



QUALITY ASSURANCE SPECIFICATIONS™

SFI SPECIFICATION 14.2

EFFECTIVE: APRIL 1, 2022*

PRODUCT: Methanol Fuel Supercharger Restraint Devices

1.0 GENERAL INFORMATION

- 1.1 This SFI Specification establishes uniform test procedures and minimum standards for evaluating and determining performance capabilities for Methanol Fuel Supercharger Restraint Devices 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 14.2" 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 Methanol Fuel Supercharger Restraint Devices that meet or exceed the SFI Specification 14.2 test standards, by complying with the requirements of the SFI Specification 14.2 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 Methanol Fuel Supercharger Restraint Devices in compliance with all requirements of the SFI Specification 14.2 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 Methanol Fuel Supercharger Restraint Devices are used to constrain the supercharger and injector in the event of separation from the engine due to an explosion.
- 2.2 Vehicles requiring the use of this specification shall be powered with engines using high performance racing fuel.
- 2.3 Methanol Fuel Supercharger Restraint Devices shall be inspected every two years by the manufacturer for recertification. If the constraining straps are sensitive to ultraviolet light, they shall be replaced at that time.
- 2.4 Any restraint device pertaining to this specification shall remain as constructed by the original manufacturer and not modified.

3.0 CONSTRUCTION

3.1 TYPES

3.1.1 GIRDLE

This type shall be a girdle that employs a spacer plate between the injector body and the supercharger case. The spacer plate shall be made of a material with a minimum elongation of 12 percent. This spacer shall have a minimum of five individual attachment points for the supercharger straps (one at each corner and one at the rear). The girdle shall secure the supercharger with straps from the mounting points on the spacer plate to at least five mounting points on the engine. The spacer plate shall also have two attachment points for the injector strap (one on each side, mid-length). The injector strap shall secure the injector by attachment across the top.

3.1.2 BAG

A bag type shall consist of a ballistic blanket formed into a sack which covers the injector and supercharger completely. A minimum of five straps shall be attached to the sack (one on each corner and one on the rear) to five mounting points on the engine.

3.2 CONSTRAINING STRAPS

Constraining straps shall be made of a material with a minimum elongation of 20 percent of its length. If the strap material used is subject to fire damage, it shall have a material sheath completely covering the exposed straps which the manufacturer represents to be fire retardant.

3.3 HEADER BRACKET

The header bracket for each supercharger strap must be attached by a minimum of two 0.375 inch studs (SAE Grade 5 or Class 9.8). The strap attachments can also be a one piece flange running the full length of the header. Any welding of the bracket to the exhaust header is not acceptable.

3.4 BALLISTIC MATERIAL

The ballistic material shall cover 90 percent of each side and rear of the complete supercharger housing (inclusive) and be permanently secured on each end and the rear. If the straps support the ballistic material, their location must constrain the edges.

4.0 MODEL CLASSIFICATION

Any variation of the original design, i.e. spacer plate, straps or mounting method is considered a model change.

5.0 TESTING

5.1 TENSILE STRENGTH

5.1.1 SAMPLES

Test samples shall be fully processed new restraint devices which are representative of restraint devices currently produced or to be produced. All necessary mounting hardware along with mounting instructions shall be supplied with the restraint device.

5.1.2 APPARATUS

A. TEST MACHINE

The test machine must be capable of applying a minimum tensile load of 31,000 pounds {lb}(14,060kg) with an excursion travel of four to ten inches per minute {ipm}(10.2-25.4cm/min), and must have adequate instrumentation to verify the test load. The test machine must also be in calibration and traceable to the National Bureau of Standards.

B. FIXTURE

The test fixture must duplicate the mounting method of the supercharger restraint device and be capable of withstanding the applied load.

5.1.3 PROCEDURES

A. GIRDLE TYPE AND BAG TYPE

1. The supercharger restraint device shall be mounted to the test fixture per manufacturer's instructions with the supplied attachment hardware.
2. The test fixture shall be installed into the test machine.
3. Using an excursion rate between four and ten ipm (10.2-25.4cm/min), apply an increasing load to the restraint device. Continue until a load of 31,000lb (14,060kg) is applied. Hold at that level for ten seconds, then release the load.

B. GIRDLE TYPE ONLY

1. In each head of the test machine, mount one end of the injector strap. If the strap has a buckle and/or adjustment hardware, connect and adjust per manufacturer's instructions. The strap, strap hardware and heads shall be in axial alignment.
2. Using an excursion rate between four and ten ipm, (10.2-25.4cm/min) apply an increasing load to the injector strap. Continue until a load of 2,500lb (1134kg) is applied. Hold at that level for ten seconds, then release the load.

5.2 PENETRATION RESISTANCE

This test is based on Military Standard 662D, "Ballistic Test for Armor" (MIL-STD-662D).

5.2.1 SAMPLES

One sample, 11 by 14 ± 1 inch (27.9 by 35.6 ± 2.5 centimeters) shall be supplied. The sample shall have the identical layer fabric, layer order and construction, thread and stitch composition, and overall assembly as that of the ballistic material that is being evaluated.

5.2.2 APPARATUS

As per MIL-STD-662D.

A. PROJECTILE

Caliber .22 - Type 2, fragment simulators conforming to MIL-P-46593A shall be used.

5.2.3 PROCEDURES

The sample shall be testing in accordance with MIL-STD-662D for the Ballistic Limit, V_{50} BL (P). The maximum velocity span shall be 150 feet per second {fps} (46 meters per second {mps}).

5.2.4 INTERPRET RESULTS

The V_{50} BL (P) shall be calculated by taking the arithmetic mean of the two highest partial, and the two lowest complete, penetration impact velocities within the allowable velocity span.

6.0 PROOF OF COMPLIANCE

Methanol Fuel Supercharger Restraint Device 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 TENSILE STRENGTH

The girdle type must pass both tensile strength tests to be acceptable.

A. GIRDLE TYPE AND BAG TYPE

The restraint device shall pass the tensile strength test if it is able to maintain the test load for ten seconds.

B. GIRDLE TYPE ONLY

The injector strap shall pass the tensile strength test if it is able to maintain the test load for ten seconds.

6.2.1 PENETRATION RESISTANCE

The ballistic resistance of the sample shall be greater than or equal to a V_{50} BL(P) of 1385 fps (422 mps).

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 and the report date 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 The 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 Photographs of the submitted assembly, pre and post-test photographs of submitted ballistic samples.

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 14.2 Program, the manufacturer must submit to SFI all information delineated in the Proof of Compliance section. This information shall be provided for each Methanol Fuel Supercharger Restraint Device 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 24 month period following the date of the initial design validation test for each model of Methanol Fuel Supercharger Restraint Device 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.

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 Methanol Fuel Supercharger Restraint Devices for sale with the representation that their product meets the SFI Specification 14.2. 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 patch. A patch shall be attached to the bag and to each strap facing outward. The month and year of manufacturer shall appear on each patch.

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 14.2" 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 14.2, Methanol Fuel Supercharger Restraint Device, Program, must demonstrate full compliance with the requirements of this specification within ninety (90) days of the latest effective date.

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