NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
		106FM12		
GLOVE ASSEMBLY, 4000, ITEM 106 --- 0106-111723-15/-16 (2) GLOVE ASSEMBLY, PHASE VI, ITEM 106 --- 0106-110106-09/-10, -11/-12 (2)	2/2	Loss of wrist tether strap. Defective Material: Bracket, webbing, thread lock adhesive. Missing or loose screws. Material abrasion.	END ITEM: Wrist tether strap separates from glove. GFE INTERFACE: Unable to attach wrist tether to glove. Loss of tethered objects. MISSION: Terminate EVA if tethered item cannot be retrieved. CREW/VEHICLE: None. TIME TO EFFECT /ACTIONS: Seconds. TIME AVAILABLE: N/A TIME REQUIRED: N/A REDUNDANCY SCREENS: A-N/A B-N/A C-N/A	A. Design - A breakaway wrist tether strap is provided for use with the Phase VI Glove Assembly. The tether strap is designed to separate between 30 and 150 lbs in order to preclude loads from being transmitted through the arm axial restraint system. The wrist tether is fabricated from 3/4" wide Nomex webbing. Loops are formed by stitching the ends together with a type 301 stitch per FED-STD-751A using size "B" Nomex thread for the large loop and size "E" Nomex thread for the small loop. Both threads conform to A-A-50195. The large loop which engages the tether hooks is wrapped with 1/8" diameter nylon core yarn conforming to MILJ-C-5040 and is coated with a polyurethane solution to provide abrasion resistance. The breakaway feature is accomplished by the use of the size "B": thread of the large loop. This thread size allow separation of the webbing at that stitch row between 30 and 150 lbs. Loose or missing screws are precluded by adherence to standard engineering torque requirements for screw installation and the use of thread locking adhesive. The tether attachment bracket is fabricated from 17-4 stainless steel heat treated to H1050. It is subjected to magnetic particle inspection per ams 2640 to preclude acceptance of defective parts, and finished to 125 to preclude abrasion of the tether strap. B. Test - Acceptance: The breakaway tether is subjected to a 20 lb tensile load during acceptance testing (Ref. ILC Doc. 0111-70028 for 4000 Series gloves or 0111-710112 for Phase VI gloves). Also, each lot of wrist tethers is pull tested to verify they break between 30 and 150 lbs. Certification: The breakaway tether successfully passed certification testing. The tether strap withstood a tensile loading of 30 lbs and separated between the range of 30 to 150 lbs. (ref. ILC Doc. 0111-712420 for 4000 Series gloves or 0111-712413 for Phase VI gloves). C. Inspection - Components and material manufactured to ILC requirements at an approved supplier are documented from procurement through shipping by the supplier. ILC incoming 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. The following MIPs are performed during the glove tether manufacturing process to assure that the failure causes are precluded from the fabricated item: 1. Visual inspection of the thread and webbing for signs of defective threads and material. 2. Verification of the presence of screws during application of loctite and torquing of the tether bracket screws. D. Failure History - B-EMU-106-A057 (1/24/02) Left Wrist Tether Strap broke during SSATA dry run for STS-110. Break most likely caused by inadvertent overload of breakaway stitching during donning or crew training. Pre-flight processing inspection per

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
		106FM12		FEMU-R-001 would detect this anomaly. Tether performed as designed; no correction action required. E. Ground Turnaround - During ground turnaround, in accordance with FEMU-R-001, the glove assembly is visually inspected (pressurized and unpressurized) with TMG removed for; structural integrity, material damage or degradation and loose or missing screws. Every 56 hours of manned pressurized time on the 4000, the glove restraint is removed from the bladder assembly and is subjected to a complete visual inspection during which time the tether strap and bracket are removed, inspected and reinstalled. F. Operational Use - Crew Response Pre/Post EVA: Troubleshoot Problem - If repair is not possible, use strap on other glove or use spare glove if available. Continue EVA operations. EVA: Attempt tool retrieval using EV crew and orbiter if necessary. Otherwise use redundant tool and strap on other glove to continue EVA. Training - Standard training covers this failure mode. Operational Considerations - Not Applicable.

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

_____
HS - Reliability

_____
HS - Engineering Manager

Approved by: _____
NASA – SSA/SSM

_____
NASA – EMU/SSM

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NASA – S&MA

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NASA – MOD

_____
NASA – Crew

_____
NASA – Program Manager