

### CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: HPA-2  
 NAME / QUANTITY: Jetison Handle  
 DRAWING REFERENCE: 417988

PROJECT: HST  
 LRU NAME / QUANTITY: HST PFR/PMC Assembly  
 LRU PART NUMBER: SED 3M19285-804803

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 SUBSYSTEM: N/A  
 EFFECTIVITY: ALL ORBITERS

FAILURE MODE NUMBER HST-HPA-2-1	CRITICALITY 1R/2	FAILURE EFFECT	RETENTION RATIONALE
<b>FUNCTION</b> Jetison Handle assist the crew with the contingency jetison of the Solar Arrays		<b>END ITEM</b> Jetison Handle is free in the payload bay.	<p><b>I. Design Feature to Minimize the Chance of the Failure Mode</b></p> <p><b>A. Design</b> The Jetison Handle was designed to an ultimate structural safety factor of 1.4.</p> <p><b>B. Tolerances</b> Sufficient tolerances were used in the PFR Extender design to prevent jamming by expansion and contraction of material due to temperature extremes or on-orbit use.</p> <p><b>C. Materials - Major Components</b> Probe - 15-5PH, Condition H1025. Pip pin - Modified MS stainless steel pin (P/N 4173211)</p> <p><b>II. Testing and Analysis</b></p> <p><b>A. Acceptance Testing</b></p> <p>1. PIA A full pre-installation acceptance (PIA) test was performed on the Jetison Handle assembly before it was delivered to KSC to support flight. The PIA verified that the Jetison Handle is functioning within tolerances and that the assembly is clean (ref. 189320299).</p> <p>2. Pip Pin Acceptance The Pip pin was used in the STS-31 manned thermal vacuum test to demonstrate its operation under thermal conditions. The operation was successful at -90°F.</p>
<b>FAILURE MODE AND CAUSE</b>		<b>MISSION</b> None.	
<b>MODE</b> Jetison Handle comes loose in the payload bay.			
<b>CAUSE(S)</b>		<b>CREW / VEHICLE</b> Loss of crew and vehicle due to damaged created from loose Jetison Handle in the payload bay.	
<p>1) Pip Pin Failure 2) Vibration</p>			
<b>REDUNDANCY SCREENS</b>	<b>REMAINING PATHS</b>	<b>INTERFACE</b> EVA-plate PFR socket.	
A - Pass B - Pass C - Pass	1.) Hitch Pin		
<b>MISSION PHASE</b>	<b>CORRECTIVE ACTION TIMES</b>		
	<b>TIME TO EFFECT</b>	<b>TIME TO CORRECT</b>	
Launch/Landing	Minutes	Seconds	

PREPARED BY: J. F. PARK

REVISION: BASIC

SUPERSEDING DATE: NONE

DATE: 10/1/89

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## CRITICAL ITEMS LIST

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SUBSYSTEM: N/A

EFFECTIVITY: ALL ORBITERS

REFERENCE DESIGNATOR: HPA-1  
 NAME/QUANTITY: Jettison Handle  
 DRAWING REFERENCE: 417002

PROJECT: HST  
 LRU NAME / QUANTITY: HST PFR/APC Assembly  
 LRU PART NUMBER: SED 3811854-581503

FAILURE MODE NUMBER HST-HPA-2-1	CRITICALITY 1R/2	FAILURE EFFECT	RETENTION RATIONALE					
<b>FUNCTION</b> Jettison Handle assist the crew with the contingency jettison of the Solar Arrays.		<b>END ITEM</b> Jettison Handle is free in the payload bay.	<b>B. Certification Testing</b>  1. Thermal Vacuum  The Jettison Handle was exposed to a cold temperature ( -132°F) vacuum ( 1x10-5 torr) environment. This test was used to check the tolerances of the hex probe to the PFR socket and the operation of the pip pin. The operational requirement was -90°F (Ref. JSC-23550)  2. Functionals  The Jettison Handle pip pin was functionally operated prior to and immediately after all acceptance/certification tests to verify that the test environment did not degrade the hardware performance.					
<b>FAILURE MODE AND CAUSE</b> <b>MODE</b> Jettison Handle comes loose in the payload bay.		<b>MISSION</b> None.						
<b>CAUSE(S)</b>  1) Pip Pin Failure 2) Vibration		<b>CREW / VEHICLE</b> Loss of crew and vehicle due to damage created from loose Jettison Handle in the payload bay.						
<b>REDUNDANCY SCREENS</b> A - Pass B - Pass C - Pass	<b>REMAINING PATHS</b> 1.) Hitch Pin	<b>INTERFACE</b> EVA-plate PFR socket.						
<b>MISSION PHASE</b>	<b>CORRECTIVE ACTION TIMES</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">TIME TO EFFECT</th> <th style="width: 50%;">TIME TO CORRECT</th> </tr> <tr> <td>Launch/Landing</td> <td>Minutes</td> </tr> <tr> <td></td> <td>Seconds</td> </tr> </table>			TIME TO EFFECT	TIME TO CORRECT	Launch/Landing	Minutes	
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Launch/Landing	Minutes							
	Seconds							

PREPARED BY: J.F. PARK

REVISION: BASIC

SUPERSIDING DATE: NONE

DATE: 10/21/93

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### CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: HPA-2  
 NAME / QUANTITY: Jettison Handle  
 DRAWING REFERENCE: 410660

PROJECT: HST  
 LRU NAME / QUANTITY: HST PFR/APC Assembly  
 LRU PART NUMBER: SED 20119295-601503

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 SUBSYSTEM: N/A  
 EFFECTIVITY: ALL ORBITERS

FAILURE MODE NUMBER HST-HPA-2-1	CRITICALITY 1R/2	FAILURE EFFECT	RETENTION RATIONALE																					
<b>FUNCTION</b> Jettison Handle assist the crew with the contingency jettison of the Solar Arrays.		<b>END ITEM</b> Jettison Handle is free in the payload bay.	<p><b>C. Certification Analysis</b>                      All Jettison Handle components were analyzed to the following induced environments to verify that the assembly can withstand the environment levels:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">1. Requirements</th> <th style="width: 30%;">Source</th> <th style="width: 40%;">Data</th> </tr> </thead> <tbody> <tr> <td colspan="3"><b>A. Structures</b></td> </tr> <tr> <td>- UL (fs = 2.0)</td> <td>F29-7064 (stress analysis)</td> <td>300 lbs all directions</td> </tr> <tr> <td>- Fracture</td> <td>JSC-25838</td> <td>OK per Mail-93-079</td> </tr> <tr> <td colspan="3"><b>B. Temperature</b></td> </tr> <tr> <td>- Hot</td> <td>LESC-30943</td> <td>+250°F</td> </tr> <tr> <td>- Cold</td> <td>JSC-23550</td> <td>-90°F</td> </tr> </tbody> </table>	1. Requirements	Source	Data	<b>A. Structures</b>			- UL (fs = 2.0)	F29-7064 (stress analysis)	300 lbs all directions	- Fracture	JSC-25838	OK per Mail-93-079	<b>B. Temperature</b>			- Hot	LESC-30943	+250°F	- Cold	JSC-23550	-90°F
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- Cold	JSC-23550	-90°F																						
<b>FAILURE MODE AND CAUSE</b> <b>MODE</b> Jettison Handle comes loose in the payload bay.		<b>MISSION</b> None.																						
<b>CAUSE(S)</b> 1) Pin Pin Failure 2) Vibration		<b>CREW / VEHICLE</b> Loss of crew and vehicle due to damaged created from loose Jettison Handle in the payload bay.																						
<b>REDUNDANCY SCREENS</b> A - Pass B - Pass C - Pass	<b>REMAINING PATHS</b> 1.) Hitch Pin	<b>INTERFACE</b> EVA-plate PFR socket.																						
<b>MISSION PHASE</b>	<b>CORRECTIVE ACTION TIMES</b>																							
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Launch/Landing	Minutes	Seconds																						

PREPARED BY: J. F. PARK

REVISION: BASIC

SUPERSEDING DATE: NONE

DATE 10/1/89

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### CRITICAL ITEMS LIST

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SUBSYSTEM: N/A  
EFFECTIVITY: ALL ORBITERS

REFERENCE DESIGNATOR: HPA-2      PROJECT: HST  
NAME / QUANTITY: Jettison Handle      LRU NAME / QUANTITY: HST PFR/AFPC Assembly  
DRAWING REFERENCE: 417869      LRU PART NUMBER: SED 301 16285-001/993

FAILURE MODE NUMBER HST-HPA-2-1	CRITICALITY 1R/2	FAILURE EFFECT	RETENTION RATIONALE
<b>FUNCTION</b> Jettison Handle assist the crew with the contingency jettison of the Solar Arrays		<b>END ITEM</b> Jettison Handle is free in the payload bay.	III. <u>Inspection</u>  A. <u>Manufacturing</u>  1. The Jettison Handle components were inspected prior to build-up for conformance to their applicable drawings.  B. <u>Assembly</u>  1. Jettison Handle and pip pin are cleaned and inspected to the levels described in JSC 5322B. Once cleaned, the Jettison Handle was bagged to prevent anything from contaminating the unit.  C. <u>Testing</u>  1. The hardware was fully inspected for any signs of galling as a part of the pre/post functional tests performed prior to and immediately after all certification and acceptance tests.
<b>FAILURE MODE AND CAUSE</b> <b>MODE</b> Jettison Handle comes loose in the payload bay.		<b>MISSION</b> None.	
<b>CAUSE(S)</b>  1) Pip Pin Failure 2) Vibration		<b>CREW / VEHICLE</b> Loss of crew and vehicle due to damaged created from loose Jettison Handle in the payload bay.	
<b>REDUNDANCY SCREENS</b> A - Pass B - Pass C - Pass	<b>REMAINING PATHS</b> t.) High Pin	<b>INTERFACE</b> EVA-plate PFR socket.	
<b>MISSION PHASE</b>	<b>CORRECTIVE ACTION TIMES</b>		
	TIME TO EFFECT	TIME TO CORRECT	
Launch/Landing	Minutes	Seconds	

PREPARED BY: J. F. PARK

REVISION: BASIC

SUPERSEDING DATE: NONE

DATE: 1628/93

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### CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: HPA-2  
 NAME / QUANTITY: Jettison Handle  
 DRAWING REFERENCE: 417660

PROJECT: HST  
 LRU NAME / QUANTITY: HST PFR/APC Assembly  
 LRU PART NUMBER: SED 38118224-001/000

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 SUBSYSTEM: N/A  
 EFFECTIVITY: ALL ORBITERS

FAILURE MODE NUMBER HST-HPA-2-1	CRITICALITY 1R/2	FAILURE EFFECT	RETENTION RATIONALE
<b>FUNCTION</b> Jettison Handle assist the crew with the contingency jettison of the Solar Arrays.		<b>END ITEM</b> Jettison Handle is free in the payload bay.	IV. Failure History A. None, HST PFR/APC flew on STS-31, but was not used.  V. Operations A. <u>Effects of Failure</u> Jettison Handle loses connection to the APC and is free to move within the payload bay.  B. <u>Crew Actions</u> None.  C. <u>Training</u> None.  D. <u>Mission Constraints</u> Possible damage to cargo within payload bay if the Jettison Handle does come loose.  E. <u>In flight Check-Outs</u> None
<b>FAILURE MODE AND CAUSE</b> <b>MODE</b> Jettison Handle comes loose in the payload bay.		<b>MISSION</b> None.	
<b>CAUSE(S)</b> 1) Pin Failure 2) Vibration		<b>CREW / VEHICLE</b> Loss of crew and vehicle due to damaged created from loose Jettison Handle in the payload bay.	
<b>REUNDANCY SCREENS</b> A - Pass B - Pass C - Pass	<b>REMAINING PATHS</b> 1.) Hitch Pin	<b>INTERFACE</b> EVA-plate PFR socket.	
<b>MISSION PHASE</b>	<b>CORRECTIVE ACTION TIMES</b>		
	<b>TIME TO EFFECT</b>	<b>TIME TO CORRECT</b>	
Launch/Landing	Minutes	Seconds	

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