RMS™ 29/40-120 Assembly and Operation Instructions

BEFORE YOU BEGIN:

- Study the illustrations and sequence of assembly. THE SEQUENCE OF ASSEMBLY IS EXTREMELY IMPORTANT. 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 (431) 865-7100 or email at: warranty@aerotech-rocketry.com
- DO NOT USE ANY PART OF THE RMS™ SYSTEM THAT IS 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 specifically designed for use in your particular AeroTech/RCS RMS™ Motor. Use of imitation components may destroy your rocket, rocket and payload and will invalidate your motor warranty. Only use AeroTech/RCS RMS™ reload kits or motor components for any other purpose than to refurbish an AeroTech/RCS 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 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. It is not advisable to handle a motor before it has cooled down. Use a rag or similar article.

Read and follow the safety codes of the National Association of Rocketry (NAR) and the Tripoli Rocketry Association and comply with all federal, state and local laws in all activities with hobby rockets.

PARTS:

**RMS-29/40-120 MOTOR**

29mm Alt Closure
29mm Case
29mm Forward Closure
Grease
1 tube

**RELOAD KIT**

Liner (1” O.D. tube)
Propellant Grain (long slotted part)
Grain Adapter (7/8” O.D. tube)
Delay Grain (short solid part)
Delay Spacer (9/16” O.D. washer or tube)
Delay Insulator (0.05” O.D. tube)
Delay O-Ring (5/8” O.D. x 3/32” thick)
Forward Insulator (1” O.D. washer)
Alt O-Ring (1 1/16” thick x 1/16” O.D.)
Forward O-Ring (1 1/16” thick x 1 1/16”)
Nozzle (Black plastic part)
COOPERHEAD™ Igniter
Ejection Charge Container/Nozzle Cap

**ITEMS NEEDED FOR USE:**

- Wet cloths or damp paper towels
- Hobby knife or scissors
- Masking tape, disposable rubber gloves
- A light coating of grease to the O-rings and all threads will facilitate assembly and prevent the threads from seizing. NOTE: When all the grease that comes with the motor has been consumed, use petroleum jelly or similar grease.
- Using your fingernails or a blunt object, remove the burr from the inside and outside ends of the delay insulator tube by pressing or scraping and rotating the tube at the same time.

1. Apply a light coat of grease to the O-rings and all threaded surfaces. This will facilitate assembly and prevent the threads from seizing. NOTE: When all the grease that comes with the motor has been consumed, use petroleum jelly or similar grease.
2. Using your fingernails or a blunt object, remove the burr from the inside and outside ends of the delay insulator tube by pressing or scraping and rotating the tube at the same time.
3. Fig-1: If supplied with the reload kit, press the delay spacer into one end of the delay insulator tube until FLUSH with the end of the tube.
4. Fig-2: If supplied with the reload kit, press the delay insulator into one end of the delay insulator tube until FLUSH with the end of the tube.
5. Fig-3: Place the greased 5/8” O.D. x 3/32” thick O-ring in the forward closure, seated against the forward end of the delay cavity.
6. Fig-4: Hold the two propellant grains joined end to end so that the slots in both grains are in alignment as shown. Apply a 1” to 1 1/2” long piece of clear tape to the joint between the grains to hold them together. NOTE: The use of disposable rubber gloves when handling Mojave Green propellant grains is strongly recommended.
7. Fig-5: Remove the drain from the inside of the forward closure. Insert the tapped propellant grain into the liner tube until one end of the joined grain is flush with the end of the liner tube.
8. Fig-6: Insert the liner assembly into the motor case until it is recessed equally from both ends of the case. Hold the liner assembly in place with your finger.
9. Fig-7: Place the forward insulator into the case, where the end of the propellant grain is flush with the end of the liner tube. Place the greased 1/16” x 1” forward o-ring against the forward insulator as shown.
10. Fig-8: Insert the forward (black) closure into the same end of the motor case by hand until it stops against the case.
11. Fig-9: Insert the black coated end of the COPPERHEAD™ igniter into the slot in the propellant grain until it stops against the delay element.
12. Fig-10: Using the point of a pencil, remove any plastic “flashing” that may still remain in the nozzle throat. Insert the nozzle into the open end of the motor case, with the igniter lead threaded through the nozzle throat, until the nozzle is in the liner tube and seated against the propellant grain.
13. Fig-11: Place the greased 1/16” O-ring (1/16” thick) into the groove between the nozzle and case.
14. Fig-12: Thread the aft (gold) closure into the motor by hand until it stops against the end of the case. A rag or paper towel may be used to get a tighter grip on the closure.
15. Fig-13: Hold the ejection charge container/nozzle cap assembly with the nozzle cap (the wider plastic cap) pointing up. CAREFULLY remove the nozzle cap from the ejection charge container. Holding the motor in a vertical position with the FORWARD (black) closure pointing down, snap the ejection charge container over the matching end of the FORWARD closure. WARNING: DO NOT LOOSEN THE FORWARD CLOSURE ONCE THE EJECTION CHARGE CONTAINER HAS BEEN SNAPPED INTO POSITION. Loosening the forward closure will cause ejection charge to leak under the forward O-ring and may lead to seal failure.
16. With the motor held in a NOZZLE DOWN position, gently shake the motor several times to set the ejection charge into the delay cavity above the delay element. NOTE: If it becomes necessary to remove the AFT (gold) closure to replace the igniter due to misfire, hold the motor in a nozzle-up position and avoid moving the liner assembly in the case during the operation.
AEROTECH CONSUMER AEROSPACE

RELOADABLE MOTOR SYSTEM™

RMS™ - 29/40-120
Fits All Kits Designed for “F & G” Motors

Division of RCS Rocket Motor Components, Inc.

DO NOT OPEN RELOAD KIT UNTIL READY TO USE

2-Grain Design!

NOTE: SALE TO PERSONS UNDER 18 YEARS OF AGE PROHIBITED BY FEDERAL LAW.

IMPORTANT! This reload kit is loaded in a manner different from most other Aero-
Tech/RCS reload kits. PLEASE READ ALL INSTRUCTIONS BEFORE USE!

The reload kits shown above are ONLY for use in AeroTech/RCS RMS 29-40/120 motors.

NOTE: SALE TO PERSONS UNDER 18 YEARS OF AGE PROHIBITED BY FEDERAL LAW.

DANGER-POISON: Contains Barium Nitrate. DO NOT INGEST PROPELLANT OR BREATHE
EXHAUST FUMES. WARNING-FLAMMABLE: Read Instructions Before Use. KEEP
OUT OF REACH OF CHILDREN, FOR USE ONLY BY INDIVIDUALS 18 YEARS OF AGE OR
OLDER. DO NOT SMOKE when loading these motors or use in the vicinity of open flames.

TYPICAL TIME - THRUST CURVES:

<table>
<thead>
<tr>
<th>Motor Type</th>
<th>Propellant Weight</th>
<th>Total Impulse</th>
<th>Average Thrust</th>
<th>Loaded Motor Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>G76-4G</td>
<td>oz gms</td>
<td>lb·sec N·sec</td>
<td>lbs N oz</td>
<td>gms</td>
</tr>
<tr>
<td>G76-7G</td>
<td>2.1 60.0</td>
<td>26.5 118</td>
<td>17.1 76</td>
<td>5.2 147</td>
</tr>
<tr>
<td>G76-10G</td>
<td>3.5 100.0</td>
<td>43.0 170</td>
<td>22.5 90</td>
<td>9.0 190</td>
</tr>
</tbody>
</table>

G = Mojave Green™ Propellant

REQUIRES 12 VOLT LAUNCH SYSTEM

G76-4G SINGLE
G76-7G SINGLE
G76-10G SINGLE

DANGER: DO NOT INGEST PROPELLANT OR BREATHE EXHAUST FUMES! WASH HANDS AFTER HANDLING MOJAVE GREEN PROPEL-
LANT AND BEFORE EATING. 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.
Mojave Green composite propellant consists primarily of Ammonium Perchlo-
rate, Barium Nitrate and a rubber-like plastic elastomer.

FIRST AID

DANGER: DO NOT INGEST PROPELLANT OR BREATHE EXHAUST FUMES! WASH HANDS AFTER HANDLING MOJAVE GREEN PROPEL-
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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.
Mojave Green composite propellant consists primarily of Ammonium Perchlo-
rate, Barium Nitrate and a rubber-like plastic elastomer.

DISPOSAL

Damaged or defective reloads should be returned to RCS.

NOTICE: As we can not 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 thereof and accepts and uses
Aerotech/RCS

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