Forward O-ring (2" O.D. X 1/8" thick) for the Pyrovalve™ element charge well.

CAUTION: Do not insert a Pyrovalve™ element with any visible defects.

2-3. Insert the Pyrovalve™ back-up washer (5/8" O.D. X 1/16" thick stainless steel washer) into the Pyrovalve™ charge well until it is seated against the Pyrovalve™ element.

2-4. Drop the Pyrovalve™ retainer screw onto the Pyrovalve™ charge well. Using the Pyrovalve™ retainer has key wrench, gently tighten the retainer screw against the Pyrovalve™ back-up washer until the retainer screw is flush with the end of the Pyrovalve™ charge well and a dramatic increase in thread force is felt. This should be considered the final tightening of the retainer screw. DO NOT OVER-TIGHTEN.

CAUTION: Do not over tighten the Pyrovalve™ retainer screw. Over-tightening the screw could crack the Pyrovalve™ element resulting in a leak and/or possible spontaneous ignition of the element when the flight cylinder is threaded into the RMS/Hybrid™ forward closure.

2-6. 1/16" long, 3/32" I.D. (P) paper fuel grain into the liner tube, seated against the nozzle if necessary. Wrap the fuel grain with a layer of masking tape to insulate the grain from the forward closure until a dramatic increase in thread force is felt.

3-3. Insert the large-diameter end of the nozzle (large black plastic part) into the RMS/Hybrid™ forward closure. The nozzle flange is seated against the internal thread root of the motor forward closure.

3-4. Push the liner assembly, nozzle end first, into the motor case until the nozzle protrudes from the case about 1/8". NOTE: A liberal coat of petroleum-based grease applied to the outside surface of the liner (especially on threads and sealants) will facilitate installation and casing cleanup after motor firing.

3-5. Place the greased (1/16" thick X 2" O.D.) O-ring into the groove in the nozzle insert.

3-6. Thread the aft (gold) closure into the motor case by hand until about 1/16" gap remains between the case and the closure. NOTE: Final tightening of the motor case will be done after the other motor components are seated into the case.

4-1. Set the Pyrovalve™ element in the Pyrovalve™ charge well of the RMS/Hybrid™ forward closure, seated against the teflon separator disc.

4-2. Insert the Pyrovalve™ back-up washer (5/8" O.D. X 1/16" thick, stainless steel washer) into the Pyrovalve™ charge well until it is seated against the Pyrovalve™ element.

4-3. Using a pyrovalve™ element with any visible defects.

4-4. Install the Pyrovalve™ element onto the Pyrovalve™ charge well of the RMS/Hybrid™ forward closure, seated against the teflon separator disc.

4-5. Install the Pyrovalve™ back-up washer (5/8" O.D. X 1/16" thick stainless steel washer) into the Pyrovalve™ charge well until it is seated against the Pyrovalve™ element.

4-6. Drop the Pyrovalve™ retainer screw onto the Pyrovalve™ charge well. Using the Pyrovalve™ retainer has key wrench, gently tighten the retainer screw against the Pyrovalve™ back-up washer until the retainer screw is flush with the end of the Pyrovalve™ charge well and a dramatic increase in thread force is felt. This should be considered the final tightening of the retainer screw. DO NOT OVER-TIGHTEN.

CAUTION: Do not over tighten the Pyrovalve™ retainer screw. Over-tightening the screw could crack the Pyrovalve™ element resulting in a leak and/or possible spontaneous ignition of the element when the flight cylinder is threaded into the RMS/Hybrid™ forward closure.

Chapter 3: Combustion Chamber Assembly

3-1. Apply a light coat of petroleum-based grease to all casing threads and closure outer threads and both forward and aft o-rings. This will facilitate assembly and prevents the threads from seizing.

3-2. Using your fingernail or other blunt object, remove the burr (rough, raised edge) from both inside ends of the liner tube (2" O.D. X 1/16" I.D. orange paper tube).

3-3. Insert the aft closure (2" O.D. phenolic collar) into the motor case, until it is seated against the teflon separator disc.

3-4. Place the aft closure (2" O.D. phenolic collar) on the motor case, until it is seated against the teflon separator disc.

3-5. Hold the motor case and the previously-completed forward closure in a horizontal plane to ensure proper alignment. thread the forward closure onto the open end of the motor case by hand until it is seated against the case.

3-6. Note: Identification of the motor assembly by performing the last 1/32" to 1/16" of travel. It is normal if a slight gap exists between the forward closure and the motor case during this operation.

3-7. Finishing tightening the aft (gold) closure hand until it is seated against the closure will prevent the motor from being turned during the last 1/32" to 1/16" of travel. No flat of a slight gap remains between the case and the closure after tightening.

Chapter 4: Final Motor Assembly

4-1. Cut the forward closure o-rings. This will prevent the motor from being turned during the last 1/32" to 1/16" of travel. No flat of a slight gap remains between the case and the closure after tightening.

4-2. Hold the motor case and the previously-completed forward closure in a horizontal plane to ensure proper alignment. thread the forward closure onto the open end of the motor case by hand until it is seated against the case.

4-3. Using a pyrovalve™ element with any visible defects.

4-4. Install the Pyrovalve™ element onto the Pyrovalve™ charge well of the RMS/Hybrid™ forward closure, seated against the teflon separator disc.

4-5. Insert the Pyrovalve™ back-up washer (5/8" O.D. X 1/16" thick stainless steel washer) into the Pyrovalve™ charge well until it is seated against the Pyrovalve™ element.

4-6. Drop the Pyrovalve™ retainer screw onto the Pyrovalve™ charge well. Using the Pyrovalve™ retainer has key wrench, gently tighten the retainer screw against the Pyrovalve™ back-up washer until the retainer screw is flush with the end of the Pyrovalve™ charge well and a dramatic increase in thread force is felt. This should be considered the final tightening of the retainer screw. DO NOT OVER-TIGHTEN.

CAUTION: Do not over tighten the Pyrovalve™ retainer screw. Over-tightening the screw could crack the Pyrovalve™ element resulting in a leak and/or possible spontaneous ignition of the element when the flight cylinder is threaded into the RMS/Hybrid™ forward closure.

3-1. Apply a light coat of petroleum-based grease to all casing threads and closure outer threads and both forward and aft o-rings. This will facilitate assembly and prevents the threads from seizing.

3-2. Using your fingernail or other blunt object, remove the burr (rough, raised edge) from both inside ends of the liner tube (2" O.D. X 1/16" I.D. orange paper tube).

3-3. Insert the aft closure (2" O.D. phenolic collar) into the motor case, until it is seated against the teflon separator disc.

3-4. Place the aft closure (2" O.D. phenolic collar) on the motor case, until it is seated against the teflon separator disc.

3-5. Hold the motor case and the previously-completed forward closure in a horizontal plane to ensure proper alignment. thread the forward closure onto the open end of the motor case by hand until it is seated against the case.

3-6. Note: Identification of the motor assembly by performing the last 1/32" to 1/16" of travel. It is normal if a slight gap exists between the forward closure and the motor case during this operation.

3-7. Finishing tightening the aft (gold) closure hand until it is seated against the closure will prevent the motor from being turned during the last 1/32" to 1/16" of travel. No flat of a slight gap remains between the case and the closure after tightening.

4-1. Cut the forward closure o-rings. This will prevent the motor from being turned during the last 1/32" to 1/16" of travel. No flat of a slight gap remains between the case and the closure after tightening.

4-2. Hold the motor case and the previously-completed forward closure in a horizontal plane to ensure proper alignment. thread the forward closure onto the open end of the motor case by hand until it is seated against the case.

4-3. Using a pyrovalve™ element with any visible defects.

4-4. Install the Pyrovalve™ element onto the Pyrovalve™ charge well of the RMS/Hybrid™ forward closure, seated against the teflon separator disc.

4-5. Insert the Pyrovalve™ back-up washer (5/8" O.D. X 1/16" thick stainless steel washer) into the Pyrovalve™ charge well until it is seated against the Pyrovalve™ element.

4-6. Drop the Pyrovalve™ retainer screw onto the Pyrovalve™ charge well. Using the Pyrovalve™ retainer has key wrench, gently tighten the retainer screw against the Pyrovalve™ back-up washer until the retainer screw is flush with the end of the Pyrovalve™ charge well and a dramatic increase in thread force is felt. This should be considered the final tightening of the retainer screw. DO NOT OVER-TIGHTEN.

CAUTION: Do not over tighten the Pyrovalve™ retainer screw. Over-tightening the screw could crack the Pyrovalve™ element resulting in a leak and/or possible spontaneous ignition of the element when the flight cylinder is threaded into the RMS/Hybrid™ forward closure.

3-1. Apply a light coat of petroleum-based grease to all casing threads and closure outer threads and both forward and aft o-rings. This will facilitate assembly and prevents the threads from seizing.

3-2. Using your fingernail or other blunt object, remove the burr (rough, raised edge) from both inside ends of the liner tube (2" O.D. X 1/16" I.D. orange paper tube).

3-3. Insert the aft closure (2" O.D. phenolic collar) into the motor case, until it is seated against the teflon separator disc.

3-4. Place the aft closure (2" O.D. phenolic collar) on the motor case, until it is seated against the teflon separator disc.

3-5. Hold the motor case and the previously-completed forward closure in a horizontal plane to ensure proper alignment. thread the forward closure onto the open end of the motor case by hand until it is seated against the case.

3-6. Note: Identification of the motor assembly by performing the last 1/32" to 1/16" of travel. It is normal if a slight gap exists between the forward closure and the motor case during this operation.
Place the rocket on the launcher and make any other preparations required before hooking up the igniter.

Chapter 7. Post-Flight Motor Cleanup

7-1. After the motor has cooled down, remove the flight cylinder and the forward and aft closures. Replace the nitrous oxide preheater charge, through the opening in the motor and approved eye protection during this operation. Pointing the nozzle end away from people, animals, buildings and flammable materials, slowly thread the cylinder valve fitting into the cylinder valve receptacle of the forward closure until a dramatic increase in threading resistance is felt. This increase signals the seating of the cylinder valve into the throated forward closure cavities with nitrous oxide. Continue threading the cylinder valve fitting into the RMS/Hybrid® forward closure cylinder valve receptacle until the valve fittings bottoms out against the forward closure.

7-2. Install the RMS/Hybrid® motor in the rocket’s motor mount tube. Ensure that the motor is secured in the rocket by using positive retention means to prevent it from being ejected during recovery system deployment.

7-3. Remove the nitrous oxide preheater insulator tube and forward insulator from the forward closure and discard. Using the Pyrovalve™ key wrench, remove the Pyrovalve™ retaining screw from the Pyrovalve™ charge well of the forward closure and set aside. Remove the Pyrovalve™ lock-up ring and Pyrovalve™ o-ring from the bolted closure and discard. Using wet wipes, degreaser paper towels and/or a ‘Chore Boy™’ steel wool pad, remove all combustion residue from the forward and aft closures and the Pyrovalve™ retaining screw.

7-4. Apply a light coat of petroleum-based grease to casing threads, outer forward and aft closure threads only and the inside of the motor case. Reassemble metal parts and store motor in a dry place.

Chapter 8. First Aid

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 igniter propellant or Pyrovalve™ element, induce vomiting and see a physician as quickly as possible. The AeroTech RMS/Hybrid™ Pyrovalve™/RMS/Turbo™/Turbo™ composite propellant grains contain ammonium perchlorate and a rubber like plastic elastomer. The Pyrovalve™ pellet consists of black powder.

Chapter 9. Fire Safety

Tests show that the pyrotechnic ignition components of RMS/Hybrid™ reload kits will not explode in fumes and normally will not ignite unless subjected to direct flame and then will burn slowly. Use water to fight fires in which AeroTech™ RMS/Hybrid™ motors are involved. Do not attempt to fight a fire in which AeroTech™ RMS/Hybrid™ motors are involved with CO2 fire extinguishers. Foam and carbon dioxide fire extinguishers will NOT extinguish burning propellants of the type contained in AeroTech™ RMS/Hybrid™ motors. Fire will burn slowly. Use water to fight fires in which AeroTech™ RMS/Hybrid™ motors are involved. Do not attempt to fight a fire in which AeroTech™ RMS/Hybrid™ motors are involved with CO2 fire extinguishers. Foam and carbon dioxide fire extinguishers will NOT extinguish burning propellants of the type contained in AeroTech™ RMS/Hybrid™ motors.

Chapter 10. Material Safety Data

AeroTech™, Inc. Las Vegas, NV 89104

NOTE: RMS/HYBRID™ MOTORS DO NOT INCLUDE A DELAY OR EJECTION CHARGE. RMS/HYBRID™ MOTORS MUST BE USED IN CONJUNCTION WITH A TIMER, ALTIMER OR RADIO ACTUATED RECOVERY SYSTEM. Notes: Total impulse shown is optimum. Turbo reloads MUST be used with fully loaded 440cc flight cylinders ONLY. Fuel grain weight includes N₂O preheater and excess use as insulation.

RMS/HYBRID™ 54/1280 3-Jet Turbo™ Configuration Hardware Data

<table>
<thead>
<tr>
<th>Hardware Designation</th>
<th>Motor Diameter</th>
<th>Motor Length</th>
<th>Hardware Weight</th>
<th>Reload Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMS/Hybrid™ 54/1280 3-Jet</td>
<td>2.125” (54mm)</td>
<td>27.9”</td>
<td>902 g (1.99 lb)</td>
<td>J390HW 3-Jet Turbo™</td>
</tr>
</tbody>
</table>

NOTE: Motor lengths are measured from end of aft closure to forward end of nitrous oxide cylinder.