**READ THIS BEFORE YOU BEGIN:**

- Study the illustrations and sequence of assembly. THE SEQUENCE OF ASSEMBLY IS EXTREMELY IMPORTANT. READE ALL INSTRUCTIONS BEFORE USE. USE RMS™ MOTORS AND RELOAD KITS ONLY IN ACCORDANCE WITH ALL INSTRUCTIONS. Review the parts list and become familiar with all parts before assembly. IF ANY PARTS ARE MISSING OR DAMAGED, CONTACT RCS AT 1-435-865-7100 OR EMAIL AT warranty@aerotech-rockety.com.

- DO NOT USE ANY PARTS OF THE RMS™ SYSTEM THAT ARE DAMAGED IN ANY WAY. If in doubt, contact RCS at the number above for assistance.

- DO NOT MODIFY THE MOTOR IN ANY WAY. Modification of the motor or the reload kit parts could result in motor failure, lead to the destruction of both your rocket and motor and may cause personal injury, death and/or property damage. Modification of the motor or reload kit in any way will invalidate your motor warranty.

- USE ONLY AEROTECH/RCS RMS™ RELOAD KITS AND MOTOR PARTS TO REFURBISH YOUR RMS™ MOTOR. The AeroTech/RCS reload kits have been designed specifically for use in your particular AeroTech/RCS RMS™ motor. Use of imitation components may destroy your motor, rocket and payload and will invalidate your motor warranty. Only use AeroTech/RCS RMS™ reload kits intended for your specific AeroTech/RCS RMS™ motor. DO NOT INTERCHANGE PARTS! Do not use AeroTech/RCS RMS™ reload kits or motor components for any other purpose than to refurbish an AeroTech/RCS RMS™ motor.

- DO NOT REUSE ANY OF THE DISPOSABLE PARTS OF THE RMS™ RELOAD KIT. This includes the liner, nozzle and o-rings. These components have been designed for one use only and must be discarded after firing. Reuse can result in motor failure during subsequent operation and will invalidate your motor warranty.

- Motors are hot after firing. Although the RMS™ operates at a lower temperature than most disposable motors, the higher thermal conductivity of the aluminum motor parts may make it seem otherwise. If necessary to handle a motor before it has cooled down, use a rag or similar article.

- Read and follow the safety code of the Tripoli Rocketry Association (TRA) and comply with all federal, state and local laws in all activities involving high power rockets.

**SAVE THE RELOAD KIT PLASTIC BAG FOR THE USED RELOAD PARTS. DISPOSE OF BAG AND PARTS PROPERLY.**

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**Chapter 1. Forward Closure Assembly**

1-1. Apply a light coat of Synco Super Lube or other grease to all threads and all 4 o-rings. This will facilitate assembly and prevents the threads from seizing.

1-2. **Fig.-1:** Chamfer both inner edges of the smoke charge insulator with your fingernail. Assemble the RMS-Plus smoke charge element, smoke charge insulator, aft smoke charge spacer and smoke charge o-ring as shown. **NOTE:** It is not necessary to tape the smoke charge element or insulator, the hot gas seal is provided by the smoke charge o-ring alone.

1-3. **Fig.-2:** Insert the forward smoke charge spacer (1-1/8” O.D. neoprene washer) into the smoke charge cavity until it is seated against the forward end of the cavity. Apply a light film of grease to the inner circumference of the smoke charge cavity (but not the forward end of the cavity).

1-4. **Fig.-3:** Insert the smoke charge assembly shown in Fig.-1 into the smoke charge cavity, o-ring end first, until it is seated against the forward smoke charge spacer. **NOTES:** When using a plugged forward closure ONLY, fill the opening in the forward smoke charge spacer with grease prior to installing the smoke charge assembly, and install the smoke charge components in this order: Forward smoke charge spacer, smoke charge o-ring, smoke charge element, smoke charge insulator and aft smoke charge spacer.

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**Chapter 2. Case Assembly**

2-1. **Fig.-4:** Place the greased nozzle (1/16” thick X 1” O.D.) o-ring into the nozzle well of the small nozzle aft closure.

2-2. **Fig.-5:** Insert the nozzle into the aft closure and press firmly until it is seated against the nozzle o-ring.

2-3. **Fig.-6:** Insert the propellant grain into the liner.

2-4. **Fig.-7:** Insert the liner assembly into the motor case. **NOTE:** A light coat of grease on the outside surface of the liner will facilitate installation and casing cleanup after motor firing.

2-5. **Fig.-8:** Place the aft insulator (2” O.D. washer) into the motor case until it is seated against the end of the liner.

2-6. **Fig.-9:** Place the greased aft (1/16” thick X 2” O.D.) o-ring into the case, seated against the aft insulator.

2-7. **Fig.-10:** Thread the aft closure assembly into the motor case by hand until about 1/16” gap remains between the case and the closure. **NOTE:** Final tightening will be done after the other motor components are loaded into the case.

2-8. **Fig.-11:** Place the forward insulator (2” O.D. washer) into the motor case until it is seated against the end of the liner.

2-9. **Fig.-12:** Place the greased forward (1/8” thick X 2” O.D. ) o-ring into the case, seated against the forward insulator.

2-10. **Fig.-13:** With the motor case held in a horizontal position, thread the completed forward closure assembly into the open end of the motor case by hand until it is seated against the case.

2-11. Finish tightening the aft closure 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 a slight gap remains between the closure and the case after tightening and the grain rattles slightly inside the liner.
Chapter 4. Preparation For Flight

Install Igniter Against Smoke Charge

Nozzle Throat

Fig.-12

4-1.  Fig.-12: Insert the coated end of a FirstFire™, Firestar™ or other igniter through the center nozzle throat until it stops against the smoke charge element.

4-2.  Secure the igniter to the nozzle with a piece of masking tape.

4-3.  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 during recovery system deployment.

4-4.  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 smoke charge 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, unthread and remove the forward and aft closures.

5-2.  Remove the smoke charge assembly components from the forward closure and discard. Using wet cotton swabs or damp paper towels, remove all smoke charge and propellant residue from the closures. WARNING: FAILURE TO COMPLETELY REMOVE SMOKE CHARGE 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. NOTE: Use of a plugged forward closure will eliminate the possibility of this failure mode.

5-3.  Remove and discard the forward and aft o-rings from the motor case. Remove the liner, forward insulator, nozzle and liner o-rings from the casing by pushing on the nozzle end and discard. Using wet cotton swabs or damp paper towels, wipe the inside of the casing to remove all propellant residue.

5-4.  Apply a light coat of grease to all threads and the inside of the motor case. Reassemble metal parts and store motor in a dry place.

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.

RMS™-54/426 SMALL NOZZLE RELOAD KIT DATA

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<th>Hardware Desig.</th>
<th>Performance Desig.</th>
<th>Total Impulse (Typ.)</th>
<th>Propellant WL</th>
<th>Loaded Motor WL</th>
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<td>410 N-sec</td>
<td>185.8 g (0.409 lb)</td>
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RMS-54/426 HARDWARE DATA

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<th>Motor Length</th>
<th>Hardware Weight</th>
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NOTE: Motor lengths are measured from end of aft closure to end of forward closure.

NOTE: SALE TO PERSONS UNDER 18 YEARS OF AGE PROHIBITED BY FEDERAL LAW. WARNING—FLAMMABLE: Read Instructions Before Use. KEEP OUT OF REACH OF CHILDREN. FOR USE ONLY BY CERTIFIED HIGH-POWER USERS 18 YEARS OF AGE OR OLDER. DO NOT SMOKE when loading these motors or use in the vicinity of open flames.