

CIL
EMU CRITICAL ITEMS LIST

08/21/90 SUPERSEDES 81/02/90

ANALYST:

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NAME P/N REV	CRIT	FATIGUE MODE & CRACKS	FATIGUE EFFECT	RATIONALE FOR ACCEPTANCE
PACKAGING, (SOP), SIDE 300 ----- SUTPP045-00 011	R/100	Z8881003 Fracture of one of seven screws which mount SOP to PLSB shear PLSS. CAUSE: Screw overstress or fatigue.	1SD ITEM: Fracture of one of seven screws mounting the SOP assembly to the PLSS shear plate. SFB INTERFACE: Redistribution of loads to remaining six screws. If four of the seven attachment screws fracture, the SOP assembly detaches from the shear plate structure. It may impact the struck. REVISION: None for single, double, or triple screw failure. Loss of use of one EMU with loss of four screws. SOP assembly detaches from PLSB structure. CREW/VEHICLE: None for single, double or triple screw failure. Possible crew jeopardy due to struck damage with loss of four screws.	A. Design - The Secondary Oxygen Pack (SOP) is attached to the PLSB by seven mounting screws, each torqued to 27-30 pounds above running torque. Analysis shows that the applied torque provides four times the preload required to maintain positive surface contact at the SOP/PLSS interface and withstand a landing load applied at the SOP housing center of gravity. Packing insert pellets prevent the screws from loosening under vibration and cyclic loads. Should the screws lose preload, thread engagement would prevent the SOP from detaching the PLSB. Analysis indicates that the stainless steel dowel pins provide a factor of safety of 4.2 with respect to shear for a worst case loading of 6.04 g's acceleration. Failure of the SOP mounting and subsequent detachment requires that at least 4 of 7 screws be removed such that the 3 remaining become subject to screw bending instead of tension or compression. B. Test - Certification test - The item completed the 15 year structural vibration and shock certification requirement during 10/83. EC 42806-810 (dimensional) has been incorporated and certified since that time. C. Inspection - During the installation of the SOP to the PLSB per EPSP-8-35, the seven screws are examined for evidence of damage. This examination requires a mandatory inspection point. There is also a mandatory inspection point for the unique requirements of the screw. A mandatory inspection is required for proper alignment of the stainless steel dowel pins. D. Failure History - 8-EMU-200-4000 (6-2-87): Screw broken during SOP installation. Failure was due to shear of bolt at reduced cross section which exists at the single locking pellet hole. ECO 42807-162 creates an improved screw configuration using two smaller locking pellet holes .080 inch apart.