

CHILD SEAT AND RESTRAINT SYSTEMS TEST RESULTS

APPENDIX D

**THE UNIVERSITY OF MICHIGAN
HIGHWAY SAFETY RESEARCH INSTITUTE
HURON PARKWAY AND BAXTER ROAD
ANN ARBOR, MICHIGAN 48105**

Final Report

October 1970

Volume III of III

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NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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16. Abstract This report contains the data records obtained in a test program studying the safety performance of child car seats and restraint systems. Included with each test result is an HSRI Summary Data Sheet, a copy of a oscillographic record of transducer data, and high speed photographic documentation of occupant kinematics. In cases where the oscillographic record or the photographic documentation is missing, the data was not obtained.			
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TABLE OF CONTENTS

Table of Contents

Volume I. Test Nos. A-017 to A-095 (pages 1-125).

Volume II. Test Nos. A-096 to A-130 (pages 126-249).

Volume III. Test Nos. A-131 to A-182 (pages 250-374).

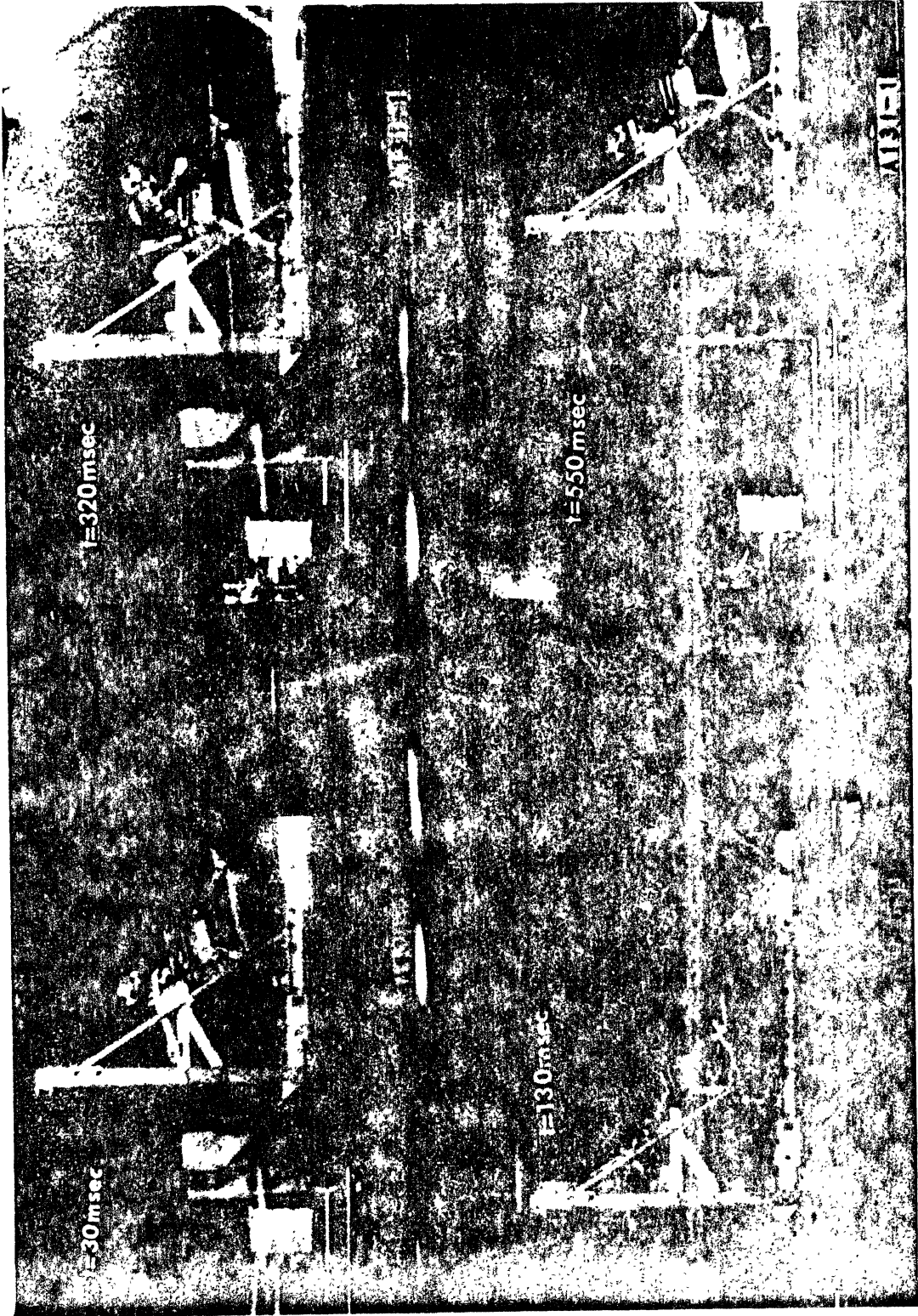
HSRI SUMMARY DATA SHEET (FH-11-6962)

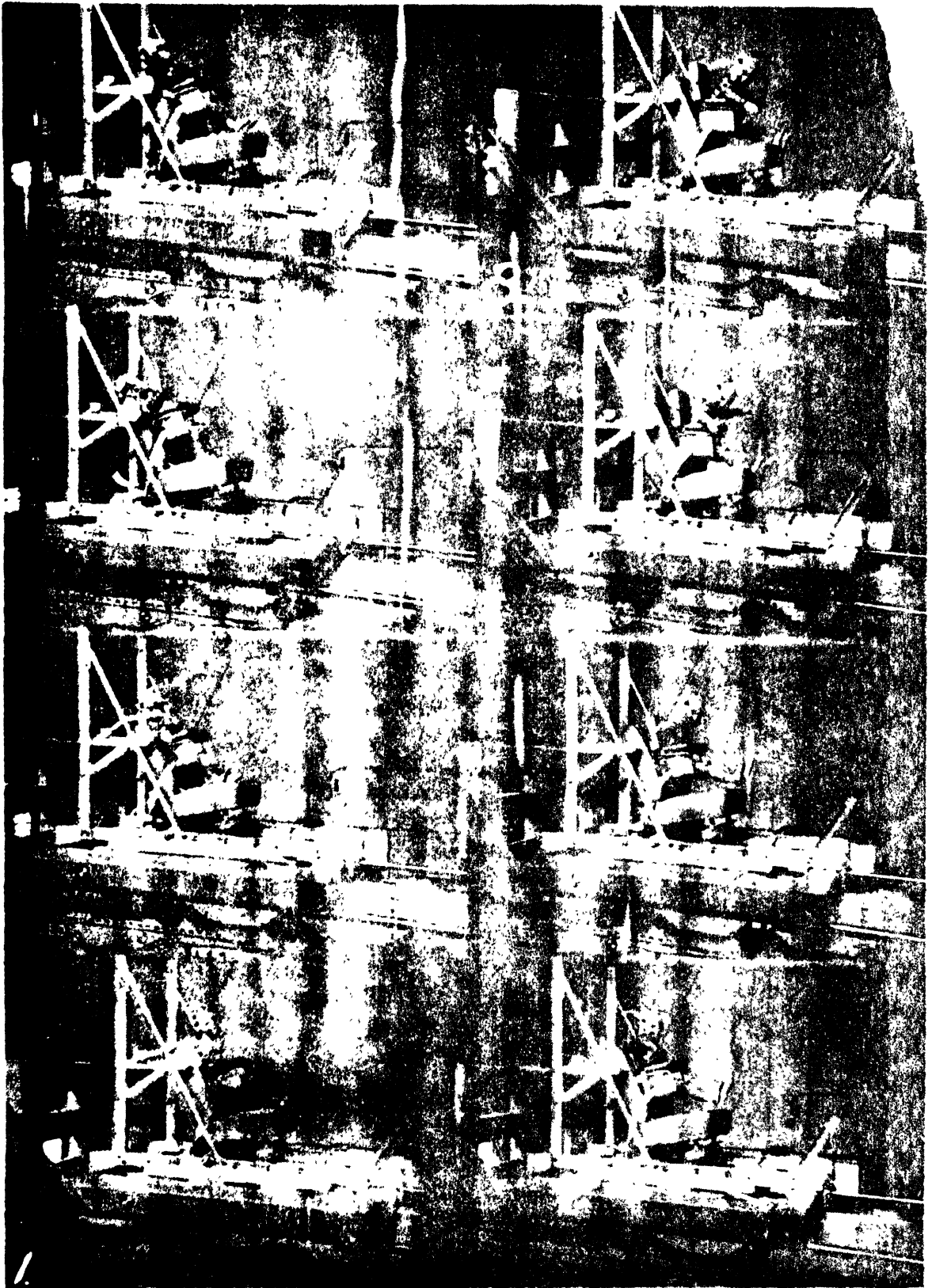
Test No: A-131
Test Date: 5 August 1969
Restraint Code No: C-14
Restraint Description: International Seat No. 4613

Dummy: 3 year
Sled Velocity: 30 mph
Sled G-level: 18
Impact Direction: Rear-end
Dummy Attitude: Sitting

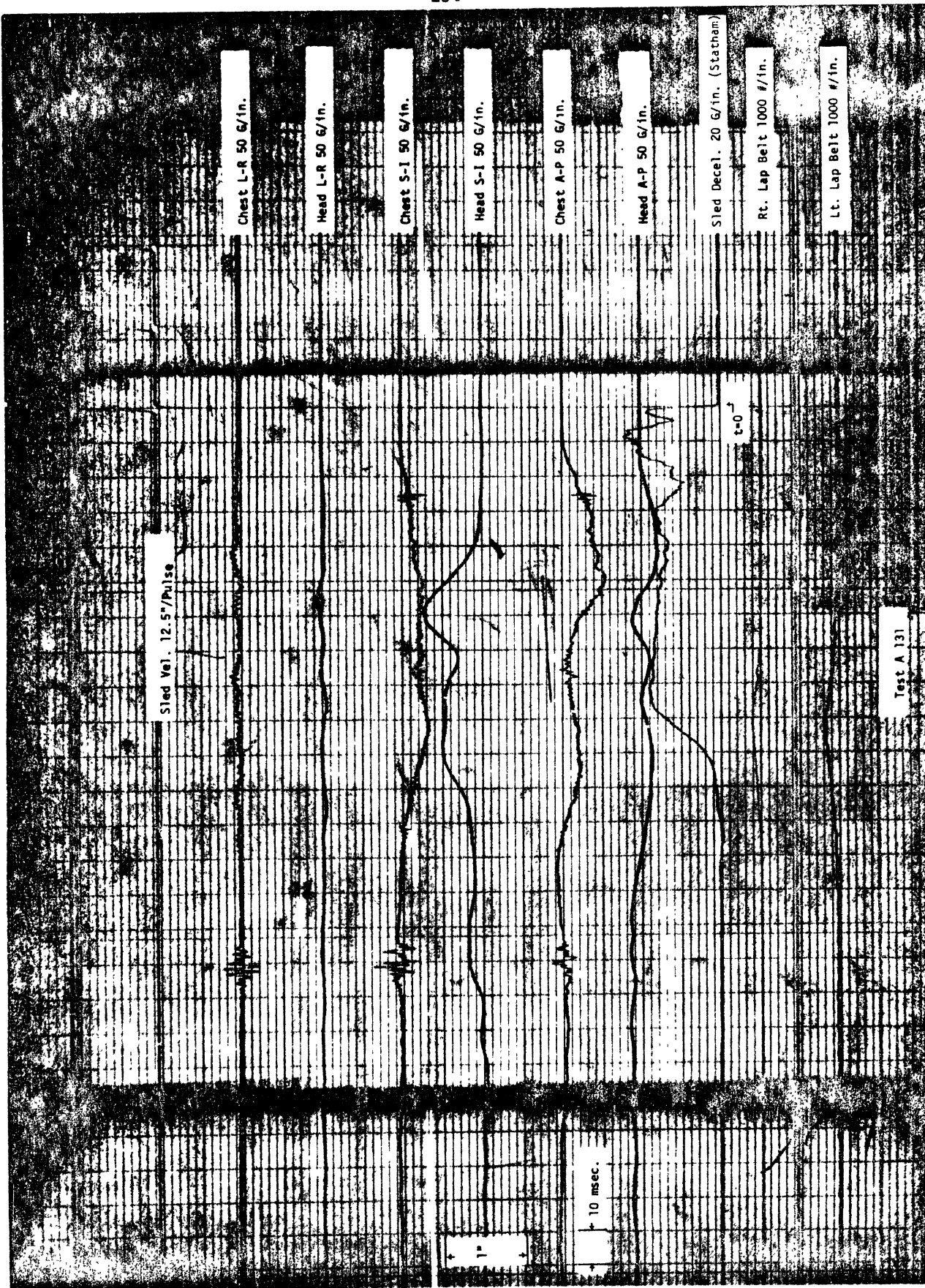
Test Observation:

The g-loadings experienced by the dummy were moderate. However, the height of the child seat back coincided exactly with the height of the adult seat back. Because there was no headrest on the adult seat, severe whiplash was encountered by the dummy.





A131



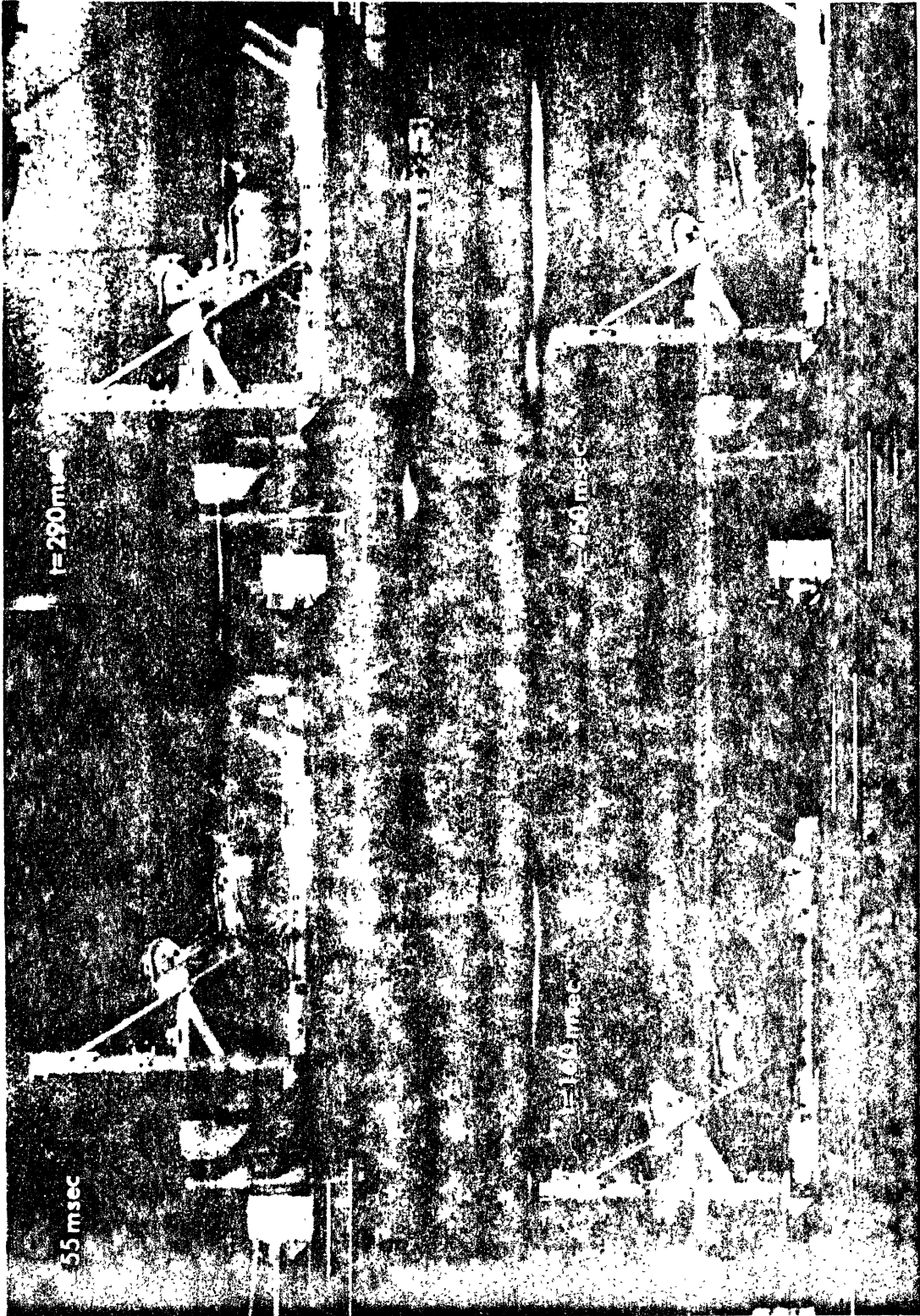
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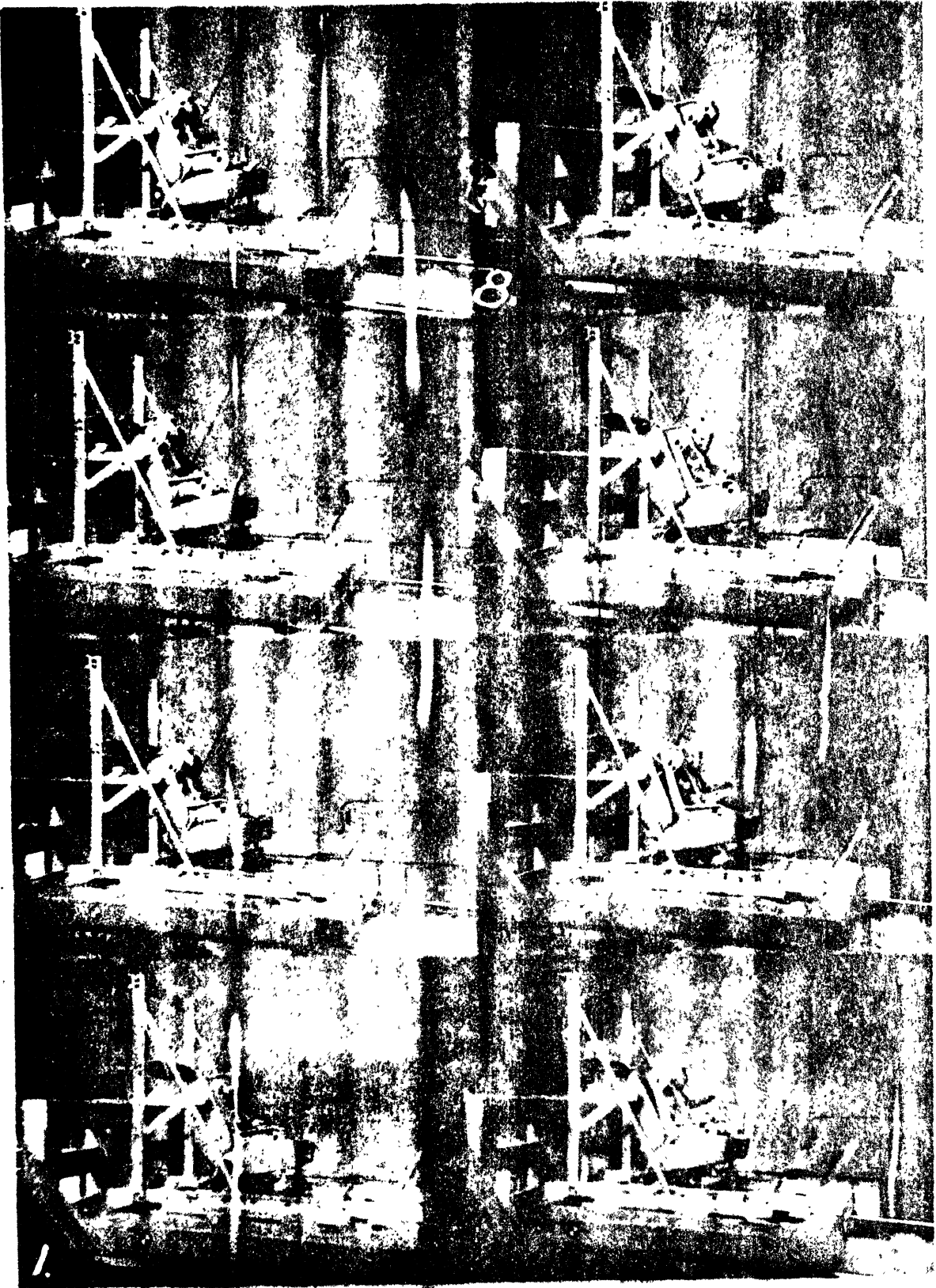
Test No: A-132
Test Date: 6 August 1969
Restraint Code No.: C-16
Restraint Description: Klippan Safety Seat

Dummy: 3 year
Sled Velocity: 30 mph
Sled G-level: 18
Impact Direction: Rear-end
Dummy Attitude: Sitting

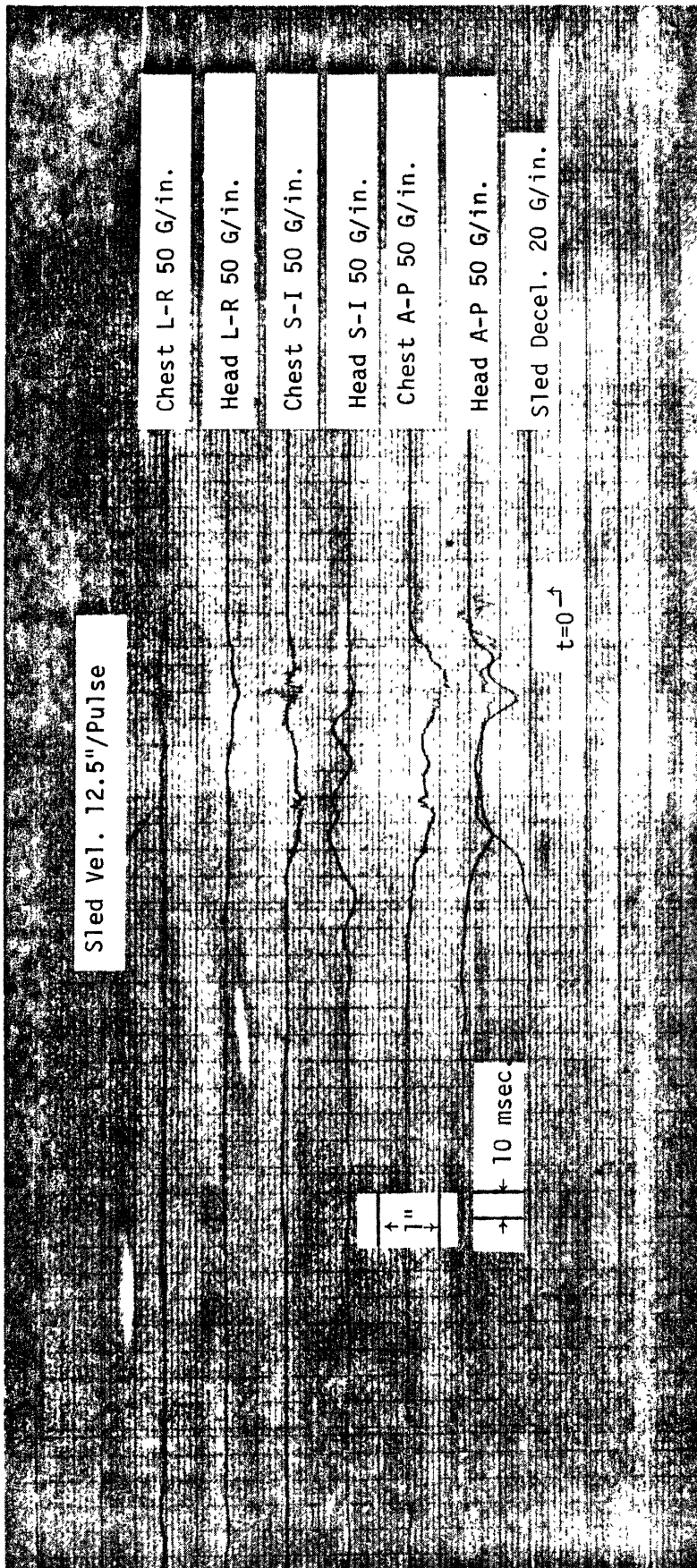
Test Observation:

The dummy appeared to receive a very gentle ride and the restraint system performed well.





A132



Test A 132

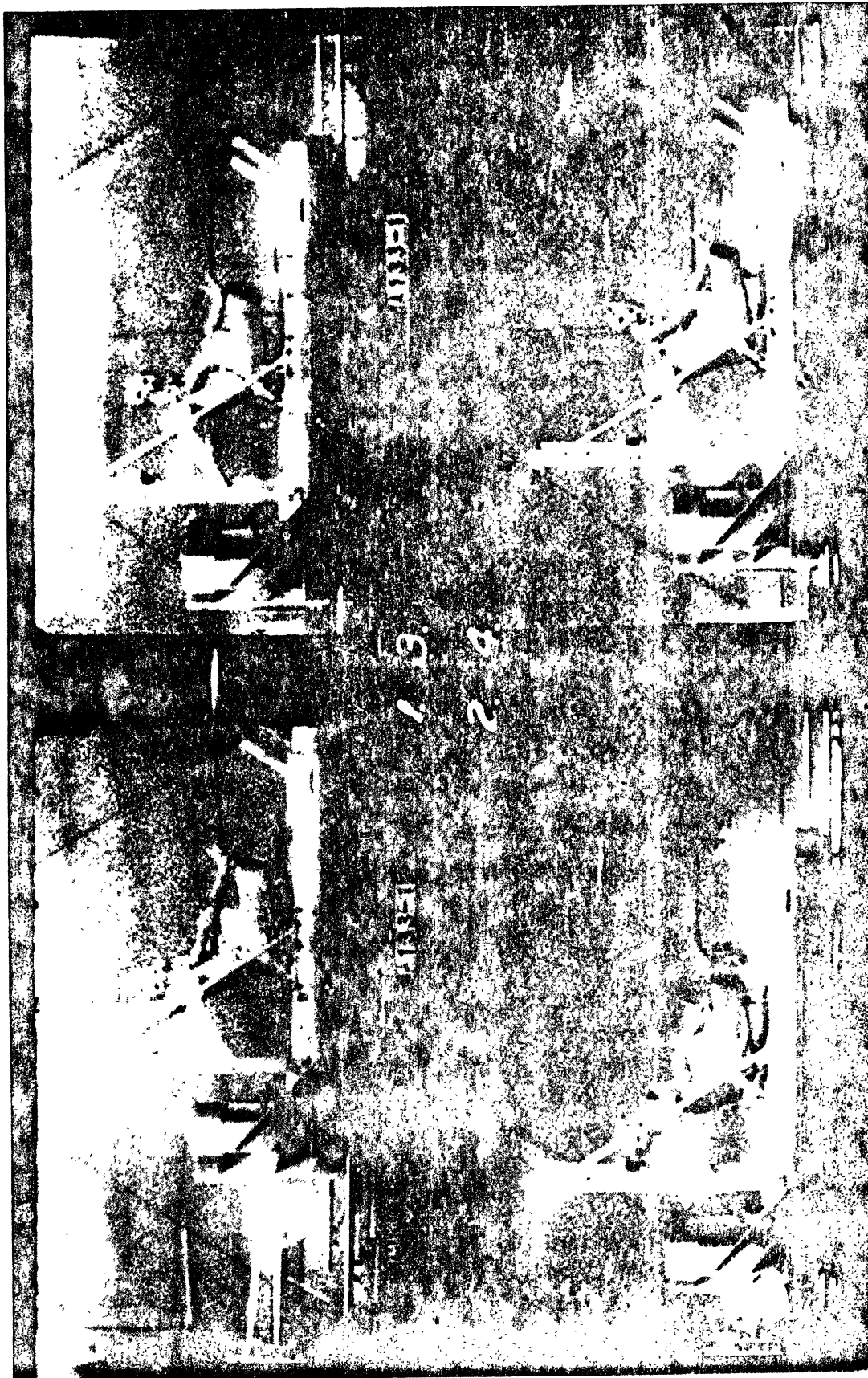
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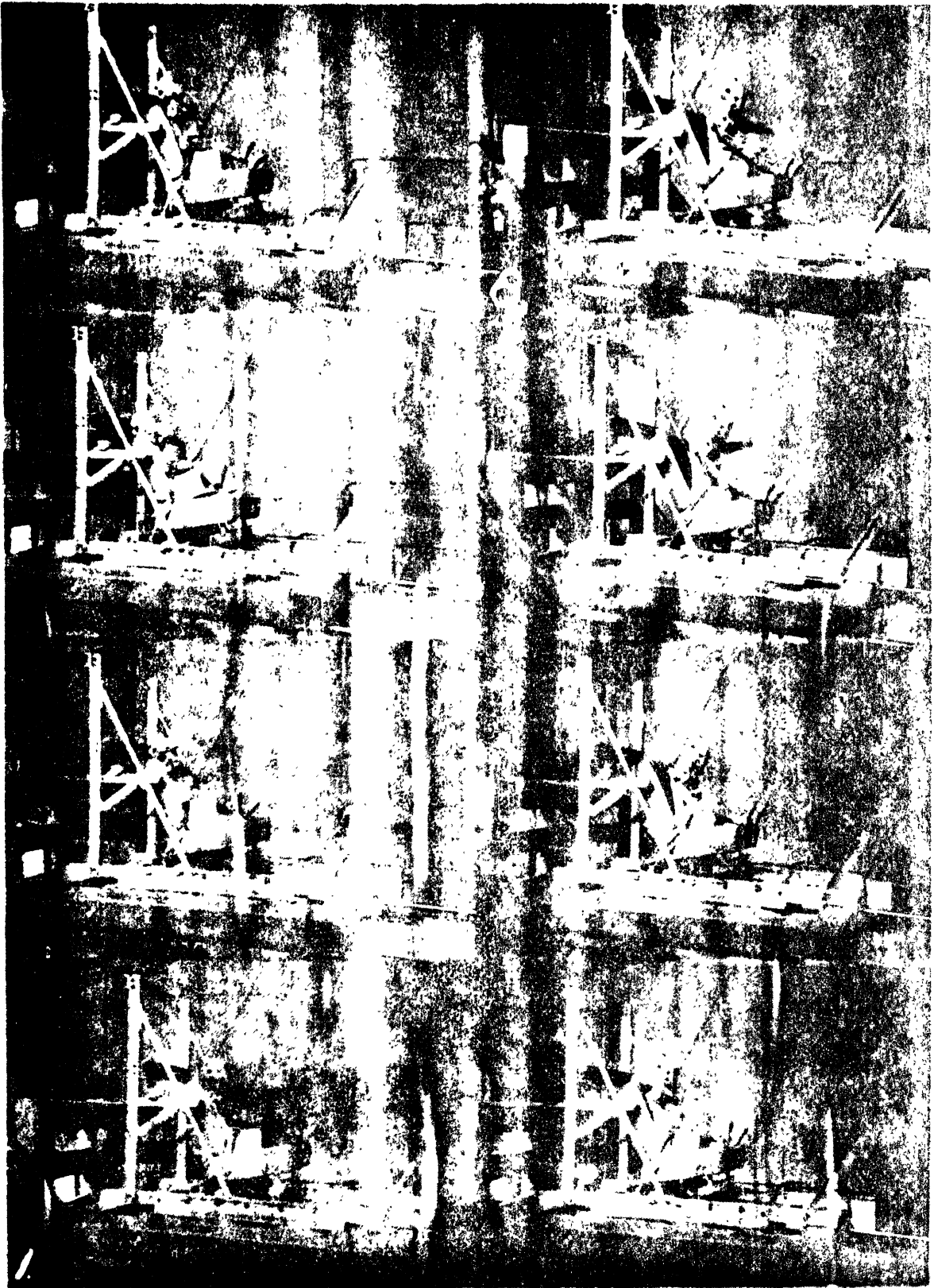
Test No: A-133
Test Date: 6 August 1969
Restraint Code No.: C-3
Restraint Description: General Motors Standard Seat

Dummy: 3 year
Sled Velocity: 30 mph
Sled G-level: 18
Impact Direction: Rear-end
Dummy Attitude: Sitting

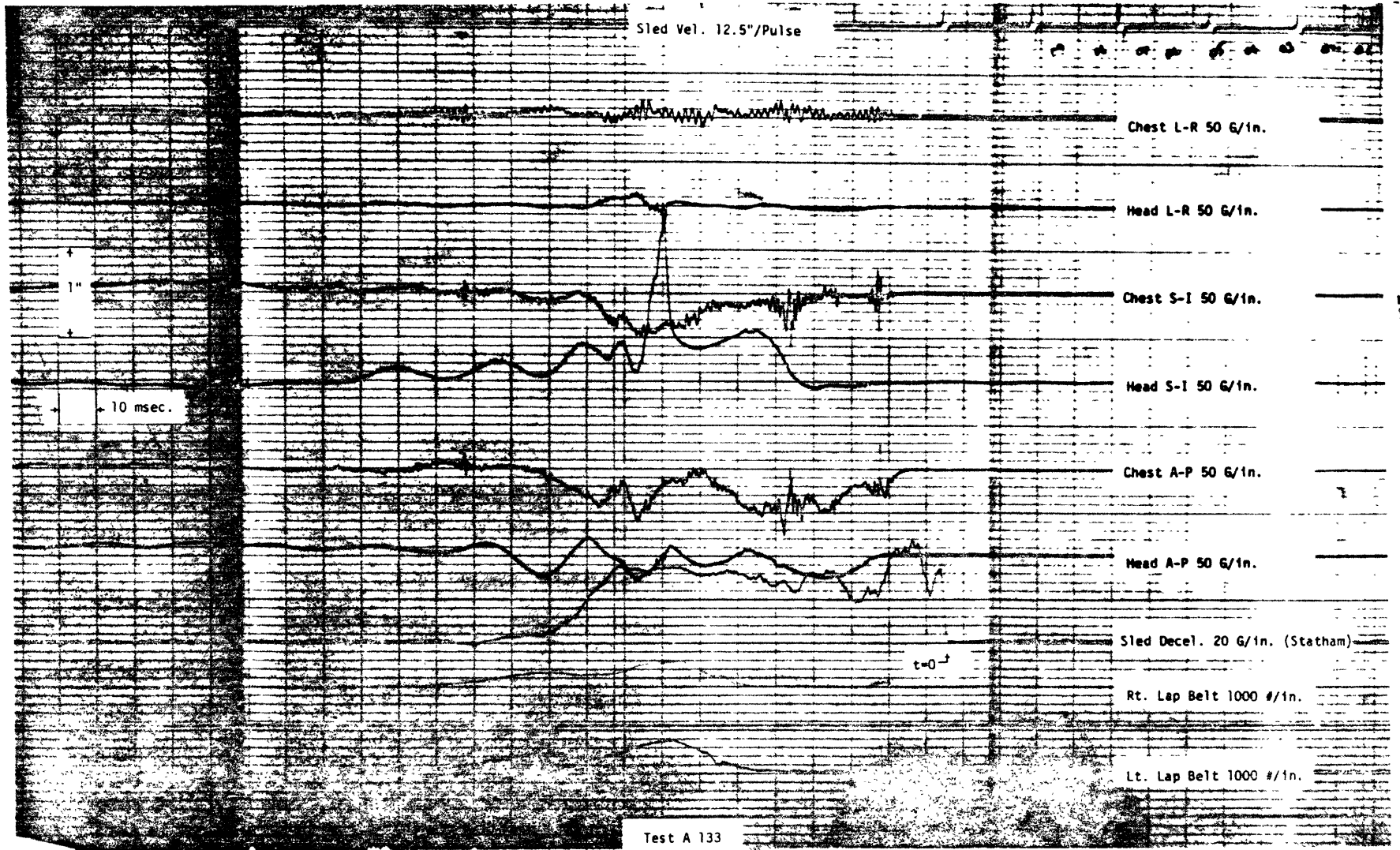
Test Observation:

The dummy received quite high loadings especially in the chest superior-inferior accelerometer. Because the height of the child seat and the height of the adult seat were similar the dummy received a very severe whiplash of the neck. Moderate rebound was observed.





A133



202

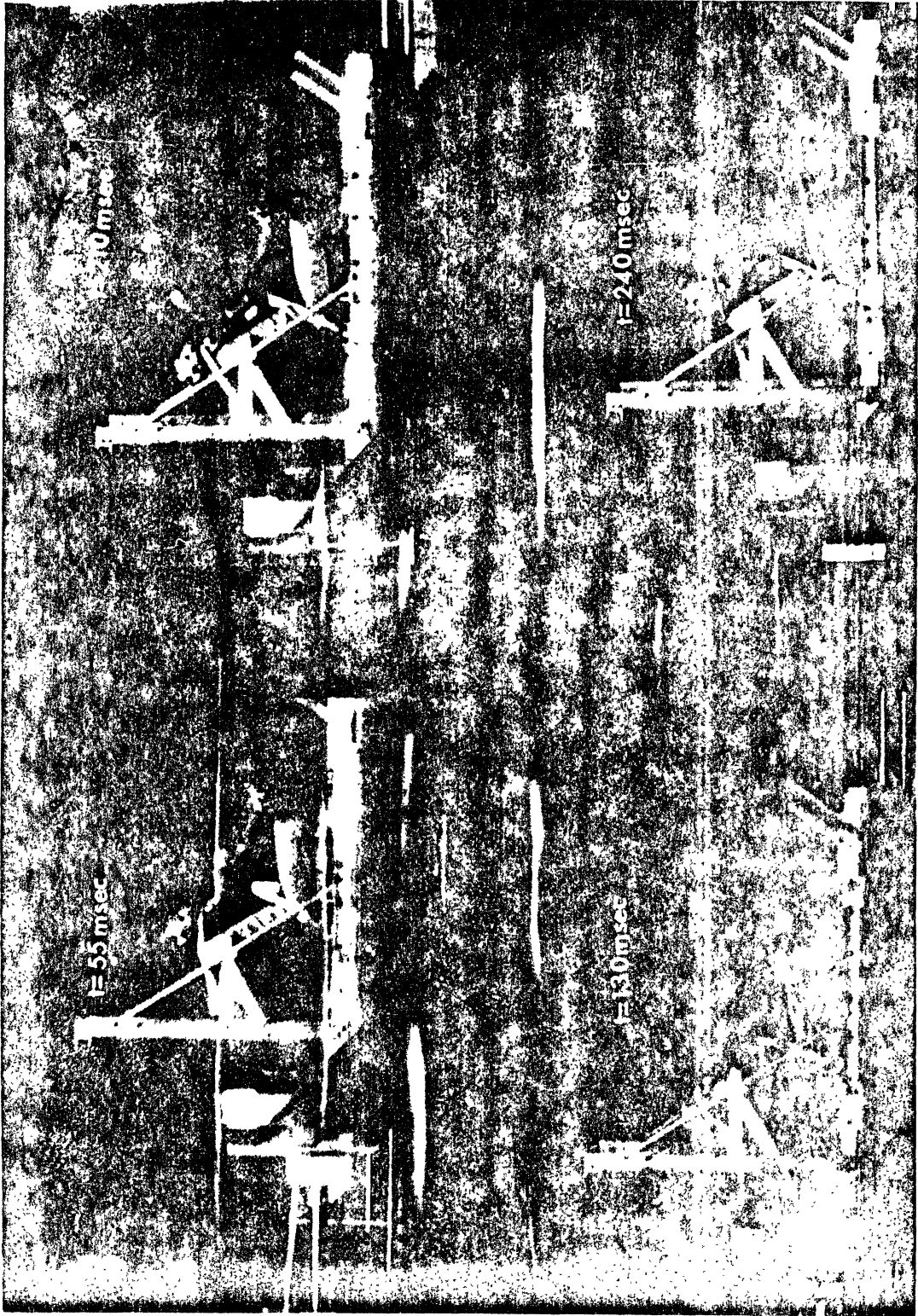
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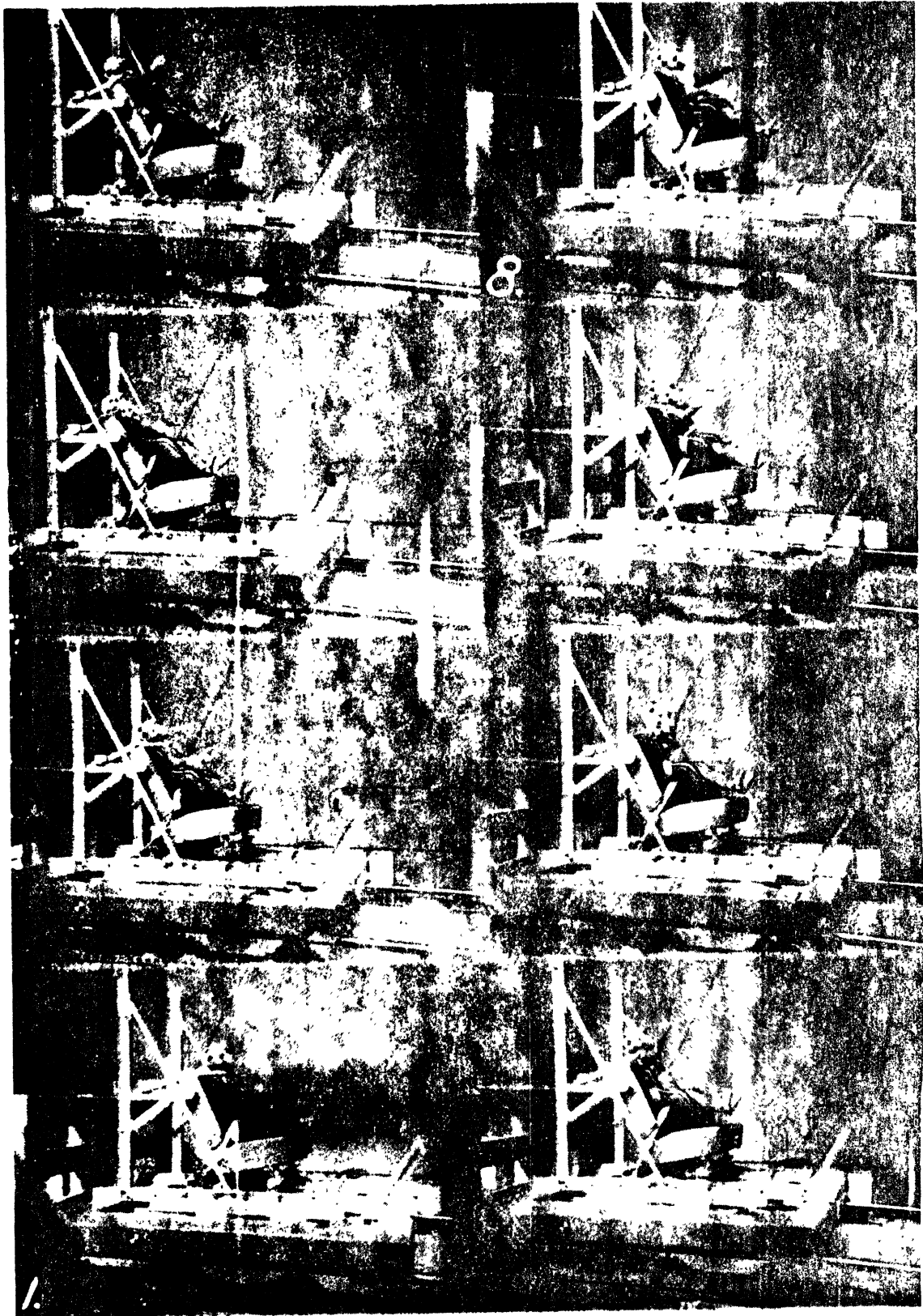
Test No: A-134
Test Date: 7 August 1969
Restraint Code No.: C-5
Restraint Description: Sears Seat No. 5516

Dummy: 3 year
Sled Velocity: 30 mph
Sled G-level: 18
Impact Direction: Rear-end
Dummy Attitude: Sitting

Test Observation:

The loadings experienced by the dummy in this test were quite gentle. However, because of the seat height problem severe whiplash was again observed.





A134

Test A 134

Lt. Lap Belt 1000 #/in.

Rt. Lap Belt 1000 #/in.

Sted Decel. 20 g/in. (Statham)

t=0

Head A-P 50 G/in.

Chest A-P 50 G/in.

Head S-I 50 G/in.

Chest S-I 50 G/in.

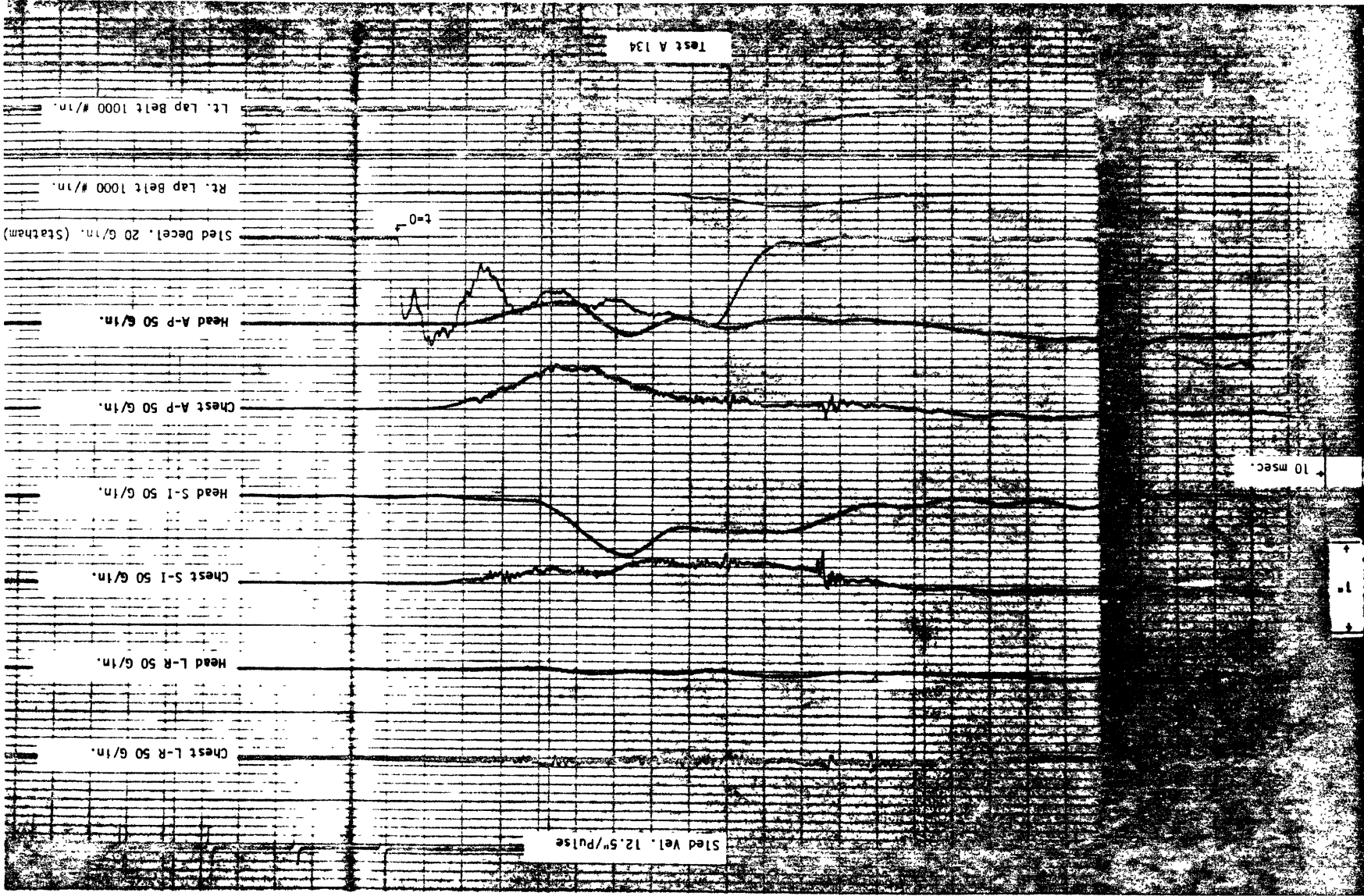
Head L-R 50 G/in.

Chest L-R 50 G/in.

Sted Vel. 12.5"/pulse

10 msec.

NYC



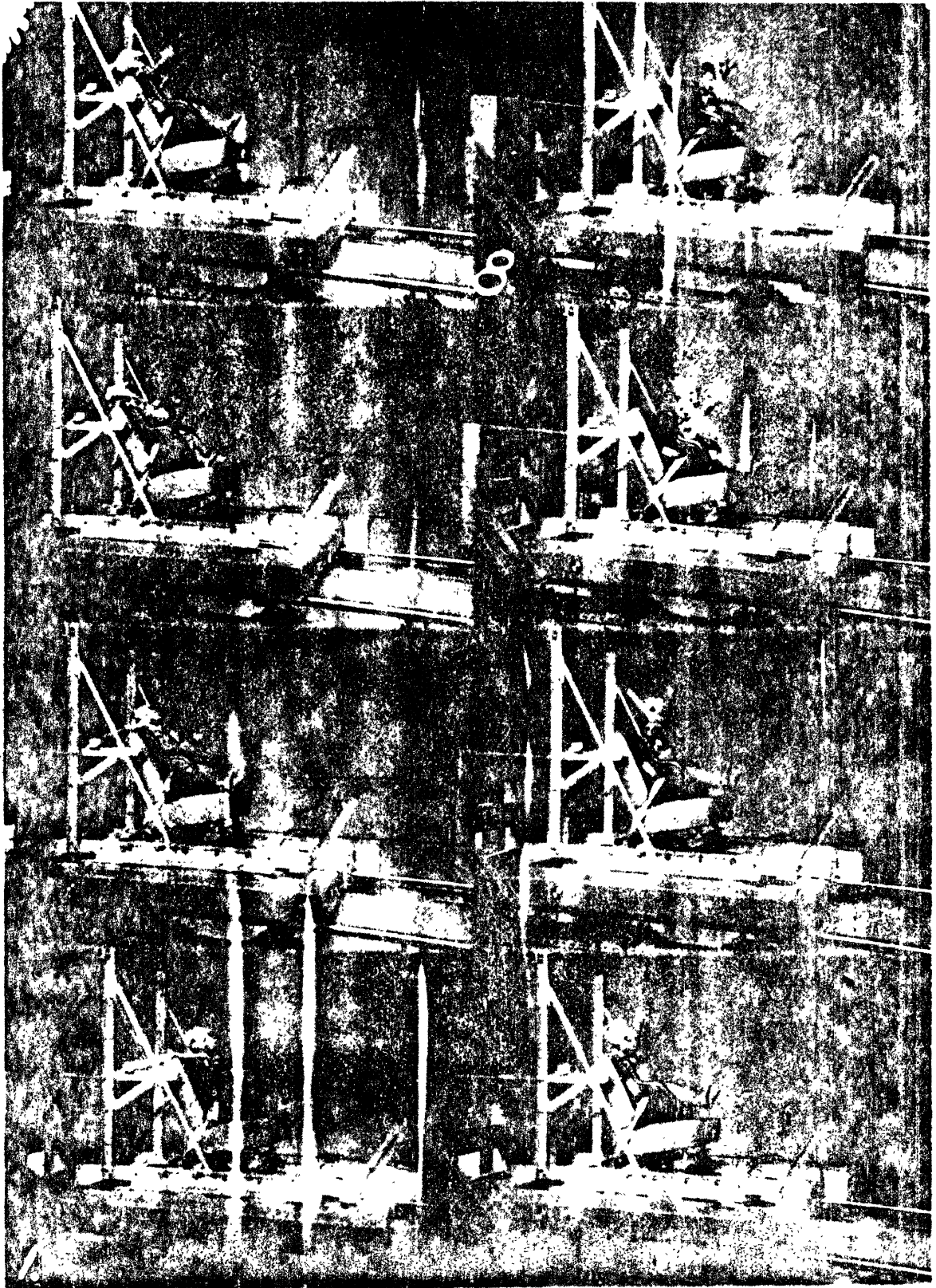
HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-135
Test Date: 7 August 1969
Restraint Code No.: C-5
Restraint Description: Sears Seat No. 5515

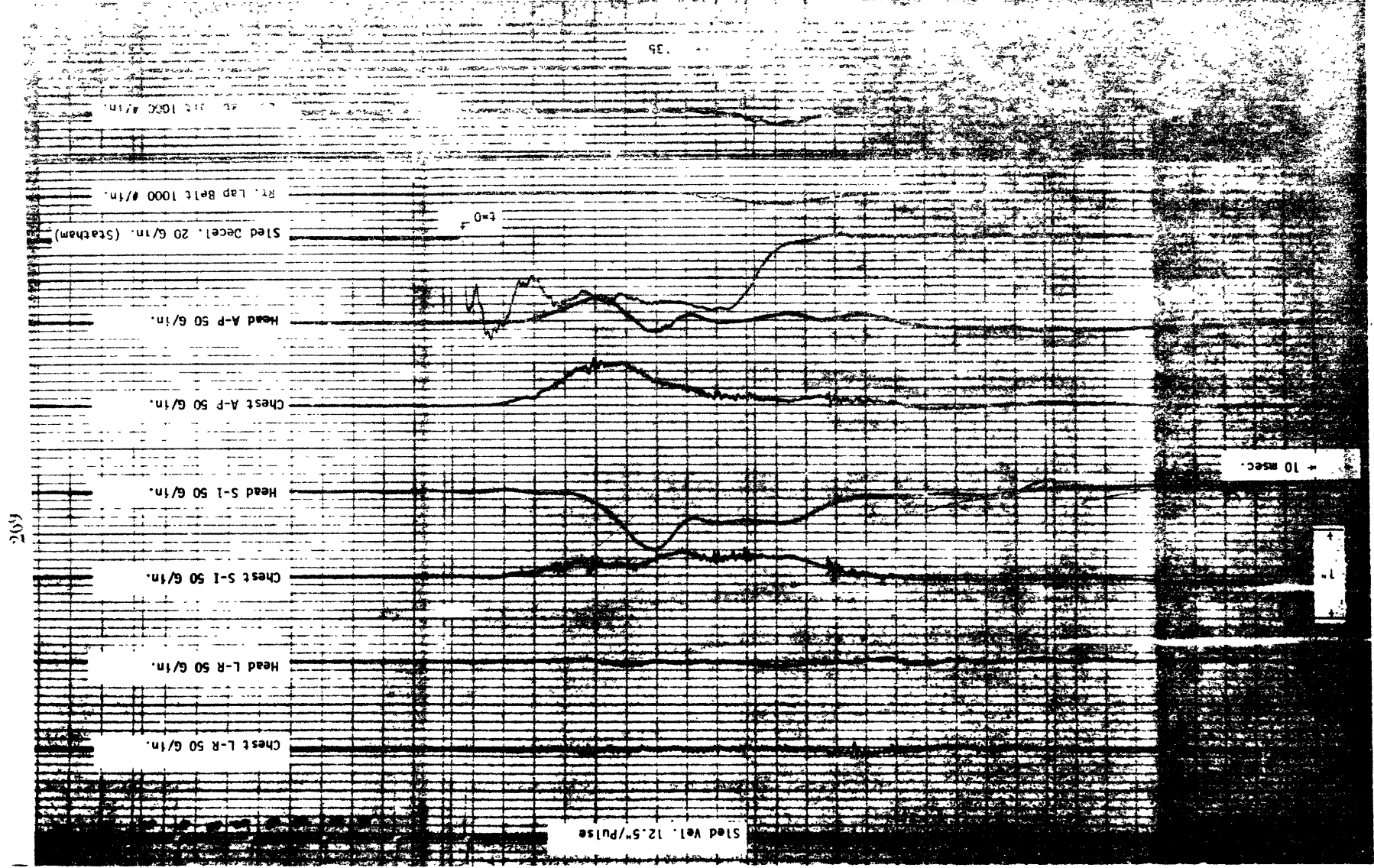
Dummy: 3 year
Sled Velocity: 30 mph
Sled G-level: 18
Impact Direction: Rear-end
Dummy Attitude: Sitting

Test Observation:

The loadings experienced by the dummy were quite gentle. However, severe whiplash was again observed.



A135



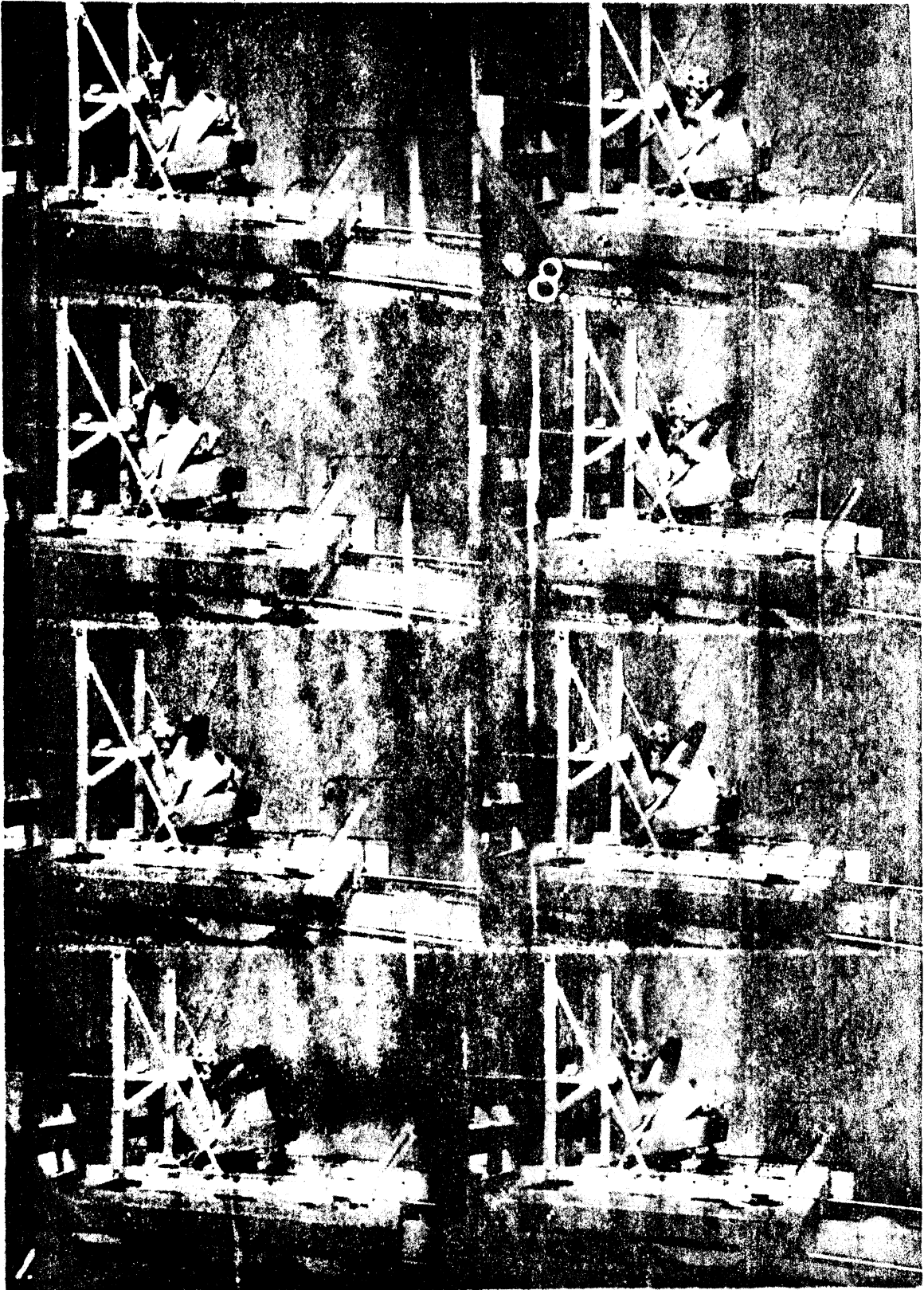
HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-136
Test Date: 7 August 1969
Restraint Code No.: C-1
Restraint Description: Ford Tot-Guard

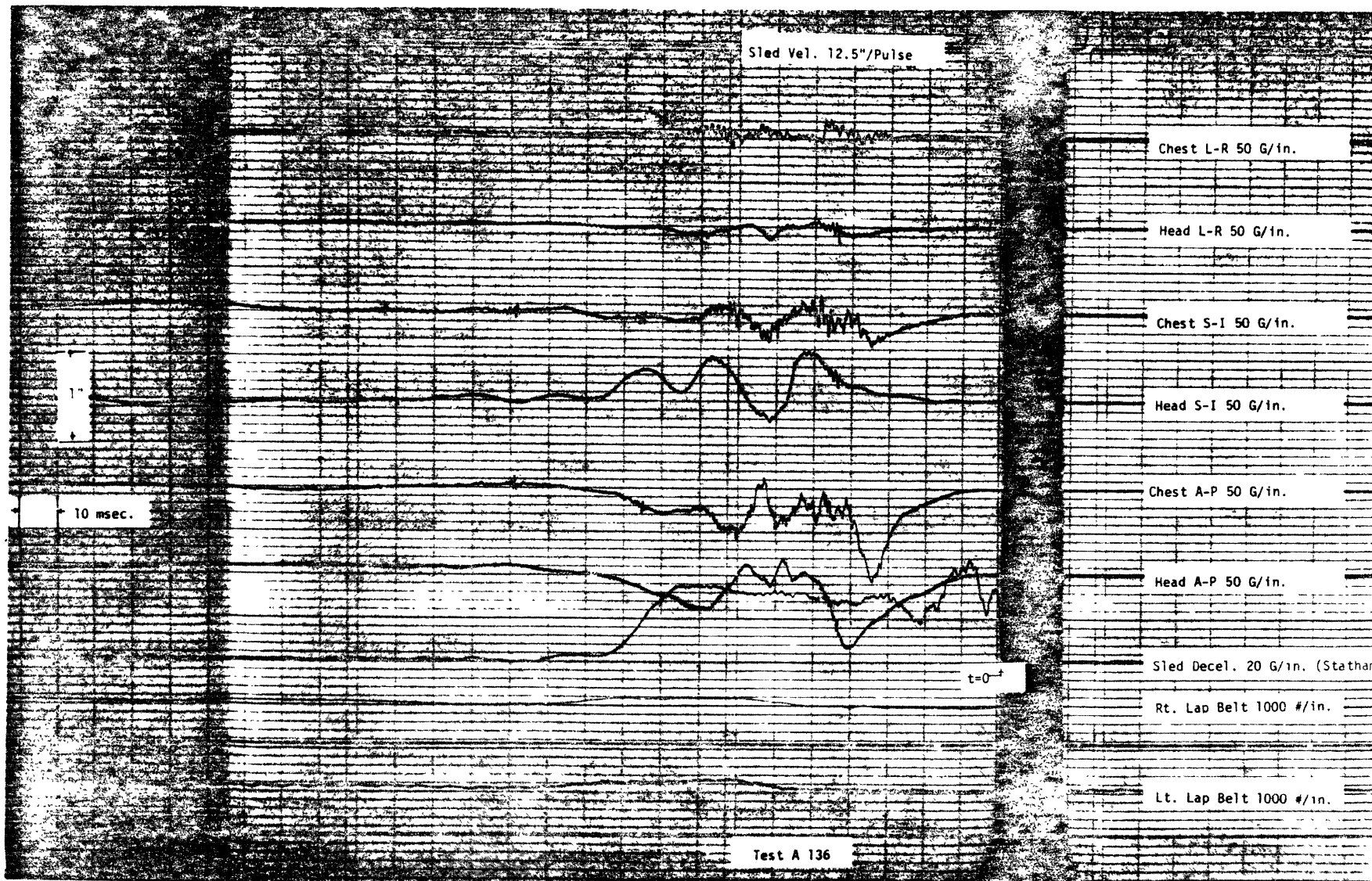
Dummy: 3 year
Sled Velocity: 30 mph
Sled G-level: 18
Impact Direction: Rear-end
Dummy Attitude: Sitting

Test Observation:

The dummy received moderately high chest and head anterior-posterior accelerations, but the motion experienced was minimum. The upper part of the Tot-Guard appeared to rotate upward during the deceleration pinning the dummy's head between the front piece and the adult seat.



A136



2-2

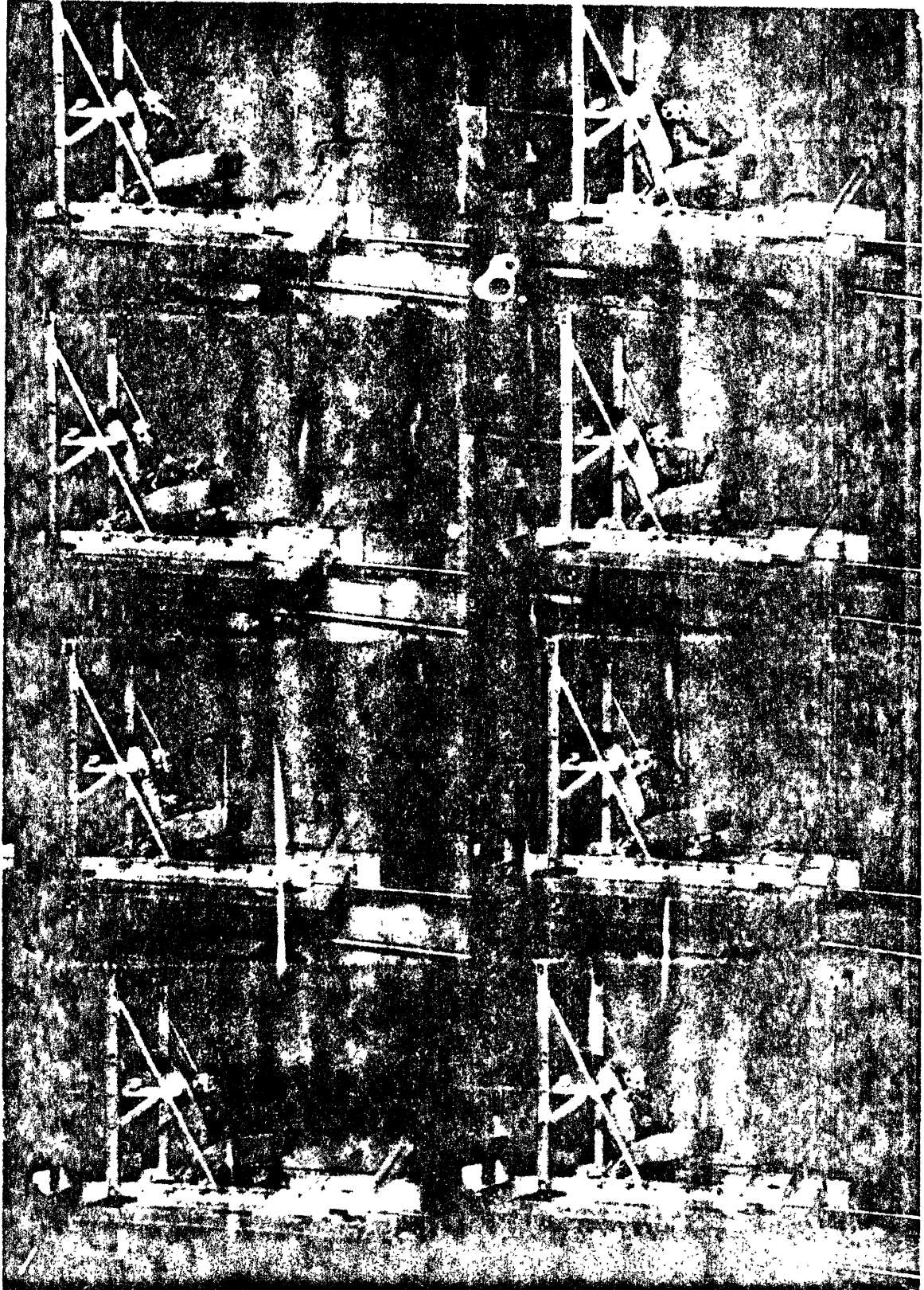
HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-137
Test Date: 7 August 1969
Restraint Code No.: C-31
Restraint Description: Sears Auto Harness, small

Dummy: 3 year
Sled Velocity: 30 mph
Sled G-level: 18
Impact Direction: Rear-end
Dummy Attitude: Sitting

Test Observation:

The dummy appeared to receive a gentle ride in this test. However, the dummy's legs became spread-eagled and rotated upwards toward the seat back causing flexure of the lower spine.



A137

275

Dist. Decent. 20 G/in. (Station)

Head A-P 50 G/in.

Chest A-P 50 G/in.

Head S-I 50 G/in.

Chest S-I 50 G/in.

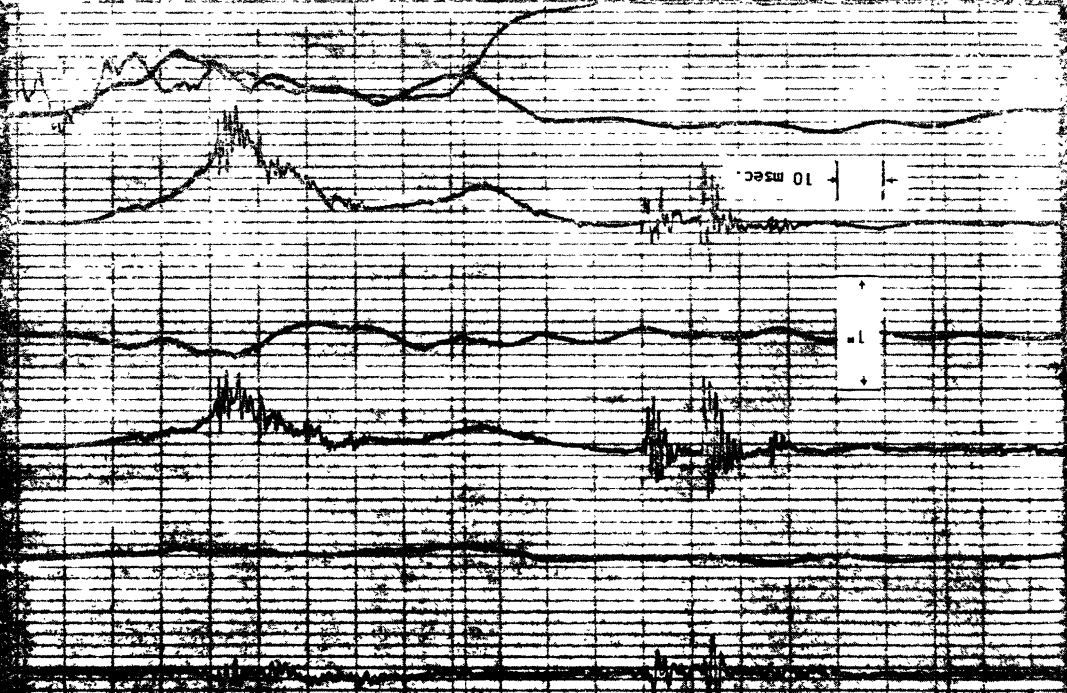
Head L-R 50 G/in.

Chest L-R 50 G/in.

Sted Vol. 12.5"/Pulse

10 msec.

1-



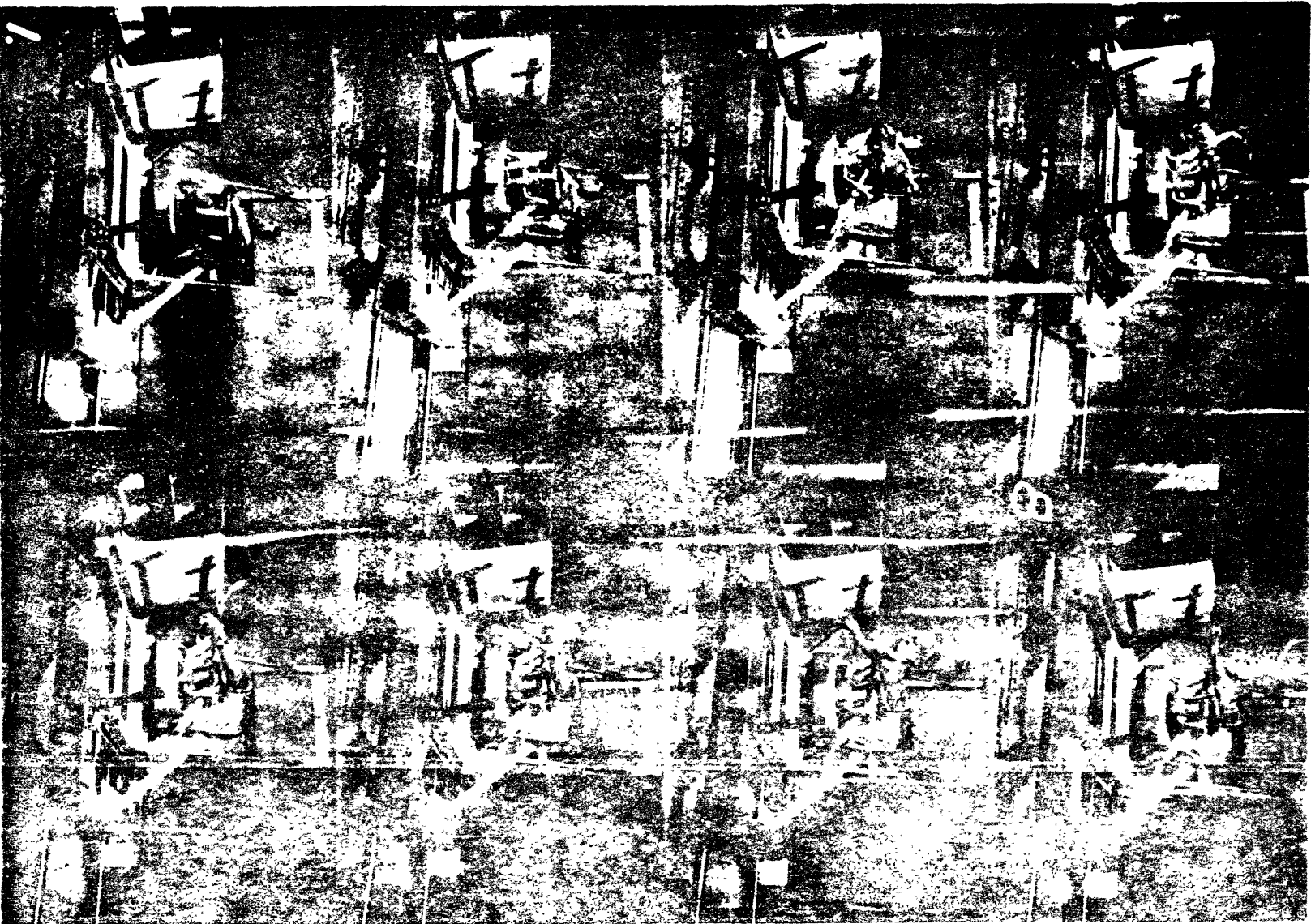
HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-138
Test Date: 8 August 1969
Restraint Code No.: C-14
Restraint Description: International Seat No. 4613

Dummy: 3 year
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: Side impact
Dummy Attitude: Sitting

Test Observation:

The deceleration loadings experienced by the dummy were quite low. However, there was considerable side flexing over the hand bar and the excursion experienced by the dummy was sufficient to allow contact with any side members which would be adjacent to the seat. The seat was badly deformed. The rear frame upright members were badly bent and the plastic shell was deformed.



A138

Sled Vel. 12.5"/Pulse

Chest L-R 50 G/in.

Head L-R 50 G/in.

Chest S-I 50 G/in.

Head S-I 50 G/in.

Chest A-P 50 G/in.

Head A-P 50 G/in.

Sled Decel. 20 G/in. (Statham)

Rt. Lap Belt 1000 #/in.

Lt. Lap Belt 1000 #/in.

1"

10 msec.

t=0

Test A 138

278

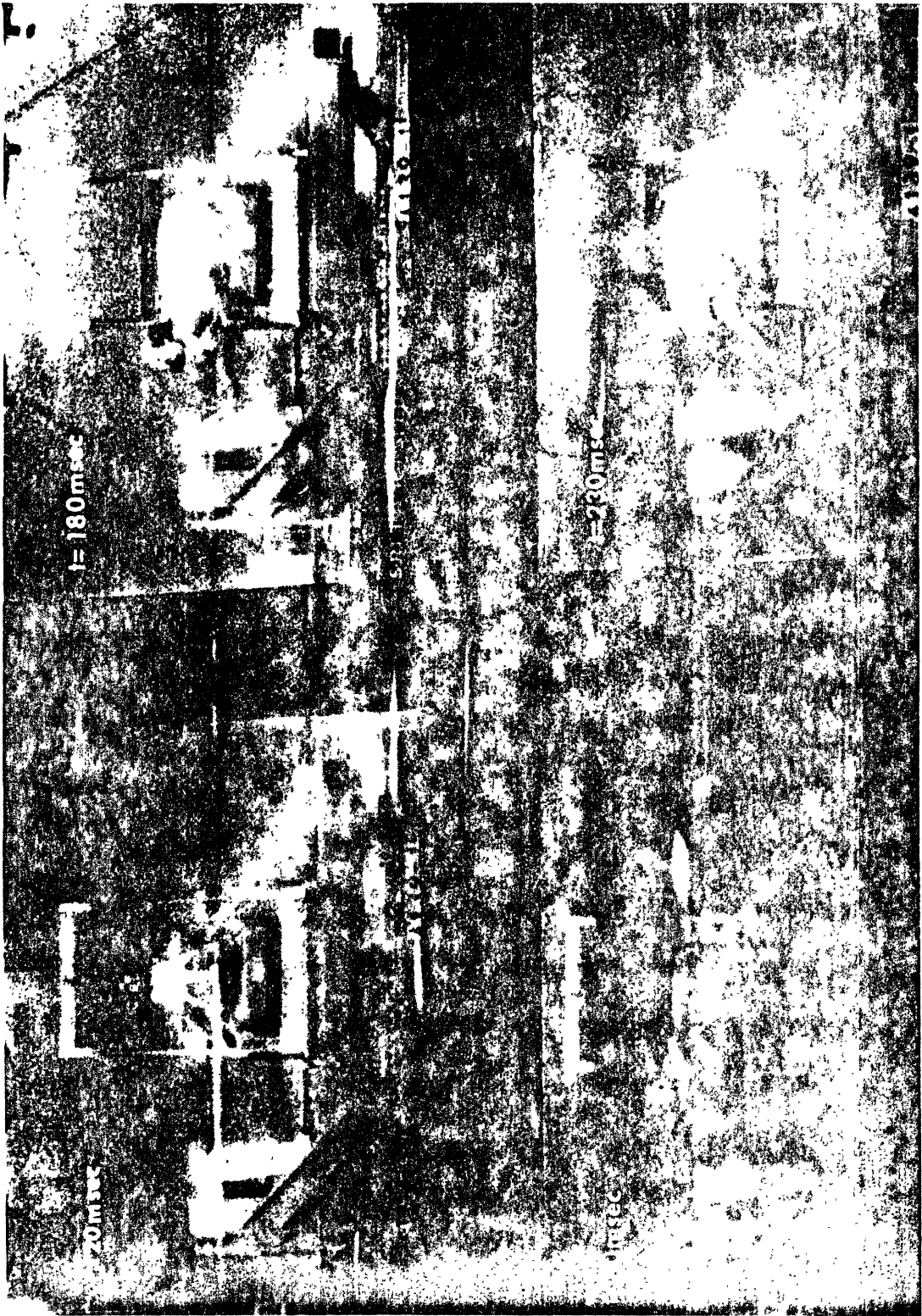
HSRI SUMMARY DATA SHEET (FH-11-6962)

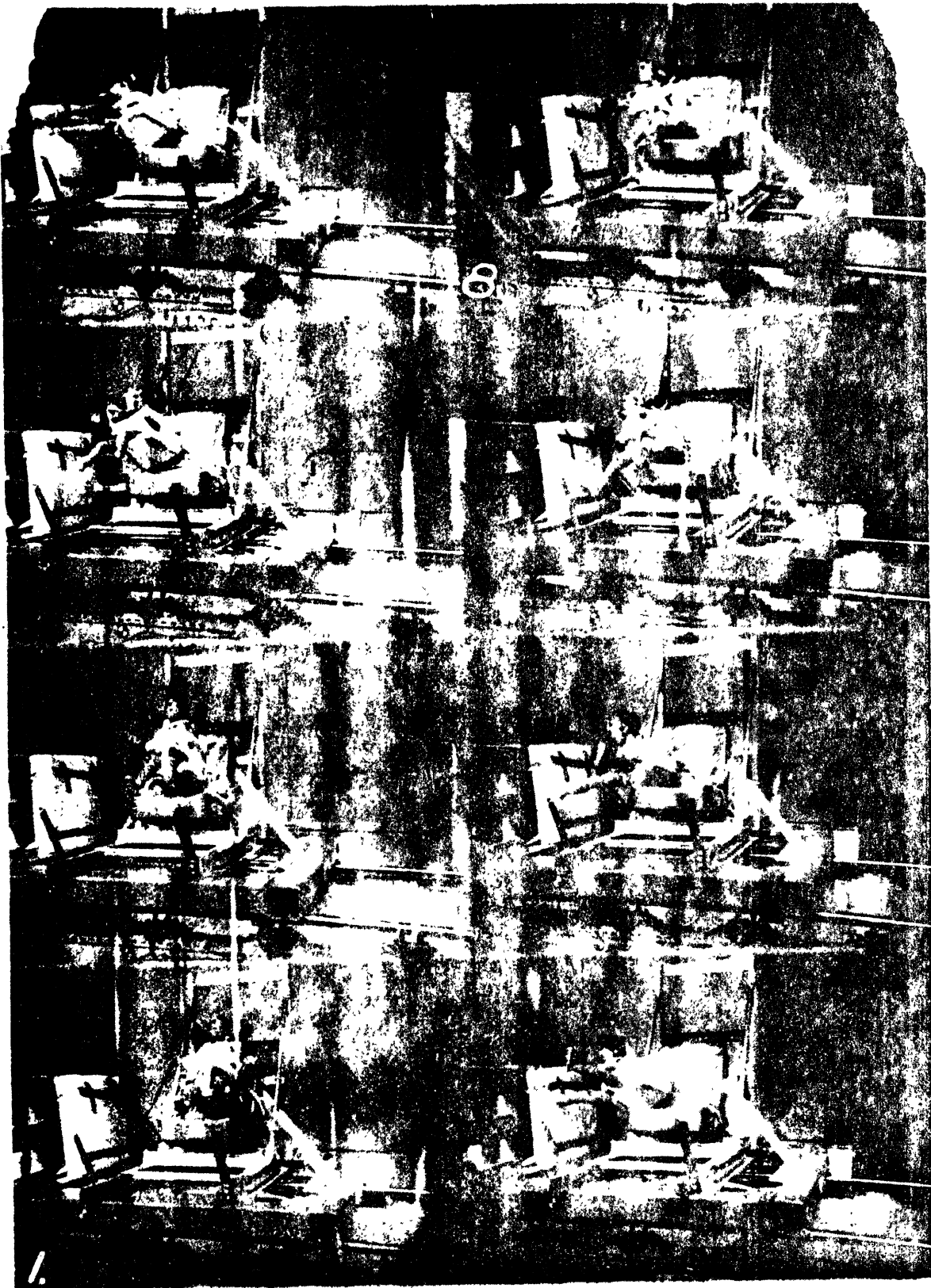
Test No: A-139
Test Date: 8 August 1969
Restraint Code No: C-19
Restraint Description: Strollee Seat No. 589

Dummy: 3 year
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: Side impact
Dummy Attitude: Sitting

Test Observation:

The dummy received a fairly gentle deceleration in this test. However, the excursion was large enough to ensure contact with any side structures which would be present in an automobile interior. The child seat was badly deformed. The tubular frame collapsed sideways and the lower left seat retaining strap tore at the buckle. The headrest jumped out of its sockets.





A139

Test A 139

Lt. Lap Belt 1000 #/in.

Rt. Lap Belt 1000 #/in.

Sted Decel. 20 G/in. (Station)

Head A-P 50 G/in.

Chest A-P 50 G/in.

Head S-I 50 G/in.

Chest S-I 50 G/in.

Head L-R 50 G/in.

Chest L-R 50 G/in.

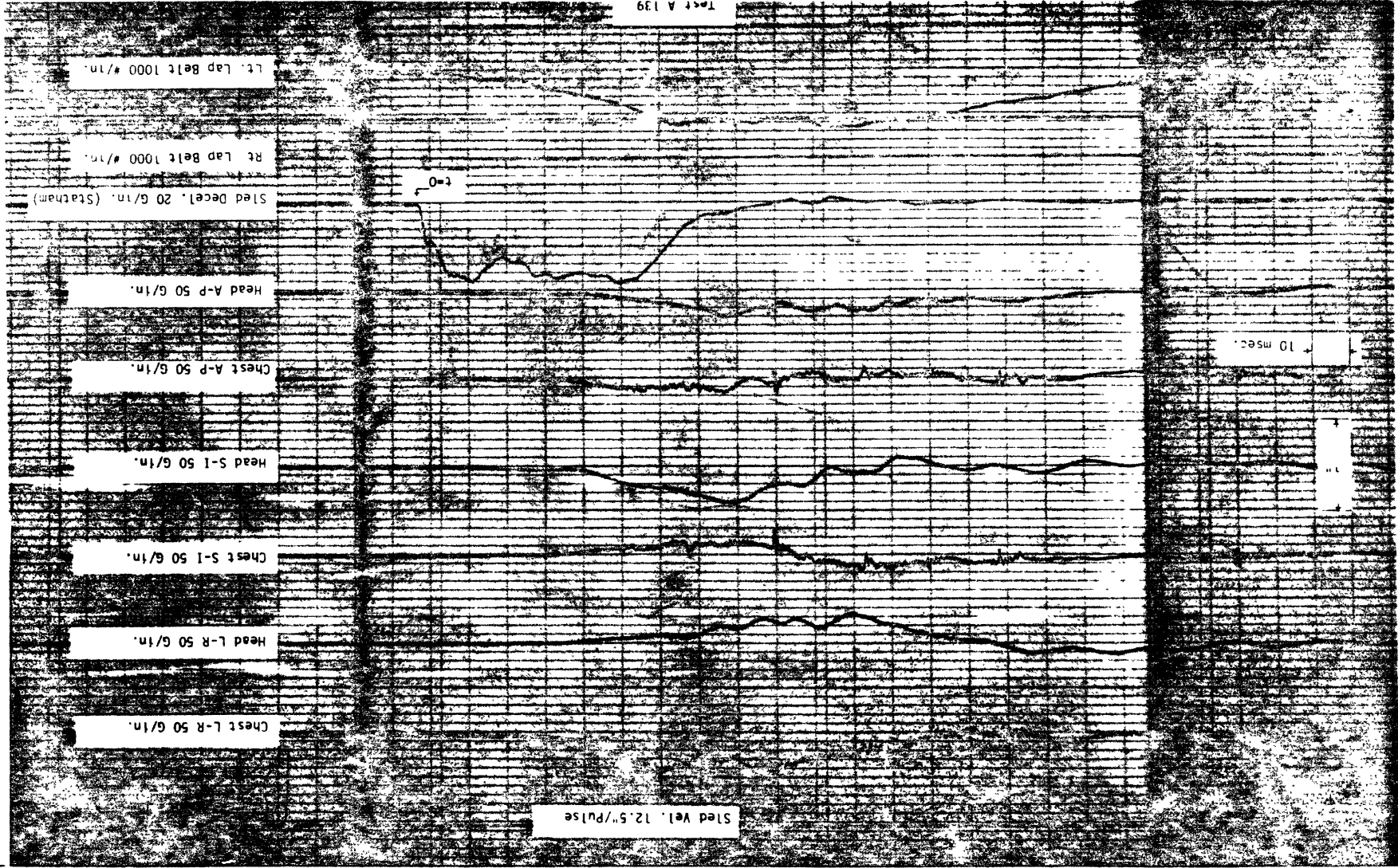
Sted Vel. 12.5"/pulse

t=0

10 msec

1 in

202



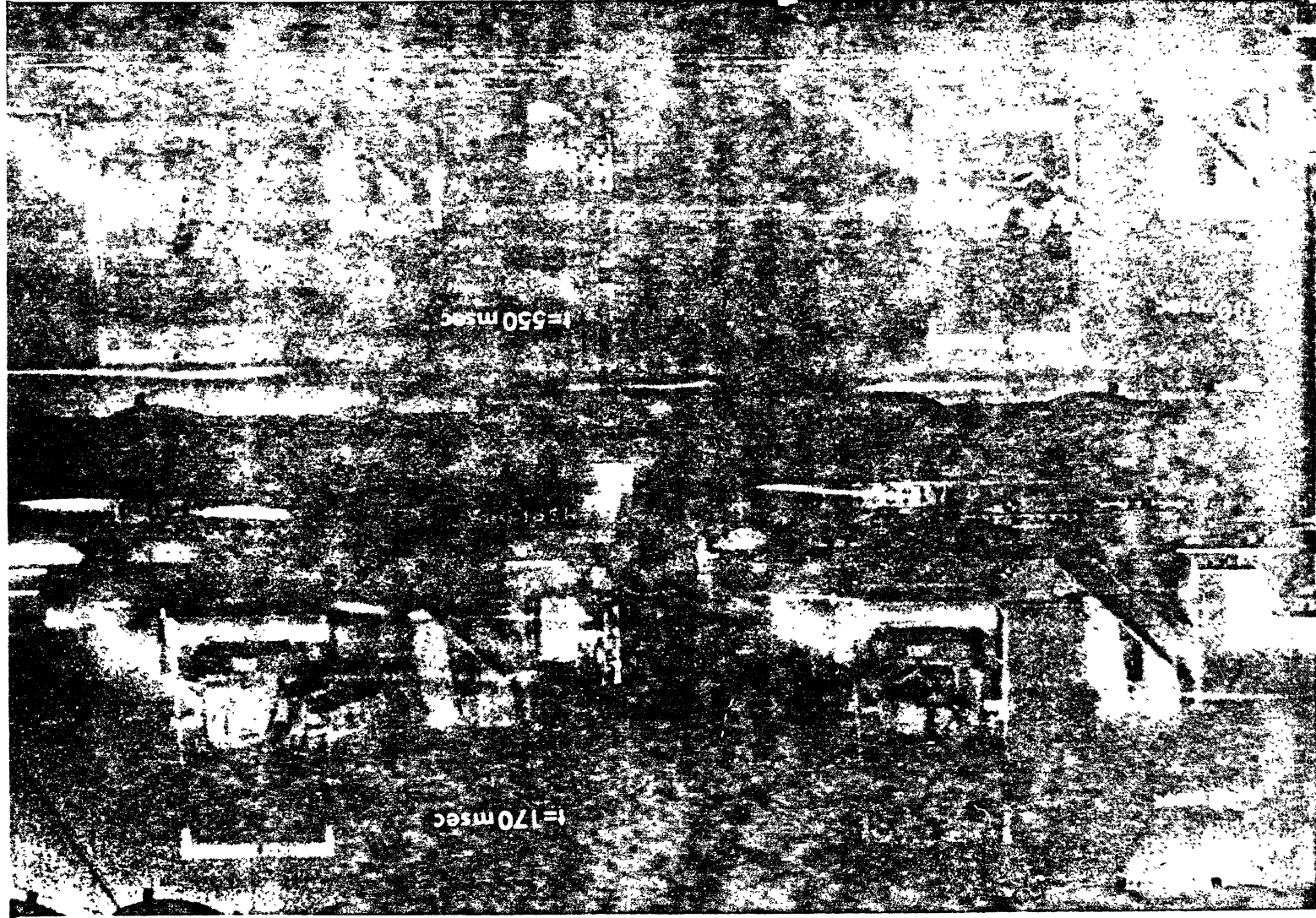
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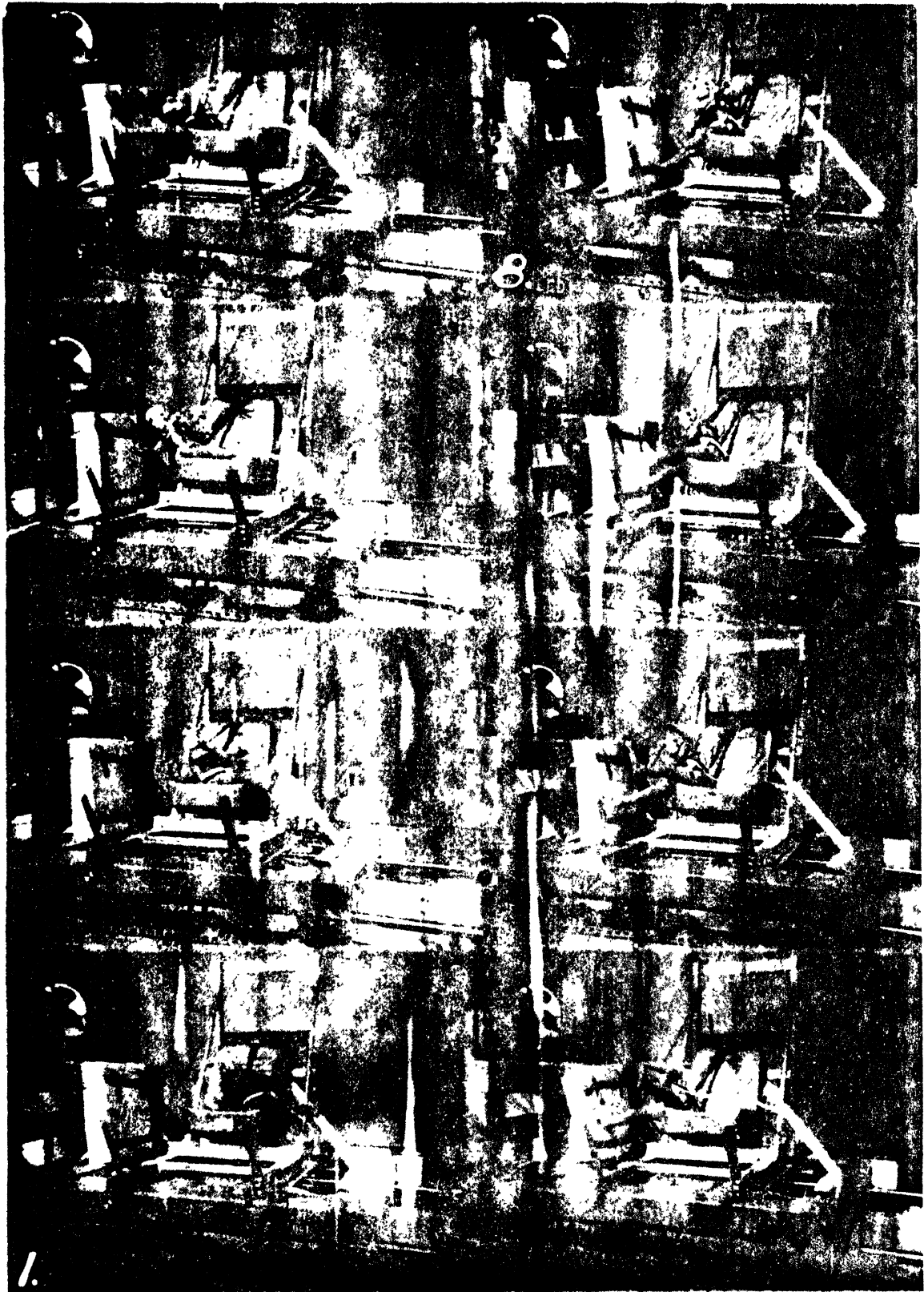
Test No: A-140
Test Date: 11 August 1969
Restraint Code No.: C-31
Restraint Description: Sears Auto Harness, small

Dummy: 3 years
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: Side Impact
Dummy Attitude: Sitting

Test Observation:

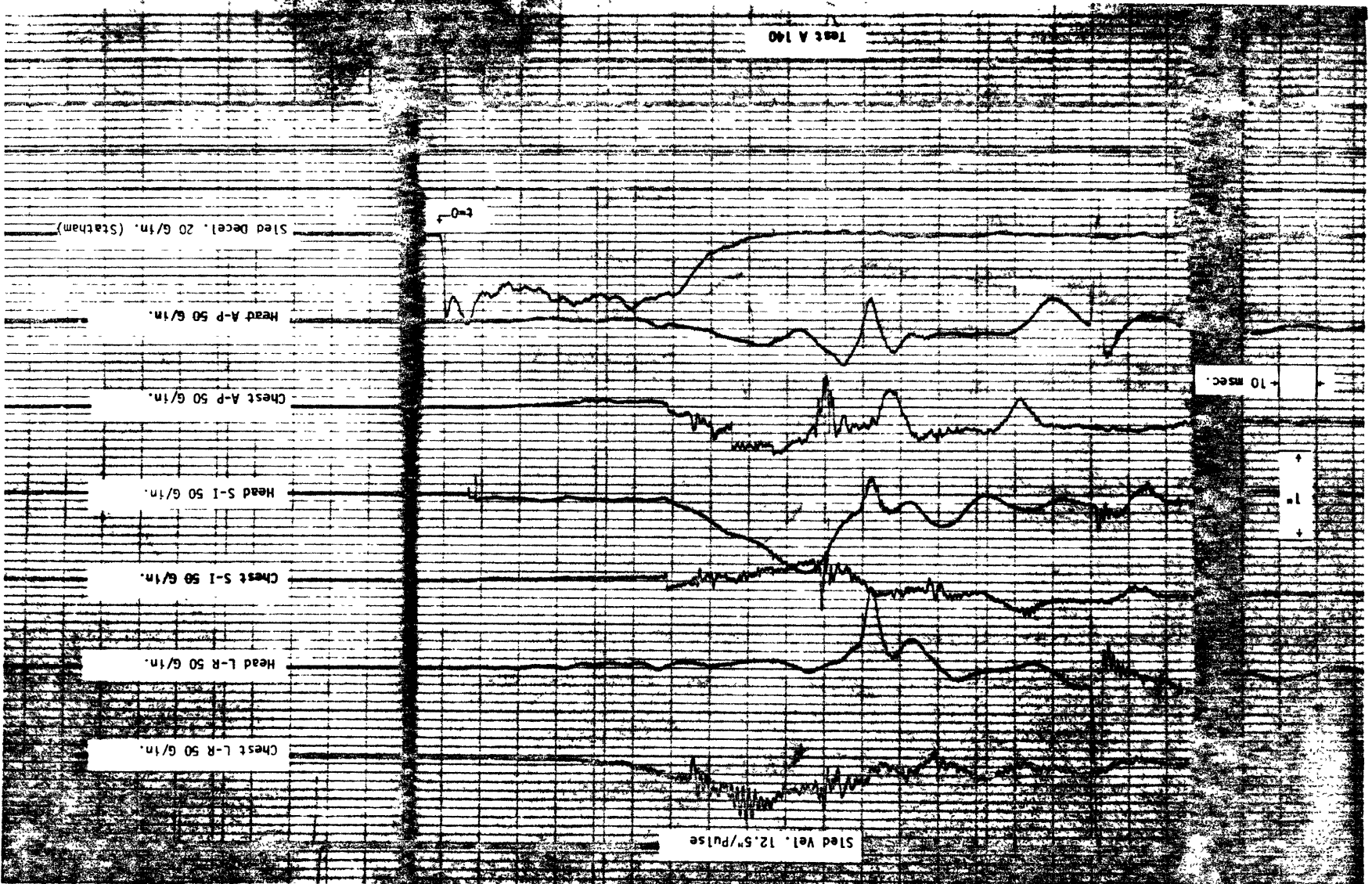
Accelerometer readings were moderate. However, excursion was large enough to ensure contact with any side structures of the vehicle interior. No damage was apparent to the restraint system except that the straps over the shoulders slipped in their buckle.





A140

Test A 140



HSRI SUMMARY DATA SHEET (FH-11-6962)

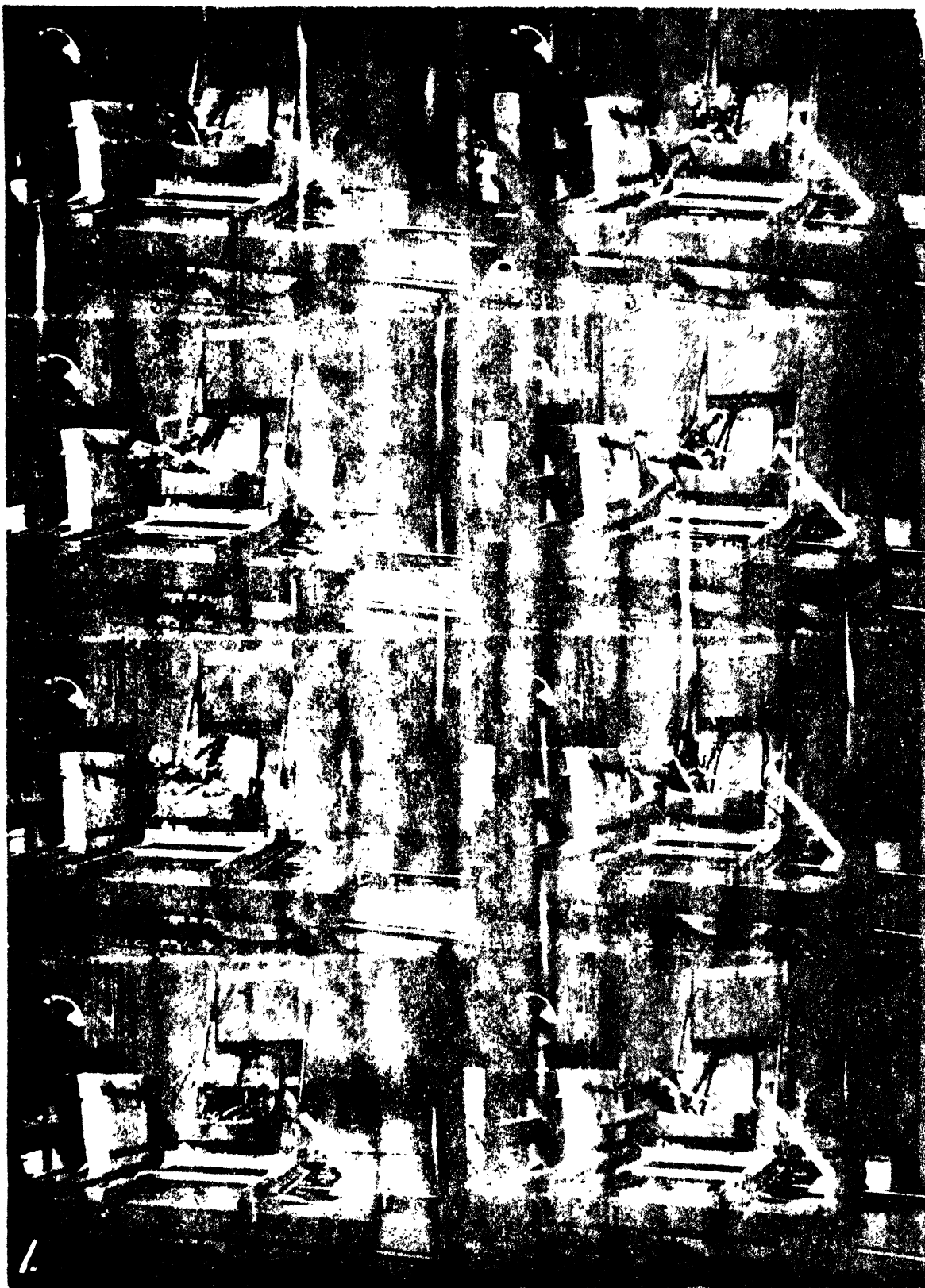
Test No: A-141
Test Date: 11 August 1969
Restraint Code No.: C-31
Restraint Description: Sears Auto Harness, small

Dummy: 3 year
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: Side facing
Dummy Attitude: Sitting

Test Observation:

The dummy received moderate acceleration loadings in this test. The excursion was large enough to ensure contact with any vehicle side structures adjacent to the seat.





A141

Test A 141

Sled Decel. 20 G/in. (Statham)

Head A-P 50 G/in.

Chest A-P 50 G/in.

Head S-I 50 G/in.

Chest S-I 50 G/in.

Head L-R 50 G/in.

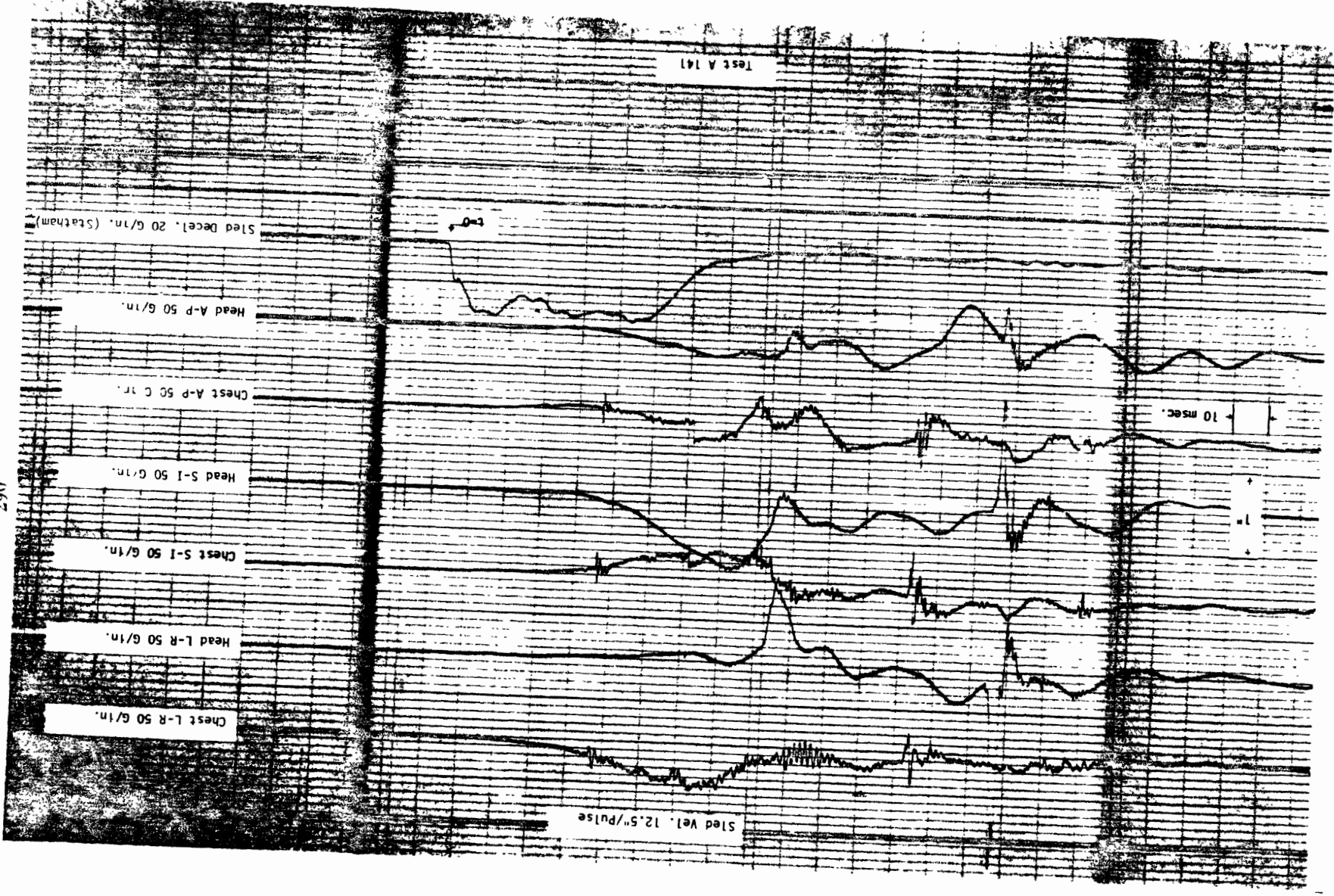
Chest L-R 50 G/in.

Sled Vel. 12.5"/Pulse

10 msec.

1g

290



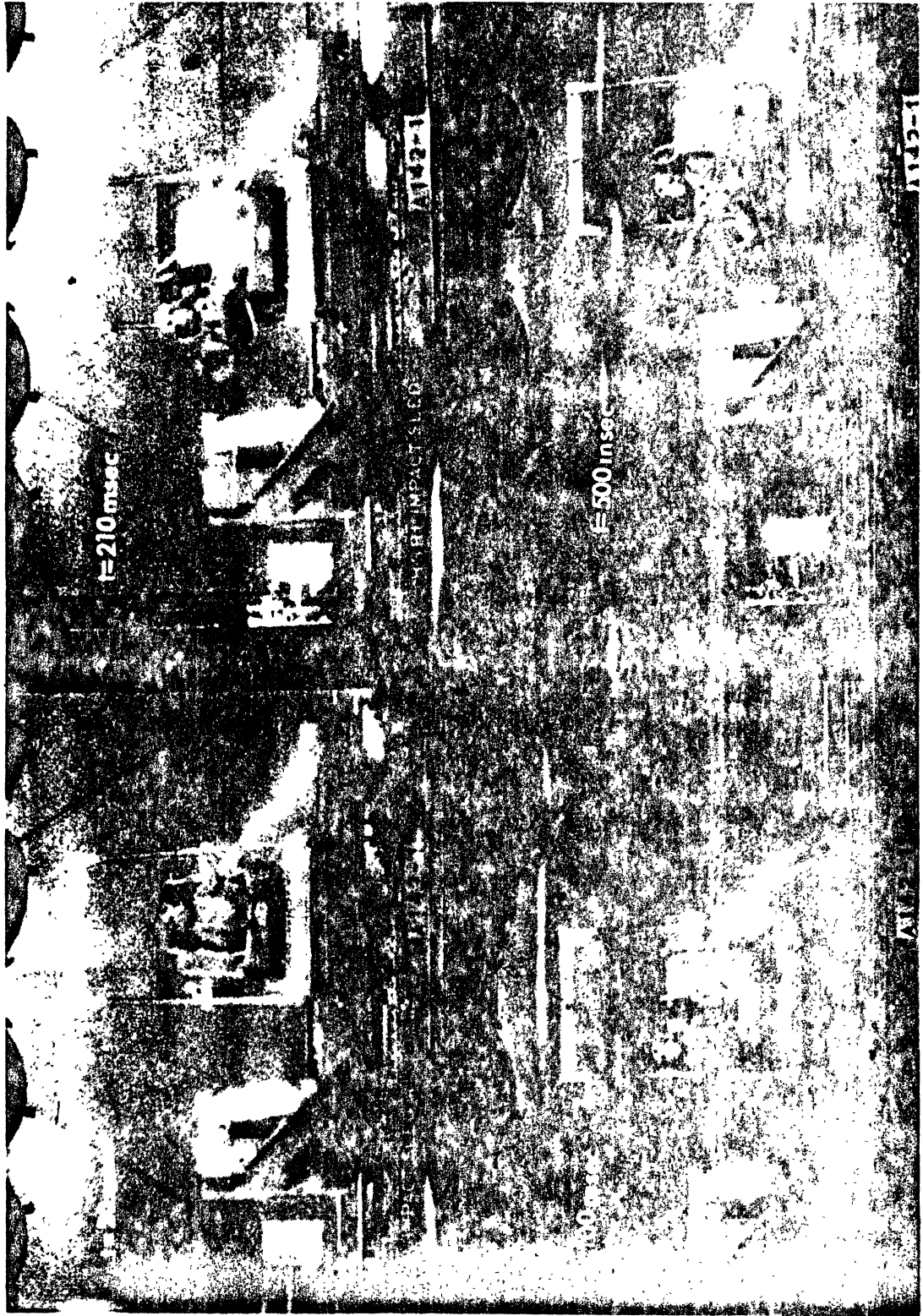
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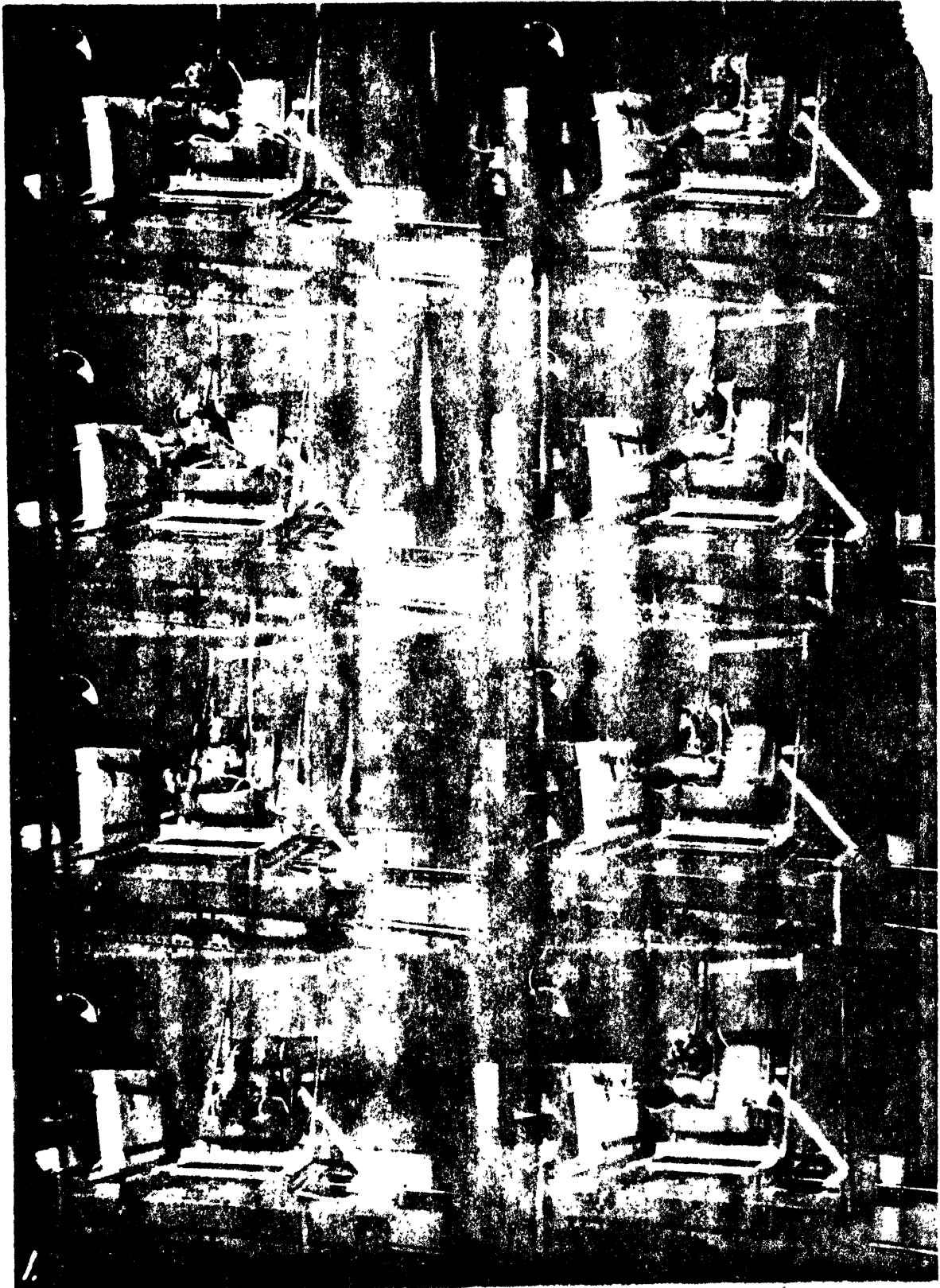
Test No: A-142
Test Date: 11 August 1969
Restraint Code No: C-16
Restraint Description: Klippan Safety Seat

Dummy: 3 year
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: Side Impact
Dummy Attitude: Sitting

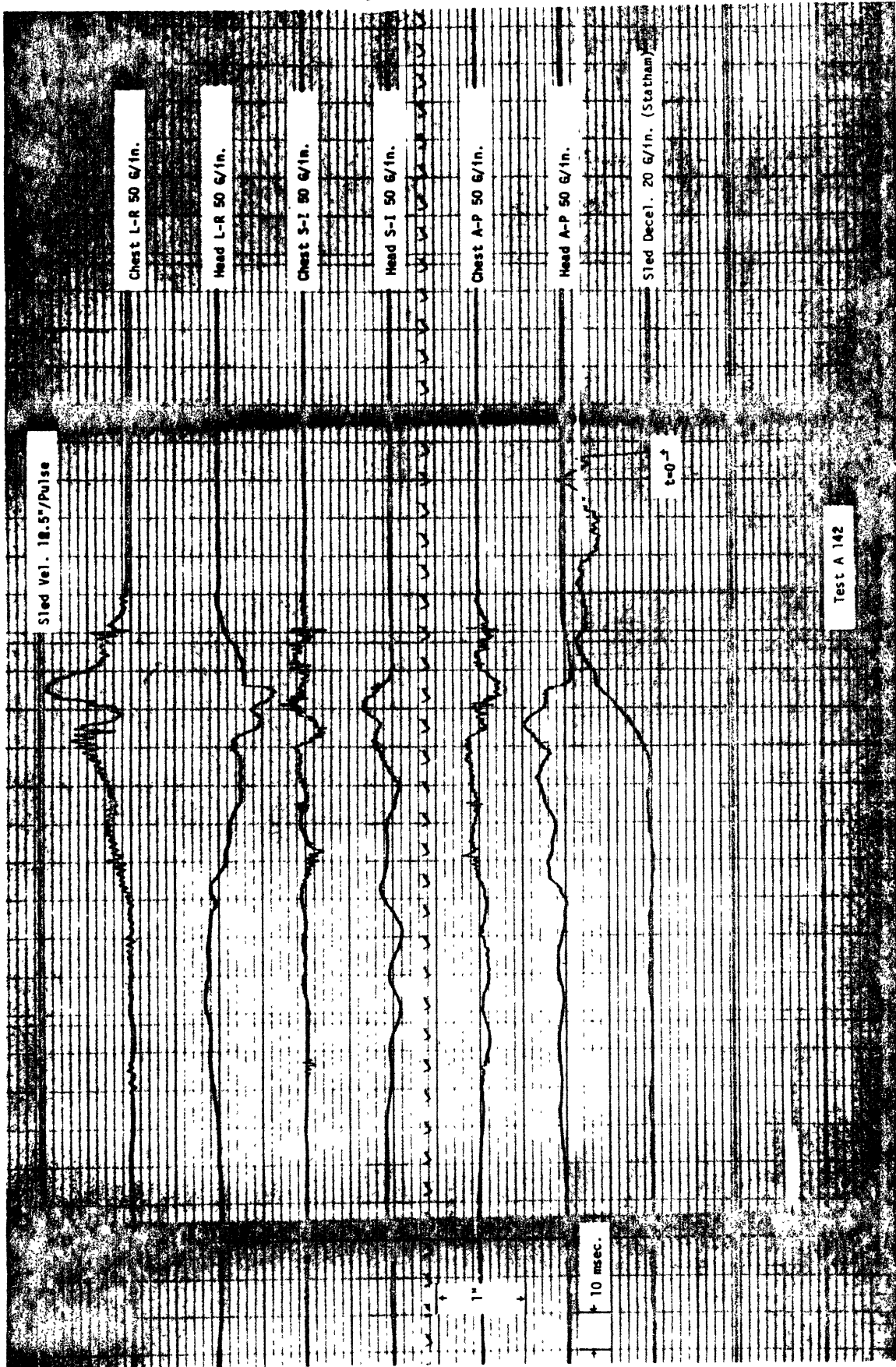
Test Observation:

The seat failed, causing both the dummy and the seat to be ejected from the adult seat. The special integral retaining strap on the left side of the Klippan Safety Seat ripped completely out of the shell.





A142



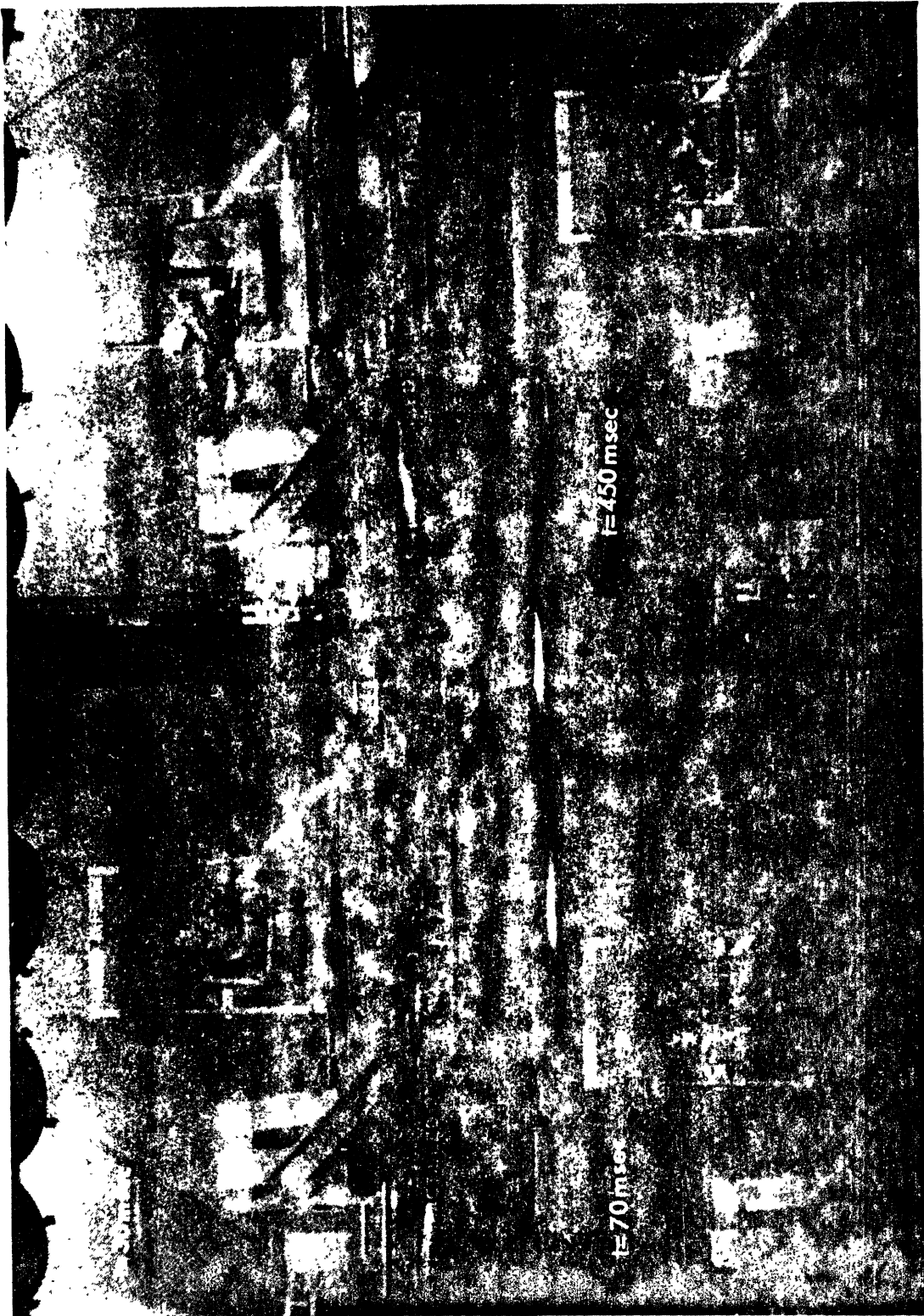
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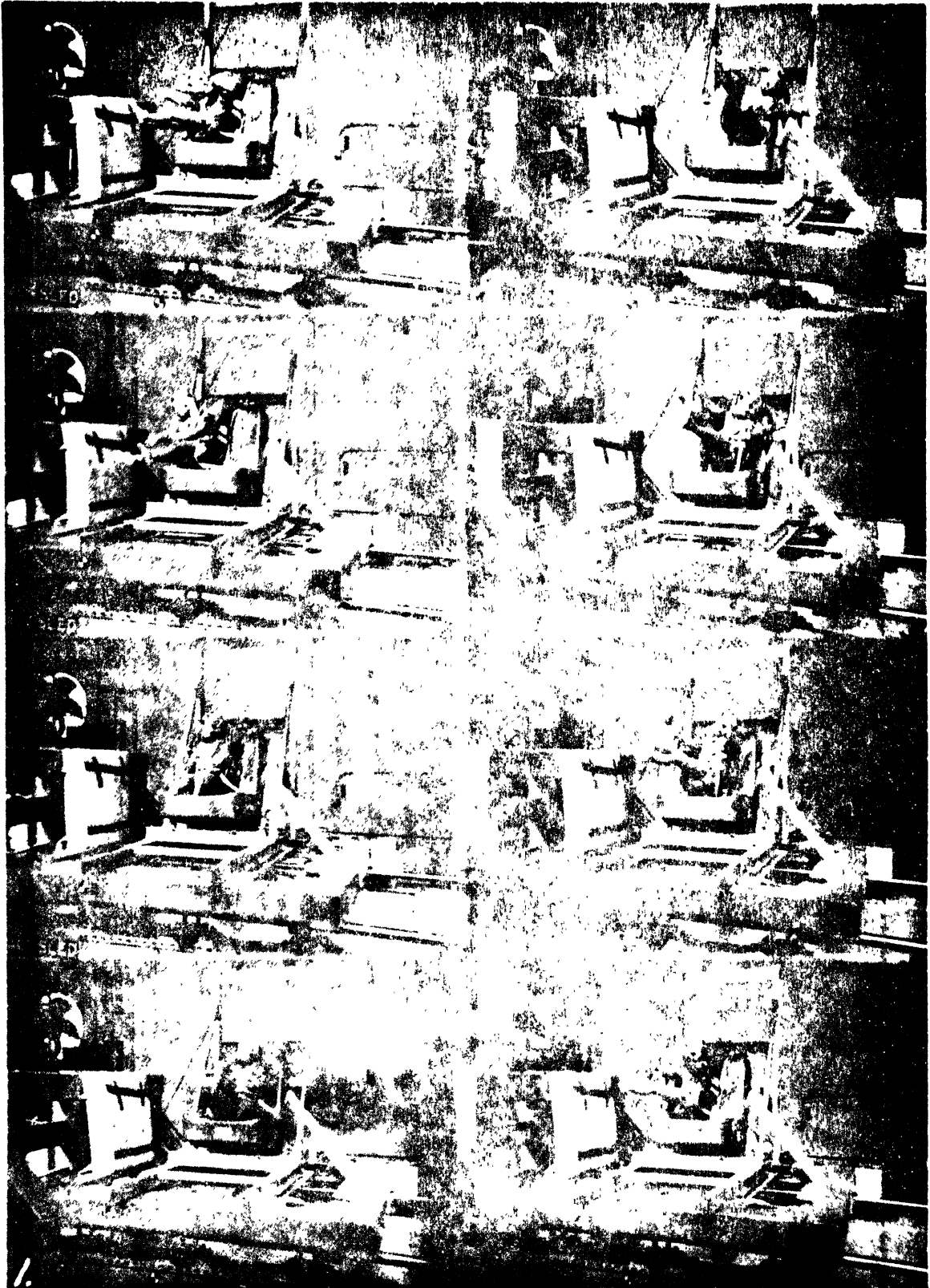
Test No: A-143
Test Date: 12 August 1969
Restraint Code No.: C-26
Restraint Description: K L Jeenay Child Safety Seat

Dummy: 3 years
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: Side impact
Dummy Attitude: Sitting

Test Observation:

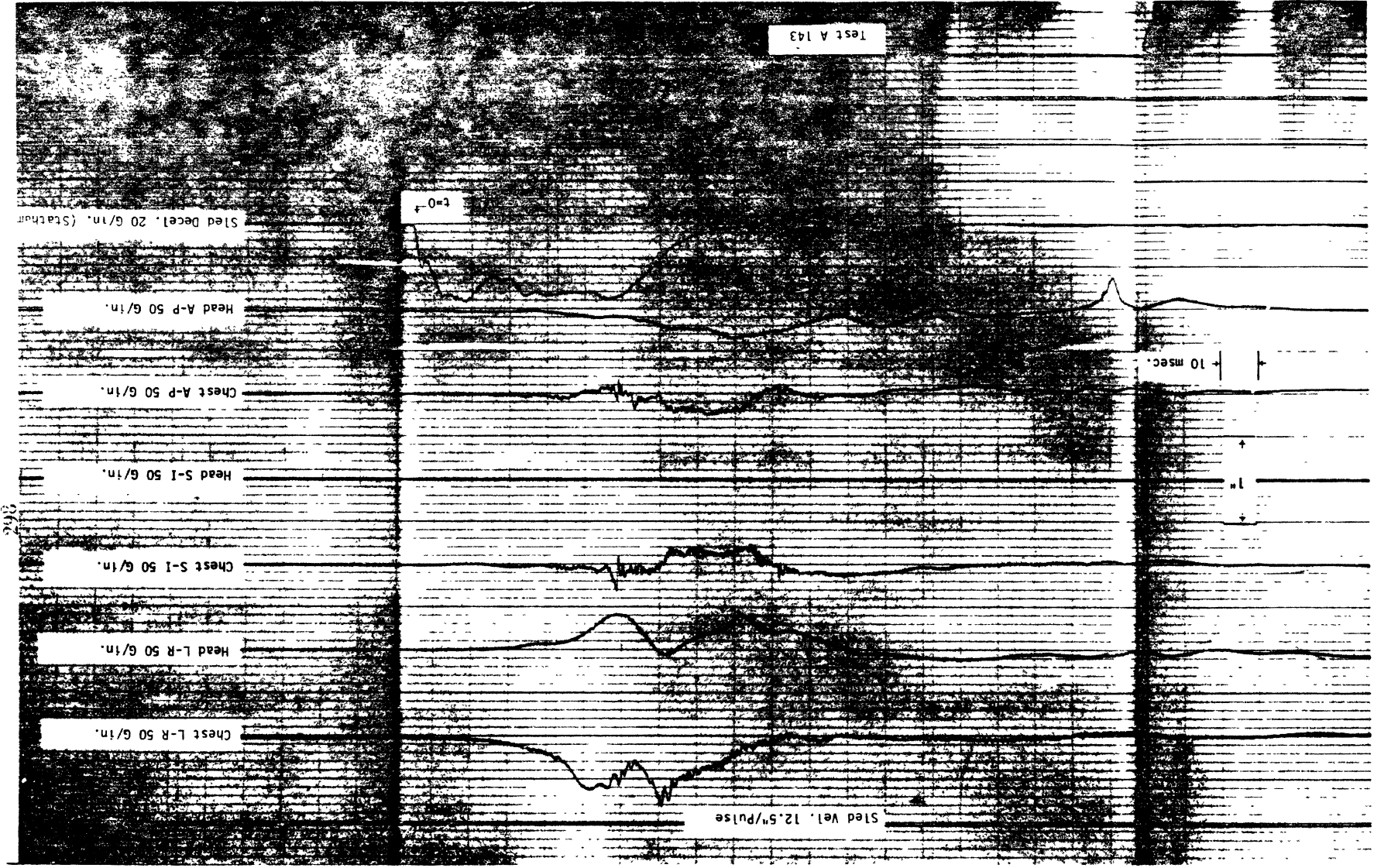
The loadings experienced by the dummy were quite gentle. No excessive excursion was observed, indicating that there was only slight danger of contact with interior structures in the automobile. This seat maintained its integrity in side impact very well.





A143

Test A 143



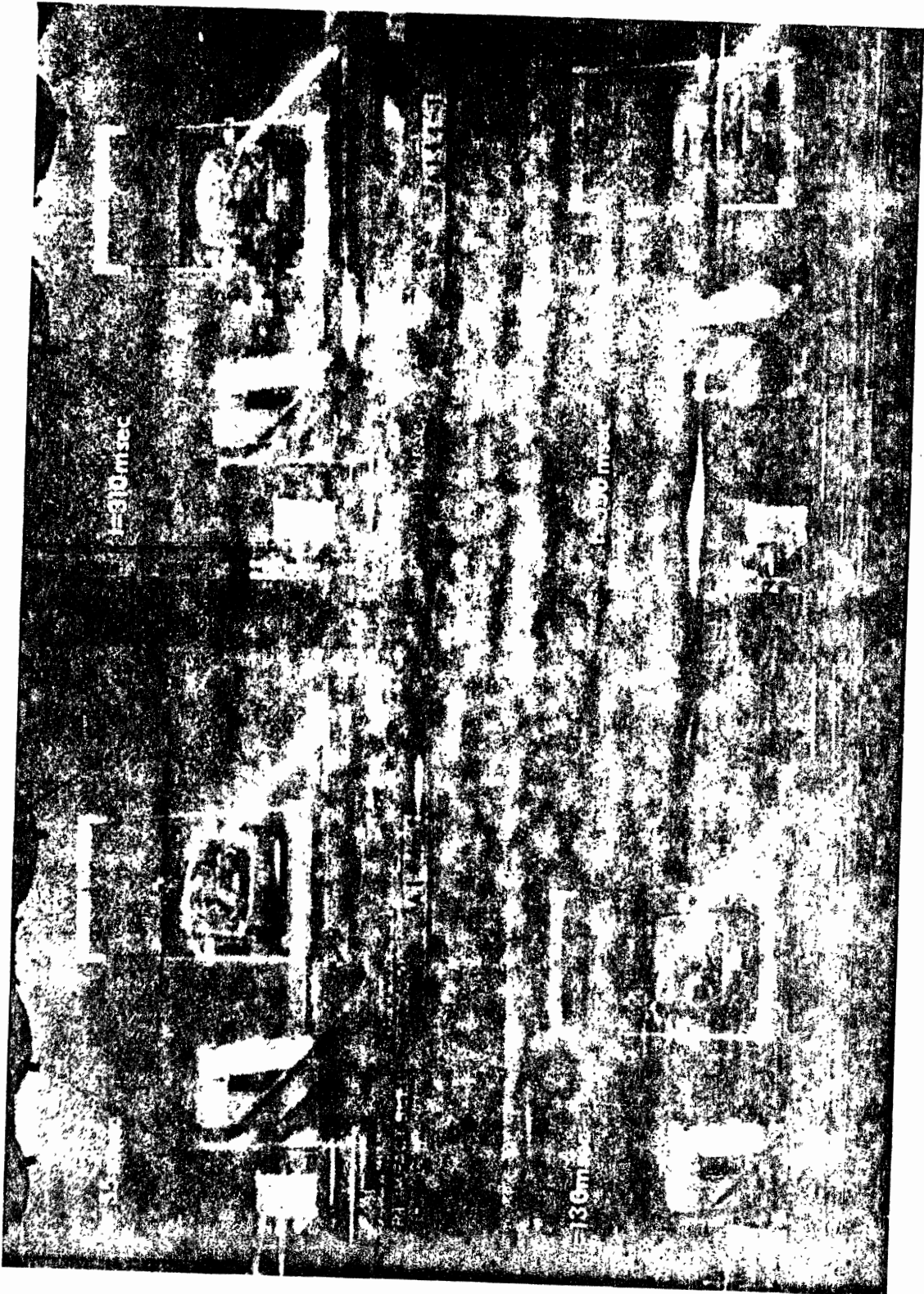
HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-144
Test Date: 12 August 1969
Restraint Code No.: C-22
Restraint Description: Hamilton Cosco Go-Seat

Dummy: 3 year
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: Side impact
Dummy Attitude: Sitting

Test Observation:

The metal structure supporting this pedestal seat was observed to dig deep into the adult seat cushion, causing the dummy to pitch to the side violently, ensuring contact with any adjacent interior structures. High accelerometer readings were observed.



NOT REPRODUCIBLE



A144

Test A 144

Lt. Lap Belt 1000 #/in.

Rt. Lap Belt 1000 #/in.

Sled Decel. 20 G/in. (Statham)

Head A-P 50 G/in.

Chest A-P 50 G/in.

Head S-I 50 G/in.

Chest S-I 50 G/in.

Head L-R 50 G/in.

Chest L-R 50 G/in.

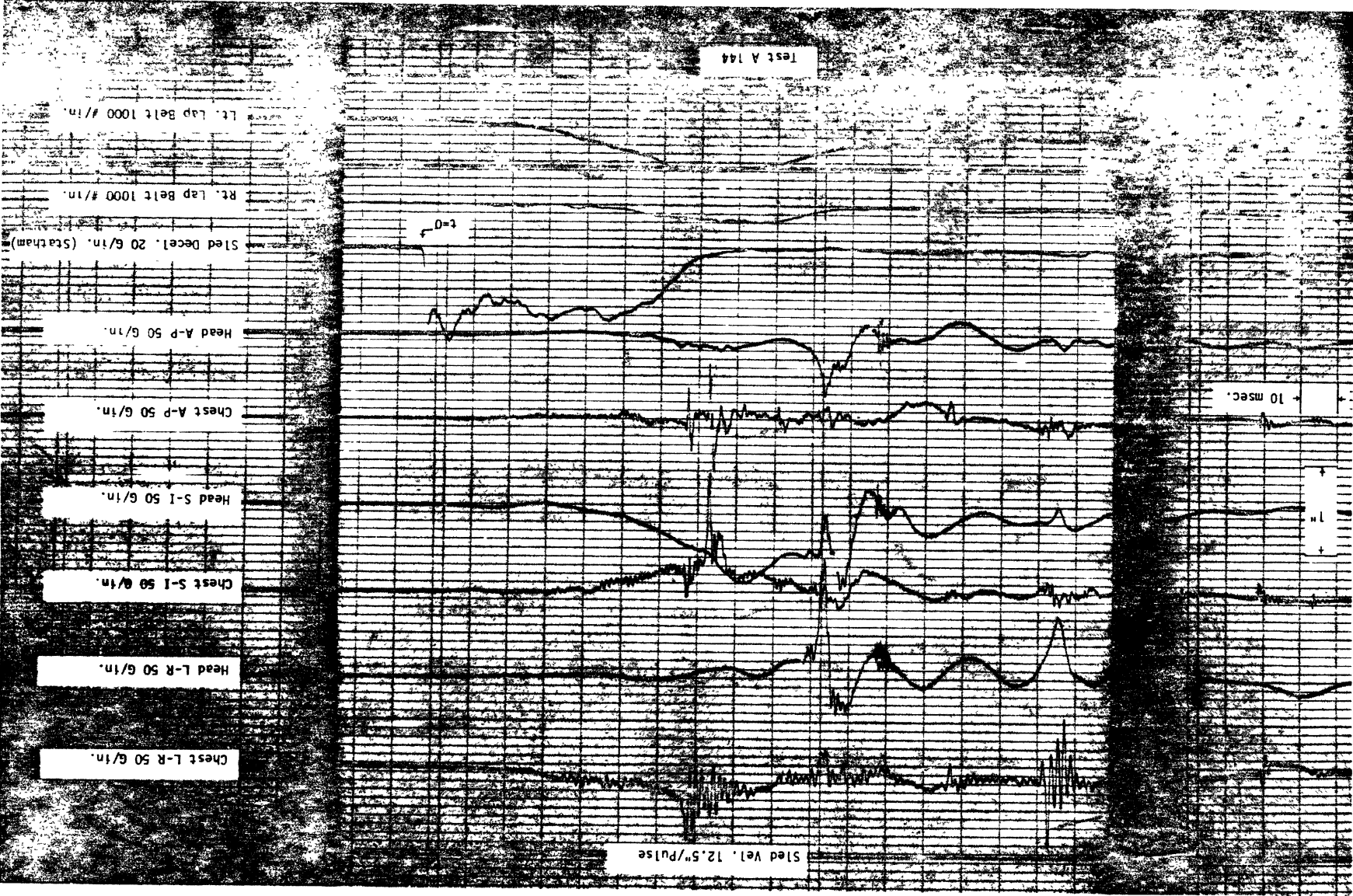
Sled Vel. 12.5"/pulse

t=0

10 msec.

1"

302



HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-145
Test Date: 12 August 1969
Restraint Code No.: C-28
Restraint Description: Kelly Kiddy Kaddy

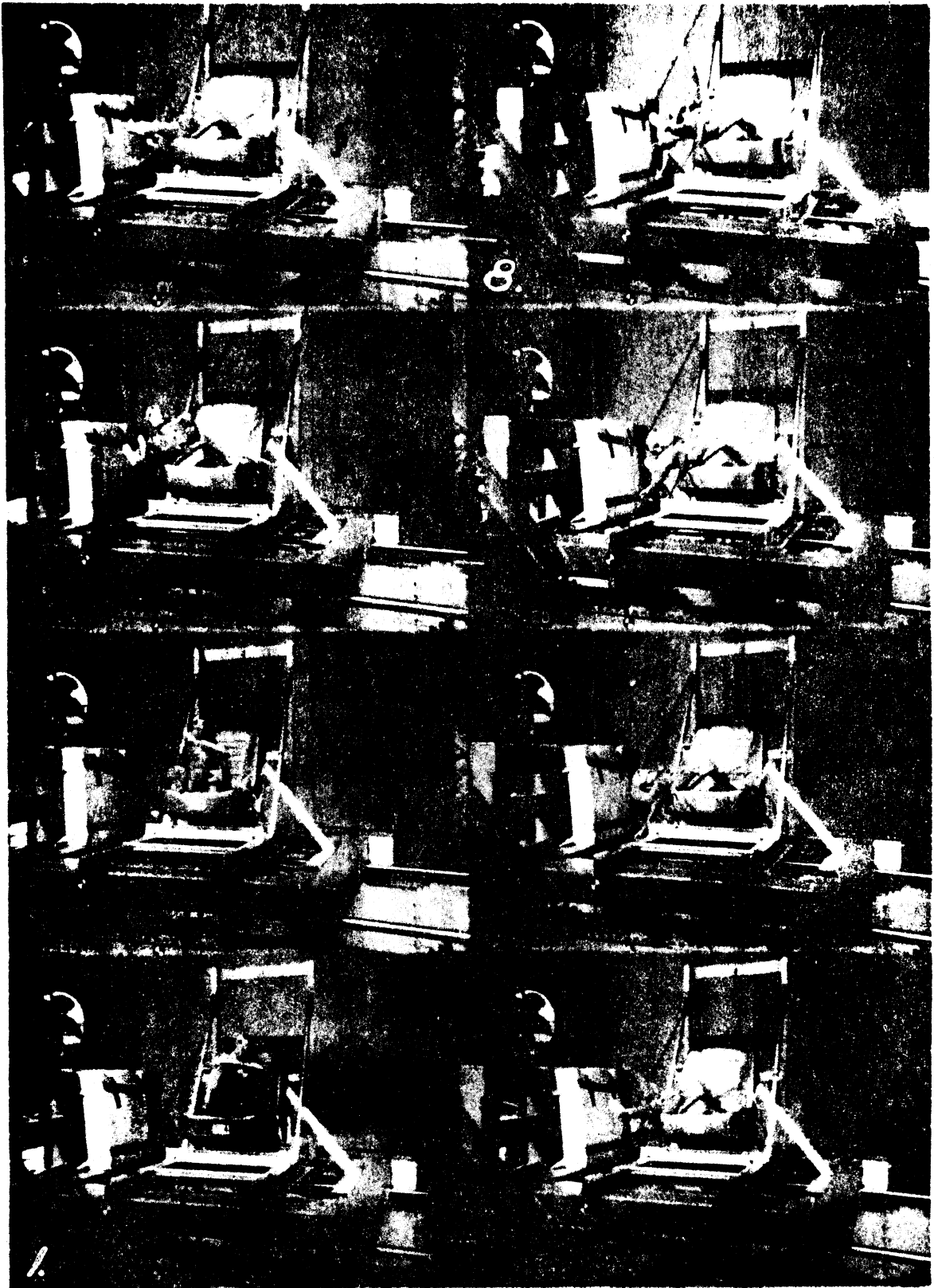
Dummy: 3 years
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: Side impact
Dummy Attitude: Sitting

Test Observation:

This pedestal type seat was observed to dig deeply into the cushion of the adult seat. This caused the dummy to flex at the waist so severely that the head bent downwards to a level equivalent to the floorboard of the simulated model. Contact with any adjacent interior structures would be ensured.

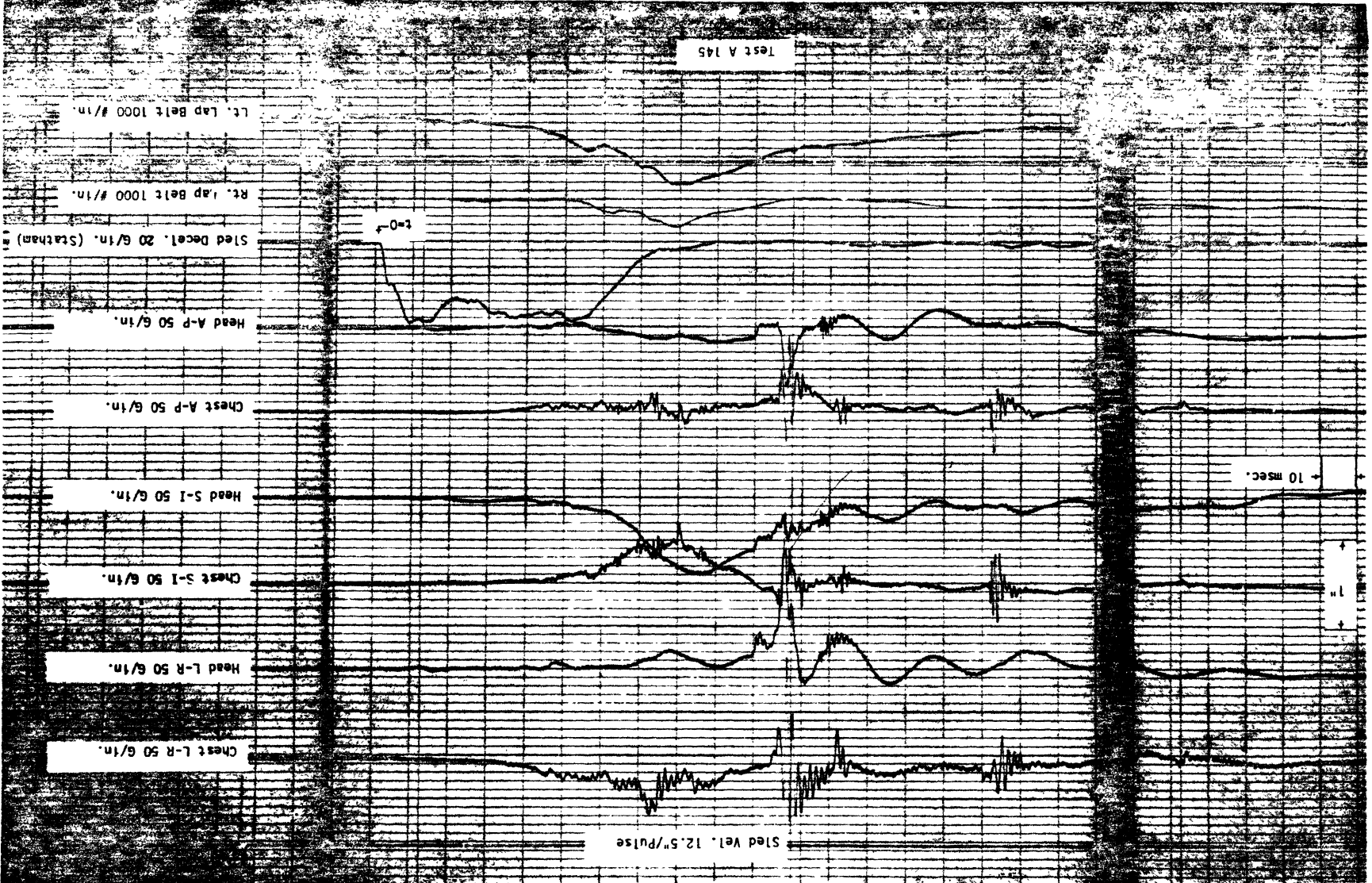


NOT REPRODUCIBLE



A145

Test A 145



903

HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-146
Test Date: 13 August 1969
Restraint Code No.: C-35
Restraint Description: American Motors Harness No. 8992185

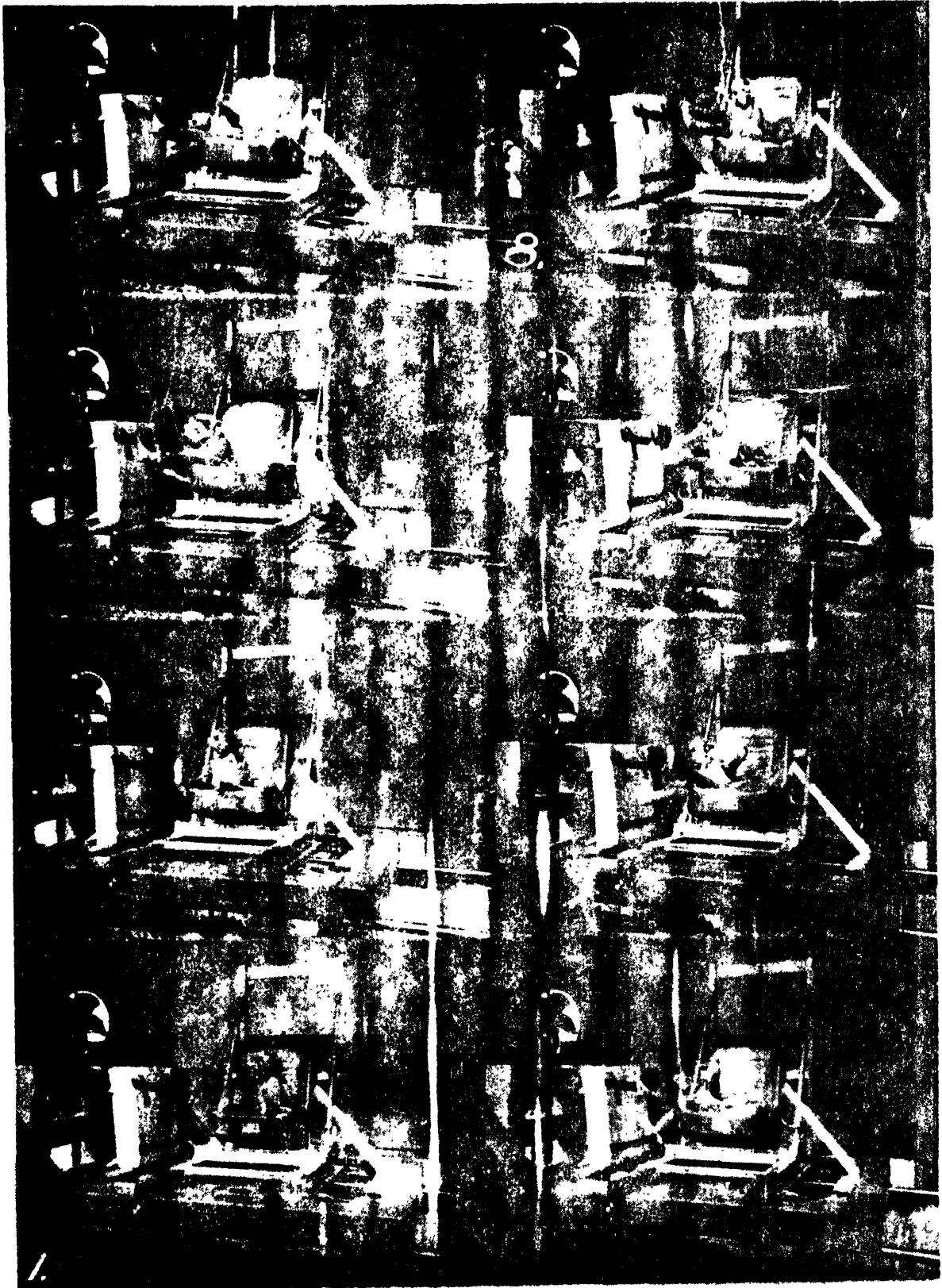
Dummy: 3 year
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: Side impact
Dummy Attitude: Sitting

Test Observation:

The loads experienced by the dummy in this test were moderate. However, the restraint system slid sideways allowing the dummy to move sufficiently far to the side to contact any vehicle structures adjacent to the seat location. No damage to the restraint system was observed, but the button snap on the vest strap, which is independent of the harness, came unsnapped.



NOT REPRODUCIBLE



A146.

Test A 146

t=0

Sted Decel. 20 g/in. (Statham)

Head A-P 50 g/in.

Chest A-P 50 g/in.

Head S-I 50 g/in.

Chest S-I 50 g/in.

Head L-R 50 g/in.

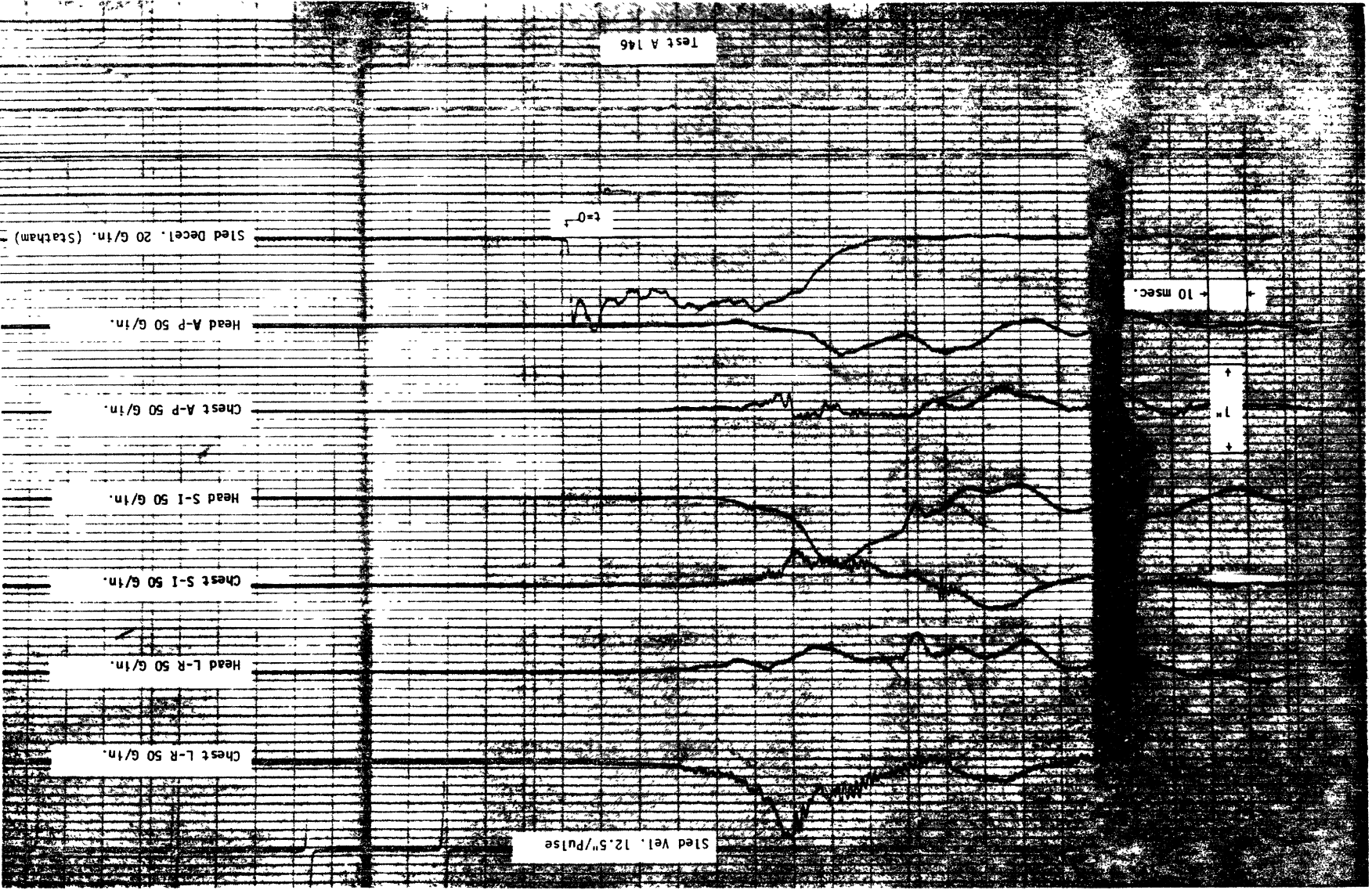
Chest L-R 50 g/in.

Sted Vel. 12.5"/Pulse

10 msec.

1"

013



HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-147
Test Date: 13 August 1969
Restraint Code No.: C-35
Restraint Description: American Motors Harness No. 8992185

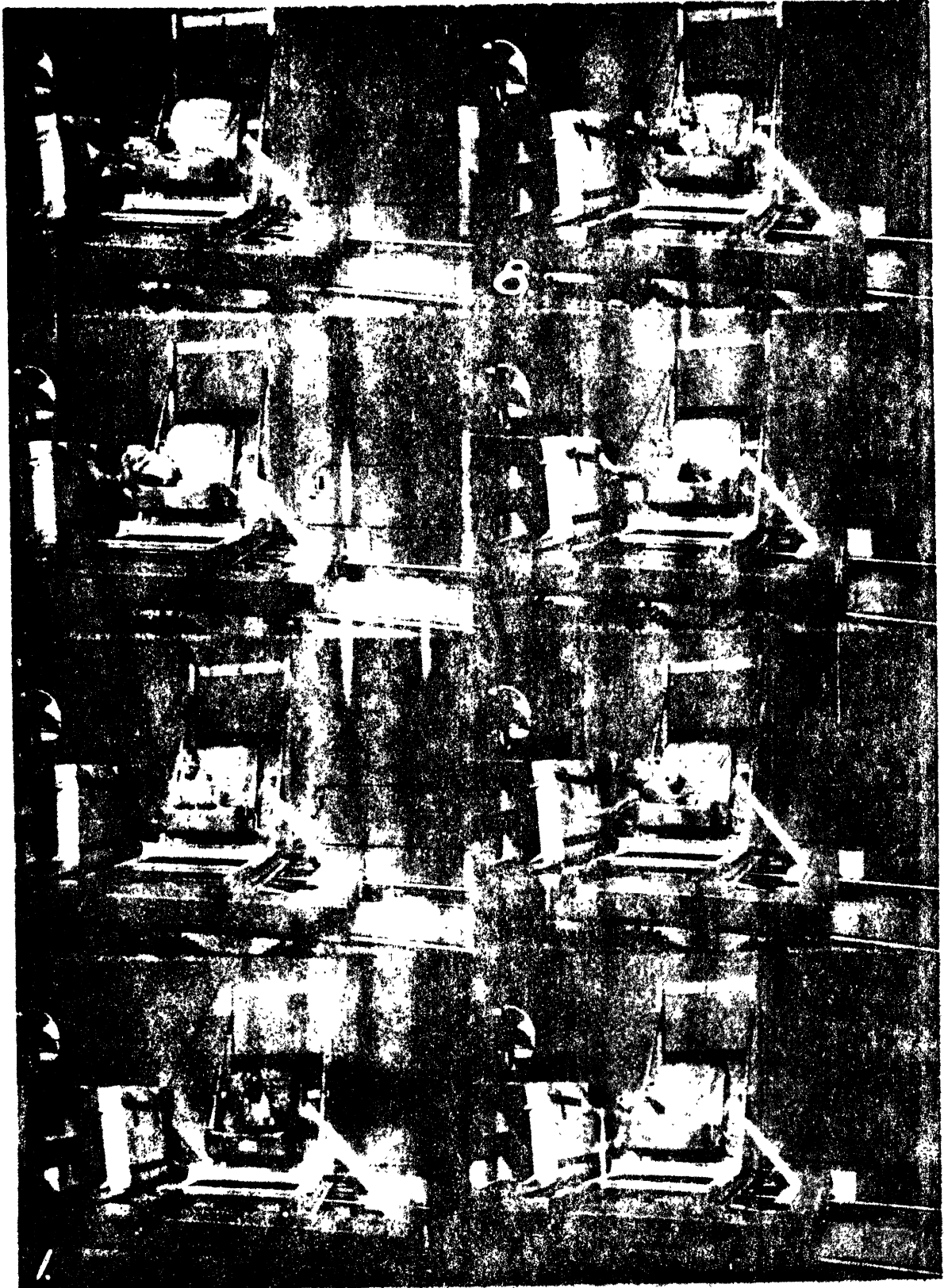
Dummy: 3 year
Sled Velocity: 30 mph
Sled G-level: 18
Impact Direction: Side impact
Dummy Attitude: Sitting

Test Observation:

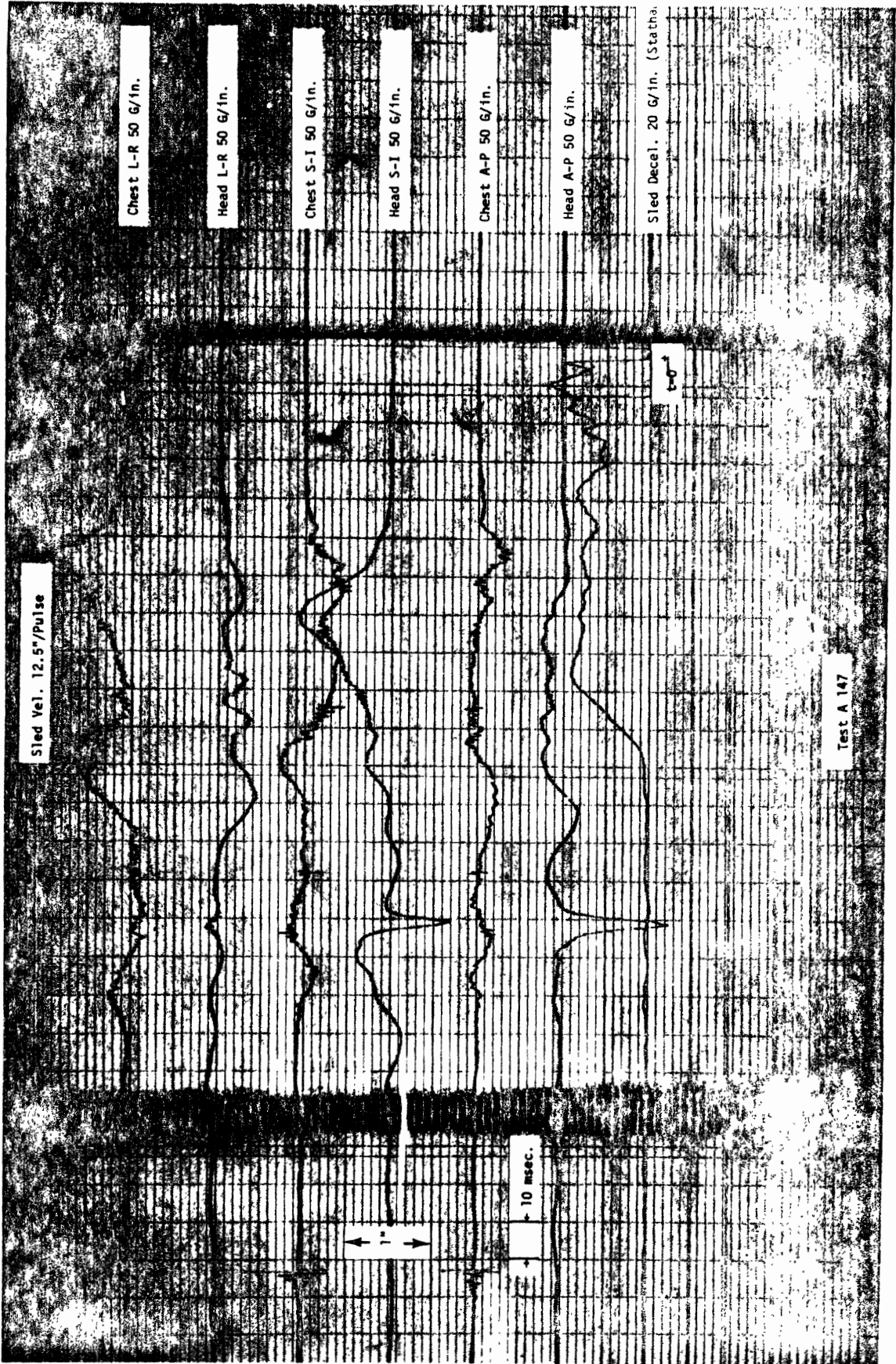
The g-loadings experienced by the dummy were quite high. Sideways motion of the dummy was sufficient enough to cause contact with any adjacent interior structures in a vehicle. The nylon mesh vest was torn where it was sewed to the upper left shoulder strap.



NOT REPRODUCIBLE



A147



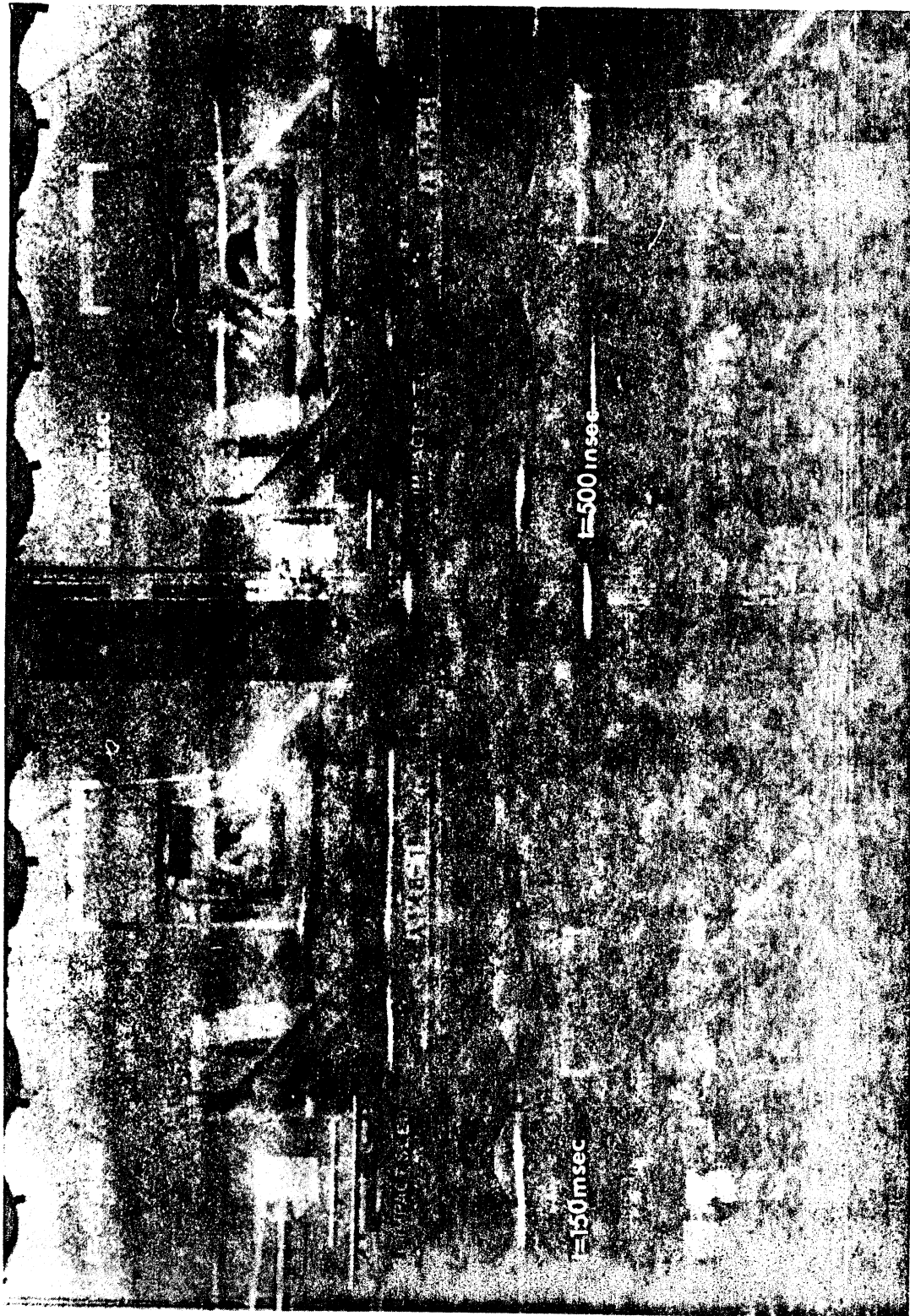
HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-148
Test Date: 13 August 1969
Restraint Code No.: C-1
Restraint Description: Ford Tot-Guard

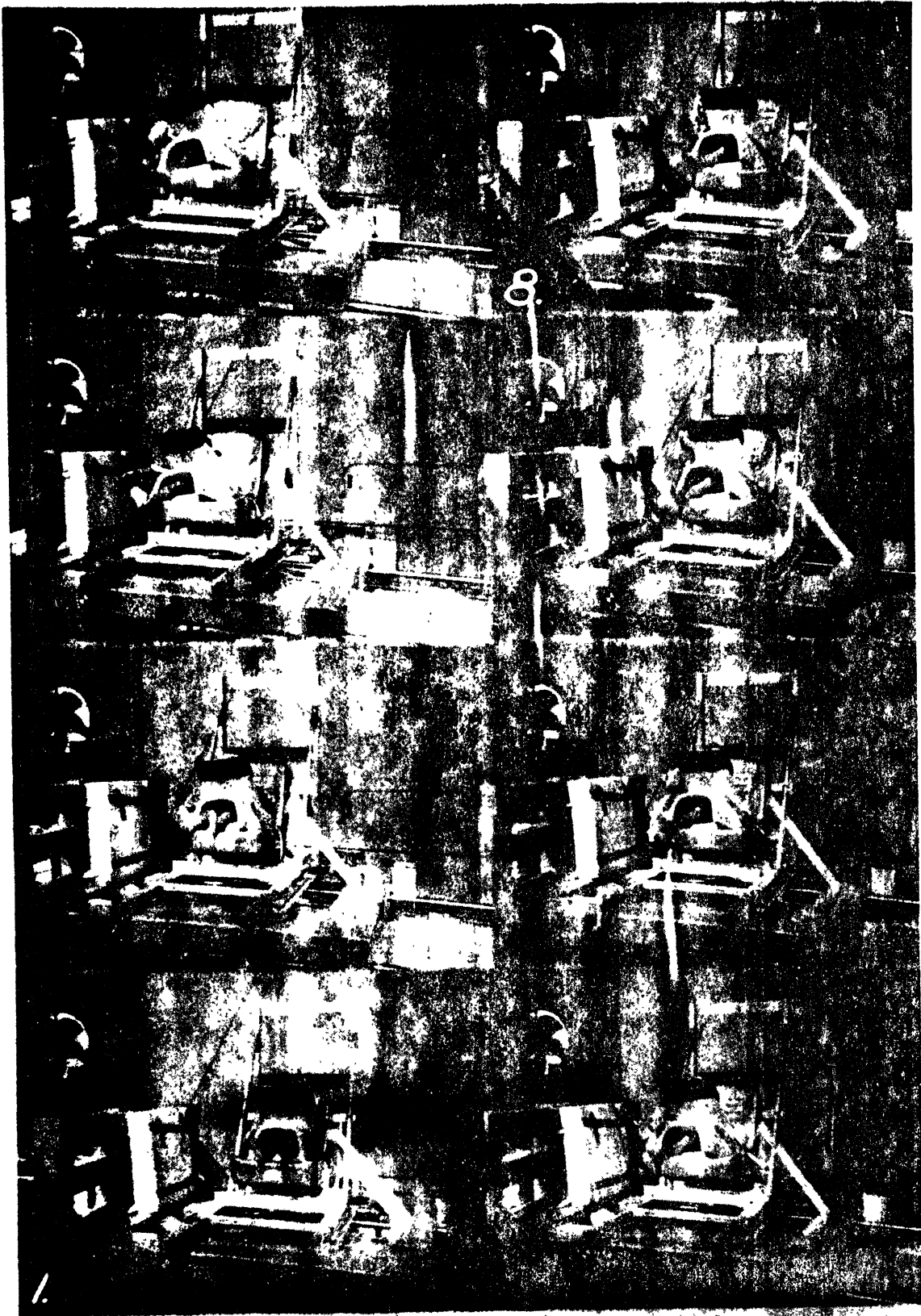
Dummy: 3 year
Sled Velocity: 30 mph
Sled G-level: 18
Impact Direction: Side impact
Dummy Attitude: Sitting

Test Observation:

Superior-inferior accelerometer readings in both the head and the chest were fairly high. The dummy torso and head bent sideways over the low support structure at the side of the Tot-Guard. Contact with the vehicle interior side structures is likely.



NOT REPRODUCIBLE



A148

Sled Vel. 12.5"/Pulse

Chest L-R 50 G/in.

Head L-R 50 G/in.

Chest S-I 50 G/in.

Head S-I 50 G/in.

Chest A-P 50 G/in.

Head A-P 50 G/in.

Sled Decel. 20 G/in. (Statham)

Rt. Lap Belt 1000 #/in.

Lt. Lap Belt 1000 #/in.

318

10 msec.

t=0

Test A 148

HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-149
Test Date: 13 August 1969
Restraint Code No.: C-6
Restraint Description: George B. Walker Safety Seat

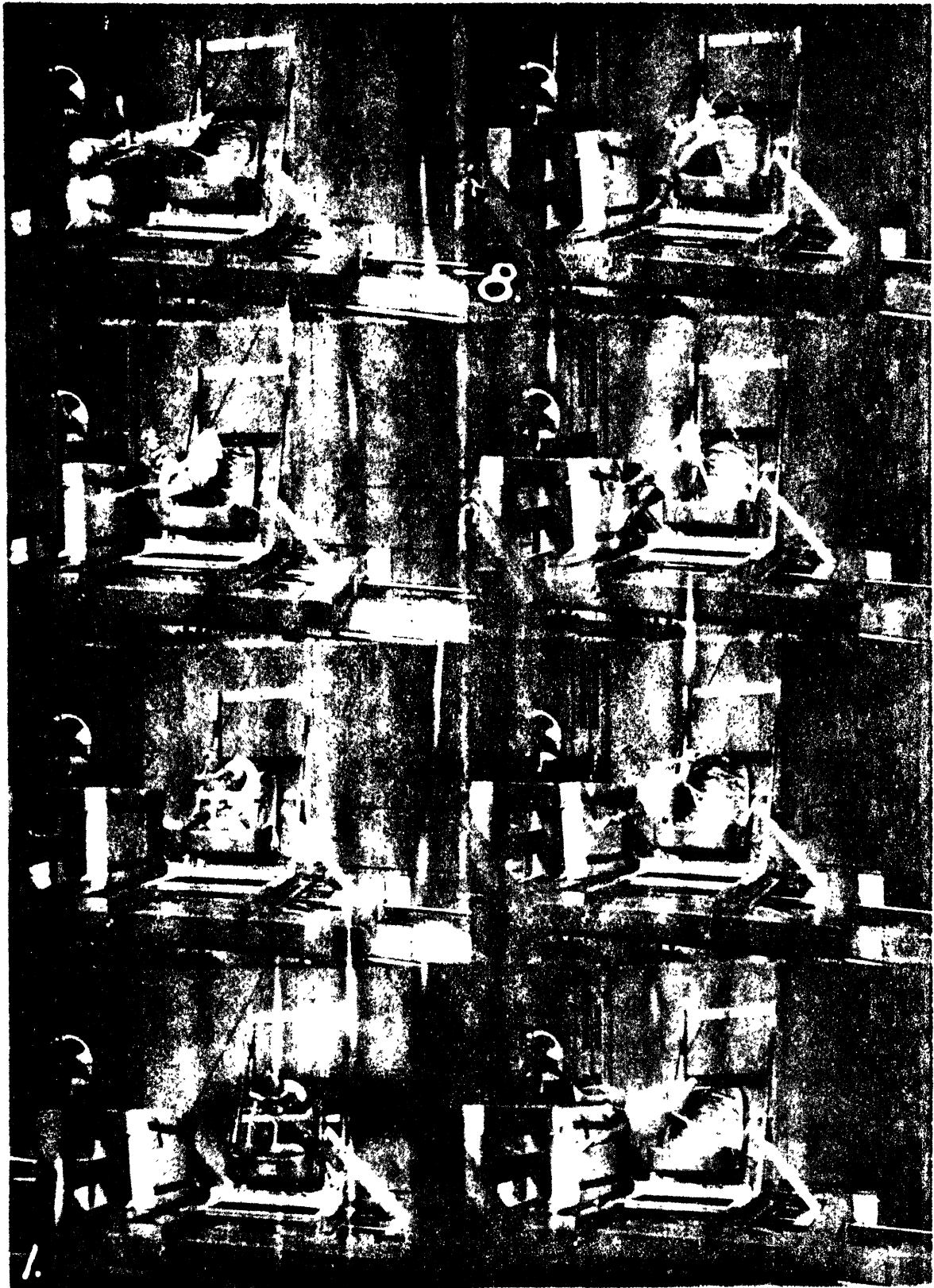
Dummy: 3 year
Sled Velocity: 30 mph
Sled G-level: 18
Impact Direction: Side Impact
Dummy Attitude: Sitting

Test Observation:

The rear seat retaining strap which anchors the bail hooks to the floor parted at the intersection of the Y. Thus, the dummy and the seat were both ejected from the adult seat. The restraint system would have offered no protection whatsoever in this situation.



NOT REPRODUCIBLE



A149

Test A 149

Sted Decel. 20 G/in. (Station)

Head A-P 50 G/in.

Chest A-P 50 G/in.

Head S-I 50 G/in.

Chest S-I 50 G/in.

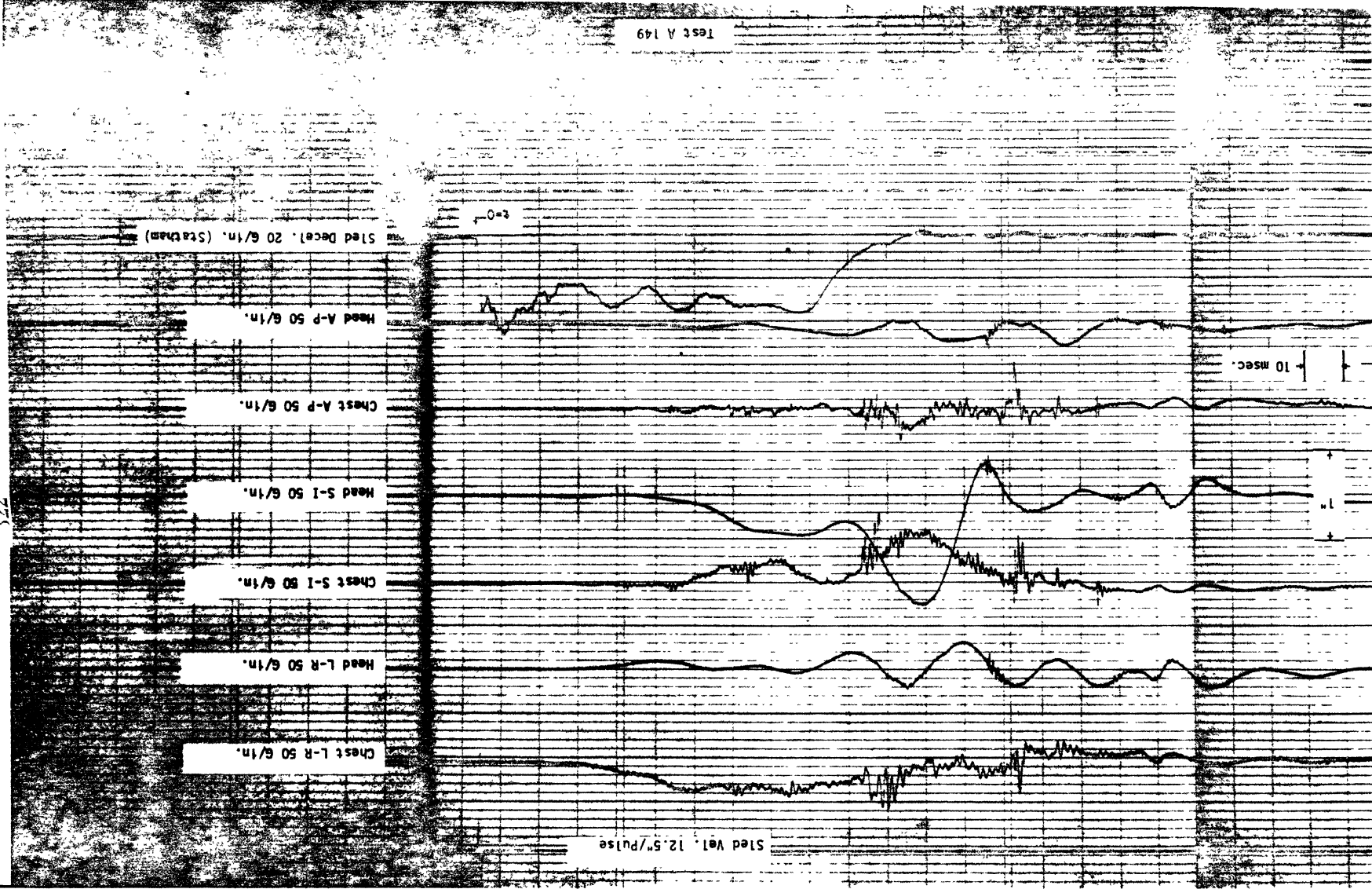
Head L-R 50 G/in.

Chest L-R 50 G/in.

10 msec

Sted Vol. 12.5"/pulse

322



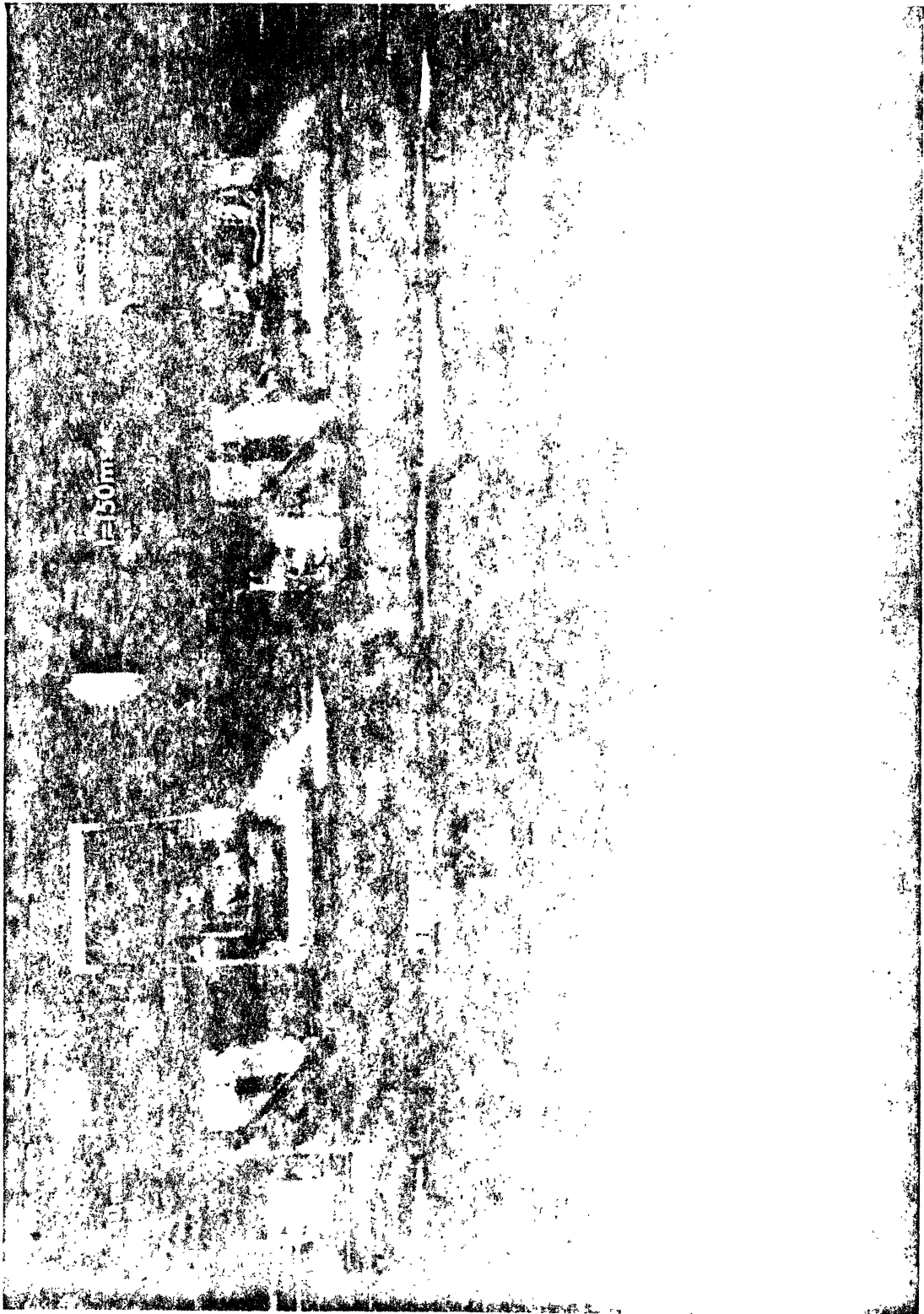
HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-150
Test Date: 13 August 1969
Restraint Code No.: C-23
Restraint Description: Volvo Child Safety Seat

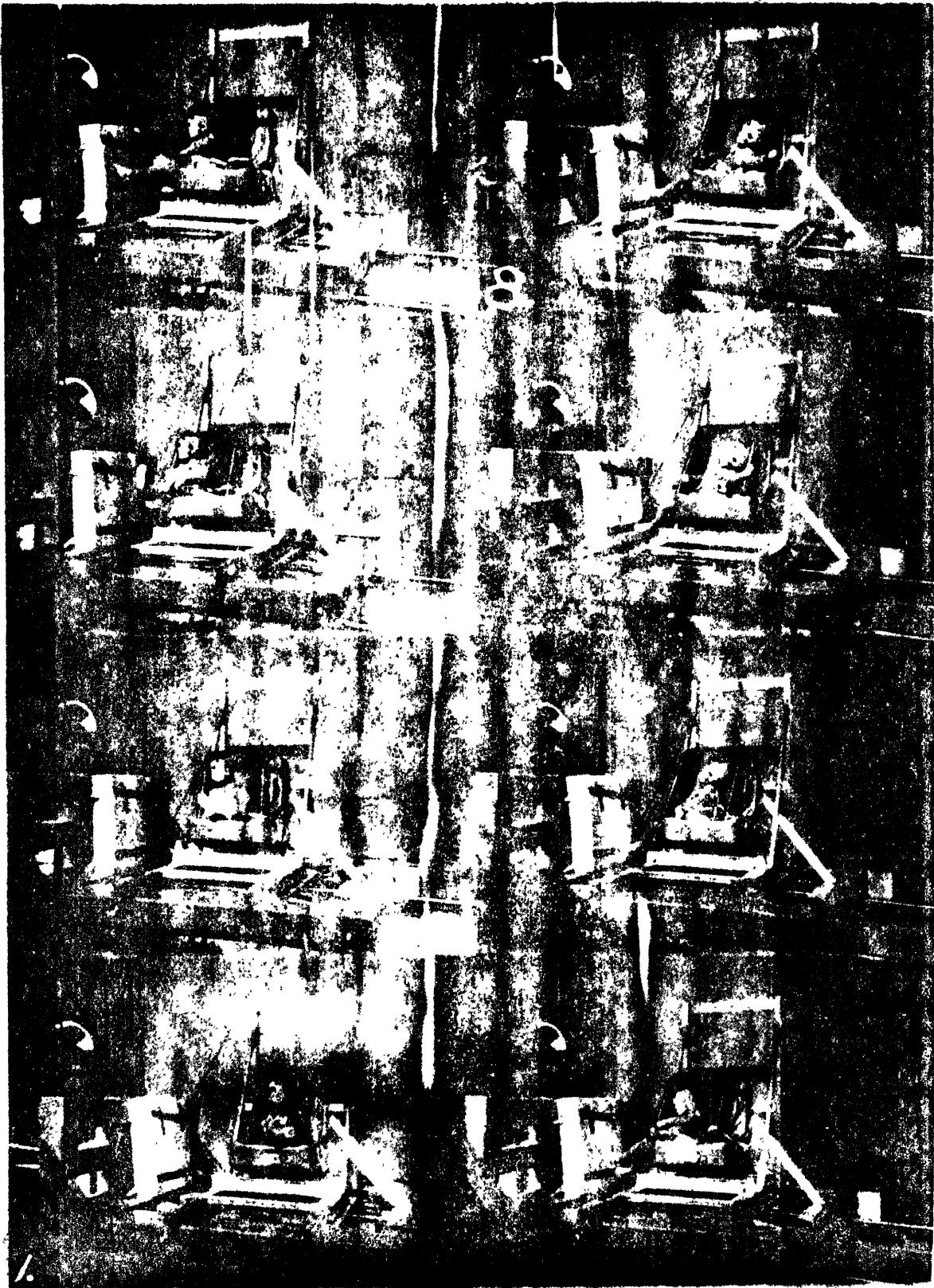
Dummy: 3 year
Sled Velocity: 30 mph
Sled G-level: 18
Impact Direction: Side Impact
Dummy Attitude: Sitting

Test Observation:

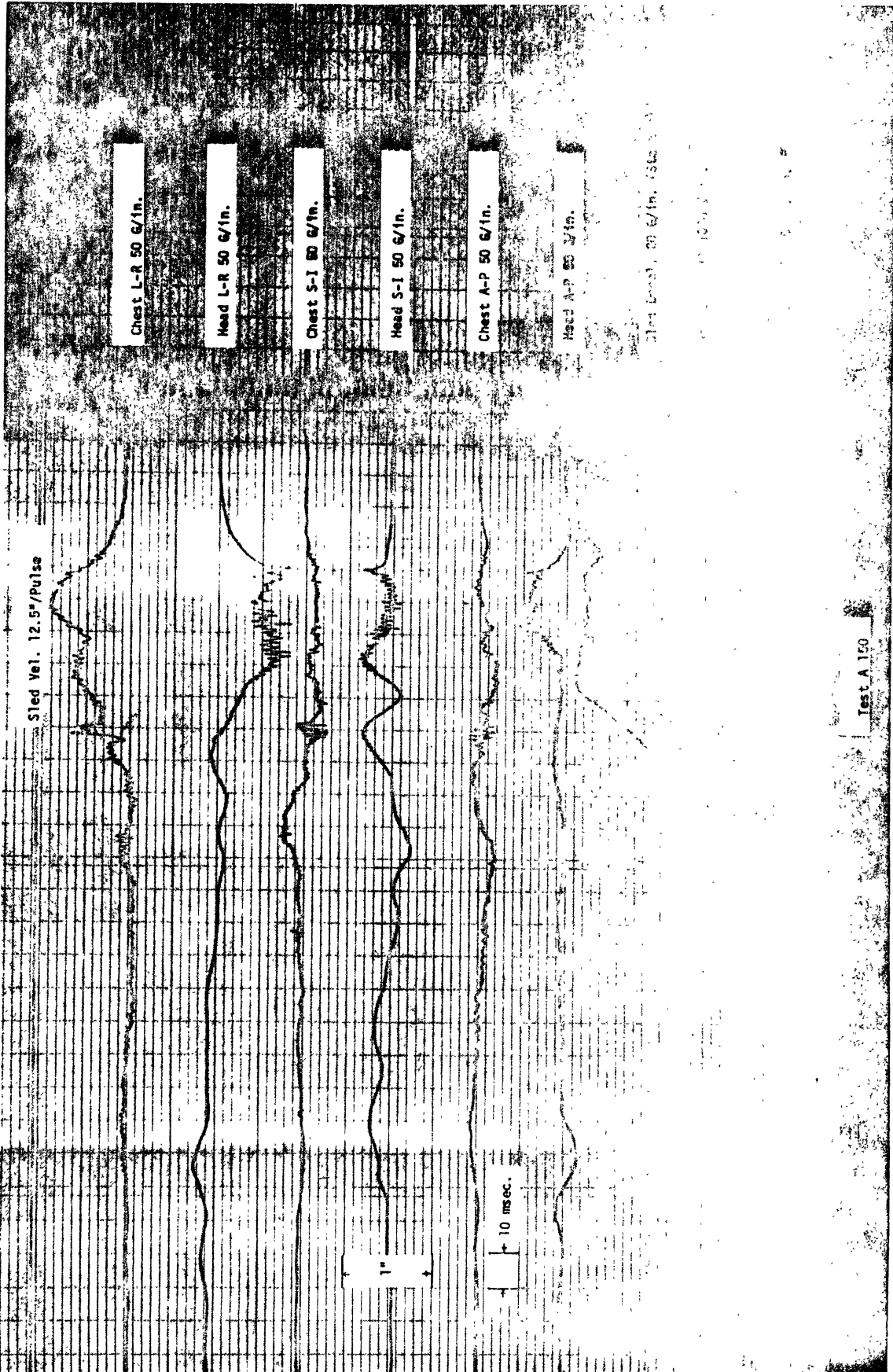
The g-loadings experienced by the dummy in this test were moderate. The side structures of this restraint system would have prevented the dummy from contacting vehicle interior structures. In addition to this, no gross relative motion between the head and the torso took place. The side structure of this seat was somewhat bent outward in this test. This is the only seat observed in this test series which offered a substantial degree of protection in side impact.



NOT REPRODUCIBLE



A150



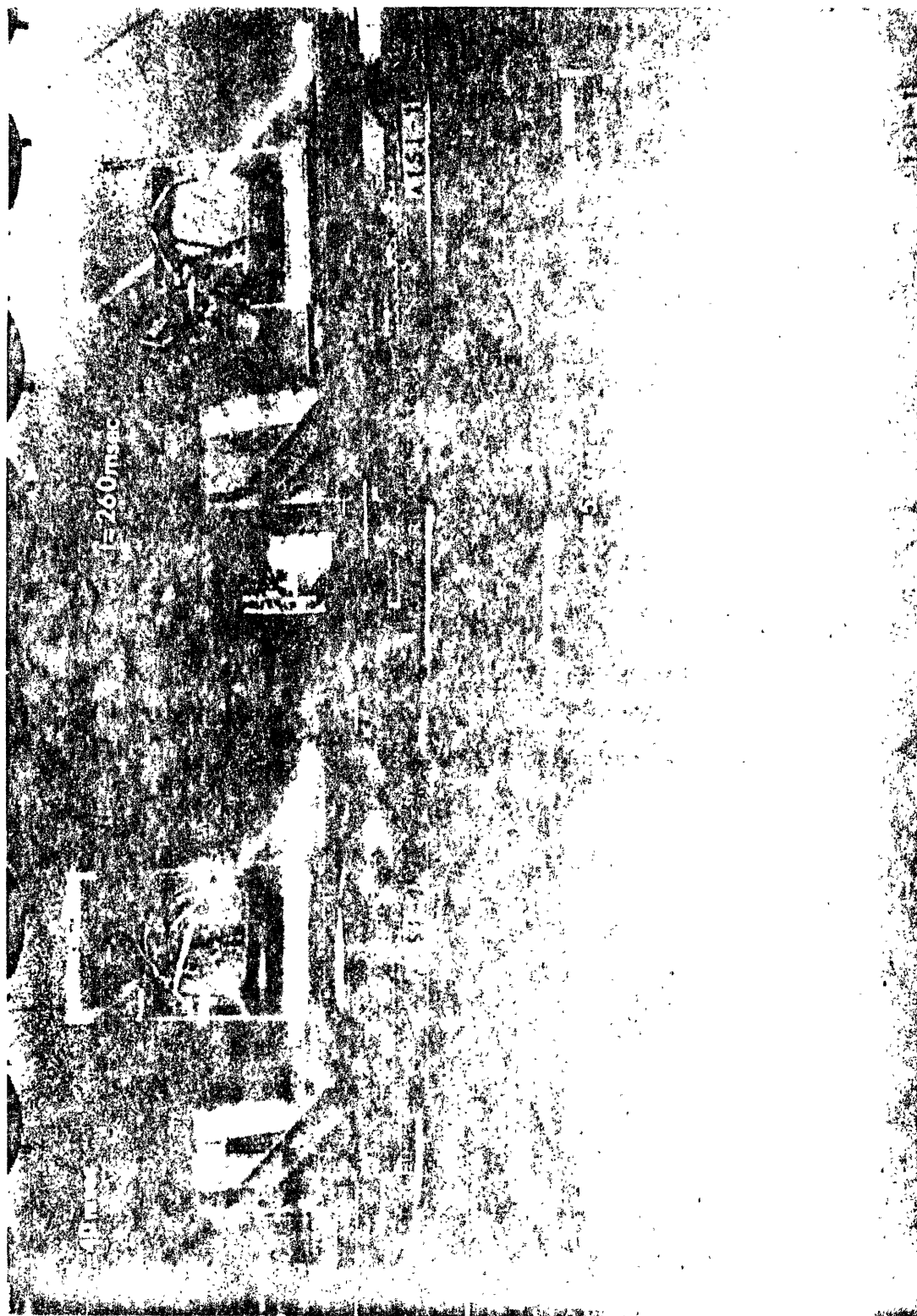
HSRI SUMMARY DATA SHEET (FH-11-6962)

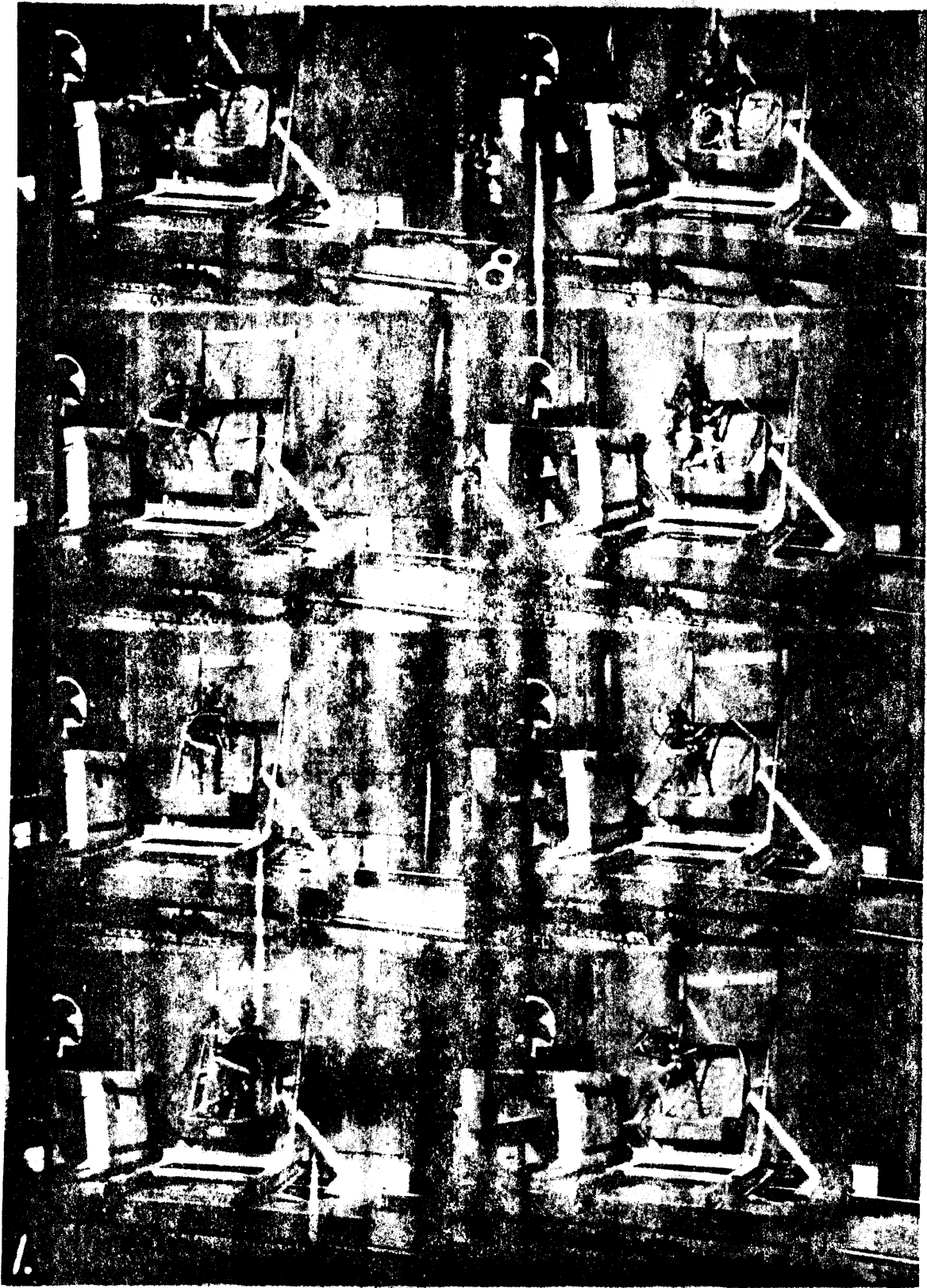
Test No: A-151
Test Date: 14 August 1969
Restraint Code No.: C-31
Restraint Description: Sears Auto Harness, small

Dummy: 3 year
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: Side impact
Dummy Attitude: Standing

Test Observation:

The dummy went through rather wild contortions during this test. The right arm was broken off. Because the restraint system slid to the side, the dummy would have contacted any adjacent vehicle structures.





A151

Test A 151

Sted Decel. 20 g/in. (Steady)

Head A-P 50 g/in.

Chest A-P 50 g/in.

Head S-I 50 g/in.

Chest S-I 50 g/in.

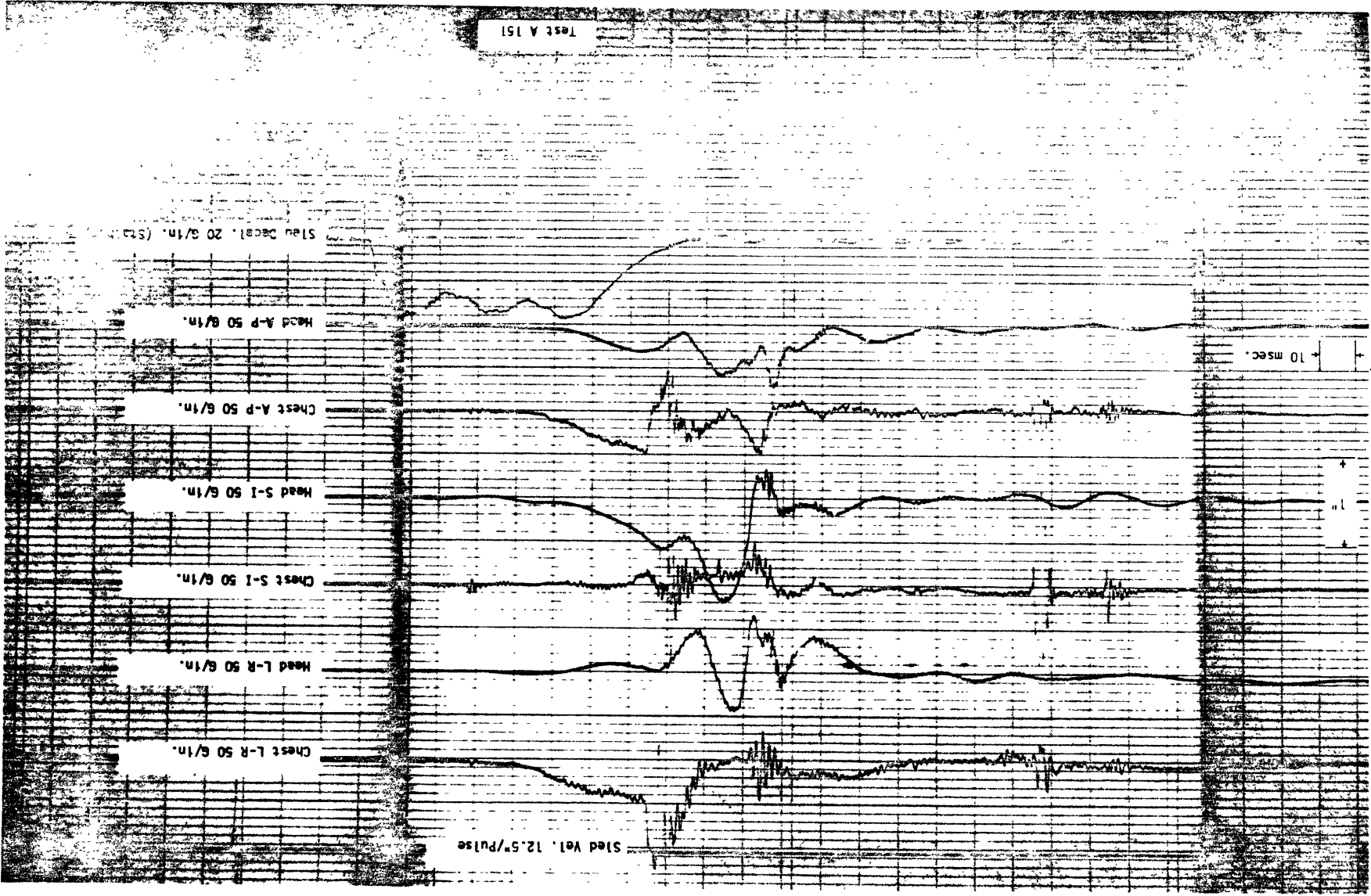
Head L-R 50 g/in.

Chest L-R 50 g/in.

10 msec.

Sted Vel. 12.5"/Pulse

151



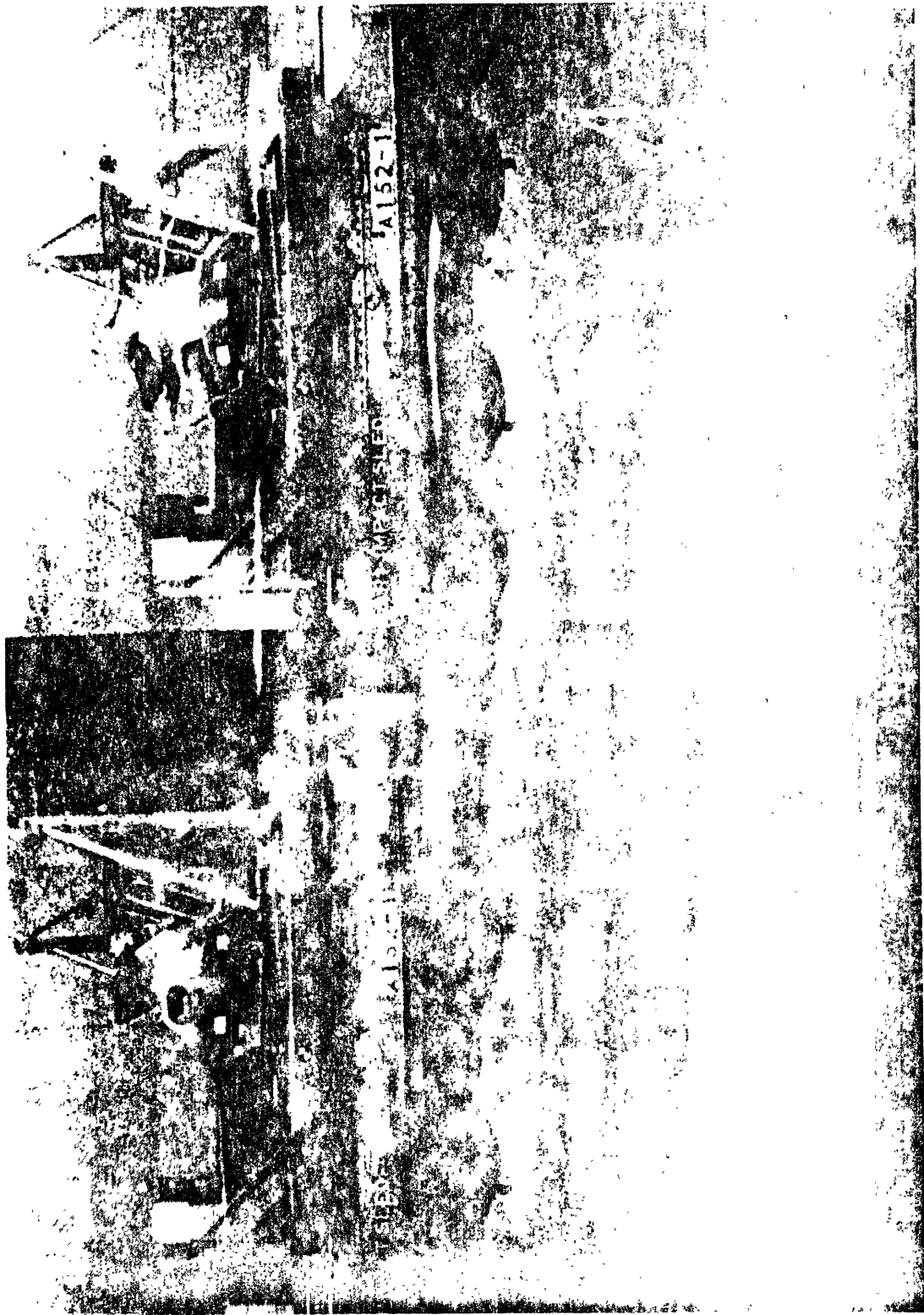
HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-152
Test Date: 15 August 1969
Restraint Code No.: C-1
Restraint Description: Ford Tot-Guard

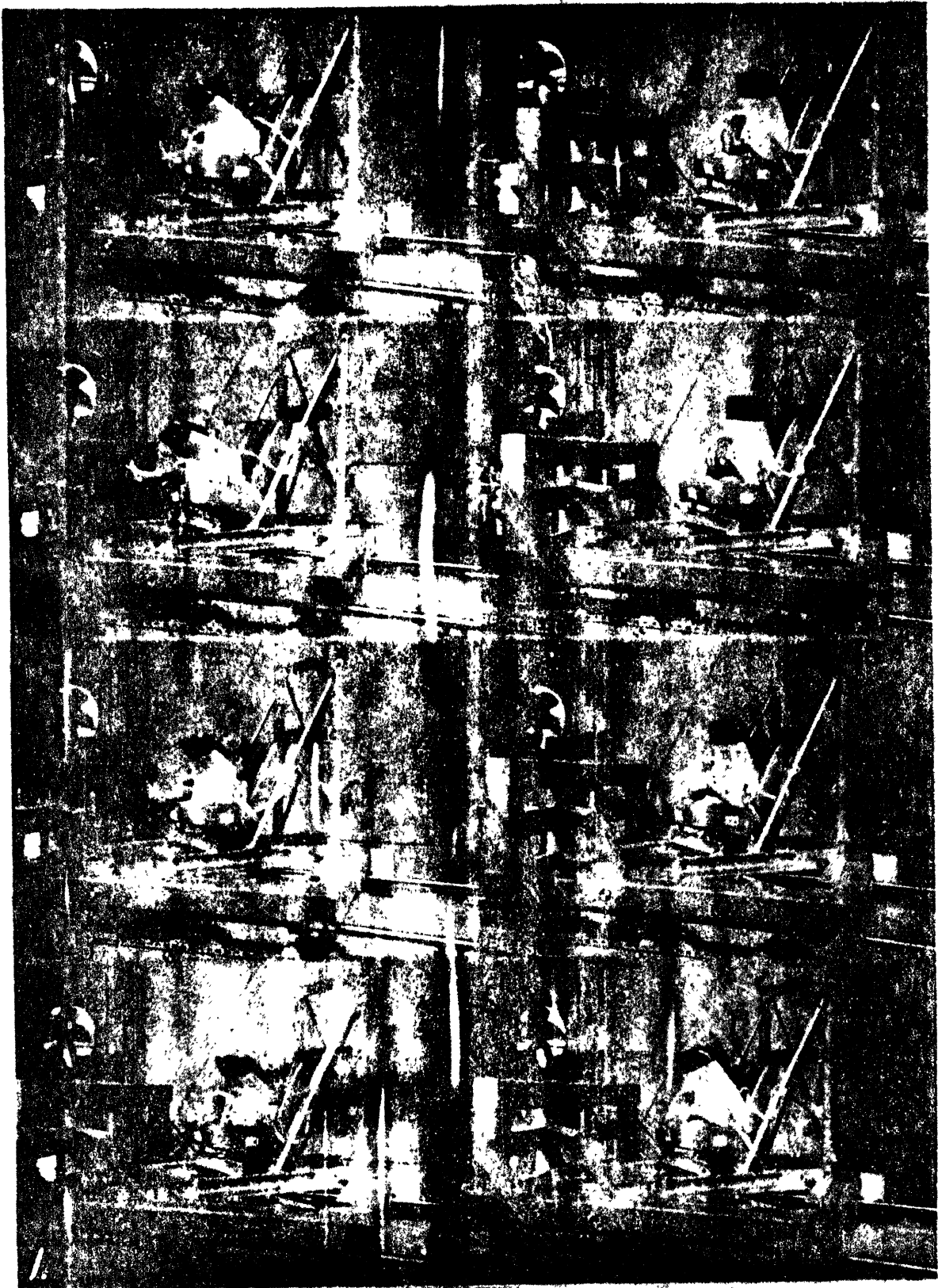
Dummy: 3 year
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: 45° oblique
Dummy Attitude: Sitting

Test Observation:

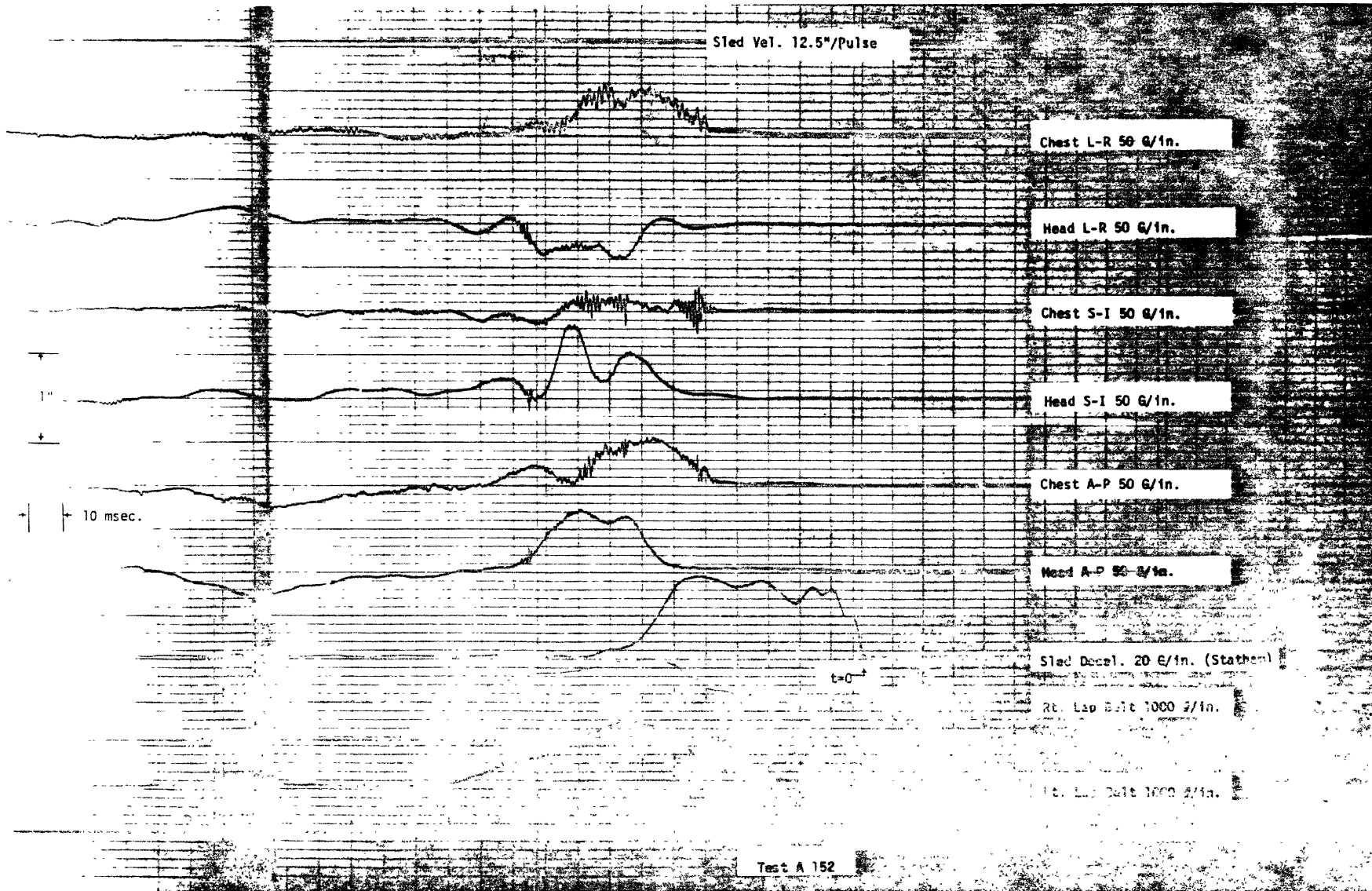
The g-loadings experienced by the dummy were moderate and the motion experienced was minimal. Rebound was quite severe.



NOT REPRODUCIBLE



A152



Test A 152

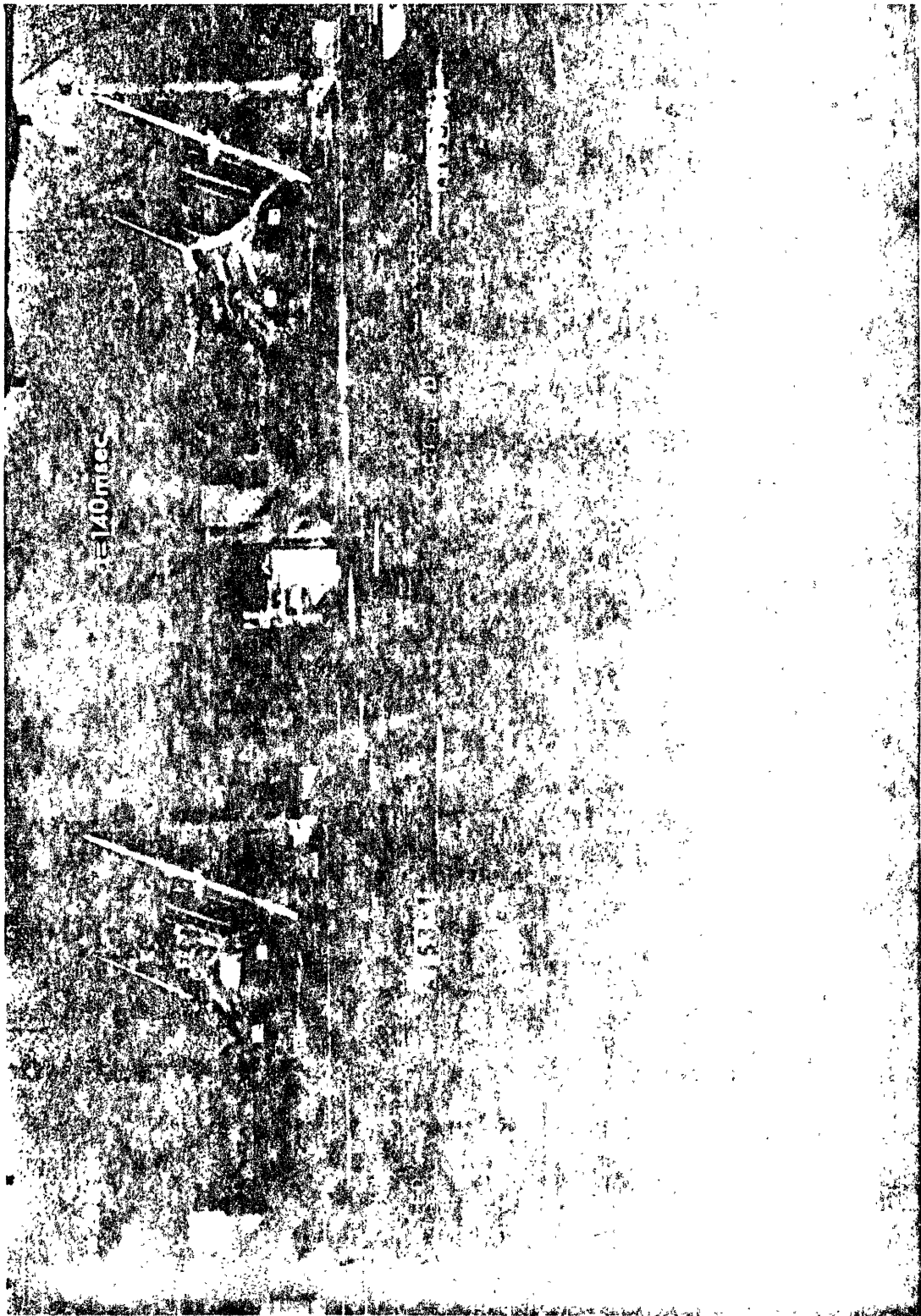
HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-153
Test Date: 15 August 1969
Restraint Code No.: C-3
Restraint Description: General Motors Standard Seat

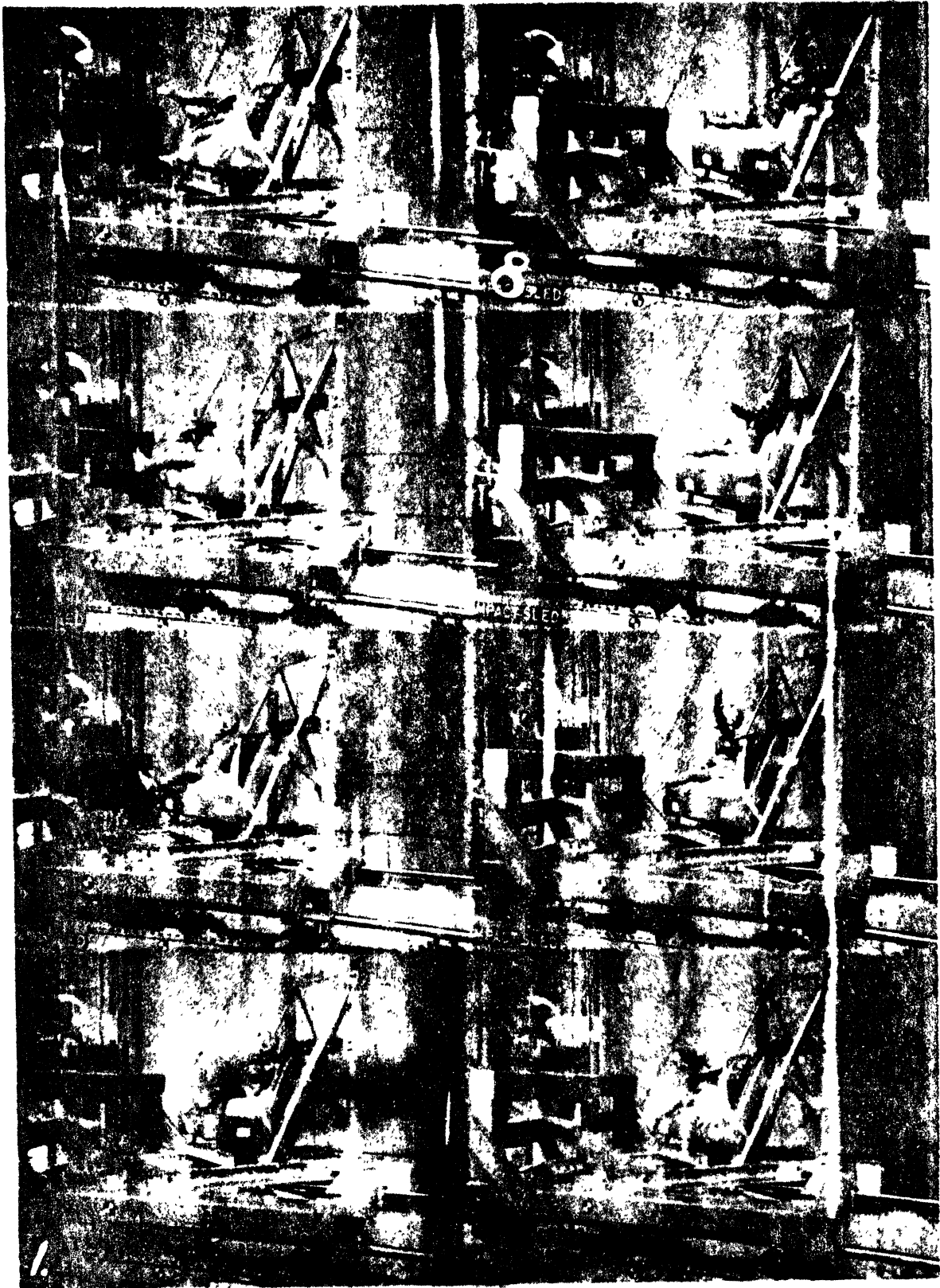
Dummy: 3 year
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: 45° oblique
Dummy Attitude: Sitting

Test Observation:

The loadings received by the dummy were quite high, especially in the head superior-inferior accelerometer. As is usual with this pedestal type seat, it was observed to dig into the seat cushion structure of the adult seat. The upper part of the upper torso of the dummy and the head pitched forward over the chest restraining strap.

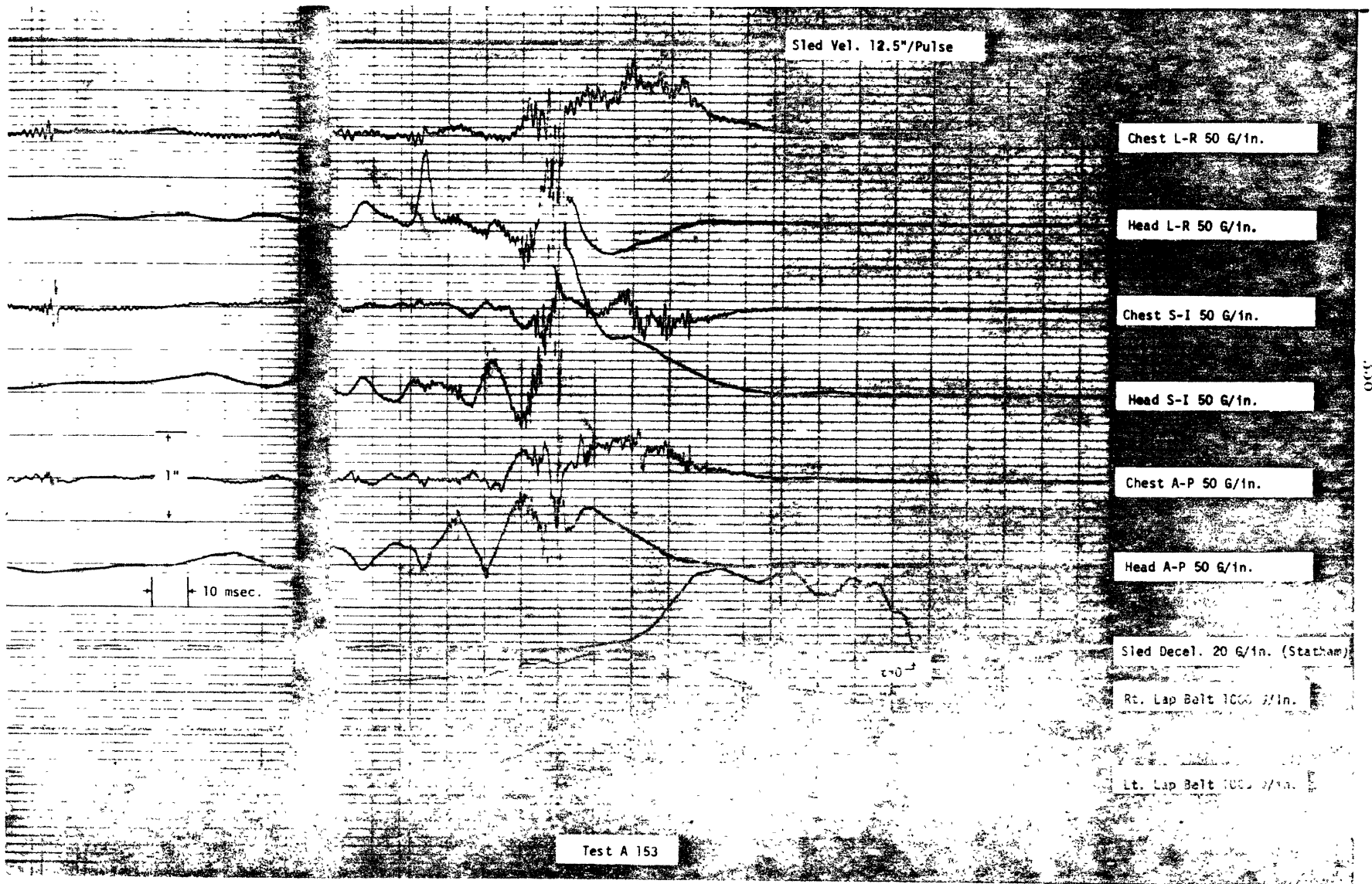


NOT REPRODUCIBLE



A153

NOT REPRODUCIBLE



HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-154
Test Date: 17 August 1969
Restraint Code No.: C-17
Restraint Description: Stroller Seat No. 509

Dummy: 3 year
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: 45° oblique
Dummy Attitude: Sitting

Test Observation:

The failure of the left ball hook allowed the dummy and the child seat to cartwheel sideways off the adult seat. This would have resulted in impacting the inside of the car. NOTE: Instructions with the seat recommended use of the adult lap belt across the seat behind the dummy's buttock to help restrain the seat. This was not done in this test.





A154

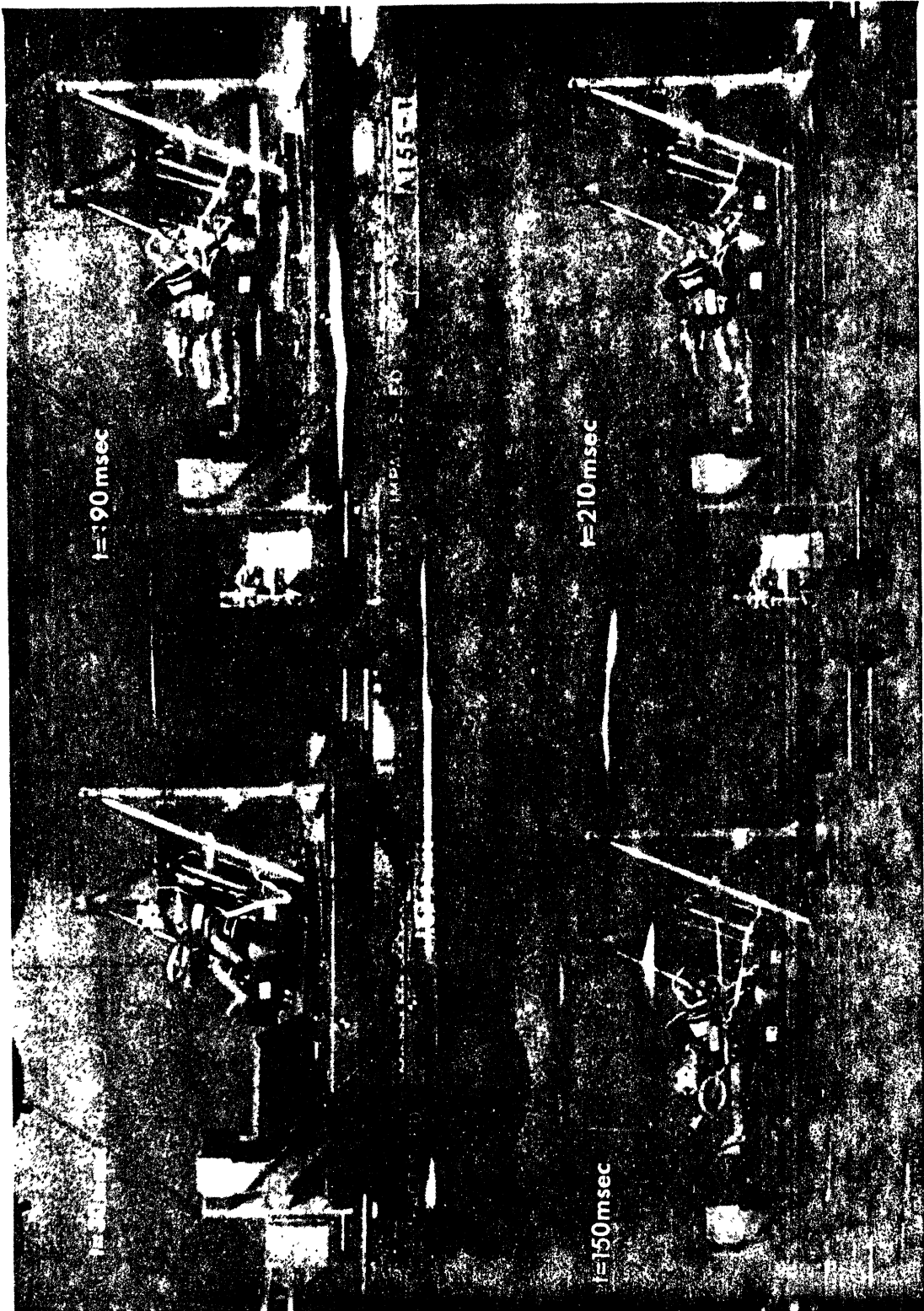
HSRI SUMMARY DATA SHEET (FH-11-6962)

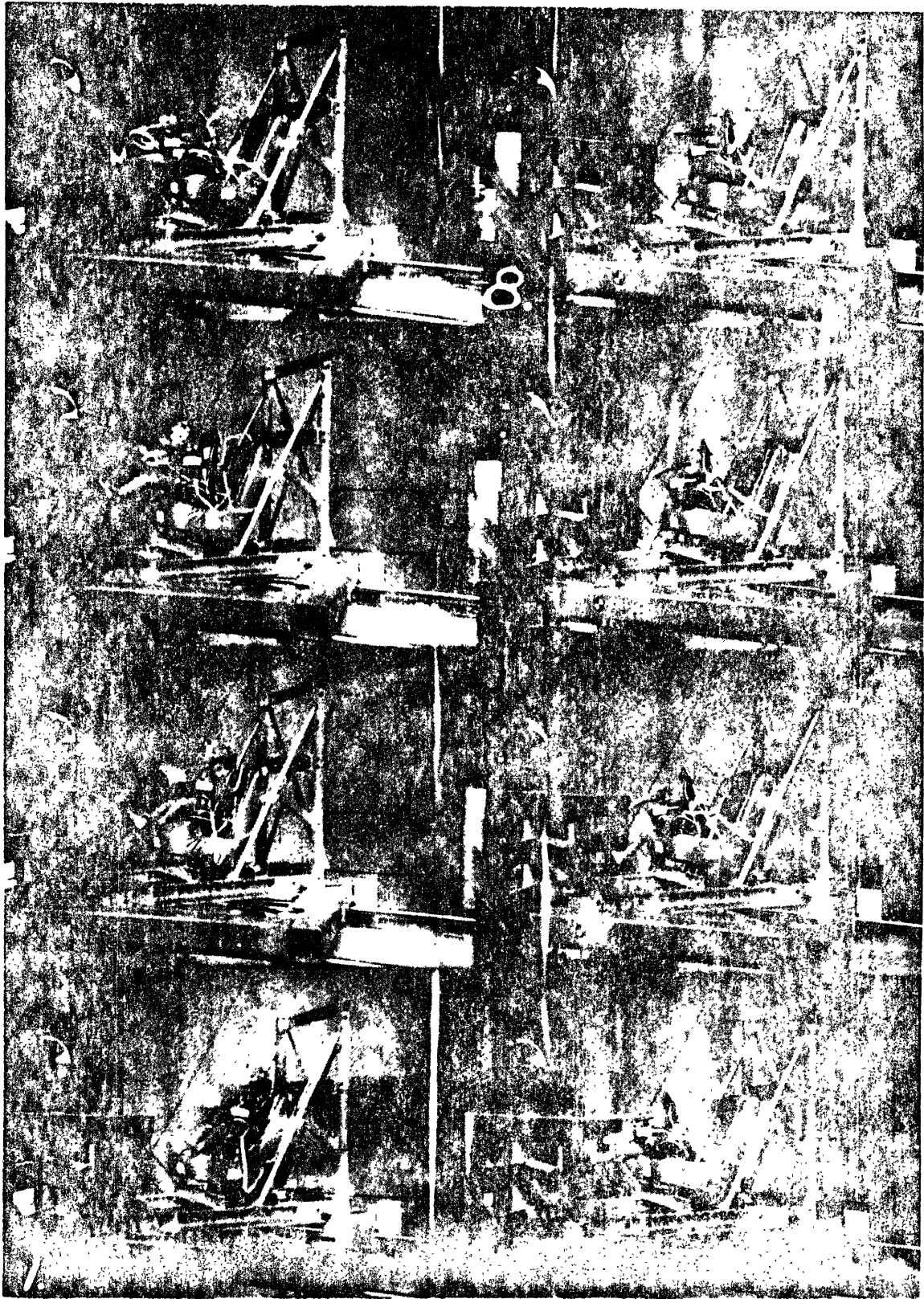
Test No: A-155
Test Date: 17 August 1969
Restraint Code No.: C-20
Restraint Description: Bunny-Bear Seat No. T8905H

Dummy: 3 year
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: 45° oblique
Dummy Attitude: Sitting

Test Observation:

The dummy experienced very low g-levels, apparently due to the gradual collapse of the seat. The tubular frame structure of the seat collapsed completely. The seat and dummy were partially off the seat after the test. The excursions appeared to be very large.





A155

Test A 155

Sted Decel. 20 G/in. (Station)

t=0

10 msec.

Head A-P 50 G/in.

Chest A-P 50 G/in.

Head S-I 50 G/in.

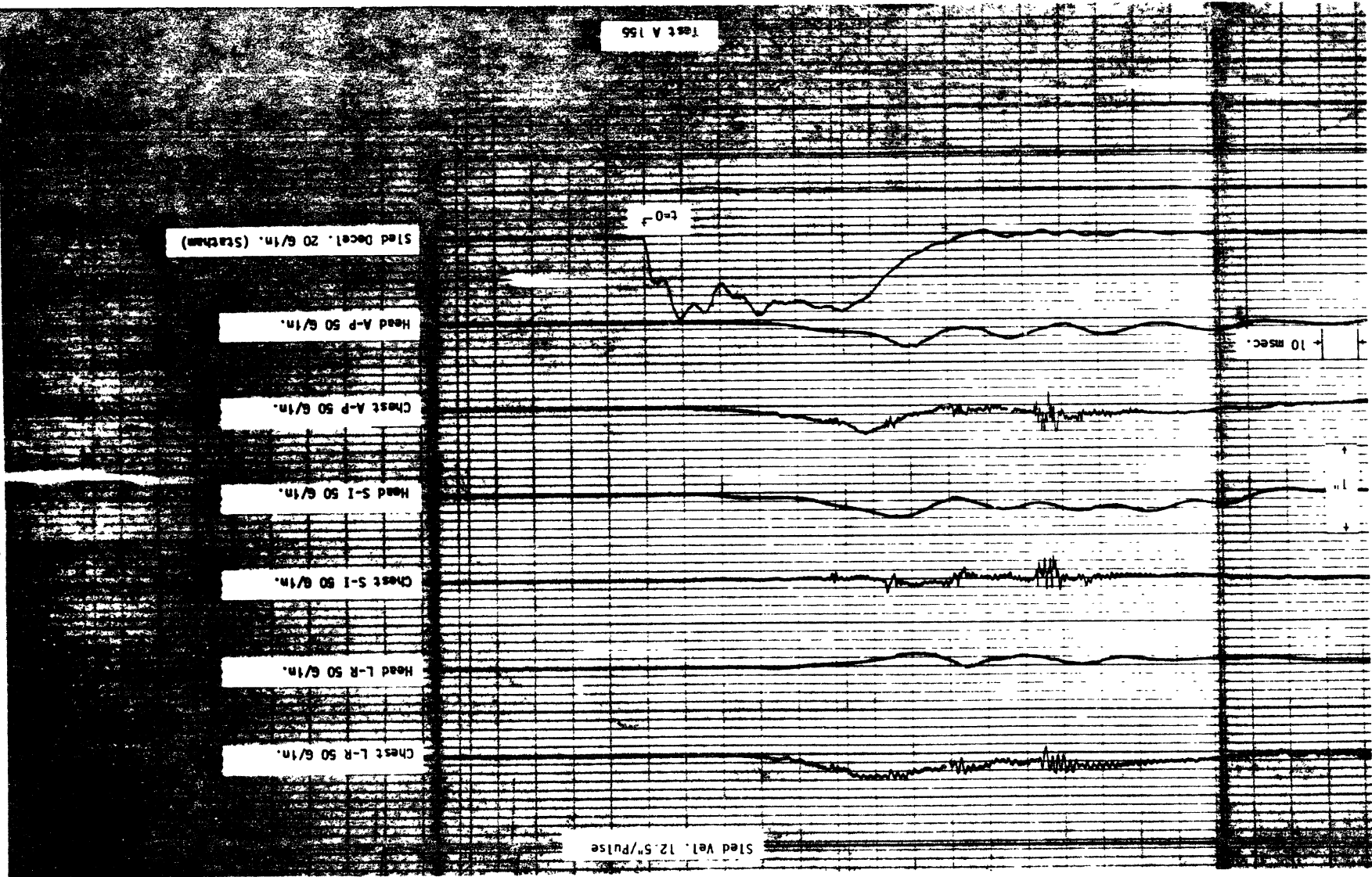
Chest S-I 50 G/in.

Head L-R 50 G/in.

Chest L-R 50 G/in.

Sted Vel. 12.5"/Pulse

345



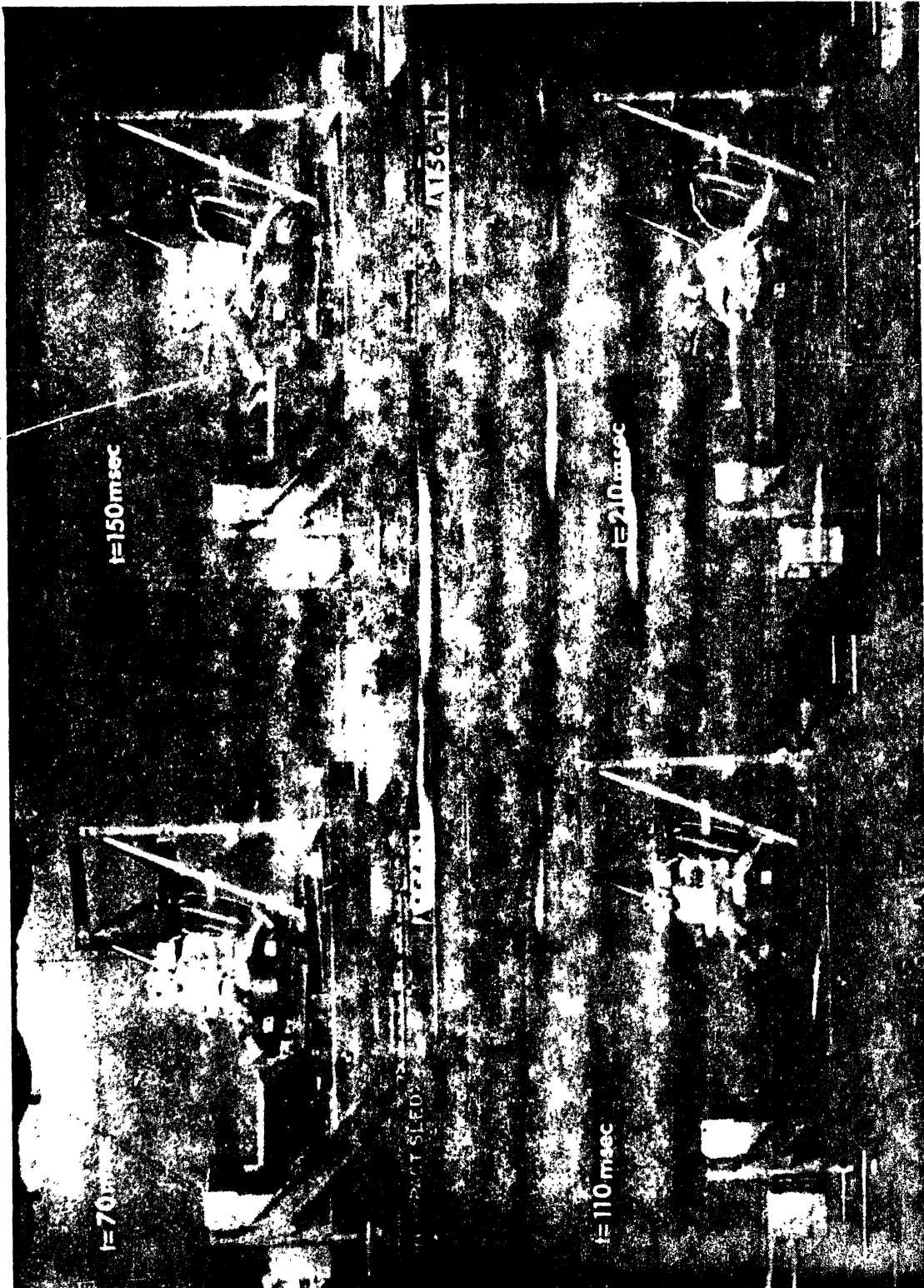
HSRI SUMMARY DATA SHEET (FH-11-6962)

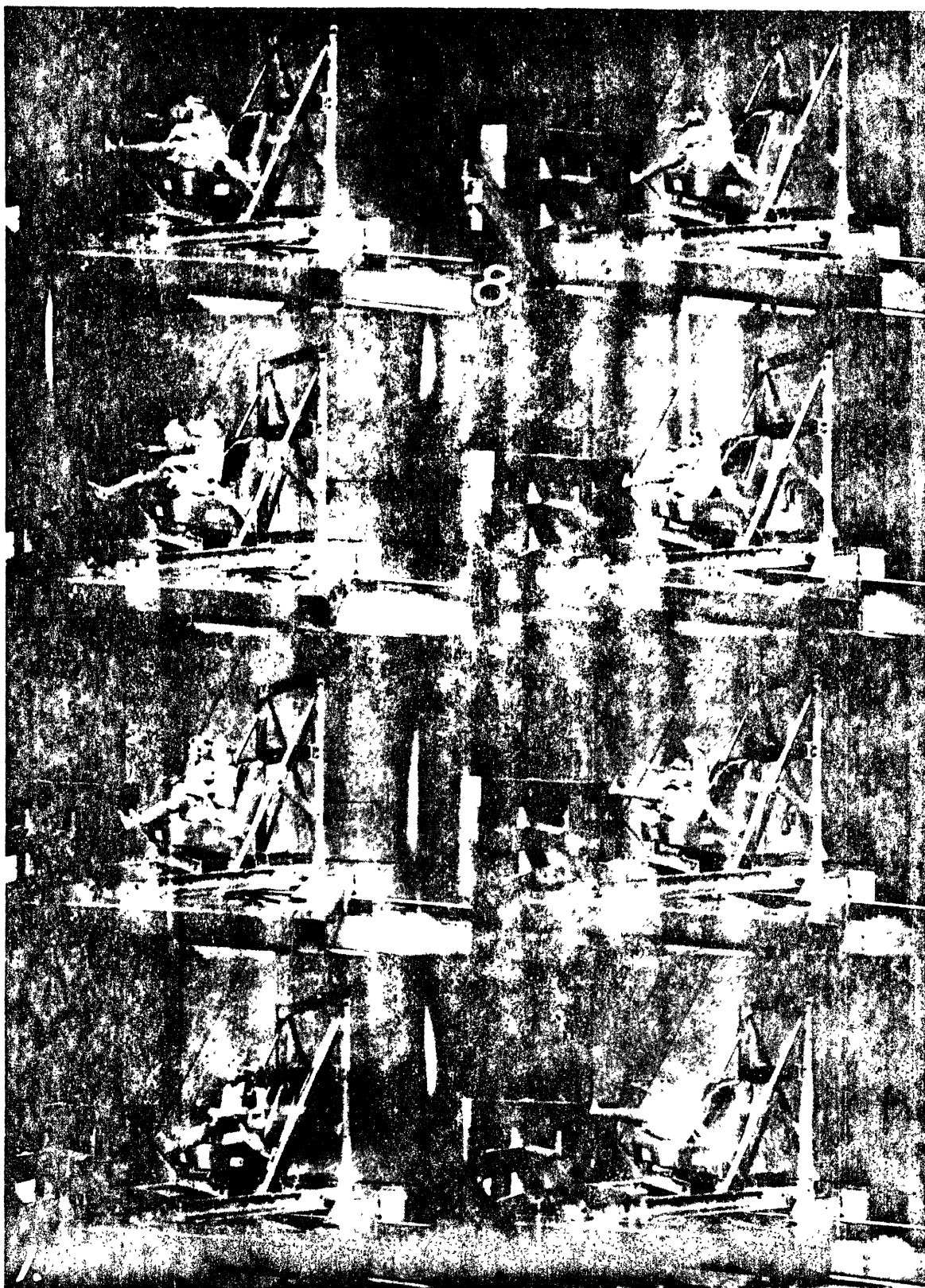
Test No: A-156
Test Date: 17 August 1969
Restraint Code No.: C-17
Restraint Description: Strollee Seat No. 509

Dummy: 3 year
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: 45° oblique
Dummy Attitude: Sitting

Test Observation:

The failure of the left bail hook allowed the seat and the dummy to cart-wheel sideways until the motion was arrested by the adult lap belt. Acceleration loadings of the dummy were moderate. Extreme excursions were experienced by the upper torso and head of the dummy. The left bail hook was bent nearly straight, the main vertical side tube was fractured and bent, and the crotch strap was torn between the dummy's legs.





A156

Test A 156

Lt. Lap Belt 1000 #/in.

Rt. Lap Belt 1000 #/in.

Sted Decel. 20 g/in. (Statham)

Head A-P 50 g/in.

Chest A-P 50 g/in.

Head S-I 50 g/in.

Chest S-I 50 g/in.

Head L-R 50 g/in.

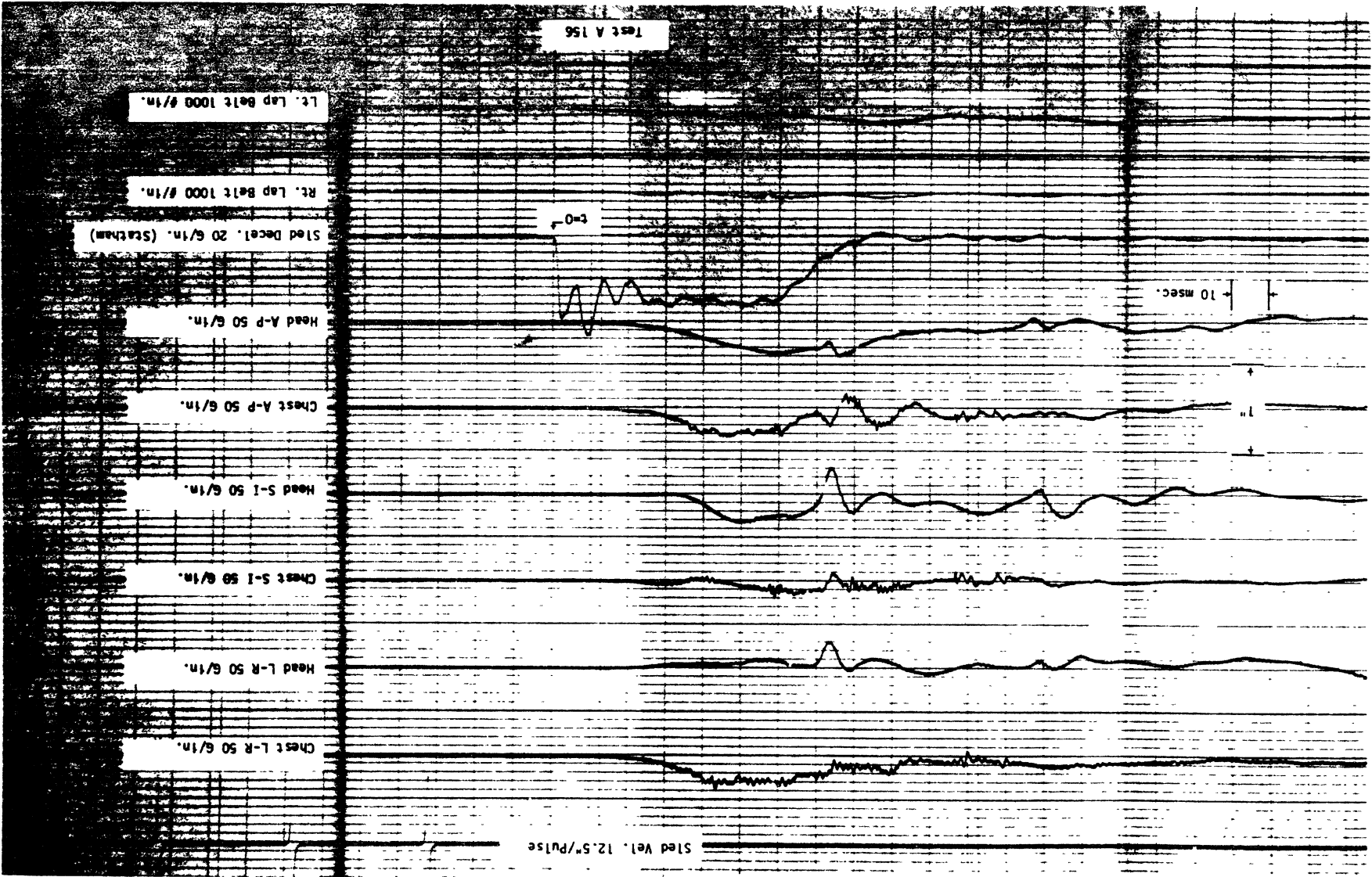
Chest L-R 50 g/in.

Sted Vel. 12.5"/pulse

10 msec.

t=0

319



HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-157
Test Date: 17 August 1969
Restraint Code No.: C-26
Restraint Description: K L Jeenay Child Safety Seat

Dummy: 3 year
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: 45° oblique
Dummy Attitude: Sitting

Test Observation:

The acceleration loadings experienced by the dummy were moderate. The seat appeared to be too narrow for the dummy's shoulders. The seat held up well and retained its integrity. No undue excursions were observed.



157-1

157-1

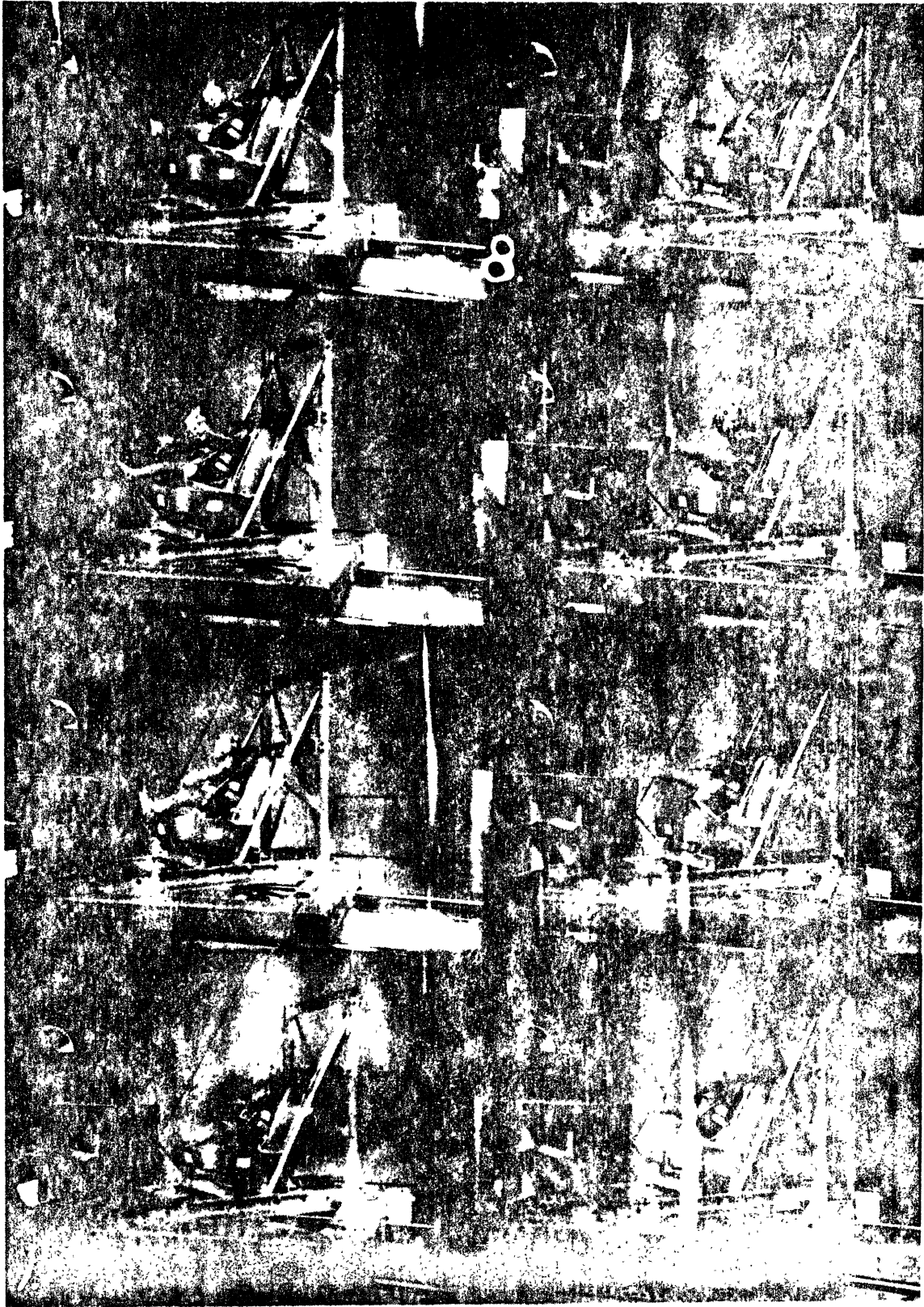
157-1

157-1

157-1

150msec

157-1



A157

Case A 157

20 G/10 (Scale)

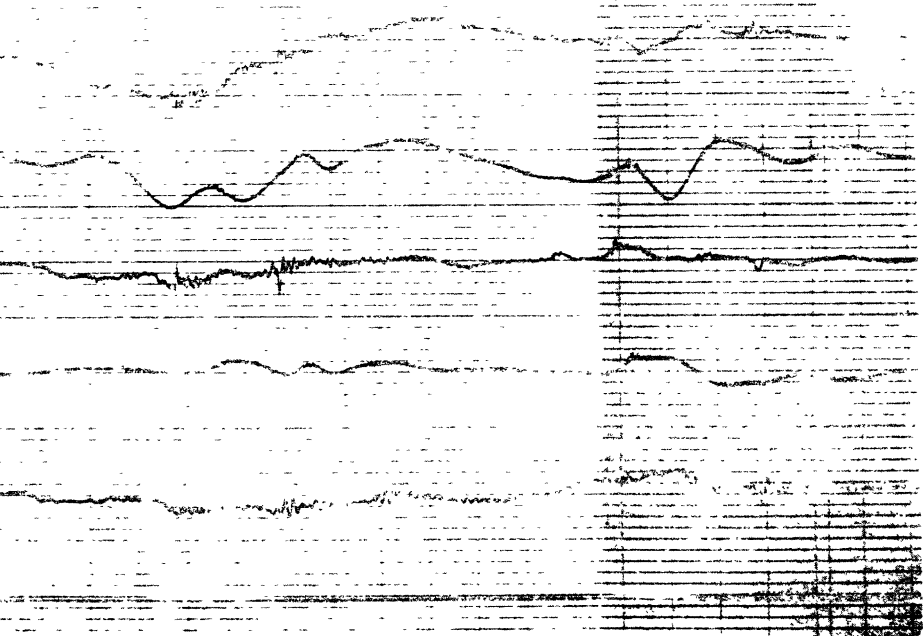
20 G/10

Chest S-I 50 G/10

Lead 50 G/10

Chest L-R 50 G/10

Lead Vel. 12.5"/pulse



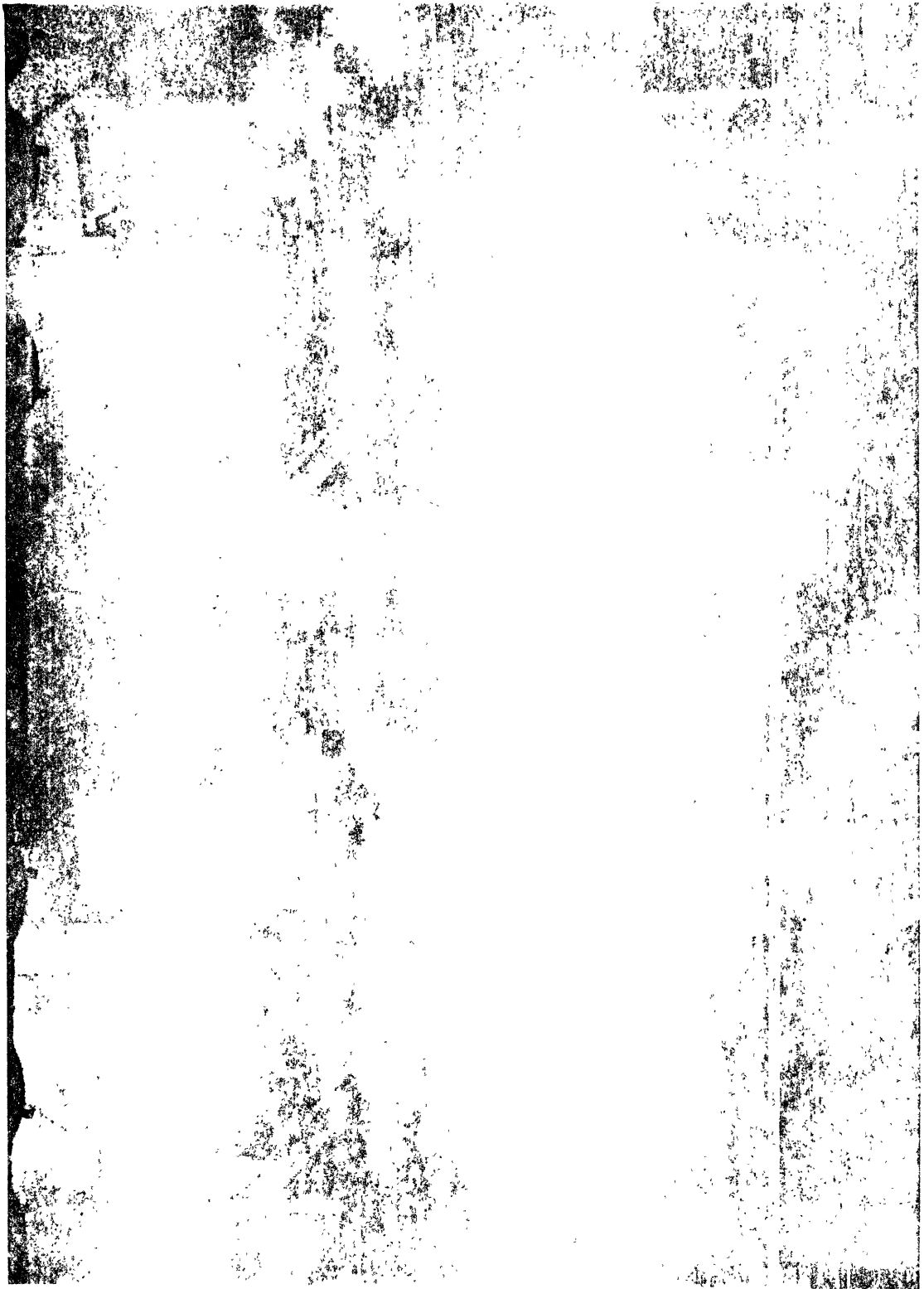
HSRI SUMMARY DATA SHEET (FH-11-6962)

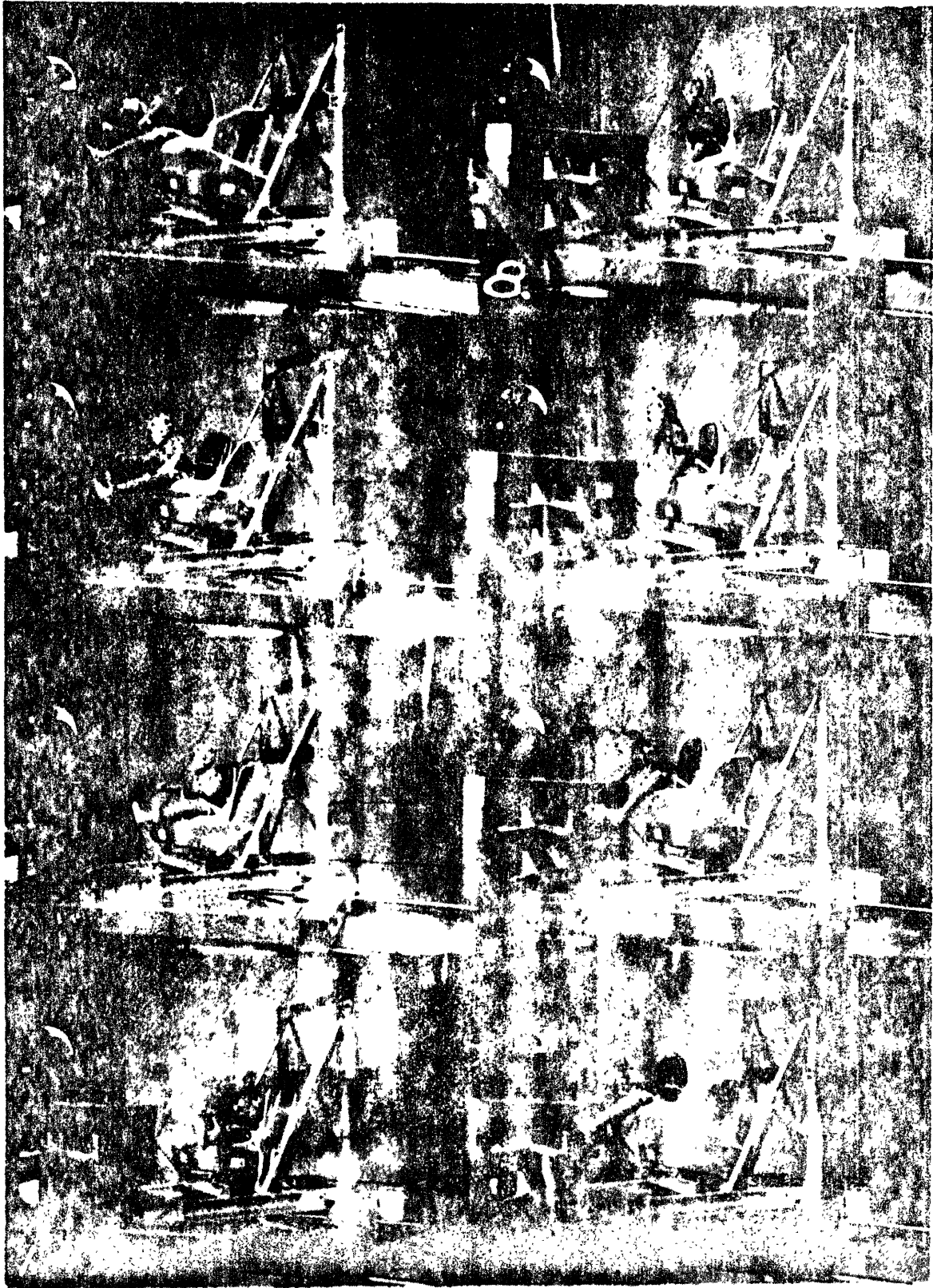
Test No: A-158
Test Date: 17 August 1969
Restraint Code No.: C-24
Restraint Description: Union Carbide High Back Sports Car Seat

Dummy: 3 year
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: 45° oblique
Dummy Attitude: Sitting

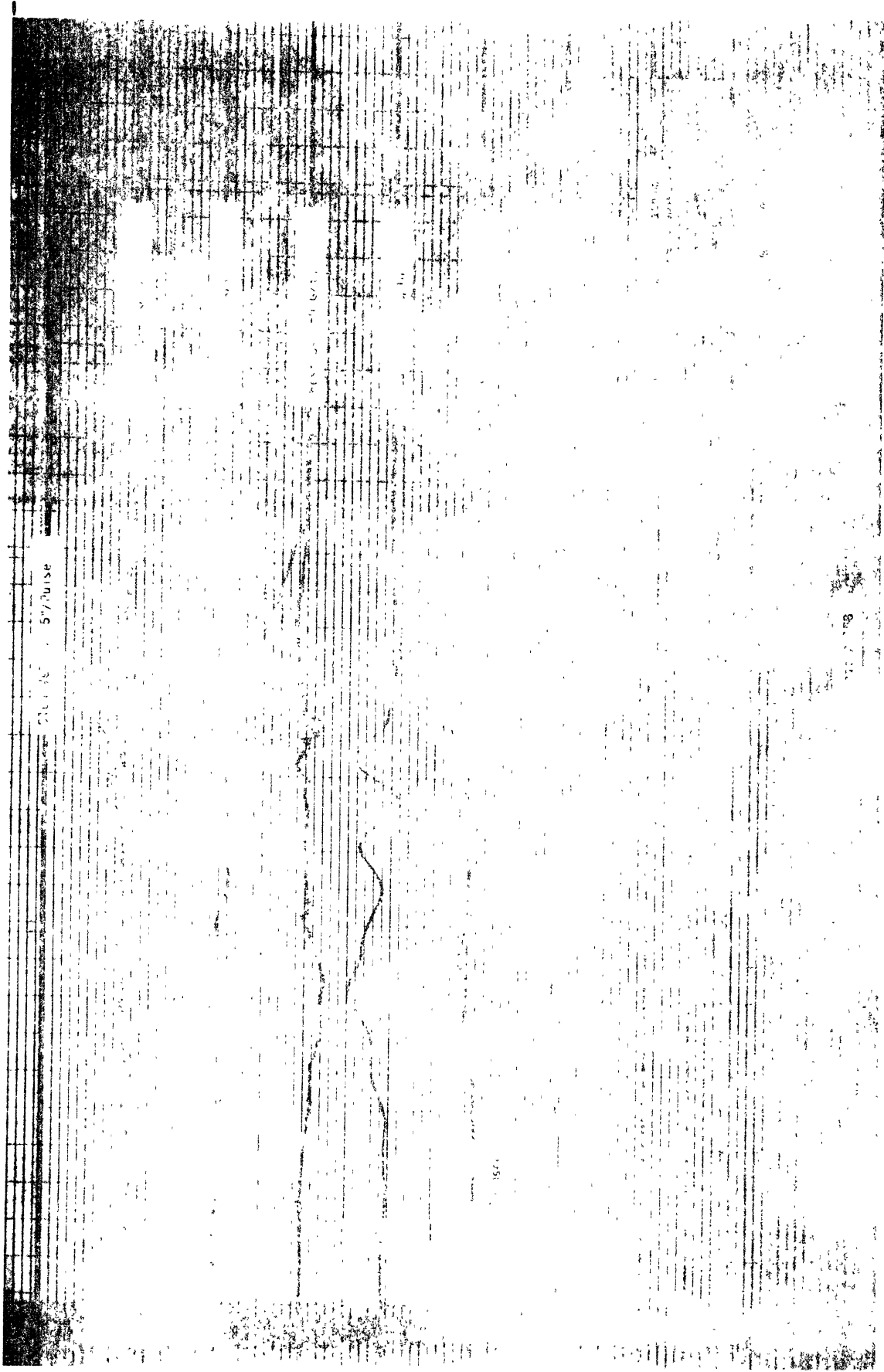
Test Observation:

The left bail hook failed because of severe bending, allowing the seat to be ejected from the back of the adult seat. The dummy was also ejected. The bail was bent at the swivel joint where it enters the seat. The belly strap pulled loose from the seat at the left side where it was anchored with staples.





A158



SUN 57/1918

1918

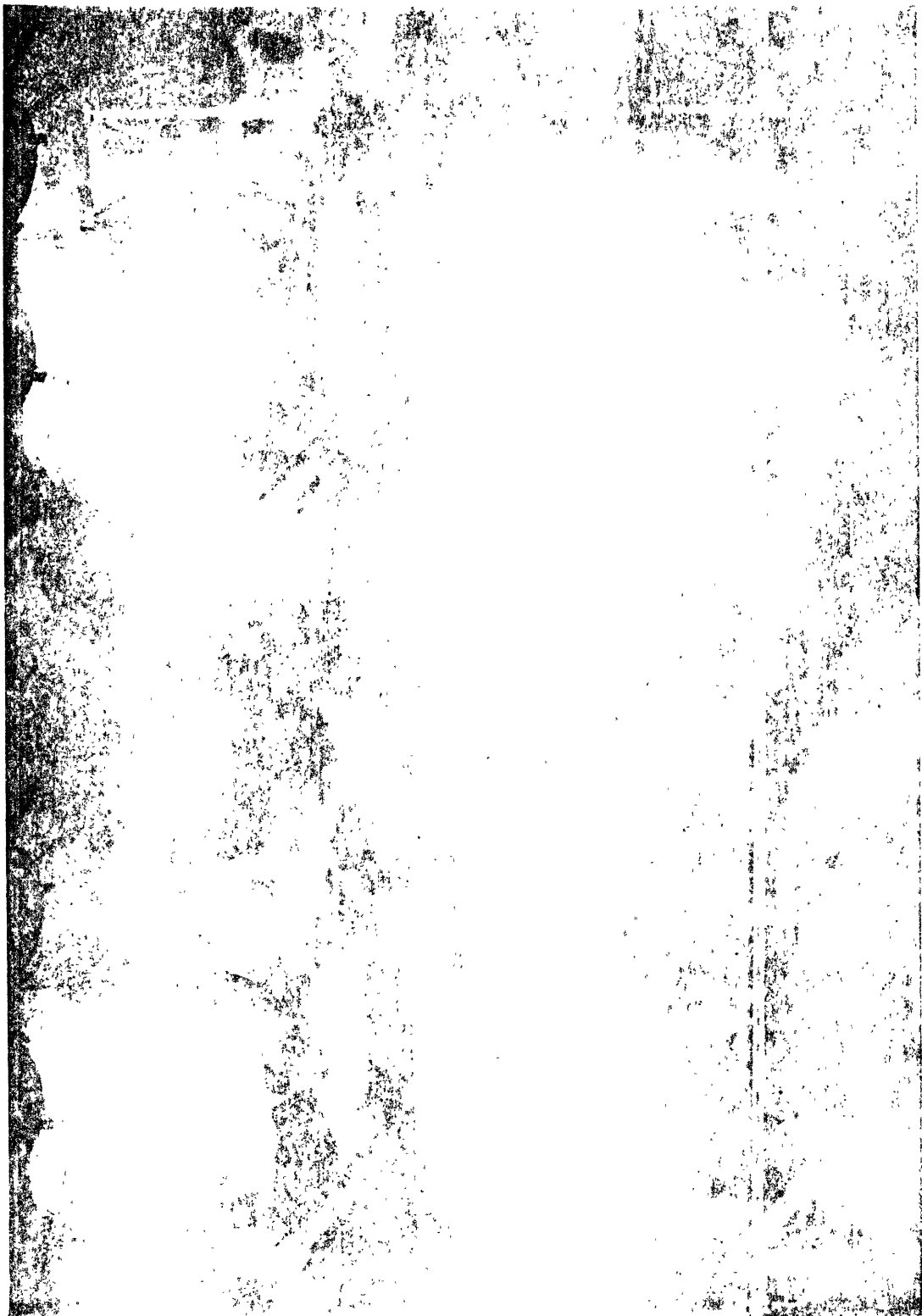
HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-159
Test Date: 18 August 1969
Restraint Code No.: C-35
Restraint Description: American Motors Harness No. 8992185

Dummy: 3 year
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: 45° oblique
Dummy Attitude: Sitting

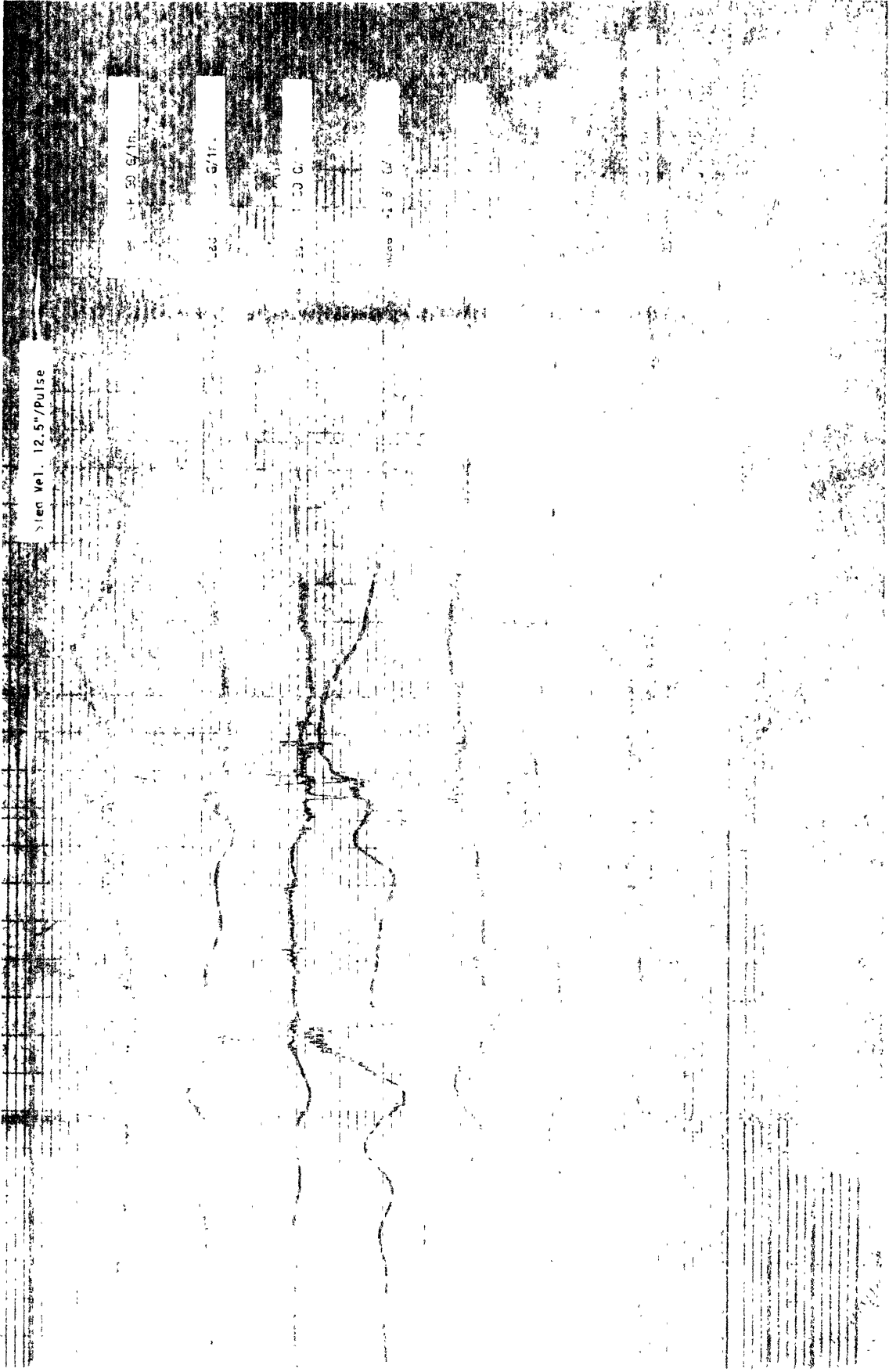
Test Observation:

The restraint system slid sideways allowing the dummy to be ejected from the seat. Contact with the vehicle interior adjacent to the adult seat would have been assured.





A159



Speed Vel. 12.5/Pulse

1-4 50 6/16

1-20 50 6/17

1-21 50 6/17

1-22 50 6/17

1-23 50 6/17

1-24 50 6/17

1-25 50 6/17

1-26 50 6/17

1-27 50 6/17

1-28 50 6/17

1-29 50 6/17

1-30 50 6/17

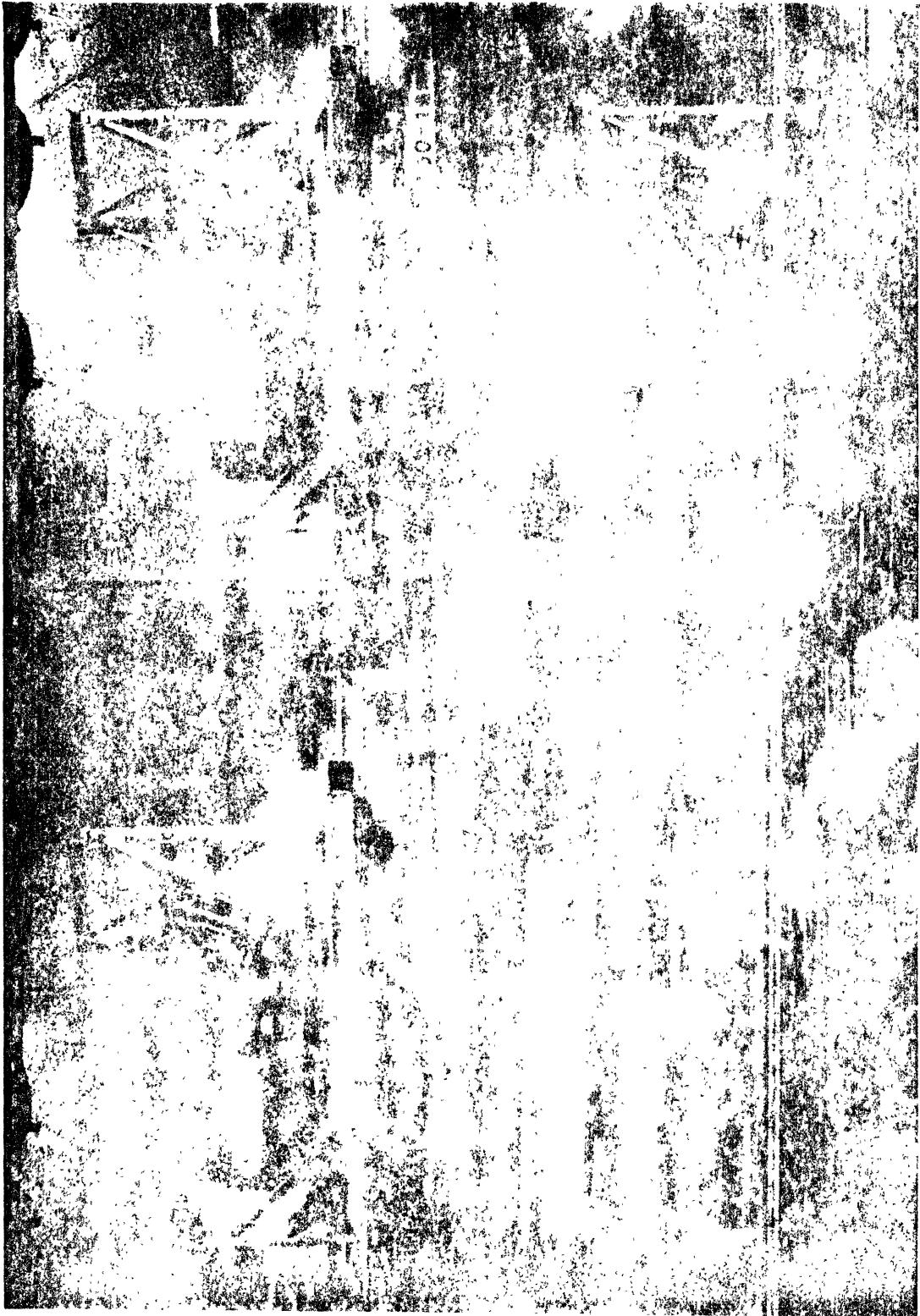
HSRI SUMMARY DATA SHEET (FH-11-6962)

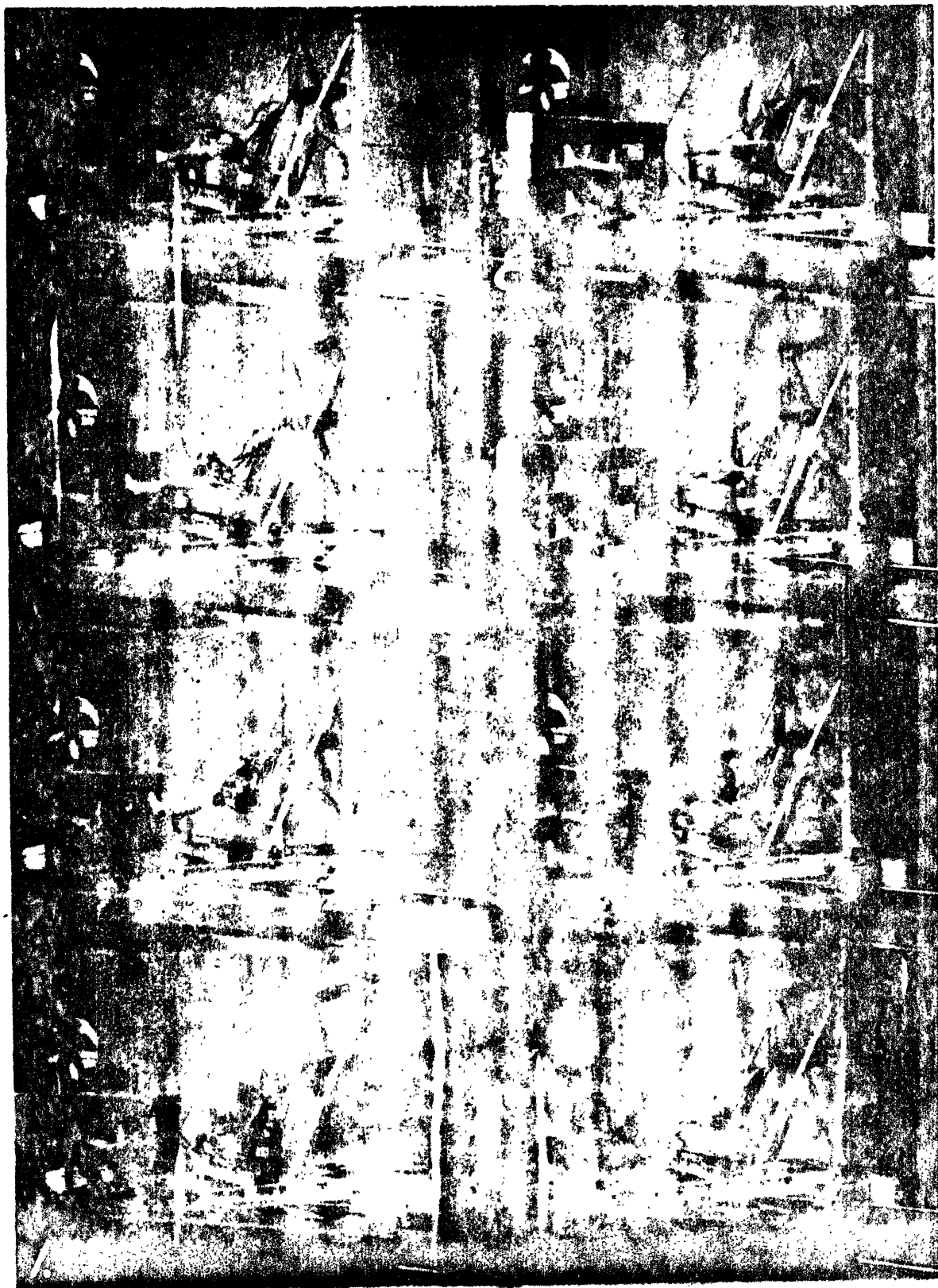
Test No: A-160
Test Date: 18 August 1969
Restraint Code No.: C-31
Restraint Description: Sears Auto Harness, small

Dummy: 3 years
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: 45° oblique
Dummy Attitude: Sitting

Test Observation:

The g-loadings received by the dummy were moderate. The dummy moved to the right front portion of the adult seat on the initial deceleration. Upon rebound the dummy slid from the seat and contacted the sled structure violently.





A160

A160

Sted Vel. 12.5"/Pulse

Chest L-R 50 G/in.

Head L-R 50 G/in.

Chest S-I 50 G/in.

Head S-I 50 G/in.

Chest A-P 50 G/in.

Head A-P 50 G/in.

Sted Dece 20 G/in.

10 msec.



HSRI SUMMARY DATA SHEET (FH-11-6962)

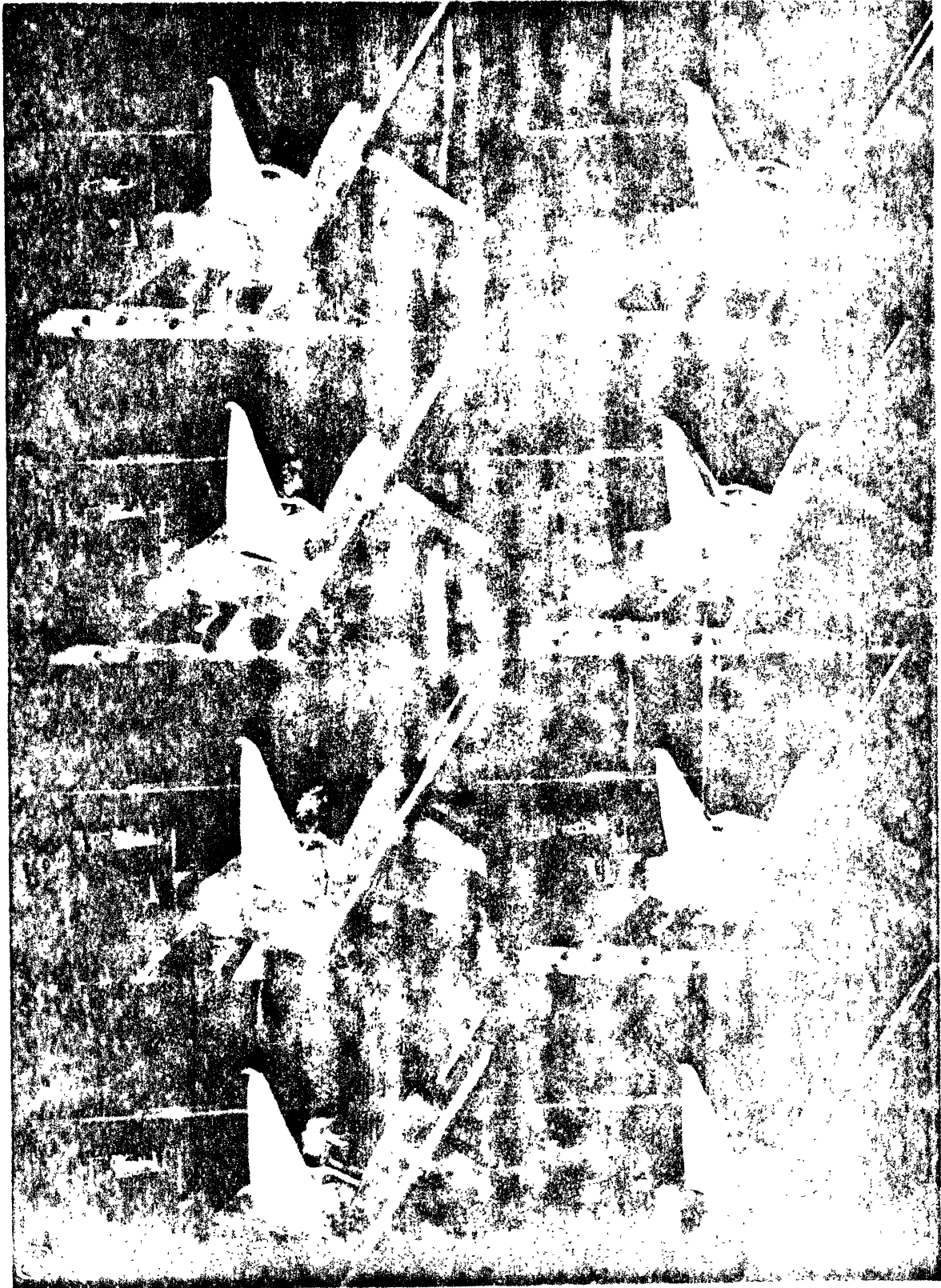
Test No: A-161
Test Date: 18 August 1969
Restraint Code No.: C-25
Restraint Description: General Motors Infant Carrier

Dummy: doll
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: 45° oblique
Dummy Attitude: Semi-reclining

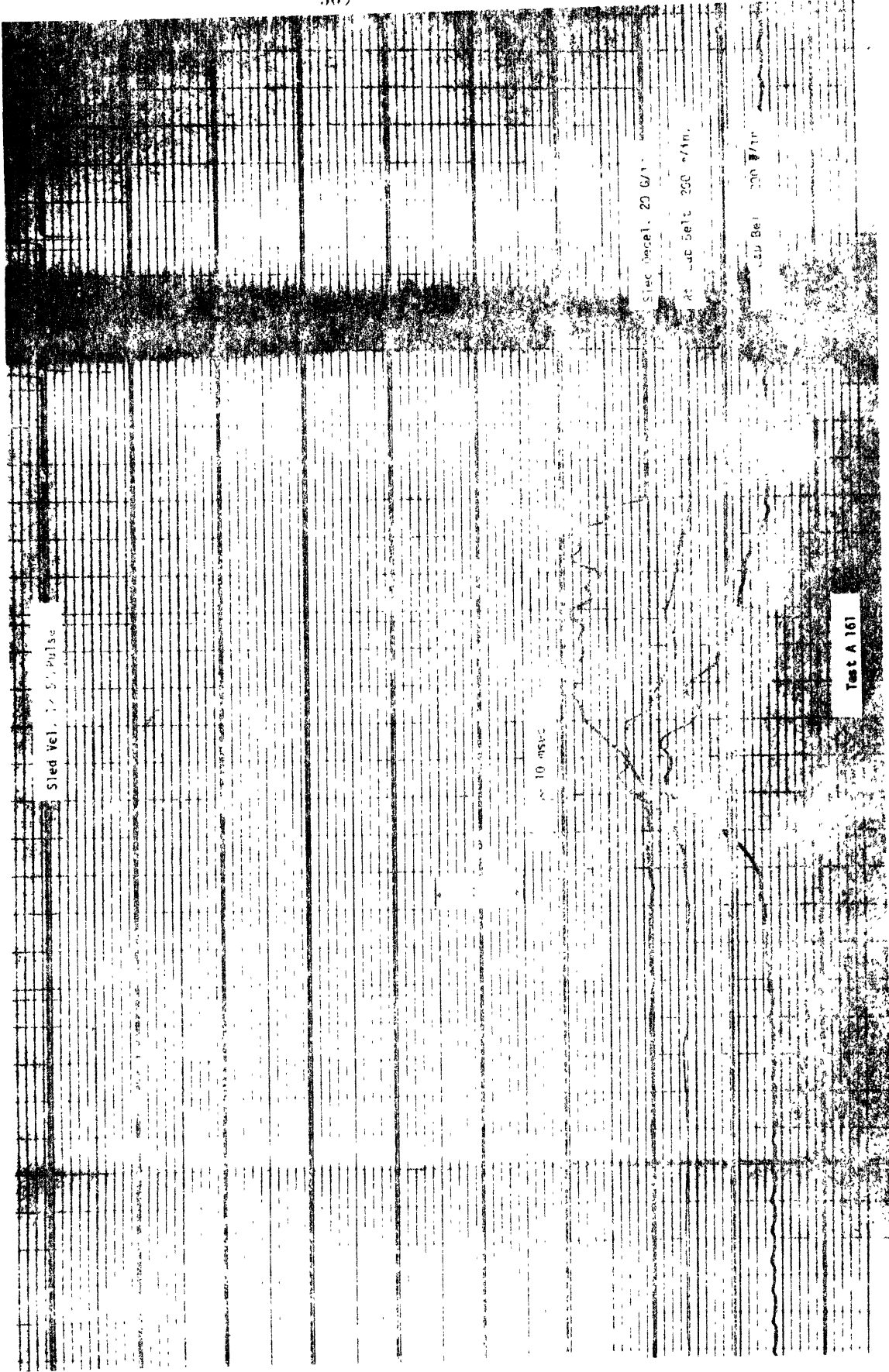
Test Observation:

Restraint system appeared to perform well and no gross motions were observed.





A161



HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-181
Test Date: 5 November 1969
Restraint Code No.: C-26
Restraint Description: K-L Jeenay Child Safety Seat

Dummy: 3-year
Sled Velocity: 20 mph
Sled G-level: 16
Impact Direction: Forward facing
Dummy Attitude: Sitting

Test Observation:

Dummy accelerations were moderate, except for a 48 g head A-P spike which occurred when the dummy rebounded into the seat back. Excursion was acceptable, but there was approximately 80° head flexion with respect to the upper torso.



A181

Test A 181

372

Head S-I 20 G/in.

Head A-P 50 G/in.

Chest A-P 50 G/in.

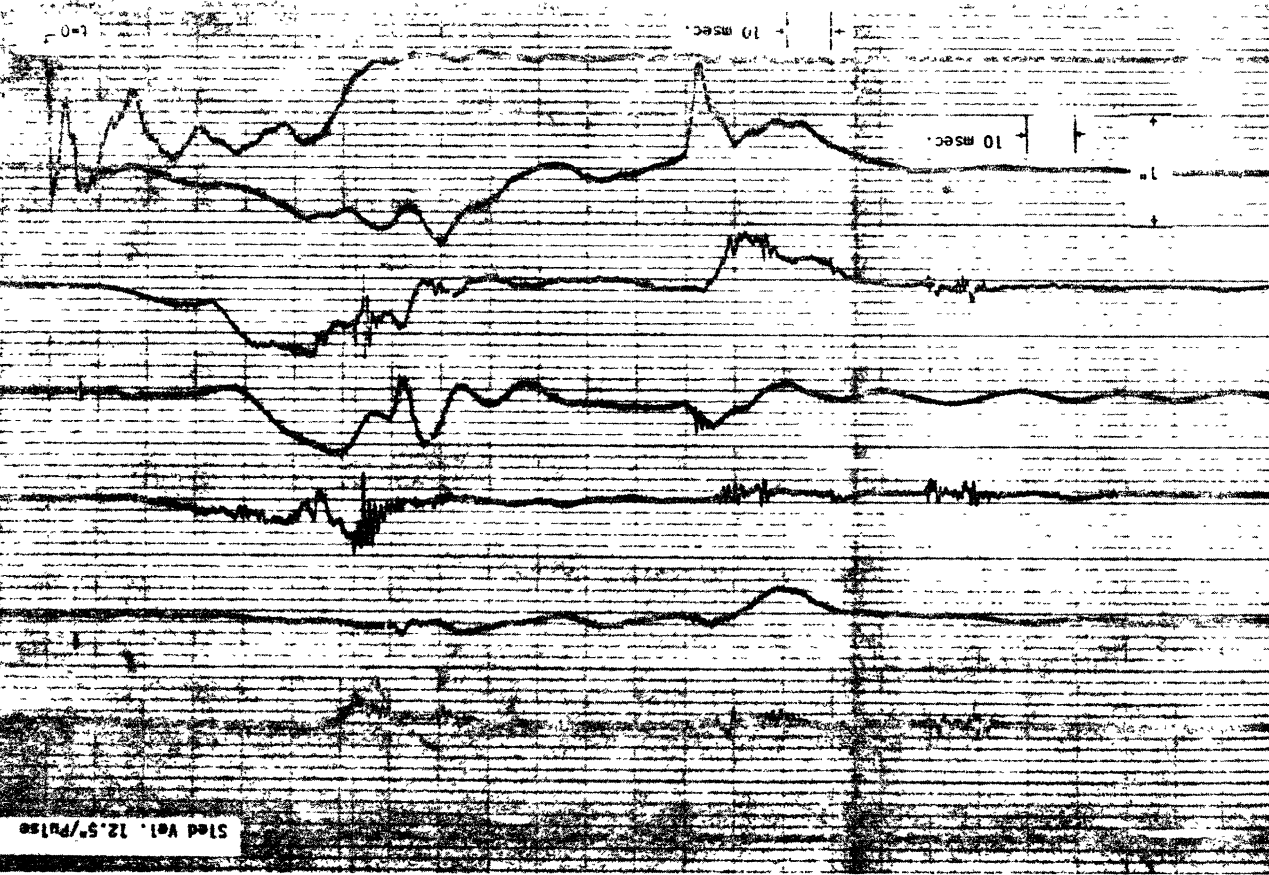
Head S-I 50 G/in.

Chest S-I 50 G/in.

Head L-R 50 G/in.

Chest L-R 50 G/in.

Std Vel. 12.5"/pulse



HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-182
Test Date: 5 November 1969
Restraint Code No.: C-26
Restraint Description: K-L-Jeenay Child Safety Seat

Dummy: 3 year
Sled Velocity: 30 mph
Sled G-level: 16
Impact Direction: Forward facing
Dummy Attitude: Sitting

Test Observation:

Dummy acceleration levels were moderately low but of longer duration than 20 mph test #A-181. Rebound into the seat resulted in 40 g head A-P spike. Excursion was small, but was accompanied by approximately 80° head flexion with respect to torso. Some deformation of the harness grommets was observed where they were pinned. In addition, the seat shell cracked where the lower seat anchor belt bracket was riveted to the shell.



A182

Sled Vel. 12.5"/Pulse

Chest L-R 50 G/in.

Head L-R 50 G/in.

Chest S-I 50 G/in.

Head S-I 50 G/in.

Chest A-P 50 G/in.

Head A-P 50 G/in.

Sled Decel 20 G/in.

10 msec.

t=0

test A 182

375

