

CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: HET-1
 NAME / QUANTITY: Interface Adapter Assy.
 DRAWING REFERENCE: 6.32, 33, 34

PROJECT: HST
 LRU NAME / QUANTITY: Interface Adapter Assy.
 LRU PART NUMBER: See List in Section 2.0 of This Document

PAGE 1 OF 5
 SUBSYSTEM: TOOLS
 EFFECTIVITY: ALL ORBITERS

FAILURE MODE NUMBER	CRITICALITY	FAILURE EFFECT	RETENTION RATIONALE
HST-HET-1-1	2/2		
FUNCTION The interface adapter connects to a bayonet receptacle on the mini-work station and the manipulator foot restraint (MFR) work stanchion. The HST power tool and McTeather and ratchet caddies have interface adapter assy. attached to them.		END ITEM Cannot detach HST tool (s) from the MFR work stanchion.	DESIGN I. Design Feature to Minimize the Chance of the Failure Mode A. Design All HST tools were designed to an ultimate structural safety factor of 1.4. B. Tolerances Sufficient tolerances will be used in the Interface adapter design to prevent jamming by expansion and contraction of material due to temperature extremes or on-orbit use. C. Materials - Major Components 1. Bracket: Al 6061-T651 2. Pin: CRES 304 S/S II. Testing and Analysis A. Acceptance Testing 1. PDA A full pre-delivery acceptance (PDA) test will be performed on the HST tools before they are delivered to JSC for the beginning of the certification process. The PDA will verify that the interface adapter is built within tolerances and that the assembly is clean. 2. Vibration The flight tool box will be exposed to acceptance vibration loads while all tools are in their flight stowage location. The test will verify that the interface adapters will be free of manufacturing defects and identify any tolerance problems.
FAILURE MODE AND CAUSE MODE Cannot disengage an interface adapter assy from the bayonet receptacle on the MFR work stanchion CAUSE(S) 1.) Contamination. 2.) Binding.		MISSION Unable to use the MFR on subsequent EVAs. Unable to properly slow the MFR.	
REDAUNDANCY SCREENS A - N/A B - N/A C - N/A		CREW / VEHICLE None.	
REMAINING PATHS f.) None.		INTERFACE MWS work stanchion.	
MISSION PHASE	CORRECTIVE ACTION TIMES		
	TIME TO EFFECT	TIME TO CORRECT	
EVA	Hours	Minutes	

CRITICAL ITEMS LIST

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REFERENCE DESIGNATOR: HET-1
 NAME / QUANTITY: Interface Adapter Assy.
 DRAWING REFERENCE: h.32, 33, 34

PROJECT: HST
 LRU NAME / QUANTITY: Interface Adapter Assy.
 LRU PART NUMBER: See List in Section 2.6 of This Document

SUBSYSTEM: TOOLS
 EFFECTIVITY: ALL ORBITERS

FAILURE MODE NUMBER	CRITICALITY	FAILURE EFFECT	RETENTION RATIONALE																																								
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CRITICAL ITEMS LIST

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REFERENCE DESIGNATOR: HET-1
 NAME / QUANTITY: Interface Adapter Assy.
 DRAWING REFERENCE: 6.22, 23, 24

PROJECT: HST
 LRU NAME / QUANTITY: Interface Adapter Assy.
 LRU PART NUMBER: See List in Section 2.6 of This Document

SUBSYSTEM: TOOLS
 EFFECTIVITY: ALL ORBITERS

FAILURE MODE NUMBER	CRITICALITY	FAILURE EFFECT	RETENTION RATIONALE																		
HST-HET-1-1	2/2																				
FUNCTION The interface adapter connects to a bayonet receptacle on the mini-work station and the manipulator foot restraint (MFR) work station. The HST power tool and McTeer and ratchet caddies have interface adapter assy. attached to them.		END ITEM Cannot detach HST tool (s) from the MFR work station.	DESIGN B. <u>Certification Testing (continued)</u> 2. Functionals The HST tools will be functionally operated prior to and immediately after all certification test to verify that the test environment does not degrade the hardware performance. Attach/disconnect operations with the MFR will be part of these tests. C. <u>Certification Analysis</u> All interface adapter assembly will be analyzed to the following induced environments to verify that the assembly can withstand the environment levels: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">I. Requirements</th> <th style="width: 30%;">Source</th> <th style="width: 40%;">Applicability</th> </tr> </thead> <tbody> <tr> <td>a. <u>Shock</u> - Functional</td> <td>NSTS-07700 VOL. XIV</td> <td>If stowed in box</td> </tr> <tr> <td>b. <u>Vibration (FR Levels)</u> - Acoustics</td> <td>NSTS-07700 VOL. XIV</td> <td>If stowed in box</td> </tr> <tr> <td>c. <u>Structures</u> - I/M (Ns = 2.0) - Fracture</td> <td>NSTS-07700 VOL. XIV NSTS-07700 VOL. XIV</td> <td>Applicable to all Applicable to all</td> </tr> <tr> <td>d. <u>Acceleration</u> - Flight - Crash</td> <td>MF004-014D ML STD-810, Meth. 516, Proced</td> <td>If stowed in box If stowed in box</td> </tr> <tr> <td>e. <u>Temperature</u> - Hot (+250°F) - Cold (-90°F)</td> <td>HST S/AD (10181-10081A) HST S/AD (10181-10081A)</td> <td>Applicable to all Applicable to all</td> </tr> </tbody> </table>	I. Requirements	Source	Applicability	a. <u>Shock</u> - Functional	NSTS-07700 VOL. XIV	If stowed in box	b. <u>Vibration (FR Levels)</u> - Acoustics	NSTS-07700 VOL. XIV	If stowed in box	c. <u>Structures</u> - I/M (Ns = 2.0) - Fracture	NSTS-07700 VOL. XIV NSTS-07700 VOL. XIV	Applicable to all Applicable to all	d. <u>Acceleration</u> - Flight - Crash	MF004-014D ML STD-810, Meth. 516, Proced	If stowed in box If stowed in box	e. <u>Temperature</u> - Hot (+250°F) - Cold (-90°F)	HST S/AD (10181-10081A) HST S/AD (10181-10081A)	Applicable to all Applicable to all
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CAUSE(S) 1.) Contamination. 2.) Binding.		CREW / VEHICLE None.																			
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CRITICAL ITEMS LIST

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 NAME / QUANTITY: Interface Adapter Assy.
 DRAWING REFERENCE: 4.32, 33, 34

PROJECT: HST
 LRU NAME / QUANTITY: Interface Adapter Assy.
 LRU PART NUMBER: See List in Section 2.9 of this Document

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 SUBSYSTEM: TOOLS
 EFFECTIVITY: ALL ORDERS

FAILURE MODE NUMBER HST-HET-1-1	CRITICALITY 2/2	FAILURE EFFECT	RETENTION RATIONALE
FUNCTION The interface adapter connects to a bayonet receptacle on the mini-work station and the manipulator tool restraint (MFR) work station. The HST power tool and McTeer and ratchet caddies have interface adapter Assy. attached to them.		END ITEM Cannot detach HST tool (s) from the MFR work station. MISSION Unable to use the MFR on subsequent EVAs. Unable to properly stow the MFR. CREW / VEHICLE None. INTERFACE MWS work station.	DESIGN III. Inspection A. Manufacturing 1. The interface adapter assemblies will be inspected prior to build-up for conformance to their applicable drawings. 2. All fracture critical piece parts will be inspected as described on their applicable drawings. B. Assembly 1. Tools will be cleaned and inspected to the levels described in JSC 5322B. Once cleaned, the tool will be bagged to prevent any contamination from entering the tool. All tools will be stowed in their appropriate location in the box and the box will be sealed prior to shipment to the KSC. C. Testing 1. The hardware will be fully inspected for any signs of galling as a part of the prepost functional tests performed prior to and immediately after all major certification and acceptance testing. 2. All HST tools with interface adapters will be fit checked with the flight MFR
FAILURE MODE AND CAUSE MODE Cannot disengage an interface adapter Assy. from the MFR work station. CAUSE(S) 1.) Contamination. 2.) Binding.			
REUNDANCY SCREENS A - N/A B - N/A C - N/A	REMAINING PATHS 1.) None.		
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 SUBSYSTEM TOOLS
 EFFECTIVITY: ALL CRITERIA

FAILURE MODE NUMBER HST-HET-1-1	CRITICALITY 2/2	FAILURE EFFECT	RETENTION RATIONALE				
FUNCTION The interface adapter connects to a bayonet receptacle on the mini-work station and the manipulator foot restraint (MFR) work stanchion. The HST power tool and McTether and ratchet caddies have interface adapter assy. attached to them.		END ITEM Cannot detach HST tool (s) from the MFR work stanchion. MISSION Unable to stow the MFR on subsequent EVAs. Unable to properly stow the MFR. CREW / VEHICLE None. INTERFACE MWS work stanchion.	DESIGN IV. Failure History A. There have been no failures associated with the interface adapter to the MFR work stanchion. V. Operations A. <u>Effects of Failure</u> Cannot detach HST tool (s) from the MFR work stanchion. B. <u>Crew Actions</u> If the HST tool cannot be removed by using a hammer or crow bar, the tool and MFR must be jettisoned. The crew will attempt to remove the interface adapter from the tool and/or attempt to remove the bayonet receptacle from the MFR work stanchion. If all corrective actions fail, the MFR will be jettisoned. C. <u>Training</u> Optional removal techniques will be rehearsed by the crew prior to flight. D. <u>Mission Constraints</u> Unable to use the MFR on subsequent EVAs. Unable to properly stow the MFR E. <u>In Flight Check-Outs</u> None.				
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TIME TO EFFECT	TIME TO CORRECT						
Hours	Minutes						

FMEA /CIL for the HST EVA Tools, JSC-37687

