



Tripoli Rocketry Association
Tripoli Motor Testing Policies and
Procedures

Tripoli Rocketry Association, Inc.
Tripoli Motor Testing Committee (TMT)

Testing Policies

1. Introduction

- 1.1. The Tripoli Motor Testing Committee (TMT) is a service division of the Tripoli Rocketry Association, Inc. (TRA).
- 1.2. The primary duty of the TMT Committee is certification testing of commercially manufactured rocket motors in accordance with NFPA 1125 Chapter 8. Data collected during the certification process shall be processed, and distributed for the benefit of Tripoli membership.

2. Organization

- 2.1. The TMT Committee is made up of volunteers who are accountable to the TMT CHAIR. The TMT CHAIR is accountable to the TRA Board of Directors (BoD).
- 2.2. The BoD authorizes the TMT CHAIR to make decisions regarding all phases of motor testing, including the interpretation and development of these policies and procedures, and adjustment of rulings in situations where such may arise.
- 2.3. All correspondence concerning motor testing, classification, eligibility, requirements, and all questions regarding motor testing should be addressed to TMT. As of September, 2019, the mailing address for the TMT Committee is 223 NC Highway 54 West, Chapel Hill, NC, 27516.
- 2.4. The policies and procedures noted herein are intended to supplement NFPA 1125. *Code for the Manufacture of Model Rocket and High Power Rocket Motors*. Where a contradiction may appear to exist between these policies and NFPA 1125, the current version of NFPA 1125 shall supersede TMT policy.
- 2.5. The policies and procedures noted herein are in effect at the time of approval by the TRA BoD. These policies and procedures are subject to change without notice. Changes shall be posted on the Tripoli website as soon as possible.

3. Responsibilities

- 3.1. TMT volunteers shall maintain and operate test stands and recording equipment necessary for testing any commercial solid propellant or hybrid motor included in the impulse range 'A' through 'O'. TMT will provide test fixtures capable of accommodating standard diameter motors of cylindrical configuration and equipped with or without delay elements and ejection charges. The diameters currently considered industry standard are 13, 18, 24, 29, 38, 54, 75, and 98mm.

- 3.2. The TMT CHAIR may designate multiple test sites for testing rocket motors based on need.
- 3.3. TMT shall make every effort to perform its duties promptly.
- 3.4. TMT shall publish its acquired data in a form usable by the TRA membership to better understand and select the proper motor(s) for their application(s). Only those motors appearing on the combined lists of motors certified by TRA, NAR and CAR may be used at launches sanctioned by those organizations (with the exception of TRA Research Launches).

4. Definitions

- 4.1. Adjustable Delay Motor: A motor type that employs a delay intended to be user-adjustable for time.
- 4.2. Catastrophic failure (CATO): Any failure of the motor case including but not limited to: visually apparent bulging or splitting of the motor case; ejection of nozzle or forward bulkhead or propellant grain(s); or any other failure after which the hardware is no longer usable.
- 4.3. Certification: The process by which a commercial motor is tested by TMT or another recognized motor testing organization and found to be in compliance with the requirements defined in Chapter 8 of NFPA 1125.
- 4.4. Commercial Manufacturer: [NFPA 1125 3.3.7 Any individual, firm, partnership, joint venture, corporation or other business entity formally recognized by the TMT CHAIR as engaged in research, production, preparation, testing, maintenance, or supply of rockets, rocket motors, rocket propellant chemicals, rocket propellant, delay or ejection modules, or rocket components or parts.]
- 4.5. Cross-certification: The process by which reloads produced by one manufacturer are certified for use in hardware produced by another manufacturer.
- 4.6. Decertification: Revocation of certification by the motor testing organization which originally certified it or by of at least two of the three certification organizations recognized by Tripoli Rocketry Association: (TMT, NAR S&T, or CAR/ACF MC²).
- 4.7. Disposable rocket motor: A rocket motor designed to be discarded in its entirety after use; also known as a single-use motor.
- 4.8. Ground support equipment (GSE) for hybrid rocket motors: Apparatus apart from the motor that is necessary for proper operation of a rocket powered by a hybrid rocket motor. Includes the apparatus for filling the oxidizer tank.
- 4.9. High Power Rocket Motor: [From NFPA 1125 3.3.24.2 A rocket motor that has between 160 (36 lb-sec) and 40,960 N-sec (9209 lb-sec) of total impulse, and that does not otherwise meet all the requirements for a model rocket motor set forth in this code.]

- 4.10. Manufacturers' Cross Certification: Any manufacturer's reload offered to be specifically used in another manufacturer's reloadable hardware, or one manufacturer's hardware being offered to be used with another manufacturer's reload.
- 4.11. MESS: Malfunctioning Engine Statistical Survey. A website dedicated to collecting and publicly sharing user reports of rocket motor problems for use by the motor testing organizations, manufacturers, and end users.
- 4.12. Model Rocket Motor: [NFPA 1125 3.3.24.4 A solid-propellant rocket motor that has a total impulse of no greater than 160 N-sec (36 lb-sec), an average thrust of no greater than 80 N (18 lbf), and that otherwise meets the other requirements set forth in this code.]
- 4.13. Motor test firing: Instrumented and recorded motor test for determination of certification, in which thrust, burn time, total impulse, delay time (if applicable) and casing temperature of the motors are measured.
- 4.14. Motor type: Designates a subset of motors having the: same total impulse and average thrust designation (letter-number classification); same propellant formulation; same casing material; same nozzle type and size; same propellant geometry. For example, two motors both classified by the manufacturer as "J200" but with different propellant formulations are two distinct motor types. Two motors that differ only in delay time are considered the same motor type.
- 4.15. Reload: A module containing propellant or fuel units (grains), and which may contain other components such as O-rings, liners, nozzle components, etc., which Reload is designed to accompany reloadable rocket motor hardware for reuse as a reloadable rocket motor.
- 4.16. Reloadable rocket motor: A rocket motor designed to accept a Reload such that the motor casing or oxidizer tank may be re-used, with said Reload installed. This definition includes motor casings that are designed for limited reusability.
- 4.17. Reloadable rocket motor hardware: Components of a reloadable rocket motor that are designed by the manufacturer to be re-used, such as the casing, forward closure, reusable nozzle, etc.
- 4.18. TMT: Tripoli Motor Testing. As used within this document TMT refers collectively to the Chairman of the Tripoli Motor Testing Committee and the volunteers who help.
- 4.19. TMT CHAIR: Chairman of the Tripoli Motor Testing Committee
- 4.20. TMT Volunteers: Personnel selected by the TMT CHAIR to assist with test equipment design and construction, motor testing, data analysis, and publication of the test results.

5. Commercial Manufacturers

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Revised January 6, 2020

- 5.1. The TRA BoD has authorized TMT to recognize entities as Commercial Manufacturers in accordance with NFPA 1125 8.2.1.
- 5.2. A party may apply to TMT for recognition as a Commercial Manufacturer. An application shall consist of a cover letter requesting recognition of the individual/company/other party as a commercial motor manufacturer, plus all required documents as described here to be submitted by hand or by mail to the TMT CHAIR.
- 5.3. Applications shall be made by submitting copies of at least three of the following: (1) Business license; (2) D/B/A or partnership filings; (3) Certificate of Incorporation filing receipt; (4) Relevant permit/license granted to the company or party in question by a government agency; (5) Company's Certificate of Authority/Sales Tax Certificate; (6) Company's business telephone listing in white or yellow pages; (7) First and last pages of a commercial release relevant to the application; (8) Company catalog; (9) Recent company advertisement in a regularly-published periodical; (10) Commercial web site/Store URL.
- 5.4. The applicant will submit a current list of all applicable points of contact for matters regarding certification and testing. If the manufacturing endeavor is a sole proprietorship, this requirement is waived.
- 5.5. Prior to submission of motors for testing, the applicant shall submit to the TMT CHAIR a signed *TMT Agreement for Motor Testing Certification*, wherein the applicant accepts the requirements of the most current TMT Motor Testing Manual and agrees to make good any and all damages that occur during testing of the applicant's motors, regardless of the reason(s) for damages. A .pdf of this document can be downloaded from the TMT page on the Tripoli website (www.tripoli.org/tmt).
- 5.6. Only motors submitted by a Commercial Manufacturer or by a duly authorized agent of that manufacturer shall be accepted for testing. Motors submitted by any other parties shall not be tested or certified.
- 5.7. Motors submitted to TMT for testing must be fully developed and ready for commercial release, lacking only certification in order to be sold. TMT is not an extension of or a substitute for a manufacturer's dedicated test facilities.
- 5.8. Motors must be clearly labeled as TEST SAMPLES and must not include wording representing certification where none exists.
- 5.9. When a manufacturer ceases operations, any hardware currently in possession of TMT will be returned at the expense of the manufacturer, if requested of the TMT CHAIR.
- 5.10. When a manufacturer transfers manufacturing operations to a different company that is not recognized by TMT as a Commercial Manufacturer, the new company must apply for recognition as a Commercial Manufacturer and be recognized by TMT before representing any products as Certified by TMT.

- 5.11. When manufacturing operations have been transferred to a different company, the TMT CHAIR may require the different company to submit representative samples of newly manufactured motors or otherwise demonstrate a continuation of its capabilities before allowing the previous TMT Certifications to remain in effect.

6. Submittals

- 6.1. All rocket motors, Reloads, reloadable rocket motor hardware whether hybrid or solid propellant, specialized or proprietary ground support equipment, complete printed instructions, igniters, preheater grains, and other consumables shall be supplied by the manufacturer. The manufacturer may also be responsible to sponsor or provide specialized test stands for motors which exceed current capability of TMT equipment.
- 6.2. The TMT facility shall maintain and utilize reasonable sets of test equipment such as test stands, load cells, electronics for data capture, computer, and similar necessities for motor testing.
- 6.2.1. The TMT CHAIR may approve third-party test equipment from a manufacturer, educational institution, government agency, etc. for use in a particular test session or series of test sessions, with the provision that the third-party equipment shall be calibrated and tested and found to provide results that are sufficiently accurate per the normal expectations of TMT.
- 6.3. Model Rocket Motors and Reloads, Fees and Quantities for Submission
- 6.3.1. Manufacturers wishing to certify model rocket motors (≤ 160 N.s) with non-adjustable delays shall submit at least three motors of each delay time, and at least 10 total motors of that type.
- 6.3.2. Manufacturers wishing to certify model rocket motors with user-adjustable delays shall submit at least ten (10) total motors of that type. At least 3 will be tested at the maximum delay time, at least 3 will be tested at the minimum delay time, and the remainder will be tested at some intermediate delay time.
- 6.3.3. These numbers apply equally to single-use and reloadable motors.
- 6.3.4. The fees for certification of model rocket motors are \$25 US for single-use motors and \$30 US for reloadable motors, payable directly to the Treasurer of TRA, in advance.
- 6.3.5. The quantities for submission and the fees for retesting are the same as for initial certification.

6.4. High Power Rocket Motors and Reloads, Fees and Quantities for Submission

Impulse	Quantity		Fee	
	User Adjustable Delay	Non-adjustable Delay	Single Use	Reloadable
Model Rocket: Impulse <= 160 Ns	10 of longest delay	3 each delay, at least 10	\$25	\$30
High Power: 160 Ns < Impulse <= 5120Ns	3 of longest delay	1 each delay, at least 3	\$45	\$50
High Power: Impulse > 5120Ns	NA	2	\$45	\$50

6.4.1. Quantities for Motors Between 160 and 5120 N.s Total Impulse (H- through L-class)

- 6.4.1.1. Manufacturers wishing to certify high power rocket motors with non-adjustable delays shall submit at least one (1) motor at each delay time, and at least three (3) total motors of that type.
- 6.4.1.2. Manufacturers wishing to certify high power rocket motors with user-adjustable delays shall submit at least 3 total motors, 1 will be tested at the minimum delay time, one will be tested at the maximum delay time, and at least one will be tested at some intermediate time.
- 6.4.1.3. Manufacturers wishing to certify high power motors without delay elements (“plugged” motors) shall submit at least three (3) total motors of that type.
- 6.4.1.4. These numbers apply equally to single-use and reloadable motors.
- 6.4.1.5. The fees for certification of high power rocket motors are \$45 US for single use motors and \$50 US for reloadable motors, payable directly to the Treasurer of TRA, in advance.
- 6.4.1.6. The quantities for submission and the fees for re-testing are the same as for initial certification.

6.4.2. Quantities for Motors Over 5120 N.s Total Impulse (Above L-class)

- 6.4.2.1. Manufacturers wishing to certify single-use or reloadable high power rocket motors above L-class shall submit at least two (2) motors/Reloads. The fees for testing motors over 5120 N.s are the same as for other high power motors, and vary according to whether they are single-use or reloadable.

- 6.5. Cross-certifications: All of the requirements for cross-certification of reloads from one manufacturer in the hardware of another manufacturer, including numbers and fees, are, in general, the same as for reloadable motors from individual manufacturers. Parties interested in cross-certifying hardware or reloads should contact TMT in advance, as numbers and fees may vary depending on circumstances and details at the discretion of the TMT Chair.
- 6.6. Reloadable Solid Propellant Motor Hardware
- 6.6.1. Each TMT facility to which reloads are submitted shall be provided with one set of reloadable hardware with an extra set of closures for each motor type submitted for motor testing of reloadable motors. Said hardware shall be retained by the facility for possible future submissions of other reloads for certification and re-certification.
- 6.6.2. For motors that are required, either by the manufacturer or by a federal agency, to be shipped with the Reload contained within a casing or configured ready for use, the casings or other hardware shall be either (a) returned to the manufacturer at the manufacturer's expense, or (b) retained by the TMT facility for further use.
- 6.6.3. If casings, nozzles, or other reusable components become damaged or show wear to a point deemed by the TMT CHAIR to be unsatisfactory for use, replacement components shall be provided by the manufacturer. The original parts in question shall be returned to the manufacturer, upon request, shipping costs collect.
- 6.7. Hybrid Motor Hardware
- 6.7.1. Each TMT facility to which hybrid motors are submitted shall be provided with a complete set of motor hardware.
- 6.7.2. That manufacturer shall supply or cover the cost of additional components or modifications to the standard TMT test stand configuration to accommodate the testing of submitted hybrid motors. Hybrid manufacturers should contact TMT to determine the availability of suitable test equipment.
- 6.7.3. If casings, tanks, or other components become damaged or show wear to a point deemed by the TMT CHAIR to be unsatisfactory for use, replacement components shall be provided by the manufacturer. The original parts in question shall be returned to the manufacturer, shipping costs collect.
- 6.8. If a manufacturer withdraws from retail availability any hardware (hybrid or solid propellant) currently in possession of TMT, then TMT will, upon notification of the Chair of the Committee, return said hardware, shipping costs collect.

7. Submittal Requirements

- 7.1. Motor Performance Data: All motors submitted to TMT for testing shall include the following manufacturer's data: DOT EX Numbers for propellant when required, total

impulse in Newton-seconds, maximum thrust in Newtons, burn time in seconds, and the manufacturer's proposed designation for that motor type.

7.2. Igniters

7.2.1. The manufacturer should provide a suitable and properly constructed igniter for each motor submitted for testing. If the supplied igniters are type specific, they shall be identified as the motor with which it is to be used.

7.2.2. In lieu of supplying an igniter, the manufacturer may specify a standard igniter/ignition system (e.g. John Doe brand electric match, model A). In such cases the manufacturer shall either (a) order the third party igniter/ignition system for delivery to TMT, or (b) pay a fee to TMT for purchase of said igniter/ignition system. The fee for (b) shall be determined by TMT.

7.2.2.1. If the manufacturer has not complied with 7.2.1 and 7.2.2, the TMT CHAIR may choose to select an igniter or ignition method that, in the opinion of the TMT CHAIR, is best suited for the motor/reload at hand. Alternatively, the TMT CHAIR may refuse to test said motor until the manufacturer complies with 7.2.1 and 7.2.2.

7.2.2.2. The ignition method is the sole responsibility of the manufacturer and must be described in the operating instructions for that motor.

7.3. Instruction Documentation

7.3.1. Before a motor can be tested, the manufacturer must have the instructions for preparing the motor finished and substantially ready for release with the motor. The manufacturer shall provide written instructions for each motor type describing assembly, preparation, and operation. All motor preparations will be done following the instructions provided. The certification process tests the manufacturer's instructions as well as the motor's performance. If TMT determines that the instructions are deficient in any way, such as confusing instructions, unsafe procedures, or incorrect in any way, TMT may refuse to test the motor. TMT will notify the manufacturer of the deficiencies and await corrected instructions. TMT will not correct manufacturer instructions or seek work-arounds.

7.4. Right of Refusal

7.4.1. TMT reserves the right to refuse the testing of any motor(s) submitted based on the TMT CHAIR or Volunteers opinion that said motor(s) are unsuitable in any way (i.e. poor instructions, defective materials, case damaged/flawed, propellant voids, poor engineering, etc.), and would be of potential danger to the crew and/or test stand.

7.4.2. If any motor tested by TMT fails to ignite on three (3) consecutive attempts, while using igniters or ignition systems provided by or recommended by the

manufacturer, TMT reserves the right to suspend further testing of motors from that manufacturer until discussion between the TMT CHAIR and the manufacturer has resulted in an effective, mutually agreeable method of motor ignition.

Although TMT Volunteers will attempt to analyze problems with the test procedure or test equipment, TMT is not obligated to troubleshoot defects in motor documentation or design.

8. Motor Data Reduction

- 8.1. Data and thrust curves of all motors tested of a given type will be compared. The number of motors will vary per their class requirement. For each motor type, a graph of all the valid firings will be placed simultaneously on the computer screen.
- 8.2. TMT CHAIR or Volunteers will choose which of the displayed curves most closely approximates a “typical” firing.
- 8.3. The average of each set of pertinent results – total impulse, maximum thrust, average thrust, and burn time – for that motor will be used for the certification document entry.
- 8.4. All motor data shall be kept for record grouped as received. No data will be discarded. The TMT CHAIR is responsible for the security of data.

9. Motor Testing Anomalies

- 9.1. TMT recognizes two basic conditions under which a motor could fail the certification process: A Motor Failure, which will require a new series of certification tests with the appropriate fees for that test, and a Motor Test Difference, which will require discussion between TMT and the manufacturer in an effort to reconcile the differences, and will not necessarily require a complete re-certification process.
 - 9.1.1. A Motor Failure is a:
 - 9.1.1.1. Catastrophic Motor Failure as defined in section 2.2,
 - 9.1.1.2. A complete failure of an ejection charge to operate (when one is present), or
 - 9.1.1.3. External case temperatures during or after firing which exceed the limits established by NFPA 1125 7.4.1.
 - 9.1.2. Motor Test Differences may be of several sorts:
 - 9.1.2.1. Any individual delay element is timed outside the requirements set forth in NFPA 1125, section 8.2.1(1)(b).
 - 9.1.2.2. The measured average total thrust figures show a standard deviation equal to or greater than 6.7% of the mean. The exception to this requirement would be if a motor tests with a total thrust that would place it in a different letter designation than the manufacturer’s label, regardless of the magnitude of this difference. In this case the motor must be re-labeled or redesigned (and re-certified) to insure that it is within the label specification.

- 9.1.2.3. The labeled average thrust value is not within 20% (or 10 N, whichever is greater) of the measured mean of all average thrust values.
- 9.1.2.4. Non-compliance of the packaging, marking, and instructions with any of the requirements in NFPA 1125 7.12 – 7.14.
- 9.1.2.5. Reconciliation of any Motor Test Difference may include resubmission, redesign, or acceptance of TMT results for the labeling of that specific motor.

10. Conditions of Certification

10.1. Scope of Certification

- 10.1.1. Motor certifications are available for commercially manufactured motors only. Consumer use is allowed by that certification.

10.2. Term of Certification

- 10.2.1. Motor certifications shall be certified for five years.

10.3. Manufacturer Responsibility

- 10.3.1. During the five year certification period, manufacturers shall report to the TMT CHAIR changes in:
 - 10.3.1.1. instructions (not including minor format changes or corrections of typographical or spelling errors),
 - 10.3.1.2. assembly methods,
 - 10.3.1.3. formulation, or
 - 10.3.1.4. motor design which exceed manufacturing tolerances.
- 10.3.2. The TMT CHAIR may approve the changes.
- 10.3.3. If the changes potentially affect characteristics measured during the original certification testing, the TMT CHAIR may request additional information or review manufacturer's test data.
- 10.3.4. The TMT CHAIR is authorized to order retesting.

10.4. Certification Status

- 10.4.1. Once certified, motors will have the following status:
 - 10.4.1.1. Certified – Characteristics meet NFPA 1125 requirements. Approved for manufacture, sale, and use.
 - 10.4.1.2. Expired – Characteristics meet NFPA 1125 requirements. Existing stocks are certified for sale and use but new motors may not be manufactured.
 - 10.4.1.3. Decertified – May not be manufactured, sold, or used.

10.5. Certification Review

- 10.5.1. At any time during the certification period the TMT CHAIR may request internal quality control data from the manufacturer, discuss with the manufacturer any redesign or reformulation that may have taken place after the previous

certification, examine the MESS data for that motor, conduct spot checks, or consider other information.

10.5.2. Based on the review process, the TMT CHAIR may take the following actions:

10.5.2.1. At the end of the current certification period the TMT CHAIR may:

10.5.2.1.1. Extend the certification for another five years, or

10.5.2.1.2. Allow the certification to expire. (See 10.6)

10.5.2.2. At any time, the TMT CHAIR may require one or more of the following actions:

10.5.2.2.1. Require physical examination,

10.5.2.2.2. Require retesting,

10.5.2.2.3. Require additional information, or

10.5.2.2.4. Decertify the motor. (See 10.7).

10.6. **Expired Certification Motors**

10.6.1. If a manufacturer ceases production or becomes unresponsive, certification of its entire line of motors shall expire.

10.6.2. If the manufacturer has withdrawn a motor from production that motor's certification shall expire.

10.6.3. Motors with an Expired certification may be used at commercial launches until existing stock is depleted.

10.6.4. Retesting shall be required to return a motor with an Expired certification to Certified status.

10.7. **Decertified Motors**

10.7.1. At the sole discretion of the TMT CHAIR, certified motors which do not comply with NFPA 1125 requirements or otherwise pose a safety risk may be Decertified.

10.7.2. If the manufacturer violates federal or state law or TRA's motor manufacture policies as listed in Section 3, all of that manufacturer's motors shall be Decertified and that manufacturer will no longer be considered as a Commercial Manufacturer by Tripoli.

10.7.3. Decertified Motors are not permitted at any TRA sanctioned launch, either Commercial or Research.

11. **Financial Responsibilities for Testing, Physical Examination, or Retesting**

11.1. All expenses to submit motors for initial certification testing shall borne by the manufacturer.

11.2. At the discretion of the TMT Chair, motors selected for examination or retesting shall obtained in one of four ways:

11.2.1. They may be requisitioned from a vendor at no cost to TMT. If they are requisitioned from a vendor, the motor manufacturer shall fully reimburse the vendor.

11.2.2. They may be purchased from a vendor by TMT. If they are purchased by TMT the manufacturer shall reimburse TMT for the full price paid, to include shipping, hazmat, and taxes, before test results will be released.

11.2.3. They may be provided directly to TMT by the manufacturer, or

11.2.4. They may be donated by a Tripoli member. If donated, no reimbursement shall be made or expected.

11.3. Retested motors that undergo catastrophic failure may be Decertified.

Decertified motors are not eligible for resubmittal unless the design is reviewed and possibly modified to prevent a recurrence of the catastrophic failure.

11.3.1. If a manufacturer submits a redesign of a motor that was Decertified under the previous paragraph, that motor will be treated as a new submittal and shall be applicable to new submission requirements.

11.4. If a manufacturer is non-responsive to requests for reimbursement, motor testing data, or manufacturing permit status, the TMT CHAIR may revoke Certified Manufacturer status and Revoke Certification or even Decertify that manufacturer's motors.

12. Response Time Frames

12.1. Motor Test Schedule

12.1.1. By email, TMT will notify the manufacturer of the successful arrival of shipments at the testing facility.

12.1.2. Typically, there will be a thirty (30) day cycle on actual firing of motors. Delays due to weather or testing site restrictions are possible in all testing. TMT will strive to minimize this testing cycle, with notifications of each delay to the manufacturer.

12.1.3. Final data reduction will be as soon as possible after firing, but not to exceed two (2) weeks. This data will be submitted to the manufacturer immediately after completion.

12.1.4. The manufacturer will be the first to receive the final data reduction results. This will include a thrust time curve for each motor fired. Once the data of the motors of a given type are integrated into a 'composite curve,' this will also be provided to the manufacturer (and they are free to use this 'composite curve' in their advertising literature, if the manufacturer so chooses).

12.1.5. Once the motor specifications are coordinated with the manufacturer, the motors will be posted to all of the applicable parties. See next section **Official Listings**.

13. Official Listings

13.1. TMT will provide data to an external repository which will be curated by NAR, CAR, and TRA. This repository will be the official "Combined Motor List." The Combined

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Motor List shall be considered the most current source and will supersede other listings.

- 13.2. At its convenience, TMT may also provide motor certification data to web-sites such as www.thrustcurve.org and The Rocketry Forum.