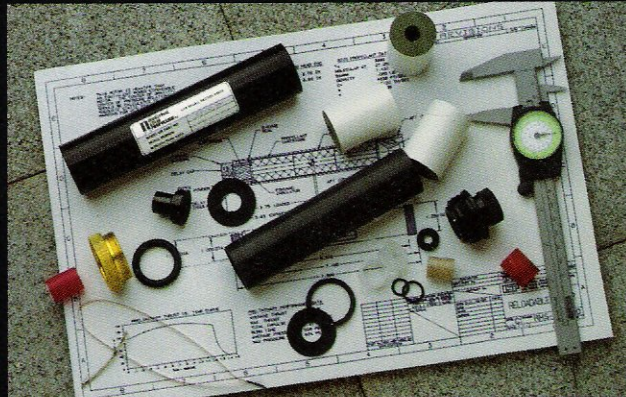


# RMS™ Reloadable Motor System

**Performance, Reliability, Flexibility,  
Availability... at Half the Price!**

**Thousands of Flights!**



▲ Because RMS™ motors are of modular design, each reliable and durable motor can use a variety of RMS™ reload kits. Each RMS™ motor can also be varied in length to give you a greater range of performance options.

▲ Now you can enjoy high power rocketry at greatly reduced cost, improved reliability and enhanced flexibility with the RMS™ Reloadable Motor System from INDUSTRIAL SOLID PROPULSION, INC. Using professional rocket motor technology, ISP™ makes the reloadable rocket motor with integral delay and ejection charge a reality.

Each RMS™ precision machined anodized aluminum motor can be flown again and again with easy to use reload kits. The AEROTECH™ WHITE LIGHTNING™, BLUE THUNDER™ and BLACK JACK™ propellant formula reload kits are about one-half the price of currently available "throwaway" motors!

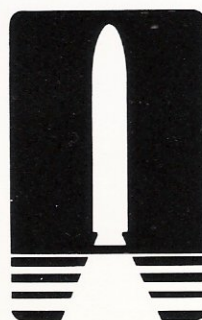
RMS™ means unprecedented consumer interaction and enjoyment!

The RMS™ product line may be shipped via "UPS ground". This eliminates the inconvenience and expense of Federal Express shipping as required for Class "B" explosives.

Send \$5.00 for a complete catalog including a list of RMS™ dealers to:  
Industrial Solid Propulsion, Inc. ■ 1955 S. Palm St., Suite #15 ■ Las Vegas, NV 89104 ■ (702) 641-2302



"E" Through "M" Power  
Reloadable Motors



**INDUSTRIAL  
SOLID  
PROPULSION Inc.**

TM





**INDUSTRIAL  
SOLID  
PROPULSION Inc.**

RELOADABLE MOTOR SYSTEM DESCRIPTION, SPECIFICATIONS & PRICE LIST



2/26/91

To all High-Power Rocketry Enthusiasts:

We would like to take this time to inform you of an exciting new product line that has been in the works for several years here at ISP. Industrial Solid Propulsion, Inc. is the parent company of AeroTech, Inc., and has been in business since 1985. We specialize in designing & manufacturing high-reliability rocket motors for commercial, industrial & military customers. These motors are used in diverse applications ranging from emergency parachute deployment for light civilian aircraft to boosters for remotely-piloted vehicles (RPV's) to guidance & control motors for the recently launched Pegasus space booster. ISP now offers this expertise to the high-power sport rocketry market.

ISP has recently introduced a line of reloadable high-power rocket motors based on technology that was developed for our professional programs. We refer to this product as the Reloadable Motor System (RMS). A typical designation for a motor would be RMS-29/180. The '29' refers to the motor diameter in millimeters. The '180' refers to the baseline total impulse of the motor. The exact delivered total impulse will vary somewhat depending on the propellant and grain design used. We intend to offer several different grain designs for these motors in the near future.

All these motors feature precision-machined anodized aluminum hardware, AeroTech's "White Lightning", "Blue Thunder" and "Blackjack" core/end burning propellant as the initial grain configurations for the line, AeroTech's "Copperhead" igniters, a disposable insulation system & nozzle insert, pressure safety margins of 300-500%, and fast & easy assembly. But the most important advantages of the system are:

\* Motor "reload kits" (RK's) may be shipped by UPS ground as a Flammable Solid! No expensive Federal Express shipping required!

\* The retail price of most reload kits has been established at about one-half that of many currently available "disposable" motors!

\* Safety and reliability are greatly enhanced by use of high-margin hardware and proven designs.

\* Unprecedented consumer interaction and enjoyment!

The Reloadable Motor System was successfully demonstrated at last years Black Rock II launch near Gerlach, Nevada, at LDRS-9 near Hartsel, Colorado, and at many launches since then. Consumer response has been overwhelming! The Tripoli Board of Directors voted to allow the use of reloadable motors by their membership based on a second-level confirmation process for a 6 month trial period last August. This trial period is now over and we are pleased to announce that reloadable motors may now be purchased and flown in the same manner as disposable motors!

Motors may be ordered in three ways. The first is to purchase the complete system for a particular motor diameter, say, 29mm. This would include one each forward & aft closure and one of each length casing, in this example the 180 & 240 N-sec. cases. The second is to purchase one complete motor (one each case, forward & aft closure). The third is to order the parts individually. This is primarily intended for those who want to add on to an existing system or to replace lost or damaged components: there is a 20% savings associated with purchasing a complete motor or system.

A smoke-producing time delay element and related material is supplied with each reload kit, and the delay time required must be specified when placing an order. Future developments will include the addition of separate delay kits so that the user has a choice of time delay at the launch site to suit specific flying conditions.

The following are a few commonly-asked questions about the system, and their answers:

Q. How is the RMS system assembled?

A. The internal components are loaded into the motor case and the end closures are threaded on. No tools are required.

Q. Is there a danger of the RMS case producing "shrapnel" if it fails?

A. No. The RMS case is made from a highly ductile aluminum alloy. If the unlikely event of overpressure exceeding the design limits should occur, the motor is engineered to blow out the nozzle insert.

Q. How many times can the RMS system be reloaded?

A. An indefinite number of times, as long as the hardware remains undamaged.

Q. How hot does the RMS get? Will it damage my motor mount tube?

A. The typical RMS stays below 200 deg. F during operation. Most "disposable" motors operate in the 300-400 deg. F range.

Q. How long does it take to assemble an RMS?

A. Most motors can be assembled in less than 10 minutes.

Q. Is the ejection charge provided?

A. Yes. It is shipped in a small capsule which is opened and dispensed into the ejection charge well of the motor.

Q. Is the RMS heavier than a comparable "throwaway" motor?

A. Depending on the motor type, the equivalent RMS motor will be 0-20% heavier than a standard motor. Rockets should be checked for their static stability margins before flying with an RMS.

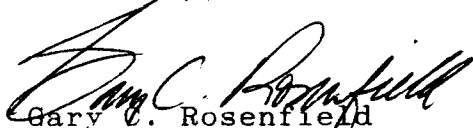
Q. Aren't metal motors forbidden by the Tripoli safety code? What about NFPA 1122?

A. No in both cases. Metal airframes are prohibited by the Tripoli safety code, but not metal motors. There is a section in the code which does not allow reloading of a motor once spent, but this was intended to discourage reloading of "disposable" motors. We will be working closely with Tripoli to clarify and further define the code for reloadable motors. Tripoli is exempt from the provisions of NFPA 1122, which currently deal with the construction requirements for model rockets & motors. This will also be redefined in the near future.

We welcome your questions and comments about the RMS system. Feel free to call us if you would like to discuss them. I think you will agree that this is one of the most significant developments in high-power rocketry since its inception and one that presents many challenges and opportunities for all of us.

We appreciate your business and look forward to serving you!

Sincerely,



Gary C. Rosenfield  
President, Industrial Solid Propulsion, Inc.

GCR/dms

enclosures

2	3	4	5	6	7	8
<h2 style="margin: 0;">REVISIONS</h2>						
REVISED BY	DATE					
DESCRIPTION	DATE					

**NOTES:**  
THIS MOTOR IS HEAVIER THAN AN EQUALLY SIZED RELOADABLE MOTOR BECAUSE THE CENTER OF GRAVITY CENTER OF PRESSURE RELATIONSHIP SHOULD BE CALCULATED TO ENSURE ADEQUATE STATIC STABILITY MARGINS FOR FLIGHT APPLICATIONS.

**WEIGHTS**

INSERTS	78.72 g
PROPELLANT	27.253 g
DELAY	27.29 g
<b>TOTAL</b>	<b>133.26 g</b>

**9225 PROPELLANT DATA**

To	3992 *R
MOLECULAR WT.	27.253
GAMMA	1.137
DENSITY	.086 LB/IN <sup>3</sup>
C*	4236 FT/SEC
a	.0120 IN/SEC
n	.4495

**C.G. DISTANCE FROM HEAD END**

X c.g. LOADED	1.90 IN
X c.g. EXPENDED	1.96 IN

**PRELIMINARY PERFORMANCE DATA**

AVERAGE THRUST	5.84 Lb
MAX. THRUST	7.50 Lb
TOTAL IMPULSE	10.86 LB-SEC
BURN TIME	1.84 SEC
AVERAGE PRESSURE	519 PSI
MAX PRESSURE	644 PSI

**PRELIMINARY THRUST VS. TIME CURVE**

Time (sec)	Thrust (lb)
0.0	0.0
0.5	4.0
1.0	6.5
1.5	7.0
1.84	7.5
2.0	5.0
2.5	0.0

**RELOADABLE MOTOR**

LIST OF MATERIAL

INDUSTRIAL SOLID PROPELLANT INC.

1000 PAUL STREET, WARE, MA 01896

1000 PAUL STREET, WARE, MA 01896

SCALE: 1/1

SHEET 1 OF 1

REVISED BY

DATE

DESCRIPTION

DATE

# REVISIONS

REV	DESCRIPTION	DATE	APPROVED
2			

**8225 PROPELLANT DATA**

T <sub>0</sub>	3692 °R
MOLECULAR WT.	27.252
GAMMA	1.137
DENSITY	.086 LB/IN <sup>3</sup>
C*	4236 FT/SEC
c	.0120 IN/SEC
n	.4465

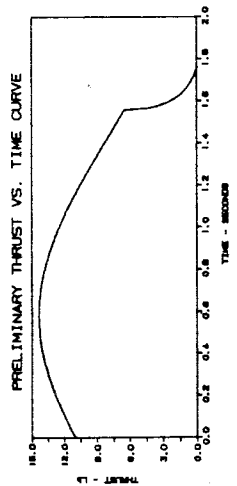
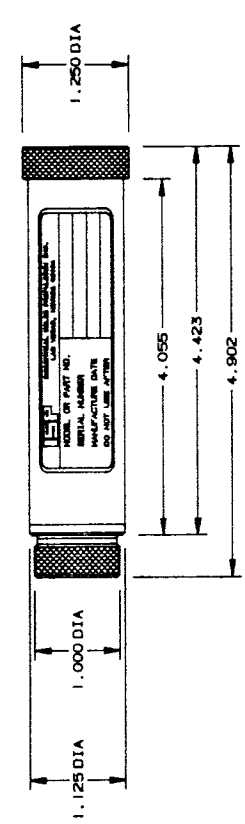
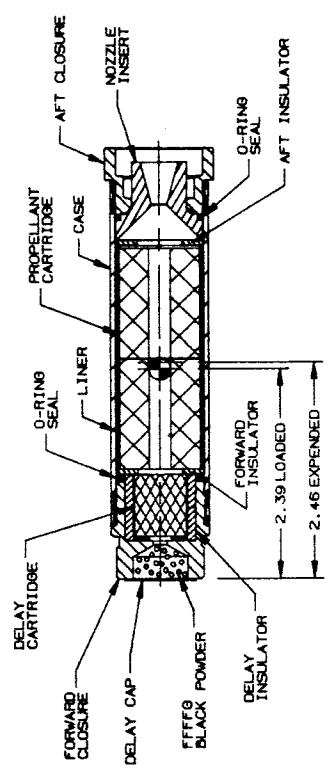
**C.G. DISTANCE FROM HEAD END**

X c.g. LOADED	2.39 IN
X c.g. EXPENDED	2.46 IN

**WEIGHTS**

INERTS	87.67
PROPELLANT	49.20
TOTAL	140.84 G

NOTES: THIS MOTOR IS HEAVIER THAN AN EQUALLY CENTERED GRAVITY MOTOR. CENTER OF PRESSURE RELATIONSHIP SHOULD BE CALCULATED TO ENSURE ADEQUATE STATIC STABILITY MARGINS FOR FLIGHT APPLICATIONS.



**PRELIMINARY PERFORMANCE DATA**

AVERAGE THRUST	10.78 Lb
MAX. THRUST	14.35 Lb
TOTAL IMPULSE	19.1 Lb-SEC
BURN TIME	1.76 SEC
AVERAGE PRESSURE	520 PSI
MAX PRESSURE	671 PSI

**RELOADABLE MOTOR**

CONTRACT No. 82-29-100

SCALE 1/1

SIZE C

PART No. RMS-29/100

SHEET 1 OF 1

**LIST OF MATERIAL**

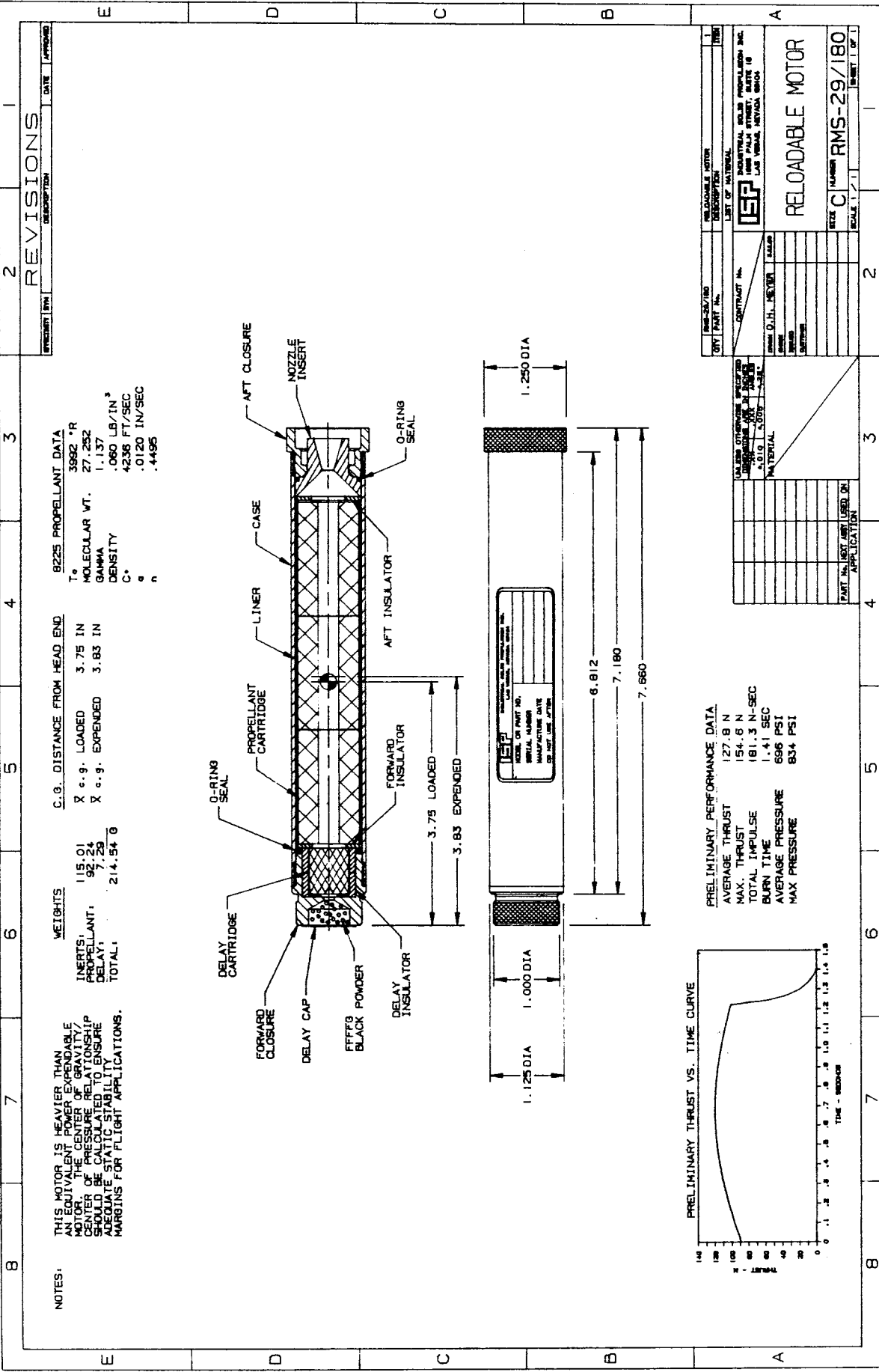
ITEM	DESCRIPTION	QTY	PART No.
1	RELOADABLE MOTOR	1	

**PRELIMINARY PERFORMANCE DATA**

AVERAGE THRUST	10.78 Lb
MAX. THRUST	14.35 Lb
TOTAL IMPULSE	19.1 Lb-SEC
BURN TIME	1.76 SEC
AVERAGE PRESSURE	520 PSI
MAX PRESSURE	671 PSI

**LAUNCH OPERATIONS**

LAUNCH OPERATIONS	UNCLASSIFIED
DATE	1-1-70
BY	W. J. WILSON
FOR	RESEARCH AND DEVELOPMENT
PROJECT	82-29-100
ITEM	RELOADABLE MOTOR
REV	1



**REVISIONS**

REV	DESCRIPTION	DATE	APPROVED
2			

**9225 PROPPELLANT DATA**

T <sub>0</sub>	3992 °R
MOLECULAR WT.	27.252
GAMMA	1.137
DENSITY	.060 LB/IN <sup>3</sup>
C*	4236 FT/SEC
a	.0120 IN/SEC
n	.4495

**WEIGHTS**

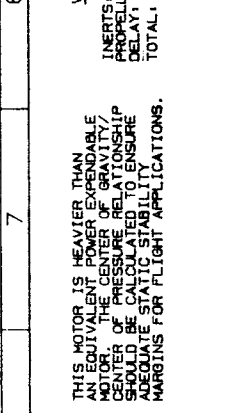
C.G. DISTANCE FROM HEAD END	
X e.g. LOADED	3.75 IN
X e.g. EXPANDED	3.83 IN

INERTS	115.01
PROPPELLANT	92.24
DELAY	7.29
TOTAL	214.54 G

**NOTES:**  
 THIS MOTOR IS HEAVIER THAN AN EQUIVALENT POWER EXPENDABLE MOTOR. THE CENTER OF GRAVITY/PROPPELLANT CENTER OF GRAVITY DELTA SHOULD BE CORRECTED TO ENSURE ADEQUATE STATIC STABILITY MARGINS FOR FLIGHT APPLICATIONS.

**PRELIMINARY PERFORMANCE DATA**

AVERAGE THRUST	127.8 N
MAX. THRUST	154.6 N
TOTAL IMPULSE	181.3 N-SEC
BURN TIME	1.41 SEC
AVERAGE PRESSURE	696 PSI
MAX PRESSURE	834 PSI



**QUALIFIED OTHERS RELOAD**

RELOAD PART NO.	
RELOAD PART NAME	
RELOAD PART DATE	
RELOAD PART QTY	

**RELOADABLE MOTOR**

QTY	PART NO.	DESCRIPTION
1		

**CONTRACT NO.**

NAME	Q.H. NUMBER	DATE
ISSUED		

**INDUSTRIAL SOLID PROPELLANT INC.**

1000 PALLA STREET, SUITE 10
LOS ANGELES, CALIF. 90015

**RELOADABLE MOTOR**

SIZE	C	CLASS	RMS-29/180
SCALE	1/2" = 1"		
SHEET	1 OF 1		

**PART NUMBER USED ON APPLICATION**

APPLICATION



# REVIEWS

REV.	DESCRIPTION	DATE	APPROVED
1			
2			

**NOTES:**  
 THIS MOTOR IS HEAVIER THAN AN EQUIVALENT POWER EXPENDABLE MOTOR. THE CENTER OF GRAVITY/CENTER OF PRESSURE RELATIONSHIP SHOULD BE CALCULATED TO INSURE MARGINS FOR FLIGHT APPLICATIONS.

**WEIGHTS**

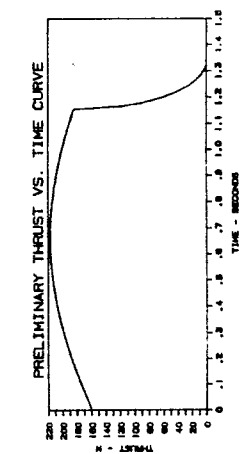
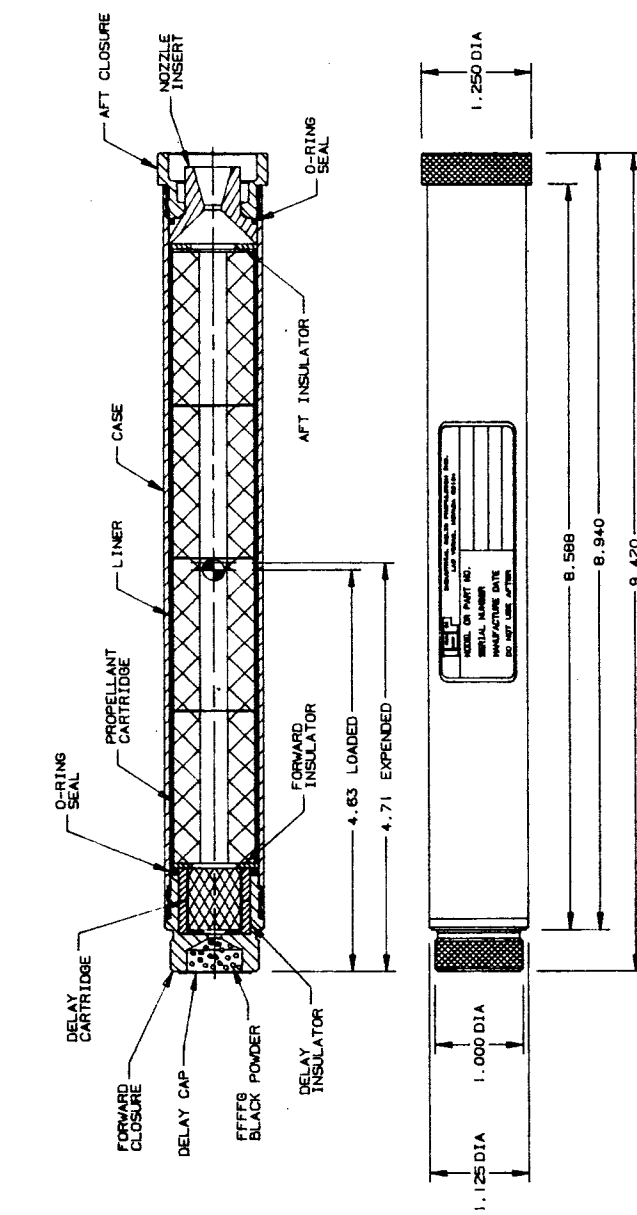
INERTS:	133.28
PROPELLANT:	122.96
DELAY:	7.28
<b>TOTAL:</b>	<b>263.55</b>

**C.G. DISTANCE FROM HEAD END**

X c.g. LOADED	4.63 IN
X c.g. EXPANDED	4.71 IN

**8225 PROPELLANT DATA**

T <sub>6</sub>	3992 °R
MOLECULAR WT.	27.252
GAMMA	1.137
DENSITY	.066 LB/IN <sup>3</sup>
C*	4236 FT/SEC
n	.0120 IN/SEC
	.4495



**PRELIMINARY PERFORMANCE DATA**

AVERAGE THRUST	180.0 N
MAX. THRUST	216.9 N
TOTAL IMPULSE	239.6 N-SEC
BURN TIME	1.32 SEC
AVERAGE PRESSURE	800 PSI
MAX PRESSURE	956 PSI

DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

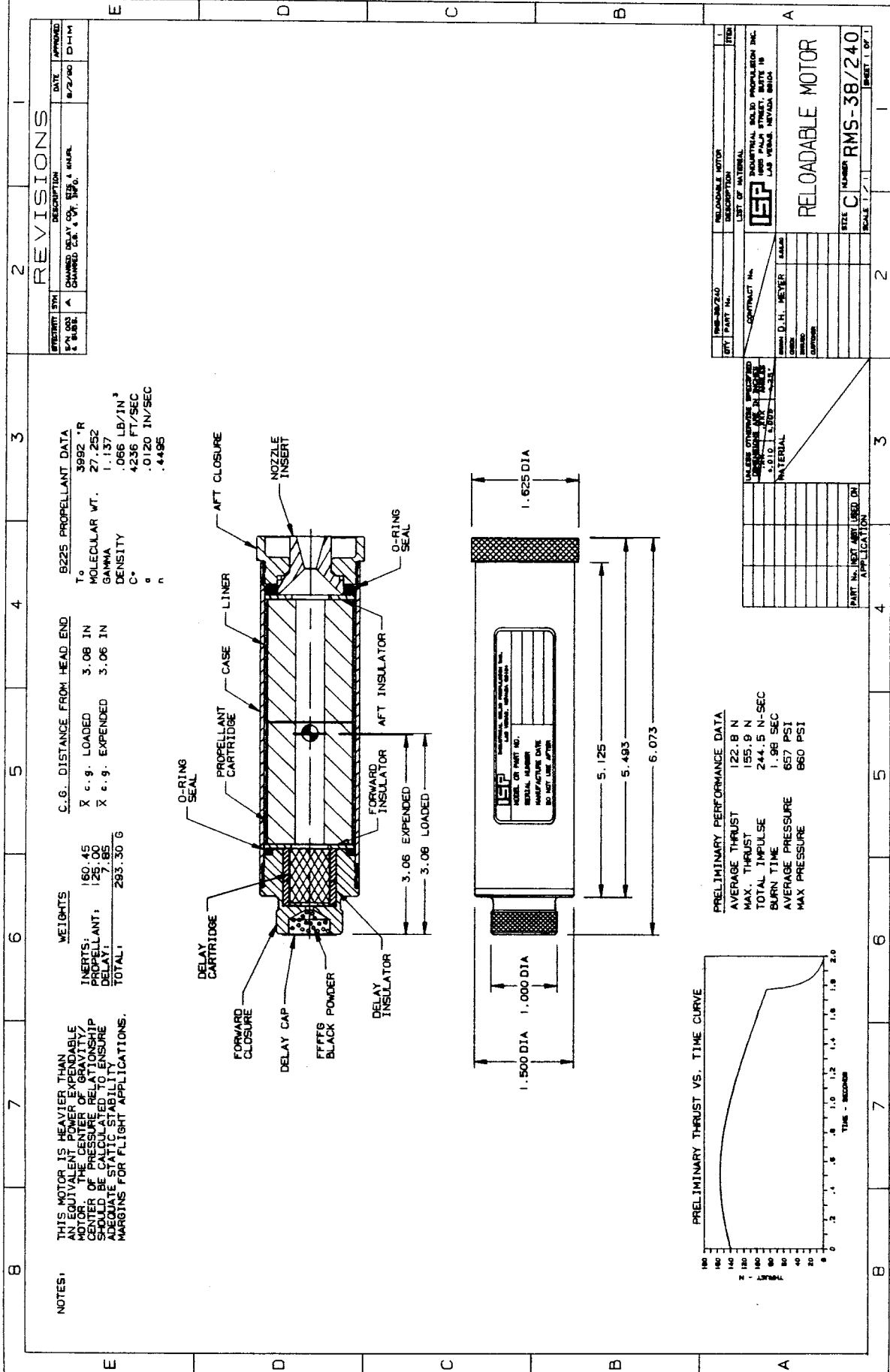
DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

DESIGN/SCALE	REV.	DESCRIPTION	DATE	APPROVED

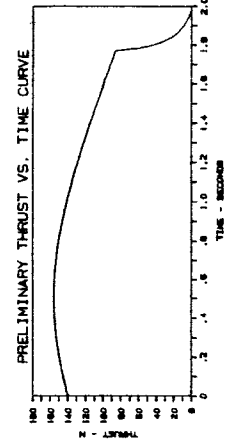


NOTES:  
 THIS MOTOR IS HEAVIER THAN AN EQUIVALENT POWER EXPENDABLE CENTER OF PRESSURE DELAY MOTOR. SHOULD BE CALCULATED TO ENSURE ADEQUATE STATIC STABILITY MARGINS FOR FLIGHT APPLICATIONS.

WEIGHTS  
 INERTS: 160.45  
 PROPELLANT: 125.00  
 DELAY: 7.85  
 TOTAL: 293.30 G

C.G. DISTANCE FROM HEAD END  
 X c.g. LOADED 3.06 IN  
 X c.g. EXPENDED 3.06 IN

B225 PROPELLANT DATA  
 T<sub>0</sub> 3992 °R  
 MOLECULAR WT. 27.252  
 GAMMA 1.137  
 DENSITY .066 LB/IN<sup>3</sup>  
 4236 FT/SEC  
 C\* .0120 IN/SEC  
 n .4495



PRELIMINARY PERFORMANCE DATA  
 AVERAGE THRUST 122.8 N  
 MAX. THRUST 155.9 N  
 TOTAL IMPULSE 244.5 N-SEC  
 BURN TIME 1.98 SEC  
 AVERAGE PRESSURE 657 PSI  
 MAX PRESSURE 860 PSI

2 REVISIONS

REV	DATE	APPROVED	DESCRIPTION
1	8/2/60	D.H.M.	CHANGED DELAY CO. SIZE & MATH.
2			

REV	DATE	APPROVED	DESCRIPTION
1	8/2/60	D.H.M.	CHANGED DELAY CO. SIZE & MATH.
2			

REV	DATE	APPROVED	DESCRIPTION
1	8/2/60	D.H.M.	CHANGED DELAY CO. SIZE & MATH.
2			

REV	DATE	APPROVED	DESCRIPTION
1	8/2/60	D.H.M.	CHANGED DELAY CO. SIZE & MATH.
2			

REV	DATE	APPROVED	DESCRIPTION
1	8/2/60	D.H.M.	CHANGED DELAY CO. SIZE & MATH.
2			

RELOADABLE MOTOR  
 LIST OF MATERIAL  
 CONTRACT No. 63-1000  
 D.H. MEYER  
 ENGINEER  
 REVISIONS

RELOADABLE MOTOR  
 LIST OF MATERIAL  
 CONTRACT No. 63-1000  
 D.H. MEYER  
 ENGINEER  
 REVISIONS

INDUSTRIAL SOLID PROPELLATION INC.  
 1000 PALM STREET, SUITE 18  
 LAS VEGAS, NEVADA 89101

SCALE 1/1

SIZE C NUMBER RMS-38/240

RELOADABLE MOTOR  
 LIST OF MATERIAL  
 CONTRACT No. 63-1000  
 D.H. MEYER  
 ENGINEER  
 REVISIONS

RELOADABLE MOTOR  
 LIST OF MATERIAL  
 CONTRACT No. 63-1000  
 D.H. MEYER  
 ENGINEER  
 REVISIONS

REVISE	SYMBOL	DESCRIPTION	DATE	APPROVED
1	A	CHANGED DIA. OF NOZZLE	7/24/60	D-111

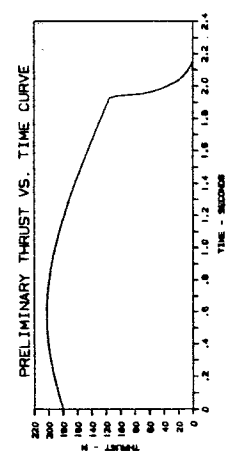
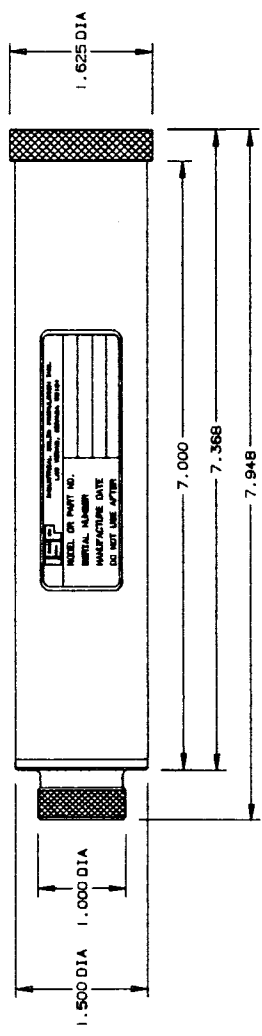
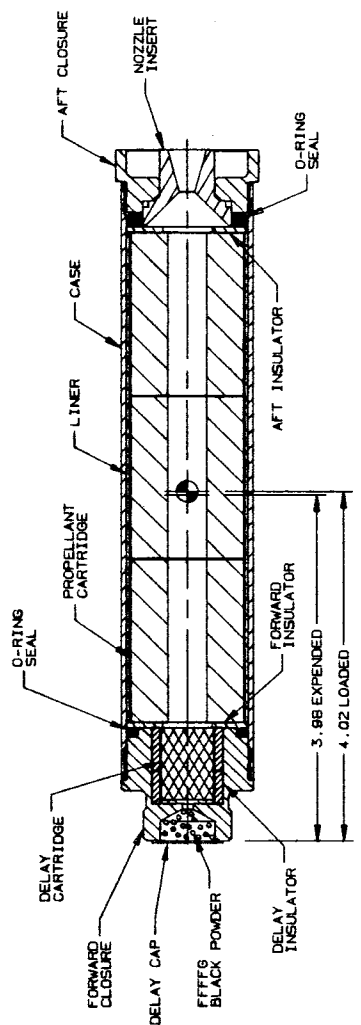
REVISONS	
DESCRIPTION	DATE
APPROVED	APPROVED

NOTES: THIS MOTOR IS HEAVIER THAN AN EQUIVALENT POWER EXPENDABLE MOTOR. THE CENTER OF GRAVITY/CENTER OF PRESSURE RELATIONSHIP SHOULD BE CALCULATED TO ENSURE ADEQUATE STABILITY MARGINS FOR FLIGHT APPLICATIONS.

WEIGHTS  
 INERTS: 189.46  
 PROPELLANT: 187.50  
 DELAY: 7.65  
 TOTAL: 384.61 G

C.G. DISTANCE FROM HEAD END  
 X c.g. LOADED 4.02 IN  
 X c.g. EXPENDED 3.98 IN

8225 PROPELLANT DATA  
 T<sub>0</sub> 3982 °R  
 MOLECULAR WT. 27.252  
 GAMMA 1.137  
 DENSITY .066 LB/IN<sup>3</sup>  
 C\* 4236 FT/SEC  
 n .0120 IN/SEC  
 n .4485



ITEM	DESCRIPTION	QUANTITY
1	RELOADABLE MOTOR	1

ITEM	DESCRIPTION	QUANTITY
1	RELOADABLE MOTOR	1

ITEM	DESCRIPTION	QUANTITY
1	RELOADABLE MOTOR	1

ITEM	DESCRIPTION	QUANTITY
1	RELOADABLE MOTOR	1

ITEM	DESCRIPTION	QUANTITY
1	RELOADABLE MOTOR	1

ITEM	DESCRIPTION	QUANTITY
1	RELOADABLE MOTOR	1

RELOADABLE MOTOR  
 SIZE C NUMBER RMS-38/360  
 SCALE 1:1  
 SHEET 1 OF 1

CONTRACT NO.  
 DESIGNER: D.H. MEYER  
 DRAWN: [ ]  
 CHECKED: [ ]  
 APPROVED: [ ]

MANUFACTURED BY: [ ]  
 MATERIAL: [ ]  
 PART NO. NEXT ASSY USED ON: [ ]  
 APPLICATION: [ ]

MANUFACTURED BY: [ ]  
 MATERIAL: [ ]  
 PART NO. NEXT ASSY USED ON: [ ]  
 APPLICATION: [ ]

MANUFACTURED BY: [ ]  
 MATERIAL: [ ]  
 PART NO. NEXT ASSY USED ON: [ ]  
 APPLICATION: [ ]

MANUFACTURED BY: [ ]  
 MATERIAL: [ ]  
 PART NO. NEXT ASSY USED ON: [ ]  
 APPLICATION: [ ]

# REVISIONS

REVISED BY	DATE	APPROVED
AW	8/2/60	DMM
AW	8/2/60	DMM

9225 PROPELLANT DATA

To 3992 \*R  
 MOLECULAR WT. 27.252  
 GAMMA 1.137  
 DENSITY .066 LB/IN.<sup>3</sup>  
 4236 FT/SEC  
 .0120 IN/SEC  
 .4495

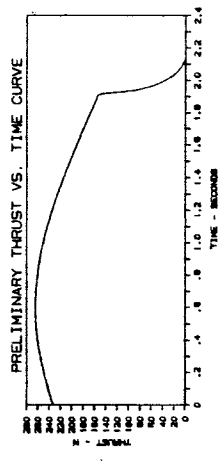
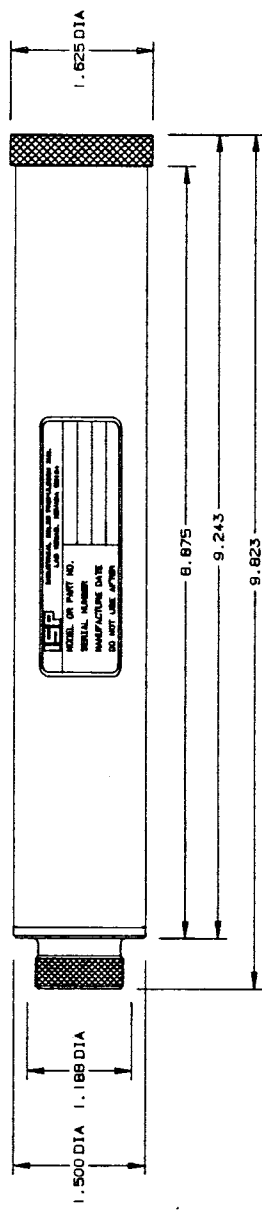
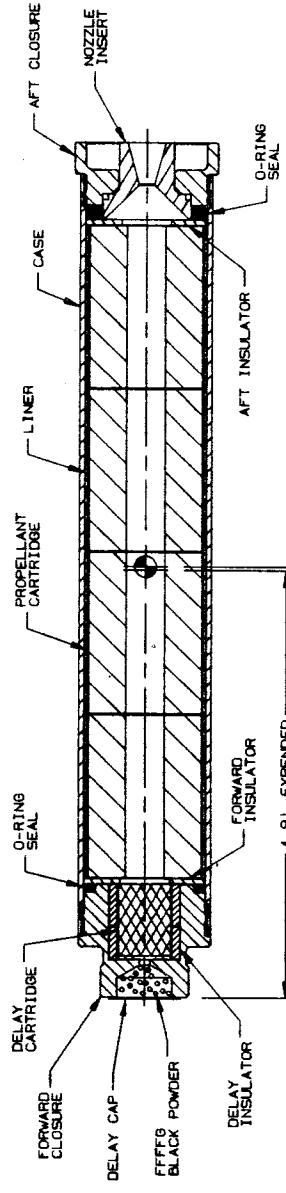
C.G. DISTANCE FROM HEAD END

X c.g. LOADED 4.95 IN  
 X c.g. EXPANDED 4.91 IN

WEIGHTS

505.1  
 INERTS: 666.0  
 PROPELLANT: 27.7  
 DELAY: 1198.8 G  
 TOTAL:

NOTES: THIS MOTOR IS HEAVIER THAN AN EQUIVALENT POWER EXPANDABLE MOTOR. THE CENTER OF GRAVITY/CENTER OF PRESSURE RELATIONSHIP SHOULD BE CALCULATED TO ENSURE ADEQUATE STABILITY MARGINS FOR FLIGHT APPLICATIONS.



PRELIMINARY PERFORMANCE DATA

AVERAGE THRUST	211.0 N
MAX. THRUST	285.8 N
TOTAL IMPULSE	452.7 N-SEC
BURN TIME	2.13 SEC
AVERAGE PRESSURE	553 PSI
MAX PRESSURE	704 PSI

RELOADABLE MOTOR

LIST OF MATERIAL

INDUSTRIAL BOLD PROPELLATION INC.  
 1000 W. PALM BLVD., SUITE 18  
 LAS VEGAS, NEVADA 89102

CONTRACT NO.

ISSUED BY: JAMES D. H. MEYER

DATE: 8/2/60

SCALE: 1:1

SIZE: C

NUMBER: RMS-38/480

FIGURE: 1 OF 1

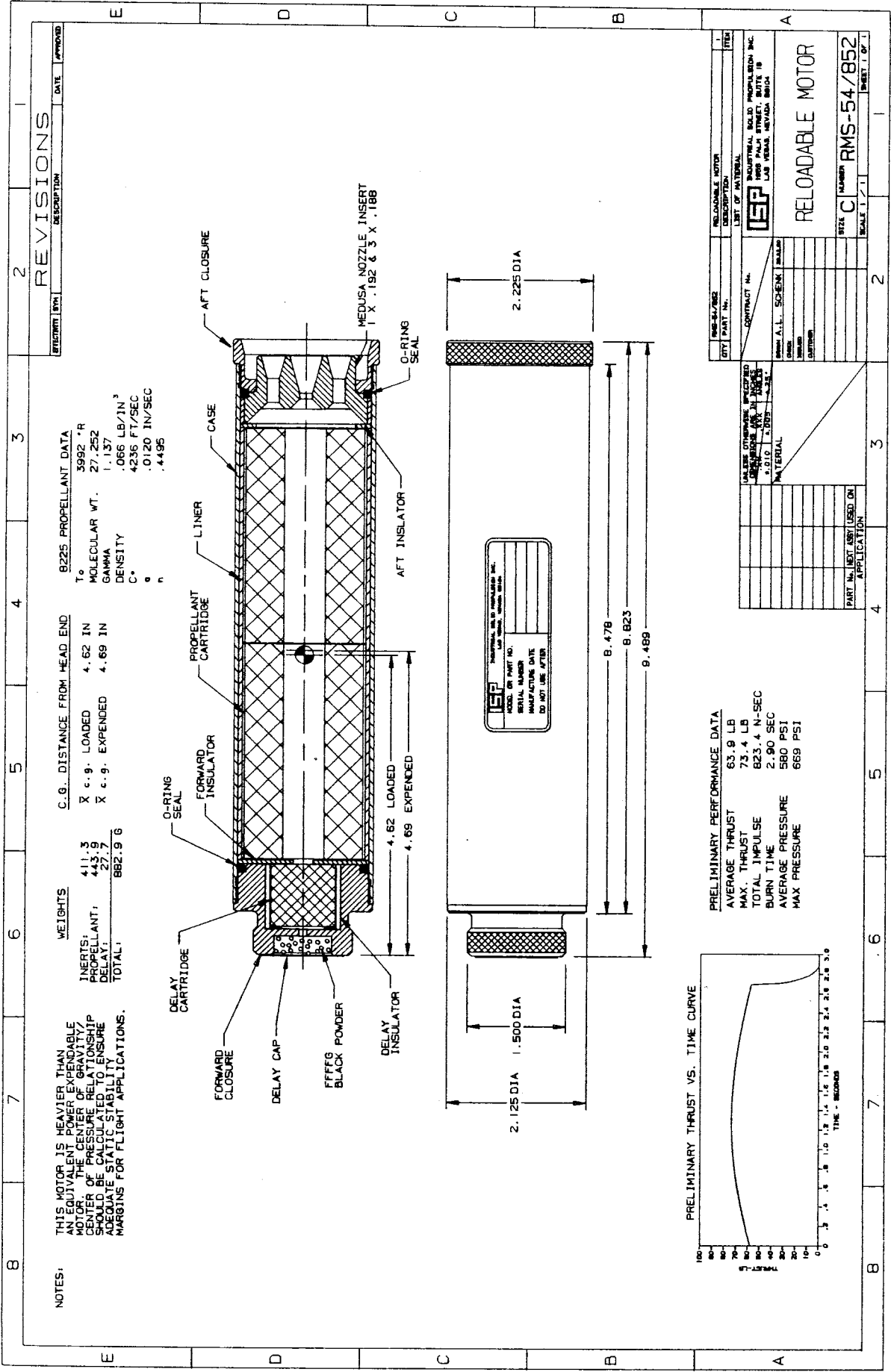
USE THE FOLLOWING INFORMATION TO IDENTIFY THE MOTOR AND TO IDENTIFY THE MATERIAL

INS-38/480

PART NO. NET WEIGHT (G)

APPLICATION





REV	DATE	DESCRIPTION	APPROVED
2			

B225 PROPELLANT DATA  
 T<sub>0</sub> 3992 \*R  
 MOLECULAR WT. 27.252  
 GAMMA 1.137  
 DENSITY .066 LB/IN.<sup>3</sup>  
 C\* 4236 FT/SEC  
 g .0120 IN/SEC  
 n .4495

C.G. DISTANCE FROM HEAD END  
 X c.g. LOADED 4.62 IN  
 X c.g. EXPANDED 4.69 IN

WEIGHTS  
 INERTS: 411.3  
 PROPELLANT: 443.9  
 DELAY: 27.7  
 TOTAL: 882.9 lb

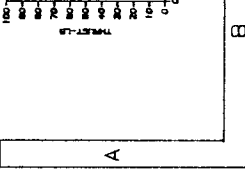
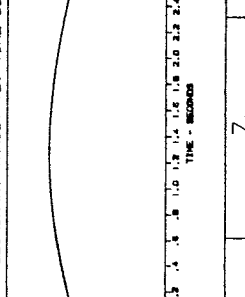
NOTES:  
 THIS MOTOR IS HEAVIER THAN AN EQUIVALENT POWER EXPENDABLE MOTOR. THE CENTER OF GRAVITY, CENTER OF PRESSURE RELATIONSHIP SHOULD BE CALCULATED TO ENSURE ADEQUATE STATISTICAL MARGINS FOR FLIGHT APPLICATIONS.

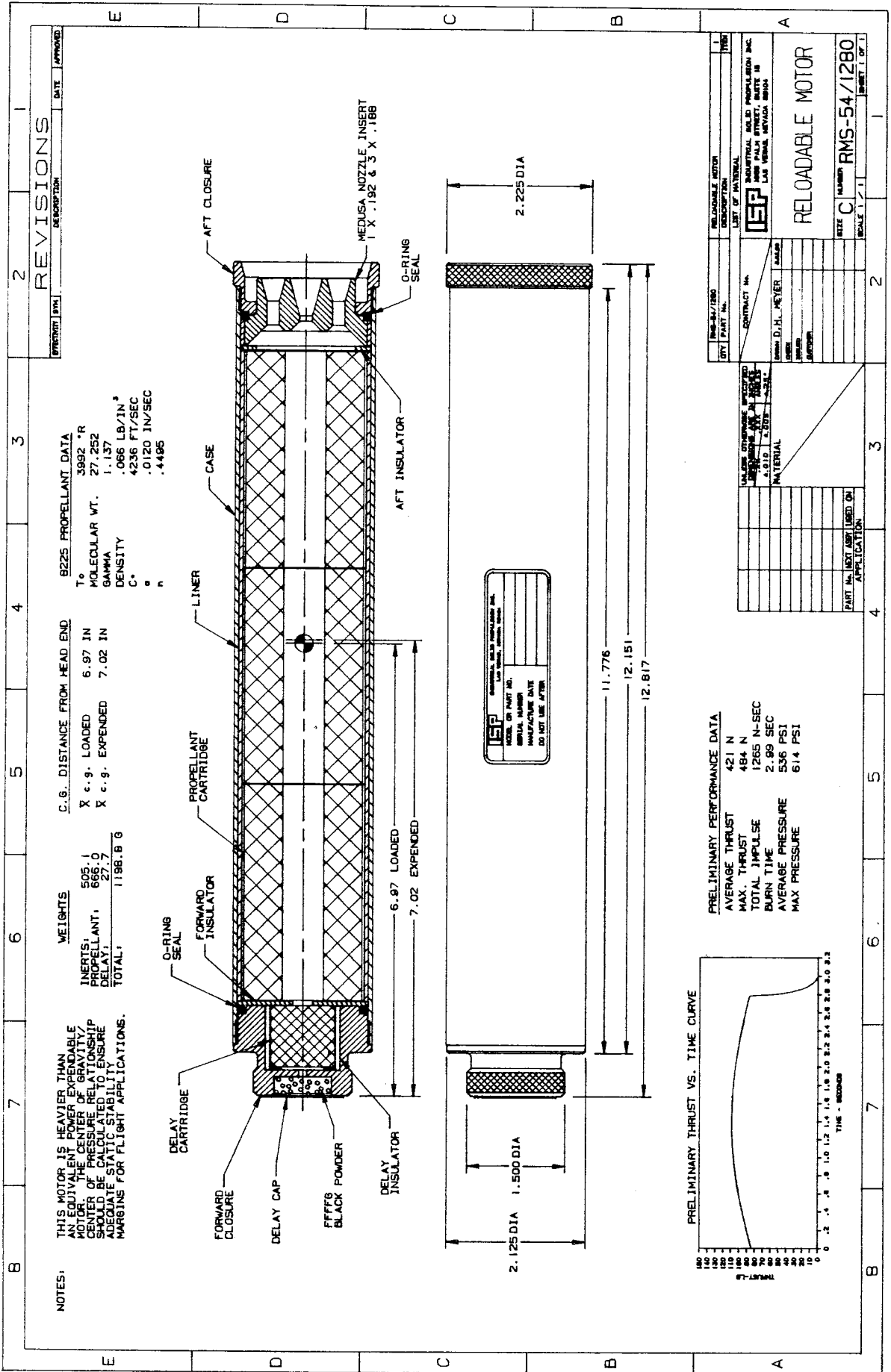
INDUSTRIAL BOLD PROPELLANT INC.	RELOADABLE MOTOR
CONTRACT NO. SERIAL NO. MANUFACTURE DATE DO NOT USE AFTER	LIST OF MATERIALS ITEM
CITY PART NO. STATE ZIP CODE	INDUSTRIAL BOLD PROPELLANT INC. 100 WALL STREET, SUITE 18 JERSEY CITY, N.J. 07310
NAME A.L.L. SCHEIN DESIGNER CHECKED DATE	RELOADABLE MOTOR SCALE 1/1
PART NO. NOT USED ON APPLICATION	SIZE C NUMBER RMS-54/852 SHEET 1 OF 1

INDUSTRIAL BOLD PROPELLANT INC.	RELOADABLE MOTOR
MODEL ON PART NO. SERIAL NUMBER MANUFACTURE DATE DO NOT USE AFTER	LIST OF MATERIALS ITEM
CITY PART NO. STATE ZIP CODE	INDUSTRIAL BOLD PROPELLANT INC. 100 WALL STREET, SUITE 18 JERSEY CITY, N.J. 07310
NAME A.L.L. SCHEIN DESIGNER CHECKED DATE	RELOADABLE MOTOR SCALE 1/1
PART NO. NOT USED ON APPLICATION	SIZE C NUMBER RMS-54/852 SHEET 1 OF 1

INDUSTRIAL BOLD PROPELLANT INC.	RELOADABLE MOTOR
MODEL ON PART NO. SERIAL NUMBER MANUFACTURE DATE DO NOT USE AFTER	LIST OF MATERIALS ITEM
CITY PART NO. STATE ZIP CODE	INDUSTRIAL BOLD PROPELLANT INC. 100 WALL STREET, SUITE 18 JERSEY CITY, N.J. 07310
NAME A.L.L. SCHEIN DESIGNER CHECKED DATE	RELOADABLE MOTOR SCALE 1/1
PART NO. NOT USED ON APPLICATION	SIZE C NUMBER RMS-54/852 SHEET 1 OF 1

INDUSTRIAL BOLD PROPELLANT INC.	RELOADABLE MOTOR
MODEL ON PART NO. SERIAL NUMBER MANUFACTURE DATE DO NOT USE AFTER	LIST OF MATERIALS ITEM
CITY PART NO. STATE ZIP CODE	INDUSTRIAL BOLD PROPELLANT INC. 100 WALL STREET, SUITE 18 JERSEY CITY, N.J. 07310
NAME A.L.L. SCHEIN DESIGNER CHECKED DATE	RELOADABLE MOTOR SCALE 1/1
PART NO. NOT USED ON APPLICATION	SIZE C NUMBER RMS-54/852 SHEET 1 OF 1





**REVISIONS**

REV	DESCRIPTION	DATE	APPROVED
1			
2			

**8225 PROPELLANT DATA**

To	3992 *R
MOLECULAR WT.	27.252
GAMMA	1.137
DENSITY	.066 LB/IN <sup>3</sup>
C*	4236 FT/SEC
e	.0120 IN/SEC
h	.4495

**C.G. DISTANCE FROM HEAD END**

X c.g. LOADED	6.97 IN
X c.g. EXPANDED	7.02 IN

**WEIGHTS**

INERTS	505.1
PROPELLANT	666.0
DELAY	27.7
TOTAL	1198.8 G

**NOTES:** THIS MOTOR IS HEAVIER THAN AN EQUIVALENT POWER EXPANDABLE MOTOR. THE CENTER OF GRAVITY/CENTER OF PRESSURE RELATIONSHIP SHOULD BE CALCULATED TO ENSURE MARGINS FOR FLIGHT APPLICATIONS.

**PRELIMINARY PERFORMANCE DATA**

AVERAGE THRUST	421 N
MAX THRUST	484 N
TOTAL IMPULSE	1265 N-SEC
BURN TIME	2.89 SEC
AVERAGE PRESSURE	536 PSI
MAX PRESSURE	614 PSI

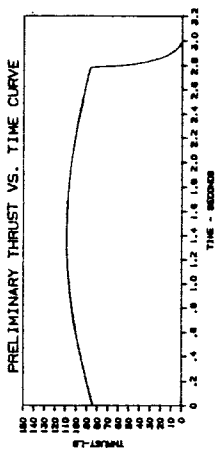
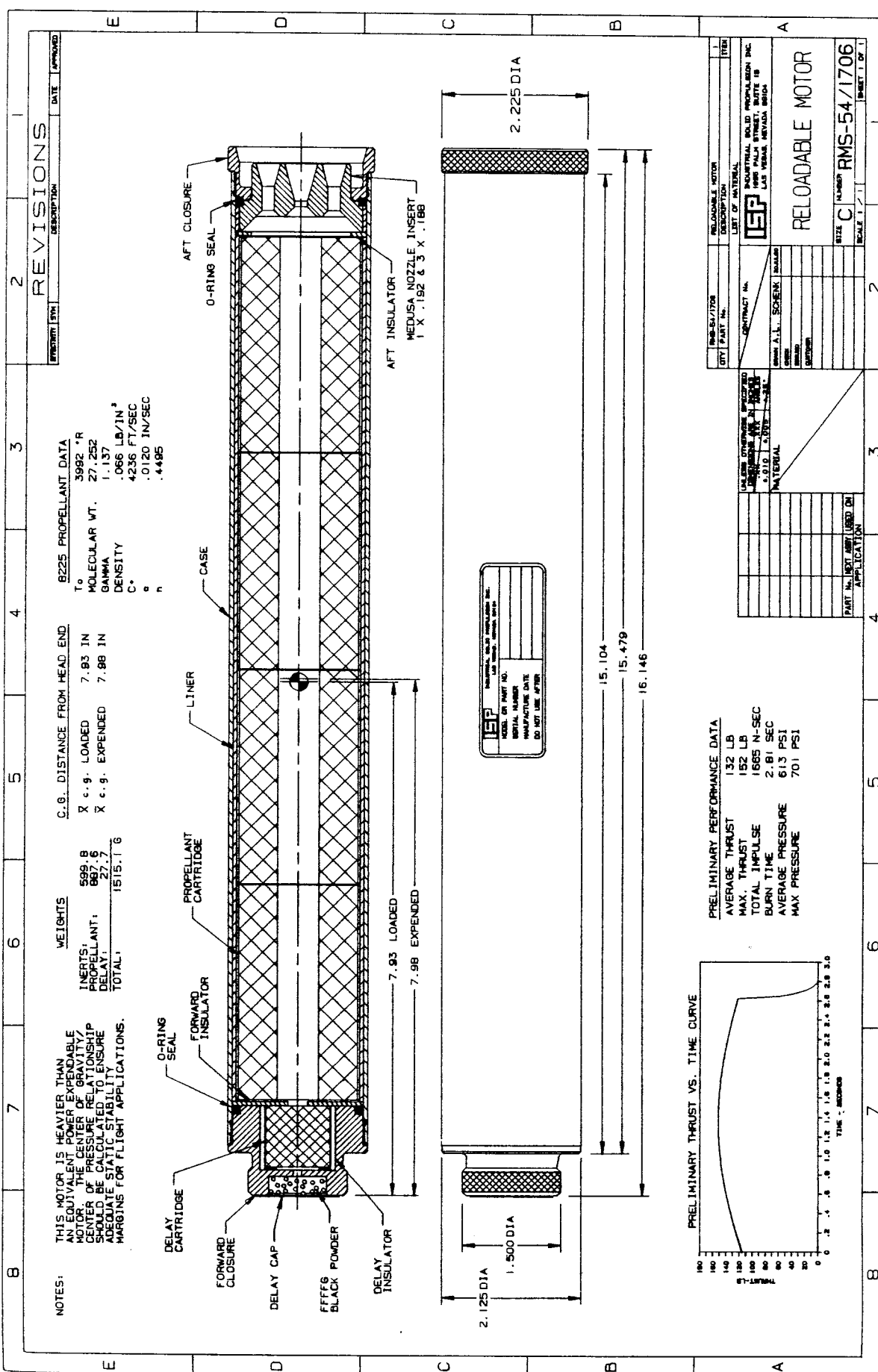


FIG.-84/1280	RELOADABLE MOTOR														
QTY PART NO.	DESCRIPTION														
<table border="1"> <tr> <td>CONTRACT NO.</td> <td>INDUSTRIAL BOLD PROPELLANT INC.</td> </tr> <tr> <td>DESIGN NO.</td> <td>RELOADABLE MOTOR</td> </tr> <tr> <td>REV.</td> <td>REV. 1</td> </tr> <tr> <td>DATE</td> <td>NOV 1968</td> </tr> <tr> <td>BY</td> <td>W.D.H. MEYER</td> </tr> <tr> <td>CHECKED</td> <td></td> </tr> <tr> <td>APPROVED</td> <td></td> </tr> </table>		CONTRACT NO.	INDUSTRIAL BOLD PROPELLANT INC.	DESIGN NO.	RELOADABLE MOTOR	REV.	REV. 1	DATE	NOV 1968	BY	W.D.H. MEYER	CHECKED		APPROVED	
CONTRACT NO.	INDUSTRIAL BOLD PROPELLANT INC.														
DESIGN NO.	RELOADABLE MOTOR														
REV.	REV. 1														
DATE	NOV 1968														
BY	W.D.H. MEYER														
CHECKED															
APPROVED															
SCALE	1:1														
SIZE	C														
NAME	RMS-54/1280														
SHEET	1 OF 1														

UNION OF ENGINEERS	RESEARCH
MEMBER	OF THE
A.S.T.M.	STANDARD
MATERIAL	
PART NO. NOT LISTED ON	APPLICATION



**REVISIONS**

REV	DESCRIPTION	DATE	APPROVED
2			

**5225 PROPELLANT DATA**  
 To 3992 \*R  
 MOLECULAR WT. 27.252  
 GAMMA 1.137  
 DENSITY .066 LB/IN<sup>3</sup>  
 C\* 4236 FT/SEC  
 n .4495

**C.G. DISTANCE FROM HEAD END**  
 X c.g. - LOADED 7.93 IN  
 X c.g. - EXPENDED 7.98 IN

**WEIGHTS**  
 INSERTS: 599.8  
 PROPELLANT: 827.9  
 DELAY: 27.9  
 TOTAL: 1515.1 G

**NOTES:**  
 THIS MOTOR IS HEAVIER THAN AN ADVISORY GRAVITY MOTOR. THE CENTER OF GRAVITY/ CENTER OF PRESSURE RELATIONSHIP SHOULD BE CALCULATED TO ENSURE ADEQUATE STATIC STABILITY MARGINS FOR FLIGHT APPLICATIONS.

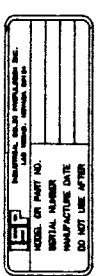
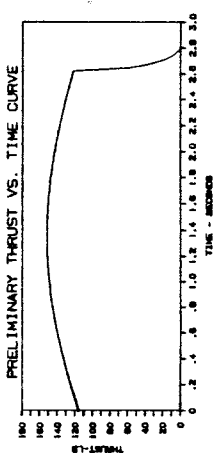
**5225 PROPELLANT DATA**  
 To 3992 \*R  
 MOLECULAR WT. 27.252  
 GAMMA 1.137  
 DENSITY .066 LB/IN<sup>3</sup>  
 C\* 4236 FT/SEC  
 n .4495

**C.G. DISTANCE FROM HEAD END**  
 X c.g. - LOADED 7.93 IN  
 X c.g. - EXPENDED 7.98 IN

**WEIGHTS**  
 INSERTS: 599.8  
 PROPELLANT: 827.9  
 DELAY: 27.9  
 TOTAL: 1515.1 G

**NOTES:**  
 THIS MOTOR IS HEAVIER THAN AN ADVISORY GRAVITY MOTOR. THE CENTER OF GRAVITY/ CENTER OF PRESSURE RELATIONSHIP SHOULD BE CALCULATED TO ENSURE ADEQUATE STATIC STABILITY MARGINS FOR FLIGHT APPLICATIONS.

**PRELIMINARY PERFORMANCE DATA**  
 AVERAGE THRUST 132 LB  
 MAX. THRUST 152 LB  
 TOTAL IMPULSE 1665 N-SEC  
 BURN TIME 2.81 SEC  
 AVERAGE PRESSURE 613 PSI  
 MAX PRESSURE 701 PSI



IND. SA/1708	RELOADABLE MOTOR
1	1708
LIST OF MATERIAL	
INDUSTRIAL SOLID PROPELLANT INC.	
1000 PALM STREET, SUITE 18	
LAS VEGAS, NEVADA 89104	
CONTRACT NO.	
CROSS A.L. SCHEM	
SERIAL	
DATE	
DRAWN	
CHECKED	
APPROVED	
SCALE 1/1	
SIZE C	NUMBER RMS-54/1706
SHEET 1 OF 1	

**RELOADABLE MOTOR**

**PART NO. 5225**  
**USED ON**  
**APPLICATION**

3

4

5

6

7

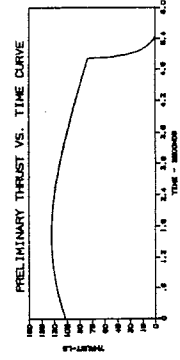
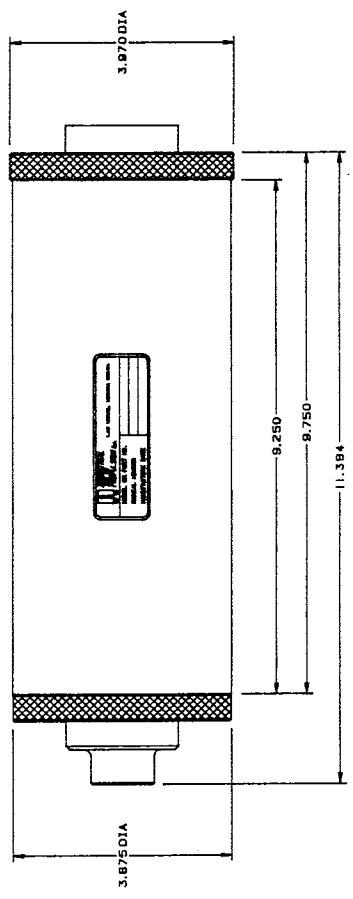
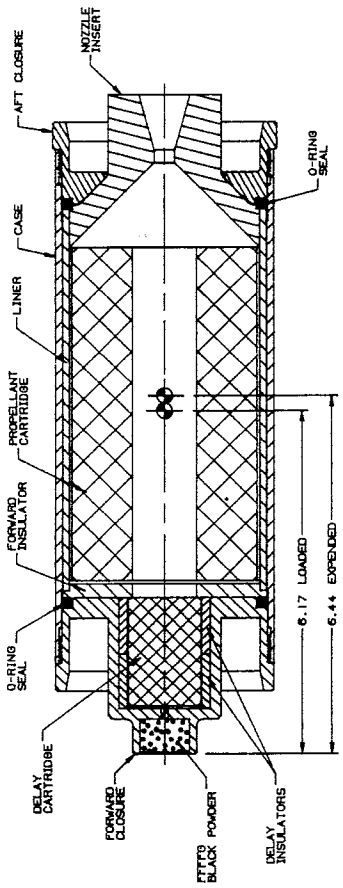
8

NOTES:  
THIS MOTOR IS HEAVIER THAN AN EQUIVALENT POWER EXPENDABLE MOTOR. THE CENTER OF GRAVITY/PROPULSION IS CALIBRATED TO ENSURE ASSOCIATE STATIC STABILITY MARGINS FOR FLIGHT APPLICATIONS.

WEIGHTS  
INERTS: 1886.43  
PROPULSION: 1350.37  
TOTAL: 3106.15 lb

C.B. DISTANCE FROM HEAD END  
X o-g. LOADED: 6.17 IN  
X o-g. EXPENDED: 6.44 IN

6225 PROPPELLANT DATA  
3982 -R  
27.132  
0.088 LB/IN<sup>3</sup>  
4236 FT/SEC  
0.120 IN/SEC  
.4495



PRELIMINARY PERFORMANCE DATA  
AVERAGE THRUST 103 LB  
MAX. THRUST 123 LB  
TOTAL IMPULSE 2496 N-SEC  
BURN TIME 5.43 SEC  
AVERAGE PRESSURE 551 PSI  
MAX PRESSURE 725 PSI

RMS-98/2560		RELOADABLE MOTOR		1	
INDUSTRIAL SOLID PROPELLANT INC. 1085 PALM STREET, SUITE 18 LAS VEGAS, NEVADA 89104		SCHAENK		DO NOT SCALE DIMENSIONS	
RMS-98/2560		RMS-98/2560		RMS-98/2560	
1/1		1/1		1/1	

3

4

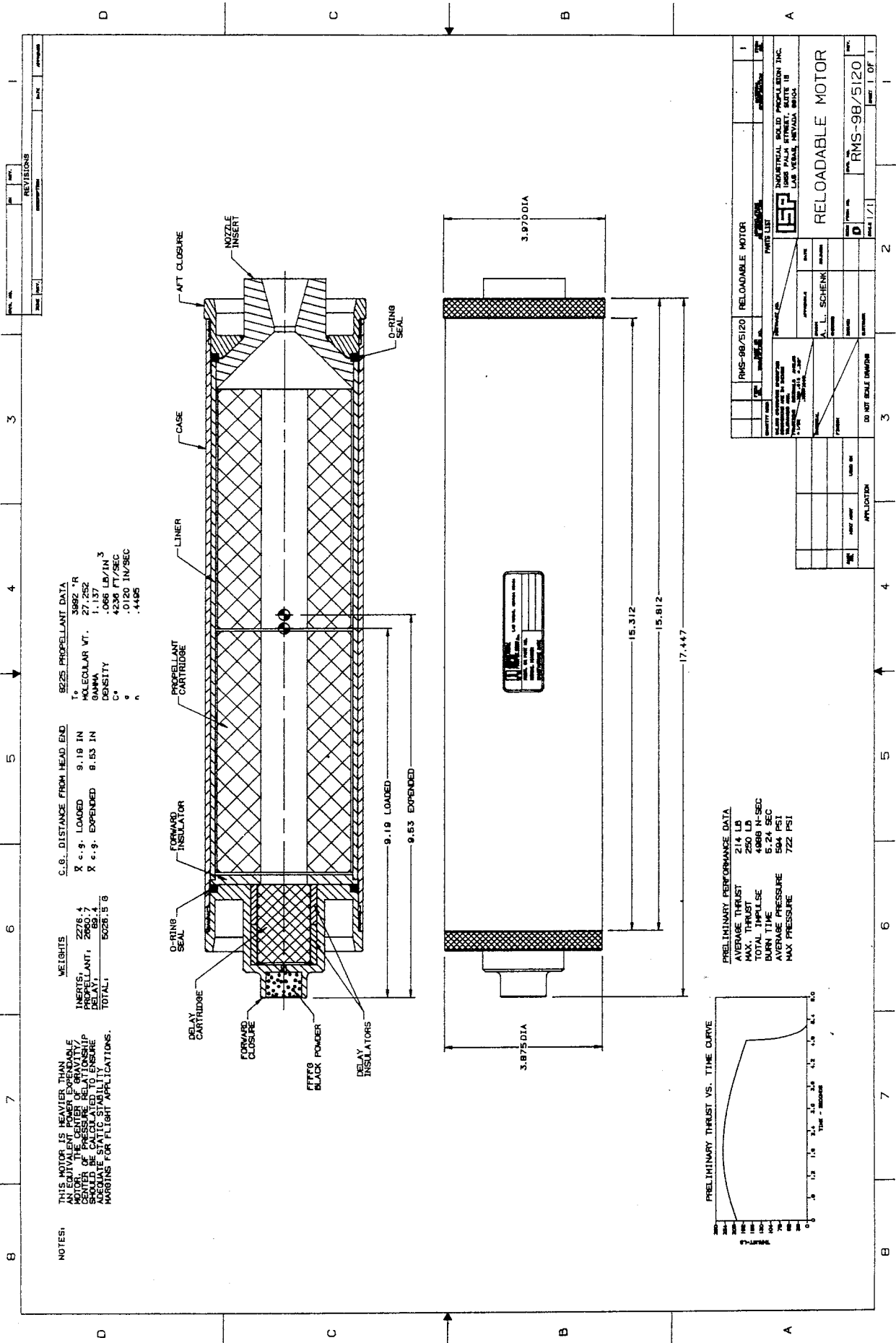
5

6

7

8





REV. NO. DATE BY APPR. BY

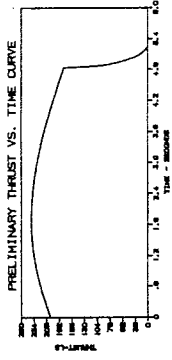
REV.	NO.	DATE	BY	APPR.

NOTES:  
 THIS MOTOR IS HEAVIER THAN AN EQUIVALENT POWER EXPANDABLE MOTOR. THE CENTER OF GRAVITY/PROPPELLANT, 2660.7 INCHES, SHOULD BE CALCULATED TO ENSURE ADEQUATE STATIC STABILITY MARGINS FOR FLIGHT APPLICATIONS.

WEIGHTS  
 INERTS: 2276.4  
 PROPPELLANT, 2660.7  
 TOTAL: 5228.3 G

C.O. DISTANCE FROM HEAD END  
 X c.g. LOADED 9.19 IN  
 X c.g. EXPANDED 9.63 IN

5225 PROPPELLANT DATA  
 Tc 3992 °R  
 REGULAR WT. 27.252  
 DENSITY 1.086 LB/IN<sup>3</sup>  
 CA 4236 FT/SEC  
 C .0120 IN/SEC  
 C .4485



PRELIMINARY PERFORMANCE DATA  
 AVERAGE THRUST 214 LB  
 MAX. THRUST 250 LB  
 TOTAL IMPULSE 4988 N-SEC  
 BURN TIME 6.24 SEC  
 AVERAGE PRESSURE 504 PSI  
 MAX PRESSURE 722 PSI

PROPERTY NO.	DATE	BY	APPROVED BY

DO NOT SCALE DIMENSIONS

APPLICATION

SCALE 1/1

REV. NO. DATE BY APPR. BY

REV.	NO.	DATE	BY	APPR.

ITEM NO. 1

DESCRIPTION: RELOADABLE MOTOR

QUANTITY: 1

UNIT: EACH

DATE: 10/1/58

BY: [Signature]

APPROVED BY: [Signature]

RELOADABLE MOTOR

ITEM NO. 1

DESCRIPTION: RELOADABLE MOTOR

QUANTITY: 1

UNIT: EACH

DATE: 10/1/58

BY: [Signature]

APPROVED BY: [Signature]

RELOADABLE MOTOR

ITEM NO. 1

DESCRIPTION: RELOADABLE MOTOR

QUANTITY: 1

UNIT: EACH

DATE: 10/1/58

BY: [Signature]

APPROVED BY: [Signature]

RELOADABLE MOTOR

ITEM NO. 1

DESCRIPTION: RELOADABLE MOTOR

QUANTITY: 1

UNIT: EACH

DATE: 10/1/58

BY: [Signature]

APPROVED BY: [Signature]

RELOADABLE MOTOR

ITEM NO. 1

DESCRIPTION: RELOADABLE MOTOR

QUANTITY: 1

UNIT: EACH

DATE: 10/1/58

BY: [Signature]

APPROVED BY: [Signature]

RELOADABLE MOTOR

ITEM NO. 1

DESCRIPTION: RELOADABLE MOTOR

QUANTITY: 1

UNIT: EACH

DATE: 10/1/58

BY: [Signature]

APPROVED BY: [Signature]

RELOADABLE MOTOR

ITEM NO. 1

DESCRIPTION: RELOADABLE MOTOR

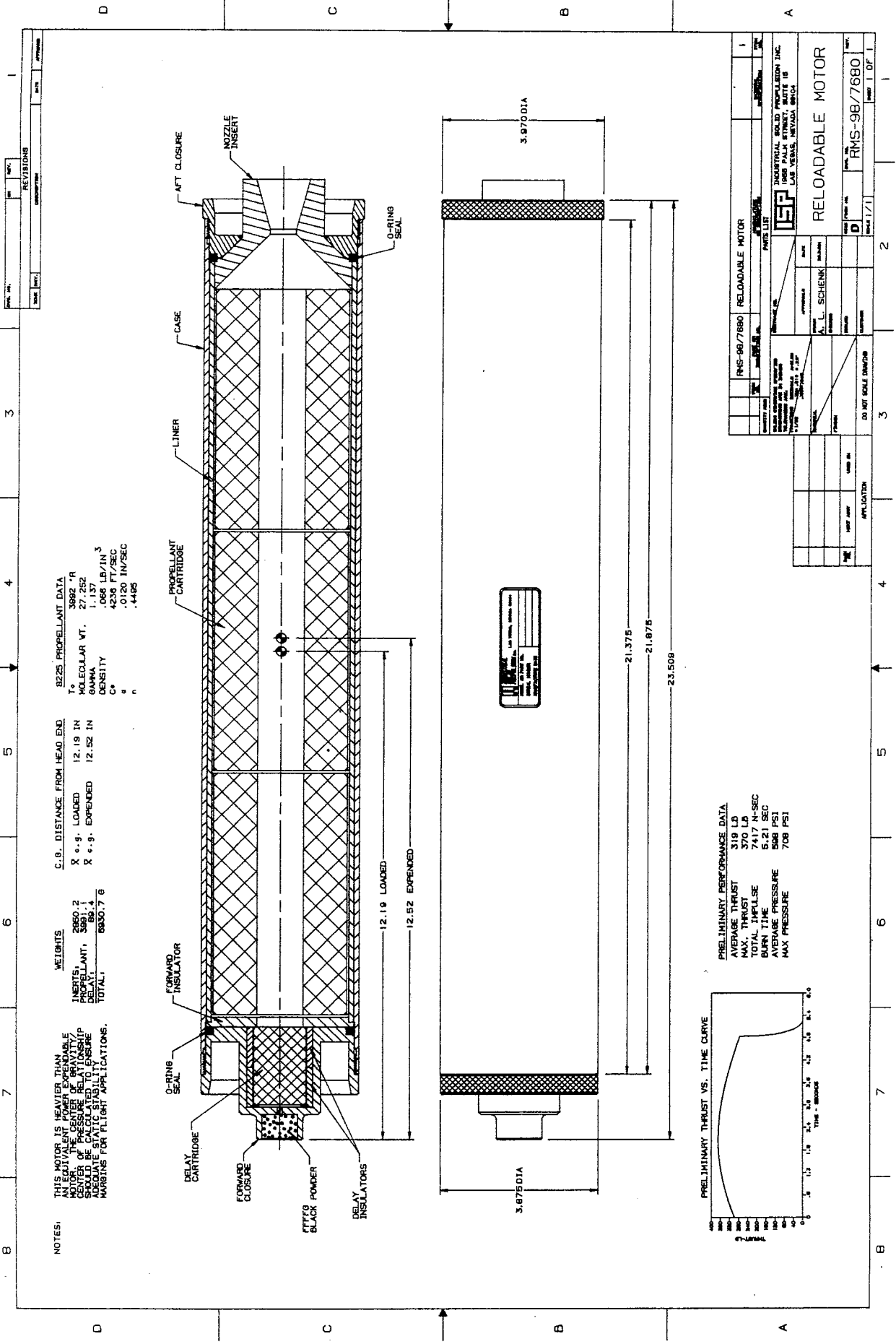
QUANTITY: 1

UNIT: EACH

DATE: 10/1/58

BY: [Signature]

APPROVED BY: [Signature]

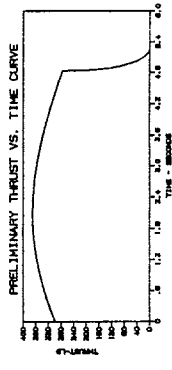


NOTES:  
 THIS MOTOR IS HEAVIER THAN AN EQUIVALENT POWER EXPENDABLE INERTS MOTOR. THE CENTER OF PRESSURE RELATIONSHIP SHOULD BE CALCULATED TO ENSURE MARGINS FOR FLIGHT APPLICATIONS.

WEIGHTS  
 INERTS 2850.2  
 DELAY 388.4  
 TOTAL 3238.6

C.G. DISTANCE FROM HEAD END  
 X o.g. LOADED 12.19 IN  
 X o.g. EXPENDED 12.52 IN

8225 PROPELLANT DATA  
 T\* 3882 °R  
 MOLECULAR WT. 27.252  
 GAMMA 1.137  
 DENSITY .068 LB/IN<sup>3</sup>  
 C\* 4236 FT/SEC  
 e .0120 IN/SEC  
 n .4485



PRELIMINARY PERFORMANCE DATA  
 AVERAGE THRUST 319 LB  
 MAX. THRUST 370 LB  
 BURST TIME PULSE 5.17 msec  
 AVERAGE PRESSURE 508 PSI  
 MAX PRESSURE 708 PSI

RMS-9B/7680 RELOADABLE MOTOR		PARTS LIST	
REV.	DATE	BY	CHKD.
1			
INDUSTRIAL SOLID PROPELLANT INC. 1800 PALM STREET, SUITE 10 LAS VEGAS, NEVADA 89104			
DO NOT SCALE DIMENSIONS		SCALE 1/1	
APPLICATOR		DATE	
RMS-9B/7680		RMS-9B/7680	
REV. 1		REV. 1	

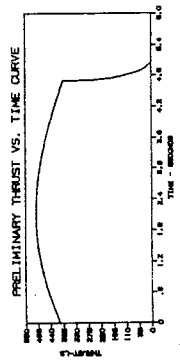
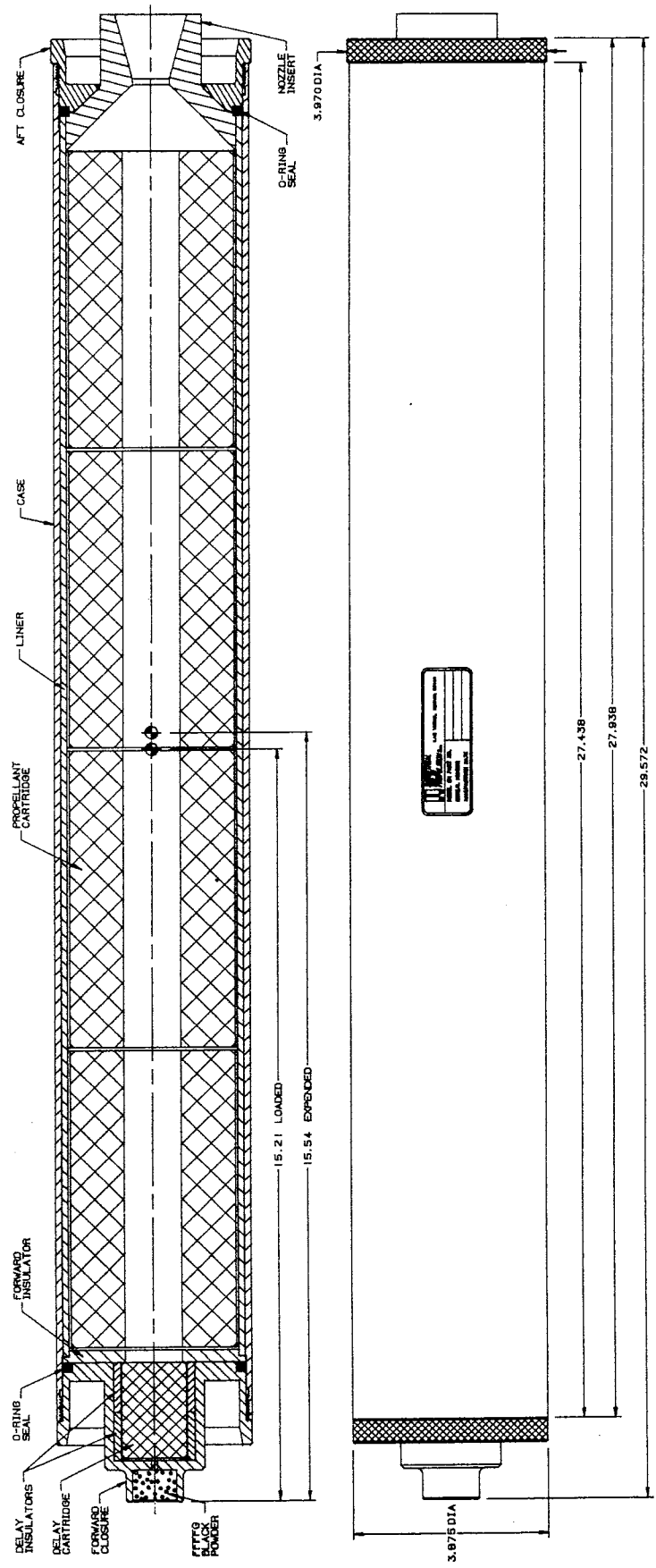
REV.	DATE	DESCRIPTION

8225 PROPELLANT DATA  
 T<sub>0</sub> 3892 °R  
 MOLECULAR WT. 27.252  
 GAMMA 1.137  
 DENSITY .066 LB/IN<sup>3</sup>  
 C\* 4236 FT/SEC  
 C<sub>0</sub> .0120 IN/SEC  
 C<sub>1</sub> .4495

C.B. DISTANCE FROM HEAD END  
 X e.g. LOADED 15.21 IN  
 X e.g. EXPENDED 15.54 IN

WEIGHTS  
 INERTS 3433.7  
 PROPELLANT 584.4  
 TOTAL 8844.5 lb

NOTES:  
 THIS MOTOR IS HEAVIER THAN AN EQUIVALENT POWER EXPENDABLE MOTOR. THE CENTER OF GRAVITY SHOULD BE CALCULATED TO ENSURE ADEQUATE STATIC STABILITY MARGINS FOR FLIGHT APPLICATIONS.



PRELIMINARY PERFORMANCE DATA  
 AVERAGE THRUST 436 LB  
 MAX. THRUST 508 LB  
 BURN TIME 5.07 SEC  
 BURN THROTTLE 5.07 SEC  
 AVERAGE PRESSURE 826 PSI  
 MAX PRESSURE 745 PSI

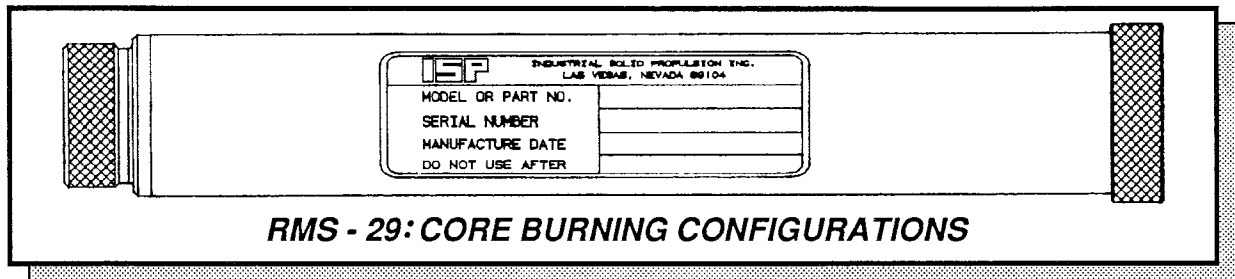
REV.	DATE	DESCRIPTION

RMS-9B/10240	RELOADABLE MOTOR
INDUSTRIAL SOLID PROPELLATION INC. 1000 MAIN STREET, SUITE 18 LOS ANGELES, CALIF. 90015	
DESIGNED BY	A. L. SCHENK
DATE	1/71
DO NOT SCALE DIMENSIONS	

APPLICATOR	





**RMS - 29: CORE BURNING CONFIGURATIONS**

**Assembly and Operation Instructions**

**BEFORE YOU BEGIN:**

**DO NOT OPEN RELOAD KIT UNTIL READY TO USE.**

- Study the illustrations and sequence of assembly. **THE SEQUENCE OF ASSEMBLY IS EXTREMELY IMPORTANT.** Review the parts list and become familiar with all parts before assembly. **If any parts are missing or damaged, contact ISP™ at 1-800-752-8018.**
- **DO NOT MODIFY THE MOTOR IN ANY WAY.** Modification of the motor or the reload kit parts could result in motor failure and lead to the destruction of both your rocket and motor. Modification of the motor or reload kit in any way will invalidate your motor warranty.
- **USE ONLY ISP™ RELOAD KITS AND MOTOR PARTS TO REFURBISH YOUR RMS™.** The ISP™ reload kits have been designed specifically for use in your particular ISP™ motor. Use of imitation components may destroy your motor, rocket and payload and will invalidate your motor warranty. Only use ISP™ reload kits intended for your specific ISP™ motor. **DO NOT INTERCHANGE PARTS!** Do not use ISP™ reload kits or motor components for any other purpose than to refurbish an ISP™ RMS™ motor.
- **DO NOT REUSE ANY OF THE DISPOSABLE PARTS OF THE RMS™ RELOAD KIT.** This includes the liner, nozzle insert 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 will invalidate your motor warranty.
- **DO NOT USE ANY PARTS OF THE RMS™ SYSTEM THAT ARE DAMAGED IN ANY WAY.** If in doubt, contact ISP™ at the number above for assistance.

**PARTS:**

**RELOADABLE MOTOR SYSTEM**

Aft closure	1
Case	1
Forward closure	1
O-ring grease	1 tube

**RELOAD KIT**

Nozzle	1
Liner	1
Propellant grains	*
Thin (aft) O-ring (1/16" thick X 1" dia.)	1
Thick (fwd) O-ring (3/32" thick X 1" dia.)	1
Outer delay O-ring (5/8" O.D.)	1
Inner delay O-ring (1/2" O.D.)	1
Delay element	1
Delay insulators	2
Forward & aft insulators (1" O.D.)	2
Delay spacer ring(s) (5/8" O.D.)	0,1 or 2
Ejection charge container	1
Ejection charge cap	1
COPPERHEAD™ igniter	1
Nozzle cap igniter holder	1
Pre-moistened towellette	1
Thermalite igniter booster ("H" only)	1

\* Number of grains will vary depending on motor size.

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

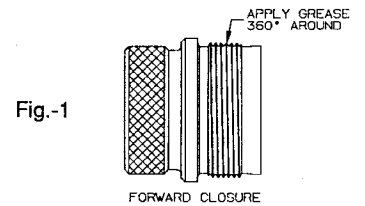
**ALSO NEEDED FOR ASSEMBLY:**

- 3/4" wide masking tape

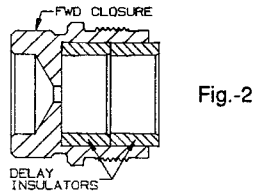


## FORWARD CLOSURE

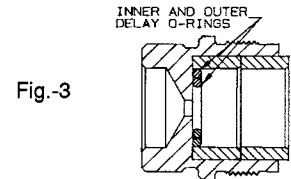
1. Fig.-1: Apply a light coat of grease to the threads of the forward closure. This will facilitate assembly and prevent the threads from seizing.



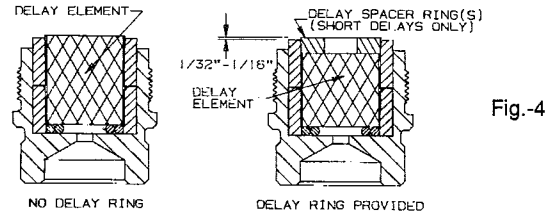
2. Fig.-2: Insert both delay insulators into the cavity in the forward closure such that the chamfered inner edges face the outside of the cavity.



3. Fig.-3: Apply a light coat of grease to the inner and outer delay O-rings. Then drop the O-rings into the delay charge cavity. Be sure they are seated on the bottom. Also check that the O-rings are concentric with each other.



4. Fig.-4: With the delay cavity facing up, gently press the delay element into the cavity until it stops. Install the delay spacer ring (s), if provided, on top of the delay element. The delay element or delay spacer ring should protrude 1/32" to 1/16" above the delay insulator.



5. Fig.-5: Apply a light coat of grease to the threads of both ends of the motor case. Thread the forward closure assembly into one end of the motor case until it stops. DO NOT OVERTIGHTEN. Check to see that the delay spacer ring(s), if used, remain in the forward closure.

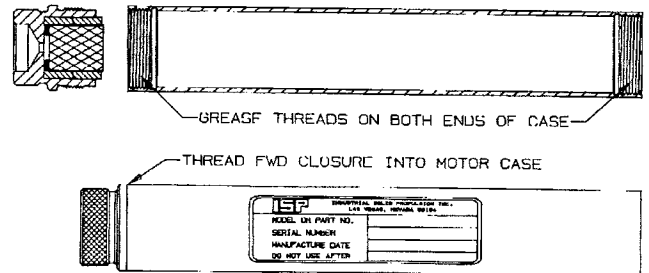
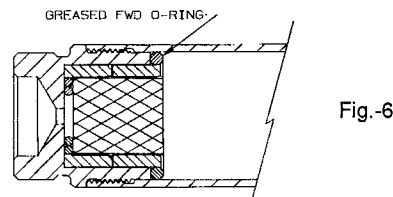


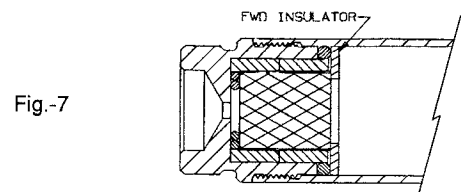
Fig.-5

## CENTRAL COMPONENTS

1. Fig.-6: Apply a light coat of grease to the thick 1" diameter (forward) O-ring. Drop the forward O-ring into the motor case. Be sure it is seated against the forward closure. (**NOTE:** If necessary, use the liner as a tool to help push the O-ring into position.)

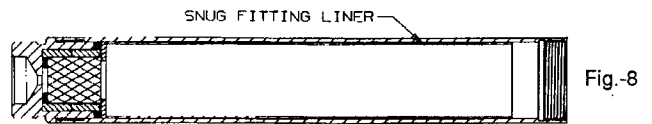


2. Fig.-7: Drop the forward insulator into the motor case. Be sure it is seated against the thick (forward) O-ring and the forward closure.

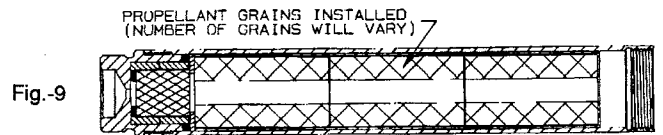


## CENTRAL COMPONENTS (CONT.)

3. Fig.-8: Insert the liner into the motor case and push it against the forward insulator. (**NOTE:** If the liner does not fit into the case snugly, wrap a layer of masking tape around each end of the liner.)



4. Fig.-9: Install the propellant grains into the liner.



## AFT END ASSEMBLY

1. Fig.-10: Push the aft insulator into the motor case until it is seated against the end of the liner

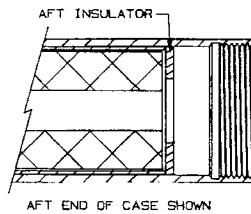


Fig.-10

2. Fig.-11: Drop the nozzle insert into the motor case. Be sure it is seated against the aft insulator.

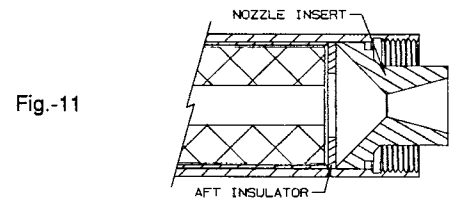


Fig.-11

3. Fig.-12: Apply a light coat of grease to the thin 1" diameter (aft) O-ring. Place the aft O-ring into the matching groove in the nozzle insert.

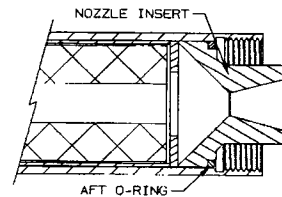


Fig.-12

4. Fig.-13: Apply a light coat of grease to the threads of the aft closure. Thread the aft closure into the motor case until it stops. **DO NOT OVERTIGHTEN.** There should be some resistance to threading in the closure during the last 1/32" to 1/16" of travel.

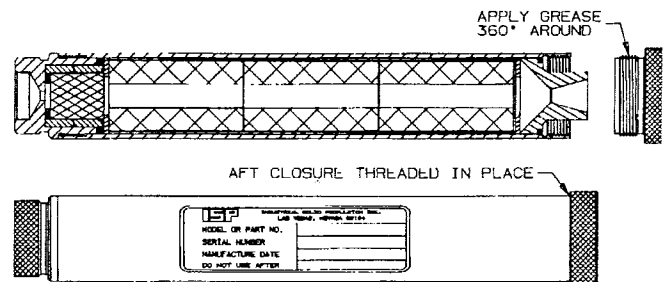


Fig.-13

## EJECTION CHARGE INSTALLATION

1. Fig.-14: Thoroughly clean the entire outside surface of the motor of any grease or other residue. Open the ejection charge container and dispense enough ejection charge into the ejection charge well of the forward closure to fill the well approximately 3/4 full.

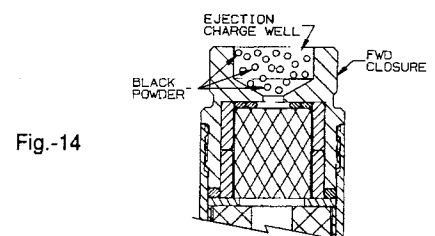


Fig.-14

## EJECTION CHARGE INSTALLATION (CONT.)

- Fig.-15: Apply the ejection charge cap to the center of the end of the forward closure over the ejection charge well. Put a layer of tape around the seam where the forward closure meets the motor case. (**NOTE:** This tape layer is to discourage you or someone else from loosening the forward closure after the ejection charge has been put in the forward closure. Do not loosen the forward or aft closures once the ejection charge has been loaded. Loosening the closures can cause ejection charge to leak under the delay O-rings and lead to seal failure. If it becomes necessary to disassemble the motor before it

is fired, remove the ejection charge, delay element and delay O-rings and reinstall per instructions prior to launch.)

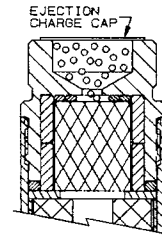


Fig.-15

## PREPARATION FOR FLIGHT

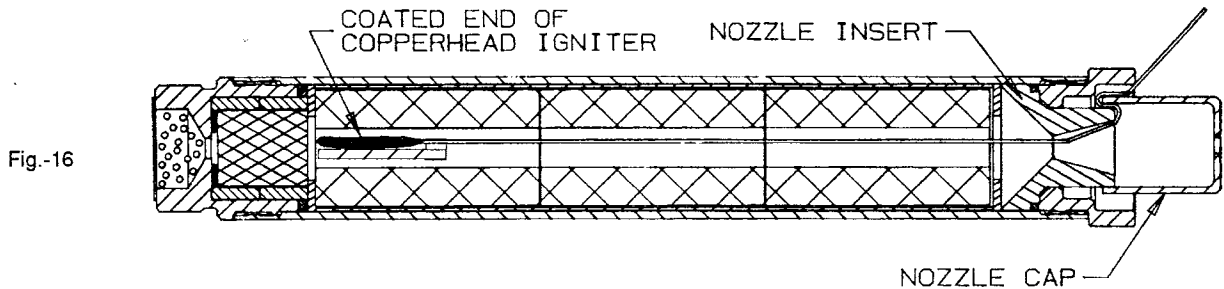


Fig.-16

- Fig. - 16: Attach the thermalite igniter booster (if supplied) to the coated end of the COPPERHEAD™ igniter using a small piece of masking tape.
- Insert the coated end of the COPPERHEAD™ igniter into the motor nozzle until it stops against the delay element.
- Push the nozzle cap igniter holder over the nozzle insert until it stops.
- Install the motor into the rocket's motor mount tube. Secure the motor into the rocket and prevent it from being ejected at the time of ejection charge firing by using a motor hook, friction fit or wrapping tape around the junction of the motor with the rocket motor tube
- Prepare the rocket's recovery system and then launch the rocket in the normal manner.

## POST RECOVERY CLEAN-UP

**NOTE:** Perform motor clean-up as soon as possible after motor firing. Propellant and delay residues become difficult to remove after 24 hours and could lead to corrosion of the metal parts. Place the spent motor components in the reload kit plastic bag and dispose of properly.

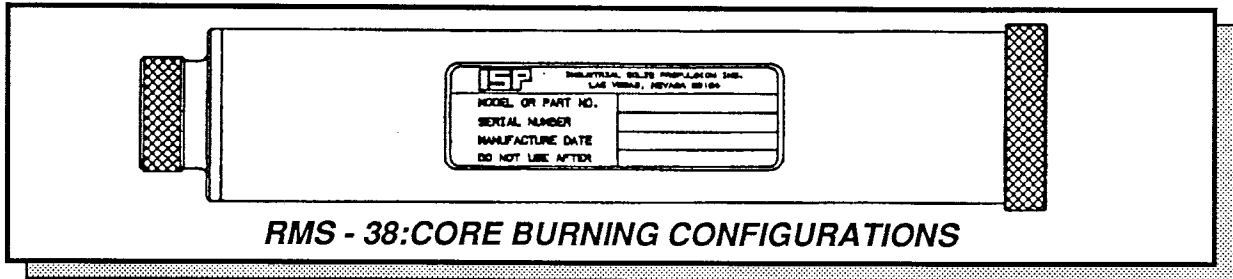
- After the motor has cooled down, remove the forward and aft closures.
- Remove the delay insulator and O-rings from the forward

closure and discard. Discard the nozzle insert and aft O-ring. Using the pre-moistened towelette, remove all delay and propellant residue from the closures.

- Remove the liner and aft and forward insulators from the casing and discard. Using the towelette, wipe the inside of the casing to remove all propellant residue.
- Apply a light coat of grease to all threads. Reassemble metal parts and store motor in a dry place.

**NOTICE:** ISP™ certifies that it has exercised reasonable care in the design and manufacture 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. ISP™ 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 accepts and uses ISP™ products on these conditions.

No warranty either expressed or implied is made regarding ISP™ products, except for replacement or repair, at ISP'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 ISP™. Proof of purchase will be required. Note: Your state may provide additional rights not covered by this warranty.



**RMS - 38: CORE BURNING CONFIGURATIONS**

**Assembly and Operation Instructions**

**BEFORE YOU BEGIN:**

- Study the illustrations and sequence of assembly. **THE SEQUENCE OF ASSEMBLY IS EXTREMELY IMPORTANT.** Review the parts list and become familiar with all parts before assembly. **If any parts are missing or damaged, contact ISP™ at 1-800-752-8018.**
- **DO NOT MODIFY THE MOTOR IN ANY WAY.** Modification of the motor or the reload kit parts could result in motor failure and lead to the destruction of both your rocket and motor. Modification of the motor or reload kit in any way will invalidate your motor warranty.
- **USE ONLY ISP™ RELOAD KITS AND MOTOR PARTS TO REFURBISH YOUR RMS™.** The ISP™ reload kits have been designed specifically for use in your particular ISP™ motor. Use of imitation components may destroy your motor, rocket and payload and will invalidate your motor warranty. Only use ISP™ reload kits intended for your specific ISP™ motor. **DO NOT INTERCHANGE PARTS!** Do not use ISP™ reload kits or motor components for any other purpose than to refurbish an ISP™ RMS™ motor.
- **DO NOT REUSE ANY OF THE DISPOSABLE PARTS OF THE RMS™ RELOAD KIT.** This includes the liner, nozzle insert 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 will invalidate your motor warranty.
- **DO NOT USE ANY PARTS OF THE RMS™ SYSTEM THAT ARE DAMAGED IN ANY WAY.** If in doubt, contact ISP™ at the number above for assistance.

- 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. If necessary to handle a motor before it has cooled down, use a rag or similar article.
- Read and follow the safety code of the Tripoli Rocketry Association (TRA) and comply with all federal, state and local laws in all activities with high power rockets.

**DO NOT OPEN RELOAD KIT UNTIL READY TO USE.**

**PARTS:**

**RELOADABLE MOTOR SYSTEM**

Aft closure	1
Case	1
Forward closure	1
O-ring grease	1 tube

**RELOAD KIT**

Nozzle	1
Liner	1
Propellant grains	*
Thick (aft) O-ring (3/16" thick X 1-3/8" O.D.)	1
Thin (fwd) O-ring (1/8" thick X 1-3/8" O.D.)	1
Outer delay O-ring (5/8" O.D.)	1
Inner delay O-ring (1/2" O.D.)	1
Delay element	1
Delay insulators	2
Forward & aft insulators (1-3/8" O.D.)	2
Delay spacer ring(s) (5/8" O.D.)	0,1 or 2
Ejection charge container	1
Ejection charge cap	1
COPPERHEAD™ igniter	1
Nozzle cap igniter holder	1
Pre-moistened towelette	1
Thermalite igniter booster	1

\* Number of grains will vary depending on motor size.

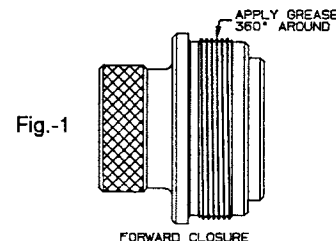
**SAVE THE RELOAD KIT PLASTIC BAG FOR THE USED RELOAD PARTS. DISPOSE OF THE PLASTIC BAG AND USED PARTS PROPERLY.**

**ALSO NEEDED FOR ASSEMBLY:**

- 3/4" wide masking tape

## FORWARD CLOSURE

1. Fig.-1: Apply a light coat of grease to the threads of the forward closure. This will facilitate assembly and prevent the threads from seizing.



2. Fig.-2: Insert both delay insulators into the cavity in the forward closure such that the chamfered inner edges face the outside of the cavity.

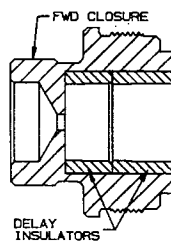


Fig.-2

3. Fig.-3: Apply a light coat of grease to the inner and outer delay O-rings. Then drop the O-rings into the delay charge cavity. Be sure they are seated on the bottom. Also check that the O-rings are concentric with each other.

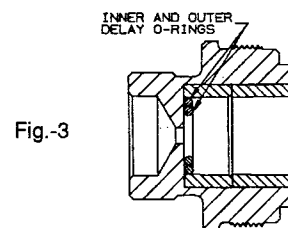


Fig.-3

4. Fig.-4: With the delay cavity facing up, gently press the delay element into the cavity until it stops. Install the delay spacer ring (s), if provided, on top of the delay element. The delay element or delay spacer ring should protrude 1/32" to 1/16" above the delay insulator.

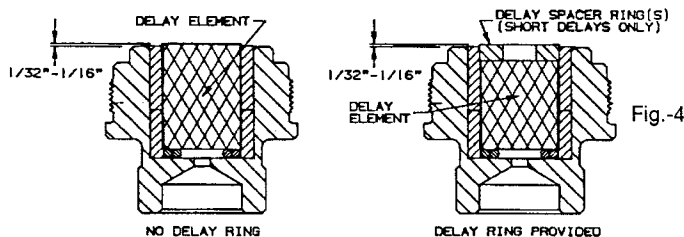


Fig.-4

5. Fig.-5: Apply a light coat of grease to the threads of both ends of the motor case. Thread the forward closure assembly into one end of the motor case until it stops. DO NOT OVERTIGHTEN. Check to see that the delay spacer ring(s), if used, remain in the forward closure.

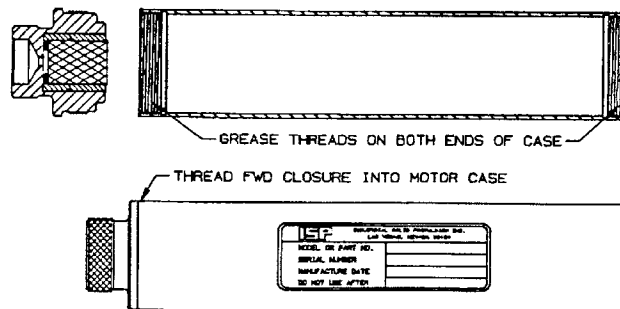


Fig.-5

## CENTRAL COMPONENTS

1. Fig.-6: Apply a light coat of grease to the thin 1-3/8" diameter (forward) O-ring. Drop the forward O-ring into the motor case. Be sure it is seated against the forward closure. (NOTE: If necessary, use the liner as a tool to help push the O-ring into position.)

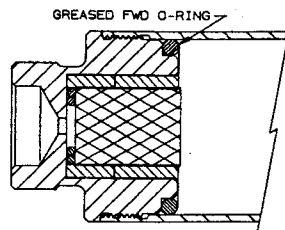


Fig.-6

2. Fig.-7: Drop the forward insulator into the motor case. Be sure it is seated against the thin (forward) O-ring and the forward closure.

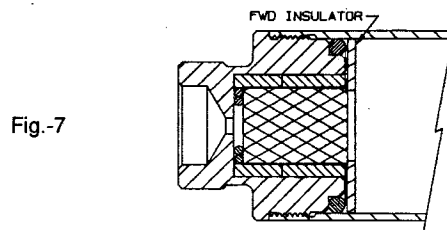
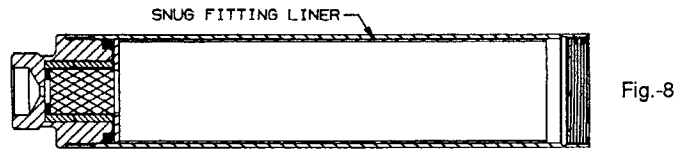


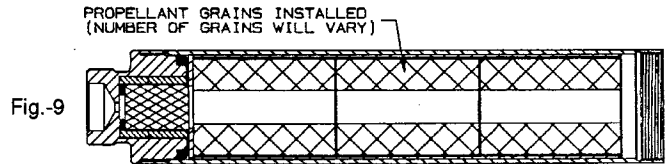
Fig.-7

## CENTRAL COMPONENTS (CONT.)

- Fig.-8: Insert the liner into the motor case and push it against the forward insulator. (**NOTE:** If the liner does not fit into the case snugly, wrap a layer of masking tape around the end of the liner that will be next to the forward closure.)



- Fig.-9: Install the propellant grains into the liner.



## AFT END ASSEMBLY

- Fig.-10: Push the aft insulator into the motor case until it is seated against the end of the liner

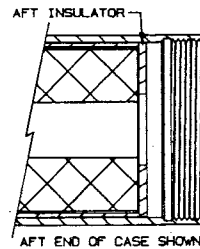
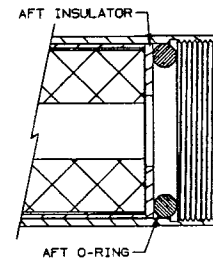


Fig.-10

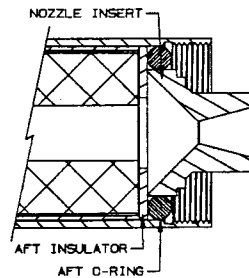
- Fig.-11: Apply a light coat of grease to the thick 1-3/8" diameter (aft) O-ring. Drop the aft O-ring into the motor case. Be sure it is seated against the aft insulator.

Fig.-11



- Fig.-12: Push the nozzle insert into the aft O-ring and against the aft insulator.

Fig.-12



- Fig.-13: Apply a light coat of grease to the threads of the aft closure. Thread the aft closure into the motor case until it stops. **DO NOT OVERTIGHTEN.** There should be some resistance to threading in the closure during the last 1/32" to 1/16" of travel.

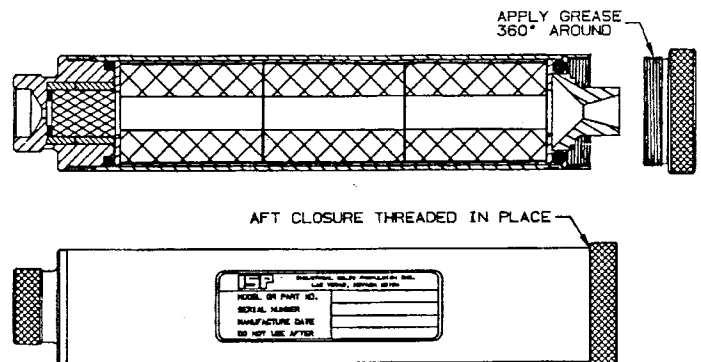
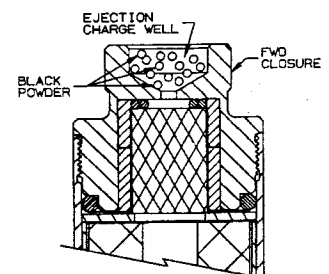


Fig.-13

## EJECTION CHARGE INSTALLATION

- Fig.-14: Thoroughly clean the entire outside surface of the motor of any grease or other residue. Open the ejection charge container and dispense enough ejection charge into the ejection charge well of the forward closure to fill the well approximately 3/4 full.

Fig.-14



## EJECTION CHARGE INSTALLATION (CONT.)

- Fig.-15: Apply the ejection charge cap to the center of the end of the forward closure over the ejection charge well. Put a layer of tape around the seam where the forward closure meets the motor case. (**NOTE:** This tape layer is to discourage you or someone else from loosening the forward closure after the ejection charge has been put in the forward closure. Do not loosen the forward or aft closures once the ejection charge has been loaded. Loosening the closures can cause ejection charge to leak under the delay O-rings and lead to seal failure. If it becomes necessary to disassemble the motor before it

is fired, remove the ejection charge, delay element and delay O-rings and reinstall per instructions prior to launch.)

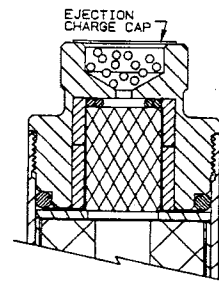


Fig.-15

### PREPARATION FOR FLIGHT

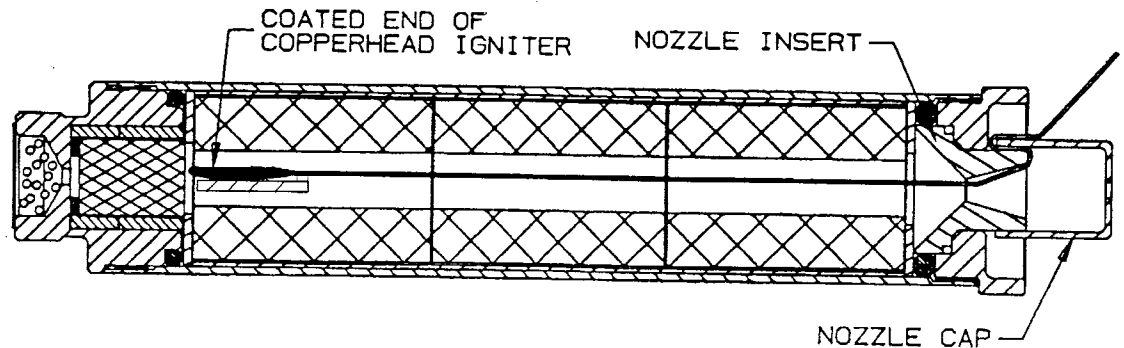


Fig.-16

- Fig. - 16: Attach the thermalite igniter booster to the coated end of the COPPERHEAD™ igniter using a small piece of masking tape.
- Insert the coated end of the COPPERHEAD™ igniter into the motor nozzle until it stops against the delay element.
- Push the nozzle cap igniter holder over the nozzle insert until it stops.
- Install the motor into the rocket's motor mount tube. Secure the motor into the rocket and prevent it from being ejected at the time of ejection charge firing by using a motor hook, friction fit or wrapping tape around the junction of the motor with the rocket motor tube
- Prepare the rocket's recovery system and then launch the rocket in the normal manner.

### POST RECOVERY CLEAN-UP

**NOTE:** Perform motor clean-up as soon as possible after motor firing. Propellant and delay residues become difficult to remove after 24 hours and could lead to corrosion of the metal parts. Place the spent motor components in the reload kit plastic bag and dispose of properly.

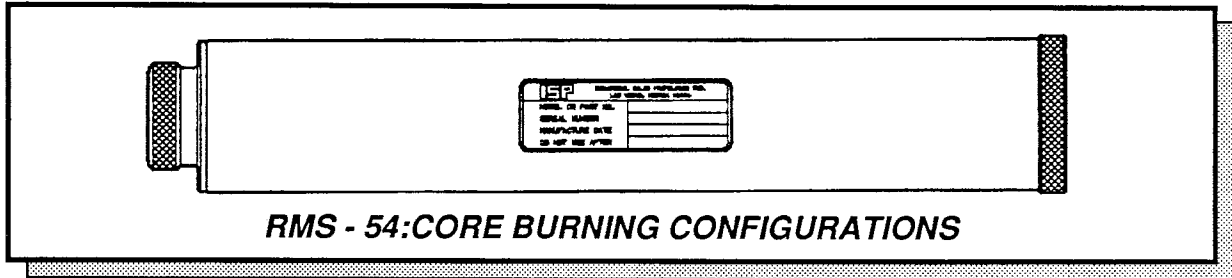
- After the motor has cooled down, remove the forward and aft closures.
- Remove the delay insulator and O-rings from the forward

closure and discard. Discard the nozzle insert and aft O-ring. Using the pre-moistened towelette, remove all delay and propellant residue from the closures.

- Remove the liner and aft and forward insulators from the casing and discard. Using the towelette, wipe the inside of the casing to remove all propellant residue.
- Apply a light coat of grease to all threads. Reassemble metal parts and store motor in a dry place.

**NOTICE:** ISP™ certifies that it has exercised reasonable care in the design and manufacture 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. ISP™ 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 accepts and uses ISP™ products on these conditions.

No warranty either expressed or implied is made regarding ISP™ products, except for replacement or repair, at ISP'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 ISP™. Proof of purchase will be required. Note: Your state may provide additional rights not covered by this warranty.



**Assembly and Operation Instructions**

**BEFORE YOU BEGIN:**

- Study the illustrations and sequence of assembly. **THE SEQUENCE OF ASSEMBLY IS EXTREMELY IMPORTANT.** Review the parts list and become familiar with all parts before assembly. **If any parts are missing or damaged, contact ISP™ at 1-800-752-8018.**
- **DO NOT MODIFY THE MOTOR IN ANY WAY.** Modification of the motor or the reload kit parts could result in motor failure and lead to the destruction of both your rocket and motor. Modification of the motor or reload kit in any way will invalidate your motor warranty.
- **USE ONLY ISP™ RELOAD KITS AND MOTOR PARTS TO REFURBISH YOUR RMS™.** The ISP™ reload kits have been designed specifically for use in your particular ISP™ motor. Use of imitation components may destroy your motor, rocket and payload and will invalidate your motor warranty. Only use ISP™ reload kits intended for your specific ISP™ motor. **DO NOT INTERCHANGE PARTS!** Do not use ISP™ reload kits or motor components for any other purpose than to refurbish an ISP™ RMS™ motor.
- **DO NOT REUSE ANY OF THE DISPOSABLE PARTS OF THE RMS™ RELOAD KIT.** This includes the liner, nozzle insert 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 will invalidate your motor warranty.
- **DO NOT USE ANY PARTS OF THE RMS™ SYSTEM THAT ARE DAMAGED IN ANY WAY.** If in doubt, contact ISP™ at the number above for assistance.
- 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. If necessary to handle a motor before it has cooled down, use a rag or similar article.
- Read and follow the safety code of the Tripoli Rocketry Association (TRA) and comply with all federal, state and local laws in all activities with high power rockets.

**DO NOT OPEN RELOAD KIT UNTIL READY TO USE.**

**PARTS:**

**RELOADABLE MOTOR SYSTEM**

Aft closure	1
Case	1
Forward closure	1
O-ring grease	1 tube
Nozzle adapter ring	1

**RELOAD KIT**

Nozzle	1
Liner	1
Propellant grains	*
Thick (aft) O-ring (1/8" thick X 2" O.D.)	1
Thick (fwd) O-ring (1/8" thick X 2" O.D.)	1
Liner O-ring (2"O.D. X 1/16")	1
Outer delay O-ring (1/16" X 1" O.D.)	1
Inner delay O-ring (1/16" X 7/8" O.D.)	1
Delay element	1
Delay insulator	1
Thermalite igniter booster	1
Forward and aft insulators (2"O.D. phenolic washerswith 5/8" hole)	2
Delay spacer ring(s) (small fiber washer(s) or paper ring)	varies
Ejection charge container	1
Ejection charge cap	1
COPPERHEAD™ igniter	1
Nozzle cap igniter holder	1
Pre-moistened towelettes	2

\* Number of grains will vary depending on motor size.

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

**ALSO NEEDED FOR ASSEMBLY:**

- 3/4" wide masking tape



## FORWARD CLOSURE

1. Fig.-1: Apply a light coat of grease to the threads of the forward closure. This will facilitate assembly and prevent the threads from seizing.

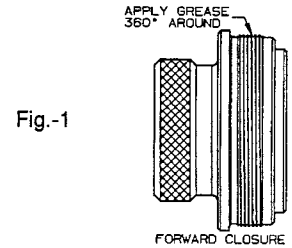


Fig.-1

2. Fig.-2: Insert the delay insulator into the cavity in the forward closure as shown.

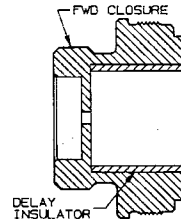


Fig.-2

3. Fig.-3: Apply a light coat of grease to the inner and outer delay O-rings. Then drop the O-rings into the delay charge cavity. Be sure they are seated on the bottom. Also check that the O-rings are concentric with each other.

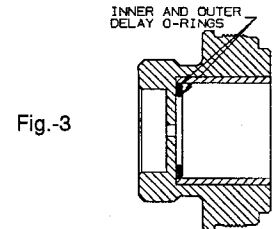


Fig.-3

4. Fig.-4: With the delay cavity facing up, gently press the delay element into the cavity until it stops. Install the delay spacer ring (s), if provided, on top of the delay element. The delay element or delay spacer ring should protrude 1/32" to 1/16" above the delay insulator.

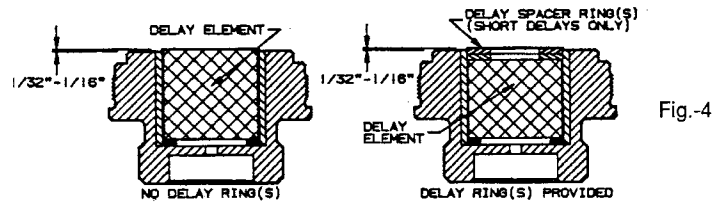


Fig.-4

5. Fig.-5: Apply a light coat of grease to the threads of both ends of the motor case. Thread the forward closure assembly into one end of the motor case until it stops. DO NOT OVERTIGHTEN. Check to see that the delay spacer ring(s), if used, remain in the forward closure.

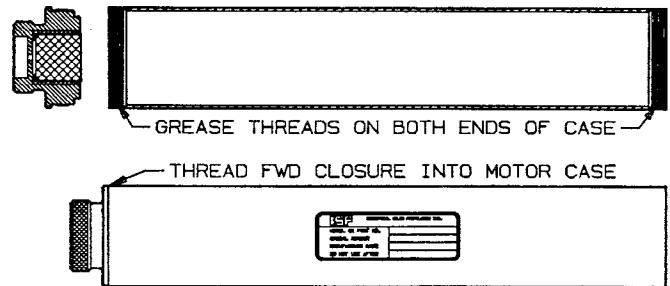


Fig.-5

## CENTRAL COMPONENTS

1. Fig.-6: Apply a light coat of grease to the thick 2" diameter (forward) O-ring. Drop the forward O-ring into the motor case. Be sure it is seated against the forward closure. (NOTE: If necessary, use the liner as a tool to help push the O-ring into position.)

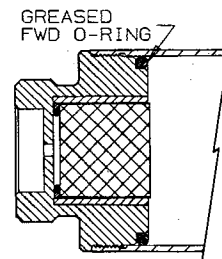


Fig.-6

2. Fig.-7: Drop the forward insulator into the motor case. Be sure it is seated against the thick (forward) O-ring and the forward closure.

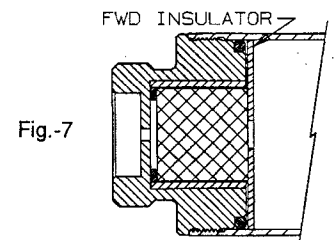


Fig.-7

3. Fig.-8: Apply a light of grease to the thin 2" diameter liner O-ring. Drop the liner O-ring into the motor case until it is seated against the forward insulator. (NOTE: If necessary, use the liner as a tool to help push the O-ring into position.)

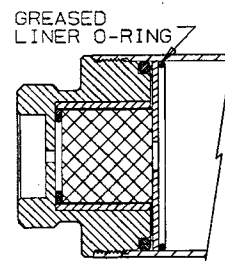
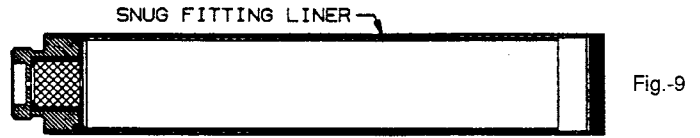


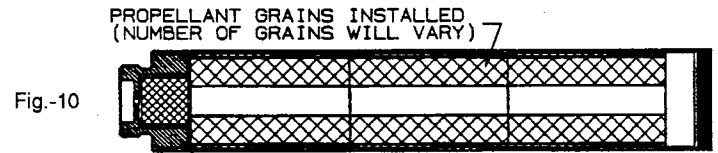
Fig.-8

## CENTRAL COMPONENTS (CONT.)

- Fig.-9: Insert the liner into the motor case and push it against the forward insulator. (**NOTE:** If the liner does not fit into the case snugly, wrap a layer of masking tape around forward end of the liner.)

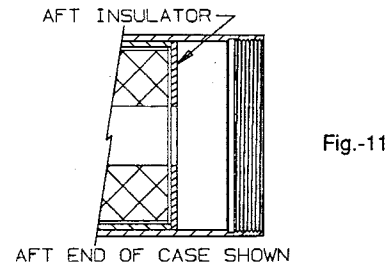


- Fig.-10: Install the propellant grains into the liner.

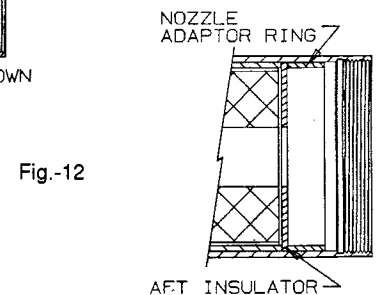


## AFT END ASSEMBLY

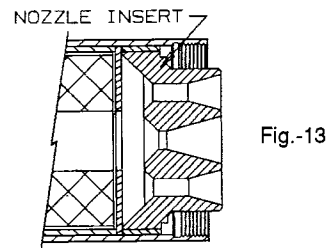
- Fig.-11: Push the aft insulator into the motor case until it is seated against the end of the liner.



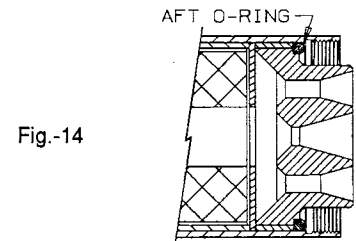
- Fig.-12: Place the nozzle adaptor ring into the motor case so that it is seated against the aft insulator.



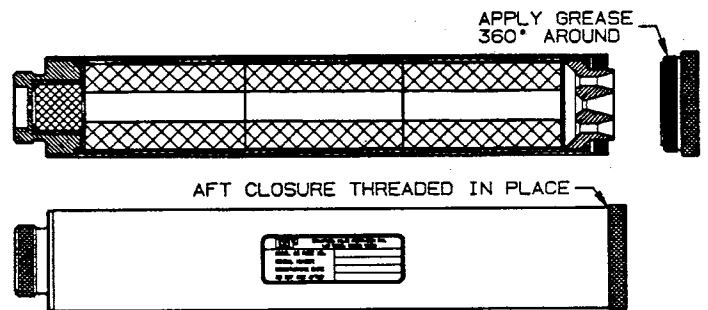
- Fig.-13: Drop the nozzle insert into the motor case. Be sure it is seated against the aft insulator.



- Fig.-14: Apply a light coat of grease to the thick 2" diameter (aft) O-ring. Place the aft O-ring into the matching groove in the nozzle insert.

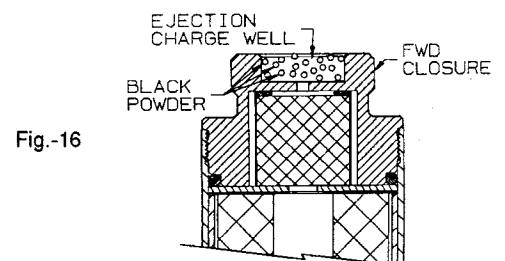


- Fig.-15: Apply a light coat of grease to the threads of the aft closure. Thread the aft closure into the motor case until it stops. **DO NOT OVERTIGHTEN.** There should be some resistance to threading in the closure during the last 1/32" to 1/16" of travel.



## EJECTION CHARGE INSTALLATION

- Fig.-16: Thoroughly clean the entire outside surface of the motor of any grease or other residue. Open the ejection charge container and dispense enough ejection charge into the ejection charge well of the forward closure to fill the well approximately 3/4 full.



## EJECTION CHARGE INSTALLATION (CONT.)

- Fig.-17: Apply the ejection charge cap to the center of the end of the forward closure over the ejection charge well. Put a layer of tape around the seam where the forward closure meets the motor case. (**NOTE:** This tape layer is to discourage you or someone else from loosening the forward closure after the ejection charge has been put in the forward closure. Do not loosen the forward or aft closures once the ejection charge has been loaded. Loosening the closures can cause ejection charge to leak under the delay O-rings and lead to seal failure. If it becomes necessary to disassemble the motor before it

is fired, remove the ejection charge, delay element and delay O-rings and reinstall per instructions prior to launch.)

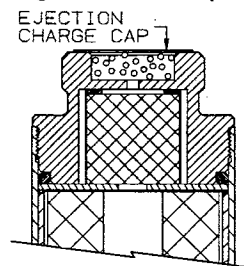


Fig.-17

### PREPARATION FOR FLIGHT

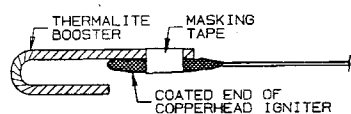


Fig.-18

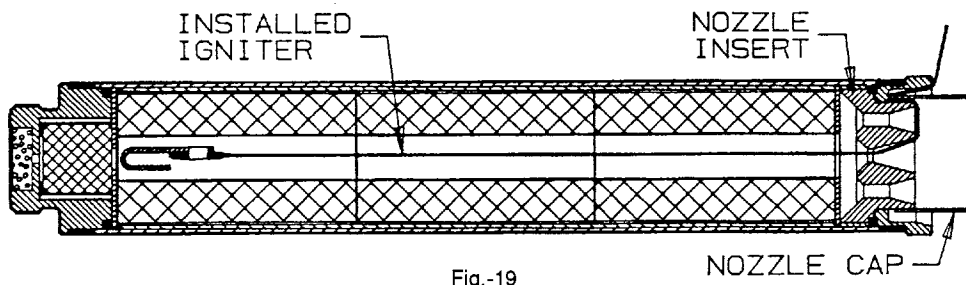


Fig.-19

- Fig.-18: Bend the thermalite igniter booster as shown and tape it to the coated end of the COPPERHEAD™ igniter using a small piece of masking tape.
- Fig.-19: Insert the coated end of the COPPERHEAD™ igniter into the center motor nozzle until it stops against the delay element.
- Push the nozzle cap igniter holder over the nozzle insert until it stops.
- Install the motor into the rocket's motor mount tube. Secure the motor into the rocket and prevent it from being ejected at the time of ejection charge firing by using a motor hook, friction fit or wrapping tape around the junction of the motor with the rocket motor tube
- Prepare the rocket's recovery system and then launch the rocket in the normal manner.

### POST RECOVERY CLEAN-UP

**NOTE:** Perform motor clean-up as soon as possible after motor firing. Propellant and delay residues become difficult to remove after 24 hours and could lead to corrosion of the metal parts. Place the spent motor components in the reload kit plastic bag and dispose of properly.

- After the motor has cooled down, remove the forward and aft closures.
- Remove the delay insulator and O-rings from the forward

closure and discard. Discard the nozzle insert and aft O-ring. Using the pre-moistened towelette, remove all delay and propellant residue from the closures.

- Remove the liner and aft and forward insulators from the casing and discard. Using the towelette, wipe the inside of the casing to remove all propellant residue.
- Apply a light coat of grease to all threads. Reassemble metal parts and store motor in a dry place.

**NOTICE:** ISP™ certifies that it has exercised reasonable care in the design and manufacture 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. ISP™ 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 accepts and uses ISP™ products on these conditions.

No warranty either expressed or implied is made regarding ISP™ products, except for replacement or repair, at ISP'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 ISP. Proof of purchase will be required. Note: Your state may provide additional rights not covered by this warranty.



ISP RELOADABLE MOTOR SYSTEM (RMS) RETAIL PRICE LIST

2/91

DESCRIPTION

RETAIL PRICE

MOTORS & MOTOR PARTS

Precision machined from high-strength aircraft aluminum alloy

1-1/8" (29mm) Dia. Reloadable Motor Systems

Complete Systems

Includes one forward & one aft closure, casings for 60 & 100 newton-seconds, CAT.# RMS-29/60-100 \$102.00

Includes one forward & one aft closure, casings for 180 & 240 newton-seconds, CAT.# RMS-29/180-240 108.00

Complete Motors

Approx. 60 N-sec., CAT.# RMS-29/60 65.00  
Approx. 100 N-sec., CAT.# RMS-29/100 66.00  
Approx. 180 N-sec., CAT.# RMS-29/180 68.00  
Approx. 240 N-sec., CAT.# RMS-29/240 70.00

Motor Parts

Forward closure  
W/time delay & ejection charge cavities, CAT.# RMS-29FCE 19.00  
Aft closure for 1.000" dia. nozzle insert, CAT.# RMS-29AC 17.00  
Case for approx. 60 N-sec., CAT.# RMS-29C-60 35.00  
Case for approx. 100 N-sec., CAT.# RMS-29C-100 36.00  
Case for approx. 180 N-sec., CAT.# RMS-29C-180 46.00  
Case for approx. 240 N-sec., CAT.# RMS-29C-240 47.00

1-1/2" (38mm) Dia. Reloadable Motor System

Complete System (Does not include case for 600 newton-seconds)

Includes one forward & one aft closure, casings for 240, 360 & 480 newton seconds, CAT.# RMS-38/240-480 \$198.00



### Complete Motors

Approx. 240 N-sec.. CAT.# RMS-38/240	\$114.00
Approx. 360 N-sec.. CAT.# RMS-38/360	116.00
Approx. 480 N-sec.. CAT.# RMS-38/480	118.00
Approx. 600 N-sec.. CAT.# RMS-38/600	120.00

### Motor Parts

Forward closure	
W/time delay & ejection charge cavities, CAT.# RMS-38FCE	49.00
Aft closure for 1.000" dia. nozzle insert, CAT.# RMS-38AC	42.00
Case for approx. 240 N-sec.. CAT.# RMS-38C-240	46.00
Case for approx. 360 N-sec.. CAT.# RMS-38C-360	49.00
Case for approx. 480 N-sec.. CAT.# RMS-38C-480	51.00
Case for approx. 600 N-sec.. CAT.# RMS-38C-600	55.00

### 2-1/8" (54mm) Dia. Reloadable Motor System

#### Complete System

Includes one forward & one aft closure, casings for 852, 1280 & 1706 newton-seconds, CAT.# RMS-54/852-1706	\$295.00
--	----------

#### Complete Motors

Approx. 852 N-sec.. CAT.# RMS-54/852	165.00
Approx. 1280 N-sec.. CAT.# RMS-54/1280	173.00
Approx. 1706 N-sec.. CAT.# RMS-54/1706	179.00

#### Motor Parts

Forward closure	
W/time delay & ejection charge cavities, CAT.# RMS-54FCE	63.00
Aft closure, CAT.# RMS-54AC	55.00
Case for approx. 852 N-sec.. CAT.# RMS-54C-852	80.00
Case for approx. 1280 N-sec., CAT.# RMS-54C-1280	89.00
Case for approx. 1706 N-sec.. CAT.# RMS-54C-1706	97.00



3-7/8" (98mm) Dia. Reloadable Motor System (Available Spring 1991)

Complete System

Includes one forward & one aft closure, casings for 2560, 5120, 7680 & 10240 newton-seconds, CAT.# RMS-98/2560-10240 \$995.00

Complete Motors

Approx. 2560 N-sec., CAT.# RMS-98/2560	355.00
Approx. 5120 N-sec., CAT.# RMS-98/5120	381.00
Approx. 7680 N-sec., CAT.# RMS-98/7680	408.00
Approx. 10240 N-sec., CAT.# RMS-98/10240	443.00

Motor Parts

Forward closure	
W/time delay & ejection charge cavities, CAT.# RMS-98FCE	116.00
Aft closure, CAT.# RMS-98AC	108.00
Case for approx. 2560 N-sec., CAT.# RMS-98C-2560	202.00
Case for approx. 5120 N-sec., CAT.# RMS-98C-5120	233.00
Case for approx. 7680 N-sec., CAT.# RMS-98C-7680	265.00
Case for approx. 10240 N-sec., CAT.# RMS-98C-10240	307.00



RELOAD KITS

Includes propellant grain(s), o-rings, fiber washers, nozzle insert, liner, igniter, nozzle cap igniter holder, time delay element, adapter ring(s), spacer ring(s) (if required), ejection charge, end cap and complete instructions

SEGMENTED CORE CONFIGURATION

Flammable Solid Shippable

For RMS-29/60

CAT.# F37W-S, M, L	\$5.95
CAT.# F62B-S, M, L	5.95

For RMS-29/100

CAT.# G54W-S, M, L	7.95
CAT.# G104B-S, M, L	7.95

For RMS-29/180

CAT.# G75J-S, M	9.95
CAT.# H128W-S, M, L	9.95
CAT.# H238B-S, M, L	9.95

For RMS-29/240

CAT.# H97J-S, M	15.00
CAT.# H180W-S, M, L	15.00

For RMS-38/240

CAT.# H73J-S	15.00
CAT.# H123W-S, M, L	15.00
CAT.# H242B-S, M, L	15.00

For RMS-38/360

CAT.# I112J-S	25.00
CAT.# I161W-S, M, L	25.00
CAT.# I357B-S, M, L	25.00



For RMS-38/480

CAT.# I154J-S	\$30.00
CAT.# I211W-S, M, L	30.00

For RMS-38/600

CAT.# I284W-S, M, L	35.00
---------------------	-------

For RMS-54/852

CAT.# J275W-S, M, L, X	54.00
CAT.# J460B-S, M, L, X	54.00

For RMS-54/1280

CAT.# J415W-S, M, L, X	65.00
CAT.# J800B-S, M, L, X	65.00

For RMS-54/1706

CAT.# K550W-S, M, L, X	100.00
CAT.# K1100B-S, M, L, X	100.00

For RMS-98/2560

CAT.# K458W-S, M, L, X	125.00
------------------------	--------

For RMS-98/5120

CAT.# L952W-S, M, L, X	250.00
------------------------	--------

For RMS-98/7680

CAT.# M1419W-S, M, L, X	375.00
-------------------------	--------

For RMS-98/10240

CAT.# M1939W-S, M, L, X	500.00
-------------------------	--------





DELAY TIMES AVAILABLE

Please specify delay times desired when ordering RMS reload kits by referring to the list below:

RMS-29 & RMS-38 (all casing lengths)

"Short" time delay (approx. 6 second delay)  
"Medium" time delay (approx. 10 second delay)  
"Long" time delay (approx. 14 second delay)

RMS-54 (all casing lengths)

"Short" time delay (approx. 6 second delay)  
"Medium" time delay (approx. 10 second delay)  
"Long" time delay (approx. 14 second delay)  
"Extra-long" time delay (approx. 18 second delay)

RMS-98 (all casing lengths)

"Short" time delay (approx. 10 second delay)  
"Medium" time delay (approx. 14 second delay)  
"Long" time delay (approx. 18 second delay)  
"Extra-long" time delay (approx. 22 second delay)

PROPELLANT TYPES AVAILABLE

A "J" designation after the average thrust indicates "BlackJack".  
A "W" designation indicates "White Lightning".  
A "B" designation indicates "Blue Thunder".

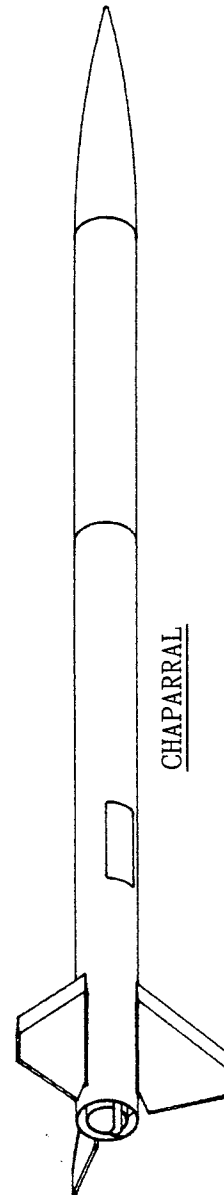
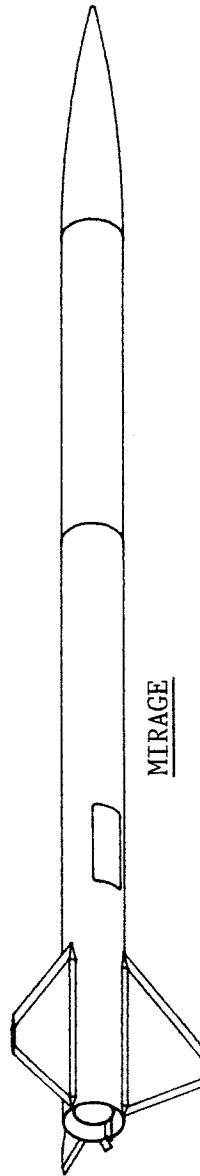
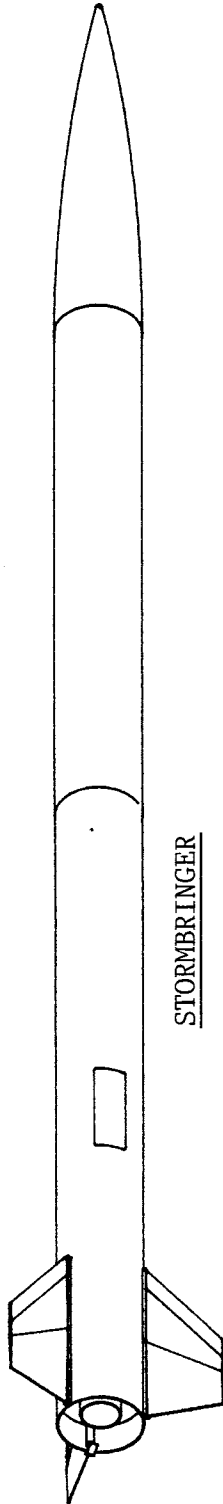
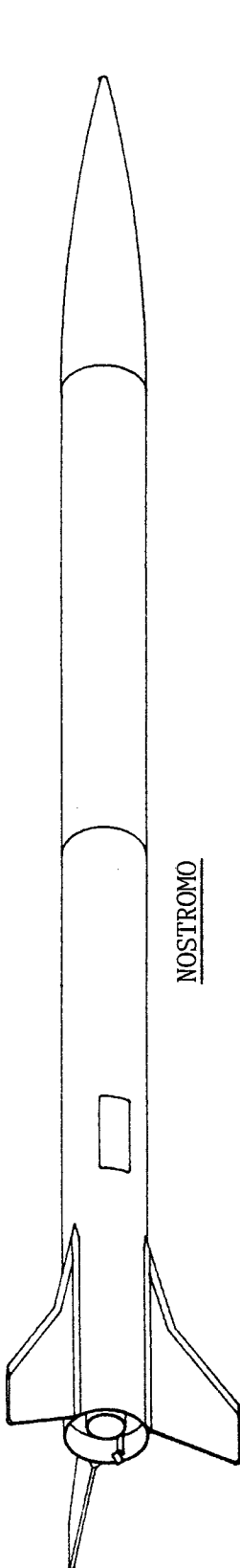


ISP RMS RELOADABLE MOTOR SYSTEM SPECIFICATIONS (Preliminary)

Performance data shown using White Lightning segmented core reload kits

<u>MOTOR TYPE</u>	<u>LENGTH</u>	<u>PROP. WT.</u>	<u>TOTAL WT.</u>	<u>TOTAL IMP.</u>	<u>BURN TIME</u>	<u>AVE. THRUST</u>
RMS-29/180	7.66"	92.2g	215g	181 N-s	1.4 sec.	128 N
RMS-29/240	9.42"	123.0g	264g	240 N-s	1.3 sec.	180 N
RMS-38/240	5.97"	125.0g	293g	245 N-s	2.0 sec.	123 N
RMS-38/360	7.85"	187.5g	385g	350 N-s	2.2 sec.	161 N
RMS-38/480	9.72"	250.0g	476g	453 N-s	2.1 sec.	211 N
RMS-54/852	9.38"	444.0g	998g	852 N-s	3.1 sec.	275 N
RMS-54/1280	12.69"	666.0g	1321g	1280 N-s	3.1 sec.	415 N
RMS-54/1706	16.00"	888.0g	1648g	1706 N-s	3.1 sec.	550 N
RMS-98/2560	10.25"	1330.4g	3106g	2496 N-s	5.4 sec.	458 N
RMS-98/5120	16.31"	2660.7g	5027g	4988 N-s	5.2 sec.	952 N
RMS-98/7680	22.38"	3991.1g	6931g	7417 N-s	5.2 sec.	1419 N
RMS-98/10240	28.44"	5321.4g	8845g	9858 N-s	5.1 sec.	1939 N

NOTE: RMS specifications and prices subject to change without notice.





ISP HIGH POWER KIT PRICE LIST  
SOUNDING ROCKET (SR) SERIES

JAN. 1991

ALL ISP KITS ARE COMPLETE WITH FIN-LOCK ASSEMBLY, PRE-SLOTTED AIRFRAMES, LABYRINTH BAFFLE SYSTEM AND SPECIAL MOUNTS FOR 29MM ISP RELOADABLE MOTOR SYSTEMS.

<u>KIT</u>	<u>DIMENSIONS</u>	<u>RETAIL</u>
MIRAGE-SR	1.9" X 43.5"	\$29.00
CHAPARRAL-SR	1.9" X 43.5"	\$29.00
NOSTROMO-SR	2.6" X 58"	\$39.00
STORMBRINGER-SR	2.6" X 56"	\$39.00
1.5" MOTOR MOUNT KIT FOR 2.6" DIA. TUBES		\$6.95
1.5" MOTOR MOUNT KIT FOR 1.8" DIA. TUBES		\$6.95
1.5" MOTOR MOUNT TUBE 34" LENGTH .07 WALL		\$3.50
1.5" MOTOR MOUNT TUBE 21" LENGTH .07 WALL		\$2.75
CENTERING RINGS 1.5" MMT INTO 2.6" TUBE		\$1.00
ADAPTUBE 1.5" MMT INTO 1.8" TUBE		\$1.20

PLEASE CALL (702)641-2301 OR ANY OF OUR CLASS B DEALERS FOR MORE INFORMATION.



RMS products may be obtained from the following authorized ISP dealers:

Gulf Coast Rocketry  
8470 Highway 6 N.  
Houston, TX 77095  
(713) 859-9902 / 470-2680

High Sierra Rocketry  
1800 Severn Drive  
Reno, NV 89503  
(702) 853-7111

John A. O'Brien  
41 Huntington St. #406  
Hartford, CT 06105  
(203) 549-3624

North Coast Rocketry  
5500 Kenbridge Dr.  
Highland Heights, OH 44143  
(216) 289-5880

Rocket Research  
8901 Milbrae Court  
Richmond, VA 23236  
(804) 330-4373

Rosemary Rocket Research  
1230 Nolan Ave.  
Chula Vista, CA 92011  
(619) 427-6074

West Coast Rocketry  
P.O. Box 2863  
Rancho Cordova, CA 95741  
(916) 366-8928

Attn: Loel Gnadl  
Commonwealth Displays, Inc.  
12649 Dix - Toledo Rd.  
Southgate, MI 48195  
(313) 282-1055

Attn: Dave McVeigh  
Red Arrow Hobbies  
5113 Red Arrow Hwy.  
Stevensville, MI 49127  
(616) 429-8233

Riders  
3021 Corunna Rd.  
Flint, MI 48503  
(313) 234-4051

Attn: Dana Gass  
Gasz Akustic  
9 Gertz Ct.  
Sacramento, CA 95823  
(916) 424-3386

Attn: Mike Nores  
Suncoast Hobby Supply, Inc.  
P.O. Box 41612  
St. Petersburg, FL 33743-1612  
(813) 541-3110

Attn: Ed Lacroix  
Apogee Components  
11111 Greenbriar Rd.  
Minnetonka, Mn 55343  
(612) 545-4635

Attn: Bob Webster  
Champion Electronics  
327 So Mill St.  
Pryor, OK 74361  
(918) 825-4844

Attn: Larry Viktora  
Viktora Enterprises, Inc.  
2631 Micheal Circle  
Duluth, GA 30106  
(404) 623-0392

Attn: John/Mary-Louise Rusek  
AD Astra  
P.O. Box 1124  
North Edwards, CA 93523  
(619) 769-4595