High Power Rocketry Certification

Level 1

Level 1 Certification allows flyers to fly High Power Rockets with a total installed impulse up to 640 n-sec.

Airframe – The rocket must be built by the flyer. The rocket shall have a display on the exterior identifying the calculated center of pressure. The rocket must be of "conventional rocket design". "Odd Rockets" including flying pyramids, saucers and flying spools will not be allowed for any certification flight. The rocket may be either a kit or scratch built. Scratch built rockets may contain commercially built components.

Recovery - Standard parachute recovery is required. Non-parachute recovery methods (e.g. tumble, helicopter, gliding, etc) are not permitted for certification flights. If the rocket is using dual deployment, the first event recovery may be via drogue-less or streamer as long as the main or second event uses a standard parachute.

Motor – The certification flight must be with a single certified H or I motor (tested total impulse between 160.01 and 640.00 n-sec). Staged and/or Clustered rockets may not be used for certification flights. The flyer shall be observed by the certifying member or their designated representative during the assembly (if a reload or hybrid) and preparation of the motor.

Electronics – Electronics are not required for level 1 certification flights.

Certification Flight – Level 1 Certification flight may take place at any insured launch. The certifying member (i.e. Prefect, TRA Director, or TAP Member) must be present and witness the certification flight. The certifying member must witness the rocket ascend in a stable manner and descend in stabilized manner controlled by the recovery system.

Post-Flight Inspection – The rocket must be presented to the certifying member for inspection. If the rocket cannot be recovered, but can be inspected in place (power lines, tree, etc…) this is acceptable. The certifying member shall inspect the rocket for excessive damage. Excessive damage shall be considered damage to the point that if the flyer were handed another motor, the rocket could not be put on the pad and flown again safely. Damage caused by wind dragging will not cause a disqualification.

Non-certification – Any of the following will result in non-certification for a certification flight:

Motor Cato
Excessive Damage
No recovery system deployment or tangled recovery system deployment
Rocket drifting outside the specified launch range
Components coming down not attached to the recovery system.
Any other violation of TRA safety code associated with this particular flight.
Any other legitimate reason the certifying member deems merits non-certification.

Level 2

Level 2 Certification allows flyers to fly High Power Rockets with a total installed impulse between 640.01 and 5120.00 n-sec.

Written Test – The written examination for level 2 shall be passed prior to a level 2 certification flight.

Airframe – The rocket must be built by the flyer. The rocket shall have a display on the exterior identifying the calculated center of pressure. The rocket must be of "conventional rocket design". "Odd Rockets" including flying pyramids, saucers and flying spools will not be allowed for any certification flight. The rocket may be either a kit or scratch built. Scratch built rockets may contain commercially built components.

Recovery - Standard parachute recovery is required. Non-parachute recovery methods (e.g. tumble, helicopter, gliding, etc) are not permitted for certification flights. If the rocket is using dual deployment, the first event recovery may be via drogue-less or streamer as long as the main or second event uses a standard parachute.

Motor – The certification flight must be with a single certified J, K, or L motor (tested total impulse between 640.01 and 5120.00 n-secs). Staged and/or Clustered rockets may not be used for certification flights. The flyer shall be observed by the certifying member or their designated representative during the assembly (if a reload or hybrid) and preparation of the motor.

Electronics – Electronics are not required for level 2 certification flights. However, prior to attempting level 3 certification, the flyer shall successfully fly at least one rocket in the Level 2 impulse range using an electronic device as the primary means of recovery system deployment. This may be their level 2 certification flight or any subsequent flight.

Certification Flight – Level 2 Certification flight may take place at any insured launch. The certifying member (i.e. Prefect, TRA Director, or TAP Member) must be present and witness the certification flight. The certifying member must witness the rocket ascend in a stable manner and descend in stabilized manner controlled by the recovery system.

Post-Flight Inspection – The rocket must be presented to the certifying member for inspection. If the rocket cannot be recovered, but can be inspected in place (power lines, tree, etc…) this is acceptable. The certifying member shall inspect the rocket for excessive damage. Excessive damage shall be considered damage to the point that if the flyer were handed another motor, the rocket could not be put on the pad and flown again safely. Damage caused by wind dragging will not cause a disqualification.

Non-certification – Any of the following will result in non-certification for a certification flight:

Motor Cato
Excessive Damage
No recovery system deployment or tangled recovery system deployment
Rocket drifting outside the specified launch range
Components coming down not attached to the recovery system.
Any other violation of TRA safety code associated with this particular flight.
Any other legitimate reason the certifying member deems merits non-certification.

Level 3

Level 3 Certification allows flyers to fly High Power Rockets with a total installed impulse greater than 5120 n-sec.

Airframe – The rocket must be built by the flyer. The rocket shall have a display on the exterior identifying the calculated center of pressure. The rocket must be of "conventional rocket design". "Odd Rockets" including flying pyramids, saucers and flying spools will not be allowed for any certification flight. The rocket may be either a kit or scratch built. Scratch built rockets may contain commercially built components. Commercially available pre-fabricated fin cans, either as part of a kit or obtained separately, may not be used for level 3 certification flights.

Construction Inspections - TRA members designing or preparing to fly a level 3 project must present details of their design to 2 TAP members of their choice. BEFORE attempting a level 3 flight, 2 TAP members must have signed off on the member's certification form. It is best if this TAP review is performed before the day of the launch to allow adjustments to the rocket design if deemed necessary by either of the 2 TAP reviewers. TAP members should be kept informed of any changes during construction. In general, the TAP member for objectively assessing the rocket will need the following information:

A completely filled out Pre-Flight Data Capture form
Drawings of the rocket showing airframe components, fins, bulkheads, recovery system components, payloads, etc…
A parts listing that includes material descriptions, adhesive types, screw sizes gauges, thicknesses, etc…
A simplified wiring diagram of the electronic recovery system that shows the major components
Pre-flight checklist describing: field assembly of the rocket, motor installation, recovery system preparation, launcher installation, system arming, etc.
These items should be neatly drawn, and, if possible, lists typed. The primary preparation criteria are those drawings and lists are neat and legible. All items will be returned to the submitter if desired. A self-addressed envelope or supply postage funds to assist the TAP member with returns.

Recovery - Standard parachute recovery is required. Non-parachute recovery methods (e.g. tumble, helicopter, gliding, etc) are not permitted for certification flights. If the rocket is using dual deployment, the first event recovery may be via drogue-less or streamer as long as the main or second event uses a standard parachute.

Motor – The certification flight must be with a single certified M or larger motor (tested total impulse greater than 5120.01 n-secs). Staged and/or Clustered rockets may not be used for certification flights. The flyer shall be observed by the TAP member or their designated representative during the assembly (if a reload or hybrid) and preparation of the motor.

Electronics – Prior to a level 3 certification flight, the flyer shall successfully fly at least one rocket in the level 2 range using an electronic device as the primary means of recovery system deployment. Level 3 certification flights shall include at least two completely separate electronic devices, with independent power sources, wire harnesses, and ignition devices for the primary and back-up means of recovery system deployment.

Certification Flight – Level 3 Certification flight may take place at any insured launch. The TAP member must be present and witness the certification flight. The TAP member must witness the rocket ascend in a stable manner and descend in stabilized manner controlled by the recovery system.

Post-Flight Inspection – The rocket must be presented to the certifying member for inspection. If the rocket cannot be recovered, but can be inspected in place (power lines, tree, etc…) this is acceptable. The certifying member shall inspect the rocket for excessive damage. Excessive damage shall be considered damage to the point that if the flyer were handed another motor, the rocket could not be put on the pad and flown again safely. Damage caused by wind dragging will not cause a disqualification.

Non-certification – Any of the following will result in non-certification for a certification flight:

Motor Cato
Excessive Damage
No recovery system deployment or tangled recovery system deployment
Rocket drifting outside the specified launch range
Components coming down not attached to the recovery system.
Any other violation of TRA safety code associated with this particular flight.
Any other legitimate reason the TAP member deems merits non-certification.