

SECTION II  
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CHECKOUT

2-1. GENERAL.

2-2. This section contains the procedures for electrical checkout of the Mark 4 R/V. Checkouts are performed before and after the R/V is mated to the missile.

2-3. WARHEAD CIRCUITS TEST.

2-4. Before removing the R/V from the trailer, perform a checkout of the warhead circuits using Multiple Purpose Continuity Test Set T304C and Adapter Cable Test Set Type HRU-6/E. To perform this checkout, open the tarpaulin at the flare end of the R/V to gain access to R/V interface connector J151. Perform the warhead circuits test as follows:

- a. Connect the self-test shorting plug attached to the T-304C test set to J1 of the test set.
- b. Turn the generator handle at the end of the T-304C test set. Lamps DS-1 and DS-2 should glow.
- c. Remove the self-test shorting plug from J1 of the T-304C test set.

## Note

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The adapter cable test set consists of an adapter cable and a shorting plug.

- d. Remove shorting plug, part number 603914, and adapter cable, part number 603913, from the adapter cable test set.
- e. Remove the protective caps from plugs P1 and P151 of the adapter cable.
- f. Connect plug P1 of the adapter cable to J1 on the T-304C test set.
- g. Connect the shorting plug to P151 of the adapter cable.
- h. Turn generator handle. Lamps DS-1 and DS-2 should glow.
- i. Remove shorting plug from adapter cable and turn generator handle. Neither lamp should glow.
- j. Remove protective cap from interface connector J151 on R/V adapter assembly.
- k. Connect adapter cable plug P151 to interface connector J151.

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WARNING

If lamp DS-2 fails to glow, refer to emergency procedures for warhead safety fault conditions (paragraph 5-3). If lamp DS-1 fails to glow, refer to emergency procedures for AFS safety fault condition (paragraph 5-3).

1. Turn generator handle. Lamps DS-1 and DS-2 should glow.
- m. Disconnect adapter cable from interface connector J151. Install protective cap on J151.
- n. Turn generator handle. Neither lamp should glow.
- o. ~~Install~~ shorting plug on adapter cable and turn generator handle. Lamps DS-1 and DS-2 should glow.
- p. Remove shorting plug from adapter cable.
- q. Disconnect adapter cable from test set and install protective caps on adapter cable plugs. Place adapter cable and shorting plug in storage box on trailer.
- r. ~~Install~~ self-test shorting plug in jack J1 on test set.
- s. Turn generator handle. Lamps DS-1 and DS-2 should glow.
- t. Secure the test set.

2-5. SELF-TEST OF INTERFACE TEST SET.

2-6. Figure 2-1 describes the procedure for self-test of the interface test set. This self-test must be performed before the test set can be used for monitoring (paragraph 2-8), pre mating checkout (paragraph 2-10), and checkout of installed R/V (paragraph 2-12).

2-7. The interface test set group consists of interface test set NO. 1 and interface test set NO. 2. Test set NO. 1 is used for checkout of the missile flight control circuits. Test set NO. 2 is used independently of test set NO. 1 for checkout of the R/V AGE fuze setting circuits.

2-8. MONITORING MISSILE FLIGHT CONTROL CIRCUITS.

2-9. Before the R/V is electrically mated to the missile, the interface test set is connected to Stage II for stray voltage monitoring of the missile flight control circuits. Monitoring is performed at initial missile installation and whenever a malfunction has been detected during systems monitoring and checkout. Figure 2-2 describes the procedure for stray voltage monitoring.

2-10. PREMATING CHECKOUT.

2-11. Premating checkout of the R/V AGE and the interconnecting cabling between the AGE and the missile is performed by a team of two S&I technicians and one launch complex technician. One S&I technician connects and operates the interface test set at silo level 1; the launch complex technician controls and monitors the R/V AGE in the equipment terminal; and the second S&I technician coordinates the activities by interphone communication from silo level 1. Figure 2-3 describes the procedure for a premating checkout.

2-12. CHECKOUT OF INSTALLED R/V.

2-13. Checkout of installed R/V is performed by two R/V technicians at silo level 1 and by a launch site technician at the equipment terminal. One R/V technician will coordinate the activities from silo level 1 and the other will operate the interface test set and electrically connect the R/V to the missile. The launch site technician will operate the R/V AGE in the equipment terminal. Checkout of the installed R/V consists of monitoring the missile interface cabling for stray voltage, connecting the R/V to the missile, and setting of A, B, and C target selectors by the MCCC. Figure 2-4 describes the procedure required for this checkout.

2-14. SYSTEM CHECKOUT.

2-15. After the R/V is mechanically and electrically mated to the missile, a system checkout is performed periodically to assure operational status of the R/V system. Refer to T.O. 11N-RV4A-1 for an explanation of the system checkout. Figure 2-5 describes the procedure required to perform this checkout.

2-16. READINESS MODE CHECKOUT.

2-17. The readiness mode checkout is performed every 10 days and as required by launch readiness monitoring (T.O. 21-SM68-CL-14-1) to assure a readiness condition of the R/V system. Figure 2-6 describes the procedure for this checkout.

2-18. CHECKOUT MODE CHECKOUT.

2-19. The checkout mode checkout is performed daily and as required by launch readiness monitoring (T.O. 21-SM68-CL-14-1). Refer to T.O. 11N-RV4A-1 for an explanation of the checkout mode checkout. Figure 2-7 describes the procedure for checking warhead pressure and arming and fuzing continuity.

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
1	<p><u>WARNING</u></p> <p>Do not operate the interface test set in the missile silo during fuelling or defuelling operations, or while presence of explosive vapors is indicated by the damage control system.</p> <p>Set interface test set POWER switch to OFF</p> <p>2</p> <p>Attach one end of power cable P3 to connector J3 on access door panel. Connect remaining end to 115 V 60 CPS power source.</p> <p>3</p> <p>Set POWER switch to ON. Observe POWER indicator.</p> <p>4</p> <p>Set FLIGHT CIRCUITS test switch to VOLTAGE CHECK. Check two FAULT indicators over VOLTAGE CHECK.</p> <p>5</p> <p>Press-to-test all lamps except POWER and BATTERY HEATER POWER.</p>	<p>None.</p> <p>None.</p> <p>White.</p> <p>Red.</p> <p>Lighted.</p>	<p>None.</p> <p>None.</p> <p>Replace lamp. If normal indication is not obtained, request repair of interface test set.</p> <p>Replace lamps. If normal indication is not obtained, request repair of interface test set.</p> <p>Replace lamps of indicators which do not light.</p>

Figure 2-1. Interface Test Set Self-Test Check (Sheet 1 of 3)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
6	Hold SELF TEST switch in FAULT and observe two FAULT indicators over VOLTAGE CHECK.	Red.	Replace lamps. If normal indication is not obtained, request repair of interface test set.
7	Hold SELF TEST switch in READY and observe two READY indicators over VOLTAGE CHECK.	Green.	Replace lamps. If normal indication is not obtained, request repair of interface test set.
8	Release SELF TEST switch. Observe two FAULT indicators over VOLTAGE CHECK.	Red.	Replace lamps. If normal indication is not obtained, request repair of interface test set.
9	Set FLIGHT CIRCUITS test switch to STRAY SIGNAL TEST. Observe two SAFE indicators over STRAY SIGNAL TEST.	Green.	Replace lamps. Press applicable RESET push-button. If normal indication is not obtained, request repair of interface test set.
10	Hold SELF TEST switch in READY and observe two SAFE indicators over STRAY SIGNAL TEST.	Green.	Replace lamps. Press applicable RESET push-button. If normal indication is not obtained, request repair of interface test set.
11	Hold SELF TEST switch in FAULT and observe two UNSAFE indicators over STRAY SIGNAL TEST.	Red.	Replace lamps. If normal indication is not obtained, request repair of interface test set.

Figure 2-1. Interface Test Set Self-Test Check (Sheet 2 of 3)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
<sup>12</sup>	Release SELF TEST switch. Observe two UNSAFE indicators located over STRAY SIGNAL TEST.	Red.	Replace lamps. If normal indication is not obtained, request repair of interface test set.
<sup>13</sup>	Press and hold RESET pushbuttons. Observe UNSAFE indicators located over STRAY SIGNAL TEST.	Not lighted.	Request repair of interface test set.
<sup>14</sup>	Release RESET pushbuttons. Observe SAFE indicators located over STRAY SIGNAL TEST.	Green.	Replace lamps. If normal indication is not obtained, request repair of interface test set.
<sup>15</sup>	Set interface test set POWER switch to OFF.	None.	None.

Figure 2-1. Interface Test Set Self-Test Check (Sheet 3 of 3)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
1	Perform interface test set self-test.	See figure 2-1.  <u>WARNING</u>	See figure 2-1.  None.
2		To prevent the possibility of an explosion resulting from sparks, insure that FCS power and circuit breakers CB9, CB12, CB58, and CB74 are off.	None.  Insure that the interface test set POWER switch is set to OFF and that power cable is connected between J3 on the test set and a 115 V 60 CPS power source.
3		Connect J151 of interface test set cable to connector 310P1 on missile Stage II. Connect P1-P2 of test set cable to J2 on the test set.	None.  Note  The interface test set will remain on throughout flight control system checkout. When missile power is turned off, the interface test set will also be turned off.

Figure 2-2. Flight Control Circuits Monitoring (Sheet 1 of 2)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
4	<p>Set interface test set POWER switch to ON. Observe POWER indicator.</p> <p>Set FLIGHT CIRCUITS switch to STRAY SIGNAL. Observe two SAFE indicators.</p>	<p>White.</p> <p>Green.</p>	<p>Replace lamp. Check power cabling connections and required power source. If normal indication is not obtained, request repair of interface test set.</p> <p>Replace lamps. If normal indication is not obtained, request repair of interface test set.</p> <p>None.</p>

## Note

If a red UNSAFE indication appears during flight control system checkout, notify equipment terminal personnel to not proceed until cause of stray voltage has been determined and corrected. Flight control system checkout should then be re-run. Press the applicable RESET pushbutton to clear the red UNSAFE and obtain a green SAFE indication.

Figure 2-2. Flight Control Circuits Monitoring (Sheet 2 of 2)

STEP	PROCEDURE	NORMAL INDICATION		TROUBLE ANALYSIS
		READINESS CHECK OF R/V AGE		
	<p><u>WARNING</u></p> <p>Do not operate the interface test set in the missile silo during fueling or defueling operations. Insure that interface test set power is off and that all signals are removed from missile connector 310P1 before connecting test set to Stage II cable.</p> <p>Note</p> <p>Determine and note fuze-set number of the three test target cards in use. TARGET SELECTION PULL TO TURN switch on the launch console must be in position A. Establish communications between affected work area.</p> <p>On circuit breaker panel 33, set the following circuit breakers to OFF;</p> <p>CB6 CB9 CB12 CB56 CB58 CB74 CB109</p>		None.	

Figure 2-3. Premating Checkout (Sheet 1 of 26) /

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
1 (Cont)	CB259 Perform interface test set self test.  Remove missile access door and connect J151 of interface test set test cable to connector 310P1 of Stage II. Connect P1 of test cable to J2 of test set.  Set CIRCUIT SELECT switch to READY.	None.  See figure 2-1.	See figure 2-1.
2 <sup>3</sup>	Set POWER switch to ON and observe POWER indicator.  On circuit breaker panel 33, set the following circuit breakers to ON:  CB6 CB9 CB12 CB56 CB58 CB74 CB109 CB259	White.  Disregard all indicators.	If indicator fails to light, replace defective lamp (refer to paragraph 4-66). If normal indication is not obtained, request repair of interface test set.  None.

Figure 2-3. Premating Checkout (Sheet 2 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
6.1	Turn on checkout power (assembly 8A2)	White.	Refer to T.O. 21-SM68-2J-10-1.
7	Observe that the R/V IDENT indicator corresponding to the type of R/V being used is lighted.		If an indicator fails to light, replace defective lamp. (Refer to paragraph 4-66.)
8	Set R/V GOE CONTROL switch to the R/V IDENT indicator lighted white and observe the R/V GOE indicator.	Green.	If red, check R/V GOE CONTROL switch position.
9	Set OPERATING MODE switch to LAUNCH.	Disregard all indicators.	None.
10	Set LAMP VERIFY switch to RED. Observe all indicators.	Red.	If an indicator fails to light, replace defective lamp. (Refer to paragraph 4-66.)
11	Set LAMP VERIFY switch to GREEN. Observe all indicators.	Green.	If an indicator fails to light, replace defective lamp. (Refer to paragraph 4-66.)
12	Set LAMP VERIFY switch to WHITE. Observe all indicators.	White.	If an indicator fails to light, replace defective lamp. (Refer to paragraph 4-66.)
13	Set LAMP VERIFY switch to AMBER. Observe all indicators.	Amber.	If an indicator fails to light, replace defective lamp. (Refer to paragraph 4-66.)

Figure 2-3. Premating Checkout (Sheet 3 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
14	Set LAMP VERIFY switch to OFF.  <u>SELF-TEST OF R/V AGE</u>	Disregard all indicators.	None.
15	Insure that missile checkout power is on before proceeding.	Set OPERATING MODE switch to CHECKOUT. Observe the following indicators:  <u>MARK 4 READINESS MONITOR</u>	If an indicator fails to light, replace defective lamp. (Refer to paragraph 4-66.)
16	W/H PRESSURE  A & F CONT	Green.  Green.	White during stepping, then green.
	Momentarily press PRESS TO TEST/RESET A pushbutton and observe the following indicators:	PROGRAM CHASSIS IDENTIFICATION	None.
	Remaining four CHASSIS IDENTIFICATION indicators.	Green.	None.
	PRESS TO TEST/RESET A	White during stepping, then green.	IF PRESS TO TEST/RESET A indicator lights red, replace faulty assembly as indicated by red CHASSIS

Figure 2-3. Premating Checkout (Sheet 4 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
16 (CONT)	<p>Momentarily press PRESS TO TEST/RESET A pushbutton and observe SELF TEST indicators.</p> <p>Observe the following indicators:</p> <p><u>MARK 4 READINESS MONITOR</u></p> <p>W/H PRESSURE A&amp;F CONT</p>	<p>Indicators go out.</p> <p>Note</p> <p>During self-test A, all indicators on monitor-indicator assembly are out.</p>	<p>IDENTIFICATION indicator. Repeat premating checkout procedure.</p> <p>Note</p> <p>None.</p>
17 18 19	<p>Observe the following indicators:</p> <p><u>CHASSIS IDENTIFICATION PROGRAM</u></p>	<p>W/H PRESSURE A&amp;F CONT</p> <p>Note</p> <p>Self-test A is now complete.</p> <p>Momentarily press PRESS TO TEST/RESET B pushbutton and observe the following indicators:</p>	<p>Green. Green.</p> <p>None. None.</p> <p>If PRESS TO TEST/RESET B indicator lights red, replace faulty assembly as indicated by red CHASSIS IDENTIFICATION indicator. Repeat premating checkout.</p> <p>White approximately 1 minute, then green.</p>

Figure 2-3. Premating Checkout (Sheet 5 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
19 (CONT)	Other four CHASSIS IDENTIFICATION indicators	Green.	
	PRESS TO TEST/RESET B	White approximately 1 minute, then green.  Note  During self-test B, all indicators on monitor-indicator assembly are out.	Indicators go out.  None.
	Momentarily press PRESS TO TEST/RESET B pushbutton and observe SELF TEST indicators.  Observe the following indicators:  <u>MARK 4 READINESS MONITOR</u>		
		W/H PRESSURE A&F CONT	Green. Green.
		Note	
		Self/test B is now complete.	
		<u>CHECKOUT OF INTERCONNECTING CABLING BETWEEN R/V AGE AND INTERFACE TEST SET</u>	
		Check that CIRCUIT SELECT switch is set to READY.	None.

Figure 2-3. Premating Checkout (Sheet 6 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
2 <sup>3</sup>	Set R/V GOE CONTROL switch to MARK 3, then to MARK 4.  Note  Do not proceed until stepping is complete.  Set OPERATING MODE switch on AGE to LAUNCH. Observe the following indicators:  <u>MARK 4 READINESS MONITOR</u>	Disregard all indications.  None.	Repair interconnecting cabling.
2 <sup>4</sup>	  <u>W/H SAFETY</u> A & F SAFETY FUZE SET R/V IDENT R/V GOE  Set OPERATING MODE switch on AGE to CHECKOUT. Observe the following indicators:  <u>MARK 4 READINESS MONITOR</u>	Green. Green. Green. White. Green.  Green. A & F CONT R/V IDENT	Repair interconnecting cabling.

Figure 2-3. Premating Checkout (Sheet 7 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TRROUBLE ANALYSIS
2.5 (CONT)	R/V GOE	Green.	None.
2.6	Set CIRCUIT SELECT switch to GROSS FAULT (stepping may or may not occur).	None.	Note If stepping occurs in step 26, indications will not appear until stepping is complete.
2.7	Observe the following indicators:  <u>MARK 4 READINESS MONITOR</u>  <u>W/H PRESSURE</u>  <u>A &amp; F CONT</u>  <u>Set OPERATING MODE switch to LAUNCH and observe the following indicators:</u>  <u>MARK 4 READINESS MONITOR</u>  <u>W/H SAFETY</u>  <u>A &amp; F SAFETY</u>  <u>FUZE SET</u>  <u>Set OPERATING MODE switch to CHECKOUT.</u>	Amber. Red. Red.	Repair interconnecting cabling.  None.  Note If stepping occurs, indications will not appear until stepping is complete.
2.8	Set CIRCUIT SELECT switch on interface test set to W/H PRESS (stepping may or may not occur). Observe the following indicators:	None.	Repair interconnecting cabling.
2.9			
2.10			

Figure 2-3. Premating Checkout (Sheet 8 of 26)

STEP <small>(CONT)</small>	PROCEDURE	NORMAL INDICATION	ROUBLE ANALYSIS
<u>30</u>	<u>MARK 4 READINESS MONITOR</u> W/H PRESSURE A & F CONT	Amber. Green.	Repair interconnecting cabling.
	Press and hold FAULT RELEASE switch on interface test set. Meter should indicate 15 to 35 MA:		
	<u>MARK 4 READINESS MONITOR</u> W/H PRESSURE A & F CONT	Green. Green.	Repair interconnecting cabling.
	Release FAULT RELEASE switch:		
	<u>MARK 4 READINESS MONITOR</u> W/H PRESSURE A & F CONT	Amber. Green.	Repair interconnecting cabling.
	Set CIRCUIT SELECT switch on interface test set to A & F CONT (stepping may or may not occur). Observe the following indicators: <u>31</u> <u>32</u> <u>33</u>	Note If stepping occurs, indications will not appear until stepping is complete.	
	<u>MARK 4 READINESS MONITOR</u> W/H PRESSURE	Green.	Repair interconnecting cabling.

Figure 2-3. Premating Checkout (Sheet 9 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TRROUBLE ANALYSIS
33 (CONT)	A & F CONT	Red.	
34	Press and hold FAULT RELEASE switch on interface test set. Meter should indicate 15 to 35 MA:		
	<u>MARK 4 READINESS MONITOR</u>		
	W/H PRESSURE	Green.	Repair interconnecting cabling.
	A & F CONT	Green.	
35	Release FAULT RELEASE switch:		
	<u>MARK 4 READINESS MONITOR</u>		
	W/H PRESSURE	Green.	Repair interconnecting cabling.
	A & F CONT	Red.	
36	Set OPERATING MODE switch to LAUNCH.	None.	None.
	<u>MARK 4 READINESS MONITOR</u>		
37	Set CIRCUIT SELECT switch on interface test set to W/H SAFETY (stepping may or may not occur):		Note If stepping occurs, indications will not appear until stepping is complete.
	W/H SAFETY	Red.	
	A & F SAFETY	Green.	
	FUZE SET	Green.	

Figure 2-3. Premating Checkout (Sheet 10 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
38	Press and hold FAULT RELEASE switch on interface test set. Meter should indicate 1.5 to 35 MA:  <u>MARK 4 READINESS MONITOR</u>		Repair interconnecting cabling.
	W/H SAFETY A & F SAFETY FUZE SET	Green. Green. Green.	Repair interconnecting cabling.
	Release FAULT RELEASE switch:  <u>MARK 4 READINESS MONITOR</u>		
	W/H SAFETY A & F SAFETY FUZE SET	Red. Green. Green.	Repair interconnecting cabling.
			Note  Set CIRCUIT SELECT switch on interface test set to AFS SAFETY (stepping may or may not occur):  <u>MARK 4 READINESS MONITOR</u>
	W/H SAFETY A & F SAFETY FUZE SET	Green. Red. Green.	If stepping occurs, indications will not appear until stepping is complete.

Figure 2-3. Premating Checkout (Sheet 11 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
41	Press and hold FAULT RELEASE switch on interface test set. Meter should indicate 15 to 35 MA:		Repair interconnecting cabling.
	<u>MARK 4 READINESS MONITOR</u>		
	W/H SAFETY	Green.	
	A & F SAFETY	Green.	
	FUZE SET	Green.	
42	Release FAULT RELEASE switch:		Repair interconnecting cabling.
	<u>MARK 4 READINESS MONITOR</u>		
	W/H SAFETY	Green.	
	A & F SAFETY	Red.	
	FUZE SET	Green.	
43	Set CIRCUIT SELECT switch to READY.		Note None.
			If stepping does not occur set circuit breaker CB12 to OFF and back to ON.
	W/H SAFETY	Green.	
	A & F SAFETY	Green.	
	FUZE SET	Green (after stepping).	

Figure 2-3. Premating Checkout (Sheet 12 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
44	<p>Set the TARGET SELECTION PULL TO TURN switch on the launch console to B. Observe the following indicators:</p> <p><u>MARK 4 READINESS MONITOR</u></p> <p>W/H SAFETY A &amp; F SAFETY (after stepping)</p>	<p>Green.</p> <p>Green.</p>	<p>If any indicators are red, perform steps 15 through 21 to isolate malfunction.</p>

Figure 2-3. Premating Checkout (Sheet 12A of 26)

STEP	PROCEDURE	NORMAL INDICATION	TRROUBLE ANALYSIS
44 (CONT)	FUZE SET	Green.	
45	Set the TARGET SELECTION PULL TO TURN switch on launch console to C.  Set the TARGET SELECTION PULL TO TURN switch on launch console to A.	All indications will be the same as step 44.  All indications will be the same as step 44.	Same as step 44.  Same as step 44.
46	Note  If interface test set TUU-112A/E only is used, omit steps 47 through 73.	Note  On circuit breaker panel 33, set the following circuit breakers to OFF:  47 CB6 CB9 CB12 CB56 CB58 CB74 CB109 CB259	None.  None.

Figure 2-3. Premating Checkout (Sheet 13 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
	<u>WARNING</u>		
	Do not connect or disconnect the interface test set from Stage II during fueling or de-fueling operations, or while presence of explosive vapors is indicated by the damage control system.		
48	Disconnect interface test set from plug P1-P2 of cable 603625-1.	None.	None.
49	Connect plug P1-P2 of cable 603625-1 to J1 of interface test set NO. 2.	None.	None.
50	Set EVEN STEP, ODD STEP, REVERSE STEPPING, and ZERO COINCIDENCE switches to NORMAL.	None.	None.
51	On circuit breaker panel 33, set the following circuit breakers to ON:	None.	CB6 CB9 CB12 CB56 CB58 CB74 CB109 CB259

Figure 2-3. Premating Checkout (Sheet 14 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TRROUBLE ANALYSIS
52	<p>After approximately 15 seconds, observe the following indicators:</p> <p><u>INTERFACE TEST SET NO. 2</u></p> <p>EVEN</p> <p>ODD</p> <p>BRAKE</p> <p>REVERSE</p> <p>(During stepping)</p> <p>FORWARD</p> <p>BRAKE</p> <p>EVEN</p> <p>ODD</p> <p>MOTOR POSITION</p> <p><u>MARK 4 READINESS MONITOR</u></p> <p>R/V IDENT</p> <p>R/V GOE</p> <p>W/H SAFETY</p> <p>A &amp; F SAFETY</p> <p>FUZE SET</p>	<p>Blinking white.</p> <p>Blinking white.</p> <p>White.</p> <p>White.</p> <p>Blinking white.</p> <p>White.</p> <p>Blinking white.</p> <p>Blinking white.</p> <p>Counting.</p> <p>White.</p> <p>Green.</p> <p>Green.</p> <p>Green.</p> <p>Red.</p>	<p>Replace indicator lamp. If indication is not obtained, replace fuze-set programmer assembly. If indication is not obtained, request repair of interface test set NO. 2.</p>

Figure 2-3. Premating Checkout (Sheet 15 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
<p>52 (CONT)</p> <p>(After stepping)</p> <p>R/V IDENT</p> <p>R/V GOE</p> <p>W/H SAFETY</p> <p>A &amp; F SAFETY</p> <p>FUZE SET</p> <p><u>INTERFACE TEST SET NO. 2</u></p> <p>All indicators</p> <p>MOTOR POSITION</p> <p>On interface test set NO. 2, set EVEN STEP switch to FAULT.</p> <p>Set CB12 on circuit breaker panel 33 to OFF, then back to ON.</p> <p>Observe the following indicators:</p> <p><u>INTERFACE TEST SET NO. 2</u> (For 15 seconds)</p> <p>EVEN</p> <p>ODD</p>	<p>White.</p> <p>Green.</p> <p>Green.</p> <p>Green.</p> <p>Green.</p> <p>Not lighted.</p> <p>Same as fuze setting programmed on target card.</p> <p>None.</p> <p>None.</p> <p>Replace indicator lamp. If indication is not obtained, replace fuze-set programmer assembly. If indication is not obtained, request repair of interface test set NO. 2.</p> <p>Blinking red.</p> <p>Blinking white.</p>		

Figure 2-3. Premating Checkout (Sheet 16 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
55 (CONT)	BRAKE REVERSE  (After 15 seconds)	White. White.	
	All indicators	Not lighted.	
	MOTOR POSITION	Not more than 000 <sup>b</sup> .	
	<u>MARK 4 READINESS MONITOR</u>		
	R/V IDENT	White.	
	R/V GOE	Green.	
	W/H SAFETY	Green.	
	A & F SAFETY	Green.	
	FUZE SET	Red.	
	On interface test set NO. 2, set EVEN STEP switch to NORMAL. Set ODD STEP switch to FAULT.	None.	
	On R/V AGE, set OPERATING MODE switch to CHECKOUT then back to LAUNCH.	None.	
	On interface test set NO. 2, observe the following indicators: (For 15 seconds)	None.	Replace indicator lamp. If indication is not obtained, replace fuze-set programmer assembly. If
			Note If normal indications are not obtained, set CB12 to OFF, then to ON.

Figure 2-3. Premating Checkout (Sheet 17 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
58 (CONT)	EVEN ODD BRAKE REVERSE  (After 15 seconds) All indicators MOTOR POSITION  Observe the following indicators:  <u>MARK 4 READINESS MONITOR</u>  R/V IDENT R/V GOE W/H SAFETY A & F SAFETY FUZE SET	Blinking white. Blinking red. White. White.  Not lighted. Not more than 0001.  White. Green. Green. Green. Red.	indication is not obtained, request repair of interface test set NO. 2.  Replace indicator lamp. If indication is not obtained, replace fuze-set programmer assembly. If indication is not obtained, request repair of interface test set NO. 2.  None.

Figure 2-3. Premating Checkout (Sheet 18 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
61	On R/V AGE, set OPERATING MODE switch to CHECKOUT then back to LAUNCH (stepping may or may not occur).	None.  Note  The indications in step 62 must occur within a 62 second time period.	Note  If normal indications of step 62 are not observed, set CB12 to OFF, then to ON.
	Observe the following indicators:  <u>INTERFACE TEST SET NO. 2</u>	  <u>EVEN</u> <u>ODD</u> <u>BRAKE</u> <u>REVERSE</u>	  Replace indicator lamp. If indication is not obtained, replace fuze-set programmer assembly. If indication still is not obtained, request repair of interface test set NO. 2.
		  <u>62</u>  Note  If stepping occurs, it must occur between 57 and 62 seconds.	  <u>EVEN</u> <u>ODD</u> <u>BRAKE</u>
			  Blinking white. Blinking white. White. Red.
			  Blinking white. Blinking white. White.

Figure 2-3. Premating Checkout (Sheet 19 of 26)

STEP	PROCEDURE	NORMAL INDICATION		TROUBLE ANALYSIS
6.2 (CONT)	FORWARD MOTOR POSITION (After stepping)	White. Counting.		
	All indicators	Not lighted.		
	MOTOR POSITION	0001-1125.		
	Note			
	If stepping does not occur, observe the following in- dicators.			
	All indicators	Not lighted.		
	MOTOR POSITION	0000.		
	<u>MARK 4 READINESS MONITOR</u>			
	R/V IDENT	White.		
	R/V GOE	Green.		
	W/H SAFETY	Green.		
	FUZE SET	Red.		
	On interface test set NO. 2, set REVERSE STEPPING switch to NORMAL. Set ZERO COINCIDENCE switch to FAULT.	None. <sup>63</sup>		

Figure 2-3. Premating Checkout (Sheet 20 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS																		
64	On R/V AGE, set OPERATING MODE switch to CHECKOUT and back to LAUNCH.	<p>None.</p> <p>Note</p> <p>If normal indications of step 65 are not observed, set CB12 to OFF, then to ON.</p> <p>Observe the following indicators:</p> <p><u>INTERFACE TEST SET NO. 2</u></p> <table> <tr> <td>EVEN</td> <td>Blinking white.</td> </tr> <tr> <td>ODD</td> <td>Blinking white.</td> </tr> <tr> <td>BRAKE</td> <td>White.</td> </tr> <tr> <td>REVERSE</td> <td>White.</td> </tr> <tr> <td>(After 15 seconds)</td> <td>White.</td> </tr> <tr> <td>BRAKE</td> <td>All other indicators Not lighted.</td> </tr> <tr> <td>MOTOR POSITION</td> <td>0000.</td> </tr> <tr> <td>(Wait approximately 45 seconds)</td> <td>Not lighted.</td> </tr> <tr> <td>BRAKE</td> <td>MARK 4 READINESS MONITOR</td> </tr> </table>	EVEN	Blinking white.	ODD	Blinking white.	BRAKE	White.	REVERSE	White.	(After 15 seconds)	White.	BRAKE	All other indicators Not lighted.	MOTOR POSITION	0000.	(Wait approximately 45 seconds)	Not lighted.	BRAKE	MARK 4 READINESS MONITOR	<p>None.</p> <p>Replace indicator lamp.</p> <p>If indication is not obtained, replace fuze-set programmer assembly. If indication still is not obtained, request repair of interface test set NO. 2.</p>
EVEN	Blinking white.																				
ODD	Blinking white.																				
BRAKE	White.																				
REVERSE	White.																				
(After 15 seconds)	White.																				
BRAKE	All other indicators Not lighted.																				
MOTOR POSITION	0000.																				
(Wait approximately 45 seconds)	Not lighted.																				
BRAKE	MARK 4 READINESS MONITOR																				

Figure 2-3. Premating Checkout (Sheet 21 of 26)

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STEP (CONT)	PROCEDURE	NORMAL INDICATION	ROUBLE ANALYSIS
65	R/V IDENT	White.	
	R/V GOE	Green.	
	W/H SAFETY	Green.	
	A & F SAFETY	Green.	
	FUZE SET	Red.	
	On interface test set NO. 2, set ZERO COINCIDENCE switch to NORMAL.	None.	
	On R/V AGE, set OPERATING MODE switch to CHECKOUT and back to LAUNCH.	All indications will be the same as step 52.	Same as step 52. Note If normal indications of step 52 are not obtained, set CB12 to OFF, then to ON.
	Set the TARGET SELECTION PULL TO TURN switch on the launch console to B.	All indications will be the same as step 52.	Same as step 52.
	Set the TARGET SELECTION PULL TO TURN switch on the launch console to C.	All indications will be the same as step 52.	Same as step 52.
	Set the TARGET SELECTION PULL TO TURN switch on the launch console to A.	All indications will be the same as step 52.	Same as step 52.
	On circuit breaker panel 33, set the following circuit	None.	

Figure 2-3. Premating Checkout (Sheet 22 of 26)

STEP (CONT)	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
71	breakers to OFF: CB6 CB9 CB12 CB56 CB58 CB74 CB109 CB259		
		<u>WARNING</u>	
		Do not connect or disconnect the interface test set from Stage II during fuel or defueling operations, or while presence of explosive vapors is indicated by the damage control system.	
		Disconnect plug P1-P2 of cable 603625-1 from J1 of interface test set NO. 2.	None.
		Connect plug P1-P2 of cable 603625-1 to J2 of interface test set NO. 1.	None.
		On circuit breaker panel 33, set the following circuit breakers to ON: CB6 CB9 CB12	Disregard all indicators. None.

Figure 2-3. Premating Checkout (Sheet 23 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
74 (CONT)	CB56 CB58 CB74 CB109 CB259	White.	Replace lamp. If normal indication is not obtained, request repair of interface test set.
75	Set interface test set POWER switch to ON. Observe POWER indicator.	Green.	If normal indication does not appear, notify equipment terminal of malfunction. Do not proceed until malfunction has been corrected.
76	Set FLIGHT CIRCUITS test switch on the interface test set to STRAY SIGNAL TEST. Observe the two SAFE indicators over STRAY SIGNAL TEST.	Red.	If normal indications do not appear, notify equipment terminal of malfunction. Do not proceed until malfunction has been corrected.
77	Following preparation of FCV by equipment terminal personnel, the SEPARATION green SAFE indicator over STRAY SIGNAL TEST will go out and SEPARATION UNSAFE indicator will light.	Green.	If normal indication does not appear, notify equipment terminal of malfunction. Do not proceed until malfunction has been corrected.
78	Set the FLIGHT CIRCUITS test switch on the interface test set to VOLTAGE CHECK. The red UNSAFE indicator over STRAY SIGNAL TEST will go out and the SEPARATION READY indicator over VOLTAGE CHECK will light.	Green.	If normal indication does not appear, notify equipment terminal of malfunction. Do not proceed until malfunction has been corrected.

Figure 2-3. Premating Checkout (Sheet 24 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
79	Notify equipment terminal personnel that indication of step 78 has been received on the interface test set. SEPARATION and GUIDANCE-PREAM signals will appear in the following sequence:	<p>Indications of step 79 will appear in sequence following notification of equipment terminal personnel that indication of step 78 has been received.</p> <p>Note</p> <p>GUIDANCE-PREAM GUIDANCE-PREAM GUIDANCE-PREAM GUIDANCE-PREAM SEPARATION READY SEPARATION FAULT</p>	<p>If normal indications do not appear, notify equipment terminal of malfunction. Do not proceed until malfunction has been corrected.</p> <p>Goes out. Green. Goes out. Red. Goes out. Red.</p> <p>Set FLIGHT CIRCUITS test switch on interface test set on STRAY SIGNAL TEST. Observe the two SAFE indicators over STRAY SIGNAL TEST.</p>

Figure 2-3. Premating Checkout (Sheet 25 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
81	<p>Set POWER switch on interface test set to OFF.</p> <p>On circuit breaker panel 33, set the following circuit breakers to OFF:</p> <p style="text-align: center;">CB6 CB9 CB12 CB56 CB58 CB74 CB109 CB259</p>	<p>None.</p> <p>None.</p>	<p>None.</p> <p>None.</p>
82	<p>On circuit breaker panel 33, set the following circuit breakers to OFF:</p> <p style="text-align: center;">CB6 CB9 CB12 CB56 CB58 CB74 CB109 CB259</p>	<p>None.</p>	<p><u>WARNING</u></p> <p>Do not disconnect the interface test set from Stage II nor electrically mate the R/V to Stage II during fueling or defueling operations, or while presence of explosive vapors is indicated by the damage control system.</p> <p>Disconnect interface test set from connector 310P1 on missile interface connector.</p> <p>None.</p>

Figure 2-3. Premating Checkout (Sheet 26 of 26)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
	<u>CHECKOUT OF INSTALLED R/V</u>		
	<u>WARNING</u>		
	Do not operate the interface test set in the missile silo during fueling or defueling operations, or while presence of explosive vapors is indicated by the damage control system. Insure that interface test set power is off and that all signals are removed from missile connector 310P1 before connecting interface test set to Stage II cable.		
		None.	See figure 2-1.
		None.	None
		On circuit breaker panel 33, set the following circuit breakers to OFF:	
		CB9 CB12 CB58 CB74 CB259	
			See figure 2-1.
		Perform self-test of interface test set.	
			None
		Connect J151 of interface test set cable to connector 310P1 of Stage II. Connect P1-P2 of test cable to J2 of test set.	
			None

Figure 2-4. Checkout of Installed R/V (Sheet 1 of 6)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
4	Set interface test set CIRCUIT SELECT SWITCH to READY.	None.	None.
5	On circuit breaker panel 33, set the following circuits breakers to ON:  CB6 CB9 CB12 CB56 CB58 CB74 CB109 CB259	Disregard all lights.	None.
6	Set interface test set POWER switch to ON. Observe POWER indicator.	White.	Replace lamp. If normal indication does not appear, notify equipment terminal of malfunction. Do not proceed until malfunction has been corrected.
7	Set FLIGHT CIRCUITS test switch to STRAY SIGNAL TEST. Observe the two SAFE indicators over STRAY SIGNAL TEST.	Green.	None.
8	On circuit breaker panel 33, set the following circuit breakers to OFF:  CB6 CB9	None.	

Figure 2-4. Checkout of Installed R/V (Sheet 2 of 6)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
8 (CONT)	CB12 CB56 CB58 CB74 CB109 CB259	None.	None.
9	Set interface test set POWER SWITCH to OFF.  <u>WARNING</u>  Insure that all power to interface test set is removed before dis- connecting interface test set.	None.	See figure 2-1.
10	Disconnect interface test set cable from Stage II connector and J2 of inter- face test set.	None.	See figure 2-1.
11	Perform self-test of inter- face test set.	None.	See figure 2-1.
12	Disconnect interface test set power cable from power source. Store all cables in test set storage com- partment and remove test set.	None.	See figure 2-1.

Figure 2-4. Checkout of Installed R/V (Sheet 3 of 6)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
	CAUTION  Before electrically connecting a re-entry vehicle containing a W/R warhead to the missile interface connector, insure that the exercise pushbutton on the launch control sole is lock wired in exercise position.	None.	None.
	Connect plug 310P1 on missile interface connector to R/V adapter assembly receptacle J151.	None.	None.
	Connect Stage II telemetry cable to pushbutton switch on R/V (Mark 4 MOD 5B only).	None.	None.
	On circuit breaker panel 33, set the following circuit breakers to ON:  13 14 15 CB6 CB9 CB12 CB56 CB58 CB74 CB109 CB259	None.	None.

Figure 2-4. Checkout of Installed R/V (Sheet 4 of 6)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
<sup>16</sup>	Observe the following indicators:  <u>MARK 4 READINESS MONITOR</u>		If red, check the R/V GOE CONTROL switch position. Perform self-test of R/V AGE (Figure 2-5). If self-test proves AGE indicator is correct and either W/H SAFETY or A&F SAFETY are RED, refer to emergency procedures in Section V.
	W/H SAFETY	Green.	
	A&F SAFETY	Green.	
	FUZE SET	Green.	
	R/V IDENT	White.	
	R/V GOE	Green.	
		None.	None.
	Set R/V AGE OPERATING MODE switch to CHECKOUT.		
	Observe the following indicators:  <u>MARK 4 READINESS MONITOR</u>		
<sup>17</sup>	W/H PRESSURE	Green.	
	A&F IDENT	Green.	
	R/V IDENT	White.	
	R/V GOE	Green.	
		None.	None.
<sup>18</sup>	Set R/V AGE OPERATING MODE switch to LAUNCH.		

Figure 2-4. Checkout of Installed R/V (Sheet 5 of 6)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
20	<p>Observe the following indicators (after stepping):</p> <p><u>MARK 4 READINESS MONITOR</u></p> <p>W/H SAFETY A&amp;F SAFETY FUZE SET</p> <p>Program the remaining two cards and observe that all indicators remain as noted in step 20.</p> <p><sup>21</sup></p>	<p>Green. Green. Green.</p> <p>Same as step 20.</p>	<p>Perform system checkout (Figure 2-5) if any indicator lights red. If system checkout proves no fault in the AGE and either W/H SAFETY or A&amp;F SAFETY indicators are red, refer to emergency procedures in Section V.</p> <p>Same as step 20.</p>

Figure 2-4. Checkout of Installed R/V (Sheet 6 of 6)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
1	Note	Checkout power must be on to perform system checkout.	See figure 2-6.
2	Perform readiness mode checkout.	See figure 2-6.	None.
3	<u>SELF-TEST OF R/V AGE</u>	Set OPERATING MODE switch to CHECKOUT. Observe the following indicators:	If PRESS TO TEST/RESET A indicator lights red, set OPERATING MODE switch to MALFUNCTION.
4	<u>MARK 4 READINESS MONITOR</u>	W/H PRESSURE A&F CONT.	Replace malfunctioning assembly indication by red CHASSIS IDENTIFICATION indicator. Then repeat checkout starting from step 2.
5		Momentarily press PRESS TO TEST/RESET A pushbutton and observe the following indicators:	White during stepping, then green.
6	<u>CHASSIS IDENTIFICATION PROGRAM</u>	CHASSIS IDENTIFICATION PROGRAM	Remaining four CHASSIS IDENTIFICATION indicators
7		PRESS TO TEST/RESET	White during stepping, then green.

Figure 2-5. System Checkout (Sheet 1 of 3)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
4	Momentarily press PRESS TO TEST/RESET A pushbutton and observe indicators on self test indicator assembly.	Indicators go out.	Note During SELF TEST A, all indicators on monitor-indicator assembly are out.
5	Observe W/H PRESSURE and A&F CONT indicators. This completes self-test A.	Green.	Note None.
6	Momentarily press PRESS TO TEST/RESET B pushbutton and observe the following indicators:  CHASSIS IDENTIFICATION PROGRAM  Remaining four CHASSIS IDENTIFICATION indicators  PRESS TO TEST/RESET B	White approximately 1 minute, then green.  Green.  White approximately 1 minute, then green.	If PRESS TO TEST/RESET B indicator lights red, set OPERATING MODE switch to MALFUNCTION. Replace malfunctioning assembly indicated by red CHASSIS IDENTIFICATION indicator.  Note During SELF TEST B, all indicators on monitor indicator assembly are out.

Figure 2-5. System Checkout (Sheet 2 of 3)

STEP	PROCEDURE	NORMAL INDICATION	TROUBLE ANALYSIS
7	Momentarily press PRESS TO TEST/RESET B pushbutton and observe indicators on self test indicator assembly.	Indicators go out.	None.
8	Observe W/H PRESSURE AND A & F CONT indicators. This completes self-test B.	Green.	None.
9	Set OPERATING MODE switch to LAUNCH and observe the following indications:  <u>MARK 4 READINESS MONITOR</u>	White. Green. Green. Green. Green. Green. Green.	See figure 2-6.  Repeat readiness mode checkout.

Figure 2-5. System Checkout (Sheet 3 of 3)

STEP	PROCEDURE	NORMAL INDICATION	TRROUBLE ANALYSIS
1	Check that OPERATING MODE switch is set to LAUNCH.	Disregard all indicators.	None.
2	Set LAMP VERIFY switch to:  RED GREEN AMBER WHITE	All indicators red. All indicators green. All indicators amber. All indicators white.	If any indicator does not light in the specified color, replace the defective lamp. (Refer to paragraph 4-66.)
3	Set LAMP VERIFY switch to OFF.	Disregard all indicators.	None.
4	Check that R/V GOE CONTROL switch is set to MARK 4. Observe the following indicators:		
5	<u>MARK 4 READINESS MONITOR</u>  R/V IDENT R/V GOE	White. Green.	If red, check the R/V GOE CONTROL switch position.
6	Observe the following indicators:		If any indicators are red, perform system checkout (figure 2-5.) If self-test proves AGE indication is correct and either A&F SAFETY or W/H SAFETY is red, refer to emergency procedures in Section V.
7	<u>MARK 4 READINESS MONITOR</u>  W/H SAFETY FUZE SET A&F SAFETY	Green. Green. Green.	

Figure 2-6. Readiness Mode Checkout

STEP	PROCEDURE	NORMAL INDICATIONS	TROUBLE ANALYSIS
1	Note Checkout power must be on to perform checkout mode checkout.	Check that LAMP VERIFY switch is set to OFF.  Set OPERATING MODE switch to CHECKOUT.	None.  None.  None.  If amber, perform system checkout (figure 2-5).  If red, perform system checkout (figure 2-5).  None.
2		Check that R/V GOE CONTROL switch is set to MARK 4.	
3		Observe the following indicators:	
4		<u>MARK 4 READINESS MONITOR</u>	
5		W/H PRESSURE  A&F CONT	Green.  Green.  None.
		Set OPERATING MODE switch to LAUNCH.	

Figure 2-7. Checkout Mode Checkout