



# QUALITY ASSURANCE SPECIFICATIONS™

SFI SPECIFICATION 23.1

EFFECTIVE: MAY 1, 2008\*

PRODUCT: Supercharger Pressure Relief Assemblies

## 1.0 GENERAL INFORMATION

- 1.1 This SFI Specification establishes uniform test procedures and minimum standards for evaluating and determining performance capabilities for Supercharger Pressure Relief Assemblies 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 23.1" 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 a periodic basis thereafter. Any manufacturer may participate in the program by providing Supercharger Pressure Relief Assemblies that meet or exceed the SFI Specification 23.1 test standards, by complying with the requirements of the SFI Specification 23.1 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 Supercharger Pressure Relief Assemblies in compliance with all requirements of the SFI Specification 23.1 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 Supercharger Pressure Relief Assembly is a device to prevent a supercharger explosion due to excessive internal pressure. It functions by venting the case to ambient pressure with a non-reusable rupture disk or disks.
- 2.2 A rupture disk is the pressure venting element of the relief assembly. Upon reaching the critical pressure, the disk is blown permanently open.
- 2.3 A rupture disk holder is the structure which encloses and clamps the rupture disk in position.
- 2.4 Any pressure relief assembly pertaining to this specification shall remain as constructed by the original manufacturer and not modified.

## 3.0 CONSTRUCTION

- 3.1 Rupture disks may be designed in several configurations; such as plain flat, pre-bulged or reverse buckling, and may be made of either ductile or brittle material.
- 3.2 The rupture disk must have a minimum area of ten (10) square inches (64.5 square centimeters {cm}). If more than one rupture disk is used, the total area must be at least 12 square inches (77.4 square cm).

## 4.0 MODEL CLASSIFICATION

Any variation of design, materials, construction or mounting is considered a model change.

## 5.0 TESTING

Test samples shall be fully processed new pressure relief assemblies which are representative of pressure relief assemblies currently produced or to be produced. All mounting hardware, as provided by the manufacturer, shall be tested with the corresponding pressure relief assembly.

### 5.1 BURST PRESSURE

#### 5.1.1 APPARATUS

The fixture shall be a frame that simulates a supercharger case. Inspect the frame for surface irregularities. There shall be no nicks or scratches which may constitute a leakage pathway.

#### 5.1.2 CALIBRATION

- A. All pressure gauges used in the burst tests shall be calibrated against a standard dead weight or calibrated master gauge.
- B. The test gauges shall be calibrated before each test or series of tests.
- C. A series of tests is a group of tests, using the same pressure test gauge or gauges, which are conducted within a period not to exceed one working day.

#### 5.1.3 PROCEDURES

- A. All frame and pressure relief assembly mating surfaces shall be cleaned of any contaminants or foreign material before assembly.
- B. If the manufacturer requires the use of an inlet frame section next to the potential explosive source, the pressure relief assembly to be tested shall be placed in this frame section first per manufacturer's installation instructions.
- C. Coat the engagement section of the threads with a light film of oil so as to produce free running nut action.
- D. Place the top half (outlet section) of the pressure relief assembly into position and tighten the securing nuts finger tight, making certain of proper frame alignment.

- E. Apply one-third of the manufacturer's recommended torque to all nuts. Repeat for two-thirds and full torque. Tighten opposing studs alternately to induce uniform clamping unless otherwise specified by manufacturer's instructions.
- F. The test area shall have an ambient temperature between 60°F (16°C) and 85°F (29°C). Apply an increasing pressure to the pressure relief assembly. The rate of pressure rise shall not exceed one pound per square inch {psi} per second (6.9 kilopascals {kPa} per second). Air is the preferred medium to apply the pressure. Increase the pressure until the assembly bursts. Record the pressure at burst.

## 5.2 VACUUM SIMULATION

A pressure simulating a full vacuum, 14.7  $\pm$ 0.3 psi (101  $\pm$ 2 kPa), shall be applied to what would normally be the outlet side of the pressure relief assembly. Hold this pressure for ten seconds.

## 6.0 PROOF OF COMPLIANCE

Supercharger Pressure Relief Assembly 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 BURST PRESSURE

The pressure relief assembly shall have the minimum area as specified in paragraph 3.2, section 3.0, Construction. It shall burst at a pressure between 200 psi and 250 psi. The panels shall display full opening and all cut ends shall remain attached after the test. Full opening shall be defined as 90 percent or more of the total projected area of the panel. Failure of the rupture disk to burst in the specified range or to operate as specified shall be cause for rejection of the complete lot or production run.

#### 6.1.2 VACUUM SIMULATION

The pressure relief assembly shall maintain the vacuum simulation for the entire ten seconds without loss of pressure or structural change.

## 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.
- 7.1.8. Photograph of the submitted part.

### 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 23.1 Program, the manufacturer must submit to SFI all information delineated in the Proof of Compliance section. This information shall be provided for each Supercharger Pressure Relief Assembly 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 two year period following the date of the initial design validation test for each model of Supercharger Pressure Relief Assembly manufactured by the participant. 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.

Note: At least three samples of each lot or production run shall be tested and the results submitted to SFI. Therefore, test results may be required more often than once every two year period.

## 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 Supercharger Pressure Relief Assemblies for sale with the representation that their product meets the SFI Specification 23.1. 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 sticker. The sticker shall be placed on or near the rupture disk area on an exterior surface. The sticker has a serial number which shall be permanently marked also on an exterior surface. The serial number should appear on the customer invoice to aid in identification and tracking.

## 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 23.1" 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 23.1, Supercharger Pressure Relief Assemblies, Program, must demonstrate full compliance with the requirements of this specification within ninety (90) days of the latest effective date.

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*	Original Issue:	November 19, 1987
	Edited:	August 7, 1989
	Revised:	February 16, 1990
	Reviewed:	November 10, 1991
	Reviewed:	November 21, 1992
	Reviewed:	December 2, 1994
	Reviewed:	October 25, 1996
	Revised:	January 30, 1997
	Reviewed:	January 29, 1998
	Reviewed:	November 30, 2000
	Revised:	April 23, 2001
	Reviewed:	December 6, 2003
	Reviewed:	December 3, 2005
	Reviewed:	December 8, 2007
	Revised:	May 1, 2008
	Reviewed:	December 12, 2009
	Reviewed:	December 3, 2011
	Reviewed:	December 12, 2013
	Reviewed:	December 10, 2015
	Reviewed:	December 7, 2017
	Reviewed:	December 12, 2019
	Edited:	March 26, 2020