



# QUALITY ASSURANCE SPECIFICATIONS™

SFI SPECIFICATION 35.2

EFFECTIVE: NOVEMBER 11, 2022\*

PRODUCT: Heavy Duty Stock Car Steel Wheels

## 1.0 GENERAL INFORMATION

- 1.1 This SFI Specification establishes uniform test procedures and minimum standards for evaluating and determining performance capabilities for Heavy Duty Stock Car Steel Wheels.
- 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 35.2" 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 a periodic basis thereafter. Any manufacturer may participate in the program by providing Heavy Duty Stock Car Steel Wheels that meet or exceed the SFI Specification 35.2 test standards, by complying with the requirements of the SFI Specification 35.2 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 Heavy Duty Stock Car Steel Wheels in compliance with all requirements of the SFI Specification 35.2 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 Wheel: For this specification, it shall be the specially constructed circular structure, an assembly of a rim and a center directly connected.
- 2.2 Center: The structural (load carrying) section of the wheel that includes the mounting hub or flange and extends outward to connect to the rim. It is also called a disc or a spider.
- 2.3 Rim: The supporting member for the tire or tire and tube assembly.
- 2.4 Lot: A quantity of parts of the same type and part number, produced consecutively under similar conditions. A lot may have variable time frames and may be identified by tool number and run number.
- 2.5 Offset: The distance between the mounting surface of the center member and the center line of the rim. This dimension is termed positive when the mounting face of the wheel center is outboard of the rim center line and negative when inboard of the rim center line.
- 2.6 Service Life: The service life of Heavy Duty Stock Car Steel Wheels is five (5) years from the "In Service Date", and they must be replaced at or before that time.
- 2.7 Tire and Rim: The Tire and Rim Association has established specifications for the cross sectional profile of rim contours. Heavy Duty Stock Car Steel Wheels shall comply with their standard for 5 degree drop center rim contours.

- 2.8 Date of Manufacture: The day, month and year the wheel center is welded to the rim.

### 3.0 CONSTRUCTION

- 3.1 Heavy Duty Stock Car Steel Wheels produced under this specification shall be made from a steel rim and a steel center. Center may be reinforced.

- 3.2 The Tire and Rim Association has established specifications for the diameters of wheels. The diameter of Heavy Duty Stock Car Steel Wheels shall be 15 inches per Tire and Rim Association specifications. Heavy Duty Stock Car Steel Wheels shall be only five (5) lug, weighing a minimum of 27 pounds (in the uncoated condition without valve hardware) with a 9 ½ inch rim and a 4 ½ inch offset (backside).

- 3.3 Chrome wheels are not permitted.

- 3.4 The minimum thickness of the wheel rim shall be 0.118"

### 4.0 MODEL CLASSIFICATION

A single combination of wheel and fasteners having a specific design or style, of a particular diameter and width, and produced and processed dimensionally and otherwise in a specific manner with specific materials. For this reason, variations in bolt patterns and bolt hole sizes do not constitute a different model.

### 5.0 TESTING

#### 5.1 DYNAMIC CORNERING FATIGUE

Test in accordance with SAE J328 using the information given in this section. **Validation requires one successful test for each model.**

##### 5.1.1 SAMPLES

Test samples shall be fully processed uncoated new wheels which are representative of wheels currently produced or to be produced. All samples shall be produced from the same lot of wheels. When assembling to the fixture, the wheel nuts (or bolts) shall be hand torqued at the beginning of the test to 90 ± 10 ft. lbs.

##### 5.1.2 PROCEDURE

Perform the test at a bending moment of 3,500 ft. lbs. and complete a minimum of 250,000 cycles.

### 5.1.3 INSPECTION

Inspect for any evidence of new fractures or propagation of any existing fractures of any part of the wheel. The front face shall be inspected while the wheel is under full load, with hand rotation of the wheel.

## 5.2 DYNAMIC RADIAL FATIGUE

Test in accordance with SAE J328 using the information given in this section. **Validation requires one successful test for each model.**

### 5.2.1 SAMPLES

Test samples shall be fully processed uncoated new wheels which are representative of wheels currently produced or to be produced. All samples shall be produced from the same lot of wheels. Use the same model variation as tested in the previous section. When assembling to the fixture, the wheel nuts (or bolts) shall be hand torqued at the beginning of the test to  $90 \pm 10$  ft. lbs. The cold inflation pressure of the test tire(s) shall be 60-70psi.

### 5.2.2 PROCEDURE

Perform the test at a load of 4,500 pounds for a minimum of 850,000 cycles. In the event of test tire failure while testing, it is acceptable to mount another test tire and continue the test.

### 5.2.3 INSPECTION

Inspect the rim for any evidence of new fractures or propagation of any existing fractures of any part of the wheel. The front face shall be inspected while the wheel is under full load at zero RPM.

## 5.3 BEAD BENDING STRENGTH

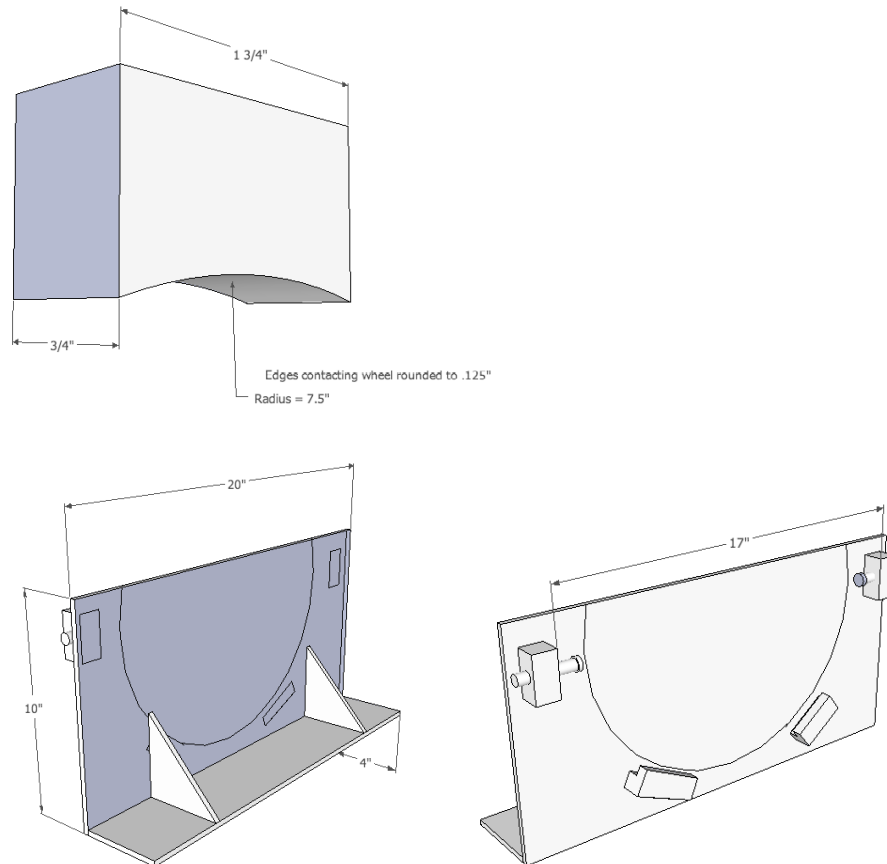
Test in using the information given in this section. Both inner and outer bead areas will be tested. For initial design validation, two wheels per model shall be tested. **For revalidation, one wheel per model shall be tested.**

### 5.3.1 SAMPLES

Test samples shall be fully processed uncoated new wheels which are representative of wheels currently produced or to be produced. All samples shall be produced from the same lot of wheels. Use the same model variation as tested in the previous section.

### 5.3.2 PROCEDURE

Mount the wheel to a fixture supporting the lower half of the wheel. Apply a load of 5,000 pounds at the inner bead area opposite of the fixture and perpendicular to the axle, at an extension rate of .5 inches per minute. Record the test force and deflection.



### 5.3.3 INSPECTION

Inspect the rim for any evidence of new fractures or propagation of any existing fractures of any part of the wheel.

## 5.4 MECHANICAL PROPERTIES

### 5.4.1 SAMPLES

Test bars used in determining mechanical properties shall be machined from the wheel rim. Use of standard test bars of a like material are not acceptable.

#### 5.4.2 APPARATUS

A standard tensile test machine shall be used. The machine shall be capable of applying the required tensile load in accordance with ASTM E-8, and shall have adequate instrumentation to verify the test load. The test machine shall also be in calibration and traceable to the National Institute of Standards and Technology.

#### 5.4.3 PROCEDURE

Record the physical dimensions of the test bar. Increase the tensile load until the test bar breaks. Record the load and elongation in accordance with ASTM E-8 test procedures.

#### 5.4.4 INTERPRET RESULTS

Determine the yield strength, tensile strength and elongation for each sample.

### 6.0 PROOF OF COMPLIANCE

Heavy Duty Stock Car Steel Wheel manufacturers 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 DYNAMIC CORNERING FATIGUE

A wheel shall be considered to have failed if any one of the following occurs:

- A. A visually detected new fracture or propagation of any existing fracture of any part of the wheel.
- B. One or more lug nuts loosening to less than 60 percent of the initial torque.
- C. Inability of the wheel to sustain the applied load for the required number of cycles.

### 6.1.2 DYNAMIC RADIAL FATIGUE

A wheel shall be considered to have failed if any one of the following occurs:

- A. A visually detected new fracture or propagation of any existing fracture of any part of the wheel.
- B. One or more lug nuts loosening to less than 60 percent of the initial torque.
- C. Inability of the wheel to sustain the applied load for the required number of cycles.
- D. Loss of air through the rim on tubeless type wheels.

### 6.1.3 BEAD BENDING STRENGTH

A wheel shall be considered to have failed if any one of the following occurs:

- A. A visually detected new fracture or propagation of any existing fracture of any part of the wheel.
- B. A deflection in excess of 0.50" at a load of 5,000 pounds or less.

### 6.1.4 MECHANICAL PROPERTIES

The wheel rim steel shall have mechanical properties in accordance with minimums listed in Table 1.

Table 1			
Material	Minimum Yield Strength psi (kg/cm <sup>2</sup> )	Minimum Tensile Strength psi (kg/cm <sup>2</sup> )	Minimum Percent Elongation
Wheel Rim Steel	55,000 (3,867)	60,000 (4,218)	10

## 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. 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 Photograph of the test wheel.
- 7.1.8 Nominal thickness of the wheel rim.
- 7.1.9 Nominal thickness of the wheel center.
- 7.1.10 Date of Manufacture of the wheel.

## 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 35.2 Program, the manufacturer must agree that the product to be tested will be obtained on a commercial basis through an outlet in the normal stream of commerce. This testing shall be done for each Heavy Duty Stock Car Steel Wheel 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 Heavy Duty Stock Car Steel Wheel 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 36 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.

## 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 Heavy Duty Stock Car Steel Wheels for sale with the representation that their product meets the SFI Specification 35.2. 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 “punch-out” sticker which shall be placed on the outboard weather surface of the wheel, visible when the tire is mounted. The “In Service” month and year shall be punched in each label with a 1/8" hole punch. Besides placing the label on the part, the serial number of the label shall be permanently marked on the part. The permanently marked number must be on the inner surface of the center section, located between any two adjacent bolt holes on the bolt circle diameter. The serial number should appear on the customer invoice to aid in identification and tracking. The date of manufacture, per 2.8, shall be stamped on outer surface of the rim center as follows: MM/DD/YYYY.

## 12.0 DECERTIFICATION

Participating manufacturers are subject to decertification when not in compliance with the requirements of this program, when their products are not in compliance with the requirements of this specification or when they are not in compliance with the SFI Quality Assurance Program 35.2. 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. Within thirty days following a request for appeal, the SFI Foundation Inc. will schedule a hearing at an appropriate site to discuss the specific details

of the case. If the decertification decision involves the special case of fatigue or performance test failure, the hearing may, at the option of the audit bureau representative, take place at the appropriate test laboratory.

#### 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 35.2" 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 35.2, Heavy Duty Stock Car Steel Wheels Program must demonstrate full compliance with the requirements of this specification within ninety (90) days of the latest effective date.

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	Reviewed:	December 8, 2016
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	Reviewed:	January 11, 2021
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