

DOT 377

REPORT NO. 6525-V-42

NEW CAR ASSESSMENT AND STANDARDS
ENFORCEMENT INDICANT TESTING
FMVSS NOS. 212, 219 AND 301-75

1981 DODGE ARIES 2-DOOR SEDAN
REAR IMPACT, 35 MPH
NHTSA 308-42-505

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OCTOBER 1980

FINAL REPORT

Prepared For

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
Enforcement
Office of Vehicle Safety Compliance
Nassif Building - 400 Seventh Street, S. W.
Washington, D. C. 20590

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Contract Technical Manager

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16. Abstract A rear impact barrier test of a 1981 Dodge Aries 2-door sedan was performed at Calspan Corporation, Advanced Technology Center, Transportation Research Department facility for the New Car Assessment and Standards Enforcement Inducant Testing of FMVSS 212 - Windshield Mounting; FMVSS 219 - Windshield Zone Intrusion; FMVSS 301 - Fuel System Integrity for the Office of Vehicle Safety Compliance, the Office of Automotive Ratings and for Research and Development. There are no requirements for compliance with FMVSS 212 and FMVSS 219 for rear barrier impact tests. Impact speed was 35.17 mph Maximum vehicle static crush was 26.3 inches Maximum rear compartment intrusion was 7.2 inches The vehicle complied with FMVSS 301-75 - Fuel System Integrity. Dummies used in a rear impact test need not be instrumented or calibrated.					
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SECTION I

PURPOSE AND TEST PROCEDURE

PURPOSE: The purpose of this test was to determine whether the subject vehicle (a 1981 Dodge Aries 2-door sedan) meets the requirements of FMVSS 301-75 (Fuel System Integrity) at a higher test speed and also to obtain structural information for the Research and Development and the Office of Automotive Ratings of the NHTSA. This test is part of the New Car Assessment Program, B.O.A., Task 2, sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract DOT-HS-8-01938.

TEST PROCEDURE: The Calspan Corporation, Advanced Technology Center, Transportation Research Department Test Procedure for the New Car Assessment Crash tests submitted to, and approved by, the Contract Technical Manager (CTM) contains the specific procedures used to perform this test.

With the exception of a higher test speed, this procedure is not in conflict with any portion of FMVSS Procedures issued by the Office of Standards Enforcement and the amendments in effect as noted by the applicable contract.

SECTION 2

SUMMARY OF CRASH TEST NUMBER 42

A 1981 Dodge Aries 2-door sedan was impacted from the rear by a moving barrier at 35.17 mph. This vehicle was equipped with a 135 cubic inch, four cylinder engine and a four-speed manual transmission. The 13 gallon fuel tank was filled to 93 percent capacity with red Stoddard fluid; the moving barrier weight was 3990 pounds and the vehicle test weight was 2800 pounds.

Two uninstrumented 50th percentile Part 572 anthropometric test devices (ATDs) were placed in the driver and right front passenger seating positions and restrained with the production three-point belt system. These ATDs were positioned according to the dummy placement procedure specified in Laboratory Procedure TP-212-02. The back of the ATDs heads were chalked to indicate head contact.

A crash test summary is presented in Table 1 and the pre- and post-test photographs of the vehicle and occupants are found in Appendix A.

Vehicle data traces are presented in Appendix B and vehicle accelerometer placement dimensions can be obtained from Figure 2.

The crash event was recorded by one real-time and six high-speed cameras. Pertinent camera information can be found in Section 4 of this report. All film has been delivered under separate cover to the National Highway Traffic Safety Administration.

GENERAL COMMENTS

The 1981 Dodge Aries complied with FMVSS No. 301-75 - Fuel System Integrity. There was no evidence of fuel leakage after impact or during any phase of the roll-over test.

Maximum intrusion into the rear occupant compartment was 7.2 inches. Maximum static crush of the vehicle was 26.3 inches measured along the right side.

Other post-test observations:

- Both of the left and right bench rails failed at impact, refer to Figure A-13.
- The heads of the driver and the passenger struck the rear seat back as indicated by the chalk marks in Figure A-10.
- Rear Window shattered and broke.
- Both front doors were operable after impact.
- The right and left rear fenders locked the rear wheels, see Figure A-4. Both rear tires remained inflated after impact.

Table 1

CRASH TEST SUMMARY

TEST NO. 308-42-505 PROJECT: NEW CAR ASSESSMENT PROGRAM

DATE: 10-22-80 TIME: 1140 TEMP: 42°F

VEHICLE Chrysler Dodge Aries 2-door sedan

TEST WEIGHT (lbs)	<u>2800</u>
IMPACT ANGLE (deg)*	<u>180</u>
IMPACT VELOCITY (mph)**	<u>35.17</u>
MAX. CRUSH (in) (Static)	<u>26.3</u>
MAX. INTRUSION (in)	<u>7.2</u>

DUMMIES

TYPE	<u>HYBRID II, Part 572</u>	<u>HYBRID II, PART 572</u>
LOCATION	<u>LF(1)</u>	<u>RF(2)</u>
RESTRAINT	<u>3-Point Production</u>	<u>3-Point Production</u>
	<u>Belt System</u>	<u>Belt System</u>
NUMBER OF DATA CHANNELS	<u>7</u>	
NUMBER OF HIGH SPEED CAMERAS	<u>6 + 1 Real Time</u>	

*With respect to tow track Centerline

**Speed trap measurement ($\pm$.05% accuracy)

Table 2

VEHICLE TEST WEIGHTS AS TESTED

Left Front 850 lbs
Right Front 830 lbs
TOTAL FRONT 1680 lbs

Left Rear 560 lbs
Right Rear 560 lbs
TOTAL REAR 1120 lbs

Total Weight = 1680 + 1120 = 2800 lbs

Wheel Base = 99.5 inches

$Cg_{F.W.} = \frac{1180 \text{ lbs} \times 99.5 \text{ inches}}{2800 \text{ lbs}} = \underline{41.9} \text{ inches}$

CALCULATION FOR TEST WEIGHT

RCLW = Rated Cargo and Luggage Weight

UDW = Unloaded Delivered Weight (2370 lbs)

VCW = Vehicle Capacity Weight (1015 lbs)

DSC = Designated Seating Capacity (6)

RCLW = VCW - 150 (DSC)

RCLW = 1015 - 150 (6) = 115 lbs

TEST WEIGHT = UDW + RCLW + (No. Dummies x 164 lbs)

TEST WEIGHT = 2370 lbs + 115 lbs + 2 (164 lbs)

TEST WEIGHT = 2813 lbs CALCULATED

SUMMARY OF TEST CONDITIONS

TEST VEHICLE INFORMATION

Vehicle Manufacturer Chrysler Corporation
Make/Model Dodge Aries
Body Style 2-door Model Year 1981
VIN 1B3BK41B8BC105687 Build Date 8/80
NHTSA No. 308-42-505 Color Lt/Green
Engine Data: 4 cylinders 135 in³ ~~xxx~~ displacement
Transmission Data: 4 speed (X) Manual () Automatic
Date Vehicle Received by Laboratory 9-30-80
Dealer's Name & Address Mid-City Dodge, 2185 Walden Avenue, Buffalo, N. Y.

DATA FROM CERTIFICATION LABEL ON LEFT DOOR REAR FACE OR 'B' POST

Vehicle Manufactured by Chrysler Corporation
Date of Manufacture 8-80 VIN 1B3BK41B8BC105687
GVW 3665 lbs GAWR: Front 1940 lbs Rear 1775 lbs

DATA FROM "RECOMMENDED TIRE PRESSURE" LABEL ON DOOR, POST, GLOVE BOX, ETC.

Vehicle Load (up to capacity) - Front 35 psi
Rear 35 psi
Recommended Tire Size P175/75R13
Vehicle Capacity: Types of Seats Bench X Bucket Split Bench
Number of Occupants (Designated Seating Capacity):

3	Front
3	Rear
6	TOTAL

Cargo Load = 115 lbs
TOTAL = 1015 lbs

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS)

Right Front =	<u>730</u> lbs	Right Rear =	<u>450</u> lbs
Left Front =	<u>760</u> lbs	Left Rear =	<u>430</u> lbs
TOTAL FRONT WEIGHT =	<u>1490</u> lbs	(<u>62.9</u> % of Total Vehicle Weight)	
TOTAL REAR WEIGHT =	<u>880</u> lbs	(<u>37.1</u> % of Total Vehicle Weight)	
TOTAL DELV. WEIGHT =	<u>2370</u> lbs		

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 102 lbs CARGO

Right Front =	<u>830</u> lbs	Right Rear =	<u>560</u> lbs
Left Front =	<u>850</u> lbs	Left Rear =	<u>560</u> lbs
TOTAL FRONT WEIGHT =	<u>1680</u> lbs	(<u>60</u> % of Total Vehicle Weight)	
TOTAL REAR WEIGHT =	<u>1120</u> lbs	(<u>40</u> % of Total Vehicle Weight)	
TOTAL TEST WEIGHT =	<u>2800</u> lbs		

Weight of ballast secured in vehicle trunk area = 0 lbs

Table 3
SUMMARY OF TEST CONDITIONS (Cont'd)

TEST CONDITIONS

Date of Test 10-22-80 Time of Test 1140 am/pm
Ambient Temperature 42 °F at impact area
Temperature in Occupant Compartment 67 °F

VEHICLE ATTITUDE (all dimensions in inches)

Delivered Attitude:	RF <u>26</u>	LF <u>26</u>	RR <u>25.75</u>	LR <u>25.5</u>
Test Attitude:	RF <u>25.3</u>	LF <u>25.3</u>	RR <u>24.6</u>	LR <u>24.5</u>

VEHICLE TIRE DATA

Recommended Cold Tire Pressure: Front = 35 psi Rear = 35 psi
Recommended Tire Size P 175/75R13
Tires on Vehicle Goodyear P175/75R13
Is Spare Tire a "Space Saver" X yes no
Is Spare Tire Standard Equipment X yes no

TEST FLUID DATA

Test Fluid Type: Red Stoddard Solvent #2 Spec. Grav.: 0.764
Kinematic Viscosity 0.96 Centistokes
EPA Capacity 13 gal (SPV)
Test Volume 12.1 gal (93% of EPA Capacity)
Fuel System Capacity (data from Owner's Manual) 13 gal
Details of fuel system Engine operated fuel pump. Fuel tank is located forward of the rear wheels and held in place by two tank straps. The fill tube is on the right side of the vehicle and sealed by a twist-type cap and is concealed by a hinged access door.
Electric Fuel Pump Yes X No Fuel Injection Yes X No
Does electric fuel pump operate with ignition switch "on" and the engine not operating Yes X No

VEHICLE REBOUND AND CRUSH

Overall Length of Test Vehicle: Pre-Test = R 174.2 /L 174.2 inches
Post-Test = R 147.9 /L 148.5 inches
Crush = R 26.3 /L 25.7

SECTION 3

SUMMARY OF RESULTS OF FMVSS 301-75

- Post-Impact Data
- Fuel System Integrity Post-Impact

FMVSS No. 301-75

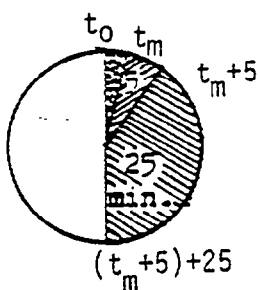
TEST VEHICLE NHTSA NO. 308-42-505 Test Date 10-22-80
Vehicle Manufacture/Make/Model 1981 Chrysler Dodge Aries

Test vehicle fuel tank filled to 90-91% of capacity with Stoddard Solvent and with electric fuel pump operating (if it will operate without engine operation). Part 572 test dummies located at each front designated seating position.

TEST VEHICLE IMPACT TYPE

_____ Frontal (35 mph)
 _____ Oblique (30 mph) with _____° barrier face first contacting
 _____ driver _____ passenger side
 X _____ Rear Moving Barrier (35 mph)
 _____ Lateral Moving Barrier (20 mph)

FUEL SPILLAGE MEASUREMENT



	Actual	Max. Allow.
From impact until vehicle motion ceases	0	1 oz
For 5 min. period after vehicle motion ceases	0	5 oz
For next 25 min.	0	1 oz/1 min

TEST VEHICLE STATIC ROLLOVER

Test information will be added to the following static rollover data sheets

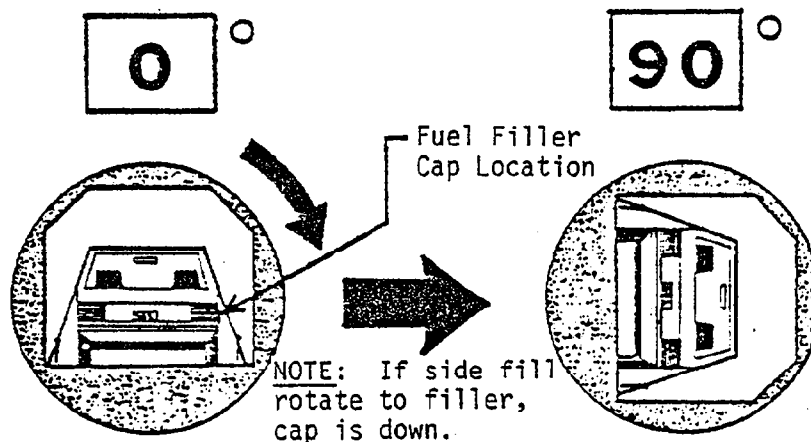
- (1) Figure 8A - Rollover data for 0° to 90° test phase
- (2) Figure 8B - Rollover data for 90° to 180° test phase
- (3) Figure 8C - Rollover data for 180° to 270° test phase
- (4) Figure 8D - Rollover data for 270° to 360° test phase

SOLVENT SPILLAGE DETAILS

No fuel spillage after impact.

Table 5A
FMVSS NO. 301-75 STATIC ROLLOVER DATA SHEET

TEST PHASE



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD

Rollover Fixture 90° Rotation Time = 2 minutes 53 seconds
(Spec. Range = 1 to 3 min.)
FMVSS 301-75 Position Hold Time = 5 minutes 00 seconds
TOTAL = 7 minutes 53 seconds
Next Whole Minute Interval = 8 minutes

FMVSS 301-75 REQUIREMENTS

Time Period

First 5 min. <u>from</u> onset of rotation	6th min.	7th min.	8th min. if reqd.
--	----------	----------	-------------------

Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

ACTUAL TEST VEHICLE SOLVENT SPILLAGE

0	0	0	0
---	---	---	---

NOTE: Record spillage for whole minute intervals only as determined above.

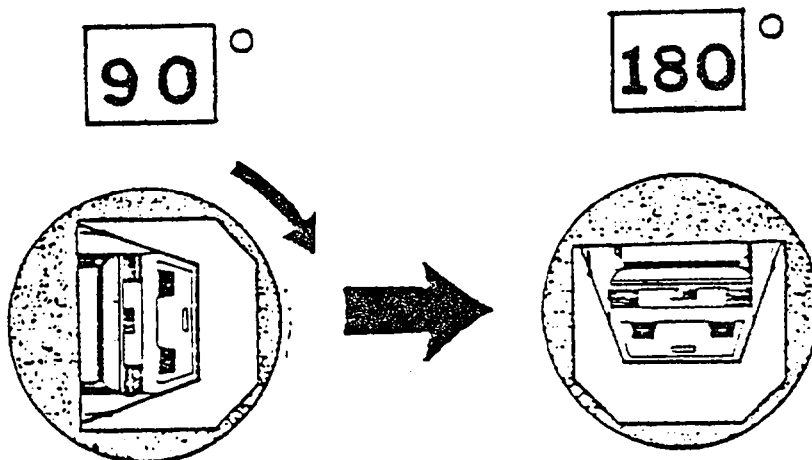
SOLVENT SPILLAGE LOCATION(S)

None

Table 5B

FMVSS NO. 301-75 STATIC ROLLOVER DATA SHEET

TEST PHASE



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD

Rollover Fixture 90° Rotation Time = 2 minutes 52 seconds
 (Spec. Range = 1 to 3 min.)
 FMVSS 301-75 Position Hold Time = 5 minutes 00 seconds
 TOTAL = 2 minutes 52 seconds
 Next Whole Minute Interval = 8 minutes

FMVSS 301-75 REQUIREMENTS

Time Period

First 5 min. <u>from</u> onset of rotation	6th min.	7th min.	8th min. if reqd.
--	----------	----------	-------------------

Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

ACTUAL TEST VEHICLE SOLVENT SPILLAGE

0	0	0	0
---	---	---	---

NOTE: Record spillage for whole minute intervals only as determined above.

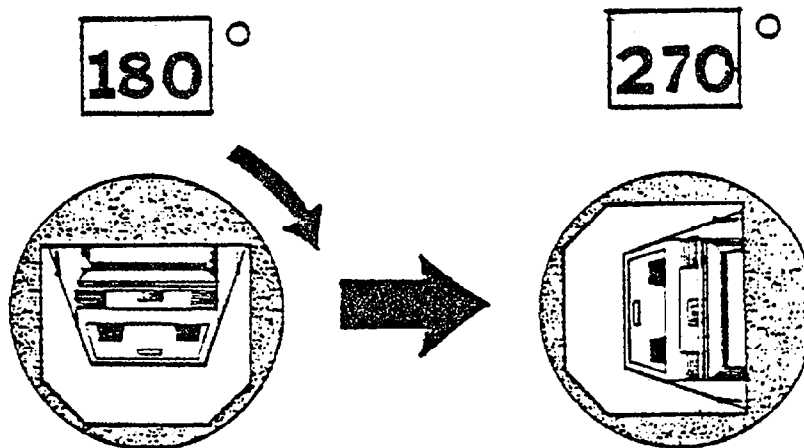
SOLVENT SPILLAGE LOCATION(S)

None

VEHICLE NHTSA ID NO. 308-42-505

Table 5C
FMVSS NO. 301-75 STATIC ROLLOVER DATA SHEET

TEST PHASE



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD

Rollover Fixture 90° Rotation Time = 2 minutes 58 seconds
(Spec. Range = 1 to 3 min.)
FMVSS 301-75 Position Hold Time = 5 minutes 00 seconds
TOTAL = 7 minutes 58 seconds
Next Whole Minute Interval = 8 minutes

FMVSS 301-75 REQUIREMENTS

Time Period

First 5 min. <u>from</u> onset of rotation	6th min.	7th min.	8th min. if reqd.
--	----------	----------	-------------------

Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

ACTUAL TEST VEHICLE SOLVENT SPILLAGE

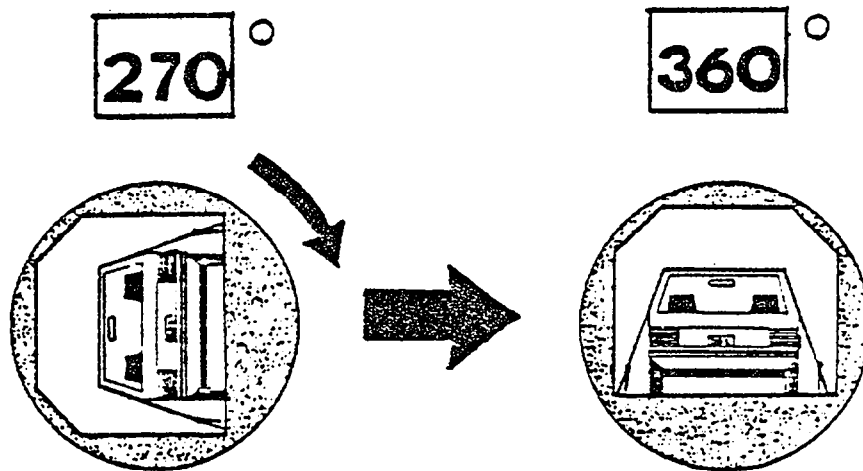
0	0	0	0
---	---	---	---

NOTE: Record spillage for whole minute intervals only as determined above.

SOLVENT SPILLAGE LOCATION(S)

None

Table 5D

FMVSS NO. 301-75 STATIC ROLLOVER DATA SHEETTEST PHASEDETERMINATION OF SOLVENT COLLECTION TIME PERIOD

Rollover Fixture 90° Rotation Time = 2 minutes 57 seconds
 (Spec. Range = 1 to 3 min.)
 FMVSS 301-75 Position Hold Time = 5 minutes 00 seconds
 TOTAL = 7 minutes 57 seconds
 Next Whole Minute Interval = 8 minutes

FMVSS 301-75 REQUIREMENTS

Time Period

First 5 min. <u>from</u> onset of rotation	6th min.	7th min.	8th min. if reqd.
--	----------	----------	-------------------

Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

ACTUAL TEST VEHICLE SOLVENT SPILLAGE

0	0	0	0
---	---	---	---

NOTE: Record spillage for whole minute intervals only as determined above.

SOLVENT SPILLAGE LOCATION(S)

None

SECTION 4

OCCUPANT AND VEHICLE INFORMATION

- Pre- and Post-Test Vehicle Measurements
- Vehicle Accelerometer Locations
- Camera Locations and Focal Lengths
- Dummy Positions
- Owners Manual Restraint System Operating Instructions

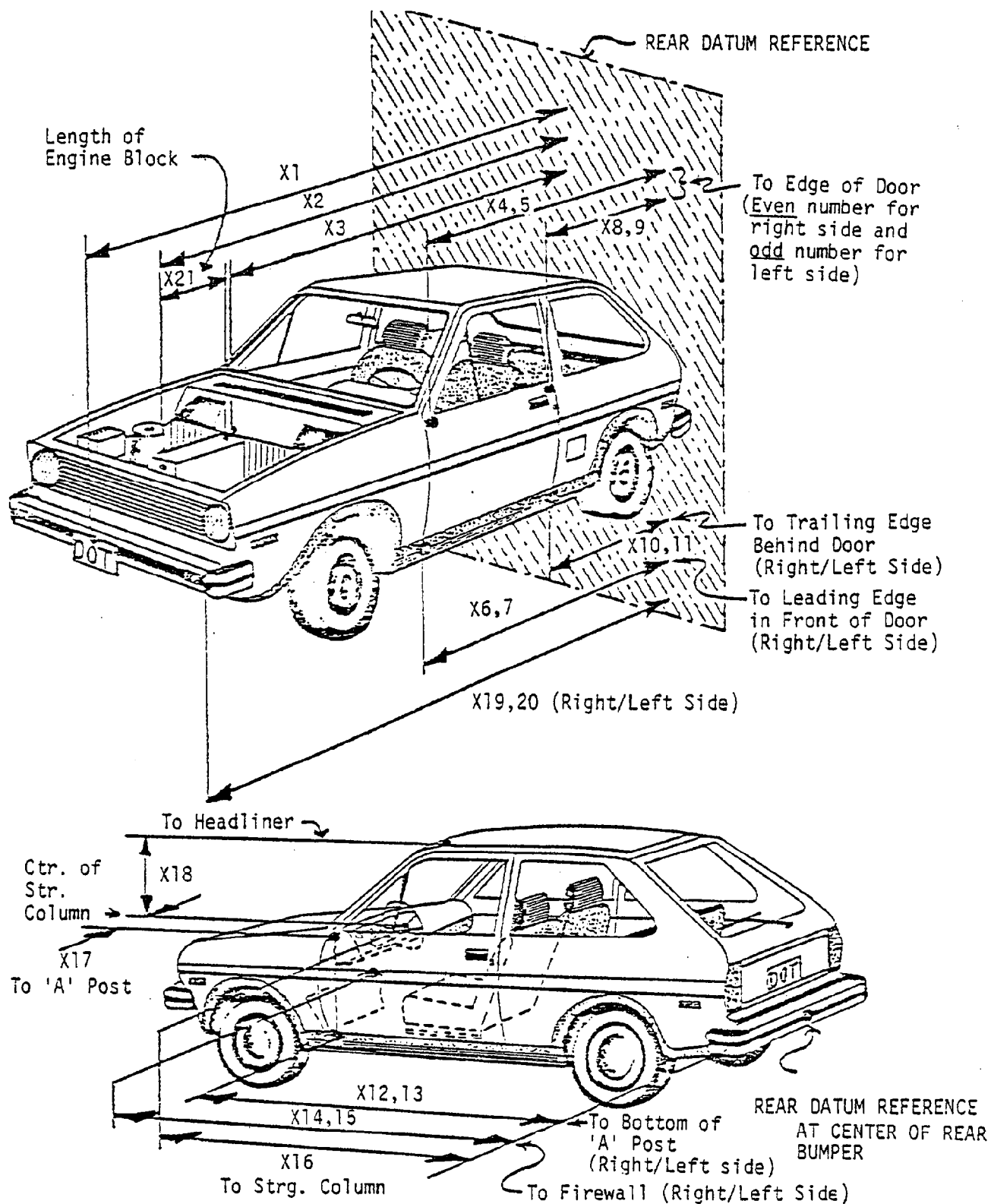
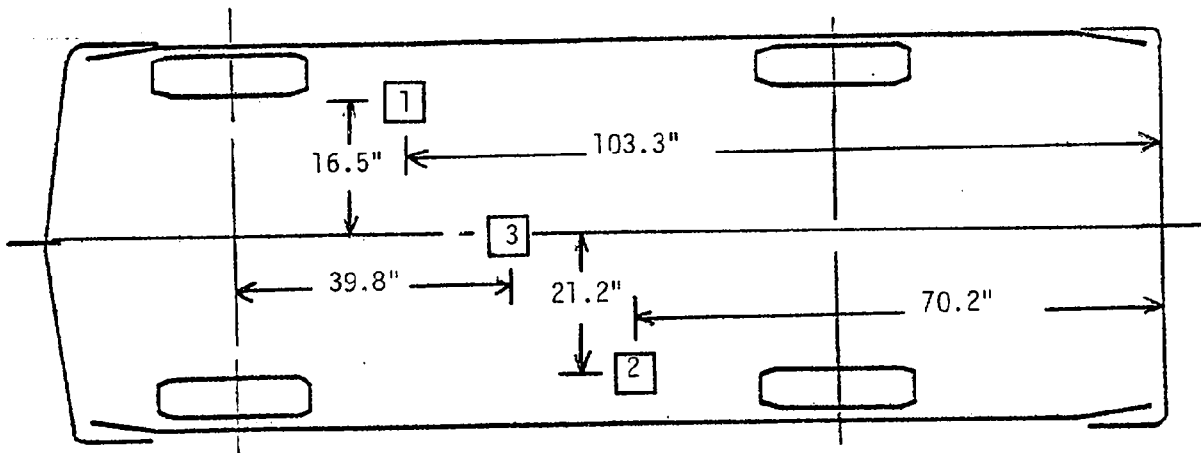


FIGURE 1 PRE-TEST AND POST-TEST MEASUREMENT POINTS

1981 Dodge Arries - 300-42-303				
VEHICLE MEASUREMENTS		ALL DIMENSIONS IN INCHES		
NO.	TYPE OF MEASUREMENT	PRE- TEST	POST TEST	Diff.
X1	Total Length of Vehicle at Centerline	176.0	150.1	25.9
X2	Rear Surface of Vehicle to Front of Engine	N/A	N/A	--
X3	Rear Surface of Vehicle to Firewall	N/A	N/A	--
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	N/A	N/A	--
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	N/A	N/A	--
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	N/A	N/A	--
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	N/A	N/A	--
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	67.1	41.6	25.5
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	67.1	42.3	24.8
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	N/A	N/A	--
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	N/A	N/A	--
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	N/A	N/A	--
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	N/A	N/A	--
X14	Rear Surface of Vehicle to Firewall - Right Side	N/A	N/A	--
X15	Rear Surface of Vehicle to Firewall - Left Side	N/A	N/A	--
X16	Rear Surface of Vehicle to Steering Column	N/A	N/A	--
X17	Center of Steering Column to "A" Post	N/A	N/A	--
X18	Center of Steering Column to Headliner	N/A	N/A	--
X19	Rear Surface of Vehicle to Right Side of Front Bumper	174.2	147.9	26.3
X20	Rear Surface of Vehicle to Left Side of Front Bumper	174.2	148.5	25.7
X21	Length of Engine Block			
X22	Dash to Rear Deck	75.3	68.1	7.2



ACCELEROMETER NUMBER *		ACCELEROMETER LOCATION	DIRECTION		
			X	Y	Z
1		Accelerometer Pack #1 Front Crossmem.	X		X
2		Accelerometer Pack #2 Rear Crossmem.	X		X
3		Accelerometer Pack #3 C/G	X	X	X

*The accelerometer pack number can be correlated with the vehicle response data traces found in Appendix B.

FIGURE 2 VEHICLE ACCELEROMETER LOCATIONS

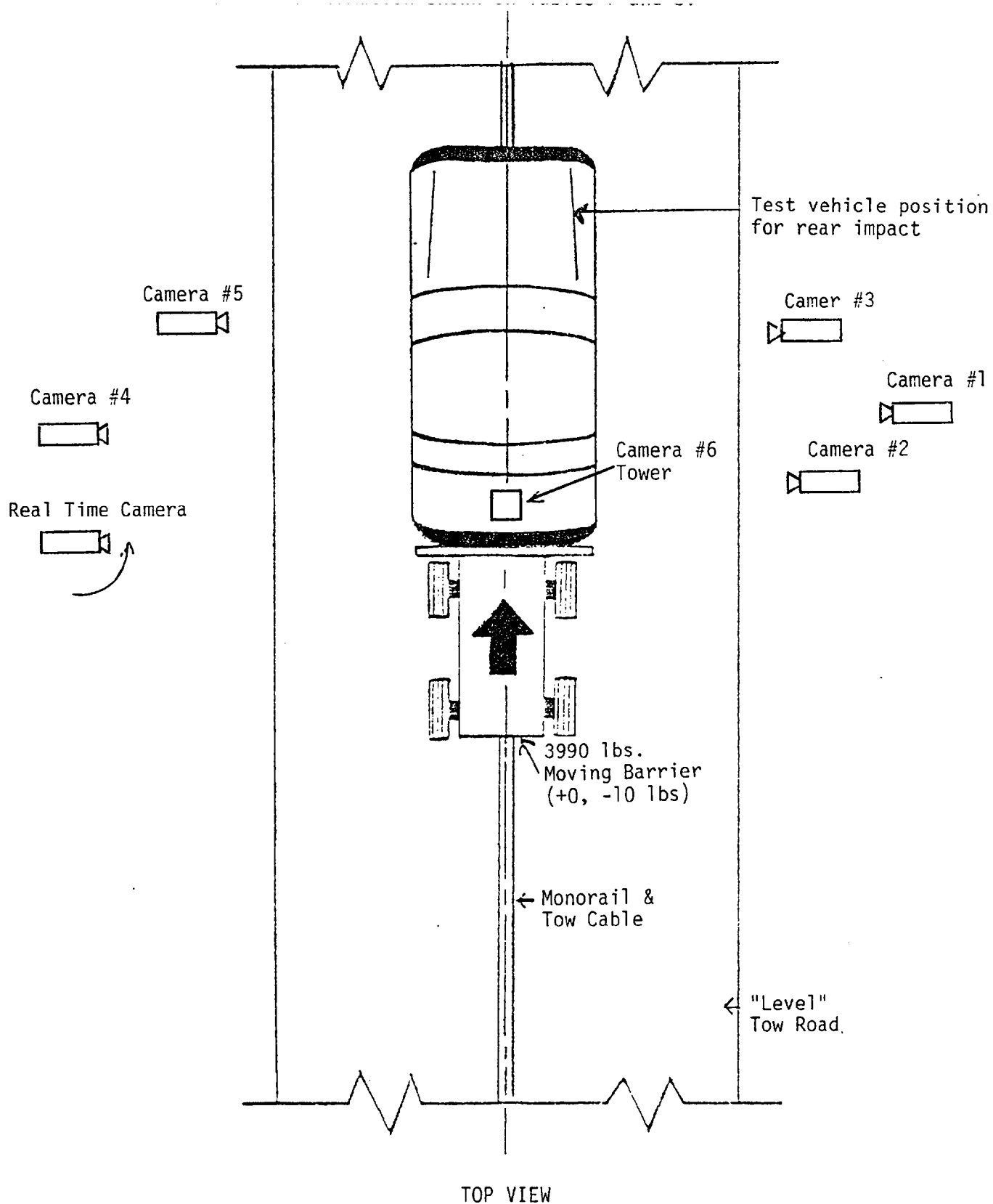


FIGURE 3 CAMERA POSITIONS FOR REAR IMPACTS

Table 7

HIGH SPEED CAMERA LOCATIONSTest No.: 308-42-505Vehicle No. 1981 Dodge Aries

CAMERA NUMBER	VIEW	CAMERA POSITIONS (IN)*			CAMERA ANGLE (DEG)**	FILM PLANE TO HEAD TARGET (IN) X
		X	Y	Z		
1	Impact Event	413	144	51	- 4	389
2	Impact (Close-up)	312	100	41	- 3	288
3	Right Front Passenger	150	72	41	- 3.5	126
4	Impact Event	295	68	49.5	- 1	271
5	Driver	243	96	45.5	- 2	219
6	Tower Overhead	0	75	388	-80	---
7						
8						
9						

* X = film plane to monorail centerline
 Y = film plane to impact location
 Z = film plane to ground

** Referenced to Horizontal Plane

Table 8

HIGH SPEED CAMERA INFORMATION

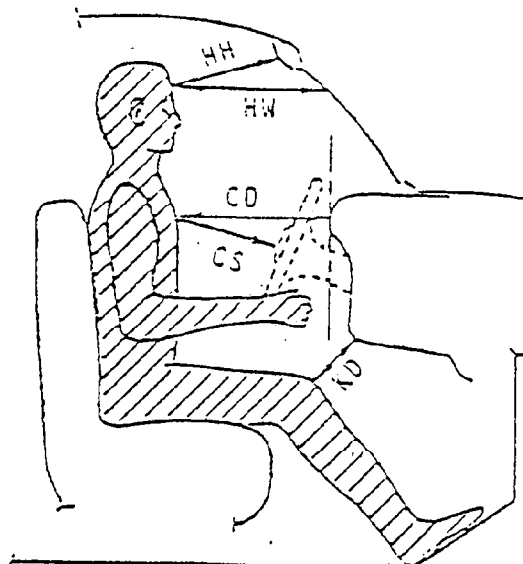
(Test 308-42-505)

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)
1	Impact Event	Photosonic	13 mm	900
2	Impact Close-up	Photosonic	35 mm	900
3	Right Front Passenger	Photosonic	35 mm	900
4	Impact Event	Photosonic	13 mm	900
5	Driver	Photosonic	35 mm	900
6	Tower Overhead	Photosonic	13 mm	900

NOTE: CAMERAS ARE NUMBERED ACCORDING TO SPLICING SEQUENCE OF FILM.

(24 fps) REAL TIME MOVIE FILM COVERAGE OF PRE-CRASH, POST-CRASH
AND CRASH EVENT SPLICED AT START OF FILM.

	<u>DRIVER</u>	<u>PASS</u>
HH	13.0	13.0
HW	16.5	16.2
CD	21.2	21.0
CS	13.5	--
KDL	5.6	4.5
KDR	5.0	4.5



HR	5.7	6.0
HS	7.2	7.5
AD	4.6	5.2
HD	7.25	7.7

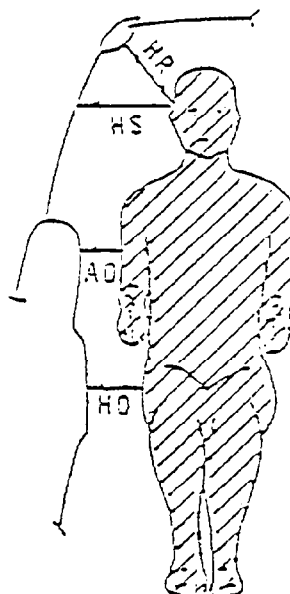


FIGURE 4 OCCUPANT CLEARANCE DIMENSIONS

the lap belt portion is desired, pull up on the shoulder belt as shown.

5. If the shoulder belt feels snug, move your shoulder forward slightly, or give a slight tug on the belt, such that you withdraw an inch or so of webbing.

The belt will retain the small amount of slack necessary for comfort when you return to your normal seating position. If the belt is still too tight, pull out 6 to 8 inches of webbing, let it return to your chest and repeat the above motion. **NOTE:** The door must be closed to achieve belt tension relief.

The shoulder belt will allow unrestricted movement under normal conditions. Extreme movements will probably require resetting the slack in the shoulder belt. The belt will lock tightly in the event of an accident.

6. To release the belt, push the button on the buckle. The belt will automatically retract to its stowed position when the door is opened.



Front Center and Rear Lap Belts

The center front and all rear seating positions are equipped with lap belts only. The lap belts should be worn with the upper edge of the belt drawn across the thighs and snug against the hips. To reduce the risk of sliding under the belt in a collision, it should be adjusted as tight as comfort will allow **WHILE SITTING WELL BACK AND ERECT IN THE SEAT.**

The center front and center rear seat belts are lengthened by tilting the tip (latch plate) relative to the webbing and pulling. To shorten the belt, pull the loose end of the webbing.

The outboard rear seat positions are equipped with automatic locking retractors. Withdraw the belt from the retractor in a continuous motion, forward and upward away from the seat, until the belt is extended as far as possible. Bring the belt across the body and insert the latch plate in the buckle until a "click" is heard. Tighten the belt by pulling the webbing back toward and into the retractor until the belt fits snugly on the hips.

Never use the same lap belt on more than one person at a time.

Seats, Seat Belts, Mirrors

Seat Belts

Always use the seat belts. The chance of a serious injury is greatly reduced when the seat-belts are properly used.

Seat belts provide protection against being thrown from the vehicle as well as reducing the risk of an injury caused by striking the interior of the vehicle.

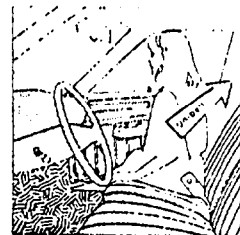
The following pages contain the recommended procedures for fastening, adjusting and wearing the belts for maximum comfort and safety.

Front Seats

The "UNIBELT" or single continuous-belt restraint system, is installed for the driver and front seat passenger. This system incorporates a vehicle sensitive shoulder belt retractor, designed to lock (i.e. restrict belt travel) only during very sudden stops or impacts. This feature allows the shoulder belt to move freely with the wearer. It will not lock by jerking or pulling the webbing.

UNIBELT SYSTEM WITH TENSION RELIEVER AND AUTOMATIC RELEASE

1. Enter the car and adjust the seat. Note the metal tip of the Unibelt in its stowed position, high on the vertical pillar.



CLOSE DOOR

2. Grasp the metal tip and slide it up the webbing as far as necessary to go around your lap as you pull out the webbing. A couple of tries and this will become an automatic one handed operation.



3. As you pull the webbing, move the metal tip toward the buckle. This system will not lock up if you stop or hesitate, so relax and continue to "buckle-up".



Insert the tip into the buckle until a "click" is heard.

4. Slack will automatically be removed due to tension created by the retractor. If a snug fit in

FIGURE 5 OWNERS MANUAL RESTRAINT SYSTEM OPERATING INSTRUCTIONS

APPENDIX A

STILL PHOTOGRAPHS

1981 DODGE ARIES 2-DOOR SEDAN

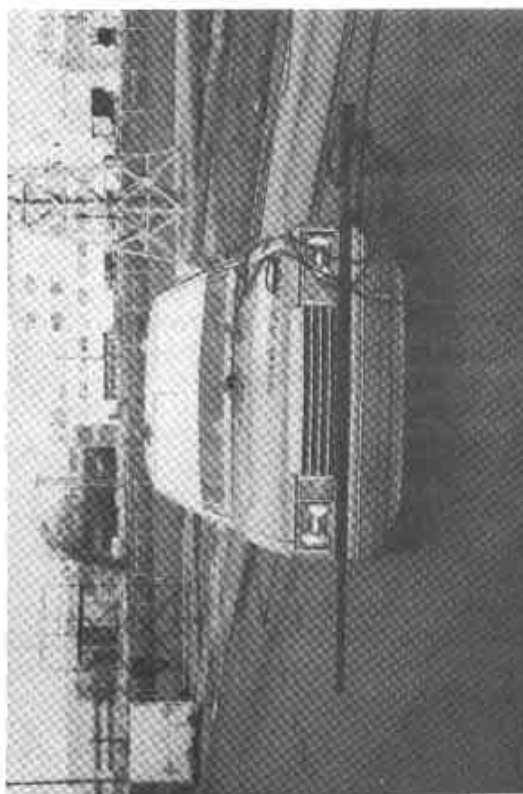
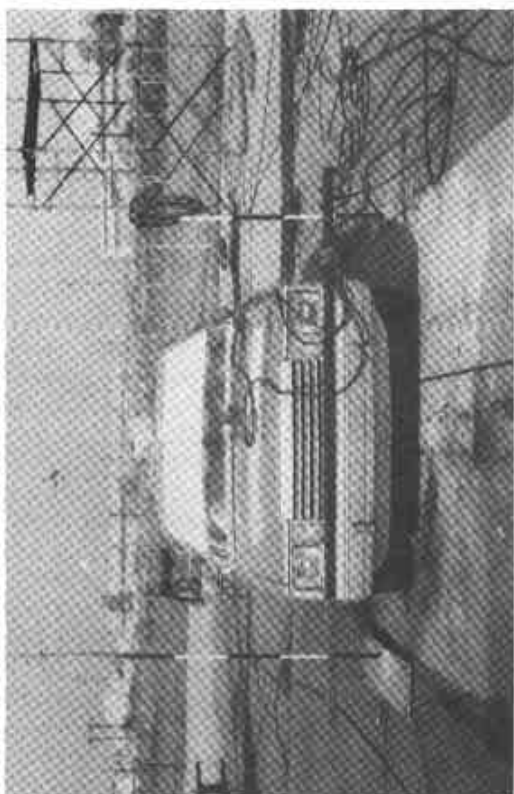
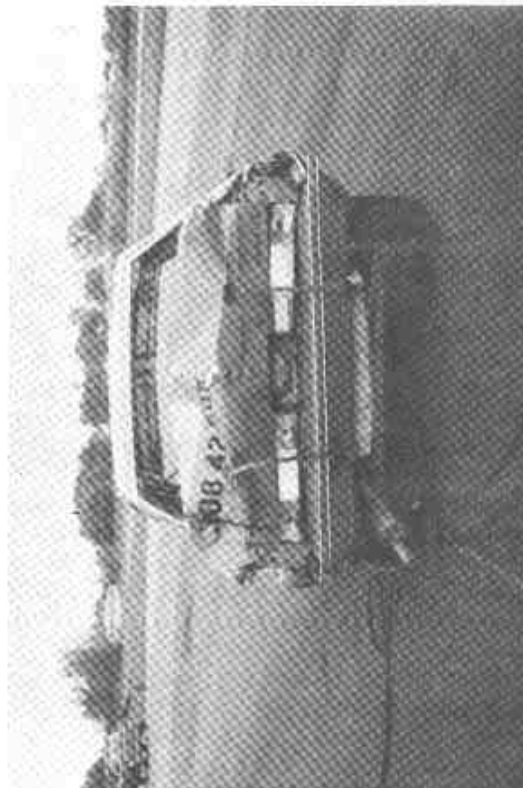
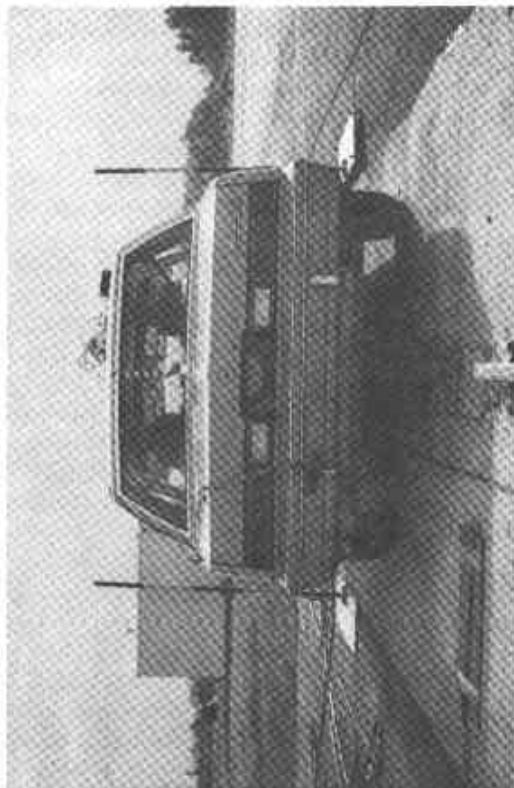


FIGURE A-1 PRE- AND POST-TEST VIEWS OF FRONT AND REAR EXTERIOR

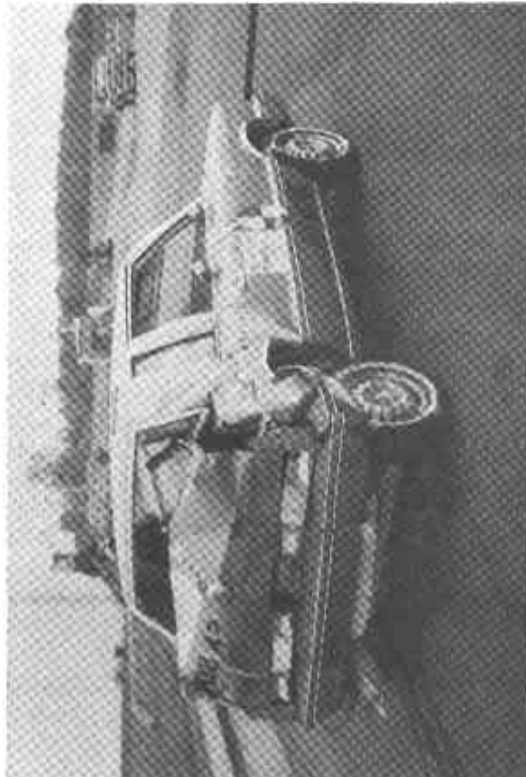
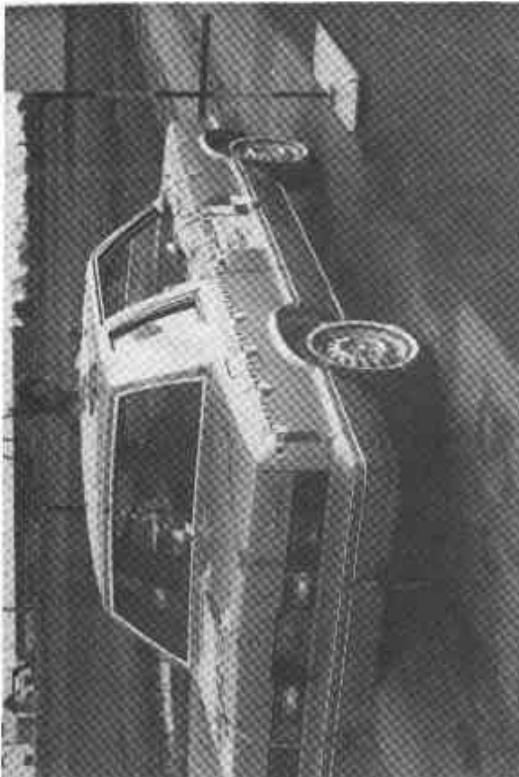
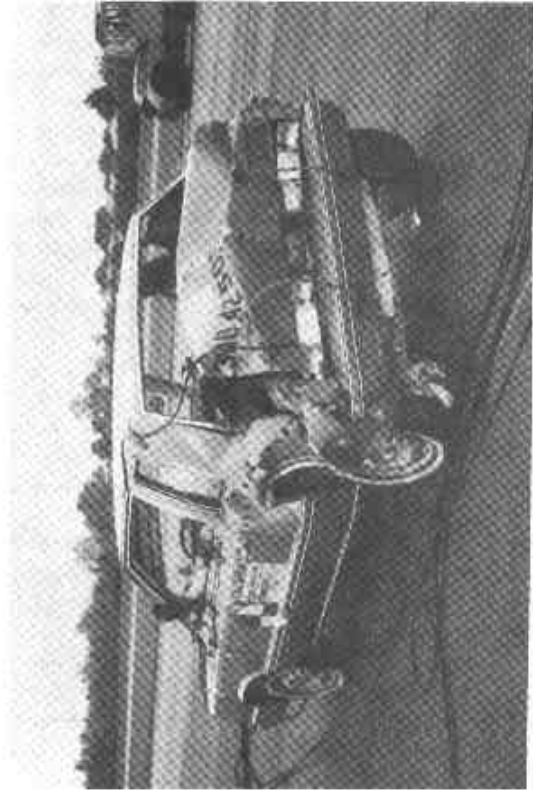
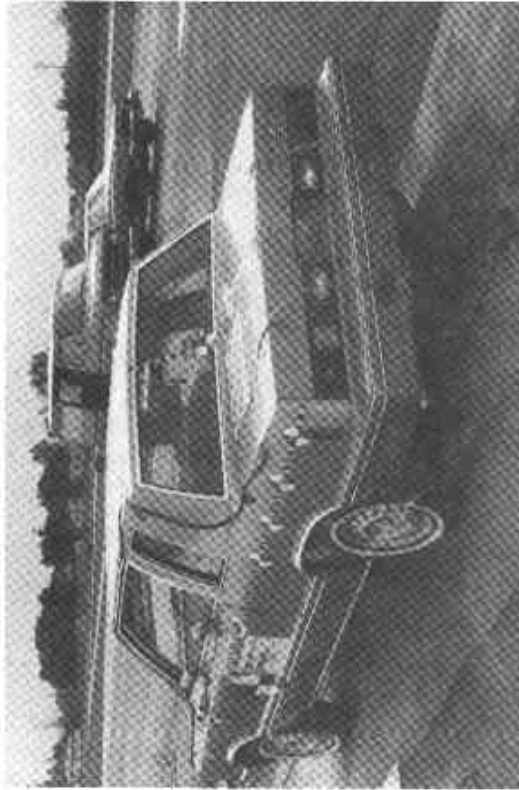


FIGURE A-2 PRE- AND POST-TEST VIEWS OF RIGHT AND LEFT REAR THREE-QUARTERS

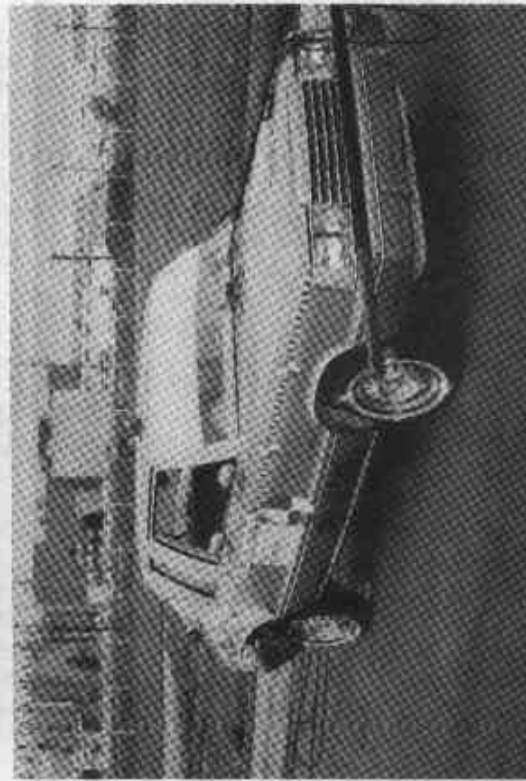
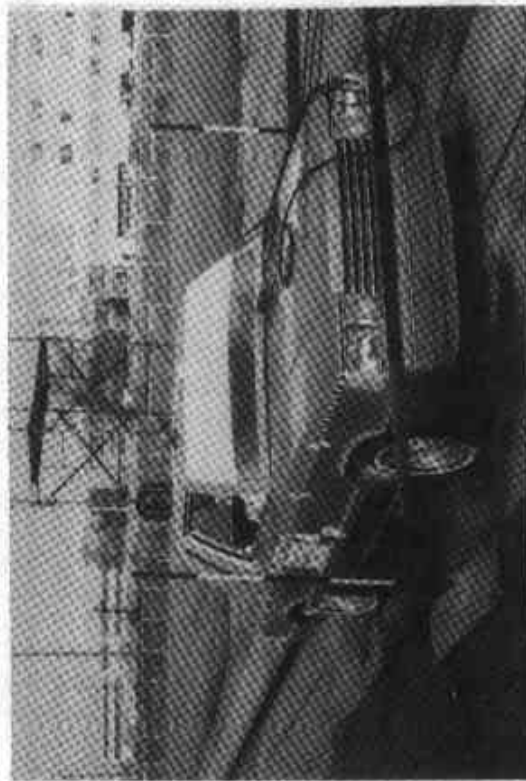
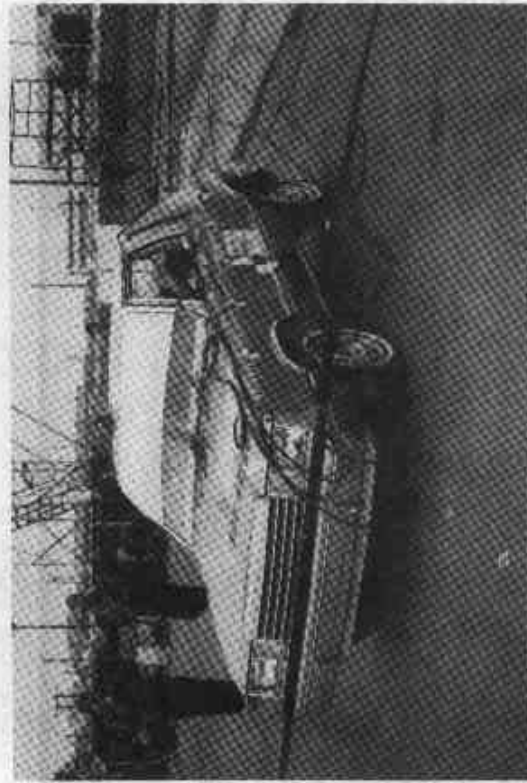
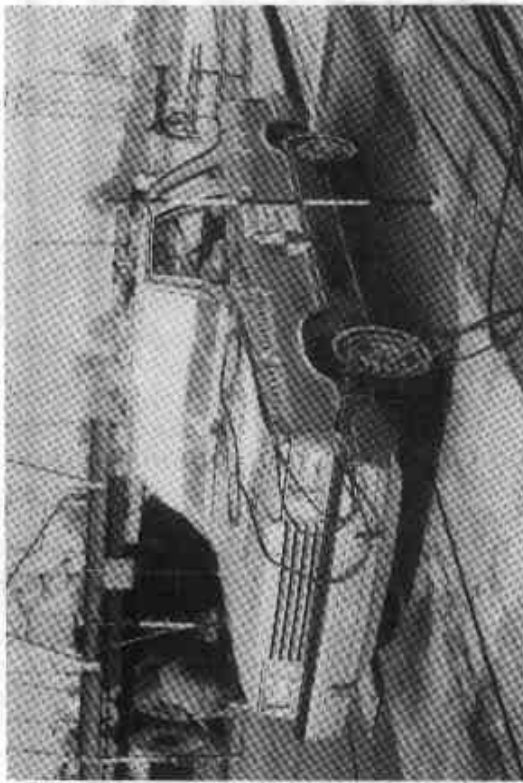


FIGURE A-3 PRE- AND POST-TEST VIEWS OF RIGHT AND LEFT FRONT THREE-QUARTERS

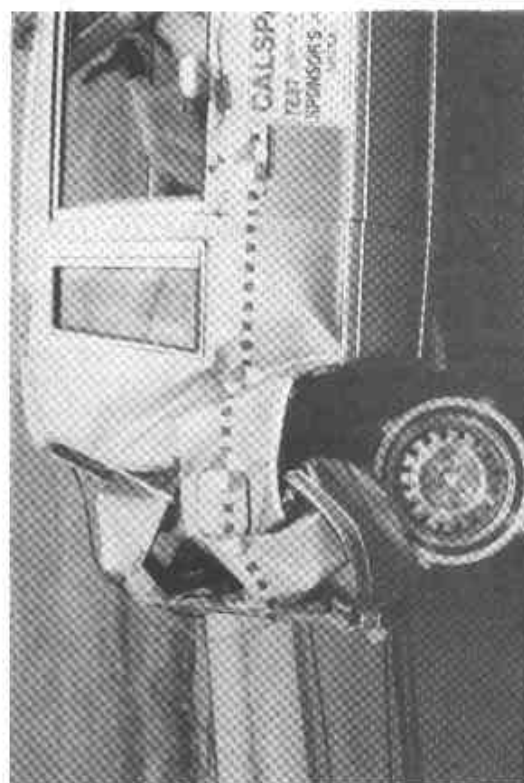
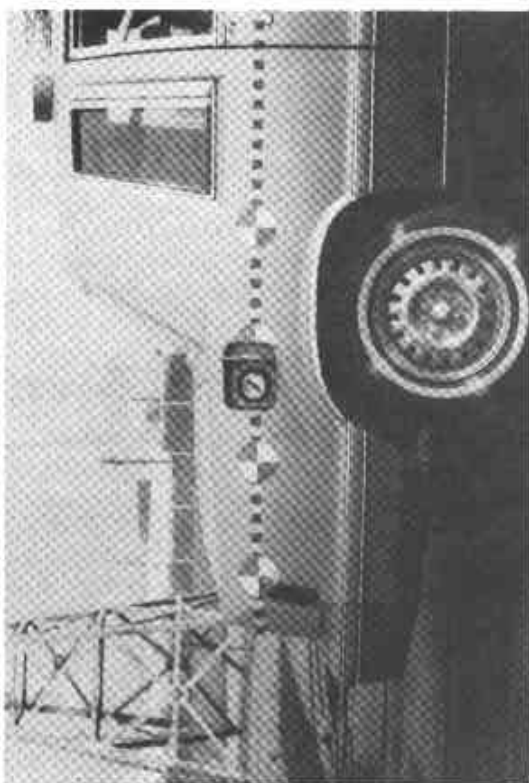
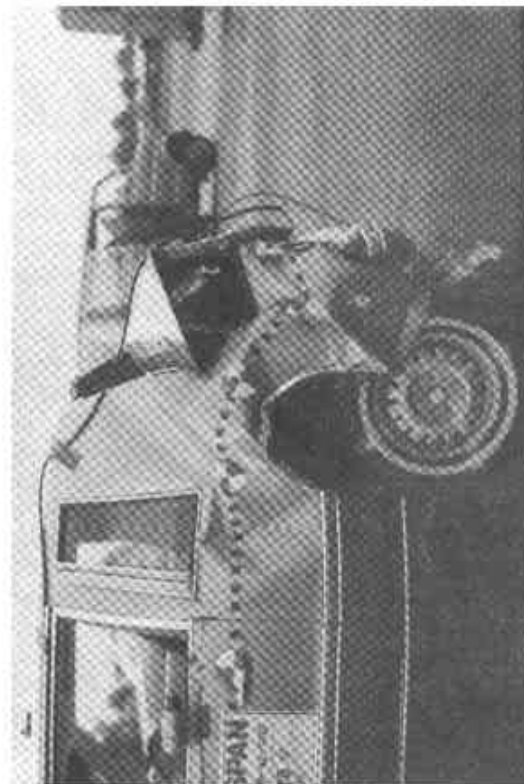


FIGURE A-4 PRE- AND POST-TEST VIEWS OF RIGHT AND LEFT REAR QUARTERS

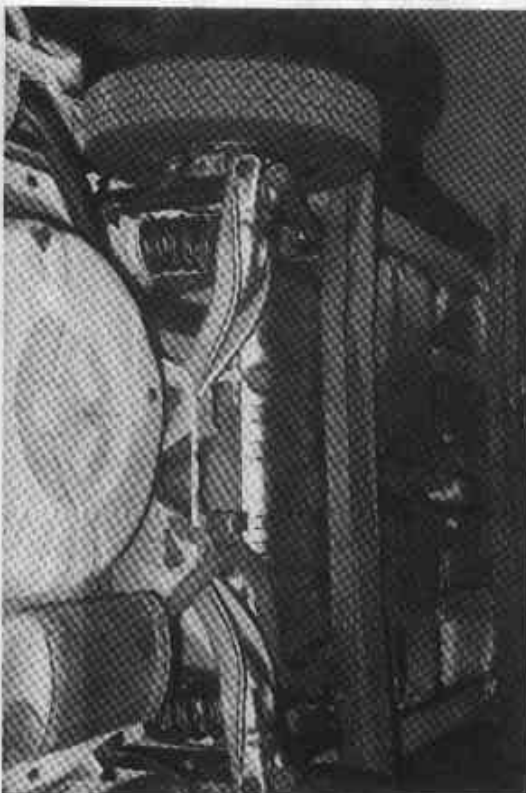


FIGURE A-5 PRE- AND POST-TEST VIEWS OF REAR UNDERBODY

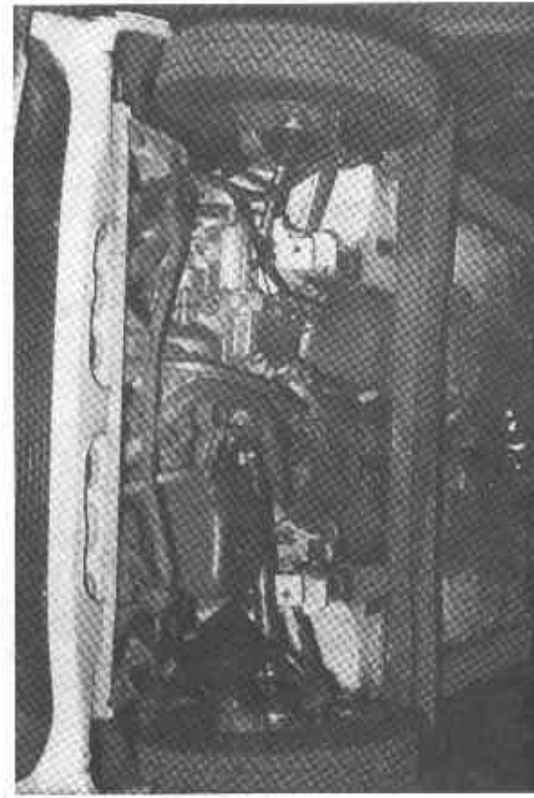


FIGURE A-7 PRE- AND POST-TEST VIEWS OF FRONT UNDERBODY



FIGURE A-8 PRE- AND POST-TEST VIEWS OF DRIVER'S POSITIONS

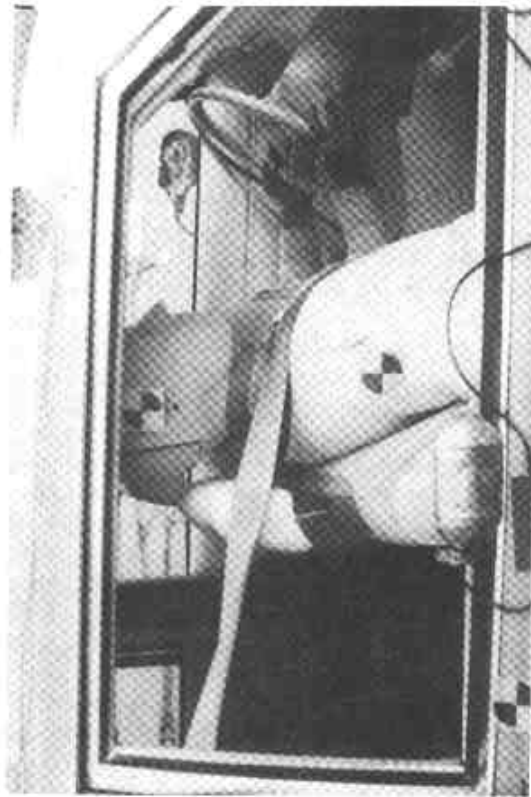


FIGURE A-9 PRE- AND POST-TEST VIEWS OF RIGHT FRONT PASSENGER'S POSITIONS



FIGURE A-10 POST-TEST VIEWS OF DRIVER'S AND RIGHT FRONT PASSENGER'S HEAD CONTACT WITH REAR SEAT BACK

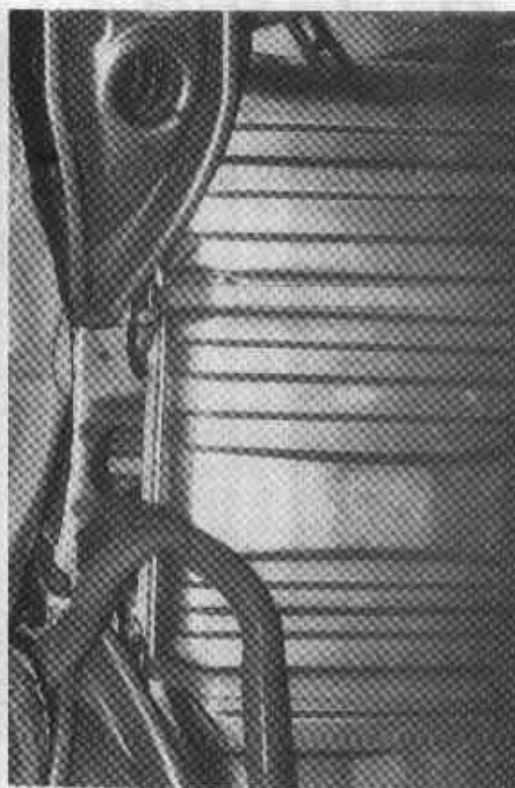


FIGURE A-11 POST-TEST VIEW OF FUEL TANK



FIGURE A-12 VELOCITY TRAP COUNTER

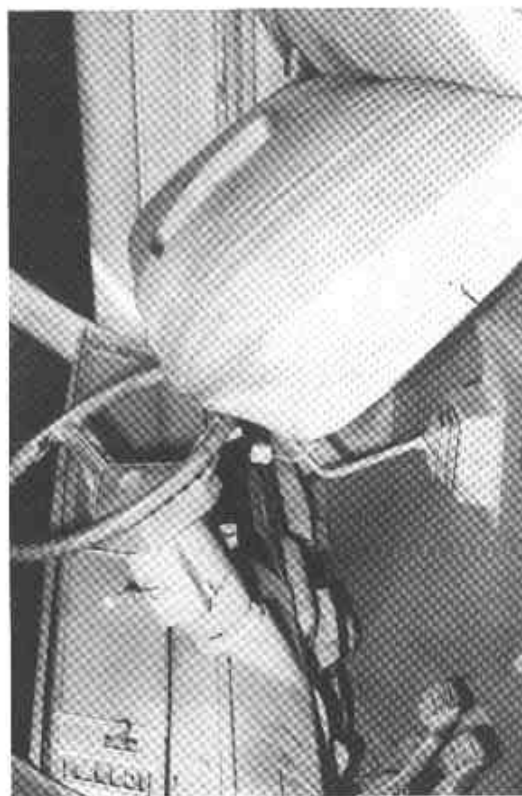
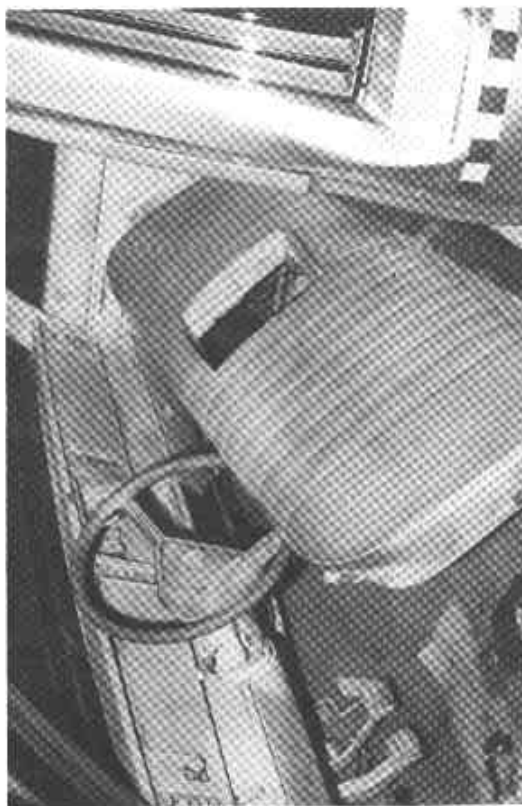
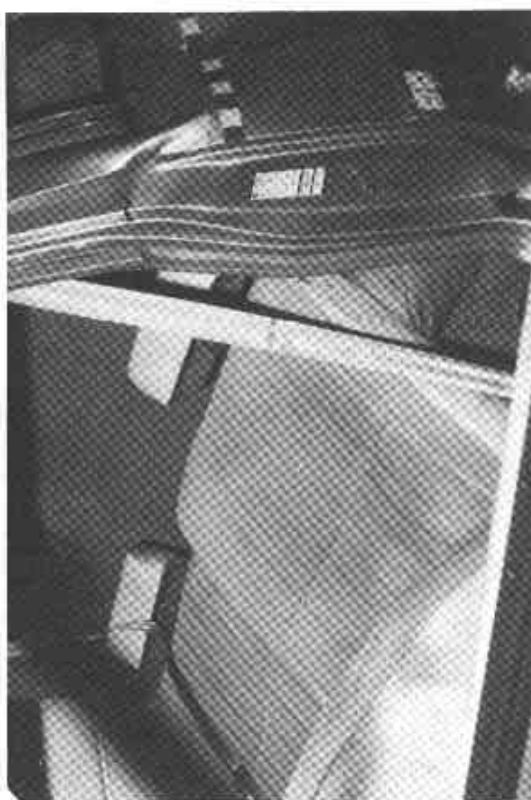


FIGURE A-13 POST-TEST VIEWS OF INTERIOR

APPENDIX B

VEHICLE RESPONSE DATA

TEST NO. 308-42-505

1981 DODGE ARIES 2-DOOR SEDAN

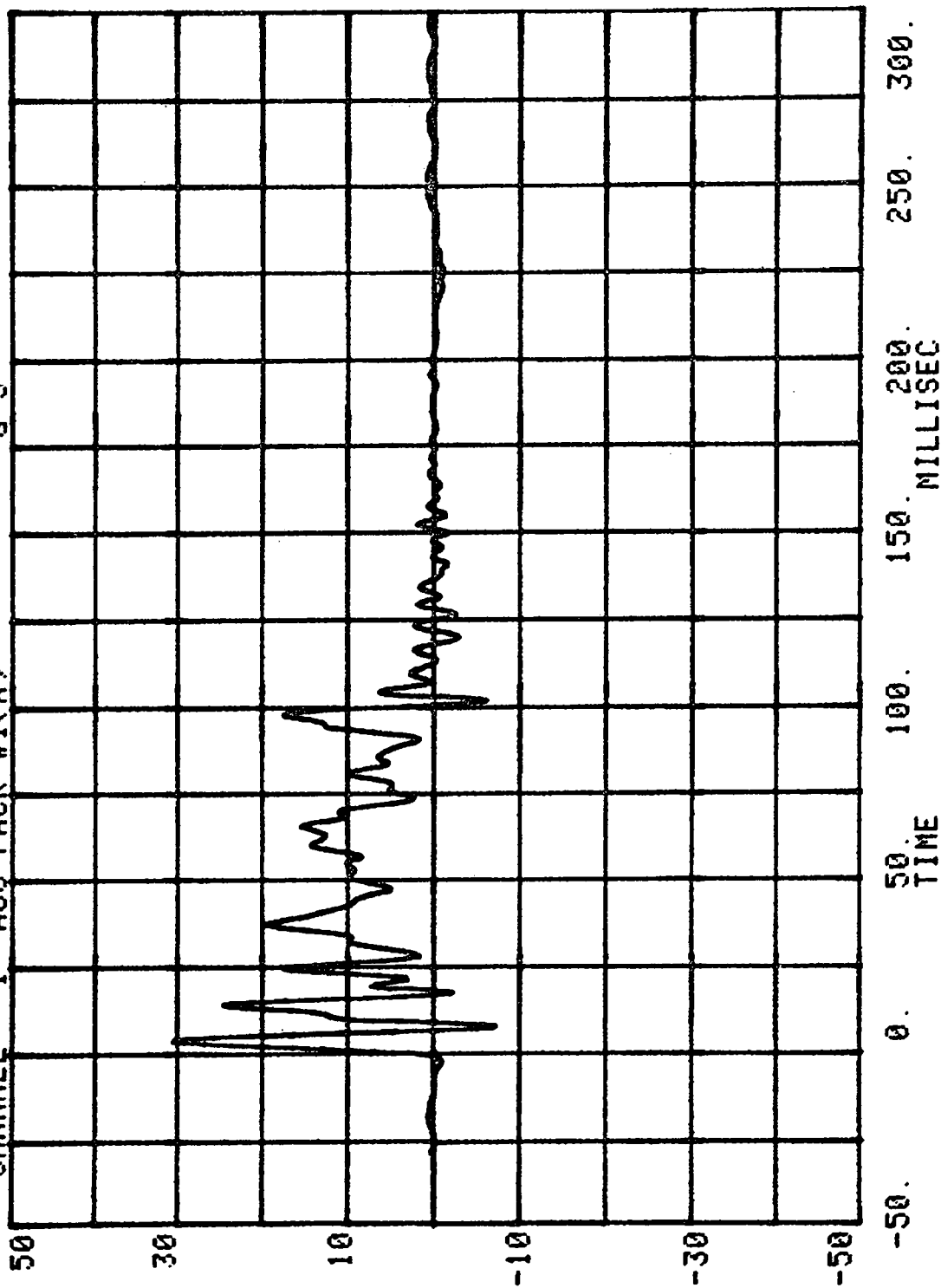
VEHICLE DATA

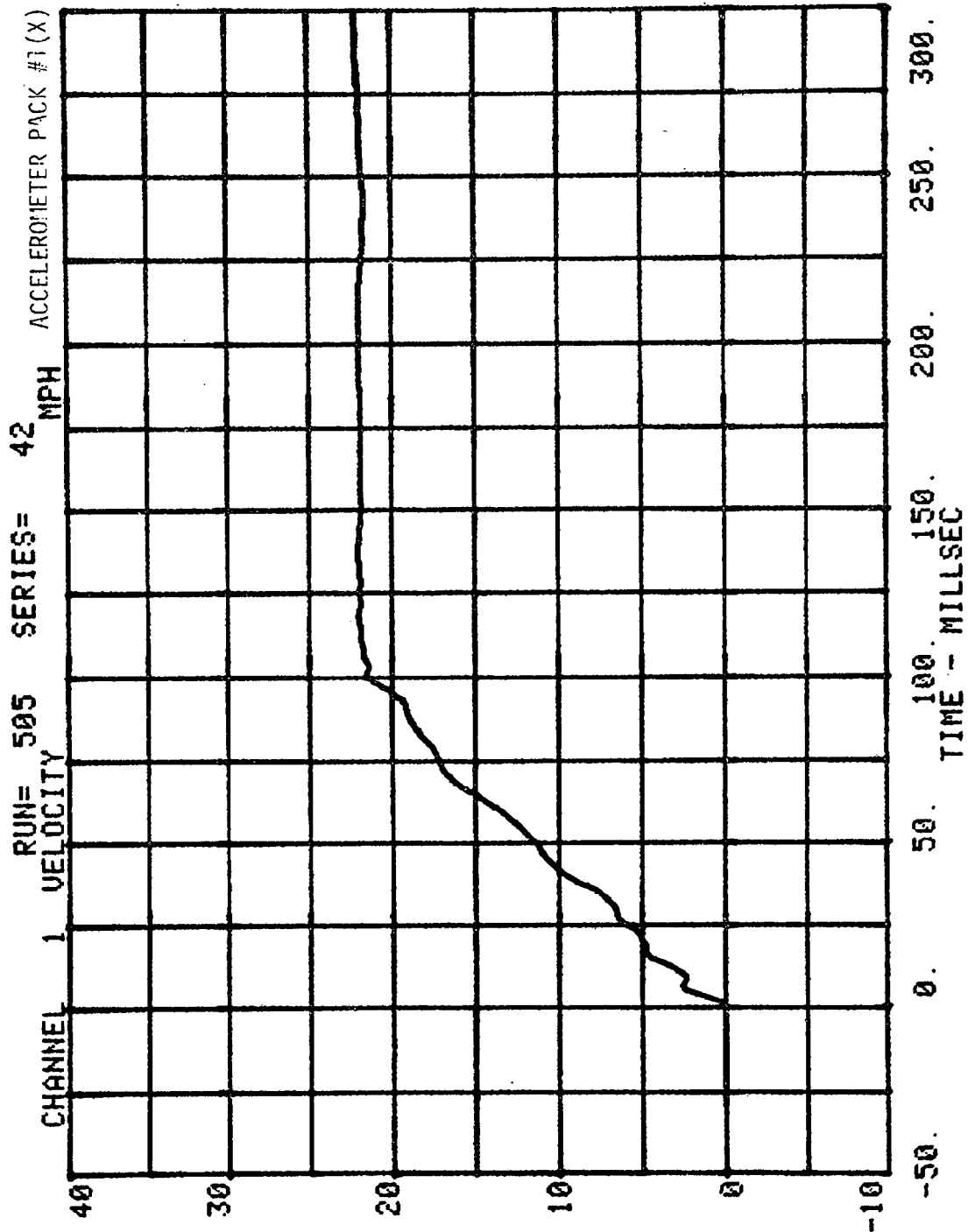
FILTER CHANNEL CLASS

60

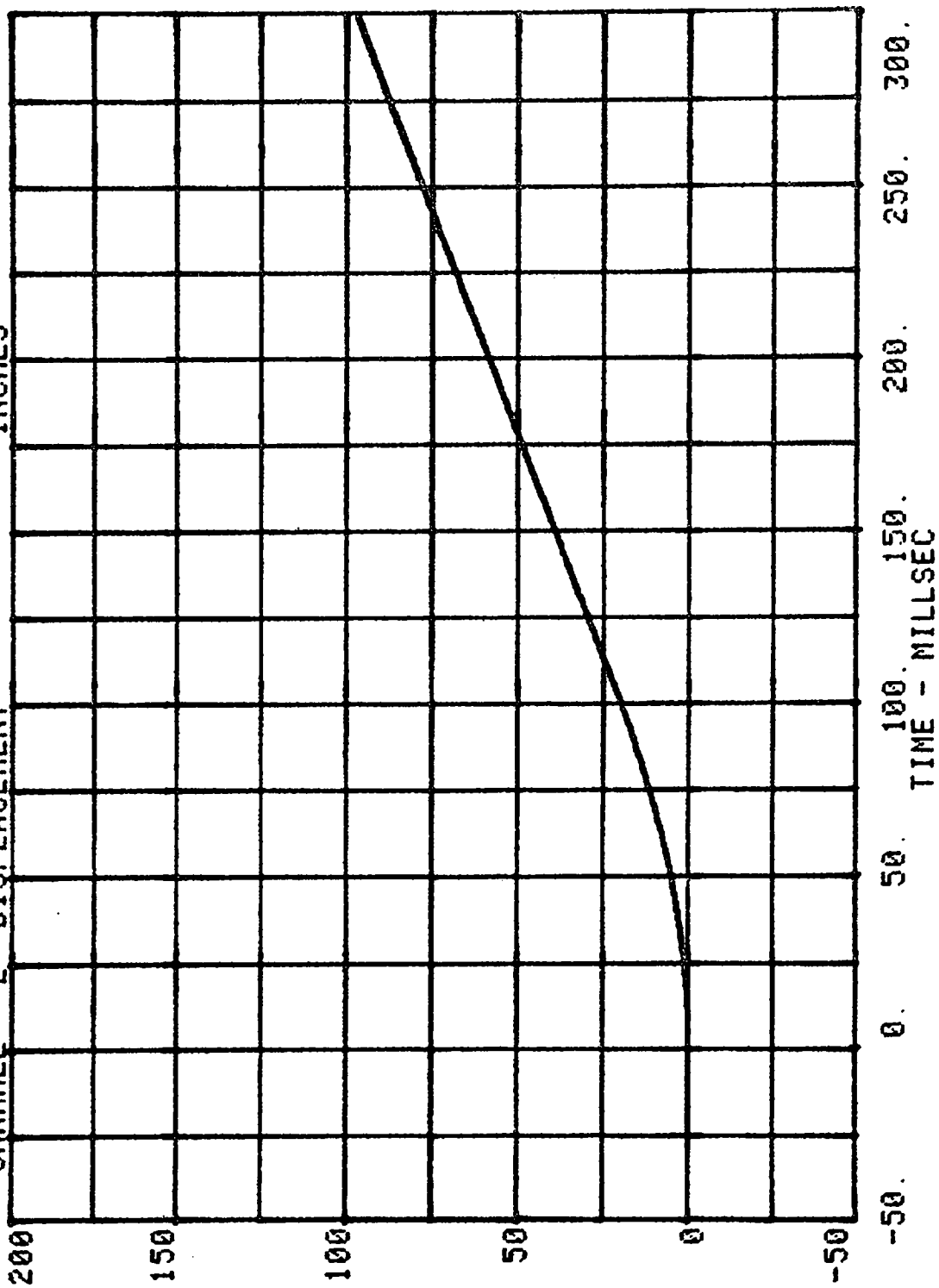
See Figure 4-2, page 4-4, for Accelerometer Layout.

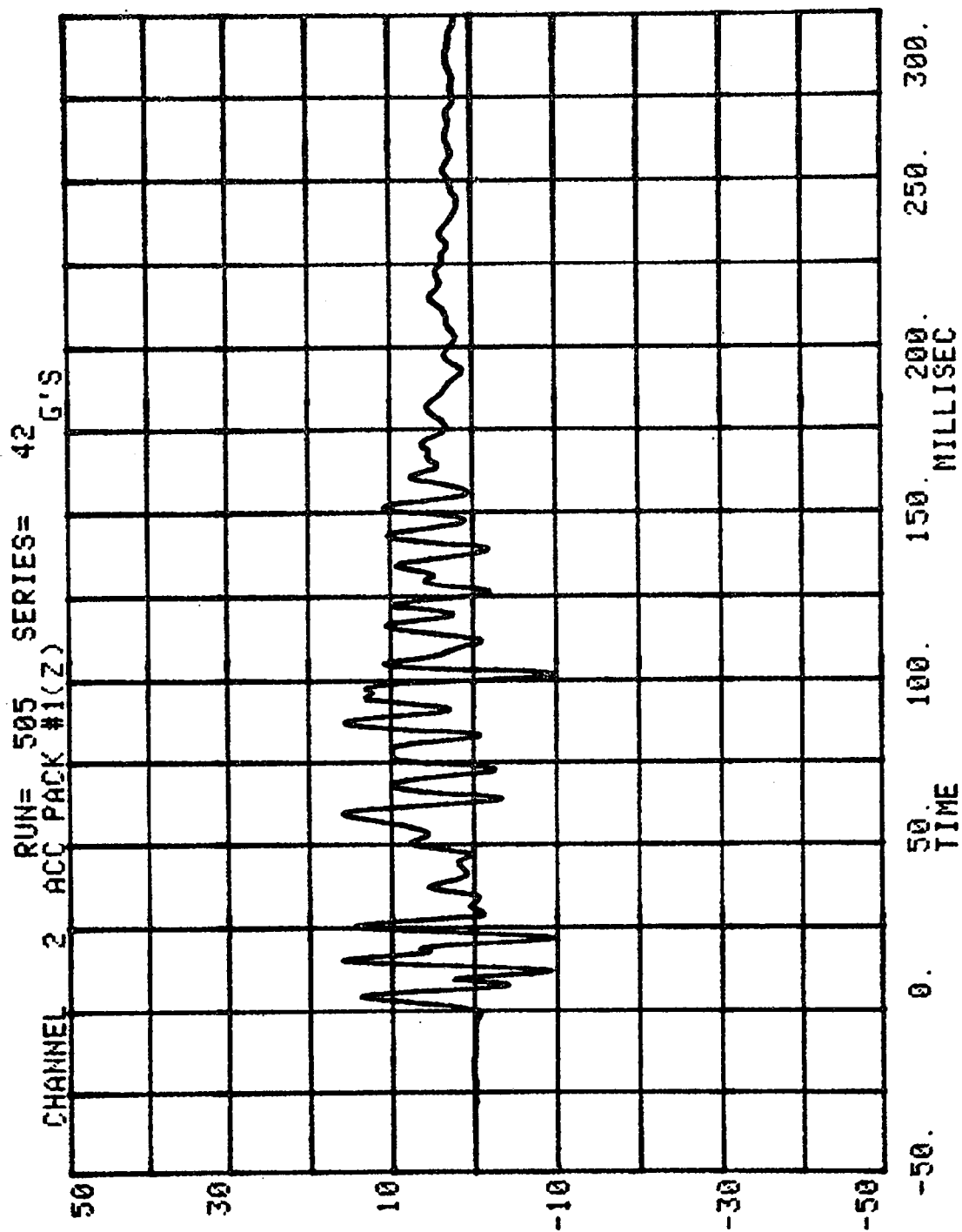
CHANNEL 1 ACC PACK #1(X) RUN= 505 SERIES= 42 G'S

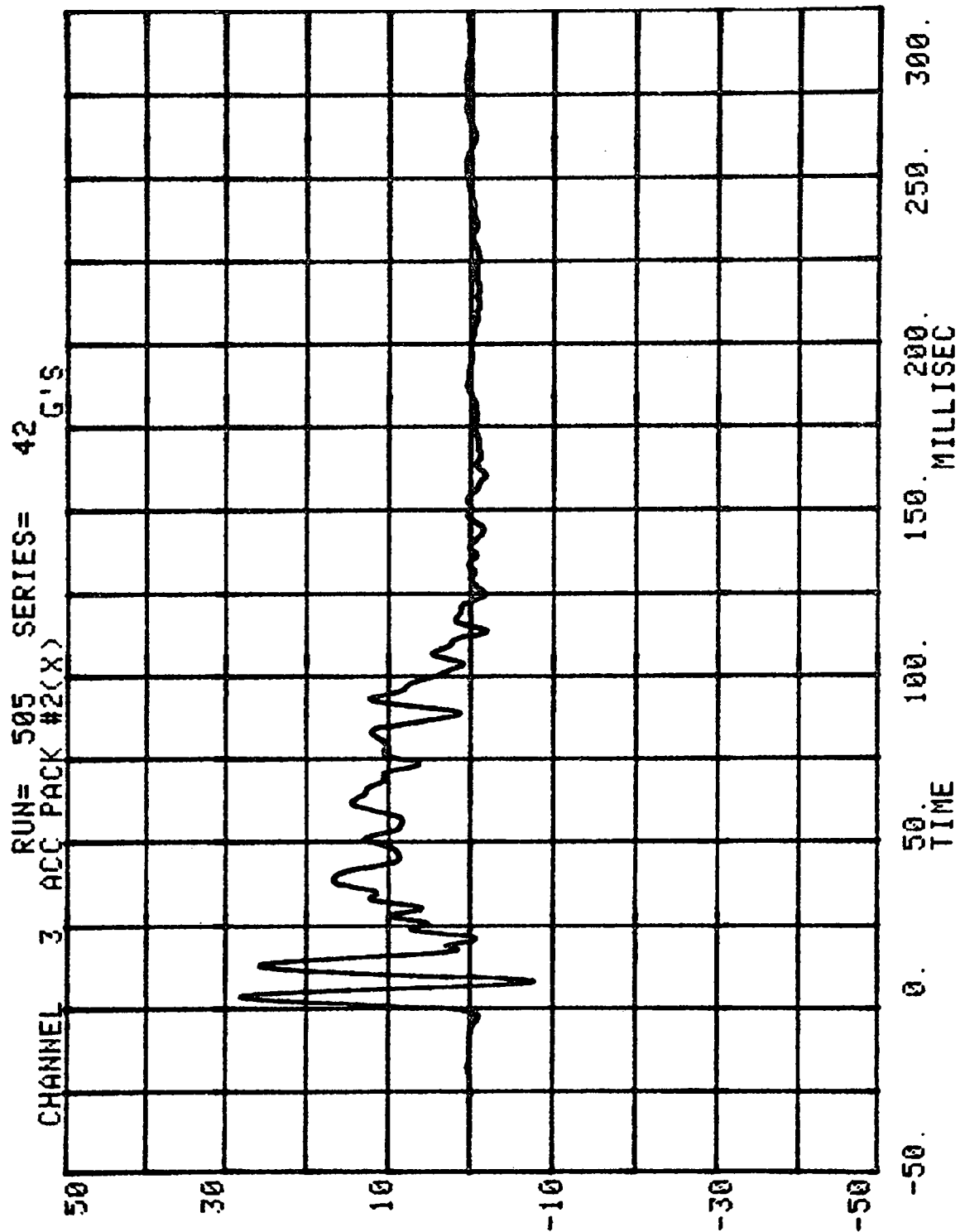


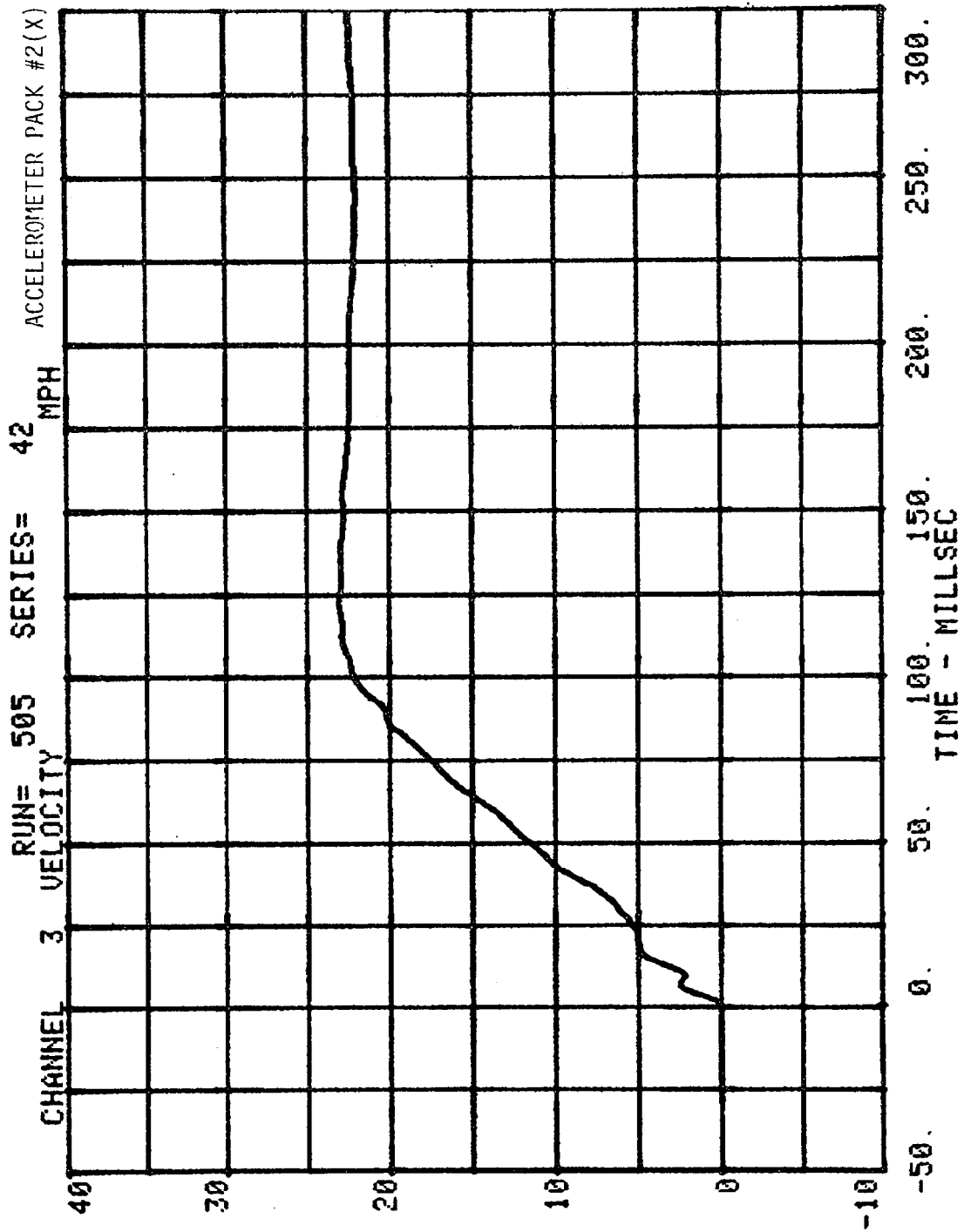


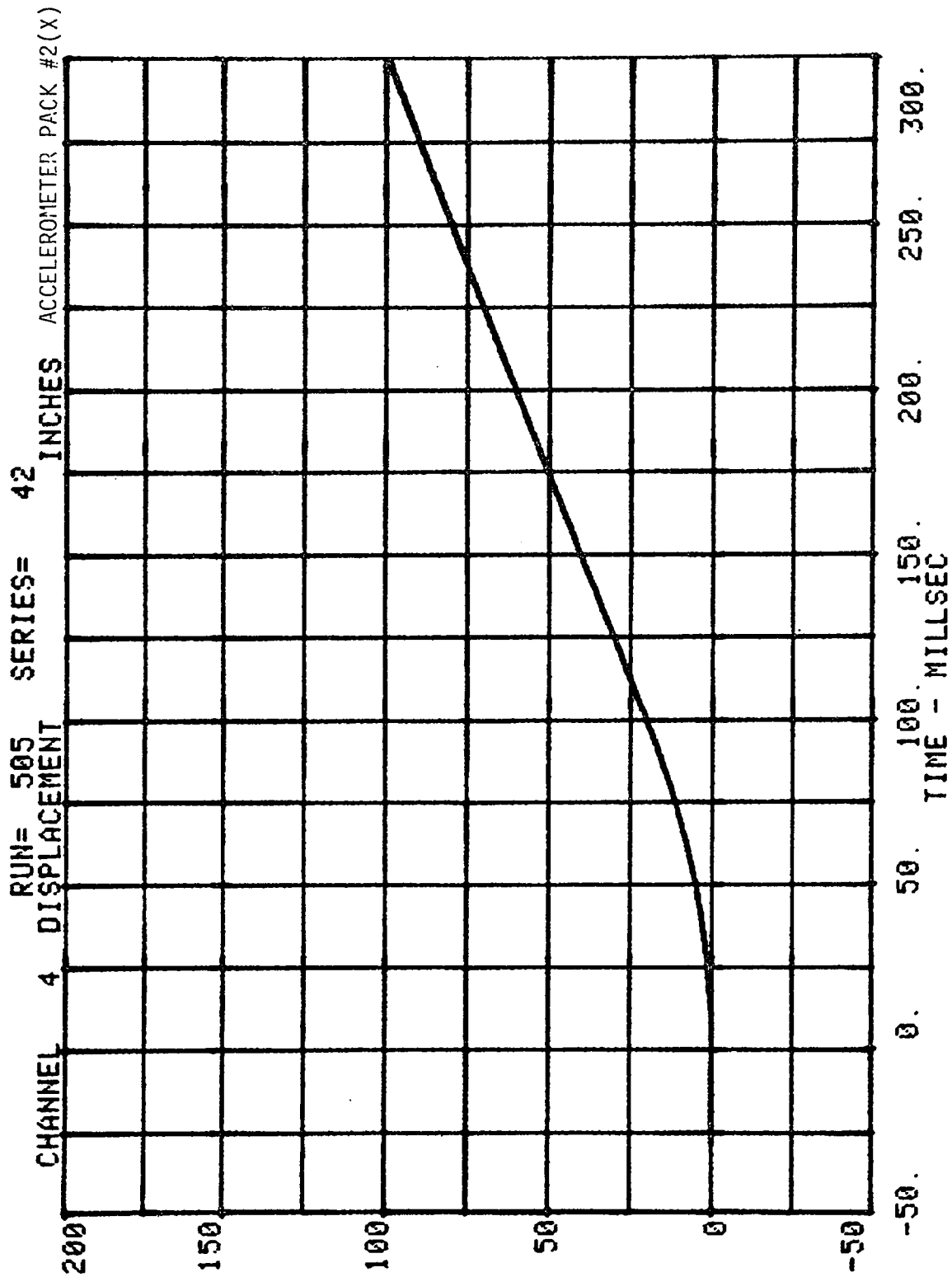
CHANNEL 2 DISPLACEMENT RUN= 505 SERIES= 42 INCHES ACCELEROMETER PACK #1(X)

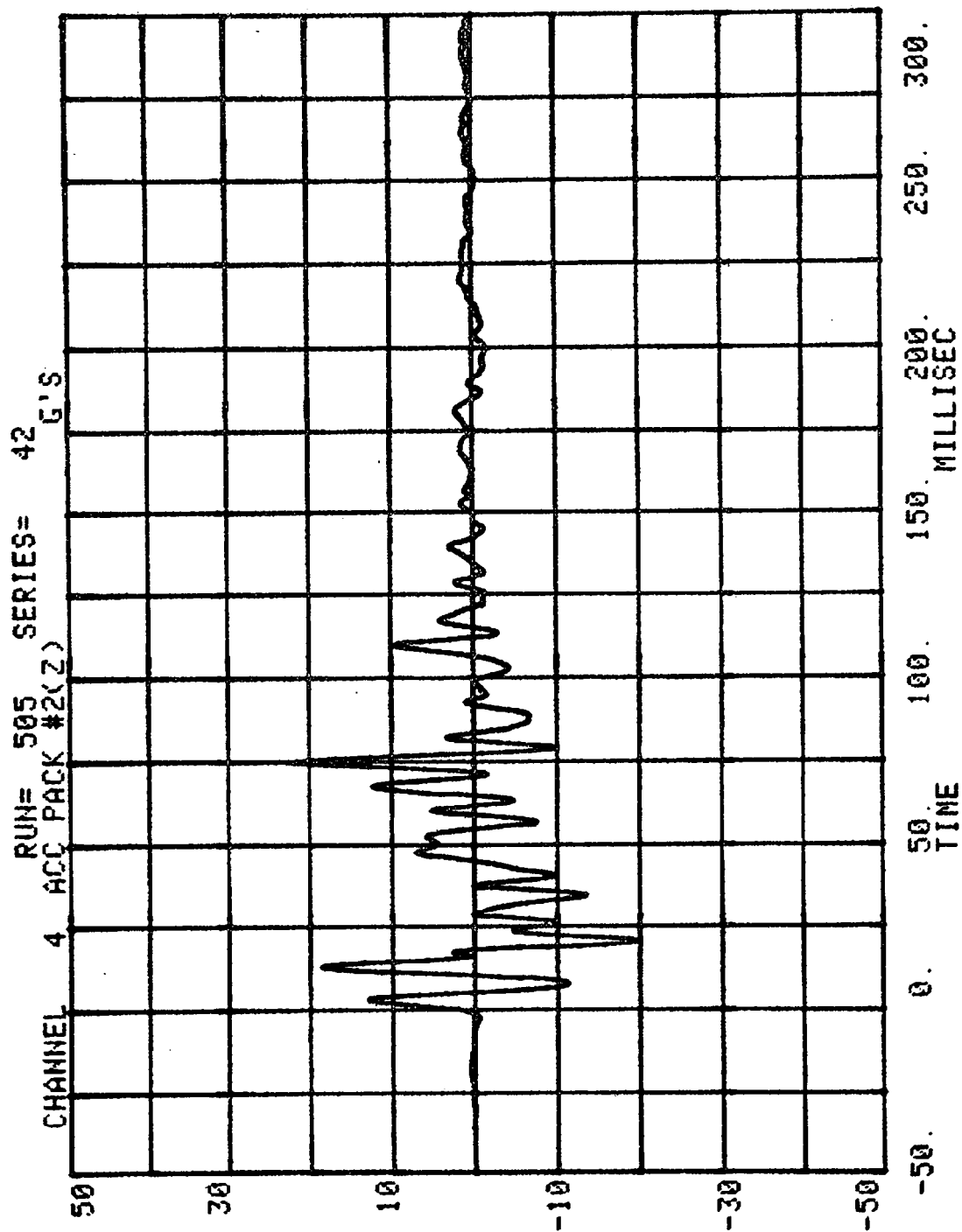


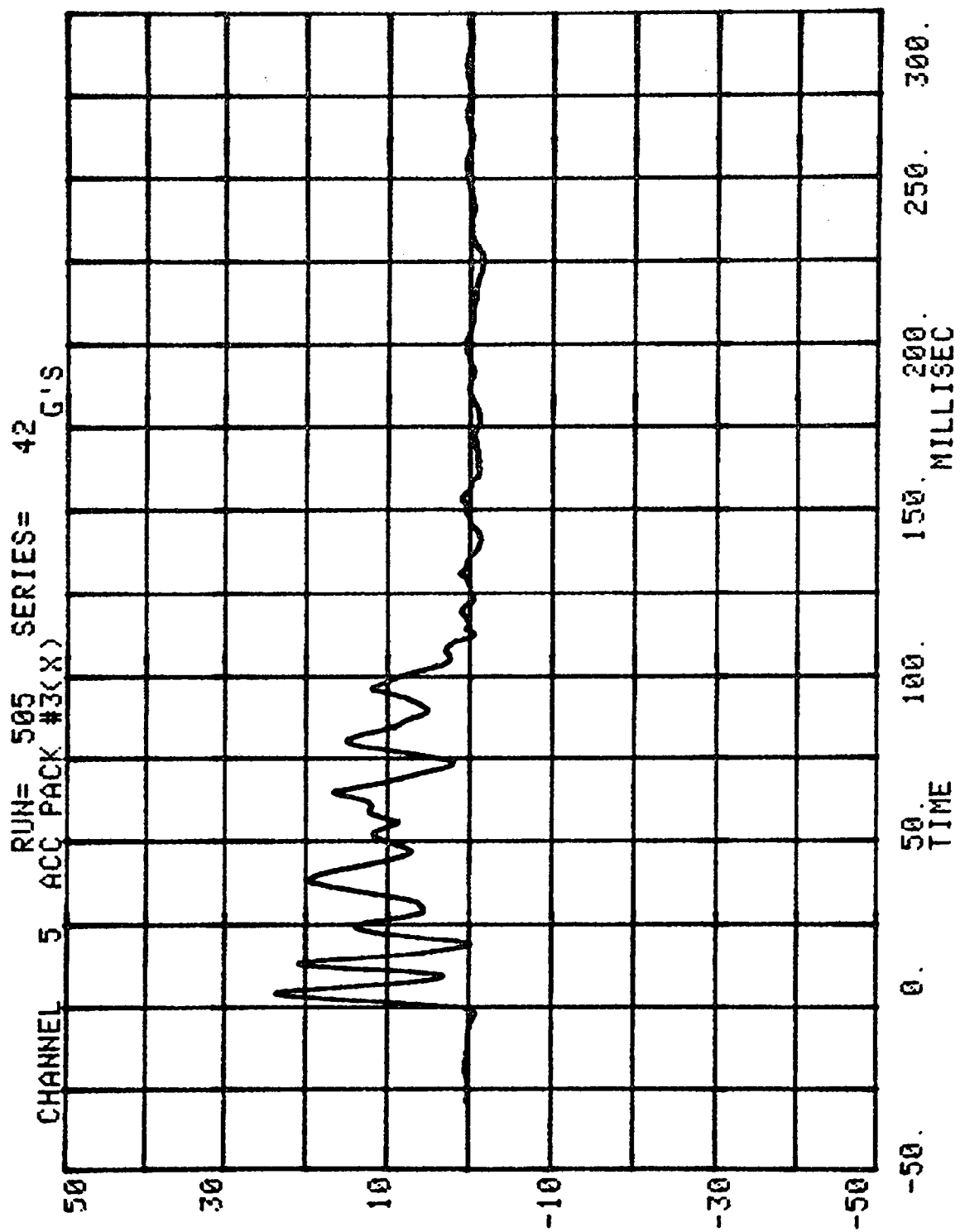


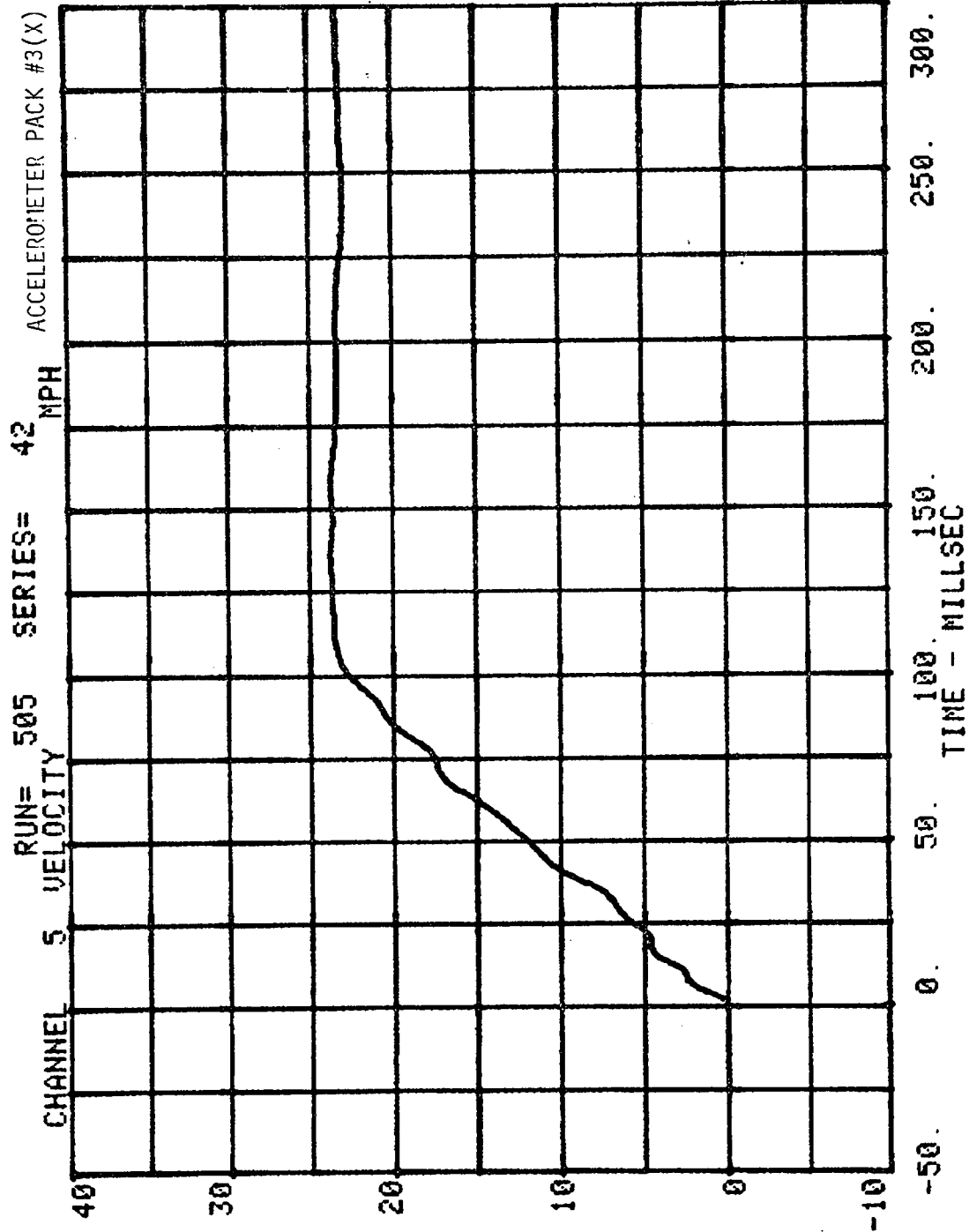


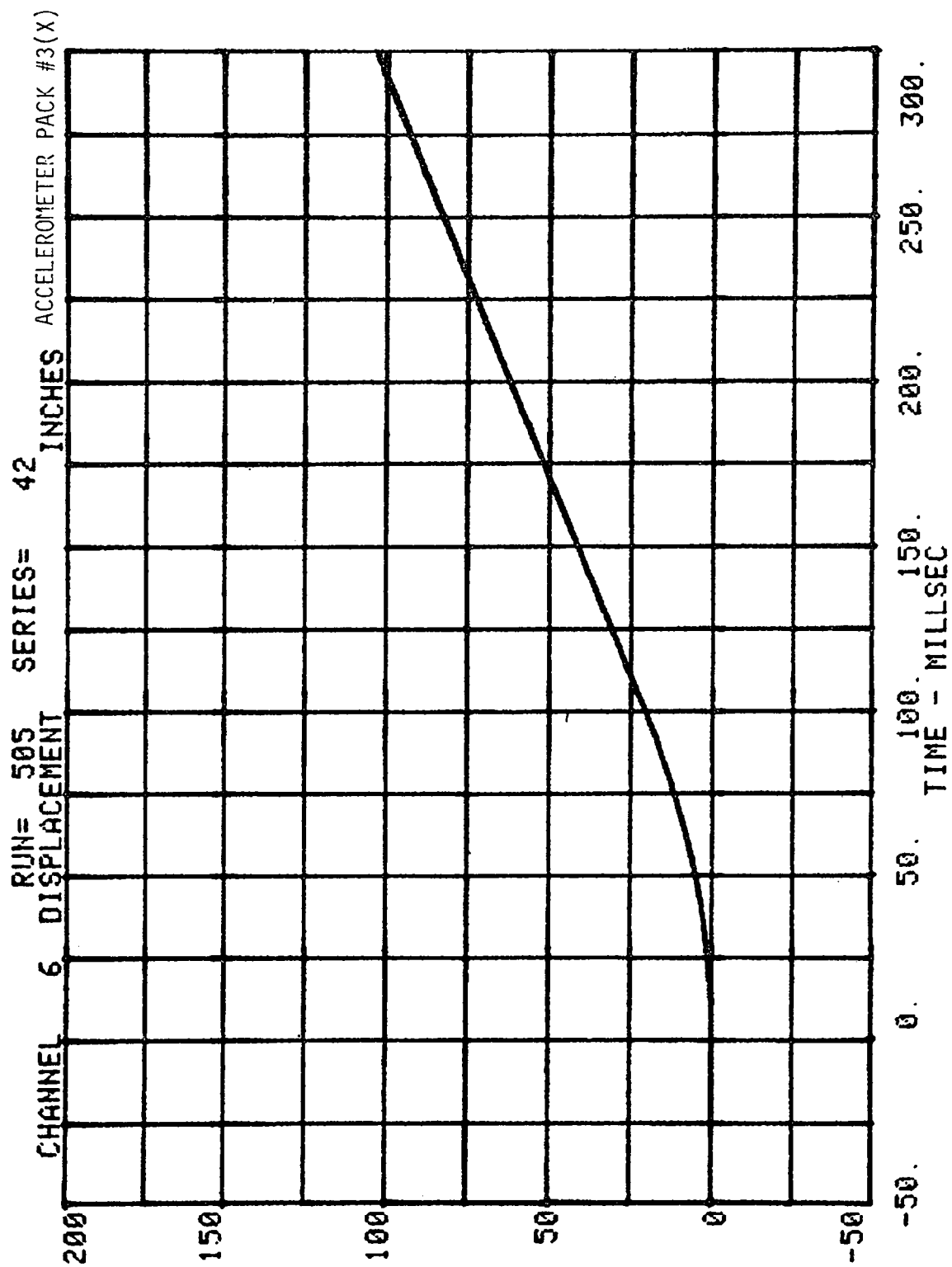


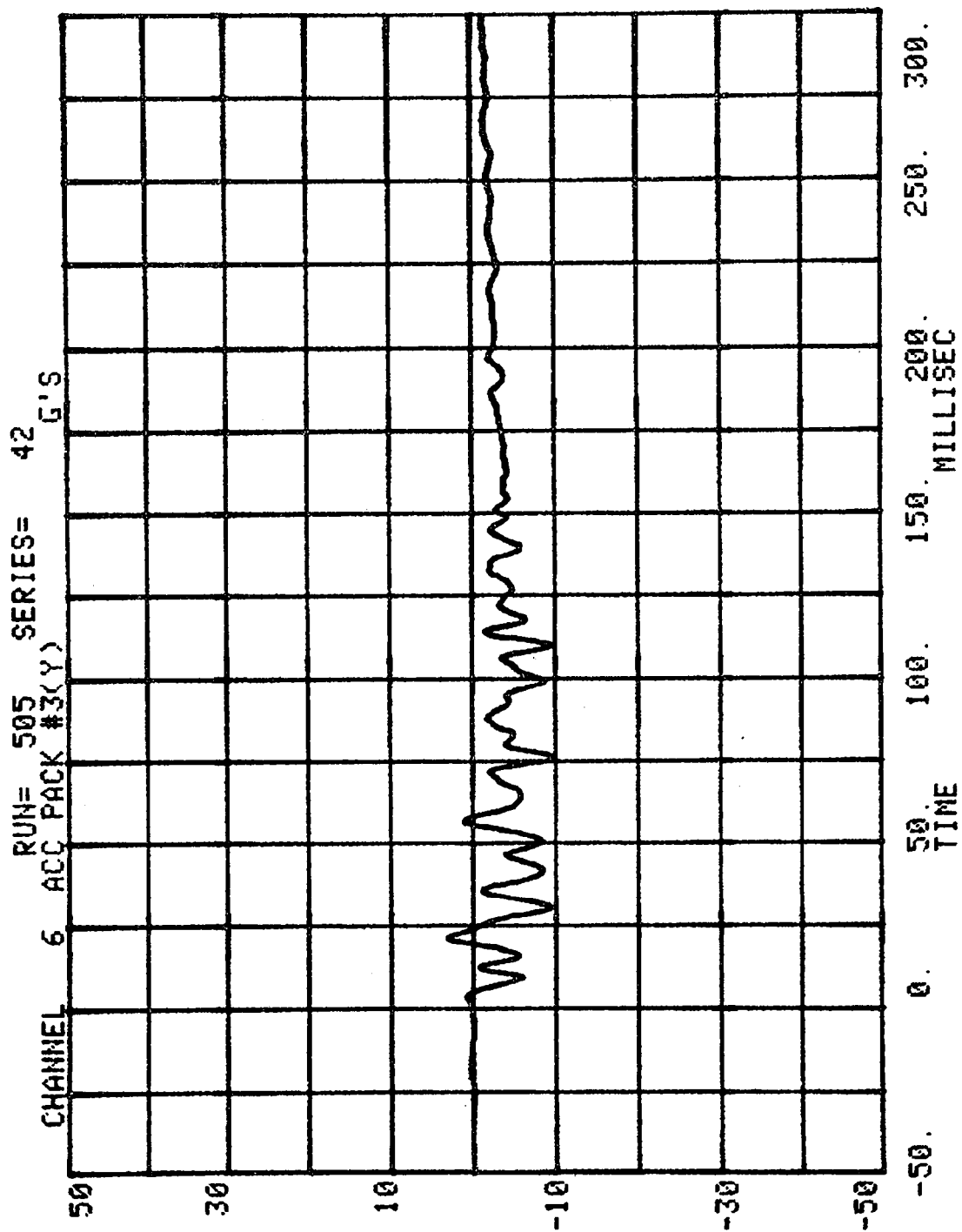




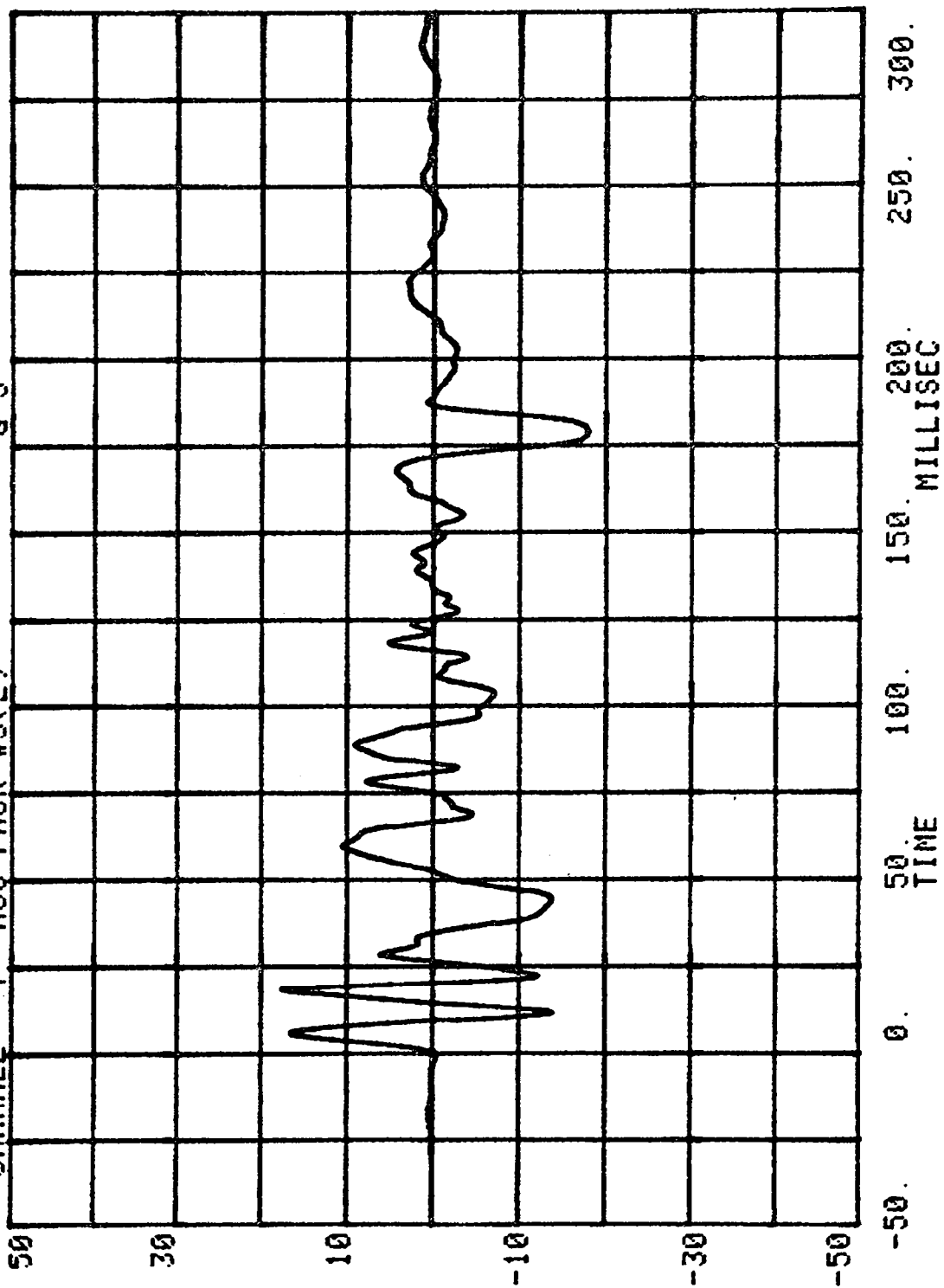


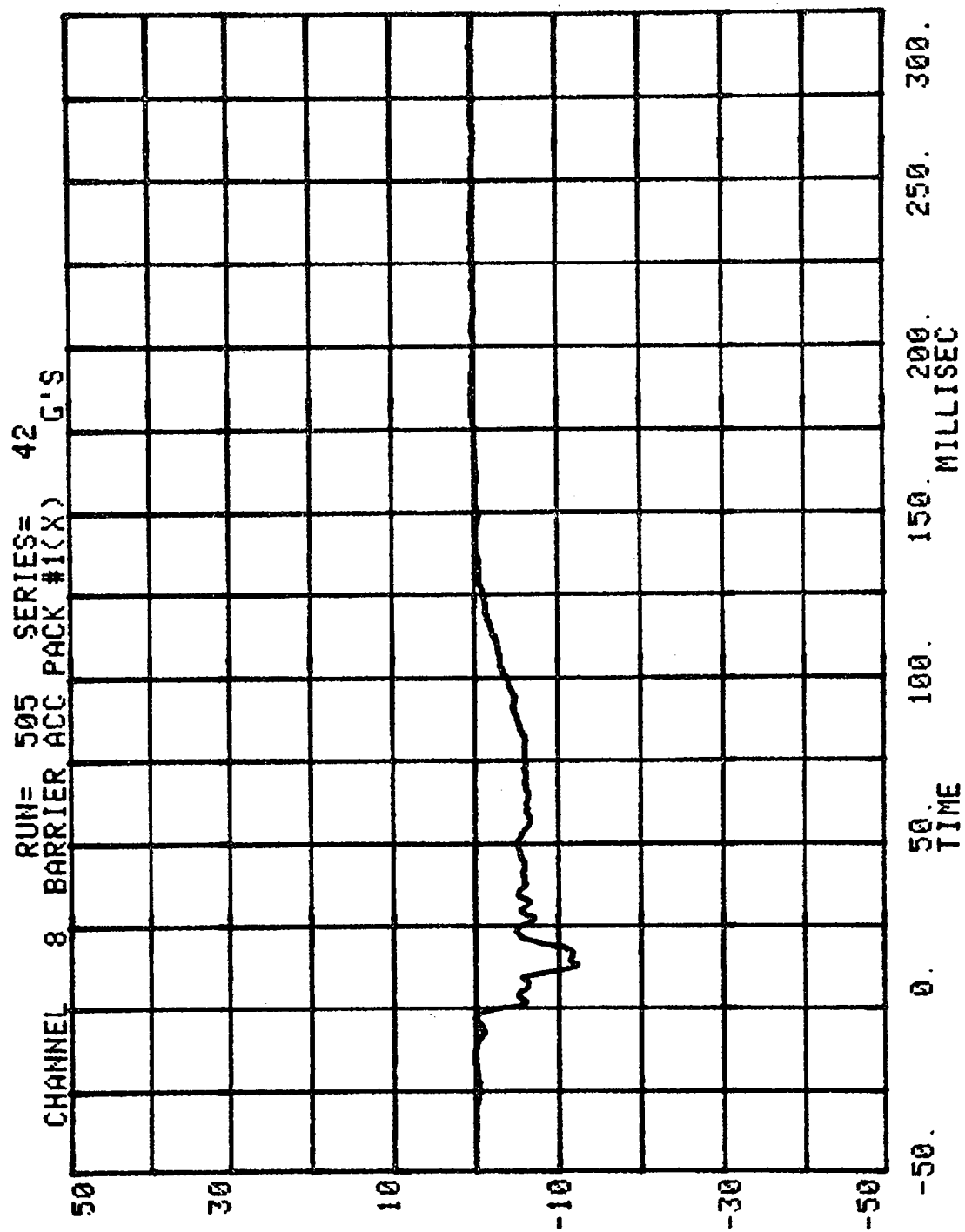




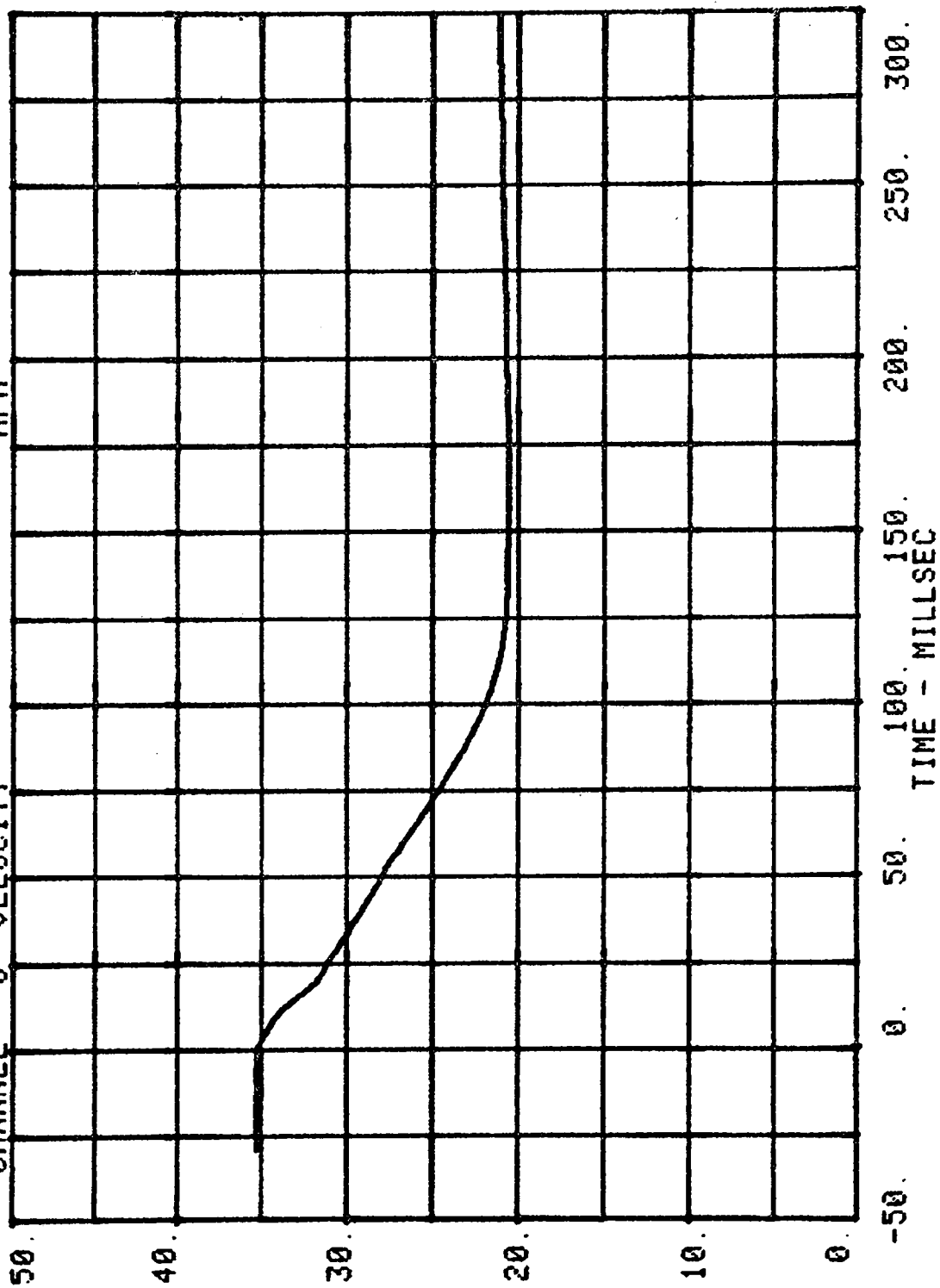


CHANNEL 7 ACC PACK #3(Z) RUN= 505 SERIES= 42 G'S

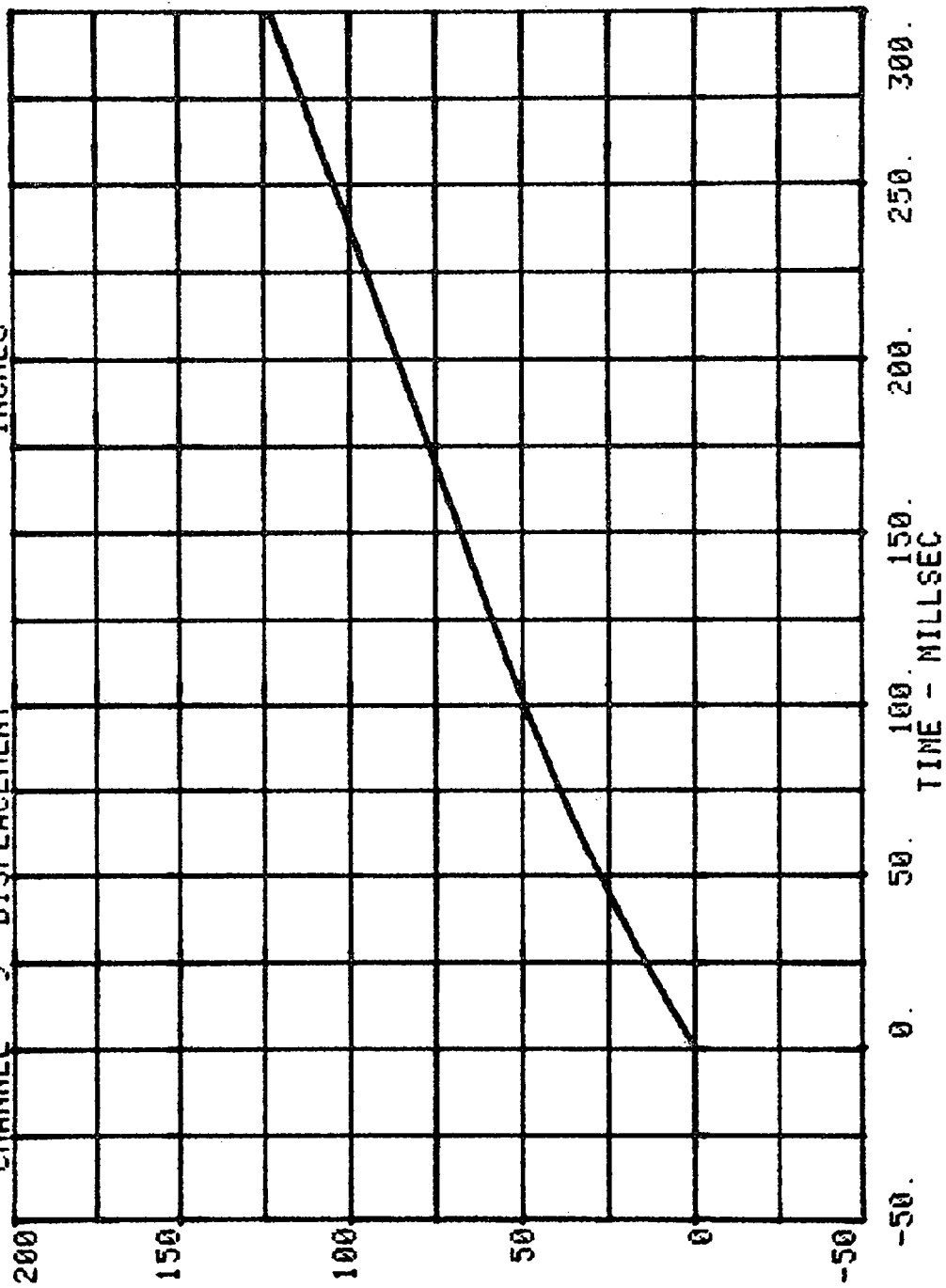




CHANNEL 8 VELOCITY RUN= 505 SERIES= 42 MPH BARRIER ACCELEROMETER PACK#1 (X)



CHANNEL 9 DISPLACEMENT RUN= 505 SERIES= 42 INCHES BARRIER ACCELEROMETER PACK #1(X)



CHANNEL 9 RUN= 505 SERIES= 42
BARRIER ACC PACK #1(Y) G'S

