

CRITICAL ITEMS LIST

REFERENCE DESIGNATION: HST-PFR-4
 NAME / QUANTITY: Platform Assy/1
 DRAWING REFERENCE: 41771R

PROJECT: HST
 LRU NAME / QUANTITY: PFR
 LRU PART NUMBER: SED00107645-391

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 SUBSYSTEM: N/A
 EFFECTIVITY: ALL ORBITERS

FAILURE MODE NUMBER HST-PFR-4-1	CRITICALITY 2/2	FAILURE EFFECT	RETENTION RATIONALE
FUNCTION This is the primary attachment location for the EMU to the HST PFR. It also serves as the support surface for the crewmember at a worksite.		END ITEM Cannot remove HST-PFR from socket	I. Design Feature to Minimize the Chance of the Failure Mode A. <u>Design</u> All HST PFRs were designed to an ultimate structural safety factor of 1.4 B. <u>Tolerances</u> Sufficient tolerances were used in the HST PFR design to prevent jamming by expansion and contraction of material due to temperature extremes or on-orbit use. C. <u>Materials - Major Components</u> See material list (Table E-2). II. <u>Testing and Analysis</u> A. <u>Acceptance Testing</u> 1. PIA A full pre-installation acceptance (PIA) test will be performed on each HST PFR before it is delivered to KSC to support any STS flight. The PIA will verify that the HST PFRs are within tolerances and that the assembly is clean. 2. Vibration The HST PFRs were exposed to qualification level vibration loads during their initial development in support of STS-31. The test verified that the HST PFRs were free of manufacturing defects and tolerance problems. (Reference LMSC Document number H177097-501.
FAILURE MODE AND CAUSE MODE The user cannot remove the EMU boot from the heel support on the platform. CAUSE(S) 1) Binding due to thermal extremes 2) Misalignment during installation 3) Contamination		MISSION No effect on mission objectives if backup HST-PFR is available	
REUNDANCY SCHEME A - N/A B - N/A C - N/A		REUNDANCY PATH None	
MISSION PHASE		CREW / VEHICLE None	
CORRECTIVE ACTION TIMES TIME TO EFFECT TIME TO CORRECT		INTERFACE None	
EVA	Minutes	N/A	

HST-PFR - 19

CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: HST-PFR-4
 NAME / QUANTITY: Platform Assy/1
 DRAWING REFERENCE: 4177182

PROJECT: HST
 LRU NAME / QUANTITY: PFR
 LRU PART NUMBER: BBDJN7035-301

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 SUBSYSTEM: N/A
 EFFECTIVITY: ALL ORBITERS

FAILURE MODE NUMBER HST-PFR-4-1	CRITICALITY 2/2	FAILURE EFFECT	RETENTION RATIONALE																								
FUNCTION This is the primary attachment location for the EMU to the HST PFR. It also serves as the support surface for the crewmember at a worksite.		END ITEM Cannot dismount from HST-PFR	A. Acceptance Testing (continued) The following vibration levels are per : <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 25%;">Frequency (Hz)</th> <th style="width: 25%;">Slope (dB/oct)</th> <th style="width: 25%;">Constant Level G²/Hz</th> <th style="width: 25%;">Overall G rms</th> </tr> </thead> <tbody> <tr> <td>20</td> <td></td> <td></td> <td>7.7</td> </tr> <tr> <td>20-45</td> <td>+7.0</td> <td>.009</td> <td></td> </tr> <tr> <td>45-600</td> <td></td> <td>.06</td> <td></td> </tr> <tr> <td>600-2000</td> <td>-8.0</td> <td></td> <td></td> </tr> <tr> <td>2000</td> <td></td> <td>.0054</td> <td></td> </tr> </tbody> </table> B. Certification Testing 1. Thermal Vacuum The HST PFR was exposed to a cold temperature (-132°F) vacuum (1x10 ⁻⁵ toms) environment. This test was used to check the workmanship of the PFR platform. The operational requirement was -90°F (Ref. JSC-23550). No parts on the platform involved with this failure mode were found to have shifted or come loose due to the thermal extremes.	Frequency (Hz)	Slope (dB/oct)	Constant Level G ² /Hz	Overall G rms	20			7.7	20-45	+7.0	.009		45-600		.06		600-2000	-8.0			2000		.0054	
Frequency (Hz)	Slope (dB/oct)	Constant Level G ² /Hz		Overall G rms																							
20				7.7																							
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FAILURE MODE AND CAUSE MODE The user cannot remove the EMU Boot from the heel support on the platform CAUSE/S 1) Binding due to thermal extremes 2) Misalignment during installation 3) Contamination		MISSION No effect on mission objectives if backup HST-PFR is available																									
REUNDANCY SCREENS A - N/A B - N/A C - N/A		CREW / VEHICLE None																									
REMAINING PARTS None		INTERFACE None																									
MISSION PHASE EVA	CORRECTIVE ACTION TIMES <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">TIME TO EFFECT</th> <th style="width: 50%;">TIME TO CORRECT</th> </tr> </thead> <tbody> <tr> <td>Minutes</td> <td>N/A</td> </tr> </tbody> </table>		TIME TO EFFECT	TIME TO CORRECT	Minutes	N/A																					
TIME TO EFFECT	TIME TO CORRECT																										
Minutes	N/A																										

HST-PFR - 20

CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: HST-PFR-4
 NAME / QUANTITY: Platform Assy/1
 DRAWING REFERENCE: 477100

PROJECT: HST
 LRU NAME / QUANTITY: PFR
 LRU PART NUMBER: 560031 0700-301

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 SUBSYSTEM: N/A
 EFFECTIVITY: ALL ORDERS

FAILURE MODE NUMBER HST-PFR-4-1	CRITICALITY 2/2	FAILURE EFFECT	RETENTION RATIONALE	
FUNCTION This is the primary attachment location for the EMU to the HST PFR. It also serves as the support surface for the crewmember at a worksite.		END ITEM Cannot dismount from HST-PFR	C. Certification Analysis All HST PFR components were analyzed to the following induced environments to verify that the assembly can withstand the environment levels: 1. Requirements Source a. Shock - Functional NSTS-07700 VOL. XIV b. Vibration / Fil Levels - Acoustics NSTS-07700 VOL. XIV c. Structures - UL (Is = 2.0) NSTS-07700 VOL. XIV - Fracture NSTS-07700 VOL. XIV d. Acceleration - Flight MF0004-014D - Crash ML-STD-810, Meth. 516, Proced. 1 e. Temperature - Hot (+250°F) NSTS-07700 VOL. XIV, Appendix 7 - Cold (-90°F) JSC-23550	
FAILURE MODE AND CAUSE MODE The user cannot remove the EMU boot from the heel support on the platform.		MISSION No effect on mission objectives if backup HST-PFR is available		
CAUSE(S) 1) Binding due to thermal extremes 2) Misalignment during installation		CREW / VEHICLE None		
REUNDANCY SCREENS REMAINING PATHS A - N/A B - N/A C - N/A None		INTERFACE None		
MISSION PHASE EVA		CORRECTIVE ACTION TIMES TIME TO EFFECT TIME TO CORRECT Minutes N/A		

HST-PFR - 21

CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: HST-PFR-4
 NAME / QUANTITY: Platform Assy/1
 DRAWING REFERENCE: 417792

PROJECT: HST
 LRU NAME / QUANTITY: PFR
 LRU PART NUMBER: 8ED03W7055-301

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 SUBSYSTEM: N/A
 EFFECTIVITY: ALL DMBITERS

FAILURE MODE NUMBER HST-PFR-4-1	CRITICALITY 2/2	FAILURE EFFECT	RETENTION RATIONALE					
FUNCTION This is the primary attachment location for the EMU to the HST PFR. It also serves as the support surface for the crewmember at a worksite.		END ITEM Cannot dismount from HST-PFR	NI. Inspection A. Manufacturing 1. The HST PFR components were inspected prior to build-up for conformance to their applicable drawings. 2. All fracture critical piece parts were and will be inspected as described on their applicable drawings. B. Assembly 1. HST PFR will be cleaned and inspected to the levels described in JSC 5322B. Once cleaned, the HST PFR will be bagged to prevent any contamination from entering the unit. C. Testing 1. The hardware will be fully inspected for any signs of misalignment or loose parts as during the pre/post functional tests performed prior to and immediately after all certification and acceptance tests.					
FAILURE MODE AND CAUSE MODE The user cannot remove the EMU tool from the heel support on the platform. CAUSE(S) 1) Binding due to thermal extremes 2) Misalignment during installation		MISSION No effect on mission objective as backup HST-PFR is available						
REUNDANCY SCREENS A - N/A B - N/A C - N/A		CREW / VEHICLE None						
REMAINING PARTS None		INTERFACE None						
MISSION PHASE EVA		CORRECTIVE ACTION TIMES <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 style="text-align: center;">Minutes</td> <td style="text-align: center;">N/A</td> </tr> </table>		TIME TO EFFECT	TIME TO CORRECT	Minutes	N/A	
TIME TO EFFECT	TIME TO CORRECT							
Minutes	N/A							

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