

# In-Flight Maintenance (IFM) Checklist

**Mission Operations Directorate  
Systems Division**

**Generic, Rev F  
October 15, 2004**

**NOTE**

For STS-114 and subsequent flights

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas



***United Space Alliance***

**Verify this is the correct version for the pending operation (training, simulation or flight).**  
Electronic copies of FDF books are available. URL: <http://mod.jsc.nasa.gov/do3/FDF/index.html>



IN-FLIGHT MAINTENANCE C/L	Generic, Rev F (Oct 15, 2004)
---------------------------	-------------------------------

PCN-13 (Oct 23, 2008) Sheet 1 of 1

List of Implemented Change Requests (482s):

IFM-325

Incorporate the following:

1. Replace iii thru x, xiii and xiv
2. Replace M-i and M-ii
3. Delete P-55 thru P-64  
Add P-55 thru P-68

<p align="center"><b>NOTE</b> For STS-126 and subsequent flights</p>
--

Prepared by: *Jerry Woodard*  
Publication Manager

Approved by: *John R. Kling*  
IFM Technical Lead

*[Signature]* for Jeff Kling  
Manager,  
Mechanical, Booster, & Maintenance Group

Accepted by: *Stacy P. Gr*  
Manager,  
Shuttle Procedures Management

*Kimberly Johnson*  
FDF Manager

Encl: 28 pages

File this PCN immediately behind the front cover as a permanent record
--



IN-FLIGHT MAINTENANCE C/L	Generic, Rev F (Oct 15, 2004)
---------------------------	-------------------------------

PCN-12 (April 12, 2008) Sheet 1 of 1

List of Implemented Change Requests (482s):

IFM-0324

Incorporate the following:

- 1. Replace iii thru viii, xiii and xiv
- 2. Replace S-i and S-ii, S-3 and S-4  
Delete pages S-5 thru S-10

**NOTE**  
For STS-124 and subsequent flights

Prepared by: Jerry Woodard  
Publication Manager

Approved by: John R. Strimpy  
IFM Technical Lead

Jeffrey V. Kelly  
Manager,  
Mechanical, Booster, & Maintenance Group

Accepted by: Larry D. ...  
Manager,  
Shuttle Procedures Management

Michael ...  
FDF Manager

Encl: 12 pages

File this PCN immediately behind the front cover as a permanent record



IN-FLIGHT MAINTENANCE C/L

Generic, Rev F (Oct 15, 2004)

## PCN-11 (Sept 14, 2007) Sheet 1 of 1

List of Implemented Change Requests (482s):

IFM-0323

Incorporate the following:

1. Replace iii thru viii
2. Replace P-63 and P-64

**NOTE**

For STS-120 and subsequent flights

Prepared by:

*Joseph Z. Bizovic Jr*  
Publication Manager

Approved by:

*Paul Sly*  
IFM Technical Lead

*Jeffrey V. Kling*  
Manager,  
Mechanical, Booster, & Maintenance Group

Accepted by:

*Kimberly Johnson*  
Manager,  
Shuttle Procedures Management

*Michael T. Holt*  
FDF Manager

Encl: 8 pages

**File this PCN immediately behind the front cover as a permanent record**





IN-FLIGHT MAINTENANCE C/L

Generic, Rev F (Oct 15, 2004)

## PCN-10 (Apr 25, 2006) Sheet 1 of 1

## List of Implemented Change Requests (482s):

IFM-0314	IFM-0319
IFM-0315	IFM-0320
IFM-0317	IFM-0321
IFM-0318	IFM-0322

**NOTE**

For STS-117 and subsequent flights

## Incorporate the following:

1. Replace iii thru xvi
2. Replace 1-1 thru 1-8, 1-15 and 1-16  
After 1-16, delete 1-17 and 1-18
3. Replace section 4 (12 pages)
4. Replace P-63 and P-64
5. Replace S-i and S-ii
6. Replace W-53 thru W-56  
After W-56, add W-56a and W-56b  
Replace W-65 thru W-70  
After W-70, add W-71 and W-72

Prepared by:

*Herald L. Scott* 4/25/07  
Publication Manager

Approved by:

*M. G.* 4/25/07  
IFM Technical Lead

*Johnny V. Key* 4/25/07  
Manager,  
Mechanical, Booster, & Maintenance Group

Accepted by:

*Kimberly Wilson*  
Manager,  
Shuttle Procedures Management

*Michael S. Holt*  
FDF Manager

Encl: 54 pages

**File this PCN immediately behind the front cover as a permanent record**



**IN-FLIGHT MAINTENANCE C/L****Generic, Rev F (Oct 15, 2004)****PCN-9 (Nov 10, 2006) Sheet 1 of 1**

List of Implemented Change Requests (482s):

IFM-0310                      IFM-0313  
IFM-0311  
IFM-0312

**NOTE**  
For STS-116 and subsequent flights

Incorporate the following:

1. Replace iii thru vi
2. Replace L-5 thru L-8
3. Replace O-11 thru O-14

**Prepared by:** \_\_\_\_\_  
Publication Manager

**Approved by:** \_\_\_\_\_  
IFM Technical Lead                      \_\_\_\_\_  
Manager,  
Mechanical, Booster, & Maintenance Group

**Accepted by:** \_\_\_\_\_  
Manager,  
Shuttle Procedures Management                      \_\_\_\_\_  
FDF Manager

Encl: 12 pages

***File this PCN immediately behind the front cover as a permanent record***



IN-FLIGHT MAINTENANCE C/L

Generic, Rev F (Oct 15, 2004)

## PCN-8 (Sept 22, 2006) Sheet 1 of 1

List of Implemented Change Requests (482s):

IFM-0303	IFM-0307
IFM-0304	IFM-0308
IFM-0305	IFM-0309
IFM-0306	

**NOTE**

For STS-116 and subsequent flights

Incorporate the following:

1. Replace iii thru x, xiii and xiv
2. Replace 1-9 thru 1-14
3. Replace 4-5 thru 4-8
4. Replace A-17 and A-18
5. Replace D-7 and D-8
6. Replace G-i and G-ii
7. Replace section H (14 pages)
8. Replace section I (4 pages)
9. Replace section L (12 pages)
10. Replace M-11 thru M-16
11. Replace O-1 and O-2
12. Replace P-1 thru P-16, P-37 and P-38, P-51 thru P-56
13. Replace R-5 thru R-12, R-29 thru R-36, R-43 and R-44, R-51 and R-52, R-59 and R-60
14. Replace section S (10 pages)
15. Replace section V (2 pages)
16. Replace W-3 and W-4, W-9 and W-10, W-39 and W-40

Prepared by: Carol H. Pierce  
Publication Manager

Approved by: John R. Shimp  
IFM Technical Lead

Jeffrey V. Kling  
Manager  
Mechanical, Booster, & Maintenance Group

Accepted by: Timberly Johnson  
Manager,  
Shuttle Procedures Management

Michael E. Shaw  
FDF Manager

Encl: 128 pages

**File this PCN immediately behind the front cover as a permanent record**



IN-FLIGHT MAINTENANCE C/L

Generic, Rev F (Oct 15, 2004)

## PCN-7 (Aug 4, 2006) Sheet 1 of 1

List of Implemented Change Requests (482s):

IFM-0299  
IFM-0300  
IFM-0301  
IFM-0302**NOTE**

For STS-115 and subsequent flights


Incorporate the following:

1. Replace iii thru x
2. Replace 1-9 and 1-10
3. Replace L-5 and L-6
4. Replace P-61 thru P-64
5. Replace V-1 and V-2

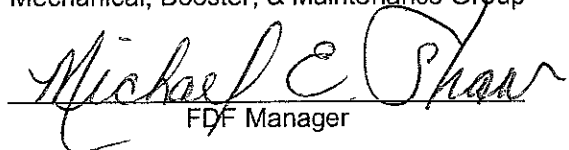
Prepared by:

  
Publication Manager

Approved by:

  
IFM Technical Lead  
Manager,  
Mechanical, Booster, & Maintenance Group

Accepted by:

  
Manager,  
Shuttle Procedures Management  
FDF Manager

Encl: 18 pages

**File this PCN immediately behind the front cover as a permanent record**





IN-FLIGHT MAINTENANCE C/L

Generic, Rev F (Oct 15, 2004)

## PCN-6 (July 28, 2006) Sheet 1 of 1

List of Implemented Change Requests (482s):

IFM-0294                      IFM-0298  
IFM-0295  
IFM-0296A  
IFM-0297

**NOTE**

For STS-115 and subsequent flights

Incorporate the following:


1. Replace iii thru x, xiii and xiv
2. Replace G-i and G-ii
3. Replace section H (14 pages)
4. Replace O-9 thru O-12
5. Replace P-15 thru P-48
6. After V-2, add W-i and W-ii

Prepared by:

  
Publication Manager

Approved by:

  
IFM Technical Lead

  
Manager,  
Mechanical, Booster, & Maintenance Group

Accepted by:

  
Manager,  
Shuttle Procedures Management

  
FDF Manager

Encl: 66 pages

**File this PCN immediately behind the front cover as a permanent record**



IN-FLIGHT MAINTENANCE C/L

Generic, Rev F (Oct 15, 2004)

## PCN-5 (Jan 23, 2005) Sheet 1 of 1

List of Implemented Change Requests (482s):

IFM-0289                      IFM-0293  
IFM-0290  
IFM-0291  
IFM-0292

**NOTE**

For STS-121 and subsequent flights

Incorporate the following:

1. Replace iii thru x
2. Replace 1-5 and 1-6
3. Replace A-7 thru A-14, A-19 and A-20
4. Replace R-11 and R-12, R-19 and R-20

Prepared by:

Carol H. Pierce  
Publication Manager

Approved by:

John R. Shing  
IFM Technical Lead

Jeffrey V. Kling  
Manager,  
Mechanical, Booster, & Maintenance Group

Accepted by:

Dorothy Thomas  
Manager,  
Shuttle Procedures Management

Michael J. Shaw  
FDF Manager

Encl: 24 pages



IN-FLIGHT MAINTENANCE C/L

Generic, Rev F (Oct 15, 2004)

## PCN-4 (Nov 4, 2005) Sheet 1 of 1

List of Implemented Change Requests (482s):

IFM-0276	IFM-0284
IFM-0278 (S)	IFM-0285
IFM-0279	IFM-0286
IFM-0280	IFM-0287
IFM-0281	IFM-0288
IFM-0282A	MULTI-1718
IFM-0283	

S – Superseded

**NOTE**

For STS-121 and subsequent flights

Incorporate the following:

1. Replace iii thru xiv
2. Replace A-i and A-ii
3. Replace A-7 and A-8, A-11 thru A-18  
After A-18, add A-19 thru A-22
4. Replace C-9 and C-10
5. Replace Section D (10 pages)
6. Replace K-11 thru K-22
7. Replace L-5 and L-6
8. Replace M-i and M-ii
9. Replace M-33 thru M-38
10. Replace R-1 thru R-4, R-13 thru R-18, R-25 and R-26

Prepared by:

*Carol H. Peirce*  
Publication Manager

Approved by:

*John R. Shing*  
IFM Technical Lead

*Jeffrey V. Kling*  
Manager,  
Mechanical, Booster, & Maintenance Group

Accepted by:

*Kimberly Johnson*  
Manager,  
Shuttle Procedures Management

*Michael E. Shaw*  
FDF Manager

Encl: 74 pages

**File this PCN immediately behind the front cover as a permanent record**



IN-FLIGHT MAINTENANCE C/L

Generic, Rev F (Oct 15, 2004)

## PCN-3 (June 17, 2005) Sheet 1 of 1

List of Implemented Change Requests (482s):

IFM-270B IFM-277  
IFM-271B  
IFM-272B  
IFM-273B  
IFM-274B  
IFM-275A

**NOTE**

For STS-114 and subsequent flights

Incorporate the following:

1. Replace iii thru x, xiii and xiv
2. Replace M-i and M-ii
3. Replace R-17 thru R-40  
After R-40, add R-41 thru R-64

Prepared by:

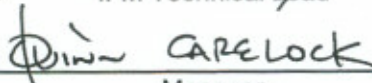


Publication Manager

Approved by:



IFM Technical Lead



Manager,

Mechanical, Booster, &amp; Maintenance Group

Accepted by:



FDF Manager

Encl: 60 pages

**File this PCN immediately behind the front cover as a permanent record**





IN-FLIGHT MAINTENANCE C/L

Generic, Rev F (Oct 15, 2004)

PCN-2 (April 29, 2005) Sheet 1 of 1

List of Implemented Change Requests (482s):

IFM-262	IFM-267
IFM-263	IFM-268
IFM-264	IFM-269
IFM-266A	

<b>NOTE</b> For STS-114 and subsequent flights
---

Incorporate the following:

1. Replace iii thru xiv  
After xiv, add xv and xvi
2. Replace Section 3 (10 pages)
3. Replace Section 4 (12 pages)
4. Replace A-i and A-ii
5. Replace (B)D-5 and (B)D-6  
After (B)D-6, add D-19 thru D-22
6. Replace G-i and G-ii
7. Replace Section L (12 pages)
8. Replace M-i and M-ii
9. Replace Section O (18 pages)
10. Replace S-i and S-ii
11. Replace U-5 and U-6
12. After U-6, add Section V (2 pages)

Prepared by: Carol H. Pierce  
Publication Manager

Approved by: John R. Sly  
IFM Technical Lead

Jeffrey V. Kling  
Manager,  
Mechanical, Booster, & Maintenance Group

Accepted by: Michael T. Hart  
FDF Manager

Encl: 84 pages

<b>File this PCN immediately behind the front cover as a permanent record</b>
---



**IN-FLIGHT MAINTENANCE C/L****Generic, Rev F (Oct 15, 2004)****PCN-1 (April 1, 2005) Sheet 1 of 1**

List of Implemented Change Requests (482s):

IFM-260  
IFM-261**NOTE**

For STS-114 and subsequent flights

Incorporate the following:

1. Replace iii thru viii
2. Replace R-39 and R-40
3. Replace W-53 and W-54

**Prepared by:** \_\_\_\_\_  
Publication Manager**Approved by:** \_\_\_\_\_  
IFM Technical Lead\_\_\_\_\_  
Manager,  
Mechanical, Booster, & Maintenance Group**Accepted by:** \_\_\_\_\_  
FDF Manager

Encl: 10 pages

***File this PCN immediately behind the front cover as a permanent record***

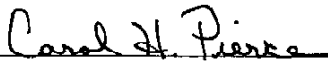


MISSION OPERATIONS DIRECTORATE

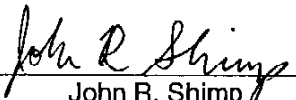
**IN-FLIGHT MAINTENANCE  
(IFM) CHECKLIST**

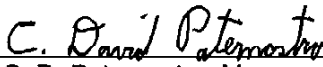
GENERIC, REVISION F  
October 15, 2004


PREPARED BY:

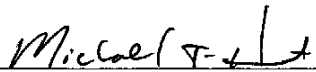
  
\_\_\_\_\_  
Carol H. Pierce  
Publication Manager

APPROVED BY:

  
\_\_\_\_\_  
John R. Shimp  
IFM Technical Lead

  
\_\_\_\_\_  
C. D. Paternostro, Manager  
Mechanical, Booster, &  
Maintenance Group

  
\_\_\_\_\_  
Quinn L. Carelock, Chief  
Mechanical, Booster, &  
Maintenance Systems Branch

  
\_\_\_\_\_  
Michael T. Hurt  
FDF Manager

This document is under the configuration control of the Crew Procedures Control Board (CPCB). All proposed changes must be submitted on FDF Workflow Crew Procedure Change Request (CR) to DO3/FDF Manager.

Additional distribution of this book, for official use only, may be requested in writing to DO3/FDF Manager. The request must include justification and requester's name, organization, position, and phone number. Contractor requests are made through the NASA or DOD organization supported. Deletions, reduction in quantity, or change of address may be submitted to DO3/FDF Management Office, 281-244-1184. E-mail: [name]@jsc.nasa.gov

IFM/ALL/GEN F

Incorporates the following:			
482#:	IFM-248	IFM-252	IFM-256
	IFM-249A	IFM-253	IFM-257
	IFM-250	IFM-254	IFM-258
	IFM-251	IFM-255	IFM-259

AREAS OF TECHNICAL RESPONSIBILITY

Publication Manager      DO35/C. H. Pierce      281-483-6087

IFM Technical Lead      DF/J. R. Shimp      281-483-2581

IN-FLIGHT MAINTENANCE (IFM) CHECKLIST

**LIST OF EFFECTIVE PAGES**

GENERIC	02/01/88	PCN-4	11/04/05	PCN-9	11/10/06
REV F	10/15/04	PCN-5	01/23/06	PCN-10	04/25/07
PCN-1	04/01/05	PCN-6	07/28/06	PCN-11	09/14/07
PCN-2	04/29/05	PCN-7	08/04/06	PCN-12	04/12/08
PCN-3	06/17/05	PCN-8	09/22/06	PCN-13	10/23/08

Sign Off.....*	ALL/GEN F	1-14.....	ALL/GEN F
ii.....*	ALL/GEN F	1-15.....	ALL/GEN F
iii.....*	ALL/GEN F,13	1-16.....	ALL/GEN F,10
iv.....*	ALL/GEN F,10	2-1.....	ALL/GEN F
v.....*	ALL/GEN F,10	2-2.....	ALL/GEN F
vi.....*	ALL/GEN F,10	2-3.....	ALL/GEN F
vii.....*	ALL/GEN F,13	2-4.....	ALL/GEN F
viii.....*	ALL/GEN F,13	2-5.....	ALL/GEN F
ix.....*	ALL/GEN F,13	2-6.....	ALL/GEN F
x.....*	ALL/GEN F,2	2-7.....	ALL/GEN F
xi.....*	ALL/GEN F,10	2-8.....	ALL/GEN F
xii.....*	ALL/GEN F,10	2-9.....	ALL/GEN F
xiii.....*	ALL/GEN F,8	2-10.....	ALL/GEN F
xiv.....*	ALL/GEN F,13	2-11.....	ALL/GEN F
xv.....*	ALL/GEN F,10	2-12.....	ALL/GEN F
xvi.....*	ALL/GEN F,2	2-13.....	ALL/GEN F
1-1.....	ALL/GEN F,10	2-14.....	ALL/GEN F
1-2.....	ALL/GEN F	2-15.....	ALL/GEN F
1-3.....	ALL/GEN F	2-16.....	ALL/GEN F
1-4.....	ALL/GEN F	2-17.....	ALL/GEN F
1-5.....	ALL/GEN F,10	2-18.....	ALL/GEN F
1-6.....	ALL/GEN F,10	2-19.....	ALL/GEN F
1-7.....	ALL/GEN F,10	2-20.....	ALL/GEN F
1-8.....	ALL/GEN F	2-21.....	ALL/GEN F
1-9.....	ALL/GEN F,7	2-22.....	ALL/GEN F
1-10.....⊗	ALL/GEN F,8	2-23.....	ALL/GEN F
1-11.....	ALL/GEN F	2-24.....	ALL/GEN F
1-12.....	ALL/GEN F	2-25.....	ALL/GEN F
1-13.....⊗	ALL/GEN F,8	2-26.....	ALL/GEN F

\* – Omit from flight book

⊗ – Flight copies of this page contain color

3-1.....	ALL/GEN F,2	A-16.....	ALL/GEN F,4
3-2.....	ALL/GEN F	A-17.....	ALL/GEN F,4
3-3.....	ALL/GEN F	A-18.....	⊗ ALL/GEN F,8
3-4.....	ALL/GEN F,2	A-19.....	ALL/GEN F,4
3-5.....	ALL/GEN F,2	A-20.....	ALL/GEN F,5
3-6.....	ALL/GEN F,2	A-21.....	ALL/GEN F,4
3-7.....	ALL/GEN F,2	A-22.....	ALL/GEN F,4
3-8.....	ALL/GEN F,2	B-1.....	ALL/GEN F
3-9.....	ALL/GEN F,2	B-2.....	ALL/GEN F
3-10.....	ALL/GEN F,2	B-3.....	ALL/GEN F
4-1.....	ALL/GEN F,10	B-4.....	ALL/GEN F
4-2.....	ALL/GEN F	C-1.....	ALL/GEN F
4-3.....	ALL/GEN F	C-2.....	ALL/GEN F
4-4.....	ALL/GEN F,10	C-3.....	ALL/GEN F
4-5.....	⊗ ALL/GEN F,10	C-4.....	ALL/GEN F
4-6.....	⊗ ALL/GEN F,10	C-5.....	ALL/GEN F
4-7.....	⊗ ALL/GEN F,10	C-6.....	ALL/GEN F
4-8.....	ALL/GEN F,10	C-7.....	ALL/GEN F
4-9.....	ALL/GEN F,10	C-8.....	ALL/GEN F
4-10.....	ALL/GEN F,10	C-9.....	ALL/GEN F,4
4-11.....	ALL/GEN F,10	C-10.....	ALL/GEN F,4
4-12.....	ALL/GEN F,2	D-1.....	ALL/GEN F,4
A-i.....	ALL/GEN F,4	D-2.....	ALL/GEN F,4
A-ii.....	ALL/GEN F	D-3.....	ALL/GEN F,4
A-1.....	ALL/GEN F	D-4.....	ALL/GEN F,4
A-2.....	ALL/GEN F	D-5.....	ALL/GEN F,4
A-3.....	ALL/GEN F	D-6.....	ALL/GEN F,4
A-4.....	ALL/GEN F	D-7.....	ALL/GEN F,8
A-5.....	ALL/GEN F	D-8.....	ALL/GEN F,8
A-6.....	ALL/GEN F	D-9.....	ALL/GEN F,4
A-7.....	ALL/GEN F,4	D-10.....	ALL/GEN F,4
A-8.....	ALL/GEN F,5	G-i.....	ALL/GEN F,8
A-9.....	ALL/GEN F	G-ii.....	ALL/GEN F
A-10.....	ALL/GEN F,5	H-1.....	ALL/GEN F,6
A-11.....	ALL/GEN F,5	H-2.....	⊗ ALL/GEN F,8
A-12.....	ALL/GEN F,5	H-3.....	⊗ ALL/GEN F,8
A-13.....	ALL/GEN F,5	H-4.....	⊗ ALL/GEN F,8
A-14.....	ALL/GEN F,4	H-5.....	⊗ ALL/GEN F,8
A-15.....	ALL/GEN F,4	H-6.....	ALL/GEN F,6

⊗ – Flight copies of this page contain color



H-7 .....	ALL/GEN F,6	L-4.....	ALL/GEN F
H-8 .....	ALL/GEN F,6	L-5.....	ALL/GEN F,9
H-9 .....	ALL/GEN F,6	L-6.....	⊗ ALL/GEN F,9
H-10 .....	⊗ ALL/GEN F,8	L-7.....	⊗ ALL/GEN F,9
H-11 .....	ALL/GEN F,6	L-8.....	ALL/GEN F,8
H-12 .....	ALL/GEN F,6	L-9.....	ALL/GEN F,8
H-13 .....	ALL/GEN F,6	L-10.....	ALL/GEN F,8
H-14 .....	ALL/GEN F,6	L-11.....	ALL/GEN F,8
I-1 .....	ALL/GEN F	L-12.....	ALL/GEN F,8
I-2.....	ALL/GEN F	M-i.....	ALL/GEN F,13
I-3.....	ALL/GEN F	M-ii.....	ALL/GEN F
I-4.....	⊗ ALL/GEN F,8	M-1.....	ALL/GEN F
K-1.....	ALL/GEN F	M-2.....	ALL/GEN F
K-2.....	ALL/GEN F	M-3.....	ALL/GEN F
K-3.....	ALL/GEN F	M-4.....	ALL/GEN F
K-4.....	ALL/GEN F	M-5.....	ALL/GEN F
K-5.....	ALL/GEN F	M-6.....	ALL/GEN F
K-6.....	ALL/GEN F	M-7.....	ALL/GEN F
K-7.....	ALL/GEN F	M-8.....	ALL/GEN F
K-8.....	ALL/GEN F	M-9.....	ALL/GEN F
K-9.....	ALL/GEN F	M-10.....	ALL/GEN F
K-10.....	ALL/GEN F	M-11.....	⊗ ALL/GEN F,8
K-11.....	ALL/GEN F,4	M-12.....	⊗ ALL/GEN F,8
K-12.....	ALL/GEN F	M-13.....	ALL/GEN F
K-13.....	ALL/GEN F	M-14.....	⊗ ALL/GEN F,8
K-14.....	ALL/GEN F,4	M-15.....	⊗ ALL/GEN F,8
K-15.....	ALL/GEN F,4	M-16.....	ALL/GEN F
K-16.....	ALL/GEN F,4	M-17.....	ALL/GEN F
K-17.....	ALL/GEN F,4	M-18.....	ALL/GEN F
K-18.....	ALL/GEN F	M-19.....	ALL/GEN F
K-19.....	ALL/GEN F,4	M-20.....	ALL/GEN F
K-20.....	ALL/GEN F,4	M-21.....	ALL/GEN F
K-21.....	ALL/GEN F	M-22.....	ALL/GEN F
K-22.....	ALL/GEN F,4	M-23.....	ALL/GEN F
K-23.....	ALL/GEN F	M-24.....	ALL/GEN F
K-24.....	ALL/GEN F	M-25.....	ALL/GEN F
L-1 .....	⊗ ALL/GEN F,8	M-26.....	ALL/GEN F
L-2 .....	⊗ ALL/GEN F,8	M-27.....	ALL/GEN F
L-3.....	ALL/GEN F	M-28.....	ALL/GEN F

⊗ – Flight copies of this page contain color

M-29.....	ALL/GEN F	P-12.....	⊗ ALL/GEN F,8
M-30.....	ALL/GEN F	P-13.....	⊗ ALL/GEN F,8
M-31.....	ALL/GEN F	P-14.....	⊗ ALL/GEN F,8
M-32.....	ALL/GEN F	P-15.....	⊗ ALL/GEN F,8
M-33.....	ALL/GEN F	P-16.....	ALL/GEN F,6
M-34.....	ALL/GEN F,4	P-17.....	ALL/GEN F,6
M-35.....	ALL/GEN F,4	P-18.....	ALL/GEN F,6
M-36.....	ALL/GEN F,4	P-19.....	ALL/GEN F,6
M-37.....	ALL/GEN F,4	P-20.....	ALL/GEN F,6
M-38.....	ALL/GEN F	P-21.....	ALL/GEN F,6
O-1.....	ALL/GEN F,2	P-22.....	ALL/GEN F,6
O-2.....	⊗ ALL/GEN F,8	P-23.....	ALL/GEN F,6
O-3.....	ALL/GEN F,2	P-24.....	ALL/GEN F,6
O-4.....	ALL/GEN F,2	P-25.....	ALL/GEN F,6
O-5.....	ALL/GEN F,2	P-26.....	ALL/GEN F,6
O-6.....	ALL/GEN F,2	P-27.....	ALL/GEN F,6
O-7.....	ALL/GEN F,2	P-28.....	ALL/GEN F,6
O-8.....	ALL/GEN F,2	P-29.....	ALL/GEN F,6
O-9.....	ALL/GEN F,2	P-30.....	ALL/GEN F,6
O-10.....	ALL/GEN F,6	P-31.....	ALL/GEN F,6
O-11.....	ALL/GEN F,6	P-32.....	ALL/GEN F,6
O-12.....	ALL/GEN F,9	P-33.....	ALL/GEN F,6
O-13.....	ALL/GEN F,9	P-34.....	ALL/GEN F,6
O-14.....	ALL/GEN F,2	P-35.....	ALL/GEN F,6
O-15.....	ALL/GEN F,2	P-36.....	ALL/GEN F,6
O-16.....	ALL/GEN F,2	P-37.....	ALL/GEN F,6
O-17.....	ALL/GEN F,2	P-38.....	ALL/GEN F,8
O-18.....	ALL/GEN F,2	P-39.....	ALL/GEN F,6
P-1.....	ALL/GEN F	P-40.....	ALL/GEN F
P-2.....	⊗ ALL/GEN F,8	P-41.....	ALL/GEN F
P-3.....	⊗ ALL/GEN F,8	P-42.....	ALL/GEN F
P-4.....	⊗ ALL/GEN F,8	P-43.....	ALL/GEN F,6
P-5.....	⊗ ALL/GEN F,8	P-44.....	ALL/GEN F,6
P-6.....	⊗ ALL/GEN F,8	P-45.....	ALL/GEN F,6
P-7.....	⊗ ALL/GEN F,8	P-46.....	ALL/GEN F
P-8.....	⊗ ALL/GEN F,8	P-47.....	ALL/GEN F,6
P-9.....	⊗ ALL/GEN F,8	P-48.....	ALL/GEN F
P-10.....	⊗ ALL/GEN F,8	P-49.....	ALL/GEN F
P-11.....	⊗ ALL/GEN F,8	P-50.....	ALL/GEN F

⊗ – Flight copies of this page contain color

P-51.....	ALL/GEN F	R-22 .....	ALL/GEN F,3
P-52.....	⊗ ALL/GEN F,8	R-23 .....	ALL/GEN F,3
P-53.....	⊗ ALL/GEN F,8	R-24 .....	ALL/GEN F,3
P-54.....	⊗ ALL/GEN F,8	R-25 .....	ALL/GEN F,3
P-55.....	⊗ ALL/GEN F,13	R-26 .....	ALL/GEN F,4
P-56.....	⊗ ALL/GEN F,13	R-27 .....	ALL/GEN F,3
P-57.....	⊗ ALL/GEN F,13	R-28 .....	ALL/GEN F,3
P-58.....	⊗ ALL/GEN F,13	R-29 .....	ALL/GEN F,3
P-59.....	ALL/GEN F,13	R-30 .....	⊗ ALL/GEN F,8
P-60.....	ALL/GEN F,13	R-31 .....	⊗ ALL/GEN F,8
P-61.....	ALL/GEN F,13	R-32 .....	ALL/GEN F,3
P-62.....	ALL/GEN F,13	R-33 .....	ALL/GEN F,3
P-63.....	ALL/GEN F,13	R-34 .....	ALL/GEN F,3
P-64.....	ALL/GEN F,13	R-35 .....	ALL/GEN F,8
P-65.....	ALL/GEN F,13	R-36 .....	ALL/GEN F,3
P-66.....	ALL/GEN F,13	R-37 .....	ALL/GEN F,3
P-67.....	ALL/GEN F,13	R-38 .....	ALL/GEN F,3
P-68.....	ALL/GEN F,13	R-39 .....	ALL/GEN F,3
R-1 .....	ALL/GEN F,4	R-40 .....	ALL/GEN F,3
R-2 .....	ALL/GEN F,4	R-41 .....	ALL/GEN F,3
R-3 .....	ALL/GEN F,4	R-42 .....	ALL/GEN F,3
R-4 .....	ALL/GEN F	R-43 .....	ALL/GEN F,3
R-5 .....	ALL/GEN F	R-44 .....	ALL/GEN F,8
R-6 .....	⊗ ALL/GEN F,8	R-45 .....	ALL/GEN F,3
R-7 .....	ALL/GEN F	R-46 .....	ALL/GEN F,3
R-8 .....	ALL/GEN F,8	R-47 .....	ALL/GEN F,3
R-9 .....	⊗ ALL/GEN F,8	R-48 .....	ALL/GEN F,3
R-10 .....	⊗ ALL/GEN F,8	R-49 .....	ALL/GEN F,3
R-11 .....	ALL/GEN F,8	R-50 .....	ALL/GEN F,3
R-12 .....	ALL/GEN F,8	R-51 .....	ALL/GEN F,8
R-13 .....	ALL/GEN F,4	R-52 .....	ALL/GEN F,3
R-14 .....	ALL/GEN F,4	R-53 .....	ALL/GEN F,3
R-15 .....	ALL/GEN F	R-54 .....	ALL/GEN F,3
R-16 .....	ALL/GEN F	R-55 .....	ALL/GEN F,3
R-17 .....	ALL/GEN F,4	R-56 .....	ALL/GEN F,3
R-18 .....	ALL/GEN F,3	R-57 .....	ALL/GEN F,3
R-19 .....	ALL/GEN F,5	R-58 .....	ALL/GEN F,3
R-20 .....	ALL/GEN F,5	R-59 .....	ALL/GEN F,3
R-21 .....	ALL/GEN F,3	R-60 .....	ALL/GEN F,8

⊗ – Flight copies of this page contain color

R-61 .....	ALL/GEN F,3	W-8 .....	ALL/GEN F
R-62 .....	ALL/GEN F,3	W-9 .....	⊗ ALL/GEN F,8
R-63 .....	ALL/GEN F,3	W-10 .....	ALL/GEN F
R-64 .....	ALL/GEN F,3	W-11 .....	ALL/GEN F
S-i.....	ALL/GEN F,12	W-12 .....	ALL/GEN F
S-ii.....	ALL/GEN F	W-13 .....	ALL/GEN F
S-1.....	ALL/GEN F,8	W-14 .....	ALL/GEN F
S-2.....	ALL/GEN F	W-15 .....	ALL/GEN F
S-3.....	ALL/GEN F	W-16 .....	ALL/GEN F
S-4.....	ALL/GEN F,12	W-17 .....	ALL/GEN F
S-5.....	deleted	W-18 .....	ALL/GEN F
S-6.....	deleted	W-19 .....	ALL/GEN F
S-7.....	deleted	W-20 .....	ALL/GEN F
S-8.....	deleted	W-21 .....	ALL/GEN F
S-9.....	deleted	W-22 .....	ALL/GEN F
S-10.....	deleted	W-23 .....	ALL/GEN F
T-1.....	ALL/GEN F	W-24 .....	ALL/GEN F
T-2.....	ALL/GEN F	W-25 .....	ALL/GEN F
T-3.....	ALL/GEN F	W-26 .....	ALL/GEN F
T-4.....	ALL/GEN F	W-27 .....	ALL/GEN F
T-5.....	ALL/GEN F	W-28 .....	ALL/GEN F
T-6.....	ALL/GEN F	W-29 .....	ALL/GEN F
U-1 .....	ALL/GEN F	W-30 .....	ALL/GEN F
U-2 .....	ALL/GEN F	W-31 .....	ALL/GEN F
U-3 .....	ALL/GEN F	W-32 .....	ALL/GEN F
U-4 .....	ALL/GEN F	W-33 .....	ALL/GEN F
U-5 .....	ALL/GEN F	W-34 .....	ALL/GEN F
U-6 .....	ALL/GEN F,2	W-35 .....	ALL/GEN F
V-1.....	ALL/GEN F,8	W-36 .....	ALL/GEN F
V-2.....	ALL/GEN F,7	W-37 .....	ALL/GEN F
W-i.....	ALL/GEN F,6	W-38 .....	ALL/GEN F
W-ii.....	ALL/GEN F,6	W-39 .....	ALL/GEN F
W-1.....	ALL/GEN F	W-40 .....	⊗ ALL/GEN F,8
W-2.....	ALL/GEN F	W-41 .....	ALL/GEN F
W-3.....	ALL/GEN F,8	W-42 .....	ALL/GEN F
W-4.....	ALL/GEN F	W-43 .....	ALL/GEN F
W-5.....	ALL/GEN F	W-44 .....	ALL/GEN F
W-6.....	ALL/GEN F	W-45 .....	ALL/GEN F
W-7.....	ALL/GEN F	W-46 .....	ALL/GEN F

⊗ – Flight copies of this page contain color

W-47..... ALL/GEN F  
W-48..... ALL/GEN F  
W-49..... ALL/GEN F  
W-50..... ALL/GEN F  
W-51..... ALL/GEN F  
W-52..... ALL/GEN F  
W-53..... ALL/GEN F,10  
W-54..... ALL/GEN F,10  
W-55..... ALL/GEN F,10  
W-56..... ALL/GEN F,10  
W-56a..... ALL/GEN F,10  
W-56b..... ALL/GEN F,10  
W-57..... ALL/GEN F  
W-58..... ALL/GEN F  
W-59..... ALL/GEN F  
W-60..... ALL/GEN F  
W-61..... ALL/GEN F  
W-62..... ALL/GEN F  
W-63..... ALL/GEN F  
W-64..... ALL/GEN F  
W-65..... ALL/GEN F,10  
W-66.....⊗ ALL/GEN F,10  
W-67.....⊗ ALL/GEN F,10  
W-68..... ALL/GEN F,10  
W-69..... ALL/GEN F,10  
W-70..... ALL/GEN F,10  
W-71..... ALL/GEN F,10  
W-72..... ALL/GEN F,10

⊗ – Flight copies of this page contain color



This Page Intentionally Blank



## CONTENTS

	<u>PAGE</u>
<u>GENERAL INFORMATION</u>	
CREW MODULE PENETRATIONS.....	1-2
ELECTRICAL SCHEMATICS (TYPICAL) .....	1-3
CONNECTOR PIN/SOCKET EXAMPLES.....	1-3
ELECTRICAL SCHEMATICS LEGEND (Typical) .....	1-3
WIRE & HARNESS ID (Typical).....	1-3
GENERIC STOWAGE VOLUME REMOVAL.....	1-4
VOL A REMOVAL (MF57A) .....	1-4
VOL B REMOVAL (MA4D).....	1-5
VOL E ACCESS (MD76C) .....	1-5
VOL E REMOVAL (MD76C).....	1-6
VOL G ACCESS (MD80R).....	1-6
VOL G REMOVAL (MD80R) .....	1-7
VOL H REMOVAL (MD23R) .....	1-7
LADDER REMOVAL.....	1-8
LiOH STOWAGE VOLUME REMOVAL (MD52M).....	1-9
LOCKER,TURNBUCKLE REMOVAL/INSTALLATION.....	1-11
ORBIT STATION ACCESS.....	1-13
SOFT STOWAGE SUPPORT REMOVAL .....	1-16
 <u>TOOLS</u>	
IFM TOOL LOCKER (TOOL)	
TRAY 1.....	2-2
DIGITAL MULTIMETER .....	2-3
DIGITAL MULTIMETER KIT.....	2-4
TEMPERATURE PROBE AND PRESSURE MODULE KIT.....	2-5
PIN KIT .....	2-6
TRAY 2.....	2-19
TRAY 3.....	2-20
TRAY 4.....	2-21
IFM BREAKOUT BOX (BOB) LOCKER.....	2-22
VACUUM CLEANER LOCKER (VAC) – AC .....	2-23
VACUUM CLEANER LOCKER (VAC) – DC.....	2-24
IFM CONTINGENCY HOSE AND CABLE KIT (CHCK).....	2-25

COMPONENT LOCATIONS

FLIGHT DECK .....	3-3
AV BAY 1 .....	3-4
AV BAY 2 .....	3-5
AV BAY 3A.....	3-6
AV BAY 3B AND WCS COMPARTMENT.....	3-7
LOWER EQUIPMENT BAY (OV103).....	3-8
LOWER EQUIPMENT BAY (OV104).....	3-9
LOWER EQUIPMENT BAY (OV105).....	3-10

SCHEDULED MAINTENANCE

FILTER CLEANING .....	4-2
MIDDECK (FLOOR) .....	4-4
MIDDECK (WCS) .....	4-4
MIDDECK (OVERHEAD) .....	4-5
FLIGHT DECK (STBD SIDE) .....	4-6
FLIGHT DECK (PORT SIDE).....	4-7
LOWER EQUIPMENT BAY (MCC call only).....	4-9
MIDDECK FLOOR (MCC call only).....	4-11

IFM PROCEDURES

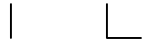
ACCU BYPASS CONNECTOR INSTALLATION.....	A-1
AC PWR TRANSFER CABLE INSTALLATION.....	A-5
APDS DIRECT DRIVE USING BOB.....	A-8
APDS SLIP CLUTCH POSITION INDICATION.....	A-12
AV BAY FAN CHANGEOUT .....	A-17
BRAKE ANTISKID CONTROL COMMAND INHIBIT .....	B-1
CAUTION AND WARNING ELECTRONICS UNIT	
CONTINGENCY PWR (CIL) .....	C-1
CONTROL BUS PWRDN.....	C-6
CRYO TANK HEATER FUSE REMOVAL (CIL) .....	C-9
DDU CHANGEOUT .....	D-1
DTV/MUX REPLACEMENT w/SPARE .....	D-7



HATCH (B): INNER JAMMED ACTUATOR/LINKAGE	
WORKAROUND .....	H-1
HATCH: SIDE JAMMED ACTUATOR .....	H-7
HUD	
HEADS UP DISPLAY ELECTRONIC (HUDE) UNIT	
CHANGEOUT .....	H-9
PILOT DISPLAY UNIT (PDU) CHANGEOUT .....	H-11
IMU CONTINGENCY COOLING .....	I-1
KEYBOARD KEY CHANGEOUT .....	K-1
KEY PBI CHANGEOUT (Orbital DAP Type).....	K-4
KU-BAND ANTENNA	
CONTINGENCY DEPLOY/STOW – FAILED	
DEPLOY/STOW SW .....	K-6
CONTINGENCY STOW – EA1 ALTERNATE PWR.....	K-16
CONTINGENCY STOW – W/EVA ANTENNA GIMBAL	
ALIGNMENT .....	K-19
LEAK DETECTION – ULTRASONIC .....	L-1
LEAK SEALING – VACUUM.....	L-5
LIGHT BULB CHANGEOUT .....	L-8
LOCKERS – MISALIGNED (MOUNTING SCREWS	
WILL NOT START) .....	L-12
MA73C WIRE CUT .....	M-1
MDM CHANGEOUT.....	M-4
MEDS IDP CHANGEOUT AND CABLE SWAP .....	M-10
MEDS KEYBOARD CHANGEOUT .....	M-18
MEDS MDU CHANGEOUT.....	M-28
MMU CHANGEOUT.....	M-34
MMU CONTINGENCY PWRUP .....	M-36
OBSS SW CONTINGENCY PWRUP .....	O-1
ODS CENTERLINE CAMR ANGULAR ALIGNMENT .....	O-4
OIU CABLE SWAP .....	O-8
OS SPEAKER DISCONNECT .....	O-10
O2 SYS 1(2), FAILED XOVR VLV BYPASS.....	O-12
OSVU CONTINGENCY PWRUP .....	O-14
OSVU REPLACEMENT .....	O-16

PARACHUTE REPACK .....	P-1
PAYLOAD BAY DOOR MOTOR OPERATION.....	P-16
PAYLOAD BAY DOOR SYS ENABLE RECOVERY .....	P-42
PDI REPLACEMENT .....	P-49
PGSC CARD CHANGEOUT .....	P-52
PGSC EXPANSION CARD CHANGEOUT (A31P).....	P-55
PREFLIGHT TEST BUS SETUP .....	P-61
PSP CHANGEOUT .....	P-66
RHC CHANGEOUT .....	R-4
RMS	
CONTINGENCY OPERATION (Installation and Removal of RMS IFM D&C Kit) .....	R-13
CONTINGENCY POWERUP .....	R-18
JETT REDUNDANCY .....	R-24
MCIU CHANGEOUT .....	R-29
PORT MANIPULATOR POSITIONING MECHANISM (MPM) CONTINGENCY DEPLOY/STOW.....	R-33
PORT MANIPULATOR RETENTION LATCHES (MRL) CONTINGENCY RELEASE/LATCH.....	R-42
STBD MANIPULATOR POSITIONING MECHANISM (MPM) CONTINGENCY DEPLOY/STOW.....	R-49
STBD MANIPULATOR RETENTION LATCHES (MRL) CONTINGENCY RELEASE/LATCH.....	R-58
S-BAND DNLK RECOVERY (Solid State MMU) .....	S-1
THC CHANGEOUT .....	T-1
UTIL CABLE/OUTLET PWR CHECK (AC) .....	U-1
UTIL CABLE/OUTLET PWR CHECK (DC).....	U-3
VTR CHANGEOUT .....	V-1

WATER PROCEDURES	
GENERAL INFORMATION .....	W-1
EQUIPMENT .....	W-1
LEGEND .....	W-4
SCHEMATICS .....	W-4
CONDENSATE COLLECTION RECONFIGURATION .....	W-8
CONTINGENCY WATER CONTAINER (CWC)	
OPS, WASTE .....	W-10
CONTINGENCY WATER CONTAINER (CWC)	
OPS, SUPPLY .....	W-12
FC H2O pH TEST .....	W-14
FC H2O SPLY LINE FLUSH .....	W-17
FES SUPPLY, WASTE H2O .....	W-21
FREE FLUID DISPOSAL .....	W-25
GALLEY, FAILED SUPPLY LINE, BYPASS .....	W-28
GALLEY H2O LINE FLUSH .....	W-32
GALLEY PURGE .....	W-38
HUM SEP AIR OUTLET H2O ABSORPTION .....	W-40
SUPPLY H2O SYS BACKUP DUMP – TK A,B .....	W-41
SUPPLY H2O SYS BACKUP DUMP – TK C(D) .....	W-45
SUPPLY(WASTE) H2O PURGE FROM DUMP	
LINE(S) .....	W-51
VACUUM VENT CONTINGENCY	
OPERATION (CIL) .....	W-53
WASTE H2O SYS BACKUP DUMP .....	W-57
WCS FAILED COMMODE CNTL VLV .....	W-61
WCS FAN SEP FAILURE (FAILED URINAL) .....	W-65
WCS FAN SEP 1(2) CLEARING .....	W-70



This Page Intentionally Blank

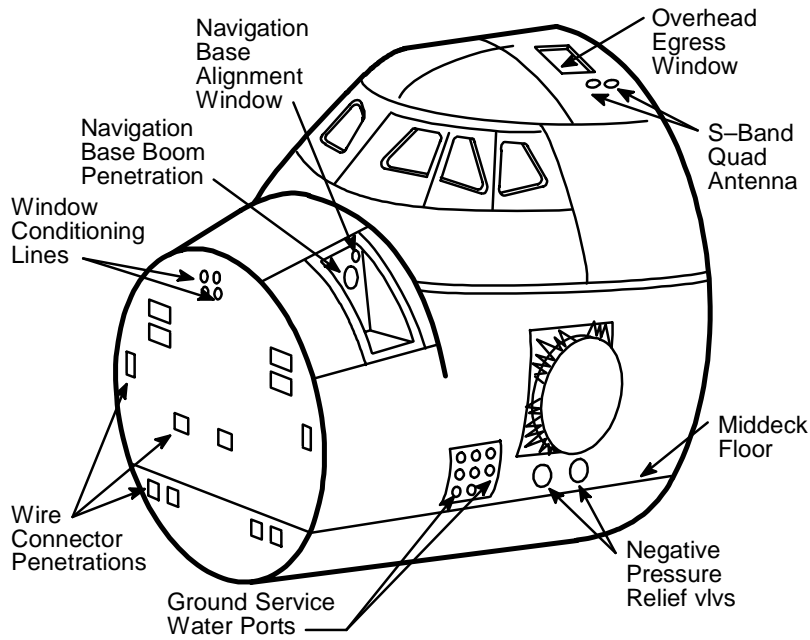
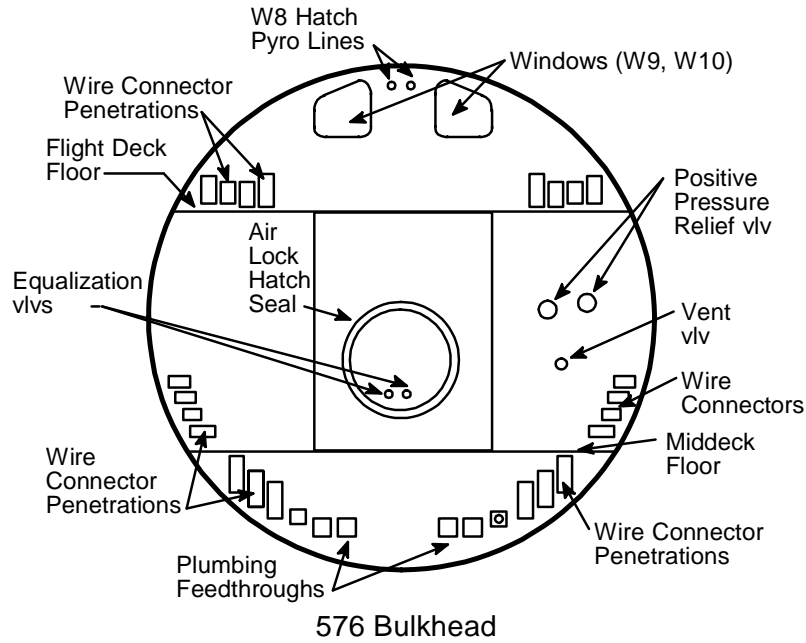


GENERAL INFORMATION

	<u>PAGE</u>
CREW MODULE PENETRATIONS.....	1-2
ELECTRICAL SCHEMATICS (TYPICAL).....	1-3
CONNECTOR PIN/SOCKET EXAMPLES.....	1-3
ELECTRICAL SCHEMATICS LEGEND (Typical).....	1-3
WIRE & HARNESS ID (Typical).....	1-3
GENERIC STOWAGE VOLUME REMOVAL.....	1-4
VOL A REMOVAL (MF57A).....	1-4
VOL B REMOVAL (MA4D).....	1-5
VOL E ACCESS (MD76C).....	1-5
VOL E REMOVAL (MD76C).....	1-6
VOL G ACCESS (MD80R).....	1-6
VOL G REMOVAL (MD80R).....	1-7
VOL H REMOVAL (MD23R).....	1-7
LADDER REMOVAL.....	1-8
LiOH STOWAGE VOLUME REMOVAL (MD52M).....	1-9
LOCKER,TURNBUCKLE REMOVAL/ INSTALLATION.....	1-11
ORBIT STATION ACCESS.....	1-13
SOFT STOWAGE SUPPORT REMOVAL.....	1-16

**GENERAL  
INFORMATION**

### CREW MODULE PENETRATIONS

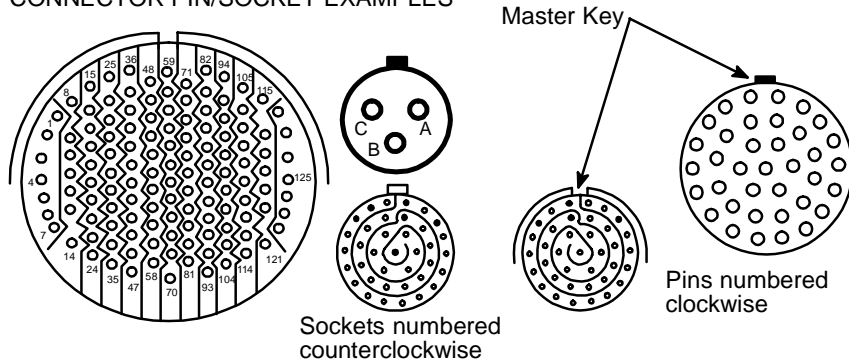


Crew Module Penetrations

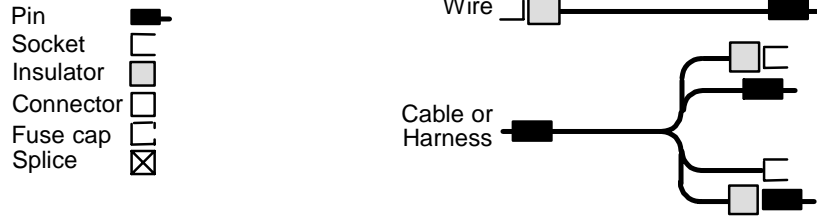
jsc48025\_001\_1.cnv

# ELECTRICAL SCHEMATICS (TYPICAL)

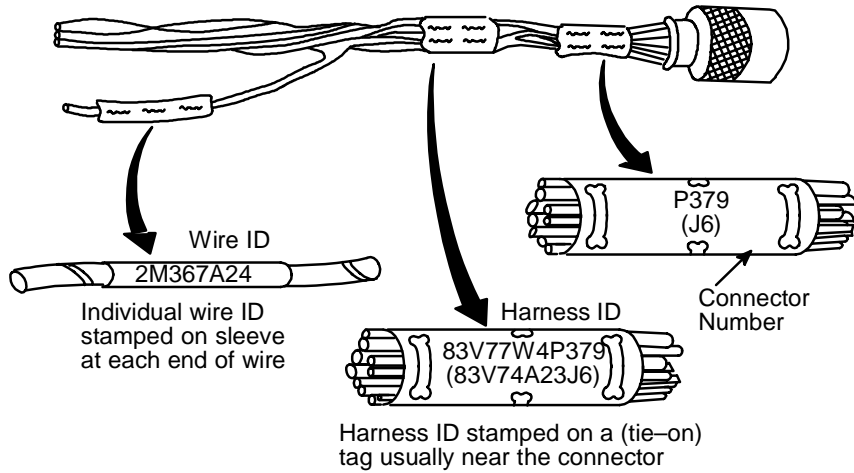
## CONNECTOR PIN/SOCKET EXAMPLES



## ELECTRICAL SCHEMATICS LEGEND (Typical)



## WIRE & HARNESS ID (Typical)



jsc48025\_002\_1.cnv

## GENERIC STOWAGE VOLUME REMOVAL

OBJECTIVE: Remove stowage volumes to gain access to LRUs (equipment) located behind pnls, closeouts, or in LEB, to allow performance of IFM

**VOL A REMOVAL (MF57A)** (15 min)

LOCATION: See AV BAYS 1,2 (COMPONENT LOCATIONS)

TOOLS REQD:

TOOL	Gray Tape
	Ratchet Wrench
	5/16-in & 7/16-in Sockets
	1/4-in to 3/8-in Adapter
	4-in, 6-in, & 10-in Extensions
	#10L Torque Tip
	5/16-in & 7/16-in Combination Wrenches

NOTE

Refer to components locations AV BAYS 1,2 for schematic, fastener location, and torques

1. Remove Debris Net from around Vol A (MF57A).  
Temp stow
2. Remove lockers MF43C, MF57C, MF71C
3. Lower audio pnl containing MO42F, MO58F to access suspension bars (two)
4. Remove screws from Vol A (MF57A) lower fwd mount brackets (two/bracket, #10L Torque Tip)
5. Remove bolts, nuts connecting Vol A (MF57A) upper mounting brackets to suspension bars (two bolts, nuts, one/mount, 5/16-in and 7/16-in sockets and wrenches, as reqd)
6. Tape H/W to Vol A (MF57A). Temp stow



**VOL B REMOVAL (MA4D)**

(5 min)

LOCATION: See AV BAY 3A (COMPONENT LOCATIONS)

TOOLS REQD:

TOOL Locker Tool  
3/8-in Driver Handle

NOTE

It may not be acceptable to remove Vol B if experiments installed in adjacent locker row. However, Vol B may be repositioned for access to AV BAY 3A upper closeout fasteners w/o removing any lockers

1. Remove Lockers MA9D thru MA9N
2. Pull Pip Pin securing Vol B to mount. Push down to disengage alignment pins (two)
3. Remove Vol B. Temp stow

**VOL E ACCESS (MD76C)**

(10 min)

LOCATION: See LOWER EQUIPMENT BAY (COMPONENT LOCATIONS)

TOOLS REQD:

TOOL Locker Tool  
3/8-in Driver Handle  
Ratchet Wrench  
1/4-in to 3/8-in Adapter

1. Remove Lockers MF71M, MF71O
2. Open Vol E (MD76C) door

**VOL E REMOVAL (MD76C)**

(15 min)

LOCATION: See LOWER EQUIPMENT BAY (COMPONENT LOCATIONS)

TOOLS REQD:

TOOL Pwr Screwdriver  
5/32-in Allen Head Driver  
Locker Tool  
3/8-in Driver Handle  
Ratchet Wrench

NOTE

It may not be possible to completely remove Vol E (MD76C) w/sleep station installed. However, Vol E (MD76C) may be repositioned enough to allow crewmember to access LEB

1. Remove Lockers MF71K,MF71M,MF71O
2. Loosen Vol E (MD76C) fasteners (eighteen, 5/32-in Allen Head Driver)
3. Reposition (remove) Vol E (MD76C). Temp stow

**VOL G ACCESS (MD80R)**

(10 min)

LOCATION: See LOWER EQUIPMENT BAY (COMPONENT LOCATIONS)

TOOLS REQD:

TOOL Locker Tool  
3/8-in Driver Handle  
Ratchet Wrench  
1/4-in to 3/8-in Adapter

1. Remove Lockers MA16N,MA16L
2. Open Vol G (MD80R) door

**VOL G REMOVAL (MD80R)**

(15 min)

LOCATION: See LOWER EQUIPMENT BAY (COMPONENT LOCATIONS)

TOOLS REQD:

TOOL Pwr Screwdriver  
Locker Tool  
3/8-in Driver Handle  
3/16-in & 5/32-in Allen Head Drivers  
1/4-in to 3/8-in Adapter  
Ratchet Wrench

1. Remove Lockers above Vol G (MD80R) (MA16 column) as reqd
2. Loosen Vol G (MD80R) fasteners (twelve, 5/32-in and five, 3/16-in Allen Head Driver)
3. Remove Vol G. Temp stow

**VOL H REMOVAL (MD23R)**

(10 min)

LOCATION: See LOWER EQUIPMENT BAY (COMPONENT LOCATIONS)

TOOLS REQD:

TOOL Pwr Screwdriver  
Locker Tool  
3/8-in Driver Handle  
3/16-in & 5/32-in Allen Head Drivers  
1/4-in to 3/8-in Adapter  
Ratchet Wrench

1. Remove Interdeck Access Ladder. See LADDER REMOVAL, 1-8
2. Loosen Vol H (MD23R) fasteners (five, 3/16-in and twelve, 5/32-in Allen Head Driver)
3. Remove Vol H (MD23R). Temp stow

## LADDER REMOVAL

(10 min)

OBJECTIVE: Remove interdeck access ladder. Ladder must be removed to allow removal of Vol H (MD23R)

LOCATION: Middeck; port side of Airlock

TOOLS REQD:

TOOL            5/32-in Allen Head Driver  
                    Ratchet Wrench  
                    4-in Extension  
                    1/4-in to 3/8-in Adapter  
                    #8 Torque Driver (for OV103,105)

1. Remove Egress Platform clamps (four) attached to ladder. Two screws/clamp (#8 Torque Driver).  
Temp stow
- MD25R 2. Loosen fasteners at ladder base (two, 5/32-in Allen Head Driver)
3. Pull ladder out at base and down, toward side hatch, to disengage pins at top of ladder.  
Temp stow

**LiOH STOWAGE VOLUME REMOVAL (MD52M) (20 min)**

OBJECTIVE: Access to LEB

LOCATION: See LOWER EQUIPMENT BAY (COMPONENT LOCATIONS)

TOOLS REQD:

TOOL                    7/16-in Socket  
                              Ratchet Wrench  
                              4-in Extension  
                              1/4-in to 3/8-in Adapter  
                              #6 Torque Driver  
                              3/8-in Standard Socket

1. Open LiOH Stowage Vol (MD52M) door. Remove and discard silver tape securing Teflon closeout strips to edges of LiOH Stowage Box

NOTE

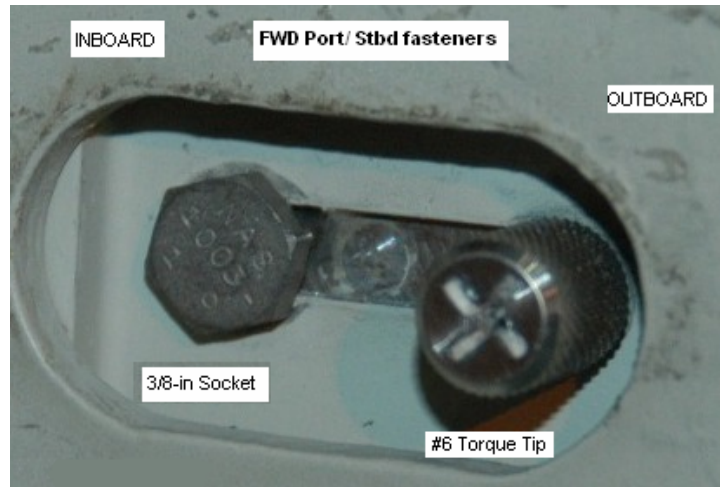
As Teflon strips have different lengths and shapes, their locations should be marked prior to removal

2. Remove Teflon closeout strips. Temp stow
3. Upper/outboard LiOH stowage racks must be removed to access fasteners. Remove other racks as reqd
4. Remove aft support bolts and then fwd support pin screws securing LiOH Stowage Vol (MD52M). See table

NOTE

For correct installation, note lengths of fasteners. They vary by location

Vehicle	Mounting Hardware	
	Fwd Port/Stbd	Aft Port/Stbd
ALL	1 Inboard – 3/8-in Non-Captive Bolt/Washers (remove two each) 1 Outboard – #6 Torque Tip Screws (Loosen/ unscrew until stop, two total) Grasp knurled handles, slide support pins inboard	3 – 7/16-in Non-Captive Bolts/Washers (Remove six total)



**CAUTION**  
Use care when removing LiOH box. It may impact water lines located in LEB fwd and port of LiOH box

5. Lift LiOH Vol from middeck floor. Temp stow

**CAUTION**  
Two knurled handles of fwd support pins must be at outboard ends of slots, 3/8-in Bolts/Washers installed at inboard ends of slots to ensure proper engagement of fwd support pins

6. Reverse steps 1 thru 5 for installation

## **LOCKER,TURNBUCKLE REMOVAL/ INSTALLATION**

(5 min,20 min)

OBJECTIVE: Remove/install lockers,turnbuckles as needed to  
access AV BAYS

LOCATION: See (COMPONENT LOCATIONS) AV BAYS 1,2,3A

### TOOLS REQD:

TOOL Locker Tool  
Ratchet Wrench  
1/4-in to 3/8-in Adapter  
Torque Wrench  
Seat Adjustment Tool (for Turnbuckles)  
3/16-in Hex Ball (for Foot Restraint Box)

### LOCKER REMOVAL

1. If Locker installed:  
    Insert Locker Tool into any corner of locker.  
    Ensure tool fully seated (green stripe flush  
    w/locker face)  
    If Foot Restraint Box installed:  
    Use 3/16-in Hex Ball to loosen locker fasteners  
    behind Foot Restraint Box
2. Install Ratchet Wrench, 1/4-in to 3/8-in Adapter
3. Loosen all four fasteners until spring releases
4. Remove, temp stow locker

### NOTE

Thermal/Debris Traps may be location  
specific and marked as such

5. Remove Thermal/Debris Trap, temp stow

### LOCKER INSTALLATION

6. Reinstall Thermal/Debris Trap,Locker. Torque  
fasteners 30 in-lb (ensure green stripe on locker  
tool flush w/locker face after torque)
7. Stow tools

TURNBUCKLE INSTALLATION (if reqd)

1. Install Thermal/Debris Trap
2. Orient turnbuckle to an 'N' shape w/long leg adjuster in lower right corner

NOTE

Ensure all adjusters have two threads exposed on each side of knurled adjuster wheel

3. Install turnbuckle. Hand tighten top left fastener
4. Adjust center leg to allow bottom right fastener to engage smoothly. Hand tighten
5. Adjust, secure remaining two legs
6. Torque all four fasteners 30 in-lb
7. Stow tools



## ORBIT STATION ACCESS

(45 min)

**OBJECTIVE:** Reposition pnl A7L to access connector brackets (wire harnesses) behind aft Orbit Station (OS) for Remote Manipulator System (RMS), Translational Hand Controller (THC), and OS Speaker IFM procedure(s)

**LOCATION:** Aft Flight Deck Orbit Station

### TOOLS REQD:

Tools	10mm Socket
	3/8-in Standard Socket (1/4-in drive)
	Inspection Mirror
	Torque Wrench
BOB	Small-Parts Retainer
MISC	Flashlight

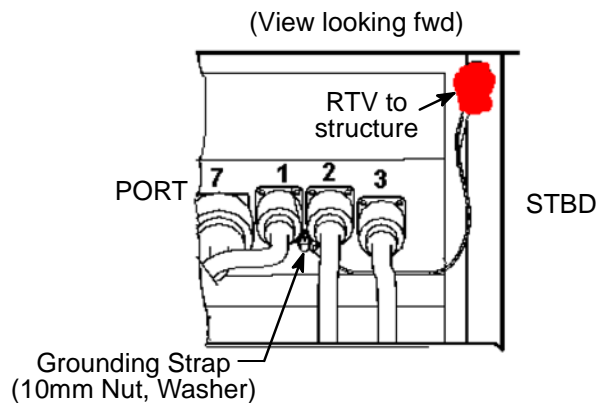
### REPOSITION A7L

- A7L      1. Remove mounting bolts (eight, 3/8-in Socket), temp stow

#### NOTE

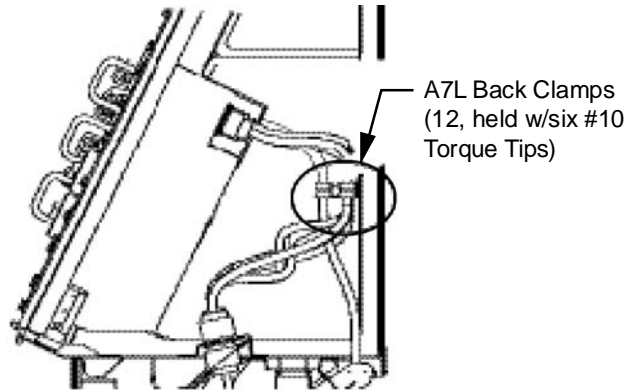
Sections of wire harnesses from pnl A7L are wrapped w/Teflon, allowing them to pull thru restraining clamp

2. Pull pnl out of OS to access cables on back side of pnl until grounding strap on back of pnl taut. See fig below for grounding strap location



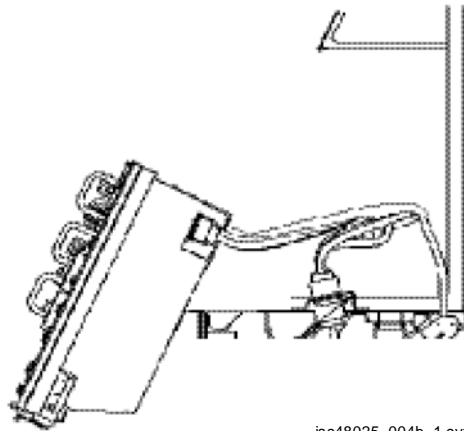
jsc48025\_003\_1.cnv

3. Starting at port side, carefully pull Teflon cover cables thru restraining clamps. This will allow pnl to be pulled fwd approx an additional 3 in
4. Disconnect grounding strap from pnl (one nut and washer, 10mm Socket). Temp stow H/W
5. Remove 12 cable clamps from aft structure (six screws, #10 Torque Tip Driver). Cut wire ties as reqd to allow more slack in cables. Stow clamps. See fig below



jsc48025\_004a\_1.cvx

6. Reposition pnl as reqd for access to connectors (wire harnesses). Secure pnl w/Gray Tape



jsc48025\_004b\_1.cvx

7. Return to appropriate IFM procedure

REINSTALL A7L

- A7L
8. Reinstall grounding strap (10mm nut and washer)  
(torque nut 40 in-lb)
  9. Install pnl, ensure wire harnesses not crimped  
(torque mounting bolts 30 in-lb)
  10. To complete, return to appropriate IFM procedure

## **SOFT STOWAGE SUPPORT REMOVAL**

(10 min)

OBJECTIVE: Access to LRUs, equipment in AV BAY 3A

LOCATION: MA9N

TOOLS REQD:

TOOL                      Locker Tool  
                                 3/8-in Driver Handle  
                                 1/4-in to 3/8-in Adapter  
                                 Ratchet Wrench

1. Remove soft stowage bags from support
2. Remove lower support aft fasteners (two, Locker Tool)
3. Remove upper fwd fasteners, two thumb screws
4. Remove soft stowage support

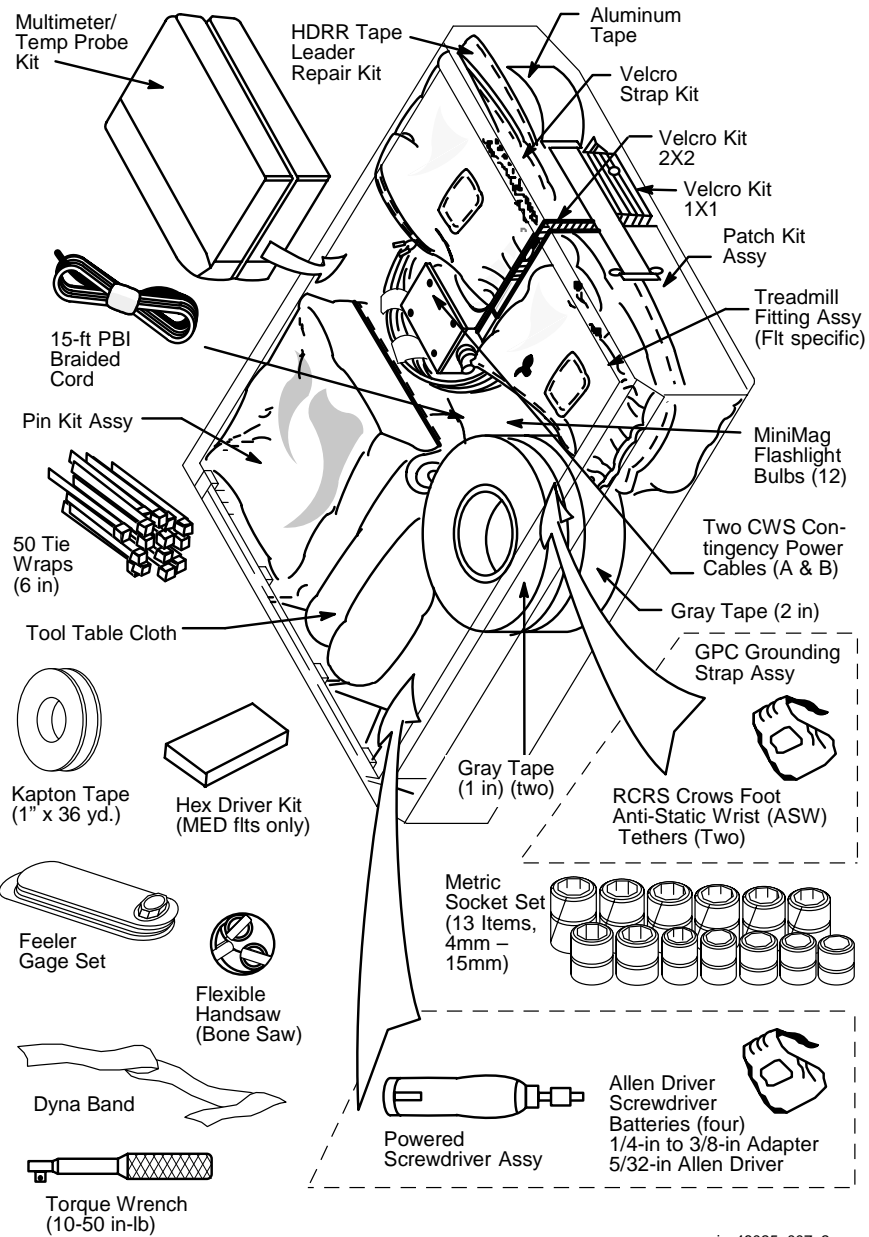
TOOLS

	<u>PAGE</u>
IFM TOOL LOCKER (TOOL)	
TRAY 1.....	2-2
DIGITAL MULTIMETER .....	2-3
DIGITAL MULTIMETER KIT.....	2-4
TEMPERATURE PROBE AND PRESSURE MODULE KIT.....	2-5
PIN KIT .....	2-6
TRAY 2.....	2-19
TRAY 3.....	2-20
TRAY 4.....	2-21
IFM BREAKOUT BOX (BOB) LOCKER.....	2-22
VACUUM CLEANER LOCKER (VAC) – AC.....	2-23
VACUUM CLEANER LOCKER (VAC) – DC.....	2-24
IFM CONTINGENCY HOSE AND CABLE KIT (CHCK).....	2-25

**TOOLS**

# IFM TOOL LOCKER: TRAY 1 (Typical Packaging)

**TOOLS**



jsc48025\_007\_2.cnv

## IFM TOOL LOCKER: TRAY 1 – DIGITAL MULTIMETER

### TO OPERATE

1. Insert BLACK probe in COM. RED probe in either  $V\Omega \rightarrow | -$  A, or mA  $\mu A$
2. If DC Volts, select  $\overline{V}$  or  $\overline{mV}$   
If AC Volts, select  $\tilde{V}$
3. If resistance, select  $\Omega$
4. If Amps, select A  $\overline{A}$   
(blue button toggles between DC  $\overline{A}$  and AC  $\tilde{A}$ )

**NOTE:** See Fluke 80 series Quick Reference Guide for additional operating instruction (stowed in pouch)

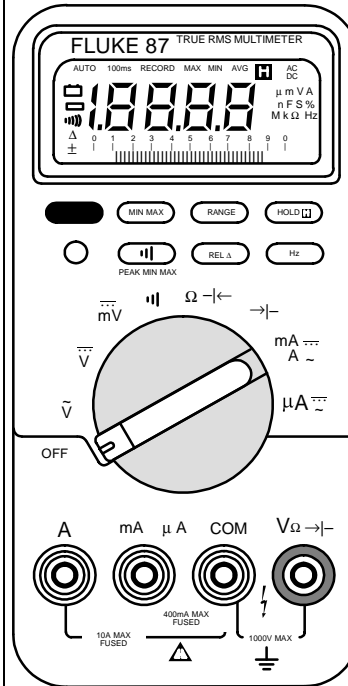
### IF TEMPERATURE MEASUREMENT

1. Install temperature probes in COM and  $V\Omega \rightarrow | -$
2. Select °F or °C on temperature probe
3. Select  $\overline{mV}$  on multimeter
4. Expose probe tip directly to measured material (noncorrosive liquid, gas, or solid)

### IF AMBIENT PRESSURE MEASUREMENT IN PSA (mm HgA)

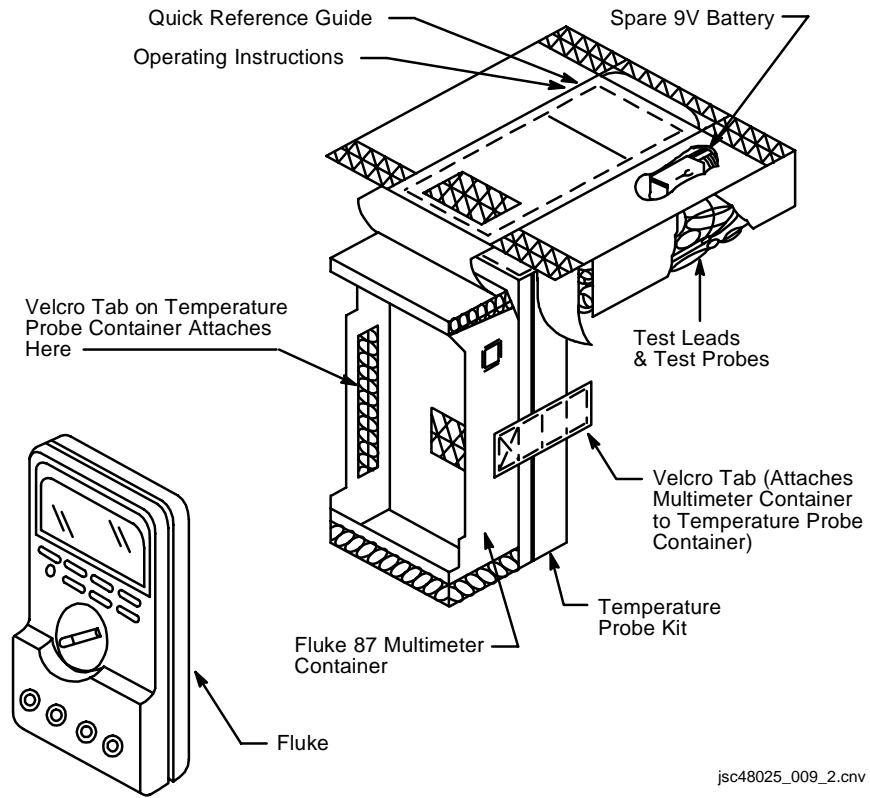
1.  $\sqrt{}$ Filter/coupler connected to QD on pressure module (PM)
2. Plug PM into multimeter (COM to COM and V to  $V\Omega \rightarrow | -$ )
3. For PSIA output with four digit display:  
 $\sqrt{}$ Multimeter – OFF  
 Depress yellow button for 2 sec while selecting  $\overline{mV}$  on Multimeter (if mm HgA) select  $\overline{V}$ , select PSIA (mm HgA) on PM
4. Deactivate by turning PM Multimeter – OFF

**NOTE:** For pressure measurement of vacuum vent SPLY H2O(WASTE H2O SYS), contact MCC



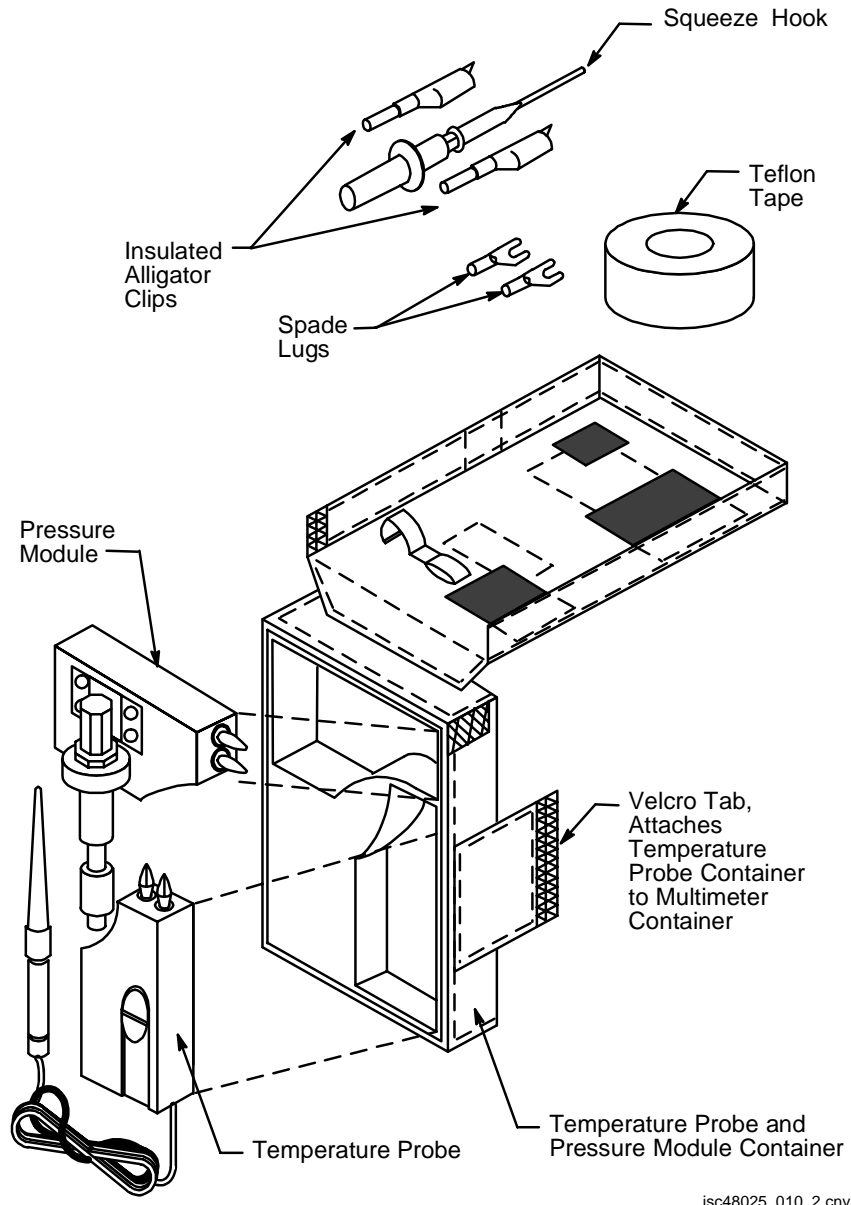
jsc48025\_008\_2.cnv

# IFM TOOL LOCKER: TRAY 1 – DIGITAL MULTIMETER KIT



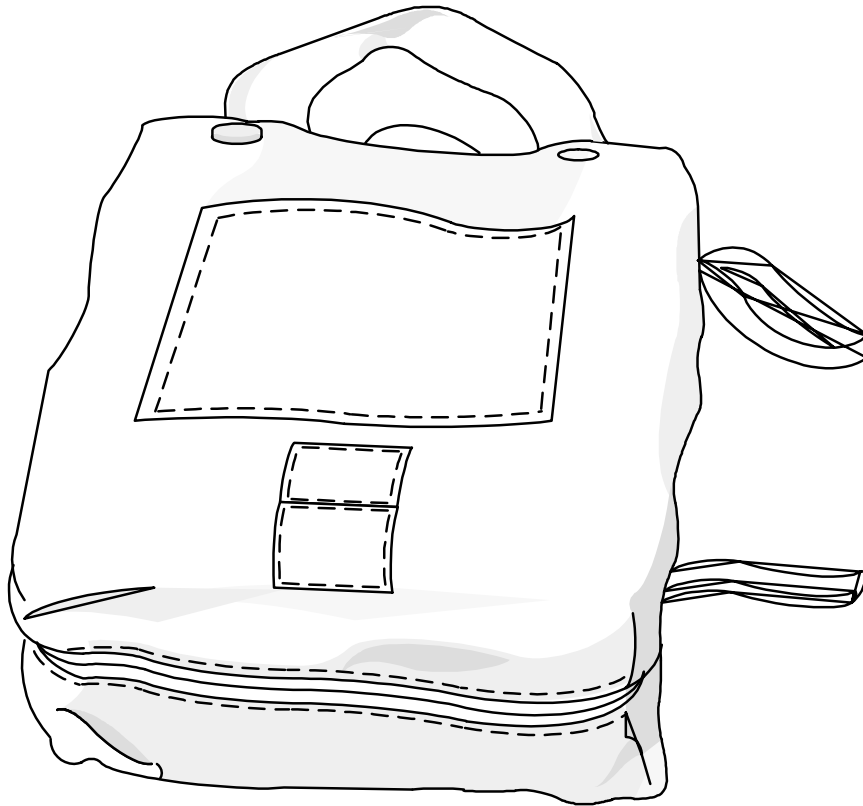


# IFM TOOL LOCKER: TRAY 1 – TEMPERATURE PROBE AND PRESSURE MODULE KIT



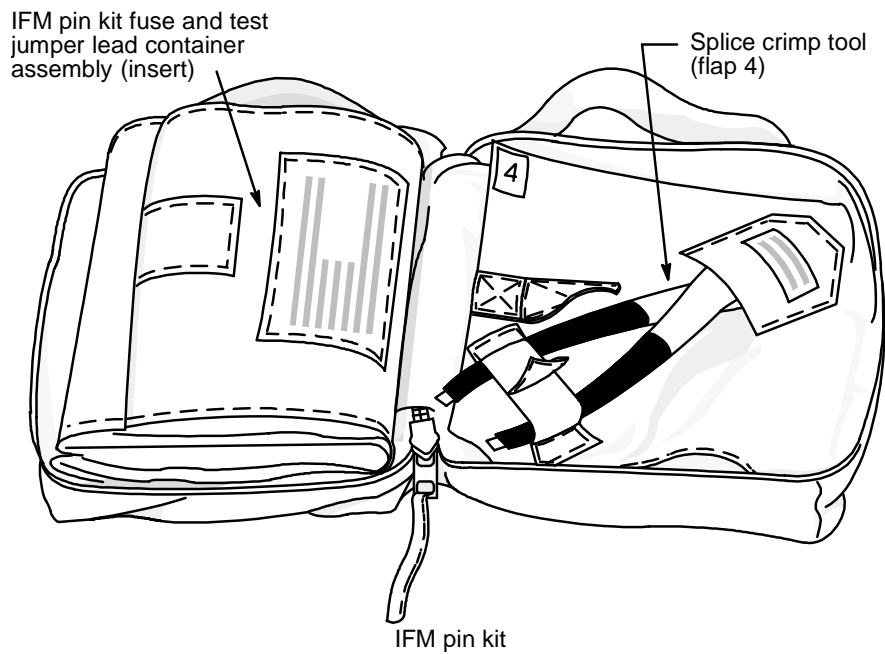
jsc48025\_010\_2.cnv

IFM TOOL LOCKER: TRAY 1 – PIN KIT



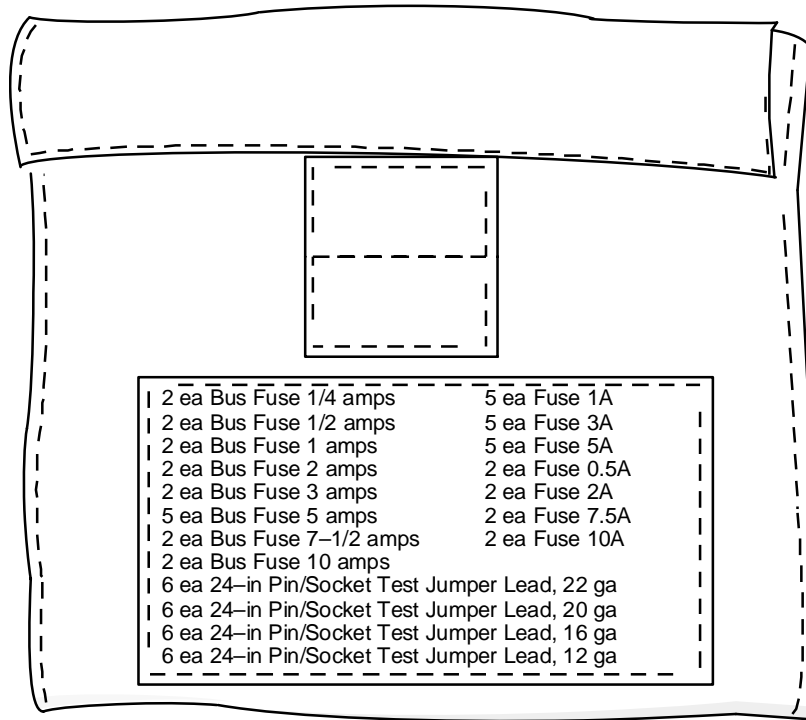
jsc48025\_011.cnv

**IFM TOOL LOCKER: TRAY 1 – PIN KIT (Continued)**



jsc48025\_012\_2.cnv

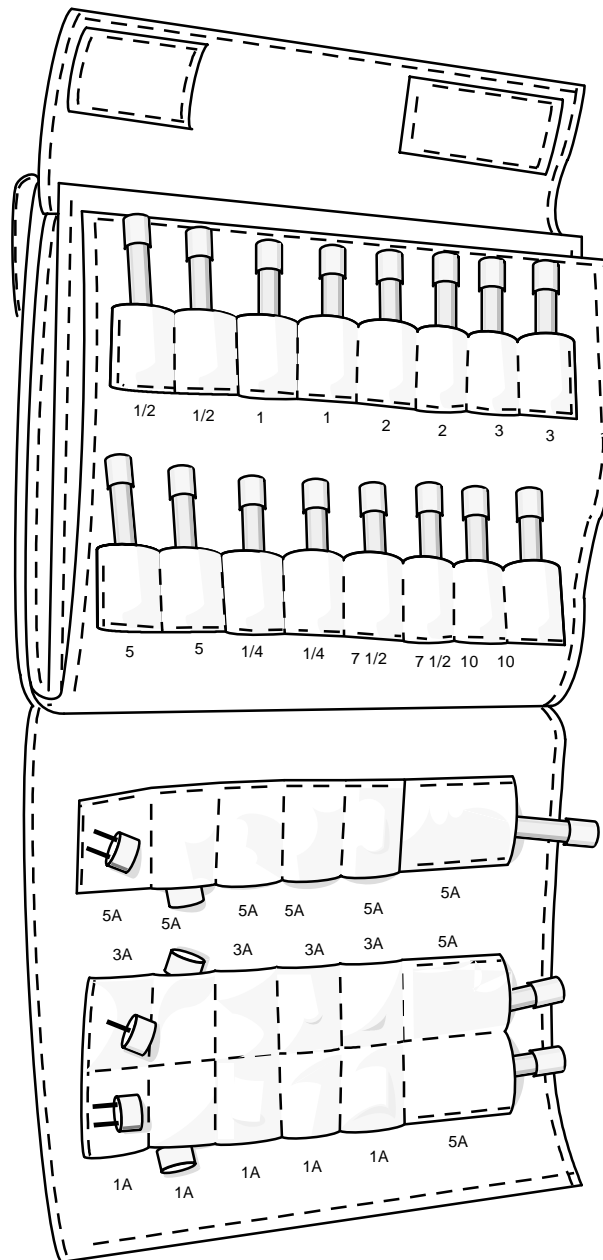
IFM TOOL LOCKER: TRAY 1 – PIN KIT (Continued)



IFM pin kit fuse and test jumper lead container assembly (insert)

jsc48025\_013\_2.cvx

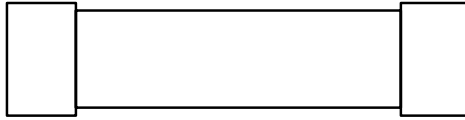
# IFM TOOL LOCKER: TRAY 1 – PIN KIT (Continued)



Standard and subminiature (instrument) fuses

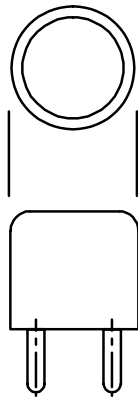
jsc48025\_014\_2.cvx

## IFM TOOL LOCKER: TRAY 1 – PIN KIT (Continued)



Fuse–Cartridge (ME451–0009–XXXX)

Ampere rating	Dash #	# Spares Flown in Pin Kit
0.25	-1022	2
0.5	-1023	2
1.0	-1001	2
2.0	-1002	2
3.0	-1003	2
5.0	-1021	5
7.5	-1019	2
10.0	-1005	2

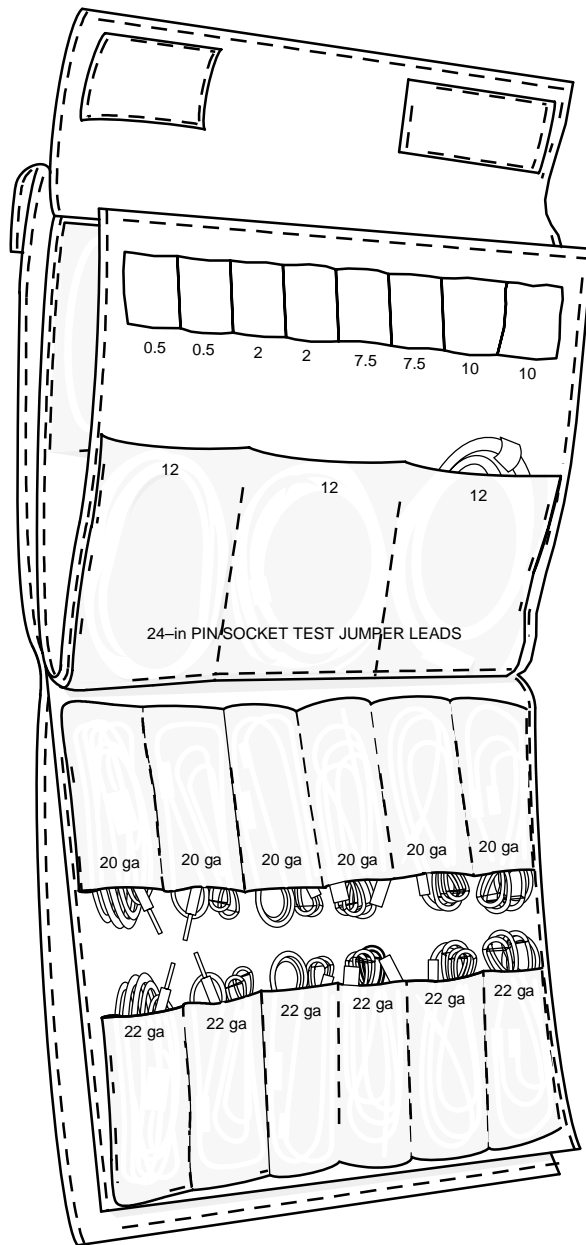


Fuse–subminiature plug in  
(ME451–0018–XXXX)

Ampere rating	Dash #	# Spares Flown in Pin Kit
1.00	0100	5
3.00	0300	5
5.00	0500	5
0.50	0050	2
2.00	0200	2
7.50	0750	2
10.00	1000	2

jsc48025\_015\_2.cnv

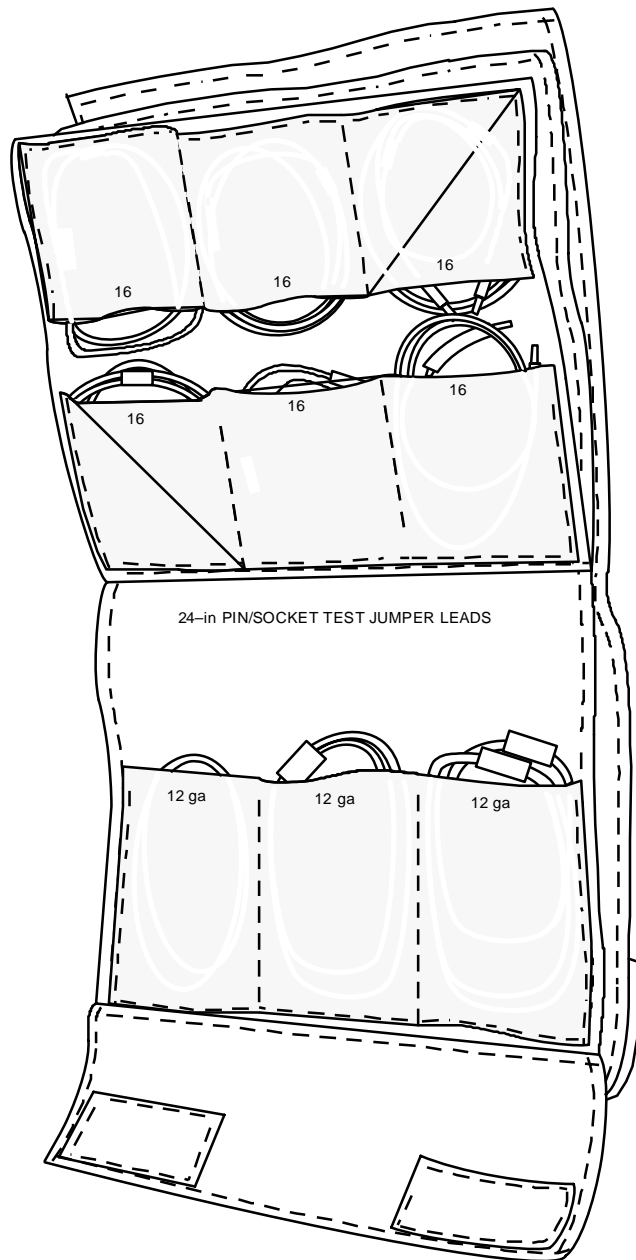
# IFM TOOL LOCKER: TRAY 1 – PIN KIT (Continued)



24-in pin/socket test jumper leads (three 12-ga, six 20-ga, and six 22-ga)

jsc48025\_016\_2.cvx

**IFM TOOL LOCKER: TRAY 1 – PIN KIT (Continued)**

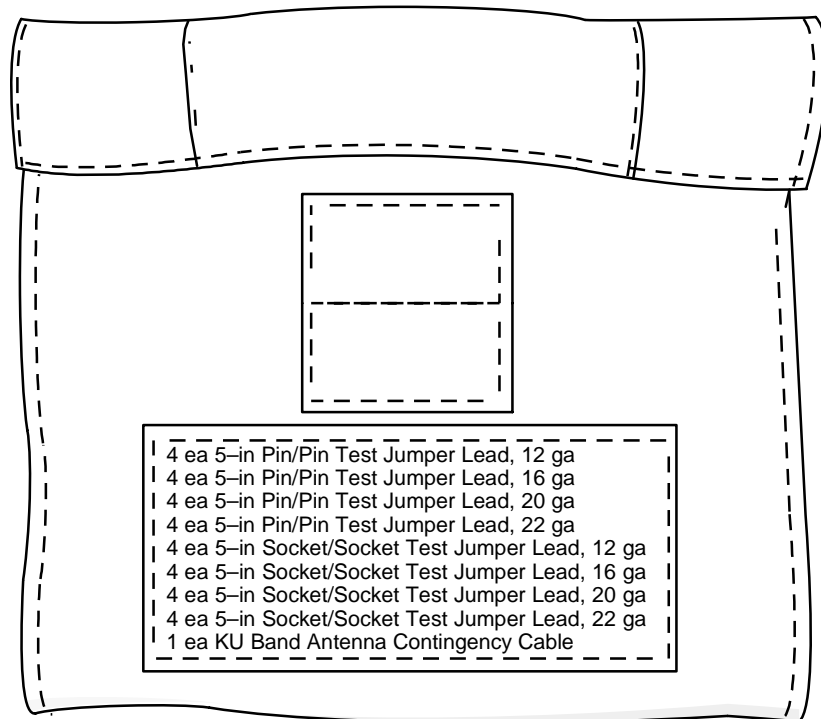


24-in pin/socket test jumper leads  
(three 12-ga and six 16-ga)

jsc48025\_017\_2.cvx



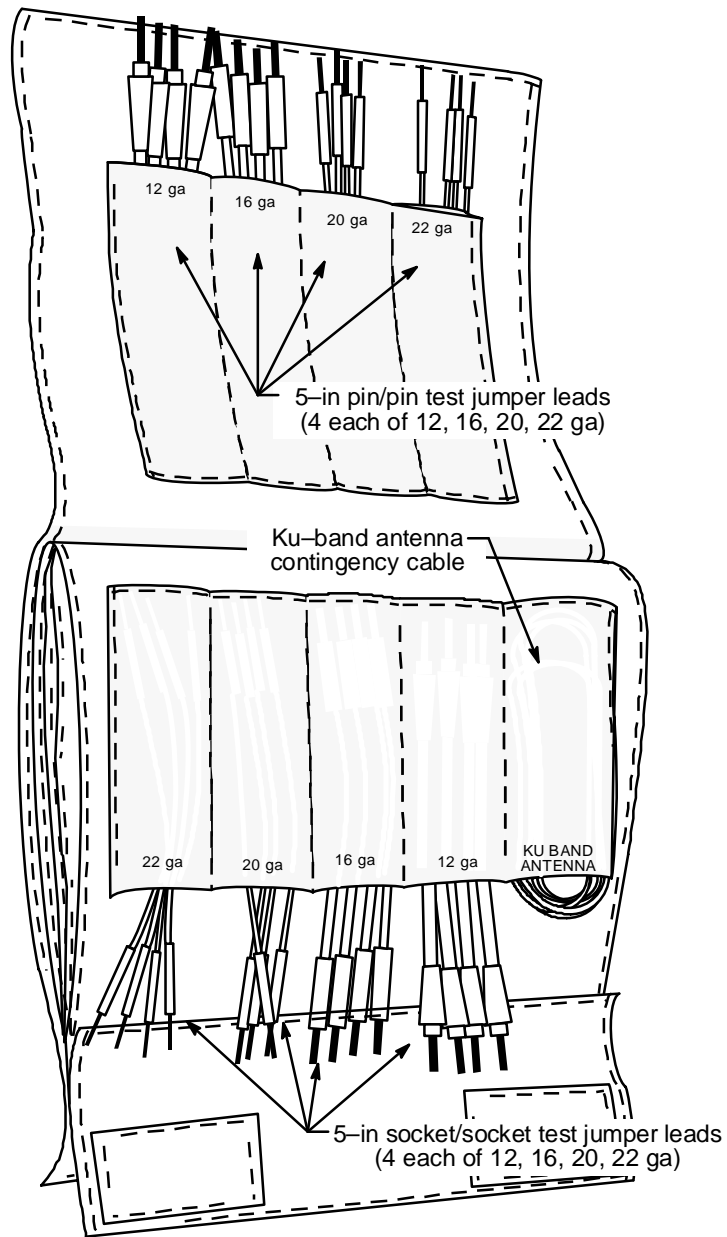
IFM TOOL LOCKER: TRAY 1 – PIN KIT (Continued)



IFM pin kit fuse and test jumper  
lead container assembly (insert)

jsc48025\_018\_2.cvx

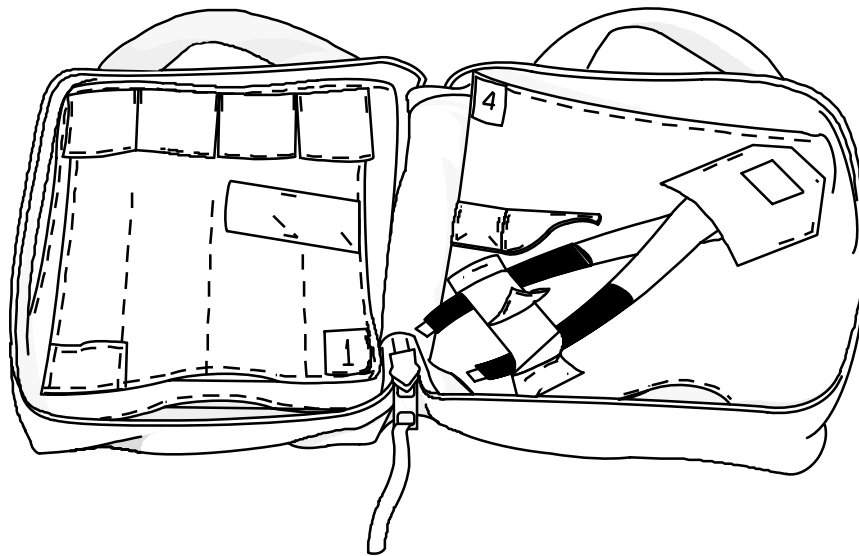
**IFM TOOL LOCKER: TRAY 1 – PIN KIT (Continued)**



Socket/socket and pin/pin test jumper leads, and  
Ku-band antenna contingency cable

jsc48025\_019\_2.cvx

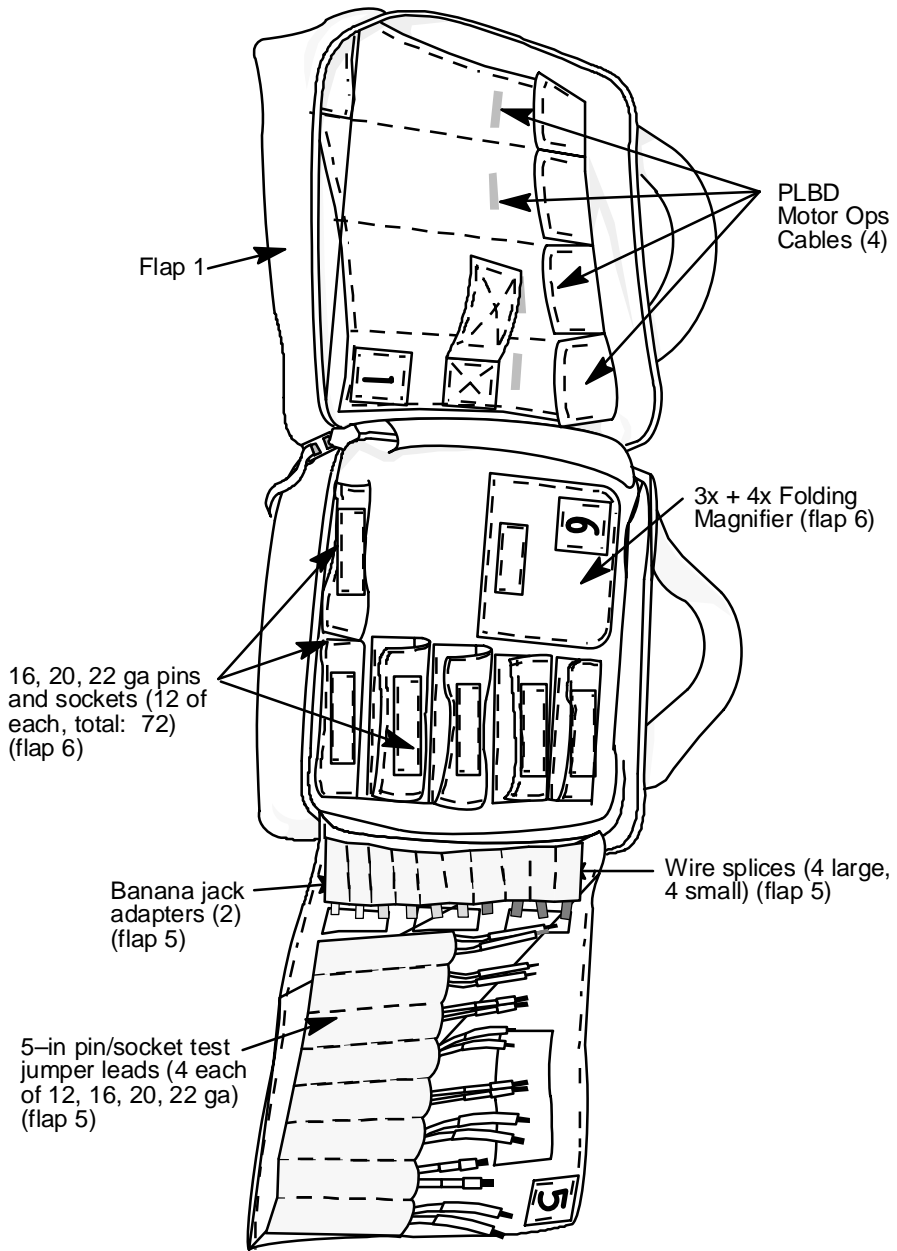
**IFM TOOL LOCKER: TRAY 1 – PIN KIT (Continued)**



IFM Pin Kit

jsc48025\_020\_2.cvx

# IFM TOOL LOCKER: TRAY 1 – PIN KIT (Continued)



Flap 1

PLBD  
Motor Ops  
Cables (4)

3x + 4x Folding  
Magnifier (flap 6)

16, 20, 22 ga pins  
and sockets (12 of  
each, total: 72)  
(flap 6)

Banana jack  
adapters (2)  
(flap 5)

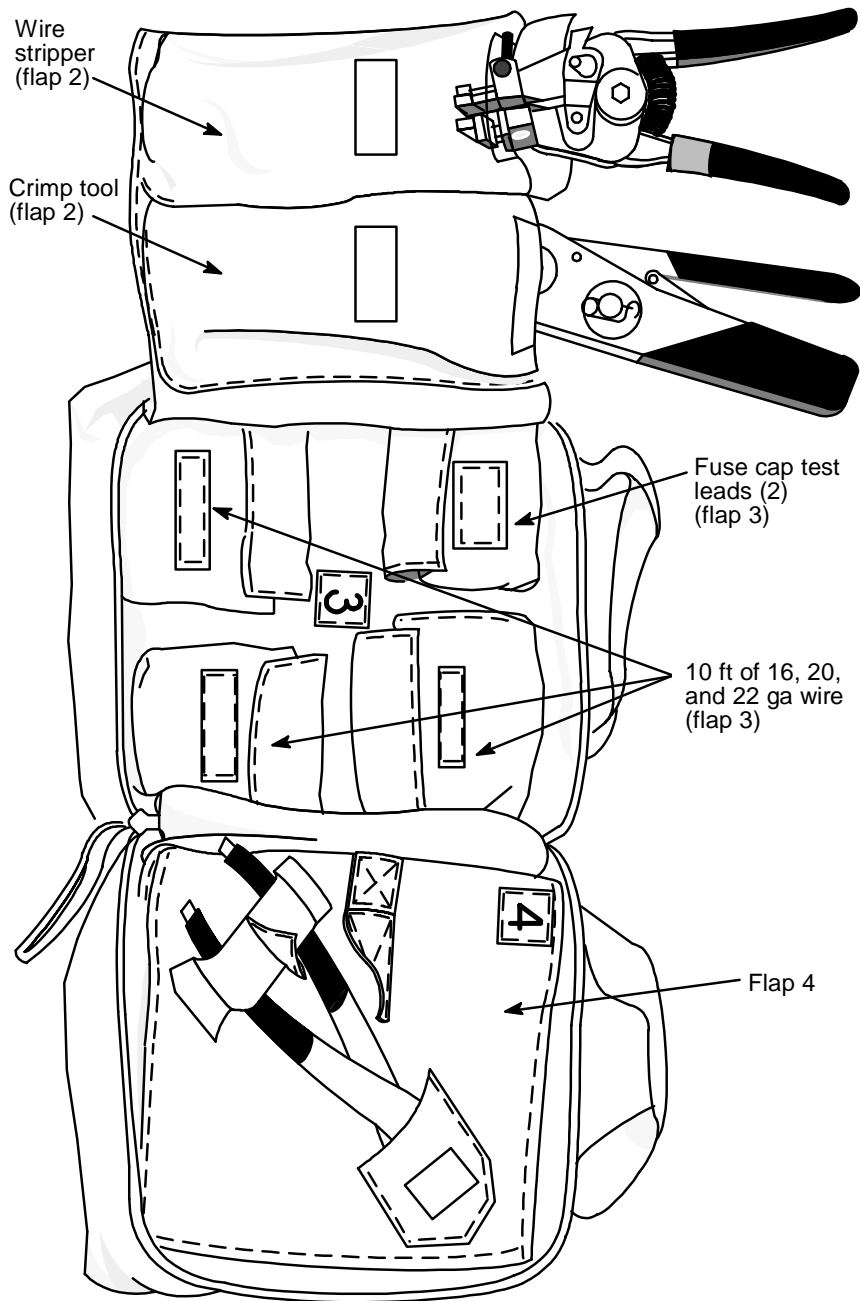
Wire splices (4 large,  
4 small) (flap 5)

5-in pin/socket test  
jumper leads (4 each  
of 12, 16, 20, 22 ga)  
(flap 5)

IFM Pin Kit

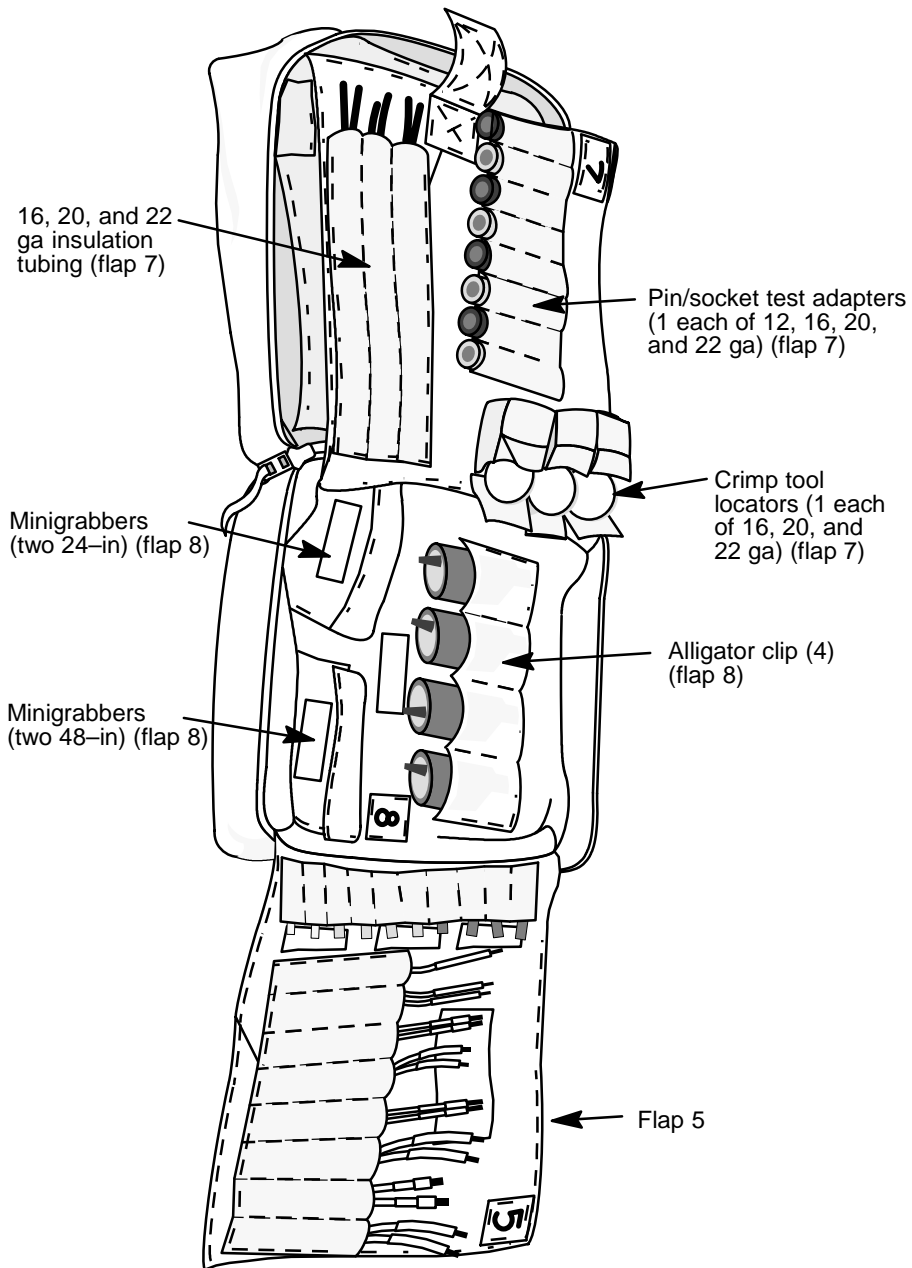
jsc48025\_021\_2.cvx

## IFM TOOL LOCKER: TRAY 1 – PIN KIT (Continued)



jsc48025\_022\_2.cnv

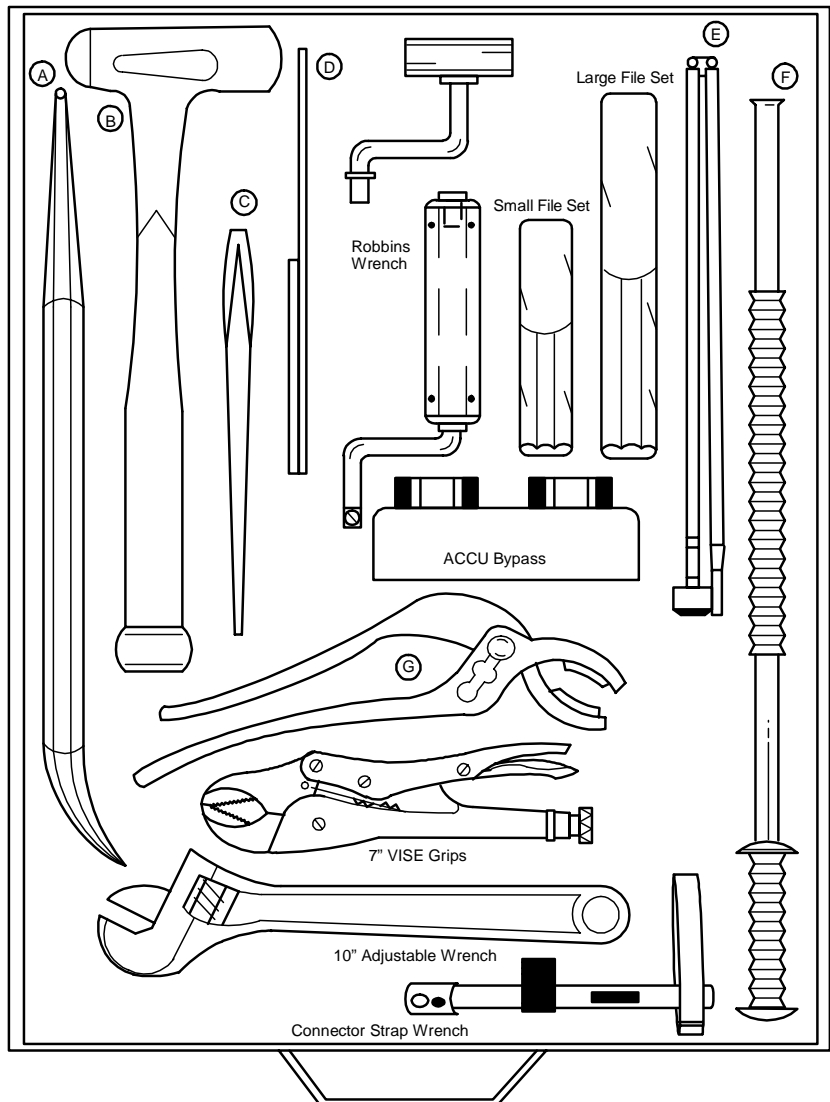
## IFM TOOL LOCKER: TRAY 1 – PIN KIT (Concluded)



IFM Pin Kit

jsc48025\_023\_2.cvx

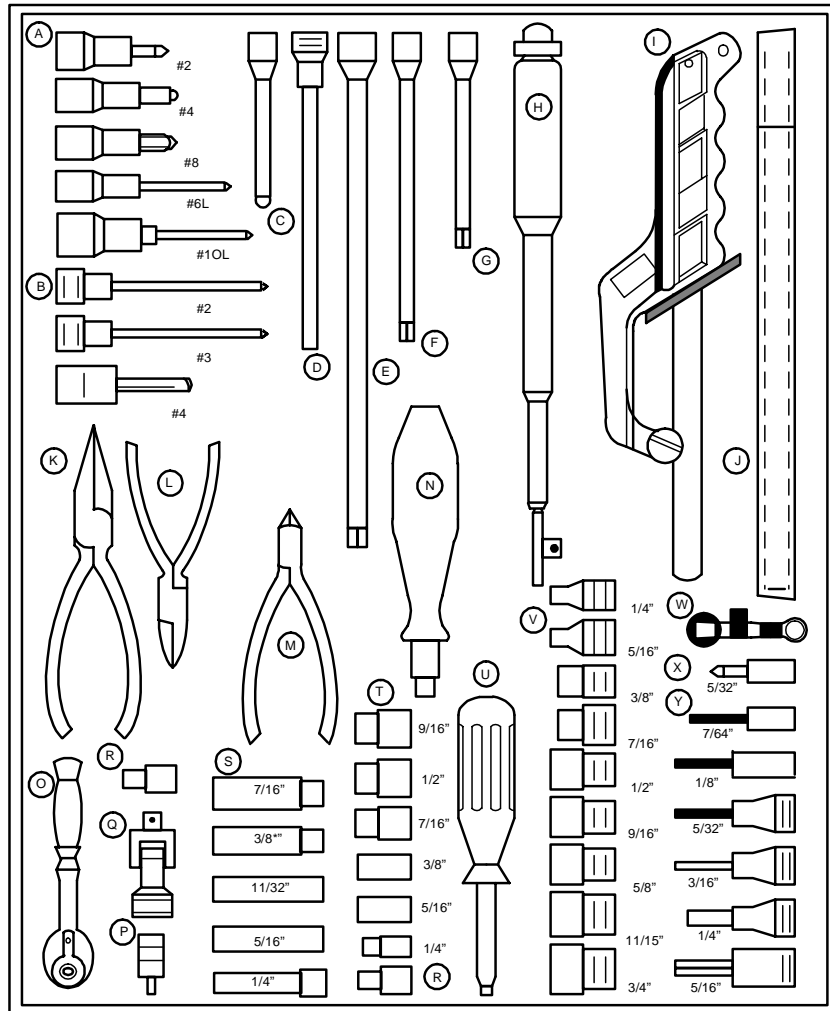
## IFM TOOL LOCKER: TRAY 2



- |                       |                                       |
|-----------------------|---------------------------------------|
| (A) Pinch Bar         | (E) Locker Tool 3/16-in Hex Drive (2) |
| (B) Deadblow Hammer   | (F) Mechanical Fingers                |
| (C) 8-in Punch        | (G) Connector Pliers (2)              |
| (D) Inspection Mirror |                                       |

jsc48025\_024\_2.cnv

# IFM TOOL LOCKER: TRAY 3

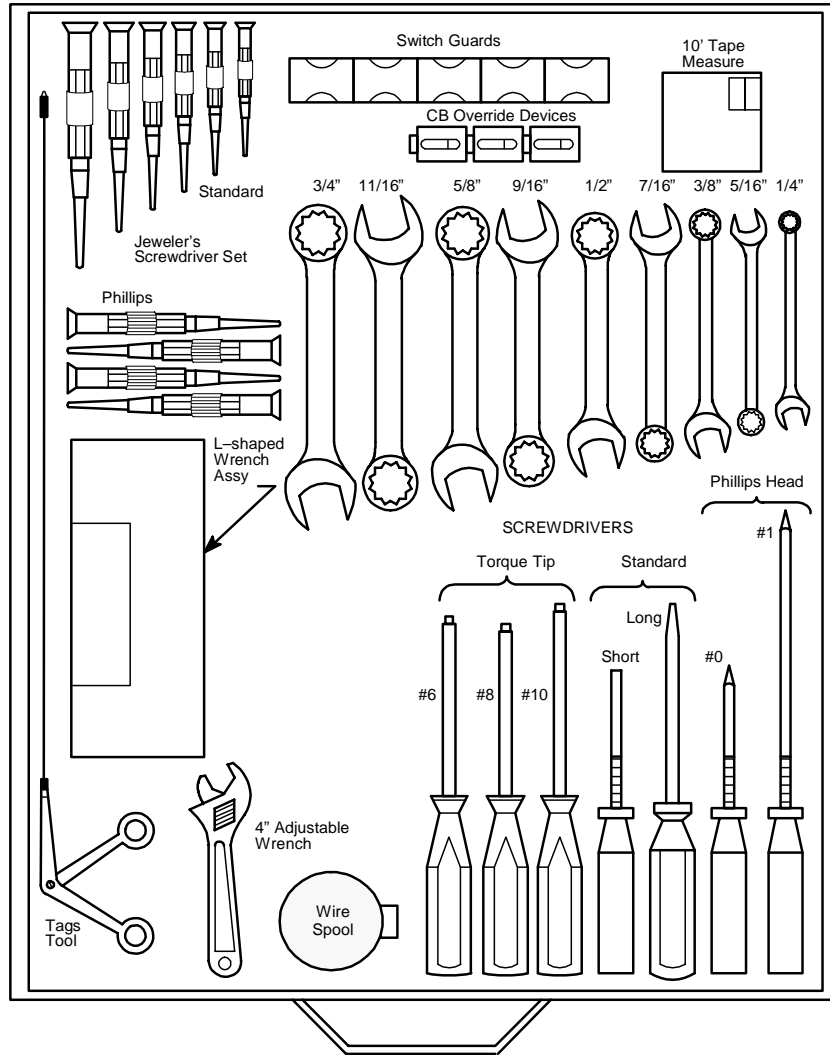


- |   |                                      |                                   |
|---|--------------------------------------|-----------------------------------|
| (A) Torque Tips                         | (J) Blades                           | (R) Adapter 1/4-in - 3/8-in       |
| (B) Phillips Driver                     | (K) Large Needlenose                 | (S) Deepwell Sockets 1/4-in Drive |
| (C) 3/16-in Hex Ball                    | (L) Small Needlenose 4 1/2-in        | (T) 1/4-in Standard Sockets       |
| (D) 3/16-in Seat Adjustment Tool        | (M) Wire Cutters                     | (U) 1/4-in Driver Handle          |
| (E) 10-in Extension 1/4-in Drive        | (N) 3/8-in Driver Handle             | (V) 3/8-in Standard Sockets       |
| (F) 6-in Extension 1/4-in Drive         | (O) 1/4-in Drive Ratchet Wrench 4-in | (W) 7/16-in Torque Adapter        |
| (G) 4-in Extension 1/4-in Drive         | (P) Adapter 3/8-in - 1/4-in          | (X) 5/32-in Hex Ball              |
| (H) 1/4-in Torque Wrench (40-200 in-lb) | (Q) Universal Joint 3/8-in           | (Y) Allen Head Drivers            |
| (I) Hacksaw                             |                                      |                                   |

jsc48025\_025\_2.cnv

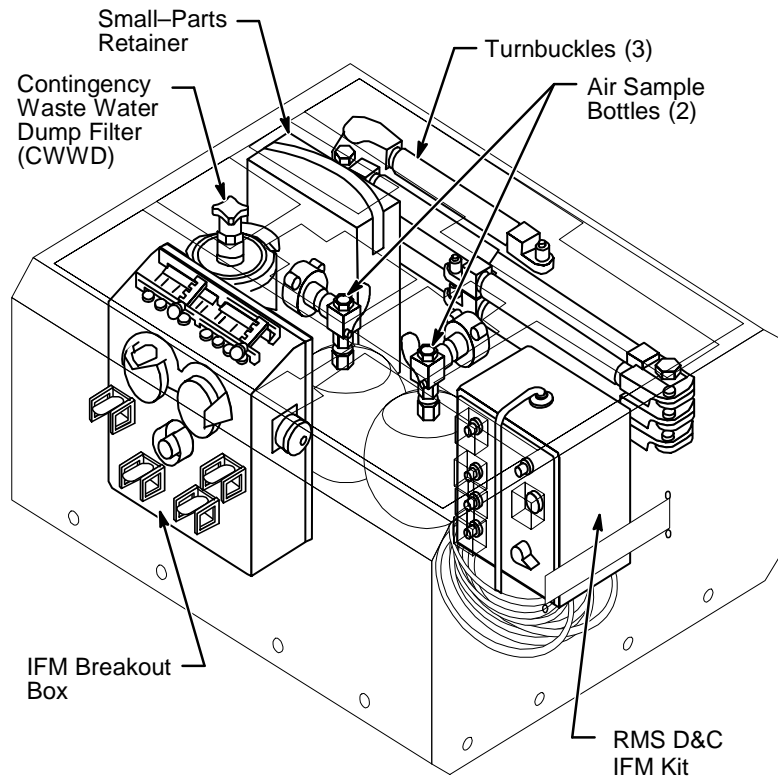


# IFM TOOL LOCKER: TRAY 4



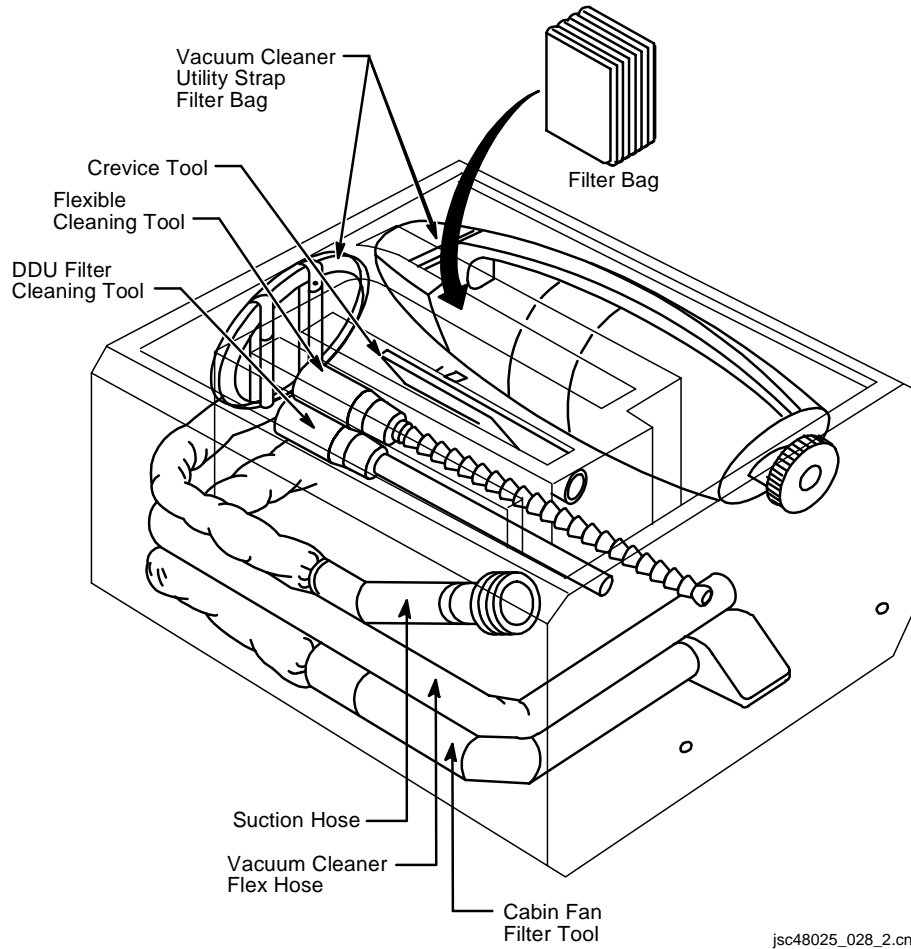
jsc48025\_026\_2.cnv

# IFM BREAKOUT BOX (BOB) LOCKER



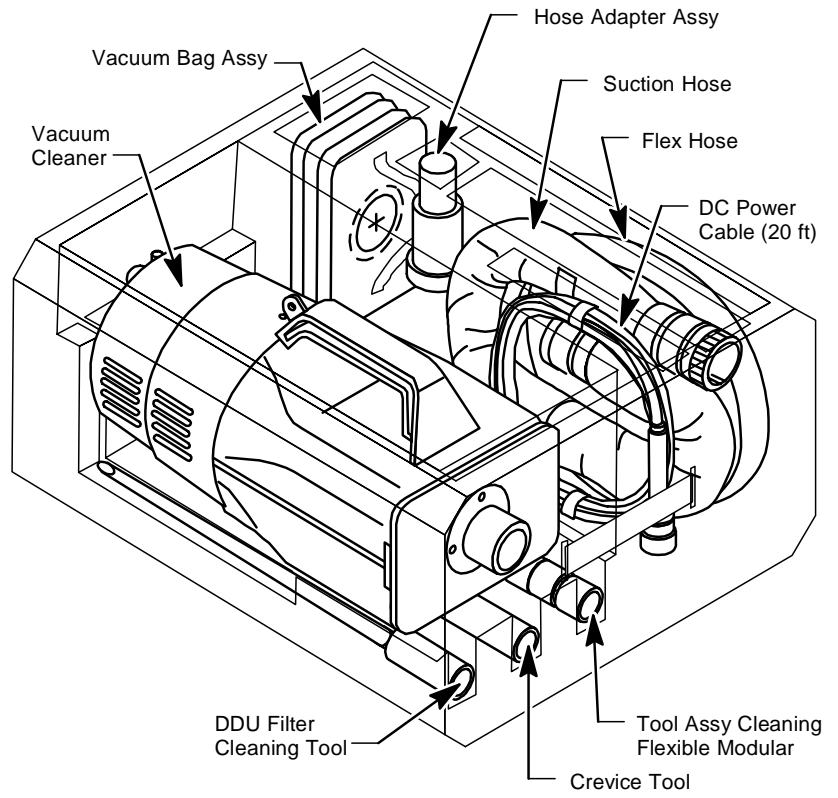
jsc48025\_027\_2.cnv

# VACUUM CLEANER LOCKER (VAC) – AC



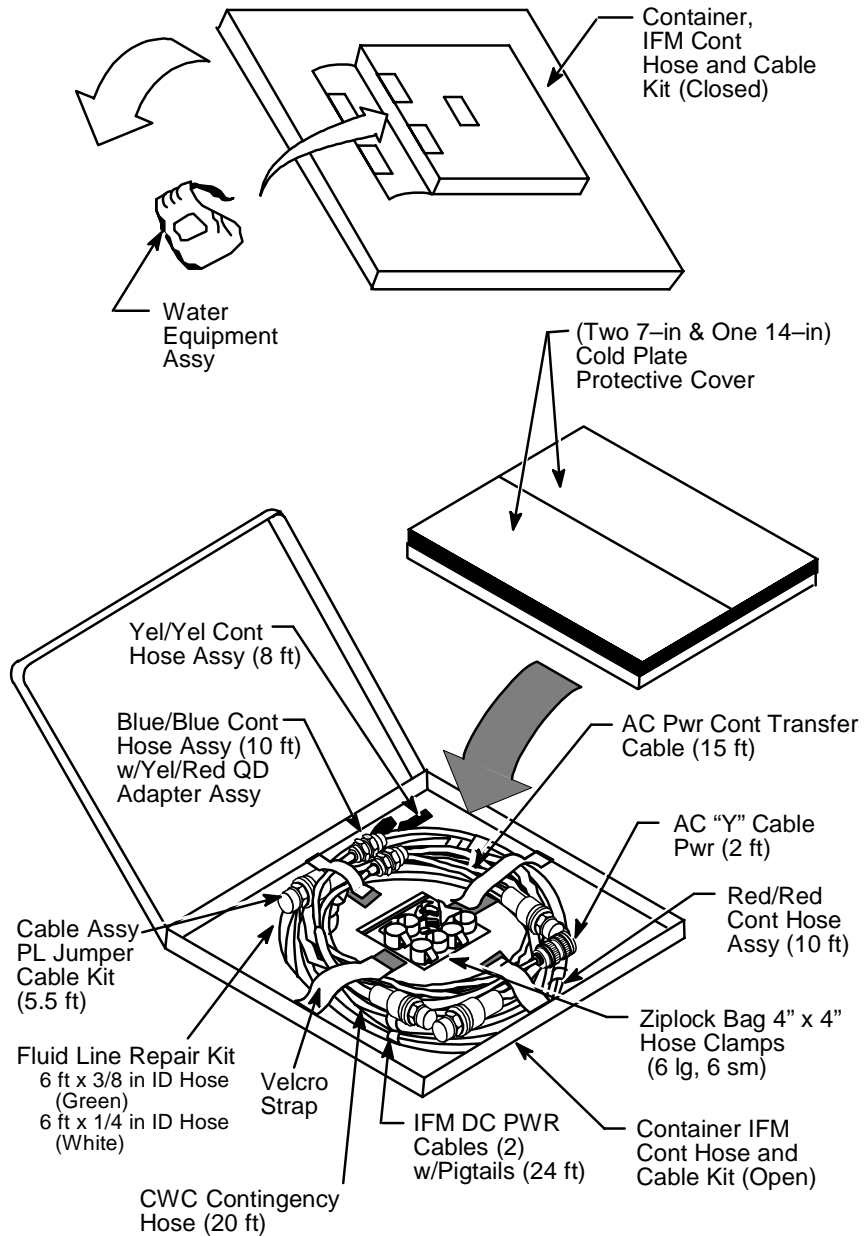
jsc48025\_028\_2.cnv

# VACUUM CLEANER LOCKER (VAC) – DC



jsc48025\_029\_2.cnv

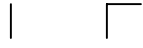
## IFM CONTINGENCY HOSE AND CABLE KIT (CHCK)



jsc48025\_030\_2.cnv



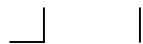
This Page Intentionally Blank



COMPONENT LOCATIONS

	<u>PAGE</u>
FLIGHT DECK .....	3-3
AV BAY 1 .....	3-4
AV BAY 2 .....	3-5
AV BAY 3A .....	3-6
AV BAY 3B AND WCS COMPARTMENT .....	3-7
LOWER EQUIPMENT BAY (OV103) .....	3-8
LOWER EQUIPMENT BAY (OV104) .....	3-9
LOWER EQUIPMENT BAY (OV105) .....	3-10

**COMPONENT  
LOCATIONS**



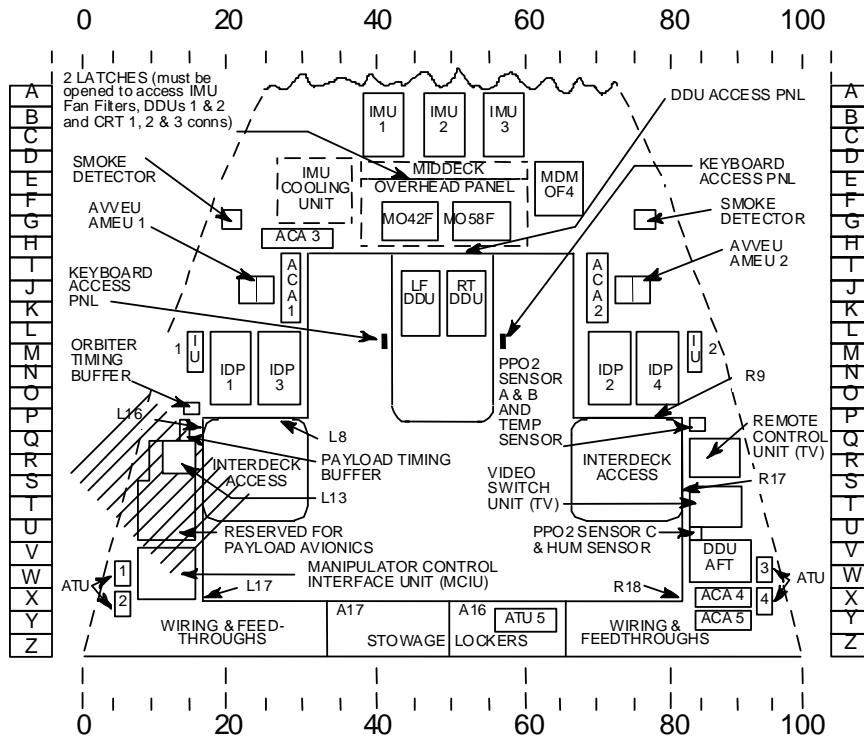
This Page Intentionally Blank

**COMPONENT  
LOCATIONS**

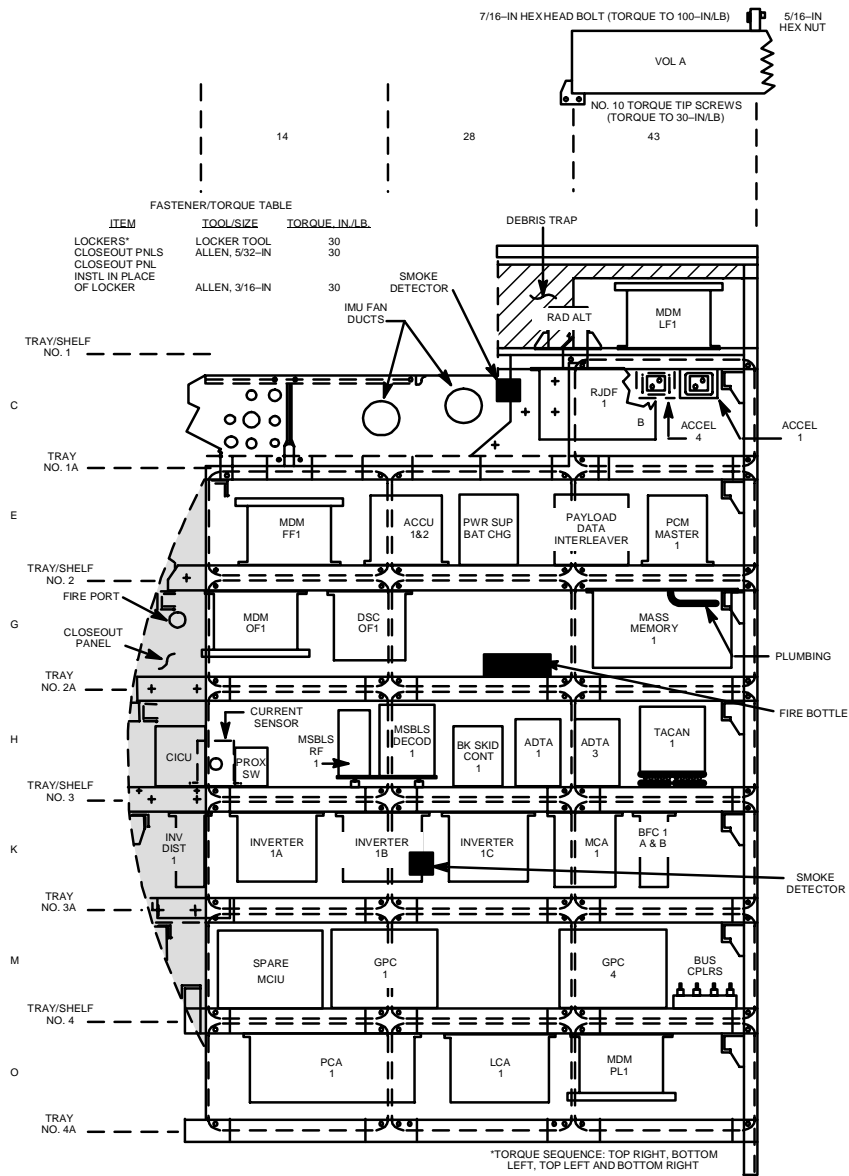




# FLIGHT DECK



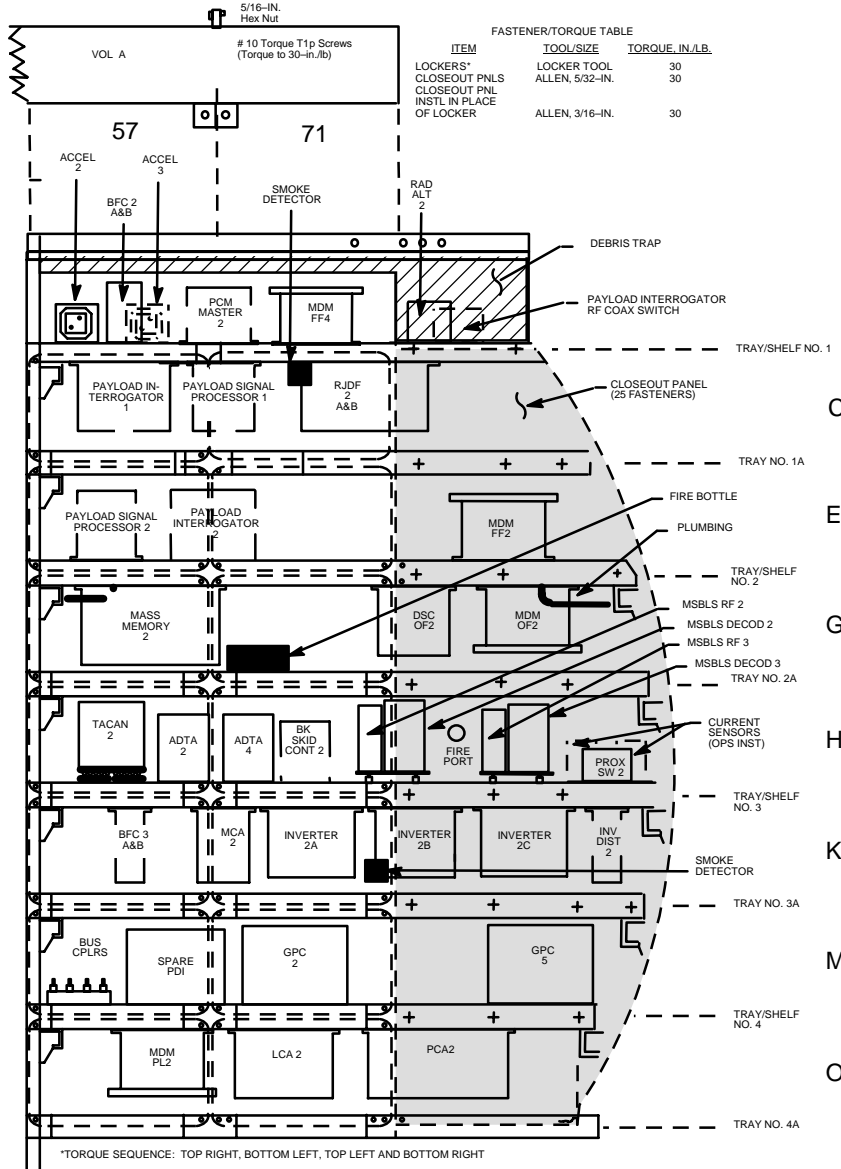
# AV BAY 1



jsc48025\_034\_3.cnv

# AV BAY 2

7/16-in. Hex Head Bolt (Torque to 100"-lb)

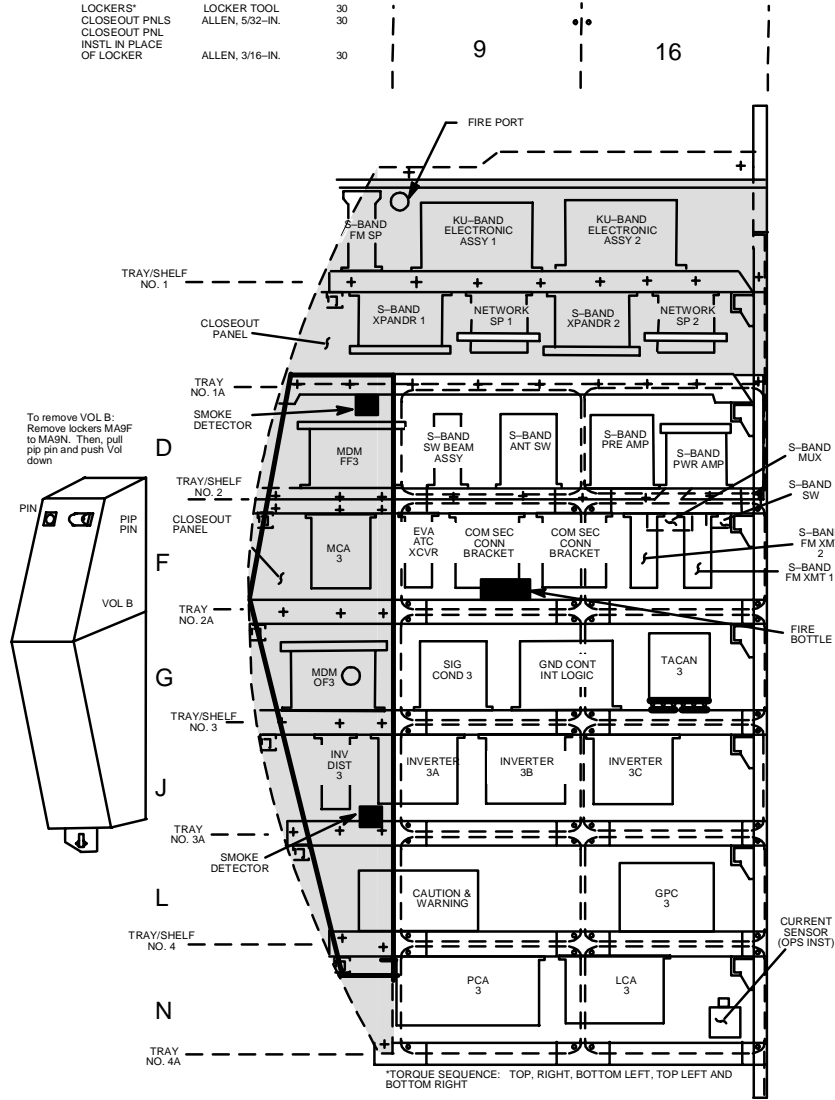


jsc48025\_035\_3.cnv

# AV BAY 3A

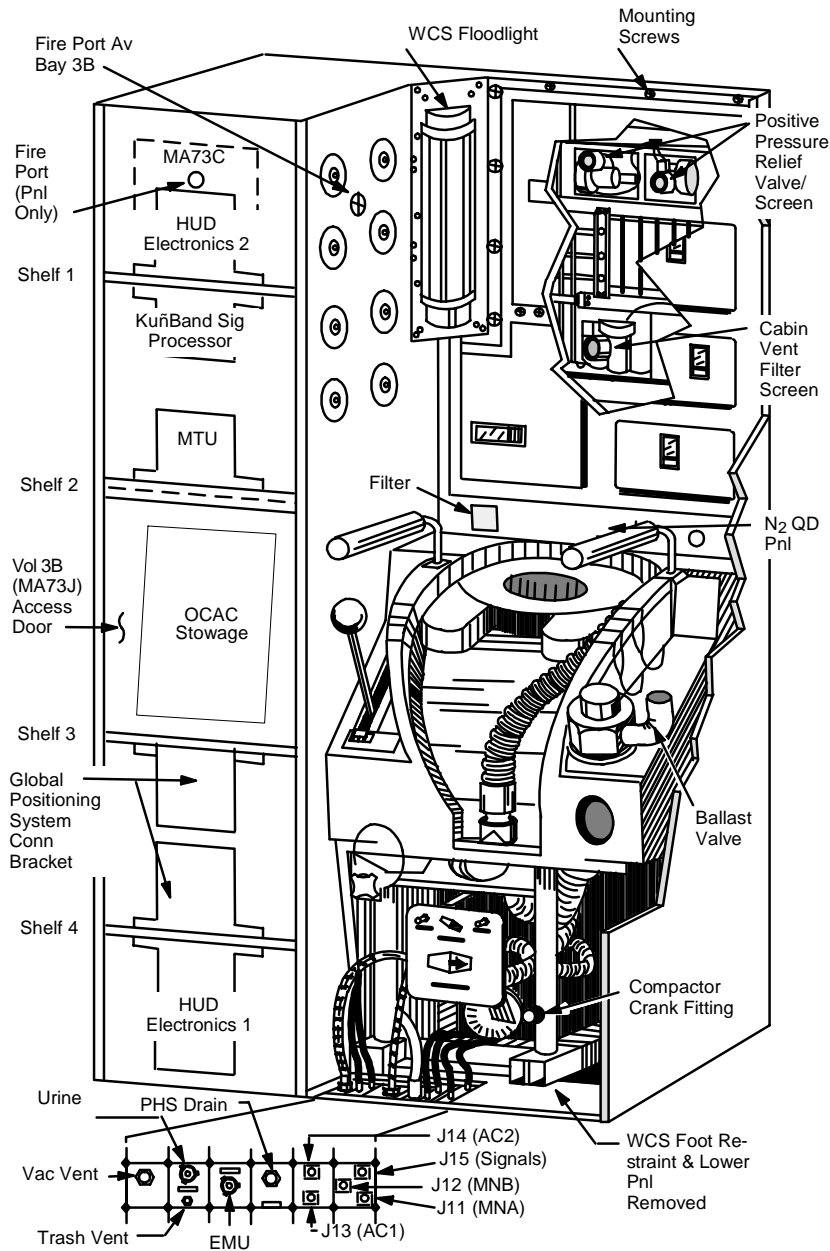
FASTENER/TORQUE TABLE

ITEM	TOOL/SIZE	TORQUE IN L.B.
LOCKERS*	LOCKER TOOL	30
CLOSEOUT PNLS	ALLEN, 5/32-IN.	30
CLOSEOUT PNL INSTL IN PLACE OF LOCKER	ALLEN, 3/16-IN.	30



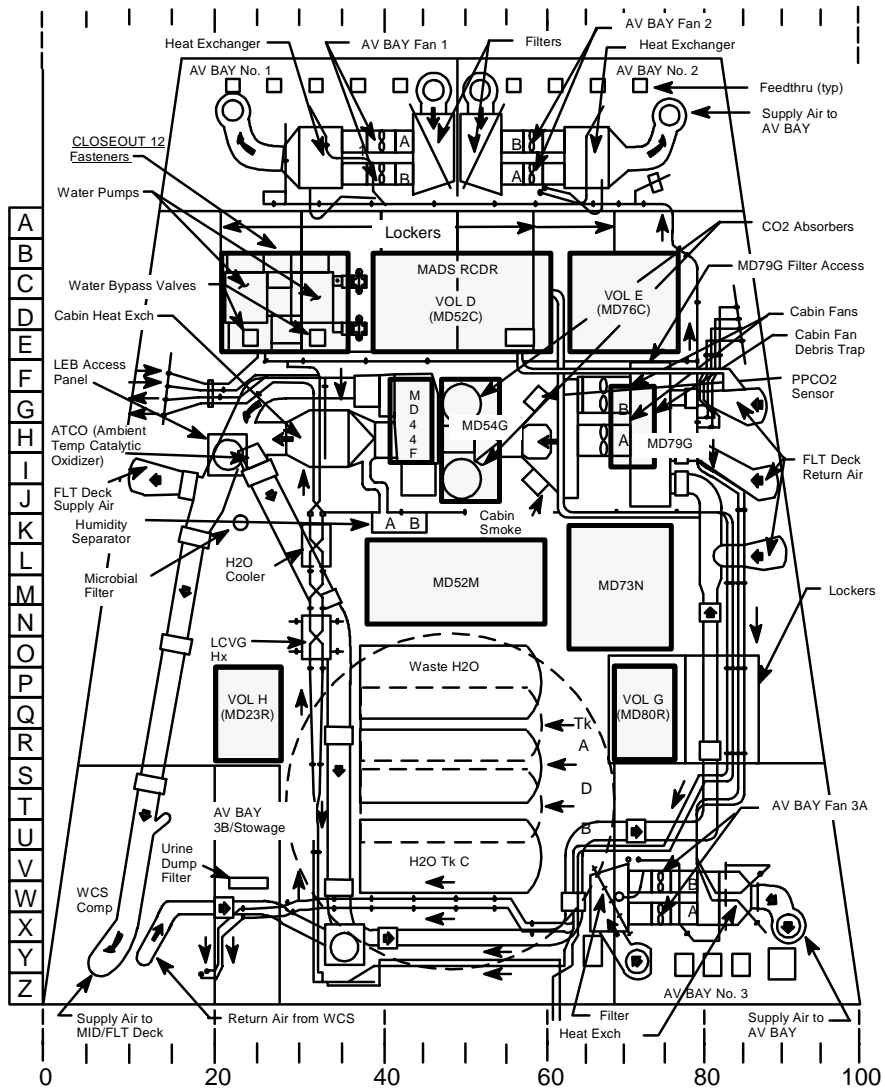
jsc48025\_036\_3.cnv

# AV BAY 3B AND WCS COMPARTMENT



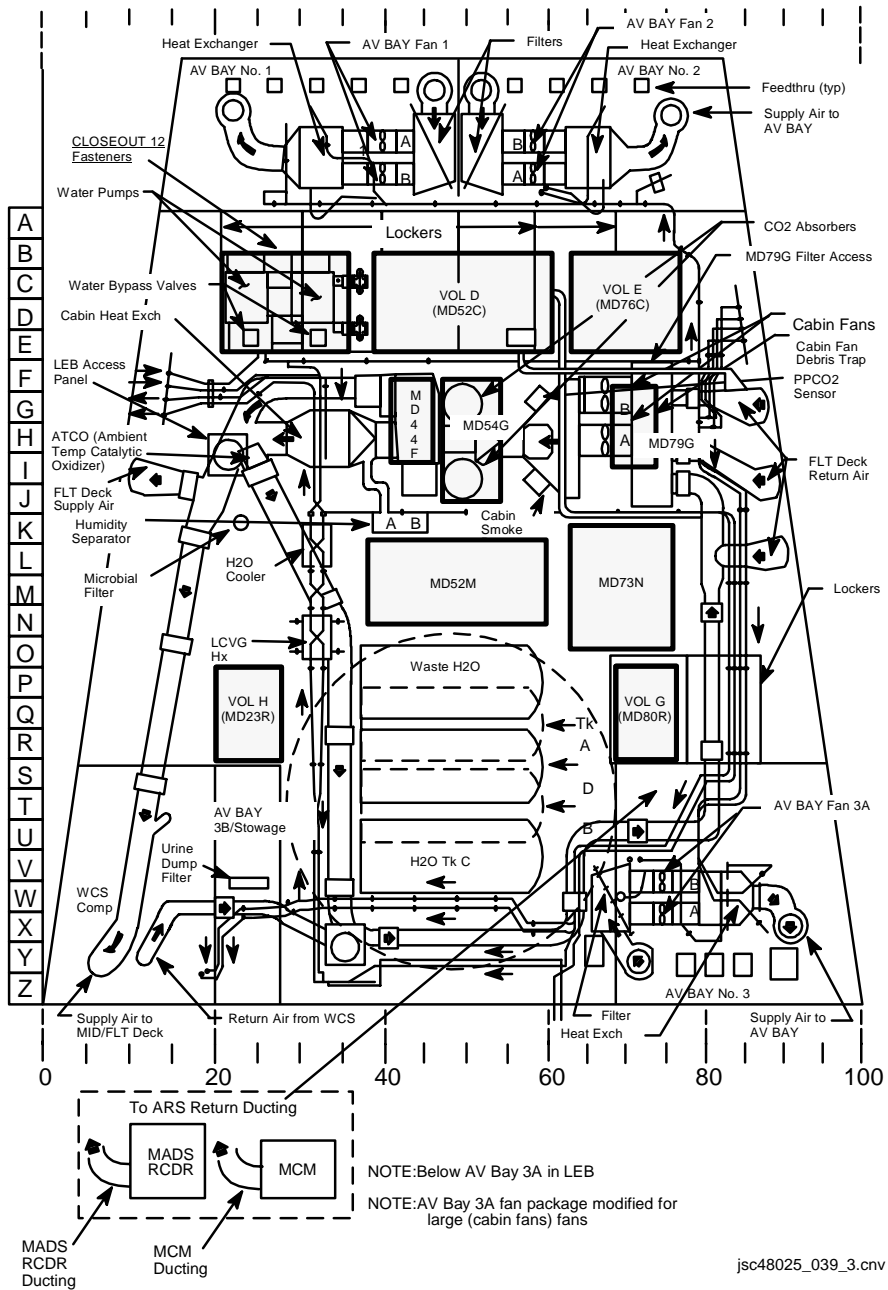
jsc48025\_037\_3.cnv

# LOWER EQUIPMENT BAY (OV103)



jsc48025\_038\_3.cnv

# LOWER EQUIPMENT BAY (OV104)







SCHEDULED MAINTENANCE

	<u>PAGE</u>
FILTER CLEANING .....	4-2
MIDDECK (FLOOR) .....	4-4
MIDDECK (WCS) .....	4-4
MIDDECK (OVERHEAD) .....	4-5
FLIGHT DECK (STBD SIDE) .....	4-6
FLIGHT DECK (PORT SIDE) .....	4-7
LOWER EQUIPMENT BAY (MCC call only) .....	4-9
MIDDECK FLOOR (MCC call only) .....	4-11

**SCHEDULED  
MAINTENANCE**

**FILTER CLEANING**

45 min w/o Av Bay Filter Cleaning  
2:10 hr w/Av Bay Filter Cleaning

OBJECTIVE: On-orbit filter/screen cleaning accomplished to minimize free air contamination and prevent component/black box damage which could result from overheating

NOTE

Cabin, AV BAY, and Booster Fans Filter cleaning will not be performed unless directed by MCC

TOOLS REQD:

VAC Vacuum Cleaner and attachments (as reqd)

AV BAY Fan Only (if reqd)  
TOOL Robbins Wrench  
Locker Tool  
1/4-in to 3/8-in Adapter  
Extension (as desired)  
Ratchet Wrench  
5/32-in Allen Head Driver  
#6 Torque Driver

VACUUM CLEANER OPERATION (TYP)

FOR AC VACUUM:

CAUTION

Do not run vacuum for more than 5 min continuously w/DDU filter tool attached

NOTE

Vacuum has thermal cutoff sw in line w/motor. If cutoff occurs, allow vacuum to cool 60 min before restart

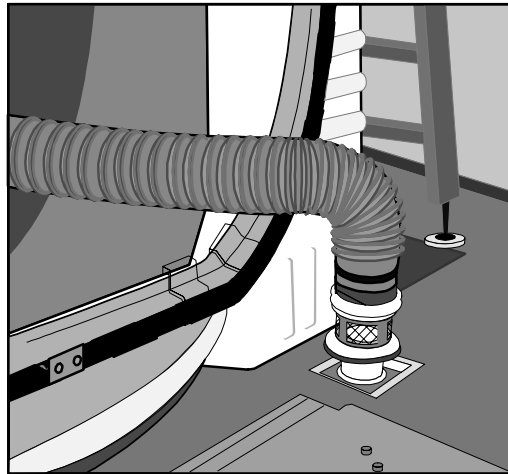
1. Unstow, assemble vacuum attachments (as reqd)
2. √Vacuum Cleaner Pwr sw – OFF  
√AC UTIL PWR AC1(3) – OFF
3. Attach Vacuum Cleaner connector to convenient AC UTIL PWR AC1(3) outlet
4. AC UTIL PWR AC1(3) – ON, then:  
VAC CLEANER – ON, clean screen/filter
5. VAC CLEANER – OFF, then:  
AC UTIL PWR AC1(3) – OFF
6. Stow

FOR DC VACUUM:

1. Unstow, assemble vacuum attachments (as reqd)
2. √Vacuum Cleaner Pwr sw – OFF  
√DC UTIL PWR MNA(B,C) – OFF
3. Attach Vacuum Cleaner connector to convenient DC UTIL PWR MNA(B,C) outlet
4. DC UTIL PWR MNA(B,C) – ON, then:  
VAC CLEANER – ON, clean screen/filter
5. VAC CLEANER – OFF, then:  
DC UTIL PWR MNA(B,C) – OFF
6. Stow

### MIDDECK (FLOOR) (2 min)

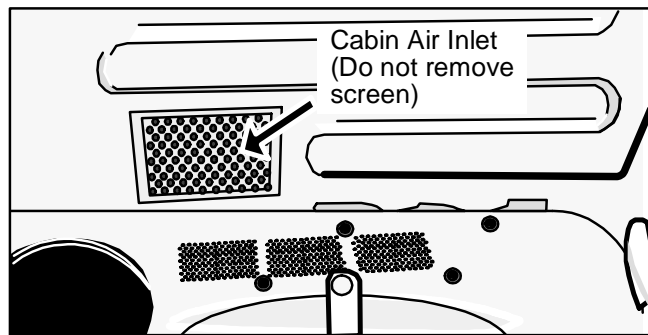
Filter/Screen	Location/Access	Access Fastener/ Cleaning Tools
ARS Hose Screen (Spacehab or Docking flts)	Middeck Floor – Left fwd of airlock/None	Not Applicable/Crevice Tool



jsc48025\_041\_4.cnv

### MIDDECK (WCS) (5 min)

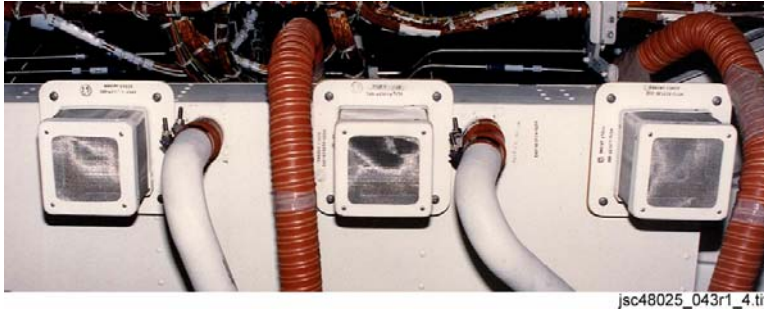
Filter/Screen	Location/Access	Access Fastener/ Cleaning Tools
Cabin inlet	WCS Compartment/Aft Bulkhead	Not Applicable/Crevice Tool



jsc48025\_042\_4.cnv

**MIDDECK (OVERHEAD) (10 min)**

Filter/Screen	Location/Access	Access Fastener/ Cleaning Tools
IMU #1,2,3	Above/fwd MO42/58F pnl (lower)	Squeeze Latch/Crevice Tool



**NOTE**

OCAC may be cleaned w/o pwr off.  
 Recommend setting to 200 CFM.  
 Daily cleaning may be done using  
 Gray Tape

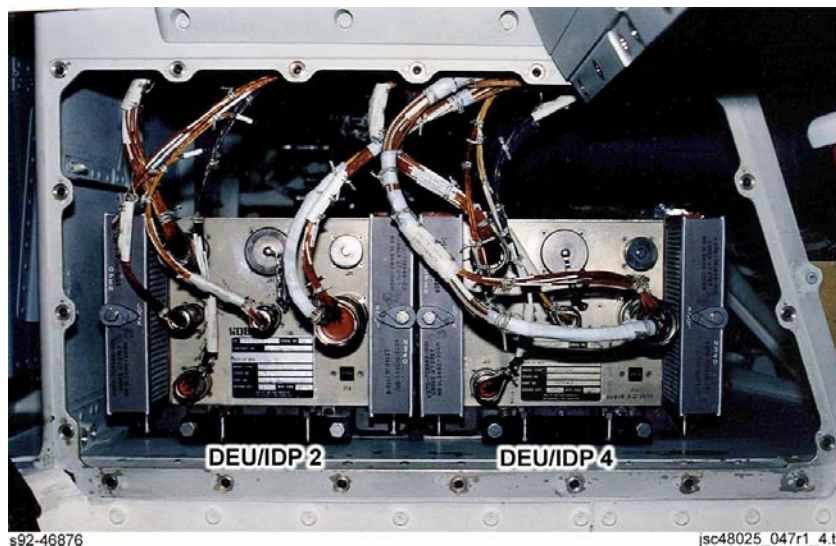
Filter/Screen	Location/Access	Access Fastener/ Cleaning Tools
OCAC	Interdeck Access/STBD Side	Not Applicable/Crevice Tool

## FLIGHT DECK (STBD SIDE) (10 min)

### NOTE

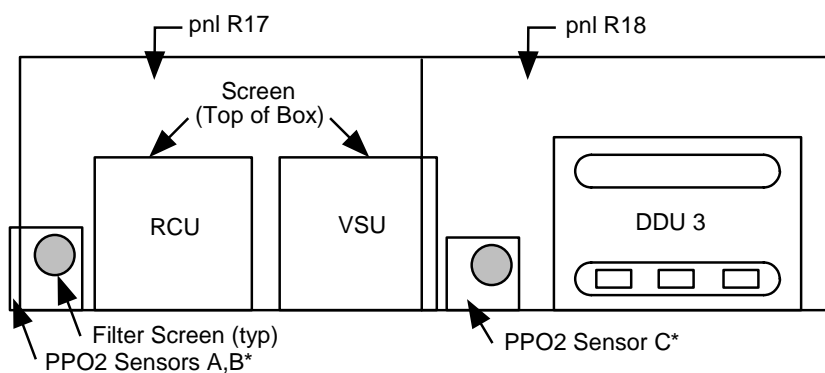
DDU filter cleaning not reqd for OV104

Filter/Screen	Location/Access	Access Fastener/ Cleaning Tools
IDP 2,4, PPO2 Sensor* (two), RCU, VSU	Behind R9, R17	Wing Head Thumbscrew/ Crevice Tool



### NOTE

Do not remove pnls R17,R18

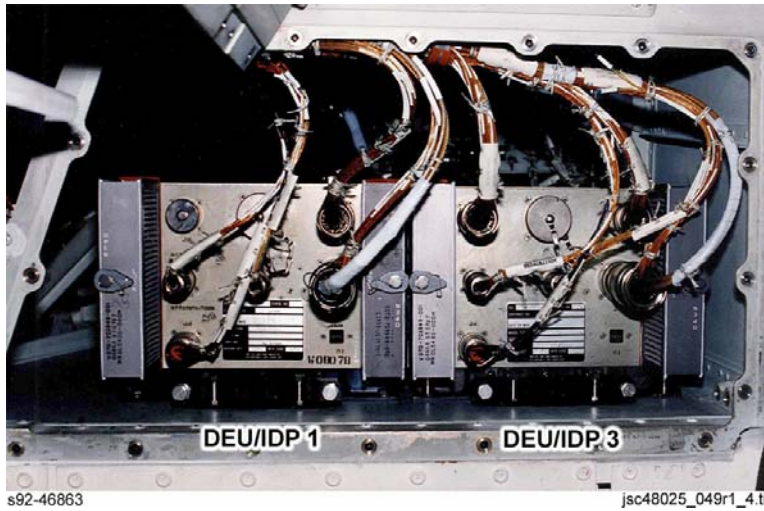


\* PPO2 Sensors are cleaned from front side of pnls R17,R18

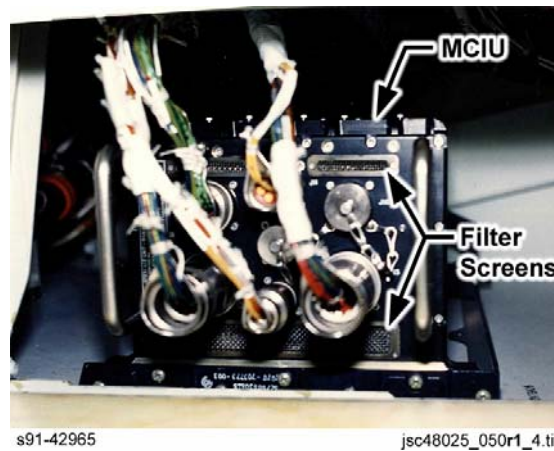
jsc48025\_048\_4r2.cvx

### FLIGHT DECK (PORT SIDE) (5 min)

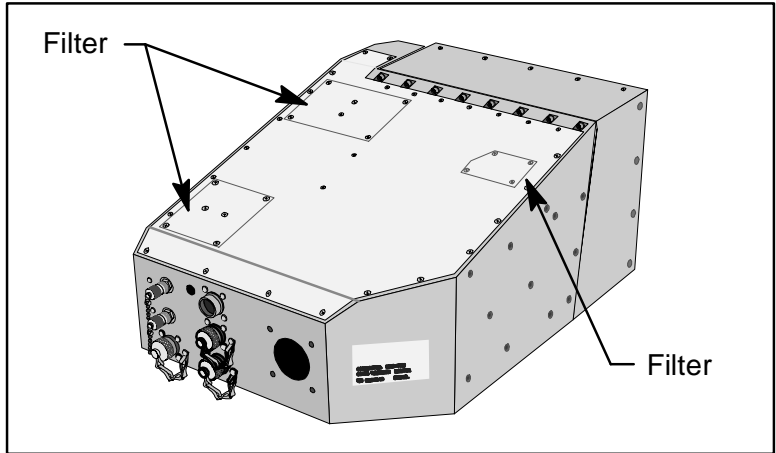
Filter/Screen	Location/Access	Access Fastener/ Cleaning Tools
IDP 1,3	Behind L8 Open door	Wing Head/Thumbscrew Crevice Tool



Filter/Screen	Location/Access	Access Fastener/ Cleaning Tools
MCIU (if installed)	Behind L17 Open door	Wing Head Thumbscrew/ Crevice Tool

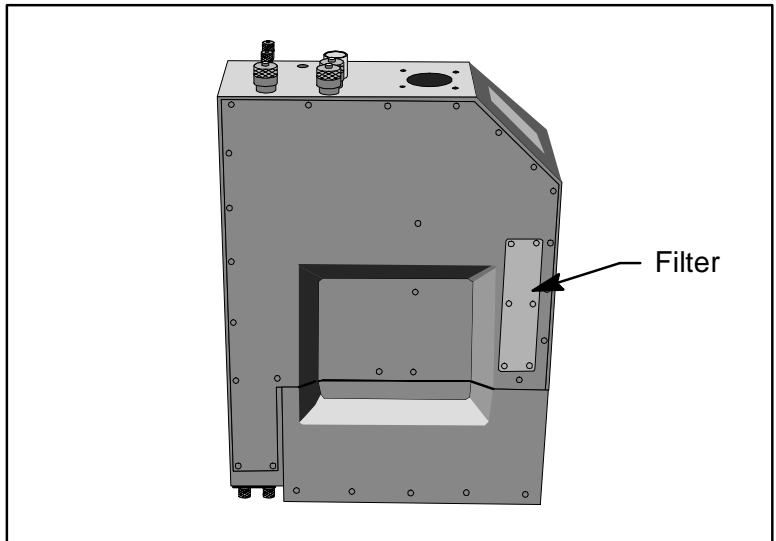


Filter/Screen	Location/Access	Access Fastener/ Cleaning Tools
CCTV MON	Above L12/Top & Bottom of CCTV MON	None/DDU Filter Cleaning Tool (Crevice Tool) (Gray Tape)



S93-48961

jsc48025\_051\_4.cnv



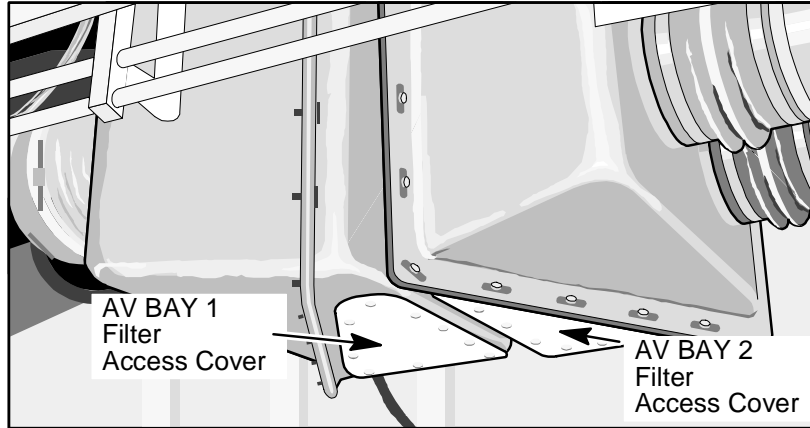
S93-48962

jsc48025\_052\_4.cnv



## LOWER EQUIPMENT BAY (MCC call only) (1:30 hr)

Filter/Screen	Location/Access	Access Fastener/ Cleaning Tools
AV BAY 1,2 Fan Filters	LEB thru Vol E (MD76C). See <u>GENERAL INFORMATION</u>	Locker tool, 5/32-in Allen, #6 Torque Driver/Crevice Tool



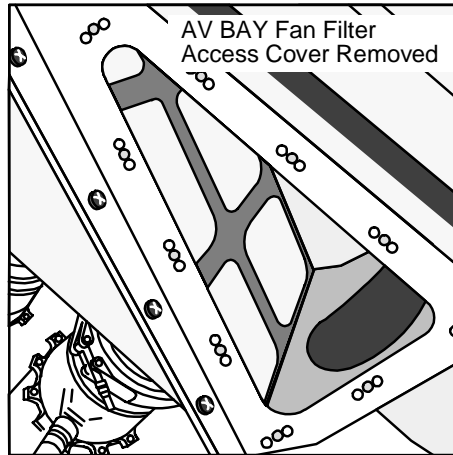
jsc48025\_053\_4.cnv

Filter/Screen	Location/Access	Access Fastener/ Cleaning Tools
AV BAY 3A Fan Filters (30 min)	LEB thru Vol G (MD80R) or Vol H (MD23R). See <u>GENERAL INFORMATION</u>	Locker tool, 5/32-in Allen, #6 Torque Driver/Crevice Tool



jsc48025\_054\_4.cnv

- MD76C 1. For AV BAYS 1,2, remove Vol E (MD76C)  
(GENERAL INFORMATION)
- MD80R (MD23R) 2. For AV BAY 3A, remove Vol G (MD80R) or Vol H  
(MD23R) (GENERAL INFORMATION)
3. Access/remove filter access cover (10 fasteners,  
#6 Torque Driver)



jsc48025\_055\_4.cnv

**CAUTION**  
If Avionics Fan off more than 20 min,  
avionics overheating could occur

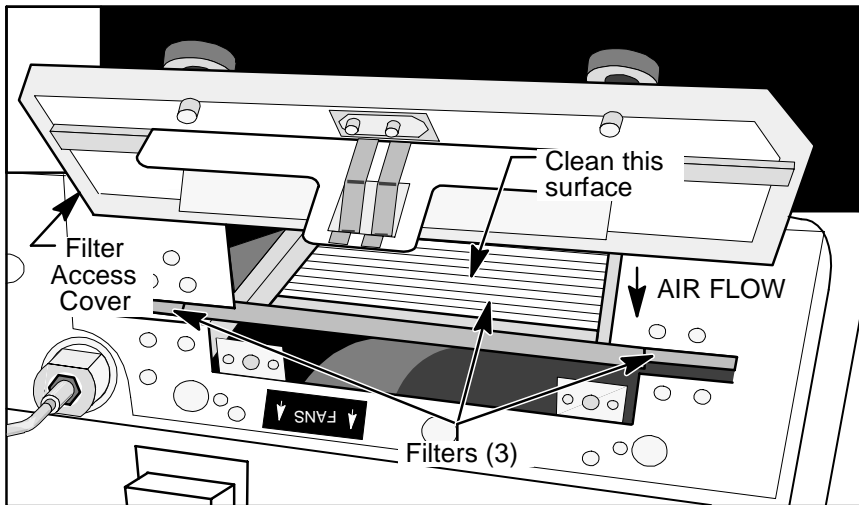
- L1 4. AV BAY 1(2,3) FAN A(B) – OFF (SM ALERT)
5. Clean filter
6. Reinstall filter access cover, hand tight
7. AV BAY 1(2,3) FAN A(B) – ON
8. Install Vol E (MD76C) or Vol G (MD80R), torque |  
(30 in-lb)
9. Install lockers
10. Stow tools

**MIDDECK FLOOR (MCC call only) (5 min)**

Filter/Screen	Location/Access	Access Fastener/ Cleaning Tools
Cabin Fan	Under MD79G (lift/open)	Squeeze latch and knurled knob/Cabin Fan Filter Tool

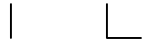
**CAUTION**  
If Cabin Fan off more than 5 min,  
avionics overheating could occur

- L1            1. CAB FAN A(B) – OFF (MA, SM ALERT)



jsc48025\_046\_4.crv

2. Open MD79G and filter access cover, clean filters (using Cabin Fan Filter Tool)  
 3. Close access cover, hand-tighten knobs, close MD79G access pnl  
 L1            4. CAB FAN A(B) – ON  
 F7            5. ✓C/W AV BAY/CAB AIR It – off



This Page Intentionally Blank



IFM PROCEDURES

	<u>PAGE</u>
ACCU BYPASS CONNECTOR INSTALLATION.....	A-1
AC PWR TRANSFER CABLE INSTALLATION.....	A-5
APDS DIRECT DRIVE USING BOB.....	A-8
APDS SLIP CLUTCH POSITION INDICATION.....	A-12
AV BAY FAN CHANGEOUT.....	A-17
BRAKE ANTISKID CONTROL COMMAND INHIBIT.....	B-1
CAUTION AND WARNING ELECTRONICS UNIT	
CONTINGENCY PWR (CIL).....	C-1
CONTROL BUS PWRDN.....	C-6
CRYO TANK HEATER FUSE REMOVAL (CIL).....	C-9
DDU CHANGEOUT.....	D-1
DTV/MUX REPLACEMENT w/SPARE.....	D-7

**PROCEDURES  
A THRU F**

**PROCEDURES  
A THRU F**

This Page Intentionally Blank

## ACCU BYPASS CONNECTOR INSTALLATION (25 min)

**OBJECTIVE:** Recover air-to-ground (A/G) comm following total failure of one (both) ACCUs

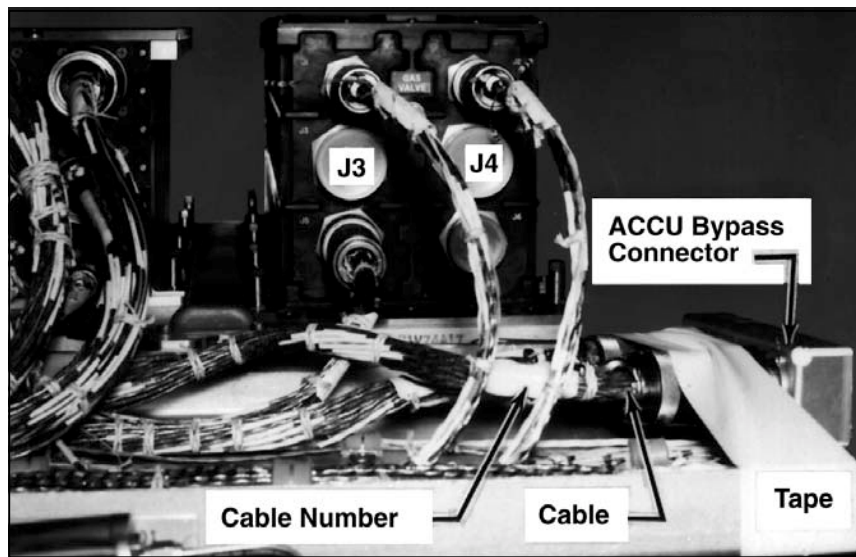
**LOCATION:** See AV BAY 1, Zone 28E (COMPONENT LOCATIONS), for ACCU location. ACCU 1,2 located in same box

### TOOLS REQD:

TOOL                      Gray Tape  
                              ACCU Bypass Connector Assy  
                              Connector Wrench  
                              Robbins Wrench  
                              Locker Tool  
                              Torque Wrench  
                              1/4-in to 3/8-in Adapter

### FOR LOSS OF BOTH ACCUs

- |       |                                       |
|-------|---------------------------------------|
| C3    | 1. AUD CTR – OFF                      |
| O5    | 2. L AUD PWR – OFF                    |
| O9    | 3. R AUD PWR – OFF                    |
| MF28E | 4. Remove Locker, Thermal Debris Trap |



S81-37945

jsc48025\_056\_A.crv

5. Disconnect  
Cable 81V77W8P333 from J3 on ACCU  
P334 from J4 on ACCU

A-1

IFM/ALL/GEN F

6. Install
  - Cable 81V77W8P333 to J3 on ACCU Bypass Connector Assy
  - Cable 81V77W8P334 to J4 on ACCU Bypass Connector Assy
7. Tape ACCU Bypass Connector Assy to wire tray
8. Install Thermal/Debris Trap, Locker
9. Stow tools, tape
- O5 10. L AUD PWR – AUD
- O9 11. R AUD PWR – AUD
- If using NSP2 (comm via PLT Aud Pnl):
- O5 12. L AUD CNTL – R
- O9 13. R AUD CNTL – NORM
- If using NSP1 (comm via CDR Aud Pnl):
- O5 14. R AUD CNTL – L
15. L AUD CNTL – NORM
16. Adjust MASTER or HIU volume as reqd
17. CCU pwr may be cycled OFF (to receive), ON (to transmit/receive)

NOTE

- A. PLT ATU hot mike to A/G 1 of NSP 2;  
CDR ATU hot mike to A/G 1 of NSP 1
  - B. Klaxon, Siren tones still avail via Flt Deck and Middeck speakers even when powered down
  - C. C/W, SM tones still available via Middeck speaker in ACCU/BYPASS Mode, if powered, and sleep station tone headset connector
  - D. All other audio functions have been lost
18. Next site AOS, attempt voice w/MCC. If no comm, go to LOSS OF ALL VOICE COMM [2], SSR-1 (MAL, COMM SSR)

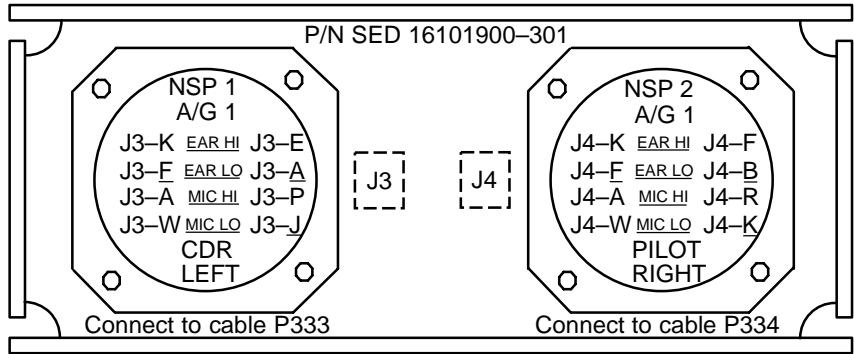


FOR LOSS OF ONE ACCU – EITHER ACCU 1(2) (J4 BYPASS)

- MF28E 19. Remove Locker, Thermal/Debris Trap  
C3 20. AUD CTR – OFF  
O9 21. R AUD PWR – OFF  
22. Disconnect:  
Cable 81V77W8P334 from J4 on ACCU  
23. Install:  
Cable 81V77W8P334 to J4 on ACCU Bypass  
Connector Assy  
24. Tape ACCU Bypass Connector Assy to wire tray  
25. Reselect remaining ACCU  
AUD CTR – 2(1)  
C3 26. R AUD PWR – AUD  
O9 27. Perform voice check to MCC using PL ATU (ATU  
will be hot mike)  
28. R AUD CNTL – L  
29. Install Thermal Debris Trap, Locker  
30. Stow tools, tape

NOTE

- A. PLT ATU hot mike to A/G 1 of NSP 2.  
Use A/G 1 w/NSP 1 (A/G 2 lost). Use  
A/G 2 w/NSP 2 (A/G 1 hot mike to PLT  
ATU)
- B. Only ICOM A capable of being recorded  
by OPS rcdrs (on CH 2 if using NSP 2  
or CH 1 if using NSP 1)
- C. Following functions have been lost:  
PS ATU, AL ATU, NSP 1 A/G 2,  
TACAN 3 TONES, NSP 1 RCD V 2,  
NSP 2 RCD V 1, C&W (B) (via  
ACCU, MD SPKR in ACCU/Bypass  
OK), ICOM B – PLB (CCTV), ICOM  
B – T-O UMB
- D. Config cntl data still available via both  
MS ATU, PLT ATU (J1, J2)



ACCU Bypass Connector Module

jsc48025\_057\_A.cvx

## AC PWR TRANSFER CABLE INSTALLATION

25 min (AC1 to AC3)  
40 min (AC1(3) to AC2)

OBJECTIVE: Repower AC Bus using AC Pwr Transfer Cable

### CAUTION

Perform applicable Bus Loss SSR and EPS SSR-200 steps prior to entering this procedure. Repowered AC Bus limited to 3 Amps per phase

LOCATION: See (COMPONENT LOCATIONS)

For AC1(3) – Flt Deck(Middeck)

For AC2 Only – J37(J36) on Payload(Mission) Station distribution pnl behind L17(R17)

TOOLS REQD: For AC1 to AC3 interconnect:

TOOL Gray Tape  
CHCK AC Pwr Transfer Cable

For AC2 to AC1(AC3)interconnect:

TOOL Gray Tape  
Pwr Screwdriver  
Torque Wrench  
Driver Handle  
5/32-in Allen Head Driver

CHCK AC Pwr Transfer Cable

MISC Tongue Depressors

### TO CONNECT AC1 TO AC3

1. √AC UTIL PWR AC1 – OFF  
F1 (MO52J)
2. √AC UTIL PWR AC3 – OFF  
A15 (MO13Q)
3. cb UTIL PWR F1/MO52J AC1 – op  
√A15/MO13Q AC3 – op
4. Connect AC Pwr Transfer Cable between AC1 and AC3 (AC1 on pnl F1 or MO52J, AC3 on pnl A15 or MO13Q). Route, secure cable w/tape
5. cb UTIL PWR F1/MO52J AC1 – cl  
A15/MO13Q AC3 – cl

On MCC GO:

- F1 (MO52J) 6. AC UTIL PWR AC1 – ON
- A15 (MO13Q) 7. AC UTIL PWR AC3 – ON
- 8. Stow tools

TO CONNECT AC2 TO AC1(AC3)

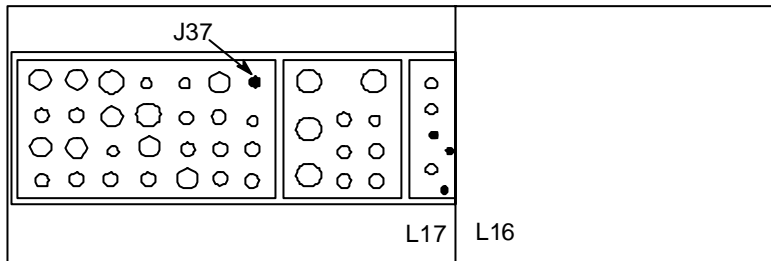
If AC2 to AC1:

- F1 (MO52J) 9. √AC UTIL PWR AC1 – OFF
- L4:B 10. √cb UTIL PWR F1/MO52J AC1 – op
- MA73C:E 11. √cb AC2 PL 3Φ – op

If AC2 to AC3:

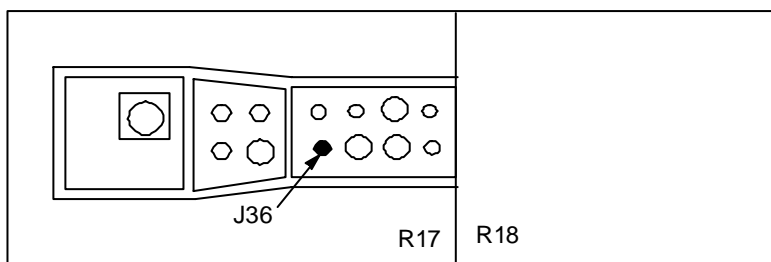
- A15 (MO13Q) 12. √AC UTIL PWR AC3 – OFF
- L4:B 13. √cb UTIL PWR A15/MO13Q AC3 – op
- MA73C:E 14. √cb AC2 PL 3Φ – op

**PAYLOAD STATION DISTRIBUTION PNL**  
(Looking thru pnl L17 opening)



jsc48025\_058a\_A.cnv

**MISSION STATION DISTRIBUTION PNL**  
(Looking thru pnl R17 opening)



jsc48025\_058b\_A.cnv

- 15. Contact MCC to verify which Distribution Panel connector should be used
- L17(R17) 16. Remove closeout pnl L17(R17) (17 fasteners/pnl, 5/32-in Allen Head Driver)
- 17. Remove cap from J37(J36); connect AC Pwr Transfer Cable to J37(J36); route cable thru hinged door in closeout pnl L17(R17); connect other end of cable to AC1(3)
- 18. Wrap AC Pwr Transfer Cable w/Gray Tape so hinged door will not chafe cable

**CAUTION**  
Do not crush cable

- 19. Install closeout pnl L17(R17) (torque fasteners, 30 in-lb). To complete closeout, Gray Tape hinged door closed as reqd
  - 20. Route, secure AC Pwr Transfer Cable w/tape
- On MCC GO:

L4:B  
MA73C:E  
F1  
(MO52J)

If AC2 to AC1:

- 21. cb UTIL PWR F1/MO52J AC1 – cl
- 22. cb AC2 PL 3Φ – cl
- 23. AC UTIL PWR AC1 – ON

L4:B  
MA73C:E  
A15  
(MO13Q)

If AC2 to AC3:

- 24. cb UTIL PWR A15/MO13Q AC3 – cl
- 25. cb AC2 PL 3Φ – cl
- 26. AC UTIL PWR AC3 – ON

- 27. Stow tools

## APDS DIRECT DRIVE USING BOB

(1:30 hr)

**OBJECTIVE:** To bypass pallet avionics boxes and directly drive APDS Capture Latch, Ring, Hook, and/or Slip Clutch motors utilizing IFM Breakout Box (BOB)

**LOCATION:** External Airlock (Port/Stbd Floor I/F Pnl)

### TOOLS REQD:

Tool	Gray Tape
	Pin Kit (two 24-in 20-ga Pin/Socket Test Jumper Leads; 3 and/or 5 Amp Fuse)
	Connector Pliers
	Ratchet Wrench
	4-in Extension
	3/8-in Standard Socket, 1/4-in drive
	3/8-in Combination Wrench
	#10 Torque Driver
	1/4-in to 3/8-in Adapter
	Vise Grips
BOB	Breakout Box
CHCK	DC Pwr Cable

### APDS POWERDOWN

- |       |   |
|-------|---|
| A7L   | 1. ✓ Status It (eighteen) – It off  |
|       | ✓ APDS POWER $A_{DS}, B_{DS}, C_{DS}$ (three) – OFF                             |
|       | ✓ $A_{DS}, B_{DS}, C_{DS}$ It (three) – It off                                  |
|       | ✓ HEATERS/DCU POWER (three) – OFF   |
|       | ✓ CONTROL PANEL POWER A,B,C (three) – OFF                                       |
| A6L   | 2. ✓ PSU PWR MNA, MNB (two) – OFF   |
| MO13Q | 3. ✓ DC UTIL PWR MNB – OFF  |
|       | 4. ✓ Connect one IFM DC pwr cable between DC Util Outlet MO13Q and Breakout Box |

### ACCESS CONNECTORS

- |         |  |
|---------|--|
| EXT A/L | 5. Determine floor I/F pnl to access (see table and diagram for connector(s) location) |
|---------|--|

#### NOTE

I/F pnl covers have slots for three lower outboard bolts. Loosen, do not remove these bolts

6. Remove floor I/F pnl cover(s):  
13 screws/bolts (four, #10 Torque Driver; nine, 3/8-in Combination Wrench or Standard Socket). Temp stow

Function	Connector	Pin # (to BOB + Jack)	Pin # (to BOB - Jack)
Port I/F Pnl			
Capture Latch M1 OPEN	P9453(J9413)	d	F
Capture Latch M2 OPEN	P9453(J9413)	j	D
Capture Latch M3 OPEN	P9449(J9409)	f	B
Capture Latch M1 CLOSE	P9453(J9413)	d	E
Capture Latch M2 CLOSE	P9453(J9413)	j	C
Capture Latch M3 CLOSE	P9449(J9409)	f	A
Stbd I/F Pnl			
Hooks 1 M6 OPEN	P9442(J9402)	b	F
Hooks 1 M7 OPEN	P9454(J9414)	B	d
Hooks 2 M8 OPEN	P9442(J9402)	D	A
Hooks 2 M9 OPEN	P9454(J9414)	H	D
Hooks 1 M6 CLOSE	P9442(J9402)	F	b
Hooks 1 M7 CLOSE	P9454(J9414)	d	B
Hooks 2 M8 CLOSE	P9442(J9402)	A	D
Hooks 2 M9 CLOSE	P9454(J9414)	D	H
Ring Motor M4 IN	P9446(J9406)	x	v
Ring Motor M5 IN	P9454(J9414)	r	t
Ring Motor M4 OUT	P9446(J9406)	v	x
Ring Motor M5 OUT	P9454(J9414)	t	r
Slip Clutch Motor M10 SLIP	P9448(J9408)	71	72
Slip Clutch Motor M11 SLIP	P9452(J9412)	71	72
Slip Clutch Motor M10 LOCK	P9448(J9408)	72	71
Slip Clutch Motor M11 LOCK	P9452(J9412)	72	71

Bubble 7. Demate selected connector(s) (from table above) from airlock floor I/F pnl (Connector Pliers).  
Gray Tape over I/F pnl connector face

CONFIGURE TOOLS

- 8. Secure BOB near floor I/F connector pnl on PORT(STBD) floor (Gray Tape)
- 9. a. Breakout Box:
  - AUX – OFF
  - 28V/VAR V – 28V
  - PWR A,B – OFF
- b. Remove fuse cap, side A
- c. Rotate GA SEL A – 20
- d. Install fuse (3-amp Capture Latch/Hook motors, or 5-amp Ring/Slip Clutch motors), replace fuse cap
- 10. Install socket end of 24-in, 20-ga Pin/Socket Test Jumper Leads onto designated pins (from table) on cable connector(s). Secure/Gray Tape if necessary
- 11. Install both Test Jumper Lead pins into (+) and (-) sockets on Breakout Box, side A

TO INITIATE DRIVE FUNCTION

- A7L 12. HEATERS/DCU POWER (three) – ON
- MO13Q 13. DC UTIL PWR MNB – ON

**CAUTION**  
Capture latch motor drive time is 3 sec and automatically stops. Hook/Ring motors will continue to drive until pwr removed. √MCC for drive times

- BOB 14. PWR A – ON

UPON COMPLETION OF DRIVE FUNCTION

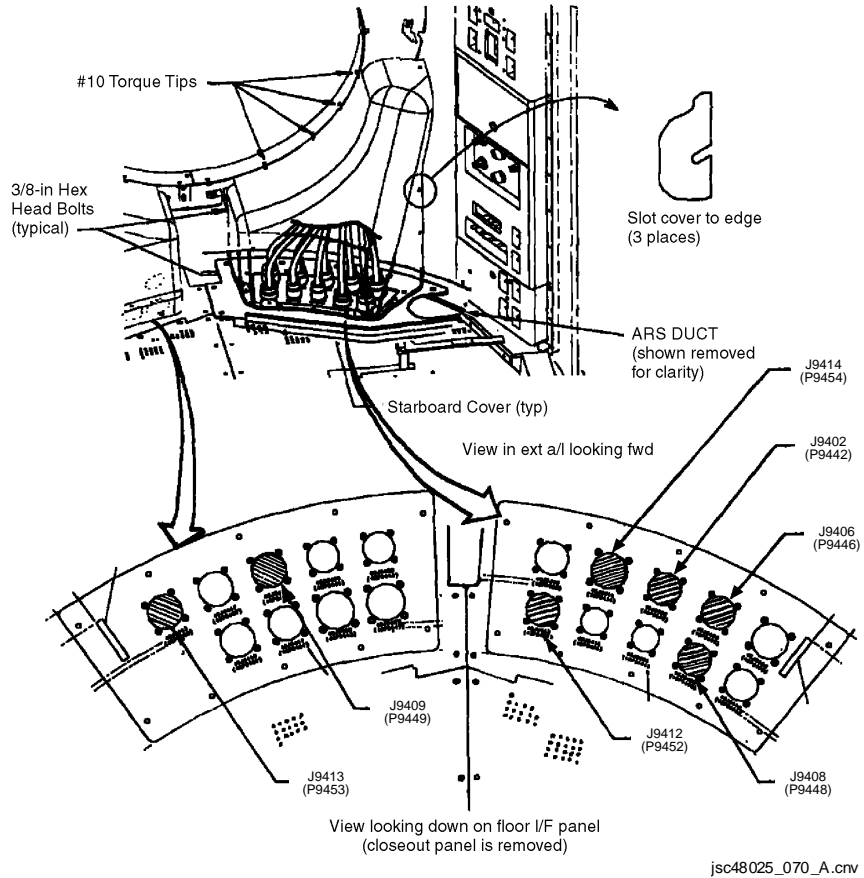
- BOB 15. PWR A – OFF
- MO13Q 16. DC UTIL PWR MNB – OFF
- A7L 17. HEATERS/DCU POWER (three) – OFF
- 18. Remove Gray Tape and Test Jumper Leads from connector(s) and Breakout Box

**NOTE**  
If multiple ODS mechanisms require IFM drive, repeat steps 9–18 until sequence complete



UPON COMPLETION OF DOCKING/UNDOCKING PROCEDURES

19. Replace connector(s) on respective floor I/F pnl(s)
20. Replace floor I/F pnl cover(s) and fasteners  
(tighten snug)
21. Stow tools



NOTE

Test Jumper Leads connect to cable connector plug(s). Remove from floor jack(s)

**APDS SLIP CLUTCH POSITION INDICATION (1:30 HR)**

OBJECTIVE: To determine posn of APDS Slip Clutch locking device via sensor continuity test due to lack of positioning telemetry

LOCATIONS: External Airlock (Stbd Floor I/F Pnl)

TOOLS REQD:

TOOL            Gray Tape  
                  Pin Kit  
                  Multimeter  
                  Connector Pliers  
                  Ratchet Wrench  
                  4-in Extension  
                  3/8-in Standard Socket, 1/4-in drive  
                  3/8-in Combination Wrench  
                  #10 Torque Driver  
                  1/4-in to 3/8-in Adapter

APDS POWERDOWN

- A7L            1. √Status It (eighteen) – It off
  - √APDS POWER A<sub>DS</sub>,B<sub>DS</sub>,C<sub>DS</sub> (three) – OFF
  - √A<sub>DS</sub>,B<sub>DS</sub>,C<sub>DS</sub> It (three) – It off
  - √HEATERS/DCU POWER (three) – OFF
  - √CONTROL PANEL POWER A,B,C (three) – OFF
- A6L            2. √PSU PWR MNA,MNB (two) – OFF

CONFIG TOOLS

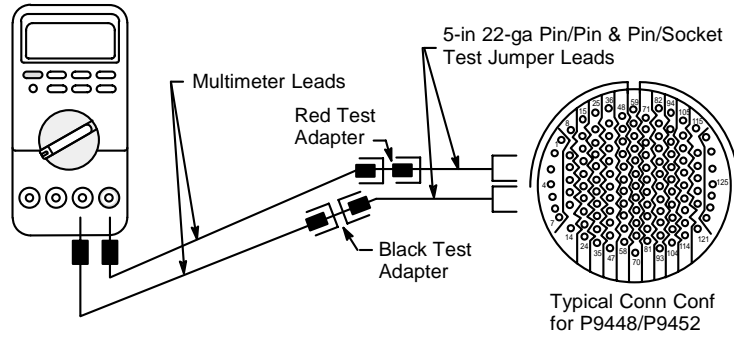
- 3. Obtain Multimeter

NOTE

Red & Black Multimeter leads have removable Test Probes installed on one end. Once removed, this end of leads can also be installed into Multimeter so that Banana Jacks on other end can be used w/Pin Kit accessories

- 4. Remove Test Probes from Red & Black Multimeter leads, insert this end into Multimeter

5. Install 22-ga Red & Black Test Adapters from Pin Kit (flap 7) onto Multimeter Lead Banana Jacks
6. Obtain one each: 5-in 22-ga Pin/Socket, Socket/Socket Test Jumper Lead from Pin Kit (flap 5). Install onto Red & Black Test Adapters as shown in diagram below



TYPICAL METER/TEST LEAD SETUP

jsc48025\_278\_A.cvx

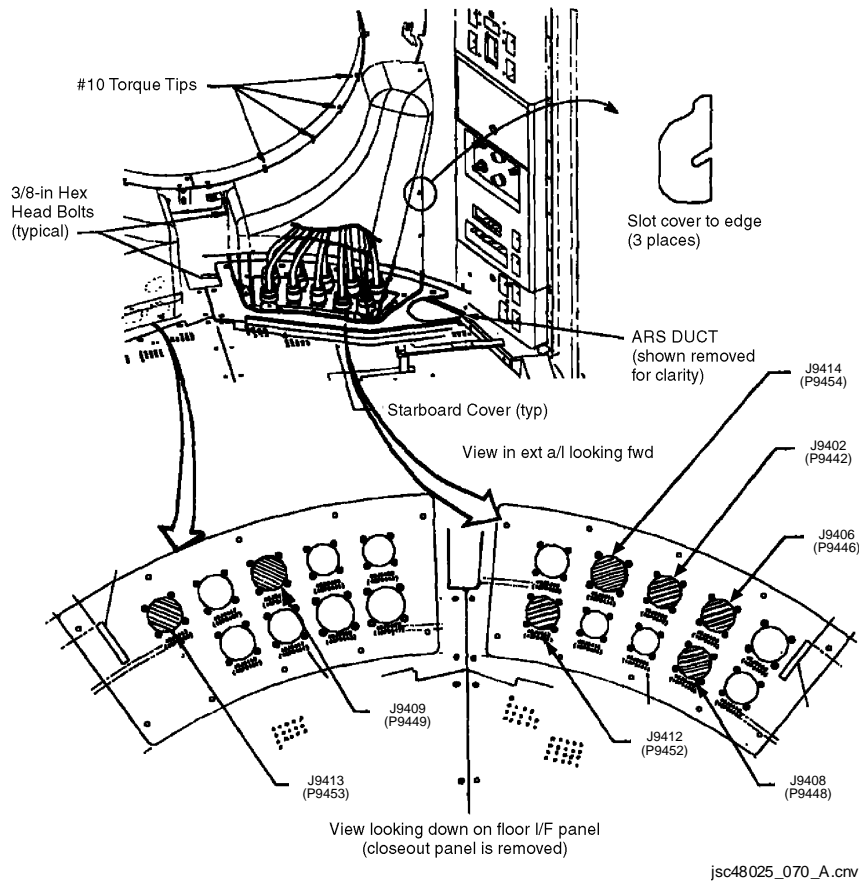
## ACCESS CONNECTORS

- EXT A/L
7. Access stbd floor I/F pnl (see diagram next page for connector(s) location)

### NOTE

I/F pnl covers have slots for three lower outboard bolts. Loosen, do not remove these bolts

8. Remove stbd floor I/F pnl cover: 13 screws/bolts (four #10 Torque Driver; nine 3/8-in Combination Wrench or Standard Socket). Temp stow



**DETERMINE SLIP CLUTCH POSN**

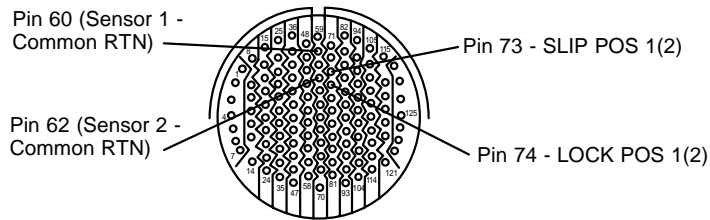
**CAUTION**

Do not demate both connectors simo. Common return runs back and forth thru both connectors. Demating both connectors at same time will provide erroneous results

**CHECK SLIP(LOCK) POSN 1 SENSORS**

- Bubble
9. Demate P9448 connector from airlock floor stbd I/F pnl (Connector Pliers). Place Gray Tape over I/F pnl connector face (J9408)

10. Set Multimeter per instructions on flap 7 for ( $\Omega$ ) resistance (auto range) as reqd for each continuity test
11. Install Socket end of Test Jumper Lead mated to Black Test Adapter onto P9448 pin 60 (Common RTN) (see connector layout below)
12. Install Socket end of Test Jumper Lead mated to Red Test Adapter onto P9448 pins 73(74) to verify SLIP(LOCK) POSN 1 indication via continuity test (see connector layout below). Record results (see table below)
13. Remove Gray Tape and Test Jumper Leads from connector(s)
14. Replace connector on respective floor I/F jack (J9408)



Connector Layout - P9448/P9452

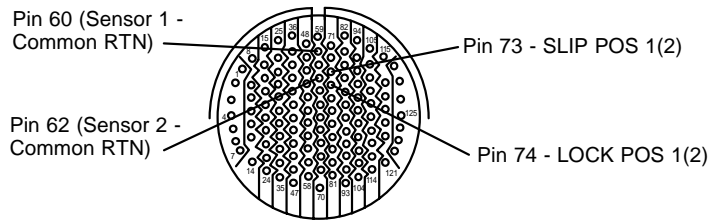
jsc48025\_279\_A.cvx

APDS Slip Clutch Logic Sensor 1			
Function	Connector	Pin #	Continuity Results
Common RTN	P9448(J9408)	60	
Slip Clutch SLIP POSN 1	P9448(J9408)	73	
Slip Clutch LOCK POSN 1	P9448(J9408)	74	

#### CHECK SLIP(LOCK) POSN 2 SENSORS

15. Demate P9452 connector from airlock floor stbd I/F pnl (Connector Pliers). Place Gray Tape over I/F pnl connector face (J9412)

16. Install Socket end of Test Jumper Lead mated to Black Test Adapter onto P9452 pin 62 (Common RTN) (see connector layout below)
17. Install Socket end of Test Jumper Lead mated to Red Test Adapter onto P9452 pins 73(74) to verify SLIP(LOCK) POSN 2 indication via continuity test (see connector layout below). Record results (see table below)
18. Remove Gray Tape and Test Jumper Leads from connector(s)
19. Replace connector on respective floor I/F jack (J9412)
20. Report results to MCC



Connector Layout - P9448/P9452

jsc48025\_279\_A.cvx

APDS Slip Clutch Logic Sensor 2			
Function	Connector	Pin #	Continuity Results
Common RTN	P9452(J9412)	62	
Slip Clutch SLIP POSN 2	P9452(J9412)	73	
Slip Clutch LOCK POSN 2	P9452(J9412)	74	

UPON COMPLETION OF PROCEDURE

21. Replace stbd floor I/F pnl cover and fasteners (tighten snug)
22. Stow tools

## AV BAY FAN CHANGEOUT

(2:30 hr)

OBJECTIVE: Replace failed Av Bay Fan Assy (Fan & Check Valve) w/one of two good fans from another Av Bay. This will be done only when both fans in one bay have failed and failure of one fan not pwr related

### NOTE

MCC will identify location of spare unit

LOCATION: See LOWER EQUIPMENT BAY (COMPONENT LOCATIONS), two fans below each Av Bay

### TOOLS REQD:

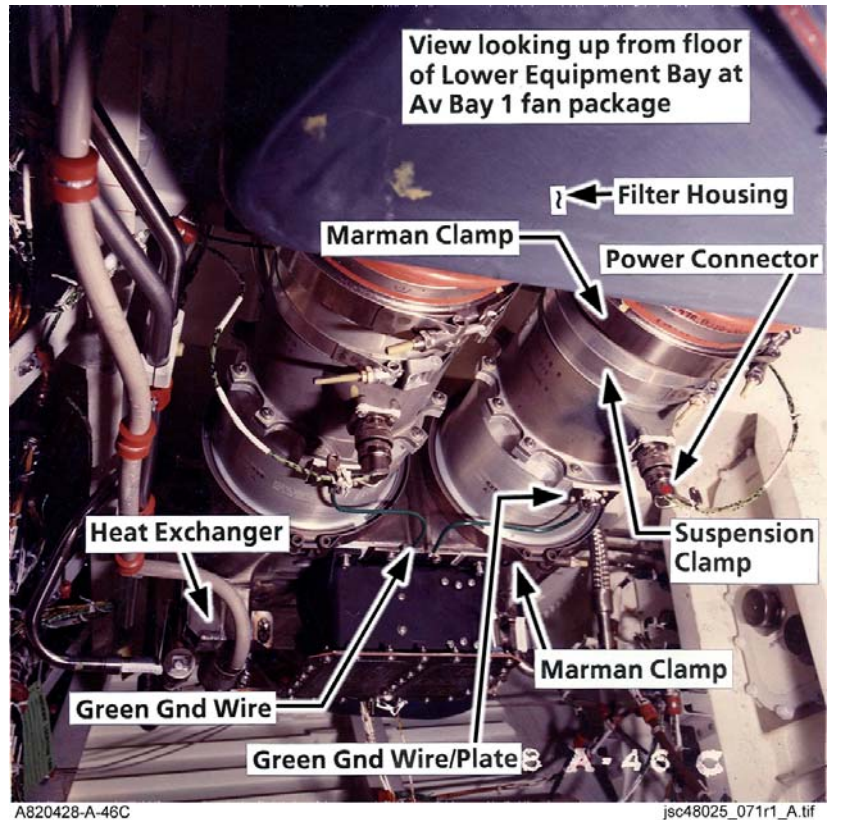
TOOL	Gray Tape
	Multimeter
	Pwr Screwdriver
	5/32-in Allen Head Driver
	Locker Tool
	Robbins Wrench
	Torque Wrench
	Driver Handle
	3/8-in Deepwell Socket
	1/4-in to 3/8-in Adapter
	3/8-in Combination Wrench
	#10 Torque Driver
MISC	Flashlight

### TO ACCESS AV BAY FANS

1. See GENERIC STOWAGE LOCKER/VOLUME REMOVAL (GENERAL INFORMATION). (Vol E (MD76) removal for AV BAY 1(2) Fans; Vol G (MD80R) or Vol H (MD23R) removal for AV BAY 3A Fans)

TO CHECK VOLTAGES ON FAN PWR CONNECTORS

- L1            2. √AV BAY 1(2,3) FAN A(B) – OFF (SM ALERT) (for failed fans)



3. Remove pwr connectors from failed fans  
AV BAY 1 Fan A: remove cable 90V77W2P1  
                  B: remove cable 90V77W3P3  
AV BAY 2 Fan A: remove cable 90V77W3P2  
                  B: remove cable 90V77W11P4  
AV BAY 3A Fan A: remove cable 90V77W11P10  
                  B: remove cable 90V77W2P12



**WARNING**  
115 Volts. Pwr must be off when  
installing(removing) test probes  
from connector

4. Set up Multimeter per instructions on flap for AC V (auto range), except as noted

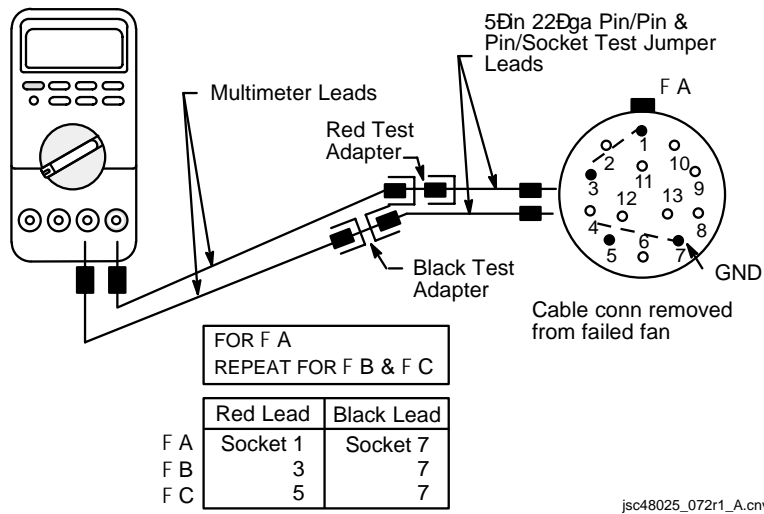
**NOTE**

Red & black Multimeter leads have removable test probes installed on one end. Once removed, this end of leads can also be installed into Multimeter so that banana jacks on other end can be used w/Pin Kit accessories

5. Remove test probes from red & black Multimeter leads and insert this end into Multimeter
6. Install 22-ga red & black Test Adapters from Pin Kit (flap 5) onto banana jacks of Multimeter leads
7. Install one 5-in 22-ga Pin/Socket Test Jumper Lead from Pin Kit (flap 5) onto red Test Adapter and one 5-in 22-ga Pin/Pin Test Jumper Lead onto black Test Adapter
8. Install Test Jumper Leads onto cable connector removed from failed fan as shown for  $\Phi A$
- L1 9. AV BAY 1(2,3) FAN A(B) – ON (rcd reading)  
– OFF (SM ALERT)
10. Repeat steps 6,7 for  $\Phi B$ ,  $\Phi C$

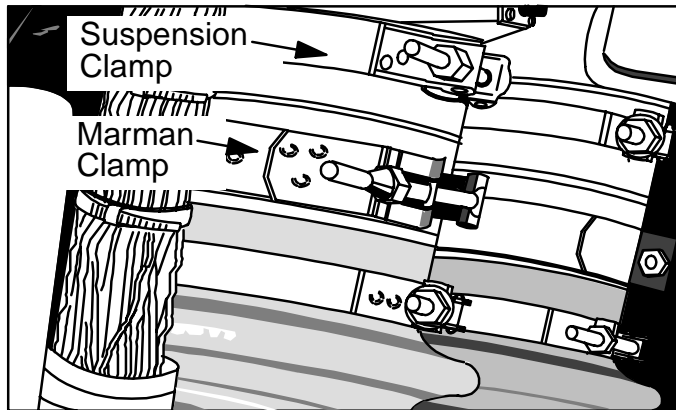
**NOTE**

If no pwr at any  $\Phi$ , inform MCC



## TO REMOVE AV BAY FANS

11. For failed fans:  
L1                   √AV BAY 1(2,3) FAN A(B) – OFF (SM ALERT)



jsc48025\_073\_A.cnv

12. Remove green ground wire/plate from fan assy (one fastener, #10 Torque Driver)
13. Remove Suspension Clamp, loosen ("T" bolt) nut and flip latch from bolt head. Clamp will spring open. Spread clamp gently and slide off suspension bracket (one nut, 3/8-in Deepwell Socket)
14. Remove Marman Clamps (two), remove nut (not captive) bolt will slide out of "T" spacer. Clamp will spring open. Spread clamp gently and slide over mounting flanges (one nut/clamp, 3/8-in Deepwell Socket)
15. Remove fan assy and mark w/Gray Tape. Temp stow
16. For spare fan:  
L1 AV BAY 1(2,3) FAN A(B) – OFF  
(SM ALERT)

NOTE

Have failed fan ready for installation at this location

17. Repeat steps 12-15.
18. Remove fan assy

TO INSTALL AV BAY FANS

AT SPARE FAN LOCATION:

19. Place clamps (three) around fan assy in relative position. Slide fan assy into place, ensure that "V" notch in check valve end of fan assy aligns w/pin in Heat Exchanger Flange, connectors face down
20. Slide suspension clamp over mounting bracket and secure latch over "T" bolt head (hand tighten)
21. Slide Marman Clamps (two) over mounting flanges. Insert bolt into "T" spacer. Tighten nuts (torque, 30 in-lb)
22. Install green ground wire/plate (torque screw, 30 in-lb)

23. Install pwr connectors  
AV BAY 1 Fan A Loc: Cable 90V77W2P1  
B Loc: Cable 90V77W3P3  
AV BAY 2 Fan A Loc: Cable 90V77W3P2  
B Loc: Cable 90V77W11P4  
AV BAY 3A Fan A Loc: Cable 90V77W11P10  
B Loc: Cable 90V77W2P12

- L1 24. AV BAY 1(2,3) FAN A(B) – ON (good fan only)

AT FAILED FAN LOCATION:

25. Repeat steps 19-23  
26. Reinstall Vol E (MD76C) and/or Vol H (MD23R) or  
Vol G (MD80R) (torque fasteners, 30 in-lb)  
27. Reinstall lockers. Stow tools

## **BRAKE ANTISKID CONTROL COMMAND INHIBIT (1:00 hr)**

**OBJECTIVE:** Inhibit brake coil command current output from Brake Antiskid Control Box associated w/failed Antiskid Control channel by cutting output signal wires from connector P301(P302) on J1(J2) of Control Box 1(2). Antiskid Fail Light annunciation signal will also be inhibited for channel that is cut/failed

**LOCATION:** See (COMPONENT LOCATIONS)

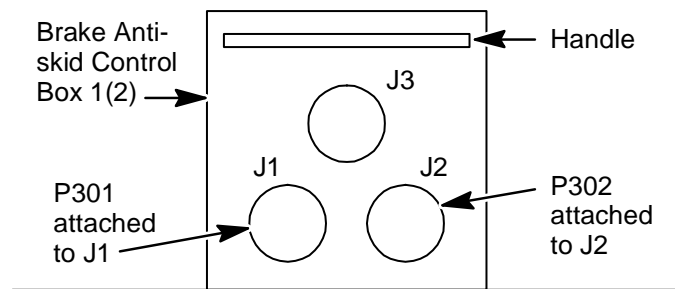
For BK SKID CONT 1 – AV BAY 1, MF28H

For BK SKID CONT 2 – AV BAY 2, MF71H

**TOOLS REQD:**

**TOOL** Gray Tape  
Locker Tool  
Torque Wrench  
#10 Torque Tip Driver  
Wire Cutters  
1/4-in to 3/8-in Adapter  
Ratchet Wrench

- O14:A,  
O15:A,  
O16:A  
L2
1. ✓BRAKES MNA,B,C (three) – OFF
  2. ✓ANTISKID – OFF
  3. Remove Locker, Thermal/Debris Trap MF28H (MF71H) to access Brake Antiskid Control Box 1(2), (four fasteners, Locker Tool)
  4. Remove clamps (temp stow) and cut wire ties as reqd to access wires attached to connector P301(P302) attached to J1(2) on Brake Antiskid Control Box 1(2), see chart, (one screw/clamp, #10 Torque Tip Driver and Wire Cutters)



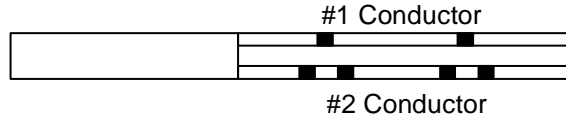
jsc48025\_074\_B.cnv

5. Remove ID tags as reqd and separate wires back ~3-5 in from connector P301(P302) back shell to access individual wires as reqd. See table below

Wheel	Signal	Connector	Wire ID	Conductor
Brake Antiskid Control Box 1				
LOB	LCA, Fail Light	P301/J1	V23A26	
LOB	Brake Coil	P301/J1	1V124A26	One stripe
LIB	LCA, Fail Light	P302/J2	V25A26	
LIB	Brake Coil	P302/J2	1V120A26	One stripe
RIB	LCA, Fail Light	P302/J2	V24A26	
RIB	Brake Coil	P302/J2	1V118A26	One stripe
ROB	LCA, Fail Light	P301/J1	V22A26	
ROB	Brake Coil	P301/J1	1V114A26	One stripe
Brake Antiskid Control Box 2				
LOB	LCA, Fail Light	P301/J1	V67A26	
LOB	Brake Coil	P301/J1	2V124A26	One stripe
LIB	LCA, Fail Light	P302/J2	V69A26	
LIB	Brake Coil	P302/J2	2V120A26	One stripe
RIB	LCA, Fail Light	P302/J2	V68A26	
RIB	Brake Coil	P302/J2	2V118A26	One stripe
ROB	LCA, Fail Light	P301/J1	V66A26	
ROB	Brake Coil	P301/J1	2V114A26	One stripe

6. Cut wire \_\_\_\_\_, LCA, Fail Light, from table as directed by MCC
7. Locate wire \_\_\_\_\_, Brake Coil, twisted pair from table as directed by MCC
8. Strip ~2 in of insulation from twisted shielded pair, ~3-5 in from connector back shell. Use care not to damage inner wires

9. Separate and cut #1 conductor in twisted pair.  
#1 conductor has single black band, #2 conductor has double band



jsc48025\_075\_B.cnv

10. Tape over wire ends (four) and tape/secure wires to harness (Gray Tape)
11. Inform MCC of status

#### ON MCC GO

12. Config for brake application  
O14:A, BRAKES MNA,B,C (three) – ON  
O15:A,  
O16:A  
L2           √ANTISKID – OFF  
R2           HYD CIRC PUMP 3 – ON (wait 10 sec)  
R4           HYD BRAKE ISOL VLV 3 – OP (Hold 5 sec,  
                  √tb-OP)
13. Depress and hold brake pedals
14. √MCC
15. Release brake pedals

#### RECONFIG SYSTEM

- R4           16. HYD BRAKE ISOL VLV 3 – CL (Hold 5 sec,  
                  √tb-CL)
- R2           HYD CIRC PUMP 3 – GPC

#### INHIBITED FAIL LIGHT VERIFICATION

- L2           17. ANTISKID – ON  
F3           √Antiskid Fail – Not Illuminated  
                  Report status to MCC  
L2           √ANTISKID – OFF  
O14:A,       BRAKES MNA,B,C (three) – OFF  
O15:A,  
O16:A

VERIFICATION COMPLETE

18. On MCC GO, replace ID tags and reinstall clamps  
(hand-tight) as reqd
19. Reinstall Thermal/Debris Trap and Locker  
MF28H(MF71H), torque 30 in-lb
20. Stow clamps and tools



**CAUTION AND WARNING ELECTRONICS UNIT  
CONTINGENCY PWR**

(1:30 hr)

OBJECTIVE: Provide pwr source to Caution and Warning (C/W) Electronics Unit (EU) pwr supply A(B) to either (1) bypass failed bus or (2) provide redundant pwr to remaining pwr supply, in event of pwr supply failure

LOCATION: See AV BAY 3A, Zone 9L (COMPONENT LOCATIONS)

NOTE

Procedure written to minimize amount of time during which C/W alarm system powered down. CRT fault messages remain operational

TOOLS REQD:

TOOL Gray Tape  
5-Amp Fuses (for Breakout Box and C/W cable as reqd) (Pin Kit)  
CWS Contingency Pwr Cable A(B)  
Locker Tool  
Connector Strap Wrench (if reqd)  
Driver Handle  
BOB Breakout Box  
CHCK DC Pwr Cable

1. Determine failure case by consulting MCC (chart below):

NOTE

Use PN ME451-0009-1021 fuses

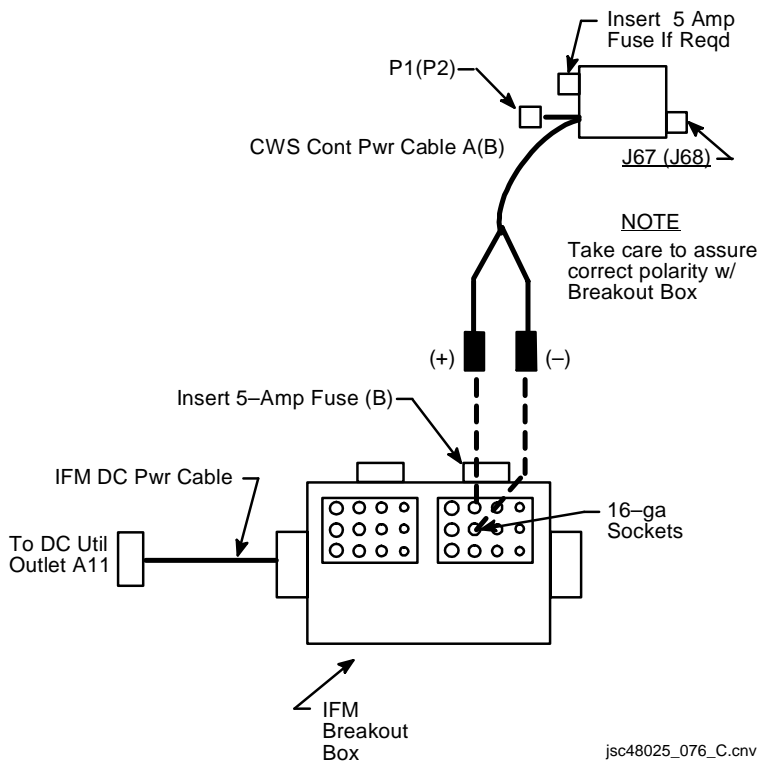
<u>Case</u>	<u>Failure</u>	<u>Cable</u>	<u>Cable Fuse</u>
I	ESS 1BC Failure (DA1 or O13/R14)	A	5-Amp
II	A Supply Failure	B	None
III	ESS 2CA Failure (DA2 or O13/R14)	B	5-Amp
IV	B Supply Failure	A	None

C-1

IFM/ALL/GEN F

A11

2. Insert fuse in fuse holder in CWS Contingency Pwr Cable, if reqd (from chart)
3. √DC UTIL PWR MNC – OFF
4. a. Breakout Box:
  - AUX – OFF
  - 28V/VAR VOLT – 28V
  - PWR A,B – OFF
- b. Remove Fuse cap from side B
- c. Rotate GA SEL B – 16
- d. Install 5-Amp Fuse, replace cap
5. Config Breakout Box and CWS CONT PWR Cable A(B) as shown:



6. If MA9N soft stowage installed, see SOFT STOWAGE SUPPORT REMOVAL (GENERAL INFORMATION)
7. Access front of C/W EU in AV BAY 3A removing locker MA9L, Thermal/Debris Traps

INSTALL CABLE

- |       |   |
|-------|---|
| O13:A | For Case I(IV): <ol style="list-style-type: none"> <li>8. Locate P67 mated w/J1 on C/W EU</li> <li>9. cb ESS 1BC C/W A – op</li> <li>10. Disconnect P67 from J1 and mate P67 w/J67 on CWS CONT PWR Cable A</li> <li>11. Connect P1 on CWS CONT PWR Cable A to J1 on EU</li> </ol>     |
| O13:C | For Case II(III): <ol style="list-style-type: none"> <li>12. Locate P68 mated w/J2 on C/W EU</li> <li>13. cb ESS 2CA C/W B – op</li> <li>14. Disconnect P68 from J2 and mate P68 w/J68 on CWS CONT PWR Cable B</li> <li>15. Connect P2 on CWS CONT PWR Cable B to J2 on EU</li> </ol> |

REPOWER C/W

- |       |   |
|-------|---|
| O13:C | For Case II:<br>  16. cb ESS 2CA C/W B – cl   |
| O13:A | For Case IV:<br>  17. cb ESS 1BC C/W A – cl (MA)  |
| A11   | For All Cases:<br>18. DC UTIL PWR MNC – ON<br>19. Breakout Box:<br>PWR B – ON (16 lt ON) (MA Case I only) |

PERFORM C/W CHECKOUT

For Case I(IV):

F2(F4,A7)

- 20. MSTR ALARM pb – off
- 21. Re-initialize C/W system A – verify C/W

R13U

- Pwr Supply A:
- a. Inhibit parameters specified on PRIMARY C/W PARAMETER MATRIX (ORB OPS, Cue Card)
  - b. Use C/W and FDA TABLE (REF DATA, C/W) to reset limits for following:

<u>CH</u>	<u>PARAMETER</u>
004	CAB PRESS
007	OMS TK P OX – L
017	OMS TK P FU – L
037	OMS TK P OX – R
047	OMS TK P FU – R
074	CAB FAN delta P
106	Freon Flow 1
116	Freon Flow 2

- c. C/W PARAM SEL tw – >119

- 22. Case I, go to step 27
- 23. Case IV, verify redundant pwr to C/W Pwr Supply A:

O13:C

O13:A

- a. ✓cb ESS 2CA C/W B – op
- b. 1BC C/W A – op (C/W tone)
- c. – cl (MA light)
- d. MSTR ALARM pb – off

F2(F4,A7)

F2(F4,A7)

For Case II:

- 24. MSTR ALARM pb – off
- 25. Verify redundant pwr to C/W Pwr

Supply B:

O13:A

- a. ✓cb ESS 1BC C/W A – op

O13:C

- b. 2CA C/W B – op (C/W tone)

- c. – cl (MA light)

F2(F4,A7)

- d. MSTR ALARM pb – off

For Case III:

F7

- 26. MSTR ALARM pb – off

- 27. ✓C/W PRI C/W It – off

B/U C/W It – off

- 28. Config assembly for entry by securing wiring and Breakout Box w/Gray Tape, reinstalling Thermal/Debris Traps (tape in place) taking care not to crimp/damage cable
- 29. Stow tools, locker, and Gray Tape

## CONTROL BUS PWRDN

(1:30 hr)

**OBJECTIVE:** Remove pwr from shorted cntl bus section by removing pwr from appropriate cntl bus RPC(s) on MCC call. If cntl bus short trips off RPC, middle pwr source cb will be opened and this procedure used to pwr down remaining RPC. If cntl bus short does not trip off either RPC, this procedure will be used to pwr down both RPCs

### NOTE

No Preflight bus pwr reqd to perform this procedure

**LOCATION:** See AV BAY 1, Zone 43A (MDM LF1)

**(COMPONENT LOCATIONS)**

### TOOLS REQD:

TOOL	Gray Tape
	Pin Kit (for Test Jumper Leads and Fuses)
	Connector Wrench (Strap)
BOB	IFM Breakout Box
CHCK	DC Pwr Cable

### PROCEDURE:

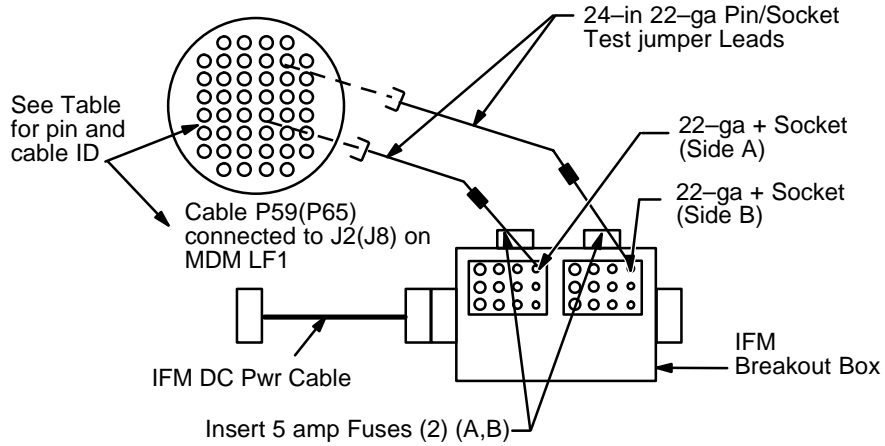
1. Remove Vol A (GENERAL INFORMATION) to access MDM LF1
2. Using CONTROL BUS SOURCE TABLE verify w/MCC appropriate actions

CNTR BUS \_\_\_\_\_, R14 cb \_\_\_\_\_, Connector \_\_\_\_\_, Pins \_\_\_\_\_

3. Remove connector P59(P65) from J2(J8) as reqd.  
Place Gray Tape over J2(J8)
4.  $\sqrt{\text{DC UTIL PWR}} - \text{OFF}$
5. a. Breakout Box:  
AUX - OFF  
28V/VAR VOLT - 28V  
PWR A,B - OFF  
b. Remove Fuse caps from sides A,B  
c. Rotate GA SEL A,B - 22  
d. Install 5-Amp Fuses (two), replace caps

MO13Q/  
MO52J

6. Connect Test Jumper Leads and Cables as shown, using table for proper connector and Pin ID



MO13Q/  
MO52J

7. DC UTIL PWR – ON

8. Breakout Box:  
PWR A,B – ON (22 It ON)

R1

9. CNTL BUS PWR MNA,MNB,MNC (three) – dn  
10. Verify shorted CNTL BUS still deenergized,  
√MCC

If reqd for entry:

11. Tape/secure harness/cable and Test Jumper Leads to nearby structure/harnesses
12. Tape/secure Breakout Box to Av Bay shelf
13. Reinstall Vol A
14. Secure DC UTIL PWR Cable
15. Stow tools >>

If procedure no longer reqd:

16. Breakout Box:  
PWR A,B – OFF

MO13Q/  
MO52J

17. DC UTIL PWR – OFF

18. Remove Cables and Test Jumper Leads and reinstall connector P59(P65) to J2(J8) on MDM LF1

19. Reinstall Vol A (MF57A) and stow tools

### CONTROL BUS SOURCE TABLE

CNTL BUS TO BE UNPOWERED	PNL R14 cb	LF1 MDM RPC COMMAND	ALSO LOST IS ONE SOURCE OF
AB1	cb MNC CNTL BUS AB1/2/3	AB1/BC1 – P59 PIN 22 AB1/CA1 – P59 PIN 14	AB2*,AB3*, BC1,CA1
AB2	cb MNC CNTL BUS AB1/2/3	AB2/BC2 – P59 PIN 80 AB2/CA2 – P59 PIN 70	AB1*,AB3*, BC2,CA2
AB3	cb MNC CNTL BUS AB1/2/3	AB3/BC3 – P65 PIN 58 AB3/CA3 – P65 PIN 47	AB1*,AB2*, BC3,CA3
BC1	cb MNA CNTL BUS BC1/2/3	AB1/BC1 – P59 PIN 22 BC1/CA1 – P59 PIN 04	BC2*,BC3*, AB1,CA1
BC2	cb MNA CNTL BUS BC1/2/3	AB2/BC2 – P59 PIN 80 BC2/CA2 – P59 PIN 92	BC1*,BC3*, AB2,CA2
BC3	cb MNA CNTL BUS BC1/2/3	AB3/BC3 – P65 PIN 58 BC3/CA3 – P65 PIN 44	BC1*,BC2*, AB3,CA3
CA1	cb MNB CNTL BUS CA1/2/3	AB1/CA1 – P59 PIN 14 BC1/CA1 – P59 PIN 04	CA2*,CA3*, AB1,BC1
CA2	cb MNB CNTL BUS CA1/2/3	AB2/CA2 – P59 PIN 70 BC2/CA2 – P59 PIN 92	CA1*,CA3*, AB2,BC2
CA3	cb MNB CNTL BUS CA1/2/3	AB3/CA3 – P65 PIN 47 BC3/CA3 – P65 PIN 44	CA1*,CA2*, AB3,BC3

\*Only lost if R14 cb tripped due to short or previously opened in step 2

20. If pwr reqd (<3 sec) for crit function:

#### NOTE

Following must be coordinated between crewmembers on flt deck and middeck

21. Hold crit function sw
22. Breakout Box  
PWR A,B – OFF (3 sec), then ON



## CRYO TANK HEATER FUSE REMOVAL

(30 min)

**OBJECTIVE:** Access back of pnl R1(A11,A15) and remove pair of fuses in attempt to disable failed-on cryo heater

**LOCATION:** Pnl R1 Flt Deck (A11,A15 Aft Flt Deck)

**TOOLS REQD:**

TOOL Pwr Screwdriver  
5/32-in Allen Head Driver  
Wire Cutters  
Torque Wrench

1. Disabling cryo heater reqs removal of pair of fuses. Use matrix to determine appropriate pnl and fuse #s:

<u>Heater</u>	<u>Pnl</u>	<u>Fuses</u>
O2 TK1 HTR A	R1	F1,F2
O2 TK1 HTR B	R1	F3,F4
H2 TK1 HTR A	R1	F5,F6
H2 TK1 HTR B	R1	F7,F8
O2 TK2 HTR A	R1	F9,F10
O2 TK2 HTR B	R1	F11,F12
H2 TK2 HTR A	R1	F13,F14
H2 TK2 HTR B	R1	F15,F16
O2 TK3 HTR A	R1	F17,F18
O2 TK3 HTR B	R1	F19,F20
H2 TK3 HTR A	R1	F21,F22
H2 TK3 HTR B	R1	F23,F24
O2 TK4 HTR A	A11	F1,F2
O2 TK4 HTR B	A11	F3,F4
H2 TK4 HTR A	A11	F5,F6
H2 TK4 HTR B	A11	F7,F8
O2 TK5 HTR A	A15	F1,F2
O2 TK5 HTR B	A15	F3,F4
H2 TK5 HTR A	A15	F5,F6
H2 TK5 HTR B	A15	F7,F8

2. To access fuses on pnl R1:

R1A2 | Loosen seven fasteners (5/32-in Allen Head Driver)

To access fuses on pnl A11(A15):

A11(A15) | Loosen 22 fasteners (5/32-in Allen Head Driver)

- R1  
(A11,A15)
3. Open pnl to access fuse caps. Do not stress wire bundles on pnl back
  4. Locate fuses (determined in step 1) on pnl back, cut safety wire to fuse caps (Wire Cutters)

NOTE

Fuses powered during removal

5. Remove fuse caps and both fuses (as determined in step 1), replace caps, stow fuses
6. Replace pnl loosened in step 2 (5/32-in Allen Head Driver) (torque fasteners, 30 in-lb)
7. Stow tools

## DDU CHANGEOUT

(1:30 hr) |

OBJECTIVE: Replace failed fwd DDU w/DDU from aft station. If DDU 1 (L) or 2 (R) has partial failure (loss of one pwr supply) and MCC desires failed unit be connected when installed in aft station, cable connection data for aft station installation provided

LOCATION: See FLIGHT DECK (COMPONENT LOCATIONS)

Zone J45 for DDU 1 (L) & 2 (R)

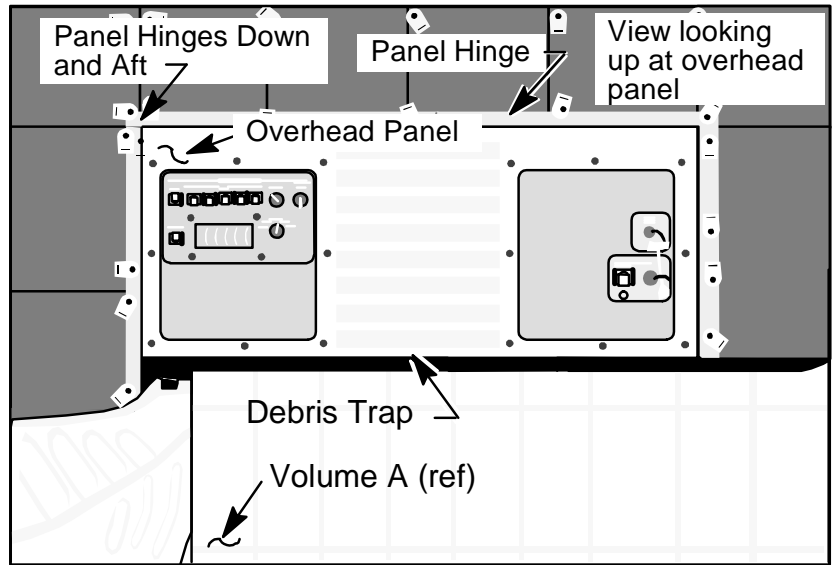
Zone V85 for DDU 3 (Aft)

TOOLS REQD:

TOOL                    Gray Tape  
                         Pwr Screwdriver  
                         6-in & 10-in Extensions  
                         Torque Wrench  
                         5/32-in Allen Head Driver  
                         3/8-in Socket  
                         1/4-in to 3/8-in Adapter  
                         Driver Handle  
                         3/8-in Combination Wrench

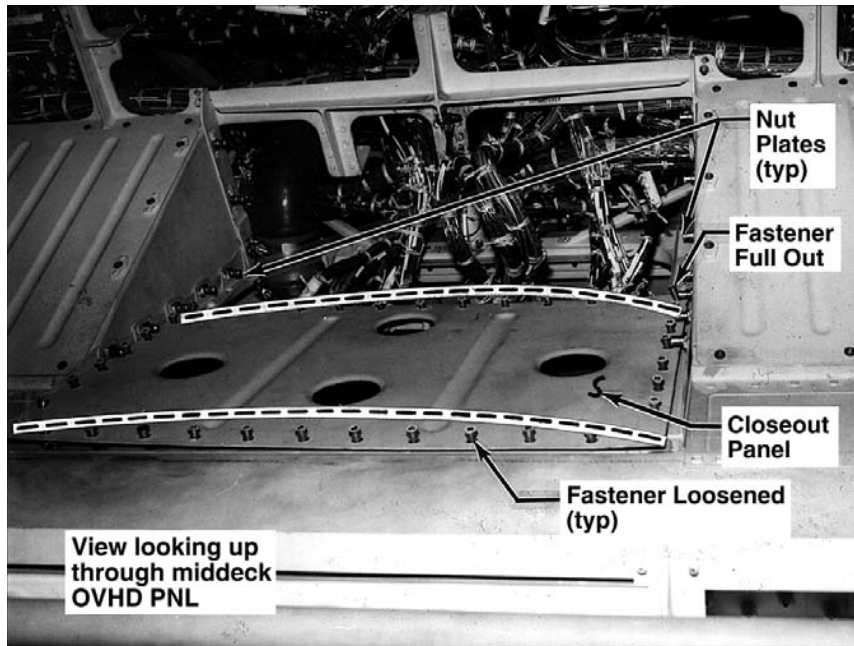
### TO REMOVE FWD DDU

	For DDU 1 (L)	
O14:E		1. cb MNA DDU L – op
O15:E		2. cb MNB DDU L – op
	For DDU 2 (R)	
		3. cb MNB DDU R – op
O16:E		4. cb MNC DDU R – op



jsc48025\_078\_D.cnv

5. Release Debris Trap on middeck ceiling and open overhead pnl containing MO42F,MO58F
6. Loosen closeout pnl fasteners (thirty-six, 5/32-in Allen Head Driver)



108-KSC-382C-2972/8

jsc48025\_066\_D.cnv

7. Pull all fasteners full out and flex pnl as reqd to facilitate removal. Pnl must be flexed to clear nut plates

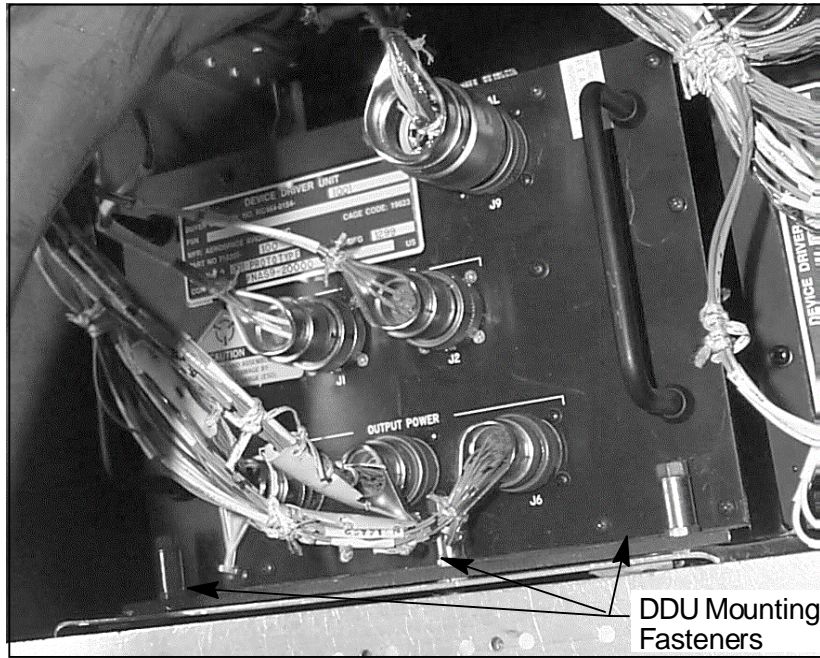
**NOTE**

Facing aft, looking at DDUs left and right reversed

8. Remove all harness connectors on failed unit. Order of removal unimportant. Tape harnesses out of way to facilitate DDU removal

**CAUTION**

Use 3/8-in Combination Wrench to loosen center mounting fastener (to prevent damage to connector above fastener)



jsc48025\_091\_D.cnv

9. Loosen DDU mounting fasteners using Socket on outboard two fasteners and Combination Wrench on center one (three, 3/8-in Socket or Combination Wrench)
10. Remove failed unit, mark w/Gray Tape

TO REMOVE AFT DDU

- O14:E 11. cb MNA DDU AFT – op
- O16:E 12. cb MNC DDU AFT – op
- 13. Remove pnl R18(17 fasteners, 5/32-in Allen Head Driver)
- 14. Remove all harness connectors on DDU. Order of removal unimportant. Tape harnesses out of way to facilitate DDU removal

**CAUTION**  
Use 3/8-in Combination Wrench to loosen center mounting fastener (to prevent damage to connector above fastener)

- 15. Loosen DDU mounting fasteners using socket on outboard two fasteners and combination wrench on center one (three, 3/8-in Socket or Combination Wrench)
- 16. Remove DDU

TO INSTALL AFT DDU FWD

- 17. Install DDU, hand-tighten DDU mounting fasteners (three). Due to interference of connectors, only right fastener can be torqued (100 in-lb)
- 18. Install connectors in following sequence (for ease of installation):

<u>DDU 1 (L), connect</u>		<u>DDU 2 (R), connect</u>	
Cable	DDU	Cable	DDU
30V77W4P274	to J4	30V77W4P284	to J4
	P275 to J5		P285 to J5
	P276 to J6		P286 to J6
	P271 to J1		P281 to J1
	P272 to J2		P282 to J2

TO INSTALL FWD DDU AFT

19. Install DDU, hand-tighten DDU mounting fasteners (three). Due to interference of connectors, only right fastener can be torqued (100 in-lb)

If DDU 3 (aft) cable connections not reqd:

20. Tape over connector interfaces and secure harnesses to structure

If connections reqd, connect:

Cable	DDU
30V77W4P299	to J9
	P291 to J1
	P292 to J2
	P294 to J4
	P295 to J5
	P296 to J6

21. Reinstall flt deck closeout pnl R18 (torque, 30 in-lb)
22. Reinstall middeck DDU closeout pnl, and resecure overhead pnl and Debris Trap (torque, 30 in-lb)



## DTV/MUX REPLACEMENT w/SPARE

(1:00 hr)

**OBJECTIVE:** Replace failed MUX w/flown spare

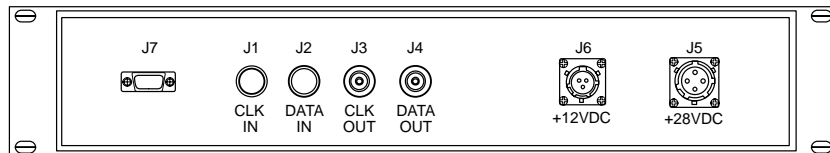
**LOCATION:** Flt Deck pnls L10, L16, L17

### **TOOLS REQD:**

Tool	Ratchet Wrench Pwr Screwdriver Philips Screwdriver 5/32-in Allen Head Driver Wire Cutters (small) 7/16-in socket 1/4-in to 3/8-in Adapter Gray Tape
DTV Bag	MUX Torque Adapter and MUX 7/16-in Combination Wrench

- R1 1. √MCC prior to pwrn  
PL AUX – OFF
- L16, L17 2. Remove pnls L16,L17 (17 fasteners ea, 5/32-in  
Allen Head Driver)
- L10 3. Demate IEEE 1394 plug from IEEE 1394  
receptacle
- L16 4. Cut,remove safety wire attached to J3,J4 (Small  
Wire Cutters)

### MUX – BACK



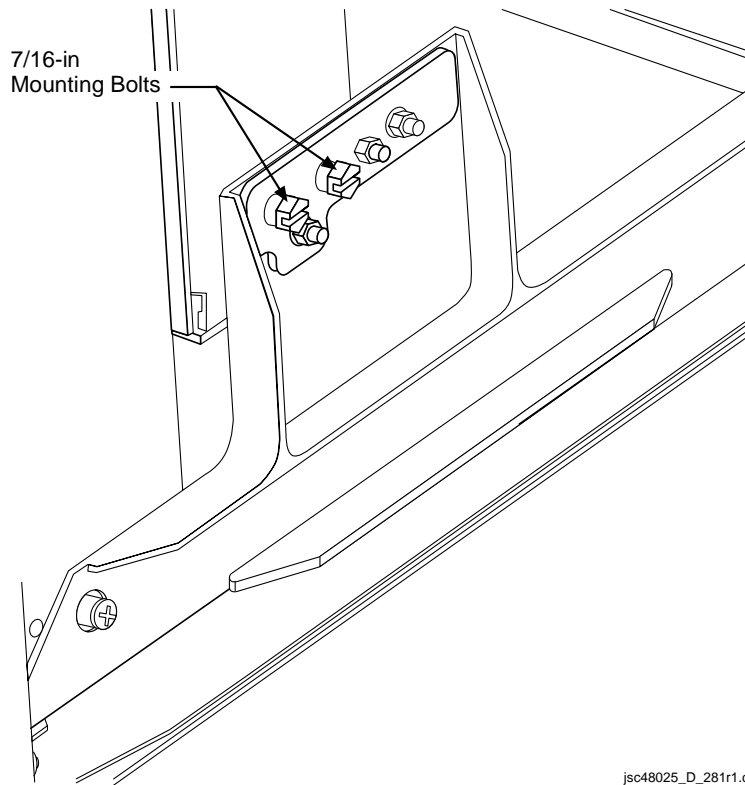
jsc48025\_282r1\_D.cnx

5. Remove connectors mated to J3,J4 (MUX Torque  
Adapter and MUX 7/16-in Combination Wrench)

**NOTE**

During video cable demate and mate, keep Mux 7/16-in Combination Wrench from turning while rotating MUX Torque Adapter in order to avoid twisting video cables

6. Remove connectors mated to J5,J6
7. Remove mounting bolts from sides of MUX support beam (4 bolts, 7/16-in socket and Ratchet Wrench); temp stow

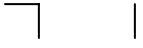


- L10
8. Remove MUX (4 fasteners, Philips Screwdriver), mark w/Gray Tape and stow
  9. Place spare MUX into position, start mounting fasteners (4 fasteners, Philips Screwdriver)

- |         |  |
|---------|--|
|         | 10. Install mounting bolts onto sides of MUX mounting bracket (4 bolts, 7/16-in socket and Ratchet Wrench) |
|         | 11. Finish tightening fasteners on top of MUX (4 fasteners, Philips Screwdriver)                           |
|         | 12. Install connectors onto MUX:   |
|         | Cable 38P74W7172 onto J3 (MUX Torque Adapter and MUX 7/16-in Combination Wrench)                           |
|         | Cable 38P74W7173 onto J4 (MUX Torque Adapter and MUX 7/16-in Combination Wrench)                           |
|         | Cable 38P77W508 onto J5  |
|         | Cable 38P77W507 onto J6  |
| L10     | 13. Mate IEEE 1394 plug to IEEE 1394 receptacle  |
| R1      | 14. PL AUX – ON  |
| L16,L17 | 15. Re-install pnls L16,L17 (17 fasteners ea, torque 30-in lb)   |
|         | 16. Stow tools   |



This Page Intentionally Blank



IFM PROCEDURES

PAGE

Section G Intentionally Omitted

HATCH (B): INNER JAMMED ACTUATOR/LINKAGE  
WORKAROUND ..... H-1  
HATCH: SIDE JAMMED ACTUATOR ..... H-7  
HUD  
HEADS UP DISPLAY ELECTRONIC (HUDE) UNIT  
CHANGEOUT ..... H-9  
PILOT DISPLAY UNIT (PDU) CHANGEOUT ..... H-11  
  
IMU CONTINGENCY COOLING ..... I-1  
  
KEYBOARD KEY CHANGEOUT ..... K-1  
KEY PBI CHANGEOUT (Orbital DAP Type)..... K-4  
KU-BAND ANTENNA  
CONTINGENCY DEPLOY/STOW – FAILED  
DEPLOY/STOW SW ..... K-6  
CONTINGENCY STOW – EA1 ALTERNATE PWR..... K-16  
CONTINGENCY STOW – W/EVA ANTENNA GIMBAL  
ALIGNMENT ..... K-19  
  
LEAK DETECTION – ULTRASONIC ..... L-1  
LEAK SEALING – VACUUM..... L-5  
LIGHT BULB CHANGEOUT ..... L-8  
LOCKERS – MISALIGNED (MOUNTING SCREWS  
WILL NOT START) ..... L-12

PROCEDURES  
G THRU L

PROCEDURES  
G THRU L

This Page Intentionally Blank

## HATCH (B): JAMMED ACTUATOR/LINKAGE WORKAROUND

(45 min)

OBJECTIVE: Disassemble,configure B hatch mechanism components to allow hatch closure,sealing in event of B Hatch actuator jam, linkage jam, or linkage malfunction when hatch is open or can be opened. Procedure will allow hatch to be re-opened after closure

LOCATION: Middeck; Airlock B Hatch

TOOLS REQD:

TOOL	1/4-in Drive Ratchet Wrench 7/16-in Std Socket 7/16-in Combination Wrench Wire Cutters Robbins Wrench Gray Tape
MISC	Adjustable Bungee (one) Ziplock Bag, 12x12

1. Rotate hatch actuator handle to full open posn if possible
2. Pull hatch away from structure and posn in a manner allowing for access to lower linkage components

**CAUTION**

Do not attempt to rotate hatch actuator handle once hatch opened

**NOTE**

Hatch,hinge arms may be removed if necessary by releasing the four pip pins attaching hatch hinge arms to airlock structure.

3. Stabilize hatch to allow for work on linkage mechanism (airlock side)
4. Remove bolt lock wires at locations labeled A, B, C, and D (fig 1) (Wire Cutters)

**NOTE**

Place all loose parts in Ziplock Bag

5. Remove latch linkage Hex Head Bolts at locations labeled A, B, C, and D (fig 1) (7/16-in Std Socket and 1/4-in Drive Ratchet Wrench)

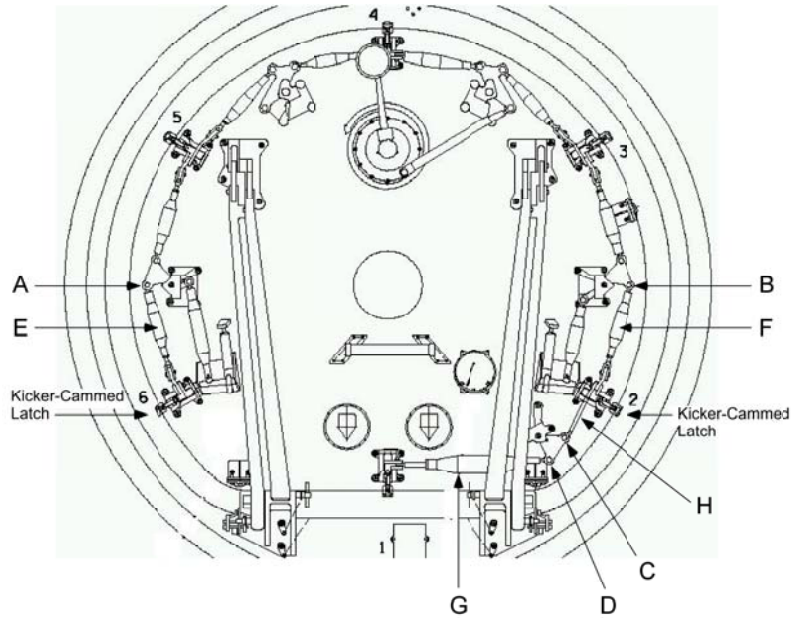


Figure 1

6. Separate linkage components (fig 2)



Figure 2



7. Remove pushrods labeled E, F, and G (fig 1) by unscrewing from attachment linkage (fig 3)

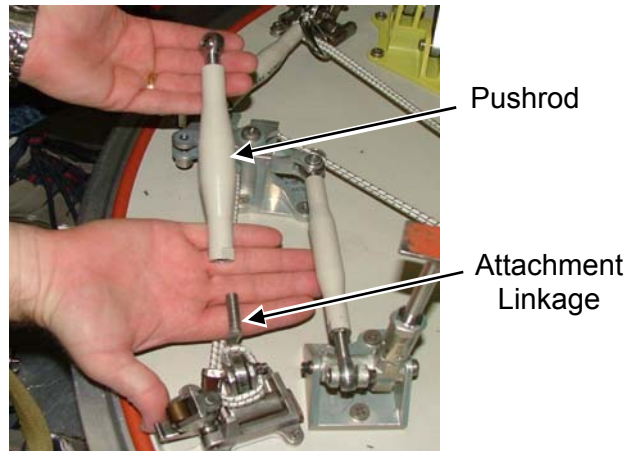


Figure 3

8. Remove eye from pushrod labeled H (fig 1) using 7/16-in Combination Wrench (fig 4)

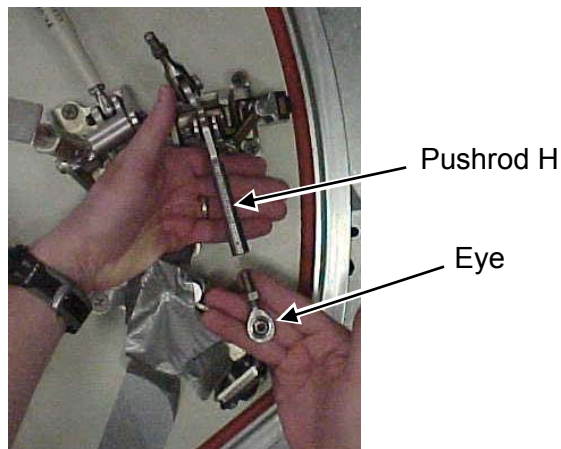


Figure 4

9. ✓All joints on kicker-cammed latches 2,6 move freely from full open to full closed by actuating latches manually

**NOTE**

When kicker-cammed latches bungeed in full open posn, they will be able to rotate towards closed posn when kickers contact bulkhead structure during hatch closure. Tension from bungee will not allow kicker-cammed latches to become over-center locked and thus allow for reopening of hatch

10. Tie adjustable bungee so as to pull kicker-cammed latches 2,6 to full open posn (figs 5,6)

**NOTE**

Bungee should be tight and run underneath hinge arms that attach the hatch to inside of airlock. Fig 5 shows force direction needed to actuate latches 2,6 to full open posn. Fig 6 shows recommended bungee config at latches 2,6

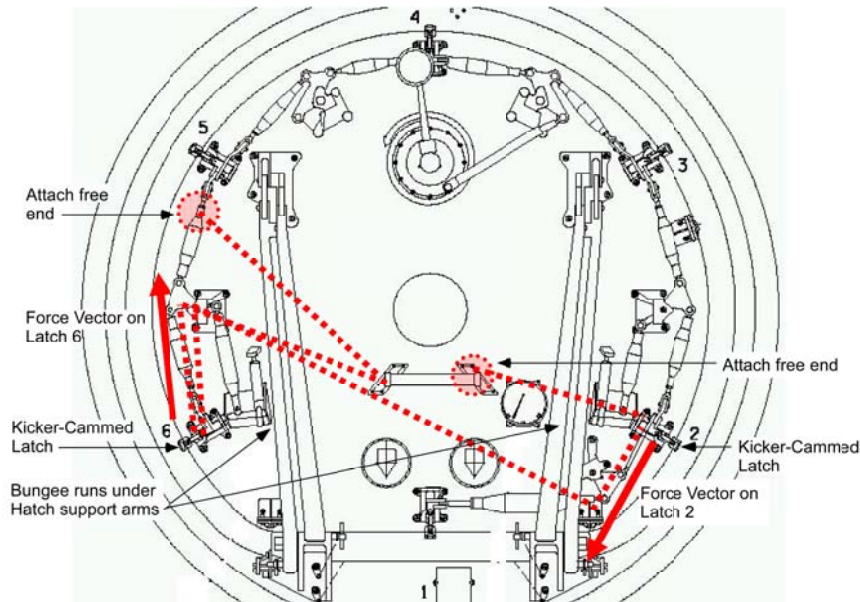


Figure 5

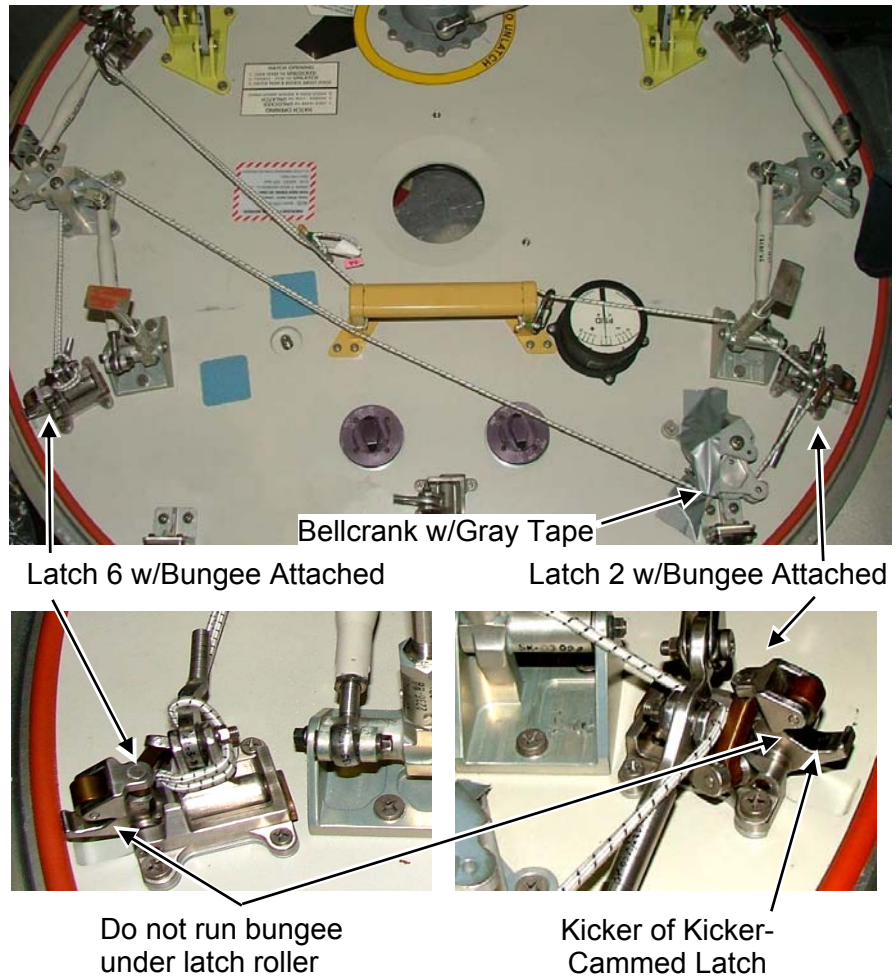


Figure 6

11. Rotate bellcrank to farthest inboard posn and gray tape in place (fig 6)
12. Manually cycle kicker-cammed latches 2,6 from full open to full closed several times. Verify loose linkage hardware will not interfere w/cammed latches. Check that bungee is functioning to pull latches open and prevent latches from becoming over-center locked once closed

- 13. Place hatch in nominal open posn and, if necessary, reinstall four pip pins attaching hatch hinge arms to airlock structure
- 14. Stow tools  
Label Ziplock Bag, stow  
√MCC for stowage location
- 15. To close Hatch:

NOTE

When hatch pushed closed, kicker-cammed latches will contact structure and rotate as hatch seals meet vehicle structure

- a. √Latches 2,6 are in the full open posn
- b. Push hatch closed by fitting hatch against structure in manner consistent w/normal hatch closure
- c. √MCC for plan to secure hatch in closed posn (bungees, wire, rope and/or differential pressure may be called for depending upon mission phase)

## HATCH: SIDE JAMMED ACTUATOR

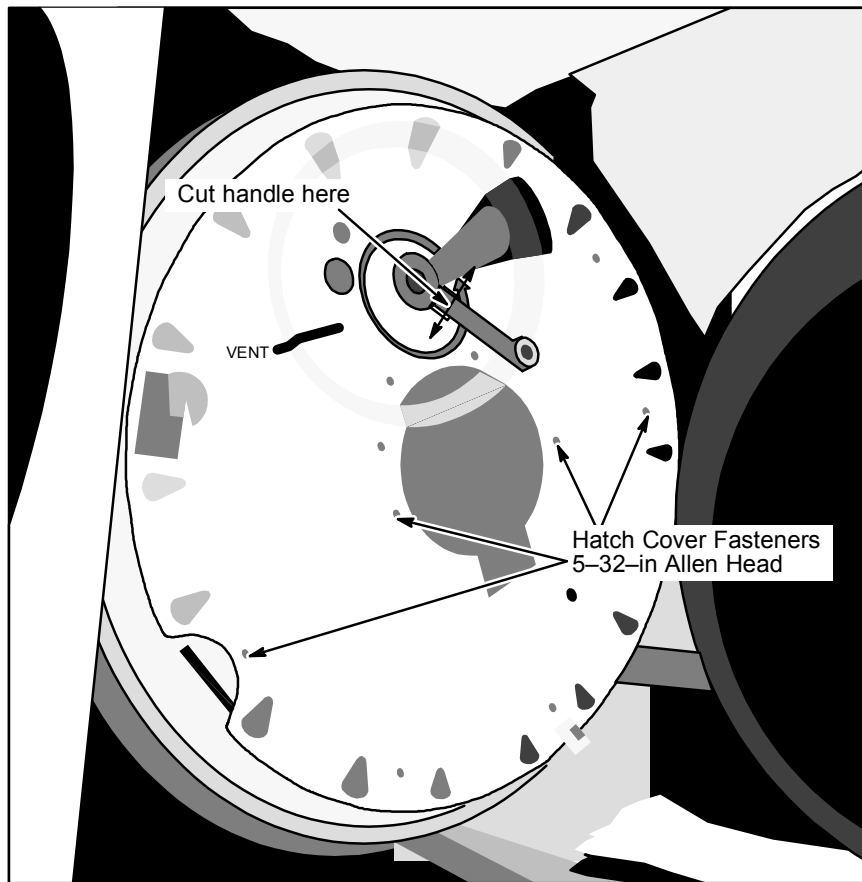
(45 min)

**OBJECTIVE:** Open cabin Side Hatch if actuator mechanism has jammed (Post Landing)

**LOCATION:** Middeck; Side Hatch

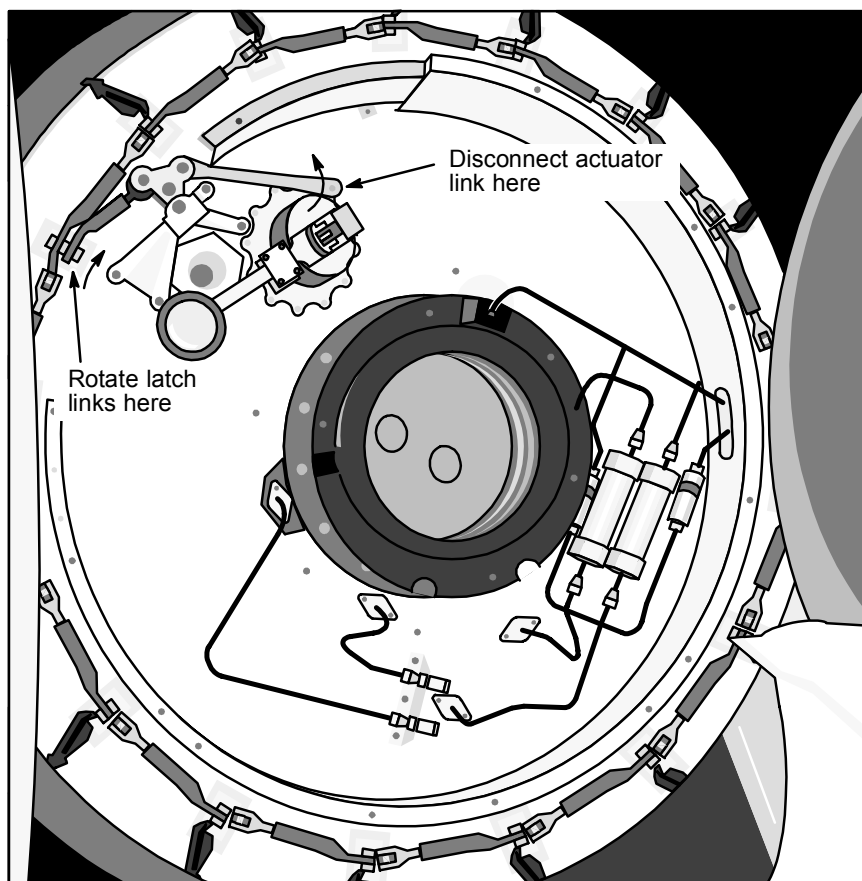
**TOOLS REQD:**

TOOL            10-in Crescent Wrench  
                    Ratchet Wrench  
                    Driver Handle  
                    5/32-in Allen Head Driver  
                    #10 Torque Driver  
                    5/16-in Combination Wrench  
                    Bone Saw



jsc48025\_098\_h.cnv

1. Cut actuator handle w/Bone Saw where shown (see photo on previous pg)
2. Loosen Hatch Cover fasteners (seventeen, 5/32-in Allen Head Driver)



jsc48025\_099\_h.cnv

3. Remove and stow cover
4. Disconnect Actuator Link where shown (see dwg) (#10 Torque Driver and 5/16-in Combination Wrench)
5. Manually (unlock) rotate latch links using Crescent Wrench on exposed nut (see dwg)
6. Open hatch. Stow tools

## HUD: HEADS UP DISPLAY ELECTRONIC (HUDE) UNIT CHANGEOUT

(1:30 hr)

OBJECTIVE: Provide instructions for changing out failed HUDE 1(2) w/operational unit, or spare HUDE if flown

LOCATION: See AV BAY 3B: shelf 1 for HUDE 2 and shelf 4 for HUDE 1 (COMPONENT LOCATIONS). "If flown" location of spare HUDE may vary

### TOOLS REQD:

TOOL	Gray Tape
	Connector Wrench
	Torque Wrench
	Driver Handle
	3/8-in Socket
	5/32-in Allen Head Driver
CHCK	Coldplate Protection Cover (small)

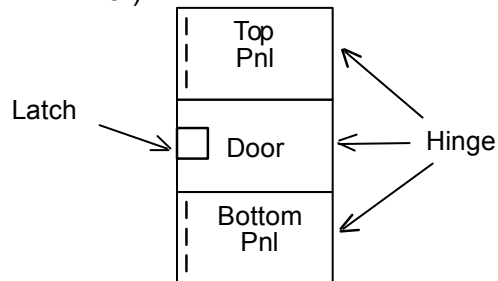
### TO REMOVE HUDE

- F3 1. L(R) HUD PWR – OFF

#### NOTE

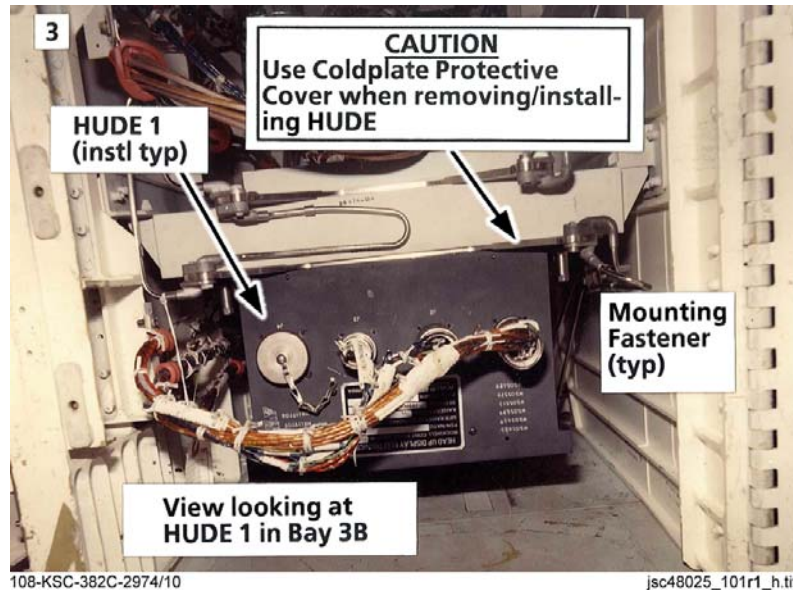
Center door must be opened before lower pnl

2. Open AV BAY 3B, hinged access pnls, top and bottom (five fasteners/door, 5/32-in Allen Head Driver)



jsc48025\_100\_h.cnv

3. Remove connectors J1,J2,J3 from HUDE(s) as reqd
4. Loosen HUDE mounting fasteners (twelve, 3/8-in Socket)
5. Slide Coldplate Protective Cover between coldplate and HUDE. Remove HUDE w/Coldplate Protective Cover, mark failed unit w/Gray Tape



### TO INSTALL HUDE

6. Place HUDE 1(2) or spare w/Coldplate Protective Cover into desired location, remove cover, tighten fasteners (torque, 70 in-lb)
7. Install failed HUDE into vacated spot (torque fasteners, 70 in-lb)
8. Install connectors –
  - For HUDE 1 (bottom shelf) connect:
    - Cable 85V77W1P41 to J1
    - P43 to J2
    - P45 to J3
  - For HUDE 2 (top shelf) connect:
    - Cable 85V77W1P40 to J1
    - P42 to J2
    - P44 to J3
9. Close AV BAY 3B access pnls (torque fasteners, 30 in-lb)
10. Stow tools



## HUD: PILOT DISPLAY UNIT (PDU) CHANGEOUT (1:30 hr)

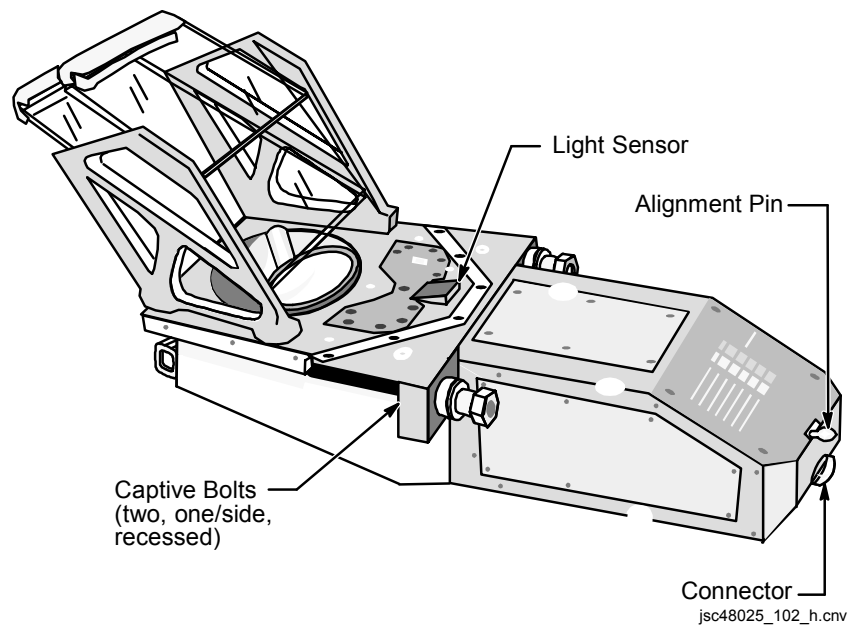
OBJECTIVE: Provide instructions for changing out failed CDR(PLT) PDU w/operational unit, or spare if flown

LOCATION: FLIGHT DECK, F6, F8. 'If flown' location of spare PDU will vary

### TOOLS REQD:

TOOL                    Gray Tape  
                          Inspection Mirror  
                          Torque Wrench  
                          7/16-in Socket  
                          Ratchet Wrench  
                          1/4-in to 3/8-in Adapter  
                          7/64-in Allen Driver  
                          10-in Extension

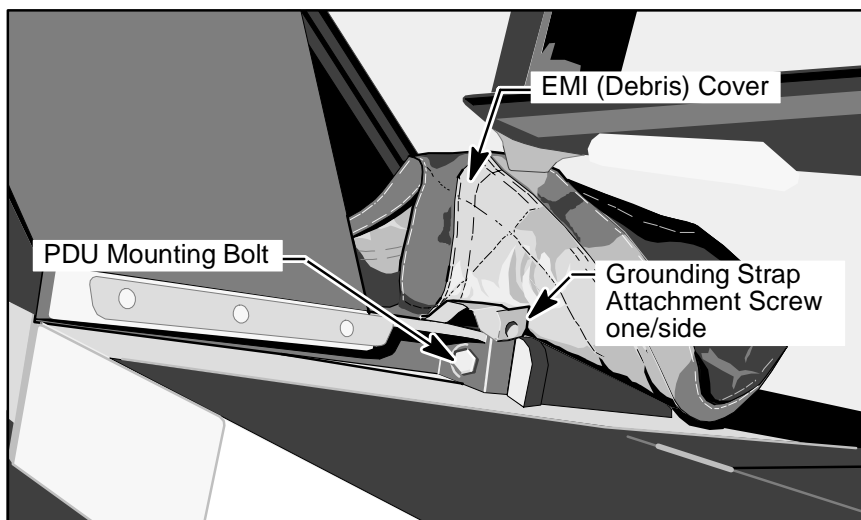
### TO REMOVE PDUs



NOTE

Steps 1-8 for both PDUs

- |       |  |
|-------|--|
| F3    | 1. L(R) HUD PWR – OFF  |
| W2,W5 | 2. Fold W2,W5 handholds to stow position                                       |
| W3,W4 | 3. Cover Windows W3,W4 w/shades  |
|       | 4. Lift EMI cover to access mounting fasteners,<br>ground strap and connectors |



jsc48025\_103\_h.cnv

NOTE

PDU ground strap acts as spring. Do not allow attachment screw (not captive) to fly loose when removing

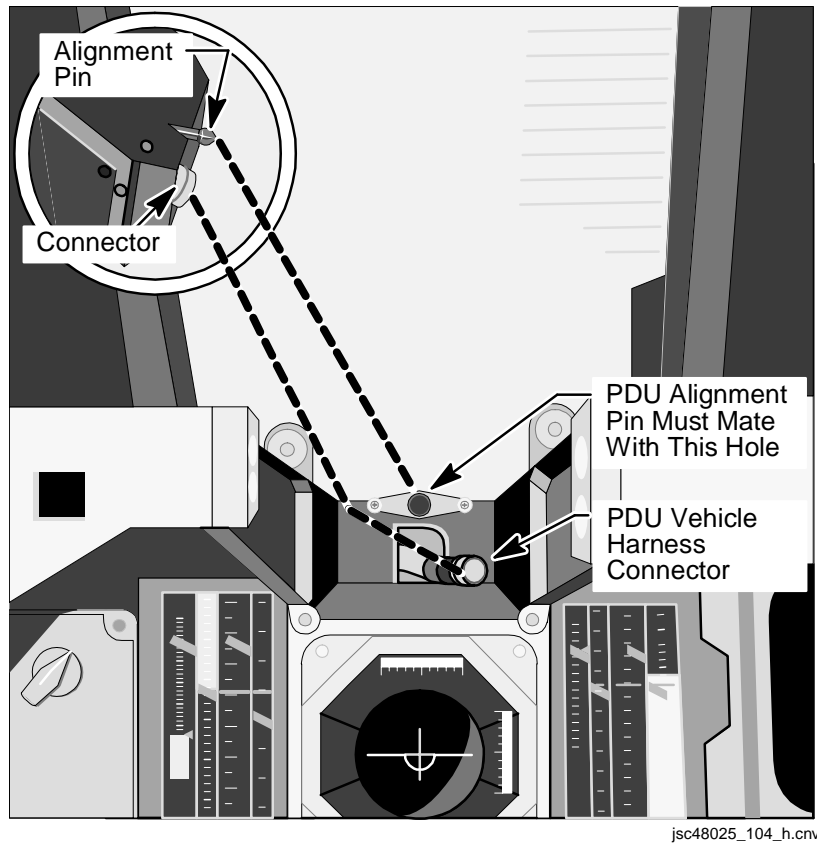
5. Disconnect ground straps (two) from glareshield (one screw, washer/side, 7/64-in Allen Head Driver)

NOTE

Due to limited space, it will be necessary to alternate sides while removing 7/16-in Fasteners (two turns Port, two turns Stbd, etc)

6. Remove mounting fasteners (one/side, 7/16-in Socket)
7. Slide unit out ~5-in and remove connector
8. Remove PDU, mark failed unit w/Gray Tape

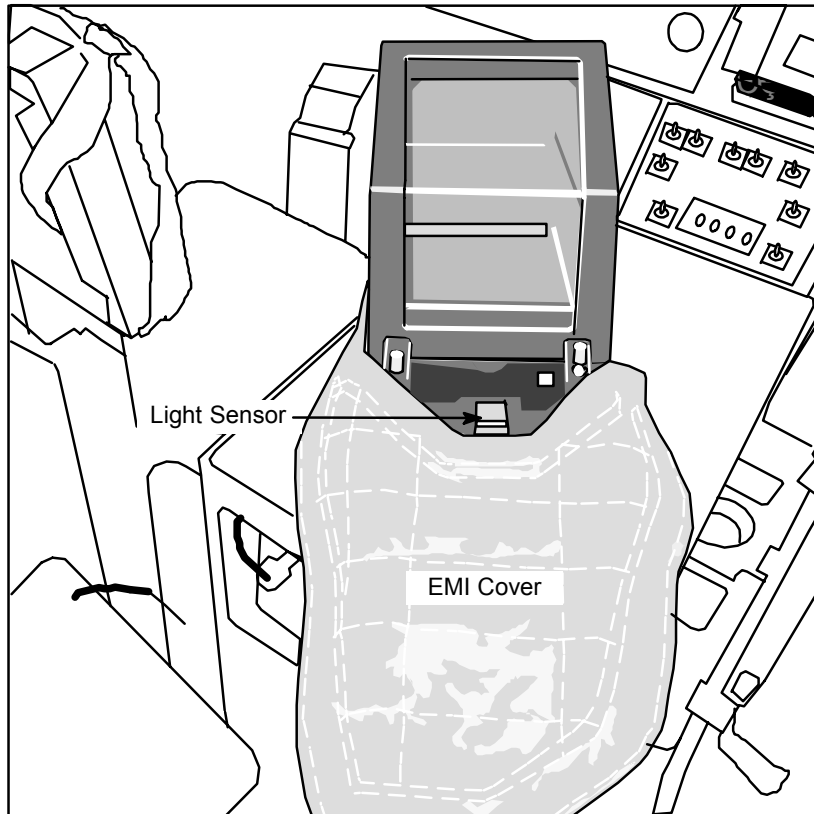
TO INSTALL PDUs



**WARNING**  
When installing PDU, ensure alignment pin at fwd end of unit mates w/hole in structure

**NOTE**  
Steps 9-12 for both PDUs

9. Place unit in approx position, install connector then slide fwd making certain alignment pin at fwd end mates w/alignment hole in mounting structure (Inspection Mirror)
10. Install mounting fasteners (torque, 45 in-lb)



jsc48025\_105\_h.cnv

11. Install ground straps (one screw, washer/side), tighten screws snug

**CAUTION**  
Ensure EMI Cover does not obstruct light sensor. PDU will not work properly if light sensor blocked

12. Reinstall EMI Cover, ensure Velcro secure around light sensor
13. Install failed PDU into vacated position
14. Stow tools

## IMU CONTINGENCY COOLING

(1:00 hr)

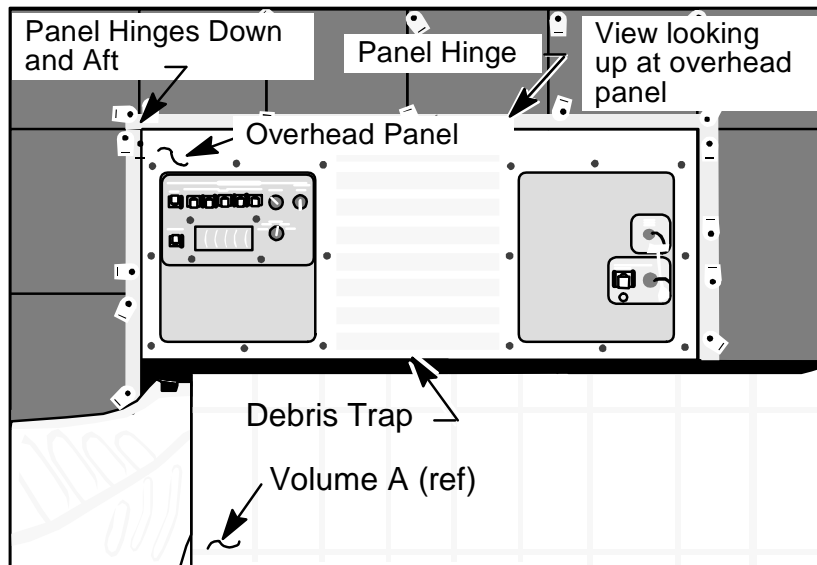
**OBJECTIVE:** Provide ambient air cooling to IMUs using Vacuum Cleaner in place of IMU fan. This procedure will only be accomplished if all three IMU fans have failed

**LOCATION:** IMU hoses are above and fwd of middeck overhead panel containing MO42F,MO58F

**TOOLS REQD:**

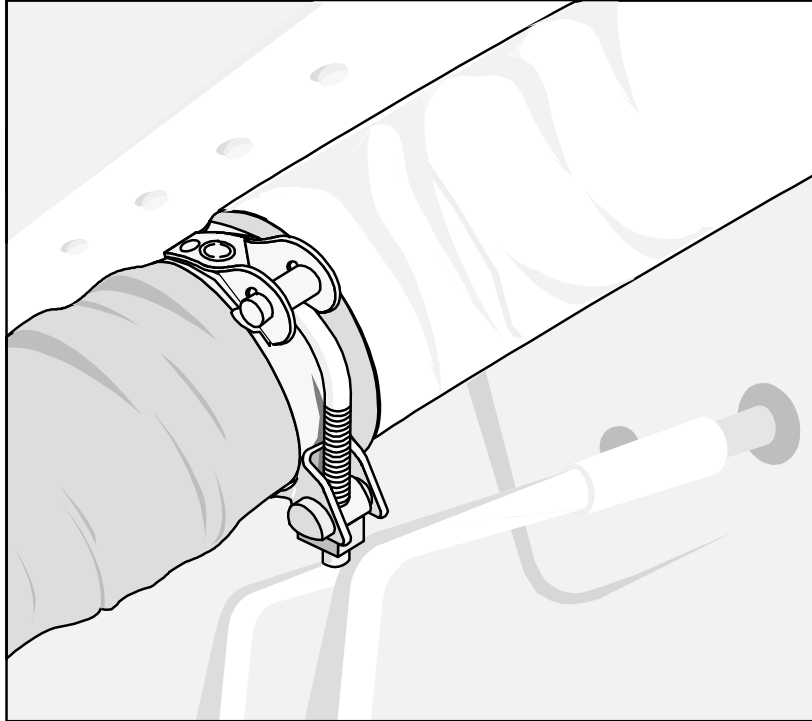
TOOL	Gray Tape
	3/8-in Deepwell Socket
	Ratchet Wrench
	1/4-in to 3/8-in Adapter
	3/8-in Combination Wrench
VAC	Vacuum Cleaner and Hose
MISC	Flight Data File

1. Release Debris Trap and open overhead panel containing MO42F,MO58F



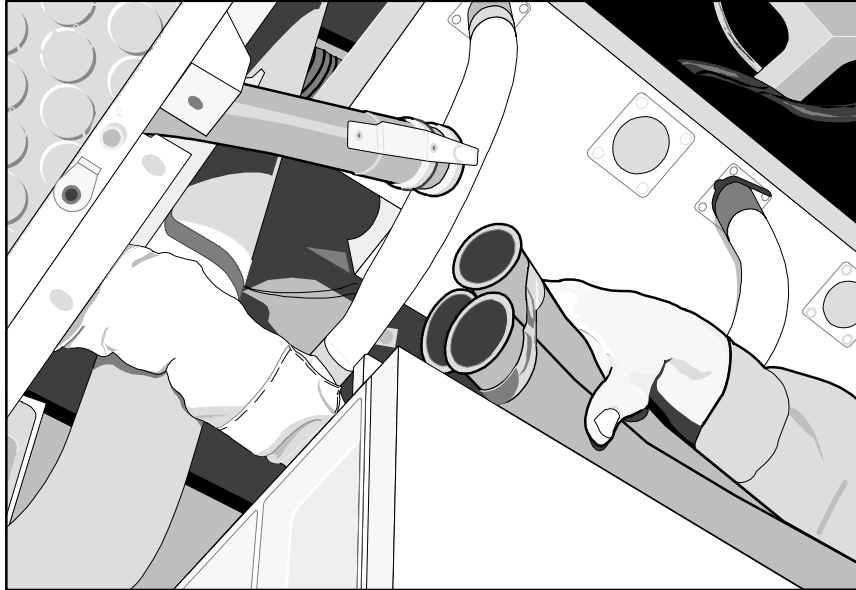
jsc48025\_078\_i.cnv

2. Loosen IMU outlet hose clamps (two above, one left of IMU Muffler) at outlet manifold (3/8-in Deepwell Socket). Remove clamps (not captive)



jsc48025\_107\_i.cnv

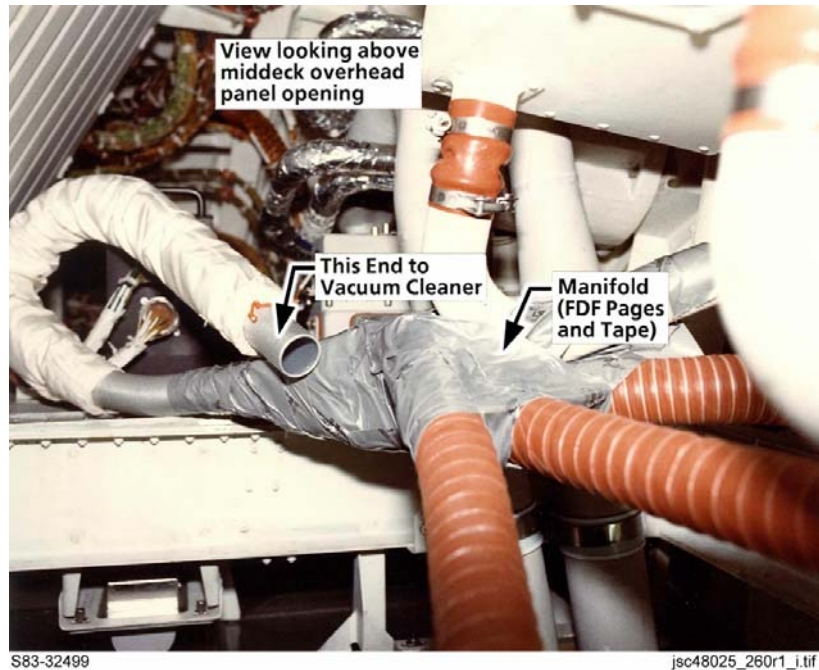
3. Pull IMU outlet hoses (three) from IMU manifold (two above, one left of IMU Muffler), bring hose ends together near Vol A (MF57A) and in close relationship to Vacuum Cleaner Hose end



jsc48025\_108\_i.cnv

**CAUTION**  
Do not crush flexible hose ends  
restricting air flow to IMUs

4. Build manifold using Flight Data File and Gray Tape as shown



5. Secure Vacuum Cleaner to top of Vol A (MF57A) w/Gray Tape. Connect Vacuum Cleaner Hose to Vacuum
  6. ✓ AC UTIL PWR AC1 – OFF
  7. Connect Vacuum Cleaner cable to AC1 outlet
  8. AC UTIL PWR AC1 – ON
  9. VAC CLEANER – ON
  10. Install middeck overhead pnl and Debris Trap w/Gray Tape
  11. Stow tools and clamps
- MO52J

Section J  
Intentionally  
Omitted



## KEYBOARD KEY CHANGEOUT

(10 min)

**OBJECTIVE:** Replace failed Key in fwd Keyboard using ACK Key from aft Keyboard as spare

**LOCATION:** Fwd Keyboards pnl C2, aft Keyboard pnl R11

**TOOLS REQD:**

TOOL            Gray Tape  
                  Small Screwdriver  
                  Jeweler's Screwdriver

### TO REMOVE KEYBOARD KEY

1. Pwr down

Left Keyboard

- L4:R            2. cb AC3  $\Phi$ B INST L/CTR – op  
C2                3. CRT1,3 PWR (two) – OFF

Right Keyboard

- L4:R            4. cb AC1  $\Phi$ A INST R – op  
C2                5. CRT2,3 PWR (two) – OFF

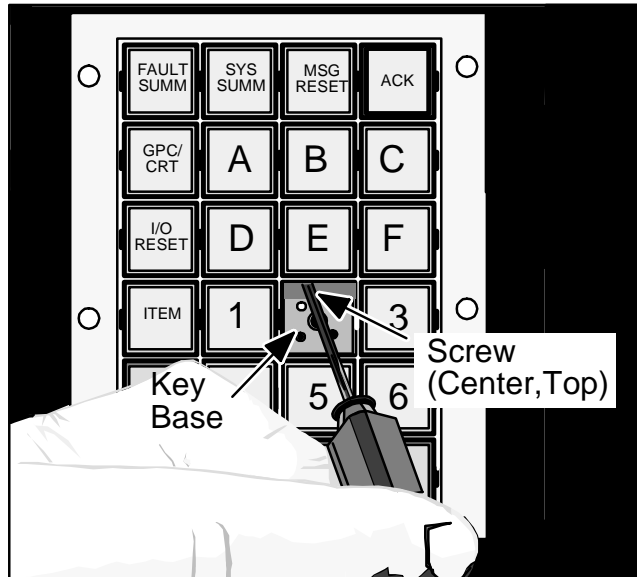
Aft Keyboard

- L4:Q            6. cb AC3  $\Phi$ B LTG PNL MS – op  
R11L            7. CRT4 PWR – OFF

8. Carefully pry Key Cap up/out and remove



jsc48025\_112\_k.cnv



jsc48025\_113\_k.cnv

9. Remove Key base by turning screw (see dwg) ccw approx 13-1/2 turns until base can be pulled free of pnl

#### TO INSTALL KEYBOARD KEY

10. Verify label (TOP) up, in relationship to Keyboard nomenclature. Install base, tighten screw
11. Install Key Cap  
Check orientation nomenclature on cap
12. Place Gray Tape over exposed hole in aft Keyboard
13. Stow tools, failed Key

14. Pwr up Keyboard and check Key for affected CRT(s)

Left Keyboard

- |      |                                     |
|------|-------------------------------------|
| L4:R | 15. cb AC3 $\Phi$ B INST L/CTR – cl |
| C2   | 16. CRT1,3 PWR (two) – ON           |

Right Keyboard

- |      |                                 |
|------|---------------------------------|
| L4:R | 17. cb AC1 $\Phi$ A INST R – cl |
| C2   | 18. CRT2,3 PWR (two) – ON       |

Aft Keyboard

- |      |                              |
|------|------------------------------|
| L4:Q | 19. cb AC3 B LTG PNL MS – cl |
| R11L | 20. CRT4 PWR – ON            |

**KEY PBI CHANGEOUT (Orbital DAP Type)**

(10 min)

OBJECTIVE: Replace failed Key w/Key from another pnl

NOTE

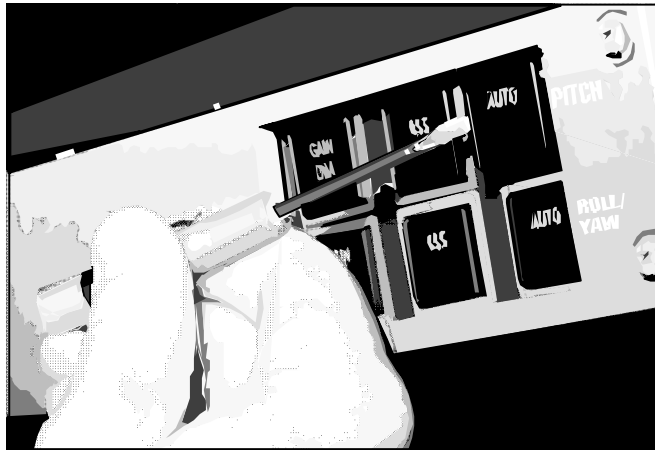
Contact MCC for location/name  
of spare Key

LOCATION: (Following PBIs interchangeable)

PBI	PNL
AUTO	F2,F4
CSS	
AUTO/MAN	
ABORT	F6
RANGE SAFE ARM	
ATT REF	F6,F8
ARM	
DN	
SM ALERT	F7
LFT/LFT	
CNT/CNT	
RT/RT	
LFT	C3
CNT	
RT	
ORBITAL DAP (ALL)	
SEP	
AGENT DISCH	L1
ATT REF	A6
ORBITAL DAP (ALL)	
VIDEO IN/OUT (ALL)	A7

TOOLS REQD:

TOOL            Gray Tape  
                  Small Screwdriver



jsc48025\_114\_k.cnv



jsc48025\_115\_k.cnv

1. To remove, pry Key (up/loose) w/screwdriver
2. To install, align Key by label (TOP) or nomenclature on face and gently push in
3. Tape over hole at spare Key location
4. Stow replaced Key and tools

**CAUTION**  
Contact MCC for functional test

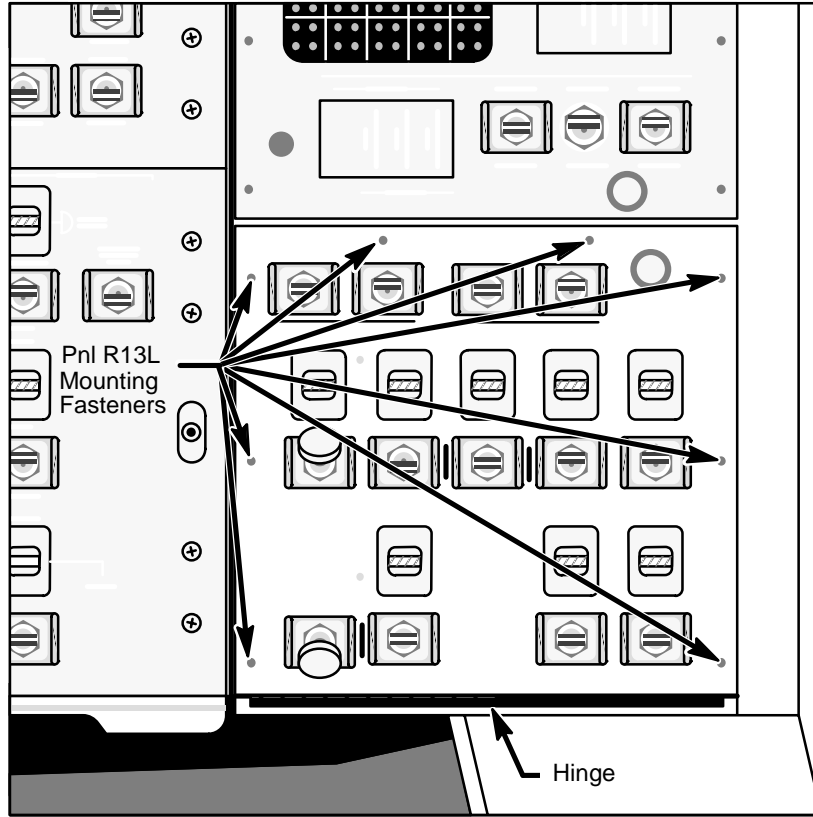
**KU-BAND ANTENNA: CONTINGENCY**  
**DEPLOY/STOW – FAILED DEPLOY/STOW SW** (1:00 hr)

OBJECTIVE: Deploy(stow) Ku-Band Antenna should Deploy/Stow sw fail. Procedure uses auxiliary source of DC voltage to bypass sw. This will be performed using single motor operation

LOCATION: Backside of pnl R13L

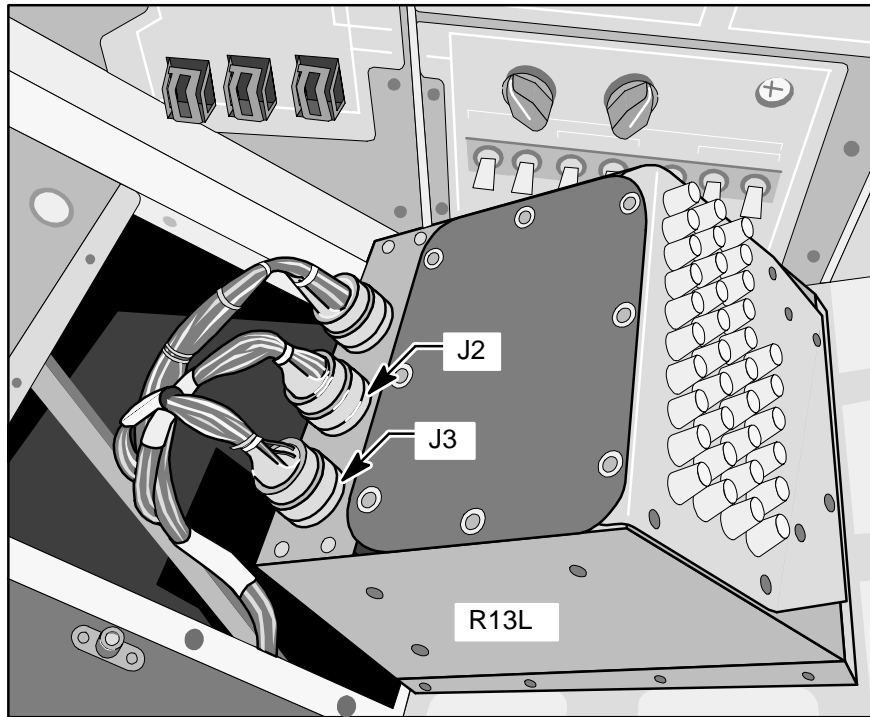
TOOLS REQD:

- |      |   |
|------|---|
| TOOL | Gray Tape   |
|      | Pin Kit (for Test Jumper Leads<br>and Ku-Band Antenna Cable)                            |
|      | Torque Wrench   |
|      | Driver Handle   |
|      | 5/32-in Allen Head Driver   |
| BOB  | IFM Breakout Box  |
| CHCK | DC Pwr Cables   |
| R13L | 1. Pwr down:<br>PL BAY MECH PWR SYS 1,2 (two) – OFF<br>KU ANT DIRECT STO – OFF<br>– GND |
|      | 2. a. Breakout Box:<br>AUX – OFF<br>28V VAR VOLT – 28V<br>PWR A,B – OFF                 |
|      | b. Remove Fuse Cap from side B  |
|      | c. Rotate GA SEL B – 22   |
|      | d. Install 1-Amp Fuse, replace cap  |



jsc48025\_262r1\_k.cnv

- R13L 3. Open pnl R13L (hinged at bottom, eight fasteners, 5/32-in Allen Head Driver)



jsc48025\_263\_k.crv

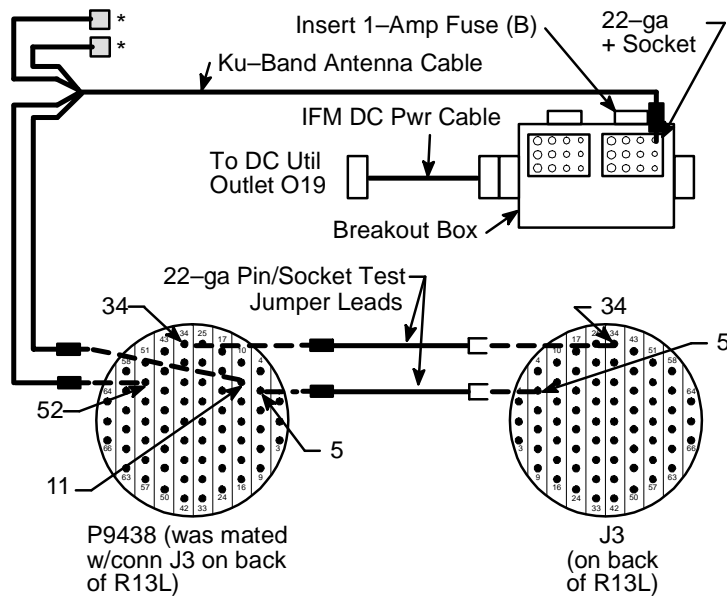
- R13L      For Motor 1 operation:  
            |    4. Disconnect Cable 30V77W2P9438 from J3  
            |    For Motor 2 operation:  
            |    5. Disconnect Cable 30V77W2P9437 from J2
- O19        6. √DC UTIL PWR MNA – OFF
- |    For Ku-Band deployment:  
            |    7. Go to step 9 (Motor 1) or step 10 (Motor 2)  
            |    For Ku-Band stowage:  
            |    8. Go to step 17 (Motor 1) or step 18 (Motor 2)



## KU-BAND ANTENNA DEPLOYMENT

9. To deploy Ku-Band Antenna using Motor 1
  - a. Connect Ku-Band Antenna Cable and two 22-ga Pin/Socket Test Jumper Leads as shown, then:
  - b. Go to steps 11-16 to deploy

PIN ASSIGNMENT		
Pin/Socket No.	Connects To	Purpose
S11(P9438)	DC UTIL PWR	Aux source of 28 VDC to close DPLY CMD RLY K72
S52(P9438)	DC UTIL PWR	Aux source of 28 VDC to close DPLY CMD RLY K70
S5(P9438)	P5(J3)	Provide CNTL CA1 pwr thru PL MECH PWR SYS 1 sw
S34(P9438)	P34(J3)	Provide CNTL CA2 pwr thru PL MECH PWR SYS 1 sw

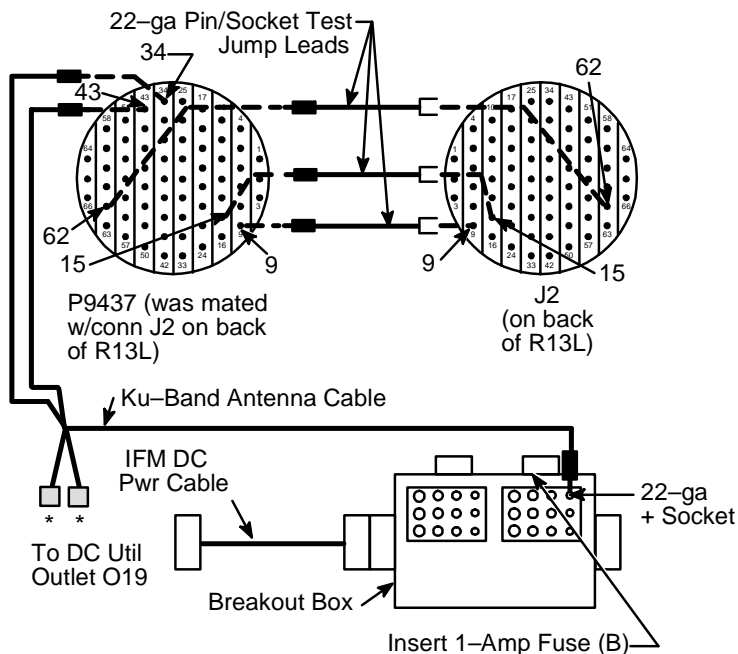


\* Install insulation (Pin Kit, Flap 7); insulation must fully cover unused sockets and pins

jsc48025\_264\_k.cvn

10. To deploy Ku-Band Antenna using Motor 2

- a. Connect Ku-Band Antenna Cable and three 22-ga Pin/Socket Test Jumper Leads as shown, then:
- b. Go to steps 11-16 to deploy



\* Install insulation (Pin Kit, Flap 7); insulation must fully cover unused sockets and pins

JSC48025\_265\_k.cnv

PIN ASSIGNMENT		
Pin/Socket No.	Connects To	Purpose
S34(P9437)	DC UTIL PWR	Aux source of 28 VDC to close DPLY CMD RLY K37
S43(P9437)	DC UTIL PWR	Aux source of 28 VDC to close DPLY CMD RLY K27
S62(P9437)	P62(J2)	Provide CNTL BC1 pwr thru PL MECH PWR SYS 2 sw
S15(P9437)	P15(J2)	Provide CNTL BC2 pwr thru PL MECH PWR SYS 2 sw
S9(P9437)	P9(J2)	Regain Deploy/Stow tb

NOTE

Activate TV, select best Camr to view  
antenna deploy and rcd video on VTR

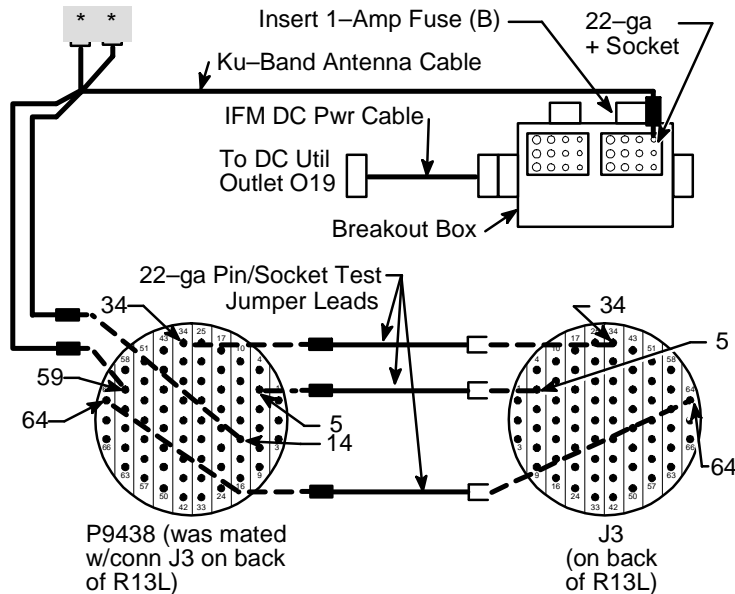
- |      |  |  |
|------|--|--|
| A1U  | 11. √KU BD PWR – OFF<br>CNTL – PNL   |  |
| R13L | 12. √KU ANT – GND<br>√DIRECT STO – OFF<br>PL BAY MECH PWR SYS 1,2 (two) – ON |  |
| O19  | 13. DC UTIL PWR MNA – ON<br>14. Breakout Box:<br>PWR B – ON (22 lt ON)       |  |
| R13L | 15. √KU ANT tb – DPY (~46 sec)<br>16. Go to step 41                          |  |

## KU-BAND ANTENNA STOWAGE

### 17. To stow Ku-Band Antenna using Motor 1

- a. Connect Ku-Band Antenna Cable and three 22-ga Pin/Socket Test Jumper Leads as shown, then:
- b. Go to steps 19-43 to stow

PIN ASSIGNMENT		
Pin/Socket No.	Connects To	Purpose
S59(P9438)	DC UTIL PWR	Any source of 28; VDC to close STO CMD RLY K68
S14(P9438)	DC UTIL PWR	Any source of 28 VDC to close STO CMD RLY K14
S5(P9438)	P5(J3)	Provide CNTL CA1 pwr thru PL MECH PWR SYS 1 sw
S34(P9438)	P34(J3)	Provide CNTL CA2 pwr thru PL MECH PWR SYS 1 sw
S64(P9438)	P64(J3)	Regain Deploy/Stow tb

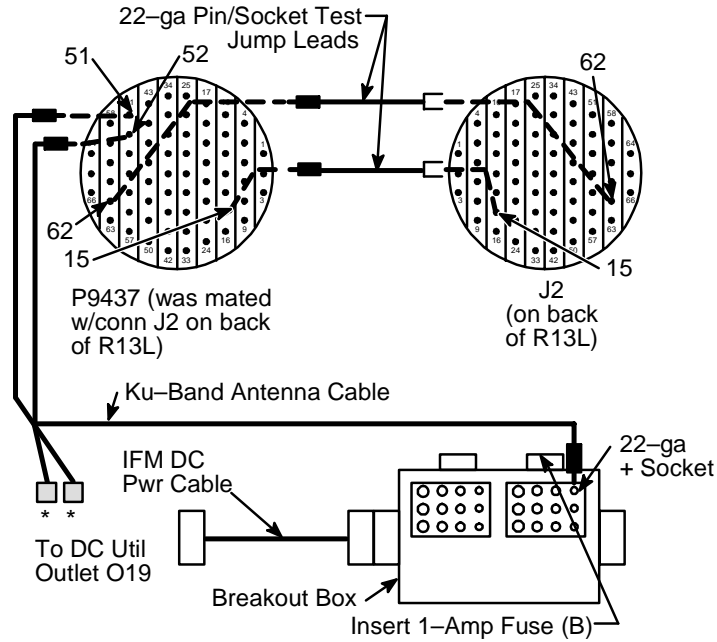


\* Install insulation (Pin Kit, Flap 7); insulation must fully cover unused sockets and pins

jsc48025\_266\_k.cnv

18. To stow Ku-Band Antenna using Motor 2

- a. Connect Ku-Band Antenna Cable and two 22-ga Pin/Socket Test Jumper Leads as shown, then:
- b. Go to steps 19-43 to stow



\* Install insulation (Pin Kit, Flap 7); insulation must fully cover unused sockets and pins

jsc48025\_267\_k.cnv

PIN ASSIGNMENT		
Pin/Socket No.	Connects To	Purpose
S51(P9437)	DC UTIL PWR	Any source of 28 VDC to close STO CMD RLY K25
S52(P9437)	DC UTIL PWR	Any source of 28 VDC to close STO CMD RLY K2
S62(P9437)	P62(J2)	Provide CNTL BC1 pwr thru PL STO PWR SYS 2 sw
S15(P9437)	P15(J2)	Provide CNTL BC2 pwr thru PL STO PWR SYS 2 sw

NOTE

Activate TV, select best Camr to view  
antenna stow and rcd video on VTR

- |      |  |  |
|------|--|--|
| R13L | 19. √PL BAY MECH PWR SYS 1,2 (two) – OFF                                   |  |
| A1U  | 20. KU BD MODE – RDR PASSIVE<br>CNTL – PNL                                 |  |
|      | 21. √KU BD PWR – ON  |  |
|      | If KU BD PWR was OFF in step 21:   |  |
|      | 22. <span style="border: 1px solid black; padding: 2px;">SM ANTENNA</span> |  |
|      | 23. I/O RESET KU – ITEM 8 EXEC (*)   |  |
|      | 24. Wait 1 min for antenna to initialize before<br>proceeding to step 25   |  |
| A2   | 25. √DIGI-DIS SEL – EL/AZ  |  |
| A1U  | 26. √KU BD sel – MAN SLEW  |  |
|      | 27. SLEW RATE – as reqd<br>ELEV – as reqd                                  |  |
| A2   | 28. R/ELE ind: -27.0 ( $\pm 1^\circ$ )                                     |  |
| A1U  | 29. SLEW AZM – as reqd   |  |
| A2   | 30. R dot/AZM ind: -123.0 ( $\pm 1^\circ$ )                                |  |

LOCK GIMBALS

NOTE

Breakout Box must remain powered  
until KU PWR deactivated to prevent  
antenna reinitialization

- |     |  |  |
|-----|--|--|
| O19 | 31. DAP: VERN(FREE)  |  |
|     | 32. DC UTIL PWR MNA – ON   |  |
|     | 33. Breakout Box:<br>PWR B – ON (22 It ON)   |  |
|     | 34. Monitor KU ANT gimbal angles for 50 sec (gimbal<br>lock test), then:           |  |
| A2  | 35. √R/EL ind: -29.0 ( $\pm 1^\circ$ )<br>√R dot/AZM ind: -125.0 ( $\pm 1^\circ$ ) |  |
|     | 36. DAP: as reqd   |  |

STOW DEPLOYED ASSEMBLY

- R13L 37. PL BAY MECH PWR SYS 1,2 (two) – ON
- 38. √KU ANT tb – STO (~46 sec)
- A1U 39. KU BD PWR – OFF (Expect 'BCE KU BYP')
- 40. cb MNB KU ELEC – op  
MNC KU SIG PROC – op
- R13L 41. PL BAY MECH PWR SYS 1,2 (two) – OFF
- 42. Breakout Box:  
PWR B – OFF
- O19 43. DC UTIL PWR MNA – OFF

CLOSE OUT PNL AND STOW TOOLS

- O19 44. Disconnect Pin/Socket Test Jumper Leads
- 45. Disconnect Ku-Band Antenna Cable
- O19 46. Disconnect IFM Pwr Cable from O19 and  
Breakout Box
  
- R13L For Motor 1:  
47. Reconnect cable 30V77W2P9438 to J3  
For Motor 2:  
48. Reconnect cable 30V77W2P9437 to J2
  
- 49. Close pnl R13L (torque fasteners, 30 in-lb)
- 50. Stow Ku-Band Antenna Cable and Pin/Socket  
Test Jumper Leads in Pin Kit
- 51. Stow Pin Kit, Breakout Box, tools, tape, IFM Pwr  
Cable

**KU-BAND ANTENNA: CONTINGENCY**

**STOW – EA1 ALTERNATE PWR**

(2:00 hr)

OBJECTIVE: Stow Ku-Band Antenna when pwr to EA1 lost due to shorted Cross Pointer, Digital Display Meter, EA2, or other failures causing loss of RPC #53. RPC #53 cntls MNC pwr to EA1

NOTE

These failures also cause loss of Radar Mode, due to loss of pwr signals for Radar Mode

LOCATION: See AV BAY 3A, Zone 9A (COMPONENT LOCATIONS)

TOOLS REQD:

TOOL

Gray Tape  
Pwr Screwdriver  
Connector Pliers  
3/16-in & 5/32-in Allen Head Drivers  
Pin Kit (12-ga Test Jumper Leads)  
Ratchet Wrench

BOB

IFM Breakout Box

CHCK

DC Pwr Cable

A1U

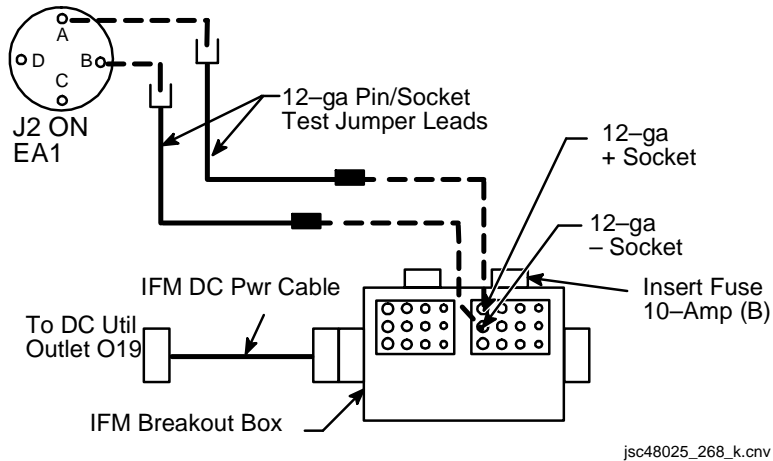
1. KU BD PWR – OFF  
CNTL – PNL

R14:C

2. cb MNB KU ELEC – op  
MNC KU SIG PROC – op
3. a. Breakout Box:  
AUX – OFF  
28V VAR VOLT – 28V  
PWR A,B – OFF  
b. Remove Fuse Cap from side B  
c. Rotate GA SEL B – 12  
d. Install 10-Amp Fuse, replace cap
4. Remove Window Shade Bag from mounting brkt (loosen straps)
5. Remove mounting brkt from AV BAY 3A (4 of 7 fasteners, 3/16-in Allen Head Driver)
6. If reqd, reposition Vol B (one pip pin) and/or remove AV BAY 3A upper closeout pnl(s) (5/32-in Allen Head Driver)
7. Remove P358 from J2 on EA1, tape over interface and temp secure cable to structure



- 8. Remove P375 from J2 of EA2, tape over interface
- O19 9. √DC UTIL PWR MNA – OFF
- 10. Install Breakout Box and Cables as illustrated:



- R14:C 11. cb MNB KU ELEC – cl  
MNC KU SIG PROC – cl
- O19 12. DC UTIL PWR MNA – ON
- 13. Breakout Box:  
PWR B – ON (12 lt ON)
- A1U 14. KU BD PWR – ON  
MODE – COMM

NOTE

Allow 2 min for system to initialize

- 15. SM ANTENNA
- 16. I/O RESET KU – ITEM 8 EXEC (\*)
- 17. √EL ACT – 00.0
- 18. √AZ ACT – 00.0

NOTE

Stow antenna in Comm Mode not Radar Mode

O19

19. Stow Antenna in Comm Mode per KU-BD ANT STOW (ORB OPS, COMM/INST)
20. DC UTIL PWR – OFF
21. Remove Test Jumper Leads and Cables.  
Remove tape from connector and reinstall P358 to J2 on EA1 and P375 on J2 of EA2
22. Reinstall AV BAY 3A upper closeout pnl(s), (torque fasteners, 30 in-lb). Reinstall Vol B if reqd
23. Reinstall Window Shade Bag mounting brkt (torque fasteners, 30 in-lb)
24. Reinstall Window Shade Bag
25. Stow tools, tape

**KU-BAND ANTENNA: CONTINGENCY STOW –  
W/EVA ANTENNA GIMBAL ALIGNMENT** (2:30 hr)

OBJECTIVE: Stow Ku-Band Antenna when gimbals can not be slewed due to EA1 Command Path(gimbal motor) failure. This procedure reqs Antenna gimbal alignment by EVA crewmember to allow gimbal lock

LOCATION: See AV BAY 3A, Zone 9 (top shelf); for Electronic Assembly 1 (EA1) location (COMPONENT LOCATIONS)

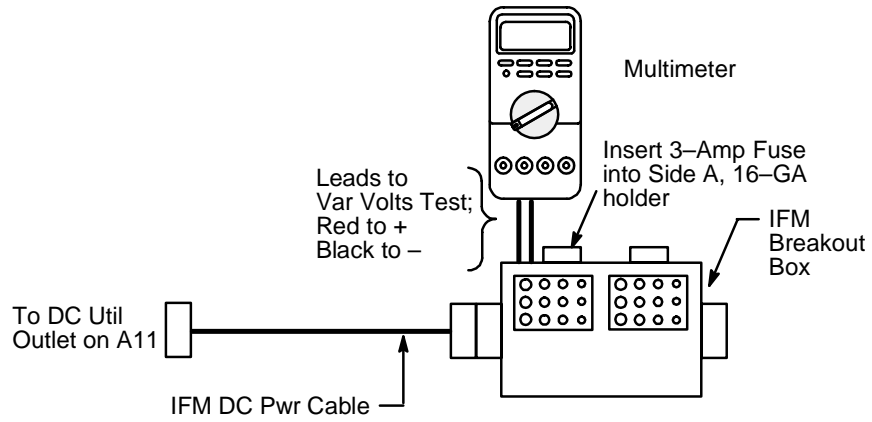
TOOLS REQD:

TOOL Gray Tape  
Pin Kit (16-ga Test Jumper Leads)  
Multimeter  
Pwr Screwdriver  
Robbins Wrench  
1/4-in to 3/8-in Adapter  
Locker Tool  
Driver Handle  
Torque Wrench  
3/16-in & 5/32-in Allen Head Drivers  
Ratchet Wrench  
BOB IFM Breakout Box  
CHCK DC Pwr Cable

1. Remove window shade bag from mounting brkt (loosen straps)
2. Remove mounting brkt from AV BAY 3A (4 of 7 fasteners, 3/16-in Allen Head Driver)
3. If reqd, reposition Vol B and/or remove AV BAY 3A upper closeout pnl(s) to gain access to Ku-Band EA1 (5/32-in Allen Head Driver)
4. Remove two, 5-in 16-ga Pin/Pin and two, 24-in 16-ga Pin/Socket Test Jumper Leads from Pin Kit
5. a. Breakout Box:  
AUX – OFF  
28V VAR VOLT – VAR VOLT  
PWR A,B – OFF  
b. Remove Fuse Cap from side A  
c. Rotate GA SEL A – 16  
d. Install 3-Amp Fuse, replace cap
6. KU BD PWR – OFF  
CNTL – PNL

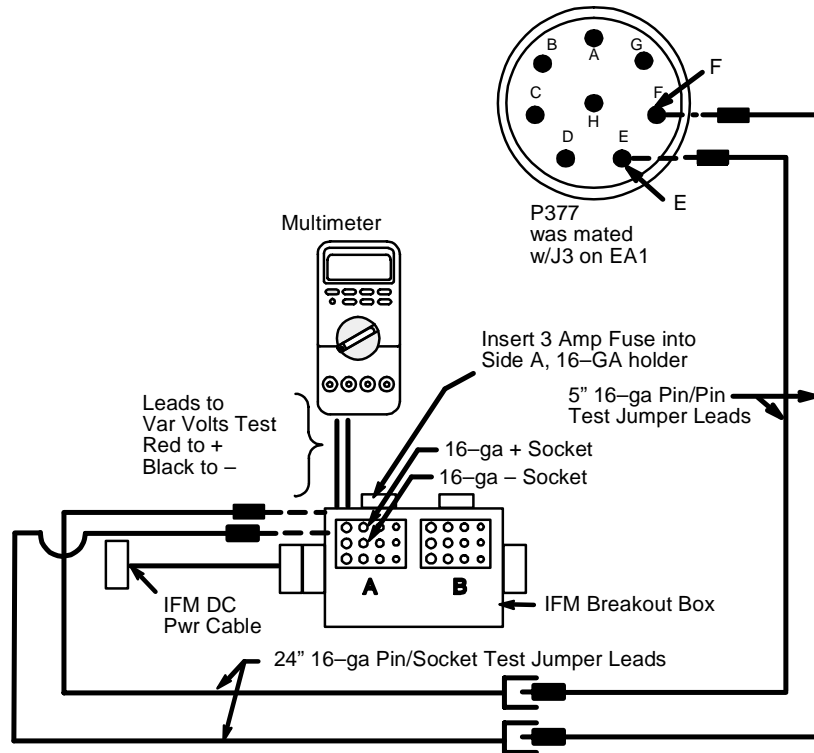
A1U

- R13L 7. PL BAY MECH PWR SYS 1,2 (two) – OFF  
KU ANT – GND
- R14:C 8. cb MNB KU ELEC – op
- A11 9. Disconnect cable 83V77W4P377 from J3 on EA1
- 10. DC UTIL PWR MNC – OFF
- 11. Config Breakout Box and Multimeter as shown:



- 12. Config Multimeter for DC volts (auto range)
- 13. DC UTIL PWR MNC – ON
- 14. Breakout Box:
  - √VAR VOLTS It – ON
  - (Set VAR VOLTS output by rotating VAR rotary sw until Multimeter reads 14 VDC)
- When VAR VOLTS output reads 14 VDC:
- 15. DC UTIL PWR MNC – OFF

16. Connect Pin/Socket and Pin/Pin Test Jumper Leads as shown:



jsc48025\_270\_k.cnv

Pin/Socket No.	Connects To	Purpose
P377, Soc E	DC Util Pwr	Provides +14V aux source to drive locking pins closed
P377, Soc F	DC Util Pwr	Provides -(return) aux source to drive locking pins closed

NOTE

Select best Camr to view antenna  
and record antenna stowage (VTR)

17. Perform steps 18-22 to stow Ku-Band Antenna  
Deployed Assembly w/gimbals unlocked

NOTE

Coordinate EV manipulation of Ku-Band  
Antenna gimbal assembly during IV stow  
of Ku-Band Antenna Deployed Assembly

CAUTION

Ku-Band Antenna sw must be in GND  
position prior to use of Direct Stow sw to  
preclude phase-to-phase bus short

- A1U 18. √KU BD PWR – OFF  
√CNTL – PNL
- R13L 19. √PL BAY MECH PWR SYS 1,2 (two) – OFF  
√KU ANT – GND
20. √DAP: VERN(FREE)

CAUTION

- EV,IV 1. Ensure Ku Antenna dish clears  
sill and slidewire while IV stows  
Antenna Deployed Assembly
- EV 2. Avoid contact between safety  
tether and Antenna dish

21. PL BAY MECH PWR SYS 1 – ON  
KU ANT DIRECT STO – ON  
√tb – bp, STO ~46 sec
22. KU ANT DIRECT STO – OFF  
PL BAY MECH PWR SYS 1 – OFF
23. Perform steps 24-27 to drive Ku-Band Antenna  
gimbal lock pins

CAUTION

1. Avoid contact w/black (Antenna dish) or gold (thermal blankets). Ku Antenna very fragile
2. Contact w/white (gimbal structure) or silver (DEA structure) only, when aligning lock pins w/lock pin wedges

NOTE

Coordinate EV manipulation of Ku Antenna gimbal assembly w/IV gimbal, lock pin, motor drive

EV  
A11

24. Align Antenna gimbal assembly
25. When Ku Antenna gimbals positioned so that lock pins aligned w/lock pin wedges:  
DC UTIL PWR MNC – ON

NOTE

Lock pins drive sequentially. Top lock pin (adjacent to gold covering) engages fully before bottom lock pin (adjacent to silver gyro box) begins to drive

26. On EVA GO:  
Breakout Box:  
PWR A – ON (after lock pins fully engage wedges, ~30 sec)  
– OFF
27. √MCC to verify BSE II High (indicates 2nd pin fully engaged)
28. Verify Ku-Band Antenna within STO envelope using Ku Antenna Overlay
29. DC UTIL PWR MNC – OFF
30. DAP: as reqd
31. Disconnect Test Jumper Leads, stow in Pin Kit
32. Reconnect Cable 83V77W4P377 to J3 of EA1
33. Reinstall AV BAY 3A upper closeout pnl(s)  
(torque fasteners, 30 in-lb)
34. If reqd, reinstall Vol B
35. Reinstall Window Shade Bag mounting brkt  
(torque fasteners, 30 in-lb)
36. Reinstall Window Shade Bag
37. Stow tools



This Page Intentionally Blank





## LEAK DETECTION – ULTRASONIC

(20 min)

**OBJECTIVE:** This procedure uses Ultrasonic Leak Detector (ULD) to locate gas leaks

**LOCATION:** N/A

**TOOLS REQD:**

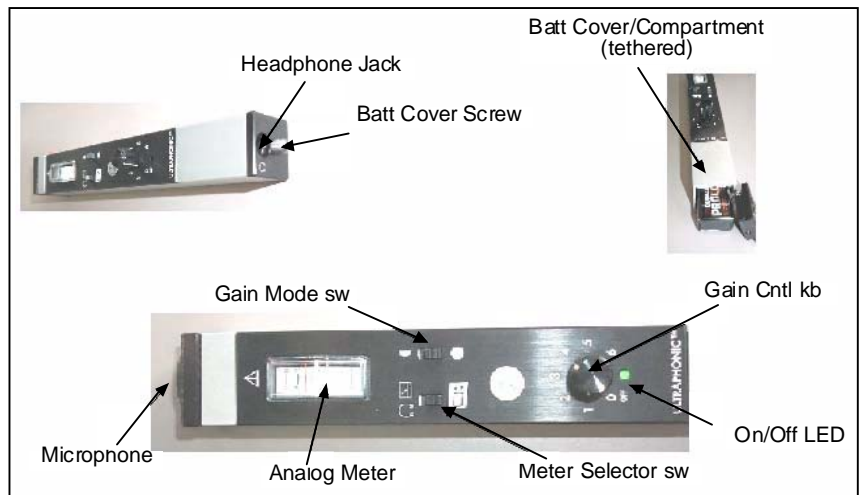
MISC                    ULD Mission Kit  
                              T-Shirt or Lint-Free Cloth (if reqd to muffle competing ultrasound)  
                              Flashlight

### ULD CHECKOUT

#### WARNING

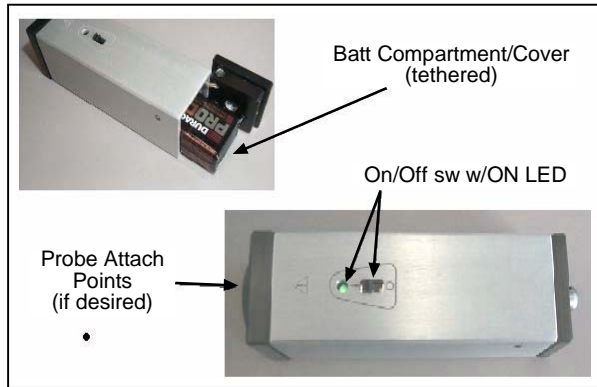
If gain control kb turned too far (cw), ultrasonic background noise may be very loud. To avoid injury to hearing, do not don Headphones until step 9 complete

1. Install 9V Alkaline Batt in ULD Receiver, ULD Transmitter



ULD Receiver

jsc48025\_116\_I.cnv



ULD Transmitter

jsc48025\_117\_l.cnv

2. Connect ULD to ULD Headphones. DO NOT don Headphones



ULD Headphones

jsc48025\_118\_l.cnv

3. Turn ULD gain control kb cw until it clicks, posn between 1,2 (green pwr-on, LED ON)
4. METER SELECTOR sw – HEADPHONES ONLY (down)
5. Check batt level on Meter. If Meter Batt level  $\leq$  half scale, turn gain kb to OFF, replace batt. Label weak batt "FAILED"
6. METER SELECTOR sw – HEADPHONES + METER (up), monitor ultrasound on Meter

7. GAIN SELECT sw – HALF GAIN (up) indicated by half-filled circle

**CAUTION**

Do not point receiver directly at transmitter at distances <10 feet. Transmitter is very powerful and close proximity between the two could damage ULD

8. Verify ULD Transmitter not pointed directly at ULD Receiver  
ULD TRANSMITTER – ON (green pwr-on, LED ON)
9. Listen for constant tone from Headphones. If tone heard from Headphones is loud, turn gain kb ccw until tone not audible w/Headphones doffed
10. Don ULD Headphones
11. Verify constant tone heard in Headphones
12. ULD TRANSMITTER – OFF (green pwr-on, LED OFF)  
Stow transmitter

**LOCATING LEAK**

**CAUTION**

When extension probes used, plastic probe end must always be at end of extension length to mitigate chances of electrical shock should an electrical source be contacted by probe extension. When used, entire length of aluminum probes must be visible at all times

13. Gain Access to area being leak checked
14. Connect ULD Receiver to attachment appropriate for leak check procedure
15. Point ULD Receiver 90 to 180 deg away from area being leak checked
16. Adjust gain kb until background noise barely audible

17. Sweep ULD as close as possible past area being leak checked. Check for leak from several orientations to determine potential leak location
18. If any leaks located, mark near locations w/Gray Tape. Continue searching for leaks as reqd
19. Inform MCC of ultrasonic leak detection results
20. When finished w/leak detection, turn gain kb ccw (green pwr-on, LED OFF)
21. Doff ULD Headphones
22. Stow tools,materials

## LEAK SEALING – VACUUM

(5 min Setup)

OBJECTIVE: Provides general guidance on sealing cabin leaks to vacuum

LOCATION: See CREW MODULE PENETRATIONS  
(GENERAL INFORMATION)

TOOLS REQD:

TOOL	Gray Tape
BOB	Duxseal Foam Applicator Assembly Chemical Resistant Bag
MISC	CCK Ultrasonic Leak Detector

**WARNING**

Do not mix Foam Applicator if Cabin Temp >80 degF. Material cures quickly and over-pressurized container will cause back lid to rupture

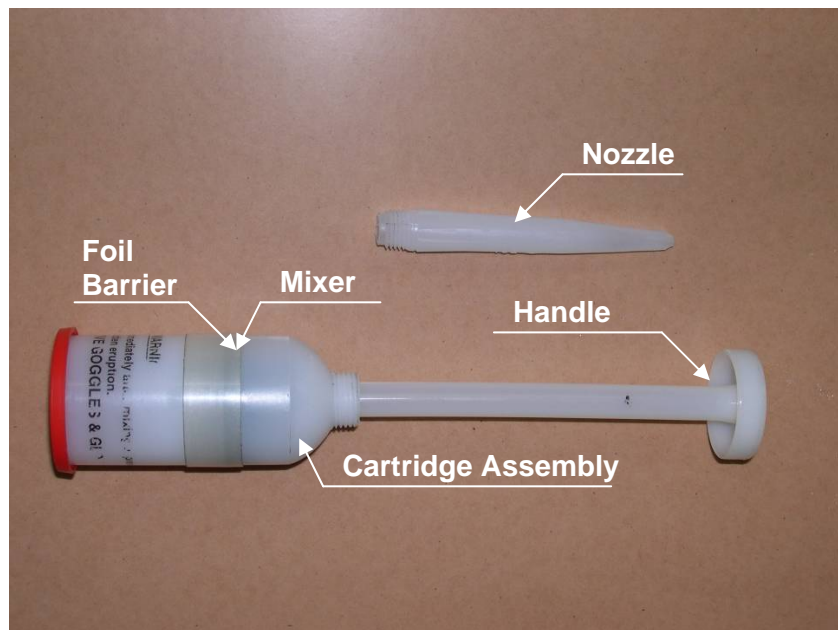
1. Determine leak location using Ultrasonic Leak Detector  
Specifically, check:
  - Around flt deck window seals
  - Around airlock hatch seals and side hatch window
  - Around Pressure Equalization Valves (under side and on airlock hatches)
  - Areas specified by MCC
2. Don goggles,gloves
3. Stop leak, using Foam Applicator. Duxseal & Tape
4. Stow equip

**NOTE**

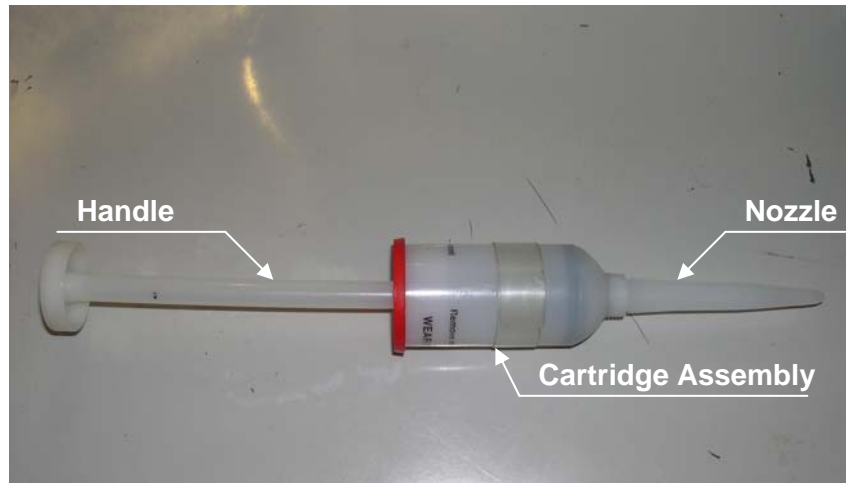
Once mixed in cartridge, two-part RTV must be quickly extruded from cartridge to desired location because foaming will begin in ~30 sec after mixing

**CAUTION**

During mixing components and foam curing, some H<sub>2</sub> is released. Keep away from ignition sources and allow proper ventilation to affected area for minimum of 1 hr



Mixing Configuration



Dispensing Configuration

DECAL FOR LEAK REPAIR KIT

1. Remove Tape

NOTE

On following step, do not squeeze too hard because back of Cartridge may pop out

2. Pull handle to bring mixer towards top of cartridge, squeeze cartridge lightly along circumference of removed tape to deform foil barrier
3. Begin rapidly mixing components ~25 cycles (30 to 60 sec), pushing handle all the way to top and bottom of each cycle, turning handle 1/4 turn on each downward stroke in a cw motion
4. Pull handle out to hard stop, grasp cartridge firmly at location of mixer, unscrew handle and remove

Immediately:

5. Attach threaded nozzle to cartridge
6. Insert handle in opposite end (to act as plunger, no threads on this end.) Wait 10 sec
7. Position for use, push handle, quickly dispense mix onto desired area. As foam appears to set up, quickly dispense remainder onto desired area. (Tacky as soon as mixed, cured in 20 min)
8. Place used Cartridge Assembly in Chemical Resistant Bag, stow

## LIGHT BULB CHANGEOUT

(20 min)

OBJECTIVE: Replace failed C&W and/or Annunciator light bulb  
w/light bulb from unused position

LOCATION: F2,F4,F6,F7,L1,A8U

TOOLS REQD:

TOOL                    Gray Tape  
                             Small Screwdriver  
                             Jeweler's Screwdriver

1. Contact MCC for pwrdn of pertinent lights
2. Three examples follow:

### CAUTION

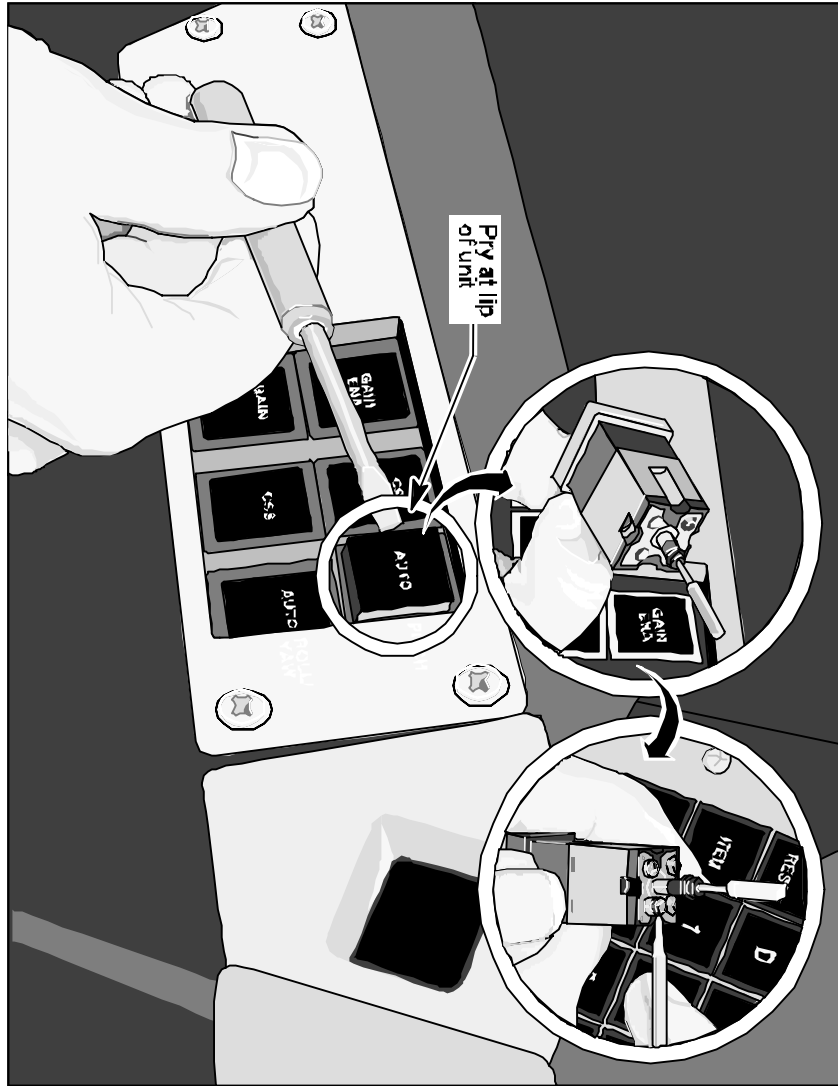
Some lights have grounding strap that prevents unit from pulling free of pnl. Use care when removing unit and bulb from unit



- Carefully pry unit from pnl. Carefully pry light from unit at lip as shown

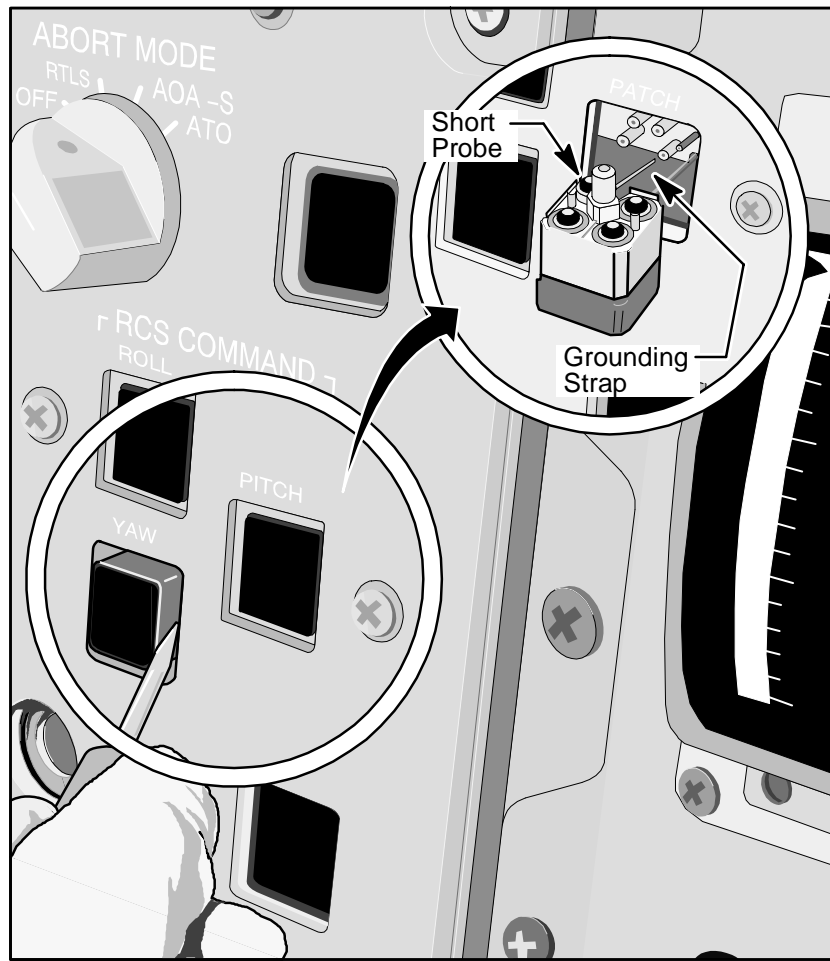
**NOTE**

Removal sequence typical of square units



jsd48100\_11&\_100v

4. Removal same as step 3, except for ground strap



jsc48025\_271\_l.cnv

5. Push in, unit will pop out. Carefully pry light from unit at lip as shown in step 3

**NOTE**

This removal sequence is typical of rectangular units



jsc48025\_272\_1.cnv

**LOCKERS – MISALIGNED (MOUNTING SCREWS  
WILL NOT START)**

(25 min)

OBJECTIVE: Propose means by which locker fasteners may be realigned to effect nut plate engagement.  $\Delta P$  across orbiter structure can result in deformation of locker mounting surface preventing normal installation

LOCATION: Any stowage locker on AV BAYS 1(2,3A)

TOOLS REQD:

TOOL                      Pinch Bar  
                                 Locker Tool  
                                 8-in Punch  
                                 Ratchet/Torque Wrench  
                                 Large Screwdriver

**CAUTION**

Minimum of three out of four locker mounting fasteners must be secured for entry

**NOTE**

If fasteners cannot be secured, remove locker, stow, and install turnbuckles

1. Position locker, secure two mounting fasteners if possible
2. Align third fastener using Pinch Bar/Screwdriver to position locker to ease installation
3. Repeat step 2 for fourth fastener
4. Torque fasteners (30 in-lb)
5. Stow tools

IFM PROCEDURES

MA73C WIRE CUT .....	M-1
MDM CHANGEOUT.....	M-4
MEDS IDP CHANGEOUT AND CABLE SWAP.....	M-10
MEDS KEYBOARD CHANGEOUT.....	M-18
MEDS MDU CHANGEOUT.....	M-28
MMU CHANGEOUT.....	M-34
MMU CONTINGENCY PWRUP.....	M-36
OBSS SW CONTINGENCY PWRUP .....	O-1
ODS CENTERLINE CAMR ANGULAR ALIGNMENT.....	O-4
OIU CABLE SWAP .....	O-8
OS SPEAKER DISCONNECT .....	O-10
O2 SYS 1(2), FAILED XOVR VLV BYPASS.....	O-12
OSVU CONTINGENCY PWRUP .....	O-14
OSVU REPLACEMENT .....	O-16
PARACHUTE REPACK .....	P-1
PAYLOAD BAY DOOR MOTOR OPERATION.....	P-16
PAYLOAD BAY DOOR SYS ENABLE RECOVERY.....	P-42
PDI REPLACEMENT .....	P-49
PGSC CARD CHANGEOUT.....	P-52
PGSC EXPANSION CARD CHANGEOUT (A31P).....	P-55
PREFLIGHT TEST BUS SETUP .....	P-61
PSP CHANGEOUT .....	P-66
RHC CHANGEOUT .....	R-4
RMS	
CONTINGENCY OPERATION (Installation and Removal of RMS IFM D&C Kit) .....	R-13
CONTINGENCY POWERUP .....	R-18
JETT REDUNDANCY .....	R-24
MCIU CHANGEOUT .....	R-29
PORT MANIPULATOR POSITIONING MECHANISM (MPM) CONTINGENCY DEPLOY/STOW.....	R-33
PORT MANIPULATOR RETENTION LATCHES (MRL) CONTINGENCY RELEASE/LATCH.....	R-42
STBD MANIPULATOR POSITIONING MECHANISM (MPM) CONTINGENCY DEPLOY/STOW.....	R-49
STBD MANIPULATOR RETENTION LATCHES (MRL) CONTINGENCY RELEASE/LATCH.....	R-58

**PROCEDURES  
M THRU R**



This Page Intentionally Blank

**PROCEDURES  
M THRU R**



## MA73C WIRE CUT

(45 min)

**OBJECTIVE:** Isolate single phase AC bus short between inverter and Pnl MA73C from three phase motors so other two phases can be used

**LOCATION:** MA73C

**TOOLS REQD:**

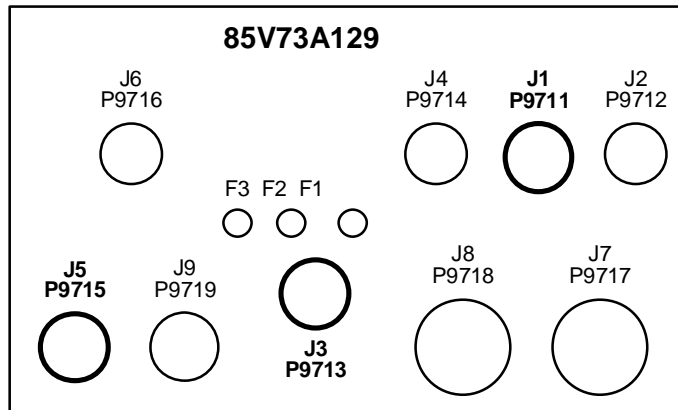
**TOOL**

- Gray Tape
- Wire Cutters
- Wire Stripper
- Multimeter
- Pwr Screwdriver
- 5/32-in Allen Head Driver
- Torque Wrench

### NOTE

Procedure assumes all cbs for affected phase and all applicable 3 $\Phi$  ganged cbs on MA73C open. This is to ensure continuity check is only for MA73C and avoid any erroneous measurements due to impedance of downstream equipment

- R1
1. Verify affected AC bus phase unpowered  
INV/AC BUS tb – OFF  
INV PWR tb – OFF
- MA73C
2. Open AV BAY 3B upper access pnl (five fasteners, 5/32-in Allen Head Driver)



Rear View of AV BAY 3B Upper Access Pnl (MA73C)

jsc48025\_120\_m.cnv

3. Locate appropriate connector and wire bundle for affected bus (see table below)

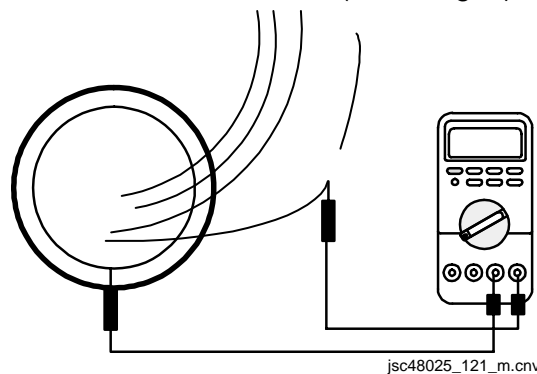
	Connector	Wire ID	$\Phi$ A	$\Phi$ B	$\Phi$ C	Neutral
AC1	P9711 (J1)	1A7B12	1 Stripe	2 Stripes	3 Stripes	4 Stripes
AC2	P9713 (J3)	2A7B12	1 Stripe	2 Stripes	3 Stripes	4 Stripes
AC3	P9715 (J5)	3A7B12	1 Stripe	2 Stripes	3 Stripes	4 Stripes

4. Remove bundle ID tag and wire wraps from appropriate bundle as reqd to separate wires back ~6 inches from connector backshell
5. Locate and cut applicable wire ~5 inches from connector backshell
6. Remove ~0.5 inch of insulation from connector side of wire cut in previous step
7. Obtain Multimeter

**NOTE**

Red & black Multimeter leads have removable test probes installed on one end. Once removed, this end of leads can also be installed into Multimeter so that banana jacks on other end can be used w/Pin Kit accessories

8. Remove test probes from red & black Multimeter leads and insert this end into Multimeter
9. Install alligator clips from Pin Kit (flap 8) onto Multimeter lead banana jacks
10. Attach red Multimeter lead alligator clip to area of wire stripped in step 6
11. Config Multimeter for continuity check
12. Attach black Multimeter lead alligator clip to connector backshell (chassis gnd)



jsc48025\_121\_m.cnv



If Multimeter indicates continuity between backshell and wire, a pnl short exists in MA73C:

13. √MCC for further actions >>

If Multimeter indicates no continuity between backshell and wire, proceed

14. Tape over exposed ends of wire cut in step 5
15. Close AV BAY 3B upper access pnl (torque fasteners, 30 in-lb), stow tools
16. Close all three  $\Phi$  ganged cbs on MA73C for affected ac bus

AC1 (5 cbs)	
MA73C:C	cb MCA PWR AC1 3 $\Phi$ FWD 1 – cl MID 1 – cl
MA73C:C	cb MCA PWR AC1 3 $\Phi$ AFT 1 – cl MID 3 – cl
MA73C:F	cb AC1 MAR 3 $\Phi$ – cl

AC2 (9 cbs)	
MA73C:C	cb MCA PWR AC2 3 $\Phi$ FWD 2 – cl MID 1 – cl MID 2 – cl
MA73C:D	cb MCA PWR AC2 3 $\Phi$ AFT 2 – cl MID 3 – cl MID 4 – cl
MA73C:E	cb AC2 PL 3 $\Phi$ – cl
MA73C:F	cb AC2 L SEAT 3 $\Phi$ – cl
MA73C:G	R SEAT 3 $\Phi$ – cl

AC3 (7 cbs)	
MA73C:C	cb MCA PWR AC3 3 $\Phi$ FWD 3 – cl MID 2 – cl
MA73C:D	cb MCA PWR AC3 3 $\Phi$ AFT 3 – cl MID 4 – cl
MA73C:E	cb AC3 PL 3 $\Phi$ – cl
MA73C:F	cb AC3 L SEAT 3 $\Phi$ – cl
MA73C:G	R SEAT 3 $\Phi$ – cl

## MDM CHANGEOUT

(3:00 hr) (15 min C/O)

**OBJECTIVE:** Replace MDM FF1(2,3) w/FF4 or swap PL MDMs.

Flight fwd MDM will be replaced only after pwr cycling and port moding fails to clear non-GPC caused 'I/O ERROR FF1(2,3)' or total output card failure and loss of MDM results in loss of second IMU or second AA (AA4 must be failed). PL MDM will be swapped only after pwr cycling and port moding fails to clear non-GPC caused 'I/O ERROR PL' and there has been failure of any PLBD MCA, except MCA2, controlled by good MDM

**LOCATION:** See (COMPONENT LOCATIONS)

AV BAY 1 (Zone 14E) for MDM FF1 and (Zone 43O) for MDM PL1

AV BAY 2 (Zone 71B) for MDM FF4 (Zone 85E) for MDM FF2, and (Zone 57O) for MDM PL2

AV BAY 3A (Zone 2D) for MDM FF3

**TOOLS REQD:**

TOOL	Gray Tape
	Pwr Screwdriver
	Locker Tool
	3/8-in Deepwell Socket
	Torque Wrench
	Driver Handle
	4-in Extension
	1/4-in to 3/8-in Adapter
CHCK	Coldplate Protective Cover

Configure prior to removal of failed MDM F1,2,3

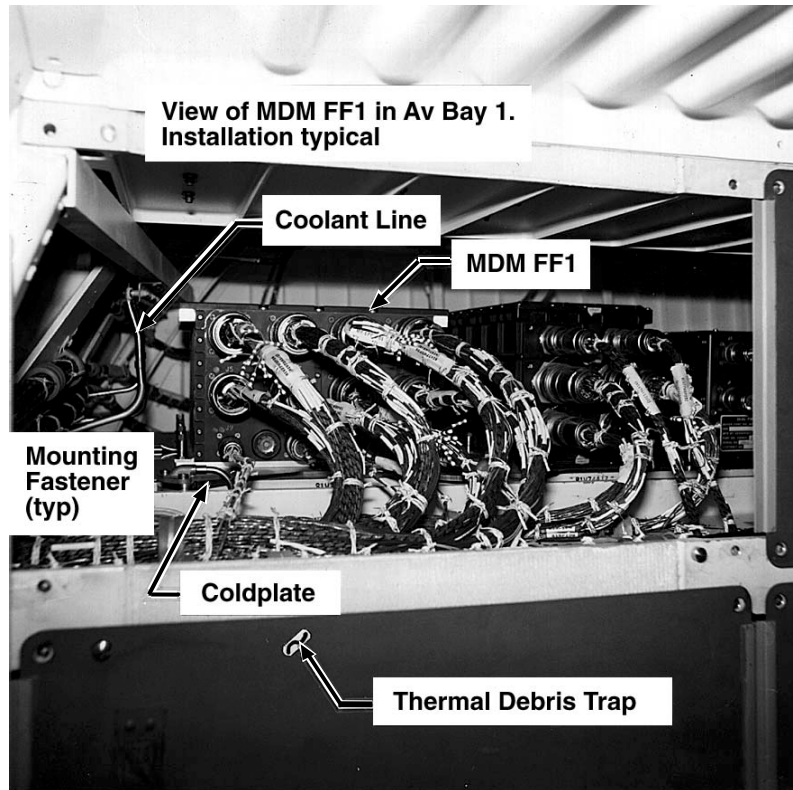
		<u>FF1</u>	<u>FF2</u>	<u>FF3</u>
C3	1. √DAP RCS JETS – NORM			X
O14:F	2. √RJDF 1B F1 DRIVER – OFF	X		
O15:F	3. √RJDF 1A F2 DRIVER – OFF		X	
O16:F	4. RJDF 2A F3 DRIVER – OFF	X	X	X
	2B F4/F5 DRIVER – OFF			X

**TO REMOVE MDM**

O6 5. MDM FF4,1(2,3) – OFF  
or  
MDM PL1,2 – OFF

M-4

IFM/ALL/GEN F



jsc48025\_122\_m.cnv

6. Remove Debris Trap, Vol A (MF57A) (see GENERAL INFORMATION) lockers, closeouts, and Thermal/Debris Traps to access MDMs as reqd
7. Remove connectors J1 thru J12 from MDMs as reqd. Tape harnesses and connectors out of way to facilitate MDM removal
8. Loosen MDM mounting fasteners (eight, 3/8-in Socket). Vehicle structure does not permit use of extension on outboard side of MDM FF1(2)
9. Slide Coldplate Protective Cover between coldplate and MDM. Remove MDM w/Coldplate Protective Cover, mark failed unit w/Gray Tape

TO INSTALL MDM

10. Slide MDM w/Coldplate Protective Cover into place, remove cover, tighten fasteners (torque, 70 in-lb)

11. Install connectors:

<u>In FF1 Location, connect</u>		<u>In FF2 Location, connect</u>	
Cable	MDM	Cable	MDM
81V77W8P36	to J1	82V77W9P36	to J1
	P37 to J2		P37 to J2
	P38 to J3		P38 to J3
	P39 to J4		P39 to J4
	P40 to J5		P40 to J5
	P41 to J6		P41 to J6
	P42 to J7		P42 to J7
	P43 to J8		P43 to J8
	P44 to J9		P44 to J9
	P45 to J10		P45 to J10
	P46 to J11		P46 to J11
	P47 to J12		P47 to J12

<u>In FF3 Location, connect</u>		<u>In FF4 Location, connect</u>	
Cable	MDM	Cable	MDM
83V77W4P23	to J1	82V77W9P48	to J1
	P24 to J2		P49 to J2
	P25 to J3		P50 to J3
	P26 to J4		P51 to J4
	P27 to J5		P52 to J5
	P28 to J6		P53 to J6
	P29 to J7		P54 to J7
	P30 to J8		P55 to J8
	P31 to J9		P56 to J9
	P32 to J10		P57 to J10
	P33 to J11		P58 to J11
	P34 to J12		P59 to J12

<u>In PL1 Location, connect</u>		<u>In PL2 Location, connect</u>	
Cable	MDM	Cable	MDM
81V77W8P108	to J1	82V77W9P60	to J1
	P109 to J2		P61 to J2
	P110 to J3		P62 to J3
	P111 to J4		P63 to J4
	P112 to J5		P64 to J5
	P113 to J6		P65 to J6
	P114 to J7		P66 to J7
	P115 to J8		P67 to J8
	P116 to J9		P68 to J9
	P117 to J10		P69 to J10
	P118 to J11		P70 to J11
	P119 to J12		P71 to J12

12. Contact MCC if reinstallation of connectors on failed unit desired. Normally, tape over connector interfaces and secure out of way
13. Install Thermal/Debris Traps

MDM CHECKOUT

If FF MDM:

**GNC 21 IMU ALIGN**

14. ✓Affected IMU deselected:

- If FF 1 – ✓DES: ITEM 7 (\*)
- 2 – ✓DES: ITEM 8 (\*)
- 3 – ✓DES: ITEM 9 (\*)

15. ✓Affected RJDF pwr OFF:

- If FF 1: ✓RJDF 1B F1 DRIVER – OFF
- 2: ✓RJDF 1A F2 DRIVER – OFF
- 3: ✓RJDF 2B F4 DRIVER – OFF

O14:F  
O15:F  
O16:F

If unexpected fault msgs occur for affected MDM:

16. Record fault msg and continue to RJDF pwrup, then **STOP** and ✓MCC

If RCS 'JET FAIL' msgs occur associated w/power-off RJDF Manfs:

17. Ignore and continue

O6

18. MDM FF1(FF2,FF3) – ON  
**FAULT**  
GNC CRT – I/O RESET  
Observe fault msgs for affected MDM:
  - √No 'I/O ERROR FF1(2,3)'
  - √No 'MDM OUTPUT FF1(2,3)'
  - √No unexpected 'BCE STRG 1(2,3)' msg**SM 1 DPS UTILITY**
19. Select SEC ports on affected MDM:  
PORT ASSIGN SEC – ITEM 16(18,20)  
EXEC (\*)  
**FAULT**
20. Observe fault msgs for affected MDM:
  - √No 'I/O ERROR FF1(2,3)'
  - √No 'MDM OUTPUT FF1(2,3)'
  - √No unexpected 'BCE STRG 1(2,3)' msg**SM 1 DPS UTILITY**
21. Reselect PRI ports on affected MDM:  
PORT ASSIGN SEC – ITEM 15(17,19)  
EXEC (\*)
22. Pwr ON affected RJDF:
  - If FF 1: RJDF 1B F1 (two) – ON
  - 2: RJDF 1A F2 (two) – ON
  - 3: RJDF 2B F4/F5 LOGIC – ON
  - F4 DRIVER – ON**GNC 23 RCS**
23. For all jets which have failed during MDM CHECKOUT:
  - RCS FWD – ITEM 1 EXEC
  - JET RESET – ITEM 45 EXEC
  - Reselect deselected jets
  - JET RESET – ITEM 45 EXEC
  - √No 'JET FAIL' fault msgs occur
24. After completion of MDM checkout, √MCC for IMU recovery, additional MDM/LRU checkout, and potential MDM FF 4 utilization/checkout

O14:F  
O15:F  
O16:F

~  
|  
If PL MDM:

NOTE

One or more of following fault msgs may be  
annunciated at I/O RESET or port moding  
steps:

'I/O ERROR FLEX'  
'BCE BYP FLEX'  
'BCE BYP SCA'  
'BCE BYP KU'  
'S62 BCE BYP PSP1(2)'  
'S62 BCE BYP PL'  
'S62 BCE BYP PDI'

\* If unexpected fault msg occurs for aff \*  
\* MDM, record fault msg and continue \*

O6

25. MDM PL1, PL2 – ON  
FAULT  
SM CRT – I/O RESET  
Observe fault msgs for aff MDMs:  
√No 'I/O ERROR PL1(2)'  
√No 'MDM OUTPUT PL1(2)'  
SM 1 DPS UTILITY
26. Select SEC ports on aff MDMs:  
PORT ASSIGN SEC – ITEM 24 EXEC (\*)  
FAULT
27. Observe fault msgs for aff MDMs:  
√No 'I/O ERROR PL1(2)'  
√No 'MDM OUTPUT PL1(2)'  
SM 1 DPS UTILITY
28. Reselect PRI ports on aff MDMs:  
PORT ASSIGN SEC – ITEM 23 EXEC (\*)
29. √MCC for additional MDM/LRU checkout
30. Go to SSR-4 PLBD CHECKOUT AFTER MDM  
CHANGEOUT (MAL, MECH)
31. Install closeouts, lockers (torque, 30 in-lb), Vol A  
(MF57A), and Debris Trap
32. Stow tools

**MEDS IDP CHANGEOUT AND  
CABLE SWAP**

3 hr (IDP 1 or 3,4)  
1:30 hr (IDP 2,4)  
(15 min C/O)

OBJECTIVE: Replace failed IDP 1,3(2) w/IDP 4. IDP 1(3) will be changed out w/IDP 4, while only cables from IDP 2 will be connected to IDP 4

LOCATION: See FLIGHT DECK (COMPONENT LOCATIONS)

Zone N25 for IDP 1,3

Zone N75 for IDP 2,4

TOOLS REQD:

TOOL	Pwr Screwdriver
	Gray Tape
	Connector Wrench
	Ratchet Wrench
	Torque Wrench
	Driver Handle
	3/8-in, 7/16-in, & 1/2-in Sockets
	5/32-in Allen Head Driver
	1/4-in to 3/8-in Adapter
	Wire Cutters
	#10 Torque Driver
	9/16-in Combination Wrench
	Anti-Static Wrist Tether



TO CHANGE OUT IDP 1(3) W/IDP 4

TO REMOVE IDP 1(3) AND 4

1. On active PASS KYBD, GPC/CRT 01(03) EXEC  
√Big 'X' and 'POLL FAIL'

For IDP 1:

MDU  
C2

2. CRT1 PWR – OFF
3. IDP/CRT1 PWR sw – OFF

For IDP 3:

MDU  
C2

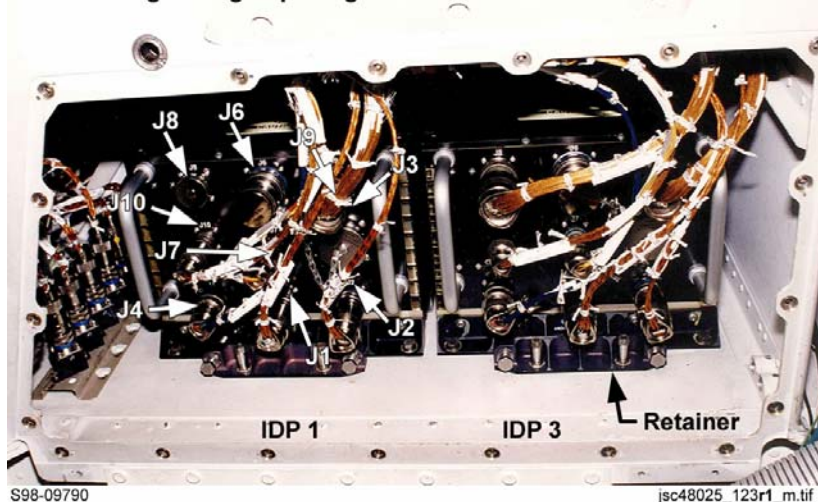
4. CRT3 PWR – OFF
5. IDP/CRT3 PWR sw – OFF
6. On active PASS KYBD, GPC/CRT 04 EXEC  
√Big 'X' and 'POLL FAIL'

For IDP 4:

MDU  
R11

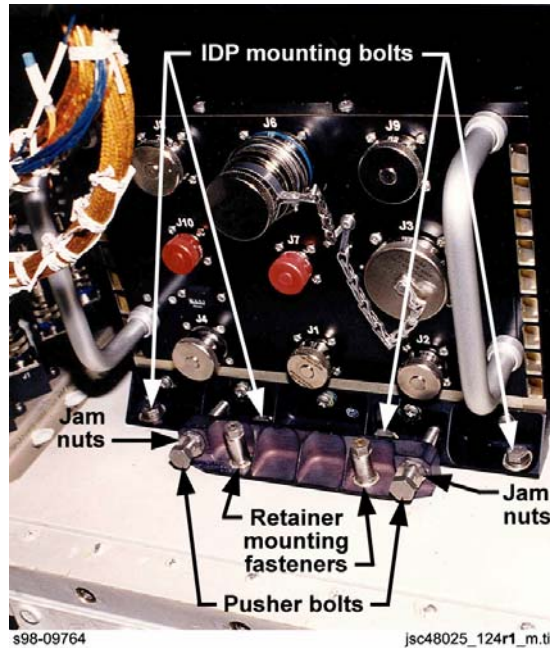
7. CRT4 PWR – OFF
8. IDP/CRT4 PWR sw – OFF
9. Remove closeouts L16,R17 (17 fasteners/  
closeout, 5/32-in Allen Head Driver), L8,R9 (19  
fasteners/closeout, 5/32-in Allen Head Driver)

View looking through opening of L8



10. Don Anti-Static Wrist Tethers, clip to unpainted ground as reqd
11. Remove all connectors and tape out of way to facilitate IDP removal

For IDP 1 – J4, J7, J9, J10, J1, J2  
 3 – J4, J7, J8, J9, J10, J1, J2  
 4 – J4, J7, J8, J10, J1, J2



12. Loosen, do not remove, four Jam Nuts and two pusher bolts (9/16-in Combination Wrench and 1/2-in Socket)
13. Loosen retainer mounting fasteners (two, 3/8-in Socket), remove retainer
14. Cut, remove filter-retaining bolt safety wire (one/filter)
15. Loosen, do not remove, filter retaining bolts far enough to allow rotation of guide tabs to open position (one/filter)
16. Remove filters (two/IDP)
17. Loosen mounting bolts (four, 7/16-in Socket); remove IDP 1(3) and mark failed unit w/Gray Tape
18. Repeat steps 11-17 for IDP 4

TO INSTALL IDP 4 AND 1(3)

19. Install IDP 4 into IDP 1(3) position and loosely install mounting bolts
20. Install retainer (torque fasteners, 100 in-lb)
21. Tighten Pusher Bolts (torque, 40 in-lb). Tighten Jam Nuts snug
22. Tighten IDP mounting bolts (torque, 100 in-lb)
23. Verify IDP filter-guide tab in open position
24. Position filter over IDP handle so alignment tabs protrude into IDP air inlet
25. Rotate guide tab to Lock position; ensure retainer engages IDP handle
26. Tighten filter-retaining bolt snug
27. Install connectors

For IDP 1 location:

Swap protective caps between J8 and J9 on each IDP

Connect Cable 30V77W1P234	to J4
W6P232	to J2
W5P237	to J7
W23P239	to J9
W5P230	to J10
W9P231	to J1

For IDP 3 location:

Move protective cap from IDP 4 J9 to IDP 3 J9

Connect Cable 30V77W1P254	to J4
W6P252	to J2
W9P257	to J7
W26P258	to J8
W24P259	to J9
W7P250	to J10
W9P251	to J1

28. Repeat steps 19-26 for installation of IDP 1(3) into IDP 4 position
29. Contact MCC if reinstallation of connectors desired; otherwise, tape over connector interfaces and secure harnesses to structure
30. Install closeouts L8,L16, then L9,L17 (torque fasteners, 30 in-lb)
31. Stow tools

FOR IDP 2 TO 4 CABLE SWAP

32. On active PASS KYBD, GPC/CRT 02 EXEC  
√Big 'X' and 'POLL FAIL'

For IDP 2:

MDU  
C2

33. CRT2 PWR – OFF

34. IDP/CRT2 PWR sw – OFF

35. On active PASS KYBD, GPC/CRT 04 EXEC  
√Big 'X' and 'POLL FAIL'

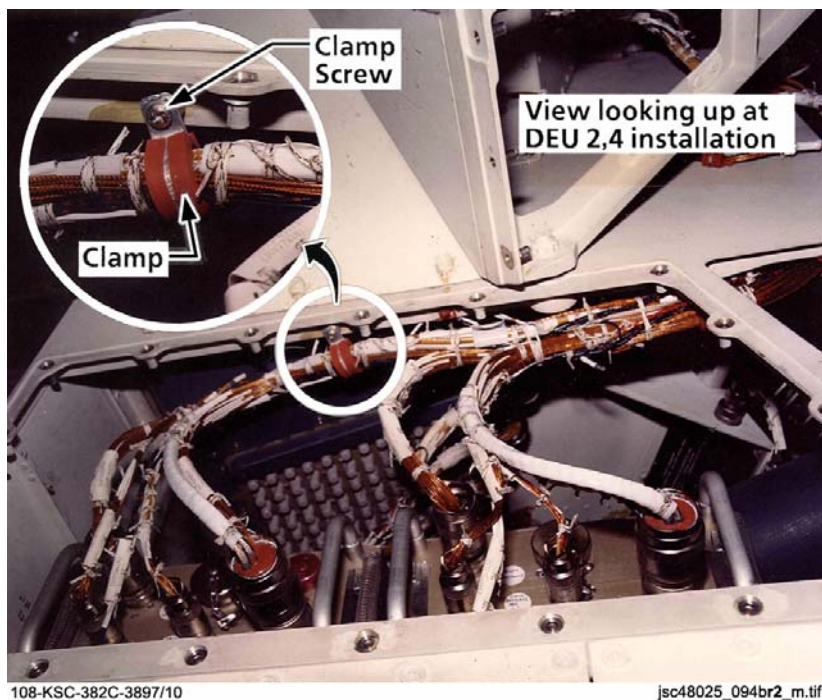
For IDP 4:

MDU  
R11

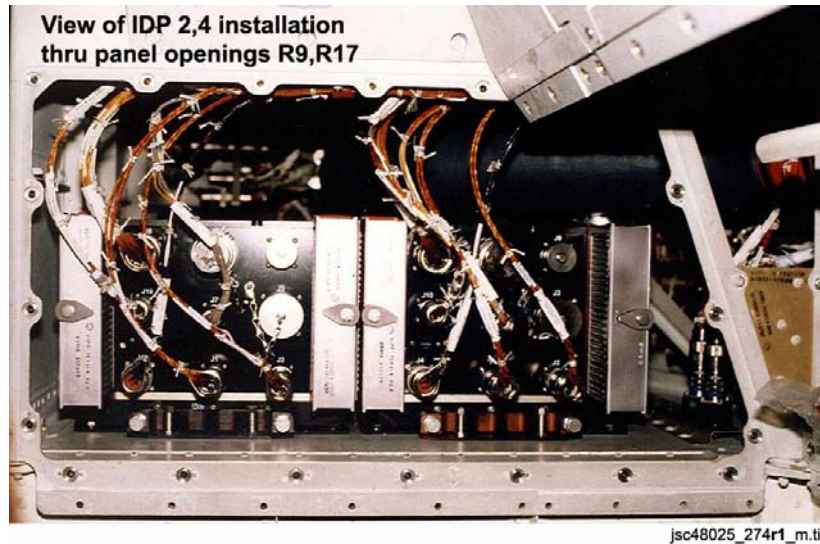
36. CRT4 PWR – OFF

37. IDP/CRT4 PWR sw – OFF

38. Remove closeouts R17,R9 (17 & 19 fasteners,  
5/32-in Allen Head Driver)



39. Remove cable clamp from structure (one screw,  
#10 Torque Driver); remove clamp from wire  
bundle. Stow clamp and screw



40. Don Anti-Static Wrist Tethers, clip to unpainted ground as reqd
41. Remove cables from IDP 4. Tape over face of connectors and tape out of way
42. Remove cables from IDP 2. Cut wire ties as reqd to allow cables to be connected to IDP 4 w/o stretch/strain
43. Connect cables:
  - 30V77W2P244 from IDP 2 to J4 of IDP 4
  - W7P247 from IDP 2 to J7 of IDP 4
  - W22P248 from IDP 2 to J8 of IDP 4
  - W5P240 from IDP 2 to J10 of IDP 4
  - W9P241 from IDP 2 to J1 of IDP 4
  - W6P242 from IDP 2 to J2 of IDP 4

## IDP CHECKOUT

If problems/errors detected at any time during self-test:

44. Stop procedure  
√MCC and report results

### NOTE

Use CRT MDU connected to replaced IDP for following checkout

## IDP POWERUP

- |     |   |
|-----|---|
| C2  | 45. IDP/CRT1(2,3) PWR sw – ON                                   |
| MDU | 46. CRT1(2,3) PWR – ON  |
|     | 47. MAIN MENU:DPS   |
|     | √Following appears on CRT MDU (adjust brightness if reqd):      |
|     | Time Fields (upper RH corner)                                   |
|     | Big 'X'   |
|     | 'POLL FAIL' (lower RH corner)                                   |
| C3  | 48. √BFC/CRT SEL – OFF  |
| C2  | 49. GPC/CRT desired GPC/(IFM'ed IDP) EXEC (on active PASS KYBD) |
|     | 50. √OPS display appears on MDU                                 |
|     | If any other display appears,                                   |
|     | RESUME (√OPS display appears on MDU)                            |
|     | FAULT (√FAULT display appears)                                  |
|     | RESUME (√OPS display appears)                                   |
|     | 51. IDP/CRT1(2,3) MAJ FUNC – GNC, SM, PL                        |
|     | (√proper response for each sw position)                         |

## PERFORM IDP SELF-TEST

- |     |  |
|-----|--|
| MDU | 52. MAIN MENU:MEDS MAINT:CST:START IDP   |
|     | √MEDS MAINT DISPLAY appears on MDU   |
|     | √"IDP 1 (2,3) INTERACTIVE CST" appears on bottom of screen   |
| C2  | 53. L(R) IDP/CRT SEL sw – 1(2,3) (IFM'ed IDP)  |
| MDU | 54. √All KYBD entries echoed next to "KEYSTROKE:" on lower RH corner of display by pressing each key on KYBD |

- If IDP 3 C/O:
- C2 55. R(L) IDP/CRT SEL sw – 3 (alt KYBD)  
Repeat step 54 w/alt KYBD
56. L(R) IDP/CRT SEL sw (both) – (non IFM'ed IDP)  
√“ACTIVE KYBD:” blank on bottom middle of display
- O6 57. IDP 1(2,3) LOAD – LOAD  
√“IDP LOAD: LOAD” on bottom left of display
- MDU 58. MAIN MENU:MEDS MAINT: CST:START  
IDP:HW CST  
Expect 'I/O ERROR CRT 1(2,3)' msg  
Wait up to 60 sec  
√IDP 1(2,3) box, rows 2,3 show all zeroes

VERIFY PROPER FC BUS INTERFACE

- MDU 59. MAIN MENU:FLT INST:ORBIT:ADI:DATA BUS  
√ADI DISPLAY appears and no “OFF” flags  
observed when selecting each FC bus  
If “OFF” flags observed, √MCC >>
60. Pwr ON(OFF) MDUs, IDPs, and config displays  
as desired

**MEDS KEYBOARD CHANGEOUT** (2:00 hr)(15 min C/O)

OBJECTIVE: Replace failed fwd MEDS Keyboard w/aft Keyboard

NOTE

This procedure will not be performed  
for failure of individual key

LOCATION: Fwd Keyboards – pnl C2  
Aft Keyboards – pnl R11L

TOOLS REQD:

TOOL Gray Tape  
3/8-in Deepwell Socket  
Ratchet Wrench  
1/4-in to 3/8-in Adapter  
Torque Wrench  
Driver Handle  
5/32-in Allen Head Driver  
#6 & #10 Torque Drivers  
Anti-Static Wrist Tethers

TO REMOVE FWD KEYBOARD

1. On active PASS KYBD, GPC/CRT 03/01,02  
EXEC as reqd
2. √Big 'X' and 'POLL FAIL'

NOTE

Expect 'PORT CHANGE' and 'MDU is  
autonomous' msgs when performing  
steps below

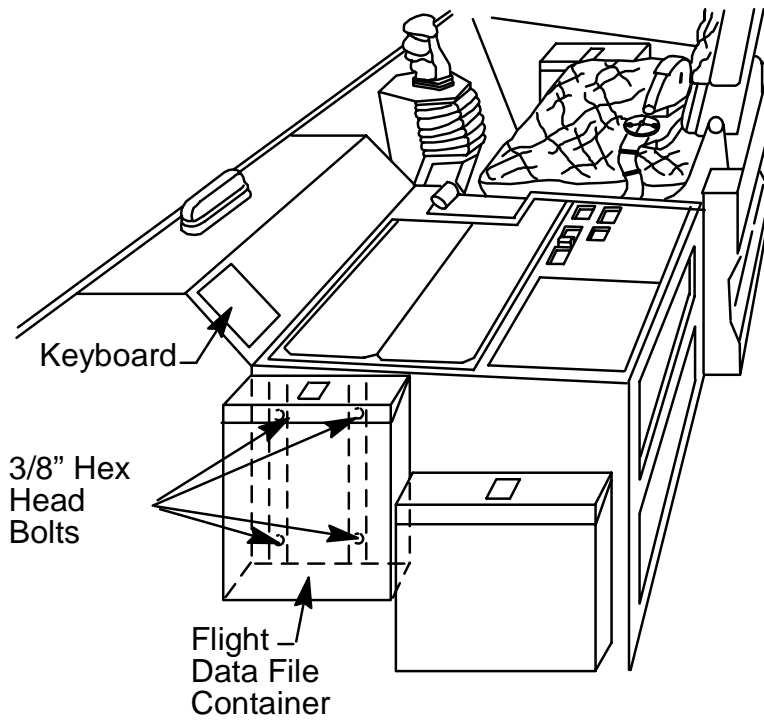
For left Keyboard:

- L4:R  
C2
3. cb AC3 ΦB INST L/CTR – op
  4. IDP/CRT1,3 PWR sw (two) – OFF

For right Keyboard:

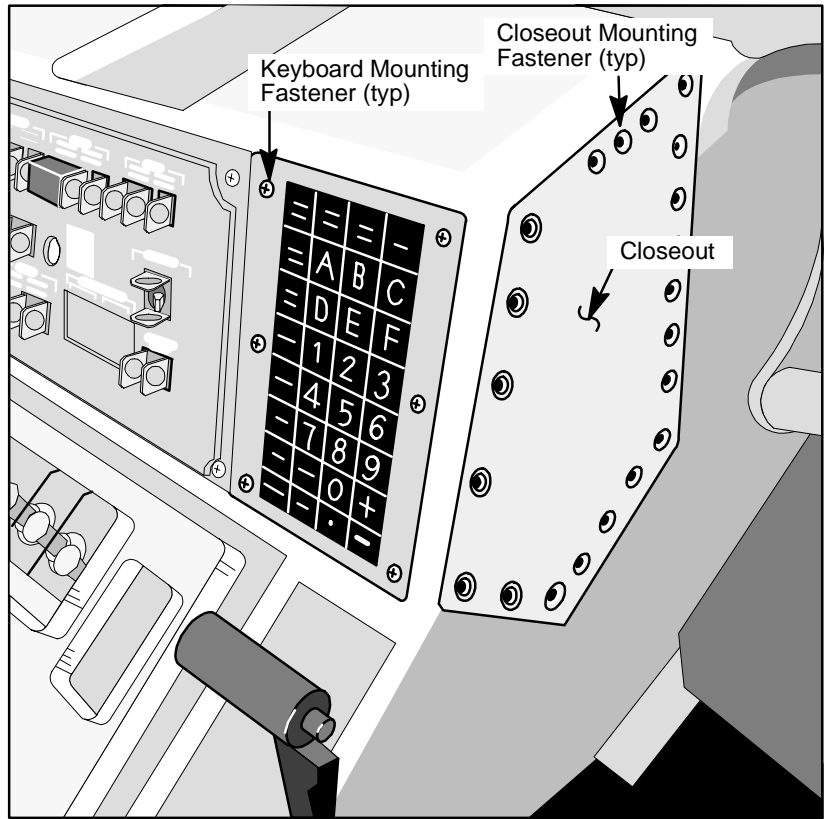
- L4:R  
C2
5. cb AC1 ΦA INST R – op
  6. IDP/CRT2,3 PWR sw (two) – OFF





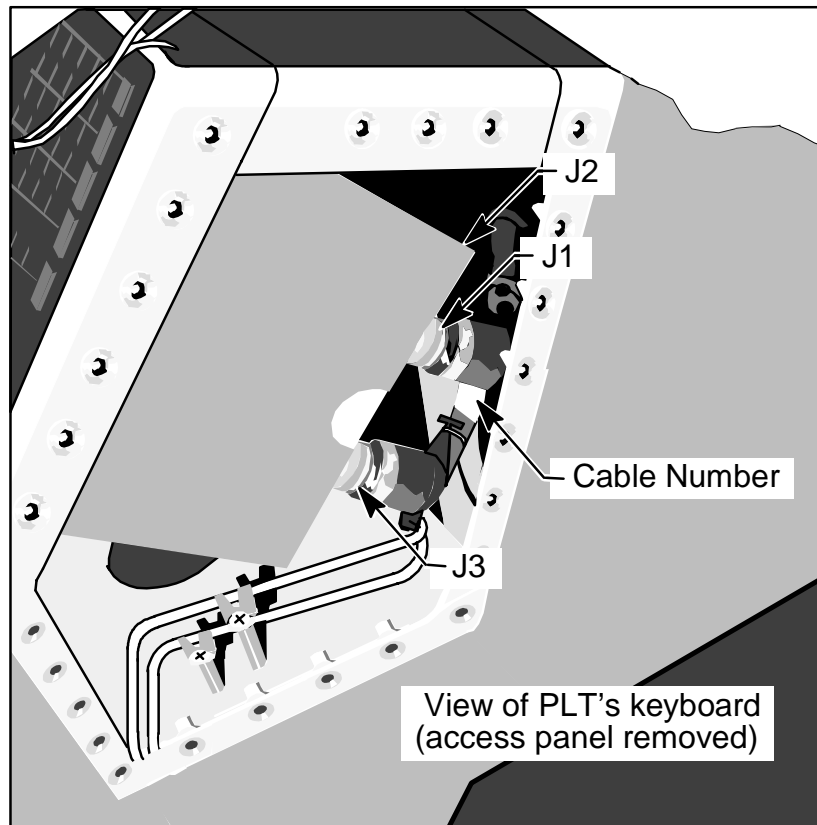
jsc48025\_275\_m.cnv

7. FDF Container blocks access to CDR's station access pnl, remove using 3/8-in Deepwell Socket



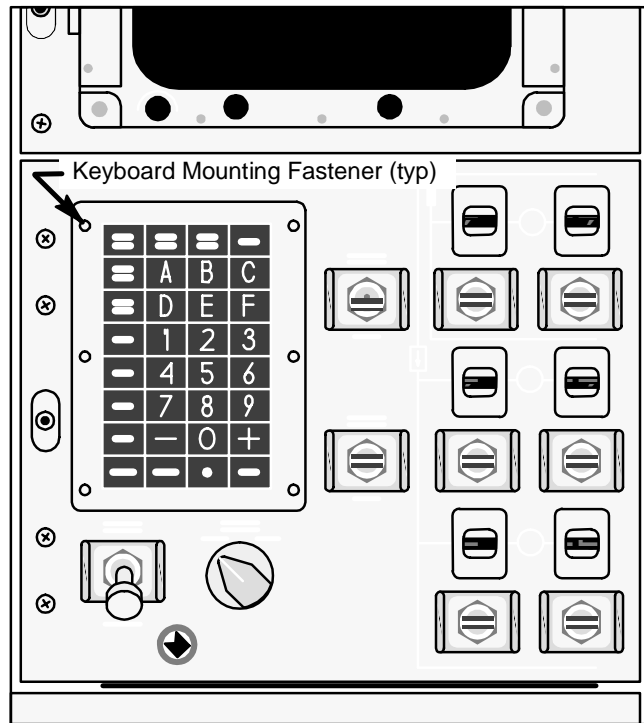
jsc48025\_110\_m.cnv

8. Remove closeout (PLT's shown) (twenty-six, 5/32-in Allen Head Driver)
9. Loosen Keyboard mounting fasteners (six, #6 Torque Driver)



jsc48025\_111\_m.cnv

10. Don Anti-Static Wrist Tethers, clip to unpainted ground as reqd
11. Disconnect cables
  - For PLT Keyboard:
    - Disconnect Cable 35V77W4P4 from J1
    - W1P5 from J2
    - W2P6 from J3
  - For CDR Keyboard:
    - Disconnect Cable 35V77W3P1 from J1
    - W1P2 from J2
    - W5P3 from J3
12. Remove failed Keyboard and mark w/tape



jsc48025\_257\_m.cnv

### TO REMOVE AFT KEYBOARD

13. On active PASS KYBD, GPC/CRT 04 EXEC
14. √Big 'X' and 'POLL FAIL'

#### NOTE

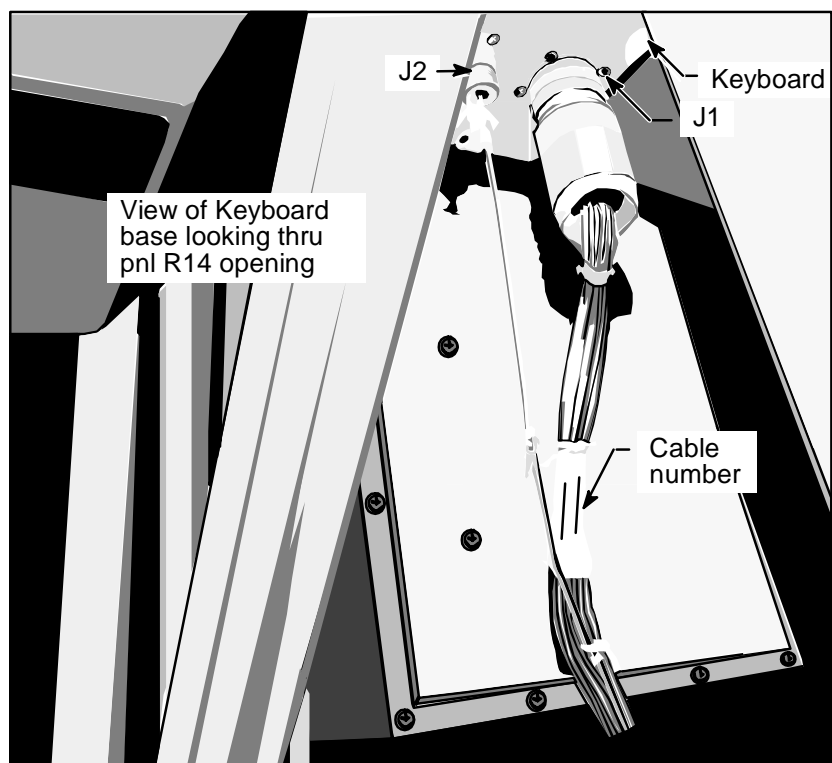
Expect 'PORT CHANGE' and 'MDU is autonomous' msgs when performing steps below

- |      |                                     |
|------|-------------------------------------|
| L4:Q | 15. cb AC3 $\Phi$ B LTG PNL MS – op |
| R11  | 16. IDP/CRT4 PWR sw – OFF           |

NOTE

Aft Keyboard connectors may be accessed thru pnls R12(R17,R18) depending on aft deck config

17. Remove fasteners from R17(R18) (5/32-in Allen Head Driver) or screws from R12 (#10 Torque Driver) (screws not captive, secure w/tape)
18. Loosen Keyboard mounting fasteners (six, #6 Torque Driver)



jsc48025\_258\_m.cnv

19. Don Anti-Static Wrist Tethers, clip to unpainted ground as reqd
20. Disconnect Cable 30V77 W28P66 from J1  
W2P67 from J2
21. Remove Keyboard

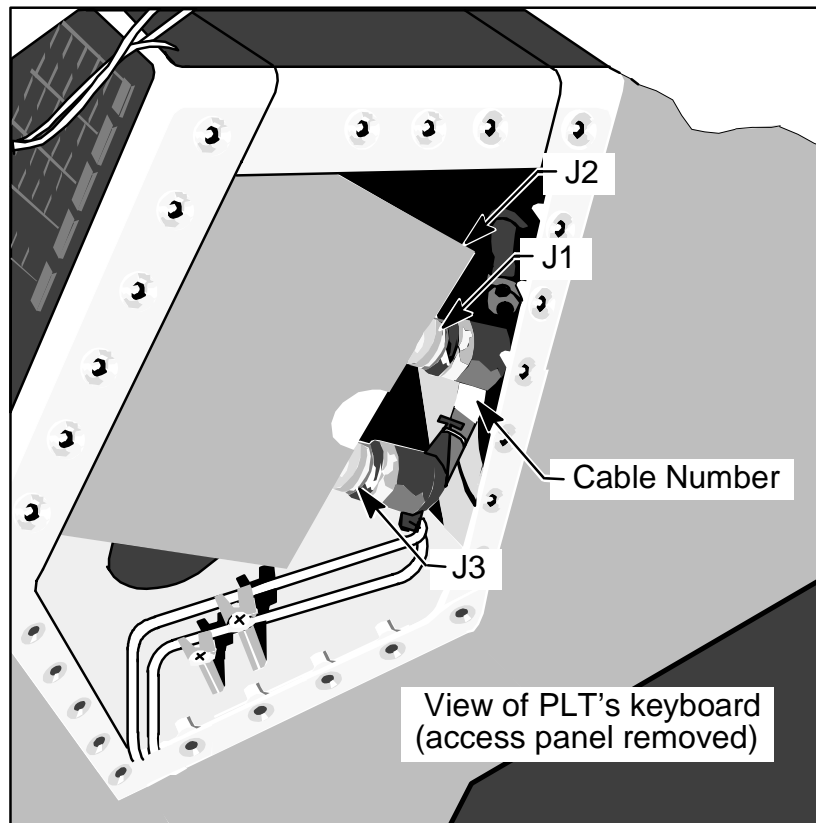
TO INSTALL AFT KEYBOARD FWD

22. Remove protective cap from J3 of aft Keyboard and install it on J3 of fwd Keyboard

NOTE

Fasteners on aft Keyboard longer than those on fwd, thus preventing snug fit

23. To prevent aft Keyboard from vibrating during entry, shim w/Gray Tape as reqd



jsc48025\_111\_m.cnv

24. Slide Keyboard into pnl and install connectors

For PLT Keyboard location:

- 25. Connect Cable 35V77W4P4 to J1
- W1P5 to J2
- W2P6 to J3

For CDR Keyboard location:

- 26. Connect Cable 35V77W3P1 to J1
- W1P2 to J2
- W5P3 to J3

27. Tighten Keyboard fasteners (six) snug

28. Install closeout (torque, 30 in-lb)

#### TO INSTALL FWD KEYBOARD AFT

29. Tape over connector interfaces. Tape harnesses to structure

30. Slide Keyboard into pnl, snug fasteners

R12, R17,R18 31. Install R12(R17,R18) (torque, 30 in-lb)

32. Stow tools, tape

#### KEYBOARD CHECKOUT

If problems encountered during checkout:

- 33. Stop procedure immediately and DO NOT proceed
- √MCC for further analysis

#### SYSTEM POWERUP

For left Keyboard:

- C2 34. IDP/CRT1,3 PWR sw (two) – ON
- MDU 35. CRT 1,3 PWR (two) – ON
- L4:R 36. cb AC3 ΦB INST L/CTR – cl (√Keyboard lighting by adjusting O6 LTG INST L/CTR as reqd)

For right Keyboard:

- C2 37. IDP/CRT2,3 PWR sw (two) – ON
- MDU 38. CRT 2,3 PWR (two) – ON
- L4:R 39. cb AC1 ΦA INST R – cl (√Keyboard lighting by adjusting O8 LTG INST R as reqd)

40. √BFC/CRT SEL – OFF

IF LEFT KEYBOARD CHANGED OUT:

- C2 41. Assign IDP 3:  
    Select desired MAJ FUNC  
    GPC/CRT desired GPC/3 EXEC (on active  
    PASS KYBD)
- MDU 42. L IDP/CRT SEL – 3
- MDU 43. Perform KEYSTROKE CHECKOUT on CRT 3  
    (steps 55,56)
- C2 44. Assign IDP 1:  
    Select desired MAJ FUNC  
    GPC/CRT desired GPC/1 EXEC (on active  
    PASS KYBD)
- MDU 45. L IDP/CRT SEL – 1
- MDU 46. Perform KEYSTROKE CHECKOUT on CRT 1  
    (steps 55,56)
- 47. Pwr ON(OFF) MDUs, IDPs, and config displays  
    as desired >>

IF RIGHT KEYBOARD CHANGED OUT:

- C2 48. Assign IDP 3:  
    Select desired MAJ FUNC  
    GPC/CRT desired GPC/3 EXEC (on active  
    PASS KYBD)
- MDU 49. R IDP/CRT SEL – 3
- MDU 50. Perform KEYSTROKE CHECKOUT on CRT 3  
    (steps 55,56)
- C2 51. Assign IDP 2:  
    Select desired MAJ FUNC  
    GPC/CRT desired GPC/2 EXEC (on active  
    PASS KYBD)
- MDU 52. R IDP/CRT SEL – 2
- MDU 53. Perform KEYSTROKE CHECKOUT on CRT 2  
    (steps 55,56)
- 54. Pwr ON(OFF) MDUs, IDPs, and config displays  
    as desired >>



KEYSTROKE CHECKOUT

- MDU      55. MAIN MENU:MEDS MAINT:CST:START IDP  
      √MEDS MAINT DISPLAY appears on MDU  
      √“IDP 1 (2,3) INTERACTIVE CST” appears on  
      bottom of screen

NOTE

Expect “IDP CST INITIATED” on other  
MDUs currently commanded by IDP

- C2      56. Check all KYBD entries are echoed next to  
      “KEYSTROKE:” on bottom RH corner of  
      display by pressing each key on KYBD

## MEDS MDU CHANGEOUT

(45 min)  
(15 min C/O)

OBJECTIVE: Replace failed MDU w/operational MDU

LOCATION: Pnl F6 for CDR1, CDR2  
Pnl F7 for CRT1, CRT2, CRT3, MFD1, MFD2  
Pnl F8 for PLT1, PLT2  
Pnl R11 for CRT4  
Pnl AFT for AFD1

### TOOLS REQD:

TOOL            Gray Tape  
                  Connector Pliers  
                  Ratchet Wrench  
                  3/32-in Allen Head Driver  
                  Anti-Static Wrist Tethers

### CAUTION

No tools are to be used to aid  
in inserting(dislodging) MDU  
during its installation(removal)

### NOTE

√MCC for MDUs to be swapped

### MDU PWRDN

	For CDR1(2):
MDU	1. CDR1(2) PWR – OFF
L4:R	2. cb AC3 ΦB INST L/CTR – op
R14:A	3. cb MNC(B) MDU/CDR1(2) – op
	For CRT1(2,3):
MDU	4. CRT1(2,3) PWR – OFF
L4:R	5. cb AC3 ΦB INST L/CTR – op
C2	6. IDP/CRT1(2,3) PWR sw – OFF
	For CRT4:
MDU	7. CRT4 PWR – OFF
L4:Q	8. cb AC3 ΦB LTG PNL MS – op
R11	9. IDP/CRT4 PWR sw – OFF

	~	
	For MFD1(2):	
MDU	10. MFD1(2) PWR – OFF	
L4:R	11. cb AC3 ΦB INST L/CTR – op	
R14:A	12. cb MNB(A) MDU/MFD1(2) – op	
	For PLT1(2):	
MDU	13. PLT1(2) PWR – OFF	
L4:R	14. cb AC1 ΦA INST R – op	
R14:A	15. cb MNA(C) MDU/PLT1(2) – op	
	For AFD1:	
MDU	16. AFD1 PWR – OFF	
L4:Q	17. cb AC1 ΦC LTG INST OS – op	
R14:A	18. cb MNC MDU/AFD1 – op	

MDU REMOVAL

19. Don Anti-Static Wrist Tethers, clip to unpainted ground as reqd
20. Loosen four front pnl fasteners (3/32-in Allen Head Driver)
21. Slide MDU out
22. Disconnect vehicle harness cables from MDU
23. Pull until clear of mounting bracket, mark failed MDU w/Gray Tape

TO INSTALL MDU

NOTE

CRT1(2,3,4) has shorting plug installed on receptacle J2

24. Mate connector as reqd

FWD MDUs

<u>For CDR1, connect</u>			<u>For CDR2, connect</u>			<u>For CRT1, connect</u>		
Cable		MDU	Cable		MDU	Cable		MDU
34P27	to	J1	34P24	to	J1	34P4	to	J1
34P22	to	J2	34P25	to	J2	34P6	to	J3
34P23	to	J3	34P26	to	J3	Shorting Plug	to	J2

<u>For CRT2, connect</u>			<u>For CRT3, connect</u>			<u>For MFD1, connect</u>		
Cable		MDU	Cable		MDU	Cable		MDU
34P7	to	J1	34P11	to	J1	34P15	to	J1
34P9	to	J3	34P13	to	J3	34P16	to	J2
Shorting Plug	to	J2	Shorting Plug	to	J2	34P17	to	J3

<u>For MFD2, connect</u>			<u>For PLT1, connect</u>			<u>For PLT2, connect</u>		
Cable		MDU	Cable		MDU	Cable		MDU
34P19	to	J1	34P21	to	J1	34P24	to	J1
34P20	to	J2	34P22	to	J2	34P25	to	J2
34P21	to	J3	34P23	to	J3	34P26	to	J3

AFT MDUs

<u>For CRT4, connect</u>			<u>For AFD1, connect</u>		
Cable		MDU	Cable		MDU
30P68	to	J1	30P857	to	J1
30P69	to	J3	30P845	to	J2
Shorting Plug	to	J2	30P849	to	J3

25. Slide MDU into pnl

NOTE

Start all fasteners before tightening them

26. Tighten four front fasteners snug (3/32-in Allen Head Driver)

MDU CHECKOUT

If problems encountered during checkout:

- 27. Stop procedure immediately  
√MCC for further actions

IDP POWERUP

- C2/R11 28. Pwr up all IDPs interfacing w/affected MDU
- 29. Aff IDP/CRT1(2,3,4) PWR – ON

MDU POWERUP

- For CDR1(2)
  - R14:A MDU 30. cb MNC(B) MDU/CDR1(2) – cl
  - 31. CDR1(2) PWR – ON  
√MDU not AUTONOMOUS
  - L4:R 32. cb AC3 ΦB INST L/CTR – cl (√Edgekey  
lighting by adjusting O6 LTG INST L/CTR  
as reqd)
- For CRT1(2,3)
  - MDU 33. CRT1(2,3) PWR – ON  
√MDU not AUTONOMOUS
  - L4:R 34. cb AC3 ΦB INST L/CTR – cl (√Edgekey  
lighting by adjusting O6 LTG INST L/CTR  
as reqd)
- For CRT4
  - MDU 35. CRT4 PWR – ON  
√MDU not AUTONOMOUS
  - L4:Q 36. cb AC3 ΦB LTG PNL MS – cl (√Edgekey  
lighting by adjusting R10 MS LTG as reqd)
- For MFD1(2)
  - R14:A MDU 37. cb MNB(A) MDU/MFD1(2) – cl
  - 38. MFD1(2) PWR – ON  
√MDU not AUTONOMOUS
  - L4:R 39. cb AC3 ΦB INST L/CTR – cl (√Edgekey  
lighting by adjusting O6 LTG INST L/CTR  
as reqd)

~

- For PLT1(2)
  - R14:A MDU 40. cb MNA(C) MDU/PLT1(2) – cl
  - 41. PLT1(2) PWR – ON
    - √MDU not AUTONOMOUS
  - L4:R 42. cb AC1 ΦA INST R – cl (√Edgekey lighting by adjusting O8 LTG INST R as reqd)
- For AFD1
  - R14:A MDU 43. cb MNC MDU/AFD1 – cl
  - 44. AFD1 PWR – ON
    - √MDU not AUTONOMOUS
  - L4:Q 45. cb AC1 ΦC LTG INST OS – cl (√Edgekey lighting by adjusting A6A1 OS LTG as reqd)

VERIFY PRIMARY,SECONDARY PORT (Non-CRT MDU)

- MDU 46. Record current MDU Port (\*):
- 47. MAIN MENU:MEDS MAINT:CONFIG STATUS:PORT SELECT
  - √Alt Port Selected (\*) and MDU not AUTONOMOUS

PERFORM MDU SELF-TEST

- MDU 48. MAIN MENU:MEDS MAINT:CST:START MDU

NOTE

Expect “MEDS I/O ERROR” msg  
annunciated for affected MDU.  
Do not perform MEDS MSG  
RST(ACK) until CST complete

- 49. Verify following displays appeared for ~10 sec each:
  - a. Blank
  - b. All red
  - c. All Green
  - d. All Blue
  - e. All White
  - f. Graphics Test Pattern

NOTE

During next step, pressing an edgekey twice will cause CST to fail

50. Verify white dots appear above each edgekey  
Press, release each edgekey  
Verify white dot above edgekey disappears
51. Wait until system status display appears  
Check affected MDU line 6 of SYSTEM  
STATUS = 0000FF
52. Reconfig MEDS as desired
  - √NEG viewing angle
  - √FC Bus assignment
  - √MDU Port assignment

## MMU CHANGEOUT

(2:00 hr)

OBJECTIVE: Swap failed MMU w/operational MMU. This will be done only when one MMU hard failed internally and other MMU failed externally (has bad data path)

LOCATION: See (COMPONENT LOCATIONS)

AV BAY 1, Zone 43G for MMU 1

AV BAY 2, Zone 57G for MMU 2

TOOLS REQD:

TOOL	Gray Tape
	Locker Tool
	3/8-in Deepwell Socket
	Torque Wrench
	1/4-in Driver Handle
	1/4-in Drive Ratchet Wrench
	1/4-in to 3/8-in Adapter
CHCK	Coldplate Protective Cover

### TO REMOVE MMU

- O14:F  
(O15:F)
1. MMU 1,2 – OFF
  2. Remove lockers and Thermal/Debris Traps to access MMUs 1,2
  3. Remove connector cables J1-J7 on MMUs 1,2
  4. Loosen mounting fasteners (ten, 3/8-in Deepwell Socket)
  5. Slide Coldplate Protective Cover between Coldplate and MMU
  6. Remove unit w/protective cover
  7. Mark hard-failed unit w/Gray Tape



TO INSTALL MMU

8. Place MMU w/Coldplate Protective Cover into position. Remove cover, tighten fasteners (torque, 70 in-lb)
9. Install connectors:

In MMU 1,2 Location, connect:	
Cable Connector	MMU
P511	J1
P512	J2
P513	J3
P514	J4
P515	J5
P516	J6
P517	J7

10. Install Thermal/Debris Traps
11. Perform MMU pwrup and checkout  
MMU 1(2) – ON

O14:F  
(O15:F)

X: SM 1 DPS UTILITY

12.  MMU STATUS 1(2) – RDY  
If busy, consult MCC  
 MMU 1(2) ASSIGN – ITEM 3(4)(\*)
13. Perform SM CHECKPOINT INITIATE (ORB OPS, DPS) to MMU 1(2) only, advise MCC of results
14. Install lockers (torque, 30 in-lb)
15. Stow tools, tape

## MMU CONTINGENCY PWRUP

(1:30 hr)

**OBJECTIVE:** Recover one MMU if failure due to loss of orbiter pwr

**LOCATION:** See (COMPONENT LOCATIONS)

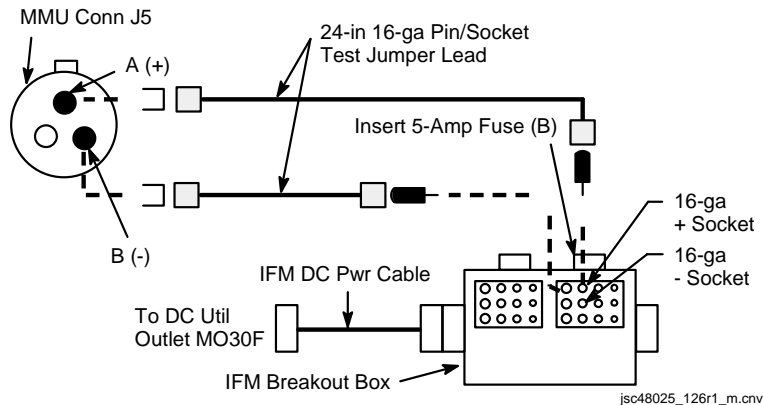
AV BAY 1, Zone 43G for MMU 1

AV BAY 2, Zone 57G for MMU 2

**TOOLS REQD:**

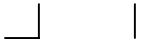
TOOL	Gray Tape
	Pin Kit (16-ga Pin/Socket Test Jumper Leads)
	Locker Tool
	Torque Wrench
	1/4-in Drive Ratchet Wrench
	1/4-in to 3/8-in Adapter
BOB	IFM Breakout Box
CHCK	DC PWR cable

- O14:F  
(O15:F)  
MO30F
1. MMU 1(2) – OFF
  2. √DC UTIL PWR MNC – OFF
  3. a. Breakout Box:  
AUX – OFF  
28V VAR VOLT – 28V  
PWR A,B – OFF  
b. Remove Fuse Cap, from side B  
c. Rotate GA SEL B – 16  
d. Install 5-Amp Fuse, replace cap
  4. Remove locker, Thermal/Debris Traps to access MMU 1(2)
  5. Remove connector from J5 on MMU 1(2) and install Breakout Box and cables as shown:



MO30F

6. Perform pwrup and checkout  
DC UTIL PWR MNC – ON  
Breakout Box:  
PWR B – ON (16 lt ON)  
 X: SM 1 DPS UTILITY
7. MMU STATUS 1(2) RDY. If busy, consult MCC |  
MMU 1(2) ASSIGN – ITEM 3(4)(\*)
8. Perform SM CHECKPOINT INITIATE (ORB OPS, |  
DPS) to MMU 1(2) only and report results
9. Install Thermal/Debris Trap using care not to  
pinch wires. Secure Breakout Box, cables as  
reqd
10. Stow locker
11. Stow tools, tape



Section N  
Intentionally  
Omitted



## **OBSS SW CONTINGENCY POWERUP**

**(1:00 HR) |**

OBJECTIVE: Bypass OBSS sw to regain CAB PL 3 Bus capability

LOCATION: Panels R12, R15

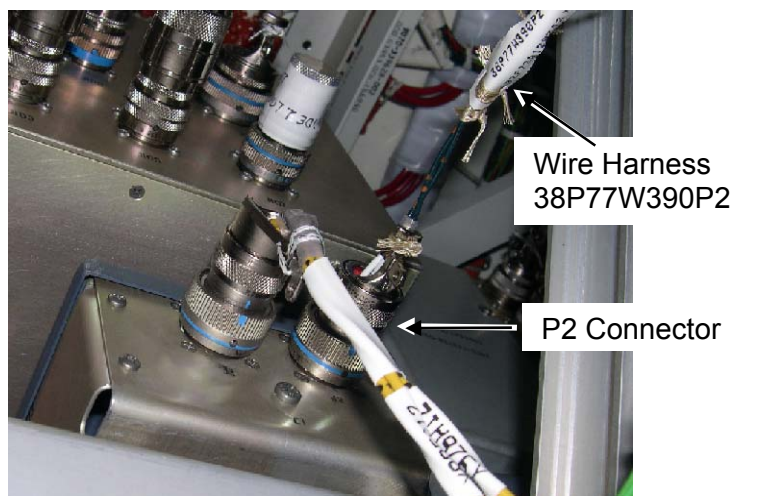
### TOOLS REQD:

TOOL	1/4-in to 3/8-in Adapter
	5/32-in Allen Head Driver
	#10 Torque Tip (3/8-in driver)
	Torque Wrench
	Ratchet Wrench
	Pin Kit (for Test Jumper leads,fuses)
	Connector Pliers
	Inspection Mirror
	Gray Tape
BOB	Breakout Box
CHCK	DC Pwr Cable
MISC	Flashlight

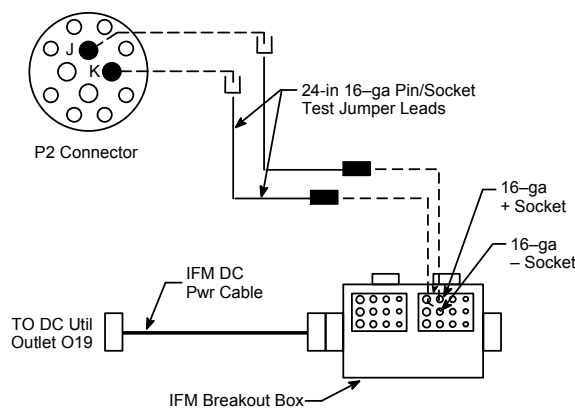
### TO INSTALL IFM

- |     |  |
|-----|--|
| R12 | 1. cb OBSS SW PWR - op   |
|     | 2. OBSS SW PWR – OFF   |
|     | 3. a. Breakout Box:  |
|     | AUX – OFF  |
|     | 28V/VAR VOLT – 28V   |
|     | PWR A,B – OFF  |
|     | b. Remove Fuse Cap from side B   |
|     | c. Rotate GA SEL B – 16  |
|     | d. Install 3-Amp Fuse, replace cap   |
| A11 | 4. √DC UTIL PWR MNC - OFF  |
| R15 | 5. Remove panel R15 (six fasteners, # 10 Torque<br>Tip, 12 fasteners, 5/32-in Allen Head Driver) |

6. Locate wire harness 38P77W390P2 (see photo below)



7. Demate connector P2 connected to J2
8. Connect two 24-in, 16-ga Pin/Socket Test Jumper Leads and 24 ft DC Pwr Cable as shown. Use Gray Tape to secure DC Pwr Cable and Breakout Box



jsc48025\_205A\_r.cnv

A11

9. DC UTIL PWR MNC – ON
10. Breakout Box:  
PWR B – ON (16-ga It ON)

O-2

IFM/ALL/GEN F,8

TO REMOVE IFM

11. Breakout Box:  
PWR B – OFF
- A11 12. DC UTIL PWR MNC – OFF
13. Stow Breakout Box and cables
- R15 14. DO NOT reconnect P2(J2), leave secured to  
bulkhead
15. Place Gray Tape over P2 connector interface to  
protect pins
16. Replace Panel R15 (torque Fasteners, 30 in-lb)
17. Stow tools

## ODS CENTERLINE CAMR ANGULAR ALIGNMENT (2:00 hr)

**OBJECTIVE:** Verify,adjust ODS Centerline Camr alignment

**LOCATIONS:** External Airlock, AFD

**TOOLS REQD:**

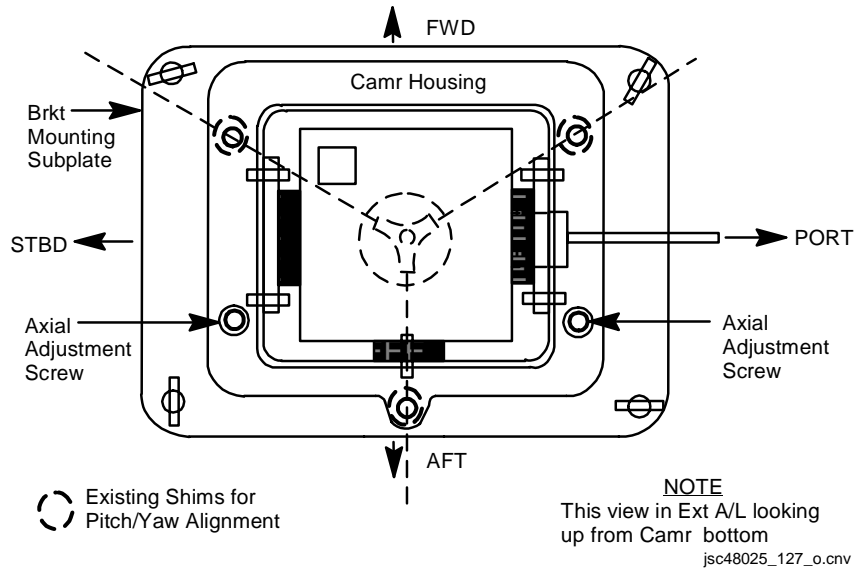
**TOOL** 3/16-in & 1/4-in Allen Drivers

1/4-in Ratchet Wrench

Torque Wrench

Tape Measure

**MISC** Feeler Gage (shims)



### VERIFY CAMERA POSITION

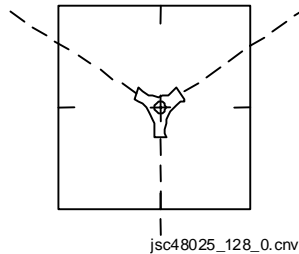
1. ✓Camr position relative to ODS structure by measuring from A,B,C decals on brkt mounting subplate to corresponding A,B,C decals on ODS wall and compare to following preflight values (Tape Measure)

Camr	Fwd Decal B	Aft No Decal	Port Decal C	Stbd Decal A
Primary	25 1/4-in	26 1/16-in	24-in	24 1/16-in
Backup	25 5/16-in	26-in	24 1/16-in	24 1/16-in



## VERIFY ANGULAR ALIGNMENT

- AFD
2. Set up CCTV monitor for C/L Camr view
  3. Adjust Camr zoom setting to  $22.0^\circ \pm 0.5^\circ$   
Check monitor lower vert tick mark and monitor center vert crosshair coincide w/target vert support wire, and are parallel w/same. If wire,crosshair,tick mark overlay each other, no yaw(axial) alignment needed



4. Check intersection of monitor vert,horiz crosshair falls within target circular opening from  $\sim 10^\circ$ - $39^\circ$  zoom range of Camr
5. Report results of both translational,angular verifications to MCC

## ADJUST ANGULAR ALIGNMENT

### FOR AXIAL MISALIGNMENT

- Ext A/L
6. Loosen, but do not remove three (3) screws at shim locations and two (2) axial adjustment screws, as indicated in diagram on O-4 (1/4-in Allen Driver, Ratchet Wrench)
  7. Twist Camr housing to align monitor lower vert tick mark w/target vert support wire
  8. Tighten two (2) axial alignment screws (45 in-lb) (1/4-in Allen Driver, Torque Wrench)

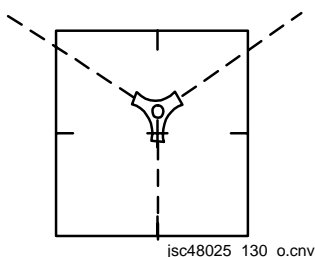
### NOTE

Following sections are written for pure vert(horiz) misalignment. For both, sections may be executed in parallel

FOR VERTICAL MISALIGNMENT

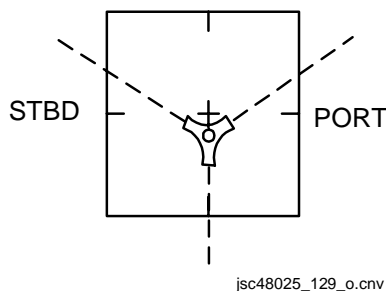
9. Loosen, but do not remove three (3) screws at shim locations, as indicated in diagram on O-4 (1/4-in Allen Driver, Ratchet Wrench)

10. If crosshairs below target circle:



Place appropriately thick Feeler Gage (shims) between Camr housing and brkt mounting subplate at both loosened screws on fwd side. Tighten screws (45 in-lb) (1/4-in Allen Driver, Torque Wrench)

11. If crosshairs above target circle:



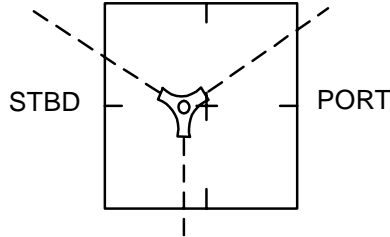
Place appropriately thick Feeler Gage (shims) between Camr housing and brkt mounting subplate at loosened fastener on aft side. Tighten screws (45 in-lb) (1/4-in Allen Driver, Torque Wrench)

12. Verify alignment by repeating steps 2 thru 5; repeat steps 9,10(9,11) as necessary to achieve proper alignment

FOR HORIZONTAL MISALIGNMENT

- Ext A/L 13. Loosen, but do not remove three (3) screws at shim locations as indicated in diagram on O-4 (1/4-in Allen Driver, Ratchet Wrench)

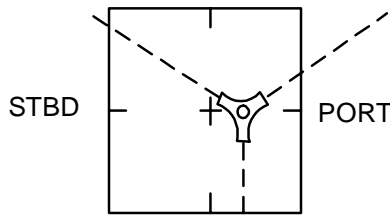
14. If crosshairs to right of target circle:



jsc48025\_131\_o.cnv

Place appropriately thick Feeler Gage (shims) between Camr housing and brkt mounting subplate on stbd side at each corner, taking care to avoid changing pitch orientation (unless desired). Tighten screws (45 in-lb) (1/4-in Allen Driver, Torque Wrench)

15. If crosshairs to left of target circle:



jsc48025\_132\_o.cnv

Place appropriately thick Feeler Gage (shims) between Camr housing and brkt mounting subplate on port side at each corner, taking care to avoid changing pitch orientation (unless desired). Tighten screws (45 in-lb) (1/4-in Allen Driver, Torque Wrench)

- AFD 16. Verify alignment by repeating steps 2 thru 5; repeat steps 13,14(13,15) as necessary to achieve proper alignment
17. Stow tools

## OIU CABLE SWAP

(45 min)

OBJECTIVE: Recover commands/data lost due to PSP/OIU failure by swapping J3 connectors at OIU 1,2

LOCATION: Flt Deck, normally Pnl L11 for OIUs and Pnl L14 for OIU cable access at rear of LRU

### NOTE

Nominal orbiter config has commands routed PSP1 to OIU 1 and PSP 2 to OIU 2. Cable swap reroutes PSP 1 to OIU 2 and PSP 2 to OIU 1, and changes OIU 1 to PDI Input 2 and OIU 2 to PDI Input 1

### TOOLS REQD:

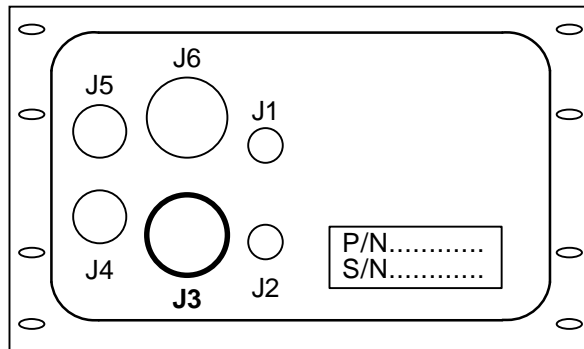
TOOL	Gray Tape Pwr Screwdriver #10L Torque Tip 1/4-in to 3/8-in Adapter 5/32-in Allen Head Driver Torque Wrench Inspection Mirror Wire Cutters
MISC	Flashlight

A1L	1. $\sqrt{S}$ -BD PL CNTL – CMD PSP CMD OUTPUT – PL UMB $\sqrt{SEL}$ – PSP PWR SYS – OFF CNTL – PNL
L11	2. OIU PWR – OFF (tb-bp)

### NOTE

PL Timing Buffer low level timing signals will remain active on following connector demate,remate

3. Remove Panel L14 (six screws, #10L Torque Tip; 12 fasteners, 5/32-in Allen Head Driver)
4. Demate cable P13 (J3) from OIU 1 and P23 (J3) from OIU 2. Remove wire ties if necessary (Wire Cutters)



REAR VIEW OF OIU

jsc48025\_133\_o.cvx

5. Remate cable P13 (J3) to OIU 2 and P23 (J3) to OIU 1

OIU ACTIVATION

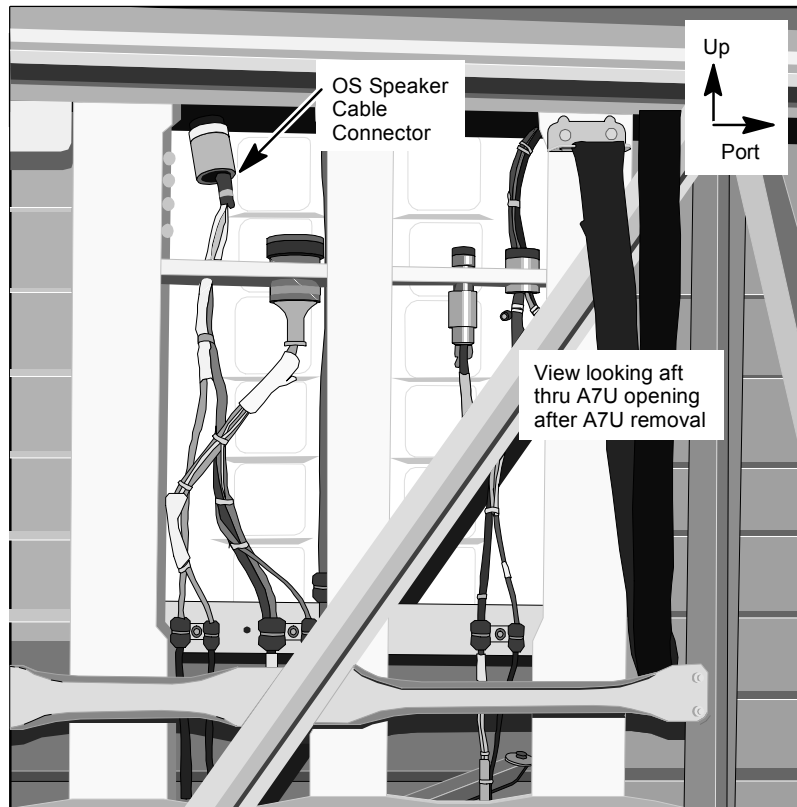
6. S-BD PL CNTL – CMD  
PWR SYS – 2(1)  
CNTL – PNL,CMD

NOTE

OIU 1 now connected to PSP 2  
and OIU 2 connected to PSP 1

7. Perform I/O RESET on PSP 2(1):  
SPEC 62 – ITEM 7(6) EXEC
- L11 8. OIU PWR – OIU 1(2) ON (tb-UP/DN)  
Advise MCC of OIU activation for PDI,OIU reconfig
9. Reinstall Panel L14, (six screws/12 fasteners, torque 30 in-lb); stow tools





jsc48025\_134\_o.cnv

5. Remove connector plug from Speaker Box
  6. Tape over plug interface and tape/secure harness to structure
- A7U
7. Reinstall A7U, eight bolts/washers (torque, 30 in-lb)
    - \* If reqd: \*
    - \* Reinstall RHC wire harness \*
    - \* clamp behind A7C from aft \*
    - \* station structure (torque, \*
    - \* 30 in-lb) \*
  8. Install pnl, ensure wire harnesses not crimped (torque mounting bolts 30 in-lb)
  9. Stow tools, tape

## O2 SYS 1(2), FAILED XOVR VLV BYPASS

(45 min) |

OBJECTIVE: Provide dual O2 sys supply, bypass failed closed O2 sys crossover valve using O2 Cont Hose between MO10W,C7

LOCATION: LEH panel connections, WCS ovhd

### TOOLS REQD:

TOOL            Gray Tape  
                  9/16-in & 11/16-in Combination Wrenches  
CHCK            O2 Cont Hose  
                  Clean Room Gloves

### WARNING

System has 100% O2 at 100 psig. Do not touch hose ends, fittings w/bare hands. Keep clean and dirt free

### CONFIG PANELS

C7                1. LEH O2 SPLY 1,2 vlv – CL  
MO69M        2. LEH O2 8 vlv – CL  
MO10W        3. O2 REG INLET SYS 1(2) vlv – CL

### INSTALL HOSE

MO10W        4. Don powder-free Gloves  
                  5. Loosen Test Port (TP), TP4(3) cap two turns by securing pnl fitting (11/16-in Combination Wrench), and rotating cap (9/16-in Combination Wrench)  
                  6. Depress TP4(3) cap insert to relieve pressure  
                  7. Remove cap from TP4(3), temp stow

### NOTE

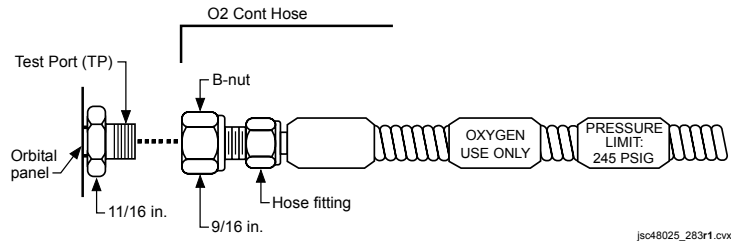
Ensure pnl and O2 Cont Hose fitting sealing surfaces remain stationary while tightening O2 Cont Hose B-nut.

### WARNING

Avoid cross-threading (scratching) sealing surfaces to prevent leakage of 100% O2 and possible fire/explosion



8. Remove protective bag from one end of O2 Cont Hose; install onto TP4(3) by maintaining hose fitting and manually rotating B-nut, snug (9/16-in Combination Wrench)



- |                |   |
|----------------|---|
| C7             | <ol style="list-style-type: none"> <li>9. Loosen TP1 cap two turns by rotating cap (9/16-in Combination Wrench)</li> <li>10. Depress TP1 cap insert to relieve pressure</li> <li>11. Remove cap from TP1, temp stow</li> <li>12. Remove protective bag from other end of O2 Cont Hose; install onto TP1 by maintaining hose fitting and manually rotating B-nut, snug (9/16-in Combination Wrench)</li> <li>13. Secure O2 Cont Hose to prevent sudden movement during pressurization and to ensure hose remains clear of egress path (Gray Tape)</li> </ol> |
| MO10W<br>MO32M | <ol style="list-style-type: none"> <li>14. O2 REG INLET SYS 1(2) vlv – OP</li> <li>15. LEH O2 5 vlv – OP</li> <li>16. Check QDM flow out of LEH 5; give MCC mark when test performed</li> </ol>   |
| MO69M<br>C7    | <ol style="list-style-type: none"> <li>17. Following flow test:<br/> <ul style="list-style-type: none"> <li>LEH O2 8 vlv – OP</li> <li>SPLY 1,2 vlv – OP</li> </ul> </li> <li>18. Stow tools</li> </ol>   |

## OSVU CONTINGENCY PWRUP

(1:00 hr)

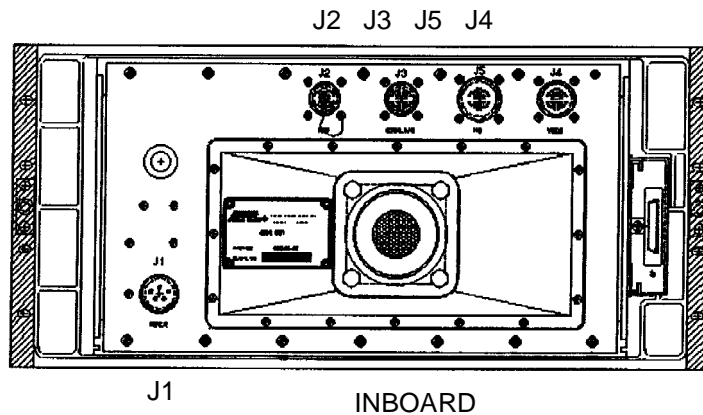
OBJECTIVE: Repower failed OSVU, due to failed switch(circuit breaker), using Breakout Box

LOCATION: Pnl R12,R15

### TOOLS REQD:

TOOL	1/4-in to 3/8-in Adapter 5/32-in Allen Head Driver #10 Torque Tip Torque Wrench Ratchet Wrench Pin Kit (for Test Jumper leads,fuses) Connector Pliers Inspection Mirror Gray Tape
BOB	Breakout Box
CHCK	DC Pwr Cable
MISC	Flashlight

- |      |   |
|------|---|
| LCDM | 1. PWR – OFF  |
| R12  | 2. √OSVS PWR – OFF<br>√It – OFF   |
| R15  | 3. √cb OSVS Pwr – op<br>4. Remove Pnl R15 (six #10 Torque Tip,<br>12 fasteners, 5/32-in Allen Head Driver)<br>5. Demate connectors P1(J1/Pwr), put Gray Tape<br>over face of connector and tape it aside. (Wire<br>bundle connector not used) |



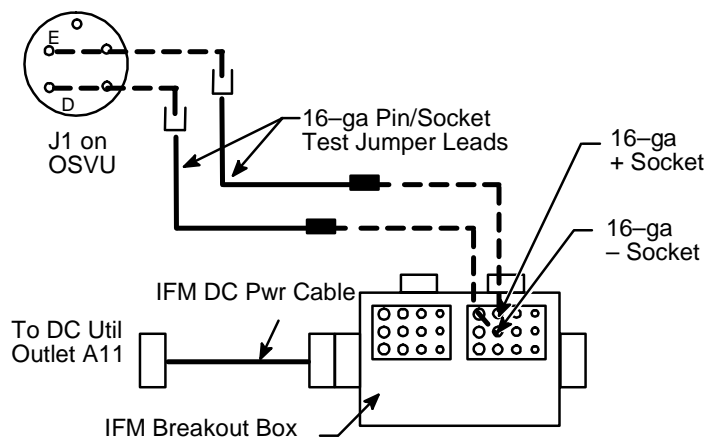
jsc48025\_136\_o.cnv

- |     |                           |
|-----|---------------------------|
| A11 | 6. √DC UTIL PWR MNC – OFF |
|-----|---------------------------|

O-14

IFM/ALL/GEN F,2

7. a. Breakout Box:  
 AUX – OFF  
 28V/VAR V – 28V  
 PWR A,B – OFF
- b. Remove fuse cap, side B
- c. Rotate GA SEL B – 16
- d. Install 10-Amp fuse, replace cap
- e. Connect two 24-in, 16-ga Pin/Socket Test Jumper Leads and 24 ft DC UTIL Cable as shown. Use Gray Tape to secure DC Pwr Cable and Breakout Box as reqd



- A11      8. DC UTIL PWR MNC – ON
9. Breakout Box:  
               PWR B – ON (16-ga It ON)

OSVU OPS COMPLETE

10. Breakout Box:  
               PWR B – OFF
- A11      11. DC UTIL PWR MNC – OFF
12. Stow Breakout Box and cables
- R15      13. DO NOT reconnect P1(J1), leave secured to  
               bulkhead
14. Place Gray Tape over J1 to protect pins
15. Replace Panel R15 (torque Fasteners, 30 in-lb)
16. Stow tools

## OSVU REPLACEMENT

(1:00 hr)

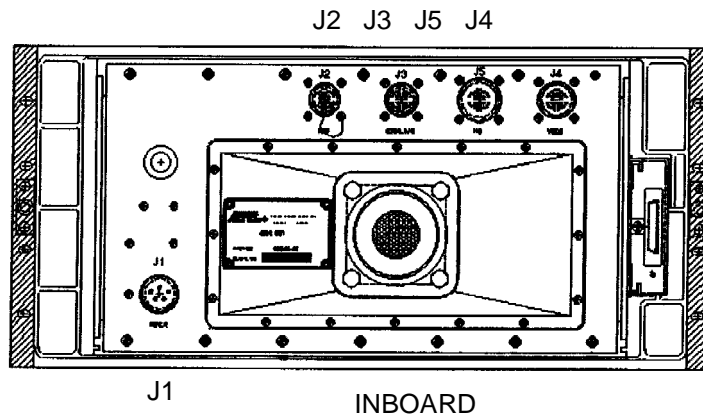
OBJECTIVE: Replace failed OSVU w/spare

LOCATION: Aft Flight Deck, Pnl R12L

TOOLS REQD:

TOOL #10 Torque Tip  
1/4-in to 3/8-in Adapter  
5/32-in Allen Head Driver  
3/8-in Deepwell Socket  
Torque Wrench  
Ratchet Wrench  
Anti-static Wrist Tether

- EXT 1. Unstow spare OSVU  
A/L Bag  
LCDM 2. PWR – OFF  
R12 3. OSVS PWR – OFF  
√lt – OFF  
4. cb OSVS Pwr – op  
R15 5. Remove Pnl R15 (six #10 Torque Tip,  
12 fasteners, 5/32-in Allen Head Driver)



jsc48025\_136\_o.cnv

6. Don Anti-static Wrist Tether
7. Demate connectors P1(J1/Pwr), P4(J4/Video), P5(J5/HMI), and P3(J3/Serial I/O)
8. Loosen clamp on orbiter air cooling hose (3/8-in Deepwell Socket)
9. Demate orbiter air cooling hose from OSVU, temp stow clamp

O-16

IFM/ALL/GEN F,2

- |         |  |
|---------|--|
| R12L    | 10. Remove OSVU mounting screws/washers (eight, #10 Torque Tip), temp stow                         |
|         | 11. Remove OSVU from panel, mark failed w/Gray Tape, temp stow                                     |
|         | 12. Remove OSVU Hard Drive (HDD1) from failed unit   |
|         | 13. Remove Dummy Hard Drive from spare OSVU  |
|         | 14. Install spare OSVU Dummy Hard Drive into failed unit, tighten thumbscrews                      |
|         | 15. Install original OSVU Hard Drive into spare OSVU, tighten thumbscrews                          |
|         | 16. Slide spare unit into panel, hand tight mounting screws (eight, #10 Torque Tip)                |
| R15     | 17. Mate orbiter air cooling hose to OSVU  |
|         | 18. Tighten clamp on orbiter air cooling hose, snug (3/8-in Deepwell Socket)                       |
|         | 19. Install connectors P3(J3/Serial I/O), P5(J5/HMI), P4(J4/Video), and P1(J1/Pwr)                 |
| R12L    | 20. Torque OSVU mounting screws, 30 in-lb  |
| R15     | 21. Install pnl R15 (six #10 Torque Tip, 12 fasteners, 5/32-in Allen Head Driver, torque 30 in-lb) |
|         | 22. Perform OSVS PWRUP (PDRS OPS, <u>OSVS OPS</u> )  |
| EXT     | 23. Stow failed OSVU   |
| A/L Bag | 24. Stow tools   |



This Page Intentionally Blank



## PARACHUTE REPACK

(30 min)

**OBJECTIVE:** Repack upper parachute compartment to regain parachute deploy capability. Procedure does not completely repack parachute. However, it does secure drogue chute compartment to prevent early drogue chute deploy and possible entanglement at bailout

**LOCATION:** See MIDDECK (COMPONENT LOCATIONS)

### TOOLS REQD:

TOOL	Gray Tape
MISC	PPA Repack Kit
	Nylon Cord (thick cord)
	Curved Pin
	Cotton Cord (narrow cord)
	Large Ziplock Bag
	Scissors

### CAUTION

Do not pull on deployed pilot chute and riser. Pulling pilot chute and riser may deploy drogue chute and further complicate repack procedure

1. Pull ripcord handle on left riser free from parachute pack. Place handle in Return-to-Houston bag

### NOTE

Red pyros under pyro flap unfired. Accidentally pulling yellow cords attached to red pyros will fire pyros but is not hazardous (however, pyros will be hot if fired. These pyros are no longer useful for parachute operation

2. Using scissors, cut two white pyro flap stitches that secure pyro flap to top flap. These two flaps cover pilot/drogue chute compartment (photo 1)



Photo 1

jsc48025 139 p.cvx

3. Separate pyro flap and top flap that are velcroed together (photo 2)

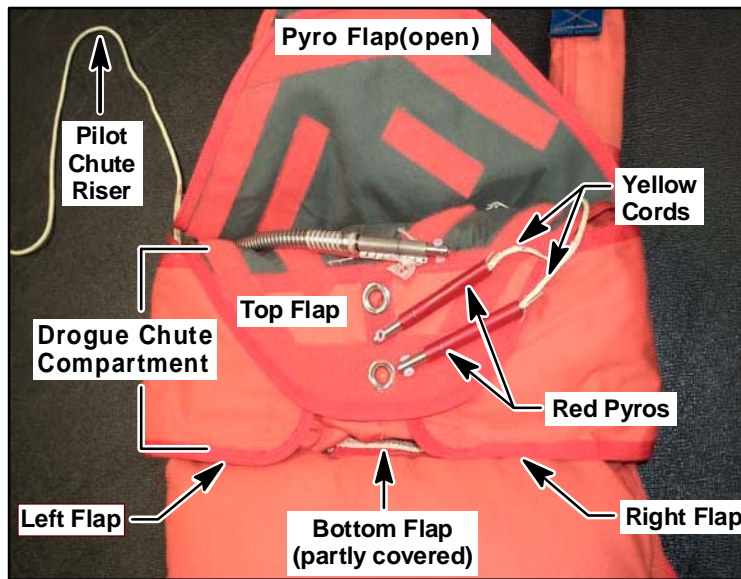


Photo 2

jsc48025 140 p.cvx



- Carefully Gray Tape red pyros (two) toward base of pyro flap (photo 3)

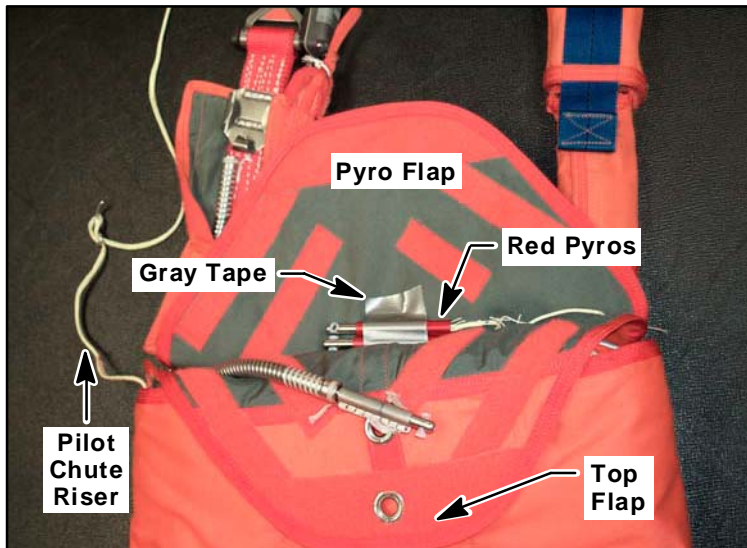


Photo 3

jsc48025\_141\_p.cvX

- Install curved pin on pilot chute riser using Lark's Head knot (photo 4)

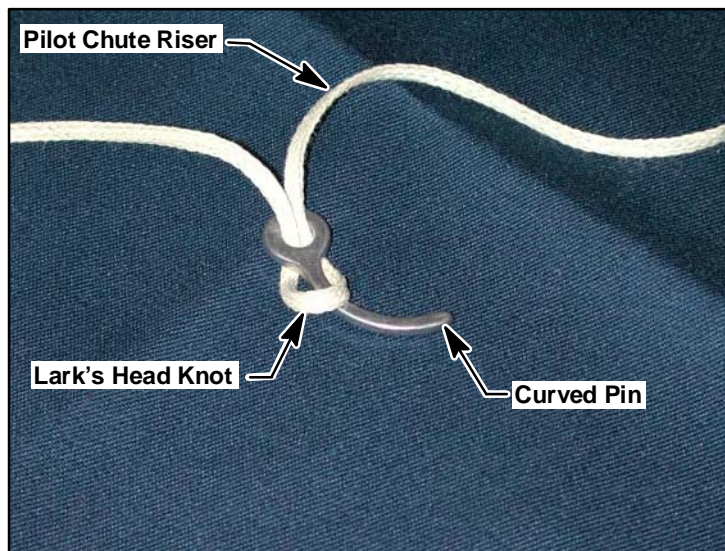


Photo 4

jsc48025 142 p.cvX

6. Locate curved pin ~6 in from stitching on pilot chute riser at drogue chute sleeve (photo 5)  
Draw Lark's Head knot tight around pilot chute riser

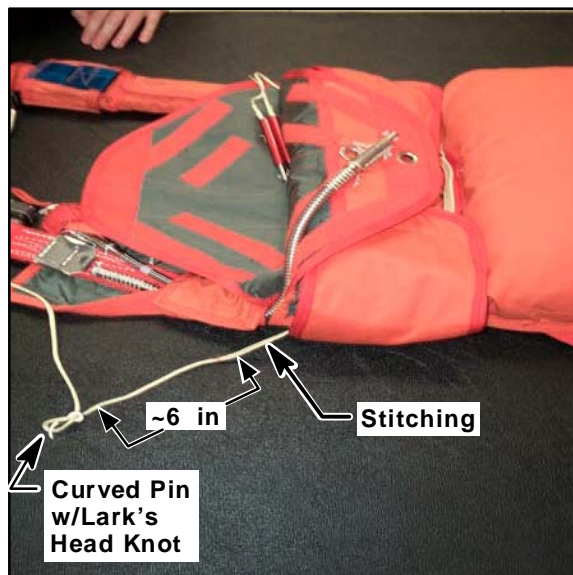


Photo 5

jsc48025\_143\_p.cvx

**WARNING**

When opening flaps covering drogue chute sleeve, drogue chute sleeve and risers will not be secure. Make sure sleeve stays close to parachute pack to prevent firing main canopy Automatic Opening Device (AOD). There is no immediate hazard if AOD fires, but main canopy will deploy immediately on bailout instead of at 14k ft

7. Open four flaps (top, left, right, bottom) covering drogue chute sleeve and locate main locking loop (photo 6)

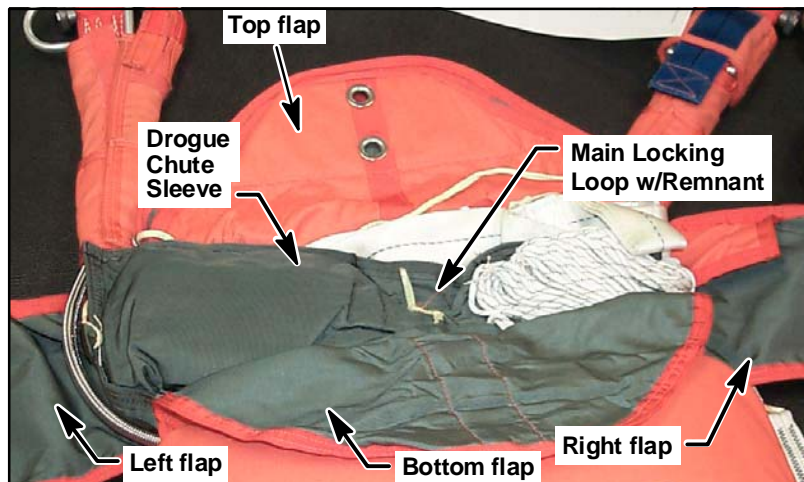


Photo 6

jsc48025\_144\_p.cvx

8. Slide cord remnant to base of main locking loop (photos 7a,7b)

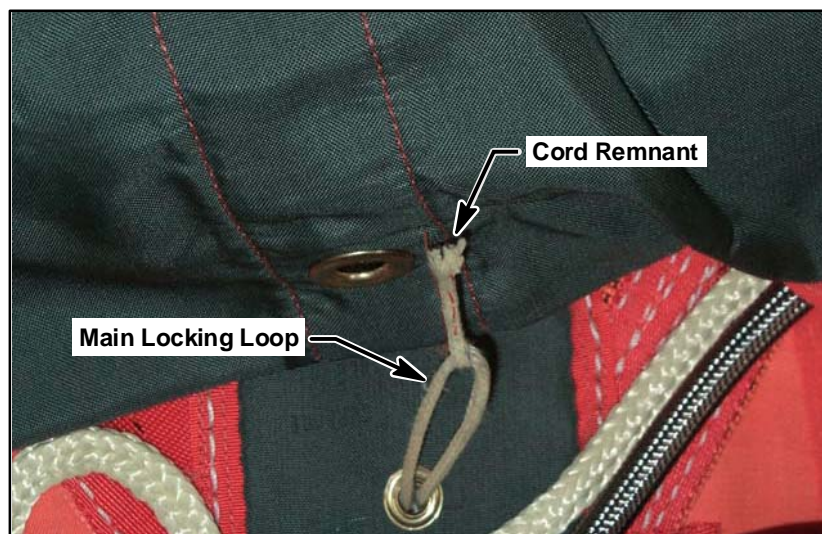


Photo 7a

jsac48025\_145\_p.cvx

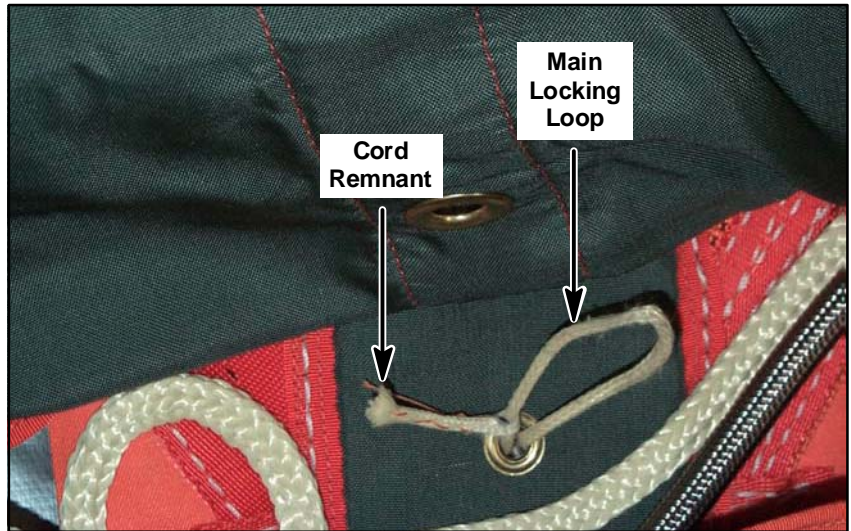


Photo 7b

jsc48025\_146\_p.cnv

9. Pass nylon cord (thick cord) from PPA Repack Kit thru main locking loop; center cord (photo 8)

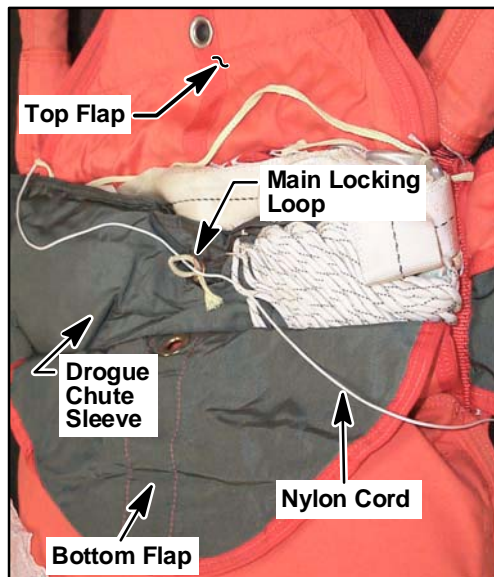


Photo 8

jsc48025 147 p.cnv

10. Place Pilot Chute on left riser side (manual ripcord handle side) of parachute pack (photo 9)

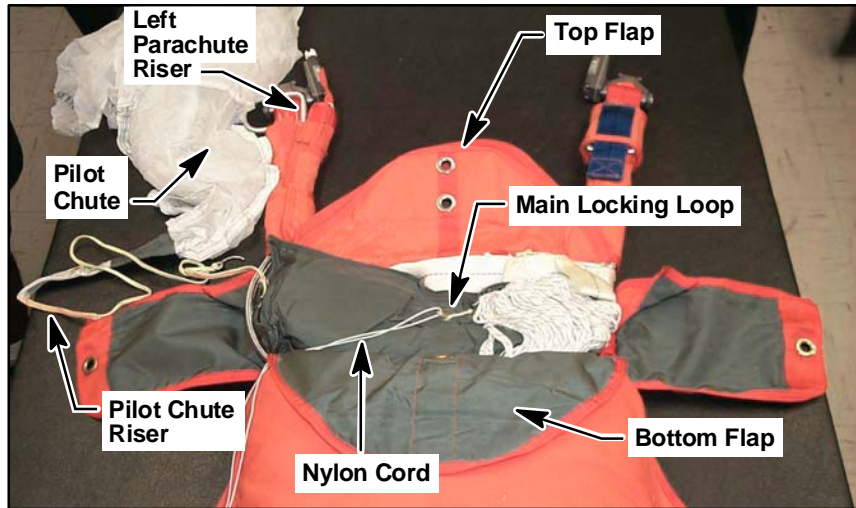


Photo 9

jsc48025\_148\_p.cnv

11. Pass both nylon cord ends thru eyelets A, B, C, then D (photos 10,11)

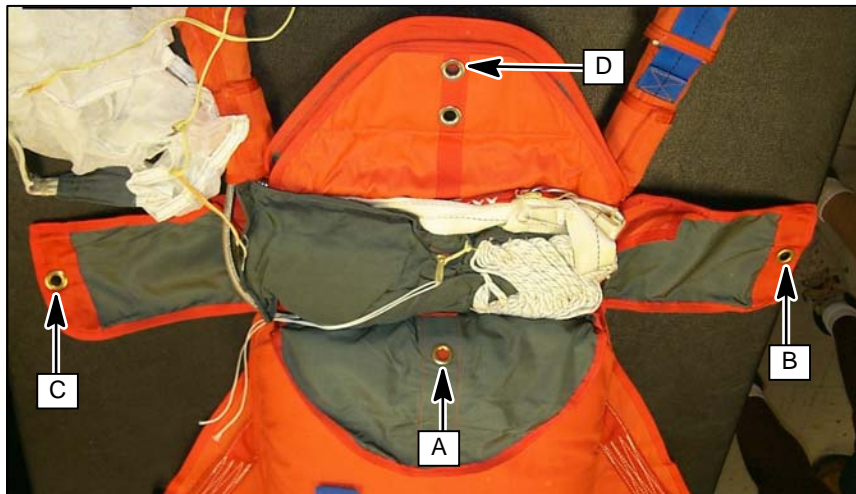


Photo 10

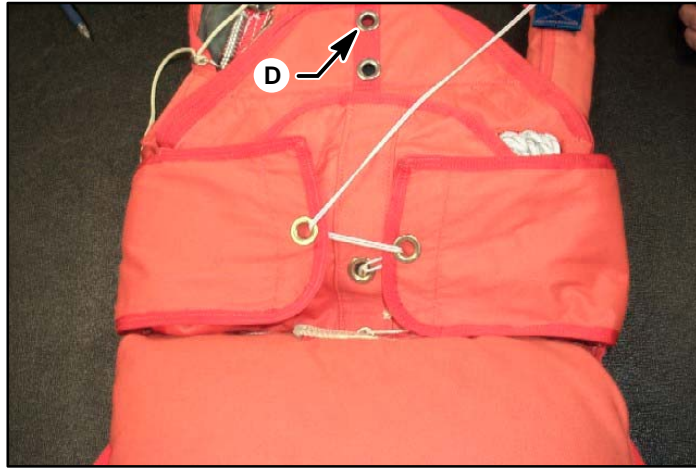


Photo 11

jsc48025\_150\_p.cnv

12. Pull on nylon cord and compress drogue chute/flaps to pull main locking loop thru eyelet. (Use as much force as necessary to expose main locking loop)
13. Pass curved pin left to right thru main locking loop to secure drogue chute compartment (curved pin may curve up(down) but must lie flat (photo 12) Remove nylon cord from main loop; discard nylon cord

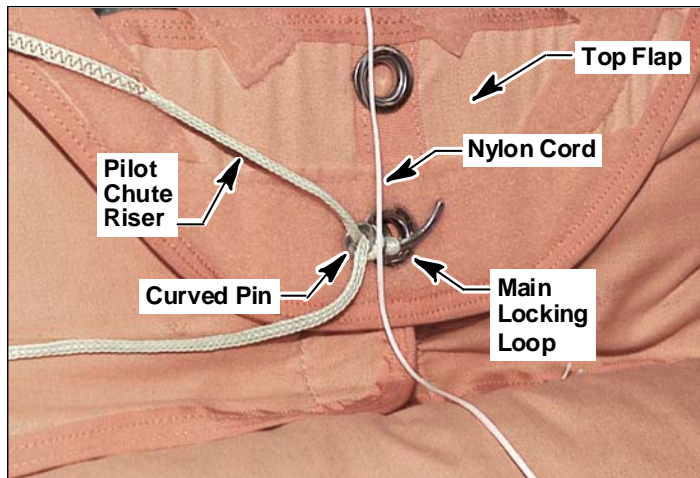


Photo 12

jsc48025 151 p.cnv

14. Remove slack in pilot chute riser at Lark's Head knot. Tighten Lark's Head knot, ensuring loop is around pilot chute riser, not around curved pin (photo 13)

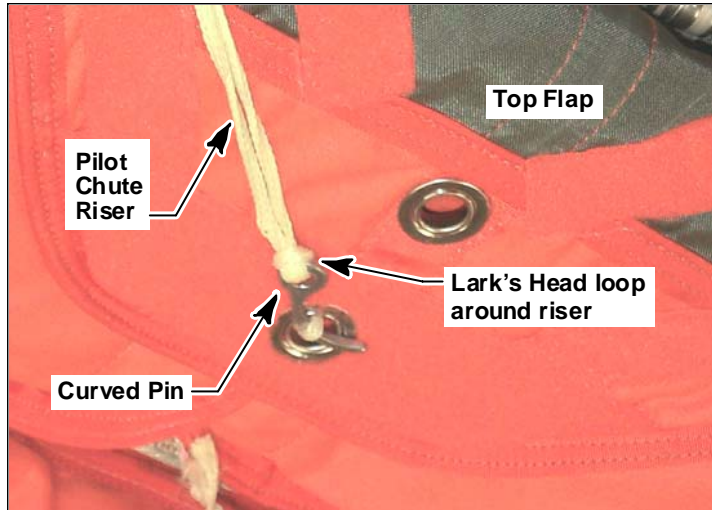


Photo 13

jsc48025\_152\_p.cnv

15. Carefully Gray Tape ripcord pyro and cable housing next to two red pyros (photo 14)

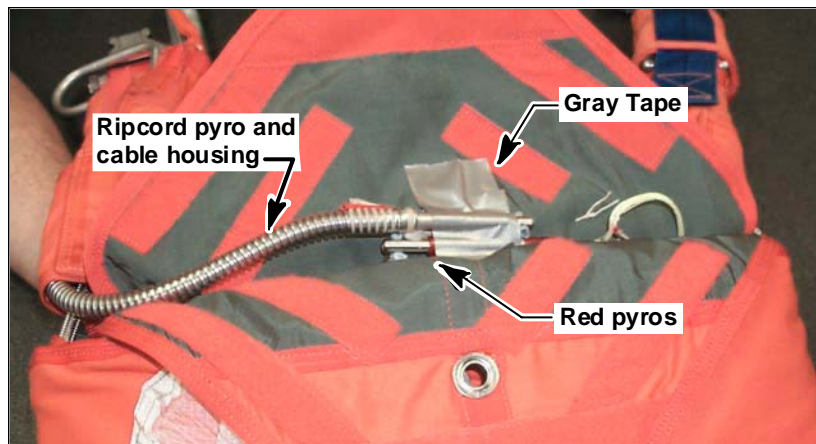


Photo 14

jsc48025\_153\_p.cnv

16. Double cotton cord (narrow cord from PPA Repack Kit) back on itself. Thread cotton cord thru eye of curved pin, around main locking loop and under end of pin (photo 15)

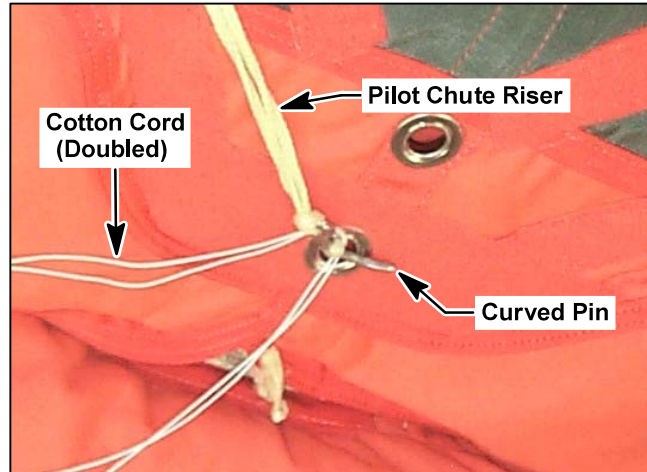


Photo 15

jsc48025\_154\_p.cnv

17. Pull cord tight against curved pin; secure cotton cord using a surgeon's knot (left over right, passed thru loop of the knot twice, then right over left) (photo 16), then a square knot (right over left, then left over right), and finally an overhand knot (right over left) (photo 17)



Photo 16  
Surgeon's knot (loose)

jsc48025\_138\_p.cnv





Photo 17  
All knots complete

18. Cut cotton cord ends 1 in from knots (photo 18)

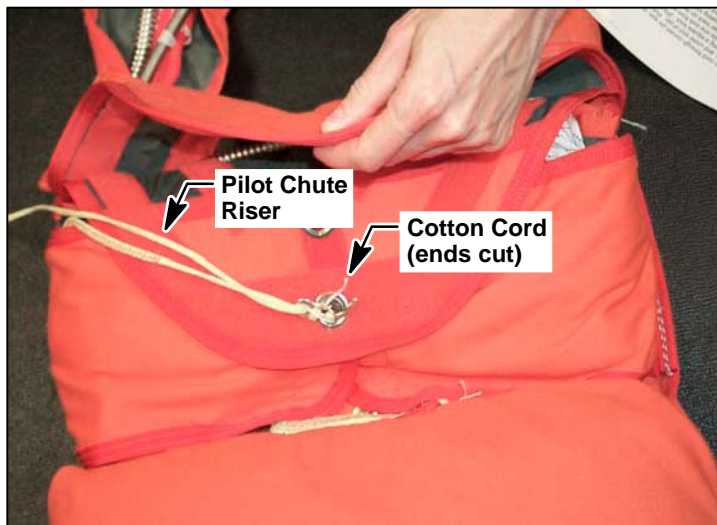


Photo 18

jsc48025\_157b\_p.cnv

19. Route pilot chute riser around side of top flap (photo 19). Close pyro flap over pilot chute riser by mating Velcro on pyro flap and top flap. Make sure pilot chute riser is routed as depicted in photo 20

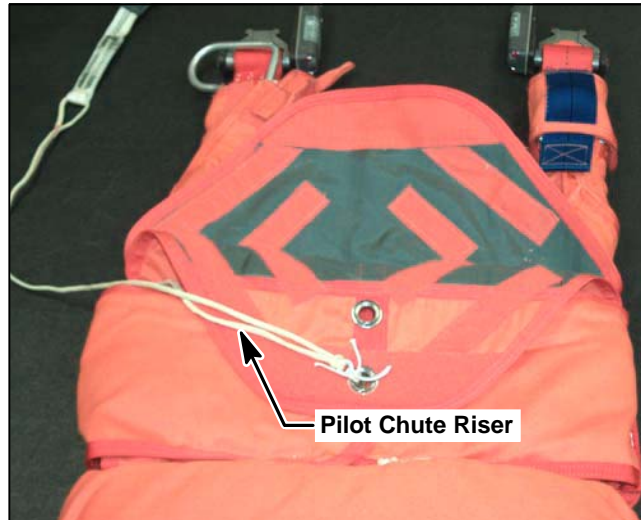


Photo 19

jsc48025\_158a\_p.cnv

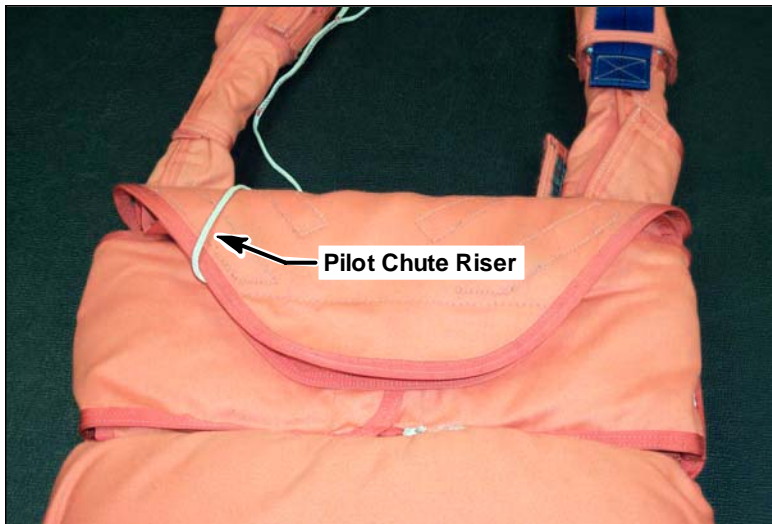


Photo 20

jsc48025\_159b\_p.cnv

**WARNING**  
Do not wrap pilot chute riser around pilot chute. Doing so may prevent proper parachute opening

20. Twist loose fabric around pilot chute (photo 21)



Photo 21

21. Place pilot chute, riser end first, into large Ziplock bag. Wrap bag closely around pilot chute

22. Using long piece of Gray Tape (>3 ft), tape Ziplock bag/pilot chute to pack. Place tape vertically across bag. Fashion pull handle at top end of tape by folding tape back on itself (photo 22)

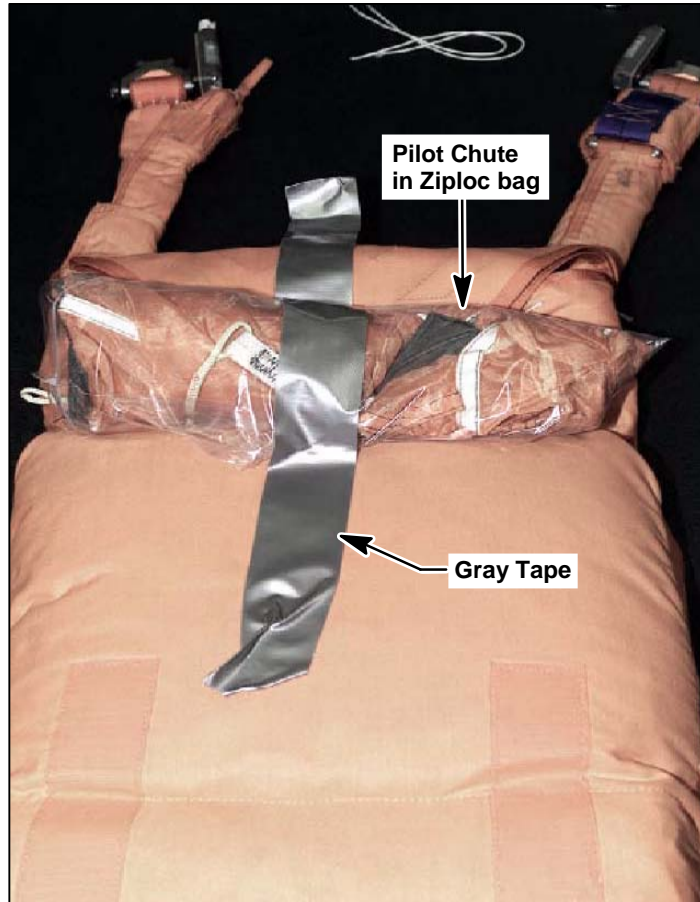


Photo 22

jsc48025\_161\_p.cnv

**NOTE**

Bailout order should be changed such that crewmember w/affected parachute pack is second to last.  
Bailout procedures modified as follows:

**WARNING**

**EARLY DEPLOYMENT OF PILOT CHUTE WILL AFFECT WING CLEARANCE MARGIN AND POSSIBLY DAMAGE PARACHUTES**

1. Prior to attaching D-ring on right riser to pole lanyard, have next crewmember in bailout sequence remove Gray Tape, and carefully remove pilot chute from Ziplock bag
2. Attach D-ring on right riser to pole lanyard
3. Next crewmember in sequence will carefully hand pilot chute over left shoulder to egressing crewmember
4. Grasp pilot chute below spring w/left hand (photo 23) and enter hatch tunnel. Hold pilot chute tightly to chest w/both hands
5. Bail out
6. Upon clearing pole, deploy pilot chute over left shoulder
7. Standard parachute ops apply at this point



Photo 23

**PAYLOAD BAY DOOR MOTOR OPERATION** (3:00 hr)

OBJECTIVE: Close door(s) and/or latch centerline/bulkhead latch gang(s) by bypassing PL MDM(s) and directly providing AC pwr enable and door/latch cmd signals

LOCATION: See MIDDECK (COMPONENT LOCATIONS)

AV BAY 1, Zone 043 for MDM PL1

AV BAY 2, Zone 057 for MDM PL2

TOOLS REQD:

TOOL Gray Tape  
Pin Kit (PLBD Motor Ops Cables,  
two 2-Amp Fuses)  
Locker Tool  
Connector Pliers  
Torque Wrench  
Ratchet Wrench  
Driver Handle  
BOB IFM Breakout Box  
CHCK DC PWR Cable

- O6 1. MDM PL1(2) – OFF (expect I/O ERROR PL1(2)) |  
MO30F 2. √DC UTIL PWR MNC – OFF  
3. a. Breakout Box:  
AUX – OFF  
28V VAR VOLT – 28V  
PWR A,B – OFF  
b. Remove Fuse Caps from sides A,B  
c. Rotate GA SEL A,B – 22  
d. Install 2-Amp Fuses (two) as reqd, replace |  
caps  
MA73C:C 4. cb MCA PWR AC1 3Φ MID 1 – op  
:D 3 – op  
:C AC2 3Φ MID 2 – op  
:D 4 – op  
:C AC3 3Φ MID 2 – op  
:D 4 – op  
5. Remove lockers, Thermal/Debris Traps to access  
applicable MDM (PL1 or PL2)

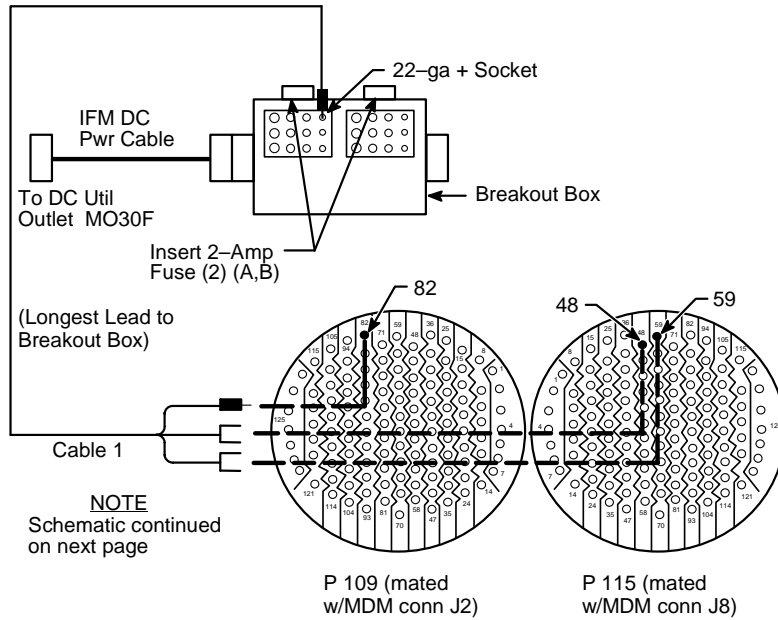
- CRT 6. SM, OPS 202 PRO or BFS, SM 63 PL BAY DOORS  
X: SM PL BAY DOORS
- R13L 7. √PL BAY DR – STOP  
√SYS 1,2 (two) – DSBL
- CRT √PBD SW – STOP  
√MAN SEL (ten) – (no \*)  
√PBD SW BYPASS – (no \*)  
√AC POWER OFF – ITEM 2 (\*)
8. Remove appropriate connector cables from J2,J6,J8 on MDM PL1(2) as reqd
9. Remove appropriate PLBD Motor Ops Cable from Pin Kit, Flap 1 (see individual step for cable rqmts)

NOTE

Steps 10-17 are for MDM PL1 bypass.  
Steps 18-25 are for MDM PL2 bypass

10. To close and latch Port Door (MDM PL1 bypassed)

a. Connect Cable 1 as illustrated

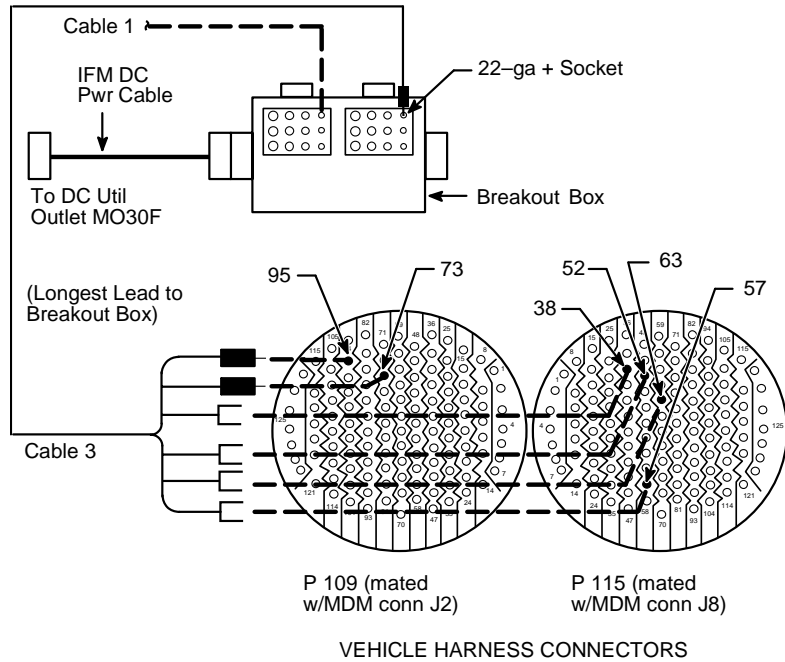


VEHICLE HARNESS CONNECTORS

jsc48025\_163r2\_p.cvx



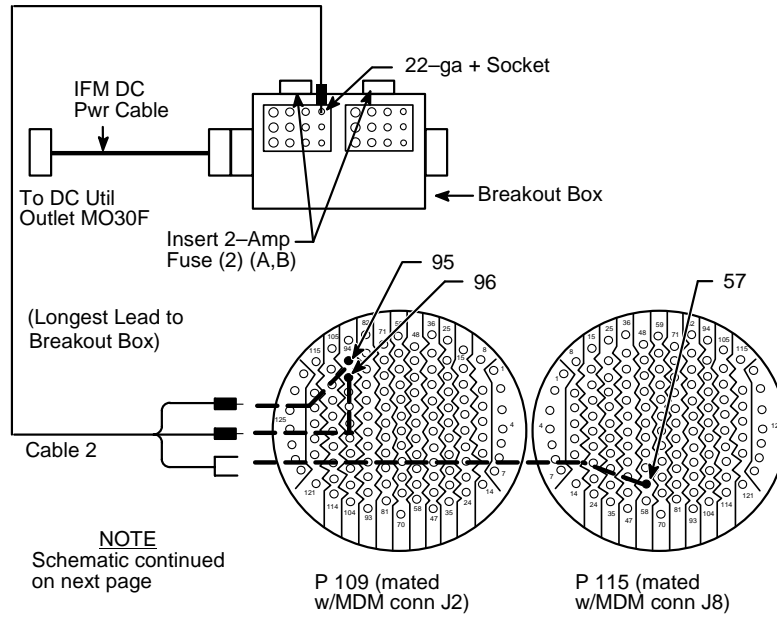
- b. Connect Cable 3 as illustrated
- c. Perform step 26, DOOR/BULKHEAD LATCH DRIVE, P-38, then return to this step
- d. To close,latch stbd door:
  - Continue w/step 11
  - To complete procedure:
    - Go to step 28



isc48025\_164r1\_p.cnv

11. To close and latch Stbd Door (MDM PL1 bypassed)

a. Connect Cable 2 as illustrated



**NOTE**  
Schematic continued  
on next page

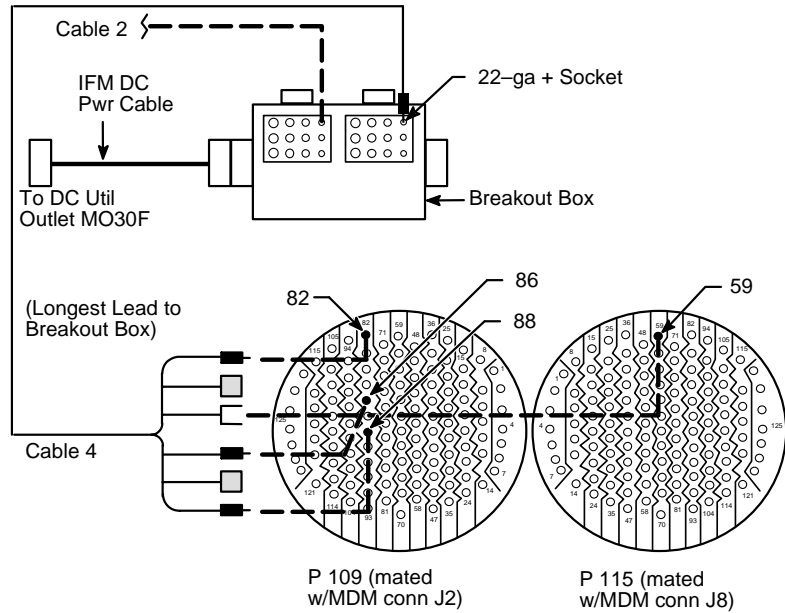
P 109 (mated  
w/MDM conn J2)

P 115 (mated  
w/MDM conn J8)

VEHICLE HARNESS CONNECTORS

jsc48025\_165r1\_p.cnv

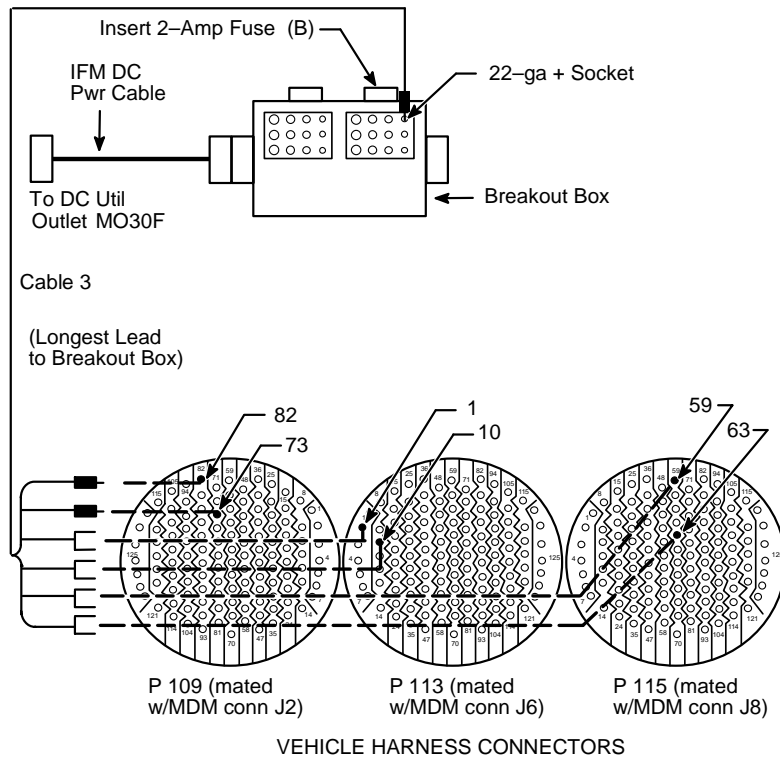
- b. Connect Cable 4 as illustrated
- c. Perform step 26, DOOR/BULKHEAD LATCH DRIVE, P-38, then return to this step
- d. To close Latch Gangs 1-4 and 13-16:  
 | Continue w/step 12  
 | To complete procedure:  
 | Go to step 28



VEHICLE HARNESS CONNECTORS

jsc48025r1\_166.cnv

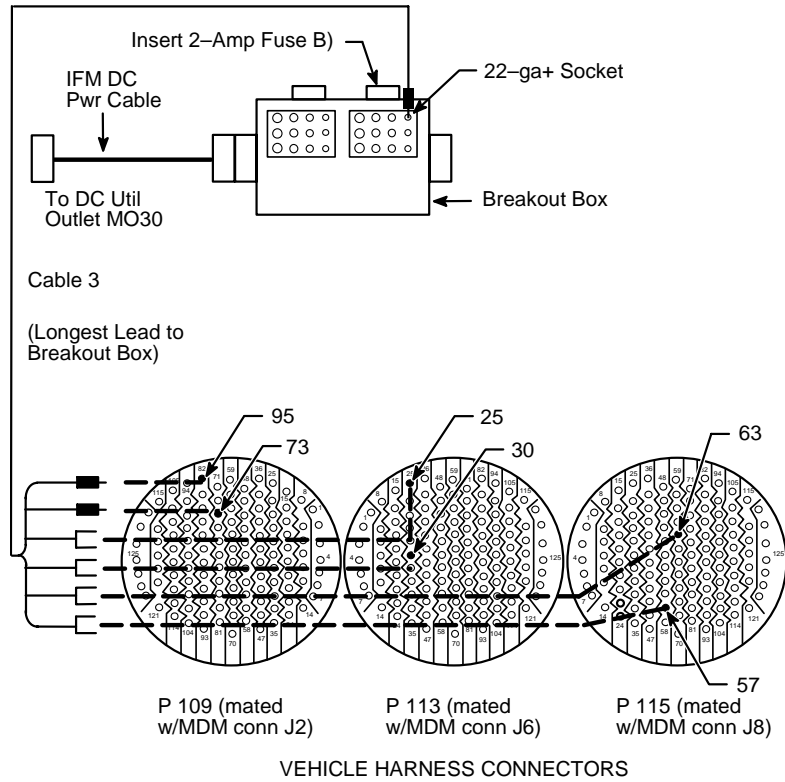
12. To close Latch Gangs 1-4 and 13-16 (MDM PL1 bypassed)
- a. Connect Cable 3 as illustrated
  - b. Perform step 27, CENTERLINE LATCH DRIVE, P-39, then return to this step
  - c. To close Latch Gangs 5-8 and 9-12:
    - Continue w/step 13
    - To complete procedure
    - Go to step 28



jsc48025\_167r2\_p.cvx

13. To close Latch Gangs 5-8 and 9-12 (MDM PL1 bypassed)

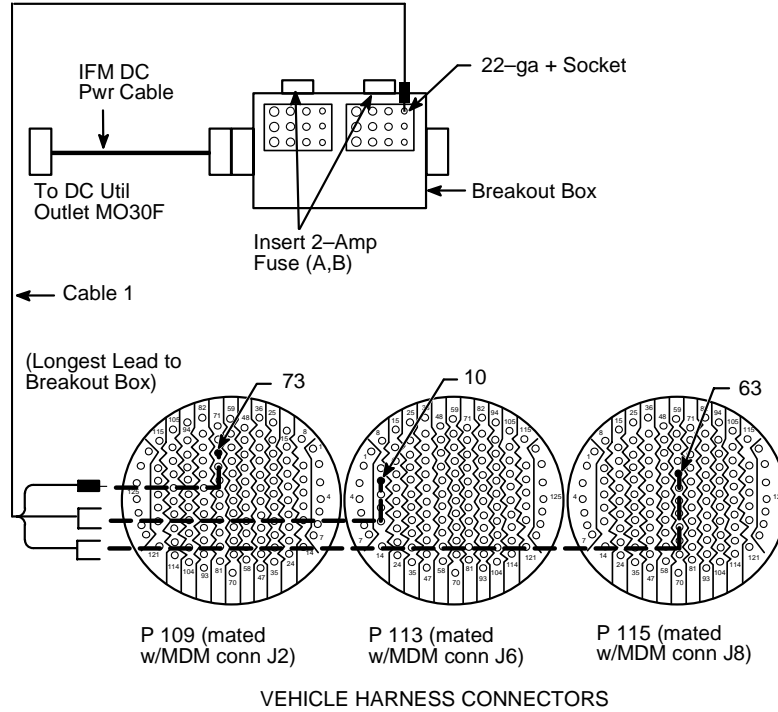
- a. Connect Cable 3 as illustrated
- b. Perform step 27, CENTERLINE LATCH DRIVE, P-39, then return to this step
- c. √MCC for next step, or go to step 28 to complete procedure



jsc48025\_168r1\_p.cnv

14. To close Latch Gangs 1-4 (MDM PL1 bypassed) |

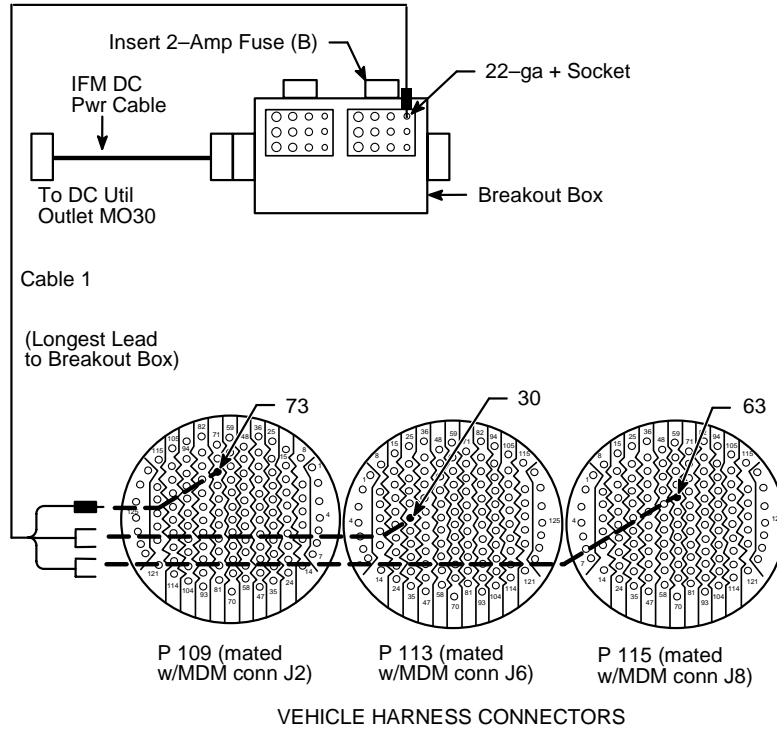
- a. Connect Cable 1 as illustrated
- b. Perform step 27, CENTERLINE LATCH DRIVE, P-39, then return to this step
- c. √MCC for next step, or go to step 28 to complete procedure



jsc48025\_169r1\_p.cnv

15. To close Latch Gangs 5-8 (MDM PL1 bypassed)

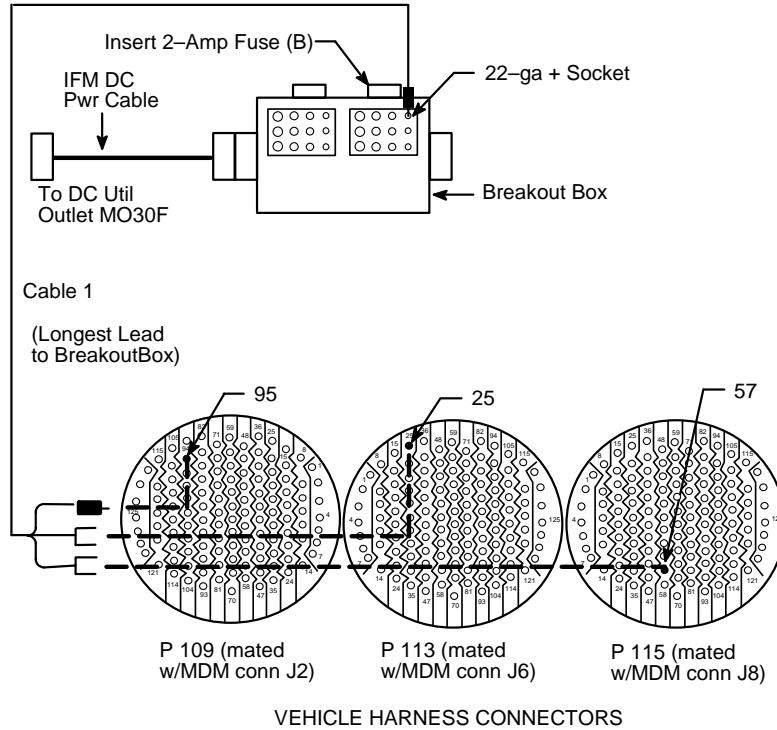
- a. Connect Cable 1 as illustrated
- b. Perform step 27, CENTERLINE LATCH DRIVE, P-39, then return to this step
- c. √MCC for next step, or go to step 28 to complete procedure



jsc48025\_170r1\_p.cnv

16. To close Latch Gangs 9-12 (MDM PL1 bypassed)

- a. Connect Cable 1 as illustrated
- b. Perform step 27, CENTERLINE LATCH DRIVE, P-39, then return to this step
- c. √MCC for next step, or go to step 28 to complete procedure

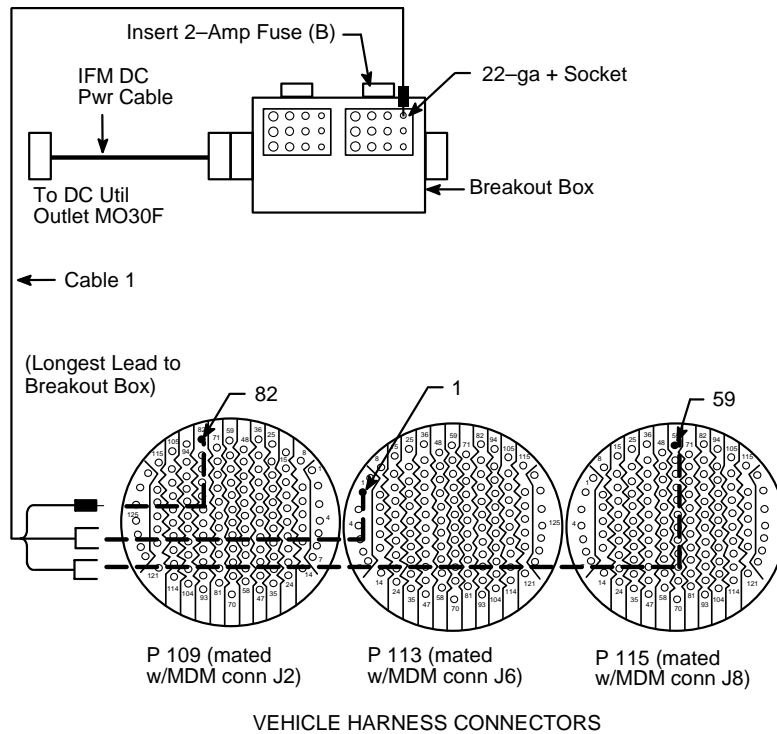


jsc48025\_171r1\_p.cnv



17. To close Latch Gangs 13-16 (MDM PL1 bypassed)

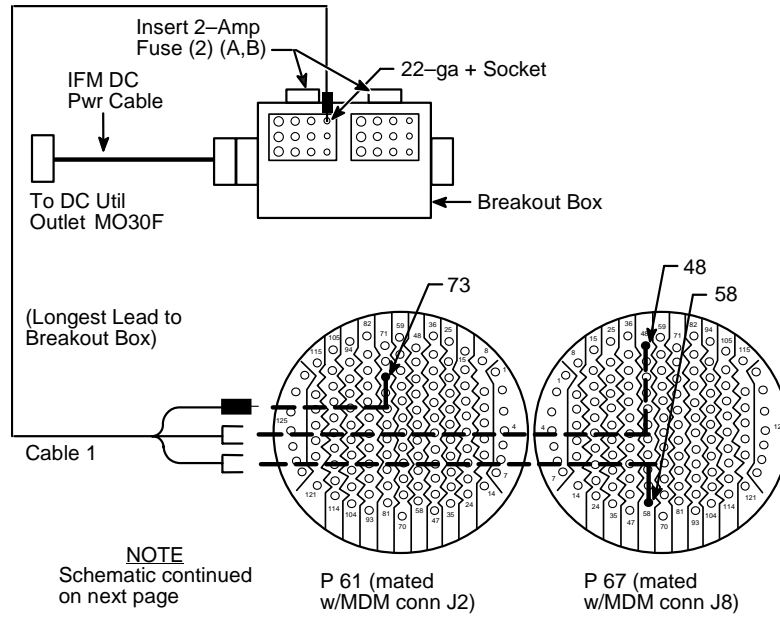
- a. Connect Cable 1 as illustrated
- b. Perform step 27, CENTERLINE LATCH DRIVE, P-39, then return to this step
- c. √MCC for next step, or go to step 28 to complete procedure



jsc48025\_172r1\_p.cnv

18. To close and latch Port Door (MDM PL2 bypassed)

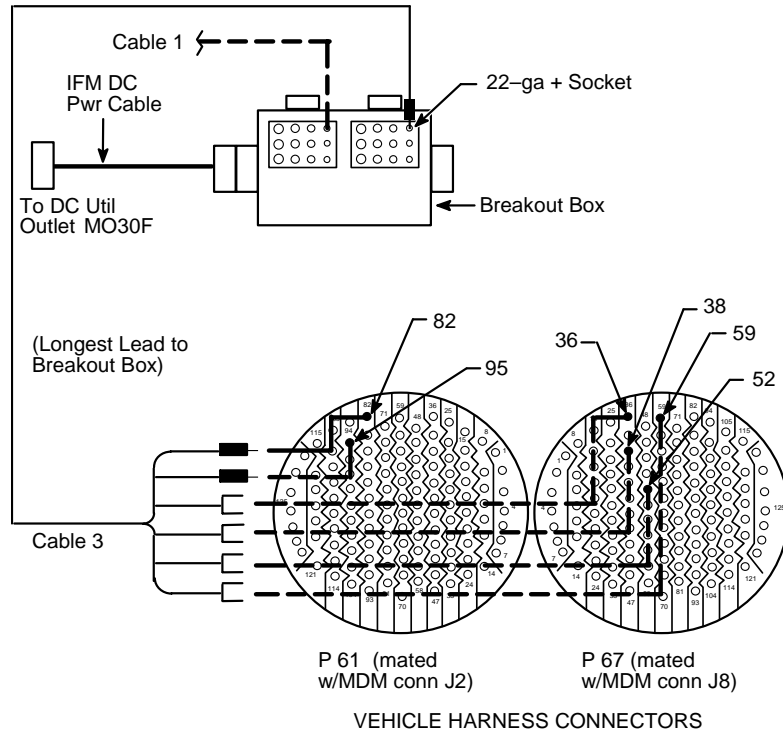
a. Connect Cable 1 as illustrated



VEHICLE HARNESS CONNECTORS

jsc48025\_173r2\_p.cvx

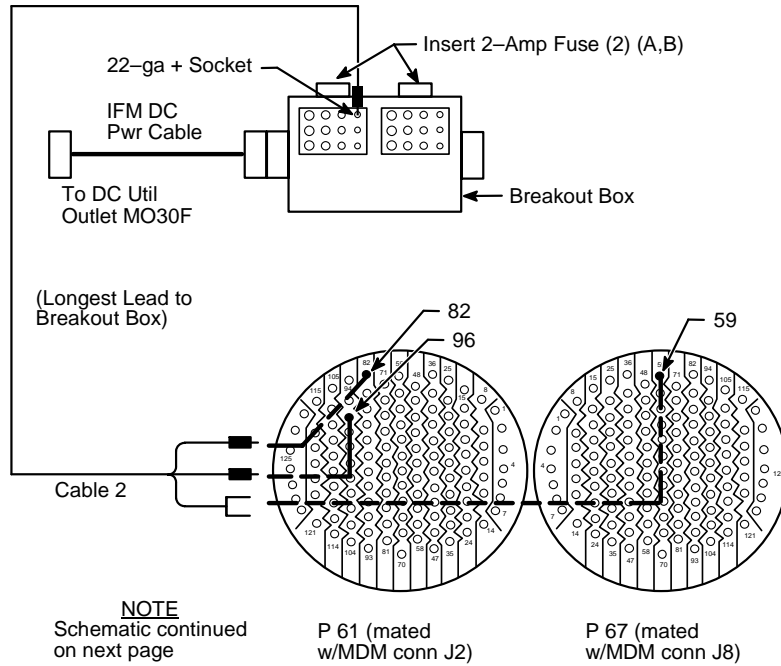
- b. Connect Cable 3 as illustrated
- c. Perform step 26, DOOR/BULKHEAD LATCH DRIVE, P-38, then return to this step
- d. To close,latch stbd door:
  - Continue w/step 19
  - To complete procedure:
    - Go to step 28



jsc48025\_174r2\_p.cvx

19. To close and latch Stbd Door (MDM PL2 bypassed)

a. Connect Cable 2 as illustrated



**NOTE**  
Schematic continued on next page

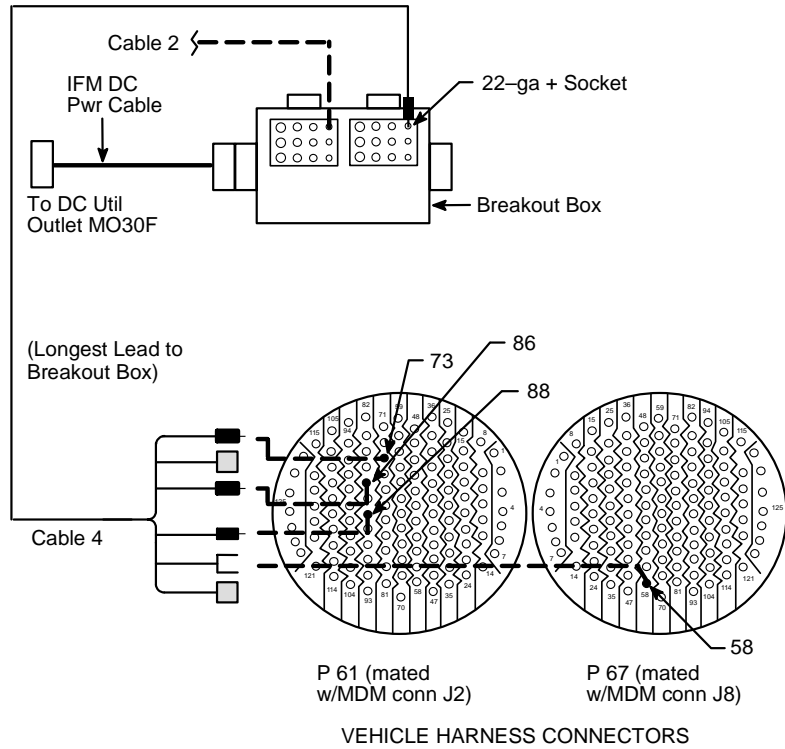
P 61 (mated w/MDM conn J2)

P 67 (mated w/MDM conn J8)

VEHICLE HARNESS CONNECTORS

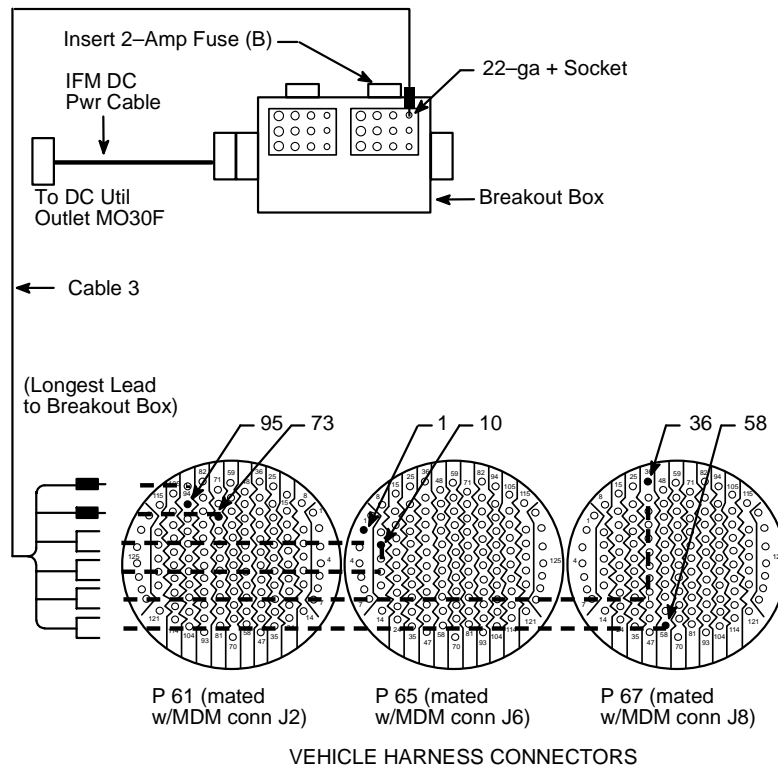
jsc48025\_175r2\_p.cvx

- b. Connect Cable 4 as illustrated
- c. Perform step 26, DOOR/BULKHEAD LATCH DRIVE, P-38, then return to this step
- d. To close Latch Gangs 1-4 and 13-16:
  - Continue w/step 20
  - To complete procedure:
  - Go to step 28



jsc48025\_176r1\_p.cnv

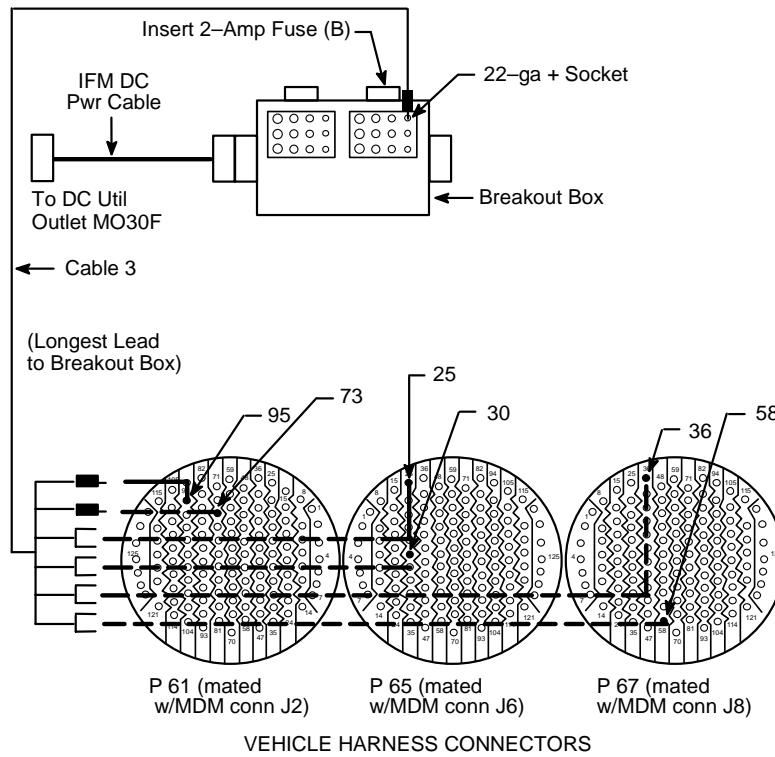
20. To close Latch Gangs 1-4 and 13-16 (MDM PL2 bypassed)
- a. Connect Cable 3 as illustrated
  - b. Perform step 27, CENTERLINE LATCH DRIVE, P-39, then return to this step
  - c. To close Latch Gangs 5-8 and 9-12:
    - Continue w/step 21
    - To complete procedure:  
Go to step 28



jsc48025\_177r1\_p.cnv

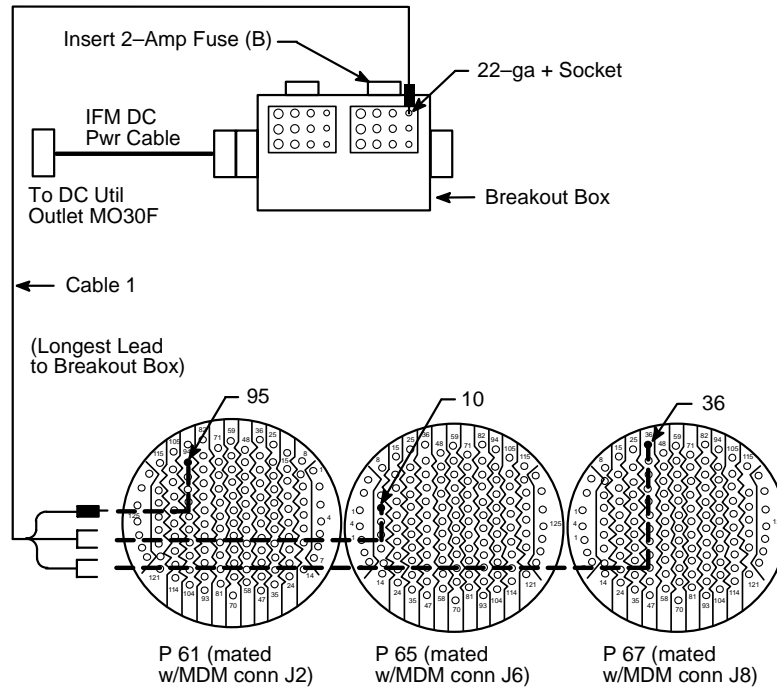
21. To close Latch Gangs 5-8 and 9-12 (MDM PL2 bypassed)

- a. Connect Cable 3 as illustrated
- b. Perform step 27, CENTERLINE LATCH DRIVE, P-39, then return to this step
- c. √MCC for next step, or go to step 28 to complete procedure



22. To close Latch Gangs 1-4 (MDM PL2 bypassed) |

- a. Connect Cable 1 as illustrated
- b. Perform step 27, CENTERLINE LATCH DRIVE, P-39, then return to this step
- c. √MCC for next step, or go to step 28 to complete procedure



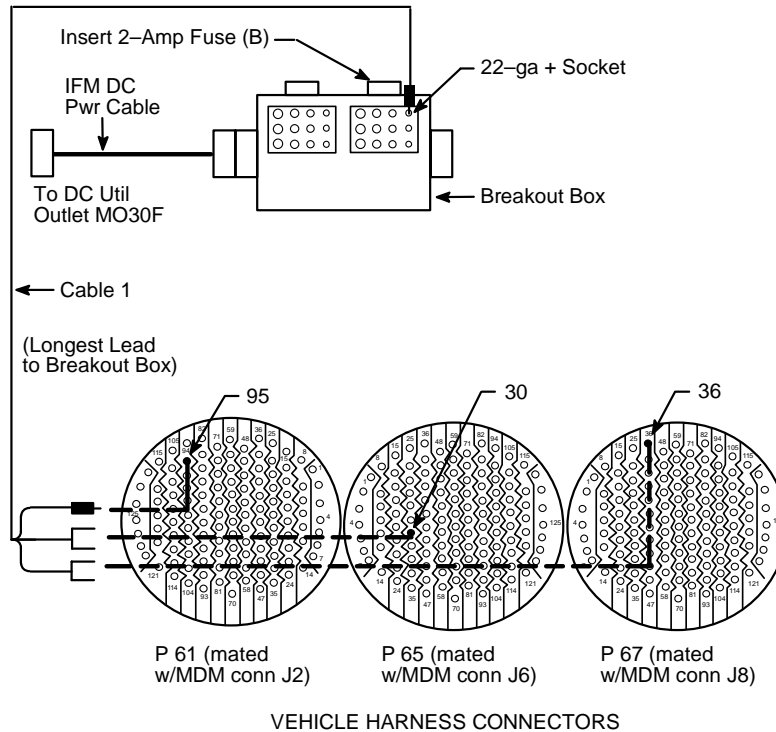
VEHICLE HARNESS CONNECTORS

jsc48025\_179r1\_p.crv



23. To close Latch Gangs 5-8 (MDM PL2 bypassed) |

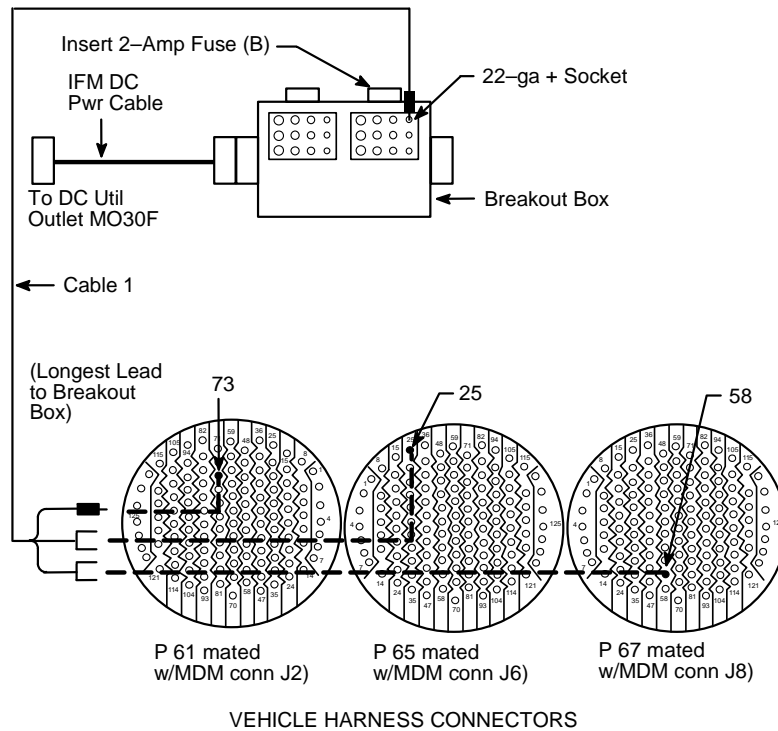
- a. Connect Cable 1 as illustrated
- b. Perform step 27, CENTERLINE LATCH DRIVE, P-39, then return to this step
- c. √MCC for next step, or go to step 28 to complete procedure



jsc48025\_180r2\_p.cvx

24. To close Latch Gangs 9-12 (MDM PL2 bypassed)

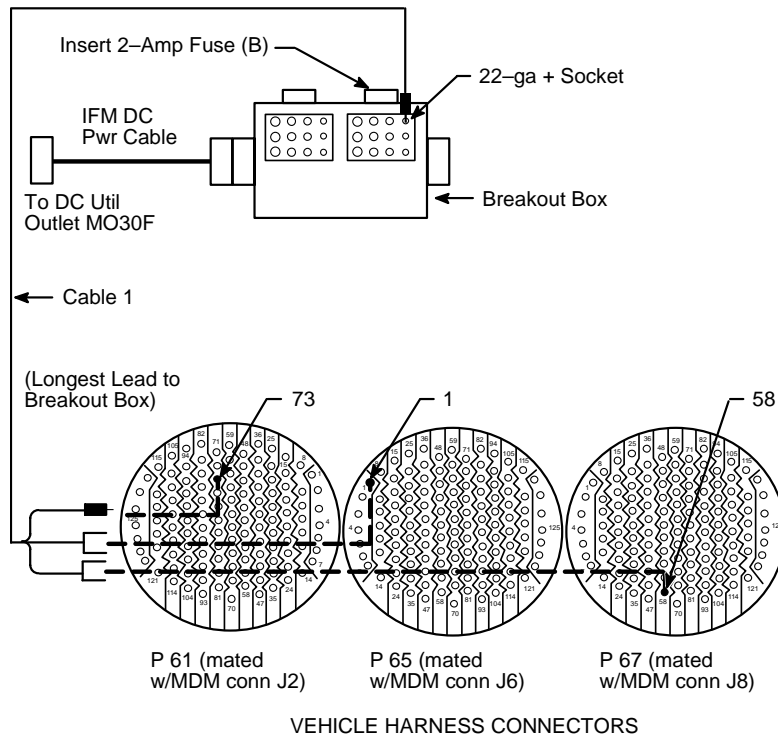
- a. Connect Cable 1 as illustrated
- b. Perform step 27, CENTERLINE LATCH DRIVE, P-39, then return to this step
- c.  $\sqrt{\text{MCC}}$  for next step, or go to step 28 to complete procedure



jsc48025\_181r1\_p.cnv

25. To close Latch Gangs 13-16 (MDM PL2 bypassed)

- a. Connect Cable 1 as illustrated
- b. Perform step 27, CENTERLINE LATCH DRIVE, P-39, then return to this step
- c. √MCC for next step, or go to step 28 to complete procedure



jsc48025\_182r1\_p.cnv

26. DOOR/BULKHEAD LATCH DRIVE

- a. Enable proper system sw(s) (see CIRCUIT BREAKER (cb) AND SYSTEM ENABLE SWITCH (sw) TABLE, P-40):  
R13L PL BAY DR SYS X – ENA
- b. DC UTIL PWR MNC – ON  
MO30F Breakout Box:  
PWR A,B (two) – ON (22 It on)
- c. Wait for MCC verification of door,latch pwr,drive cmd discretetes
- d. PWR A,B (two) – OFF
- e. Close proper door MCA cb (see table, P-40):  
MA73C:X cb MCA PWR ACX 3Φ MID X – cl
- f. Breakout Box:  
PWR A – ON (22 It on)
- g. √Door operation (~120 sec; √MCC). When door closed (door scallop on or below target stripe):  
PWR A – OFF (22 Its off)
- h. Close proper latch MCA cb (see table, P-40):  
MA73C:X cb MCA PWR ACX 3Φ MID X – cl
- i. Breakout Box:  
PWR A,B (two) – ON (22 It on)
- j. √Latch operation (~60 sec; √MCC)
- k. When door closed,latched:  
MO30F PWR A,B (two) – OFF (22 It off)  
DC UTIL PWR MNC – OFF

R13L  
MA73C:X

- l. Disable system sw(s) and open MCA cb (see table, P-40):  
PL BAY DR SYS X – DSBL  
cb MCA PWR ACX 3Φ MID X – op

m. Return to original step

## 27. CENTERLINE LATCH DRIVE

R13L

- a. Enable proper system sw(s) (see CIRCUIT BREAKER (cb) AND SYSTEM ENABLE SWITCH (sw) TABLE, P-40):  
PL BAY DR SYS X – ENA

MO30F

- b. DC UTIL PWR MNC – ON  
Breakout Box:  
PWR B – ON (22 It on)

c. Wait for MCC verification of latch pwr,drive cmd discrettes

d. PWR B – OFF (22 It off)

MA73C:X

- e. Close proper door/latch MCA cb (see table, P-40):  
cb MCA PWR ACX 3Φ MID X – cl

f. Breakout Box:  
PWR B – ON (22 It on)

g. √Latch operation (~40 sec; √MCC)

MO30F

- h. When latching complete:  
PWR B – OFF (22 It off)  
DC UTIL PWR MNC – OFF

- i. Disable system sw(s) and open MCA cb (see table, P-40):

R13L

PL BAY DR SYS X – DSBL

MA73C:X

cb MCA PWR ACX 3Φ MID X – op

- j. Return to original step

**CIRCUIT BREAKER (cb) AND SYSTEM ENABLE SWITCH (sw) TABLE**

Actuator(s) to close:		If PL1 Bypassed:		If PL2 Bypassed:	
		cb	Sys ENA	cb	Sys ENA
a	Port Door	MA73C:C AC2 3Φ MID 2	1	MA73C:D AC3 3Φ MID 4	2
b	Port Bkhd Latches	MA73C:D AC1 3Φ MID 3 MA73C:C AC1 3Φ MID 1	1,2 (two)	MA73C:C AC3 3Φ MID 2 MA73C:D AC2 3Φ MID 4	1,2 (two)
c	Stbd Door	MA73C:C AC1 3Φ MID 1	1	MA73C:D AC2 3Φ MID 4	2
d	Stbd Bkhd Latches	MA73C:C AC1 3Φ MID 1 MA73C:C AC2 3Φ MID 2	1	MA73C:D AC2 3Φ MID 4 MA73C:D AC3 3Φ MID 4	2
e	C/L Latch 1-4	MA73C:D AC1 3Φ MID 3	2	MA73C:C AC3 3Φ MID 2	1
f	C/L Latch 13-16	MA73C:C AC2 3Φ MID 2	1	MA73C:D AC3 3Φ MID 4	2
g	C/L Latches 1-4 and 13-16	MA73C:D AC1 3Φ MID 3 MA73C:C AC2 3Φ MID 2	1,2 (two)	MA73C:C AC3 3Φ MID 2 MA73C:D AC3 3Φ MID 4	1,2 (two)
h	C/L Latch 5-8	MA73C:D AC1 3Φ MID 3	2	MA73C:C AC3 3Φ MID 2	1
i	C/L Latch 9-12	MA73C:C AC1 3Φ MID 1	1	MA73C:D AC3 3Φ MID 4	2
j	C/L Latches 5-8 and 9-12	MA73C:D AC1 3Φ MID 3 MA73C:C AC1 3Φ MID 1	1,2 (two)	MA73C:C AC3 3Φ MID 2 MA73C:D AC3 3Φ MID 4	1,2 (two)

CLEANUP

NOTE

Ensure all reqd steps completed  
before continuing

- MO52J 28. Disconnect:  
IFM DC Pwr Cable from MO30F,Breakout Box  
PLBD Motor Ops Cable from vehicle harness  
connectors,Breakout Box  
Reinstall vehicle harness connectors

PL1 connect			PL2 connect		
Cable		MDM	Cable		MDM
81V77W8P109	to	J2	82V77W9P61	to	J2
P113	to	J6	P65	to	J6
P115	to	J8	P67	to	J8

29. Install Thermal/Debris Traps and lockers (torque,  
30 in-lb)
30. Stow IFM Tools
- O6 31. MDM PL1(PL2) – ON  
CRTX SM, I/O RESET
32. Close MCA cbs:  
MA73C:C cb MCA PWR AC1 3Φ MID 1 – cl  
:D 3 – cl  
:C AC2 3Φ MID 2 – cl  
:D 4 – cl  
:C AC3 3Φ MID 2 – cl  
:D 4 – cl
- CRT 33. Continue PLBD closing as reqd

**PAYLOAD BAY DOOR SYS ENABLE RECOVERY (1:00 hr)**

OBJECTIVE: Bypass PL BAY DOOR SYS 1(2) sw to regain AB1(AB2), BC1(BC2), and/or CA1(CA2) capability

LOCATION: R13L

TOOLS REQD:

TOOL	Gray Tape
	Pin Kit
	Torque Wrench
	3/8-in Driver Handle
	5/32-in Allen Head Driver
	1/4-in to 3/8-in Adapter
BOB	IFM Breakout Box
CHCK	DC PWR Cable
MED	Tongue Depressors

- R13L
1. ✓ PL BAY DR SYS 1,2 (two) – DSBL
  2. ✓ PL BAY MECH PWR SYS 1,2 (two) – OFF
  3. ✓ RAD LAT CNTL SYS A,B (two) – OFF
  4. ✓ RAD CNTL SYS A,B (two) – OFF
  5. ✓ KU ANT DIRECT STO – OFF
  6. ✓ KU ANT – GND
  7. ✓ MMU GN2 SPLY ISOL VLV A,B (two) – CL
  8. ✓ PL BAY DR – STOP
- O19
9. ✓ DC UTIL PWR MNA – OFF

If using Breakout Box:

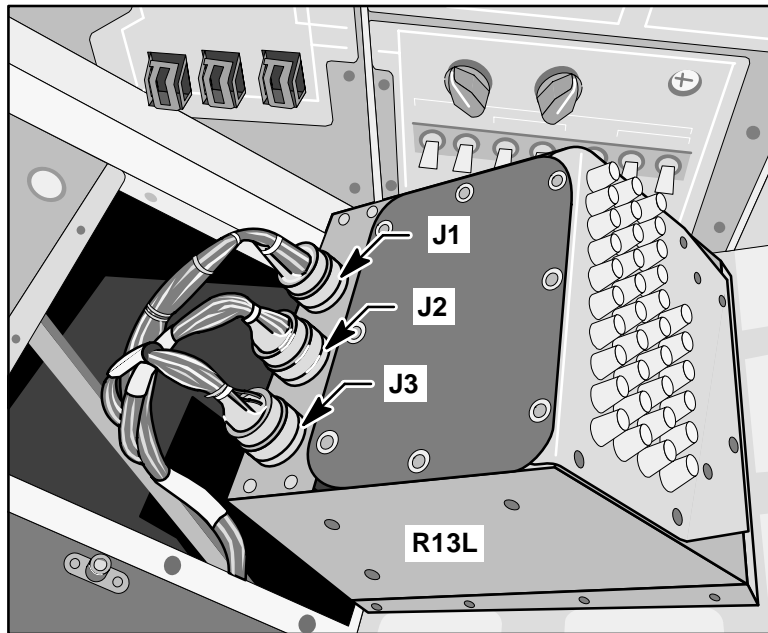
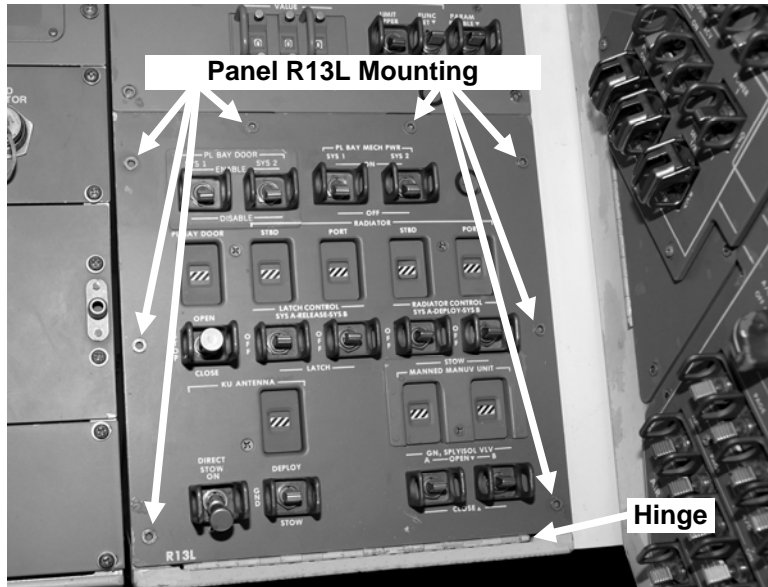
- |     |  |
|-----|--|
| BOB | 10. a. Breakout Box:<br>AUX – OFF<br>28V VAR VOLT – 28V<br>PWR A,B – OFF |
|     | b. Remove Fuse Caps from sides A,B                                       |
|     | c. Rotate GA SEL A,B – 22  |
|     | d. Install 2-Amp Fuses (two), replace caps                               |

If not using Breakout Box:

11. Proceed to next step



- R13L 12. Open pnl R13L (hinged at bottom, eight fasteners, 5/32-in Allen Head Driver)



S83R32560

jsc48025\_183r1\_p.cvx

13. Select appropriate connector from table below based on CNTL bus failure

CNTL Bus	Connector	Pins	MCA Pwr	Affected Functions
AB1(2)	P9436 (J1)	65	AC1 Mid 1	C/L 9-12 M1 STBD FWD BKHD M1 STBD Door M1 PORT FWD BKHD M1
		63	AC1 Mid 3	C/L 5-8 M1 C/L 1-4 M1 PORT AFT BKHD M1
BC 1(2)	P9437 (J2)	65	AC2 Mid 2	C/L 13-16 M2 STBD AFT BKHD M2 PORT Door M2
		63	AC2 Mid 4	STBD FWD BKHD M2 STBD Door M2 PORT FWD BKHD M2
CA1(2)	P9438 (J3)	65	AC3 Mid 2	C/L 5-8 M2 C/L 1-4 M2 PORT AFT BKHD M2
		63	AC3 Mid 4	C/L 9-12 M2 C/L 13-16 M1 STBD AFT BKHD M1 PORT Door M1

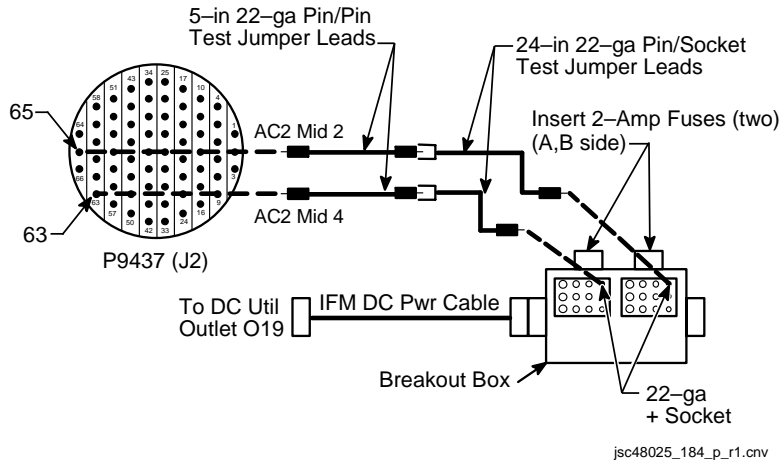
<p><b>WARNING</b> Hot 28V dc may be present in some receptacle pins</p>
---

14. Demate connector selected from table

15. To configure using Breakout Box:
  - a. Use following setup to config Breakout Box, DC Cable, and Test Jumper Leads to provide 28V to both affected PLBD System Enables thru demated connector
  - b. Use Gray Tape to secure connections, and place a piece of tape over face on pin receptacle (hot 28V dc may be in some of pins)

**NOTE**

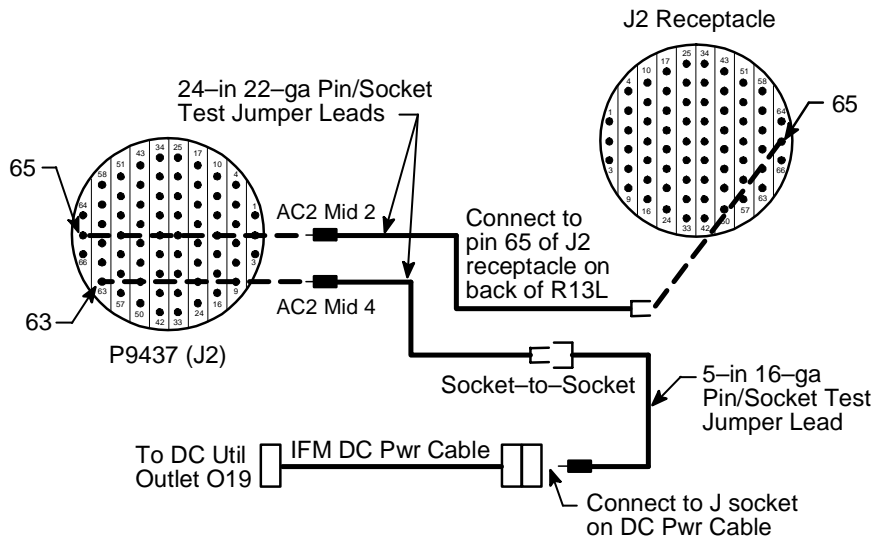
Following assumes CNTLBC2 failure. This config provides enables from Breakout Box to CNTLBC2 and CNTLBC1, enable lost when J2 demated. To config for other failures, check table for correct connector/pin number(s)



16. To configure w/o Breakout Box
  - a. Obtain two 24-in 22-ga Pin/Socket and one 5-in 16-ga Pin/Socket Test Jumper Leads from Pin Kit
  - b. Use following setup to config DC Cable and Test Jumper Leads to provide 28V to both affected PLBD System Enables thru demated connector
  - c. Use Gray Tape to secure connections

**NOTE**

Following assumes CNTLBC2 failure. This config provides enables from pwr outlet to BC2 MCAs and regains BC1 MCAs by reconnecting BC1 pwr signal as shown below. To config for other failures, check previous table for correct connector/pin number(s)



jsc48025\_185\_p.cnv

CAUTION  
Do not pinch Test Jumper Leads when closing pnl. Use Tongue Depressor, if necessary

- O19 17. Rotate pnl R13L to closed posn. Secure pnl closed w/Gray Tape  
18. Secure either config to pnl(s) w/Gray Tape  
19. DC UTIL PWR MNA – ON
- BOB If using Breakout Box:  
20. PWR A,B – ON (22 lt on)  
If not using Breakout Box:  
21. Proceed to next step

VERIFY FUNCTIONS REGAINED

- R13L 22. SM, OPS 202 PRO or BFS, SM 63 PL BAY DOORS  
X: SM PL BAY DOORS  
√PBD SW – STOP  
√MAN SEL (ten) – (no \*)  
√PBD SW BYPASS – (no \*)  
AC POWER ON – ITEM 1 EXEC (\*)  
PL BAY DR SYS 1,2 (two) – ENA  
√MCC for PLBD POWER ENA indications

PERFORM PLBD OPS

NOTE

Use sw bypass instead of R13L PL BAY DOOR sw for subsequent PLBD ops. Use MANUAL PLBD procedure

- a. Post Insertion:  
Perform MANUAL PLBD OPENING PROCEDURES (POST INSERT, POST-INSERTION)
- b. Deorbit Prep:  
Perform MANUAL PLBD CLOSING (D/O PREP, NOMINAL DEORBIT PREP) or MANUAL PLBD OPENING (D/O PREP, DEORBIT PREP BACKOUT) as reqd

- CRTX 23. PBD SW BYPASS – ITEM 14 (\*)

WHEN PLBD OPS COMPLETE

- |      |  |
|------|--|
| BOB  | If using Breakout Box:<br>24. PWR A,B – OFF  |
|      | If not using Breakout Box:<br>25. Proceed to next step   |
| O19  | 26. DC UTIL PWR MNA – OFF<br>27. Remove DC Pwr Cable, Test Jumper Leads, and Gray Tape from receptacle |
|      | 28. Reconnect appropriate connector to receptacle  |
| R13L | 29. Close pnl and tighten fasteners (torque, 30 in-lb)<br>30. Stow tools                               |

## **PDI REPLACEMENT**

(2:30 hr) (15 min C/O)

OBJECTIVE: Replace failed PDI with spare

LOCATION: See AV BAY 1, Zones 28 and 43E for PDI location,  
AV BAY 2, Zone 57M for spare (COMPONENT LOCATION)

### TOOLS REQD:

TOOL	Gray Tape
	Locker Tool
	Inspection Mirror
	3/8-in Deepwell Socket
	Torque Wrench
	Driver Handle
	1/4-in to 3/8-in Adapter
	6-in Extension (1/4-in drive)
	Ratchet Wrench
	7/16-in Socket
CHCK	Coldplate Protective Covers (2)
MISC	Flashlight

### TO OBTAIN SPARE PDI

1. Remove Locker(s) MF57M(MF71M), Thermal/Debris Trap to access spare PDI
2. Tape one Coldplate Protective Cover to wireway in front and above spare PDI to protect wire harnesses

### NOTE

PDI and MCIU mounted to trays which attach to original GPC mount points (two pins at back, four bolts in front), plus leveling shim under front edge

3. Remove bolts securing PDI/MCIU mount tray to Av Bay Shelf (four, 7/16-in Socket)
4. Remove mount tray and shim w/PDI attached. Use caution to prevent damage to adjacent wiring. Temp stow shim
5. Remove PDI from mount tray (fourteen fasteners, 3/8-in Deepwell Socket). Temp stow tray

TO REMOVE FAILED PDI

NOTE

Following step may cause 'S62 BCE BYP PDI' and/or 'S62 PDI decom FAIL' and/or 'S62 BCE BYP PL' msg(s)

- A1L
6. Pwr dn failed PDI:  
PL DATA INTLVR PWR – OFF  
S-BD PL CNTL – PNL
- MF28E  
(MF43E)
7. Remove lockers and Thermal/Debris Traps to access failed PDI
8. Remove connectors:  
Cable 81V77W8P386 from J3 on PDI  
P389 from J6 on PDI  
P384 from J1 on PDI  
P385 from J2 on PDI  
P388 from J5 on PDI
9. Loosen mounting fasteners (fourteen, 3/8-in Socket), slide Coldplate Protective Covers between Coldplate and PDI
10. Remove failed unit w/Coldplate Protective Cover. Use caution to prevent damage to adjacent wiring
11. Mark failed PDI w/Gray Tape

TO INSTALL SPARE PDI

12. Position replacement PDI w/Coldplate Protective Cover, then remove cover (torque fasteners, 60 in-lb)
13. Install connectors:  
Cable 81V77W8P388 onto J5 of PDI  
P385 onto J2 of PDI  
P384 onto J1 of PDI  
P389 onto J6 of PDI  
P386 onto J3 of PDI

NOTE

If J4 on replacement PDI not capped, remove cap from failed PDI, install on replacement PDI



- 14. Install Thermal/Debris Traps and contact MCC for pwrap/checkout
- 15. Reinstall lockers (torque, 30 in-lb), stow failed PDI, tools

TO STOW FAILED PDI

- 16. Position failed PDI on mount tray start fasteners then tighten (torque, 60 in-lb)
- MF57M 17. Verify Coldplate Protective Cover in place in front and above spare PDI location
- 18. Slide tray w/PDI attached into position. Ensure pins in GPC bracket engage tray receptacles
- 19. Position shim under front of tray and start bolts (four). ✓Proper pin engagement w/Inspection Mirror, Flashlight
- 20. Tighten bolts (torque, 100 in-lb)
- 21. Install Thermal/Debris Traps and Lockers (torque, 30 in-lb). Stow tools

## PGSC CARD CHANGEOUT

(45 min)

OBJECTIVE: Swap malfunctioning PGSC card w/stowed spare

### NOTE

Procedure originally written for OCA card.  
Deltas may be reqd for other PGSC cards

LOCATION: PGSC Expansion Chassis

### TOOLS REQD:

TOOL #2 Phillips Driver  
Driver Handle  
Anti-static Wrist Tether

BOB Fastener Retainer Cushion

- PGSC
1. Pwr off PGSC,Expansion Chassis
  2. Demate Expansion Chassis Pwr Cable
  3. Demate PGSC Card I/F Cable
  4. Don anti-static Wrist Tether(s)
  5. Loosen, do not remove (1.5 turns), two (2) countersunk Phillips Screws between connectors on aft face of chassis



jsc48025\_186\_p.cnv

6. Remove five (5) non-captive screws from bottom of PGSC Expansion Chassis (four corners, center aft; #2 Phillips Driver, Fastener Retainer)

7. Remove chassis cover, temp stow

NOTE

PGSC card has label on card endplate



jsc48025\_187a\_p.cnv

8. Remove one screw securing PGSC card to chassis (#2 Phillips Driver, Fastener Retainer)  
If reqd to ease card removal:

9. Loosen, do not remove, two screws securing card end guide positioning brkt to chassis (#1 Phillips Screwdriver)



jsc48025\_187b\_p.tif

10. Grasping card by edges only, remove card from edge connector. Gentle rocking may be reqd to release from connector

11. Mark failed card w/Gray Tape on endplate only, temp stow



jsc48025\_188\_p.cnv

12. Unstow new card
  13. Grasping new card by edges only, slide card into place ensuring end guide and edge connector engaged
  14. Secure card w/one screw thru tab on outboard side (#2 Phillips Driver)
- If step 9 performed:
15. Verify proper engagement of end guide brkt; hand tighten two screws securing brkt to chassis
  16. Tighten two (2) screws loosened in step 5
  17. Replace chassis cover, install, tighten five (5) screws
  18. Stow tools

## PGSC EXPANSION CARD CHANGEOUT (A31P) (1:30 HR)

OBJECTIVE: Swap malfunctioning PGSC expansion card  
w/stowed spare

LOCATION: PGSC Docking Station

TOOLS REQD:

TOOL #2 Phillips Driver  
#2 Standard Driver  
Anti-static Wrist Tether  
Gray Tape

### CAUTION

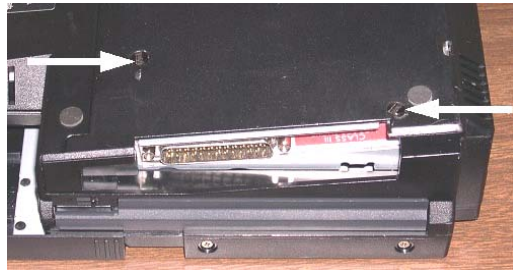
If docking station cooling fan failed,  
card will be hot

PGSC

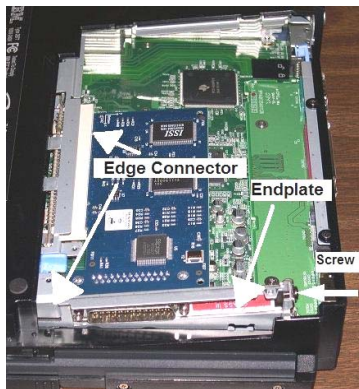
1. PGSC Pwr – OFF
2. DC Util Pwr – OFF
3. Demate all PGSC, Docking Station cables
4. Don Anti-Static Wrist Tether, clip to unpainted ground as required
5. Rotate knob on right side of docking station to unlock position (see below)
6. Slide Alt Eject button forward, eject button on top of docking station should pop up (see below)



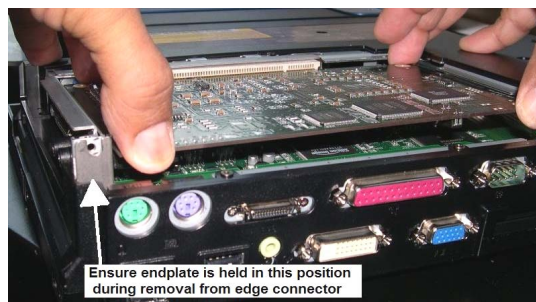
7. Depress eject button on top of docking station; remove PGSC from docking station
8. On underside of docking station, disengage captive screws securing chassis cover (#2 Standard Driver, see below)



9. Remove cover, temp stow
10. Remove single screw on endplate securing PGSC expansion card, temp stow (#2 Phillips Driver, see below)



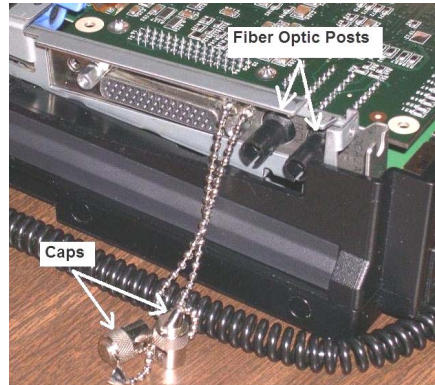
11. Remove card:
  - For PCMMU card:
    - a. Grasp by card edges only, ensure endplate is held in original position (see below)



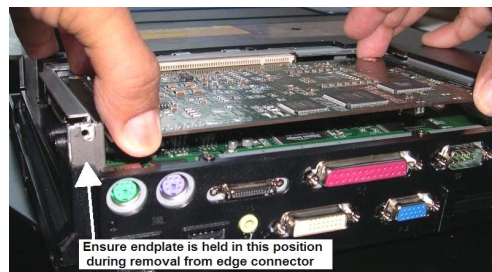
- b. Remove card from edge connector, gentle rocking may be required to release from connector

For OCA card:

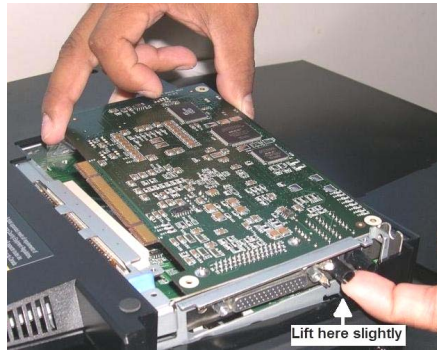
- a. Remove caps from fiber optic posts (see below)



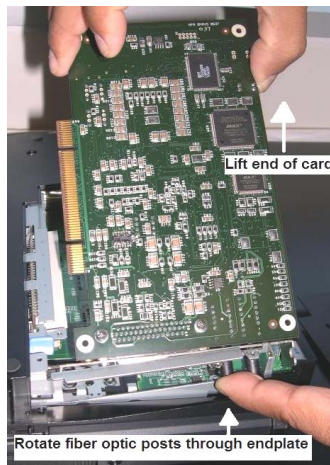
- b. Grasp by card edges only, ensure endplate is held in original position (see below)



- c. Remove card from edge connector, gentle rocking may be required to release from connector (see below)
- d. Grasping card as shown below, lift card slightly at fiber optic posts



- e. Lift opposite end of card allowing fiber optic posts and caps to rotate through endplate (see below)

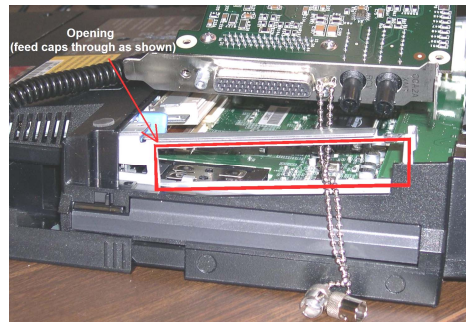


12. Mark failed card w/Gray Tape on endplate only, temp stow
13. Unstow new card
14. Install new card:
  - For PCMMU card:
    - a. Grasping new card by edges only, slide card into place ensuring edge connector is engaged
    - b. Reinstall screw on edge of endplate (#2 Phillips Driver)

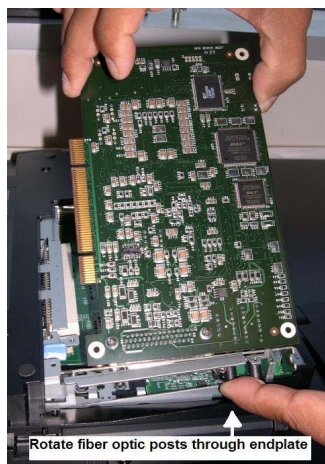


For OCA card:

- a. Grasping new card by edges only, remove caps on fiber optic posts, feed caps through opening as shown below



- b. Grasping card as shown below, insert fiber optic posts through endplate



- c. Rotate card down, reinstall into edge connector
  - d. Reinstall Screw on edge of endplate (#2 Phillips Driver), reinstall fiber optic post caps
15. Replace chassis cover, ensure guide clips seat properly
  16. Hand tighten captive screws (#2 Standard Driver)

- 17. Dock PGSC to docking station, rotate knob on side of docking station to lock position
- 18. Reconnect PGSC, Docking Station cables
- 19. DC Util PWR – ON
- 20. Docking Station PWR – ON
- 21. Stow Tools

## **PREFLIGHT TEST BUS SETUP**

(FC1 - 1:30 hr)

(FC2,3 - 2:00 hr)

OBJECTIVE: Recover system(function) by using preflight test bus

LOCATION: See (COMPONENT LOCATIONS)

AV BAY 1, Zone 14O (PCA 1) and 43 (MDM LF1)

AV BAY 3A, Zone 9N (PCA 3)

TOOLS REQD:

- |      |   |
|------|---|
| TOOL | Gray Tape                                     |
|      | Pin Kit (for 16-ga & 22-ga Test Jumper Leads) |
|      | Locker Tool                                   |
|      | Torque Wrench                                 |
|      | Ratchet Wrench                                |
| BOB  | IFM Breakout Box                              |
| CHCK | DC Pwr Cables (two, as reqd)                  |
- 
- |       |   |
|-------|---|
| MO30F | 1. Remove Vol A (see <u>GENERAL INFORMATION</u> ,<br>VOL A REMOVAL) to access MDM LF1   |
| MO52J | For FC 1 recovery, access PCA 1   |
|       | Remove MF14O Locker Thermal/Debris Trap   |
|       | For FC 2(3) recovery, access PCA 3  |
|       | See SOFT STOWAGE SUPPORT REMOVAL<br>( <u>GENERAL INFORMATION</u> )  |
|       | Remove MA9N closeout  |
|       | For other recovery, contact MCC   |
|       | 2. Remove Plugs P67,P68 from MDM LF1<br>connectors J10,J11, respectively. (This<br>disconnects MDM LF1 from preflight test buses) |
|       | 3. DC UTIL PWR MNC – OFF  |
|       | MNA – OFF   |
|       | 4. a. Config Breakout Box   |
|       | AUX – OFF   |
|       | 28V VAR VOLT – 28V  |
|       | PWR A,B – OFF   |
|       | b. Remove fuse cap and fuse from F10 of PCA<br>1(3). Stow fuse cap  |
|       | c. Install fuse into Fuse Cap Test Lead and<br>install assembly into F10 of PCA 1(3)  |

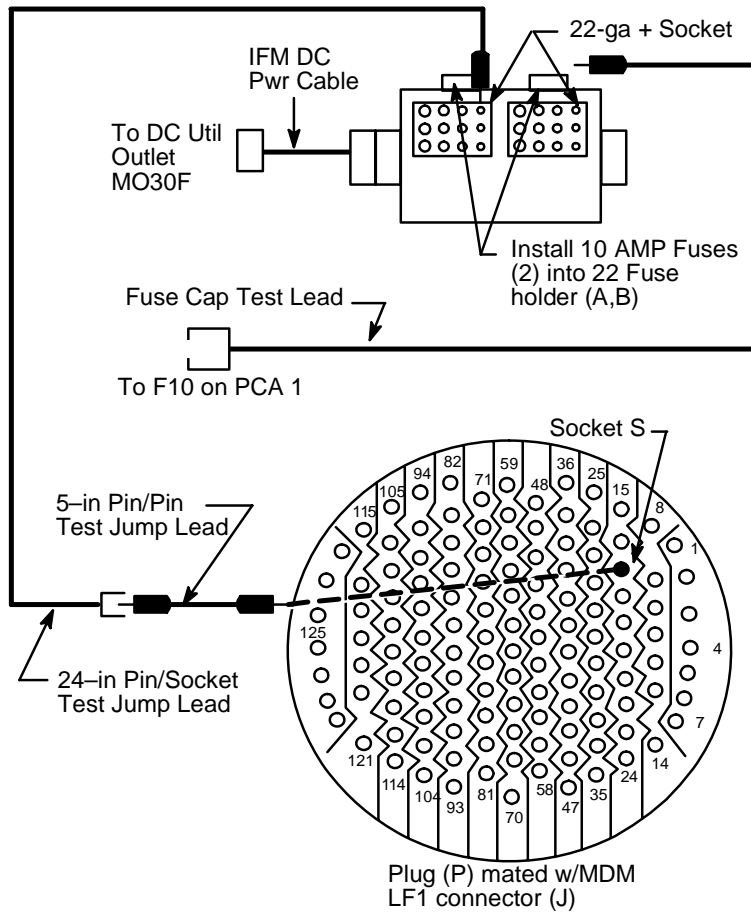
5. If FC 1 recovery desired, go to step 6  
If FC 2(3) recovery desired, go to step 7  
If function(system) recovery other than FC  
desired, then:  
For Preflight test bus 1(2), use setup shown in  
step 6(7)  
√MCC for exact plug, connector, and pin socket  
reqd for system/function recovery

6. FC 1 Recovery/Preflight Test Bus 1 Use:

- a. See table below for exact plug, connector, and socket location reqd

	Plug	Connector	Socket
FC1 Recovery	P59	J2	17
Other (√MCC)			

- b. Install fuses and connect cables as shown below, then go to step 8



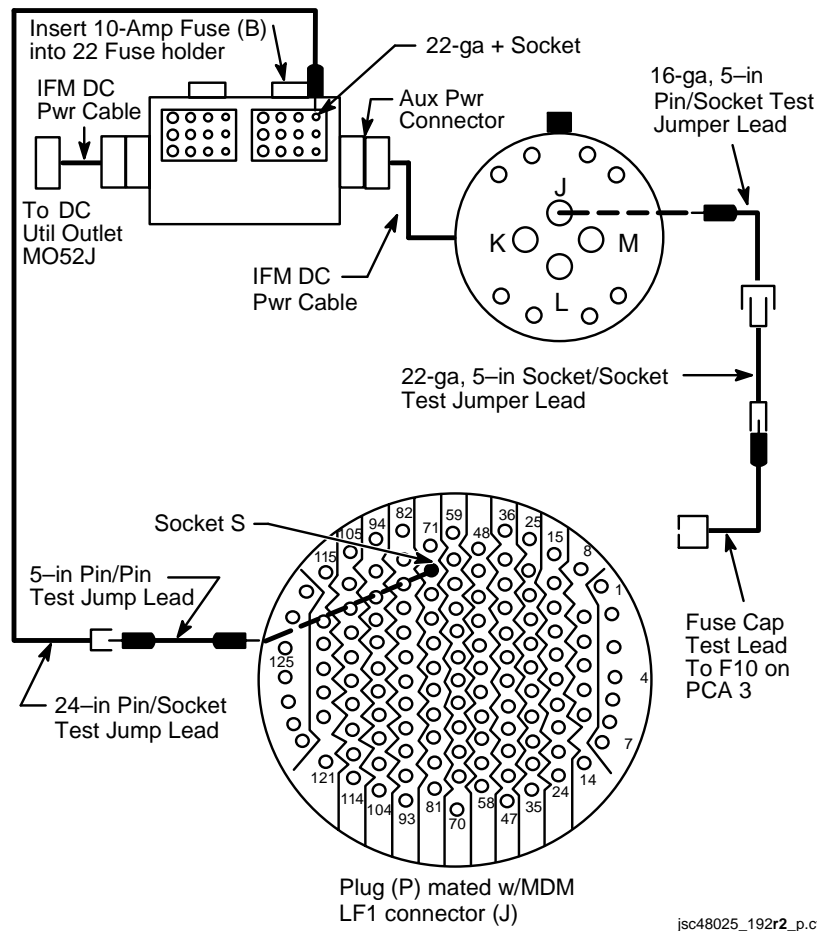
jsc48025\_191\_p.cnv

7. FC 2(FC 3) Recovery/Preflight Test Bus 2 Use:

- a. See table below for exact plug, connector, and socket location reqd

	Plug	Connector	Socket
FC 2 Recovery	P59	J2	72
FC 3 Recovery	P63	J6	72
Other (√MCC)			

- b. Install fuses and connect cables as shown below, then go to step 8



8. Return to MAL, EPS SSR-202 to complete recovery procedure

If preflight test bus task completed and installation no longer reqd for this flight:

9. Disconnect and stow cables
10. Reinstall all Thermal/Debris Traps, Vol A, lockers, and stow tools >>

If preflight bus reqd to be installed for remainder of flight:

11. Reinstall all Thermal/Debris Traps, Vol A, and lockers (see next step), taking care not to crimp(cut) wires going to PCA(MDM)
12. Restrain lockers that cannot be installed (installation of locker could cut/crimp wires)
13. Locate Breakout Box(es) where it can be powered ON/OFF during entry by crewmember strapped in seat, and secure box(es) and cables
14. Stow tools

## PSP CHANGEOUT

(2:00 hr)

OBJECTIVE: Replace failed PSP 1 w/PSP 2

LOCATION: See AV BAY 2, Zones 71C and 57E, for PSP locations (COMPONENT LOCATIONS)

### TOOLS REQD:

TOOL	Gray Tape
	Locker Tool
	3/8-in Deepwell Socket
	Torque Wrench
	Driver Handle
	1/4-in to 3/8-in Adapter
	Ratchet Wrench
	10-in Extension (1/4-in drive)
CHCK	Coldplate Protective Cover

### TO REMOVE PSP

#### NOTE

Following step may cause  
'S62 BCE BYP PSP' msg

A1L            1. Pwr dn PSP:  
                  S-BD PL PWR SYS – OFF  
                                  SEL – BOTH  
                                  CNTL     – PNL

For PSP 1:

2. Remove Lockers MF71C and MF71E,  
Thermal/Debris Traps. Access PSP 1  
fastener from MF71E opening (below PSP 1)

For PSP 2:

3. Remove Lockers MF57E and MF57C,  
Thermal/Debris Traps. Access PSP 2  
fastener from MF57C opening (above PSP 2)
4. Remove connector cables J1,J2,J3 on PSP 1,2
5. Loosen mounting fasteners (eight, 3/8-in socket),  
slide Coldplate Protective Cover between  
Coldplate,PSP
6. Remove PSP w/Coldplate Protective Cover  
w/caution to prevent damage to adjacent wiring
7. Mark failed unit w/Gray Tape



TO INSTALL PSP

8. Place PSP w/Coldplate Protective Cover into position being careful not to damage coldplate(cabling)
9. Remove Coldplate Protective Cover (torque fasteners, 60 in-lb)
10. Install connectors

In PSP 1 location:

In PSP 2 location:

Connect Cable	PSP	Connect Cable	PSP
82V77W9P291 to	J1	82V77W9P294 to	J1
P292 to	J2	P295 to	J2
P293 to	J3	P296 to	J3

11. Install Thermal/Debris Traps and contact MCC for pwrup/checkout
12. Reinstall lockers (torque, 30 in-lb), stow tools

Section Q  
Intentionally  
Omitted



Procedure Deleted



R-1

IFM/ALL/GEN F,4





Procedure Deleted



R-2

IFM/ALL/GEN F,4





Procedure Deleted



R-3

IFM/ALL/GEN F,4



**RHC CHANGEOUT**

(3:00 hr)

OBJECTIVE: Replace failed fwd RHC w/aft RHC (RHC considered failed if two channels lost)

LOCATION: FLT DECK

TOOLS REQD:

TOOL	Gray Tape
	Silicon Lubricant (Patch Kit)
	7/64-in Allen Head Wrench
	3/8-in & 1/4-in Combination Wrenches
	Torque Wrench
	Ratchet Wrench
	3/8-in Socket
	4-in Extension
	5/32-in Allen Head Driver
	1/4-in to 3/8-in Adapter
	#6 & #10 Torque Drivers

TO REMOVE FWD RHC

**GNC 25 RM ORBIT**

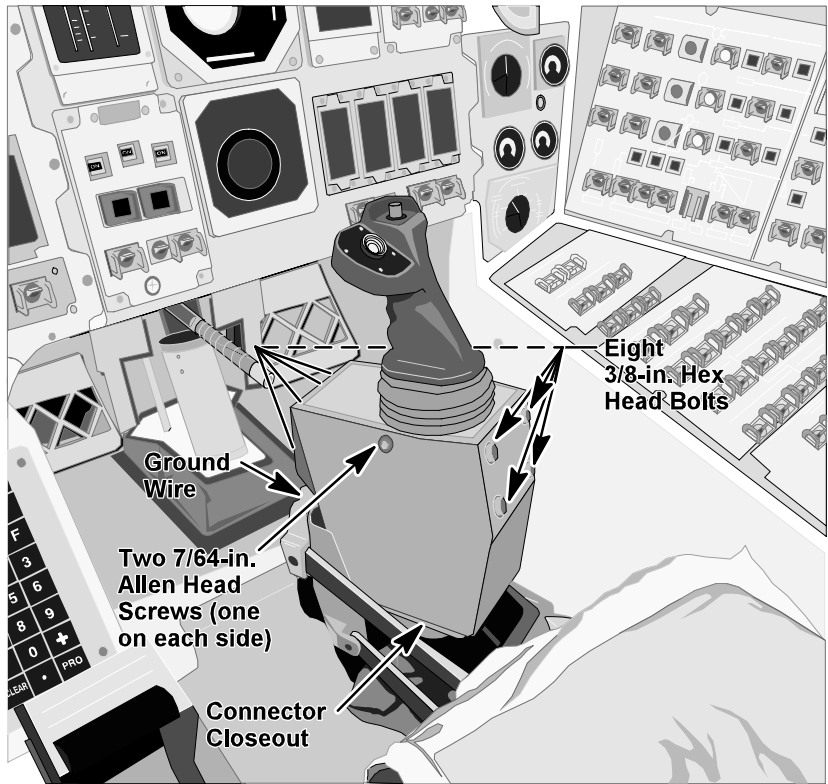
1. Deselect non-failed L(R) RHC XDCRS RHC L(R)  
DES ITEMS 7,8,9(10,11,12)EXEC (\*)

For left RHC:

- |       |                      |
|-------|----------------------|
| O14:E | 2. cb MNA DDU L – op |
| O15:E | MNB DDU L – op       |

For right RHC:

- |       |                      |
|-------|----------------------|
| O16:E | 3. cb MNB DDU R – op |
|       | MNC DDU R – op       |

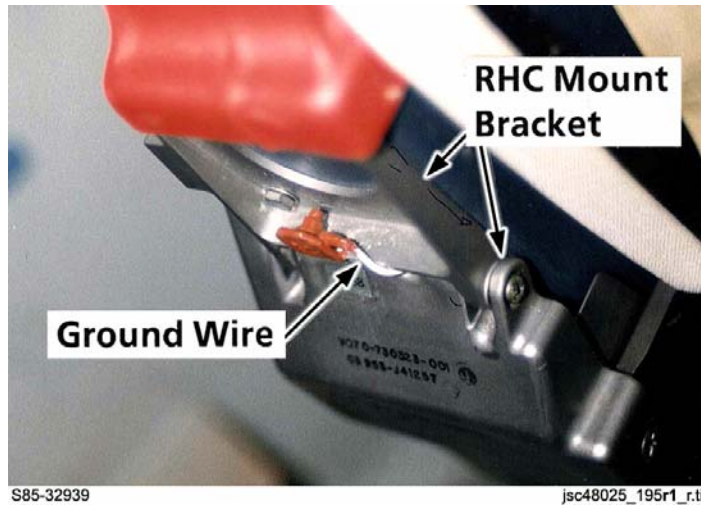


S82-40060

jsc48025\_194\_r.cnv

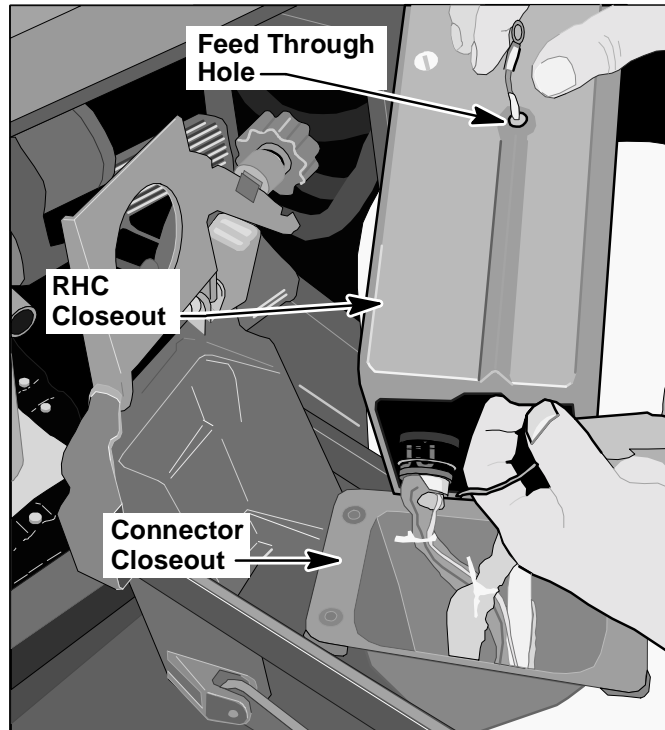
**NOTE**

RHC closeout pnls and RHC mounting bolts, screws not captive; should be secured temporarily to structure w/tape



4. Remove ground wire from fwd side of RHC mount. One screw and nut covered w/red RTV (#10 Torque Driver and 1/4-in Combination Wrench)





S885-43887

jsc48025\_196\_r.cnv

5. Remove RHC assembly from mount using care that ground wire does not hang up in mount slot (four bolts/washers, 3/8-in Socket)
6. Remove connector closeout from base of RHC closeout (four fasteners, #10 Torque Driver)

**NOTE**

There are eight additional washers, four fwd & four aft, used as spacers under RHC closeout

7. Remove closeout from around RHC. Ground wire feeds thru hole in fwd side of closeout (four bolts/washers, 3/8-in Socket and two screws/washers, 7/64-in Allen Head Driver)
8. Remove connectors:  
For PLT's(CDR's) RHC, remove cables from J1,J2,J3
9. Remove RHC, mark failed unit w/Gray Tape

TO REMOVE AFT RHC

- O14:E      10. cb MNA DDU AFT – op  
O16:E              MNC DDU AFT – op

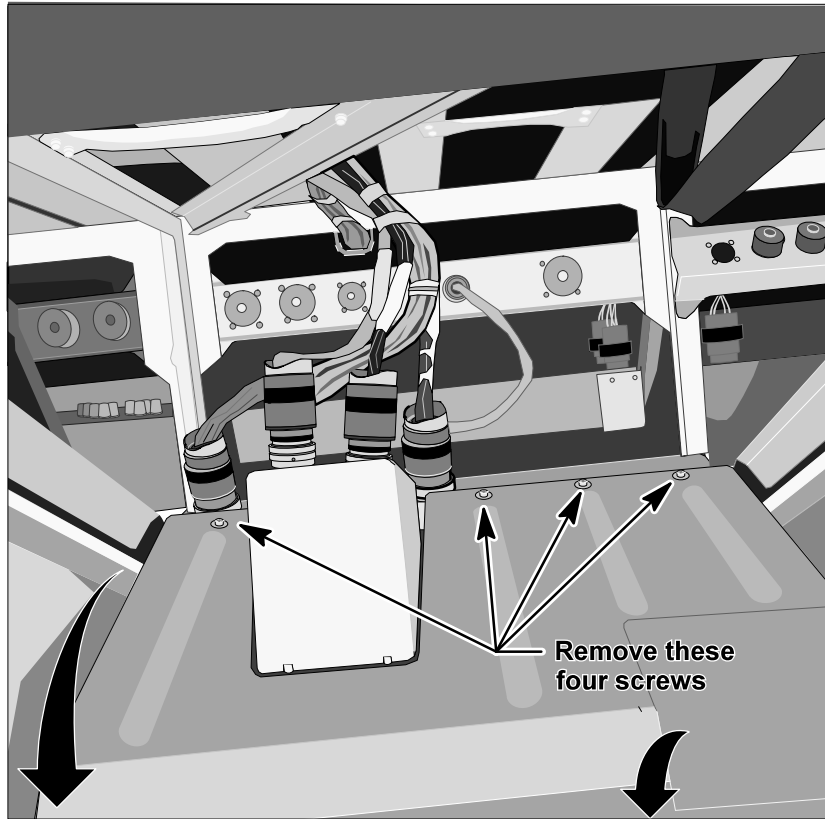
NOTE

Panel bolts/washers, closeout screws/  
washers and RHC mounting bolts  
(removed in steps 11-15) not captive;  
should be secured to pnl using tape

WARNING

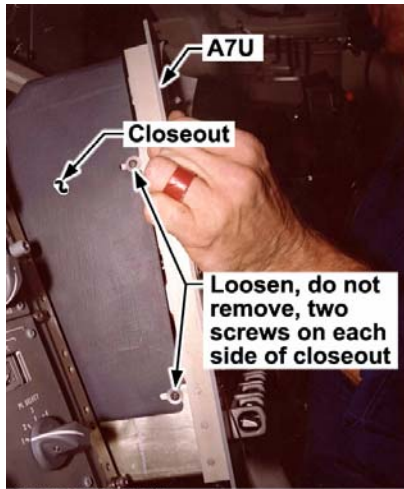
DO NOT demate connectors in back of  
pnl A7U(A7C)

11. Perform ORBIT STATION ACCESS (GENERAL  
INFORMATION)
- A7U      12. Remove A7U (eight bolts/washers, 3/8-in Socket)  
13. Remove A7U rear closeout. Remove four lower  
rear screws; loosen, do not remove, three top  
and four side screws (eleven screws/washers,  
7/64-in Allen Head Driver)

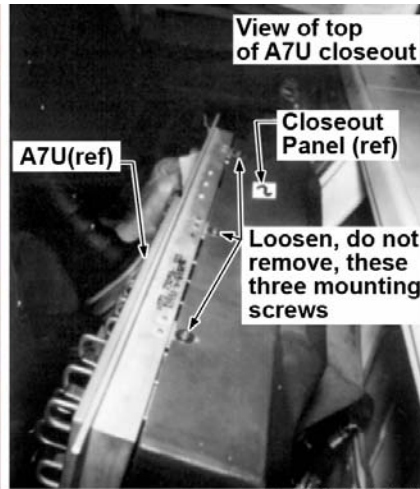


108-KSC-382C-3778/7

jsc48025\_197ar1\_r.cvx

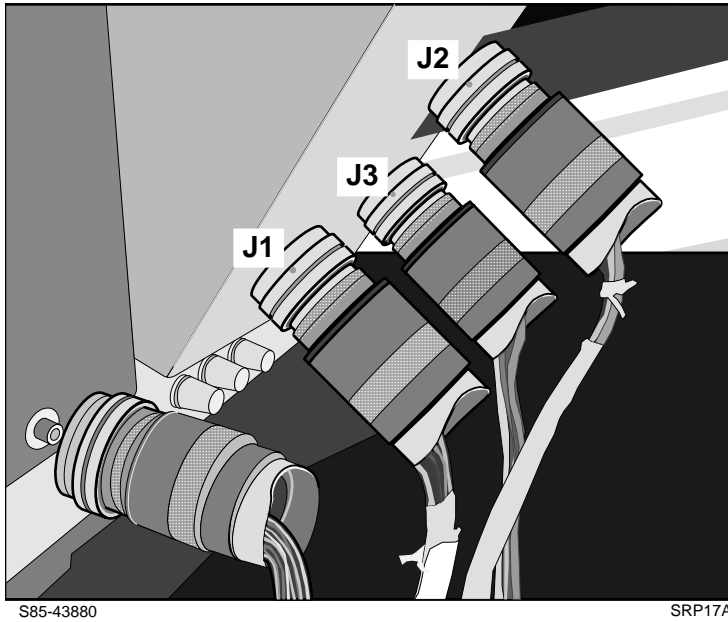


108-KSC-379C-2284/7

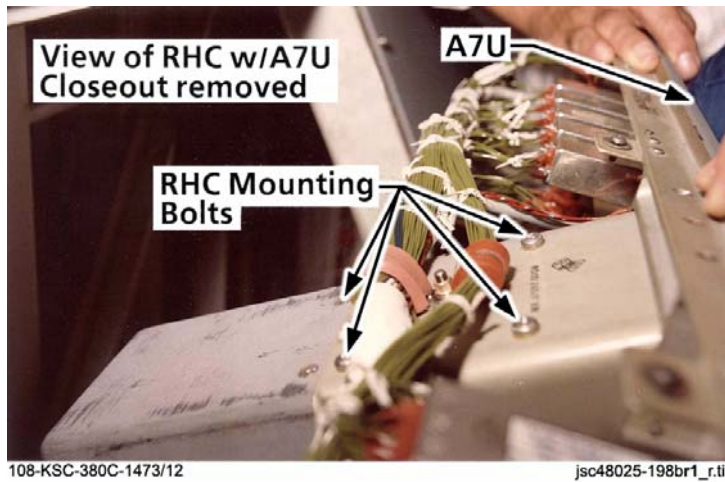


jsc48025\_197br2\_r.tif

14. Remove RHC connectors as follows (for ease of removal): J2,J3,J1 on RHC



15. Remove RHC (four bolts, 3/8-in Socket)



TO INSTALL AFT RHC FWD

16. Install connectors  
For left RHC:
  - 30V77W1P201 to J1
  - P203 to J2
  - P205 to J3For right RHC:
  - 30V77W2P200 to J1
  - P202 to J2
  - P204 to J3
17. Place eight washers (four fwd & four aft) as spacers under closeout and over nut plates. Use small dab of Silicon lubricant, stowed in patch kit, to stick washers in place, if reqd
18. Install closeout around RHC. Ensure ground wire fed thru hole in fwd side of closeout. Start four bolts/washers and two screws/washers, do not tighten
19. Install connector closeout to base of RHC closeout (four fasteners, #10 Torque Driver), snug
20. Install RHC to mount. Ensure ground wire fed thru slot in mount before tightening fasteners. Flex closeout as reqd to align holes for mounting bolts. Tighten mount, closeout fasteners (eight bolts/washers, torque, 30 in-lb); (two screws/washers), gently tighten snug
21. Reconnect ground wire to RHC mount. Do not allow wire to rotate/twist when tightening nut (tighten snug)

TO INSTALL FWD RHC AFT

22. Tape over connector interfaces, tape connector harnesses out of way to structure
23. Install RHC into pnl A7U (four bolts/washers, torque, 30 in-lb)
24. Install A7U rear closeout (11 screws), gently tighten snug
25. Install cable clamps if removed

- A7L 26. Install pnl, ensure wire harnesses not crimped (torque mounting bolts 30 in-lb)
- O14:E 27. cb MNA DDU AFT – cl
- O16:E MNC DDU AFT – cl

L(R) RHC TEST

- For left RHC:
  - O14:E 28. cb MNA DDU L – cl
  - O15:E MNB DDU L – cl
- For right RHC:
  - O16:E 29. cb MNB DDU R – cl
  - F6(F8) MNC DDU R – cl
- 30. L(R) FLT CNTLR PWR – ON  

GNC 25 RM ORBIT
- 31. √L(R) RHC deflect to hardstop in each axis:
  - √RHC L(R): R,P > 92%
  - Y > 88%
- 32. √Correct polarity of output, RM tracking test limit not exceeded:
  - 22% P, 29% R, 20% Y
- 33. Reselect all good RHC XDCRS:
  - RHC L(R) DES – ITEMS 7,8,9(10,11,12)
  - EXEC (no \*)
- If time permits:
  - 34. Perform G2 to G8 TRANSITION, perform L(R)  
 RHC TRIM SWITCH TEST  

GNC 43 CONTROLLERS

  
 L(R) RHC TRIM – deflect sw in each axis  
 √RHC TRIM L(R): R – R/L, P – U/D
- O14,O15, 35. L(R) FLT CNTLR PWR – OFF
- O16:E 36. cb DDU L(R) (two) – as reqd
- 37. Stow tools, tape

**RMS: CONTINGENCY OPERATION (Installation and Removal of RMS IFM D&C Kit)** (1:00 hr)  
(Add 45 min for Orbit Station Access)

OBJECTIVE: Provide contingency ops of Remote Manipulator System using RMS IFM D&C Kit which is designed to work around following failures:

- Shoulder Brace Release sw
- End Effector Capture/Release sw
- End Effector Mode sw
- K1,K2,K6 relays
- Zener diodes
- Mode Select sw
- Single (Direct) sw
- Joint Select sw
- 28V Brake sw contact
- EE Man Contr sw

LOCATION: FLIGHT DECK (COMPONENT LOCATIONS);  
Connector Bracket (CB) behind pnl A8L

TOOLS REQD:

- |      |                   |
|------|-------------------|
| TOOL | Gray Tape         |
|      | Inspection Mirror |
|      | Connector Wrench  |
|      | Ratchet Wrench    |
|      | Driver Handle     |
|      | 4-in Extension    |
|      | 3/8-in Socket     |
|      | Torque Wrench     |
| BOB  | RMS IFM D&C Kit   |

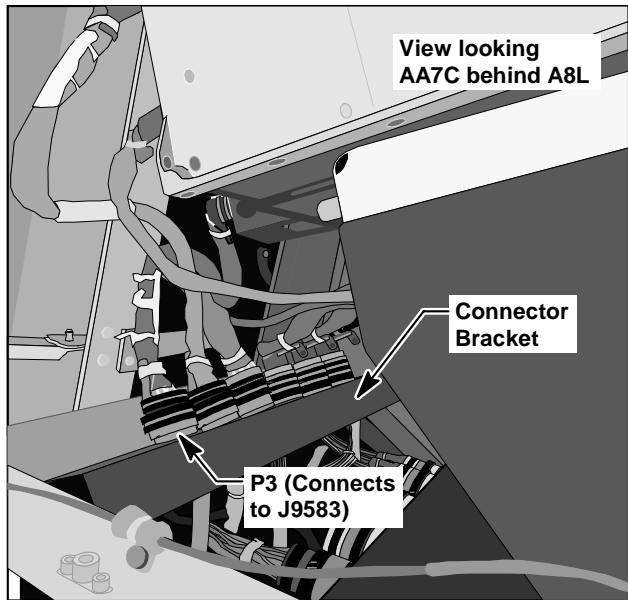
TO INSTALL RMS IFM D&C KIT

- |     |  |  |
|-----|--|--|
|     | 1. Perform ORBIT STATION ACCESS<br>(GENERAL INFORMATION)                       |  |
|     | <span style="border: 1px solid black; padding: 2px;">SM 94 PDRS CONTROL</span> |  |
|     | 2. Record WRR _____  |  |
| A8L | 3. RMS SEL – OFF<br>PWR – OFF  |  |
| A8U | 4. √EE MODE – OFF  |  |
| O19 | 5. √DC UTIL PWR MNA – OFF  |  |

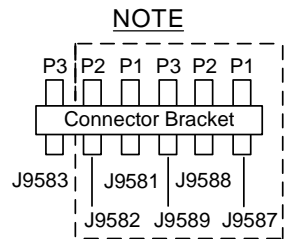
O19  
L4:Q

If Shoulder Brace Release reqd:  
6. ✓COAS PWR – OFF  
   ✓cb LIGHTING COAS – op

**WARNING**  
DO NOT demate connectors behind pnl A7C



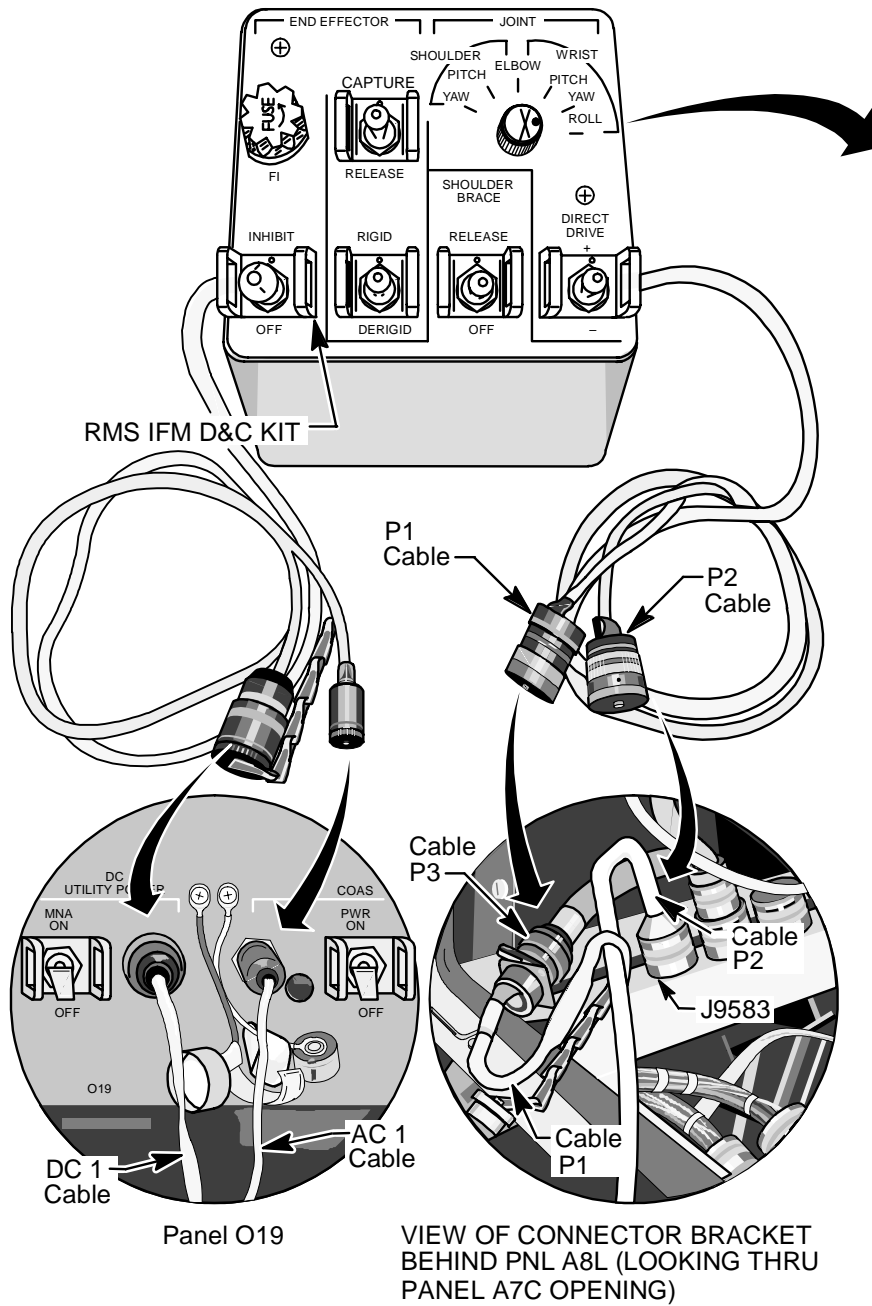
S81-33607



DO NOT DEMATE

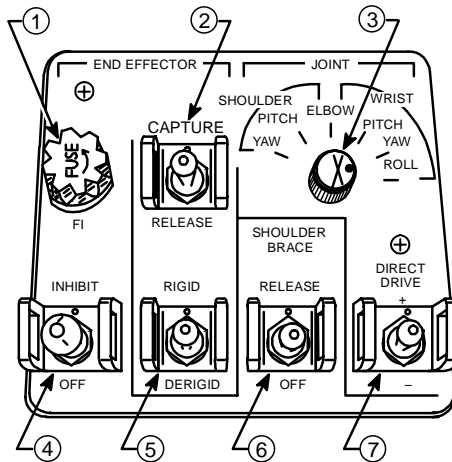
jsc48025\_199\_r.cnv





jsc48025\_200\_r.cnv

## RMS IFM D&C KIT SWITCH FUNCTIONS



jsc48025\_201\_r.cnv

- ① FUSE – 1/4 AMP. All VDC protected by this fuse
- ② CAPTURE/RELEASE – Captures/releases PL when Box installed. End Effector sw on D&C pnl and RHC disabled when Box installed
- ③ JOINT SELECT – Selects joint which Direct Drive will drive. Joint Select on D&C pnl will still work single mode and joint angle readout
- ④ INHIBIT/OFF – Function no longer available due to SPA design change
- ⑤ RIGID/DERIGID – Rigidizes/derigidizes end effector when attached to PL. End Effector sw on D&C pnl and RHC disabled when Box installed
- ⑥ SHOULDER BRACE – Release posn applies 115 VAC ( $\Phi$ A) directly to drive motor. Center,down posn – OFF posn
- ⑦ DIRECT DRIVE – Drives select joint regardless of Brake sw posn

7. Disconnect P3 from J9583 (J9583 located on Connector Bracket behind A8L)
  8. Connect RMS IFM D&C Kit connector P1 to P3 on vehicle harness
  9. Connect RMS IFM D&C Kit connector P2 to J9583 on Connector Bracket
- If DIRECT DRIVE(END EFFECTOR) functions reqd:
- O19      10. Connect RMS IFM D&C Kit DC 1 Pwr Cable connector to DC Util Outlet
- If SHOULDER BRACE RELEASE reqd:
- L4:Q      11. Connect RMS IFM D&C Kit AC 1 Pwr Cable connector to COAS Outlet  
cb LIGHTING COAS – cl
12. Perform RMS IFM D&C Kit, SSR-4 (MAL, PDRS SSR)

TO REMOVE RMS IFM D&C KIT

- A8L      13. RMS SEL – OFF  
PWR – OFF
- A8U      14. √EE MODE – OFF
- O19      15. √COAS PWR – OFF
16. √DC UTIL PWR MNA – OFF
- L4:Q      17. √cb LIGHTING COAS – op
18. Disconnect RMS IFM D&C Kit AC 1 Pwr Cable connector from COAS Outlet, if connected
19. Disconnect RMS IFM D&C Kit DC 1 Pwr Cable connector from DC Utility Outlet, if connected
20. Disconnect RMS IFM D&C Kit connector P1 from connector P3 on vehicle harness
21. Disconnect RMS IFM D&C Kit connector P2 from connector J9583 on Connector Bracket
22. Reconnect Vehicle Harness connector P3 to connector J9583 on Connector Bracket behind A8L
- A7L      23. Reinstall pnl, ensure wire harnesses not crimped |  
(torque mounting bolts 30 in-lb)
24. Stow tools, RMS IFM D&C Kit

**RMS: CONTINGENCY POWERUP**

(3:45 hr)

OBJECTIVE: Regain all primary modes of operation of arm due to RMS PWR(RMS SEL) sw failure (assumes stbd MPMs installed)

NOTE

BACKUP pwr will not be regained in event of total RMS PWR(RMS SEL) sw failure

NOTE

Port functions lost while IFM in place:

MPM mtr 2, fwd MRL mtr 2, mid MRL mtr 2, aft MRL mtr 1, STO/DPY tb will remain bp, RETEN LAT tb will remain bp.

Stbd functions lost while IFM in place:

RMS Htr A, MPM mtr 2, fwd MRL mtr 1, mid MRL mtr 2, aft MRL mtr 2, STO/DPY tb will remain bp, RETEN LAT tb will remain bp

LOCATION: FLIGHT DECK (COMPONENT LOCATIONS);

Connector Bracket behind pnl A8L

TOOLS REQD:

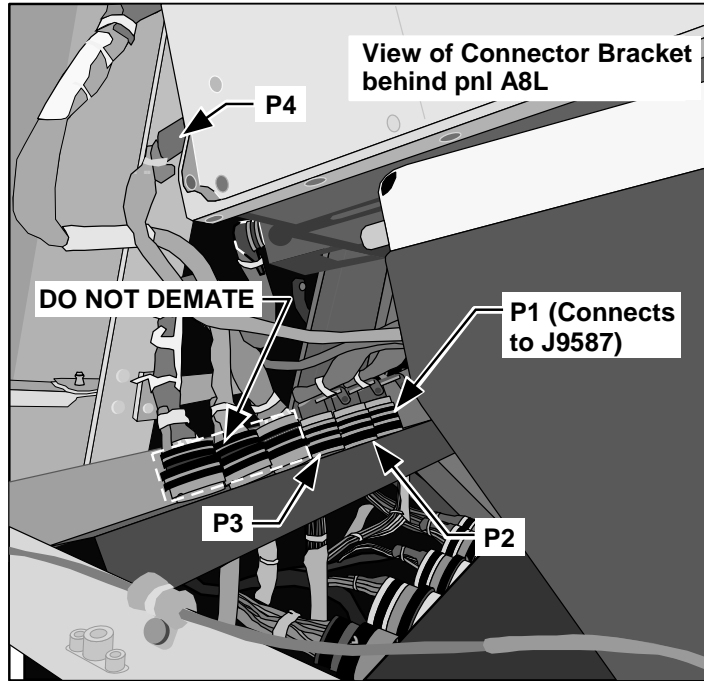
TOOL	Gray Tape
	Pin Kit
	Pwr Screwdriver
	Inspection Mirror
	Torque Wrench
	Driver Handle
	4-in Extension
	3/8-in Socket
BOB	IFM Breakout Box
CHCK	DC Pwr Cable

TO INSTALL IFM

- A8L
1. Perform ORBIT STATION ACCESS (GENERAL INFORMATION)
  2. RMS SEL – OFF  
PWR – OFF

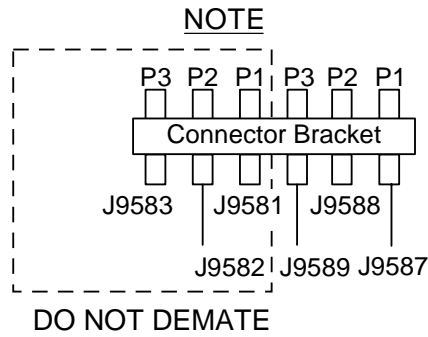
<p style="text-align: center;"><u>CAUTION</u> STBD HTR pwr must be reapplied within 90 min to prevent OBSS sensor damage</p>
--

- A6U
- PORT RMS HTR A,B (two) – OFF  
STBD RMS HTR A,B (two) – OFF  
EVENT TIMER MODE – UP  
CNTL – START
- L4:Q
- MA73C:F
3. cb AC3  $\Phi$ C LTG PNL OS – op
  4. cb AC1 RMS PRI  $\Phi$ A – op  
AC2 RMS B/U  $\Phi$ A – op
  5. a. Breakout Box:  
AUX – OFF  
28V/VAR VOLT – 28V  
PWR A,B – OFF  
b. Remove Fuse Cap from side B  
c. Rotate GA SEL B – 22  
d. Install 2-Amp Fuse, replace cap
  6. Remove bolts from pnl A8L (eight, 3/8-in Socket) |



S81-33607

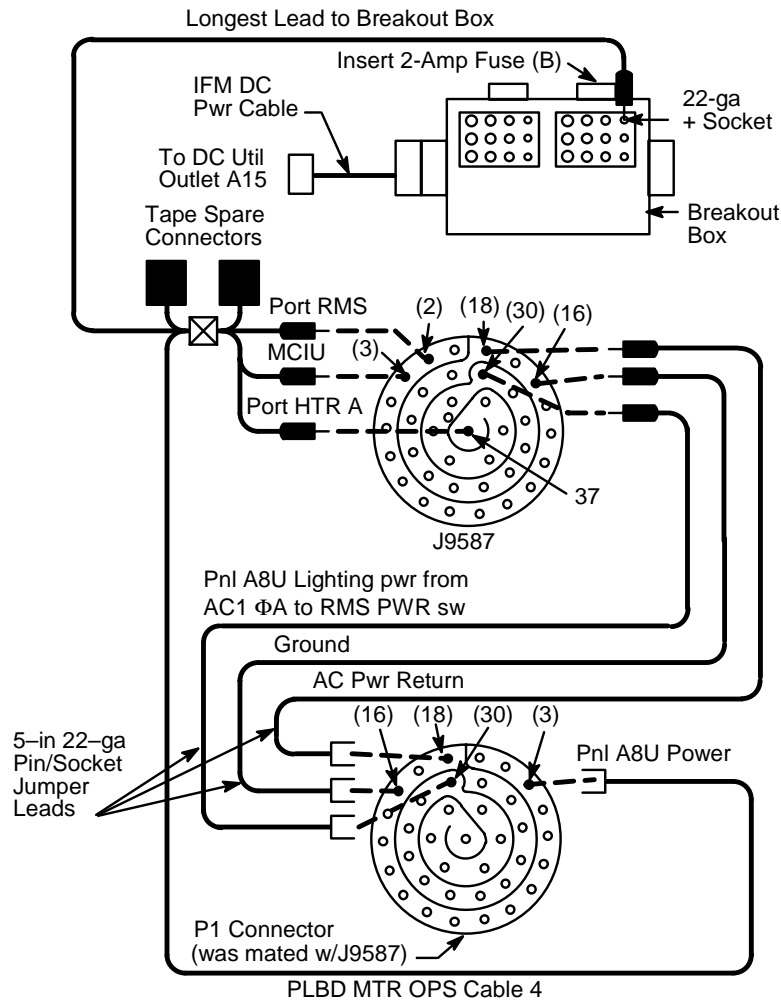
**CAUTION**  
 28V bus voltage present in some connections.  
 RMS BACKUP pwr will not be available while  
 P2 disconnected



jsc48025\_202r2\_r.cvx

A15

7. Remove connectors P1,P2,P3,P4 then reposition pnl A8L to provide access to P1,J9587 (outboard connector on bracket)
8. Remove PLBD MTR OPS Cable 4 and three 22-ga Pin/Socket Test Jumper Lead from Pin Kit
9. √DC UTIL PWR MNC – OFF  
If pnl A8U lighting available prior to IFM
10. Connect pins 18,30
11. Install cables as follows:



jsc48025\_203r2\_r.cnv

- |         |  |
|---------|--|
| A15     | 12. Move pnl A8L back into position and reconnect P2,P3,P4 |
| A8L     | PORT RMS HTR B – AUTO                                      |
|         | If OBSS berthed:   |
|         | STBD RMS HTR B – AUTO                                      |
| A6U     | EVENT TIMER CNTL – STOP                                    |
| L4:Q    | 13. cb AC3 ΦC LTG PNL OS – cl                              |
|         | If pnl A8U lighting available prior to IFM:                |
| MA73C:F | 14. cb AC1 RMS PRI ΦA – cl                                 |
|         | AC2 RMS B/U ΦA – cl  |
| A8L     | 15. RMS PWR – PRI  |

NOTE

For both port and stbd:

Expect single motor times for MPMs (68 sec) and MRLs (18 sec) while IFM installed. RMS tb and RETEN LAT tb will remain bp. AFT,MID, FWD ready for latch tb available

- |     |  |
|-----|--|
| A15 | 16. DC UTIL PWR MNC – ON   |
|     | Breakout Box:  |
|     | PWR B – ON (22 lt ON) (MA)   |
|     | <span style="border: 1px solid black; padding: 2px;">SM 94 PDRS CONTROL</span>   |
| CRT | 17. I/O ON – ITEM 5 EXEC (*)   |
| A8U | 18. SAFING – CANCEL (tb-gray)  |
|     | If pnl A8U lighting not available:   |
|     | <span style="border: 1px solid black; padding: 2px;">SPEC 169 PDRS STATUS</span> |
|     | 19. √Joint Angles  |

TO REMOVE IFM

- |         |   |
|---------|---|
|         | 20. Breakout Box:                               |
|         | PWR B – OFF                                     |
| A15     | 21. DC UTIL PWR MNC – OFF                       |
| MA73C:F | 22. cb AC1 RMS PRI ΦA – op                      |
| A8L     | 23. √RMS PWR – OFF                              |
|         | 24. √PORT RMS HTR A – OFF                       |
|         | If OBSS berthed:                                |
|         | √STBD RMS HTR A – OFF                           |
|         | 25. Disconnect cable installed in step 11, stow |



- ┌ | | |
- 26. Reconnect P1 to J9587
  - A7L 27. Install pnl, ensure wire harnesses not crimped  
(torque mounting bolts 30 in-lb)
  - MA73C:F 28. cb AC1 RMS PRI  $\Phi$ A – cl
  - A8L 29.  $\sqrt$ PORT RMS A,B (two) – AUTO |  
If OBSS berthed:  
 $\sqrt$ STBD RMS HTR A,B (two) – AUTO
  - 30. Stow tools

**RMS: JETT REDUNDANCY**

(2:30 hr)

OBJECTIVE: Restore redundancy for jettison to RMS Jettison System. Due to loss of either sub-bus MNA (stbd), MNB (port), or MNC (port,stbd) from pnl ML86B

LOCATION: See Middeck (pnl ML86B) and FLIGHT DECK (pnl A14) (COMPONENT LOCATIONS)

TOOLS REQD:

TOOL	Gray Tape
	Pin Kit
	Pwr Screwdriver
	5/32-in Allen Head Driver
	Driver Handle
	Torque Wrench
BOB	IFM Breakout Box
CHCL	DC Pwr Cable

TO REGAIN PORT RMS JETT SYS A (LOSS OF MNB SUB-BUS)

NOTE

Regains jettison deadface capability for the port side

- ML86B:D A14
1. √cb MNB PYRO JETT SYS A PORT RMS – op
  2. RCS/OMS HTR FWD RCS JET 2,3 – OFF
  3. Loosen fasteners (sixteen, 5/32-in Allen Head Driver). Reposition pnl A14 to access connectors on back

**WARNING**

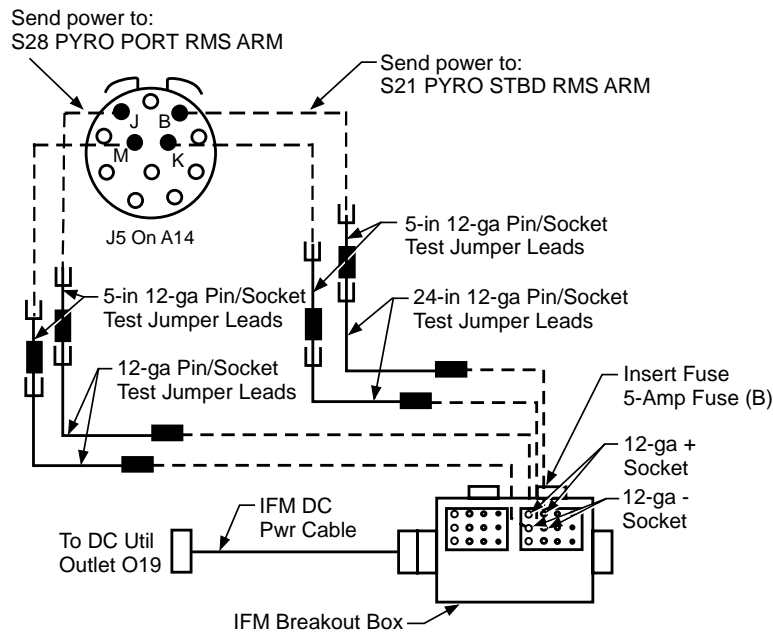
Socket A on P9644 hot (MNB) 24V DC pwr for RCS JET HTR

4. Remove connector P9644 from J4 on back of pnl A14
  5. Tape over face of P9644, tape secure harness to nearby harness/structure
- O19
6. √DC UTIL PWR MNA – OFF



**WARNING**  
 Socket A on P9645 hot (MNC) 28V DC  
 pwr for RCS JET HTR

- O19
13. Remove connector P9645 from J5 on back of pnl A14
  14. Tape over face of P9645, tape secure harness to nearby harness/structure
  15.  $\sqrt{\text{DC UTIL PWR MNA}} - \text{OFF}$
  16. a. Breakout Box:  
 AUX - OFF  
 28V/VAR VOLT - 28V  
 PWR A,B - OFF
  - b. Remove Fuse Cap from side B
  - c. Rotate GA SEL B-12
  - d. Install 5-Amp Fuse, replace cap
  17. Install Breakout Box, Cables, and Test Jumper Leads as shown:



jsc48025\_277A1\_r.cvx

18. Go to step 27

TO REGAIN STBD RMS JETT SYS A (LOSS OF MNA SUB-BUS)

NOTE

Regains jettison deadface capability  
for the stbd side

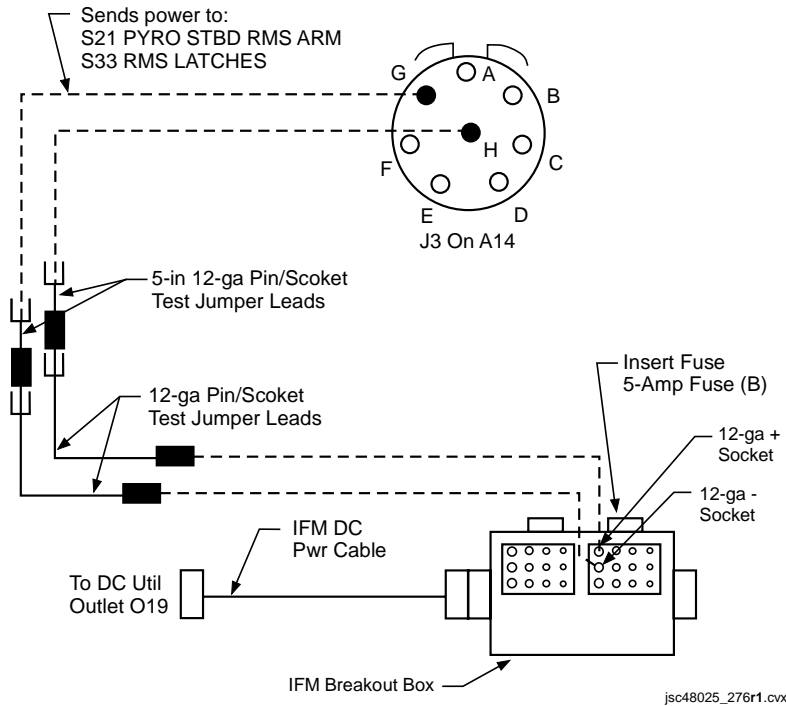
- ML86B:D A14
19. √cb MNA PYRO JETT SYS A STBD RMS – op
  20. RCS/OMS HTR FWD RCS JET 1 – OFF
  21. Loosen fasteners (sixteen, 5/32-in Allen Head Driver). Reposition pnl A14 to access connectors on back

WARNING

Socket A on P9643 hot (MNA) 24V DC  
pwr for RCS JET HTR

- O19
22. Remove connector P9643 from J3 on back of pnl A14
  23. Tape over face of P9643, tape secure harness to nearby harness/structure
  24. √DC UTIL PWR MNA – OFF
  25. a. Breakout Box:
    - AUX – OFF
    - 28V/VAR VOLT – 28V
    - PWR A,B – OFF
  - b. Removes Fuse Cap from side B
  - c. Rotate GA SEL B – 12
  - d. Install 5-Amp Fuse, replace cap

26. Install Breakout Box, Cables, and Test Jumper Leads as shown:



- O19
27. DC UTIL PWR MNA – ON
  28. Breakout Box:  
PWR B – ON (12 lt ON)
  29. Perform jettison: RMS JETT (PDRS OPS)
  30. Breakout Box:  
PWR B – OFF
  31. DC UTIL PWR MNA – OFF
- A14
32. Remove Test Jumper Leads,Cables
  33. Reconnect P9644(P9645,P9643) to J4(J5,J3) on back of pnl A14
  34. Reposition pnl A14 and tighten fasteners (torque, 30 in-lb)
  35. Stow tools

**RMS: MCIU CHANGEOUT**

(2:30 hr)

OBJECTIVE: Replace hard failed MCIU w/spare. Provides full recovery of RMS computer supported modes and data display capabilities via CRT and D&C pnls

LOCATION: See FLIGHT DECK, Zone W15 for MCIU, AV BAY 1, Zone 14M for spare (COMPONENT LOCATIONS)

TOOLS REQD:

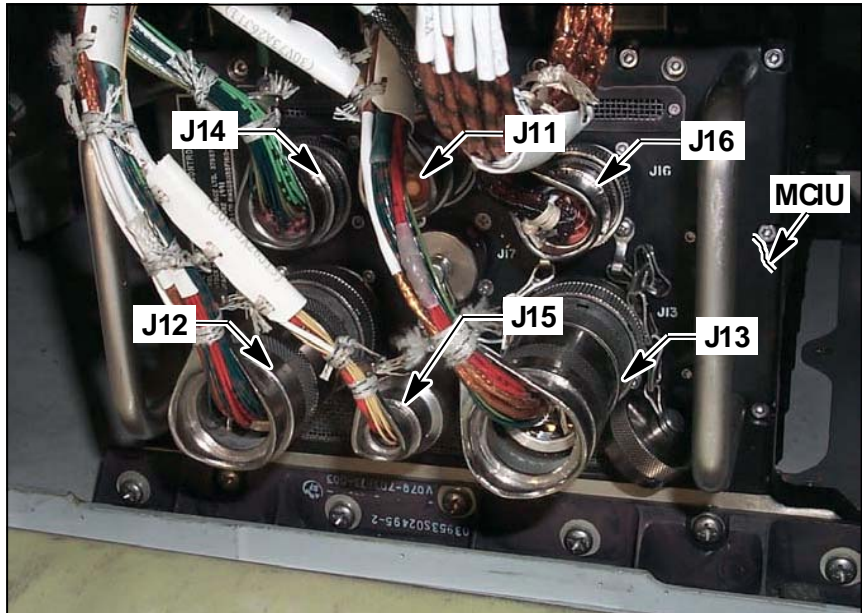
TOOL	Gray Tape
	Pwr Screwdriver
	Inspection Mirror
	Driver Handle or Ratchet Wrench
	1/4-in to 3/8-in Adapter
	Torque Wrench
	5/32-in Allen Head Driver
	7/16-in Socket
	11/32-in Deepwell Socket
	6-in and 10-in Extension
	1/4-in Deepwell Socket
MISC	Flashlight

TO OBTAIN SPARE MCIU

- |       |   |
|-------|---|
| MF14M | 1. Remove Locker,Thermal/Debris Trap to access spare MCIU   |
|       | 2. Tape Coldplate Protective Cover to wireway in front and above spare MCIU to protect wire harnesses |
|       | 3. Loosen MCIU mounting bolts (three, 7/16-in Sockets)  |
|       | 4. Remove spare MCIU using caution to prevent damage to adjacent wiring                               |

TO REMOVE MCIU

- |     |   |
|-----|---|
|     | 5. Pwr dn RSAD PGSC   |
| A8L | 6. √RMS SEL – OFF   |
|     | √PWR – OFF (If ON, SM ALERT, BCE BYP MCIU)                  |
| L17 | 7. Remove pnl L17 (17 fasteners, 5/32-in Allen Head Driver) |



jsc48025\_211\_r.cnv

8. Remove connectors from MCIU:
  - Cable 30V77W3P451 from J11
  - W1P452 from J12
  - W1P453 from J13
  - W1P454 from J14
  - W5P455 from J15
  - P16 from J16 (PGSC)

**NOTE**

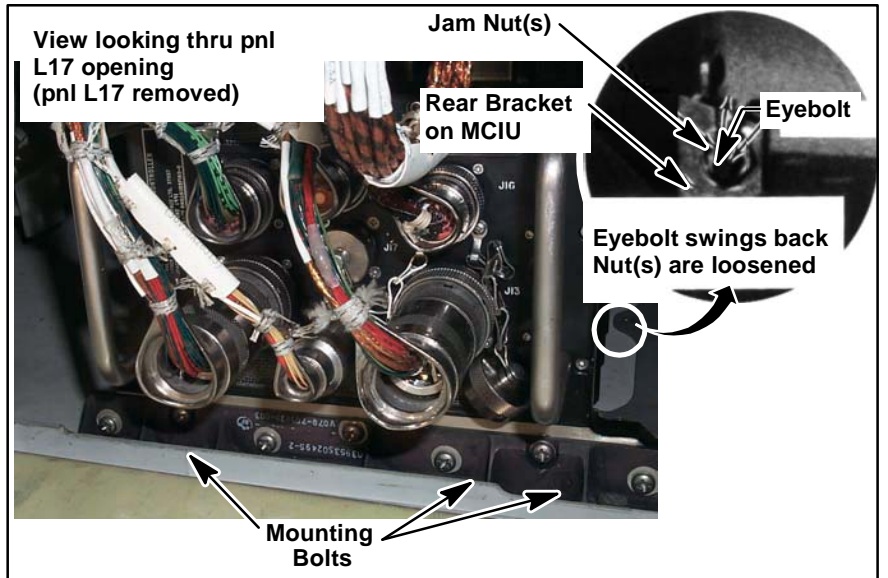
When removing jam nuts, ensure socket engages both 11/32-in nuts

9. Loosen, do not remove, eyebolt nut(s) (one or two/side, 1/4-in or 11/32-in Deepwell socket), swing eyebolt out of way
10. Loosen MCIU mounting bolts (three, 7/16-in Socket)
11. Remove MCIU. Mark failed unit w/Gray Tape



## TO INSTALL MCIU

12. Place spare MCIU into position, start mounting fasteners
13. Install eyebolts, tighten nuts (torque, 30 in-lb)
14. Tighten mounting bolts (torque, 100 in-lb)



jsc48025\_212\_r.cnv

15. Install connectors onto MCIU:
  - Cable 30V77W3P451 onto J11
  - W1P452 onto J12
  - W1P453 onto J13
  - W1P454 onto J14
  - W5P455 onto J15
  - P16 onto J16
16. Perform ON-ORBIT INIT, PDRS OPS, steps 2,5; then, record any out-of-limit temps
- L17 17. Install pnl L17 (torque, 30 in-lb)

TO STOW FAILED MCIU

- MF14M
18. Verify Coldplate Protective Cover in place in front and above spare MCIU location
  19. Position failed MCIU into spare location. Ensure pins on shelf bracket engage receptacles in rear of MCIU
  20. Start mounting fasteners. ✓Proper pin engagement w/Inspection Mirror, Flashlight (torque fasteners, 100 in-lb)
  21. Install Thermal/Debris Trap and Locker (torque, 30 in-lb). Stow tools

**RMS: PORT MANIPULATOR POSITIONING MECHANISM  
(MPM) CONTINGENCY DEPLOY/STOW** (3:15 hr)

OBJECTIVE: Provide alternate method to deploy/stow MPM due to deploy/stow sw failure by applying 28 VDC UTIL Pwr for appropriate deploy/stow MPM motor 1(2) command signal

NOTE

Expect single motor time for stbd MPMs while IFM in place for either motor.

Functions lost pwring mtr 1:

PORT,STBD RMS HTR B, BACKUP pwr, backup pnl lts, PORT,STBD RMS R-F-L tb (six) will remain bp.

Functions lost pwring mtr 2:

PORT,STBD RMS HTR A, port fwd MRL mtr 2, mid MRL mtr 2, aft MRL mtr 1, stbd fwd MRL mtr 1, mid MRL mtr 2, aft MRL mtr 2, PORT RMS pwr, MCIU pwr, pnl A8U lts, PORT,STBD RMS STO/DPY tb will remain bp, PORT,STBD RMS RETEN LAT tb will remain bp

LOCATION: Flight Deck; CB behind pnl A8L

TOOLS REQD:

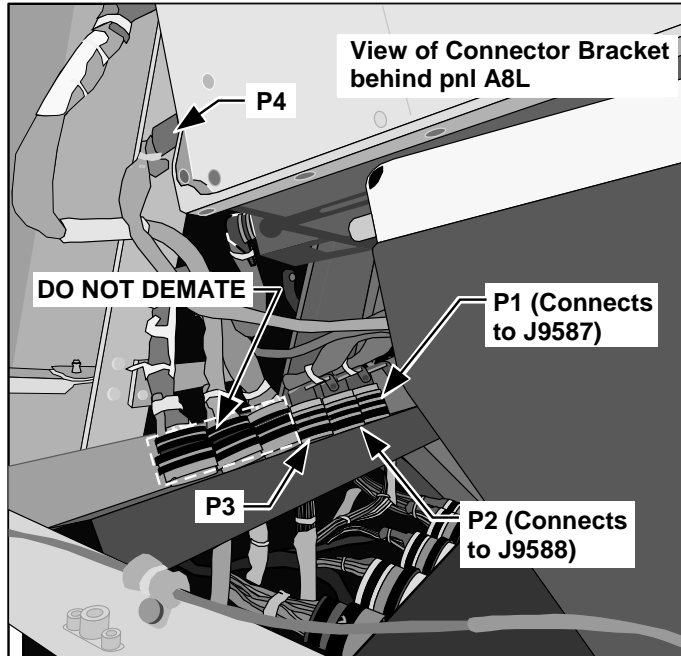
TOOL	Gray Tape
	Pin Kit (for Test Jumper Leads)
	Pwr Screwdriver
	Robbins Wrench
	Driver Handle
	1/4-in to 3/8-in Adapter
	Torque Wrench
	4-in Extension
	3/8-in Socket
BOB	IFM Breakout Box
CHCK	DC Pwr Cable

- |            |  |
|------------|--|
| O19<br>A8L | <ol style="list-style-type: none"> <li>1. Perform ORBIT STATION ACCESS (<u>GENERAL INFORMATION</u>)</li> <li>2. DC UTIL PWR MNA – OFF</li> <li>3. √PORT RMS – OFF<br/>√STBD RMS – OFF<br/>RMS SEL – OFF<br/>PWR – OFF</li> </ol> |
|------------|--|

**CAUTION**  
STBD HTR pwr must be reapplied within 90 min to prevent OBSS sensor damage

- |     |   |
|-----|---|
| A6U | <p>PORT RMS HTR A,B (two) – OFF<br/>STBD RMS HTR A,B (two) – OFF<br/>EVENT TIMER MODE – UP<br/>CNTL – START</p> |
|-----|---|

- |                 |  |
|-----------------|--|
| L4:Q<br>MA73C:F | <ol style="list-style-type: none"> <li>4. cb AC3 <math>\phi</math>C LTG PNL OS – op</li> <li>5. cb AC1 RMS PRI <math>\phi</math>A – op<br/>AC2 RMS B/U <math>\phi</math>A – op</li> <li>6. a. Breakout Box:<br/>AUX – OFF<br/>28V/VAR VOLT – 28V<br/>PWR A,B – OFF<br/>b. Remove Fuse Cap from side B<br/>c. Rotate GA SEL B-22<br/>d. Install 1-Amp Fuse, replace cap</li> <li>7. Remove bolts from pnl A8L (eight bolts, 3/8-in Socket)</li> </ol> |
|-----------------|--|

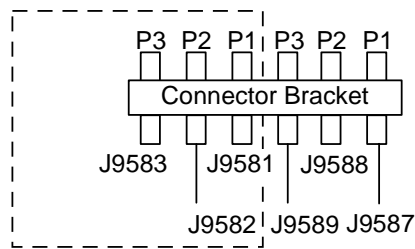


S81-33607

**CAUTION**

28V bus voltage present in some connections. RMS BACKUP pwr will not be available while P2 disconnected. RMS PRIMARY pwr will not be available while P1 disconnected

**NOTE**



DO NOT DEMATE

jsc48025\_206r3\_r.cvx

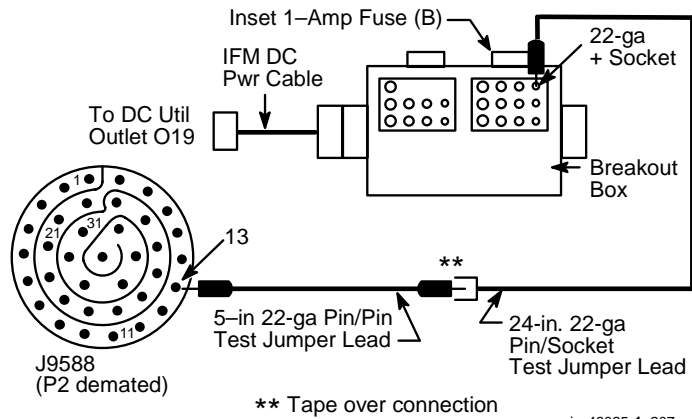
8. Remove connectors P1,P2,P3,P4. Reposition A8L to access J9588(J9587)
9. To deploy MPM, go to step 10(11)  
To stow MPM, go to step 13(14)

**DEPLOY MPM**

10. To deploy MPM using motor 1:
  - a. Install 22-ga Test Jumper Lead as shown in diagram below
  - b. Move pnl A8L back into posn, reconnect P1,P3,P4
  - c. PORT RMS HTR A – AUTO  
If OBSS berthed:  
STBD RMS HTR A – AUTO  
EVENT TIMER CNTL – STOP
  - d. Go to step 12

A8L

A6U

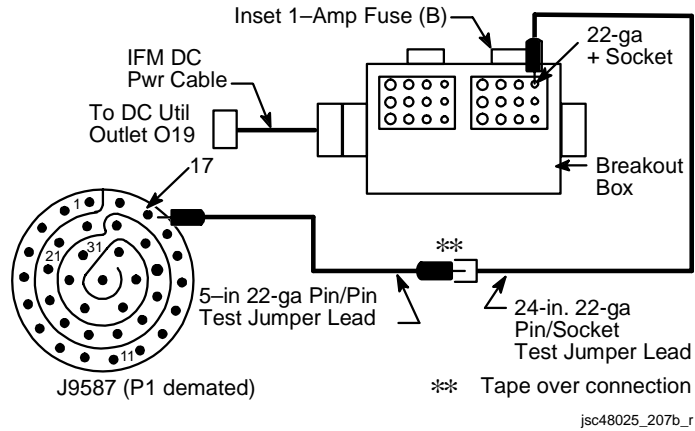


jsc48025r1\_207a\_r

11. To deploy MPM using motor 2:
  - a. Install 22-ga Test Jumper Lead as shown in diagram below
  - b. Move pnl A8L back into posn, reconnect P1,P3,P4
  - c. PORT RMS HTR B – AUTO  
If OBSS berthed:  
STBD RMS HTR B – AUTO  
EVENT TIMER CNTL – STOP
  - d. Go to step 12

A8L

A6U



MA73C:C 12. a. √cb MCA PWR AC2 3Φ MID2 – cl  
:D √AC3 3Φ MID4 – cl

NOTE

Expect single motor time (68 sec)

R13L b. PL BAY MECH PWR SYS 1,2 – ON  
O19 c. DC UTIL PWR MNA – ON

**SM 94 PDRS CONTROL**

d. √RMS PORT, ITEM 1 – (\*)

If P1 disconnected:

e. PORT RMS tb not available. Check  
SPEC 94 for STO/DPLY indications

f. Breakout Box:

PWR B – ON (22 lt ON) (68 sec max)

A8L g. √PORT RMS tb – DPY

h. Breakout Box:

PWR B – OFF

O19 i. DC UTIL PWR MNA – OFF

If PORT RMS DPLY/STO sw failed short:

j. Release MRLs prior to opening cbs and  
reconnecting plug and jacks

R13L k. PL BAY MECH PWR SYS 1,2 – OFF

MA73C:C l. cb MCA PWR AC2 3Φ MID2 – op  
:D AC3 3Φ MID4 – op

m. Disconnect Pin/Pin Test Jumper Lead from  
J9588 (J9587), reconnect P2(P1), temp  
stow Lead and tools (they will be reqd to  
stow MPM)

A7L n. Install pnl, ensure wire harnesses not crimped  
(torque mounting bolts 30 in-lb)

L4:Q o. cb AC3 ΦC LTG PNL OS – cl

MA73C:F p. cb AC1 RMS PRI ΦA – cl  
AC2 RMS B/U ΦA – cl

q. Stow tools

r. Go to step 16

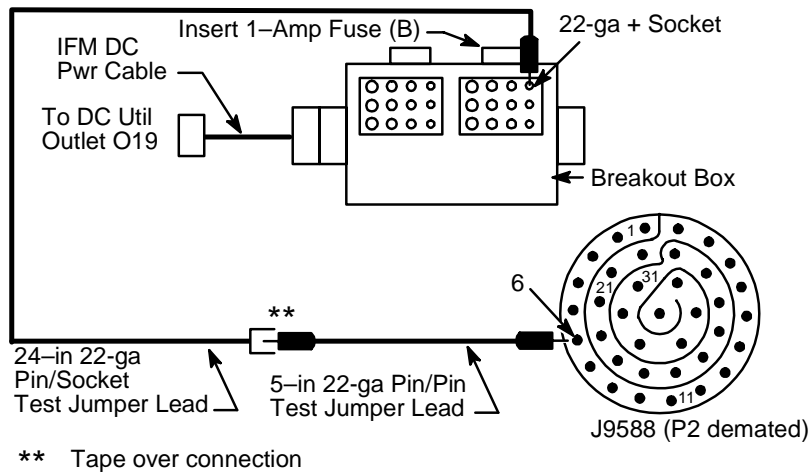


STOW MPM:

13. To stow MPM using motor 1
- Install 22-ga Test Jumper Lead as shown in diagram below
  - Move pnl A8L back into posn, reconnect P1,P3,P4
  - PORT RMS HTR A – AUTO  
If OBSS berthed:  
STBD RMS HTR A – AUTO  
EVENT TIMER CNTL – STOP
  - Go to step 15

A8L

A6U

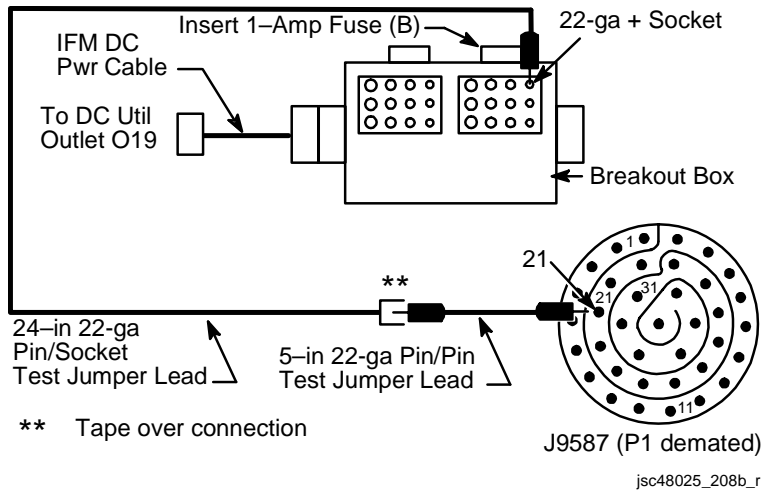


jsc48025\_208a\_r.cnv

14. To stow MPM using motor 2
  - a. Install 22-ga Test Jumper Lead as shown in diagram below
  - b. Move pnl A8L back into posn, reconnect P1,P3,P4
  - c. PORT RMS HTR B – AUTO  
If OBSS berthed:  
STBD RMS HTR B – AUTO  
EVENT TIMER CNTL – STOP
  - d. Go to step 15

A8L

A6U



- MA73C:C 15. a. cb MCA PWR AC2 3Φ MID 2 – cl  
:D AC3 3Φ MID 4 – cl

NOTE

Expect single motor time (68 sec)

- R13L b. PL BAY MECH PWR SYS 1,2 – ON  
O19 c. DC UTIL PWR MNA – ON

SM 94 PDRS CONTROL

- d. √RMS PORT, ITEM 1 – (\*)

If P1 disconnected:

- e. PORT RMS tb not available. Check  
SPEC 94 for STO/DPLY indications

- f. Breakout Box:

PWR B – ON (22 lt ON)(68 sec max)

- A8L g. √PORT RMS tb – STO

- h. Breakout Box: PWR B – OFF

- O19 i. DC UTIL PWR MNA – OFF

- R13L j. PL BAY MECH PWR SYS 1,2 – OFF

- MA73C:C k. cb MCA PWR AC2 3Φ MID 2 – op  
:D AC3 3Φ MID 4 – op

- l. Disconnect Pin/Pin Test Jumper Lead from  
J9588 (J9587), stow in Pin Kit

- m. Disconnect IFM Pwr Cable from utility outlet,  
stow

- n. Reconnect P2 to J9588 (P1 to J9587)

- A7L o. Install pnl, ensure wire harnesses not crimped  
(torque mounting bolts 30 in-lb)

- L4:Q p. cb AC3 ΦC LTG PNL OS – cl

- MA73C:F q. cb AC1 RMS PRI ΦA – cl  
AC2 RMS B/U ΦA – cl

- r. Stow tools

16. RMS TEMP MON

- A8L a. √PORT RMS HTR A,B (two) – AUTO

If OBSS berthed:

√STBD RMS HTR A,B (two) – AUTO

- b. RMS PWR – PRI (MA)

SM 94 PDRS CONTROL

- c. I/O ON – ITEM 5 EXEC (\*)

- A8U d. SAFING – CANCEL (tb-bp)

√GPC DATA lt – off

PARAM sel – PORT TEMP

JOINT sel – CRIT TEMP

**RMS: PORT MANIPULATOR RETENTION LATCHES  
(MRL) CONTINGENCY RELEASE/LATCH** (3:15 hr)

**OBJECTIVE:** Provide alternate method of releasing(latching) MRLs (due to Retention Latch sw failure) by applying 28 VDC Util Pwr to FWD MRL motor 1, MID MRL motor 1, and AFT MRL motor 2

**NOTE**

Functions lost while IFM in place:  
Stbd fwd MRL mtr 2, mid MRL mtr 1, and  
aft MRL mtr 1 (expect single mtr time for  
both release or latch).  
Pnl A8L edge lighting

**LOCATION:** Flt Deck; CB behind pnl A8L

**TOOLS REQD:**

**TOOL** Gray Tape  
Pin Kit  
Pwr Screwdriver  
Robbins Wrench  
Driver Handle  
1/4-in to 3/8-in Adapter  
Torque Wrench  
4-in Extension  
3/8-in Socket  
**BOB** IFM Breakout Box  
**CHCK** DC Pwr Cable

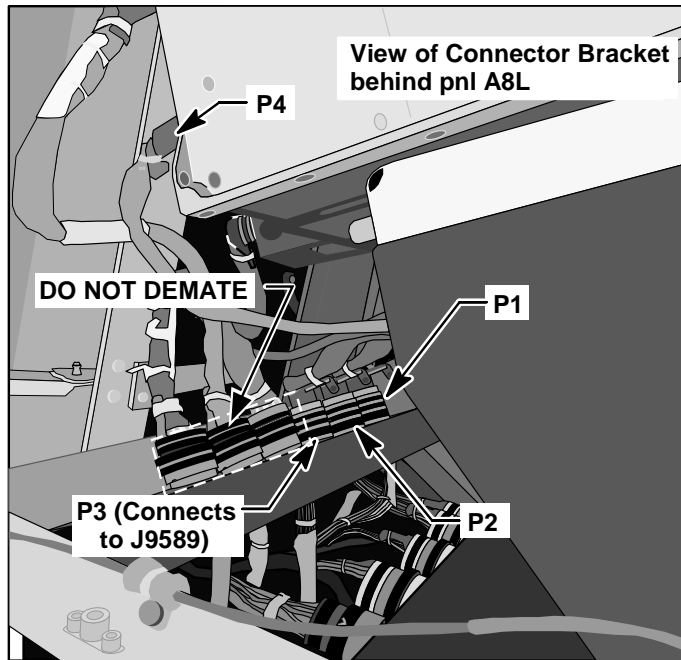
1. Perform ORBIT STATION ACCESS (GENERAL INFORMATION)
- O19 2. DC UTIL PWR MNA – OFF
- A8L 3. √PORT RMS RETEN LAT – OFF  
√STBD RMS RETEN LAT – OFF  
RMS SEL – OFF  
PWR – OFF

**CAUTION**

STBD HTR pwr must be reapplied within  
90 min to present OBSS sensor damage

A6U PORT RMS HTR A,B (two) – OFF  
STBD RMS HTR A,B (two) – OFF  
EVENT TIMER MODE – UP  
CNTL – START

- L4:Q  
MA73C:F
4. cb AC3  $\Phi$ C LTG PNL OS – op
  5. cb AC1 RMS PRI  $\Phi$ A – op  
AC2 RMS B/U  $\Phi$ A – op
  6. a. Breakout Box:  
AUX – OFF  
28V/VAR VOLT – 28V  
PWR A,B – OFF  
b. Remove Fuse Cap from side B  
c. Rotate GA SEL B – 22  
d. Install 1-Amp Fuse, replace cap
  7. Remove bolts from pnl A8L (eight bolts, 3/8-in Socket)

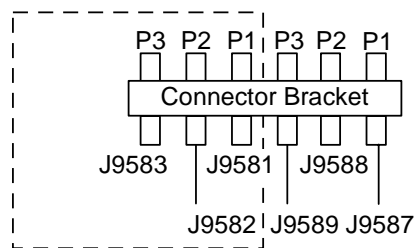


S81-33607

**CAUTION**

28V bus voltage present in some connections. RMS BACKUP pwr will not be available while P2 disconnected. RMS PRIMARY pwr will not be available while P1 disconnected

**NOTE**



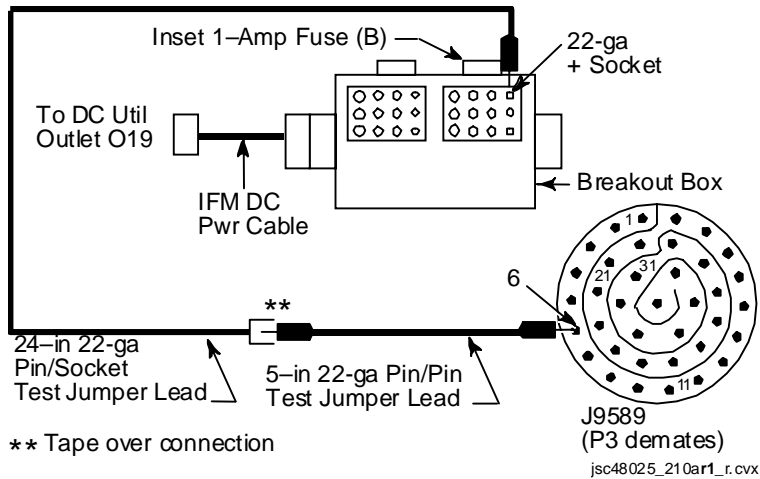
DO NOT DEMATE

jsc48025\_209r2\_r.cnv

8. Remove connectors P1,P2,P3,P4 then reposition A8L to access J9589
9. To release MRLs, perform steps 10,11  
To latch MRLs, perform steps 12,13

TO RELEASE MRLs

10. Install 22-ga Test Jumper Lead as shown in diagram below:



11. Move pnl A8L back into position and reconnect P1,P2,P4
- |         |   |
|---------|---|
| A8L     | a. PORT RMS HTR A,B (two) – AUTO<br>If OBSS berthed:<br>STBD RMS HTR A,B (two) – AUTO |
| A6U     | EVENT TIMER CNTL – STOP   |
| MA73C:C | b. √cb MCA PWR AC1 3Φ MID1 – cl<br>√AC2 3Φ MID2 – cl<br>√AC1 3Φ MID3 – cl             |
| :D      |   |

NOTE

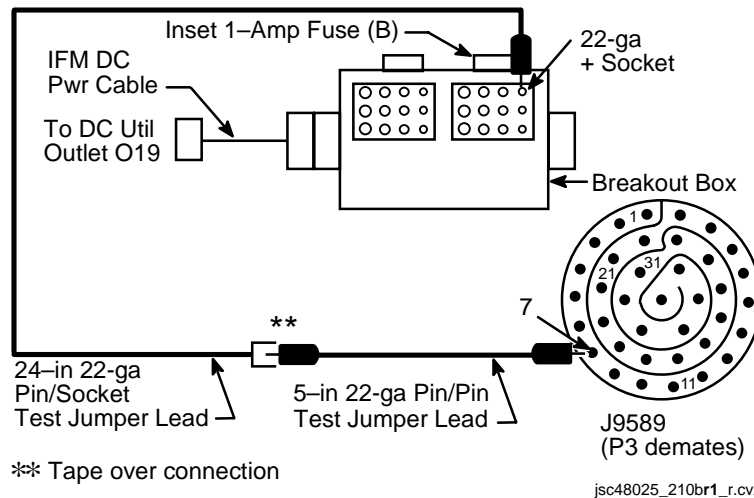
Expect single motor time (18 sec)

- |      |  |
|------|--|
| R13L | c. DAP: VRCS(FREE)   |
| O19  | d. PL BAY MECH PWR SYS 1,2 – ON<br>e. DC UTIL PWR MNA – ON |

- f. Breakout Box:  
PWR B – ON (22 lt ON) (18 sec max)
- A8L g. √PORT RMS RETEN LAT tb – REL
- h. Breakout Box:  
PWR B – OFF
- O19 i. DC UTIL PWR MNA – OFF
- R13L j. PL BAY MECH PWR SYS 1,2 – OFF
- MA73C:C k. cb MCA PWR AC1 3Φ MID1 – op  
AC2 3Φ MID2 – op  
AC1 3Φ MID3 – op
- :D l. Disconnect Pin/Pin Test Jumper Lead from  
J9589. Reconnect P3. Temp stow Lead  
and tools (they will be reqd to latch MRLs)
- A7L m. Install pnl, ensure wire harnesses not crimped |  
(torque mounting bolts 30 in-lb)
- L4:Q n. cb AC3 ΦC LTG PNL OS – cl
- MA73C:F o. cb AC1 RMS PRI ΦA – cl  
AC2 RMS B/U ΦA – cl
- p. Stow tools
- q. Go to step 14

TO LATCH MRLs

12. Install 22-ga Test Jumper Lead as shown in diagram below:





13. Move pnl A8L back into position and reconnect P1,P2,P4
- A8L a. PORT RMS HTR A,B (two) – AUTO  
If OBSS berthed:  
STBD RMS HTR A,B (two) – AUTO
  - A6U EVENT TIMER CNTL – STOP
  - MA73C:C b. √cb MCA PWR AC1 3Φ MID1 – cl  
√AC2 3Φ MID2 – cl  
√AC1 3Φ MID3 – cl
  - :D

NOTE

Expect single motor time (18 sec)

- R13L c. DAP: VRCS(FREE)
- O19 d. PL BAY MECH PWR SYS 1,2 – ON
- e. DC UTIL PWR MNA – ON
- f. Breakout Box:  
PWR B – ON (22 lt ON) (18 sec max)
- A8L g. √PORT RMS RETEN LAT tb – LAT
- h. Breakout Box:  
PWR B – OFF
- O19 i. DC UTIL PWR MNA – OFF
- R13L j. PL BAY MECH PWR SYS 1,2 – OFF
- MA73C:C k. cb MCA PWR AC1 3Φ MID 1 – op  
AC2 3Φ MID 2 – op  
AC1 3Φ MID 3 – op
- :D l. Disconnect Pin/Pin Test Jumper Lead from J9589, stow in Pin Kit
- m. Disconnect IFM DC Pwr Cable from util outlet, stow
- n. Reconnect P3 to J9589
- A7L o. Install pnl, ensure wire harnesses not crimped (torque mounting bolts 30 in-lb)
- L4:Q p. cb AC3 ΦC LTG PNL OS – cl
- MA73C:F q. cb AC1 RMS PRI ΦA – cl  
AC2 RMS B/U ΦA – cl
- r. Stow tools

- ┌ | | | ┐
- A8L 14. RMS TEMP MON
- a. RMS PWR – PRI (MA)
- SM 94 PDRS CONTROL
- b. I/O ON – ITEM 5 EXEC (\*)
- A8U c. SAFING – CANCEL (tb-bp)
- √GPC DATA It – off
- PARAM sel – PORT TEMP
- JOINT sel – CRIT TEMP

**RMS: STBD MANIPULATOR POSITIONING MECHANISM  
(MPM) CONTINGENCY DEPLOY/STOW** (3:15 hr)

OBJECTIVE: Provide alternate method to deploy/stow MPM due to deploy/stow sw failure by applying 28 VDC UTIL Pwr for appropriate deploy/stow MPM motor 1(2) command signal

NOTE

Expect single motor time for port MPMs while IFM in place for either motor

Functions lost pwring mtr 1:

PORT,STBD RMS HTR B, BACKUP pwr, backup pnl lts, PORT,STBD RMS R-F-L tb (six) will remain bp.

Functions lost pwring mtr 2:

PORT,STBD RMS HTR A, port fwd MRL mtr 2, mid MRL mtr 2, aft MRL mtr 1, stbd fwd MRL mtr 1, mid MRL mtr 2, aft MRL mtr 2, PORT RMS pwr, MCIU pwr, pnl A8U lts, PORT,STBD RMS STO/DPY tb will remain bp, PORT,STBD RMS RETEN LAT tb will remain bp

LOCATION: Flight Deck; CB behind pnl A8L

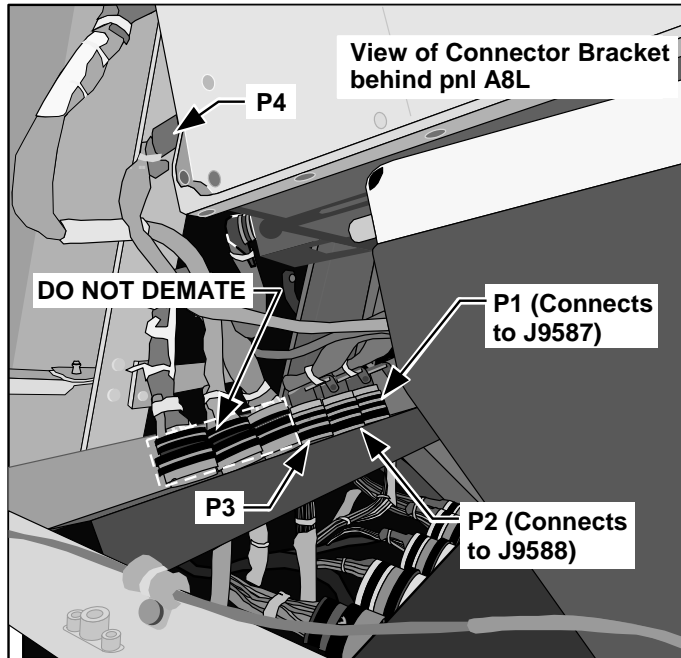
TOOLS REQD:

TOOL	Gray Tape
	Pin Kit (for Test Jumper Leads)
	Pwr Screwdriver
	Robbins Wrench
	Driver Handle
	1/4-in to 3/8-in Adapter
	Torque Wrench
	4-in Extension
	3/8-in Socket
BOB	IFM Breakout Box
CHCK	DC Pwr Cable

- O19  
A8L
1. Perform ORBIT STATION ACCESS (GENERAL INFORMATION)
  2. DC UTIL PWR MNA – OFF
  3. √PORT RMS – OFF  
√STBD RMS – OFF  
RMS SEL – OFF  
PWR – OFF

**CAUTION**  
STBD HTR pwr must be reapplied within  
90 min to prevent OBSS sensor damage

- A6U  
L4:Q  
MA73C:F
- PORT RMS HTR A,B (two) – OFF  
STBD RMS HTR A,B (two) – OFF  
EVENT TIMER MODE – UP  
CNTL – START
4. cb AC3  $\phi$ C LTG PNL OS – op
  5. cb AC1 RMS PRI  $\phi$ A – op  
AC2 RMS B/U  $\phi$ A – op
  6. a. Breakout Box:  
AUX – OFF  
28V/VAR VOLT – 28V  
PWR A,B – OFF  
b. Remove Fuse Cap from side B  
c. Rotate GA SEL B-22  
d. Install 1-Amp Fuse, replace cap
  7. Remove bolts from pnl A8L (eight bolts, 3/8-in Socket)

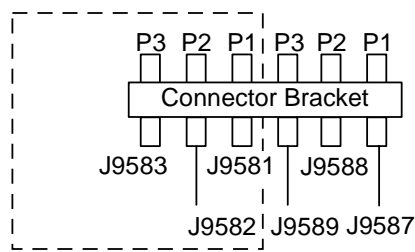


S81-33607

**CAUTION**

28V bus voltage present in some connections. RMS BACKUP pwr will not be available while P2 disconnected. RMS PRIMARY pwr will not be available while P1 disconnected

**NOTE**



**DO NOT DEMATE**

jsc48025\_206r3\_r.cvx

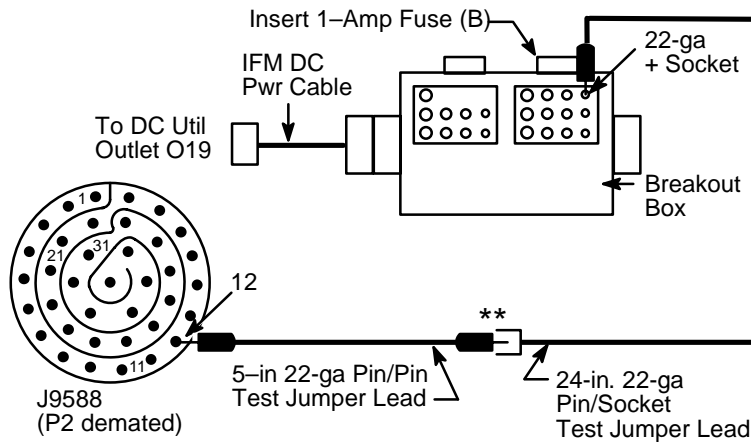
8. Remove connectors P1,P2,P3,P4. Reposition A8L to access J9588(J9587)
9. To deploy MPM, go to step 10(11)  
To stow MPM, go to step 13(14)

**DEPLOY MPM**

10. To deploy MPM using motor 1:
  - a. Install 22-ga Test Jumper Lead as shown in diagram below
  - b. Move pnl A8L back into posn, reconnect P1,P3,P4
  - c. PORT RMS HTR A – AUTO  
STBD RMS HTR A – AUTO  
EVENT TIMER CNTL – STOP
  - d. Go to step 12

A8L

A6U



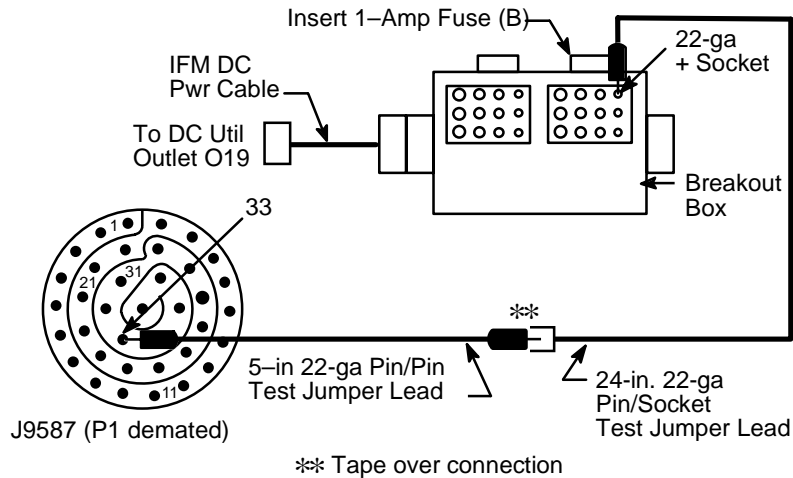
\*\* Tape over connection

jsc48025r1\_207ar1\_r

11. To deploy MPM using motor 2:
  - a. Install 22-ga Test Jumper Lead as shown in diagram below
  - b. Move pnl A8L back into posn, reconnect P1,P3,P4
  - c. PORT RMS HTR B – AUTO  
STBD RMS HTR B – AUTO  
EVENT TIMER CNTL – STOP
  - d. Go to step 12

A8L

A6U



jsc48025\_207br1\_r

- MA73C:C 12. a.  $\sqrt{cb}$  MCA PWR AC2 3 $\Phi$  MID2 – cl  
:D  $\sqrt{AC3}$  3 $\Phi$  MID4 – cl

**NOTE**

Expect single motor time (68 sec)

R13L  
O19

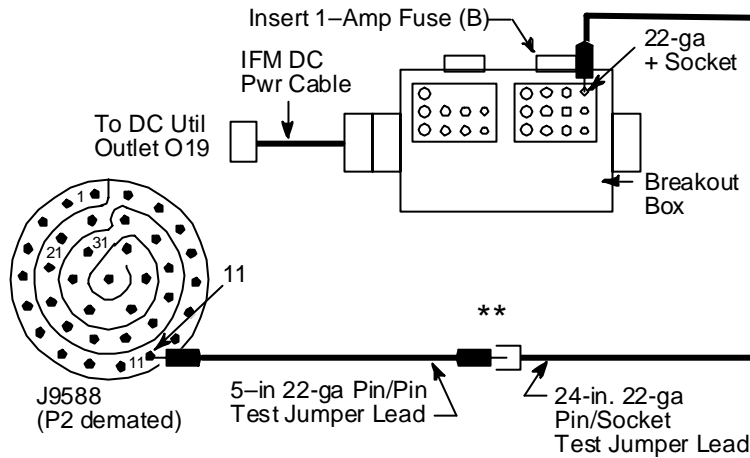
- b. PL BAY MECH PWR SYS 1,2 – ON
  - c. DC UTIL PWR MNA – ON  
**SM 94 PDRS CONTROL**
  - d.  $\sqrt{RMS}$  STBD, ITEM 2 – (\*)
- If P1 disconnected:
- e. STBD RMS tb not available. Check SPEC 94 for STO/DPLY indications
  - f. Breakout Box:  
PWR B – ON (22 lt ON) (68 sec max)

- A8L g.  $\sqrt{\text{STBD RMS tb}} - \text{DPY}$
- h. Breakout Box:
  - PWR B – OFF
- O19 i. DC UTIL PWR MNA – OFF
- If STBD RMS DPLY/STO sw failed short:
  - j. Release MRLs prior to opening cbs and reconnecting plug and jacks
- R13L k. PL BAY MECH PWR SYS 1,2 – OFF
- MA73C:C l. cb MCA PWR AC2 3 $\Phi$  MID2 – op
- :D AC3 3 $\Phi$  MID4 – op
- m. Disconnect Pin/Pin Test Jumper Lead from J9588 (J9587), reconnect P2(P1), temp stow Lead and tools (they will be reqd to stow MPM)
- A7L n. Install pnl, ensure wire harnesses not crimped (torque mounting bolts 30 in-lb)
- L4:Q o. cb AC3  $\Phi$ C LTG PNL OS – cl
- MA73C:F p. cb AC1 RMS PRI  $\Phi$ A – cl
- AC2 RMS B/U  $\Phi$ A – cl
- q. Stow tools
- r. Go to step 16



STOW MPM:

13. To stow MPM using motor 1
- a. Install 22-ga Test Jumper Lead as shown in diagram below
  - b. Move pnl A8L back into posn, reconnect P1,P3,P4
  - c. PORT RMS HTR A – AUTO  
STBD RMS HTR A – AUTO  
EVENT TIMER CNTL – STOP
  - d. Go to step 15
- A8L
- A6U



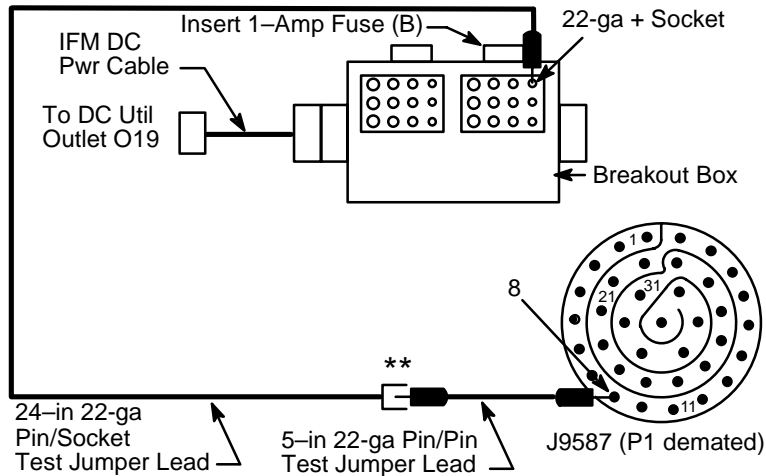
\*\* Tape over connection

jsc48025r1\_208ar1\_r

14. To stow MPM using motor 2
  - a. Install 22-ga Test Jumper Lead as shown in diagram below
  - b. Move pnl A8L back into posn, reconnect P1,P3,P4
  - c. PORT RMS HTR B – AUTO  
STBD RMS HTR B – AUTO  
EVENT TIMER CNTL – STOP

A8L

A6U



\*\* Tape over connection

jsc48025\_208br1\_r

- MA73C:C 15. a. cb MCA PWR AC2 3Φ MID 2 – cl  
:D AC3 3Φ MID 4 – cl

**NOTE**

Expect single motor time (68 sec)

R13L  
O19

- b. PL BAY MECH PWR SYS 1,2 – ON
  - c. DC UTIL PWR MNA – ON  
**SM 94 PDRS CONTROL**
  - d. √RMS STBD, ITEM 2 – (\*)
- If P1 disconnected:
- e. STBD RMS tb not available. Check SPEC 94 for STO/DPLY indications
  - f. Breakout Box:  
PWR B – ON (22 lt ON) (68 sec max)

- A8L g. √STBD RMS tb – STO
- O19 h. Breakout Box: PWR B – OFF
- R13L i. DC UTIL PWR MNA – OFF
- MA73C:C j. PL BAY MECH PWR SYS 1,2 – OFF
- :D k. cb MCA PWR AC2 3Φ MID 2 – op  
AC3 3Φ MID 4 – op
- l. Disconnect Pin/Pin Test Jumper Lead from J9588(J9587), stow in Pin Kit
- m. Disconnect IFM Pwr Cable from utility outlet, stow
- n. Reconnect P2 to J9588 (P1 to J9587)
- A7L o. Install pnl, ensure wire harnesses not crimped (torque mounting bolts 30 in-lb)
- L4:Q p. cb AC3 ΦC LTG PNL OS – cl
- MA73C:F q. cb AC1 RMS PRI ΦA – cl  
cb AC2 RMS B/U ΦA – cl
- r. Stow tools
- 16. RMS TEMP MON
- A8L a. √PORT RMS HTR A,B (two) – AUTO  
√STBD RMS HTR A,B (two) – AUTO
- b. RMS PWR – PRI (MA)  
SM 94 PDRS CONTROL
- CRT c. RMS PORT, ITEM 1 – (\*)
- d. I/O ON – ITEM 5 EXEC (\*)
- A8U e. SAFING – CANCEL (tb-bp)
- √GPC DATA It – off
- PARAM sel – PORT TEMP
- JOINT sel – CRIT TEMP

**RMS: STBD MANIPULATOR RETENTION LATCHES  
(MRL) CONTINGENCY RELEASE/LATCH (3:15 hr)**

OBJECTIVE: Provide alternate method of releasing(latching) MRLs (due to Retention Latch sw failure) by applying 28 VDC Util Pwr to FWD MRL motor 2, MID MRL motor 1, and AFT MRL motor 1

NOTE

Functions lost while IFM in place:  
Port fwd MRL mtr 1, mid MRL mtr 1, and aft MRL mtr 2  
(expect single mtr time to release or latch).  
Pnl A8L edge lighting

LOCATION: Flt Deck; CB behind pnl A8L

TOOLS REQD:

TOOL	Gray Tape Pin Kit Pwr Screwdriver Robbins Wrench Driver Handle 1/4-in to 3/8-in Adapter Torque Wrench 4-in Extension 3/8-in Socket
BOB	IFM Breakout Box
CHCK	DC Pwr Cable

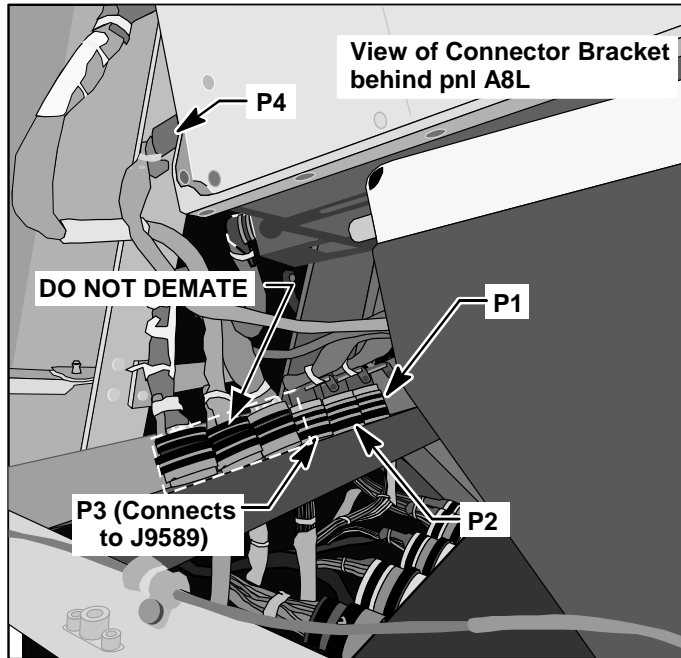
1. Perform ORBIT STATION ACCESS (GENERAL INFORMATION)
2. DC UTIL PWR MNA – OFF
3. √PORT RMS RETEN LAT – OFF  
√STBD RMS RETEN LAT – OFF  
RMS SEL – OFF  
PWR – OFF

CAUTION

STBD HTR pwr must be reapplied within 90 min to prevent OBSS sensor damage

A6U	PORT RMS HTR A,B (two) – OFF STBD RMS HTR A,B (two) – OFF EVENT TIMER MODE – UP CNTL – START
-----	---

- L4:Q  
MA73C:F
4. cb AC3  $\Phi$ C LTG PNL OS – op
  5. cb AC1 RMS PRI  $\Phi$ A – op  
AC2 RMS B/U  $\Phi$ A – op
  6. a. Breakout Box:  
AUX – OFF  
28V/VAR VOLT – 28V  
PWR A,B – OFF  
b. Remove Fuse Cap from side B  
c. Rotate GA SEL B – 22  
d. Install 1-Amp Fuse, replace cap
  7. Remove bolts from pnl A8L (eight bolts, 3/8-in  
Socket)

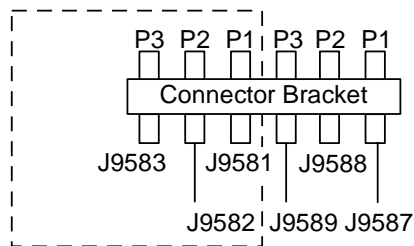


S81-33607

**CAUTION**

28V bus voltage present in some connections. RMS BACKUP pwr will not be available while P2 disconnected. RMS PRIMARY pwr will not be available while P1 disconnected

**NOTE**



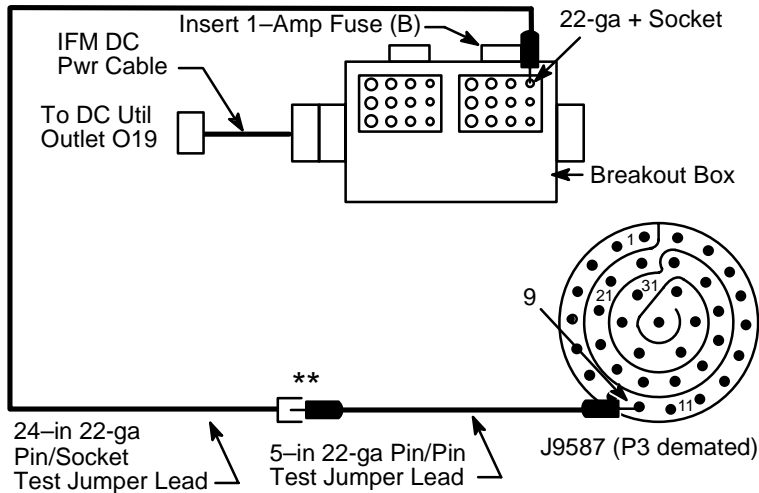
**DO NOT DEMATE**

jsc48025\_209r2\_r.cnv

8. Remove connectors P1,P2,P3,P4 then reposition A8L to access J9589
9. To release MRLs, perform steps 10,11  
To latch MRLs, perform steps 12,13

TO RELEASE MRLs

10. Install 22-ga Test Jumper Lead as shown in diagram below:



\*\* Tape over connection

jsc48025\_210ar1\_r

11. Move pnl A8L back into position and reconnect P1,P2,P4

- |         |                                  |
|---------|----------------------------------|
| A8L     | a. PORT RMS HTR A,B (two) – AUTO |
| MA73C:C | b. √cb MCA PWR AC1 3Φ MID1 – cl  |
| :D      | √AC2 3Φ MID4 – cl                |
|         | √AC1 3Φ MID3 – cl                |

NOTE

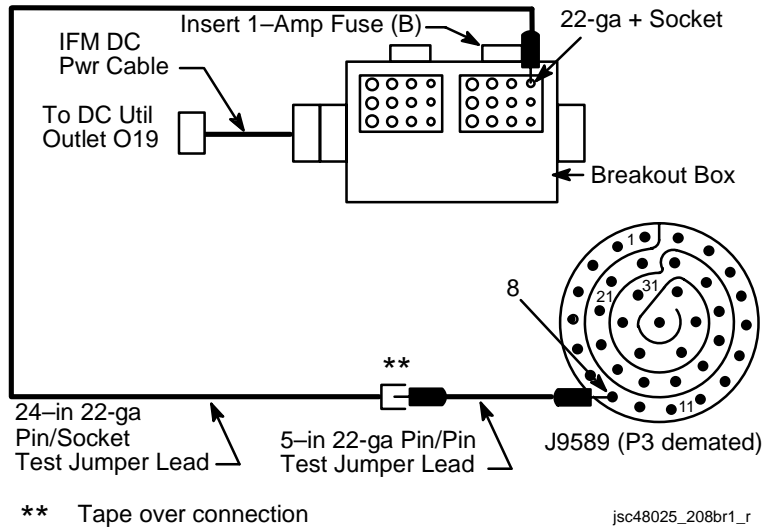
Expect single motor time (18 sec)

- |      |                                    |
|------|------------------------------------|
| R13L | c. DAP: VRCS(FREE)                 |
| O19  | d. PL BAY MECH PWR SYS 1,2 – ON    |
|      | e. DC UTIL PWR MNA – ON            |
|      | f. Breakout Box:                   |
|      | PWR B – ON (22 lt ON) (18 sec max) |

- A8L g. √STBD RMS RETEN LAT tb – REL
- h. Breakout Box:
  - PWR B – OFF
- O19 i. DC UTIL PWR MNA – OFF
- R13L j. PL BAY MECH PWR SYS 1,2 – OFF
- MA73C:C k. cb MCA PWR AC1 3Φ MID1 – op
- :D AC2 3Φ MID4 – op
- AC1 3Φ MID3 – op
- l. Disconnect Pin/Pin Test Jumper Lead from J9589. Reconnect P3. Temp stow Lead and tools (they will be reqd to latch MRLs)
- m. Install pnl, ensure wire harnesses not crimped (torque mounting bolts 30 in-lb)
- L4:Q n. cb AC3 ΦC LTG PNL OS – cl
- MA73C:F o. cb AC1 RMS PRI ΦA – cl
- AC2 RMS B/U ΦA – cl
- p. Stow tools
- q. Go to step 14

TO LATCH MRLs

12. Install 22-ga Test Jumper Lead as shown in diagram below:





13. Move pnl A8L back into position and reconnect P1,P2,P4

- A8L a. PORT RMS HTR A,B (two) – AUTO
- MA73C:C b. √cb MCA PWR AC1 3Φ MID1 – cl
- :D √AC2 3Φ MID4 – cl
- √AC1 3Φ MID3 – cl

NOTE

Expect single motor time (18 sec)

- R13L c. DAP: VRCS(FREE)
- O19 d. PL BAY MECH PWR SYS 1,2 – ON
- e. DC UTIL PWR MNA – ON
- f. Breakout Box:
  - PWR B – ON (22 lt ON) (18 sec max)
- A8L g. √STBD RMS RETEN LAT tb – LAT
- h. Breakout Box:
  - PWR B – OFF
- O19 i. DC UTIL PWR MNA – OFF
- R13L j. PL BAY MECH PWR SYS 1,2 – OFF
- MA73C:C k. cb MCA PWR AC1 3Φ MID 1 – op
- :D cb MCA PWR AC2 3Φ MID 4 – op
- AC1 3Φ MID 3 – op
- A8L l. STBD RMS HTR A,B (two) – AUTO
- A6U EVENT TIMER CNTL – STOP
- m. Disconnect Pin/Pin Test Jumper Lead from J9589, stow in Pin Kit
- n. Disconnect IFM DC Pwr Cable from util outlet, stow
- o. Reconnect P3 to J9589
- p. Install pnl, ensure wire harnesses not crimped (torque mounting bolts 30 in-lb)
- L4:Q q. cb AC3 ΦC LTG PNL OS – cl
- MA73C:F r. cb AC1 RMS PRI ΦA – cl
- AC2 RMS B/U ΦA – cl
- s. Stow tools

14. RMS TEMP MON
- A8L a. √PORT RMS HTR A,B (two) – AUTO  
b. RMS PWR – PRI (MA)  
SM 94 PDRS CONTROL
- CRT c. I/O ON – ITEM 5 EXEC (\*)  
A8U d. SAFING – CANCEL (tb-bp)  
√GPC DATA It – off  
PARAM sel – PORT TEMP  
JOINT sel – CRIT TEMP

IFM PROCEDURES

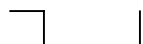
	<u>PAGE</u>
S-BAND DNLK RECOVERY (Solid State MMU) .....	S-1
THC CHANGEOUT .....	T-1
UTIL CABLE/OUTLET PWR CHECK (AC) .....	U-1
UTIL CABLE/OUTLET PWR CHECK (DC) .....	U-3
VTR CHANGEOUT .....	V-1
 WATER PROCEDURES	
GENERAL INFORMATION .....	W-1
EQUIPMENT .....	W-1
LEGEND .....	W-4
SCHEMATICS .....	W-4
CONDENSATE COLLECTION RECONFIGURATION .....	W-8
CONTINGENCY WATER CONTAINER (CWC)	
OPS, WASTE .....	W-10
CONTINGENCY WATER CONTAINER (CWC)	
OPS, SUPPLY .....	W-12
FC H2O pH TEST .....	W-14
FC H2O SPL Y LINE FLUSH .....	W-17
FES SUPPLY, WASTE H2O .....	W-21
FREE FLUID DISPOSAL .....	W-25
GALLEY, FAILED SUPPLY LINE, BYPASS .....	W-28
GALLEY H2O LINE FLUSH .....	W-32
GALLEY PURGE .....	W-38
HUM SEP AIR OUTLET H2O ABSORPTION .....	W-40
SUPPLY H2O SYS BACKUP DUMP – TK A,B .....	W-41
SUPPLY H2O SYS BACKUP DUMP – TK C(D) .....	W-45
SUPPLY(WASTE) H2O PURGE FROM DUMP	
LINE(S) .....	W-51
VACUUM VENT CONTINGENCY OPERATION (CIL) .....	W-53
WASTE H2O SYS BACKUP DUMP .....	W-57
WCS FAILED COMMODOE CNTL VLV .....	W-61
WCS FAN SEP FAILURE (FAILED URINAL) .....	W-65
WCS FAN SEP 1(2) CLEARING .....	W-70

**PROCEDURES  
S THRU Z**



This Page Intentionally Blank

**PROCEDURES  
S THRU Z**



**S-BAND DNLK RECOVERY (Solid State MMU) (2:00 hr)**

OBJECTIVE: Recover real-time dnlk telemetry due to S-Band Transponder failure by bypassing MMU 1(2) using alternate data path from NSP 1(2) to S-Band FM System. This results in loss of SSR function in bypassed MMU

LOCATION: See AV BAY 1, Zone 43G for MMU 1 or AV BAY 2, Zone 57G for MMU 2 (COMPONENT LOCATIONS)

TOOLS REQD:

TOOL Gray Tape  
Pin Kit (for Test Jumper Leads)  
Locker Tool  
Torque Wrench  
Ratchet Wrench  
1/4-in to 3/8-in Adapter

1. Remove lockers, Thermal/Debris Traps to access MMU 1(2)
2. Obtain two 5-in 20-ga pin/pin Test Jumper Leads (from Pin Kit)
3. Perform pwrdn:

C3 S-BD PM CNTL – PNL  
A1L NSP POWER – OFF

For MMU 1:

O15:F √MMU 2 – ON  
O14:F MMU 1 – OFF

For MMU 2:

O15:F √MMU 1 – ON  
MMU 2 – OFF

For MMU 1, disconnect:

4. Cable 81V77W8P511 from J1 on MMU 1  
P513 from J3 on MMU 1

For MMU 2, disconnect:

5. Cable 82V77W9P511 from J1 on MMU 2  
P513 from J3 on MMU 2

For NSP 1 to Dnlk Connection bypassing MMU 1(2):

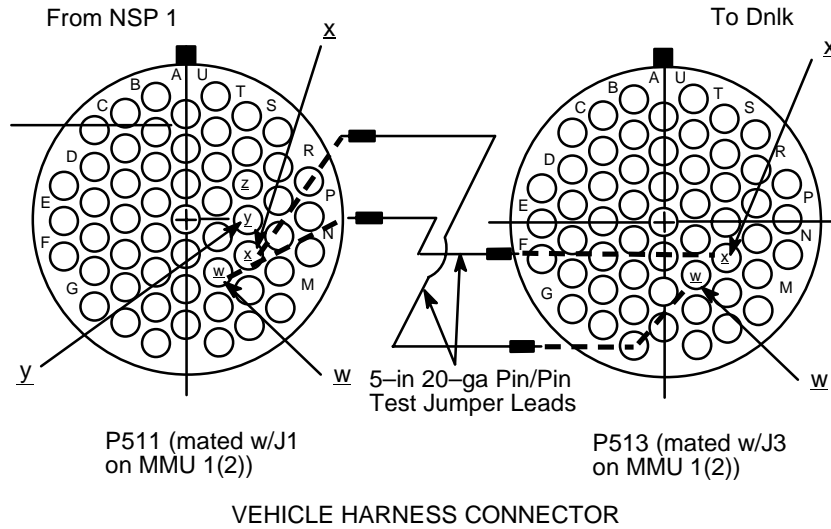
6. Perform step 8

For NSP 2 to Dnlk Connection bypassing MMU 1(2):

7. Perform step 9

For NSP 1 to Dnlk:

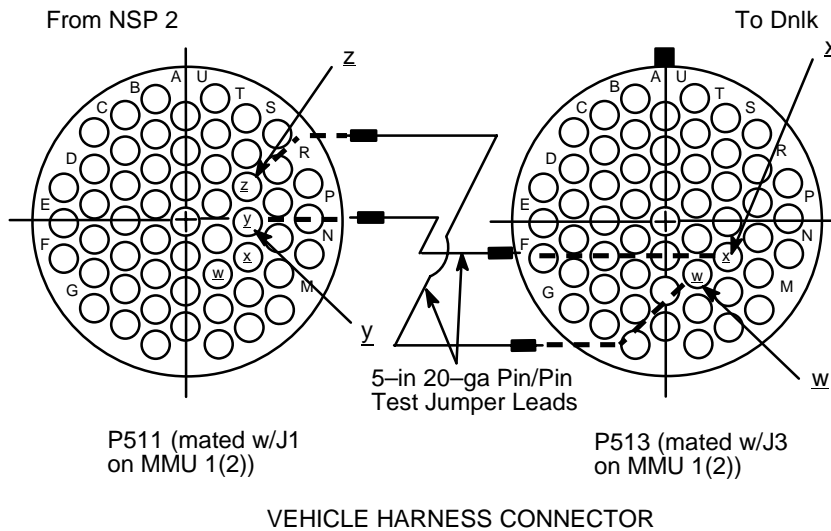
8. Connect Test Jumper Leads as illustrated, then perform steps 10-14



jsc48025\_213a\_s.cnv

For NSP 2 to Dnlk:

9. Connect Test Jumper Leads as illustrated, then perform steps 10-14



jsc48025\_213b\_s.cnv

A1L  
C3

10. Tape/secure jumper cables to connectors and tape connectors to wire trays
11. NSP PWR – 1(2)  
S-BD PM CNTL – CMD
12. Reinstall Thermal/Debris Traps
13. Wait for MCC checkout
14. Reinstall Locker (torque, 30 in-lb)
15. Stow tools



This Page Intentionally Blank





## THC CHANGEOUT

(2:00 hr)

OBJECTIVE: Replace failed fwd THC w/aft THC. THC considered failed when two channels lost

LOCATION: Flt Deck; pnl F5, Aft Station

TOOLS REQD:

TOOL	Gray Tape
	Torque Wrench
	Driver Handle
	Ratchet Wrench
	5/32-in Allen Head Driver
	4-in Extension
MISC	Window Shade (W9)

### TO REMOVE FWD THC

1. Deselect THC contacts:  
**GNC 25 RM ORBIT**  
THC L – ITEMS 1,2,3 EXEC (\*)  
AFT – ITEMS 4,5,6 EXEC (\*)
- 014:E    2. cb MNA DDU L,AFT – op  
015:E        MNB DDU L – op  
016:E        MNC DDU AFT – op
3. Loosen THC mounting fasteners (four, 5/32-in Allen Head Driver)



108-KSC-379C-2283/2

jsc48025\_219\_t.crv



108-KSC-379C-2283/5

jsc48025\_220b\_t.cnv

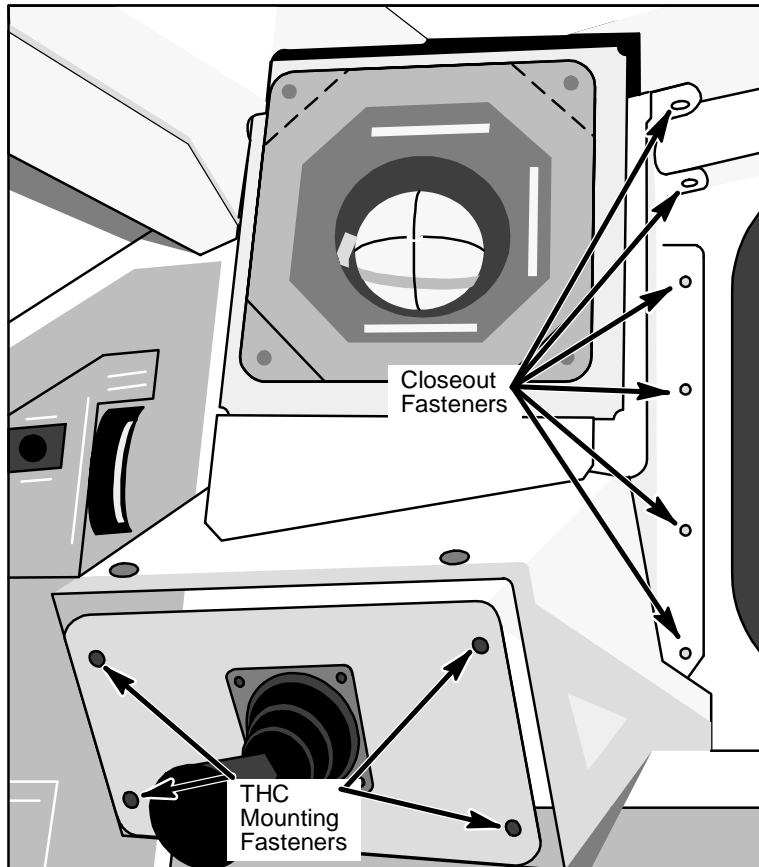
4. Pull unit clear of pnl using care not to stretch/strain cables, note arrow points down
5. Remove connectors from J1,J2,J3 on THC.  
Mark failed unit w/Gray Tape

T-2

IFM/ALL/GEN F

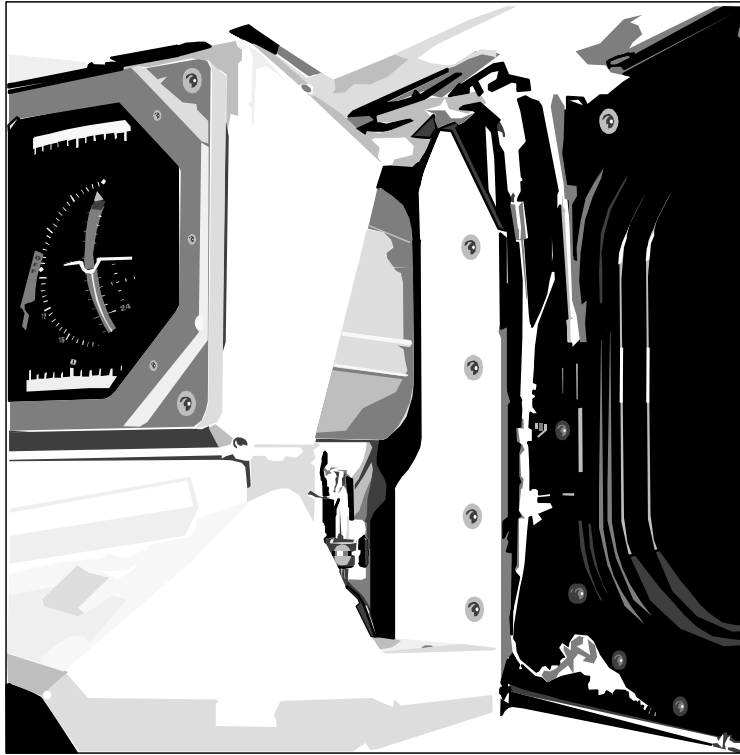
TO REMOVE AFT THC

6. Install Window Shade (W9)
7. Remove closeout inboard of ADI to access connectors when THC partially removed (six fasteners, 5/32-in Allen Head Driver)



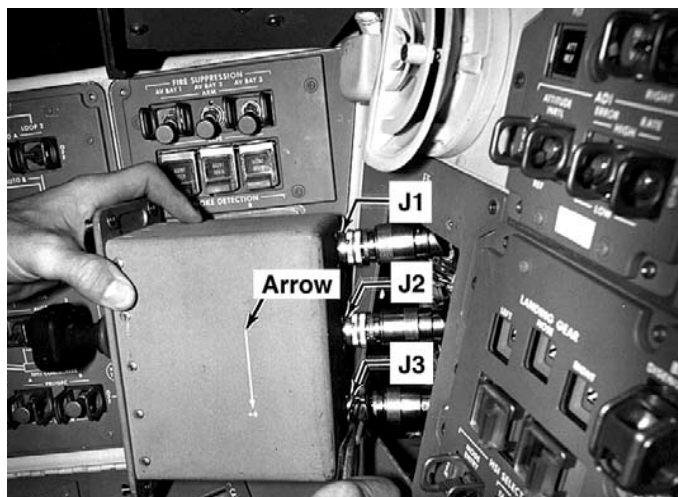
jsc48025\_221\_t.cnv

8. Loosen THC mounting fasteners (four, 5/32-in Allen Head Driver)
9. Remove connectors from J1,J2,J3 on THC
10. Remove THC from pnl



jsc48025\_222\_t.cnv

TO INSTALL AFT THC FWD



108-KSC-379C-2283/5

jsc48025\_220a\_t.cnv

**WARNING**

To assure proper THC response, ARROW on side of THC must point down when installed

11. Install connectors:
  - Cable 30V77W1P219 to J1 on THC
  - P221 to J2 on THC
  - P223 to J3 on THC
12. Install THC into pnl, ARROW down (torque fasteners, 30 in-lb)
13. cb MNA DDU L – cl  
MNB DDU L – cl  
L FLT CNTLR PWR – ON
14. L THC – deflect in each axis  
 $\sqrt{\text{THC}}$  – '+' and '-'  
L FLT CNTLR PWR – OFF
15. Reselect THC contacts:
  - GNC 25 RM ORBIT**
  - THC L – ITEMS 1,2,3 EXEC

O14:E  
O15:E  
F7

TO STOW FWD THC IN AFT LOCATION

16. Tape over connector interfaces and tape harnesses to structure (out of way)
17. Install THC (torque fasteners, 30 in-lb)
18. Install closeout (tighten snug)
19. Stow tools

**UTIL CABLE/OUTLET PWR CHECK (AC)** (30 min)

OBJECTIVE: Determine if loss of pwr is in middeck experiment or in AC UTIL PWR Cable/Outlet

LOCATION: Middeck Lockers and/or Middeck Overhead AC UTIL PWR outlets

TOOLS REQD:

TOOL Pin Kit  
Multimeter

NOTE

Check for recessed pins after connector demate

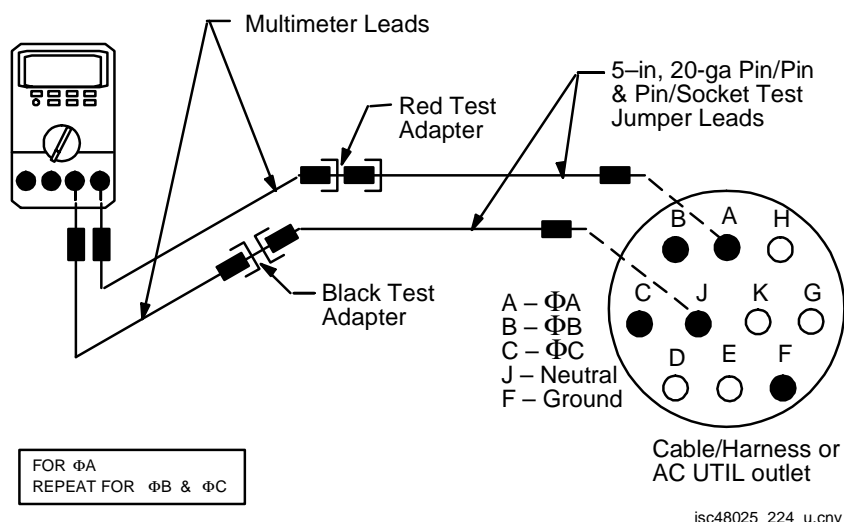
1. AC UTIL PWR – OFF (as reqd)
2. Disconnect AC UTIL PWR Cable at middeck experiment or AC UTIL PWR Outlet (as reqd)
3. Set up Multimeter per instructions on flap for AC V (auto range), except as noted

NOTE

Red & black Multimeter leads have removable test probes installed on one end. Once removed, this end of leads can also be installed into Multimeter so that banana jacks on other end can be used w/Pin Kit accessories

4. Remove test probes from red & black Multimeter leads and insert this end into Multimeter
5. Install, 20-ga, red & black test adapters from Pin Kit (flap 5), onto banana jacks of Multimeter leads
6. Install one 5-in, 20-ga pin/socket test jumper lead from Pin Kit (flap 5), onto red test adapter and one 5-in, 20-ga pin/pin test jumper lead onto black test adapter

7. Install test jumper leads into AC UTIL PWR Cable or Outlet as shown for  $\Phi A$



**NOTE**  
 Normally ~115V

8. AC UTIL PWR – ON (as reqd)(record voltages)
9. AC UTIL PWR – OFF (as reqd)
10. Repeat steps 7,8 for  $\Phi B$ ,  $\Phi C$
11. Contact MCC w/results
12. Repeat steps 7-10 as reqd
13. When complete, stow Pin Kit and Multimeter



**UTIL CABLE/OUTLET PWR CHECK (DC)**

(30 min)

OBJECTIVE: Determine if loss of pwr is in middeck experiment or in DC UTIL PWR Cable/Outlet

LOCATION: Middeck Experiments and/or Middeck Util Pnl (MUP) Overhead DC UTIL, or Payload Distribution Box (PDB) PWR outlets

TOOLS REQD:

TOOL Pin Kit  
Multimeter

NOTE

Check for recessed pins after connector demate

1. DC UTIL PWR – OFF (as reqd):

O19 DC UTIL PWR MNA – OFF  
MO52J – OFF  
F1 MNB – OFF  
MO13Q – OFF  
A11 MNC – OFF  
MO30F – OFF  
A15 – OFF

ML85E If MUP J12(J13,J22,J23)  
DC 10 AMP MNB S2 – OFF (J12)  
S3 – OFF (J13)  
S4 – OFF (J22)  
S5 – OFF (J23)

If MUP J5  
√MCC for appropriate cb  
cb PUMPS CB6 – op  
CB7 – op

If MUP J11  
√MCC before pwrdrn

NOTE

Opening CB95 affects  
MUP J5(J11,J12,J13)

ML86B:E MNB MAR 1 (CB95) – op

If MUP J21  
√MCC before pwrdrn

NOTE

Opening CB96 affects  
MUP J5(J21,J22,J23)

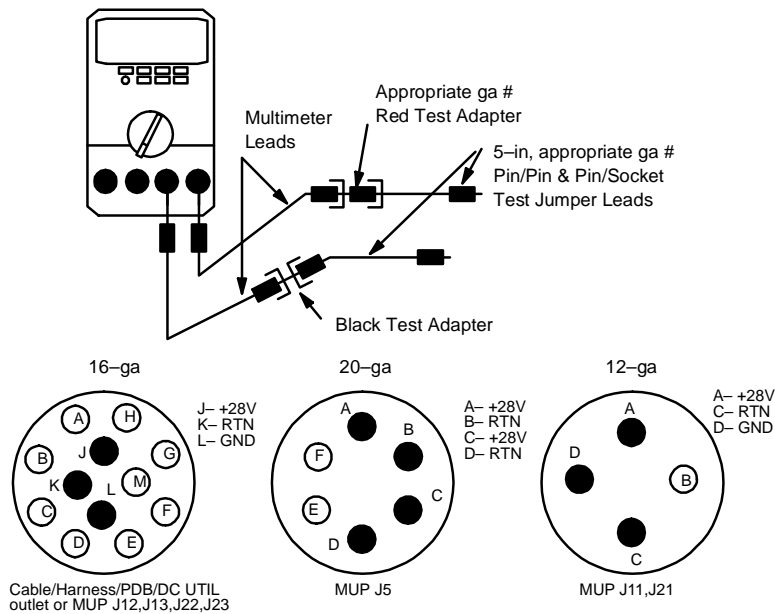
MNB MAR 2 (CB96) – op

2. Disconnect DC UTIL PWR Cable at middeck experiment, MUP, PDB, or DC UTIL PWR Outlet (as reqd)

**NOTE**

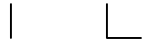
Red & black Multimeter leads have removable test probes installed on one end. Once removed, this end of leads can also be installed into Multimeter so that banana jacks on other end can be used w/Pin Kit accessories

3. Remove test probes from red & black Multimeter leads and insert this end into Multimeter
4. Set up Multimeter per instructions on flap for DC V (auto range), except as noted
5. Install following items; (refer to diagram below for appropriate ga numbers)
  - a. Red & black Test Adapters (Pin Kit, flap 7) onto banana jacks of Multimeter leads
  - b. 5-in pin/socket test jumper lead (Pin Kit, flap 5) onto red test adapter
  - c. 5-in pin/pin test jumper lead (Pin Kit, insert) onto black test adapter
6. Install test jumper leads into DC UTIL PWR Cable, MUP, PDB, or DC UTIL PWR Outlet as shown



jsc48025\_225\_u.cnv





This Page Intentionally Blank



## VTR CHANGEOUT

(45 min)

OBJECTIVE: Swap failed VTR w/spare VTR

LOCATION: Flt Deck L10 pnl

### TOOLS REQD:

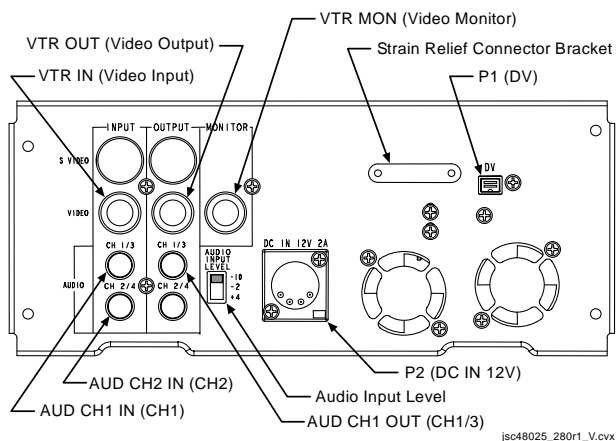
TOOL #1 Phillips Head Screwdriver  
Gray Tape

### TO REMOVE VTR

1. √VTR/CC PWR – OFF (LED off)
2. √MUX/VTR/CC PWR – OFF (LED off)
3. Remove shims from around VTR
4. Pull VTR from container (tight fit)
5. Remove P1 (DV) strain relief connector brkt (two non-captive fasteners, #1 Phillips Head Screwdriver)
6. Disconnect cables from back of VTR
7. Remove unit
8. Mark failed unit w/Gray Tape

### TO INSTALL SPARE VTR

9. Obtain spare VTR
10. Connect cables on back of VTR using diagram below as reference



11. AUDIO INPUT LEVEL – 10 (back of VTR)
12.  $\sqrt{P1}$  (DV) connector sealed properly. Adjust if necessary
13. Carefully slide VTR into place. Make sure cables do not get kinked
14. Re-install shims around VTR
15. Stow failed unit



-----WATER PROCEDURES-----

W-i

IFM/ALL/GEN F,6



-----WATER PROCEDURES-----

This Page Intentionally Blank



## WATER PROCEDURES

### GENERAL INFORMATION

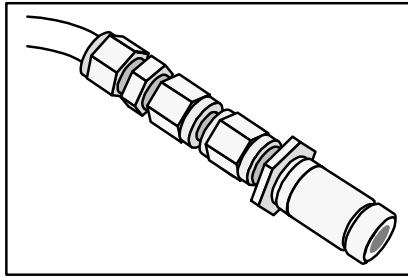
#### EQUIPMENT

Following listing identifies all water equipment carried to support IFM procedures

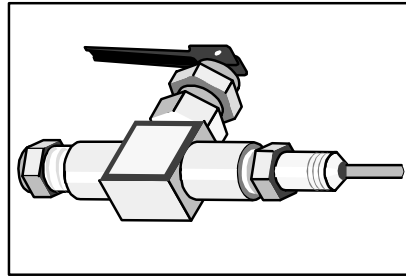
COMPONENT	COLOR BAND	LENGTH	CONNECTOR
B/B Hose	Blue – Blue	10 ft	Male <sup>4,1</sup>
R/R Hose	Red – Red	10 ft	Female <sup>1</sup>
Y/Y Hose	Yellow – Yellow	8 ft	Female <sup>3</sup>
Y/R QD Adapter	Yellow – Red	5 in	Female <sup>4</sup>
Free Fluid Nozzle	None	8 in	Male <sup>8</sup>
Personal Hygiene Hose	None	12 ft	Female <sup>2</sup>
CWC Hose (1)	Yellow – Yellow	20 ft	Female <sup>3</sup>
CWC (2)	None		Male <sup>3,5</sup>
Contingency Water Dispenser	None	6 in	Male <sup>6</sup>
Waste Water Dump Filter	None	8 in	Male, Female <sup>7</sup>

#### NOTES

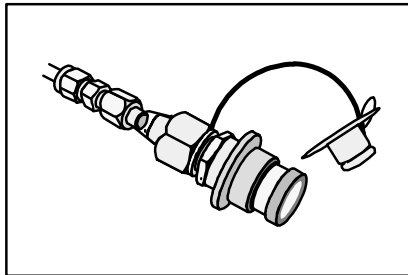
1. Red hose mates to blue hose
2. Personal hygiene hose mates w/auxiliary ports and deck QDs. Connector same size as R/R Hose connectors
3. Yellow hose mates w/potable and waste CONTINGENCY X-TIE QDs in WCS, Free Fluid Nozzle, and CWC and payload QDs
4. Y/R QD Adapter allows blue hose to mate w/potable and waste CONTINGENCY X-TIE QDs in WCS
5. CWC – contingency water container (max allowable capacity 95 lb)
6. Contingency water dispenser attaches to R/R Hose
7. Connects to CONTINGENCY X-TIE QDs in WCS; used for Free Fluid Disposal and CWC dumps
8. Free Fluid Nozzle attaches to Y/Y and CWC hoses



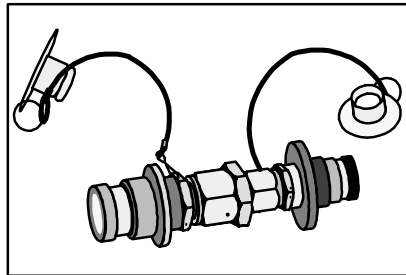
B/B Hose (male QD)



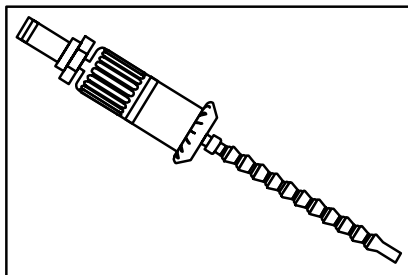
Contingency Water Dispenser (male QD)



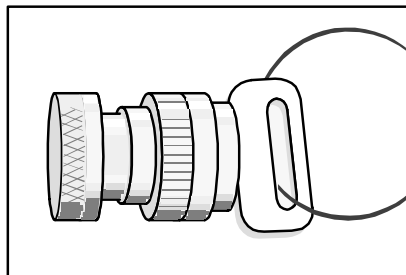
R/R Hose (female QD)



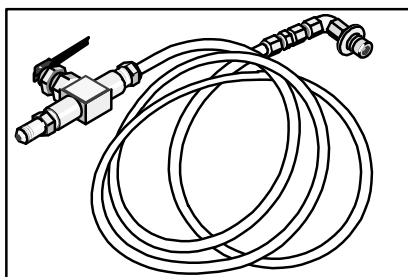
Y/R QD Adapter (female/female QDs)



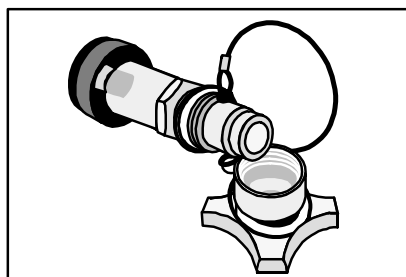
Free Fluid Nozzle (male QD)



5/8-in to 7/8-in Adapter

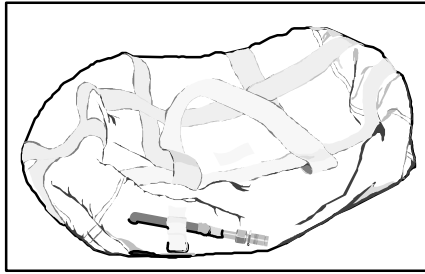


Personal Hygiene Hose (female QD)

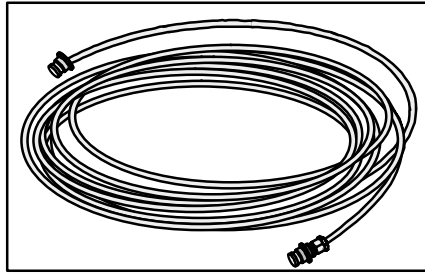


Urine QD Adapter (male QD)

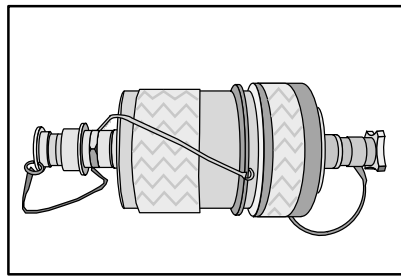
jsc48025\_226\_w.cnv



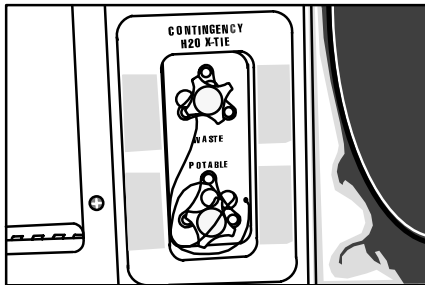
Contingency Water Container (CWC) (male)



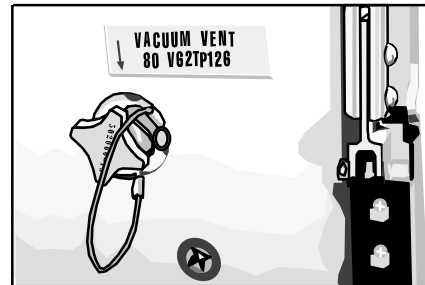
CWC Hose (20 ft)



Waste Water Dump Filter (male, female QDs)



Contingency H2O X-TIE (male QDs)

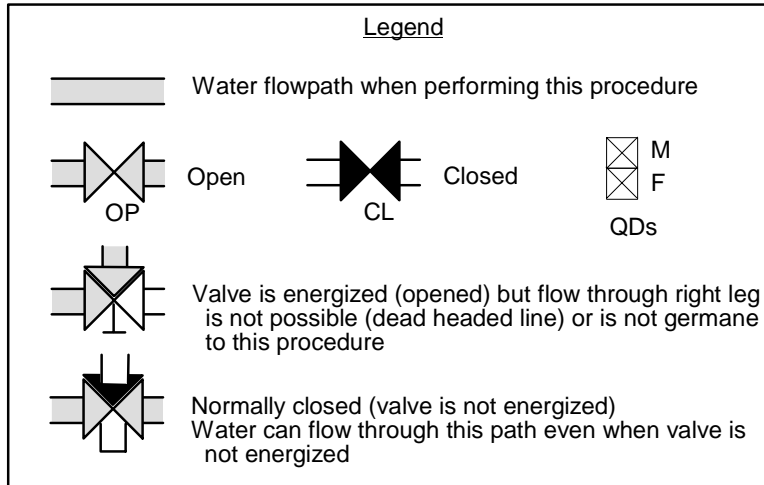


WCS Vacuum Vent (male QDs)

jsc48025\_227\_wr1.cvx

## LEGEND

Following legend may be used in conjunction with schematics/drawings provided as part of individual water procedures



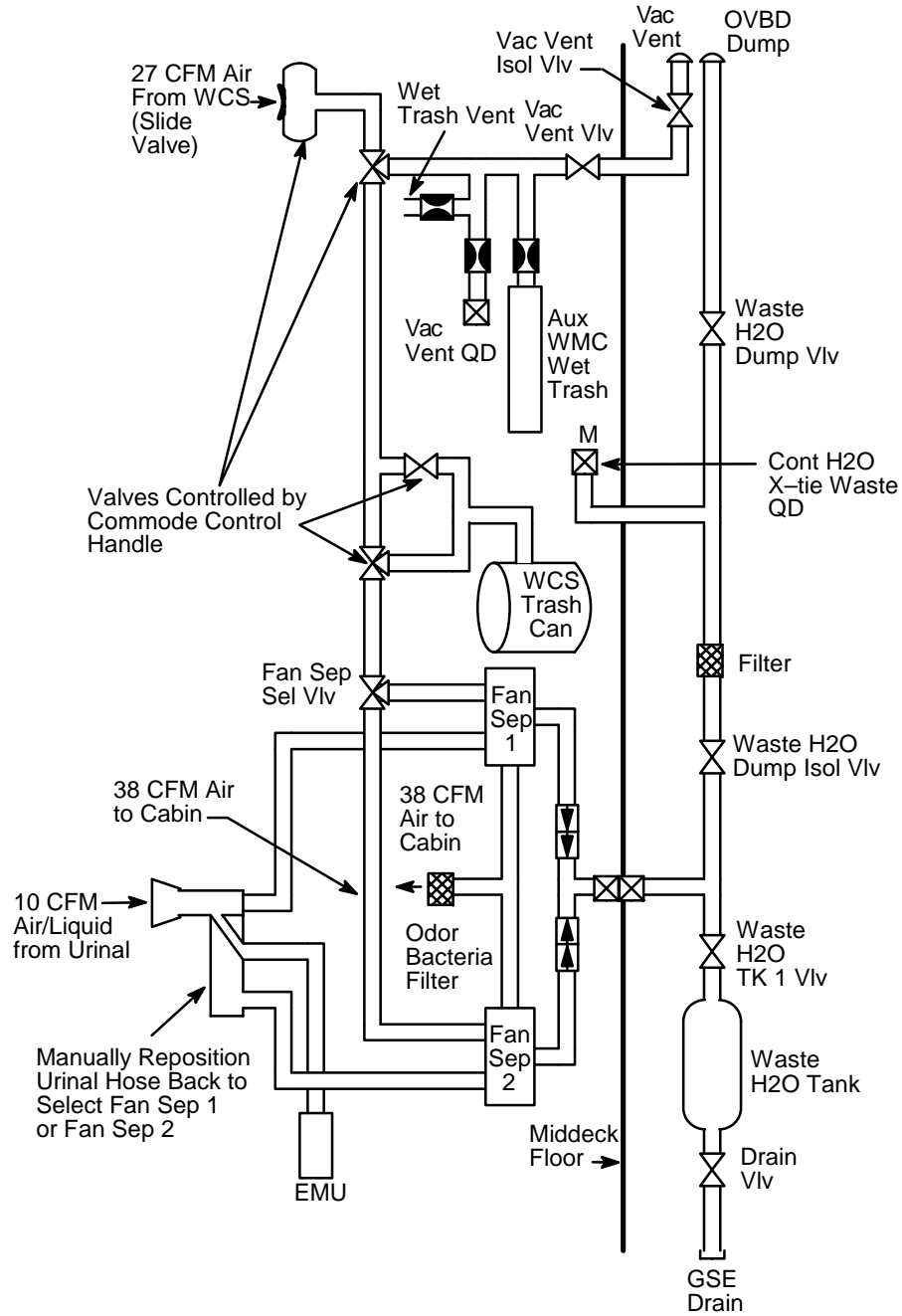
jsc48025\_228\_w.cnv

## SCHEMATICS

Following schematics cover galley, supply, and waste water systems. Middeck floor reference line shown to distinguish between water lines in cabin and water lines in lower equipment bay



# WASTE WATER SYSTEM (WWS)

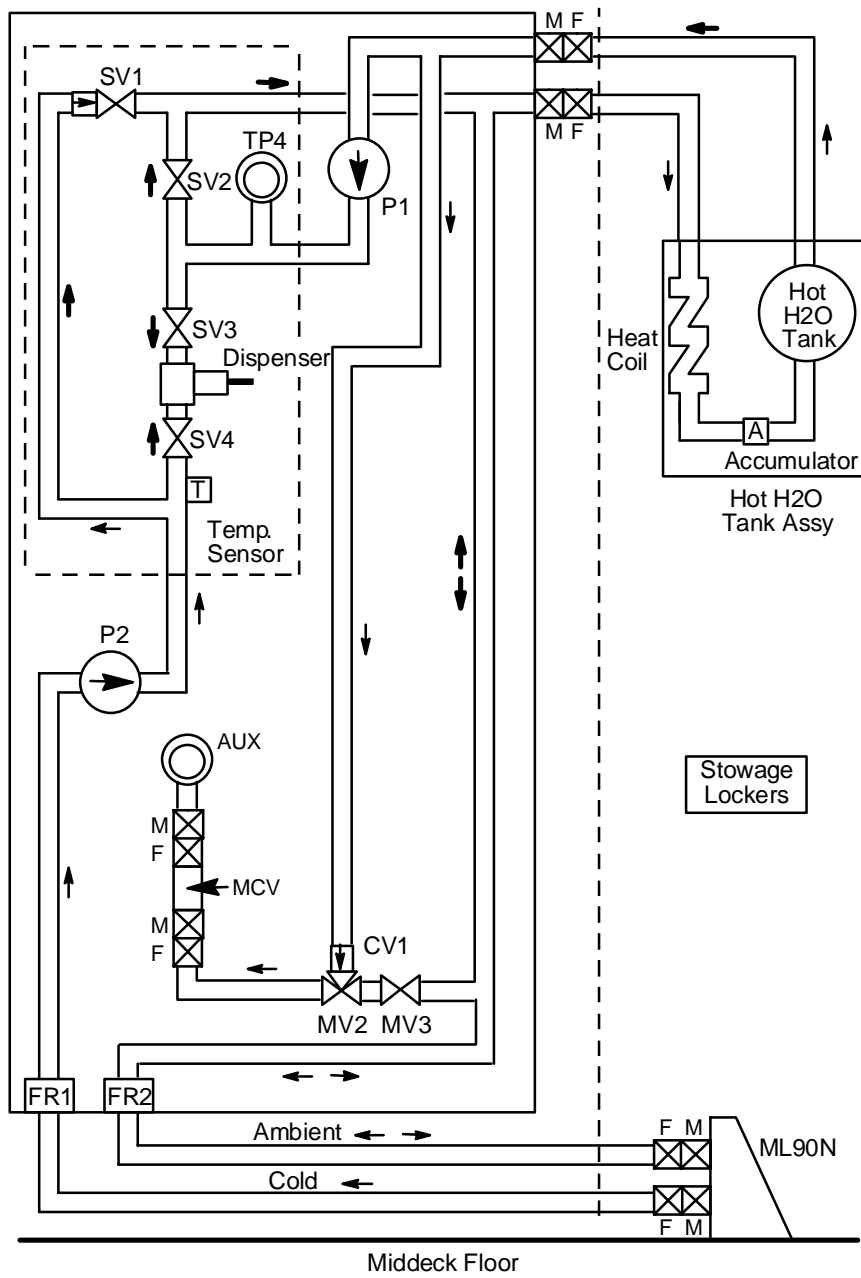


jsc48025\_230\_w.cvx

W-6

IFM/ALL/GEN F

# GALLEY WATER SYSTEM (GWS)



jsc48025\_231\_w.cvx

W-7

IFM/ALL/GEN F

**CONDENSATE COLLECTION  
RECONFIGURATION**

(1:00 hr)

OBJECTIVE: This procedure reconfigures condensate collection plumbing to use Hum Sep A

LOCATION: See LOWER EQUIPMENT BAY (COMPONENT LOCATIONS), Humidity Separator

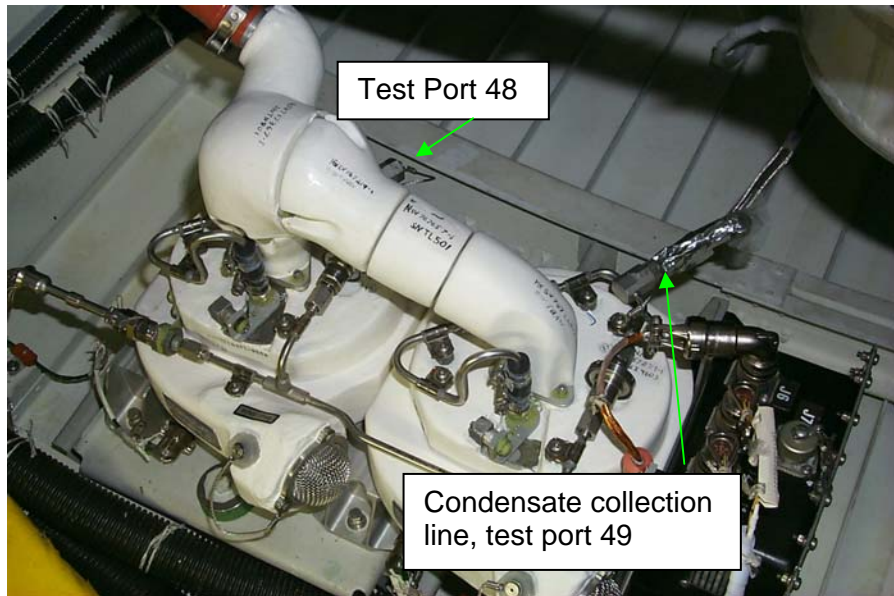
TOOLS REQD:

TOOL	9/16-in Combination Wrench
	10-in Adjustable Wrench
MISC	Pin Kit (Splice Crimp Tool)
	Flashlight
	Towels

TO ACCESS HUMIDITY SEPARATORS

- |    |  |
|----|--|
| L1 | <ol style="list-style-type: none"><li>1. See GENERIC STOWAGE LOCKER/VOLUME REMOVAL (<u>GENERAL INFORMATION</u>). LiOH STOWAGE VOLUME REMOVAL (MD52M)</li><li>2. HUM SEP A,B – OFF</li><li>3. Cut safety tether (Splice Crimp Tool) and remove Cap from test port 48 of Hum Sep A (9/16-in Combination Wrench and 10-in Adjustable Wrench)</li><li>4. Cut safety tether and remove condensate collection line from test port 49 of Hum Sep B</li><li>5. Install condensate collection line onto test port 48 of Hum Sep A</li><li>6. Install Cap onto test port 49 of Hum Sep B</li></ol> |
|----|--|





- L1
  - 7. Clean any leaked water w/towels
  - 8. HUM SEP A – ON
- ML31C
  - If Shuttle Condensate Collection CWC installed:
    - 9. WASTE H2O TK1 DRAIN VLV – CL (tb–CL)
    - 10. Reinstall LiOH Volume. Stow tools

**CONTINGENCY WATER CONTAINER  
(CWC) OPS, WASTE**

(1:00 hr Setup)

OBJECTIVE: CWC used to store waste water in event waste tank full and cannot be dumped

NOTE

Requires Ops 2 config and two crewmembers

LOCATION: CONT H2O X-TIE WASTE QD located on outboard WCS wall, inside WCS compartment

TOOLS REQD:

TOOL Gray Tape  
CHCK CWC Contingency Hose  
MISC Contingency Water Container (CWC) in Vol G (MD80R)

1. To access Vol G (MD80R), see VOL G ACCESS (GENERAL INFORMATION)
2. Remove contents of Vol H (MD23R) or Vol G (MD80R) and stow as directed by MCC

NOTE

LiOH Vol (MO52M) may be used on RCRS-configured flts

3. Pack soft material (clothing or towels) in bottom of Vol H (MD23R) or Vol G (MD80R)
4. Verify no trapped gas in CWC  
If gas present:
  5. Connect Hose to CWC QD and WCS Vacuum Vent QD; vent CWC
  6. Disconnect hose from vacuum vent  
If no gas present:
  7. Connect Hose to CWC
8. Install CWC in Vol H (MD23R) or Vol G (MD80R)
9. WASTE H2O DUMP ISOL VLV – CL (tb-CL)  
√TK1 VLV – OP (tb-OP)
10. Connect CWC Contingency Hose to CONT H2O X-TIE WASTE QD  
Secure CWC Contingency Hose w/Gray Tape

ML31C

WCS

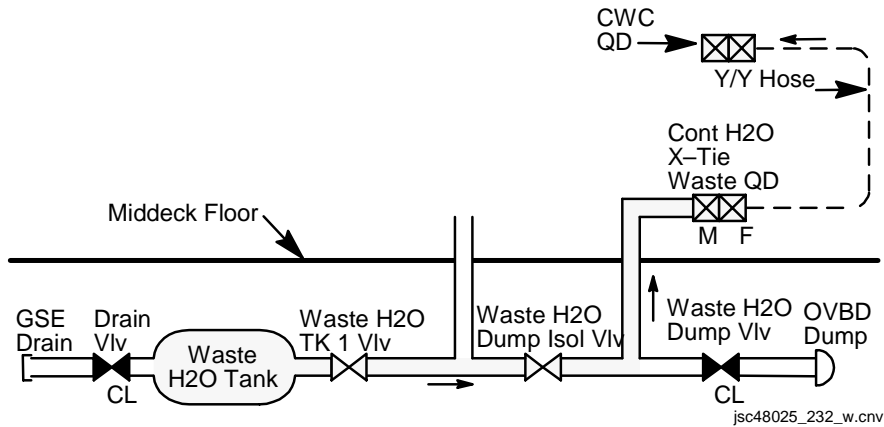
NOTE

MCC will TMBU limits if desired

- 11. Log present Waste H2O TK qty \_\_\_\_\_%
- 12. Subtract 56% (95 Lbm) -56 %
- 13. FDA limit for Waste TK to CWC transfer \_\_\_\_\_%
- 14. SM 60 TABLE MAINT

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
WASTE H2O QTY 1	0620540	5	-

- ML31C 15. WASTE H2O DUMP ISOL VLV – OP (tb-OP)
- 16. Monitor CWC fill rate continuously
- CRT 17. When 'S66 H2O' for Waste TK qty, continue
- ML31C 18. WASTE H2O DUMP ISOL VLV – CL (tb-CL)
- WCS 19. Disconnect CWC Contingency Hose from CONT H2O X-TIE WASTE QD
- 20. Disconnect CWC Contingency Hose from CWC
- 21. Cover CWC w/towels(clothing) and close Vol H (MD23R) or Vol G (MD80R)
- 22. Stow tools
- ML31C 23. WASTE H2O DUMP ISOL VLV – OP (tb-OP)



**CONTINGENCY WATER CONTAINER  
(CWC) OPS, SUPPLY**

(1:00 hr Setup)

OBJECTIVE: Create ullage for supply water system if water cannot be dumped due to payload constraints or system failure. Procedure dumps water from TKB. Reconfig may be reqd if dump reqd from other supply water tanks

NOTE

Requires Ops 2 config and two crewmembers

LOCATION: CONT H2O X-TIE POT QD located on outboard WCS wall, inside WCS compartment

TOOLS REQD:

TOOL	Gray Tape
	Locker Tool
	3/8-in Driver Handle
CHCK	CWC Contingency Hose
MISC	Contingency Water Container (CWC) in Vol G (MD80R)

1. To access Vol G (MD80R), see VOL G ACCESS (GENERAL INFORMATION)
2. Remove contents of Vol H (MD23R) or Vol G (MD80R) and temp stow as directed by MCC

NOTE

LiOH Vol (MO52M) may be used on RCRS-config flts

3. Pack soft material (clothing or towels) in bottom of Vol H (MD23R) or Vol G (MD80R)
4.  No trapped gas in CWC  
If gas present:
  5. Connect Hose to CWC QD and WCS Vacuum Vent QD; vent CWC
  6. Disconnect hose from vacuum vent  
If no gas present:
  7. Connect Hose to CWC
8. Install CWC in Vol H (MD23R) or Vol G (MD80R)
9. SPLY H2O DUMP ISOL VLV – CL (tb-CL)  
 TKB OUTLET – OP (tb-OP)

R11L

- |      |   |
|------|---|
| WCS  | 10. Connect CWC Contingency Hose to CONT H2O X-TIE POT QD<br>Secure CWC Contingency Hose w/Gray Tape  |
|      | 11. Log present Supply H2O TKB qty _____%   |
|      | 12. Subtract 56% (95 Lbm) <u>-56%</u>   |
|      | 13. FDA limit for Supply TKB to CWC transfer _____%   |
|      | <u>SM 60 TABLE MAINT</u>  |
|      | 14. ITEM 1 + <u>0 6 2 0 4 2 0</u> EXEC<br>ITEM 2 + TKB limit from above EXEC  |
| R11L | 15. SPLY H2O DUMP ISOL VLV – OP (tb-OP)   |
|      | 16. Monitor CWC fill rate continuously  |
| CRT  | 17. When 'S66 H2O' for Supply TK qty, continue  |
| R11L | 18. SPLY H2O DUMP ISOL VLV – CL (tb-CL)   |
|      | 19. Verify total qty dumped from TKB = 56% (95 Lbm)  <br>If total dump < 56%:<br>20. SPLY H2O DUMP ISOL VLV – OP (tb-OP)<br>When total dump = 56%:<br>21. SPLY H2O DUMP ISOL VLV – CL (tb-CL) |
| WCS  | 22. Disconnect CWC Contingency Hose from CONT H2O X-TIE POT QD  |
|      | 23. Disconnect CWC Contingency Hose from CWC QD   |
|      | 24. Cover CWC w/towels(clothing) and close Vol H (MD23R) or Vol G (MD80R)   |
|      | 25. Stow tools  |
| R11L | 26. SPLY H2O DUMP ISOL VLV – OP (tb-OP)   |

NOTE

MCC will TMBU lower limits  
post procedure as reqd

## FC H2O pH TEST

(20 min)

OBJECTIVE: Test Fuel Cell water to confirm pH indication.

Accomplished by flowing Fuel Cell water into urinal and checking pH concentration using pH Strips (high pH caused by high KOH concentration in water)

LOCATION: WCS,ML90N below Galley

TOOLS REQD:

TOOL	Pin Kit
	Gray Tape
	9/16-in & 11/16-in Combination Wrenches
CHCK	R/R Hose
MISC	Wet Washes (WCS)
	Spare (Clean) Urinal Funnel
	Goggles & Gloves (CCK)
	pH Strips (CCK)

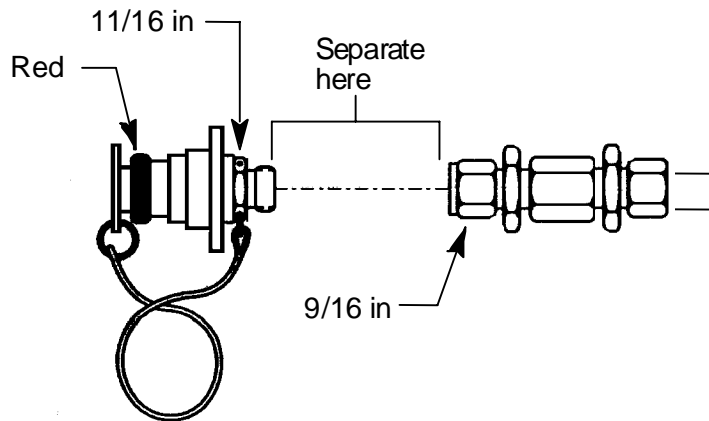
### NOTE

For detailed schematic, see SUPPLY WATER SYSTEM (SWS), W-5

### CAUTION

KOH caustic. Avoid contact w/skin and eyes

CCK	1. Don Goggles & Gloves
R11L	2. √SPLY H2O TKA INLET – CL (tb-CL) GALLEY SPLY VLV – OP (tb-OP)
GALLEY	3. Disconnect ambient and chilled line QDs from ML90N, below Galley
	4. Remove QD from one end of R/R hose (9/16-in & 11/16-in Combination Wrenches)



jsc48025\_233\_w.cnv

WCS

5. ✓FAN SEP same as HOSE BLOCK

✓MODE – AUTO

✓CRADLE – AUTO

Unstow hose and install spare urinal funnel

6. Tape free end of R/R hose into urinal funnel; allow for adequate airflow

NOTE

Ensure adequate airflow before connecting R/R hose to ML90N QDs

7. ✓Airflow

✓WCS ON Lt – ON

NOTE

Using 22-ga Insulation Tubing from Pin Kit (flap 7), a sample drop of water should be taken as soon as it begins flowing into WCS

8. Connect R/R hose to ML90N ambient QD below Galley

9. Immediately obtain drop of water from urinal to blot pH Strip
  - If pH > 9:
    10. Disconnect R/R hose from ambient QD
    11. Return to MAL, EPS, 7.3a [2] >>
  - If pH < 9:
    12. Flow water into urinal for 10 min. (This ensures fuel cell water to ambient QD)
    13. After 10 min, check pH of water flowing into urinal
  - If pH still > 9:
    14. Disconnect R/R hose from ambient QD
    15. Return to MAL, EPS, 7.3a [2] >>
  - If pH still < 9:
    16. Disconnect R/R hose from ML90N and remove remaining QD from end of R/R Hose (9/16-in & 11/16-in Combination Wrenches) to evacuate residual water
17. Reconnect Galley ambient line to its ML90N QD

NOTE

FAN SEP will run for ~30 sec  
after hose stowage

18. Stow hose in cradle
  - √WCS ON Lt – OFF
19. Reattach QDs removed in steps 4,16
20. Stow equipment
21. Return to MAL, EPS, 7.3a [2]



## FC H2O SPLY LINE FLUSH

(45 min)

**OBJECTIVE:** Purge Fuel Cell water lines of high pH water.

Accomplished by dumping Fuel Cell water into urinal (high pH caused by high KOH concentration in water)

**LOCATION:** WCS,ML90N below Galley

**TOOLS REQD:**

TOOL	Pin Kit
	Gray Tape
	9/16-in & 11/16-in Combination Wrenches
CHCK	R/R Hose
MISC	Spare (Clean) Urinal Funnel
	Goggles & Gloves (CCK)
	pH Strips (CCK)
	Wet Washes (WCS)

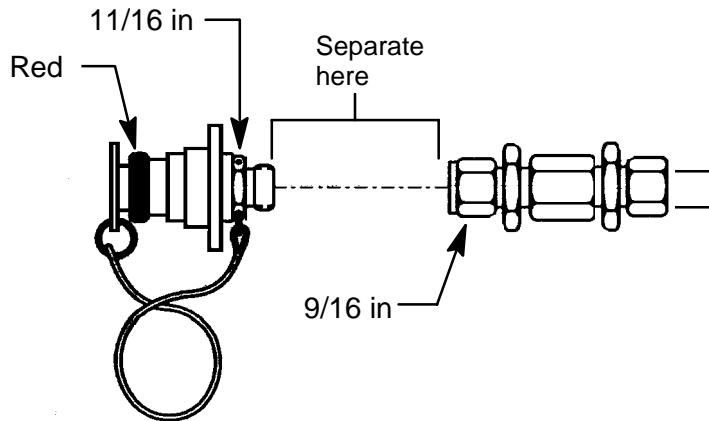
**NOTE**

For detailed schematic, see SUPPLY WATER SYSTEM (SWS), W-5

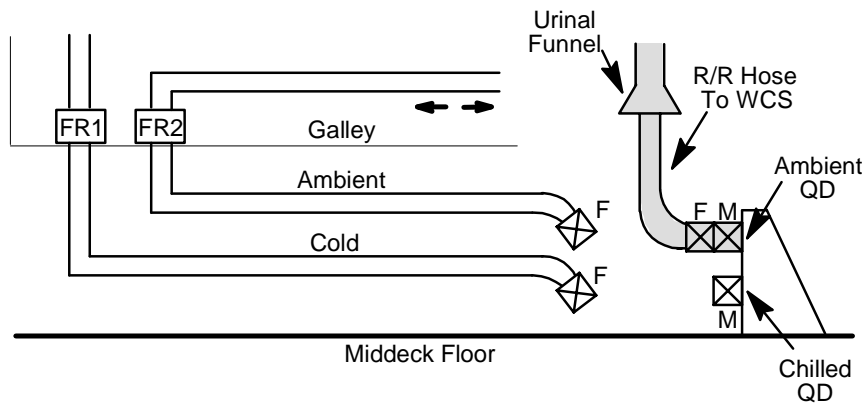
**CAUTION**

KOH caustic. Avoid contact w/skin and eyes

- |        |   |
|--------|---|
|        | 1. If FC H2O pH TEST already performed, go to step 9                            |
| CCK    | 2. Don Goggles & Gloves   |
| R11L   | 3. √SPLY H2O TKA INLET – CL (tb-CL)<br>√GALLEY SPLY VLV – OP (tb-OP)            |
| GALLEY | 4. Disconnect ambient and chilled line QDs from ML90N, below Galley             |
|        | 5. Remove QD from one end of R/R hose (9/16-in & 11/16-in Combination Wrenches) |



jsc48025\_233\_w.cnv



jsc48025\_234\_w.cnv

WCS

6. ✓FAN SEP same as HOSE BLOCK

✓MODE – AUTO

✓CRADLE – AUTO

Unstow hose and install spare urinal funnel

7. Tape free end of R/R hose into urinal funnel; allow for adequate airflow

NOTE

Ensure adequate airflow before connecting R/R hose to ML90N QDs

8. ✓Airflow

✓WCS ON Lt – ON

NOTE

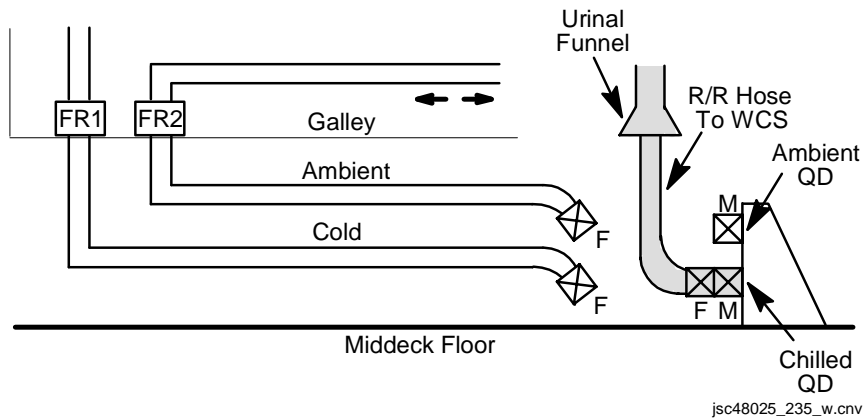
Using 22-ga Insulation Tubing from Pin Kit (flap 7), a sample drop of water should be taken as soon as it begins flowing into WCS. If pH > 9, this procedure will be followed by galley line flush (see step 23)

- R11L
9. Connect R/R hose to ML90N ambient QD below Galley. Immediately obtain drop of water from urinal to blot pH Strip
  10. Flow water into urinal for 10 min. (This clears high pH from Fuel Cell to ambient QD)
  11. Check pH of water flowing into urinal. If pH > 9, continue to flow water until pH < 9
  12. SPLY H2O TKA INLET – OP (tb-OP)
  13. After 10 min, check pH of H2O TKA water flowing into urinal  
If pH > 9, SPLY H2O TKA unusable (contaminated)
    14. SPLY H2O TKA INLET – CL (tb-CL)
    15. Continue to flow water until pH < 9If pH < 9, SPLY H2O TKA usable (not contaminated):
  16. Disconnect R/R hose from ML90N and remove remaining QD from end of R/R Hose (9/16-in & 11/16-in Combination Wrenches) to evacuate residual water before performing next step

NOTE

Using 22-ga Insulation Tubing from Pin Kit (flap 7), a sample drop of water should be taken as soon as it begins flowing into WCS. If pH > 9, this procedure must be followed by galley line flush (see step 23)

17. Reattach QD removed in step 16 and connect R/R hose to ML90N chilled QD below Galley. Immediately obtain drop of water from urinal to blot pH Strip



18. Flow water into urinal for 10 min. (This clears high pH from Fuel Cell to chilled QD)
19. Check pH of water flowing into urinal. If pH > 9, continue to flow water until pH < 9
20. Disconnect R/R hose from ML90N and remove remaining QD from end of R/R Hose (9/16-in & 11/16-in Combination Wrenches) to evacuate residual water
21. Reconnect ambient and chilled lines to their respective QDs (chilled line is insulated line)

NOTE

FAN SEP will run for ~30 sec  
after hose stowage

22. Stow hose in cradle  
√WCS ON Lt – OFF
- If pH in steps 9,13 or step 9 in FC H<sub>2</sub>O pH TEST > 9, as water started to flow:
23. Go to GALLEY H<sub>2</sub>O LINE FLUSH, W-30
- If galley line flush not reqd:
24. Remove R/R from urinal and clean w/wet wash
  25. Reattach QDs removed in steps 5,20
  26. Stow equipment

## FES SUPPLY, WASTE H2O

(15 min)

**OBJECTIVE:** Supply Flash Evaporator System (FES)  
w/supplemental waste water by interconnecting Supply and  
Waste Water Systems

**LOCATION:** CONT H2O X-TIE POT and WASTE QDs are on  
outboard WCS wall

**TOOLS REQD:**

CHCK Y/Y Hose

**NOTE**

WCS should not be used for urine collection  
until after step 10(16) completed

- R11L 1. √SPLY H2O DUMP ISOL VLV – CL (tb-CL)  
√VLV – CL (tb-CL)  
√TKA OUTLET – CL (tb-CL)  
√XOVR VLV – OP (tb-OP)  
√TKB OUTLET – CL (tb-CL)
- ML31C 2. √WASTE H2O DUMP ISOL VLV – CL (tb-CL)  
√VLV – CL (tb-bp)  
√TK1 VLV – OP (tb-OP)

3. **SM 60 TABLE MAINT**

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
WASTE H2O QTY 1	0620540	5	99

**SM 66 ENVIRONMENT**

- WCS 4. Connect one end of Y/Y Hose to CONT H2O  
X-TIE POT QD and other end to CONT H2O  
X-TIE WASTE QD
- R11L 5. SPLY H2O DUMP ISOL VLV – OP (tb-OP)
- ML31C 6. WASTE H2O DUMP ISOL VLV – OP (tb-OP)

\* If FES shuts down, cycle affected FES \*  
\* controller OFF, then ON (pnl L1) \*

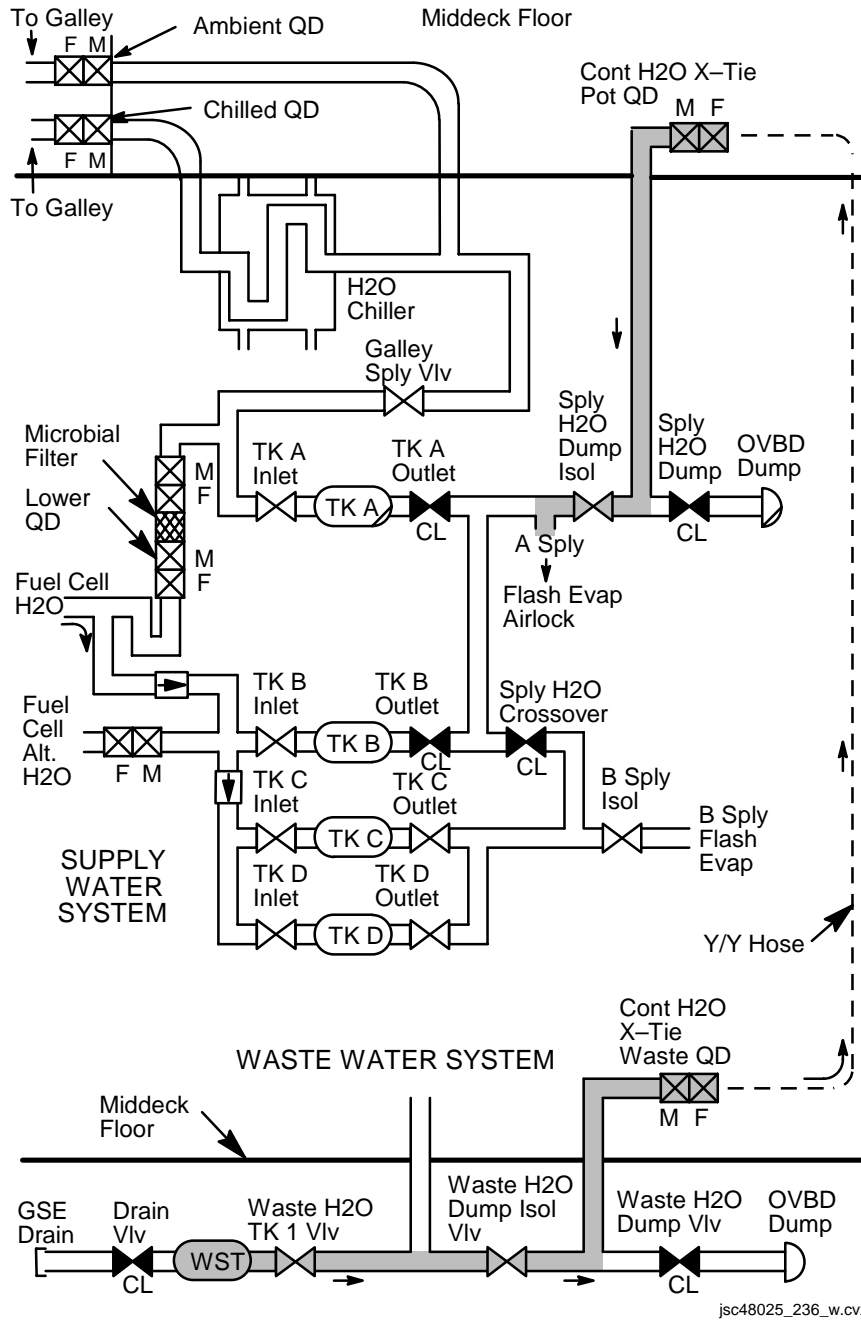
For FES A SPLY (schematic, W-21)

- R11L 7. SPLY H2O XOVR VLV – CL (tb-CL)
- CRT 8. When WASTE H2O QTY 1 = 5%,
- R11L 9. SPLY H2O XOVR VLV – OP (tb-OP)
- ML31C 10. WASTE H2O DUMP ISOL VLV – CL  
(tb-CL)
- R11L 11. SPLY H2O TKB OUTLET – OP (tb-OP)

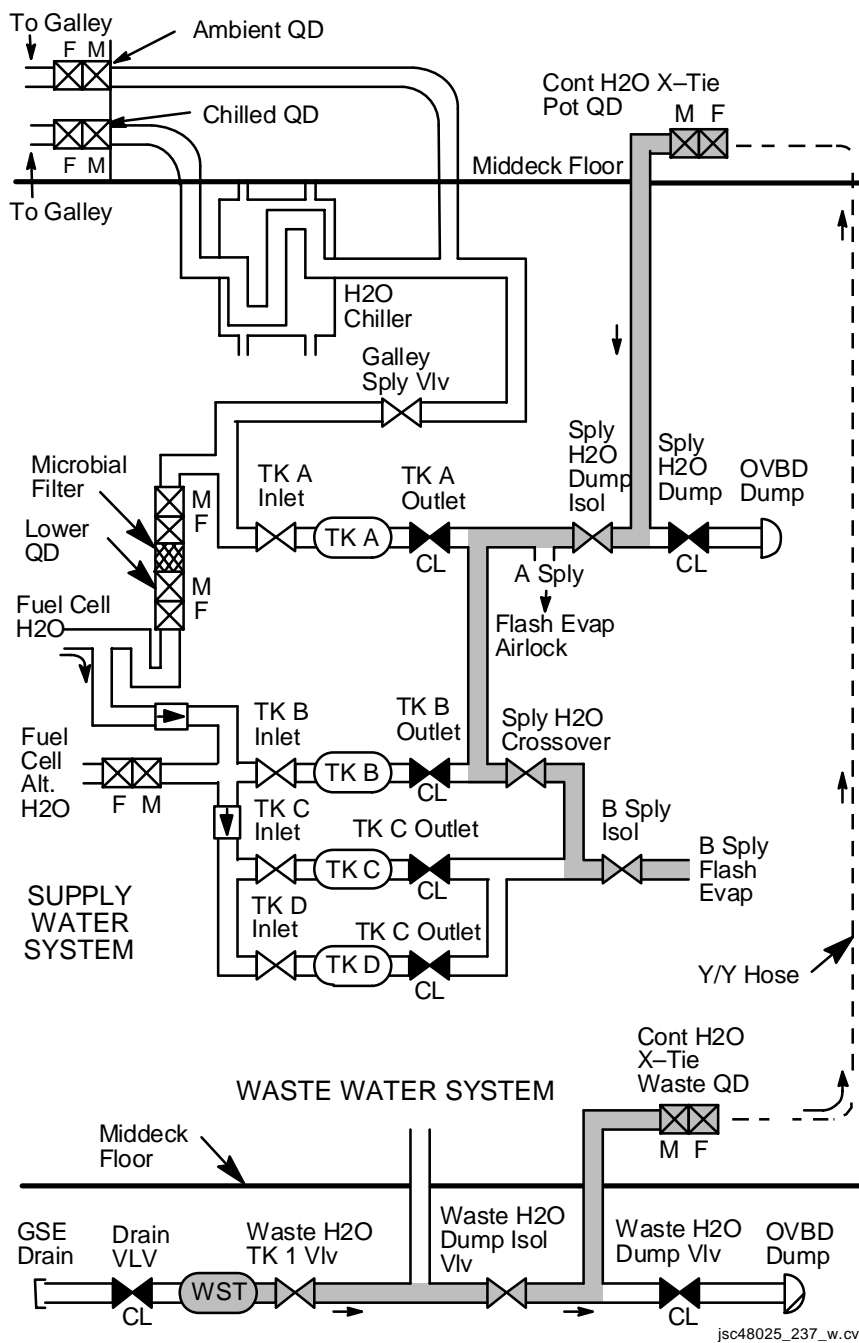
For FES B SPLY (schematic, W-22)

- ML31C 12. SPLY H2O TKD OUTLET – CL (tb-CL)
- R11L 13. SPLY H2O TKC OUTLET – CL (tb-CL)
- CRT 14. When WASTE H2O QTY 1 = 5%,
- ML31C 15. SPLY H2O TKD OUTLET – OP (tb-OP)
- 16. WASTE H2O DUMP ISOL VLV – CL  
(tb-CL)
- R11L 17. SPLY H2O TKB,TKC OUTLET (two) – OP  
(tb-OP)

# FES A SUPPLY



# FES B SUPPLY



jsc48025\_237\_w.cvx



# FREE FLUID DISPOSAL

(30 min)

**OBJECTIVE:** Remove free fluid from cabin by dumping overboard via Waste Water Dump Line

**LOCATION:** CONT H2O X-TIE WASTE QD located on WCS compartment outboard wall

**TOOLS REQD:**

- BOB Waste Water Dump Filter
- CHCK Free Fluid Nozzle  
Y/Y Hose
- MISC 12x12 Ziplock Bag

1. **SM 60 TABLE MAINT**

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
WASTE H2O NOZ A B	0620520	60	250
	0620519	60	250

**CAUTION**  
WASTE H2O NOZ T should not exceed 350

**SM 66 ENVIRONMENT**

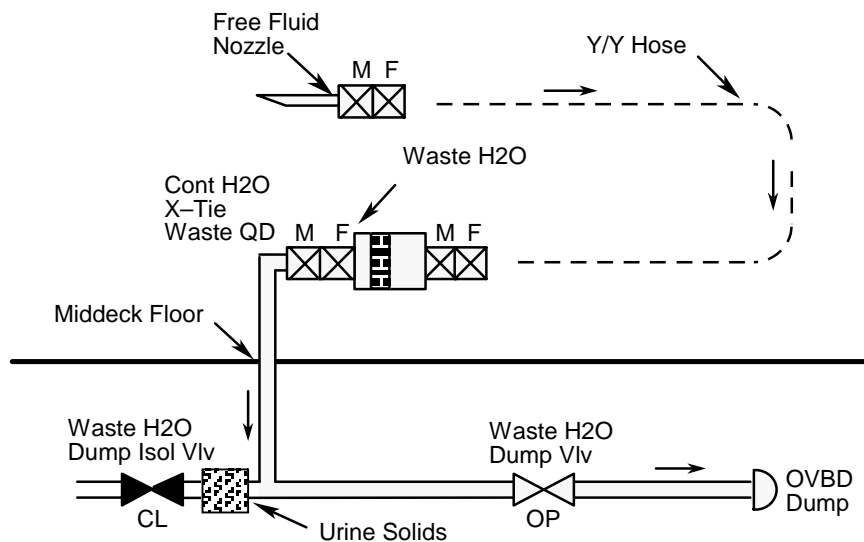
2.  $\sqrt{\text{WASTE DMP LN T}} > 50$

- \* If  $T \leq 50$ , enable 2nd heater: \*
- \* ML86B:A \*
- \* cb MNA(MNB) H2O LINE HTR \*
- \* A(B) – cl \*

ML31C 3. WASTE H2O DUMP ISOL VLV – CL (tb-CL)

**NOTE**

Schematic shows water flowpath for this procedure when system properly configured. See WASTE WATER SYSTEM (WWS), W-6 for complete schematic



jsc48025\_238\_w.cvx

- ML31C 4. WASTE H2O DUMP VLV ENA/NOZ HTR – ON (√DUMP VLV tb-CL)
- WCS 5. Connect Free Fluid Nozzle to one end of Y/Y Hose  
Connect free end of Y/Y Hose to WASTE H2O DUMP FILTER. Do not connect to CONT H2O X-TIE WASTE QD at this time
- CRT 6. When WASTE H2O NOZ T A,B (two) > 250, continue  
7. Connect WASTE H2O DUMP FILTER to CONT H2O X-TIE WASTE QD
- ML31C 8. WASTE H2O DUMP VLV – OP (tb-OP)  
9. Insert Nozzle into free fluid; when fluid collection complete, continue  
10. Wait 30 sec to empty any remaining water from hoses; then disconnect WASTE H2O DUMP FILTER from CONT H2O X-TIE WASTE QD

- ML31C 11. WASTE H2O DUMP VLV – CL (tb-CL)  
ISOL VLV – OP (tb-OP)
- CRT 12. When WASTE H2O NOZ T A,B (two) > 250,  
continue
- ML31C 13. WASTE H2O DUMP VLV ENA/NOZ HTR – OFF  
(√DUMP VLV tb-bp)
- If no further use expected:
14. Disconnect Y/Y Hose from Nozzle and Waste  
H2O Dump Filter
15. Place WASTE H2O DUMP FILTER in plastic  
(Ziplock) bag, seal and stow
16. Stow Y/Y Hose and Nozzle
- CRT 17. √WASTE H2O NOZ T A,B (two) – not increasing

- \* If NOZ T increasing \*
- \* ML86B:A \*
- \* cb MNA WASTE H2O DUMP \*
- \* VLV/NOZ HTR – op \*

18. SM 60 TABLE MAINT

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
WASTE H2O NOZ A B	0620520	-82	250
	0620519	-82	250

## **GALLEY, FAILED SUPPLY LINE, BYPASS**

(45 min)

**OBJECTIVE:** Bypass failed Galley Supply line/valve. Procedure draws water from TK A by backflowing thru Microbial Filter

**LOCATION:**

Microbial Filter located under middeck floor. See LOWER EQUIPMENT BAY, Zone K25 (COMPONENT LOCATIONS)

Primary access to Microbial Filter thru LEB access pnl.

See LOWER EQUIPMENT BAY, Zone I25 (COMPONENT LOCATIONS)

Secondary access to Microbial Filter thru (Vol H) MD23R.

See LOWER EQUIPMENT BAY, Zone R25 (COMPONENT LOCATIONS)

**TOOLS REQD:**

TOOL	Gray Tape
	Torque Wrench
	Driver Handle
	5/32-in Allen Head Driver
	Ratchet Wrench
	1/4-in to 3/8-in Adapter
CHCK	R/R Hose
	B/B Hose

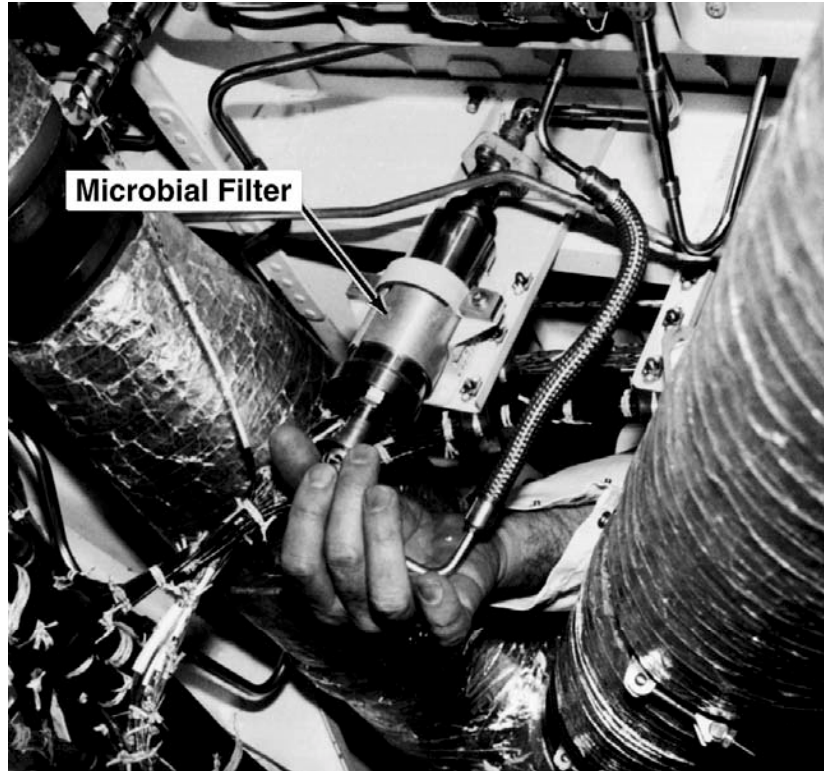
**NOTE**

Upon completion of this procedure, Galley will function normally

1. Open LEB access pnl on middeck floor and disconnect Fuel Cell Hose (lower QD) from Microbial Filter (See photo, W-29)
  - \* If reqd, remove Vol H (MD23R) \*
  - \* (see GENERAL INFORMATION) \*
  - \* to access Microbial Filter \*
2. Connect one end of R/R hose to bottom of Microbial Filter QD and route hose thru LEB access pnl opening on middeck floor
3. Disconnect PHS hose from Galley AUX PORT and connect R/R hose to AUX PORT
4. Connect one end of B/B Hose to PHS Hose QD

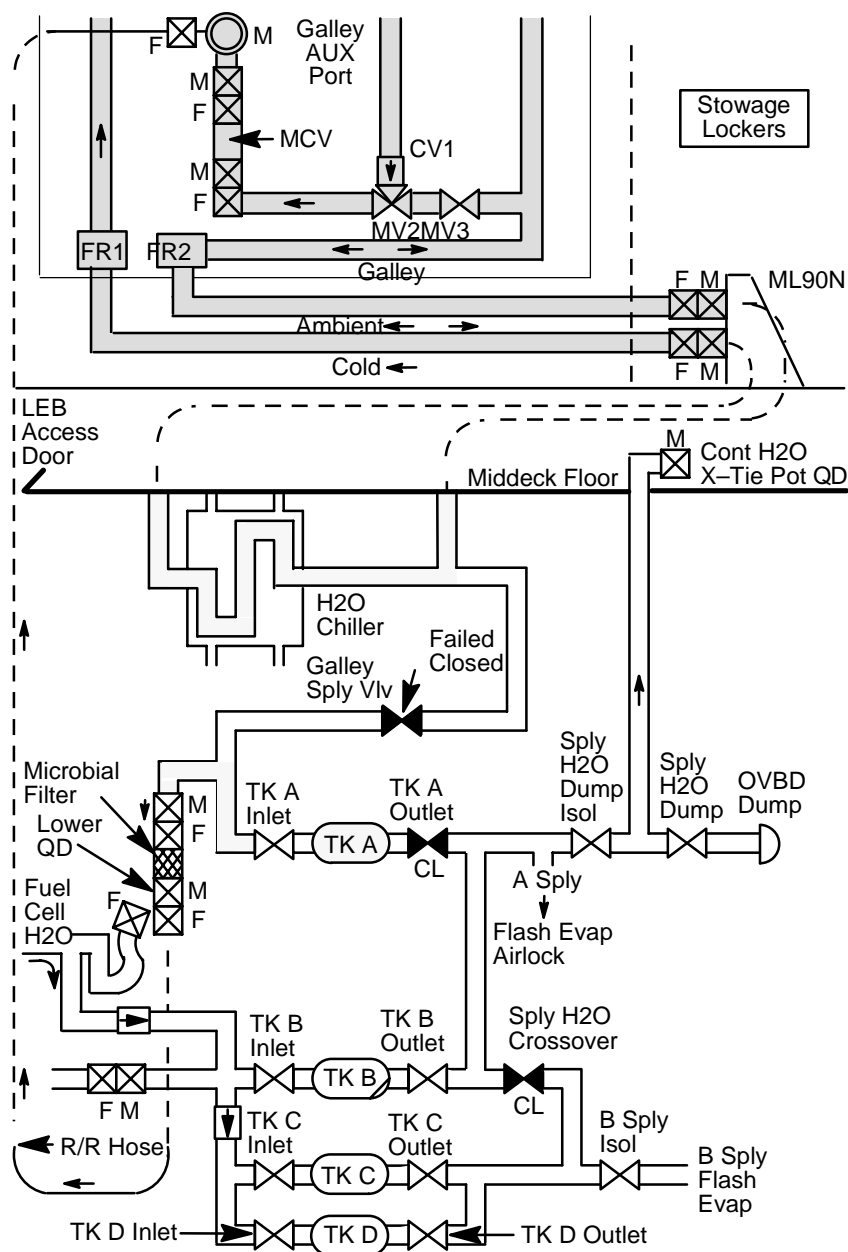
5. Tape B/B hose to Galley so free end near AUX PORT

- \* To use PHS hose: Remove R/R hose \*
- \* from Galley AUX PORT and connect to \*
- \* free end of B/B hose \*
- \* When finished: Remove R/R hose from \*
- \* B/B hose and reconnect to AUX PORT \*



jsc48025\_239\_w.cnv

# SUPPLY WATER SYSTEM



jsc48025\_240\_w.cvx

R11L

6. √SPLY H2O TKA INLET – OP (tb-OP)

7. Secure hoses to middeck structure w/Gray Tape

- \* Reinstall Vol H, if necessary \*
- \* (torque, 30 in-lb). Reinstall \*
- \* ladder (torque, 30 in-lb) \*

8. Stow tools, Gray Tape

9. When procedure no longer reqd:

Disconnect R/R, B/B Hoses

Reconnect Fuel Cell Hose to Microbial Filter

## GALLEY H2O LINE FLUSH

(20 min setup)

**OBJECTIVE:** Purge Galley water lines of high pH water by dumping water into urinal

**LOCATION:** Galley

**TOOLS REQD:**

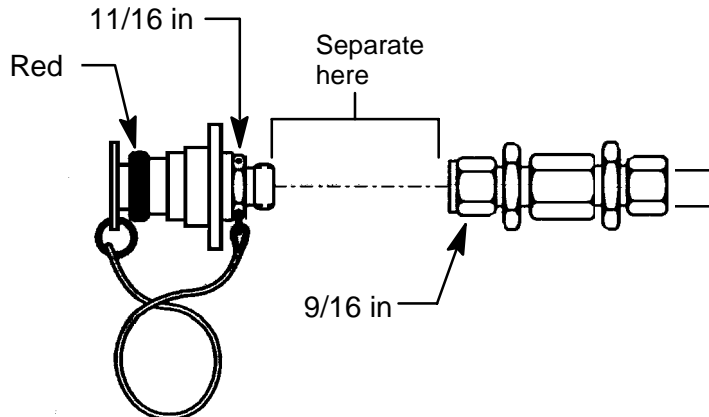
**TOOL** Pin Kit  
Gray Tape  
9/16-in & 11/16-in Combination Wrenches

**CHCK** R/R Hose

**MISC** Goggles & Gloves (CCK)  
ph Strips (CCK)  
Spare (Clean) Urinal Funnel  
Wet Washes (WCS)

**CAUTION**  
KOH caustic. Avoid contact  
w/skin and eyes

- CCK
- R11L
1. Don Goggles & Gloves
  2. √SPLY H2O TKA INLET – CL (tb-CL)  
√GALLEY SPLY VLV – OP (tb-OP)
  3. Disconnect QD from one end of R/R Hose  
(9/16-in & 11/16-in Combination Wrenches)



jsc48025\_233\_w.cnv

- Galley
- WCS
4. H2O HTRS (two) – OFF
  5. √FAN SEP same as HOSE BLOCK  
√MODE – AUTO  
√CRADLE – AUTO  
Unstow hose and install spare urinal funnel

W-32

IFM/ALL/GEN F

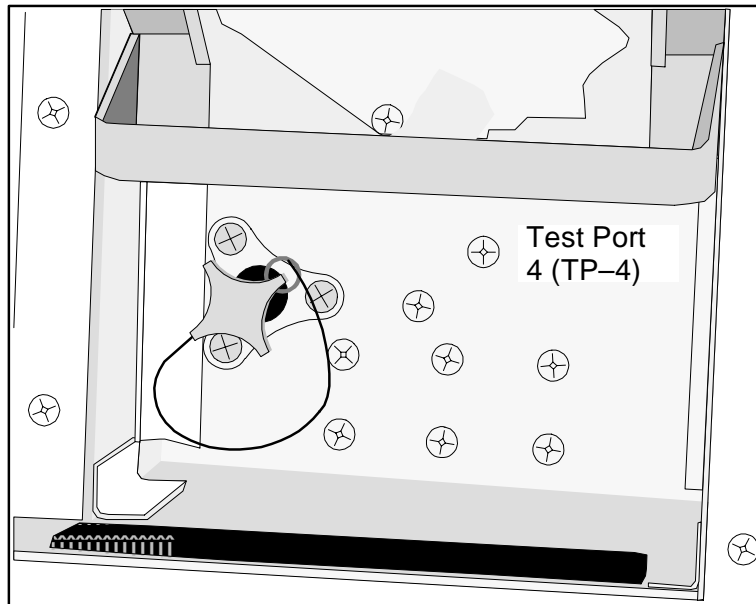


6. Tape hose end into urinal funnel; allow for adequate airflow
7. ✓ Airflow  
✓ WCS ON Lt – ON

**NOTE**

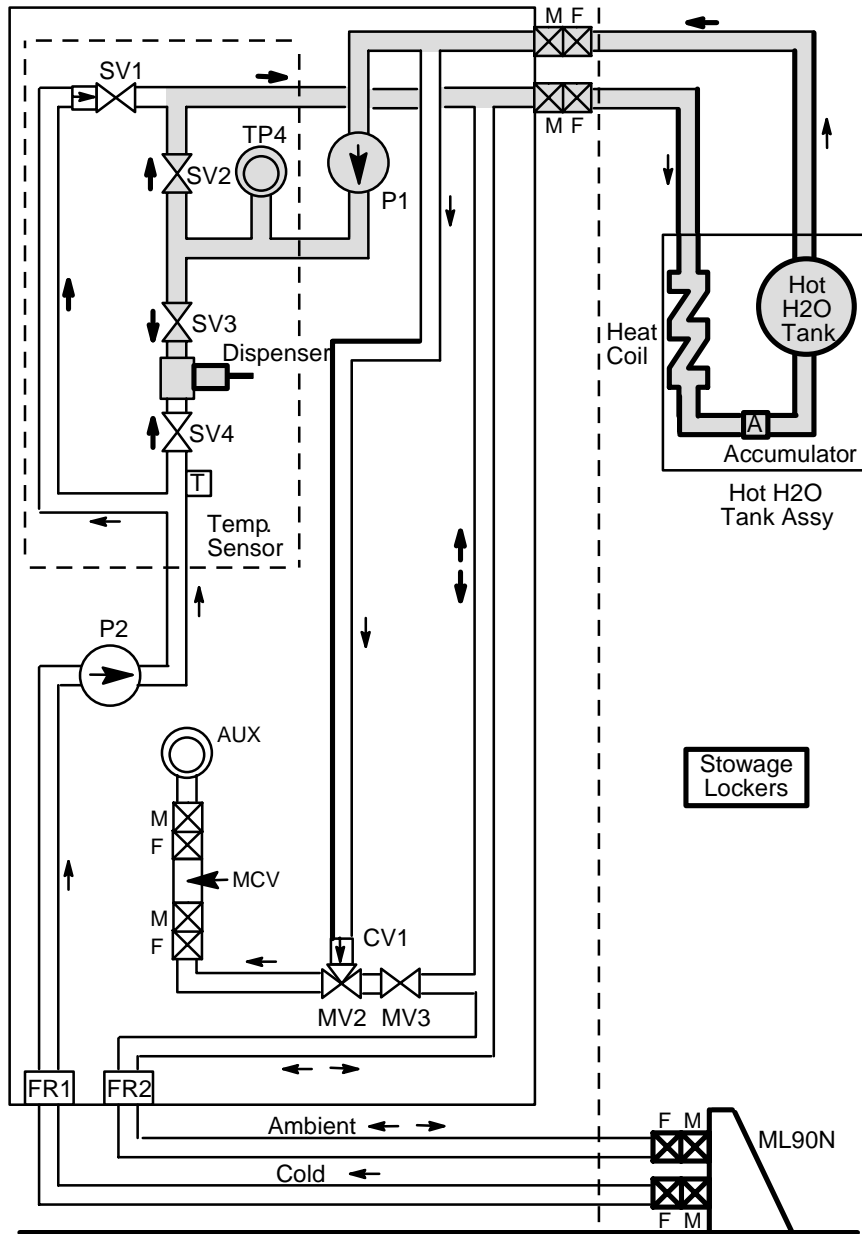
Ensure adequate airflow before connecting R/R hose to Galley

8. Remove cap from TP-4 (front of galley) and connect R/R Hose to TP-4



9. Flow water for 10 min or until pH < 9 (using pH strip from CCK and 22-ga Insulation Tubing from Pin Kit (flap 7), obtain single drop of water to determine pH). This clears Hot Water lines and tank of high pH. (See flow diagram, W-34)
10. When pH < 9, fill 8-oz drink container w/hot water (at Rehydration Station). This clears Hot Water Line of high pH water thru Hot Water Solenoid Valve (SV-3). (See flow diagram, W-34)

# GWS – HOT H2O LINES FLUSH



Middeck Floor

jsc48025\_243\_w.cvx

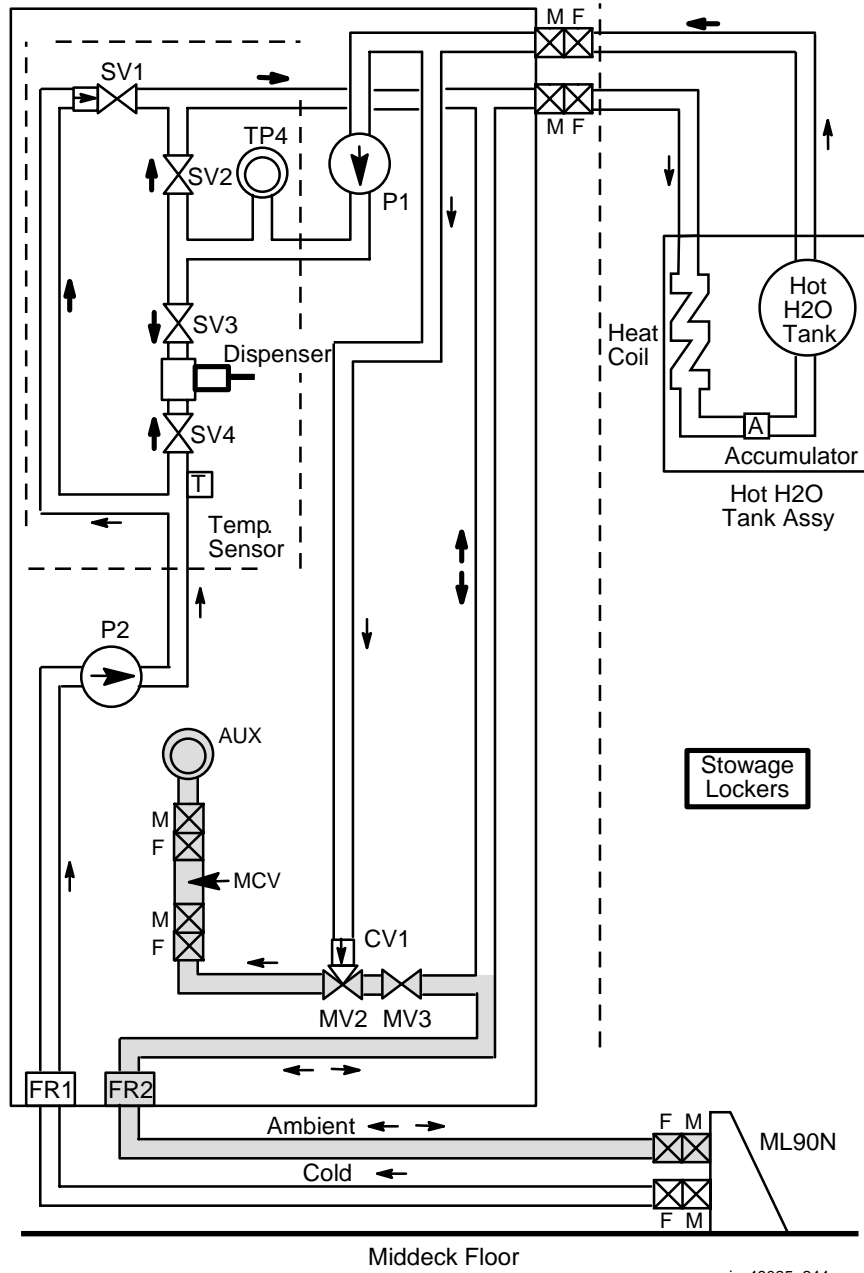
- Galley
11. Disconnect R/R Hose from TP-4 and replace cap on TP-4
  12. MV2 vlv – Full HOT
  13. Remove PHS Hose and install R/R Hose to Galley AUX PORT
  14. Flow water for 10 min or until pH < 9 (using pH Strip from CCK and 22-ga Insulation Tubing from Pin Kit (flap 7), obtain single drop of water to determine pH). This clears Hot Water Line of high pH water from Hot H2O Tank thru Galley AUX PORT. (See flow diagram, W-34)
  15. MV2 vlv – Full AMB
  16. Flow water for 10 min or until pH < 9 (using pH Strip from CCK and 22-ga Insulation Tubing from Pin Kit (flap 7), obtain single drop of water to determine pH). This clears Ambient Water Line of high pH water from Fuel Cell thru Galley. (See flow diagram, W-36)
  17. When pH < 9, disconnect R/R Hose from AUX PORT. Fill two 8-oz drink containers w/cold water (at Rehydration Station). This clears Chilled Water Lines internal to Galley of high pH water. (See flow diagram, W-37)
  18. Remove remaining QD from end of R/R Hose (1/2 in & 9/16 in Combination Wrenches) to evacuate residual water
  19. Remove R/R Hose from urinal and clean w/Wet Wash stowed in WCS
  20. Reconnect PHS Hose to AUX PORT and flush line into urinal funnel
  21. Empty drink bags filled in steps 10,17 into WCS. Stow empty drink bags in trash

NOTE

FAN SEP will run for ~30 sec  
after hose stowage

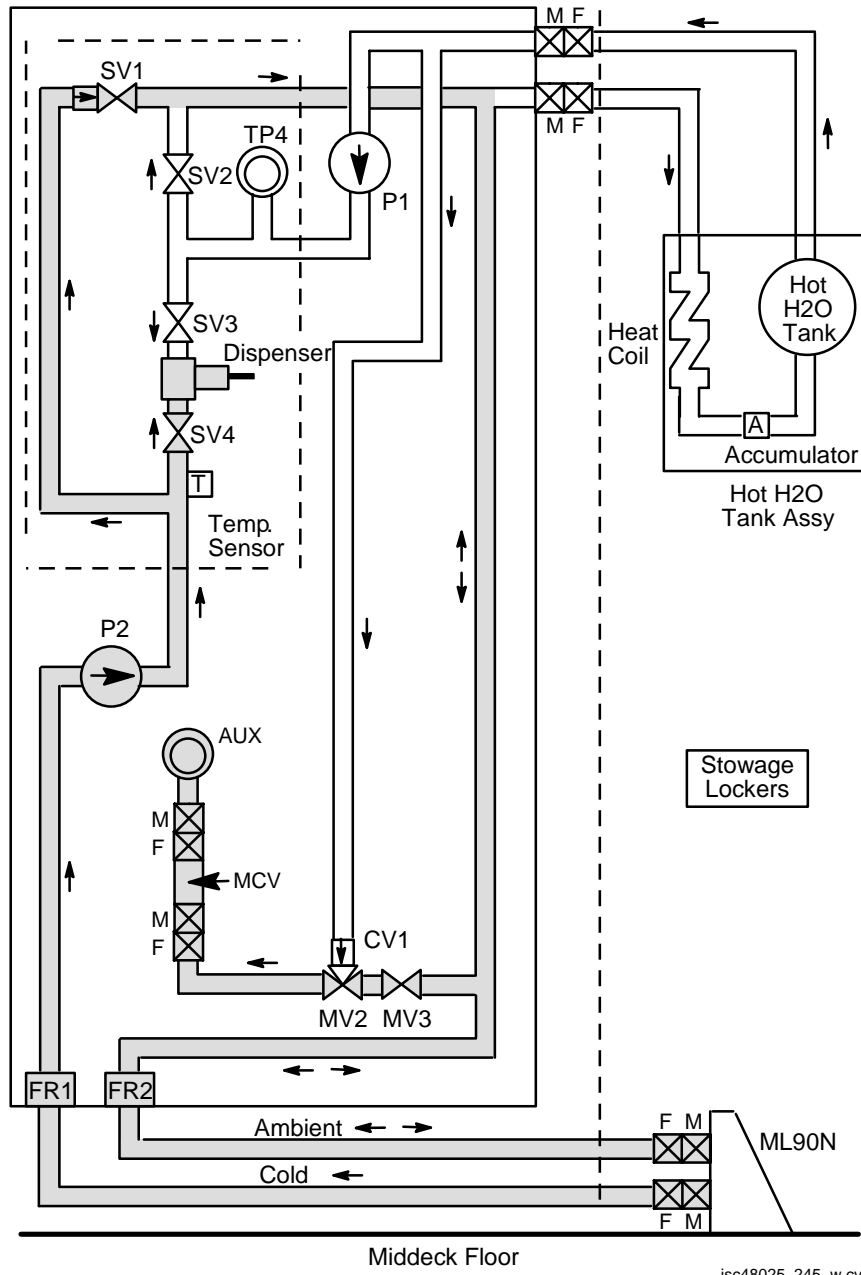
22. Stow hose in cradle  
√WCS ON Lt – OFF
23. H2O HTRS (two) – ON
24. Reattach QDs removed in steps 3,18 to R/R Hose
25. Stow tools and tape

# GWS – AMBIENT H2O LINE FLUSH



jsc48025\_244\_w.cvx

# GWS – CHILLED H2O LINES FLUSH



jsc48025\_245\_w.cvx

## **GALLEY PURGE**

(30 min)

OBJECTIVE: Purge Galley supply lines of gas/contaminated water by dumping water into urinal/drink containers

LOCATION: Galley (for schematic, see GALLEY WATER SYSTEM (GWS), W-7

### TOOLS REQD:

MISC Spare (Clean) Urinal Funnel  
PHS Hose  
Drink Containers (three)  
Towels

- |        |  |
|--------|--|
| Galley | 1. H2O HTRS (two) – OFF  |
| WCS    | 2. √FAN SEP same as HOSE BLOCK<br>√MODE – AUTO<br>√CRADLE – AUTO<br>Unstow hose and install spare urinal funnel  |
|        | 3. √Airflow<br>√WCS ON Lt – ON   |
| Galley | 4. Demate PHS Hose from AUX PORT. Remove cap from TP-4 (front of galley) and connect PHS Hose to TP-4  |
| WCS    | 5. Flow water into WCS for 5 min (clears Hot Water Lines and Tank of contaminated water)   |
| Galley | 6. Disconnect PHS Hose from TP-4 and replace cap on TP-4   |
|        | 7. Mate PHS Hose to AUX PORT   |
|        | 8. MV2 vlv – Full HOT  |
|        | 9. Flow water into WCS for 2 min (clears Hot Water Line of contaminated water from Hot H2O Tank thru Galley AUX PORT)  |
|        | 10. MV2 vlv – Full AMB   |
|        | 11. Flow water into WCS for 2 min (clears Ambient Water Line of contaminated water from Fuel Cell thru Galley)   |
|        | 12. Fill two 8-oz drink containers w/cold water (at Rehydration Station). This clears Chilled Water Lines internal to Galley of contaminated water               |
|        | 13. Fill single 8-oz drink container w/hot water (at Rehydration Station). This clears Hot Water Line of contaminated water thru Hot Water Solenoid Valve (SV-3) |

14. Empty drink bags filled in steps 12,13 into WCS.  
Stow empty drink bags in trash

NOTE

FAN SEP will run for ~30 sec  
after hose stowage

15. Stow hose in cradle  
√WCS ON Lt – OFF
16. H2O HTRS (two) – ON
17. Report results to MCC
18. Stow tools

**HUM SEP AIR OUTLET H2O ABSORPTION** (1:30 hr)

OBJECTIVE: To prevent free fluid from clogged Hum Sep leaking into LEB

LOCATION: See LOWER EQUIPMENT BAY, fwd of Vol. MD52M  
(COMPONENT LOCATIONS)

TOOLS REQD:

TOOL Gray Tape  
MISC Trash Bag Liner (Food Trash Bag)  
1-2 Towels

1. Remove LiOH stowage volume: See LiOH STOWAGE VOLUME REMOVAL (GENERAL INFORMATION)
2. Obtain trash bag liner and reinforce bottom and sides w/strips of Gray Tape
3. Use pocket knife to punch holes thru Gray Tape and liner, for airflow
4. Loosely pack 1-2 towels in trash bag liner
- LEB 5. Securely attach opening of trash bag liner to air outlet port of leaking Hum Sep (Gray Tape). Allow room for reinstallation of LiOH Stowage Box
6. Stow tape



7. Periodically, check towel for accumulated water
8. When saturated, replace w/dry towel. Stow wet towel in wet trash





CAUTION  
WASTE H2O NOZ T should not  
exceed 350

SM 66 ENVIRONMENT

6.  $\sqrt$ WASTE DMP LN T > 50

- \* If  $T \leq 50$ , enable 2nd heater: \*
- \* ML86B:A \*
- \* cb MNB(MNA) H2O LINE HTR \*
- \* B(A) – cl \*

ML31C 7. WASTE H2O DUMP VLV ENA/NOZ HTR – ON  
( $\sqrt$ DUMP VLV tb-CL)

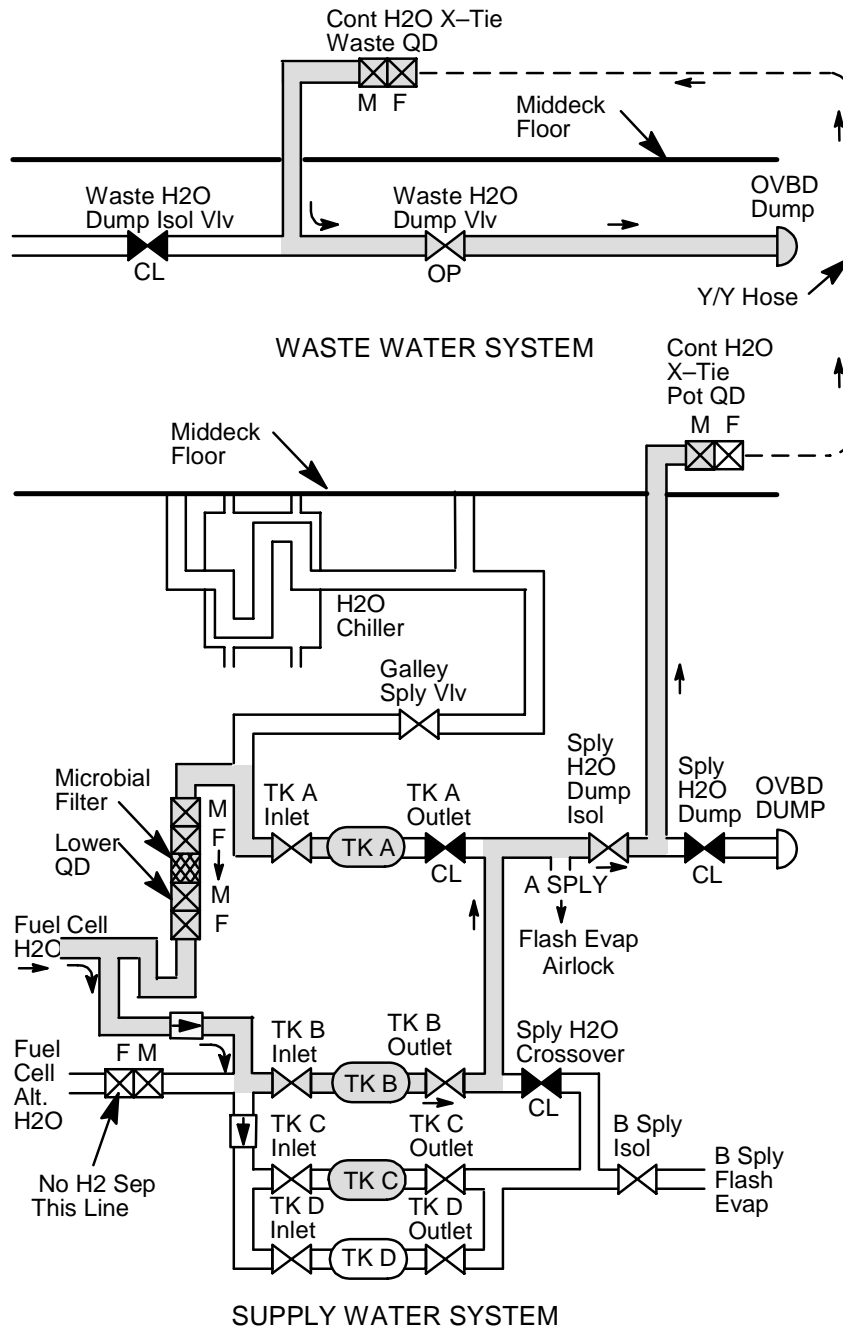
CRT 8. When WASTE H2O NOZ T A,B (two) > 250,  
continue

If PASS SM not available:

9. Dump tank(s) using time supplied by MCC

R11L 10. SPLY H2O DUMP ISOL VLV – OP (tb-OP)

ML31C 11. WASTE H2O DUMP VLV – OP (tb-OP)



jsc48025\_247\_w.cnv

CRT 12. √SUPPLY H2O QTY B decr (~1%/min) followed by  
SUPPLY H2O QTY A decr

When SUPPLY H2O QTY B(A) at specified level or  
time has elapsed:

ML31C 13. WASTE H2O DUMP VLV – CL (tb-CL)  
R11L 14. SPLY H2O DUMP ISOL VLV – CL (tb-CL)  
ML31C 15. WASTE H2O DUMP VLV ENA/NOZ HTR –  
OFF (√DUMP VLV tb-bp)

CRT 16. √SUPPLY H2O QTY B(A) – not decr  
17. √WASTE H2O NOZ T A,B (two) – not incr

\* If T increasing: \*  
\* ML86B:A \*  
\* cb MNA WASTE H2O DUMP \*  
\* VLV/NOZ HTR – op \*

18. SM 60 TABLE MAINT

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
WASTE H2O NOZ T A B	0620520	-82	250
	0620519	-82	250

WCS 19. Disconnect Y/Y Hose from CONT H2O X-TIE  
POT and WASTE QDs

ML31C 20. WASTE H2O DUMP ISOL VLV – OP (tb-OP)  
R11L 21. SPLY H2O DUMP ISOL VLV – OP (tb-OP)  
22. Stow hose, Gray Tape

**SUPPLY H2O SYS BACKUP DUMP – TK C(D) (30 min Setup)**

OBJECTIVE: Dump supply water from TKs C/D thru waste water dump line. Procedure assumes Supply System Dump Valve failure

LOCATION: CONT H2O X-TIE POT and WASTE QDs reqd for this procedure are located on outboard WCS wall

TOOLS REQD:

TOOL Gray Tape  
CHCK Y/Y Hose

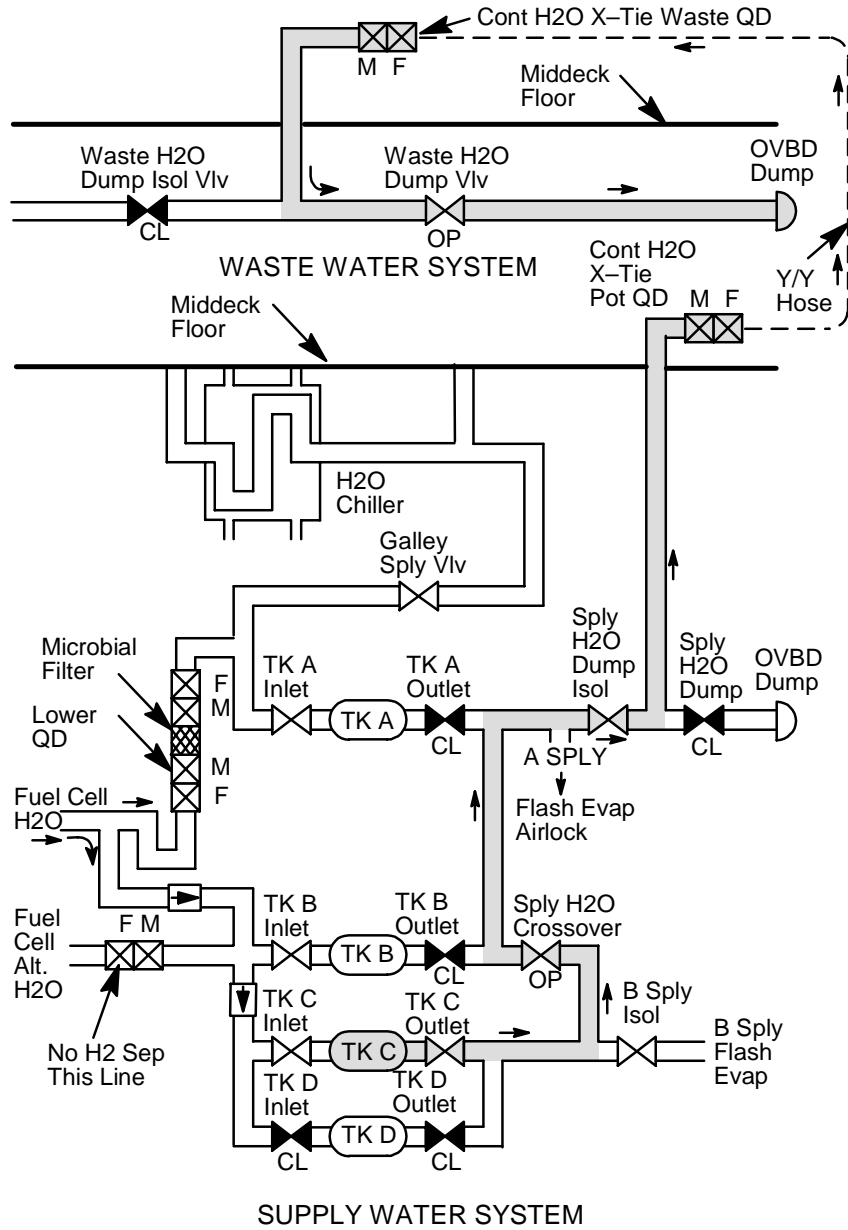
- ML31C 1. WASTE H2O DUMP ISOL VLV – CL (tb-CL)  
R11L SPLY H2O DUMP ISOL VLV – CL (tb-CL)  
√TKA OUTLET – CL (tb-CL)

NOTE

Disregard √s requiring temperatures (quantities) if PASS SM not available

- WCS 2. Connect one end of Y/Y Hose to CONT H2O X-TIE POT QD and other end to CONT H2O X-TIE WASTE QD
- R11L 3. SPLY H2O TKB OUTLET – CL (tb-CL)  
√TKC INLET – OP (tb-OP)  
√OUTLET – OP (tb-OP)  
XOVR VLV – OP (tb-OP)
- ML31C 4. √SPLY H2O TKD INLET – OP (tb-OP)  
√OUTLET – OP (tb-OP)
5. Config TKs C,D for dumping as follows:

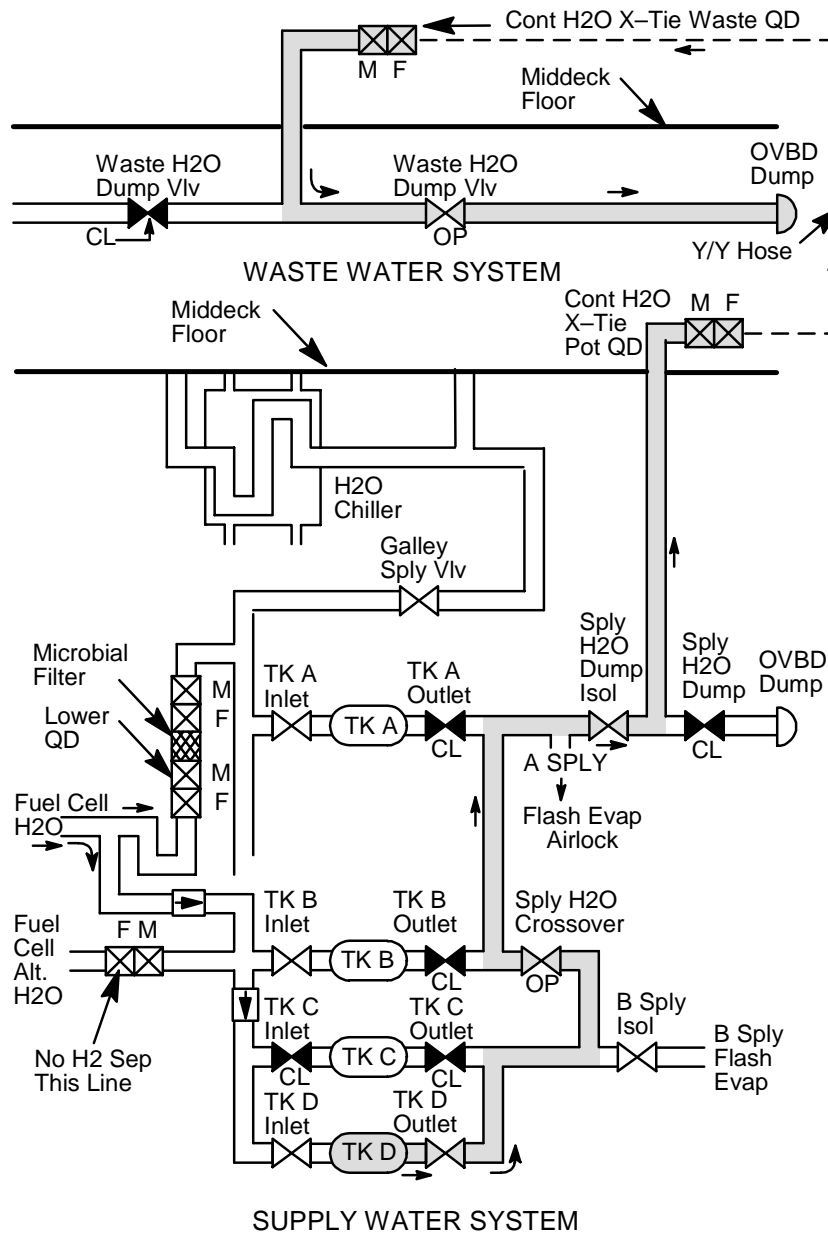
If TKC only dump desired:  
 ML31C 6. SPLY H2O TKD INLET – CL (tb-CL)  
 OUTLET – CL (tb-CL)



**TANK C DUMP SCHEMATIC**

jsc48025\_248\_w.cnv

If TKD only dump desired:  
 R11L 7. SPLY H2O TKC INLET - CL (tb-CL)  
 OUTLET - CL (tb-CL)



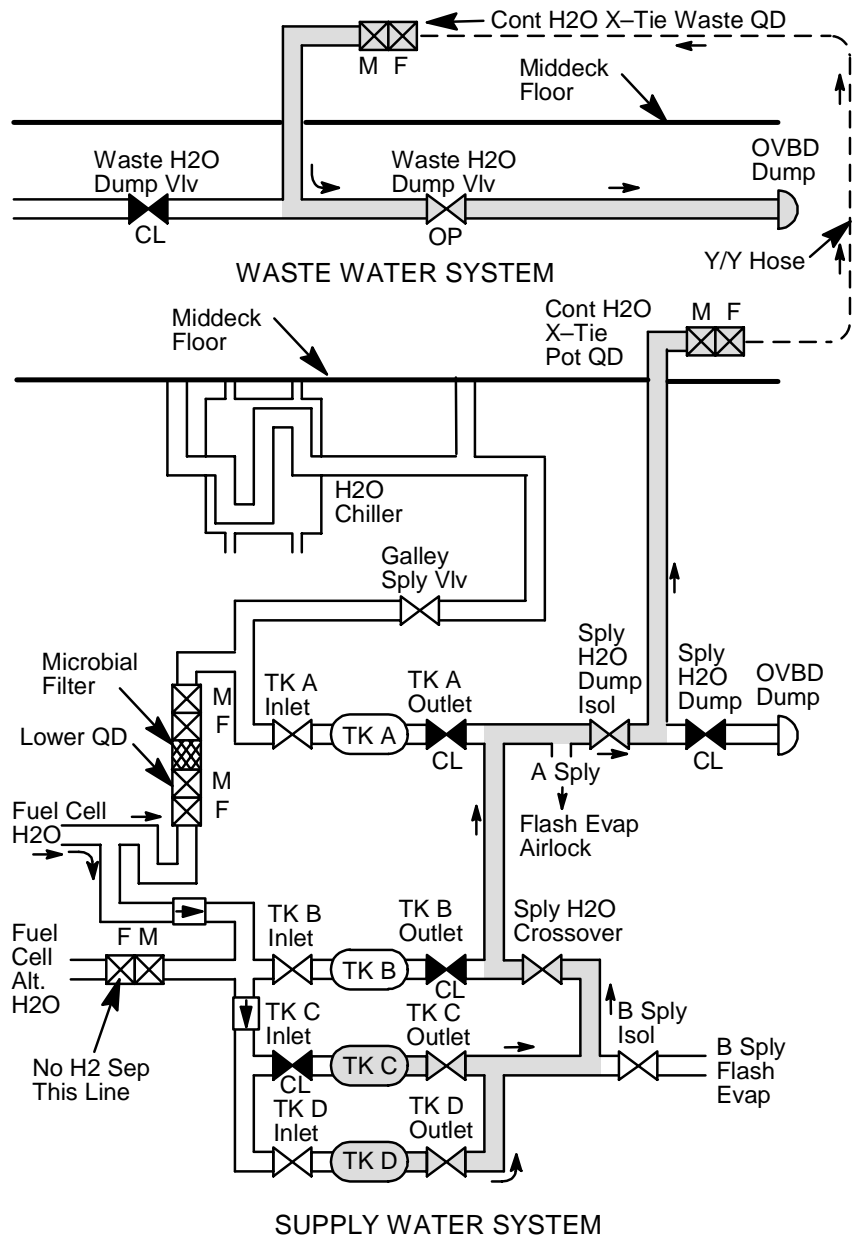
jsc48025\_249\_w.cnv

**TANK D DUMP SCHEMATIC**

W-47

IFM/ALL/GEN F

8. If TKC,D dump desired, continue



jsc48025\_250\_w.cnv

**TANK C,D DUMP SCHEMATIC**



9. **SM 60 TABLE MAINT**

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
WASTE H2O NOZ T A B	0620520	60	250
	0620519	60	250

**CAUTION**  
WASTE H2O NOZ T A/B should not exceed 350

**SM 66 ENVIRONMENT**

10.  $\sqrt{\text{WASTE DMP LN T}} > 50$

- \* If T < 50, enable 2nd Heater: \*
- \* ML86B:A \*
- \* cb MNB(MNA) H2O LINE HTR \*
- \* B(A) – cl \*

- ML31C 11. WASTE H2O DUMP VLV ENA/NOZ HTR – ON  
( $\sqrt{\text{DUMP VLV tb-CL}}$ )
- CRT When WASTE H2O NOZ T A,B (two) > 250,  
continue
- If PASS SM not available:
- R11L 12. Dump tank(s) using time supplied by MCC
- ML31C 13. SPLY H2O DUMP ISOL VLV – OP (tb-OP)
- ML31C 14. WASTE H2O DUMP VLV – OP (tb-OP)
- CRT 15.  $\sqrt{\text{SPLY H2O QTY C(D)}}$  decreasing
- When SUPPLY H2O QTY C(D) at specified level or  
specified time has elapsed:
- ML31C 16. WASTE H2O DUMP VLV – CL (tb-CL)
- R11L 17. SPLY H2O DUMP ISOL VLV – CL (tb-CL)
- ML31C 18. WASTE H2O DUMP VLV ENA/NOZ HTR –  
OFF ( $\sqrt{\text{DUMP VLV tb-bp}}$ )

- CRT
19. √SPLY H2O QTY C(D) – not decr
  20. √WASTE H2O NOZ T (A/B) – not incr

- \* If NOZ T incr: \*
- \* ML86B:A \*
- \* cb MNA WASTE H2O DUMP \*
- \* VLV/NOZ HTR – op \*

21. SM 60 TABLE MAINT

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
WASTE H2O NOZ T A B	0620520	-82	250
	0620519	-82	250

- WCS
22. Disconnect Y/Y Hose from CONT H2O X-TIE POT and WASTE QDs
  23. Stow hose, tape
- ML31C
24. WASTE H2O DUMP ISOL VLV – OP (tb-OP)
- R11L
25. SPLY H2O DUMP ISOL VLV – OP (tb-OP)  
XOVR VLV – CL (tb-CL)  
TKB OUTLET – OP (tb-OP)

Reconfigure TKs C,D as follows:

- ML31C
- If TKC dumped:
    26. SPLY H2O TKD INLET – OP (tb-OP)  
OUTLET – OP (tb-OP)
  - If TKD dumped:
    27. SPLY H2O TKC INLET – OP (tb-OP)  
OUTLET – OP (tb-OP)
- R11L
- If TKs C,D dumped:
    28. No reconfiguration reqd

**SUPPLY(WASTE) H2O PURGE  
FROM DUMP LINE(S)**

(30 min)

**OBJECTIVE:** Purge water from supply(waste) dump line(s) to avoid freezing water in line(s) for heater failure(s), dump valve(s) failure, or loss of line/nozzle temperature insight

**LOCATION:** CONTINGENCY H2O X-TIE POT (WASTE) QD located on WCS outboard wall

**TOOLS REQD:**

CHCK Free Fluid Nozzle  
Y/Y Hose

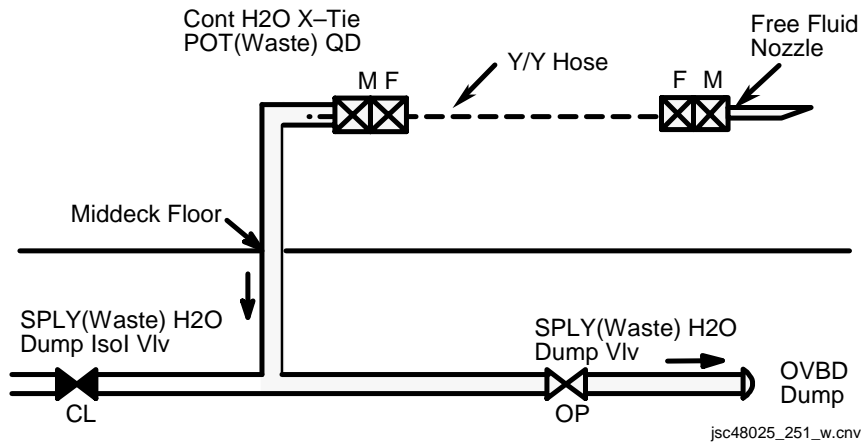
MISC Towel

- R11L (ML31C)
1. SPLY(WASTE) H2O DUMP ISO VLV – CL (tb-CL)
  2. SPLY(WASTE) DUMP VLV ENA/NOZ HTR – ON

**CAUTION**  
SPLY(WASTE) H2O DUMP NOZ T should not exceed 350

**SM 66 ENVIRONMENT**

3. When SPLY(WASTE) NOZ T (A/B) > 100(250), continue
4. Connect one end of Y/Y Hose to Free Fluid Nozzle QD
5. Hold towel around Free Fluid Nozzle top to soak up water and connect free end of Y/Y Hose to CONT H2O X-TIE POT(WASTE) QD



W-51

IFM/ALL/GEN F

- R11L  
(ML31C)  
WCS
6. SPLY(WASTE) H2O DUMP VLV – OP (tb-OP)
  7. Check Free Fluid Nozzle tip for airflow and purge for 5 min or until MCC call
  8. √MCC to continue
- R11L  
(ML31C)
9. SPLY(WASTE) H2O DUMP VLV – CL (tb-CL)
  10. SPLY(WASTE) H2O DUMP VLV ENA/NOZ HTR – OFF
  11. √SPLY(WASTE) H2O DUMP VLV tb – bp

NOTE

Supply(Waste) H2O Dump Isolation Valve will remain close thru EOM unless notified by MCC

- WCS
12. Disconnect Y/Y Hose from CONT H2O X-TIE POT(WASTE) QD and Free Fluid Nozzle. Stow tools
  13. Report results to MCC

**VACUUM VENT CONTINGENCY OPERATION** (30 min)

**OBJECTIVE:** In event of failed close Vacuum Vent Isolation Valve and clogged valve orifice. Procedure allows H<sub>2</sub> gas from hydrogen separator and odors from wet trash to be vented overboard. Interconnects Vacuum Vent System to Waste Water Dump System

**NOTE**

No crew insight into clogged orifice. Procedure done on MCC call.

Vacuum Vent Isolation Valve has orifice in valve plate that allows 3-lb/hr flow when valve closed. Orifice may freeze w/moisture from Wet Trash/WCS

**LOCATION:** CONT H<sub>2</sub>O X-TIE WASTE QD on outboard WCS compartment wall and WCS Vacuum Vent QD (TP126) on WCS compartment lower pnl

**TOOLS REQD:**

TOOL	Gray Tape Multimeter Pressure Module (PM)
CHCK	Free Fluid Nozzle Y/Y Hose

**WARNING**

All WCS Commode Ops must be terminated until 5 min after IFM complete. WCS Commode Ops will decrease Vacuum Vent System volume and increase H<sub>2</sub> concentration

**VACUUM VENT SYS PRESSURE CHECK**

1. Remove coupler connected to QD on PM
2. Plug PM into Multimeter (COM to COM, V to  $\Omega$ -|←)
3.  $\sqrt$ Multimeter – OFF
4. Select mV on Multimeter, PSIA on PM
5. Connect one end of Y/Y Hose to PM

6. Connect other end of Y/Y Hose to Vacuum Vent QD (TP126)
7. Observe pressure reading, report results to MCC

NOTE

Normal pressure in Vacuum Vent should be 0.0 psia

If blockage does not exist (pressure reading 0.0 psia)

8. Demate Y/Y Hose from Vacuum Vent and PM
9. Turn Multimeter, PM – OFF
10. Stow tools

If blockage exists (pressure reading above 0.5 psia), proceed to next step

PURGE WATER FROM LINE

NOTE

WCS Urinal Ops should be terminated during purge to prevent additional liquid in Waste Water lines

- ML31C      11. WASTE H2O DUMP VLV ENA/NOZ HTR – ON
- √VLV – CL (tb-CL)
- √ISOL VLV – OP (tb-OP)

CAUTION

WASTE H2O DUMP NOZ T should not exceed 350

- WCS      12. √FAN SEP same as HOSE BLOCK
- √MODE – AUTO
- √CRADLE – AUTO
- Unstow hose
- √Airflow
- √WCS ON Lt – ON

SM 66 ENVIRONMENT

- CRT      13. When WASTE NOZ T A,B (two) > 250, continue
- ML31C    14. WASTE H2O TK1 VLV – CL (tb-CL)
- DUMP VLV – OP (tb-OP)
15. Wait 5 min

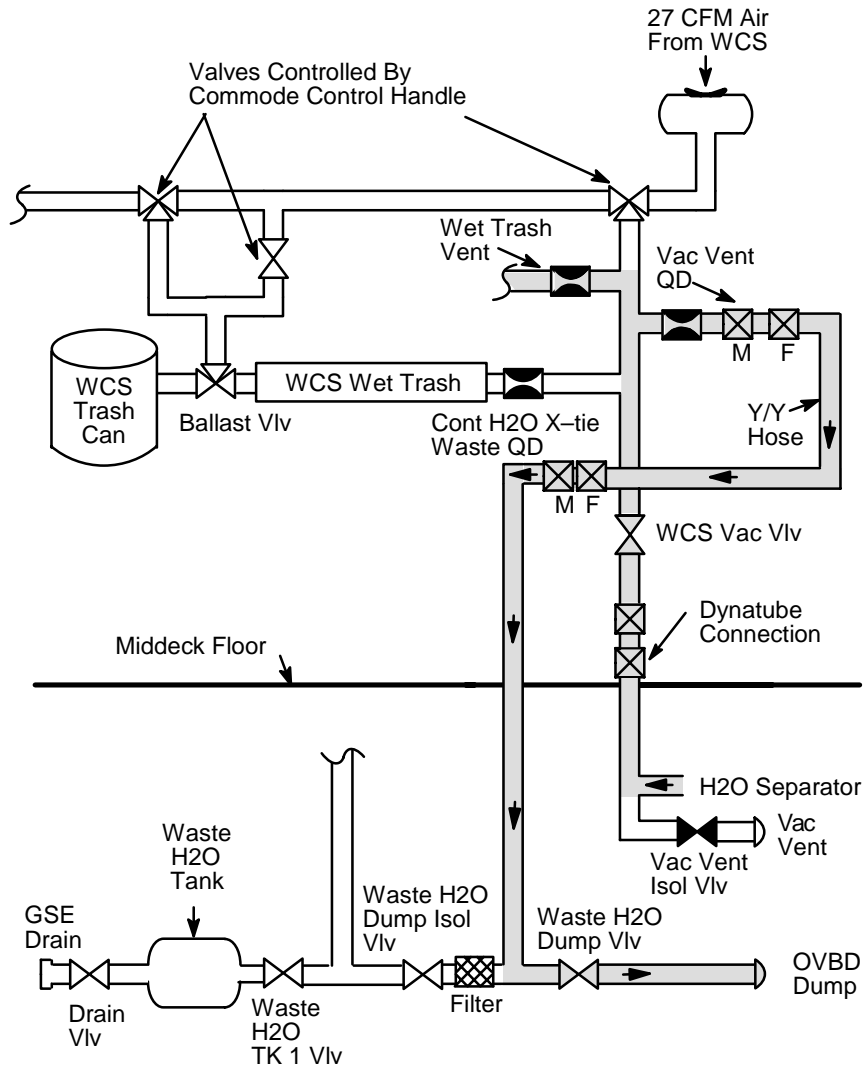
- WCS
16. Connect one end of Y/Y Hose to Free Fluid Nozzle
  17. Connect free end of Y/Y Hose to CONT H2O X-TIE WASTE QD (upper QD w/yellow Velcro and "WASTE" label)

NOTE

FAN SEP will run for ~30 sec  
after hose stowage

- ML31C
18. Stow hose in cradle  
√WCS ON Lt – OFF
  19. WASTE H2O DUMP ISOL VLV – CL (tb-CL)  
TK1 VLV – OP (tb-OP)
  20. Wait 5 min
  21. Disconnect Y/Y Hose from Free Fluid Nozzle

# VACUUM VENT SYSTEM



jsc48025\_252\_w.cvx



INTERCONNECT VACUUM VENT AND WASTE WATER DUMP SYSTEMS

- WCS 22. Connect free end of Y/Y Hose to Vacuum Vent QD (TP126)
- ML31C 23. √WASTE H2O DUMP VLV – OP (tb-OP)  
VLV ENA/NOZ HTR – OFF
- 24. √MCC for Waste Collector Pressure

NOTE

WCS Commode Ops can resume when Waste Collector Pressure < 1 psia for 5 min. If necessary, light downward pressure should be applied to WCS slide gate to assist it in sealing due to reduced flowrate

- WCS 25. Route Y/Y Hose to avoid interference w/egress path and emergency egress slide. Secure hose w/Gray Tape
- 26. Stow tools, towel

CONFIGURE FOR WASTE WATER DUMP

- WCS 27. Disconnect Y/Y Hose QD from CONT H2O X-TIE WASTE QD (upper QD w/yellow Velcro and "WASTE" label)
- ML31C 28. WASTE H2O DUMP VLV ENA/NOZ HTR – ON  
VLV – CL (tb-CL)  
ISOL VLV – OP (tb-OP)  
VLV ENA/NOZ HTR – OFF
- 29. Go to SUPPLY/WASTE WATER DUMP (ORB OPS, ECLS)

RECONFIGURE FOR CONTINGENCY VACUUM VENT OPERATION

- 30. Repeat steps 11-26



This Page Intentionally Blank



## WASTE H2O SYS BACKUP DUMP

(45 min Setup)

**OBJECTIVE:** Dump waste water thru supply water dump line.

Procedure assumes failure of waste water system dump vlv

**LOCATION:** CONT H2O X-TIE POT and WASTE QDs are located on outboard WCS wall

**TOOLS REQD:**

TOOL Gray Tape  
CHCK Y/Y Hose

**CAUTION**

SPLY H2O DUMP ISOL VLV will remain closed until end of mission. Supply water will be dumped via Flash Evaporator System (FES)

- R11L  
ML31C
1. SPLY H2O DUMP ISOL VLV – CL (tb-CL)
  2. √WASTE H2O TK1 VLV – OP (tb-OP)
  3. Connect one end of Y/Y Hose to CONT H2O X-TIE POT QD and other end to CONT H2O X-TIE WASTE QD
  4. √WASTE H2O DUMP ISOL VLV – OP (tb-OP)

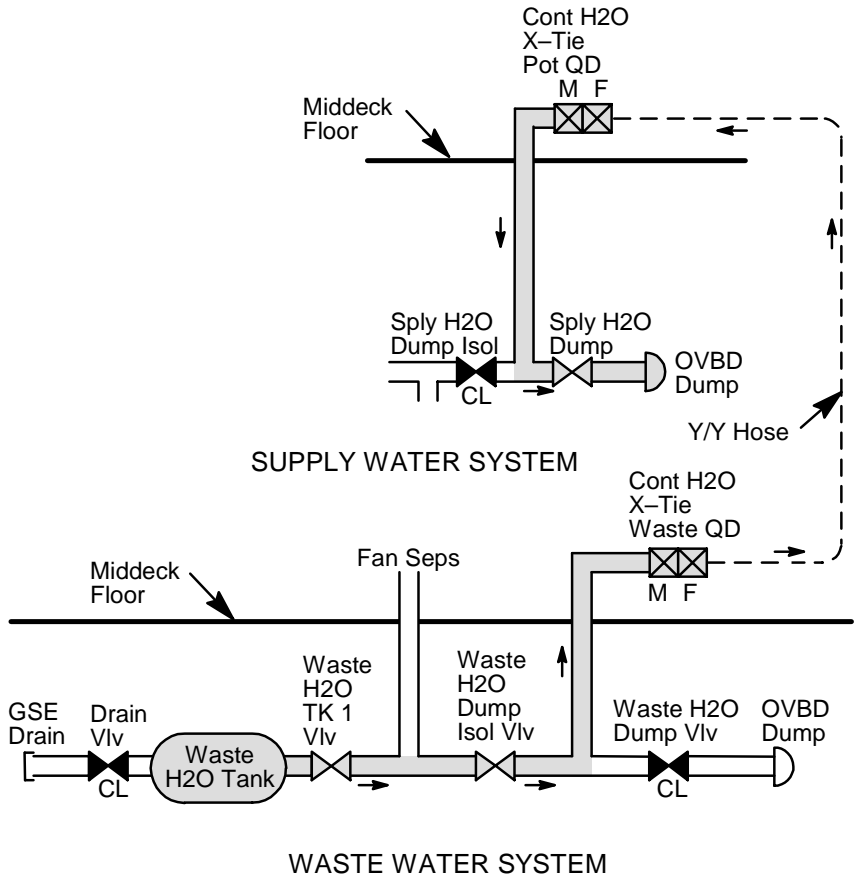
5. SM 60 TABLE MAINT

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
SUPPLY H2O NOZ T A B	0620440	90	250
	0620434	90	250

CAUTION  
SUPPLY H2O NOZ T A/B should  
not exceed 350

SM 66 ENVIRONMENT

6.  $\sqrt{\text{SUPPLY H2O DMP LN T}} \geq 65$
- \* If  $T < 65$ , enable 2nd Heater: \*
  - \* ML86B:A \*
  - \* cb MNB(MNA) H2O LINE HTR \*
  - \* B(A) – cl \*
- R11L 7. SPLY H2O DUMP VLV ENA/NOZ HTR – ON  
(DUMP VLV tb-CL)
- CRT 8. When SUPPLY H2O NOZ T A,B (two) > 250,  
continue  
If PASS SM not available:
9. Dump tank on MCC call
- R11L 10. SPLY H2O DUMP VLV – OP (tb-OP)
- CRT 11.  $\sqrt{\text{WASTE H2O QTY 1}}$  decreasing (~1%/min)  
If 'S66 H2O', H2O SPLY NOZ T A(B) ↓:
12. Then, SPLY H2O DUMP VLV – cl (tb-CL)
13. When H2O SPLY NOZ T A,B (two) > 250,  
continue
- R11L 14. SPLY H2O DUMP VLV – OP (tb-OP)



jsc48025\_253\_w.cnv

- 15. When WASTE H2O QTY 1 at level specified by MCC, or specified time has elapsed, continue  
 R11L SPLY H2O DUMP VLV – CL (tb-CL)  
 ML31C WASTE H2O DUMP ISOL VLV – CL (tb-CL)
- 16. When SPLY H2O NOZ T A,B (two) > 250, continue  
 R11L SPLY H2O DUMP VLV ENA/NOZ HTR – OFF (DUMP VLV tb-bp)
- 17. √WASTE H2O QTY 1 not decr  
 CRT
- 18. √SUPPLY H2O NOZ T A,B (two) not incr

- \* If SPLY H2O NOZ T incr: \*
- \* ML86B:A \*
- \* cb MNC SPLY H2O DUMP \*
- \* VLV/NOZ HTR – op \*

19. SM 60 TABLE MAINT

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
H2O SUPPLY NOZ T A	0620440	-82	250
B	0620439	-82	250

- WCS 20. Disconnect Y/Y Hose from CONT H2O X-TIE POT and WASTE QDs
- ML31C 21. WASTE H2O DUMP ISOL VLV – OP (tb-OP)
- 22. Stow hose, Gray Tape
- 23. After last waste water dump, perform SUPPLY (WASTE) H2O PURGE FROM DUMP LINE(S), W-51

## WCS FAILED COMMODE CNTL VLV

(1:30 hr)

OBJECTIVE: Access WCS Commode cntl vlv linkage, test, and manually operate if reqd

LOCATION: WCS

TOOLS REQD:

TOOL	Gray Tape
	Inspection Mirror
	Large Screwdriver
MISC	WCS Linkage Tool
	Pen Light

### NOTE

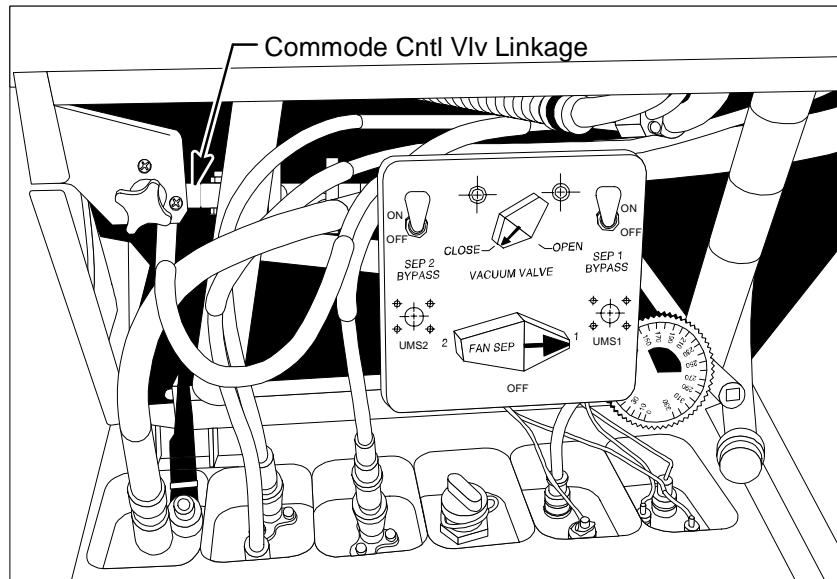
No WCS ops until procedure complete

- |         |   |
|---------|---|
| ML31C   | 1. √VAC VENT ISOL VLV BUS SEL – MNA<br>√CNTL – CL (tb – CL)       |
| ML86B:B | 2. cb MNA,B WCS CNTLR (two) – op                                  |
| MA73C:E | 3. cb AC1,2 WCS FAN SEP 1,2 (six) – op                            |
| WCS     | 4. √VAC VLV – CL  |
|         | 5. Remove WCS kickplate (nine fasteners, large Screwdriver), stow |

### CAUTION

Ignore second (aft-most) linkage which also extends from WCS Commode Cntl vlv

6. Locate WCS Commode Cntl vlv linkage:
  - a. Start from WCS Vacuum vlv sw
  - b. Locate vlv housing immediately aft of this sw
  - c. WCS Commode Cntl vlv linkage extends horizontally inboard from vlv assembly
  - d. Commode Cntl vlv linkage is fwd-most, larger, of two double-U-joint linkages



jsc48025\_254\_w.cnv

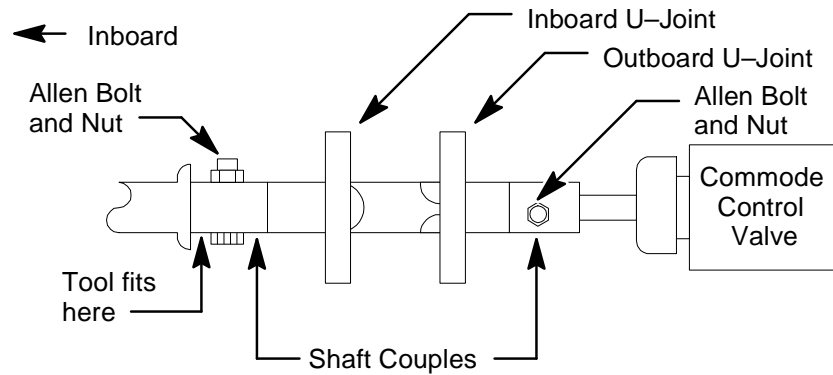
WCS 7. MODE – COMMODE/MANUAL/EMU

NOTE

In following steps, cw is oriented looking outboard along axis of Commode Cntl vlv linkage

8. Observe Commode Cntl vlv linkage, would normally rotate cw during this step:  
WCS COMMODE CNTL – UP
9. Report observation to MCC
10. If Commode Cntl vlv linkage does not rotate, on MCC call, continue
11. Locate Allen bolt and nut fastening inboard U-joint to Commode Cntl vlv (~3-1/2 in inboard of vlv and 4 in aft of SEP 2 Bypass sw)





12. Slide WCS Linkage Tool upwards onto shaft to immediate left of Allen Bolt
13. Rotate Commode Cntl vlv linkage cw 1/4 turn (90 deg) against stop; do not overtorque
- ML31C 14. VAC VENT ISOL VLV CNTL – OP (tb–OP)  
VLV – OP (wait 20 sec)
15. COMMODE CNTL – FORWARD
- If cabin dP/dT Alarm:
  16. WCS VAC VLV – CL
  17. COMMODE CNTL – BACK
  18. ✓MCC
- If no cabin dP/dT Alarm, continue
19. COMMODE CNTL – BACK
20. Rotate Commode Cntl vlv linkage ccw 1/4 turn (90 deg) against stop, do not overtorque

**CAUTION**

If Mode Cntl vlv will not rotate in next step, ensure Commode Cntl vlv linkage fully ccw against stop

21. MODE – AUTO
- ML86B:B 22. cb MNA,B WCS CNTLR (two) – cl

- MA73C:E  
WCS
23. cb AC1,2 WCS FAN SEP 1,2 (six) – cl
  24. MODE – COMMODE/MANUAL/EMU
  25. Rotate Commode Cntl vlv linkage cw 1/4 turn (90 deg) against stop; do not overtorque (wait 20 sec)
  26. COMMODE CNTL – FORWARD
  27. √WCS airflow at both commode and urinal; report to MCC
  28. COMMODE CNTL – BACK  
– DOWN
  29. Rotate Commode Cntl vlv linkage ccw against stop
  30. MODE – AUTO
  31. Stow tools, except WCS Linkage Tool

### REVISED WCS OPERATING PROCEDURES

#### CAUTION

This procedure bypasses normal interlocks which prevent opening a cabin leak path thru WCS. Before moving COMMODE CNTL – FORWARD, be sure Commode Cntl vlv linkage has been rotated 90 deg cw against stop

#### TO USE WCS:

1. MODE – COMMODE/MANUAL/EMU
2. Rotate Commode Cntl vlv linkage cw 1/4 turn (90 deg) against stop; do not over torque (wait 20 sec)
3. COMMODE CNTL – UP  
– FORWARD

#### TO SECURE WCS:

1. COMMODE CNTL – BACK  
– DOWN
2. Rotate Commode Cntl vlv linkage ccw 1/4 turn (90 deg) against stop; do not overtorque
3. MODE – AUTO

## WCS FAN SEP FAILURE (FAILED URINAL)

(1 hr) |

OBJECTIVE: Recover use of urinal in event of fan separator failure

LOCATION: WCS

TOOLS REQD:

BOB	Waste H2O Dump Filter (WWD)
CHCK	Y/Y Hose
	Free Fluid Nozzle
TOOL	Gray Tape, 2 in
WCS	Individual Urinal Funnel
	Prefilter Housing Block
	Washcloth

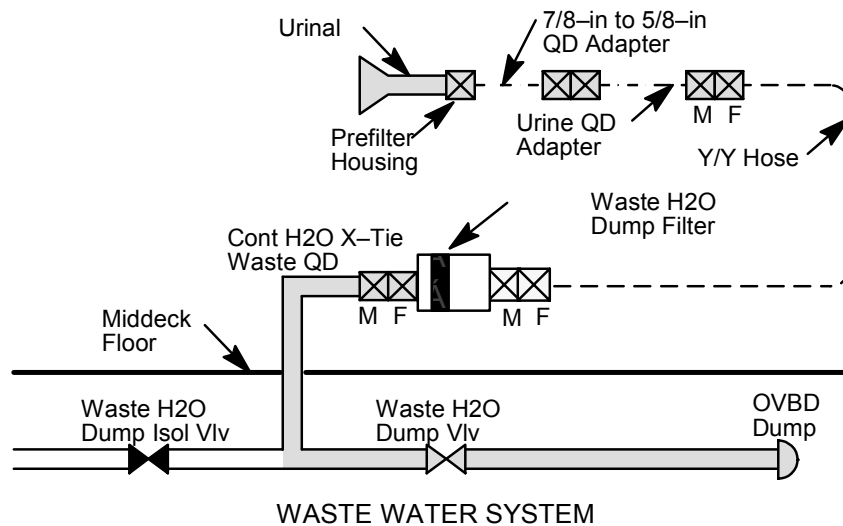
If first use:

1. Perform steps 3-21

If not first use:

2. Perform steps 12-21

ML31C 3. WASTE H2O DUMP ISOL VLV – CL (tb-CL)



jsc48025\_256\_w.cnv

4. Obtain Free Fluid Nozzle, demate upper assy from lower assy (threaded) as shown below



5. Disconnect urinal Prefilter Housing Block from WCS line at QD
6. Slide QD end of Prefilter Housing Block into open end of Free Fluid Nozzle, as shown below



7. Obtain a 6-in strip of 2-in wide Gray Tape and wrap it around assy at mating point between QD and Free Fluid Nozzle, as shown below



8. Obtain Washcloth, fold in half. Wrap Washcloth around assy as shown below. Ensure Washcloth wrapped in good config to allow changing urinal filter



- WCS
9. Tightly wrap 2-in wide Gray Tape around Washcloth
  10. Connect one end of Y/Y Hose to WASTE H2O DUMP FILTER
  11. Connect WASTE H2O DUMP FILTER to CONT H2O X-TIE WASTE QD
  12. SM 60 TABLE MAINT

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
WASTE H2O NOZ T A B	0620520	50	250
	0620519	50	250

**CAUTION**  
WASTE H2O NOZ T should not exceed 350

**SM 66 ENVIRONMENT**

13. Attach Individual Urinal Funnel to Prefilter housing
14.  $\sqrt{\text{WASTE DMP LN T}} > 50$

- \* If T < 50, enable 2nd Heater: \*
- \* ML86B:A \*
- \* cb MNB(MNA) H2O LINE HTR \*
- \* B(A) – cl \*

- ML31C 15. WASTE H2O DUMP VLV ENA/NOZ HTR – ON
- CRT 16. When WASTE H2O NOZ T A,B (two) > 250,  
continue
- 17. Connect free end of Y/Y Hose to Free Fluid  
Nozzle
- ML31C 18. WASTE H2O DUMP VLV – OP (tb-OP)

NOTE

Be aware of urine splashback due  
to decreased flow

WARNING

Urinal connected to vacuum. Allow for  
airflow. Do not 'Hard Dock' w/Urinal  
Funnel. Physical injury possible

- 19. Urinate into urinal funnel  
When urine cleared from hose and (CRT) WASTE  
H2O NOZ T A,B (two) > 250:
  - 20. WASTE H2O DUMP VLV – CL (tb-CL)  
ENA/NOZ – OFF  
(DUMP VLV tb-bp)
  - 21. Remove urinal funnel from Prefilter housing block
  - 22. For subsequent urinal ops, repeat steps 13-21
- When operations no longer desired:
- 23. Disconnect WASTE H2O DUMP FILTER  
from CONT X-TIE WASTE QD and stow  
hardware
  - 24. Disconnect Y/Y Hose from WASTE H2O  
DUMP FILTER and Prefilter Housing  
Block/Free Fluid Nozzle Assy. Place WASTE  
H2O DUMP FILTER and Prefilter Housing  
Block/Free Fluid Nozzle Assy in separate  
plastic (Ziplock) bags
  - 25. Stow hardware

ML31C  
CRT

26. WASTE H2O DUMP ISOL VLV – OP (tb-OP)  
27. √NOZ T A,B (two) – not incr

\* If NOZ T incr: \*  
\* ML86B:A \*  
\* cb MNA WASTE H2O DUMP \*  
\* VLV/NOZ HTR – op \*

28. SM 60 TABLE MAINT

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
WASTE H2O NOZ T A B	0620520	-82	250
	0620519	-82	250

## WCS FAN SEP 1(2) CLEARING

(30 min Setup)

**OBJECTIVE:** Clear flooded Fan Sep 1(2) by reducing Fan Sep outlet pressure by opening outlets to vacuum using Waste Water Dump System

### NOTE

Procedure should be performed only if both Fan Seps fail due to flooding

**LOCATION:** WCS

### TOOLS REQD:

MISC Towels (as reqd)  
Trash Bag Liner  
Goggles, Gloves, & Mask (CCK)

1. Consult MCC for possible Waste H2O dump if:  
WASTE QTY 1 > 58%
2. **SM 60 TABLE MAINT**

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
WASTE H2O NOZ T A B	0620520	60	250
	0620519	60	250

### **SM 66 ENVIRONMENT**

3.  $\sqrt{\text{H2O WASTE DMP LN T}} > 50$

\* If H2O WASTE DMP LN T < 50, \*  
\* enable 2nd heater: \*  
\* ML86B:A \*  
\* cb MNB(MNA) H2O LINE HTR \*  
\* B(A) – CL \*

- ML31C
4. WASTE H2O DUMP VLV ENA/NOZ HTR – ON  
 $\sqrt{\text{VLV}} - \text{CL (tb-CL)}$
  5. When H2O WASTE NOZ T A,B (two) exceed 250 (~10 min), continue
  6. WASTE H2O TK1 VLV – CL (tb-CL)  
 $\sqrt{\text{DUMP ISOL VLV}} - \text{OP (tb-OP)}$   
 $\sqrt{\text{VLV}} - \text{OP (tb-OP)}$

W-70

IFM/ALL/GEN F,10



- CCK  
WCS
7. Don Goggles, Gloves, Mask
  8. Remove odor/bacteria filter and install towel(s) loosely in filter cavity (absorbs backflowing liquid)
  9. √FAN SEP same as HOSE BLOCK
    - √MODE – AUTO
    - √CRADLE – AUTO
    - Unstow hose
    - √Airflow
    - √WCS ON Lt – ON
  10. Allow fan to run until it clears (runs faster, more noise, more airflow)

NOTE

FAN SEP will run for ~30 sec  
after hose stowage

11. Stow hose in cradle
  - √WCS ON Lt – OFF
12. Repeat steps 9,10 for alternate Fan Sep, if necessary. See WCS (Cue Card) (ORB OPS, FAN SEP SWITCHING)
- ML31C 13. WASTE H2O DUMP VLV – CL (tb-CL)
  - ENA/NOZ HTR – OFF (tb-bp)
- CRT 14. √WASTE H2O NOZ T A,B (two) – not incr

- \* If NOZ T incr: \*
- \* ML86B:A \*
- \* cb MNA WASTE H2O DUMP \*
- \* VLV/NOZ HTR – op \*

15. SM 60 TABLE MAINT

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
WASTE H2O NOZ T A B	0620520	-82	250
	0620519	-82	250

ML31C  
WCS

16. WASTE H2O TK1 VLV – OP (tb-OP)
17.  FAN SEP same as HOSE BLOCK
  - MODE – AUTO
  - CRADLE – AUTO
  - Unstow hose
  - Airflow
  - WCS ON Lt – ON
18. Run fan for 2 min, then:

NOTE

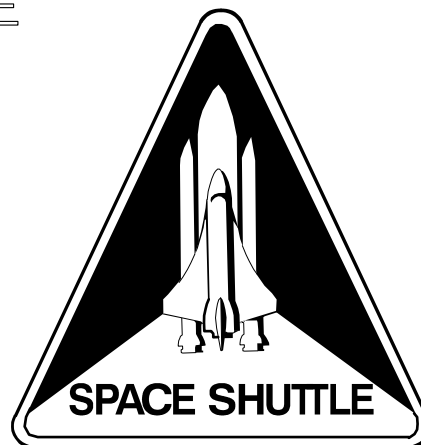
FAN SEP will run for ~30 sec  
after hose stowage

19. Stow hose in cradle
  - WCS ON Lt – OFF
20. Remove towels from odor/bacteria filter cavity,  
place towels in trash bag liner and stow in wet  
trash
21. Replace odor/bacteria filter
22. Resume normal WCS ops

Sections X, Y, & Z  
Intentionally  
Omitted

Space Shuttle Program  
FLIGHT DATA FILE

JSC-48025  
GENERIC, REV F



<b>IFM</b> <b>CHECKLIST</b>	<b>STS</b> <b>ALL</b>
--------------------------------	--------------------------

Flight Cover (trim bottom to expose tabs)