

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE															
RESTRAINT PHASE VI, ITEM 106 (1) LEFT (1) RIGHT ----- 0106-812146-01/02 (2)	2/2	106FM04X Binding of gimbal swivel.  Defective swivel, contamination.	END ITEM: Binding or jamming in wrist area, torque increased.	A. Design - The gimbal swivel is fabricated from 17-4 PH stainless steel heat treated to condition H1050. The swivel is coated with Nedox to assure free movement. In addition, the TMG covers the wrist area helping to prevent swivel contamination.  B. Test - Acceptance: Component - See Inspection.															
----- 0106-812146-03/04 (2)			GFE INTERFACE: Hampered mobility in the flexion/extension on or abduction/ adduction/ wrist movement. Crewman fatigue.  MISSION: Terminate EVA.	PDA Test - Break-in cycling is performed by test subject to verify torque per ILC Document 0111-710112.  Certification Test - The glove restraint assembly was successfully tested (manned) during certification testing to duplicate operational usage (Ref. Certification Test Report for the Phase VI Glove, ILC Doc. 0111-712701). The following usage, reflecting requirements of significance to the glove restraint assembly, was documented during certification testing. The S/AD applies 229 hours in certification while the actual indicates 198 hours toward the Phase VI glove restraint in the Hamilton Sundstrand Limited Life Items list (EMU1-19-001).															
				<table border="1"> <thead> <tr> <th>Requirements</th> <th>S/AD</th> <th>Actual</th> </tr> </thead> <tbody> <tr> <td>-----</td> <td>----</td> <td>-----</td> </tr> <tr> <td>Wrist Joint Cycles</td> <td></td> <td></td> </tr> <tr> <td>Add/Abd</td> <td>17104</td> <td>14830</td> </tr> <tr> <td>Flex/Ext</td> <td>12646</td> <td>10830</td> </tr> </tbody> </table>	Requirements	S/AD	Actual	-----	----	-----	Wrist Joint Cycles			Add/Abd	17104	14830	Flex/Ext	12646	10830
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			TIME TO EFFECT /ACTIONS: Minutes.	C. Inspection - Components and material manufactured to ILC requirements at an approved supplier are documented from procurement through shipping by the supplier. ILC inventory receiving inspection verifies that the materials received are as identified in the procurement documents, that no damage has occurred during shipment and that supplier certifications have been received which provide traceability information.															
			TIME AVAILABLE: N/A																
			TIME REQUIRED: N/A	The following MIP's are performed for visual inspection during the glove manufacturing process to assure that this particular failure cause is precluded from the fabricated item.															
		REDUNDANCY SCREENS: A-N/A B-N/A C-N/A		1. Perform visual inspection of wrist assembly.  During PDA, the following inspection points are performed at the glove assembly level in accordance with ILC Document 0111-710112: 1. Visual inspection for fabric or material degradation. 2. Visual inspection for damage following proof pressure test and restraint loading.															
				D. Failure History - None.															
				E. Ground Turnaround - During ground turnaround, in accordance with FEMU-R-001, the glove assembly fit checked and visually inspected (pressurized and unpressurized) with the															

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		106FM04X		<p>removed for material damage or degradation. Additionally, glove and EMU leakage structural and leakage tests are performed.</p> <p>F. Operational Use - Crew Response - Pre/Post EVA: If during airlock operations, repress airlock. Consider use backup gloves. EVA: Continue EVA. If hand fatigue, terminate EVA.</p> <p>Special Training - Standard training covers this failure mode.</p> <p>Operational Considerations - Flight rule A15.1.2-2 of "Space Shuttle Operational Flight Rules", NSTS-12820 defines go/no go criteria related to EMU pressure integrity. Generic EVA Checklist, JSC-48023, procedures Section 3 (EMU Checkout) and 4 (EVA prep) verify hardware integrity and systems operational status prior to EVA. Real Time Data System allows ground monitoring of EMU systems.</p>

EXTRAVEHICULAR MOBILITY UNIT  
SYSTEMS SAFETY REVIEW PANEL REVIEW  
FOR THE  
I-106 GLOVE ASSEMBLY  
CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

Prepared by:   
HS - Project Engineering

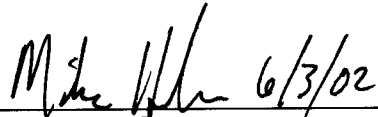
Approved by:  22mar02  
NASA - SSA/SSM

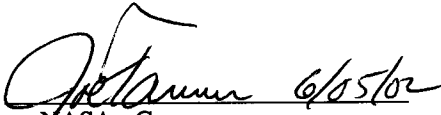
  
HS - Reliability


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 4/24/02  
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 6/3/02  
NASA - S & MA

 6/3/02  
NASA - MOD

 6/5/02  
NASA - Crew

 6/3/02  
NASA - Program Manager