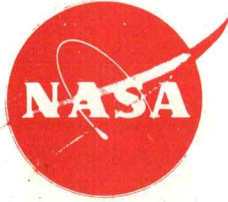


TCP NO. V-20130, VOL 2

REVISION 027

DATE JULY 3, 1975

EFFECTIVITY AS-210



**JOHN F. KENNEDY  
SPACE CENTER**

**RELEASED  
FOR ASTP**

**LAUNCH VEHICLE OPERATIONS FOR  
SUPPORT OF SPACE VEHICLE  
COUNTDOWN DEMONSTRATION TEST  
AND LAUNCH COUNTDOWN**

**VOLUME 2**

**ASSEMBLED FOR CD**

**- PARTIAL REVISION -**

**Prepared For**

**LAUNCH VEHICLE OPERATIONS**

**Prepared By**

**THE BOEING COMPANY**

**SATURN-LAUNCH OPERATIONS**

**THIS TCP CONTAINS  
HAZARDOUS OPERATIONS**

THE PAGES IN THIS PARTIAL REVISION REPLACE AND SUPPLEMENT CORRESPONDING PAGES IN REVISION 024 (ASSEMBLED FOR CD). THIS REVISION 027 INCORPORATES PCR'S AS FOLLOWS, PREVIOUSLY INCORPORATED INTO PARTIAL REVISIONS 025 & 026 FOR CDDT:

|                                            |           |         |         |
|--------------------------------------------|-----------|---------|---------|
| C-68-38                                    | B-20-42   | I-36-45 | I-38-48 |
| C-69-40                                    | XB-122-43 | I-37-46 | I-39-49 |
| XB-121-41                                  | XB-123-44 | C-70-47 |         |
| THIS REVISION 027 ALSO INCORPORATES PCR'S: |           |         |         |
| XB-124-50                                  | C-71-53   | M-30-56 | I-42-59 |
| XB-127-51                                  | I-41-54   | I-41-57 | C-73-60 |
| I-40-52                                    | XB-129-55 |         |         |

AND M-29-B (OTO)(AS-210 ONLY)

TCP NO V-20130, VOL II

REVISION 027

DATE JULY 3, 1975

NO OF PAGES 180 THIS REV; 582 TOTAL

EFFECTIVITY AS-210

**RELEASED  
FOR ASTP**

LAUNCH VEHICLE OPERATIONS FOR  
SUPPORT OF SPACE VEHICLE COUNTDOWN  
DEMONSTRATION TEST AND LAUNCH COUNTDOWN

VOLUME 2

ASSEMBLED FOR LCD

- PARTIAL REVISION -

**THIS TCP CONTAINS  
HAZARDOUS OPERATIONS**

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# INTRODUCTION

## A. INTEGRATED TCP INTERFACE

1. SPECIFIC SEQUENCES IDENTIFIED IN THIS TCP WITH THE SYMBOL TCPI (TEST & CHECKOUT PROCEDURE INTERFACE) HAVE BEEN COORDINATED WITH OTHER ORGANIZATIONS WHOSE CORRESPONDING TCP'S ARE USED DURING THIS TEST. IT IS THE RESPONSIBILITY OF THE ORGANIZATION INITIATING A CHANGE TO A TCPI SEQUENCE TO ENSURE THAT COORDINATION WITH AFFECTED ORGANIZATIONS IS ACCOMPLISHED THROUGH THE INTEGRATION SUPPORT CONTRACTOR. PROBLEMS RESULTING FROM THE COORDINATION WILL BE RESOLVED BY LV-OMO-1 PRIOR TO THE DLO PRE-TEST BRIEFING, AND LV-OMO-3 FROM THE TIME OF DLO PRE-TEST BRIEFING THROUGH COMPLETION OF THE TEST.

## B. SAFETY

1. THE LAUNCH VEHICLE COUNTDOWN OPERATIONS ARE CONSIDERED TO BE HAZARDOUS FOR THE FOLLOWING REASONS:  
(A) SPACECRAFT HYPERGOLICS WILL BE ON BOARD.  
(B) RP-1 WILL BE ON BOARD.  
(C) SPACE VEHICLE ORDNANCE WILL BE INSTALLED AND CONNECTED.  
(D) SPACE VEHICLE PROPELLANT TANKS AND GAS STORAGE SPHERES WILL BE PRESSURIZED.  
(E) HAZARDOUS ENVIRONMENTAL CONDITIONS MAY BE ENCOUNTERED (INERT ATMOSPHERES; WORK AT HEIGHTS AND ENGINE GIMBALLING).  
(F) HEAVY EQUIPMENT MOVEMENTS WILL BE REQUIRED.  
(G) SPACE VEHICLE CRYOGENIC LIQUIDS (LOX & LH2) WILL BE LOADED.  
(H) THE FLIGHT CREW WILL INGRESS AND THE HATCH WILL BE CLOSED.  
(I) THE SPACE VEHICLE WILL BE LAUNCHED.

## 2. TEST DESCRIPTION

1. THIS LAUNCH VEHICLE TEST AND CHECKOUT PROCEDURE IS A TIME SEQUENCE OF OPERATIONS REQUIRED TO PREPARE THE LAUNCH VEHICLE FOR FLIGHT. THIS VOLUME CONTAINS THE OPERATIONS NECESSARY TO COMPLETE PREPARATION OF THE LAUNCH VEHICLE & GSE FOR INITIATION OF THE AUTOMATIC TERMINAL COUNT SEQUENCE.  
2. LAUNCH VEHICLE TEST AND CHECKOUT PERSONNEL WILL USE THIS PROCEDURE AS THE OFFICIAL DOCUMENT FOR LAUNCH VEHICLE OPERATIONS. THIS DOCUMENT IS ONE OF FIVE RELATED DOCUMENTS USED DURING LAUNCH OPERATIONS. THE OTHER FOUR DOCUMENTS ARE:  
(A) SPACECRAFT COUNTDOWN PROCEDURE - K0007  
(B) SPACE VEHICLE COUNTDOWN PROCEDURE - SV-40400 (INCLUDES INFORMATION TO DIRECT INTERFACE OPERATIONS AMONG LV, SC, SUPPORT & RANGE)  
(C) SPACE VEHICLE SCRUB TURNAROUND PROCEDURE SV-40401  
(D) LAUNCH MISSION RULES K-18-02.10/10  
3. UNDER EMERGENCY CONDITIONS SPECIFIED THEREIN, THE LAUNCH VEHICLE EMERGENCY PROCEDURE, V-20133 (HAZARDOUS) WILL BE USED.  
4. IN THE EVENT OF A CONFIRMED LIGHTNING STRIKE, RETESTING WILL BE ACCOMPLISHED PER THE SATURN IS LIGHTNING RETEST PROCEDURE, V-20111

## D. CDDT & COUNTDOWN PROCEDURE DESCRIPTION

1. VOLUME I WILL BE USED ONCE TO PREPARE THE LAUNCH VEHICLE FOR BOTH CDDT AND CD. VOLUME II "ASSEMBLED FOR CDDT" WILL BE USED FOR VET CDDT, INCLUDING CRYOGENIC PROPELLANT DRAIN AND PREPARING THE LAUNCH VEHICLE FOR PICKING UP THE LAUNCH COUNTDOWN AT THE START OF VOLUME II "ASSEMBLED FOR CD". VOLUME I WILL NOT BE REPEATED.

## E. CODES IN COMMAND STATION COLUMN

1. \*\*\* INDICATES A SEQUENCE TO BE PERFORMED BY A LINKING PROGRAM  
2. IAPX ANY IVAR INDICATES A SEQUENCE TO BE PERFORMED BY A COMPUTER PROGRAM  
3. TCS INDICATES A SEQUENCE TO BE PERFORMED BY THE TERMINAL COUNT SEQUENCER

## F. CODES IN THE REMARKS COLUMN

1. \*\*\* INDICATES A SEQUENCE NORMALLY PERFORMED BY A COMPUTER PROGRAM BUT WHICH MAY BE PERFORMED MANUALLY IF THE PROGRAM IS NOT EXECUTED.  
2. (IKLJ) INDICATES A SEQUENCE WHICH MUST BE COMPLETE BEFORE THE IVAR (IDENTIFIED WITHIN PARENTHESES) IS EXECUTED.  
3. XB-1 IDENTIFIES AN INCORPORATED PCR  
4. TCPI SEE PARAGRAPH A.1 ABOVE.  
5. \* INDICATES INFORMATION UNIQUE TO THE CDDT.  
6. # INDICATES INFORMATION UNIQUE TO THE LCD.  
7. \* INDICATES START OR COMPLETION OF TASK DEPICTED WITH BAR ON A BARCHART IN THIS TCP.  
8. \* INDICATES A SEQUENCE REFERRED TO ELSEWHERE IN THE TCP  
9. P INDICATES A SEQUENCE (BETWEEN T-37' AND T-15') WHICH MUST BE PERFORMED EVEN IF TARGET UPDATE IS OMITTED REAL TIME AT T-37 MINUTES  
10. D INDICATES A SEQUENCE WHICH REFERENCES ANOTHER TCP



| LIST OF EFFECTIVE PAGES |      |          |      | DATE         |         | EFFECTIVITY |      | TEST NUMBER     |      | REVISION | PAGE |
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| 4&5                     | 023  | 118-120  | 024  | 235&236      | 027     | 453-456     | 024  |                 |      |          |      |
| 6                       | 024  | 121      | 023  | 237          | 023     | 457         | 027  |                 |      |          |      |
| 7&8                     | 027  | 122&123  | 024  | 238          | 025     | 458-462     | 024  |                 |      |          |      |
| 9-12                    | 023  | 124&125  | 023  | 239-241      | 023     | 463         | 027  |                 |      |          |      |
| 13-16                   | 024  | 126      | 024  | 242          | 025     | 464-473     | 024  |                 |      |          |      |
| 16-1                    | 027  | 127      | 027  | 243-249      | 023     | 474         | 027  |                 |      |          |      |
| 17-25                   | 023  | 128-132  | 023  | 250-253      | 025     | 475-525     | 024  |                 |      |          |      |
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| 35-43                   | 024  | 139      | 025  | 288          | 025     |             |      |                 |      |          |      |
| 44                      | 023  | 140&141  | 023  | 289-299      | 023     |             |      |                 |      |          |      |
| 45                      | 024  | 142      | 024  | 300          | 025     |             |      |                 |      |          |      |
| 46                      | 023  | 143-145  | 023  | 301-304      | 023     |             |      |                 |      |          |      |
| 47                      | 024  | 146      | 025  | 305          | 027     |             |      |                 |      |          |      |
| 48                      | 027  | 147-158  | 023  | 306-308      | 024     |             |      |                 |      |          |      |
| 49                      | 024  | 159&160  | 027  | 309&310      | 027     |             |      |                 |      |          |      |
| 50&51                   | 027  | 161&162  | 026  | 311-314      | 024     |             |      |                 |      |          |      |
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| 52&53                   | 027  | 164&165  | 023  | 319          | 027     |             |      |                 |      |          |      |
| 54&55                   | 024  | 166      | 026  | 320-323      | 024     |             |      |                 |      |          |      |
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| 61-63                   | 023  | 177      | 024  | 330          | 024     |             |      |                 |      |          |      |
| 64&65                   | 024  | 178      | 023  | 331          | 023     |             |      |                 |      |          |      |
| 66-68                   | 023  | 179      | 024  | 332          | 024     |             |      |                 |      |          |      |
| 69                      | 024  | 180      | 023  | 333-336      | 023     |             |      |                 |      |          |      |
| 70-72                   | 023  | 181      | 024  | 337          | 024     |             |      |                 |      |          |      |
| 73                      | 024  | 182&183  | 023  | 338-354      | 023     |             |      |                 |      |          |      |
| 74                      | 023  | 184&185  | 024  | 355&356      | 027     |             |      |                 |      |          |      |
| 75                      | 024  | 186-188  | 023  | 357          | 025     |             |      |                 |      |          |      |
| 76&77                   | 023  | 189      | 024  | 358-372      | 023     |             |      |                 |      |          |      |
| 78&79                   | 024  | 190      | 023  | 373          | 027     |             |      |                 |      |          |      |
| 80-83                   | 023  | 191      | 024  | 374          | 023     |             |      |                 |      |          |      |
| 84                      | 025  | 192      | 025  | 375-388      | OMITTED |             |      |                 |      |          |      |
| 85-91                   | 023  | 193-198  | 023  | 388-1-       |         |             |      |                 |      |          |      |
| 92                      | 025  | 199      | 027  | 388-7        | 025     |             |      |                 |      |          |      |
| 93&94                   | 023  | 200-201  | 023  | 388-8 -      |         |             |      |                 |      |          |      |
| 95                      | 024  | 202&203  | 024  | 388-12       | 027     |             |      |                 |      |          |      |
| 96-98                   | 023  | 204      | 023  | 389-390      | 023     |             |      |                 |      |          |      |
| 99-102                  | 024  | 205&206  | 024  | 391-397      | 027     |             |      |                 |      |          |      |
| 103                     | 023  | 207-211  | 023  | 398          | 024     |             |      |                 |      |          |      |
| 104                     | 024  | 212-215  | 024  | 399          | 027     |             |      |                 |      |          |      |
| 105                     | 023  | 216-221  | 023  | 400          | 024     |             |      |                 |      |          |      |
| 106                     | 027  | 222      | 025  | 401&402      | 027     |             |      |                 |      |          |      |
| 107-109                 | 024  | 223      | 027  | 403-411      | 024     |             |      |                 |      |          |      |
| 110                     | 027  | 224      | 023  | 412          | 027     |             |      |                 |      |          |      |
| 111-113                 | 024  | 225      | 027  | 413-425      | 024     |             |      |                 |      |          |      |
| 114                     | 027  | 226&227  | 023  | 426          | 027     |             |      |                 |      |          |      |
| 115                     | 023  | 228      | 025  | 427 -435     | 024     |             |      |                 |      |          |      |
| 116                     | 024  | 229&230  | 023  | 436          | 027     |             |      |                 |      |          |      |
|                         |      | 231&232  | 027  | 437-451      | 024     |             |      |                 |      |          |      |



# REVISION RECORD PAGE

## PAGES AFFECTED

| REV.  | REVISED | ADDED | DELETED | REASON/SUPPORTING DOCUMENT                                                                                                                                                     |
|-------|---------|-------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BASIC |         |       |         | PRERELEASE FOR AS-206, 10/17/72                                                                                                                                                |
| 001   |         |       |         | SECOND PRERELEASE FOR AS-206                                                                                                                                                   |
| 002   |         |       |         | INITIAL RELEASE FOR AS-206                                                                                                                                                     |
| 003   |         |       |         | PARTIAL REVISION FOR AS-206 CDDT, 4/13/73                                                                                                                                      |
| 004   |         |       |         | RELEASE FOR AS-206 CD, 5/4/73                                                                                                                                                  |
| 005   |         |       |         | PARTIAL REVISION FOR AS-206 CD, 5/16/73                                                                                                                                        |
| 006   |         |       |         | PRERELEASE FOR AS-207, DERIVED FROM REV 002.                                                                                                                                   |
| 007   |         |       |         | SECOND PRERELEASE FOR AS-207, 4/27/73.                                                                                                                                         |
| 008   |         |       |         | SL-2 "AS PLANNED" TCP FOR ARCHIVE PACKAGE                                                                                                                                      |
| 009   |         |       |         | RELEASE FOR AS-207 CDDT (CD ONLY MATERIAL DELETED), 6/29/73.                                                                                                                   |
| 010   |         |       |         | RELEASE FOR AS-207 CD, SAME AS REVISION 009 EXCEPT "CDDT ONLY" MATERIAL DELETED, 7/3/73.                                                                                       |
| 011   |         |       |         | PARTIAL REVISION FOR AS-207 CD, 7/19/73                                                                                                                                        |
| 012   |         |       |         | INITIAL RELEASE FOR AS-208 (RESCUE MISSION), 8/27/73.                                                                                                                          |
| 013   |         |       |         | RERELEASE FOR AS-208 (NOMINAL MISSION), 8/30/73. DERIVED FROM REV 009/011 BY INCORPORATING AS-207 REAL TIME PCRS AND APPLICABLE PORTIONS OF AS-208 PCRS. (ASSEMBLED FOR CDDT.) |
| 014   |         |       |         | AS-208 (NOMINAL MISSION), 8/30/73, ASSEMBLED FOR CD, OTHERWISE SAME AS REV 013.                                                                                                |
| 015   |         |       |         | PRERELEASE FOR AS-208 HYBRID CDDT/CD, 8/30/73. DERIVED FROM REV 013/014 BY INCORPORATING PCR XB-90-17.                                                                         |
| 016   |         |       |         | RELEASE FOR AS-208 CDDT FOR NOVEMBER LAUNCH, 10/10/73, DERIVED FROM REV 015. "CD ONLY" SEQUENCES DELETED.                                                                      |
| 017   |         |       |         | RELEASE FOR AS-208 CD FOR NOVEMBER LAUNCH, 10/11/73, SAME AS REV 016 EXCEPT "CDDT ONLY" SEQUENCES DELETED INSTEAD OF "CD ONLY" SEQUENCES.                                      |

# REVISION RECORD PAGE (CONTINUED)

## PAGES AFFECTED

| REV. | REVISED                                                                                                                                                                                                             | ADDED                                         | DELETED | REASON/SUPPORTING DOCUMENT                                                                                                                                                                                                                                                               |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 018  |                                                                                                                                                                                                                     |                                               |         | PARTIAL REVISION FOR AS-208 CD FOR NOVEMBER LAUNCH, 11/2/73.                                                                                                                                                                                                                             |
| 019  |                                                                                                                                                                                                                     |                                               |         | RELEASE FOR AS-209 RESCUE MISSION, DERIVED FROM REV 012.                                                                                                                                                                                                                                 |
| 020  | (NOT PUBLISHED)                                                                                                                                                                                                     |                                               |         | RELEASE FOR AS-209 CDDT. DERIVED FROM REVISION 016/018 BY INCORPORATING PERMANENT AS-208 REAL TIME PCRS.                                                                                                                                                                                 |
| 021  |                                                                                                                                                                                                                     |                                               |         | RELEASE FOR AS-209 CD, SAME AS REV 020 EXCEPT "CDDT ONLY" SEQUENCES DELETED INSTEAD OF "CD ONLY" SEQUENCES.                                                                                                                                                                              |
| 022  |                                                                                                                                                                                                                     |                                               |         | PRERELEASE FOR ASTP CDDT/CD, DERIVED FROM REVISION 016/018 BY INCORPORATING PERMANENT AS-208 REAL TIME PCRS AND INITIAL ASTP PCRS XB-104-1, XB-105-2, XB-106-3, XB-108-4, XB-111-5, XB-107-6, XB-110-7, XB-112-8, XB-116-9, XB-117-10, XB-118-11, C-63-12, XB-119-13, I-28-14.           |
| 023  |                                                                                                                                                                                                                     |                                               |         | RELEASE FOR AS-210 CDDT. INCORPORATES PCRS B-3-15, B-6-16, B-7-17, B-8-18, B-9-19, C-64-20, XB-120-21, B-4-22, B-11-23, B-12-24, B-14-25, C-65-26, C-66-27, I-30-28, C-67-29, I-32-30, I-33-31, M-26-32, B-15-33, M-27-34, B-16-35, B-17-36, B-19-37, T-1-39. CD ONLY SEQUENCES DELETED. |
| 024  |                                                                                                                                                                                                                     |                                               |         | RELEASE FOR AS-210 LAUNCH CD. SAME AS REVISION 023 EXCEPT CDDT ONLY SEQUENCES DELETED INSTEAD OF CDDT ONLY SEQUENCES                                                                                                                                                                     |
| 025  |                                                                                                                                                                                                                     |                                               |         | PARTIAL REVISION FOR AS-210 CDDT. INCORPORATES PCR'S C-68-38, C-69-40, XB-121-41, XB-122-43, XB-123-44, I-36-45 AND I-37-46.                                                                                                                                                             |
| 026  |                                                                                                                                                                                                                     |                                               |         | PARTIAL REVISION FOR AS-210 CDDT. INCORPORATES PCR'S C-70-47, I-38-48, AND I-39-49.                                                                                                                                                                                                      |
| 027  | COVER, 2, 3, 7, 8, 48, 50, 51, 52, 53, 56, 106, 110, 114, 127, 159, 160, 163, 199, 223, 225, 231, 232, 235, 236, 305, 309, 310, 319, 355, 356, 373, 391-397, 399, 401, 402, 412, 426, 436, 452, 457, 463, 474, 526. | 16-1, 51-1, 388-1 THRU 388-12, & 527THRU 582. |         | PARTIAL REVISION FOR AS-210 LCD. INCORPORATES PCR'S C-68-38, C-69-40, XB-121-41, B-20-42, XB-122-43, XB-123-44, I-36-45, I-37-46, C-70-47, I-38-48, I-39-49, XB-124-50, XB-127-51, I-40-52, C-71-53, I-41-54, XB-129-55, M-30-56, I-41-57, I-42-59, C-73-60, AND M-29-B (AS-210 ONLY).   |



# TYPE IV RECYCLE POSTIGNITION SCRUB TURNAROUND

## ASTP LV POST IGNITION/CUTOFF SCRUB TURNAROUND

### CONTROLLED AREAS

ML 127 FT LVL, DIRECTLY BELOW ESP, INSIDE PEDESTAL & FLAME TRENCH

### CONDITIONS

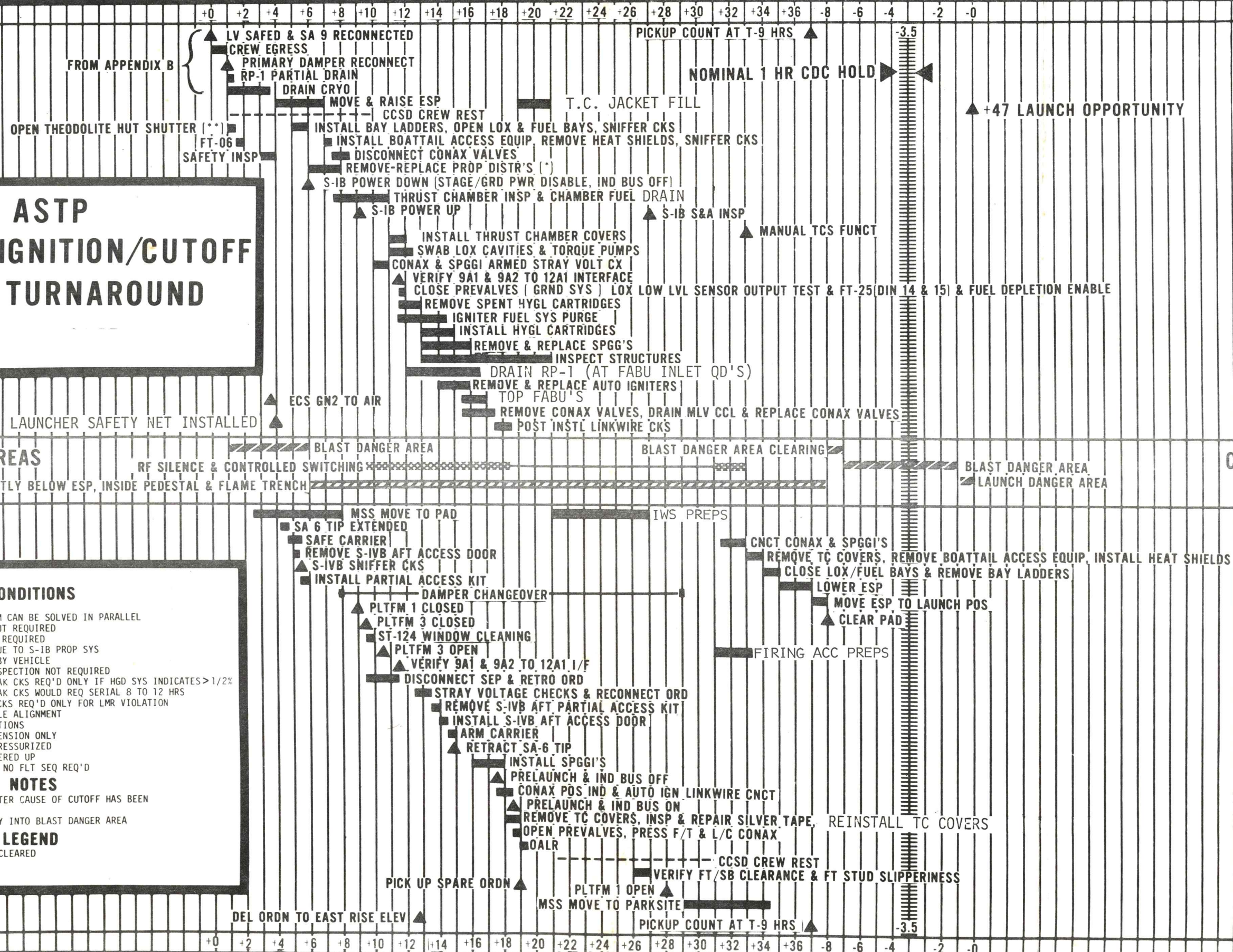
1. ASSUMES CUTOFF PROBLEM CAN BE SOLVED IN PARALLEL
2. NO LV BATTERY CHANGEOUT REQUIRED
3. NO SC CRYO RE-SERVICE REQUIRED
4. CAUSE OF CUTOFF NOT DUE TO S-IB PROP SYS
5. DAMAGE NOT SUSTAINED BY VEHICLE
6. S-IB/IU STRUCTURE INSPECTION NOT REQUIRED
7. S-IB POST LOAD LOX LEAK CKS REQ'D ONLY IF HGD SYS INDICATES >1/2%
8. S-IB POST LOAD LOX LEAK CKS WOULD REQ SERIAL 8 TO 12 HRS
9. S-IB POST LOAD LEAK CKS REQ'D ONLY FOR LMR VIOLATION
10. FT-06 SATISFIES VEHICLE ALIGNMENT
11. CONCURRENT ORDN OPERATIONS
12. SERVICE ARM 6 TIP EXTENSION ONLY
13. SERVICE ARMS REMAIN PRESSURIZED
14. ALL STAGES REMAIN POWERED UP
15. NO OAT CABLES HOOKUP, NO FLT SEQ REQ'D

### NOTES

- (\*) NOT TO START UNTIL AFTER CAUSE OF CUTOFF HAS BEEN DETERMINED  
(\*\*) REQUIRES TWO MAN ENTRY INTO BLAST DANGER AREA

### LEGEND

- ▨ PAD APRON OR GREATER CLEARED  
▨ LOCAL CLEAR  
▨ RF SILENCE





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VEHICLE AS-210

| TIME              | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA.     | DESCRIPTION                                                                        | REMARKS |
|-------------------|--------------|----------|-----------------|----------------------|------------------------------------------------------------------------------------|---------|
| *22 HRS<br>20' 0" | 241          | 1        | C4TC            | S4CE                 | VERIFY AFT & FORWARD BATTERIES<br>INTERMEDIATE ELECTRICAL CONNECTIONS<br>COMPLETE, | #       |
|                   | 241          | 2        | C4TC            | C4ES                 | VERIFY POWER DOWN PORTION OF PREPS FOR<br>POWER COMPLETE                           |         |
| *22 HRS<br>15' 0" |              | 1        |                 | C4TC                 | APPLY S-IVB ESE & STAGE POWER PER<br>V-30610, APP B (NON-HAZARDOUS),               | D       |
| *22 HRS<br>13' 0" | 261          | 1        | CUTC            | CLTC                 | IU STAGE POWER IS ON AND COOLING IS<br>SUPPORTING (LA01 IS COMPLETE)               |         |
|                   | 241          | 2        | ***             | C4NK                 | REQUEST & EXECUTE EAPS (S-IVB POWER UP).<br>REPORT WHEN COMPLETE,                  | ***     |
|                   | 251          | 3        | CUNE            | CUTC<br>CUES         | VERIFY LIFTOFF LIGHT OFF (HARDWIRE<br>CHECKS),                                     |         |
|                   | 261          | 4        | CLTC            | CUTC                 | START ELECTRICAL CONNECTION OF LAUNCH<br>VEHICLE FLIGHT BATTERIES                  | #       |
|                   | 251          | 5        | CUTC            | CUNE<br>SUVE<br>RUBM | CONNECT IU FLIGHT BATTERIES PER V-21479<br>ON CH 253 (HAZARDOUS)                   | # D     |
|                   | 231          | 6        | L3RT            | C3TC                 | RF & TM SYSTEM PREPS COMPLETE                                                      |         |
|                   | 231          | 7        | E3TM            | C3TC                 | TCE/CIF 291 S-IB MODULE PREPS COMPLETE                                             |         |



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VEHICLE AS-210

| TIME            | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA.     | DESCRIPTION                                                                                                | REMARKS         |
|-----------------|--------------|----------|-----------------|----------------------|------------------------------------------------------------------------------------------------------------|-----------------|
| 22 HRS<br>51 0" |              |          |                 |                      |                                                                                                            |                 |
|                 | 261          | 1        | CLTC            | CUFS                 | START FLIGHT CONTROL SYSTEM PREPS ON CH 262,                                                               | (LAF2)          |
|                 | 261          | 1-1      | CUFS            | CLTC                 | REQUEST CLTK TO TERMINATE IALJ WHEN EAPS IS COMPLETE. (REQUIRED FOR FLIGHT CONTROL TEST.)                  | I40-52          |
|                 | 261          | 1-2      | CLTC            | CLTK                 | TERMINATE IALJ WHEN EAPS IS COMPLETE AND VERIFY                                                            | I40-52          |
|                 | 251          | 2        | CUFS            | CUNP                 | SWITCH SELECTOR INHIBIT OFF                                                                                | (LAF2)          |
|                 | 262          | 3        | CUFS            | CUSP<br>CUGA         | PLACE ALL FCC, CCIS, CONT ACCEL AND EDS/CRG PANEL SWITCHES TO AUTO                                         | (LAF2)          |
|                 | 251          | 4        | CUFS            | CUES                 | VERIFY EDS MODE SWITCH IS IN THE MONITOR POSITION AND THE PITCH-YAW ENABLE AND ROLL ENABLE LIGHTS ARE OFF. | (LAF2)          |
|                 | 251          | 5        | CUFS            | BGCC                 | MOUNT CTC4, CTC5/CSBO TAPE ON IODC 1-3                                                                     | (CTC4/<br>CTC5) |
| 22 HRS<br>01 0" |              |          |                 |                      |                                                                                                            |                 |
|                 | 166          | 1        | CLTC            | CLPS                 | START MSS PLATFORM 2 INSPECTION PER QCP-11                                                                 |                 |
|                 | 261          | 2        | C4TC            | CLTC                 | EAPS IS COMPLETE.                                                                                          |                 |
|                 | 261          | 3        | CLTC            | C3TC<br>C4TC<br>CUTC | VERIFY STAGE AND GROUND POWER APPLIED                                                                      |                 |
|                 | 181          | 4        | CLTC            | CVTS                 | LV POWER IS ON.                                                                                            | TCPI            |
|                 | 261          | 5        | CVTS            | CLTC                 | ETR COMMAND VALIDATION TEST IS COMPLETE. RANGE SAFETY COMMAND CARRIER IS OFF.                              | TCPI            |
|                 | 261          | 6        | C1TC            | CLTC                 | REQUEST CLEARANCE FOR LOCAL RANGE SAFETY COMMAND CARRIER (PROTECTION NOT REQUIRED)                         |                 |
|                 | 181          | 7        | CLTC            | CVTS                 | REQUEST CLEARANCE FOR LOCAL RANGE SAFETY COMMAND CARRIER (PROTECTION NOT REQUIRED)                         | TCPI            |
|                 | 261          | 8        | CLTC            | CGIC                 | VERIFY ETR/DRSCS AUDIO LINES PATCHED TO PAD B, LC 39.                                                      | TCPI            |



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| TIME            | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.        | DESCRIPTION                                                                                              | REMARKS |
|-----------------|-----------|----------|--------------|----------------------|----------------------------------------------------------------------------------------------------------|---------|
| 22 HRS<br>01 00 | 266       | 9        | C1TC         | BRFS                 | START PREPS PER V-38000, SECT 14 (NON-HAZARDOUS).                                                        | D       |
|                 | 231       | 10       | C3TC         | C3NP                 | VERIFY SAFETY SWITCHES INSTALLED INDICATION ON                                                           |         |
|                 | 231       | 11       | C3TC         | C3NP                 | ARM SAFETY SWITCHES AND VERIFY ARMED INDICATION ON                                                       |         |
|                 | 231       | 12       | C3TC         | C3NP                 | VERIFY 1D10 AND 1D20 BATTERY INDICATIONS NOT ON                                                          |         |
|                 | 231       | 13       | C3TC         | C3NP                 | SAFETY SWITCHES TO DISARM                                                                                |         |
|                 | 231       | 14       | C3TC         | R3RM<br>S3NE<br>C3NP | REPORT TO CH 233 AND CONNECT S-1B BATTERIES PER V-31118 SECT C PART 11 (HAZARDOUS), REPORT WHEN COMPLETE | # D     |
|                 | 231       | 15       | C3TC         | C3PP                 | CDDT ONLY                                                                                                | *       |
|                 |           | 15-1     |              | C3NP                 | CDDT ONLY                                                                                                | *       |
|                 | 231       | 16       | C3TC         | C3PP                 | CDDT ONLY                                                                                                | *       |
|                 |           | 16-1     |              | C3NP                 | CDDT ONLY                                                                                                | *       |
|                 | 231       | 17       | C3TC         | L3NV                 | CDDT ONLY                                                                                                | *       |
|                 | 241       | 18       | C4TC         | C4PS                 | START PROPULSION FINAL CHECKS PER V-30610, SECT K, PARTS 1 THROUGH 4 (NON-HAZARDOUS)                     | D       |
|                 | 241       | 19       | C4TC         | C4ES                 | CONNECT S-1VB FLIGHT BATTERIES PER V-30610, SECT H, PART 4 (NON-HAZARDOUS)                               | # D     |
|                 | 243       | 20       | C4ES         | C4NK                 | MONITOR BATTERY VOLTAGES, CURRENTS AND TEMPERATURES AND RECORD DATA PER V-21413 (NON-HAZARDOUS)          | # D     |
|                 | 243       | 21       | C4ES         | C4NP                 | STAGE BATTERY MONITOR TO ENABLE                                                                          |         |



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VEHICLE

AS-210

| TIME             | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                       | REMARKS       |
|------------------|-----------|----------|--------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 22 HRS<br>01 00" | 243       | 22       | C4ES         | C4NP          | VERIFY 4D10, 4D20, 4D30 & 4D40 BATTERY INDICATIONS ON                                                                                                             |               |
|                  | 243       | 23       | C4ES         | C4NP          | APPLY 4D10 LOAD AND/OR BATTERY MONITOR TO ENABLE AS REQUIRED TO STABILIZE BATTERY VOLTAGE.                                                                        | #             |
|                  | 243       | 24       | C4ES         | C4NP          | AFTER BATTERY VOLTAGES ARE RECORDED, STAGE BATTERY MONITOR TO AUTO                                                                                                |               |
|                  | 241       | 25       | C4TC         | S4HY<br>L4CE  | VERIFY FINAL ENGINEERING WALKAROUND AFT, ESE & ML COMPLETE,                                                                                                       |               |
|                  | 241       | 26       | C4TC         | C4PS          | VERIFY APS ENGINE POWER OFF AND SWITCH LOCK INSTALLED                                                                                                             |               |
|                  | 261       | 27       | C4TC         | CLTC          | APS ENGINE POWER OFF, SWITCH LOCK IS INSTALLED,                                                                                                                   |               |
|                  | 231       | 28       | C3TC         | R3RM          | MONITOR STAGE BATTERY VOLTAGES, CURRENTS AND TEMPERATURES, RECORD DATA PER V-31118 SECT C PART IV (NON-HAZARDOUS),                                                | # D           |
|                  | 261       | 28-1     | CLTK         | CLTC          | IALJ HAS BEEN TERMINATED                                                                                                                                          | I40-52        |
|                  | 261       | 28-2     | CLTC         | CUFS          | REQUEST & EXECUTE LAF2 ON CH 262. REPORT WHEN COMPLETE.                                                                                                           | I40-52        |
|                  | 262       | 29       | CUFS         | CLFK          | REQUEST & EXECUTE LAF2 (FLIGHT CONTROL PREPS) WITH THE FOLLOWING OPTIONS:<br>PRIMARY OPTION 2 (FCC & CONT ACCEL PREPS)<br>SECONDARY OPTION 1 (COMPARATORS RESET)  | ***<br>I40-52 |
|                  | 261       | 30       | C3TC         | CLTC          | RF AND TM SYSTEM PREPS COMPLETE,                                                                                                                                  |               |
|                  | 231       | 31       | C3TC         | S3NE          | START ENGINEERING WALKAROUND,                                                                                                                                     |               |
|                  | 181       | 32       | CLTC         | CVTS          | VERIFY CLEARANCE FOR LOCAL OPEN LOOP IU COMMAND CARRIER (PROTECTION REQUIRED), VERIFY CLEARANCE FOR LV FREQUENCIES 240.2, 256.2, 258.5, 250.7, 255.1, & 5765 MHZ. | TCPI          |
|                  | 262       | 1        | CUFS         | CUSP          | FCC SYSTEM POWER SWITCH TO ON                                                                                                                                     | I40-52        |

21 HRS  
55 00"



LAUNCH OPERATIONS

| TIME              | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                       | REMARKS          |
|-------------------|-----------|----------|--------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------|------------------|
| -21 HRS<br>55' 0" | 262       | 2        | CUFS         | CUGA          | CONTROL ACCELEROMETER SYSTEM POWER SWITCH TO ON                                                                                   | I40-52           |
|                   | 261       | 3        | CUFS         | CLTC          | LAF2 COMPLETE                                                                                                                     | I40-52           |
|                   | 261       | 4        | CLTC         | CLGK          | REQUEST & EXECUTE LAPW (LVDC/LVDA POWER ON) PER V-33033, SECT I (FT04, FT35, FT20, FT23 & FT08) (NON-HAZARDOUS)                   | D<br>I40-52      |
|                   | 261       | 5        | CLTC         | ECOP          | INITIATE REAL TIME PROGRAM                                                                                                        | I40-52           |
|                   | 261       | 6        | CLTC         | ETMS          | TAPE RECORDING ON                                                                                                                 | I40-52           |
|                   | 241       | 1        | C4TC         | S4PC          | MAINTAIN CLEARANCE OF AREA ON MSS PLATFORM 2 AROUND APS MODULES 1 & 2 UNTIL COMPLETION OF APS COMMAND TEST.                       | (CTC5)<br>I40-52 |
| -21 HRS<br>45' 0" | 261       | 1        | CLGK         | CLTC          | LVDC/LVDA POWER ON IS COMPLETE                                                                                                    | I40-52           |
|                   | 261       | 2        | CLTC         | ALL           | THE FOLLOWING STATIONS SWITCH TO CH 262 TO SUPPORT CTC5 (APS GAIN TEST)                                                           |                  |
|                   |           |          |              |               | CLFK CUFS CLGK CUCR CUFE CUGA CUSP<br>C4FC C4FS C4HY                                                                              | I40-52           |
|                   | 261       | 3        | CLTC         | CUFS          | PREPARE FOR AND START CTC5 ON CH 262. REPORT WHEN COMPLETE.                                                                       | I40-52           |
|                   | 262       | 4        | CUFS         | C4FC          | VERIFY PREPS COMPLETE AND APS CONTROL POWER IS OFF                                                                                | I40-52           |
|                   | 262       | 5        | CUFS         | C4HY          | VERIFY PREPS COMPLETE AND S-IVB HYDRAULICS ARE OFF                                                                                | I40-52           |
|                   | 262       | 6        | CUFS         | CLGK          | VERIFY READY TO SUPPORT CTC5 AND CTB1                                                                                             | I40-52           |
|                   | 262       | 7        | CUFS         | BGCC          | MASK THE FOLLOWING DISCRETES:<br>\$FUNCSE935-38 MMSK (MDI'S 0888-0911)                                                            | I40-52           |
|                   | 262       | 8        | CUFS         | CLFK          | REQUEST & EXECUTE CTC5, OPTIONS A, CD, EFG, H, J (AO, BURN, COAST, P, Y, R, ACTIVE & APS POWER OFF). ENTER \$PB FOR POWER OPTION. | I40-52           |
|                   |           | 8-1      |              | CLFK          | ***** NOTE ADVISE ALL PERSONNEL ON CHANNEL 262 OF MAJOR PROGRAM EVENTS BEING DISPLAYED ON SANDERS CONSOLE                         | I40-52           |
|                   |           | 8-2      |              | CUNP          | ***** NOTE GROUP 1 RESET WILL BE ISSUED PERIODICALLY DURING THIS PROGRAM                                                          | I40-52           |
|                   |           | 1 THRU 3 |              |               | DELETED                                                                                                                           | I40-52           |
| -21 HRS<br>30' 0" |           |          |              |               |                                                                                                                                   |                  |
|                   |           |          |              |               |                                                                                                                                   |                  |



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 VEHICLE AS-210

| TIME              | COMM. CH. | SEQUENCE    | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                       | REMARKS |
|-------------------|-----------|-------------|--------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| -21 HRS<br>25' 0" |           | 1 THRU<br>4 |              |               | DELETED                                                                                                                                           | I40-52  |
| -21 HRS<br>20' 0" | 262       | 1           | CUFS         | CLFK          | TERMINATE CTC5 WHEN EXECUTION IS COMPLETE                                                                                                         | I40-52  |
|                   | 261       | 2           | CUFS         | CLTC          | CTC5 IS COMPLETE. STARTING LAF2.                                                                                                                  | I40-52  |
|                   | 262       | 3           | CUFS         | CLFK          | REQUEST & EXECUTE LAF2 (FLIGHT CONTROL PREPS) WITH THE FOLLOWING OPTIONS: PRIMARY OPTION 3 (EDS/CRG PREPS) SECONDARY OPTION 1 (COMPARATORS RESET) | I40-52  |
| -21 HRS<br>15' 0" | 262       | 1           | CUFS         | CLFK          | REPORT WHEN LAF2 IS COMPLETE                                                                                                                      | I40-52  |
|                   | 261       | 2           | CUFS         | CLTC          | LAF2 IS COMPLETE. STARTING CTC5.                                                                                                                  | I40-52  |
|                   | 262       | 3           | CUFS         | CUGA          | EDS/CRG SYSTEM POWER SWITCH TO ON                                                                                                                 | I40-52  |
|                   | 262       | 4           | CUFS         | CLFK          | REQUEST & EXECUTE CTC5 OPTIONS B, CD, EFG, H, J, (A1, BURN, COAST, P, Y, R, ACTIVE AND APS POWER OFF) ENTER \$PBC FOR POWER OPTION                | I40-52  |
|                   |           | 4-1         |              | CLFK          | **** NOTE ADVISE ALL PERSONNEL ON CH 262 OF MAJOR PROGRAM EVENTS BEING DISPLAYED ON SANDERS CONSOLE                                               | I40-52  |
|                   |           | 4-2         |              | CUNP          | **** NOTE GROUP 1 RESET WILL BE ISSUED PERIODICALLY DURING THIS PROGRAM.                                                                          | I40-52  |
| -21 HRS<br>10' 0" |           | 1           |              |               | DELETED                                                                                                                                           | I40-52  |
|                   | 251       | 2           | CUTC         | CUNE          | VERIFY IU BATTERY CONNECTIONS ARE COMPLETE                                                                                                        | #       |



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| TIME              | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                   | REMARKS |
|-------------------|-----------|----------|--------------|---------------|-------------------------------------------------------------------------------------------------------------------------------|---------|
| +21 HRS<br>10' 0" |           | 3        |              |               | DELETED                                                                                                                       | I40-52  |
| +21 HRS<br>5' 0"  | 261       | 1        | CLTC         | SURF          | VERIFY ANTENNA COUPLER INSTALLATION<br>COMPLETE AND CONFIGURED FOR IU COMMAND<br>SYSTEM CHECKS PER V-28233<br>(NON-HAZARDOUS) | D       |
|                   |           | 2        |              |               | DELETED                                                                                                                       | I40-52  |
|                   |           | 3        |              |               | DELETED                                                                                                                       | I40-52  |
|                   |           | 4        |              |               | DELETED                                                                                                                       | I40-52  |
|                   |           | 5        |              |               | DELETED                                                                                                                       | I40-52  |
|                   |           | 6        |              |               | DELETED                                                                                                                       | I40-52  |
| +21 HRS<br>0' 0"  | 251       | 1        | CUTC         | SUVM          | REMOVE ST-124M PURGE LINE AND PLENUM<br>CHECK VALVE PER V-31119, PART III<br>(HAZARDOUS),                                     | # D     |
|                   | 251       | 2        | CUTC         | SUVM          | <b>CDDT ONLY</b>                                                                                                              | * D     |
|                   | 251       | 3        | CUTC         | EUTM          | VERIFY TM RERADIATION SYSTEM INSTALLED                                                                                        |         |







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| TIME             | COMM. CH. | SEQUENCE      | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                   | REMARKS |
|------------------|-----------|---------------|--------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 21 HRS<br>01' 0" | 261       | 4             | CLTC         | C3IP<br>CUIP  | VERIFY RF SILENCE OFF                                                                                                                                         |         |
|                  | 266       | 5             | C1TC         | BRFS          | VERIFY DRSCS FLIGHT CODE PLUG INSTALLED IN LCC GSE PER V-38000, SECT 14 (NON-HAZARDOUS).                                                                      | D       |
|                  | 261       | 6             | CLTC         | C1TC<br>C4TC  | START PREPS FOR UMBILICAL RELEASE SENSOR CHECKS                                                                                                               |         |
|                  | 241       | 7             | C4TC         | S4ML          | REMOVE S/A 6 CARRIER DISCONNECT SWITCHES FOR UMBILICAL RELEASE SENSOR CHECKS PER V-30610, SECT I (NON-HAZARDOUS).                                             | D       |
| 20 HRS<br>59' 0" |           | 1 THRU<br>1-2 |              |               | DELETED                                                                                                                                                       | I40-52  |
| 20 HRS<br>55' 0" | 262       | 1             | CUFS         | CLFK          | TERMINATE CTC5 WHEN EXECUTION IS COMPLETE                                                                                                                     | I40-52  |
|                  | 261       | 2             | CUFS         | CLTC          | CTC5 IS COMPLETE. STARTING CTC4.                                                                                                                              | I40-52  |
|                  | 251       | 3             | CUFS         | BGCC          | UNMASK THE FOLLOWING DISCRETES:<br>\$FUNCSE935-38 MREL (MDI'S 0888 TO 0911)                                                                                   | I40-52  |
|                  | 241       | 4             | C4FC         | C4TC<br>S4PC  | APS COMMAND TEST (CTC5) IS COMPLETE                                                                                                                           | I40-52  |
|                  | 262       | 5             | CUFS         | CLFK          | REQUEST & EXECUTE CTC4, NORM OPTION (CRG CALIB TEST; P,Y,R AXES; POS & NEG; BILEVEL PKG; COMPARATOR TEST AND RATE EXCESSIVE TEST)                             | I40-52  |
| 20 HRS<br>30' 0" | 181       | 1             | CLTC         | CVTS          | REQUEST MSS ELEVATOR 2 (WEST) BE LOCKED OUT AT MSS PLATFORM 5 AND MSS PLATFORM 2 BE POSITIONED BELOW LV STATION 1400 TO SUPPORT LONG RANGE THEODOLITE CHECKS, | TCP!    |
|                  | 251       | 2             | CUTC         | SUVM          | VERIFY ST-124M PURGE LINE AND PLENUM CHECK VALVE REMOVED.                                                                                                     | #       |



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| TIME              | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                          | REMARKS |
|-------------------|-----------|----------|--------------|---------------|------------------------------------------------------------------------------------------------------|---------|
| *20 HRS<br>30: 0" |           |          |              |               |                                                                                                      |         |
|                   | 251       | 3        | CUTC         | SUVM          | <b>CDDT ONLY</b>                                                                                     | *       |
|                   | 251       | 4        | CUTC         | SUVM          | REMOVE SUBLIMATOR VENT COVERS PER V-31119, PART III, REPORT WHEN COMPLETE (HAZARDOUS),               | # D     |
|                   | 261       | 5        | CLTC         | VURF          | ENABLE LOCAL OPEN LOOP IU COMMAND CARRIER PER V-28233 AND VERIFY, (NON-HAZARDOUS)                    | D       |
|                   | 261       | 6        | CLTC         | CUNP          | IU SWITCH SELECTOR INHIBIT OFF                                                                       |         |
|                   | 261       | 7        | CLTC         | CUIP          | RADAR BEACON 1 & 2 INHIBIT - ON<br>RADAR BEACON 1 & 2 - ON<br>IU COMMAND RECEIVER/DECODER POWER - ON |         |
|                   | 261       | 8        | CLTC         | VURF          | START IU COMMAND CHECKS PER V-28233, (NON-HAZARDOUS)                                                 | D       |
|                   | 181       | 9        | CLTC         | CVTS          | LOCAL OPEN LOOP IU COMMAND CARRIER AND IU COMMAND RECEIVER/DECODER ARE ON,                           | TCP!    |
|                   | 261       | 10       | CLTC         | C4TC          | HAVE OBSERVERS ON STATION IN 30 MINUTES FOR MSS PLATFORM 2 OPENING                                   |         |
|                   | 266       | 11       | C1TC         | CSPP          | REMOVE GROUNDING STRAP FROM S/A 6 TO MSS PLATFORM 2. REPORT WHEN COMPLETE,                           |         |
|                   | 241       | 12       | C4TC         | S4ML          | VERIFY S/A 6 CARRIER DISCONNECT SWITCHES REMOVED AND READY FOR UMBILICAL RELEASE SENSOR CHECKS,      |         |
|                   | 266       | 13       | C4TC         | C1TC          | S/A 6 CARRIER DISCONNECT SWITCHES REMOVED, READY FOR UMBILICAL RELEASE SENSOR CHECKS                 |         |
|                   | 241       | 14       | C4TC         | S4CE          | REMOVE IVD EQUIPMENT PER V-27250 (NON-HAZARDOUS), REPORT WHEN COMPLETE,                              | D       |
|                   | 241       | 15       | C4TC         | S4CE          | VERIFY FINAL ENGINEERING WALKAROUND AFT & FORWARD COMPLETE                                           |         |
|                   | 241       | 16       | C4TC         | C4ES          | VERIFY S-IVB FLIGHT BATTERIES CONNECTED                                                              | #       |



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| TIME             | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                                                          | REMARKS |
|------------------|--------------|----------|-----------------|------------------|------------------------------------------------------------------------------------------------------|---------|
| 20 HRS<br>30' 0" | 241          | 17       | C4TC            | S4MA<br>S4MF     | SECURE FROM BATTERY INSTALLATION PER V-30610, SECT H, PART 5 (NON-HAZARDOUS), REPORT WHEN COMPLETE.  | # D     |
|                  | 241          | 18       | C4TC            | C4PS             | VERIFY S-IB/S-IVB SEPARATION SIMULATION IS OFF AND NO LONGER REQUIRED                                |         |
|                  | 231          | 19       | C4TC            | C3TC             | SEPARATION SIMULATION JUMPER NO LONGER REQUIRED                                                      |         |
|                  | 231          | 20       | C3TC            | L3NV             | REMOVE S-IB/S-IVB SEPARATION SIMULATION (SIM ENABLE) JUMPER 202-121A3-J5                             |         |
|                  |              | 20-1     |                 |                  | VERIFICATION BY LV-QAL<br>-----                                                                      |         |
|                  | 231          | 21       | C3TC            | C3FE             | VERIFY S-IB FLIGHT CONTROL SYSTEM PREPS COMPLETE                                                     |         |
|                  | 266          | 22       | C1TC            | CSPP             | START UMBILICAL RELEASE SENSOR CHECKS PER V-31045 (NON-HAZARDOUS)                                    | D       |
| 20 HRS<br>25' 0" | 261          | 1        | CLTC            | VURF             | VERIFY RADAR BEACON READY FOR INTERROGATION                                                          |         |
|                  | 261          | 2        | CLTC            | CUIP             | RADAR BEACON 1 & 2 INHIBIT - OFF<br>RADAR BEACON 1 INHIBIT - ON                                      |         |
|                  | 181          | 3        | CLTC            | CVTS             | REQUEST RANGE INTERROGATE RADAR BEACON 2, REPORT RANGE READOUTS TO VURF ON CHANNEL 264.              | TCPI    |
|                  | 261          | 4        | CLTC            | C4TC             | VERIFY S-IB/S-IVB SEPARATION SIMULATION IS OFF AND WILL REMAIN OFF UNTIL COMPLETION OF CTB1 AND CTB7 | (CTB1)  |



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VEHICLE AS-210

| TIME              | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.        | DESCRIPTION                                                                                                                                                                                                     | REMARKS         |
|-------------------|-----------|----------|--------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| -20 HRS<br>25, 0" | 261       | 5        | CLTC         | ALL                  | THE FOLLOWING STATIONS SWITCH TO CHANNEL 262 TO SUPPORT FLIGHT CONTROL SYSTEM GAIN TEST (CTB1):<br>CLGK CUSP CUNP R4HY C3FE C3HY<br>CUFE CUCR S4HY C4FC C3FC L3FC<br>CUGA CLFK C4HY C4FS L3PM R3RM<br>C4NP C3ED | (CTB1)          |
|                   | 251       | 6        | CUFS         | BGCC                 | REMOVE CSB0 TAPE AND MOUNT CSD1 ACTUATOR CAL TAPE ON IQDC 1-3                                                                                                                                                   | (CTB1/<br>CTB7) |
|                   | 262       | 7        | CUFS         | S4HY<br>L3FC<br>L3PM | VERIFY HYDRAULIC SYSTEMS READY AND ENGINE AREAS CLEAR FOR ENGINE GIMBALLING                                                                                                                                     | (CTB1)          |
|                   | 262       | 8        | CUFS         | C4NP                 | 4D411 POWER ON OR VERIFY ON                                                                                                                                                                                     | (CTB1)          |
|                   | 262       | 9        | CUFS         | C4HY                 | AUXILIARY PUMP POWER SWITCH TO AUTO                                                                                                                                                                             | (CTB1)          |
|                   | 262       | 10       | CUFS         | C3HY                 | PLACE HYDRAULIC SYSTEM SWITCHES 1, 2, 3 & 4 TO AUTO                                                                                                                                                             | (CTB1)          |
| -20 HRS<br>20, 0" | 262       | 1        | CUFS         | CLFK                 | TERMINATE CTC4 WHEN EXECUTION IS COMPLETE                                                                                                                                                                       | I40-52          |
|                   | 261       | 2        | CUFS         | CLTC                 | CTC4 IS COMPLETE. REQUEST CLTK TO REQUEST AND EXECUTE IALJ                                                                                                                                                      | I40-52          |
|                   | 261       | 3        | CLTC         | CLTK                 | REQUEST & EXECUTE IALJ AT STEP 0915 (CTB1)                                                                                                                                                                      | I40-52          |
|                   |           | 4        |              |                      | DELETED                                                                                                                                                                                                         | I40-52          |
|                   | 262       | 5        | CUFS         | C3HY                 | PLACE HYDRAULIC PUMPS ENABLE SWITCH TO AUTO                                                                                                                                                                     | (CTB1)          |



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| TIME             | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                             | REMARKS |
|------------------|-----------|----------|--------------|---------------|-------------------------------------------------------------------------------------------------------------------------|---------|
| 18 HRS<br>55' 0" |           | 11-1     |              | CRSS          | *** NOTE ALL EBWIS NOT CHARGED                                                                                          |         |
|                  | 261       | 12       | CLTC         | C3DP<br>C4DP  | RSCR'S NO. 1 & NO. 2 - EXTERNAL THEN AUTO,                                                                              |         |
|                  | 261       | 13       | CLTC         | C3DP<br>C4DP  | VERIFY RSCR POWER ON INDICATIONS OFF,                                                                                   |         |
|                  | 261       | 14       | CLTC         | CLVN          | DESTRUCT SYSTEM - OFF, DELIVER DESTRUCT SYSTEM ENABLE KEY TO CPSS, REPORT WHEN COMPLETE,                                |         |
|                  | 261       | 15       | CLTC         | BRFS          | TAPE RECORDING - OFF                                                                                                    |         |
|                  | 181       | 16       | CLTC         | CVTS          | DRSCS OPEN LOOP TEST COMPLETE. REQUEST RANGE SAFETY COMMAND CARRIER - OFF, DESTRUCT SYSTEM ENABLE KEY RETURNED TO CPSS, | TCPI    |
|                  | 181       | 17       | CLTC         | CVTS          | REQUEST SRO TO RECONFIGURE TO FLIGHT CODE PLUGS                                                                         | TCPI    |
| 18 HRS<br>45' 0" | 251       | 1        | CUTC         | EUTM          | VERIFY READY FOR SECURING TM RERADIATION SYSTEM,                                                                        |         |
|                  | 251       | 2        | CUTC         | SUVE          | DISCONNECT TM RERADIATION SYSTEM PER V-31119, PART III, REPORT WHEN COMPLETE, (HAZARDOUS)                               | D       |
|                  | 251       | 3        | CUTC         | SURF          | SECURE RADAR BEACON GSE AND REMOVE RADAR BEACON ANTENNA COUPLERS PER V-28233, REPORT WHEN COMPLETE, (NON-HAZARDOUS)     | D       |
|                  | 241       | 4        | C4TC         | S4OR          | VERIFY SHORTING PLUGS INSTALLED ON PD DETONATORS AND PRIMACORD NOT CONNECTED TO S&A                                     |         |



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V-20130, PART 1

VEHICLE

AS-280

| TIME             | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                     | REMARKS  |
|------------------|-----------|----------|--------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| -18 HRS<br>35:00 |           |          |              |               |                                                                                                                                                 |          |
|                  | 262       | 1        | GT07         | CUFK          | TERMINATE CE10                                                                                                                                  | ***      |
|                  | 262       | 2        | CUFS         | CSHY          | S-18 HYDRAULIC SYSTEM 1, 2, 3 & 4 AND<br>HYDRAULIC PUMPS ENABLE SWITCHES OFF                                                                    |          |
|                  | 261       | 3        | CUFS         | CLTC          | GT07 COMPLETE.                                                                                                                                  |          |
|                  |           | 3-1      |              |               | *****WARNING*****<br>*<br>* RESUME PREVIOUS HAZARD *<br>* LEVEL - END OF WARNING *<br>* FOR S-18 ENGINE GIMBAL *<br>* ENVELOPE. *<br>*<br>***** |          |
|                  | 251       | 4        | CUFS         | BGCC          | REMOVE CSD1 ACTUATOR CAL TAPE FROM 10DC<br>1-3                                                                                                  |          |
|                  | 181       | 5        | CLTC         | CVTS          | REQUEST SCO PERSONNEL ON CH 223 FOR<br>ABORT LIGHT VERIFICATION. REQUEST EOS<br>POWER ON.                                                       | TCP!     |
|                  |           | 6        |              |               | DELETED                                                                                                                                         | XB123-44 |
|                  | 181       | 7        | CLTC         | CVTS          | REQUEST CPSS RELEASE DESTRUCT SYSTEM<br>ENABLE KEY TO CLVN;                                                                                     | TCP!     |
|                  | 181       | 8        | CLTC         | CVTS          | VERIFY CLEARANCE TO BRING UP THE LOCAL<br>RANGE SAFETY COMMAND CARRIER (PROTECTION<br>IS REQUIRED)                                              | TCP!     |
|                  | 181       | 9        | CLTC         | CVTS          | VERIFY RANGE READY TO SUPPORT DRSCS<br>CLOSED LOOP TEST ON CH 261.                                                                              | TCP!     |



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| TIME             | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA.     | DESCRIPTION                                                                                                        | REMARKS |
|------------------|--------------|----------|-----------------|----------------------|--------------------------------------------------------------------------------------------------------------------|---------|
| 18 HRS<br>30' 0" |              | 67-1     |                 | CRSS                 | *** NOTE S-1B RSCR'S REMAIN ON INTERNAL<br>AND S-1B EBW'S REMAIN CHARGED                                           |         |
|                  | 261          | 68       | CLTC            | C3DP<br>C4DP         | EBW'S NO. 1 & NO. 2 - EXTERNAL THEN AUTO<br>AND VERIFY EBW'S NOT CHARGED AND EBW'S<br>POWER ON INDICATIONS ARE OFF |         |
|                  |              | 68-1     |                 | CRSS                 | *** NOTE S-1B EBW'S NOT CHARGED                                                                                    |         |
|                  | 261          | 69       | CLTC            | BRFS                 | SIG GEN-SELECT 1,                                                                                                  |         |
|                  |              | 69-1     |                 | CRSS<br>BRFS         | *** NOTE S-1B LIMITER VOLTAGES RECEIVED,                                                                           |         |
|                  | 261          | 70       | CLTC            | C4DP                 | RSCR'S 1 & 2 TRANSFER - EXTERNAL THEN<br>INTERNAL                                                                  |         |
|                  | 261          | 71       | CLTC            | B4RF                 | VERIFY S-1VB LIMITER VOLTAGES OK                                                                                   |         |
|                  |              | 71-1     |                 | CRSS                 | *** NOTE S-1VB LIMITER VOLTAGES<br>RECEIVED,                                                                       |         |
|                  | 261          | 72       | CLTC            | C3DP<br>C4DP         | RSCR'S NO. 1 & NO. 2 - EXTERNAL THEN<br>AUTO AND VERIFY RSCR'S OFF AND POWER ON<br>INDICATIONS ARE OFF             |         |
|                  |              | 72-1     |                 | B3RF<br>CRSS<br>B4RF | *** NOTE RSCR LIMITER VOLTAGE<br>INDICATIONS OFF,                                                                  |         |
|                  | 261          | 73       | CLTC            | CLVN                 | DESTRUCT SYSTEM - OFF, RETURN DESTRUCT<br>SYSTEM ENABLE KEY TO CPSS, REPORT WHEN<br>COMPLETE,                      |         |
|                  | 121          | 74       | CLTC            | C3DP<br>C4DP         | VERIFY SAFETY BUS OFF,                                                                                             |         |
|                  | 261          | 75       | CLTC            | BRFS                 | SIGNAL GENERATOR SELECTOR - STANDBY,                                                                               |         |
|                  | 181          | 76       | CLTC            | CVTS                 | DRSCS CHECKS COMPLETE,                                                                                             | TCPI    |
|                  | 181          | 77       | CLTC            | CVTS                 | LOCAL RANGE SAFETY COMMAND CARRIER IS<br>OFF & DESTRUCT SYSTEM ENABLE KEY<br>RETURNED TO CPSS,                     | TCPI    |



| TIME              | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                                | DESCRIPTION                                                                                                                                                                                                                                                | REMARKS           |
|-------------------|-----------|----------|--------------|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| -18 HRS<br>30' 0" |           |          |              |                                              |                                                                                                                                                                                                                                                            |                   |
|                   | 261       | 78       | CLTC         | RRSC                                         | DRSCS RECORDERS OFF                                                                                                                                                                                                                                        |                   |
|                   | 261       | 79       | CLTC         | BRFS                                         | TAPE RECORDING - OFF AND RELOAD.                                                                                                                                                                                                                           | B-4-22            |
|                   |           | 79-1     |              | BRFS                                         | *** NOTE DELIVER TAPE TO SECURITY OFFICER                                                                                                                                                                                                                  | B-4-22            |
|                   | 261       | 80       | CLTC         | C3DP<br>C4DP                                 | STATUS SYSTEMS SWITCH - SAFE.                                                                                                                                                                                                                              |                   |
|                   | 261       | 81       | CLTC         | CRSS                                         | VERIFY RF OPEN-LOOP AND CLOSED-LOOP DRSCS CHECKS COMPLETED.                                                                                                                                                                                                |                   |
|                   | 261       | 81-1     | CLTC         | CUEV                                         | REPORT TO CRSS ON CHANNEL 264 FOR HOLDFIRE CHECKS                                                                                                                                                                                                          | XB123-44          |
|                   |           | 81-2     |              | C3FR<br>CUEV<br>CWES<br>C3DE<br>CUDE<br>C3EV | NOTE<br>----<br>CRSS WILL CONDUCT HOLDFIRE CHECKS WITH RSO & SRO DURING THE NEXT 30 MINUTES. THE RANGE SAFE INDICATION ON THE C3FR & C3EV PANEL AND BOTH SRO/RSO PROCEED INDICATIONS ON IU EVENTS DISPLAY PANEL WILL CYCLE ON AND OFF DURING THESE CHECKS. | XB123-44          |
|                   | 188       | 82       | CLTC         | ALL                                          | ALL PERSONNEL WHO SUPPORTED LV DRSCS CHECKS RETURN TO ASSIGNED CHANNELS.                                                                                                                                                                                   |                   |
|                   | 261       | 83       | CLTC         | BRFS                                         | (IF HOLD SCHEDULED AT T-9 HRS)<br>LUT/LCC GSE POWER - OFF<br>SECURE DRSCS FLIGHT CODE PLUG PER V-38000 (NON-HAZARDOUS)                                                                                                                                     | D                 |
|                   | 261       | 84       | CVTS         | CLTC                                         | MSS PLATFORM 2 IS OPEN AND SECURE                                                                                                                                                                                                                          | TCP1              |
|                   | 266       | 85       | CSAB         | C1TC                                         | S/A 8 ECS DUCT IN FLIGHT CONFIGURATION                                                                                                                                                                                                                     | *<br>XB122-43     |
|                   | 261       | 86       | G1TC         | CLTC                                         | S/A 8 ECS DUCT IN FLIGHT CONFIGURATION                                                                                                                                                                                                                     | *<br>XB122-43     |
|                   | 181       | 87       | CLTC         | CVTS                                         | S/A 8 ECS DUCT IN FLIGHT CONFIGURATION                                                                                                                                                                                                                     | * TOP<br>XB122-43 |
| -18 HRS<br>20' 0" |           |          |              |                                              |                                                                                                                                                                                                                                                            |                   |
|                   | 261       | 1        | CLTC         | CWTC                                         | VERIFY TM RADIATION SYSTEM IN FLIGHT CONFIGURATION                                                                                                                                                                                                         |                   |
|                   | 261       | 2        | CLTC         | CUIP                                         | RF DUMMY LOAD OFF                                                                                                                                                                                                                                          |                   |
|                   | 261       | 3        | CLTC         | ETMC<br>ETMS                                 | TM TAPE RECORDING - ON                                                                                                                                                                                                                                     |                   |
|                   | 261       | 4        | CLTC         | CUIP                                         | P1 - RF ON                                                                                                                                                                                                                                                 |                   |
| -18 HRS<br>10' 0" |           |          |              |                                              |                                                                                                                                                                                                                                                            |                   |
|                   | 241       | 1        | C4TC         | E4TM<br>S4CE                                 | RECONFIGURE S-IVB ANTENNA SYSTEM PER V-30610, SECT L. (NON-HAZARDOUS)                                                                                                                                                                                      | D                 |



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| TIME             | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                | REMARKS       |
|------------------|-----------|----------|--------------|---------------|--------------------------------------------------------------------------------------------|---------------|
| 16 HRS<br>15' 0" | 261       | 7        | C1TC         | CLTC<br>C4TC  | UMBILICAL RELEASE SENSOR CHECKS ARE COMPLETE                                               |               |
| 16 HRS<br>5' 0"  | 251       | 1        | CUTC         | CUIP          | MEASUREMENT TRANSFER - AUTO<br>S-IVB COAST TEST - AUTO<br>(60X-607A6-CCIS PANEL)           | (MT01)        |
|                  | 261       | 2        | CLTC         | ALL           | DISPLAY OPERATORS DO NOT CALL DISPLAY DESCRIPTIONS (FORMAT SELECT) UNTIL MT01 IS COMPLETE, |               |
|                  | 251       | 3        | CUTC         | BGCC          | REMOVE DISPLAY DESCRIPTION TAPE FROM IODC 2-6                                              |               |
|                  | 251       | 4        | CUTC         | BGCC          | VERIFY/MOUNT MT01 DATA TAPE ON IODC 2-9 AND SCRATCH TAPE ON IODC 1-3                       | (MT01)        |
|                  | 181       | 5        | CLTC         | CVTS          | LV RF & TM SYSTEMS ARE OFF                                                                 | TCP1          |
|                  | 231       | 6        | C3TC         | C3IP          | MEASUREMENT TRANSFER TO INFLIGHT AND MEASURING RATE GYRO SWITCH TO ON,                     | (MT01)        |
| 16 HRS<br>2' 0"  | 261       | 1        | CLTC         | C3TC<br>CUTC  | VERIFY READY FOR MT01                                                                      |               |
|                  | 261       | 2        | ***          | C4IP          | PRELAUNCH CHECKOUT GROUP ON,                                                               | ***<br>(MT01) |
|                  | 261       | 3        | ***          | CLIK          | ISSUE S-IVB ALL RACS RUN                                                                   | ***<br>(MT01) |
|                  | 188       | 4        | CLTC         | ALL           | STAGE MEASUREMENTS WILL BE INTERRUPTED DURING MT01 (MEAS SCAN),                            |               |



| TIME              | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                  | REMARKS          |
|-------------------|-----------|----------|--------------|---------------|------------------------------------------------------------------------------------------------------------------------------|------------------|
| *16 HRS<br>01 00" |           |          |              |               |                                                                                                                              |                  |
|                   | 261       | 1        | CLSK         | CLTC          | IASP IS COMPLETE. 42D100 POWER IS UP,                                                                                        |                  |
|                   | 266       | 2        | C1TC         | CSPP          | TRANSFER SMDPS TO 42D100 POWER PER V-21194, APP G, PART II (NON-HAZARDOUS),                                                  | D                |
|                   | 261       | 3        | ***          | CLIK          | REQUEST & EXECUTE MT01 (MEAS SCAN VEHICLE OPTION)                                                                            | ***              |
|                   | 266       | 4        | C1TC         | CWCP          | START IWS INITIAL PREPS PER V-36937 (HAZARDOUS)                                                                              | D                |
|                   |           | 4-1      |              |               | NOTE<br>- - -<br><br>THERE IS A POSSIBILITY OF<br>WATER FLOW FROM THE 240'<br>LEVEL OF THE ML DOWN                           |                  |
|                   | 122       | 5        | CLTC         | BOSC          | HAVE INDUSTRIAL WATER ENGINE READY TO START UPON 30 MINUTE NOTIFICATION FROM CWCP.                                           | TCPI             |
|                   | 266       | 6        | C1TC         | CWCP          | NOTIFY BOSC 30 MINUTES PRIOR TO HAVING INDUSTRIAL WATER ENGINE START,                                                        |                  |
|                   | 266       | 7        | C1TC         | CSPP          | REMOVE 43D100 & 43D200 POWER PER V-21194 (NON-HAZARDOUS),                                                                    | D                |
|                   | 241       | 8        | C4TC         | S4ML          | VERIFY FINAL ML WALKAROUND COMPLETE                                                                                          |                  |
|                   | 261       | 9        | CVTS         | CLTC          | REDUCE S/A 8 ECS FLOWRATE TO MINIMUM. REPORT WHEN COMPLETE.                                                                  | TCPI<br>XB124-50 |
|                   | 261       | 10       | CLTC         | C1TC          | REDUCE S/A 8 ECS FLOWRATE TO MINIMUM. REPORT WHEN COMPLETE.                                                                  | XB124-50         |
|                   | 266       | 11       | C1TC         | CECS          | ESTABLISH MINIMUM POSSIBLE FLOW FOR SM DUCT AND JUMPER LIMIT SWITCH ON FLOW CONTROL VALVE IF REQUIRED. REPORT WHEN COMPLETE. | XB124-50         |
|                   | 261       | 12       | C1TC         | CLTC          | S/A 8 ECS FLOW AT MINIMUM                                                                                                    | XB124-50         |
|                   | 181       | 13       | CLTC         | CVTS          | S/A 8 ECS FLOW AT MINIMUM                                                                                                    | TCPI<br>XB124-50 |
|                   | 261       | 14       | CVTS         | CLTC          | RECONFIGURE S/A 8 ECS "Y" DUCT TO FLIGHT CONFIGURATION. REPORT WHEN COMPLETE.                                                | TCPI<br>XB124-50 |
|                   | 261       | 15       | CLTC         | C1TC          | RECONFIGURE S/A 8 ECS "Y" DUCT TO FLIGHT CONFIGURATION. REPORT WHEN COMPLETE.                                                | XB124-50         |
|                   | 266       | 16       | C1TC         | CSA8          | RECONFIGURE S/A 8 ECS "Y" DUCT TO FLIGHT CONFIGURATION PER V-36084 (NON-HAZARDOUS). REPORT WHEN COMPLETE.                    | D<br>XB124-50    |
| *15 HRS<br>50 00" |           |          |              |               |                                                                                                                              |                  |
|                   | 231       | 1        | C3TC         | L3IV<br>S3NE  | VERIFY READY FOR FUEL BAY CLOSEOUT                                                                                           |                  |
|                   | 241       | 2        | C4TC         | S4PC          | REMOVE STAGE MONITOR HUT AND RETURN TO VAB, REPORT WHEN COMPLETE,                                                            | #                |



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| TIME             | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                                                                            | REMARKS   |
|------------------|-----------|----------|--------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 15 HRS<br>30' 0" |           | 4-1      |              |               | *****WARNING*****<br>*<br>* THE CONTROL AREA FOR<br>* S-IB ORDNANCE<br>* OPERATIONS IS THE ML<br>* ZERO LEVEL, FLAME<br>* TRENCH, TOP OF THE<br>* PEDESTAL, S-IB AFT, AND<br>* A 10 FT RADIUS OF THE<br>* S-IB S&A UNIT,<br>*<br>***** | TCPI<br># |
| 241              | 5         | C4TC     | C4SM         |               | START ORDNANCE CONTROL PANEL SETUPS PER V-30610, SECT 0, PART 2 (NON-HAZARDOUS) REPORT WHEN COMPLETE.                                                                                                                                  | D         |
| 266              | 6         | C3TC     | C1TC         |               | VERIFY LSE POWER (42D100) IS SUPPORTING, (REQUIRED FOR HDA STRAY VOLTAGE CHECKS)                                                                                                                                                       |           |
| 261              | 7         | BOSC     | CLTC         |               | REQUEST S-IVB PERSONNEL REPORT TO PGHE ON CH 127 FOR GH2 CROSS COUNTRY LINE LEAK CHECKS,                                                                                                                                               | TCPI      |
| 261              | 8         | CLTC     | C4TC         |               | HAVE S-IVB PERSONNEL REPORT TO PGHE ON CH 127 FOR GH2 CROSS COUNTRY LINE LEAK CHECKS.                                                                                                                                                  |           |
| 241              | 9         | C4TC     | U4PN         |               | VERIFY GH2 INLET HANDVALVE (A-11982) ON MODEL 438 HEX IS CLOSED                                                                                                                                                                        |           |
| 241              | 10        | C4TC     | U4PN         |               | MONITOR 6000 PSI GH2 INLET PRESSURE GAGE (A11987) ON 438 HEX FOR ZERO PRESSURE INDICATION DURING GH2 SUPPLY LEAK CHECK AND ACTIVATION.                                                                                                 |           |
|                  | 10-1      |          | U4PN         |               | *** NOTE IF ANY PRESSURE IS INDICATED, REQUEST PGHE TO CLOSE GH2 SUPPLY AND VENT SYSTEM.                                                                                                                                               |           |
| 241              | 11        | C4TC     | S4SY         |               | PERFORM GH2 SNIFFER CHECKS AT THE 438 HEX INLET AND AROUND THE FACILITY LINE ON THE ML 240 FOOT LEVEL DURING GH2 SUPPLY LEAK CHECK AND ACTIVATION,                                                                                     |           |



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| TIME             | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                        | DESCRIPTION                                                                                     | REMARKS          |
|------------------|-----------|----------|--------------|--------------------------------------|-------------------------------------------------------------------------------------------------|------------------|
| 15 HRS<br>30' 0" |           | 11=1     |              | S4SY                                 | *** NOTE IF GH2 LEAKAGE IS INDICATED, REQUEST PGHE TO CLOSE GH2 SUPPLY AND VENT SYSTEM.         |                  |
|                  | 241       | 12       | C4TC         | U4PN<br>S4SY<br>C4HN                 | REPORT TO PGHE ON CH 127 FOR GH2 CROSS COUNTRY LINE LEAK CHECKS AND ACTIVATION. MONITOR CH 241. |                  |
|                  | 261       | 13       | C4TC         | CLTC                                 | S-IVB READY FOR ACTIVATION OF 6000 PSI GH2 SUPPLY.                                              |                  |
|                  | 261       | 14       | C1TC         | CLTC                                 | LH2 FACILITY VENT SYSTEM IS CONFIGURED TO SUPPORT S-IVB GH2 PREPS,                              |                  |
|                  | 122       | 15       | CLTC         | BOSC                                 | ACTIVATE 6000 PSI GH2 SUPPLY,                                                                   | TCPI             |
|                  | 251       | 16       | C1TC         | CUTC                                 | REQUEST LRPR REPORT TO CSAC ON CHANNEL 236 TO SUPPORT DRRS HARDWIRE CHECKS.                     |                  |
|                  | 266       | 17       | C1TC         | CSPP                                 | START HARDWIRE FUNCTIONAL CHECKS PER V-31045 (NON-HAZARDOUS)                                    | D #              |
|                  | 266       | 18       | CSA8         | C1TC                                 | S/A 8 ECS DUCT IS IN FLIGHT CONFIGURATION                                                       | XB124-50         |
|                  | 261       | 19       | C1TC         | CLTC                                 | S/A 8 ECS DUCT IS IN FLIGHT CONFIGURATION                                                       | XB124-50         |
|                  | 181       | 20       | CLTC         | CVTS                                 | S/A 8 ECS DUCT IS IN FLIGHT CONFIGURATION                                                       | TCPI<br>XB124-50 |
| 15 HRS<br>15' 0" |           |          |              |                                      |                                                                                                 |                  |
|                  | 241       | 1        | S4MF         | C4TC                                 | FORWARD ACCESS KIT REMOVAL IS COMPLETE EXCEPT FOR PLATFORMS REQUIRED FOR S&A CONNECTION         |                  |
|                  | 236       | 2        | CSAC         | CSA1<br>CSA6<br>CSA7<br>CSA8<br>CSA9 | VERIFY PRELAUNCH TOWER PREPS COMPLETE,                                                          |                  |
|                  | 236       | 3        | CSAC         | CHCU                                 | PREP HCU PER V-36079 (NON-HAZARDOUS),                                                           | D                |
|                  | 261       | 4        | CLTC         | C3TC                                 | PREPARE S-IB STAGE FOR RF SILENCE AND CONTROLLED SWITCHING,                                     |                  |
|                  | 231       | 5        | C3TC         | C3DP                                 | VERIFY FOLLOWING SWITCH POSITIONS;<br>STATUS SYSTEMS SWITCH - SAFE<br>S&A - SAFE                |                  |



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 TEST NO. V-20130, PART 1  
 VEHICLE AS-210

| TIME             | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                      | REMARKS          |
|------------------|-----------|----------|--------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 15 HRS<br>15' 0" |           | 27-1     |              |               | *****WARNING*****<br>*<br>* THE CONTROL AREA FOR<br>* S-IVB ORDNANCE<br>* OPERATIONS IS THE<br>* LAUNCH VEHICLE<br>* INTERIOR<br>*<br>*****      | # TCPI           |
| 15 HRS<br>0' 0"  | 261       | 1        | CUTC         | CLTC          | REQUEST SUPPORT REMOVE CAMERA FROM IU MONITOR HUT                                                                                                | #                |
|                  | 114       | 2        | CLTC         | BTIS          | REQUEST CAMERA BE REMOVED FROM IU MONITOR HUT                                                                                                    | # TCPI           |
|                  | 266       | 3        | C1TC         | LPLX          | START PTCS FINAL PREPS PER V-25441 (NON-HAZARDOUS)                                                                                               | D<br>B17-36      |
| 14 HRS<br>45' 0" | 266       | 1        | C1TC         | CSPP          | VERIFY/START FINAL LUT WALKDOWN, REPORT WHEN COMPLETE, LV=QAL PARTICIPATION REQUIRED,                                                            |                  |
|                  | 266       | 2        | CSAC         | C1TC          | REQUEST CLEARANCE TO PRESSURIZE S/A 9,                                                                                                           |                  |
|                  | 261       | 3        | C1TC         | CLTC          | REQUEST CLEARANCE TO PRESSURIZE S/A 9,                                                                                                           |                  |
|                  | 181       | 4        | CLTC         | CVTS          | S/A 9 WILL BE PRESSURIZED IN 15 MINUTES, LOCAL CLEARING ON S/A 9 WILL BE CONTROLLED BY S/A PERSONNEL,<br><br>S-IVB ORDNANCE CONNECTIONS<br>----- | TCPI             |
|                  | 261       | 5        | CVTS         | CLTC          | START S-IVB ORDNANCE OPERATIONS,                                                                                                                 | # TCPI<br>C64-20 |
|                  | 261       | 6        | CLTC         | C4TC          | CONNECT PD DETONATORS AND PRIMACORD                                                                                                              | #                |
|                  | 241       | 7        | C4TC         | C4SM          | START S&A CONNECTIONS PER V-30610, SECT 0, PART 3 (HAZARDOUS)                                                                                    | # D              |



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VEHICLE AS-210

| TIME             | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                               | REMARKS          |
|------------------|-----------|----------|--------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 14 HRS<br>30' 0" |           |          |              |               |                                                                                                                                                           |                  |
|                  | 266       | 1        | C1TC         | CSPP          | REMOVE GROUNDING STRAPS FROM S/A 8 TO MSS PLATFORM 4A AND S/A 9 TO MSS PLATFORM 4C.                                                                       |                  |
|                  | 266       | 2        | C1TC         | CSAC          | CLEAR TO PRESSURIZE S/A 9 AND DRRS, REPORT WHEN COMPLETE.                                                                                                 |                  |
|                  | 236       | 3        | CSAC         | CSA9<br>CSAD  | PRESSURIZE S/A 9 PER V-36085 (HAZARDOUS) AND DRRS PER V-36086 (NON-HAZARDOUS).                                                                            | D                |
|                  | 231       | 4        | C3TC         | S3NE          | VERIFY PD EBW DETONATOR CONNECTIONS COMPLETE.                                                                                                             | #                |
|                  | 261       | 5        | C3TC         | CLTC          | S&B PD CONNECTIONS COMPLETE.                                                                                                                              | #                |
|                  | 231       | 6        | C3TC         | S3NE          | CDDT ONLY                                                                                                                                                 | *                |
|                  | 231       | 7        | C3TC         | CLTC          | CDDT ONLY                                                                                                                                                 | *                |
|                  | 261       | 8        | CVTS         | CLTC          | INCREASE SM ECS FLOWRATE TO 75 +/- 5 LB/MIN                                                                                                               | TCPI<br>XB124-50 |
|                  | 261       | 9        | CLTC         | C1TC          | INCREASE SM ECS FLOWRATE TO 75 +/- 5 LB/MIN                                                                                                               | XB124-50         |
|                  | 266       | 10       | C1TC         | CECS          | INCREASE SM ECS FLOWRATE TO 75 +/- 5 LB/MIN                                                                                                               | XB124-50         |
| 14 HRS<br>0' 0"  |           |          |              |               |                                                                                                                                                           |                  |
|                  | 266       | 1        | C1TC         | CSAC          | VERIFY S/A 9 PRESSURIZED.                                                                                                                                 |                  |
|                  | 261       | 2        | CVTS         | CLTC          | INSTALL MSS WHITE ROOM DOOR LOCK AND REMOVE S/A 9 HANGERS. (S/A 9 LOAD LIMITED TO 5 PEOPLE WITH HANGERS REMOVED).                                         | TCPI             |
|                  | 261       | 3        | CLTC         | C1TC          | INSTALL WHITE ROOM MSS DOOR POSITIVE LOCK AND REMOVE S/A 9 HANGERS.                                                                                       |                  |
|                  | 266       | 4        | C1TC         | CSAC          | INSTALL WHITE ROOM MSS DOOR POSITIVE LOCK AND REMOVE S/A 9 HANGERS.                                                                                       |                  |
|                  | 236       | 5        | CSAC         | CSA9          | INSTALL WHITE ROOM MSS DOOR POSITIVE LOCK, POST LOAD LIMIT WARNING SIGN AND REMOVE S/A 9 HANGER PER V-36085 SECT J (NON-HAZARDOUS). REPORT WHEN COMPLETE. | D                |
|                  | 241       | 6        | C4TC         | C4SM          | VERIFY COMPLETION OF S&A CONNECTIONS                                                                                                                      | #                |
|                  | 261       | 7        | CLTC         | C4TC          | VERIFY PD DETONATOR AND PRIMACORD CONNECTIONS COMPLETED.                                                                                                  | #                |



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| TIME             | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                          | REMARKS          |
|------------------|-----------|----------|--------------|---------------|----------------------------------------------------------------------------------------------------------------------|------------------|
| 10 HRS<br>15' 0" | 261       | 2        | C1TC         | CLTC          | S/A 7 FINAL CLOSEOUT IS COMPLETE.                                                                                    |                  |
| 10 HRS<br>0' 0"  | 266       | 1        | CSA9         | C1TC          | CDDT ONLY                                                                                                            | *                |
|                  | 261       | 2        | C1TC         | CLTC          | CDDT ONLY                                                                                                            | *                |
|                  | 181       | 3        | CLTC         | CVTS          | CDDT ONLY                                                                                                            | * TCPI           |
|                  | 266       | 4        | CSAC         | C1TC          | S/A 1A FINAL CLOSEOUT IS COMPLETE,                                                                                   |                  |
|                  | 261       | 5        | C1TC         | CLTC          | S/A 1A FINAL CLOSEOUT IS COMPLETE,                                                                                   |                  |
|                  | 266       | 6        | CWCP         | C1TC          | IWS PREPS COMPLETE,                                                                                                  |                  |
|                  | 251       | 7        | CUTC         | BGCC          | PERFORM ZT96 OPTION D, REPORT WHEN COMPLETE.                                                                         |                  |
|                  | 261       | 8        | CLTC         | CGIC          | VERIFY RECTIFIERS AND ALARMS ARE ON AND BATTERIES ARE SATISFACTORY FOR DRSC IN PTCR-RM 203, LCC-RM 1P3, AND CD & SC. | TCPI<br>XB129-55 |
| 9 HRS<br>0' 0"   | 231       | 1        | L3ME         | C3TC          | ESP LOWERING IS COMPLETE. H/H CRANE NO LONGER REQUIRED,                                                              |                  |
|                  | 261       | 2        | C3TC         | CLTC          | ESP LOWERING IS COMPLETE. THE H/H CRANE IS RELEASED FOR NORMAL SERVICE,                                              |                  |
|                  | 181       | 3        | CLTC         | CVTS          | ESP LOWERING IS COMPLETE. THE H/H CRANE IS RELEASED FOR NORMAL SERVICE,                                              | TCPI             |
|                  | 266       | 4        | LPLX         | C1TC          | PTCS PREPS COMPLETE                                                                                                  | B17-36           |



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| TIME                      | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | REMARKS |
|---------------------------|--------------|----------|-----------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| HOLDING<br>9 HRS<br>0' 0" |              | 1        |                 |                  | <p>NOTE</p> <p>ALL LV OPERATORS ARE<br/>REQUIRED TO CHECK THEIR<br/>PROCEDURES TO VERIFY THAT<br/>PCR'S FROM T-9 HRS THROUGH<br/>APPENDIX D (LISTED BELOW)<br/>HAVE BEEN INCORPORATED,<br/>(INCLUDING PCR'S TO VOL<br/>III).</p> <p>PCR PAGE TIME STATIONS AFFECTED</p> <p>CLIP THIS INFORMATION TO BE PROVIDED IN A<br/>MEMO TO BE DISTRIBUTED AT THIS TIME BY<br/>THE INTEGRATED TEST &amp; CHECKOUT<br/>PROCEDURES TEST MONITOR,</p> <p>2100 HRS AFTER START OF HOLD</p> |         |
| HOLDING<br>9 HRS<br>0' 0" | 251          | 1        | CUCP            | CUTC             | HIGH PRESSURE TEST COMPLETE.                                                                                                                                                                                                                                                                                                                                                                                                                                                |         |
|                           | 251          | 2        | CUTC            | CUCP             | SECURE ST-124M AIR BEARING SYSTEM PER<br>V=31119 PART III (HAZARDOUS)                                                                                                                                                                                                                                                                                                                                                                                                       | D       |

-7:00  
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| TIME                         | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                                       | REMARKS        |
|------------------------------|--------------|----------|-----------------|------------------|-----------------------------------------------------------------------------------|----------------|
| HOLDING<br>- 9 HRS<br>15' 0" |              |          |                 |                  |                                                                                   |                |
|                              |              |          |                 |                  | 15 MINUTES PRIOR TO RESUMING COUNT<br>-----                                       | -9:15<br>----- |
|                              | 231          | 1        | G3TC            | V3MS             | REPORT STATUS OF THE FOLLOWING HIGHLY<br>DESIRABLE LMR RANGE SAFETY MEASUREMENTS: |                |
|                              |              |          |                 | RULE MEAS        |                                                                                   |                |
|                              |              |          |                 | NO, NO,          | MEASUREMENT DESCRIPTION                                                           |                |
|                              |              |          |                 | -----            | -----                                                                             |                |
|                              |              |          |                 | 20135 D1-1       | PRESS, COMBUSTION CHAMBER                                                         |                |
|                              |              |          |                 | 20136 D1-2       |                                                                                   |                |
|                              |              |          |                 | 20137 D1-3       |                                                                                   |                |
|                              |              |          |                 | 20138 D1-4       |                                                                                   |                |
|                              |              |          |                 | 20139 D1-5       |                                                                                   |                |
|                              |              |          |                 | 20140 D1-6       |                                                                                   |                |
|                              |              |          |                 | 20141 D1-7       |                                                                                   |                |
|                              |              |          |                 | 20142 D1-8       |                                                                                   |                |
|                              |              |          |                 | 20154 VK138-1    | THRUST PRESS SW 1 TOK                                                             |                |
|                              |              |          |                 | 20155 VK140-2    |                                                                                   |                |
|                              |              |          |                 | 20156 VK142-3    |                                                                                   |                |
|                              |              |          |                 | 20157 VK144-4    |                                                                                   |                |
|                              |              |          |                 | 20158 VK146-5    |                                                                                   |                |
|                              |              |          |                 | 20159 VK148-6    |                                                                                   |                |
|                              |              |          |                 | 20160 VK150-7    |                                                                                   |                |
|                              |              |          |                 | 20161 VK152-8    |                                                                                   |                |
|                              |              |          |                 | 20168 VM505-13   | RSCR 1 LOW LEVEL FIELD                                                            |                |
|                              |              |          |                 | 20169 VM508-13   | RSCR 2 LOW LEVEL FIELD                                                            |                |
|                              | 241          | 2        | G4TC            | C4N3<br>V4MS     | REPORT STATUS OF THE FOLLOWING HIGHLY<br>DESIRABLE LMR RANGE SAFETY MEASUREMENTS: |                |
|                              |              |          |                 | RULE MEAS        |                                                                                   |                |
|                              |              |          |                 | NO, NO,          | MEASUREMENT DESCRIPTION                                                           |                |
|                              |              |          |                 | -----            | -----                                                                             |                |
|                              |              |          |                 | 20314 D1-401     | PRESS, THRUST CHAMBER                                                             |                |
|                              |              |          |                 | 20349 VK14-401   | MNSTG OK PRESS SW 1                                                               |                |
|                              |              |          |                 | 20350 VK158-401  | MNSTG OK PRESS SW 1 DERPRESS                                                      |                |
|                              |              |          |                 | 20359 M30-411    | VOLT, F/U 1 BBW RANGE SAFETY                                                      |                |
|                              |              |          |                 | 20360 M31-411    | VOLT, F/U 2 BBW RANGE SAFETY                                                      |                |
|                              |              | 3        |                 |                  | DELETED                                                                           |                |
|                              | 266          | 4        | G1TC            | CSAC             | VERIFY THE FOLLOWING INDICATIONS:                                                 |                |
|                              |              |          |                 | T-187            | LSE PREPS COMPLETE                                                                |                |
|                              |              |          |                 | T-3              | LSE READY FOR IGNITION                                                            |                |

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| TIME                       | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                  | REMARKS         |
|----------------------------|-----------|----------|--------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| HOLDING<br>9 HRS<br>15' 0" |           |          |              |               | 15 MINUTES PRIOR TO RESUMING COUNT<br>-----                                                                                                  | CONT'D<br>----- |
|                            | 266       | 5        | CLTC         | CLDE          | VERIFY DEE 4229, 4006 GN.                                                                                                                    |                 |
|                            | 231       | 6        | CSYC         | CSBV          | VERIFY LBB PREP COMPLETE & LBB READY FOR IGNITION INDICATIONS ON (DEE'S 0357 & 0356)                                                         | C64-20          |
|                            | 261       | 7        | CUYC         | CLTC          | REQUEST CLEARANCE TO PRESSURIZE IU SPHERES TO FLIGHT PRESSURE,                                                                               |                 |
|                            | 251       | 8        | CUYC         | CUCP          | PRESSURIZE ST-124M GN2 SPHERE TO 3100 PSI PER V-31119, PART III. REPORT WHEN COMPLETE. (HAZARDOUS)                                           | D               |
|                            |           | 8-1      |              |               | *****CAUTION*****<br>* IU STAGE ST-124M SUPPLY *<br>* SPHERE WILL BE *<br>* PRESSURIZED TO 3100 PSI *<br>*<br>*****                          |                 |
|                            | 251       | 9        | CUYC         | CUYC          | START ST-124M SLIP RING EXERCISE PER V-23068 (NON-HAZARDOUS)                                                                                 | D               |
| HOLDING<br>9 HRS<br>10' 0" |           |          |              |               | 10 MINUTES PRIOR TO RESUMING COUNT<br>-----                                                                                                  | -9:40<br>-----  |
|                            | 261       | 1        | SLYC         | CSYC<br>C4YC  | VERIFY ALL HIGHLY DESIRABLE LMR RANGE SAFETY MEASUREMENTS ARE GO AND READY TO TRANSFER LMR MONITOR RESPONSIBILITY TO THE EASTERN TEST RANGE, |                 |



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 VEHICLE 20330, PART 2  
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| TIME              | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                | DESCRIPTION                                                                                                          | REMARKS |
|-------------------|-----------|----------|--------------|------------------------------|----------------------------------------------------------------------------------------------------------------------|---------|
| - 8 HRS<br>55: 0" | 261       | 3        | GLTC         | CSBK                         | VERIFY TELETYPE ON.                                                                                                  |         |
|                   | 181       | 4        | GLTC         | CVTS                         | REQUEST WFLT GO TO CH 263 FOR TELETYPE DATA VERIFICATION                                                             | TCP!    |
|                   | 251       | 5        | CUVC         | BGCC                         | MOUNT LVDC VARIABLE DATA TAPE ON IODC 1-3                                                                            | (PTOS)  |
|                   |           | 6        |              | CNTC<br>C1TC<br>CSAC<br>CSAD | NOTE<br>-----<br>THE FOLLOWING SIX SEQUENCES ARE NOT APPLICABLE IF RECYCLING VIA APPENDIX D PART 1 (TYPE 1 RECYCLE), |         |
|                   |           | 7        |              |                              | NOTE<br>-----<br>FOR THE NEXT 5 MINUTES CSAD REQUIRES CONTROL OF TV CAMERAS 27B & AAS-3 OR AAS-4.                    |         |
|                   | 261       | 8        | GVTS         | GLTC                         | CONNECT PRIMARY DAMPER.                                                                                              | TCP!    |
|                   | 261       | 9        | GLTC         | C1TC                         | CONNECT PRIMARY DAMPER.                                                                                              |         |
|                   | 266       | 10       | C1TC         | CSAC                         | CONNECT PRIMARY DAMPER: REPORT WHEN COMPLETE.                                                                        |         |
|                   | 236       | 11       | CSAC         | CSAD                         | CONNECT PRIMARY DAMPER PER V-36086 (NON-HAZARDOUS). REPORT WHEN COMPLETE.                                            | D       |
|                   | 188       | 12       | CSAD         | PA                           | PRIMARY DAMPER WILL BE CONNECTED AT THIS TIME. VEHICLE MOTION AND GAS VENTING WILL OCCUR.                            |         |



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V#20130, PART 2

VEHICLE

AS-230

| TIME            | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                | DESCRIPTION                                                                                                                          | REMARKS        |
|-----------------|-----------|----------|--------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|----------------|
| 8 HRS<br>50' 0" |           | 1        |              | C1TC<br>C1TC                 | NOTE<br>-----<br><br>THE FOLLOWING TWO<br>SEQUENCES ARE NOT<br>APPLICABLE IF RECYCLING VIA<br>APPENDIX D PART 1 (TYPE I<br>RECYCLE). | B14-25         |
| 261             |           | 2        | C1TC         | CLTC                         | PRIMARY DAMPER CONNECTED.                                                                                                            |                |
| 181             |           | 3        | CLTC         | CVTS                         | PRIMARY DAMPER ARM CONNECTION COMPLETE.                                                                                              | TCP1           |
| 261             |           | 4        | CVTS         | C1TC                         | CHANGE SHOPS FROM 2 SWITCH 1 VALVE MODE<br>TO 1 SWITCH MODE. REPORT WHEN COMPLETE.                                                   | TCP1<br>B14-25 |
| 261             |           | 5        | CLTC         | CVTS                         | CHANGE SHOPS FROM 2 SWITCH 1 VALVE MODE<br>TO 1 SWITCH MODE. REPORT WHEN COMPLETE.                                                   | B14-25         |
| 266             |           | 6        | C1TC         | CPDC                         | CHANGE SHOPS FROM 2 SWITCH 1 VALVE MODE<br>TO 1 SWITCH MODE. REPORT WHEN COMPLETE.                                                   | B14-25         |
| 266             |           | 7        | C1TC         | CSPP                         | PLACE LSE POWER OVERRIDE SWITCH TO ON AND<br>VERIFY                                                                                  | XB122-43       |
| 8 HRS<br>45' 0" |           | 1        | CLTC         | C1TC<br>C3TC<br>C4TC<br>C1TC | VERIFY ALL LV COMPARTMENTS CLOSED OUT<br>AND READY TO SWITCH ECS FROM AIR TO GN2.                                                    |                |
| 181             |           | 2        | CLTC         | CVTS                         | ALL LV COMPARTMENTS CLOSED OUT AND READY<br>TO SWITCH ECS FROM AIR TO GN2.                                                           | TCP1           |
| 261             |           | 3        | C1TC         | C1TC                         | REQUEST ACCF (CCF GN2) TO REPORT TO CECS<br>ON CH 237 FOR ECS SUPPORT                                                                |                |
| 122             |           | 4        | CLTC         | BOSC                         | REQUEST ACCF REPORT TO CECS ON CH 237<br>FOR ECS SUPPORT                                                                             | TCP1           |



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TEST NO. V-20130, PART 2

VEHICLE

AS-210

| TIME            | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                                                                                                           | REMARKS         |
|-----------------|--------------|----------|-----------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 7 HRS<br>15' 0" |              |          |                 |                  |                                                                                                                                                       |                 |
|                 | 261          | 8        | CLTC            | C3NP             | STAGE LOGIC TO INHIBIT                                                                                                                                |                 |
|                 | 261          | 9        | ***             | CLGK             | REQUEST & EXECUTE FT10 (LADDER OUTPUT TEST)                                                                                                           | ***             |
| 7 HRS<br>9' 0"  |              |          |                 |                  |                                                                                                                                                       |                 |
|                 | 261          | 1        | CLTC            | CUFS             | START FLIGHT CONTROL SYSTEM PREPS ON CH 262                                                                                                           | (LAF2)          |
|                 | 262          | 2        | CUFS            | CUSP<br>CUGA     | PLACE ALL FCC, CCIS, CONTROL ACCEL AND EDS/CRG PANEL SWITCHES TO AUTO.                                                                                | (LAF2)          |
|                 | 251          | 3        | CUFS            | CUNP             | SWITCH SELECTOR INHIBIT OFF                                                                                                                           | (LAF2)          |
|                 | 251          | 4        | CUFS            | BGCC             | MOUNT CTC4, CTC5/CS80 CAL TAPE ON IODC 1-3,                                                                                                           | (CTC5/<br>CTC4) |
|                 | 261          | 5        | CUFS            | CLTC             | REQUEST CLTK TO TERMINATE IALK WHEN FT10 IS COMPLETE                                                                                                  | I38-48          |
|                 | 261          | 6        | CLTC            | CLTK             | TERMINATE IALK WHEN FT10 IS COMPLETE                                                                                                                  | I38-48          |
| 7 HRS<br>5' 0"  |              |          |                 |                  |                                                                                                                                                       |                 |
|                 | 261          | 1        | CLGK            | CLTC             | FT10 COMPLETE                                                                                                                                         |                 |
|                 | 262          | 2        | CUFS            | CLFK             | REQUEST & EXECUTE LAF2 (FLT CONTROL PREPS) WITH THE FOLLOWING OPTIONS: PRIMARY OPTION 2 (FCC CONT ACCEL PREPS) SECONDARY OPTION 1 (COMPARATORS RESET) | ***<br>I38-48   |
|                 | 262          | 3        | CUFS            | CUSP             | FLIGHT CONTROL COMPUTER SYSTEM POWER - ON                                                                                                             |                 |
|                 | 262          | 4        | CUFS            | CUGA             | CONTROL ACCELEROMETER POWER - ON                                                                                                                      |                 |
|                 | 261          | 5        | CVTS            | CLTC             | RANGE SAFETY COMMAND CARRIER IS COMING ON FOR ETR COMMAND VALIDATION TEST. VERIFY IU COMMAND RECEIVER/DECODER AND DRSCS RECEIVERS ARE OFF.            | # TCP           |



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V-20130, PART 2

VEHICLE

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| TIME           | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                                                                     | REMARKS |
|----------------|--------------|----------|-----------------|------------------|-----------------------------------------------------------------------------------------------------------------|---------|
| 7 HRS<br>1' 0" | 261          | 1        | CUFS            | CLTC             | LAF2 COMPLETE.                                                                                                  |         |
|                |              | 1-1      |                 |                  | DELETED                                                                                                         | 138-48  |
|                | 261          | 2        | CLTC            | ALL              | THE FOLLOWING STATIONS SWITCH TO CHANNEL 262 TO PREPARE FOR CTC5:<br>CLGK CLFK CUGA CUCR<br>CUFE C4FC CUSP C4FS | (CTC5)  |
|                | 262          | 3        | CUFS            | CLGK             | VERIFY READY TO SUPPORT CTC5.                                                                                   | (CTC5)  |
|                | 251          | 4        | CUFS            | BGCC             | MASK THE FOLLOWING DISCRETES:<br>SFUNCSE935-38MMSK (MDI'S 0888-0911)                                            | (CTC5)  |
| 7 HRS<br>0' 0" | 181          | 1        | CLTC            | CVTS             | VERIFY CLEARANCE TO START AUTOMATIC LOX LOADING (WITH CROSS COUNTRY LINE CHILLDOWN THROUGH S-IB STAGE VENTS),   | TCPI    |
|                |              | 1-1      | ALL             |                  | *** NOTE 10 MINUTES AFTER LOX FILL COMMAND, S-IB SLOW FILL WILL START AUTOMATICALLY                             |         |
|                | 261          | 2        | CVTS            | CLTC             | PAD CLEARING OPERATIONS HAVE BEEN COMPLETED, START AUTOMATIC LOX LOADING.                                       | TCPI    |
|                | 266          | 3        | C1TC            | CECS             | VERIFY ECS GN2 FLOW FOR MINIMUM OF 30 MINUTES,                                                                  |         |
|                | 261          | 4        | CLTC            | C3NP             | VERIFY PREMATURE IGNITION SAFE INDICATION ON,                                                                   | #       |
|                | 261          | 5        | CLTC            | C3NP             | PREMATURE IGNITION SWITCH TO ARM,                                                                               | #       |
|                | 266          | 6        | C1TC            | CWCP             | PAD IS CLEAR, ACTUATE IWS MANUAL ARMING BUS = ON,                                                               |         |
|                | 261          | 7        | CLTC            | C1TC             | PAD IS CLEAR, START AUTOMATIC LOX LOADING PER V-20132 (HAZARDOUS)                                               | D       |
|                | 266          | 8        | C1TC            | C3OU             | VERIFY S-IB LOX PRA'S OFF AND DISABLED,                                                                         | B-6-16  |



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VEHICLE AS-210

| TIME           | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                | DESCRIPTION                                                                                                                                      | REMARKS |
|----------------|-----------|----------|--------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 7 HRS<br>01 00 |           |          |              |                              |                                                                                                                                                  |         |
|                | 266       | 9        | C1TC         | CCLO                         | START VEHICLE LOX FILL PER V-20132 (HAZARDOUS).                                                                                                  | D       |
|                |           | 9-1      |              |                              | NOTE<br>----<br>FROM NOW THRU T+0, THE FOLLOWING STATIONS REQUIRE ACCESS TO THE NOTED TV CAMERAS<br><br>CSA6/7 - CAMERAS 16B, 21B, 22B, 24B, 34B |         |
|                | 261       | 10       | CLTC         | C1TC<br>C3TC<br>C4TC<br>C0TC | DISPLAY DESCRIPTIONS (FORMAT SELECTS) MUST BE COORDINATED WITH CLTC PRIOR TO EXECUTION.                                                          |         |
|                | 262       | 11       | CUFS         | CLPK                         | REQUEST & EXECUTE CTC5 WITH THE FOLLOWING OPTIONS: A,CD,EFG,HI,J.(LVDC; BURN & COAST; P, Y & R; SPARE & ACTIVE; APS POWER OFF)                   | I38-48  |
|                |           | 11-1     |              |                              | DELETED                                                                                                                                          | I38-48  |
|                |           | 11-2     |              | CLPK                         | *** NOTE ADVISE ALL PERSONNEL OF MAJOR PROGRAM EVENTS BEING DISPLAYED ON SANDERS CONSOLE.                                                        |         |
|                |           | 12       |              |                              | *****WARNING*****<br>*<br>* THE FOLLOWING 5<br>* SEQUENCES ARE HAZARDOUS *<br>*<br>*****                                                         |         |
|                | 231       | 13       | C3TC         | C3FP                         | PRESSURIZE FUEL PRESSURIZING SPHERES TO FLIGHT PRESSURE.                                                                                         |         |



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|------------------|-----------|----------|--------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 7 HRS<br>01 00   |           |          |              |               |                                                                                                                                                   |         |
|                  | 232       | 14       | C3FP         | R3RM          | MONITOR FUEL SPHERES TO FLIGHT PRESSURE.                                                                                                          | C66-27  |
|                  |           | 14-1     | C3FP         |               | *** NOTE FUEL PRESSURIZING 3000 # OK INDICATION ON                                                                                                |         |
|                  | 231       | 15       | C3FP         | C3TC          | FUEL PRESSURIZING SPHERES AT FLIGHT PRESSURE                                                                                                      |         |
|                  | 231       | 16       | C3TC         | C3FP          | PRESSURIZE CONTROL SPHERE TO FLIGHT PRESSURE                                                                                                      |         |
|                  | 232       | 17       | C3FP         | R3RM          | MONITOR CONTROL SPHERE TO FLIGHT PRESSURE                                                                                                         |         |
|                  |           | 17-1     | C3FP         |               | *** NOTE CONTROL 3000 PSI OK AND 3000 PSI ORIFICE BYPASS INDICATIONS ON                                                                           |         |
|                  | 231       | 18       | C3FP         | C3TC          | CONTROL SPHERE IS AT FLIGHT PRESSURE                                                                                                              |         |
|                  | 261       | 19       | C1TC         | CLTC          | LOX FILL COMMAND HAS BEEN GIVEN (AUTOMATIC LOX LOADING INITIATED)                                                                                 |         |
|                  | 266       | 20       | C0RP         | C1TC          | RP-1 REPLENISH IS COMPLETE                                                                                                                        |         |
|                  | 261       | 21       | C1TC         | CLTC          | RP-1 REPLENISH IS COMPLETE                                                                                                                        |         |
|                  | 181       | 22       | CLTC         | CVTS          | RP-1 REPLENISH IS COMPLETE                                                                                                                        | TCP;    |
| 6 HRS<br>50 00   |           |          |              |               |                                                                                                                                                   |         |
|                  | 261       | 1        | C1TC         | CLTC          | STARTING S-1B LOX SLOW FILL                                                                                                                       |         |
| - 6 HRS<br>30 00 |           |          |              |               |                                                                                                                                                   |         |
|                  | 262       | 1        | CUFS         | CLFK          | TERMINATE CTC5 WHEN PROGRAM IS COMPLETE                                                                                                           | I38-48  |
|                  | 262       | 2        | CUFS         | CLFK          | REQUEST & EXECUTE LAF2 (FLIGHT CONTROL PREPS) WITH THE FOLLOWING OPTIONS: PRIMARY OPTION 3 (EDS/CRG PREPS) SECONDARY OPTION 1 (COMPARATORS RESET) | I38-48  |
| - 6 HRS<br>28 00 |           |          |              |               |                                                                                                                                                   |         |
|                  | 262       | 1        | CUFS         | CLFK          | REPORT WHEN LAF2 IS COMPLETE                                                                                                                      | I38-48  |
|                  | 262       | 2        | CUFS         | CUGA          | EDS/CRG SYSTEM POWER SWITCH TO ON                                                                                                                 | I38-48  |
|                  | 262       | 3        | CUFS         | CLFK          | REQUEST & EXECUTE CTC5 WITH THE FOLLOWING OPTIONS: B,CD,EFG,HI,J. (CRG; BURN & COAST; P, Y & R; SPARE & ACTIVE; APS POWER OFF)                    | I38-48  |
| 6 HRS<br>10 00   |           |          |              |               |                                                                                                                                                   |         |
|                  | 261       | 1        | C1TC         | CLTC          | STARTING S-1B LOX FAST FILL.                                                                                                                      |         |



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VEHICLE

AS-210

| TIME              | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.        | DESCRIPTION                                                                                                                                                                                                                                                                            | REMARKS |
|-------------------|-----------|----------|--------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| * 6 HRS<br>51' 0" | 261       | 1        | CLTC         | C3TC<br>C4TC<br>CUTC | CDDT ONLY                                                                                                                                                                                                                                                                              | *       |
|                   | 261       | 2        | CVTS         | CLTC                 | CDDT ONLY                                                                                                                                                                                                                                                                              | * TCPI  |
| * 5 HRS<br>48' 0" | 261       | 1        | C1TC         | CLTC<br>C4TC         | S-IB STAGE AT 65 PERCENT LOX, STARTING S-IVB LOX FILL LINE FILL AND S-IVB LOX TANK CHILLDOWN.                                                                                                                                                                                          |         |
|                   | 241       | 2        | C4TC         | C4HY                 | MANUALLY CYCLE AUX HYD PUMP ON AND OFF TO MAINTAIN SYSTEM OIL TEMPERATURE ABOVE +10 DEG F. COORDINATE ALL SWITCH ACTIONS WITH C4TC PRIOR TO EXECUTION. TEMPERATURES MAY BE ALLOWED TO DECREASE BELOW THIS LIMIT IN THE EVENT OF INTERFERENCE WITH IU CONTROL COMPUTER FUNCTIONAL TEST. |         |
|                   |           | 2-1      |              | C4HY<br>R4HY         | *****CAUTION*****<br>*<br>* DO NOT ALLOW HYDRAULIC<br>* SYSTEM FLUID TEMPS TO<br>* DECREASE BELOW -25<br>* DEG F.<br>*<br>*****                                                                                                                                                        |         |
| * 5 HRS<br>45' 0" | 262       | 1        | CUFS         | CLFK                 | TERMINATE CTC5 WHEN PROGRAM IS COMPLETE                                                                                                                                                                                                                                                | I38-48  |
|                   | 262       | 1-1      | CUFS         | CLFK                 | REQUEST & EXECUTE LAF2 (FLIGHT CONTROL PREPS) WITH THE FOLLOWING OPTIONS: PRIMARY OPTION 3 (EDS/CRG PREPS) SECONDARY OPTION 1 (COMPARATORS RESET)                                                                                                                                      | I38-48  |
|                   | 262       | 1-2      | CUFS         | CLFK                 | REPORT WHEN LAF2 IS COMPLETE                                                                                                                                                                                                                                                           | I38-48  |
|                   | 261       | 1-3      | CUFS         | CLTC                 | CTC5 AND LAF2 ARE COMPLETE. REQUEST CLTK TO CALL IALK FOR CTC3                                                                                                                                                                                                                         | I38-48  |
|                   | 261       | 1-4      | CLTC         | CLTK                 | REQUEST & EXECUTE IALK AT STEP 3470 (CTC3 WILL EXECUTE IMMEDIATELY)                                                                                                                                                                                                                    | I38-48  |



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| TIME            | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                                                                                               | REMARKS |
|-----------------|--------------|----------|-----------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 5 HRS<br>45' 0" | 251          | 3        | CUPS            | BGCC             | UNMASK THE FOLLOWING DISCRETES:<br>\$FUNCSE935-38MREL (MDI'S 0888-0911)                                                                   |         |
| 5 HRS<br>32' 0" | 261          | 1        | C1TC            | CLTC             | S-IB LOX FAST FILL COMPLETE. CONTINUING<br>WITH S-IB LOX SLOW FILL TO REPLENISH,<br>STARTING S-IVB LOX SLOW FILL TO 5%.                   |         |
|                 | 188          | 2        | CLTC            | ALL              | AT START OF S-IVB LOX FAST FILL, ALL<br>PERSONNEL REQUIRED FOR S-IVB LH2 FILL<br>SWITCH TO CH 245 AND STANDBY FOR<br>COMMUNICATIONS CHECK |         |
| 5 HRS<br>30' 0" | 241          | 1        | C4TC            | C4PS             | VERIFY READY FOR LH2 LOAD AND TAKE<br>PERSONNEL TO CH 245.                                                                                |         |
|                 | 261          | 2        | C4TC            | CLTC             | READY FOR LH2 LOAD.                                                                                                                       |         |
|                 | 241          | 3        | C1TC            | C4TC             | READY FOR LH2 LOADING. ALL SUPPORT<br>PERSONNEL GO TO CH 245.                                                                             |         |
|                 | 261          | 4        | C1TC            | CLTC             | REQUEST CLEARANCE TO START S-IVB LH2<br>LOADING WHEN S-IVB LOX IS ABOVE 60%.                                                              |         |
| 5 HRS<br>26' 0" | 261          | 1        | C1TC            | CLTC             | S-IB LOX FILL COMPLETE. MAINTAINING<br>S-IB LOX REPLENISH.                                                                                |         |
| 5 HRS<br>25' 0" | 261          | 1        | C1TC            | CLTC             | STARTING S-IVB LOX FAST FILL,<br>CONTINUING S-IB LOX REPLENISH                                                                            |         |



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| TIME            | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                                  | REMARKS     |
|-----------------|-----------|----------|--------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 5 HRS<br>25' 0" |           |          |              |               |                                                                                                                                                                                              |             |
|                 | 245       | 2        | C1TC         | CCLH          | START S-IVB LH2 FILL WHEN S-IVB LOX IS ABOVE 60%,                                                                                                                                            |             |
|                 | 251       | 3        | C4TC         | CUTC          | REMOVE FLAGS ON DISCRETES 3662, 3663, 3664 & 3669 (S-IVB LH2 POINT LEVEL SENSORS),                                                                                                           |             |
|                 | 251       | 4        | CUTC         | RLDE          | REMOVE FLAGS ON DISCRETES 3662, 3663, 3664 & 3669 (S-IVB LH2 POINT LEVEL SENSORS),                                                                                                           |             |
| 5 HRS<br>20' 0" |           |          |              |               |                                                                                                                                                                                              |             |
|                 | 261       | 1        | CUFS         | CLTC          | CTC3 COMPLETE                                                                                                                                                                                |             |
|                 | 261       | 2        | ***          | CLGK          | REQUEST & EXECUTE FT31 (ACCELEROMETER PULSE COUNT)                                                                                                                                           | ***         |
|                 |           | 2=1      |              | CLGK          | *** NOTE Z ACCELEROMETER BEING READ AT 90 DEGREES WITH A 6000 PULSE COUNT                                                                                                                    |             |
|                 |           | 2=2      |              | CLTC          | *** NOTE FT06 FOLLOWS IMMEDIATELY,                                                                                                                                                           |             |
| 5 HRS<br>17' 0" |           |          |              |               |                                                                                                                                                                                              |             |
|                 | 261       | 1        | CLGK         | CLTC          | FT31 COMPLETE                                                                                                                                                                                |             |
|                 | 261       | 2        | ***          | CUPC          | REQUEST & EXECUTE FT06 (DRIFT CHECKS OPTION)                                                                                                                                                 | ***         |
| 5 HRS<br>10' 0" |           |          |              |               |                                                                                                                                                                                              |             |
|                 | 261       | 1        | CLTC         | ALL           | THE FOLLOWING STATIONS SWITCH TO CHANNEL 262 TO PREPARE FOR FLIGHT CONTROL SYSTEM GAIN TEST (CTB1):<br>CLGK CUCR CUGA C4HY CUSP CLFK<br>CUFE C3FE C4FS R4HY C4FC CUFS<br>C3ED C3FC C3HY R3RM | (CTC4/CTB1) |



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| TIME            | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                         | REMARKS |
|-----------------|-----------|----------|--------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 5 HRS<br>10: 0" |           |          |              |               |                                                                                                                                                                     |         |
|                 | 262       | 2        | CUFS         | C3HY          | HYDRAULIC SYSTEMS 1, 2, 3, & 4 TO AUTO<br>VERIFY READY TO SUPPORT CTB1                                                                                              | (CTB1)  |
|                 | 262       | 3        | CUFS         | C4HY          | AUX HYDRAULIC PUMP POWER SWITCH TO AUTO.                                                                                                                            | (CTB1)  |
|                 | 262       | 4        | CUFS         | C4FC          | VERIFY READY TO SUPPORT CTB1                                                                                                                                        | (CTB1)  |
|                 | 251       | 5        | CUFS         | CUES          | VERIFY EDS MODE SWITCH TO MONITOR<br>POSITION AND THE PITCH-YAW ENABLE AND<br>ROLL ENABLE LIGHTS ARE OFF                                                            | (CTC4)  |
|                 |           | 6        |              |               | DELETED                                                                                                                                                             | I38-48  |
| 5 HRS<br>51: 0" |           |          |              |               |                                                                                                                                                                     |         |
|                 | 261       | 1        | CLTC         | CLTC          | S-IVB LOX FAST FILL COMPLETE.                                                                                                                                       |         |
|                 | 261       | 2        | CUFC         | CLTC          | FTD6 COMPLETE                                                                                                                                                       |         |
|                 | 262       | 3        | ***          | CLFK          | REQUEST & EXECUTE CTC4 NORM OPTIONS (CRG<br>CALIB TEST; P, Y & R AXES; POS & NEG;<br>BI-LEVEL PKG; COMPARATOR TEST & RATE<br>EXCESSIVE TEST). REPORT WHEN COMPLETE. | ***     |
| 5 HRS<br>21: 0" |           |          |              |               |                                                                                                                                                                     |         |
|                 | 261       | 1        | CLTC         | CLTC<br>C4TC  | S-IVB LOX FILL TO 99% COMPLETE,<br>STARTING ALL STAGE LOX REPLENISH                                                                                                 |         |
| 5 HRS<br>01: 0" |           |          |              |               |                                                                                                                                                                     |         |
|                 | 261       | 1        | CVVS         | CLTC          | ETR COMMAND VALIDATION TEST IS COMPLETE,<br>RANGE SAFETY COMMAND CARRIER IS OFF,                                                                                    | TCR;    |
|                 | 261       | 2        | CLTC         | CLTC          | LV LOX LOADING IS COMPLETE, ALL STAGE<br>REPLENISH IS NORMAL.                                                                                                       |         |
|                 | 181       | 3        | CLTC         | CVTS          | LV LOX LOADING IS COMPLETE, ALL STAGE<br>REPLENISH IS NORMAL.                                                                                                       | TCR;    |



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VEHICLE

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| TIME            | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                                                                                                                                                                                                                                                                              | REMARKS |
|-----------------|--------------|----------|-----------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 4 HRS<br>42: 0" |              |          |                 |                  |                                                                                                                                                                                                                                                                                                                          |         |
|                 | 261          | 34       | IARS            | C3DP<br>C4DP     | VERIFY SAFETY BUS - OFF,                                                                                                                                                                                                                                                                                                 | ***     |
|                 | 261          | 35       | IARS            | BRFS             | SIGNAL GENERATOR SELECTOR TO STANDBY AND<br>HYBRID TO SELECT MONITOR 1                                                                                                                                                                                                                                                   | ***     |
|                 | 262          | 36       | CUFS            | C3HY             | HYDRAULIC PUMPS ENABLE TO AUTO                                                                                                                                                                                                                                                                                           | (CTB1)  |
| 4 HRS<br>37: 0" |              |          |                 |                  |                                                                                                                                                                                                                                                                                                                          |         |
|                 | 261          | 1        | CLTK            | CLTC             | IARS COMPLETE.                                                                                                                                                                                                                                                                                                           |         |
|                 | 262          | 2        | ***             | CLFK             | REQUEST & EXECUTE CTB1 WITH THE<br>FOLLOWING OPTIONS (NORM) (A0, A1, S-IB,<br>S-IVB PRIME & SPARE, PY & R, ALL SWITCH<br>POINTS)                                                                                                                                                                                         | ***     |
|                 |              | 2-1      |                 | CLFK             | *** NOTE ADVISE ALL PERSONNEL OF MAJOR<br>PROGRAM EVENTS BEING DISPLAYED ON<br>SANDERS CONSOLE,                                                                                                                                                                                                                          |         |
|                 |              | 2-2      |                 | CLTC             | *** NOTE OALB, OALB & OATO WILL FOLLOW<br>IMMEDIATELY IN SEQUENCE AND NOT<br>NECESSARILY AT THE TIME SHOWN,<br>IF AUTOMATED PROGRAMS ARE NOT AVAILABLE OR<br>CANNOT BE USED, OALB WILL BE REPLACED BY<br>APPENDIX III A OF V-24522 (NON-HAZARDOUS)<br>AND OATO WILL BE REPLACED BY PART II OF<br>V-24508 (NON-HAZARDOUS) | C70-47  |
|                 | 262          | 3        | CTB1            | CLFK             | REQUEST & EXECUTE CE10 (S-IB HYDRAULIC<br>FUNCTION EXECUTOR)                                                                                                                                                                                                                                                             | ***     |
|                 | 261          | 4        | CLTC            | BRFS             | TAPE RECORDING OFF AND RELOAD                                                                                                                                                                                                                                                                                            |         |
|                 |              | 4-1      |                 | BRFS             | *** NOTE DELIVER TAPE TO SECURITY<br>OFFICER                                                                                                                                                                                                                                                                             |         |
|                 | 261          | 5        | CLTC            | CLVN             | RETURN DESTRUCT SYSTEM ENABLE KEY TO<br>CPSS, REPORT WHEN COMPLETE,                                                                                                                                                                                                                                                      |         |
|                 | 181          | 6        | CLTC            | CVTS             | DRSCS CLOSED LOOP TEST IS COMPLETE,<br>LOCAL RANGE SAFETY COMMAND CARRIER IS<br>OFF AND DESTRUCT SYSTEM ENABLE KEY<br>RETURNED TO CPSS                                                                                                                                                                                   | TCP1    |



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|-----------------|-----------|----------|--------------|---------------|---------------------------------------------------------------------------------------|-------------|
| 4 HRS<br>31' 0" | 231       | 1        | C3SC         | C3CT          | START TOPS SWITCH END TO END CHECK PER V-24508 (NON-HAZARDOUS); REPORT WHEN COMPLETE. | (OATB)<br>D |
| 4 HRS<br>22' 0" | 261       | 1        | C1TC         | CLTC<br>C4TC  | S-IVB LH2 LOADING IS COMPLETED AND REPLENISH INITIATED. LOX & LH2 AT FLIGHT MASS.     |             |
|                 | 181       | 2        | CLTC         | CVTS          | LV CRYO LOADING IS COMPLETE AND NORMAL REPLENISH HAS BEEN ESTABLISHED.                | TCPI        |
| 4 HRS<br>20' 0" | 261       | 1        | CLTC         | C4TC          | START LH2 DIRECTIONAL VENT CHECK. REPORT WHEN COMPLETE.                               |             |
|                 | 241       | 2        | C4TC         | C4PS          | START LH2 DIRECTIONAL VENT CHECK, AND LH2 AND LOX TANK VENT CHECKS ON CH 242.         |             |
|                 | 245       | 3        | C4PS         | C4HU          | POSITION S-IVB REPLENISH VALVE OVERRIDE CLOSE SWITCH TO CLOSE AND MONITOR CH 242.     |             |
|                 | 242       | 4        | C4PS         | C4PR          | VERIFY LH2 REPLENISH VALVE CLOSED                                                     |             |
|                 | 242       | 5        | C4PS         | C4SP          | LH2 L/R OPEN ON THEN OFF                                                              |             |
|                 | 242       | 6        | C4PS         | C4SP          | VERIFY CLOSED IND ON AND LH2 VENT BOOST CLOSE AND L/R LATCH RESET COMMANDS IND ON.    |             |
|                 | 242       | 7        | C4PS         | C4SP          | LH2 TANK VENT CLOSE                                                                   |             |
|                 | 242       | 8        | C4PS         | C4SP          | DIR VENT TO FLIGHT THEN AUTO. VERIFY FLIGHT POSITION.                                 |             |
|                 | 242       | 9        | C4PS         | C4SP          | DIR VENT TO GROUND THEN AUTO. VERIFY GROUND POSITION.                                 |             |



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| TIME         | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.        | DESCRIPTION                                                                                                                                                                                                                                                                       | REMARKS    |
|--------------|-----------|----------|--------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 1 HRS 53' 0" | 181       | 3        | CLTC         | CVTS                 | LV READY FOR EDS TEST, REQUEST SCO PERSONNEL SWITCH TO CH 223.                                                                                                                                                                                                                    | TCPI       |
| 1 HRS 52' 0" | 261       | 1        | CVTS         | CLTC                 | SCO PERSONNEL ARE ON CH 223 TO SUPPORT EDS TEST.                                                                                                                                                                                                                                  | TCPI       |
| 1 HRS 51' 0" | 261       | 1        | ***          | CEDK                 | REQUEST & EXECUTE IAED (EDS TEST) PER V-21096 (PROGRAMS IAED, IZ33, FT33, IZSA, IZEA, IZRE), (SPR1 OPTION), REPORT WHEN PROGRAMS HAVE TERMINATED, (NON-HAZARDOUS)                                                                                                                 | # ***<br>D |
|              | 261       | 2        | ***          | CEDK                 | CDDT ONLY                                                                                                                                                                                                                                                                         | * ***<br>D |
|              |           | 3        |              | C3FR<br>C3EV<br>CUEV | NOTE<br>---<br>CRSS WILL CONDUCT HOLDFIRE CHECKS WITH RSO & SRO DURING THE NEXT 30 MINUTES. THE RANGE SAFE INDICATION ON THE C3FR PANEL, THE S-1B EVENTS DISPLAY PANEL AND BOTH SRO/RSO PROCEED INDICATIONS ON IU EVENTS DISPLAY PANEL WILL CYCLE ON AND OFF DURING THESE CHECKS. |            |



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| TIME            | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                              | REMARKS        |
|-----------------|-----------|----------|--------------|---------------|--------------------------------------------------------------------------------------------------------------------------|----------------|
| 1 HRS<br>36' 0" | 261       | 1        | HFLT         | CLTC          | (IF TARGET UPDATE TO BE SENT AT T-1121)<br>TARGET COMMAND SEQUENCE WILL BE SENT                                          |                |
|                 | 261       | 2        | CLTC         | CLGK          | (IF TARGET UPDATE TO BE SENT AT T-1121)<br>VERIFY TELETYPE ON                                                            |                |
| 1 HRS<br>33' 0" | 263       | 1        | HFLT         | CLGK          | (IF TARGET DATA SENT) VERIFY RECEPTION<br>OF TARGET DATA                                                                 |                |
| 1 HRS<br>25' 0" | 181       | 1        | CLTC         | CVTS          | REQUEST SRO TURN RANGE SAFETY COMMAND<br>CARRIER ON AND VERIFY, IU COMMAND<br>RECEIVER/DECODER IS OFF,                   | TCP!           |
|                 | 261       | 2        | CVTS         | CLTC          | RANGE SAFETY COMMAND CARRIER IS ON                                                                                       | TCP!           |
|                 | 261       | 3        | CLTC         | CUIP          | IU COMMAND RECEIVER/DECODER POWER ON                                                                                     | (FT47)         |
|                 | 181       | 4        | CLTC         | CVTS          | IU COMMAND RECEIVER/DECODER IS ON,<br>REQUEST GMIL, HFLT, & SRO MONITOR CH 261<br>AND REPORT WHEN READY TO SUPPORT FT47. | TCP!<br>(FT47) |
| 1 HRS<br>23' 0" | 261       | 1        | CLTC         | CGIC          | START ELECTROMAGNETIC COMPATIBILITY<br>MONITORING.                                                                       | TCP!           |
|                 |           | 2        |              |               | DELETED                                                                                                                  | I 36-45        |
| 1 HRS<br>21' 0" | 261       | 1        | CERK         | CLTC          | EDS PROGRAM COMPLETE.                                                                                                    | (FT47)         |



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| TIME             | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                  | REMARKS |
|------------------|-----------|----------|--------------|---------------|--------------------------------------------------------------------------------------------------------------|---------|
| 1 HRS<br>21' 0"  |           |          |              |               |                                                                                                              |         |
|                  | 261       | 38-34    | CLGK         | CLTC          | FT47 COMPLETE                                                                                                |         |
|                  | 261       | 38-35    | ***          | CLGK          | REQUEST & EXECUTE FTB1 (TARGETING DATA TEST),                                                                | ***     |
|                  |           | 38-36    |              | CLGK          | *** NOTE FOR UNSUCCESSFUL CARD READ, SELECT ALTERNATE MAG TAPE SOURCE FOR VERIFY/LOAD.                       |         |
|                  | 261       | 38-37    | CLGK         | CLTC          | FTB1 COMPLETE                                                                                                |         |
|                  | 261       | 38-38    | ***          | CLGK          | REQUEST & EXECUTE FT23 (SECTOR SUM CHECK AFTER COMMANDS,)                                                    | ***     |
|                  | 261       | 38-39    | CLGK         | CLTC          | FT23 COMPLETE                                                                                                |         |
|                  | 261       | 39       | GVTS         | CLTC          | SDS POWER IS OFF                                                                                             | # TOP   |
|                  | 261       | 40       | CLTC         | BGCC          | REMOVE FTB1 TAPE AND CARDS                                                                                   | I36-45  |
|                  | 261       | 41       | CLTC         | CUFS          | GO TO CH 262 TO PERFORM RATE GYRO TEST                                                                       | I37-46  |
|                  | 181       | 42       | CLTC         | ALL           | THE FOLLOWING PERSONNEL GO TO CH 262 TO SUPPORT SPECIAL RATE GYRO TEST<br>CUCR CUSP CUFE CUGA CUFC CLFK C4FS | I37-46  |
|                  | 262       | 43       | CUFS         | CUSP          | VERIFY/SELECT S-IVB COAST MODE                                                                               | I37-46  |
|                  | 262       | 44       | CUFS         | CUGA          | SELECT REF. AND SPARE GYROS                                                                                  | I37-46  |
|                  | 262       | 45       | CUFS         | CUGA          | RAMP TO COMPARATOR SET FOR PITCH, YAW AND ROLL                                                               | I37-46  |
|                  | 262       | 46       | CUFS         | CUGA          | RAMP POS AND NEG FOR EACH AXIS AND VERIFY PROPER RESPONSE                                                    | I37-46  |
|                  | 262       | 47       | CUFS         | CUGA          | ZERO RAMP. DESELECT REF AND SPARE GYROS AND RESET COMPARATORS                                                | I37-46  |
|                  | 262       | 48       | CUFS         | CUSP          | DESELECT/VERIFY S-IVB COAST MODE                                                                             | I37-46  |
|                  | 262       | 49       | CUFS         | ALL           | ALL PERSONNEL SUPPORTING SPECIAL RATE GYRO TEST RETURN TO ASSIGNED CHANNELS                                  | I37-46  |
|                  | 261       | 50       | CUFS         | CLTC          | SPECIAL RATE GYRO TEST IS COMPLETE                                                                           | I37-46  |
| 1 HRS<br>16' 15" |           |          |              |               |                                                                                                              |         |
|                  | 261       | 1        | CLTC         | RLDE          | LOAD SEQUENCE COMPARE QW69 FOR IASL AND START GROUP 1.                                                       | (IASL)  |
|                  | 266       | 2        | CLTC         | CSAC          | VERIFY S/A'S READY FOR IASL.                                                                                 | (IASL)  |
|                  | 261       | 3        | CLTC         | CLTC          | S/A'S READY IASL.                                                                                            | (IASL)  |
| 1 HRS<br>15' 0"  |           |          |              |               |                                                                                                              |         |
|                  | 122       | 1        | CLM4         | BOSC          | REQUEST PRESENT QW2 BATTERY PRESSURE                                                                         | TOP     |
| 1 HRS<br>10' 0"  |           |          |              |               |                                                                                                              |         |
|                  | 261       | 1        | CLTC         | RLDE          | ENTER/VERIFY CDC MODE                                                                                        | #       |

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| TIME           | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                            | REMARKS      |
|----------------|-----------|----------|--------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 1 HRS<br>91 0" | 261       | 1        | CLTC         | CUFS          | PREPARE FOR AND START FLIGHT CONTROL SYSTEM TEST ON CH 262, MONITOR CH 261. REPORT WHEN COMPLETE.                                                                      | (IAFC)       |
|                | 188       | 2        | CLTC         | ALL           | FOLLOWING STATIONS SWITCH TO CHANNEL 262 FOR FLIGHT CONTROL SYSTEM NULL TEST:<br>CUFE CUFS C3FE C4FC CUCR CUGA<br>C3FC C4FS CLFK C4HY CUSP C3HY<br>C3ED R4EI R4HY R3RM | (IAFC)       |
|                | 262       | 3        | CUFS         | R4HY<br>R4EI  | RECORDERS TO FAST                                                                                                                                                      | (IAFC)       |
|                | 262       | 4        | CUFS         | C4HY          | FLIGHT MODE TO AUTO,                                                                                                                                                   | (IAFC/ IAPX) |
|                | 181       | 5        | CLTC         | CVTS          | HOUSTON PREFLIGHT COMMAND SYSTEM TEST IS COMPLETE, REQUEST CLEARANCE TO BRING UP LOCAL CLOSED LOOP IU COMMAND CARRIER, (PROTECTION NOT REQUIRED)                       | TCPI         |
|                | 261       | 6        | CLTC         | CUGS          | BRING UP LOCAL CLOSED LOOP IU COMMAND CARRIER, REPORT WHEN COMPLETE,                                                                                                   |              |
|                | 181       | 7        | CLTC         | CVTS          | REQUEST SRO REMOVE RANGE SAFETY COMMAND CARRIER, REPORT WHEN COMPLETE, LOCAL CLOSED LOOP IU COMMAND CARRIER IS ON,                                                     | TCPI         |
|                | 261       | 8        | CLTC         | VURF          | VERIFY RADAR BEACON 2 READY FOR INTERROGATION,                                                                                                                         |              |
|                | 261       | 9        | CLTC         | CUIP          | RADAR BEACONS 1 & 2 INHIBIT OFF<br>RADAR BEACON 1 INHIBIT ON                                                                                                           |              |
|                | 181       | 10       | CLTC         | CVTS          | READY TO START RADAR BEACON 2 CHECKS, REPORT GO/NO-GO AND RANGE READOUT TO VURF ON CH 264.                                                                             | TCPI         |
|                | 261       | 11       | ***          | CLSK          | REQUEST & EXECUTE IASL (S/A PRESSURE & LEVEL CHECKS)                                                                                                                   | ***          |
|                |           | 11-1     | CSAC         | ****          | NOTE THE FOLLOWING INDICATIONS WILL CYCLE OFF AND ON DURING IASL:<br>T-187 LSE PREPS COMPLETE<br>T-3 LSE READY FOR IGNITION                                            | B16-35       |



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| TIME       | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                                                                                                                                               | REMARKS |
|------------|--------------|----------|-----------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| -37' 0"    | 261          | 7        | CLTC            | HFLT             | FLIGHT COMPUTER READY FOR HOUSTON<br>PREFLIGHT COMMANDS USING RANGE SAFETY<br>COMMAND CARRIER                                                                                             |         |
|            | 266          | 8        | CCRP            | CLTC             | RP-1 LEVEL ADJUST AND LINE INERTING ARE<br>COMPLETED                                                                                                                                      | P       |
| -35' 0"    | 261          | 1        | HFLT            | ALL              | COMMAND ON MY MARK (MEMORY DUMP LOC 0,<br>16, 360-370)                                                                                                                                    |         |
|            | 261          | 2        | CLTC            | EUGM             | VERIFY AVP, CRP AND MEMORY DUMP                                                                                                                                                           |         |
|            | 261          | 3        | CLTC            | HFLT             | LV READY FOR TARGET UPDATE                                                                                                                                                                |         |
|            | 261          | 4        | HFLT            | ALL              | COMMAND ON MY MARK (TARGET UPDATE).                                                                                                                                                       |         |
|            | 261          | 5        | CLTC            | EUGM             | VERIFY AVP, CRP AND TARGET UPDATE.                                                                                                                                                        |         |
|            | 261          | 6        | CLTC            | HFLT             | LV READY FOR MEMORY DUMP                                                                                                                                                                  |         |
|            | 261          | 7        | HFLT            | ALL              | COMMAND ON MY MARK (MEMORY DUMP LOC 0,<br>16, 360-370)                                                                                                                                    |         |
|            | 261          | 8        | CLTC            | EUGM             | VERIFY AVP, CRP AND MEMORY DUMP                                                                                                                                                           |         |
|            | 261          | 9        | CLTC            | HFLT             | VERIFY HOUSTON COMMANDS COMPLETE AND<br>TARGET UPDATE SUCCESSFUL.                                                                                                                         |         |
| 261<br>181 |              | 10       | CVTS            | CLTC             | NEW LIFTOFF TIME IS (--) HRS (--) MINS<br>(--) SECS GMT. CLOSING OF LAUNCH WINDOW<br>IS (--) HRS (--) MINS (--) SECS GMT.                                                                 | TCR!    |
|            |              | 10-1     | CVTS            |                  | *** NOTE CALCULATION REQUIRED TO<br>DETERMINE COUNT CLOCK PICKUP TIME AT<br>T-15 MINUTES IS:<br><br>NEW LIFTOFF TIME (---) GMT<br>MINUS 15 MINUTES -0115 MIN<br>CDC PICKUP TIME (---) GMT | P       |



| TIME    | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA.                     | DESCRIPTION                                                                                                                                                                                                | REMARKS     |
|---------|--------------|----------|-----------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| -33: 0" | 261          | 1        | CLTC            | C3DP<br>C4DP                         | SAFE & ARM TO ARM FOR 2 SECONDS AND VERIFY<br>ARMED INDICATION ON AND SAFE INDICATION OFF                                                                                                                  | P<br>C68-38 |
|         |              | 1-1      |                 | C3TC<br>C3DP<br>C4TC<br>C4DP         | **** NOTE IF SAFE INDICATION OFF AND ARMED<br>INDICATION ON CANNOT BE VERIFIED, GO TO<br>APPENDIX C PART 5 FOR CONTINGENCY PROCEDURE                                                                       | P<br>C68-38 |
|         |              | 1-1A     |                 | C3TC<br>C3NE<br>C3DP<br>C4TC<br>C4DP | **** NOTE IF SAFE INDICATION GOES OFF AND ARMED<br>INDICATION DOES NOT COME ON, GO TO INTERLOCK<br>BYPASS CONTINGENCY PROCEDURE IN V-20130,<br>VOLUME III<br>(S-IB PD SYSTEM READY)<br>(S-IVB ORDNANCE OK) | P<br>C68-38 |
|         |              | 1-2      |                 | CRSS                                 | *** NOTE ALL S&A ARMED INDICATIONS ON                                                                                                                                                                      | P           |
|         |              | 1-3      |                 | C3FR<br>C4TC                         | *** NOTE PD SYSTEM READY (C) S-IB DEE<br>0167                                                                                                                                                              | P           |
|         | 261          | 2        | CLTC            | BRFS                                 | VERIFY TAPE RECORDER ON                                                                                                                                                                                    | B-4-22      |
| -27: 0" | 261          | 1        | CLTC            | CRSS                                 | VERIFY PROCEED ON & BYPASS IS OFF                                                                                                                                                                          | (IATS)<br>P |
|         |              | 1-1      |                 | C3FR                                 | *** NOTE RANGE SAFE - ON                                                                                                                                                                                   | P           |
|         |              | 1-2      |                 | CUEV                                 | *** NOTE BOTH SRO/RSO PROCEED<br>INDICATIONS ON                                                                                                                                                            | P           |
|         | 261          | 2        | CLTC            | BGCC                                 | VERIFY/LOAD TARGET UPDATE CARDS ARE IN<br>READER.                                                                                                                                                          | (FTB1)      |
|         | 261          | 3        | CLTC            | BGCC                                 | VERIFY FTB1 PARAMETER TAPE MOUNTED ON<br>IODC 1-3                                                                                                                                                          | (FTB1)      |
|         | 261          | 4        | CLGK            | CLTC                                 | ATOLL IN SEMI AWAITING OPTION ENTRY                                                                                                                                                                        |             |
|         | 261          | 5        | CLTC            | CLGK                                 | (IF DCS LOAD WAS SUCCESSFUL) SELECT<br>OPTION TO "VERIFY" TARGET UPDATE VIA<br>FTB1, (IF DCS LOAD WAS NOT SUCCESSFUL)<br>SELECT OPTION TO "LOAD" TARGET UPDATE<br>VIA FTB1                                 |             |



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| TIME    | COMM.<br>CH. | SEQUENCE     | COMMAND<br>STA. | RESPONSE<br>STA.                     | DESCRIPTION                                                                                                                           | REMARKS     |
|---------|--------------|--------------|-----------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------|
| +26' 0" | 261          | 1            | ***             | CLGK                                 | REQUEST AND EXECUTE FT47 (PREFLIGHT<br>COMMAND SYSTEM TEST) (HOUSTON) (OPTION<br>SP3).                                                | ***         |
| +25' 0" |              | 2 THRU<br>11 |                 |                                      | DELETED                                                                                                                               | I38-48      |
|         | 261          | 1            | CLGK            | CLTC                                 | FT47 COMPLETE.                                                                                                                        |             |
|         | 181          | 2            | CLTC            | CVTS                                 | (IF FT47 WAS RUN) HOUSTON PREFLIGHT<br>COMMAND SYSTEM TEST COMPLETE, REQUEST<br>GMIL REPORT IN COMMAND GO/NO-GO TO VURF<br>ON CH 264. | TCPI        |
|         | 261          | 3            | ***             | CLGK                                 | REQUEST & EXECUTE FTB1 (TARGETING DATA<br>TEST)                                                                                       | ***         |
|         |              | 3-1          |                 | CLGK                                 | *** NOTE FOR UNSUCCESSFUL CARD READ,<br>SELECT ALTERNATE MAG TAPE FOR<br>VERIFY/LOAD                                                  |             |
|         | 261          | 4            | CVTS            | CLTC                                 | RANGE INTERROGATION OF RADAR BEACON 1 IS<br>COMPLETE, VERIFY RADAR BEACON 2 IS<br>COMING ON.                                          | TCPI<br>P   |
|         | 261          | 5            | CLTC            | CUIP                                 | RADAR BEACON 1 INHIBIT ON<br>RADAR BEACONS 1 & 2 INHIBIT OFF                                                                          | P           |
|         | 181          | 6            | CLTC            | CVTS                                 | CDDT ONLY                                                                                                                             | * TCPI<br>P |
| +20' 0" | 261          | 1            | CLGK            | CLTC                                 | FTB1 COMPLETE                                                                                                                         |             |
|         | 261          | 1-1          | CLTC            | BGCC                                 | REMOVE FTB1 TAPE AND CARDS                                                                                                            | I36-45      |
|         | 261          | 2            | ***             | CLGK                                 | REQUEST & EXECUTE FT23 (SECTOR SUM<br>CHECK AFTER COMMANDS)                                                                           | ***         |
|         |              | 3            |                 | CLTC<br>C1TC<br>C3TC<br>C4TC<br>CUTC | NOTE<br>-----<br>IATS SWITCH SCAN<br>IMMEDIATELY FOLLOWS FT23<br>PROGRAM COMPLETION,                                                  |             |



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| TIME    | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                | DESCRIPTION                                                                                                               | REMARKS     |
|---------|-----------|----------|--------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------|
| *19'30" |           |          |              |                              |                                                                                                                           | 130-28      |
|         | 241       | 1        | C4TC         | C4EP                         | THRUST CHAMBER PURGE SUPPLY = ON                                                                                          | M26-32      |
|         | 241       | 2        | C4TC         | R4E1<br>R4HY                 | RECORDERS TO FAST                                                                                                         | M26-32      |
| *18' 0" |           |          |              |                              |                                                                                                                           |             |
|         | 188       | 1        | CVTS         | PA                           | AT CONCLUSION OF T=15'0" HOLD FOR CDC LIFTOFF ADJUSTMENT, THE COUNT WILL BE RESUMED AT (---) HRS (---) MIN (---) SEC GMT  | TCP1<br>P   |
|         | 261       | 2        | CLTC         | ALL                          | AT CONCLUSION OF T=15'0" HOLD FOR CDC LIFTOFF ADJUSTMENT, THE COUNT WILL BE RESUMED AT (---) HRS (---) MIN (---) SEC GMT, | P           |
|         | 241       | 3        | C4TC         | C4HY                         | FLIGHT MODE - ON THEN AUTO                                                                                                | M26-32      |
|         | 241       | 4        | C4TC         | R4HY                         | REPORT WHEN HYDRAULIC SYSTEM HAS STABILIZED                                                                               | M26-32      |
| *17' 0" |           |          |              |                              |                                                                                                                           |             |
|         |           | 1        |              | CLFK<br>C3NK<br>C4PK<br>C4NK | TERMINATE DISPLAY DESCRIPTIONS ON CONSOLE PAGE A. DO NOT RECALL WHILE IATS IS EXECUTING,                                  | (IATS)<br>P |
| *16' 0" |           |          |              |                              |                                                                                                                           |             |
|         | 261       | 1        | CLGK         | CLTC                         | FT23 COMPLETE                                                                                                             |             |



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VEHICLE

| TIME    | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                        | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | REMARKS  |
|---------|-----------|----------|--------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| -16' 0" | 261       | 2        | ***          | CLTK                                 | REQUEST & EXECUTE IATS (TERMINAL SEQ PROGRAM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ***<br>P |
|         |           | 2-1      | ALL          |                                      | NOTE<br>-----<br>FUNCTIONS EXECUTED BY COMPUTER PROGRAMS ARE DESIGNATED BY THREE ASTERISKS OR THE PROGRAM IVAR. IF THE TEST IS TO BE PERFORMED MANUALLY, THE TEST CONDUCTOR ASSIGNED TO THE COMMAND CHANNEL WILL COMMAND THE FUNCTION. FUNCTIONS DESIGNATED CH261 WILL BE PERFORMED BY THE CLOCK WITHOUT COMMAND.<br>TIME CRITICAL FUNCTIONS PERFORMED BY IATS WILL BE MANUALLY ACCOMPLISHED BY THE DESIGNATED OPERATOR IF THE FUNCTION IS 10 SECONDS LATE, SUCH ACTION WILL BE REPORTED.<br><br>IF A HOLD OCCURS, CLTK WILL ADVISE CLTC OF THE REMAINING HOLD TIME. CLTC WILL BE FURTHER ADVISED WHEN THE HOLD TIME IS 1 MINUTE OR LESS.<br><br>IATS WILL AUTOMATICALLY COMPLETE FUNCTION INITIATED PRIOR TO CALLING THE HOLD. PREFERRED HOLD TIMES ARE 10 MINUTES AND 4' 0". | T-1-39   |
|         |           | 2-2      |              | CLTC<br>C1TC<br>C3TC<br>C4TC<br>CUTC | CDDT ONLY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | • P      |



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| TIME               | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                      | REMARKS       |
|--------------------|-----------|----------|--------------|---------------|----------------------------------------------------------------------------------|---------------|
| HOLDING<br>-15' 0" |           |          |              |               | --- STARTING SCHEDULED HOLD ---<br>-----                                         |               |
|                    | 188       | 1        | CVTS         | PA            | THE COUNT IS HOLDING FOR LIFTOFF ADJUSTMENT!                                     | TCP!          |
| HOLDING<br>-15' 0" |           |          |              |               | --- JUST PRIOR TO RESUMING COUNT ---<br>-----                                    |               |
|                    | 188       | 1        | CVTS         | PA            | THE CDC WILL BE RESTARTED AT T-15'0" ON MY MARK,<br><br>5 - 4 - 3 - 2 - 1 - MARK | TCP!          |
|                    | 241       | 2        | C4TC         | C4PS          | MONITOR/START CHILLDOWN SEQUENCES BY THE CLOCK                                   |               |
| -15' 0"            |           |          |              |               |                                                                                  |               |
|                    | 261       | 1        | CLTK         | CLTC          | IATS IS EXECUTING                                                                |               |
| -14'58"            |           |          |              |               |                                                                                  |               |
|                    | 241       | 1        | ***          | C4PP          | PLUG SUPERVISION POWER OFF THEN AUTO                                             | ***           |
| -14'30"            |           |          |              |               |                                                                                  |               |
|                    | 241       | 1        | C4TC         | C4EP          | THRUST CHAMBER PURGE SUPPLY - CLOSE                                              | M26=32        |
|                    |           | 2        |              | C4ET          | AT C4PS COMMAND CT HELIUM CONT SOL ON AND OFF,                                   |               |
|                    |           | 3        | ***          | C4EP          | START TANK VENT OPEN                                                             | ***           |
|                    |           | 4        | ***          | C4EP          | START TANK SUPPLY VALVE OPEN,                                                    | ***           |
|                    |           | 5        | ***          | C4EP          | THRUST CHAMBER CHILLDOWN SUPPLY - OPEN                                           | ***<br>M26=32 |
|                    | 241       | 6        | C4PS         | C4TC          | CHILLDOWN IS IN PROGRESS                                                         | M26=32        |



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| TIME    | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                       | REMARKS |
|---------|-----------|----------|--------------|---------------|-----------------------------------------------------------------------------------|---------|
| -14:30" | 261       | 7        | C4TC         | CUTC          | S-1VB START TANK AND THRUST CHAMBER CHILLDOWN ARE IN PROGRESS.                    | M26-32  |
| -14:25" |           | 1        | ***          | C4SP          | LOX TANK VENT CLOSED FOR 3 SECONDS THEN OPEN THEN AUTO.                           | ***     |
|         |           | 2        | ***          | C4SP          | LH2 TANK VENT CLOSED FOR 3 SECONDS THEN OPEN THEN AUTO.                           | ***     |
|         | 261       | 3        | ***          | C3SP          | SEQUENCER POWER ON                                                                | ***     |
|         |           | 3-1      |              | C3SP          | *** NOTE ALL VOLTAGES (+25, -25, +8)                                              |         |
|         |           | 3-2      |              | C3SP          | *** NOTE SEQUENCER RESET (C) DEE 0006 ON                                          |         |
|         |           | 3-3      |              | C3FR          | *** NOTE TCS POWER SUPPLY OK (C) DEE 0348 ON                                      |         |
|         | 261       | 4        | ***          | CLFK          | REQUEST & EXECUTE IAAR (S-1B ATTITUDE RATE COMMAND TEST)                          | ***     |
|         | 261       | 5        | IAAR         | CUSP          | VERIFY CONTROL COMPUTER IN S-1B BURN MODE                                         | ***     |
|         | 261       | 6        | IAAR         | C3HY          | S-1B HYDRAULIC SYSTEMS ON                                                         | ***     |
|         | 261       | 7        | IAAR         | CUGA          | ATTITUDE RATE COMMANDS - (PLUS 2 DEG/SEC PITCH AND YAW, AND PLUS 5 DEG/SEC ROLL). | ***     |
|         | 236       | 8        | CSAC         | CHCU          | START CIRCUIT BYPASS TO BYPASS AND VERIFY                                         | B12-24  |
| -14: 0" | 261       | 1        | GLTC         | ECOP          | VERIFY GUIDANCE REAL TIME REDUCTION PROGRAM EXECUTING                             | (FT42)  |
|         | 266       | 2        | CSAC         | C1TC          | SERVICE ARMS READY FOR LAUNCH.                                                    |         |
|         |           | 2-1      |              | C3FR<br>CSAC  | *** NOTE LAUNCH SUPPORT PREPS COMPLETE (C) S-1B DEE 0357, LSE DEE 4229            | C64-20  |



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| TIME    | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.        | DESCRIPTION                                                                               | REMARKS  |
|---------|-----------|----------|--------------|----------------------|-------------------------------------------------------------------------------------------|----------|
| -14: 0" |           | 2-2      |              | CSAC<br>C3FR         | *** NOTE LAUNCH SUPPORT READY FOR IGNITION (C) S-IB DEE 0356                              |          |
|         | 266       | 3        | CACS         | C1TC                 | SACS READY FOR LAUNCH                                                                     |          |
|         | 261       | 4        | CLTC         | C3NP                 | VERIFY STAGE LOGIC TO INHIBIT AND RESET SWITCH SELECTOR COUNTER,                          | C64-20   |
|         |           | 4-1      |              | C3FR                 | *** NOTE FLIGHT SEQUENCE ZERO (C) DEE 0041 ON                                             |          |
|         |           | 4-2      |              | C3FR                 | *** NOTE NO CONAX FIRED (C) DEE 0383 ON                                                   | XB122-43 |
| -13: 0" | 261       | 1        | CLTC         | CUES                 | EDS MODE TO LAUNCH                                                                        |          |
|         |           | 1-1      |              | C3FR<br>CUES         | *** NOTE EDS READY (C) S-IB DEE 0157 ON                                                   | C64-20   |
|         |           | 1-2      |              | C3FR                 | *** NOTE IU READY FOR LAUNCH (C) DEE 0042 ON                                              |          |
| -12:40" | 261       | 1        | IAAR         | C3HY                 | S-IB HYDRAULIC SYSTEMS OFF                                                                | ***      |
|         | 261       | 2        | CLRK         | CLTC                 | IAAR COMPLETE                                                                             |          |
|         |           | 3        |              |                      | *****CAUTION*****<br>*<br>* DO NOT PROCEED UNTIL *<br>* IAAR IS COMPLETE, *<br>*<br>***** |          |
|         | 261       | 4        | ***          | C4AL                 | APS ENGINE POWER ON                                                                       | ***      |
|         |           | 4-1      |              | C4DE<br>C4EV<br>C4TC | *** NOTE S-IVB PREPS COMPLETE ON (C) (DEE 1947 - ON)                                      | M26-32   |



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| TIME    | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA.                     | DESCRIPTION                                                                                                                                                 | REMARKS |
|---------|--------------|----------|-----------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| +10'45" |              | 2-2      |                 | CLGK                                 | *** NOTE IF FT42 DISPLAY MESSAGE "PLOT BEFORE WINDOW OPEN TIME" RECEIVED, ENTER "CONTINUE" IF HOUSTON CONCURRENCE HAS BEEN RECEIVED                         |         |
|         |              | 3        |                 | CHGD                                 | *** NOTE MONITOR S-IB ENGINE COMPARTMENT FROM T-10' THROUGH T+1' UNLESS OTHERWISE DIRECTED BY CLSM                                                          |         |
| -10' 0" |              |          |                 |                                      | IF GE01 IS TO BE TERMINATED<br>-----                                                                                                                        |         |
|         | 261          | 1        | CLGK            | CLTC                                 | PLATFORM POSITIONING IS COMPLETE                                                                                                                            | I41-57  |
|         | 261          | 2        | CLTC            | CLGK                                 | TERMINATE GE01 (\$FUNTGE01)                                                                                                                                 | I41-57  |
|         |              | 3        |                 | CLGK                                 | NOTE<br>----                                                                                                                                                |         |
|         |              |          |                 |                                      | IF HOLD OCCURS, PERFORM THE FOLLOWING SUBSEQUENCES                                                                                                          | I41-57  |
|         |              | 3-1      |                 | CLGK                                 | START GE01 (\$FUNCGE01/005 PMRE) AND VERIFY PLATFORM IS DRIVING                                                                                             | I41-57  |
|         |              | 3-2      |                 | CLGK                                 | AFTER CDC STARTS COUNTING DOWN, READ OUT NEW FIRING AZIMUTH                                                                                                 | I41-57  |
|         |              | 3-3      |                 | CLGK                                 | VERIFY PLATFORM POSITIONING IS COMPLETE                                                                                                                     | I41-57  |
|         |              | 3-4      |                 |                                      | DELETED                                                                                                                                                     | I42-59  |
| + 9'58" |              | 1        |                 | CLTC<br>C1TC<br>C3TC<br>C4TC<br>CUTC | CDDT ONLY                                                                                                                                                   | *       |
| + 9'56" |              | 1        |                 | C4EP                                 | NOTE<br>-----<br>IF HOLD OCCURS BETWEEN T-9'56" & T-9'43" ALL "****" FUNCTIONS THROUGH T-9'43" WILL OCCUR (OR BE PERFORMED) TO ESTABLISH HOLD CONFIGURATION | M26=32  |
|         |              | 2        | ***             | C4EP                                 | LH2 CHILLDOWN PUMP ON THEN AUTO,                                                                                                                            | ***     |



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VEHICLE AS-210

| TIME  | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                 | REMARKS                  |
|-------|-----------|----------|--------------|---------------|---------------------------------------------------------------------------------------------|--------------------------|
| 9:48" |           | 1        | ***          | C4EP          | LOX CHILLDOWN PUMP ON THEN AUTO;                                                            | ***                      |
| 9:43" |           | 1        | ***          | C4EP          | LOX & LH2 PREVALVES CLOSE THEN AUTO,                                                        | ***                      |
| 8:00" | 188       | 1        | CVTS         | PA            | AT CONCLUSION OF T-4:00" HOLD, THE COUNT WILL BE RESUMED AT (--) HRS (--) MINS (--) SEC GMT | TCPI<br>I39-49<br>I42-59 |
|       | 261       | 2        | CLTC         | ALL           | AT CONCLUSION OF T-4:00" HOLD, THE COUNT WILL BE RESUMED AT (--) HRS (--) MINS (--) SEC GMT | I39-49<br>I42-59         |
| 7:00" | 261       | 1        | CLTC         | EUGM          | VERIFY GUIDANCE TM SATISFACTORY                                                             |                          |
|       | 261       | 2        | CLTC         | CRSS          | CDDT ONLY                                                                                   | *                        |
|       | 261       | 3        | CLTC         | C4ET          | CDDT ONLY                                                                                   | *                        |
|       |           |          |              |               |                                                                                             | C64-20                   |
| 6:30" | 261       | 1        | CLTC         | CUNP          | INHIBIT SWITCH SELECTOR AND RESET COUNTER,                                                  |                          |
| 6:15" | 251       | 1        | ***          | CUCP          | PUMP PRESSURE SWITCH ACTIVATE ON                                                            | ***                      |
|       |           | 1-1      |              | CUCP          | *** NOTE PUMP PRESSURE ACTIVATE INDICATION ON (DEE 0655 ON)                                 |                          |
| 6:00" | 251       | 1        | CUTC         | BGCC          | THERMAL OVERRIDE SWITCHES - ON (SENSE CONTROL PANEL BITS 21 & 22)                           |                          |
|       | 261       | 2        | CLTC         | BPHO          | START S-IB & S-IVB LOX AND LH2 FILM CAMERAS                                                 |                          |
|       |           | 2-1      |              | BPHO          | *** NOTE LOX & LH2 CAMERAS MAY BE STOPPED UPON COMPLETION OF TCS PLUS ONE MINUTE            |                          |



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| TIME               | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                                                                                 | REMARKS                               |
|--------------------|-----------|----------|--------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| 4:20"              | 261       | 1<br>1-1 | ***          | C3HY          | S-IB HYDRAULIC PUMPS ON<br><br>NOTE<br>---<br><br>IF HOLD IS CALLED AFTER<br>T-4:20", TURN S-IB<br>HYDRAULICS SYSTEMS 1, 2,<br>3 & 4 OFF, UPON<br>RESUMING THE COUNT,<br>POSITION S-IB HYDRAULIC<br>SYSTEMS 1, 2, 3, & 4 TO ON<br>THEN AUTO | ***<br><br><br><br><br><br><br>C73-60 |
| 4:10"              | 261       | 1<br>1-1 | ***          | CUES<br>AC    | THRUST OK INHIBIT A & B SWITCHES TO OFF<br><br>*** NOTE LV ENGINE 1 THROUGH 8 LIGHTS<br>ON IN SC                                                                                                                                            | ***<br><br># TCPI                     |
| HOLDING<br>- 4:00" |           |          |              |               | --- STARTING SCHEDULED HOLD ---<br>-----                                                                                                                                                                                                    |                                       |
|                    | 188       | 1        | CVTS         | PA            | THE COUNT IS HOLDING                                                                                                                                                                                                                        | TCPI<br>I42-59                        |
| HOLDING<br>- 4:00" |           |          |              |               | --- JUST PRIOR TO RESUMING THE COUNT ---<br>-----                                                                                                                                                                                           |                                       |
|                    | 261       | 1        | CVTS         | CLTC          | THE COUNTCLOCK WILL BE STARTED IN APPROXIMATELY<br>15 SECONDS                                                                                                                                                                               | TCPI<br>I42-59                        |
|                    | 261       | 2        | CLTC         | C3FR          | THE COUNT WILL BE RESUMED IN APPROXIMATELY<br>15 SECONDS                                                                                                                                                                                    | I42-59                                |
|                    | 188       | 3        | CVTS         | PA            | THE CDC WILL BE RESTARTED AT T-4:00" ON MY<br>MARK<br>3 - 2 - 1 - MARK                                                                                                                                                                      | TCPI<br>I42-59                        |
| 4:00"              | 261       | 1<br>1-1 | CVTS         | CLTC<br>ALL   | CLEARED FOR LAUNCH,<br><br>*** NOTE DISPLAY OPERATORS, DO NOT CALL<br>UP DISPLAY DESCRIPTIONS AFTER TCS<br>START,                                                                                                                           | TCPI                                  |



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| TIME     | COMM. CH.  | SEQUENCE | COMMAND STA.         | RESPONSE STA. | DESCRIPTION                                                                                                                                                                             | REMARKS        |
|----------|------------|----------|----------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| - 4' 0"  | 181<br>261 | 2        | CVTS                 | ALL           | *****<br>COUNT TIME ANNOUNCEMENTS<br>-----<br>-3:30" TO -0:40" EVERY 10 SECONDS<br>-0:40" TO -0:15" EVERY 5 SECONDS<br>-0:11" TO L/O EVERY 1 SECOND<br>*****                            | TCPI           |
|          |            | 2-1      | C3FR<br>C3NP<br>C3SP |               | NOTE<br>----<br>IF MANUAL CUTOFF IS REQUESTED AND C3FR DOES NOT ANNOUNCE CUTOFF START INDICATION, THEN C3SP WILL CYCLE THE SEQUENCER POWER SWITCH TO OFF THEN BACK TO ON TO GIVE CUTOFF |                |
|          |            | 3        | CLTC                 |               | NOTE<br>----<br>IF A HOLD OCCURS AFTER T-4' 0" AND THE LAUNCH WINDOW CLOSING TIME PERMITS, PERFORM THE FOLLOWING SUB-SEQUENCES TO RECYCLE BACK TO T-4 MINUTES.                          | I42-59         |
|          |            | 3-1      | CLTC                 | CVTS          | HOLD COUNTDOWN CLOCK AND PRESET/RESET TO T-4 MIN 05 SEC.                                                                                                                                | TCPI<br>I42-59 |
|          |            | 3-2      | CLTC                 | CVTS          | START CDC COUNTING AND HOLD AT T-4' 0"                                                                                                                                                  | TCPI<br>I42-59 |
| - 3' 20" |            | 1        | ALL                  |               | *****CAUTION*****<br>* ALL LV STATIONS MONITOR *<br>* CHANNEL 261 DURING *<br>* TERMINAL SEQUENCE. *<br>*****                                                                           |                |
|          |            |          |                      |               | SEQUENCES DELETED                                                                                                                                                                       | I42-59         |



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| TIME  | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | REMARKS |
|-------|-----------|----------|--------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 3:20" |           | 2        |              |               | <p>* ***** CONTINGENCY NOTES ***** *</p> <p>* CONTINGENCY ACTIONS INCLUDED IN THE *</p> <p>* TCS ARE TO BE PERFORMED ONLY IF THE *</p> <p>* ASSOCIATED INDICATION DOES NOT OCCUR *</p> <p>* AS EXPECTED, A FAILURE OF A "NOTE" *</p> <p>* STEP IS TO BE REPORTED TO CLTC IF IT *</p> <p>* IS ONE OF THE FOLLOWING: *</p> <p>* 1. AN LMR *</p> <p>* 2. CAUSED CONTINGENCY ACTION TO BE *</p> <p>* IMPLEMENTED *</p> <p>* 3. INTERLOCKED FOR IGNITION/POWER *</p> <p>* TRANSFER *</p> <p>* ANY SWITCHES POSITIONED VIA *</p> <p>* CONTINGENCY ACTION MUST BE RETURNED TO *</p> <p>* NORMAL DURING SAFING, IN THE EVENT OF *</p> <p>* A CUTOFF. *</p> <p>* ***** *</p> |         |
|       |           | 3        |              |               | <p>* *****CAUTION***** *</p> <p>* OPERATORS TAKING *</p> <p>* CONTINGENCY ACTIONS *</p> <p>* UTILIZING *</p> <p>* COMPUTER/HARDWARE *</p> <p>* SWITCHES SHOULD AVOID *</p> <p>* HAVING ANY ML DISCRETE *</p> <p>* IN AN UNWANTED STATE AT *</p> <p>* T-2:32" (LUT COMPUTER *</p> <p>* INHIBIT). AN MDO *</p> <p>* CHANGE-IN-STATE CANNOT *</p> <p>* BE EFFECTED AFTER THAT *</p> <p>* TIME, *</p> <p>* ***** *</p>                                                                                                                                                                                                                                                  |         |



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| TIME   | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                             | REMARKS |
|--------|-----------|----------|--------------|---------------|-------------------------------------------------------------------------------------------------------------------------|---------|
| 3' 10" | 261       | 1        |              | C3FR          | INITIATE FIRING COMMAND (DO NOT RELEASE UNTIL EITHER FIRING COMMAND IS VERIFIED OR UNTIL SAFING PROCEDURE IS INITIATED) |         |
|        |           | 1-1      |              | C3FR          | *** NOTE FIRING COMMAND ENABLED (C) DEE 0360.                                                                           |         |
|        |           | 2        |              |               | DELETED                                                                                                                 | B20-42  |
| 3' 6"  | 261       | 1        | C3FR         |               | VERIFY FIRING COMMAND IS ON (H)                                                                                         |         |
|        |           | 1-1      |              | C3FR          | *** NOTE TCS READY OFF (C) DEE 0000                                                                                     |         |
|        |           | 1-2      |              | C3SP          | *** NOTE SEQUENCER RESET OFF (C) DEE 0006                                                                               |         |
|        |           | 1-3      |              | C3SP          | *** NOTE SEQUENCER OUTPUT ON AND PULSE OK BLINKING ONCE PER SECOND (H).                                                 |         |
|        |           | 2        | TCS          |               | S-IVB LOX REPLENISH TERMINATION<br>-----                                                                                |         |
|        |           | 2-1      |              | CCLO<br>C4PR  | *** NOTE S-IVB LOX REPL COMPLETED                                                                                       |         |
|        |           | 2-2      |              | C4OU          | *** NOTE S-IVB REPL VALVE ENABLED OFF,                                                                                  |         |
|        |           | 2-3      |              | CP02<br>C4PR  | *** NOTE S-IVB REPL (A206) CLOSED                                                                                       |         |



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| TIME    | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                         | REMARKS |
|---------|-----------|----------|--------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| - 3' 6" |           | 3-5      |              | C3PM<br>CP02  | *** NOTE S-IB UMB VENT (A204) OPEN<br><br>* *****CONTINGENCY ACTION*****<br>*<br>* 1. CP02, VERIFY S-IB FILL AND DRAIN VALVE CLOSED.<br>*<br>* 2. CCLO, MANUAL ARMING ON<br>*<br>* 3. CP02, OPEN S-IB MAIN FILL (A200)<br>*<br>* 4. CP02, OPEN S-IB UMB VENT (A204).<br>*<br>* 5. IF THE SKID OUTLET PRESSURE (3C41) EXCEEDS 25 PSIG:<br>*<br>* (A) CP03, OPEN RERLENISH LINE PRECOOL (A28749)<br>*<br>* *****<br>* |         |
|         |           | 3-6      |              | CCLO<br>CP02  | *** NOTE S-IB UMB PURGE ON<br><br>* *****CONTINGENCY ACTION*****<br>*<br>* 1. CP02, VERIFY S-IB LOX UMB VENT (A204 OR A200) OPEN;<br>*<br>* 2. CCLO, MANUAL ARMING ON<br>*<br>* 3. CP02, SELECT S-IB MAST PURGE OPEN (A61618)<br>*<br>* *****<br>*                                                                                                                                                                  |         |
|         |           | 3-7      |              | CP01          | *** NOTE LOX PUMP "PROGRAMMER LOW LIMIT" ON                                                                                                                                                                                                                                                                                                                                                                         |         |
|         |           | 3-8      |              | CP01          | *** NOTE LOX PUMP CHILDDOWN VALVES (A128/A129) OPEN                                                                                                                                                                                                                                                                                                                                                                 |         |
|         |           | 3-9      |              | CP03          | *** NOTE VAPORIZER CONTROL VALVE (A12) CLOSED                                                                                                                                                                                                                                                                                                                                                                       |         |



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VEHICLE AS-210

| TIME    | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | REMARKS  |
|---------|-----------|----------|--------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| - 3' 6" |           | 3-10     |              | CP03          | *** NOTE REPLENISH LINE DRAIN (A134) OPEN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |          |
|         |           | 4        | TCS          |               | S-IVB LM2 REPLENISH TERMINATION<br>-----                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |
|         |           | 4-1      |              | CCLH<br>C4PR  | *** NOTE S-IVB REPLENISH COMPLETED ON                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |
|         |           | 4-2      |              | C4HU          | *** NOTE S-IVB REPLENISH VALVE (A3311) CLOSES, IF IN MANUAL REPLENISH PERFORM THE FOLLOWING:<br><br>1. MANUALLY PLACE OVERRIDE SWITCH TO OVERRIDE CLOSE POSITION.<br><br>2. PLACE THUMBWHEELS TO 00 AND OVERRIDE SWITCH TO NORMAL.<br><br>3. PLACE REPLENISH VALVE AUTO - MANUAL SWITCH TO AUTO POSITION.<br><br>* *****CONTINGENCY ACTION***** *<br>* 1. C4HU, ISSUE OVERRIDE CLOSE COMMAND *<br>* 2. IF CLOSED INDICATION NOT RECEIVED, *<br>* (A) CCLH, PLACE MANUAL ARMING SWITCH ON, *<br>* (B) CPH1, VERIFY S-IVB FILL VALVE (A3321) AND S-IVB FILL AND DRAIN VALVE CLOSED, *<br>* (C) CPH1, OPEN S-IVB UMBILICAL LINE DRAIN VALVE (A3317), *<br>* (D) CPH1, OPEN S-IVB UMBILICAL LINE PURGE VALVE (A11773). *<br>* ***** | XB122-43 |



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| TIME  | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                                                                                                                      | REMARKS |
|-------|-----------|----------|--------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 1:43" |           | 1        | TCS          |               | END S-IB LOX BUBBLING<br>-----<br>START S-IB LOX PRESSURIZING<br>-----                                                                                                                                                                                                           |         |
|       |           | 1-1      |              | C3FR          | *** NOTE TIME TO END LOX BUBBLING ON (C)<br>DEE 0051                                                                                                                                                                                                                             |         |
|       |           | 1-2      |              | C3FR<br>C3CT  | *** NOTE S-IB LOX PRESSURIZING VALVE<br>OPEN ON (C) DEE 0053<br><br>* *****CONTINGENCY ACTION*****<br>*<br>* 1. C3CT, VERIFY LOX FILL & DRAIN<br>* VALVE OPEN-OFF<br>*<br>* 2. C3CT, LEAK TEST ON<br>*<br>* 3. C3CT, LOX PRESSURIZING VALVE OPEN<br>*<br>* *****<br>*<br>* ***** |         |
| 1:37" |           |          |              |               |                                                                                                                                                                                                                                                                                  |         |
| 1:12" |           | 1        | TCS          |               | S-IVB LH2 VENT LINE PURGE<br>-----                                                                                                                                                                                                                                               |         |
|       |           | 1-1      |              | CPH1          | *** NOTE S-IVB SERVICE ARM PURGE VALVE<br>(A2983) OPEN<br><br>* *****CONTINGENCY ACTION*****<br>*<br>* 1. CCLM, MANUAL ARMING SWITCH ON,<br>*<br>* 2. CPH1, INITIATE MANUAL A2983 OPEN<br>* COMMAND.<br>*<br>* *****                                                             |         |



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 VEHICLE

| TIME  | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                | DESCRIPTION                                                                                        | REMARKS |
|-------|-----------|----------|--------------|------------------------------|----------------------------------------------------------------------------------------------------|---------|
| 1:00" |           | 1        |              |                              | DELETED                                                                                            | B20-42  |
|       |           | 1-1      |              |                              | DELETED                                                                                            | B20-42  |
| 0:50" |           | 1        | TCS          |                              | POWER TRANSFER INTERNAL<br>-----                                                                   |         |
|       |           | 1-1      |              | C3PP                         | *** NOTE CALORIMETER PURGE ON (C) DEE 0075                                                         |         |
|       |           | 1-2      |              | C3NP<br>C4DE<br>C4NP<br>CUNP | *** NOTE POWER TRANSFER COMPLETE (S-IVB DEE 1843 ON) (S-IB DEE 0150 ON)                            |         |
|       |           | 1-3      |              | CUDE                         | *** NOTE DEE 0779 AND 0777 ON, 0781 OFF                                                            |         |
|       |           | 1-4      |              | C3FR<br>CUEV                 | *** NOTE IU READY TO LAUNCH MAY CYCLE OFF THEN ON (MAX TIME ONE SECOND - DEE 0872) (S-IB DEE 0042) |         |
|       |           | 1-5      |              | CUCP                         | *** NOTE PUMP PRESSURE SWITCH ACTIVATE INDICATION OFF (DEE 0655 OFF)                               |         |
|       | 261       | 2        | C3NP         |                              | VERIFY ALL STAGES POWER TRANSFER COMPLETE ON                                                       |         |



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| TIME  | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                                                  | REMARKS |
|-------|--------------|----------|-----------------|------------------|----------------------------------------------------------------------------------------------|---------|
| 0:47" |              | 1        | TCS             |                  | PRESSURE SWITCH ACTIVATE AND GSCUIS OFF<br>-----                                             |         |
|       |              | 1-1      |                 | CUCP             | *** NOTE PUMP PRESSURE SWITCH ACTIVATE<br>INDICATION ON (DEE 0655 ON)                        |         |
|       |              | 1-2      |                 | CUCP             | *** NOTE GSCU ON INDICATION OFF (DEE<br>0658/0874 OFF)                                       |         |
|       |              |          |                 |                  | * *****CONTINGENCY ACTION***** *                                                             |         |
|       |              |          |                 |                  | * 1. CUCP, HAVE CUPP TURN GROUND                                                             |         |
|       |              |          |                 |                  | * COOLING POWER SWITCH - OFF                                                                 |         |
|       |              |          |                 |                  | * *****                                                                                      |         |
| 0:40" |              | 1        | TCS             |                  | S-IVB TIME FOR DIRECTIONAL VENT TO<br>FLIGHT POSITION<br>-----                               |         |
|       |              | 1-1      |                 | C4SP<br>C4DE     | *** NOTE S-IVB DIRECTIONAL VENT TO<br>FLIGHT POSITION (C) AND (D) DEE 1714<br>OR DEE 1721 ON |         |
|       |              | 1-2      |                 | C4TC<br>C4DE     | *** NOTE S-IVB READY FOR LAUNCH (C) DEE<br>1966 ON                                           |         |
|       |              | 1-3      |                 |                  | DELETED                                                                                      | B20-42  |



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| TIME  | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                       | REMARKS |
|-------|--------------|----------|-----------------|------------------|---------------------------------------------------|---------|
| 0:30" |              | 1        |                 |                  | DELETED                                           | B20-42  |
|       |              | 1-1      |                 |                  | DELETED                                           | B20-42  |
|       |              | 2        | TCS             |                  | LSE INHIBIT<br>-----                              |         |
|       |              | 2-1      |                 | CSAC             | *** NOTE T-30 LSE INHIBIT ON (DEE 3959 ON)        |         |
| 0:28" |              | 1        | TCS             |                  | S-1B ENGINE PURGE COMMAND<br>-----                |         |
|       |              | 1-1      |                 | C3FR<br>R3RM     | *** NOTE TIME FOR ENGINE PURGE ON (C)<br>DEE 0067 |         |
|       |              |          |                 |                  | *****CONTINGENCY ACTION*****                      |         |
|       |              |          |                 |                  | * 1. R3RM, IF NO RISE IN XD35-1 THRU              |         |
|       |              |          |                 |                  | * XD35-8 IS OBSERVED BY T-23                      |         |
|       |              |          |                 |                  | * SECONDS, REQUEST C3FP TO TURN ON                |         |
|       |              |          |                 |                  | * GG LOX INJECTOR PURGE AND LOX DOME              |         |
|       |              |          |                 |                  | * PURGE,                                          |         |
|       |              |          |                 |                  | *****                                             |         |
|       |              | 1-2      |                 | C3FR             | *** NOTE LOX PRESSURIZED (C) DEE 0054 ON          |         |
|       |              | 1-3      |                 | C3FR             | *** NOTE PROPELLANTS PRESSURIZED (C) DEE 0056 ON  |         |



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| TIME  | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                                 | REMARKS |
|-------|--------------|----------|-----------------|------------------|-----------------------------------------------------------------------------|---------|
| 0'22" | 261          | 1        | TCS             |                  | GUIDANCE REF ALERT AND INSTRUMENT<br>-----<br>HEATER_POWER DISABLE<br>----- |         |
|       |              | 2        | CUEV            |                  | VERIFY GUIDANCE ALERT. (DEE 0370 ON)                                        |         |
|       |              | 2-1      |                 | C3FR             | *** NOTE IU READY FOR LAUNCH - OFF (C)<br>DEE 0042 - OFF                    |         |
|       |              | 2-2      |                 | C3FR             | *** NOTE PREPS COMPLETE - OFF (C) DEE<br>0353.                              |         |
|       |              | 2-3      |                 |                  | DELETED                                                                     | B20-42  |
| 0'17" | 261          | 1        | TCS             |                  | GUIDANCE REF RELEASE<br>-----                                               |         |
|       |              | 2        | CUEV            |                  | VERIFY GUIDANCE RELEASE (DEE 0869 ON).                                      |         |
|       |              | 2-1      |                 | C3FR             | *** NOTE IU READY FOR LAUNCH - ON (C)<br>DEE 0042 - ON                      |         |
|       | 263          | 2-2      |                 | C3FR             | *** NOTE PREPS COMPLETE - ON (C) DEE<br>0353                                |         |
|       |              | 3        | RLDE            |                  | GRR OCCURRED AT        SEC        MS<br>-----                               |         |
| 0'15" | 263          | 4        | HFLT            |                  | VERIFY RECEIPT OF GRR TIME                                                  |         |
|       |              | 1        |                 | C3FR<br>C3FR     | *** NOTE GG LOX INJECTOR PURGE ON (C)<br>DEE 0072 ON                        | C64-20  |



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VEHICLE AS-210

| TIME  | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA.     | DESCRIPTION                                                                                                              | REMARKS |
|-------|--------------|----------|-----------------|----------------------|--------------------------------------------------------------------------------------------------------------------------|---------|
| 0'12" |              | 1        |                 | C3FR<br>C3FP         | *** NOTE LOX DOME PURGE ON (C) DEE 0073 ON                                                                               | C64-20  |
| 0'11" |              | 1        |                 | C3FR                 | *** NOTE TC FUEL INJECTOR PURGE ON (C) DEE 0071 ON                                                                       |         |
|       | 261          | 2        | C3FR            | ALL                  | READY FOR IGNITION IS ON (C) DEE 0153                                                                                    | C64-20  |
| 0' 8" |              | 1        | TCS             |                      | SHORT CABLE MASTS 2 AND 4 FIRING RETRACT<br>-----<br>VALVES NO, 1 OPEN<br>-----                                          |         |
|       |              | 1-1      |                 | C3FA                 | *** NOTE SCM 2 & 4 VALVE 1 OPEN ON (D) DEE 4127 & 4126 ON                                                                |         |
| 0' 5" |              | 1        | TCS             |                      | S-IB, S-IVB RSCR PD BLOCK OFF, ARM S-IB<br>-----<br>CONAX SQUIBS, DISABLE PREMATURE IGNITION<br>-----<br>CUTOFF<br>----- |         |
|       |              | 1-1      |                 | C3DP<br>C4DP<br>C4DE | *** NOTE RSCR 1 & 2 PD BLOCKED OFF<br>(C) S-IB DEE 0115, 0116 = OFF<br>(C) S-IVB DEE 1673, 1674 = OFF                    |         |
|       |              | 1-2      |                 | C3EV                 | *** NOTE CONAX SAFE AND PREVALVES INHIBIT OFF (C) DEE 0847 OFF (EDS DISCRETE)                                            |         |



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| TIME  | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                             | REMARKS |
|-------|--------------|----------|-----------------|------------------|-------------------------------------------------------------------------|---------|
| A3 LV |              |          |                 |                  |                                                                         |         |
| 261   |              | 11       | GLTC            | C3NP             | IGNITION SAFE/ARM TO SAFE                                               |         |
| 261   |              | 12       | GLTC            | C4VN             | ML BLOCK INHIBIT ON                                                     |         |
|       |              | 12-1     |                 | BGCC             | *** NOTE COMPUTER IN GO MODE                                            |         |
|       |              | 13       |                 | C4EP             | THRUST CHAMBER CHILLDOWN SUPPLY CLOSED<br>THEN AUTO                     |         |
| 261   |              | 14       | GLTC            | C3SP             | SEQUENCER TO SAFE AND SEQUENCER POWER TO<br>OFF THEN AUTO               |         |
| 261   |              | 15       | GLTC            | C3DP<br>C4DP     | S&A - SAFE                                                              |         |
| 261   |              | 16       | GLTC            | C3HY             | S-1B HYDRAULIC PUMP ENABLE AND HYDRAULIC<br>SYSTEMS 1, 2, 3 & 4 TO OFF  |         |
| 261   |              | 17       | GLTC            | CUSW             | VERIFY LVDA/ESE TO ESE                                                  |         |
| 261   |              | 18       | GLTC            | CHCU             | START CIRCUIT BYPASS SWITCHES OFF                                       |         |
|       |              | 18-1     |                 | CLDE             | *** NOTE DEE-6 (1482, 1485, 4221, 4222)<br>OFF                          |         |
| 261   |              | 19       | GLTC            | CSCT             | FUEL PRESSURIZING VALVE TO CLOSE                                        |         |
| 261   |              | 20       | GLTC            | C3NP             | FUNCTION SELECTOR - PRELAUNCH                                           |         |
| 261   |              | 21       | GLTC            | CUSP             | S-1VB COAST TEST MODE - ON                                              |         |
| 261   |              | 22       | GLTC            | CUSP             | VERIFY FLIGHT CONTROL SYSTEM IN SAFE<br>CONFIGURATION FOR LADDER DRIFT. |         |



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VEHICLE AS-210

| TIME  | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                      | REMARKS |
|-------|-----------|----------|--------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| A3 LV |           | 23       | CLTC         |               | *****CAUTION*****<br>* IF CUTOFF IS DUE TO *<br>* PREMATURE IGNITION OR *<br>* OCCURS AFTER IGNITION *<br>* COMMAND, PERFORM THE *<br>* FOLLOWING SUBSEQUENCES *<br>* *<br>***** |         |
|       | 261       | 23-1     | CLTC         | C3FP          | OPERATE BOATTAIL DELUGE PURGE TO ON AND/OR VERIFY ON                                                                                                                             |         |
|       | 261       | 23-2     | CLTC         | C3FP          | ALL EIGHT PREVALVE SWITCHES TO CLOSED                                                                                                                                            |         |
|       | 261       | 23-3     | CLTC         | C3FP          | ALL PREVALVES ENABLE SWITCH TO CLOSE                                                                                                                                             |         |
|       | 261       | 23-4     | CLTC         | C3FP          | LOX DOME PURGE ON (TO REMAIN ON 15 SECONDS MINIMUM AFTER CUTOFF)                                                                                                                 |         |
|       | 261       | 23-5     | CLTC         | C3FP          | GG LOX INJECTOR PURGE ON (TO REMAIN ON 10 MINUTES MINIMUM AFTER CUTOFF)                                                                                                          |         |
|       | 261       | 24       | CLTC         | C4AL          | APS ENGINE POWER - OFF                                                                                                                                                           |         |
|       | 261       | 25       | CLTC         | C3SP          | RESET CUTOFF.                                                                                                                                                                    |         |
|       | 261       | 26       | CLTC         | C3FP          | VERIFY CUTOFF START - OFF                                                                                                                                                        |         |
|       | 261       | 27       | CLTC         | CLVN          | ML COMPUTER INHIBIT TO AUTO                                                                                                                                                      |         |
|       |           | 27-1     |              | BGCC          | *** NOTE COMPUTER IN GG MODE.                                                                                                                                                    |         |
|       |           | 28       |              |               | DELETED                                                                                                                                                                          | B20-42  |
|       |           | 29       |              | C4SP          | *** NOTE DIRECTIONAL VENT IN GROUND POSITION AND LH2 VENT OPEN,                                                                                                                  |         |
|       |           | 30       |              | C4SP          | AT C4PS COMMAND, LOX TANK VENT OPEN                                                                                                                                              |         |
|       |           | 30-1     |              | CLTK          | *** NOTE TERMINATE IATS IF EXECUTING                                                                                                                                             |         |



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| TIME  | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                                           | REMARKS |
|-------|-----------|----------|--------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| A4 LV |           |          |              |               |                                                                                                                                                                                                       |         |
|       | 231       | 27-15    | G3ME         | C3CT          | LEAK TEST SWITCH OFF                                                                                                                                                                                  |         |
|       | 231       | 27-16    | G3ME         | C3CT          | COMPONENT TEST POWER OFF                                                                                                                                                                              |         |
|       | 261       | 27-17    | G3ME         | CLTC          | ALL PREVALVES ARE OPEN                                                                                                                                                                                |         |
|       | 261       | 28       | CLTC         | CUES          | MODE SWITCH TO MONITOR;<br>DEPRESS LIPTOFF RESET                                                                                                                                                      |         |
|       |           | 29       |              |               | DELETED                                                                                                                                                                                               | B20-42  |
|       |           | 30       |              | CUTC<br>BGCC  | NOTE<br>-----<br><br>ADVISE CLTC OF ESTIMATED<br>TIME REQUIRED TO<br>REESTABLISH COMPUTER<br>SUPPORT.                                                                                                 |         |
|       | 261       | 31       | GLTC         | ADLI          | (IF DECISION TO SAFE WITH COMPUTER<br>SUPPORT) PERFORM ONLY SEQUENCES 42, 46,<br>47 & 52. THEN GO TO APPENDIX A3<br>SEQUENCE 31.                                                                      |         |
|       | 261       | 32       | GLTC         | CLVN          | ISSUE THE FOLLOWING MDDS ON OR OFF<br>SIMULTANEOUSLY BY SETTING UP THE DCE BIT<br>PATTERN DEFINED FOR EACH GROUP PER<br>V-21222 (ANNOUNCE OVER OIS CH 261 AS<br>EACH GROUP IS ISSUED) (NON-HAZARDOUS) | 0       |
|       |           | 32-1     |              |               | *** NOTE ALL PANEL OPERATORS PLACE<br>SWITCHES TO POSITION INDICATED IN<br>PARENTHESES AFTER EACH GROUP IS<br>ISSUED                                                                                  |         |
|       | 261       | 32-2     |              | CLVN          | GRP 1 - MUX 22, ADDRESS 13, DATA BIT<br>14 UP,<br>1334 OFF (C3NP - S-18 SAFETY SWITCHES -<br>DISARM)<br>(C3DE - DEE 0164 OFF)                                                                         |         |



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| TIME  | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                                                                                                                              | REMARKS |
|-------|-----------|----------|--------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| A4 LV |           |          |              |               |                                                                                                                                                                                                                                                                                          |         |
|       | 261       | 32-3     |              | CUVN          | GRP 2 - MUX 21, 22, ADDRESS 12.<br>DATA BIT 7 DN.<br>1807 ON (CUSP - S-IVB COAST TEST MODE - ON)                                                                                                                                                                                         |         |
|       |           | 32-4     |              | CUSP          | *** NOTE FLIGHT CONTROL IN SAFE CONFIGURATION FOR LADDER DRIFT.                                                                                                                                                                                                                          |         |
|       | 261       | 32-5     |              | CUVN          | GRP 3 - MUX 21, 22, ADDRESS 16.<br>DATA BIT 17 DN, 18 DN.<br>1913 ON (CUES-TOK INHIBIT A SW TO AUTO)<br>1914 ON (CUES-TOK INHIBIT B SW TO AUTO)                                                                                                                                          |         |
|       | 261       | 32-6     |              | CUVN          | GRP 4 - MUX 21, 22, ADDRESS 2.<br>DATA BIT 12 UP.<br>1572 OFF (C4EP - TCH CHILLDOWN SUPPLY CLOSED THEN AUTO)                                                                                                                                                                             |         |
|       | 261       | 33       | CLTC         | CUSW          | ISSUE THE OCTALS IN SEQUENCE NOTED.<br>REPORT WHEN COMPLETE.<br>S-IVB 151 (C4EP - LOX & LH2 PREVALVES OPEN THEN AUTO)<br>S-IVB 042 (C4EP - LOX CHILLDOWN PUMP OFF THEN AUTO)<br>S-IVB 153 (C4EP - LH2 CHILLDOWN PUMP OFF THEN AUTO)<br>S-IVB 074 (C4HY - FLIGHT PUMP MODE OFF THEN AUTO) |         |
|       |           | 34       |              | C4EP          | ON C4PS COMMAND, START TANK VENT/EMERGENCY DUMP OPEN                                                                                                                                                                                                                                     |         |
|       |           | 35       |              | C4ET          | USE HE CONTROL SOLENOID TO MAINTAIN ENGINE CONTROL BOTTLE PRESSURE BELOW 3400 PSIA MAX                                                                                                                                                                                                   |         |
|       |           | 36       |              | C4SP          | *** NOTE LH2 TANK VENT OPEN                                                                                                                                                                                                                                                              |         |
|       |           | 37       |              | C4SP          | AT C4PS COMMAND, LOX VENT OPEN.                                                                                                                                                                                                                                                          |         |
|       | 261       | 38       | CLTC         | CCLO          | REVERT LOX SYSTEM                                                                                                                                                                                                                                                                        |         |
|       | 261       | 39       | CLTC         | CC LH         | REVERT LH2 SYSTEM                                                                                                                                                                                                                                                                        |         |
|       | 261       | 40       | CLTC         | CHCU          | START CIRCUIT BYPASS SWITCHES - OFF                                                                                                                                                                                                                                                      |         |
|       |           | 41       |              | CLTC          | *** NOTE CUSW MUST BE COMPLETE PRIOR TO NEXT STEP                                                                                                                                                                                                                                        |         |



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| TIME   | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                                                                                                                              | REMARKS     |
|--------|--------------|----------|-----------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| APP B1 |              |          |                 |                  | APPENDIX B - DRAIN OPERATIONS<br>-----<br>PART 1 - COMPUTER SUPPORTING<br>-----<br>CONDITIONS:<br>* APPENDIX A SAFING COMPLETE<br>* ALL PERSONNEL MONITORING CHANNEL 261 |             |
|        | 181          | 1        | CLTC            | CVTS             | READY TO PROCEED WITH LV COMPUTER UP DRAIN OPERATIONS                                                                                                                    | TCPI        |
|        | 261          | 2        | CLTC            | C3DP<br>C4DP     | STATUS SYSTEMS SWITCH TO SAFE                                                                                                                                            | #           |
|        |              | 2-1      |                 | C3DP<br>C4DP     | *** NOTE RSCR POWER ON AND INTERNAL POWER INDICATIONS OFF                                                                                                                | #           |
|        | 261          | 3        | CLTC            | CLVN             | DESTRUCT SYSTEM OFF                                                                                                                                                      | #           |
|        |              | 3-1      |                 | C3DP<br>C4DP     | *** NOTE SAFETY BUS OFF                                                                                                                                                  | #           |
|        | 261          | 4        | CLTC            | C3FP             | BOATTAIL DELUGE PURGE TO OFF                                                                                                                                             |             |
|        | 261          | 5        | CLTC            | C3CT             | SECURE CALIPS SYSTEM PER V-24508 (NON-HAZARDOUS)                                                                                                                         | D           |
|        | 261          | 6        | CLTC            | C3SP             | SEQUENCER POWER OFF AND RETURN TCS KEY TO CPSS                                                                                                                           |             |
|        | 261          | 7        | CLTC            | C3PP             | DC POWER COMMIT OFF                                                                                                                                                      |             |
|        | 231          | 8        | C3FP            | R3RM             | MARK FUEL SPHERE STRIP CHART FOR EVALUATION                                                                                                                              |             |
|        | 261          | 9        | CLTC            | CUPC             | (DO NOT PERFORM IF PROCEEDING TO TYPE IV RECYCLE)<br>POWER DOWN ST-124M PER V-33011 (NON-HAZARDOUS)                                                                      | D<br>I41-54 |
|        | 261          | 10       | CLTC            | CUSP             | FCC POWER SWITCH - OFF                                                                                                                                                   |             |
|        | 261          | 11       | CLTC            | CUGA             | CONTROL EDS RATE GYRO POWER SWITCH - OFF<br>CONTROL ACCELEROMETER POWER - OFF                                                                                            |             |



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| TIME   | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                | DESCRIPTION                                                                                                              | REMARKS |
|--------|-----------|----------|--------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------|---------|
| APP B1 |           |          |              |                              |                                                                                                                          |         |
| 261    |           | 12       | CLTC         | CLGK                         | REQUEST & EXECUTE FT04 (POWER OFF LVDC/LVDA) PER V-33033, SECTION 4 (NON-HAZARDOUS)                                      | D       |
| 261    |           | 13       | CLTC         | CUPC                         | TERMINATE GE01 IF EXECUTING                                                                                              |         |
| 261    |           | 14       | CLTC         | CUES                         | MODE SWITCH TO MONITOR POSITION, THRUST OK SWITCHES A & B TO INHIBIT,                                                    |         |
| 261    |           | 15       | CLTC         | CWCP                         | RECONFIGURE THE IWS TO AN EGRESS CONFIGURATION PER V-36937 (HAZARDOUS),                                                  | D       |
|        |           | 15-1     |              | C3FP                         | *** NOTE IWS SWITCH ACTION HAS DISABLED THE BOATTAIL QUENCH.                                                             |         |
| 122    |           | 16       | CLTC         | BOSC                         | SHUTDOWN TWO INDUSTRIAL WATER ENGINES, RETAIN ONE ENGINE AT 165 PSIG UNTIL CRYO DRAIN IS COMPLETE,                       | TCPI    |
| 261    |           | 17       | CLTC         | CSPP                         | REMOVE LSE 43D100 & 43D200 FIRING POWER PER V-21194 (NON-HAZARDOUS) AND REMOVE LSE POWER OVERRIDE, REPORT WHEN COMPLETE, | D       |
| 261    |           | 18       | CLTC         | C4ET                         | CDDT ONLY                                                                                                                | *       |
|        |           |          |              |                              |                                                                                                                          | *       |
| 261    |           | 19       | CLTC         | C1TC<br>C3TC<br>C4TC<br>CUTC | CDDT ONLY                                                                                                                | *       |
| 261    |           | 20       | CLTC         | CUNP                         | CDDT ONLY                                                                                                                | *       |
| 261    |           | 21       | CVTS         | CLTC                         | CDDT ONLY                                                                                                                | * TCPI  |
| 181    |           | 22       | CLTC         | CVTS                         | CDDT ONLY                                                                                                                | * TCPI  |
| 188    |           | 23       | CLTC         | ALL                          | CDDT ONLY                                                                                                                | *       |
| 261    |           | 24       | CLTC         | GMIL                         | CDDT ONLY                                                                                                                | * TCPI  |



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| TIME   | COMM. CH. | SEQUENCE | COMMAND STA.                 | RESPONSE STA. | DESCRIPTION                                                                                                                                                           | REMARKS                    |
|--------|-----------|----------|------------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| APP B1 |           |          |                              |               |                                                                                                                                                                       |                            |
| 261    | 56        | CLTC     | C1TC<br>C3TC<br>C4TC<br>CUTC |               | VERIFY SYSTEMS SAFED & READY FOR CREW EGRESS,                                                                                                                         | #                          |
| 181    | 57        | CLTC     | CVTS                         |               | LV READY FOR CREW EGRESS.                                                                                                                                             | # TCPI                     |
| 261    | 57-1      | CUTC     | CLTC                         |               | (TYPE IV RECYCLE ONLY) REQUEST CLEARANCE FOR TWO MEN TO ENTER PAD TO OPEN THEODOLITE SHUTTER                                                                          | (FT06)<br>XB127-51         |
| 181    | 57-2      | CLTC     | CVTS                         |               | (TYPE IV RECYCLE ONLY) REQUEST CLEARANCE FOR TWO MEN TO ENTER PAD TO OPEN THEODOLITE SHUTTER                                                                          | TCPI<br>(FT06)<br>XB127-51 |
| 261    | 57-3      | CLTC     | CUTC                         |               | (TYPE IV RECYCLE ONLY) OPEN THEODOLITE HUT SHUTTER. REPORT WHEN COMPLETE.                                                                                             | (FT06)<br>XB127-51         |
| 251    | 57-4      | CUTC     | PUTO                         |               | (TYPE IV RECYCLE ONLY) OPEN THEODOLITE HUT SHUTTER. REPORT WHEN COMPLETE.                                                                                             | (FT06)<br>XB127-51         |
| 188    | 58        | CLTC     | ALL                          |               | ALL LV SYSTEMS WILL BE HELD AT THIS POINT UNTIL FLIGHT CREW EGRESS IS COMPLETE,                                                                                       | #                          |
| 181    | 59        | CVTS     | CSA9                         |               | (IF NOT ALREADY CONNECTED) RECONNECT SERVICE ARM 9 PER V-36085 (HAZARDOUS)                                                                                            | TCPI<br>D                  |
| 181    | 60        | CSA9     | CVTS                         |               | S/A 9 RECONNECTED,                                                                                                                                                    | TCPI                       |
| 181    | 61        | CVTS     | CSA9                         |               | RETURN TO CHANNEL 236,                                                                                                                                                | TCPI                       |
| 261    | 62        | CVTS     | CLTC                         |               | SC EDS POWER IS OFF                                                                                                                                                   | # TCPI                     |
| 236    | 63        | CSA9     | CSAC                         |               | S/A 9 HAS BEEN RECONNECTED, CSA9 IS NOW ACTIVE ON CHANNEL 236,                                                                                                        |                            |
| 266    | 64        | CSAC     | C1TC                         |               | S/A 9 IS RECONNECTED,                                                                                                                                                 |                            |
| 236    | 65        | CSAC     | CHCU                         |               | PLACE ONE PUMP IN STANDBY AND VERIFY OTHER PUMP IS RUNNING,                                                                                                           |                            |
|        | 66        |          |                              |               | NOTE<br>---<br>WITH FLIGHT CREW ABOARD,<br>IT WILL BE APPROXIMATELY<br>ONE HOUR BEFORE ALL<br>PERSONNEL WILL BE CLEAR OF<br>THE CONTROL AREA FOR DRAIN<br>OPERATIONS. | #                          |



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|--------|-----------|----------|--------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| APP B1 |           |          |              |                      |                                                                                                                                                        |             |
| 261    |           | 1        | CVTS         | CLTC                 | CREW EGRESS IS COMPLETE. ALL PERSONNEL ARE CLEAR OF THE CONTROL AREA. START LV DRAIN OPERATIONS;                                                       | # TCPI      |
| 261    |           | 1-1      | CLTC         | CUTC                 | (TYPE IV RECYCLE ONLY) REQUEST & EXECUTE FT06 (GIMBAL ANGLE READ)                                                                                      | XB127-51    |
| 251    |           | 1-2      | CUTC         | CUPC                 | (TYPE IV RECYCLE ONLY) REQUEST & EXECUTE FT06 (GIMBAL ANGLE READ) AND VERIFY VEHICLE ALIGNMENT BY COMPARING WITH LAST FT06 DATA. REPORT WHEN COMPLETE. | I41-54      |
| 251    |           | 1-3      | CUTC         | CUPC                 | (TYPE IV RECYCLE ONLY) AFTER VEHICLE ALIGNMENT IS SATISFAIED, POWER DOWN ST-124M SYSTEM PER V-33011 (NON-HAZARDOUS)                                    | D<br>I41-54 |
| 261    |           | 2        | CVTS         | CLTC                 | CDDT ONLY                                                                                                                                              | * TCPI      |
|        |           | 3        |              |                      | NOTE<br>---<br><br>FOR THE NEXT 15 MINUTES<br>CSAD REQUIRES EXCLUSIVE<br>CONTROL OF TV CAMERAS<br>27B AND AA3 OR AA4,                                  |             |
| 261    |           | 4        | CLTC         | C1TC                 | RECONNECT PRIMARY DAMPER                                                                                                                               |             |
| 266    |           | 5        | C1TC         | CSAC                 | RECONNECT PRIMARY DAMPER                                                                                                                               |             |
| 236    |           | 6        | CSAC         | CSAD                 | RECONNECT PRIMARY DAMPER PER V-36086, (NON-HAZARDOUS)                                                                                                  | D           |
| 121    |           | 7        | CLTC         | C1TC                 | VERIFY LOX & LH2 SYSTEMS ARE IN REVERT CONFIGURATION PER V-20132 (HAZARDOUS)                                                                           | D           |
| 261    |           | 8        | CLTC         | C4TC                 | START S-IVB PROPELLANT DRAIN PREPS PER V-30610, SECT S, PART 1 (NON-HAZARDOUS),                                                                        | D           |
| 261    |           | 9        | CLTC         | C3IP<br>C4IP<br>CUIP | ALL TM RF ASSY'S - OFF AND MARK,                                                                                                                       | #           |
| 261    |           | 10       |              | C3IP                 | TRANSMITTERS F-1 & P-1 OFF                                                                                                                             | #           |
| 261    |           | 11       |              | CUIP                 | F-1 & P-1 OFF                                                                                                                                          | #           |
| 261    |           | 12       |              | C4IP                 | P-1 OFF THEN AUTO                                                                                                                                      | #           |
| 261    |           | 13       | CLTC         | CUIP                 | F-1 TM ASSY OFF                                                                                                                                        | #           |
| 261    |           | 14       | CLTC         | C3IP                 | RACS POWER - OFF                                                                                                                                       | #           |
| 261    |           | 15       | CLTC         | ETMC<br>ETMS         | TM TAPE RECORDING OFF                                                                                                                                  | #<br>XB-120 |



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| TIME                        | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                | DESCRIPTION                                                                                                                                                                                                                          | REMARKS                      |
|-----------------------------|-----------|----------|--------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| APP B1<br>* 3 HRS<br>50' 0" |           |          |              |                              |                                                                                                                                                                                                                                      |                              |
|                             | 261       | 4        | CLTC         | C1TC<br>C3TC<br>C4TC<br>CUTC | CONTROL AREA IS OPEN FOR REQUIRED PERSONNEL,                                                                                                                                                                                         |                              |
|                             | 261       | 5        | BTIS         | CLTC                         | (NOT APPLICABLE FOR TYPE I RECYCLE) 25 TON FORKLIFTS & CABLES AT PAD GATE FOR MOVE OF ESP TO ML,                                                                                                                                     | TCPI                         |
|                             | 188       | 6        | CLTC         | ALL                          | ALL PERSONNEL TURN TO;<br>APPENDIX D PART 1 FOR TYPE I RECYCLE<br>APPENDIX D PART 1A FOR TYPE IA RECYCLE<br>APPENDIX D PART 2 FOR TYPE II RECYCLE<br>APPENDIX D PART 3 FOR TYPE III RECYCLE<br>APPENDIX D PART 4 FOR TYPE IV RECYCLE | #<br>#<br>#<br>#<br>XB127-51 |



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APPENDIX C - CONTINGENCY PROCEDURES  
-----

PART 3 - RECYCLE FOR MISSED TCS START  
-----

THIS APPENDIX INCLUDES THE NECESSARY OPERATIONS TO RECYCLE IF THE TCS FIRING COMMAND IS NOT INITIATED AT T-3 MIN 07 SEC AND GE01 IS PASSIVE OR TERMINATED. I42-59

GENERAL EXPLANATION  
-----

A HOLD WILL BE CALLED BY C3SP IF THE TCS IS NOT STARTED. THE CLOCK WILL BE HELD, RESET TO T-4 MIN 5 SEC, THEN STARTED COUNTING DOWN TO T-4 MIN AND HELD. GE01 WILL BE RESTARTED AND THE PLATFORM WILL START DRIVING TO A NEW FIRING AZIMUTH. THE CLOCK WILL THEN BE PICKED UP AND THE COUNT RESUMED. I42-59



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| TIME       | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                                                                                                                               | REMARKS                  |
|------------|--------------|----------|-----------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| APP C3     |              |          |                 |                  | <p>APPENDIX C - CONTINGENCY PROCEDURES<br/>-----</p> <p>PART 31. RECYCLE FOR MISSED TCS START<br/>-----</p>                                                               |                          |
| 261        |              | 1        | 638P            | CLTC             | THE TCS WAS NOT INITIATED. HOLD THE COUNT CLOCK                                                                                                                           |                          |
| 181<br>261 |              | 2        | CL9C            | CVTS             | HOLD COUNTDOWN CLOCK & PRESET/RESET TO T-4 MIN & 300 COUNTDOWN/HOLDING FOR TCS RECYCLE                                                                                    | TCP1<br>I42-59<br>C69-40 |
| 261        |              | 3        | CLTC            | C3FR             | RELEASE FIRING COMMAND SWITCH AND VERIFY FIRING COMMAND ENABLED ON                                                                                                        | C69-40                   |
| 261        |              | 4        | CLTC            | C3SP             | TCS TO SAFE                                                                                                                                                               | C69-40                   |
| 261        |              | 5        | CLTC            | C3FR             | VERIFY FIRING COMMAND ENABLED OFF                                                                                                                                         | C69-40                   |
| 261        |              | 6        | CLTC            | C3SP             | TCS TO ARM                                                                                                                                                                | C69-40                   |
| 261        |              | 7        | CLTC            | C3EV             | VERIFY IGNITION SEQUENCING READY ON                                                                                                                                       | C69-40                   |
| 261        |              | 8        | CLTC            | C3FR             | VERIFY PREPARATIONS COMPLETE ON                                                                                                                                           | C69-40                   |
| 261        |              | 9        | CLTC            | C3DE             | VERIFY DEE 2110 (T-187 CLOCK SYNC) AND DEE 3177 (TIMED OUTPUT COMMAND NO. 2) CAME ON AT T-3'07"                                                                           | C69-40                   |
|            |              | 10       | CLTC            |                  | *** NOTE IF DEE'S 2110 & 3177 DID NOT COME ON, PERFORM THE FOLLOWING SUBSEQUENCE                                                                                          | C69-40                   |
| 261        |              | 10-1     | CLTC            | RUIR             | INSTALL A 1 AMP FUSED SWITCH JUMPER FROM 603-1122A1-J11/A TO J13/D AND FROM 603-1122A1-J11/B TO J13/E. LEAVE SWITCH #1 OPEN ON THE 603-1122A2 PANEL. (INTEG. ESE SH. 105) |                          |
|            |              |          |                 |                  | VERIFICATION BY LV-QAL _____                                                                                                                                              | C69-40                   |
| 261        |              | 11       | CL9C            | CLCK             | ENTER SFUNC0001/0005PKLD                                                                                                                                                  |                          |
| 181<br>261 |              | 12       | CL9C            | CVTS             | START CDC COUNTING AND HOLD AT T-4 MIN                                                                                                                                    | TCP1<br>I42-50           |
| 261        |              | 13       | CL9C            | CLVN             | VERIFY/PLACE COMPUTER TEST SWITCH ON AND VERIFY DISCRETE CYCLING                                                                                                          |                          |
| 261        |              | 14       | CL9C            | CLCK             | RESTART 0001 AND VERIFY WHEN READY FOR CDC PICK UP. (ENTER SFUNC0001/0005PLOT)                                                                                            |                          |
|            |              | 14-1     |                 | CLCK             | *** NOTE SAFE TO PICK UP CDC WHEN PLATFORM POSITION WITHIN 1 DEG OF FIRING AZIMUTH                                                                                        | C69-40                   |



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| TIME       | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                | DESCRIPTION                                                                                                                                                                              | REMARKS |
|------------|-----------|----------|--------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| APP C3     |           | 15       |              | CLCK                         | NOTE<br>----<br>IF RESTART ATTEMPT FAILS,<br>PERFORM THE FOLLOWING<br>SUBSEQUENCES                                                                                                       |         |
| 261        |           | 15-1     | CLCK         | CLTK                         | TAKE LINKER TO SEM1 AND RECALL FT42 (SPS) (SPOEXEMFT42,A7)                                                                                                                               |         |
|            |           | 15-2     |              | CLCK                         | ENTER SPX WHEN OPTION IS DISPLAYED                                                                                                                                                       |         |
|            |           | 15-3     |              | CLCK                         | *** NOTE NOTIFY CLTC WHEN FT42 IS COMPLETE AND LVDC IS IN PREPARE TO LAUNCH MODE. SAFE TO PICKUP CDC WHEN PLATFORM POSITION IS WITHIN 1 DEG OF FIRING AZIMUTH.                           | C69-40  |
| 261        |           | 15-4     | CLGK         | CLTK                         | CONTINUE IATS (ENTER \$PA)                                                                                                                                                               | C69-40  |
| 261        |           | 16       | CLTC         | C1TC<br>C3TC<br>C4TC<br>CUTC | VERIFY READY TO RESUME THE COUNT                                                                                                                                                         |         |
| 261        |           | 17       | CLTC         | RUIR                         | (IF T-187 JUMPER INSTALLED) CLOSE SWITCH #1 ON THE 603-1122A2 PANEL                                                                                                                      | C69-40  |
| 261        |           | 18       | CLTC         | C3DE                         | (IF T-187 JUMPER INSTALLED) VERIFY DEE 2110 ON (T-187 CLOCK SYNC)                                                                                                                        | C69-40  |
| 261        |           | 19       | CLTC         | C3FR                         | (IF T-187 JUMPER INSTALLED) DO NOT DEPRESS FIRING COMMAND AT T-3'10". WAIT UNTIL T-3'07" BY THE CDC DISPLAY THEN DEPRESS FIRING COMMAND AND RELEASE WHEN FIRING COMMAND INDICATION IS ON | C69-40  |
| 181<br>261 |           | 20       | CLTC         | CVTS                         | LV READY TO RESUME THE COUNT                                                                                                                                                             | TCPI    |



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| TIME   | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                           | REMARKS |
|--------|-----------|----------|--------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| APP C9 |           |          |              |               | <p>APPENDIX C - CONTINGENCY PROCEDURES<br/>           -----</p> <p>PART 9 - RECOVERY FROM LVDA TD1<br/>           -----</p>                                                           |         |
|        |           | 1        |              |               | DELETED                                                                                                                                                                               | I42-59  |
| 261    |           | 2        | CLGK         | CLTK          | TAKE LINKER TO SEMI AND CALL FT23 (SPS) (SPOEXEMFT23,A7)                                                                                                                              |         |
|        |           | 3        | CLGK         |               | ENTER SP1 WHEN OPTION IS DISPLAYED (SELECTS SUM CHECKS AFTER COMMAND TEST)                                                                                                            |         |
|        |           | 4        | CLGK         |               | ENTER SPO WHEN OPTION IS DISPLAYED (AUTO MODE - STARTS FT23)                                                                                                                          |         |
|        |           | 5        | CUNE         |               | READ VOLTAGES TO CLGK FROM RUBM RECORDERS ON 6D111 AND 6D211 PRIOR TO, DURING AND AFTER SWITCH TO BACKUP BATTERIES, ASSESS BACKUP BATTERY CONDITIONS                                  |         |
|        |           | 6        | CLGK         |               | <p>NOTE<br/>           ---S</p> <p>IF CDC IS AFTER T-12'30"<br/>           AND LVDA FIRING COMMIT<br/>           INHIBIT WAS ISSUED (D013),<br/>           PERFORM THE FOLLOWING:</p> |         |
| 261    |           | 6-1      | CLGK         | C3NP          | IGNITION SAFE/ARM TO SAFE                                                                                                                                                             |         |
| 261    |           | 6-2      | CLGK         | C3SP          | SEQUENCER TO SAFE                                                                                                                                                                     |         |
| 261    |           | 6-3      | CLGK         | C3NP          | FUNCTION SELECTOR TO PRELAUNCH                                                                                                                                                        |         |
| 261    |           | 6-4      | CLGK         | CUEV          | VERIFY IU READY TO LAUNCH INDICATION ON                                                                                                                                               |         |
| 261    |           | 6-5      | CLGK         | C3NP          | FUNCTION SELECTOR TO LAUNCH                                                                                                                                                           |         |



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| TIME                                                                  | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                              | REMARKS |
|-----------------------------------------------------------------------|-----------|----------|--------------|---------------|----------------------------------------------------------|---------|
| APP C9                                                                |           |          |              |               |                                                          |         |
| 261                                                                   |           | 6-6      | CLGK         | C3SP          | ARM TCS                                                  |         |
| 261                                                                   |           | 6-7      | CLGK         | C3NP          | IGNITION SAFE/ARM TO ARM                                 |         |
| 261                                                                   |           | 6-8      | CLGK         | C3FR          | VERIFY PREPARATION COMPLETE ON                           |         |
|                                                                       |           | 7        |              | CLGK          | ENTER SPA WHEN SUM CHECKS ARE COMPLETE (TERMINATES FT23) |         |
| 261                                                                   |           | 8        | CLGK         | CLTK          | CALL FT42 (SPDEXEMFT42,A7) (RECALLS FT42 & GE01)         |         |
|                                                                       |           | 8-1      |              | CLGK          | ENTER SPX WHEN OPTION IS DISPLAYED (EXECUTES FT42)       |         |
| 261                                                                   |           | 8-2      | CLGK         | CLTC          | FT42 COMPLETE AND LVDC IS IN PREPARE TO LAUNCH MODE      |         |
| 261                                                                   |           | 9        | CLTC         | CLTK          | RESTART LINKER (ENTER SPA)                               |         |
| 181<br>261                                                            |           | 10       | CLTC         | CVTS          | LV READY FOR COUNTDOWN CLOCK PICKUP                      | TCP1    |
| PAGES 375 THROUGH 388 INTENTIONALLY OMITTED (APPLICABLE TO CDDT ONLY) |           |          |              |               |                                                          |         |



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SECTION ADDED PER XB-121-II-41

### APPENDIX C - CONTINGENCY PROCEDURES

#### PART 14: PROPELLANT TANKS PRESSURIZATION FOR VERIFICATION OF ACCEPTABLE PRELAUNCH HGD SYSTEM INDICATIONS

PART 14A: PRESSURIZATION OF S-IB LOX TANKS

PART 14B: PRESSURIZATION OF S-IVB LOX AND LH2 TANKS

UPON CHGD REPORT THAT THE CONCENTRATION OF O2 OR H2 IN THE S-IVB STAGE OR O2 IN THE S-IB STAGE HAS EXCEEDED ONE OR MORE OF THE CONDITIONS SPECIFIED IN THE HGD SYSTEM LMR'S, CLTC WILL REQUEST CLSM FOR AN ASSESSMENT AND RECOMMENDATION. UPON CLSM RECOMMENDATION OF AN IMPLEMENTATION TIME FOR THIS APPENDIX, CLTC WILL OBTAIN CLES, CLIS, AND CLMS CONCURRENCE AND CVTS CLEARANCE AND THEN EXECUTE THE APPROPRIATE PART OF THIS APPENDIX ACCORDINGLY.



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| TIME       | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | REMARKS |
|------------|-----------|----------|--------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| PART 14A   |           |          |              |               | <p>APPENDIX C, PART 14A: PRESSURIZATION OF<br/>           -----<br/>           S-IB LOX TANKS TO FLIGHT PRESSURE FOR<br/>           -----<br/>           HGD SYSTEM CHECK OF O2 CONCENTRATION IN<br/>           -----<br/>           S-IB LOX BAYS OR ENGINE AREA<br/>           -----</p> <p>CONDITIONS:</p> <p>* EXCESSIVE O2 INDICATED IN S-IB LOX BAYS<br/>           OR ENGINE AREA</p> <p>* LOX IN ALL STAGE REPLENISH MODE</p> <p>* COUNTDOWN HAS NOT PASSED T-35 MINUTES</p> <p>* ALL NON-ESSENTIAL PERSONNEL ARE CLEAR OF THE<br/>           BLAST DANGER AREA</p> |         |
| 181        |           | 1        | CLTC         | CVTS          | LMR ----- HAS BEEN EXCEEDED. THIS LMR REQUIRES PRESSURIZATION OF THE S-IB LOX TANKS TO FLIGHT PRESSURE TO DETERMINE IF GAS CONCENTRATIONS ARE ACCEPTABLE FOR FLIGHT. REQUEST CLEARANCE TO PROCEED WITH THE CONTINGENCY PROCEDURE FOR S-IB LOX TANK PRESSURIZATION PER V-20130, VOL II, APPENDIX C, PART 14A, STARTING AT A CDC TIME OF "T" MINUS ----- MINUTES. (HAZARDOUS)                                                                                                                                                                                                 | TCPI    |
| 261        |           | 2        | CVTS         | CLTC          | LV IS CLEARED TO PROCEED WITH PROPELLANT TANKS PRESSURIZATION TO FLIGHT PRESSURE FOR CONTINGENCY TEST.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | TCPI    |
| 188<br>261 |           | 3        | CLTC         | ALL           | ALL PERSONNEL SUPPORTING THE S-IB LOX TANKS PRESSURIZATION TEST GO TO CHANNEL 232.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |         |
| 261        |           | 4        | CLTC         | C1TC<br>C3TC  | START S-IB LOX TANK PRESSURIZATION TEST PER APPENDIX C, PART 14A. (HAZARDOUS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |         |
| 261        |           | 5        | C3TC         | C3ME          | GO TO CHANNEL 232 AND START S-IB LOX TANKS PRESSURIZATION TEST PER V-20130, VOL II, APPENDIX C, PART 14A. REPORT WHEN COMPLETE.                                                                                                                                                                                                                                                                                                                                                                                                                                             |         |
| 266        |           | 6        | C1TC         | CCLO          | GO TO CHANNEL 232 AND SUPPORT THE S-IB LOX TANK PRESSURIZATION TEST PER V-20130, VOL II, APPENDIX C, PART 14A. (HAZARDOUS)                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |
| 232        |           | 7        | C3ME         | ALL           | FOLLOWING PERSONNEL REPORT READY TO SUPPORT S-IB LOX TANKS PRESSURIZATION TEST:<br><br>C3CT, R3RM, CCLO, CHGD, CLSM, C3OU, CLM3                                                                                                                                                                                                                                                                                                                                                                                                                                             |         |
| 232        |           | 8        | C3ME         | ALL           | STARTING S-IB LOX TANK PRESSURIZATION TEST PER APPENDIX C, PART 14A.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |



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| TIME     | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                             | REMARKS |
|----------|-----------|----------|--------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| PART 14A |           |          |              |               |                                                                                                                                                         |         |
| 232      |           | 9        | C3ME         | CHGD          | MONITOR THE AREA OF DETECTION AND REPORT ANY INCREASE IN O2 CONCENTRATION TO CLSM                                                                       |         |
| 232      |           | 10       | C3ME         | CCLO          | TERMINATE LOX REPLENISH TO THE S-IB STAGE                                                                                                               |         |
| 232      |           | 11       | CCLO         | C3OU          | S-IB REPLENISH VALVE A205 TO OVERRIDE CLOSE                                                                                                             |         |
| 232      |           | 12       | C3ME         | R3RM          | MONITOR LOX TANK-PRESSURE DURING TANK PRESSURIZATION TEST. REPORT STABLE AT FLIGHT PRESSURE.                                                            |         |
| 232      |           | 13       | C3ME         | C3CT          | CLOSE LOX TANK VENTS 1 & 3. START ELAPSED TIME MEASUREMENT.                                                                                             |         |
| 232      |           | 14       | C3ME         | C3CT          | CLOSE LOX TANK VENTS 2 & 4                                                                                                                              |         |
| 232      |           | 15       | C3ME         | C3CT          | CLOSE LOX TANK RELIEF VALVE                                                                                                                             |         |
| 232      |           | 16       | C3ME         | C3CT          | PLACE LEAK TEST SWITCH TO ON POSITION                                                                                                                   |         |
| 232      |           | 17       | C3ME         | C3CT          | PRESSURIZE LOX TANKS TO FLIGHT PRESSURE BY PLACING LOX TANK PRESSURIZING SWITCH TO ON POSITION. REPORT WHEN COMPLETE.                                   |         |
|          |           | 18       | C3ME         |               | NOTE<br>-----<br><br>DO NOT SECURE LOX TANK PRESSURIZING UNTIL SO DIRECTED BY CLSM OR A MAXIMUM OF TEN MINUTES HAS ELAPSED AT FLIGHT PRESSURE.          |         |
| 232      |           | 19       | CLSM         | C3ME          | HGD READINGS HAVE BEEN OBTAINED. LOX TANKS MAY BE VENTED.                                                                                               |         |
| 232      |           | 20       | C3ME         | C3CT          | SECURE LOX TANK PRESSURIZING BY PLACING LOX TANK PRESSURIZING SWITCH TO CLOSE POSITION.                                                                 |         |
| 232      |           | 21       | C3ME         | C3CT          | PLACE LEAK TEST SWITCH TO OFF POSITION                                                                                                                  |         |
| 232      |           | 22       | C3ME         | C3CT          | PLACE LOX RELIEF VALVE TO AUTO POSITION                                                                                                                 |         |
| 232      |           | 23       | C3ME         | C3CT<br>R3RM  | WHEN LOX TANK-PRESSURE FALLS BELOW 18 PSIA, PLACE LOX TANK VENTS 1 & 3 AND 2 & 4 TO AUTO POSITION. STOP ELAPSED TIME MEASUREMENT. REPORT WHEN COMPLETE. |         |



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| TIME     | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                       | REMARKS |
|----------|-----------|----------|--------------|---------------|-----------------------------------------------------------------------------------|---------|
| PART 14A |           |          |              |               |                                                                                   |         |
|          | 232       | 24       | C3ME         | CCLO          | LOX TANK PRESSURIZATION TEST IS COMPLETE. RESUME LOX REPLENISH.                   |         |
|          | 232       | 25       | CCLO         | C3OU          | S-IB REPLENISH VALVE OVERRIDE SWITCH TO NORMAL                                    |         |
|          | 232       | 26       | CCLO         | C3ME          | NORMAL REPLENISH HAS BEEN ESTABLISHED                                             |         |
|          | 266       | 27       | CCLO         | C1TC          | NORMAL REPLENISH TO THE S-IB STAGE HAS BEEN ESTABLISHED                           |         |
|          | 261       | 28       | C1TC         | CLTC          | NORMAL REPLENISH TO THE S-IB STAGE HAS BEEN ESTABLISHED                           |         |
|          | 232       | 29       | C3ME         | ALL           | S-IB LOX TANK PRESSURIZATION TEST IS COMPLETE. RETURN TO ASSIGNED CHANNELS.       |         |
|          | 231       | 30       | C3ME         | C3TC          | S-IB LOX REPLENISH HAS BEEN RESUMED. LOX TANK PRESSURIZATION TEST IS COMPLETE.    |         |
|          | 261       | 31       | C3TC         | CLTC          | S-IB LOX REPLENISH HAS BEEN RESUMED. LOX TANK PRESSURIZATION TEST IS COMPLETE.    |         |
|          | 261       | 32       | CLSM         | CLTC          | S-IB LOX TANK PRESSURIZATION TEST IS COMPLETE. RESULTS ARE AS FOLLOWS:<br>(-----) |         |
|          | 181       | 33       | CLTC         | CVTS          | S-IB LOX TANK PRESSURIZATION TEST IS COMPLETE                                     | TCPI    |



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| TIME     | COMM. CH.  | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | REMARKS |
|----------|------------|----------|--------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| PART 14B |            |          |              |               | <p>APPENDIX C, PART 14B: PRESSURIZATION OF<br/>           -----<br/>           S-IVB LOX &amp; LH2 TANKS TO FLIGHT PRESSURE<br/>           -----<br/>           FOR HGD SYSTEM CHECK OF H2 OR O2 CONCEN-<br/>           -----<br/>           TRATION IN S-IVB AFT OR FORWARD INTERSTAGE<br/>           -----</p> <p>CONDITIONS:</p> <p>* EXCESSIVE H2 OR O2 INDICATED IN S-IVB AFT<br/>           OR FORWARD INTERSTAGE</p> <p>* COUNTDOWN HAS NOT PASSED T-35 MINUTES</p> <p>* LOX AND LH2 IN ALL STAGE REPLENISH MODE</p> <p>* ALL NON-ESSENTIAL PERSONNEL ARE CLEAR OF<br/>           THE BLAST DANGER AREA</p> |         |
|          | 181        | 1        | CLTC         | CVTS          | <p>LMR ----- HAS BEEN EXCEEDED. THIS LMR REQUIRES<br/>           PRESSURIZATION OF THE S-IVB PROPELLANT TANKS TO<br/>           FLIGHT PRESSURE TO DETERMINE IF GAS CONCENTRA-<br/>           TIONS ARE ACCEPTABLE FOR FLIGHT. REQUEST<br/>           CLEARANCE TO PROCEED WITH THE CONTINGENCY<br/>           PROCEDURE FOR S-IVB PROPELLANT TANK PRESSUR-<br/>           IZATION PER V-20130, VOL II, APPENDIX C,<br/>           PART 14B, STARTING AT A CDC TIME OF "T" MINUS<br/>           ----- MINUTES. (HAZARDOUS)</p>                                                                                     | TCPI    |
|          | 261        | 2        | CVTS         | CLTC          | <p>LV IS CLEARED TO PROCEED WITH PROPELLANT TANK<br/>           PRESSURIZATION TO FLIGHT PRESSURE FOR<br/>           CONTINGENCY TEST.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | TCPI    |
|          | 188<br>261 | 3        | CLTC         | ALL           | <p>ALL PERSONNEL SUPPORTING THE S-IVB PROPELLANT<br/>           TANKS PRESSURIZATION TEST GO TO CHANNEL 242.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |
|          | 261        | 4        | CLTC         | C1TC<br>C4TC  | <p>START S-IVB PROPELLANT TANK PRESSURIZATION<br/>           TEST PER APPENDIX C, PART 14B. (HAZARDOUS)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |
|          | 266        | 5        | C1TC         | CCLO<br>CCLH  | <p>GO TO CHANNEL 242 AND SUPPORT S-IVB PROPELLANT<br/>           TANKS PRESSURIZATION TEST</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |
|          | 241        | 6        | C4TC         | C4PS          | <p>PROCEED WITH TANK PRESSURIZATION TEST</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |         |
|          | 242        | 7        | C4PS         | ALL           | <p>FOLLOWING PERSONNEL REPORT READY TO SUPPORT<br/>           S-IVB PROPELLANT TANKS PRESSURIZATION TEST:</p> <p>C4OU RLDR C4HN C4SP C4HY<br/>           CCLO CHGD CLSM CLM4 CCLH<br/>           C4EP</p>                                                                                                                                                                                                                                                                                                                                                                                                          |         |



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| TIME     | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                          | REMARKS |
|----------|-----------|----------|--------------|---------------|------------------------------------------------------------------------------------------------------|---------|
| PART 14B |           |          |              |               |                                                                                                      |         |
|          | 242       | 8        | C4PS         | CHGD          | MONITOR THE AREA OF DETECTION AND REPORT ANY INCREASE IN O2 OR H2 CONCENTRATION TO CLSM              |         |
|          | 242       | 9        | C4PS         | C4OU          | POSITION S-IVB LOX REPLENISH VALVE OVERRIDE SWITCH TO OVERRIDE CLOSE                                 |         |
|          | 242       | 10       | C4PS         | RLDR          | S-IVB LOX OVERPRESS REVERT INHIBIT SWITCH TO ON                                                      |         |
|          | 242       | 11       | C4PS         | CCLH          | REVERT LH2 SYSTEM. VERIFY NORMAL REVERT.                                                             |         |
|          | 242       | 12       | C4PS         | C4HN          | MAINTAIN HEAT EXCHANGER LEVEL BETWEEN LOW AND MAXIMUM                                                |         |
|          | 242       | 13       | C4PS         | C4SP          | CLOSE LOX VENT                                                                                       |         |
|          | 242       | 14       | C4PS         | C4SP          | OPEN LOX PREPRESS AND REPORT WHEN LOX MINIMUM LIFTOFF ILLUMINATES, THEN CLOSE LOX PREPRESS           |         |
|          | 242       | 15       | C4PS         | C4SP          | CLOSE LH2 VENT                                                                                       |         |
|          | 242       | 16       | C4PS         | C4SP          | OPEN LH2 PREPRESS AND REPORT WHEN LH2 MINIMUM LIFTOFF ILLUMINATES, THEN CLOSE LH2 PREPRESS           |         |
|          |           | 17       |              | C4PS          | START 10 MINUTES STABILIZATION PERIOD                                                                |         |
|          |           | 18       |              | C4PS<br>CLM4  | IF ACTIVATION OF LOX & LH2 RECIRC SYSTEM IS CONSIDERED ADVISABLE, PERFORM THE FOLLOWING SUBSEQUENCES |         |
|          | 242       | 18-1     | C4PS         | C4HY          | VERIFY READY FOR RECIRC PUMP OPERATION                                                               |         |
|          | 242       | 18-2     | C4PS         | C4EP          | LH2 RECIRC PUMP ON THEN AUTO                                                                         |         |
|          | 242       | 18-3     | C4PS         | C4EP          | LOX RECIRC PUMP ON THEN AUTO                                                                         |         |
|          | 242       | 18-4     | C4PS         | C4EP          | LOX AND LH2 PREVALVES TO CLOSE THEN AUTO                                                             |         |
|          | 242       | 18-5     | C4PS         | CLM4          | RECIRC SYSTEM IS IN OPERATION                                                                        |         |
|          | 242       | 18-6     | CLM4         | C4PS          | RECIRC SYSTEM MAY BE SECURED                                                                         |         |
|          | 242       | 18-7     | C4PS         | C4EP          | LOX AND LH2 PREVALVES TO CLOSE THEN AUTO                                                             |         |
|          | 242       | 18-8     | C4PS         | C4EP          | LOX RECIRC PUMP OFF THEN AUTO                                                                        |         |
|          | 242       | 18-9     | C4PS         | C4EP          | LH2 RECIRC PUMP OFF THEN AUTO                                                                        |         |
|          | 242       | 18-10    | C4PS         | CLM4          | RECIRC SYSTEM HAS BEEN SECURED                                                                       |         |



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| TIME     | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                | REMARKS |
|----------|-----------|----------|--------------|---------------|------------------------------------------------------------------------------------------------------------|---------|
| PART 14B |           |          |              |               |                                                                                                            |         |
| 242      |           | 19       | CLSM         | C4PS          | HGD READINGS HAVE BEEN OBTAINED. PROPELLANT TANKS MAY BE VENTED.                                           |         |
| 242      |           | 20       | C4PS         | C4SP          | OPEN LH2 TANK VENT. REPORT WHEN PRESSURE IS LESS THAN 18 PSIA.                                             |         |
| 242      |           | 21       | C4PS         | C4SP          | OPEN LOX VENT. REPORT WHEN AMBIENT.                                                                        |         |
| 242      |           | 22       | C4PS         | C4SP          | (IF AFTER T-1 HR 21 MIN) POSITION LOX AND LH2 VENT SWITCHES TO AUTO                                        |         |
| 242      |           | 23       | C4PS         | C4OU          | REPLENISH VALVE OVERRIDE SWITCH TO NORMAL. REPORT WHEN AUTO REPLENISH HAS BEEN ESTABLISHED.                |         |
| 242      |           | 24       | C4PS         | RLDR          | S-IVB LOX OVERPRESS REVERT INHIBIT SWITCH TO OFF                                                           |         |
| 242      |           | 25       | C4PS         | CCLH          | LH2 ULLAGE PRESSURE IS LESS THAN 16.5 PSIA. REESTABLISH LH2 LOADING PER V-20132, ADDENDUM D.3. (HAZARDOUS) |         |
| 242      |           | 26       | C4PS         | ALL           | S-IVB PROPELLANT TANK PRESSURIZATION TEST IS COMPLETE. RETURN TO ASSIGNED CHANNELS.                        |         |
| 241      |           | 27       | C4PS         | C4TC          | PROPELLANT TANKS HAVE BEEN VENTED AND PROPELLANT FLOW IS BEING REESTABLISHED                               |         |
| 261      |           | 28       | C4TC         | CLTC          | PROPELLANT TANKS HAVE BEEN VENTED AND PROPELLANT FLOW IS BEING REESTABLISHED                               |         |
| 266      |           | 29       | CCLO         | C1TC          | S-IVB LOX IS IN NORMAL REPLENISH MODE                                                                      |         |
| 266      |           | 30       | CCLH         | C1TC          | S-IVB LH2 IS IN NORMAL REPLENISH MODE                                                                      |         |
| 261      |           | 31       | C1TC         | CLTC          | S-IVB LOX AND LH2 ARE IN NORMAL REPLENISH MODES                                                            |         |
| 261      |           | 32       | CLSM         | CLTC          | S-IVB PROPELLANT TANK PRESSURIZATION TEST IS COMPLETE. RESULTS ARE AS FOLLOWS:<br>(-----)                  |         |
| 181      |           | 33       | CLTC         | CVTS          | S-IVB PROPELLANT TANK PRESSURIZATION TEST IS COMPLETE                                                      | TCPI    |



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| TIME     | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.        | DESCRIPTION                                                                                                                                                               | REMARKS |
|----------|-----------|----------|--------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| APP C15A |           |          |              |                      | CONTINGENCY FOR G0001-403 ANOMALY RECURRENCE<br>-----<br>PART A - T-21:30 HRS TO T-1:06 HRS<br>-----                                                                      | M29-B   |
| 241      |           | 1        | R4HY         | C4FS                 | G0001-403 ANOMALY HAS RECURRED                                                                                                                                            |         |
| 241      |           | 2        | R4HY         | C4FS                 | ALL HYDRAULIC PARAMETERS HAVE BEEN ANALYZED. NO ACTUAL ACTUATOR MOVEMENT CAN BE VERIFIED. (YES ___ NO ___) IF YES, PERFORM SEQUENCE 3. IF NO, PERFORM SEQUENCES 4 THRU 13 |         |
| 241      |           | 3        | C4FS         | C4TC                 | G0001-403 ANOMALY HAS RECURRED. DATA ANALYSIS INDICATES NO ACTUAL ACTUATOR MOVEMENT. RECOMMEND CONTINUING COUNT.                                                          |         |
| 241      |           | 4        | C4FS         | R4HY<br>C4HY<br>V4MS | GO ACTIVE ON CHANNEL 262 FOR G0001-403 CONTINGENCY                                                                                                                        |         |
| 262      |           | 5        | C4FS         | ALL                  | G0001-403 ANOMALY HAS RECURRED                                                                                                                                            |         |
| 262      |           | 6        | C4FS         | CUSP                 | S-IVB BURN ON                                                                                                                                                             |         |
| 262      |           | 7        | C4FS         | CUCR                 | MONITOR G0001-400                                                                                                                                                         |         |
| 262      |           | 8        | C4FS         | R4HY                 | NOTIFY CUCR AND V4MS IF ANOMALY RECURS.                                                                                                                                   |         |
| 262      |           | 9        | C4FS         | CLFK                 | NOTIFY C4FS PRIOR TO CALL UP OF ANY OF THE FOLLOWING PROGRAMS:<br>CTB1 CTB2 CTC3 CTC4 CTC5 CTB7                                                                           |         |
| 262      |           | 10       | C4FS         | CUSP                 | PRIOR TO ANY OF THE ABOVE PROGRAMS PERFORM:<br>(1) S-IVB BURN TO AUTO<br>(2) INTERRUPT A&B ON THEN AUTO                                                                   |         |
| 262      |           | 11       | CLFK         | C4FS                 | PROGARM COMPLETE                                                                                                                                                          |         |
| 262      |           | 12       | C4FS         | CUSP                 | S-IVB BURN ON                                                                                                                                                             |         |
| 262      |           | 13       | C4FS         | CUSP<br>CLFK         | PERFORM SEQ 10, 11, 12 FOR ALL PROGRAMS LISTED IN SEQUENCE 9                                                                                                              |         |
| 262      |           | 14       | C4FS         | CUSP                 | PRIOR TO IAFC PROGRAM START, PLACE S-IVB BURN TO AUTO                                                                                                                     |         |
| 262      |           | 15       | C4FS         | CUSP                 | INT A&B ON THEN AUTO                                                                                                                                                      |         |



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| TIME     | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.        | DESCRIPTION                                                                                                                                                                | REMARKS |
|----------|-----------|----------|--------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| APP C15B |           |          |              |                      | CONTINGENCY FOR G0001-403 ANOMALY RECURRENCE<br>-----<br>PART B - T-50 MINUTES TO T-20 MINUTES<br>-----                                                                    | M29-B   |
| 241      |           | 1        | R4HY         | C4FS                 | G0001-403 ANOMALY HAS RECURRED                                                                                                                                             |         |
| 241      |           | 2        | R4HY         | C4FS                 | ALL HYDRAULIC PARAMETERS HAVE BEEN ANALYZED. NO ACTUAL ACTUATOR MOVEMENT CAN BE VERIFIED. (YES ___ NO ___) IF YES, PERFORM SEQUENCE 3. IF NO, PERFORM SEQUENCES 4 THRU 14. |         |
| 241      |           | 3        | C4FS         | C4TC                 | G0001-403 ANOMALY HAS RECURRED. DATA ANALYSIS INDICATES NO ACTUAL ACTUATOR MOVEMENT. RECOMMEND CONTINUING COUNT.                                                           |         |
| 241      |           | 4        | C4FS         | R4HY<br>C4HY<br>V4MS | GO ACTIVE ON CHANNEL 262 FOR G0001-403 CONTINGENCY                                                                                                                         |         |
| 262      |           | 5        | C4FS         | ALL                  | G0001-403 ANOMALY HAS RECURRED                                                                                                                                             |         |
| 262      |           | 6        | C4FS         | CUSP                 | S-IVB BURN ON                                                                                                                                                              |         |
| 262      |           | 7        | C4FS         | CUCR                 | MONITOR G0001-400                                                                                                                                                          |         |
| 262      |           | 8        | C4FS         | R4HY                 | NOTIFY CUCR & V4MS IF ANOMALY RECURS                                                                                                                                       |         |
| 262      |           | 9        | C4FS         | CUSP                 | PLACE S-IVB BURN TO AUTO                                                                                                                                                   |         |
| 262      |           | 10       | C4FS         | CUSP                 | INT A&B ON THEN AUTO                                                                                                                                                       |         |
| 241      |           | 11       | C4FS         | C4TC                 | G0001-403 CONTINGENCY COMPLETE. REQUEST CLTK TO EXEM FT10 TO CLGK                                                                                                          |         |
| 261      |           | 12       | C4TC         | CLTC                 | REQUEST CLTK TO STOP IALL                                                                                                                                                  |         |
| 261      |           | 13       | CLTC         | CLTK                 | EXEM FT10 TO CLGK                                                                                                                                                          |         |
| 261      |           | 14       | CLTC         | CLGK                 | EXECUTE FT10 (PREDETERMINED PROFILE)                                                                                                                                       |         |
| 261      |           | 15       | CLGK         | CLTC                 | FT10 COMPLETE                                                                                                                                                              |         |
| 261      |           | 16       | CLTC         | CLTK                 | RESTART IALL                                                                                                                                                               |         |



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APPENDIX C, PART 16 - J-2 ENGINE DIODE FAILURE CONTINGENCY PROCEDURE  
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NOTE  
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THIS DIODE FAILURE WILL APPLY 28 VDC INTO THE S-IVB SWITCH SELECTOR WHEN THE ENGINE-READY LOGIC HAS BEEN ESTABLISHED AT T-1 HR 21 MIN. THIS WILL CAUSE AN ENGINE-START COMMAND (SW SEL CHAN 9) TO BE ISSUED WHENEVER THE SWITCH SELECTOR COMMANDS FOR CHAN 24 (ENGINE PUMP PURGE ON) OR CHAN 82 (PREVALVES CLOSE ON) ARE ISSUED.

J-2 IGNITION WILL NOT OCCUR BECAUSE OF THE S-IB/S-IVB SEPARATION LOGIC. THE ONLY CORRECTIVE ACTION REQUIRED, AFTER VERIFYING A DIODE FAILURE, IS FOR THE PANEL OPERATOR TO RESET THE ENGINE-START COMMAND, AFTER CHAN 24 OR CHAN 82 HAVE BEEN ISSUED.

M30-56



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| TIME     | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                 | REMARKS |
|----------|-----------|----------|--------------|---------------|-----------------------------------------------------------------------------------------------------------------------------|---------|
| APP C16  |           |          |              |               | J-2 ENGINE DIODE FAILURE CONTINGENCY PROCEDURE<br>-----                                                                     | M30-56  |
|          | 241       | 1        | C4TC         | C4PS          | MEASUREMENT K128-404 HAS BEEN REPORTED ON, AND AUX HYD PUMP COAST MODE RELAY RESET IS OFF. PROCEED WITH CONTINGENCY ACTION. |         |
| APP C16A |           |          |              |               | NOTE<br>-----                                                                                                               |         |
|          |           |          |              |               | THIS SECTION APPLICABLE BETWEEN T-1:21 HRS AND T-15 MINUTES                                                                 |         |
|          | 241       | 1        | C4PS         | V4MS          | VERIFY K128 INDICATION ON ("ON" INDICATION IS GREATER THAN 0.2 VDC)                                                         |         |
|          | 241       | 2        | C4PS         | C4ET          | ENGINE IGNITION POWER OFF, AND VERIFY ENGINE-READY INDICATION OFF, AND CUTOFF-LOCKIN INDICATION ON                          |         |
|          | 241       | 3        | C4PS         | V4MS          | VERIFY K128 DROPS TO ZERO                                                                                                   |         |
|          | 241       | 4        | C4PS         | C4ET          | ENGINE IGNITION POWER ON, AND VERIFY ENGINE-READY INDICATION ON AND CUTOFF LOCKIN INDICATION OFF                            |         |
|          | 241       | 5        | C4PS         | V4MS          | VERIFY K128 INDICATION ON                                                                                                   |         |
|          | 241       | 6        | C4PS         | C4ET          | ENGINE CONTROL POWER OFF AND VERIFY ENGINE-READY INDICATION OFF                                                             |         |
|          | 241       | 7        | C4PS         | V4MS          | VERIFY K128 DROPS TO ZERO                                                                                                   |         |
|          | 241       | 8        | C4PS         | C4ET          | ENGINE CONTROL POWER ON, AND VERIFY ENGINE-READY INDICATION ON                                                              |         |
|          | 241       | 9        | C4PS         | V4MS          | VERIFY K128 INDICATES ON                                                                                                    |         |
|          | 241       | 10       | C4PS         | C4EP          | PREVALVES CLOSE, OPEN, THEN AUTO                                                                                            |         |
|          | 241       | 11       | C4PS         | C4ET          | VERIFY ENGINE START RELAY RESET INDICATION OFF                                                                              |         |
|          | 241       | 12       | C4PS         | C4ET          | ENGINE-START TO AUTO, THEN OFF; VERIFY ENGINE-START RELAY RESET INDICATION ON                                               |         |
|          | 241       | 13       | C4PS         | C4EP          | ENGINE-PUMP PURGE TO ENABLE, THEN DISABLE                                                                                   |         |
|          | 241       | 14       | C4PS         | C4ET          | VERIFY ENGINE-START RELAY RESET INDICATION OFF                                                                              |         |
|          | 241       | 15       | C4PS         | C4ET          | ENGINE-START TO AUTO, THEN OFF; VERIFY ENGINE-START RELAY RESET INDICATION ON                                               |         |



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| TIME     | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | REMARKS |
|----------|-----------|----------|--------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| APP C16A |           | 16       |              | C4ET          | <p>NOTE</p> <p>-----</p> <p>EVERYTIME A PREVALVE-CLOSE COMMAND OR ENGINE PUMP PURGE ENABLE COMMAND IS ISSUED, VERIFY ENGINE START RELAY RESET INDICATION GOES OFF, THEN POSITION ENGINE START SWITCH TO AUTO, THEN OFF, AND VERIFY ENGINE-START RELAY RESET INDICATION ON</p> <p>REPORT ACTION TAKEN TO C4PS.<br/>           (PREVALVE CLOSE COMMANDS WILL BE ISSUED AT T-1 HR 21 MIN, T-55 MIN, AND T-9 MIN 43 SEC)</p> <p>(ENGINE PUMP PURGE ENABLE IS ISSUED AT T-1 HR 21 MIN, OR POSSIBLY DURING AN EXTENDED THRUST CHAMBER CHILLDOWN)</p> |         |
| APP C16B |           |          |              |               | <p>NOTE</p> <p>-----</p> <p>THIS SECTION APPLICABLE BETWEEN T-15 MIN AND T-9 MIN 30 SEC</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |
|          | 241       | 1        | C4PS         | C4ET          | POSITION ENGINE-START SWITCH TO AUTO, THEN OFF AFTER PREVALVE-CLOSE COMMAND HAS BEEN ISSUED AT T-9 MIN 43 SEC, AND VERIFY ENGINE START RELAY RESET INDICATION ON                                                                                                                                                                                                                                                                                                                                                                               |         |
|          |           | 2        |              | C4ET          | <p>NOTE</p> <p>-----</p> <p>NO ACTION IS REQUIRED FOR A DIODE FAILURE AFTER THE PREVALVE CLOSE COMMAND HAS BEEN SENT, UNLESS AN EXTENDED THRUST CHAMBER CHILLDOWN IS IN PROGRESS AND THE ENGINE PUMP PURGE IS ENABLED.</p> <p>IF ENGINE PUMP PURGE HAS BEEN ENABLED, PERFORM CORRECTIVE ACTION DEFINED IN SEQUENCE 1.</p>                                                                                                                                                                                                                      |         |



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| TIME                        | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | REMARKS |
|-----------------------------|-----------|----------|--------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE I<br>+ 3 HRS<br>50' 0" |           |          |              |               | <p>PART 1 - TYPE I RECYCLE<br/>           -----</p> <p>SIMPLE 24 HOUR RECYCLE<br/>           -----</p> <p>CONDITIONS:</p> <ul style="list-style-type: none"> <li>* IGNITION COMMAND HAS NOT OCCURRED</li> <li>* LV DRAIN &amp; PURGE COMPLETE PER APP B</li> <li>* CSM WE VENTING NOT REQUIRED</li> <li>* SC CRYO RESERVICE NOT REQUIRED</li> <li>* ALL S/V ORDNANCE TO REMAIN CONNECTED</li> <li>* CSM FUEL CELLS TO REMAIN ACTIVATED</li> <li>* LV FLIGHT BATT REPLACEMENT NOT REQD</li> <li>* ESP INSTALLATION NOT REQUIRED</li> <li>* GH2 SYSTEMS REMAIN UP</li> </ul> |         |
|                             | 181       | 1        | CLTC         | CVTS          | LV IS STARTING TURNAROUND OPERATIONS, RESET COUNT CLOCK TO T+4 HRS 50 MIN AND CONTINUE COUNTING UP,                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | TCP1    |
| TYPE I<br>+ 4 HRS<br>50' 0" |           |          |              |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |
|                             | 261       | 1        | CVTS         | CLTC          | CHANGE SMDPS FROM 1 SWITCH MODE TO 2 SWITCH 1 VALVE MODE, REPORT WHEN COMPLETE,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | TCP1    |
|                             | 261       | 2        | CLTC         | C1TC          | CHANGE SMDPS FROM 1 SWITCH MODE TO 2 SWITCH 1 VALVE MODE, REPORT WHEN COMPLETE,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |
|                             | 266       | 3        | C1TC         | CPDC          | CHANGE SMDPS FROM 1 SWITCH MODE TO 2 SWITCH 1 VALVE MODE, REPORT WHEN COMPLETE,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |



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| TIME                      | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                | DESCRIPTION                                                                                       | REMARKS        |
|---------------------------|-----------|----------|--------------|------------------------------|---------------------------------------------------------------------------------------------------|----------------|
| TYPE I<br>4 HRS<br>50: 0" |           |          |              |                              |                                                                                                   |                |
| 261                       |           | 4        | CLTC         | C1TC<br>C3TC<br>C4TC<br>CUTC | START RECYCLE OPERATIONS AND PREP FOR MT01                                                        |                |
| 266                       |           | 5        | C1TC         | CWCP                         | START IWS RECYCLE OPERATIONS PER V-36937 (HAZARDOUS)                                              | D              |
| 231                       |           | 6        | C3TC         | U3PC                         | SECURE THE S-IB BOATTAIL DELUGE PURGE PANEL PER V-36941 (HAZARDOUS). REPORT WHEN COMPLETE.        | D              |
| 181                       |           | 7        | CLTC         | CVTS                         | REQUEST PEWE PERFORM SNIFFER CHECKS IN S-IB BOATTAIL AND BAY AREAS WHEN ACCESS DOORS ARE OPENED.  | TCPI<br>C71-53 |
| 231                       |           | 8        | C3TC         | C3IP                         | MEASUREMENT TRANSFER TO INFLIGHT.                                                                 | (MT01)         |
| 231                       |           | 9        | C3TC         | C3IP                         | MEASURING RATE GYRO SWITCH ON                                                                     | (MT01)         |
| 251                       |           | 10       | CUTC         | CUIP                         | MEASUREMENT TRANSFER AUTO, S-IVB COAST TEST - AUTO, (60X-607A6 - CCIS PANEL).                     | (MT01)         |
| 251                       |           | 11       | CUTC         | BGCC                         | REMOVE ATOLL TAPE AND LOAD MT01 TARE ON IODC 2-9, LOAD SCRATCH TAPE ON IODC 1-3,                  | (MT01)         |
| 261                       |           | 12       | CLTC         | C1TC<br>C3TC<br>C4TC<br>CUTC | VERIFY READY FOR MT01 (LV MEAS SCAN),                                                             |                |
| 261                       |           | 13       | CLTC         | C4IP                         | PRELAUNCH CHECKOUT GROUP - ON,                                                                    | (MT01)         |
| 261                       |           | 14       | CLTC         | CLIK                         | ISSUE S-IVB ALL RACS RUN.                                                                         | (MT01)         |
| 188                       |           | 15       | CLTC         | ALL                          | STAGE MEASUREMENTS WILL BE INTERRUPTED DURING MT01,                                               |                |
| 261                       |           | 16       | CLTC         | CLIK                         | REQUEST & EXECUTE MT01 (LV MEAS SCAN),                                                            |                |
| 266                       |           | 17       | CCLH         | C1TC                         | LH2 SYSTEM COMPONENT CHECKS ARE IN WORK PER V-25418 (NON-HAZARDOUS). COMPLETION WILL BE REPORTED, | D              |



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| TIME                      | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                | DESCRIPTION                                                                      | REMARKS        |
|---------------------------|-----------|----------|--------------|------------------------------|----------------------------------------------------------------------------------|----------------|
| TYPE I<br>4 HRS<br>50' 0" |           |          |              |                              |                                                                                  |                |
|                           | 266       | 18       | CCLO         | C1TC                         | STARTING LOX SYSTEM PREPS FOR LOADING PER V-25279 (HAZARDOUS)                    | D              |
| TYPE I<br>5 HRS<br>20' 0" |           |          |              |                              |                                                                                  |                |
|                           | 231       | 1        | C3TC         | L3ME                         | EXTEND EMERGENCY ACCESS PLATFORM PER V-36136 (HAZARDOUS)                         | D              |
|                           | 261       | 2        | CVTS         | CLTC                         | THE CONTROLLED AREAS ARE OPEN FOR NORMAL WORK                                    | TCPI           |
|                           | 121       | 3        | CLTC         | CTSC                         | INSTALL SAFETY NET ON LAUNCHER AND SECURE TO HDA                                 | TCPI<br>C71-53 |
| TYPE I<br>5 HRS<br>35' 0" |           |          |              |                              |                                                                                  |                |
|                           | 231       | 0        | C3TC         | L3PM                         | INSTALL BAY LADDERS AND OPEN BAYS FOR SNIFFER CHECKS                             | C71-53         |
|                           | 261       | 1        | CLIK         | CLTC                         | LV MT01 IS COMPLETE,                                                             |                |
|                           | 261       | 2        | CLTC         | C1TC<br>C3TC<br>C4TC<br>CUTC | MT01 IS COMPLETE,                                                                |                |
|                           | 231       | 3        | C3TC         | C3IP                         | MEASUREMENT TRANSFER TO GROUND,                                                  |                |
|                           | 231       | 4        | C3TC         | C3IP                         | MEASURING RATE GYRO SWITCH OFF,                                                  |                |
|                           | 251       | 5        | CUTC         | CUIP                         | MEASUREMENT TRANSFER - OFF,<br>S-IVB COAST TEST - OFF, (60X-607A6 - CCIS PANEL), |                |
|                           | 251       | 6        | CUTC         | BGCC                         | REMOVE MT01 TAPE AND RELOAD ATOLL TAPE ON IODC 2-7,                              |                |
|                           | 241       | 7        | C4TC         | C4IP                         | PRELAUNCH CHECKOUT GROUP AUTO                                                    |                |
|                           | 241       | 8        | C4TC         | C4PU                         | VERIFY PU OVEN AND INVERTER POWER ON A MINIMUM OF 45 MINUTES,                    |                |
|                           | 241       | 9        | C4TC         | C4PS                         | VERIFY PROPELLANT TANKS PRESSURIZED FOR PU CAL CHECKS                            | (EAPU)         |
|                           | 241       | 10       | C4TC         | C4NK                         | REQUEST & EXECUTE EAPU (CONSOLE 11),                                             |                |



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AS-210

| TIME                      | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                     | REMARKS        |
|---------------------------|-----------|----------|--------------|---------------|---------------------------------------------------------------------------------------------------------------------------------|----------------|
| TYPE I<br>6 HRS<br>0' 0"  |           |          |              |               |                                                                                                                                 |                |
|                           | 231       | 1        | L3ME         | C3TC          | EMERGENCY ACCESS PLATFORM EXTENSION COMPLETE,                                                                                   |                |
|                           | 231       | 2        | C3TC         | L3PM          | VERIFY SNIFFER CHECKS COMPLETE                                                                                                  |                |
|                           | 261       | 3        | CLTC         | C3TC          | VERIFY ACCESS DOOR OPENED AND BOATTAIL AND BAYS SNIFFER CHECKS COMPLETE                                                         | C71-53         |
|                           | 261       | 4        | CVTS         | CLTC          | CPSS HAS APPROVED ACCESS TO THE S-IB BOATTAIL AND BAYS                                                                          | TCPI<br>C71-53 |
|                           | 261       | 5        | CLTC         | C3TC          | START S-IB BOATTAIL DRYOUT                                                                                                      |                |
|                           | 231       | 6        | C3TC         | L3PM          | START BOATTAIL DRYOUT                                                                                                           |                |
| TYPE I<br>6 HRS<br>5' 0"  |           |          |              |               |                                                                                                                                 |                |
|                           | 231       | 0        | C3TC         | L3PM          | START 24 HR INSPECTION PER V-24497, PART IX (NON-HAZARDOUS). REPORT WHEN COMPLETE.                                              | D<br>C71-53    |
|                           | 241       | 1        | C4TC         | C4ES          | VERIFY S-IVB PU QUICK LOOK COMPLETE,                                                                                            |                |
|                           | 241       | 2        | C4TC         | R4PU          | PU STRIP CHARTS OFF                                                                                                             |                |
|                           | 261       | 3        | C4TC         | CLTC          | EAPU (S-IVB PU CHECKS) COMPLETE,                                                                                                |                |
| TYPE I<br>8 HRS<br>0' 0"  |           |          |              |               |                                                                                                                                 |                |
|                           | 266       | 1        | CCLH         | C1TC          | LH2 SYSTEM COMPONENT CHECKS ARE COMPLETE                                                                                        |                |
| TYPE I<br>9 HRS<br>15' 0" |           |          |              |               |                                                                                                                                 |                |
|                           |           | 1        |              |               | *****CAUTION*****<br>*<br>* S-IVB STAGE AND ENGINE *<br>* HELIUM SPHERES WILL BE *<br>* PRESSURIZED TO 3000 PSI *<br>*<br>***** | M26-32         |



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VEHICLE AS-210

| TIME                        | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                            | REMARKS         |
|-----------------------------|-----------|----------|--------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| TYPE I<br>+9 HRS<br>15' 0"  | 241       | 2        | C4TC         | C4PS          | START FINAL STAGE & ENGINE SPHERE PRESSURIZATION PER V-30610, SECT Q, PART 2 (NON-HAZARDOUS), REPORT WHEN COMPLETE.                                                                    | D<br><br>M26-32 |
| TYPE I<br>+10 HRS<br>15' 0" | 266       | 1        | CCLH         | C1TC          | STARTING LH2 SYSTEM RECONFIGURATION AND FINAL PREPS FOR LOADING                                                                                                                        |                 |
| TYPE I<br>+11 HRS<br>15' 0" | 231       | 1        | L3PM         | C3TC          | 24 HOUR INSPECTION IS COMPLETE                                                                                                                                                         | C71-53          |
|                             | 231       | 2        | C3TC         | L3PM          | CLOSEOUT BAYS PER V-24522, PART IV, SEQ 7, 9, 18, 19, 25, 26 & 28 (NON-HAZARDOUS). REPORT WHEN COMPLETE.                                                                               | C71-53          |
| TYPE I<br>+12 HRS<br>15' 0" | 261       | 1        | CVTS         | CLTC          | AVO POLICY IS IN EFFECT FOR NON-TCP WORK                                                                                                                                               | TCPI            |
| TYPE I<br>+12 HRS<br>30' 0" | 231       | 1        | L3PM         | C3TC          | BOATTAIL DRYOUT COMPLETE.                                                                                                                                                              |                 |
|                             | 231       | 2        | C3TC         | L3ME          | START RETRACTION OF EMERGENCY ACCESS PLATFORM PER V-36136 (HAZARDOUS)                                                                                                                  | D               |
|                             | 261       | 3        | C3TC         | CLTC          | S-1B BOATTAIL DRYOUT IS COMPLETE, BOATTAIL CLOSEOUT IS IN PROGRESS                                                                                                                     |                 |
| TYPE I<br>+12 HRS<br>45' 0" | 261       | 1        | C1TC         | CLTC          | REQUEST THAT FIRE, SAFETY & SECURITY WILL BE ON STATION IN 1 HOUR AND READY TO SUPPORT HAZARDOUS PORTIONS OF LOX SYSTEM FINAL PREPS AND LV PROPELLANT LOADING PER V-25279 (HAZARDOUS), | D               |
|                             | 181       | 2        | CLTC         | CVTS          | REQUEST THAT FIRE, SAFETY & SECURITY WILL BE ON STATION IN 1 HOUR AND READY TO SUPPORT HAZARDOUS PORTIONS OF LOX SYSTEM FINAL PREPS AND LV PROPELLANT LOADING,                         | TCPI            |



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| TIME                       | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA.             | DESCRIPTION                                                                                        | REMARKS        |
|----------------------------|--------------|----------|-----------------|------------------------------|----------------------------------------------------------------------------------------------------|----------------|
| TYPE I<br>12 HRS<br>45' 0" | 261          | 3        | CLTC            | C1TC<br>C3TC<br>C4TC<br>CUTC | VERIFY FINAL PURGE BOX VALIDATION,                                                                 |                |
|                            | 261          | 4        | CVTS            | CLTC                         | VERIFY FINAL PURGE BOX VALIDATION,                                                                 | TCPI           |
| TYPE I<br>13 HRS<br>15' 0" | 121          | 0        | CLTC            | CTSC                         | REMOVE SAFETY NET ON LAUNCHER                                                                      | TCPI<br>C71-53 |
|                            | 231          | 1        | C3TC            | L3ME                         | VERIFY EMERGENCY ACCESS PLATFORM<br>RETRACTED                                                      |                |
|                            | 231          | 2        | C3TC            | U3PC                         | ACTIVATE THE S-IB BOATTAIL DELUGE PURGE<br>PANEL PER V=36941 (HAZARDOUS), REPORT<br>WHEN COMPLETE. | D              |
|                            | 261          | 3        | C3TC            | CLTC                         | S-IB TURNAROUND OPERATIONS ARE COMPLETE.                                                           |                |
|                            | 261          | 4        | CLTC            | C1TC<br>C3TC<br>C4TC<br>CUTC | VERIFY READY TO RESUME COUNTDOWN AT T-9<br>HOURS                                                   |                |
|                            | 181          | 5        | CLTC            | CVTS                         | LV HAS COMPLETED TURNAROUND OPERATIONS,<br>RESET COUNTCLOCK TO T-9 HRS AND START<br>COUNTING DOWN  | TCPI           |
|                            | 188          | 6        | CVTS            | PA                           | THE CLOCK WILL START ON MY MARK AT T-9<br>HRS 0 MIN 0 SEC.                                         | TCPI           |
|                            |              |          |                 |                              | 5 - 4 - 3 - 2 - 1 = MARK                                                                           | TCPI           |
|                            | 188          | 7        | CLTC            | ALL                          | ALL PERSONNEL TURN TO T-8:59 HRS, PAGE<br>143                                                      |                |



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VEHICLE

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| TIME                       | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA.             | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | REMARKS |
|----------------------------|--------------|----------|-----------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IA<br>3 HRS<br>50' 0" |              |          |                 |                              | <p>PART 1A - TYPE IA RECYCLE</p> <p>-----</p> <p>24 HOUR RECYCLE WITH BATTERY CHANGEOUT</p> <p>-----</p> <p>CONDITIONS:</p> <ul style="list-style-type: none"> <li>* IGNITION COMMAND HAS NOT OCCURRED</li> <li>* LV DRAIN AND PURGE COMPLETE PER APP B</li> <li>* ALL SV ORDNANCE TO REMAIN CONNECTED</li> <li>* CSM ME VENTING NOT REQUIRED</li> <li>* SC CRYO RESERVICB NOT REQUIRED</li> <li>* LV BATT REPLACEMENT REQUIRED</li> <li>* LV BATT ACTIVATION REQD TO START 19 HRS PRIOR TO INSTALLATION</li> <li>* MSS RETURNING TO PAD B</li> </ul> | #       |
|                            | 181          | 1        | CLTC            | CVTS                         | LV IS STARTING TURNAROUND OPERATIONS, RESET COUNT CLOCK TO T+4 HRS 50 MIN AND CONTINUE COUNTING UP,                                                                                                                                                                                                                                                                                                                                                                                                                                                   | TCPI    |
| TYPE IA<br>4 HRS<br>50' 0" |              |          |                 |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |         |
|                            | 261          | 1        | CVTS            | CLTC                         | CHANGE SMDPS FROM 1 SWITCH MODE TO 2 SWITCH 1 VALVE MODE, REPORT WHEN COMPLETE,                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | TCPI    |
|                            | 261          | 2        | CLTC            | C1TC                         | CHANGE SMDPS FROM 1 SWITCH MODE TO 2 SWITCH 1 VALVE MODE, REPORT WHEN COMPLETE,                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |         |
|                            | 266          | 3        | C1TC            | CSPP                         | REMOVE LSE POWER OVERRIDE COMMAND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |
|                            | 266          | 4        | C1TC            | CPDC                         | CHANGE SMDPS FROM 1 SWITCH MODE TO 2 SWITCH 1 VALVE MODE, REPORT WHEN COMPLETE,                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |         |
|                            | 261          | 5        | CLTC            | C1TC<br>C3TC<br>C4TC<br>CUTC | START RECYCLE OPERATIONS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |         |



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VEHICLE AS-210

| TIME                       | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                                                                                                 | REMARKS        |
|----------------------------|-----------|----------|--------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| TYPE IA<br>4 HRS<br>50' 0" | 266       | 6        | C1TC         | CWCP          | START IWS RECYCLE OPERATIONS PER V=36937 (HAZARDOUS)                                                                                                                                                                                                        | D<br>B19-37    |
|                            | 231       | 7        | C3TC         | U3PC          | SECURE THE S-IB BOATTAIL DELUGE PURGE PANEL PER V=36941 (HAZARDOUS), REPORT WHEN COMPLETE.                                                                                                                                                                  | D              |
|                            | 181       | 8        | CLTC         | CVTS          | REQUEST PEHE PERFORM SNIFFER CHECKS IN S-IVB AFT, IU/S-IVB FWD AND S-IB BOATTAIL AND BAY AREAS WHEN ACCESS DOORS ARE OPENED, (S-IB FWD ACCESS WILL REQUIRE THE MSS).                                                                                        | TCPI<br>C71-53 |
|                            |           | 8-1      |              |               | *****WARNING*****<br>*<br>* ACCESS TO THE S-IVB AFT<br>* & IU/S-IVB FWD, S-IB<br>* FWD & S-IB BOATTAIL AND<br>* BAY AREAS WILL NOT BE<br>* PERMITTED UNTIL SAFETY<br>* HAS VERIFIED THAT THE<br>* OXYGEN LEVEL IS AT<br>* LEAST 19.5 PERCENT,<br>*<br>***** | TCPI<br>C71-53 |
|                            | 114       | 9        | CLTC         | BTIS          | VERIFY READY TO SUPPORT ESP TRANSPORTER MOVE,                                                                                                                                                                                                               | TCPI           |
|                            | 231       | 10       | C3TC         | L3ME          | PREP AND MOVE ESP TRANSPORTER TO SERVICE POSITION PER V=26552 (NON-HAZARDOUS), REPORT WHEN COMPLETE.                                                                                                                                                        | D              |
|                            | 231       | 11       | C3TC         | C3IP          | MEASUREMENT TRANSFER TO INFLIGHT,                                                                                                                                                                                                                           | (MT01)         |
|                            | 231       | 12       | C3TC         | C3IP          | MEASURING RATE GYRO SWITCH ON                                                                                                                                                                                                                               | (MT01)         |
|                            | 251       | 13       | CUTC         | CUIP          | MEASUREMENT TRANSFER TO AUTO, S-IVB COAST TEST AUTO (60X-607A6 - CCIS PANEL)                                                                                                                                                                                |                |
|                            | 251       | 14       | CUTC         | BGCC          | REMOVE ATOLL TAPE AND LOAD MT01 TAPE ON IODC 2-9, LOAD SCRATCH TAPE ON IODC 1-3,                                                                                                                                                                            |                |



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| TIME                       | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA.             | DESCRIPTION                                                                                                                                                                | REMARKS |
|----------------------------|--------------|----------|-----------------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IA<br>4 HRS<br>50' 0" | 261          | 15       | CLTC            | C1TC<br>C3TC<br>C4TC<br>CUTC | VERIFY READY FOR MT01 (LV MEAS SCAN)                                                                                                                                       |         |
|                            | 261          | 16       | CLTC            | C4IP                         | PRELAUNCH CHECKOUT GROUP - ON                                                                                                                                              |         |
|                            | 261          | 17       | CLTC            | CLIK                         | ISSUE S-IVB ALL RAPS RUN.                                                                                                                                                  |         |
|                            | 188          | 18       | CLTC            | ALL                          | STAGE MEASUREMENTS WILL BE INTERRUPTED DURING MT01 (LV MEAS SCAN)                                                                                                          |         |
|                            | 261          | 19       | CLTC            | CLIK                         | REQUEST & EXECUTE MT01 (LV MEAS SCAN)                                                                                                                                      |         |
|                            | 266          | 20       | C1TC            | CSPP                         | POWER DOWN 43D100 & 43D200 FIRING SYSTEM POWER SUPPLIES.                                                                                                                   |         |
|                            | 266          | 21       | CSPP            | C1TC                         | FIRING SYSTEM POWER HAS BEEN REMOVED,                                                                                                                                      |         |
| TYPE IA<br>5 HRS<br>0' 0"  | 266          | 1        | C1TC            | CSPP                         | UNLOCK ALL POWER MODULE CIRCUIT BREAKERS, OPEN LSE OVERRIDE POWER MODULE CIRCUIT BREAKER AND TURN ON EMERGENCY LIGHTING PER V-31045 (NON-HAZARDOUS), REPORT WHEN COMPLETE. | D       |
|                            | 121          | 2        | CLTC            | BOSC                         | REPORT TO LASE IN ML ROOM 8A TO SUPPORT CLOSING CIRCUIT BREAKERS IN PANEL L-14A (200 FT LEVEL).                                                                            | TCPI    |
|                            | 266          | 3        | CCLH            | C1TC                         | LH2 SYSTEM COMPONENT CHECKS ARE IN WORK, COMPLETION WILL BE REPORTED.                                                                                                      |         |
| TYPE IA<br>5 HRS<br>20' 0" | 261          | 1        | CVTS            | CLTC                         | THE CONTROL AREAS ARE OPEN FOR NORMAL WORK.                                                                                                                                | TCPI    |
|                            | 261          | 2        | CLTC            | C1TC                         | LOWER SAFETY GATES AND EXTEND TIPS ON S/AIS 6 & 7                                                                                                                          |         |



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| TIME                       | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                | DESCRIPTION                                                                   | REMARKS |
|----------------------------|-----------|----------|--------------|------------------------------|-------------------------------------------------------------------------------|---------|
| TYPE IA<br>5 HRS<br>20' 0" | 266       | 3        | C1TC         | CSAC                         | LOWER SAFETY GATES AND EXTEND TIPS ON S/AIS 6 & 7,                            |         |
|                            | 236       | 4        | CSAC         | CSA6<br>CSA7                 | LOWER SAFETY GATES AND EXTEND ARM TIPS,                                       |         |
|                            | 251       | 5        | CUTC         | LUNW                         | ST-124M HEATERS TO STANDBY                                                    |         |
|                            |           | 6        |              |                              | DELETED                                                                       | I36-45  |
|                            | 231       | 7        | C3TC         | L3ME                         | EXTEND EMERGENCY ACCESS PLATFORM PER V-36136 (HAZARDOUS),                     | D       |
|                            | 121       | 8        | CLTC         | CTSC                         | INSTALL SAFETY NET ON LAUNCHER AND SECURE TO HDA                              | C71-53  |
| TYPE IA<br>5 HRS<br>35' 0" | 231       | 0        | C3TC         | L3PM                         | INSTALL BAY LADDERS AND OPEN BAYS FOR SNIFFER CHECKS                          | C71-53  |
|                            | 261       | 1        | CL1K         | CLTC                         | MT01 IS COMPLETE                                                              |         |
|                            | 261       | 2        | CLTC         | C1TC<br>C3TC<br>C4TC<br>CUTC | MT01 IS COMPLETE                                                              |         |
|                            | 231       | 3        | C3TC         | C3IP                         | MEASUREMENT TRANSFER TO GROUND,                                               |         |
|                            | 231       | 4        | C3TC         | C3IP                         | MEASUREMENT RATE GYRO SWITCH OFF                                              |         |
|                            | 251       | 5        | CUTC         | CUIP                         | MEASUREMENT TRANSFER - OFF<br>S-IVB COAST TEST - OFF (60X-607A6 - CCIS PANEL) |         |
|                            | 251       | 6        | CUTC         | BGCC                         | REMOVE MT01 TAPE AND RELOAD ATOLL TAPE ON IODC 2-7,                           |         |
|                            | 241       | 7        | C4TC         | C4IP                         | PRELAUNCH CHECKOUT GROUP AUTO,                                                |         |
|                            |           |          |              |                              |                                                                               |         |
|                            |           |          |              |                              |                                                                               |         |



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VEHICLE AS-210

| TIME                       | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA.     | DESCRIPTION                                                                                      | REMARKS |
|----------------------------|--------------|----------|-----------------|----------------------|--------------------------------------------------------------------------------------------------|---------|
| TYPE IA<br>5 HRS<br>40' 0" |              |          |                 |                      |                                                                                                  |         |
|                            | 251          | 1        | CUTC            | CUCP                 | VENT IU SPHERES TO 1700 PSI PER V-34017,<br>REPORT WHEN COMPLETE, (NON-HAZARDOUS)                | D       |
| TYPE IA<br>5 HRS<br>50' 0" |              |          |                 |                      |                                                                                                  |         |
|                            | 266          | 1        | C1TC            | CSAC                 | VERIFY S/A 6 & 7 TIPS EXTENDED                                                                   |         |
|                            | 261          | 2        | C1TC            | CLTC                 | S/A 6 & 7 TIPS EXTENDED,                                                                         |         |
|                            | 261          | 3        | CLTC            | C3TC<br>C4TC<br>CUTC | S/A 6 & 7 TIPS EXTENDED, CLEAR FOR<br>CARRIER SECURING AND ACCESS DOOR<br>REMOVAL.               |         |
|                            | 241          | 4        | C4TC            | S4MF                 | SAFE FORWARD CARRIER PER V-30610, SECT<br>S, PART 4 (NON-HAZARDOUS), REPORT WHEN<br>COMPLETE,    | D       |
|                            | 241          | 5        | C4TC            | S4MA                 | SAFE AFT CARRIER PER V-30610, SECT S,<br>PART 4 (NON-HAZARDOUS), REPORT WHEN<br>COMPLETE,        | D       |
| TYPE IA<br>5 HRS<br>55' 0" |              |          |                 |                      |                                                                                                  |         |
|                            | 241          | 1        | C4TC            | S4MR                 | SAMPLE PROPELLANT TANKS PER V-30610,<br>SECT S, PART 4 (NON-HAZARDOUS), REPORT<br>WHEN COMPLETE, | D       |
|                            | 241          | 2        | C4TC            | S4MA                 | REMOVE S-IVB AFT ACCESS DOOR PER<br>V-30610, SECT T, PART 2 (NON-HAZARDOUS)                      | D       |
|                            | 261          | 3        | C4TC            | CLTC                 | FORWARD CARRIER SAFED, READY FOR IU<br>DOOR REMOVAL,                                             |         |
|                            | 261          | 4        | CLTC            | CUTC                 | START REMOVAL OF IU DOOR                                                                         |         |
|                            | 251          | 5        | CUTC            | UUVN                 | START REMOVAL OF IU ACCESS DOOR PER<br>V-34046 (NON-HAZARDOUS),                                  | D       |



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| TIME                      | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                                                                                                                                                                                                                                                        | REMARKS        |
|---------------------------|--------------|----------|-----------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| TYPE IA<br>6 HRS<br>01 0" |              | 1        |                 |                  | NOTE<br>---<br><br>FOR NEXT 15 MIN CSAD<br>REQUIRES CONTROL OF TV<br>CAMERAS 26B & 27B AND AAS-3<br>OR AAS-4,                                                                                                                                                                                      |                |
|                           | 181          | 2        | CLTC            | CVTS             | VERIFY PREVAILING WINDS DO NOT EXCEED<br>REDLINE VALUES FOR FREE STANDING S/V,                                                                                                                                                                                                                     | TCPI           |
|                           |              | 2-1      |                 |                  | NOTE<br>---<br><br>REDLINE WINDSPEED IS 30 KNOTS PEAK WINDS<br>AT 530 FT ABOVE GROUND LEVEL. IF HIGHER<br>WINDS PREDICTED, DAMPER SWITCHOVER MAY<br>PROCEED ONLY IF BENDING MOMENT<br>ASSESSMENT INDICATES SATISFACTORY<br>CONDITIONS. (LO DIRECTOR'S CONCURRENCE<br>WITH ASSESSMENT IS REQUIRED), |                |
|                           | 261          | 3        | CVTS            | CLTC             | CLEAR TO DISCONNECT PRIMARY DAMPER,                                                                                                                                                                                                                                                                | TCPI           |
|                           | 115          | 4        | C4TC            | S4MM             | VERIFY MSS PLATFORM MONITORS ON STATION.                                                                                                                                                                                                                                                           |                |
|                           | 261          | 5        | CLTC            | C1TC             | DISCONNECT PRIMARY DAMPER,                                                                                                                                                                                                                                                                         |                |
|                           | 266          | 6        | C1TC            | CSAD             | DISCONNECT PRIMARY DAMPER PER V-36086<br>(NON-HAZARDOUS), REPORT WHEN COMPLETE.                                                                                                                                                                                                                    | D              |
|                           | 231          | 7        | L3ME            | C3TC             | EMERGENCY ACCESS PLATFORM EXTENSION<br>COMPLETE,                                                                                                                                                                                                                                                   |                |
|                           | 231          | 8        | C3TC            | L3PM             | REMOVE HEAT SHIELD PANEL FOR SNIFFER<br>CHECK,                                                                                                                                                                                                                                                     |                |
|                           | 261          | 9        | CVTS            | CLTC             | CPSS HAS APPROVED ACCESS TO THE S-IB<br>BOATTAIL AND BAYS                                                                                                                                                                                                                                          | TCPI<br>C71-53 |
|                           | 261          | 10       | CLTC            | C3TC             | START S-IB BOATTAIL DRYOUT                                                                                                                                                                                                                                                                         |                |
|                           | 231          | 11       | C3TC            | L3PM             | START S-IB BOATTAIL DRYOUT                                                                                                                                                                                                                                                                         |                |



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| TIME                       | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.        | DESCRIPTION                                                                                                                                    | REMARKS    |
|----------------------------|-----------|----------|--------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| TYPE IA<br>6 HRS<br>10' 0" | 231       | 0        | C3TC         | L3PM                 | START 24 HR INSPECTION PER V-24497, PART IX (NON-HAZARDOUS). REPORT WHEN COMPLETE.                                                             | D<br>C7-53 |
|                            | 241       | 1        | C4TC         | C4PS                 | S-IVB PROPELLANT TANKS HAVE BEEN SAMPLED, COMPLETE PURGE TERMINATION AND PROPULSION FINAL SECURING PER V-30610, SECT S; PART 2 (NON-HAZARDOUS) | D          |
|                            | 241       | 2        | C4TC         | S4MA                 | VERIFY S-IVB AFT DOOR REMOVED                                                                                                                  |            |
| TYPE IA<br>6 HRS<br>15' 0" | 266       | 1        | C1TC         | CSAD                 | VERIFY PRIMARY DAMPER RETRACTED AND LATCHED,                                                                                                   |            |
|                            | 261       | 2        | C1TC         | CLTC                 | PRIMARY DAMPER IS DISCONNECTED,                                                                                                                |            |
|                            | 261       | 3        | CLTC         | C3TC<br>C4TC<br>CUTC | VERIFY READY FOR MSS MATE,                                                                                                                     |            |
|                            | 181       | 4        | CLTC         | CVTS                 | PRIMARY DAMPER IS DISCONNECTED, READY FOR MSS MATE,                                                                                            | TCPI       |
|                            | 266       | 5        | C1TC         | CPDC                 | SECURE FACILITY AIR STANDBY PANEL PER V-26603 (HAZARDOUS), REPORT WHEN COMPLETE,                                                               | D          |
|                            | 241       | 6        | C4TC         | C4PU                 | VERIFY PU OVEN AND INVERTER POWER HAS BEEN ON A MINIMUM OF 45 MINUTES,                                                                         |            |
|                            | 241       | 7        | C4TC         | C4PS                 | VERIFY PROPELLANT TANKS PRESSURIZED FOR PU CAL CHECKS                                                                                          | (EAPU)     |
|                            | 261       | 8        | CLTC         | C4TC                 | CLEAR TO RUN EAPU (S-IVB PU CAL CK)                                                                                                            |            |
|                            | 241       | 9        | C4TC         | C4NK                 | REQUEST & EXECUTE EAPU (CONSOLE 11)                                                                                                            |            |
|                            | 241       | 10       | C4TC         | C4NP                 | 4D411 POWER OFF                                                                                                                                |            |
| TYPE IA<br>6 HRS<br>30' 0" | 251       | 1        | UUVN         | CUTC                 | IU ACCESS DOOR IS REMOVED,                                                                                                                     |            |



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| TIME                        | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.        | DESCRIPTION                                                                                                                          | REMARKS |
|-----------------------------|-----------|----------|--------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE I A<br>6 HRS<br>30' 0" | 241       | 2        | C4TC         | S4SY                 | VERIFY SNIFFER CHECKS COMPLETE;                                                                                                      |         |
|                             | 261       | 3        | CLTC         | C4TC<br>CUTC         | VERIFY ACCESS DOORS OPENED/REMOVED AND SNIFFER CHECKS ARE COMPLETE (IU, S-IVB AFT).                                                  |         |
|                             | 261       | 4        | CVTS         | CLTC                 | CPSS HAS APPROVED LV ACCESS THROUGH S-IVB AFT & IM DOORS.                                                                            | TCPI    |
|                             | 261       | 5        | C4TC         | C4PS                 | VERIFY PROPULSION SECURING COMPLETE                                                                                                  |         |
|                             | 241       | 6        | C4NK         | C4TC                 | S-IVB PU CALS (EAPU) COMPLETE                                                                                                        |         |
|                             | 261       | 7        | C4TC         | CLTC                 | S-IVB PU CALS (EAPU) COMPLETE, READY FOR REMOVAL OF IU STAGE POWER.                                                                  |         |
|                             | 261       | 8        | CLTC         | CUTC                 | REMOVE STAGE POWER, REPORT WHEN COMPLETE.                                                                                            |         |
|                             | 251       | 9        | CUTC         | CUNP                 | REMOVE IU STAGE POWER PER V-21223, 6D110 BUS MUST REMAIN UP TO PROVIDE SWITCH SELECTOR POWER, REPORT WHEN COMPLETE, (NON-HAZARDOUS). | D       |
|                             | 261       | 10       | CLTC         | C4TC                 | INSTALL S-IVB FWD AND AFT ACCESS KITS                                                                                                |         |
|                             | 241       | 11       | C4TC         | S4MF                 | INSTALL PARTIAL S-IVB FWD ACCESS KIT PER V-30610, SECT T, PART 1 (HAZARDOUS).                                                        | D       |
|                             | 241       | 12       | C4TC         | S4MA                 | INSTALL PARTIAL S-IVB AFT ACCESS KIT PER V-30610, SECT T, PART 3 (HAZARDOUS).                                                        | D       |
| TYPE I A<br>6 HRS<br>40' 0" | 181       | 1        | CLTC         | CVTS                 | VERIFY FIRE TRUCK IS ON STATION AND EMERGENCY EQUIPMENT IS AVAILABLE FOR LV BATTERY OPERATIONS.                                      | TCPI    |
|                             | 261       | 2        | CLTC         | C3TC<br>C4TC<br>CUTC | EMERGENCY EQUIPMENT IS AVAILABLE AND THE FIRE TRUCK IS ON STANDBY FOR BATTERY OPERATIONS.                                            |         |



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VEHICLE

AS=210

| TIME                        | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA.      | RESPONSE<br>STA.                                                                                                  | DESCRIPTION | REMARKS |
|-----------------------------|--------------|----------|----------------------|-------------------------------------------------------------------------------------------------------------------|-------------|---------|
| TYPE IA<br>11 HRS<br>30' 0" |              |          |                      |                                                                                                                   |             |         |
| 243                         | 6            | C4ES     | C4NP                 | STAGE BATTERY MONITOR TO ENABLE                                                                                   |             |         |
| 243                         | 7            | C4ES     | C4NP                 | VERIFY 4D10, 4D20, 4D30 & 4D40 BATTERY INDICATIONS ON                                                             |             |         |
| 243                         | 8            | C4ES     | C4NP                 | APPLY 4D10 LOAD AND/OR BATTERY MONITOR TO ENABLE AS REQUIRED TO STABILIZE BATTERY VOLTAGE                         |             |         |
| 243                         | 9            | C4ES     | C4NP                 | AFTER BATTERY VOLTAGES ARE RECORDED, STAGE BATTERY MONITOR TO AUTO                                                |             |         |
| 251                         | 10           | CUTC     | CUNE                 | VERIFY IU BATTERY CONNECTIONS ARE COMPLETE                                                                        |             |         |
| 251                         | 11           | CUTC     | CUPC                 | TURN ON ST-124M SYSTEM PER V=33011 (NON-HAZARDOUS)                                                                |             | D       |
| 251                         | 12           | CUTC     | CLGK                 | POWER ON LVDC/DA PER V=33033, SECT 1, REPORT WHEN COMPLETE. (LAPW, FT04, FT35, FT20, FT23 & FT08) (NON-HAZARDOUS) |             | D       |
| 251                         | 13           | CUTC     | SUVM                 | INSTALL THERMAL ISOLATION SHROUDS (LOC 4 & 5). REPORT WHEN COMPLETE.                                              |             |         |
| 231                         | 14           | L3PM     | C3TC                 | 24 HR INSPECTION IS COMPLETE                                                                                      |             | C71-53  |
| 231                         | 15           | C3TC     | L3PM                 | CLOSEOUT BAYS PER V-24522, PART IV, SEQ 7, 9, 18, 19, 25, 26 & 28 (NON-HAZARDOUS). REPORT WHEN COMPLETE.          |             | C71-53  |
| TYPE IA<br>11 HRS<br>45' 0" |              |          |                      |                                                                                                                   |             |         |
| 261                         | 1            | CVTS     | CLTC                 | MSS PLATFORM OBSERVERS ARE TO REPORT TO PVTS AT THE BASE OF THE MSS LOW RISE ELEVATOR FOR BRIEFING IN 45 MINUTES, |             | TCP1    |
| 261                         | 2            | CLTC     | C3TC<br>C4TC<br>CUTC | MSS PLATFORM OBSERVERS ARE TO REPORT TO PVTS AT THE BASE OF THE MSS LOW RISE ELEVATOR FOR BRIEFING IN 45 MINUTES, |             |         |
| TYPE IA<br>11 HRS<br>50' 0" |              |          |                      |                                                                                                                   |             |         |
| 251                         | 1            | CLGK     | CUTC                 | LVDC/DA POWER ON (LAPW) IS COMPLETE                                                                               |             |         |



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| TIME                         | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                   | REMARKS        |
|------------------------------|-----------|----------|--------------|---------------|---------------------------------------------------------------------------------------------------------------|----------------|
| TYPE IA<br>+11 HRS<br>50' 0" |           |          |              |               |                                                                                                               |                |
|                              | 251       | 2        | CUPC         | CUTC          | ST-124M POWER ON COMPLETE                                                                                     |                |
|                              | 261       | 3        | CUTC         | CLTC          | LVDC/DA AND ST-124M POWER ON COMPLETE                                                                         |                |
| TYPE IA<br>+11 HRS<br>58' 0" |           |          |              |               |                                                                                                               |                |
|                              | 241       | 1        | C4ES         | C4TC          | FORWARD & AFT BATTERY CONNECTIONS COMPLETE                                                                    |                |
|                              | 266       | 2        | C1TC         | BRFS          | VERIFY DRSCS/QSE READY TO SUPPORT LV POWER TRANSFER TEST,                                                     |                |
|                              | 181       | 3        | CLTC         | CVTS          | LV PROCEEDING WITH POWER TRANSFER TEST, REQUEST CPSS RELEASE DESTRUCT SYSTEM ENABLE KEY TO CLVN,              | TCPI           |
|                              | 261       | 4        | CLTC         | CLVN          | OBTAIN DESTRUCT SYSTEM ENABLE KEY FROM CPSS,<br><br>POWER TRANSFER TEST PREPS<br>-----                        | (IAPX)         |
|                              | 181       | 5        | CLTC         | CVTS          | VERIFY CLEARANCE TO BRING UP LOCAL RANGE SAFETY COMMAND CARRIER (PROTECTION REQUIRED),                        | TCPI<br>(IAPX) |
|                              | 261       | 6        | CLTC         | BRFS          | TAPE RECORDER ON                                                                                              | (IAPX)         |
|                              | 261       | 7        | CLTC         | C3DP<br>C4DP  | ALL SWITCHES IN AUTO POSITION EXCEPT:<br>PD RSCR ENABLE - OFF,<br>STATUS SYSTEMS SWITCH - OFF,<br>S&A - SAFE, | (IAPX)         |
|                              | 261       | 8        | CLTC         | CLVN          | DESTRUCT SYSTEM TO ENABLE,                                                                                    | (IAPX)         |
|                              |           | 8-1      |              | C3DP<br>C4DP  | *** NOTE SAFETY BUS ON,                                                                                       |                |
|                              | 261       | 9        | CLTC         | RRSC          | VERIFY DRSCS RECORDERS ON,                                                                                    | (IAPX)         |
|                              | 261       | 10       | CLTC         | ETMC<br>ETMS  | VERIFY TOE/CIF READY TO SUPPORT TEST                                                                          | XB-120         |



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| TIME                         | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                                                                                                                           | REMARKS        |
|------------------------------|-----------|----------|--------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| TYPE IA<br>+13 HRS<br>0' 0"  |           |          |              |               |                                                                                                                                                                                                                                                                                       |                |
|                              | 266       | 10       | C1TC         | CSPP          | START FINAL CLOSEOUT PER V-31045 (NON-HAZARDOUS)                                                                                                                                                                                                                                      | D              |
|                              | 261       | 11       | CVTS         | CLTC          | AVO POLICY IS IN EFFECT FOR NON-TCP WORK                                                                                                                                                                                                                                              | TCPI           |
|                              | 241       | 12       | C4TC         | S4MA          | VERIFY AFT ACCESS KIT REMOVAL COMPLETE                                                                                                                                                                                                                                                |                |
|                              | 241       | 13       | C4TC         | S4MA          | INSTALL AFT INTERSTAGE ACCESS DOOR PER V-30610, SECT M, PART 2 (NON-HAZARDOUS)                                                                                                                                                                                                        | D              |
|                              | 241       | 14       | C4TC         | S4MF          | VERIFY FORWARD ACCESS KIT REMOVAL IS COMPLETE AND READY TO INSTALL IU DOOR                                                                                                                                                                                                            |                |
|                              | 251       | 15       | C4TC         | CUTC          | S-IVB FWD AREA CLEAR FOR IU FLIGHT DOOR INSTALLATION,                                                                                                                                                                                                                                 |                |
|                              | 251       | 16       | CUTC         | SUVE          | VERIFY READY TO INSTALL IU FLIGHT DOOR,                                                                                                                                                                                                                                               |                |
|                              | 251       | 17       | CUTC         | UUVH          | INSTALL AND SECURE IU FLIGHT DOOR PER V-34046, (HAZARDOUS),                                                                                                                                                                                                                           | D              |
|                              | 251       | 18       | CUTC         | VURF          | START RF GSE SETUP PER V-28233 (PAB & VAB) (NON-HAZARDOUS)                                                                                                                                                                                                                            | D              |
|                              | 231       | 19       | C3TC         | L3PM          | VERIFY VEHICLE CLOSEOUT COMPLETE                                                                                                                                                                                                                                                      |                |
|                              | 231       | 20       | C3TC         | L3ME          | VERIFY EMERGENCY ACCESS PLATFORM RETRACTED                                                                                                                                                                                                                                            |                |
| TYPE IA<br>+13 HRS<br>15' 0" |           |          |              |               |                                                                                                                                                                                                                                                                                       |                |
|                              | 121       | 0        | CLTC         | CTSC          | REMOVE SAFETY NET ON LAUNCHER                                                                                                                                                                                                                                                         | TCPI<br>C71-53 |
|                              | 181       | 1        | CLTC         | CVTS          | VERIFY PREVAILING WINDS DO NOT EXCEED REDLINE VALUES FOR FREE STANDING SV,                                                                                                                                                                                                            | TCPI           |
|                              |           | 1-1      |              |               | NOTE<br>-9-5<br><br>REDLINE WINDSPEED IS 30 KNOTS PEAK WINDS AT 530 FT ABOVE GROUND LEVEL. IF HIGHER WINDS ARE PREDICTED, DAMPER SWITCHOVER MAY PROCEED ONLY IF BENDING MOMENT ASSESSMENT INDICATES SATISFACTORY CONDITIONS. (LO DIRECTOR'S CONCURRENCE WITH ASSESSMENT IS REQUIRED), | TCPI           |



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| TIME                          | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                | DESCRIPTION                                                                                                                                       | REMARKS |
|-------------------------------|-----------|----------|--------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE I A<br>+13 HRS<br>15' 0" |           | 2        |              |                              | NOTE<br>---<br>FOR THE NEXT 15 MINUTES<br>CSAD REQUIRES CONTROL OF TV<br>CAMERA 27B,                                                              |         |
| 261                           |           | 3        | CVTS         | CLTC                         | DISCONNECT AUX DAMPER                                                                                                                             | TCPI    |
| 261                           |           | 4        | CLTC         | C1TC                         | DISCONNECT AUX DAMPER,                                                                                                                            |         |
| 266                           |           | 5        | C1TC         | CSAC                         | DISCONNECT AUX DAMPER, REPORT WHEN COMPLETE,                                                                                                      |         |
| 236                           |           | 6        | CSAC         | CSAD                         | DISCONNECT AUX DAMPER PER V-36088 (NON-HAZARDOUS), REPORT WHEN COMPLETE,                                                                          | D       |
| 261                           |           | 7        | CVTS         | CLTC                         | VERIFY READY FOR MSS POWER TRANSFER TO ONBOARD POWER                                                                                              | TCPI    |
| TYPE I A<br>+13 HRS<br>25' 0" |           | 261      | 1            | C1TC                         | CLTC AUX DAMPER DISCONNECT COMPLETE,                                                                                                              |         |
| 261                           |           | 2        | CLTC         | C1TC<br>C3TC<br>C4TC<br>CUTC | VERIFY READY FOR MSS JACKING,                                                                                                                     |         |
| 181                           |           | 3        | CLTC         | CVTS                         | LV-QAL INSPECTION OF MSS PLATFORMS 1 & 2 PER LV-QAL-QCM-11 IS COMPLETE, AUX DAMPER IS DISCONNECTED AND LV READY FOR MSS JACKING BUT NOT FOR MOVE, | TCPI    |
| TYPE I A<br>+13 HRS<br>30' 0" |           | 231      | 1            | C3TC                         | CLTC VERIFY BTIS IS READY TO SUPPORT ESP TRANSPORTER MOVE,                                                                                        |         |
| 114                           |           | 2        | CLTC         | BTIS                         | VERIFY READY TO SUPPORT ESP TRANSPORTER MOVE,                                                                                                     | TCPI    |



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| TIME                       | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                      | REMARKS |
|----------------------------|-----------|----------|--------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE II<br>3 HRS<br>50' 0" |           |          |              |                              | <p>PART 2 - TYPE II RECYCLE</p> <p>-----</p> <p>72 HR RECYCLE WITH LV BATTERY CHANGEOUT</p> <p>-----</p> <p>AND SC CRYO RESERVICE</p> <p>-----</p> <p>CONDITIONS:</p> <p>* IGNITION HAS NOT OCCURRED</p> <p>* LV DRAIN AND PURGE COMPLETE PER APP B</p> <p>* CSM WE VENTING NOT REQUIRED</p> <p>* SC CRYO RESERVICE IS REQUIRED</p> <p>* LV FLIGHT BATT REPLACEMENT REQUIRED</p> <p>* MSS RETURNING TO PAD B</p> | #       |
|                            | 181       | 1        | CLTC         | CVTS                         | LV IS STARTING TURNAROUND OPERATIONS, RESET COUNT CLOCK TO T+4 HRS 50 MIN AND CONTINUE COUNTING UP.                                                                                                                                                                                                                                                                                                              | TCP!    |
| TYPE II<br>4 HRS<br>50' 0" |           |          |              |                              |                                                                                                                                                                                                                                                                                                                                                                                                                  |         |
|                            | 261       | 1        | CVTS         | CLTC                         | CHANGE SMDPS FROM 1 SWITCH MODE TO 2 SWITCH 1 VALVE MODE, REPORT WHEN COMPLETE,                                                                                                                                                                                                                                                                                                                                  | TCP!    |
|                            | 261       | 2        | CLTC         | C1TC                         | CHANGE SMDPS FROM 1 SWITCH MODE TO 2 SWITCH 1 VALVE MODE, REPORT WHEN COMPLETE,                                                                                                                                                                                                                                                                                                                                  |         |
|                            | 266       | 3        | C1TC         | CPDC                         | CHANGE SMDPS FROM 1 SWITCH MODE TO 2 SWITCH 1 VALVE MODE, REPORT WHEN COMPLETE,                                                                                                                                                                                                                                                                                                                                  |         |
|                            | 261       | 4        | CLTC         | C1TC<br>C3TC<br>C4TC<br>CUTC | START RECYCLE OPERATIONS,                                                                                                                                                                                                                                                                                                                                                                                        |         |



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|----------------------------|-----------|----------|--------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| TYPE II<br>4 HRS<br>50:00" | 266       | 5        | C1TC         | CWCP          | SECURE THE IWS TO STANDBY MODE PER V-36937 (HAZARDOUS)                                                                                                                                                                                                            | D              |
|                            | 231       | 6        | C3TC         | U3PC          | SECURE THE S-IB BOATTAIL DELUGE PURGE PANEL PER V-36941 (HAZARDOUS), REPORT WHEN COMPLETE.                                                                                                                                                                        | D              |
|                            | 181       | 7        | CLTC         | CVTS          | REQUEST PEHE PERFORM SNIFFER CHECKS IN S-IVB AFT, IU/S-IVB FWD, & S-IB BOATTAIL AND BAY AREAS WHEN ACCESS DOORS ARE OPENED. (S-IB FWD ACCESS WILL REQUIRE THE MSS),                                                                                               | TCP;<br>C71-53 |
|                            |           | 7-1      |              |               | *****WARNING*****<br>* ACCESS TO THE S-IVB AFT *<br>* & IU/S-IVB FWD, S-IB *<br>* FWD & S-IB BOATTAIL AND *<br>* BAY AREAS WILL NOT BE *<br>* PERMITTED UNTIL SAFETY *<br>* HAS VERIFIED THAT THE *<br>* OXYGEN LEVEL IS AT *<br>* LEAST 19.5 PERCENT. *<br>***** | TCP;<br>C71-53 |
|                            | 114       | 8        | CLTC         | BTIS          | VERIFY READY TO SUPPORT ESP TRANSPORTER MOVE.                                                                                                                                                                                                                     | TCP;           |
|                            | 231       | 9        | C3TC         | L3ME          | PREP AND MOVE ESP TRANSPORTER TO SERVICE POSITION PER V-26552 (NON-HAZARDOUS), REPORT WHEN COMPLETE.                                                                                                                                                              | D              |
|                            | 231       | 10       | C3TC         | U3PC          | SECURE S-IB PNEUMATICS PER V-36941 SEQUENCES D, PART I AND D, PART II (HAZARDOUS), REPORT WHEN COMPLETE.                                                                                                                                                          | D              |
|                            | 231       | 11       | C3TC         | C3IP          | MEASUREMENT TRANSFER TO INFLIGHT.                                                                                                                                                                                                                                 | (MT01)         |
|                            | 231       | 12       | C3TC         | C3IP          | MEASURING RATE GYRO SWITCH ON                                                                                                                                                                                                                                     | (MT01)         |
|                            | 231       | 13       | C3TC         | L3ME          | SECURE FIRING ACCESSORIES SYSTEM PER V-36136 PART VII (HAZARDOUS), REPORT WHEN COMPLETE.                                                                                                                                                                          | D              |
|                            | 251       | 14       | CUTC         | CUIP          | MEASUREMENT TRANSFER TO AUTO, S-IVB COAST TEST AUTO (60X-607A6 - CCIS PANEL)                                                                                                                                                                                      | (MT01)         |



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| TIME                      | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                      | REMARKS |
|---------------------------|-----------|----------|--------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE II<br>9 HRS<br>01 0" |           |          |              |               |                                                                                                                                                                  |         |
| 251                       |           | 5        | CUTC         | SUVM          | START PARTIAL REMOVAL OF IU THERMAL ISOLATION SHROUDS PER V-31119, PART VI, REPORT WHEN COMPLETE, (NON-HAZARDOUS)                                                | D       |
| 241                       |           | 6        | C4TC         | S4HY          | SECURE AUX HYDRAULIC SYSTEM PER V-30610, SECT U, PART 2 (NON-HAZARDOUS), REPORT WHEN COMPLETE,                                                                   | D       |
| 231                       |           | 7        | S30E         | C3TC          | HDA & SPGGI ORDNANCE IS SAFED,                                                                                                                                   |         |
| 261                       |           | 8        | C3TC         | CLTC          | HDA & SPGGI ORDNANCE IS SAFED,                                                                                                                                   |         |
| 181                       |           | 9        | CLTC         | CVTS          | HDA & SPGGI OPERATIONS COMPLETE,                                                                                                                                 | TCPI    |
| 188                       |           | 10       | CVTS         | PA            | LV HDA & SPGGI OPERATIONS ARE COMPLETE, THE S-IB AFT AND TOP OF THE PEDESTAL ARE OPEN FOR NORMAL WORK,                                                           | TCPI    |
| 231                       |           | 11       | C3TC         | L3PM          | START THRUST CHAMBER JACKET DRAIN PER V-24528 (HAZARDOUS)                                                                                                        | D       |
| 181                       |           | 12       | CLTC         | CVTS          | READY TO CLEAR THE CONTROL AREA FOR S-IB PD EBW DETONATOR DISCONNECTION                                                                                          | TCPI    |
| 188                       |           | 13       | CVTS         | PA            | ALL NON-ESSENTIAL PERSONNEL CLEAR THE CONTROL AREA FOR S-IB PD EBW DETONATOR DISCONNECTION                                                                       | TCPI    |
|                           |           | 13-1     |              |               | *****WARNING*****<br>*<br>* THE CONTROL AREA FOR<br>* S-IB PD EBW DETONATOR<br>* DISCONNECTION IS A 10<br>* FOOT RADIUS OF THE S-IB<br>* S&A UNIT.<br>*<br>***** |         |
| 261                       |           | 14       | CVTS         | CLTC          | START S-IB PD EBW DETONATOR DISCONNECTION,                                                                                                                       | TCPI    |
| 261                       |           | 15       | CLTC         | C3TC          | CONTROL AREA IS OPEN FOR PERSONNEL REQUIRED FOR S&A OPERATIONS,                                                                                                  |         |
| 231                       |           | 16       | C3TC         | S30E          | SAFE PD EBW DETONATORS PER V-29121 (HAZARDOUS), REPORT WHEN COMPLETE,                                                                                            | D       |



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|----------------------------|-----------|----------|--------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE II<br>9 HRS<br>01 0"  |           |          |              |               |                                                                                                                                           |         |
|                            | 231       | 17       | C3TC         | L3VM          | DISCONNECT PRIMACORD ADAPTERS FROM MAIN TRAIN, TEMPORARILY TAPE TO S-IVB STRUT                                                            |         |
| TYPE II<br>9 HRS<br>30 0"  |           |          |              |               |                                                                                                                                           |         |
|                            | 231       | 1        | S30E         | C3TC          | PD EBW DETONATORS ARE SAFED                                                                                                               |         |
|                            | 231       | 2        | L3VM         | C3TC          | PRIMACORD ADAPTERS ARE DISCONNECTED FROM MAIN TRAIN,                                                                                      |         |
|                            | 261       | 3        | C3TC         | CLTC          | S&A OPERATIONS ARE COMPLETE, READY TO REMOVE RF SILENCE & CONTROLLED SWITCHING,                                                           |         |
|                            | 181       | 4        | CLTC         | CVTS          | LV ORDNANCE OPERATIONS COMPLETE; LV READY TO REMOVE RF SILENCE & CONTROLLED SWITCHING                                                     | TCPI    |
|                            | 188       | 5        | CVTS         | PA            | LV ORDNANCE OPERATIONS ARE COMPLETE, RF SILENCE & CONTROLLED SWITCHING ARE NO LONGER IN EFFECT; THE CONTROL AREA IS OPEN FOR NORMAL WORK, |         |
|                            | 231       | 6        | C3TC         | L3VM          | OPEN UNIT 12 FOR SNIFFER CHECKS AND/OR BATTERY REMOVAL                                                                                    |         |
| TYPE II<br>9 HRS<br>45 0"  |           |          |              |               |                                                                                                                                           |         |
|                            | 251       | 1        | SUVM         | CUTC          | PARTIAL IU THERMAL ISOLATION SHROUD REMOVAL COMPLETE (LOCATION 4,5,6 & 21)                                                                | 136-45  |
|                            | 251       | 2        | CUTC         | SUVE          | START IU BATTERY DISCONNECTION PER V=21479, REPORT WHEN COMPLETE (NON-HAZARDOUS)                                                          | D       |
| TYPE II<br>10 HRS<br>01 0" |           |          |              |               |                                                                                                                                           |         |
|                            | 251       | 1        | CUTC         | SUVM          | REMOVE IU BATTERIES PER V=34047 (NON-HAZARDOUS),                                                                                          | D       |



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TEST NO. V=20130, APP D2  
VEHICLE AS=210

| TIME                                | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                                                                                              | REMARKS     |
|-------------------------------------|--------------|----------|-----------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| TYPE II<br>+17 HRS<br>15' 0"        |              |          |                 |                  |                                                                                                                                          | C66=27      |
|                                     |              | 2-2      |                 | L3VM             | VERIFY DEWPOINT LESS THAN -10 DEG F.                                                                                                     | C66=27      |
|                                     |              | 2-3      |                 | L3VM             | DISCONNECT MOISTURE MONITOR UNIT FROM<br>VEHICLE, CAP VEHICLE FITTING WITH<br>ATTACHED MC17704A CAP, TORQUE CAP TO<br>70-120 IN-LBS.     | C66=27      |
|                                     |              | 2-4      |                 | L3VM             | LEAK CHECK FITTING                                                                                                                       | C66=27      |
| TYPE II<br>+1 DAY<br>1 HRS<br>0' 0" |              |          |                 |                  |                                                                                                                                          |             |
|                                     | 261          | 1        | C3TC            | CLTC             | VERIFY CLEARANCE TO START S-IB STAGE<br>BATTERIES ACTIVATION,                                                                            |             |
|                                     | 231          | 2        | C3TC            | V3PE             | (19 HOURS PRIOR TO INSTALLATION) START<br>S-IB STAGE BATTERIES ACTIVATION PER<br>V-31112 (HAZARDOUS),                                    | D           |
|                                     | 261          | 3        | CLTC            | C4TC             | START S-IVB BATTERY ACTIVATION                                                                                                           |             |
|                                     |              | 4        |                 | C4TC             | START S-IVB BATTERY ACTIVATION PER<br>V-21323, V-21324, V-21529, V-21530<br>(HAZARDOUS), REPORT WHEN COMPLETE                            | D           |
| TYPE II<br>+1 DAY<br>3 HRS<br>0' 0" |              |          |                 |                  |                                                                                                                                          |             |
|                                     | 231          | 0        | C3TC            | L3PM             | START 48 HR INSPECTION PER V-24497, PART IV<br>(NON-HAZARDOUS). REPORT WHEN COMPLETE.                                                    | D<br>C71-53 |
|                                     | 188          | 1        | CVTS            | PA               | THE COUNTDOWN CLOCK HAS BEEN RESET TO -1<br>DAY 18 HOURS 30 MINUTES. THE CLOCK WILL<br>START ON MY MARK,<br><br>5 - 4 - 3 - 2 - 1 - MARK | TCPI        |



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VEHICLE AS-210

| TIME                                 | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA.             | DESCRIPTION                                                                               | REMARKS |
|--------------------------------------|--------------|----------|-----------------|------------------------------|-------------------------------------------------------------------------------------------|---------|
| TYPE II<br>1 DAY<br>14 HRS<br>01 00" |              |          |                 |                              | CSM CRYO SERVICING<br>-----                                                               |         |
|                                      | 261          | 1        | CLTC            | C1TC<br>C3TC<br>C4TC<br>CUTC | REQUEST PURGE BOX VALIDATION STATUS                                                       |         |
|                                      | 261          | 2        | CVTS            | CLTC                         | REQUEST PURGE BOX VALIDATION STATUS                                                       | TCPI    |
| TYPE II<br>1 DAY<br>13 HRS<br>01 00" |              |          |                 |                              |                                                                                           |         |
|                                      | 261          | 1        | CVTS            | CLTC                         | CHANGE THE SMDPS FROM 2 SWITCH 1 VALVE<br>MODE TO 2 SWITCH MODE, REPORT WHEN<br>COMPLETE, | TCPI    |
|                                      | 261          | 2        | CLTC            | C1TC                         | CHANGE THE SMDPS FROM 2 SWITCH 1 VALVE<br>MODE TO 2 SWITCH MODE, REPORT WHEN<br>COMPLETE, |         |
|                                      | 266          | 3        | C1TC            | CPDC                         | CHANGE THE SMDPS FROM 2 SWITCH 1 VALVE<br>MODE TO 2 SWITCH MODE, REPORT WHEN<br>COMPLETE, |         |



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VEHICLE

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| TIME                      | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                        | REMARKS |
|---------------------------|--------------|----------|-----------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| HOLDING<br>9 HRS<br>0' 0" |              |          |                 |                  | <p>PART 3 - TYPE III RECYCLE</p> <p>-----</p> <p>RECYCLE FROM T-9 HR HOLD FOR LV BATTERY<br/>CHANGE OUT AND SC CRYO RESERVICE</p> <p>-----</p> <p>CONDITIONS:</p> <ul style="list-style-type: none"> <li>* NOT LATER THAN 2 HRS PRIOR TO RESUMING COUNT DURING HOLD AT T-9 HRS</li> <li>* SC CRYO RESERVICE IS REQUIRED</li> <li>* LV FLIGHT BATT REPLACEMENT REQUIRED</li> <li>* MSS ON MOUNTS AT PAD B</li> <li>* ALL LV ORDNANCE TO REMAIN CONNECTED</li> </ul> |         |
| TYPE 3<br>0' 0"           | 181          | 1        | CLTC            | CVTS             | LV IS STARTING TURNAROUND OPERATIONS, RESET COUNTCLOCK TO T+0 HRS AND START COUNTING UP,                                                                                                                                                                                                                                                                                                                                                                           | TCP!    |
|                           | 188          | 1        | CVTS            | PA               | THE CONTROL AREA IS OPEN FOR NORMAL WORK EXCEPT THE CONTROL AREA FOR ESP RAISING,                                                                                                                                                                                                                                                                                                                                                                                  | TCP!    |
|                           |              | 1-1      |                 |                  | <p>*****CAUTION*****</p> <p>* THE CONTROL AREA FOR *<br/>* ESP RAISING IS THE ML *<br/>* 127 FT LEVEL, DIRECTLY *<br/>* BELOW THE ESP AND *<br/>* INSIDE THE PEDESTAL *<br/>* LEGS, *<br/>* *<br/>*****</p>                                                                                                                                                                                                                                                        | TCP!    |
|                           | 181          | 2        | CLTC            | CVTS             | VERIFY THE H/W CRANE WILL BE AVAILABLE FOR ESP RAISING IN 30 MINUTES,                                                                                                                                                                                                                                                                                                                                                                                              | TCP!    |



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VEHICLE AS-210

| TIME            | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                | DESCRIPTION                                                                                                                                                                                                                                                                 | REMARKS        |
|-----------------|-----------|----------|--------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| TYPE 3<br>01 0" |           |          |              |                              |                                                                                                                                                                                                                                                                             |                |
| 261             |           | 3        | CLTC         | C1TC<br>C3TC<br>C4TC<br>CUTC | START RECYCLE OPERATIONS                                                                                                                                                                                                                                                    |                |
| 181             |           | 4        | CLTC         | CVTS                         | CLOSE MSS PLAT 1 AND MOVE TO LV STA 878, REQUEST PEHE REPORT TO MSS PLAT 1 FOR S-IB FWD SNIFFER CHECK WHEN ACCESS DOOR IS OPENED,                                                                                                                                           | TCPI           |
| 231             |           | 5        | C3TC         | U3PC                         | SECURE THE S-IB BOATTAIL DELUGE PURGE PANEL PER V-36941 (HAZARDOUS), REPORT WHEN COMPLETE,                                                                                                                                                                                  | D              |
| 181             |           | 6        | CLTC         | CVTS                         | REQUEST PEHE PERFORM SNIFFER CHECKS IN S-IVB AFT, IU/S-IVB FWD AND S-IB BOATTAIL AND BAY AREA WHEN ACCESS DOORS ARE OPENED.                                                                                                                                                 | TCPI<br>C71-53 |
|                 |           | 6-1      |              |                              | *****WARNING*****<br>*<br>* ACCESS TO THE S-IVB AFT *<br>* & IU/S-IVB FWD, S-IB *<br>* FWD & S-IB BOATTAIL AND *<br>* BAY AREAS WILL NOT BE *<br>* PERMITTED UNTIL SAFETY *<br>* HAS VERIFIED THAT THE *<br>* OXYGEN LEVEL IS AT *<br>* LEAST 19.5 PERCENT, *<br>*<br>***** | TCPI<br>C71-53 |
| 261             |           | 7        | BOSC         | CLTC                         | REQUEST S-IVB REPORT TO PGHE ON CH 127 FOR GH2 CROSS COUNTRY LINE SECURING AND INERTING WITH GHE,                                                                                                                                                                           | TCPI           |
| 261             |           | 8        | CLTC         | C4TC                         | HAVE YOUR PERSONNEL REPORT TO PGHE ON CH 127 FOR GH2 CROSS COUNTRY LINE SECURING AND INERTING WITH GHE,                                                                                                                                                                     |                |
| 231             |           | 9        | C3TC         | L3ME                         | SECURE FIRING ACCESSORIES SYSTEMS PER V-36136, PART VII (HAZARDOUS), REPORT WHEN COMPLETE,                                                                                                                                                                                  | D<br>C67-29    |
| 241             |           | 10       | C4TC         | C4PS                         | START GH2 CROSS COUNTRY LINE SECURING AND PURGE PER V-30610, SECT S, PART 3 (HAZARDOUS), REPORT WHEN COMPLETE                                                                                                                                                               | D              |



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VEHICLE AS-210

| TIME                        | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.        | DESCRIPTION                                                                                    | REMARKS     |
|-----------------------------|-----------|----------|--------------|----------------------|------------------------------------------------------------------------------------------------|-------------|
| TYPE 3<br>+ 6 HRS<br>451 0" |           |          |              |                      |                                                                                                |             |
|                             | 261       | 1        | CVTS         | CLTC                 | MSS PLATFORM 3 IS AVAILABLE FOR ACCESS                                                         | TCP1        |
|                             | 261       | 2        | CLTC         | C1TC<br>C4TC<br>CUTC | MSS PLATFORM 3 IS AVAILABLE FOR ACCESS                                                         |             |
|                             | 266       | 3        | C1TC         | CSPP                 | CONNECT GROUNDING STRAPS FROM S/A 7 TO MSS PLATFORM 3                                          |             |
| TYPE 3<br>+ 7 HRS<br>301 0" |           |          |              |                      |                                                                                                |             |
|                             | 251       | 1        | SUVM         | CUTC                 | ST-124M PLENUM CHECK VALVE & SUBLIMATOR COVERS INSTALLED                                       | 132=30      |
| TYPE 3<br>+ 8 HRS<br>201 0" |           |          |              |                      |                                                                                                |             |
|                             | 266       | 1        | C1TC         | LEBS                 | RECHARGE EMERGENCY BACKUP BATTERIES PER V-21439 (NON-HAZARDOUS).                               | D<br>815=33 |
| TYPE 3<br>+ 14 HRS<br>01 0" |           |          |              |                      |                                                                                                |             |
|                             | 261       | 1        | C3TC         | CLTC                 | VERIFY CLEARANCE TO START S-IB STAGE BATTERIES ACTIVATION                                      |             |
|                             | 261       | 2        | C3TC         | V3PE                 | (19 HOURS PRIOR TO INSTALLATION) START S-IB STAGE BATTERIES ACTIVATION PER V-31112 (HAZARDOUS) | D           |
|                             | 261       | 3        | CLTC         | C4TC                 | START S-IVB BATTERY ACTIVATION                                                                 |             |
|                             |           | 4        |              | C4TC                 | START S-IVB BATTERY ACTIVATION PER V-21323, V-21324, V-21529, & V-21530 (HAZARDOUS)            | D           |
|                             | 261       | 5        | CLTC         | CUTC                 | START 1U BATTERY ACTIVATION                                                                    | 132=30      |
| TYPE 3<br>+ 18 HRS<br>01 0" |           |          |              |                      |                                                                                                |             |
|                             | 231       | 1        | C3TC         | L3PM                 | START 48 HRS INSPECTION PER V-24497, PART IV (NON-HAZARDOUS). REPORT WHEN COMPLETE.            | C71-53      |



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VEHICLE AS-210

| TIME                               | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                | DESCRIPTION                                                                                                      | REMARKS |
|------------------------------------|-----------|----------|--------------|------------------------------|------------------------------------------------------------------------------------------------------------------|---------|
| TYPE 3<br>18 HRS<br>30' 0"         | 188       | 1        | CVTS         | ALL                          | THE COUNTDOWN IS BEING RESET TO T-1 DAY 17 HRS. THE COUNTDOWN WILL START ON MY MARK.<br>5 - 4 - 3 - 2 - 1 - MARK | TCPI    |
| TYPE 3<br>1 DAY<br>17 HRS<br>0' 0" |           |          |              |                              | CSM CRYO SERVICING<br>-----                                                                                      |         |
| TYPE 3<br>1 DAY<br>14 HRS<br>0' 0" | 261       | 1        | CLTC         | C1TC<br>C3TC<br>C4TC<br>CUTC | REQUEST PURGE BOX VALIDATION STATUS                                                                              |         |
|                                    | 261       | 2        | CVTS         | CLTC                         | REQUEST PURGE BOX VALIDATION STATUS                                                                              | TCPI    |
| TYPE 3<br>1 DAY<br>13 HRS<br>0' 0" | 261       | 1        | CVTS         | CLTC                         | CHANGE THE SMDPS FROM 2 SWITCH 1 VALVE MODE TO 2 SWITCH MODE, REPORT WHEN COMPLETE,                              | TCPI    |
|                                    | 261       | 2        | CLTC         | C1TC                         | CHANGE THE SMDPS FROM 2 SWITCH 1 VALVE MODE TO 2 SWITCH MODE, REPORT WHEN COMPLETE,                              |         |
|                                    | 266       | 3        | C1TC         | CPDC                         | CHANGE SMDPS FROM 2 SWITCH 1 VALVE MODE TO 2 SWITCH MODE, REPORT WHEN COMPLETE,                                  |         |
|                                    | 188       | 4        | CVTS         | PA                           | ALL NON-ESSENTIAL PERSONNEL ARE TO CLEAR THE PAD B CONTROL AREA FOR CSM CRYO SERVICING,                          | TCPI    |



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| TIME                     | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                | DESCRIPTION                                                                                                                     | REMARKS     |
|--------------------------|-----------|----------|--------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-------------|
| TYPE 3<br>9 HRS<br>51 0" | 266       | 7        | C1TC         | CCRP                         | VERIFY RP-1 PREPS COMPLETE,                                                                                                     |             |
|                          | 261       | 8        | C1TC         | CLTC                         | ML ELECTRICAL LAUNCH PREPS COMPLETE,                                                                                            |             |
|                          | 266       | 9        | C1TC         | RDTs                         | VERIFY DTS/DEE PAD SECURING COMPLETED AND PERSONNEL ARE CLEARING PAD                                                            |             |
|                          | 266       | 10       | C1TC         | CSAC                         | VERIFY PAD MANUAL PREPS COMPLETE AND PERSONNEL CLEARING PAD,                                                                    |             |
|                          | 231       | 11       | C3TC         | C3FP<br>L3PM                 | VERIFY S-1B BOATTAIL CLOSED OUT AND READY FOR DELUGE PURGE PANEL ACTIVATION,                                                    |             |
|                          | 231       | 12       | C3TC         | C3FP                         | VERIFY DELUGE PURGE SWITCH OFF,                                                                                                 |             |
|                          | 231       | 13       | C3TC         | U3PC                         | ACTIVATE THE S-1B BOATTAIL GN2 DELUGE PURGE PANEL PER V-36941 (HAZARDOUS), REPORT WHEN COMPLETE,                                | D           |
|                          | 231       | 14       | C3TC         | C3FP                         | START FUEL BUBBLING PER V-24522, PART IV SEQ 32 (NON-HAZARDOUS)                                                                 | D<br>C66-27 |
| TYPE 3<br>9 HRS<br>01 0" | 261       | 1        | CVTS         | CLTC                         | MSS JACKING COMPLETE.                                                                                                           | TCP1        |
|                          | 261       | 2        | CLTC         | C1TC<br>C3TC<br>C4TC<br>CUTC | VERIFY READY FOR MSS MOVE,                                                                                                      |             |
|                          | 181       | 3        | CLTC         | CVTS                         | LV CLEAR FOR MSS MOVE,                                                                                                          | TCP1        |
|                          | 261       | 4        | CVTS         | CLTC                         | MSS IN MOTION                                                                                                                   | TCP1        |
|                          | 231       | 5        | C3TC         | L3ME                         | MOVE ESP TRANSPORTER TO SOUTH END OF LAUNCH PAD AND SECURE FOR LAUNCH PER V-26552 PART V (NON-HAZARDOUS), REPORT WHEN COMPLETE, | D           |
|                          | 261       | 6        | CLTC         | ALL                          | ALL LV PERSONNEL TURN TO T=8:59 HRS,<br>PAGE 143                                                                                | XB127-50    |



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| TIME                         | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | REMARKS |
|------------------------------|-----------|----------|--------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+ 3 HRS<br>50' 0" |           |          |              |               | PART 4 - TYPE IV RECYCLE<br>-----<br>47 HR RECYCLE AFTER S-IB IGNITION/CUTOFF<br>-----<br>CONDITIONS:<br>* IGNITION HAS OCCURRED<br>* NO LV BATTERY CHANGEOUT REQUIRED<br>* NO S/C CRYO RE-SERVICE REQUIRED<br>* LV DRAIN AND PURGE COMPLETE PER APP B<br>* S-IB/IU STRUCTURE INSPECTION NOT REQUIRED<br>* CAUSE OF CUTOFF NOT DUE TO S-IB PROPULSION SYS<br>* DAMAGE NOT SUSTAINED BY VEHICLE<br>* CONCURRENT ORDNANCE OPERATIONS<br>* SERVICE ARMS REMAIN PRESSURIZED<br>* SERVICE ARM 6 TIP EXTENSION ONLY<br>* MSS RETURNING TO PAD B<br>* FT06 SATISFIES VEHICLE ALIGNMENT | #       |
|                              | 181       | 1        | CLTC         | CVTS          | LV IS STARTING TURNAROUND OPERATIONS, RESET COUNT CLOCK TO T+4 HRS 0 MIN AND CONTINUE COUNTING UP,                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | TCPI    |
| TYPE IV<br>+ 4 HRS<br>01' 0" |           |          |              |               | CHANGE SMDPS FROM 1 SWITCH MODE TO 2 SWITCH 1 VALVE MODE, REPORT WHEN COMPLETE,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | TCPI    |
|                              | 261       | 1        | CVTS         | CLTC          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |         |



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| TIME                        | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                | DESCRIPTION                                                                                                                                                                                                                                                | REMARKS |
|-----------------------------|-----------|----------|--------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+ 4 HRS<br>01 00 | 261       | 2        | CLTC         | C1TC                         | CHANGE SMDPS FROM 1 SWITCH MODE TO 2 SWITCH 1 VALVE MODE, REPORT WHEN COMPLETE,                                                                                                                                                                            |         |
|                             | 266       | 3        | C1TC         | CPDC                         | CHANGE SMDPS FROM 1 SWITCH MODE TO 2 SWITCH 1 VALVE MODE, REPORT WHEN COMPLETE,                                                                                                                                                                            |         |
|                             | 261       | 4        | CLTC         | C1TC<br>C3TC<br>C4TC<br>CUTC | START RECYCLE OPERATIONS,                                                                                                                                                                                                                                  |         |
|                             | 266       | 5        | C1TC         | CWCP                         | SECURE THE IWS TO STANDBY MODE PER V=36937 (HAZARDOUS)                                                                                                                                                                                                     | D       |
|                             | 231       | 6        | C3TC         | U3PC                         | SECURE THE S=IB BOATTAIL DELUGE PURGE PANEL PER V=36941 SEQ D, PART I (HAZARDOUS), REPORT WHEN COMPLETE,                                                                                                                                                   | D       |
|                             | 181       | 7        | CLTC         | CVTS                         | REQUEST PEHE PERFORM SNIFFER CHECKS IN S-IVB AFT, S=IB BOATTAIL AND BAY AREAS WHEN ACCESS DOORS ARE OPENED, (S=IB FWD ACCESS WILL REQUIRE THE MSS).                                                                                                        | TCP1    |
|                             |           | 7-1      |              |                              | *****WARNING*****<br>*<br>* ACCESS TO THE S-IVB *<br>* AFT, S=IB FWD, S=IB *<br>* BOATTAIL, & BAY AREAS *<br>* WILL NOT BE PERMITTED *<br>* UNTIL SAFETY HAS *<br>* VERIFIED THAT THE *<br>* OXYGEN LEVEL IS AT *<br>* LEAST 19.5 PERCENT, *<br>*<br>***** | TCP1    |
|                             | 114       | 8        | CLTC         | CTIS                         | VERIFY READY TO SUPPORT ESP TRANSPORTER MOVE,                                                                                                                                                                                                              | TCP1    |
|                             | 231       | 9        | C3TC         | L3ME                         | PREP AND MOVE ESP TRANSPORTER TO SERVICE POSITION PER V=26552 (NON=HAZARDOUS), REPORT WHEN COMPLETE,                                                                                                                                                       | D       |



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| TIME                         | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA.             | DESCRIPTION                                                                                                                                                                                  | REMARKS |
|------------------------------|--------------|----------|-----------------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+ 4 HRS<br>01 00  |              |          |                 |                              |                                                                                                                                                                                              |         |
|                              | 231          | 10       | C3TC            | U3PC                         | SECURE S=1B PNEUMATICS PER V=36941<br>SEQUENCE D, PART II, (HAZARDOUS). (EXCEPT<br>FOR RP-1 VENT CONTROL WHICH WILL REMAIN ACTIVATED<br>PER V=26589 (NON-HAZARDOUS)<br>REPORT WHEN COMPLETE, | D       |
|                              | 231          | 11       | U3PC            | C3TC                         | S=1B PNEUMATICS ARE SUPPORTING PER<br>V=26589 (NON-HAZARDOUS)                                                                                                                                | D       |
|                              | 231          | 12       | C3TC            | C3IP                         | MEASUREMENT TRANSFER TO INFLIGHT,                                                                                                                                                            | (MT01)  |
|                              | 231          | 13       | C3TC            | C3IP                         | MEASURING RATE GYRO SWITCH ON                                                                                                                                                                | (MT01)  |
|                              | 231          | 14       | C3TC            | L3ME                         | SECURE FIRING ACCESSORIES SYSTEM PER<br>V=36136 PART VII (HAZARDOUS); REPORT<br>WHEN COMPLETE,                                                                                               | D       |
|                              | 251          | 15       | CUTC            | CUIP                         | MEASUREMENT TRANSFER TO AUTO; S=1VB<br>COAST TEST AUTO (60X-607A6 = CCIS PANEL)                                                                                                              | (MT01)  |
|                              | 251          | 16       | CUTC            | BGCC                         | REMOVE ATOLL TAPE AND LOAD MT01 TAPE ON<br>IODC 2=9, LOAD SCRATCH TAPE ON IODC<br>1=3,                                                                                                       | (MT01)  |
|                              | 261          | 17       | CLTC            | C1TC<br>C3TC<br>C4TC<br>CUTC | VERIFY READY FOR MT01 (LV MEAS SCAN)                                                                                                                                                         |         |
|                              | 261          | 18       | CLTC            | C4IP                         | PRELAUNCH CHECKOUT GROUP = ON                                                                                                                                                                | (MT01)  |
|                              | 261          | 19       | CLTC            | CLIK                         | ISSUE S=1VB ALL RACS RUN;                                                                                                                                                                    | (MT01)  |
|                              | 188          | 20       | CLTC            | ALL                          | STAGE MEASUREMENTS WILL BE INTERRUPTED<br>DURING MT01 (LV MEAS SCAN)                                                                                                                         |         |
|                              | 261          | 21       | CLTC            | CLIK                         | REQUEST & EXECUTE MT01 (LV MEAS SCAN)                                                                                                                                                        |         |
|                              | 121          | 22       | CLTC            | CTSC                         | INSTALL SAFETY NET ON LAUNCHER AND SECURE TO<br>HDA                                                                                                                                          |         |
| TYPE IV<br>+ 4 HRS<br>101 00 | 181          | 1        | CLTC            | CVTS                         | READY TO CLEAR THE CONTROL AREA FOR ESP<br>RAISING, VERIFY H/H CRANE WILL BE<br>AVAILABLE IN 30 MINUTES,                                                                                     | TCPI    |



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VEHICLE

AS-210

| TIME                         | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.        | DESCRIPTION                                                                                                                                                               | REMARKS |
|------------------------------|-----------|----------|--------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+ 4 HRS<br>10' 0" |           | 1-1      |              |                      | *****WARNING*****<br>*<br>* THE CONTROL AREA FOR<br>* ESP RAISING IS DIRECTLY<br>* BELOW THE ESP; INSIDE<br>* THE PEDESTAL LEGS & THE<br>* ML 127 FT LEVEL.<br>*<br>***** | TCPI    |
|                              | 266       | 2        | C1TC         | CSPP                 | OPEN LSE OVERRIDE POWER MODULE CIRCUIT BREAKER AND TURN ON EMERGENCY LIGHTING PER V-31045 (NON-HAZARDOUS); REPORT WHEN COMPLETE;                                          | D       |
|                              | 121       | 3        | CLTC         | BOSC                 | REPORT TO LASE IN ML ROOM 8A TO SUPPORT CLOSING CIRCUIT BREAKERS IN PANEL L-14A (200 FT LEVEL);                                                                           | TCPI    |
|                              | 251       | 4        | CUTC         | CCAP<br>LRPR         | REMOVE LOCKING PINS FROM AUXILIARY POWER CIRCUIT BREAKERS PER V-31119; APP D; REPORT WHEN COMPLETE, (NON-HAZARDOUS);                                                      | D       |
| TYPE IV<br>+ 4 HRS<br>15' 0" |           |          |              |                      |                                                                                                                                                                           |         |
|                              | 261       | 1        | CVTS         | CLTC                 | MSS PLATFORM OBSERVERS ARE TO REPORT TO PVTS AT LO TRAILER 020; PAD GATE FOR OBSERVER BRIEFING IN 45 MINUTES;                                                             | TCPI    |
|                              | 261       | 2        | CLTC         | C3TC<br>C4TC<br>CUTC | MSS PLATFORM OBSERVERS ARE TO REPORT TO PVTS AT LO TRAILER 020; PAD GATE FOR OBSERVER BRIEFING IN 45 MINUTES;                                                             |         |
| TYPE IV<br>+ 4 HRS<br>20' 0" |           |          |              |                      |                                                                                                                                                                           |         |
|                              | 261       | 1        | CVTS         | CLTC                 | THE CONTROL AREAS ARE OPEN FOR NORMAL WORK EXCEPT FOR THE ML 127 FT LEVEL, DIRECTLY BELOW THE ESP, AND INSIDE PEDESTAL LEGS;                                              | TCPI    |



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| TIME                         | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                | DESCRIPTION                                                                                                                                          | REMARKS |
|------------------------------|-----------|----------|--------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+ 4 HRS<br>20: 0" |           |          |              |                              |                                                                                                                                                      |         |
|                              | 261       | 2        | CLTC         | C1TC                         | EXTEND S/A 6 TIP                                                                                                                                     |         |
|                              | 266       | 3        | C1TC         | CSAC                         | EXTEND S/A 6 TIP AND SECURE ARM,                                                                                                                     |         |
|                              | 236       | 4        | CSAC         | CSA6                         | EXTEND ARM TIP & SECURE ARM,                                                                                                                         |         |
|                              | 251       | 5        | CUTC         | LUNW                         | ST=124M HEATERS TO STANDBY                                                                                                                           |         |
|                              | 251       | 6        | CUTC         | UUPC                         | MANUALLY ADJUST HIGH PRESSURE REGULATOR AND REDUNDANT REGULATOR FROM 3100 +/- 100 TO 1700 +/- 100 PER V=36038, REPORT WHEN COMPLETE (NON-HAZARDOUS), | D       |
| TYPE IV<br>+ 4 HRS<br>30: 0" |           |          |              |                              |                                                                                                                                                      |         |
|                              | 261       | 1        | CVTS         | CLTC                         | CLEAR TO START ESP RAISING OPERATIONS,                                                                                                               | TCP!    |
|                              | 122       | 2        | CLTC         | BOSC                         | VERIFY HH CRANE READY TO SUPPORT ESP RAISING OPERATIONS,                                                                                             | TCP!    |
|                              | 261       | 3        | CLTC         | C3TC                         | START ESP RAISING PREPS                                                                                                                              |         |
|                              | 231       | 4        | C3TC         | L3ME                         | START ESP RAISING PREPS PER V=26516 (HAZARDOUS), REPORT WHEN COMPLETE                                                                                | D       |
| TYPE IV<br>+ 4 HRS<br>35: 0" |           |          |              |                              |                                                                                                                                                      |         |
|                              | 261       | 1        | CLIK         | CLTC                         | MT01 IS COMPLETE,                                                                                                                                    |         |
|                              | 261       | 2        | CLTC         | C1TC<br>C3TC<br>C4TC<br>CUTC | MT01 IS COMPLETE,                                                                                                                                    |         |
|                              | 261       | 3        | CLTC         | C4TC                         | CLEAR TO RUN EAPU                                                                                                                                    |         |
|                              | 231       | 4        | C3TC         | C3IP                         | MEASUREMENT TRANSFER TO GROUND,                                                                                                                      |         |
|                              | 231       | 5        | C3TC         | C3IP                         | MEASURING RATE GYRO SWITCH OFF,                                                                                                                      |         |
|                              | 251       | 6        | CUTC         | CUIP                         | MEASUREMENT TRANSFER - OFF<br>S=IVB COAST TEST - OFF (60X=607A6 = CCIS PANEL)                                                                        |         |



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|------------------------------|-----------|----------|--------------|---------------|-----------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+ 4 HRS<br>35: 0" |           |          |              |               |                                                                                                                       |         |
|                              | 251       | 7        | CUTC         | BGCC          | REMOVE MT01 TAPE AND RELOAD ATOLL TAPE ON IODC 2-7;                                                                   |         |
|                              | 241       | 8        | C4TC         | C4IP          | PRELAUNCH CHECKOUT GROUP AUTO;                                                                                        |         |
| TYPE IV<br>+ 4 HRS<br>50: 0" |           |          |              |               |                                                                                                                       |         |
|                              | 266       | 1        | C1TC         | CSAC          | VERIFY S/A 6 TIP EXTENDED;                                                                                            |         |
|                              | 261       | 2        | C1TC         | CLTC          | S/A 6 TIP EXTENDED;                                                                                                   |         |
|                              | 261       | 3        | CLTC         | C4TC          | S/A 6 TIP EXTENDED; CLEAR FOR CARRIER SECURING AND ACCESS DOOR REMOVAL;                                               |         |
|                              | 241       | 4        | C4TC         | S4MA          | SAFE AFT CARRIER PER V-30610; SECT S, PART 4 (NON-HAZARDOUS); REPORT WHEN COMPLETE,                                   | D       |
|                              | 231       | 5        | C3TC         | L3NF          | UNPIN AND OPEN CIRCUIT BREAKERS 6714 & 6715 (HDA EXPLOSIVE RELEASE POWER) AND 6717 & 6718 (FIRING ACCESSORIES POWER); |         |
| TYPE IV<br>+ 5 HRS<br>0: 0"  |           |          |              |               |                                                                                                                       |         |
|                              | 231       | 1        | C3TC         | L3PM          | INSTALL BAY LADDERS AND OPEN FUEL AND LOX BAYS FOR SNIFFER CHECKS; REPORT WHEN COMPLETE,                              |         |
|                              | 241       | 2        | C4TC         | S4MA          | REMOVE S-IVB AFT ACCESS DOOR PER V-30610, SECT T, PART 2 (NON-HAZARDOUS);                                             | D       |
| TYPE IV<br>+ 5 HRS<br>10: 0" |           |          |              |               |                                                                                                                       |         |
|                              | 241       | 1        | C4TC         | S4MA          | VERIFY S-IVB AFT DOOR REMOVED                                                                                         |         |



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| TIME                         | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                                           | REMARKS |
|------------------------------|--------------|----------|-----------------|------------------|---------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+ 5 HRS<br>15: 0" | 241          | 1        | C4TC            | C4PU             | VERIFY PU OVEN AND INVERTER POWER HAS BEEN ON A MINIMUM OF 45 MINUTES.                |         |
|                              | 241          | 2        | C4TC            | C4PS             | VERIFY PROPELLANT TANKS PRESSURIZED FOR PU CAL CHECKS;                                | (EAPU)  |
|                              | 241          | 3        | C4TC            | C4NK             | REQUEST & EXECUTE EAPU (CONSOLE 11)                                                   |         |
| TYPE IV<br>+ 5 HRS<br>30: 0" | 241          | 1        | C4TC            | S4SY             | VERIFY SNIFFER CHECKS COMPLETE.                                                       |         |
|                              | 261          | 2        | CLTC            | C4TC             | VERIFY ACCESS DOOR OPENED/REMOVED AND SNIFFER CHECKS ARE COMPLETE (S=IVB AFT).        |         |
|                              | 261          | 3        | CVTS            | CLTC             | CPSS HAS APPROVED LV ACCESS THROUGH S=IVB AFT.                                        | TCP1    |
|                              | 241          | 4        | C4TC            | C4PS             | VERIFY PROPULSION SECURING COMPLETE.                                                  |         |
|                              | 241          | 5        | C4TC            | C4PS             | START PANEL VERIFICATIONS AND MONITORING PER V=30610, SECT K, PART 7 (NON=HAZARDOUS). | D       |
|                              | 241          | 6        | C4NK            | C4TC             | S=IVB PU CALS (EAPU) COMPLETE.                                                        |         |
|                              | 261          | 7        | C4TC            | CLTC             | S=IVB PU CALS (EAPU) COMPLETE.                                                        |         |
|                              | 261          | 8        | CLTC            | C4TC             | INSTALL S=IVB AFT PARTIAL ACCESS KITS.                                                |         |
|                              | 241          | 9        | C4TC            | S4MA             | INSTALL S=IVB AFT (PARTIAL) ACCESS KIT PER V=30610, SECT V, PART 20 (HAZARDOUS).      | D       |
| TYPE IV<br>+ 5 HRS<br>50: 0" | 231          | 1        | C3TC            | L3ME             | VERIFY ESP RAISING PREPS COMPLETE.                                                    |         |
|                              | 231          | 2        | C3TC            | L3ME             | START RAISING ESP TO SERVICE POSITION PER V=26516 (HAZARDOUS). REPORT WHEN COMPLETE.  | D       |



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|----------------------------|-----------|----------|--------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>5 HRS<br>50' 0" |           | 3        |              |               | NOTE<br>---<br>FOR NEXT 15 MIN CSAD<br>REQUIRES CONTROL OF TV<br>CAMERAS 26B & 27B AND AAS=3<br>OR AAS=4,                                                                                                                                                                                      |         |
|                            | 181       | 4        | CLTC         | CVTS          | VERIFY PREVAILING WINDS TO NOT EXCEED<br>REDLINE VALUES FOR FREE STANDING S/V,                                                                                                                                                                                                                 | TCP1    |
|                            |           | 4-1      |              |               | NOTE<br>---<br>REDLINE WINDSPEED IS 30 KNOTS PEAK WINDS<br>AT 530 FT ABOVE GROUND LEVEL; IF HIGHER<br>WINDS PREDICTED, DAMPER SWITCHOVER MAY<br>PROCEED ONLY IF BENDING MOMENT<br>ASSESSMENT INDICATES SATISFACTORY<br>CONDITIONS, (LO DIRECTOR'S CONCURRENCE<br>WITH ASSESSMENT IS REQUIRED), |         |
|                            | 261       | 5        | CVTS         | CLTC          | CLEAR TO DISCONNECT PRIMARY DAMPER;                                                                                                                                                                                                                                                            | TCP1    |
|                            | 115       | 6        | C4TC         | S4MM          | VERIFY MSS PLATFORM MONITORS ON STATION                                                                                                                                                                                                                                                        |         |
|                            | 261       | 7        | CLTC         | C1TC          | DISCONNECT PRIMARY DAMPER                                                                                                                                                                                                                                                                      |         |
|                            | 266       | 8        | C1TC         | CSAD          | DISCONNECT PRIMARY DAMPER PER V=36086<br>(NON-HAZARDOUS), REPORT WHEN COMPLETE;                                                                                                                                                                                                                | D       |
|                            |           |          |              |               |                                                                                                                                                                                                                                                                                                |         |
| TYPE IV<br>6 HRS<br>0' 0"  |           |          |              |               |                                                                                                                                                                                                                                                                                                |         |
|                            | 231       | 1        | L3PM         | C3TC          | FUEL AND LOX BAYS ARE OPEN AND SNIFFER<br>CHECKS COMPLETE                                                                                                                                                                                                                                      |         |
|                            | 261       | 2        | C3TC         | CLTC          | VERIFY CAUSE OF CUTOFF HAS BEEN<br>DETERMINED, REQUEST CLEARANCE TO REPLACE<br>PROPULSION DISTRIBUTORS,                                                                                                                                                                                        |         |
|                            | 241       | 2-1      | C4TC         | S4MA          | VERIFY PARTIAL ACCESS KIT INSTALLATION IS<br>COMPLETE                                                                                                                                                                                                                                          |         |



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| TIME                      | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                          | REMARKS |
|---------------------------|-----------|----------|--------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>6 HRS<br>01 00 |           | 3        |              | C3TC          | *****CAUTION*****<br>* DO NOT REMOVE S-IB *<br>* STAGE POWER AND *<br>* REPLACE PROPULSION *<br>* DISTRIBUTORS UNTIL *<br>* CAUSE OF CUTOFF HAS *<br>* BEEN DETERMINED, *<br>* ***** |         |
|                           | 231       | 3-1      | C3TC         | C3NP          | REMOVE S-IB STAGE POWER AND INDICATION BUS PER V=31115, SECT E, PART I, STEPS 1 THRU 14, (NON=HAZARDOUS), REPORT WHEN COMPLETE,                                                      |         |
|                           |           | 3-2      |              | C3TC          | *****CAUTION*****<br>* DO NOT REAPPLY STAGE *<br>* POWER UNTIL *<br>* DISTRIBUTORS CHANGEOUT *<br>* AND CONAX VALVE *<br>* ACTUATOR DISCONNECTIONS *<br>* ARE COMPLETE, *<br>* ***** |         |
|                           | 231       | 4        | C3TC         | S3NE          | REPLACE 9A1 AND 9A2 PROPULSION DISTRIBUTORS, REPORT WHEN COMPLETE,                                                                                                                   |         |
|                           |           | 4-1      |              |               | NOTE<br>***<br>9A1 AND 9A2 DISTRIBUTOR REPLACEMENT WILL BE DONE IN PARALLEL, (REF, SEQ 5 & 6)                                                                                        |         |



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|----------------------------|-----------|----------|--------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>6 HRS<br>01 00" |           | 5        |              |               | 9A1 DISTRIBUTOR REPLACEMENT<br>-----                                                                                                                                                                                                                                                                                                                    |         |
|                            |           | 5-1      | S3NA         |               | DISCONNECT THE 9A1 DISTRIBUTOR. INSPECT MATING CONNECTIONS AS EACH CABLE IS DISCONNECTED. REMOVE CABLE BUNDLE TO CABLE SUPPORT BRACKET SPOT TIES TO FACILITATE CABLE DISCONNECTS AND DISTRIBUTOR REMOVAL.                                                                                                                                               |         |
|                            |           |          |              |               | J1 FROM 9W1/P2 J11 FROM 9W194/P1<br>J2 FROM 9W23/P2 J14 FROM 9W20/P2<br>J3 FROM 9W39/P1 J15 FROM 9W21/P2<br>J4 FROM 9W210/P1 J16 FROM 9W46/P1<br>J5 FROM 9W3/P2 J17 FROM 9W36/P2<br>J6 FROM 9W49/P1 J18 FROM 9W60/P1<br>J7 FROM 9W43/P1 J19 FROM 9W6/P4<br>J8 FROM 9W35/P2 E998 FROM 9W151/E4<br>J9 FROM 9W42/P1 E999 FROM 9W151/E5<br>J10 FROM 9W40/P1 |         |
|                            |           |          |              |               | LV-QAL MIP<br>=====                                                                                                                                                                                                                                                                                                                                     |         |
|                            |           | 5-2      | L3PM         |               | REMOVE THE 9A1 DISTRIBUTOR. SAVE THE MOUNTING HARDWARE FOR THE INSTALLATION OF THE REPLACEMENT DISTRIBUTOR.                                                                                                                                                                                                                                             |         |
|                            |           | 5-3      | L3PM         |               | INSTALL REPLACEMENT 9A1 DISTRIBUTOR PER 60C11010-1. TORQUE MOUNTING BOLTS TO 50-70 IN-LBS PLUS RUNNING TORQUE.                                                                                                                                                                                                                                          |         |
|                            |           | 5-4      | S3NA         |               | CONNECT REPLACEMENT 9A1 DISTRIBUTOR, INSPECT MATING CONNECTIONS PRIOR TO EACH CONNECTION.                                                                                                                                                                                                                                                               |         |
|                            |           |          |              |               | J1 TO 9W1/P2 J11 TO 9W194/P1<br>J2 TO 9W23/P2 J14 TO 9W20/P2<br>J3 TO 9W39/P1 J15 TO 9W21/P2<br>J4 TO 9W210/P1 J16 TO 9W46/P1<br>J5 TO 9W3/P2 J17 TO 9W36/P2<br>J6 TO 9W49/P1 J18 TO 9W60/P1<br>J7 TO 9W43/P1 J19 TO 9W6/P4<br>J8 TO 9W35/P2 E998 TO 9W151/E4<br>J9 TO 9W42/P1 E999 TO 9W151/E5<br>J10 TO 9W40/P1                                       |         |
|                            |           |          |              |               | LV-QAL MIP<br>=====                                                                                                                                                                                                                                                                                                                                     |         |



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| TIME                      | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                                                                       | REMARKS |
|---------------------------|--------------|----------|-----------------|------------------|-------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>6 HRS<br>01 00 |              |          |                 |                  |                                                                                                                   |         |
|                           |              | 5-5      |                 | L3PM             | TORQUE NUTS ON E998 AND E999 TO 12<br>IN/LBS, COAT WITH VARNISH (MIL-V=173)                                       |         |
|                           |              | 5-6      |                 | S3NA             | SAFETY WIRE 9W1/P2 WITH STEEL SAFETY<br>WIRE,                                                                     |         |
|                           |              | 5-7      |                 | S3NA             | SAFETY WIRE 9W3/P2 WITH GREEN EDS SAFETY<br>WIRE,                                                                 |         |
|                           |              | 5-8      |                 | S3NA             | SPOT TIE CABLE BUNDLES TO THE CABLE<br>SUPPORT BRACKET TO PREVENT STRESS ON THE<br>DISTRIBUTOR CABLE CONNECTIONS. |         |
|                           | 231          | 5-9      | S3NE            | C3NE             | 9A1 DISTRIBUTOR REPLACEMENT IS COMPLETE,                                                                          |         |



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| TIME                      | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                                                                                                                                       | REMARKS |
|---------------------------|-----------|----------|--------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>6 HRS<br>01 00 |           | 6        |              |               | 9A2 DISTRIBUTOR REPLACEMENT<br>-----                                                                                                                                                                                                                                                              |         |
|                           |           | 6-1      | S3NA         |               | DISCONNECT THE 9A2 DISTRIBUTOR; INSPECT MATING CONNECTIONS AS EACH CABLE IS DISCONNECTED; REMOVE CABLE BUNDLE TO CABLE SUPPORT BRACKET SPOT TIES TO FACILITATE CABLE DISCONNECTS AND DISTRIBUTOR REMOVAL.                                                                                         |         |
|                           |           |          |              |               | J1 FROM 9W1/P8 J11 FROM 9W194/P2<br>J2 FROM 9W23/P7 J14 FROM 9W20/P3<br>J4 FROM 9W211/P1 J15 FROM 9W21/P3<br>J5 FROM 9W3/P3 J16 FROM 9W56/P1<br>J6 FROM 9W59/P1 J17 FROM 9W36/P3<br>J7 FROM 9W53/P1 J18 FROM 9W60/P2<br>J8 FROM 9W35/P6 E998 FROM 9W154/E2<br>J9 FROM 9W144/P1 E999 FROM 9W154/E3 |         |
|                           |           |          |              |               | LV-QAL MIP<br>-----                                                                                                                                                                                                                                                                               |         |
|                           |           | 6-2      | L3PM         |               | REMOVE THE 9A2 DISTRIBUTOR; SAVE THE MOUNTING HARDWARE FOR INSTALLATION OF THE REPLACEMENT DISTRIBUTOR.                                                                                                                                                                                           |         |
|                           |           | 6-3      | L3PM         |               | INSTALL REPLACEMENT 9A2 DISTRIBUTOR PER 60C11009-1; TORQUE MOUNTING BOLTS TO 50-70 IN/LBS PLUS RUNNING TORQUE;                                                                                                                                                                                    |         |
|                           |           | 6-4      | S3NA         |               | CONNECT REPLACEMENT 9A2 DISTRIBUTOR; INSPECT MATING CONNECTIONS PRIOR TO EACH CONNECTION.                                                                                                                                                                                                         |         |
|                           |           |          |              |               | J1 TO 9W1/P8 J11 TO 9W194/P2<br>J2 TO 9W23/P7 J14 TO 9W20/P3<br>J4 TO 9W211/P1 J15 TO 9W21/P3<br>J5 TO 9W3/P3 J16 TO 9W56/P1<br>J6 TO 9W59/P1 J17 TO 9W36/P3<br>J7 TO 9W53/P1 J18 TO 9W60/P2<br>J8 TO 9W35/P6 E998 TO 9W154/E2<br>J9 TO 9W144/P1 E999 TO 9W154/E3                                 |         |
|                           |           |          |              |               | LV-QAL MIP<br>-----                                                                                                                                                                                                                                                                               |         |



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| TIME                      | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA.     | DESCRIPTION                                                                                                 | REMARKS |
|---------------------------|--------------|----------|-----------------|----------------------|-------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>6 HRS<br>01 0" |              | 6-5      |                 | L3PM                 | TORQUE NUTS ON E998 AND E999 TO 12 IN/LBS; COAT WITH VARNISH (MIL-V-173)                                    |         |
|                           |              | 6-6      |                 | S3NA                 | INSTALL METAL CAP ON 9A2/J3                                                                                 |         |
|                           |              | 6-7      |                 | S3NA                 | SAFETY WIRE 9W1/P8 WITH STEEL SAFETY WIRE,                                                                  |         |
|                           |              | 6-8      |                 | S3NA                 | SAFETY WIRE 9W3/P3 WITH GREEN EDS SAFETY WIRE,                                                              |         |
|                           |              | 6-9      |                 | S3NA                 | SPOT THE CABLE BUNDLES TO THE CABLE SUPPORT BRACKET TO PREVENT STRESS ON THE DISTRIBUTOR CABLE CONNECTIONS; |         |
|                           | 231          | 6-10     | S3NE            | C3NE                 | 9A2 DISTRIBUTOR REPLACEMENT IS COMPLETE,                                                                    |         |
|                           |              |          |                 |                      |                                                                                                             |         |
|                           |              |          |                 |                      |                                                                                                             |         |
|                           |              |          |                 |                      |                                                                                                             |         |
|                           |              |          |                 |                      |                                                                                                             |         |
| TYPE IV<br>6 HRS<br>51 0" | 266          | 1        | C1TC            | CSAD                 | VERIFY PRIMARY DAMPER RETRACTED AND LATCHED,                                                                |         |
|                           | 261          | 2        | C1TC            | CLTC                 | PRIMARY DAMPER IS DISCONNECTED                                                                              |         |
|                           | 261          | 3        | CLTC            | C3TC<br>C4TC<br>CUTC | VERIFY READY FOR MSS MATE,                                                                                  |         |
|                           | 181          | 4        | CLTC            | CVTS                 | PRIMARY DAMPER IS DISCONNECTED; READY FOR MSS MATE,                                                         | TCPI    |
|                           | 266          | 5        | C1TC            | CPDC                 | SECURE FACILITY AIR STANDBY PANEL PER V-26603 (HAZARDOUS), REPORT WHEN COMPLETE,                            | D       |
| TYPE IV<br>7 HRS<br>01 0" | 231          | 1        | L3ME            | C3TC                 | ESP SECURE IN SERVICE POSITION; READY FOR INSTALLATION OF ACCESS LADDERS,                                   |         |
|                           | 231<br>122   | 2<br>2-1 | C3TC<br>CLTC    | L3PM<br>CTSC         | INSTALL THE BOATTAIL ACCESS EQUIPMENT, REMOVE SAFETY NET ON LAUNCHER                                        |         |



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| TIME                      | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                                                                                              | REMARKS |
|---------------------------|--------------|----------|-----------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>7 HRS<br>01 0" | 231          | 3        | C3TC            | L3PM             | REMOVE HEAT SHIELD PANELS FOR SNIFFER CHECKS AND RECYCLE OPERATIONS. INSTALL TEMPORARY HEAT SHIELD CLOSURES WHEN NO WORK IS IN PROGRESS, |         |
|                           | 261          | 4        | C3TC            | CLTC             | ESP IS IN SERVICE POSITION; STARTING INSTALLATION OF ACCESS EQUIPMENT; HH CRANE SUPPORT NO LONGER REQUIRED,                              |         |
|                           | 181          | 5        | CLTC            | CVTS             | HH CRANE SUPPORT FOR ESP RAISING NO LONGER REQUIRED,                                                                                     | TCPI    |
| TYPE IV<br>7 HRS<br>30 0" | 231          | 1        | L3PM            | C3TC             | ACCESS EQUIPMENT INSTALLATION AND SNIFFER CHECKS ARE COMPLETE; READY TO START DRYOUT AND ENGINE RECONFIGURATION OPERATIONS,              |         |
|                           | 231          | 2        | C3TC            | L3PM             | START THRUST CHAMBER INSPECTION AND THRUST CHAMBER FUEL DRAIN PER V-24521 (HAZARDOUS); REPORT WHEN COMPLETE,                             | D       |
|                           | 231          | 3        | C3TC            | S30E             | DISCONNECT CONAX VALVES AND AUTO IGNITERS PER V-29121 (HAZARDOUS); REPORT WHEN COMPLETE,                                                 | D       |
|                           | 231          | 4        | C3TC            | L3FC             | INSTALL ACTUATOR MID-STROKE LOCKS PER V-33039, SECT D, STEPS 1(A) THRU 1(C) (NON=HAZARDOUS); REPORT WHEN COMPLETE,                       | D       |
| TYPE IV<br>7 HRS<br>45 0" | 261          | 1        | CVTS            | CLTC             | MSS IS OVER SUPPORT COLUMNS; VERIFY READY FOR JACKDOWN;                                                                                  | TCPI    |



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|----------------------------|--------------|----------|-----------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>8 HRS<br>01 0"  | 266          | 1        | CPDC            | C1TC             | FACILITY AIR STANDBY PANEL SECURED                                                                                                                                                        |         |
|                            |              | 2        |                 |                  | *****WARNING*****<br>*<br>* THE FACILITY AIR SYSTEM *<br>* HAS BEEN PURGED OF GN2 *<br>* AND IS BACK IN NORMAL *<br>* CONFIGURATION; RESUME *<br>* PREVIOUS HAZARD LEVEL. *<br>*<br>***** |         |
|                            | 261          | 3        | CVTS            | CLTC             | MSS IS ON SUPPORT COLUMNS, CONNECT AUX DAMPER,                                                                                                                                            | TCPI    |
|                            |              | 4        |                 |                  | NOTE<br>==                                                                                                                                                                                |         |
|                            |              |          |                 |                  | FOR THE NEXT 15 MINUTES;<br>CSAD REQUIRES CONTROL OF<br>CAMERA 27B,                                                                                                                       |         |
|                            | 261          | 5        | CLTC            | C1TC             | CONNECT AUX DAMPER;                                                                                                                                                                       |         |
|                            | 266          | 6        | C1TC            | CSAD             | CONNECT AUX DAMPER PER V=36086<br>(NON=HAZARDOUS), REPORT WHEN COMPLETE;                                                                                                                  | D       |
|                            | 181          | 7        | CLTC            | CVTS             | CLOSE MSS PLAT 1 AND MOVE TO LV STA 878,                                                                                                                                                  | TCPI    |
| TYPE IV<br>8 HRS<br>151 0" | 231          | 8        | C3NE            | C3TC             | 9A1 AND 9A2 DISTRIBUTOR REPLACEMENT IS<br>COMPLETE,                                                                                                                                       |         |
|                            | 261          | 1        | C1TC            | CLTC             | AUX DAMPER IS CONNECTED                                                                                                                                                                   |         |
|                            | 181          | 2        | CLTC            | CVTS             | AUX DAMPER IS CONNECTED                                                                                                                                                                   | TCPI    |
|                            | 261          | 3        | CVTS            | CLTC             | STANDBY FOR OIS TRANSFER FROM CRAWLER<br>TRANSPORTER TO PAD                                                                                                                               | TCPI    |
|                            |              |          |                 |                  |                                                                                                                                                                                           |         |



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|----------------------------|-----------|----------|--------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>8 HRS<br>15: 0" | 231       | 4        | L3FC         | C3TC                 | ACTUATOR MID-STROKE LOCK INSTALLATION IS COMPLETE,                                                                                                  |         |
| TYPE IV<br>8 HRS<br>20: 0" | 266       | 1        | CWCP         | C1TC                 | IWS SECURING COMPLETE,                                                                                                                              |         |
|                            | 266       | 2        | C1TC         | LEBS                 | RECHARGE EMERGENCY BACK-UP BATTERIES V=21439 (NON=HAZARDOUS),                                                                                       | D       |
| TYPE IV<br>8 HRS<br>30: 0" | 261       | 1        | CVTS         | CLTC                 | MSS OIS CONNECTED TO PAD                                                                                                                            | TCPI    |
| TYPE IV<br>8 HRS<br>45: 0" | 261       | 1        | CVTS         | CLTC                 | VERIFY READY FOR MSS POWER TRANSFER TO PAD POWER,                                                                                                   | TCPI    |
|                            | 231       | 2        | S30E         | C3TC                 | CONAX VALVES AND AUTO IGNITERS ARE DISCONNECTED,                                                                                                    |         |
|                            | 231       | 3        | C3TC         | L3NE                 | PERFORM BUS READINGS PER V=31115, SECT; B,1, (NON=HAZARDOUS), DO NOT READ PLUG SUPV, 1D110, 1D210, 1D80, 1D10 AND 1D20 BUSES, REPORT WHEN COMPLETE, |         |
| TYPE IV<br>9 HRS<br>0: 0"  | 261       | 1        | CVTS         | CLTC                 | MSS PLATFORM 1 IS AVAILABLE FOR ACCESS                                                                                                              | TCPI    |
|                            | 261       | 2        | CLTC         | C1TC<br>C3TC<br>C4TC | MSS PLATFORM 1 IS AVAILABLE FOR ACCESS                                                                                                              |         |
|                            | 266       | 3        | C1TC         | CSPP                 | CONNECT GROUNDING STRAP FROM S/A 1A TO MSS PLATFORM 1,                                                                                              |         |



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|----------------------------|--------------|----------|-----------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>9 HRS<br>15: 0" |              |          |                 |                      |                                                                                                                                                                                                                                   |         |
|                            | 231          | 1        | L3NE            | C3TC                 | BUS READINGS ARE COMPLETE,                                                                                                                                                                                                        |         |
|                            | 231          | 2        | C3TC            | C3NE<br>C3SN<br>C3ME | VERIFY READY FOR STAGE POWER                                                                                                                                                                                                      |         |
|                            | 231          | 3        | C3TC            | C3SN                 | APPLY S-IB STAGE POWER PER V#31115, SECT<br>C, PART I, STEPS 14 THRU 23<br>(NON=HAZARDOUS), REPORT WHEN COMPLETE;                                                                                                                 | D       |
| TYPE IV<br>9 HRS<br>20: 0" |              |          |                 |                      |                                                                                                                                                                                                                                   |         |
|                            | 231          | 1        | C3SN            | C3TC                 | POWER IS ON THE S-IB STAGE                                                                                                                                                                                                        |         |
|                            | 261          | 2        | C3TC            | CLTC                 | POWER IS ON THE S-IB STAGE                                                                                                                                                                                                        |         |
|                            | 181          | 3        | CLTC            | CVTS                 | READY TO CLEAR THE CONTROL AREA FOR<br>S-IVB SEPARATION EBW DETONATOR AND<br>RETROCKET EBW INITIATOR SAFING;                                                                                                                      | TCPI    |
|                            | 188          | 4        | CVTS            | PA                   | ALL NON=ESSENTIAL PERSONNEL CLEAR THE<br>CONTROL AREA FOR S-IVB SEPARATION EBW<br>DETONATOR AND RETROCKET EBW INITIATOR<br>SAFING;                                                                                                | TCPI    |
|                            |              | 4-1      |                 |                      | *****WARNING*****<br>*<br>* THE CONTROL AREA FOR<br>* S-IVB SEPARATION AND<br>* RETROCKET SAFING IS<br>* THE S-IVB AFT<br>* INTERSTAGE INTERNAL TO<br>* THE LV AND A 10 FT.<br>* RADIUS AROUND EACH<br>* RETROCKET;<br>*<br>***** |         |
|                            |              | 5        |                 |                      | DELETED                                                                                                                                                                                                                           |         |
|                            | 261          | 6        | CLTC            | C4TC                 | CONTROL AREA IS OPEN FOR PERSONNEL<br>REQUIRED FOR S-IVB SEPARATION AND<br>RETROCKET SAFING OPERATIONS;                                                                                                                           |         |



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|----------------------------|--------------|----------|-----------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>9 HRS<br>20: 0" | 241          | 7        | C4TC            | C4SM                         | START ORDNANCE PANEL SETUP PER V=30610,<br>SECT V, PART 21 (NON=HAZARDOUS); REPORT<br>WHEN COMPLETE;                                                                                                 |         |
|                            | 261          | 8        | CLTC            | CUTC                         | PREPARE IU STAGE FOR RF SILENCE AND<br>CONTROLLED SWITCHING PER V=31119<br>APPENDIX C (NON=HAZARDOUS);                                                                                               | D       |
|                            | 231          | 9        | C3TC            | C3DP                         | VERIFY STATUS SYSTEMS SWITCH SAFE AND<br>S&A SAFE;                                                                                                                                                   |         |
|                            | 231          | 10       | C3TC            | C3DP                         | VERIFY S&A SAFE INDICATION ON                                                                                                                                                                        |         |
|                            | 231          | 11       | C3TC            | C3NP                         | STAGE LOGIC TO INHIBIT AND VERIFY STAGE<br>LOGIC ZERO ON;                                                                                                                                            |         |
|                            | 261          | 12       | CLTC            | C1TC<br>C3TC<br>C4TC<br>CUTC | VERIFY READY FOR RF SILENCE AND LV<br>CONTROLLED SWITCHING                                                                                                                                           |         |
|                            | 181          | 13       | CLTC            | CVTS                         | REQUEST RF SILENCE; LV CONTROLLED<br>SWITCHING AND LV/SC INTERFACE CONTROLLED<br>SWITCHING ARE NOW IN EFFECT;                                                                                        | TCPI    |
| TYPE IV<br>9 HRS<br>30: 0" | 188          | 1        | CVTS            | PA                           | RF SILENCE IS NOW IN EFFECT; CONTROLLED<br>SWITCHING ON THE LV AND ACROSS THE LV/SC<br>INTERFACE IS NOW IN EFFECT; SWITCHING<br>REQUESTS ARE TO BE COORDINATED THROUGH<br>TEST CONDUCTORS WITH CVTS; | TCPI    |
|                            | 261          | 2        | CLTC            | C4TC                         | START S=IVB SEPARATION AND RETROROCKET<br>SAFING OPERATIONS                                                                                                                                          |         |
|                            | 241          | 3        | C4TC            | S4OR                         | DISCONNECT AND SAFE SEPARATION AND<br>RETROROCKET EBW ORDNANCE PER V=30610,<br>SECT V, PART 22 (HAZARDOUS); REPORT<br>WHEN COMPLETE                                                                  | D       |
|                            | 261          | 4        | CVTS            | CLTC                         | MSS PLATFORM 3 IS AVAILABLE FOR ACCESS                                                                                                                                                               | TCPI    |



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|----------------------------|-----------|----------|--------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>9 HRS<br>30' 0" |           |          |              |                      |                                                                                                                                     |         |
|                            | 261       | 5        | CLTC         | C1TC<br>C4TC<br>CUTC | MSS PLATFORM 3 IS AVAILABLE FOR ACCESS                                                                                              |         |
|                            | 251       | 6        | CUTC         | PUTO                 | INSPECT/CLEAN ST=124M WINDOW. REPORT WHEN COMPLETE.                                                                                 |         |
|                            | 231       | 7        | C3TC         | S3OE                 | DISCONNECT SPGGI'S PER V=29121 (HAZARDOUS). REPORT WHEN COMPLETE.                                                                   | D       |
|                            | 261       | 8        | C3TC         | CLTC                 | REQUEST CPSS RELEASE TCS ARM KEY TO C3SP                                                                                            |         |
|                            | 181       | 9        | CLTC         | CVTS                 | REQUEST CPSS RELEASE TCS ARM KEY TO C3SP FOR IGNITION ARMED STRAY VOLTAGE CHECK.                                                    | TCPI    |
| TYPE IV<br>10 HRS<br>0' 0" |           |          |              |                      |                                                                                                                                     |         |
|                            | 251       | 1        | PUTO         | CUTC                 | ST=124M WINDOW INSPECTION/CLEANING IS COMPLETE. READY FOR MSS PLATFORM 3 OPENING.                                                   |         |
|                            | 261       | 2        | CUTC         | CLTC                 | IU READY FOR MSS PLATFORM 3 OPENING                                                                                                 |         |
|                            | 231       | 3        | S3OE         | C3TC                 | SPGGI'S DISCONNECTIONS COMPLETE                                                                                                     |         |
|                            | 231       | 4        | C3TC         | S3OE                 | START CONAX ARMED STRAY VOLTAGE AND CONTINUITY CHECK PER V=29126, SECT. C, PART I (NON=HAZARDOUS). REPORT WHEN COMPLETE.            | D       |
|                            | 231       | 5        | C3TC         | S3OE                 | START IGNITION SYSTEM ARMED STRAY VOLTAGE AND CONTINUITY CHECKS PER V=29129, SECT. C, PART I (NON=HAZARDOUS). REPORT WHEN COMPLETE. | D       |
|                            | 261       | 6        | CLTC         | C1TC<br>C4TC         | VERIFY READY FOR MSS PLATFORM 3 OPENING                                                                                             |         |
|                            | 181       | 7        | CLTC         | CVTS                 | MSS PLATFORM 3 IS AVAILABLE FOR OPENING                                                                                             | TCPI    |



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|------------------------------|-----------|----------|--------------|---------------|-------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+11 HRS<br>01 00" | 231       | 1        | L3PM         | C3TC          | THRUST CHAMBER INSPECTION AND THRUST CHAMBER DRAIN IS COMPLETE.                                                         |         |
|                              | 231       | 2        | C3TC         | L3PM          | INSTALL THRUST CHAMBER COVERS                                                                                           |         |
|                              | 231       | 3        | C3TC         | L3PM          | START LOX CAVITIES SWAB PER V#24476 (NON=HAZARDOUS) AND TORQUE PUMPS PER V#24477 (NON=HAZARDOUS), REPORT WHEN COMPLETE, | D       |
|                              | 231       | 4        | S30E         | C3TC          | CONAX AND IGNITION SYSTEM ARMED STRAY VOLTAGE CHECKS ARE COMPLETE,                                                      |         |
|                              | 231       | 5        | C3TC         | C3SP          | VERIFY TCS ARM KEY HAS BEEN RETURNED TO CPSS,                                                                           |         |
|                              | 261       | 6        | C3TC         | CLTC          | CONAX AND IGNITION SYSTEM ARMED STRAY VOLTAGE CHECKS ARE COMPLETE, THE TCS ARM KEY HAS BEEN RETURNED TO CPSS,           |         |
|                              | 181       | 7        | CLTC         | CVTS          | CONAX AND IGNITION ARMED STRAY VOLTAGE CHECKS ARE COMPLETE, THE TCS ARM KEY HAS BEEN RETURNED TO CPSS,                  | TCPI    |
| TYPE IV<br>+11 HRS<br>30 00" | 241       | 1        | C4SM         | C4TC          | SEPARATION AND RETROROCKET ORDNANCE SAFING IS COMPLETE;                                                                 |         |
|                              | 261       | 2        | C4TC         | CLTC          | SEPARATION AND RETROROCKET ORDNANCE SAFING IS COMPLETE;                                                                 |         |



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|-----------------------------|-----------|----------|--------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| TYPE IV<br>11 HRS<br>30' 0" | 261       | 3        | CLTC         | C1TC<br>C3TC<br>C4TC<br>CUTC | VERIFY READY TO REMOVE RF SILENCE AND CONTROLLED SWITCHING                                                                                                  |             |
|                             | 181       | 4        | CLTC         | CVTS                         | S=IVB SEPARATION AND RETROROCKET ORDNANCE SAFING IS COMPLETE, LV READY TO REMOVE RF SILENCE AND CONTROLLED SWITCHING,                                       | TCP1        |
|                             | 188       | 5        | CVTS         | PA                           | S=IVB SEPARATION AND RETROROCKET SAFING IS COMPLETE, RF SILENCE AND CONTROLLED SWITCHING ARE NO LONGER IN EFFECT, THE CONTROL AREA IS OPEN FOR NORMAL WORK, | TCP1        |
|                             | 231       | 6        | C3TC         | L3PM                         | REMOVE SPENT HYPERGOL CARTRIDGES PER V=29124 (HAZARDOUS), REPORT WHEN COMPLETE,                                                                             | D           |
|                             | 231       | 7        | C3TC         | L3PM                         | START IGNITER FUEL SYSTEM PURGE PER V=24515 (HAZARDOUS), REPORT WHEN COMPLETE,                                                                              | D           |
|                             | 261       | 8        | CLTC         | CLGK                         | REQUEST AND EXECUTE LAPW (LVDC/DA POWER ON) PER V=33033 (NON-HAZARDOUS), REPORT WHEN COMPLETE,                                                              | (FT25)<br>D |
|                             | 261       | 9        | CLTC         | C3TC                         | CLEAR TO START LOX LOW LEVEL SENSOR OUTPUT TEST, PREVALVE ACTUATION TEST, AND 9A1, 9A2 TO 12A1 INTERFACE TEST ON CH 231;                                    |             |
|                             |           | 10       |              |                              | LOX LOW LEVEL SENSOR OUTPUT TEST<br>-----                                                                                                                   |             |
|                             | 231       | 10-1     | C3TC         | C3EV                         | VERIFY LOX LOW LEVEL SENSOR #2 AND #3 INDICATIONS ARE ON                                                                                                    |             |
|                             | 231       | 10-2     | C3TC         | C3NP                         | LEVEL SENSORS SWITCH TO DISABLE                                                                                                                             |             |
|                             | 231       | 10-3     | C3TC         | C3EV                         | VERIFY LOX LOW LEVEL SENSOR #2 AND #3 INDICATIONS ARE OFF                                                                                                   |             |
|                             | 231       | 10-4     | C3TC         | C3NP                         | LEVEL SENSORS SWITCH TO ENABLE                                                                                                                              |             |



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|-----------------------------|-----------|----------|--------------|---------------|-----------------------------------------------------------------------------------------|---------|
| TYPE IV<br>11 HRS<br>30: 0" |           |          |              |               |                                                                                         |         |
|                             | 231       | 10-5     | C3TC         | C3EV          | VERIFY LOX LOW LEVEL SENSOR #2 AND #3 INDICATIONS ARE ON                                |         |
|                             | 231       | 10-6     | C3TC         | ALL           | LOX LOW LEVEL SENSOR OUTPUT TEST IS COMPLETE                                            |         |
|                             |           | 11       |              |               | PREVALVE ACTUATION TEST<br>-----                                                        |         |
|                             | 231       | 11-1     | C3TC         | C3FP          | VERIFY ALL LOX AND FUEL PREVALVE OPEN INDICATIONS ARE ON                                |         |
|                             | 231       | 11-2     | C3TC         | C3FP          | ENGINE 1 THROUGH 8 PREVALVE SWITCHES TO CLOSE                                           |         |
|                             | 231       | 11-3     | C3TC         | C3FP          | VERIFY ALL LOX AND FUEL PREVALVE CLOSED INDICATIONS ARE ON AND OPEN INDICATIONS ARE OFF |         |
|                             | 231       | 11-4     | C3TC         | C3FP          | ENGINE 1 THROUGH 8 PREVALVE SWITCHES TO AUTO                                            |         |
|                             | 231       | 11-5     | C3TC         | C3FP          | VERIFY ALL LOX AND FUEL PREVALVE OPEN INDICATIONS ARE ON AND CLOSED INDICATIONS ARE OFF |         |
|                             | 231       | 11-6     | C3TC         | C3FP          | ALL PREVALVES SWITCH TO CLOSE AND VERIFY ALL PREVALVES CLOSED                           |         |
|                             | 231       | 11-7     | C3TC         | ALL           | THE PREVALVE ACTUATION TEST IS COMPLETE                                                 |         |
|                             |           | 12       |              |               | 9A1 & 9A2 TO 12A1 INTERFACE TEST<br>-----                                               |         |
|                             | 231       | 12-1     | C3TC         | C3NE          | VERIFY READY TO START THE 9A1 & 9A2 TO 12A1 INTERFACE TEST                              |         |
|                             | 231       | 12-2     | C3TC         | C3NP          | STAGE LOGIC TO AUTO                                                                     |         |
|                             | 231       | 12-3     | C3TC         | C3NK          | ISSUE SWITCH SELECTOR CHANNEL 104 (PROPELLANT LEVEL SENSORS ENABLE) (\$MSIB104)         |         |
|                             | 231       | 12-4     | C3TC         | C3DP          | VERIFY SEPARATION AND RETROROCKET EBW FIRING UNITS #1 & #2 CHARGE                       |         |



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|-----------------------------|-----------|----------|--------------|---------------|---------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>11 HRS<br>30' 0" | 231       | 12-5     | C3TC         | C3NP          | STAGE LOGIC TO RESET THEN INHIBIT AND RESET COUNTER                                                                       |         |
|                             | 231       | 12-6     | C3TC         | C3DP          | VERIFY SEPARATION AND RETROROCKET EBW FIRING UNITS #1 & #2 DISCHARGE                                                      |         |
|                             | 231       | 12-7     | C3TC         | ALL           | THE 9A1 & 9A2 TO 12A1 INTERFACE TEST IS COMPLETE                                                                          |         |
|                             | 261       | 12-8     | C3TC         | CLTC          | THE 9A1 & 9A2 TO 12A1 INTERFACE TEST IS COMPLETE                                                                          |         |
| TYPE IV<br>11 HRS<br>45' 0" |           | 1        |              |               | DIN 14 & 15 AND FUEL DEPLETION ENABLE<br>-----<br>TEST<br>----                                                            |         |
|                             | 261       | 1-1      | CLGK         | CLTC          | LVDC/DA POWER ON IS COMPLETE                                                                                              |         |
|                             | 261       | 1-2      | CLTC         | CLGK          | REPORT TO CH, 231 TO SUPPORT DIN 14 & 15 TEST                                                                             |         |
|                             | 261       | 1-3      | CLTC         | C3TC          | YOU ARE CLEAR TO RUN THE DIN 14 & 15 AND FUEL DEPLETION ENABLE TEST                                                       |         |
|                             | 231       | 1-4      | C3TC         | CLGK          | REQUEST AND EXECUTE FT25 DISCRETE INPUT TEST (LVDA/DC DISCRETE INPUT TEST) (MANUAL OPTION), REPORT WHEN READY TO PROCEED, |         |
|                             | 231       | 1-5      | C3TC         | C3EV          | VERIFY FUEL DEPL, CUTOFF INDICATION OFF AND FLIGHT SEQUENCE ZERO INDICATION ON                                            |         |
|                             | 231       | 1-6      | C3TC         | C3NP          | STAGE LOGIC TO AUTO                                                                                                       |         |
|                             | 231       | 1-7      | C3TC         | C3NK          | ISSUE SWITCH SELECTOR CHANNEL 97 (LOX DEPLETION CUTOFF ENABLE) (SMS18097)                                                 |         |
|                             | 231       | 1-8      | C3TC         | C3DE          | VERIFY DEE 2219 ON                                                                                                        |         |
|                             | 231       | 1-9      | C3TC         | CLGK          | DIN 14 WILL BE ISSUED THE NEXT STEP                                                                                       |         |



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|-----------------------------|-----------|----------|--------------|---------------|---------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>11 HRS<br>45: 0" |           |          |              |               |                                                                                                   |         |
|                             | 231       | 1-10     | C3TC         | C3NK          | ON YOUR MARK, ISSUE SWITCH SELECTOR CHANNEL 18 (OUTBOARD CUTOFF) (SMSIB018)                       |         |
|                             | 231       | 1-11     | C3TC         | C3EV          | VERIFY +1D11 AND +1D21 ENGINE 1 THRU 8 CUTOFF INDICATIONS ON AND FUEL DEPL. CUTOFF INDICATION OFF |         |
|                             | 231       | 1-12     | C3TC         | CLGK          | VERIFY DIN 14 RECEIVED                                                                            |         |
|                             | 231       | 1-13     | C3TC         | C3NK          | ISSUE SWITCH SELECTOR CHANNEL 79 (FUEL DEPLETION CUTOFF ENABLE) (SMSIB079)                        |         |
|                             | 231       | 1-14     | C3TC         | C3EV          | VERIFY FUEL DEPL. CUTOFF INDICATION ON (DEE 0378)                                                 |         |
|                             | 231       | 1-15     | C3TC         | C3NP          | STAGE LOGIC TO RESET THEN AUTO                                                                    |         |
|                             | 231       | 1-16     | C3TC         | C3EV          | VERIFY FLIGHT SEQUENCE ZERO INDICATION ON                                                         |         |
|                             | 231       | 1-17     | C3TC         | C3EV          | VERIFY +1D11 AND +1D21 ENGINE 1 THRU 8 CUTOFF INDICATIONS ARE OFF                                 |         |
|                             | 231       | 1-18     | C3TC         | C3EV          | VERIFY FUEL DEPL. CUTOFF INDICATION IS OFF                                                        |         |
|                             | 231       | 1-19     | C3TC         | C3NK          | ISSUE SWITCH SELECTOR CHANNEL 97 (LOX DEPLETION CUTOFF ENABLE) (SMSIB097)                         |         |
|                             | 231       | 1-20     | C3TC         | C3DE          | VERIFY DEE 2219 IS ON                                                                             |         |
|                             | 231       | 1-21     | C3TC         | CLGK          | DIN 15 WILL BE ISSUED THE NEXT STEP                                                               |         |
|                             | 231       | 1-22     | C3TC         | C3NK          | ON YOUR MARK, ISSUE SWITCH SELECTOR CHANNEL 18 (OUTBOARD CUTOFF) (SMSIB018)                       |         |
|                             | 231       | 1-23     | C3TC         | C3EV          | VERIFY +1D11 AND +1D21 ENGINE 1 THRU 8 CUTOFF INDICATIONS ARE ON                                  |         |
|                             | 231       | 1-24     | C3TC         | CLGK          | VERIFY DIN 15 RECEIVED                                                                            |         |
|                             | 231       | 1-25     | C3TC         | C3NP          | STAGE LOGIC TO RESET THEN INHIBIT AND RESET COUNTER                                               |         |
|                             | 231       | 1-26     | C3TC         | C3EV          | VERIFY FLIGHT SEQUENCE ZERO INDICATION IS ON                                                      |         |



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|-----------------------------|-----------|----------|--------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>11 HRS<br>45' 0" |           |          |              |                              |                                                                                                                                                                     |         |
|                             | 231       | 1-27     | C3TC         | ALL                          | THE DIN 14 & 15 AND FUEL DEPLETION ENABLE TEST IS COMPLETE                                                                                                          |         |
|                             | 261       | 1-28     | C3TC         | CLTC                         | THE DIN 14 & 15 AND FUEL DEPLETION ENABLE TEST IS COMPLETE                                                                                                          |         |
|                             | 261       | 1-29     | CLTC         | CLGK                         | TERMINATE FT25 AND REQUEST & EXECUTE FT04 (LVDC/DA POWER OFF) PER V=33033 (NON=HAZARDOUS)                                                                           | D       |
| TYPE IV<br>12 HRS<br>0' 0"  |           |          |              |                              |                                                                                                                                                                     |         |
|                             | 231       | 0        | C3TC         | L3PM                         | START RP=1 DRAIN AT FABU INLET QD'S PER V=24528 (HAZARDOUS). REPORT WHEN COMPLETE,                                                                                  | D       |
|                             | 261       | 1        | CLTC         | C3TC                         | VERIFY READY FOR S=IB ENGINE ORDNANCE DELIVERY                                                                                                                      |         |
|                             | 181       | 2        | CLTC         | CVTS                         | REQUEST CTSC START S=IB ENGINE ORDNANCE DELIVERY. ORDNANCE IS TO BE DELIVERED TO THE PAD LEVEL EAST ELEVATOR                                                        | TCPI    |
|                             | 181       | 3        | CLTC         | CVTS                         | PROVIDE FIREMAN, BUNKER SUITED, AT TOP OF PEDESTAL IN 45 MINUTES TO SUPPORT S=IB HYPERGOL INSTALLATION                                                              | TCPI    |
|                             | 261       | 4        | CLTC         | C1TC<br>C3TC<br>C4TC<br>CUTC | VERIFY READY TO CLEAR THE CONTROL AREA FOR LV ORDNANCE OPERATIONS                                                                                                   |         |
|                             | 181       | 5        | CLTC         | CVTS                         | READY TO CLEAR THE CONTROL AREA FOR LV ORDNANCE OPERATIONS                                                                                                          | TCPI    |
|                             | 188       | 6        | CVTS         | PA                           | ALL NON=ESSENTIAL PERSONNEL ARE TO CLEAR THE CONTROL AREA FOR LV ORDNANCE OPERATIONS                                                                                | TCPI    |
|                             |           | 7        |              |                              | *****WARNING*****<br>*<br>* THE CONTROL AREA FOR LV *<br>* ORDNANCE OPERATIONS *<br>* CONSISTS OF THE ML, *<br>* MSS, PAD APRON AND *<br>* FLAME TRENCH, *<br>***** | TCPI    |



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|----------------------------|-----------|----------|--------------|---------------|-------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>12 HRS<br>01 00 |           |          |              |               |                                                                                                                               |         |
|                            | 261       | 8        | CVTS         | CLTC          | CHANGE THE SMDPS FROM 2 SWITCH 1 VALVE MODE TO 2 SWITCH MODE, REPORT WHEN COMPLETE,                                           | TCPI    |
|                            | 261       | 9        | CLTC         | C1TC          | CHANGE THE SMDPS FROM 2 SWITCH 1 VALVE MODE TO 2 SWITCH MODE, REPORT WHEN COMPLETE,                                           |         |
|                            | 266       | 10       | C1TC         | CPDC          | CHANGE THE SMDPS FROM 2 SWITCH 1 VALVE MODE TO 2 SWITCH MODE, REPORT WHEN COMPLETE,                                           |         |
|                            | 261       | 11       | CLTC         | C3TC<br>C4TC  | CONFIGURE ORDNANCE AND PD PANELS FOR ORDNANCE OPERATIONS,                                                                     |         |
|                            | 241       | 12       | C4TC         | C4SM          | CONFIGURE ORDNANCE CONTROL PANELS PER V#30610, SECT V, PART 23 (NON-HAZARDOUS), REPORT WHEN COMPLETE,                         |         |
|                            | 231       | 13       | C3TC         | C3DP          | VERIFY FOLLOWING SWITCH POSITIONS:<br><br>STATUS SYSTEMS SWITCH = SAFE<br>S&A = SAFE                                          |         |
|                            | 231       | 14       | C3TC         | C3NP          | VERIFY FOLLOWING SWITCH POSITIONS:<br><br>PREMATURE IGNITION = OFF<br>IGNITION SAFE/ARM = SAFE<br>STAGE LOGIC = INHIBIT       |         |
|                            | 231       | 15       | C3TC         | C3SP          | VERIFY TCS SAFE/ARM = SAFE                                                                                                    |         |
|                            | 231       | 16       | C3TC         | C3FA          | VERIFY FOLLOWING SWITCH POSITIONS:<br><br>SYSTEM POWER = OFF<br>TEST POWER = SAFE<br>VALVE 1 AND EBW = HOLD<br>VALVE 2 = HOLD |         |
|                            | 231       | 17       | C3TC         | C3CE          | VERIFY READY FOR CONTROLLED SWITCHING                                                                                         |         |
|                            | 261       | 18       | CLTC         | RRSC          | DRSCS RECORDERS ON                                                                                                            |         |



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|-----------------------------|--------------|----------|-----------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+12 HRS<br>01 0" | 261          | 19       | CLTC            | CUTC                         | PREPARE IU STAGE FOR RF SILENCE &<br>CONTROLLED SWITCHING PER V#31119<br>APPENDIX C (NON-HAZARDOUS);                                                                                             | D       |
|                             | 261          | 20       | CLTC            | C1TC<br>C3TC<br>C4TC<br>CUTC | VERIFY READY FOR RF SILENCE AND<br>CONTROLLED SWITCHING AND VERIFY SWITCH<br>SELECTORS INHIBITED                                                                                                 |         |
|                             | 181          | 21       | CLTC            | CVTS                         | LV READY FOR RF SILENCE AND CONTROLLED<br>SWITCHING                                                                                                                                              | TCPI    |
|                             | 188          | 22       | CVTS            | PA                           | CONTROLLED SWITCHING ON THE LV AND<br>ACROSS THE LV-SC INTERFACE IS NOW IN<br>EFFECT, SWITCHING REQUESTS ARE TO BE<br>COORDINATED THROUGH TEST CONDUCTORS WITH<br>CVTS, RF SILENCE IS IN EFFECT; | TCPI    |
| TYPE IV<br>+12 HRS<br>30 0" | 231          | 1        | L3PM            | C3TC                         | LOX CAVITY SWAB AND PUMP TORQUE IS<br>COMPLETE;                                                                                                                                                  |         |
|                             | 261          | 2        | CLTC            | C4TC                         | CLEAR TO START SEPARATION AND RETRO-<br>ROCKET ORDNANCE STRAY VOLTAGE CHECKS AND<br>CONNECTIONS                                                                                                  |         |
|                             | 231          | 3        | C4TC            | C3TC                         | VERIFY S-IB OBSERVER ON STATION FOR<br>SEPARATION AND RETROROCKET ORDNANCE<br>STRAY VOLTAGE CHECKS AND CONNECTIONS                                                                               |         |
|                             | 241          | 4        | C4TC            | C4SM                         | START SEPARATION AND RETROROCKET<br>ORDNANCE STRAY VOLTAGE CHECKS AND<br>CONNECTIONS PER V#30610, SECT. V, PART<br>24 (HAZARDOUS); REPORT WHEN COMPLETE.                                         | D       |



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|------------------------------|-----------|----------|--------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+13 HRS<br>01 00" | 231       | 1        | L3PM         | C3TC          | SPENT HYPERGOL CARTRIDGE REMOVAL IS COMPLETE                                                                                                                |         |
|                              | 231       | 2        | C3TC         | L3PM          | START STRUCTURAL INSPECTION PER V=24497 (NON-HAZARDOUS), REPORT WHEN COMPLETE,                                                                              | D       |
|                              | 231       | 3        | C3TC         | L3PM          | START HYPERGOL CARTRIDGE INSTALLATION PER V=39019 (HAZARDOUS), REPORT WHEN COMPLETE,                                                                        | D       |
|                              | 231       | 4        | C3TC         | L3PM          | START REMOVAL OF SPENT SPGG'S PER V=29121 (HAZARDOUS) AND START INSTALLATION OF REPLACEMENT SPGG'S PER V=39021 (HAZARDOUS), REPORT WHEN COMPLETE,           | D       |
| TYPE IV<br>+13 HRS<br>30 00" | 241       | 1        | C4SM         | C4TC          | SEPARATION AND RETROROCKET ARMING IS COMPLETE                                                                                                               |         |
|                              | 261       | 2        | C4TC         | CLTC          | SEPARATION AND RETROROCKET ARMING IS COMPLETE                                                                                                               |         |
|                              | 181       | 3        | CLTC         | CVTS          | SEPARATION AND RETROROCKET ORDNANCE ARMING IS COMPLETE,                                                                                                     | TCPI    |
|                              | 241       | 4        | C4TC         | S4MA          | REMOVE AFT ACCESS KIT PER V=30610, SECT V, PART 25 (HAZARDOUS), REPORT WHEN COMPLETE,                                                                       | D       |
| TYPE IV<br>+14 HRS<br>01 00" | 241       | 1        | S4MA         | C4TC          | AFT ACCESS KIT REMOVAL IS COMPLETE                                                                                                                          |         |
|                              | 241       | 2        | C4TC         | S4MA          | INSTALL AFT INTERSTAGE ACCESS DOOR PER V=30610, SECT M, PART 2 (NON HAZARDOUS), REPORT WHEN COMPLETE,                                                       | D       |
|                              | 231       | 3        | C3TC         | L3PM          | START SPENT AUTO IGNITER REMOVAL PER V=29121 (HAZARDOUS) AND START INSTALLATION OF REPLACEMENT AUTO IGNITERS PER V=39020 (HAZARDOUS), REPORT WHEN COMPLETE, | D       |



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|-----------------------------|-----------|----------|--------------|---------------|----------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>14 HRS<br>30' 0" |           |          |              |               |                                                                                                          |         |
|                             | 241       | 1        | S4MA         | C4TC          | AFT INTERSTAGE ACCESS DOOR INSTALLATION IS COMPLETE,                                                     |         |
|                             | 241       | 2        | C4TC         | S4MA          | START FINAL S/A 6 CARRIER PREPARATION PER V=30610, SECT M, PART 3 (NON=HAZARDOUS), REPORT WHEN COMPLETE, | D       |
|                             | 231       | 3        | L3PM         | C3TC          | IGNITER FUEL SYSTEM PURGE IS COMPLETE,                                                                   |         |
| TYPE IV<br>14 HRS<br>45' 0" |           |          |              |               |                                                                                                          |         |
|                             | 241       | 1        | S4MA         | C4TC          | AFT CARRIER PREPS ARE COMPLETE AND READY TO RETRACT S/A 6 TIP,                                           |         |
|                             | 261       | 2        | C4TC         | C1TC          | READY FOR S/A 6 TIP RETRACTION                                                                           |         |
|                             | 266       | 3        | C1TC         | CSAC          | RETRACT S/A 6 EXTENSION PLATFORM AND CLOSE SAFETY GATE FOR S/A 6                                         |         |
| TYPE IV<br>15 HRS<br>0' 0"  |           |          |              |               |                                                                                                          |         |
|                             | 231       | 1        | L3PM         | C3TC          | HYPERGOL CARTRIDGE INSTALLATION IS COMPLETE                                                              |         |
|                             | 261       | 2        | C3TC         | CLTC          | HYPERGOL CARTRIDGE INSTALLATION IS COMPLETE                                                              |         |
|                             | 181       | 3        | CLTC         | CVTS          | HYPERGOL CARTRIDGE INSTALLATION IS COMPLETE, RELEASE FIREMAN,                                            | TCPI    |
| TYPE IV<br>15 HRS<br>30' 0" |           |          |              |               |                                                                                                          |         |
|                             | 231       | 1        | L3PM         | C3TC          | RP-1 DRAIN AT FABU INLET QD'S IS COMPLETE                                                                |         |



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|------------------------------|--------------|----------|-----------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+15 HRS<br>30' 0" |              |          |                 |                  |                                                                                                                                                                   |         |
|                              | 231          | 2        | C3TC            | L3PM             | START FABU TOPPING PER V-24519<br>(NON-HAZARDOUS), REPORT WHEN COMPLETE                                                                                           | D       |
|                              | 231          | 3        | C3TC            | L3PM             | START EXPENDED CONAX VALVES REMOVAL PER<br>V-29121 (HAZARDOUS) AND DRAIN MAIN LOX<br>VALVES CLOSING CONTROL LINE PER V-24528<br>(HAZARDOUS), REPORT WHEN COMPLETE | D       |
|                              | 231          | 4        | C3TC            | L3PM             | START INSTALLATION OF REPLACEMENT CONAX<br>VALVES PER V-39018 (HAZARDOUS), REPORT<br>WHEN COMPLETE.                                                               | D       |
| TYPE IV<br>+16 HRS<br>0' 0"  |              |          |                 |                  |                                                                                                                                                                   |         |
|                              | 231          | 1        | L3PM            | C3TC             | SPGG AND AUTO IGNITER INSTALLATION IS<br>COMPLETE                                                                                                                 |         |
|                              | 231          | 2        | C3TC            | S30E             | START AUTO IGNITER POST INSTALLATION<br>LINKWIRE CHECKS PER V-29141, SECT. C,<br>PART I (HAZARDOUS), REPORT WHEN<br>COMPLETE,                                     | D       |
|                              | 231          | 3        | C3TC            | L3PM             | START INSTALLATION OF SPGGI'S PER<br>V-39022 (HAZARDOUS), REPORT WHEN<br>COMPLETE                                                                                 | D       |
|                              | 261          | 4        | C3TC            | CLTC             | SPGG AND AUTO IGNITER INSTALLATION IS<br>COMPLETE                                                                                                                 |         |
| TYPE IV<br>+17 HRS<br>0' 0"  | 181          | 5        | CLTC            | CVTS             | SPGG AND AUTO IGNITER INSTALLATION IS<br>COMPLETE                                                                                                                 | TCPI    |
|                              | 231          | 1        | S30E            | C3TC             | AUTO IGNITER LINKWIRE CHECKS COMPLETE                                                                                                                             |         |
|                              | 231          | 2        | L3PM            | C3TC             | FABU TOPPING COMPLETE                                                                                                                                             |         |



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|------------------------------|--------------|----------|-----------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+17 HRS<br>30' 0" |              |          |                 |                  |                                                                                                                                                                                                  |         |
| 231                          |              | 1        | L3PM            | C3TC             | CONAX VALVE INSTALLATION IS COMPLETE                                                                                                                                                             |         |
| 261                          |              | 2        | C3TC            | CLTC             | CONAX VALVE INSTALLATION IS COMPLETE,<br>REQUEST CLEARANCE TO REMOVE S=IB STAGE<br>POWER (PRELAUNCH AND INDICATION BUSES)<br>TO CONNECT CONAX POSITION INDICATORS AND<br>AUTO IGNITER LINKWIRES. |         |
| 181                          |              | 3        | CLTC            | CVTS             | CONAX VALVE INSTALLATION COMPLETE,<br>REQUEST LV CONTROLLED SWITCHING ACROSS<br>LV/SC INTERFACE BE LIFTED FOR CONAX<br>POSITION INDICATOR AND AUTO IGNITER<br>LINKWIRE CONNECTIONS.              | TCPI    |
| 188                          |              | 4        | CVTS            | PA               | CONTROLLED SWITCHING INCLUDING<br>CONTROLLED SWITCHING ACROSS THE LV/SC<br>INTERFACE IS LIFTED FOR S=IB LINKWIRE<br>CONNECTIONS, RF SILENCE IS STILL IN<br>EFFECT.                               | TCPI    |
| 261                          |              | 5        | CLTC            | C3TC             | REMOVE STAGE POWER & START LINKWIRE &<br>POSITION INDICATOR CONNECTIONS                                                                                                                          |         |
| 231                          |              | 6        | C3TC            | C3NP             | FUNCTION SELECTOR TO OFF AND VERIFY<br>+1D151 INDICATES 0 VOLTS                                                                                                                                  |         |
| 231                          |              | 7        | C3TC            | C3NP             | INDICATION BUS TO OFF AND VERIFY +1D119<br>INDICATES 0 VOLTS                                                                                                                                     |         |
| 231                          |              | 8        | C3TC            | S3OE             | START CONAX POSITION INDICATOR<br>CONNECTIONS PER V=29126, SECT C, PART II<br>(NON-HAZARDOUS), REPORT WHEN COMPLETE.                                                                             | D       |
| 231                          |              | 9        | C3TC            | S3OE             | START AUTO IGNITER CONNECTIONS PER<br>V=29141, SECT C, PART II (HAZARDOUS),<br>REPORT WHEN COMPLETE.                                                                                             | D       |
| TYPE IV<br>+18 HRS<br>0' 0"  |              |          |                 |                  |                                                                                                                                                                                                  |         |
| 231                          |              | 1        | L3PM            | C3TC             | SPGGI INSTALLATION COMPLETE                                                                                                                                                                      |         |
| 231                          |              | 2        | C3TC            | L3PM             | START TC COVER REMOVAL,<br>AND SILVER TAPE INSPECTION AND<br>REPAIR PER V=24521 (HAZARDOUS),<br>REINSTALL TC COVERS.                                                                             | D       |



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|------------------------------|-----------|----------|--------------|---------------|------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+18 HRS<br>01 0"  | 261       | 3        | C3TC         | CLTC          | SPGGI INSTALLATION COMPLETE                                                                                            |         |
|                              | 181       | 4        | CLTC         | CVTS          | SPGGI INSTALLATION IS COMPLETE                                                                                         | TCPI    |
| TYPE IV<br>+18 HRS<br>301 0" | 231       | 1        | S30E         | C3TC          | AUTO IGNITER LINKWIRE CONNECTIONS AND CONAX VALVE POSITION INDICATOR CONNECTIONS ARE COMPLETE                          |         |
|                              | 261       | 2        | C3TC         | CLTC          | AUTO IGNITER CONNECTIONS AND CONAX VALVE POSITION INDICATOR CONNECTIONS ARE COMPLETE, READY TO APPLY STAGE POWER,      |         |
|                              | 231       | 3        | C3TC         | C3NP          | INDICATION BUS ON AND VERIFY +1D119 INDICATES 28 VDC,                                                                  |         |
|                              | 231       | 4        | C3TC         | C3NP          | FUNCTION SELECTOR TO PRELAUNCH AND VERIFY +1D151 INDICATES 28 VDC                                                      |         |
|                              | 231       | 5        | C3TC         | C3NP          | VERIFY PREMATURE IGNITION SAFE INDICATION ON                                                                           |         |
|                              | 231       | 6        | C3TC         | C3EV          | VERIFY ANY CONAX FIRED INDICATION OFF AND NO CONAX FIRED INDICATION ON                                                 |         |
|                              | 261       | 7        | C3TC         | CLTC          | SeIB ORDNANCE INSTALLATION OPERATIONS ARE COMPLETE, READY TO REMOVE RF SILENCE                                         |         |
|                              | 181       | 8        | CLTC         | CVTS          | LV ORDNANCE INSTALLATION OPERATIONS ARE COMPLETE, LV READY TO REMOVE RF SILENCE,                                       | TCPI    |
|                              | 188       | 9        | CVTS         | PA            | LV ORDNANCE OPERATIONS ARE COMPLETE, LV CONTROLLED SWITCHING, RF SILENCE AND INTERFACE CONTROLLED SWITCHING ARE ENDED. | TCPI    |
|                              | 231       | 9-1      | C3TC         | C3CT          | VERIFY FUEL VENTS CLOSED INDICATIONS "OFF"                                                                             | I40-52  |
|                              | 231       | 10       | C3TC         | C3FP          | ALL PREVALVES SWITCH TO OPEN ENABLE AND VERIFY ALL PREVALVES OPEN                                                      |         |
|                              | 231       | 11       | C3TC         | L3PM<br>C3CT  | PRESSURIZE FUEL TANKS AND LEAK CHECK CONAX VALVES PER V-24520 (HAZARDOUS).                                             | D       |



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|-----------------------------|--------------|----------|-----------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>18 HRS<br>30' 0" |              |          |                 |                  |                                                                                                                                                                                                              |         |
|                             | 231          | 12       | C3TC            | L3NV             | REPORT WHEN COMPLETE,<br>INSTALL THE FOLLOWING JUMPERS IN<br>PREPARATION FOR OALR, REPORT WHEN<br>COMPLETE,                                                                                                  | (OALR)  |
|                             |              | 12-1     |                 |                  | 202-121A3<br>-----<br>J5 - SIM, ENABLE<br>LV-QAL MIP<br>-----                                                                                                                                                |         |
|                             |              | 12-2     |                 |                  | 202-120A1<br>-----<br>FUSED (2 AMP) JUMPER J5/A TO J52/Z<br>FUSED (2 AMP) JUMPER J5/B TO J3/A<br>(+1D34) ESE PAGE 56 &<br>37<br>LEAVE SWITCH 1 OPEN ON JUMPER PANEL<br>LV-QAL MIP<br>-----                   |         |
|                             |              | 12-3     |                 |                  | 202-121A1<br>-----<br>FUSED (1 AMP) JUMPER J5/A TO J59/BB<br>FUSED (1 AMP) JUMPER J5/B TO J2/CC<br>(MEASURING SYSTEMS ON) ESE PAGE 241 &<br>41<br>LEAVE SWITCH 1 OPEN ON JUMPER PANEL<br>LV-QAL MIP<br>----- |         |
|                             |              | 12-4     |                 |                  | 201-164A2<br>-----<br>FUSED (1 AMP) JUMPER J31/K TO J39/W<br>(+1D20 BATTERY SUB TO POWER PAGE 30<br>+1D211)<br>LV-QAL MIP<br>-----<br>FUSED (1 AMP) JUMPER J31/J TO J39/V<br>(CONTINUED)                     |         |



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|------------------------------|--------------|----------|-----------------|------------------|---------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+18 HRS<br>30' 0" |              |          |                 |                  | (+1D10 BATTERY SUB TO POWER PAGE 22<br>+1D111)<br><br>LV GAL MIP<br>0000                                                  |         |
| TYPE IV<br>+19 HRS<br>0' 0"  |              |          |                 |                  |                                                                                                                           |         |
|                              | 231          | 1        | L3PM            | C3TC             | CONAX VALVE LEAK CHECK & SILVER TAPE<br>REPAIR IS COMPLETE                                                                |         |
|                              | 231          | 1-1      | C3TC            | C3PM             | START THRUST CHAMBER JACKET FILL PER V-24521<br>(HAZARDOUS). REPORT WHEN COMPLETE.                                        | D       |
|                              | 231          | 2        | L3NV            | C3TC             | JUMPER INSTALLATION FOR OALR IS COMPLETE                                                                                  |         |
|                              | 231          | 3        | C3TC            | C3NE<br>C3SN     | VERIFY READY FOR OALR                                                                                                     |         |
|                              | 251          | 4        | C3TC            | CUTC             | REQUEST EDS BUS +1D199 FOR APPROXIMATELY<br>30 MINUTES                                                                    |         |
|                              |              | 5        |                 | CUTC             | NOTE<br>0000<br><br>PERFORM THE FOLLOWING SUB-<br>SEQUENCE ONLY IF SC PYRO<br>AND LOGIC BUS SAFE<br>INDICATIONS ARE ON.   |         |
|                              | 251          | 5-1      | CUTC            | CUES             | MODE SWITCH TO TEST & VERIFY +1D199 BUS<br>ON.                                                                            | (OALR)  |
|                              |              | 6        |                 | CUTC             | NOTE<br>0000<br><br>PERFORM THE FOLLOWING SUB-<br>SEQUENCES ONLY IF SC PYRO<br>AND LOGIC BUS SAFE<br>INDICATIONS ARE OFF. |         |
|                              | 231          | 6-1      | CUTC            | C3TC             | REQUEST SIM FLIGHT SWITCH ON                                                                                              |         |
|                              | 231          | 6-2      | C3TC            | C3NP             | SIMULATED FLIGHT SWITCH ON                                                                                                | (OALR)  |
|                              | 251          | 6-3      | C3TC            | CUTC             | SIM FLIGHT IS ON                                                                                                          |         |



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|------------------------------|--------------|----------|-----------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+19 HRS<br>01 00  |              |          |                 |                  |                                                                                                                                                                               |         |
|                              | 251          | 6-4      | CUTC            | CUES             | MODE SWITCH TO LAUNCH AND VERIFY +1D199 BUS ON,                                                                                                                               | (OALR)  |
|                              | 231          | 7        | CUTC            | C3TC             | +1D199 BUS IS ON,                                                                                                                                                             |         |
|                              | 261          | 8        | C3TC            | CLTC             | REQUEST CLEARANCE TO REQUEST & EXECUTE OALR                                                                                                                                   |         |
|                              | 231          | 9        | C3TC            | C3NK             | REQUEST AND EXECUTE OALR WITH THE FOLLOWING OPTIONS<br><br>1, STEP 0,4 SPR2 (FUEL ON BOARD)<br>2, STEP 4,0 SPR3 (FLIGHT BATTERIES)<br>3, STEP 1032,0 SPR2 (ORDNANCE ON BOARD) | (OALR)  |
| TYPE IV<br>+19 HRS<br>301 00 |              |          |                 |                  |                                                                                                                                                                               |         |
|                              | 231          | 1        | C3NK            | C3TC             | OALR IS COMPLETE                                                                                                                                                              |         |
|                              | 231          | 2        | C3TC            | C3NE<br>C3SN     | VERIFY OALR WAS SATISFACTORY                                                                                                                                                  |         |
|                              | 261          | 3        | C3TC            | CLTC             | OALR COMPLETE                                                                                                                                                                 |         |
|                              | 251          | 4        | C3TC            | CUTC             | OALR COMPLETE, EDS BUS +1D199 NO LONGER REQUIRED,                                                                                                                             |         |
|                              | 251          | 5        | CUTC            | CUES             | MODE SWITCH TO MONITOR AND VERIFY +1D199 BUS OFF,                                                                                                                             |         |
|                              | 231          | 6        | C3TC            | L3NV             | REMOVE THE FOLLOWING JUMPERS, REPORT WHEN COMPLETE<br><br>202-121A3<br>-----<br>J5 - SIM, ENABLE                                                                              |         |
|                              |              | 6-1      |                 |                  |                                                                                                                                                                               |         |
|                              |              |          |                 |                  | LV-OAL MIP                                                                                                                                                                    |         |



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| TIME                        | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA.                                       | DESCRIPTION                                                             | REMARKS |
|-----------------------------|--------------|----------|-----------------|--------------------------------------------------------|-------------------------------------------------------------------------|---------|
| TYPE IV<br>19 HRS<br>30' 0" |              | 6-2      |                 | 202-120A1<br>-----<br>J5/A TO J52/Z<br>J5/B TO J3/A    | LV=QAL MIP<br>-----                                                     |         |
|                             |              | 6-3      |                 | 202-121A1<br>-----<br>J5/A TO J59/BB<br>J5/B TO J2/CC  | LV=QAL MIP<br>-----                                                     |         |
|                             |              | 6-4      |                 | 201-164A2<br>-----<br>J31/K TO J39/W<br>J31/J TO J39/V | LV=QAL MIP<br>-----                                                     |         |
| TYPE IV<br>20 HRS<br>0' 0"  | 231          | 1        | L3NV            | C3TC                                                   | JUMPER REMOVAL IS COMPLETE                                              |         |
| TYPE IV<br>21 HRS<br>0' 0"  | 231          | 1        | L3PM            | C3TC                                                   | S-IB STRUCTURE INSPECTION IS COMPLETE                                   |         |
|                             | 231          | 1-1      | L3PM            | C3TC                                                   | THRUST CHAMBER JACKET FILL IS COMPLETE                                  |         |
|                             | 261          | 2        | C3TC            | CLTC                                                   | S-IB STRUCTURE INSPECTION IS COMPLETE,<br>CCSD CREW REST PERIOD STARTS, |         |
|                             | 266          | 3        | C1TC            | CWCP                                                   | START IWS PREPS PER V=36937 (HAZARDOUS),<br>REPORT WHEN COMPLETE,       | D       |



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|-----------------------------|--------------|----------|-----------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>23 HRS<br>30' 0" |              |          |                 |                  |                                                                                                                                                                                                  |         |
|                             | 251          | 1        | CUTC            | CUCP             | START IU PNEUMATIC SYSTEM LOW PRESSURE TEST PER V=31119, PART VIII (HAZARDOUS)                                                                                                                   | D       |
| TYPE IV<br>26 HRS<br>0' 0"  |              |          |                 |                  |                                                                                                                                                                                                  |         |
|                             | 231          | 1        | C3TC            | L3VM             | VERIFY FUEL TANK TO SPIDER BEAM CLEARANCE AND VERIFY SLIPPERINESS ON THE EXPOSED SURFACES OF THE FUEL TANKS MOUNTING STUDS PER V=24522 (HAZARDOUS); OBTAIN CLOSEOUT PHOTOS; REPORT WHEN COMPLETE | D       |
| TYPE IV<br>27 HRS<br>0' 0"  |              |          |                 |                  |                                                                                                                                                                                                  |         |
|                             | 231          | 1        | L3VM            | C3TC             | SPIDERBEAM AND MOUNTING STUD INSPECTION COMPLETE                                                                                                                                                 |         |
|                             | 231          | 2        | C3TC            | S3OE<br>L3VM     | VISUALLY INSPECT S&IB S&A UNIT; VERIFY SYSTEM IN FLIGHT CONFIGURATION PER 60C10715 AND NO DAMAGE IS EVIDENT; OBTAIN PHOTOS OF S&A INSTALLATION, REPORT WHEN COMPLETE.                            |         |
|                             | 266          | 3        | C1TC            | LHGD             | VERIFY HGD SYSTEM PREPS IN PROGRESS PER V=27087 (NON=HAZARDOUS).                                                                                                                                 | D       |
|                             | 261          | 4        | CLTC            | CUTC             | START AUXILIARY POWER BACKUP BATTERY CHECKS                                                                                                                                                      |         |
|                             | 251          | 5        | CUTC            | CCAP             | START BACKUP BATTERY CHECKS ON AUXILIARY POWER SUPPLIES PER V=31119; APPENDIX I; REPORT WHEN COMPLETE, (NON=HAZARDOUS)                                                                           | D       |
|                             | 266          | 6        | CWCP            | C1TC             | IWS PREPS COMPLETE                                                                                                                                                                               |         |
|                             | 261          | 7        | CLTC            | CLQS             | START LV QAL INSPECTION OF MSS PLATFORM 1 PER LV-QAL-QCP-11                                                                                                                                      |         |



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|------------------------------|-----------|----------|--------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+27 HRS<br>15: 0" |           |          |              |                      |                                                                                                                                         |         |
|                              | 231       | 1        | S30E         | C3TC                 | S&A INSPECTION IS COMPLETE                                                                                                              |         |
|                              | 231       | 2        | C3TC         | L3VM<br>S30E         | VERIFY READY FOR MSS PLATFORM 1 OPENING                                                                                                 |         |
|                              | 261       | 3        | C3TC         | CLTC                 | S-IB S&A INSPECTION COMPLETE;<br>S-IB READY FOR PLATFORM 1 OPENING.                                                                     |         |
|                              | 266       | 4        | C1TC         | CSPP                 | REMOVE GROUNDING STRAP FROM S/A 1A TO<br>MSS PLATFORM 1;                                                                                |         |
|                              | 261       | 5        | CVTS         | CLTC                 | MSS PLATFORM OBSERVERS ARE TO REPORT TO<br>PVTS AT THE BASE OF THE MSS LOW RISE<br>ELEVATOR FOR BRIEFING IN 45 MINUTES.                 | TCPI    |
|                              | 261       | 6        | CLTC         | C3TC<br>C4TC<br>CUTC | MSS PLATFORM OBSERVERS ARE TO REPORT TO<br>PVTS AT THE BASE OF THE MSS LOW RISE<br>ELEVATOR FOR BRIEFING IN 45 MINUTES.                 | TCPI    |
| TYPE IV<br>+27 HRS<br>30: 0" | 261       | 7        | CVTS         | CLTC                 | STARTING MSS OIS TRANSFER - PAD HARDLINE<br>TO CRAWLER TRASPORTER UHF, CRAWLER<br>TRANSPORTER OIS CHANNEL ASSIGNMENTS ARE<br>IN EFFECT. | TCPI    |
|                              | 261       | 1        | CVTS         | CLTC                 | MSS OIS TRANSFER (PAD TO CRAWLER<br>TRANSPOTER) IS COMPLETE.                                                                            | TCPI    |
|                              | 266       | 2        | C1TC         | CPDC                 | START PNEUMATIC DISTRIBUTION SYSTEM<br>FINAL PREPS FOR LAUNCH PER V#36064<br>(NON-HAZARDOUS)                                            | D       |
|                              | 266       | 3        | CSPP         | C1TC                 | GROUNDING STRAP FROM S/A 1A TO MSS<br>PLATFORM 1 HAS BEEN REMOVED.                                                                      |         |
|                              | 261       | 4        | C1TC         | CLTC                 | GROUNDING STRAP REMOVED, READY FOR MSS<br>PLATFORM 1 OPENING.                                                                           |         |
|                              | 181       | 5        | CLTC         | CVTS                 | MSS PLATFORM 1 AVAILABLE FOR OPENING.                                                                                                   | TCPI    |



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|----------------------------|-----------|----------|--------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>28 HRS<br>01 00 | 261       | 1        | CVTS         | CLTC                 | MSS PLATFORM 1 IS OPEN AND SECURE,                                                                                                                                                                                                                                | TCP1    |
|                            | 261       | 2        | CLTC         | C3TC<br>C4TC<br>CUTC | VERIFY LV OBSERVERS ARE ON STATION FOR MSS MOVE,                                                                                                                                                                                                                  |         |
|                            | 251       | 3        | CCAP         | CUTC                 | BACKUP BATTERY CHECKS COMPLETE,                                                                                                                                                                                                                                   |         |
|                            | 251       | 4        | CUCP         | CUTC                 | LOW PRESSURE TEST IS COMPLETE,                                                                                                                                                                                                                                    |         |
|                            | 251       | 5        | CUTC         | CUCP                 | START IU PNEUMATIC SYSTEM HIGH PRESSURE TEST PER V-31119, PART VIII (HAZARDOUS),                                                                                                                                                                                  | D       |
|                            | 261       | 6        | CVTS         | CLTC                 | VERIFY READY FOR MSS POWER TRANSFER TO ONBOARD POWER,                                                                                                                                                                                                             | TCP1    |
| TYPE IV<br>28 HRS<br>15 00 | 181       | 1        | CLTC         | CVTS                 | VERIFY PREVAILING WINDS DO NOT EXCEED REDLINE VALUES FOR FREE STANDING SV,                                                                                                                                                                                        | TCP1    |
|                            |           | 1-1      |              |                      | NOTE<br>8-88                                                                                                                                                                                                                                                      | TCP1    |
|                            |           | 2        |              |                      | REDLINE WINDSPEED IS 30 KNOTS PEAK WINDS AT 530 FT ABOVE GROUND LEVEL; IF HIGHER WINDS ARE PREDICTED, DAMPER SWITCHOVER MAY PROCEED ONLY IF BENDING MOMENT ASSESSMENT INDICATES SATISFACTORY CONDITIONS, (LO DIRECTOR'S CONCURRENCE WITH ASSESSMENT IS REQUIRED); |         |
|                            |           |          |              |                      | NOTE<br>8-88<br><br>FOR THE NEXT 15 MINUTES CSAD REQUIRES CONTROL OF TV CAMERA 27B,                                                                                                                                                                               |         |
|                            | 261       | 3        | CVTS         | CLTC                 | DISCONNECT AUX DAMPER                                                                                                                                                                                                                                             | TCP1    |



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| TIME                         | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA.             | DESCRIPTION                                                               | REMARKS |
|------------------------------|--------------|----------|-----------------|------------------------------|---------------------------------------------------------------------------|---------|
| TYPE IV<br>+28 HRS<br>15' 0" |              |          |                 |                              |                                                                           |         |
|                              | 261          | 4        | CLTC            | C1TC                         | DISCONNECT AUX DAMPER                                                     |         |
|                              | 266          | 5        | C1TC            | CSAC                         | DISCONNECT AUX DAMPER, REPORT WHEN COMPLETE,                              |         |
|                              | 236          | 6        | CSAC            | CSAD                         | DISCONNECT AUX DAMPER PER V#36086 (NON=HAZARDOUS), REPORT WHEN COMPLETE;  | D       |
| TYPE IV<br>+28 HRS<br>25' 0" |              |          |                 |                              |                                                                           |         |
|                              | 261          | 1        | C1TC            | CLTC                         | AUX DAMPER DISCONNECT COMPLETE;                                           |         |
|                              | 261          | 2        | CLTC            | C1TC<br>C3TC<br>C4TC<br>CUTC | VERIFY READY FOR MSS JACKING;                                             |         |
|                              | 181          | 3        | CLTC            | CVTS                         | AUX DAMPER IS DISCONNECTED AND LV READY FOR MSS JACKING BUT NOT FOR MOVE; | TCPI    |
| TYPE IV<br>+29 HRS<br>0' 0"  |              |          |                 |                              |                                                                           |         |
|                              | 261          | 1        | CVTS            | CLTC                         | MSS JACKING COMPLETE,                                                     | TCPI    |
|                              | 261          | 2        | CLTC            | C1TC<br>C3TC<br>C4TC<br>CUTC | VERIFY READY FOR MSS MOVE,                                                |         |
|                              | 181          | 3        | CLTC            | CVTS                         | LV CLEAR FOR MSS MOVE,                                                    | TCPI    |
|                              | 261          | 4        | CVTS            | CLTC                         | MSS IN MOTION;                                                            | TCPI    |
| TYPE IV<br>+29 HRS<br>5' 0"  |              |          |                 |                              |                                                                           |         |
|                              | 261          | 1        | CVTS            | CLTC                         | CONNECT PRIMARY DAMPER;                                                   | TCPI    |
|                              | 261          | 2        | CLTC            | C1TC                         | CONNECT PRIMARY DAMPER;                                                   |         |



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| TIME                         | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                                                                                  | REMARKS |
|------------------------------|--------------|----------|-----------------|------------------|------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+29 HRS<br>51 0"  | 266          | 3        | C1TC            | CSAC             | CONNECT PRIMARY DAMPER; REPORT WHEN COMPLETE,                                                                                |         |
|                              | 236          | 4        | CSAC            | CSAD             | CONNECT PRIMARY DAMPER PER V#36086 (NON=HAZARDOUS), REPORT WHEN COMPLETE;                                                    | D       |
|                              | 188          | 5        | CSAD            | PA               | PRIMARY DAMPER WILL BE CONNECTED AT THIS TIME, VEHICLE MOTION AND GAS VENTING WILL OCCUR,                                    |         |
| TYPE IV<br>+30 HRS<br>01 0"  | 122          | 1        | CLTC            | BOSC             | HAVE INDUSTRIAL WATER ENGINE READY TO START UPON 30 MINUTE NOTIFICATION FROM CWCP,                                           | TCPI    |
|                              | 266          | 2        | C1TC            | CWCP             | NOTIFY BOSC 30 MINUTES PRIOR TO HAVING INDUSTRIAL WATER ENGINE START,                                                        |         |
|                              | 231          | 3        | C3TC            | L3FC             | REMOVE ACTUATOR MID-STROKE LOCKS PER V#33039, SECT C, STEP 3(F) (NON=HAZARDOUS), REPORT WHEN COMPLETE;                       | D       |
| TYPE IV<br>+30 HRS<br>301 0" | 231          | 1        | L3FC            | C3TC             | ACTUATOR MID-STROKE LOCK REMOVAL IS COMPLETE                                                                                 |         |
|                              | 231          | 1        | C3TC            | L3ME             | START FIRING ACCESSORIES PREPS PER V#36136, PART V (HAZARDOUS), REPORT WHEN COMPLETE;                                        | D       |
| TYPE IV<br>+31 HRS<br>01 0"  | 261          | 2        | C3TC            | CLTC             | REQUEST CPSS RELEASE TCS KEY TO C3SP FOR IGNITION SOURCE VOLTAGE CHECKS (TO BE PERFORMED DURING SPGGI STRAY VOLTAGE CHECKS), |         |



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|----------------------------|-----------|----------|--------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>31 HRS<br>01 00 | 181       | 3        | CLTC         | CVTS                         | REQUEST CPSS RELEASE TCS TO C3SP FOR IGNITION SOURCE VOLTAGE CHECKS;                                                                                                          |         |
|                            | 261       | 4        | CLTC         | C1TC<br>C3TC<br>C4TC<br>CUTC | VERIFY READY TO CLEAR THE CONTROL AREA FOR S=IB CONAX VALVE AND SPGGI CONNECTIONS;                                                                                            |         |
|                            | 181       | 5        | CLTC         | CVTS                         | READY TO CLEAR THE CONTROL AREA FOR S=IB CONAX VALVE AND SPGGI CONNECTIONS;                                                                                                   | TCPI    |
|                            |           | 5-1      |              |                              | *****WARNING*****<br>*<br>* THE CONTROL AREA FOR<br>* S=IB CONAX AND SPGGI<br>* CONNECTIONS IS THE ML<br>* ZERO LEVEL, FLAME<br>* TRENCH, AND THE S=IB<br>* AFT<br>*<br>***** |         |
|                            | 241       | 6        | C4TC         | C4NP                         | STAGE SWITCH SELECTOR = INHIBIT                                                                                                                                               | D       |
|                            | 241       | 7        | C4TC         | C4ES<br>C4PS                 | CONTROLLED SWITCHING IS IN EFFECT                                                                                                                                             |         |
|                            | 231       | 8        | CLTC         | C3TC                         | PREPARE S=IB STAGE FOR RF SILENCE AND CONTROLLED SWITCHING.                                                                                                                   |         |
|                            | 231       | 9        | C3TC         | C3DP                         | VERIFY FOLLOWING SWITCH POSITIONS:<br><br>STATUS SYSTEMS SWITCH = SAFE<br>S&A = SAFE                                                                                          |         |
|                            | 231       | 10       | C3TC         | C3NP                         | VERIFY FOLLOWING SWITCH POSITIONS:<br><br>PREMATURE IGNITION ARM = OFF<br>IGNITION SAFE/ARM = SAFE<br>STAGE LOGIC = INHIBIT                                                   |         |
|                            | 231       | 11       | C3TC         | C3SP                         | VERIFY TCS SAFE/ARM SWITCH = SAFE                                                                                                                                             |         |



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| TIME                       | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                | DESCRIPTION                                                                                                                                                                              | REMARKS |
|----------------------------|-----------|----------|--------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>31 HRS<br>01 00 | 231       | 12       | C3TC         | C3FA                         | VERIFY FOLLOWING SWITCH POSITIONS:<br><br>SYSTEM POWER = OFF<br>TEST POWER = SAFE<br>VALVE 1 AND EBW = HOLD<br>VALVE 2 = HOLD                                                            |         |
|                            | 231       | 13       | C3TC         | C3CE                         | VERIFY READY FOR RF SILENCE AND CONTROLLED SWITCHING,                                                                                                                                    |         |
|                            | 261       | 14       | CLTC         | CUTC                         | PREPARE IU STAGE FOR RF SILENCE AND CONTROLLED SWITCHING PER V#31119, APPENDIX C, (NON=HAZARDOUS);                                                                                       | D       |
|                            | 261       | 15       | CLTC         | C1TC<br>C3TC<br>C4TC<br>CUTC | VERIFY ORDNANCE AND PD PANELS IN CORRECT CONFIGURATION FOR ORDNANCE CONNECTION AND READY FOR RF SILENCE & CONTROLLED SWITCHING,                                                          |         |
|                            | 181       | 16       | CLTC         | CVTS                         | REQUEST RF SILENCE ON; LV CONTROLLED SWITCHING AND CONTROLLED SWITCHING ACROSS LV/SC INTERFACE IS IN EFFECT,                                                                             | TCPI    |
|                            | 188       | 17       | CVTS         | PA                           | RF SILENCE IS NOW IN EFFECT; CONTROLLED SWITCHING IS NOW IN EFFECT ON THE LV AND ACROSS THE LV/SC INTERFACE; SWITCHING REQUESTS ARE TO BE COORDINATED THROUGH TEST CONDUCTORS WITH CVTS, | TCPI    |
|                            | 261       | 18       | CLTC         | CUDE                         | VERIFY DEE 755 (RF SILENCE) ON                                                                                                                                                           |         |
|                            | 261       | 19       | CVTS         | CLTC                         | START S#IB ORDNANCE OPERATIONS;                                                                                                                                                          | TCPI    |
|                            | 261       | 20       | CLTC         | C3TC                         | START S#IB ORDNANCE OPERATIONS;                                                                                                                                                          |         |
|                            | 251       | 1        | CUTC         | LGCC                         | START LUT EVACUATION PER V#22006, VERIFY 28 VDC #1 SWITCH ON 1504A1A6 DISTRIBUTOR IS LEFT ON; REPORT WHEN COMPLETE, (NON=HAZARDOUS);                                                     | D       |
| TYPE IV<br>31 HRS<br>30 00 |           |          |              |                              |                                                                                                                                                                                          |         |



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|-----------------------------|-----------|----------|--------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>31 HRS<br>30' 0" | 231       | 2        | C3TC         | S30E                         | START CONAX VALVE FINAL STRAY VOLTAGE CHECKS AND CONNECTIONS PER V=29126, SECT, C, PART III (HAZARDOUS); REPORT WHEN COMPLETE; | D       |
| TYPE IV<br>32 HRS<br>15' 0" | 231       | 1        | S30E         | C3TC                         | CONAX CONNECTIONS COMPLETE;                                                                                                    |         |
|                             | 231       | 2        | C3TC         | S30E                         | START SPGGI STRAY VOLTAGE CHECKS AND CONNECTIONS PER V=29129, SECT, C, PART II (HAZARDOUS); REPORT WHEN COMPLETE;              |         |
|                             | 261       | 3        | C3TC         | CLTC                         | CONAX CONNECTIONS COMPLETE; STARTING SPGGI CONNECTIONS;                                                                        |         |
| TYPE IV<br>33 HRS<br>0' 0"  | 231       | 1        | S30E         | C3TC                         | SPGGI CONNECTIONS COMPLETE;                                                                                                    |         |
|                             | 231       | 2        | C3TC         | C3SP                         | VERIFY TCS SAFE AND TCS KEY RETURNED TO CPSS;                                                                                  |         |
|                             | 261       | 3        | C3TC         | CLTC                         | TCS SAFE, TCS KEY RETURNED TO CPSS; AND SPGGI CONNECTIONS COMPLETE;                                                            |         |
|                             | 181       | 4        | CLTC         | CVTS                         | LV ORDNANCE CONNECTIONS COMPLETE; TCS HAS BEEN SAFED AND TCS KEY HAS BEEN RETURNED TO CPSS;                                    | TCPI    |
|                             | 261       | 5        | CLTC         | C1TC<br>C3TC<br>C4TC<br>CUTC | VERIFY LV READY TO REMOVE RF SILENCE & CONTROLLED SWITCHING;                                                                   |         |
|                             | 181       | 6        | CLTC         | CVTS                         | RF SILENCE AND CONTROLLED SWITCHING ARE NO LONGER REQUIRED;                                                                    | TCPI    |
|                             | 188       | 7        | CVTS         | PA                           | LV ORDNANCE OPERATIONS ARE COMPLETE; RF SILENCE AND CONTROLLED SWITCHING ARE ENDED, THE CONTROL AREA IS OPEN FOR NORMAL WORK;  | TCPI    |
|                             | 231       | 8        | C3TC         | S3NE                         | VERIFY READY TO SECURE S=IB BOATTAIL.                                                                                          |         |



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| TIME                        | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA. | DESCRIPTION                                                                                                                                                                                                  | REMARKS |
|-----------------------------|--------------|----------|-----------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+33 HRS<br>01 00 | 231          | 9        | C3TC            | L3PM             | OBTAIN CLOSEOUT PHOTOS AND INSTALL HEAT SHIELD PANELS, REMOVE ACCESS LADDERS, AND REMOVE THRUST CHAMBER PROTECTIVE COVERS PER V-24522, PART IV, SEQ'S 25, 26, 28 & 29 (NON-HAZARDOUS). REPORT WHEN COMPLETE. |         |
|                             | 231          | 10       | C3TC            | L3NF             | CLOSE AND PIN CIRCUIT BREAKERS 6714 & 6715 (MDA EXP REL PWR) AND 6717 & 6718 (FIRING ACCESSORIES POWER). REPORT WHEN COMPLETE.                                                                               |         |
|                             | 266          | 11       | C1TC            | BRFS             | DRSCS GSE LCC AND ML POWER ON (STARTING DRSCS PREPS).                                                                                                                                                        |         |



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| TIME                        | COMM. CH.  | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                                                          | REMARKS |
|-----------------------------|------------|----------|--------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>33 HRS<br>15: 0" |            | 1        |              | CLIP          | NOTE<br>ALL LV OPERATORS ARE<br>REQUIRED TO CHECK THEIR<br>PROCEDURES TO VERIFY THAT<br>PCRAS FROM T-9 HRS THROUGH<br>APPENDIX D (LISTED BELOW)<br>HAVE BEEN INCORPORATED,<br>(INCLUDING PCRS TO VOL<br>III, IF ANY) |         |
|                             | PCR<br>--- |          | PAGE<br>---  | TIME<br>----  | STATIONS AFFECTED<br>-----                                                                                                                                                                                           |         |
|                             |            |          |              |               | THIS INFORMATION TO BE PROVIDED IN A<br>MEMO TO BE DISTRIBUTED AT THIS TIME BY<br>THE TBC INTEGRATED TEST & CHECKOUT<br>PROCEDURES TEST MONITOR (CLIP):                                                              |         |
| 231                         |            | 2        | L3ME         | C3TC          | FIRING ACCESSORIES PREPS COMPLETE.                                                                                                                                                                                   |         |
| 231                         |            | 3        | L3NE         | C3TC          | HDA EXP REL PWR & FIRING ACCESSORIES PWR<br>CIRCUIT BREAKERS PINNING COMPLETE.                                                                                                                                       |         |
| 231                         |            | 4        | C3TC         | L3ME          | START HDA PRESSURIZATION PER V=36136,<br>PART VI (HAZARDOUS), REPORT WHEN COMPLETE.                                                                                                                                  | D       |
| 231                         |            | 5        | C3TC         | U3PC          | START S-IB PNEUMATIC VERIFICATION PER<br>V=36941 (HAZARDOUS),                                                                                                                                                        | D       |
|                             |            | 6        |              |               | *****CAUTION*****<br>*<br>* S-IVB STAGE AND ENGINE *<br>* HELIUM SPHERES WILL BE *<br>* PRESSURIZED TO 3000 PSI *<br>*<br>*****                                                                                      |         |
| 241                         |            | 7        | C4TC         | C4PS          | START FINAL STAGE AND ENGINE SPHERE<br>PRESSURIZATION PER V=30610; SECT O,<br>PART 2 (NON=HAZARDOUS); REPORT WHEN<br>COMPLETE,                                                                                       | D       |



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| TIME                         | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                  | REMARKS |
|------------------------------|-----------|----------|--------------|---------------|------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+33 HRS<br>15' 0" | 266       | 8        | C1TC         | CSPP          | START 43D100 & 43D200 BUS CHECKS PER V=21194 (NON=HAZARDOUS).                                                                | D       |
|                              | 231       | 9        | C3TC         | C3SN<br>L3SR  | START MANUAL TCS FUNCTIONAL TEST PER V=31117, TEST II (NON=HAZARDOUS).                                                       | D       |
| TYPE IV<br>+33 HRS<br>45' 0" | 261       | 1        | C1TC         | CLTC          | REQUEST CLEARANCE FOR LOCAL RANGE SAFETY COMMAND CARRIER (PROTECTION NOT REQUIRED).                                          |         |
|                              | 181       | 2        | CLTC         | CVTS          | REQUEST CLEARANCE FOR LOCAL RANGE SAFETY COMMAND CARRIER (PROTECTION NOT REQUIRED).                                          | TCP I   |
|                              | 261       | 3        | CLTC         | CGIC          | VERIFY ETR/DRSCS AUDIO LINES PATCHED TO PAD B, LC=39.                                                                        | TCP I   |
|                              | 266       | 4        | C1TC         | BRFS          | START DRSCS GSE PREPS PER V=38000, SECT 14 (NON=HAZARDOUS).                                                                  | D       |
| TYPE IV<br>+34 HRS<br>0' 0"  | 231       | 1        | L3PM         | C3TC          | ENGINE COMPARTMENT CLOSEOUT IS COMPLETE.                                                                                     |         |
|                              | 231       | 2        | C3TC         | L3PM          | CLOSE LOX & FUEL BAYS AND REMOVE BAY LADDERS PER V=24522, PART IV, SEQS 7, 9, 18, 19 & 28 (HAZARDOUS). REPORT WHEN COMPLETE. | D       |
|                              | 261       | 3        | C1TC         | CLTC          | REQUEST BOSC TO REPORT TO LASE IN ML ROOM 8A TO SUPPORT OPENING OF CIRCUIT BREAKERS PER V=31045 (NON=HAZARDOUS).             | D       |
|                              | 122       | 4        | CLTC         | BOSC          | REPORT TO LASE IN ML ROOM 8A TO SUPPORT OPENING OF CIRCUIT BREAKERS IN PANEL L=14A (200 FT LEVEL).                           | TCP I   |
|                              | 266       | 5        | CCLH         | C1TC          | STARTING LH2 SYSTEM FINAL PREPS FOR LOADING PER V=25418 (HAZARDOUS).                                                         | D       |



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| TIME                        | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                          | REMARKS |
|-----------------------------|-----------|----------|--------------|---------------|----------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+34 HRS<br>01 0" |           |          |              |               |                                                                                                                      |         |
|                             | 266       | 6        | C1TC         | CCLO          | START LOX SYSTEM FINAL PREPS PER V=25279 (HAZARDOUS);                                                                | D       |
|                             | 266       | 7        | CCRP         | C1TC          | STARTING RP=1 SYSTEM FINAL PREPS PER V=25443 (HAZARDOUS);                                                            | D       |
|                             | 266       | 8        | C1TC         | CSPP          | TURN OFF EMERGENCY LIGHTING CIRCUIT BREAKERS PER V=31045 (NON=HAZARDOUS);                                            | D       |
|                             | 266       | 9        | C1TC         | CSPP          | VERIFY LUT WALKDOWN COMPLETE.<br>VERIFICATION BY LV=QAL<br>-2255-1000                                                |         |
| TYPE IV<br>+34 HRS<br>30 0" |           |          |              |               |                                                                                                                      |         |
|                             | 266       | 1        | C1TC         | LPLX          | START RP=1 LOW PRESSURE SENSE LINE PURGE PER V=25441 (NON=HAZARDOUS);                                                | D       |
|                             | 241       | 2        | C4TC         | C4PS          | START LH2 AND LOX PROPELLANT COMPONENT CHECKS PER V=30610; SECT K; PART 5 & 6 (NON=HAZARDOUS); REPORT WHEN COMPLETE; |         |
|                             | 251       | 3        | CUCP         | CUTC          | HIGH PRESSURE TEST IS COMPLETE; 10 GN2 SPHERES WILL REMAIN AT FLIGHT PRESSURE THROUGH LAUNCH;                        |         |
| 181                         | 4         | CLTC     | CVTS         |               | VERIFY THE M/H CRANE WILL BE AVAILABLE FOR ESP LOWERING PREPS IN 30 MIN;                                             | TCPI    |
| TYPE IV<br>+34 HRS<br>45 0" |           |          |              |               |                                                                                                                      |         |
|                             | 261       | 1        | CLTC         | BRFS          | VERIFY DRSCS FLIGHT CODE PLUG INSTALLED IN LCC GSE PER V=38000; SECT 14 (NON=HAZARDOUS);                             | D       |



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| TIME                       | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                                       | REMARKS |
|----------------------------|-----------|----------|--------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>35 HRS<br>01 00 |           |          |              |               |                                                                                                                                                                                   |         |
|                            | 231       | 1        | C3TC         | C3PM          | START PRESSURE DECAY TEST ON S=IB RP=1 DELTA-P HIGH PRESSURE SENSING LINE PER V=20107, TEST 9, PART B (HAZARDOUS),                                                                | D       |
|                            | 231       | 2        | L3PM         | C3TC          | FUEL & LOX BAYS ARE CLOSED; S=IB STAGE CLOSEOUT IS COMPLETE, READY FOR ESP LOWERING,                                                                                              |         |
|                            | 261       | 3        | CLTC         | C1TC<br>C3TC  | VERIFY READY TO CLEAR THE CONTROL AREA FOR ESP LOWERING,                                                                                                                          |         |
|                            | 181       | 4        | CLTC         | CVTS          | READY TO CLEAR THE CONTROL AREA FOR ESP LOWERING,                                                                                                                                 | TCPI    |
|                            |           | 5        |              |               | *****WARNING*****<br>*<br>* THE CONTROL AREA FOR<br>* ESP LOWERING IS THE ML<br>* 127 FT LEVEL, DIRECTLY<br>* BELOW THE ESP AND<br>* INSIDE THE PEDESTAL<br>* LEGS,<br>*<br>***** | TCPI    |
|                            | 261       | 6        | CVTS         | CLTC          | START ESP PREPS & LOWERING OPERATIONS                                                                                                                                             | TCPI    |
|                            | 261       | 7        | CLTC         | C3TC          | START ESP PREPS & LOWERING OPERATIONS                                                                                                                                             |         |
|                            | 231       | 8        | C3TC         | L3ME          | START ESP LOWERING PREPS PER V=26516 (HAZARDOUS),                                                                                                                                 | D       |
|                            | 231       | 9        | L3ME         | C3TC          | HDA PRESSURIZATION COMPLETE                                                                                                                                                       |         |
|                            | 251       | 10       | CVTC         | CCAP<br>LRPR  | INSTALL AUXILIARY POWER CIRCUIT BREAKER LOCKING PINS PER V=31119, APPENDIX D, (NON=HAZARDOUS), REPORT WHEN COMPLETE,                                                              | D       |
|                            | 266       | 11       | C1TC         | LAS1          | CLOSE WSE OVERRIDE POWER MODULE CIRCUIT BREAKER PER V=31045 (NON=HAZARDOUS),                                                                                                      | D       |
| 266                        | 12        | C1TC     | CSPP         |               | VERIFY 43D100 & 43D200 BUS CHECK COMPLETE,                                                                                                                                        |         |



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| TIME                        | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.                | DESCRIPTION                                                                                                                              | REMARKS |
|-----------------------------|-----------|----------|--------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+35 HRS<br>01 0" |           |          |              |                              |                                                                                                                                          |         |
|                             | 266       | 13       | C1TC         | CSPP                         | VERIFY READY FOR APPLICATION OF FIRING SYSTEM POWER;                                                                                     |         |
|                             | 266       | 14       | C1TC         | CSAC                         | FIRING POWER BEING APPLIED MOMENTARILY;                                                                                                  |         |
|                             | 261       | 15       | CLTC         | C1TC                         | CLEAR TO REQUEST & EXECUTE IASP (LSE POWER ON);                                                                                          |         |
|                             | 266       | 16       | C1TC         | CLSK                         | CALL UP IASP PROGRAM UPON CSPP REQUEST AND NOTIFY C1TC PRIOR TO EXECUTION; REPORT WHEN COMPLETE;                                         |         |
|                             | 261       | 17       | CLTC         | C1TC<br>C3TC<br>C4TC<br>CUTC | VERIFY PCR VERIFICATION COMPLETE;                                                                                                        |         |
|                             | 266       | 18       | CSPP         | C1TC                         | 43D100 & 43D200 POWER APPLIED AND SWITCHOVER TEST COMPLETE. IASP COMPLETE;                                                               |         |
|                             | 261       | 19       | C1TC         | CLTC                         | IASP COMPLETE;                                                                                                                           |         |
|                             | 266       | 20       | C1TC         | CSPP                         | START FINAL CLOSEOUT PER V=31045 (NON-HAZARDOUS)                                                                                         | D       |
|                             | 266       | 21       | LPLX         | C1TC                         | RP-1 LOW PRESSURE SENSE LINE PURGE COMPLETE;                                                                                             |         |
|                             | 251       | 22       | CUTC         | VURF                         | START PAD RF GSE SETUP PER V=28233; REPORT WHEN COMPLETE. (NON-HAZARDOUS);                                                               | D       |
| TYPE IV<br>+35 HRS<br>30 0" |           |          |              |                              |                                                                                                                                          |         |
|                             | 231       | 1        | C3TC         | C3FP                         | PRESSURIZE FUEL SPHERES TO 1700 PSI;                                                                                                     |         |
|                             | 231       | 2        | C3TC         | C3FR                         | SETUP CALIPS CONSOLE PER V=24508, PREP STEPS 1 THRU 10 ONLY AND V=24522, PART IV, SEQ 31 (NON-HAZARDOUS); OBTAIN PHOTO OF PRESSURE GAGE; | D       |
|                             | 266       | 3        | C1TC         | BRFS                         | VERIFY READY FOR RANGE SUPPORT OF DRSCS PREPS;                                                                                           |         |



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| TIME                         | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                                      | REMARKS   |
|------------------------------|-----------|----------|--------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| TYPE IV<br>+35 HRS<br>30' 0" |           |          |              |               |                                                                                                                                                                  |           |
|                              | 261       | 4        | C1TC         | CLTC          | READY FOR RANGE TO SUPPORT DRSCS PREPS.                                                                                                                          |           |
|                              | 181       | 5        | CLTC         | CVTS          | REQUEST RANGE SUPPORT DRSCS PREPS ON CH. 264 PER V#38000, SECT 14 (NON-HAZARDOUS)                                                                                | TCP!<br>D |
| TYPE IV<br>+35 HRS<br>45' 0" |           |          |              |               |                                                                                                                                                                  |           |
|                              | 251       | 1        | CUTC         | VURF          | START RF/GSE SETUP PER V#28233; REPORT WHEN COMPLETE (NON-HAZARDOUS);                                                                                            | D         |
| TYPE IV<br>+36 HRS<br>0' 0"  |           |          |              |               |                                                                                                                                                                  |           |
|                              | 261       | 1        | CLTC         | CUTC          | START ALTERNATE FIRING ROOM ELECTRICAL SUPPORT PREPS PER V#21243 PART 1A (NON-HAZARDOUS);                                                                        | D         |
|                              | 231       | 2        | C3TC         | L3NE          | START PRECLEARING CHECKLIST PER V#31138, SECTION C,9, (NON-HAZARDOUS);                                                                                           | D         |
| TYPE IV<br>+36 HRS<br>5' 0"  |           |          |              |               |                                                                                                                                                                  |           |
|                              | 266       | 1        | C1TC         | BRFS          | VERIFY DRSCS GSE PREPS ARE COMPLETE;                                                                                                                             |           |
| TYPE IV<br>+36 HRS<br>30' 0" |           |          |              |               |                                                                                                                                                                  |           |
|                              | 261       | 1        | C1TC         | CLTC          | REQUEST THAT FIRE, SAFETY AND SECURITY WILL BE ON STATION IN 1 HOUR AND READY TO SUPPORT HAZARDOUS PORTIONS OF LOX SYSTEM FINAL PREPS AND LV PROPELLANT LOADING, |           |
|                              | 181       | 2        | CLTC         | CVTS          | REQUEST THAT FIRE, SAFETY AND SECURITY WILL BE ON STATION IN 1 HOUR AND READY TO SUPPORT HAZARDOUS PORTIONS OF LOX SYSTEM FINAL PREPS AND LV PROPELLANT LOADING, | TCP!      |



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| TIME                         | COMM.<br>CH. | SEQUENCE | COMMAND<br>STA. | RESPONSE<br>STA.             | DESCRIPTION                                                                                                                                                                              | REMARKS |
|------------------------------|--------------|----------|-----------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+36 HRS<br>30:00" |              |          |                 |                              |                                                                                                                                                                                          |         |
| 251                          |              | 3        | CUTC            | BGCC                         | MASK THE FOLLOWING DISCRETES; REPORT<br>WHEN COMPLETE;<br><br>SFUNCSE937=05 MMSK (MDI'S 1608=1631)<br>SFUNCSE937=20 MMSK (MDI'S 1968=1991)                                               |         |
|                              |              | 3-1      |                 | ALL                          | *** NOTE THE ABOVE MASKED MDI/LDOIS WILL<br>BE UPDATED EVERY 2 SECONDS UNTIL<br>T=2123                                                                                                   |         |
| 266                          |              | 4        | C1TC            | CHGD                         | VERIFY HGD PREPS COMPLETE PER V=27087<br>(NON=HAZARDOUS); PERSONNEL CLEAR OF PAD<br>AND HGD SYSTEM READY TO SUPPORT AIR TO<br>GN2 SWITCHOVER;                                            | D       |
| 231                          |              | 5        | C3TC            | CLTC                         | VERIFY BTIS IS READY TO SUPPORT ESP<br>TRANSPORTER MOVE;                                                                                                                                 |         |
| 114                          |              | 6        | CLTC            | BTIS                         | VERIFY READY TO SUPPORT ESP TRANSPORTER<br>MOVE;                                                                                                                                         | TCPI    |
|                              |              | 7        |                 |                              | *****WARNING*****<br>*<br>* THE FACILITY AIR SYSTEM *<br>* WILL BE CHARGED WITH *<br>* GN2, PERSONNEL SHOULD *<br>* AVOID USE OF AIR TOOLS *<br>* INSIDE ENCLOSED AREAS; *<br>*<br>***** |         |
| 266                          |              | 8        | C1TC            | CPDC                         | ACTIVATE FACILITY AIR STANDBY PANEL PER<br>V=26603 (HAZARDOUS); REPORT WHEN<br>COMPLETE;                                                                                                 | D       |
| 261                          |              | 9        | CLTC            | C1TC<br>C3TC<br>C4TC<br>CUTC | VERIFY FINAL PURGE BOX VALIDATION                                                                                                                                                        |         |
| 261                          |              | 10       | CVTS            | CLTC                         | VERIFY FINAL PURGE BOX VALIDATION.                                                                                                                                                       | TCPI    |
| 236                          |              | 11       | CSAC            | CSA9                         | START FINAL CLOSEOUT OF S/A 9 LSE<br>SYSTEMS;                                                                                                                                            |         |



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| TIME                        | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA.        | DESCRIPTION                                                                    | REMARKS |
|-----------------------------|-----------|----------|--------------|----------------------|--------------------------------------------------------------------------------|---------|
| TYPE IV<br>36 HRS<br>40: 0" |           |          |              |                      |                                                                                |         |
|                             | 266       | 1        | C1TC         | CPDC                 | VERIFY PNEUMATIC DISTRIBUTION SYSTEM PREPS COMPLETE;                           |         |
|                             | 236       | 2        | CSAC         | CMCU                 | START SECOND PUMP SYSTEM AND VERIFY BOTH PUMP SYSTEMS 1 & 2 RUNNING;           |         |
| TYPE IV<br>36 HRS<br>45: 0" |           |          |              |                      |                                                                                |         |
|                             | 231       | 1        | C3TC         | V3MS                 | REPORT STATUS OF THE FOLLOWING HIGHLY DESIRABLE LMR RANGE SAFETY MEASUREMENTS: |         |
|                             |           |          |              | RULE MEAS<br>NO: NO: | MEASUREMENT DESCRIPTION                                                        |         |
|                             |           |          |              | 2-135 D1-1           | PRESS; COMBUSTION CHAMBER                                                      |         |
|                             |           |          |              | 2-136 D1-2           | PRESS; COMBUSTION CHAMBER                                                      |         |
|                             |           |          |              | 2-137 D1-3           | PRESS; COMBUSTION CHAMBER                                                      |         |
|                             |           |          |              | 2-138 D1-4           | PRESS; COMBUSTION CHAMBER                                                      |         |
|                             |           |          |              | 2-139 D1-5           | PRESS; COMBUSTION CHAMBER                                                      |         |
|                             |           |          |              | 2-140 D1-6           | PRESS; COMBUSTION CHAMBER                                                      |         |
|                             |           |          |              | 2-141 D1-7           | PRESS; COMBUSTION CHAMBER                                                      |         |
|                             |           |          |              | 2-142 D1-8           | PRESS; COMBUSTION CHAMBER                                                      |         |
|                             |           |          |              | 2-154 VK138-1        | THRUST PRESS SW 1 TOK                                                          |         |
|                             |           |          |              | 2-155 VK140-2        | THRUST PRESS SW 1 TOK                                                          |         |
|                             |           |          |              | 2-156 VK142-3        | THRUST PRESS SW 1 TOK                                                          |         |
|                             |           |          |              | 2-157 VK144-4        | THRUST PRESS SW 1 TOK                                                          |         |
|                             |           |          |              | 2-158 VK146-5        | THRUST PRESS SW 1 TOK                                                          |         |
|                             |           |          |              | 2-159 VK148-6        | THRUST PRESS SW 1 TOK                                                          |         |
|                             |           |          |              | 2-160 VK150-7        | THRUST PRESS SW 1 TOK                                                          |         |
|                             |           |          |              | 2-161 VK152-8        | THRUST PRESS SW 1 TOK                                                          |         |
|                             |           |          |              | 2-168 VK505-13       | RESCR 1 LOW LEVEL FIELD                                                        |         |
|                             |           |          |              | 2-169 VK508-13       | RESCR 2 LOW LEVEL FIELD                                                        |         |
|                             | 241       | 2        | C4TC         | C4NE                 | REPORT STATUS OF THE FOLLOWING HIGHLY DESIRABLE LMR RANGE SAFETY MEASUREMENTS: |         |
|                             |           |          |              | V4MS                 | REPORT STATUS OF THE FOLLOWING HIGHLY DESIRABLE LMR RANGE SAFETY MEASUREMENTS: |         |
|                             |           |          |              | RULE MEAS<br>NO: NO: | MEASUREMENT DESCRIPTION                                                        |         |
|                             |           |          |              | 2-314 D1-401         | PRESS; THRUST CHAMBER                                                          |         |
|                             |           |          |              | 2-349 VK14-401       | MNSTG OK PRESS SW 1                                                            |         |
|                             |           |          |              | 2-350 VK158-401      | MNSTG OK PRESS SW 1 DEPRESS                                                    |         |
|                             |           |          |              | 2-359 M30-411        | VOLT F/U 1 EBW RANGE SAFETY                                                    |         |
|                             |           |          |              | 2-360 M31-411        | VOLT F/U 2 EBW RANGE SAFETY                                                    |         |
|                             | 266       | 3        | C1TC         | CSAC                 | VERIFY THE FOLLOWING INDICATIONS:                                              |         |
|                             |           |          |              | T=187                | LSE PREPS COMPLETE                                                             |         |
|                             |           |          |              | T=3                  | LSE READY FOR IGNITION                                                         |         |
|                             | 266       | 4        | C1TC         | CLDE                 | VERIFY DEE 4229, 4006 ON;                                                      |         |



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| TIME                         | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                                                                                                  | REMARKS |
|------------------------------|-----------|----------|--------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TYPE IV<br>+36 HRS<br>45: 0" |           |          |              |               |                                                                                                                                              |         |
|                              | 231       | 5        | C3TC         | C3EV          | VERIFY LSE PREPS COMPLETE AND LSE READY FOR IGNITION INDICATIONS ON (DEE'S 0357 & 0356)                                                      |         |
|                              | 251       | 6        | CUTC         | CUPC          | START ST-124M SLIP RING EXERCISE PER V-23068 (NON-HAZARDOUS)                                                                                 | D       |
| TYPE IV<br>+36 HRS<br>50: 0" |           |          |              |               |                                                                                                                                              |         |
|                              | 261       | 1        | CLTC         | C3TC<br>C4TC  | VERIFY ALL HIGHLY DESIRABLE LMR RANGE SAFETY MEASUREMENTS ARE GO AND READY TO TRANSFER LMR MONITOR RESPONSIBILITY TO THE EASTERN TEST RANGE; |         |
| TYPE IV<br>+36 HRS<br>55: 0" |           |          |              |               |                                                                                                                                              |         |
|                              | 181       | 1        | CLTC         | CVTS          | ALL HIGHLY DESIRABLE LMR RANGE SAFETY MEASUREMENTS ARE GO, VERIFY EASTERN TEST RANGE ASSUMES MONITORING RESPONSIBILITY AT THIS TIME;         | TCPI    |
|                              | 266       | 2        | C1TC         | CSPP          | VERIFY LUT ELECTRICAL PREPS COMPLETE AND PERSONNEL ARE CLEARING PAD;                                                                         |         |
|                              | 266       | 3        | C1TC         | CPDC          | VERIFY FACILITY AIR STANDBY PANEL HAS BEEN ACTIVATED;                                                                                        |         |
|                              | 266       | 4        | C1TC         | BRFS          | VERIFY DRSCS GSE PERSONNEL CLEAR OF PAD;                                                                                                     |         |
|                              | 231       | 5        | C3TC         | LSNE          | VERIFY S-1B LUT AND LAUNCHER LSE & ESE LAUNCH PREPS COMPLETE AND PERSONNEL CLEARING PAD;                                                     |         |
|                              | 266       | 6        | C1TC         | CCLH          | VERIFY LH2 SYSTEM FINAL PREPS FOR LOADING COMPLETE AND PERSONNEL CLEARING PAD;                                                               |         |
|                              | 266       | 7        | C1TC         | CCRP          | VERIFY RP-1 PREPS COMPLETE;                                                                                                                  |         |
|                              | 261       | 8        | C1TC         | CLTC          | ML ELECTRICAL LAUNCH PREPS COMPLETE;                                                                                                         |         |



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## LAUNCH OPERATIONS

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VEHICLE

AS=210

| TIME                        | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                           | REMARKS                                                                                                                                        |      |
|-----------------------------|-----------|----------|--------------|---------------|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|------|
| TYPE IV<br>36 HRS<br>55: 0" |           | 266      | 9            | G1TC          | CSAC                                  | VERIFY PAD MANUAL PREPS COMPLETE AND PERSONNEL CLEARING PAD;                                                                                   |      |
|                             |           | 231      | 10           | C3TC          | C3FP<br>L3PM                          | VERIFY S-IB BOATTAIL CLOSED OUT AND READY FOR DELUGE PURGE PANEL ACTIVATION,                                                                   |      |
|                             |           | 231      | 11           | C3TC          | C3FP                                  | VERIFY DELUGE PURGE SWITCH OFF;                                                                                                                |      |
|                             |           | 231      | 12           | C3TC          | U3PC                                  | ACTIVATE THE S-IB BOATTAIL GN2 DELUGE PURGE PANEL PER V-36941 (HAZARDOUS); REPORT WHEN COMPLETE,                                               | D    |
|                             |           | 231      | 13           | C3TC          | C3FP                                  | START FUEL BUBBLING PER V-24522, PART IV SEQ 32 (NON-HAZARDOUS)                                                                                | D    |
|                             |           | 231      | 14           | L3ME          | C3TC                                  | ESP LOWERING IS COMPLETE, H/H CRANE NO LONGER REQUIRED,                                                                                        |      |
|                             |           | 261      | 15           | C3TC          | CLTC                                  | ESP LOWERING COMPLETE, H/H CRANE NO LONGER REQUIRED,                                                                                           |      |
|                             |           | 181      | 16           | CLTC          | CVTS                                  | ESP LOWERING COMPLETE, THE H/H CRANE IS RELEASED FOR NORMAL SERVICE;                                                                           | TCPI |
|                             |           | 231      | 17           | C3TC          | L3ME                                  | MOVE ESP TRANSPORTER TO SOUTH END OF LAUNCH PAD AND SECURE FOR LAUNCH PER V-26552 PART V (NON-HAZARDOUS); REPORT WHEN COMPLETE,                | D    |
| TYPE IV<br>37 HRS<br>0: 0"  |           |          |              |               | JUST PRIOR TO RESUMING COUNT<br>----- |                                                                                                                                                |      |
|                             |           | 261      | 1            | CLTC          | C1TC<br>C3TC<br>C4TC<br>CUTC          | VERIFY ALL PERSONNEL WITHOUT HAZARDOUS ACCESS BADGES ARE CLEARING THE PAD,                                                                     |      |
|                             |           | 181      | 2            | CLTC          | CVTS                                  | LV READY TO START PAD CLEARING OPERATIONS; REQUEST SECURITY TO VERIFY BOTH DOORS TO ROOM 1P4 ARE LOCKED AND INTEGRITY SEALS HAVE BEEN APPLIED, | TCPI |



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## LAUNCH OPERATIONS

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V#20130, APP D4

VEHICLE

AS=210

| TIME                        | COMM. CH. | SEQUENCE | COMMAND STA. | RESPONSE STA. | DESCRIPTION                                                             | REMARKS |
|-----------------------------|-----------|----------|--------------|---------------|-------------------------------------------------------------------------|---------|
| TYPE IV<br>+37 HRS<br>01 0" |           |          |              |               |                                                                         |         |
|                             | 188       | 3        | CVTS         | PA            | THE COUNT CLOCK WILL BE STARTED COUNTING<br>DOWN AT T-9 HRS ON MY MARK! | TCPI    |
|                             |           |          |              |               | 5 - 4 - 3 - 2 - 1 - MARK,                                               |         |
|                             | 261       | 4        | CLTC         | ALL           | ALL LV PERSONNEL TURN TO T-8:59 HRS,<br>PAGE 143                        |         |
|                             |           |          |              |               | END OF TEST PROCEDURE                                                   |         |



## RELEASED PROCEDURE DISTRIBUTION (V=20130)

| RECEIVER           | ADDRESS               | II |
|--------------------|-----------------------|----|
| NASA               |                       |    |
| BLACKWOOD, M. F.   | AA=MFP=1              | 3  |
| ROBERTS, J. T.     | DD=MD=42              | 1  |
| ROW, M. H.         | DF=IPE                | 15 |
| JENKINS, G. T.     | GeUS8                 | 2  |
| SEDLER, K.         | IN                    | 1  |
| MILLER, B. E.      | IN=CSO=2              | 5  |
| WILKINSON, R. L.   | IN=MSD                | 1  |
| MICHALEK, T.       | IN=MSD=1              | 1  |
| STEVENS, D. K.     | IN=MSD=12             | 3  |
| BROWN, R. A.       | IN=JIS                | 3  |
| PARRISH, A. J.     | IN=JIS=1              | 1  |
| WRIGHT, C. J.      | IN=JIS=2              | 2  |
| ROBINSON, G. A.    | IN=JIS=3              | 1  |
| COONCE, J. M.      | IN=DMO                | 2  |
| FIKE, J. W.        | IN=JAL                | 2  |
| HERSHEY, T. P.     | IN=TEL                | 2  |
| KIESLING, H. C.    | IN=TEL=12             | 3  |
| SHIRLEY, R. C.     | IN=TEL=2              | 3  |
| SUMMY, R. N.       | IN=TEL=31             | 2  |
| LENNON, C. L.      | IN=TEL=32             | 2  |
| GLINES, A.         | JSC/CP33              | 20 |
| TEST SUPERVISORS   | LA=OPN=A              | 7  |
| JEVITT, S. J.      | LA=PLV=1              | 1  |
| RIGELL, I. A.      | LV                    | 2  |
| THWIG, J.          | LV=8                  | 0  |
| MEDLOCK, J.        | LV=CAP                | 0  |
| POST, J. P.        | LV=CAP=A              | 1  |
| BRAYAN, F. G.      | LV=ENG=A              | 1  |
| ROUSE, C. R.       | LV=ENG=B              | 1  |
| JAFFERIS, W.       | LV=ENG=C              | 2  |
| LEALMAN, R. E.     | LV=JDC                | 4  |
| CHAMBERS, M.       | LV=JDC=1              | 3  |
| CHANDLER, M. O.    | LV=JDC=2              | 3  |
| OVERSTREET, C. F.  | LV=JDC=22             | 2  |
| JONES, D. R.       | LV=JDC=23             | 3  |
| CLAY, R. P.        | LV=JDC=24             | 1  |
| DAVIS, L. R.       | LV=JDC=25             | 2  |
| WHEELER, W. P.     | LV=JDC=28             | 0  |
| WHITESIDE, C. A.   | LV=JDC=3              | 2  |
| REGISTER, B. J.    | LV=JDC=31             | 3  |
| PFNOVICH, F.       | LV=JDC=32             | 4  |
| ELY, G. W.         | LV=JDC=33             | 3  |
| SAHYER, A. L.      | LV=JDC=4              | 1  |
| EDWARDS, M. D.     | LV=INS                | 2  |
| CROSSWELL, A. L.   | LV=INS=A              | 1  |
| HUFFMAN, B.        | LV=INS=1              | 3  |
| BIZZELL, J. S.     | LV=INS=11             | 1  |
| BLANCHARD, L. C.   | LV=INS=12             | 1  |
| GRUENFELDER, A. C. | LV=INS=13             | 1  |
| FITZGERALD, J. J.  | LV=INS=2              | 4  |
| RALEY, F. O.       | LV=INS=21             | 2  |
| FULMER, O.         | LV=INS=22             | 1  |
| FANNIN, L. E.      | LV=MEC                | 1  |
| PANTOLIANO, T. D.  | LV=MEC                | 2  |
| SCOVILLE, D. A.    | LV=MEC=1              | 2  |
| HUBBLE, E. E.      | LV=MEC=11A            | 1  |
| ROBINSON, G. H.    | LV=MEC=12             | 3  |
| GRUMBLATT, L. J.   | LV=MEC=12A            | 12 |
| HUMPHREY, J. T.    | LV=MEC=2              | 1  |
| CORN, G. F.        | LV=MEC=3              | 3  |
| WARD, R. G.        | LV=MEC=31             | 1  |
| OHARA, A. D.       | LV=DMO                | 1  |
| ADAMS, L. M.       | LV=DMO=1              | 5  |
| YOHANS, R. E.      | LV=DMO=3              | 1  |
| WILLIAMS, M. C.    | LV=PLN=1              | 1  |
| COOK, M. D.        | LV=PLN=13             | 2  |
| MADERY, G. L.      | LV=QAL=4              | 1  |
| WOLFE, G.          | LV=QAL=53             | 0  |
| BUCK, K. J.        | LV=QAL=54             | 3  |
| COX, W. M.         | LV=QAL=61             | 2  |
| BELL, J. H.        | LV=THO                | 1  |
| MSFC REPOSITORY    | MSFC/AS218, BLDG 4566 | 40 |
| LADNER, J. E.      | MSFC/EF25, BLDG 4708  | 1  |
| JOHNSON, B.        | MSFC/ET43, BLDG 4708  | 1  |
| OWEN, C. M.        | MSFC/VA22, BLDG 4201  | 3  |
| KEYES, P.          | MSFC/VA23, BLDG 4201  | 8  |
| LEE, C. M.         | O&C 3121              | 1  |
| WOODS, R. E.       | SF=OPN                | 1  |
| MOSES, C. S.       | SO=OPN                | 1  |
| JOHNSON, F. E.     | SO=OPN=1              | 5  |
| KINCH, R. C.       | SF=PRO                | 1  |
| HUBER, G. A.       | TS=NTS=1              | 2  |
| SCHEALER, R. B.    | TS=DSM                | 6  |
| COLLEY, K. W.      | VA06/KSC HQ/RM 1362   |    |

## RELEASED PROCEDURE DISTRIBUTION (V=20130)

| RECEIVER              | ADDRESS                                                                                     | II  |
|-----------------------|---------------------------------------------------------------------------------------------|-----|
| AFETR                 |                                                                                             |     |
| WALKER, R. J.         | AFETR/PAPQ, MU=5420                                                                         | 2   |
| NUCKELS, J. G.        | AFETR/PAPP, MU=595                                                                          | 1   |
| SUPPORT CONTRACTORS   |                                                                                             |     |
| EVERETT, J. D.        | FEC=230                                                                                     | 1   |
| SWEAT, DR. B.         | FEC=300                                                                                     | 1   |
| BUCHANAN, N. L.       | FEC=381                                                                                     | 1   |
| TAYLOR, J. N.         | FEC=720                                                                                     | 2   |
| TVETER, R. W.         | FEC=820                                                                                     | 1   |
| DEETER, W. W.         | FEC=870                                                                                     | 1   |
| OTT, T. E.            | VAB 10E7 (GE)                                                                               | 2   |
| FLAMM, R. H.          | RCA=1                                                                                       | 1   |
| ANDERSON, B. C.       | ROC=2 VAB 2N7 (ROCKETDYNE)                                                                  | 7   |
| STAGE/GSE CONTRACTORS |                                                                                             |     |
| STEWART, K. H.        | VAB 16E18 (CCSD)                                                                            | 120 |
| OATES, D.             | VAB 24E7 (CCSD)                                                                             | 0   |
| YOUNG, E. L.          | VAB 3L4 (MDAC)                                                                              | 74  |
| IBM DOCUMENTATION     | VAB 2N11 (IBM)                                                                              | 130 |
| MILIKIN, W. M.        | ZK20/DAC 3080 (RI)                                                                          | 2   |
| ELLIOTT, P. J.        | IBM, DEPT F11.                                                                              | 2   |
| BRABEILL, C. A.       | 150 SPARKMAN DRIVE<br>HUNTSVILLE, ALA<br>BOX 29200 (CCSD MICHOUD)<br>NEW ORLEANS, LA. 70129 | 1   |
| BOEING                |                                                                                             |     |
| ADAMS, R. H.          | BOFM=64                                                                                     | 6   |
| BAGGETT, J. A.        | BOFM=64                                                                                     | 10  |
| CALVETTO, R. S.       | BOFM=64                                                                                     | 5   |
| ECKHOFF, J. L.        | BOFM=64                                                                                     | 3   |
| HARDCASTLE, H. S.     | BOFM=34                                                                                     | 1   |
| KRAMP, H.             | BOFM=31                                                                                     | 1   |
| LUNDY, J. H.          | BOFM=64                                                                                     | 1   |
| LYONS, B. P.          | BOFM=64                                                                                     | 1   |
| MELTON, B. R.         | BOFM=36                                                                                     | 15  |
| MOUNT, W. E.          | BOFM=42                                                                                     | 2   |
| MOELHANEY, B. E.      | BOFM=36                                                                                     | 7   |
| REILLY, B. P.         | BOFL=46                                                                                     | 1   |
| SCHOLZ, A. L.         | BOFM=34                                                                                     | 1   |
| SKOWRON, J. F.        | BOFM=64                                                                                     | 14  |
| TUCKER, D. T.         | BOFM=44                                                                                     | 1   |
| YANCEY, J. T.         | BOFD=41                                                                                     | 12  |
| ANDERSON, D.          | PM=MO=F (MSN) BLDG 45                                                                       | 1   |
| RANCE COORDINATOR     | BOFM=35                                                                                     | 1   |
| CHAMBLEE, B.          | HOSE, HA=04                                                                                 | 1   |
| DAVIS, J. R.          | HTVL JD=49                                                                                  | 1   |
| EDWARDS, J.           | LS=03 MICHOUD                                                                               | 3   |
| GERHARDT, E. D.       | HTVL JD=83                                                                                  | 2   |
| OWENS, J. D.          | BOFM=35                                                                                     | 10  |
| SCHINDLER, D. H.      | HTVL AG=80                                                                                  | 1   |
| SIDES, C. A.          | MICHOUD LT=54                                                                               | 2   |
| TBC FILE              | BOFM=49                                                                                     | 10  |
| HOLD FOR RERUN        | BOFM=49                                                                                     | 100 |

NOTE  
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TO ARRANGE CORRECTIONS,  
CHANGES, ADDITIONS OR  
DELETIONS, PLEASE SUBMIT AN  
AVD TO LV=DMO=1, LCC 2R17.

DELIVER ALL EXTRAS AND ORIGINALS  
TO VAB 2L3, BOFM=35 (J. C. REED)