



International Space Station Multi-Purpose Logistics Module Book

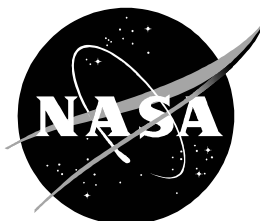
**Mission Operations Directorate
Operations Division**

20 JUN 05

**This publication replaces
all previous publications.**
**These procedures are available
electronically on the SODF Homepage
at <http://mod.jsc.nasa.gov/do3>**

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas

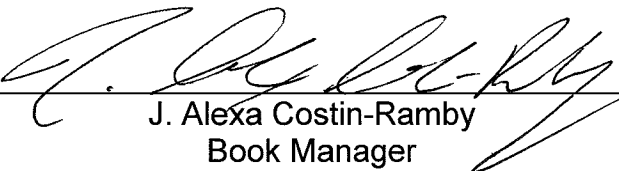


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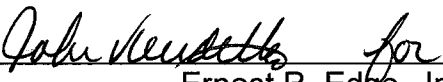
INTERNATIONAL SPACE STATION MULTI-PURPOSE LOGISTICS MODULE BOOK

20 JUN 05

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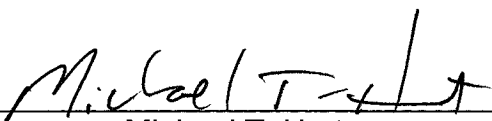


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This document is under the configuration control of the Systems Operations Data File Control Board (SODFCB).

Incorporates the following:
CR: MPLM_U127 MPLM_U130 MPLM_U131

Uplinked Messages (or Approved Flight Notes) replaced by this revision,
remove from Book:

None

**INTERNATIONAL SPACE STATION
MULTI-PURPOSE LOGISTICS MODULE BOOK**

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NOMINAL

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1.101 MPLM ENVIRONMENT CHECK

(MPLM/LF1 - ALL/FIN 3)

Page 1 of 4 pages

I

OBJECTIVE:

Measure the MPLM temperature and pressure.

NOTE

1. Ground is prime for this procedure.
2. Verify shuttle APCU power is active.
3. Wait 5 minutes after applying ISS power to ensure MPLM MDM bootup is complete.

PCS

1. MDM MPLM I/O CHECK

Wait 5 minutes after applying ISS power.

Task:

Task Nav

'Multi-flight Task Displays'

sel MPLM Act-Deact

MPLM Act-Deact

'MDM Control'

sel MPLM MDM

MDM MPLM

√MDM ID MPLM Frame Count – incrementing

√MDM ID MPLM Sync Status – In Sync

2. PDB ACTIVATION AND CHECKOUT

MPLM Act-Deact

'PDB Control'

sel PDB Details

PDB Details

cmd APS – On

√APS Posn – On

√PDB Input Voltage (Orbiter) \geq 116V

√PDB Current: 0.5 to 1.0A

MPLM Act-Deact

'PDB Control'

√RPC 01 MDM – CI

√All other RPCs – Op

1.101 MPLM ENVIRONMENT CHECK

(MPLM/LF1 - ALL/FIN 3)

Page 2 of 4 pages

3. MPLM CAB FAN ACTIVATION

3.1 Smoke Detector Activation

MPLM: ECLSS: Smoke Detector

MPLM Smoke Detector

sel MPLM PDB RPC 13

PDB Details

cmd RPC 13 – Close (Verify DSD RPC Posn – CI)

MPLM Smoke Detector

'Active BIT'

cmd Initiate

Wait 5 seconds.

'Passive BIT'

√Lens Status – Clean

√Degraded – blank

'Smoke Status'

√Smoke Status – No Smoke

3.2 Cab Fan Activation

MPLM: ECLSS: Cab Fan

MPLM Cabin Fan

sel MPLM PDB RPC 11

PDB Details

cmd RPC 11 – Close (Verify CFA RPC Posn – CI)

MPLM Cabin Fan

'State – On'

cmd On

√State – On

√Speed: 3056 to 4048 rpm

1.101 MPLM ENVIRONMENT CHECK

(MPLM/LF1 - ALL/FIN 3)

Page 3 of 4 pages

4. MPLM ENVIRONMENT CHECK

Wait 15 minutes after fan activation to mix MPLM air.

Checking Pressure and Temperature

MPLM: ECLSS

'Cabin Air T'

Record Cabin Air Temperature _____ deg C

Record GMT _____

'Cab P Avg'

Record Average Cabin Air Pressure _____ mmHg

If only one APCU 1(2) providing power to MPLM

Task:

'Multi-flight Task Displays'

sel MPLM Act-Deact

'PDB Control'

sel PDB Details

cmd All GLAs – ON

5. MPLM CAB FAN DEACTIVATION

5.1 Cabin Fan Deactivation

MPLM: ECLSS: Cab Fan

'Off'

cmd Arm

cmd Off

√State – Off

√Speed: 2000 rpm

sel MPLM PDB RPC 11

cmd RPC 11 – Open (√CFA RPC Posn – Op)

1.101 MPLM ENVIRONMENT CHECK

(MPLM/LF1 - ALL/FIN 3)

Page 4 of 4 pages

5.2 Smoke Detector Deactivation

PDB Details

cmd RPC 13 – Open (√DSD RPC Posn – Op)

6. MPLM PDB DEACTIVATION

If GLA lights are On

PDB Details

cmd All GLAs – OFF

NOTE

PDB data becomes unchanging and invalid when PDB Aux Pwr is removed in next step.

Commanding APS Off

PDB Details

cmd APS – Off

√APS Posn – Off

1.102 NODE 1 TO MPLM VESTIBULE PRESSURIZATION AND LEAK CHECK

I

(MPLM/LF1 - ALL/FIN 6) Page 1 of 7 pages

OBJECTIVE:

Utilize Internal Sampling Adapter (ISA), Vacuum Access Jumper (VAJ), Scopemeter, Scopemeter Pressure Probe to verify integrity of pressure in Node 1 Deck to MPLM Vestibule, post MPLM mating.

LOCATION:

Node 1 Deck Hatch

DURATION:

30 min

CREW:

One

PARTS:

None

MATERIALS:

9V Alkaline Battery (if Battery changeout required)
Ear Plugs

TOOLS:

Internal Sampling Adapter (ISA) P/N 97M55830-1
5 ft VAJ P/N 683-17111-1
Scopemeter and Accessories Kit: P/N SJG33115340-301
Scopemeter P/N SEG39129678-303
ISA Scopemeter Pressure Probe P/N 97M55830-1
ISS IVA Toolbox:
Drawer 3
#0 Phillips Screwdriver (if Battery change out required)

1. SETTING UP SCOPEMETER

NOTE

ISA has two identical ISA VAJ Ports. To ensure proper Scopemeter Accuracy Verification, one ISA VAJ Port must be capped.

1.1 Gamah Cap ←|→ ISA VAJ Port
√Gamah Cap →|← remaining ISA VAJ Port
Hand tighten.

1.2 √ISA Scopemeter Pressure Probe →|← ISA

NOTE

Plug marked "COM" must be inserted in COM jack on Scopemeter; plug marked "V" must be inserted in EXT mV jack. ISA Scopemeter Pressure Probe slide switch will be facing away from user.

1.102 NODE 1 TO MPLM VESTIBULE PRESSURIZATION AND LEAK CHECK

(MPLM/LF1 - ALL/FIN 6) Page 2 of 7 pages

- 1.3 ISA Scopemeter Pressure Probe COM plug →|← COM jack (black) on top of Scopemeter
V plug of ISA Scopemeter Pressure Probe →|← EXT mV jack of Scopemeter
Refer to Figure 1.



Figure 1.- ISA Scopemeter Pressure Probe Connected to Scopemeter.

- 1.4 √ISA Scopemeter Pressure Probe slide switch – OFF
- 1.5 While holding down F5, press and release ON/OFF. Listen for two beeps, release F5.
- 1.6 Set up Scopemeter for pressure measurement.
F5 → Press (to select EXT.mV)
F1 → Press (to select CLOSE)
- 1.7 Verify voltage reading > 80 mVDC (good ISA Scopemeter Pressure Probe battery indication).

If voltage reading < 80 mVDC, ISA Scopemeter Pressure Probe battery must be replaced.

Replace 9V Battery by removing noncaptive screw on back of probe (#0 Phillips Screwdriver).
- 1.8 Select mmHg on ISA Scopemeter Pressure Probe using slide switch.

1.102 NODE 1 TO MPLM VESTIBULE PRESSURIZATION AND LEAK CHECK

(MPLM/LF1 - ALL/FIN 6) Page 3 of 7 pages

2. VERIFYING ISA SCOPEMETER PRESSURE PROBE ACCURACY

NOTE

ISA Scopemeter Pressure Probe displays 1 mV of output per pressure unit. Ex. 0.760 V = 760 mV = 760 mmHgA

2.1 Record ISA Scopemeter Pressure Probe P1: _____ mmHg

PCS

2.2 US Lab: ECLSS

Lab: ECLSS

Record Cab Press P2: _____ mmHg

* If $\Delta P |P1-P2| > 20$ mmHg
* | Notify **MCC-H** ISA Scopemeter Pressure Probe inaccurate.
* | \checkmark **MCC-H** for further instructions

3. CONNECTING VAJ, ISA, MANUAL PRESSURE EQUALIZATION VALVE (MPEV)

Node 1
Deck Hatch

3.1 \checkmark Node 1 Deck MPEV – CLOSED

3.2 Cap \leftarrow | \rightarrow ISA Sampling Port
 \checkmark ISA Sampling Port Valve – CLOSED
Refer to Figure 2.

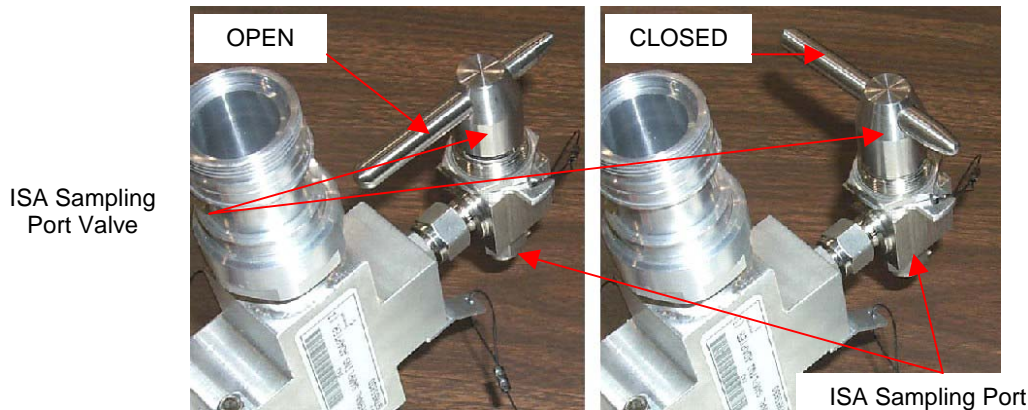


Figure 2.- ISA Sampling Port Valve.

3.3 Gamah Cap \leftarrow | \rightarrow 5 ft VAJ (both ends)
Inspect seals for any visible damage.
 \checkmark **MCC-H** if any damage noted to seals

1.102 NODE 1 TO MPLM VESTIBULE PRESSURIZATION AND LEAK CHECK CHECK

(MPLM/LF1 - ALL/FIN 6) Page 4 of 7 pages

- 3.4 5 ft VAJ (straight end) →|← ISA VAJ Port
 Hand tighten.
 Refer to Figure 3.

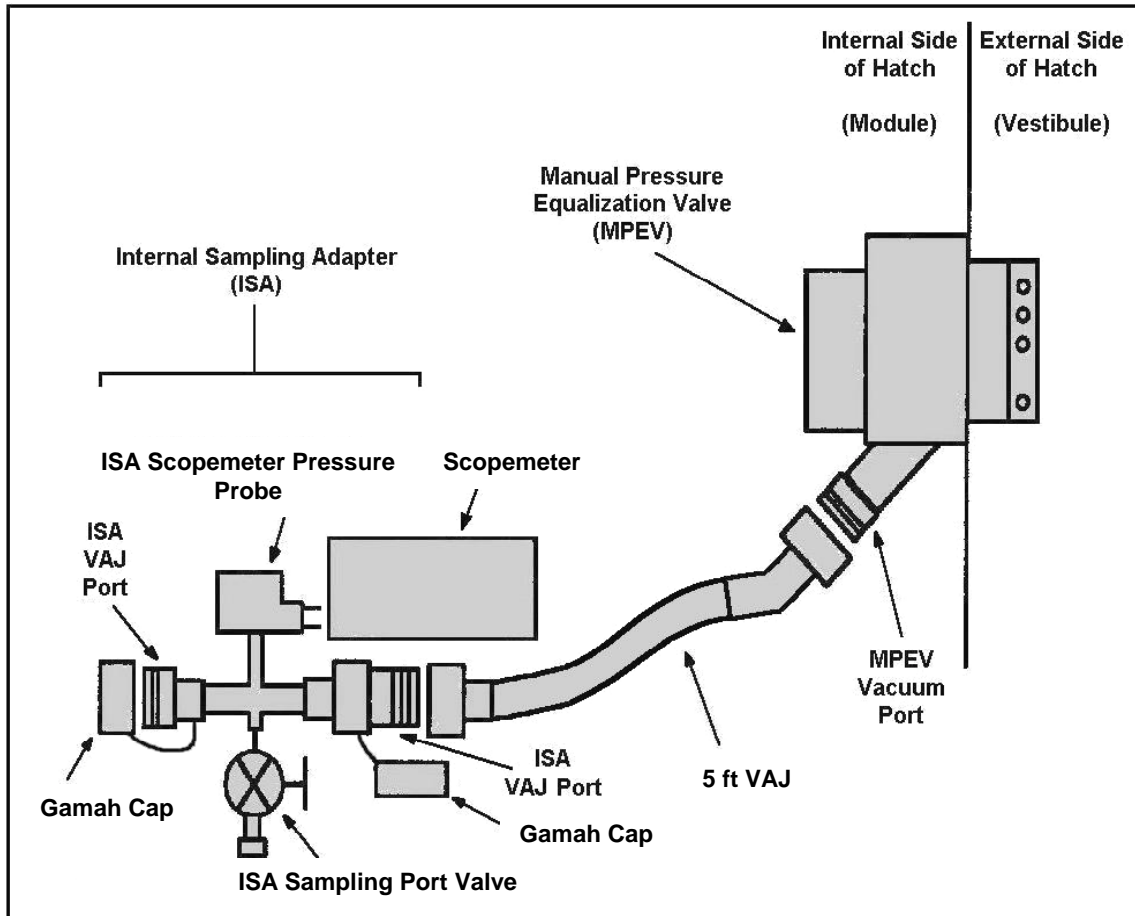


Figure 3.- ISA/VAJ/MPEV Connection.

- Node 1 Deck Hatch 3.5 Cap ←|→ Node 1 Deck MPEV
 5 ft VAJ (bent end) →|← Node 1 Deck MPEV
 Hand tighten.
 Refer to Figure 3.

WARNING

VAJ will move when pressurized or evacuated. Failure to secure ISA/VAJ Assembly may result in injury to crew and/or damage to equipment.

- 3.6 Secure ISA/VAJ Assembly.

1.102 NODE 1 TO MPLM VESTIBULE PRESSURIZATION AND LEAK CHECK

(MPLM/LF1 - ALL/FIN 6) Page 5 of 7 pages

4. CHECKING ISA/VAJ CONNECTION FOR LEAKS

WARNING

Opening the MPEV will start the pressurization of the ISA/VAJ setup and may cause a loud hissing noise. Crew in the vicinity should don Ear Plugs.

4.1 Don Ear Plugs.

Node 1
Deck Hatch

4.2 **ON MCC-H Go**
Node 1 Deck MPEV → OPEN
Wait 5 minutes.

4.3 Node 1 Deck MPEV → CLOSED
Wait 3 minutes, then monitor ISA/VAJ pressure for 5 minutes.

* If $\Delta P > 5$ mmHg during 5 minute monitoring period
* | Notify **MCC-H** of suspected ISA/VAJ leak.
* | $\sqrt{\text{MCC-H}}$ for further instructions

5. PRESSURIZING VESTIBULE

WARNING

1. Opening the ISA Sampling Port Valve will start the pressurization of the vestibule and may cause a loud hissing noise. Ear Plugs are required for crew in the vicinity.
2. Keep clear of inlet of ISA Sampling Port Valve when opened.

5.1 Node 1 Deck MPEV → OPEN

NOTE

1. To obtain accurate measurements, pressure readings should be taken only when ISA Sampling Port Valve is CLOSED.
2. Pressure readings should be noted every 2 minutes, but do not need to be recorded or reported to **MCC-H**.
3. Vestibule should pressurize to 550 mmHg in approximately 8 minutes.

5.2 ISA Sampling Port Valve → OPEN
Wait 2 minutes.
Refer to Figure 2.

5.3 ISA Sampling Port Valve → CLOSED
Note Scopemeter Pressure Probe reading.

1.102 NODE 1 TO MPLM VESTIBULE PRESSURIZATION AND LEAK CHECK

(MPLM/LF1 - ALL/FIN 6) Page 6 of 7 pages

5.4 Repeat steps 5.2 to 5.3 until Scopemeter Pressure Probe P ~ 550 mmHg (~8 minutes).

5.5 ISA Sampling Port Valve → CLOSED

5.6 Doff Ear Plugs.

6. PERFORMING GROSS LEAK CHECK

Scope
meter

6.1 Record Scopemeter Pressure Probe P1: _____ mmHg
Record GMT ____/____:____:____ GMT
Notify **MCC-H** pressure reading.

6.2 Wait 10 minutes for thermal stabilization.

6.3 Record Scopemeter Pressure Probe P2: _____ mmHg
Record GMT ____/____:____:____ GMT
Notify **MCC-H** pressure reading.

6.4 Wait 10 minutes.

6.5 Record Scopemeter Pressure Probe P3: _____ mmHg
Record GMT ____/____:____:____ GMT
Notify **MCC-H** pressure reading.

* If $\Delta P |P2-P3| > 4$ mmHg during monitoring period
* | Notify **MCC-H** of suspected vestibule leak.
* | $\sqrt{\text{MCC-H}}$ for further instructions

7. EQUALIZING VESTIBULE PRESSURE POST LEAK CHECK

WARNING

Opening the ISA Sample Port and MPEV will equalize ISS with the vestibule and may cause a loud hissing noise. Crew in the vicinity should don Ear Plugs.

7.1 Don Ear Plugs.

Node 1
Deck Hatch

7.2 Node 1 Deck MPEV → CLOSED

7.3 ISA Sampling Port Valve → Open
Wait 10 seconds.

7.4 5 ft VAJ (bent end) ←|→ Node 1 Deck MPEV
Gamah Cap →|← 5 ft VAJ (bent end)

1.102 NODE 1 TO MPLM VESTIBULE PRESSURIZATION AND LEAK CHECK

(MPLM/LF1 - ALL/FIN 6) Page 7 of 7 pages

7.5 Node 1 Deck MPEV → OPEN

PCS

7.6 US Lab: ECLSS
Lab: ECLSS

When dp/dt ~0 (approximately 30 seconds)
Node 1 Deck MPEV → CLOSED

7.7 Doff Ear Plugs.

8. POST MAINTENANCE

Scope
meter

8.1 ON/OFF → Press (to power down Scopemeter)

8.2 Scopemeter Pressure Probe slide switch → OFF

8.3 Scopemeter ←|→ Scopemeter Pressure Probe on ISA

8.4 5 ft VAJ (straight end) ←|→ ISA VAJ Port
Gamah Cap →|← 5 ft VAJ (straight end)
Gamah Cap →|← ISA VAJ Port

8.5 √ISA Sampling Port Valve – OPEN
Cap →|← ISA Sampling Port
Refer to Figure 2

8.6 Check for FOD within 3' radius.

8.7 Notify **MCC-H** of task completion.

8.8 Stow tools, materials.
Update IMS with stowage location of hardware.

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1.103 MPLM ACTIVATION

(MPLM/ULF1 - ALL/FIN 3)

Page 1 of 11 pages

I

OBJECTIVE:

Activate the MPLM in preparation for ingress. This procedure is performed in parallel with S&M/1.108 MPLM VESTIBULE - CONFIGURE FOR INGRESS.

√**MCC-H** for MPLM manual or automatic activation preference

WARNING

MPLM power umbilical mating operations must be complete prior to performing MPLM activation to avoid electrical shock hazard.

NOTE

1. Verify with crewmembers performing S&M/1.108 MPLM VESTIBULE - CONFIGURE FOR INGRESS that MPLM Power (one) and 1553 Data Jumpers (two) are installed, associated C&DH buses have been reconfigured, and they are ready for MPLM activation up through completion of auto(manual) activation part 1.
2. Wait 5 minutes after applying ISS power to ensure MPLM MDM bootup is complete.
3. **MCC-H:** Expect '**I/O Card BIT Status Fail**' message due to smoke detector being powered off.

* If activating MPLM on APCU power, go to step 3.

PCS

1. ACTIVATING MPLM ON ISS POWER

1.1 Verify MPLM Power Inhibits No Longer Required

Verify with ISS IV crew that MPLM power jumper installation is complete.

1.2 Verify RPCM LA2A3B D On

US Lab: EPS: Lab Rack LAB1O6

Lab Rack LAB1O6

sel RPCM LA2A3B D

RPCM_LA2A3B_D

√Integ Counter – incrementing

√Bus Voltage, V: 120.2 to 128.8V

1.103 MPLM ACTIVATION

(MPLM/ULF1 - ALL/FIN 3)

Page 2 of 11 pages

2. CLOSING RPC TO APPLY POWER TO MPLM

RPCM_LA2A3B_D

sel RPC 4

RPCM_LA2A3B_D_RPC_04

cmd Close Cmd – Enable (√ – Ena)

cmd RPC Position – Close (Verify – Cl)

* If activating MPLM on ISS power, go to step 4.

3. ACTIVATING MPLM ON APCU POWER

3.1 Verify APCU Input Power

R1 √tb PL PRI MNC – On

3.2 Verify APCU Control Power

√PL CAB – MNA

√PL AUX – On

3.3 Verify APCU Switch Power

L12U √cb SW PWR 1 – Cl (cb2)

CAUTION

To prevent damage to internal converter and relay, APCU output relay must not be opened or closed under load (CONV – On (tb – gray)).

3.4 Verify APCU 1,2 Deactivated

√APCU 1,2 CONV (two) – Off

√tb APCU 1,2 CONV (two) – bp

3.5 Close APCU Output Relays

Verify with ISS IV crew that {1.108 MPLM VESTIBULE -
CONFIGURE FOR INGRESS} (SODF: S&M: NOMINAL:
VESTIBULE) is complete through step 20.

Notify ISS IV crew that APCU power is coming ON.

APCU 1 OUTPUT RLY (two) → Close

3.6 Turn APCU Converters On

APCU 1,2 CONV (two) → On

√tb APCU 1,2 CONV (two) – gray

√tb APCU 1 OUTPUT RLY – gray

SM 200 APCU STATUS

√APCU 1,2 OUT VOLTS RES LOW (two) 120 to 128V

1.103 MPLM ACTIVATION

(MPLM/ULF1 - ALL/FIN 3)

Page 3 of 11 pages

MCC-H 4. LOADING MPLM LOCATION PPL

To build and uplink data load command to the Primary INT SYS MDM, DRAM, perform {1.231 CCS BUILD DATA LOAD COMMAND}, all (SODF: GND AVIONICS: C&DH: NOMINAL), then:

input Load Image file – intr2_ppl_0060_4_a_00002.lif

input Ops name – MPLM attached to Node 1

PCS

CDH: INT PRIMARY: PPL Version IDs

Primary Int PPL Version IDs

'MPLM Location'

√Version Number – 60

√Version ID – 2

5. ENABLING INTSYS MDM TO MPLM MDM I/O

Wait 5 minutes after applying ISS power, then:

Task:

Task Nav

'Multi-flight Task Displays'

sel MPLM Act-Deact

MPLM Act-Deact

'MDM Control'

sel Primary Int MDM

Primary Int MDM

sel LB SYS HAB 1

LB SYS HAB1

sel RT Status

LB SYS HAB 1 RT Status

cmd 17 MPLM-1 RT Status – Enable Execute

√17 MPLM-1 RT Status – Ena

cmd 17 MPLM-1 RT FDIR Status – Enable FDIR Execute

√17 MPLM-1 RT FDIR Status – Ena

MPLM Act-Deact

'MDM Control'

sel MPLM MDM

1.103 MPLM ACTIVATION

(MPLM/ULF1 - ALL/FIN 3)

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MDM MPLM

- √MDM ID: MPLM Frame Count – incrementing
- √MDM ID: MPLM Sync Status – In Sync
- √I/F Scenario – USOS

6. PDB ACTIVATION AND CHECKOUT

MPLM Act-Deact

'PDB Control'

sel PDB Details

PDB Details

cmd APS – On

NOTE

MPLM can be powered from either the orbiter APCU or USOS ISS power. While powered from either orbiter APCU or ISS power, the MPLM PDB Input Voltage telemetry will show on the PCS in the PDB Input Voltage (Orbiter) field.

- √APS Posn – On
- √PDB Input Voltage (Orbiter) $\geq 116V$
- √PDB Current: 0.5 to 1.0A

MPLM Act-Deact

'PDB Control'

Verify RPC 01 MDM Posn – CI

- √All other RPCs Posn – Op

7. ACTIVATING MPLM ISS SHELL HEATERS

- √**MCC-H** if MPLM air temperature is estimated to be $<10^{\circ}$ F above the calculated ISS dew point, perform the following:

'PDB Control'

sel PDB Details

PDB Details

cmd RPC 23 – Close

Verify RPC 23 Shell Htr Posn – CI

Verify RPC 23 Shell Htr Voltage, V: 115 to 130V

8. VERIFYING MPLM CONFIGURATION FOR ACTIVATION

8.1 Powering and Enabling Node 1 IMV Valve

'IMV and SDS'

sel Node 1 IMV Deck Aft

sel RPCM N13B B RPC 15

√Close Cmd – Ena

cmd RPC Position – Close (Verify – CI)

'Enable'

cmd Arm (√Arm Status – Armed)

cmd Enable (√State – Enabled)

8.2 Verifying MPLM Configuration

Task:

'Multi-flight Task Displays'

sel MPLM Act-Deact

'IMV and SDS'

√Node 1 IMV Deck Aft Vlv Posn – CI

√MPLM IMV Aft, Fwd Vlv Posn (two) – CI

√MPLM SDS IsoV Vlv Posn – CI

'DA and PPRA'

√DA1 Inbd,Outbd Vlv Posn (two) – CI

√DA2 Inbd,Outbd Vlv Posn (two) – CI

√PPRA 1,2,3 Vlv Posn (three) – Op

'Automatic Control – Auto Activate'

√Part 1 Activate Status – Idle

√Part 2 Activate Status – Idle

'Automatic Control – Auto Deactivate'

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√Deactivate Status – Idle

For MANUAL ACTIVATION PART 1, go to step 10.

9. AUTO ACTIVATION PART 1

'Automatic Control – Auto Activate'

cmd Part 1 – Arm

√Part 1 Arm Status – No Error

√Part 1 Activate Status – Armed

cmd Part 1 – Activate

√Part 1 Activate Status – Activating

When Part 1 Activate Status – Idle (75 seconds from Activate command),
continue

'PDB Control'

√RPC 11 Cab Fan Posn – CI

√RPC 13 SD Posn – CI

'SD, Cab Fan, and Pressure'

√SD Status – No Fire

√Cab Fan Spd: 3056 to 4048 rpm

10. AUTO ACTIVATION PART 2

Verify with crewmembers performing {1.108 MPLM VESTIBULE
- CONFIGURE FOR INGRESS} (SODF: S&M: NOMINAL: VESTIBULE)
that the Node 1 to MPLM IMV Supply Jumper (Aft) is installed and is
ready for MPLM AUTO ACTIVATION PART 2.

If **MCC-H** directs MANUAL ACTIVATION PART 2, go to step 11.

Task:

'Multi-flight Task Displays'

sel MPLM Act-Deact

'Automatic Control – Auto Activate'

cmd Part 2 – Arm

√Part 2 Arm Status – No Error

√Part 2 Activate Status – Armed

cmd Part 2 – Activate

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√Part 2 Activate Status – Activating

When Part 2 Activate Status – Idle (2 minutes from Activate command),
continue

'IMV and SDS'

√MPLM IMV Aft, Fwd Vlv Posn (two) – Op

'DA and PPRA'

√PPRA 1,2,3 Vlv Posn (three) – CI

'PDB Control'

Verify RPC 02 Gen Lt 1 Posn – CI

Verify RPC 03 Gen Lt 2 Posn – CI

Verify RPC 04 Gen Lt 3 Posn – CI

Verify RPC 05 Gen Lt 4 Posn – CI

Verify RPC 06 Gen Lt 5 Posn – CI

Verify RPC 07 Gen Lt 6 Posn – CI

Verify RPC 08 Gen Lt 7 Posn – CI

Verify RPC 09 Gen Lt 8 Posn – CI

Verify RPC 10 Emer Lts Posn – CI

√Converter 1,2 Status (two) – Off

Report to **MCC-H**, "MPLM AUTO ACTIVATION is complete." >>

11. [MANUAL ACTIVATION PART 1](#)

NOTE

This step required only if MPLM ACTIVATION PART
1 not performed using automatic macro command.

11.1 Activate SD

Task:

'Multi-flight Task Displays'

sel MPLM Act-Deact

'PDB Control'

sel PDB Details

cmd RPC 13 – Close (Verify DSD RPC Posn – CI)

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(MPLM/ULF1 - ALL/FIN 3)

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MPLM Act-Deact

'SD, Cab Fan, and Pressure'

sel MPLM SD

MPLM Smoke Detector

'Active BIT'

cmd Initiate

Wait 5 seconds.

√Smoke Status – No Smoke

11.2 Activate Cab Fan

Task:

Task Nav

'Multi-flight Task Displays'

sel MPLM Act-Deact

MPLM Act-Deact

'PDB Control'

sel PDB Details

PDB Details

cmd RPC 11 – Close (Verify CFA RPC Posn – CI)

MPLM Act-Deact

'SD, Cab Fan, and Pressure'

sel MPLM Cab Fan

MPLM Cabin Fan

'State – On'

cmd On

√State – On

√Speed: 3056 to 4048 rpm

12. MANUAL ACTIVATION PART 2

NOTE

1. Verify with crewmembers performing 1.108 MPLM VESTIBULE - CONFIGURE FOR INGRESS that the Node 1 to MPLM IMV Supply Jumper (Aft) is installed and is ready for MPLM MANUAL ACTIVATION PART 2.
2. This step is required only if MPLM ACTIVATION PART 2 is not performed using automatic macro command.

12.1 Enable MPLM IMV Valve Power

Task:

'Multi-flight Task Displays'

sel MPLM Act-Deact

'PDB Control'

sel PDB Details

cmd Converter 02 – On (√Posn – On)

cmd RPC 15 – Close (Verify ISOV1 RPC Posn – Cl)

cmd RPC 16 – Close (Verify ISOV2 RPC Posn – Cl)

12.2 Open MPLM IMV Valves

Task:

'Multi-flight Task Displays'

sel MPLM Act-Deact

'IMV and SDS'

sel MPLM IMV Aft

'Position – Open'

cmd Open (√Position – Open)

'IMV and SDS'

sel MPLM IMV Fwd

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MPLM IMV Ovhd Fwd Vlv

'Position – Open'

cmd Open ($\sqrt{\text{Position – Open}}$)

12.3 Remove Power from IMV

Task:

Task Nav

'Multi-flight Task Displays'

sel MPLM Act-Deact

MPLM Act-Deact

'PDB Control'

sel PDB Details

PDB Details

cmd RPC 15 – Open ($\sqrt{\text{ISOV1 RPC Posn – Op}}$)

cmd RPC 16 – Open ($\sqrt{\text{ISOV2 RPC Posn – Op}}$)

cmd Converter 02 – Off ($\sqrt{\text{Posn – Off}}$)

12.4 Enabling PPRA Motorized Valve Power

cmd Converter 01 – On ($\sqrt{\text{Posn – On}}$)

cmd RPC 27 – Close (Verify PPRA All RPC Posn – Cl)

12.5 Close PPRA Motorized Valves

Task:

Task Nav

'Multi-flight Task Displays'

sel MPLM Act-Deact

MPLM Act-Deact

'DA and PPRA'

sel MPLM PPRA

MPLM PPR Assemblies

cmd PPRA 1,2,3 (three) – Close

$\sqrt{\text{PPRA 1,2,3 Valve Position (three) – Closed}}$

12.6 Remove Power from PPRAs

Task:

Task Nav

'Multi-flight Task Displays'

sel MPLM Act-Deact

1.103 MPLM ACTIVATION

(MPLM/ULF1 - ALL/FIN 3)

Page 11 of 11 pages

MPLM Act-Deact

'PDB Control'

sel PDB Details

PDB Details

cmd RPC 27 – Open ($\sqrt{\text{PPRA All RPC Posn – Op}}$)

cmd Converter 01 – Off ($\sqrt{\text{Posn – Off}}$)

12.7 Configuring General Lighting

PDB Details

'All GLAs'

cmd All GLAs – ON

Verify RPC 02 GLA1 Posn – CI

Verify RPC 03 GLA2 Posn – CI

Verify RPC 04 GLA3 Posn – CI

Verify RPC 05 GLA4 Posn – CI

Verify RPC 06 GLA5 Posn – CI

Verify RPC 07 GLA6 Posn – CI

Verify RPC 08 GLA7 Posn – CI

Verify RPC 09 GLA8 Posn – CI

12.8 Enable Power to Emergency Egress Lights

cmd RPC 10 – Close (Verify ELPS RPC Posn – CI)

$\sqrt{\text{RPC 10 ELPS Voltage, V: 116 to 130V}}$

Report to **MCC-H**, "MPLM MANUAL ACTIVATION is complete."

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OBJECTIVE:

Ingress and configure the MPLM for on-orbit operations.

EQUIPMENT REQUIRED:

Unstow:

- R&MAs
- PBA
- PFE
- Air Sample Bottle
- Surgical Masks
- Eye Protection

CAUTION
Wear Surgical Masks and Eye Protection if initial MPLM ingress.

- | | | | | | | | | | | | | | |
|------------------------------|---|----------|------------------------------|------|--------------------|------|----------------|---------------|------|-------------------------|------|-------------------------|----------------------|
| MPLM Hatch | <p>1. <u>INGRESSING MPLM</u></p> <p>1.1 Open Hatch per decal.</p> <p style="padding-left: 40px;">√MPEV – CLOSED</p> | | | | | | | | | | | | |
| MPLM | <p>1.2 Visually inspect MPLM for condensation, atmosphere quality, general condition, etc.
Report condition to MCC-H.</p> <p>1.3 Collect one air sample inside the MPLM and label location and GMT of sample.</p> <p>1.4 Stow Air Sample Bottle for return to Houston.</p> | | | | | | | | | | | | |
| PCS | <p>2. <u>OPENING NODE 1 DECK AFT IMV VLV</u></p> <p>2.1 Task:</p> <table border="0" style="margin-left: 20px;"><tr><td style="border: 1px solid black; padding: 2px;">Task Nav</td></tr><tr><td>'Multi-flight Task Displays'</td></tr><tr><td>
</td></tr><tr><td>sel MPLM Act-Deact</td></tr><tr><td>
</td></tr><tr><td style="border: 1px solid black; padding: 2px;">MPLM Act-Deact</td></tr><tr><td>'IMV and SDS'</td></tr><tr><td>
</td></tr><tr><td>sel Node 1 IMV Deck Aft</td></tr><tr><td>
</td></tr><tr><td style="border: 1px solid black; padding: 2px;">Node 1 IMV Deck Aft Vlv</td></tr><tr><td>'RPCM N13B B RPC 15'</td></tr></table> | Task Nav | 'Multi-flight Task Displays' |
 | sel MPLM Act-Deact |
 | MPLM Act-Deact | 'IMV and SDS' |
 | sel Node 1 IMV Deck Aft |
 | Node 1 IMV Deck Aft Vlv | 'RPCM N13B B RPC 15' |
| Task Nav | | | | | | | | | | | | | |
| 'Multi-flight Task Displays' | | | | | | | | | | | | | |
|
 | | | | | | | | | | | | | |
| sel MPLM Act-Deact | | | | | | | | | | | | | |
|
 | | | | | | | | | | | | | |
| MPLM Act-Deact | | | | | | | | | | | | | |
| 'IMV and SDS' | | | | | | | | | | | | | |
|
 | | | | | | | | | | | | | |
| sel Node 1 IMV Deck Aft | | | | | | | | | | | | | |
|
 | | | | | | | | | | | | | |
| Node 1 IMV Deck Aft Vlv | | | | | | | | | | | | | |
| 'RPCM N13B B RPC 15' | | | | | | | | | | | | | |

√RPC Position – Closed

'State'

√State – Enabled

2.2 'Open'

cmd Arm (√Status – Armed)

cmd Open (√Position – In Transit)

Wait 25 seconds.

√Position – Open

NOD1
S4-02

2.3 Node 1 RAMV Temperature Control → Full Warm (↻)

3. R&MA AND LIGHTING SETUP

3.1 Alcove R&MA Restraint Assy, Foot-Anchor → Install

3.2 Manually adjust GLA Intensity dial for comfort.

Ovhd Aft
Alcove

3.3 Remove Emergency Lighting Power Supply access cloth cover (Velcro).

sw EEL → TEST (hold 3 to 5 seconds)

Verify TEST Lamp illuminates.

sw EEL → Enable

Ovhd Aft
Alcove

Reinstall Emergency Lighting Power Supply access cloth cover (Velcro).

4. VERIFYING NPRV COVERS CLOSED

Ovhd
Fwd
Alcove

4.1 √NPRV Covers (three) – CI

Velcro cloth closeout cover in closed position.

MPLM
Deck
Endcone

4.2 √NPRV Covers (two) – CI

5. INSTALLING PFE AND PBA

5.1 Retrieve PFE from NOD1P2-14 and stow in MPLM Stbd Alcove.

5.2 Retrieve PBA from NOD1P2-14 and stow in MPLM Fwd Alcove.

6. ESTABLISHING MCA SAMPLING OF MPLM

Opening SDS Valve

Task:

Task Nav

'Multi-flight Task Displays'

sel MPLM Act-Deact

MPLM Act-Deact

'IMV and SDS'

sel MPLM SDS Isov

MPLM SDS Isov

'Master'

cmd Open (\sqrt Position – Open)

Report to **MCC-H**, "MPLM Ingress is complete."

NOTE

MCC-H will perform steps 7 and 8 from the ground.

MCC-H
PCS

7. VERIFYING MPLM LOCATION PPL

CDH: INT PRIMARY: PPL Version IDs

Primary Int PPL Version IDs

'MPLM Location'

Verify Version Number – 60

Verify Version ID – 2

MCC-H

8. AUTOSEQUENCE CHANGE INITIATION

NOTE

1. Per SPN 29905, INT software incorrectly uses MPLM cabin fan state instead of MPLM SDS position to verify MCA sample location. Should the valve be open, but the fan state is off, the INT will think the MPLM sample location is inaccessible and set the Location Accessible Flag to False, which can be ignored. Conversely if the fan state is on and the valve is closed there will be no notice the MCA is no longer able to sample the MPLM.
2. When the MPLM is present, the nominal autosequence list will include the Lab, Node, Airlock, and MPLM modules

PCS

US Lab: ECLSS: AR Rack

LAB AR Rack Overview

'MCA'

\sqrt State – Operate (Standby)

NOTE

Per SPN 3572 (5A - x2 INTR3), the MCA can get out of sync with the INT SYS after an autosequence command. To prevent this, a Standby Immediate command should be issued first.

If State \neq Standby

'Standby Immediate'

cmd Standby Immediate

\surd State – Standby

If desired autosequence list is LAB/Node1/Airlock/MPLM or LAB/Node1/Airlock, LAB/Node1

NOTE

Expect transient '**MCA Pressure Out of Tolerance - LAB**' caution. Refer to PRACA 3660.

US Lab: ECLSS: AR Rack

LAB AR Rack Overview

'MCA'

'Auto Sequence'

cmd LAB/Node1/Airlock/MPLM (LAB/Node1/Airlock) (LAB/Node1)

\surd State – Operate

US Lab: ECLSS: AR Rack: MCA: Additional TIm

LAB MCA Additional TIm

\surd Invalid Sequence – blank

If another autosequence list is desired, go to [{2.301 MCA AUTO SEQUENCE LIST CHANGE}](#), all (SODF: ECLSS: NOMINAL: ARS).

OBJECTIVE:

Remove all ISS items from the MPLM and configure the MPLM for final closeout.

MPLM EQUIPMENT TRANSFER

1. Visually inspect MPLM crew compartment to verify all contents are secure.
2. Remove any R&MAs which were brought from ISS.
Stow in ISS (leave Alcove in place).
Stow R&MAs in Node 1 and LAB as desired.
- Stbd Alcove 3. PFE → Remove
Stow in Node 1 spare PFE locker.
- Fwd Alcove 4. PBA → Remove
Stow in Node 1 spare PBA locker.
5. Report to **MCC-H**, "MPLM PFE and PBA have been removed."

FINAL CLOSEOUT

CAUTION
Failure to leave the NPRV Cover open upon MPLM egress could cause degraded MPLM NPR performance and deformation of MPLM Closeout Panels during reentry.

- Ovhd Fwd Alcove 6. MPLM NPRV Closeout Cover → Release cloth Closeout Cover from Velcro
MPLM NPRV Closeout Cover → Fold cover back
MPLM NPRV Closeout Cover → Velcro open
- Ovhd Aft Alcove 7. Remove Emergency Lighting Power Supply access cloth cover with Velcro.
- ELPS sw EEL → Disable
- Ovhd Aft Alcove Reinstall Emergency Lighting Power Supply access cloth cover with Velcro.

NOTE
Do not depress RCA OFF button when exiting module. Ground control of MPLM GLAs may be required for MPLM environment checks in orbiter Payload Bay.

8. Alcove R&MA equipment → Remove
Stow in Node 1 or LAB as desired.

MPLM HATCH CLOSURE

CAUTION

To prevent possible interference between Hatch Kicker Pin and MPLM bulkhead, kicker pins (eight) position must be verified to be clear of the bulkhead structure prior to hatch closure. Failure to comply could result in hardware damage to pin/bulkhead and FOD.

9. Perform MPLM Hatch Close per decal steps 1 to 3 to partially close hatch, allow access to Hatch Kicker Pins (eight).

NOTE

1. Hatch Kicker Pins may already be in correct position; therefore, step 10 is required only if visual inspection shows re-positioning is necessary.
2. Hatch Kicker Pins known to be stiff, may be difficult to move.

10. Check Hatch kicker pins (eight) slid toward the closest Hatch corner. Refer to Figure 1, slide in direction of red arrows.

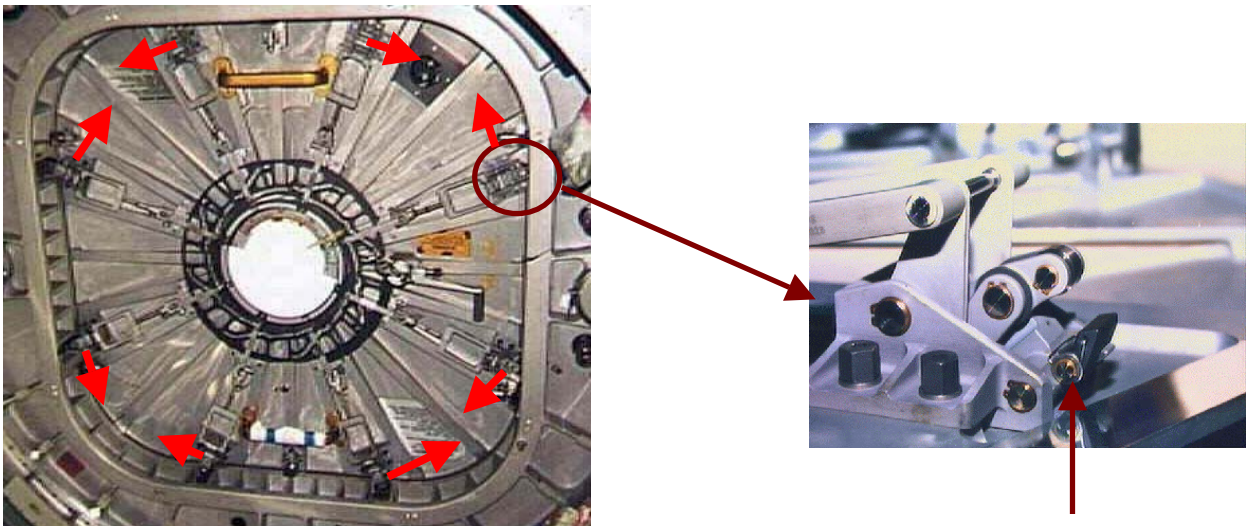


Figure 1.- Hatch Kicker Pin Location.

11. Fully close MPLM Hatch per decal.
√MPEV – Closed

TERMINATING IMV WITH NODE

- NOD1 S4-02
12. Node 1 RAMV Temperature Control → Full Cool (or for crew comfort)

CLOSING IMV DECK AFT IMV VLV

PCS

13. Task:

Task Nav

'Multi-flight Task Displays'

sel MPLM Act-Deact

MPLM Act-Deact

'IMV and SDS'

sel Node 1 IMV Deck Aft

Node 1 IMV Deck Aft Vlv

√State – Enabled

'Close'

cmd Arm (√Status – Armed)

cmd Close (√Position – In Transit)

Wait 25 seconds, then:

√Position – Closed

14. NODE 1 IMV DECK AFT VALVE DEACTIVATION

14.1 Node 1 IMV Deck Aft Vlv

'Inhibit'

cmd Arm (√Status – Armed)

cmd Inhibit (√State – Inhibited)

14.2 sel RPCM N13B B RPC 15

RPCM_N13B_B_RPC_15

√Open Cmd – Ena

'RPC Position'

cmd Open (√ – Op)

PCS

15. Terminating MCA Sampling of MPLM

US Lab: ECLSS: AR Rack

LAB AR Rack Overview

'MCA'

√State – Operate

NOTE

The nominal autosequence list will include Node, Airlock, and Lab modules when MPLM is not available.

If desired autosequence list is LAB/Node1/Airlock, or LAB/Node1

NOTE

Per SPN 3572 (5A - x2 INTR3), the MCA can get out of sync with the INT SYS after an autosequence command. To prevent this, a Standby Immediate command should be issued first.

'Standby Immediate'

cmd Standby Immediate

√State – Standby

'Auto Sequence'

cmd LAB/Node1/Airlock (LAB/Node1)

√State – Operate

US Lab: ECLSS: AR Rack: MCA: Additional TIm

LAB MCA Additional TIm

√Invalid Sequence – blank

If another autosequence list is desired, go to [{2.301 MCA AUTO SEQUENCE LIST CHANGE}](#), all (SODF: ECLSS: NOMINAL: ARS).

OBJECTIVE:

Deactivate the MPLM in preparation for closeout and unberthing.

√**MCC-H** for Manual or Automatic Deactivation preference

1. CHECKING MPLM SOFTWARE CONFIGURATION

Task:

'Multi-flight Task Displays'

sel MPLM Act-Deact

'Automatic Control – Auto Activate'

√Part 1 Activate Status – Idle

√Part 2 Activate Status – Idle

'Automatic Control – Auto Deactivate'

√Deactivate Status – Idle

For Manual Deactivation, go to step 3.

2. DEACTIVATING AUTOMATIC MPLM

'Automatic Control – Auto Deactivate'

cmd Arm

√Arm Status – No Error

√Deactivate Status – Deact Armed

cmd Deactivate (√Deactivate Status – Deactivating)

When Deactivate Status – Idle (2 minutes from Deactivate command),
continue

'PDB Control'

√Converter 1,2 Status (two) – Off

'SD, Cab Fan, and Pressure'

√Cab Fan Spd: 2000 rpm

'IMV and SDS'

1.106 MPLM DEACTIVATION

(MPLM/LF1 - ALL/FIN 4)

Page 2 of 6 pages

√MPLM IMV Aft, Fwd Vlv Posn (two) – CI

√MPLM SDS IsoV Vlv Posn – CI

'DA and PPRA'

√PPRA 1,2,3 Vlv Posn (three) – Op

Go to step 4.

3. DEACTIVATING MANUAL MPLM

NOTE

This step required only if MPLM deactivation not performed using automatic macro command.

3.1 Enabling MPLM IMV Valve Power

MPLM Act-Deact

'PDB Control'

sel PDB Details

PDB Details

cmd Converter 02 – On (√Posn – On)

cmd RPC 15 – Close (Verify ISOV1 RPC Posn – CI)

cmd RPC 16 – Close (Verify ISOV2 RPC Posn – CI)

3.2 Closing MPLM IMV Valves

MPLM Act-Deact

'IMV and SDS'

sel MPLM IMV Aft

MPLM IMV Ovhd Aft Vlv

'Position – Close'

cmd Close (√Position – Closed)

MPLM Act-Deact

'IMV and SDS'

sel MPLM IMV Fwd

MPLM IMV Ovhd Fwd Vlv

'Position – Close'

cmd Close (√Position – Closed)

1.106 MPLM DEACTIVATION

(MPLM/LF1 - ALL/FIN 4)

Page 3 of 6 pages

3.3 Removing Power from IMV

MPLM Act-Deact

'PDB Control'

sel PDB Details

PDB Details

cmd RPC 15 – Open (√ISOV1 RPC Posn – Op)

cmd RPC 16 – Open (√ISOV2 RPC Posn – Op)

cmd Converter 02 – Off (√Posn – Off)

3.4 Closing SDS Valve

MPLM Act-Deact

'IMV and SDS'

sel MPLM SDS Isov

MPLM SDS Isov

'Master'

cmd Close

'Position'

√Position – Closed

3.5 Shutting Down Cabin Fan and DSD

MPLM Act-Deact

'SD, Cab Fan, and Pressure'

sel MPLM Cab Fan

MPLM Cabin Fan

'State – Off'

cmd Arm

cmd Off

√Speed decreases to 2000 rpm

MPLM Act-Deact

'PDB Control'

sel PDB Details

1.106 MPLM DEACTIVATION

(MPLM/LF1 - ALL/FIN 4)

Page 4 of 6 pages

PDB Details

cmd RPC 11 – Open ($\sqrt{\text{CFA RPC Posn}} - \text{Op}$)

cmd RPC 13 – Open ($\sqrt{\text{DSD RPC Posn}} - \text{Op}$)

3.6 Enabling PPRA Motorized Valve Power

PDB Details

cmd Converter 01 – On ($\sqrt{\text{Posn}} - \text{On}$)

cmd RPC 27 – Close (Verify PPRA All RPC Posn – Cl)

3.7 Opening PPRA Motorized Valves

MPLM Act-Deact

'DA and PPRA'

sel MPLM PPRA

MPLM PPR Assemblies

cmd PPRA 1,2,3 Valve (three) – Open ($\sqrt{\text{Valve Position}} - \text{Open}$)

3.8 Removing Power from PPRAs

MPLM Act-Deact

'PDB Control'

sel PDB Details

PDB Details

cmd RPC 27 – Open ($\sqrt{\text{PPRA All RPC Posn}} - \text{Op}$)

cmd Converter 01 – Off ($\sqrt{\text{Posn}} - \text{Off}$)

3.9 Removing Power from GLA and ELPS

cmd All GLAs – OFF

$\sqrt{\text{RPC 02-09 (GLAs 1-8) RPC Posn}} - \text{Op}$

cmd RPC 10 – Open ($\sqrt{\text{ELPS RPC Posn}} - \text{Op}$)

4. DEACTIVATING MPLM PDB

NOTE

PDB data becomes unchanging and invalid when PDB Aux Pwr Supply (APS) is removed in next step.

Task:

Task Nav

'Multi-flight Task Displays'

1.106 MPLM DEACTIVATION

(MPLM/LF1 - ALL/FIN 4)

Page 5 of 6 pages

sel MPLM Act-Deact

'PDB Control'

sel PDB Details

cmd APS – Off (√Posn – Off)

5. INHIBITING I/O WITH MPLM MDM

'MDM Control'

sel Primary Int MDM

sel LB SYS HAB 1

sel RT Status

cmd 17 MPLM-1 RT FDIR Status – Inhibit FDIR **Execute**

√17 MPLM-1 RT FDIR Status – Inh

cmd 17 MPLM-1 RT Status – Inhibit **Execute**

√17 MPLM-1 RT Status – Inh

* If MPLM operating on APCU power, go to step 7.

6. OPENING RPC TO REMOVE POWER FROM MPLM

US Lab: EPS: Lab Rack LAB1O6

sel RPCM LA2A3B D

sel RPC 4

cmd RPC Position – Open (Verify – Op)

1.106 MPLM DEACTIVATION

(MPLM/LF1 - ALL/FIN 4)

Page 6 of 6 pages

cmd Close Cmd – Inhibit (Verify – Inh)

CAUTION

To prevent damage to internal converter and relay, APCU output relay must not be opened or closed under load (Converter – On (tb – gray)).

L12U 7. TURNING APCU OFF TO REMOVE POWER FROM MPLM

7.1 Turning APCU Converters Off

APCU 1,2 CONV (two) → Off

√APCU 1,2 CONV tb (two) – bp

7.2 Opening APCU Output Relays

APCU 1 OUTPUT RLY → Open

√APCU 1,2 OUTPUT RLY tb – bp

Report to **MCC-H**, “MPLM deactivation is complete.”

NOTE

MCC-H will perform step 8 from the ground.

MCC-H 8. LOADING MPLM NOT PRESENT PPL

To build and uplink data load command to the Primary INT SYS MDM, DRAM only, perform {1.231 **CCS BUILD DATA LOAD COMMAND**}, all (SODF: GND AVIONICS: C&DH: NOMINAL), then:

input Load Image file – intr2_ppl_0060_4_a_00001.lif

input Ops name – MPLM not present

PCS CDH: INT PRIMARY: PPL Version IDs

Primary Int PPL Version IDs

'MPLM Location'

√Version Number- 60

√Version ID - 1

1.110 NODE 1 MPLM VESTIBULE DEPRESS

(MPLM/LF1 - ALL/FIN 6)

Page 1 of 7 pages

I

OBJECTIVE:

Depress the Node 1 MPLM vestibule in preparation for MPLM unberthing.

TOOLS AND EQUIPMENT REQUIRED:

(IMS)

MPEV Internal Sampling Adapter (ISA) P/N 97M55830-1

Scopemeter P/N SEG39129678-303

Vacuum Access Jumper (VAJ) 35 ft P/N 683-17111-2

Vacuum Access Jumper (VAJ) 5 ft P/N 683-17111-1

1. ISA/SCOPEMETER SETUP AND ACTIVATION

1.1 Uncap one ISA-VAJ port.

1.2 ✓ Other ISA-VAJ port (1 of 2) is capped

NOTE

Scopemeter will be face down with respect to ISA Pressure Module, if installed properly.

1.3 Attach Scopemeter to ISA Pressure Module.

1.4 ✓ COM-COM and V-V on Scopemeter to ISA Pressure Module connection

1.5 On Scopemeter, while holding down the F5 button, press and release the ON/OFF button only, listen for two beeps, then release F5. This will perform a Scopemeter master reset.

1.6 Press F5 to highlight EXT.mV mode, then:
If required, press F1 to close mode change message.

2. PRESSURE MODULE BATTERY VERIFICATION

2.1 ✓ ISA Pressure Module – OFF

2.2 Verify V reading is > 100 mV DC (ISA Pressure Module battery reading).
If reading < 100 mV DC, ISA Pressure Module should be swapped with a spare or the battery must be replaced.

3. PRESSURE VERIFICATION

3.1 ISA Pressure Module → mmHg

3.2 Record ISA pressure: _____ mmHg
(1mV = 1 mmHg, readout X 1000 = mmHg)

1.110 NODE 1 MPLM VESTIBULE DEPRESS

(MPLM/LF1 - ALL/FIN 6)

Page 2 of 7 pages

PCS

3.3 US Lab: ECLSS

Lab: ECLSS

Record Cab Press: _____ mmHg

Calculate ΔP (ISA Pressure – Cab Press): _____ mmHg

If $\Delta P > 20$ mmHg

√**MCC-H** for instructions >>

4. ISA/VAJ/MPEV SETUP

4.1 √Node 1 Deck MPEV – CLOSED

4.2 Uncap Node 1 Deck MPEV and ends of 5 ft VAJ hose.
Inspect soft seals to verify they are properly seated and in good condition (no nicks or cuts).

4.3 Connect bent end of 5 ft VAJ to Node Deck MPEV.

4.4 Connect other end of 5 ft VAJ to ISA.
Refer to Figure 1.

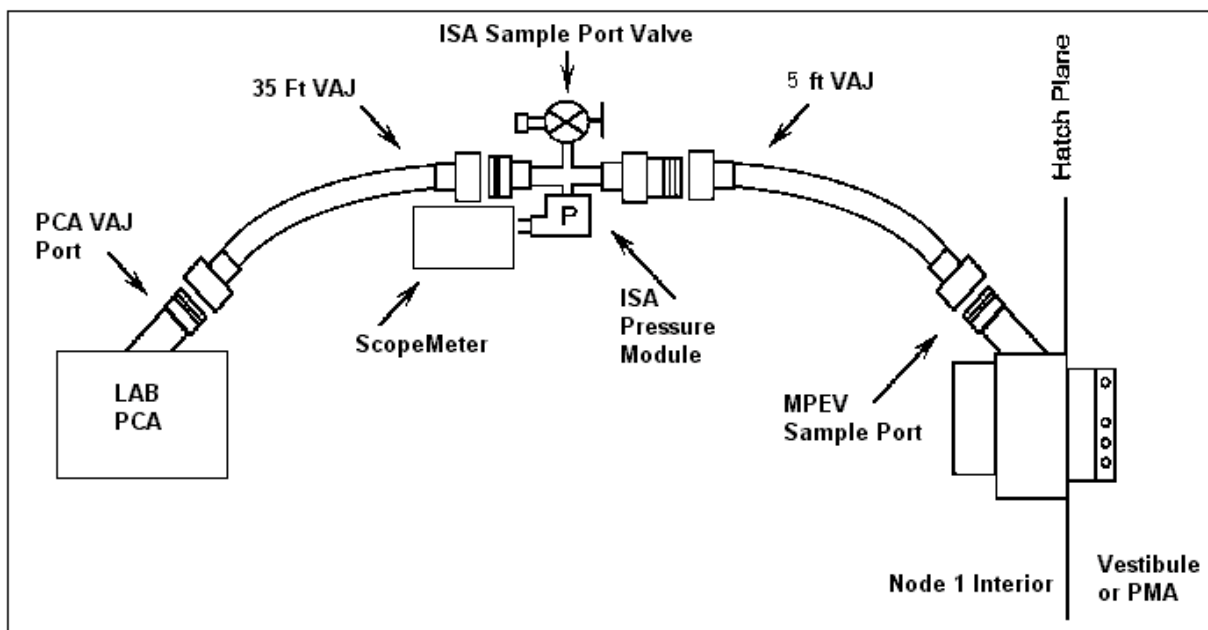


Figure 1.- ISA/VAJ/MPEV Connection.

4.5 Uncap PCA Vacuum Access Port (LAB1DO-02) and ends of 35 ft VAJ hose.
Inspect soft seals to verify they are properly seated and in good condition (no nicks or cuts).

Attach bent end of 35 ft VAJ to Lab PCA Vacuum Access Port.
Attach other end of 35 ft VAJ to second ISA VAJ Port.

1.110 NODE 1 MPLM VESTIBULE DEPRESS

(MPLM/LF1 - ALL/FIN 6)

Page 3 of 7 pages

WARNING

Hoses will move when pressurized or evacuated. Failure to secure ISA/VAJ assembly may result in injury to crew and/or damage to equipment.

- 4.6 Secure ISA/VAJ assembly to seat track with bungees and anchors.

NOTE

The following caution message will be received after PPR is inhibited

'Positive P Relief Failure - LAB'

No action required. This message will return to normal once PPR is reenabled in step 10.

5. PPR INHIBITING

On MCC-H GO

PCS

US Lab: ECLSS: PCA: PCA Commands

LAB PCA Commands

'Positive Press Relief'

'Inhibit'

cmd Arm (√Status – Armed)

cmd Inhibit

√Positive Pressure Relief State – Inhibited

WARNING

Opening the VRIV will vent the ISA and VAJs to space and may cause a loud hissing noise. Crew in the vicinity should don ear plugs.

6. ISA/VAJ CONNECTION LEAK CHECK

NODE

6.1 √ISA SAMPLE PORT VALVE – CLOSED

Refer to Figure 2.



Figure 2.- ISA Sample Port Valve.

1.110 NODE 1 MPLM VESTIBULE DEPRESS

(MPLM/LF1 - ALL/FIN 6)

Page 4 of 7 pages

6.2 Open PCA VRIV

Don earplugs.

PCS

US Lab: ECLSS: PCA

Lab ACS

'Pressure Control Assembly'

sel VRIV

LAB PCA VRIV

'Open'

cmd Arm (√Status – Armed)

cmd Open

√Position – Open

√Open Indicator – √

Wait 10 minutes.

Doff ear plugs.

6.3 Close PCA VRIV

US Lab: ECLSS: PCA

Lab ACS

'Pressure Control Assembly'

sel VRIV

LAB PCA VRIV

'Close'

cmd Close

√Position – Closed

√Closed Indicator – √

Wait 2 minutes.

6.4 Monitoring For ISA/VAJ Leak

Monitor ISA pressure for 5 minutes.

If ISA pressure increases > 10 mmHg during monitoring period
suspect ISA/VAJ leak.

√**MCC-H** for instructions >>

1.110 NODE 1 MPLM VESTIBULE DEPRESS

(MPLM/LF1 - ALL/FIN 6)

Page 5 of 7 pages

7. VESTIBULE DEPRESS

7.1 Don ear plugs.

PCS

7.2 US Lab: ECLSS: PCA

'Pressure Control Assembly'

sel VRIV

'Open'

cmd Arm (√Status – Armed)

cmd Open

√Position – Open

√Open Indicator – √

7.3 Node 1 Deck MPEV → OPEN

7.4 Wait 30 minutes for depressurization or until ISA Press < 2 mmHg.

√ISA Press < 2 mmHg

7.5 Node 1 Deck MPEV → CLOSED

Wait an additional 10 minutes for thermal stabilization.

7.6 Doff ear plugs.

PCS

8. CLOSING PCA VRIV

US Lab: ECLSS: PCA

'Pressure Control Assembly'

sel VRIV

'Close'

cmd Close

√Position – Closed

√Closed indicator – √

1.110 NODE 1 MPLM VESTIBULE DEPRESS

(MPLM/LF1 - ALL/FIN 6)

Page 6 of 7 pages

8.1 Node 1 Deck MPEV → OPEN

Record ISA Pressure P1: _____ mmHg

Record GMT ____/____:____:____ GMT

8.2 Node 1 Deck MPEV → CLOSED

8.3 Wait 30 minutes.

8.4 Node 1 Deck MPEV → OPEN

8.5 Record ISA Pressure P2: _____ mmHg

Record GMT ____/____:____:____ GMT

8.6 If ISA ΔP (P2-P1) > 2 mmHg, suspect Node 1 Deck Hatch leak.

√**MCC-H** for instructions >>

8.7 During next ground comm opportunity, report all pressures and times from previous steps to **MCC-H** (Lab Cab Press, ISA Pressure, P1, P2).

9. RESIDUAL VESTIBULE VENT

If P2 reading > 2 mmHg

Repeat steps 7 & 8 to vent vestibule pressure.

10. ENABLING PPR

On MCC-H GO

PCS US Lab: ECLSS: PCA: PCA Commands

LAB PCA Commands

'Positive Press Relief'

cmd Enable (√Positive Pressure Relief State – Enabled)

11. DETACHING AND STOWING EQUIPMENT

11.1 Node 1 Deck MPEV → CLOSED

11.2 ISA PRESSURE MODULE → OFF

11.3 SCOPEMETER → OFF, Detach from ISA PRESSURE MODULE

11.4 Uncap ISA Sample Port Valve.

11.5 ISA SAMPLE PORT VALVE → OPEN

11.6 Disconnect all VAJs and install all VAJ caps.

11.7 Cap all ISA-VAJ Ports.

1.110 NODE 1 MPLM VESTIBULE DEPRESS

(MPLM/LF1 - ALL/FIN 6)

Page 7 of 7 pages

- 11.8 Close and Cap ISA Sample Port Valve.
- 11.9 Cap Node 1 Deck MPEV.
- 11.10 Inspect Cap Seal on PCA Vacuum Access Port.
Replace if necessary.
Install cap, hand-tighten.
- 11.11 Stow ISA, Scopemeter, and VAJs in location from which retrieved.

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1.111 MPLM CLOSEOUT DEWPOINT READINGS

(MPLM/ULF1 - ALL/FIN) Page 1 of 2 pages

I

OBJECTIVE:

Measure the MPLM, SM, and Orbiter dewpoint using the Velocicalc for MPLM closeout.

TOOLS AND EQUIPMENT REQUIRED

LAB1P5_A2 Velocicalc with probe (P/N 8386A)
If batteries need to be replaced

FGB 424 | 4 AA batteries
| Ziplock bag for used batteries

1. BATTERY INSTALLATION

Install 4 AA batteries per the drawing on the inside of the battery compartment.

2. VELOCICALC SETUP

CAUTION	
1.	Metal probe is conductive and contains delicate sensors. Damage may cause electronics to overheat and/or off-gas. Do not contact power sources or use out-of-visual scope. Do not expose to temperatures greater than 140° F.
2.	Do not breathe near the sensor/probe tip. This will bias dewpoint readings.

- 2.1 Remove Red Probe Sensor Protector.
Press the ON/OFF key.
Wait for powerup to complete (~30 sec). If the unit has not been used for at least 2 weeks, allow the unit to rest for 5 minutes.
- 2.2 If display reads LO, replace batteries per the drawing on the inside of the battery compartment.
Stow used batteries in ziplock bag and label bag as USED.
Stow bag in trash bag.
- 2.3 Extend the probe to full extension (bending the probe to a 90° angle is not necessary).

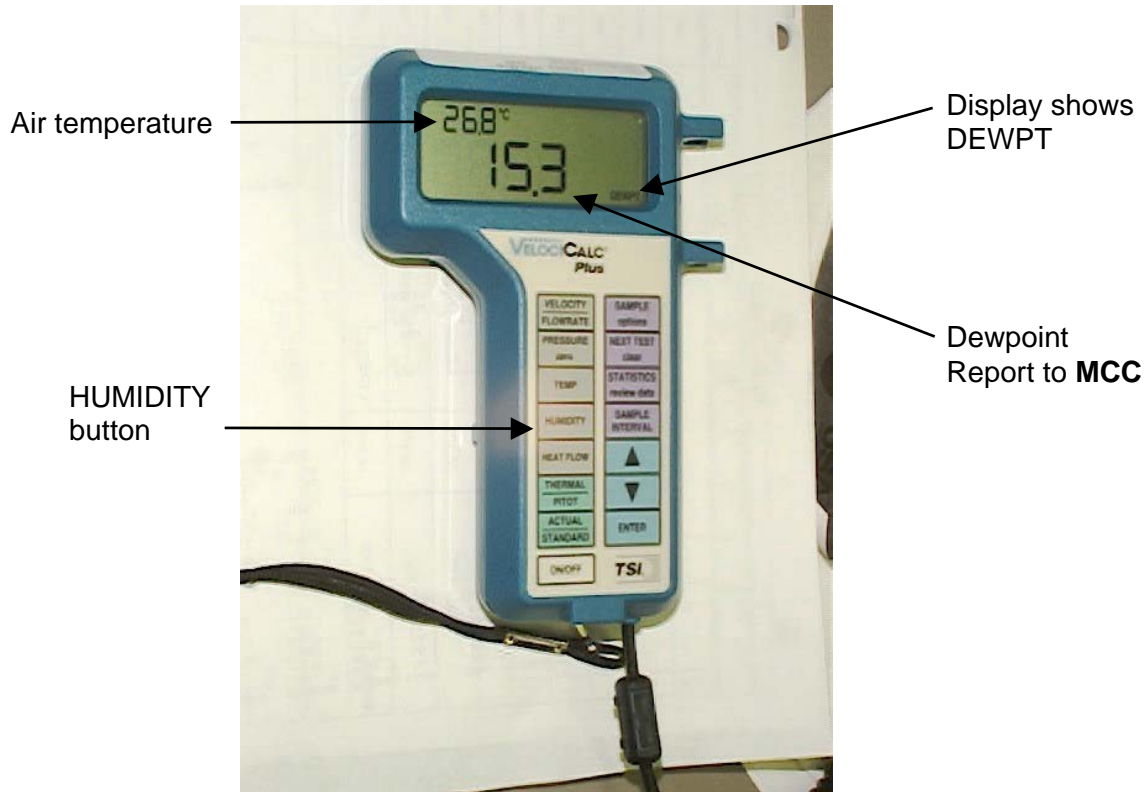
3. SAMPLING DEWPOINT IN THE MPLM, SM, AND ORBITER

<u>NOTE</u>	
Take sampling after all crew have exited the MPLM, just prior to hatch closing. Do not reenter MPLM after readings are taken.	

- 3.1 Press and release the HUMIDITY key to toggle display between %RH (humidity), DEWPT (dewpoint), and WETBULB (wet bulb).
Set display to read dewpoint.
DEWPT will be displayed in the lower right corner.

1.111 MPLM CLOSEOUT DEWPOINT READINGS

(MPLM/ULF1 - ALL/FIN) Page 2 of 2 pages



- Node/MPLM Vest 3.2 To obtain a dewpoint reading, position the instrument in the Node 1/ MPLM Vestibule and extend the probe as far as possible into the MPLM and wait for reading to stabilize (approximately 2 minutes).

MPLM dewpoint = _____

- 3.3 Report dewpoint reading to **MCC-H**. Do not reenter MPLM.

- SM/Orbiter 3.4 Take a dewpoint reading in the Service Module near the gas analyzer and in the Orbiter flight deck (allow a 2-minute stabilization for each location).

Service Module dewpoint = _____

Orbiter flight deck dewpoint = _____

- 3.5 Report dewpoint readings to **MCC-H**.
- 3.6 Press the ON/OFF key to turn unit off.
Replace Red Probe Sensor Protector.

4. STOWAGE

- 4.1 After completion of task, remove batteries from Velocicalc and stow with instrument.
- 4.2 Stow unit after use.

1.112 LAB DEWPOINT READING FOR MPLM INGRESS

(MPLM/ULF1 - ALL/FIN)

Page 1 of 2 pages

I

OBJECTIVE:

Measure the Lab CCAA outlet air dewpoint using the Velocicalc to determine the dewpoint of the air supplying the MPLM.

TOOLS AND EQUIPMENT REQUIRED

LAB1P5_A2 VELOCICALC with probe (P/N 8386A)
If batteries need to be replaced

FGB 424 | 4 AA batteries
| Ziplock bag for used batteries

1. BATTERY INSTALLATION

Install 4 AA batteries per the drawing on the inside of the battery compartment.

2. VELOCICALC SETUP

CAUTION

1. Metal probe is conductive and contains delicate sensors. Damage may cause electronics to overheat and/or off-gas. Do not contact power sources or use out-of-visual scope. Do not expose to temperatures greater than 140° F.
2. Do not breathe near the sensor/probe tip. This will bias dewpoint readings.

2.1 Remove Red Probe Sensor Protector.

Press the ON/OFF key.

Wait for powerup to complete (~30 sec). If the unit has not been used for at least 2 weeks, allow the unit to rest for 5 minutes.

2.2 If display reads LO, replace batteries per the drawing on the inside of the battery compartment.

Stow used batteries in ziplock bag and label bag as USED.

Stow bag in trash bag.

2.3 Extend the probe to full extension (bending the probe to a 90° angle is not necessary).

3. SAMPLING DEWPOINT IN THE LAB

3.1 Press and release the HUMIDITY key to toggle display between %RH (humidity), DEWPT (dewpoint), and WETBULB (wet bulb).

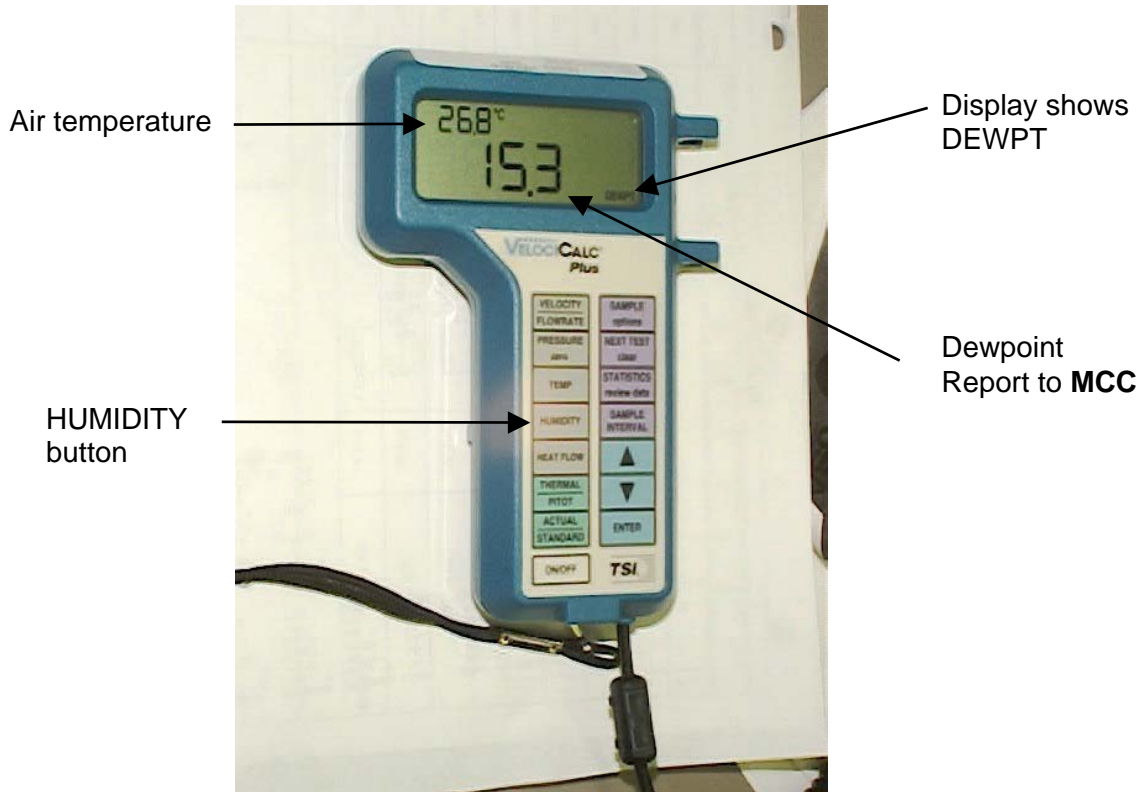
Set display to read dewpoint.

DEWPT will be displayed in the lower right corner.

1.112 LAB DEWPOINT READING FOR MPLM INGRESS

(MPLM/ULF1 - ALL/FIN)

Page 2 of 2 pages



LAB10S5
Lab Air
Diffuser

3.2 To obtain a dewpoint reading, extend the probe 1 foot from Lab diffuser location and wait for reading to stabilize (approximately 2 minutes).

Lab dewpoint = _____

3.3 Report dewpoint reading to **MCC-H**.

3.4 Press the ON/OFF key to turn unit off.
Replace Red Probe Sensor Protector.

4. STOWAGE

4.1 After completion of task, remove batteries from Velocicalc and stow with instrument.

4.2 Stow unit after use.

MALFUNCTION

MALFUNCTION

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ECLSS

2.101 MPLM CABIN FAN FAILURE (MPLM/LF1 - ALL/FIN 7/SPN) Page 1 of 3 pages

CAUTION
ALARM

Table 1. Cabin Fan/MDM Information

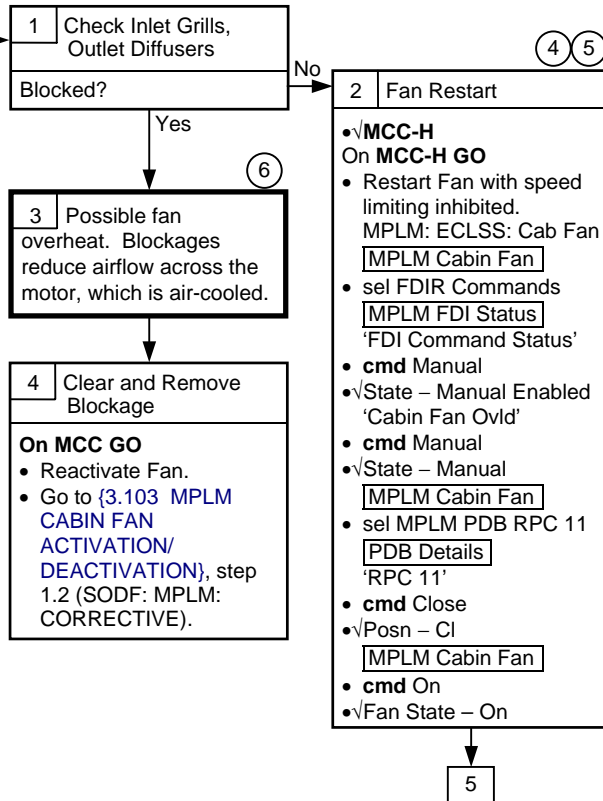
(A) Function	(B) Data Type	(C) MDM	(D) Card Type	(E) Slot	(F) Channel
Cabin Fan On/Off	Cmd	MPLM	DIO #2	4	00
Cabin Fan Speed	Cmd	MPLM	AIO #1	3	00
Cabin Fan Speed	Tlm	MPLM	AIO #1	3	01
Cabin Fan dP	Tlm	MPLM	HLA #2	6	18

① ② ③
C&W Sum
C&W Summary
Cabin Fan Failure - MPLM

Triggers:
MPLM Cabin Fan Speed
> 5100 rpm
< 3000 rpm

RPC 11 current
> 2.8A
< 0.326A

Nominal Config After Failure:
MPLM Cabin Fan State – Off
Speed – 2000 rpm
MPLM PDB RPC 11 Position – Open



① All displays in this procedure are on the PCS.

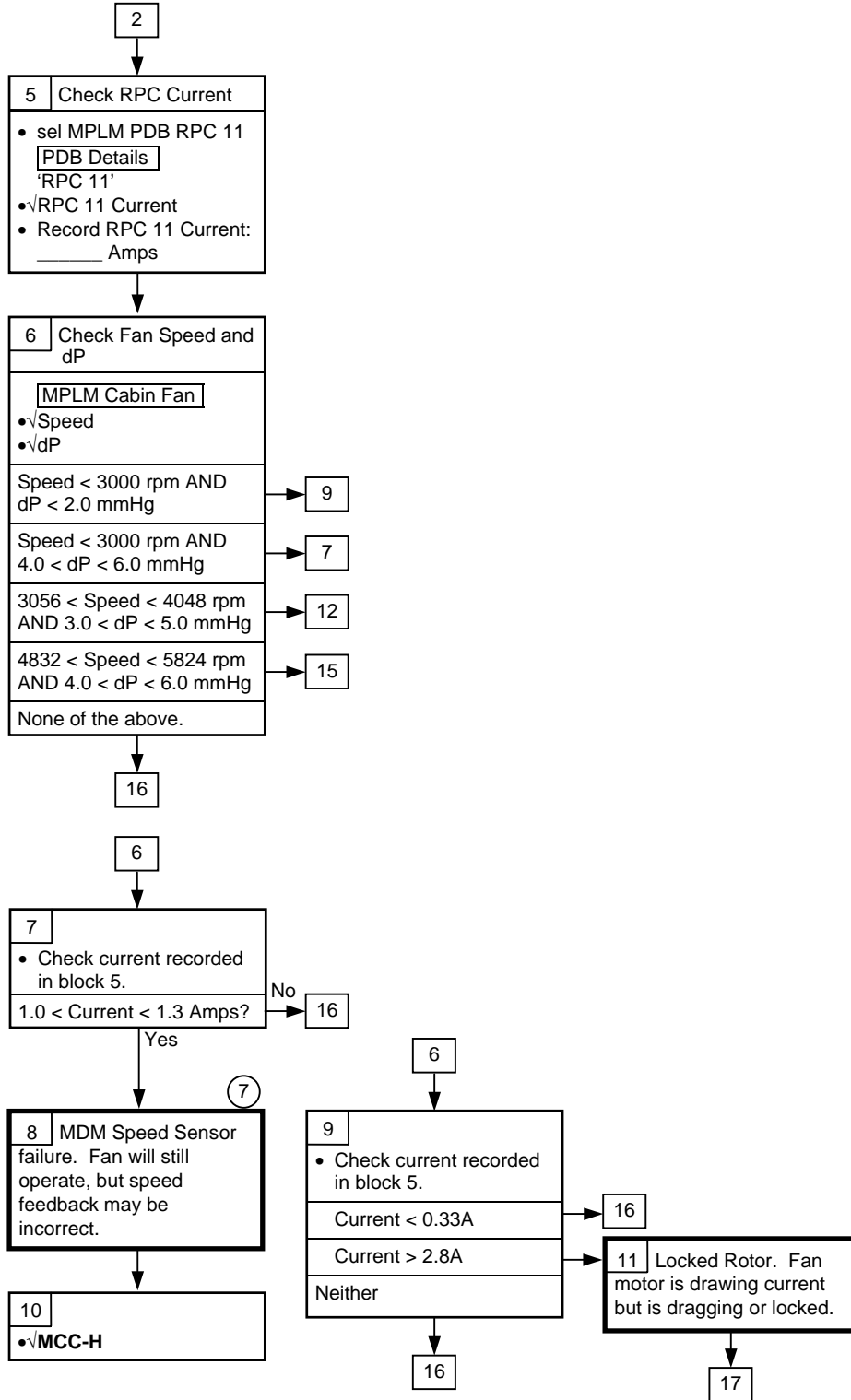
② Cabin Fan Failure message will not be present in C&W Summary if the Summary was closed. The MPLM automatically shuts down the Cabin Fan after a failure, causing the message to return to normal. The message can be found in Log Viewer.

③ Per SPN 29905, INT software incorrectly uses MPLM cabin fan state instead of MPLM SDS position to verify MCA sample location. Should the valve be open, but the fan state is off, the INT will think the MPLM sample location is inaccessible and set the Location Accessible Flag to False, which can be ignored.

④ After setting the Cabin Fan Ovld FDI to manual, the Fan will run with dP and RPC current unchecked by the MDM. However, the motor controller (firmware) will not let the Fan temperature exceed 105° C (221° F).

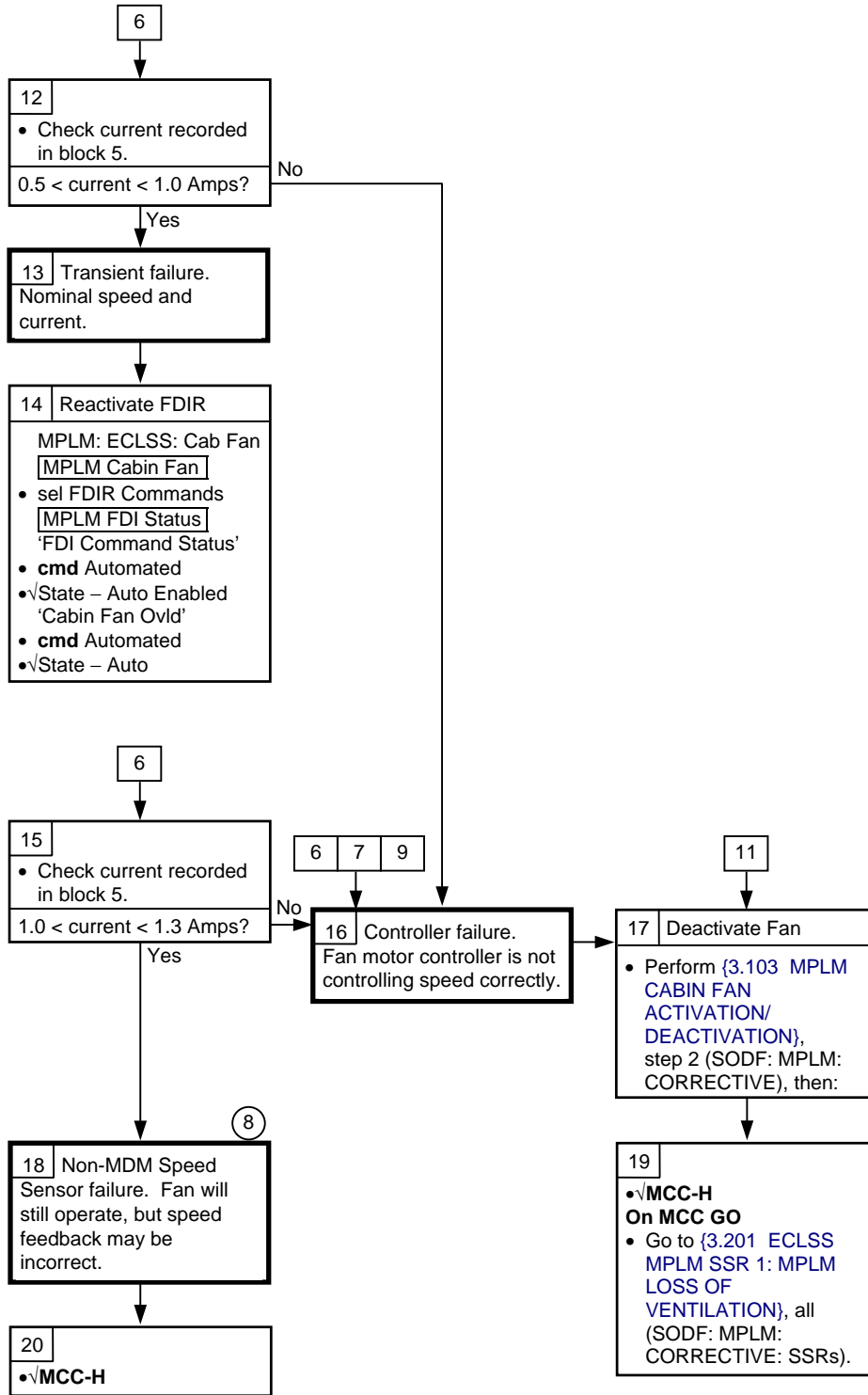
⑤ The two FDI manual commands must be sent within 10 minutes of each other.

⑥ Motor windings have internal thermistor for overheat protection. Controller will remove power from motor above 105° C (221° F). Motor requires cool down to recover function. Fan may be restarted when motor temp cools to below 91° C (196° F).



⑦
 The Fan has three speed sensors that are averaged together that the motor controller uses to control speed. Only one of these sensors is reported to the MDM and the averaged value is not. If the sensor that reports to the MDM drifts or fails, the motor controller will adjust the fan speed to keep the averaged value constant which will result in a difference in the indicated speed and the commanded speed. Depending on exactly how the sensor failed, the difference may be as much as 50 %.

2.101 MPLM CABIN FAN FAILURE
 (MPLM/LF1 - ALL/FIN 7/SPN) Page 3 of 3 pages



⑧
 The Fan has three speed sensors that are averaged together that the motor controller uses to control speed. Only one of the sensors is reported to the MDM and the averaged value is not. If a sensor that does not report to the MDM drifts or fails the motor controller will adjust the fan speed to keep the averaged value constant. The speed indicated will be the true speed of the fan.

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Table 1. MPLM IMV Valve MDM/PDB Information

(A) Module	(B) Location	(X) Converter	(Z) RPC	Valve Driver	MDM
MPLM	Aft	2	15	VMDS 7	MPLM
	Fwd	2	16	VMDS 8	MPLM

CAUTION
ALARM

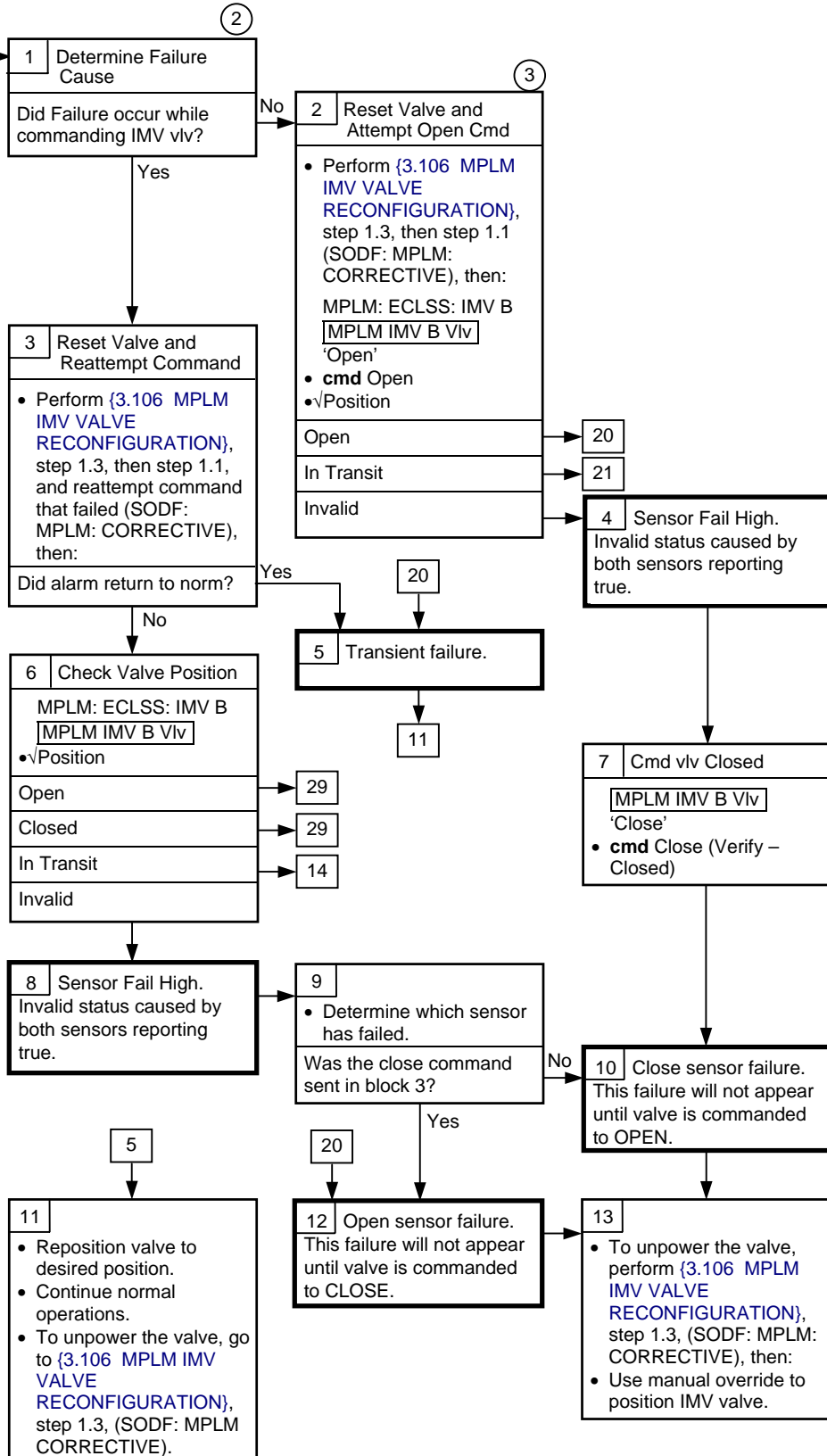
①
C&W Sum
C&W Summary
IMV B Vlv Failure – MPLM

See Table 1 for B and Z references.

Triggers:
(IMV valve has 7 sec to reach commanded posn)

The following problems will cause the IMV Vlv Failure:
Sensors read not open and not closed (In transit).
Sensors read open and closed (Invalid).
Vlv was commanded open but remains closed.
Vlv was commanded closed but remains open.

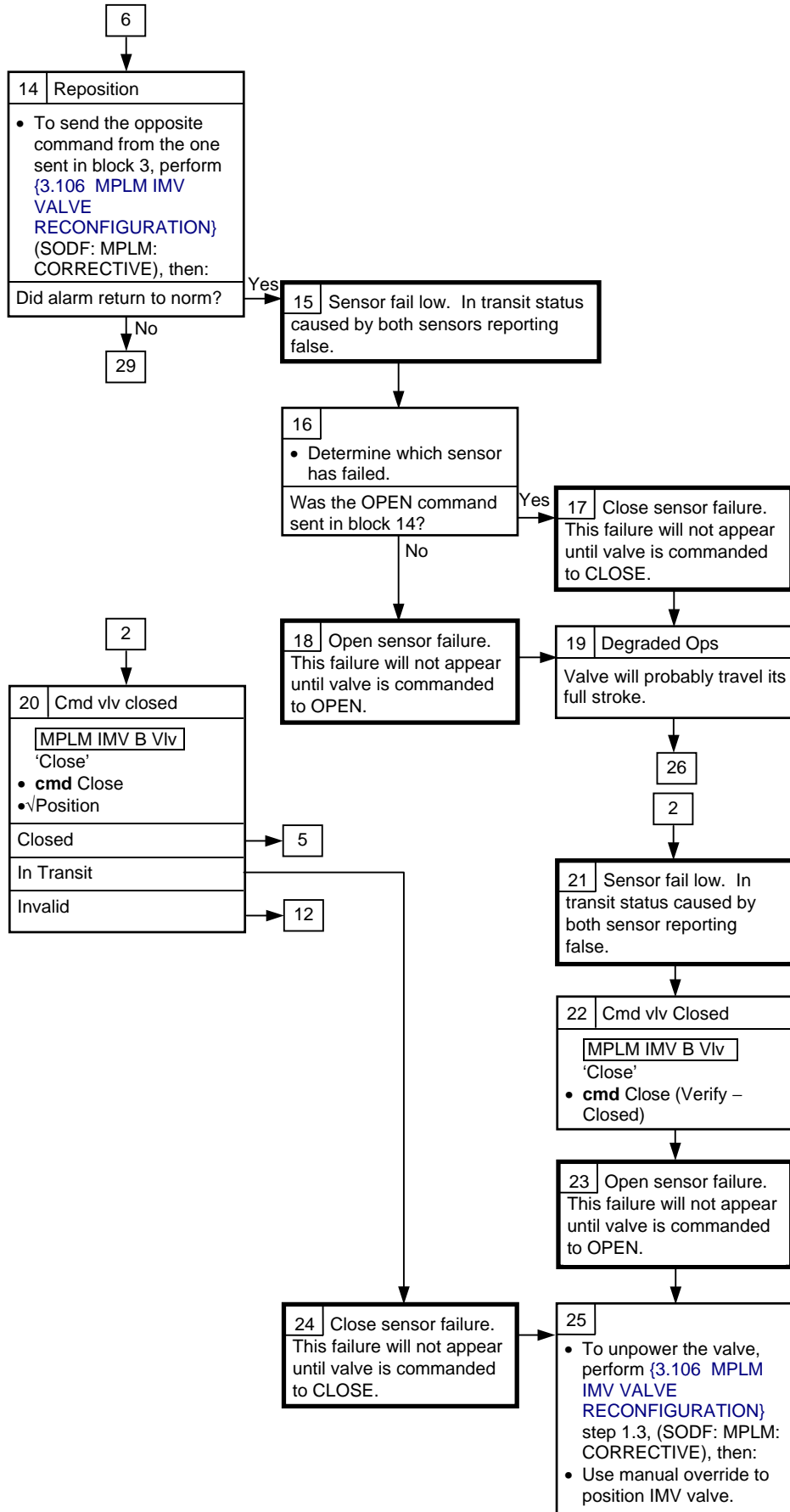
Nominal Config:
Converter 2 – On
PDB RPC Z posn – Close

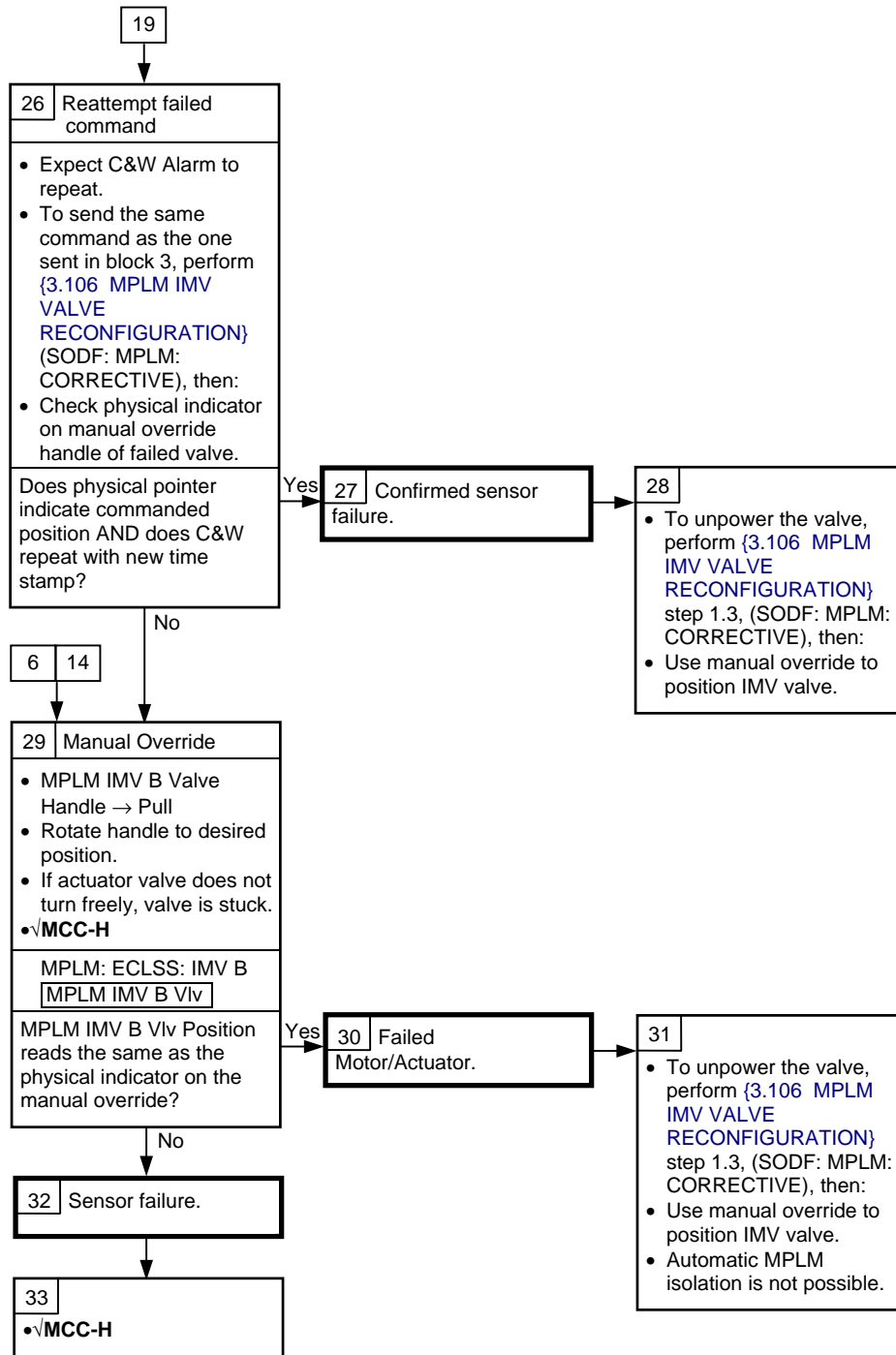


①
All displays in this procedure are on the PCS.

②
If the valve was manually repositioned, the IMV Vlv Failure caution will sound, because the valve is not in the expected position.

③
The position of the valve as seen by the MDM is derived from two discrete position sensors at the ends of the valve stroke. When one sensor fails or the valve does not reach the end of its stroke, the software cannot accurately compute the valve's position. When a sensor detects the presence of the poppet, the sensor reads "true." When the sensor detects the absence of the poppet, the sensor reads "false."





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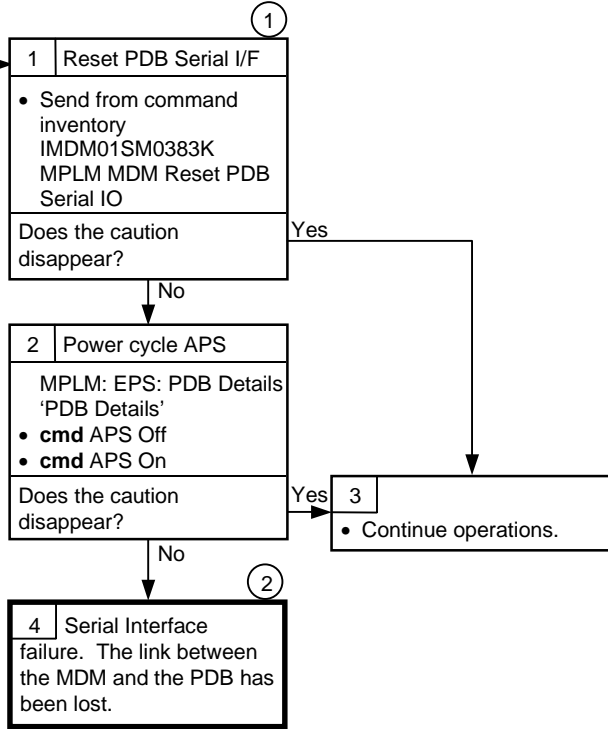
EPS

2.103 MPLM MDM PDB TO PDB SERIAL I/F FAIL

(MPLM/UF2 - ALL/FIN 2) Page 1 of 1 page

CAUTION

MPLM MDM PDB
Serial Interface
Failure



① This is a ground only step. The command can only be sent from command inventory.

② With the link lost between the PDB and the MDM, the only communications will be to and from the MDM. If this is a passive flight, the pressure temperature and smoke detection are being monitored directly by the MDM.

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EPS

2.104 MPLM PDB AUXILIARY POWER FAILURE

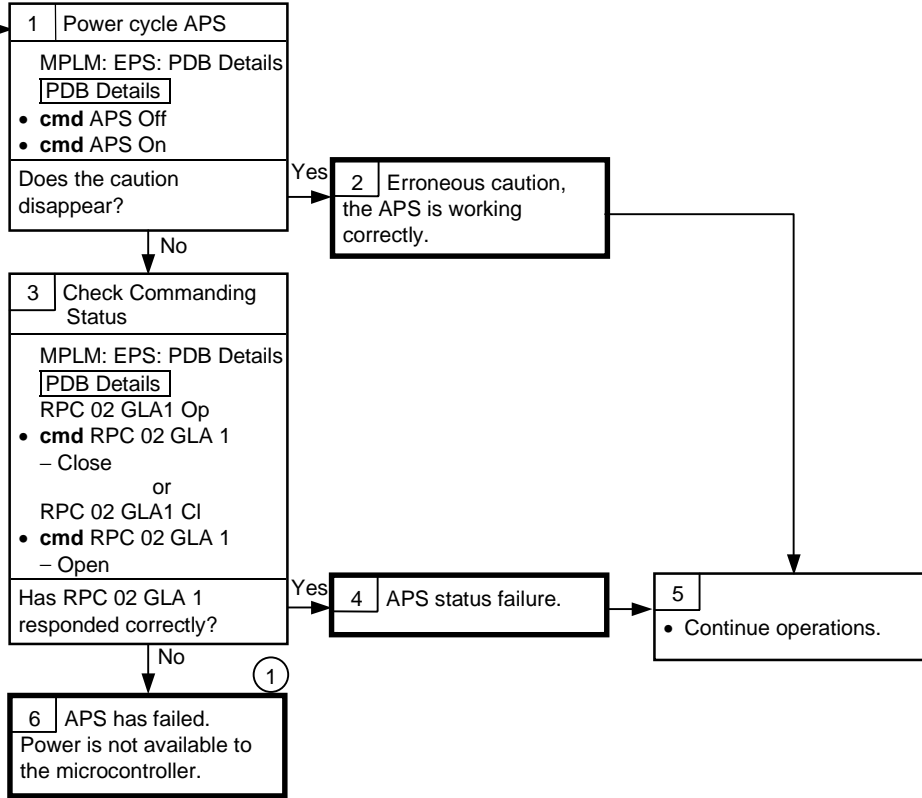
(MPLM/UF2 - ALL/FIN 2) Page 1 of 1 page

CAUTION

MPLM PDB
Auxiliary Pwr
Failure - MPLM

If
APS status
changes from On
to Off.

Nominal Config:
MPLM is activated.



①
A loss of the APS means there is no power being fed to the microcontroller. Commands cannot be sent to the MDM. However, the MDM still has power and it will stay in its last configuration.

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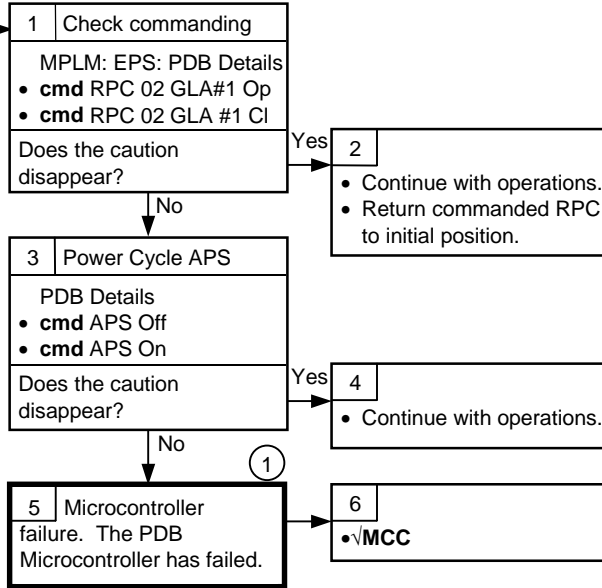
EPS

2.105 MPLM PDB CONTROLLER FAILURE

(MPLM/UF2 - ALL/FIN 2) Page 1 of 1 page

CAUTION

MPLM PDB
Controller Failure



①
A microcontroller failure results in a loss of communication with the PDB. Therefore, no telemetry or commanding capabilities exist with the PDB. The deactivation procedure will now be a manual reconfiguration.

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EPS

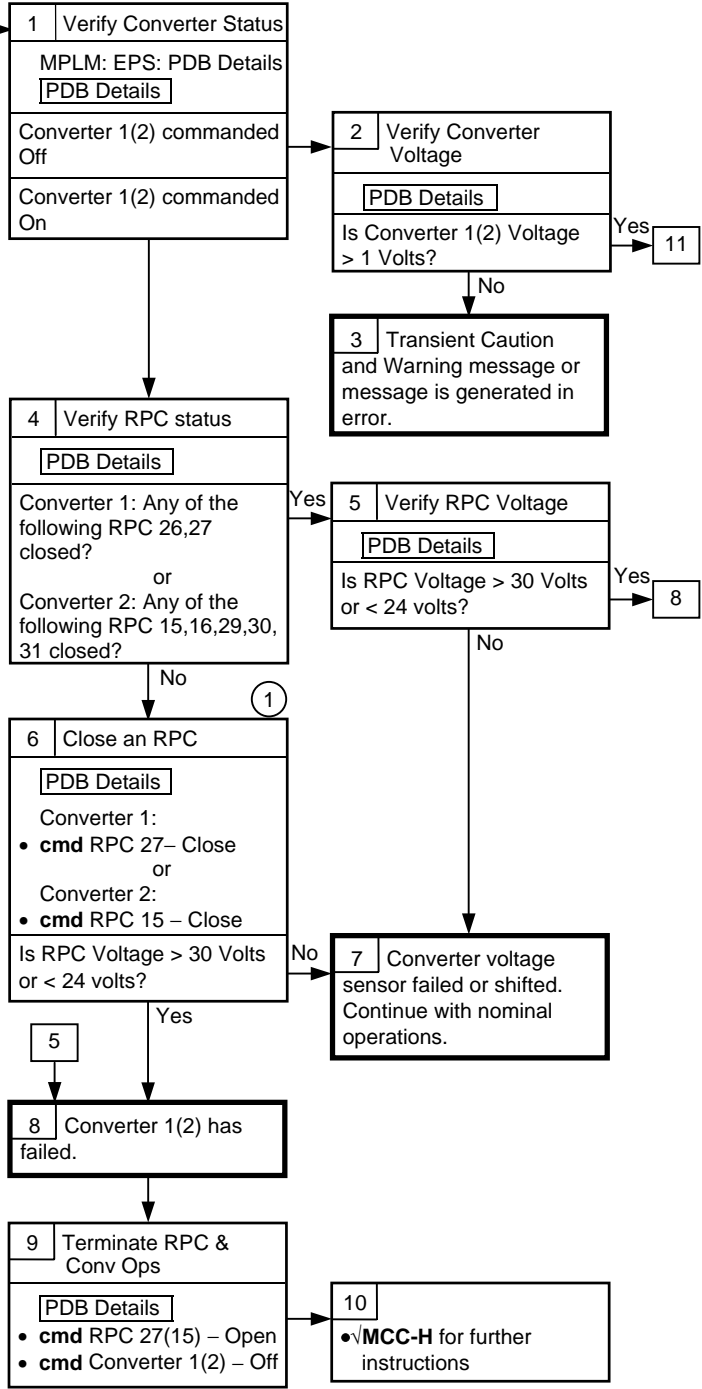
2.106 MPLM PDB CONVERTER 1(2) FAILURE
(MPLM/UF2 - ALL/FIN 2) Page 1 of 2 pages

CAUTION

MPLM Converter 1(2) Failure - MPLM

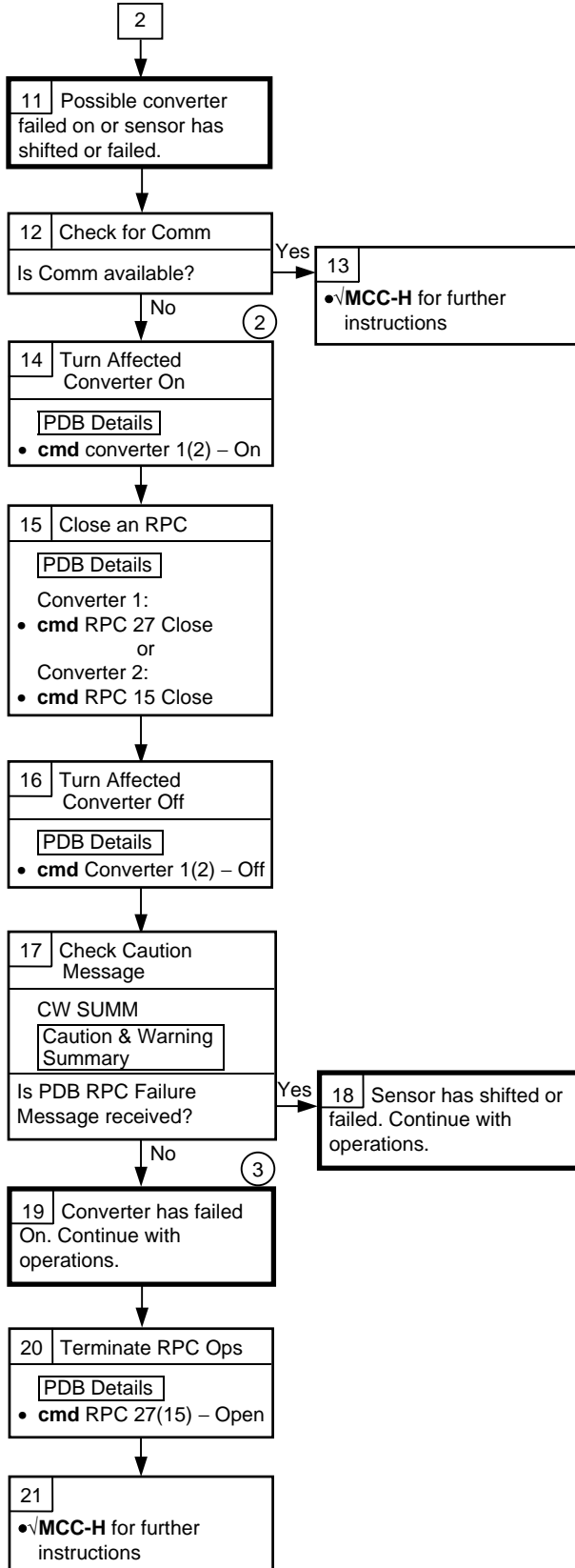
If:
 Converter is On:
 Conv Voltage < 24 Vdc
 or
 Conv Voltage > 30 Vdc
 Converter is Off:
 Conv Voltage > 1 Vdc

Nominal Config:
 MPLM is activated



① Two RPCs are connected to Converter 1 (RPC26 to DA and RPC27 to PPRA). It is preferable to use RPC27 for safety reasons. If we use RPC26 we would be one failure away from depressurizing the module. Converter 2 has 5 RPCs connected to it. Selecting any RPC would be OK; there is no safety concern, but for simplicity, RPC 15 is preferable.

2.106 MPLM PDB CONVERTER 1(2) FAILURE
(MPLM/UF2 - ALL/FIN 2) Page 2 of 2 pages



② Any RPC downstream of the converter cannot be commanded to close unless the converter is commanded on.

③ Operating the MPLM with the converter failed on should not have an impact to downstream loads. In order for these loads to operate prematurely, it requires a failed closed RPC and an inadvertent Open/Close command.

EPS

2.107 MPLM PDB RPC FAILURE - MPLM
(MPLM/UF2 - ALL/FIN 4) Page 1 of 7 pages

CAUTION
ALARM

1
MPLM PDB RPC
Failure - MPLM

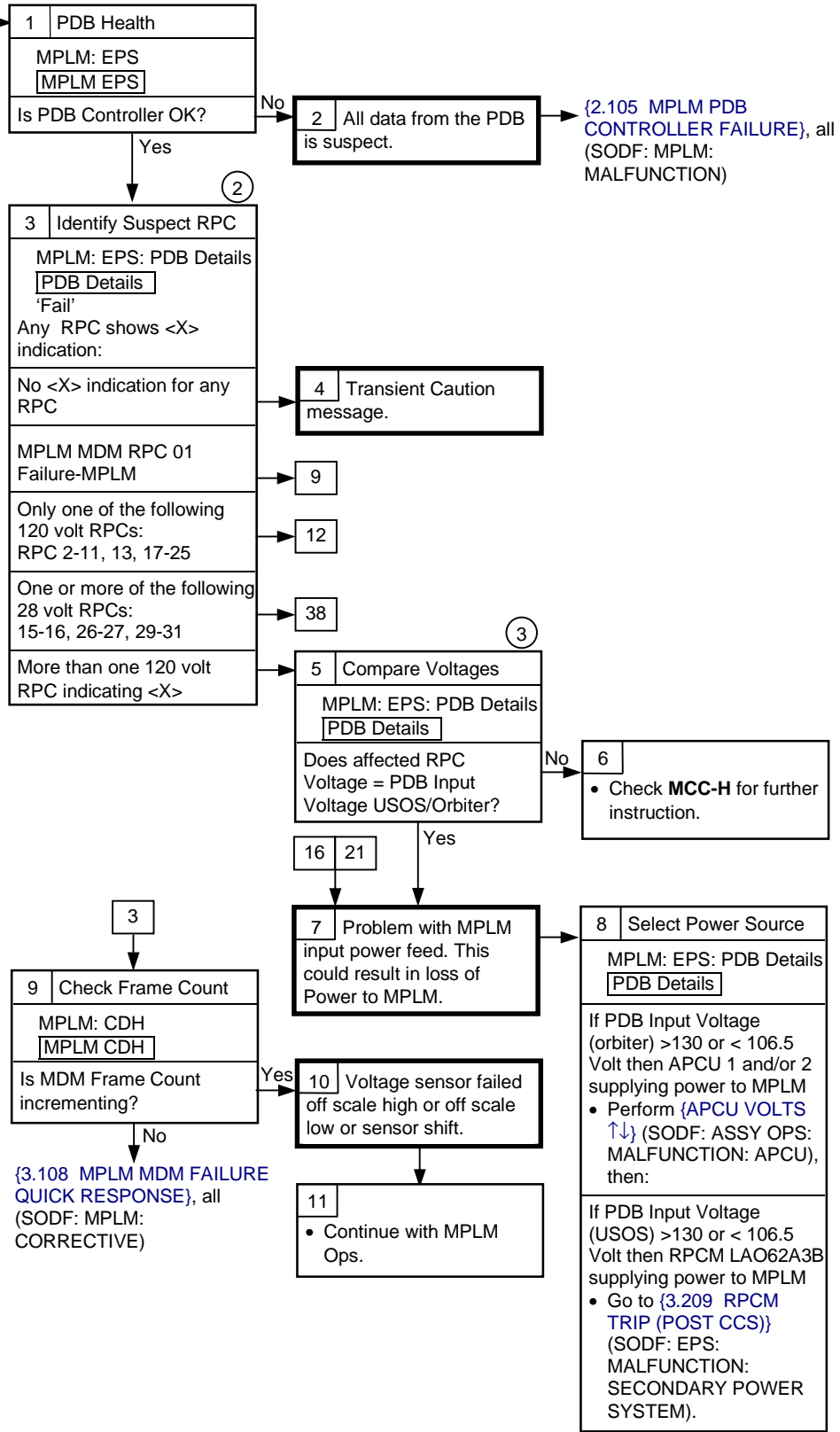
For any 120V RPCs
Voltage ≤ 106.5 V
or Voltage ≥ 131 V
OR
For Any 28V RPCs
Voltage ≤ 24 V or
Voltage ≥ 30 V

ADVISORY

MPLM Load name
RPC XX Failure
- MPLM

If
For any 120V RPCs
Voltage ≤ 106.5 V or
Voltage ≥ 131 V
OR
For any 28V RPCs
Voltage ≤ 24 V or
Voltage ≥ 30 V

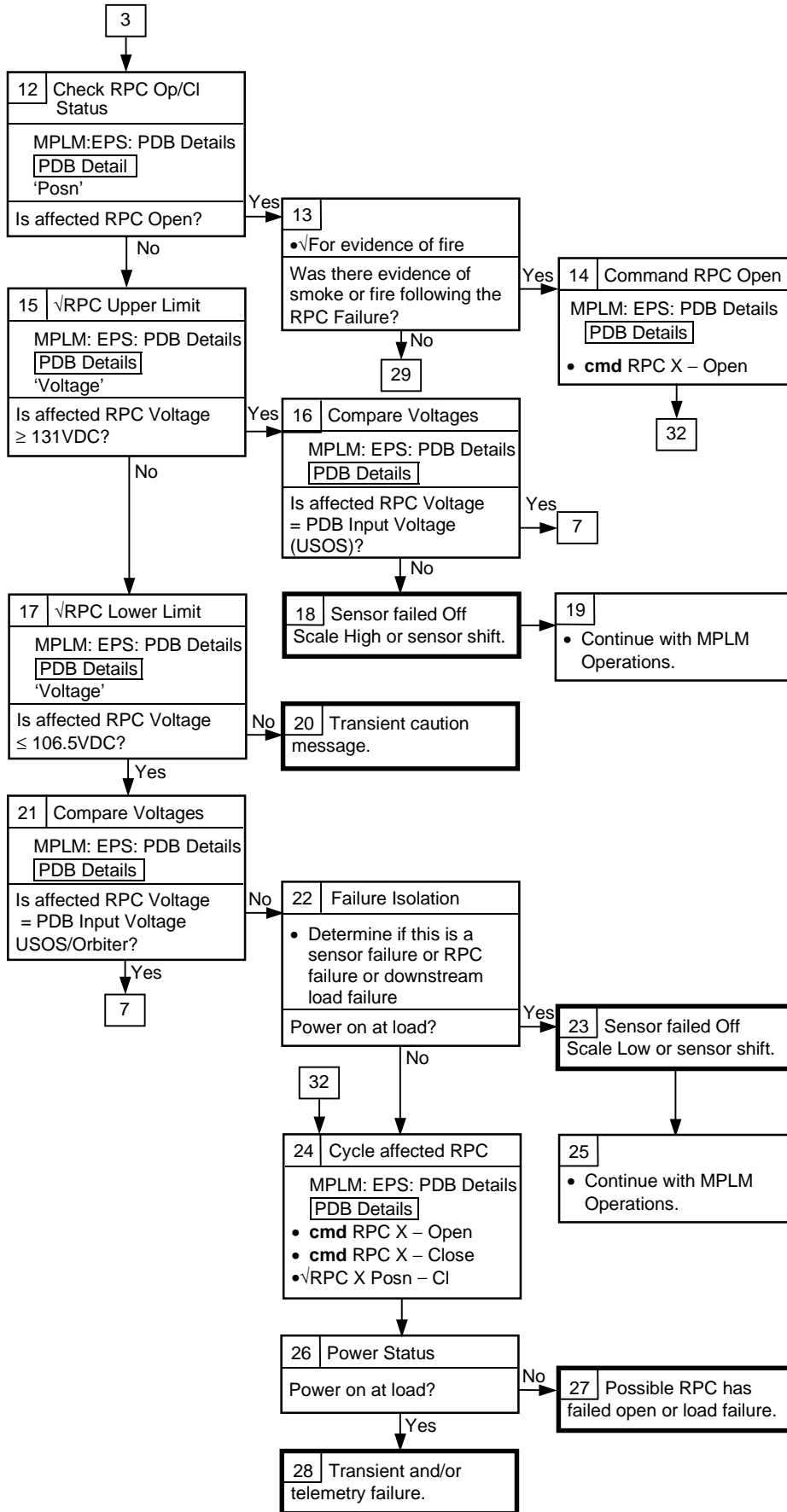
Nominal Config:
MPLM Module is
activated.



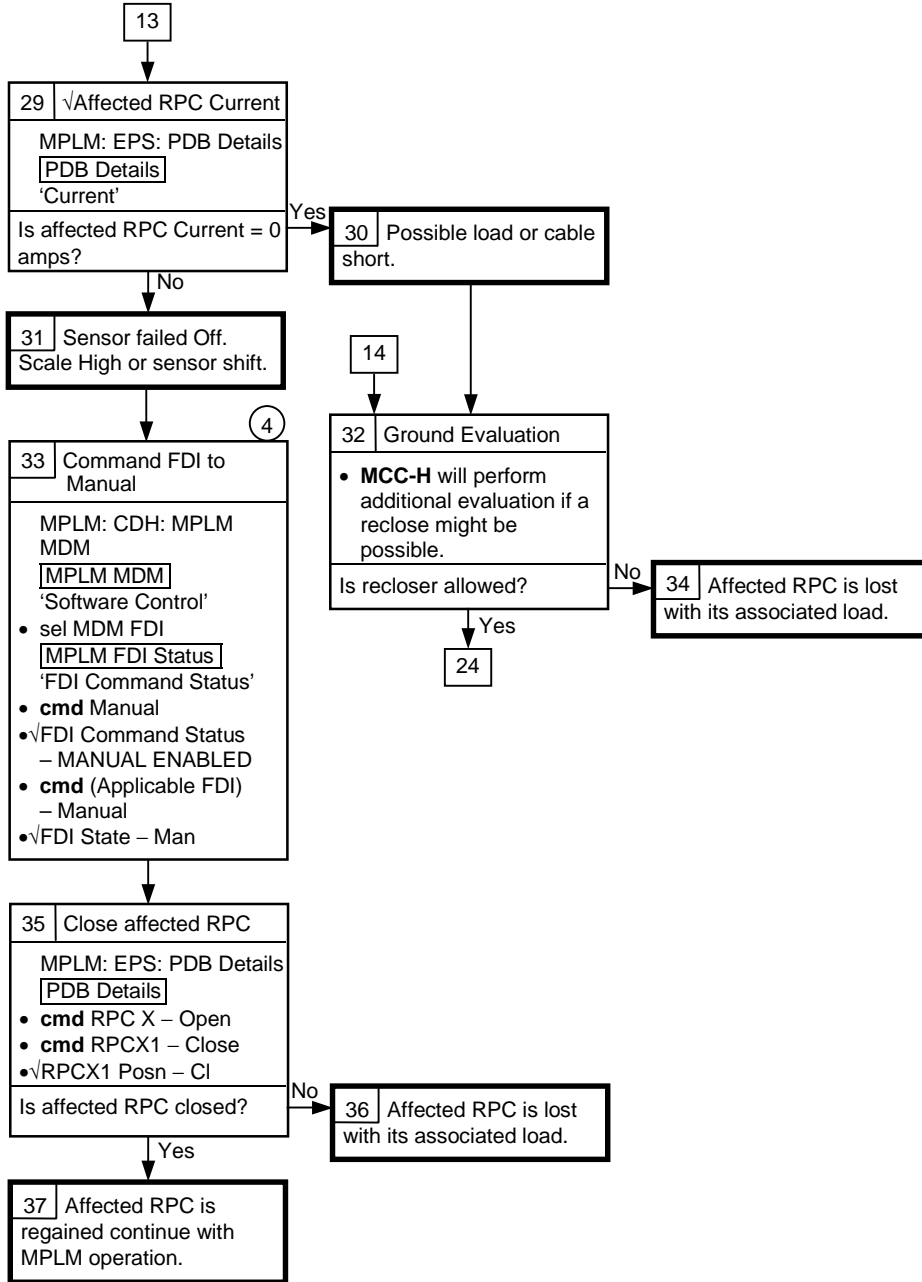
1
The Caution 'MPLM PDB RPC Failure - MPLM' is a generic C&W message. Refer to advisory log to determine a specific RPC failure.

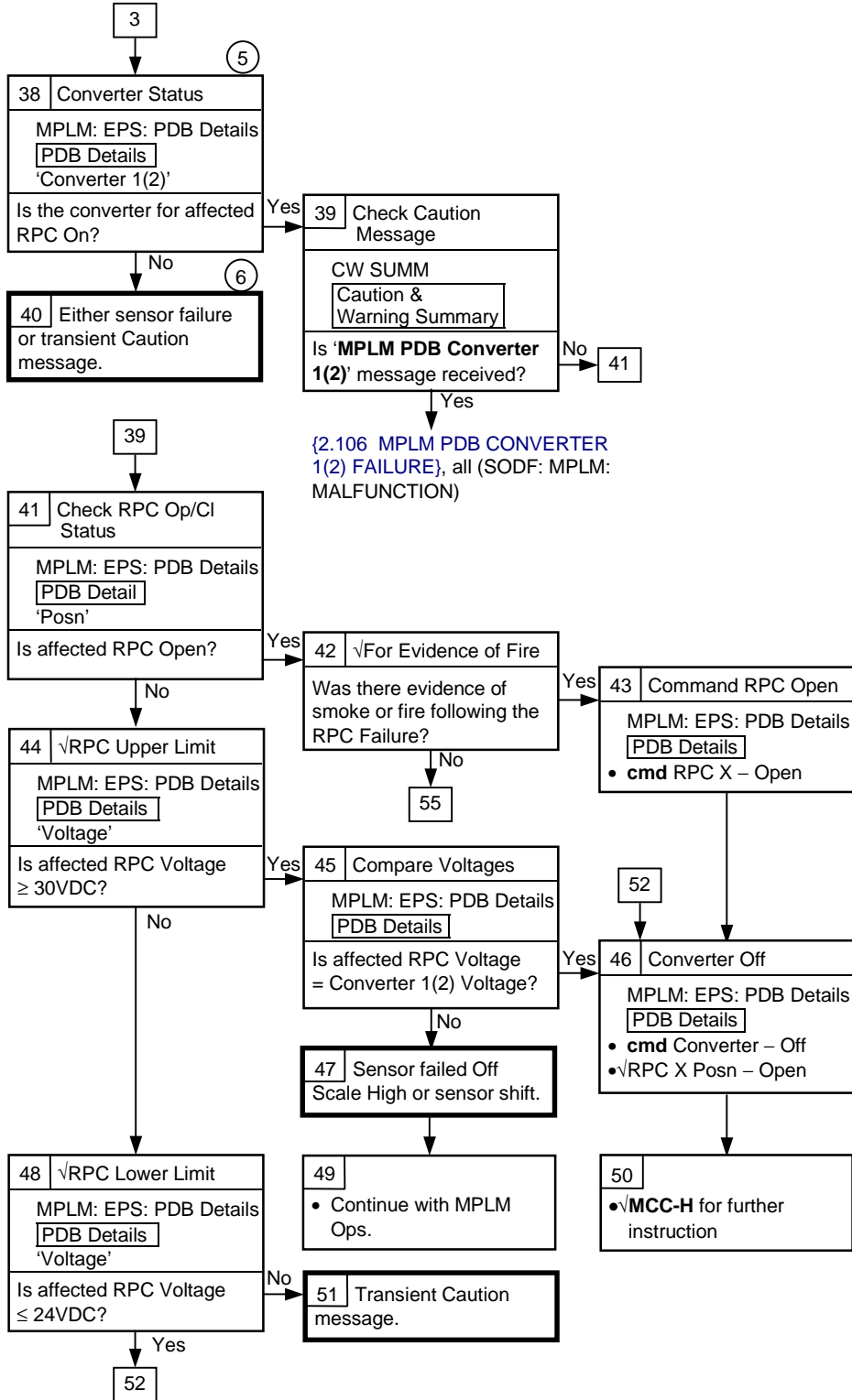
2
There are two spare 120VDC RPCs and they are RPCs 12 and 14. There is one spare 28VDC RPC, and it is RPC 28.

3
When multiple RPCs indicate <X> most likely the problem is caused by PDB input power source (Input voltage is > 130 or < 106.5 volts).



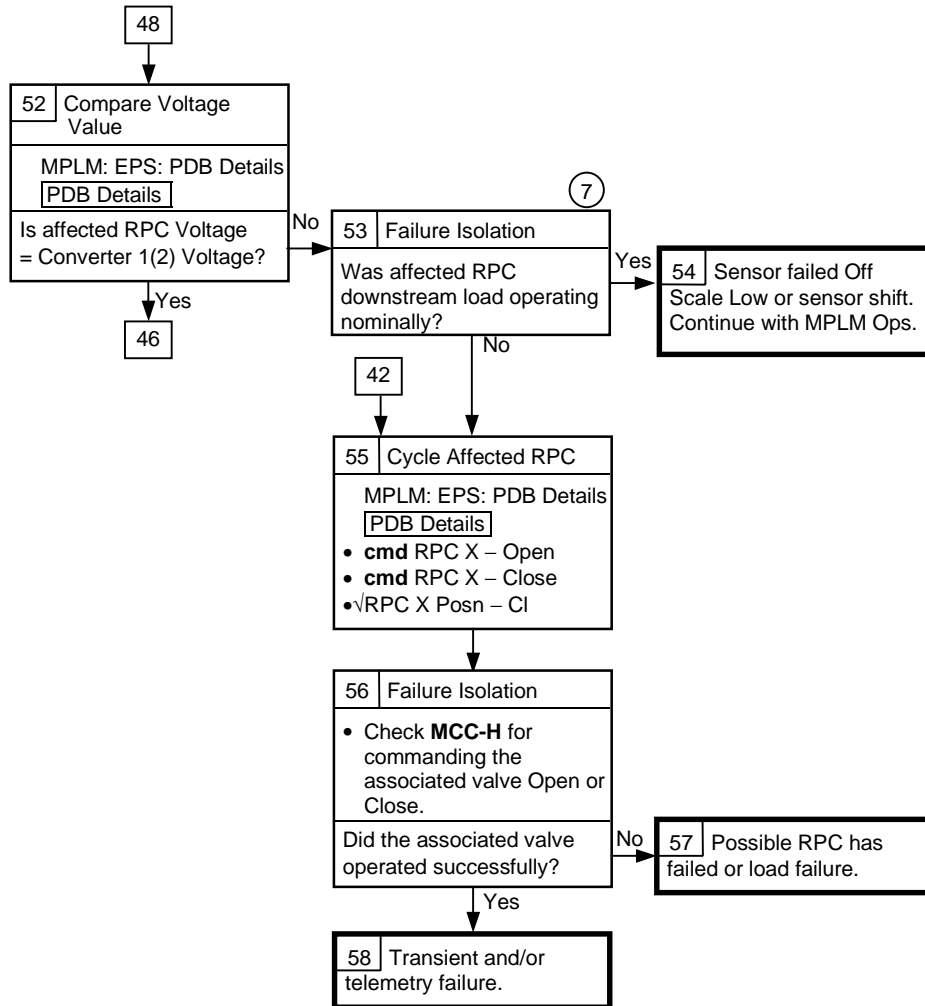
④
See Table 1 for proper FDI name.





5 Converter 1 provides power to RPC26 and 27. Converter 2 provides power to RPC 15, 16, 29, 30 and 31.

6 When the 28VDC RPC is open and the voltage reading is > 1 volt the MDM will trigger the caution message 'MPLM PDB RPC Failure'.



7
 Reference Table 1 for affected RPC downstream load.

2.107 MPLM PDB RPC FAILURE - MPLM
 (MPLM/UF2 - ALL/FIN 4) Page 6 of 7 pages

Table 1. RPC Type and Trip Current

RPC Number	Output voltage	RPC Load	Power Max (W)	Surge Current	Rate Current	Lower Threshold Current (A)	Upper Threshold Current (A)
1	120	MDM	80	0.75	2.8	1.0	2.60
2 to 9	120	GLA 1 to 8	30	< 3.80	4.2	1.0	3.80
10	120	ELPS	5	< 3.52	4.2	1.0	3.80
11	120	Cabin Fan	345	11.90	12.60	---	11.90
12	120	Spare	1.5	< 0.05	1.4	0.3	1.0
13	120	DSD	1.5	< 0.05	1.4	0.3	1.0
14	120	Spare	1.5	< 0.05	1.4	0.3	1.0
15	28	ISOV#1	7	< 1.0	7.0	1.4	4.0
16	28	ISOV#2	7	< 1.0	7.0	1.4	4.0
17	120	DA#1Htr	250	0	2.8	---	2.60
18	120	DA#2Htr	250	0	2.8	---	2.60
19	120	R/FR#1	1050	< 9.3	9.8	---	9.30
20 to 22	120	R/FR#2-4	598	< 5.3	5.6	---	5.30
23	120	R/FR#5/HCU	1050	< 9.3	9.8	---	9.30
24	120	HCU	60	1.0	2.80	0.80	2.60
25	120	WPP	100	< 7.90	8.4	---	7
26	28	DA#1(Vlv1,2)/ DA#2(Vlv1,2)	7	< 1.0	7.0	1.40	4.00
27	28	PPRA#1,2,3	7	< 1.0	7.0	1.40	4.00
28	28	Spare			7.0	---	---
29	28	SSOV	7	< 1.0	7.0	1.40	4.00
30	28	WOV	20	< 3.0	7.0	1.40	4.00
31	28	WMV	20	< 3.0	7.0	1.40	4.00

2.107 MPLM PDB RPC FAILURE - MPLM
 (MPLM/UF2 - ALL/FIN 4) Page 7 of 7 pages

Table 2. Fault Detection and Isolation (FDI) Over Current Algorithms

RPC Number	FDI Name	Software Lower Limit (A)	Software Upper Limit (A)	Action
2	GLA1	-	0.4	Open RPC
3	GLA2	-	0.4	Open RPC
4	GLA3	-	0.4	Open RPC
5	GLA4	-	0.4	Open RPC
6	GLA5	-	0.4	Open RPC
7	GLA6	-	0.4	Open RPC
8	GLA7	-	0.4	Open RPC
9	GLA8	-	0.4	Open RPC
10	ELPS	-	0.15	Open RPC
11	Cabin Fan Ovid	0.326	2.8	Stop Fan
13	Smk Det Ovid	-	0.05	Open RPC
17	DPRS Assy 1 Htr Ovid	-	2.5	Open RPC & SSW1
18	DPRS Assy 1 Htr Ovid	-	2.5	Open RPC & SSW2
19	RFRCK1	-	9.66	Open RPC
20	RFRCK2	-	5.2	Open RPC
21	RFRCK3	-	5.2	Open RPC
22	RFRCK4	-	5.2	Open RPC
23	RFRCK5	-	9.66	Open RPC
24	HCU	-	0.65	Open RPC
31	WMV	-	0.35	None

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ECLSS

2.108 MPLM PPR ASSEMBLY FAILURE

(MPLM/LF1 - ALL/FIN 3)

Page 1 of 2 pages

CAUTION
ALARM

C&W Sum
C&W Summary
Loss of Positive
Press Relief –
MPLM

ADVISORY
ALARM

C&W Sum
C&W Summary
Positive Press
Relief Assy
1(2)(3) Vlv
Failure – MPLM

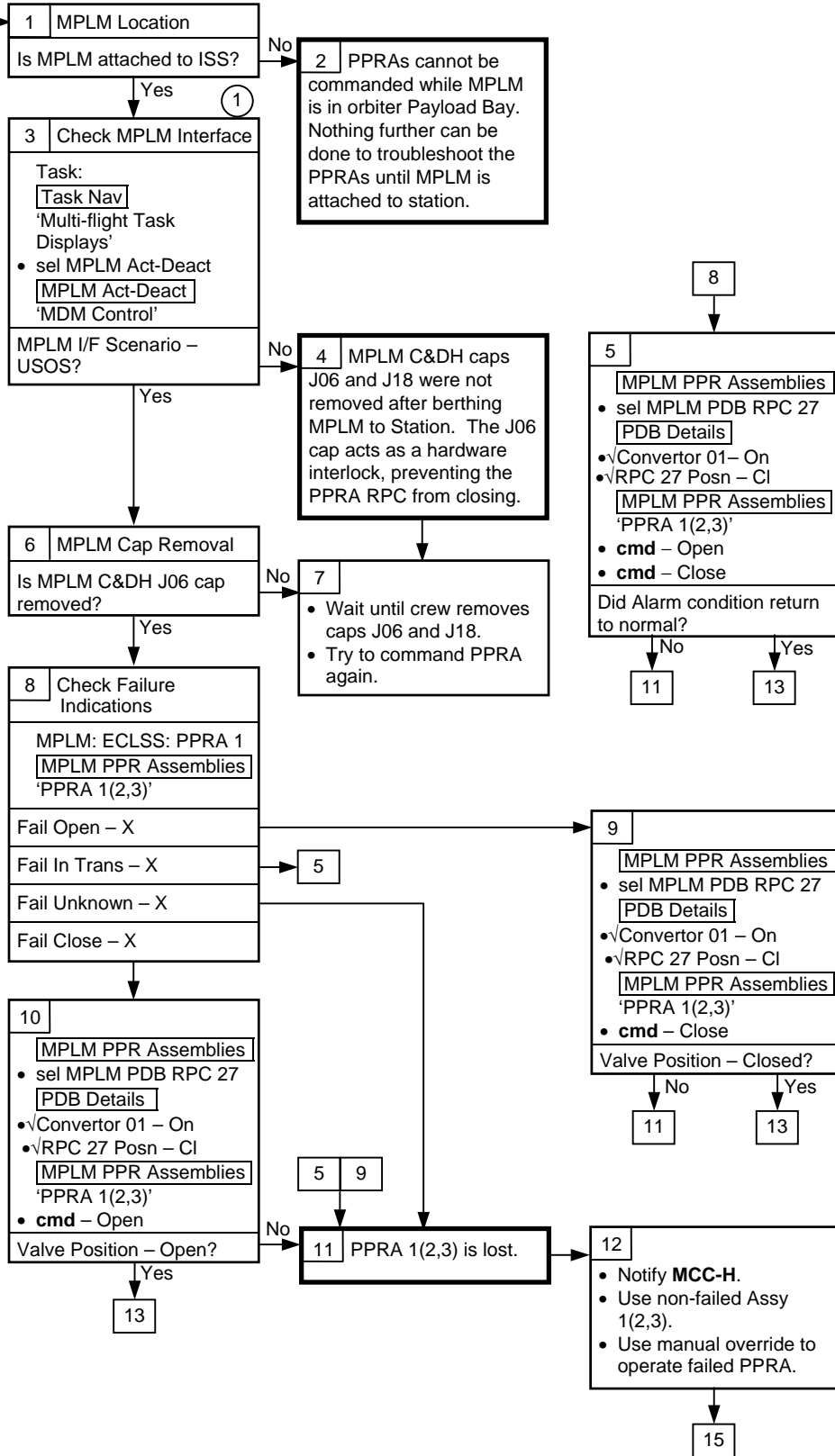
(PPRA valve has 5 seconds to reach commanded position)

Caution Triggers:
Two of the three PPRAs must have one of the following failures:
PPRA vlv position is in transition (not open, not closed or PPRa is commanded open but remains closed)

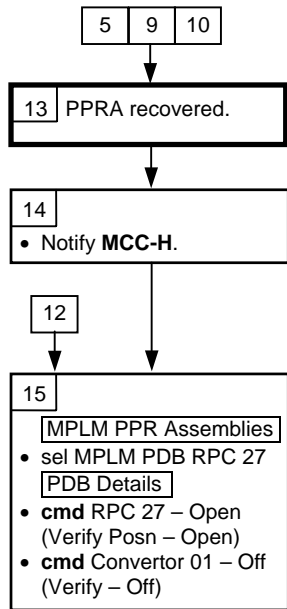
Advisory Triggers:
PPRA position in transition (not open, not closed)
OR
PPRA position is unknown (open and closed)
OR
PPRA is commanded open but remains closed
OR
PPRA is commanded closed but remains open

Nominal Config:
If MPLM isolated, PPRAs Open
If MPLM not isolated, PPRAs Closed

MPLM PDB
Converter 1 – On
MPLM PDB RPC 27
Position – Closed



1 All displays in this procedure are on the PCS.



ECLSS

CAUTION
ALARM

2.109 MPLM SMOKE DETECTOR FAILURE

(MPLM/UF2 - ALL/FIN 4) Page 1 of 2 pages

Table 1. MPLM Smoke Detector MDM Information

(A) Function	(B) Data Type	(C) MDM	(D) Card Type	(E) Slot	(F) Chnl
Smoke Det. Active Bit	Cmd	MPLM	DIO #1	2	13
Smoke Det. Obscuration	Tim	MPLM	HLA #1	7	09
Smoke Det. Scatter	Tim	MPLM	HLA #1	7	08

C&W Summ
C&W Summary
Loss of Smoke Detection
- MPLM

ADVISORY
ALARM

C&W Summ
C&W Summary
Smoke Detector Overcurrent
- MPLM

C&W Summ
C&W Summary
Smoke Detector Failure - MPLM

Caution Triggers:
Passive/Active BIT failed
OR
RPC 13 current > 0.05 A

Overcurrent Advisory Trigger:
Current > 0.05 A

Smoke Detector Failure Advisory Triggers:
Passive Bit Lens Status - Dirty OR

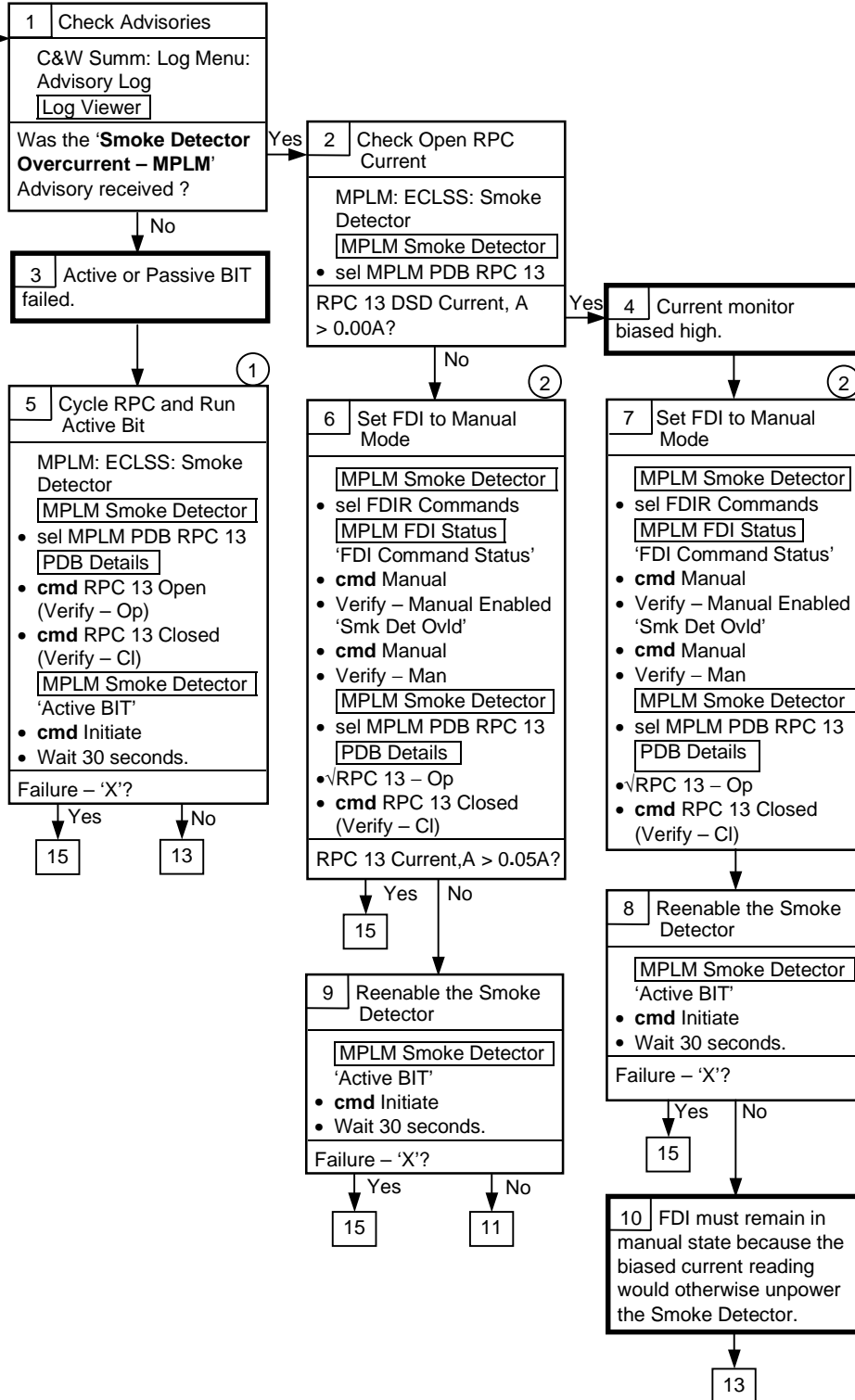
Failure - Contaminated (not visible on PCS)

Nominal Config:
No CDH failures in MDM
Cards D, Slots E, Chnls F

PDB operating nominally

MPLM PDB RPC 13 closed (open if overcurrent advisory received) and not tripped, current = 0.02A (0.0A if overcurrent advisory received).

Lens Status - Clean
Degraded - Blank
Smoke Status - No Smoke
Fire Status - No Fire
FDI Recovery - Auto

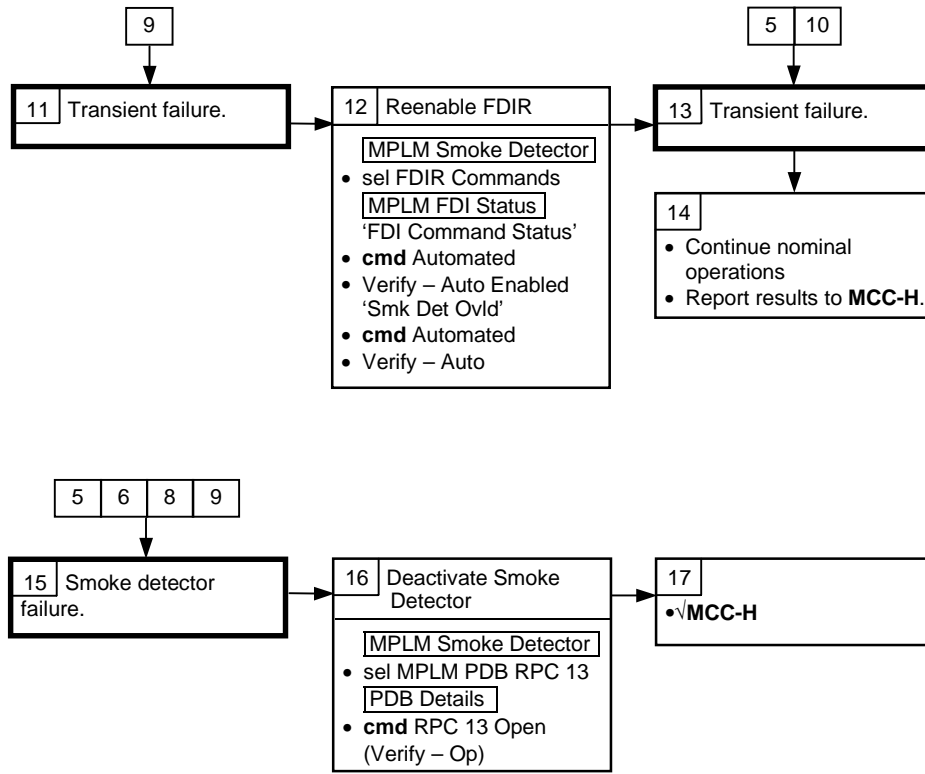


1 Expect repeat C&W.

2 When Smoke Detector FDI is in manual, the Smoke Detector will still announce, a fire and isolation will still occur; however, no Smoke Detector failure C&W messages will be announced, nor will a high current (> 0.05 A) automatically unpower the Smoke Detector.

2.109 MPLM SMOKE DETECTOR FAILURE

(MPLM/UF2 - ALL/FIN 4) Page 2 of 2 pages



EPS

2.110 MPLM PDB INTERNAL HIGH TEMPERATURE

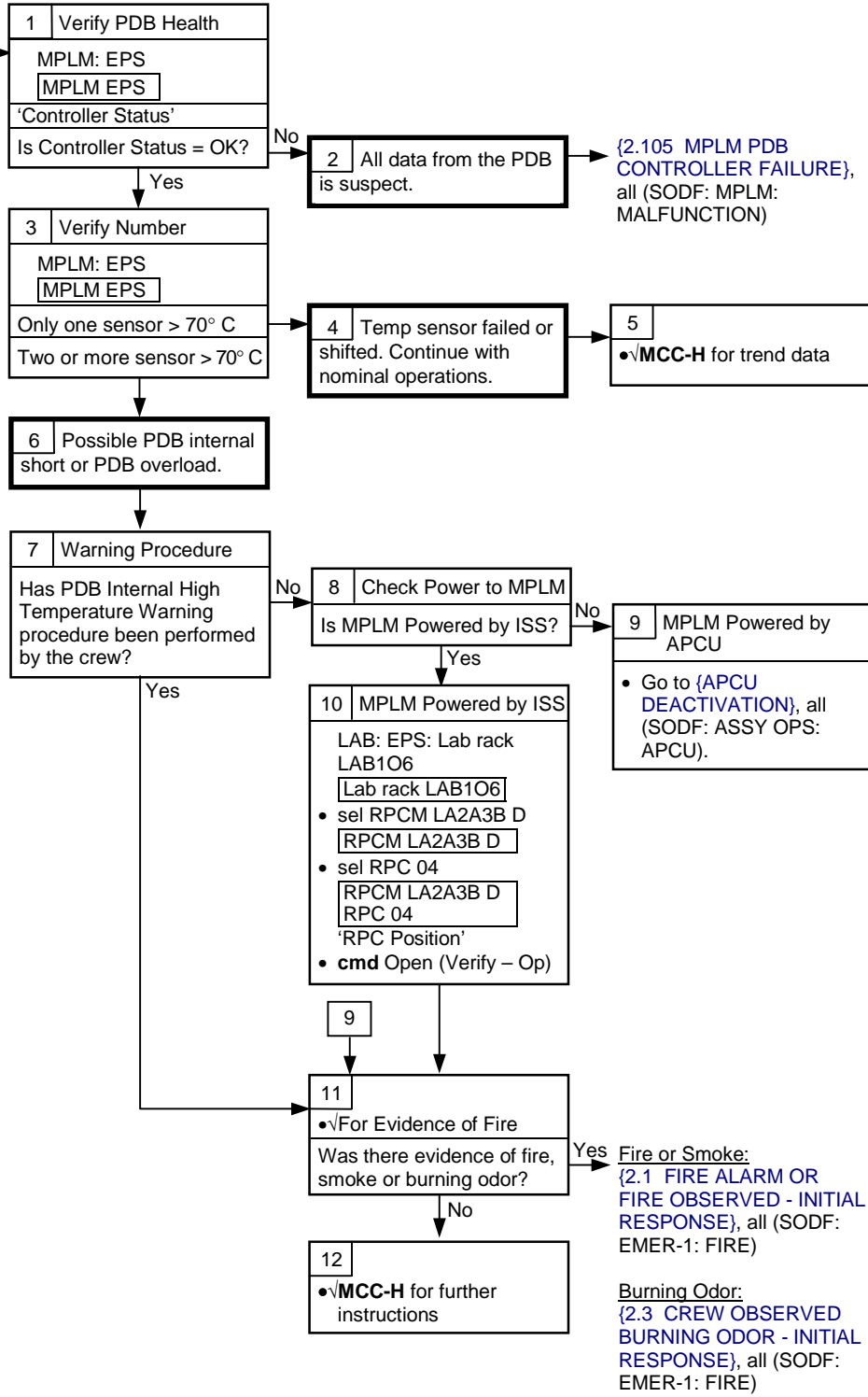
(MPLM/LF1 - ALL/FIN 2) Page 1 of 1 page

CAUTION

PDB Internal High Temperature

If:
Converter is On:
PDB Temp 1, 2 or 3
> 70 ° C

Nominal Config:
MPLM is activated



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2.120 MPLM DEPRESS ASSEMBLY VALVE FAILURE
 (MPLM/ULF1 - ALL/FIN 1) Page 1 of 3 pages

Table 1. MPLM Depress Assembly Valve PDB Information

[A] Depress Assembly	[B] Valve	[C] Valve Driver	Power Converter	[Y] Valve RPC
1	1 (Inboard)	VMDS 2	1	PDB 26
	2 (Outboard)	VMDS 1	1	PDB 26
2	1 (Inboard)	VMDS 4	1	PDB 26
	2 (Outboard)	VMDS 3	1	PDB 26

Table 2. MPLM Depress Assembly Heater MDM/PDB Information

[A] Depress Assembly	MDM	[D] Cmd Card	[E] Cmd Chnl	[F] Tlm Card	[G] Tlm Chnl	[Z] Heater RPC
1	MPLM	DIO 2	7, 8	LLA 5	12, 29	PDB 17
2	MPLM	DIO 4	8, 9	LLA 5	5, 30	PDB 18

ECLSS

CAUTION
ALARM

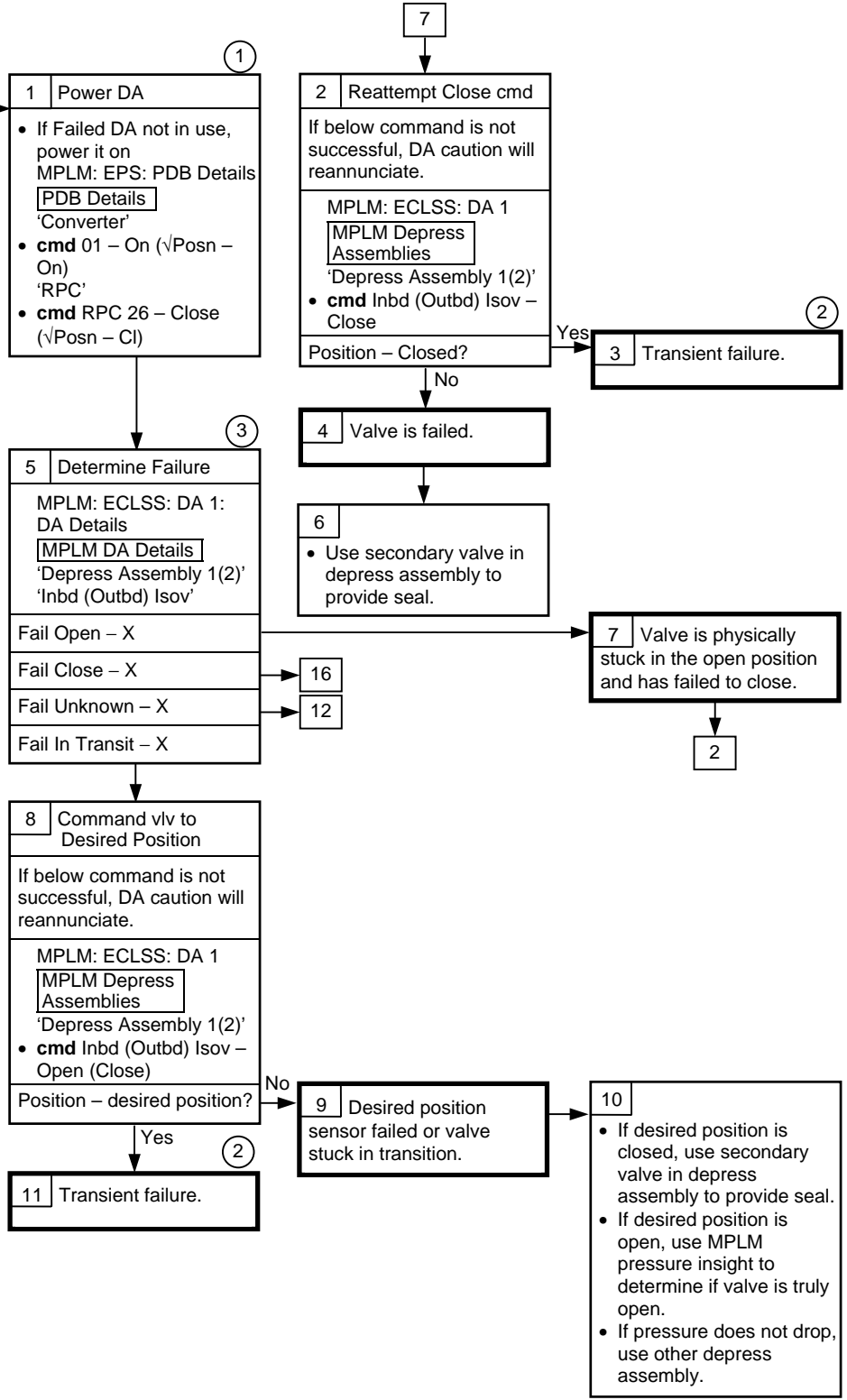
C&W Summ
C&W Summary
Depress Assy [A]
Vlv [B] Failure –
MPLM

Triggers:
(Valve has 5 sec
to reach
commanded
posn)
Valve was
commanded
open but remains
closed.
Valve was
commanded
closed but
remains open.
Valve is neither
open nor closed
(Fail in Transit)
Valve is both open
and closed (Fail
Unknown).

Nominal Config:
(if using DA)
Converter 1 – On
PDB RPC [Y], [Z]
posn – Closed
All C&DH cards
good.
MPLM MDM is good.
MPLM IMV Vlvs –
Closed
MPLM SSOV –
Closed

(if not using DA)
Converter 1 – Off
PDB RPC [Y], [Z]
posn – Open
All C&DH cards
good.
MPLM MDM is good.

2.120 MPLM DEPRESS ASSEMBLY VALVE FAILURE (MPLM/ULF1 - ALL/FIN 1) Page 2 of 3 pages



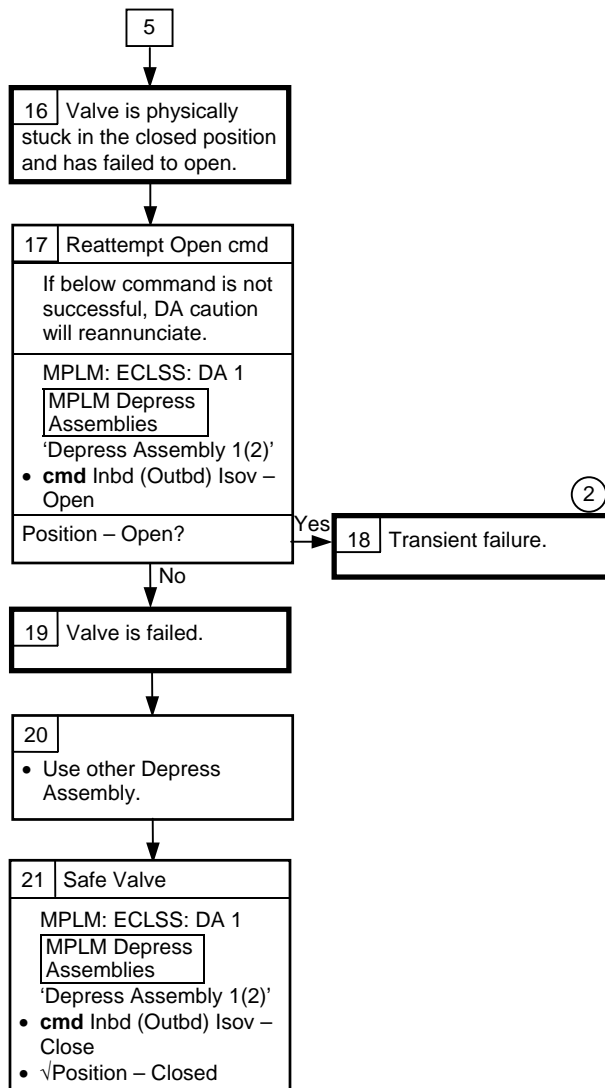
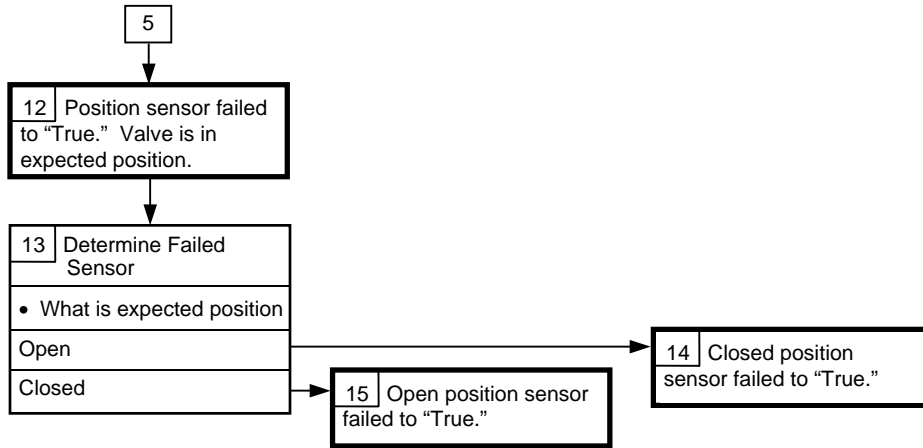
① All displays in this procedure are on the PCS.

② Per PRACA 2703, Depress Assembly valves can indicate "In transit" when they are really closed. This happens when the vlv is commanded closed, and it bounces off of the microswitch sensor. The close command should be sent again.

③ The DA valves have two position sensors per valve. The indication of "Fail Open" means valve has been commanded to close and has remained open. "Fail Close" is the opposite. "Fail Unknown" indicates that the valve sensors indicate open and closed at the same time. "Fail In Transit" is when sensors show valve to be in neither position.

2.120 MPLM DEPRESS ASSEMBLY VALVE FAILURE

(MPLM/ULF1 - ALL/FIN 1) Page 3 of 3 pages



②
Per PRACA 2703, Depress Assembly valves can indicate "In transit" when they are really closed. This happens when the valve is commanded closed, and it bounces off of the microswitch sensor. The close command should be sent again.

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CORRECTIVE

CORRECTIVE

CORRECTIVE

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WARNING

Failure to remove power can result
in electrical shock hazard.

1. VERIFYING APCU 1 AND 2 DEACTIVATED

CRT

SM 200 APCU Status

Verify APCU1,2 OUT VOLTS LOW RES: $0.0 \pm 2V$

SSP1

Verify APCU1,2 CONV tb – bp
Verify APCU1,2 OUTPUT RLY tb – bp

2. VERIFYING ISS POWER SOURCE RPC TO MPLM OPEN

PCS

LAB: EPS: Lab Rack LAB1O6

Lab Rack LAB1O6

'Power Bus 2A3B'

sel RPCM LA2A3B D

RPCM LA2A3B D

Verify Integ Counter – incrementing

sel RPC 04

RPCM LA2A3B D RPC 04

√RPC Position – Op

√Close Cmd – Inh)

RPCM LA2A3B D

sel RPC 03

RPCM LA2A3B D RPC 03

√RPC Position – Op

√Close Cmd – Inh)

Report at completion.

3.101 APCU TO MPLM EPS JUMPER RECONFIGURATION

(MPLM/UF2 - ALL/FIN 3) Page 2 of 3 pages

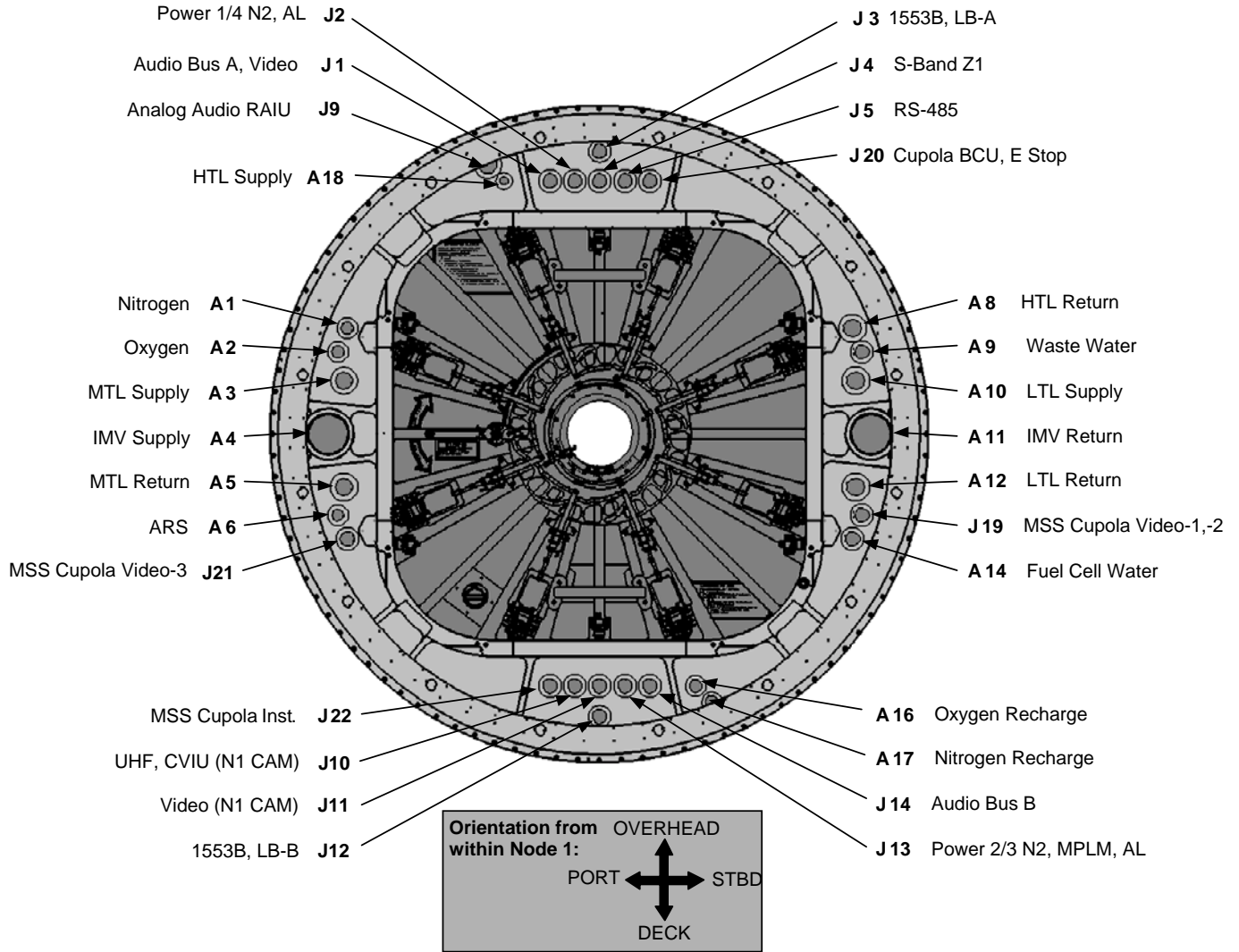


Figure 1.- LAB Aft External Bulkhead (view from inside Node 1).

CAUTION
Care must be taken while working in the vicinity of Hatch Seal to avoid rubbing, scratching, or placing any type of direct pressure upon Seal. Damaging Hatch Seal could prevent Hatch from maintaining pressure when closed.

3. REMOVING AXIAL PORT CLOSEOUT (IF REQUIRED)

Detach Velcro strips.

Remove Closeout, loosen 1/4-turn fasteners.
Roll Closeout from loose end toward attached end.

Temporarily stow Closeout.

3.101 APCU TO MPLM EPS JUMPER RECONFIGURATION

(MPLM/UF2 - ALL/FIN 3) Page 3 of 3 pages

4. REMOVING ISS TO MPLM EPS JUMPER

W2018P13 ←|→ J13

W2018P16 ←|→ J16

5. INSTALLING POWER 2/3 JUMPER FROM LAB TO NODE 1 VESTIBULE

W2004P13 →|← J13

W2004P16 →|← J16

6. Inform **MCC-H** of task completion.

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WARNING

Failure to remove power can result in electrical shock hazard.

1. VERIFYING APCU 1 AND 2 DEACTIVATED

CRT

SM 200 APCU Status

Verify APCU1,2 OUT VOLTS LOW RES: $0.0 \pm 2V$

SSP1

Verify APCU1,2 CONV tb – bp
Verify APCU1,2 OUTPUT RLY tb – bp

2. VERIFYING ISS POWER SOURCE RPC TO MPLM OPEN

PCS

LAB: EPS: Lab Rack LAB1O6

Lab Rack LAB1O6

'Power Bus 2A3B'

sel RPCM LA2A3B D

RPCM LA2A3B D

Verify Integ Counter – incrementing

sel RPC 04

RPCM LA2A3B D RPC 04

Verify RPC Position – Op
Verify Close Cmd – Inh

RPCM LA2A3B D

sel RPC 03

RPCM LA2A3B D RPC 03

Verify RPC Position – Op
Verify Close Cmd – Inh

Report at completion.

3.102 ISS TO MPLM EPS JUMPER RECONFIGURATION

(MPLM/UF2 - ALL/FIN 3) Page 2 of 3 pages

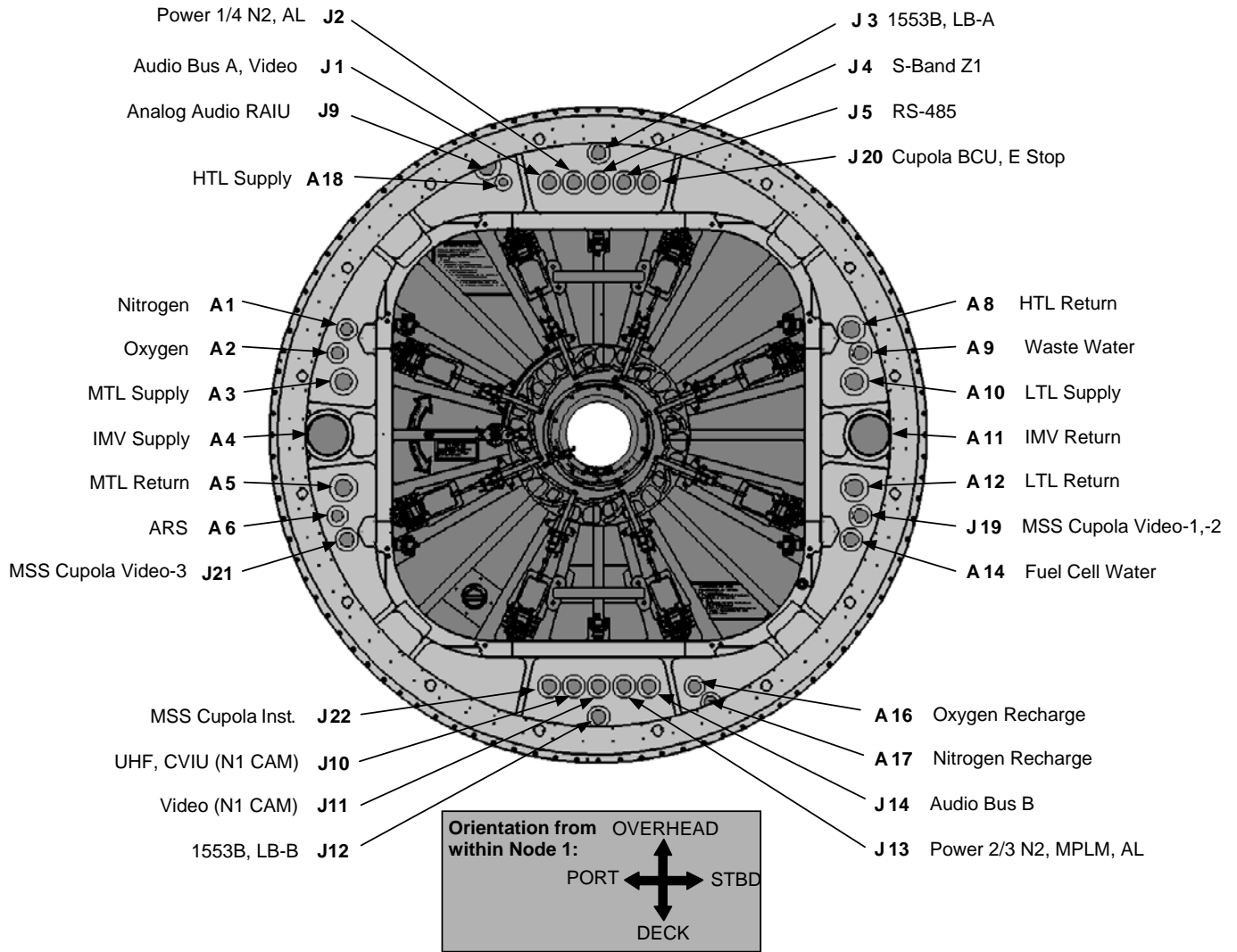


Figure 1.- LAB Aft External Bulkhead
(view from inside Node 1).

CAUTION
Care must be taken while working in the vicinity of Hatch Seal to avoid rubbing, scratching, or placing any type of direct pressure upon Seal. Damaging Hatch Seal could prevent Hatch from maintaining pressure when closed.

3. REMOVING AXIAL PORT CLOSEOUT (IF REQUIRED)

Detach Velcro strips.

Remove closeout, loosen 1/4-turn fasteners.
Roll closeout from loose end toward attached end.

Temporarily stow closeout.

3.102 ISS TO MPLM EPS JUMPER RECONFIGURATION

(MPLM/UF2 - ALL/FIN 3) Page 3 of 3 pages

4. REMOVING POWER 2/3 JUMPER FROM LAB TO NODE 1 VESTIBULE

W2004P13 ←|→ J13

W2004P16 ←|→ J16

5. INSTALLING ISS TO MPLM EPS JUMPER

W2018P13 →|← J13

W2018P16 →|← J16

6. Inform **MCC-H** of task completion.

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3.103 MPLM CABIN FAN ACTIVATION/DEACTIVATION

(MPLM/LF1 - ALL/FIN 5/SPN) Page 1 of 2 pages

I

OBJECTIVE:

Activates and deactivates the MPLM Cabin Fan and Smoke Detector.

1. CABIN FAN ACTIVATION

1.1 Smoke Detector Activation

MPLM: ECLSS: Smoke Detector

MPLM Smoke Detector

sel MPLM PDB RPC 13

PDB Details

cmd RPC 13 Close (Verify – Cl)

MPLM Smoke Detector

'Active BIT'

cmd Initiate

Wait 5 seconds.

'Passive BIT'

Verify Degraded – Blank

'Smoke Status'

Verify Smoke Status – No Smoke

1.2 Cab Fan Activation

MPLM: ECLSS: Cab Fan

MPLM Cabin Fan

sel MPLM PDB RPC 11

PDB Details

cmd RPC 11 Close (Verify – Cl)

MPLM Cabin Fan

'On'

cmd On

Verify State – On

Verify Speed: 3056 to 4048 rpm

3.103 MPLM CABIN FAN ACTIVATION/DEACTIVATION

(MPLM/LF1 - ALL/FIN 5/SPN)

Page 2 of 2 pages

NOTE

Per SPN 29905, INT software incorrectly uses MPLM cabin fan state instead of MPLM SDS position to verify MCA sample location. Should the valve be open, and the fan state off, the INT will think the MPLM sample location is inaccessible and set the Location Accessible Flag to False, which can be ignored.

2. CABIN FAN DEACTIVATION

2.1 Cabin Fan Deactivation

MPLM: ECLSS: Cab Fan

MPLM Cabin Fan

'Off'

cmd Arm

cmd Off

Verify State – Off

Verify Speed: 2000 rpm

sel MPLM PDB RPC 11

PDB Details

cmd RPC 11 Open (Verify – Op)

2.2 Smoke Detector Deactivation

MPLM: ECLSS: Smoke Detector

MPLM Smoke Detector

sel MPLM PDB RPC 13

PDB Details

cmd RPC 13 Open (Verify – Op)

3.104 MPLM CABIN FAN SAFING

(MPLM/LF1- ALL/FIN 5)

Page 1 of 1 page

WARNING

1. MPLM cabin smoke detection is lost when Cabin Fan fails.
2. Crew in the MPLM should be alert to symptoms resulting from excessive heat, humidity, and CO2. Leave the MPLM if symptoms develop.

- MPLM
1. MONITORING MPLM ATMOSPHERE
Deploy CDM in MPLM, perform {2.5.280 CARBON DIOXIDE MONITOR: CDM - OPERATIONS FOR CARBON DIOXIDE MONITORING}, all (SODF: MED OPS: NOMINAL: EHS), then:
- PCS
2. TROUBLESHOOTING MPLM CABIN FAN
Go to {2.101 MPLM CABIN FAN FAILURE}, all (SODF: MPLM: MALFUNCTION).

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3.105 MPLM CABIN FAN SPEED CHANGE

(MPLM/UF2 - ALL/FIN 3) Page 1 of 1 page

I

1. CHANGING FAN SPEED IN MDM MEMORY

MPLM: ECLSS: Cab Fan

MPLM Cabin Fan

'Speed'

Enter new speed in Set Target rpm field.

NOTE

Expect '**Cabin Fan Speed out of tolerance - MPLM**' advisory message after sending the Set Speed command.

cmd Set Speed [Template]

2. COMMANDING CABIN FAN TO NEW SPEED

MPLM: ECLSS: Cab Fan

MPLM Cabin Fan

'On'

NOTE

Expect '**Cabin Fan Speed out of tolerance - MPLM**' advisory message to return to normal when the "On" Cmd is received.

cmd On

Verify Speed, rpm: New commanded speed \pm 496 rpm

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3.106 MPLM IMV VALVE RECONFIGURATION

(MPLM/ULF1 - ALL/FIN 1) Page 1 of 2 pages

I

OBJECTIVE:

To open or close the MPLM IMV valves.

NOTE Refer to Table 1 for [X] and [Y] references that follow.

Table 1. IMV Valve Information

[X] Location	[Y] RPC
Aft	15 ISOV1
Fwd	16 ISOV2

1. MPLM IMV ACTIVATION

PCS

1.1 Enabling Power to MPLM IMV Vlvs

MPLM: ECLSS: IMV [X]

MPLM IMV Ovhd [X] Vlv

sel MPLM PDB RPC [Y]

PDB Details

cmd Converter 02 – On ($\sqrt{\text{Posn}} - \text{On}$)

cmd RPC [Y] Close (Verify [Y] RPC Posn – Cl)

1.2 Opening MPLM IMV [X] Vlv

MPLM: ECLSS: IMV [X]

MPLM IMV Ovhd [X] Vlv

'Position – Open'

cmd Open ($\sqrt{\text{Position}} - \text{Open}$)

1.3 Inhibiting Power to MPLM IMV Vlvs

MPLM IMV Ovhd [X] Vlv

sel MPLM PDB RPC [Y]

PDB Details

cmd RPC [Y] Open ($\sqrt{[Y] \text{ RPC Posn}} - \text{Op}$)

cmd Converter 02 – Off ($\sqrt{\text{Posn}} - \text{Off}$)

2. MPLM IMV DEACTIVATION

2.1 Enabling Power to MPLM IMV Vlvs

MPLM: ECLSS: IMV [X]

MPLM IMV Ovhd [X] Vlv

sel MPLM PDB RPC [Y]

PDB Details

3.106 MPLM IMV VALVE RECONFIGURATION

(MPLM/ULF1 - ALL/FIN 1) Page 2 of 2 pages

cmd Converter 02 – On ($\sqrt{\text{Posn}} - \text{On}$)
cmd RPC [Y] Close (Verify [Y] RPC Posn – Cl)

2.2 Closing MPLM IMV [X] Vlv

MPLM: ECLSS: IMV [X]

MPLM IMV Ovhd [X] Vlv

'Position – Close'

cmd Close ($\sqrt{\text{Position}} - \text{Closed}$)

2.3 Inhibiting Power to MPLM IMV Vlvs

MPLM IMV Ovhd [X] Vlv

sel MPLM PDB RPC [Y]

PDB Details

cmd RPC [Y] Open ($\sqrt{[Y]} \text{RPC Posn} - \text{Op}$)

cmd Converter 02 – Off ($\sqrt{\text{Posn}} - \text{Off}$)

3.107 MPLM ISS SHELL HEATER ACTIVATION/DEACTIVATION

(MPLM/UF2 - ALL/FIN 2) Page 1 of 1 page

1. POWERING ON PDB POWER OUTLET DEDICATED TO MPLM ISS HEATERS

PCS

MPLM: EPS: PDB Details

PDB Details

'RPC'

cmd 23 – Close (Verify Posn – Cl)

NOTE

1. Each of the 19 MPLM ISS Heater circuits is thermostatically controlled. The power draw after the upstream RPC is closed is between 15 and 976 watts.
2. Expected initial power draw is 976 watts.
3. **MCC-H** will monitor individual heater currents to verify proper operation of RPC.

2. POWER OFF PDB POWER OUTLET DEDICATED TO MPLM ISS HEATERS

PCS

MPLM: EPS: PDB Details

PDB Details

'RPC'

cmd 23 – Open (Verify Posn – Op)

NOTE

1. Each of the 19 MPLM ISS Heater circuits is thermostatically controlled. The power draw before the upstream RPC is opened is between 15 and 976 watts.
2. After the RPC is opened, the power draw is expected to be 0 watts.
3. **MCC-H** will monitor individual heater currents to verify proper operation of RPC.

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3.108 MPLM MDM FAILURE QUICK RESPONSE

(MPLM/LF1 - ALL/FIN 4)

Page 1 of 1 page

NOTE

This procedure will be executed for the following messages:

Caution: '**MPLM MDM Fail - MPLM, Event Code 8531**'

1. If in progress, discontinue rack transfer ops.
2. Check MPLM air diffuser outlets for air flow.
Verify the MPLM Cabin Fan can be heard running.

If MPLM Cabin Fan is not running

Deploy battery-powered Fans (4) in MPLM, then:

Deploy CDM in MPLM, perform {[2.5.280 CARBON DIOXIDE](#)

[MONITOR: CDM - OPERATIONS FOR CARBON DIOXIDE](#)

[MONITORING](#)}, all (SODF: MED OPS: NOMINAL: EHS), then:

Check **MCC-H** for MPLM ventilation reconfiguration actions.

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PCS

1. VERIFYING MPLM MDM RT STATUS ENABLED

CDH: Primary INT

Primary Int MDM

Verify Frame Count – incrementing

Verify MDM ID – INT 2(1)

Verify Processing State – Operational

sel LB SYS HAB 1

sel RT Status

LB SYS HAB 1 RT Status

√17 MPLM-1 RT Status – Ena

If MPLM MDM has been previously verified in Diagnostic, go to step 4.

2. SUPPRESSING NUISANCE CAUTION EVENT (IF DESIRED)

NOTE

The 'Primary INT MDM Detected Loss of Sync with MPLM MDM-LAB' Caution may go into alarm when the MDM RT I/O is enabled. Suppressing the Caution will prevent annunciation of a tone, if desired.

C&W Summ

Caution & Warning Summary

'Event Code Tools'

sel Suppress

Suppress Annunciation of an Event

input Event Code – 6 7 4 3 ('Primary INT MDM Detected Loss of Sync with MPLM MDM-LAB')

cmd Arm

cmd Execute

input Event Code – 8 5 3 1 ('MPLM MDM Fail-MPLM')

cmd Arm

cmd Execute

3. VERIFYING MPLM MDM IS IN DIAGNOSTIC

CDH: Primary INT

Primary Int MDM

Verify Frame Count – incrementing

NOTE

After the MDM has been transitioned to Diagnostic, the only way to verify that it is in Diagnostic is to send a Mode Code command.

'Software Control'

sel Transmit Mode Code

Primary Int Transmit Mode Code

Verify RT Address \neq 17

If RT Address is 17, clear Mode Code

'Transmit Mode Code Commands'

input RT Address – 1 3

input Bus ID – 8

input Mode Code – 2

cmd Set Execute

Verify Subsystem Flag Set – No

Verify RT Address: 13

'Transmit Mode Code Commands'

input RT Address – 1 7

input Bus ID – 3

input Mode Code – 2

cmd Set Execute

Verify Subsystem Flag Set – Yes

Verify RT Address: 17

4. REINITIALIZING MPLM MDM

MPLM: CDH: MDM Utilities

MPLM MDM Utilities

'Reinitializations'

√**MCC** for how the MDM should be reinitialized

NOTE

1. In nominal cases, the EEPROM option below should be selected.
2. SPN 2794, the MDM reinitialization commands may cause the MDM to fail to an unknown state. Power cycling the MPLM module is the only option for recovery.

If Reinitialization is from EEPROM

cmd Reinitialize EEPROM **Execute**

If Reinitialization is from DRAM

cmd Reinitialize DRAM **Execute**

Wait 5 minutes for MDM to go through Bootup and Post.

MDM MPLM

Verify Frame Count – incrementing

If there is no Frame Count after the Reinitialization

On MCC GO power cycle MPLM module.

Perform {1.106 MPLM DEACTIVATION}, all (SODF: MPLM: NOMINAL), then:

Perform {1.103 MPLM ACTIVATION}, all (SODF: MPLM: NOMINAL), then:

5. ENABLING RT FDIR FOR MPLM MDM

CDH: Primary INT

Primary Int MDM

Verify Frame Count – incrementing

sel LB SYS HAB 1

sel RT Status

LB SYS HAB 1 RT Status

cmd 17 MPLM-1 RT FDIR Status – Enable FDIR **Execute**

√17 MPLM-1 RT FDIR Status – Ena

6. RE-ENABLE CAUTION EVENT (AS REQUIRED)

C&W Summ

Caution & Warning Summary

'Event Code Tools'

sel Enable

Enable an Event

input Event Code – 6 7 4 3 ('Primary INT MDM Detected Loss of Sync with
MPLM MDM-LAB')

cmd Execute

input Event Code – 8 5 3 1 ('MPLM MDM Fail-MPLM')

cmd Execute

3.110 MPLM MDM TRANSITION B: MPLM MDM TRANSITION TO DIAGNOSTIC

I

(MPLM/LF1 - ALL/FIN 1) Page 1 of 3 pages

1. INHIBITING RT FDIR FOR MPLM MDM

PCS

CDH: Primary INT

Primary Int MDM

Verify Frame Count – incrementing

Verify MDM ID – INT 2(1)

Verify Processing State – Operational

sel LB SYS HAB 1

sel RT Status

LB SYS HAB 1 RT Status

cmd 17 MPLM-1 RT FDIR Status – Inhibit FDIR Execute

√17 MPLM-1 RT FDIR Status – Inh

2. SUPPRESSING NUISANCE CAUTION EVENT (IF DESIRED)

NOTE

The '**MPLM MDM Fail-MPLM Caution**' will go into alarm when the MDM RT I/O is enabled. Suppressing the Caution will prevent annunciation of a tone, if desired.

C&W Summ

Caution & Warning Summary

'Event Code Tools'

sel Suppress

Suppress Annunciation of an Event

input Event Code – 8 5 3 1 ('**MPLM MDM Fail-MPLM**')

cmd Arm

cmd Execute

3. TRANSITIONING MPLM MDM TO DIAGNOSTIC

MPLM: CDH

MDM MPLM

Verify Frame Count – incrementing

NOTE

Sending the following commands will cause the '**MPLM MDM Fail-MPLM**' caution message and '**Primary INT Detected Static Frame Count MPLM MDM – MPLM**' advisory message to annunciate. No action required.

3.110 MPLM MDM TRANSITION B: MPLM MDM TRANSITION TO DIAGNOSTIC

(MPLM/LF1 - ALL/FIN 1) Page 2 of 3 pages

sel Processing State

MPLM Processing State Transitions
'Commanded Transition To Diag Status'

cmd Arm Execute

√Command Transition To Diag Status – Arm

cmd Transition Execute

Wait 5 minutes.

MDM MPLM

Verify Frame Count – not incrementing

4. VERIFYING MPLM MDM IN DIAGNOSTIC

NOTE

After the MDM has been transitioned to Diagnostic, the only way to verify that it is in Diagnostic is to send a Mode Code command.

CDH: Primary INT

Primary Int MDM

Verify Frame Count – incrementing

'Software Control'

sel Transmit Mode Code

Primary Int Transmit Mode Code

Verify RT Address \neq 17

If RT Address is 17, clear Mode Code.

'Transmit Mode Code Commands'

input RT Address – 13

input Bus ID – 8

input Mode Code – 2

cmd Set Execute

Verify Subsystem Flag Set – No

Verify RT Address: 13

3.110 MPLM MDM TRANSITION B: MPLM MDM TRANSITION TO DIAGNOSTIC

(MPLM/LF1 - ALL/FIN 1) Page 3 of 3 pages

'Transmit Mode Code Commands'

input RT Address – 17

input Bus ID – 3

input Mode Code – 2

cmd Set Execute

Verify Subsystem Flag Set – Yes

Verify RT Address: 17

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3.111 MPLM POSITIVE PRESSURE RELIEF ASSEMBLY ENABLE/DISABLE I (MPLM/LF1 - ALL/FIN 1) Page 1 of 2 pages

1. ENABLING MPLM PPR FUNCTION

1.1 Enabling PPR Motorized Valve Power

MPLM: ECLSS: PPRA1

sel MPLM PDB RPC 27

cmd Converter 01 – On (Verify – On)

cmd RPC 27 – Close (Verify Posn – Cl)

1.2 Opening PPR Motorized Valves

cmd All Open

Verify PPR 1,2,3 Valve Position (three) – Open

1.3 Removing Power from PPRAs

MPLM: ECLSS: PPRA1

sel MPLM PDB RPC 27

cmd RPC 27 – Open (Verify Posn – Op)

cmd Converter 01 – Off (Verify – Off)

2. INHIBITING MPLM PPR FUNCTION

2.1 Enabling PPR Motorized Valve Power

MPLM: ECLSS: PPRA1

sel MPLM PDB RPC 27

cmd Converter 01 – On (Verify – On)

cmd RPC 27 – Close (Verify Posn – Cl)

2.2 Closing PPR Motorized Valves

cmd All Closed

Verify PPR 1,2,3 Valve Position (three) – Closed

3.111 MPLM POSITIVE PRESSURE RELIEF ASSEMBLY ENABLE/DISABLE
(MPLM/LF1 - ALL/FIN 1) Page 2 of 2 pages

2.3 Removing Power from PPRAs

MPLM: ECLSS: PPRA1

sel MPLM PDB RPC 27

cmd RPC 27 – Open (Verify Posn – Op)

cmd Converter 01 – Off (Verify – Off)

3.112 MPLM SMOKE DETECTOR ACTIVATION/DEACTIVATION

I

(MPLM/UF2 - ALL/FIN 3) Page 1 of 1 page

1. SMOKE DETECTOR ACTIVATION

1.1 RPC Closure

MPLM: ECLSS: Smoke Detector

sel MPLM PDB RPC 13

cmd RPC 13 Close (Verify Posn – Cl)

1.2. Active Bit Enabling

MPLM: ECLSS: Smoke Detector

'Active BIT'

cmd Initiate

Wait 5 seconds.

'Passive BIT'

Verify Degraded – blank

'Smoke Status'

Verify Smoke Status – No Smoke

2. SMOKE DETECTOR DEACTIVATION

2.1 Opening RPC

MPLM: ECLSS: Smoke Detector

sel MPLM PDB RPC 13

cmd RPC 13 Open (Verify Posn – Op)

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TOOLS AND EQUIPMENT REQUIRED

VOK CTB:

12" x 12" Ziplock Bag (two) P/N 528-50000-5

IMV Return Jumper P/N 683-13870-17

Kit D:

5/32" Hex Head, 1/4" Drive

1/8" Hex Head, 1/4" Drive

Kit E:

Driver Handle, 1/4" Drive

Ratchet, 1/4" Drive

3/8" to 1/4" Adapter

Kit F:

7/16" Deep Socket, 1/4" Drive

Kit G:

(30-200 in-lbs) Trq Wrench, 3/8" Drive

IMV Cap O-Ring Replacement Kit

Lubricant

Cleaning Pads

Bore O-Ring (1)

1. RECONFIGURING MPLM IMV FOR LOSS OF MPLM CABIN FAN

1.1 If the Node 1 to MPLM Fwd IMV Jumper is not installed, perform
| {1.108 MPLM VESTIBULE - CONFIGURE FOR INGRESS}, steps
| 26 to 31 for Deck Fwd (A11) IMV Jumper (SODF: S&M: NOMINAL:
| VESTIBULE), then:

1.2 To open the MPLM Overhead Fwd IMV Valve, perform {3.106
| MPLM IMV VALVE RECONFIGURATION}, step 1 (SODF: MPLM:
| CORRECTIVE), then:

2. RECONFIGURING NODE 1 IMV FOR LOSS OF MPLM CABIN FAN

2.1 To open Node Deck Fwd IMV Valve, perform {2.506 IMV VALVE
| RECONFIGURATION POST CCS}, steps 1 to 2 (SODF: ECLSS:
| NOMINAL: THC), then:

NOD1 2.2 Remove Closeout Seam Supports (two) in front of Closeout Panel
OP2-23 NOD1OP2-23 (Driver Handle, 1/8" Hex Head).
Temporarily stow.

NOD1 2.3 Remove Panel NOD1OP2-23 (Driver Handle, 5/32" Hex Head).
OP2-23 Node 1 Duct Valve 4 → Closed
Replace Panel.

2.4 Replace Closeout Seam Supports (two) in front of Closeout Panel
NOD1OP2-23 (Driver handle, 1/8" Hex Head).

NOD1 2.5 Remove Panel NOD1O1-01 (Driver Handle, 5/32" Hex Head).
O1-01 Node 1 Duct Valve 2 → Closed
Replace Panel.

3.201 ECLSS MPLM SSR 1: MPLM LOSS OF VENTILATION

(MPLM/LF1 - ALL/FIN 6)

Page 2 of 2 pages

- NOD1 2.6 Node 1 RAMV Temperature Control → full warm
- S4-02
- NOD1 2.7 Remove Panel NOD1D3-02 (Driver Handle, 5/32" Hex Head).
- D3-02
- 2.8 ✓Node 1 Duct Valve 3 – Closed
- 2.9 Replace Panel.

3. RECONFIGURING LAB IMV FOR LOSS OF MPLM CABIN FAN

- 3.1 To activate Lab Aft Port IMV Fan, perform {1.504 IMV FAN
| ACTIVATION/DEACTIVATION POST CCS}, steps 1 to 2 (SODF:
| ECLSS: ACTIVATION AND CHECKOUT: THC), then:
- 3.2 **On MCC-H GO**
Go to {2.502 LAB CCAA DUAL OPERATIONS, LAB1S6
CONDENSING}, all (SODF: ECLSS: NOMINAL: THC).

OBJECTIVE:

To partially depress the MPLM in a contingency using one Depress Assembly (DA).

1. CONFIGURING MPLM AND NODE 1 HATCH

MPLM Hatch √Hatch open
 If Hatch closed
 √MPEV – open

Node 1 Hatch √Hatch closed
 √MPEV closed

2. OPENING PPRA

To open PPRAs, perform {3.111 MPLM POSITIVE PRESSURE RELIEF ASSEMBLY ENABLE/DISABLE}, step 1 (SODF: MPLM: CORRECTIVE), then:

3. CONFIRMING ISOLATION (VALVES CLOSED)

PCS Task: MPLM Act-Deact
MPLM Act-Deact
 'IMV and SDS'
 'MPLM IMV'

√IMV Aft,Fwd valves (both) – CI

'Node 1'

√IMV Deck Aft, Deck Fwd valves (both) – CI

'MPLM SDS'

√SDS Isov valve – CI

4. CHECKING TARGET PRESSURE

NOTE
 Valid software target pressure for partial depress is 14 psia to 5 psia (724 mmHg to 259 mmHg).

√**MCC-H** for target pressure and which Depress Assembly to use.

Target P _____mmHg Estimate Time to Target P _____

NOTE
 Per SPN 1226, only one Depress Assembly should be used for a Partial Depress. Attempts to use both DA1 and DA2 at the same time will make one DA unresponsive. In step 5, DA1 heater power is RPC 17 and DA2 heater power is RPC 18.

PCS 5. ACTIVATING DEPRESS ASSEMBLY
MPLM: EPS: PDB Details

PDB Details

'Converter'

cmd 01 – On ($\sqrt{\text{Posn}} - \text{On}$)

'RPC'

cmd RPC 26 – Close ($\sqrt{\text{Posn}} - \text{Cl}$)

cmd RPC 17(18) – Close ($\sqrt{\text{Posn}} - \text{Cl}$)

NOTE

1. If depressing to a pressure below 698 mmHg, expect the following Warning:
'Cabin Press Low - MPLM'
2. The Cabin Fan will deactivate when the pressure gets below 465 mmHg and the GLAs and DSD will deactivate when the pressure gets below 259 mmHg.

PCS 6. COMMANDING DEPRESS
MPLM: ECLSS: DA1(2)

MPLM Depress Assemblies

'Depress Assembly 1(2)'

'Partial Depress'

Enter target pressure between 724 mmHg to 259 mmHg in Start field.

cmd Start

Verify Partial Depress State – Active

Report to **MCC-H**, "MPLM Partial Depress State Active."

NOTE

Controlled depress will continue until target pressure is reached, or until the Stop command is received.

* To immediately stop the depressurization
* | 'Depress Assembly 1(2)'
* |
* | **cmd** Stop
* |
* | Verify Stop Cmd State – Stopped

3.202 ECLSS MPLM SSR-2: MPLM CONTROLLED DEPRESSURIZATION
(MPLM/LF1 - ALL/FIN 4/SPN) Page 3 of 3 pages

PCS 7. MPLM: ECLSS
MPLM: ECLSS

$\sqrt{\text{Cab P Avg}} = \text{Target Pressure} \pm 20 \text{ mmHg}$

PCS 8. DEACTIVATING DEPRESS ASSEMBLY
MPLM: EPS: PDB Details
PDB Details
'RPC'

cmd RPC 17(18) – Open ($\sqrt{\text{Posn}} - \text{Op}$)

cmd RPC 26 – Open ($\sqrt{\text{Posn}} - \text{Op}$)

'Converter'

cmd 01 – Off ($\sqrt{\text{Posn}} - \text{Off}$)

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NOTE

1. The MPLM software is designed to turn off its equipment when the average MPLM pressure is reached per Table 1. However, it is possible to deactivate the MPLM equipment individually using the commands below.
2. It is recommended that Fire Detection remain active during depress.

Table 1. Equipment Pressure

Equipment	Pressure (psia)	Pressure (mmHg)
IMV (valves)	10	517
SDS (sample valve)	10	517
CFA (fan)	9	466
DSD (smoke detector)	5	259
GLA (lighting)	5	259

1. CLOSING MPLM IMV VALVES

Task:

Task Nav
'Multi-flight Task Displays'

sel MPLM Act-Deact

MPLM Act-Deact
'IMV and SDS'

sel MPLM IMV Aft

MPLM IMV Ovhd Aft Vlv
'Position'
'Close'

cmd Master Close

MPLM Act-Deact
'IMV and SDS'

√Position Aft, Fwd IMV Vlv – CI

2. CLOSING SDS VALVE

Task:

Task Nav
'Multi-flight Task Displays'

sel MPLM Act-Deact

'IMV and SDS'

sel MPLM SDS IsoV

'Master'

cmd Close

'Position'

√Position – Closed

3. SHUTTING DOWN CABIN FAN AND DSD

Task:

'Multi-flight Task Displays'

sel MPLM Act-Deact

'SD, Cab Fan, and Pressure'

sel MPLM Cab Fan

'State'

'Off'

cmd Arm

cmd Off

√Speed decreases to 0 rpm

'PDB Control'

sel PDB Details

cmd RPC 11 Open (√Posn – Op)

cmd RPC 13 Open (√Posn – Op)

4. REMOVING POWER FROM GLA AND ELPS

Task:

'Multi-flight Task Displays'

sel MPLM Act-Deact

'PDB Control'

sel PDB Details

cmd All GLAs OFF

√RPC 02–09 (GLAs 1 to 8) – Op

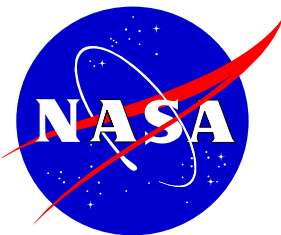
cmd RPC 10 Open (√Posn – Op)

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