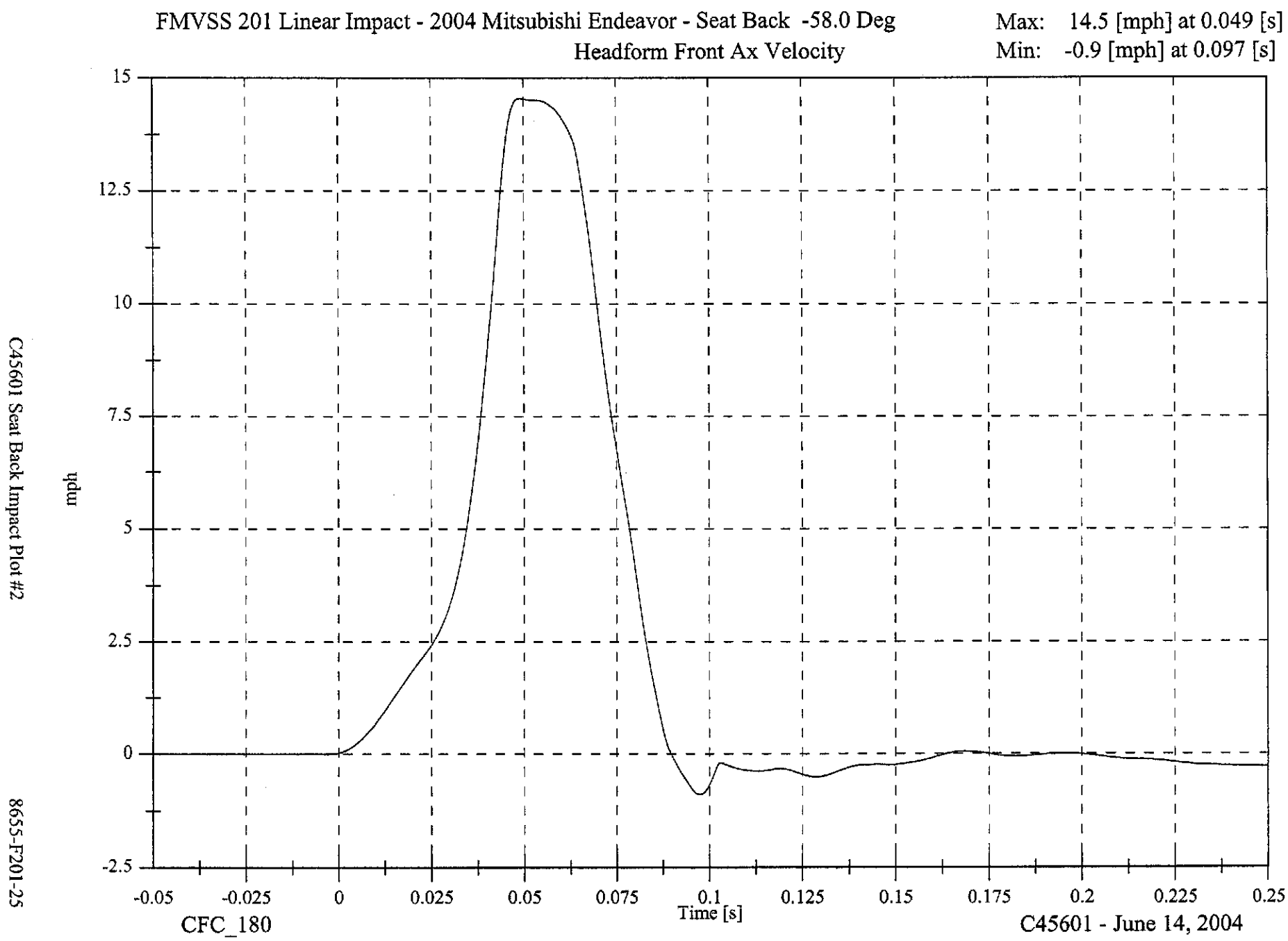
C45601 Center Dash Impact Plot #2

8655-F201-25



C45601 Seat Back Impact Plot #1

8655-F201-25



C45601 Seat Back Impact Plot #2

8655-F201-25