

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL HARDWARE  
NUMBER: 05-7BA-2001A -X

SUBSYSTEM NAME: EW&amp;I/LANDING GEAR &amp; CONTROL

REVISION: 0 08/23/00

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**PART DATA**


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| PART NAME                                | PART NUMBER   |
|--|---------------|
| VENDOR NAME                              | VENDOR NUMBER |
| SRU : CONNECTOR, PLUG- MEDS MODIFICATION | NLS6GT14-35XX |
| SRU : CONNECTOR, PLUG- MEDS MODIFICATION | NLS6GT18-35XX |
| SRU : CONNECTOR, PLUG- MEDS MODIFICATION | NLS6GT22-35XX |
| SRU : CONNECTOR, PLUG- MEDS MODIFICATION | NLS6GT24-35XX |

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**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:**

CONNECTOR, PLUG, ((1.) 37 #22 CONTACTS, (2.) 66 #22 CONTACTS, (3.) 100 #22 CONTACTS, (4.) 128 #22 CONTACTS) - LANDING GEAR DOWN COMMAND CIRCUIT.  
LOCATION: SEE TABLE 05-7BA-2001A-1

REFERENCE DESIGNATORS: 34V73A8W1P1  
34V73A6W1P1  
30V77W4P9282  
30V77W4P9263  
81V77W8P143  
30V77W4P617

**QUANTITY OF LIKE ITEMS: 6**

1. NLS6GT14-35XX (2)
2. NLS6GT18-35XX (1)
3. NLS6GT22-35XX (2)
4. NLS6GT24-35XX (1)

**FUNCTION:**

PROVIDES MATE/DEMATE CAPABILITY FOR WIRING THAT CONTAINS COMMANDS FOR ENERGIZING THE LANDING GEAR DOWN RELAYS. FOR PLUG AND SHORTED PIN-TO-PIN PIN/SOCKET REFERENCE DESIGNATORS, SEE TABLE 05-7BA-2001A-1.

**FAILURE MODES EFFECTS ANALYSIS FMEA – CIL FAILURE MODE**

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**LRU:**

**CRITICALITY OF THIS**

**ITEM NAME: CONNECTOR, PLUG - MEDS MODIFICATION**

**FAILURE MODE: 1/1**

**FAILURE MODE:**

**PIN-TO-PIN SHORT (HOT)**

**MISSION PHASE:**

**LS LANDING/SAFING**

**VEHICLE/PAYLOAD/KIT EFFECTIVITY:**

|     |           |
|-----|-----------|
| 102 | COLUMBIA  |
| 103 | DISCOVERY |
| 104 | ATLANTIS  |
| 105 | ENDEAVOUR |

OK  
AQ-RWG  
9-1-00

**CAUSE:**

**PIECE PART FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING ANOMALY, THERMAL STRESS**

**CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO**

**REDUNDANCY SCREEN**

- A) N/A
- B) N/A
- C) N/A

**PASS/FAIL RATIONALE:**

A)

B)

C)

**- FAILURE EFFECTS -**

**(A) SUBSYSTEM:**

**INADVERTENTLY ENERGIZES THE LANDING GEAR DOWN LATCHING RELAY COILS.**

**(B) INTERFACING SUBSYSTEM(S):**

**LANDING GEAR DOWN RELAY CONTACTS ARE CLOSED. LANDING GEARS WILL BE DEPLOYED UPON ACTIVATION OF ARM SWITCH.**

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**(C) MISSION:**

LANDING GEARS WILL BE EXTENDED AS SOON AS ARM SWITCH IS ACTIVATED BECAUSE LANDING GEAR DOWN RELAYS HAVE ALREADY BEEN ENERGIZED. LANDING GEAR IS ARMED AT 2000 FT. IF CONNECTOR PIN-TO-PIN SHORT ACTIVATES DOWN RELAY BEFORE "ARM", CREW WILL DELAY "ARM" UNTIL 300 FT.

REFERENCE CIL 05-6BA-2115-3

**(D) CREW, VEHICLE, AND ELEMENT(S):**

LANDING GEAR IS ARMED AT 2000 FT. IF CONNECTOR PIN-TO-PIN SHORT ACTIVATES DOWN CIRCUIT RELAYS AFTER "ARM" AND BEFORE 300FT, A PREMATURE DEPLOYMENT OF THE LANDING GEAR WILL RESULT. THIS MAY OCCUR AT A TIME WHEN THERE IS A LIGHT WEIGHT VEHICLE, STRONG HEAD WINDS AND LOW VEHICLE ENERGY WHICH COULD LAND VEHICLE SHORT OF RUNWAY AND MAY CAUSE VEHICLE DAMAGE RESULTING IN POSSIBLE LOSS OF CREW/VEHICLE.

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**-DISPOSITION RATIONALE-**

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**(A) DESIGN:**

REFER TO APPENDIX K: ITEM NO. 3 - TYPE NLS CONNECTOR, CIRCULAR, MINIATURE

**(B) TEST:**

REFER TO APPENDIX K: ITEM NO. 3 - TYPE NLS CONNECTOR, CIRCULAR, MINIATURE

**GROUND TURNAROUND TEST**

ANY TURNAROUND CHECKOUT TESTING IS ACCOMPLISHED IN ACCORDANCE WITH OMSRD.

**(C) INSPECTION:**

REFER TO APPENDIX K: ITEM NO. 3 - TYPE NLS CONNECTOR, CIRCULAR, MINIATURE

**(D) FAILURE HISTORY:**

REFER TO APPENDIX K: ITEM NO. 3 - TYPE NLS CONNECTOR, CIRCULAR, MINIATURE

CURRENT DATA ON TEST FAILURES, FLIGHT FAILURES, UNEXPLAINED ANOMALIES, AND OTHER FAILURES EXPERIENCED DURING GROUND PROCESSING ACTIVITY CAN BE FOUND IN THE PRACTICE DATA BASE.

**(E) OPERATIONAL USE:**

GEAR IS NORMALLY ARMED AT TWO THOUSAND FOOT ALTITUDE WHICH ASSURES MAKING THE RUNWAY THRESHOLD EXCEPT FOR THE WORSE CASE COMBINATION OF LIGHT WEIGHT VEHICLE, STRONG HEAD WINDS AND LOW VEHICLE ENERGY. CREW TRAINS IN SHUTTLE TRAINING AIRCRAFT AT TWO THOUSAND FOOT ALTITUDE TO MAKE FLIGHT ADJUSTMENTS TO COMPENSATE FOR INADVERTENT GEAR EXTENSION. IF

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DOWN RELAY IS INADVERTENTLY CLOSED PRIOR TO ARM SWITCH ACTIVATION, CREW WILL DELAY "ARM" UNTIL IT IS SAFE TO DEPLOY LANDING GEAR. CREW WILL SEE "DOWN" PBI LIGHT ON AND THE GROUND WILL SEE THE ASSOCIATED TELEMETRY MEASUREMENT ON WHEN DOWN SWITCH FAILS.

TABLE 05-7BA-2001A-1

| PART NUMBER      | PLUG REFERENCE DESIGNATOR | CONNECTOR LOCATION        | PIN/ SOCKET DESIG                |
|------------------|---------------------------|---------------------------|----------------------------------|
| 1. NLS6GT14-35XX | 34V73A8W1P1               | PANEL F8A3                | 14-13                            |
| 2. NLS6GT14-35XX | 34V73A6W1P1               | PANEL F6A3                | 14-13                            |
| 3. NLS6GT18-35XX | 30V77W4P9282              | PANEL F8                  | 6-2<br>6-5<br>8-12<br>6-13       |
| 4. NLS6GT22-35XX | 30V77W4P9263              | PANEL F6                  | 51-40<br>51-41<br>51-52          |
| 5. NLS6GT22-35XX | 81V77W8P143               | FWD PCA-1                 | 70-58<br>70-69<br>70-71          |
| 6. NLS6GT24-35XX | 30V77W4P617               | FWD LEFT PRODUCTION BREAK | 48-36<br>48-37<br>48-59<br>48-60 |

- APPROVALS -

S & R ENGINEERING  
 S & R ENGINEERING ITM  
 DESIGN ENGINEERING  
 EPD&C SUBSYSTEM MANAGER  
 SR&QA  
 NASA DCE  
 MOD  
 USA SAM  
 USA ORBITER ELEMENT

: M. D. DUMETZ / G. T. TATE  
 : P. A. STENGER  
 : J. L. PECK  
 : R. L. PHAN

: J. Cipolletti

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 SR+QA Subsystem Engineer

: M. D. DUMETZ / G. T. TATE :  
 : P. A. STENGER  
 : J. L. PECK  
 : R. L. PHAN

*Manoj Dinkar* 8/23/00  
*NO. Khan* 8/24/00  
*J. L. Peck*  
*R. Phan* 8/24/00  
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