MiniSShot

ProtoSShot-M Short Stack Rocket Motor

Thermal Label Mapping and Results from Static Firing #1

Rev. 2008/10/03

Introduction

The document illustrates the mounting locations for the thermal measurement labels to be mounted on the *ProtoSShot-M Short Stack* rocket motor.

A table is provided for recording post-firing temperature readings.

Labels

Omega Irreversible Temperature Monitoring Labels

Omega P/N	Temperature Ratings							
TL-5-340	°F	340	350	360	370	**380**		**YELLOW**
	°C	171	177	182	188	193		
TL-5-450	°F	450	465	480	490	**500**		**GOLD**
	°C	232	241	249	254	260		
6MB-175/79	°F	175	200	225	250	275	**300**	**RED**
	°C	78	93	107	121	135	149	

Adhesive Backs for Easy Mounting for
Temperatures Above -40°C/°F
 Indicator Turns Black When Exposed

Specifications (TL series)
Accuracy: Up to 99°C (210°F) is ±1°C (1.8°F)
From 100°C (212°F) to 154°C (309°F) is ±1.5°C (2.7°F)
From 160°C (320°F) to 280°C (536°) is ±1% and ±1°C (1.8°F)

Typical appearance of TL series label.


Typical appearance of MB series label.

PRIOR TO INSTALLATION OF LABELS, <u>CLEAN CASING SURFACE</u> WITH ISOPROPYL ALCOHOL OR MINERAL SPIRITS.
<u>CLEAN METAL SURFACE</u> WITH LACQUER THINNER OR ACETONE.

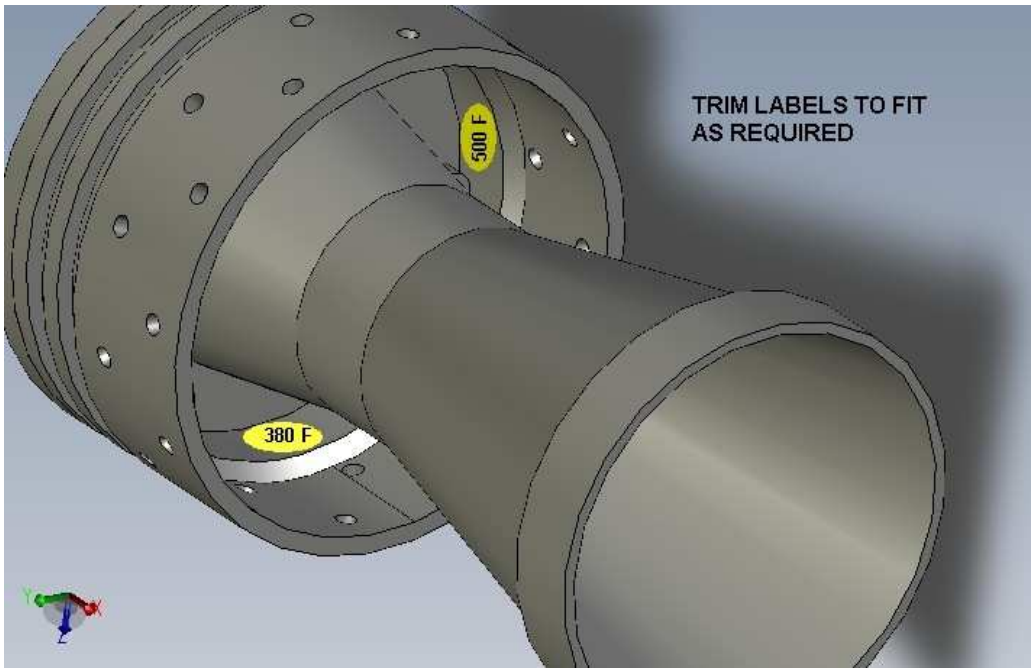


Figure 1 – Labels 380-1, 500-1 (Nozzle Ring)

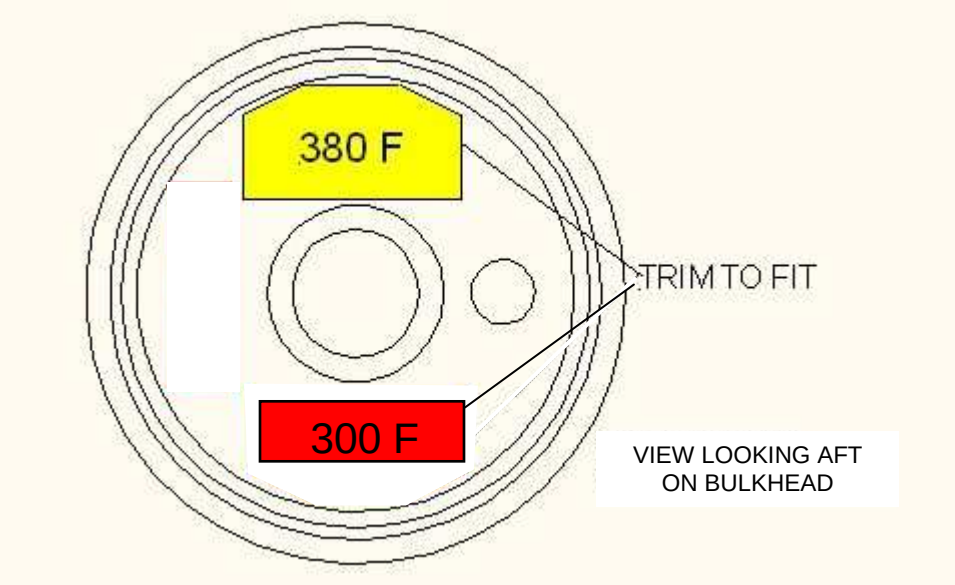


Figure 2 – Labels 300-1, 380-2 (Bulkhead)

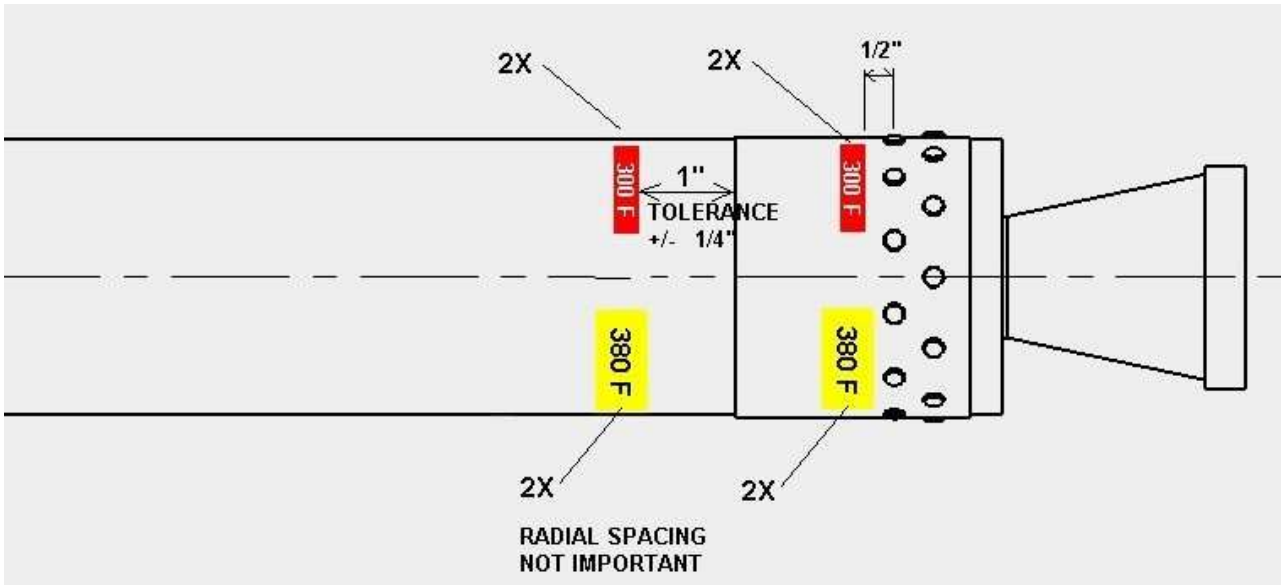


Figure 3 – Labels 300-2a, 300-2b, 380-3a, 380-3b (forward location)
300-3a, 300-3b, 380-4a, 380-4b (aft location)

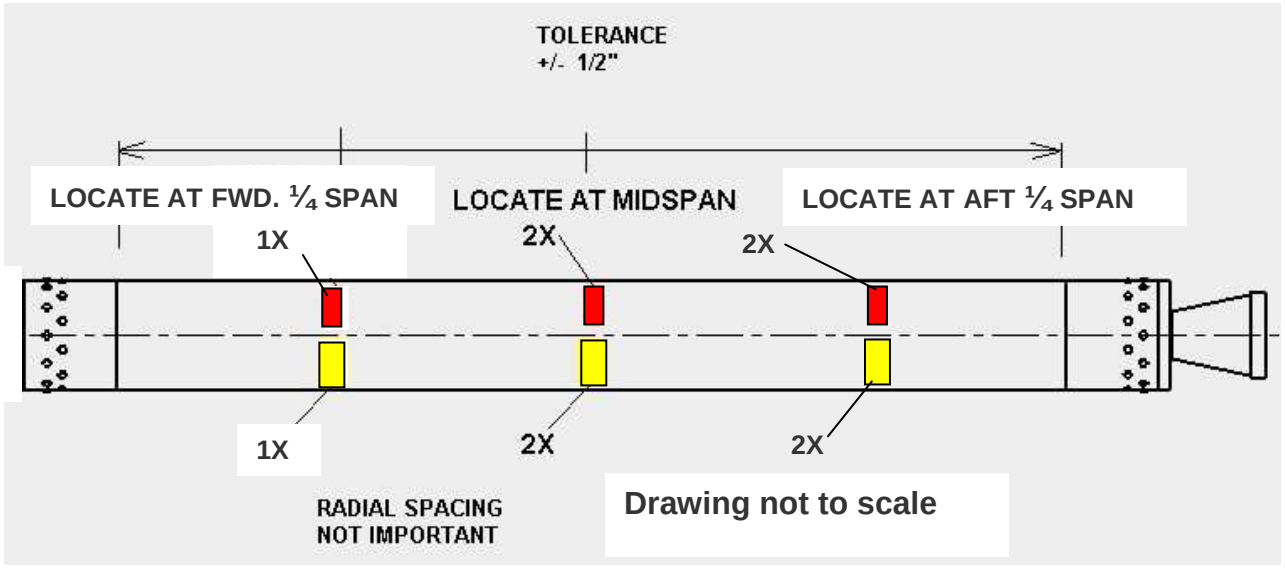


Figure 4 – Labels 300-4a, 300-4b, 380-5a, 380-5b (at midspan)
300-5a, 300-5b, 380-6a, 380-6b (at aft quarter span),
300-8a, 380-8a (at fwd quarter span)

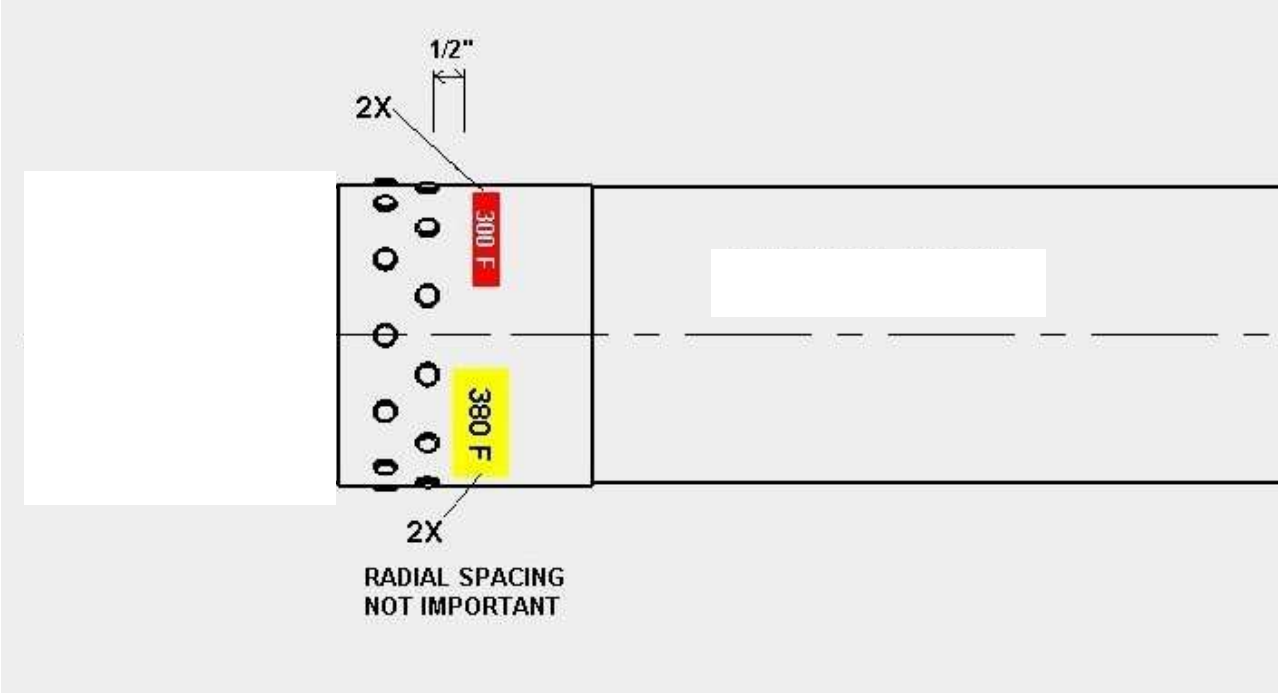


Figure 5 – Labels 300-6a, 300-6b, 380-7a, 380-7b (forward end)

Place 2 labels at middle of each grain segment, on opposing sides

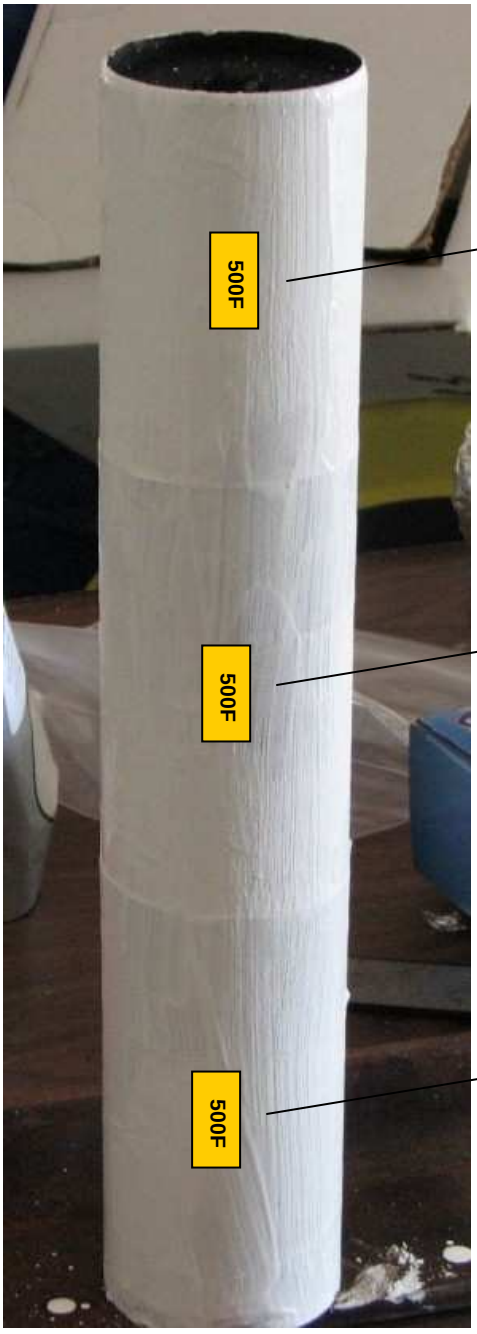
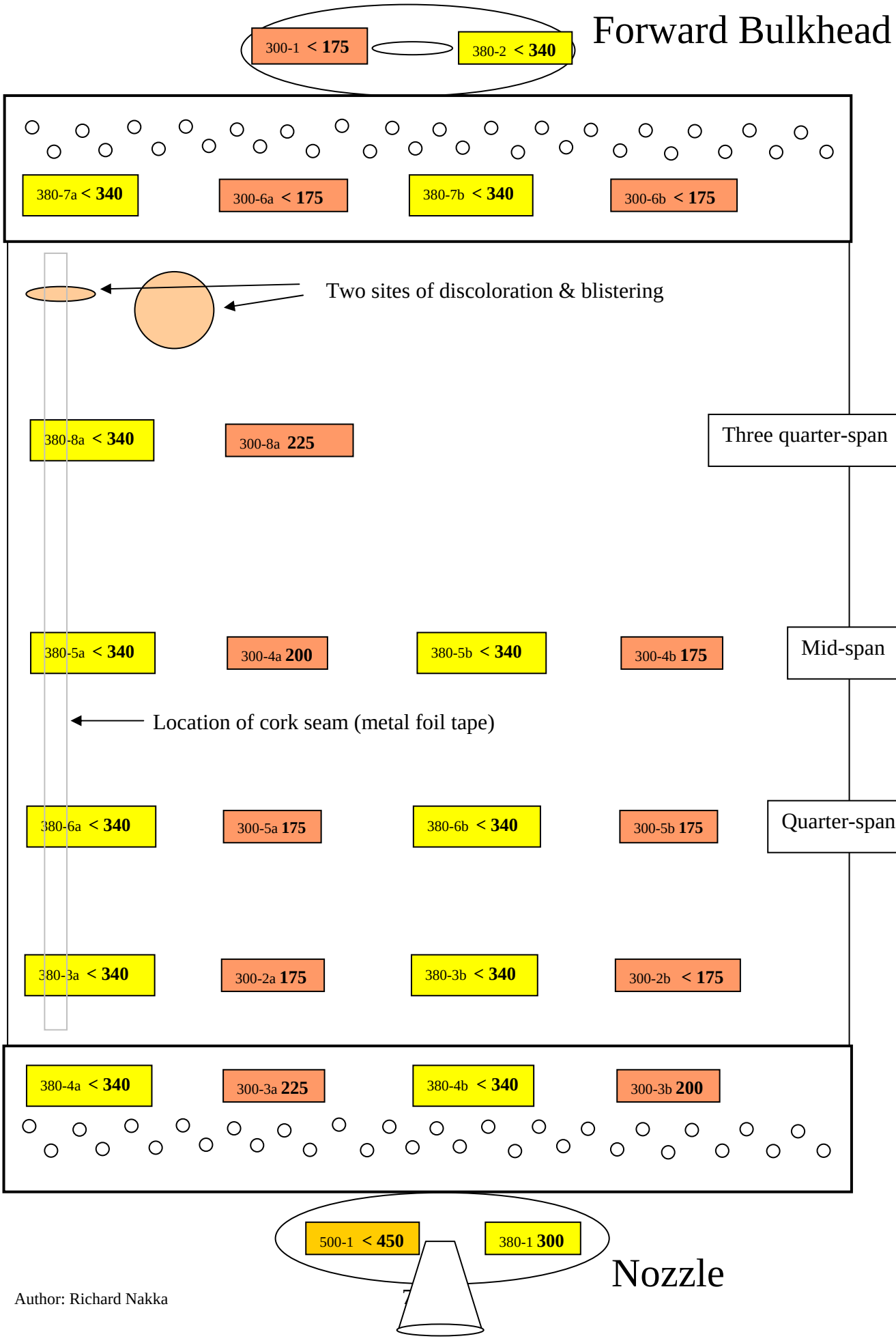


Figure 6 – Labels 500-2a, 500-2b, 500-3a, 500-3b, 500-4a & 500-4b

Table for recording post-firing temperatures

Figure	Label no.	Temperature (°F)	Notes
1	380-1	300	
	500-1	< 450	No change registered
2	300-1	< 175	No change registered
	380-2	< 340	No change registered
3	300-2a	175	
	300-2b	< 175	No change registered
	380-3a	< 340	No change registered
	380-3b	< 340	No change registered
	300-3a	225	
	300-3b	200	
	380-4a	< 340	No change registered
	380-4b	< 340	No change registered
4	300-4a	200	
	300-4b	175	
	380-5a	< 340	No change registered
	380-5b	< 340	No change registered
	300-5a	175	
	300-5b	175	
	380-6a	< 340	No change registered
	380-6b	< 340	No change registered
	300-8a	225	
	380-8b	< 340	No change registered
5	300-6a	< 175	No change registered
	300-6b	< 175	No change registered
	380-7a	< 340	No change registered
	380-7b	< 340	No change registered
6	500-2a	>500	Label burnt.
	500-2b	>500	Label burnt.
	500-3a	>500	Label burnt.
	500-3b	>500	Label burnt.
	500-4a	>500	Label burnt.
	500-4b	>500	Label burnt.
Notes	Casing thermal discoloration located 8.3 –12.0 cm from the forward end between labels 300-6a and label 300-8a. All results courtesy Rick Maschek.		

Figure 7 –(next page) A flat-development view of the motor with thermal results.



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