



For more information on rocketry in Australia or to contact a local club in your state call 0418 917 410 or email wolflair@live.com.au or visit us on the web at www.australianrocketryclub.com.au to check out the Australian Rocketry Association website or follow the links to the ARA forum.

April 2008 Edition
Model Rocketry Safety Code

1 Materials. My model rocket will be made of balsa, wood, paper or plastics or a combination of those materials, but contains no metal as structural parts.

2 Motors. I will use only certified, commercially made model rocket motors, and will not tamper with these motors or use them for any purposes except those recommended by the manufacturer.

3 Ignition system. I will launch my rockets with an electrical launch system and electrical motor igniters. My launch system will have a safety interlock in series with the launch switch, and will use a launch switch that returns to the "off" position when released.

4 Misfires. If my rocket does not launch when I press the button of my electrical launch system, I will remove the launcher's safety interlock or disconnect its battery, and wait 60 seconds after the last launch attempt before allowing anyone to approach the rocket.

5 Launch safety. I will use a countdown before launch, and will ensure that everyone is paying attention and is a safe distance of at least 5 meters away when I launch rockets with D motors or smaller, and 10 meters when I launch larger rockets. If I am uncertain about the safety or stability of an untested rocket, I will check the stability before flight and will fly it only after warning spectators and clearing them away to a safe distance.

6 Launcher. I will launch my rocket from a launch rod, tower, or rail that is pointed to within 30 degrees of the vertical to ensure that the rocket flies nearly straight up, and I will use a blast deflector to prevent the motors exhaust from hitting the ground. To prevent accidental eye injury, I will place launchers so that the end of the launch rod is above eye level or will cap the end of the rod when it is not in use.

7 Size. My model rocket will not weight more than 1,500 grams at lift off and will not contain more than 125 grams of propellant or 320 n-sec of total impulse. If my model rocket weights more than 500 grams at lift off or produces more than 20 n-sec of total impulse or contains more the 25grams propellant I will check and comply with Civil Aviation Safety Regulations (CASRs) before flying.

8 Flight safety. I will not launch my rocket at targets, into clouds, or in a manner that is hazardous to persons or property, or near airplanes, or in the approach or departure paths of aerodromes or airports, and will not put any flammable or explosive payload in my rocket. **WARNING Large fines apply by CASA for non-compliance.**

9 Launch site. I will launch my rocket outdoors, in an open area at least as large as shown in the accompanying table, and in safe weather conditions with wind speeds no greater than 32 kilometers per hour. I will ensure that there is no dry grass close to the launch pad, and that the launch site does not present risk of grass fires.

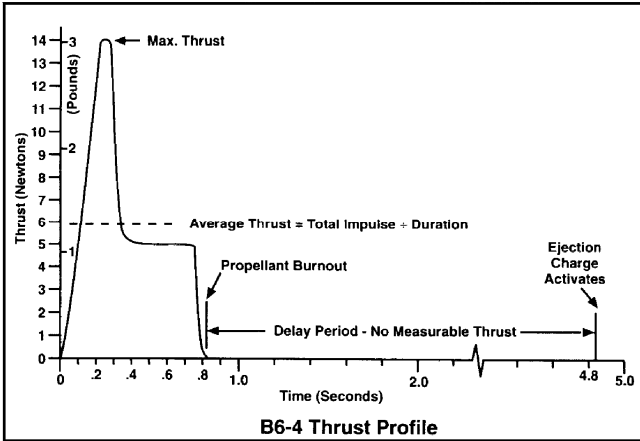
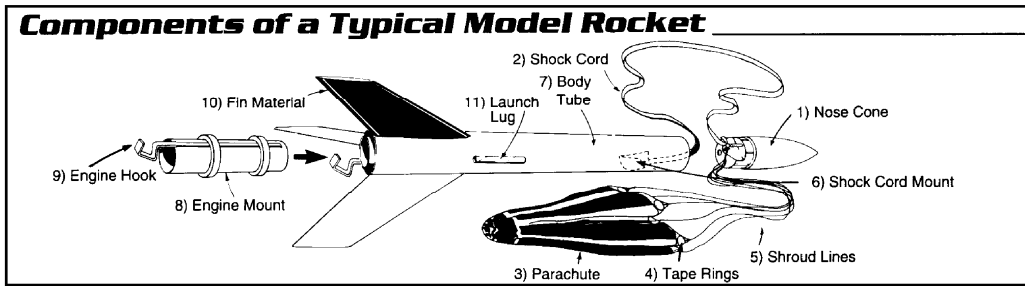
10 recovery system. I will use a recovery system such as a streamer or parachute in my rocket so that it returns safely and undamaged and can be flown again, and I will use only flame-resistant or fireproof recovery system wadding in my rocket.

11 Recovery safety. I will not attempt to recover my rocket from power lines, tall trees, or other dangerous places.

Launch site dimensions

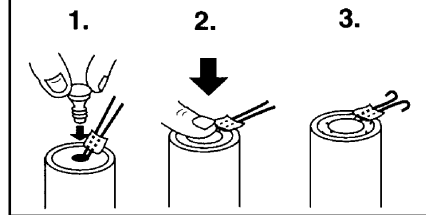
| INSTALLED TOTAL IMPULSE | EQUIVALENT MOTOR TYPE | SITE DIMENSION |
|----------------------------|--------------------------|-------------------|
| (Newton-seconds) | | (Meters) |
| 0-1.25 | 1/4A&1/2A | 15 |
| 1.26-2.50 | A | 30 |
| 2.51-5.00 | B | 60 |
| 5.01-10.00 | C | 120 |
| 10.01-20.00 | D | 150 |
| 20.01-40.00 | E | 300 |
| 40.01-80.00 | F | 300 |
| 80.01-160.00 | G | 300 |
| 160.01-320.00 | 2G | 460 |

ALWAYS USE ALKALINE BATTERIES IN YOUR CONTROLLER



Here's how to use Estes' new igniter plug technology.

Our new brightly colored reusable igniter plugs have virtually eliminated the frustrations and misfires common to other igniter systems.



Coding Systems

Two codes completely describe each Estes rocket engine:

- Color code: Provides at a glance the specific application of the engine:
 - Green - Single Stage
 - Purple - Upper Stage (on Multi-Staged Rockets)
 - Red - Booster Stage
 - Black - Plugged for special applications
- Alpha-numeric code: Provides the engine's performance information.

TOTAL IMPULSE

This letter indicates total impulse (total power in Newton-seconds) produced by the engine. Each succeeding letter has twice the total power as the previous letter. (Example: "B" engines have twice the power of "A" engines, which results in approximately twice the altitude the rocket will reach.)

AVERAGE THRUST

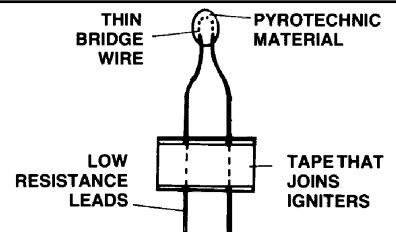
This number shows the engine's average thrust or average push in Newtons. (4.45 Newtons = 1 lb.)

DELAY

This number gives you the time delay in seconds between the end of thrusting and the ejection charge (green and purple labels). It lets you choose the engine with the delay time you want for any flight. Engine types ending in "0" (red label) have no delay or ejection charge and are for use in booster stages only.

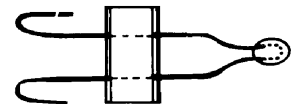


The Estes Igniter



An igniter is a device used to ignite a rocket engine. In model rocketry an igniter element is a strip of resistance wire with or without a coating of pyrotechnic material on it. In the system it performs like a resistor in an electrical circuit. As electricity passes through micro-clips connected to the igniter, the igniter begins to glow and give off heat. If there is a pyrotechnic material coating the wire, it is ignited, and is the last step in the ignition. Igniters must be installed so that the coatings or wire itself is touching the dark-colored propellant grain. If the igniter is not touching the grain, this could cause a misfire. Heat created by the igniter is not great enough to cross a gap between the igniter and propellant grain -- there must be direct contact between the igniter and the propellant.

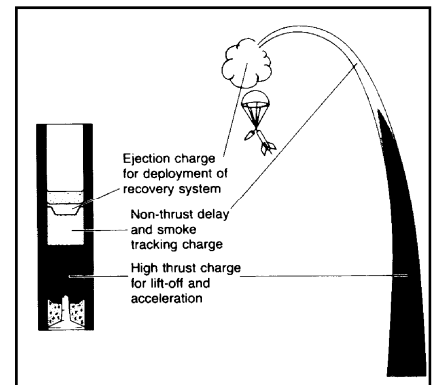
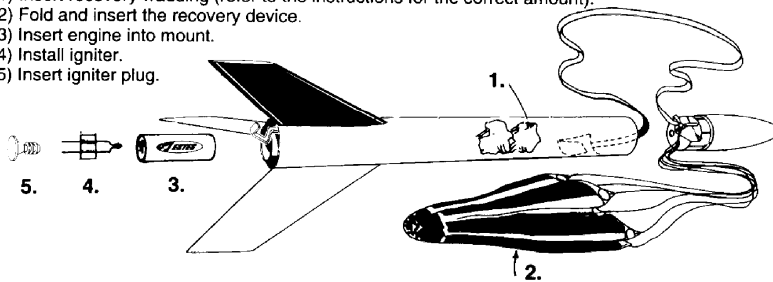
First, separate the igniter you are going to use from the other igniters by tearing or cutting the paper between any two igniters. **Do not remove the paper from the igniter** as this may result in cracking the pyrotechnic coating. Now take the igniter and push it all the way into the nozzle of the engine, **making sure that the igniter is touching the propellant grain**. For some engines you may have to push the igniter a long way down, as when using a B8 type engine, so push down gently until the igniter will go no further. Make certain that the igniter's leads are not crossed. If the leads are crossed, this can cause a "short" in your launch system and thus a misfire. Place the igniter plug in the nozzle of the engine and press down firmly. Bend the igniter leads as shown below.



Rocket Preflight Preparation

Once your rocket is complete, follow this simple sequence to ready it for flight:

- 1) Insert recovery wadding (refer to the instructions for the correct amount).
- 2) Fold and insert the recovery device.
- 3) Insert engine into mount.
- 4) Install igniter.
- 5) Insert igniter plug.



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