

CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: HET-2
 NAME / QUANTITY: Adjustable Door Stay (1)
 DRAWING REFERENCE: 10761-10010

PROJECT: HST
 LRU NAME / QUANTITY: Adjustable Door Stay (1)
 LRU PART NUMBER: 10761-10010-01

PAGE 1 OF 5
 SUBSYSTEM TOOLS
 EFFECTIVITY: ALL ORBITERS

FAILURE MODE NUMBER HST-HET-2-1	CRITICALITY 2/2	FAILURE EFFECT	RETENTION RATIONALE				
FUNCTION The adjustable door stay is designed to hold a HST compartment door open. It is adjustable in length and has a positive retention bolt.		END ITEM Cannot remove the adjustable door stay which will prevent closure and sealing of the affected compartment.	DESIGN <ol style="list-style-type: none"> I. Design Feature to Minimize the Chance of the Failure Mode <ol style="list-style-type: none"> 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 adjustable door stay design to prevent jamming by expansion and contraction of material due to temperature extremes or on-orbit use. C. Materials - Major Components <ol style="list-style-type: none"> 1. Locking mechanism- PLUG, CRES 304 S/S passivated, EXTENSION ARM, A1 6061-T651 Anodized. 2. Bolt - 15-5 PH H1075 passivated. II. Testing and Analysis <ol style="list-style-type: none"> A. Acceptance Testing <ol style="list-style-type: none"> 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 adjustable door stay is operating correctly 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 adjustable door stay will be free of manufacturing defects and identify any tolerance problems. 				
FAILURE MODE AND CAUSE MODE The adjustable door stay cannot be removed from its position of holding a HST compartment door open. CAUSE(S) <ol style="list-style-type: none"> 1) Hex-head bolt galled and cannot be backed out. 2) The adjustment feature is jammed. 		MISSION Possible damage to the equipment in the affected compartment if the door cannot be closed.					
REUNDANCY SCREENS A - N/A B - N/A C - N/A		CREW / VEHICLE None.					
REMAINING PATHS 1.) None.		INTERFACE HST compartment door.					
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 style="text-align: center;">Hours</td> <td style="text-align: center;">Minutes</td> </tr> </tbody> </table>		TIME TO EFFECT	TIME TO CORRECT	Hours	Minutes
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CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: HET-2
 NAME / QUANTITY: Adjustable Door Stay (1)
 DRAWING REFERENCE: HST-1000

PROJECT: HST
 LRU NAME / QUANTITY: Adjustable Door Stay (1)
 LRU PART NUMBER: 10001-10000-01

PAGE 2 OF 5
 SUBSYSTEM: TOOLS
 EFFECTIVITY: ALL DRAWERS

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CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: HET-2
 NAME / QUANTITY: Adjustable Door Stay (1)
 DRAWING REFERENCE: 10101-1000

PROJECT: HST
 LRU NAME / QUANTITY: Adjustable Door Stay (1)
 LRU PART NUMBER: 10101-1000-01

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 SUBSYSTEM TOOLS
 EFFECTIVITY ALL OR INTERS

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FUNCTION The adjustable door stay is designed to hold a HST compartment door open. It is adjustable in length and has a positive retention bolt.		END ITEM Cannot remove the adjustable door stay which will prevent closure and sealing of the affected compartment.	DESIGN B. <u>Certification Testing (continued)</u> 2. Functionals The HST took like the adjustable door stay will be functionally operated prior to and immediately after all certification test to verify that the test environment does not degrade the hardware performance. C. <u>Certification Analysis</u> The adjustable door stay will be analyzed to the following indicated environments to verify that the assembly can withstand the environment levels: <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%;">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 (EIL Levels)</u> - Acoustics</td> <td>NSTS-07700 VOL. XIV</td> <td>If stowed in box</td> </tr> <tr> <td>c. <u>Structures</u> - Ull (fs = 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>MF0004-014D ML-STD-810, Meth. 516, Proced. 1</td> <td>If stowed in box If stowed in box</td> </tr> <tr> <td>e. <u>Temperatures</u> - Hot (+250°F) - Cold (-90°F)</td> <td>HST S/AD (10101-10001A) HST S/AD (10101-10001A)</td> <td>Applicable to all Applicable to all</td> </tr> </tbody> </table>	1. Requirements	Source	Applicability	a. <u>Shock</u> - Functional	NSTS-07700 VOL. XIV	If stowed in box	b. <u>Vibration (EIL Levels)</u> - Acoustics	NSTS-07700 VOL. XIV	If stowed in box	c. <u>Structures</u> - Ull (fs = 2.0) - Fracture	NSTS-07700 VOL. XIV NSTS-07700 VOL. XIV	Applicable to all Applicable to all	d. <u>Acceleration</u> - Flight - Crash	MF0004-014D ML-STD-810, Meth. 516, Proced. 1	If stowed in box If stowed in box	e. <u>Temperatures</u> - Hot (+250°F) - Cold (-90°F)	HST S/AD (10101-10001A) HST S/AD (10101-10001A)	Applicable to all Applicable to all
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CRITICAL ITEMS LIST

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REFERENCE DESIGNATOR: HET-2
 NAME / QUANTITY: Adjustable Door Stay (1)
 DRAWING REFERENCE: 1001-10010

PROJECT: HST
 LRU NAME / QUANTITY: Adjustable Door Stay (1)
 LRU PART NUMBER: 1001-10010-01

SUBSYSTEM: TOOLS
 EFFECTIVITY: ALL ORBITERS

HST-HET - 22

FAILURE MODE NUMBER HST-HET-2-1	CRITICALITY 2/2	FAILURE EFFECT	RETENTION RATIONALE		
FUNCTION The adjustable door stay is designed to hold a HST compartment door open. It is adjustable in length and has a positive retention bolt.		END ITEM Cannot remove the adjustable door stay which will prevent closure and sealing of the affected compartment.	DESIGN C. <u>Certification Analysis (continued)</u> 2. Since the tool cannot be interfaced with the HST, analysis will be conducted to verify that the as build dimensions will not bind with the interface locations on the HST to validate that no binding will occur.		
FAILURE MODE AND CAUSE MODE The adjustable door stay cannot be removed from its position of holding a HST compartment door open.					
CAUSES: 1.) Hex head bolt galled and cannot be backed out. 2.) The adjustment feature is jammed.					
REUNDANCY SCREENS A - N/A B - N/A C - N/A		MISSION Possible damage to the equipment in the affected compartment if the door cannot be closed.	III. <u>Inspection</u> A. <u>Manufacturing</u> 1. The adjustable door stay 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. <u>Assembly</u> 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.		
REMAINING PARTS 1.) None.					
MISSION PHASE EVA					
INTERFACE HST compartment door.		C. <u>Tealing</u> 1. The assembly will be fully inspected and functionally operated during PDAs and PIAs. 2. The hardware will be fully inspected for any signs of galling as a part of the pre/post functional tests performed prior to and immediately after all major certification and acceptance testing.			
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PREPARED BY: J.F. PARK

REVISION: BASIC

SUPERSEDING DATE: NONE

DATE: 10/20

CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: HET-3
 NAME / QUANTITY: Adjustable Door Stay (1)
 DRAWING REFERENCE: 19181-10018

PROJECT: HET
 LRU NAME / QUANTITY: Adjustable Door Stay (1)
 LRU PART NUMBER: 19181-1001801

PAGE 5 OF 5
 SUBSYSTEM: TOOLS
 EFFECTIVITY: ALL ORBITERS

FAILURE MODE NUMBER HST-HET-2-1	CRITICALITY 2/2	FAILURE EFFECT	RETENTION RATIONALE
FUNCTION The adjustable door stay is designed to hold a HST compartment door open. It is adjustable in length and has a positive retention bolt.		END ITEM Cannot remove the adjustable door stay which will prevent closure and sealing of the affected compartment.	DESIGN C. <u>Testing (continued)</u> 3. The flight Adjustable door stay was li-checked with the HST (reference Interface verification test on Doc. No. LMSC/D887233) IV. <u>Failure History</u> A. There have been no failures associated with the adjustable door stay V. <u>Operations</u> A. <u>Effects of Failure</u> Cannot remove the adjustable door stay which will prevent closure and sealing of the affected compartment. B. <u>Crew Actions</u> The crew will have to use a crow bar to try and actuate the adjustment mechanism if it is jammed. C. <u>Training</u> Optional removal techniques will be rehearsed by the crew prior to flight. D. <u>Mission Constraints</u> Possible damage to the equipment in the affected compartment if the door cannot be closed. E. <u>In Flight Check-Outs</u> None.
FAILURE MODE AND CAUSE MODE The adjustable door stay cannot be removed from its position of holding a HST compartment door open. CAUSE(S) 1.) Hex-head bolt had galled and cannot be backed out. 2.) The adjustment feature is jammed.		MISSION Possible damage to the equipment in the affected compartment if the door cannot be closed.	
REUNDANCY SCREENS A - N/A B - N/A C - N/A	REMAINING PATHS 1.) None.	CREW / VEHICLE None.	
MISSION PHASE EVA		INTERFACE HST compartment door	
		CORRECTIVE ACTION TIMES	
		TIME TO EFFECT	TIME TO CORRECT
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HST-HET - 23

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

