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**JOHN F. KENNEDY
SPACE CENTER**

TEST NUMBER	V-20035
REVISION NO.	BASIC
EFFECTIVITY	502 & SUBS
RELEASE DATE	9 NOVEMBER 1967

LAUNCH VEHICLE OVERALL TEST (PLUGS OUT)

**RELEASED
FOR AS 502**

PREPARED BY:

THE BOEING COMPANY
LC-39 LAUNCH OPERATIONS
BOEING ATLANTIC TEST CENTER

**THIS TCP CONTAINS
HAZARDOUS OPERATIONS**

TCP NO. V-20035
DATE 9 NOVEMBER 1967
NO. OF PAGES 164
EFFECTIVITY 502 & SUBS

**RELEASED
FOR AS 502**

LAUNCH VEHICLE OVERALL TEST (PLUGS OUT)

**THIS TCP CONTAINS
HAZARDOUS OPERATIONS**

CONTRACTOR

PREPARED BY: L. S. Buckner

APPROVED BY: L. R. Corbridge 11/20/67

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TBC

CONCURRENCE: F. W. Blum for H. Kojan 11/20/67
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NASA

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KSC Safety Officer

APPROVED BY: Don W. Chandler Jr.
LVO Branch Chief

APPROVED BY: P. E. Vannoy
LVO Test Conductor

**KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET**

PAGE 1 OF 2

1. TEST TITLE

Launch Vehicle Overall Test - Plugs Out

2. KSC TEST NUMBER

V-20035

3. EFFECTIVITY

502 & Subs

4. TEST OBJECTIVES

To verify proper operation of Stage and GSE Systems during a normal automatic firing sequence and a flight sequence, simulating separation operation, holddown release, propellant loading, and liftoff. Electrical umbilical ejection will be performed to verify no electrical interference at the time of umbilical disconnect.

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☒ DOES ☐ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

All applicable systems of the Launch Vehicle and GSE will be prepared and after conditions for "Preps Complete" have been achieved and/or simulated, the systems will be sequenced in a countdown and simulated flight to meet the objectives of this test.

The Launch Vehicle Flight Computer System will drive the L/V switch selectors through an accelerated flight sequence. The interstage separation simulators will be exercised during L/V staging functions in the simulated flight sequence. Range safety commands will be sent in minus time and plus time to check RSCR's.

This test will be performed at the VAB with the IU, S-IVB, S-II, and S-IC mechanically and electrically mated on the Mobile Launcher.

Phase IV

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
7. CONTRACTOR APPROVAL		8. ORGANIZATION	9. DATE	
<i>LR Corbridge</i>		BATC 5-8522	10/19/67	
10. NASA KSC APPROVAL		11. ORGANIZATION	12. APPROVAL DATE	
<i>DCM</i> <i>Regell</i>		LV-ENG	10-31-67	

1. TEST TITLE

Launch Vehicle Overall Test - Plugs Out

2. KSC TEST NUMBER

V-20035

3. EFFECTIVITY

502

13. LOCATION

VAB

14. COMPUTER PROC. IDENTIFICATION

15. EST. TEST TIME

10 Hours

16. SUPPORT REQUIREMENTS

Ground Power
S-IVB or S-IC Stage Pwr
S-II Stage Power
S-IVB Stage Power
III Power
Back-Up Batteries
Timing
Countdown Clock
ETR S.R.O.
LCC Measuring (LVO)

LCC Measuring (INS)
GSE Measuring (LVO)
GSE Measuring (INS)
LCC Data Display
CIF Data Display
DDAS
DDAS Tape Recording
RCA-110A Computers
L/V W-G ECS
Facility ECS (Gas)

H.P. Gas
CCF
Facility Comm. (OIS)
DEE 6
L/V ECS Gas
LCC TM Sta. (Monitor)
LCC TM Recording
CIF TM Sta. (Monitor)
CIF TM Recording

RD4100Z-Launch Vehicle Overall Test-Plugs Out

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

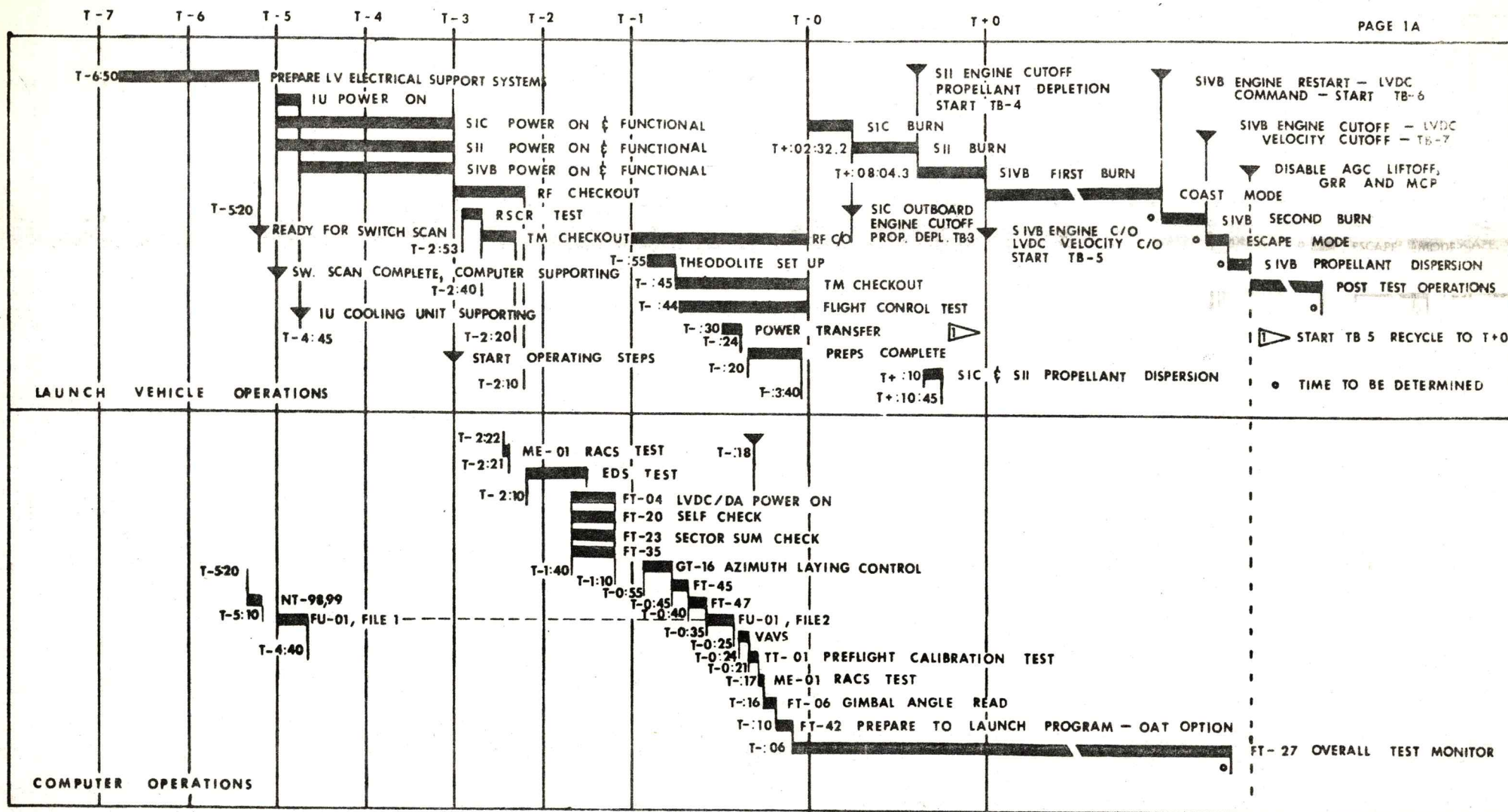
5251.60
PAGE 1
TEST NO. V-20035
VEHICLE SA-502

TABLE OF CONTENTS

TIME SEQUENCE BAR CHART	1A
TEST OUTLINE	1B
OPERATING STATIONS	2
COMMUNICATION CHANNELS	11
TEST PREPARATIONS	12
GENERAL PREPARATIONS	24
OPERATING STEPS	26
POST TEST OPERATIONS	144
EMERGENCY PROCEDURES	145
TEST SUMMARY SHEET	163

L/V OVERALL TEST PLUGS OUT

PAGE 1A



TEST OUTLINE

1. TCP TITLE L/V OVERALL TEST PLUGS OUT	2. TCP NUMBER V-20035	3. REV. Orig.	4. VEHICLE NUMBER AS-502 & Subs	5. PAGE <u>1</u> OF <u>1</u>
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6. CONTENT:

L/V Overall Test, Plugs Out

- (a) OAT batteries will be used for internal power.
- (b) Interstage separation simulators and fuse boxes will be installed in all Launch Vehicle separation planes and fuse boxes at S-IVB/IU interface and at IU/Apollo S/C simulator.
- (c) Overall test equipment will be used for LV.
- (d) Holddown release and lift off will be simulated.
- (e) Service Arm retraction will be simulated.
- (f) G&C system will be operated.
- (g) Launch Vehicle telemetry systems will be operated through closed loop cables & antenna hats.
- (h) Airborne tape recorders will be disabled.
- (i) UHF Xmit will be disabled.
- (j) RSCR's will be operated through closed loop cables with the LCC RF station. 450 MHZ open loop clearance required.
- (k) Calips pressure switch system will be utilized on all stages where available.
- (l) Engine actuator arms will be disconnected.
- (m) S-II camera capsules and light batteries will not be installed.
- (n) F-1 engine sequence will be performed with control pressure and hydraulics. J2 engine sequences will be performed without control pressures.
- (o) Pulse sensors and ordnance simulators will be used.
- (p) L/V RF tracking systems, C-band Beacons, CCS and ODOP, will be interrogated and read out by the VAB RFCE.
- (q) Azusa will operate open loop with the range using hats and repeater antennas. 5000 MHZ open loop clearance required.

After all systems have been prepared and functionally checked, the conditions required for "Preparations Complete" will be achieved and launch sequence start will be given. A normal automatic sequence will progress through Power Transfer, S-IC Ignition, and on to Commit. At this time, liftoff will be simulated which will initiate Electrical Umbilical Ejection, Simulated Hold Down Arms Release, Simulated Service Arms Retraction, and start of the Simulated Flight Sequence.

The LVDC will drive the switch selectors through an accelerated flight sequence with S-II burn time shortened by 35 seconds (S-II LOX and LH propellant depletion occurring before sensor cutoff arming). The flight sequence will continue through Time Base seven plus ten minutes (S/C separation).

7. PREPARED BY <i>L. R. Cowbridge</i>	8. DATE 10/20/67	9. CHIEF ENGINEER <i>D. R. [unclear] - ENO</i>	10. DATE 10-31-67
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LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 2
TEST NO. V-20035
VEHICLE SA-502

A. OPERATING STATIONS

S-IC

B1RF	S-IC RF SYSTEMS ENGINEER
B1TM	TM CHECKOUT EQUIPMENT, S-IC MODULE - 2P10
BRFS	LCC-RF DRSCS GND STATION - 2P10A
BTMC	TM CHECKOUT EQUIPMENT COMMON MODULE - 2P10
C1CS	S-IC CUTOFF SENSORS PANEL
C1DE	S-IC DIGITAL EVENTS EVALUATOR PRINTER
C1DP	S-IC PROPELLANT DISPERSION (DESTRUCT) PANEL
C1EH	S-IC ENGINE HEATERS PANEL
C1EN	S-IC ENGINE PANEL
C1EV	S-IC EVENTS DISPLAY PANEL
C1FC	S-IC FLIGHT CONTROL ENGINE DEFLECTION
C1FE	S-IC FLIGHT CONTROL SYSTEM ENGINEER
C1FR	S-IC FIRING PANEL
C1GA	S-IC FLIGHT CONTROL RATE GYRO/ACCEL. PANEL
C1GP	S-IC GROUND PNEUMATICS PANEL
C1HP	S-IC HYDRAULICS PANEL
C1IP	S-IC MEASURING AND RF PANEL
C1LO	S-IC LOX SYSTEM PANEL
C1MS	S-IC MEASURING SYSTEMS ENGINEER
C1NE	S-IC GND ELECT NETWORKS SYSTEM ENGINEER
C1NK	S-IC CRT KEYBOARD - NETWORKS
C1NP	S-IC NETWORKS PANEL
C1TC	S-IC TEST CONDUCTOR

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251,60
PAGE 3
TEST NO. V-20035
VEHICLE SA-502

(CONTINUED)

A. OPERATING STATIONS

C10P	S-IC EBW AND ORDNANCE PANEL
C1PC	S-IC CONTROL AND PURGE PANEL (STAGE PNEUMATICS CONTROL)
C1PE	S-IC PROPULSION & MECHANICAL SYSTEM ENGINEER
C1PP	S-IC POWER PANEL
C1RP	S-IC RP-1 SYSTEM PANEL
C1SP	S-IC SEQUENCER PANEL
CSAC	SERVICE ARM CONTROL CONSOLE
CSPP	SERVICE ARMS POWER PANEL
CSA6	SERVICE ARM #6 CONTROL CONSOLE (S-IVB AFT)
CSA7	SERVICE ARM #7 CONTROL CONSOLE (S-IVB FORWARD)
CTS1	TAIL SERVICE MAST 1-2 FIRING & MONITOR TEST CONSOLE
CWCP	INDUSTRIAL WATER CONTROL PANEL
L1EF	S-IC FLIGHT CONTROL - ENGINE AREA
L1OT	S-IC OVERALL TEST RACK
L1TT	S-IC THRUST STRUCTURE TM & RF
LLRS	DIGITAL R/S COMMAND SYSTEM GSE
LWCD	WATER CONTROL DISTRIBUTOR
LP7B	POWER SUPPLY SYSTEM RACKS - AREA 7B
R1SC	S-IC STRIP CHARTS
RRSC	RANGE SAFETY & EBW RECORDERS
U1FN	S-IC FORWARD SKIRT TM & RF
V1RF	RF (TV AND ODOP) CHECKOUT STATION - 26E7
V1TM	S-IC TELEMETRY ENGINEER
VOBS	OVERALL TEST BATTERY STATION (HI BAY)

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 4
TEST NO. V-20035
VEHICLE SA-502

(CONTINUED)

A. OPERATING STATIONS

V1MS S-IC GSE MEASURING STATION

S-II

B2RF S-II RF SYSTEM ENGINEER

B2TM TM CHECKOUT EQUIP., S-II MODULE - 2P10

C2AE S-II ALL ENGINE PANEL

C2CC S-II CAMERA CONTROL PANEL

C2CP S-II CAMERA PNEUMATICS PANEL

C2DE S-II DIGITAL EVENTS EVALUATOR PRINTER

C2DP S-II PROPELLANT DISPERSION PANEL

C2EC S-II ENGINE COMPONENTS PANEL

C2EV S-II EVENTS DISPLAY PANEL

C2FC S-II HYDRAULICS PANEL

C2FE S-II FLIGHT CONTROL SYSTEM ENGINEER

C2GP S-II GND PNEUMATICS PANEL

C2HO S-II HANDLING/ORDNANCE ENGINEER

C2NK S-II CRT KEYBOARD - NETWORKS

C2IP S-II MEASURING AND RF PANEL

C2NP S-II NETWORKS PANEL

C2TC S-II TEST CONDUCTOR

C2TV S-II TV CONTROLLER

C2OP S-II EBW AND ORDNANCE PANEL

C2PC S-II DC POWER CONTROL PANEL #1

C2PE S-II PROPELLANT DEPLETION PANEL

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 5
TEST NO. V-20035
VEHICLE SA-502

(CONTINUED)

A. OPERATING STATIONS

C2PK	S-II PROPULSION CRT DISPLAY
C2PM	S-II PROPELLANT MONITOR PANEL
C2PU	S-II PROPELLANT UTILIZATION PANEL
C2RP	S-II RECIRCULATION PANEL
C2RR	S-II RELAY RACKS (#1 AND #2)
C2SI	S-II STRUCTURES ENGINEER
C2SP	S-II PRESSURIZATION PANEL
E2IM	S-II INSTRUMENTATION MONITOR (CIF)
L2OT	S-II OAT RACKS
L2PD	S-II POWER DISTRIBUTOR RACKS (RM 8B)
L2RR	S-II RELAY RACKS (1 THROUGH 5 RM 7A)
R2SC	S-II STRIP CHARTS
U2AN	S-II AIRBORNE NETWORKS
U2EC	S-II ENVIRONMENTAL CONTROL ENGINEER
U2FE	S-II FLIGHT CONTROL ENGINEER
U2A1	S-II AIRBORNE NETWORKS, FWD
U2HO	S-II HANDLING AND ORDNANCE ENGINEER
U2A2	S-II AIRBORNE NETWORKS, AFT
U2J2	S-II ENG. ENGINEER
U2LE	S-II ENGINES LEADMAN
U2LF	S-II FLIGHT CONTROL LEADMAN
U2SE	S-II STAGE ENGINEER
U2LH	S-II HYDRAULIC LEADMAN
U2LI	S-II INSULATION LEADMAN

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 6
TEST NO. V-20035
VEHICLE SA-5-2

(CONTINUED)

A. OPERATING STATIONS

U2LL S-II LEAK DETECTION LEADMAN
U2LP S-II PRESSURIZATION LEADMAN
U2LS S-II STRUCTURES LEADMAN
U2LU S-II UMBILICALS LEADMAN
U2MU S-II MECH/UMBILICAL ENGINEER
U2MH S-II MECH/HYDRAULICS ENGINEER
U2SI S-II STRUCT/INST ENGINEER
U2PE S-II PROPELL/PRESS ENGINEER
U2PF S-II PROPELLANT FILL ENGINEER
V2EC S-II ENVIRONMENTAL CONTROL ENGINEER
V2MS S-II MEAS. STATION

S-IVB

B4IE S-IVB INSTRUMENTATION ENGINEER
B4RF S-IVB LCC RF STATIONS
B4TM S-IVB STAGE MODULE - 2P10
C4AL S-IVB APS LAUNCH AND MONITOR PANEL
C4DE S-IVB DIGITAL EVENTS EVALUATOR PRINTER
C4DP S-IVB PROPELLANT DISPERSION PANEL AND EBW ORDNANCE PANEL
C4EP S-IVB ENGINE PREP PANEL AND RECIRCULATION PANEL
C4ES S-IVB ELECTRONIC SYSTEMS ENGINEER
C4ET S-IVB ENGINE TEST PANEL
C4EV S-IVB EVENTS DISPLAY PANEL
C4FC S-IVB ENGINE DEFLECTION AND ENGINE CHAMBER PANEL

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 7
TEST NO. V-20035
VEHICLE SA-502

(CONTINUED)

A. OPERATING STATIONS

C4FS	S-IVB FLIGHT CONTROL SYSTEM ENGINEER
C4HC	S-IVB HELIUM CONTROL PANEL
C4HN	S-IVB GH2/GN2 CONTROL PANEL
C4HV	S-IVB HYDRAULIC PANEL
C4IP	S-IVB MEAS. AND RF PANEL
C4MS	S-IVB MECH/STRUCTURES ENGINEER
C4NK	S-IVB CRT KEYBOARD - NETWORKS
C4NP	S-IVB NETWORK PANEL
C4TC	S-IVB TEST CONDUCTOR
C4PP	S-IVB DC POWER SUPPLY PANELS
C4PR	S-IVB PROPELLANT STATUS PANEL
C4PU	S-IVB PROPELLANT UTILIZATION SYSTEMS PANEL
C4SP	S-IVB STAGE PRESSURE PANEL
C4TV	S-IVB TV MONITORS
L4JR	S-IVB JUNCTION RACKS
L4OT	S-IVB OAT RACK
L4PR	S-IVB POWER RACKS
R4EI	S-IVB E & I RECORDERS
R4JR	S-IVB LCC PATCH DISTRIBUTORS
R4SC	S-IVB STRIP CHARTS
S4CE	S-IVB CONTROL ELECTRONICS ENGINEER
S4HY	S-IVB HYDRAULICS ENGINEER
S4FC	S-IVB FLIGHT CONTROL ENGINEER
S4ME	S-IVB MECHANICAL ENGINEER

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 8
TEST NO. V-20035
VEHICLE SA-F

(CONTINUED)

A. OPERATING STATIONS

S4PE S-IVB PROPULSION ENGINEER
S4PL S-IVB PROPULSION MECHANIC
U4IE S-IVB INSTRUMENTATION ENGINEER
V4MS S-IVB MEASURING GSE STATION
B4TM S-IVB TELEMETRY ENGINEER

IU

BGCC LCC GND COMPUTER
BUTM TM CHECKOUT EQUIP, IU MODULE - 2P10
CEDK CRT KEYBOARD - EDS
CLFS L/V FLIGHT CONTROL SYSTEMS ENGINEER
CLGK CRT KEYBOARD - GUIDANCE
CLMK L/V CRT KEYBOARD - MEASURING
CGBL Q-BALL CHECKOUT PANEL
CUCP IU FLIGHT CONTROL COMPUTER PANEL
CUCR IU FLIGHT CONTROL RECORDERS
CUDE IU DIGITAL EVENTS EVALUATOR PRINTER
CUEF EDS FLIGHT MONITOR PANEL
CUES EDS PREPARATION
CUEV IU EVENTS DISPLAY
CUFE IU FLIGHT CONTROL SYSTEMS ENGINEER
CUFS FLIGHT CONTROL SYSTEMS INTEGRATOR
CUGA IU FLIGHT CONTROL EDS RATE GYRO/CONTROL PANEL
CUIP IU MEASURING & TRACKING PANEL

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 9
TEST NO. V-20035
VEHICLE SA-502

(CONTINUED)

A. OPERATING STATIONS

CUNC	IU MECHANICAL CONTROL PANEL
CUNE	IU ELECTRICAL NETWORK ENGINEER
CUNK	IU CRT KEYBOARD - NETWORKS
CUNP	IU NETWORKS PANEL
CUTC	IU TEST CONDUCTOR
CUPP	IU AC & DC POWER PANEL
CUSE	ST-124 SYSTEM ENGINEER
CUSP	IU FLIGHT CONTROL COMPUTER INPUT SUBST. PANEL
CUSW	IU NETWORKS SWITCH SELECTOR PANEL
CVNP	VEHICLE NETWORKS PANEL
LGCC	RCA 110A (ML)
LUNW	IU NETWORKS (ML)
LUOT	IU OAT RACKS
RUSC	IU STRIP CHARTS
RDAS	DDAS GSE RACKS
RDE6	DIGITAL EVENTS EVALUATOR
CUAS	S/C SUBSTITUTE PANEL #1
VURF	RF (AZUSA, "C" BAND RADAR & CCS) CHECKOUT STA 26E7
RCCC	COUNT CLOCK
SUAS	APOLLO SIMULATOR
SUVE	IU VEHICLE NETWORKS
SUNE	IU VEHICLE NETWORK ENGINEER
CUCS	IU COMMAND SIMULATOR

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 10
TEST NO. V-20035
VEHICLE SA-500

(CONTINUED)

A. OPERATING STATIONS

MISC.

BLTM	L/V TM SYSTEMS ENGINEER
BLRF	L/V RF SYSTEM ENGINEER (LCC)
BTMI	TM CHECKOUT EQUIPMENT C/F MODULE - 2P10
BTML	RF & TM LAB - 2P24
BTTM	L/V INSTRUMENTATION TEST COORDINATOR
CGIC	INSTRUMENTATION CONTROLLER
CLES	L/V ELECTRICAL NETWORKS SYSTEMS ENGINEER
CLIS	L/V INSTRUMENTATION SYSTEMS ENGINEER
CLTC	L/V TEST CONDUCTOR
CPSS	LCC SYSTEMS SAFETY
CRSO	RANGE SAFETY SUPERVISION PANEL
CSTC	S/C CHIEF TEST CONDUCTOR
CTSE	TELEMETRIC SYSTEMS ENGINEER
CVTS	SPACE VEHICLE TEST SUPERVISOR
ECOP	COMPUTER FACILITY
ETMS	TELEMETRY STATION (C/F)
LLMR	MOBILE LAUNCHER MEAS, RACKS
ORNG	RANGE OPERATIONS
VECS	ECS CONTROL PANEL - VAB
VLRF	L/V RF SYSTEMS ENGINEER (VAB)

LV DAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 11
TEST NO. V-20035
VEHICLE SA-502

B. COMMUNICATION CHANNELS

CH 111	CVTS	TEST SUPERVISOR
CH 121	CLTC	L/V TEST CONDUCTOR
CH 123	CLFS	L/V FLIGHT CONTROL
CH 125	CLES	L/V ELECT SYSTEMS ENGINEER
CH 141	CPSS	LCC SYSTEMS SAFETY
CH 151	CUTC	L/V IU TEST CONDUCTOR
CH 153	CLGK	L/V GUIDANCE
CH 161	C4TC	L/V S-IVB TEST CONDUCTOR
CH 171	C2TC	L/V S-II TEST CONDUCTOR
CH 181	C1TC	L/V S-IC TEST CONDUCTOR
CH 188		PAGING
CH 251	CGIC	INSTRUMENTATION CONTROLLER

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 12
TEST NO. V-20035
VEHICLE SA-502

C. CABLE CONNECTIONS AND PREPARATIONS

S-II STAGE CABLE CONNECTIONS

ITEM	NOMENCLATURE	PART NO.	CONNECT: FROM - TO	LOCATION
1	PULSE SENSOR	200A4A2	J2-1137W147P2 J1-200A4/P2	AFT INTERSTAGE
2	PULSE SENSOR	200A3A2	J2-1137W146P2 J1-200A3/P2	AFT INTERSTAGE
3	PULSE SENSOR	200A6A2	J2-1137W145P2 J1-200A6/P2	AFT INTERSTAGE
4	PULSE SENSOR	200A5A2	J2-1137W144P2 J1-200A5/P2	AFT INTERSTAGE
5	AUX HYD #1	206A36A2 206A36A3	J1-6161W601P2 J2-6161W601P3	AFT INTERSTAGE
6	AUX HYD #2	206A37A2 206A37A3	J1-6161W601P4 J2-6161W601P5	AFT INTERSTAGE
7	AUX HYD #3	206A38A2 206A38A3	J1-6161W601P6 J2-6161W601P7	AFT INTERSTAGE
8	AUX HYD #4	206A39A2 206A39A3	J1-6161W601P8 J2-6161W601P9	AFT INTERSTAGE
9	INVERTER #1	206A221	J3-1137W202P2	AFT INTERSTAGE
10	INVERTER #2	206A222	J3-1137W203P2	AFT INTERSTAGE
11	INVERTER #3	206A223	J3-1137W204P2	AFT INTERSTAGE
12	INVERTER #4	206A224	J3-1137W205P2	AFT INTERSTAGE
13	INVERTER #5	206A225	J3-1137W206P2	AFT INTERSTAGE
14	LOAD BANK #4	1137-305	J1-1137W206P1	AFT INTERSTAGE
15	LOAD BANK #4	1137-304	J1-1137W205P1	AFT INTERSTAGE
16	LOAD BANK #3	1137-303	J1-1137W204P1	AFT INTERSTAGE
17	LOAD BANK #2	1137-302	J1-1137W203P1	AFT INTERSTAGE
18	LOAD BANK #1	1137-301	J1-1137W202P1	AFT INTERSTAGE
19	CABLE	1137W231	P2-206W8P11 P3-206W8P12	AFT INTERSTAGE

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 13
TEST NO. V-20035
VEHICLE SA-502

(CONTINUED)

C. CABLE CONNECTIONS AND PREPARATIONS

Item	Description	Part Number	Connections	Location
20	SPECIAL TEST CONNECTOR	206A40	J14-1137W58P2 J16-1137W59P2 J18-1137W60P2 J20-1137W61P2 J22-1137W63P2 J2-1137W64P2	AFT INTERSTAGE
21	OAT DISTRIBUTOR	1137-8	J14-1137W59P1 J15-1137W60P1 J16-1137W61P1 J22-1137W63P1 J23-1137W64P1 J12-1137W83P1 J1-1137W84P1 J19-1137W81P1 J9-1137W231P1 J18-1137W66P1 J20-1137W65P1 J7-1137W79P1 J6-1137W77P1 J4-1137W75P1 J8-1137W70P1 J10-1137W73P1 J2-1137W69P1 J13-1137W58P1	AFT INTERSTAGE
22	CABLE	1137W147	P1-1137W77-P2 P3-200W1-P9	AFT INTERSTAGE
23	CABLE	1137W146	P1-1137W75-P2 P3-200W1-P8	AFT INTERSTAGE
24	CABLE	1137W145	P1-1137W73P2 P3-200W1-P7	AFT INTERSTAGE
25	CABLE	1137W144	P1-1137W70/P2 P3-200W1P6	AFT INTERSTAGE
26	BATTERY CONTROL BOX	1137-35	J1-1137W68P1 J2-1137W69P2 J3-STD-295W1P2	AFT INTERSTAGE
27	CABLE	STD-295W1	P1-200W2P2	
28	BATTERY CONTROL BOX	1137-36	J1-1137W67P1 J2-1137W66P2 J3-STD-295W2P2	AFT INTERSTAGE

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 14
TEST NO. V-20035
VEHICLE SA-502

(CONTINUED)

C. CABLE CONNECTIONS AND PREPARATIONS

29	CABLE	STD-295W2	P1-200W2P3	
30	BATTERY CONTROL BOX	1137-31	J1-1137W181P1 J2-1137W83P2 J3-STD-296W1P2	AFT INTERSTAGE
31	CABLE	STD-296W1	P1-207A1W1P10	
32	BATTERY CONTROL BOX	1137-32	J1-1137W180P1 J2-1137W81P2 J3-STD-296W2P2	AFT INTERSTAGE
33	CABLE	STD-296W2	P1-207A1W1P11	
34	CABLE	1137W1B1	P2-9363W4BP2	"D" BLOCK PLATFORM
35	CABLE	9363W4B	P1-9363W4AP2	"D" BLOCK PLATFORM
36	CABLE	9363W4A	P1-M140-274W1P2	16TH FLOOR "E" TOWER
37	CABLE	M140-274W1	P1-M140-274 (OAT BATTERY 2D10)	16TH FLOOR "E" TOWER
38	CABLE	1137W180	P2-9363W3BP2	"D" BLOCK PLATFORM
39	CABLE	9363W3B	P1-9363W3AP2	16TH FLOOR "E" TOWER
40	CABLE	9363W3A	P1-M140-273W1P2	
41	CABLE	M140-273W1	P1-M140-273 (OAT BATTERY 2D20)	16TH FLOOR "E" TOWER
42	CABLE	1137W68	P2-9363W1BP2	"D" BLOCK PLATFORM
43	CABLE	9363W1B	P1-9363W1AP2	"D" BLOCK PLATFORM
44	CABLE	9363W1A	P1-M140-271W1P2	16TH FLOOR "E" TOWER

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 15
TEST NO. V-20035
VEHICLE SA-502

(CONTINUED)

C. CABLE CONNECTIONS AND PREPARATIONS

45	CABLE	M140-271W1	P1-M140-271 (OAT BATTERY 2D50)	16TH FLOOR "E" TOWER
46	CABLE	1137W67	P2-9363W2BP2	"D" BLOCK PLATFORM
47	CABLE	9363W2B	P1-9363W2AP2	"D" BLOCK PLATFORM
48	CABLE	9363W2A	P1-M140-272W1P2	16TH FLOOR "E" TOWER
49	CABLE	M140-272W1	P1-M140-272 (OAT BATTERY 2D60)	16TH FLOOR "E" TOWER
50	CROSSOVER	6161	J41-1137W84P2 J21-6161W18P1 J42-1137W65P2 J113-6161W601P1 J22-6161W63P1	LUT 160 FOOT LEVEL
51	ISS CONTROL PANEL	1137-3004	J1-1137W79P2 J2-FACILITY PWR	AFT INTERSTAGE
52	OAT PATCH	202- 1137A2A1	J3-1137A2W4P1 J4-1137A2W1P1 J6-1137W5P1 J7-1130W127P2 J10-1137W4P1 J11-1137A2W2P1 J14-1137A2W3P1 J17-1137W6P1 J20-221W16P2 J8-222W86P2	LUT "A" LEVEL
53	OAT PANEL	1137A2A2	J1-1137A2W1P2	LUT "A" LEVEL
54	BATTERY CONTROL & MONITOR PANEL	1137A2A3	J1-1137A2W2P2	LUT "A" LEVEL
55	E AND I RECORDERS	1137A2A4	J1-1137A2W5P1	LUT "A" LEVEL

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 16
TEST NO. V-20035
VEHICLE SA-502

(CONTINUED)

C. CABLE CONNECTIONS AND PREPARATIONS

56	E AND I RECORDERS	1137A2A5	J1-1137A2W6P1	LUT "A" LEVEL
57	E AND I RECORDERS	1137A2A6	J1-1137A2W3P2 J2-1137W7P1 J3-1137W143P2	LUT "A" LEVEL
58	E AND I CALIB PANEL	1137A2A7	J1-1137A2W4P2 J2-1137A2W6P2 J3-1137A2W5P2	LUT "A" LEVEL
59	CROSSOVER DIST	6201	J33-1137W173P2 J11-6201W11P1	LUT 200 FOOT LEVEL
60	OAT DIST	1137-4	J1-1137W173P1 J2-1137W44P1 J4-1137W46P1 J6-1137W48P1 J9-1137W51P1 J11-1137W53P1 J13-1137W55P1 J15-1137W57P1 J10-1137W230P1	FWD SKIRT
61	PULSE SENSOR	402A5A1	J2-1137W160P2 J1-402A1P2	S-IVB AFT INTERSTAGE
62	CABLE	1137W160	P1-1137W51P2 P3-219W10P8	S-IVB AFT INTERSTAGE
63	CABLE	1137W230	P2-219W2P11 P4-219W2P13 P3-219W2P12	S-IVB AFT INTERSTAGE
64	PULSE SENSOR	402A5A2	J1-402A2P2 J2-1137W161P2	S-IVB AFT INTERSTAGE
65	CABLE	1137W161	P1-1137W53P2 P3-219W10P9	S-IVB AFT INTERSTAGE
66	PULSE SENSOR	402A5A3	J1-402A3P2 J2-1137W158P2	S-IVB AFT INTERSTAGE
67	CABLE	1137W158	P1-1137W44P2 P2-219W10P6	S-IVB AFT INTERSTAGE
68	PULSE SENSOR	402A5A4	J1-402A4P2 J2-1137W159P2	S-IVB AFT INTERSTAGE

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251,60
PAGE 17
TEST NO. V-20035
VEHICLE SA-502

(CONTINUED)

C. CABLE CONNECTIONS AND PREPARATIONS

69	CABLE	1137W159	P1-1137W46P2 P3-219W10P7	S-IVB AFT INTERSTAGE
70	PULSE SENSOR	223A4A1	J1-223A4P2 J2-1137W163P2	FWD SKIRT
71	CABLE	1137W163	P1-1137W57P2 P3-223W2P2	FWD SKIRT
72	PULSE SENSOR	223A3A1	J1-223A3P2 J2-1137W162P2	FWD SKIRT
43	CABLE	1137W162	P1-1137W55P2 P3-223W2P1	FWD SKIRT
74	ISS CONT. PANEL	1137-4007	J1-1137W48P2 J2-FAC PWR	FWD SKIRT
75	VERIFY ISS CONTROL PANEL AND HOOKUP IN ACCORDANCE WITH DOP-C02-Y008, FIG 3 & 4,			
76	CHARGE 5 ISS UNITS (2 FWD, 3 AFT) TO 400 +/- 50 PSIG			

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 18
TEST NO. V-20035
VEHICLE SA-50

(CONTINUED)

C. CABLE CONNECTIONS AND PREPARATIONS

S-1! STAGE JUMPER INSTALLATIONS

1. L2RR INSTALL JUMPER J-4 IN X02-220A2 (ENGINE CT BUS ENABLE),
2. L2RR INSTALL JUMPER IN X02-222A1 FROM J19-BB TO J13-A, AND FROM J13-B TO J19-CC, MARK SW S1 ON X02-222A3 "HE 2800 PSIG," CLOSE SW,
3. L2RR INSTALL JUMPER IN X02-222A1 FROM J19-EE TO J13-C, AND FROM J13-D TO J19-FF, MARK SW S2 ON X02-222A3 "HE 2800 PSIG," CLOSE SW,
4. L2RR INSTALL JUMPER J1 IN X02-220A2 (SEPARATION SYSTEM LIFT-OFF SIMULATE ENABLE),
5. L2RR INSTALL JUMPER J2 IN X02-220A2 (PROPELLANT DISPERSION SYSTEM LIFT-OFF SIMULATE ENABLE),
6. L2RR INSTALL JUMPER J3 IN X02-220A2 (CAMERA EJECT SYSTEM ARM ENABLE),
7. L2RR INSTALL JUMPER IN X02-222A1 FROM J25-T TO J13-T, AND FROM J15-K TO J13-U, MARK SW S9 ON X02-222A3 "LOX UMB PURGE CMD," CLOSE SW,
8. L2RR INSTALL JUMPER IN X02-222A1 FROM J16-X TO J13-X, AND FROM J16-W TO J13-Y, MARK SW S11 ON X02-222A3 "HE PRESSURE ON", CLOSE SW,
9. C2RR INSTALL ODD NUMBERED JUMPERS (J1, J3, ETC) J1 THRU J15, AND INSTALL JUMPER J35 IN 60X-221A2 SPECIAL COMPONENT PANEL,
10. L2RR INSTALL JUMPER IN X02-222A1 FROM J2-A TO J13-Z AND FROM J13-A+ TO J29-K, MARK SWITCH S12 ON X02-222A3 "1500 PSIG GN2", CLOSE SW,
11. L2RR INSTALL JUMPER IN X02-222A1 FROM J2-B TO J13-B AND FROM J13-C+ TO J43-P, MARK SWITCH S13 ON X02-222A3 "HE TURBO PUMP PURGE", CLOSE SW,
12. L2RR INSTALL JUMPER IN X02-221A1 FROM J2-A TO J12-D AND FROM J12-C TO J34-O+, MARK SWITCH S2 ON X02-221A4 "RECIRC PUMP ENABLE", CLOSE SW,
C2NP INFORM C2TC ON CHANNEL 171 THAT JUMPERS ARE INSTALLED,

LV DAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 19
TEST NO. V-20035
VEHICLE SA-502

(CONTINUED)

C. CABLE CONNECTIONS AND PREPARATIONS

IU STAGE

IU PREPARATIONS

(A) IU NETWORKS VERIFY THE FOLLOWING CONNECTIONS:

1137W172/P1 TO 1137-7/J4
1137W133/P1 TO 1137-7/J1
1137W130/P1 TO 1137-7/J10
1137W130/P2 TO 601W16/J3 TEST COM,
1137W131/P1 TO 1137-7/J2
1137W131/P2 TO 602A5/J15
1137W132/P1 TO 1137-7/J3
1137W132/P2 TO 603A2/J5
1137W134/P2 TO VMTB/J2
VMTB ADAPTOR CABLE/P2 TO 601A1/J13
VMTB ADAPTOR CABLE/P1 TO VMTB/J1
1137W171/P1 TO 1137-7/J12
1137W171/P2 TO 1137-7/J13
1137W135/P1 TO 1137-7/J9
1137W135/P2 1137-71/J2 +6D10 BOX
1137W137/P1 TO 1137-7/J8
1137W137/P2 TO 1137-72/J2 +6D20 BOX
1137W139/P1 TO 1137-7/J7
1137W139/P2 TO 1137-73/J2 +6D30 BOX
1137W141/P1 TO 1137-7/J6
1137W141/P2 TO 1137-74/J2 +6D40 BOX

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 20
TEST NO. V-20035
VEHICLE SA-500

(CONTINUED)

C. CABLE CONNECTIONS AND PREPARATIONS

1137W136/P1 TO 1137-71/J1
1137W136/P2 TO OAT BATT CABLE 4360/J3
1137W138/P1 TO 1137-72/J1
1137W138/P2 TO OAT BATT CABLE 9360/J4
1137W140/P1 TO 1137-73/J1
1137W140/P2 TO OAT BATT CABLE 9360/J5
1137W142/P1 TO 1137-74/J1
1137W142/P2 TO OAT BATT CABLE 9360/J6

(B) IU NETWORKS PERFORM BATTERY LOAD CHECK PER V-31010-GSE/VAB.

(C) IU NETWORKS VERIFY THE FOLLOWING CONNECTIONS:

601W31/P2 TO 1137-71/J3
601W31/P3 TO 1137-72/J3
601W32/P2 TO 1137-73/J3
601W32/P3 TO 1137-74/J3
601W61/P2 TO 1137-71/J4 BY ADAPTOR CABLE
601W61/P4 TO 1137-72/J4 BY ADAPTOR CABLE
601W61/P5 TO 1137-73/J4 BY ADAPTOR CABLE
601W61/P7 TO 1137-74/J4 BY ADAPTOR CABLE

(D) IU NETWORKS INSTALL THE FOLLOWING TEST BOXES:

(1) DISCONNECT

603W49/P1 FROM 603A20/J1
603W47/P8 FROM 603A2/J6

(2) CONNECT

603A2/J6 TO SSITB/P1.

LV DAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 21
TEST NO. V-20035
VEHICLE SA-502

(CONTINUED)

C. CABLE CONNECTIONS AND PREPARATIONS

SSITB/J1 TO 603W47/P8

PEA INT, BOX/J1 TO 603A20/J1

PEA INT, BOX/J2 TO 603W49/P1 (LEAVE SW, ON)

(E) IU NETWORKS VERIFY THE FOLLOWING CONNECTIONS FOR APOLLO S/C
SIMULATOR:

601W25/P1 TO FUSE BOX #25

FUSE BOX #25 TO 1244-201W1/P2

601W26/P1 TO FUSE BOX #26

FUSE BOX #26 TO 1244-201W2/P2

601W27/P1 TO FUSE BOX #27

FUSE BOX #27 TO 1244-202W1/P2

S/C SIMULATOR AC CABLE TO AC OUTLET

(F) IU NETWORKS VERIFY THE FOLLOWING TELEMETRY CABLES CONNECTED:

9028W1/P2 TO 601W144/J1 (601A564)

9028W1/P3 TO 602A595/J1

9028W1/P1 TO 9028/J11

(G) IU NETWORKS DISCONNECT THE FOLLOWING CABLE:

602W86/P4 FROM 602A604/J1 (TAPE RECORDER)

(H) RUJR - CONNECT FUSED JUMPERS
IN 602-1120A1

J2/BB TO J44/A SW 1

J2/CC TO J44/B SW 2

J2/N TO J44/F SW 3

J2/P TO J44/G SW 4

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 22
TEST NO. V-20035
VEHICLE SA-50

(CONTINUED)

C. CABLE CONNECTIONS AND PREPARATIONS

SWITCHES 1 & 2 OPEN

SWITCHES 3 & 4 CLOSED

(I) RUJR - DISCONNECT 15W1 FROM
J35 OF 602-622A1,

CONNECT 602-622A1W1 TO J35 OF 602-622A1,

PRETEST PREPS

VERIFY JUMPERS IN 302-622A1:

J25/AA TO J1/A

J25/BB TO J1/B

J25/CC TO J1/C

J25/DD TO J1/D

VERIFY JUMPERS IN 602-622A1:

J35/MM TO J1/A

J35/LL TO J1/B

ALL SWITCHES CLOSED,

(J) RUSC - PERFORM IU LCC ANALOG RECORDER PREPS PER PROCEDURE
V-27075-GSE LCC

(K) BUTM - VERIFY THE FOLLOWING TM OAT CABLE CONNECTIONS:

P1 TO 601W144/J1

P2 TO 602A595/J1

P3 TO 9028/J11

LV DAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 23
TEST NO. V-20035
VEHICLE SA-502

D. TEST PREPARATIONS

1. SATURN V LAUNCH VEHICLE

- (A) PREPARE S-1C PER V-30035-SA502,
- (B) PREPARE S-1I PER V-30042-S-112 (DOP-C02-M025)
- (C) PREPARE S-1VB PER S-V-31035-SA502 REV B
- (D) PREPARE SWING ARMS PER V-21202-GSE VAB, (PLUGS OUT)

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 24
TEST NO. V-20035
VEHICLE SA-500

GENERAL PREPS

- 6 HRS
50' 0"

121	1	CLTC	CUTC	PREPARE L/V ELECTRICAL SUPPORT SYSTEMS PER PROCEDURE V-21243-GSE502
-----	---	------	------	--

- 5 HRS
20' 0"

121	2	CUTC	CLTC	SUPPORT PREPS ARE COMPLETE - READY TO APPLY S-IC, S-II & S-IVB SWITCH POWER,
-----	---	------	------	---

121	3	CLTC	C1TC C2TC C4TC	APPLY SWITCH POWER AND VERIFY
-----	---	------	----------------------	-------------------------------

121	4	CLTC	BGCC	INITIALIZE DISCRETES PER V-32015-GSE 39 (PROGRAMS NT99 AND NT98)
-----	---	------	------	---

- 5 HRS
10' 0"

121	5	BGCC	CLTC	SWITCH SCAN IS BEING DISPLAYED FOR VERIFICATION,
-----	---	------	------	---

121	6	CLTC	CVNP	ML COMPUTER INHIBIT - AUTO
-----	---	------	------	----------------------------

121	7	CLTC	C1TC C2TC C4TC CUTC	VERIFY SWITCH SCAN IS SATISFACTORY
-----	---	------	------------------------------	------------------------------------

- 5 HRS
0' 0"

121	8	CLTC	BGCC	ENTER SGO AND PERFORM DATA LINK SWITCHOVER PER V-32015-GSE 39
-----	---	------	------	--

121	1	BGCC	CLTC	GROUND COMPUTER IS SUPPORTING
-----	---	------	------	-------------------------------

LV OAT TST PLUGS OUT
TE NOVEMBER 9, 1967
VISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 25
TEST NO. V-20035
VEHICLE SA-502

- 5 HRS
0' 0"

121	1	CLTC	CVNP	COMPUTER TEST SWITCH ON
121	2	CLTC	BGCC	REQUEST AND EXECUTE FU01 (FILE 1)
121	3	CLTC	ALL	GROUND COMPUTER IS SUPPORTING
121	4	C1TC	CLTC	L/V ECS SUPPORTING
121	5	CLTC	C1TC C2TC CUTC	BEGIN POWER UP AND FUNCTIONALS
121	6	CLTC	C2TC C4TC CUTC	REQUEST FOR OAT BATTERY CONTACTORS TO BE PLACED ON WILL BE MAKE TO C1TC ON CHANNEL 181.
151	1	CUTC	SUVE CUNP	VERIFY IU POWER UP PREPS COMPLETE.
	2	CUTC	CUNP	APPLY IU STAGE POWER PER V-21223 GSE 39A AND VERIFY WHEN COMPLETE.
	3	CUTC	LUOT	TURN ON 6D10, 6D20, 6D30 & 6D40
	4	CUTC	CUNP	VERIFY 6D10, 6D20, 6D30 & 6D40 ON.
	5	CUTC	LUOT	IU OAT POWER ON

- 4 HRS
45' 0"

121	6	CUTC	CLTC	IU STAGE POWER IS ON AND COOLING IS SUPPORTING
121	7	CLTC	C4TC	BEGIN POWER UP AND FUNCTIONALS
121	8			STEP DELETED
121	9			STEP DELETED

LV OAT TST PLUGS OUT
DATE: NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 26
TEST NO. V-20035
VEHICLE SA-502

- 4 HRS
45' 0"

121	10			STEP DELETED
121	11	CLTC	BUTM	PERFORM TCE POWER UP PER V-28072 AND VERIFY WHEN COMPLETE
151	12	CUTC	CUES	VERIFY MODE SWITCH IN TEST POSITION
	13	CUTC	LUNW	PYRO FIRING RELAY SAFE A & B SWITCHES ON
	14	CUTC	LUNW	EDS LOGIC BUS SAFE ON
	15	CUTC	LUNW	PYRO RELAYS INDICATE SAFE SWITCH ON
	16	CUTC	RUAS	S/C READY SWITCH TO READY
	17	CUTC	RUAS	PYRO FIRING RELAYS INDICATE SAFE, PYRO RELAYS SAFE A & B AND EDS LOGIC BUS SAFE ON
	18	CUTC	RUAS	S/C POWER SWITCH TO EXTERNAL
	19	CUTS	SUAS	+23D211 POWER ON
	20	CUTC	SUAS	EDS BUSES 1, 2 & 3 ON
	21	CUTC	SUAS	LET JETTISON RESET ON THEN OFF
	22	CUTC	SUAS	AUTO ABORT ENABLE ON. LOGIC BUS A & B ON.

- 4 HRS
40' 0"

121	1	BGCC	CLTC	FU01 COMPLETE
-----	---	------	------	---------------

- 4 HRS
05' 0"

121	1	CLTC	VURF	PERFORM RF GSE SET-UP PER V-28069 AND REPORT WHEN COMPLETE
-----	---	------	------	--

OPERATING STEPS

- 3 HRS
0' 0"

121	1	CLTC	C1TC C2TC C4TC CUTC	VERIFY TEST PREPARATIONS ARE COMPLETE AND READY TO SUPPORT L/V OAT PLUGS OUT
-----	---	------	------------------------------	--

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

PAGE
TEST NO.
VEHICLE

27
V-20035
SA-502

- 3 HRS
0' 0"

TEST

TEST NO.	TIME	CLTC	CVTS	DESCRIPTION
121	2	CLTC	CVTS	PRESET COUNT CLOCK TO T-3 HRS AND HOLD
111	3	CLTC	CVTS	VERIFY CLEARANCE FOR ALL VEHICLE RF & TM SYSTEMS, RANGE READY FOR READOUTS, AND CIF READY TO SUPPORT TM CHECKS
111	4	CLTC	CVTS	REQUEST ETMS TO MONITOR CH 121 FOR REMAINDER OF TEST
121	5	CLTC	BTMC	VERIFY LCC TM STATION READY TO SUPPORT TM CHECKS
121	6	CLTC	RDAS	TAPE RECORDER ON RF CHECKOUT *****
121	7	CLTC	CVTS	START COUNT CLOCK IN COUNTDOWN MODE
121	8	CLTC	C1IP C2IP C4IP CUIP	VERIFY RF SILENCE OFF
121	9	CLTC	CVNP	DESTRUCT SYSTEM TO ENABLE
121	9-1	CLTC	C1DP C2DP C4DP	VERIFY SAFETY BUS ON
121	10	CLTC	CUIP	G-BAND BEACON NOS, 1 AND 2 ON
121	11	CLTC	CUIP	AZUSA ON
121	12	CLTC	CUIP	CCS TRANSPONDER POWER ON
121	13	CLTC	CUIP	COMMAND DECODER POWER ON
121	14	CLTC	V1RF	ODOP SIGNAL GENERATOR ON
121	15	CLTC	C1IP	ODOP ON

NOTE: B1RF, VURF ALLOW 5 MIN, WARM-UP
----- BEFORE COMMENCING RF TESTS

LV DAT TST PLUGS OUT
DATE 10 FEBER 7, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 28
TEST NO. V-20035
VEHICLE SA-502

- 3 HRS
01 0"

121	16	CLTC	C1NP	VERIFY STAGE LOGIC ZERO
121	17	CLTC	C1NP C2NP C4NP CUNP	SWITCH SELECTOR INHIBIT OFF
121	18	CLTC	C1IP	400 CYCLE CAL PWR, ON
121	18-1	CLTC	CUSW	ISSUE IU OCTAL 007 (CCS DIRECTIONAL HI GAIN)
121	19	CLTC	CUIP	C-BAND BEACONS 1 & 2 INHIBIT ON
121	19-1	CLTC	CUIP	C-BAND BEACONS 1 & 2 INHIBIT OFF
121	20	CLTC	C4IP	BOTH TM MODE SELECT TO COAX,
121	21	CLTC	C1IP	VERIFY BOTH TM MODE SELECT COAX SWITCHES TO COAX,
	21-1		C1IP	*** NOTE LEAVE COAX SWITCHES IN COAX FOR DURATION OF TEST
121	22	CLTC	C2IP	GROUND POWER ON (CAL POWER),
121	23	CLTC	C2IP	RF COUPLER TO COAX,
121	24	CLTC	CUIP	RF DUMMY LOAD ON,
		CLTC	ETMS	TM TAPE RECORDING ON
121	25	CLTC	C1IP C4IP CUIP	ALL TELEMETERS ON,
	26		C1IP	S1 & S2 TM ON
	27		C4IP	FLT SCO & SSB GROUPS ON
	28		CUIP	F1 AND S1 TM ON
121	29	CLTC	C1IP C2IP C4IP CUIP	ALL TM TRANSMITTERS ON IN SEQUENCE SHOWN BELOW, AND MARKED OVER CH, 121

LV TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 29
TEST NO. V-20035
VEHICLE SA-502

- 3 HRS
01 00

	30		C1IP	F1, F2, F3, S1, S2 & P1 RF ON.
	31		C2IP	F1, F2, F3, S1, S2 AND P1 RF ON.
	32		C4IP	F1, F2, F3, S1 AND P1 TELEMETERS ON.
	33		CUIP	F1, F2, S1, P1 RF ON
121	34	CLTC	C1IP CUIP	TM CALIBRATOR ON.
121	35	CLTC	C1IP C2IP C4IP CUIP	TM CAL MODE TO PREFLIGHT.
121	36	CLTC	C1IP C2IP C4IP CUIP	PREFLIGHT LEVELS TO 50%.
	37	CLTC	BTTM	ALLOW 5 MIN. WARM-UP THEN CONDUCT L/V TM CHECK OUT ON CH 127, AND REPORT WHEN COMPLETE
	38	CLTC	ALL	ALL PERSONNEL SUPPORTING L/V TM CHECKS GO TO CHANNEL 127 ACTIVE AND MONITOR STAGE "TC" CHANNEL
121	39	CLTC	VURF	PERFORM CCS G-BAND AND AZUSA RF CHECKS PER V-28069/502 AND REPORT WHEN COMPLETE
121	40	CLTC	B1RF	PERFORM ODOP RF CHECKS PER S-V-38002 GSE39 AND VERIFY WHEN COMPLETE
121	41	V1RF	V1MS	READOUT K117-120, K118 120, & K119-120

RSCR FUNCTIONAL TEST

LV *** 1ST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 30
TEST NO. V-20035
VEHICLE SA-502

- 2 HRS
53: 0"

121	42	CLTC	C4ET	ENGINE CONTROL POWER ON
121	43	CLTC	C4ET	ENGINE READY BYPASS ON THEN AUTO AND VERIFY ENGINE READY
121	44	CLTC	C2NP	SIMULATED LAUNCH TO AUTO.
121	45	CLTC	C2EC	ENG 201-205 MAIN STAGE OK TO ON AND VERIFY
121	46	CLTC	C2AE	PREVALVE LOCKOUT SW, ON THEN AUTO
121	47	CLTC	C2AE	VERIFY ALL ENGINE EMERGENCY CUTOFF - AUTO
121	48	CLTC	C1DP C2DP C4DP	SYSTEM STATUS SAFE OFF.
121	49	CLTC	C2EV	VERIFY EDS #1 & #2 CUTOFF OFF INDICATORS OFF
121	50	CLTC	C2AE	VERIFY PREVALVE LOCKOUT & SWITCH SELECTOR CUTOFF OFF - OFF
121	51	CLTC	C2AE	VERIFY PREVALVE LOCKOUT ON - ON
121	51-1	CLTC	C2AE	VERIFY ALL ENG READY - OFF
121	51-2	CLTC	C1DP	VERIFY LIFTOFF SIMULATE OFF
121	51-3	CLTC	C2DP C4DP	VERIFY PD RSCR SWITCH OFF
121	52	CLTC	RRSC	RECORDERS ON
121	53	CLTC	BRFS	RSCR RF CARRIER ON.
121	54	CLTC	L10T	VERIFY 1D10 & 1D20 BATTERY VOLTAGES WITHIN LIMITS
121	55	CLTC	L20T	VERIFY 2D10 AND 2D20 BATTERY VOLTAGES WITHIN LIMITS
121	56	CLTC	C4NP	VERIFY 4D20 & 4D30 VOLTAGES WITHIN LIMITS.

LV TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 31
TEST NO. V-20035
VEHICLE SA-502

- 2 HRS
53:00

121	57	CLTC	R4SC	RECORDERS TO FAST
121	58	CLTC	C1DP C2DP C4DP	RSCR'S #1 & #2 TO INTERNAL AND VERIFY ON,
121	59	CLTC	C1DP C2DP C4DP	VERIFY EBW'S #1 & #2 OFF
121	60	CLTC	C1DP C2DP C4DP	VERIFY RSCR #1 & #2 "PD, BLOCKED"
121	61	CLTC	B1RF B2RF B4RF	VERIFY LIMITER OUTPUTS ARE SATISFACTORY,
	61-1		CRSO	*** NOTE RECEIVERS #1 & #2 VOLTAGES OK
121	62	CLTC	RRSC	RECORDERS TO FAST
121	63	CLTC	BRFS	ON YOUR MARK SEND ARM & ENGINE CUTOFF FOR 3 SECONDS
121	64		BRFS	3-2-1 MARK
121	65	CLTC	RRSC	RECORDERS TO SLOW
121	66	CLTC	C1DP C2DP C4DP	VERIFY EBW'S #1 AND #2 CHARGED & ON INTERNAL POWER,
	66-1		CRSO	*** NOTE EBW'S #1 & #2 CHARGED
	66-2	CLTC	C4ET	VERIFY ENG CONTROL POWER REMAINS - ON
121	67	CLTC	C2EV	VERIFY EDS #1 & #2 CUTOFF OFF INDICATORS OFF
121	67-1	CLTC	C1CS C2EC C4ET	VERIFY ENGINE CUTOFF NOT RECEIVED,

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251,60
PAGE 32
TEST NO. V-20035
VEHICLE SA-502

- 2 HRS
53: 0"

121	68	CLTC	RRSC	RECORDERS TO FAST
121	69	CLTC	BRFS	ON YOUR MARK SEND PD COMMAND FOR
				1 SECOND,
121			BRFS	3-2-1 MARK
121	70	CLTC	RRSC	RECORDERS TO SLOW
121	71	CLTC	C1DP C2DP C4DP	VERIFY EBW'S #1 & #2 NOT FIRED
121	72	CLTC	C1DE	VERIFY DEE 2108 & 2109 NOT ON
121	73	CLTC	C1DP C2DP C4DP	VERIFY PD ON MOMENTARILY
	73-1		CRSO	*** NOTE PD ON MOMENTARILY & EBW'S #1 & #2 NOT FIRED
121	74	CLTC	C1DP C2DP C4DP	EBW'S #1 & #2 POWER TO EXTERNAL THEN AUTO, VERIFY EBW'S #1 & #2 NOT CHARGED,
	74-1		CRSO	*** NOTE EBW'S #1 & #2 NOT CHARGED
121	75	CLTC	C1DP	LIFTOFF TO SIMULATE AND VERIFY RSCR'S #1 & #2 PD BLOCKED OFF
	76	CLTC	C2DP C4DP	P.D. RSCR SW TO ENABLE AND VERIFY RSCR'S #1 & #2 PD BLOCKED OFF
121	77	CLTC	C1DP C2DP C4DP	SAFE AND ARM TO ARM
	77-1		C1DP C2DP C4DP	*** NOTE SAFE AND ARM DEVICE ARMED - ON
121	78	CLTC	RRSC V2MS	RECORDERS TO FAST

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE
TEST NO.
VEHICLE

33
V-20035
SA-502

- 2 HRS
53: 0"

121	79	CLTC	BRFS	ON YOUR MARK SEND ARM AND ENGINE CUTOFF FOR 3 SECONDS
121	80		BRFS	3-2-1 MARK
121	81	CLTC	RRSC V2MS	RECORDERS TO SLOW
121	82	CLTC	C1DP C2DP C4DP	VERIFY EBW'S #1 & #2 CHARGED AND ON INTERNAL POWER
	82-1		CRSO	*** NOTE EBW'S #1 & #2 CHARGED
121	82-2	CLTC	C2EV	VERIFY ALL ENG CUTOFF - ON
121	82-3	CLTC	C1CS C2EC	VERIFY ENGINES CUTOFF - ON
121	82-4	CLTC	C2EV	VERIFY EDS 1 & 2 CUTOFF OFF - ON
121	82-5	CLTC	C4ET	VERIFY NON PROGRAM ENGINE CUTOFF AND ENGINE CUTOFF ON
121	82-6	CLTC	C4ET	VERIFY ENGINE CONTROL POWER OFF
121	82-7	CLTC	C2EC C4ET	VERIFY ENGINE READY OFF
121	83	CLTC	RRSC V2MS	RECORDERS TO FAST
121	84	CLTC	BRFS	ON YOUR MARK SEND PD COMMAND FOR 1 SECOND
121	85		BRFS	3-2-1 MARK
121	86	CLTC	RRSC V2MS	RECORDERS TO SLOW
121	87	CLTC	C1DP C2DP C4DP	VERIFY PD ON MOMENTARILY

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 34
TEST NO. V-20035
VEHICLE SA-502

- 2 HRS
53: 0"

121	88	CLTC	C2DP C4DP	VERIFY EBW'S #1 & #2 FIRED
	88-1		CRSO	*** NOTE PD ON MOMENTARILY AND EBW'S #1 & #2 FIRED
121	88-2	CLTC	C1DE	VERIFY DEE 2108 AND 2109 ON
121	89	CLTC	C4DP	RESET PULSE SENSORS
	89-1		C4DP	*** NOTE EBW FIRED INDICATIONS OFF
121	90	CLTC	C1DP C2DP C4DP	EBW'S 2 THEN 1 POWER TO EXTERNAL THEN AUTO & VERIFY EBW'S #1 & #2 NOT CHARGED
	90-1		CRSO	*** NOTE EBW'S #1 & #2 NOT CHARGED
121	91	CLTC	C4ET	VERIFY ENGINE CUTOFF OFF AND NON PROGRAMMED ENGINE CUTOFF OFF
121	92	CLTC	C4ET	VERIFY ENGINE CONTROL POWER ON
121	93	CLTC	C2EC	ENG 201-205 M/S OK PRESS SW, TO AUTO
121	94	CLTC	C2EV	VERIFY EDS 1 & 2 CUTOFF OFF - OFF
121	94-1	CLTC	C2EV	*** NOTE ALL ENG CUTOFF - OFF
121	94-2	CLTC	C1CS C2EC	VERIFY ENGINE CUTOFF OFF
121	95	CLTC	C2AE	VERIFY ALL ENGINES READY ON
121	96	CLTC	C1SP	POSITION +1D171 RESET TO ON, THEN OFF AND VERIFY CUTOFF OFF
121	97	CLTC	C1DP C2DP	RESET PULSE SENSORS
121	97-1	CLTC	C1DP C2DP C4DP	VERIFY EBW'S #1 & #2 NOT FIRED

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 35
TEST NO. V-20035
VEHICLE SA-502

- 2 HRS
53: 0"

	97-2	CRSO	*** NOTE EBW'S #1 & #2 NOT FIRED
121	98	CLTC C1DE	VERIFY DEE 2108 AND 2109 OFF
121	99	CLTC BRFS	ON YOUR MARK SEND SAFE COMMAND FOR 3 SECONDS
121	99-1	BRFS	3-2-1 MARK
121	99-2	CLTC C2DP C4DP	VERIFY RSCR'S #1 & #2 OFF
121	100	CLTC R4SC	RECORDERS TO SLOW
121	101	CLTC C1DP	VERIFY RSCR'S #1 & #2 ON INTERNAL POWER
	101-1	CRSO	*** NOTE S-IVB & S-II RECEIVER POWER OFF AND S-IC ON INTERNAL POWER
121	102	CLTC C1DP	LIFTOFF TO AUTO AND VERIFY RSCR'S 1 & 2 PD BLOCKED ON
	102-1	CLTC C2DP C4DP	PD RSCR SWITCH TO AUTO AND VERIFY RSCR'S 1 & 2 BLOCKED ON
121	103	CLTC C1DP C2DP C4DP	RSCR'S #1 & #2 EXTERNAL THEN AUTO, VERIFY OFF
121	104	CLTC C1DP C2DP C4DP	SAFE AND ARM TO SAFE
121	104-1	C1DP C2DP C4DP	*** NOTE SAFE AND ARM DEVICE SAFE - ON
121	105	CLTC BRFS	RSCR RF CARRIER OFF
121	106	CLTC C4ET	ENGINE CONTROL POWER OFF
121	107	CLTC C4ET	ENGINE READY BYPASS OFF

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 36
TEST NO. V-20035
VEHICLE SA-502

- 2 HRS
53: 0"

121	108	CLTC	RRSC V2MS	RECORDERS OFF
121	109	CLTC	C2AE	ALL ENGINES EMERGENCY CUTOFF SW, TO CUTOFF
121	110	CLTC	C2EV	VERIFY RSCR #1 & #2 CUTOFF OFF - ON
121	111	CLTC	C2EV	VERIFY EDS #1 & #2 CUTOFF OFF - ON

- 2 HRS
40: 3"

TM CHECKS

127	112	BTTM	BTMS	TELEMETRY TAPE RECORDING ON
127	113	BTTM	ETMS	BEGIN TM PARAMETER CHECKS (DELAY 2 MIN.)
127	114	BTTM	CUIP	TM CAL SELECT TO SSB
127	115	BTTM	C2IP	FREQ MEAS CAL ON
127	116	BTTM	C1IP C2IP C4IP	PREFLIGHT LEVELS TO 0%.
	117	BTTM	CUIP	IU TO AUTO
127	118	BTTM	C1IP CUIP	TM CAL COMMAND ON MOMENTARILY
127	119	BTTM	C2IP	SSB PREFLIGHT ON THEN OFF
127	120	BTTM	C4IP	SSB COMMAND ON MOMENTARILY (DELAY 60 SEC)
127	121	BTTM	C1IP C2IP C4IP CUIP	PREFLIGHT LEVELS TO 100%

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 37
TEST NO. V-20035
VEHICLE SA-502

- 2 HRS
401 0"

127	122	BTTM	C1IP CUIP	TM CAL COMMAND ON MOMENTARILY
127	123	BTTM	C2IP	SSB PREFLIGHT ON THEN OFF
127	124	BTTM	C4IP	SSB COMMAND ON MOMENTARILY (DELAY NEXT STEP 60 SEC,)
127	125	BTTM	CUIP C1IP	TM CAL COMMAND ON MOMENTARILY
127	126	BTTM	C2IP	SSB PREFLIGHT ON THEN OFF
127	127	BTTM	C4IP	SSB COMMAND ON MOMENTARILY (DELAY NEXT STEP 30 SEC,)
127	128	BTTM	C2IP	PCM MODE TO MODE 2
188	129	BTTM	ALL	S-II DDAS CAL ERROR INDICATION MAY OCCUR AND ALL MEASUREMENTS ON THE S-II A1 DDAS MULTIPLEXER WILL BE INVALID UNTIL FURTHER NOTICE.
127	130	BTTM	C1IP C2IP C4IP CUIP	PREFLIGHT LEVELS TO AUTO
127	131	BTTM	C1IP C2IP C4IP CUIP	TM CALIBRATION MODE TO INFLIGHT
188	132	BTTM	ALL	ANNOUNCE! TM INFLIGHT CAL WILL INTERRUPT DDAS MEASUREMENTS MOMENTARILY
127	133	BTTM	C1IP	TM CAL COMMAND ON FOR 5 SECONDS.
127	134	BTTM	C2IP	FM/FM INFLIGHT ON FOR 5 SECONDS, THEN OFF
127	135	BTTM	C4IP	SPECIAL CAL COMMAND ON
127	136	BTTM	C4IP	REGULAR CAL COMMAND ON FOR 5 SEC THEN OFF

LV TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 38
TEST NO. V-20035
VEHICLE SA-502

- 2 HRS
40' 0"

127	137	BTTM	C4IP	SPECIAL CAL COMMAND OFF
127	138	BTTM	CUIP	TM CAL COMMAND ON FOR 5 SECONDS
127	139	BTTM	C2IP	PCM MODE TO AUTO
188	140	BTTM	ALL	ANNOUNCE: S-II A1 MUX MEASUREMENTS ARE AGAIN VALID
127	141	BTTM	C2IP	FM/FM INFLIGHT ON FOR 5 SEC, THEN OFF
127	142	BTTM	ALL	L/V TM CHECKS ARE COMPLETED, ALL PERSONNEL CONNECTED WITH TM CHECKS SWITCH TO CHANNEL 121,
121	143	BTTM	CLTC	L/V TM CHECKS ARE COMPLETED

- 2 HRS
22' 0"

121	144	CLTC	C2NP	RACS POWER ON
	144-1		C1PP C2PC C4PP CUPP RUE1 R4SC	*** NOTE CURRENT & VOLTAGE SURGES WILL OCCUR DURING ME-01
121	145	CLTC	CLMK	REQUEST AND EXECUTE ME01

- 2 HRS
21' 0"

121	146	CLMK	CLTC	ME01 COMPLETE
121	147	CLTC	C2NP	RACS POWER OFF
121	148	CLTC	B1RF VURF	VERIFY RF TESTING COMPLETE AND STANDBY FOR RF SYSTEMS SHUTDOWN

LV DAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 39
TEST NO. V-20035
VEHICLE SA-502

- 2 HRS
20' 0"

121	149	CLTC	CUIP	C-BAND BEACON NO. 1 AND 2 OFF
121	150	CLTC	CUIP	COMMAND DECODER POWER OFF
121	151	CLTC	CUIP	CCS TRANSPONDER POWER OFF
121	152	CLTC	C1IP	ODOP OFF
121	153	CLTC	V1RF	ODOP SIGNAL GENERATOR OFF (GSE STANDBY)
121	154	CLTC	CUIP	AZUSA OFF
121	155	CLTC	C1IP C2IP C4IP CUIP	ALL TM TRANSMITTERS OFF AND MARK ON CH. 121
	155-1		C1IP	
			C2IP	F1, F2, F3, S1, S2, & P1 RF OFF
	155-2		C4IP	F1, F2, F3, S1, & P1 TELEMETERS OFF
	155-3		CUIP	F1, F2, S1, & P1, RF OFF
121	156	CLTC	C1IP C4IP CUIP	TURN OFF TM ASSYS NOT REQ'D FOR PCM/DDAS SYSTEM
	156-1		C1IP	S1 AND S2 TM OFF
	156-2		C4IP	FLIGHT SCO GROUP OFF
	156-3		C4IP	SSB GROUP OFF
	156-4		CUIP	F1 AND S1 TM OFF
121	157	CLTC	ETMS BTMS	TELEMETER TAPE RECORDERS OFF,
121	158	CLTC	ETMS	REPORT OUT OF TOLERANCE PARAMETERS TO BLTM WHEN ANALYSIS IS COMPLETE

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 40
TEST NO. V-20035
VEHICLE SA-502

- 2 HRS
20: 0"

121	159	CLTC	C1IP CUIP	TM CALIBRATOR OFF
121	160	CLTC	C1IP C4IP CUIP	TM CAL MODE TO PREFLIGHT
121	161	CLTC	C1NP C2NP C4NP	SWITCH SELECTOR INHIBIT ON
121	162	CLTC	CUNP	VERIFY SWITCH SELECTOR INHIBIT OFF
121	163	CLTC	CVNP	DESTRUCT SYSTEM TO OFF
121	164	CLTC	C1DP C2DP C4DP	VERIFY SAFETY BUS OFF
121	165	CLTC	CLGK	START POWER ON PREPS PER V-33026-IU502

- 2 HRS
10: 0"

121	166	CLTC	CEDK	CONDUCT EDS TEST PER V-21000-SA502 ON CHANNEL 158 AND REPORT WHEN COMPLETE
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- 2 HRS
0: 0"

121	167	CLTC	ETMS	VERIFY OUT OF TOLERANCE PARAMETERS HAVE BEEN REPORTED TO BLTM
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- 1 HRS
40: 0"

121	168	CLTC	CLGK	REQUEST AND EXECUTE FT04, FT35, FT20, & FT23 PER V-33026-IU502 AND REPORT WHEN COMPLETE,
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LV DAY TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 41
TEST NO. V-20035
VEHICLE SA-502

- 1 HRS
30' 0"

121	169	CEDK	CLTC	EDS TEST COMPLETE
151	170	CUTC	CUNC	PRESSURIZE ST-124 GN2 SUPPLY SPHERE TO 1700 PSI PER PROCEDURE V-24210-1U502

*****CAUTION*****
*
* IU STAGE ST-124 SUPPLY *
* SPHERE WILL BE *
* PRESSURIZED TO 1700 PSI *
*

121	171	CLTC	LUNW	ST-124 HEATERS FROM STANDBY TO NORMAL
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- 1 HRS
10' 0"

121	172	CLTC	CUSE	TURN ON ST-124M SYS PER V-33018-1U502
121	173	CLGK	CLTC	FT04, FT35, FT20 AND FT23 COMPLETE.

- 1 HRS
5' 0"

121	174	CLTC	CUSE	CONDUCT THEODOLITE CHECKS AS REQUIRED TO SUPPORT ST-124 PLATFORM CHECKS
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- 1 HRS
0' 0"

121	175	CLTC	CUSE	START FLIGHT CONTROL SYSTEM PREPS PER V-33029-SA502
111	176	CLTC	CVTS	VERIFY RF CLEARANCE FOR CCS,
121	177	CLTC	CUIP	VERIFY RF SILENCE OFF
121	178	CLTC	CUIP	CCS TRANSPONDER POWER ON

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 42
TEST NO. V-20035
VEHICLE SA-502

- 1 HRS
01 0"

121 179 CLTC CUIP COMMAND DECODER POWER ON

-55: 0"

121 180 CUSE CLTC ST-125 TURN ON AND THEODOLITE CHECKS ARE COMPLETE.

121 181 CLTC CUSE REQUEST AND EXECUTE GT-16 (AZIMUTH LAYING)

-54: 0"

-49: 0"

121 182 CLTC CUNP VERIFY IU READY FOR POWER TRANSFER ON

111 183 CLTC CVTS VERIFY RANGE CLEARANCE FOR ALL L/V RF AND TM SYSTEMS. RANGE READY FOR READOUTS AND CIF READY TO SUPPORT TM CHECKS

121 184 CLTC BTMC VERIFY LCC TM CHECKOUT EQUIPMENT READY TO SUPPORT

121 185 CLTC ETMS VERIFY CIF TM STATION READY TO SUPPORT TEST

121 186 CLTC C1IP
C2IP
C4IP
CUIP VERIFY RF SILENCE OFF

121 187 CLTC CVNP DESTRUCT SYSTEM TO ENABLE

121 188 CLTC C1DP
C2DP
C4DP VERIFY SAFETY BUS ON

121 189 CLTC C1DP VERIFY LIFTOFF SIMULATE AUTO & PD BLOCKED ON

121 190 CLTC C2DP
C4DP VERIFY PD RSCR SWITCH IN AUTO AND PD BLOCKED ON

121 191 CLTC C1NP
C2NP
C4NP

LV DAY TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 43
TEST NO. V-20035
VEHICLE SA-502

-49 : 0"

		CUNP	SWITCH SELECTOR INHIBIT OFF
121	192	CLTC CUIP	G-BAND BEACON NOS, 1 AND 2 ON
121	193	CLTC CUIP	AZUSA ON
121	194	CLTC V1RF	ODOP SIGNAL GENERATOR ON AND MONITOR
121	195	CLTC C1IP	ODOP ON
121	196	CLTC C4PU	PU OVEN AND INVERTER ON THEN AUTO
121	197	CLTC ETMS	TM TAPE RECORDING ON
121	198	CLTC C1IP C4IP CUIP	ALL TELEMETERS ON
	198-1	C1IP	S1 & S2 TM ON
	198-2	C4IP	FLT SCO AND SSB GROUPS ON
	198-3	CUIP	F1, AND S1 TM ON
121	199	CLTC C1IP C2IP C4IP CUIP	ALL TM TRANSMITTERS ON IN SEQ, BELOW AND MARKED ON CH 121
	199-1	C1IP	F1, F2, F3, S1, S2, & P1 RF ON
	199-2	C2IP	F1, F2, F3, S1, S2, & P1 RF ON
	199-3	C4IP	F1, F2, F3, S1, & P1 TELEMETERS ON
	199-4	CUIP	F1, F2, S1, & P1, RF ON
121	200	CLTC CUIP C1IP	TM CALIBRATOR ON
121	201	CLTC C2IP	VERIFY GROUND POWER ON
121	202	CLTC CQBL	Q-BALL POWER ON THEN AUTO
121	203	CLTC SUAS	VERIFY Q-BALL POWER ON

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 44
TEST NO. V-20035
VEHICLE SA-502

-49' 0"

121	204	CLTC	COBL	Q-BALL HEATER ON
121	204-1	CLTC	SUAS	VERIFY Q-BALL HEATER ON
121	205	CLTC	C1IP C4IP CUIP	VERIFY TM CAL MODE IN PREFLIGHT
121	206	CLTC	C2IP	T/M CAL MODE TO PREFLIGHT
121	207	CLTC	C1IP C2IP C4IP CUIP	PREFLIGHT LEVEL TO 50%

-45' 0"

121	207-1	CLTC	VURF	VERIFY READY TO SUPPORT FT-45 AND FT-47
121	208	CUSE	CLTC	GT-16 COMPLETE
121	208-1	CLTC	CUCS	VERIFY THAT ACS IN COMP/COMP MODE
121	209	CLTC	CLGK	REQUEST AND EXECUTE FT-45 & REPORT WHEN COMPLETE, (COMMAND SYSTEM TEST)
121	210	CLTC	BTTM	ALLOW 3 MIN WARM-UP THEN CONDUCT L/V TM CHECKS ON CH, 127, AND REPORT WHEN COMPLETE.
188	211	CLTC	ALL	ALL PERSONNEL SUPPORTING L/V TM CHECKS GO TO CHANNEL 127 ACTIVE AND MONITOR "STAGE TC" CHANNEL
181	212	V1RF	V1MS	READOUT K117-120, K118-120, & K119-120
127	213	BTTM	BTMC	TM TAPE RECORDING ON
127	214	BTTM	ETMS	BEGIN TM PARAMETER QUICK SCAN CHECK (DELAY NEXT TM STEP 2 MIN)
127	215	BTTM	C1IP C2IP C4IP	PREFLIGHT LEVELS TO 0%

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 45
TEST NO. V-20035
VEHICLE SA-502

-45' 0"

127	215-1	BTTM	CUIP	IU TO AUTO
127	216	BTTM	C1IP CUIP	TM CAL. COMMAND ON MOMENTARILY
127	217	BTTM	C2IP	SSB PREFLIGHT ON THEN OFF
127	218	BTTM	C4IP	SSB COMMAND ON MOMENTARILY (DELAY 60 SEC)
127	219	BTTM	C1IP C2IP C4IP CUIP	PREFLIGHT LEVELS TO 100%
127	220	BTTM	C1IP CUIP	TM CAL COMMAND ON MOMENTARILY
127	221	BTTM	C2IP	SSB PREFLIGHT ON THEN OFF
127	222	BTTM	C4IP	SSB COMMAND ON MOMENTARILY (DELAY 60 SEC)
127	223	BTTM	C1IP CUIP	TM CAL COMMAND ON MOMENTARILY
127	224	BTTM	C2IP	SSB PREFLIGHT ON THEN OFF
127	225	BTTM	C4IP	SSE COMMAND ON MOMENTARILY (DELAY 30 SEC)
127	226	BTTM	C1IP C2IP C4IP CUIP	PREFLIGHT LEVELS TO AUTO
127	227	BTTM	C1IP C2IP C4IP CUIP	TM CAL. MODE TO INFLIGHT
188	228	BTTM	ALL	ANNOUNCE: TM INFLIGHT CAL WILL INTERRUPT DDAS MEASUREMENTS MOMENTARILY
127	229	BTTM	C1IP	TM CAL ON FOR 5 SECONDS

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 46
TEST NO. V-20035
VEHICLE SA-502

-45: 0"

127	230	BTTM	C2IP	FM/FM INFLIGHT ON FOR 5 SEC., THEN OFF
127	231	BTTM	C4IP	SPECIAL CAL COMMAND ON
127	232	BTTM	C4IP	REGULAR CAL COMMAND ON FOR 5 SEC THEN OFF
127	233	BTTM	C4IP	SPECIAL CAL COMMAND OFF
	234	BTTM	CUIP	TM CAL COMMAND ON FOR 5 SEC,
127	235	BTTM	C4IP	TM CAL MODE TO PREFLIGHT
127	236	BTTM	C4IP	INFLIGHT RELAYS ON
127	237	BTTM	ETMS	REPORT ANY OUT OF TOLERANCE PARAMETERS TO BLTM WHEN ANALYSIS IS COMPLETE
127	238	BTTM	ALL	L/V TM CHECKS ARE COMPLETED, ALL PERSONNEL CONNECTED WITH TM CHECKS SWITCH TO CHANNEL 121,
121	239	BTTM	CLTC	L/V TM CHECKS ARE COMPLETED

-44: 0"

111	240	CLTC	CVTS	L/V READY FOR AZUSA CHECK
111	241	CVTS	ORNG	INTERROGATE AZUSA AND REPORT RANGE READOUT TO VURF ON CHANNEL 127 WHEN COMPLETE,
121	242	CLTC	VURF	MONITOR IU RF SYSTEMS WITH RF GSE,
121	243			STEP DELETED
121	244	CLTC	ALL	ALL PERSONNEL INVOLVED IN FLIGHT CONTROL SYSTEM TEST SWITCH TO CHANNEL 123 AND REPORT TO CUFS, ALL OTHERS PROCEED TO STEP 274
123	245	CUFS	CUFE	VERIFY SUBTASK V-33029-SA502 COMPLETE,
123	246	CUFS	CUCP	CONTROL COMPUTER ON

LV DAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 47
TEST NO. V-20035
VEHICLE SA-502

441 0"

123	247	CUFS	CUGA	EDS/C.R.G. ON
123	248	CUFS	CUSP	FLIGHT CONTROL COMPUTER IN S-II BURN MODE
123	249	CUFS	U2LH	VERIFY S-II ENGINE AREA CLEAR FOR HYDRAULIC PRESSURE APPLICATION
123	250	CUFS	C2FC	VERIFY AUXILIARY HYDRAULIC PUMP DISABLE SW IN ENABLE
123	251	CUFS	C2FC	ALL ACCUMULATOR CONTROL TO UNLOCK MOMENTARILY THEN TO AUTO
	252	CUFS	C2FC	VERIFY REMAINING FUNCTIONAL SWITCHES ARE DOWN OR OFF
	253	CUFS	C2FC	S-II AUXILIARY HYDRAULIC PUMPS #1, 2, 3 AND 4 ON AND VERIFY CORRECT PRESSURES

*****CAUTION*****

*
* MONITOR HYDRAULIC
* SYSTEM TEMPERATURES -
* DO NOT EXCEED 175 DEG.
* F. NOTIFY CUFS AND C2TC
* IF TEMPERATURE EXCEEDS
* 160 DEG. F.
*

*****CAUTION*****

123	254	CUFS	C2FC	VERIFY ARMA AND AUX PUMP TEMPS OK
123	255	CUFS	C2FC CUCR	VERIFY SERVO VALVE CURRENTS (IV) AND ENGINE BETA POSITION SIGNAL NULLS IN TOLERANCE
123	256	CUFS	C4NP	+4D411 POWER ON
123	257	CUFS	C4HY	COAST MODE SWITCH ON, THEN AUTO
123	258	CUFS	S4HY	VERIFY S-IVB ENGINE AREA CLEAR FOR HYDRAULICS

LV QAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251,60
PAGE 48
TEST NO. V-20035
VEHICLE SA-502

-441 0"

123	259	CUFS	C4AL	APS ENGINE VALVE POWER ON
123	260	CUFS	CUSP	FLIGHT CONTROL COMPUTER IN S-IVB BURN MODE
123	261	CUFS	C4HY	AUX HYDRAULIC PUMP POWER ON AND VERIFY WHEN PRESSURE IS STABILIZED

*****CAUTION*****

*
* MONITOR HYDRAULIC *
* SYSTEM TEMPERATURES, *
* DO NOT EXCEED 175 *
* DEGREES F. NOTIFY CUFS *
* WHEN TEMPERATURE *
* EXCEEDS 165 DEGREES F. *
*

*****CAUTION*****

123	262	CUFS	C4FC CUCR	VERIFY SERVO VALVE CURRENT (IV) AND BETA POSITION SIGNAL NULLS IN TOLERANCE
123	263	CUFS	CUSP	FLIGHT CONTROL COMPUTER IN S-IVB COAST MODE
123	264	CUFS	CUCR	VERIFY CONTROL COMPUTER NULL IN TOLERANCE AND SPATIAL AMPLIFIER OUTPUT AT ZERO (ABSENCE OF -28 VOLTS ON APS ENGINE RELAY MONITORS)
123	265	CUFS	C4HY	AUX HYDRAULIC PUMP POWER OFF
123	266	CUFS	C4AL	APS ENGINE VALVE POWER OFF
123	267	CUFS	CUSP	CONTROL COMPUTER IN S-IC BURN MODE ON THEN OFF.
123	267-1	CUFS	L1EF C1HP	VERIFY S-IC ENGINE SECTION CLEAR FOR HYDRAULICS AND MONITOR HYDRAULIC SYSTEM OPERATION DURING POWER TRANSFER
123	268	CUFS	C1HP	S-IC STAGE HYDRAULIC SUPPLY AND C/O UNIT ON AND VERIFY WHEN COMPLETE CONTACT L1HC AND L1GH ON CH, 183.

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
VISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 49
TEST NO. V-20035
VEHICLE SA-502

-44: 0"

123	269	CUFS	CUGA	S-IC ATTITUDE RATE COMMAND (PLUS 10 DEG/ SEC ROLL) AND HOLD UNTIL IU POWER TRANSFER IS COMPLETE
121	270	CLTC	CLGK	REQUEST AND EXECUTE FT-47 AND REPORT WHEN COMPLETE, (PREFLIGHT COMMAND TEST)

-35: 0"

121	271	CLTC	CQBL	Q-BALL SIMULATE COMMAND ON FOR 10 SEC (DELAY 10 SEC)
121	271-1	CLTC	SUAS	VERIFY Q BALL SIMULATE INDICATION
121	271-2	CLTC	C4HC	VERIFY CIRCUIT #2 AND #3 CLOSED
121	272	CLTC	C4SP	OPEN COLD HELIUM SUPPLY
121	273	CLTC	C4EP	OPEN CONTROL BOTTLE SUPPLY VALVE
121	274	CLTC	C4SP	VERIFY DIRECTIONAL CONTROL VALVE SW IN AUTO
121	275	CLTC	CUNC	ECS HEATER SWITCH TO ON
121	276	CLTC	BGCC	REQUEST AND EXECUTE FU-01 (FILE 2)

POWER TRANSFER TEST

-30: 0"

121	277	CLTC	ETMS	VERIFY READY FOR POWER TRANSFER
121	278	CLTC	L10T L20T L40T LUOT	VERIFY OAT BATTERIES ON AND READY TO SUPPORT TEST
121	279	CLTC	BRFS	RSCR RF CARRIER ON

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 50
TEST NO. V-20035
VEHICLE SA-502

-30! 0"

	280	CLTC	RRSC	RECORDERS ON
121	281	CLTC	C1DP C2DP C4DP	RSCR'S #1 & #2 TO INTERNAL POWER AND VERIFY
	281-1		V4MS	*** NOTE N57-411 & N62-411 ARE SATISFACTORY
121	282	CLTC	ALL	ALL PERSONNEL INVOLVED IN POWER TRANSFER TEST MONITOR CH121, AND GO TO INDIVIDUAL "STAGE TC" ACTIVE CHANNELS AND PREPARE FOR POWER TRANSFER
121	283	CLTC	B1RF B2RF B4RF	VERIFY RSCR LIMITER VOLTAGES SATISFACTORY
181	284	C1TC	L1RS	CLOSE SWITCH ON JUMPER BETWEEN J19/K AND J2/K+ IN THE 302-121A1 PATCH DISTRIBUTOR (BATTERY INSTALLED INDICATION ENABLE)
181	285	C1TC	C1NP	VERIFY S-IC READY FOR POWER TRANSFER ON
181	286	C1TC	C1NP	VERIFY INTERNAL & EXTERNAL BUSES ARE CORRECT FOR POWER TRANSFER
181	287	C1TC	C1NE C1MS	VERIFY READY FOR POWER TRANSFER
181	288	C1TC	C1NP	ON MARK FROM CLTC TRANSFER TO INTERNAL.
121	289	C1TC	CLTC	S-IC READY FOR POWER TRANSFER
171	290	C2TC	C2NP	SIMULATED LAUNCH TO LAUNCH
171	291	C2TC	C2RP	VERIFY OK TO OPERATE PUMPS - ON,
171	292	C2TC	C2PM	*** NOTE RECIRC PUMPS ENABLE ON

*****CAUTION*****

*
* ALLOW AT LEAST TWO *
* SECONDS DELAY FROM *

LV OAT TST PLUGS OUT
DATE: NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 51
TEST NO. V-20035
VEHICLE SA-502

-30' 0"

* START OF EACH LH PUMP *
*
*****CAUTION*****

171	293	C2TC	C2RP	LH PUMPS NOS. 1, 2, 3, 4 & 5 TO START THEN INHIBIT
171	294	C2RP	C2TC	LH PUMPS NO, 1-5 ARE ON
171	295	C2TC	C2NP	VERIFY RECIRC BUS CURRENT INCREASED WITH EACH PUMP START CMD,
171	295-1	C2TC	C2RP	LH PREVALVES TO CLOSE THEN INHIBIT
171	295-2		C2PK	*** NOTE K396-207 THRU K400-207 (LH PRE-V CLOSE CMD) - ON,
171	296	C2TC	L20T C2NP R2SC	VERIFY READY FOR POWER TRANSFER
171	297	C2TC	C2NP	ON MARK FROM CLTC TRANSFER RECIRC BUS, INSTRUMENTATION BUS, AND MAIN BUS TO INTERNAL
121	298	C2TC	CLTC	S-II READY FOR POWER TRANSFER
161	299	C4TC	S4HY	VERIFY ENGINE AREA CLEAR FOR HYD,
161	300	C4TC	C4HY	FLT. MODE ON THEN AUTO,
161	301	C4TC	C4HY	COAST MODE OFF. THEN AUTO
161	302	C4TC	C4HY R4EI	VERIFY S-IVB HYD SYSTEM STABILIZED

*****CAUTION*****
*
* MONITOR HYDRAULIC *
* SYSTEM TEMPERATURES, *
* DO NOT EXCEED 175 *
* DEGREES F. NOTIFY C4TC *
* WHEN TEMPERATURE *
* EXCEEDS 165 DEGREES F. *
*
*****CAUTION*****

-301 0"

161	303	C4TC	C4EP	LH2 CHILLDOWN PUMP ON - WAIT 10 SEC -
161	304	C4TC	C4EP	LOX CHILLDOWN PUMP ON
161	305	C4TC	C4NP	VERIFY INTERNAL & EXTERNAL BUSSES ARE CORRECT FOR POWER TRANSFER
161	305-1	C4TC	C4NP	VERIFY SIMULATED FLIGHT-ON
161	306	C4TC	C4NP	EMERGENCY POWER TRANSFER OFF
161	307	C4TC	C4NP R4EI R4SC	VERIFY READY FOR POWER TRANSFER
161	308	C4TC	C4IP	C/O MEAS. GROUP OFF
161	309	C4TC	C4IP	*** NOTE TM READY
161	310	C4TC	C4NP	ON MARK FROM CLTC TRANSFER TO INTERNAL
121	311	C4TC	CLTC	S-IVB READY FOR POWER TRANSFER
151	312	CUTC	CUNP	VERIFY INTERNAL & EXTERNAL BUSSES ARE CORRECT FOR POWER TRANSFER
151	313	CUTC	CUNP	VERIFY READY FOR POWER TRANSFER
151	314	CUTC	CUNP	ON MARK FROM CLTC TRANSFER TO INTERNAL
151	315	CUFS	CUTC	FLIGHT CONTROL READY FOR POWER TRANSFER
121	316	CUTC	CLTC	IU READY FOR POWER TRANSFER
121	317			STEP DELETED
121	318	CLTC	C1NP	VERIFY ALL STAGES READY FOR POWER TRANSFER - ON
121	319	CLTC	C1TC C2TC C4TC CUTC	AFTER TRANSFER TO INTERNAL SECURE STAGES ON STAGE TC CHANNELS
121	320	CLTC	ALL	RECORDERS SUPPORTING POWER TRANSFER GO TO FAST AT COUNT "3"

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 53
TEST NO. V-20035
VEHICLE SA-502

-30' 0"

121	321	CLTC	C1NP C2NP C4NP CUNP	ON MY MARK TRANSFER TO INTERNAL POWER SIMULTANEOUSLY 5 - 4 - 3 - 2 - 1 "MARK"
121	322	CLTC	ALL	RECORDERS SUPPORTING POWER TRANSFER GO TO SLOW
	322-1		C1NP	*** NOTE BUS +1D121 - OFF
	322-2		C1NP	*** NOTE BUS +1D111 - OFF
	322-3		C1NP	*** NOTE BUS +1D211 - OFF
181	323	C1TC	C1NP	VERIFY POWER TRANSFER EXTERNAL - OFF
181	324	C1TC	C1NP	VERIFY POWER TRANSFER INTERNAL - ON
181	325	C1TC	C1NP	VERIFY S-IC POWER TRANSFER COMPLETE - ON
181	326	C1TC	C1FR	VERIFY POWER TRANSFER COMPLETE (ALL STAGES) ON
181	326-2	C1TC	R1SC	VERIFY BUS VOLTAGE & CURRENT WITHIN LIMITS (+1D10 AND +1D20 VOLTAGE 28 VDC NOMINAL +1D10 CURRENT LESS THAN 40 AMPS, +1D20 CURRENT LESS THAN 120 AMPS,)
181	327	C1TC	C1NP	POWER TRANSFER SWITCH TO EXTERNAL THEN AUTO
181	328	C1TC	C1NP	VERIFY S-IC POWER TRANSFER COMPLETE - OFF
181	329	C1TC	C1NP	VERIFY POWER TRANSFER INTERNAL - OFF
181	330	C1TC	C1NP	VERIFY POWER TRANSFER EXTERNAL - ON
181	331	C1TC	C1FR	VERIFY POWER TRANSFER COMPLETE (ALL STAGES) OFF

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 54
TEST NO. V-20035
VEHICLE SA-502

-30' 0"

	331-1	C1NP	*** NOTE BUS +1D121 - ON
	331-2	C1NP	*** NOTE BUS +1D211 - ON
	331-3	C1NP	*** NOTE BUS +1D111 - ON
181	332	C1TC	L1RS OPEN SWITCH ON JUMPER BETWEEN J19/K AND J2/K+ IN 302-121A1 DISTRIBUTOR
121	333	C1TC	CLTC S-IC POWER TRANSFER TEST COMPLETE
171	334	C2TC	C2NP VERIFY POWER TRANSFER COMPLETE - ON
171	334-1	C2NP	*** NOTE RECIRC BUS INTERNAL - ON
171	334-2	C2NP	*** NOTE INSTR BUS INTERNAL - ON
171	334-3	C2NP	*** NOTE MAIN BUS INTERNAL - ON
171	335	C2TC	R2SC VERIFY BUS VOLTAGE & CURRENT WITHIN LIMITS
171	336	C2TC	C2NP TRANSFER MAIN, INSTR, & RECIRC TO EXTERNAL
171	336-1	C2NP	*** NOTE MAIN BUS EXTERNAL - ON
171	336-2	C2NP	*** NOTE INST BUS EXTERNAL - ON
171	336-3	C2NP	*** NOTE RECIRC BUS EXTERNAL - ON
171	336-4	C2NP	*** NOTE POWER TRANSFER COMPLETE - OFF
171	337	C2TC	C2RP RECIRC RESET CONTROL TO RESET THEN TO INHIBIT,
171	338	C2TC	C2RP LOX HE INJECTION TO AUTO,
171	339	C2TC	C2RP VERIFY LH2 PUMPS NO 1-5 AT ZERO RPM, RECIRC STOP RESET - ON, AND LOX HE INJECTION OFF - OFF,
171	339-1	C2PK	*** NOTE K396-207 THRU K400-207 - OFF (PRE-V CLOSE CMD)
171	340	C2TC	C2FC ALL ACCUMULATOR CONTROL TO LOCK THEN TO AUTO

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 55
TEST NO. V-20035
VEHICLE SA-502

-30' 0"

171	341	C2TC	C2FC	S-II AUX HYDRAULIC PUMPS 1, 2, 3 & 4 TO OFF.
171	342	C2TC	U2LH	VERIFY AUX HYDR PUMPS DISABLED AND NORMAL SHUTDOWN
121	343	C2TC	CLTC	S-II POWER TRANSFER TEST COMPLETE
161	344	C4TC	C4NP	VERIFY POWER TRANSFER COMPLETE
161	344-1	C4TC	C4NP	VERIFY STAGE ON INTERNAL POWER
161	344-2	C4TC	R4SC	VERIFY BUS VOLTAGE AND CURRENT WITHIN LIMITS
161	345	C4TC	C4NP	POWER TRANSFER SWITCH TO EXTERNAL THEN AUTO
161	346	C4TC	C4NP	VERIFY STAGE ON EXTERNAL POWER
161	347	C4TC	C4NP	VERIFY POWER TRANSFER COMPLETE - OFF
161	348	C4TC	C4IP	C/O MEAS GROUP ON
161	349	C4TC	C4EP	LOX CHILLDOWN PUMP - OFF
161	350	C4TC	C4EP	LH2 CHILLDOWN PUMP - OFF
161	351	C4TC	C4HY	COAST MODE ON THEN AUTO
161	352	C4TC	C4HY	FLIGHT MODE OFF THEN AUTO
161	353	C4TC	C4HY	VERIFY HYD PUMP-OFF
161	354	C4TC	V4MS	ISSUE S-IVB ALL RACS RUN COMMAND
	355	C4TC	R4SC	RECORDERS TO SLOW SPEED
121	356	C4TC	CLTC	S-IVB POWER TRANSFER TEST COMPLETE
151	357	CUTC	CUNP	VERIFY POWER TRANSFER COMPLETE & IU STAGE POWER ON
151	358	CUTC	RUSC	VERIFY VOLTAGE AND CURRENT WITHIN LIMITS
151	359	CUTC	CUNP	POWER TRANSFER TO EXTERNAL

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 56
TEST NO. V-20035
VEHICLE SA-502

-30: 0"

151	360	CUTC	CUNP	VERIFY IU GROUND POWER ON
151	361	CUTC	CUNP	VERIFY POWER TRANSFER COMPLETE AND IU STAGE POWER OFF
	362	CUTC	LUOT	RECORDERS TO SLOW SPEED
121	363	CUTC	CLTC	IU POWER TRANSFER TEST COMPLETE
121	364	CLTC	ETMS BTMC	TM TAPE RECORDERS OFF & RELOAD

-25: 0"

121	365	BGCC	CLTC	FU-01 COMPLETE
-----	-----	------	------	----------------

-24: 0"

121	366	CLTC	CUFS	POWER TRANSFER TEST COMPLETE, CLEAR TO CONTINUE FLIGHT CONTROL TESTS
111	367	CLTC	CVTS	POWER TRANSFER TEST COMPLETE, VERIFY AZUSA HAD NO CHANGES,
121	368	CLTC	C1DP C2DP C4DP	VERIFY RSCR'S #1 & #2 ON INTERNAL
	368-1		V1MS	*** NOTE RSCR LIMITER VOLTAGES SATISFACTORY DURING POWER TRANSFER
	368-2		V1MS	*** NOTE ODOP MEASUREMENTS SATISFACTORY DURING POWER TRANSFER
123	369	CUFS	CUGA C1FE CUCR	VERIFY ATTITUDE RATE COMMAND UNDISTURBED BY POWER TRANSFER
123	370	CUFS	CUGA	REMOVE PLUS ROLL ATTITUDE RATE COMMAND
123	371	CUFS	ALL	ALL PERSONNEL CONNECTED WITH FLIGHT CONTROL SYSTEM TEST SWITCH TO CHANNEL 121

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 57
TEST NO. V-20035
VEHICLE SA-502

-241 0"

121	372	GUFS	CLTC	FLIGHT CONTROL SYSTEM TEST COMPLETE
121	373	CLTC	C1CS	VERIFY LOX & FUEL LEVEL SENSORS IN AUTO
121	374	CLTC	L10T	VERIFY THRUST OK'S IN CUTOFF
121	375	CLTC	L10T	VERIFY THRUST OK ENABLES 1 THRU 5 - ON
121	376	CLTC	L10T	MOMENTARILY RESET STOP/START CMDS,
121	377	CLTC	C1NP	VERIFY PLUGS OUT OAT ON
121	378	CLTC	C2PU	VERIFY ALL WET SIM'S TO AUTO
121	379	CLTC	C2EC	VERIFY MAINSTAGE OK'S TO AUTO
121	380	CLTC	C2EC	IGNITION DETECTED SIM'S TO AUTO
161	381	C4TC	C4ET	LOX AND LH2 CUTOFF SENSORS TO AUTO
161	382	C4TC	C4ET	MAINSTAGE OK SIM'S TO AUTO
161	383	C4TC	C4NP	VERIFY SIM FLT ON
161	384	C4TC	C4ET	ENGINE CONTROL POWER AND ENGINE COMPONENT TEST POWER ON
	384-1		C4ET	*** NOTE TURN ENGINE CONTROL POWER AND COMPONENT TEST POWER OFF AFTER VERIFYING VAVS PROG, ILLUMINATES MAINSTAGE NO, 1 & 2 OK
121	385	CLTC	C1NK	REQUEST AND EXECUTE VAVS SIM FLIGHT PREPS SPR1 OPTION
121	386	CLTC	C1IP C2IP C4IP CUIP	POSITION TM CAL CONTROLS FOR TT-01 AND REPORT WHEN COMPLETE
	386-1		C1IP	TM CAL POWER ON
	386-2		C1IP	TM CAL MODE AUTO
	386-3		C1IP	PREFLIGHT LEVELS AUTO

APOLLO/SATURN
LAUNCH OPERATIONS

- 24' 0"

386-4	C2IP	TM CAL MODE AUTO
386-5	C2IP	FREQ MEAS CAL AUTO
386-6	C2IP	FM/FM INFLIGHT AUTO
386-7	C2IP	SSB PREFLIGHT AUTO
386-8	C2IP	PREFLIGHT LEVELS AUTO
386-9	C2IP	PCM MODE AUTO
386-10	C4IP	SPECIAL CAL AUTO
386-11	C4IP	REGULAR CAL AUTO
386-12	C4IP	INFLIGHT RELAYS OFF THEN AUTO
386-13	C4IP	TM CALIBRATION MODE AUTO
386-14	C4IP	PREFLIGHT LEVELS AUTO
386-15	CUIP	PREFLIGHT LEVELS AUTO
386-16	CUIP	TM CAL MODE AUTO
386-17	CUIP	AC-SSB AUTO

- 22' 0"

121	387	CLTC	C2AE	ENG. SW SELECTOR CUTOFF TO ON THEN AUTO
121	388		C2AE	*****NOTE ENG CUTOFF SAFE ON
121	389	CLTC	C2AE	ALL ENG EMER CUTOFF TO AUTO
121	390	CLTC	C2AE	START TANK ALL VENT TO ALL VENT
121	391	CLTC	C2AE	START TANK SUPPLY VALVE TO PRESSURE

LV OAT TEST PLUGS OUT
DATE: 9 NOVEMBER 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 59
TEST NO. V-20035
VEHICLE SA-502

21' 0"

121	392	C1NK	CLTC	VAVS COMPLETE
121	392-1	CLTC	CLMK	REQUEST TT-01 (TM PREFLT CAL) AND REPORT WHEN READY TO EXECUTE
	392-2		C1CS	****NOTE LOX LEVEL INBOARD #5 DRY OFF
	392-3		C1CS	****NOTE LOX LEVEL OUTBOARD #1 & #2 & #3 & #4 DRY OFF
	392-4		C1CS	****NOTE FUEL LEVEL OUTBOARD #1 & #2 DRY OFF
	392-5		C4ET	****NOTE LOX AND LH2 CUTOFF SENSORS #1 & #2 & #3 SIM WET ON
	392-6		C2PU	****NOTE LOX #1 #2 #3 #4 #5 DRY OFF
	392-7		C2PU	****NOTE LH #1 #2 #3 #4 #5 DRY OFF
	392-8		C2EV	****NOTE NO LOX & LH2 DEPLETION SENSORS DRY ON
121	393	CLTC	C2NK	VERIFY THE FOLLOWING MDO'S ARE ON & REPORT WHEN COMPLETE
	393-1			MDO 1184 (S-II ENG 201 IGN. DET SIM)
	393-2			MDO 1195 (S-II ENG 202 IGN. DET SIM)
	393-3			MDO 1206 (S-II ENG 203 IGN. DET SIM)
	393-4			MDO 1217 (S-II ENG 204 IGN. DET SIM)
	393-5			MDO 1228 (S-II ENG 205 IGN. DET SIM)
	393-6			MDO 1183 (S-II ENG 201 MAINSTAGE OK SIM)
	393-7			MDO 1194 (S-II ENG 202 MAINSTAGE OK SIM)
	393-8			MDO 1205 (S-II ENG 203 MAINSTAGE OK SIM)
	393-9			MDO 1216 (S-II ENG 204 MAINSTAGE OK SIM)
	393-10			MDO 1227 (S-II ENG 205 MAINSTAGE OK SIM)

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 60
TEST NO. V-20035
VEHICLE SA-502

-22: 0"

121	394	CLMK	CLTC	TT-01 READY TO EXECUTE
121	395	CLTC	BTMC ETMS	TELEMETRY TAPE RECORDING ON
	395-1		C1NP C2NP C4NP CUNP	VERIFY SWITCH SELECTOR INHIBIT OFF
121	396	CLTC	CLMK	ON YOUR MARK EXECUTE TT-01 AND REPORT WHEN COMPLETE

-20: 0"

121	397	CLTC	C4EP	OPEN START TANK VENT
121	398	CLTC	C4SP	COLD HELIUM SUPPLY SHUTOFF VALVE TO AUTO
121	399	CLTC	C4SP	LOX VENT OPEN THEN AUTO
121	400	CLTC	C4SP	LH2 VENT OPEN THEN AUTO
121	401	CLTC	C4HN	LOX UMBILICAL PURGE SUPPLY TO AUTO

-18: 0"

121	402	CLMK	CLTC	TT01 COMPLETE
121	403	CLTC	C1IP C2IP C4IP CUIP	POSITION ALL TM CAL CONTROLS TO FLIGHT CONFIGURATION AND REPORT WHEN COMPLETE
	403-1		C1IP	TM CAL POWER ON
	403-2		C1IP	TM CAL MODE INFLIGHT
	403-3		C2IP	SSB PREFLIGHT OFF
	403-4		C2IP	TM CAL MODE INFLIGHT
	403-5		C2IP	FM/FM INFLIGHT OFF

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 61
TEST NO. V-20035
VEHICLE SA-502

-18: 0"

	403-6		C2IP	FREQ MEAS CAL ON
	403-7		C4IP	REGULAR CAL OFF
	403-8		C4IP	SPECIAL CAL OFF
	403-9		C4IP	TM CAL MODE INFLIGHT THEN PREFLIGHT
	403-10		C4IP	INFLIGHT RELAYS OFF THEN ON
	403-11		CUIP	TM CAL MODE INFLIGHT
121	404	CLTC	C1NP C2NP C4NP CUNP	SWITCH SELECTOR INHIBIT ON
121	405	CLTC	C1IP	VERIFY READY TO SUPPORT ME01
121	406	CLTC	C2NP	RACS POWER ON
	406-1		C1PP C2PC C4PP CUPP R4SC R4EI	*** NOTE CURRENT & VOLTAGE SURGES WILL OCCUR DURING ME-01
121	407	CLTC	ECOP	VERIFY READY TO SUPPORT GUIDANCE REAL TIME REDUCTION

-17: 0"

121	408	CLTC	CLMK	REQUEST AND EXECUTE ME01 (RACS CHECK) (CALL OUT RACS HIGH, RACS LOW, AND ME01 TERMINATED WHEN DISPLAYED).
-----	-----	------	------	---

-16: 0"

121	409	CLMK	CLTC	ME01 COMPLETE
121	410	CLTC	BTMC ETMS	TELEMETRY TAPE RECORDING OFF

LV DAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 62
TEST NO. V-20035
VEHICLE SA-502

-16: 0"

121	411	CLTC	C1SP	CUTOFF RESET ON MOMENTARILY
	412	CLTC	L10T	MOMENTARILY RESET IMV TIMER
121	413	CLTC	L10T	MOMENTARILY RESET IGNITER SUBSTITUTES
121	414	CLTC	C1EN	ARM IGNITORS INSTALLED TO ARM MOMENTARILY
	414-1		C1EN	*** NOTE EXHAUST AND G/G IGNITORS INSTALLED
	414-2		C1EN	*** NOTE HYPERGOL INSTALLED 101-105 ON
121	415	CLTC	C2NP	RACS POWER OFF
121	416	CLTC	C2IP	FREQ MEAS CAL OFF
121	417	CLTC	C1NP C2NP C4NP CUNP	SWITCH SELECTOR INHIBIT OFF
121	418	CLTC	C4TC	TAKE THE STATIONS NOTED BELOW TO CH, 161 C4EP, C4HN, C4HY, C4PY, C4ES, C4ET, C4SP, C4PS (CHILLDOWN FUNCTIONS WILL BE PERFORMED BY THE CLOCK)
121	419	CLTC	CSA6	SET CARRIER KICK OFF GN2 SYS TO OPEN
121	420	CLTC	CSA7	SET CARRIER KICK OFF GN2 SYS TO AUTO
121	421	CLTC	USA6	ADJUST REG, A-5835-6 TO 750 +/- 50 PSIG
121	422	CLTC	CSAC	VERIFY LSE PREPS COMPLETE ON

-15: 0"

121	423	CLTC	CRSO	RANGE SAFETY TO BYPASS
	423-1		C1FR	*** NOTE RANGE SAFE ON
121	424	CLTC	C1FR	VERIFY LAUNCH SUPPORT PREP COMPLETE
121	425	C4TC	C4SP	OPEN COLD HELIUM CROSSOVER

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 63
TEST NO. V-20035
VEHICLE SA-502

-15:00"

121	426	C4TC	C4EP	OPEN THRUST CHAMBER CHILLDOWN
-----	-----	------	------	-------------------------------

-14:30"

161	427	C4TC	C4EP	OPEN START TANK SUPPLY VALVE
121	428	CLTC	CLGK	REQUEST AND EXECUTE FT-06 (GIMBAL ANGLE READ)

-13:00"

121	429	CLTC	C2AE	TCH PURGE TO ON,
-----	-----	------	------	------------------

-12:30"

121	430	CLTC	RDE6	GIVE DEMAND PRINTOUT ON ALL PRINTERS, AND VERIFY WHEN COMPLETE (SELECT CDC & ENTER)
-----	-----	------	------	--

121	431	CLTC	C1DE C2DE C4DE C4DE RDE6	MARK TAPES
-----	-----	------	--------------------------------------	------------

121	432	CLTC	C2NP	VERIFY RESET FOR FIRING COMMAND
-----	-----	------	------	---------------------------------

161	433	C4TC	C4HN	OPEN HEAT EXCHANGER CIRCUIT #1 VENT
-----	-----	------	------	-------------------------------------

-12:00"

121	434	CLTC	CUSP	VERIFY CONTROL COMPUTER IN S-IC BURN MODE,
-----	-----	------	------	---

121	435	CLTC	CUGA	ATTITUDE RATE COMMAND PLUS 5 DEG, SEC, PITCH AND YAW (EXCESSIVE RATES FOR PITCH & YAW WILL ILLUMINATE)
-----	-----	------	------	--

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 64
TEST NO. V-20035
VEHICLE SA-502

-11: 0"

121	436	CLTC	C1NP	SWITCH SELECTOR STAGE LOGIC RESET
	436-1		C1NP	*** NOTE STAGE LOGIC ZERO
	436-2		C1SP	*** NOTE SWITCH SELECTOR ZERO
121	437	CLTC	C1SP	SEQUENCER POWER ON
	437-1		C1SP	*** NOTE ALL VOLTAGES NORMAL
	437-2		C1SP	*** NOTE SEQUENCER RESET ON

-10:45"

121	438	CLTC	C1LO	START S-IC LOX BUBBLING
161	439	C4TC	C4PU	FUEL BOIL OFF BIAS ON THEN AUTO

-10: 0"

121	440	CLGK	CLTC	FT-06 COMPLETE.
171	440-1	C2TC	C2AE	ENG SSEL CUTOFF SW TO ON THEN TO AUTO
171	440-2		C2AE	*** NOTE ENGINE CUTOFF SAFE ON.
121	441	CLTC	C4IP	CHECKOUT MEAS GROUP OFF
121	442	CLTC	C4IP	*** NOTE TM READY INDICATION ON
121	443	CLTC	CLGK	REQUEST AND EXECUTE FT-42 (OVERALL SIM FLT OPTION)
121	444	CLTC	C2TC	CONDUCT YOUR CHILLDOWN SEQ ON CH. 171

NOTE: THE FOLLOWING STATIONS GO TO
----- CHANNEL 171 FOR CHILLDOWN SEQ.

C2AE
C2CP
C2EC
C2EV
C2EP
C2FC
C2PK

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 65
TEST NO. V-20035
VEHICLE SA-502

-10: 0"

C2PM
C2RP
C2RR
C2SP
L2OT
U2MH
U2LH

171	445	C2TC	C2RP	VERIFY OK TO OPERATE PUMPS - ON
	446		C2PM	*** NOTE LH2 RECIRC PUMPS ENABLE - ON
171	447	C2TC	C2RP	LH PUMPS NO 1 THRU NO, 5 TO START, THEN INHIBIT.

NOTE: ALLOW 2 SEC DELAY BETWEEN PUMP
----- START COMMANDS.

171	448	C2RP	C2TC	LH PUMPS NO, 1-5 ARE ON
171	449	C2TC	C2NP	VERIFY RECIRC BUS CURRENT INCREASES WITH EACH PUMP STAND CMD
171	450	C2TC	C2RP	LH2 PREVALVES TO CLOSE THEN TO INHIBIT
171	451	C2TC	C2PK	VERIFY K396-207 THRU K400-207 ON (LH2 PREVALVES CLOSE CMD)

- 8: 0"

	452	CLTC	BTMC ETMS	TELEMETRY TAPE RECORDING ON
121	453	CLTC	ECOP	INITIATE GUIDANCE REDUCTION PROGRAM
171	454	C2TC	C2EV	VERIFY RECIRC READY FOR LAUNCH ON
171	455	C2TC	C2AE	TCH PURGE TO OFF
171	456	C2TC	C2AE	TCH CHILLDOWN TO ON
161	457	C4TC	C4ET	ENGINE CONTROL POWER ON

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 66
TEST NO. V-20035
VEHICLE SA-502

- 8: 0"

161	458	C4TC	C4ET	SW SELECTOR CUTOFF ON THEN AUTO
161	459	C4TC	C4ET	VERIFY THE FOLLOWING INDICATIONS: NON PROGRAMMED ENGINE CUTOFF NOT ON, ENGINE CUTOFF ON, ENGINE CUTOFF LOCKIN ON
161	460	C4TC	C4ET	ENG IGN POWER ON
161	461	C4TC	C4ET	VERIFY ENGINE READY ON AND ENGINE CUTOFF LOCKIN OFF,
	461-1	C1FR		*** NOTE ENGINES IN NULL POSITION
	461-2	C1HP		*** NOTE HYDRAULIC PRESSURE OK

- 7: 0"

	461-3	ALL		*** NOTE COUNT TIME WILL BE ANNOUNCED AT 30 SEC INTERVALS TO TCS START
171	462	C2TC	U2LH	VERIFY S-II ENG AREA CLEAR FOR HYD PRESS APPLICATION
123	463	CUFS	CUGA	VERIFY ALL EDS/CRG PANEL SWITCHES TO AUTO EXCEPT SYSTEM POWER SWITCH
171	464	C2TC	C2SP	LOW LEVEL PURGE V SW TO OPEN

- 6:30"

121	465	CLTC	CUES	EDS MODE TO LAUNCH
	465-1		CUES	*** NOTE EDS READY
121	466	CLTC	CUES	SIMULATED LIFTOFF ON
	466-1		C1CS	*** NOTE FCM RESET
	466-2		C1SP	*** NOTE SEQUENCER REMOTE ENABLE

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 67
TEST NO. V-20035
VEHICLE SA-502

- 6:00"

121	467	CLGK	CLTC	FT-42 COMPLETE AND LVDC IN PREPARE TO LAUNCH MODE
121	468	CLTC	CLGK	EXECUTE FT-27 (SIM FLT MONITOR)
121	469	CLTC	L1TP	PCMU LOX & FUEL TANK MODULES TO 20 PSIG FILL.
121	470	CLTC	C1LO C1RP	S-1C LOX & FUEL VENTS OPEN AND REPORT WHEN VENTED
	470-1		C1LO	*** NOTE ALL DUCTS LOX BUBBLING ON WHILE VENTING
	470-2		C1LO C1RP	*** NOTE RETURN VENTS TO AUTO AFTER VENTING
	471	CLTC	CUNC	VERIFY WATER CONTROL VALVE SWITCH CLOSED
171	472	C2TC	C2FC	ALL ACCUMULATOR CONTROL TO UNLOCK, THEN TO AUTO
171	473	C2TC	C2FC	S-1I AUX PUMPS 1-4 TO ON AND VERIFY CORRECT PRESS
171	474	C2TC	C2SP	LOX & LH2 VENT VALVES NO. 1 & 2 TO OPEN.
	474-1		C1FR	*** NOTE IU AND SPACECRAFT READY FOR LAUNCH AND READY FOR FIRING

- 5:30"

121	475	CLTC	C1DP C2DP C4DP	ARM S & A DEVICE
	475-1		C1FR	*** NOTE ORDNANCE PREP COMPLETE
	475-2		C2EV	*** NOTE ORDNANCE OK
121	476	CLTC	C1NP	FUNCTION SELECTOR TO LAUNCH

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 68
TEST NO. V-20035
VEHICLE SA-502

- 5:30"

	476-1		C1NP	*** NOTE LAUNCH BUS +1D161 ON AND PRELAUNCH BUS +1D151 OFF
	476-2		C2NP	*** NOTE READY FOR POWER TRANSFER
121	477	CLTC	C1NP	VERIFY READY FOR POWER TRANSFER
	477-1		C4TC	*** NOTE PD SYSTEM READY
	477-2		C1NP	*** NOTE READY FOR LAUNCH POWER
161	478	C4TC	C4HN	CLOSE HEAT EXCHANGER CIRCUIT #1 VENT
161	479	C4TC	C4EP	CLOSE START TANK VENT
161	480	C4TC	C4HY	FLIGHT MODE ON THEN AUTO
161	481	C4TC	C4HY	COAST MODE OFF THEN AUTO
161	482	C4TC	C4HY R4EI	VERIFY S-IVB HYD SYSTEM STABILIZED

- 5: 7"

121	483	CLTC	CUSE	TERMINATE GE-01 (AZIMUTH LAYING MONITOR)
171	484	C2TC	C2SP	LOX DISC PRESS TO ON
171	485	C2TC	C2SP	LOX SUPPLY VALVE TO OPEN

- 5: 0"

	486	CLTC	C1NP C2NP CUNP	SWITCH SELECTOR INHIBIT ON & RESET SWITCH SELECTOR COUNTER,
161	487	C4TC	C4EP	LH2 CHILLDOWN PUMP ON THEN AUTO
161	488		C4EP	CLOSE START TANK SUPPLY VALVE
	489		C4EP	OPEN START TANK SUPPLY VENT
	490		C4EP	CLOSE CONTROL BOTTLE SUPPLY VALVE

LV OAT TEST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

PAGE 5251.60
TEST NO. 69
VEHICLE V-20035
SA-502

5' 0"

491 C4EP OPEN CONTROL BOTTLE SUPPLY VENT

- 4' 50"

161 493 C4TC C4EP LOX CHILLDOWN PUMP ON THEN AUTO

- 4' 45"

161 494 C4TC C4EP PREVALVES CLOSE THEN AUTO

161 492 C4TC C4NP INHIBIT SWITCH SELECTOR AND RESET SW SEL, COUNTER

- 4' 37"

171 495 C2TC C2AE START TANK ALL VENT TO OFF

- 4' 30"

161 496 C4TC ALL ALL STATIONS RETURN TO CH 121

497 C4TC CLTC S-IVB CHILLDOWN SEQUENCE COMPLETE

171 498 C2TC C2FC PREPARE FOR LAUNCH TO LAUNCH

121 499 CLTC C1SP ARM TCS AND VERIFY

499-1 C1FR *****NOTE TCS READY

499-2 C1FR *****NOTE IGNITION SOURCE VOLTAGE OK

NOTE: S-IVB CHILLDOWN SEQUENCE MUST BE
----- COMPLETE PRIOR TO NEXT STEP

121 500 CLTC CUSW ESE/LVDA TO LVDA

121 501 CLTC SUVE OPEN SWITCH #3 ON SSITP (INTERRUPTS SW. SEL.
ADDRESS NO. 3)

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 70
TEST NO. V-20035
VEHICLE SA-502

- 4:00"

121	501-1	CLTC	L10T	GIVE ENGINE 105 THRUST OK AT T-10 SECOND COUNT
	501-2		C2FC	*** NOTE ACCUMULATOR LOCKUP INDICATION
171	502	C2TC	U2LH	VERIFY AUX PUMPS DISABLED AND NORMAL SHUTDOWN
	502-1		C2FC	*** NOTE HYD READY FOR LAUNCH ON
171	503	C2TC	C2EV	VERIFY S-II SYSTEMS READY
171	504	C2TC	C2FC	S-II AUX HYDRAULIC PUMPS 1, 2, 3, & 4 OFF,
	504-1		C2FC	*** NOTE ACCUMULATOR FLUID PRESSURE 1, 2, 3, & 4 3650 +/- 150 PSI.
171	505	C2TC	L2RR	VERIFY X02-220A4 SW #30 OFF, INSERT FUSE INTO FUSE HOLDER FOR SW #30.
171	506	C2TC	ALL	ALL STATIONS RETURN TO CH 121.

- 3:40"

121	507	CLTC	C4AL	APS ENGINE POWER ON
	507-1		C4TC C4EV	*** NOTE PREPS COMPLETE
121	508	CLTC	C1FR	VERIFY PREPARATIONS COMPLETE

NOTE: COUNT TIME WILL BE ANNOUNCED AT
----- 10 SECOND INTERVALS FROM T-3:30"
TO T-10", AND AT 1 SECOND
INTERVALS FROM T-10" TO LIFTOFF.

- 3:30"

121	509		C4SP	CLOSE COLD HELIUM CROSSOVER
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LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 71
TEST NO. V-20035
VEHICLE SA-502

- 3:20"

121	510	CLTC	C1FR	CLEARED FOR FIRING COMMAND
	511		C2SP	LOX SUPPLY VALVE - AUTO.

NOTE: CVTS WILL HOLD THE CLOCK AT T-3:
----- 15" IF ABOVE CLEARANCE IS NOT
GIVEN BY THAT TIME.

- 3:10"

121	512	CLTC	C1FR	INITIATE FIRING COMMAND AND VERIFY
-----	-----	------	------	------------------------------------

- 3: 6"

513	TCS		S-II	LOX TANK PREPRESS
513-1		C1SP	***	NOTE TCS OUTPUT ON AND PULSE OK
514		C1FR	***	NOTE FIRING COMMAND ON
514-1		C2SP	***	NOTE S-II LOX PRESS SUPPLY VALVE OPEN
514-2		C2SP	***	NOTE S-II LOX DISCONNECT PRESS ON
514-3		C2SP	***	NOTE S-II LOX VENTS CLOSED
514-4		C2AE	***	NOTE S-II START TANK SUPPLY VALVE OPEN INDICATOR TO OFF
514-5		C2AE	***	NOTE S-II START TANK SUPPLY VENT OPEN ON,

- 2:51"

514-6		C2PM	***	NOTE S-II LOX UMBILICAL PURGE VALVE OPEN
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LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 72
TEST NO. V-20035
VEHICLE SA-502

- 2:47"

515	TCS	S-IVB LOX TANK PREPRESS
515-1	C4SP	*** NOTE S-IVB LOX VENT CLOSES
515-2	C4EV	*** NOTE S-IVB LOX TANK PREPRESS ON
515-3	C4SP	*** NOTE S-IVB LOX MIN LIFTOFF PRESS OK ON

- 2:32"

515-4	C4EV	*** NOTE S-IVB LOX TANK PRESSURIZED - ON
516	TCS	S-IVB LOX PREPRESS +15 SEC
516-1	C4PR	*** NOTE S-IVB LOX REPLENISH COMPLETE
516-2	C4PR	*** NOTE S-IVB LOX FILL AND DRAIN CLOSED

- 2:00"

516-3	L2OT	LOX HIGH PRESS SW NO. 1 AND NO. 2 SIM TO AUTO
516-4	C2SP	*** NOTE LOX ULLAGE PRESS SW 1 & 2 ON

- 1:42"

517	TCS	S-IC HYDRAULIC COMMIT
-----	-----	-----------------------

- 1:37"

518	TCS	S-IC, S-II & S-IVB FUEL PREPRESS
518-1	C2SP	*** NOTE S-II LH2 PRESS SUPPLY VALVE OPEN
518-2	C2SP	*** NOTE S-II LH2 DISCONNECT PRESS ON
518-3	C2SP	*** NOTE S-II LH2 VENTS CLOSED
518-4	C4SP	*** NOTE S-IVB LH2 VENT CLOSES

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 73
TEST NO. V-20035
VEHICLE SA-502

- 1:37"

518-5	C4SP	*** NOTE S-IVB LH2 GROUND PREPRESS SUPPLY OPENS
518-6	C2EV	*** NOTE LH2 VENT VALVES OVERRIDE CLOSE ON FOR 5 SEC, THEN OFF.
519	C4EV	NOTE S-IVB FUEL TANK PREPRESS ON
519-1	C4SP	*** NOTE S-IVB LH MIN, LIFTOFF PRESS OK- ON
519-2	C4EV	*** NOTE S-IVB LH TANK PRESSURIZED - ON

- 1:26"

121	520	C1RP	VERIFY S-IC FUEL FLIGHT PRESS & PREPRESS OK
-----	-----	------	--

- 1:25"

121	521	L2OT	FUEL LOW PRESSURE SW SIMULATE TO AUTO
	521-1	C2SP	*** NOTE LH 23 PSIA PRESS SW ON
	521-2	C2SP	*** NOTE LOW LEVEL PURGE VALVE CLOSED

- 1:22"

522	TCS		S-IVB LH PRESS +15 SEC
523		C4PR	*** NOTE S-IVB LH2 REPLENISH COMPLETE
523-1		C4PR	*** NOTE S-IVB LH2 FILL AND DRAIN CLOSED

- 1:12"

524	TCS		S-IC TIME FOR LOX PREPRESS
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LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 74
TEST NO. V-20035
VEHICLE SA-502

- 1: 5"

525 TCS GROUND CAMERA CONTROL ON
525-1 *** NOTE GROUND CAMERA CONTROL ON

- 1: 0"

526 TCS S-IC, S/A #1 RESET VALVE INHIBIT COMMAND

- 0:52"

527 TCS S-IC ENGINE CALORIMETER PURGE ON
527-1 C1PC *** NOTE S-IC ENGINE CALORIMETER PURGE
ON

- 0:50"

528 TCS POWER TRANSFER INTERNAL
528-1 C1FR VERIFY POWER TRANSFER COMPLETE (ALL
STAGES)
528-2 C1NP
C2NP
C4NP
CUNP *** NOTE POWER TRANSFER COMPLETE.
529 L2OT FUEL HI PRESS SW #1 AND #2 SIMULATE TO
AUTO
529-1 C2SP *** NOTE S-II LH ULLAGE PRESS SW 1 & 2
INDICATORS ON

- 0:48"

121 530 C1LO VERIFY S-IC LOX PREPRESS OK

LV DAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 75
TEST NO. V-20035
VEHICLE SA-502

- 0140"

531	TCS	DISABLE S-IC FUEL & LOX FILL AND DRAIN VALVES.
531-1	CSA1	*** NOTE ALL SUPPLY AND RETURN VALVES OPEN
531-2	C2SP	*** NOTE LOX TANK HIGH PRESS ON INDICATOR ON

- 0130"

532	TCS	S/A #1 RETRACT ENABLE SIMULATED AND S-IC ENG HYD CHECKOUT VALVES TO STAGE POSITION AND UNLATCH S-IC FWD AND INFIGHT SERVICE ARMS.
532-1	C1EN	*** NOTE S-IC ENG, CHECKOUT VALVES TO STAGE POSITION
532-2	C2SP	*** NOTE LOX & LH SUPPLY VALVE CLOSED
532-3	C2SP	*** NOTE LOX & LH SUPPLY LINE VENT OPEN
532-4	C2SP	*** NOTE LOX & LH DISC PRESS OFF
532-5	C2SP	*** NOTE LOX TANK HIGH PRESS ON INDICATOR - OFF
532-6	C2RP	*** NOTE RECVR DISC ACT PRESS OFF
532-7	C2RP	*** NOTE PNEU SUPPLY VALVE CLOSED
532-8	C2EV	*** NOTE LOX VENT VALVES OVERRIDE CLOSE ON FOR 5 SEC, THEN OFF
532-9	C2GP	*** NOTE RECIRC PNEU RECVR LINE VENT OPEN
532-10	C2AE	*** NOTE HE BOTTLES SUPPLY LINE VENT OPEN
532-11	C2AE	*** NOTE START TANK VENT CONTROL PRESSURE OFF
532-12	C2AE	*** NOTE HE BOTTLES SUPPLY VALVE OPEN LIGHT OFF

LV DAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 76
TEST NO. V-20035
VEHICLE SA-502

- 0:30"

532-13	C2SP	*** NOTE LOX & LH ACTUATION PRESS VENTING
532-14	CSA1	*** NOTE ARM SAFE ANGLE (SIMULATED)
532-15	CSAC	*** NOTE LSE READY FOR S/A #2 RETRACT
532-16	C1FR	*** NOTE S-IC S-IC PROPELLANTS PRESSURIZED
532-17	C2SP	*** NOTE LOX & LH PRESS SYS READY FOR LAUNCH,

- 0:27"

	533	TCS	S-IVB TIME FOR DIRECTIONAL VENT TO FLIGHT POSITION
121	534	C2TC	VERIFY S-II READY FOR LAUNCH
	534-1	C4SP	*** S-IVB DIRECTIONAL VENT TO FLIGHT POSITION
121	535	C4TC	VERIFY S-IVB READY FOR LAUNCH

- 0:22"

	536	TCS	GUIDANCE ALERT & PAD WATER ON
121	536-1	CUEV	*** NOTE GUIDANCE ALERT
	536-2	CWCP LWCD	*** NOTE INDUSTRIAL WATER SIGNAL RECEIVED

- 0:20"

537	TCS	CLOSE S-IC LOX INTERCONNECT VALVES, S-IC LOX DOME & GG FUEL INJECTOR PURGE ON,
537-1	C1LO	*** NOTE S-IC LOX INTERCONNECT VALVES NOS, 1, 2, 3, 4, CLOSED

LV DAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 77
TEST NO. V-20035
VEHICLE SA-502

- 0:20"

537-2	C1FR	*** NOTE S-IC HIGH LOX DOME PURGE ON
537-3	C1PC	*** NOTE S-IC LOX DOME & GG INJECTOR HIGH PURGE ON

- 0:17"

538	TCS	S-IC, S-II, S-IVB RSCR BLOCKED OFF & IU GUIDANCE REF. RELEASE,
121 538-1	CUEV	*** NOTE GUIDANCE RELEASE
538-2	C1DP C2DP C4DP	*** NOTE PD BLOCKED INDICATIONS OFF

01
16.7 "

539	TCS	S-IC FORWARD SERVICE ARM RETRACT AND GROUND CAMERA CONTROL OFF
539-1	CSA2	*** NOTE ARM SAFE ANGLE (SIMULATED)
539-2	CSAC	*** NOTE LSE READY FOR IGNITION
539-3	CSA2	*** NOTE GROUND CAMERA CONTROL OFF
121 540	C1FR	VERIFY READY FOR IGNITION

- 01
8.90"

541	TCS	S-IC TIME FOR IGNITION
541-1	C1FR	*** NOTE TIME FOR IGNITION
121 542	C1FR	VERIFY IGNITION SEQUENCE START
542-1	C4SP	*** NOTE S-IVB COLD HELIUM SUPPLY CLOSES
542-2	C4SP	*** NOTE S-IVB COLD HELIUM SUPPLY VENT OPENS

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 78
TEST NO. V-20035
VEHICLE SA-502

- 01
8,90"

542-3	C2AE	*** NOTE S-II TCH CHILLDOWN - OFF
542-4	C2PM	*** NOTE S-II LOX UMBILICAL PURGE VALVE CLOSED
542-5	C4SP	*** NOTE S-IVB GROUND PREPRESS SUPPLY CLOSES
542-6	C4SP	*** NOTE S-IVB GROUND PREPRESS SUPPLY VENT OPENS
542-7	C4SP	*** NOTE S-IVB CONTROL & REPRESS SUPPLY CLOSES
542-8	C4EP	*** NOTE S-IVB T/C CHILLDOWN SUPPLY CLOSES
542-9	CTS1	*** NOTE PURGE VALVES #1 & #2 OPEN

- 01
8,80"

543	TCS	START S-IC IGNITION #1
543-1	C1DE	*** NOTE DEE 2035 ON

- 01
8,70"

544	TCS	START S-IC IGNITION #2
544-1	C1DE	*** NOTE DEE 2036 ON

- 01
6,20"

545	TCS	TIME FOR S-IC LINKS BURNED
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LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 79
TEST NO. V-20035
VEHICLE SA-502

- 01
6,20"

121 546 C1FR VERIFY ENGINES ARMED
546-1 C1DE *** NOTE DEE 0174 ON

- 01
6,11"

547 TCS START S-IC ENG 102
547-1 C1FR *** NOTE ENG 102 START
547-2 C1EN *** NOTE 102 HYPERGOL INSTALLED OFF
547-3 C1EN *** NOTE 102 LOX AND GG VALVES OPEN

01
6,09"

548 TCS START S-IC ENG 105
548-1 C1FR *** NOTE ENG 105 START
548-2 C1EN *** NOTE 105 HYPERGOL INSTALLED OFF
548-3 C1EN *** NOTE 105 LOX AND GG VALVES OPEN

- 01
5,97"

549 TCS START S-IC ENG 101
549-1 C1FR *** NOTE ENG 101 START
549-2 C1EN *** NOTE 101 HYPERGOL INSTALLED OFF
549-3 C1EN *** NOTE 101 LOX AND GG VALVES OPEN

LV DAT YST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 80
TEST NO. V-20035
VEHICLE SA-502

- 01
5.87"

550	TCS	START S-1C ENG 103
550-1	C1FR	*** NOTE ENG 103 START
550-2	C1EN	*** NOTE 103 HYPERGOL INSTALLED OFF
550-3	C1EN	*** NOTE 103 LOX AND GG VALVES OPEN

- 01
5.62"

551	TCS	START S-1C ENG 104
551-1	C1FR	*** NOTE ENG 104 START
551-2	C1EN	*** NOTE 104 HYPERGOL INSTALLED OFF
551-3	C1EN	*** NOTE 104 LOX AND GG VLAVES OPEN

- 01 5"

552	TCS	S-1C ENG START SOLENOIDS OFF AND GROUND CAMERA CONTROL ON
552-1	C1FR	*** NOTE ENG 102 START - OFF
552-2	C1FR	*** NOTE ENG 105 START - OFF
552-3	C1FR	*** NOTE ENG 101 START - OFF
552-4	C1FR	*** NOTE ENG 103 START - OFF
552-5	C1FR	*** NOTE ENG 104 START - OFF
552-6		*** NOTE GROUND CAMERA CONTROL ON
552-7	C1EN	*** NOTE ENG 105-103, 101, 104, 102 MAIN FUEL VALVES OPEN

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 81
TEST NO. V-20035
VEHICLE SA-502

- 01
3.61"

553 TCS S-IC FUEL AUX, PREPRESS ON

- 01
1.92"

553-1 C1FR *** NOTE ALL ENGINES RUNNING

- 0.05"

554 TCS S-IC TIME FOR THRUST CHECK

554-1 C1FR *** NOTE TIME FOR THRUST CHECK

- 01 0"

555 TCS S-IC TIME FOR COMMIT AND S-II ELEC
DEADFACE COMPLETION

555-1 C1FR *** NOTE ESE COMMIT

121 556 C1FR VERIFY LAUNCH COMMIT

556-1 C1FR *** NOTE ALL HOLDDOWN ARM RELEASED

556-2 C1RP *** NOTE S-IC HELIUM FLOW CONTROL
VALVE NO. 1 OPEN

556-3 C2NP *** NOTE COMMIT BUS +2D131 - ZERO

556-4 C2EV *** NOTE COMMIT BUS +2D131 - OFF

556-5 C2EV *** NOTE S-IC COMMIT

556-6 C2FC *** NOTE ALL ACCOM LIGHTS OFF, HYD READY
FOR LAUNCH LIGHT OFF, TEMP LOW LIGHT
ON,

556-7 C4NP *** NOTE +4D131 BUS OFF

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251,60
PAGE 82
TEST NO. V-20035
VEHICLE SA-502

TB 1
+ 0: 0"

121	1	C1NP	VERIFY LIFTOFF	T1 + 010
	2	C1NP C2NP C4NP SUVE	VERIFY UMBILICAL PLUGS DISCONNECTED	
	2-1	CWCP LWCD	***NOTE INDUSTRIAL WATER TIMER INITIATE SIGNAL RECEIVED	
	2-2	C1DP	***NOTE RSCR #1 & #2 BLOCKED OFF	
	3	C4PR	***NOTE S-IVB LH2 DEBRIS VALVE CLOSED	
	4	C4PR	***NOTE S-IVB LOX DEBRIS VALVE CLOSED	
	5	C2NP	***NOTE AFT & FWD PLUGS CONNECTED - OFF	

TB 1
+ 0: 5"

	6	V2A1	VERIFY FWD, ELEC CARRIER PLATE EJECTED	
	7	V2A2	VERIFY AFT, ELEC CARRIER PLATE EJECTED	
	8		IU/0001 0001/16 AUTO - ABORT ENABLE RELAYS RESET	021
121	9	CUES	SIMULATE LIFTOFF SWITCH OFF	
	9-1	C2RP	*** NOTE REQIRC STOP RESET - OFF	

TB 1
+ 0: 6"

10	TCS	LAUNCH FAILURE ENABLE	
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TB 1
+ 0: 14"

11		S-IC/0110 0010/3 MULTIPLE ENGINE CUTOFF ENABLE	142
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LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 83
TEST NO. V-20035
VEHICLE SA-502

TB 1
+ 0:15"

12 L2RR CLOSE SW, S-30 UMB EJECT ON X02-220A4

TB 1
+ 0:25"

13 S-IC/0101 1111/2 TELEMETER CALIBRATE ON 137

TB 1
+ 0:27"

14 IU/0010 0010/23 TELEMETER CALIBRATOR 42
INFLIGHT CALIBRATE

TB 1
+ 0:
29,8 "

15 S-IC/0111 1111/1 S-IC TELEMETER 177
CALIBRATE OFF

TB 1
+ 0:30"

16 IU/0011 0001/38 LV ENGINES EDS CUTOFF 061
ENABLE

17 C1TC CSAC SECURE YOUR AREA ON CH 132 PER
V-30036-SA502

TB 1
+ 0:32"

18 IU/0001 0010/24 TELEMETER CALIBRATOR
STOP IN FLIGHT CALIBRATE

TB 1
+ 0:
49,5 "

19 S-IC/0000 0010/5 FUEL PRESSURIZING 002
VALVE NO, 2 OPEN & TAPE RECORDER RECORD

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 84
TEST NO. V-20035
VEHICLE SA-502

TB 1
+ 1: 0"

161	20	C4SP	CLOSE COLD HELIUM SUPPLY
161	21	C4SP	CLOSE CONTROL AND REPRESS SUPPLY
161	22	C4EP	CLOSE THRUST CHAMBER CHILL-DOWN SUPPLY
181	23	C1TC CSAC	SECURE YOUR AREA ON CHANNEL 252

TB 1
+ 1:
14.1 "

24	S-II/0001 0111/71 START DATA RECORDERS	027
----	--	-----

TB 1
+ 1:30"

25	IU/0010 0010/23 TELEMETER CALIBRATOR IN-FLIGHT CALIBRATE	042
171	25-1	U2LH VERIFY S-II ENGINE AREA CLEAR FOR HYDRAULIC PRESS APPLICATION,
171	25-2	C2FC PREPARE FOR LAUNCH SW TO INHIBIT
171	25-3	C2FC MONITOR HYDRAULIC PRESSURES AND VERIFY ACCUMULATORS LOCKED UP,
171	25-4	C2FC AUX. PUMPS CONTROL TO DISABLE
	25-5	C2FC AUX HYDRAULIC PUMPS 1, 2, 3, & 4 TO ON
171	25-6	C2SP LOW LEVEL PURGE V TO CLOSE
171	25-7	C2SP LOX AND LH2 VENT VALVES TO AUTO
171	25-8	C2SP LOX AND LH2 ACT PRESS TO AUTO
171	25-9	C2SP LOX AND LH2 DISC PRESS TO AUTO
171	26	C2GP SHROUD PURGE VALVE TO CLOSE
171	27	C2AE TCH CHILLDOWN AND ST, TK, SUPPLY V TO OFF
171	28	C2AE HE BTL SUPPLY V AND ST, TK VENT, CONT PRESS TO OFF

LV DAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 85
TEST NO. V-20035
VEHICLE SA-502

TB 1
+ 1:30"

171	29	C2RP	PNEUM SUPPLY VALVE TO OFF
171	30	C2RP	PNEUM RECV'R DISC TO CLOSE
171	31	L2OT	LOX AND FUEL HIGH PRESS SW, #1 & 2 SIM, TO FAULT AND FUEL LOW PRESS SIM SW TO FAULT,
171	32	C2TC L2OT	FUEL LOW PRESS SW SIM, TO FAULT

TB 1
+ 1:35"

33	IU/0001 0010/24	TELEMETER CALIBRATOR	022
	STOP IN-FLIGHT CALIBRATE		

TB 1
+ 1:
35.3 "

34	S-IC/0010 1101/6	FUEL PRESSURIZING VALVE	055
	NO. 3 OPEN		

TB 1
+ 1:45"

35	IU/0111 1101/26	FLIGHT CONTROL COMPUTER	175
	SWITCH POINT #1		

TB 1
+ 1:55"

36	S-IC/0101 1111/2	S-IC TELEMETER	137
	CALIBRATE ON		

TB 1
+ 1:59"

37	S-IVB/0100 1010/62	SPECIAL CALIBRATE	112
	RELAYS ON (COUNTER)		

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 86
TEST NO. V-20035
VEHICLE SA-502

TB 1
+ 1'
59.2 "

38

S-IVB/0011 1010/64 REGULAR CALIBRATE 072
RELAYS ON (COUNTER)

TB 1
+ 2' 0"

IU/0100 0001/21 FLIGHT CONTROL COMPUTER
SWITCH POINT NO, 2

TB 1
+ 2'
0.2 "

39

S-IC/0111 1111/1 S-IC TELEMETER 177
CALIBRATE OFF

TB 1
+ 2'
4.2 "

40

S-IVB/0010 1010/65 REGULAR CALIBRATE 052
RELAYS OFF (COUNTER)

TB 1
+ 2'
4.4 "

41

S-IVB/0000 0111/63 SPECIAL CALIBRATE 007
RELAYS OFF (COUNTER)

TB 1
+ 2'
13.4 "

42

FT-27 S-IC LOX LEVEL CUTOFF SENSOR NO, 5 DRY
(MDO 1382 OFF)

TB 1
+ 2'
13.5 "

43

S-IC/0001 1101/7 FUEL PRESSURIZING 035
VALVE NO, 4 OPEN

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 87
TEST NO. V-20035
VEHICLE SA-502

TB 1
+ 21
13,9 "

44 S-IVB/0100 1100/105 FAST RECORD ON 114
(COUNTER)

TB 1
+ 2114"

45 IU/0000 1111/39 IU TAPE RECORDER 017
RECORD ON

TB 1
+ 21
14,2 "

46 IU/0000 1110/51 S-IC TWO ENGINE 016
OUT AUTO-ABORT INHIBIT ENABLE

TB 1
21
4,4 "

47 IU/0001 1110/35 S-IC TWO ENGINE OUT 036
AUTO-ABORT INHIBIT

TB 1
+ 21
14,6 "

48 IU/0110 1111/15 EXCESSIVE RATE 157
(P, Y, R) AUTO-ABORT INHIBIT ENABLE

TB 1
+ 21
14,8 "

IU/0

49 IU/0101 1111/2 EXCESSIVE RATE
(P, Y & R) AUTO-ABORT INHIBIT ENABLE

TB 1
+ 2115"

50 S-IC/0001 1111/17 TWO ADJACENT OUTBOARD 037
ENGINES OUT ENABLE

LV 017 TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 88
TEST NO. V-20035
VEHICLE SA-502

TB 1
+ 21
15.2 "

1 S-IC/0011 1111/8 ENABLE INBOARD ENGINE 077
CUTOFF COMMAND - START TIME BASE #2 T2+
(T2) 0.0

2 C1EN VERIFY S-IC INBOARD ENGINE CUTOFF

TB 1
+ 21
15.6 "

3 S-II/0000 0011/30 START FIRST PAM-FM/FM 003
CALIBRATION

TB 1
+ 21
20.6 "

4 S-II/0001 0011/9 STOP FIRST PAM-FM/FM 023
CALIBRATION

TB 1
+ 21
24.1 "

5 S-II/0111 0011/11 S-II ORDNANCE ARM 163

5-1 C2OP ***NOTE ULLAGE AND SECOND PLANE
SEPARATION EBW #1 AND #2 CHARGED

TB 1
+ 21
24.3 "

6 S-IC/0110 0011/10 ARM EBW RETRO AND 143
SEPARATION

6-1 C1OP ***NOTE SEPARATION & RETRO ROCKET EBW
FIRING UNIT VOLTMETERS #1 & #2 READ
2300 +/- 100 VDC

LV DAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 89
TEST NO. V-20035
VEHICLE SA-502

TB 1
+ 21
24,5 "

7 I,U,/0111 1111/1 Q-BALL POWER OFF 177
8 SUAS ***NOTE Q-BALL POWER A & B OFF

TB 1
+ 21
24,7 "

9 S-II/0011 0111/67 CAMERA LIGHTS ON 067

TB 1
+ 21
24,9 "

10 S-IC/0111 0010/13 S-IC TELEMETRY MEASUREMENT SWITCH OVER 162

TB 1
21
25,1 "

11 S-IC/0001 0011/9 ENABLE OUTBOARD ENGINE CUTOFF

TB 1
+ 2130"

12 FT-27 S-IC BI-LEVEL FUEL SENSOR SIM WET - OFF (MDO-1389)

TB 1
+ 21
32,1 "

1 S-IC OUTBOARD CUTOFF - START TIME T3+
BASE #3 00.0

121 2 C1EN VERIFY S-IC OUTBOARD ENGINES CUTOFF

TB 1
+ 21
32,2 "

3 S-II/0110 0111/85 CAMERA MOTOR ON 147

LV C-17 TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 90
TEST NO. V-20035
VEHICLE SA-502

TB 1
+ 2'
32.3 "

4 S-II/0010 1100/48 S-II LH RECIRCULATION 54
PUMPS OFF.

4-1 C2RP ***NOTE RECIRC CONTROL STOP

4-2 C2PK ***NOTE K396-207 THRU K400-207 OFF (LH
PREVALVES CLOSE CMD)

4-3 C2RP *** NOTE LOX HE INJECTION OFF - ON

171 5 L2OT PULSE GENERATOR TO OFF AND VERIFY

5-1 C2RP ***NOTE LH2 PUMPS NO. 1-5 RPM TO ZERO

TB 1
+ 2'
32.6 "

6 S-II/0001 0010/24 ULLAGE TRIGGER 022

6-1 C2OP ***NOTE ULLAGE ROCKET EBW #1 AND #2
FIRED

TB 1
+ 2'
32.7 "

7 S-II/0010 1001/69 CAMERA EVENT MARK 051

TB 1
+ 2'
32.8 "

8 S-IC/0110 1111/15 S-IC/S-II SEPARATION 157

9 L1OT VERIFY S-IC/S-II SEPARATION

9-1 C1DE ***NOTE DEE 2106, 2107, 2110, 4260 ON

9-2 C1DP ***NOTE SEP & RR F/U METERS DECREASE TO
OVDC

9-3 C2AE ***NOTE ENGINE START ARMED

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 91
TEST NO. V-20035
VEHICLE SA-502

TB 1
+ 21
32.9 "

10 I,U./0001 1100/33 SWITCH ENGINE CONTROL 034
TO S-II, ENABLE S-II ENGINE OUT AND
SECOND SEPARATION INDICATION "A"

TB 1
+ 21
33"

11 S-II/0010 0011/31 S-II ENGINES CUTOFF 043
RESET

TB 1
+ 21
33.1 "

12 S-II/0110 1110/20 ENGINES READY BYPASS 156

TB 1
+ 21
33.2 "

13 S-II/0101 0010/19 PREVALVES LOCKOUT 122
RESET

13-1 C2AE ***NOTE PREVALVE LOCKOUT LIGHT - OFF

TB 1
+ 21
33.5 "

14 S-II/0001 1100/33 S-II ENGINE START 034

14-1 C2EV ***NOTE HE CONROL SOL. ON, ENG 1-5

14-2 C2EC ***NOTE ASI & GG SPARK EXCITER ON

TB 1
+ 21
33.6 "

14-3 S-II/0010 1001/69 CAMERA EVENT MARK 051

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 92
TEST NO. V-20035
VEHICLE SA-5

TB 1
+ 2:
33,7 "

15

I,U./0010 1100/48 ENABLE S-II ENGINE OUT 054
& S-II SECOND SEPARATION INDICATION
"B"

TB 1
+ 2:
33,9 "

16

S-II/0000 1100/49 ENGINE READY BYPASS 014
RESET

16-1

C2EC ***NOTE IGN DETECTED ON, ENG 1-5

TB 1
+ 2:
35,1 "

17

S-II/0100 1101/12 COMMAND S-II HYDRAULIC 115
ACCUMULATORS UNLOCK

17-1

C2FC ***NOTE ACCUMULATORS UNLOCKED AND
SYSTEM PRESSURE DECAYING

17-2

C2EC ***NOTE M/S OK #1 & 2 PICKED UP ON.
ENG 1-5

17-3

C2EV ***NOTE STEP PRESSURE & ACCUM, UNLOCKED
ON.

TB 1
+ 2:
35,9 "

181	18	C1TC	C1HP	S-IC HYDRAULIC SUPPLY AND CHECKOUT UNIT OFF
181	19	C1TC	C1SP	TCS TO SAFE
181	20	C1TC	C1SP	SEQUENCER POWER OFF

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
DIVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 93
TEST NO. V-20035
VEHICLE SA-502

TB 1
+ 21
38,5 "

21 S-II/0101 1100/88 CHILLDOWN VALVES CLOSE 134
(CLOSE CMD)

21-1 C2PK ***NOTE K313-207 ON (CHILLDOWN VALVE)

TB 1
+ 21
38,8 "

22 S-II/0011 1101/25 S-II START PHASE 075
LIMITER CUTOFF ARM

TB 1
+ 2139"

23 S-II/0100 0011/32 ACTIVATE P.U. SYSTEM 103

171 24 C2TC C2FC AUX PUMPS CONTROL TO ENABLE

TB 1
+ 21
39,8 "

25 S-II/0010 1101/6 S-II START PHASE 055
LIMITER CUTOFF ARM RESET

TB 1
+ 21
43,2 "

26 I.U./0001 1111/17 IU TAPE RECORDER 037
RECORD OFF

171 27 C2EC L20T TURN OFF 2D60 BUSS (IF ASI SPARK
EXCITERS ARE ON)

TB 1
+ 21
43,4 "

28 S-II/0111 0111/104 STOP DATA RECORDERS 167

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 94
TEST NO. V-20035
VEHICLE SA-5C

TB 1
+ 2'
43.6 "

29 S-II/0111 0101/106 FAST RECORD OFF 165
(COUNTER)

TB 1
+ 2'
44.9 "

29-1 C2FC ***NOTE AUX HYDRAULIC PUMPS 1, 2, 3 AND
4 ARE ON,

TB 1
+ 2'
49.9 "

29-2 C2FC ***NOTE SYSTEM PRESSURES STABILIZED AT
3650 +/- 150 PSI,

TB 1
+ 2'
59.7 "

30 IU/0110 0101/10M WATER COOLANT VALVE 145
OPEN

TB 1
+ 2'
2.8 "

31 S-II/0010 0010/23 S-II SECOND PLANE 042
SEPARATION

32 C2OP ***NOTE ULLAGE ROCKET EBW #1 AND #2
FIRED - OFF

32-1 L20T
U2A2 ***NOTE S-II/S-II SEPARATION COMPLETE

32-2 L20T PLACE 2D50 & 2D60 TO OFF

TB 1
+ 3'
2.9 "

33 S-II/0010 1001/69 CAMERA EVENT MARK 051

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 95
TEST NO. V-20035
VEHICLE SA-502

TB 1
+ 3,
4.9 "

34 S-II/0010 1001/69 CAMERA EVENT MARK 051

TB 1
+ 3,
8.5 "

35 I,U./0010 1110/52 L,E,T, JETTISON "A" 056

36 SUAS ***NOTE LET JETTISON "A" ON

TB 1
+ 3,
8.7 "

37 I,U./0011 1110/36 L,E,T, JETTISON "B" 076

38 SUAS ***NOTE LET JETTISON "B" ON

TB 1
+ 3,
10.1 "

39 S-II/0000 1001/87 CAMERA EJECT #1 011

TB 1
+ 3,
10.7 "

40 S-II/0101 0111/86 CAMERA EJECT #2 127

TB 1
+ 3,
11.2 "

41 S-II/0001 1001/68 CAMERA EJECT #3 031

TB 1
+ 3,
33.5 "

42 IU/0101 0001/22 FLIGHT CONTROL COMPUTER 121
SWITCH POINT #3

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 96
TEST NO. V-20035
VEHICLE SA-5

TB 1
+ 41
37,1 "

43 S-II/0000 0011/30 START SECOND PAM-FM/FM 003
CALIBRATION

TB 1
+ 41
42,1 "

44 S-II/0001 0011/9 STOP SECOND PAM-FM/FM 023
CALIBRATION

TB 1
+ 51
43,5 "

45 IU/0110 0001/4 FLIGHT CONTROL COMPUTER 141
SWITCH POINT #4

TB 1
+ 51
49,7 "

46 I,U./0010 0010/23 TELEMETER CALIBRATOR 042
IN-FLIGHT CALIBRATE

TB 1
+ 51
54,7 "

47 I,U./0001 0010/24 TELEMETER CALIBRATOR 022
STOP IN-FLIGHT CALIBRATE

TB 1
+ 61
4,8 "

48 S-II/0010 0111/90 MEASUREMENT CONTROL 047
SWITCH NO, 2 ACTIVATE

TB 1
+ 61
17,1 "

49 S-II/0000 0011/30 START THIRD PAM-FM/FM 003
CALIBRATION

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
VISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 97
TEST NO. V-20035
VEHICLE SA-502

TB 1
+ 61
22,1 "

50 S-II/0001 0011/9 STOP THIRD PAM-FM/FM CALIBRATION 023

TB 1
+ 71
52,1 "

51 S-II/0001 1101/7 S-II LH2 STEP PRESSURIZATION 035

121 51-1 V2MS VERIFY K455-207 OFF (LH PRESSURE REGULATOR SOLENOID ENERGIZED)

51-2 V2MS TURN OFF BRUSH PEN RECORDERS

TB 1
+ 71
57,1 "

52 S-IVB/0100 1010/62 SPECIAL CALIBRATE RELAYS ON (COUNTER) 112

TB 1
+ 71
57,3 "

53 S-IVB/0011 1010/64 REGULAR CALIBRATE RELAYS ON (COUNTER) 072

TB 1
+ 71
57,5 "

54 I.U./0010 0010/23 TELEMETER CALIBRATOR IN-FLIGHT CALIBRATE 042

TB 1
+ 81
2,1 "

55 S-IVB/0010 1010/65 REGULAR CALIBRATE RELAYS OFF (COUNTER) 052

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 98
TEST NO. V-20035
VEHICLE SA-5

TB 1
+ 8'
2,3 "

56 S-IVB/0000 0111/63 SPECIAL CALIBRATE 007
RELAYS OFF (COUNTER)

56-1 FT-27 SIMULATE LOX & LH2 CUTOFF SENSORS #2 &
#3 DRY (MDO 1230 & MDO 1229 OFF)

TB 1
+ 8'
2,5 "

57 I,U./0001 0010/24 TELEMETRY CALIBRATOR 022
STOP IN-FLIGHT CALIBRATE

TB 1
+ 8'
2,7 "

58 S-IVB/0101 1010/100 RATE GYRO OFF 132
(COUNTER)

TB 1
+ 8'
2,9 "

59 S-IVB/0111 0100/54 CHARGE ULLAGE 164
IGNITION ON (COUNTER)

59-1 C4DP *** NOTE ULLAGE IGNITION FIRING UNITS
1 & 2 CHARGED

TB 1
+ 8'
3,1 "

60 S-II/0011 1111/8 S-II/S-IVB ORDNANCE 077
ARM

TB 1
+ 8'
3,3 "

61 I,U./0000 1111/39 IU TAPE RECORDER 017
RECORD ON

61-1 C20P *** NOTE RETRO ROCKET AND S-II/S-IVB
SEPARATION EBW #1 AND #2 CHARGED

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 99
TEST NO. V-20035
VEHICLE SA-502

TB 1
+ 8'
3.5 "

62 S-IVB/0100 1100/105 FAST RECORD ON 114
(COUNTER)

TB 1
+ 8'
3.7 "

63 S-II/0001 0111/71 START DATA RECORDERS 027

TB 1
+ 8'
3.9 "

64 S-II/0110 0010/3 S-II LOX DEPLETION 142
SENSOR SHUTOFF ARM

TB 1
+ 8'
4.1 "

65 S-II/0101 1110/42 S-II LH DEPLETION 136
SENSOR CUTOFF ARM

TB 1
+ 8'
4.2 "

1 S-II/0011 0011/18 CUTOFF S-II J2 ENGINES 063
START TIME BASE #4 T4+
0010

1-1 C2PK *** NOTE K396-207 THRU K400-207 - ON
(LH PREVALVE CLOSE CMD)

1-2 C2EC *** NOTE ENGINE CUTOFF ON (201-205)

121 2 C2EV *** NOTE S-II ALL ENGINES CUTOFF - ON

171 3 C2FC S-II AUX HYDRAULIC PUMPS 1-4 TO OFF AND
NOTE NORMAL SHUTDOWN

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 100
TEST NO. V-20035
VEHICLE SA-57

TB 1
+ 81
4,3 "

4 S-II/0100 1001/66 START RECORDER TIMERS 111

TB 1
+ 81
4,4 "

5 S-IVB/0110 1001/83 PREVALVES CLOSE OFF 151
(COUNTER)

TB 1
+ 81
4,5 "

6 S-IVB/0111 0010/13 S-IVB ENGINE CUTOFF 162
OFF (COUNTER)

6-1 C4ET *** NOTE ENGINE CUTOFF OFF

TB 1
+ 81
4,7 "

7 S-IVB/0110 0011/10 ENGINE READY BYPASS 143
(COUNTER)

TB 1
+ 81
4,8 "

8 S-IVB/0010 0010/23 LOX CHILLDOWN PUMPS 042
OFF (COUNTER)

TB 1
+ 81
4,9 "

9 S-IVB/0101 0100/56 FIRE ULLAGE IGNITION 124
ON (COUNTER)

10 C4DP *** NOTE UR IGN FU #1 & #2 PULSE SENSORS
FIRED

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 101
TEST NO. V-20035
VEHICLE SA-502

TB 1
+ 8: 5"

	11	S-II/0000 0010/5 S-II/S-IVB SEPARATION	002
121	12	C4TC VERIFY S-II/S-IVB SEPARATION	
	12-1	C20P*** NOTE RETRO ROCKET AND S-II/S-IVB SEPARATION EBW #1 AND #2 FIRED	
	12-2	U2A1 *** NOTE SEPARATION COMPLETE	

TB 1
+ 8: 5,1 "

	13	S-IVB/0000 0100/74 S-IVB ENGINE START INTERLOCK BYPASS ON (COUNTER)	004
--	----	---	-----

TB 1
8: 5,2 "

	14	S-IVB/0001 0011/9 S-IVB ENGINE START ON (COUNTER)	023
121	15	C4ET VERIFY S-IVB ENGINE START	
	16	C4ET *** NOTE ENGINE IN MAINSTAGE CONFIGURATION	
	17	C4ET *** NOTE MAINSTAGE SW #1 & #2 OK ON	

*****CAUTION*****

* IF SPARKS REMAIN ON *
* OVER 20 SEC, LAJR TURN *
* ENGINE IGNITION POWER *
* OFF *

*****CAUTION*****

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 102
TEST NO. V-20035
VEHICLE SA-502

TB 1 + 8' 5.4 "	18	I.U./0010 0011/31 FLIGHT CONTROL COMPUTER S-IVB BURN MODE ON	043
TB 1 + 8' 5.5 "	19	IU/0000 0100/74 FLIGHT CONTROL COMPUTER S-IVB BURN MODE ON "B"	004
TB 1 + 8' 5.8 "	20	I.U./0001 0011/9 S-IVB ENGINE OUT INDICATION "A" ENABLE	023
TB 1 + 8' 6"	21	I.U./0111 0011/11 S-IVB ENGINE OUT INDICATION "B" ENABLE	163
TB 1 + 8' 5.4 "	22	S-IVB/0110 1011/59 FUEL CHILLDOWN PUMP OFF (COUNTER)	153
TB 1 + 8' 8"	23	S-IVB/011,1001/103 LOX TANK FLIGHT PRESSURE SYSTEM ON (COUNTER)	171
TB 1 + 8' 8.2 "	24	S-IVB/0111 0011/11 FUEL INJECTION TEMPERATURE OK BYPASS (COUNTER)	163

LV DAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 103
TEST NO. V-20035
VEHICLE SA-502

TB 1
+ 8'
8.4 "

25 S-IVB/0101 1101/27 ENGINE START OFF 135
(COUNTER)

TB 1
+ 9'10"

26 S-IVB/0001 1001/68 FIRST BURN RELAY ON 031
(COUNTER)

TB 1
+ 8'12"

27 S-IVB/0110 0101/107 EMERGENCY PLAYBACK 145
ENABLE ON (COUNTER)

TB 1
8'
12.2 "

28 S-IVB/1111 0101/106 FAST RECORD OFF 165
(COUNTER)

TB 1
+ 8'
17.2 "

29 S-IVB/0000 0010/5 P,U. ACTIVATE ON 002
(COUNTER)

TB 1
+ 8'
14.5 "

30 S-IVB/0110 0100/55 CHARGE ULLAGE 144
JETTISON ON (COUNTER)

TB 1
+ 8'17"

S-IVB/0001 1010/57 FIRE ULLAGE JETTISON 032
ON (COUNTER)

30-1 C4DP *** NOTE ULLAGE JETTISON FIRING UNIT
1 & 2 FIRED

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 104
TEST NO. V-20035
VEHICLE SA-50

TB 1
+ 8'
20.3 "

S-IVB/0101 1100/88 134
ULLAGE CHARGING RESET (COUNTER)

TB 1
+ 8'
20.5 "

1 S-IVB/0010 1001/73 053
ULLAGE FIRING RESET (COUNTER)

TB 1
+ 8'
23.1 "

2 IU/0001 1111/17 037
TAPE RECORDER RECORD OFF

TB 1
+ 8'
25.5 "

3 S-IVB/0100 0101/108 105
EMERGENCY PLAYBACK ENABLE OFF (COUNTER)

TB 1
+ 8'
26.6 "

4 IU/0010 0010/23 042
TELEMETRY CALIBRATOR IN-FLIGHT
CALIBRATE ON

TB 1
+ 8'
31.6 "

5 IU/0001 0010/24 022
TELEMETRY CALIBRATION IN-FLIGHT
CALIBRATE OFF

TB 1
+ 8'36"

6 S-IVB/0011 1010/64 072
REGULAR CALIBRATE RELAYS ON (COUNTER)

LV OAT TEST PLUGS OUT
DATE: NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 105
TEST NO. V-20035
VEHICLE SA-502

TB 1 + 8' 40.9"									
	7			S-IVB/0010 1010/65				052	
TB 1 + 8' 50"				REGULAR CALIBRATE DELAYS OFF (COUNTER)					
	7-1	FT27		LDO 0400 ON (CDC RESET ENABLE)					
TB 1 + 9' 49.5"									
	8			S-IVB/0101 0101/91				125	
				CHILLDOWN SHUTOFF PILOT VALVE CLOSE ON (COUNTER)					
TB 1 +12' 18.2"									
	9			S-IVB/0001 0010/24				022	
				ENGINE PUMP PURGE CONTROL ENABLE ON (COUNTER)					
TB 1 + 12' 24.1 "									
	10			S-IVB/0100 1101/12 CUTOFF S-IVB ENGINE				115	
				LVDC VEL. CUTOFF (COUNTER)					
	11	C4ET		NOTE ENGINE IN CUTOFF CONFIGURATION					
TB 1 +12' 25.2"									
TB 5 + 0' 0"									
	11-1			S-IVB/0100 1101/12 REDUNDANT CUTOFF				T5+00	
				S-IVB ENGINE START TB-5 (COUNTER)					
				(RESET TO T+0.0)					
	11-2	FT27		LDO 0400 ON (CDC RESET ENABLE)					
121	11-3	CLTC	RDE6	EST/CDC TO EST AND ENTER, THEN TO CDC AND ENTER					
121	12	CLTC	LLRS	DISCONTINUE DRSCS TRANSMISSION TO S-IVB RECEIVERS					
121	13	CLTC	BRFS	VERIFY RF TRANSMISSION TO S-IVB DISCONNECTED					

LV OAT TEST PLUGS OUT
DATE: NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 106
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 0' 0"

	14		V4MS	NOTE 5-IVB LIMITER VOLTAGE TO 0 RF LEVEL (N57 & N62)
121	15	CLTC	V2MS RRSC	RECORDER TO FAST
	16	CLTC	BRFS	ON YOUR MARK SEND ARM AND ENGINE CUTOFF FOR 7 SECONDS
121	17		BRFS	3-2-1 "MARK"
121	18	CLTC	V2MS RRSC	RECORDER TO SLOW
121	19	CLTC	RRSC V2MS	VERIFY EBW'S CHARGED AND ARM AND ENGINE CUTOFF ON MOMENTARILY
121	20	CLTC	V2MS RRSC	RECORDER TO FAST
	21	CLTC	BRFS	ON YOUR MARK SEND PD FOR 1 SECOND
121	22		BRFS	3-2-1 "MARK"
121	23	CLTC	V2MS RRSC	RECORDER TO SLOW
121	24	CLTC	RRSC V2MS	VERIFY EBW'S VOLTAGE DROPS AND RSCR'S PD ON MOMENTARILY
121	25	CLTC	CRSO C2DP	VERIFY EBW'S FIRED
121	26	CLTC	C1DE	VERIFY DEE 2108 & 2109 - ON
121	26-1	CLTC	C1DP	RSCR'S TO EXTERNAL THEN AUTO & VERIFY
121	26-2	CLTC	C1DP	SYSTEMS SAFE SWITCH TO SAFE AND VERIFY.
121	27	CLTC	C1TC C2TC	SECURE STAGE POWER AND REPORT WHEN COMPLETE
181	28	C1TC	L1TN	ALL TM RF ASSY'S OFF AND MARK, ODOP OFF AND MARK
181	29	C1TC	L1OT	+1D10 & +1D20 POWER OFF AND VERIFY

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 107
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 01 0"

181 30 C1TC VOBS POSITION S-IC OAT BATTERY CONTACTORS TO
OFF. S-IC OAT BATTERIES ARE RELEASED
FROM TEST.

181 31 C1TC C1NP FUNCTION SELECTOR TO OFF AND VERIFY

181 32 C1TC C1NP *1D119 BUS TO OFF

181 33 C1TC C1IP ALL TM RF ASSY'S OFF AND ODOP OFF

181 34 C1TC V1RF ODOP SIGNAL GENERATOR OFF & SECURE PER
S-V-38002-GSE39

35 C1TC V1MS RECORDERS OFF (ODOP & RSCR)

181 36 C1TC C1PE SECURE THE FOLLOWING SYSTEMS AND REPORT
WHEN COMPLETE:

STAGE GN2 CONTROL & PURGE SYSTEMS
(V-24057-SIC-2)

PNEUMATICS (V-24053-GSE-LCC)

PNEUMATIC C/O RACKS (V-24054-GSE-LCC)

181 37 C1PE C1TC PNEUMATICS SECURED

121 38 C1TC CLTC S-IC STAGE POWER AND PNEUMATICS SECURED

171 39 C2TC C2GP SECURE GND, PNEUMATICS PER DOP-C02-M025

40 C2GP C2TC GROUND PNEUMATICS SECURED

171 41 C2TC C2RP
C2AE
C2EC
C2CP
C2PM
C2GP
C2FC
C2SP
C2PR

PLACE ALL CONSOLE SWITCHES IN NORMAL
POWER DOWN POSITION.

171 42 C2TC C2IP ALL TM RF ASSEMBLIES TO OFF

TB 5
+ 0' 0"

171	43	C2TC	C2OP	PULSE SENSOR TO RESET THEN AUTO
171	44	C2TC	L2OT	ISS TRIGGER TO RESET
	45	C2TC	L2OT	PLACE 2D10, 2D20, 2D50, AND 2D60 POWER OFF AND VERIFY
181	46	C2TC	C1TC	S-II OAT BATTERIES RELEASED FROM TEST
181	47	C1TC	VOBS	POSITION S-II OAT BATTERY CONTACTORS TO OFF, S-II OAT BATTERIES RELEASED FROM TEST,
171	48	C2TC	C2NP	SIMULATED LAUNCH SW TO AUTO
171	49	C2TC	C2PC	PLUG SUPERVISION TO OFF
171	50	C2TC	C2DP	SAFE & ARM SW TO SAFE
171	51	C2TC	C2DP	STATUS SYSTEM SW TO SAFE
171	52	C2TC	C2IP	VERIFY ALL RF ASSEMBLIES OFF
171	53	C2TC	L2OT	PLACE OAT POWER OFF
171	54	C2TC	CLTC	S-II STAGE POWER SECURED
121	55	CLTC	C2TC	PERFORM POST-TEST SECURING PER SEC F, V-30042 AND VERIFY WHEN COMPLETE.
121	56	CLTC	LLRS	DISCONTINUE DRSCS-RF TRANSMISSION TO S-IC & S-II
	56-1		BTMC	VERIFY CONTINUOUS T/R OPERATION
121	57	CLTC	LLRS	PATCH DRSCS-RF TRANSMISSION TO S-IVB RECEIVERS
121	58	CLTC	BRFS	VERIFY S-IVB PATCH COMPLETE AND MONITOR S-IVB LIMITER VOLTAGE LEVELS
	58-1		CRSO V4MS BRFS	*** NOTE RETURN OF LIMITER VOLTAGE LEVELS

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 109
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 01
0.1 "

59 S-IVB/00100 0100/98 COMMAND POINT LEVEL 104
SENSOR DISARMING (COUNTER)

TB 5
+ 01
0.3 "

60 S-IVB/0101 1110/42 S-IVB ULLAGE ENGINE 136
#1 ON (COUNTER)

TB 5
+ 01
0.4 "

61 S-IVB/0011 0110/101 S-IVB ULLAGE ENGINE 066
#2 ON (COUNTER)

TB 5
+ 01
0.6 "

62 I,U./0111 1110/43 ULLAGE THRUST PRESENT 176
ON

TB 5
+ 01
0.7 "

63 S-IVB/0010 1001/69 FIRST BURN RELAY OFF 051
(COUNTER)

TB 5
+ 01
0.9 "

64 S-IVB/0010 1101/6 P,U. ACTIVATE OFF 055
(COUNTER)

TB 5
+ 01 1"

65 S-IVB/0001 0110/82 PREVALVES CLOSED 026
(COUNTER)

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 110
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 0!
1.1 "

66 S-IVB/0111 0111/104 LOX TANK FLIGHT 167
PRESSURE SYSTEM OFF (COUNTER)

TB 5
+ 0!
1.3 "

67 S-IVB/0110 1010/79 COAST PERIOD ON 152
(COUNTER)

TB 5
+ 0!
1.5 "

68 S-IVB/0001 0010/24 ENGINE PUMP PURGE 022
CONTROL VALVE ENABLE ON (COUNTER)

TB 5
+ 0!
1.7 "

69 S-IVB/0001 1110/35 P.U. FUEL BOILOFF 036
BIAS OFF (COUNTER)

TB 5
+ 0!
3.3 "

69-1 IU/0001 0100/75 FLIGHT CONTROL COMPUTER 024
S4B BURN MODE OFF "B"

TB 5
+ 0!
3.5 "

70 I,U./0100 1101/12 FLIGHT CONTROL 115
COMPUTER S-IVB BURN MODE OFF

TB 5
+ 0!
3.7 "

71 S-IVB/0000 0011/30 AUX. HYDRAULIC PUMP 003
COAST MODE ON (COUNTER)

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 111
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 01
3.9 "

72 S-IVB/0011 1100/29 AUX HYDRAULIC PUMP 074
FLIGHT MODE OFF (COUNTER)

TB 5
+ 0110"

73 I,U./0011 0011/18 COMMAND S-IVB ENGINE 063
OUT INDICATION "A" ENABLE OFF

TB 5
+ 01
10.2 "

74 I,U./0010 0001/53 COMMAND S-IVB ENGINE 041
OUT INDICATION "B" ENABLE OFF

TB 5
+ 01
1.2 "

75 S-IFB/0010 0001/53 SS/FM TRANSMITTER OFF 041
(COUNTER)

TB 5
+ 01
22.4 "

76 S-IVB/0100 1110/41 SS/FM GROUP OFF 116
(COUNTER)

77 S-IVB/0000 1010/111 LH2 TANK CONTINUOUS 012
VENT VALVE OPEN ON (COUNTER)

TB 5
+ 01
59.6 "

78 I,U./0010 0010/23 TELEMETRY CALIBRATOR 042
IN-FLIGHT CALIBRATE ON

LV DAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 112
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 1'
0.5 "

79 S-IVB/0110 1001/83 PREVALVES CLOSE OFF 151
(COUNTER)

TB 5
+ 1'
0.7 "

80 S-IVB/0011 0101/92 CHILLDOWN SHUTOFF 065
PILOT VALVE CLOSE OFF (COUNTER)

TB 5
+ 1' 1"

81 S-IVB/0100 1011/112 LH2 TANK CONTINUOUS 113
VENT VALVE OPEN OFF (COUNTER)

TB 5
+ 1'
4.6 "

82 I.U./0001 0010/24 TELEMETRY CALIBRATOR 022
IN-FLIGHT OFF

TB 5
+ 1'28"

83 S-IVB/0111 1110/43 S-IVB ULLAGE ENGINE 176
#1 OFF (COUNTER)

TB 5
+ 1'
28.1 "

84 S-IVB/0010 0110/120 S-IVB ULLAGE ENGINE 046
#2 OFF (COUNTER)

TB 5
+ 1'
28.3 "

85 I.U./0100 0010/46 S-IVB ULLAGE THRUST 102
PRESENT INDICATION OFF

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 113
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 1'
38,3 "

86

S-IVB/01100101/107 EMERGENCY PLAYBACK 145
ENABLE ON (COUNTER

TB 5
+ 1'
42,5 "

87

I,U./0101 0010/19 TAPE RECORDER PLAYBACK 122
REVERSE ON

TB 5
+ 3'
7,5 "

88

I,U./0110 0010/3 TAPE RECORDER PLAYBACK 142
REVERSE OFF

TB 5
+ 3'
8,3 "

89

S-IVB/0100 0101/108 EMERGENCY PLAYBACK 105
ENABLE OFF (COUNTER)

TB 5
+ 4'
8,3 "

90

S-IVB/0111 111/1 SLOW RECORD ON 177
(COUNTER)

TB 5
+ 4'
51,3 "

91

S-IVB/0111 111/1 SLOW RECORD ON 177
(COUNTER)

TB 5
+ 5' 3"

151 92 CUTC SUVE TURN PEA INTERRUPT BOX SWITCH TO OFF

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 114
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 6140"

92-1

CANARY ISLAND - TIME REFERENCE

TB 5
+101
2,6 "

93

S-IVB/0011 1101/25 ENGINE PUMP PURGE
CONTROL VALVE ENABLE OFF (COUNTER)

075

*** LOSE CANARY ***
*** GAIN TANANARIVE ***

TB 5
+13149"

TANANARIVE TEL MEM, LOC,

TB 5
+141
20,5 "

94

S-IVB/0111 1111/1 SLOW RECORD ON
(COUNTER)

177

TB 5
+141
52,5 "

95

S-IVB/0101 1111/2 SLOW RECORD OFF
(COUNTER)

137

TB 5
+141
52,7 "

96

S-IVB/0100 1001/66 RECORDER PLAYBACK ON
(COUNTER)

111

TB 5
+16139"

97

TANANARIVE - MODE 25

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 115
TEST NO. V-20035
VEHICLE SA-502

TB 5
+171
37.7 "

98

S-IVB/011 0111/47 RECORDER PALYBACK OFF 067
(COUNTER)

TB 5
+181
59.5 "

99

S-IVB/0111 1111/1 SLOW RECORD ON 177
(COUNTER)

TB 5
+191
2.5 "

100

S-IVB/0111 1111/1 SLOW RECORD ON 177
(COUNTER)

TB 5
+191
21.2 "

101

*** LOSE TANANARIVE ***

TB 5
+201
27.6 "

102

*** GAIN CARNARVON ***

TB 5
+201
34.9 "

103

I,U./0010 0010/23 TELEMETRY CALIBRATOR 042
IN-FLIGHT CALIBRATE ON

TB 5
+201
35.1 "

104

S-IVB/0100 1010/61 SPECIAL CALIBRATE 112
RELAYS ON (COUNTER)

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251,60
PAGE 116
TEST NO. V-20035
VEHICLE SA-502

TB 5
+201
35,3 "

105

S-IVB/0011 1010/64 REGULAR CALIBRATOR 072
RELAYS ON (COUNTER)

TB 5
+20137"

106

CARNARVON - SECTOR DUMP

TB 5
+201
40,1 "

107

I,U./0001 0010/24 TELEMETRY CALIBRATOR 022
IN-FLIGHT CALIBRATE OFF

TB 5
+201
40,3 "

108

S-IVB/0010 1010/65 REGULAR CALIBRATE 052
RELAYS OFF (COUNTER)

TB 5
+201
40,5 "

109

S-IVB/0000 0111/63 SPECIAL CALIBRATE 007
RELAYS OFF (COUNTER)

TB 5
+261
20,6 "

*** LOSE CARNARVON ***

TB 5
+301 7"

*** GAIN QUAYMAS ***

TB 5
+301
1,5 "

110

I,U./0010 0010/23 TELEMETRY CALIBRATE 042
IN-FLIGHT CALIBRATE ON

LV OAT TST PLUGS OUT
DATE: NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 117
TEST NO. V-20035
VEHICLE SA-502

TB 5
+30!
14,7 "

S-IVB/0111 1111/1 SLOW RECORD ON 177
(COUNTER)

TB 5
+30!
14,9 "

111 S-IVB/0100 1010/42 SPECIAL CALIBRATE 112
RELAYS ON (COUNTER)

TB 5
+30!
15,1 "

112 S-IVB/0011 1010/64 REGULAR CALIBRATE 072
RELAYS ON (COUNTER)

TB 5
+30!
17,17 "

112-1 GUAYMAS - NAV UPDATE

TB 5
+30!
19,5 "

113 I.U./0001 0010/24 TELEMETRY CALIBRATOR 022
IN-FLIGHT CALIBRATE OFF

TB 5
+30!
20,1 "

114 S-IVB/0010 1010/65 REGULAR CALIBRATE 052
(COUNTER)

TB 5
+30!
20,3 "

115 S-IVB/0000 0111/63 SPECIAL CALIBRATE 007
(COUNTER)

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 118
TEST NO. V-20035
VEHICLE SA-502

TB 5
+30'
46.7 "

116

S-IVB/0101 1111/2 SLOW RECORD OFF 137
(COUNTER)

TB 5
+30'
46.9 "

117

S-IVB/0100 1001/66 RECORDER PLAYBACK ON 111
(COUNTER)

TB 5
+36'
37.1 "

118

S-IVB/0011 0111/67 RECORDER PLAYBACK OFF 067
(COUNTER)

TB 5
+36'
37.3 "

119

S-IVB/0111 1111/1 SLOW RECORD ON 177
(COUNTER)

TB 5
+36'
40.3 "

120

S-IVB/0111 1111/1 SLOW RECORD ON 177
(COUNTER)

TB 5
+36'56"

120-1

TEXAS -- SW SEL

TB 5
+40'17"

120-2

KSC -- MODE 26

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

3251.60
PAGE 119
TEST NO. V-20035
VEHICLE SA-502

TB 5
+46.56"

120-3

BERMUDA - TEL MEM. LOC.

TB 5
+47.1
34.1 "

121

I.U./0010 0010/23 TELEMETRY CALIBRATOR
IN-FLIGHT CALIBRATE ON

042

TB 5
+47.1
34.3 "

122

S-IVB/0180 1010/62 SPECIAL CALIBRATE
RELAYS ON (COUNTER)

112

TB 5
+47.1
34.5 "

123

S-IVB/0011 1010/64 REGULAR CALIBRATE
RELAYS ON (COUNTER)

072

TB 5
+47.1
39.1 "

124

IU/0001 0010/24 TELEMETRY CALIBRATOR
IN-FLIGHT CALIBRATE OFF

022

TB 5
+47.1
39.5 "

125

S-IVB/0010 1010/65 REGULAR CALIBRATE
RELAYS OFF (COUNTER)

052

TB 5
+47.1
39.7 "

126

S-IVB/0000 0111/63 SPECIAL CALIBRATE
RELAYS OFF (COUNTER)

007

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 120
TEST NO. V-20035
VEHICLE SA-502

TB 5
+53:37"

126-1

CANARY ISLAND - TERMINATE

TB 5
+57:20"

126-2

*** LOSE CANARY ***

TB 5
+58:
57.5 "

126-3

*** GAIN TANANRIVE ***

TB 5
+59:
6.8 "

127

S-IVB/0111 1111/1 SLOW RECORD ON
(COUNTER)

177

TB 5
+59:11"

TANANARIVE - TIME REFERENCE

TB 5
+59:
38.8 "

128

S-IVB/0101 1111/2 SLOW RECORD OFF
(COUNTER)

137

TB 5
+59:39"

129

S-IVB/0100 1001/66 RECORDER PLAYBACK ON
(COUNTER)

111

TB 5
+ 1 HRS
3:
42.8 "

130

S-IVB/0011 0111/67 RECORDER PLAYBACK OFF
(COUNTER)

067

LV DAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 121
TEST NO. V=20035
VEHICLE SA=502

TB 5
+ 1 HRS
3:43"

131

S-IVB/0111 1111/1 SLOW RECORD ON
(COUNTER)

177

TB 5
+ 1 HRS
3:46"

132

S-IVB/0111 1111/1 SLOW RECORD ON
(COUNTER)

177

TB 5
+ 1 HRS
5:
56.5 "

*** LOSE TANANARIVE

TB 5
+ 1 HRS
3:
3.1 "

*** GAIN CARNARVON

TB 5
+ 1 HRS
7:
4.4 "

133

S-IVB/0100 1010/62 SPECIAL CALIBRATE
RELAYS ON (COUNTER)

112

TB 5
+ 1 HRS
7:
4.6 "

134

S-IVB/0011 1010/64 REGULAR CALIBRATE
RELAYS ON (COUNTER)

072

TB 5
+ 1 HRS
7:
4.8 "

135

I,U./0010 0010/23 TELEMETRY CALIBRATOR
IN-FLIGHT CALIBRATE ON

04

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 122
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 1 HRS
7'
9.6 "

136

S-IVB/0010 1010/65 REGULAR CALIBRATE
RELAYS OFF (COUNTER)

052

TB 5
+ 1 HRS
7'
9.8 "

137

S-IVB/0000 0111/63 SPECIAL CALIBRATE
RELAYS OFF (COUNTER)

007

TB 5
+ 1 HRS
7:10"

138

I,U./0001 0010/24 TELEMETRY CALIBRATOR
IN-FLIGHT CALIBRATE OFF

022

TB 5
+ 1 HRS
7:18"

138-1

CARNARVON - SECTOR DUMP

TB 5
+ 1 HRS
10:37"

138-2

CARNARVON - MODE 27

TB 5
+ 1 HRS
13'
42.1 "

138-3

*** LOSE CARNARVON ***

TB 5
+ 1 HRS
16: 0"

138-4

*** GAIN HAWAII ***

LV OAT TST PLUGS OUT
DA 3 NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 123
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 1 HRS
16'
6.4 "

139

S-IVB/0111 1111/1 SLOW RECORD ON
(COUNTER)

177

TB5
+ 1 HRS
16'19"

HAWAII TERMINATE

TB 5
+ 1 HRS
16'
38.4 "

140

S-IVB/0101 1111/2 SLOW RECORD OFF
(COUNTER)

137

TB 5
1 HRS
16'
38.6 "

141

S-IVB/0100 1001/66 RECORDER PLAYBACK ON
(COUNTER)

111

TB 5
+ 1 HRS
21'
22.7 "

142

S-IVB/0011 0111/67 RECORDER PLAYBACK OFF
(COUNTER)

067

TB 5
+ 1 HRS
21'
22.9 "

143

S-IVB/0111 1111/1 SLOW RECORD ON
(COUNTER)

177

LV 04T 7ST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

V-20
5251.60
PAGE 124
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 1 HRS
21'
25.9 "

144

S-IVB/0111 1111/1 SLOW RECORD ON
(COUNTER)

177

TB 5
+ 1 HRS
22'
3.2 "

145

*** LOSE HAWAII ***

TB 5
+ 1 HRS
22'
38.9 "

146

*** GAIN GUAYMAS ***

TB 5
+ 1 HRS
22'
22:46"

147

I.U./0010 0010/23 TELEMETRY CALIBRATOR
IN-FLIGHT CALIBRATE ON

042

TB 5
+ 1 HRS
22'
46.2 "

148

S-IVB/0100 1010/42 SPECIAL CALIBRATE
RELAYS ON (COUNTER)

112

TB 5
+ 1 HRS
22'
46.4 "

149

S-IVB/0011 1010/64 REGULAR CALIBRATE
RELAYS ON (COUNTER)

072

LV DAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 125
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 1 HRS
22'51"

150

I,U./0001 0010/24 TELEMETRY CALIBRATOR
IN-FLIGHT CALIBRATE OFF

022

TB 5
+ 1 HRS
22'
51,4 "

151

S-IVB/0010 1010/65 REGULAR CALIBRATE
RELAYS OFF (COUNTER)

052

TB 5
0 1 HRS
22'
51,6 "

152

S-IVB/0000 0111/63 SPECIAL CALIBRATE
RELAYS OFF (COUNTER)

007

TB 5
+ 1 HRS
22'58"

152-1

GUAYMAS SW SEL

TB 5
+ 1 HRS
23'
33,9 "

153

S-IVB/0111 1100/28 AUX HYDRAULIC PUMP
FLIGHT MODE ON (COUNTER)

174

TB 5
+ 1 HRS
23'
34,1 "

154

S-IVB/0010 0011/31 AUX HYDRAULIC PUMP
CAOST MODE OFF (COUNTER)

043

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 126
TEST NO. V=20035
VEHICLE SA-500

TB 5
+ 1 HRS
23'
38.9 "

155

S-IVB/0011 1001/58 FUEL CHILLDOWN PUMP
ON (COUNTER)

071

TB 5
+ 1 HRS
23'
43.9 "

156

S-IVB/0101 0001/22 LOX CHILLDOWN PUMP
ON (COUNTER)

121

TB 5
+ 1 HRS
23'
53.9 "

157

S-IVB/0001 0110/82 PREVALVES CLOSE ON
(COUNTER)

026

TB 5
+ 1 HRS
26'
55.6 "

1

LVDC COMMAND - START TIME BASE 6

6+
0.0

TB 5
+ 1 HRS
26'
5.8 "

2

S-IVB/0101 1110/42 S-IVB ULLAGE ENGINE
#1 ON COUNTER)

136

TB 5
+ 1 HRS
26'
55.9 "

3

S-IVB/0011 0110/101 S-IVB ULLAGE ENGINE
#2 ON (COUNTER)

066

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 127
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 1 HRS
26'
56,1 "

4 I.U./0111 1110/43 S-IVB ULLAGE THRUST 176
PRESENT INDICATION ON

TB 5
+ 1 HRS
26'
56,4 "

5 S-IVB/0110 0110/77 LH2 TANK VENT VALVE 146
BOOST CLOSE ON (COUNTER)

TB 5
+ 1 HRS
26'
56,6 "

6 S-IVB/0011 1011/95 LOX TANK VENT VALVE 073
BOOST CLOSE ON (COUNTER)

TB 5
+ 1 HRS
26'
56,8 "

7 S-IVB/0101 1001/84 LH2 TANK CONTINUOUS 131
VENT VALVE CLOSE ON (COUNTER)

TB 5
+ 1 HRS
26'
57,8 "

8 S-IVB/0000 1111/39 LH2 PRESSURIZATION 017
CONTROL VALVE OPEN ON (COUNTER)

TB 5
+ 1 HRS
26'
58,4 "

9 S-IVB/0111 0110/78 LH2 TANK VENT VALVE 166
BOOST CLOSE OFF (COUNTER)

LV DAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 128
TEST NO. V-20035
VEHICLE SA-502

TB 5 + 1 HRS 26' 58.6 "	10	S-IVB/0001 1011/96 LOX TANK VENT VALVE BOOST CLOSE OFF (COUNTER)	033
TB 5 + 1 HRS 27' 58.8 "	11	S-IVB/0000 1001/87 LH2 TANK CONTINUOUS VENT VALVE CLOSE OFF (COUNTER)	011
TB 5 + 1 HRS 27' 1.6 "	12	S-IVB/0011 1001/58 FUEL CHILLDOWN PUMP ON (COUNTER)	071
TB 5 + 1 HRS 27' 6.6 "	13	S-IVB/0101 0001/22 LOX CHILLDOWN PUMP ON (COUNTER)	121
TB 5 + 1 HRS 27' 16.6 "	14	S-IVB/0001 0110/82 PREVALVES CLOSE ON (COUNTER)	026
+ 1 HRS 30' 31.1 "	15	IU/0010 0010/23 TELEMETRY CALIBRATION IN-FLIGHT CALIBRATE ON	042

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 129
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 1 HRS
30'
31.3 "

16

S-IVB/0100 1010/42 SPECIAL CALIBRATE
RELAYS ON (COUNTER)

112

TB 5
+ 1 HRS
30'
31.5 "

17

S-IVB/0011 1010/64 REGULAR CALIBRATE
RELAYS ON (COUNTER)

072

TB 5
+ 1 HRS
30'
36.1 "

18

IU/0001 0010/24 TELEMETRY CALIBRATE
IN-FLIGHT CALIBRATE OFF

022

TB 5
+ 1 HRS
30'
36.5 "

19

S-IVB/0010 1010/65 REGULAR CALIBRATE
RELAYS OFF (COUNTER)

052

TB 5
+ 1 HRS
33'
36.7 "

20

S-IVB/0000 0111/63 SPECIAL CALIBRATE
RELAYS OFF (COUNTER)

007

TB 5
+ 1 HRS
30'
36.9 "

21

S-IVB/0010 1111/40 SS/FM GROUP ON
(COUNTER)

057

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 130
TEST NO. V-20035
VEHICLE SA-502

• 1 HRS 30' 37.1 "	22	S-IVB/0010 1110/52 SS/FM TRANSMITTER ON (COUNTER)	056
TB 5 • 1 HRS 31' 12.6 "	23	S-IVB/0110 0010/3 LOX REPRESSURIZATION VALVE OPEN ON (COUNTER)	142
TB 5 • 1 HRS 32' 2.6 "	23-1	S-IVB/0000 0010-5 P,U, ACTIVATE ON (COUNTER)	002
TB 5 • 1 HRS 32' 2.8 "	23-2	S-IVB/0001 1111/17 P,U, VALVE HARDOVER POSITION ON (COUNTER)	037
	23-3	C4PU *** NOTE PU VALVE IN 4. 5/1 POSITION	
TB 5 • 1 HRS 32' 11.8 "	24	S-IVB/0110 1001/83 PREVALVES CLOSE OFF (COUNTER)	151
TB 5 • 1 HRS 32' 12.6 "	25	IU/0111 1100/28 S-IVB RESTART ALERT	174

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 131
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 1 HRS
32'
21,2 "

26 S-IVB/0111 0010/13 S-IVB ENGINE CUTOFF 162
OFF (COUNTER)
26-1 C4ET *** NOTE ENGINE CUTOFF OFF

TB 5
+ 1 HRS
32'
21,4 "

27 S-IVB/0110 0011/10 ENGINE READY BYPASS 143
(COUNTER)

TB 5
+ 1 HRS
32'
2,8 "

28 S-IVB/0000 0101/81 LH2 REPRESSURIZATION 005
CONTROL VALVE OPEN OFF (COUNTER)

TB 5
+ 1 HRS
32'
11,8 "

29 S-IVB/0110 1011/59 FUEL CHILLDOWN PUMP 153
OFF (COUNTER)

+ 1 HRS
32'

30 S-IVB/0010 0010/23 LOX CHILLDOWN PUMP 042
OFF (COUNTER)

TB 5
+ 1 HRS
32'
21,2 "

31 S-IVB/01100 0001/4 LOX TANK 141
REPRESSURIZATION CONTROL VALVE OPEN OFF
(COUNTER)

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 132
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 1 HRS
32'
21.4 "

32 S-IVB/0001 0011/9 ENGINE START ON 023
(COUNTER)

33 C4ET *** NOTE ENGINE IN MAINSTAGE
CONFIGURATION

TB 5
+ 1 HRS
32'
22.6 "

*****CAUTION*****
*
* L4JR - IF ASI & GG *
* SPARKS ON FOR MORE THAN *
* 20 SEC SECURE ENG IGN *
* POWER AND NOTIFY C4TC *
*
*****CAUTION*****

34 C4ET *** NOTE MAINSTAGE 1 & 2 OK ON

TB 5
+ 1 HRS
32'
23.4 "

35 IU/0001 0011/9 S-IVB ENGINE OUT 023
INDICATION "A" ENABLE

TB 5
+ 1 HRS
32'
23.6 "

36 IU/0111 0011/11 S-IVB ENGINE OUT 163
INDICATION "B" ENABLE

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.00
PAGE 133
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 1 HRS
32'
25.6 "

37 S-IVB/0111 1110/43 S-IVB ULLAGE ENGINE 176
#1 OFF (COUNTER)

TB 5
+ 1 HRS
32'
25.7 "

38 S-IVB/0010 0110/102 S-IVB ULLAGE ENGINE 046
#2 OFF (COUNTER)

TB 5
+ 1 HRS
32'
25.9 "

39 IU/0100 0010/46 S-IVB ULLAGE THRUST 102
PRESENT INDICATION OFF

TB 5
+ 1 HRS
32'
30.2 "

40 IU/0000 0100/94 FLIGHT CONTROL COMPUTER 004
S-IVB BURN MODE ON "B"

TB 5
+ 1 HRS
32'
30.4 "

41 IU/0010 0011/31 FLIGHT CONTROL COMPUTER 043
S-IVB BURN MODE ON "A"

TB 5
+ 1 HRS
32'
30.6 "

42 ATTITUDE ERROR COMMAND (+3 DEG PITCH)

43 S-IVB/0111 0011/11 FUEL INJECTION 163
TEMPERATURE OK BYPASS (COUNTER)

LV DAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 134
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 1 HRS
32'
30.8 "

44

S-IVB/0111 1001/103 LOX TANK FLIGHT
PRESSURE SYSTEM ON (COUNTER)

171

TB 5
+ 1 HRS
32'31"

45

S-IVB/0111 1010/80 COAST PERIOD OFF
(COUNTER)

172

TB 5
+ 1 HRS
32'
31.2 "

46

S-IVB/0101 1001/27 ENGINE START OFF
(COUNTER)

135

47

C4ET *** NOTE ENGINE START OFF

TB 5
+ 1 HRS
32'
33.2 "

48

S-IVB/0100 0011/32 SECOND BURN RELAY ON
(COUNTER)

103

TB 5
+ 1 HRS
32'
35.6 "
TB 5
+ 1'
36.30"

49

S-IVB/0011 0011 P.U. VALVE HARDOVER
POSITION OFF (COUNTER)

063

49-1 FT27

LDO 0400 ON. (CDC RESET ENABLE)

TB 5
+ 1 HRS
36'
48.1 "

50

S-IVB/0010 0001/53 SS/FM TRANSMITTER OFF
(COUNTER)

041

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 135
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 1 HRS
36'
48.3 "

51

S-IVB/0100 1110/41 SS/FM GROUP OFF
(COUNTER)

116

TB 5
+ 1 HRS
36'
52.6 "

52

IU/0011 0010/44 FLIGHT CONTROL COMPUTER
SWITCH POINT NO, 5

062

TB 5
+ 1 HRS
36'
54.2 "

53

IU/0010 0010/23 TELEMETRY CALIBRATOR
IN-FLIGHT CALIBRATE ON

042

TB 5
+ 1 HRS
36'
54.4 "

54

S-IVB/0100 1010/62 SPECIAL CALIBRATE
RELAYS ON (COUNTER)

112

TB 5
+ 1 HRS
36'
54.6 "

55

S-IVB/0011 1010/64 REGULAR CALIBRATE
RELAYS ON (COUNTER)

072

TB 5
+ 1 HRS
36'
59.2 "

55-1

IU/0001 0010/24 TELEMETRY
CALIBRATOR IN-FLIGHT CALIBRATE OFF

022

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 136
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 1 HRS
36'
59.6 "

55-2

S-IVB/0010 1010/65 REGULAR
CALIBRATE RELAYS OFF

052

TB 5
+ 1 HRS
36'
59.8 "

55-3

S-IVB/0000 0111/63 SPECIAL
CALIBRATE RELAYS OFF

007

TB 5
+ 1 HRS
37'
23.0 "

55-4

S-IVB/0101 0101/91 CHILLDOWN
SHUTOFF PILOT VALVE CLOSE ON

125

TB 5
+ 1 HRS
37'
48.2 "

55-5

S-IVB/0000 0110/97 POINT LEVEL
SENSOR ARMING S-IVB ENGINE

006

TB 5
+ 1 HRS
38'
27.9 "

55-6

S-IVB/0100 1101/12 S-IVB ENGINE
CUTOFF-LVDC VELOCITY CUTOFF

115

TB 5
+ 1 HRS
38'29"

55-7

S-IVB/0100 1101/12 REDUNDANT S-IVB
ENGINE CUTOFF - START TIME BASE 7
(COUNTER)

115
T7+
00

56

C4ET *** NOTE ENGINE CUTOFF ON

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 137
TEST NO. V-20035
VEHICLE SA-502

TB 5
+ 1 HRS
38'29"

56-1 C4ET *** ENGINE CUTOFF LOCKIN ON THEN OFF

TB 7
+ 0'
0.2 "

1 S-IVB/0010 0101/93 LOX TANK VENT VALVE 045
OPEN (COUNTER)

1-1 RDE6 EST/CDC TO EST AND ENTER, THEN TO CDC AND ENTER

TB 7
+ 0'
0.3 "

2 S-IVB/0100 0100/98 POINT LEVEL SENSORS 104
DISARMING (COUNTER)

TB 7
+ 0'
0.4 "

3 S-IVB/0011 0001/38 LH2 TANK VENT VALVE 061
OPEN (COUNTER)

TB 7
+ 0'
0.5 "

4 S-IVB/0001 1100/33 SECOND BURN RELAY 034
OFF (COUNTER)

TB 7
+ 0' 1"

5 S-IVB/0111 0111/104 LOX TANK FLIGHT 167
PRESSURE SYSTEM OFF (COUNTER)

TB 7
+ 0'
1.1 "

6 S-IVB/0001 0110/82 PREVALVES CLOSE ON 026
(COUNTER)

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 138
TEST NO. V-20035
VEHICLE SA-502

7	S-IVB/0110 1010/79 COAST PERIOD ON (COUNTER)	152
TB 7 + 01 1.2 "		
8	S-IVB/0010 1101/6 P.U. ACTIVATE OFF (COUNTER)	055
TB 7 + 01 1.4 "		
9	S-IVB/0011 1111/8 P.U. INVERTER AND DC POWER OFF (COUNTER)	07
TB 7 + 01 1.5 "		
10	S-IVB/0100 0001/21 LOX CHILLDOWN PUMP PURGE CONTROL VALVE OPEN OFF (COUNTER)	101
10-1	C4EP MONITOR FOR PRESSURE DECAY	
TB 7 + 01 3.3 "		
11	IU/0001 0100/74 FLIGHT CONTROL COMPUTER S-IVB BURN MODE OFF "B"	024
TB 7 + 01 3.5 "		
12	IU/0100 1101/12 FLIGHT CONTROL COMPUTER S-IVB BURN MODE OFF	115

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 139
TEST NO. V-20035
VEHICLE SA-502

TB 7
+ 0:
3.7 "

13 S-IVB/0011 1100/29 AUX HYDRAULIC PUMP 074
FLIGHT MODE OFF (COUNTER)

TB 7
+ 0:10"

14 S-IVB/0000 1011/94 LOX TANK VENT VALVE 013
CLOSE (COUNTER)

TB 7
+ 0:13"

15 S-IVB/0011 1011/95 LOX TANK VENT VALVE 073
BOOST CLOSE ON (COUNTER)

TB 7
+ 0:15"

16 S-IVB/0001 1011/96 LOX TANK VENT VALVE 033
BOOST CLOSE OFF (COUNTER)

TB 7
+ 1:
0.5 "

17 S-IVB/0110 1001/83 PREVALVES CLOSE OFF 151
(COUNTER)

TB 7
+ 1:
0.7 "

18 S-IVB/0011 0101/92 CHILLDOWN SHUTOFF 065
PILOT VALVE CLOSE OFF (COUNTER)

TB 7
+ 2: 0"

19 S-IVB/0100 0110/76 LH2 TANK VENT VALVE 106

20 S-IVB/0110 0110/77 LH2 TANK VENT VALVE 14
BOOST CLOSE ON (COUNTER)

LV ON TEST PLUGS OUT

5251.60

DATE: NOVEMBER 9, 1967
REVISION: BASICAPOLLO/SATURN
LAUNCH OPERATIONSPAGE 140
TEST NO. V-20035
VEHICLE SA-502TB 7
+ 2' 5"

	21			S-IVB/0111 0110/78 LH2 TANK VENT VALVE BOOST CLOSE OFF (COUNTER)	166
121	22	CLTC	R4SC RRSC V4MS	RECORDERS TO FAST	
121	23	CLTC	BRFS	ON YOUR MARK SEND ARM AND ENGINE CUTOFF COMMAND FOR 3 SECONDS	
121	23-1		BRFS	3-2-1 MARK	
121	24	CLTC	RRSC V4MS	RECORDERS TO SLOW	
121	25	CLTC	V4MS	VERIFY EBW'S CHARGED AND ARM & ENGINE CUTOFF ON MOMENTARILY	
121	26	CLTC	RRSC V4MS	RECORDERS TO FAST	
121	27	CLTC	BRFS	ON YOUR MARK SEND PD FOR 1 SECOND	
121	27-1		BRFS	3-2-1 MARK	
121	28	CLTC	RRSC V4MS	RECORDERS TO SLOW	
121	29	CLTC	C4DP	VERIFY EBW'S VOLTAGE FLUCTUATE AND EDW'S FIRED	
121	30	CLTC	RRSC V4MS	RECORDERS TO FAST	
121	31	CLTC	BRFS	ON YOUR MARK SEND SAFE COMMAND FOR 3 SECONDS	
121	31-1		BRFS	3-2-1 MARK	
121	31-2	CLTC	V4MS R4SC	RECORDERS TO SLOW	

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 141
TEST NO. V-20035
VEHICLE SA-502

TB 7
+ 21 5"

121	32	CLTC	V4MS	VERIFY RSCRS #1 & #2 POWER GOES OFF
121	33	CLTC	C4DP	SYSTEM SAFE TO SAFE

TB 7
+101 0"

	34			IU/0000 0001/37 LV/SC SEPARATION SEQUENCE START,	001
121	35	CLGK	CLTC	OAT SIM FLT COMPLETE	
121	36	CLTC	CUSW	ESE/LVDA TO ESE	
121	36-1	CLTC	SUVE	CLOSE SWITCH #3 ON SSITP	
121	37	CLTC	CVNP	DESTRUCT SYSTEM TO OFF	
121	38	CLTC	DRFS	SWITCH DRSCS - RF CARRIER OFF (GSE STANDBY) AND SECURE DRSCS - GSE PER S-V-38001-GSE39-REV A	
121	39	CLTC	RRSC	RECORDERS OFF	
121	40	CLTC	CLGK	ON-AUTO-OFF SWITCH TO OFF AND VERIFY HALT AND MEMORY RELEASE	
121	41	CLTC	CLGK	VERIFY FT-27 TERMINATED	
121	42	CLTC	ECOP	TERMINATE GUIDANCE REDUCTION PROGRAM	
121	43	CLTC	CUEV	VERIFY GUIDANCE REFERENCE RELEASE & GUIDANCE REFERENCE ALERT REMOVED,	
121	44	CLTC	ETMS BTMC	TURN TAPE RECORDERS OFF	
121	45	CLTC	RDAS	TAPE RECORDER OFF	
121	46	CLTC	C1FR	GIVE CUTOFF	
121	47	CLTC	C1SP	CUTOFF RESET MOMENTARILY	
121	48	CLTC	C1TC	VERIFY PNEU & HYDRAULICS SECURED	
121	49	CLTC	C1IP	NORMALIZE MEASUREMENT PANEL	
121	50	CLTC	C1NE	POWER DOWN PER V-21097-502 & NORMALIZE ALL S-IC AND OAT PANELS, GIVE C4NP MARK WHEN DEACTIVATING +1D100 BUS.	

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 142
TEST NO. V-20035
VEHICLE SA-502

T8.7
+10.0"

121	51	CLTC	C4TC	RELEASE S-IVB OAT BATTERIES AND SECURE S-IVB STAGE ON CH 161 PER S-V-31035-SA502
181	52	C4TC	C1TC	S-IVB OAT BATTERIES RELEASED FROM TEST
181	53	C1TC	VOBS	POSITION S-IVB OAT BATTERIES CONTACTORS TO OFF, S-IVB OAT BATTERIES RELEASED FROM TEST,
121	54	CLTC	C4TC	VERIFY S-IVB IN SAFE CONDITION AND ALL POWER OFF,
121	55	CLTC	LUOT	6D20, 6D30, 6D40, 6D10, OAT BATTERY POWER OFF & RELEASE OAT BATTERIES FROM TEST,
181	56	CUTC	C1TC	IU OAT BATTERIES RELEASED FROM TEST,
121	57	CLTC	CUFS	SECURE FLIGHT CONTROL SYSTEMS
181	58	C1TC	VOBS	POSITION IU OAT BATTERY CONTACTOR TO OFF IU OAT BATTERIES ARE RELEASED FROM TEST,
121	59	CLTC	CUPP	PLUG SUPERVISION POWER OFF
121	60	CLTC	CUIP	CCS TRANSPONDER POWER OFF
121	61	CLTC	CUPP	+6D100 & +6D200 BATTERY ENABLE SWITCHES OFF
121	62	CLTC	CUPP	+6D110 & +6D210 OUTPUT SWITCHES OFF
121	63	CLTC	CUPP	STOP +6D100 & +6D200 PWR SUPPLIES
121	64	CLTC	C1NK	REQUEST AND EXECUTE VAVS RESET OPTION
121	65	CLTC	C1TC C2TC C4TC CUTC	VERIFY ALL POWER OFF AND READY TO REIMATE SEP SIM
121	66	CLTC	C1TC	APPLY S-IC GND PWR PER V-21038-502 AND VERIFY PRIOR TO REIMATE

LV DAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 143
TEST NO. V-20035
VEHICLE SA-502

TB 7
+10' 0"

66-1	CLTC	L10T	TURN ON S-IC DAT POWER
121	67	CLTC	U1FN
		U2A1	
		U2A2	REDATE SEPARATION SIMULATORS AND VERIFY
171	68	C2NP	U2A1
		U2A2	ON ISS CONTROL PANEL, PLACE MODE SELECT SWITCH TO REMATE AND PRESS AND HOLD REMATE PUSH BUTTON UNTIL SEPARATION READY LIGHT ILLUMINATES
171	69	C2NP	U2A1
		U2A2	DEPRESS 28 VDC/115 VAC IND SWITCH ON ISS CONTROL PANELS
171	70	C2NP	U2A1
		U2A2	SHUT OFF GN2 TO ISS UNITS
121	71	CLTC	C1TC
			C2TC
			C4TC
		CUTC	CONDUCT POST TEST OPERATIONS ON STAGE TC CHANNELS

E. POST TEST OPERATIONS

IU STAGE

151	1	CUTC	CVNP	VERIFY LIFTOFF, DESTRUCT ENABLE & COMMIT ARE OFF,
151	2	CUTC	SUAS LUOT CUNP CUPP	RESET ALL PANEL SWITCHES TO NORMAL POWER OFF CONDITION,
151	3	CUTC	SUVE	DISCONNECT UMBILICALS FROM ELECTRICAL EJECT PLATE & VERIFY WHEN COMPLETE,
151	4	CUTC	UUVH	INSTALL ELECTRICAL EJECT PLATE & VERIFY WHEN COMPLETE,
151	5	CUTC	SUVE	CONNECT UMBILICALS TO ELECTRICAL EJECT PLATE & VERIFY WHEN COMPLETE,

NOTE

VERIFY THAT S-1C & S-1I
SEPARATION SIMULATORS ARE
MATED PRIOR TO PROCEEDING
TO NEXT SEQUENCE,

151	6	CUTC	CUPP	START 6D100 & 6D200 POWER SUPPLIES,
151	7	CUTC	CUPP	PLUG SUPERVISION POWER - ON,
151	8	CUTC	CUNP	VERIFY "PLUGS CONNECTED" - ON
151	9	CUTC	CUPP	6D100 & 6D200 OUTPUT POWER - ON,
151	10	CUTC	CUNP	INDICATION BUS - ON
151	11	CUTC	CUNP	EMERGENCY EXTERNAL ON THEN OFF,
151	12	CUTC	CUNP	STAGE LOGIC RESET ON THEN OFF,
151	13	CUTC	CUNP	VERIFY STAGE LOGIC ZERO - ON

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 145
TEST NO. V-20035
VEHICLE SA-502

151	14	CUTC	CUNP	VERIFY "IU READY FOR POWER" - ON
151	15	CUTC	CUNP	POWER DOWN IU PER V-21223-GSE39A & VERIFY WHEN COMPLETE.
151	16	CUTC	LUNW	OPEN SWITCH & REMOVE JUMPER IN 302-620A1 FROM J31/Z+ TO J57/U.
151	17	CUTC	SUVE	DISCONNECT FOLLOWING CABLES & NOTIFY WHEN COMPLETE, 603W47/P8 FROM SSITB/J1 SSITB/P1 FROM 603A2/J6 PEA INT, BOX/J1 FROM 603A20/J1 PEA INT, BOX/J2 FROM 603W49/P1 S/C SIM, AC CABLE FROM AC OUTLET,
151	18	CUTC	SUVE	CONNECT FOLLOWING CABLES & NOTIFY WHEN COMPLETE, 603W47/P8 TO 603A2/J6 603W49/P1 TO 603A20/J1.
151	19	CUTC	RUJR	REMOVE FUSED JUMPERS FROM 602-1120A1 J2/BB TO J44/A J2/CC TO J44/B J2/N TO J44/F J2/P TO J44/G EMERGENCY PROCEDURE T-14: 30" TO T-3: 07"
121	20	CLTC	CVTS	HOLD COUNT CLOCK
121	21	CLTC	C1SP	SAFE TCS
121	22	CLTC	CRSO	BYPASS - OFF
	23	CLTC	CRSO	VERIFY CLEAR TO SAFE PROPELLANT DISPERSION S & A
121	24	CLTC	C1DP C2DP C4DP	SAFE & ARM TO SAFE
121	25	CLTC	C1DP C2DP C4DP	SYSTEMS STATUS TO SAFE

121	26	CLTC	C1EN	VERIFY CHECKOUT VALVES IN GND POS
121	27	CLTC	C4AL	APS ENGINE POWER - OFF
121	28	CLTC	C1NP	POWER SELECTOR TO PRELAUNCH
	28-1		C1NP	*** NOTE +1D151 ON
121	29	CLTC	C1NP CUNP	SWITCH SELECTOR INHIBIT - ON
121	30	CLTC	C2NP C4NP	STAGE SELECT INHIBIT OFF
121	31	CLTC	CUSW	ESE/LVDA TO ESE
	31-1	CLTC	SUVE	CLOSE SW #3 ON SSITB
121	31-2	CLTC	BGCC	VERIFY COMPUTER IN GO MODE

* IF COMPUTER IS UP *

*****CAUTION*****
*
* C2SP - OPERATE LOX &
* LH2 EMERG VENT VALVE
* SWIS AS REQUIRED TO
* MAINTAIN 0-5 PSIG TANK
* PRESSURES
*
*****CAUTION*****

121	32	CLTC	C2FC	PREPARE FOR LAUNCH TO INHIBIT
	33		C2FC	VERIFY ACCUMULATORS LOCKED UP IND. - ON
121	34	CLTC	C2AE	ALL ENG EMER CUTOFF TO CUTOFF
121	35	CLTC	C2AE	PREVALVE LOCKOUT TO ON
121	36	CLTC	C2NP	STAGE LOGIC TO RESET
121	36-1	CLTC	C2AE	PRE-VALVE LOCKOUT TO AUTO
	36-2		C2AE	*** NOTE PRE-VALVE LOCKOUT - ON

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 147
TEST NO. V-20035
VEHICLE SA-502

121	36-3	CLTC	C2RP	VERIFY RECIRC CONTROL RESET AND RECIRC STOP RESET - ON
	36-4		C2FC	VERIFY ACCUM. UNLOCKED & SYS. PRES, DECAYING
121	37	CLTC	C4EP	CLOSE THRUST CHAMBER CHILLDOWN VALVE
121	38	CLTC	C4EP	CLOSE ENGINE CONTROL BOTTLE SUPPLY VALVE
121	39	CLTC	C4EP	CLOSE START TANK SUPPLY VALVE
121	40	CLTC	C4EP	OPEN LOX AND LH2 PREVALVES
121	41	CLTC	C4EP	LOX AND LH2 CHILLDOWN PUMPS OFF
121	42	CLTC	C4HY	AUX HYD PUMP COAST MODE ON
121	43	CLTC	C4HY	AUX HYD PUMP FLIGHT MODE OFF
121	44	CLTC	C4EP	OPEN START TANK VENT
121	45	CLTC	CLGK	TERMINATE FT-27
121	46	CLTC	CLGK	REQUEST AND EXECUTE FT-20 (IF REQUIRED)
121	47	CLTC		GO TO APPENDIX "A"

* IF COMPUTER IS DOWN *

*****CAUTION*****
*
* C2SP - OPERATE LOX &
* LH2 EMERG VENT VALVE
* SWIS AS REQUIRED TO
* MAINTAIN 0-5 PSIG TANK
* PRESSURES
*
*****CAUTION*****

121	48	CLTC	CVNP	ML/DCE TO MANUAL MODE
121	49	CLTC	CVNP	TURN OFF MDO 1256 (S-II PREPARE TO LAUNCH - OFF)

	50	CLTC	C2FC	PREPARE FOR LAUNCH TO INHIBIT
121	50-1	CLTC	C2AE	ALL ENG EMER CUTOFF TO CUTOFF
121	50-2	CLTC	CVNP	TURN ON MDO 0334 (S-II PREVALVE LOCKOUT - ON)
121	51	CLTC	C2NP	STAGE LOGIC TO RESET
	51-1		C2AE	*** NOTE PREVALVE LOCKOUT ON - ON
	51-2		C2DE	*** NOTE DEE 1077 & 1076 ON
	51-3		C2RP	*** NOTE RECIRC CONTROL STOP - OFF
	51-4		C2FC	*** NOTE ACCUMULATOR UNLOCKED AND SYS PRESS DECAYING
121	52	CLTC	CVNP	TURN OFF MDO 1572 (S-IVB CLOSE THRUST CHAMBER CHILLDOWN VALVE)
121	53	CLTC	CVNP	TURN OFF MDO 1715 (S-IVB CLOSE ENGINE CONTROL BOTTLE SUPPLY)
121	54	CLTC	CVNP	TURN OFF MDO 1719 (S-IVB CLOSE START TANK SUPPLY VALVE)
121	55	CLTC	CUSW	ISSUE S-IVB OCTAL 151 (LOX & LH2 PREVALVES - OPEN)
121	56	CLTC	CUSW	ISSUE S-IVB OCTAL 042 (LOX CHILLDOWN PUMP - OFF)
121	57	CLTC	CUSW	ISSUE S-IVB OCTAL 153 (LH2 CHILLDOWN PUMP - OFF)
121	58	CLTC	CUSW	ISSUE S-IVB OCTAL 003 (AUX HYD PUMP COAST MODE - ON)
121	59	CLTC	CUSW	ISSUE S-IVB OCTAL 074 (AUX HYD FLIGHT MODE - OFF)
121	60	CLTC	C4EP	OPEN START TANK VENT
121	61	CLTC	C2NP C4NP	STAGE SELECT INHIBIT TO INHIBIT
121	62	CLTC	CLGK	OFF AUTO ON SWITCH TO OFF

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 149
TEST NO. V-20035
VEHICLE SA-502

121 63 CLTC CUDE VERIFY 728 (HALT) AND 730 (MEMORY
RELEASE) ARE ON

*****CAUTION*****
*
* DO NOT PROCEED BEYOND *
* THIS STEP UNTIL HALT *
* AND MEMORY RELEASE HAVE *
* BEEN VERIFIED. *
*
*****CAUTION*****

121 64 CLTC GO TO APPENDIX "A"

EMERGENCY PROCEDURE
T-3:07" TO T-08:19"

121 65 CLTC C1FR GIVE CUTOFF IF REQUIRED

121 66 CLTC C1NP
C2NP
C4NP
CUNP VERIFY STAGE PWR EXTERNAL

67 C2SP *** NOTE LOX & LH2 VENT VALVES OPEN (IF
CUTOFF GIVEN)

121 68 CLTC C1SP SAFE THE TCS

121 69 CLTC CUSW ESE/LVDA TO ESE

69-1 CLTC SUVE CLOSE SW #3 ON SSITB

121 70 CLTC CRSO BYPASS OFF

121 71 CLTC CRSO VERIFY CLEAR TO SAFE PROPELLANT
DISPERSION S & A

121 72 CLTC C1DP
C2DP
C4DP S & A TO SAFE

121 73 CLTC C4AL APS ENGINE POWER OFF

121 74 CLTC C1EN VERIFY CHECKOUT VALVES IN GND POS

121	75	CLTC	C1DP C2DP C4DP	SYSTEMS STATUS - SAFE
121	76	CLTC	C1PE	VERIFY READY FOR PRELAUNCH
121	77	CLTC	C1NP	FUNCTION SELECTOR TO PRELAUNCH
121	78	CLTC	C1NP CUNP	SWITCH SELECTOR INHIBIT - ON
121	79	CLTC	C2NP C4NP	STAGE SELECT INHIBIT TO OFF
121	80	CLTC	C1NE C1PE	VERIFY READY FOR CUTOFF RESET
121	81	CLTC	C1SP	RESET CUTOFF
121	82	CLTC	C4SP	VERIFY LH2 DIRECTIONAL VENT CONTROL TO GROUND POSITION
121	83	CLTC	C4SP	VERIFY LH2 TANK VENT OPEN
121	84	CLTC	C4SP	OPEN S-IVB LOX TANK VENT WHEN DIRECTED BY C4PS
121	84-1	CLTC	BGCC	VERIFY COMPUTER IN GO MODE

* IF COMPUTER IS UP *

*****CAUTION*****
*
* C2SP - OPERATE LOX &
* LH2 EMERG VENT VALVE
* SW'S AS REQUIRED TO
* MAINTAIN 0-5 PSIG TANK
* PRESSURES
*
*****CAUTION*****

121	85	CLTC	C2FC	PREPARE FOR LAUNCH TO INHIBIT
	86		C2FC	VERIFY ACCUMULATORS LOCKED UP INDICATIONS - ON

LV DAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 151
TEST NO. V-20035
VEHICLE SA-502

121	87	CLTC	C2AE	ALL ENG EMER CUTOFF TO CUTOFF
121	88	CLTC	C2AE	PREVALVE LOCKOUT TO ON
121	89	CLTC	C2NP	STAGE LOGIC TO RESET
121	90	CLTC	C2AE	PRE-VALVE LOCKOUT TO AUTO
	90-1		C2AE	*** NOTE PREVALVE LOCKOUT - ON
121	91	CLTC	C2RP	VERIFY RECIRC CONTROL RESET AND RECIRC STOP RESET - ON
	92		C2FC	VERIFY ACCUMULATORS UNLOCKED AND SYS PRESS DECAYING
121	93	CLTC	C4EP	CLOSE THRUST CHAMBER CHILLDOWN VALVE
121	94	CLTC	C4EP	OPEN LOX AND LH2 PREVALVES
121	95	CLTC	C4EP	LOX AND LH2 CHILLDOWN PUMPS OFF
121	96	CLTC	C4HY	AUX HYD PUMP COAST MODE ON
121	97	CLTC	C4HY	AUX HYD PUMP FLIGHT MODE OFF
121	98	CLTC	C4EP	OPEN START TANK VENT
121	99	CLTC	C2NP C4NP	STAGE SELECT INHIBIT TO INHIBIT
121	100	CLTC	CLGK	TERMINATE FT-27
121	101	CLTC	CLGK	REQUEST & EXECUTE FT-20
121	102	CLTC		GO TO APPENDIX "A"

* IF COMPUTER IS DOWN *

*****CAUTION*****
*
* C2SP - OPERATE LOX &
* LH2 EMERG VENT VALVE
* SWIS AS REQUIRED TO
* MAINTAIN 0-5 PSIG TANK
* PRESSURES
*
*****CAUTION*****

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 152
TEST NO. V-20035
VEHICLE SA-502

121	103	CLTC	CVNP	ML/DCE TO MANUAL MODE
121	104	CLTC	CVNP	TURN OFF MDO 1256 (S-II PREPARE TO LAUNCH - OFF)
	104-1	CLTC	C2FC	PREPARE FOR LAUNCH TO INHIBIT
121	104-2	CLTC	C2AE	ALL ENG EMER CUTOFF TO CUTOFF
121	104-3	CLTC	CUNP	TURN ON MDO 0334 (S-II PREVALVE LOCKOUT - ON)
121	105	CLTC	C2NP	STAGE LOGIC TO RESET
	105-1		C2AE	*** NOTE PRE-VALVE LOCKOUT ON - ON
	106		C2DE	*** NOTE DEE 1077, 1076 - ON
	107		C2RP	*** NOTE RECIRC CONTROL STOP - OFF
	108		C2FC	*** NOTE ACCUMULATORS UNLOCKED AND SYS PRESS DECAYING
121	109	CLTC	CVNP	TURN OFF MDO 1572 (S-IVB THRUST CHAMBER CHILLDOWN SUPPLY VALVE - CLOSED)
121	110	CLTC	CUSW	ISSUE S-IVB OCTAL 151 (LOX & LH2 PREVALVES - OPEN)
121	111	CLTC	CUSW	ISSUE S-IVB OCTAL 042 (LOX CHILLDOWN PUMP - OFF)
121	112	CLTC	CUSW	ISSUE S-IVB OCTAL 153 (LH2 CHILLDOWN PUMP - OFF)
121	113	CLTC	CUSW	ISSUE S-IVB OCTAL 003 (AUX HYD PUMP COAST MODE - ON)
121	114	CLTC	CUSW	ISSUE S-IVB OCTAL 074 (AUX HYD FLIGHT MODE - OFF)
121	115	CLTC	C4EP	OPEN START TANK VENT
121	116	CLTC	C2NP C4NP	STAGE SELECT INHIBIT TO INHIBIT)
121	117	CLTC	CLGK	OFF-AUTO-ON SWITCH TO OFF

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 153
TEST NO. V-20035
VEHICLE SA-502

121 118 CLTC CUDE VERIFY 728 (HALT) AND 730 (MEMORY
RELEASE) ARE ON

*****CAUTION*****
*
* DO NOT PROCEED BEYOND *
* THIS STEP UNTIL HALT *
* AND MEMORY RELEASE HAVE *
* BEEN VERIFIED *
*
*****CAUTION*****

121 119 CLTC GO TO APPENDIX "A"
EMERGENCY PROCEDURE
T-0'8.9" TO T-0'01"

121 120 CLTC C1FR VERIFY AUTOMATIC CUTOFF

121 121 CLTC C1NP
C2NP
C4NP
CUNP VERIFY STAGE PWR EXTERNAL

121-1 C2SP *** NOTE LOX & LH2 VENT VALVES OPEN

121 122 CLTC C1SP SAFE THE TCS

121 123 CLTC C1FR VERIFY CUTOFF COMPLETE ON (AFTER T-0,7")

121 124 CLTC CUSW ESE/LVDA TO ESE

125 CLTC SUVE CLOSE SW #3 ON SSITB

121 126 CLTC CRSO VERIFY CLEAR TO SAFE PROPELLANT
DISPERSION S & A

121 127 CLTC C1DP
C2DP
C4DP S & A TO SAFE

121 128 CLTC C4AL APS ENGINE POWER OFF

121 129 CLTC C1DP
C2DP
C4DP SYSTEM STATUS - SAFE

121 130 CLTC C1EN VERIFY CHECKOUT VALVES IN GND POS.

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 154
TEST NO. V-20035
VEHICLE SA-502

121	131	CLTC	C1PE	VERIFY READY FOR PRELAUNCH
121	132	CLTC	C1NP	FUNCTION SELECTOR TO PRELAUNCH
121	133	CLTC	C1NP CUNP	SWITCH SELECTOR INHIBIT - ON
121	134	CLTC	C2NP C4NP	STAGE SELECT INHIBIT TO OFF
121	135	CLTC	C4SP	VERIFY LH2 DIRECTIONAL VENT CONTROL TO GROUND POSITION
121	136	CLTC	C4SP	VERIFY LH2 TANK VENT OPEN
121	137	CLTC	C4SP	OPEN S-IVB LOX TANK VENT WHEN DIRECTED BY C4PS
121	138	CLTC	C1EN	VERIFY ENGINES 101 THRU 105 STOP COMMAND ON
121	139	CLTC	C1LO	VERIFY LOX VENTS OPEN
121	140	CLTC	C1LO	VERIFY LOX BUBBLING DUCTS 1 & 3 ON
121	141	CLTC	C1RP	VERIFY FUEL TANK VENTS OPEN
121	142	CLTC	C1NE C1PE	VERIFY READY FOR CUTOFF RESET
121	143	CLTC	C1SP	RESET CUTOFF
121	144	CLTC	BGCC	VERIFY COMPUTER IN GO MODE

* IF COMPUTER IS UP *

*****CAUTION*****
*
* C2SP - OPERATE LOX &
* LH2 EMERG. VENT VALVE
* SWITCHES AS REQ'D TO
* MAINTAIN 0-5 PSIG TANK
* PRESSURE
*
*****CAUTION*****

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 155
TEST NO. V-20035
VEHICLE SA-502

121	145	CLTC	C2FC	PREPARE FOR LAUNCH TO INHIBIT
	146		C2FC	VERIFY ACCUMULATORS LOCKED UP INDICATIONS - ON
121	147	CLTC	C2AE	ALL ENG EMER CUTOFF TO CUTOFF
121	148	CLTC	C2AE	PRE-VALVE LOCKOUT TO ON
121	149	CLTC	C2NP	STAGE LOGIC TO RESET
121	150	CLTC	C2AE	PRE-VALVE LOCKOUT TO AUTO
121	151	CLTC	C2RP	VERIFY RECIRC CONTROL RESET AND RECIRC STOP RESET - ON
	151-1		C2FC	VERIFY ACCUMULATORS UNLOCKED AND SYS PRESS DECAYING
121	152	CLTC	C4EP	CLOSE THRUST CHAMBER CHILLDOWN VALVE
121	153	CLTC	C4EP	OPEN LOX AND LH2 PREVALVES
121	154	CLTC	C4EP	LOX AND LH2 CHILLDOWN PUMPS OFF
121	155	CLTC	C4HY	AUX HYD PUMP COAST MODE ON
121	156	CLTC	C4HY	AUX HYD PUMP FLIGHT MODE OFF
121	157	CLTC	C4EP	OPEN START TANK VENT
121	158	CLTC	C2NP C4NP	STAGE SELECT INHIBIT TO INHIBIT
121	159	CLTC	CLGK	TERMINATE FT-27
121	160	CLTC	CLGK	REQUEST & EXECUTE FT-20
121	161	CLTC		GO TO APPENDIX "A"
				***** * IF COMPUTER IS DOWN * *****
121	162	CLTC	C1DE	VERIFY DEE 0231, 0227, 0229, 0225 AND 0223 - ON
121	163	CLTC	C1LO	VERIFY LOX VENT #2 OPEN

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 156
TEST NO. V-20035
VEHICLE SA-502

121 164 CLTC C1DE VERIFY DEE 0007 - ON
121 165 CLTC C1NE
C1PE VERIFY READY FOR CUTOFF RESET
121 166 CLTC C1SP RESET CUTOFF

*****CAUTION*****

*
* C2SP - OPERATE LOX &
* LH2 EMERG. VENT VALVES
* AS REQ'D TO MAINTAIN
* 0-5 PSIG TANK PRESSURES *
*

*****CAUTION*****

121 167 CLTC CVNP M/L DCE TO MANUAL MODE
121 168 CLTC CVNP TURN OFF MDO 1256 (S-II PREPARE TO
LAUNCH - INHIBIT)
121 169 CLTC C2FC PREPARE FOR LAUNCH TO INHIBIT
121 170 CLTC C2AE ALL EMER CUTOFF TO CUTOFF
121 171 CLTC CUNP TURN ON MDO 0334 (S-II PRE-VALVE
LOCKOUT - ON)
121 172 CLTC C2NP STAGE LOGIC TO RESET
172-1 C2AE *** NOTE PRE-VALVE LOCKOUT ON - ON
172-2 C2DE *** NOTE DEE 1077, 1076 - ON
172-3 C2RP *** NOTE RECIRC CONTROL STOP - OFF
172-4 C2FC *** NOTE ACCUMULATORS UNLOCKED AND SYS
PRESS DECAYING
121 173 CLTC CVNP TURN OFF MDO 1572 (S-IVB THRUST CHAMBER
CHILLDOWN SUPPLY VALVE - CLOSED)
121 174 CLTC CUSW ISSUE S-IVB OCTAL 151 (LOX & LH2
PREVALVES - OPEN)
121 175 CLTC CUSW ISSUE S-IVB OCTAL 042 (LOX CHILLDOWN
PUMP - OFF)

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 157
TEST NO. V-20035
VEHICLE SA-502

121	176	CLTC	CUSW	ISSUE S-1VB OCTAL 153 (LH2 CHILLDOWN PUMP - OFF)
121	177	CLTC	CUSW	ISSUE S-1VB OCTAL 003 (AUX HYD PUMP COAST MODE - ON)
121	178	CLTC	CUSW	ISSUE S-1VB OCTAL 074 (AUX HYD FLIGHT MODE - OFF)
121	179	CLTC	C4EP	OPEN START TANK VENT
121	180	CLTC	C2NP C4NP	STAGE SELECT INHIBIT TO INHIBIT
121	181	CLTC	CLGK	OFF-AUTO-ON SWITCH TO OFF
121	182	CLTC	CUDE	VERIFY 728 (HALT) & 730 (MEMORY RELEASE) ARE ON

*****CAUTION*****

*
* DO NOT PROCEED BEYOND *
* THIS STEP UNTIL HALT & *
* MEMORY RELEASE HAVE *
* BEEN VERIFIED *
*

*****CAUTION*****

121	183	CLTC		GO TO APPENDIX "A" EMERGENCY PROCEDURE T-0'0" TO T+0'0"
121	184	CLTC	C1FR	VERIFY AUTOMATIC CUTOFF
121	185	CLTC	C1NP C2NP C4NP CUNP	VERIFY STAGE PWR EXTERNAL
121	185-1		C2SP	*** NOTE LOX & LH2 VENT VALVES OPEN
121	186	CLTC	C1SP	SAFE THE TCS
121	187	CLTC	CUSW	ESE/LVDA TO ESE
	188	CLTC	SUVE	CLOSE SW #3 ON SSITB
121	189	CLTC	CRSO	VERIFY CLEAR TO SAFE PROPELLANT DISPERSION S & A

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 158
TEST NO. V-20035
VEHICLE SA-502

121	190	CLTC	C1DP C2DP C4DP	S & A TO SAFE
121	191	CLTC	C1DP C2DP C4DP	SYSTEM STATUS - SAFE
121	192	CLTC	C4AL	APS ENGINE POWER OFF
121	193	CLTC	C1EN	VERIFY CHECKOUT VALVES IN GND POSITION
121	194	CLTC	C1PE	VERIFY READY FOR PRELAUNCH
121	195	CLTC	C1NP	FUNCTION SELECTOR TO PRELAUNCH
121	196	CLTC	C1NP CUNP	SWITCH SELECTOR INHIBIT - ON
121	197	CLTC	C2NP C4NP	STAGE SELECT INHIBIT TO OFF
121	198	CLTC	C1NE C1PE	VERIFY READY FOR CUTOFF RESET
121	199	CLTC	C1SP	RESET CUTOFF
121	200	CLTC	C4SP	VERIFY LH2 DIRECTIONAL VENT CONTROL TO GROUND POSITION
121	201	CLTC	C4SP	VERIFY LH2 TANK VENT OPEN
121	202	CLTC	C4SP	OPEN S-IVB LOX TANK VENT WHEN DIRECTED BY C4PS
121	203	CLTC	BGCC	VERIFY COMPUTER IN GO MODE

* IF COMPUTER IS UP *

*****CAUTION*****

*
* C2SP - OPERATE LOX & LH2 *
* EMERG VENT VALVE SW'S *
* AS REQUIRED TO MAINTAIN *
* 0-5 PSIG TANK PRESSURE *
*

*****CAUTION*****

LV CAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 159
TEST NO. V-20035
VEHICLE SA-502

121	204	CLTC	C2FC	PREPARE FOR LAUNCH TO INHIBIT
	205		C2FC	VERIFY ACCUMULATORS LOCKED UP
121	206	CLTC	C2AE	ALL ENG EMER CUTOFF TO CUTOFF
	207	CLTC	C2AE	PREVALVE LOCKOUT TO ON
121	208	CLTC	C2NP	STAGE LOGIC TO RESET
121	209	CLTC	C2AE	PRE-VALVE LOCKOUT TO AUTO
	209-1		C2AE	*** NOTE PREVALVE LOCKOUT - ON
121	210	CLTC	C2RP	VERIFY RECIRC CONTROL RESET AND RECIRC STOP RESET - ON
	211		C2FC	VERIFY ACCUMULATORS UNLOCKED AND SYS PRESS DECAYING
121	212	CLTC	C4EP	CLOSE THRUST CHAMBER CHILLDOWN VALVE
121	213	CLTC	C4EP	OPEN LOX AND LH2 PREVALVES
121	214	CLTC	C4EP	LOX AND LH2 CHILLDOWN PUMPS OFF
121	215	CLTC	C4HY	AUX HYD PUMP COAST MODE ON
121	216	CLTC	C4HY	AUX HYD PUMP FLIGHT MODE OFF
121	217	CLTC	C4EP	OPEN START TANK VENT
121	218	CLTC	C2NP C4NP	STAGE SELECT INHIBIT TO INHIBIT
121	219	CLTC	CLGK	TERMINATE FT-27
121	220	CLTC	CLGK	REQUEST & EXECUTE FT-20
121	220-1	CLTC		GO TO APPENDIX "A"
				***** * IF COMPUTER IS DOWN * *****
121	221	CLTC	CVNP	M/L DCE TO MANUAL MODE

*****CAUTION*****

* C2SP - OPERATE LOX & *

V OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 160
TEST NO. V-20035
VEHICLE SA-502

* LH2 EMERG VENT VALVE *
* SWIS AS REQUIRED TO *
* MAINTAIN 0-5 PSIG TANK *
* PRESSURES *
*****CAUTION*****

121	222	CLTC	CVNP	TURN OFF MDO 1256 (S-II PREPARE TO LAUNCH - OFF)
121	223	CLTC	C2FC	PREPARE FOR LAUNCH TO INHIBIT
121	224	CLTC	C2AE	ALL ENGINE EMER CUTOFF TO CUTOFF
121	225	CLTC	CVNP	TURN ON MDO 0334 (S-II PREVALVE LOCKOUT ON)
121	226	CLTC	C2NP	STAGE LOGIC TO RESET
121	226-1		C2AE	*** NOTE PREVALVE LOCKOUT ON - ON
	227		C2DE	*** NOTE DEE 1077, 1076 - ON
	228		C2RP	*** NOTE RECIRC CONTROL STOP - OFF
	229		C2FC	*** NOTE ACCUMULATORS UNLOCKED AND SYS PRESS DECAYING
121	230	CLTC	CVNP	TURN OFF MDO 1572 (S-IVB THRUST CHAMBER CHILLDOWN SUPPLY VALVE - CLOSED)
121	231	CLTC	CUSW	ISSUE S-IVB OCTAL 151 (LOX & LH2 PREVALVES - OPEN)
121	232	CLTC	CUSW	ISSUE S-IVB OCTAL 042 (LOX CHILLDOWN PUMP - OFF)
121	233	CLTC	CUSW	ISSUE S-IVB OCTAL 153 (LH2 CHILLDOWN PUMP - OFF)
121	234	CLTC	CUSW	ISSUE S-IVB OCTAL 003 (AUX HYD PUMP COAST MODE - ON)
121	235	CLTC	CUSW	ISSUE S-IVB OCTAL 074 (AUX HYD PUMP FLIGHT MODE - OFF)
121	236	CLTC	C4EP	OPEN START TANK VENT
121	237	CLTC	C2NP C4NP	STAGE SELECT INHIBIT TO INHIBIT

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
VISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 161
TEST NO. V-20035
VEHICLE SA-502

121	238	CLTC	CLGK	ON-AUTO-OFF SWITCH TO OFF
121	239	CLTC	CUDE	VERIFY 728 (HALT) AND 730 (MEMORY RELEASE) ARE ON

*****CAUTION*****
*
* DO NOT PROCEED BEYOND *
* THIS STEP UNTIL HALT *
* AND MEMORY RELEASE HAVE *
* BEEN VERIFIED *
*
*****CAUTION*****

121	240	CLTC		GO TO APPENDIX "A" APPENDIX "A" (RECYCLE TO T-14:30")
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NOTE: IF COMPUTER IS DOWN, REINITIALIZE
----- BEFORE PROCEEDING WITH APPENDIX A

121	241	CLTC	C1DP C2DP C4DP	STATUS SYSTEM - OFF
121	242	CLTC	CRSO	BYPASS - ON (IF REQUIRED)
121	243	CLTC	CLGK	TERMINATE FT-27 IF REQUIRED
121	244	CLTC	CLGK	EXECUTE FT-20 IF REQUIRED
121	245	CLTC	ECOP	STOP GUIDANCE REAL TIME PROGRAM
121	246	CLTC	C1NP C2NP C4NP CUNP	SWITCH SELECTOR INHIBIT - OFF
121	247	CLTC	C4SP	CLOSE HELIUM CROSSOVER VALVE
121	248	CLTC	CUES	EDS SELECTOR SWITCH TO TEST POSITION
121	249	CLTC	CUES	SIMULATE LIFTOFF TO OFF
121	250	CLTC	C4ET	ENGINE IGNITION POWER OFF

121	251	CLTC	C4ET	SWITCH SELECTOR CUTOFF - OFF
121	252	CLTC	C4ET	ENGINE CONTROL POWER OFF
121	253	CLTC	C1DP C2DP C4DP	RSCR'S #1 & #2 TO INTERNAL
121	254	CLTC	C1EN	ARM IGNITORS INSTALLED CIRCUITS TO ARM MOMENTARILY
121	255	CLTC	L10T	RESET IGNITOR SUBSTITUTE
121	256	CLTC	C2SP	VERIFY LOX AND LH2 ACT PRESSURE ON
121	257	CLTC	C2SP	LOX AND LH2 VENT VALVES TO AUTO
121	258	CLTC	C2SP	LOX AND LH2 EMERGENCY VENT VALVE SWITCHES TO OFF
121	259	CLTC	C2SP	LOX AND LH2 SUPPLY VALVES TO AUTO
121	260	CLTC	C2SP	LOX AND LH2 DISC PRESS TO AUTO
121	261	CLTC	C2SP	LOW LEVEL PURGE VALVE TO AUTO
121	262	CLTC	L20T	FAULT AND FUEL LOW PRESS SIM TO FAULT
121	263	CLTC	L20T	FUEL LOW PRESS SW SIM TO FAULT
121	264	CLTC	C2AE	TCH PURGE AND TCH CHILLDOWN TO OFF (AS REQ'D)
121	264-1	CLTC	C2AE	START TANK ALL VENT TO ALL VENT,
121	264-2	CLTC	C2AE	START TANK SUPPLY VALVE TO PRESSURIZE,
121	265	CLTC	C2AE	PREVALVE LOCKOUT TO AUTO (IF REQ'D)
121	265-1	CLTC	C2AE	ENG SW SELECTOR CUTOFF TO ON THEN AUTO.
121	265-2	CLTC	C2AE	ALL ENG EMER CUTOFF TO AUTO
121	266	CLTC	C2RP	LOX HE INJECTION TO START, THEN AUTO
121	266-1	CLTC	C2RP	VERIFY LOX HE INJECTION OFF - OFF
121	267	CLTC	BTMC	TM TAPE RECORDING OFF AND PRELOAD IF REQUIRED,

**APOLLO LAUNCH OPERATIONS
TEST SUMMARY SHEET**

PAGE **163** OF PAGES

1. VEHICLE/STAGE	2. TEST TITLE		3. TEST NO.
4. COMPLEX	5. TEST STARTED DATE	6. TEST COMPLETED DATE	7. WORK AUTHORIZATION NO.

8. This summary serves as a record of completion of this procedure. All deviations and marginal or questionable conditions must be listed with disposition and reason for acceptance.

9. CONTRACTOR ENG. APPROVAL	10. DATE	11. NASA ENG. APPROVAL	12. DATE
13. CONTRACTOR INSPECTION	14. DATE	15. NASA INSPECTION	16. DATE

LV OAT TST PLUGS OUT
DATE NOVEMBER 9, 1967
REVISION BASIC

APOLLO/SATURN
LAUNCH OPERATIONS

5251.60
PAGE 164
TEST NO. V-20035
VEHICLE SA-502

END OF TEST PROCEDURE V-20035