

REPORT NUMBER: 201-CAL-05-03

**SAFETY COMPLIANCE TESTING FOR FMVSS 201
OCCUPANT PROTECTION IN INTERIOR IMPACT**

**GM DAEWOO AUTO AND TECHNOLOGY CO.
2005 SUZUKI FORENZA**

NHTSA NUMBER: C50505

GD TEST NUMBER: 8655-F201-31

**CALSPAN
TRANSPORTATION SCIENCES CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225**



Test Date: June 23, 2005

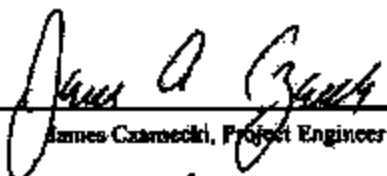
FINAL REPORT

PREPARED FOR:

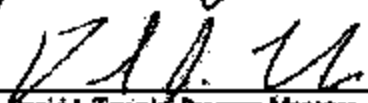
**U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance
Mail Code: NVS-220, Room 6111
400 Seventh Street, SW
Washington, DC 20590**

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NHTSA, Office of Vehicle Safety Compliance

12/5/2005
Date of Report Acceptance

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7. Author(s) David J. Travale, Program Manager James Czamecki, Project Engineer				8. Performing Organization Report No. 8655-F201-31	
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16. Abstract Compliance tests were conducted on the subject vehicle, a 2005 Suzuki Forenza, 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					
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TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	PURPOSE AND TEST PROCEDURE	1-1
2	SUMMARY OF OCCUPANT PROTECTION IN INTERIOR IMPACTS	2-1
APPENDIX A	PHOTOGRAPHS	A-1
APPENDIX B	INTERIOR COMPARTMENT CALCULATIONS	B-1
APPENDIX C	DATA PLOTS	C-1

LIST OF DATA SHEETS

<u>DATA SHEET</u>	<u>DESCRIPTION</u>	<u>PAGE NO.</u>
2-1	TEST VEHICLE RECEIVING INSPECTION DATA SHEET	2-2
2-2	HEADFORM IMPACT TEST RESULTS INSTRUMENT PANEL	2-3
2-3	HEADFORM IMPACT TEST RESULTS SEAT BACKS	2-4
2-4	SUN VISOR AND ARMREST EVALUATION	2-5
2-5	DOOR LATCH EVALUATION	2-6
2-6	SUMMARY OF RESULTS	2-7

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 2005 Suzuki Forenza, NHTSA No. C50505, 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 2005 Suzuki Forenza, NHTSA No. CS0505, 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 target area impacts were chosen by the NHTSA Contracting Officer's Technical Representative (COTR). 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 the centerline of the head.

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 along with still photographs can be found in Appendix A of this report.

To document each target area impact test, a digital picture was taken pre- and post-test at various locations to view the headform contact with the selected target areas.

TEST VEHICLE RECEIVING INSPECTION DATA SHEET

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Suzuki Forenza
NHTSA NO.:	C50505
VIN:	KL5JD56Z15K080227
DATE OF MANUFACTURE:	08/04 (SEE CERTIFICATION LABEL)
COLOR:	Silver
ODOMETER READING:	79
LABORATORY:	Calapan
TEST DATE:	June 23, 2005

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, center console arm rest and rear seat center fold-down

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 Compartment

HEADFORM IMPACT TEST RESULTS INSTRUMENT PANEL

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Suzuki Forenza
NHTSA NO.:	C50505
VIN:	KL5JD56Z15K080227
DATE OF MANUFACTURE:	08/04 (SEE CERTIFICATION LABEL)
COLOR:	Silver
ODOMETER READING:	79
LABORATORY:	Calspan
TEST DATE:	June 23, 2005

IMPACT LOCATION AND NUMBER				VELOCITY (mph)	PEAK ACCELERATION (3 ms Clip) Gs
NUMBER	X (inches)	Y (inches)	ANGLE (degrees)		
IP1 Center cluster above air vent	25.00	-11.0	-49	11.46	48.50
IP2 Airbag Cover, Left Side, Bottom	25.50	-7.0	-53	11.35	63.98
IP3 Airbag Cover, Right Side, Bottom	25.25	4.0	-53	11.59	65.05

REFERENCE POINT: Seating Reference Position (SgRP) of front outboard passenger designated seating position is the reference point (x positive forward of SgRP and y positive right of SgRP).

REMARKS:

HEADFORM IMPACT TEST RESULTS **SEAT BACKS**

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Suzuki Forenza
NHTSA NO.:	C50505
VIN:	KL5JD56Z15K080227
DATE OF MANUFACTURE:	08/04 (SEE CERTIFICATION LABEL)
COLOR:	Silver
ODOMETER READING:	79
LABORATORY:	Calspan
TEST DATE:	June 23, 2005

IMPACT LOCATION AND NUMBER				VELOCITY (mph)	PEAK ACCELERATION (3 ms Clip) Gs
NUMBER	X (inches)	Y (inches)	ANGLE (degrees)		
SB1 Seat Back	14.75	0	-52	14.8	41.17

REFERENCE POINT: SgRP of rear outboard passenger designated seating position is the reference point (x positive forward of SgRP and y positive right of SgRP).

SUN VISOR AND ARMREST EVALUATION

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Suzuki Forenza
NHTSA NO.:	C50505
VIN:	KL5JD56Z15K080227
DATE OF MANUFACTURE:	08/04 (SEE CERTIFICATION LABEL)
COLOR:	Silver
ODOMETER READING:	79
LABORATORY:	Calspan
TEST DATE:	June 23, 2005

SUN VISOR INFORMATION:

- Are sun visors constructed of or covered with energy absorbing material?
YES (PASS): X NO (FAIL): -
- 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

- 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
- 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
- Does it provide adequate pelvic area impact protection?
YES: X NO: -
- 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:	2005 Suzuki Forenza
NHTSA NO.:	C50505
VIN:	KL5JD56Z15K000227
DATE OF MANUFACTURE:	08/04 (SBB CERTIFICATION LABEL)
COLOR:	Silver
ODOMETER READING:	79
LABORATORY:	Calspan
TEST DATE:	June 23, 2005

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	Pass	Pass	Pass	Pass

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

SUMMARY OF RESULTS

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Suzuki Forenza
NHTSA NO.:	C50505
VIN:	KL5JD56Z15K080227
DATE OF MANUFACTURE:	08/04 (SEE CERTIFICATION LABEL)
COLOR:	Silver
ODOMETER READING:	79
LABORATORY:	Calspan
TEST DATE:	June 23, 2005

	NUMBER OF IMPACTS	PASS/FAIL
INSTRUMENT PANEL	1	PASS
SEAT BACK	3	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
A-6	VEHICLE'S TIRE INFORMATION LABEL
A-7	SUN VISOR CONSTRUCTION
A-8	ARMREST LEFT FRONT DOOR
A-9	ARMREST FRONT CONSOLE
A-10	ARMREST LEFT REAR DOOR
A-11	ARMREST REAR CENTER
A-12	INSTRUMENT PANEL
A-13	INSTRUMENT PANEL IMPACT ZONE PRE-TEST
A-14	INSTRUMENT PANEL IMPACT ZONE POST-TEST
A-15	INSTRUMENT PANEL LEFT SIDE AIRBAG COVER IMPACT PRE-TEST
A-16	INSTRUMENT PANEL LEFT SIDE AIRBAG COVER IMPACT POST-TEST
A-17	INSTRUMENT PANEL RIGHT SIDE AIRBAG COVER IMPACT PRE-TEST
A-18	INSTRUMENT PANEL RIGHT SIDE AIRBAG COVER IMPACT POST-TEST
A-19	INSTRUMENT PANEL ABOVE CENTER CLUSTER VENT IMPACT PRE-TEST
A-20	INSTRUMENT PANEL ABOVE CENTER CLUSTER VENT IMPACT POST-TEST
A-21	HEAD RESTRAINT
A-22	HEAD RESTRAINT IMPACT AREA PRE-TEST
A-23	HEAD RESTRAINT IMPACT AREA POST-TEST

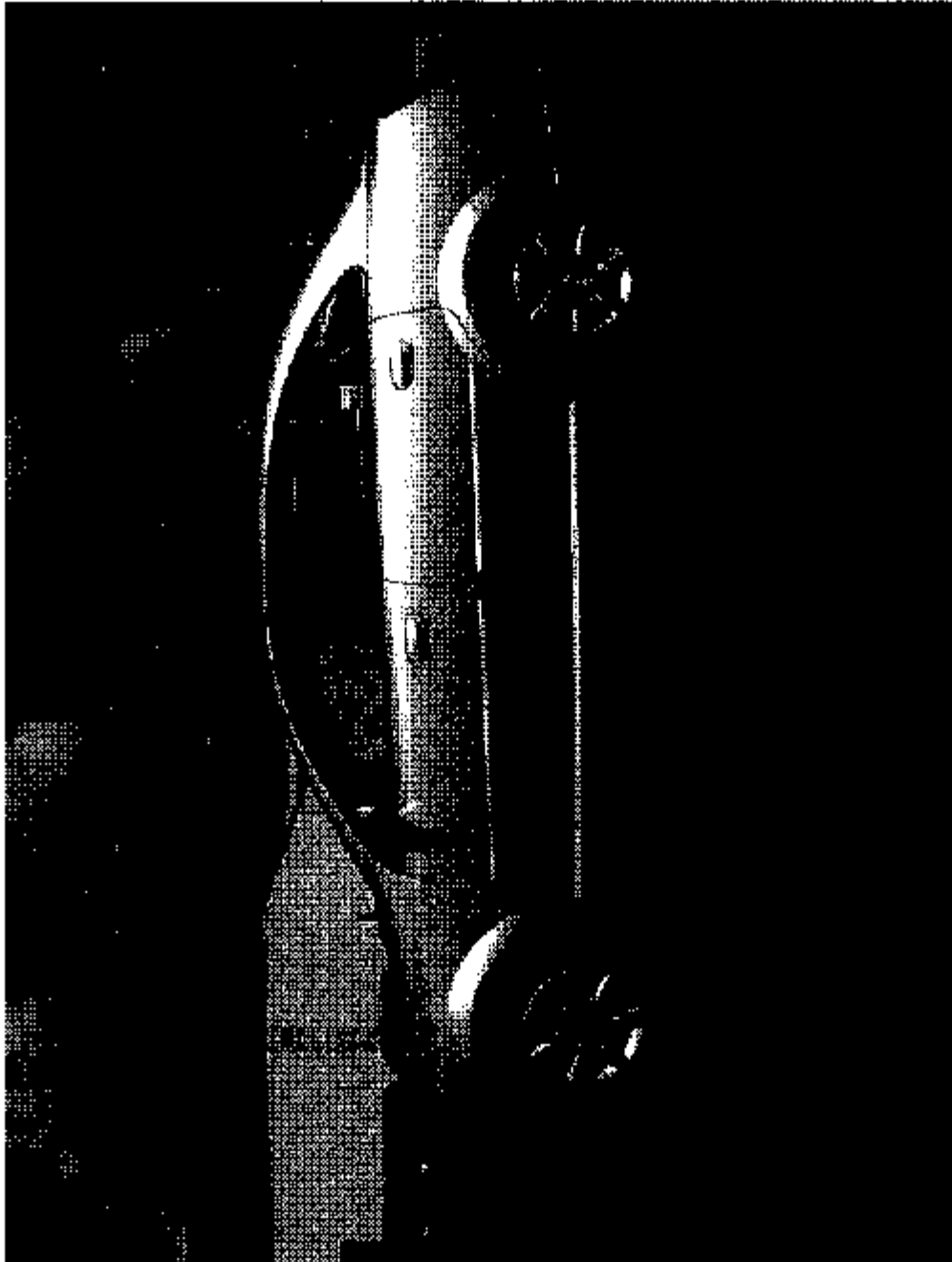


Figure A-1 : LEFT SIDE VIEW OF VEHICLE



Figure A-2 : RIGHT SIDE VIEW OF VEHICLE

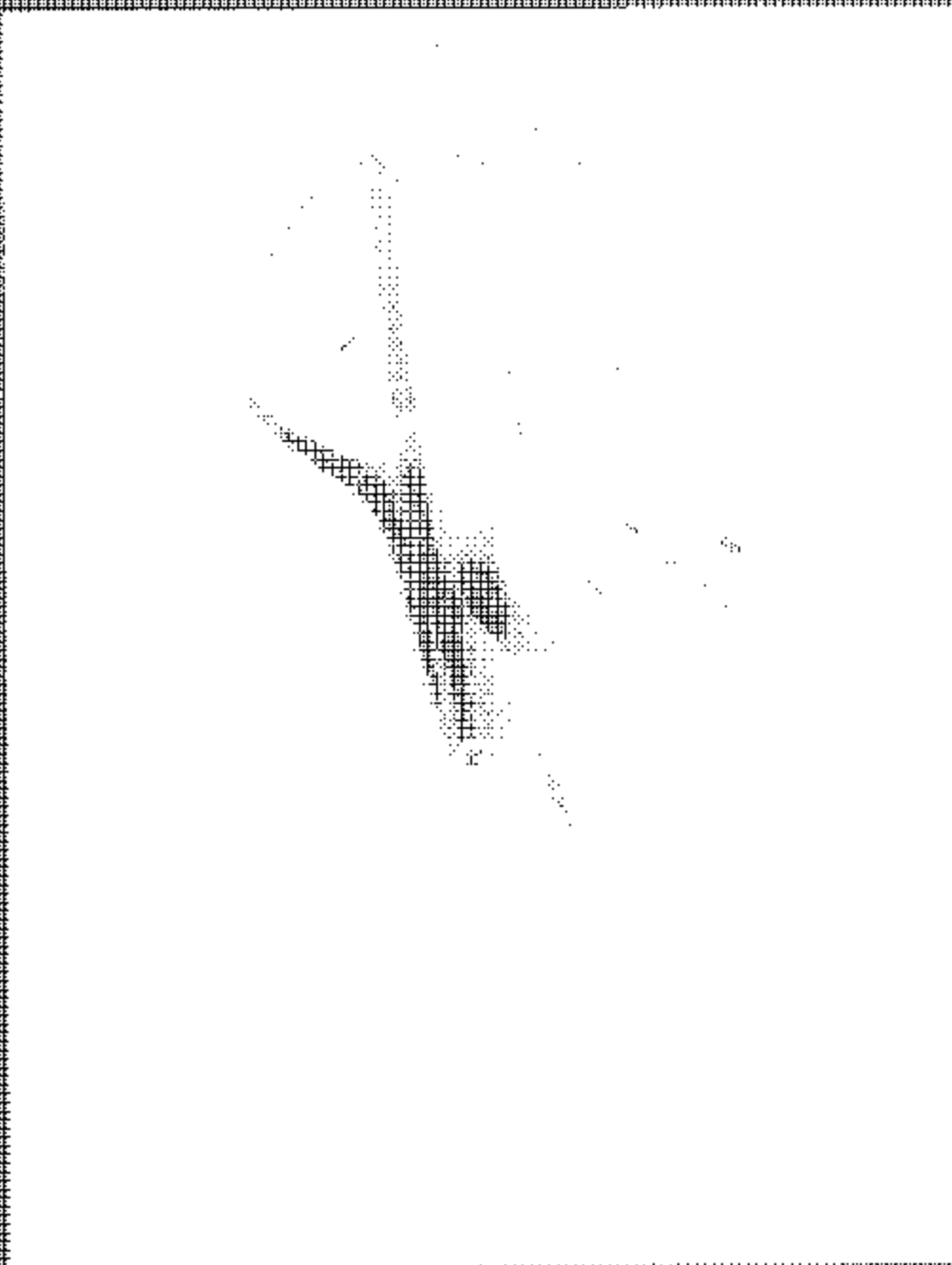
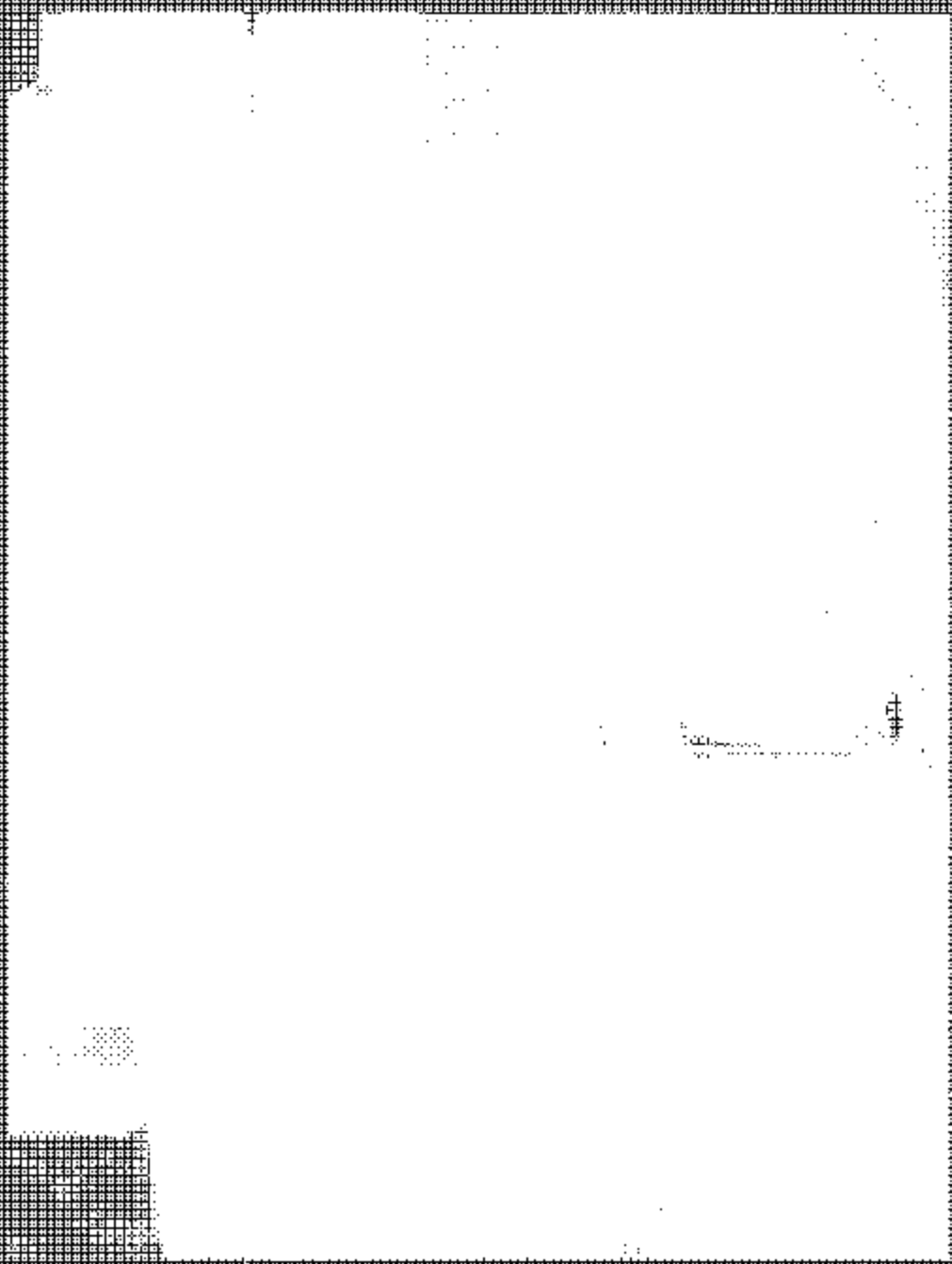


FIGURE 1. A PERSONAL VIEW FROM THE SIDE OF THE VEHICLE



FROM AERIAL VIEW OF THE POLICE OFFICE



FOUO: S. J. HILL'S CONFIDENTIALITY LINES

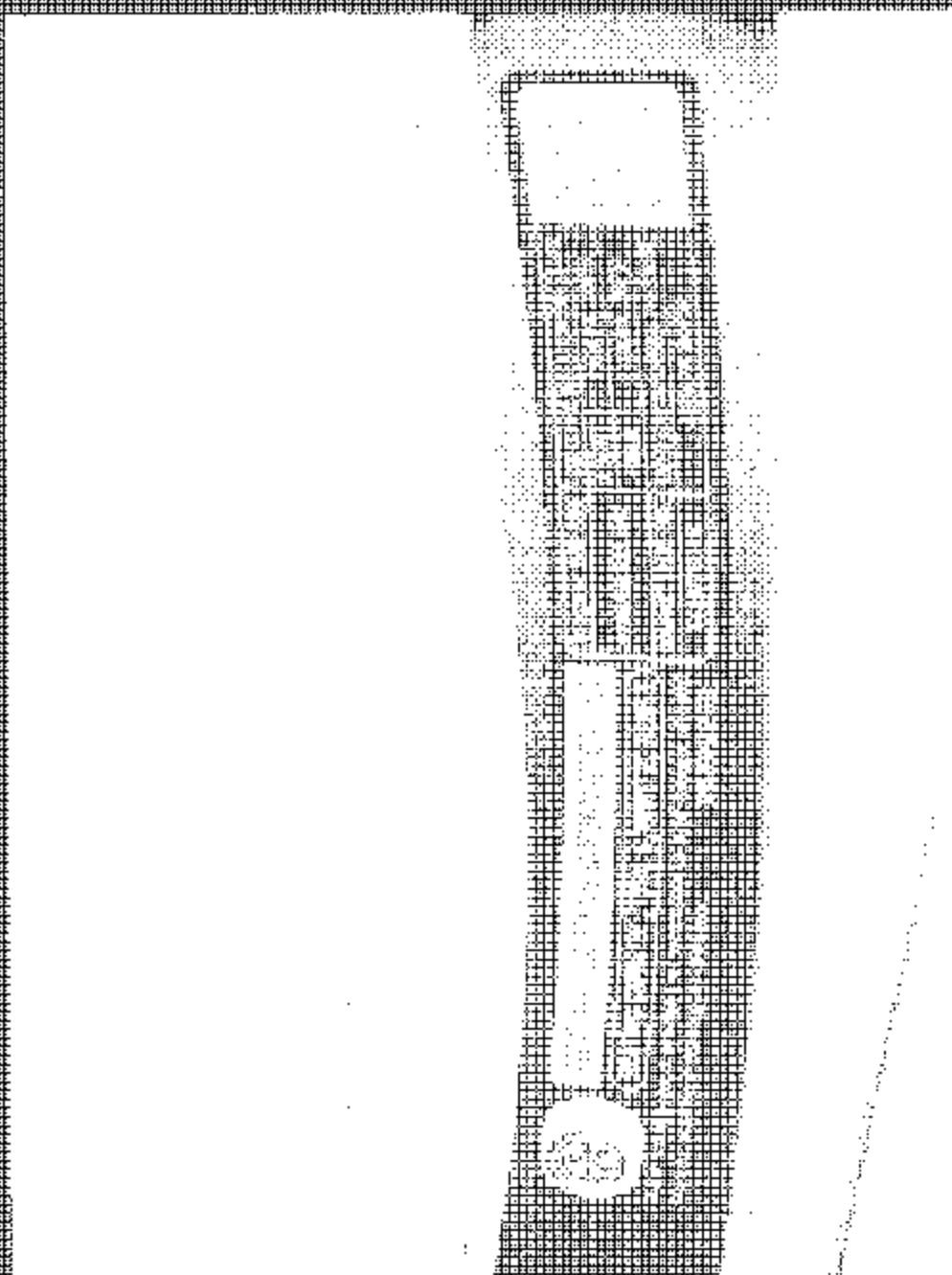
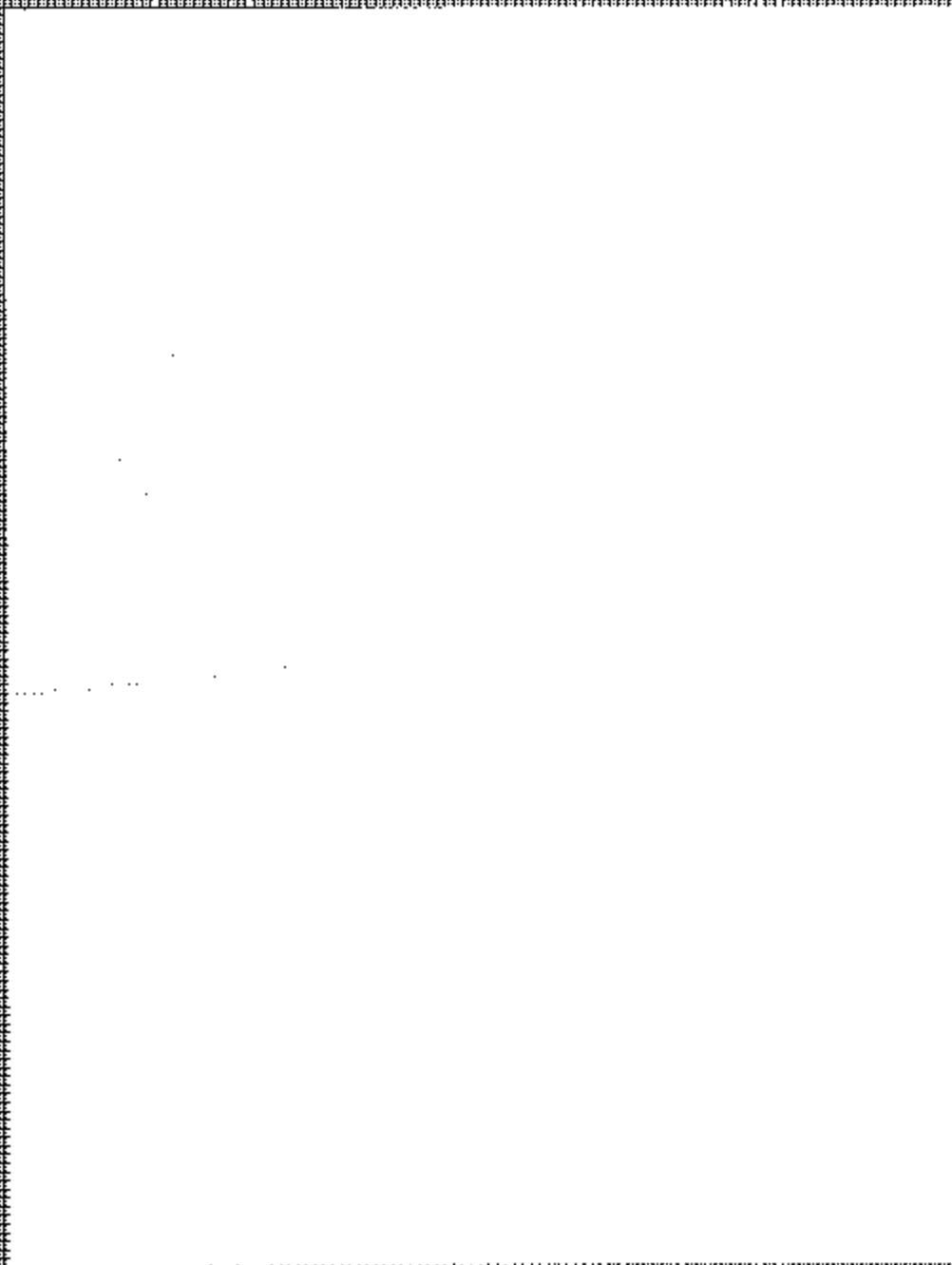


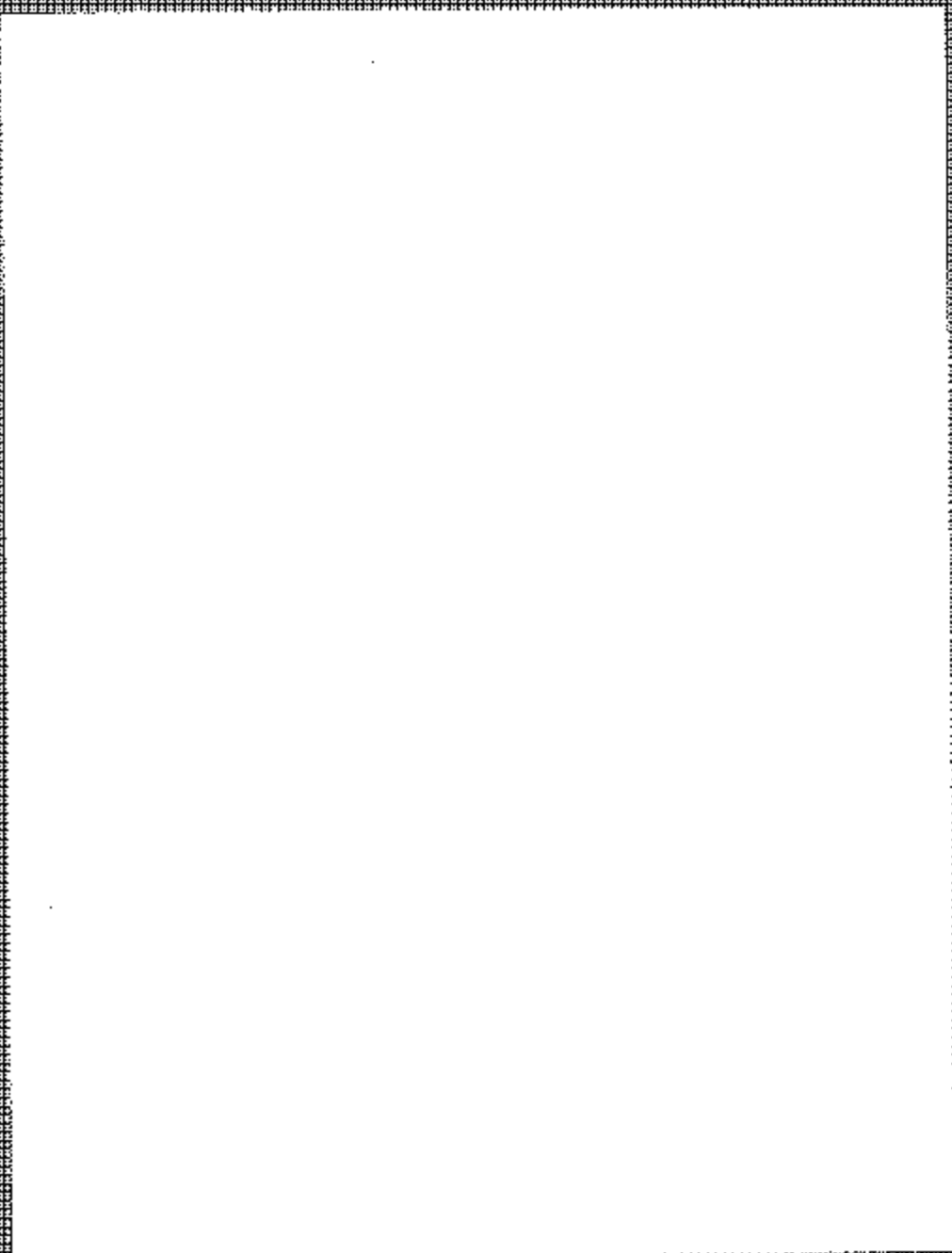
FIGURE 1. VIBRATION TRANSDUCER LOCATION



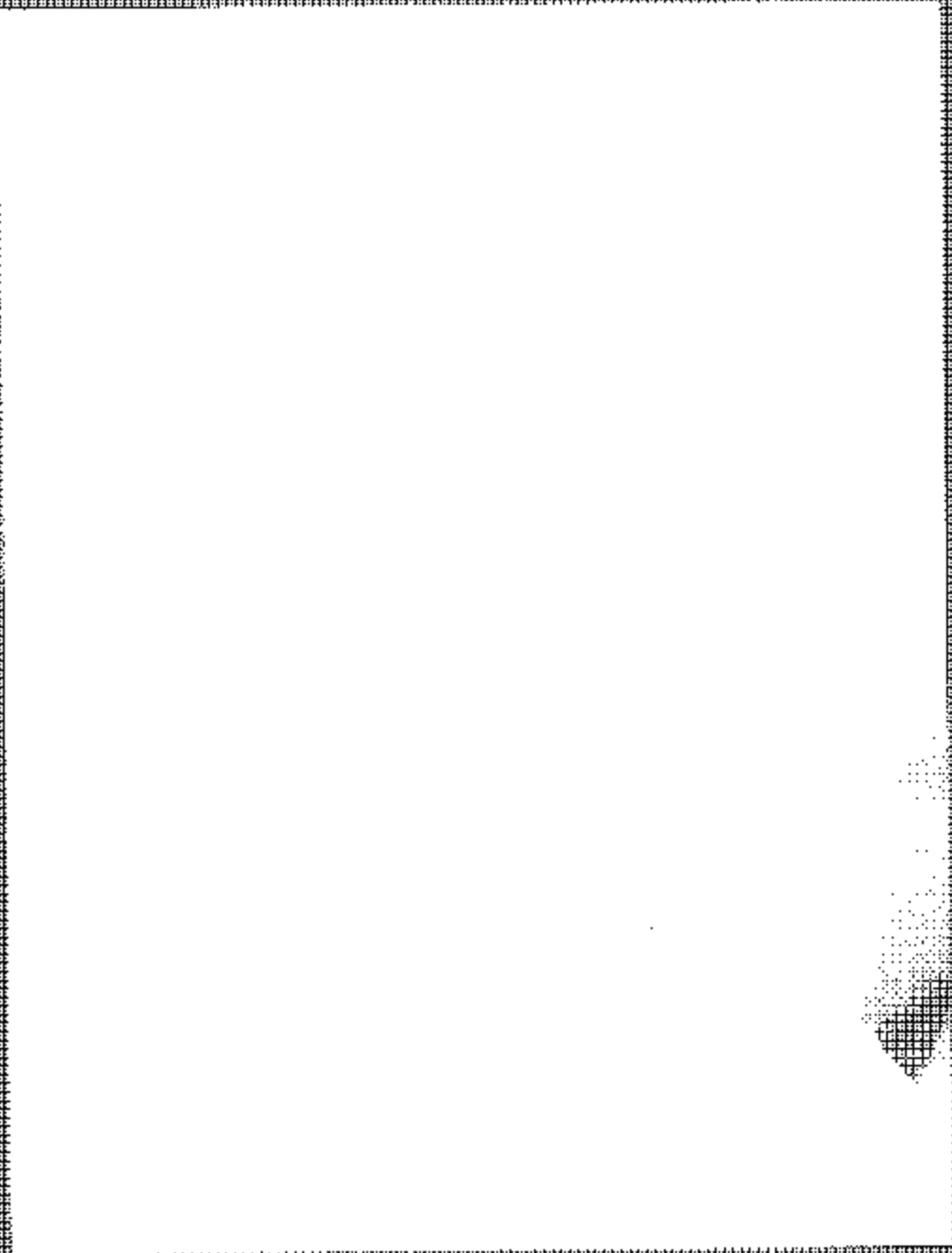
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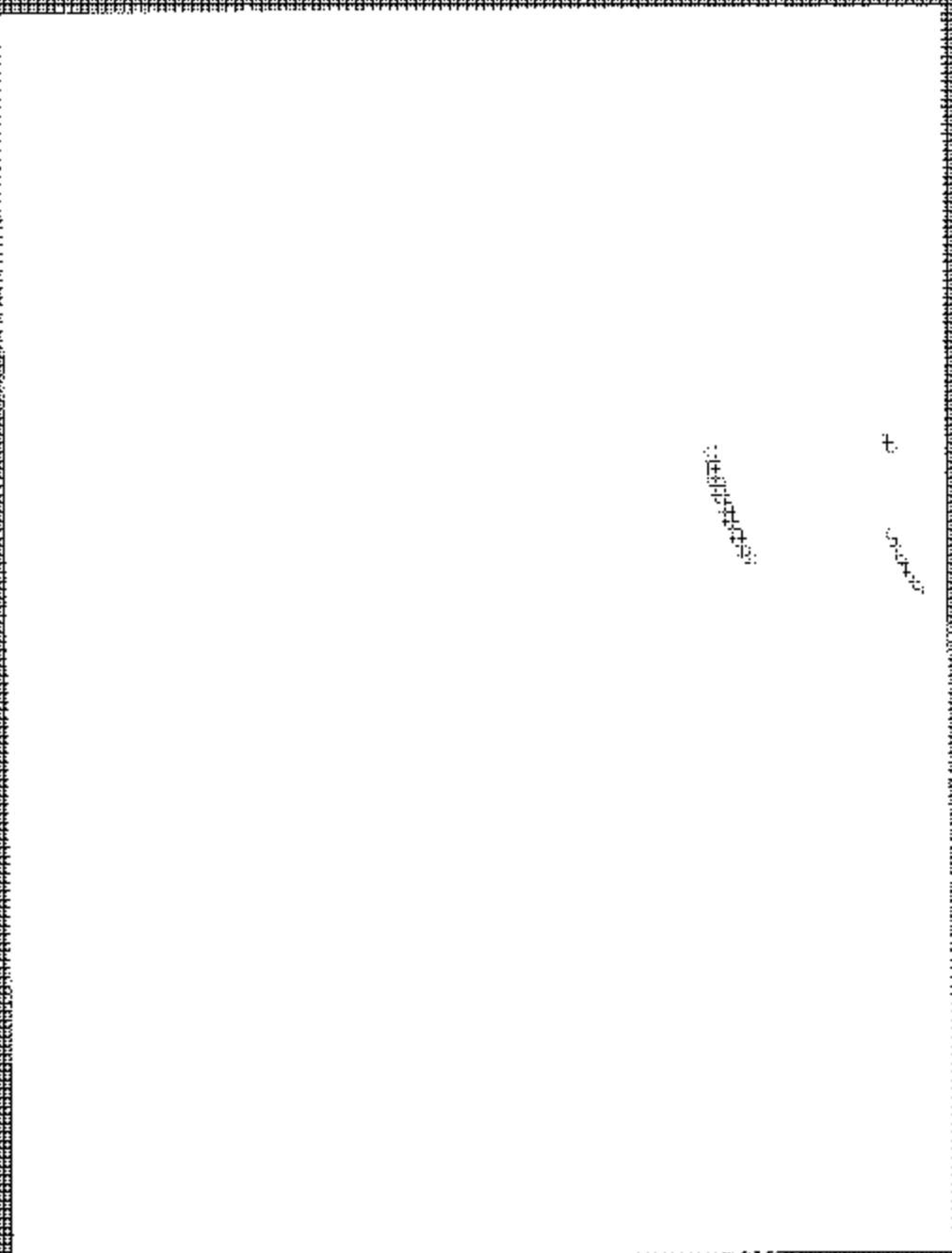
RESEARCH MATERIALS



REPRODUCTION OF ORIGINAL DOCUMENT



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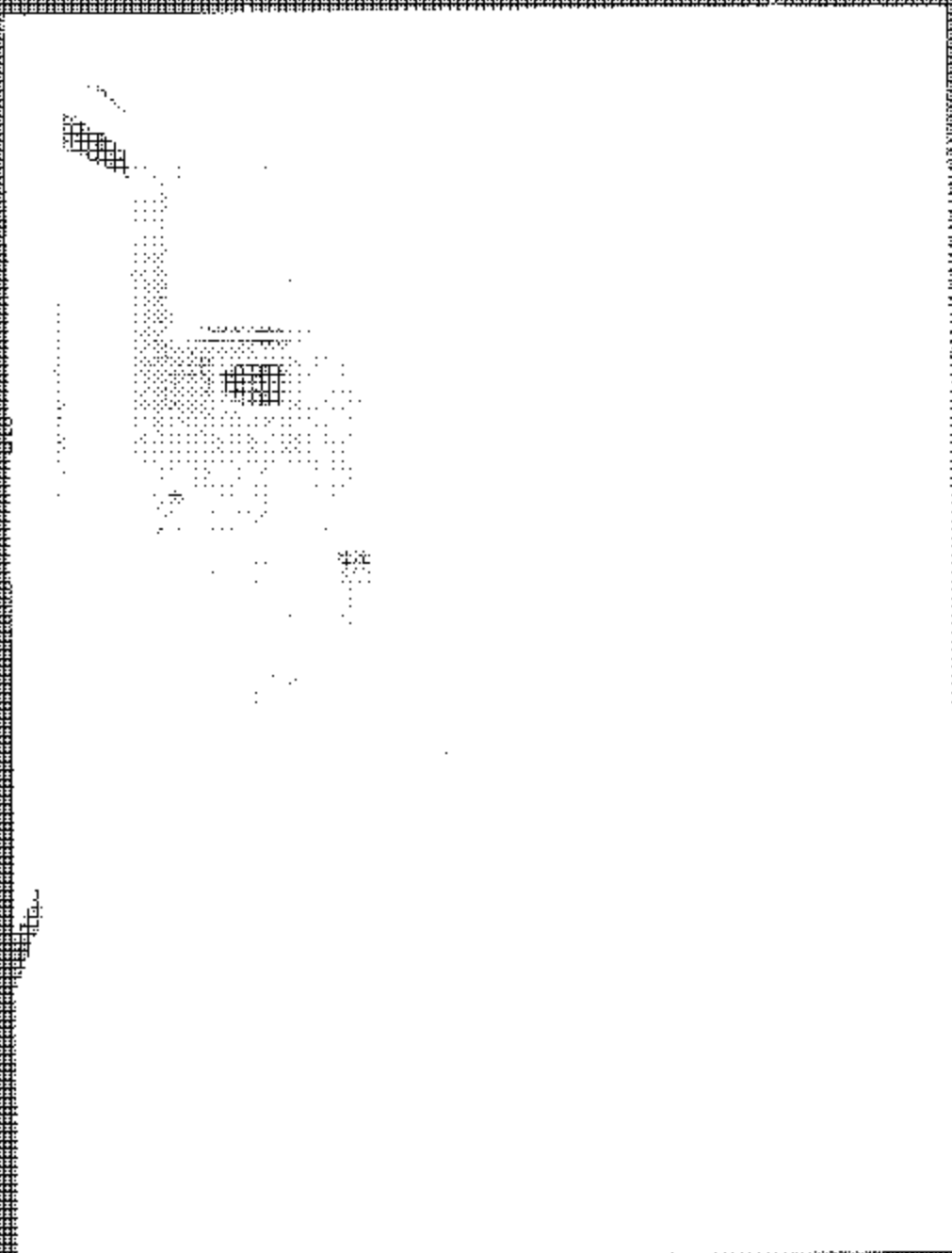


REPRODUCTION OF ORIGINAL

2015年12月15日

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新美大藥房



Page 2 of 12 - 2025 RELEASE UNDER E.O. 14176



Figure 1.1: Instrument Panel Left Side - All Cores (Image of the Panel)

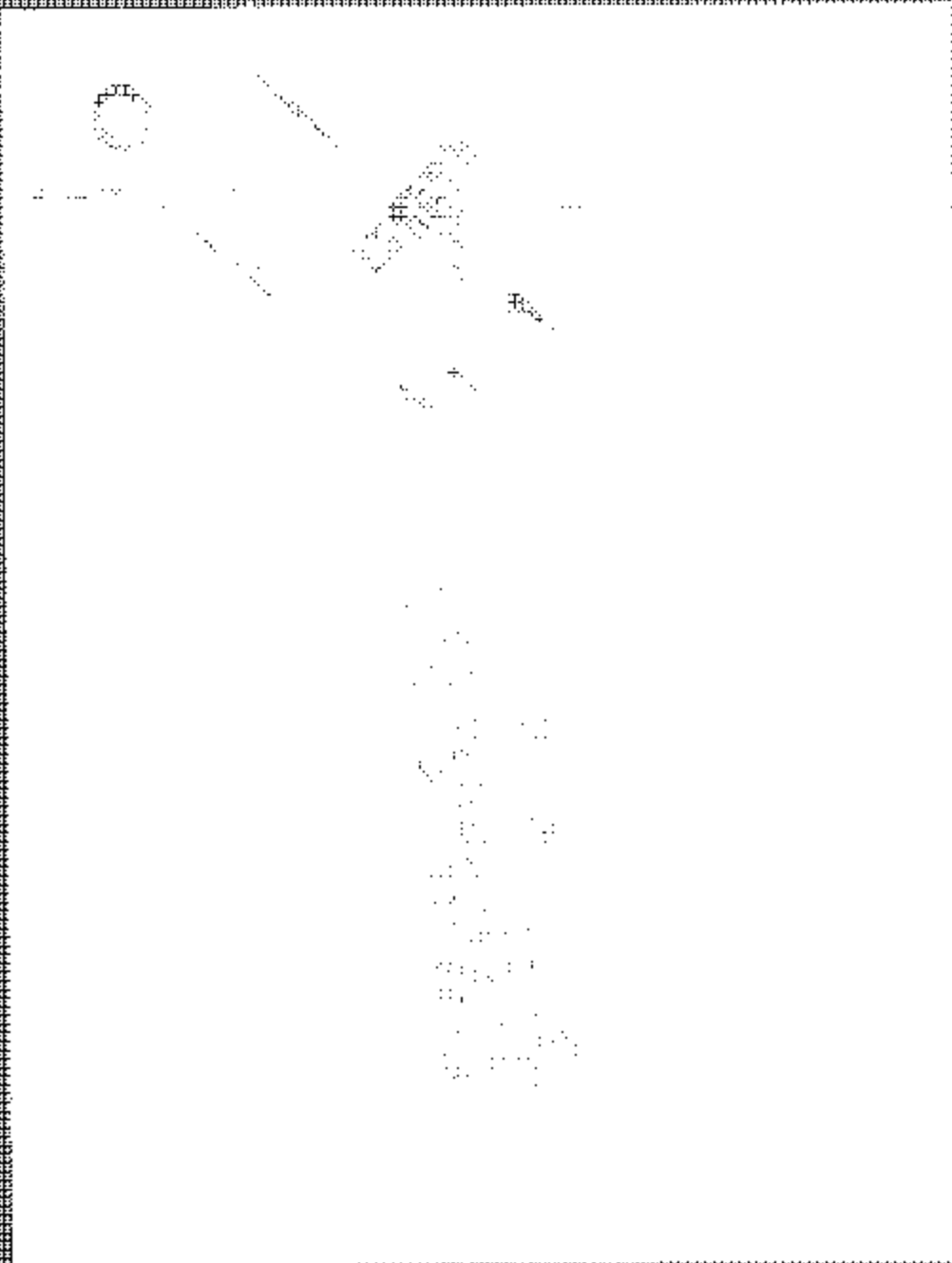
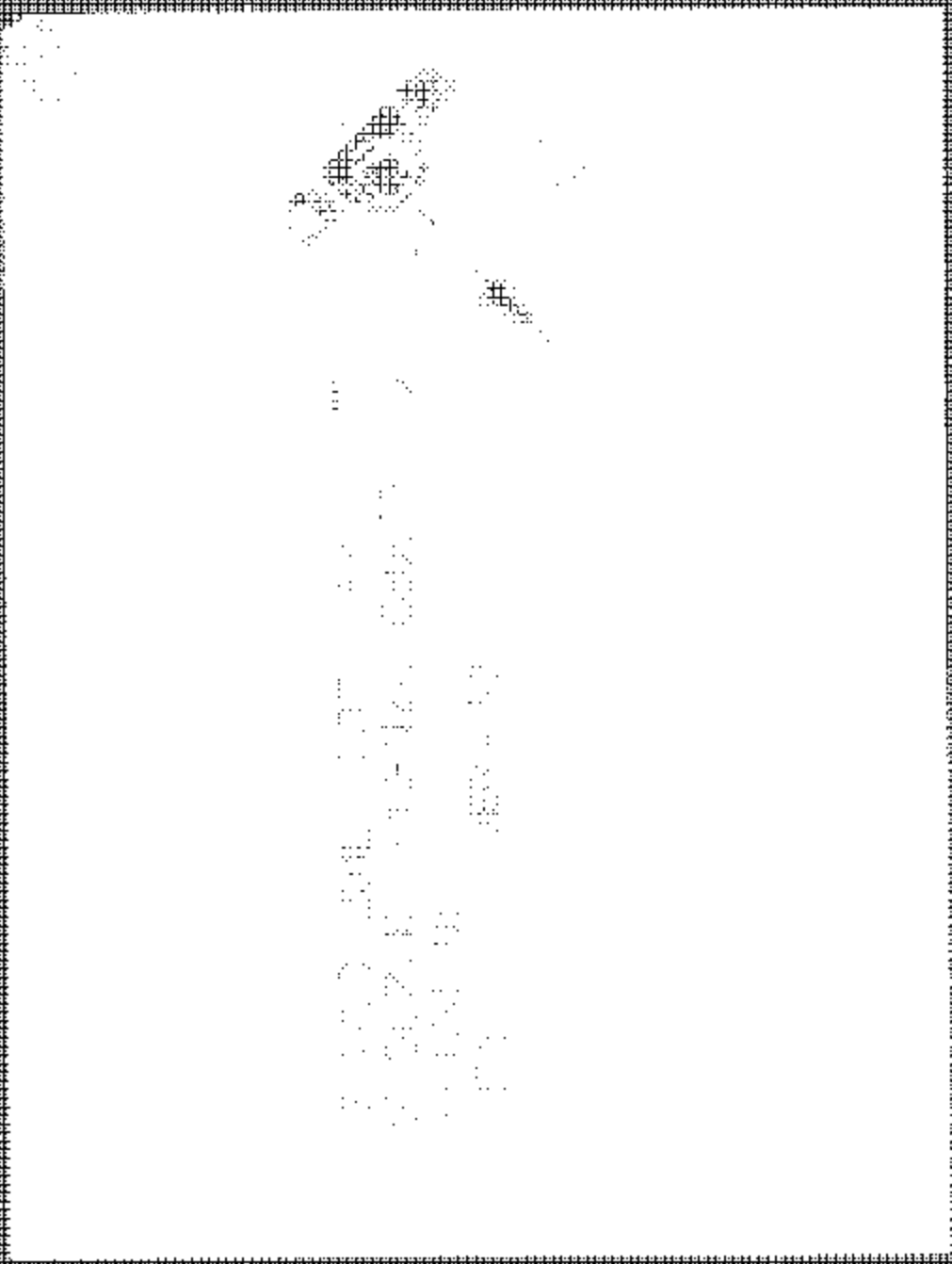
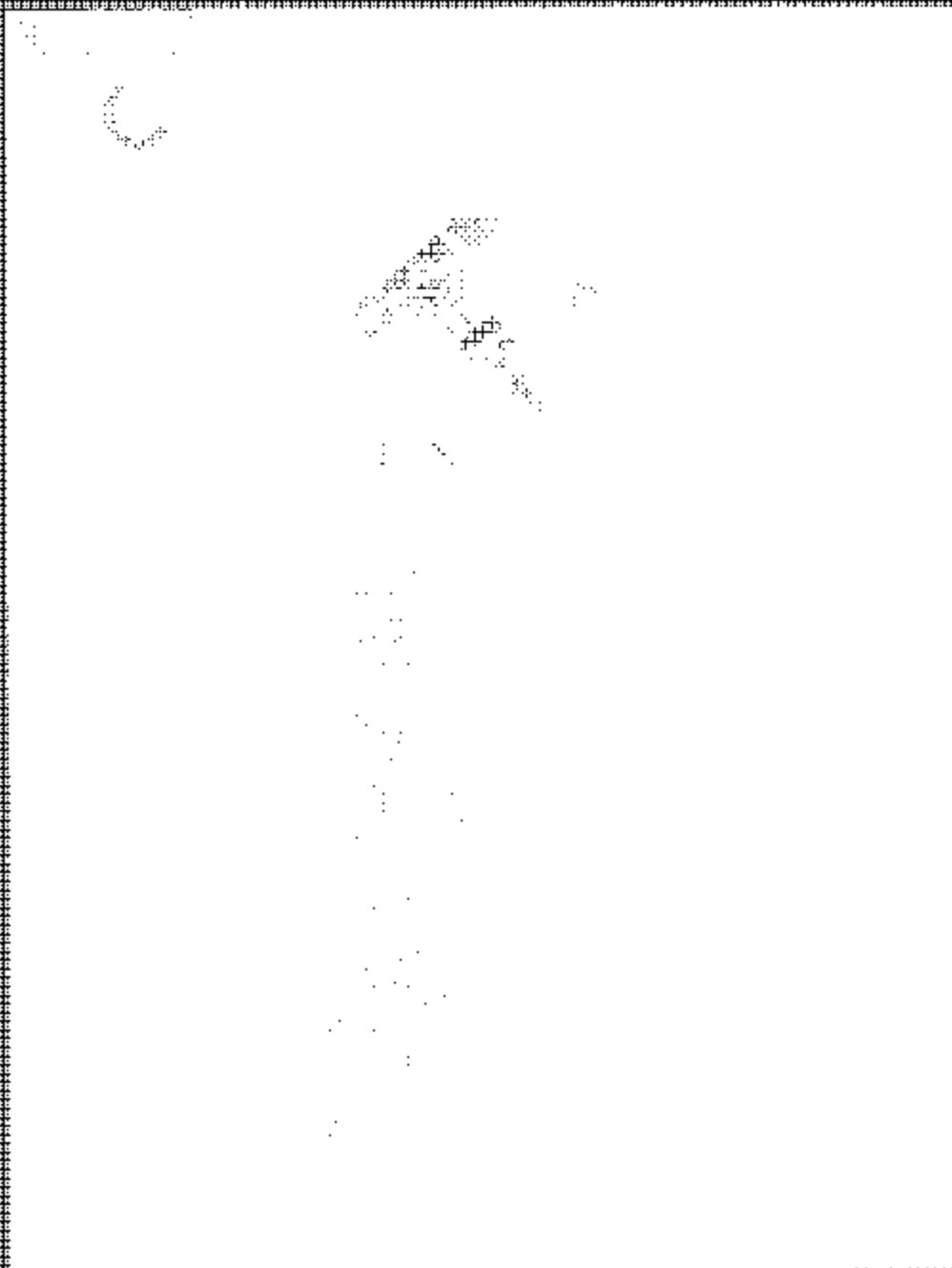


Figure 1.15: Posture of the person in the image.



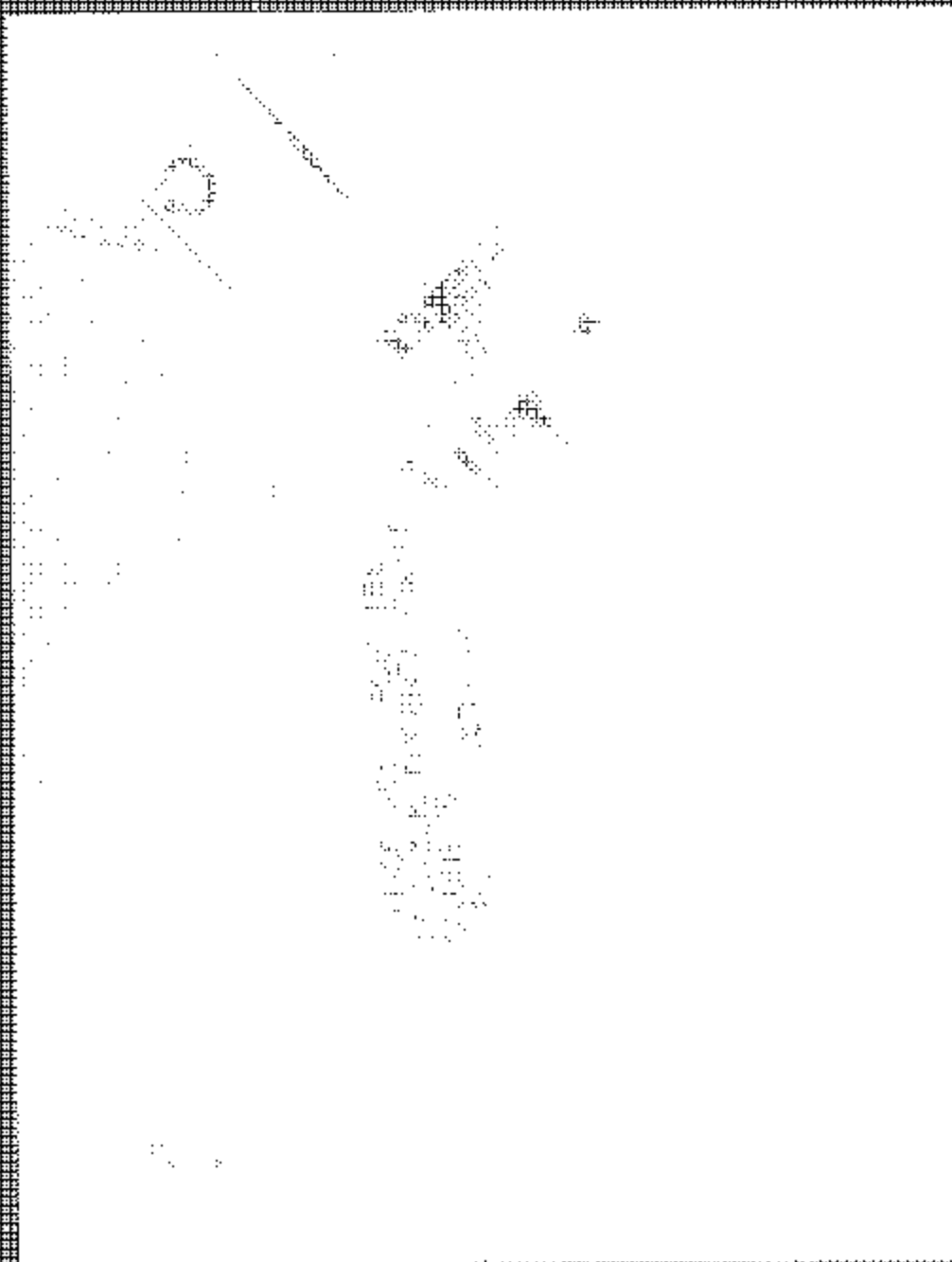
PHOTOGRAPHY UNIT, FBI LABORATORY, WASHINGTON, D.C. 20535



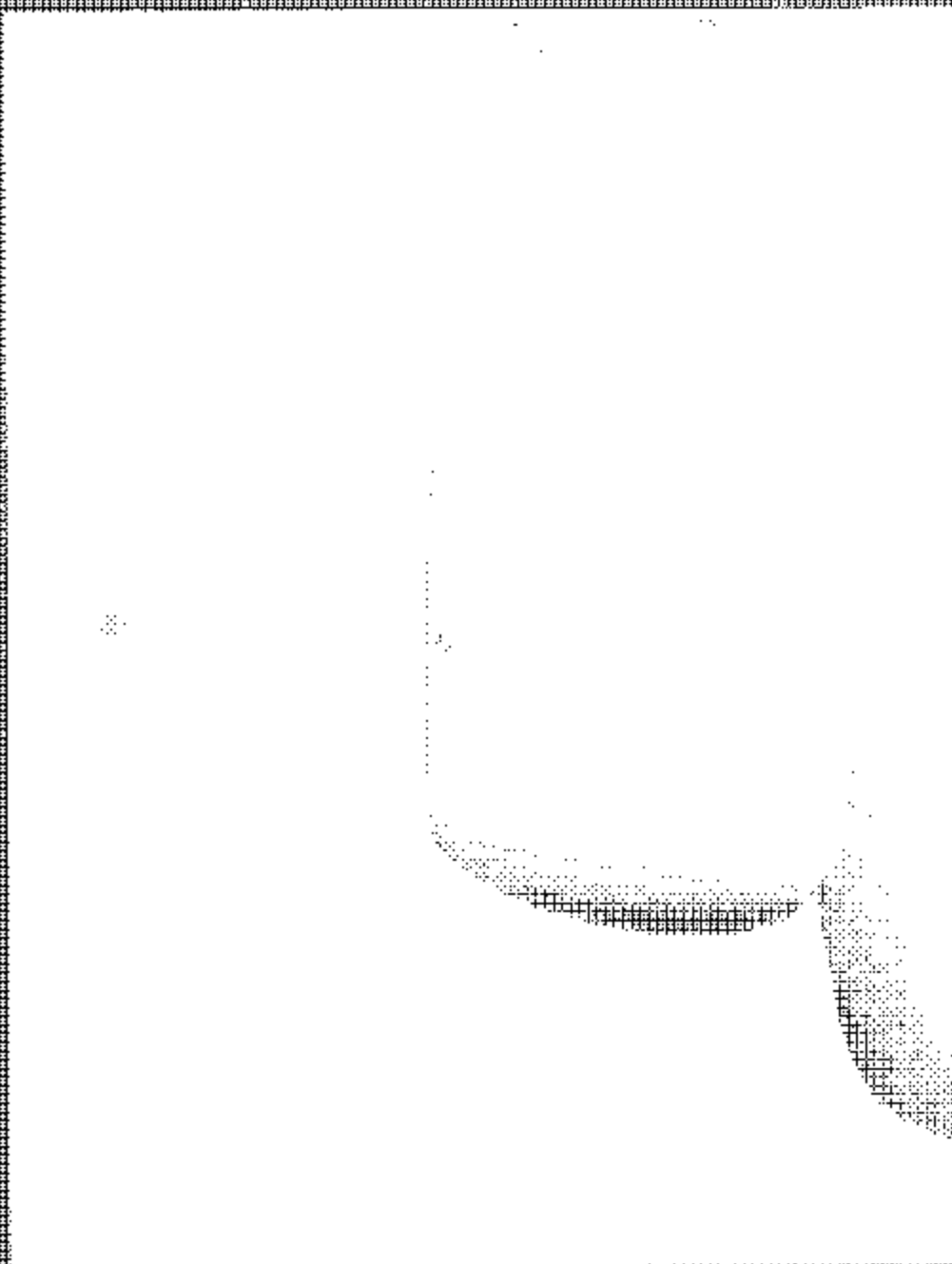
2010-2011 INDIANAPOLIS POLICE DEPARTMENT ANNUAL REPORT



Figure 1. Distribution of the species in the United States.



PAUL A. 2011 DUTY BELT PANEL ABOVE CENTER OF THE CENTER VESSEL WADANT NOV-1981



Page 1 of 1

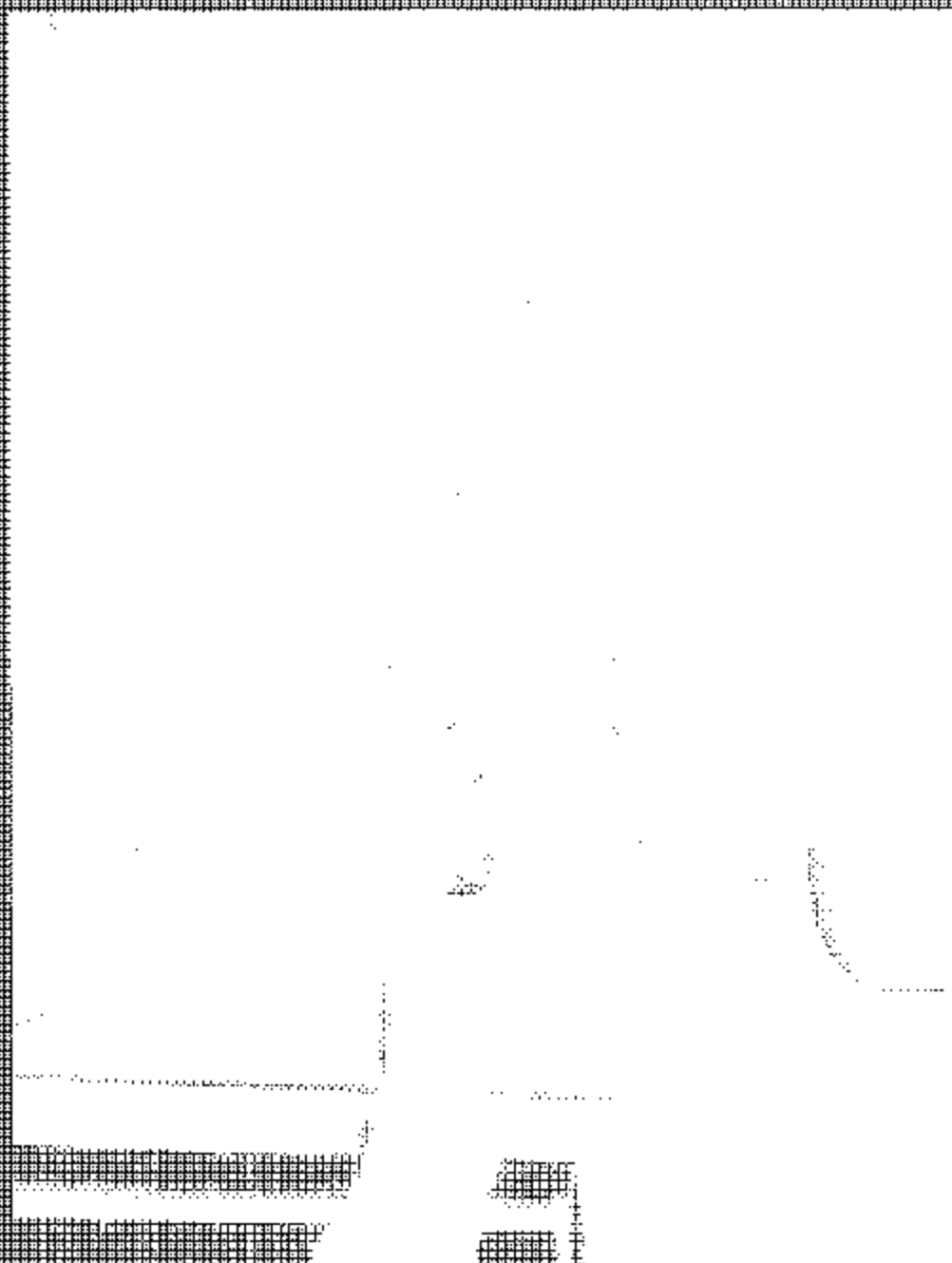


Figure 1.02: Field observations of the site (10/10/10)

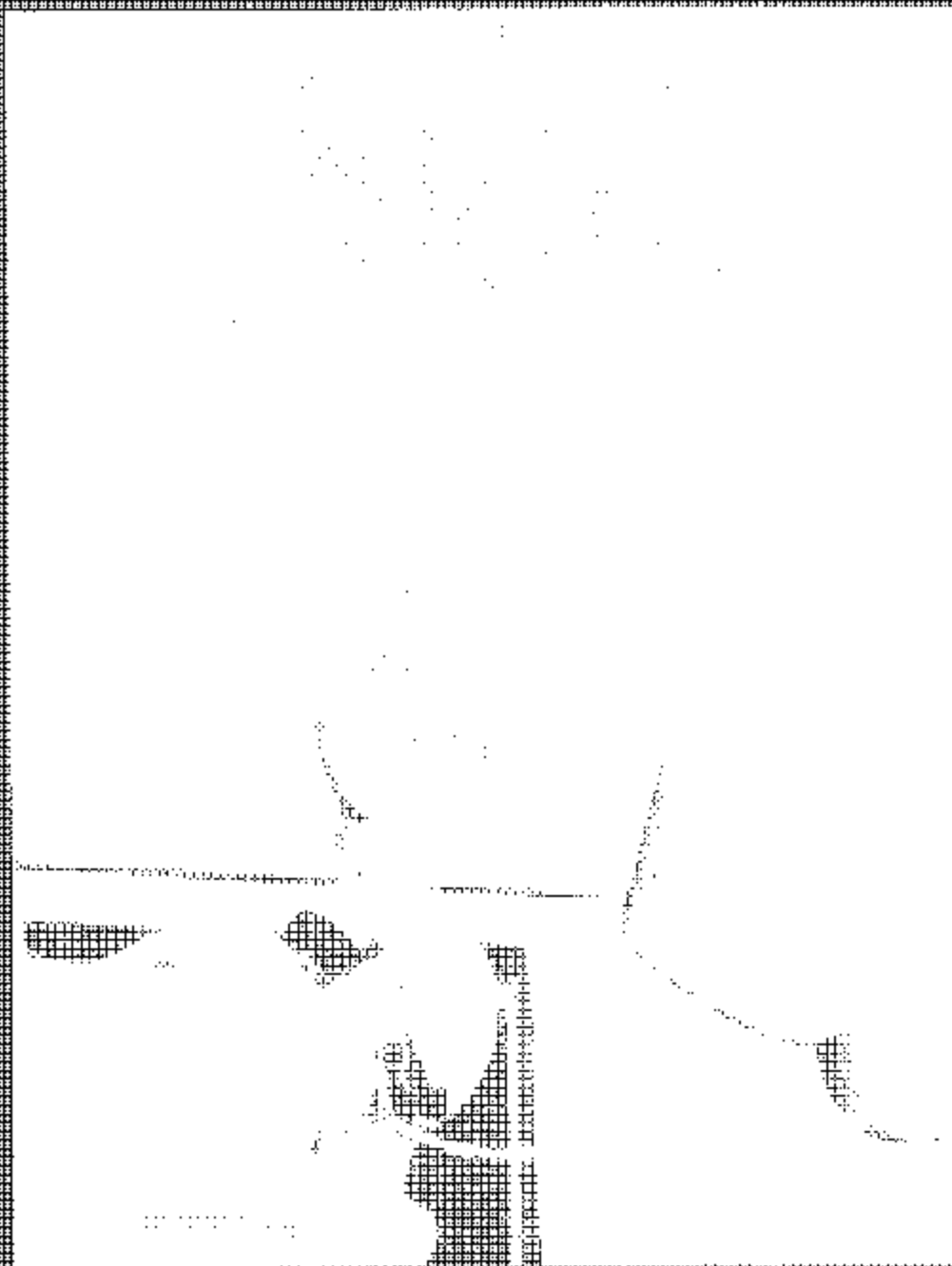


FIGURE 1. HAWAIIAN ISLANDS MARINE RESERVE LOCATION

APPENDIX B

INTERIOR COMPARTMENT DOOR CALCULATIONS

FORM 5

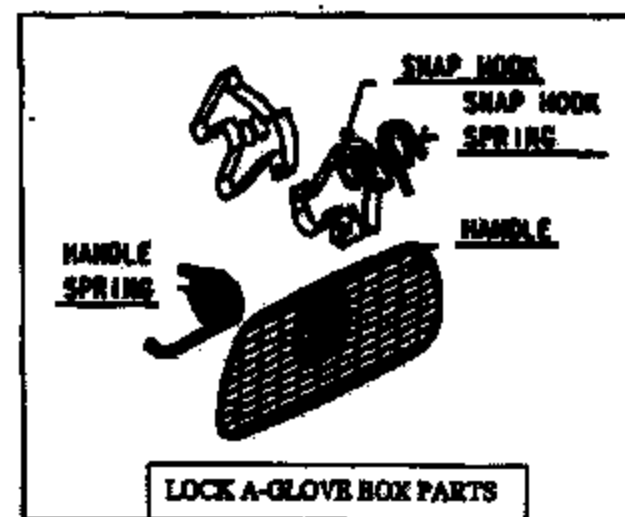
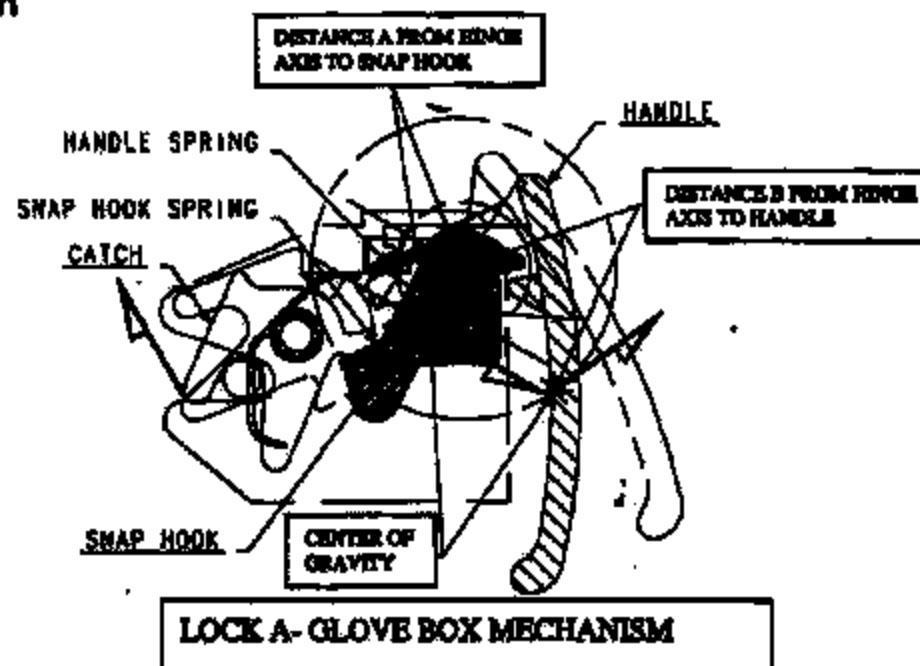
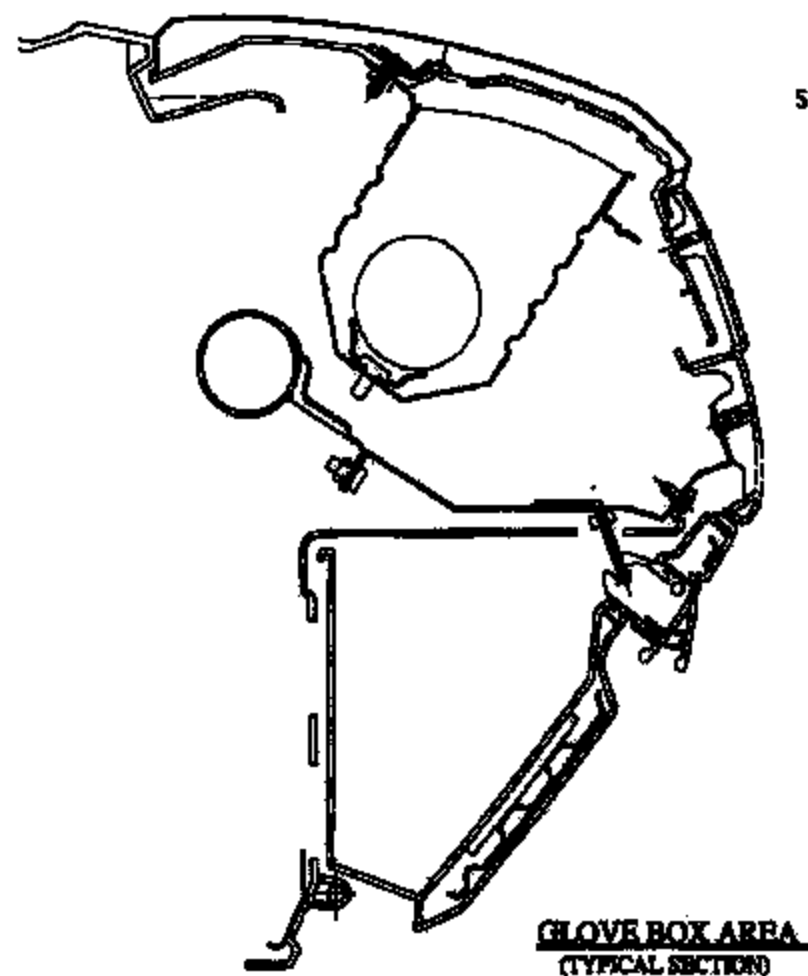
**FMVSS No. 201
Latch Component Analysis Information**

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."

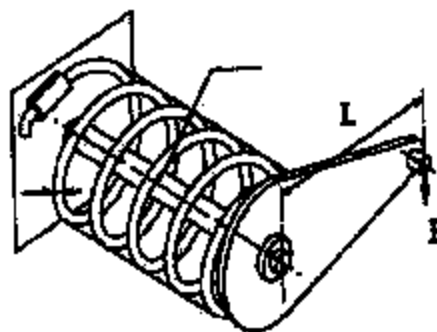
Such data shall include:

1. Geometric details of the latch/lock configuration.
 - See Attachment # 1 for Glove Box
 - See Attachment # 4 for Console
2. Mass data for each element in the linkage.
 - See Attachments # 2 and # 3 for Glove Box
 - See Attachment # 4 for Console
3. Spring rates for each spring element in the configuration.
 - See Attachments # 2, and # 3 for Glove Box
 - See Attachment # 4 for Console
4. Any additional details unique to the design yet necessary for the calculations.
 - None

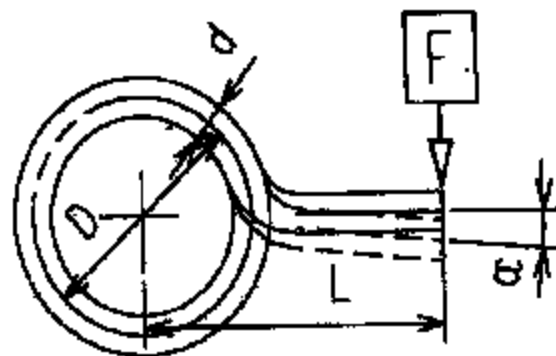
Attachment # 1. Glove Box Lock Configuration



Attachment # 2. Spring Configuration



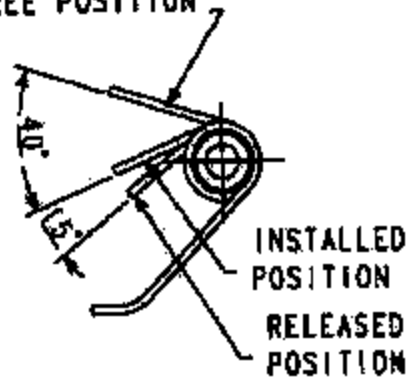
(FIG-1)



(FIG-2)

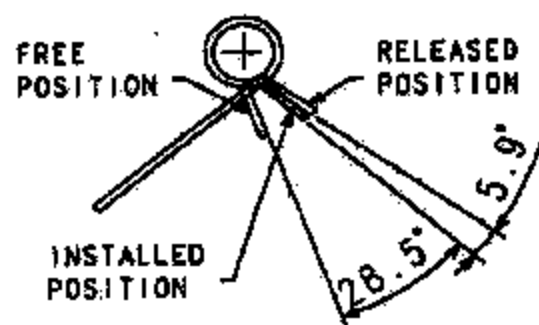
HANDLE SPRING

FREE POSITION



(FIG-3)

SNAP SPRING



(FIG-4)

Attachment # 3. Data for Calculations

1. SNAP HOOK RELATION DATA

VEH.	d [mm]	D [mm]	Modulus of elasticity E [10 ³ N/mm ²]	Stress Factor K	Spring Installed Angle[deg]	Spring Release Angle[deg]	Angle Twist α [rad]	Number of Active Coils	WEIGHT [g]	Distance A [mm]
FORENZA	0.7	8.2	201 - 222	1.062	18.5	5.9	0.374	2.9	3.2	6.1

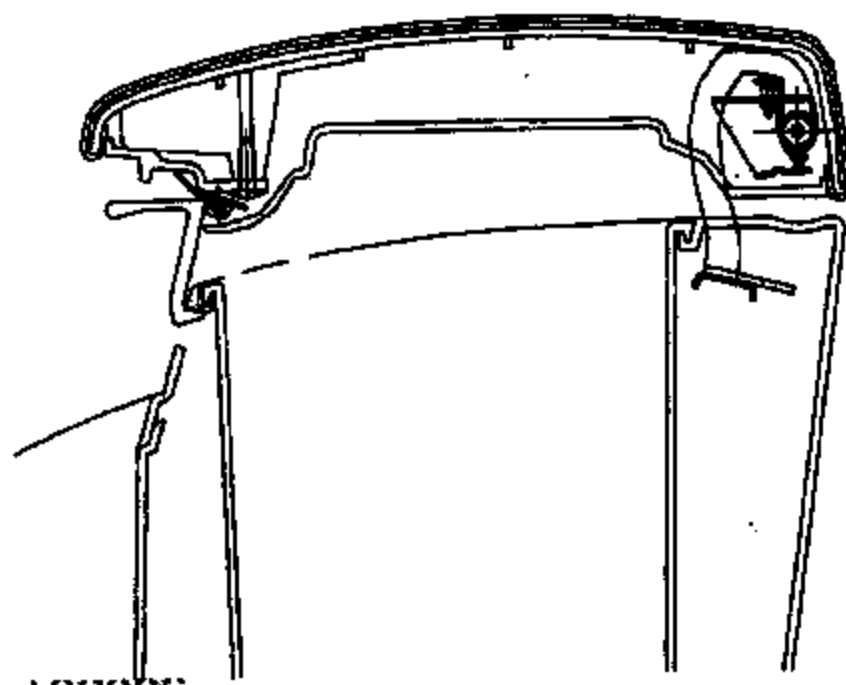
2. HANDLE RELATION DATA

VEH.	d [mm]	D [mm]	Modulus of elasticity E [10 ³ N/mm ²]	Stress Factor K	Spring Installed Angle[deg]	Spring Release Angle[deg]	Angle Twist α [rad]	Number of Active Coils	WEIGHT [g]	Distance B [mm]
FORENZA	1.2	7.4	182 - 201	1.142	43	15	1.012	2.39	18	18.5

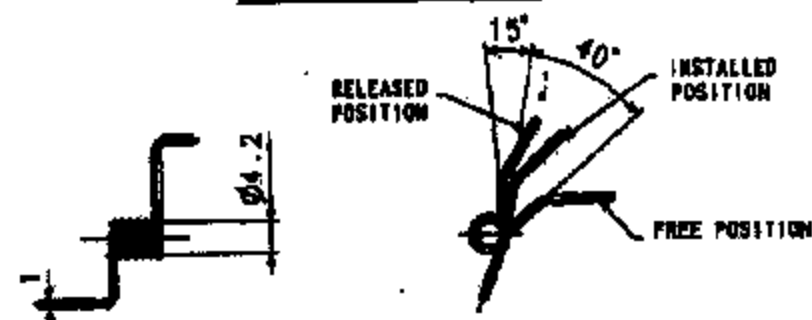
Note) 1. Modulus of Elasticity E based on Korea standard

2. Stress factor $K = (4 \times C^2 - C - 1) / (4 \times C \times (C - 1))$ $C = D/d$

Attachment # 4. Console Lock Configuration



CONSOLE HANDLE

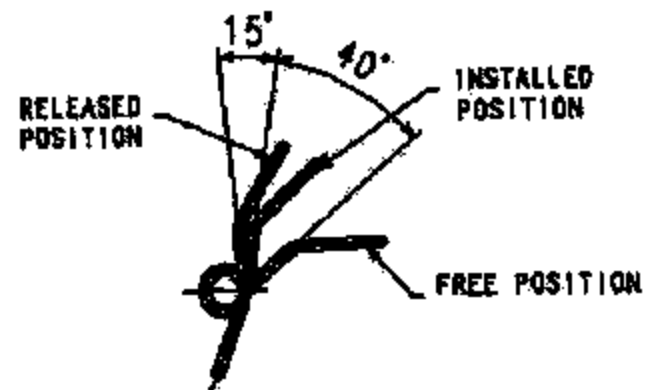


CONSOLE SPRING

- Data for Calculations

VEH.	d [mm]	D [mm]	Modulus of elasticity E [10 ⁹ N/mm ²]	Stress Factor k'	Spring Installed Angle[deg]	Spring Release Angle[deg]	Angle Twist α [rad]	Number of Active Coils	WEIGHT [g]	Distance A [mm]
------	-----------	-----------	--	------------------------	-----------------------------------	---------------------------------	----------------------------------	---------------------------	---------------	--------------------

FORNZA	1.0	4.2	201 - 222	1.218	40	15	0.969	5.92	8	14.8
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APPENDIX C

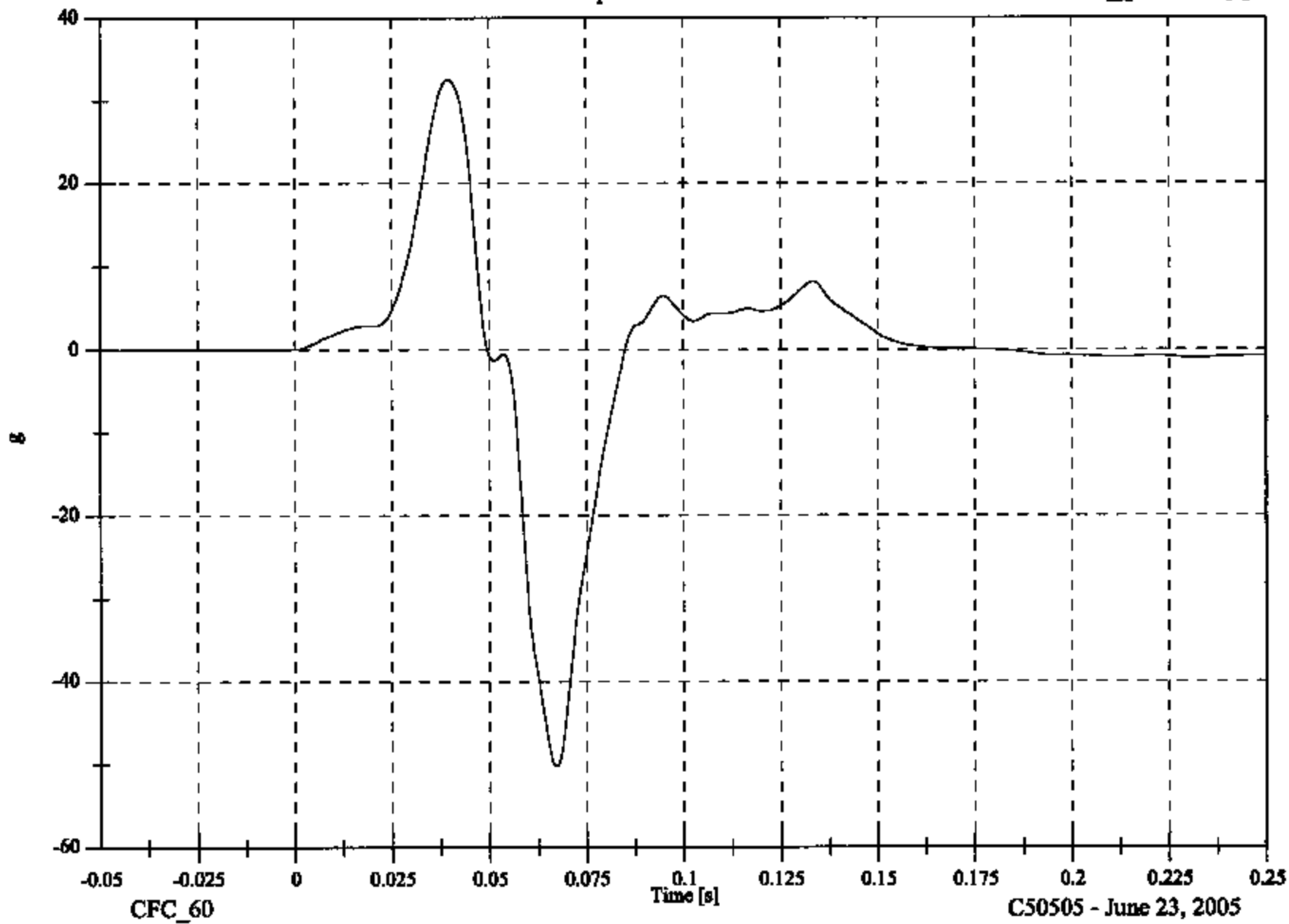
DATA PLOTS

FMVSS 201 Linear Impact - 2005 Suzuki Forenza - IP1 -49 Degrees

Impactor Headform Ax

Max: 32.6 [g] at 0.039 [s]

Min: -50.3 [g] at 0.067 [s]

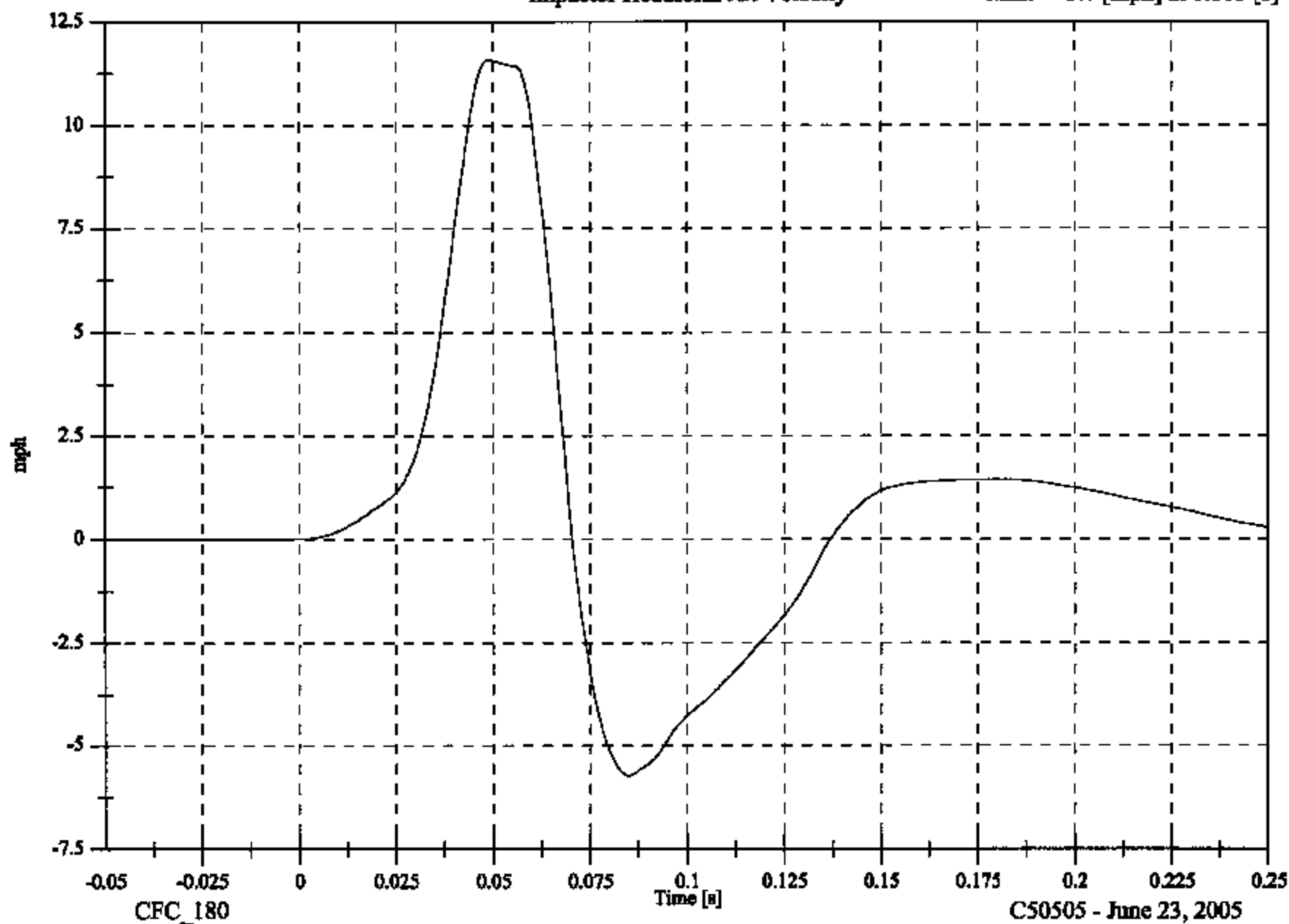


FMVSS 201 Linear Impact - 2005 Suzuki Forenza - IP1 -49 Degrees

Impactor Headform Ax Velocity

Max: 11.6 [mph] at 0.049 [s]

Min: -5.7 [mph] at 0.085 [s]



C50505 IP1 IMPACT PLOT #2

8655-F201-31

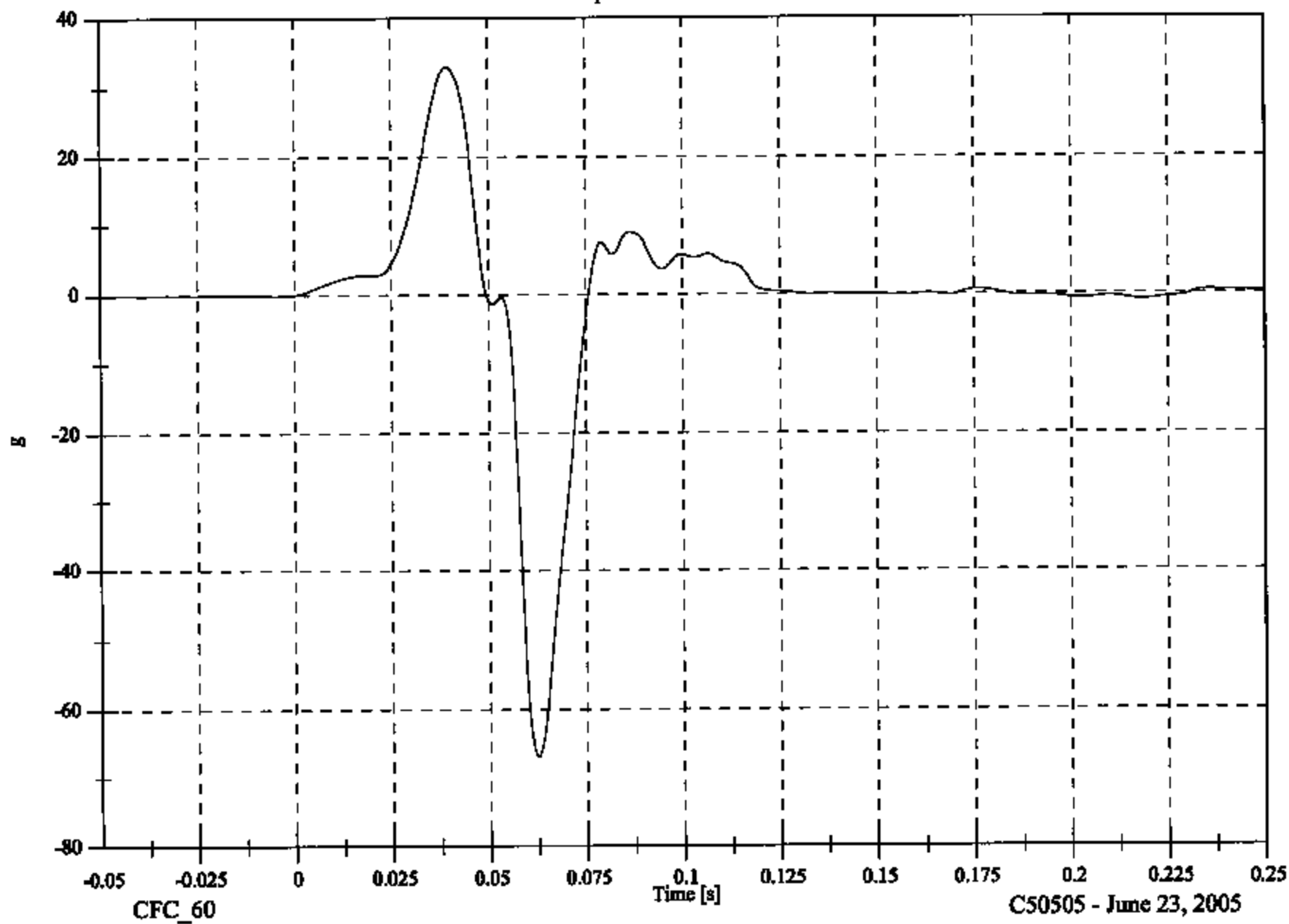
CFC_180

C50505 - June 23, 2005

FMVSS 201 Linear Impact - 2005 Suzuki Forenza - IP2 -53 Degrees
Impactor Headform Ax

Max: 33.0 [g] at 0.039 [s]

Min: -66.9 [g] at 0.062 [s]

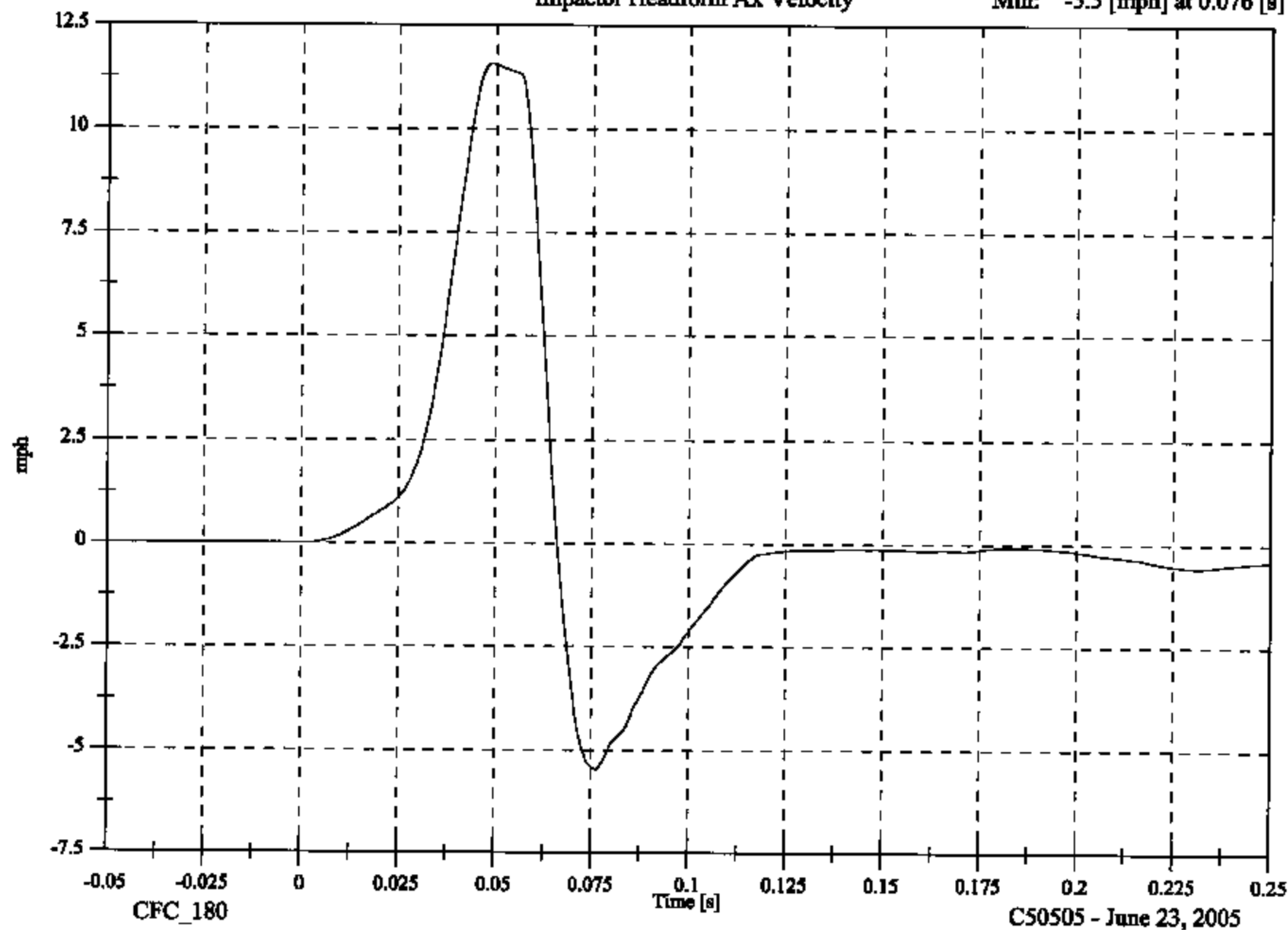


FMVSS 201 Linear Impact - 2005 Suzuki Forenza - IP2 -53 Degrees

Max: 11.6 [mph] at 0.049 [s]

Impactor Headform Ax Velocity

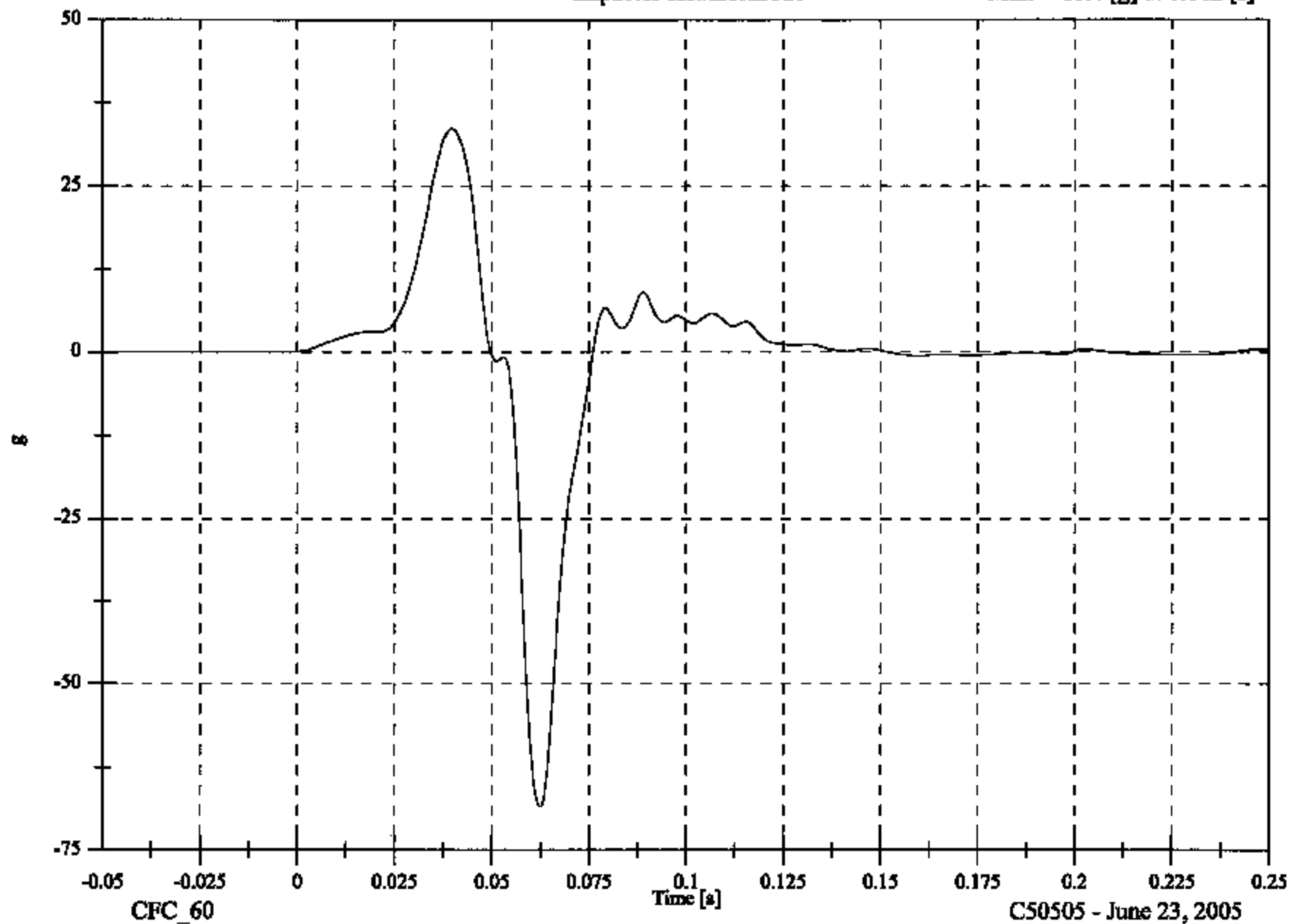
Min: -5.5 [mph] at 0.076 [s]



FMVSS 201 Linear Impact - 2005 Suzuki Forenza - IP3 -53 Degrees
Impactor Headform Ax

Max: 33.5 [g] at 0.040 [s]

Min: -68.4 [g] at 0.062 [s]



C50505 IP3 IMPACT PLOT #1

8655-F201-31

CFC_60

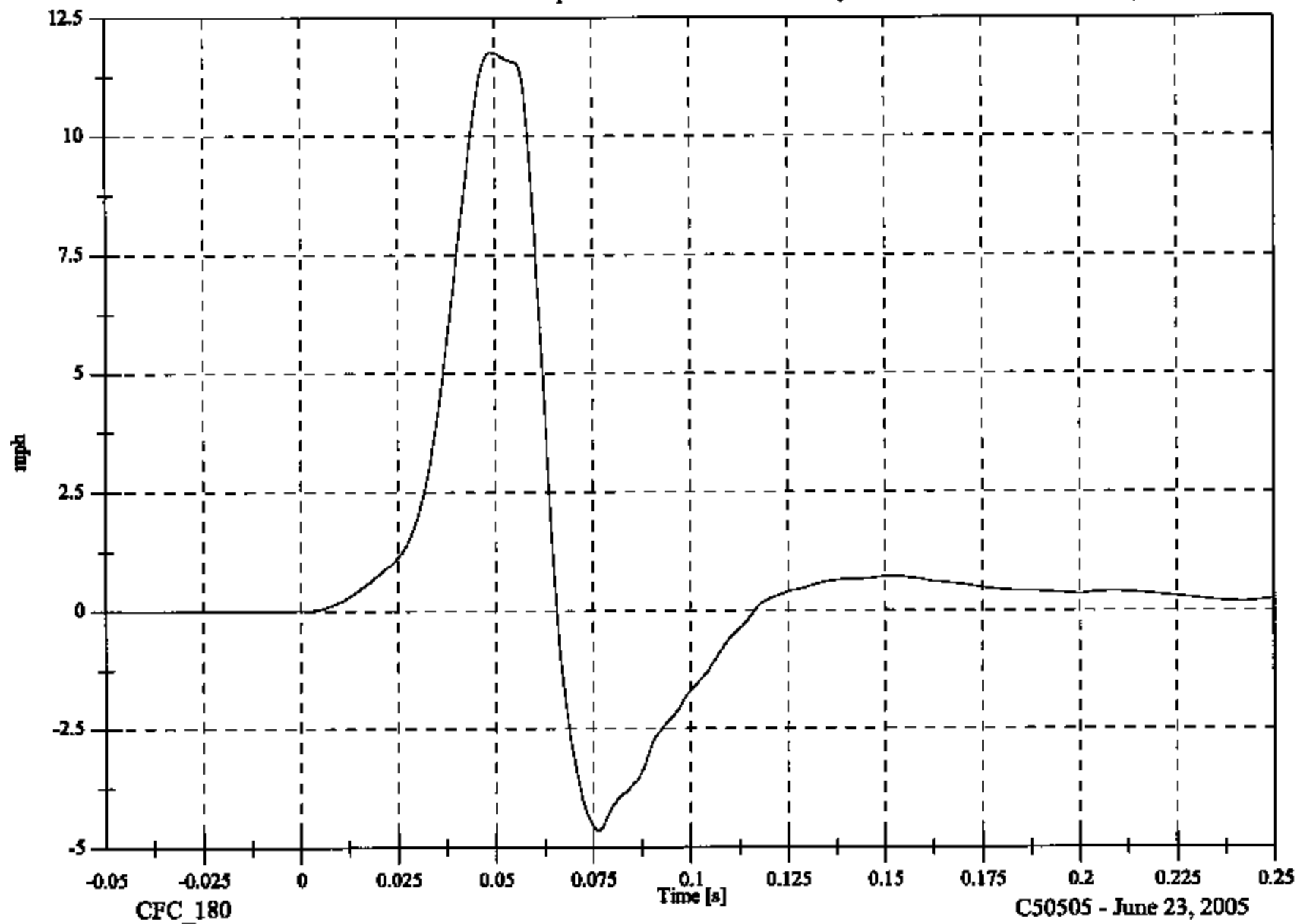
C50505 - June 23, 2005

FMVSS 201 Linear Impact - 2005 Suzuki Forenza - IP3 -53 Degrees

Impactor Headform Ax Velocity

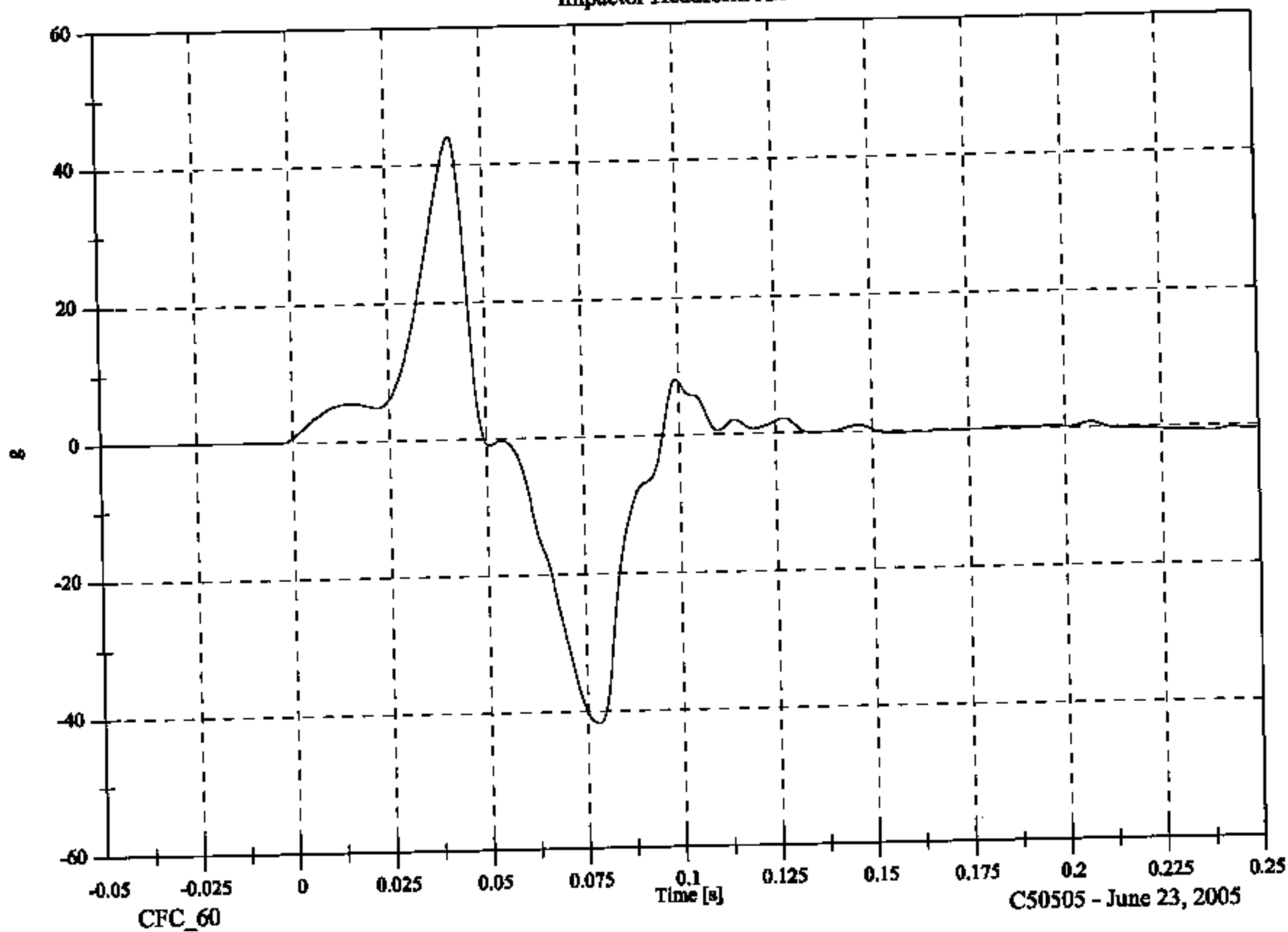
Max: 11.8 [mph] at 0.049 [s]

Min: -4.6 [mph] at 0.076 [s]



FMVSS 201 Linear Impact - 2005 Suzuki Forenza - SB -52 Degrees
Impactor Headform Ax

Max: 44.1 [g] at 0.041 [s]
Min: -41.8 [g] at 0.078 [s]



C50505 SEAT BACK IMPACT PLOT #1

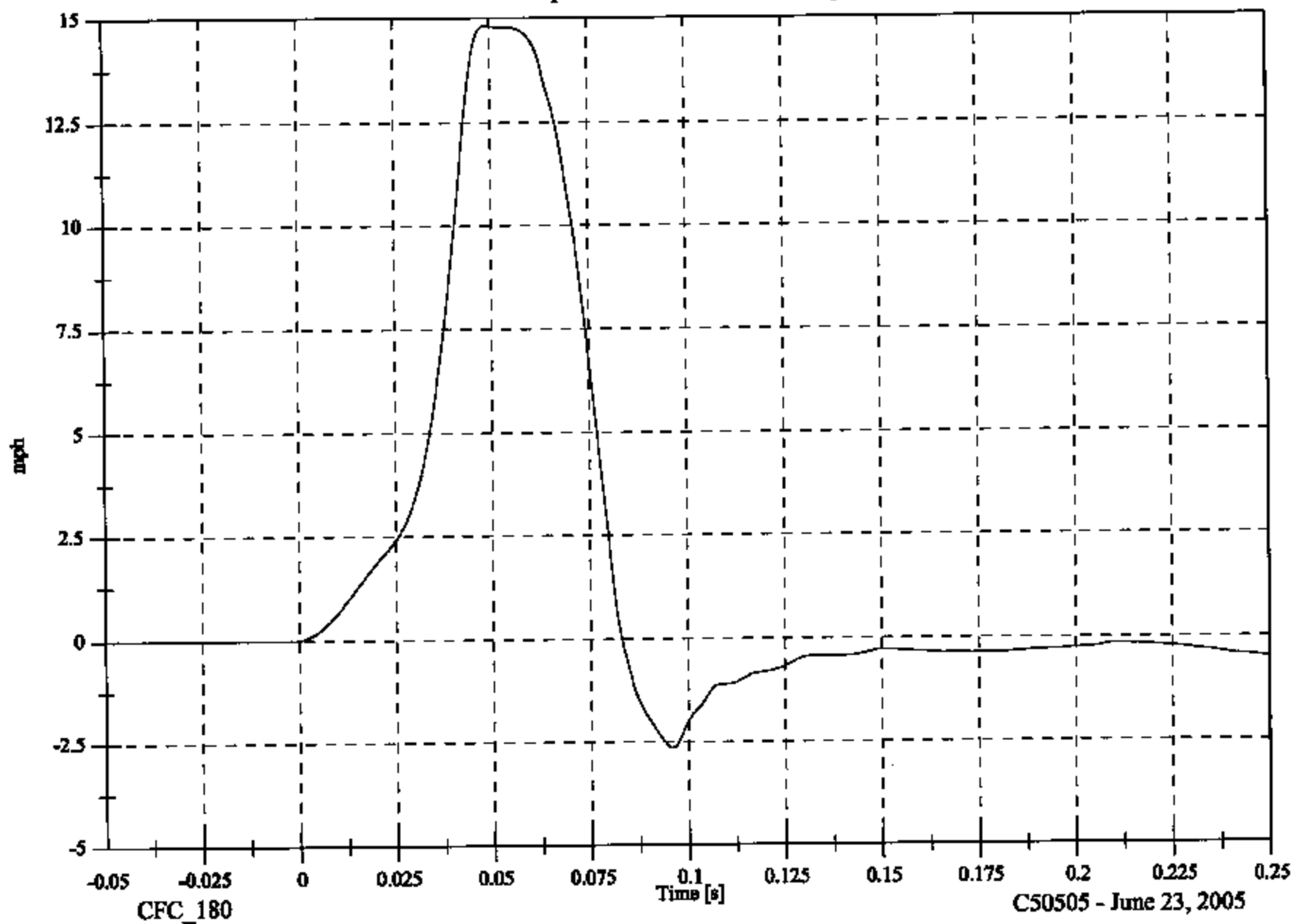
8655-F201-31

FMVSS 201 Linear Impact - 2005 Suzuki Forenza - SB -52 Degrees

Impactor Headform Ax Velocity

Max: 14.8 [mph] at 0.049 [s]

Min: -2.6 [mph] at 0.096 [s]



C50505 SEAT BACK IMPACT PLOT #2

8655-F201-31

C50505 - June 23, 2005