DO NOT OPEN RELOAD KIT UNTIL READY TO USE.

PARTS:

RM-1™ HARDWARE
29mm aft closure 1
29/40 case 1
29mm std. or plugged forward closure 1
29mm forward seal ring 1

RELOAD KIT
Nozzle (black plastic part) 1
Liner (1” O.D. black plastic tube) 1
Propellant grains 4
Aft o-ring (1/16” thick X 1” O.D.) 1
Forward o-ring (3/32” thick X 1” O.D.) 1
Forward seal ring o-ring (1/8” thick X 7/8” O.D.) 1
Delay o-ring (3/32” thick X 13/16” O.D.) 1
RM-Plus™ delay element (short solid part) 1
Delay insulator (13/16” O.D. tube) 1
Alt insulator (1” O.D. fiber washer) 1
Alt delay spacer (short paper ring) 1
Forward delay spacer (13/16” O.D. neoprene washer) 1
Ejection charge cap (adhesive paper disk) 1
FirstFire™ igniter 1
Ejection charge container (red plastic cap) 1

ITEMS NEEDED FOR USE:

• Sysco™ Super Lube™ or other grease
• Hobby knife or scissors
• Wet wipes or damp paper towels

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

Chapter 1. Forward Closure Assembly

1-1. Apply a light coat of Sysco™ 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. Chamfer both inner edges of the delay insulator with your fingernail. Assemble the RM-Plus delayed element, delay insulator, alt delay spacer, and delay o-ring as shown. NOTE: It is not necessary to tape the delay element or delay insulator, the hot gas seal is provided by the delay o-ring alone.

1-3. Insert the forward delay spacer (13/16” O.D. neoprene washer) into the delay cavity until it is seated against the forward end of the cavity. Apply a light film of grease to the inner circumference of the delay cavity (but not the forward end of the cavity).

1-4. Insert the delay charge assembly shown in Fig. 1 into the delay cavity, o-ring end first, until it is seated against the forward delay spacer. NOTE: When using a plugged forward closure ONLY, fill the opening in the forward delay spacer with grease prior to installing the delay charge assembly.

Chapter 2. Case Assembly

2-1. Fig. 4: Place the greased forward seal ring (1/16” thick X 7/8” O.D.) o-ring into the groove in the forward seal ring.

2-2. Fig. 5: Using a hobby knife or similar tool, gently remove the burr (rough, raised edge) from both inside ends of the liner tube. Insert the smaller (o-ring) end of the seal ring into one end of the liner tube until the seal ring flange is seated against the end of the liner.

2-3. Fig. 6: Install the four (4) propellant grains into the liner.

2-4. Fig. 7: 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.

2-5. Fig. 8: Place the greased forward (THICKER 3/32” thick X 1” O.D.) o-ring into the forward (bulkhead head) end of the case until it is seated against the forward seal ring.

2-6. Fig. 9: 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.

2-7. Fig. 10: Place the alt insulator (THINNER 1” O.D. fiber washer) into the aft (nozzle) end of the motor case, seated against the liner assembly.

2-8. Fig. 11: Insert the larger end of the nozzle into the aft end of the case and against the aft insulator.

2-9. Fig. 12: Place the greased aft (1/16” thick X 1” O.D.) o-ring into the aft end of the motor case, seated in the groove between the nozzle and 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 in the liner after tightening.

2-10. Front closure assembly.

Chapter 3. Ejection Charge Installation

3-1. Fig. 14: 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.-15: 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

1/16”-1/8”

Vent Hole

Nozzle Throat

Install Igniter Against Delay Charge

Nozzle Cap Igniter Holder

Fig.-15

Chapter 4. Preparation For Flight

3-2. Fig.-15: 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

1/16”-1/8”

Vent Hole

Nozzle Throat

Install Igniter Against Delay Charge

Nozzle Cap Igniter Holder

Fig.-15

Typical Time-Thrust Curve:

This package contains one RMS-PLUS™ reload kit:

□ H220T-M (29/240)

NOTE: MEDIUM DELAY CHARGE COMPONENTS INCLUDED. For other delay times, use one of the appropriate AeroTech Reload Delay Kits (RDK’s) for the delay time desired. Please refer to the RDK cross-reference list on back of the reload kit header card for proper RDK selection.

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 from the forward closure and discard.

5-3. Remove the liner from the casing by pushing on either end. Remove the forward seal ring from the liner. Discard the liner and forward seal ring O-ring only. Using wet paper towels, wipe the inside of the casing and the forward seal ring to remove all propellant residue. Do NOT discard the forward seal ring!

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 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

As we cannot control the storage and use of our product, 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.

AeroTech Division
RCS Rocket Motor Components, Inc.
Cedar City, UT 84720
©2006 RCS Rocket Motor Components, Inc., All rights reserved

P/N 20052 Rev. 4/10/06
Made in U.S.A.
www.aerotech-rocketry.com