Technical Report Documentation Page

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Seat Belt Tests Type 1 Seat Belt Assembly

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16. ABSTRACT
This report contains the results of tests performed to determine compliance with the applicable requirements of Federal Vehicle Safety Standard No. 209.

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881

SEAT BELT TESTS
TYPE 1 SEAT BELT ASSEMBLY

by Merle Wilson

72-55

DND

5881 Test Authorization Date: May 21, 1971

Report Date: April 10, 1972

Test Report No. 1154

Name of Device: Ashimori Model No. M-312
Type 1 Seat Belt Assembly with
a Type 2a Shoulder Belt
No retractor

Submitted by: California Highway Patrol

SUMMARY OF TEST

Seat Belt Tests: See Data Sheets for Individual Tests

This is a Standards Conformity Evaluation Report.

This report contains the results of tests performed to determine compliance with the applicable requirements of Federal Vehicle Safety Standard No. 209.

JOHN L. BEATON
Materials and Research Engineer

By Merle E. Wilson

Test No. 1154

Name of Device: - Ashimori Model No. M-312. Type 1 Seat Belt Assembly with a Type 2a Shoulder Belt. No retractor.

NOTES: FOR CHP ONLY

These belts failed to meet the requirements of the following sections:

S4.1 Requirements for complete Assembly.
(l) Installation instructions, page 2.
(m) Usage and maintenance instructions, page 2.

S4.3 Requirements for Hardware
(g) Buckle latch Cycling - The latch spring failed on one device during the cycling operation, Page 13.

Report Fee: $ 540.00 plus overhead assessment of 8.39%.

TESTS AND INSPECTION

FM VSS Section Number		Specifications	Results of Test and Inspection
S4.		Requirements for complete assembly.	
S4.1	(a)	Single occupancy	Satisfactory
	(b)	Pelvic restraint	Satisfactory
	(c)	Upper torso restraint	Satisfactory
	(d)	Hardware - Free from burrs and sharp edges	Satisfactory
	(e)	Release Type 1 or 2 - Accessibile for easy and rapid release Type 3 - Readily accessible to an adult for easy and rapid release	Satisfactory
	(f)	Attachment hardware - Includes all hardware for installation in accordance with SAE J800b	Satisfactory
	(g)	Adjustment - Capable of snug adjustment	Satisfactory
	(h)	Seat back retainer - Retainer is included for Type 3 belts used on hinged seats.	N/A
	(i)	Webbing - Ends are protected or treated to prevent raveling and cannot pull out of adjustment hardware	Satisfactory
	(j)	Strap - Meets requirements of S4.2, S4.3 and S4.4 if applicable.	N/A
	(k)	Marking - permanently and legibly marked or labeled with year of manufacture, model and name or trademark of manufacturer.	Satisfactory
	(l)	Installation instructions - Shall include applicable items in SAE J800b	None supplied
	(m)	Usage and maintenance instructions	None Supplied
	(n)	Workmanship	Satisfactory

Name of Device: DODGE COLT-ASHLMORE Model No. -312. Type 1 Seat Belt Assembly with a Type 2a Shoulder Belt. No Retractor.

Devices Received: Nine devices, May 21, 1971.

Description: Refer to photographs. Device B-4.

Devices B-4 and 5

Buckle:
Latch - 0.135" molded plastic.
Frame - 0.083" stamped steel.
Locking Dog - 0.100" stamped steel.
Sliding Webbing Grip- 3/8" x 2-1/4" knurled drawn steel.

Tongue:
Three point type - 0.121" stamped steel, slotted to receive shoulder belt attachment hook.
Sliding Webbing Grip-0.120" stamped steel with drawn steel cover and nylon slider.

Shoulder Belt Hook:
0.121" stamped steel with 1/4" x 1/2" steel stud including a 0.023" wire spring with a nylon retainer.

Webbing:
Weave - Ribbed.
Material - Nylon
Color- Charcoal.
Stitching - Zigzag.
Maximum length (measured between points of attachment to the hardware.)
Lap Belt Tongue Side - 40"
Buckle Side - 28"
Shoulder Belt - 44"

Mounting Hardware:
Bracket Inboard Side Lap Belt - 0.125" stamped steel.
Bracket Outboard Side Lap Belt - 0.125" stamped steel.
Bracket Outboard Side Shoulder Belt - 0.80" stamp steel, with 0.039" stamped drawn steel sliding webbing grip.
Bolts, Lap Belt Inboard and Outboard Side, Common (2)-steel 7/16"-20x1" with 1/4" shoulder Bolt, Shoulder Belt Outboard Side - Steel 7/16"-20 x 1-1/4" with 1/4" shoulder

Name of Device: DODGE COLT - ASHIMORI Model No. 512.(cont.)

Marks of Identification:
Printed on a 1-1/2" x 2-1/2" nylon label sewn to each of the three pieces of webbing:

"THIS BELT HAS BEEN MANUFACTURED
IN CONFORMITY WITH MVSS NO. 209"
"J15 D4604".
"BY ASHIMORI INC., CO. LTD."
"MFG. DATE 1970"
"TYPE 3 POINT"
"MODEL M312"
"MFG. No. F152" All in 3/32" characters.

Stamped on Inboard and Outboard Brackets, Lap Belt common:

"A 6025" In 1/8" characters.

Stamped on Outboard Bracket, Shoulder belt:

"A 632" In 5/32" characters.
"N-15" In 1/8" characters.

Stamped on Buckle Frame:

"Autofriend" In 1/4" high script.
"MODEL #6880" In 1/8" characters.
"MADE IN JAPAN" In 1/16" letters.
"N-54" In 1/8" characters.

Stamped on tongue"

"A 285" In 3/16" characters.
"N-5" In 5/32" characters.

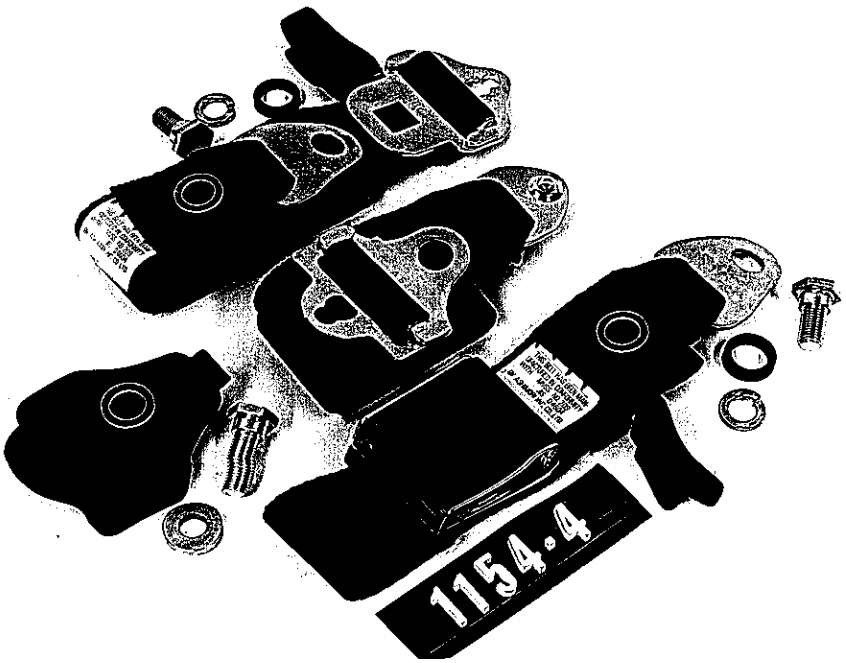
Stamped on Shoulder Belt Hook Attachment:

"A 280" In 3/16" characters.

Test No. 1154

Photographs

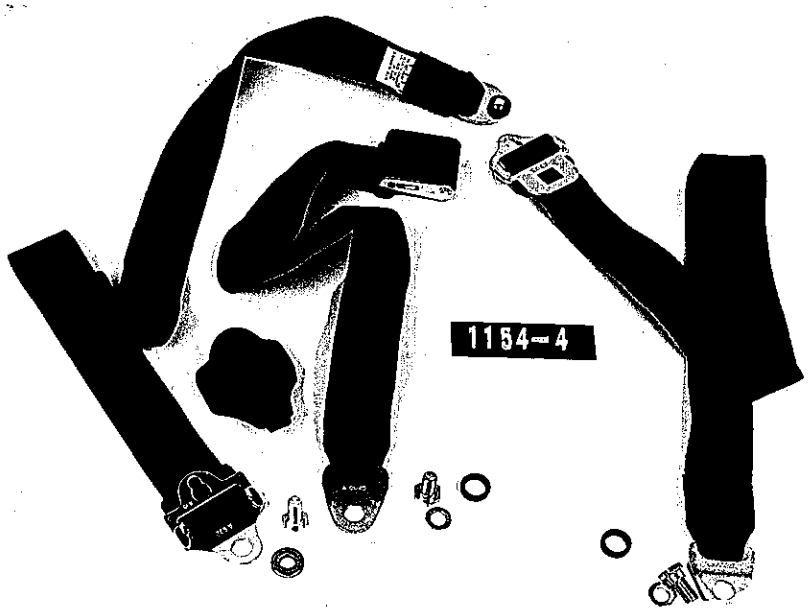
Name of Device: Dodge Colt-Ashimori Model No. M-312. Type 1 Seat Belt Assembly with a Type 2a Shoulder Belt. No retractor.

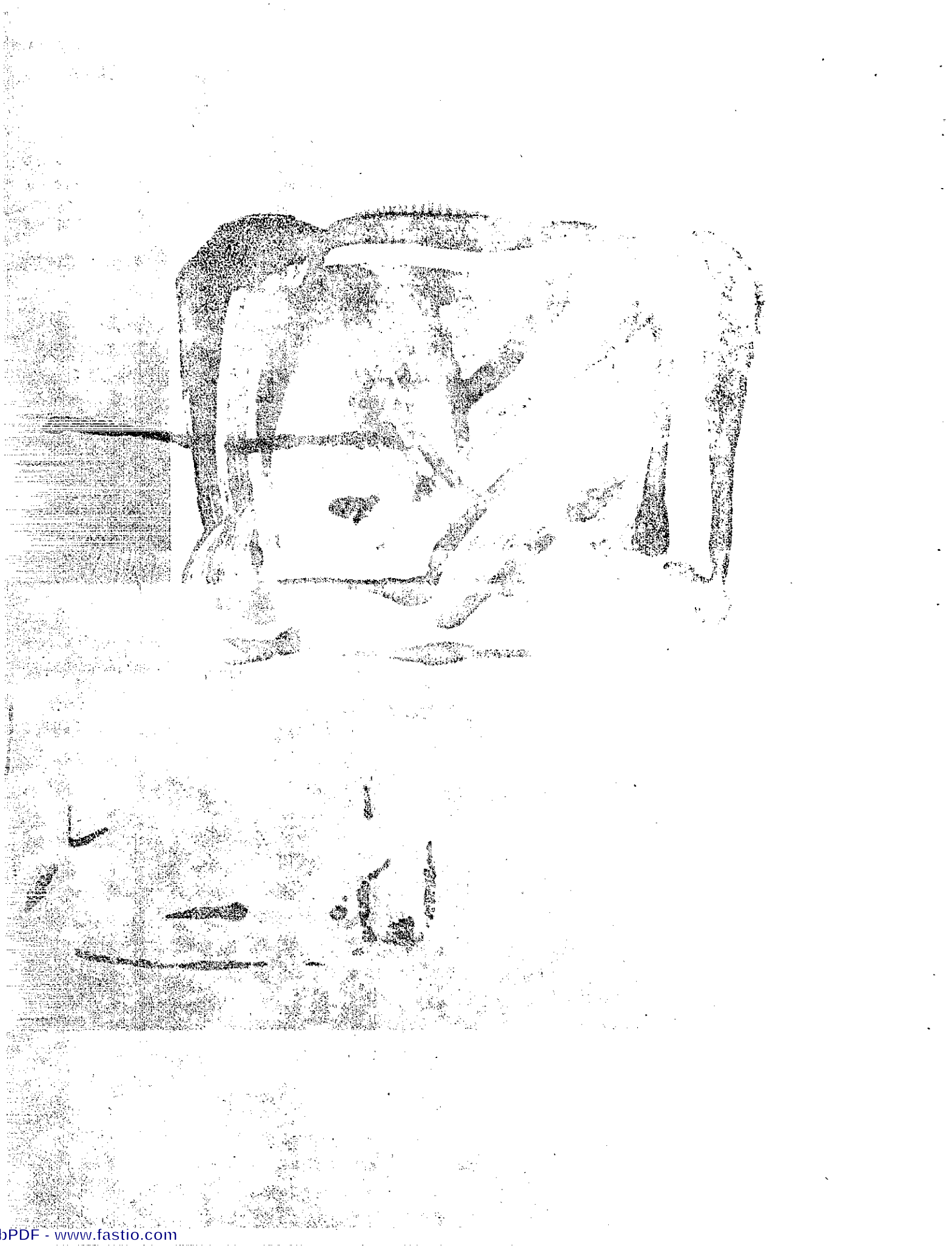


Test No. 1154

Photographs (continued)

Name of Device: Dodge Colt- Ashimori Model No. M-312.





Requirements for Webbing

S4.2

(a) Width - shall not be less than 1.8 inches for Type 1 or 2 and 0.9 inches for Type 3.

Belt No.	Location	Width (Inches)
B- 1	Pelvic	1.98
	Upper Torso	1.98
B- 2	Pelvic	1.98
	Upper Torso	1.98
B- 3	Pelvic	1.98
	Upper Torso	1.98

(b) Breaking Strength

Type 1 - Min. 6000 lbs.

Belt No.	Breaking Strength (Lbs)	
B- 1	7,700	
B- 2	7,600	
B- 3	7,500	Median 7,600

Type 2 - Pelvic - Min. 5000 lbs. (Except that a pelvic restraint of a Type 2 seat belt assembly that can be used without the upper torso restraint shall have a minimum of 6000 lbs.)

Belt No.	Breaking Strength (Lbs.)	
B- N/A		
B- N/A		
B- N/A		Median N/A

Type 2 - Upper Torso - Min. 4000 lbs.

Belt No.	Breaking Strength (Lbs.)	
B- 1	4160	
B- 2	4600	
B- 3	4,500	Median 4,500

(c) Elongation

Type 1 - Max. 20% at 2500 lbs.

Belt No.	Elongation (%)
B- 1	16.8
B- 2	12.5
B- 3	15.0

Type 2 - Pelvic - Max. 30% at 2500 lbs. (Except that a pelvic restraint of a Type 2 seat belt assembly that can be used without the upper torso restraint shall have a maximum of 20% at 2500 lbs.)

Belt No.	Elongation (%)
B- N/A	
B- N/A	
B- N/A	

Type 2 - Upper Torso - Max. 40% at 2500 lbs.

Belt No.	Elongation (%)
B- 1	31.2
B- 2	30.5
B- 3	32.5

(d) Resistance to Abrasion - Minimum breaking strength after abrasion test shall be at least 75% of original strength.

Pelvic Belt No.	Breaking Strength (Lbs.)	% of Original
B- 1	7,240	94.0
B- 2	6,300	82.9
B- 3	6,900	92.0
Median	6,900	Median 92.0

Upper Torso See Note 1, Page 17

Belt No.	Breaking Strength (lbs)	% of Original
B- 10	4,190	100.7
B- 11	4,460	97.0
B- 12	4,400	97.8
Median	4,400	Median 97.8

Requirements for Hardware

S4.3

(a) Corrosion Resistance

(1) Attachment hardware (including retractors)

	Belt No.	Results
B-	1	Satisfactory
B-	2	Satisfactory
B-	3	Satisfactory

(2) Buckles and metallic parts other than attachment hardware.

	Belt No.	Results
B-	4	Satisfactory
B-	5	Satisfactory
B-	6	Satisfactory

(b) Temperature Resistance

Belt No.	Results
B- 4	Satisfactory
B- 5	Satisfactory
B- 6	Satisfactory

(c) Attachment Hardware

1. Eye bolts, shoulder bolts and other bolts shall withstand 9000 lbs, or 5000 lbs if single belt only.

Belt No.	Location	Load (lbs.)	Failure
B- 4	Inboard	5030	None
	Outboard	5020	None
B- 5	Inboard	5080	None
	Outboard	5000	None
B- 6	Inboard	5090	None
	Outboard	5040	None

2. Other attachment hardware designed to receive the ends of two seat belt assemblies shall withstand 6000 lbs.

Belt No.	Load (lbs.)	Failure
B- N/A		
B- N/A		
B- N/A		

3. Quick disconnect hooks retaining latch shall not move more than 0.80 inches in vertical or horizontal direction when loaded to 150 lbs.

Belt No.	Location	Vertical Movement (Inches)	Horizontal Movement (Inches)
B- N/A	Pelvic		
	Upper Torso		
B- N/A	Pelvic		
	Upper Torso		

(d) Buckle Release

(1) Type 1 and Type 2 - 30 lbs. max.

Belt No.	Location	Force (lbs)
B- 4	Pelvic	14.5
	Upper Torso	N/A
B- 5	Pelvic	25.0
	Upper Torso	N/A
B- 6	Pelvic	18.0
	Upper Torso	N/A

Type 3 - 20 lbs. Max.

Belt No.	Force (lbs.)
B- N/A	
B- N/A	
B- N/A	

(2) Pushbutton Area - 0.7 sq. inches and 0.4 inches min. linear dimension,

Area N/A sq.in.

Lever type shall permit insertion of .4 inch by 1.5 inch long bar. Satisfactory

(3) Pushbutton shall not release under 400 lbs. compressive load.

Belt No.	Results
B- N/A	
B- N/A	
B- N/A	

(e) Adjustment Force - 11 lbs. max.

Belt No.	Location	Adjustment Force (lbs.)	
			Tongue s
B- 4	Pelvic	Buckle side-11.0	-3.0
	Upper Torso	3.5	
B- 5	Pelvic	Buckle side-10.5	Tongue Side
	Upper Torso	2.5	3.0
B- 6	Pelvic	Buckle side -9.0	Tongue Side
	Upper Torso	2.0	4.5

(f) Tilt-Lock Adjustment - 30° min.

Belt No.	Location	Locking Angle (Degrees)	
B- 4	Pelvic	Buckle Side-52	Tongue Side -
	Upper Torso	34	39
B- 5	Pelvic	Buckle Side-55	Tongue Side -
	Upper Torso	34	40
B- 6	Pelvic	Buckle Side-53	Tongue Side-
	Upper Torso	33	37

(g) Buckle latch

Buckle latch cycling - Normal latching and unlatching shall not be impaired. If partial engagement is possible - Separation force - 5 lbs. Max.

Belt No.	Belt Component	Separation Force (lbs.)	Results Cycling Tests
B- 4	Pelvic		Spring failed
	Upper Torso		N/A
B- 5	Pelvic		Satisfactory
	Upper Torso		N/A
B- 6	Pelvic		Satisfactory
	Upper Torso		N/A

(h) Non-locking retractor

Pelvic restraint, residual extension of web - 0.25" max.

Belt No.	Extension (Inches)
B- N/A	
B- N/A	
B- N/A	

Upper torso restraint, maximum retraction force - 1.1 lbs.

Belt No.	Retraction Force (lbs.)
B- N/A	
B- N/A	
B- N/A	

(i) Automatic - locking retractor

Retraction force

Pelvic - 0.60 lbs. min.
Upper Torso - 0.45 lbs. min.
Belt movement between locking dogs
Both belt types - 1 inch max.

Belt No.	Belt Component	Retractor Force (lbs.)	Movement Inches)
B- N/A	Pelvic		
	Upper Torso		
B- N/A	Pelvic		
	Upper Torso		
B- N/A	Pelvic		
	Upper Torso		

(j) Emergency locking retractor

Pelvic retractor - max. extension under 0.5 g load is 1 inch
retractor force - 1.5 lbs. min.

Belt No.	Extension (Inches)	Retraction Force (lbs.)
B- N/A		
B- N/A		
B- N/A		

Inspection - Cont'd

Upper torso retractor - max. extension under 0.5 g load is 1 inch; retraction force - 0.45 lbs. min., 1.1 lb. max.

Belt No.	Extension (Inches)	Retraction Force (lbs)
B- N/A		
B- N/A		
B- N/A		

(k) Performance of retractor

Final retraction force shall not be less than 50% of its original value

Belt No.	Original Force (lbs)	Final Force (lbs)	% of Original
B- N/A			
B- N/A			
B- N/A			

S4.4 Requirements for Assembly Performance

(a) Type 1 Seat Belt

(1) The assembly loop shall withstand a force of not less than 5000 lbs.

(2) The length of the pelvic restraint between anchorages shall not increase more than 14 inches when loaded to 5000 lbs (7 inches loop extension).

(3) Any webbing cut by the hardware during the test shall have a breaking strength at the cut of not less than 4,200 lbs.

(4) Complete fracture through any solid section of metal attachment hardware shall not occur during test.

Belt No.	Loop Load (lbs)	Assembly Extension (Inches)	Webbing Cut	Webbing Retest	Hardware Failures
B- 4	5000	8.5	None	N/A	None
B- 5	5020	8.75	None	N/A	None
B- 6	50.0	6.5	None	N/A	None

* Tested with tongue inverted.

(b) Type 2 Seat Belt

(1) The structural components in the pelvic restraint shall withstand a force of not less than 2500 lbs. (Except that a pelvic restraint of a Type 2 seat belt assembly that can be used without upper torso restraint shall comply with requirements for Type 1 seat belt assembly).

(2) The structural components in the upper torso restraint shall withstand a force of not less than 1500 lbs.

(3) The structural components that are common to pelvic and upper torso restraints shall withstand a force of not less than 3000 lbs.

(4) The length of the pelvic restraint between anchorages shall not increase more than 20 inches when loaded to 2500 lbs.

(5) The length of the upper torso restraint between anchorages shall not increase more than 20 inches when loaded to 1500 lbs (10 inches loop extension).

(6) Webbing cut by the hardware during test shall have a breaking strength of not less than 3500 lbs for webbing in the pelvic restraint or not less than 2800 lbs for webbing in the upper torso restraint.

(7) Complete fracture through any solid section of metal attachment hardware shall not occur during test.

	Belt No.	Belt Component	Loop Load (lbs.)	Assembly Extension Inches	Webbing Cut	Webbing Retest	Hdwe. Failu
*	B- 4	Pelvic	N/A	N/A	N/A	N/A	N/A
		Upper Torso	1520	6.5	None	N/A	None
		Common	3010	7.5	None	N/A	None
	B- 5	Pelvic	N/A	N/A	N/A	N/A	N/A
		Upper Torso	1560	6.0	None	N/A	None
		Common	3000	8.5	None	N/A	None
	B- 6	Pelvic	N/A	N/A	N/A	N/A	N/A
		Upper Torso	1530	6.0	None	N/A	None
		Common	3050	6.5	None	N/A	None

Test No. 1154

Name of Device: DODGE COLT-ASHIMORI Model No. 312. Type 1 Seat Belt Assembly with a Type 2a Shoulder Belt. No Retractor.

NOTES:

1. There was insufficient length of webbing for the abraded strength test (upper torso), Page 9; therefore webbing taken from Devices B-10, 11, and 12 was used and compared to the median value of the original breaking strengths from Devices B-1, 2, and 3, Page 7.

2. There was insufficient length of webbing for the Resistance to Light strength test, Page 9, therefore, webbing taken from Devices B-7, 8 and 9 was used and compared to the median value of the original breaking strengths from Devices B-1, 2 and 3, Page 7.