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

2-5. Install the Pyrovalve™ element in the Pyrovalve™ charge well of the RMS/Hybrid™ forward closure, seated against the Pyrovalve™ element.

2-6. 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 tightening resistance is felt. This increase signals the opening of the cylinder valve. If the motor has been housed in a pressurized container, a leak may be observed in the form of a thin stream of nitrous oxide. If no leaks are heard or otherwise noted, unload the cylinder into the forward insulator for the Pyrovalve™ assembly. If a leak is detected, unload the cylinder, remove the Pyrovalve™ assembly, and inspect the nozzle and nozzle plate for any signs of damage. Proceed as directed above before performing this leak check again. NOT: A small burr may form against the forward closure valve seat; the cylinder valve may require significant force to break free. Do not use a Pyrovalve™ element with any visible defects.

2-7. Leak Check.

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

WARNING: DO NOT at any time look directly into the Pyrovalve™ end of the RMS/Hybrid™ forward closure during this operation.

2-8. Using a partially or fully filled flight cylinder at or above room temperature, and poring the (after) Pyrovalve™ end of the RMS/Hybrid™ forward closure away from people, animals, buildings and other sources of high heat, apply a liberal coat of petroleum-based grease to the outside of the flight cylinder. CAUTION: Do not use a Pyrovalve™ element with any visible defects.

2-9. Thread the aft (gold) closure into the motor case by hand until about 1-2 threads are visible beyond the aft (gold) closure. DO NOT USE ANY REPAIR OR INTERCHANGE PARTS. Do not use any other motor case components for the purpose of disassembling the aft closure.

2-10. Apply a liberal coat of petroleum-based grease to the inside surface of the flight cylinder. DO NOT USE ANY REPAIR OR INTERCHANGE PARTS. Do not use any other motor case components for the purpose of disassembling the aft closure.

2-11. Insert the nitrous oxide preheater charge (1/4” O.D. X 13” long tube) into the motor case. CAUTION: DO NOT MODIFY THE MOTOR IN ANY WAY.

2-12. Using your fingernail or other blunt object, remove the burr (rough, raised edge) from both inside ends of the liner tube (1/4” O.D. X 7-1/8” d.) paper tube. Fill the tube using a 1/8” O.D. X 9” fiber washer, seated against the liner with a 9/32” O.D. X 7” long (1/4” I.D.) o-ring. Felt and o-rings (1/8” thick X 2” O.D.)

2-13. Insert the forward (gold) O-ring and (1” O.D. X 6-3/8” I.D.) liner into the Pyrovalve™ back-up washer. CAUTION: DO NOT MODIFY THE MOTOR IN ANY WAY.

2-14. Insert the aft closure (1/4” O.D. X 13” I.D.) paper tube into the Pyrovalve™ back-up washer. CAUTION: DO NOT MODIFY THE MOTOR IN ANY WAY.

2-15. Using your fingernail or other blunt object, remove the burr (rough, raised edge) from both inside ends of the liner tube (1/4” O.D. X 7-1/8” d.) paper tube. Fill the tube using a 1/8” O.D. X 9” fiber washer, seated against the liner with a 9/32” O.D. X 7” long (1/4” I.D.) o-ring. Felt and o-rings (1/8” thick X 2” O.D.)
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 rear closure and attach the igniter parts kit. 

3-16. Carefully raise the motor to a nozzle-up orientation and slowly thread the forward closure assembly into the open end of the motor case 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 closure by hand until it is seated against the case. NOTE: There will be moderate resistance to thread the aft 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.

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 or +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. Above 97 deg. F, nitrous oxide transitions to the gas phase regardless of pressure and may result in ejection or variable thrust during burn. During cold weather delivered total impulse can be adversely affected. Obtain priority status to launch your rocket within 15 minutes of installation on the launch pad during hot or cold weather conditions.

4-1. CAUTION: Perform step 4-1 outdoors ONLY. Wear leather gloves and approved eye protection during this operation. Pointing the nozzle end of the RMS/Hybrid™ motor away from people, animals, buildings, and flammable materials, slowly thread the cylinder valve fitting into the RMS/Hybrid™ forward closure valve receptacle until the valve fitting bottoms out against the forward closure.

4-2. 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 or a motor mount bracket/flare 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 and plug the rocket into the igniter in the approved manner in accordance with the Tripoli safety code.

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 electronic 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 fingers and hands out of the vehicle and away from the possible path of the motor exhaust jet. Do not place any part of your body in front of the vehicle. Disconnect the igniter clip(s) from the electric match or other ignition means. Carefully remove the RMS/Hybrid™ motor from the rocket while still on the launch pad, if possible. Otherwise, remove the rocket from the launch pad and keep it pointed in a safe direction. Keeping the motor nozzle and flight cylinder pointed away from your face and body, and away from any flammable objects, carefully remove the motor combustion chamber. Remove the igniter, unscrew the RMS/Hybrid™ forward closure, and repeat the motor preparation and launching process.

Chapter 6. Post-Flight Motor Cleanup

NOTE: Perform motor clean-up as soon as possible after motor firing. Fuel combustion residues become difficult to remove after 24 hours and can lead to corrosion of the metal parts. Remove the spent motor components in the reload kit 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 cap (1316™ D).