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SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: MO-AA4-705-X

SUBSYSTEM NAME: STABILIZED PAYLOAD DEPLOYMENT SYSTEM

REVISION : 2 03/01/90

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
■ SRU :	TIE ROD ASSEMBLY	V790-544188

PART DATA

- EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
THIS IS A COLLECTION OF COMPONENTS WITH V790-544187 AND V790-544188 AS MAJOR ELEMENTS. OTHER HARDWARE ITEMS ARE ALSO INCLUDED; SEE THE MO72-544790 INSTALLATION DRAWING FOR DETAILS.
- QUANTITY OF LIKE ITEMS: 1
SINGLE ASSEMBLY PER SPDS INSTALLATION
- FUNCTION:
THIS ASSEMBLY INTERCONNECTS THE PRIMARY AND SECONDARY PEDESTALS. THE PRIMARY (FORWARD) PEDESTAL IS FIRMLY ATTACHED TO THE LONGERON SILL WHILE THE SECONDARY (AFT) PEDESTAL IS ALLOWED TO "FLOAT" ALONG THE LONGERON. THIS TIE ROD ASSEMBLY ACTS TO RETAIN THE SECONDARY PEDESTAL IN PLACE. THIS TIE ROD ASSEMBLY ACTS TO RETAIN THE SECONDARY PEDESTAL IN PLACE FOLLOWING RELEASE OF THE PAYLOAD.

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SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: MO-AA4-706-01

SUBSYSTEM: STABILIZED PAYLOAD DEPLOYMENT SYSTEM REVISION# 2 03/01/90

ITEM NAME: TIE ROD ASSEMBLY

CRITICALITY OF THIS
FAILURE MODE: 1/1

■ FAILURE MODE:
STRUCTURAL FAILURE, BREAKS

MISSION PHASE:
00 ON-ORBIT

■ VEHICLE/PAYLOAD/KIT EFFECTIVITY: 102 COLUMBIA
: 103 DISCOVERY
: 104 ATLANTIS
: 105 ENDEAVOUR

■ CAUSE:
WEAR, CORROSION, FATIGUE, EXCESSIVE LOAD

■ CRITICALITY 1/1 DURING INTACT ABORT ONLY? N

■ REDUNDANCY SCREEN A) N/A
B) N/A
C) N/A

PASS/FAIL RATIONALE:

■ A)
■ B)
■ C)

- FAILURE EFFECTS -

■ (A) SUBSYSTEM:
FAILURE OF THE TIE ROD COULD ALLOW THE SECONDARY PEDESTAL TO BECOME
LOOSE WITH THE POSSIBILITY OF ITS DISENGAGEMENT FROM THE LONGERON SILL
AND MAKING CONTACT WITH ORBITER STRUCTURE.

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- (B) INTERFACING SUBSYSTEM(S):
A BROKEN TIE ROD WOULD ALLOW THE SECONDARY PEDESTAL TO BECOME LOOSE AND POSSIBLY CONTACT ORBITER STRUCTURE. SOME RESTRAINT IS AVAILABLE AT THE YO TORQUE TUBE ATTACHMENT AT THE SECONDARY PEDESTAL GEAR BOX. THE STRENGTH OF THIS ATTACHMENT TO REACT TO LOADS IMPOSED BY FLIGHT MANEUVERS IS NOT DEFINED.
- (C) MISSION:
EVA ACTIVITY TO PERMIT SAFE COMPLETION OF THE ORBITER MISSION.
- (D) CREW, VEHICLE, AND ELEMENT(S):
FOLLOWING PAYLOAD DEPLOYMENT, FAILURE OF THE TIE ROD WOULD ALLOW THE SECONDARY PEDESTAL TO BECOME LOOSE FROM THE LONGERON SILL. POTENTIAL IMPACT WITH VEHICLE STRUCTURE.
- (E) FUNCTIONAL CRITICALITY EFFECTS:
LOSS OF THE TIE ROD REMOVES THE ASSURANCE THAT THE SECONDARY PEDESTAL AND THE ADJACENT LATCH WILL BE RETAINED IN PLACE FOR THE REMAINDER OF THE FLIGHT.

- DISPOSITION RATIONALE -

- (A) DESIGN:
THE TIE ROD ASSEMBLY IS MADE OF HIGH STRENGTH CORROSION RESISTANT MATERIAL FOR SPACE ENVIRONMENT USE. THE DESIGN SHOWS POSITIVE STRUCTURAL MARGIN BY ANALYSIS AND MEETS 1.4 MINIMUM FACTOR OF SAFETY.
- (B) TEST:
QUALIFICATION TESTS PER DTP4779-801 WERE SUCCESSFULLY COMPLETED JANUARY 5, 1990 AND WILL BE DOCUMENTED IN TEST REPORT STS9000115.
- (C) INSPECTION:
ALL DIMENSIONAL CHARACTERISTICS ARE VERIFIED BY INSPECTION. PROCESSES ARE VERIFIED BY INSPECTION EITHER AT ROCKWELL OR AT SUPPLIER FACILITIES. CLEANLINESS AND MATERIAL INSPECTION ARE VERIFIED BY INSPECTION. NDT IS VERIFIED BY INSPECTION.
- (D) FAILURE HISTORY:
NONE.
- (E) OPERATIONAL USE:
NONE.

SHUTTLE CRITICAL ITEMS LIST - ORBITER

NUMBER: MO-AA-705-01

- APPROVALS -

RELIABILITY ENGINEERING: W. R. MARLOWE
 DESIGN ENGINEERING : G. CAMPBELL
 QUALITY ENGINEERING : M. F. MERGEN
 NASA RELIABILITY : G.E.
 NASA SUBSYSTEM MANAGER :
 NASA QUALITY ASSURANCE :

W.R. Marlowe 3/6/90
G. Campbell 3/2/90
M.F. Mergen 9/17/90
9/25/90
9/29/90