

## SECTION VII

## MAINTENANCE INSTRUCTIONS, LAUNCH COMPLEX FACILITIES CONSOLE

7-1. SCOPE OF SECTION.

7-2. This section contains instructions for checkout, trouble analysis, disassembly, cleaning, inspection, repair, and reassembly of the launch complex facilities console.

7-3. CIRCUIT DESCRIPTION.

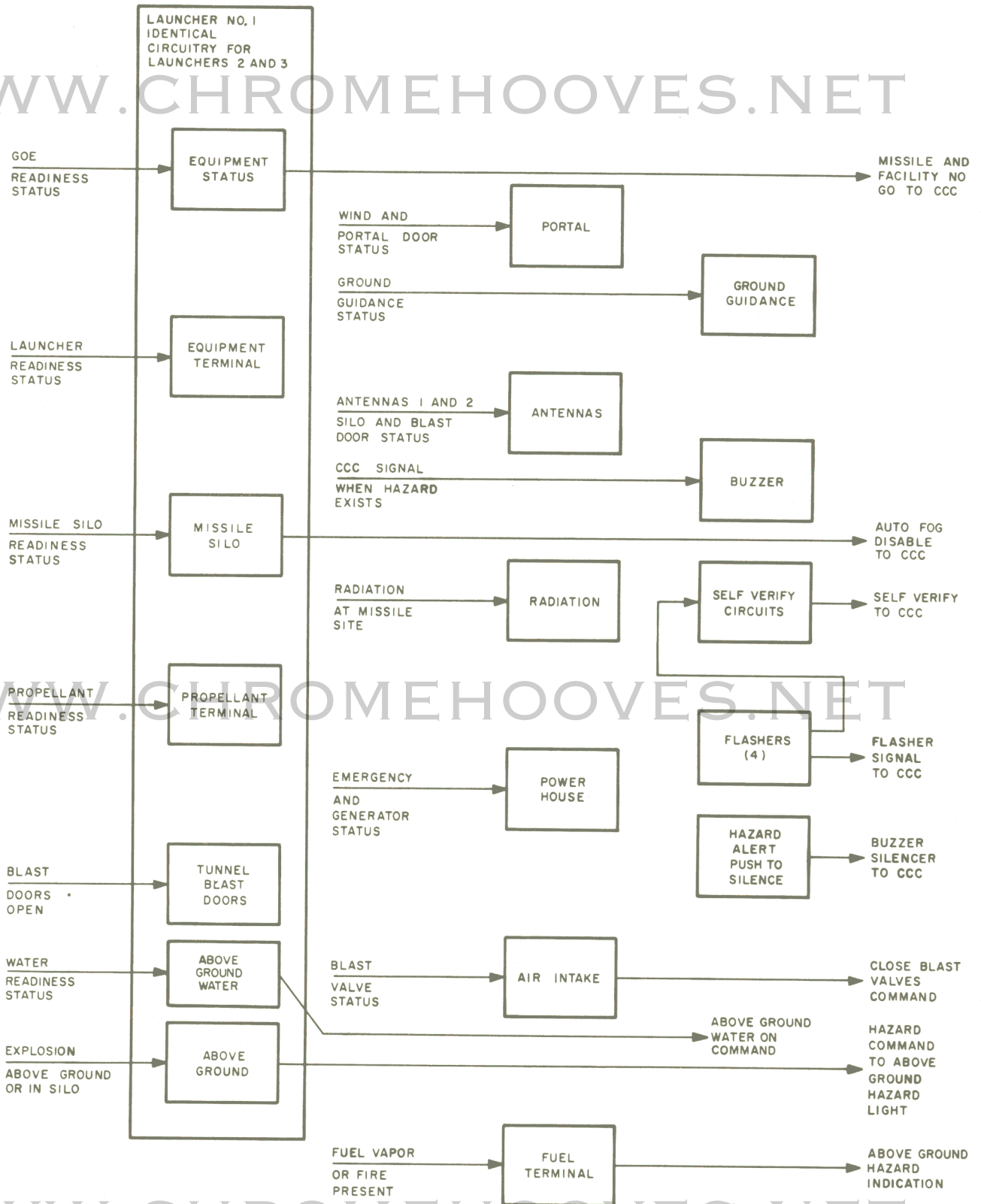
7-4. The launch complex facilities console monitors the status of the ground operating equipment and facilities for three missiles, the damage control system, and the ground guidance station. This monitoring is indicated by green, amber, red, and white lamps, flashing lamps; and a buzzer. Pushbutton indicators provide control over some corrective action. The Table of Operating Controls and Indicators (figure 1-3) gives the color capabilities of the individual monitoring indicators.

7-5. BLOCK DIAGRAM ANALYSIS.

7-6. Launchers 1, 2, and 3 are monitored by identical indicators and switches, separated into two groups. The first group consists of the equipment status indicators, which monitor the readiness status of the ground operating equipment (figure 7-1). Readiness signals are received by these indicators. If a no-go signal is received, the MISSILE AND FACILITY pushbutton indicator will illuminate red. The pushbutton may be pressed, sending a no-go signal to the control center circuits, to illuminate the CONTROL CENTER CIRCUITS and MISSILE AND FACILITY red indicators before a launch sequence is started. The second group consists of the facility status and control indicators and pushbuttons, which monitor the missile facilities. This group includes the equipment terminal indicators, missile silo indicators, propellant terminal indicators, tunnel blast doors indicators, and above ground indicators. The equipment terminal indicators monitor the readiness status and possible hazard conditions of the three launchers. The missile silo indicators monitor the readiness status of the missile silo, indicate fire and signal when action has been taken to extinguish fire. Missile silo indicators also include pushbutton indicators for disabling or shutting off fog in the missile silo. Readiness of the propellant terminal is monitored by the propellant terminal indicators. These indicators also denote fire. The tunnel blast doors indicators denote fire. The tunnel blast doors indicators denote whether the launcher blast doors are opened or closed. The above ground indicators denote water system on, explosion, or other hazards. The WATER EMER OFF pushbutton indicator controls the main water supply for each launcher. The hazard indications are accompanied by the console buzzer, which receives a signal from the control center circuits when a hazard exists, and by flashing lights, which operate from signals transmitted from the flashers through the control center circuits and back to the lamps. The HAZARD LIGHT, which is part of the above ground indicators, has a pushbutton which signals hazard status to personnel above ground.

7-7. The facility status and control indicators are also composed of indicators that are common to all three launchers. These indicators consist of the portal indicators, ground guidance indicators, antenna indicators, radiation indicators, power house indicators, air intake indicators, and fuel terminal indicators. The portal indicators denote excessive wind above ground and the status of the portal and blast doors. The ground guidance indicators denote whether the ground guidance is in a ready condition, an in-operation condition, or in a not-ready condition. The antenna indicators denote whether the antenna silo

WWW.CHROMEHOOVES.NET



WWW.CHROMEHOOVES.NET

Figure 7-1. Launch Complex Facilities Console Block Diagram

and blast doors are open or closed. Radiation indicators light red to indicate the presence of radiation at the launcher, control center, power house, or above ground. The generators in the power house are monitored separately by the power house indicators, which light white if the generators are on line. The air intake indicators denote whether the blast valves are open or closed. If the blast valves are open, pressing the BLAST VALVES pushbutton will cause the blast valves to close. The fuel terminal is monitored for vapor, fire, or both, by the fuel terminal indicators. Both of these indicators flash to indicate the hazard condition. These indicators act in conjunction with the buzzer and hazard alert lamps. The buzzer is silenced by pressing the PUSH TO SILENCE pushbutton.

7-8. All of the indicators, the buzzer, and the flashers are verified by self-verify circuits within the console. These circuits are controlled by switches located on the back panel of the console. Setting these switches sends self-verify signals to the control center circuits, where they are routed back to the console.

#### 7-9. DETAILED CIRCUIT ANALYSIS.

7-10. MONITORING CIRCUITS. A typical monitoring circuit is shown in figure 7-2. When the above ground conditions indicate an explosion, a signal from flasher power supply bus 3 red is relayed to the EXPLOSION indicator lamp. This signal causes the lamp to flash red and buzzer DS114 to be energized by the control center circuits. Buzzer DS114 operates when a flashing red signal appears at any of the indicators. This flashing signal originates at the flasher power supply bus and at a relay located in the control center circuits. Flasher 3, located in the launch complex facilities console, energizes the flasher power supply bus with a square wave at an amplitude of 0-to-28 V, 120 cycles per minute. When the relay in the control center circuits energizes, the flashing signal from the bus is returned to the EXPLOSION indicator red lamps. The two white lamps in the EXPLOSION indicator are spares.

7-11. The ABOVE GND HAZARD LIGHT lamps light green when HAZARD LIGHT pushbutton S15 is first pressed, indicating that the hazard lamps above ground have been lighted. The second pressing of this pushbutton results in an amber indication on the HAZARD LIGHT and causes the hazard lamp above ground to light amber. The third pressing of the pushbutton causes the HAZARD LIGHT to indicate red, the hazard lamp above ground to light red and warning horns above ground actuate. The fourth pressing causes the HAZARD LIGHT to light indicate a flashing red, the hazard lamp above ground to light red and warning horns above ground actuate to give a signal different from the preceding step. The fifth pressing results in a green indication on the HAZARD LIGHT and causes the hazard lamp above ground to light green.

#### **Note**

First application of power to the console will cause the HAZARD LIGHT to be in the amber mode.

7-12. SELF-VERIFY CIRCUITS. The self-verify circuits (figure 7-3) consists of the LAMP VERIFY switch, the BUZZER VERIFY switch, the FLASHER VERIFY switch, and the FLASHER TEST LIGHT. Setting LAMP VERIFY switch S1 to ON applies 28 VDC power to all spare lamps. This voltage is also sent to the control center circuits, where it is relayed back to operational lamps of the console through their respective monitoring circuits, thereby verifying operation of all lamps. FLASHER TEST LIGHT DS112 is verified if FLASHER VERIFY switch S19 is set to one of the two OFF positions.

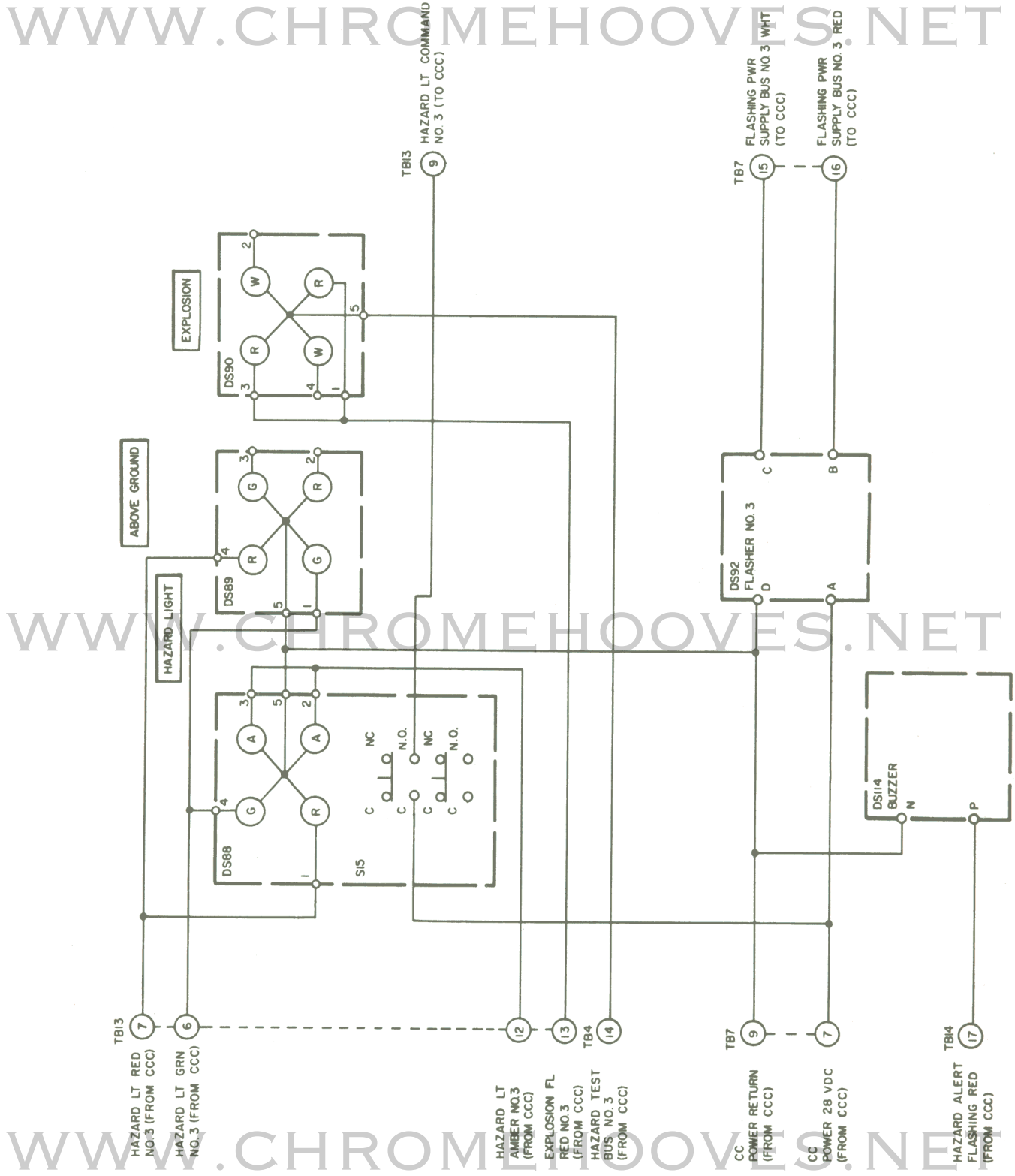


Figure 7-2. Monitoring Circuit Simplified Schematic

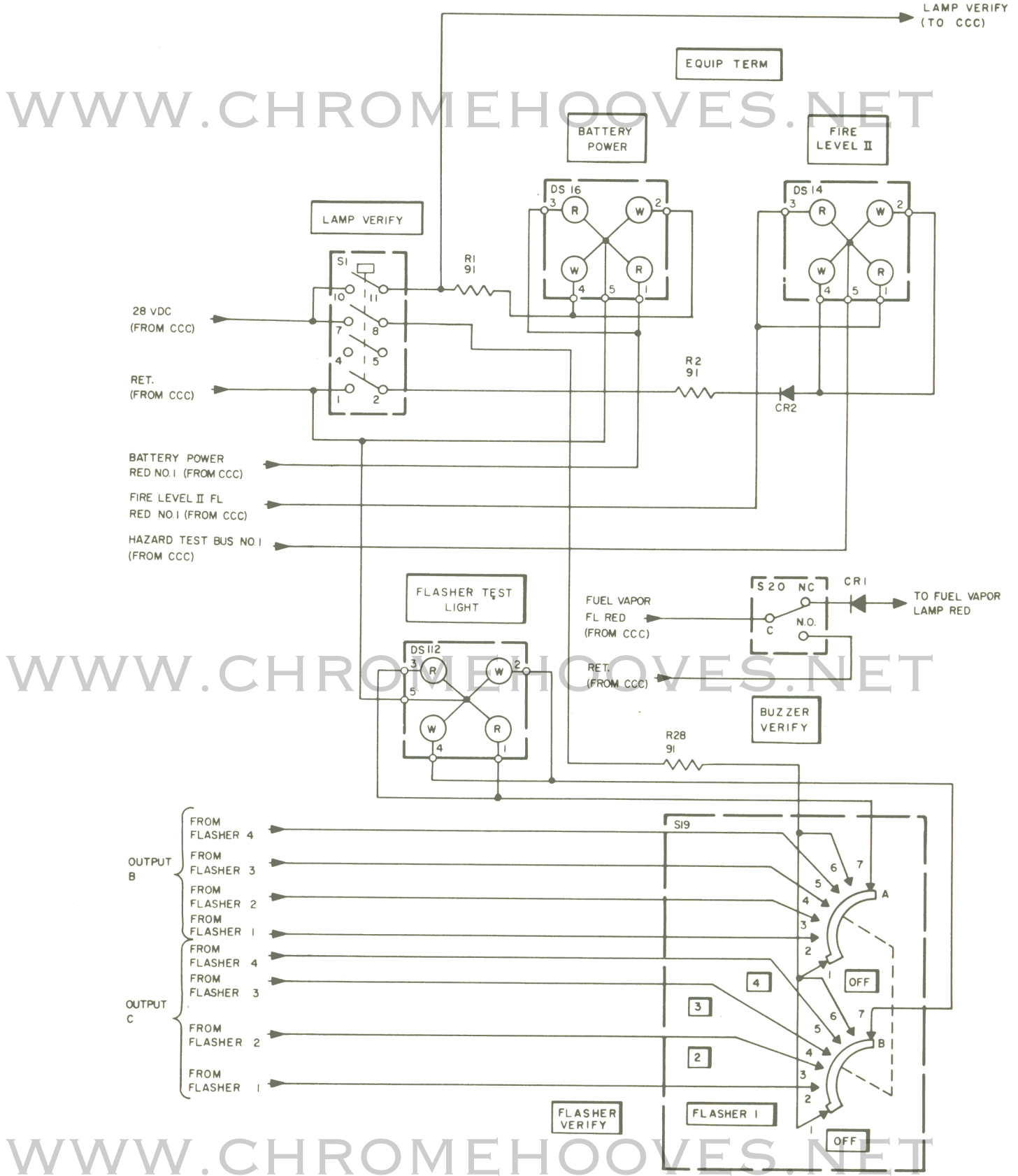


Figure 7-3. Self-Verify Circuits Simplified Schematic

5151-3-57C

7-13. Buzzer verification is accomplished by setting BUZZER VERIFY switch S20 to ON. When this switch is set to ON, the fuel vapor flashing red input is grounded, simulating a hazard. This simulated hazard causes the control center circuits to energize the buzzer in the launch complex facilities console.

7-14. FLASHER TEST LIGHT DS112 flashes alternately white and red when FLASHER VERIFY switch S19 is set to one of the four numbered positions. These numbered positions correspond to the flasher of the same number, indicating which of the four flashers is faulty. The FLASHER VERIFY output is sent directly to the FLASHER TEST LIGHT through the FLASHER VERIFY switch instead of being relayed through the control center circuits.

7-15. TEST SETUP.

7-16. To prepare the facilities console for checkout, proceed as follows:

- a. Disconnect all external wiring from control center circuits to terminal boards TB1 through TB14.
- b. Obtain test equipment listed in figure 3-1.
- c. Set power supply as near to lefthand access door of console as possible and open access door. Connections between power supply and console are given in checkout tables.
- d. Set multimeter on ohms scale and check for open circuit from terminals TB7-1, -3, -5, and -9, and TB14-20 to the static ground lug located on leg of console.

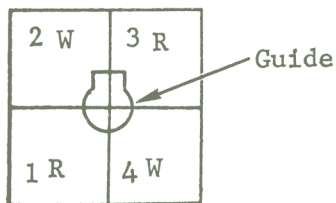
7-17. CHECKOUT.

7-18. Operation of the launch complex facilities console is verified by using standard test equipment and checkout procedures described in figures 7-4 through 7-11.

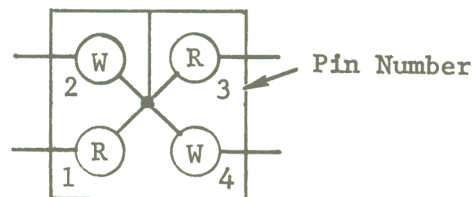
**Note**

During checkout, voltages and power supply returns are applied to the console terminals. Remove these voltages and disconnect power supply returns, at the completion of each step, unless instructed to do otherwise.

Normal indications during checkout are displayed by one or more quadrants of the indicator being checked. The quadrants of these indicators are relative to the guide position and are identical with corresponding pin numbers as indicated below.



Quadrant Designation



Schematic Designation

(Text continued on page 7-36.)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
1	Connect negative terminal of power supply to TB7-9. Do not remove connection until completion of checkout. Apply 28 VDC to TB2-12.	GROUND GUIDANCE lamp DS1 quadrant 1 lights white and DS2 quadrant 4 lights white.	Replace lamp.
2	Apply 28 VDC to TB2-13.	GROUND GUIDANCE lamp DS1 quadrants 2 and 3 light red.	Replace lamp.
3	Apply 28 VDC to TB2-14.	GROUND GUIDANCE lamp DS1 quadrant 4 lights green.	Replace lamp.
		GROUND GUIDANCE lamp DS2 quadrant 1 lights green.	Replace lamp.

Figure 7-4. Table of Checkout Procedures for Ground Guidance Indicators

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
<p style="text-align: center;"><b>Note</b></p> <p>Do not remove 28 VDC from TB-7 or power supply return from TB14-20 unless instructed to do so.</p> <p style="text-align: center;"><b>CAUTION</b></p> <p>This note applies when the console is connected to the missile launch system.</p> <p>During replacement of lamps and lamp modules of pushbutton indicators, use caution when replacing the lens cap to prevent actuation of the switch. The lens cap should be inserted until a barely audible clicking sound indicates that the locking mechanism has engaged. No additional pressure should be applied as this may actuate the switch.</p>			
1	Connect negative lead of multimeter and power supply return to TB14-20 and positive lead of multimeter to TB9-18. Apply 28 VDC to TB7-7. Press to close BLAST VALVES pushbutton S17.	Meter indicates 28(+2, -3) VDC.	Replace switch.
2	Remove 28 VDC from TB7-7.		
3	Connect positive lead of multimeter to TB11-18. Set meter to lowest ohm scale for resistance check. Press to close PUSH TO SILENCE pushbutton S18.	Meter indicates 0 ohms.	Replace switch.
4	Remove power supply return from TB14-20. Connect power supply return to TB14-1; then apply 28 VDC to TB7-7.	WIND lamp DS93 quadrants 1 and 3 light red.	Replace lamp.
5	Apply power supply return to TB14-2.	DOORS lamp DS94 quadrants 1 and 3 light red.	Replace lamp.
6	Apply power supply return to TB14-3.	DOORS lamp DS94 quadrants 2 and 4 light amber.	Replace lamp.

Figure 7-5. Table of Checkout Procedures for Common Facilities Indicators  
(Sheet 1 of 3)



STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
7	Apply power supply return to TB14-4.	ANT-1 DOOR lamp DS95 quadrants 1 and 3 light red.	Replace lamp.
8	Apply power supply return to TB14-5.	ANT-1 DOOR lamp DS95 quadrants 2 and 4 light amber.	Replace lamp.
9	Apply power supply return to TB14-6.	ANT-1 DOOR lamp DS95 quadrants 1 and 3 light red.	Replace lamp.
10	Apply power supply return to TB14-7.	ANT-2 DOOR lamp DS96 quadrants 2 and 4 light amber.	Replace lamp.
11	Remove 28 VDC from TB7-7.		
<b>Note</b>			
Do not remove 28 VDC from TB7-7, power supply return from TB7-9, or disconnect jumper wire from TB4-15 and TB7-18 unless instructed to do so.			
12	Connect jumper wire between TB4-15 and TB7-18. Apply power supply return to TB7-9 and TB14-8; then apply 28 VDC to TB7-7.	ABOVE GROUND lamp DS97 quadrants 1 and 3 flash red.	Replace lamp or flasher.
13	Apply power supply return to TB14-9.	LAUNCHER lamp DS98 quadrants 1 and 3 flash red.	Replace lamp or flasher.
14	Apply power supply return to TB14-10.	CONTROL CENTER lamp DS99 quadrants 1 and 3 flash red.	Replace lamp or flasher.
15	Apply power supply return to TB14-11.	POWER HOUSE lamp DS100 quadrants 1 and 3 flash red.	Replace lamp or flasher.
16	Apply power supply return to TB14-16.	EMERGENCY lamp DS105 quadrants 1 and 3 flash red.	Replace lamp or flasher.
17	Apply power supply return to TB9-15.	ATTACK lamp DS106 quadrants 1 and 3 flash red.	Replace lamp or flasher.
18	Apply power supply return to TB11-15. Before removing power supply return from TB11-15, complete step 19.	FUEL VAPOR lamp DS109 quadrants 1 and 3 flash red.	See step 1, figure 7-12.

Figure 7-5. Table of Checkout Procedures for Common Facilities Indicators  
(Sheet 2 of 3)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
19	Set BUZZER VERIFY switch to ON.	FUEL VAPOR lamp DS109 quadrants 1 and 3 go off while switch is set to ON.	Replace switch.
20	Remove 28 VDC from TB7-7 and power supply return from TB7-9; then disconnect jumper wire from TB4-15 and TB7-18.		
21	Apply power supply return TB14-12; then apply 28 VDC to TB7-7.	GEN 1 lamp DS101 quadrants 2 and 4 light white.	Replace lamp.
22	Apply power supply return to TB14-13.	GEN 2 lamp DS102 quadrants 2 and 4 light white.	Replace lamp.
23	Apply power supply return to TB14-14.	GEN 3 lamp DS103 quadrants 2 and 4 light white.	Replace lamp.
24	Apply power supply return to TB14-15.	GEN 4 lamp DS104 quadrants 2 and 4 light white.	Replace lamp.
25	Apply power supply return to TB9-16.	ESCAPE HATCH lamp DS107 quadrants 1 and 3 light red.	Replace lamp.
26	Apply power supply return to TB9-17.	BLAST VALVES lamps DS108 quadrants 2 and 4 light amber.	Replace lamp.
27	Remove 28 VDC from TB7-7; then connect power supply return to TB7-9.		
28	Apply 28 VDC to TB11-16.	FUEL FIRE lamp DS110 quadrants 1 and 3 light red.	Replace lamp.
29	Apply 28 VDC to TB11-17	FUEL FIRE lamp DS110 quadrants 2 and 4 light white.	Replace lamp.
30	Remove power supply return from TB7-9.		

Figure 7-5. Table of Checkout Procedures for Common Facilities Indicators  
(Sheet 3 of 3)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
<p style="text-align: center;"><b>Note</b></p> <p style="text-align: center;">Do not remove power supply return from TB7-1 and -9 until instructed to do so.</p> <div style="text-align: center; border: 1px dashed black; padding: 5px; width: fit-content; margin: 10px auto;"> <b>CAUTION</b> </div> <p style="text-align: center;">This note applies when the console is connected to the missile launch system.</p> <p style="text-align: center;">During replacement of lamps and lamp modules of pushbutton indicators, use caution when replacing the lens cap to prevent actuation of the switch. The lens cap should be inserted until a barely audible clicking sound indicates that the locking mechanism has engaged. No additional pressure should be applied as this may actuate the switch.</p>			
1	Apply 28 VDC to TB1-1 and power supply return to TB7-1 and -9.	MISSILE AND FACILITY lamp DS3 quadrants 1 and 3 light green.	Replace lamp.
2	Apply 28 VDC to TB1-2.	MISSILE AND FACILITY lamp DS3 quadrants 2 and 4 light red.	Replace lamp.
3	Apply 28 VDC to TB1-4. Before removing 28 VDC from TB1-4, complete step 4.	Check for 28(+2, -3) VDC at TB1-3. If 28 (+2, -3) VDC is not present, press MISSILE AND FACILITY pushbutton S2 once to close switch.	Replace switch.
4	Press to release MISSILE AND FACILITY pushbutton S2.	Check for 0 V at TB1-3.	Replace switch.
5	Apply 28 VDC to TB1-5.	GUIDANCE lamp DS4 quadrants 1 and 3 light red.	Replace lamp.
6	Apply 28 VDC to TB1-6.	GUIDANCE lamp DS4 quadrants 2 and 4 light amber.	Replace lamp.
7	Apply 28 VDC to TB1-7.	FLIGHT CONTROL lamp DS5 quadrants 1 and 3 light red.	Replace lamp.

Figure 7-6. Table of Checkout Procedures for Launcher NO. 1 Indicators (Sheet 1 of 6)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
8	Apply 28 VDC to TB1-8.	FLIGHT CONTROL lamp DS5 quadrants 2 and 4 light amber.	Replace lamp.
9	Apply 28 VDC to TB1-9.	GROUND POWER lamp DS6 quadrants 2 and 4 light amber. GROUND POWER lamp DS7 quadrant 1 lights white.	Replace resistor or lamp. Replace lamp.
10	Apply 28 VDC to TB1-10	GROUND POWER lamp DS6 quadrants 1 and 3 light red. GROUND POWER lamp DS7 quadrant 4 lights red.	Replace resistor or lamp. Replace lamp.
11	Apply 28 VDC to TB1-11.	GROUND POWER lamp DS7 quadrants 2 and 3 light amber.	Replace lamp.
12	Apply 28 VDC to TB1-12.	ENGINE lamp DS8 quadrants 1 and 3 light red.	Replace lamp.
13	Apply 28 VDC to TB1-13.	ENGINE lamp DS8 quadrants 2 and 4 light amber.	Replace lamp.
14	Apply 28 VDC to TB1-14.	PROP LOAD & PRESS lamp DS9 quadrants 1 and 3 light red.	Replace lamp.
15	Apply 28 VDC to TB1-15.	PROP LOAD & PRESS lamp DS9 quadrants 2 and 4 light amber.	Replace lamp.
16	Apply 28 VDC to TB2-5.	LAUNCHER lamp DS10 quadrants 1 and 3 light red.	Replace lamp.
17	Apply 28 VDC to TB2-6.	LAUNCHER lamp DS10 quadrants 2 and 4 light amber.	Replace lamp.
18	Apply 28 VDC to TB2-1.	RE-ENTRY VEHICLE lamp DS11 quadrants 1 and 3 light red.	Replace lamp.
19	Apply 28 VDC to TB2-2.	RE-ENTRY VEHICLE lamp DS11 quadrants 2 and 4 light amber.	Replace lamp.

Figure 7-6. Table of Checkout Procedures for Launcher NO. 1 Indicators (Sheet 2 of 6)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
20	Apply 28 VDC to TB2-3.	LAUNCH SEQ'R lamp DS12 quadrants 1 and 3 light red.	Replace lamp.
21	Apply 28 VDC to TB2-4.	LAUNCH SEQ'R lamp DS12 quadrants 2 and 4 light amber.	Replace lamp.
22	Apply 28 VDC to TB1-16.	CONTROL CENTER CIRCUITS lamp DS13 quadrants 2 and 4 light amber.	Replace lamp.
23	Apply 28 VDC to TB1-17.	CONTROL CENTER CIRCUITS lamp DS13 quadrants 1 and 3 light red.	Replace lamp.
<b>Note</b>			
Do not remove 28 VDC from TB7-7 or disconnect jumper wire from TB4-12 and TB7-12 unless instructed to do so.			
24	Connect jumper wire between TB4-12 and TB7-12. Apply power supply return to TB2-7. Apply 28 VDC to TB7-7.	FIRE LEVEL II lamp DS14 quadrants 1 and 3 flash red.	Replace lamp or flasher.
25	Apply power supply return to TB9-2.	LOX FIRE lamp DS25 quadrants 1 and 3 flash red.	Replace lamp or flasher.
26	Apply power supply return to TB9-13.	EXPLOSION lamp DS30 quadrants 1 and 3 flash red.	Replace lamp or flasher.
27	Remove 28 VDC from TB7-7; then disconnect jumper wire between TB4-12 and TB7-12.		
28	Apply 28 VDC to TB2-8.	HYDRAULIC FIRE lamp DS15 quadrants 1 and 3 light red.	Replace lamp.
29	Apply 28 VDC to TB2-9.	HYDRAULIC FIRE lamp DS15 quadrants 2 and 4 light white.	Replace lamp.
30	Apply 28 VDC to TB2-10.	BATTERY POWER lamp DS16 quadrants 1 and 3 light red.	Replace lamp.
31	Apply 28 VDC to TB8-1.	FUEL MISSILE lamp DS17 quadrants 1 and 3 light red.	Replace lamp.

Figure 7-6. Table of Checkout Procedures for Launcher NO. 1 Indicators (Sheet 3 of 6)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
32	Apply 28 VDC to TB8-2.	FUEL MISSILE lamp DS17 quadrants 2 and 4 light white.	Replace lamp.
33	Apply 28 VDC to TB8-3.	GOX lamp DS18 quadrants 1 and 3 light red.	Replace lamp.
34	Apply 28 VDC to TB8-4.	GOX lamp DS18 quadrants 2 and 4 light white.	Replace lamp.
35	Apply 28 VDC to TB8-5.	FUEL SUMP lamp DS19 quadrants 1 and 3 light red.	Replace lamp.
36	Apply 28 VDC to TB8-6.	FUEL SUMP lamp DS19 quadrants 2 and 4 light white.	Replace lamp.
37	Apply 28 VDC to TB8-7.	LOX SUMP lamp DS20 quadrants 1 and 3 light red.	Replace lamp.
38	Apply 28 VDC to TB8-8.	LOX SUMP lamp DS20 quadrants 2 and 4 light white.	Replace lamp.
39	Apply 28 VDC to TB8-9.	FIRE lamp DS21 quadrants 2 and 4 light white.	Replace lamp.
		FOG OFF lamp DS22 quadrants 2 and 4 light white.	Replace lamp.
40	Apply 28 VDC to TB8-10.	FIRE lamp DS21 quadrants 1 and 3 light red.	Replace lamp.
41	Apply 28 VDC to TB7-7.		
42	Press to close FOG OFF push-button S3.	Check for 28(+2, -3) VDC at TB9-1 while FOG OFF push-button is pressed closed.	Replace switch.
43	Apply power supply return to TB8-11.	AUTO FOG DISABLE lamp DS23 quadrants 2 and 4 light amber.	Replace lamp.
44	Press to close AUTO FOG DISABLE pushbutton S4.	Check for 28(+2, -3) VDC at TB8-12. If 28 (+2, -3) VDC is not present, press push-button one time.	Replace switch.
45	Press to release AUTO FOG DISABLE pushbutton S4.	Check for 0 V at TB8-12.	Replace switch.

Figure 7-6. Table of Checkout Procedures for Launcher NO. 1 Indicators (Sheet 4 of 6)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
46	Apply power supply return to TB8-13.	SIL0 DOOR lamp DS24 quadrants 2 and 4 light amber.	Replace lamp.
47	Remove 28 VDC from TB7-7.		
48	Apply 28 VDC to TB9-3.	GOX lamp DS26 quadrants 1 and 3 light red.	Replace lamp.
49	Apply 28 VDC to TB9-4.	LOX EMPTY lamp DS27 quadrants 1 and 3 light red.	Replace lamp.
50	Apply 28 VDC to TB9-6.	HAZARD LIGHT DS28 quadrant 4 lights green.	Replace lamp.
		HAZARD LIGHT DS29 quadrant 1 lights green.	Replace lamp.
51	Apply 28 VDC to TB9-7.	HAZARD LIGHT DS28 quadrant 1 lights red.	Replace lamp.
		HAZARD LIGHT DS29 quadrant 4 lights red.	Replace lamp.
52	Apply 28 VDC to TB9-12.	HAZARD LIGHT DS28 quadrants 2 and 3 light amber.	Replace lamp.
53	Apply 28 VDC to TB7-7.		
54	Press to close HAZARD LIGHT pushbutton S5.	Check for 28(+2, -3) VDC at TB9-9.	Replace switch.
55	Apply power supply return to TB9-5.	BLAST DOORS lamp DS31 lamp quadrants 1 and 3 light red.	Replace lamp.
56	Apply power supply return to TB9-19.	ABOVE GROUND WATER DS115 quadrants 2 and 4 light white.	Replace lamp.
57	Apply 28 VDC to TB7-7. Press to close WATER EMER. OFF pushbutton DS118.	WATER EMER OFF DS118 quadrants 2 and 4 light amber. If quadrants 2 and 4 do not light, press WATER EMER. OFF pushbutton.	Replace switch, diode CR7, or lamp.
		Check for 28(+2, -3) VDC at TB1-18.	Repair wiring.

Figure 7-6. Table of Checkout Procedures for Launcher NO. 1 Indicators (Sheet 5 of 6)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
		Check for 28(+2, -3) VDC at TB1-19.	Replace switch or CR8.
58	Press to release WATER EMER. OFF pushbutton S24.	Check for 0 V at TB1-18, and -19.	Replace switch.
59	Press to close ABOVE GROUND WATER pushbutton S21.	Check for 28(+2, -3) VDC at TB9-20. If 28(+2, -3) VDC is not present, press ABOVE GROUND WATER pushbutton once.	Replace switch.
60	Press to release ABOVE GROUND WATER pushbutton S21.	Check for 0 V at TB9-20.	Replace switch.
61	Remove 28 VDC from TB7-7.		
62	Remove connections made in step 1.		

Figure 7-6. Table of Checkout Procedures for Launcher NO. 1 Indicators (Sheet 6 of 6)



STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
	<p style="text-align: center;"><b>Note</b></p> <p>Do not remove power supply from TB7-3 and -9 until instructed to do so.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p style="text-align: center;"><b>CAUTION</b></p> </div> <p>This note applies when the console is connected to the missile launch system.</p> <p>During replacement of lamps and lamp modules of pushbutton indicators, use caution when replacing the lens cap to prevent actuation of the switch. The lens cap should be inserted until a barely audible clicking sound indicates that the locking mechanism has engaged. No additional pressure should be applied as this may actuate the switch.</p>		
1	Apply 28 VDC to TB3-1 and power supply return to TB7-3 and -9.	MISSILE AND FACILITY lamp DS33 quadrants 1 and 3 light green.	Replace lamp.
2	Apply 28 VDC to TB3-2	MISSILE AND FACILITY lamp DS33 quadrants 2 and 4 light red.	Replace lamp.
3	Apply 28 VDC to TB3-4. Before removing 28 VDC from TB3-4, complete step 4.	Check for 28(+2, -3) VDC at TB3-3. If 28 (+2, -3) VDC is not present, press MISSILE AND FACILITY pushbutton S7 once to close switch.	Replace switch.
4	Press to release MISSILE AND FACILITY pushbutton S7.	Check for 0 V at TB3-3.	Replace switch.
5	Apply 28 VDC to TB3-5.	GUIDANCE lamp DS34 quadrants 1 and 3 light red.	Replace lamp.
6	Apply 28 VDC to TB3-6.	GUIDANCE lamp DS34 quadrants 2 and 4 light amber.	Replace lamp.
7	Apply 28 VDC to TB3-7.	FLIGHT CONTROL lamp DS35 quadrants 1 and 3 light red.	Replace lamp.
8	Apply 28 VDC to TB3-8.	FLIGHT CONTROL lamp DS35 quadrants 2 and 4 light amber.	Replace lamp.

Figure 7-7. Table of Checkout Procedures for Launcher NO. 2 Indicators (Sheet 1 of 6)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
9	Apply 28 VDC to TB3-9.	GROUND POWER lamp DS36 quadrants 2 and 4 light white.	Replace resistor or lamp.
		GROUND POWER lamp DS37 quadrant 1 lights white.	Replace lamp.
10	Apply 28 VDC to TB3-10.	GROUND POWER lamp DS36 quadrants 1 and 3 light red.	Replace resistor or lamp.
		GROUND POWER lamp DS37 quadrant 4 lights red.	Replace lamp.
11	Apply 28 VDC to TB3-11.	GROUND POWER lamp DS37 quadrants 2 and 3 light amber.	Replace lamp.
12	Apply 28 VDC to TB3-12.	ENGINE lamp DS38 quadrants 1 and 3 light red.	Replace lamp.
13	Apply 28 VDC to TB3-13.	ENGINE lamp DS38 quadrants 2 and 4 light amber.	Replace lamp.
14	Apply 28 VDC to TB3-14.	PROP LOAD & PRESS lamp DS39 quadrants 1 and 3 light red.	Replace lamp.
15	Apply 28 VDC to TB3-15.	PROP LOAD & PRESS lamp DS39 quadrants 2 and 4 light amber.	Replace lamp.
16	Apply 28 VDC to TB4-5.	LAUNCHER lamp DS40 quadrants 1 and 3 light red.	Replace lamp.
17	Apply 28 VDC to TB4-6.	LAUNCHER lamp DS40 quadrants 2 and 4 light amber.	Replace lamp.
18	Apply 28 VDC to TB4-1.	RE-ENTRY VEHICLE lamp DS41 quadrants 1 and 3 light red.	Replace lamp.
19	Apply 28 VDC to TB4-2.	RE-ENTRY VEHICLE lamp DS41 quadrants 2 and 4 light amber.	Replace lamp.
20	Apply 28 VDC to TB4-3.	LAUNCH SEQ'R lamp DS42 quadrants 1 and 3 light red.	Replace lamp.

Figure 7-7. Table of Checkout Procedures for Launcher NO. 2 Indicators  
(Sheet 2 of 6)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
21	Apply 28 VDC to TB4-4.	LAUNCH SEQ'R lamp DS42 quadrants 2 and 4 light amber.	Replace lamp.
22	Apply 28 VDC to TB3-16.	CONTROL CENTER CIRCUITS lamp DS43 quadrants 2 and 4 light amber.	Replace lamp.
23	Apply 28 VDC to TB3-17.	CONTROL CENTER CIRCUITS lamp DS43 quadrants 1 and 3 light red.	Replace lamp.
24	Apply 28 VDC to TB10-3.	GOX lamp DS48 quadrants 1 and 3 light red.	Replace lamp.
25	Apply 28 VDC to TB10-4.	GOX lamp DS48 quadrants 2 and 4 light white.	Replace lamp.
26	Apply 28 VDC to TB10-5.	FUEL SUMP lamp DS49 quadrants 1 and 3 light red.	Replace lamp.
27	Apply 28 VDC to TB10-6.	FUEL SUMP lamp DS49 quadrants 2 and 4 light white.	Replace lamp.
28	Apply 28 VDC to TB10-7.	LOX SUMP lamp DS50 quadrants 1 and 3 light red.	Replace lamp.
29	Apply 28 VDC to TB10-8.	LOX SUMP lamp DS50 quadrants 2 and 4 light white.	Replace lamp.
<b>Note</b>			
Do not remove 28VDC from TB7-7 or disconnect jumper wire from TB4-13 and TB7-14 unless instructed to do so.			
30	Connect jumper wire between TB4-13 and TB7-14. Apply 28 VDC to TB7-7. Apply power supply return to TB4-7.	FIRE LEVEL II lamp DS44 quadrants 1 and 3 flash red.	Replace lamp or flasher.
31	Apply power supply return to TB11-2.	LOX FIRE lamp DS55 quadrants 1 and 3 flash red.	Replace lamp.
32	Apply power supply return to TB11-13.	EXPLOSION lamp DS60 quadrants 1 and 3 flash red.	Replace lamp or flasher.

Figure 7-7 Table of Checkout Procedures for Launcher NO. 2 Indicators  
(Sheet 3 of 6)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
33	Remove 28 VDC from TB7-7; then disconnect jumper wire between TB4-13 and TB7-14.		
34	Apply 28 VDC to TB4-8.	HYDRAULIC FIRE lamp DS45 quadrants 1 and 3 light red.	Replace lamp.
35	Apply 28 VDC to TB4-9.	HYDRAULIC FIRE lamp DS45 quadrants 2 and 4 light white.	Replace lamp.
36	Apply 28 VDC to TB4-10.	BATTERY POWER lamp DS46 quadrants 1 and 3 light red.	Replace lamp.
37	Apply 28 VDC to TB10-1.	FUEL MISSILE lamp DS47 quadrants 1 and 3 light red.	Replace lamp.
38	Apply 28 VDC to TB10-2.	FUEL MISSILE lamp DS47 quadrants 2 and 4 light white.	Replace lamp.
39	Apply 28 VDC to TB10-9.	FIRE lamp DS51 quadrants 2 and 4 light white.  FOG OFF lamp DS52 quadrants 2 and 4 light white.	Replace lamp.  Replace lamp.
40	Apply 28 VDC to TB10-10.	FIRE lamp DS51 quadrants 1 and 3 light red.	Replace lamp.
41	Apply 28 VDC to TB7-7.		
42	Press to close FOG OFF pushbutton S8.	Check for 28(+2, -3) VDC at TB11-1 while FOG OFF pushbutton is pressed closed.	Replace switch.
43	Apply power supply return to TB10-11.	AUTO FOG DISABLE lamp DS53 quadrants 2 and 4 light amber.	Replace lamp.
44	Press to close AUTO FOG DISABLE pushbutton S9.	Check for 28(+2, -3) VDC at TB10-12. If 28(+2, -3) VDC is not present, press to close AUTO FOG DISABLE pushbutton once.	Replace switch.
45	Press to release AUTO FOG DISABLE pushbutton S9.	Check for 0 V at TB10-12.	Replace switch.

Figure 7-7. Table of Checkout Procedures for Launcher NO. 2 Indicators  
(Sheet 4 of 6)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
46	Apply power supply return to TB10-13.	SILO DOOR lamp DS54 quadrants 2 and 4 light amber.	Replace lamp.
47	Remove 28 VDC from TB7-7; then apply 28 VDC to TB11-3.	GOX lamp DS56 quadrants 1 and 3 light red.	Replace lamp.
48	Apply 28 VDC to TB11-4.	LOX EMPTY lamp DS57 quadrants 1 and 3 light red.	Replace lamp.
49	Apply 28 VDC to TB11-6.	HAZARD LIGHT DS58 quadrant 4 lights green.	Replace lamp.
		HAZARD LIGHT DS59 quadrant 1 lights green.	Replace lamp.
50	Apply 28 VDC to TB11-7.	HAZARD LIGHT DS58 quadrant 1 lights red.	Replace lamp.
		HAZARD LIGHT DS59 quadrant 4 lights red.	Replace lamp.
51	Apply 28 VDC to TB11-12.	HAZARD LIGHT DS58 quadrant 2 and 3 light amber.	Replace lamp.
52	Press to close HAZARD LIGHT switch S10.	Check for 28(+2, -3) VDC at TB11-9.	Replace switch.
53	Apply power supply return to TB11-5; then apply 28 VDC to TB7-7.	BLAST DOORS lamp DS61 quadrants 1 and 3 light red.	Replace lamp.
54	Apply power supply return to TB11-19.	ABOVE GROUND WATER lamp DS116 quadrants 2 and 4 light white.	Replace lamp.
55	Press WATER EMER. OFF pushbutton S25.	WATER EMER. OFF lamp DS119 quadrants 2 and 4 light amber. If quadrants 2 and 4 do not light, press WATER EMER. OFF pushbutton once.	Replace switch, diode CR10, or lamp.
		Check for 28(+2, -3)VDC at TB3-18.	Repair wiring.
		Check for 28(+2, -3) VDC at TB3-19.	Replace switch or diode CR11.

Figure 7-7. Table of Checkout Procedures for Launcher NO. 2 Indicators  
(Sheet 5 of 6)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
56	Press to release WATER EMER. OFF pushbutton S25.	Check for 0 V at TB3-18, and -19.	Replace switch.
57	Press to close ABOVE GROUND WATER pushbutton S22.	Check for 28(+2, -3) VDC at TB11-20. If 28(+2, -3) VDC is not present, press to close ABOVE GROUND WATER pushbutton once.	Replace switch.
58	Press to release ABOVE GROUND WATER pushbutton S22.	Check for 0 V at TB11-20.	Replace switch.
59	Remove 28 VDC from TB7-7.		
60	Remove connections made in step 1.		

Figure 7-7. Table of Checkout Procedures for Launcher NO. 2 Indicator  
(Sheet 6 of 6)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
<p style="text-align: center;"><b>Note</b></p> <p>Do not remove power supply return from TB7-5 unless instructed to do so.</p> <p style="text-align: center;"><b>CAUTION</b></p> <p>This note applies when the console is connected to the missile launch system.</p> <p>During replacement of lamps and lamp modules of pushbutton indicators use caution when replacing the lens cap to prevent actuation of the switch. The lens cap should be inserted until a barely audible clicking sound indicates that the locking mechanism has engaged. No additional pressure should be applied as this may actuate the switch.</p>			
1	Apply 28 VDC to TB5-1, and apply power supply return to TB7-5.	MISSILE AND FACILITY lamp DS63 quadrants 1 and 3 light green.	Replace lamp.
2	Apply 28 VDC to TB5-2.	MISSILE AND FACILITY lamp DS63 quadrants 2 and 4 light red.	Replace lamp.
3	Apply 28 VDC to TB5-4. Before removing 28 VDC from TB5-4, complete step 5.		
4	Press to close MISSILE AND FACILITY pushbutton S12.	Check for 28(+2, -3) VDC at TB5-3. If 28(+2, -3) VDC is not present, press MISSILE AND FACILITY S12 once to close switch.	Replace switch.
5	Press to release MISSILE AND FACILITY pushbutton S12.	Check for 0 V at TB5-3.	Replace switch.
6	Apply 28 VDC to TB5-9.	GROUND POWER lamp DS67 quadrant 1 lights white.  GROUND POWER lamp DS66 quadrants 2 and 4 light white.	Replace lamp.  Replace lamp or resistor.
7	Apply 28 VDC to TB5-10.	GROUND POWER lamp DS66 quadrants 1 and 3 light red.	Replace resistor or lamp.

Figure 7-8. Table of Checkout Procedures for Launcher NO. 3 Indicators (Sheet 1 of 6)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
		GROUND POWER lamp DS67 quadrant 4 lights red.	Replace lamp.
8	Apply 28 VDC to TB5-11.	GROUND POWER lamp DS67 quadrants 2 and 3 light amber.	Replace lamp.
9	Apply 28 VDC to TB5-12.	ENGINE lamp DS68 quadrants 1 and 3 light red.	Replace lamp.
10	Apply 28 VDC to TB5-13.	ENGINE lamp DS68 quadrants 2 and 4 light amber.	Replace lamp.
11	Apply 28 VDC to TB5-14.	PROP LOAD & PRESS lamp DS69 quadrants 1 and 3 light red.	Replace lamp.
12	Apply 28 VDC to TB5-15.	PROP LOAD & PRESS lamp DS69 quadrants 2 and 4 light amber.	Replace lamp.
13	Apply 28 VDC to TB6-5.	LAUNCHER lamp DS70 quadrants 1 and 3 light red.	Replace lamp.
14	Apply 28 VDC to TB6-6.	LAUNCHER lamp DS70 quadrants 2 and 4 light amber.	Replace lamp.
15	Apply 28 VDC to TB6-1.	RE-ENTRY VEHICLE lamp DS71 quadrants 1 and 3 light red.	Replace lamp.
16	Apply 28 VDC to TB6-2.	RE-ENTRY VEHICLE lamp DS71 quadrants 2 and 4 light amber.	Replace lamp.
17	Apply 28 VDC to TB6-3.	LAUNCH SEQ'R lamp DS72 quadrants 1 and 3 light red.	Replace lamp.
18	Apply 28 VDC to TB6-4.	LAUNCH SEQ'R lamp DS72 quadrants 2 and 4 light amber.	Replace lamp.
19	Apply 28 VDC to TB5-16.	CONTROL CENTER CIRCUITS lamp DS73 quadrants 2 and 4 light amber.	Replace lamp.
20	Apply 28 VDC to TB5-17.	CONTROL CENTER CIRCUITS lamp DS73 quadrants 1 and 3 light red.	Replace lamp.

Figure 7-8. Table of Checkout Procedures for Launcher NO. 3 Indicators (Sheet 2 of 6)



STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
21	Apply 28 VDC to TB5-5.	GUIDANCE lamp DS64 quadrants 1 and 3 light red.	Replace lamp.
22	Apply 28 VDC to TB5-6.	GUIDANCE lamp DS64 quadrants 2 and 4 light amber.	Replace lamp.
23	Apply 28 VDC to TB5-7.	FLIGHT CONTROL lamp DS65 quadrants 1 and 3 light red.	Replace lamp.
24	Apply 28 VDC to TB5-8.	FLIGHT CONTROL lamp DS65 quadrants 2 and 4 light amber.	Replace lamp.
25	Remove power supply return from TB7-5.		
<b>Note</b>			
Do not remove 28 VDC from TB7-7 and power supply return from TB7-9 and do not disconnect jumper wire between TB4-14 and TB7-16 unless instructed to do so.			
26	Connect jumper wire between TB4-14 and TB7-16. Apply power supply return to TB6-7 and TB7-9; then apply 28 VDC to TB7-7.	FIRE LEVEL II lamp DS74 quadrants 1 and 3 flash red.	Replace lamp or flasher.
27	Apply power supply return to TB13-2.	LOX FIRE lamp DS85 quadrants 1 and 3 flash red.	Replace switch or flasher.
28	Apply power supply return to TB13-13.	EXPLOSION lamp DS90 quadrants 1 and 3 flash red.	Replace lamp or flasher.
29	Remove 28 VDC from TB7-7; then disconnect jumper wire between TB4-14 and TB7-16.		
30	Apply 28 VDC to TB6-8.	HYDRAULIC FIRE lamp DS75 quadrants 1 and 3 light red.	Replace lamp.
31	Apply 28 VDC to TB6-9.	HYDRAULIC FIRE lamp DS75 quadrants 2 and 4 light white.	Replace lamp.

Figure 7-8. Table of Checkout Procedures for Launcher NO. 3 Indicators (Sheet 3 of 6)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
32	Apply 28 VDC to TB6-10.	BATTERY POWER lamp DS76 quadrants 1 and 3 light red.	Replace lamp.
33	Apply 28 VDC to TB12-1.	FUEL MISSILE lamp DS77 quadrants 1 and 3 light red.	Replace lamp.
34	Apply 28 VDC to TB12-2.	FUEL MISSILE lamp DS77 quadrants 2 and 4 light white.	Replace lamp.
35	Apply 28 VDC to TB12-3.	GOX lamp DS78 quadrants 1 and 3 light red.	Replace lamp.
36	Apply 28 VDC to TB12-4.	GOX lamp DS78 quadrants 2 and 4 light white.	Replace lamp.
37	Apply 28 VDC to TB12-5.	FUEL SUMP lamp DS79 quadrants 1 and 3 light red.	Replace lamp.
38	Apply 28 VDC to TB12-6.	FUEL SUMP lamp DS79 quadrants 2 and 4 light white.	Replace lamp.
39	Apply 28 VDC to TB12-7.	LOX SUMP lamp DS80 quadrants 1 and 3 light red.	Replace lamp.
40	Apply 28 VDC to TB12-8.	LOX SUMP lamp DS80 quadrants 2 and 4 light white.	Replace lamp.
41	Apply 28 VDC to TB12-9.	FIRE lamp DS81 quadrants 2 and 4 light white.	Replace lamp.
42	Apply 28 VDC to TB12-10.	FOG OFF lamp DS82 quadrants 2 and 4 light white.	Replace lamp.
43	Apply 28 VDC to TB7-7.	FIRE lamp DS81 quadrants 1 and 3 light red.	Replace lamp.
44	Press to close FOG OFF push-button S13.	Check for 28(+2, -3) VDC at TB13-1 while FOG OFF push-button is closed.	Replace switch.

**Note**

Do not remove 28 VDC from TB7-7 unless instructed to do so.

Figure 7-8. Table of Checkout Procedures for Launcher NO. 3 Indicators (Sheet 4 of 6)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
45	Apply power supply return to TB12-11.	AUTO FOG DISABLE lamp DS83 quadrants 2 and 4 light amber.	Replace lamp.
46	Apply 28 VDC to TB7-7.		
47	Press to close AUTO FOG DISABLE pushbutton S14.	Check for 28(+2, -3) VDC at TB12-12. If 28(+2, -3) VDC is not present, press pushbutton one time.	Replace switch.
48	Press to release AUTO FOG DISABLE pushbutton S14.	Check for 0 V at TB12-12.	Replace switch.
49	Remove 28 VDC from TB7-7.		
50	Apply power supply return to TB12-13.	SILO DOOR lamp DS84 quadrants 2 and 4 light amber.	Replace lamp.
51	Apply power supply return to TB7-9; then apply 28 VDC to TB13-3.	GOX lamp DS86 quadrants 1 and 3 light red.	Replace lamp.
52	Apply 28 VDC to TB13-4.	LOX EMPTY lamp DS87 quadrants 1 and 3 light red.	Replace lamp.
53	Apply 28 VDC to TB13-6.	HAZARD LIGHT DS88 quadrant 4 lights green. HAZARD LIGHT DS89 quadrant 1 lights green.	Replace lamp. Replace lamp.
54	Apply 28 VDC to TB13-7.	HAZARD LIGHT DS88 quadrant 1 lights red. HAZARD LIGHT DS89 quadrant 4 lights red.	Replace lamp. Replace lamp.
55	Apply 28 VDC to TB13-12.	HAZARD LIGHT DS88 quadrants 2 and 3 light amber.	Replace lamp.
56	Apply 28 VDC to TB7-7.		
57	Press to close HAZARD LIGHT pushbutton S15.	Check for 28(+2, -3) VDC at TB13-9.	Replace switch.

Figure 7-8. Table of Checkout Procedures for Launcher NO. 3 Indicators (Sheet 5 of 6)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
58	Apply power supply return to TB13-5.	BLAST DOOR lamp DS91 quadrants 1 and 3 light red.	Replace lamp.
59	Apply power supply return to TB13-19.	ABOVE GROUND WATER DS117 quadrants 2 and 4 light white.	Replace lamp.
60	Press to close WATER EMER. OFF pushbutton S26.	WATER EMER. OFF lamp DS120 quadrants 2 and 4 light amber. If quadrants 2 and 4 do not light, press WATER EMER. OFF pushbutton once.  Check for 28(+2, -3) VDC at TB5-18.  Check for 28(+2, -3) VDC at TB5-19.	Replace switch, diode CR13, or lamp.  Repair wiring.  Replace switch or diode CR14.
61	Press to release WATER EMER. OFF pushbutton S26.	Check for 0 V at TB5-18 and -19.	Replace switch.
62	Press to close ABOVE GROUND WATER pushbutton S23.	Check for 28(+2, -3) VDC at TB13-20. If 28(+2, -3) VDC is not present, press to close ABOVE GROUND WATER pushbutton once.	Replace switch.
63	Press to release ABOVE GROUND WATER pushbutton S23.	Check for 0 V at TB13-20.	Replace switch.
64	Remove 28 VDC from TB7-7.		
65	Remove connections made in step 1.		

Figure 7-8. Table of Checkout Procedures for Launcher NO. 3 Indicators (Sheet 6 of 6)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
1	<p style="text-align: center;"><b>CAUTION</b></p> <p>This note applies when the console is connected to the missile launch system.</p> <p>During replacement of lamps and lamp modules of pushbutton indicators, use caution when replacing the lens cap to prevent actuation of the switch. The lens cap should be inserted until a barely audible clicking sound indicates that the locking mechanism has engaged. No additional pressure should be applied as this may actuate the switch.</p> <p>Set <b>FLASHER VERIFY</b> switch to one of the <b>OFF</b> positions. Set and hold <b>LAMP VERIFY</b> switch to <b>ON</b>. Apply 28 VDC to TB7-7. Apply power supply return to TB7-9.</p>	<p><b>GROUND GUIDANCE</b> lamp DS2 quadrant 2 lights white and quadrant 3 lights green.</p> <p><b>BATTERY POWER</b> lamp DS16 quadrants 2 and 4 light white.</p> <p><b>FOG OFF</b> lamp DS22 quadrants 1 and 3 light red.</p> <p><b>AUTO FOG DISABLE</b> lamp DS23 quadrants 1 and 3 light red.</p> <p><b>SILO DOOR</b> lamp DS24 quadrants 1 and 3 light red.</p> <p><b>GOX</b> lamp DS26 quadrants 2 and 4 light white.</p> <p><b>LOX EMPTY</b> lamp DS27 quadrants 2 and 4 light white.</p> <p><b>HAZARD LIGHT</b> DS29 quadrant 2 lights red and quadrant 3 lights green.</p> <p><b>BLAST DOORS</b> lamp DS31 quadrants 2 and 4 light white.</p>	<p>See step 1, figure 7-13.</p> <p>Replace lamp.</p> <p>See step 2, figure 7-13.</p> <p>See step 3, figure 7-13.</p> <p>Replace lamp.</p> <p>See step 4, figure 7-13.</p> <p>Replace lamp.</p> <p>Replace lamp.</p> <p>See step 5, figure 7-13.</p>

Figure 7-9. Table of Checkout Procedures for Lamp Verify Circuit (Sheet 1 of 5)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
		ABOVE GROUND WATER lamp DS115 quadrants 1 and 3 light red.	Replace lamp.
		BATTERY POWER lamp DS46 quadrants 2 and 4 light white.	See step 6, figure 7-13.
		FOG OFF lamp DS52 quadrants 1 and 3 light red.	See step 7, figure 7-13.
		AUTO FOG DISABLE lamp DS53 quadrants 1 and 3 light red.	See step 8, figure 7-13.
		SILO DOOR lamp DS54 quadrants 1 and 3 light red.	Replace lamp.
		GOX lamp DS56 quadrants 2 and 4 light white.	See step 9, figure 7-13.
		LOX EMPTY lamp DS57 quadrants 2 and 4 light white.	Replace lamp.
		HAZARD LIGHT DS59 quadrant 2 lights red and quadrant 3 lights green.	Replace lamp.
		BLAST DOORS lamp DS61 quadrants 2 and 4 light white.	See step 10, figure 7-13.
		ABOVE GROUND WATER DS116 quadrants 1 and 3 light red.	Replace lamp.
		BATTERY POWER lamp DS76 quadrants 2 and 4 light white.	See step 11, figure 7-13.
		FOG OFF lamp DS82 quadrants 1 and 3 light red.	See step 12, figure 7-13.
		AUTO FOG DISABLE lamp DS83 quadrants 1 and 3 light red.	See step 13, figure 7-13.
		SILO DOOR lamp DS84 quadrants 1 and 3 light red.	Replace lamp.

Figure 7-9. Table of Checkout Procedures for Lamp Verify Circuit (Sheet 2 of 5)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
		GOX lamp DS86 quadrants 2 and 4 light white.	See step 14, figure 7-13.
		LOX EMPTY lamp DS87 quadrants 2 and 4 light white.	Replace lamp.
		HAZARD LIGHT DS89 quadrant 2 lights red and quadrant 3 lights green.	Replace lamp.
		BLAST DOORS lamp DS91 quadrants 2 and 4 light white.	See step 15, figure 7-13.
		ABOVE GROUND WATER lamp DS117 quadrants 1 and 3 light red.	Replace lamp.
		WIND lamp DS93 quadrants 2 and 4 light white.	See step 16, figure 7-13.
		GEN 1 lamp DS101 quadrants 1 and 3 light red.	See step 17, figure 7-13.
		GEN 2 lamp DS102 quadrants 1 and 3 light red.	Replace lamp.
		GEN 3 lamp DS103 quadrants 1 and 3 light red.	Replace lamp.
		GEN 4 lamp DS104 quadrants 1 and 3 light red.	Replace lamp.
		ESCAPE HATCH lamp DS107 quadrants 2 and 4 light white.	See step 18, figure 7-13.
		BLAST VALVES lamp DS108 quadrants 1 and 3 light red.	See step 19, figure 7-13.
		PUSH TO SILENCE lamp DS111 quadrants 1 and 3 light red and quadrants 2 and 4 light amber.	See step 20, figure 7-13.
		FLASHER TEST LIGHT DS112 quadrants 1 and 3 light red and quadrants 2 and 4 light white.	See step 21, figure 7-13.

Figure 7-9. Table of Checkout Procedures for Lamp Verify Circuit (Sheet 3 of 5)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
2	Connect positive lead of multimeter to TB2-15 and negative lead to TB7-9.	<p>WATER EMER. OFF DS118 quadrants 1 and 3 light red and quadrants 2 and 4 light amber.</p> <p>WATER EMER. OFF DS119 quadrants 1 and 3 light red and quadrants 2 and 4 light amber.</p> <p>WATER EMER. OFF DS120 quadrants 1 and 3 light red and quadrants 2 and 4 light amber.</p> <p>Multimeter indicates 28 VDC.</p>	<p>See step 22, figure 7-13.</p> <p>See step 23, figure 7-13.</p> <p>See step 24, figure 7-13.</p> <p>Replace LAMP VERIFY switch.</p>
3	<p>Remove 28 VDC from TB7-7; then connect power supply return to TB7-9 and apply 28 VDC to TB4-12, -13, -14, and -15. Set LAMP VERIFY switch to ON.</p>	<p><b>Note</b></p> <p>Disregard any flickering of lamps on console while LAMP VERIFY switch is in OFF.</p> <p>FIRE LEVEL II lamp DS14 quadrants 2 and 4 light white.</p> <p>LOX FIRE lamp DS25 quadrants 2 and 4 light white.</p> <p>EXPLOSION lamp DS30 quadrants 2 and 4 light white.</p> <p>FIRE LEVEL II lamp DS44 quadrant 2 and 4 light white.</p> <p>LOX FIRE lamp DS55 quadrants 2 and 4 light white.</p> <p>EXPLOSION lamp DS60 quadrants 2 and 4 light white.</p> <p>FIRE LEVEL II lamp DS74 quadrants 2 and 4 light white.</p> <p>LOX FIRE lamp DS85 quadrants 2 and 4 light white.</p> <p>EXPLOSION lamp DS90 quadrants 2 and 4 light white.</p>	<p>See step 22, figure 7-13.</p> <p>Replace lamp.</p> <p>Replace lamp.</p> <p>See step 23, figure 7-13.</p> <p>Replace lamp.</p> <p>Replace lamp.</p> <p>See step 24, figure 7-13.</p> <p>Replace lamp.</p> <p>Replace lamp.</p>

Figure 7-9. Table of Checkout Procedures for Lamp Verify Circuit (Sheet 4 of 5)



STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
4	Remove 28 VDC from TB4-12, -13, -14, and -15. Disconnect power supply return from TB7-9.	<p>ABOVE GROUND lamp DS97 quadrants 2 and 4 light white.</p> <p>LAUNCHER lamp DS98 quadrants 2 and 4 light white.</p> <p>CONTROL CENTER lamp DS99 quadrants 2 and 4 light white.</p> <p>POWER HOUSE lamp DS100 quadrants 2 and 4 light white.</p> <p>EMERGENCY lamp DS105 quadrants 2 and 4 light white.</p> <p>ATTACK lamp DS106 quadrants 2 and 4 light white.</p> <p>FUEL VAPOR lamp DS109 quadrants 2 and 4 light white.</p>	<p>See step 25, figure 7-13.</p> <p>Replace lamp.</p> <p>See step 26, figure 7-13.</p> <p>Replace lamp.</p> <p>Replace lamp.</p> <p>See step 27, figure 7-13.</p> <p>Replace lamp.</p>

Figure 7-9. Table of Checkout Procedures for Lamp Verify Circuit (Sheet 5 of 5)

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
1	Connect negative lead of multimeter and power supply return to TB7-9; then apply 28 VDC to TB7-7. Do not remove connections until checkout is completed.		
2	Rotate FLASHER VERIFY switch S19 to position 1.	FLASHER TEST LIGHT lamp DS112 quadrants 1 and 3 red and 2 and 4 white flash alternately.	See step 1, figure 7-14.
3	Using multimeter, check for intermittent 28(+2, -3) VDC at TB7-11 and -12.	Multimeter indicates 28(+2, -3) VDC at each terminal.	Repair wiring.
4	Rotate FLASHER VERIFY switch S19 to position 2.	FLASHER TEST LIGHT lamp DS112 quadrants 1 and 3 red and 2 and 4 white flash alternately.	See step 2, figure 7-14.
5	Using multimeter, check for intermittent 28(+2, -3) VDC at TB7-13 and -14.	Multimeter indicates 28(+2, -3) VDC at each terminal.	Repair wiring.
6	Rotate FLASHER VERIFY switch S19 to position 3.	FLASHER TEST LIGHT lamp DS112 quadrants 1 and 3 red and 2 and 4 white flash alternately.	See step 3, figure 7-14.
7	Using multimeter, check for intermittent 28(+2, -3) VDC at TB7-15 and -16.	Multimeter indicates 28(+2, -3) VDC at each terminal.	Repair wiring.
8	Rotate FLASHER VERIFY switch S19 to position 4.	FLASHER TEST LIGHT lamp DS112 quadrants 1 and 3 red and 2 and 4 white flash alternately.	See step 4, figure 7-14.
9	Using multimeter, check for intermittent 28(+2, -3) VDC at TB7-17 and -18.	Multimeter indicates 28(+2, -3) VDC at each terminal.	Repair wiring.
10	Remove connections made in step 1.		

Figure 7-10. Table of Checkout Procedures for Flasher Verify Circuits

STEP	PROCEDURE	NORMAL RESULT	TROUBLE ANALYSIS REF
1	Apply 28 VDC to TB14-17. Apply power supply return to TB7-9.	DC buzzer sounds.	Replace buzzer.
2	Check continuity from TB11-15 to TB7-9 with BUZZER VERIFY pushbutton S20 closed.	0 ohms.	Replace switch.
3	Remove connections made in step 1.		

Figure 7-11. Table of Checkout Procedures for Buzzer Verify Circuits

(Text continued from page 7-6.) Malfunction indications, determined by the failure of lamps to light when designated in a checkout step, are referenced to the trouble analysis column. This column indicates the probable source of the malfunction or references an associated trouble analysis table if necessary. Localization to a component can be accomplished by tracing the circuitry from the terminal to the suspected part. The lamps, switch, or resistor, and associated circuitry can be checked quickly by using the multimeter.

#### 7-19. TROUBLE ANALYSIS.

7-20. When a malfunction requiring extensive trouble analysis occurs during checkout, proceed to the referenced trouble analysis step in figures 7-12, 7-13, or 7-14. Observe the malfunction indication and perform the related trouble analysis procedure. See figure 7-15 to trace the circuit to the parts listed in the corrective action column. Using a multimeter, determine the defective part.

#### 7-21. DISASSEMBLY.

7-22. The following steps describe removal of components from the launch complex facilities console when such procedures are not obvious. Unless otherwise noted, the replacement procedure is the reverse of the removal procedure. Disassemble the launch complex facilities console (figure 7-16) as follows:

a. Remove front panel (1) by releasing latches (3) on both sides of display cabinet (2). Lift front panel up and out.

**CAUTION**

Use care when withdrawing back panel as damage to wiring or components may occur.

b. Remove back panel (14) by removing 18 screws. Refer to paragraph 7-27 for removal of components from back panel.

**Note**

Do not unsolder wires from components when replacing back panel.

c. Detach resistor boards (25, 26, 27, 28, 30) from sub-panel (detail A) by removing four nuts and bolts from each board.

d. Unsolder components to remove them from resistor boards (25, 26, 27, 28, 30).

e. Remove buzzer (29) by removing two screws and nuts and unsoldering leads.

f. Open access doors (4 and 23) and detach terminal board assemblies (12 and 15) by removing nuts from terminal studs. Tag all leads from terminals. Remove six screws from each terminal board assembly.

g. Remove terminal boards (5 through 11 and 16 through 22) from terminal board assemblies (12 and 15) by removing three nuts from each terminal board.

(Text continued on page 7-50.)

STEP	MALFUNCTION INDICATION	TROUBLESHOOTING PROCEDURE	CORRECTIVE ACTION
1	FUEL VAPOR lamp DS109 quadrants 1 and 3 do not flash.	<p>Set BUZZER VERIFY switch to ON. Check for intermittent 28(+ 2, -3) VDC at pins 1, 3, and 5 of FUEL VAPOR lamp.</p> <p>Release BUZZER VERIFY switch. Remove 28 VDC from TB7-7. Then check for continuity from normally closed contact of BUZZER VERIFY pushbutton to TB11-15.</p> <p>Remove power supply return from TB11-15. Check diode CR1 for forward-to-reverse resistance ratio of 1 to 1000 and for open or short circuit.</p>	<p>Repair wiring or replace lamp.</p> <p>Repair wiring or replace switch.</p> <p>Repair wiring or replace CR1.</p>

Figure 7-12. Table of Trouble Analysis Procedures for Fuel Vapor Indicator

STEP	MALFUNCTION INDICATION	TROUBLESHOOTING PROCEDURE	CORRECTIVE ACTION
<div style="border: 1px dashed black; padding: 2px; display: inline-block; margin-bottom: 10px;">CAUTION</div> <p>This note applies when the console is connected to the missile launch system.</p> <p>During replacement of lamps and lamp modules of pushbutton indicators, use caution when replacing the lens cap to prevent actuation of the switch. The lens cap should be inserted until a barely audible clicking sound indicates that the locking mechanism has engaged. No additional pressure should be applied as this may actuate the switch.</p>			
1	GROUND GUIDANCE lamp DS2 quadrants 2 and 3 do not light.	<p>Check for 28(+2, -3) VDC at LAMP VERIFY switch S1 pin 11.</p> <p>Check for voltage at GROUND GUIDANCE lamp DS2 pin 2.</p>	<p>Repair wiring or replace switch.</p> <p>Repair wiring or replace resistor or lamp.</p>
2	FOG OFF lamp DS22 quadrants 1 and 3 do not light.	<p>Check for 28(+2, -3) VDC at FOG OFF lamp DS22 pin 1.</p>	<p>Repair wiring or replace resistor or lamp.</p>
3	AUTO FOG DISABLE lamp DS23 quadrants 1 and 3 do not light.	<p>Check for voltage at AUTO FOG DISABLE lamp DS23 pin 3.</p> <p>Remove power. Check for 91 ohms from AUTO FOG DISABLE lamp DS23 pin 3 to LAMP VERIFY S1 switch pin 2.</p> <p>Check for 0 ohms from LAMP VERIFY switch S1 pin 2 to TB7-9 with LAMP VERIFY switch S1 closed.</p>	<p>Repair wiring or replace lamp.</p> <p>Repair wiring or replace resistor.</p> <p>Repair wiring or replace switch.</p>
4	GOX lamp DS26 quadrants 2 and 4 do not light.	<p>Check for voltage at GOX lamp DS26 pin 2.</p>	<p>Repair wiring or replace resistor or lamp.</p>
5	BLAST DOORS lamp DS31 quadrants 2 and 4 do not light.	<p>Check for voltage at BLAST DOORS lamp DS31 pin 2.</p>	<p>Repair wiring or replace resistor or lamp.</p>

Figure 7-13. Table of Trouble Analysis Procedures for Lamp Verify Circuits (Sheet 1 of 6)

STEP	MALFUNCTION INDICATION	TROUBLESHOOTING PROCEDURE	CORRECTIVE ACTION
6	BATTERY POWER lamp DS16 quadrants 2 and 4 do not light.	Check for voltage at BATTERY POWER lamp DS16 pin 2.	Repair wiring or replace resistor or lamp.
7	FOG OFF lamp DS52 quadrants 1 and 3 do not light.	Check for 28(+2, -3) VDC at LAMP VERIFY switch S1 pin 8.	Repair wiring or replace switch or lamp.
8	AUTO FOG DIS-ABLE lamp DS53 quadrants 1 and 3 do not light.	Check for voltage at AUTO FOG DIS-ABLE lamp DS53 pin 1.	Repair wiring or replace resistor or lamp.
9	GOX lamp DS56 quadrants 2 and 4 do not light.	Check for voltage at GOX lamp DS56 pin 2.	Repair wiring or replace resistor or lamp.
10	BLAST DOORS lamp DS61 quadrants 2 and 4 do not light.	Check for voltage at BLAST DOORS lamp DS61 pin 2.	Repair wiring or replace resistor or lamp.
11	BATTERY POWER lamp DS46 quadrants 2 and 4 do not light.	Check for voltage at BATTERY POWER lamp DS46 pin 2.	Repair wiring or replace lamp.
12	FOG OFF lamp DS82 quadrants 1 and 3 do not light.	Check for voltage at FOG OFF lamp DS82 pin 1.	Repair wiring or replace resistor or lamp.
13	AUTO FOG DIS-ABLE lamp DS83 quadrants 1 and 3 do not light.	Check for voltage at AUTO FOG DIS-ABLE lamp DS83 pin 1.	Repair wiring or replace resistor or lamp.
14	GOX lamp DS86 quadrants 2 and 4 do not light.	Check for voltage at GOX lamp DS86 pin 2.	Repair wiring or replace resistor or lamp.

Figure 7-13. Table of Trouble Analysis Procedures for Lamp Verify Circuits  
(Sheet 2 of 6)

STEP	MALFUNCTION INDICATION	TROUBLESHOOTING PROCEDURE	CORRECTIVE ACTION
15	BLAST DOORS lamp DS91 quadrants 2 and 4 do not light.	Check for voltage at BLAST DOORS lamp DS91 pin 2.	Repair wiring or replace resistor or lamp.
16	WIND lamp DS93 quadrants 2 and 4 do not light.	Check for 28(+2, -3) VDC at WIND lamp DS93 pin 2.	Repair wiring or replace resistor or lamp.
17	GEN1 lamp DS101 quadrants 1 and 3 do not light.	Check for voltage at GEN 1 lamp DS101 pin 1.	Repair wiring or replace resistor or lamp.
18	ESCAPE HATCH lamp DS107 quadrants 2 and 4 do not light.	Check for voltage at ESCAPE HATCH lamp DS107 pin 2.	Repair wiring or replace resistor or lamp.
19	BLAST VALVES lamp DS108 quadrants 1 and 3 do not light.	Check for voltage at BLAST VALVES lamp DS108 pin 1.	Repair wiring or replace resistor or lamp.
20	PUSH TO SILENCE lamp DS111 quadrants 1, 2, 3, and 4 do not light.	Check for voltage at PUSH TO SILENCE lamp DS111 pin 1.	Repair wiring or replace resistor or lamp.
21	FLASHER TEST LIGHT lamp DS112 quadrants 1, 2, 3, and 4 do not light.	Check for voltage at FLASHER VERIFY switch S19 pin A1.	Repair wiring or replace resistor.
		Check for voltage at sections A7 and B of FLASHER VERIFY switch S19.	Repair wiring or replace switch or lamp.
22	WATER EMER. OFF lamp DS118 quadrants 1, 2, 3, and 4 do not light.	Set and hold LAMP VERIFY switch S1 to ON. Check for 28(+2, -3) VDC at pin 11 of LAMP VERIFY switch S1.	Repair wiring or replace switch.
		Check for voltage at pins 1 and 3 of DS118.	Repair wiring or replace resistor R33.
		Check for voltage at pins 2 and 4 of DS118.	Repair wiring or replace diode CR6.

Figure 7-13. Table of Trouble Analysis Procedures for Lamp Verify Circuits  
(Sheet 3 of 6)



STEP	MALFUNCTION INDICATION	TROUBLESHOOTING PROCEDURE	CORRECTIVE ACTION
23	WATER EMER. OFF lamp DS119 quadrants 1, 2, 3, and 4 do not light.	<p>Remove 28 VDC from TB7-7. Using multimeter, check for continuity between pin 5 of DS118 and TB7-9.</p> <p>Set and hold LAMP VERIFY switch S1 to ON. Check for 28(+2, -3) VDC at pin 8 of LAMP VERIFY switch S1.</p> <p>Check for voltage at pins 1 and 3 of DS119.</p> <p>Check for voltage at pins 2 and 4 of DS119.</p> <p>Remove 28 VDC from TB7-7. Using multimeter, check for continuity between pin 5 of DS119 and TB7-9.</p>	<p>If meter does not indicate continuity repair wiring. If meter indicates continuity, replace lamp.</p> <p>Repair wiring or replace switch.</p> <p>Repair wiring or replace resistor R34.</p> <p>Repair wiring or replace diode CR9.</p> <p>If meter does not indicate continuity, repair wiring. If meter indicates continuity, replace lamp.</p>
24	WATER EMER. OFF lamp DS120 quadrants 1, 2, 3, and 4 do not light.	<p>Set and hold LAMP VERIFY switch S1 to ON. Check for voltage at pins 1 and 3 of DS120.</p> <p>Check for voltage at pins 2 and 4 of DS120.</p> <p>Remove 28 VDC from TB7-7. Using multimeter, check for continuity between pin 5 of DS120 and TB7-9.</p>	<p>Repair wiring or replace resistor R35.</p> <p>Repair wiring or replace CR12.</p> <p>If meter does not indicate continuity, repair wiring. If meter indicates continuity, replace lamp.</p>
25	FIRE LEVEL II lamp DS14 quadrants 2 and 4 do not light.	<p>Set LAMP VERIFY switch S1 to OFF; then check for 28(+2, -3) VDC at pins 2, 4, and 5 of DS14.</p> <p>Remove 28 VDC from TB4-12, -13, -14, and -15; then check for resistance of 91(+4.55) ohms between pin 2 of LAMP VERIFY switch S1 and junction of R2 and CR2.</p> <p>Check diode CR2 for forward-to-reverse resistance ratio of 1 to 1000 and for open or short circuit.</p>	<p>Repair wiring or replace lamp.</p> <p>Repair wiring or replace resistor.</p> <p>Repair wiring or replace diode.</p>

Figure 7-13. Table of Trouble Analysis Procedures for Lamp Verify Circuits (Sheet 4 of 6)

STEP	MALFUNCTION INDICATION	TROUBLESHOOTING PROCEDURE	CORRECTIVE ACTION
26	FIRE LEVEL II lamp DS44 quadrants 2 and 4 do not light.	<p>Set LAMP VERIFY switch S1 to OFF; then check for 28(+2, -3) VDC at pins 2, 4, and 5 of DS44.</p> <p>Remove 28 VDC from TB4-12, -13, -14, and -15; then check for resistance of 91(±4.55) ohms between pin 2 of LAMP VERIFY switch S1 and junction of R8 and CR3.</p> <p>Check diode CR3 for forward-to-reverse resistance ratio of 1 to 1000 and for open or short circuit.</p>	<p>Repair wiring or replace lamp.</p> <p>Repair wiring or replace resistor.</p> <p>Repair wiring or replace CR3.</p>
27	FIRE LEVEL II lamp DS74 quadrants 2 and 4 do not light.	<p>Set LAMP VERIFY switch S1 to OFF; then check for 28(+2, -3) VDC at pins 2, 4, and 5 of DS74.</p> <p>Remove 28 VDC from TB4-12, -13, -14, and -15; then check for resistance of 91(±4.55) ohms between pin 2 of LAMP VERIFY switch S1 and junction of R14 and CR4.</p> <p>Check diode CR4 for forward-to-reverse resistance ratio of 1 to 1000 and for open or short circuit.</p>	<p>Repair wiring or replace lamp.</p> <p>Repair wiring or replace resistor.</p> <p>Repair wiring or replace CR4.</p>
28	ABOVE GROUND lamp DS97 quadrants 2 and 4 do not light.	<p>Set LAMP VERIFY switch S1 to OFF; then check for 28(+2, -3) VDC at pins 2, 4, and 5 of DS97.</p> <p>Remove 28 VDC from TB4-12, -13, -14, and -15; then check for resistance of 91(±4.55) ohms between pin 4 of DS97 and junction of R2 and CR5.</p> <p>Check for 0 ohms resistance between cathode of CR5 and TB7-9 with LAMP VERIFY switch S1 set to ON. Set LAMP VERIFY switch S1 to OFF.</p> <p>Check diode CR5 for forward-to-reverse resistance ratio of 1 to 1000 and for open or short circuit.</p>	<p>Repair wiring or replace lamp.</p> <p>Repair wiring or replace resistor.</p> <p>Repair wiring or replace switch.</p> <p>Repair wiring or replace CR5.</p>

Figure 7-13. Table of Trouble Analysis Procedures for Lamp Verify Circuits  
(Sheet 5 of 6)

STEP	MALFUNCTION INDICATION	TROUBLESHOOTING PROCEDURE	CORRECTIVE ACTION
29	CONTROL CENTER lamp DS99 quadrants 2 and 4 do not light.	<p>Set LAMP VERIFY switch S1 to OFF; then check for 28(+ 2, -3) VDC at pins 2, 4, and 5 of DS99.</p> <p>Remove 28 VDC from TB4-12, -13, -14, and -15; then check for resistance of 91(±4.55) ohms between pin 4 of DS99 and junction of R20 and CR5.</p>	<p>Repair wiring or replace lamp.</p> <p>Repair wiring or replace resistor.</p>
30	ATTACH lamp DS106 quadrants 2 and 4 do not light.	<p>Set LAMP VERIFY switch S1 to OFF; then check for 28(+ 2, -3) VDC at pins 2, 4, and 5 of DS106.</p> <p>Remove 28 VDC from TB4-12, -13, -14, and -15; then check for resistance of 91(±4.55) ohms between pin 4 of DS106 and junction of R20 and R23.</p>	<p>Repair wiring or replace lamp.</p> <p>Repair wiring or replace resistor R23.</p>

Figure 7-13. Table of Trouble Analysis Procedures for Lamp Verify Circuits  
(Sheet 6 of 6)

STEP	MALFUNCTION INDICATION	TROUBLESHOOTING PROCEDURE	CORRECTIVE ACTION
1	FLASHER TEST LIGHT lamp DS112 does not flash red in position 1.	Check for intermittent 28(+2, -3) VDC at pins 2 and 7 of FLASHER VERIFY switch S19A.	Repair wiring or replace switch, or flasher.
	FLASHER TEST LIGHT lamp DS112 does not flash white in position 1.	Check for intermittent 28(+2, -3) VDC at pins 2 and 7 of FLASHER VERIFY switch S19B.	Repair wiring or replace switch, or flasher.
2	FLASHER TEST LIGHT lamp DS112 does not flash red in position 2.	Check for intermittent 28(+2, -3) VDC at pins 3 and 7 of FLASHER VERIFY switch S19A.	Repair wiring or replace switch, or flasher.
	FLASHER TEST LIGHT lamp DS112 does not flash white in position 2.	Check for intermittent 28(+2, -3) VDC at pins 3 and 7 of FLASHER VERIFY switch S19B.	Repair wiring or replace switch, or flashers.
3	FLASHER TEST LIGHT lamp DS112 does not flash red in position 3.	Check for intermittent 28(+2, -3) VDC at pins 4 and 7 of FLASHER VERIFY switch S19A.	Repair wiring or replace switch, or flasher.
	FLASHER TEST LIGHT lamp DS112 does not flash white in position 3.	Check for intermittent 28(+2, -3) VDC at pins 4 and 7 of FLASHER VERIFY switch S19B.	Repair wiring or replace switch, or flasher.
4	FLASHER TEST LIGHT lamp DS112 does not flash red in position 4.	Check for intermittent 28(+2, -3) VDC at pins 5 and 7 of FLASHER VERIFY switch S19A.	Repair wiring or replace switch, or flasher.
	FLASHER TEST LIGHT lamp DS112 does not flash white in position 4.	Check for intermittent 28(+2, -3) VDC at pins 5 and 7 of FLASHER VERIFY switch S19B.	Repair wiring or replace switch, or flasher.

Figure 7-14. Table of Trouble Analysis Procedures for Flasher Verify Circuits