SFI FOUNDATION INC.

QUALITY ASSURANCE SPECIFICATIONS™

SFI SPECIFICATION 29.3 EFFECTIVE: FEBRUARY 26, 2014*

PRODUCT: Automatic Transmission Flexplates for Diesel Applications

1.0 GENERAL INFORMATION

1.1 This SFI Specification establishes uniform test procedures and minimum standards for evaluating and determining performance capabilities for Automatic Transmission Flexplates for Diesel Applications 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 29.3" 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 Automatic Transmission Flexplates for Diesel Applications that meet or exceed the SFI Specification 29.3 test standards, by complying with the requirements of the SFI Specification 29.3 program, and by signing a licensing agreement with the SFI Foundation, Inc.

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1.5 Compliance with this specification is entirely voluntary. However, when a manufacturer provides Automatic Transmission Flexplates for Diesel Applications in compliance with all requirements of the SFI Specification 29.3 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 Automatic Transmission Flexplates for Diesel Applications are circular plates that mount between the engine crankshaft and the automatic transmission converter. They replace stock units and are used in diesel racing applications.

2.2 Flexplates are also called flywheels in some configurations. For the purposes of this specification, any device used as a flywheel in vehicles with automatic transmissions will be referred to as a flexplate.

2.3 Flexplates shall be inspected every three years by the manufacturer for recertification. When a unit is determined to be acceptable for continued service, a new conformance label marked with the inspection date shall be used.

2.4 Any Flexplate pertaining to this specification shall remain as constructed by the original manufacturer and not modified.

2.5 A Certification Card is a document provided by the original manufacturer indicating the serial number(s) of components certified by the original manufacturer as being in conformance with this specification.

3.0 CONSTRUCTION

3.1 NON-ACCEPTABLE MATERIALS

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Metallurgical material tests relative to mechanical and physical properties of Automatic Transmission Flexplates manufactured from cast (gray) iron, sand, die or permanent mold castings of aluminum, stamped steel or magnesium forgings indicate marginal performance for diesel applications and are not acceptable. Powder-coating of Automatic Transmission Flexplates for Diesel Applications is not acceptable.

3.2 ACCEPTABLE MATERIALS

Automatic Transmission Flexplates for Diesel Applications manufactured from mild and cold finished steel; wrought aluminum; and titanium appear adequate for diesel racing use provided that they exhibit acceptable mechanical properties. As new technology is developed, it will be considered for inclusion.

4.0 MODEL CLASSIFICATION

If all other factors remain the same, a dimensional change in outside diameter or mounting bolt patterns is not considered a model change. A reduction in counterweight mass or removal of a counterweight from a certified model is not considered a model change.

5.0 TESTING

Test samples shall be fully processed new flexplates which are representative of flexplates currently produced or to be produced.

5.1 MECHANICAL PROPERTIES

5.1.1 SAMPLES

Test bars used in determining mechanical properties shall be machined from finished products. Use of standard test bars of a like material is not acceptable.

5.1.2 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 Bureau of Standards.

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5.1.3 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.

5.1.4 INTERPRET RESULTS

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

5.2 ROTATIONAL INTEGRITY

5.2.1 SAMPLES

For a given model, the largest outside diameter with the smallest crankshaft mounting bolt pattern and greatest counterweight mass shall be tested.

5.2.2 APPARATUS

The test fixture shall provide an environment similar to the rear portion of an engine block. A suitable containment chamber shall be used to protect test personnel. It shall incorporate the following features:

A. A tachometer with an accuracy of ±2% at 9,000 revolutions per minute {rpm}.

B. A spindle that can be driven to a rotational speed of 9,000 rpm or greater and allow attachment of the tachometer. The spindle shall accept the flexplate in a manner similar to actual use and allow it to be attached rigidly and concentrically.

5.2.3 PROCEDURE

A. Mount the flexplate to the spindle and attach the tachometer.

B. The flexplate shall be driven to a rotational speed of 9,000 rpm and maintained at that level for one hour.

5.2.4 INSPECTION

Upon completion of the test, the flexplate shall be examined for signs of failure, such as cracks, by either Fluorescent Dye Penetrant Inspection or

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Magnetic Particle Inspection. Particular attention shall be directed to the weld(s) used to hold the starter ring gear.

6.0 PROOF OF COMPLIANCE

Automatic Transmission Flexplate for Diesel Application 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 MECHANICAL PROPERTIES

For the material used, the product shall have mechanical properties in accordance with minimums listed in Table 1.

Table 1

Material	Minimum Yield Strength psi (kg/cm^2)	Minimum Tensile Strength psi (kg/cm^2)	Minimum Percent Elongation
Mild and Cold Finished Steel	45,000 (3,163)	82,000 (5,765)	16
Wrought Aluminum	35,000 (2,461)	42,000 (2,953)	8
Titanium / Ti-6AL 4V (example)	125,000 (8,788)	135,000 (9,491)	10

6.1.2 ROTATIONAL INTEGRITY

The test shall be considered successful when the product does not fail during the rotational test and post inspection does not reveal signs of failure or weld discontinuities.

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:

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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 29.3 Program, the manufacturer must submit to SFI all information delineated in the Proof of Compliance section. This information shall be provided for each Automatic Transmission Flexplate for Diesel Applications 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.

Note: A model certification is based on a successful rotational integrity test of a flexplate with the largest diameter and smallest crankshaft mounting bolt pattern. A flexplate variation shall not be considered certified under this model if it is later produced with a larger diameter , a smaller crankshaft mounting bolt pattern, addition of counterweight or increase in counterweight mass unless it is also successfully tested.

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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 Automatic Transmission Flexplates for Diesel Applications 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 Automatic Transmission Flexplates for Diesel Applications for sale with the representation that their product meets the SFI Specification 29.3. 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 Flexplate. Holes (1/8" (3.2mm) diameter) shall be punched in each sticker indicating the month and year the Flexplate is manufactured / recertified. Alternately, the conformance label may be placed on a certification card. Besides placing the label on the part or certification card, the serial number of the label along with the date shall be permanently marked on the Flexplate. The permanently marked number should be on the transmission side, adjacent to the ring gear. For periodic inspection, the old label shall be removed and the foregoing procedure shall be followed using a new label. 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.

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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 29.3" 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 29.3, Automatic Transmission Flexplate for Diesel Applications, Program, must demonstrate full compliance with the requirements of this specification within ninety (90) days of the latest effective date.

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