

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

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16. Abstract <p>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 an 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.</p>			
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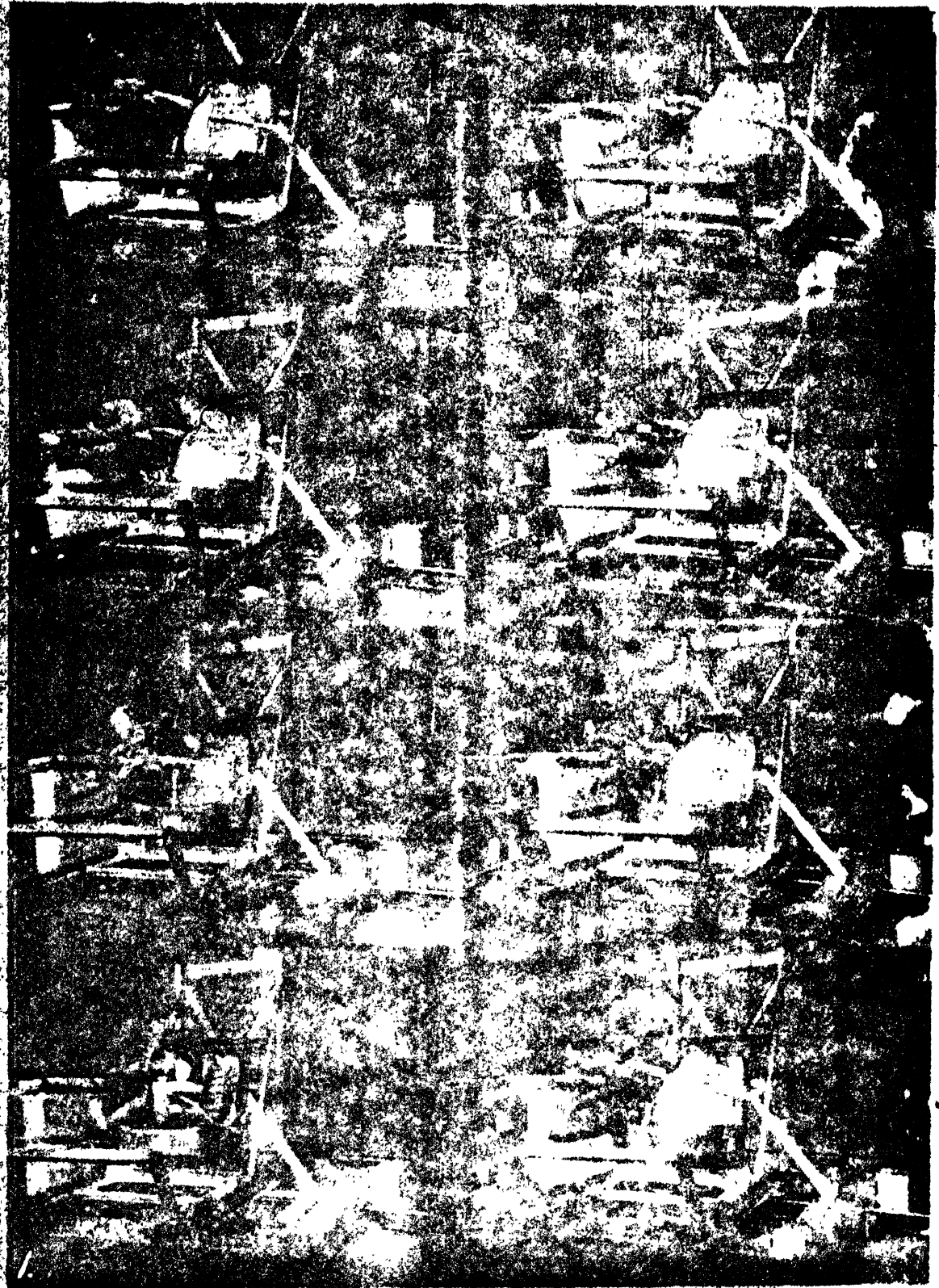
HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-096
Test Date: 11 July 1969
Restraint Code No.: C-7
Restraint Description: Trimble Products Seat No. 821

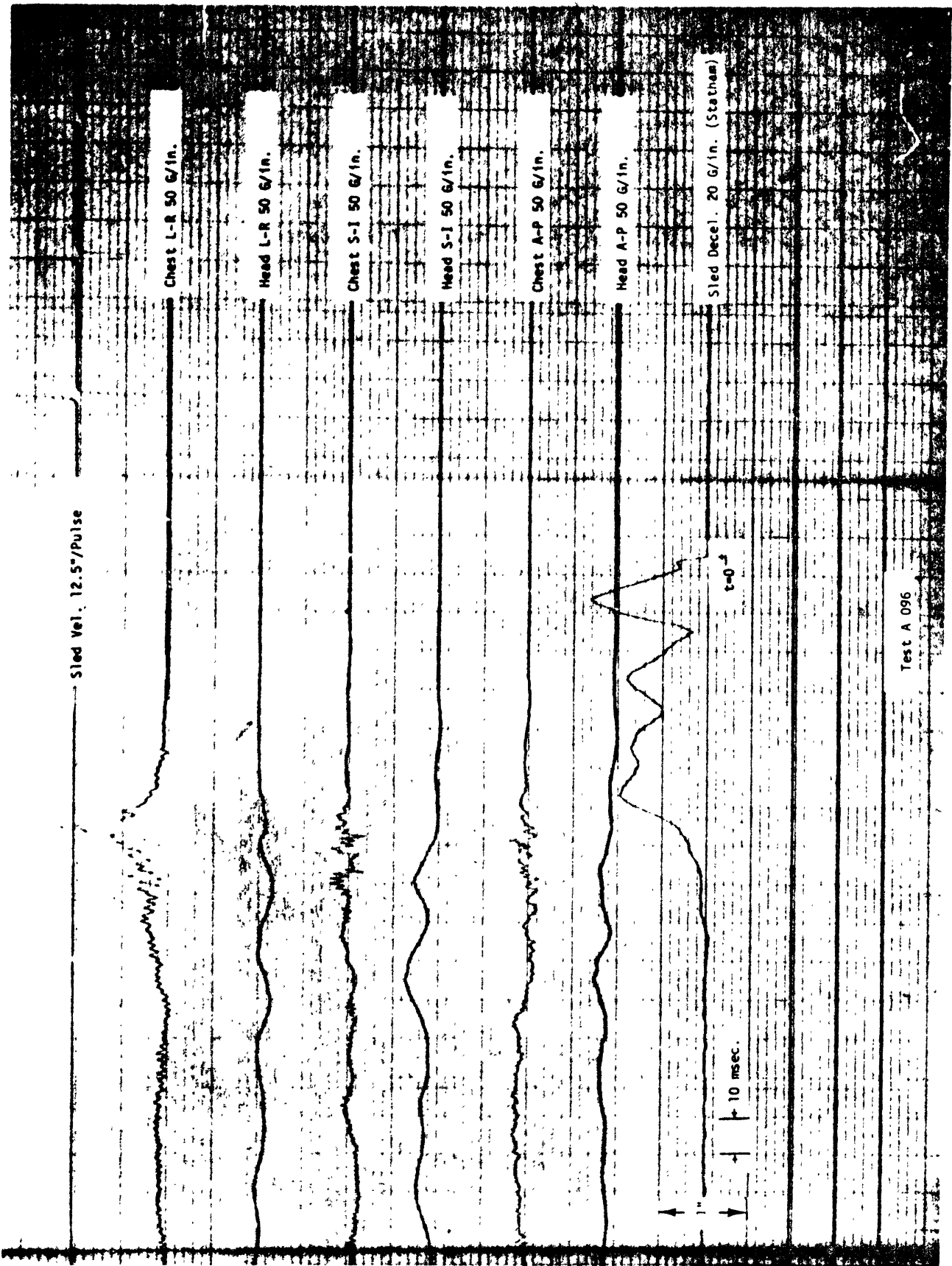
Dummy: 3 years
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: Side impact
Dummy Attitude: Sitting

Test Observation:

The dummy and child restraint seat were both ejected in this test. The dummy ended up lying over to the right of the adult seat about 20° from the horizontal. The child seat was destroyed. The right-hand bail pivoted off the adult seat back. The left-hand bail slid along the adult seat back wiping material from the plastic bail and onto the seat back. The bail tore out of the child seat back fracturing the masonite backboard.



A096



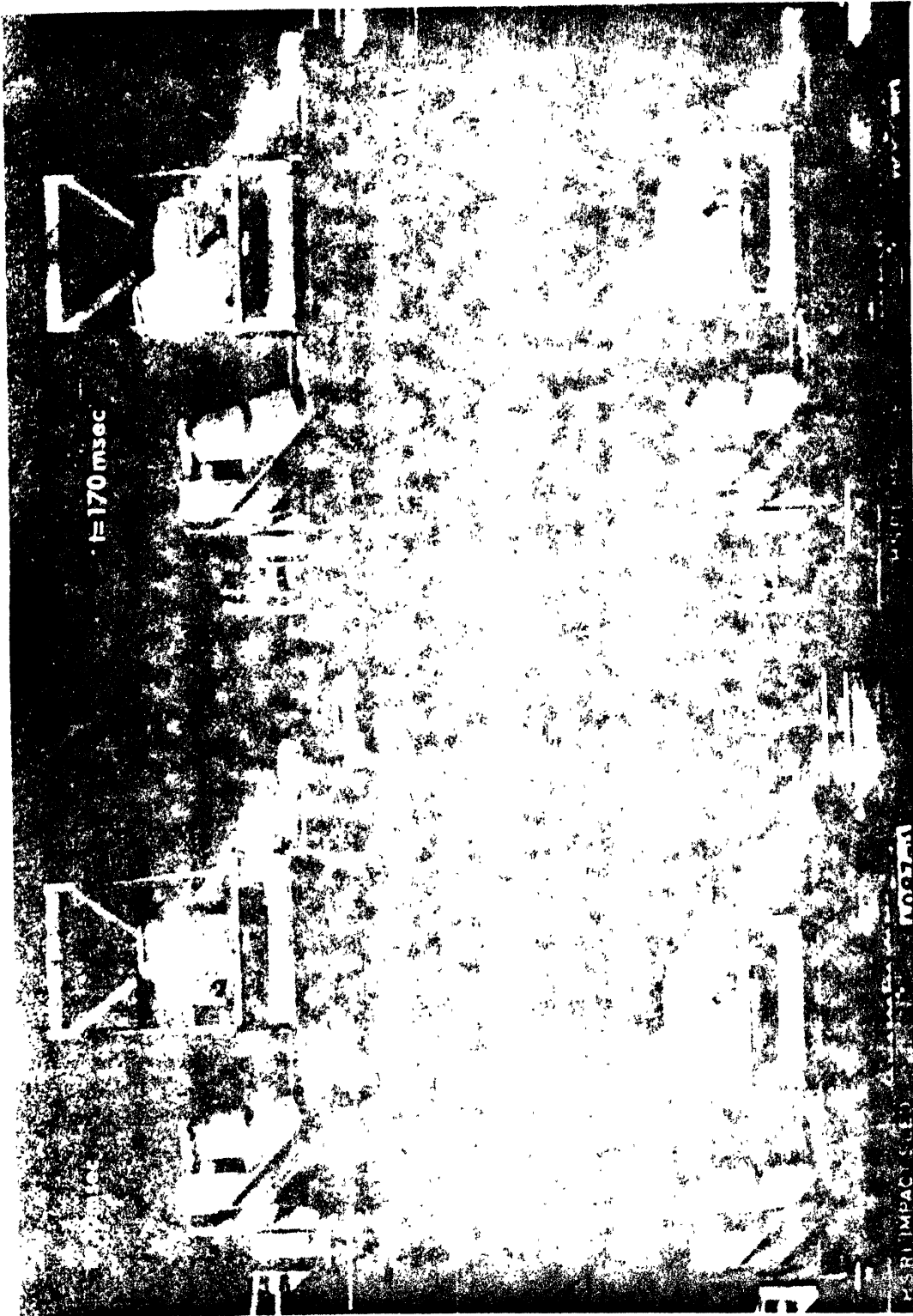
HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-097
Test Date: 11 July 1969
Restraint Code No.: C-25
Restraint Description: General Motors Infant Carrier

Dummy: Doll
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: Side impact
Dummy Attitude: Semi-reclining

Test Observation:

The restraint system appeared to perform well. It rotated about 30° on the adult seat and moved about four inches sideways.



Test A 097

1000 g/in. (Station)

1000 g/in.

20 g/in. (Station)

1-0

10 msec.

12.5/Pulse

132

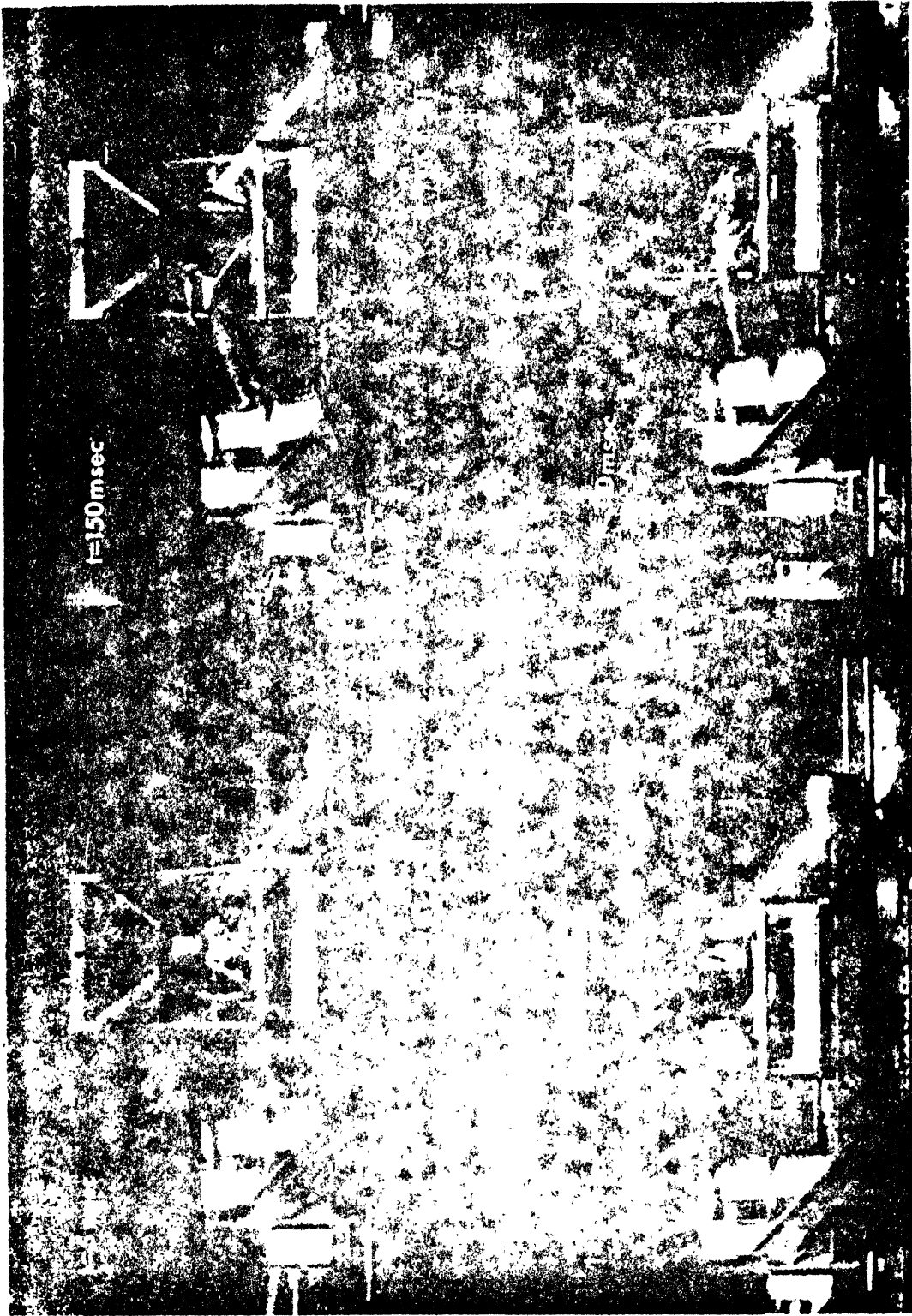
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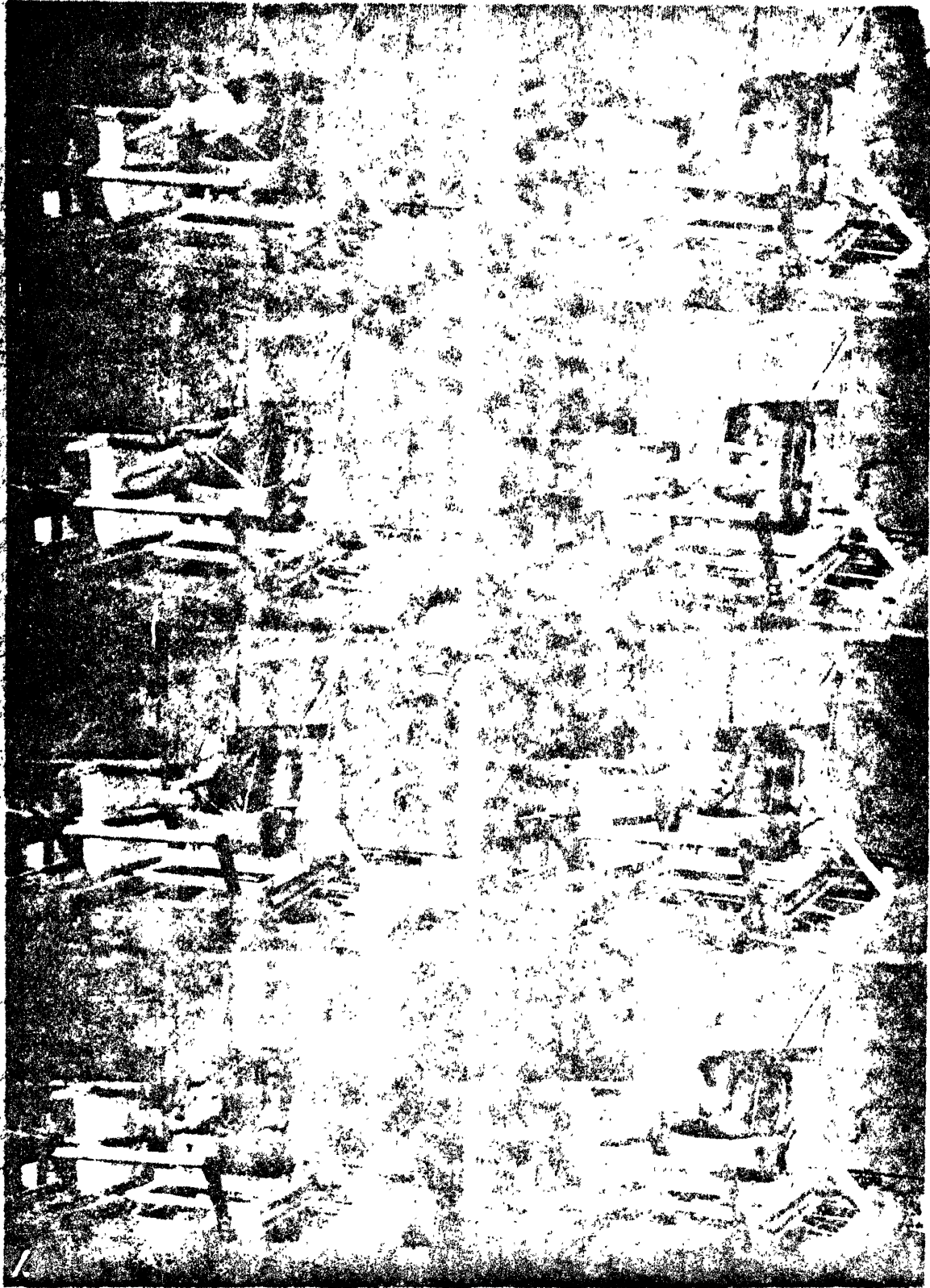
Test No: A-098
Test Date: 15 July 1969
Restraint Code No.: C-23
Restraint Description: Volvo Child Safety Seat

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

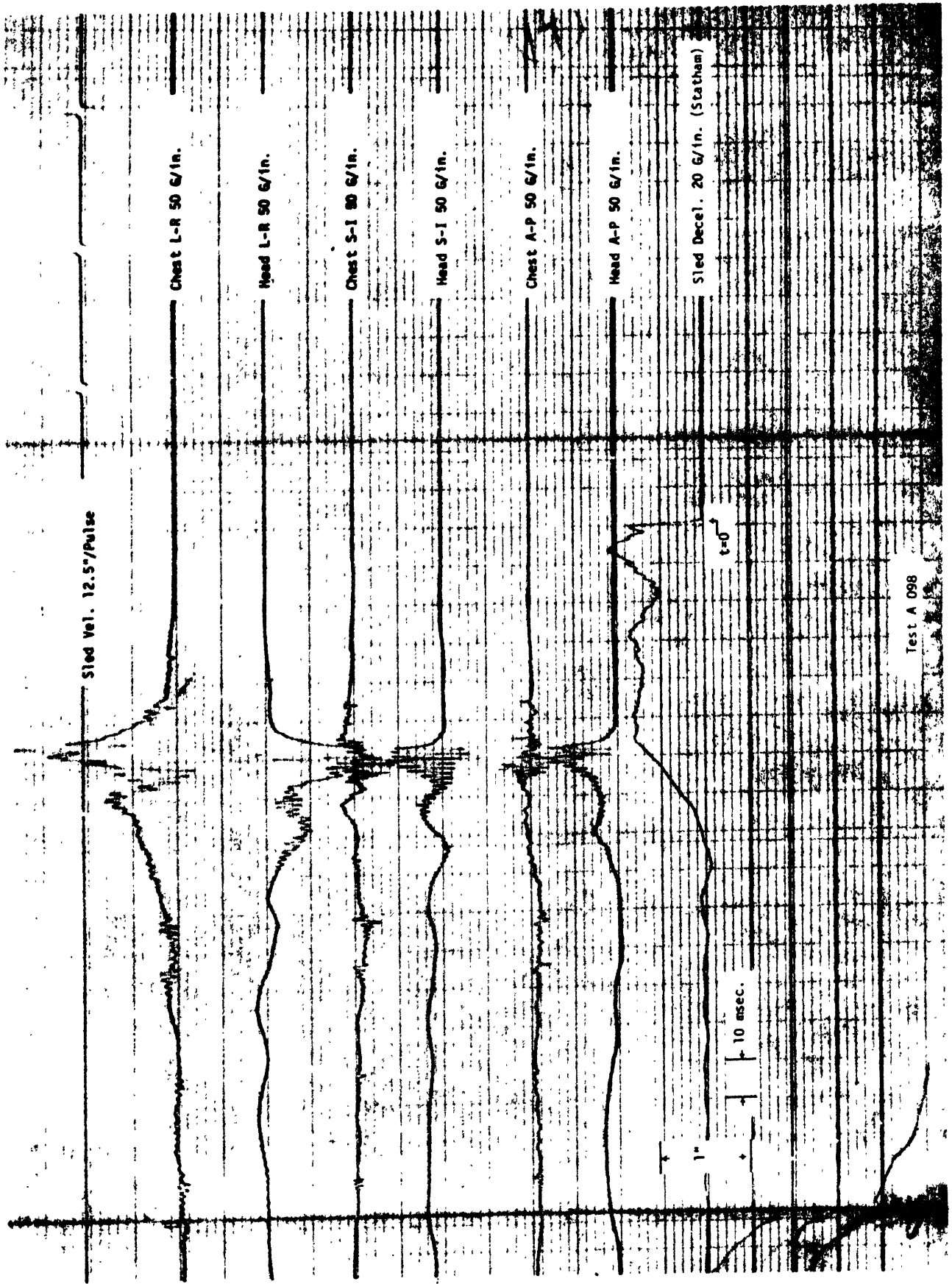
Test Observation:

The Volvo seat's integral lap restraint failed in the buckle allowing the belt to slip down. The dummy slid sideways against the side of the seat and was catapulted out of the seat. The backup restraint tether prevented ejection. The Volvo seat has pointed sheet metal screws attaching the integral straps to the side of its shell. The points protrude through the shell towards the inside approximately three-eighths inch. A child's head could be pierced by the points.





A098



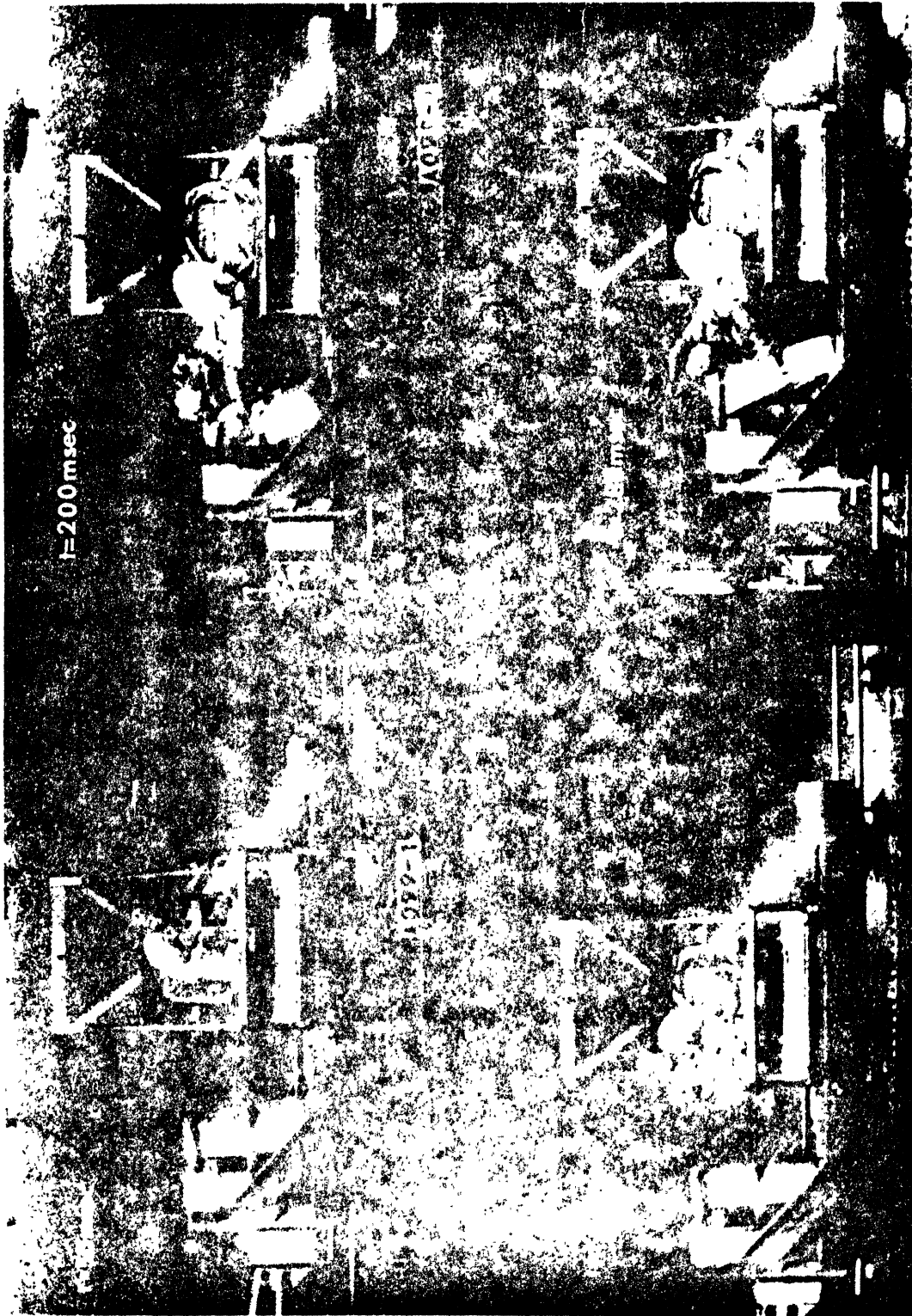
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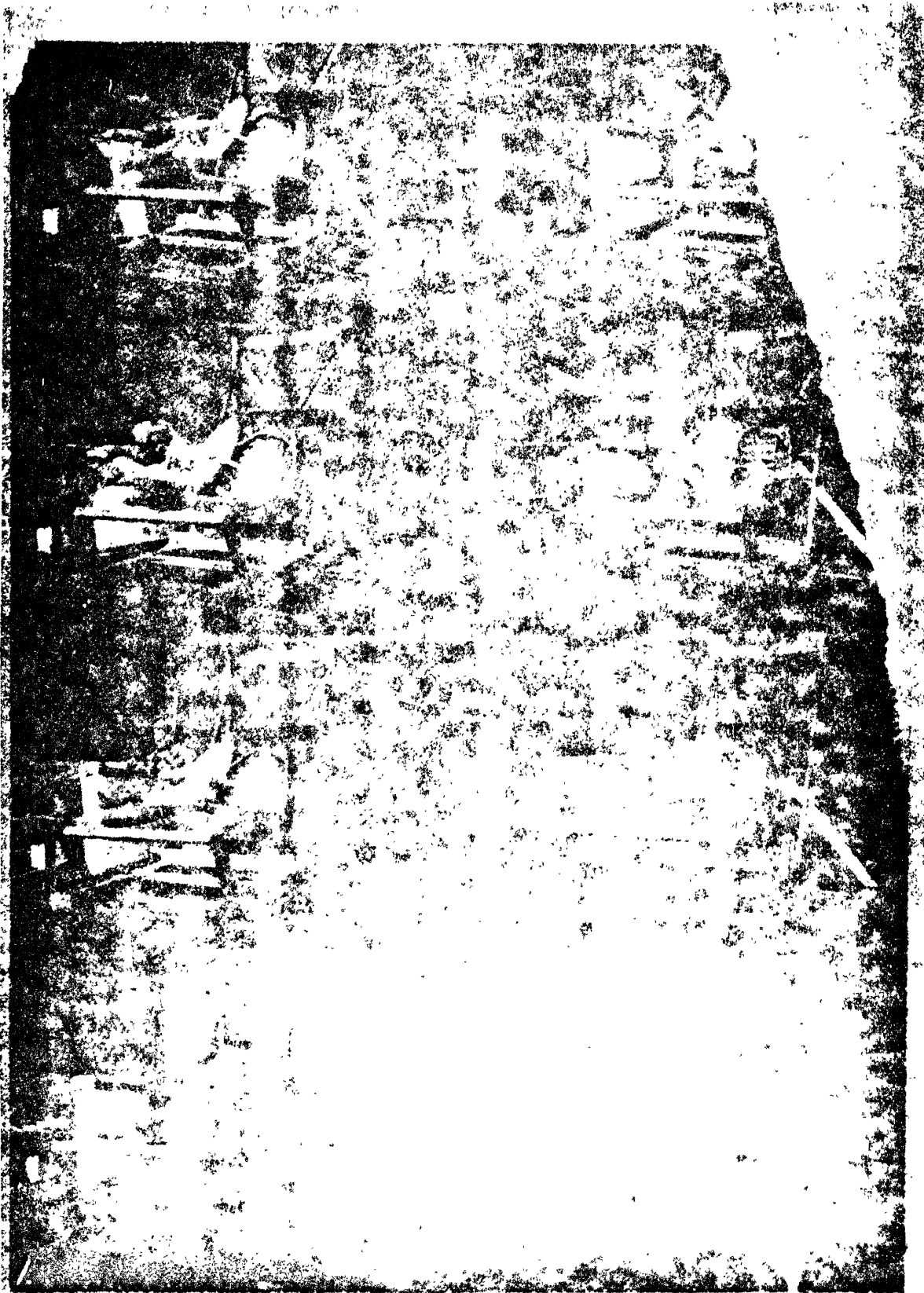
Test No.: A-099
Test Date: 15 July 1969
Restraint Code No.: C-6
Restraint Description: George B. Walker's Safety Seat

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

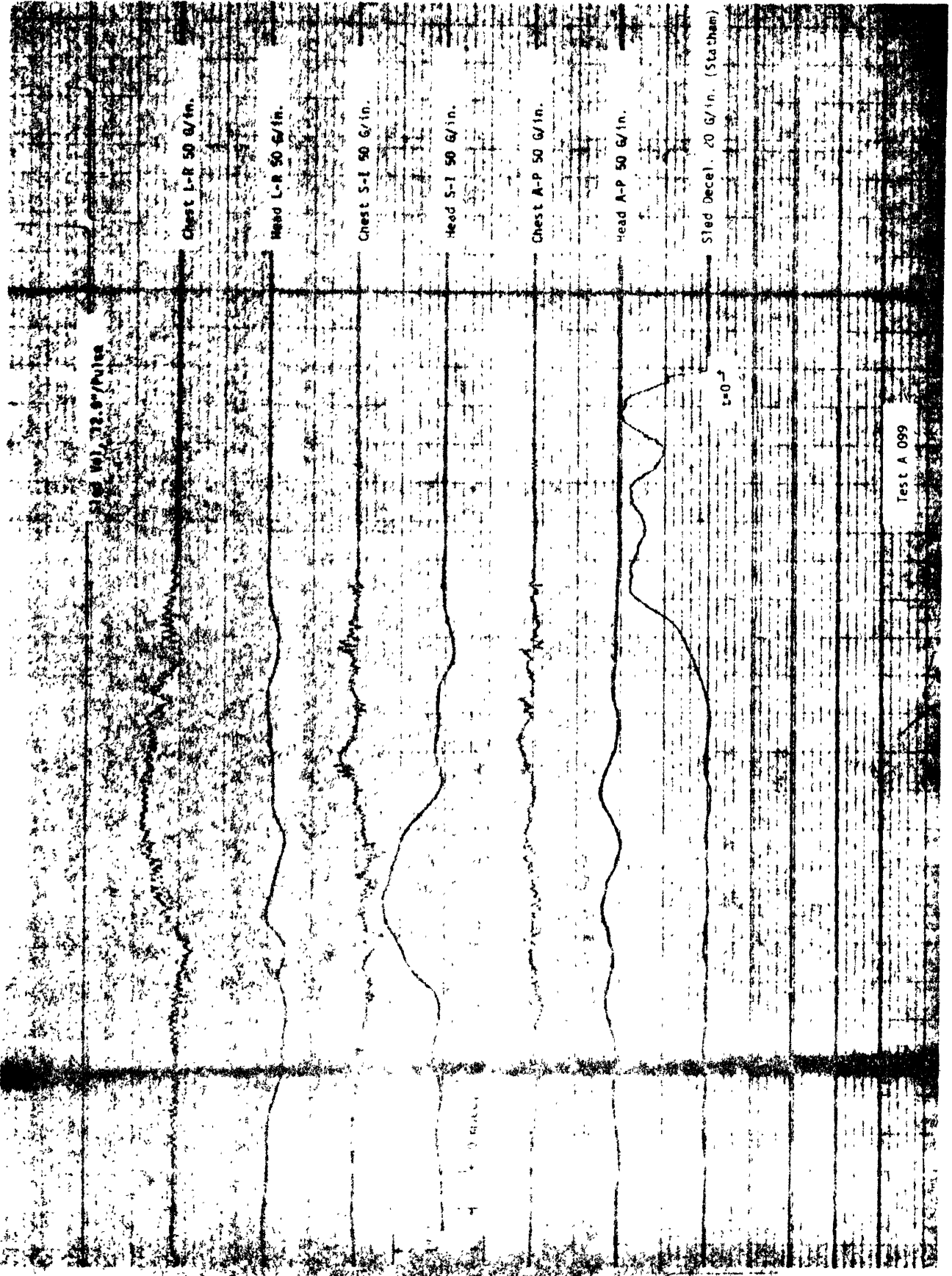
Test Observation:

The dummy loadings were quite low. However, the excursion of the dummy was large enough to insure violent contact with any adjacent side structures. The gentleness of the ride is due in part to the deformation of the plastic of the left-hand bail hook and hand guard rail.





A099



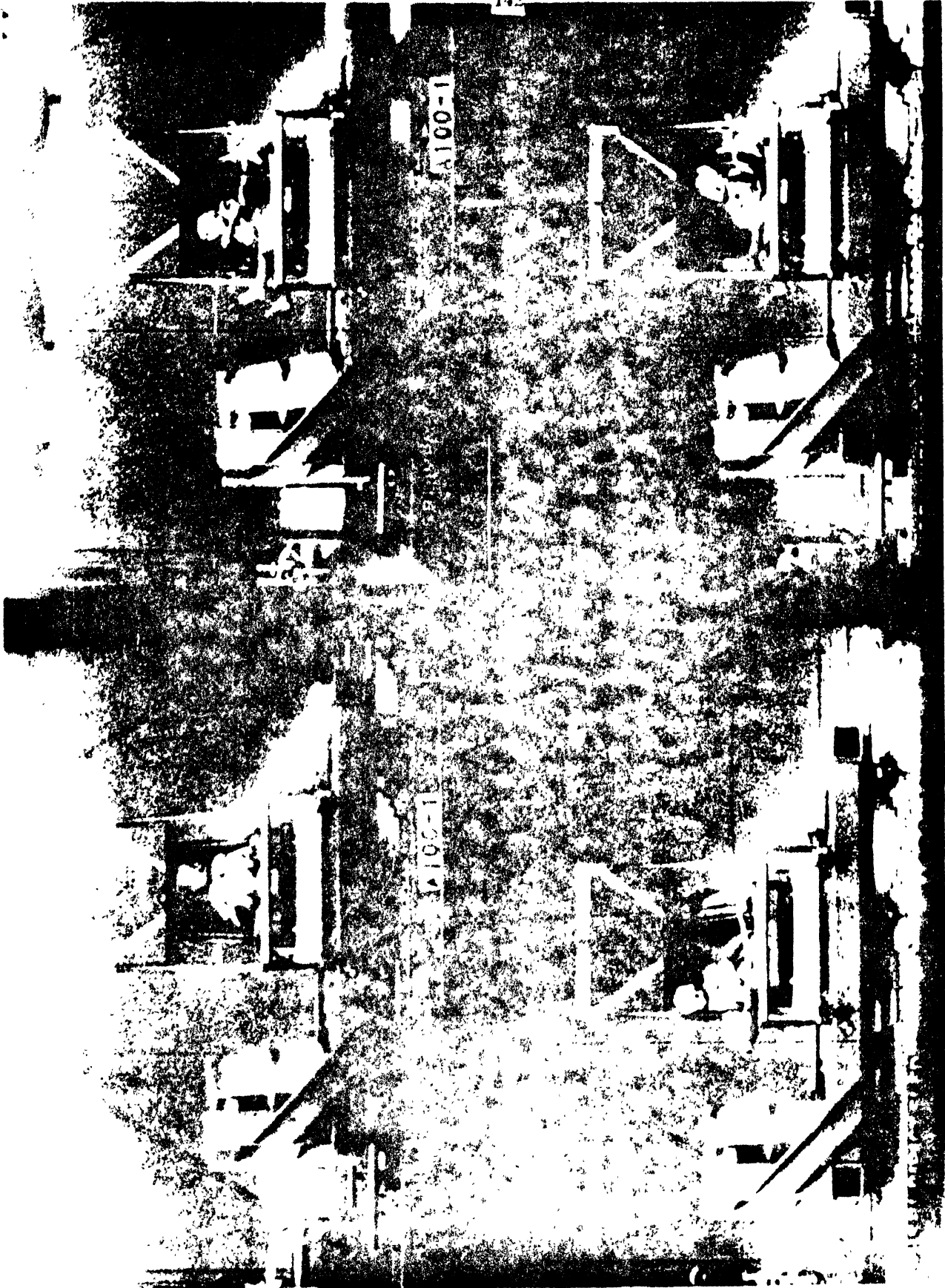
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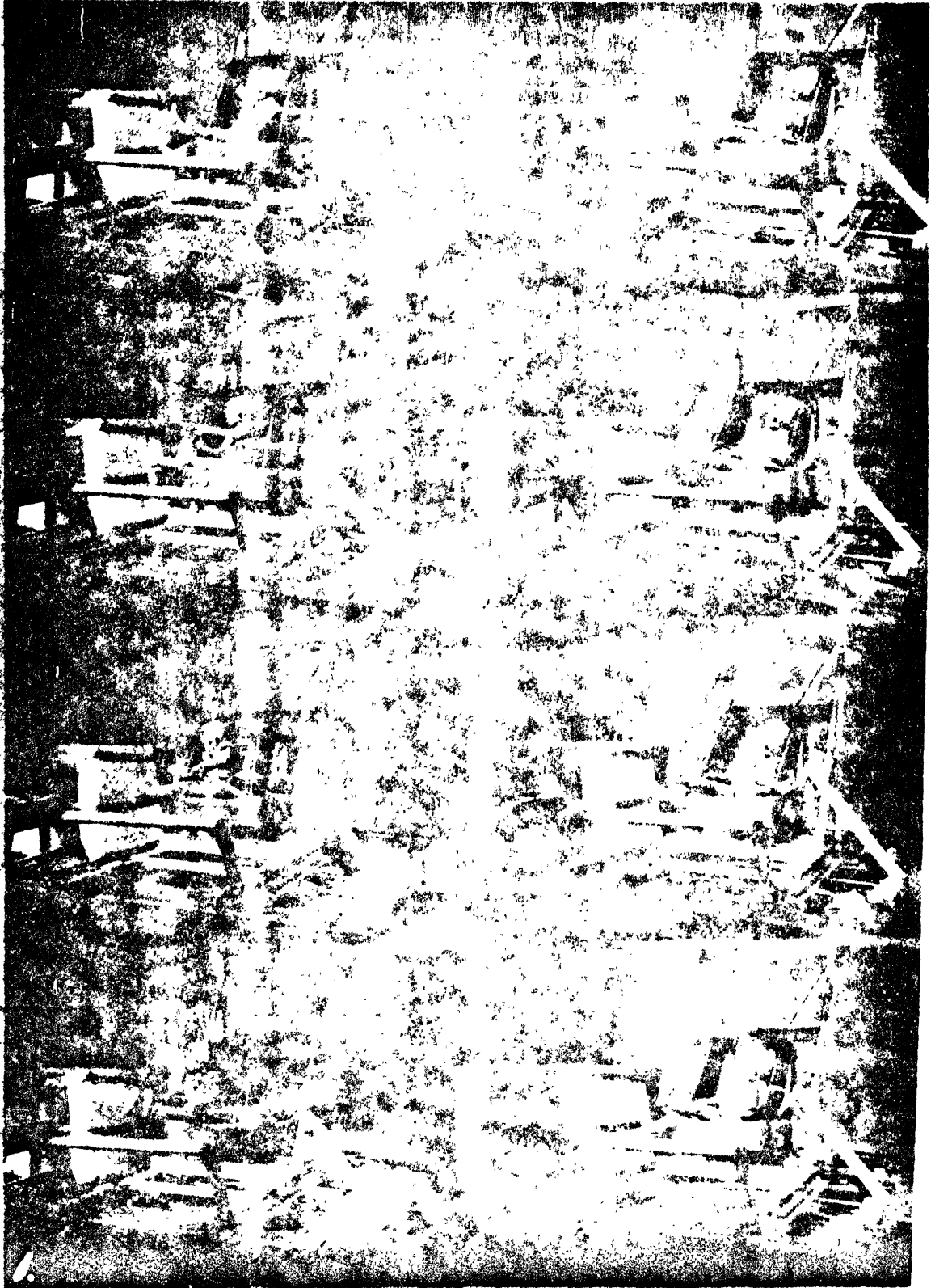
Test No: A-100
Test Date: 16 July 1969
Restraint Code No.: C-23
Restraint Description: Volvo Child Safety Seat

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

Test Observation:

A new strap attaching the child restraint system to the adult seat was attached to prevent the failure which occurred in the previous test of this system. The dummy moved sideways against the shell of the seat but little relative motion between the body parts was noted. The g loadings experienced by the dummy's head were quite high however. The right side of the Volvo seat was bent outward approximately 10°. This is the only seat which offered some degree of protection against side impact as the dummy would not have moved sideways sufficiently far to contact any side structures. The adult lap belt was used over the lap of the dummy in addition to the restraints provided by the manufacturer.





A100

Test A 100

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.

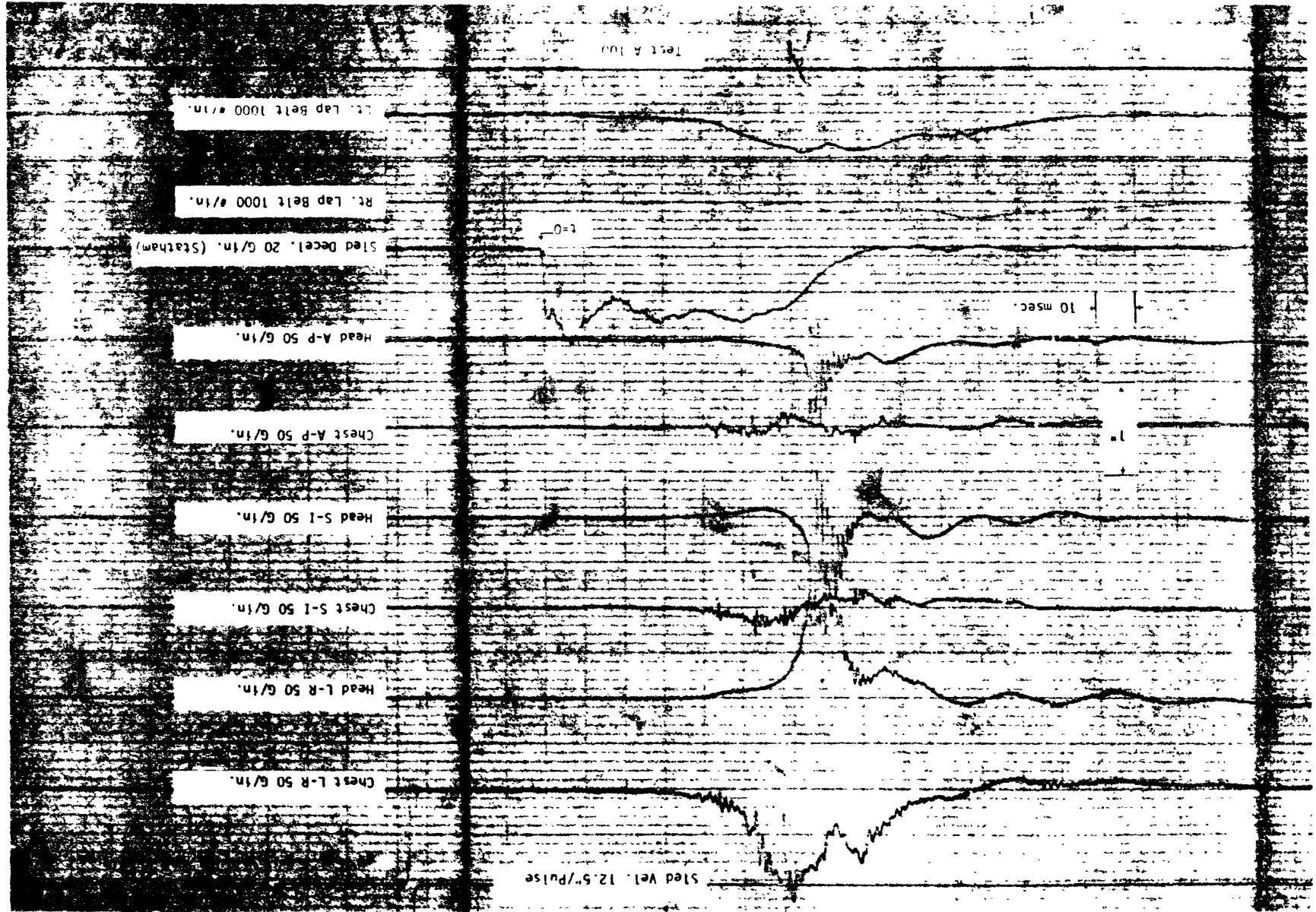
Chest S-I 50 G/in.

Head L-R 50 G/in.

Chest L-R 50 G/in.

10 msec.

Sted Vel. 12.5"/Pulse



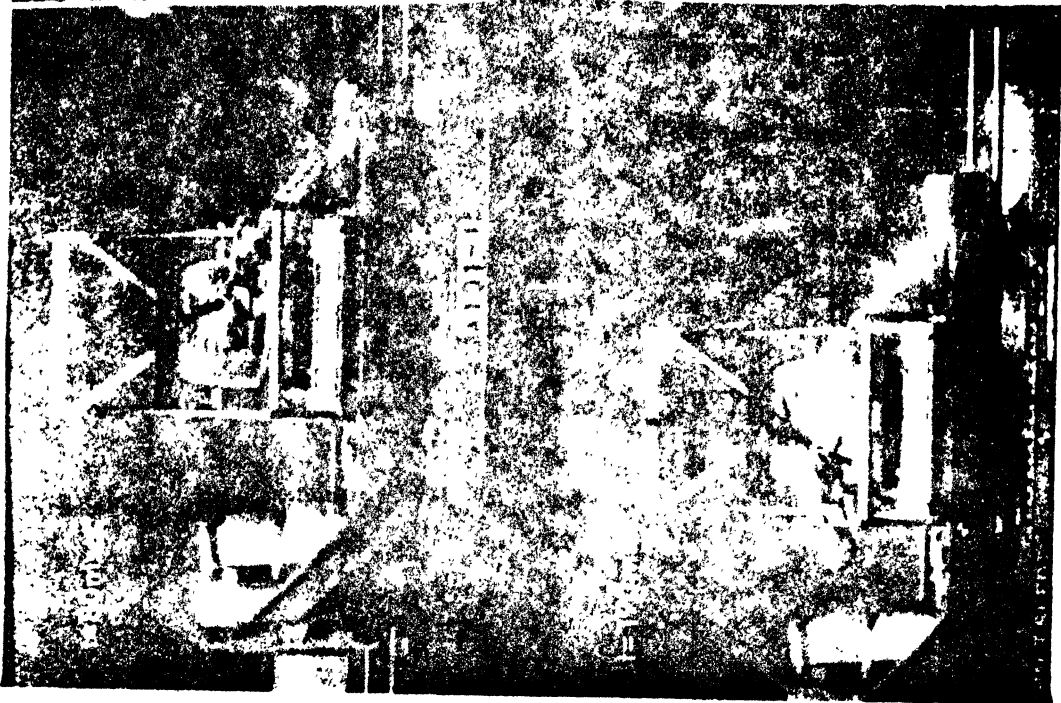
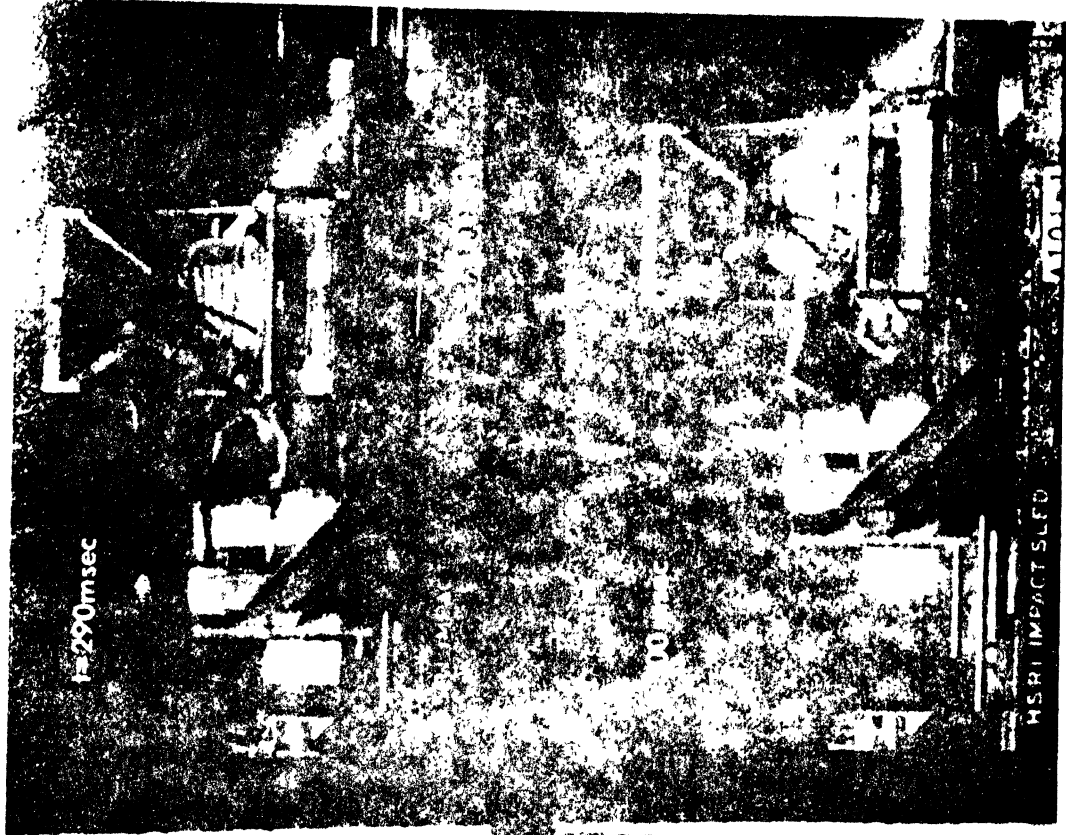
HSRI SUMMARY DATA SHEET (FH-11-6962)

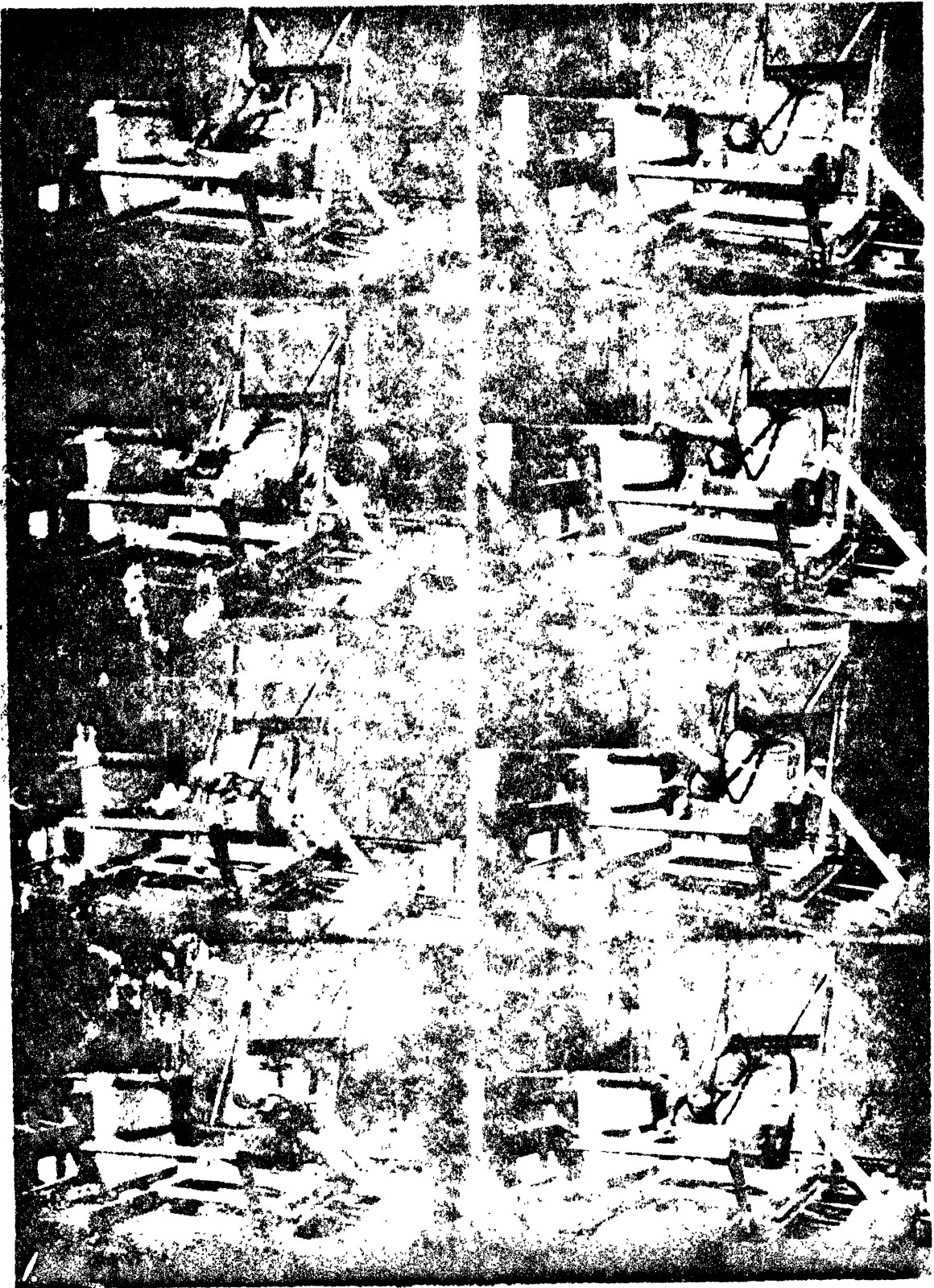
Test No: A-101
Test Date: 16 July 1969
Restraint Code No.: C-31
Restraint Description: Sears Auto Harness, Small

Dummy: 3 year
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: Side impact
Dummy Attitude: Lying, head facing in direction of impact

Test Observation:

The dummy slid rearward on the seat during sled acceleration and was in poor position when impact occurred. During deceleration the dummy's head slid out of the seat in the direction of impact and would have contacted any side structures which would have been present.





A101

Test A 101

t=0

10 msec

Sted vel. 12.5 Pulse

Chest L-R 50 G/in.

Head L-R 50 G/in.

Chest S-I 50 G/in.

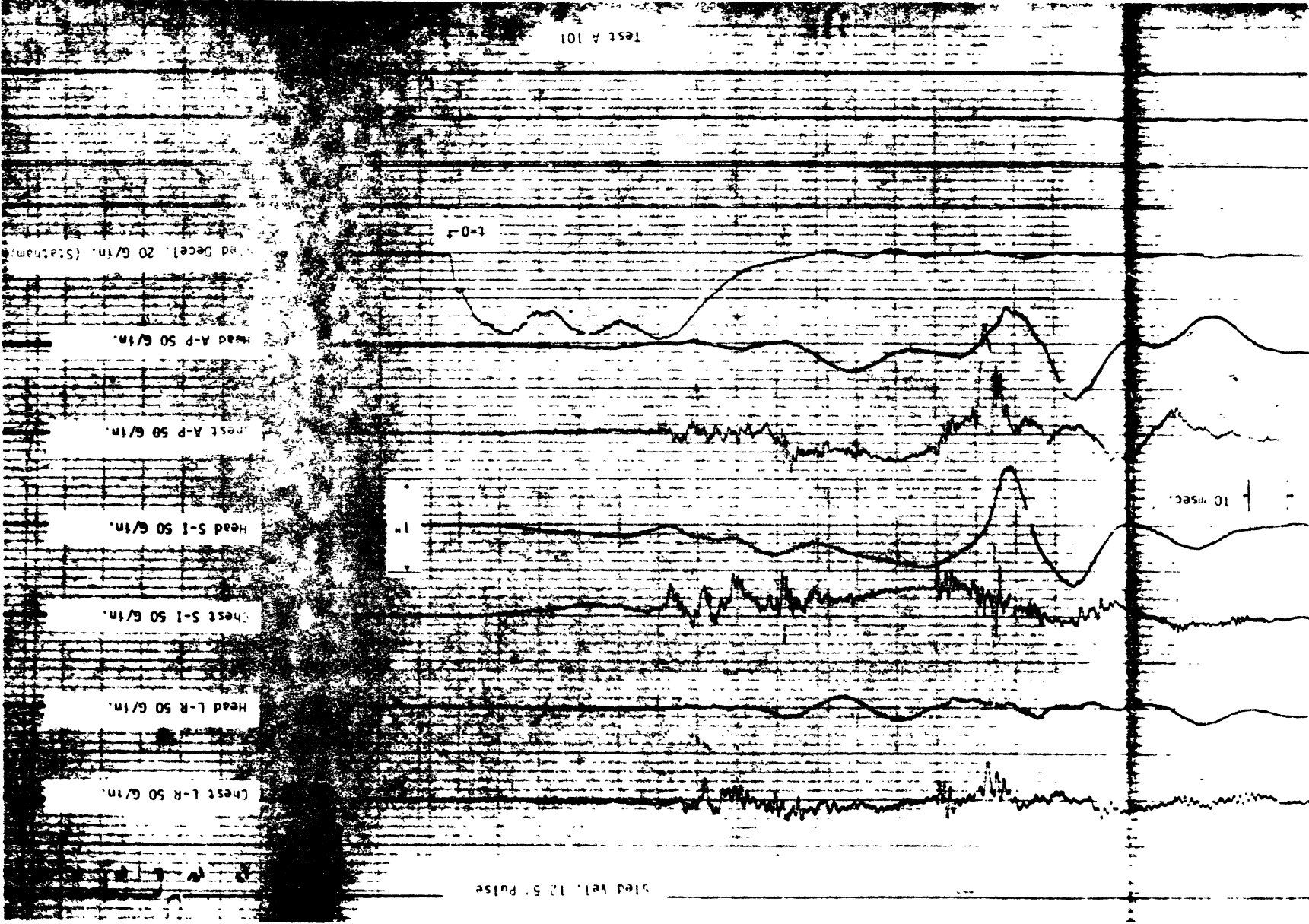
Head S-I 50 G/in.

Chest A-P 50 G/in.

Head A-P 50 G/in.

Head Decel. 20 G/in. (Statham)

311



HSRI SUMMARY DATA SHEET (FH-11-6962)

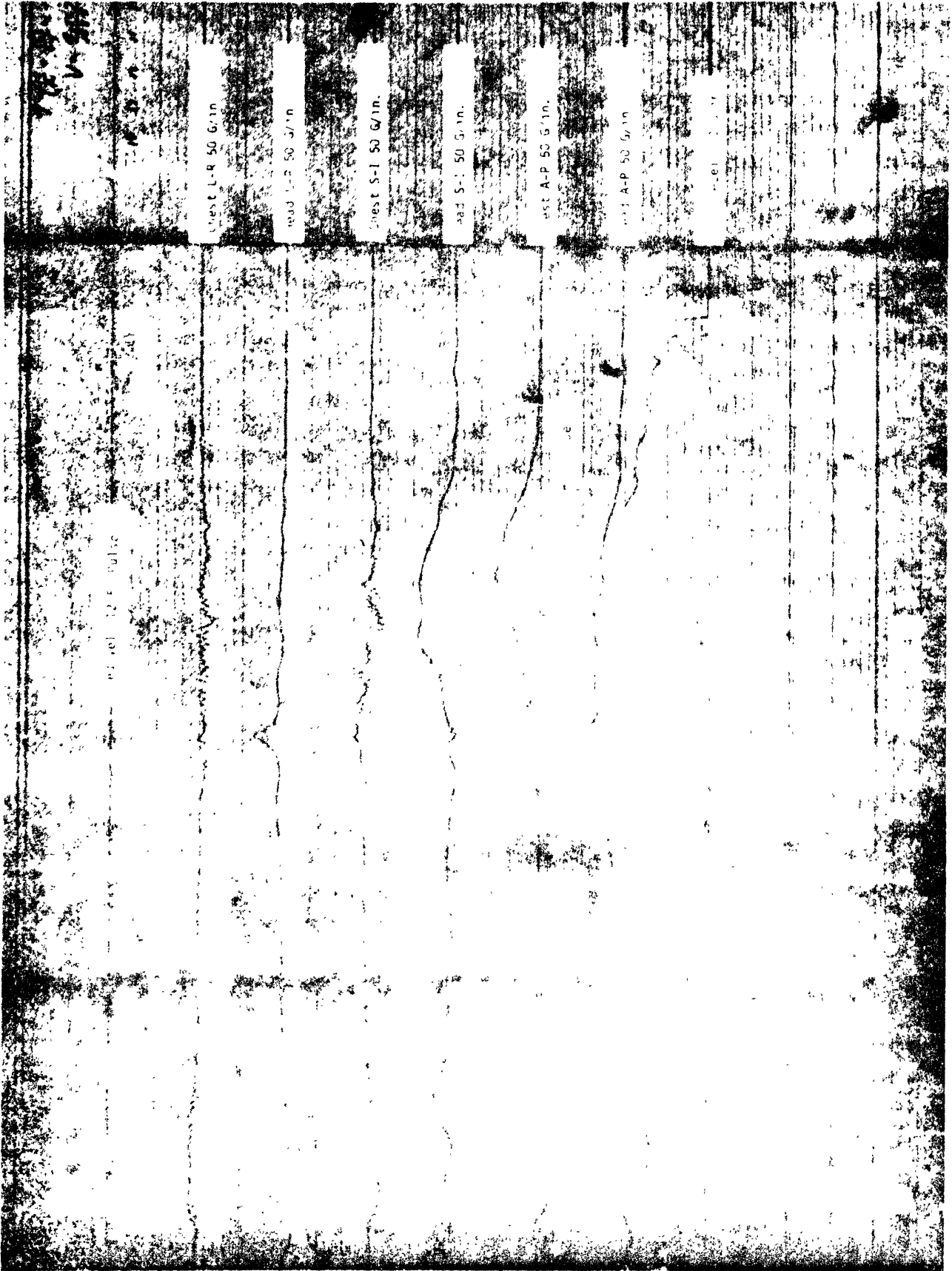
Test No: A-104
Test Date: 21 July 1969
Restraint Code No.: C-31
Restraint Description: Sears Auto Harness, small

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

Test Observation:

The loadings on the dummy did not appear to be too severe and excursion of the dummy was moderate.





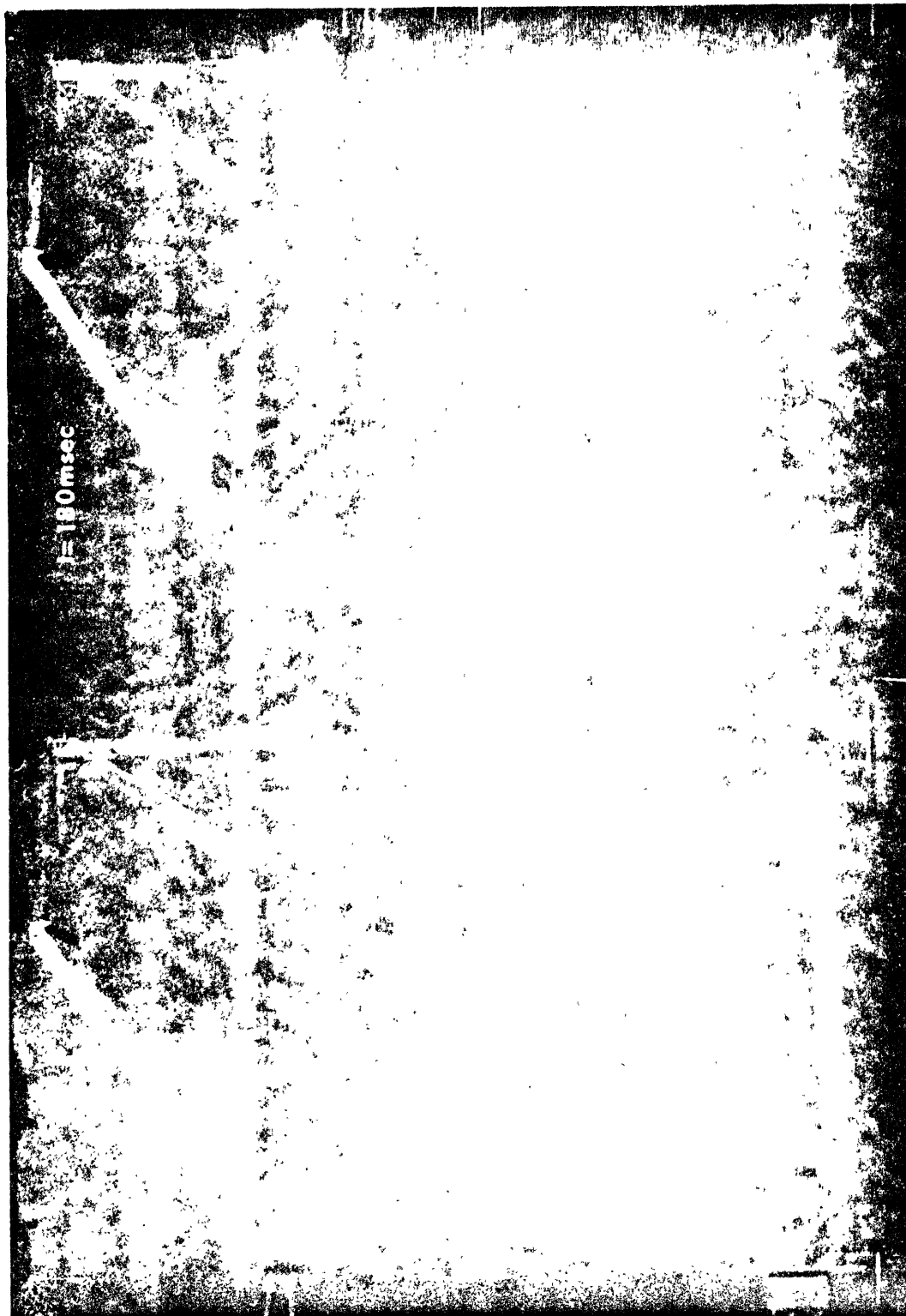
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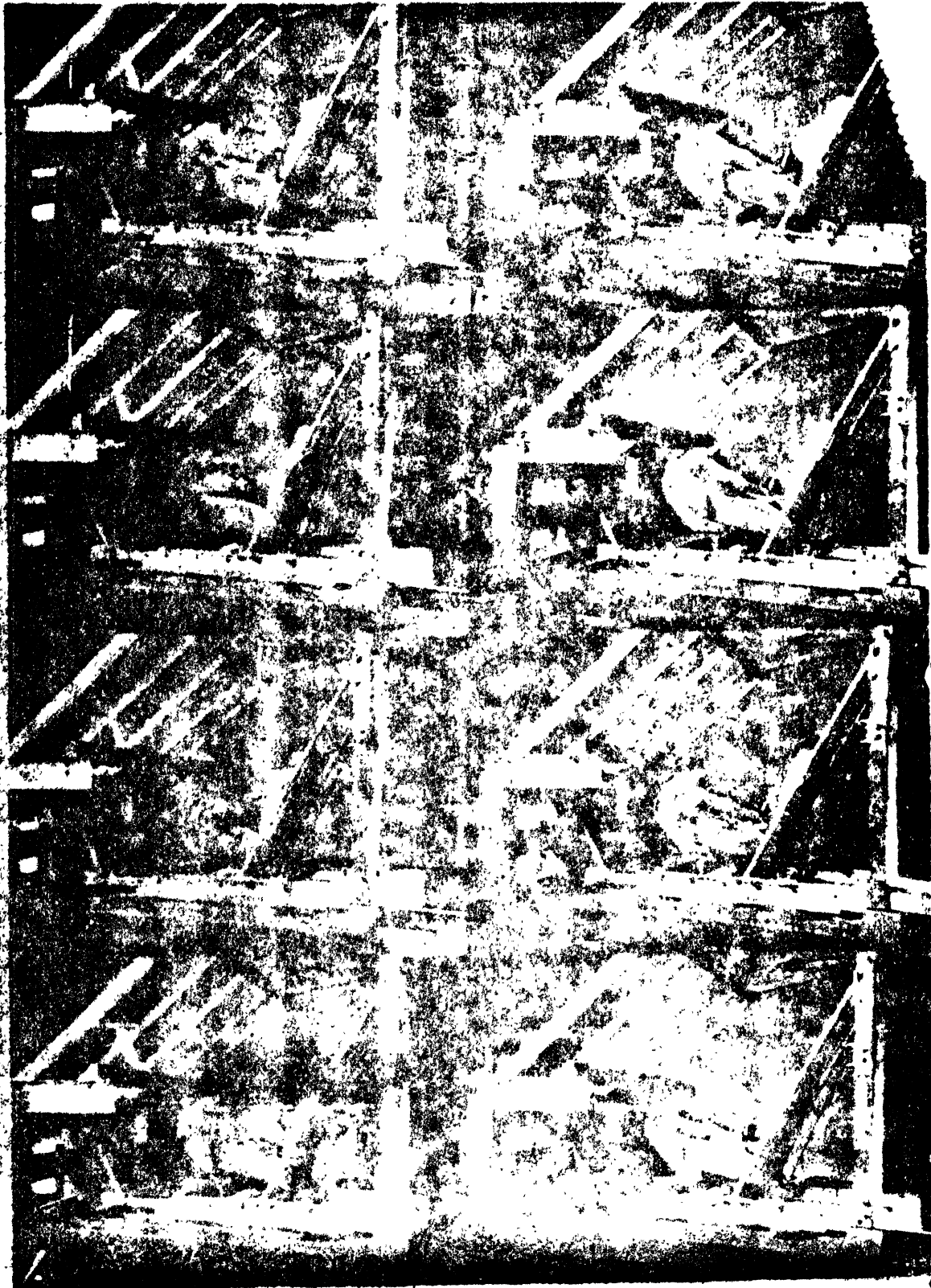
Test No: A-105
Test Date: 21 July 1969
Restraint Code No.: C-31
Restraint Description: Sears Auto Harness, small

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

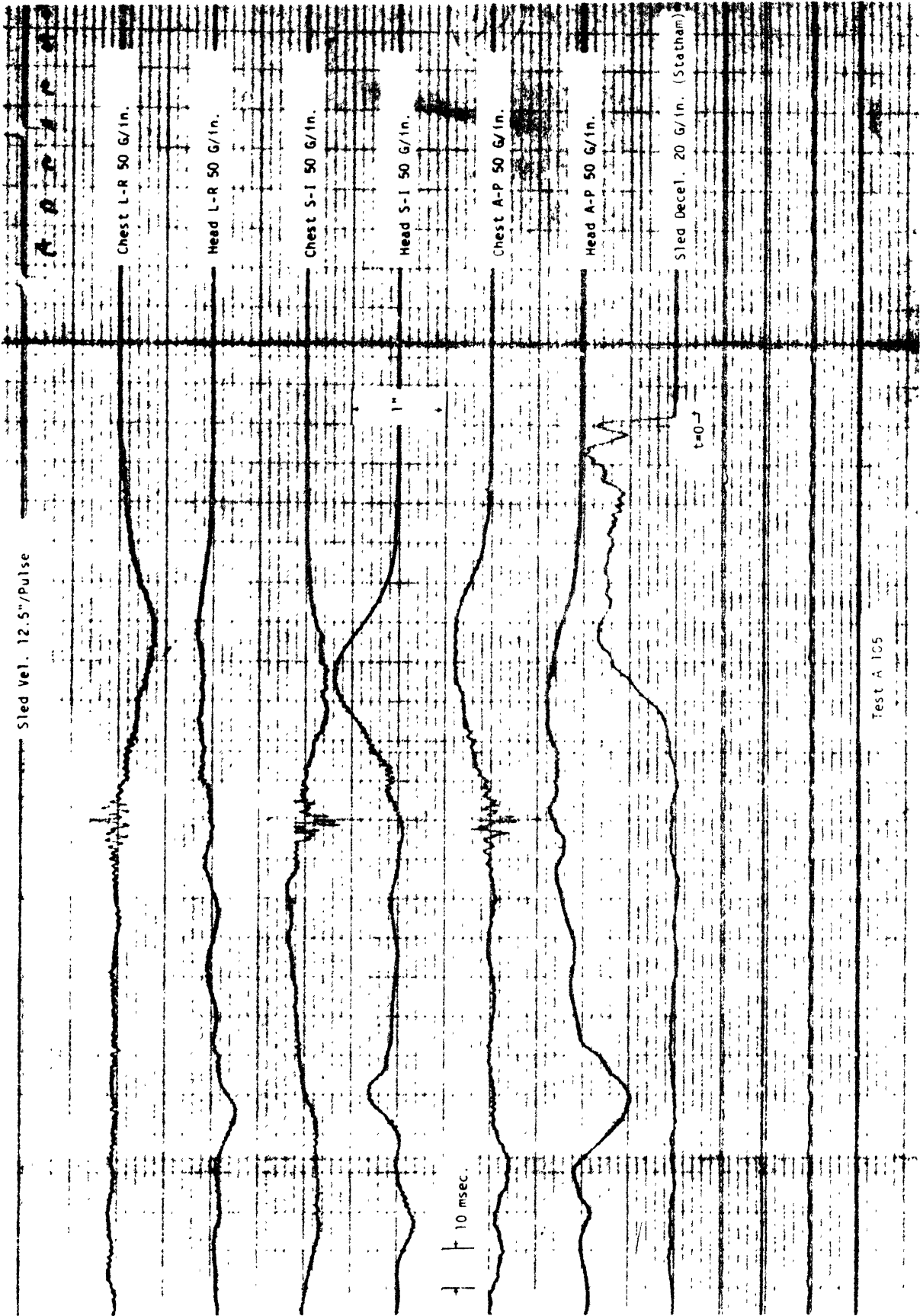
Test Observation:

Neither the loadings or excursion of the dummy appeared to be severe.





A105



Test A 105

HSRI SUMMARY DATA SHEET (FH-11-6962)

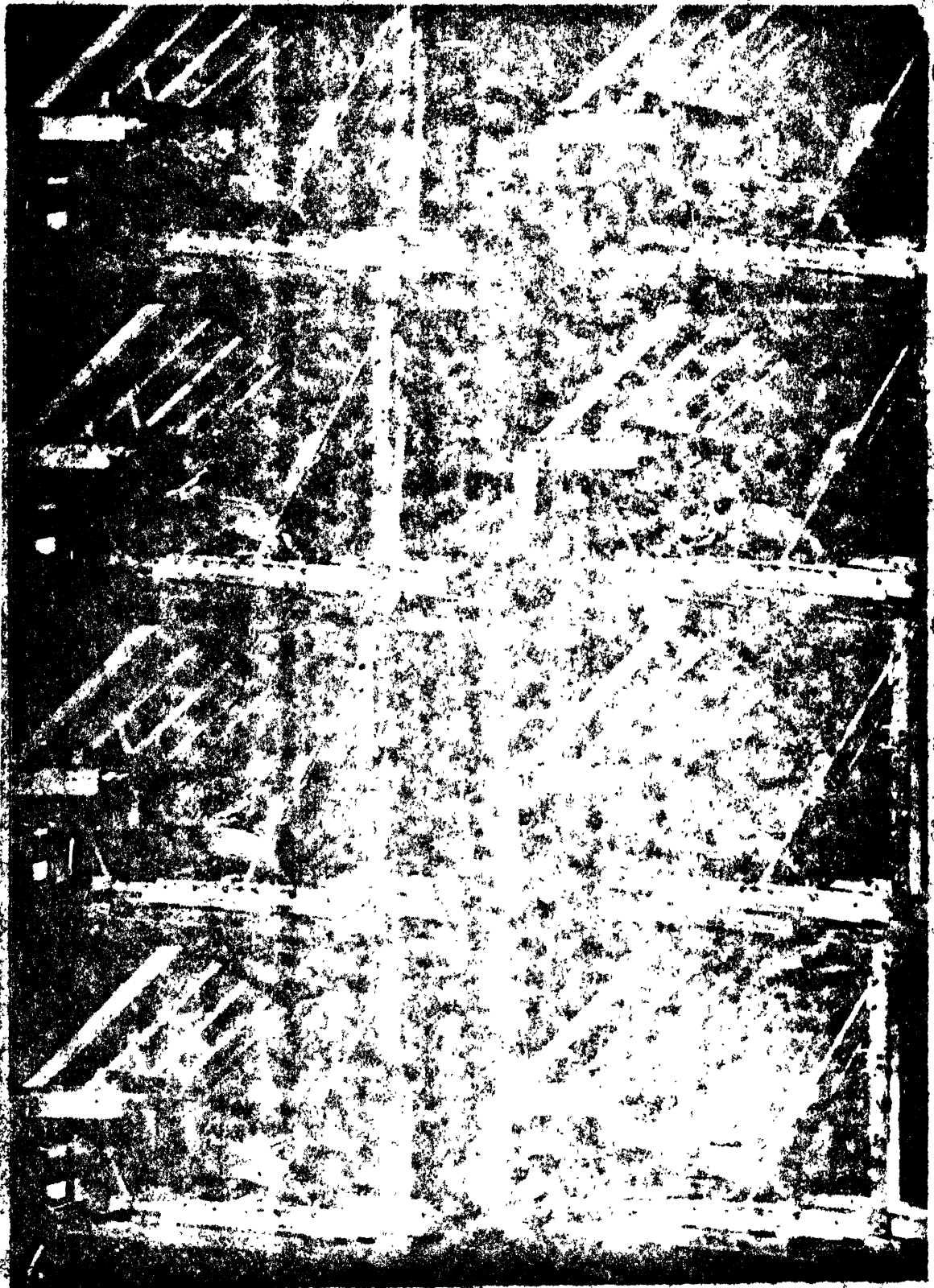
Test No: A-106
Test Date: 22 July 1969
Restraint Code No.: C-34
Restraint Description: Life Auto Babe Nylon Car Harness

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

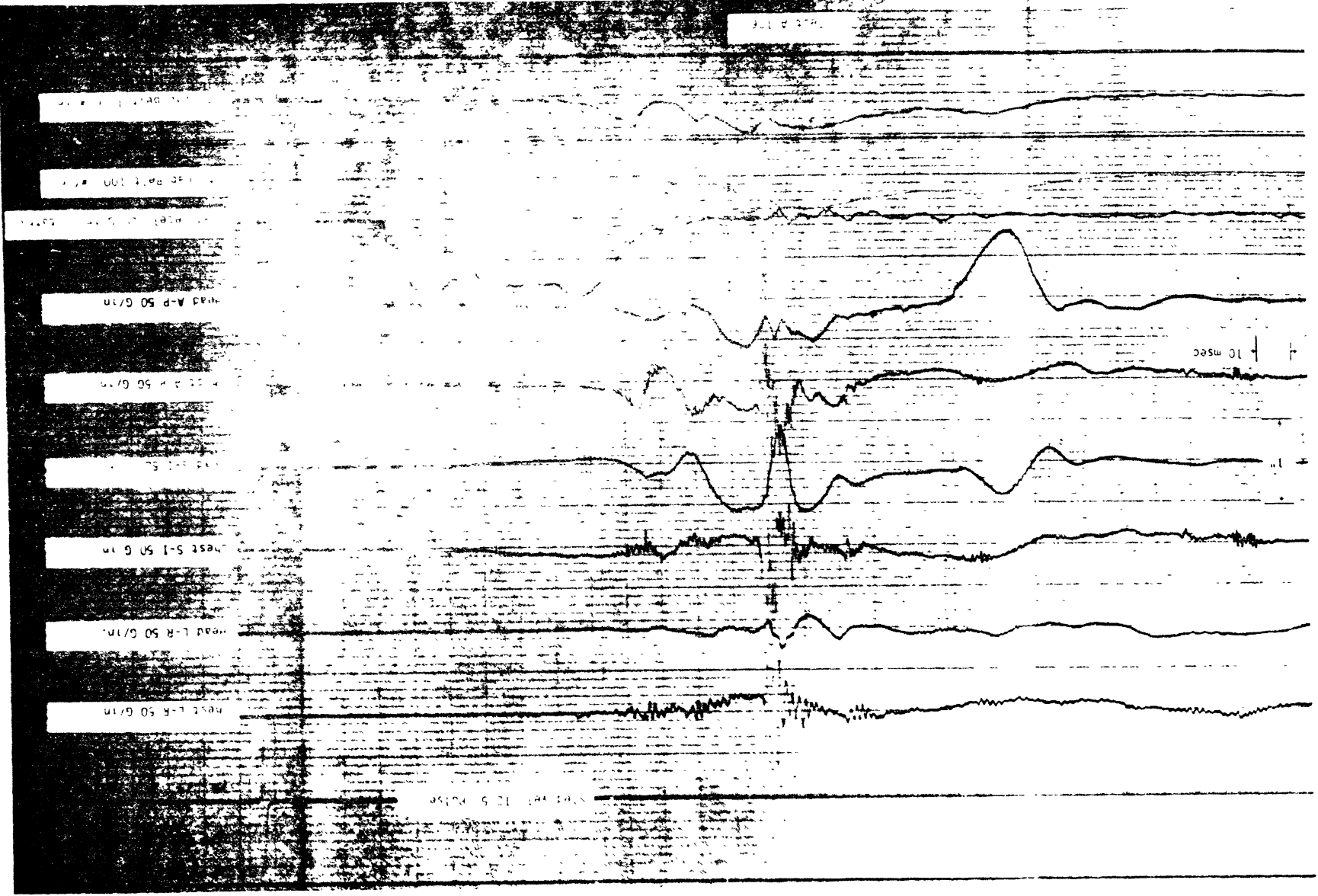
Test Observation:

The stitching parted at the rear where the belly strap and shoulder joint strap are attached. This allowed the dummy to slide downward until the remaining intact portion of the harness formed a loop and hung the dummy by its chin. The dummy was essentially ejected and hung at the same time.





A106



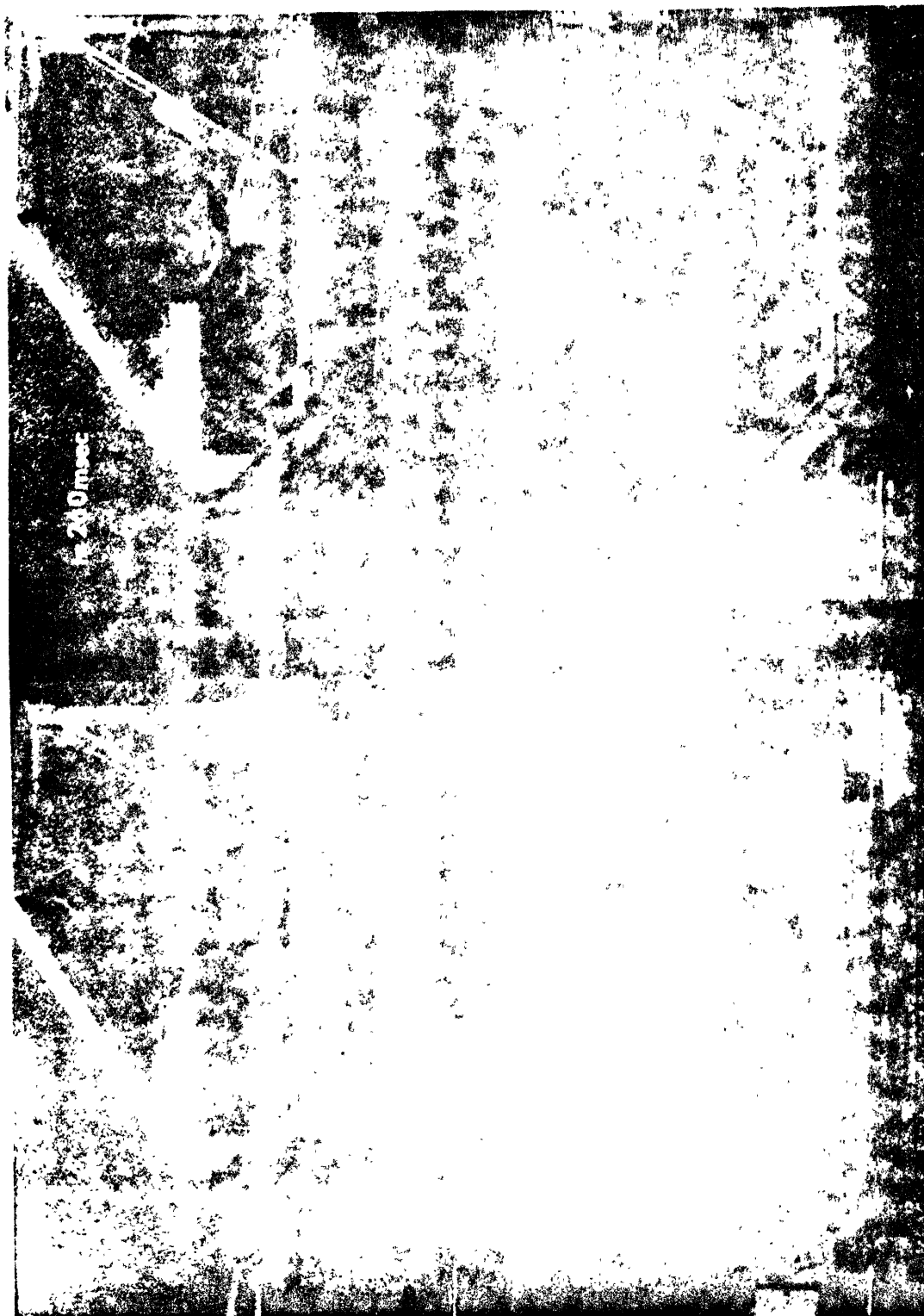
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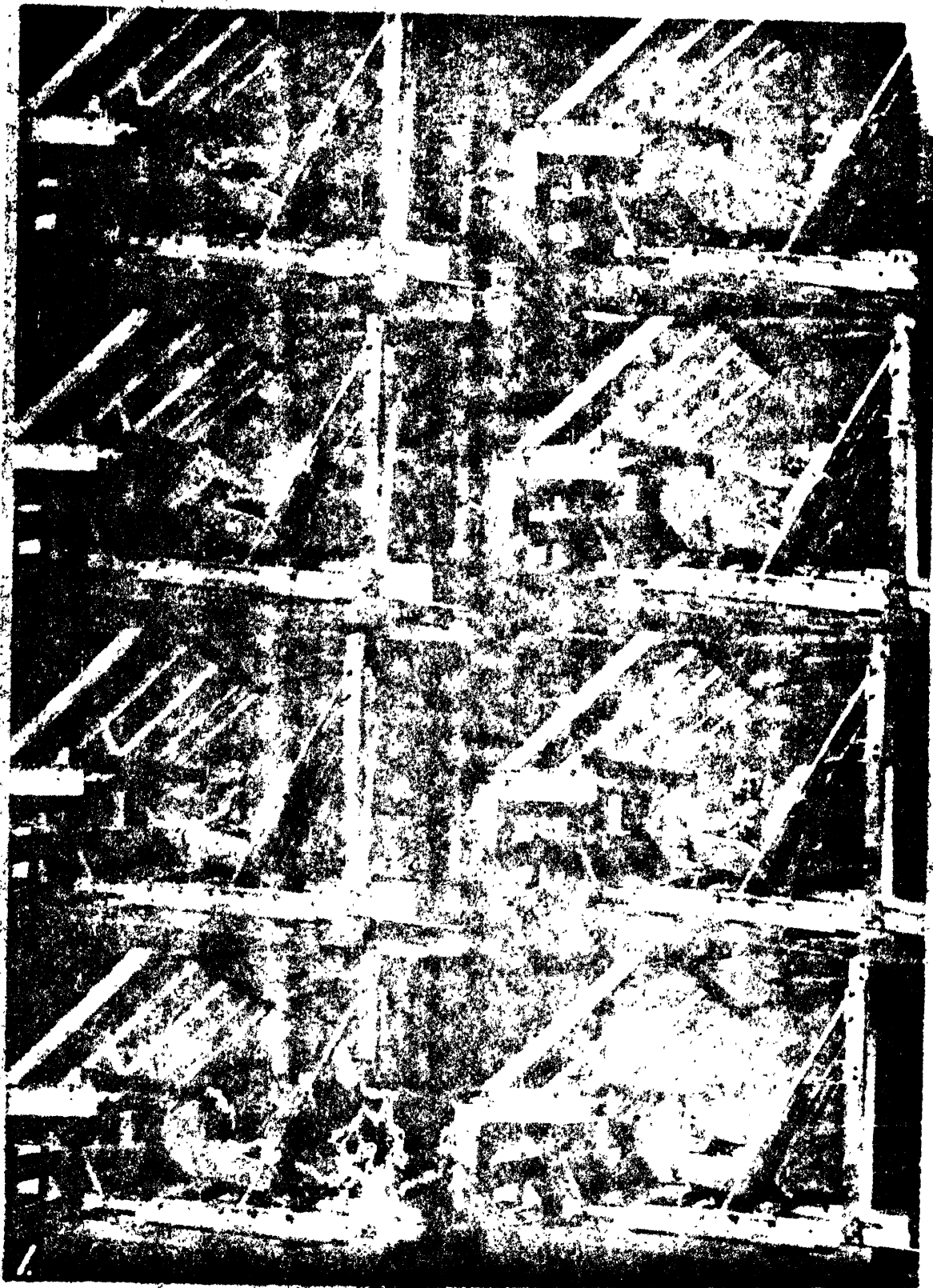
Test No: A-107
Test Date: 22 July 1969
Restraint Code No.: C-36
Restraint Description: Irvin Auto Safety Harness No. CH-102

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

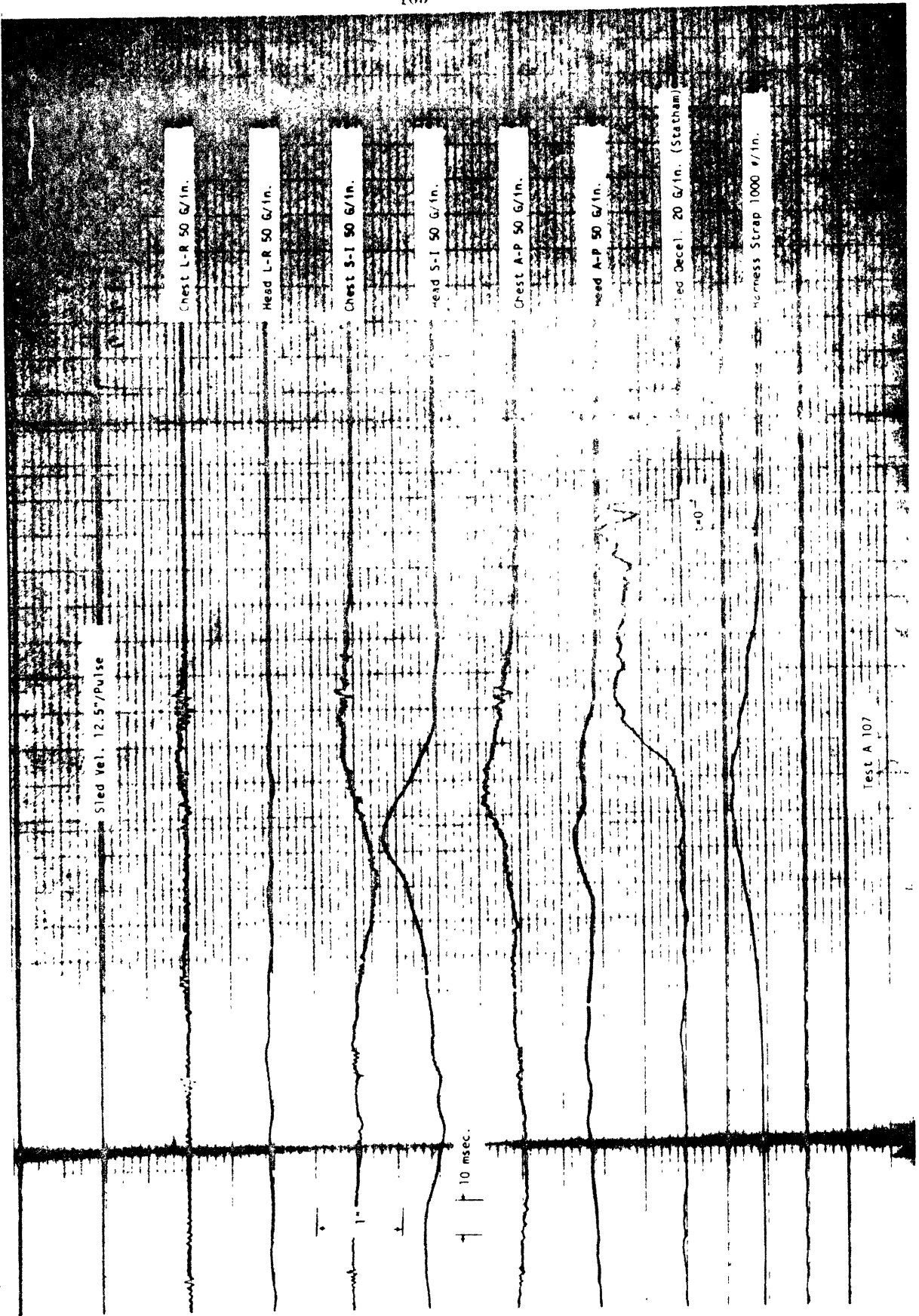
Test Observation:

The loadings experienced by the dummy were moderate. No damage was done to either the dummy or the restraint system. The restraint system seemed to slide down into the abdominal area of the dummy causing apparent high loading in that region of the body.





A107



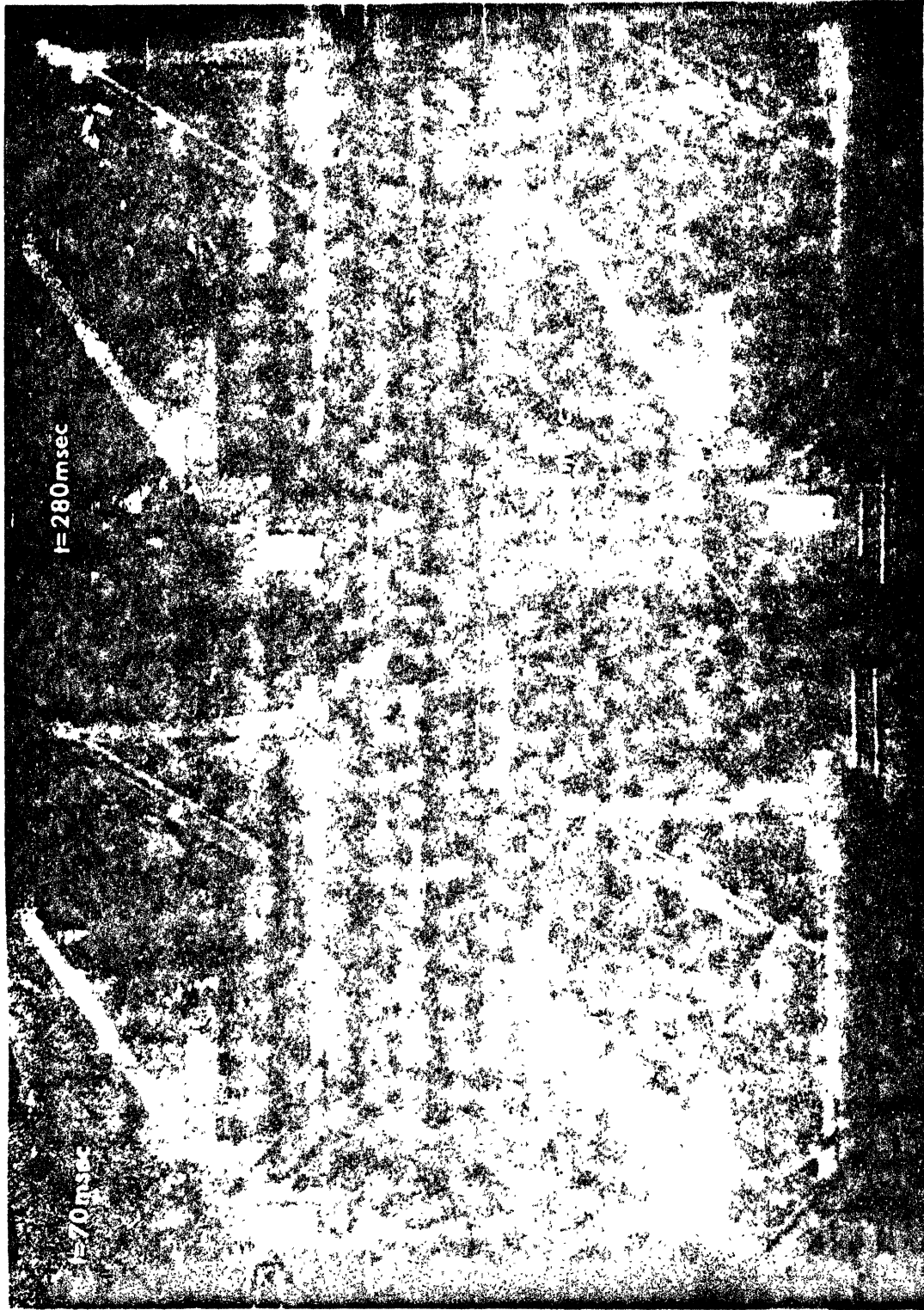
HSRI SUMMARY DATA SHEET (FH-11-6962)

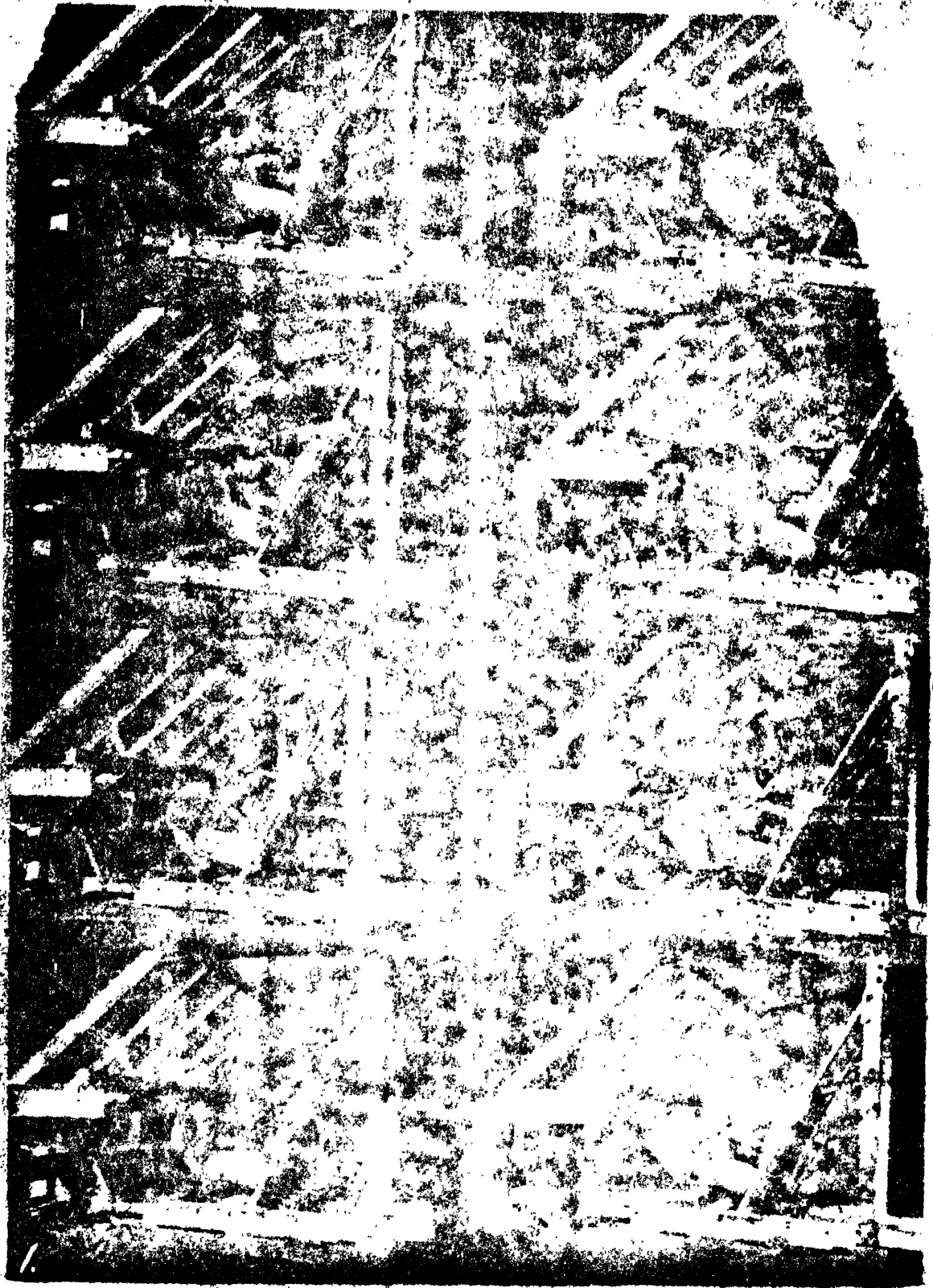
Test No: A-108
Test Date: 22 July 1969
Restraint Code No.: C-36
Restraint Description: Irvin Auto Safety Harness No. CH-102

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

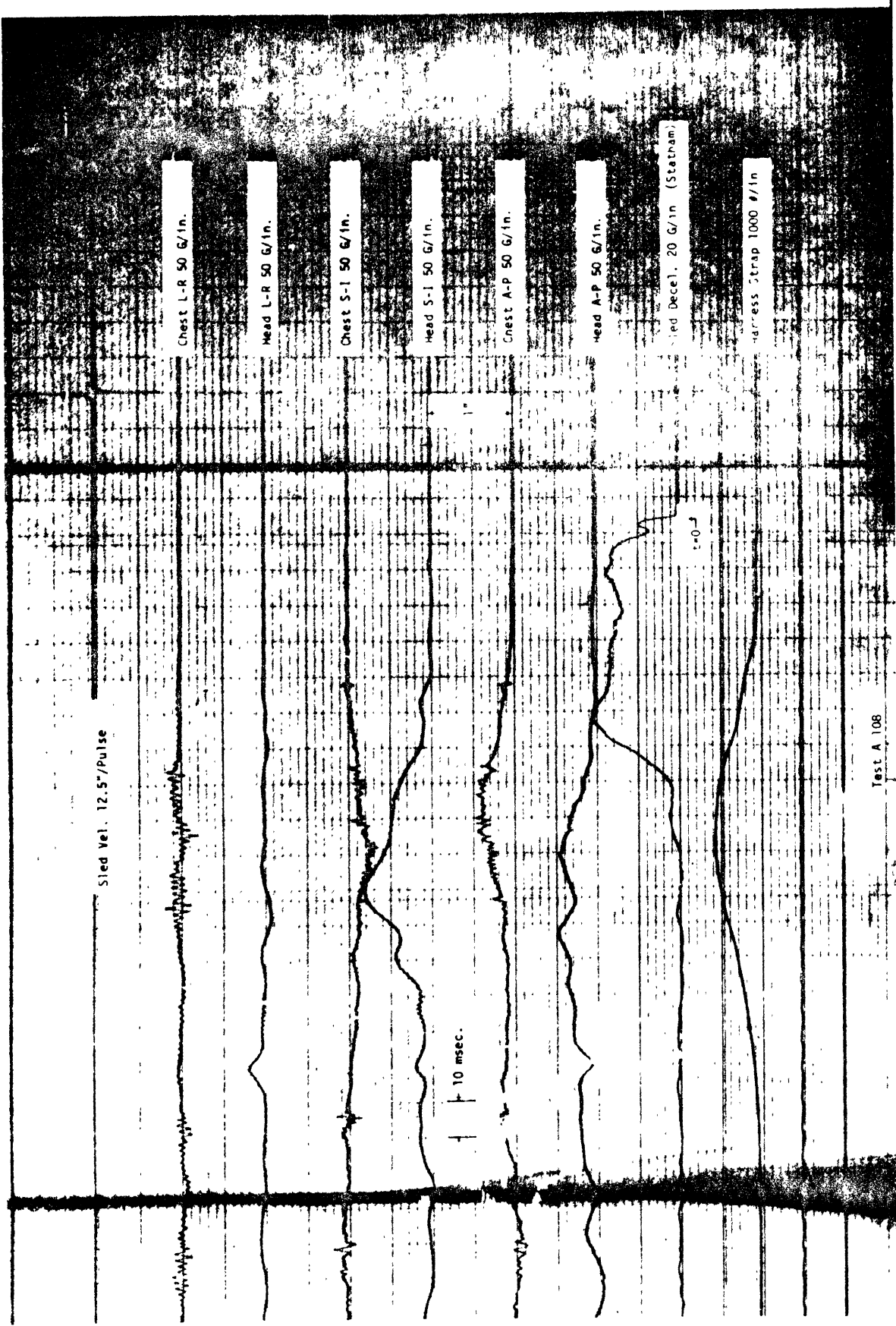
Test Observation:

The system kept the dummy from impacting the instrument panel on the body buck, but the dummy was sharply doubled over about the waist due to the belly strap. He received a peak g loading of approximately 40 g's in the head superior-interior accelerometer. The crotch strap pulled tightly into the crevice between the thigh and the lower torso.





A108



Test A 108

HSRI SUMMARY DATA SHEET (FH-11-6962)

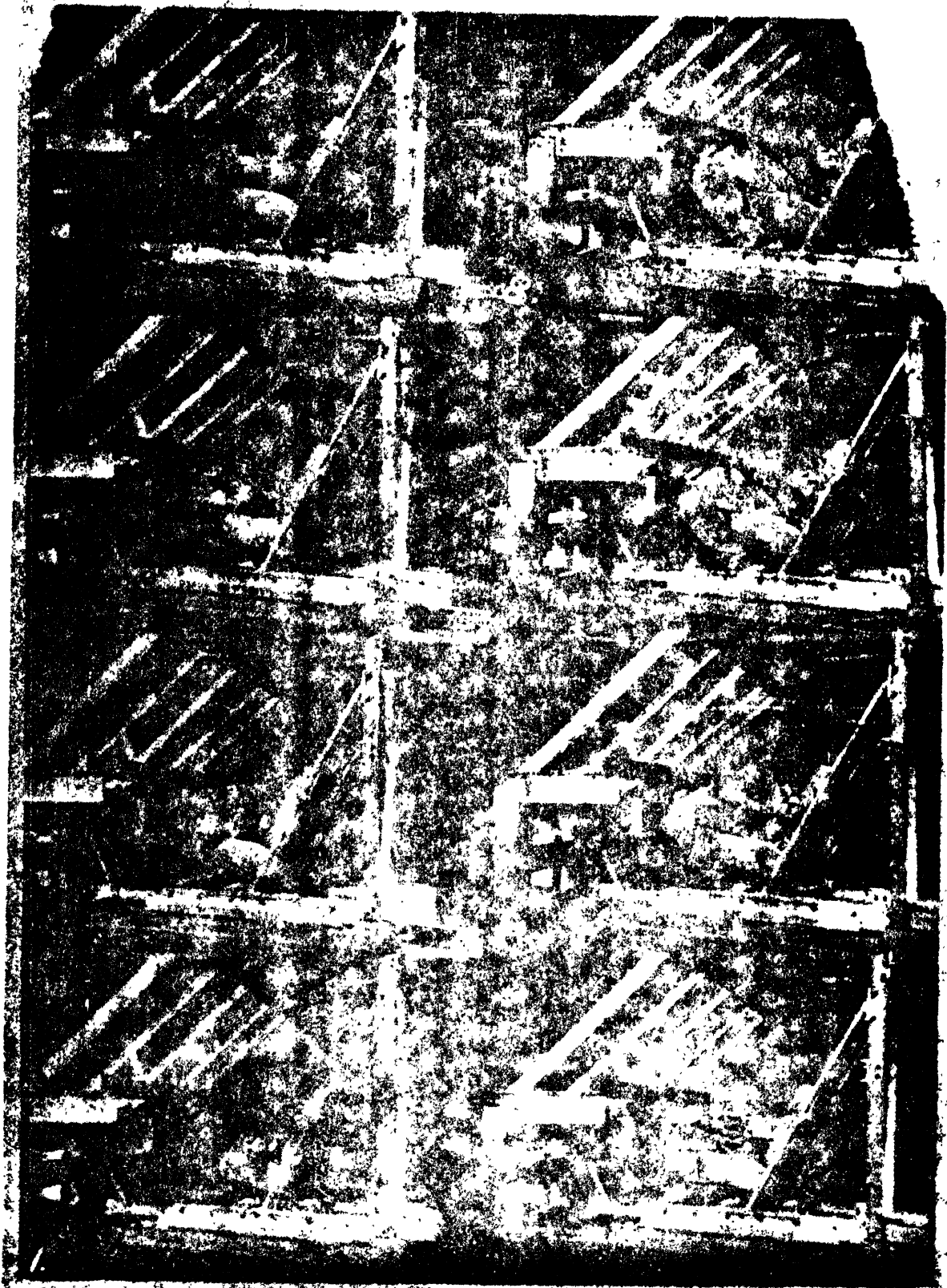
Test No: A-109
Test Date: 22 July 1969
Restraint Code No: C-36
Restraint Description: Irvin Auto Safety Harness No. C-102

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

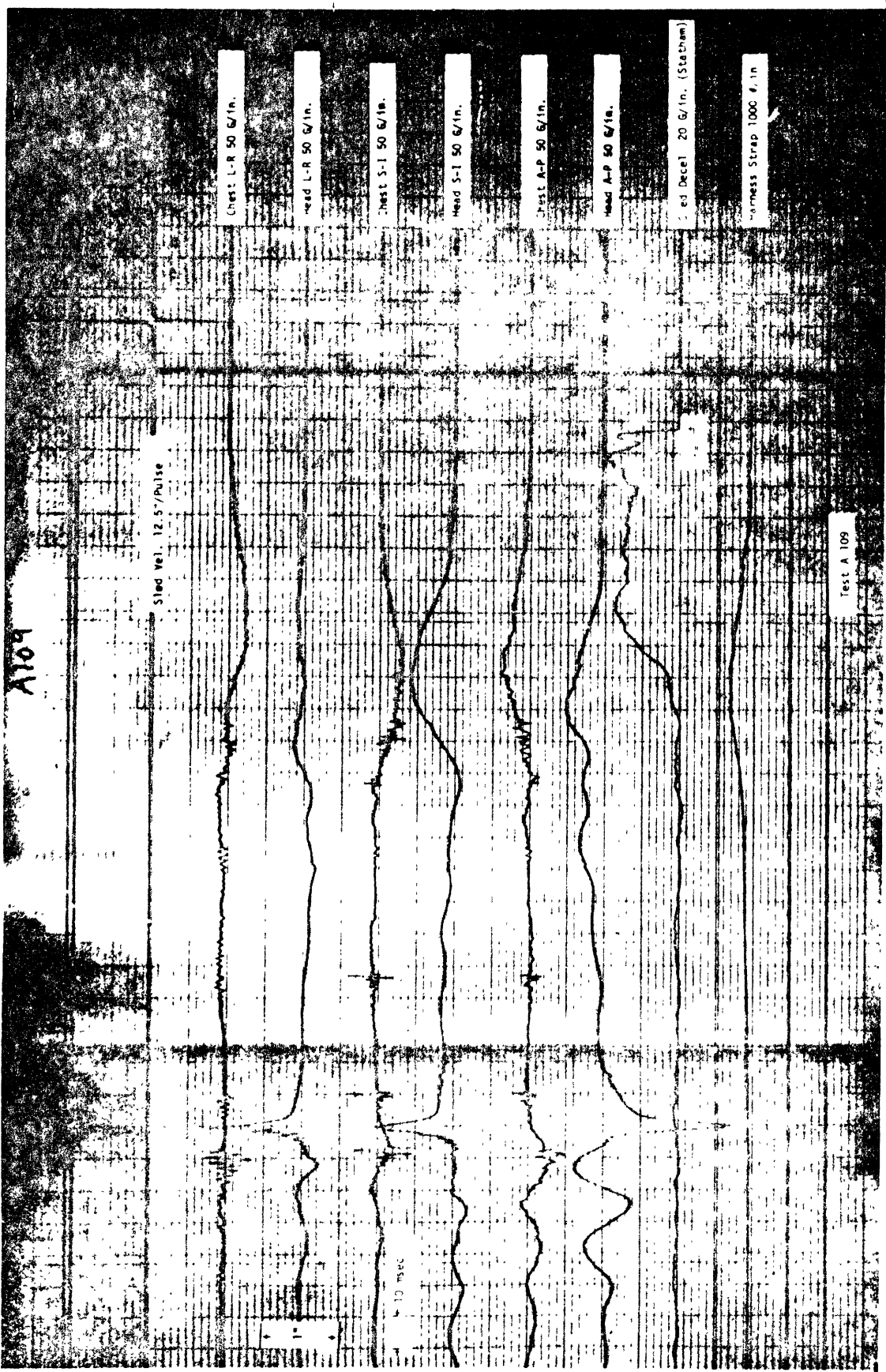
Test Observation:

The loads and the excursion experienced by the dummy were moderate as it moved forward into the deceleration. However, on the rebound the dummy interacted rather violently with the adult seat structure.





A109



HSRI SUMMARY DATA SHEET (FH-11-6962)

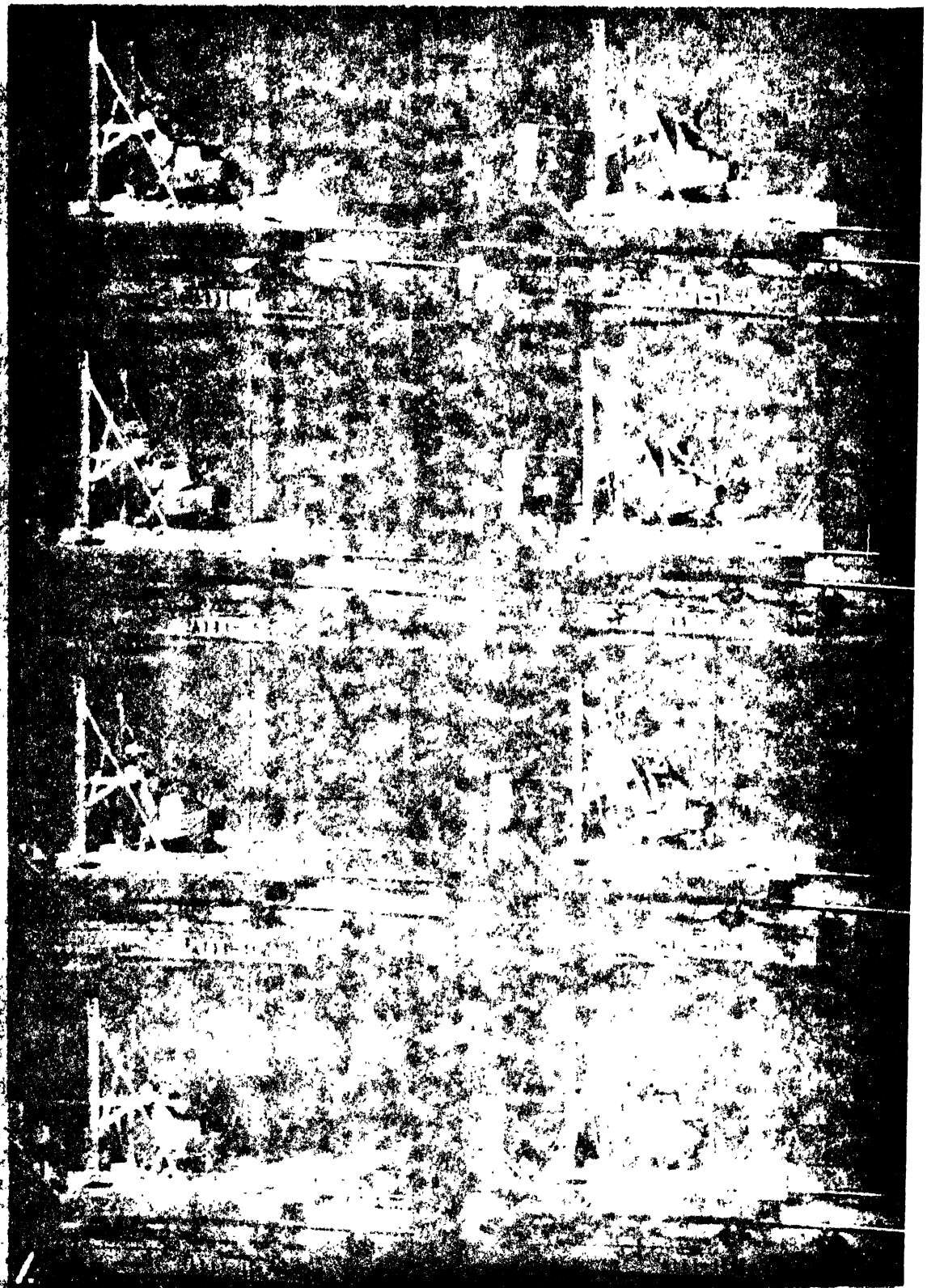
Test No: A-111
Test Date: 28 July 1969
Restraint Code No.: C-3
Restraint Description: General Motors Standard Seat

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

Test Observation:

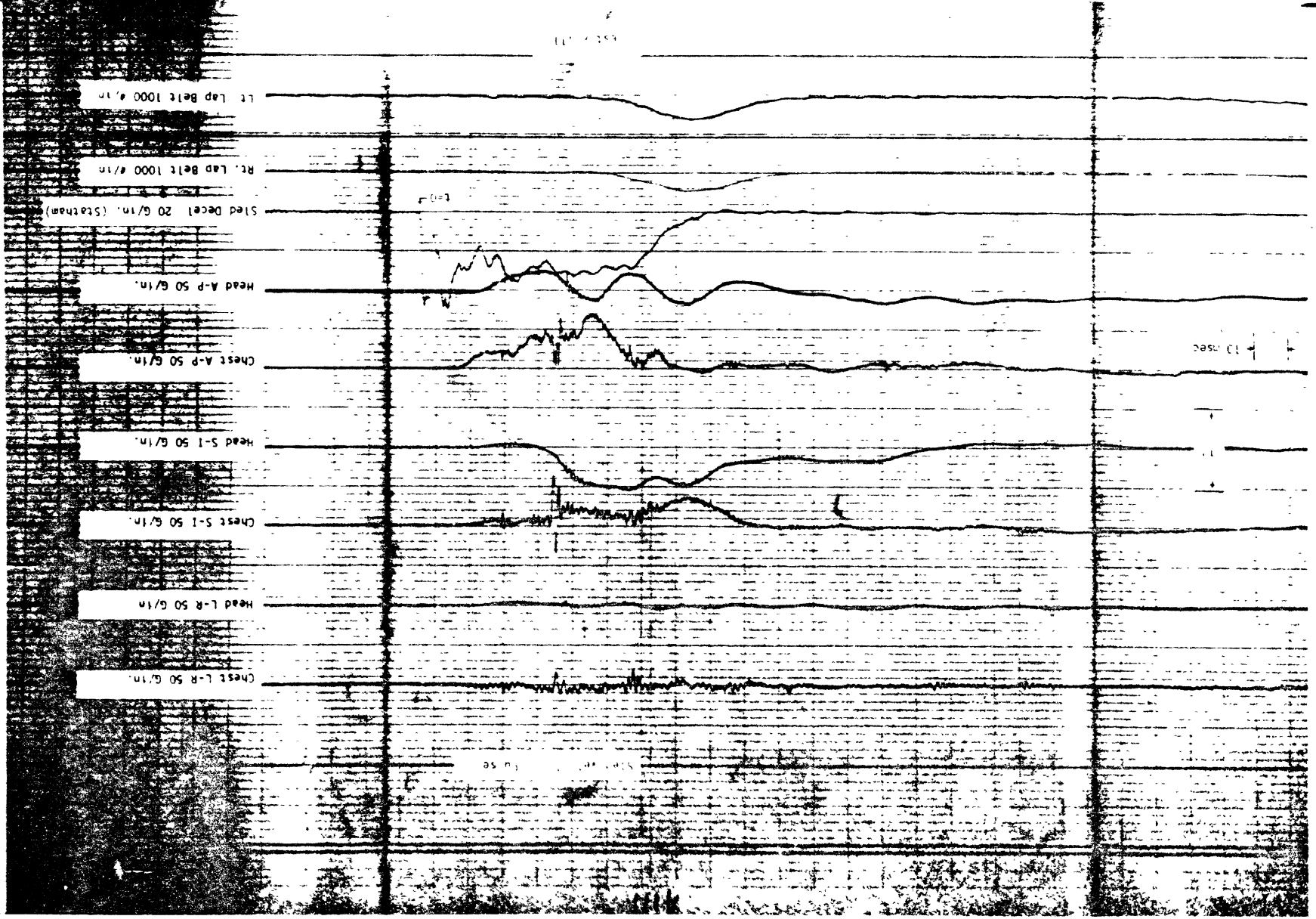
The loadings experienced by the dummy were quite moderate. However, because of the high seated position of the dummy and the lack of a head-rest on the adult seat, there were substantial whiplash effects due to the relative motion between the dummy head and the chest as the top of the adult seat acted as a pivot point.





A111

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HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-112
Test Date: 28 July 1969
Restraint Code No.: C-1
Restraint Description: Ford Tot-Guard

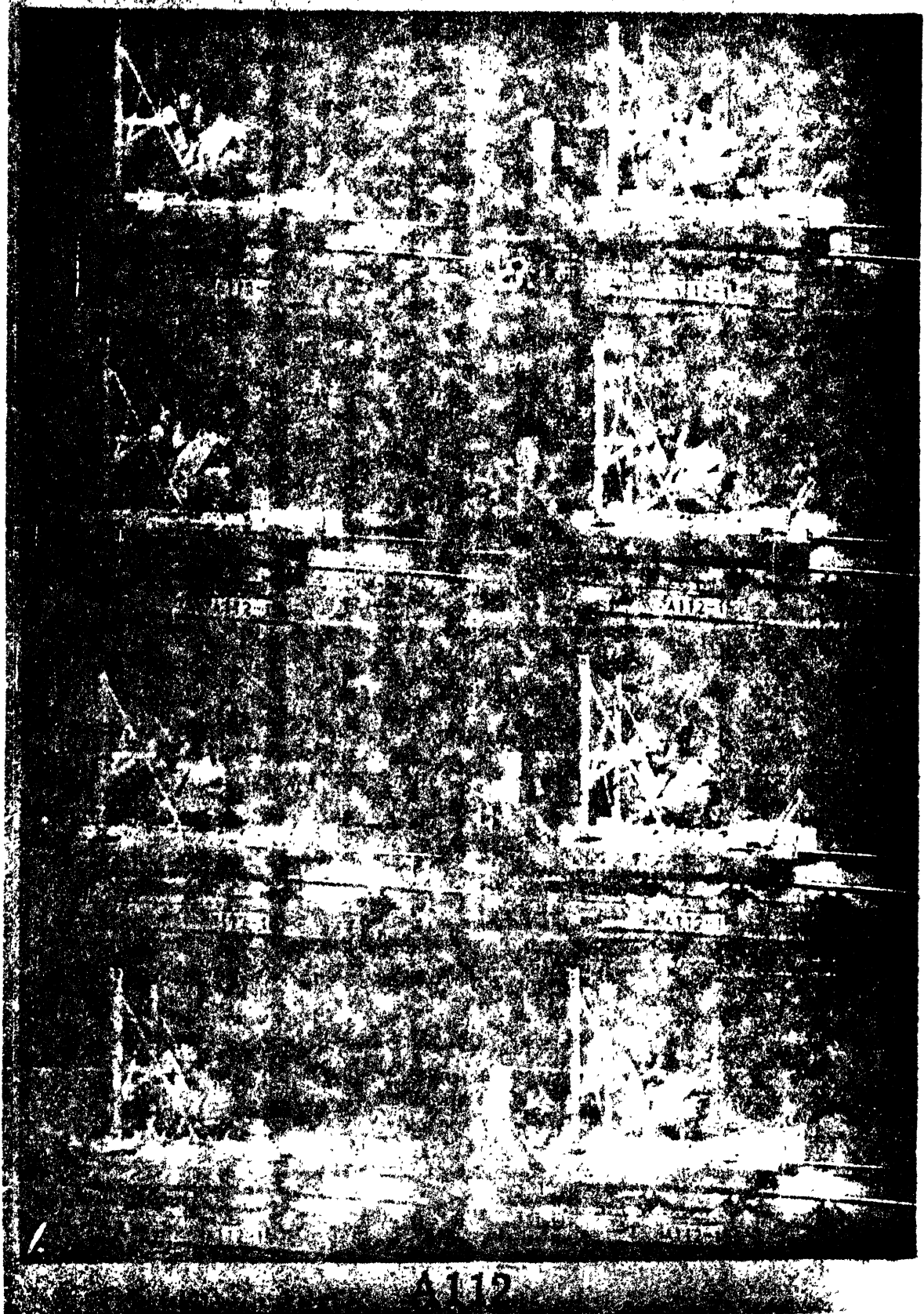
Dummy: 3 year
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: Rear-end
Dummy Attitude: Sitting

Test Observation:

Neither the g loadings or the excursion of the dummy were severe. However, the upper section of the tot-guard pivoted upward pinning the dummy's head against the back of the adult seat. The dummy's chin on rebound rubbed skin material off onto the cushion of the tot-guard.



NOT REPRODUCIBLE



Test A 112

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.

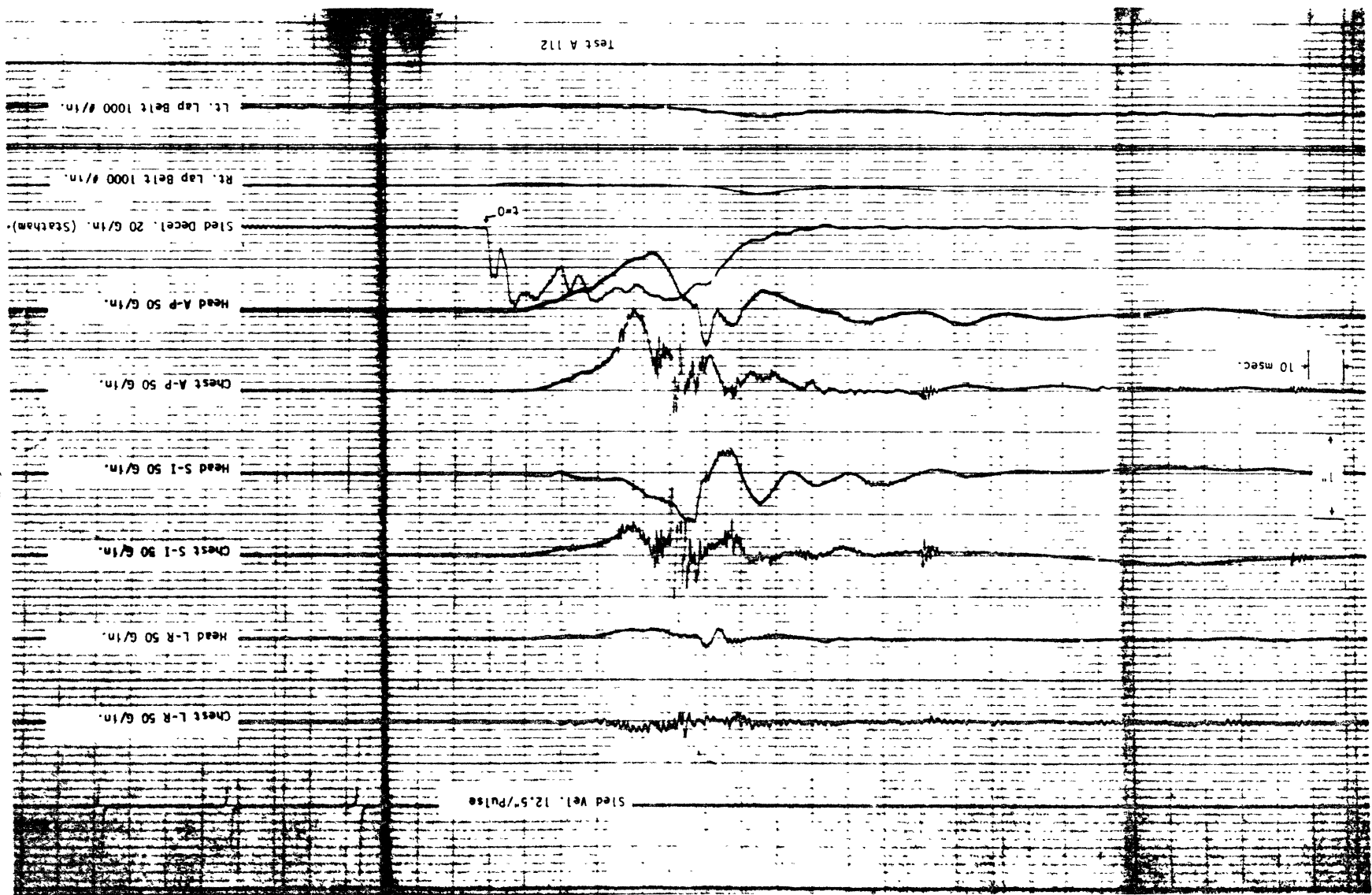
Chest L-R 50 G/in.

Sled Vel. 12.5"/Pulse

10 msec.

t=0

6.1



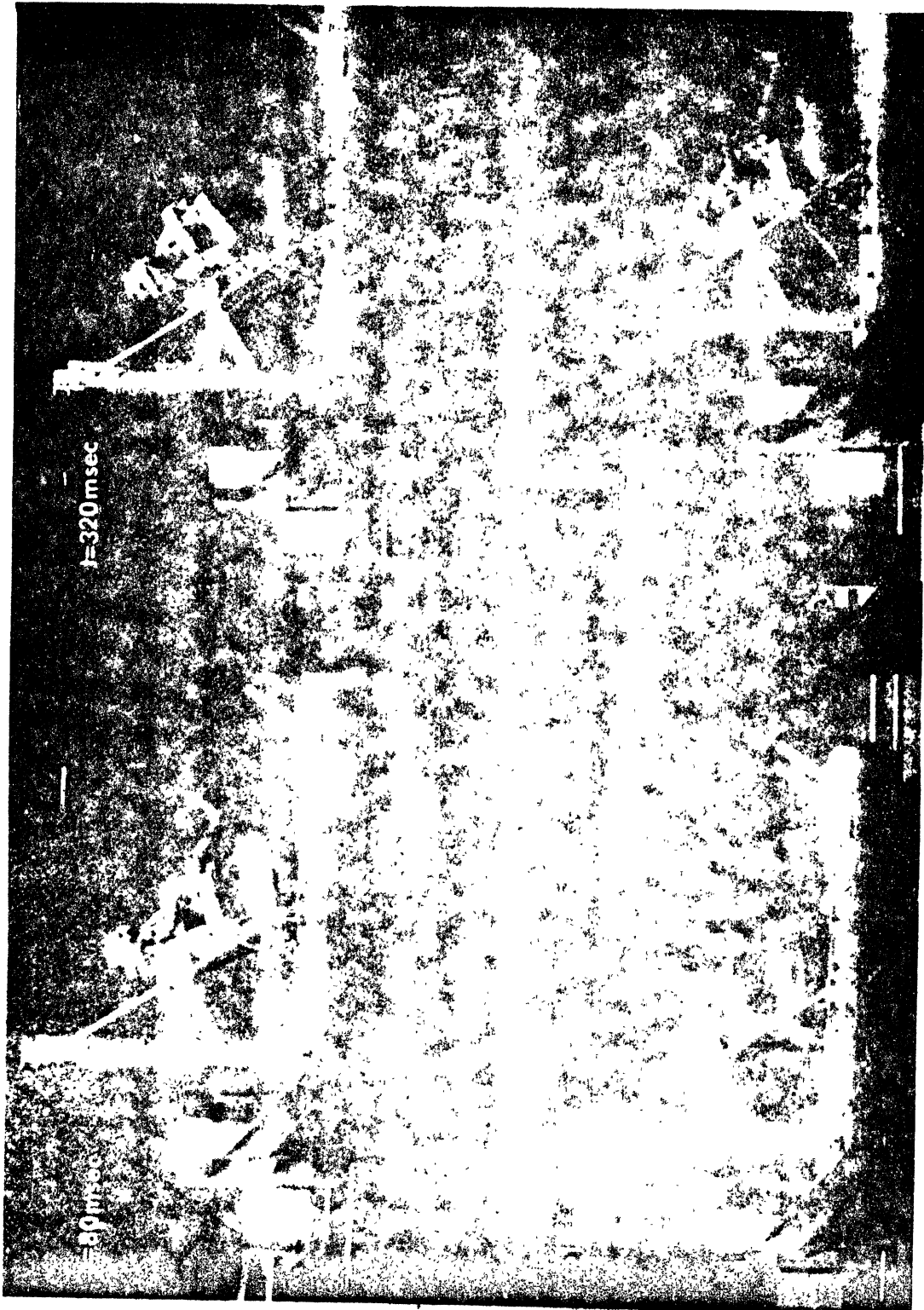
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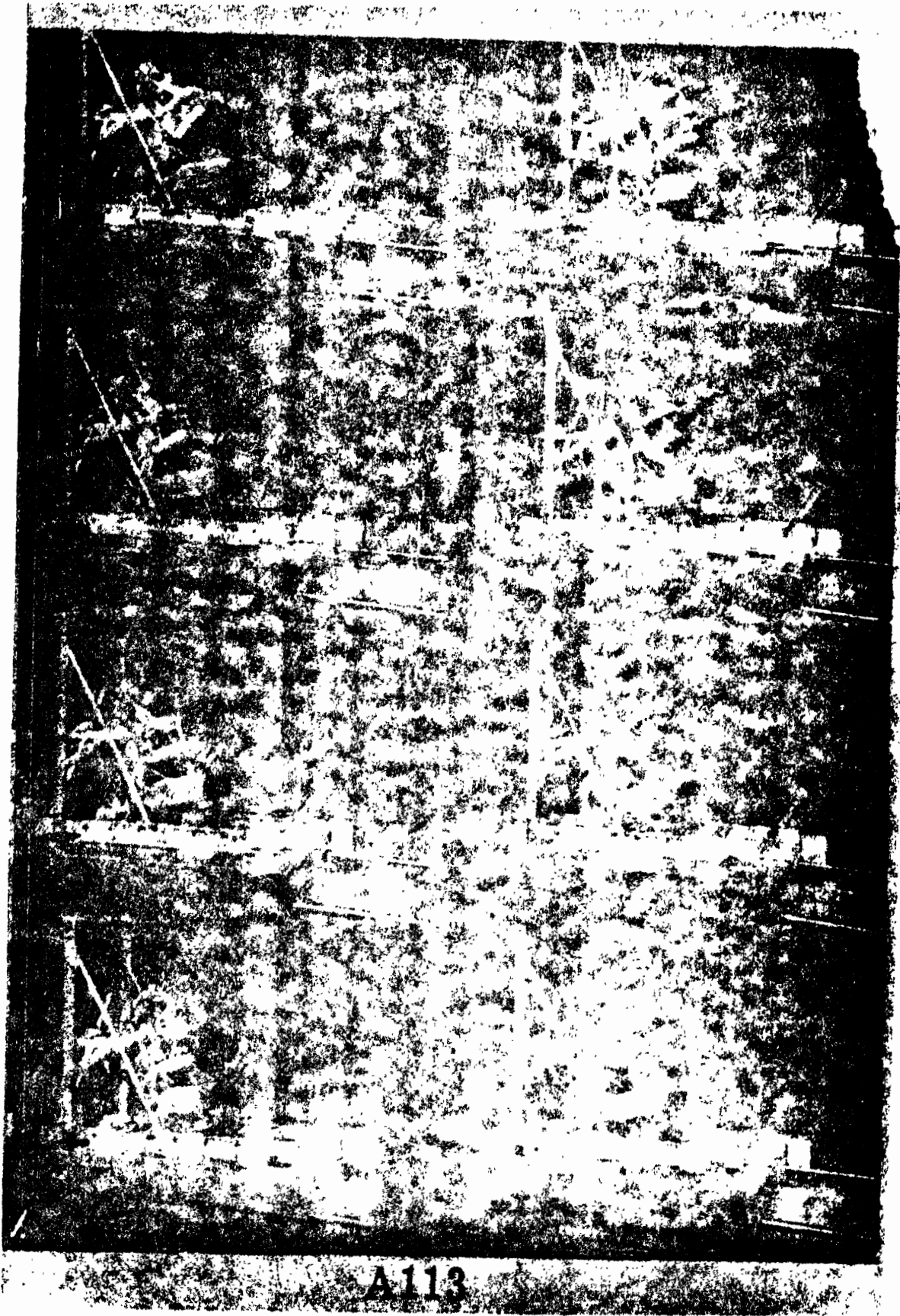
Test No: A-113
Test Date: 28 July 1969
Restraint Code No.: C-19
Restraint Description: Strolee Seat No. 589

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

Test Observation:

No extreme loadings were experienced by the dummy. However, some whiplash was evident as the dummy head interacted with the headrest structure of the Strolee seat bending it backwards.





NOT REPRODUCIBLE

Test A 113

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.

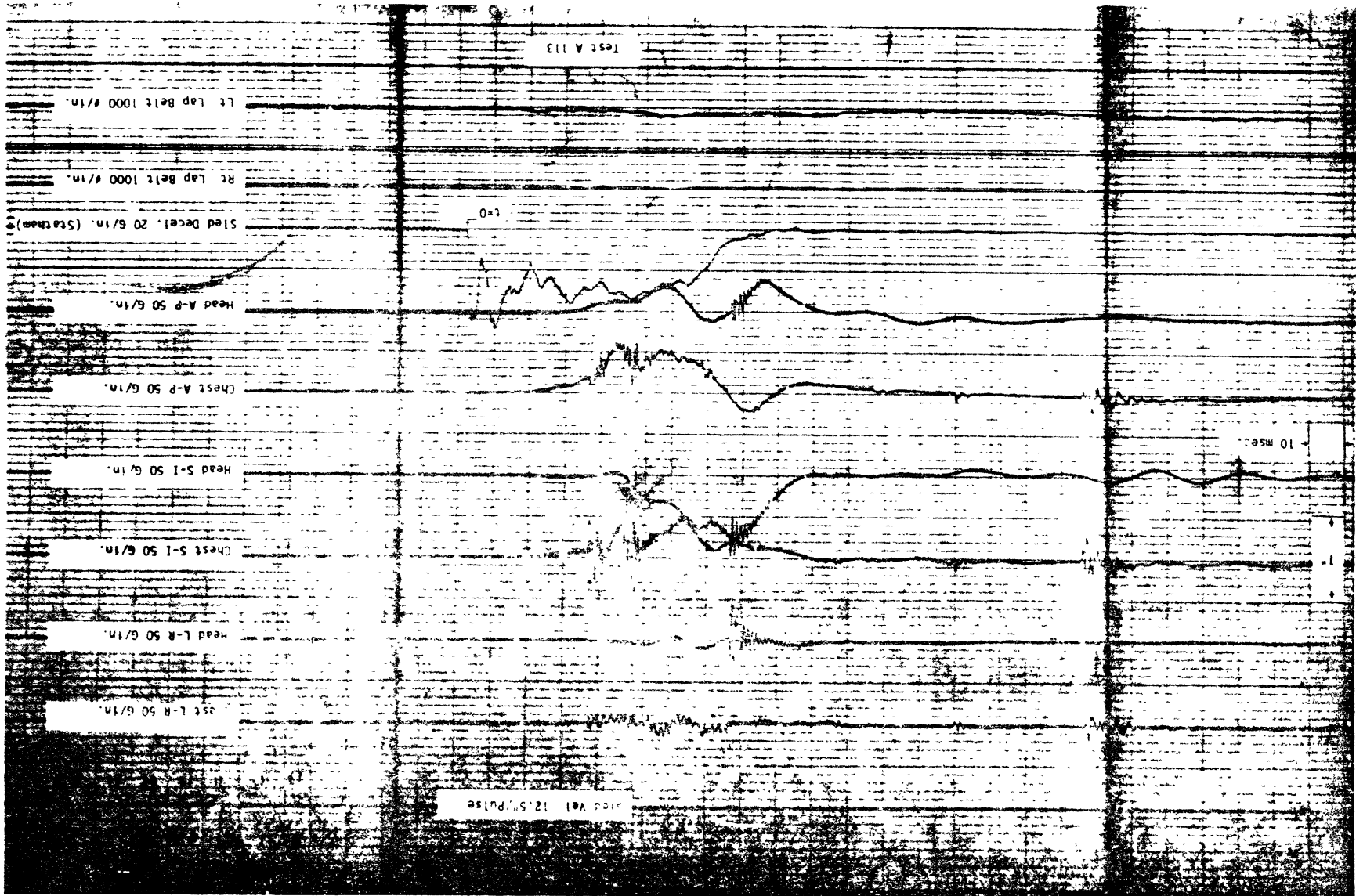
Chest S-I 50 g/in.

Head L-R 50 g/in.

Chest L-R 50 g/in.

HEAD 12.5/PULSE

10 msec



HSRI SUMMARY DATA SHEET (FH-11-6962)

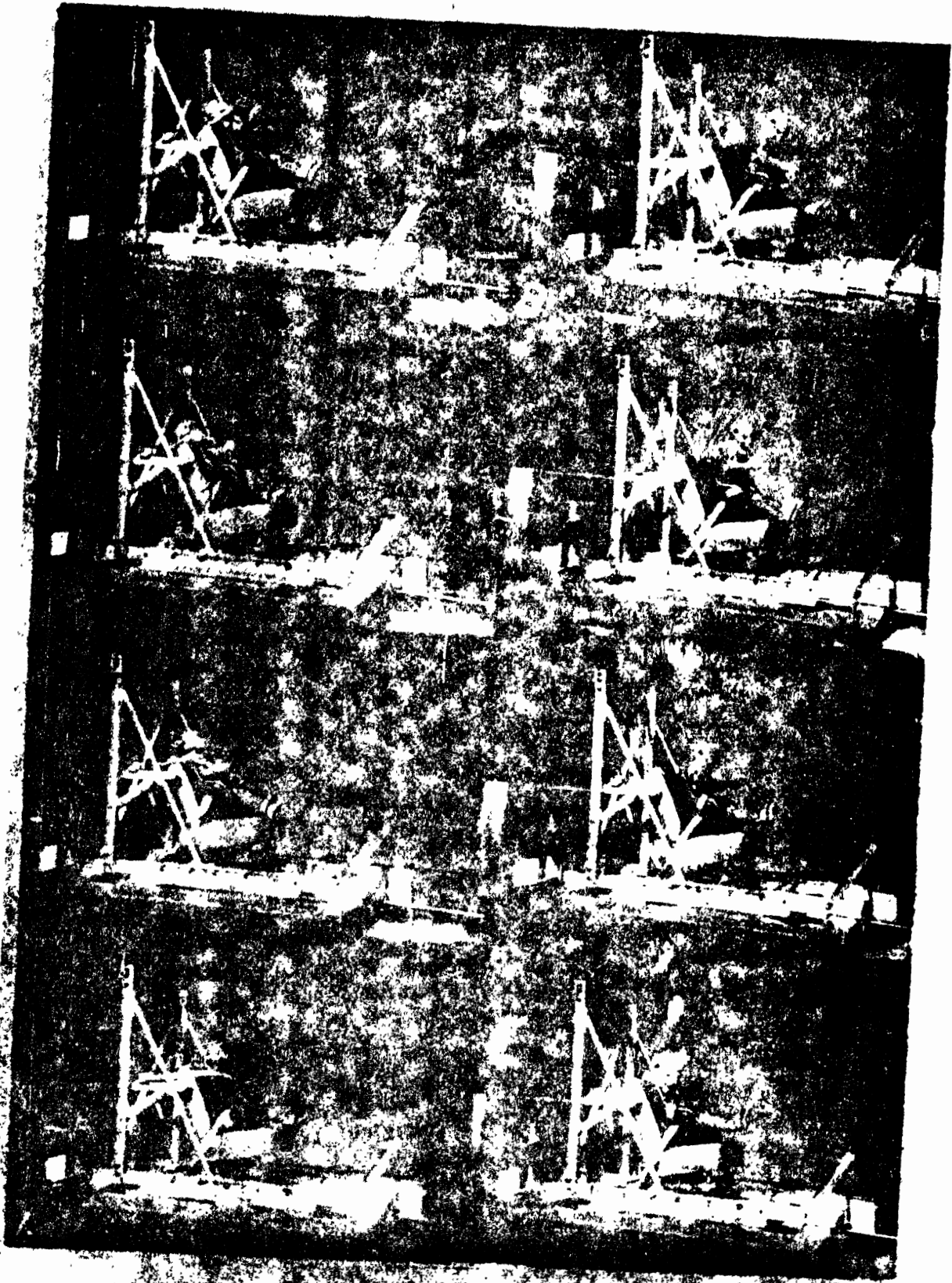
Test No: A-114
Test Date: 29 July 1969
Restraint Code No.: C-5
Restraint Description: Sears Seat No. 5515

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

Test Observation:

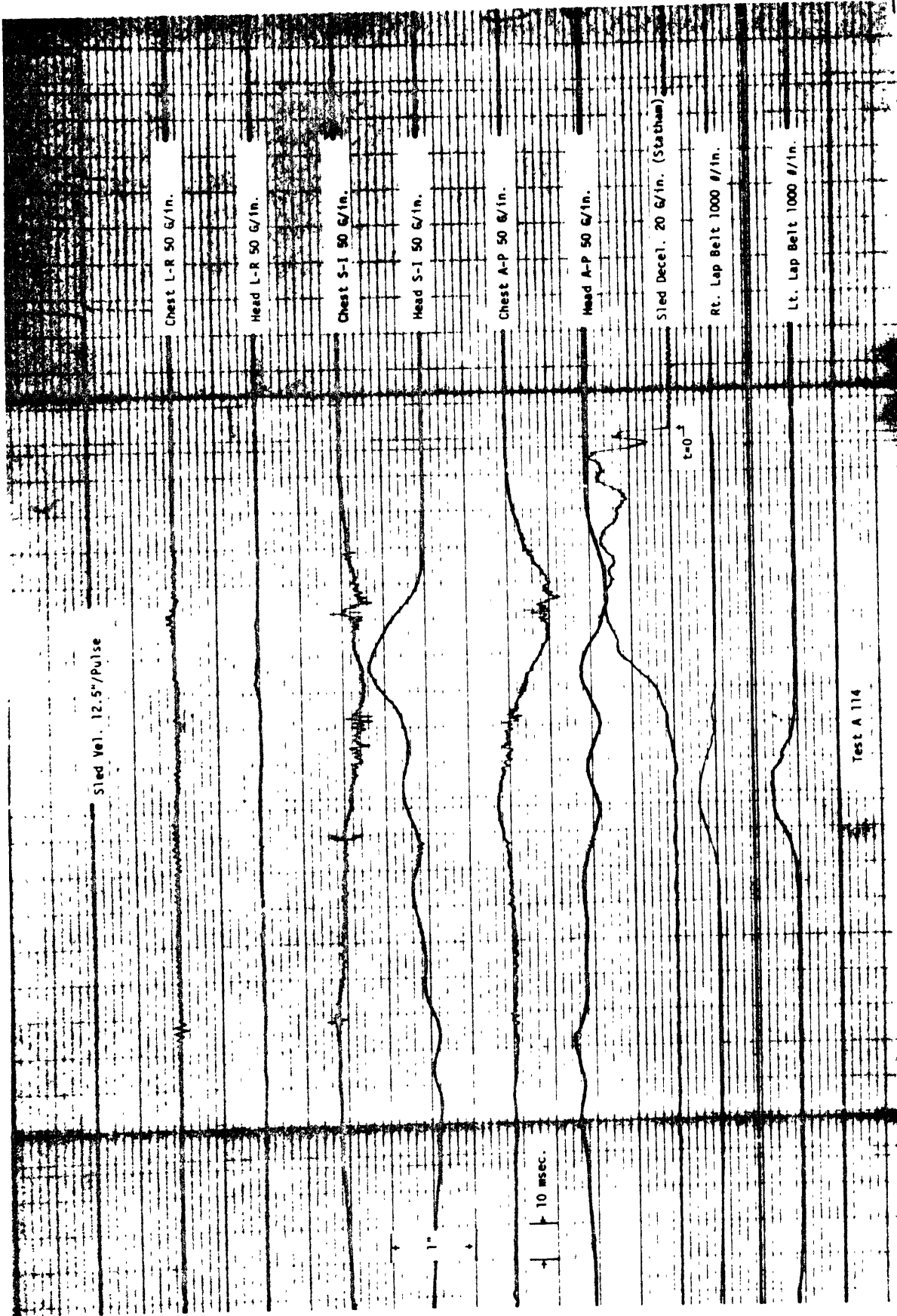
No severe loadings were experienced by the dummy. However, the dummy was seated high enough on this pedestal-type seat that whiplash was experienced as the head rotated backwards over the top of the adult seat which did not have a headrest.





A114

NOT REPRODUCIBLE



HSRI SUMMARY DATA SHEET (FH-11-6962)

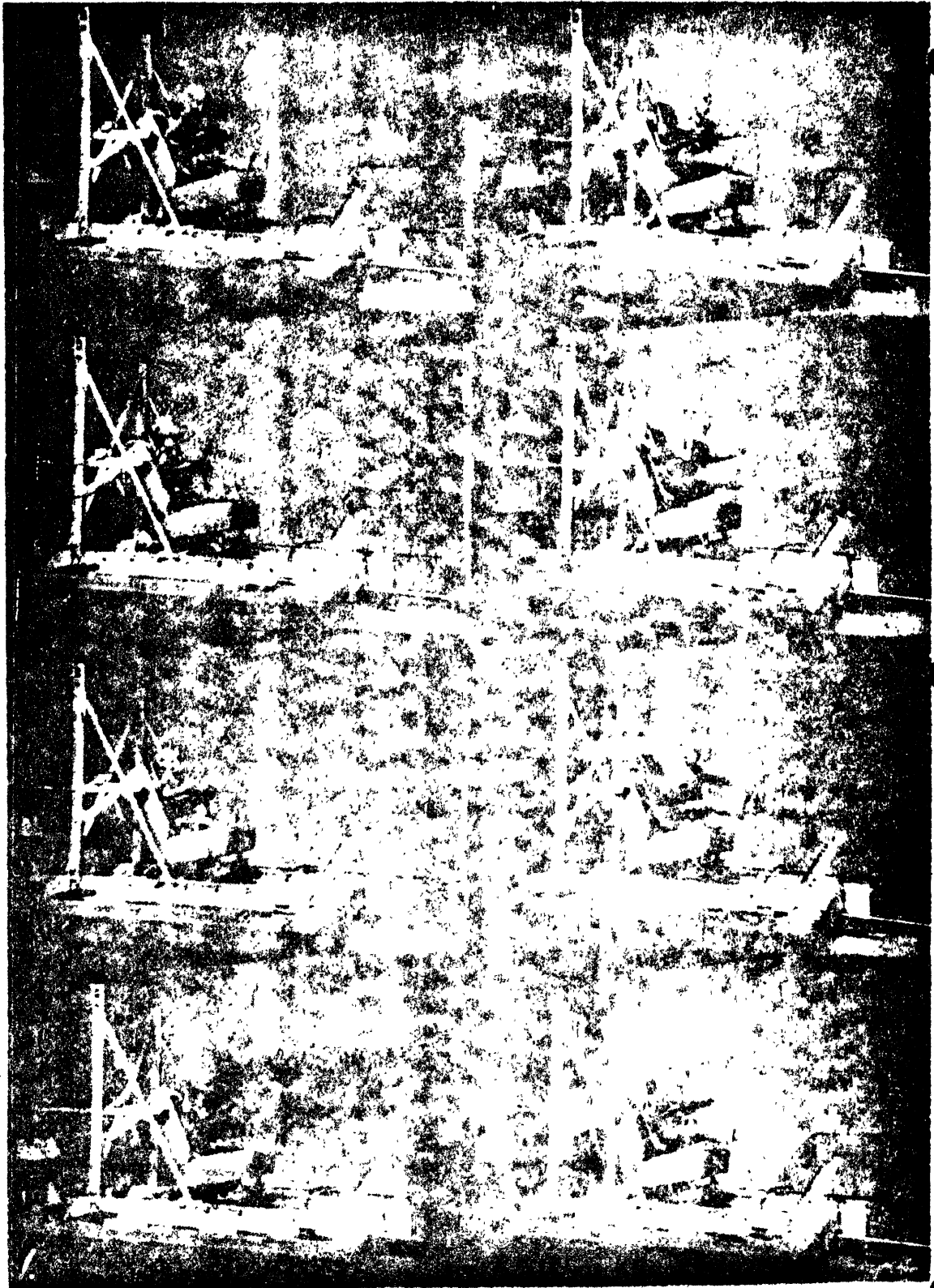
Test No: A-115
Test Date: 29 July 1969
Restraint Code No: C-13
Restraint Description: Peterson Swinger Seat, Model No. 60EC

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

Test Observation:

Head and chest loadings experienced by the dummy were fairly high. The bails bent somewhat and the masonite baseboard on the seat back was fractured by the impact on this child seat. The high seat back on this restraint system prevented any whiplash from occurring.





A115



Test A 1115

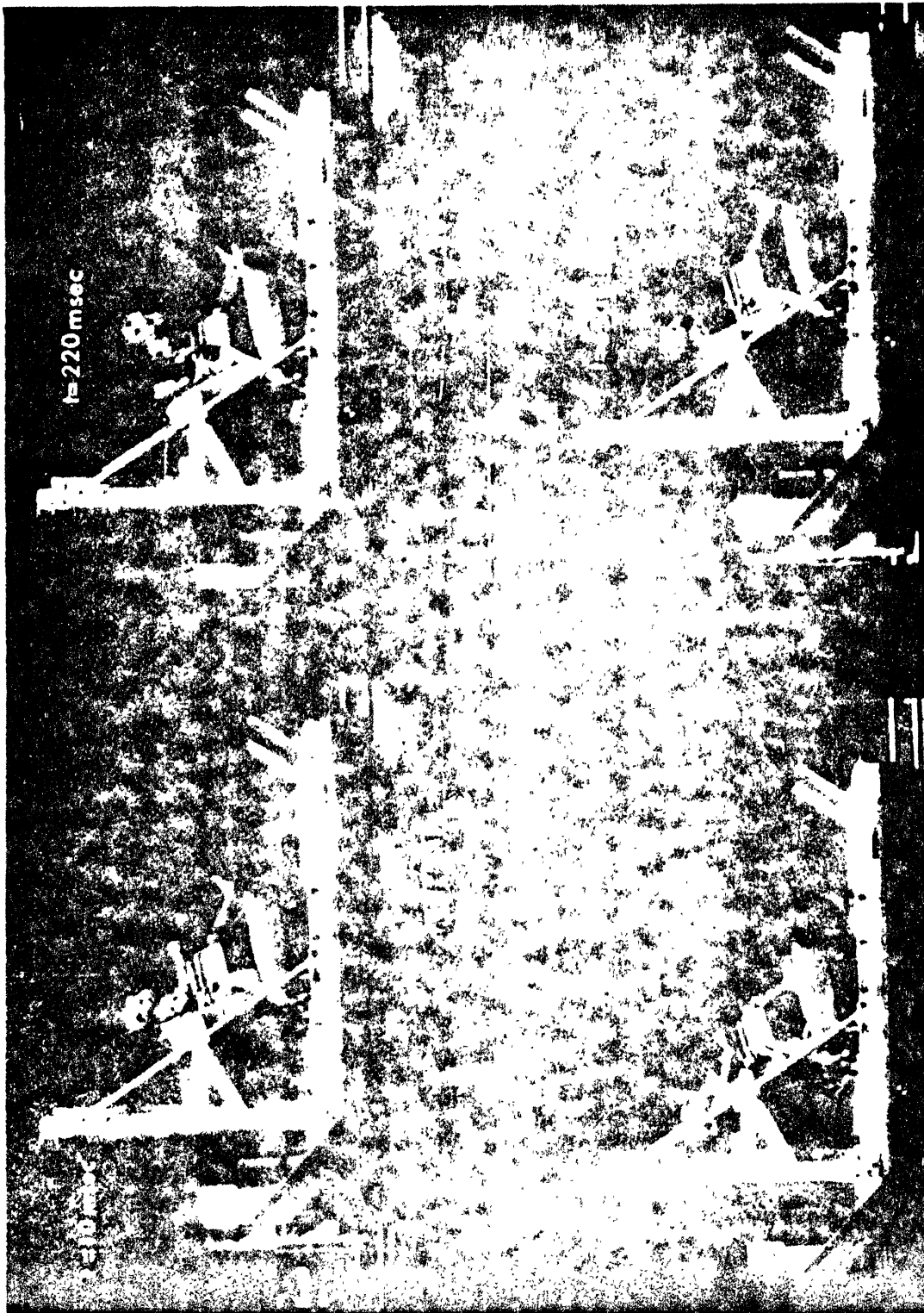
HSRI SUMMARY DATA SHEET (FH-11-6962)

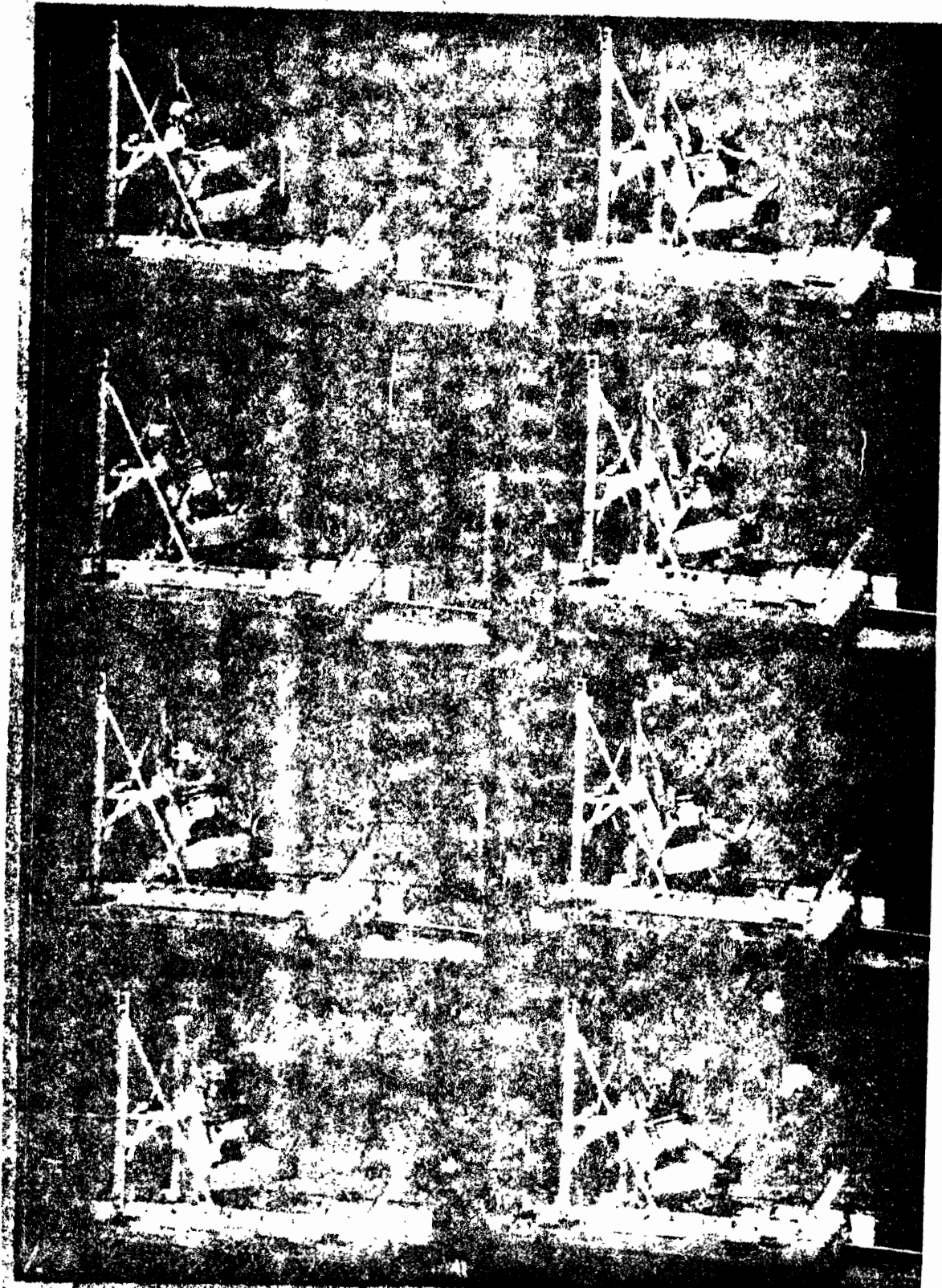
Test No: A-116
Test Date: 29 July 1969
Restraint Code No.: C-14
Restraint Description: International Seat No. 4613

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

Test Observation:

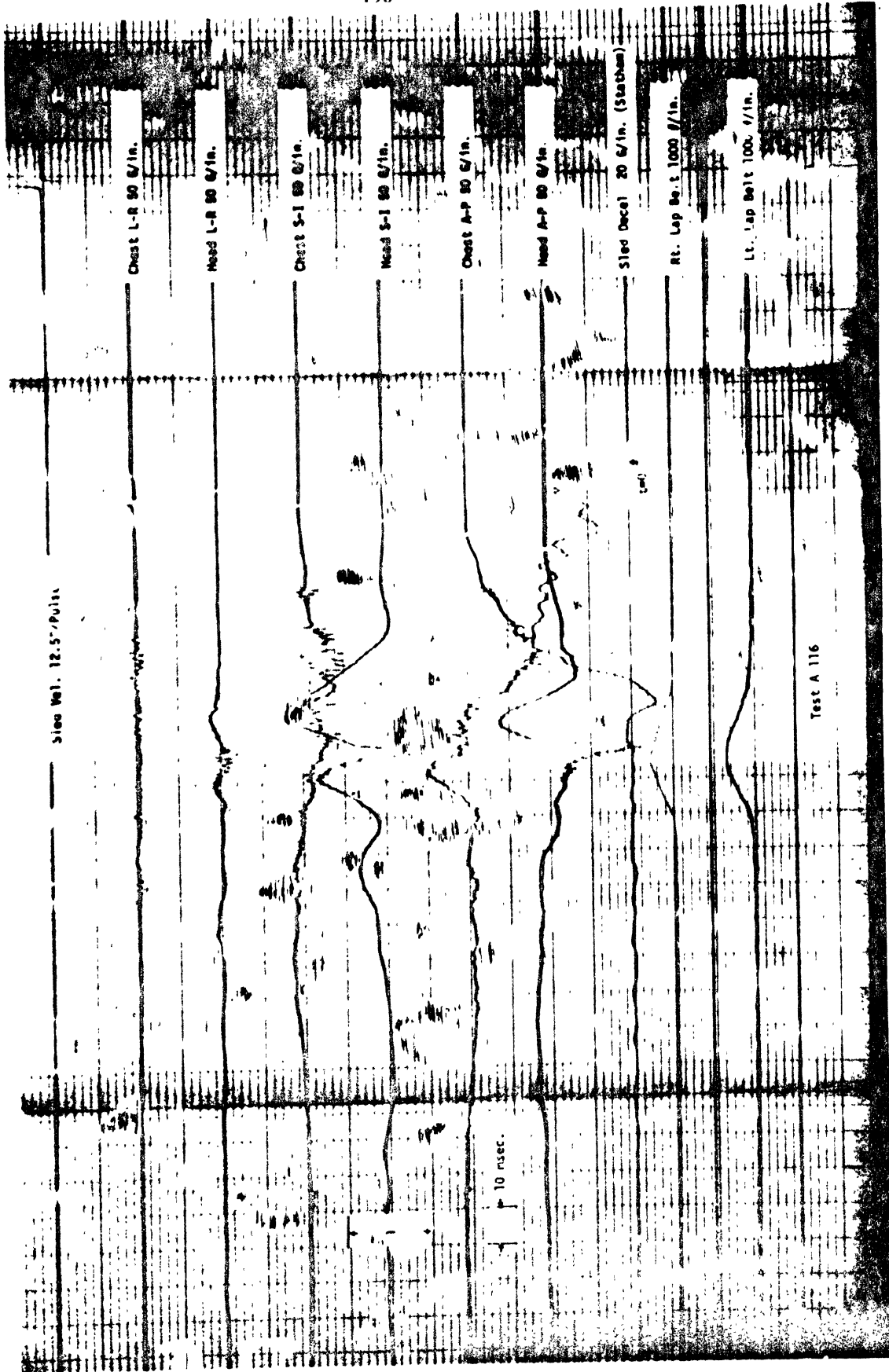
Dummy experienced high anterior-posterior head and chest accelerations. Due to the lack of a headrest on either the child restraint system or on the adult seat, the dummy experienced whiplash.





A116

NOT REPRODUCIBLE



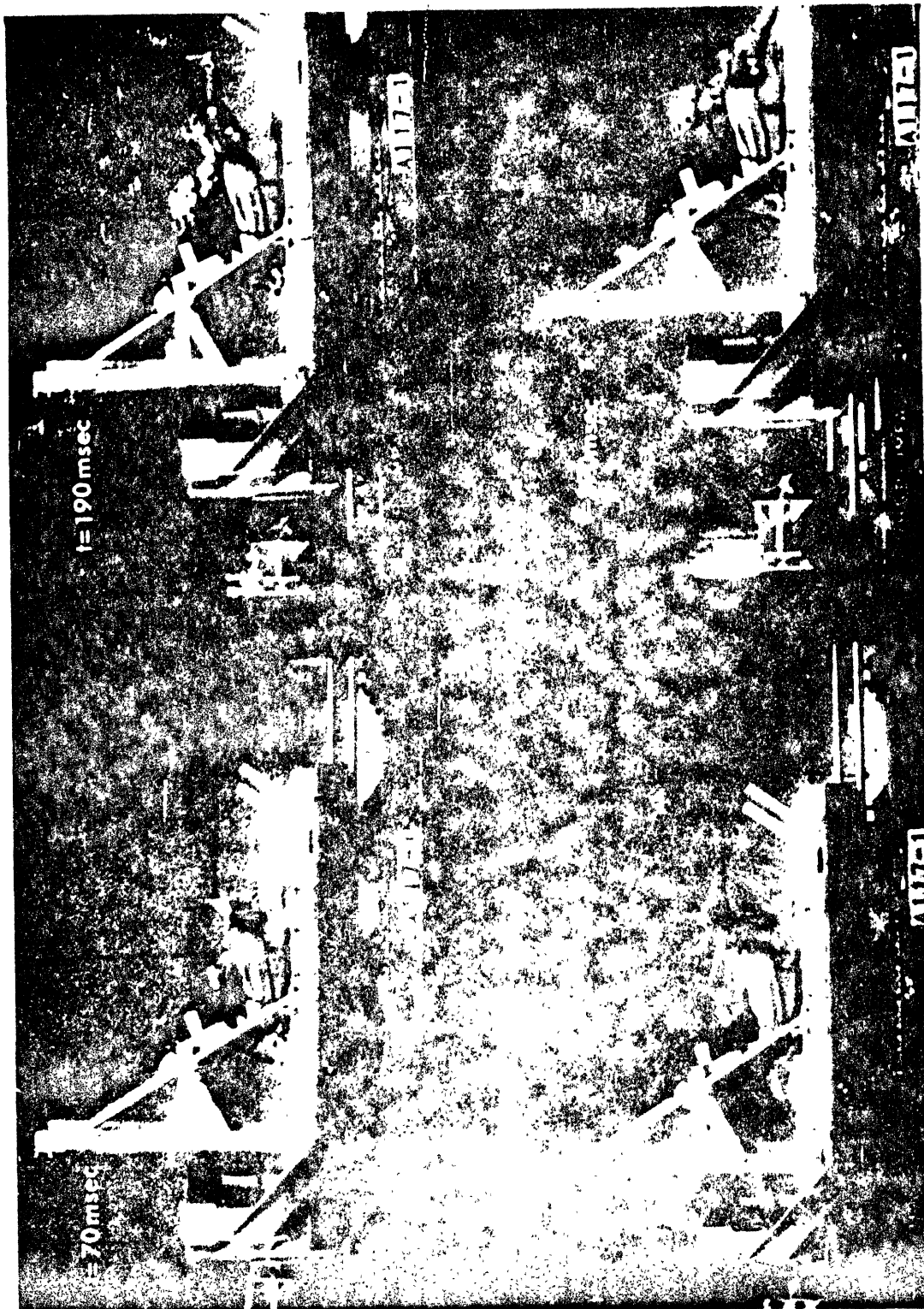
NSRI SUMMARY DATA SHEET (FH-11-0962)

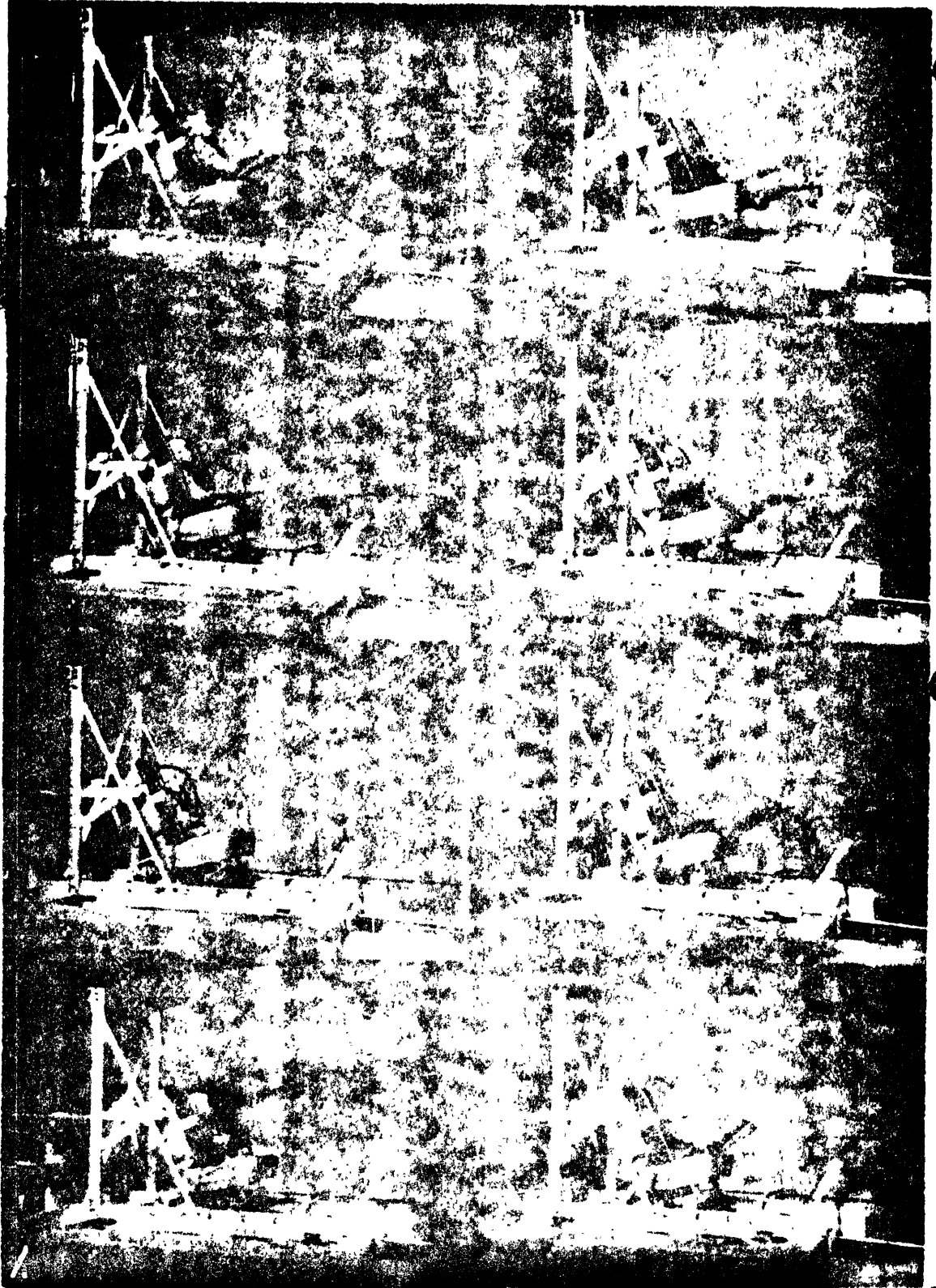
Test No: A-117
Test Date: 30 July 1960
Restraint Code No.: C-23
Restraint Description: Volvo Child Safety Seat

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

Test Observation:

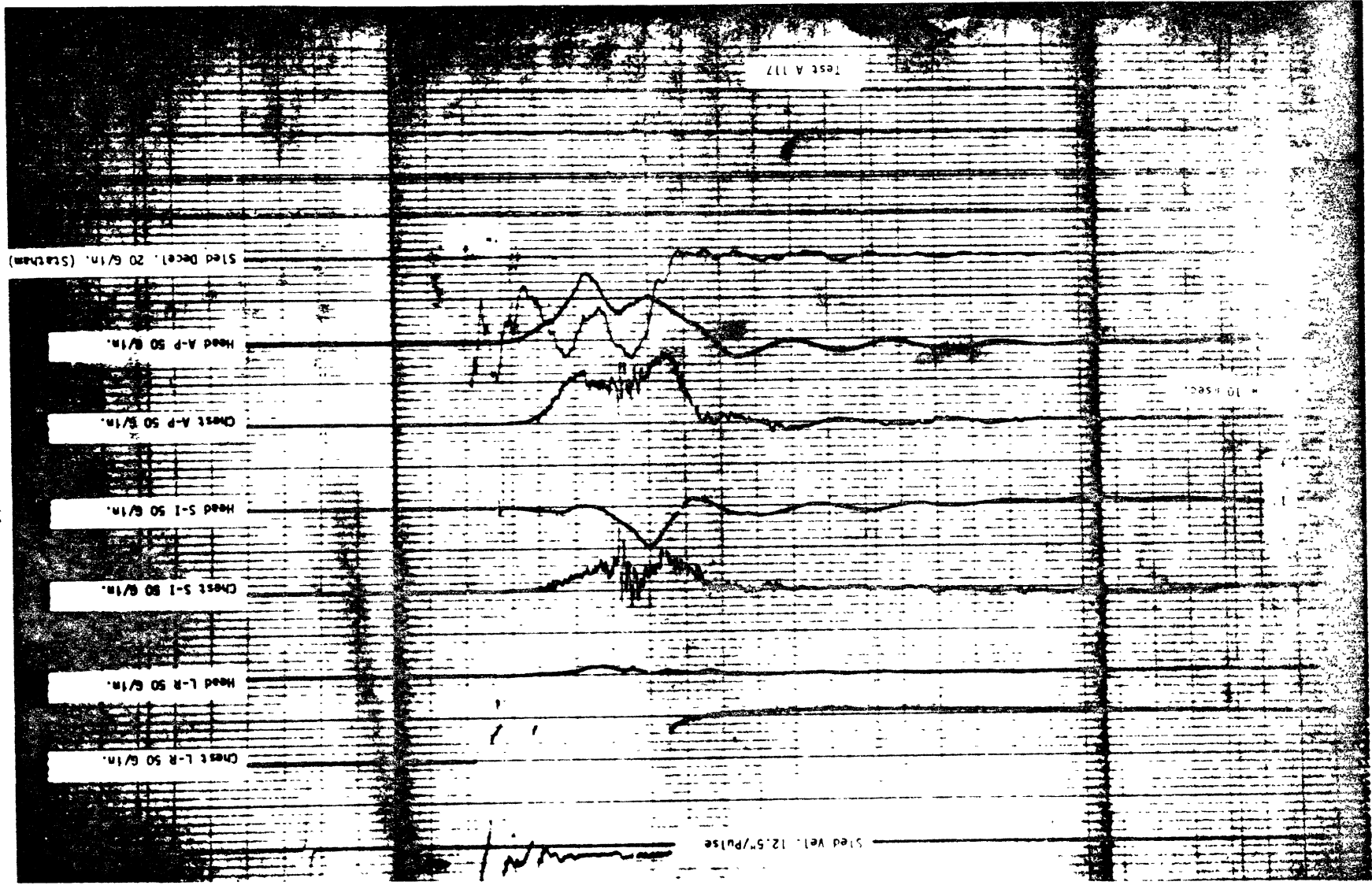
Chest and head g-loadings on the dummy were moderate. There were no gross relative motions between the various body parts. However, on the rebound the lap belt buckle which is integral with the restraint system did not hold. When the dummy rebounded from the seat, these buckles failed and the dummy was catapulted forward out of the adult seat onto the floor of the sled.





A117

Test A 117



661

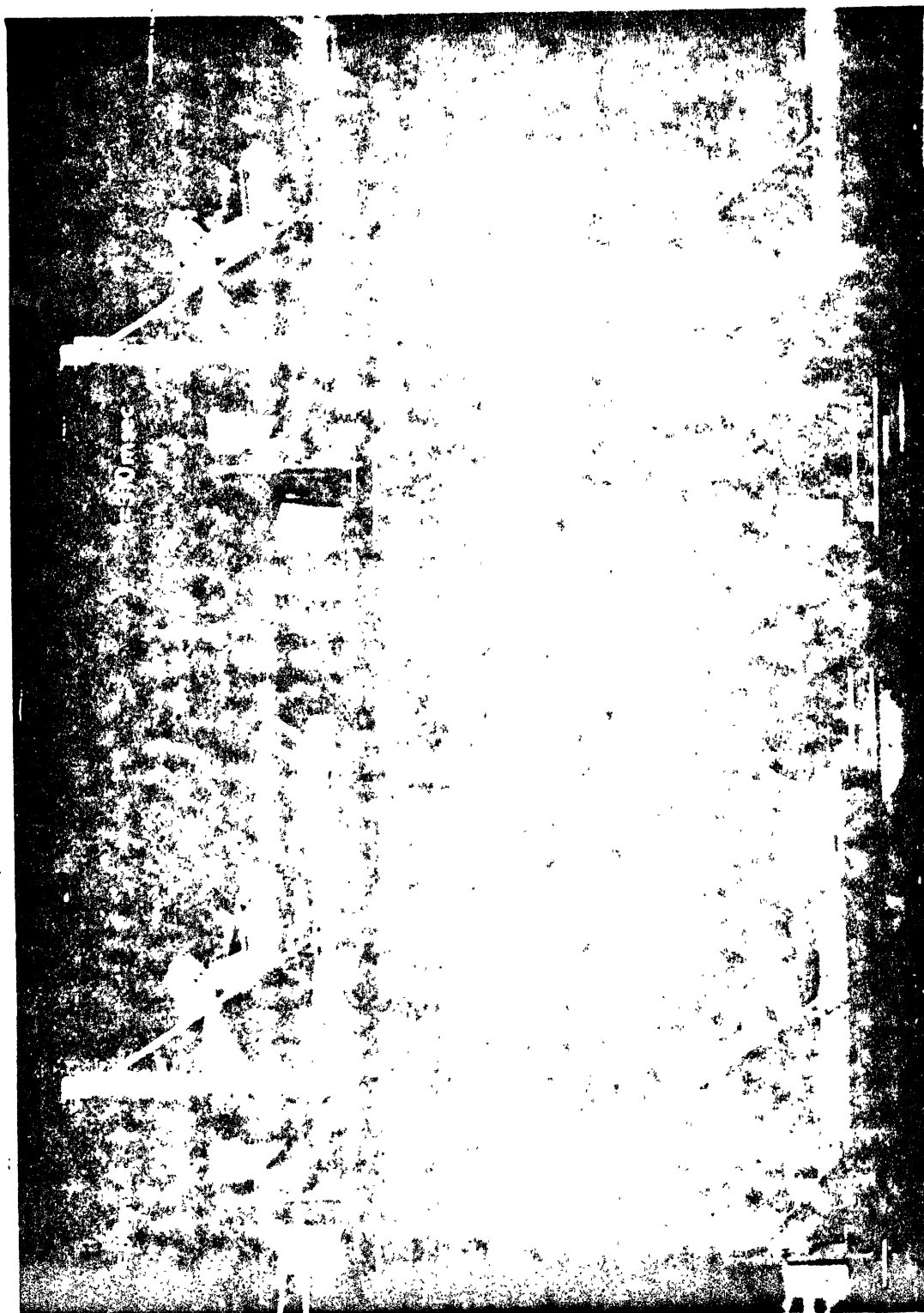
HSRI SUMMARY DATA SHEET (FH-11-6962)

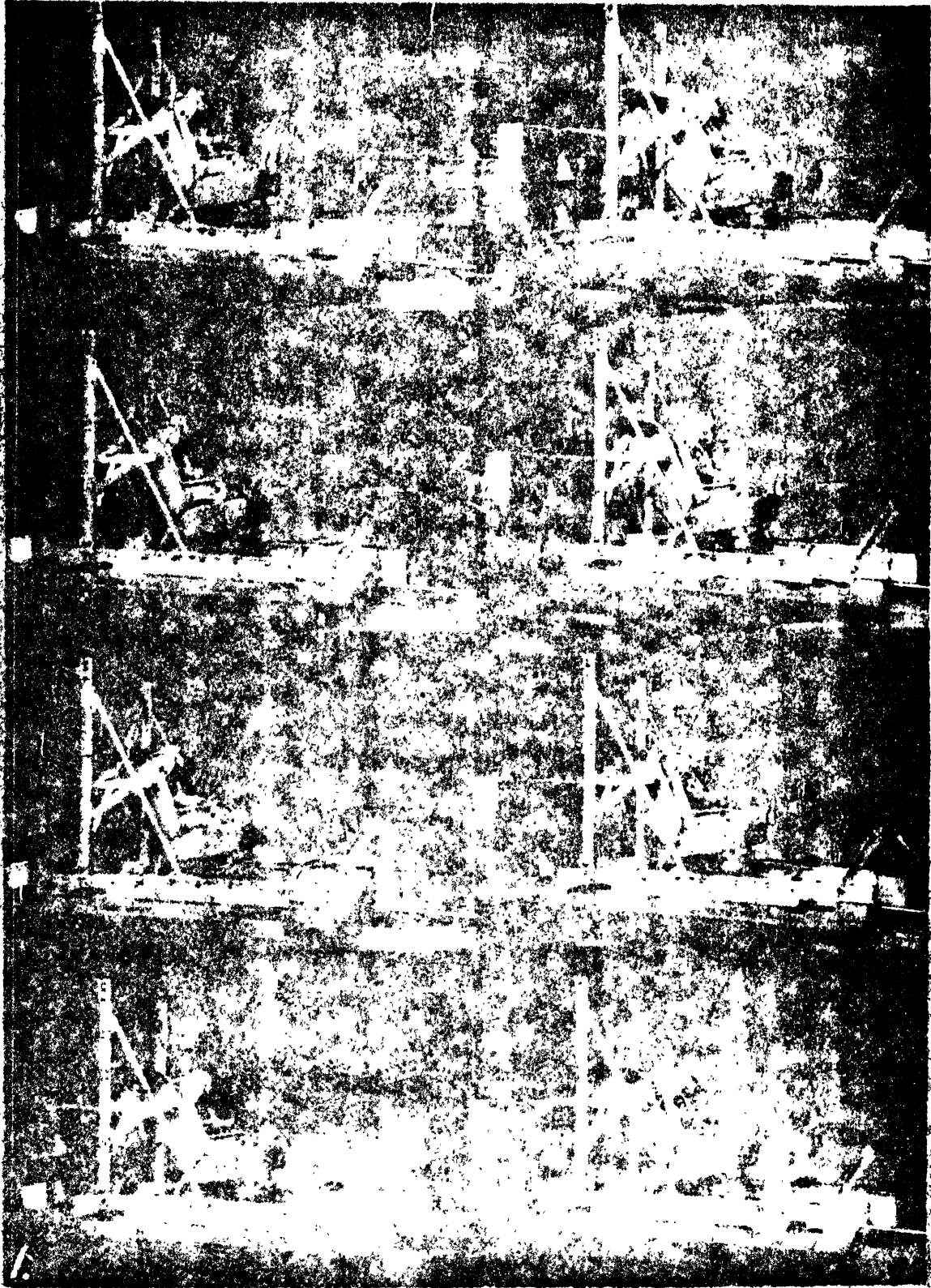
Test No: A-118
Test Date: 30 July 1969
Restraint Code No.: C-16
Restraint Description: Klippan Safety Seat

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

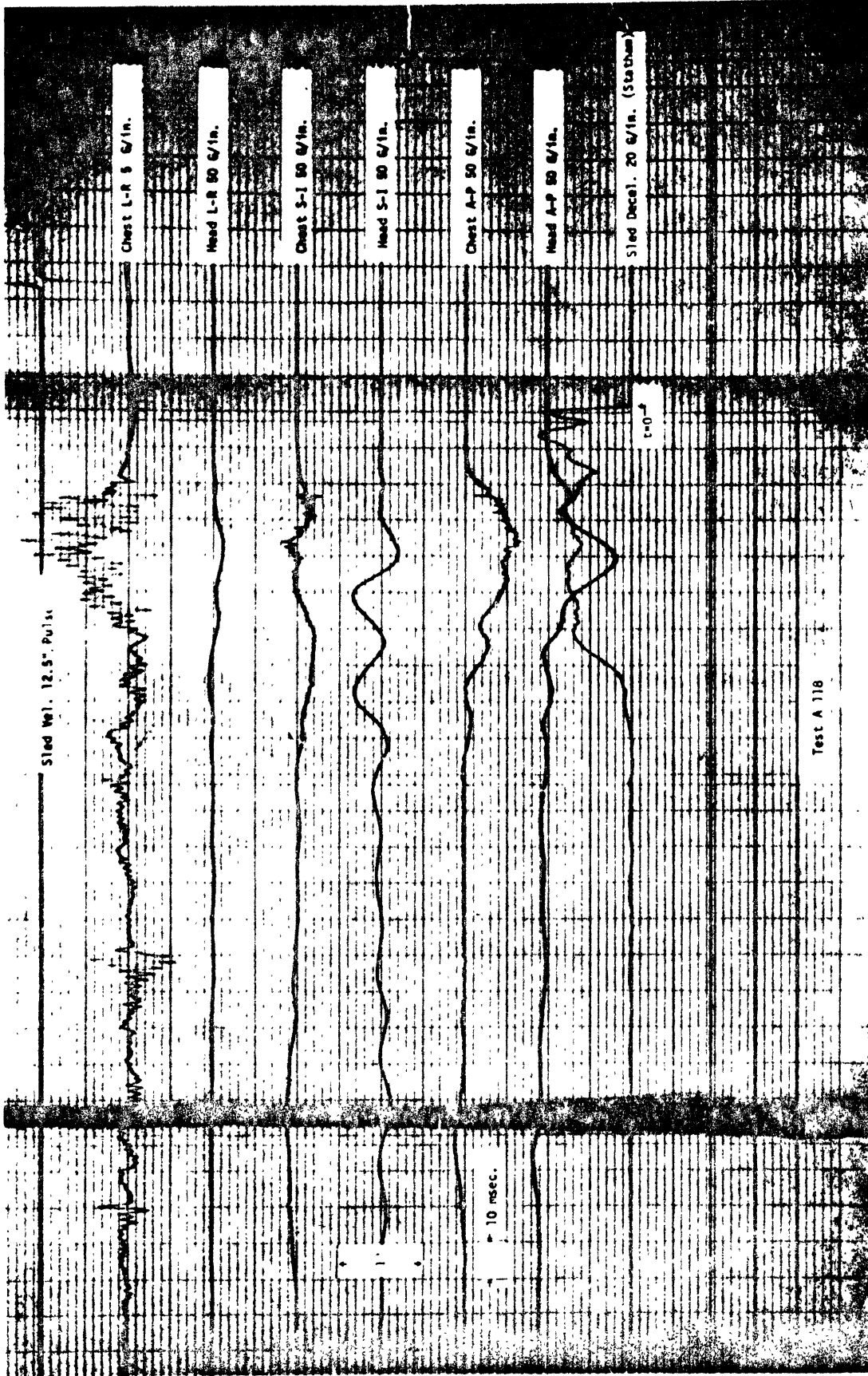
Test Observation:

Decelerations and loadings experienced by the dummy were quite mild. Because of the high seat back on the Klippan seat, no gross relative motions between body parts were recorded.





A118



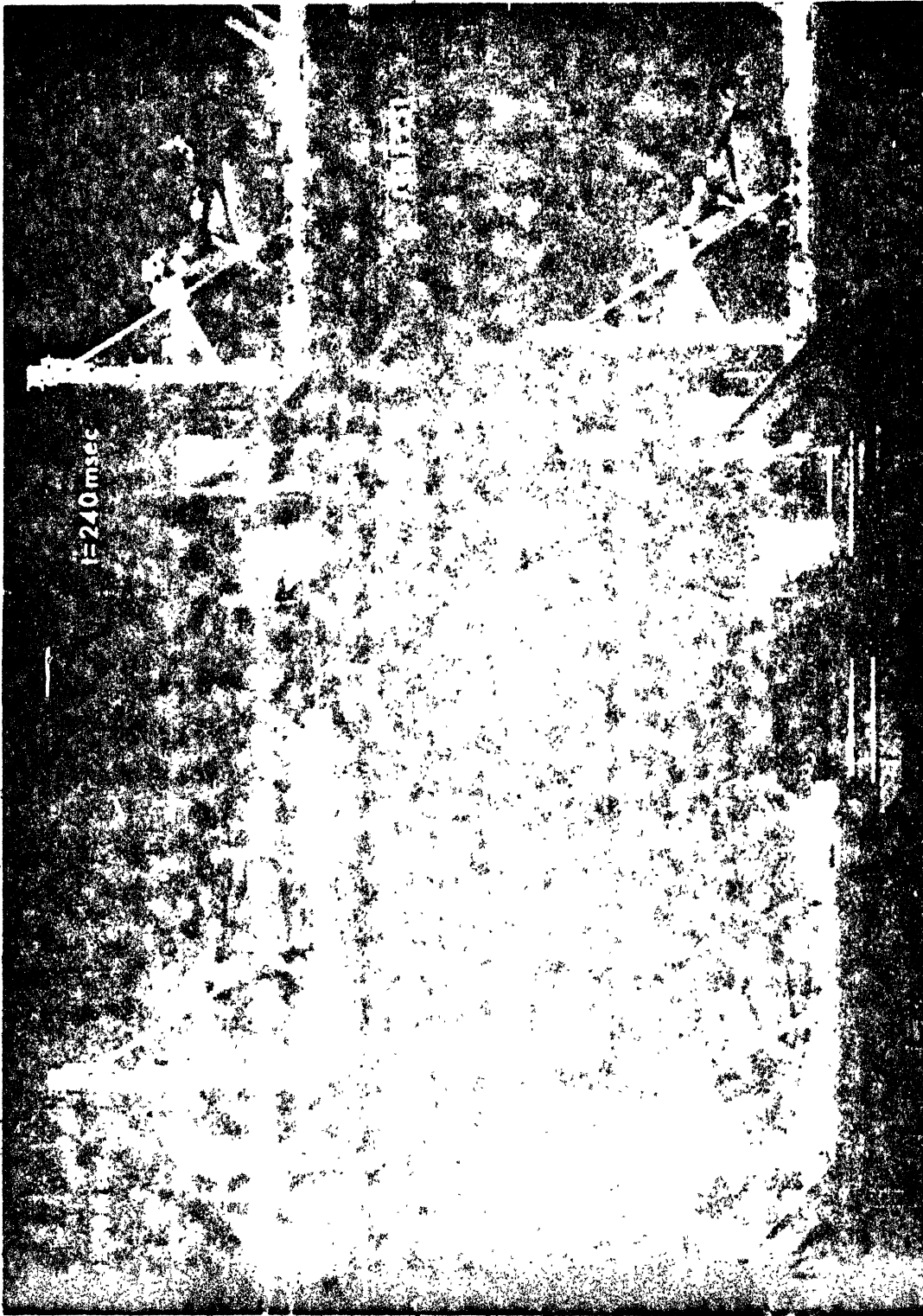
HSRI SUMMARY DATA SHEET (FH-11-6962)

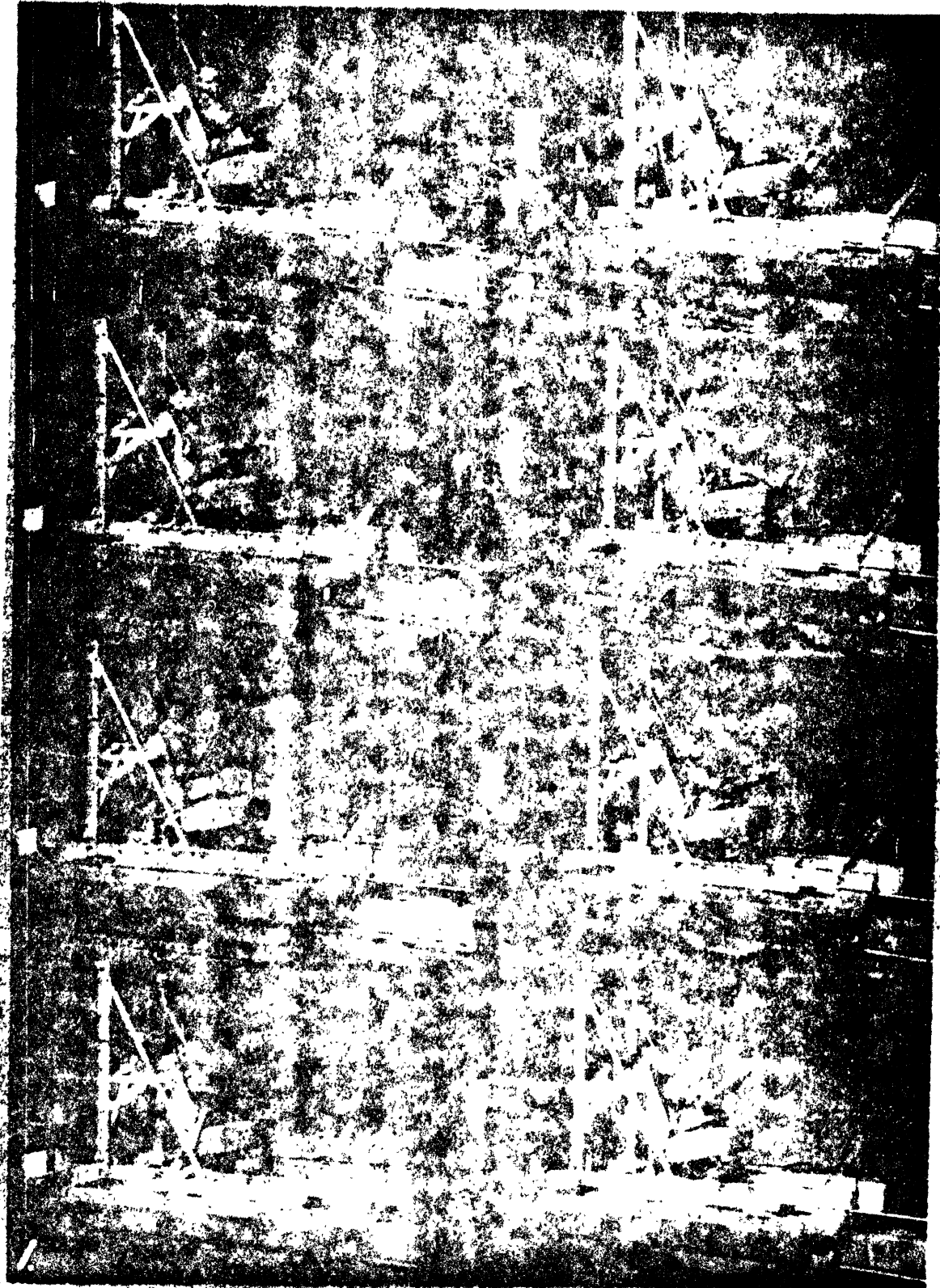
Test No: A-119
Test Date: 31 July 1969
Restraint Code No.: C-28
Restraint Description: Kelly Kiddy Kaddy

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

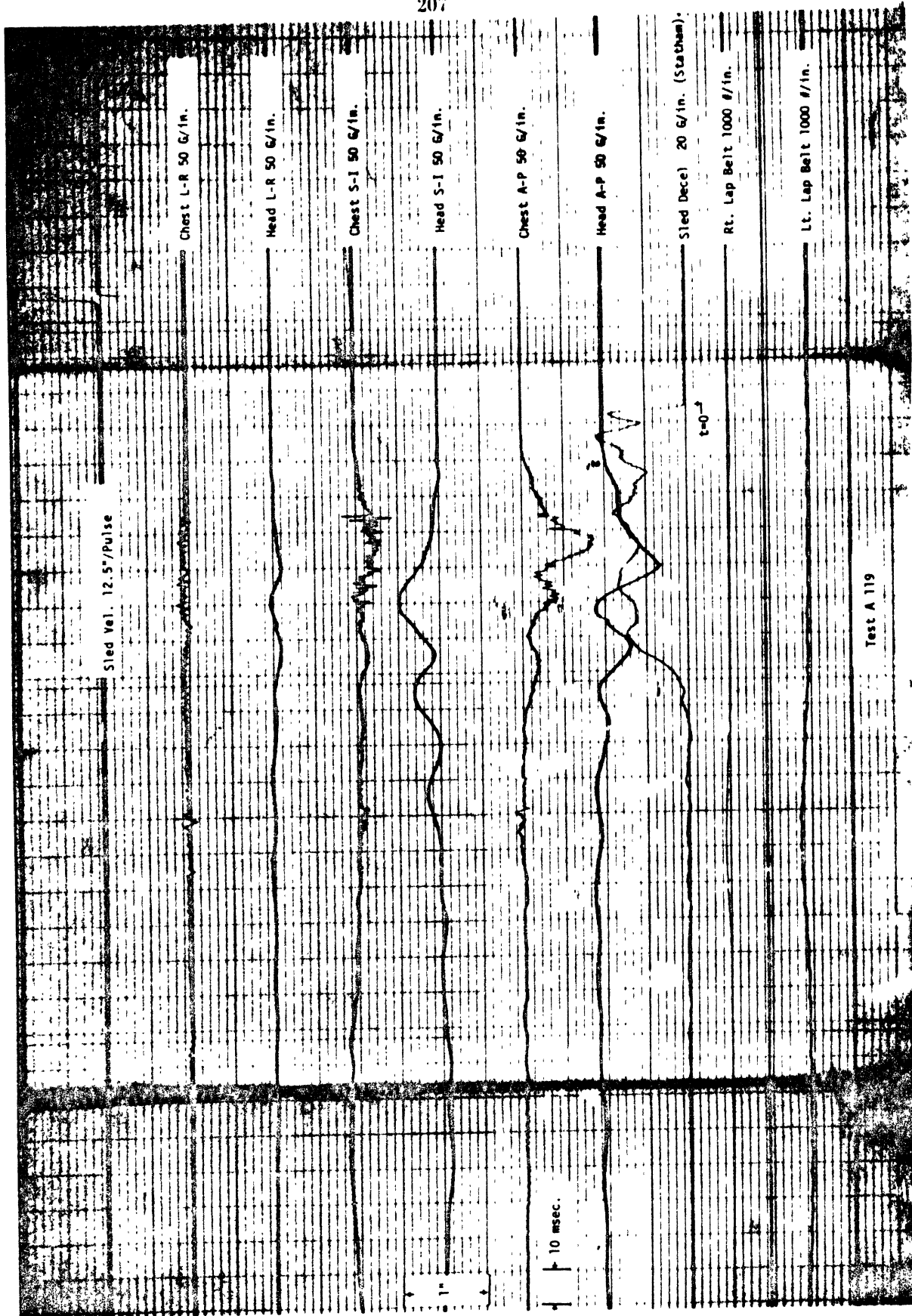
Test Observation:

The loadings and accelerations experienced by the dummy were quite mild. Although this is a booster seat, the child's head received protection against whiplash from the rear of the adult seat. The height of the seat back is a critical factor in the prevention of whiplash.





A119



ADULT SEATBELT DATA SHEET (FM-11-6962)

Test No: A-100
Test Date: 20 July 1960
Restraint Code No: C-31
Restraint Description: Sears Auto Harness, small

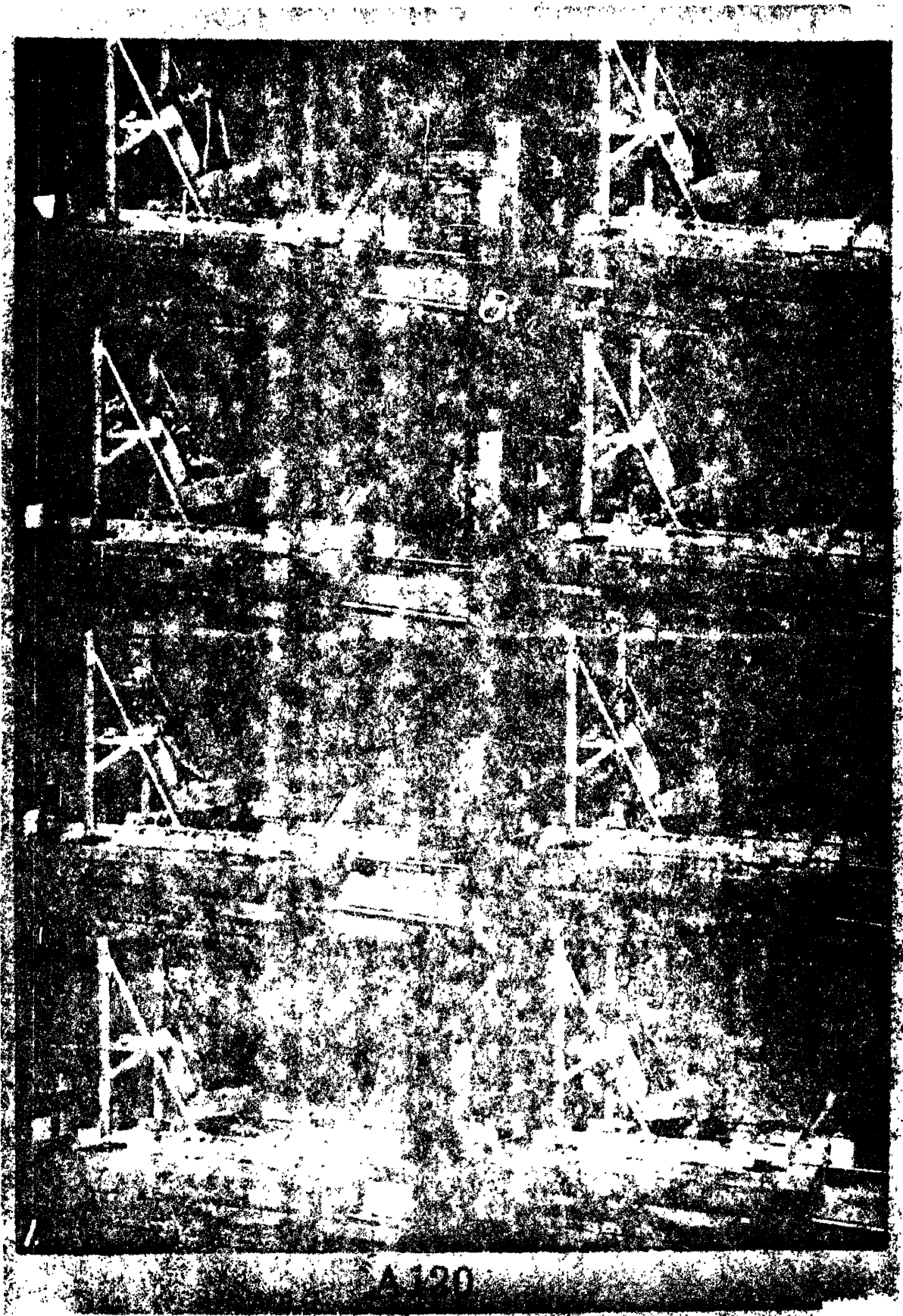
Dummy: 3 year
Sled Velocity: 20 mph
Sled G-level: 10
Impact Direction: Rear-end
Dummy Attitude: Standing

Test Observation:

Because of the high center of gravity of the dummy standing on the seat, it was pitched backwards over the adult seat back and ended up hanging by the straps of the child harness. This restraint system offered no protection whatsoever in this impact situation.



NOT REPRODUCIBLE



A 120

Test A 120

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.

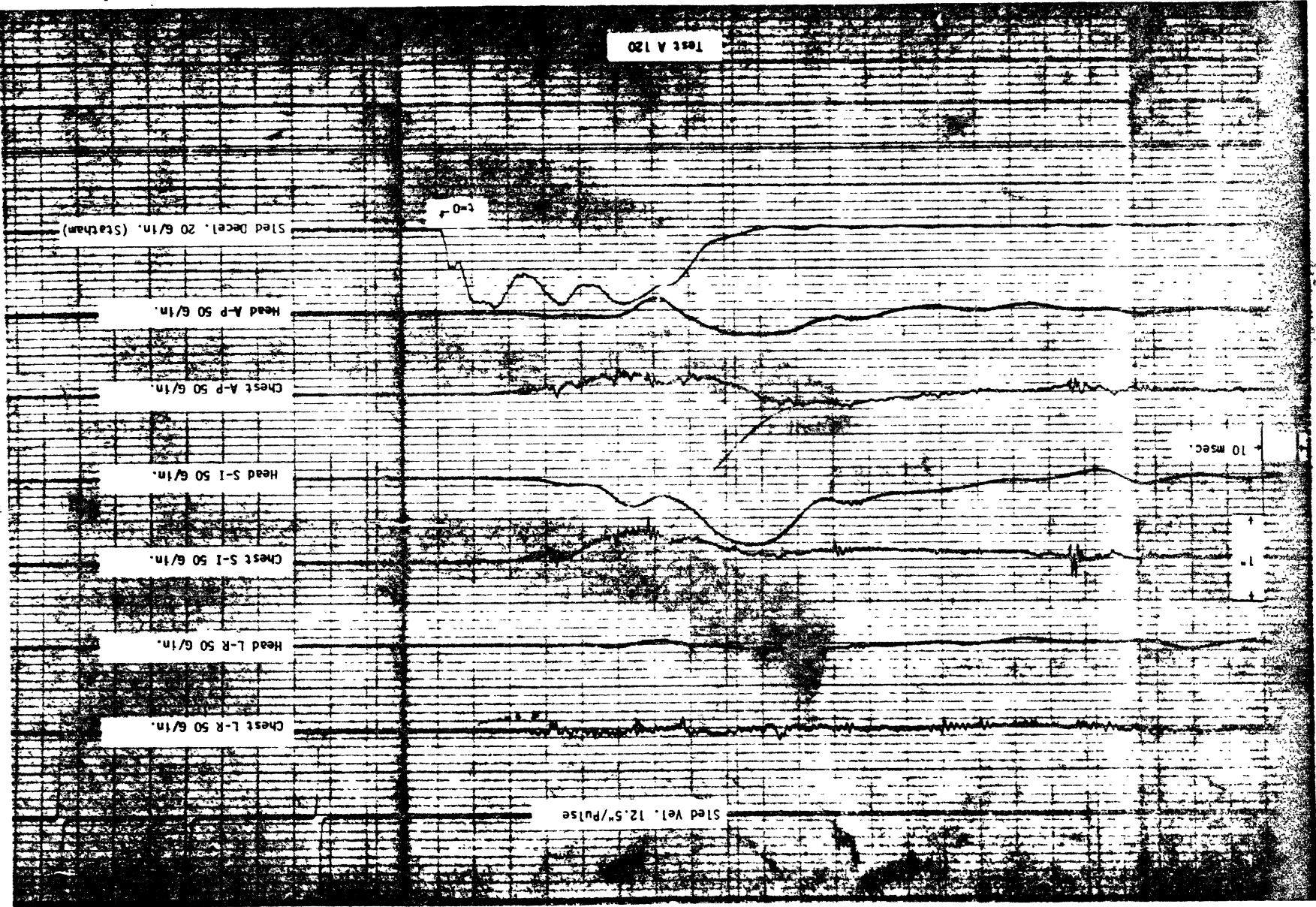
Head L-R 50 G/in.

Chest L-R 50 G/in.

Sted Vel. 12.5"/Pulse

10 msec.

211



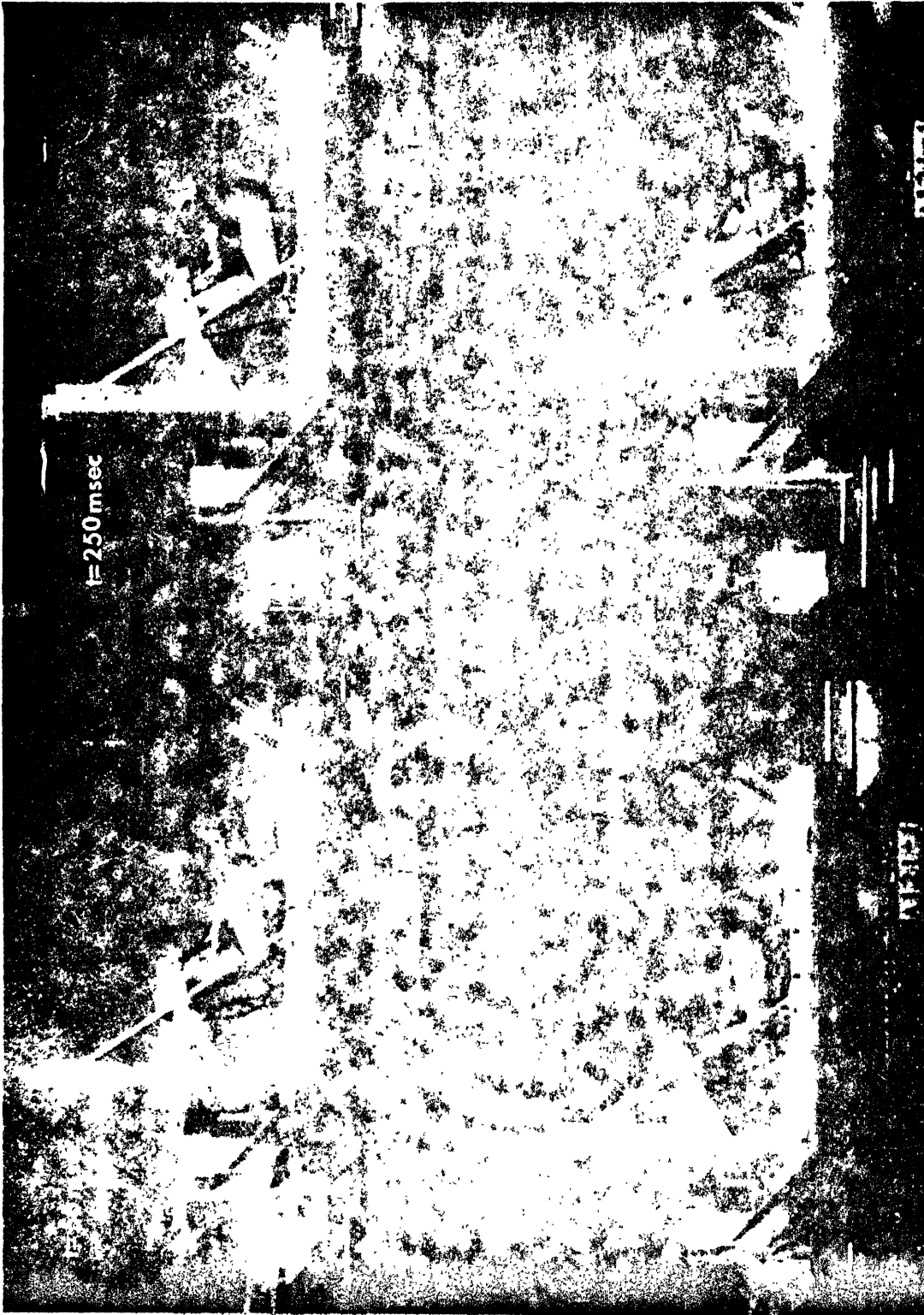
HSRI SUMMARY DATA SHEET (FH-11-6962)

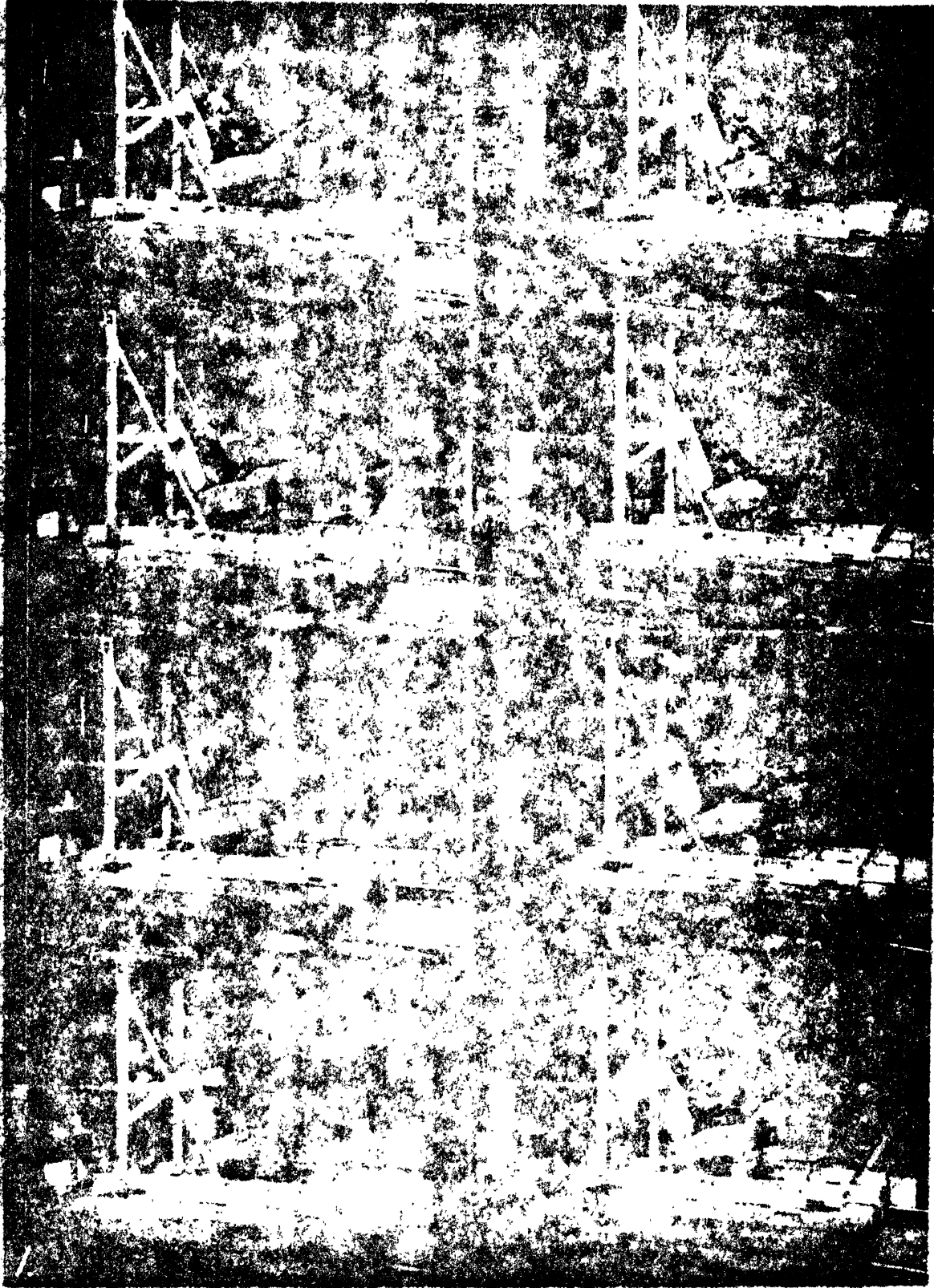
Test No: A-121
Test Date: 1 August 1969
Restraint Code No.: C-31
Restraint Description: Sears Auto Harness, small

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

Test Observation:

The dummy received a very gentle ride. No gross loadings or motions were observed.





A121

Test A 121

Sted Decel. 20 G/in. (Station)

Head A-P 50 G/in.

Chest A-P 50 G/in.

Head S-I 50 G/in.

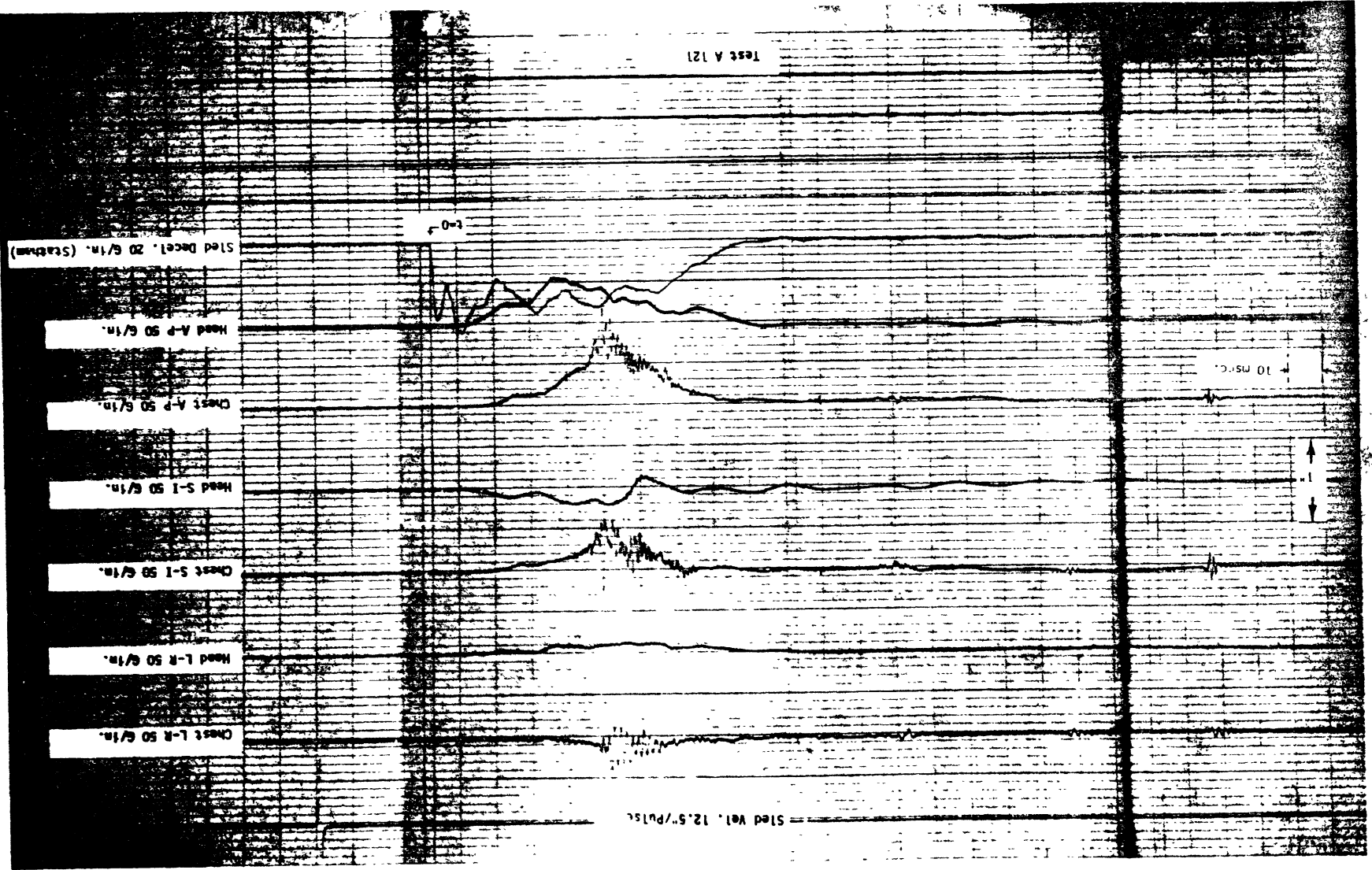
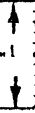
Chest S-I 50 G/in.

Head L-R 50 G/in.

Chest L-R 50 G/in.

Sted Vel. 12.5"/Pulse

10 msec



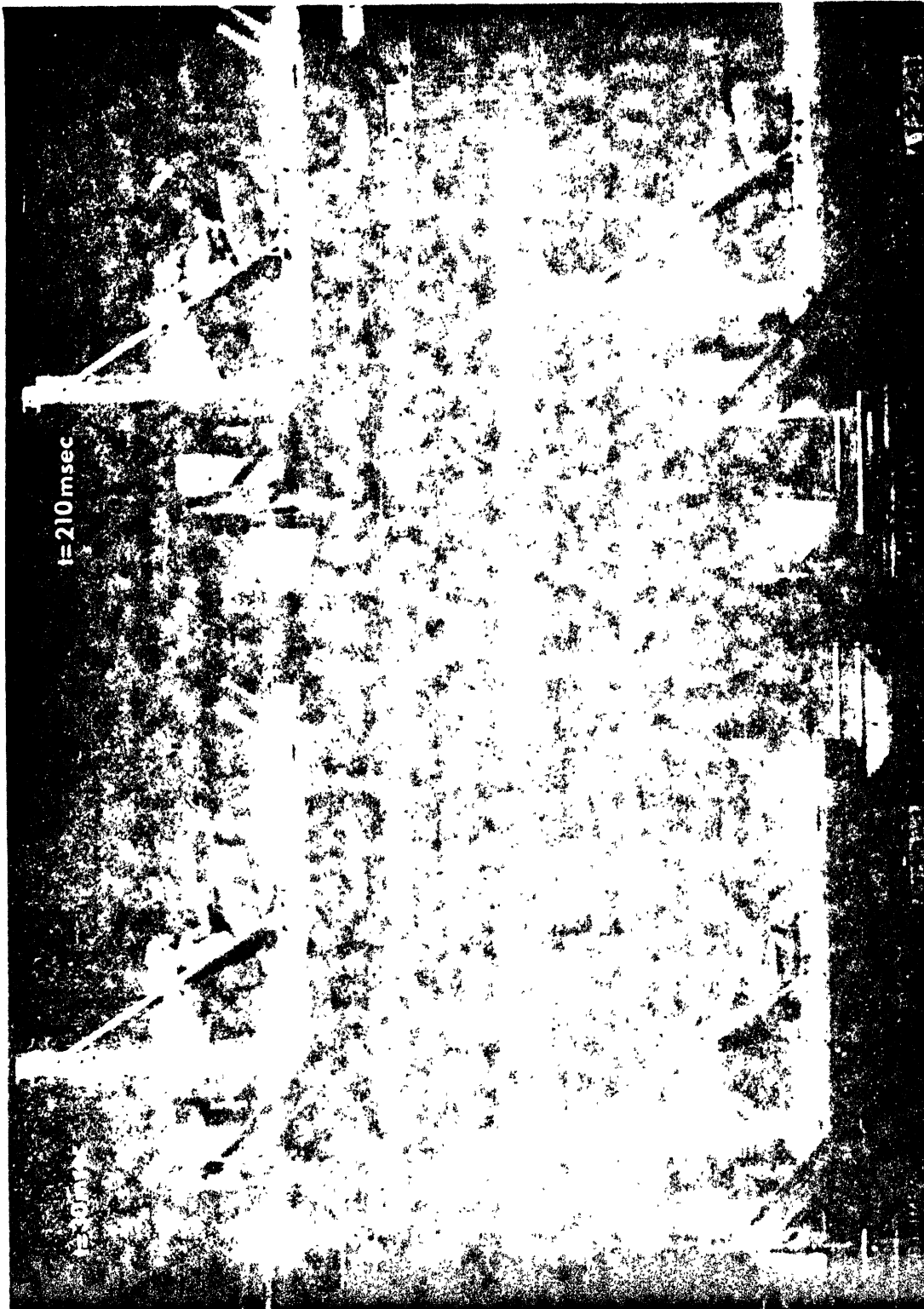
HSRI SUMMARY DATA SHEET (FH-11-6962)

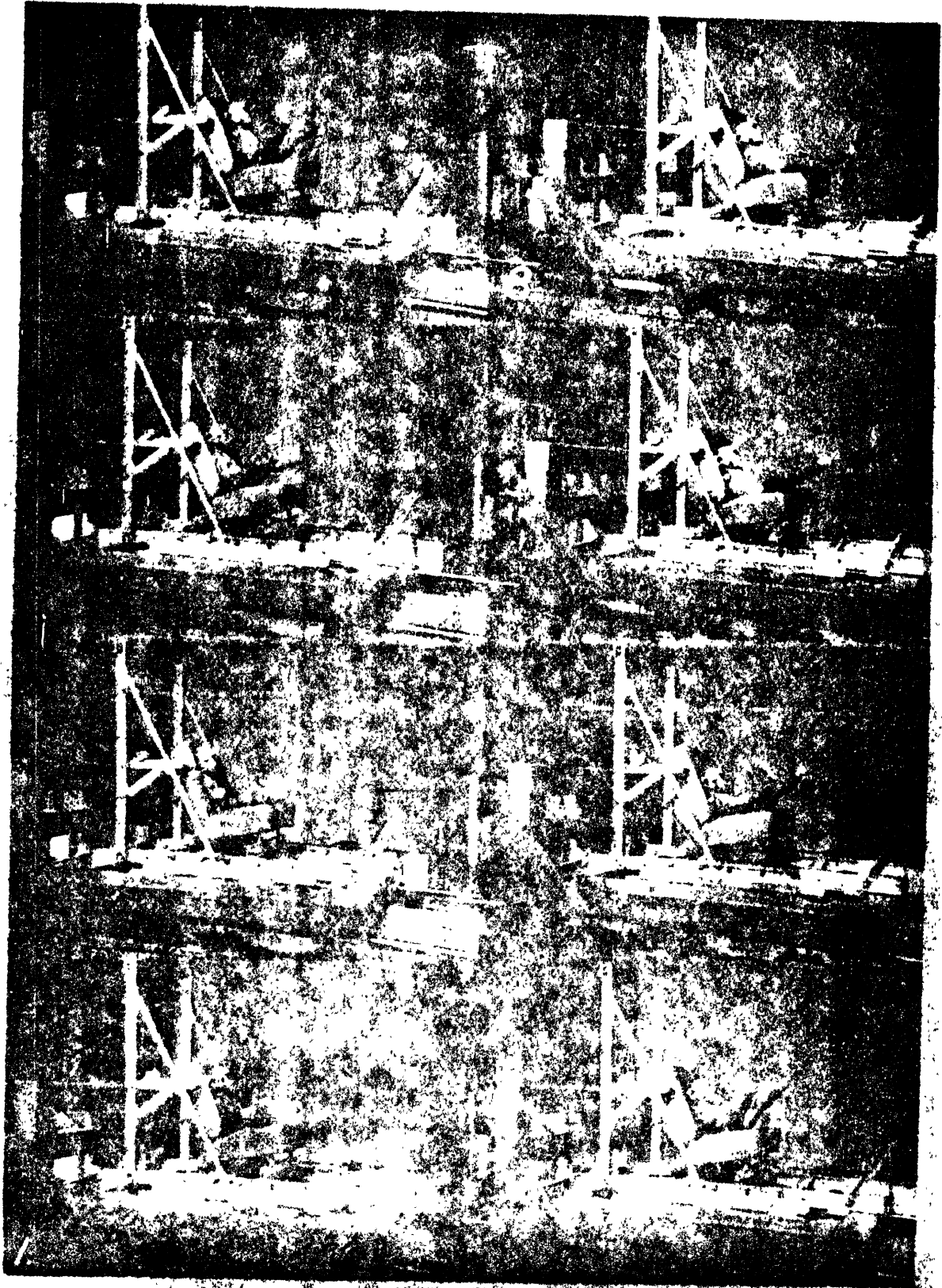
Test No: A-122
Test Date: 1 August 1969
Restraint Code No: C-35
Restraint Description: American Motors Harness No. 8992185

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

Test Observation:

The dummy received a gentle ride and no gross loadings or motions were recorded. The lack of a crotch strap on this harness caused the dummy's lower torso and legs to rebound somewhat farther than the upper torso. This harness is very difficult to install and attach to the dummy.





A122

Test A 122

Sted Decel. 20 G/in. (Statham)

Head A-P 50 G/in.

Chest A-P 50 G/in.

Head S-I 50 G/in.

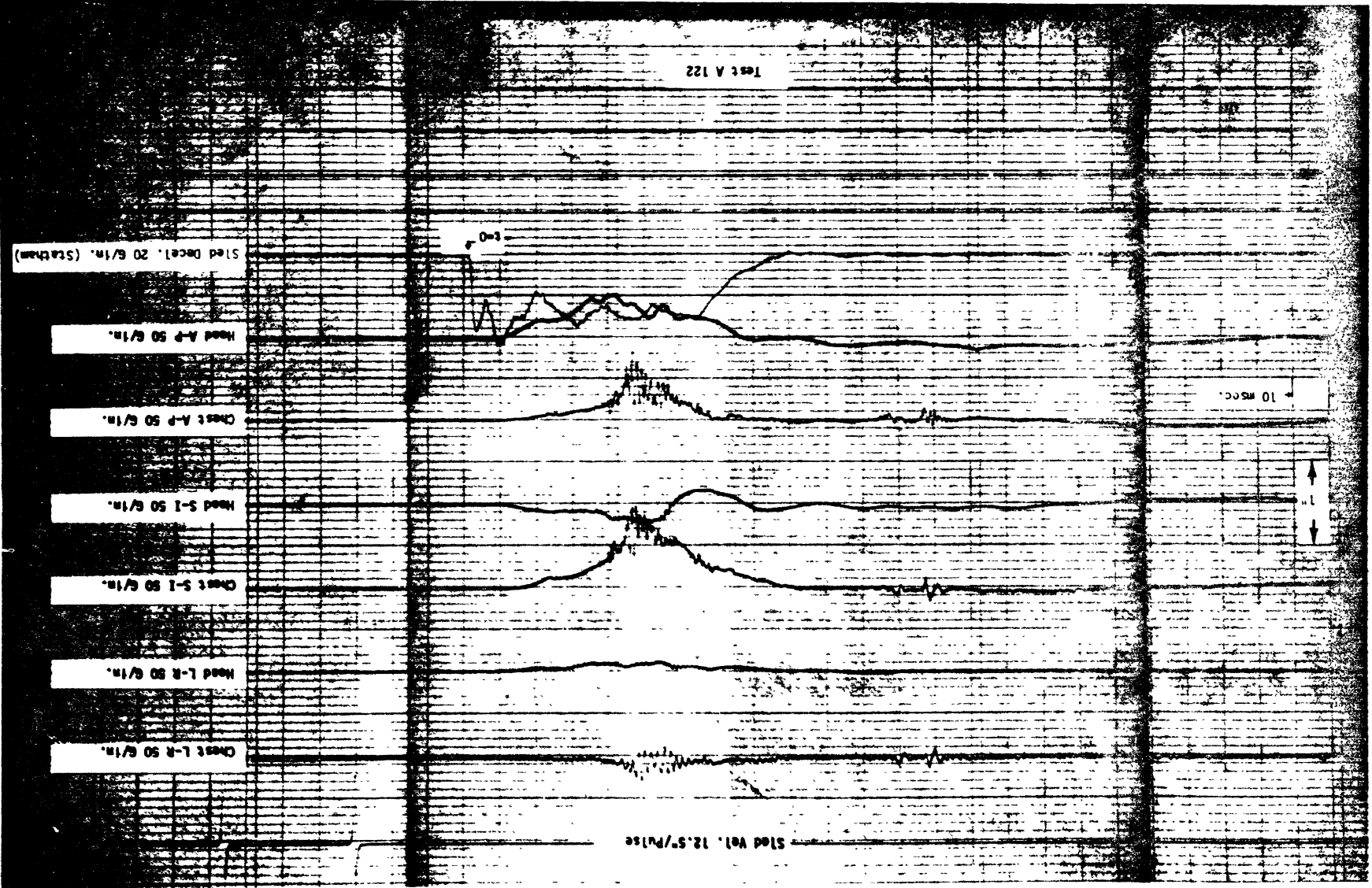
Chest S-I 50 G/in.

Head L-R 50 G/in.

Chest L-R 50 G/in.

10 msec.

Sted Vol. 12.5/Pulse



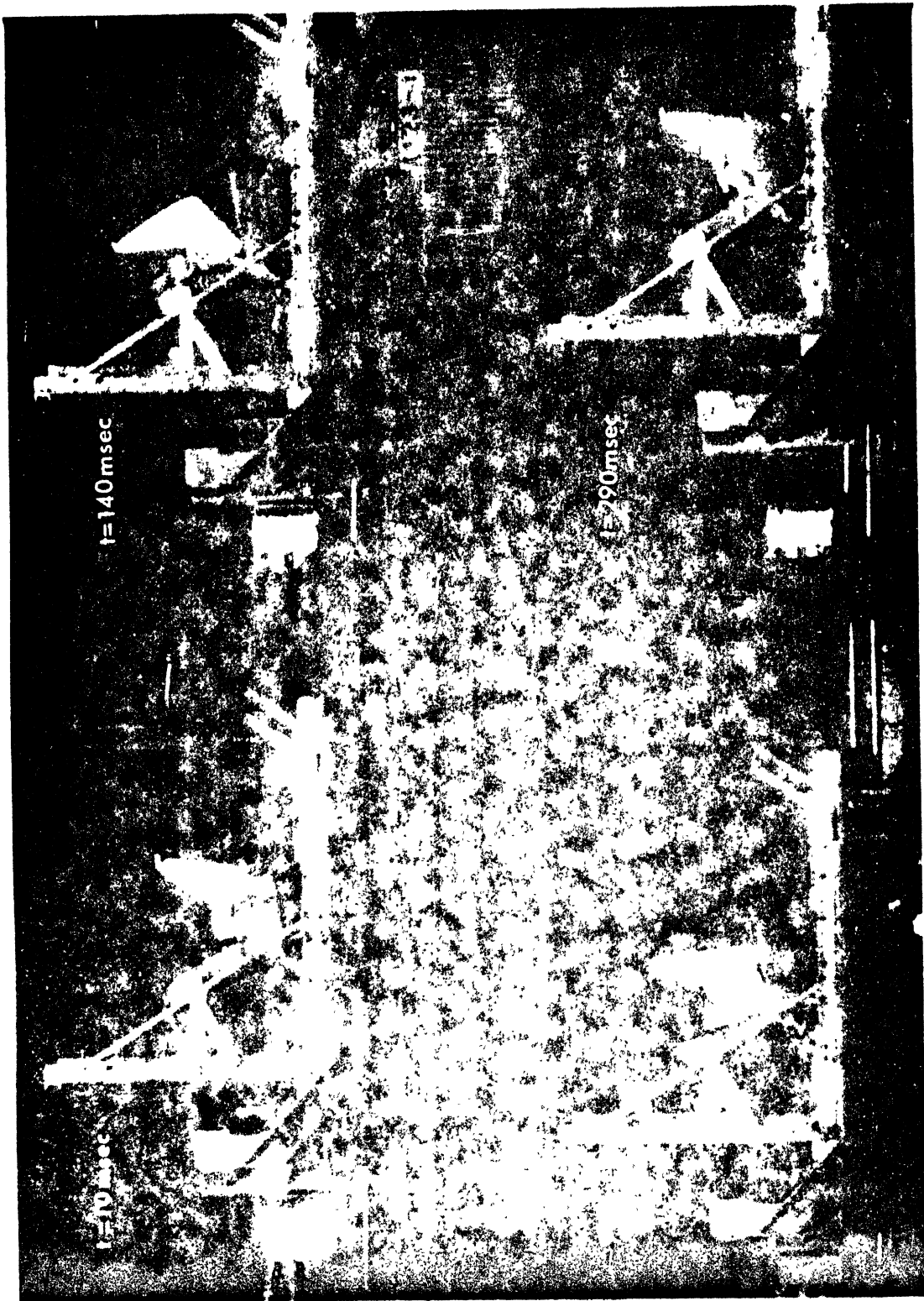
HSRI SUMMARY DATA SHEET (FH-11-6962)

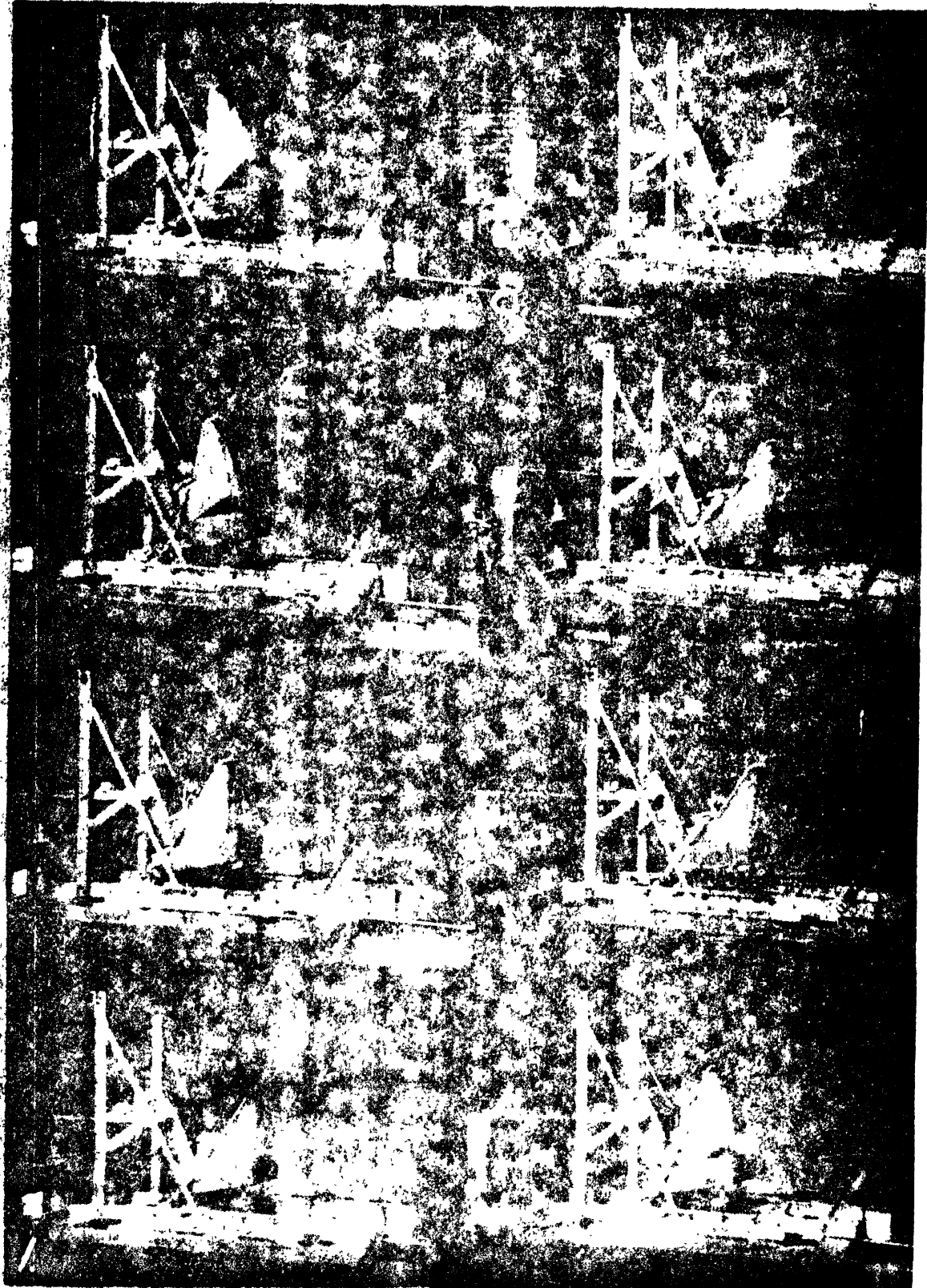
Test No: A-123
Test Date: 4 August 1969
Restraint Code No.: C-25
Restraint Description: General Motors Infant Carrier

Dummy: doll
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: Rear-end
Dummy Attitude: Semi-reclining

Test Observation:

The doll appeared to experience a fairly gentle ride. The movies showed that the infant carrier tilted upward toward the adult seat back allowing the doll to impact the seat. No damage was suffered by the dummy except that the face appeared to be flattened somewhat. The small three-quarter-inch cross strap on the infant carrier connecting the two shoulder straps came unsnapped.





A123

Test A 123

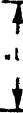
Lt. Lap Belt 1000 #/in.

Rt. Lap Belt 1000 #/in.

Std Decel. 20 g/in. (Seachem)

g=0

10 ms



Std Vol. 12.8%/Pulse

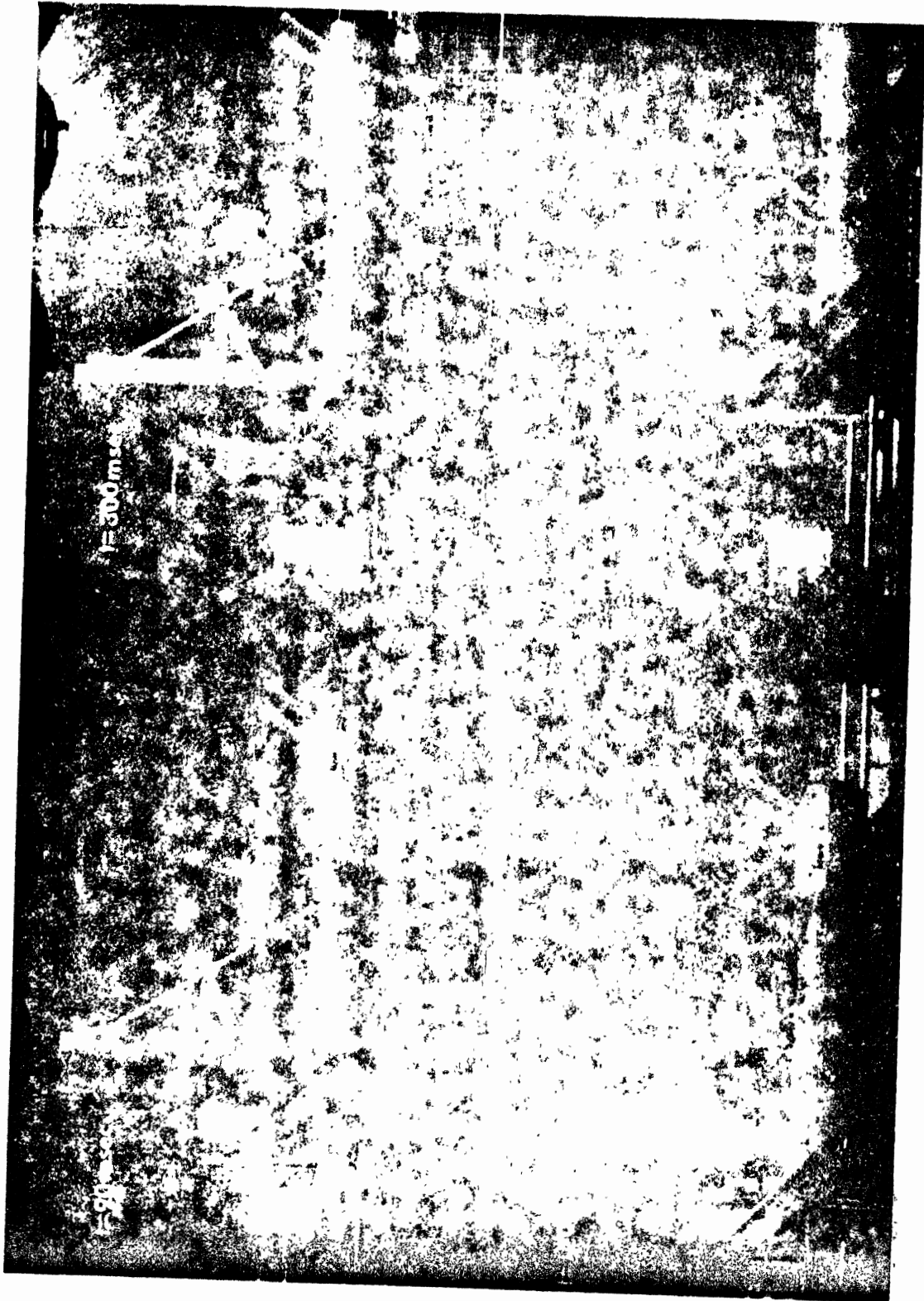
HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-124
Test Date: 4 August 1969
Restraint Code No.: C-41
Restraint Description: Circle-Square Ba-Be Safe Harness

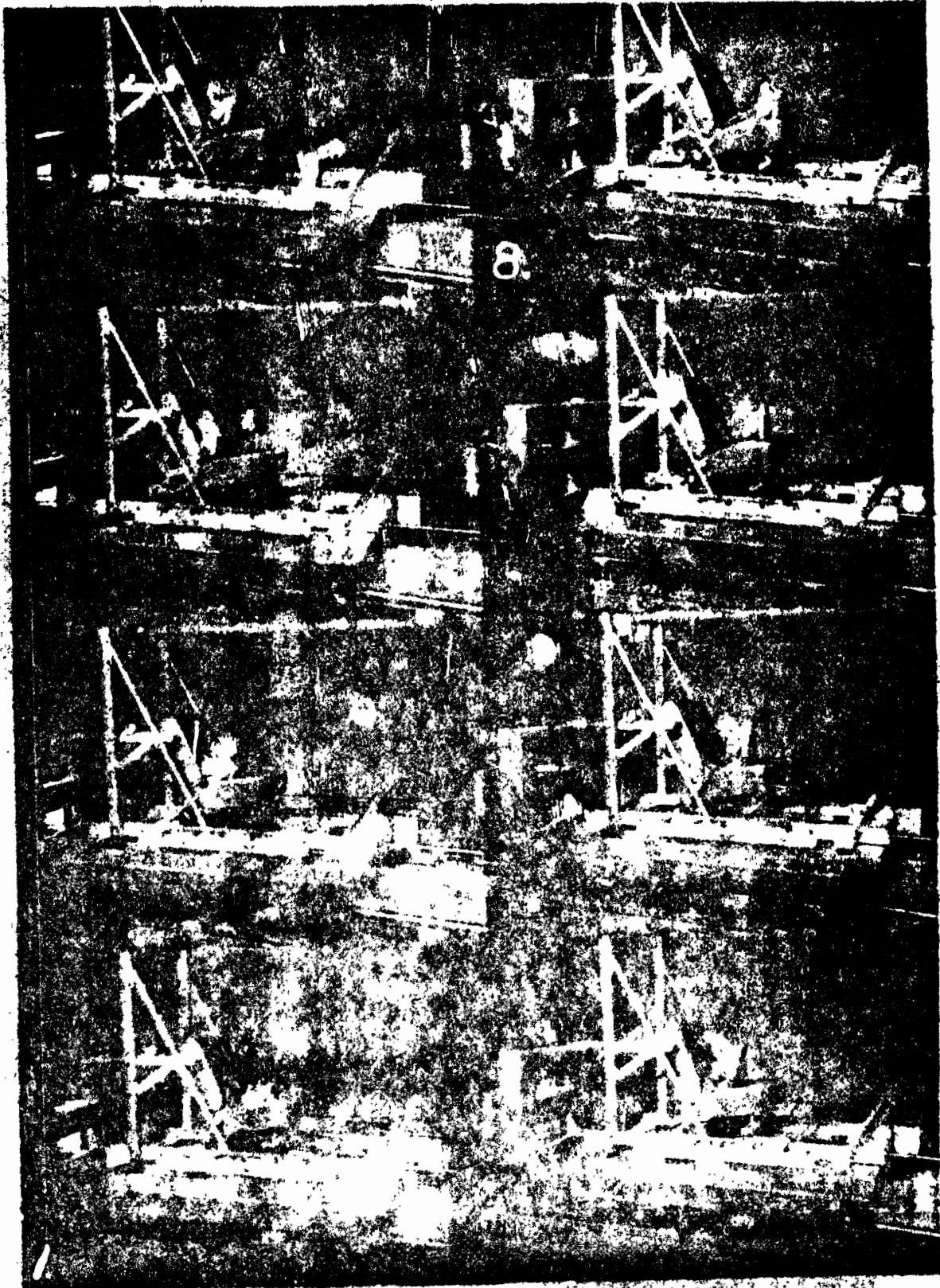
Dummy: doll
Sled Velocity: 20 mph
Sled G-level: 18
Impact Direction: Rear-end
Dummy Attitude: Reclining

Test Observation:

No damage was apparent either to the doll or to the restraint system. The doll pivoted up into contact with the adult seat back during the simulated rear-end collision, then it rebounded violently into an upright sitting position flexed at the waist.



NOT REPRODUCIBLE



A124

NOT REPRODUCIBLE

Test A 124

Lt. Lap Bolt 200 #/in.

Rt. Lap Bolt 200 #/in.

Std Decel. 20 g/in. (Station)

0-0

10 msec.



Std Vol. 12.5"/Pulse

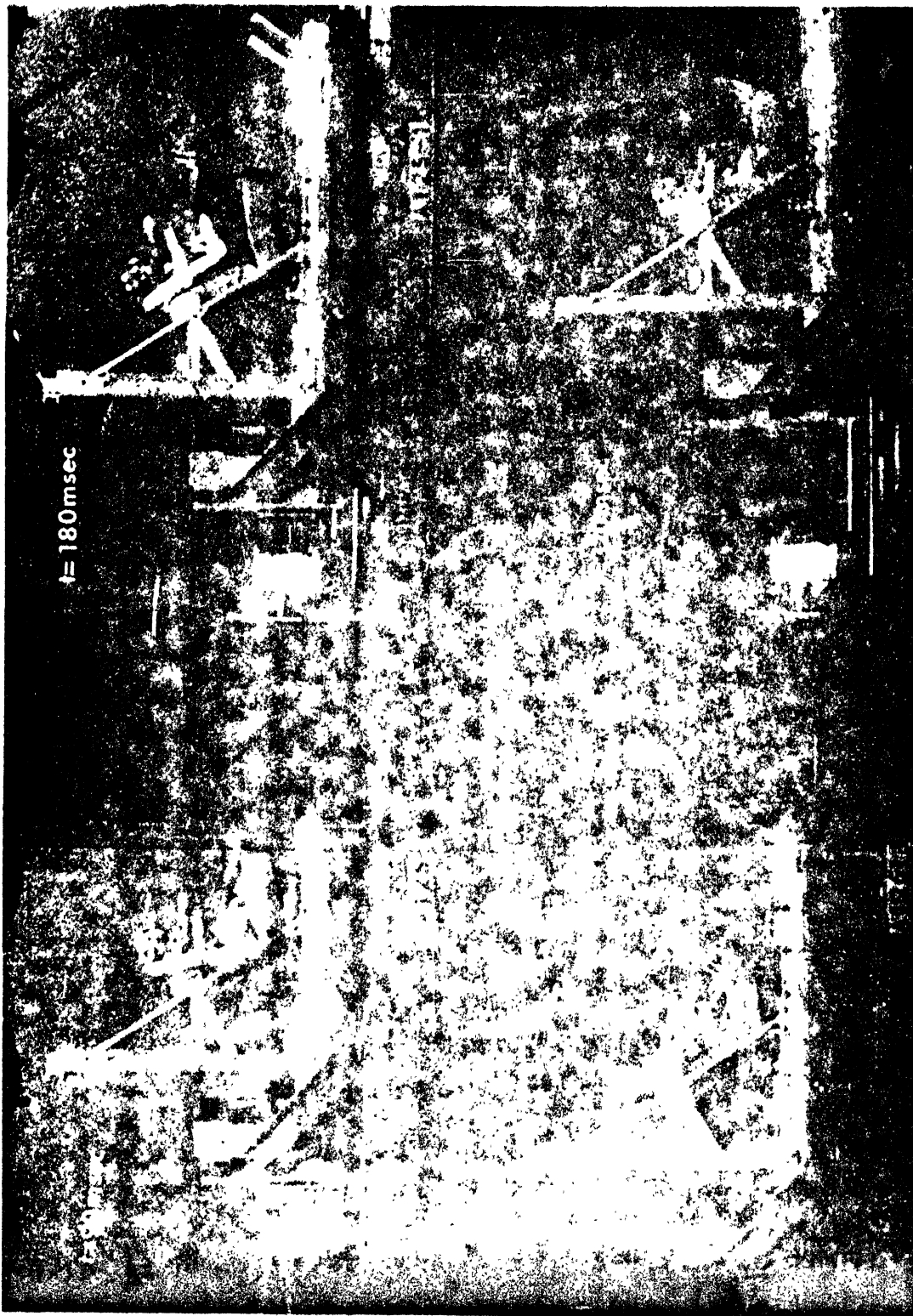
HSF:1 SUMMARY DATA SHEET (FH-11-6962)

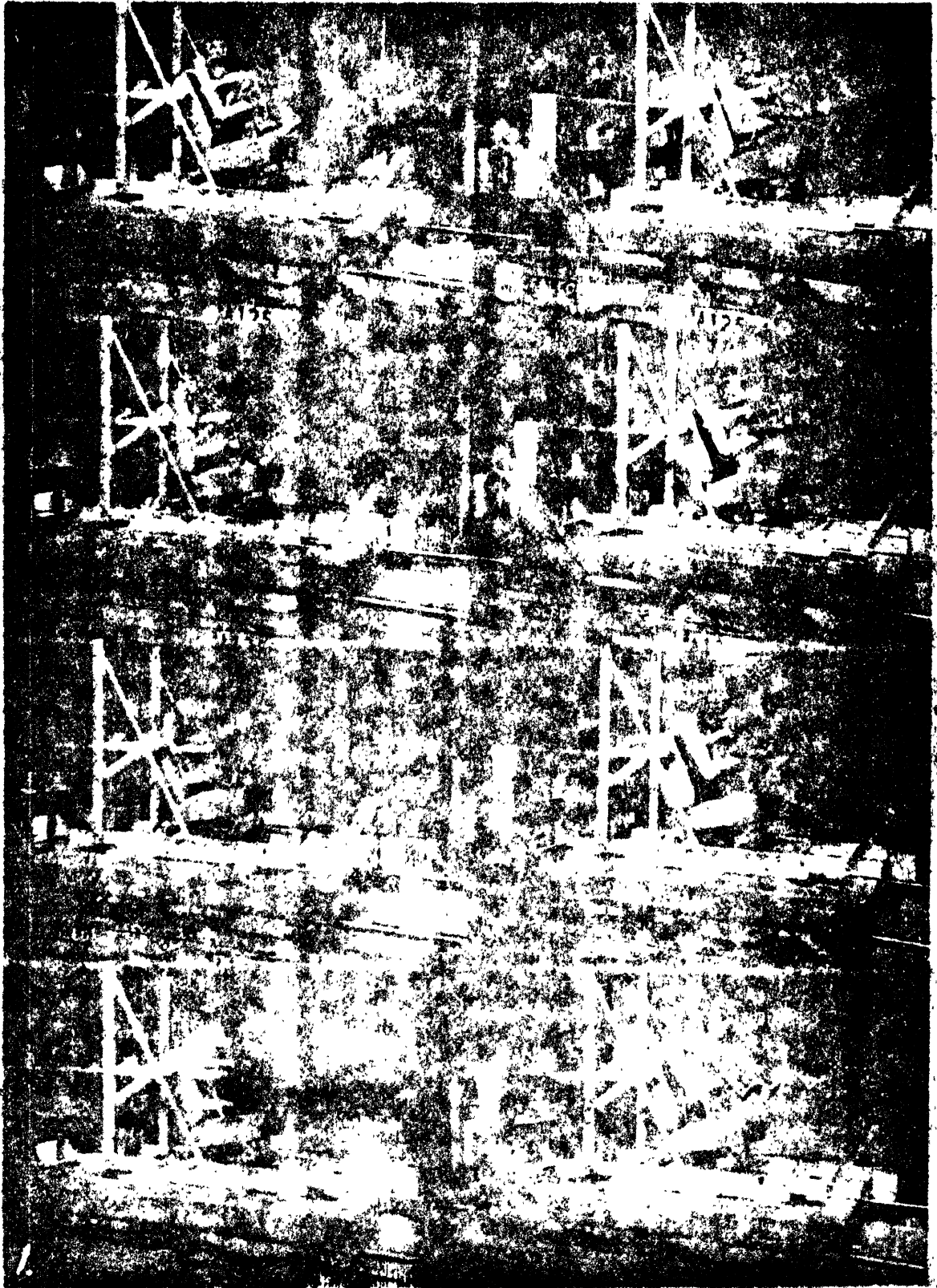
Test No: A-125
Test Date: 4 August 1969
Restraint Code No.: C-6
Restraint Description: George B. Walker Safety Seat

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

Test Observation:

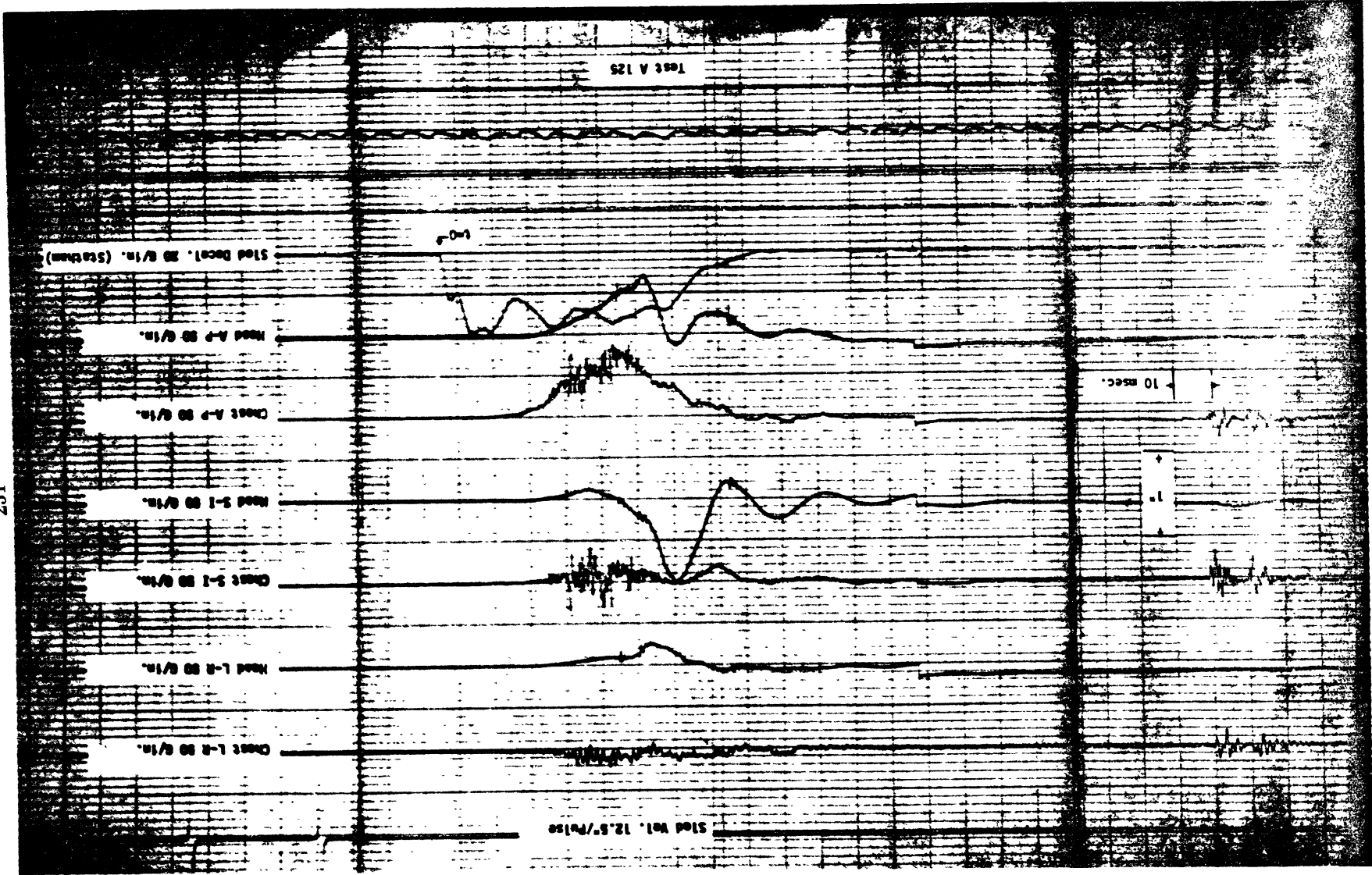
The dummy experienced fairly high g-loadings in this test. Some whiplash was observed as the dummy's head slid sideways off the high seat back. A strong rebound was observed.





A125

NOT REPRODUCIBLE



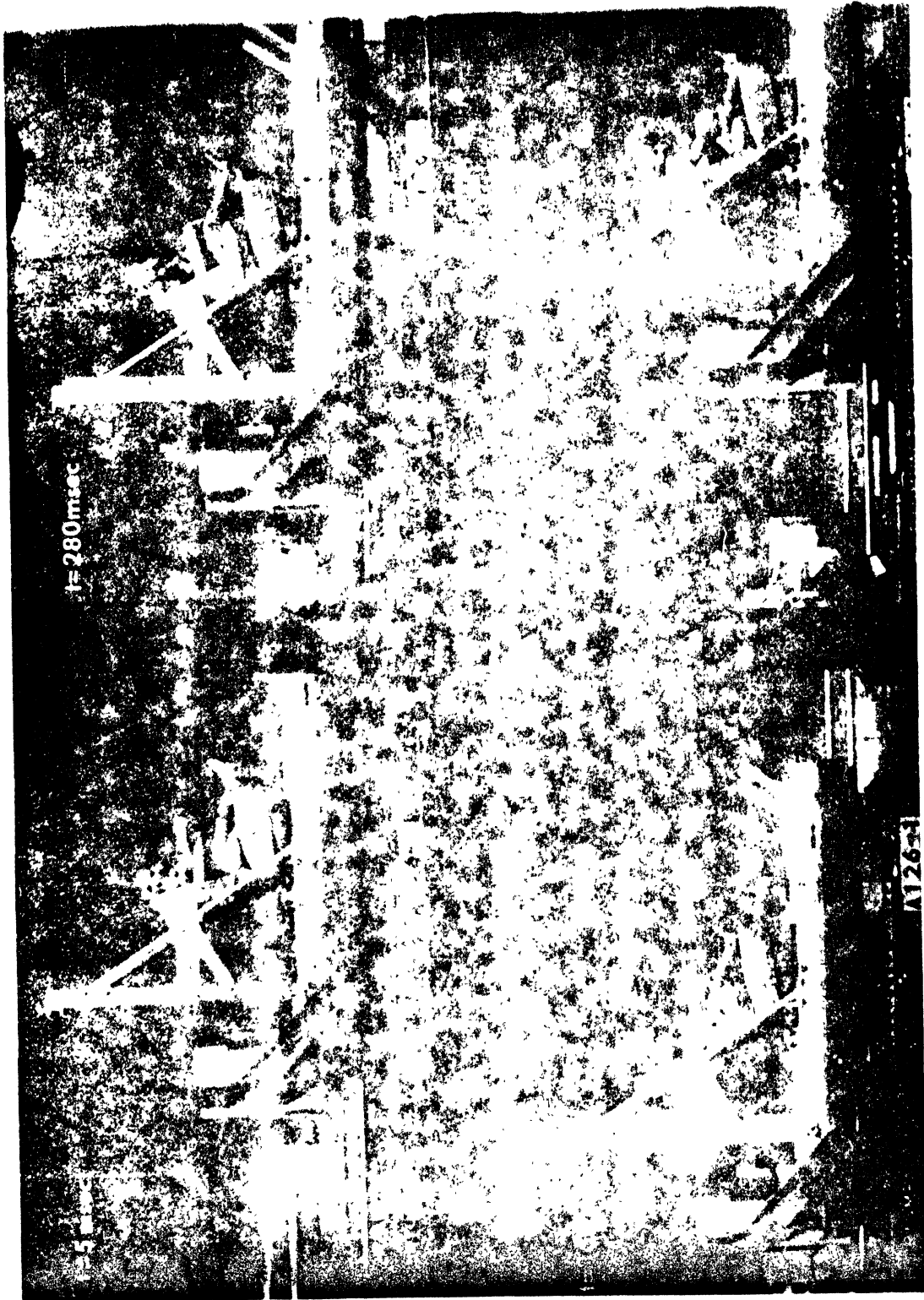
HSRI SUMMARY DATA SHEET (FH-11-6962)

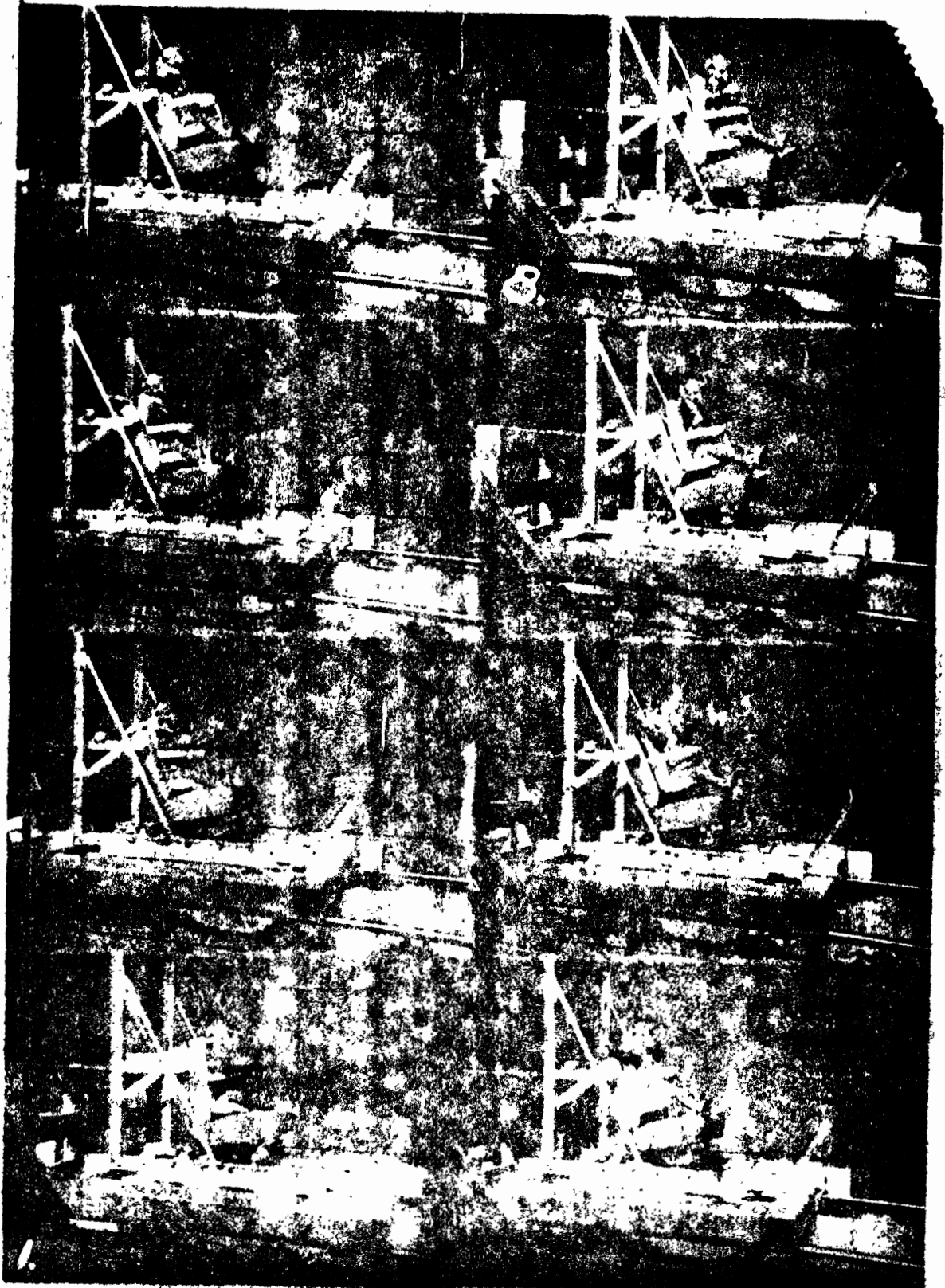
Test No: A-126
Test Date: 4 August 1969
Restraint Code No.: C-6
Restraint Description: George B. Walker Safety Seat

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

Test Observation:

The dummy received a fairly gentle ride in this test. Some straightening of the bail hooks was evidenced on the rebound.





A126

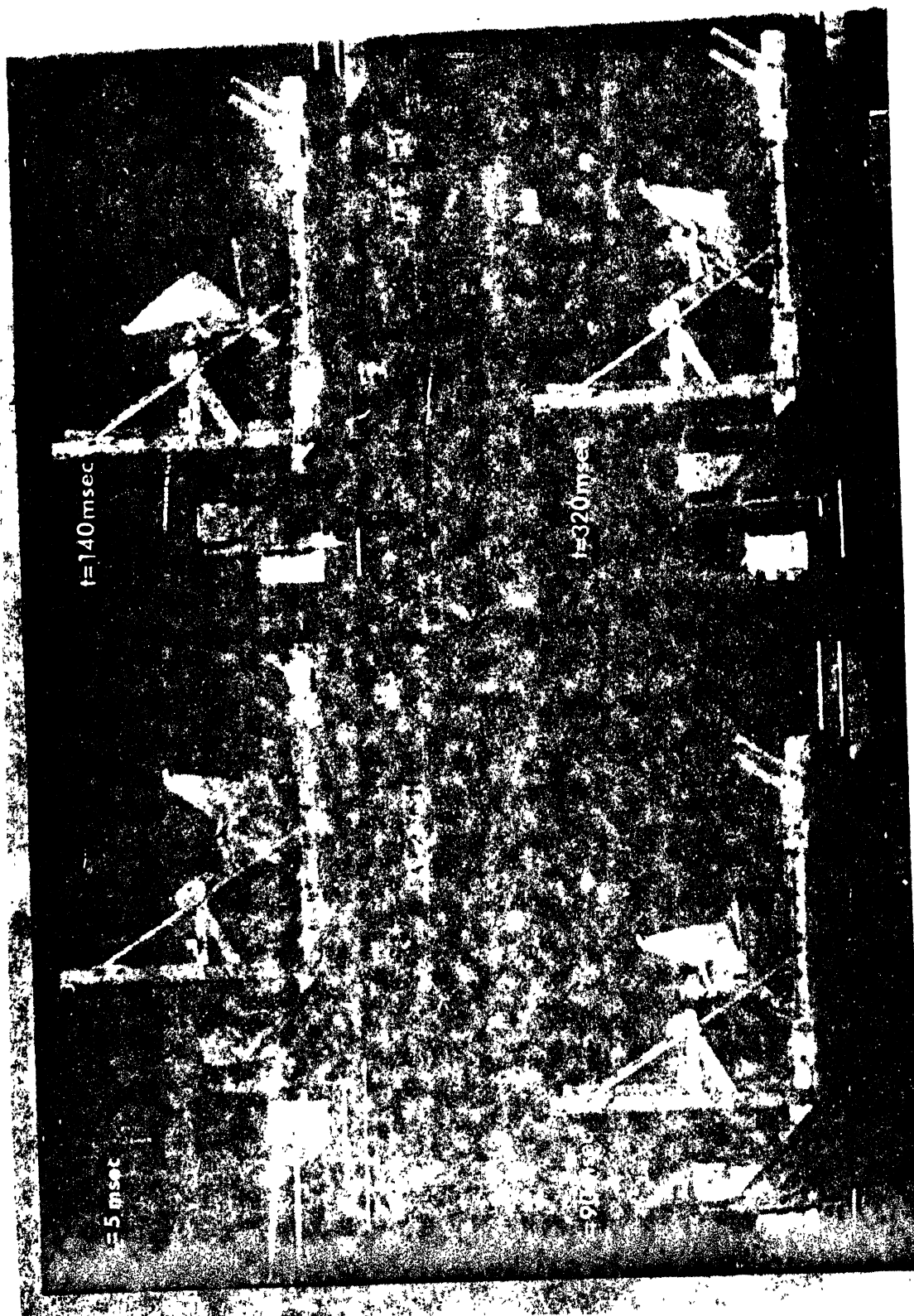
NOT REPRODUCIBLE

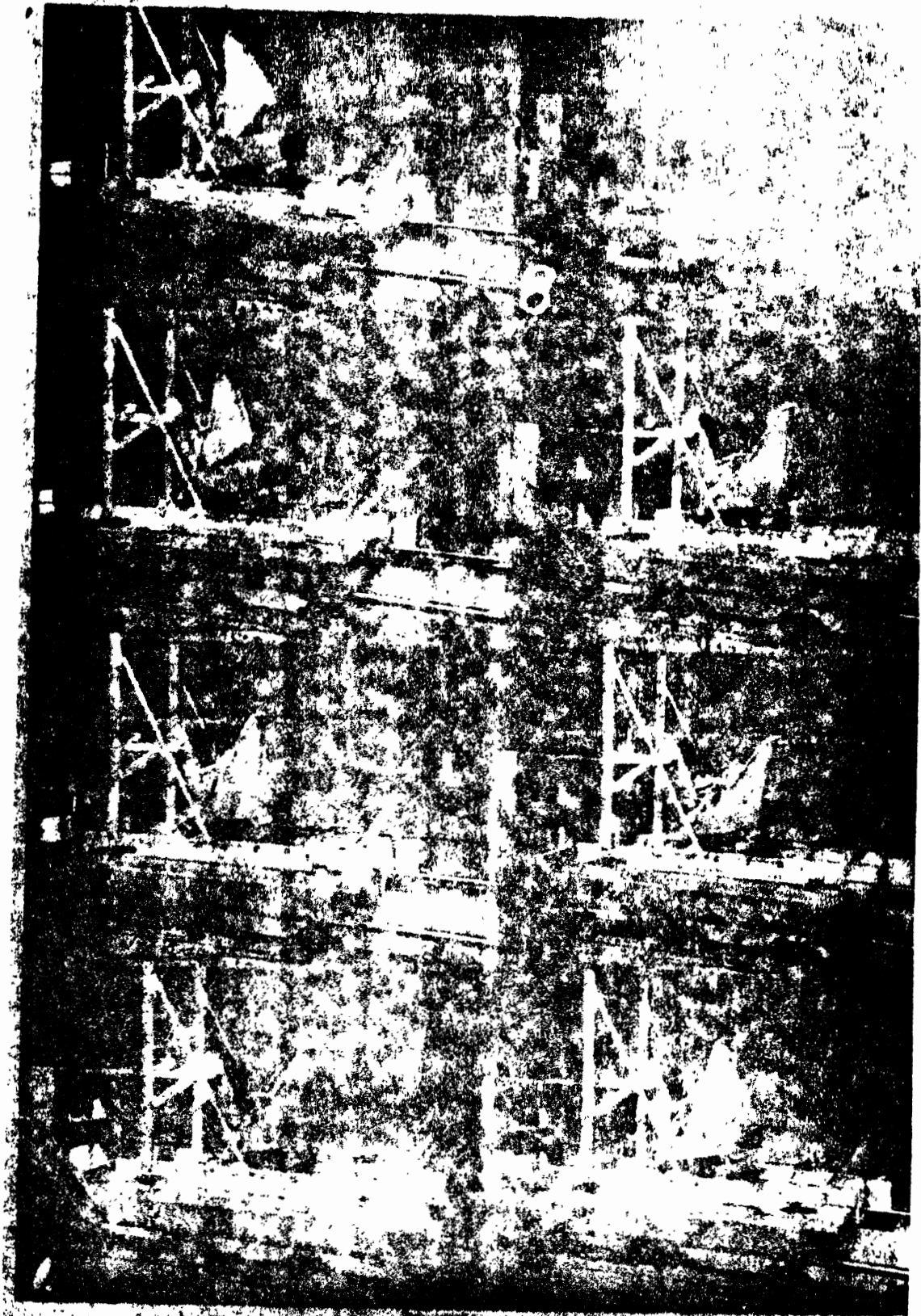
HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-127
Test Date: 5 August 1969
Restraint Code No: C-25
Restraint Description: General Motors Infant Carrier
Dummy: doll
Sled Velocity: 30 mph
Sled G-level: 18
Impact Direction: Rear-end
Dummy Attitude: Semi-reclining

Test Observation:

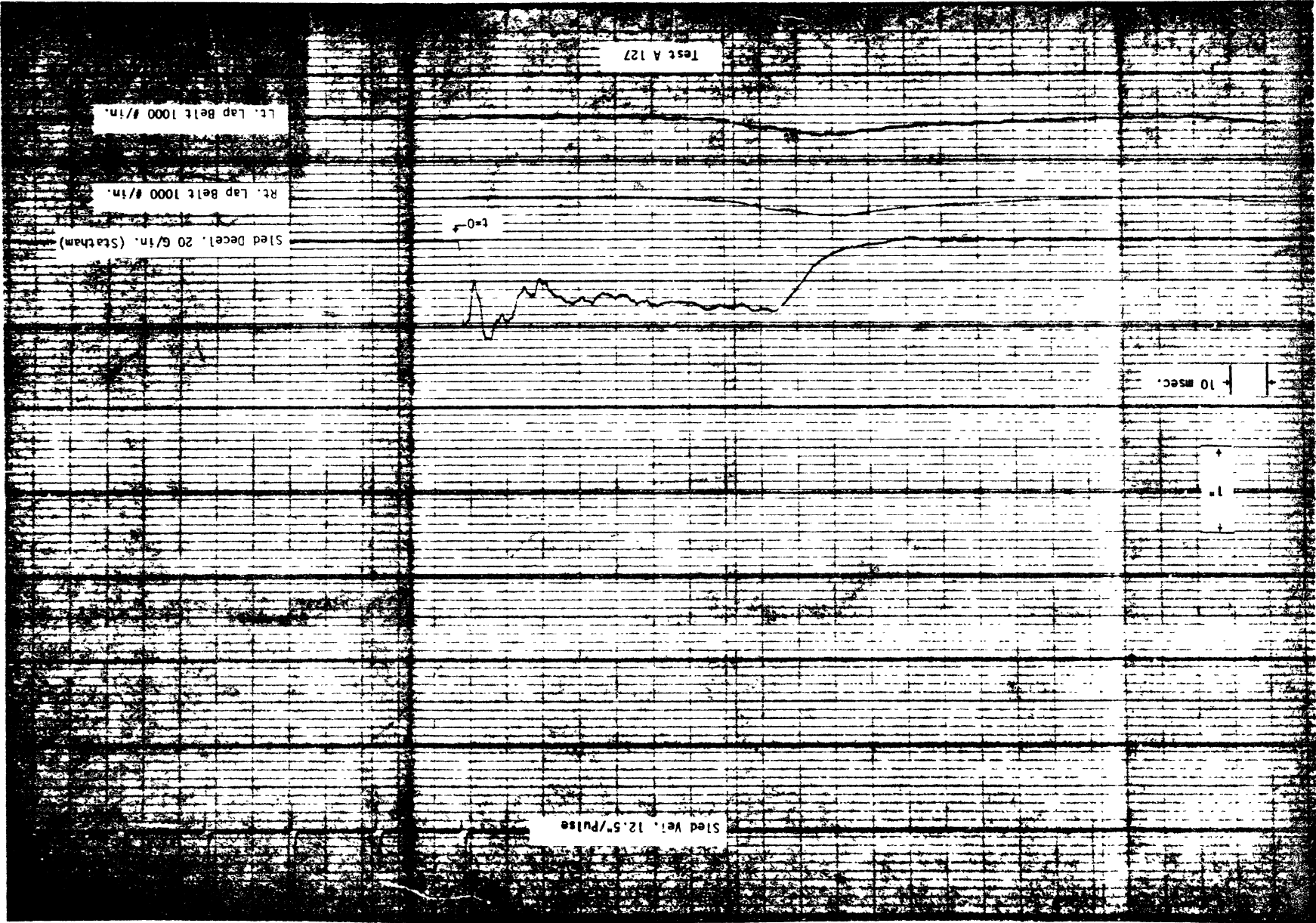
The infant carrier pitched upwards toward the adult seat back causing the doll to contact the seat back. Again the small three-quarter-inch cross strap connecting the shoulder straps came unsnapped.





A127

NOT REPRODUCIBLE



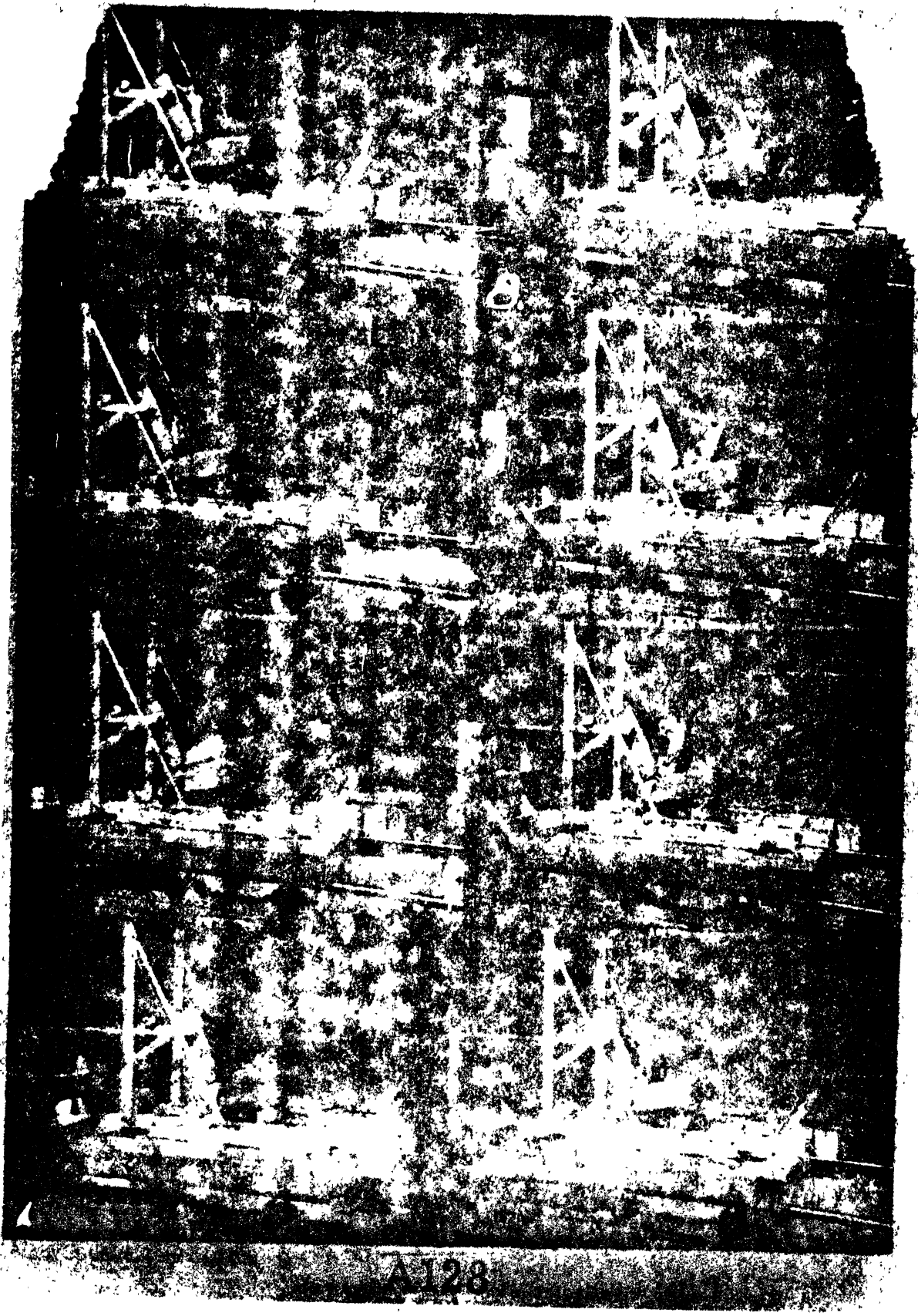
HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-128
Test Date: 5 August 1969
Restraint Code No.: C-41
Restraint Description: Circle-Square Ba-Be Safe Harness

Dummy: doll
Sled Velocity: 30 mph
Sled G-level: 18
Impact Direction: Rear-end
Dummy Attitude: Reclining

Test Observation:

The dummy and its restraint system vaulted upward against the seat back and were literally buried in it. No damage was apparent to either the dummy or the restraint system.



NOT REPRODUCIBLE

TEST A 120

Lt. Lap Bolt 1000 #/in.

Rt. Lap Bolt 1000 #/in.

Std Bolt. 20 #/in. (Stachm)

0-0



10 msec.

1

Std Bolt. 12.5 #/in

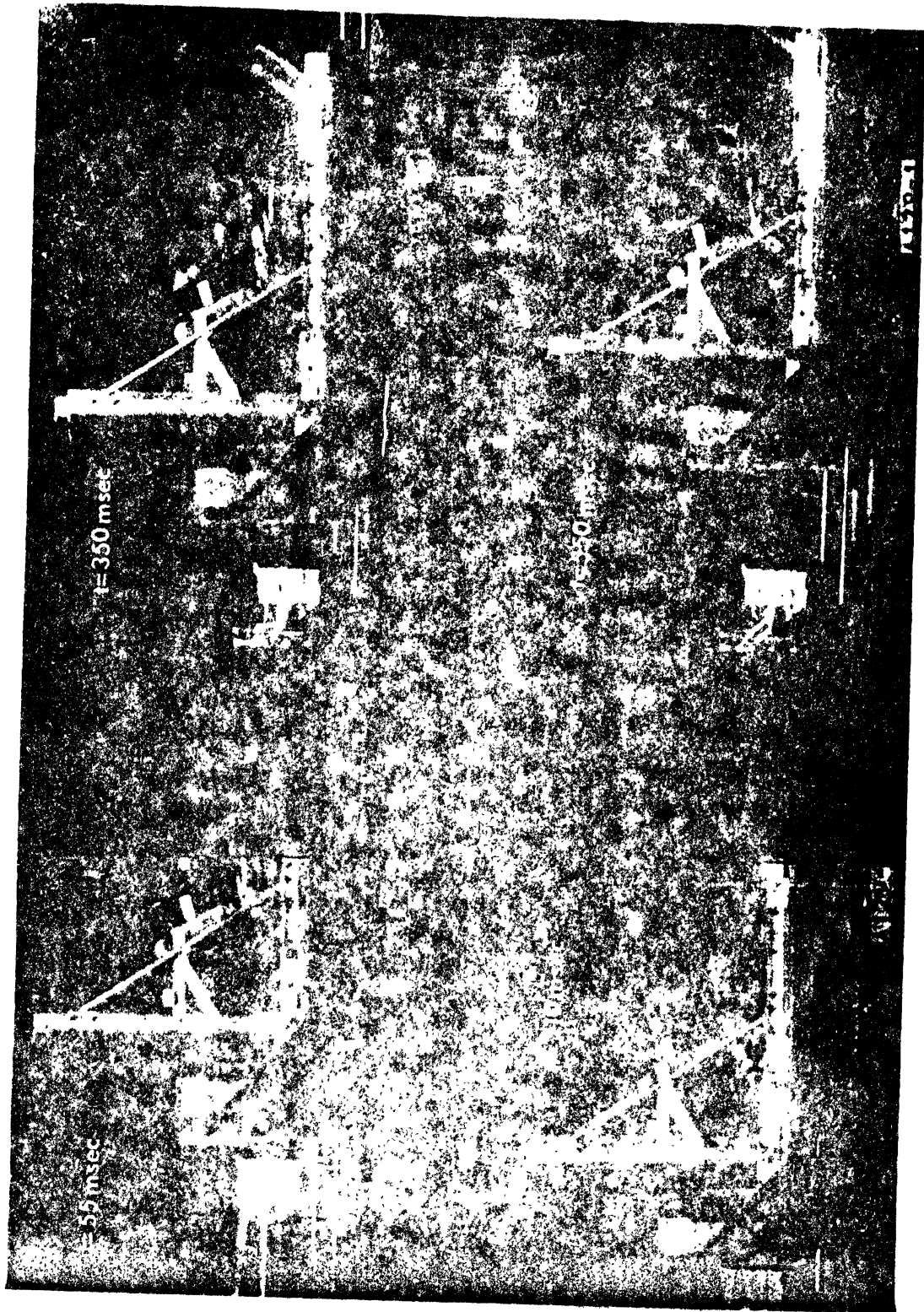
HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-129
Test Date: 5 August 1969
Restraint Code No.: C-23
Restraint Description: Volvo Child Safety Seat

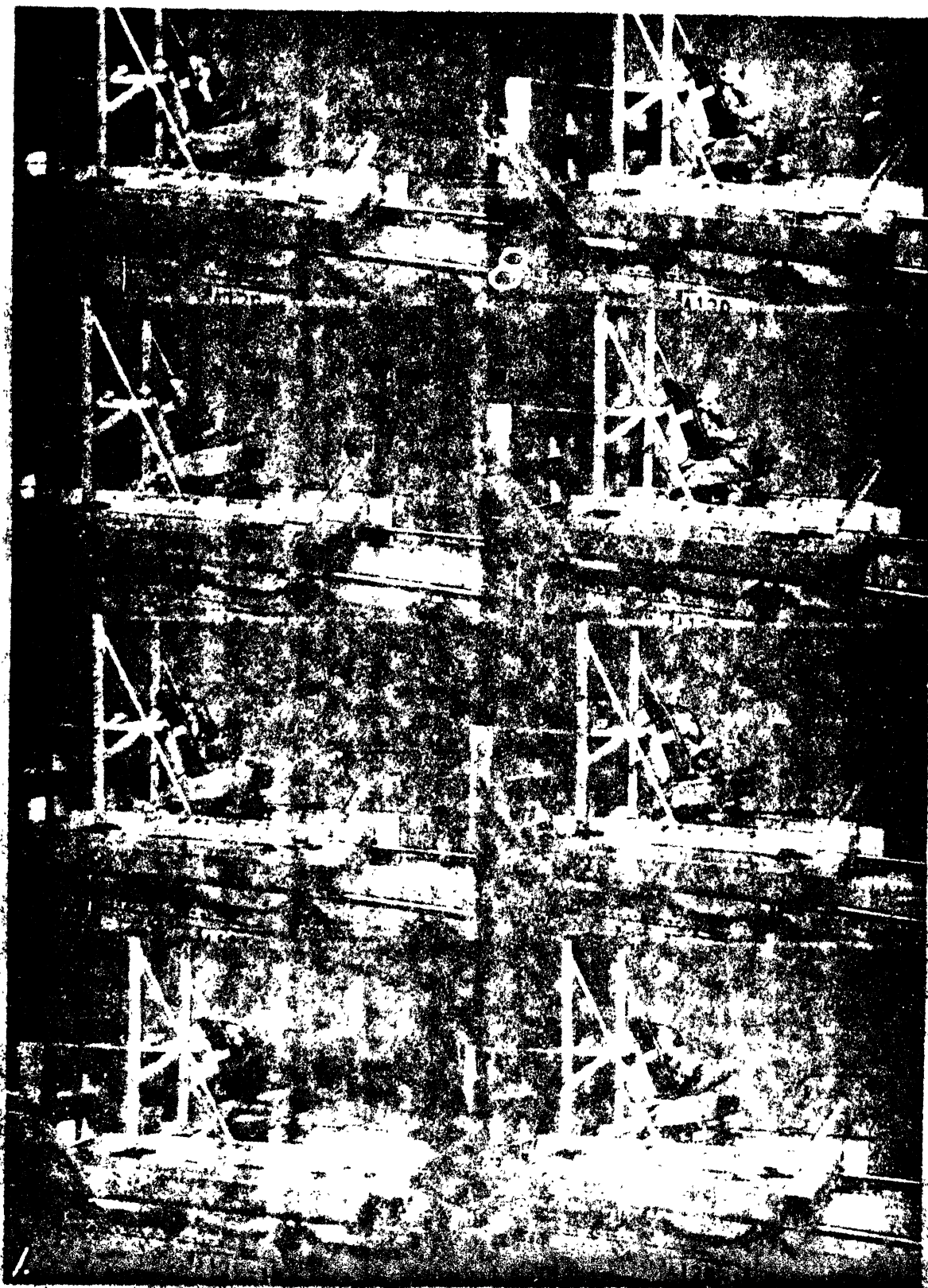
Dummy: 3 year
Sled Velocity: 30 mph
Sled G-level: 18
Impact Direction: Rear-end
Dummy Attitude: Sitting

Test Observation:

The dummy received a fairly gentle ride in this test. Rebound into the integral strap system seemed quite severe.

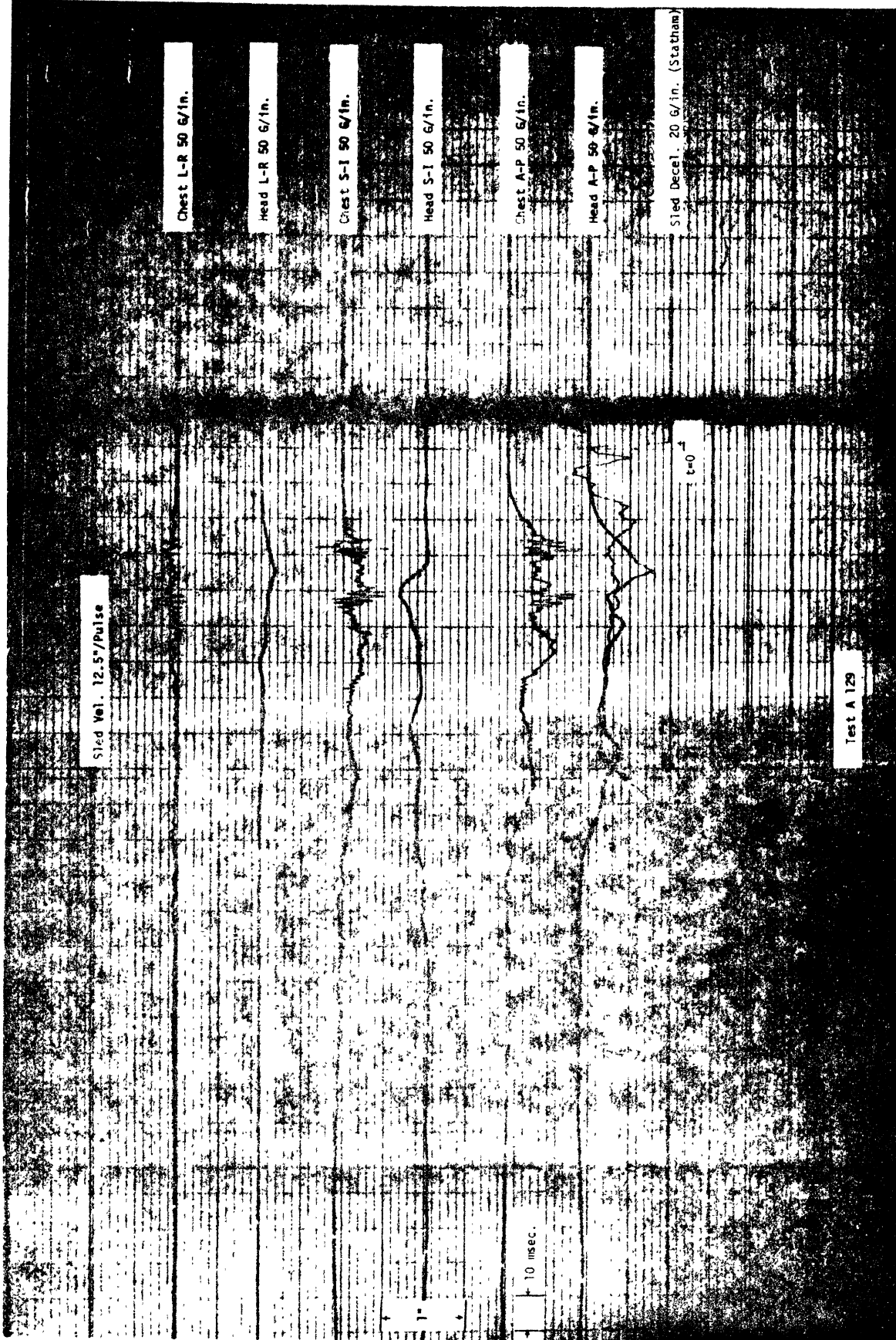


NOT REPRODUCIBLE



A129

NOT REPRODUCIBLE



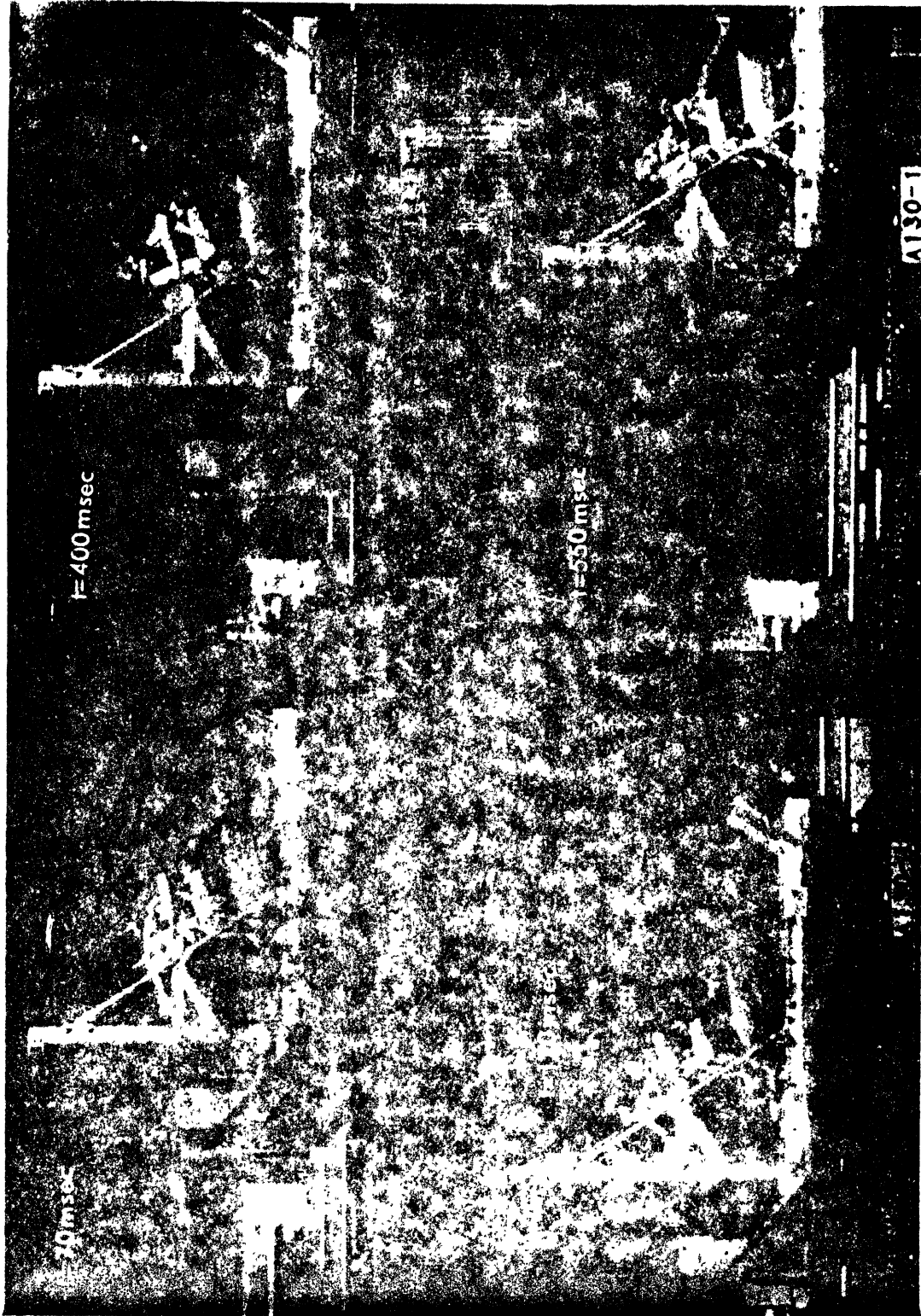
HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-130
Test Date: 5 August 1969
Restraint Code No: C-19
Restraint Description: Strolee Seat No. 589

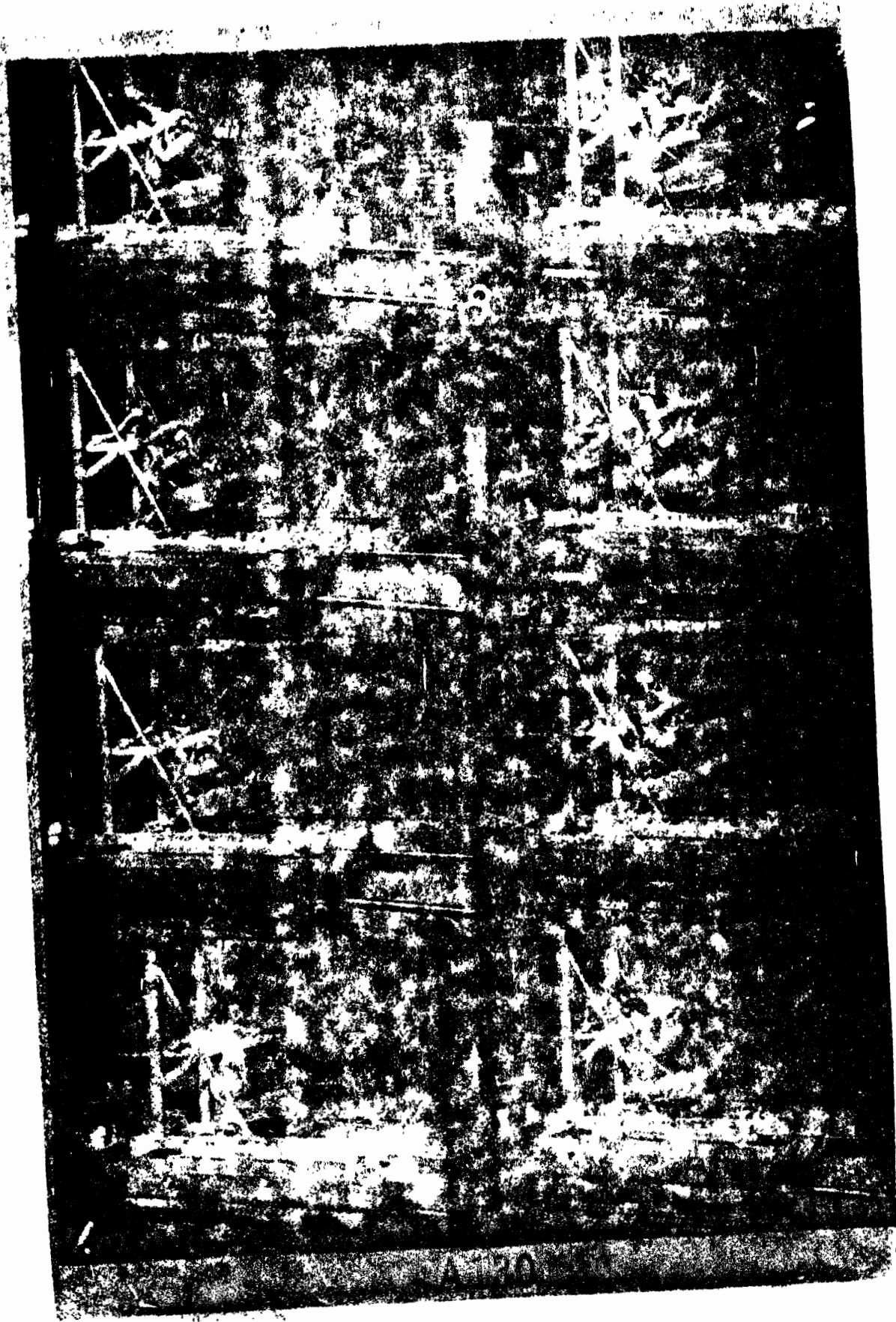
Dummy: 3 year
Sled Velocity: 30 mph
Sled G-level: 18
Impact Direction: Rear-end
Dummy Attitude: Sitting

Test Observation:

The dummy received fairly gentle loadings in this test. However, the head rest did not have the structural strength to prevent significant whiplash action between the head and the torso of the dummy. The headrest was bent back at approximately 30°, the rear tube supporting the top of the seat back also was bent rearward somewhat.



NOT REPRODUCIBLE



NOT REPRODUCIBLE

Test A 130

Lt. Lap Belt 1000 g/in.

Rt. Lap Belt 1000 g/in.

Std 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.

Std Vol. 12.6"/min

10 msec

250

