Automotive Safety Council

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August 10, 2015

Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue, SE
Washington, D.C. 20590

Re: Request for Amendment to Rule – FMVSS209 –
Seat Belt Assemblies and TP-209-08 Laboratory Test Procedure

Dear Sir:

The Automotive Safety Council (ASC), formally known as the Automotive Occupant Restraints Council (AORC), is an industry association of 40 of the world's leading suppliers of Active, Passive, Interior, Pedestrian and Child Safety Systems to the automobile industry. The mission of the ASC is to reduce highway casualties and injuries by providing the motoring public with reliable and effective safety systems, components and services, and to promote public education on the proper use and benefits of their restraint systems.

The ASC is joined by the Alliance of Automobile Manufacturers (Alliance) and the Association of Global Automakers (Global Automakers) in submitting this petition to amend FMVSS 209, Seat Belt Assemblies S4.2 (e) *Requirements for webbing, Resistance to light,* S5.1 (e) and the associated TP-209-08, Laboratory Test Procedure Section A.4, Resistance to Light [S4.2 (e), S5.1 (e)] to include Xenon Arc light exposure as an equivalent alternative test methodology to the current Carbon Arc light exposure with no other changes to the requirements for seat belt webbing performance as indicated in the following pages. Xenon Arc light exposure is shown to be a more stringent test and there is no negative effect with respect to the strength or safety of the seat belt webbing when Xenon Arc light exposure is used in place of Carbon Arc light exposure. There is urgency on this request as the manufacturer of commonly used Carbon Arc light exposure test equipment has advised users that they will end support for this equipment in January 2016 and the ability to perform this test has already become difficult for many suppliers.

The ASC, under its former name Automotive Occupant Restraints Council (AORC), submitted a similar request in December 2008 when this issue first came to light and to date there has been no action from the NHTSA even after yearly inquiries as to its status. We feel that 7 years is ample notice of this need and our effort to avoid this short timing requirement; we have become very frustrated at the unresponsiveness of NHTSA on this matter. If no NHTSA response to this petition is announced prior to the end of support for the current Carbon Arc light source equipment, it is the intention of the ASC member companies to proceed with use of this industry- and globally-recognized and accepted Xenon Arc light source test equipment as an acceptable alternative test method, according to the attached petition. Please find the original request attached (FMVSS 209; Seat Belt Assemblies NHTSA-2008-0001-0001 Request for Amendment to Rule), which requested this change along with many other needed clarifications to which we would still appreciate a response.

Request for Amendment to Rule – FMVSS209 – Seat Belt Assemblies and TP-209-08 Laboratory Test Procedure

FMVSS209 S4.2 (e) currently states:
(e) *Resistance to light.* The webbing in a seat belt assembly after exposure to the light of a carbon arc and tested by the procedure specified in S5.1(e) shall have a breaking strength not less than 60 percent of the strength before exposure to the carbon arc and shall have a color retention not less than No. 2 on the AATCC Gray Scale for Evaluating Change in Color (incorporated by reference, see § 571.5).

FMVSS209 S5.1 (e) currently states:
(e) *Resistance to light.* Webbing at least 508 mm in length from three seat belt assemblies shall be suspended vertically on the inside of the specimen track in a Type E carbon-arc light exposure apparatus described in ASTM G23–81 (incorporated by reference, see § 571.5), except that the filter used for 100 percent polyester yarns shall be chemically strengthened soda-lime glass with a transmittance of less than 5 percent for wave lengths equal to or less than 305 nanometers and 90 percent or greater transmittance for wave lengths of 375 to 800 nanometers. The apparatus shall be operated without water spray at an air temperature of 60° +/-2 °Celsius (°C) measured at a point 25 +/-5 mm outside the specimen rack and midway in height. The temperature sensing element shall be shielded from radiation. The specimens shall be exposed to light from the carbon-arc for 100 hours and then conditioned as prescribed in paragraph (a) of this section. The colorfastness of the exposed and conditioned specimens shall be determined on the AATCC Gray Scale for Evaluating Change in Color (incorporated by reference, see § 571.5). The breaking strength of the specimens shall be determined by the procedure prescribed in paragraph (b) of this section. The median values for the breaking strengths determined on exposed and unexposed specimens shall be used to calculate the percentage of breaking strength retained.

TP-209-08 currently states:
(4) Resistance to Light
(a) Light exposure (carbon-arc), 100 hours
(b) Perform breaking strength test
(c) Calculate percentage breaking strength retained
NOTE: Must retain a minimum of 60% of median breaking strength calculated in A.3(d), Webbing Breaking Strength

A.4 Resistance to Light [S4.2(e), S5.1(e)]
Webbing samples at least 508 mm in length from three seat belt assemblies shall be suspended vertically on the inside of the specimen rack in a Type E carbon-arc light-exposure apparatus described in Standard Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials, ASTM Designation: G23-81, published by the American Society for Testing and Materials, except that the filter used for 100 percent polyester yarns shall be chemically strengthened soda-lime glass with a transmittance of less than 5 percent for wavelengths equal to or less than 305 nanometers and 90 percent or greater transmittance for wave lengths of 375 to 800 nanometers. The apparatus shall be operated without water spray at an air temperature of 60 ± 2°C measured at a point 25 ± 5 mm outside the specimen rack and midway in height. The temperature sensing element shall be shielded from radiation. The specimen shall be exposed to light from the carbon-arc for 100 hours and then conditioned as prescribed in paragraph

A.1 of this section. The breaking strength of the specimens shall be determined by the procedure prescribed in paragraph A.3 of this section. The median values for breaking strengths determined on exposed and unexposed specimens shall be used to calculate the percentage of breaking strength retained. After exposure to light of a carbon arc, the webbing in a seat belt assembly shall have a median breaking strength not less than 60 percent of the median breaking strength and have a color retention of not less than Number 2 on the Geometric Gray Scale published by the AATCC.

Proposed change to each section is as follows:

FMVSS209 S4.2 (e) proposal:

(e) *Resistance to light.* The webbing in a seat belt assembly after exposure to the light of a carbon arc **or the light of a xenon arc** and tested by the procedure specified in S5.1(e) shall have a breaking strength not less than 60 percent of the strength before exposure to the carbon arc **or xenon** arc and shall have a color retention not less than No. 2 on the AATCC Gray Scale for Evaluating Change in Color (incorporated by reference, see § 571.5).

FMVSS209 S5.1 (e) proposal:

(e) *Resistance to light.* Webbing at least 508 mm in length from three seat belt assemblies shall be suspended vertically on the inside of the specimen track in a Type E carbon-arc light exposure apparatus described in ASTM G23–81 (incorporated by reference, see § 571.5), except that the filter used for 100 percent polyester yarns shall be chemically strengthened soda-lime glass with a transmittance of less than 5 percent for wave lengths equal to or less than 305 nanometers and 90 percent or greater transmittance for wave lengths of 375 to 800 nanometers. The apparatus shall be operated without water spray at an air temperature of 60° +/-2 °Celsius (°C) measured at a point 25 +/-5 mm outside the specimen rack and midway in height. The temperature sensing element shall be shielded from radiation. The specimens shall be exposed to light from the carbon-arc for 100 hours and then conditioned as prescribed in paragraph (a) of this section. The colorfastness of the exposed and conditioned specimens shall be determined on the AATCC Gray Scale for Evaluating Change in Color (incorporated by reference, see § 571.5). **Alternatively, for Xenon Arc light exposure, apparatus described in ISO 105-B02 2013-05-15 until exposure produces a contrast equal to grade 4 on the grey scale on standard Blue Dye No. 7.** The breaking strength of the specimens shall be determined by the procedure prescribed in paragraph (b) of this section. The median values for the breaking strengths determined on exposed and unexposed specimens shall be used to calculate the percentage of breaking strength retained.

TP-209-0X proposal: [page 16]

(4) Resistance to Light
(a) Light exposure (carbon-arc, 100 hours) **or (xenon arc, until exposure produces a contrast equal to grade 4 on the grey scale on standard Blue Dye No. 7)**
(b) Perform breaking strength test
(c) Calculate percentage breaking strength retained
NOTE: Must retain a minimum of 60% of median breaking strength calculated in A.3(d), Webbing Breaking Strength

A.4 Resistance to Light [S4.2(e), S5.1(e)]
Webbing samples at least 508 mm in length from three seat belt assemblies shall be suspended vertically on the inside of the specimen rack in a Type E carbon-arc light-exposure apparatus described in Standard Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and

Without Water for Exposure of Nonmetallic Materials, ASTM Designation: G23-81, published by the American Society for Testing and Materials, except that the filter used for 100 percent polyester yarns shall be chemically strengthened soda-lime glass with a transmittance of less than 5 percent for wavelengths equal to or less than 305 nanometers and 90 percent or greater transmittance for wave lengths of 375 to 800 nanometers. The apparatus shall be operated without water spray at an air temperature of 60 ± 2°C measured at a point 25 ± 5 mm outside the specimen rack and midway in height. The temperature sensing element shall be shielded from radiation. The specimen shall be exposed to light from the carbon-arc for 100 hours and then conditioned as prescribed in paragraph A.1 of this section. **Alternatively, for Xenon Arc light exposure, apparatus described in ISO 105-B02 2013-05-15, until exposure produces a contrast equal to grade 4 on the grey scale on standard Blue Dye No. 7.** The breaking strength of the specimens shall be determined by the procedure prescribed in paragraph A.3 of this section. The median values for breaking strengths determined on exposed and unexposed specimens shall be used to calculate the percentage of breaking strength retained. After exposure to light of a carbon arc **or xenon arc**, the webbing in a seat belt assembly shall have a median breaking strength not less than 60 percent of the median breaking strength and have a color retention of not less than Number 2 on the Geometric Gray Scale published by the AATCC.

Rationale for change:

In December 2008, the Automotive Occupant Restraint Council (now ASC) submitted a “Request for Amendment to Rule” with respect to FMVSS209 that included a similar request for change to FMVSS 209. To date, no change to FMVSS209 regarding Light Exposure testing has been issued.

Many, if not all, webbing manufacturers and test facilities have been using the Atlas brand carbon arc light exposure equipment since the release of FMVSS 209. Much of this equipment is still in use but is very old. Atlas has sent all equipment users letters over the last couple of years about difficulty with supplying replacement or maintenance parts and finally a letter ending Atlas support for this equipment as of January 2016. (see attachment in Appendix 1 for three different communications from Atlas).

Other Carbon Arc light exposure equipment is available from different manufacturers, but not all equipment available is capable of performing the test required in FMVSS209.

Current ECE R16 Seat Belt Assembly test requirements also include a light exposure test requirement for seat belt webbing. The light source used in the ECE R16 testing is a Xenon Arc light source. Many OEM Automobile Manufacturers also specify the use of a Xenon Arc light source for their light exposure testing of webbing (in addition to the FMVSS209 required Carbon Arc light source testing). For global market vehicles, OEM manufacturers have to perform both FMVSS and ECE certification testing to demonstrate compliance so are doing both tests currently. (see attachment in Appendix 4 for summary of light exposure tests and equipment. See Appendix 5 for summary of various Customer requirements).

By including Xenon Arc light exposure testing (as currently specified and performed in ECE R16) as an acceptable alternative to the current Carbon Arc light exposure testing in FMVSS 209, with no change in webbing performance requirements currently in FMVSS 209 after this light exposure, the NHTSA would accomplish several things…

1) An opportunity to work toward a harmonization with ECE R16 webbing light exposure test requirements with respect to FMVSS 209 webbing light exposure test requirements. The NHTSA has stated its desire to work toward harmonizing global test requirements.
2) Since no changes to the requirements for webbing performance after either Carbon Arc or Xenon Arc light exposure are being proposed, there is no degradation to the performance requirement in FMVSS 209.
3) Including both Carbon Arc and Xenon Arc light exposure requirements will allow owners of existing Carbon Arc test equipment to continue using that equipment until it is no longer viable, but allow owners of older Carbon Arc test equipment the option to buy new Xenon Arc test equipment at their choosing in the most time efficient and cost efficient manner if their current equipment has reached its end of life.
4) It will provide a reduction in effort and cost for automotive Customers, seat belt and webbing suppliers and test labs in that only one set of light exposure test equipment will be required to perform FMVSS209, ECE R16 regulatory testing and OEM Customer performance specification testing for light exposure test requirements for seat belt webbing.

Current ECE R16 webbing light exposure test requirements states:
7.4.1.2. Light-conditioning
7.4.1.2.1. The provisions of Recommendation ISO 105-B02 (1994/Amd2:2000) shall apply. The strap shall be exposed to light for the time necessary to produce a contrast equal to Grade 4 on the grey scale on Standard Blue Dye No. 7.

Supporting evidence:
Since seat belt webbing suppliers provide webbing for seat belt assembly products used in both the United States, certified to the requirements of FMVSS 209, as well as seat belt assembly products used in other global markets, certified to the requirements of ECE R16, test data for webbing tested to both requirements, including light exposure testing by Carbon Arc and Xenon Arc test equipment is available for comparative review and analysis. (see attachment in Appendix 6 for webbing test results from multiple webbing suppliers).
In general, the test results between Carbon Arc and Xenon Arc light exposure testing is comparable with the Xenon Arc test result being just a bit more severe with webbing tensile test results for the Xenon Arc exposed samples being a few percentage points lower than samples exposed to Carbon Arc light, but with both sets of post-light-exposure samples far exceeding the minimum strength required in FMVSS 209. There is no request being made to change the post light exposure tensile strength requirement for webbing.

See attachment in Appendix 7 for a simplified comparison between sunlight, Carbon arc and Xenon Arc light exposure.

This request:
This request is to add the webbing Xenon Arc light exposure test requirement currently found in ECE R16 as an acceptable alternate to the current Carbon Arc light exposure test required in FMVSS 209.

Implementation:
The proposed implementation strategy is to immediately implement into FMVSS 209 and TP-209 upon final agency review and request for comments. Immediate implementation is requested for several reasons:

1) No change to the actual post-light-exposure test requirement found in FMVSS 209 is being made or requested.

2) Current Carbon Arc test equipment is beginning to reach end of life. Manufacturer support for this equipment will end January 2016 and replacement parts and test consumables are and will continue to be harder to find. Immediate implementation may prevent an interruption in testing.
3) The Xenon Arc light exposure test equipment is currently available and being used for ECE R16 certified product and has proven to be a reliable and repeatable test based on user feedback. Inclusion of a Xenon Arc light exposure device in FMVSS209 would insure no disruptions due to Carbon Arc test equipment failure. No added work or costs to certify seat belt webbing product would be required since in most cases it's already being done.

In conclusion, the Automotive Safety Council would like to thank the National Highway Safety Traffic Administration for consideration of this request to amend a requirement in FMVSS209. Due to the urgency of the current situation, with current Carbon Arc light exposure test equipment at risk of immediate or unexpected failure due to age, lack of replacement parts / test consumables, or support from the equipment manufacturer, we would like to request an immediate review of this request.

Sincerely yours,

D. P. Campbell

Douglas P. Campbell
President
Automotive Safety Council

Scott A. Schmidt
Senior Director, Vehicle Safety and Regulatory Affairs
Alliance of Automobile Manufacturers

Michael X Cammisa

Michael X. Cammisa
Senior Director, Safety
Association of Global Automakers, Inc

(Attachments)

Appendix 1

Letter 1 from Atlas -

ATLAS
MATERIAL TESTING SOLUTIONS

AMETEK
MEASUREMENT & CALIBRATION TECHNOLOGIES

ATLAS MATERIAL TESTING TECHNOLOGY LLC
4114 North Ravenswood Avenue
Chicago, Illinois 60613 U.S.A.
Phone: +1 773-327-4520
Fax: +1 773-327-5787
www.atlas-mts.com

Date: December 3, 2013

RE: Carbon-Arc testing

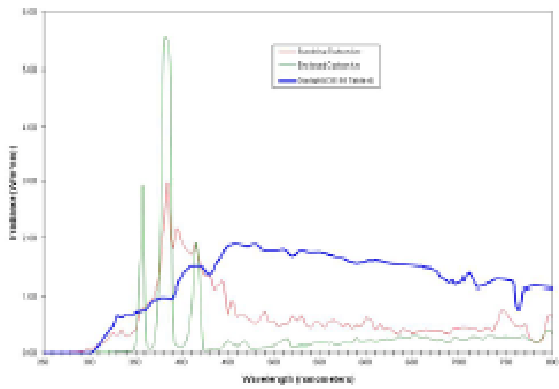
Ms. Norma Lalonde
Quality Assurance
Autoliv Americas
VOA Canada
VOC Webbing Facility
190 MacDonald Road
Collingwood, Ontario
L9Y 4N6 Canada

Dear Ms. Lalonde,

I understand from RBAtlas that you have some questions and concerns regarding carbon arc weathering testing. Below is a brief summary of carbon arc testing and the current situation with equipment support.

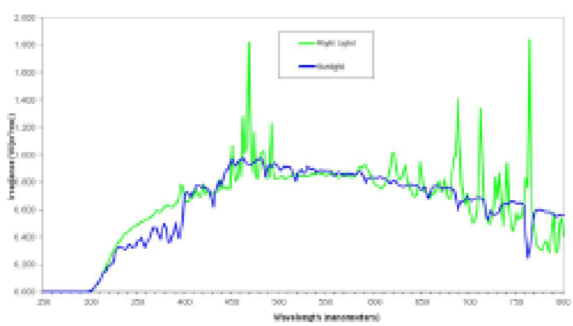
The use of carbon arc weathering equipment, both enclosed and open flame (sunshine), by industry has abruptly declined in a trend that started in the late 1970's. When first introduced for use as weathering application circa 1920, this was the only technology available that would emulate natural solar radiation to quantify solar degradation in materials. However, through the years, it became apparent that this technology had significant limitations, limiting user confidence in test results. There are countless papers comparing different weathering technologies, but they all conclude similar findings – carbon arc instruments are more likely to produce abnormal test results because of spectral limitations. Open flame (sunshine) carbon arc exposure is too rich in short wavelength ultraviolet radiation, producing conditions which are too severe for many materials. Vice versa, enclosed carbon arc exposure lacks short wavelength ultraviolet energy, and cannot induce degradation observed in natural outdoor exposures. The following graphic shows how the spectral power distribution for these two technologies differs from natural sunlight.

Carbon Arc Spectral Plots



Thus, weathering instrument manufacturers researched, and developed, newer technologies providing more realistic, and flexible, reproduction of natural solar energy. The current state of the art is xenon arc weathering, with the graphic below showing the inherent improvement in solar spectral reproduction.

Right Light Filter System vs Sunlight



Different filters produce different spectral power output, enabling users to tailor the light source to emulate specific environments, such as natural outdoor and under glass exposures. Other technologies, such as metal halide and fluorescent ultraviolet exposures are also employed in modern weathering applications.

Starting in the 1970's, industry groups responded by developing comparable alternate xenon-arc standards. Although carbon arc standards are still available, material companies rarely specify them. New material standards do not include carbon arc options. The automotive, aerospace, coatings, plastics, and textile industries, the primary users of weathering technology, have transitioned to the use of xenon and alternate fluorescent ultraviolet instruments. Only a few industries still specify carbon arc instruments. The most prominent is the Japanese automotive industry, but they are fast developing xenon options for their weathering standards. The military still specifies carbon arc for a few materials, while a few safety related motor vehicle applications remain. As such, production of carbon arc weathering instruments has ceased in the United States, and is only produced by one manufacturer in Japan to support the remaining industry in that country. Below, is a table listing all past generations of Atlas carbon arc instruments with manufacturing dates, discontinued dates and finally obsolete dates. As you can see, the last Atlas carbon arc unit was manufactured over 13 years ago (but the bulk of the units much earlier) and classified as obsolete in 2006. As mentioned above, lack of use in industry and dwindling numbers of units led to the early discontinuation as Atlas was no longer able to procure replacement parts for so few working instruments in a cost effective manner.

Atlas Carbon arc Instrument Timeline*

MODEL SERIES	Lamp	# Made (1)	First Year	DISCONTINUED	RESTRICTED	OBSOLETE
BWM-CC	Enclosed		1929	ca 1956		**July 2001**
FDAR	Enclosed		1940	1964		**July 2001**
XW R/RC, W, WR, etc	Sunshine		1950	1981	**JULY 2001**	JAN 2004
DMC H, R, HR	Enclosed		1953	1979	**JULY 2001**	JAN 2004
SMC H, R, HR,	Enclosed		1953	1969	**JULY 2001**	JAN 2004
18 F, FR, FT, W, WR, etc	Enclosed Compact		1962	1997	**JULY 2001**	Jan 2004
CXW	Sunshine		1980	1989	**July 2001**	Jan 2004
CDMC	Enclosed		1980	1989	**July 2001**	Jan 2004
CXWA	Sunshine		1989	Oct 2001	Jan 2004	Jan 2006
CDMCA	Enclosed		1989	Oct 2001	Jan 2004	Jan 2006

* Confidential information not to be shared without permission from Atlas

I hope this information has helped you better understand the history of carbon-arc testing and the current situation with instrument support. Please contact me with any other questions you might have.

Kind regards,

Jack Martin
Director, Sales - Americas & Asia
Atlas Material Testing Technology, LLC
4114 N. Ravenswood Avenue
Chicago, IL 60613
Office: (+1) 773-289-5519
Cell: 954-559-4563
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Appendix 1 (cont'd)

Letter 2 from Atlas -

ATLAS
MATERIAL TESTING SOLUTIONS

AMETEK®
MEASUREMENT & CALIBRATION TECHNOLOGIES

July 1, 2013

Dear Customer,

In August 2012, Atlas announced a December 2015 obsolescence date for Ci35/65 series of carbon-arc and xenon-arc Weather-Ometers (including "A" series). That communication was the latest step in the obsolescence plan first introduced in 2007. In the six years that have passed since this first customer notification was distributed, we have continued to see a declining number of these instruments in use. The last xenon-arc Ci65A was manufactured 15 years ago, and the average age of Ci35/65 model in the field is approximately 25 years.

The sourcing of repair parts for these legacy instruments has proven to be a greater challenge than expected since our August 2012 letter. Parts obsolescence is accelerating and Atlas is continually challenged to secure repair parts while trying to manage supplier price increases. Currently, over 50 key parts, a significant percentage of the repair parts list, are only available in kits so that we can maintain the volume level required that will support the availability of these parts from suppliers. While Atlas is doing everything possible to minimize parts shortages, we can no longer ensure all repair parts will be available up to the December 2015 obsolescence date.

Many Atlas Ci35/65 instrument users have acted on this information to replace their ageing units with the latest generation of Ci instruments, not only guaranteeing parts availability and support for years to come, but also to take advantage of the industry leading technology and enhancements offered with modern instruments. The Atlas 2012 Ci 35/65 Replacement Program was well received, providing incentives to upgrade instruments over a 6 month period. In an effort to help our customers transition to modern instruments, the **2013 Atlas Ci35/65 Replacement Program** is now being offered; see your Atlas Sales Representative to learn more about this program.

Atlas staff will continue to work closely with the installed user base to provide the support required during this next obsolescence phase, and provide technical sales support to identify the best replacement unit to meet your testing needs. Should you have any questions regarding the obsolescence of the Ci35 and Ci65 instruments, please contact Atlas.

Sincerely,

Matthew McGreer

Matthew McGreer, Product Manager, Weathering Instruments

ATLAS MATERIAL TESTING TECHNOLOGY LLC
4114 North Ravenswood Avenue. Chicago, Illinois 60613
Phone (773) 327 – 4520 Fax (773) 327-5787 www.atlas-mts.com

Appendix 1 (cont'd)

Letter 3 from Atlas -

ATLAS
MATERIAL TESTING SOLUTIONS

AMETEK
MEASUREMENT & CALIBRATION TECHNOLOGIES

Mount Prospect, IL
October 1, 2014

Dear Atlas Customer,

In July 2013, Atlas distributed a communication confirming the December 2015 obsolescence date for Ci35/65 series of carbon-arc and xenon-arc Weather-Ometers® (including "A" series) as the final step in our product obsolescence plan first communicated in 2007.

We are continually challenged to provide the same high level of support you expect for your Atlas Weathering Instrument fleet as certain parts are no longer available to us. January 1, 2016, repair and replacement items used in the Ci35/65 instruments will be officially discontinued. We will continue to support these units with our best effort and anticipate the ability to provide general preventive maintenance and calibration services as well as consumables such as lamps and filters for the foreseeable future. However, the price and availability of items for this generation of instruments can no longer be guaranteed.

As with past obsolescence communications, Atlas will offer you one last Trade-Up Program, providing you incentives to trade up your instruments to our current Ci products, meeting the new and more stringent standards.

–Please talk to your Atlas Sales Representative to learn more about the Atlas Ci35/65 Trade-Up Program being offered through March 31, 2015, or if you have any questions regarding the obsolescence of the Ci35 and Ci65 instruments.

Sincerely,

Joergen Olsson
President
Atlas Material Testing LLC

DESIGN OF EXPERIMENT · MATERIAL SCREENING · ACCELERATED LABORATORY TESTING · OUTDOOR WEATHERING TESTING · INDEPENDENT LABORATORY VALIDATION

Appendix 2

- Quotes were obtained from China and Japan for replacement Carbon Arc machines but the equipment is unable to perform the FMVSS 209 required tests.

Appendix 4

Light resistance test comparison (Equipment, Methods and Materials)

Test Specification	Apparatus	Test Method Specification	Source of Light	Black Thermometer Temperature and Humidity	Irradiation	Irradiation Filters	Tensile Criteria	Grey Scale Criteria
FMVSS 209, Sec 4.2(e)	Weather-o-meter Atlas ci65(water cooled)	Type E carbon Arc specified in ASTM G23-81 (recently modified and separated the carbon arc to G152-13)	2 sizes of Copper coated Sunshine carbon electrodes, 3 electrodes of each size will last 24h only and need to be replaced to continue the test	Black panel Thermometer(BPT) 60°C ± 2°C No Humidity	100h	Soda Lime glass, transmittance of <5% for wave length <305nm, and >90% of wave length of (375-800) nm	Normal webbing Tensile is 22.3KN min Post light, min 60% of original value	Not less than No. 2
Customer 1	Weather-o-meter Atlas ci65(water cooled)	M7100 NES 1999	Xenon Arc lamp of correlated Colour Temperature 5500K to 6500K	Black Panel Thermometer(BPT) 89°C ± 2°C 50% ± 5% Humidity	75MJ/m² for 393h	Inner: Borosilicate type S, Outer: Soda Lime wave length (300-400)nm Light Intensity on specimen: 53W/m² (wideband)	Normal webbing Tensile is 22.3KN min Post light, min 70% of original value	Not less than No.3
ECE R16, Sec 7.4.1.2	Weather-o-meter Atlas ci65(water cooled)	ISO 105-B02. 1994/Amd2:2000	Xenon Arc lamp of correlated Colour Temperature 5500K to 6500K	Either: a: Black Panel Thermometer(BPT) 63°C ± 3°C 30% ± 5% Humidity OR: b: Black Standard Thermometer(BST) 65° C ± 3C° 30% ± 5% Humidity	Until produce a contrast equal to grade 4 on the grey scale on standard Blue Wool Dye No.7 . (No specified J/M² or time)	Inner: Borosilicate type S, Outer: Soda Lime Either: a: wave-length 420nm, Light Intensity on specimen:1.1 ± 2W/m² (Narrowband) b: Wave length (300-400)nm, Light intensity on specimen: 42 ± 2W/m² (wide band)	Normal webbing Tensile is14.7Kmin. Post light, min of 14.7KN and 75% of original value	N/A

Notes:

1. For Xenon test method, it is preferable to have amount of Joules and hours specified similar to the Customer spec to ensure that the test is less subjective to human eyes as per ECE method.

<u>**Appendix 5**</u>

OEM Automobile Manufacturers specifying both Carbon Arc and Xenon Arc light exposure tests in their internal performance specifications

- General Motors – GMW 3020
- Honda – 8140Z – T5A
- Isuzu – 5-SFTS-2301
- Nissan – 86840 NDS00
- BMW – QS 72003

OEM Automobile Manufacturers specifying Xenon Arc light exposure tests in their internal performance specifications

- Ford – WSS M7H57 A1-A5 (SAE J1885)

OEM Automobile Manufacturers specifying Carbon Arc light exposure tests in their internal performance specifications

- Chrysler – MS JE9000
- Mazda – MES PA 57060
- VW – TL52454

All OEM Automobile Manufacturers require seat belt assembly and seat belt webbing compliance reports for both FMVSS 209 and ECE R16 performance requirements for vehicle sold in both the United States and ECE R16 market vehicles (most of the rest of the world).

Appendix 6

Summary of webbing tensile strength and color retention for one seat belt webbing manufacturer that has performed both Carbon Arc and Xenon Arc light exposure testing on the same styles/lots of webbing from 2012 – Feb 2015.
The ECE R16 testing run using the Xenon Arc light exposure shows approx. 10% more reduction in strength but post test tensile strength values are still well above the 60% retained strength specified in FMVSS209.
The Xenon Arc light exposure test is slightly more harsh than the Carbon Arc light exposure test.

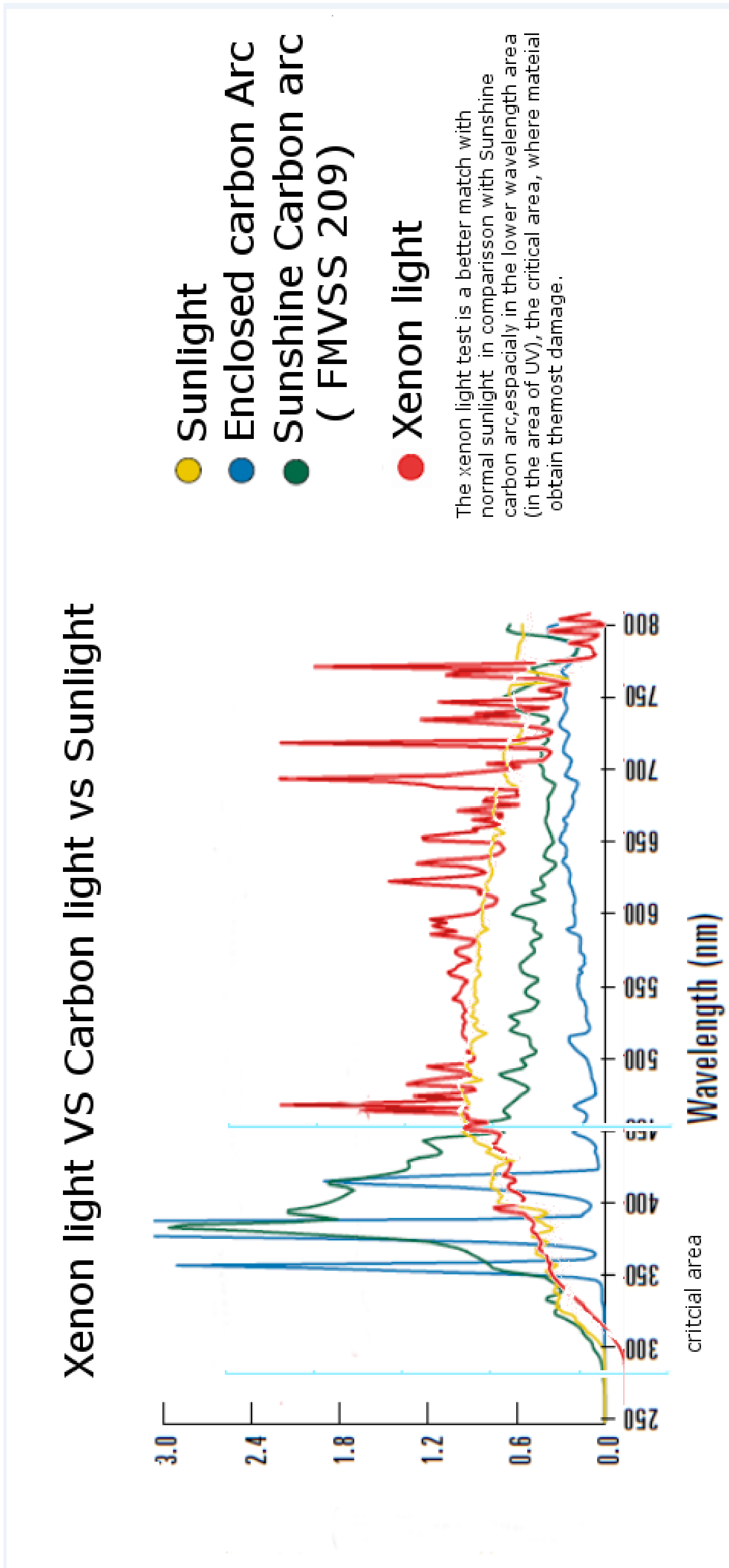
Standard	Average Retained Strength	Average Retained Color	# of results
FMVSS 209	96%	4	129
ECE R16	85.70%	N/A	45
NES 7100	81.50%	3.78	33
SAE J1885	N/A	4.05	69
Total Average	88%	3.94	
	Delta = 14.5%	Delta = 0.27	

A total of 276 results were evaluated between the years of 2012 to 2015.

Summary of testing from a second webbing manufacturer

Webbing type	Webbing color	Xenon										Carbon Arc				
		Per ECE				Approximate date for the test	Per Customer				Approximate date for the test	Per FMVSS				Approximate date for the test
		Tensile (kN)	Tensile (KN)	of original	Grey Scale		Tensile (kN)	Tensile (KN)	of original	Scale (1 - 5)		Tensile (kN)	Tensile (KN)	of original	Scale (1 - 5)	
Construction A	Black	29.91	24.92	83.3%	N/A	2014	N/A				N/A	30.66	30.19	98.5%	4-5	2013
	Beige	29.33	22.28	76.0%								30.54	30.04	98.4%	4-5	
	Grey	30.60	25.35	82.8%								31.12	29.44	94.6%	4	
Construction B	Black	29.74	24.35	81.9%	N/A	2014						30.80	30.57	99.3%	4-5	2013
	Beige	28.81	23.21	80.6%								30.77	30.40	98.8%	4-5	
	Grey	30.45	25.30	83.1%								31.22	30.10	96.4%	4	
Construction C	Black	29.77	24.00	80.6%	N/A	2014						31.22	30.56	97.9%	4-5	2008
	Beige	29.57	22.82	77.2%								29.02	29.52	101.7%	4-5	
	Grey	29.34	23.27	79.3%								30.65	29.76	97.1%	4-5	
Construction D	Black	27.40	23.30	85.0%	N/A	2014						29.80	29.77	99.9%	4-5	2008
	Beige	28.32	23.17	81.8%								29.00	30.40	104.8%	4-5	
	Grey	27.96	23.30	83.3%								28.98	29.12	100.5%	4-5	
Construction E	Black	N/A				N/A	30.70	21.60	70.4%	4	2006	32.60	30.60	93.9%	4-5	2008
	Beige						30.10	21.80	72.4%	3		32.00	30.70	95.9%	4-5	
	Grey						30.40	21.60	71.1%	3-4		32.10	29.50	91.9%	4-5	
Construction F	Black						28.50	21.40	75.1%	3	2006	28.52	27.64	96.9%	4	2008
	Beige						28.60	21.30	74.5%	3-4		28.64	27.74	96.9%	4	
	Grey						28.60	21.50	75.2%	3-4		28.65	27.17	94.8%	4	
TEST EQUIPMENT INFLUENCE											Carbon Arc (Per FMVSS)					
Construction G	Beige – Test Facility #1 – SUGA SX2-75 (water cooled) – grade 4 on the greyscale (ΔE-N/A)	30.20	28.35	93.9%	N/A	2013	N/A				Beige	31.33	25.33	80.8%	5	2013
	Beige – Test Facility #2 – SUGA SX-75 (water cooled) – grade 4 on the greyscale (ΔE-2.04)	30.98	29.03	93.7%												
	Beige – Test Facility #3 – Atlas Ci3000+ (water cooled) – grade 4 on the greyscale (ΔE-1.77)	31.13	23.82	76.5%												
	Beige – Test Facility #4 – Atlas Ci4000 (water cooled) – grade 4 on the greyscale (ΔE-N/A)	30.05	23.85	79.4%												
	Beige – Test Facility #4	28.80	22.40	77.8%		2012						N/A				N/A
	Black – Test Facility #4	28.50	24.05	84.4%		2013					Black	31.07	26.30	84.6%	5	2013
	Black – Test Facility #4	28.90	24.20	83.7%		2012						N/A				N/A

Appendix 7



Xenon light VS Carbon light vs Sunlight
Sunlight
Enclosed carbon Arc
Sunshine Carbon arc (FMVSS 209)
Xenon light
The xenon light test is a better match with normal sunlight in comparisson with Sunshine carbon arc,espacialy in the lower wavelength area (in the area of UV), the critical area, where mateial obtain themost damage.
3.0
2.4
1.8
1.2
0.6
0.0
250
300
350
400
450
500
550
600
650
700
750
800
Wavelength (nm)
critcial area

Appendix 7 (cont'd)

From the Atlas "Weathering Testing Guidebook" –

Both carbon arc technologies require daily replacement of the carbon rods and cleaning of the filters or globes. Filters and globes degrade and must be periodically replaced; accumulated carbon soot also must be removed. There is a vast amount of historical data on the use of carbon arcs, and a number of test methods still specify their use. While good correlation with outdoor exposures has been reported for some materials whose weathering mechanisms are appropriate for these limited spectrum sources, this technology has largely been replaced with fluorescent UV or xenon arc systems. ISO 4892-4, *Plastics — Methods of Exposure to Laboratory Light Sources — Part 4: Open-flame Carbon arc Lamps*; ASTM G152, *Standard Practice for Operating Open-Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials*; and ASTM G153, *Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials* are the primary documents describing performance characteristics of devices that use a carbon arc light source.

Appendix 8 – previously submitted

Automotive Occupant Restraints Council

Administrative Office
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Lexington, Kentucky 40502
(859) 269-4240
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E-mail: info@aorc.org

December 15, 2008

Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue S.E.
West Building, Ground Floor, Room W12-140
Washington, D.C. 20590

Re: FMVSS 209; Seat Belt Assemblies
NHTSA-2008-0001-0001
Request for Amendment to Rule

Dear Sir:

The Automotive Occupant Restraints Council (AORC) is an industry association of 42 suppliers of occupant restraints, components/materials and services to the automobile industry. The mission of the Council is to reduce highway casualties and injuries by providing the motoring public with reliable and effective occupant restraint systems, components and services, and to promote public acceptance and proper use of their restraint systems.

The AORC observes that certain aspects of FMVSS 209 and TP-209 are outdated, in error, or potentially confusing. AORC therefore petitions NHTSA to amend FMVSS 209 to address these issues, and requests that TP-209 be updated as well. Enumerated below, item by item, you will find the "current" verbiage in FMVSS 209, along with our proposed changes and the supporting rationale (where appropriate).

Sincerely yours,

Douglas P. Campbell

Douglas P. Campbell,
President
Automotive Occupant Restraints Council

DPC/jm

Attachments

ITEM 1. S5- Add Reference to TP-209

FMVSS 209 does not reference NHTSA Test Procedure (TP) 209. For the sake of clarity, it would be beneficial if FMVSS 209 referenced the TP. Therefore AORC proposes adding the following to FMVSS:

Proposal:

S5.5 *Compliance Test Procedure (TP) 209.* Laboratory Test Procedures for FMVSS 209, Seat Belt Assemblies, can be located at the NHTSA website. Please go to http://www.nhtsa.c\gov.portal/site/nhtsa/menuitem.b166d5602714f9a73baf3210dba046a0/ for the latest revision level.

ITEM 2. S3 Definitions

Some of the definitions in S3 do not correlate with standard industry practice. AORC compared the S3 definitions with those of SAE J1803 and recommends adopting the following changes:

Current FMVSS 209	Current SAE J1803	Desired
Attachment hardware means any or all hardware designed for securing the webbing of a seat belt assembly to a motor vehicle.	**Attachment Hardware -** All load bearing hardware designed for securing the webbing portion of a seat belt assembly to a motor vehicle structure or intermediate structural component including but not limited to retractors, end fittings, bolts, studs, nuts or other attachment means but not including those components permanently fixed to the vehicle. NOTE - If the seat belt is attached to a seat, the seat is not attachment hardware.	Change to SAE definition for clarity.
Buckle means a quick release connector which fastens a person in a seat belt assembly.	**Buckle -** A quick release connector between two parts of a seat belt assembly.	Change to SAE definition for clarity.
Emergency-locking retractor means a retractor incorporating adjustment hardware by means of a locking mechanism that is activated by vehicle acceleration, webbing movement relative to the vehicle, or other automatic	**Emergency Locking Retractor (ELR) -** A retractor whose locking mechanism is activated by vehicle acceleration, webbing acceleration or other crash sensing means and is capable of withstanding restraint forces.	Change to SAE definition for clarity. "webbing movement relative to the vehicle" is not an accurate description of a web sense lock.

Current FMVSS 209	Current SAE J1803	Desired
action during an emergency and is capable when locked of withstanding restraint forces.		
Pelvic restraint means a seat belt assembly or portion thereof intended to restrain movement of the pelvis.	**Pelvic Restraints -** A seat belt assembly, or portion thereby, intended to restrain movement of the lower torso by directing forces to the pelvic girdle.	Change to SAE definition for clarity.
Seat belt assembly means any strap, webbing, or similar device designed to secure a person in a motor vehicle in order to mitigate the results of any accident, including all necessary buckles and other fasteners, and all hardware designed for installing such seat belt assembly in a motor vehicle.	**Seat Belt Assembly -** Any strap, webbing, or similar device designed to secure a person in a motor vehicle with the intention of minimizing the risk of bodily harm in a collision (other than a system designed solely to accommodate children), including all buckles, adjusting mechanisms, fasteners, and related hardware.	Change to SAE definition for clarity.
Webbing means a narrow fabric woven with continuous filling yarns and finished selvages.	**Webbing -** A specially woven fabric used in seat belt assemblies	Change to SAE definition for clarity.
Not currently in 209		**Nominal Stowage –** The length of extractable webbing in a retractor at the unworn design position.
Not currently in 209		**XX% Extension** – The ratio of webbing extracted versus nominal stowage.
Not currently in 209		**Latchplate -** Metal plate on the seatbelt system which usually is attached to the webbing and inserts into and locks together with the buckle end of the seat belt assembly. **Dual Mode Retractor** (also known as an “Automatic-locking retractor/emergency-locking retractor” or “ALR/ELR”) means a retractor whose primary function is as an emergency-locking retractor, but which may be converted to function as an automatic-locking retractor, by full extension of the webbing, pushing a button, or other means. A dual-mode retractor shall be considered as intended to meet all requirements for an emergency-locking retractor only.

ITEM 3. S4.1(f) ATTACHMENT HARDWARE

S4.1(f) currently states:

"…However, seat belt assemblies designed for installation in motor vehicles equipped with seat belt assembly anchorages that do not require anchorage nuts, plates, or washers, need not have such hardware, shall have 7/16–20 UNF – 2A or ½ -13- UNC – 2A attachment bolts or equivalent metric hardware…"

S4.1(f) proposal:

"…However, seat belt assemblies designed for installation in motor vehicles equipped with seat belt assembly anchorages that do not require anchorage nuts, plates, or washers, need not have such hardware, shall have 7/16–20 UNF – 2A or ½ -13- UNC – 2A attachment bolts or equivalent hardware…"

S5.2(c)(1) currently states:

"…The attachment hardware or simulated fixture shall be fastened by the bolt to the anchorage shown in Figure 3, which has a standard 7⁄16–20UNF–2B or 1⁄2-UNF–2B or metric equivalent threaded hole in a hardened steel plate at least 10 mm in thickness…"

S5.2(c)(1) proposal:

"…The attachment hardware or simulated fixture shall be fastened by the bolt to the anchorage shown in Figure 3, which has a standard 7⁄16–20UNF–2B or 1⁄2-UNF–2B or equivalent threaded hole in a hardened steel plate at least 10 mm in thickness…"

Rationale:

The proposed wording enhances the existing language by allowing the flexibility to use alternative fasteners that would still meet the structural requirements for the attachment of seat belt hardware into the vehicle.

In August 2007, Transport Canada published <u>Canada Gazette II</u>, promulgating TSD-209, eliminating the word "metric" from the otherwise exact duplication of FMVSS 209 S4.1(f). In <u>CGII</u>, TC's rationale was "…the intention is to allow equivalents to 7/16-20 UNF-2A and 1/2-13 UNC-2A attachment bolts to be used providing they meet the strength requirements of TSD 209."

In addition, S4.3(c)(1) ***(see ITEM 10),*** mandates certain static strength requirements for attachment hardware, regardless of size. Also as noted in S4.3(c)(1), FMVSS 208 crash test results using complete restraint systems and FMVSS 210 anchorage pull test results using retractors, buckles, anchors, height adjusters, etc. would verify hardware strength if a traditional threaded fastener is not used.

ITEM 4: S5.2(c)(1) Attachment Hardware

S5.2 (c) (1) currently states:

"…The attachment hardware or simulated fixture shall be fastened by the bolt to the anchorage shown in Figure 3, which has a standard 7/16-20-UNF-2B or ½ -UNF – 2B or…"

S5.2 (c) (1) proposal:

"…The attachment hardware or simulated fixture shall be fastened by the bolt to the anchorage shown in Figure 3, which has a standard 7/16-20-UNF-2B or ½ - **13-UNC** – 2B or…"

Rationale:

AORC would like to point out that the thread designation for the ½-UNF-2B is incorrect. To be consistent with the standard thread designation and other thread references in FMVSS 209 this thread size callout should be corrected.

ITEM 5: S4.1(k) Installation Instructions

S4.1(k) currently states:

"…The installation instructions shall state whether the assembly is for universal installation or for installation only in specifically stated motor vehicles, and shall include at least those items specified in SAE recommended Practice J800c, "Motor Vehicle Seat Belt Installations," November 1973…"

S4.1(k) proposal:

"… The installation instructions shall state whether the assembly is for universal installation or for installation only in specifically stated motor vehicles, and shall include at least those items specified in SAE recommended Practice J800c, "Motor Vehicle Seat Belt Installations," June 1994**…"**

Rationale:

J800c June 1994 is a general rewrite and update to the April, 1986 version which reaffirmed the November, 1973 version. There are no significant differences in these documents but the new version provides some clarifications and updated references. To be consistent with the industry standard, this section should be corrected. For specifics, see APPENDIX A.

ITEM 6: S4.2(b) Web Breaking Strength

S4.2(b) currently states:

"(b) *Breaking strength.* The webbing in a seat belt assembly shall have not less than the following breaking strength when tested by the procedures specified in S5.1(b): Type 1 seat belt assembly--26,689 N; Type 2 seat belt assembly--22,241 N for webbing in pelvic restraint and 17,793 N for webbing in upper torso restraint."

S4.2(b) proposal:

"(b) *Breaking strength.* The webbing in a seat belt assembly shall have not less than the following breaking strength when tested by the procedures specified in S5.1(b): Type 1 seat belt assembly--26,689 N; Type 2 seat belt assembly--22,241 N ~~**for webbing in pelvic restraint and 17,793 N for webbing in upper torso restraint**~~**...**"

Rationale:

Most current type 2 seat belt systems are 3 point continuous loop, which use the same webbing for both the pelvic and upper torso restraints. The present regulation specifies different strengths for the pelvic and upper torso web. This proposal suggests the higher type 2 pelvic strength requirement be applied to both pelvic and torso restraints.

ITEM 7: S4.2(e) Light Resistance for Webbing

S4.2(e) currently states:

"(e) *Resistance to light.* The webbing in a seat belt assembly after exposure to the light of a carbon arc and tested by the procedure specified in S5.1(e) shall have a breaking strength not less than 60 percent of the strength before exposure to the carbon arc and shall have a color retention not less than No. 2 on the Geometric Gray Scale published by the American Association of Textile Chemists and Colorists, Post Office Box 886, Durham, NC."

S4.2(e) proposal:

"(e) *Resistance to light.* The webbing in a seat belt assembly**, unless constructed of 100% polyester yarn,** after exposure to the light of a carbon arc and tested by the procedure specified in S5.1(e)**(1)** shall have a breaking strength **determined per S5.1(e)(3)** not less than 60 percent of the strength before exposure to the carbon arc ~~**and shall have a color retention not less than No. 2 on the Geometric Gray Scale published by the American Association of Textile Chemists and Colorists, Post Office Box 886, Durham, NC**~~."

The webbing in a seat belt assembly manufactured on or after xxx. xx, 20xx *(effective date; set, for example, approximately two years after the revised rule is promulgated)***, after exposure to a xenon arc per the procedure specified in S5.1(e)(2), shall have a breaking strength determined per S5.1(e)(3) not less than 60 percent of the strength before exposure to the xenon arc. The webbing in a seat belt assembly manufactured prior to xxx. xx, 20XX** *(same effective date as above)***, if constructed of 100% polyester yarn, may be tested per the carbon arc exposure method defined in S5.1(e)(1), or per the xenon arc procedure specified in S5.1(e)(2), and, regardless of test method, shall have a breaking strength determined per S5.1(e)(3) not less than 60 percent of the strength before exposure to the carbon or xenon arc."**

S5.1(e) currently states:

(e) *Resistance to light.* Webbing at least 508 mm in length from three seat belt assemblies shall be suspended vertically on the inside of the specimen track in a Type E carbon-arc light exposure apparatus described in Standard Practice for Generating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials, ASTM Designation: G23 81, published by the American Society for Testing and Materials, except that the filter used for 100 percent polyester yarns shall be chemically strengthened soda-lime glass with a transmittance of less than 5 percent for wave lengths equal to or less than 305 nanometers and 90 percent or greater transmittance for wave lengths of 375 to 800 nanometers. The apparatus shall be operated without water spray at an air temperature of 60° ±2 °Celsius (°C) measured at a point 25 ±5 mm outside the specimen rack and midway in height. The temperature sensing element shall be shielded from radiation. The specimens shall be exposed to light from the carbon-arc for 100 hours and then conditioned as prescribed in paragraph (a) of this section. The colorfastness of the exposed and conditioned specimens shall be determined on the Geometric Gray Scale issued by the American Association of Textile Chemists and Colorists. The breaking strength of the specimens shall be determined by the procedure prescribed in paragraph (b) of this section. The median values for the breaking strengths determined on exposed and unexposed specimens shall be used to calculate the percentage of breaking strength retained."

S5.1(e) proposal:

(e) *Resistance to light.* (1**)** ***Carbon arc testing:*** Webbing at least 508 mm in length from three seat belt assemblies shall be suspended vertically on the inside of the specimen track in a Type E carbon-arc light exposure apparatus described in Standard Practice for Generating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials, ASTM Designation: G153-04, published by the American Society for Testing and Materials except that the filter used for 100 percent polyester yarns shall be chemically strengthened soda-lime glass with a transmittance of less than 5 percent for wave lengths equal to or less than 305 nanometers and 90 percent or greater transmittance for wave lengths of 375 to 800 nanometers. The apparatus shall be operated without water spray at an air temperature of 60 +/- 2 degrees Celsius measured at a point 25 +/- 5 mm outside the specimen rack and midway in height. The temperature sensing element shall be shielded from radiation. The specimens shall be exposed to light from the carbon-arc for 100 hours and then conditioned as prescribed in paragraph (a) of this section. ~~**The colorfastness of the exposed and conditioned specimens shall be determined on the Geometric Gray Scale issued by the American Association of Textile Chemists and Colorists. The breaking strength of the specimens shall be determined by the procedure prescribed in paragraph (b) of this section. The median values for the breaking strengths determined on exposed and unexposed specimens shall be used to calculate the percentage of breaking strength retained.**~~

"(2) Xenon arc testing (effective xxx. xx, 20xx for webbing constructed of 100% polyester yarn): **Webbing at least 508 mm in length from three seat belt assemblies shall be exposed to the light of a xenon arc lamp according to the method described in Textiles – Tests for Colour Fastness – Colour fastness to artificial light: Xenon arc fading lamp test, ISO 105-B02 (1978) published by the International Organization for Standardization, for the time necessary to produce a contrast equal to grade 4 on the grey scale on Standard Blue Dye No. 7.**

"(3) Breaking strength determination: The breaking strength of the specimens **after light exposure per either S5.1(1) or S5.1(2)** shall be determined by the procedure prescribed in paragraph (b) of this section. The median values for the breaking strengths determined on exposed and unexposed specimens shall be used to calculate the percentage of breaking strength retained."

TP209 12 A. (4) (a) currently states:

(a) Light exposure (carbon-arc), 100 hours

TP209 12 A. (4) (a) proposal:

(a) Light exposure:
Polyester webbing: xenon arc, for the time necessary to produce a contrast equal to grade 4 on the grey scale on Standard Blue Dye No. 7 per ISO 105-B02 (1978)
Other webbing constructions: carbon arc, for 100 hours

TP209 12 A.4 currently states:

A.4 Resistance to Light [S4.2(e), S5.1(e)]
Webbing samples at least 508 mm in length from three seat belt assemblies shall be suspended vertically on the inside of the specimen rack in a Type E carbon-arc light-exposure apparatus described in Standard Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials, ASTM Designation: G23-81, published by the American Society for Testing and Materials, except that the filter used for 100 percent polyester yarns shall be chemically strengthened soda-lime glass with a transmittance of less than 5 percent for wavelengths equal to or less than 305 nanometers and 90 percent or greater transmittance for wave lengths of 375 to 800 nanometers. The apparatus shall be operated without water spray at an air temperature of 60 ± 2°C measured at a point 25 ± 5 mm outside the specimen rack and midway in height. The temperature sensing element shall be shielded from radiation. The specimen shall be exposed to light from the carbon-arc for 100 hours and then conditioned as prescribed in paragraph A.1 of this section. The breaking strength of the specimens shall be determined by the procedure prescribed in paragraph A.3 of this section. The median values for breaking strengths determined on exposed and unexposed specimens shall be used to calculate the percentage of breaking strength retained. After exposure to light of a carbon arc, the webbing in a seat belt assembly shall have a median breaking strength not less than 60 percent of the median breaking strength and have a color retention of not less than Number 2 on the Geometric Gray Scale published by the AATCC.

TP209 12 A.4 proposal:
A.4 Resistance to Light [S4.2(e), S5.1(e)]
(a) ***Polyester webbing prior to xxx. xx, 20xx*** *(effective date)****, and all other webbing constructions:*** Webbing samples at least 508 mm in length from three seat belt assemblies shall be suspended vertically on the inside of the specimen rack in a Type E carbon-arc light-exposure apparatus described in Standard Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type)

With and Without Water for Exposure of Nonmetallic Materials, ASTM Designation: G23-81, published by the American Society for Testing and Materials, except that the filter used for 100 percent polyester yarns shall be chemically strengthened soda-lime glass with a transmittance of less than 5 percent for wavelengths equal to or less than 305 nanometers and 90 percent or greater transmittance for wave lengths of 375 to 800 nanometers. The apparatus shall be operated without water spray at an air temperature of 60 ± 2°C measured at a point 25 ± 5 mm outside the specimen rack and midway in height. The temperature sensing element shall be shielded from radiation. The specimen shall be exposed to light from the carbon-arc for 100 hours and then conditioned as prescribed in paragraph A.1 of this section.

(b) ***Polyester webbing on or after xxx. xx, 20xx:*** **Webbing at least 508 mm in length from three seat belt assemblies shall be exposed to the light of a xenon arc lamp according to the method described in Textiles – Tests for Colour Fastness – Colour fastness to artificial light: Xenon arc fading lamp test, ISO 105-B02 (1978) published by the International Organization for Standardization, for the time necessary to produce a contrast equal to grade 4 on the grey scale on Standard Blue Dye No. 7.**

(c) ***Breaking strength determination:*** The breaking strength of the specimens following light exposure **per the applicable procedure (a) or (b) above** shall be determined by the procedure prescribed in paragraph A.3 of this section. The median values for breaking strengths determined on exposed and unexposed specimens shall be used to calculate the percentage of breaking strength retained. After the applicable light exposure, the webbing in a seat belt assembly shall have a median breaking strength not less than 60 percent of the unexposed median breaking strength ~~**and have a color retention of not less than Number 2 on the Geometric Gray Scale published by the AATCC.**~~"

Rationale:

FMVSS 209 calls for light exposure by carbon arc, followed by testing for strength degradation. Carbon arc testing apparatus is out of date and cumbersome to maintain due to poor availability of replacement parts for this obsolete equipment. Also, the electrodes (which are consumed during testing) are relatively expensive, making carbon arc testing more costly than alternatives.

A suggested alternative is xenon exposure, as is used in ECE R16. ECE R16 references ISO 105-B02 (1978) (NOTE: ISO 105-B02 was most recently revised in 2000, but R16 references the older version). Makers of carbon arc and xenon apparatus state that xenon exposure is a better spectral match to natural light and is therefore more representative of real-world exposure. Available test data indicate that polyester webbing subjected to the ECE R16 exposure generally degrades at least as much in tensile strength as webbing exposed to current FMVSS 209 carbon arc requirements. The data provided in APPENDIX B show that, on average, xenon exposure conducted per ECE R16 caused more than double the percentage of tensile strength degradation in a variety of polyester webbing constructions and colors than does carbon arc testing performed per the current FMVSS 209 requirement. It is also noteworthy that the degradation in webbing tensile strength due to light exposure was substantially less severe in every sample tested than the allowed degradation to 60% of retained strength, ranging from 89.6% to 100% for 60 samples subjected ECE R16 testing, and from 97.4% to 100% for 60 samples subjected to FMVSS 209 testing.

Since webbing constructions other than polyester were not considered or tested during the research and preparation of this AORC proposal, this petition specifically addresses only 100% polyester webbing constructions. No alternative in the requirements is proposed for webbing constructed of other materials, and this distinction is incorporated in the proposed revision. (NOTE: AORC notes this recommendation is consistent with light exposure work previously performed by NHTSA.)

In addition to specifying strength after light exposure, FMVSS 209 S4.2(e) requires evaluation for color retention. AORC proposes the color retention requirement be removed (while still maintaining the strength requirement). NHTSA rescinded the requirements for colorfastness to crocking and staining in 1996, stating that the industry control was more stringent than the standard (reference NHTSA Final Rule, see APPENDIX C). At the time, NHTSA “noted that it had included the colorfastness requirements in Standard No. 209 out of concern that occupants would be less likely to wear their seat belt if a lack of colorfastness of the webbing damaged their clothing.” Despite this concern, NHTSA ultimately decided to eliminate the “crocking” requirement at that time, based on the agency’s belief “that there is a countervailing market force that will minimize the possibility and extent of any such lessening of colorfastness.” The same rationale may be applied to this requirement for color retention after light exposure testing. Light-induced fading of webbing color is less likely to discourage belt use by occupants than would the risk of color transference to the occupant’s clothing. Therefore, considering NHTSA’s decision in 1996, it is logical to also propose elimination of the requirement for colorfastness after light exposure.

Reference information: Excerpted from ECE R16
“7.4.1.2. Light-conditioning
7.4.1.2.1. The provisions of Recommendation ISO 105-BO2 (1978) shall apply. The strap shall be exposed to light for the time necessary to produce a contrast equal to grade 4 on the grey scale on Standard Blue Dye No. 7.”

Item 8: S4.3(a)(1) Corrosion

S4.3(a)(1) currently states:

"(a) *Corrosion resistance.* (1) Attachment hardware of a seat belt assembly after being subjected to the conditions specified in S5.2(a) shall be free of ferrous corrosion on significant surfaces except for permissible ferrous corrosion at peripheral edges or edges of holes on underfloor reinforcing plates and washers. Alternatively, such hardware at or near the floor shall be protected against corrosion by at least an electrodeposited coating of nickel, or copper and nickel with at least a service condition number SC2, and other attachment hardware shall be protected against corrosion by at least an electrodeposited coating of nickel, or copper and nickel with at least a service condition number SC1, in accordance with…"

S4.3(a)(1) proposal:

"(a) *Corrosion resistance.* (1) **Any hardware of a seat belt assembly shall be adequately protected by plating, paint or other protective coating or made of a corrosion resistant material so that it will not allow any ferrous or nonferrous corrosion which may be transferred, either directly or by means of the webbing, to a person or his clothing during the use of a seat belt assembly incorporating the hardware, and must still meet all functional and static strength requirements of FMVSS 209 S4.3."**

Rationale:

This proposal is not merely an academic concern since many current production seat belt components use paint or other type of metallic plating to meet corrosion requirements, and have for the last 30 years. Coatings such as e-coat and autophoretic paints, zinc plating and other metallic and non-metallic coatings are commonly used to meet the corrosion performance requirements currently specified in FMVSS 209.

When originally released, SAE J4c and FMVSS 209 were addressing both aftermarket user installed and OEM installed seat belt assemblies; primarily two point belt systems with OEM requested decorative plating of chrome over nickel over copper. This was done for both decorative and corrosion resistance performance. Seat belt components were all visible and in the passenger compartment of the vehicle. As seat belt systems have evolved, retractors and others seat belt hardware have become "behind trim" items, are not visible or accessible by passenger compartment occupants and do not require the decorative aspect of a chrome, nickel, copper plating. Alternative coatings such as paints or other metallic or non-metallic coatings have successfully met the corrosion and post-corrosion functional requirements of FMVSS 209 (and ECE

R16) for many years. In recent years, the European end of life (ELV) directive for hazardous materials has been implemented and many efforts have been taken to eliminate chromium, lead, mercury, and cadmium. Additional efforts are underway to eliminate or reduce the use of nickel and other materials. As these alternate coatings and materials are implemented the chrome, nickel, copper type coating may cease to exist altogether so the removal of this requirement from FMVSS 209 will need to occur.

Item 9: S5.2(a), TP-209 12.C.1 Corrosion

S5.2 Hardware currently states:

"(a) *Corrosion resistance.* Three seat belt assemblies shall be tested in accordance with American Society for Testing and Materials B11773, ``Standard Method of Salt Spray (Fog) Testing.'' Any surface coating or material not intended for permanent retention on the metal parts during service life shall be removed prior to preparation of the test specimens for testing. The period of test shall be 50 hours for all attachment hardware at or near the floor, consisting of two periods of 24 hours exposure to salt spray followed by 1 hour drying and 25 hours for all other hardware, consisting of one period of 24 hours exposure to salt spray followed by 1 hour drying. In the salt spray test chamber, the parts from the three assemblies shall be oriented differently, selecting those orientations most likely to develop corrosion on the larger areas. At the end of test, the seat belt assembly shall be washed thoroughly with water to remove the salt. After drying for at least 24 hours under standard laboratory conditions specified in S5.1(a) attachment hardware shall be examined for ferrous corrosion on significant surfaces, that is, all surfaces that can be contacted by a sphere 19 mm in diameter, and other hardware shall be examined for ferrous and nonferrous corrosion which may be transferred, either directly or by means of the webbing, to a person or his clothing during use of a seat belt assembly incorporating the hardware."

S5.2 Hardware proposal:

(a) *Corrosion resistance.* Three seat belt assemblies shall be tested in accordance with American Society for Testing and Materials **B117- 07a**, "Standard Practice for Operating Salt Spray (Fog) Apparatus." Any surface coating or material not intended for permanent retention on the metal parts during service life shall be removed prior to preparation of the test specimens for testing**. In the salt spray test chamber, the parts from the three assemblies shall be positioned in an orientation as follows: Retractors will be hung by the webbing or positioned similar to "in-vehicle orientation" within the chamber.   Buckles will be supported in a rack with the tongue slot facing upwards or positioned similar to "in vehicle orientation" within the**

chamber. The period of test shall be 50 **continuous** hours for all ~~**attachment hardware at or near the floor**~~ **seat belt hardware** ~~**consisting of two periods of 24 hours exposure to salt spray followed by 1 hour drying and 25 hours for all other hardware, consisting of one period of 24 hours exposure to salt spray followed by 1 hour drying In the salt spray test chamber, the parts from the three assemblies shall be oriented differently, selecting those orientations most likely to develop corrosion on the larger areas**~~. At the end of the test, the seat belt assembly shall be washed thoroughly with water to remove the salt. After drying for at least 24 hours under standard laboratory conditions specified in S5.1(a), attachment hardware shall be examined ~~**for ferrous corrosion on significant surfaces, that is, all surfaces that can be contacted by a sphere 19 mm in diameter, and other hardware shall be examined**~~ ~~**for ferrous and nonferrous corrosion which may be transferred, either directly or by means of the webbing, to a person or his clothing during use of a seat belt assembly incorporating the hardware**~~. **Ferrous and nonferrous corrosion deposits are allowed for components normally behind trim or covered when installed in the vehicle provided they can not be transferred, either directly or by means of the webbing, to a person or their clothing during the use of a seat belt assembly incorporating the hardware. After testing, seat belt assemblies must meet all functional and strength requirements. Seat belt components in the passenger compartment normally handled while using the seat belt system shall be examined for ferrous corrosion on significant surfaces, that is, all surfaces that can be contacted by a sphere 19mm in diameter, and other hardware shall be examined for ferrous and nonferrous corrosion which may be transferred, either directly or by means of the webbing, to a person or their clothing during the use of a seat belt assembly incorporating the hardware."**

TP-209 Section 12.C.1.b currently states:

> "Suspend or support the specimens between 15 and 30 degrees from the vertical and preferably parallel to the principal direction of horizontal flow of fog through the chamber. "

TP-209 12.C.1.b proposal:

> **"Retractors will be hung by the webbing or positioned similar to "in-vehicle orientation" within the chamber. Buckles will be supported by a rack with the tongue slot facing up or positioned similar to "in-vehicle orientation" within the chamber."**

Rationale:

ASTM B117-73 had been superseded by ASTM B117-07.

There are differences between the regulation and the test procedure in corrosion test position.

AORC recommends that corrosion testing be performed in an orientation similar to in-vehicle. This will ensure that the corrosion testing will be representative of actual conditions seen by the retractor or buckle.

The proposal standardizes the time of salt fog exposure to 50 hours for all seat belt components to simplify the test procedure, eliminate any ambiguity in determining which hardware is exposed for what period of time and to make the specification common with the ECE R16 specification.

Further, the proposal eliminates the 19mm sphere test reference for seat belt components normally covered or behind trim once installed in a vehicle to eliminate misinterpretation and confusion as to its meaning, since this test is not well known and is often misinterpreted. AORC believes the 19mm ball requirement in FMVSS 209 S5.2(a) was implemented to address those components that could be contacted by an occupant with their fingers (19mm dia. is near the radius on the tip of the first, middle and ring finger on an average adult male hand). With many seat belt system components being behind trim now, occupants are unable to contact those components, so the 19mm sphere test should not apply to those components. The components in the occupant passenger compartment and able to be contacted by the occupants fingers during normal use of the seat belt system will continue to be tested to the 19mm sphere test.

ITEM 10: S4.3(c)(1) Attachment Hardware Strength

S4.3(c)(1) currently states:

"(c) *Attachment hardware.* (1) Eye bolts, shoulder bolts, or other bolts used to secure the pelvic restraint of a seat belt assembly to a motor vehicle shall withstand a force of 40,034 N when tested by the procedure specified in S5.2(c)(1), except that attachment bolts of a seat belt assembly designed for installation in specific models of motor vehicles in which the ends of two or more seat belt assemblies cannot be attached to the vehicle by a single bolt shall have breaking strength of not less than 22,241 N."

S4.3(c)(1) proposal:

"(c) *Attachment hardware.* (1) Eye bolts, shoulder bolts, or other bolts used to secure **one end of** the pelvic restraint of a seat belt assembly to a motor vehicle shall withstand a force of **22,241 N** when tested by the procedure specified in S5.2(c)(1) ~~**except that attachment bolts of a seat belt assembly designed for installation in specific models of motor vehicles in which the ends of two or more seat belt assemblies cannot be attached to the vehicle by a single bolt shall have breaking strength of not less than 22,241 N**~~. **Bolts used to secure one retractor, buckle, or one upper turning loop shall withstand a force of 22,241 N. Attachment bolts of a seat belt assembly designed for installation in specific models of motor vehicles in which the ends of two or more seat belt assemblies can be attached to the vehicle by a single bolt shall have a breaking strength of not less than 40,034 N.**

"If bolts or other similar fasteners are not used to attach the seat belt assembly or component to the motor vehicle anchorage then the seat belt assembly or component must be tested as a part of the vehicle anchorage pull strength test as specified in FMVSS 210 and be dynamically tested with no separation or fracture per the requirements of FMVSS 208."

Rationale:

AORC would like to revise this section to improve the clarity of the regulation. This is a consistent source of confusion within the seatbelt industry.

In SAE J4c-Jul 1965, section 5.3 (which was the original basis for FMVSS 209) the text states, "Eye bolts, shoulder bolts, or other bolts used to secure the pelvic restraint of a seat belt assembly to a motor vehicle shall withstand a force of 5000 lb. (2270kg) when tested by the procedure in paragraph 8.3." (Note: 5000 lb. is 22,241N)

ITEM 11: S4.3(j)(1) and S4.3(j)(1)(i) Locking Distance

S4.3(j)(1)(i) currently states:

"(i) Shall lock before the webbing extends 25 mm when the retractor is subjected to an acceleration of 7 m/s^2 (0.7g)"

S4.3(j)(1)(i) proposal:

"(i) Shall lock before the webbing ~~extends~~ **payout exceeds 25.4** mm when the retractor is subjected to an acceleration of 7 m/s^2 (0.7 g)"

S4.3(j)(2)(ii) currently states:

"(ii) Shall lock before the webbing payout exceeds the maximum limit of 25 mm when the retractor is subjected to an acceleration of 0.7 g under the applicable test conditions of S5.2(j)(2)(iii)(A) or (B)."

S4.3(j)(2)(ii) proposal:

"(ii) Shall lock before the webbing payout exceeds ~~**the maximum limit of**~~ **25.4** mm when the retractor is subjected to an acceleration of 0.7 g under the applicable test conditions of S5.2(j)(2)(iii)(A) or (B)."

Rationale:

When first issued, FMVSS 209 included English units for this webbing payout standard and the requirement was one inch (25.4 mm). In 1997 the NHTSA converted all English units to metric and "simplified" the exact conversion of one inch (25.4 mm) to read 25mm. Many seat belt retractor designs currently in production have been based on a webbing payout requirement of one inch/25.4 mm. From a practical standpoint with respect to occupant safety, 0.4 mm additional webbing payout will not have any impact on occupant safety, the ability to meet FMVSS 208 occupant protection requirements or the NCAP or IIHS tests currently run to evaluate occupant protection in vehicle crashes.

In a Federal Register Notice dated Wednesday April 14, 2004 (Docket No. NHTSA 2002-12366 Notice 2) the NHTSA ruled in favor of a request for determination of inconsequential noncompliance for a seat belt system that had an increase in webbing payout greater than the 0.4mm increase currently being requested to return the Standard back to its original requirement. Relevant excerpts from this Ruling can be found in APPENDIX D.

In its Final Rule published in the Federal Register dated Wednesday May 27, 1998, the NHTSA addressed *Exact vs. Equivalent* conversions and listed examples where rounding the metric equivalent up or down from the English unit original value might cause difficulties to manufacturers. *NHTSA also noted that it proposed to make exact conversions to avoid a possibility that the standard would become more stringent as a result of the conversion.*

The conversion of one inch to 25 millimeters instead of 25.4 millimeters causes the requirement to become more stringent and may pose difficulties to manufacturers that continue to use and service product originally designed to meet the one inch requirement.

In a NHTSA interpretation letter to Indiana Mills & Manufacturing dated 11/16/01 (copy included in APPENDIX E) on the 25mm vs. 25.4 mm webbing payout requirement, NHTSA states, "We note, however, that we are considering a rulemaking to amend S4.3(j)(1). We will consider including a proposal to change the 25 mm value to 25.4 mm."

ITEM 12: S4.3(j)(2)(iii), S5.2(j)(2)(iii)(C) Web Sense No Lock

S4.3 (j)(2)(iii) currently states:

"(iii) For a retractor sensitive to webbing withdrawal, shall not lock before the webbing payout extends to the minimum limit of 51mm when the retractor is subjected to an acceleration no greater than 0.3g under the test condition of S5.2(j)(2)(iii)(C)."

S4.3 (j)(2)(iii) proposal:

"(iii) For a retractor sensitive **only** to webbing withdrawal, shall not lock before the webbing payout extends to the minimum limit of 51mm when the retractor is subjected to an acceleration no greater than 0.3g under the test condition of S5.2(j)(2)(iii)(C)."

TP-209 currently states (top of page 41, TP-209-08):

"FOR WEBBING SENSITIVE INERTIAL ELRs (retractor sensitive to webbing withdrawal):"

TP-209 proposal:

"FOR WEBBING SENSITIVE **ONLY** INERTIAL ELRs (retractor sensitive **only** to webbing withdrawal):"

S5.2(j)(2)(iii)(C) currently states:

"(C) A retractor that is sensitive to webbing withdrawal shall be subjected to an acceleration no greater than 0.3 g occurring within a period of the first 50 ms and sustaining an acceleration no greater than 0.3 g throughout the test, while the webbing is at 75 percent extension. Measure the webbing payout."

S5.2(j)(2)(iii)(C) proposal:

"(C) A retractor that is sensitive **only** to webbing withdrawal shall be subjected to an acceleration no greater than 0.3 g occurring within a period of the first 50 ms and sustaining an acceleration no greater than 0.3 g throughout the test, while the webbing is at 75 percent extension. Measure the webbing payout."

Rationale:

AORC would like to point out that this is a perennial source of confusion within the industry, and has been the subject of previous requests for interpretation and clarification from the agency. NHTSA has gone on record stating that dual-sensing ELRs need only meet one (i.e. vehicle-, or web-) set of sensing requirements. However, as the standard is currently written, the implication continues to be made that all ELRs must meet this no-lock requirement.

ITEM 13: S4.4 & S5.3 Assembly Performance

S4.4 currently states:

S4.4 *Requirements for assembly performance*.

(a) *Type I seat belt assembly.* Except as provided in S4.5, the complete seat belt assembly including webbing, straps, buckles, adjustment and attachment hardware, and retractors shall comply with the following requirements when tested by the procedures specified in S5.3(a):

(1) The assembly loop shall withstand a force of not less than 22,241 N; that is, each structural component of the assembly shall withstand a force of not less than 11,120 N.

(2) The assembly loop shall extend not more than 7 inches or 178 mm when subjected to a force of 22,241 N; that is, the length of the assembly between anchorages shall not increase more than 356 mm.

(3) Any webbing cut by the hardware during test shall have a breaking strength at the cut of not less than 18,683 N.

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

(b) *Type 2 seat belt assembly.* Except as provided in S4.5, the components of a Type 2 seat belt assembly including webbing, straps, buckles, adjustment and attachment hardware, and retractors shall comply with the following requirements when tested by the procedure specified in S5.3(b):

(1) The structural components in the pelvic restraint shall withstand a force of not less than 11,120 N.

(2) The structural components in the upper torso restraint shall withstand a force of not less than 6,672 N.

(3) The structural components in the assembly that are common to pelvic and upper torso restraints shall withstand a force of not less than 13,345N.

(4) The length of the pelvic restraint between anchorages shall not increase more than 508 mm when subjected to a force of 11,120 N.

(5) The length of the upper torso restraint between anchorages shall not increase more than 508 mm when subjected to a force of 6,672 N.

(6) Any webbing cut by the hardware during test shall have a breaking strength of not less than 15,569 N at a cut in webbing of the pelvic restraint, or not less than 12,455 N at a cut in webbing of the upper torso restraint.
(7) Complete fracture through any solid section of metal attachment hardware shall not occur during test.

S4.4 proposal:

S4.4 Requirements for assembly performance.
(a) Type I seat belt assembly. Except as provided in S4.5, the complete seat belt assembly including webbing, straps, buckles, adjustment and attachment hardware, and retractors shall comply with the following requirements when tested by the procedures specified in S5.3(a):
(1) The assembly loop shall withstand a force of not less than 22,241 N; that is, each structural component of the assembly shall withstand a **tensile** force of not less than 11,120 N.
(2) **The length between the anchorages** shall extend not more than **356 mm (corresponding to an increase of not more than 178 mm in head separation, dimension C in figure 5)** when subjected to a **loop load** force of 22,241 N, **(tensile force of 11,120 N on components)*.***
(3) Any webbing cut by the hardware during test shall have a breaking strength at the cut of not less than 18,683 N.
(4) Complete fracture through any solid section of metal attachment hardware shall not occur during test.

(b) Type 2 seat belt assembly. Except as provided in S4.5, the components of a Type 2 seat belt assembly including webbing, straps, buckles, adjustment and attachment hardware, and retractors shall comply with the following requirements when tested by the procedure specified in S5.3(b):
(1) ~~**The structural components in the pelvic restraint shall withstand a force of not less than 11,120 N.**~~ **The pelvic restraint loop shall withstand a force of not less than 22,241 N; that is, each structural component of the assembly shall withstand a tensile force of not less than 11,120 N.**
(2) ~~**The structural components in the upper torso restraint shall withstand a force of not less than 6,672 N.**~~ **The upper torso restraint loop shall withstand a force of not less than 13,344 N; that is, each structural component of the assembly shall withstand a tensile force of not less than 6,672 N.**
(3) The structural components in the assembly that are common to pelvic and upper torso restraints shall withstand a **loop load of not less than 26,690 N; that is, each structural component of the assembly shall withstand a tensile** force of not less than 13,345 N.
(4) The length of the pelvic restraint between anchorages shall not increase more than 508 mm **(corresponding to an increase of not more than 254mm in head separation, dimension C in figure 5)** when subjected to a loop load of **22,241N (tensile force of 11,120N on components)**.

(5) The length of the upper torso restraint between anchorages shall not increase more than 508 mm **(corresponding to an increase of not more than 254mm in head separation, dimension C in figure 5)** when subjected to a loop load of **13,344 N (tensile force of 6,672N on components)**.

S5.3 currently states:

S5.3 *Assembly performance—*
(a) Type 1 seat belt assembly. Three complete seat belt assemblies, including webbing, straps, buckles, adjustment and attachment hardware, and retractors, arranged in the form of a loop as shown in Figure 5, shall be tested in the following manner:

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(3) The length of the assembly loop from attaching bolt to attaching bolt shall be adjusted to about 1295 mm, or as near thereto as possible. A force of 245 N shall be applied to the loop to remove any slack in webbing at hardware. The force shall be removed and the heads of the testing machine shall be adjusted for an assembly loop between 1220 and 1270 mm in length. The length of the assembly loop shall then be adjusted by applying a force between 89 and 98 N to the free end of the webbing at the buckle, or by the retraction force of an automatic-locking or emergency-locking retractor. A seat belt assembly that cannot be adjusted to this length shall be adjusted as closely as possible. An automatic-locking or emergency locking retractor when included in a seat belt assembly shall be locked at the start of the test with a tension on the webbing slightly in excess of the retractive force in order to keep the retractor locked. The buckle shall be in a location so that it does not touch the rollers during test, but to facilitate making the buckle release test in S5.2(d) the buckle should be between the rollers or near a roller in one leg.

(4) The heads of the testing machine shall be separated at a rate between 51 and 102 mm per minute until a force of 22,241 ±222 N is applied to the assembly loop. The extension of the loop shall be determined from measurements of head separation before and after the force is applied. The force shall be decreased to 667 ±45 N and the buckle release force measured as prescribed in S5.2(d).

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(b) *Type 2 seat belt assembly.* Components of three seat belt assemblies shall be tested in the following manner:

(1) The pelvic restraint between anchorages shall be adjusted to a length between 1220 and 1270 mm, or as near this length as possible if the design of the pelvic restraint does not permit its adjustment to this length. An automatic-locking or emergency-locking retractor when included in a seat belt assembly

shall be locked at the start of the test with a tension on the webbing slightly in excess of the retractive force in order to keep the retractor locked. The attachment hardware shall be oriented to the webbing as specified in paragraph (a)(2) of this section and illustrated in Figure 5. A tensile force 11,120 ±111 N shall be applied on the components in any convenient manner and the extension between anchorages under this force shall be measured. The force shall be reduced to 334 ±22 N and the buckle release force measured as prescribed in S5.2(d).

(2) The components of the upper torso restraint shall be subjected to a tensile force of 6,672 ±67 N following the procedure prescribed above for testing pelvic restraint and the extension between anchorages under this force shall be measured. If the testing apparatus permits, the pelvic and upper torso restraints may be tested simultaneously. The force shall be reduced to 334 ±22 N and the buckle release force measured as prescribed in S5.2(d).

(3) Any component of the seat belt assembly common to both pelvic and upper torso restraint shall be subjected to a tensile force of 13,344 ±134 N.

S5.3 proposal:

S5.3 Assembly performance--

(a) Type 1 seat belt assembly. Three complete seat belt assemblies, including webbing, straps, buckles, adjustment and attachment hardware, and retractors, arranged in the form of a loop as shown in Figure 5, shall be tested in the following manner:

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(3) The length of the assembly loop from attaching bolt to attaching bolt shall be adjusted to about 1295 mm, or as near thereto as possible. A force of 245 N shall be applied to the loop **(tensile force of 122 N on components)** to remove any slack in webbing at hardware. The force shall be removed and the heads of the testing machine shall be adjusted for an assembly loop between 1220 and 1270 mm in length. The length of the assembly loop shall then be adjusted by applying a **tensile** force between 89 and 98 N to the free end of the webbing at the buckle, or by the retraction force of an automatic-locking or emergency-locking retractor. A seat belt assembly that cannot be adjusted to this length shall be adjusted as closely as possible. An automatic-locking or emergency locking retractor when included in a seat belt assembly shall be locked at the start of the test with a tension on the webbing slightly in excess of the retractive force in order to keep the retractor locked. The buckle shall be in a location so that it does not touch the rollers during test, but to facilitate making the buckle release test in S5.2(d) the buckle should be between the rollers or near a roller in one leg.

(4) The heads of the testing machine shall be separated at a rate between 51 and 102 mm per minute until a force of 22,241+/- 222 N is applied to the

assembly loop **(tensile force of 11,120N +/- 111N on components).** The extension of the loop shall be determined from measurements of head separation before and after the force is applied. The loop load force shall be decreased to 667 +/- 45 N **(tensile force of 334 +/- 22N on components)** and the buckle release force measured as prescribed in S5.2(d).

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(b) Type 2 seat belt assembly. Components of three seat belt assemblies shall be tested in the following manner:

(1) The pelvic restraint between anchorages shall be adjusted to a length between 1220 and 1270 mm, or as near this length as possible if the design of the pelvic restraint does not permit its adjustment to this length. An automatic-locking or emergency-locking retractor when included in a seat belt assembly shall be locked at the start of the test with a tension on the webbing slightly in excess of the retractive force in order to keep the retractor locked. The attachment hardware shall be oriented to the webbing as specified in paragraph (a)(2) of this section and illustrated in Figure 5. **A loop load of 22,241 +/- 222 N (tensile force of 11,120 N +/-111 N on components)** shall be applied on the components in any convenient manner and the extension between anchorages under this force shall be measured. **The loop load shall be reduced to 667 +/- 44 N (tensile force of 334 +/-22 N on components)** and the buckle release force measured as prescribed in S5.2(d).

(2) **The upper torso restraint between anchorages shall be adjusted to a length between 1220 and 1270 mm, or as near this length as possible if the design of the torso restraint does not permit its adjustment to this length. An emergency-locking retractor when included in a seat belt assembly shall be locked at the start of the test with a tension on the webbing slightly in excess of the retractive force in order to keep the retractor locked. The attachment hardware shall be oriented to the webbing as specified in paragraph (a)(2) of this section and illustrated in Figure 5. A loop load of 13,344 +/-134 N (tensile force of 6667 +/-67 N on components) shall be applied in any convenient manner and the extension between anchorages under this force shall be measured.** If the testing apparatus permits, the pelvic and upper torso restraints may be tested simultaneously. **The force shall be reduced to a loop load of 667 +/- 44 N (tensile force of 334 +/-22N on components)** and the buckle release force measured as prescribed in S5.2(d).

(3) Any component of the seat belt assembly common to both pelvic and upper torso restraint shall be subjected to a **loop load of 26,688 +/-268 N (tensile force of 13,344 +/-134N on components).**

TP-209 C.6 currently states:

ASSEMBLY PERFORMANCE TESTS

The length of webbing on the retractor spool during the loop load test will be representative of that which would be on the spool when the seat belt assembly is being used by a 50th percentile adult male. These lengths will be supplied by the COTR. The length of webbing on the retractor spool shall be recorded on the data sheet.

If the 1220 to 1270 mm loop specified in FMVSS 209, S5.3(b)(1) cannot be attained when the required webbing length is wrapped around the retractor spool, clamp the webbing to attain the correct loop size and ensure the excess remains in slack throughout the loop load test.

TP-209 C.6 proposal:

ASSEMBLY PERFORMANCE TESTS

The length of webbing on **a** retractor spool during the loop load test **(type 1 or type 2, pelvic or torso)** shall be representative of that which would be on the spool when the seat belt assembly is being used by a 50th percentile adult male, **if this is possible**. These lengths will be supplied by the COTR. **If the amount of web on spool referenced above is insufficient to create a 1220-1270 mm loop, then the amount of web on spool shall be reduced in order to create the required loop.** The length of webbing on the retractor shall be recorded on the data sheet.

If the 1220-1270 mm loop specified in FMVSS 209, S5.3(b) ~~**cannot be attained when the required webbing length is wrapped around the retractor spool, clamp the webbing**~~ **results in an amount of web on spool greater than specified above, the excess web shall be clamped** to attain the correct loop size and ensure that the excess remains in slack throughout the loop load test.

Rationale:

In some cases, FMVSS 209 specifies a tensile load, but illustration FMVSS 209 Fig 5 shows a loop load. AORC proposes that loop loads be specified in all instances to be consistent with FMVSS 209 Figure 5. The tensile loads would also be stated. AORC also proposes some clarification of the allowable loop extension, and a revision to figure 5. SEE APPENDIX F: “REVISED FMVSS209 FIGURE 5LOOP LOAD TEST SETUP”, showing “Dimension C,” “Initial Head Position,” and “Final Head Position.”

S5.3(b)(1) specifies that the web length in the pelvic loop load test be adjusted to “a length between 1220 and 1270 mm, or as near this length as possible if the design of the pelvic restraint does not permit its adjustment to this length.” S5.3(b)(2) specifies that the torso loop load test be performed “following the procedure prescribed above.” This seems to mean that the loop should be set to between 1220 and 1270 mm, or as near as possible.

TP-209 (Section 12, ASSEMBLY PERFORMANCE TESTS) specifies that the torso loop test be performed with the length of webbing on the retractor that is "representative of what would be on the spool when the seat belt assembly is being used by a 50% adult male."

AORC proposes the above modifications for clarity, and to allow for situations when there is not enough webbing to satisfy both the 1220-1270mm loop and the 50% adult male web on spool.

ITEM 14: S5.1(b) Web Breaking Strength

S5.1(b) currently states:

"(b) *Breaking strength.* Webbing from three seat belt assemblies shall be conditioned in accordance with paragraph (a) of this section and tested for breaking strength in a testing machine of capacity verified to have an error of not more than one percent in the range of the breaking strength of the webbing in accordance with American Society for Testing and Materials E4-79 "Standard Methods of Load Verification of Testing Machines..."

S5.1(b) proposal:

"(b) *Breaking strength.* Webbing from three seat belt assemblies shall be conditioned in accordance with paragraph (a) of this section and tested for breaking strength in a testing machine of capacity verified to have an error of not more than one percent in the range of the breaking strength of the webbing in accordance with American Society for Testing and Materials **E4-07** "Standard Practices for Force Verification of Testing Machines..."

Rationale:

The old ASTM specification is out of date and no longer applicable or available. A more recent version of the above recommended practice was published in 2007. A comparison of the new and old practices was attempted but the earliest version that could be obtained was ASTM E4-83. There were several changes between E4-83 and E4-07 but a review by representatives of two major independent test labs that serve the restraint industry confirmed that changing to the latest practice would not have a significant impact on their current procedures.

ITEM 15: S5.2(b) Temperature

S5.2(b) currently states:

"(b) *Temperature resistance.* Three seat belt assemblies having plastic or nonmetallic hardware or having retractors shall be subjected to the conditions prescribed in Procedure D of American Society for Testing and Materials D756-78 ''Standard Practice for Determination of Weight and Shape Changes of Plastics under Accelerated Service Conditions.'' The dimension and weight measurement shall be omitted. Buckles shall be unlatched and retractors shall be fully retracted during conditioning. The hardware parts after conditioning shall be used for all applicable tests in S4.3 and S4.4."

S5.2(b) proposal:

"(b) *Temperature resistance.* Three seat belt assemblies having plastic or non-metallic hardware or having retractors shall be subjected to **the temperature resistance test and shall not warp or otherwise deteriorate to cause the assembly to operate improperly or fail to comply with applicable requirements in this section and S4.4. Condition three specimens for 24 hours at 23 +/- 2 degrees C and 48%-67% relative humidity prior to beginning the temperature resistance test. Immediately after conditioning, expose the assemblies to a temperature of 80 +/- 1 degrees C (176 +/- 1.8 degrees F), for 24 hours, over water, in a circulating air type oven. Immediately following this 24 hour exposure perform an additional 24 hour exposure of dry heat at 80 +/- 1 degrees C (176 +/- 1.8 degrees F).** Buckles shall be unlatched and retractors shall be fully retracted during conditioning **and test**. **These parts shall then be used** for all applicable tests in S4.3 and S4.4."

TP-209 paragraph C.2 currently states:

Hardware Temperature Resistance [S4.3(b), S5.2(b)]

"Plastic or other nonmetallic parts of 3 specimens shall be subjected to the temperature resistance test and shall not warp or otherwise deteriorate. Condition 3 specimens as in paragraph A.1 and then expose the assemblies to a temperature of 80 ± 1°C (176 ± 1.8°F), for 24 hours in a circulating air type oven in accordance with ASTM D756-78, Procedure D. The first 24 hour period will be a humid exposure, and then, the 3 specimens will be subjected to a second 24 hour period of dry heat at 80 ± 1°C (176 ± 1.8°F) in accordance with ASTM D756-78, Procedure D."

TP-209 paragraph C.2 proposal:

Hardware Temperature Resistance [S4.3(b), S5.2(b)]

“Plastic or other nonmetallic parts of 3 specimens shall be subjected to the temperature resistance test and shall not warp or otherwise deteriorate. Condition 3 specimens as in paragraph A.1 and then expose the assemblies to a temperature of 80 ± 1°C (176 ± 1.8°F), for 24 hours in a circulating air type oven in accordance with ASTM D756-78, Procedure D. The first 24 hour period will be a humid exposure, and then, the 3 specimens will be subjected to a second 24 hour period of dry heat at 80 ± 1°C (176 ± 1.8°F) ~~**in accordance with ASTM D756-78, Procedure D**~~.”

Rationale:

ASTM D756-78 is no longer an active standard. This standard was discontinued in 1998 and not superseded. AORC would like to propose that the detailed requirements from this specification and as itemized in TP-209 C.2 be listed in FMVSS 209 S5.2(b) to show the temperature exposure requirements, and eliminate the reference to ASTM D756-78 Procedure D.

ITEM 16: S5.2(d)(1) Buckle Release Force

5.2(d)(1) currently states:

“(d) *Buckle release.* (1) Three seat belt assemblies shall be tested to determine compliance with the maximum buckle release force requirements, following the assembly test in S5.3. After subjection to the force applicable for the assembly being tested, the force shall be reduced and maintained at 667N on the assembly loop of a Type 1 seat belt assembly, 334N on the components of a Type 2 seat belt assembly...”

S5.2(d) proposal:

“(d) *Buckle release.* (1) Three seat belt assemblies shall be tested to determine compliance with the maximum buckle release force requirements, following the assembly test in S5.3. After subjection to the force applicable for the assembly being tested, the force shall be reduced and maintained at 667N **(334N tensile force on the buckle)** on the assembly loop of a Type 1 or Type 2 seat belt assembly...”

Rationale:

The concept of “loop load” can be confusing. TP 209 Section C.9 states, “After each elongation test, reduce the loop load to 667N (334 +/- 22N force on buckle)…” AORC believes this verbiage clears up the relationship between loop load and tensile force, and is less confusing than that in FMVSS 209. This would clarify the wording of FMVSS 209, and make it consistent with the clearer wording of TP 209.

ITEM 17: S5.2(k) Webbing Extension/cycling

S5.2 (k) currently states:

(k) *Performance of retractor*. After completion of the corrosion-resistance test described in paragraph (a) of this section, the webbing shall be fully extended and allowed to dry for at least 24 hours under standard laboratory conditions specified in S5.1(a). The retractor shall be examined for ferrous and nonferrous corrosion which may be transferred, either directly or by means of the webbing, to a person or his clothing during use of a seat belt assembly incorporating the retractor, and for ferrous corrosion on significant surfaces if there tractor is part of the attachment hardware. The webbing shall be withdrawn manually and allowed to retract for 25 cycles. The retractor shall be mounted in an apparatus capable of extending the webbing fully, applying a force of 89 N at full extension, and allowing the webbing to retract freely and completely. The webbing shall be withdrawn from the retractor and allowed to retract repeatedly in this apparatus until 2,500 cycles are completed. The retractor and webbing shall then be subjected to the temperature resistance test prescribed in paragraph (b) of this section. The retractor shall be subjected to 2,500 additional cycles of webbing withdrawal and retraction. Then, the retractor and webbing shall be subjected to dust in a chamber similar to one illustrated in Figure 8 containing about 0.9 kg of coarse grade dust conforming to the specification given in Society of Automotive Engineering Recommended Practice J726, ``Air Cleaner Test Code'' Sept.1979. The dust shall be agitated every 20 minutes for 5 seconds by compressed air, free of oil and moisture, at a gage pressure of 550 +/- 55 kPa entering through an orifice 1.5 +/- 0.1 mm in diameter. The webbing shall be extended to the top of the chamber and kept extended at all times except that the webbing shall be subjected to10 cycles of complete retraction and extension within 1 to 2 minutes after each agitation of the dust. At the end of 5hours, the assembly shall be removed from the chamber. The webbing shall be fully with drawn from the retractor manually and allowed to retract completely for 25 cycles. An automatic-locking retractor or a non locking retractor attached to pelvic restraint shall be subjected to 5,000 additional cycles of webbing withdrawal and retraction. An emergency locking retractor or a non locking retractor attached to upper torso restraint shall be subjected to 45,000 additional cycles of webbing withdrawal and retraction between 50 and 100 per cent extension. The locking mechanism of an emergency locking retractor shall be actuated at least 10,000times within 50 to100 percent extension of webbing during the 50,000 cycles. At the end of test, compliance of the retractors with applicable requirements in S4.3(h), (i), and (j) shall be determined. Three retractors shall be tested for performance.

S5.2 (k) Proposal:

(k) *Performance of retractor.* After completion of the corrosion-resistance test described in paragraph (a) of this section, the webbing shall be fully extended and allowed to dry for at least 24 hours under standard laboratory conditions specified in S5.1(a). The retractor shall be examined for ferrous and nonferrous corrosion which may be transferred, either directly or by means of the webbing, to a person or his clothing during use of a seat belt assembly incorporating the retractor, and for ferrous corrosion on significant surfaces if there tractor is part of the attachment hardware. The webbing shall be withdrawn manually and allowed to retract for 25 cycles. The retractor shall be mounted in an apparatus capable of extending the webbing fully, applying a force of 89 N at full extension, and allowing the webbing to retract freely and completely. The webbing shall be withdrawn from the retractor and allowed to retract repeatedly in this apparatus until 2,500 cycles are completed. The retractor and webbing shall then be subjected to the temperature resistance test prescribed in paragraph (b) of this section. The retractor shall be subjected to 2,500 additional cycles ~~**of webbing withdrawal and retraction**~~**. The webbing shall be fully withdrawn from the retractor and allowed to retract completely for these cycles.** Then, the retractor and webbing shall be subjected to dust in a chamber similar to one illustrated in Figure 8 containing about 0.9 kg of coarse grade dust conforming to the specification given in ~~**Society of Automotive Engineering Recommended Practice J726, ``Air Cleaner Test Code'' Sept.1979**~~ **ISO 12103-1 A4.** The dust shall be agitated every 20 minutes for 5 seconds by compressed air, free of oil and moisture, at a gage pressure of 550 +/- 55 kPa entering through an orifice 1.5 +/- 0.1 mm in diameter. The webbing shall be extended to the top of the chamber and kept extended at all times except that the webbing shall be subjected to 10 cycles of complete retraction and extension within 1 to 2 minutes after each agitation of the dust. At the end of 5 hours, the assembly shall be removed from the chamber. The webbing shall be fully with drawn from the retractor manually and allowed to retract completely for 25 cycles. An automatic-locking retractor or a non locking retractor attached to pelvic restraint shall be subjected to 5,000 additional cycles of webbing withdrawal and retraction. An emergency locking retractor or a non locking retractor attached to upper torso restraint shall be subjected to 45,000 additional cycles of webbing withdrawal and retraction between ~~**50 and 100**~~ **40 +/- 5 and 90 +/- 5** percent extension**.** The locking mechanism of an emergency-locking retractor shall be actuated at least 10,000 times within ~~**50 and 100**~~ **40 +/- 5 to 90 +/- 5** percent extension of **the** webbing during the 50,000 cycles. At the end of test, compliance of the retractors with applicable requirements in S4.3(h), (i), and (j) shall be determined. Three retractors shall be tested for performance.

TP209 section D.5 (Additional Cycling) currently states:

D.5 Additional Cycling (5000 or 45000)

After removing the three specimens from the dust chamber, retract and extend the webbing fully 25 times. Then subject the three specimens to 5,000 cycles at 100 percent extension (or the “effective length” as in the case of continuous webbing systems) with an 89N load for ALR units, and 45,000 cycles at 50 percent to 100 percent extension with an 89 N load for ELR units. Of the total

50,000 cycles for ELR units (5,000 + 45,000), 10,000 of them will be lockup cycles between 50 percent and 100 percent extension with an 89N load. The lockup cycles can occur at the beginning or end of the 50,000 cycles or can be performed every fifth cycle depending on the laboratory setup.

TP209 section D.5 (Additional Cycling) Proposal:

D.5 Additional Cycling (5000 or 45000)

After removing the three specimens from the dust chamber, retract and extend the webbing fully 25 times. Then subject the three specimens to 5,000 cycles at 100 percent extension (or the "effective length" as in the case of continuous webbing systems) with an 89N load for ALR units, and 45,000 cycles at ~~**50 percent to 100**~~ **40 +/- 5 percent to 90 +/- 5** percent extension ~~**with an 89 N load**~~ for ELR units**.** Of the total 50,000 cycles for ELR units (5,000 + 45,000), 10,000 of them will be lockup cycles between ~~**50 percent and 100**~~ **40 +/- 5 percent and 90 +/- 5** percent extension ~~**with an 89N load**~~. The lockup cycles can occur at the beginning or end of the 50,000 cycles or can be performed every fifth cycle depending on the laboratory setup.

Rationale:

The use of dual-mode (automatic-locking and emergency-locking) retractors, also called ALR/ELR, is common. Such retractors typically function as an ELR, and are converted to ALR mode by full extension of the webbing, in order to satisfy the requirements of FMVSS 208 S7.1.1.5. Engagement of the ALR mode at full webbing extension becomes a problem when cycle testing the retractor. To avoid the need to disable the ALR mechanism of retractors before subjecting them to testing, it is recommended that the cycling requirements of FMVSS 209 be revised slightly to accommodate this popular retractor type. The revision reduces the extension of the webbing from 100 percent to 90 +/- 5 percent to prevent engaging the ALR function during cycling.

This revision would enable the cycle testing of dual-mode retractors without the need to disable the ALR mechanism. This revision would also clarify the requirements for so-called "dual mode" (ALR/ELR) retractors by specifying a total of 5000 cycles of ALR function through full extraction/retraction cycling.

FMVSS 209 S5.2(k) calls for dust conforming to the specification given in Society of Automotive engineering Recommended Practice J726, ``Air Cleaner Test Code'' Sept. 1979. This specification is obsolete and dust is not longer produced to it. ISO 12103-1 A4 now specifies an equivalent dust.

ITEM 18: S5.3(c) Resistance to Buckle Abrasion

S5.3(c) currently states:

"(c) *Resistance to buckle abrasion.* Seat belt assemblies shall be tested for resistance to abrasion by each buckle or manual adjusting device normally used to adjust the size of the assembly. The webbing of the assembly to be used in this test shall be exposed for 4 hours to an atmosphere having relative humidity of 65 per cent and temperature of 18 °C. The webbing shall be pulled back and forth through the buckle or manual adjusting device as shown schematically in Figure 7. The anchor end of the webbing (A) shall be attached to a mass (B) of 1.4 kg. The webbing shall pass through the buckle (C), and the other end (D) shall be attached to a reciprocating device so that the webbing forms an angle of 8° with the hinge stop (E). The reciprocating device shall be operated for 2,500 cycles at a rate of 18 cycles per minute with a stroke length of 203 mm. The abraded webbing shall be tested for breaking strength by the procedure described in paragraph S5.1(b)."

S5.3(c) proposal:

"(c) *Resistance to* ***~~buckle~~ adjuster*** *abrasion* Seat belt assemblies shall be tested for resistance to abrasion by each buckle or manual adjusting device normally used to adjust the size of the assembly. The webbing of the assembly to be used in this test shall be exposed for 4 hours to an atmosphere having relative humidity of 65 per cent and temperature of 18 °C. The webbing shall be pulled back and forth through the buckle or manual adjusting device as shown schematically in Figure 7. The anchor end of the webbing (A) shall be attached to a mass (B) of 1.4kg. The webbing shall pass through the **~~buckle~~ adjuster** (C), and the other end (D) shall be attached to a reciprocating device so that the webbing forms an angle of 8° with the hinge stop (E). The reciprocating device shall be operated for 2,500 cycles at a rate of 18 cycles per minute with a stroke length of 203 mm. The abraded webbing shall be tested for breaking strength by the procedure described in paragraph S5.1(b).

"If the mass of 1.4kg should prove insufficient to pull the webbing through the adjuster on the lengthening stroke, it is allowable to clamp the webbing to the abrasion cycling drum such that the drum pulls the webbing through the adjuster in both directions."

Rationale:

AORC recommends changing the name of this section to "Resistance to **adjuster** abrasion" because adjusters are rarely, if ever, found on buckles.

At times, the 1.4 kg mass is not heavy enough to pull webbing through the adjuster on the lengthening stroke. AORC therefore investigated other alternatives, and in discussion with some test labs, makes the above proposal.

The photos below show two abrasion cycling setups. In each photo, a "standard" FMVSS 209 abrasion cycling setup utilizing a 1.4kg mass is on the left, and the proposed alternate setup, with the webbing clamped to the cycling drum, is on the right.

APPENDIX A
ITEM 5

Differences between SAE J800c November 1973 and June 1994 versions: The following are the most noticeable differences but are not significant to the intent of the document: The Scope was updated to specifically cover "aftermarket" universal seat belt assemblies and it only applies "to seat belt assemblies which are not identified by a vehicle manufacturer part number or which are not designed for a specific vehicle application." Where the original document suggests that, "These minimum instruction requirements may be supplemented by more specific manufacturer's instructions," the new document states, "The vehicle manufacturer's instructions should be followed in the installation." It also goes on to say, "If the vehicle manufacturer ... has no applicable seat belt assembly installation instructions available, the installation should be done in accordance with Section 4." The instructions in Section 4 are generally consistent with the original document except for the following updates/clarifications: Where the original document calls for the lap belt portion "to bear across his hip bones and pull downward and rearward at an angle of about 70 deg." this has been clarified to "an angle no less than 30 degrees and not more than 75 degrees from the horizontal." Where the original document refers to adjusting the belt to fit around the "smallest passenger" and "largest passenger," the new document clarifies this to the "5th percentile adult female and 95th percentile adult male (see SAE J833)." In the section regarding upper torso restraint anchorage the new document includes wording similar to the original but also calls for using the vehicle manufacturer's recommended position and if that is not available, "consult FMVSS 210 and HS 13." The only other differences are the addition of "Applicable Documents" and "Terminology" sections. The figures are all the same.

APPENDIX B
ITEM 7 (page 1 of 3)

SUPPORTING DATA- CARBON ARC vs. XENON EXPOSURE OF SEAT BELT WEBBING

Article	Color	Light exposure per EG/ECE (ISO 105-B2) (xenon arc)					
		Percentage of tensile strength retained (actual data for 3 samples)	**Median** percentage of tensile strength **retained**	**Average** percentage of tensile strength **retained**	**Standard Deviation** of tensile strength **retained**	**Average** percentage of tensile strength **degradation**	**Standard Deviation** of tensile strength **degradation**
97017	"Orange"	97,4 / 97,8 / 97,1	97.4	97.4	0.35	2.6	0.35
95050	"Savanna Beige"	99,0 / 99,0 / 95,1	99.0	97.7	2.25	2.3	2.25
95050	"Slate Blue"	89,6 / 99,0 / 99,3	99.0	96.0	5.52	4.0	5.52
97047	"Pearl Dark"	98,9 / 98,9 / 98,9	98.9	98.9	0.00	1.1	0.00
97017	"India Red"	98,1 / 98,5 / 97,5	98.1	98.0	0.50	2.0	0.50
97017	"Teracotta"	95,9 / 96,3 / 95,9	95.9	96.0	0.23	4.0	0.23
78058	"Spin Black"	99,4 / 99,7 / 99,7	99.7	99.6	0.17	0.4	0.17
95050	"Grey 60"	97,5 / 97,5 / 98,2	97.5	97.7	0.40	2.3	0.40
97017	"Granite Blue"	95,6 / 95,6 / 94,8	95.6	95.3	0.46	4.7	0.46
97017	"Landscape"	97,4 / 97,4 / 97,0	97.4	97.3	0.23	2.7	0.23
97017	"Como Beige"	97,4 / 97,0 / 97,4	97.4	97.3	0.23	2.7	0.23
95050	"Lava Blue"	97,9 / 97,6 / 97,9	97.9	97.8	0.17	2.2	0.17
94207	"Spin Black"	98,3 / 98,3 / 97,9	98.3	98.2	0.23	1.8	0.23
97017	"Buckskin"	97,8 / 97,8 / 97,8	97.8	97.8	0.00	2.2	0.00
95050	"Mocha"	99,3 / 99,0 / 99,3	99.3	99.2	0.17	0.8	0.17
95050	"Greige"	99,0 / 98,6 / 98,6	98.6	98.7	0.23	1.3	0.23
95050	"Beige 3"	98,8 / 98,4 / 98,1	98.4	98.4	0.35	1.6	0.35
90033	"Silver"	100 / 100 / 99,3	100.0	99.8	0.40	0.2	0.40
95050	"Lavender Grey"	97,5 / 97,9 / 97,5	97.5	97.6	0.23	2.4	0.23
97017	"Basalt Grey"	96,6 / 96,2 / 96,2	96.2	96.3	0.23	3.7	0.23
		Column average:	98.0	97.8	0.62	2.2	0.62

APPENDIX B
ITEM 7 (page 2 of 3)

SUPPORTING DATA- CARBON ARC vs. XENON EXPOSURE OF SEAT BELT WEBBING

		Light exposure per FMVSS 209 S4.2(e) (carbon arc)					
Article	Color	**Percentage of tensile strength retained (actual data for 3 samples)**	**Median** percentage of tensile strength **retained**	**Average** percentage of tensile strength **retained**	**Standard Deviation** of tensile strength **retained**	**Average** percentage of tensile strength **degradation**	**Standard Deviation** of tensile strength **degradation**
97017	"Orange"	97,4 / 98,5 / 98,5	98.5	98.1	0.64	1.9	0.64
95050	"Savanna Beige"	99,4 / 99,8 / 100	99.8	99.7	0.31	0.3	0.31
95050	"Slate Blue"	100 / 99,3 / 99,7	99.7	99.7	0.35	0.3	0.35
97047	"Pearl Dark"	99,3 / 99,6 / 99,3	99.3	99.4	0.17	0.6	0.17
97017	"India Red"	100 / 100 / 100	100.0	100.0	0.00	0.0	0.00
97017	"Teracotta"	100 / 100 / 100	100.0	100.0	0.00	0.0	0.00
78058	"Spin Black"	99,4 / 99,7 /100	99.7	99.7	0.30	0.3	0.30
95050	"Grey 60"	98,9 / 100 / 99,3	99.3	99.4	0.56	0.6	0.56
97017	"Granite Blue"	100 / 99,6 / 99,6	99.6	99.7	0.23	0.3	0.23
97017	"Landscape"	99,6 / 99,3 / 99,6	99.6	99.5	0.17	0.5	0.17
97017	"Como Beige"	100 / 100 / 99,3	100.0	99.8	0.40	0.2	0.40
95050	"Lava Blue"	98,6 / 98,6 / 97,6	98.6	98.3	0.58	1.7	0.58
94207	"Spin Black"	98,2 / 98,2 / 98,2	98.2	98.2	0.00	1.8	0.00
97017	"Buckskin"	97,8 / 97,8 / 98,1	97.8	97.9	0.17	2.1	0.17
95050	"Mocha"	98,6 / 99,0 / 98,6	98.6	98.7	0.23	1.3	0.23
95050	"Greige"	99,3 / 97,6 / 99,0	99.0	98.6	0.91	1.4	0.91
95050	"Beige 3"	97,3 / 97,4 / 97,7	97.4	97.5	0.21	2.5	0.21
90033	"Silver"	98,5 / 97,8 / 98,1	98.1	98.1	0.35	1.9	0.35
95050	"Lavender Grey"	100 / 100 / 99,6	100.0	99.9	0.23	0.1	0.23
97017	"Basalt Grey"	98,9 / 98,5 / 98,5	98.5	98.6	0.23	1.4	0.23
		Column average:	99.1	99.0	0.30	1.0	0.30

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ITEM 7 (page 3 of 3)

SUPPORTING DATA- CARBON ARC vs. XENON EXPOSURE OF SEAT BELT WEBBING

Article	Color	**Difference in median retained tensile strength between test methods** (positive value indicates ECE is more severe than FMVSS)	**Difference in average retained tensile strength between test methods** (positive value indicates ECE is more severe than FMVSS)
97017	"Orange"	1.1	0.7
95050	"Savanna Beige"	0.8	2.0
95050	"Slate Blue"	0.7	3.7
97047	"Pearl Dark"	0.4	0.5
97017	"India Red"	1.9	2.0
97017	"Teracotta"	4.1	4.0
78058	"Spin Black"	0.0	0.1
95050	"Grey 60"	1.8	1.7
97017	"Granite Blue"	4.0	4.4
97017	"Landscape"	2.2	2.2
97017	"Como Beige"	2.6	2.5
95050	"Lava Blue"	0.7	0.5
94207	"Spin Black"	-0.1	0.0
97017	"Buckskin"	0.0	0.1
95050	"Mocha"	-0.7	-0.5
95050	"Greige"	0.4	-0.1
95050	"Beige 3"	-1.0	-1.0
90033	"Silver"	-1.9	-1.6
95050	"Lavender Grey"	2.5	2.2
97017	"Basalt Grey"	2.3	2.3
	AVERAGE DIFFERENCE IN PERCENT TENSILE STRENGTH RETAINED AFTER EXPOSURE	**1.1**	**1.3**
	MEDIAN DIFFERENCE IN PERCENT TENSILE STRENGTH RETAINED AFTER EXPOSURE	**0.8**	**1.2**

APPENDIX C
ITEM 7

(2) Illegal activity or fraud;
(3) Non-payment or late payment to a foreign administration or agent;
(4) Failure to follow ITR requirements and procedures;
(5) Failure to take into account ITU-T Recommendations;
(6) Failure to follow FCC rules and regulations;
(7) Bankruptcy; or
(8) Providing false or incomplete information to the Commission or failure to comply with or respond to requests for information.

(b) Prior to taking any of the enforcement actions in paragraph (a) of this section, the Commission will give notice of its intent to take the specified action and the grounds therefor, and afford a 30-day period for a response in writing; provided that, where the public interest so requires, the Commission may temporarily suspend a certification pending completion of these procedures. Responses must be forwarded to the Accounting Authority Certification Officer. See Section 3.61.

§ 3.73 Waiting period after cancellation.

An accounting authority whose certification has been cancelled must wait a minimum of three years before reapplying to be an accounting authority.

§ 3.74 Ship stations affected by suspension, cancellation or relinquishment.

(a) Whenever the accounting authority privilege has been suspended, cancelled or relinquished, the accounting authority is responsible for immediately notifying all U.S. ship licensees for which it was performing settlements of the circumstances and informing them of the requirement contained in paragraph (b) of this section.

(b) Those ship stations utilizing an accounting authority's AAIC for which the subject accounting authority certification has been suspended, cancelled or relinquished, should make contractual arrangements with another properly authorized accounting authority to settle its accounts.

(c) The Commission will notify the ITU of all accounting authority suspensions, cancellations and relinquishments, and

(d) The Commission will publish a Public Notice detailing all accounting authority suspensions, cancellations and relinquishments.

§ 3.75 Licensee's failure to make timely payment.

Failure to remit proper and timely payment to the Commission or to an accounting authority may result in one or more of the following actions against the licensee:

(a) Forfeiture or other authorized sanction.

(b) The refusal by foreign countries to accept or refer public correspondence communications to or from the vessel or vessels owned, operated or licensed by the person or entity failing to make payment. This action may be taken at the request of the Commission or independently by the foreign country or coast station involved.

(c) Further action to recover amounts owed utilizing any or all legally available debt collection procedures.

§ 3.76 Licensee's liability for payment.

The U.S. ship station licensee bears ultimate responsibility for final payment of its accounts. This responsibility cannot be superseded by the contractual agreement between the ship station licensee and the accounting authority. In the event that an accounting authority does not remit proper and timely payments on behalf of the ship station licensee:

(a) The ship station licensee will make arrangements for another accounting authority to perform future settlements, and

(b) The ship station licensee will settle any outstanding accounts due to foreign entities.

(c) The Commission will, upon request, take all possible steps, within the limits of applicable national law, to ensure settlement of the accounts of the ship station licensee. As circumstances warrant, this may include issuing warnings to ship station licensees when it becomes apparent that an accounting authority is failing to settle accounts. See also Sections 3.70 through 3.74.

[FR Doc. 96–10974 Filed 5–03–96; 8:45 am]

BILLING CODE 6712–01–P

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 571

[Docket No. 95–42; Notice 2]

RIN 2127–AF67

Federal Motor Vehicle Safety Standards; Seat Belt Assemblies; Child Restraint Systems

AGENCY: National Highway Traffic Safety Administration (NHTSA), DOT.

ACTION: Final rule.

SUMMARY: This document rescinds the colorfastness requirements for seat belt assemblies. The purpose of those requirements is to ensure that motorists are not discouraged from using safety belts out of a concern that the belts will transfer their coloring to the motorists' clothing. NHTSA concludes that manufacturer concerns about public acceptance are sufficient by themselves to ensure that manufacturers will continue to make their belts colorfast. Therefore, retention of the requirements is not necessary.

DATES: *Effective Date:* The amendments made in this rule are effective June 20, 1996.

Applicability Date: Seat belt assemblies manufactured after June 20, 1996 are not required to meet the colorfastness requirements.

Petition Date: Any petitions for reconsideration must be received by NHTSA no later than June 20, 1996.

ADDRESSES: Any petitions for reconsideration should refer to the docket and notice number of this notice and be submitted to: Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, SW., Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: The following persons at the National Highway Traffic Safety Administration, 400 Seventh Street, SW, Washington, DC 20590:

For non-legal issues: Clarke Harper, Office of Vehicle Safety Standards, NPS–12, telephone (202) 366–4916, facsimile (202) 366–4329, electronic mail "charper@nhtsa.dot.gov".

For legal issues: Mary Versailles, Office of the Chief Counsel, NCC–20, telephone (202) 366–2992, facsimile (202) 366–3820, electronic mail "mversailles@nhtsa.dot.gov".

SUPPLEMENTARY INFORMATION: Pursuant to the March 4, 1995 directive, "Regulatory Reinvention Initiative," from the President to the heads of departments and agencies, NHTSA undertook a review of all its regulations and directives. During the course of that review, the agency identified several requirements and regulations as being potential candidates for rescission. On June 19, 1995, the agency published an NPRM proposing the rescission of several of those candidate requirements, including the colorfastness requirements in Standard No. 209, "Seat Belt Assemblies" (60 FR 31946).

In the NPRM, NHTSA noted that it had included the colorfastness requirements in Standard No. 209 out of concern that occupants would be less likely to wear their seat belt if a lack of colorfastness of the webbing damaged their clothing. Paragraphs S4.2 (g) and (h) of the Standard require seat belt webbing to resist transferring color to a wet or dry crock cloth and to resist

APPENDIX D
ITEM 11

EXCERPTS FROM "General Motors Corporation; Ruling on Petition for Determination of Inconsequential Noncompliance," NHTSA 2002-12366 Notice 2

"Although there is a very slight increase in the amount of belt payout when the vehicle-sensitive mechanism is disabled, we have concluded that it is unlikely to significantly increase the risk of injury during pre-crash braking events in any of these vehicles…

"…in a 32 km/h (20 mph) frontal sled test of a C/K vehicle with a 50th percentile male dummy, the webbing payout was only 5.0 mm (0.2 inches) more than that allowed by the compliant ELR, there was no increase in the lock time, and there was no difference in forward head excursion.

"NHTSA has concluded that the extremely small increases in webbing payout and lock time, with little or no increased head excursion, reflected in the tests of the ELRs installed in the C/ K vehicles do not demonstrate a significant likelihood of increased injury due to the absence of a complying ELR in these vehicles."

APPENDIX E
ITEM 11

Mr. William E. Lawler
Manager, Specifications
Indiana Mills & Manufacturing, Inc., (IMMI)
18881 U.S. 31 North
P.O. Box 408
Westfield, IN 46074-0408

Dear Mr. Lawler:

This responds to your request that the National Highway Traffic Safety Administration interpret the metric conversion of one inch in Standard No. 209 Seat Belt Assemblies, at S4.3(j)(1), as 25.4 millimeters (mm), not the specified 25 mm. You do not explain why you prefer 25.4 mm.

The 25 mm measurement was adopted as part of an initiative to convert English measurements in the Federal motor vehicle safety standards to metric measurements. We proposed to convert one inch in S4.3(j)(1) of Standard No. 209 to 25 mm, in accordance with the principle that we generally favor equivalent, not exact conversions. We adopted the 25 mm measurement after publishing notice of the proposed conversion in the Federal Register (April 21, 1997; 62 FR 19253), and receiving comment on the proposal. The 25 mm measurement is clearly specified in Standard No. 209. We cannot interpret the provision as 25.4 mm.

We note, however, that we are considering rulemaking to amend S4.3(j)(1). We will consider including a proposal to change the 25 mm value to 25.4 mm.

Please contact us if you have further questions. For information about metric conversion principles, please feel free to contact Ms. Dorothy Nakama of my staff at (202) 366-2992. If you have questions about Standard No. 209, you may contact Mr. Otto Matheke at the same telephone number.

Sincerely,

John Womack
Acting Chief Counsel

Enclosure
ref:209
d.11/16/01

APPENDIX F
ITEM 13

REVISED FMVSS 209 FIGURE 5 LOOP LOAD TEST SETUP

S4.4 *Requirements for assembly performance*.

(4) The length of the pelvic restraint between anchorages shall not increase more than 508 mm when subjected to aforce of 11,120 N.

(5) The length of the upper torso restraint between anchorages shall not increase more than 508 mm when subjected to a force of 6,672 N.

S5.3 *Assembly performance—(a) Type 1 seat belt assembly.* Three complete seat belt assemblies, including webbing, straps, buckles, adjustment and attachment hardware, and retractors, arranged in the form of a loop as shown in Figure 5, shall be tested in the following manner:

Proposed FIGURE 5

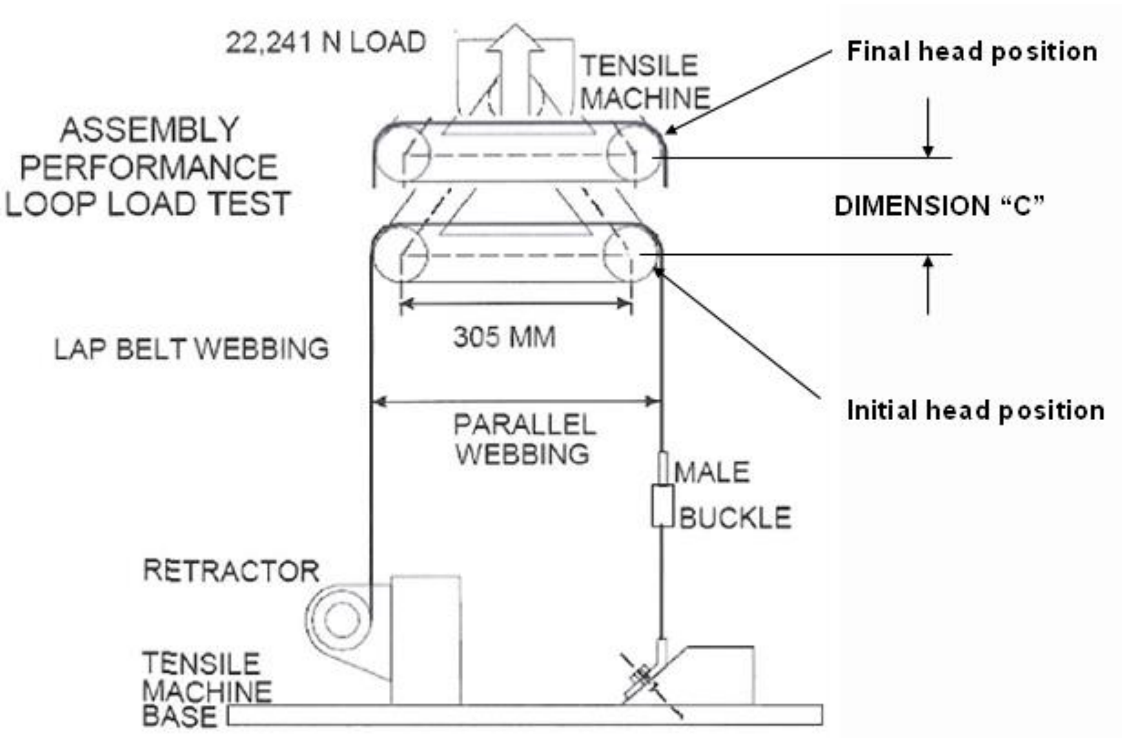

FIGURE 5