



# QUALITY ASSURANCE SPECIFICATIONS™

SFI SPECIFICATION 39.1

EFFECTIVE: MARCH 16, 2015\*

PRODUCT: Stock Car Type Racing Seats (Custom)

## 1.0 GENERAL INFORMATION

- 1.1 This SFI Specification establishes uniform test procedures and minimum standards for evaluating and determining performance capabilities for Stock Car Type Racing Seats (Custom) used by individuals engaged in competitive motorsports.
- 1.2 The procedures, test evaluations and standards contained herein, are intended only as minimum guidelines for construction and evaluation of products. Certification that products meet such minimum standards is made by the product manufacturer and products are not certified, endorsed or approved by SFI under this program.
- 1.3 Use of the "This Manufacturer Certifies That This Product Meets SFI Specification 39.1" logo/designation, the authorized artwork style, or conventional lettering by a manufacturer, on a subject product, is intended only to indicate that the manufacturer of the product has represented that they have submitted the product to the recommended tests, with positive results, in compliance with the standards established herein.
- 1.4 This SFI Specification requires a demonstration that the product of a manufacturer meets or exceeds the requirements when the manufacturer enters the program; and on an annual basis thereafter. Any manufacturer may participate in the program by providing Stock Car Type Racing Seats (Custom) that meet or exceed the SFI Specification 39.1 test standards, by complying with the requirements of the SFI Specification 39.1 program, and by signing a licensing agreement with the SFI Foundation, Inc.

- 1.5 Compliance with this specification is entirely voluntary. However, when a manufacturer provides Stock Car Type Racing Seats (Custom) in compliance with all requirements of the SFI Specification 39.1 and enters into the licensing agreement with the SFI Foundation, Inc., they may certify that compliance with such standards is in accordance with the guidelines established herein.
- 1.6 Manufacturers wishing to participate in the program, in addition to the other requirements of this specification, must label each of their products with the manufacturer's name, trademark or symbol as well as the date of manufacture of the product.
- 1.7 No manufacturer may display the SFI logo/designation on their product unless the manufacturer has signed a licensing agreement with SFI and has successfully complied with all the requirements of this specification and the self-certification program.

## 2.0 DEFINITIONS

- 2.1 A Stock Car Type Racing Seat (Custom) assembly is used to secure the user within a stock car racing vehicle with the objective of minimizing injury to the driver during accident conditions and of supporting the driver safety during normal racing activity.
- 2.2 Stock Car Type Racing Seats (Custom) shall be inspected by the original manufacturer for recertification every two years from the date of original certification. When a seat is determined to be acceptable for continued service, a new conformance label marked with the inspection date shall be used. In-field recertification is permitted, but ONLY by the original manufacturer or its authorized agent. Mailing of certification labels to customers is strictly prohibited.
- 2.3 Any seat assembly pertaining to this specification shall remain as constructed by the original manufacturer and shall not be modified or altered by anyone else.
- 2.4 A Stock Car Type Racing Seat (Custom) is a seat which adheres to the NASCAR rule book requirements for using either aluminum or composite material and provides for mounting the seat back with a minimum of three (3) high-quality bolts and the seat bottom with a minimum of two (2) high-quality bolts per side.

- 2.5 All support projections/"wings" are portions of the seat which are positioned opposite the head, shoulder, and pelvic areas and are extensions of the regular seat shape designed to provide extra support for those body locations during side load and side crashes.
- 2.6 Nets, struts, bolt-on or temporary auxiliary attachments, etc, shall be removed for certification tests per this spec.
- 2.7 If the seat to be certified is of different materials, etc. and is intended for use in other racing sanctioning body events other than NASCAR, all requirements of this spec must still be met but may not be accepted by NASCAR officials for certification.
- 2.8 A Stock Car Type Racing Seat (Custom) shall be a stand-alone structure. The seat back shall be mounted to the shoulder bar of the vehicle roll cage. In NASCAR competition, the seat back shall be mounted to the #7 bar, per paragraph 2.4 of this specification.
- 2.9 Although Force Performance Testing (per section 5.1 of this specification) is conducted on the seat's right side, any Stock Car Type Racing Seat (Custom) pertaining to this specification shall be constructed so that seat stiffness is bilateral.
- 2.10 Seats conforming to this SFI specification must be mounted per the seat manufacturer's instructions.

### 3.0 CONSTRUCTION

#### 3.1 MATERIALS

The materials used in the construction of the Stock Car Type Racing Seat (Custom) shall be resistant to the elements to which they are exposed in normal service. Besides environmental considerations, these elements include fluids used in and around motor vehicles that may come in contact with the seat assembly. All metal rivets, bolts, buckles, adjusters, etc. shall be corrosion resistant.

### 4.0 MODEL CLASSIFICATION

Any variation in construction method, material, structural strength and rigidity, mounting system, shell thickness, ventilation holes outside the option area defined in section 5 below, or major contour or shape shall be considered a model change and requires additional testing.

## 5.0 TESTING

### 5.1 FORCE PERFORMANCE

#### 5.1.1 SAMPLES

- A. Test samples shall be fully processed new Stock Car Type Racing Seats (Custom) that are representative of devices currently being produced or to be produced. Due to variability in end product mounting systems, the manufacturer shall be required to supply attachment and adjustment hardware which will adapt the test seats to the specific test rig being used within the dimensional envelope provided by the NASCAR Rulebook and the certifying test facility.
  
- B. Ventilation Hole Option: As an option the manufacturer may choose to test their seat with a portion of the seatback removed. The purpose of this test option is to allow the manufacturer to offer multiple ventilation configurations inside of this area without separate certification tests for each configuration. This optional area is defined as a rectangular window on the seatback shown in red in Figure 1 below. The upper limit of the window is at the connection of the bottom of the shoulder support to the seatback. The lower limit of the window is at the intersection of the top of the side leg/pelvic supports with the seatback. The width of the window shall be a maximum of +/- 6 inches from the measured lateral centerline of the seatback. The rectangular window is shown in red on the rear view diagram of the seat in Figure 1. The corners of the rectangular window may have a maximum 0.25 inch radius. All seatback material (including any structure behind the seatback surface) must be removed from the rectangular window for all tests in Section 5.1.3 if the manufacturer chooses this test option. Successful compliance with Section 6.1 with this option allows the manufacturer to place round ventilation holes inside the rectangular window. All holes must be round and be completely contained inside of the rectangular window. Individual ventilation hole diameter may not exceed 3.0 in. and total ventilation hole area may not exceed 15.0 in<sup>2</sup>. A minimum of 0.5 in. of seatback material must be left between multiple ventilation holes.

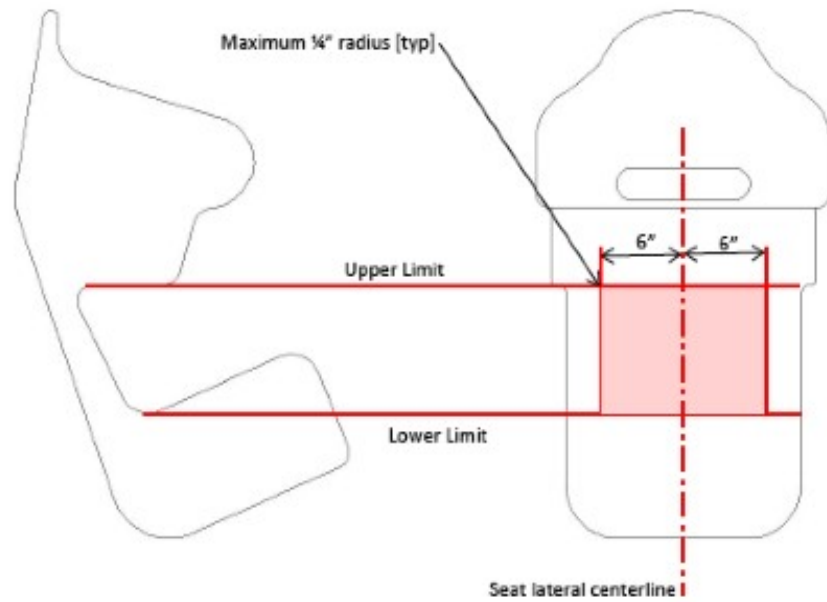
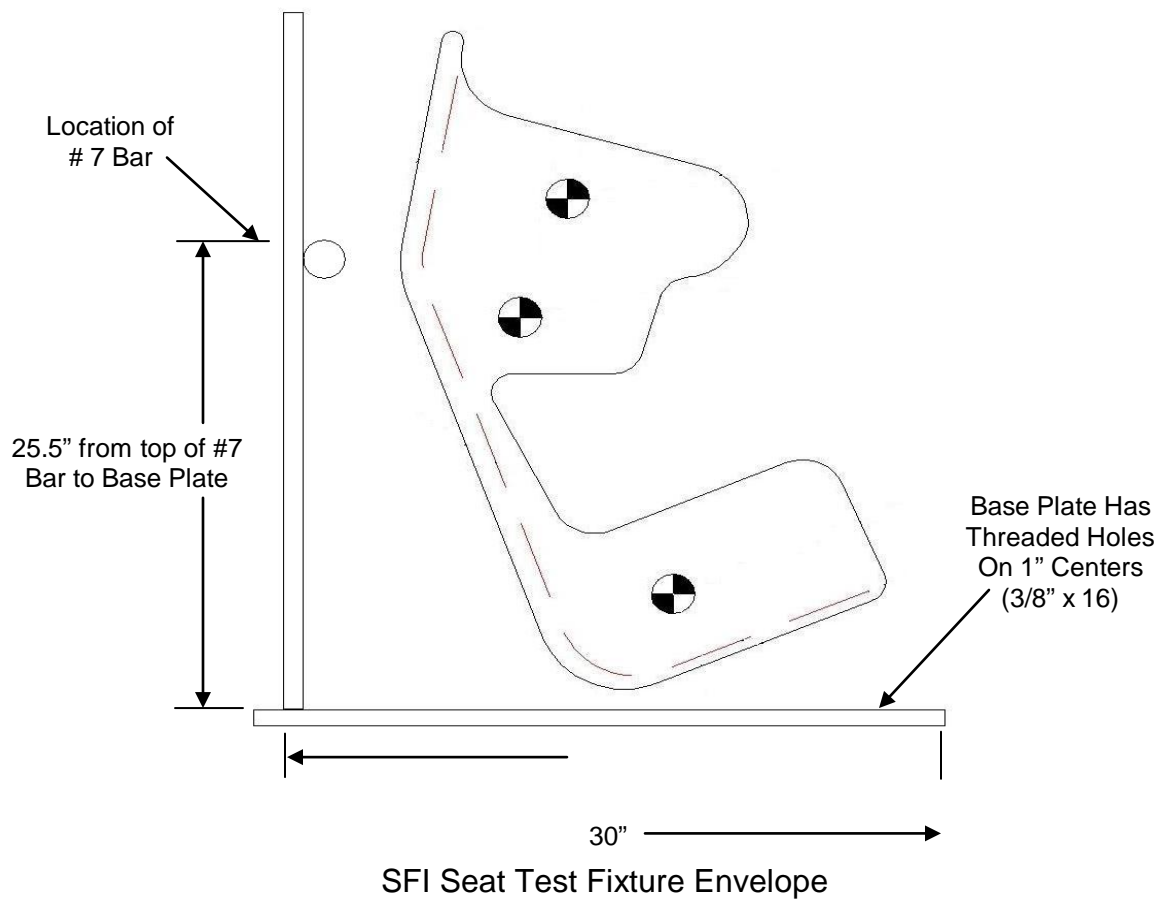


Figure 1 Ventilation Hole Window



### 5.1.2 APPARATUS

- A. The test fixture must be capable of mounting the Stock Car Type Racing Seat (Custom) to be certified in a manner which adheres to NASCAR mounting requirements and manufacturer's instructions.
  
- B. To accommodate variations in specific seat configuration and seat back angles (with respect to vertical), the support structure for the load cylinder must be readily adjustable in both horizontal and vertical directions to allow horizontal load applications per Figure 2 when the seat is installed. Dimensions shown in Figure 1 account for minimum foam thickness of 1" in rear of seat, and 0.5" in bottom of seat. Measurements should be taken from bare seat structure with any seat insert foam removed. Load shall be applied outward to the right side of the seat only. Special load shapes are required at the end of the cylinder to all load application per Figure 3.

Figure 2  
Profile of Seat  
Load Application Points

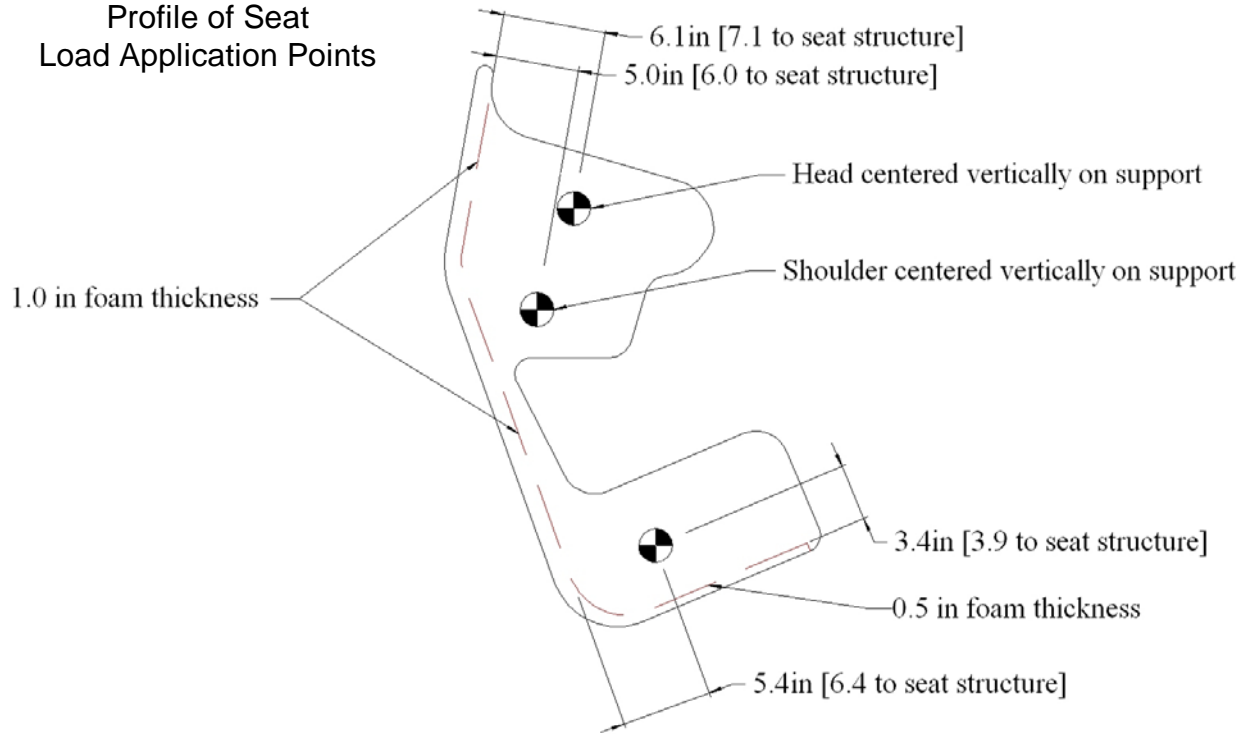
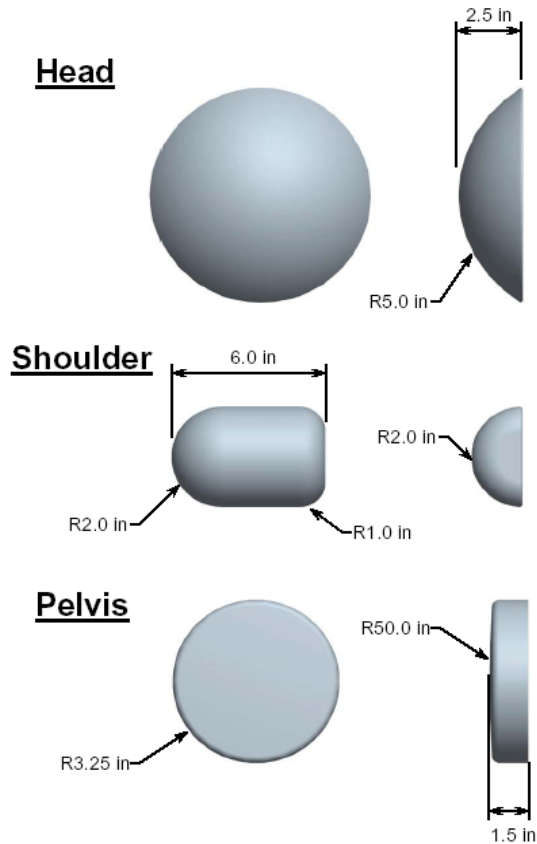


Figure 3  
Profile of Seat  
Load Shapes



- C. Instrumentation shall be capable of measuring deflection of the test locations with respect to the floor mounting surface of the test seat at points aligned and parallel with the centerline of the load cylinder axis and measured in a lateral direction with respect to vehicle fore and aft axis. The deflection instrumentation shall be accurate and readable within .001 inch.
- D. The load cell measuring applied load shall be accurate and readable within 10-lbs. (44N) increments.

### 5.1.3 PROCEDURE

- A. The Stock Car Type Racing Seat (Custom) shall be mounted to the test fixture meeting NASCAR and manufacturer's requirements. All product padding shall be removed from the test seat and replaced at the load points by a 2.0 inch slab of foam adhering to SFI 45.2 requirements (example manufacturer: BSCI Mfg.)
- B. The load cylinder, load cell, and any load adapter(s) shall be mounted on the test fixture located such that the load will be applied in a lateral direction (90° to vehicle axis) and positioned at the specific application point at the HEAD location (Figure 2). Apply a momentary "conditioning" load of 1,000 lbs. (4,448N), reduce the load to zero and zero the position sensor.
- C. Apply a load of 2,000 lbs. (8,896N), measure and record the deflection on seat "wing" at application point, hold for 10 seconds and release. Reduce the load to zero, measure and record the permanent deflection.
- D. The load cylinder, load cell, and any load adapter(s) shall be mounted on the test fixture located such that the load will be applied in a lateral direction (90° to vehicle axis) and positioned at the specific application point at the SHOULDER location (Figure 2). Apply a momentary "conditioning" load of 1,500 lbs. (6,672N), reduce the load to zero and zero the position sensor.
- E. Apply a load of 3,000 lbs. (13,344N), measure and record the deflection on seat "wing" at application point, hold for 10 seconds and release. Reduce the load to zero, measure and record the permanent deflection.



- F. The load cylinder, load cell, and any load adapter(s) shall be mounted on the test fixture located such that the load will be applied in a lateral direction (90° to vehicle axis) and positioned at the specific application point at the PELVIC location (Figure 2). Apply a momentary “conditioning” load of 2,000 lbs. (8,896N), reduce the load to zero and zero the position sensor.
- G. Apply a load of 4,000 lbs. (17,792N), measure and record the deflection on seat “wing” at application point, hold for 10 seconds and release. Reduce the load to zero, measure and record the permanent deflection.
- H. If the “wings” at any of the locations above are not a continuous surface, a flat plate may be inserted so the prescribed load may be applied.
- I. If any of the test locations do not exist on the test seat, no certification test can be performed.

## 6.0 PROOF OF COMPLIANCE

Certifying manufacturers of tested Stock Car Type Racing Seats (Custom) are required to provide the following information to enroll in this program:

### 6.1 TEST RESULTS

Test results shall be documented in a test report.

- 6.1.1 Load Performance at the point of load for the initial load application in paragraphs 5.1.3 B, C, D.

Maximum deflection at <u>HEAD</u> location:	.50 in. (12.7 mm)
Maximum deflection at <u>SHOULDER</u> location:	.50 in. (12.7 mm)
Maximum deflection at <u>PELVIC</u> location:	.50 in. (12.7 mm)

- 6.1.2 Cracks or dislodged pieces in the seat assembly are not allowed but permanent distortion at the load points in paragraphs 5.1.3 B, C, D up to .25 inch (6.4 mm) from original contour is acceptable after the initial load application.

## 7.0 TEST REPORTS

A separate test report, or set of test reports if required, shall be submitted for each product model. If more than one test facility is required to complete all necessary tests, then a separate test report shall be submitted from each one. A test report shall be submitted for each component, if tested separately. The test facility shall assign a unique number to each test report. This number along with the report date and page number shall appear on each page. Each test report shall include:

### 7.1 RELEVANT INFORMATION

- 7.1.1 Manufacturer's name, contact name, address and telephone number.
- 7.1.2 Name, address and telephone number of the test facility.
- 7.1.3 Name and signature of the responsible test supervisor.
- 7.1.4 Actual date of the test.
- 7.1.5 Specification number and effective date.
- 7.1.6 Product name, description and model designation.
- 7.1.7 Component name and description.

### 7.2 TESTS

Each test conducted shall be listed showing the test name, apparatus used, procedure used and test results obtained along with any other appropriate information.

### 7.3 AUTHENTICATION

Test reports shall be authenticated and stamped by a Professional Engineer who is registered in the state in which the testing is conducted. If necessary, SFI may allow an equivalent entity to provide authentication.

## 8.0 INITIAL DESIGN VALIDATION

To receive initial recognition from SFI as a participant in the SFI Specification 39.1 Program, the manufacturer must submit to SFI all information delineated in the Proof of Compliance section. This information shall be provided for each Stock Car Type Racing Seat (Custom) model offered by the applicant that is to be included in the program. Any

change in design, materials and/or methods of manufacturing not specifically excluded is considered a model change and, therefore, requires initial design validation.

## 9.0 PERIODIC REVALIDATION

Test reports with successful test results must be submitted to SFI at least once every 12 month period following the date of the initial design validation test for each model of Stock Car Type Racing Seat (Custom) manufactured by the participant. After the second retest cycle following the initial design validation test (a total of three test occurrences), successful test results must be submitted to SFI at least once every 24 months. If multiple test reports are required to obtain all test results, then the earliest test date shall be used to determine when the periodic revalidation reports are due. Also, SFI shall retain the option to conduct random audit reviews. SFI shall purchase the product on a commercial basis and test for compliance to the specification. The submitting manufacturer shall reimburse SFI for all audit costs.

## 10.0 CERTIFICATION OF COMPLIANCE

Upon demonstration of successful compliance with all the requirements of the specification and the self-certification program and upon entering the licensing agreement with SFI, the manufacturer may advertise, present and offer the Stock Car Type Racing Seats (Custom) for sale with the representation that their product meets the SFI Specification 39.1. Continuing certification is contingent upon the following additional considerations: (1) the product shall be resubmitted for testing following any change in design, materials and/or methods of manufacturing not specifically excluded, and (2) periodic revalidation test reports are submitted when due to SFI.

## 11.0 CONFORMANCE LABELS

The conformance label is a serialized “punch-out” sticker for the Stock Car Type Racing Seats (Custom). The manufacturer must obtain the conformance labels from SFI. The label shall be punched with the month and year of manufacture and be placed on the outside surface. The month and year of manufacture shall be punched in each label with a 1/8" hole punch. The serial number should appear on the customer invoice to aid in identification and tracking. Multi-component Stock Car Type Racing Seats (Custom) must employ an individual conformance label on each seat component.

## 12.0 DECERTIFICATION

Participating manufacturers are subject to decertification when not in compliance with the requirements of this program or when their products are not in compliance with the requirements of this specification. Decertification will provide SFI the right to effect any and all remedies which are available to SFI in the licensing agreement.

## 13.0 APPEAL PROCEDURE

In the event of decertification, the manufacturer is entitled to an appeal of the decision of SFI. Requests for appeal must be received by SFI no later than thirty days following receipt of the notice of decertification. Appeals of such decisions will be heard at the next meeting of the Board of Directors of SFI.

## 14.0 STATEMENT OF LIMITATIONS

Testing procedures and/or standards contained in this specification are intended for use only as a guide in determining compliance with the minimum performance requirements as defined herein. The granting and assignment of the "This Manufacturer Certifies That This Product Meets SFI Specification 39.1" logo/designation is in no way an endorsement or certification of product performance or reliability by SFI. SFI, its officers, directors and/or members assume no responsibility, legal or otherwise, for failure or malfunctions of a product under this program.

## 15.0 COSTS

All costs involved in this program will be absorbed by the submitting manufacturer.

## 16.0 COMPLIANCE PERIOD

As this specification is revised to reflect changes in technology and/or field conditions, to remain current, participating manufacturers in the SFI Specification 39.1, Stock Car Type Racing Seats (Custom), Program, must demonstrate full compliance with the requirements of this specification within ninety (90) days of the latest effective date.

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