

## CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: HET-4  
 NAME / QUANTITY: Circular Connector Tool (2)  
 DRAWING REFERENCE: 10100-10030 (R and 007)

PROJECT: HST  
 LRU NAME / QUANTITY: Circular Connector Tool (2)  
 LRU PART NUMBER: 10100-10030-01 (R) (02007)

PAGE 1 OF 5  
 SUBSYSTEM: TOOLS  
 EFFECTIVITY: ALL ORBITERS

FAILURE MODE NUMBER	CRITICALITY	FAILURE EFFECT	RETENTION RATIONALE
HST-HET-0-1	2/2		
<b>FUNCTION</b> The circular connector tools are used to assist mating/demating circular electrical connectors which are located deep within HST compartments. There is one tool with a 90° angle at the jaws and one with straight parallel jaws.		<b>LRU ITEM</b> Cannot operate the connector tool which prevents mating and/or demating electrical connectors.	<b>DESIGN</b> I. <b>Design Feature to Minimize the Chance of the Failure Mode</b>  A. <b>Design</b> All HST tool were designed to an ultimate structural safety factor of 1.4  B. <b>Tolerances</b> Sufficient tolerances will be used in the tool mount and circular connector tool hinge designs to prevent jamming by expansion and contraction of material due to temperature extremes or on-orbit use  C. <b>Materials - Major Components</b> 1. Arms: CRES 304 S/S passivated 2. Handles: Al 8061-T651 anodized 3. Hinge: Shoulder screw - CRES 304S/S, passivated  II. <b>Testing and Analysis</b>  A. <b>Acceptance Testing</b> 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 circular connector tools are 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 circular connector tools will be free of manufacturing defects and identify any tolerance problems
<b>FAILURE MODE AND CAUSE MODE</b> The connector tool will not operate.			
<b>CAUSE(S)</b> 1.) Jamming in the pivot locations or slots. 2.) Contamination in the pivot locations.			
<b>REUNDANCY SCREENS</b> A - N/A B - N/A C - N/A		<b>MISSION</b> Certain servicing tasks cannot be completed.	
<b>REPAIRING PATHS</b> None.			
<b>CREW / VEHICLE</b> None.			
<b>MISSION PHASE</b>		<b>INTERFACE</b> HST.	
<b>CORRECTIVE ACTION TIMES</b>			
	TIME TO EFFECT      TIME TO CORRECT		
EVA.	Minutes                  Seconds		

PREPARED BY: J. F. PARK

REVISION: BASIC

SUPERSEDING DATE: NONE

DATE: 1/8/93

## CRITICAL ITEMS LIST

PAGE 2 OF 5

REFERENCE DESIGNATOR: HET-8  
 NAME/QUANTITY: Circular Connector Tool (2)  
 DRAWING REFERENCE: 1918-1803 (R) and 887

PROJECT: HST  
 LRU NAME / QUANTITY: Circular Connector Tool (2)  
 LRU PART NUMBER: 1918-1803-01 (R) - 02(87)

SUBSYSTEM: TOOLB  
 EFFECTIVITY: ALL ORBITERS

HST-HFT - 26

FAILURE MODE NUMBER	CRITICALITY	FAILURE EFFECT	RETENTION RATIONALE																																								
HST-HET-B-1	2/2																																										
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## CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: HET-8  
 NAME / QUANTITY: Circular Connector Tool (2)  
 DRAWING REFERENCE: 10181-1008 (P and S)

PROJECT: HST  
 LRU NAME / QUANTITY: Circular Connector Tool (2)  
 LRU PART NUMBER: 10181-1008-01 (P) 40001

PAGE 3 OF 5  
 SUBSYSTEM: TOOLS  
 EFFECTIVITY: ALL ORBITERS

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## CRITICAL ITEMS LIST

PAGE 4 OF 5  
SUBSYSTEM TOOLS  
EFFECTIVITY: ALL DRIVERS

REFERENCE DESIGNATOR: HET-4  
NAME / QUANTITY: Circular Connector Tool (2)  
DRAWING REFERENCE: 10100-10220-01 (R) and (S)

PROJECT: NBT  
LFU NAME / QUANTITY: Circular Connector Tool (2)  
LFU PART NUMBER: 10100-10220-01 (R) and (S)

HST-HFM - CR

FAILURE MODE NUMBER HST-HET-8-1	CRITICALITY 2/2*	FAILURE EFFECT	RETENTION RATIONALE
<b>FUNCTION</b> The circular connector tools are used to assist mating/demating circular electrical connectors which are located deep within HST compartments. There is one tool with a 90° angle of the jaws and one with straight parallel jaws.		<b>END ITEM</b> Cannot operate the connector tool which prevents mating and/or demating electrical connectors.	<b>DESIGN</b> 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.  III. <u>Inspection</u>  A. <u>Manufacturing</u>  1. The circular connector tools 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.  C. <u>Testing</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.
<b>FAILURE MODE AND CAUSE</b> <b>MODE</b> The connector tool will not operate.		<b>MISSION</b> Certain servicing tasks cannot be completed.	
<b>CAUSE(S)</b>  1.) Jamming in the pivot locations or slots. 2.) Contamination in the pivot locations.		<b>CREW / VEHICLE</b> None.	
<b>REDUNDANCY SCREENS</b>  A - N/A B - N/A C - N/A	<b>REMAINING PATHS</b> None.	<b>INTERFACE</b> HST.	
<b>MISSION PHASE</b>	<b>CORRECTIVE ACTION TIMES</b>		
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## CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: HET-4  
 NAME / QUANTITY: Circular Connector Tool (2)  
 DRAWING REFERENCE: 18189-18028 (P and B)

PROJECT: NST  
 LRU NAME / QUANTITY: Circular Connector Tool (2)  
 LRU PART NUMBER: 18189-18028-01 (P) -02(B)

PAGE 5 OF 5  
 SUBSYSTEM: TOOLB  
 EFFECTIVITY: ALL ORINTERS

HST-ITEM - 00

FAILURE MODE NUMBER	CRITICALITY	FAILURE EFFECT	RETENTION RATIONALE				
HST-HET-0-1	2/2						
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<b>FAILURE MODE AND CAUSE</b> <b>MODE</b> The connector tool will not operate.  <b>CAUSE(S)</b> 1.) Jamming in the pivot locations or slots. 2.) Contamination in the pivot locations.							
<b>REDDUNDANCY SCREENS</b> A - N/A B - N/A C - N/A	<b>REMAINING PATHS</b> None.						
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FMEA/CIL for the HST EVA Tools, JSC-37687

