

PROTOFLIGHT ENVIRONMENTS
FOR
N-STAR BIPROPELLANT TANK ASSEMBLY
ATK P/N 80366-1

80366-1 was subjected to the following protoflight tests:

<u>Test Sequence</u>	<u>Test Description</u>	<u>P</u>
1	Preliminary Inspection of Product	
2	Mass Measurement	
3	Pre-Proof Volumetric Capacity, Ambient Proof Pressure, Visual Inspection, and Post-Proof Volumetric Capacity	
4	Cryogenic Proof Pressure, Visual Inspection, and Post-Proof Volumetric Capacity	
5*	External Leakage Test	
6*	Tank Assembly Bubble Point Test	
7	Sine and Random Vibration Test and Visual Inspection	
8	Expulsion Test	
9 **	Tank Assembly Bubble Point Test	
10 **	External Leakage Test	
11 +	Radiographic Inspection	
12 +	Dye Penetrant Inspection	
13	Cleanliness Check	
14	Data Review	

Sine Vibration (Wet)

Protoflight Sine Vibration Levels (Wet)

<u>Axis</u>	<u>Frequency (HZ)</u>	<u>Acceleration(G)</u> <u>(0-PEAK)</u>
Lateral (X & Y)	5-13	.25 inch SA
	13-17	4.3
	17-45	3
	45-100	2
Axial (Z)	5-22.3	.20 inch SA
	22.3-24	10.2
	24-26	Ramp Down
	26-50	2.6
	50-52	Ramp Down
	52-100	1.3

Tank is loaded with 2094, +5/-0 lbs of water and pressurized to 250, +0/-10 psig of gaseous nitrogen.

The vibration sweep is applied at a sweep rate of 4 octaves/min minimum in each of the three orthogonal axes.

Acceleration Load Limits

<u>Axis</u>	<u>Frequency (HZ)</u>	<u>Limit Acceleration(G)</u> <u>(0-PEAK)</u>
Lateral (X & Y)	5.0-17	4.3
	17-100	3
Axial (Z)	5.0-26	10.2
	26-52	4.5
	52-100	2.6

Random Vibration (Wet)

Random Vibration Levels

<u>Frequency (HZ)</u>	<u>Levels</u>
90-100	+30dB/Octave
100-800	.054G ² /HZ
800-2000	-3dB/Octave
Overall G-rms	8.7

The 8.7 G-rms random vibration spectrum may be split into two bands, if necessary, to meet vibration shaker equipment limitations.

Tank is loaded with 2094, +5/-0 lbs of water and pressurized to 250, +0/-10 psig of gaseous nitrogen.

The vibration spectrum is applied in each of the three orthogonal axes for 1 minute each.