

QUALIFICATION ENVIRONMENTS
FOR
SERIES 7000 HYDRAZINE TANK
ATK P/N 80373-11

80373-11 was subjected to the following qualification tests:

Test Sequence	Test Title
1	Examination of Product
2	Tank Assy Bubblepoint Test
3	Pre-Proof Vol Capacity Test
4	Proof Pressure Test
5	Post-Proof Vol Capacity Test
6	Cryogenic Proof Pressure & Post-Cryo Dimensional
7	Pressure Cycle Life
8	External Leakage
9	Tank Assy Bubblepoint Test
10	Vibration Test Slosh Test Dry Random Wet Sine Wet Random
11	Expulsion Test
12	External Leakage
13	Tank Assy Bubblepoint Test
14	Examination of Product
15	Burst Pressure & Rupture Test
16	Preparation for Delivery

MEOP Pressure Cycle Life

The tank is pressurized to 300, +10/-0 psig and held for a minimum of 30 seconds. Number of cycles is 50.

Slosh Test

Tank is loaded with 371, \pm 5 lb of distilled water and pressurized to 80 psig.

X axis (thrust), Z axis (lateral), and Y axis (lateral): 18.5 minutes of dwell vibration with applied amplitude of 6.0 inches at frequency of 1.15 Hz.

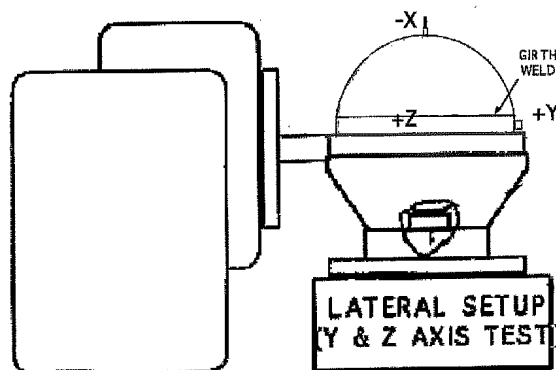
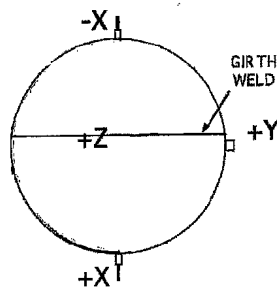
Random Vibration (Dry)

AXIS	FREQUENCY (HZ)	QUALIFICATION
ALL	20-200	+2.1dB/oct
	200-1000	0.06 g ² /Hz
	1000-2000	-3.0dB/oct

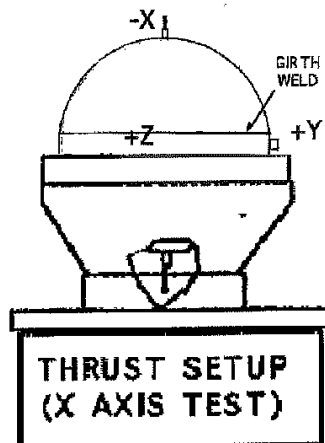
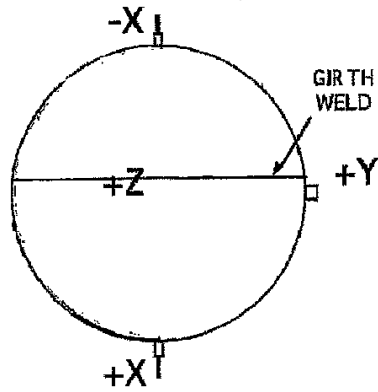
- Test duration is 2 minutes per axis.
- Limit the tank response to 0.50 g²/Hz below 500 Hz and 2.0 g²/Hz from 500-2000 Hz in each of the three axis. These limits are applied only at the tank major resonant frequencies. Local shell response spikes (narrow frequency bands less than 20 Hz or the associated energy less than 10 g RMS) shall not require additional limiting.

Tank is pressurized to 80, ± 5 psi.

LATERAL SET-UP



THRUST SET-UP



Sine Vibration (Wet)

TEST AXIS	FREQUENCY (HZ)	INPUT LEVEL (0-Peak)	RESPONSE LIMIT
"X"(Thrust)	5-17	0.5 (D.A.)	10.0 g's
	17-30	9.0 g	
	30-65	3.6 g	
	65-100	1.5 g	
"Y" & "Z" (LATERAL)	5-11	0.5 (D.A.)	7.0 g's
	11-65	3.6 g	
	65-100	1.2 g	

- Limited to 0.5 inch maximum double amplitude
- The input level shall be notched when responses are exceeding limits defined. The G limit shall be set at levels specified for all three directions and activated during test.

Tank is filled with 730, +0/-5 lbs of D.I. water and pressurized to 80, ± 5 psi with GN₂.

Sinusoidal vibration test conducted at 2 oct/min.

Random Vibration (Wet)

AXIS	FREQUENCY (HZ)	QUALIFICATION
ALL	20-200	+2.1dB/oct
	200-1000	0.06 g ² /Hz
	1000-2000	-3.0 dB/oct

- Test duration is 2 minutes per axis.
- Limit the tank response to 0.50 g²/Hz below 500 Hz and 2.0 g²/Hz from 500-2000 Hz.in each of the three axis. These limits are applied only at the tank major resonant frequencies. Local shell response spikes (narrow frequency bands less than 20 Hz or the associated energy less than 10 g RMS) shall not require additional limiting.

Tank is filled with 730, +0/-5 lbs of D.I. water and pressurized to 80, ± 5 psi with GN₂.

Burst Pressure Test

The design burst pressure for the tank is 450 psig.

The actual burst pressure for the tank is N/A.