### Parts

**RMS/HYBRID™ 54/300-900 RELOADABLE HYBRID MOTOR SYSTEM™**

- **RMS/HYBRID™ 54 4 aft closure
- **RMS/HYBRID™ 300 4 jet plug closure with injector plate & jet plugs
- **RMS/HYBRID™ 900 6 jet plug closures with injector plate

**RMS/HYBRID™ RELOADABLE HYBRID MOTOR SYSTEM™ ASSEMBLY REQUIREMENTS**

- Pyrovale™ retainer key wrench (3/8”)
- Injector plate plug (1-1/16” o.d. black plastic)
- N200 cylinder fitting adapter & transfer hose kit
- Krytox™ grease (available from local agricultural supply)
- Ethanol #55000 5000 gram electronic balance
- 1/16” 0.015” 600 gram calibration weight

**RMS/HYBRID™ 2.3 or 3-JET RELOAD KIT**

- Nozzle (Large black plastic part)
- Forward hybrid grain (1/16” x 3” for 2.3 jet)
- Pressure relief valve (1/8” NPT female for 2.3 jet)
- 7/16” O.D. x 1” I.D. black plastic tube
- Field & all-rings (1/8” thick X 2” OD)

### Chapter 3: Combustion Chamber Assembly

1. **Apply a light coat of petroleum-based grease to all casing threads and closure outer threads and both forward and aft o-rings.**

2. **Install the Pyrovale™ element in the Pyrovale™ charge well of the RMS/Hybrid™ forward closure, seated against the retainer screw.**

3. **CAUTION:** Do not use a Pyrovale™ element with any visible defects.

4. **CAUTION:** Do not use a Pyrovale™ element in the Pyrovale™ charge well of the RMS/Hybrid™ forward closure, seated against the retaining washer.

5. **Drop the Pyrovale™ retainer screw into the Pyrovale™ charge well.**

6. **CAUTION:** Do not over tighten the Pyrovale™ retainer screw. Over tightening this screw could crush the Pyrovale™ element resulting in a leak and or possible detonation of the element when the flight cylinder is threaded into the RMS/Hybrid™ forward closure.

7. **Leak Check.**

   **CAUTION:** Perform step 2-7 outdoors ONLY. Wear leather gloves and approved eye protection during this operation.

8. **WARNING:** Do not at any time look directly into the Pyrovale™ end of the RMS/Hybrid™ forward closure during this operation.

### Chapter 2: Pyrovale™/Forward Closure Preparation

- **Forward Closure**
- **Pyrovale™ Retainer Screw**
- **Pyrovale™ Retainer Disc**
- **Pyrovale™ O-ring**
- **Pyrovale™ Element**
- **Pyrovale™ Assembly**

1. **Check the forward closure to ensure that the proper number of jet plugs (3-48 jet plugs) are installed in the Pyrovale™ injector plate corresponding to the reload kit being used (2, 3 or 4 jet) and the maximum thrust level desired. Using the 0.50” jet plug key wrench, remove or install one or two jet plugs in the injector plate as necessary. Store any removed jet plugs in the plug “parking spots”.**

2. **Apply a light coat of Krytox™ grease to the Pyrovale™ (3/32” X 3/8” O.D.) o-ring.**

3. **Wet wipes or damp paper towels**

**NOTE:** These abbreviated instructions are for field use only. For detailed instructions, including flight cylinder loading procedures, please refer to the RMS/Hybrid™ Assembly and Operations Manual that accompanied your RMS/Hybrid™ motor or upgrade package.
3-15. With the motor case and the previously-completed RMS/Hybrid™ forward closure assembly held facing each other, place the head end of the electric match ignition assembly through the hole in the nitrous oxide forward closure and secure it with the Pyrovalve™ retainer screw and against the exposed portion of the Pyrovalve™ charge. A small piece of tape on the Pyrovalve™ charge end of the Pyrovalve™ retainer may be used to hold the ignitor in this position if necessary.

3-16. Carefully rotate the motor to a nozzle-up orientation and slowly thread the forward closure assembly and Pyrovalve™ retainer screw by hand until it is seated against the case. NOTE: Ensure that the electric match ignition assembly remains positioned against the Pyrovalve™ charge during this operation.

3-17. Continue holding the motor vertically with the nozzle pointing up. Push the vented nozzle cap igniter holder over the nozzle to secure the electric match to the motor.

3-18. Finish tightening the aft (cylinder) closure by hand until it is seated against the case. NOTE: There will be moderate resistance to thread the rear closure during the last 1/32" to 1/16" of travel. It is normal if a slight gap remains between the case and the case after tightening.

Chapter 4. Final Motor Assembly & Flight Preparation

NOTE: It is recommended that final motor assembly be performed at the launch pad, immediately prior to flight. The flight cylinder should be at 75 deg. F. +/- 20 deg. F. for best performance and proper motor operation. Use a thermal insulated cooler to store your flight cylinders during extreme temperature situations. Leave the flight cylinders in the cooler until just before you are ready to attach to the motor and install in your rocket.

4-1. CAUTION: Perform step 4-1 outdoors ONLY. Wear leather gloves and a hooded eye protection during this step. The nitrous oxide forward closure end of the RMS/Hybrid™ motor is ejected when the motor is reached through the hole in the nitrous oxide forward closure and4-2. Install the RMS/Hybrid™ motor in the rocket’s motor mount tube. Ensure that the motor is securely retained in the rocket by using tape around the motor mount tube/closure flange joint, a motor hook or other means to prevent it from being ejected during recovery system deployment.

4-3. Place the rocket on the launcher and make any other preparations required before hooking up the igniter. Attach the igniter clips to the leads of the electric match ignition assembly by positioning the forward closure end of the electric match ignition assembly about 1⁄8" to 3⁄16" from the Nitrous Oxide forward closure end of the rocket.

Chapter 5. Misfires

5-1. If a misfire occurs and a loaded RMS/Hybrid™ motor does not ignite for any reason within five seconds of pressing the launch button, release the launch button and remove the safety key from the electric match launch controller. WAIT ONE MINUTE before approaching or allowing anyone else to approach the vehicle. CAUTION: Wear leather gloves and approved eye protection during this operation. Keep your hands and body away from the rocket and vehicle and/or any ignition source for three minutes before approaching.

Chapter 6. Post-Flight Motor Cleanup

NOTE: Perform motor cleanup as soon as possible after motor firing. Fuel combustion residues become difficult to remove after 24 hours and can lead to corrosion of the motor parts. Flush any motor component in the reload to plastic bag and dispose of properly.

6-1. After the motor has cooled down, remove the flight cylinder and the forward and aft closures. Replace the cylinder valve fitting.

Chapter 7. 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 ignitor propellant or Pyrovalve™ element, induce vomiting and see a physician as quickly as possible. The AeroTech RMS/Hybrid™ nitrous oxide preheater composite propellant contains ammonium perchlorate and a rubber like plastic elastomer. The Pyrovalve™ pellet consists of black powder.

Chapter 8. Disposal

Damaged or defective reload kits should be returned to AeroTech™.

Disclaimer and Warranty

NOTICE: AeroTech™ certifies that it has exercised reasonable care in the design, manufacture and testing of its products. As we cannot control the storage and use of our products, once sold we cannot assume any responsibility for product storage, transportation or usage. AeroTech™ 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 agrees to hold us harmless from any claim which may be brought against us in connection with the use of our products, once sold we cannot assume any responsibility for product storage, transportation or usage. AeroTech™ 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 agrees to hold us harmless from any claim which may be brought against us in connection with the use of our products, once sold we cannot assume any responsibility for product storage, transportation or usage.

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