Chapter 2. Case Assembly

**Assembly and Operation Instructions**

**HIGH-POWER RMS-PLUS**

**Chapter 2. Case Assembly**

**DO NOT OPEN RELOAD KIT UNTIL READY TO USE.**

**PARTS:**

**RMS™ HARDWARE**

- 29mm Std. or Enlarged Aft Closure 1
- 29/180 Case (G75J) 1
- 29/240 Case (H79J) 1
- 29mm Std. or Plugged Forward Closure 1

**RELOAD KIT**

- Nozzle (black plastic part) 1
- Liner (1” O.D. paper tube) 1
- Propellant grains 3 or 4
- Aft o-ring (1/16” thick × 1” O.D.) 1
- Forward o-ring (3/32” thick × 1” O.D.) 1
- Forward & aft insulators (1” O.D. fiber washers) 2
- Ejection charge cap (adhesive paper disk) 1
- FirstFire™ igniter 1
- Ejection charge container (red plastic cap) 1
- RMS-Plus™ delay element (short solid part) 1
- Delay insulator (13/16” O.D. tube) 1
- Delay o-ring (3/32” thick × 13/16” O.D.) 1
- Aft delay spacer (short colored paper ring) 1
- Forward delay spacer (13/16” O.D. neoprene washer) 1

**ITEMS NEEDED FOR USE:**

- Synco™ Super Lube™ or other grease
- Hobby knife
- Wet wipes or damp paper towels

**Chapter 3. Ejection Charge Installation**

**Chapter 2. Case Assembly**

2-1. Fig.4: Install the propellant grains into the liner. **NOTE:** Two grains are shown in all illustrations for clarity. RMS-29/180 motors use three (3) grains, and RMS-29/240 motors use four (4) grains.

2-2. Fig.5: Push the liner assembly into the motor case until it is approximately equally recessed from both ends of the case. **NOTE:** A light coat of grease on the outside surface of the liner will facilitate installation and casing cleanup after motor firing.

2-3. Fig.6: Place the forward insulator (1” O.D. fiber washer) into one end of the case, seated against the liner assembly.

2-4. Fig.7: Place the greased forward (THICKER 3/32” thick × 1” O.D.) o-ring into the forward insulator end of the case until it is seated against the forward insulator.

2-5. Fig.8: With the motor case held in a horizontal position, thread the previously assembled forward closure assembly into the forward end of the motor case by hand until it is seated against the case.

2-6. Fig.9: Place the aft insulator (1” O.D. fiber washer) into the aft (nozzle) end of the motor case, seated against the liner assembly.

2-7. Fig.10: Insert the larger end of the nozzle into the aft end of the case and against the insulator.

2-8. Fig.11: Place the greased aft (THINNER 1/16” thick × 1” O.D.) o-ring into the aft end of the motor case, seated in the groove between the nozzle and the case.

2-9. Fig.12: Thread the aft (gold) closure into the aft end of the motor case by hand until it is seated against the case. **NOTE:** There will be some resistance to threading in the closure during the last 1/32” to 1/16” of travel. It is normal if the grains rattle slightly inside the liner after tightening.

3-1. Fig.13: Thoroughly clean the outside of the motor of any grease or other residue. Open the ejection charge container (5/8” O.D. red plastic cap) and dispense enough ejection charge into the ejection charge well of the forward closure to fill the well approximately 3/4 full. **NOTE:** For 4” and larger diameter rockets, fill the well completely.
Chapter 3. Ejection Charge Installation (Cont’d)

3-2. Fig.-13: Apply the ejection charge cap (adhesive paper disk) to the center of the end of the forward closure. With the motor held in a NOZZLE DOWN position, gently shake the motor to settle the ejection charge into the cavity above the delay element.

Chapter 4. Preparation For Flight

4-1. Fig.-14: Using a hobby knife, cut a corner off the red ejection charge cap (empty ejection charge container) to create a small (1/16”-1/8”) vent hole. Set the nozzle cap aside.

4-2. Fig.-14: Insert the coated end of the FirstFire™ or other igniter through the nozzle throat until it stops against the delay element or forward insulator.

4-3. Push the vented nozzle cap igniter holder over the igniter lead(s) and nozzle until it stops.

4-4. Install the motor into the rocket’s motor mount tube. Ensure that the motor is securely retained in the rocket by using positive mechanical means to prevent it from being ejected at the time of ejection charge firing.

4-5. Prepare the rocket’s recovery system and then launch the rocket in accordance with the Tripoli Rocketry Association (TRA) Safety Code and National Fire Protection Association (NFPA) Code 1127.

Chapter 5. Post-Recovery Cleanup

NOTE: Perform motor clean-up as soon as possible after motor firing. Propellant and delay residues become difficult to remove after 24 hours and can lead to corrosion of the metal parts. Place the spent motor components in the reload kit plastic bag and dispose of properly.

5-1. After the motor has cooled down, remove the forward and aft closures.

5-2. Remove the delay insulator, delay o-ring and forward delay spacer (neoprene washer) from the forward closure and discard. Remove and discard the nozzle and the forward and aft o-rings. Using wet wipes or damp paper towels, remove all delay and propellant residue from the closures. WARNING: FAILURE TO COMPLETELY REMOVE DELAY RESIDUE FROM THE INSIDE OF THE FORWARD CLOSURE CAN LEAD TO GAS LEAKAGE ON A SUBSEQUENT FLIGHT AND DAMAGE TO YOUR RMS MOTOR FORWARD CLOSURE AND ROCKET VEHICLE.

5-3. Remove the liner from the casing by pushing on either end. Discard the liner and the forward and aft insulators. Using wet wipes or damp paper towels, wipe the inside of the casing to remove all propellant residue.

Chapter 6. First Aid

For a minor burn, apply a burn ointment. For a severe burn, immerse the burned area in ice water at once and see a physician as quickly as possible. In the unlikely event of oral ingestion of the propellant, induce vomiting and see a physician as quickly as possible. The AeroTech/RCS composite propellant consists primarily of ammonium perchlorate and a rubber-like plastic elastomer.

Chapter 7. Disposal

Damaged or defective reload kits should be returned to RCS.

Chapter 8. Fire Safety

Tests show that the pyrotechnic components of RMS™ reload kits will not explode in fires and normally will not ignite unless subjected to direct flame and then will burn slowly. Use water to fight any fires in which AeroTech/RCS RMS™ reload kit pyrotechnic components may become involved. Direct the water at the AeroTech/RCS RMS™ reload kit pyrotechnic components to keep them below their 550 deg. F autoignition temperature. Foam and carbon dioxide fire extinguishers will NOT extinguish burning propellants of the type used in RMS™ reload kit pyrotechnic components. Keep reload kit pyrotechnic components away from flames, sources of heat and flammable materials.

Disclaimer and Warranty

NOTE: As we cannot control the storage and use of our products, once sold we cannot assume any responsibility for product storage, transportation or usage. RCS shall not be held responsible for any personal injury or property damage resulting from the handling, storage or use of our product. The buyer assumes all risks and liabilities therefrom and accepts and uses AeroTech/RCS products on these conditions. No warranty either expressed or implied is made regarding AeroTech/RCS products, except for replacement or repair, at RCS’s option, of those products which are proven to be defective in manufacture within one year from the date of original purchase. For repair or replacement under this warranty, please contact RCS. Proof of purchase will be required. Note: Your state may provide additional rights not covered by this warranty.

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