

CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: HET-19
 NAME / QUANTITY: Quarter Turn Fastener Assy./4
 DRAWING REFERENCE: 10181-40062

PROJECT: HST
 IRI NAME / QUANTITY: Stud Adapter Caddy Assy./1
 IRI PART NUMBER: 10181-4007-01

PAGE 1 OF 5
 SUBSYSTEM: TOOLS
 EFFECTIVITY: ALL ORBITER

FAILURE MODE NUMBER	CRITICALITY	FAILURE EFFECT	RETENTION RATIONALE																								
HST-HET-19-1	2/2																										
FUNCTION The stud caddy is used to temporarily store and transport the studs that are installed into the WF/PC.		END ITEM Cannot remove all of the studs for removing the WF/PC.	I. Design Feature to Minimize the Chance of the Failure Mode A. Design All HST tool were designed to an ultimate structural safety factor of 1.4 B. Tolerances Sufficient tolerances are used in the quarter turn fasteners to prevent loosening by expansion and contraction of material due to temperature extremes C. Materials - Major Components <table style="width: 100%; border: none;"> <tr> <td style="width: 60%;">1. Latch Plate</td> <td style="width: 20%;">10181-20046-01</td> <td style="width: 20%;">Al 6061 T6</td> </tr> <tr> <td colspan="3">2. Quarter Turn Fastener Assy.</td> </tr> <tr> <td> Base</td> <td>10181-20038-05</td> <td>Al 7075-T7531</td> </tr> <tr> <td> Post</td> <td>10181-20041-05</td> <td>CHES 15.5 P41 H1050</td> </tr> <tr> <td> Detent Block</td> <td>10181-20043-05</td> <td>Acetal ASTM D4181</td> </tr> <tr> <td> Handle</td> <td>10181-20045-01</td> <td>Al 6061-1651</td> </tr> <tr> <td> Spring</td> <td>ST27C959-90</td> <td>SS 302 AMS 568B</td> </tr> <tr> <td> Set Screw</td> <td>MS51038-104</td> <td>SS</td> </tr> </table>	1. Latch Plate	10181-20046-01	Al 6061 T6	2. Quarter Turn Fastener Assy.			Base	10181-20038-05	Al 7075-T7531	Post	10181-20041-05	CHES 15.5 P41 H1050	Detent Block	10181-20043-05	Acetal ASTM D4181	Handle	10181-20045-01	Al 6061-1651	Spring	ST27C959-90	SS 302 AMS 568B	Set Screw	MS51038-104	SS
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FAILURE MODE AND CAUSE MODE Cannot remove one or more of the studs from the storage pouch.		MISSION The operation of removing the WF/PC is hampered due to the loss of a stud.	II. Testing and Analysis A. Acceptance Testing 1. PDA A full pre delivery acceptance (PDA) test will be performed on the tools before they are delivered to JSC for the beginning of the certification process. The PDA will verify that the quarter turn fasteners are operating correctly and that the assembly is clean.																								
CAUSE(S) 1) Quarter turn fastener is stuck due to binding 2) Thermal restrictions prevent the quarter turn from working.																											
REUNDANCY SCREENS A - N/A B - N/A C - N/A		CREW / VEHICLE None																									
REPAIRING PARTS None		INTERFACE None																									
MISSION PHASE EVA																											
CORRECTIVE ACTION TIMES <table style="width: 100%; border: none;"> <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;">None</td> </tr> </table>			TIME TO EFFECT	TIME TO CORRECT	Minutes	None																					
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PREPARED BY: J.F. PARK

REVISION: BASIC

SUPERSEDED DATE: NONE

DATE: 8/25/85

HST-HET - 13

CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: HET-18
 NAME / QUANTITY: Quarter Turn Fastener Assy. 2
 DRAWING REFERENCE: 19181-0002

PROJECT: HST
 URU NAME / QUANTITY: Stud Adapter Caddy Assy. 1
 URU PART NUMBER: 19181-0001-00

PAGE 2 OF 5
 SUBSYSTEM: TOOLS
 EFFICIENCY: ALL ORDERS

FAILURE MODE NUMBER HST-HET-19-1	CRITICALITY 2/2	FAILURE EFFECT	RETENTION RATIONALE
FUNCTION The stud caddy is used to temporarily store and transport the studs that are installed into the WF/PC.		END ITEM Cannot remove all of the studs for removing the WF/PC.	6. Certification Testing 1. Thermal Vacuum The stud caddy will be exposed to the following thermal vacuum environment. Quarter turn fastener functioning will be a part of the test plan. a. <u>Temperature</u> - Cold Side Only (amb to -90°F) b. <u>Pressure</u> - ATM to 1x10 ⁻⁵ Torr c. <u>Interface</u> - The flight stud caddy will be checked with the WF/PC studs. 2. Functionals The quarter turn fasteners will be functionally operated prior to and immediately after all certification test to verify that the test environment does not degrade the hardware performance.
FAILURE MODE AND CAUSE MODE Cannot remove one or more of the studs from the storage pouch.		MISSION The operation of removing the WF/PC is hampered due to the loss of a stud.	
CAUSE(S) 1.) Quarter turn fastener is stuck due to bonding 2.) Thermal restrictions prevent the quarter turn from working.		CREW / VEHICLE None	
RESONANCE SCREEN A - N/A B - N/A C - N/A	REMAINING PATHS None	INTERFACE None	
MISSION PHASE	CORRECTIVE ACTION TIMES		
	TIME TO EFFECT	TIME TO CORRECT	
EVA	Minutes	None	

PREPARED BY: J.P. PARK

REVISION: BASIC

SUPPERSEDING DATE: NONE

DATE: 6/10/88

HST-HET-19-1

CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: HET-18
 NAME / QUANTITY: Quarter Turn Fastener Assy./4
 DRAWING REFERENCE: 1101-1002

PROJECT: HST
 LRU NAME / QUANTITY: Stud Adapter Caddy Assy./1
 LRU PART NUMBER: 1001-1007-01

PAGE 3 OF 5
 SUBSYSTEM: TOOLS
 EFFICIENCY: ALL ORBITERS

FAILURE MODE NUMBER HST-HET-19-1	CRITICALITY 2/2	FAILURE EFFECT	RETENTION RATIONALE			
FUNCTION The stud caddy is used to temporarily store and transport the studs that are installed into the WF/PC.		ENV. ITEM Cannot remove all of the studs for removing the WF/PC. MISSION The operation of removing the WF/PC is hampered due to the loss of a stud. CREW / VEHICLE None INTERFACE None	C. Certification Analysis The stud caddy will be analyzed to the following induced environments to verify that the assembly can withstand the environment levels: 1. Requirements Source a. Structures - Ur (Is - 2 D) NSTS 07700 VOL XIV - Fracture NSTS 07700 VOL XIV b. Temperature - Hot (+250°F) HST S/AD (10181 10081A) - Cold (-90°F) HST S/AD (10181 10081A)			
FAILURE MODE AND CAUSE MODE Cannot remove one or more of the studs from the stowage pouch. CAUSE(S) 1.) Quarter turn fastener is stuck due to bonding. 2.) Thermal restrictions prevent the quarter turn from working.						
REUNDUNCTY SCREENS A - N/A B - N/A C - N/A	REUNDUNCTY PATHS None					
MISSION PHASE EVA	CONNECTIVE 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>Minutes</td> <td>None</td> </tr> </table>			TIME TO EFFECT	TIME TO CORRECT	Minutes
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Minutes	None					

PREPARED BY: J.F. PARK

REVISION: BASIC

SUPERSEDING DATE: NONE

DATE: 5/10/90

HST-HET - 15

CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: HET-19
 NAME / QUANTITY: Quarter Turn Fastener Assy/1
 DRAWING REFERENCE: 1001-0002

PROJECT: HST
 LRU NAME / QUANTITY: Stud Adapter Caddy Assy/1
 LRU PART NUMBER: 1001-0007-01

PAGE 4 OF 5
 SUBSYSTEM: TOOLS
 EFFECTIVITY: ALL ORBITERS

FAILURE MODE NUMBER	CRITICALITY	FAILURE EFFECT	RETENTION RATIONALE
HST-HET-19.1	2/2		
FUNCTION The stud caddy is used to temporarily store and transport the studs that are installed into the WF/PC.		REQ. ITEM Cannot remove all of the studs for removing the WF/PC.	III. Inspection A. Manufacturing 1. The stud caddy will be inspected prior to build up for conformance to the applicable drawings. 2. All fracture critical piece parts will be inspected as described on their applicable drawings. B. Assembly 1. The stud caddy will be cleaned and inspected to the levels described in JSC 5022B. Once cleaned, the tool will be bagged for shipment to the KSC to prevent any contamination from entering the tool. C. Testing 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.
FAILURE MODE AND CAUSE MODE Cannot remove one or more of the studs from the storage pouch.		MISSION The operation of removing the WF/PC is hampered due to the loss of a stud	
CAUSE(S) 1.) Quarter turn fastener is stuck due to bonding 2.) Thermal restrictions prevent the quarter turn from working.		CREW / VEHICLE None	
REDUNDANCY SCHEMES A - N/A B - N/A C - N/A	REMAINING PATHS None	INTERFACE None	
MISSION PHASE	CORRECTIVE ACTION TIMES		
EVA	TIME TO EFFECT Minutes	TIME TO CORRECT None	

PREPARED BY: J.F. PARR

REVISION: BASIC

SUPERSEDED DATE: NONE

DATE: 6/10/93

HST-HET - 16

CRITICAL ITEMS LIST

PAGE 4 OF 5
 SUBSYSTEM TOOLS
 EFFECTIVITY ALL ORBITERS

REFERENCE DESIGNATOR: HET-19
 NAME / QUANTITY: Quarter Turn Fastener Assy./1
 DRAWING REFERENCE: 19121-10002

PROJECT: HST
 LRU NAME / QUANTITY: Stud Adapter Caddy Assy./1
 LRU PART NUMBER: 19091-10007-01

FAILURE MODE NUMBER	CRITICALITY	FAILURE EFFECT	RETENTION RATIONALE
HST-HET-19-1	2/2		
FUNCTION Provides semi flexible/semi-rigid tether for tethering and positioning the HST PFR during EVA translation		END ITEM Cannot remove all of the studs for removing the WF/PC. MISSION The operation of removing the WF/PC is hampered due to the loss of a stud CREW / VEHICLE None INTERFACE None	IV. Failure History A. There have been no failures associated with the stud caddy V. Operations A. <u>Effects of Failure</u> Cannot remove WF/PC studs, preventing the completion of the WF/PC change out. B. <u>Crew Actions</u> Crew will have to cut the fabric with the EVA scissors. C. <u>Training</u> None D. <u>Mission Constraints</u> Loss of the ability to perform the WF/PC change out. E. <u>In Flight Check-Outs</u> None
FAILURE MODE AND CAUSE MODE Cannot remove one or more of the studs from the stowage pouch. CAUSE(S) 1.) Quarter turn fastener is stuck due to bouncing 2.) Thermal restrictions prevent the quarter turn from working.			
REDDUNDANCY SCREENS A - N/A B - N/A C - N/A	REDDUNDANCY PATHS None		
MISSION PHASE EVA	CORRECTIVE ACTION TIMES TIME TO EFFECT: Minutes TIME TO CORRECT: None		

PREPARED BY J. F. PARK

REVISION: BASIC

SUPPLSE DING DATE: NONE

DATE: 6/10/93

FMEA /CIL for the HST EVA Tools. JSC-37687 A

