APOGEE F10

CERTIFIED VALUES

Total Impulse: 74.26 newton-seconds
Delays: 4, 6 and 8 seconds

Propellant Type: Composite
Propellant Mass: 40.0 grams

Casing Dimensions: 29 mm × 92 mm

Certification Date: 06-Oct - 29
Contest Use Date:

Certification Type: Model Rocket

STATIC TEST DATA

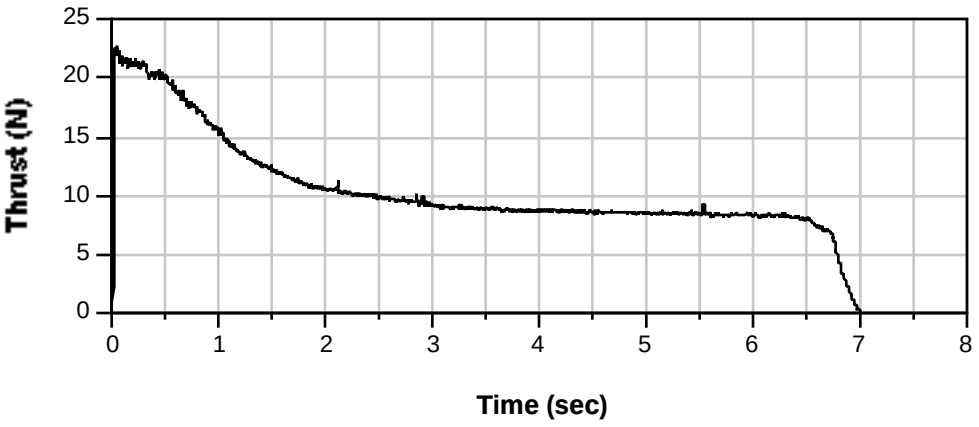
Date Tested: October 28, 2006

Total Impulse:	74.26 newton-seconds	(σ 2.90)
Peak Thrust:	22.69 newtons	(σ 2.24)
Burn Time:	7.02 seconds	(σ 0.80)
Average Thrust:	10.58 newtons	

Mass After Firing: 34.5 grams

Delay Time	Average Measured Delay	Initial Mass
4	3.35	82.3 g
6	5.65	83.0 g
8	6.64	82.5 g

TYPICAL THRUST-TIME CURVE



REMARKS

Updated: 10/06

				APOGEE	F10					
			ENGINE	TOTAL	MAX	AVG	BURN	DELAY	INIT	BURNT
			TYPE	IMPULSE	THRUST	THRUST	TIME	TIME	WT	WT
			F10-4T	74.752	21.802	9.554	7.824	3.324	82.4	34.4
			F10-4T	75.739	20.405	10.390	7.290	3.692	82.8	34.4
			F10-4T	74.979	26.229	10.785	6.952	3.036	81.8	33.7
			F10-6T	78.892	26.627	15.591	5.060	4.642	83.4	34.9
			F10-6T	74.757	23.750	10.432	7.166	5.984	82.5	34.4
			F10-6T	74.723	22.558	10.208	7.320	6.330	83.2	34.8
			F10-8T	67.191	21.348	10.499	6.400	BAD	82.1	
			F10-8T	73.499	20.208	9.720	7.562	6.858	81.7	33.6
			F10-8T	73.785	21.325	9.688	7.616	6.424	83.7	35.5
			AVG	74.26	22.69	10.76	7.02	5.04	82.62	
			STD	2.90	2.24	1.75	0.80	1.45		
			STD %	3.90	9.85	16.28	11.34	28.70		
						10.576				
				DELAYS						
ALLOWABLE										
RANGE			INDICATED	AVG	ACTUAL	ACTUAL	ACTUAL			
2.5	TO	5.5	4	3.35	3.32	3.69	3.04			
4.5	TO	7.5	6	5.65	4.64	5.98	6.33			
6.4	TO	9.8	8	6.64		6.86	6.42			

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;
; Apogee F10 RASP.ENG file made from NAR published data
; File produced NOV 24, 2006
; This file my be used or given away.  All I ask is that this header
; is maintained to give credit to NAR S&T.  Thank you, Jack Kane.
; The total impulse, peak thrust, average thrust and burn time are
; the same as the averaged static test data on the NAR web site in
; the certification file.  The curve drawn with these data points is as
; close to the certification curve as can be with such a limited
; number of points (32) allowed with wRASP up to v1.6.
   F10    29   92   4-6-8   .040   0.082   AP
 0.027       16.867
 0.046       22.690
 0.302       21.009
 0.375       19.934
 0.467       20.262
 0.687       17.952
 0.989       15.552
 1.327       13.083
 1.812       10.932
 2.481       10.036
 3.121       8.964
 4.101       8.642
 4.934       8.569
 5.437       8.574
 5.510       9.236
 5.556       8.409
 5.867       8.496
 6.224       8.416
 6.508       8.089
 6.600       7.262
 6.719       7.015
 6.764       6.106
 6.810       4.701
 6.883       3.047
 6.938       1.477
 7.020       0.000
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