

**CREW # 2**

**T.O. 21-TM76A-1-2**

**TECHNICAL MANUAL**

**LAUNCH AREA OPERATIONS**

**MISSILE AND AEROSPACE  
GROUND EQUIPMENT MAINTENANCE CREWS**

**NCOIC**

**USAF SERIES**

**TM76A**

**GUIDED MISSILE**

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## INTRODUCTION

This manual is one in a series of manuals containing maintenance instructions to be used in the Launch Area for the TM76A Guided Missile.

The purpose of these manuals is to provide complete instructions for designated personnel to install, remove, and check out the TM76A Guided Missile.

A sequence-of-operations block diagram and a figure listing the manuals of this series are included in the Introduction. The diagram shows the operational sequences which are required to maintain the readiness of each Launch Pad and the ability to launch the Missile.

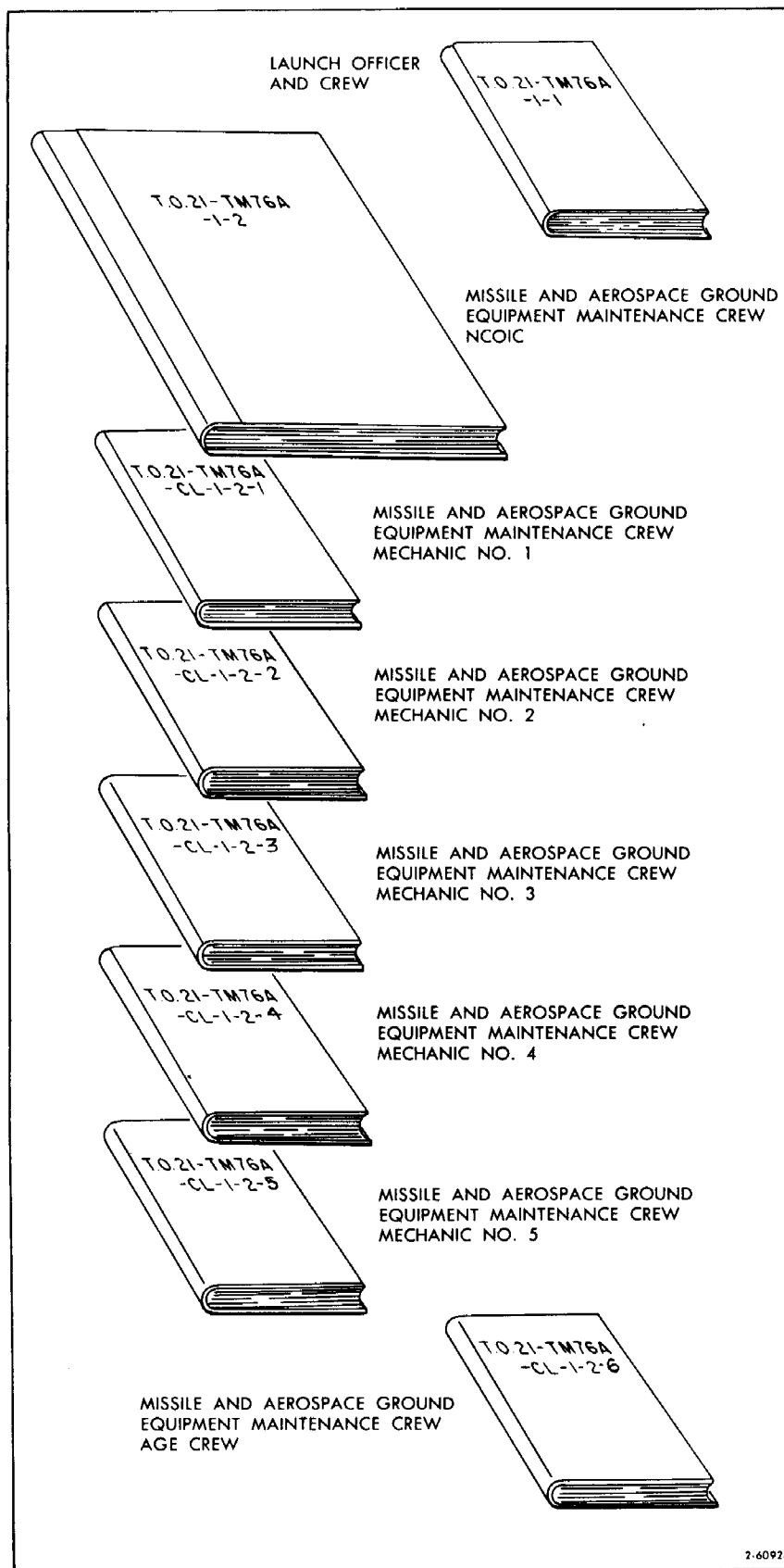
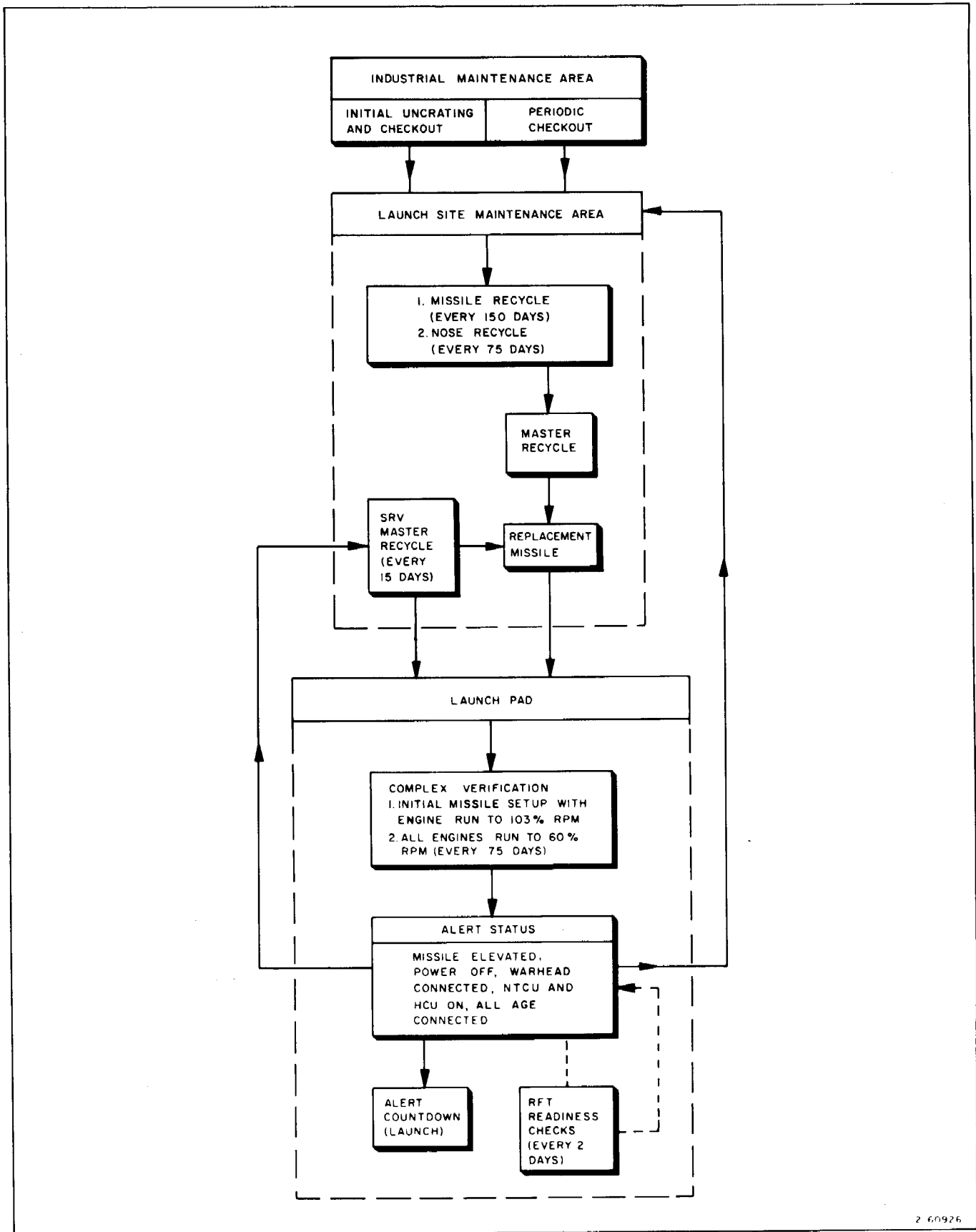


Figure 1-1. Launch Area Manuals





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Figure 1-2. Launch Pad Sequence of Operations



Figure 1-3. Missile Checkout

## SECTION I

## DESCRIPTION AND LEADING PARTICULARS

1-1. SCOPE.

## 1-2. GENERAL.

1-3. This manual contains Launch Area operating instructions for the Non-Commissioned Officer-in-Charge. The instructions are written specifically for the TM76A MACE Guided Missile manufactured by the Martin Marietta Corporation, Baltimore, Maryland.

## 1-4. MANUAL CONTENT.

1-5. This manual contains all information necessary for the NCOIC to perform, direct, and co-ordinate the Missile Setup, Recycle, and Replacement checks of each Missile. Section I, Description and Leading Particulars, contains general manual information, description of overall operation of the Launch Area, effectivity tables, and tables listing necessary tools and equipment. Section II, Checklists, contains a master checklist for the Missile Setup, fifteen-day Recycle, and Missile Replacement procedures. Section III, Operating Instructions, contains all the detailed procedures referenced in the checklists for the NCOIC and all the mechanics. Section IV, Supplemental Procedures, contains procedures that are not normally part of the checklists.

1-6. LAUNCH AREA MANUALS.

## 1-7. PRESENTATION.

1-8. The complete launch area operating instructions are presented in eight manuals of which this is one. These manuals are:

T.O. 21-TM76A-1-1	Technical Manual, Operating Instructions Launch Operations, Launch Officer and Crew
T.O. 21-TM76A-1-2	Technical Manual, Launch Area Operations Missile and Aerospace Ground Equipment Maintenance Crews, NCOIC
T.O. 21-TM76A-CL-1-2-1	Technical Manual, Checklist, Launch Area Operations Missile and Aerospace Ground Equipment Maintenance Crews, Mechanic No. 1
T.O. 21-TM76A-CL-1-2-2	Technical Manual, Checklist, Launch Area Operations Missile and Aerospace Ground Equipment Maintenance Crews, Mechanic No. 2
T.O. 21-TM76A-CL-1-2-3	Technical Manual, Checklist, Launch Area Operations, Missile and Aerospace Ground Equipment Maintenance Crews, Mechanic No. 3
T.O. 21-TM76A-CL-1-2-4	Technical Manual, Checklist, Launch Area Operations, Missile and Aerospace Ground Equipment Maintenance Crews, Mechanic No. 4

Section I  
Paragraphs 1-9 to 1-13

T.O. 21-TM76A-1-2

T.O. 21-TM76A-CL-1-2-5

Technical Manual, Checklist, Launch Area Operations, Missile and Aerospace Ground Equipment Maintenance Crews, Mechanic No.5

T.O. 21-TM76A-CL-1-2-6

Technical Manual, Checklist, Launch Area Operations, Missile and Aerospace Ground Equipment Maintenance Crews, AGE Crew

In addition to the manuals mentioned above, there is a manual to be used to aid in Malfunction Localization. That manual is:

T.O. 21-TM76A-1-2C

Supplemental Technical Manual, Launch Area Maintenance Malfunction Localization

1-9. USAGE.

1-10. The procedures and philosophies contained in this manual must be followed exactly as presented.

1-11. TERMINOLOGY.

1-12. NOMENCLATURE.

1-13. In this manual the abbreviated nomenclature listed in table 1-1 is used in place of official nomenclature.

TABLE 1-1  
NOMENCLATURE

---

Official Nomenclature	Abbreviated Nomenclature
USAF Series TM76A Guide Missile	Missile
Launch Site Maintenance Area	LSMA
Missile Combat Crew	MCC
Missile Maintenance Crew	MMC
Test Equipment Maintenance Set Crew	TEMS
Aerospace Ground Equipment Crew	AGEC
Missile Combat Crew Commander	MCCC
Start Fuel Box	SFB
Umbilical Outlet Box	UOB
Nose/Thermal/RF Hood	RF Hood
Nose Temperature Control Unit	NTCU
Hydraulic Cycling Unit	HCU

TABLE 1-1 (cont)

## NOMENCLATURE

Official Nomenclature	Abbreviated Nomenclature		
Adapter Control Box	ACB		
Launch Area Power Pack (skid mounted)	LAPP		
Power Distribution Control Unit	PDCU		
Generator Set, 100KW Diesel	100KW		
Transformer-Rectifier	TR		
System Recycle Pack	SRP		
Multi-purpose Power Pack	PP		
MM-1 Truck	MM-1		
Systems Recycle Vehicle	SRV		
		Power Takeoff	PTO
		Nose and Booster Pack	N&B
Warhead	W/H		
Field Alignment Systems Test (er)	FAST		
Flight Controls Test (er)	FCT		
Launch Control Center	LCC		
Launch Control Equipment Group	LCEG		
Launch Command Control Console	LCCC		
Rapid Fire Test (er)	RFT		
Launch Enable Unit	LEU		
Auxiliary Power Plant Checker Console	APPC		
Remote Launch Control Panel	RLCP		
Power Monitoring Distribution Panel	PMDP		

1-14. CAPITALIZATION.

1-15. The initial letters of major systems of the Missile have been capitalized; initial letters of subsidiary systems have not been capitalized. Names of switches, controls, etc. will appear with all letters capitalized exactly as placarded on the Missile and operating panels. The names of major items of test equipment will also appear with the initial letter capitalized.

1-16. LOCATION REFERENCE.

1-17. Missile position and location references are given as left and right of the Missile longitudinal axis when viewed from the rear of the Missile.

1-18. EFFECTIVITY.

1-19. This manual is effective for TM76A Guided Missiles listed in table 1-2 and its necessary Aerospace Ground Equipment. Changes, additions, or deletions that are required in this manual because of modifications to either the Missile or its Aerospace Ground Equipment are identified by effectivity codes. Table 1-3 reflects any change in configuration to specific Missiles; the change is designated by a code letter. Table 1-4 reflects any change in configuration to specific Aerospace Ground Equipment; the change is designated by a code number. The code letter and code number reappears near any portion of text, diagram, and table that applies only to specific Missiles and Aerospace Ground Equipment, respectively.

TABLE 1-2

MISSILE SERIAL NUMBERS

Serial Numbers	Remarks
57-2353, -2379, -2384, -2385, -2391 thru -2394, -2398 thru -2402, -2404 thru -2406, -2408 thru -2416, -2418 thru -2430, -2432 thru -2444, -2446 thru -57-2451	Basic Missiles as delivered plus 16 Missile augmentation program.
58-1365 thru -1374, -1378 thru -1380, -1382 thru -1390, -1394 thru -1398, -1400, -1402, -1409 thru -1411, -1445 thru -1457, -1461 thru 58-1466	
59-2464 thru 58-2467	

TABLE 1-3

MISSILE EFFECTIVITY

Code Letter	Missile Serial Number	TCTO
A	Missile Guidance Sets without TCTO 21-TM76A-533 incorporated.	

TABLE 1-3 (cont)

## MISSILE EFFECTIVITY

Code Letter	Missile Serial Number	TCTO
B	Missile Guidance Sets with TCTO 21-TM76A-533 incorporated (A91-1 through A93-30).	TCTO 21-TM76A-533, adds FSS Gain Servo
C	Missile Guidance Sets without TCTO 21-TM76A-548 incorporated.	
D	Missile Guidance Sets with TCTO 21-TM76A-548 incorporated. (Serial numbers not designated.)	TCTO 21-TM76A-548, replaces Program Unit Control

TABLE 1-4

## AEROSPACE GROUND EQUIPMENT EFFECTIVITY

CODE NUMBER	Equipment Serial Number	TCTO
I	Power Packs (Fixed without Launch Area Hydraulic System installed.)	
II	Power Packs (Fixed with Launch Area Hydraulic System installed. (Serial numbers are not designated.)	TCTO 36Y41-2-525

1-20. LAUNCH AREA SAFETY PRECAUTIONS.

## 1-21. GENERAL.

1-22. The following general rules apply at all times while personnel are in the Launch Area:

- a. Use checklists for performing all operations on the Launch area.
- b. Observe Engine Danger Limits. (See figure 1-4.)
- c. Take appropriate precautions when working with electrical equipment.
- d. Handle all explosives, such as Squibs and Rocket Motors according to applicable ordnance instructions.

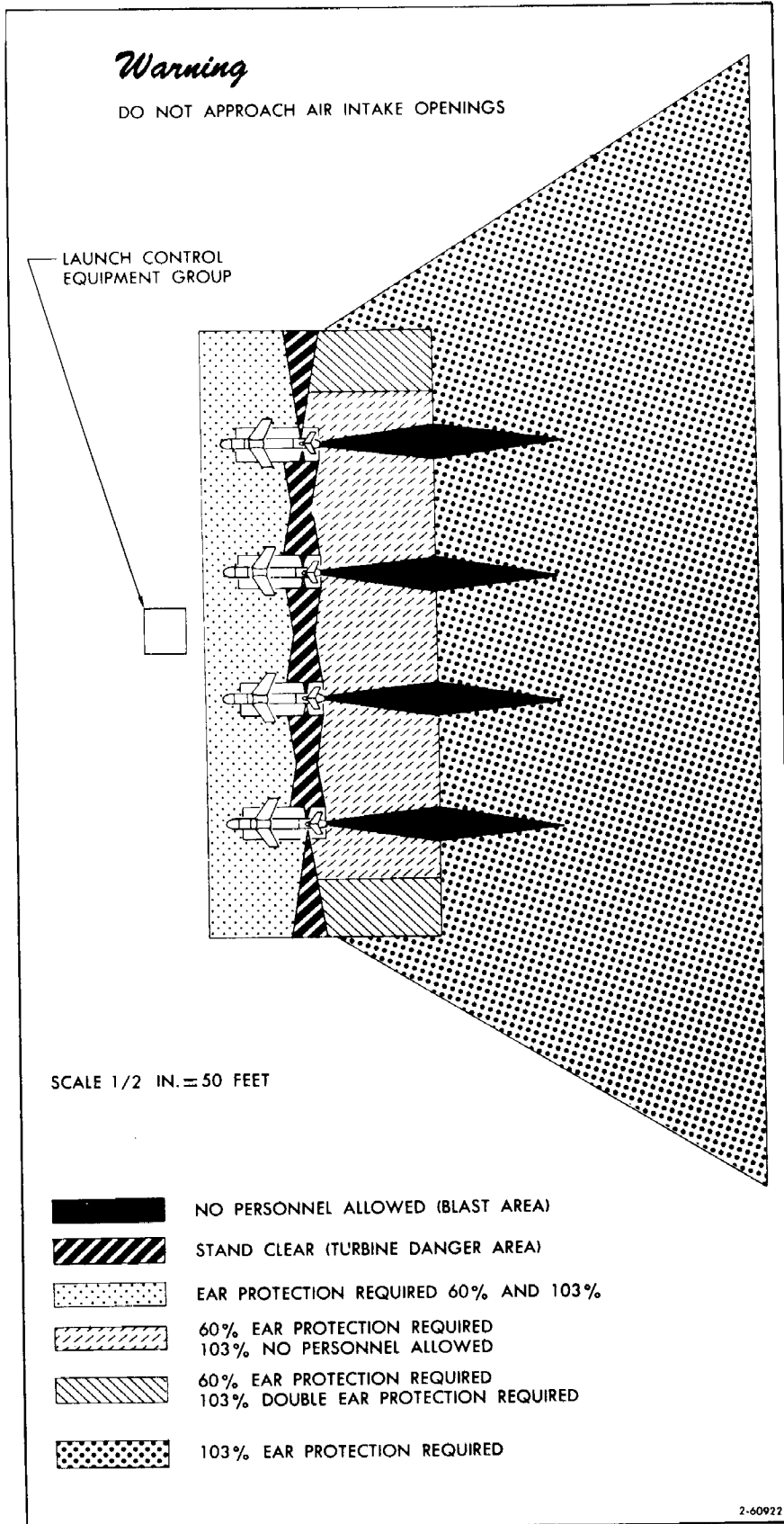


Figure 1-4. Engine Danger Area



e. Warhead will be electrically disconnected whenever:

(1) Maintenance functions are to be performed requiring power application to missile.

(2) Radome and/or base casting opened.

f. Insure that all personnel are clear of the Rocket Motor Danger Area during launch operations. (See figure 1-5.)

g. When performing checks at the launch pad, insure that the Arming and Safety plug is inserted in the UOB.

h. Insure that all personnel observe the RF Hazard Area. (See figure 1-6.)

i. Do not move AGE vehicles within the Launch Area without a Spotter directing movements.

j. Do not operate Missile Engine without fire-fighting personnel and equipment available, except during actual launch.

k. When operating with the instructions or performing maintenance on equipment described in the manual, adhere to safety precautions as prescribed by AFR 122-29 and other pertinent safety directives.

#### 1-23. DESCRIPTION OF LAUNCH AREA OPERATIONS.

##### 1-24. GENERAL.

1-25. The Launch Complex is a fixed installation consisting of a TM76A Guided Missile on each of four launch pads, and a Launch Control Center housing the Launch Control Equipment Group. The LCEG consists of the major items of equipment and harness of the Missile Launch Pack. The Launch Control Power is a centralized self-supporting area, forward of the Missiles, providing all requirements necessary to launch the four Missiles. Entrenched cables and hoses interconnect the LCEG with each of the four launch pads. These cables carry electrical power, command, and test signals, while hoses carry start fuel and hydraulic power. Each launch pad consists of a Missile mounted on a Translauncher, connected to a Nose Temperature Control Unit (NTCU) and a Hydraulic Cycling Unit (HCU). The two units assist in enabling the Missile to be launched in a minimum amount of time by alleviating Nose and Hydraulic warm-up time.

1-26. When each Missile reaches the launch area, it is positioned in the Launch Site Maintenance Area where the Wings are unfolded, the Nose Section, Warhead Section, Rocket Motor, and some of the accessories are installed. This operation is called the Missile Setup Procedure. A qualitative checkout of the Missile Armament, Flight Controls, and Guidance systems is then performed using the Systems Recycle Pack (SRP), the Flight Controls Tester (FCT), and related test equipment. This check is called the Missile Recycle Procedure. The Missile is then moved, as required, to a Launch Pad, tied down, and connected to the LCEG.

1-27. To insure operational readiness of the weapons system, the Missile and the LCEG must undergo checks at definite time intervals. A checkout of the missile with the Rapid Fire Tester (RFT) is performed every other day in accordance with the Readiness Checklist. Initially, an Engine run on the Launch Pad will be per-

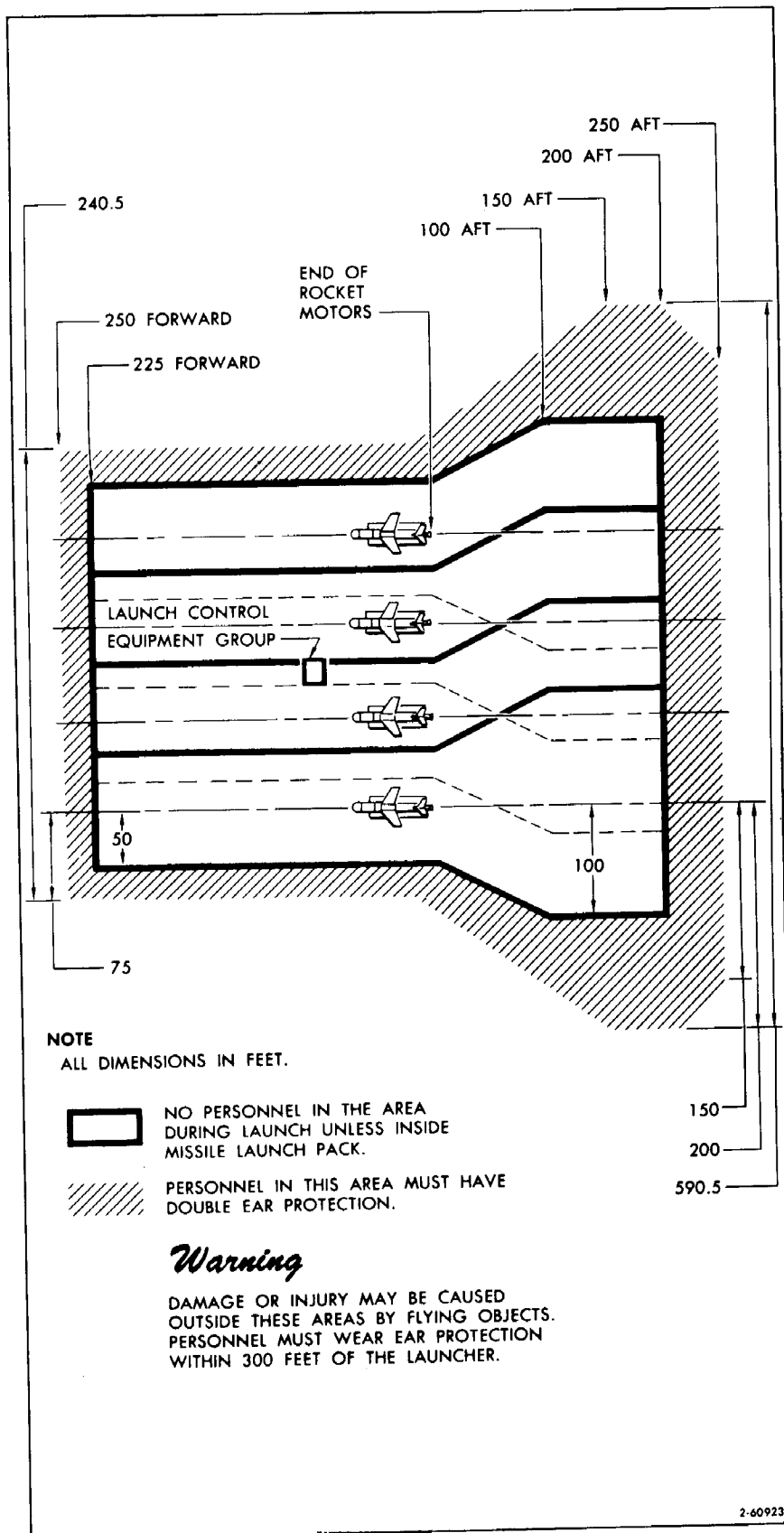


Figure 1-5. Rocket Motor Danger Area

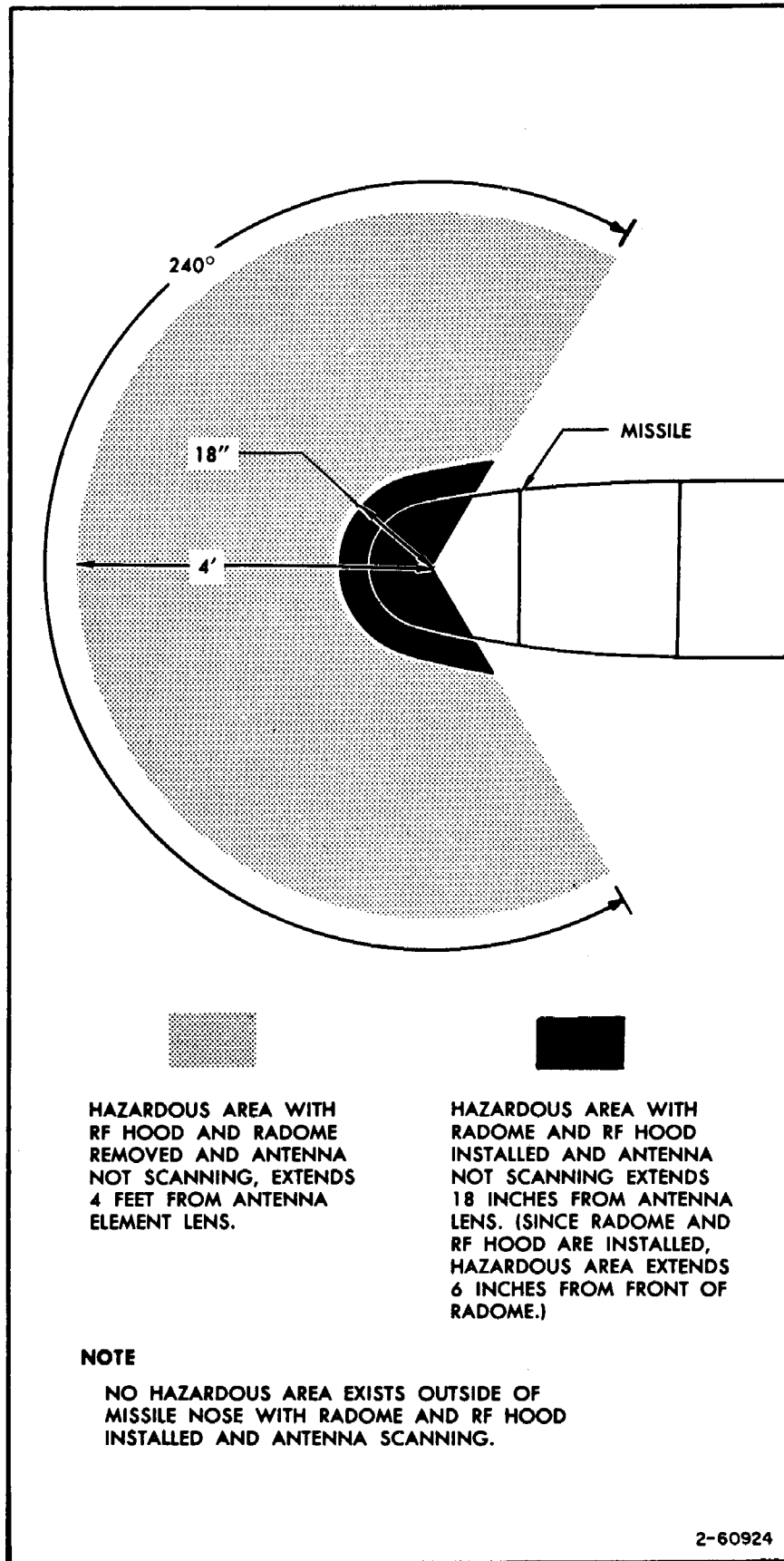


Figure 1-6. RF Hazard Area

formed on each Missile received from the Industrial Maintenance Area in accordance with Launch Complex Operational Checklist contained in Section IV and the Verification Readiness Checklist contained in T. O. 21-TM76A-1-1. Every 15 days, the Missile requires a qualitative check using the Missile Recycle Checklist. This check is performed at the Launch Site. An additional Missile as required. The process of replacing the Missile on the Launch Pad is called the Missile Replacement Procedure. Each nose and/or missile must be returned to the Industrial Maintenance Area at specified time intervals for a major inspection in accordance with T. O. 21-TM76A-1-1. When the incoming Missile arrives from the Industrial Maintenance Area, the Wings are unfolded, and a Rocket Motor is installed. Replacement of the Alert Missile is then accomplished; the Nose Package and accessories are transferred to the incoming Missile, and Missile Recycle Procedure is performed. The incoming Missile, at this point, is in replacement Missile status and can be moved to an operational Launch Pad as required. Preparations are then completed to move the Basic Missile and/or Nose to the Industrial Maintenance Area and the cycle is repeated.

1-28. Periodically a verification and operational check of the Launch Complex must be accomplished. To do this, all Launch Area AGE, must have been inspected and be operational, and the Verification Readiness Checklist (T. O. 21-TM76A-1-1) must be performed. During this phase of the weapons system checkout two qualitative checks must be completed: 1) A verification of the Remote Launch Control Panel (RLCP), and 2) A self-verification of the Auxiliary Console (APPC). These checks are performed by Test Equipment Maintenance (TEMS) personnel in accordance with applicable T. O.s. The Launch Complex Operational Checklist is included under Supplemental Procedures (Table 4-3). Operational Missile engines require a minimum of one run every 75 days.

1-29. A check of Launch Complexes will be performed daily, or more frequently as required. (See paragraph 3-11 T. O. 21-TM76A-1-1).

1-30. The Missile and AGE Maintenance Crew must accomplish certain functions during launch operations to enable the Launch Crews to accomplish the launch sequence. Dependent on the weather, configuration of the generators and the work in progress (when the Launch order is received.) These tasks may include:

- a. Start, electrically connect, and monitor the generators.
- b. Remove Breather Doors from Missiles.
- c. Position and maintain readiness of MM-1 Truck with emergency Power Pack to provide replacement capability for the Engine Pack (PE-200).
- d. Insure that Missiles are deiced.
- e. Remove non-stationary equipment from the Rocket Motor Danger Area.
- f. Adjust, repair, or replace malfunctioning, aborted Missiles, or AGE.

## SECTION II

## CHECKLISTS

2-1. CONTENT

2-2. This section contains Table 2-1, the Master Missile Setup Checklist, Table 2-2, the Master Recycle Checklist, Table 2-3, the Master Missile Replacement Checklist, and Table 2-4, the Emergency Procedures. The checklists provide a guide for the Non-Commissioned Officer-in-Charge (NCOIC) to perform his duties and to supervise the mechanics to their duties in accordance with the sequence of operations outlined in the checklists. The Emergency Procedures, Table 2-4, must be read and thoroughly understood before performing any Launch Area maintenance.

## 2-3. MASTER MISSILE SETUP CHECKLIST.

2-4. The Master Missile Setup Checklist must be performed whenever a Missile is received from the Maintenance Industrial Area. Also, the setup checklist contains operations that are utilized to prepare a Basic Missile and/or Nose Section when either must be recycled back to the Industrial Maintenance Area due to recycle time for the Basic Missile and/or Nose Section. The operations in the setup checklist include: 1) Positioning the Missile in the Launch Site Maintenance Area and unfolding the Wings and installing the Rocket Motor, 2) removal of Nose and Warhead Section and equipment from a Missile (Basic Missile being returned to Industrial Maintenance Area) when applicable, 3) installation of Nose/Warhead Section and equipment necessary to configure a Missile in replacement status, 4) preparation of a basic Missile for return to the Industrial Maintenance Area, and 5) removal and replacement of the Nose Section (only) when required. By performing the proper setup checklist operations, a complete Missile can be made ready and become the replacement Missile. This Missile can be used to replace an alert Missile that must be removed from the operational Launch Pad. For the initial setup of a basic Missile and Nose-Warhead Section, perform only operations 1 and 3. For recycle of a Nose Section back to the Industrial Maintenance Area, perform only operation 5. For recycle of a Basic Missile back to the Industrial Maintenance Area, perform only operation 2 and 4.

## 2-5. MASTER MISSILE RECYCLE CHECKLIST.

2-6. The Master Missile Recycle Checklist must be performed on each Missile in the Alert or Replacement Status every 15 days. The procedures include: 1) connecting test equipment and performing Flight Controls Test when required, 2) performing Step Zero procedures, 3) performing a qualitative checkout of the Missile Armament, Flight Controls, and Guidance Systems, and 4) returning the Missile to Alert/replacement status. The SRP console must be verified every 15 days.

## 2-7. MASTER MISSILE REPLACEMENT CHECKLIST.

2-8. The Master Missile Replacement Checklist must be performed whenever a Missile on an operational Launch Pad requires replacement. These procedures include: 1) removing the Missile from alert status, 2) disconnecting the Missile from Launch Area cabling and support equipment, 3) moving the Missile to the Launch Site Maintenance Area, 4) positioning the Replacement Missile on the empty launch pad, 5) connecting Launch Area cabling and equipment to the Missile, and 6) performing final alert status checks.

## Paragraphs 2-9 to 2-21

## 2-9. CHECKLIST USAGE.

2-10. The concept defined in the checklists is to replace the Missile on the Launch Pad rather than accomplish extensive maintenance. A replacement Missile is maintained in a backup area (LSMA) to be exchanged with any Missile that must be replaced.

2-11. Initial setup of a Basic Missile and Nose/Warhead Section which have just arrived in the LSMA from the Industrial Maintenance Area will be accomplished by performing operations 1 and 3 of table 2-1. The Missile will be readied for replacement status by performing the recycle checks contained in table 2-2. When an alert Missile on a Launch Pad must be removed, the alert Missile will be replaced with the replacement Missile by performing table 2-3. The replacement Missile will then become the alert Missile.

2-12. When a Basic Missile requires periodic recycle checks (150-days), the alert Missile will be replaced on the Launch Pad by performing table 2-3. Table 2-3 will replace the alert Missile with a replacement Missile. The Nose/Warhead Section will be removed from the Basic Missile (due periodic recycle) and placed on another Basic Missile (Basic Missile that has been set up by performing operation 1 of table 2-1). The Nose/Warhead Section will be transferred by performing operation 2 and 3 of table 2-1. Then, the Missile will be readied for replacement status by performing table 2-2. The Basic Missile that is due periodic recycle will be prepared for return to the Industrial Maintenance Area by performing operation 4 of table 2-1.

2-13. When a Nose Section requires periodic recycle checks (75-days), the alert Missile will be replaced on the Launch Pad by performing table 2-3. After being replaced on the Launch Pad, the Nose Section is removed and replaced in the LSMA by performing operation 5 of table 2-1. Then, the Missile is readied for replacement status by performing table 2-2. If during a recycle check (table 2-2) a malfunction is encountered, the Nose Section will be replaced by performing operation 5, of table 2-1. After replacement of the Nose Section, repeat the recycle checks (table 2-2).

2-14. When a Missile requires recycle check (every 15 days) the missile will be removed from alert or replacement status by performing table 2-2.

2-15. The checklist pages in this manual should be protected against wear through normal use whenever feasible. Pre-punched plastic envelopes are available from Air Force stock for checklist pages of this manual.

## 2-16. EMERGENCY PROCEDURES.

2-17. Emergency Procedures have been included in this manual to provide the NCOIC with adequate procedures to handle emergency conditions effectively. These procedures must be thoroughly understood before any Launch Area maintenance is performed.

## 2-18. LAUNCH AREA MALFUNCTION.

2-19. Should any Launch Area malfunction occur, report them to Maintenance Control, and refer to applicable Servicing Instructions.

## 2-20. SAFETY REQUIREMENTS.

2-21. When operating according to instructions or performing maintenance on equipment contained in this manual, adhere to the safety precautions prescribed in AFR-122-29 and other pertinent safety directives. Procedural steps contained in the supporting checklists have been arranged to ensure maximum safety.

TABLE 2-1  
MASTER MISSILE SETUP CHECKLIST

T.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2-1 1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2-2 2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2-3 3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2-4 4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2-5 5 Weapons Mechanic Mechanic No. 5
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Operation 1.

NOTE

Operation 1 will be performed on the incoming Re-  
placement Missile prior to removing the Alert  
Missile from the Launch Pad.

Supervise and  
assist in setup  
of Basic Missile.

Assist Mech.  
No. 1 in posi-  
tioning N & B  
vehicle for  
Rocket Motor  
installation.  
*SRV*

Position SRV on  
left side of Missile.

Assist Mech.  
No. 5 in posi-  
tioning ~~SRV~~. *NAB*

Position N & B  
vehicle for Rocket  
Motor installa-  
tion (para.  
3-165).

Engage power take-  
off (para. 3-59).

Inspect Power  
Pack (para.  
3-138).

Energize Power  
Pack hydraulics  
(para. 3-139).

Position jack  
pads. (Para.  
3-131).

Connect hyd.  
hoses to  
Translauncher  
(para. 3-140).

Remove Rocket  
Motor tiedown  
straps and  
position turn-  
table (para.  
3-166).

Assist Mech.  
No. 4 in rais-  
ing Missile.

Raise Missile to  
checkout position  
(para. 3-141).

TABLE 2-1 (cont)

## MASTER MISSILE SETUP CHECKLIST

T.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2-1 1 Guidance System Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2-2 2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2-3 3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2-4 4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2-5 5 Weapons Mechanic Mechanic No. 5
	Install Hold Back bolt (para. 3-62).	Remove Spoiler operating mechanism from stowed position (para. 3-88).			
Assist Mech. No. 5 in installing booster dolly tracks.		Remove crown panel (para. 3-89).	Remove crown panel.	Assist Mech. No. 3 in re-moving crown panel.	Install booster dolly tracks (para. 3-167).
		Remove Spoiler Actuator Package from stowed position (para. 3-90).	Remove Spoiler actuator package into spoiler operating mechanism (para. 3-91).		
		Remove Wing Tiedown Bracket (para. 3-92).		Assist Mech. No. 3 in re-moving Wing Tiedown Bracket.	



TABLE 2-1 (cont)

MASTER MISSILE SETUP CHECKLIST

T.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2-1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2-2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2-3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2-4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2-5 Weapons Mechanic Mechanic No. 5
Supervise installation of Rocket Motor.	Assist Mech. No. 3 in installing Wings.	Assist Mech. No. 3 in installing Wings.	Install left Wing (para. 3-93).  Install right Wing (para. 3-94).	Assist Mech. No. 3 in installing Wings.	Install Rocket Motor (para. 3-168).
<u>WARNING</u> Insure that FWD Locking Mechanisms are free to move up and down.	Assist Mech. No. 5 in installing Rocket Motor.	Assist Mech. No. 5 in installing Rocket Motor.	Connect spoiler control rods and actuator package electrical cables. (para. 3-95).	Lower Trans-launcher (para. 3-147). 3-145	Install Rocket Motor (para. 3-168).
	Assist Mech. No. 5 in installing Rocket Motor.	Disengage power takeoff (para. 3-61).		Shutdown Power Pack hydraulics (para. 3-143).	
	Assist Mech. No. 4 in removing folding Wing mechanism.	Assist Mech. No. 4 in removing folding Wing mechanism.		Disconnect hyd. hose from Trans-launcher (para. 3-144).	
				Remove folding Wing Mechanism (para. 3-145).	

TABLE 2-1 (cont)

MASTER MISSILE SETUP CHECKLIST

T.O. 21-TM76A-1-2- Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2- 1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2- 2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2- 3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2- 4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2- 5 Weapons Mechanic Mechanic No. 5
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Operation 2.

NOTE

Perform Operation 2 when Basic Missile is being replaced.

Supervise re-moving Nose & W/H Section	Assist Mech. No. 3 in removing lanyard posts and fittings.	Assist Mech. No. 5 position N & B Vehicle.	Remove Lanyard Posts and Fittings (para. 3-96).	Assist Mech. No. 5 in positioning N & B vehicle.	Position N & B vehicle for Nose and W/H Section removal (para. 3-169).
	Assist Mech. No. 3 in removing Start and Hold Power Cables	Assist Mech. No. 5 in positioning Nose and W/H handling mechanism.	Remove Start and Hold Power Cables (para. 3-97).	Assist Mech. No. 5 in positioning Nose and W/H handling mechanism. 3-171).	Disconnect Nose Package/Center Section connections (para. 3-170).
	Assist Mech. No. 3 in removing Umbilical Cable.	Assist Mech. No. 5 in removing Nose and W/H Section.	Remove Umbilical Cable (para. 3-98).	Assist Mech. No. 5 in removing Nose and W/H Sections.	Remove Nose and W/H Section (para. 3-172).
	Assist Mech. No. 3 in removing Collar Assemblies.	Assist Mech. No. 5 in removing N & B vehicle from area.	Remove Collar Assemblies (para. 3-99).	Assist Mech. No. 5 in removing N & B vehicle from area.	Remove N & B vehicle from area.

TABLE 2-1 (cont)

## MASTER MISSILE SETUP CHECKLIST

T.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2- 1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2- 2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2- 3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2- 4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2- 5 Weapons Mechanic Mechanic No. 5
Operation 3.  Supervise in- stalling Nose & W/H Sections.	Assist Mech. No. 3 in in- stalling lanyard posts and fittings.	Assist Mech. No. 5 in posi- tioning N & B vehicle for Nose and W/H Sections Installation.	Install lanyard posts and fittings (para. 3-100).	Assist Mech. No. 5 in posi- tioning N & B vehicle for Nose and W/H Section Installation.	Position N & B vehicle for Nose and W/H Sections installation (para. 3-169).
	Assist Mech. No. 3 in installing Start and Hold Power Cables.	Assist Mech. No. 5 in posi- tioning Nose and W/H handling Mechanism.	Install Start and Hold Power Cables (para. 3-101).	Assist Mech. No. 5 in posi- tioning Nose and W/H Section handling mechanism.	Position Nose handling mech- anism (para. 3-171).
	Assist Mech. No. 3 in installing Umbilical Cable.		Install Umbilical Cable (para. 3-102).		
	Assist Mech. No. 3 in installing Collar Assemblies.	Assist Mech. No. 5 in installing Nose and W/H Section.	Install Collar Assemblies (para. 3-103).	Assist Mech. No. 5 in installing Nose and W/H Sections.	Install Nose and W/H Sections (para. 3-173).
					Connect Nose Package/Center Section connec- tions (para. 3-174).

TABLE 2-1 (cont)

MASTER MISSILE SETUP CHECKLIST

T.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2-1 1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2-2 2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2-3 3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2-4 4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2-5 5 Weapons Mechanic Mechanic No. 5
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Assist Mech.  
No. 5 in re-  
moving N & B  
vehicle from  
area.

Remove N & B  
vehicle from area.

NOTE

Proceed to Master Missile Recycle Checklist prior to  
accomplishing Operation 4.

Operation 4.

NOTE

Perform this operation when Basic Missile is to be  
recycled back to Industrial Maintenance Area.

Supervise re-  
moving Rocket  
Motor. Assist Mech.  
No. 5 in posi-  
tioning N & B  
vehicle for  
Rocket Motor  
removal. Position N & B  
vehicle for  
Rocket Motor  
removal (para.  
3-165).

Assist Mech.  
No. 3 in in-  
stalling folding  
wing mehcanism. Assist Mech.  
No. 3 in  
installing folding  
wing mechanism.  
Position Power  
Pack on left side  
Missile. Assist Mech.  
No. 2 in posi-  
tioning Power  
Pack.

TABLE 2-1 (cont)

MASTER MISSILE SETUP CHECKLIST

T.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2-1 1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2-2 2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2-3 3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2-4 4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2-5 5 Weapons Mechanic Mechanic No. 5
Assist Mech. No. 5 in installing booster dolly tracks.	Engage power takeoff (para. 3-59).	Remove spoiler actuator package and operating mechanism (para. 3-105).	Inspect Power Pack (para. 3-138).	Inspect Power Pack (para. 3-138).	Inspect Power Pack (para. 3-138).
Assist Mech. No. 5 in re- moving Rocket Motor.	Assist Mech. No. 3 in placing Wings in folded position.	Place Wings in folded position (para. 3-106).	Energize Power Pack hydraulics (para. 3-139).	Energize Power Pack hydraulics (para. 3-139).	Install booster dolly tracks (para. 3-167).
Remove holdback bolt.	Assist Mech. No. 5 in removing Rocket Motor.	Assist Mech. No. 3 in placing Wings in folded position.	Connect hyd. hose to Trans- launcher. (para. 3-140).	Connect hyd. hose to Trans- launcher. (para. 3-140).	Assist Mech. No. 5 in removing Rocket Motor.

TABLE 2-1 (cont)

MASTER MISSILE SETUP CHECKLIST

T.O. 21-TM76A-1-2-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2-2-1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2-2-2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2-2-3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2-2-4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2-2-5 Weapons Mechanic Mechanic No. 5
	<p>Insure all exposed elect. connectors are capped and Missile dust covers installed.</p>			<p>Lower Missile to transport position (para. 3-142).</p>	<p>Install Rocket Motor tiedown straps (para. 3-176).</p>
			<p>Assist Mech. No. 5 in removing N &amp; B vehicle from area.</p>	<p>Shut down Power Pack hydraulics (para. 3-143).</p>	<p>Remove N &amp; B vehicle from area.</p>
		<p>Disengage power takeoff (para. 3-61).</p>		<p>Disconnect hyd. hoses from Trans-launcher (para. 3-144).</p>	
	<p>Assist Mech. No. 2 in removing Power Pack vehicle from area.</p>				

TABLE 2-1 (cont)

## MASTER MISSILE SETUP CHECKLIST

T.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2-1 1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2-2 2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2-3 3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2-4 4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2-5 5 Weapons Mechanic Mechanic No. 5
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## Operation 5.

## NOTE

Perform this operation upon Nose Replacement only.

Supervise re-  
moving and in-  
stalling Nose  
section.

Position Nose  
Work Stand  
(para. 3-9).

Assist Mech.  
No. 1 posi-  
tioning Nose  
Work Stand.

Remove W/H  
Access Panel.

Remove Radome  
(Para. 3-10).

Assist Mech.  
No. 1 in re-  
moving Radome.

Disconnect Nose  
Section from W/H  
Section (para.  
3-177).

Open radar base  
casting (para. 3-11).

Remove film and  
return to LCC  
(para. 3-12).

Close radar base  
casting (para.  
3-13).

Install antenna  
shipping brace  
(para. 3-64).

Install Radome  
(para. 3-14).

Assist Mech. No. 1  
in installing Radome.

TABLE 2-1 (cont)

## MASTER MISSILE SETUP CHECKLIST

T.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2-1 1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2-2 2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2-3 3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2-4 4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2-5 5 Weapons Mechanic Mechanic No. 5
	Remove Nose Work Stand (para. 3-15).	Assist Mech. No. 1 in removing Nose Work Stand.	Assist Mech. No. 5 in positioning N & B vehicle.	Assist Mech. No. 5 in positioning N & B vehicle.	Position modified N & B vehicle for Nose removal (para. 3-178).
		Assist Mech. No. 5 in positioning Nose handling mechanism.	Assist Mech. No. 5 in positioning Nose handling mechanism.	Position modified Nose handling mechanism (para. 3-179).	
		Assist Mech. No. 5 in re- moving Nose Section.	Assist Mech. No. 5 in re- moving Nose Section.	Remove Nose Section (para. 3-180).	
		Assist Mech. No. 5 in re- placing Nose Section.	Assist Mech. No. 5 in re- placing Nose Section.	Replace Nose Section (para. 3-181).	
		Remove N & B vehicle from area.	Assist Mech. No. 3 in removing N & B vehicle from area.	Connect Nose Section to W/H Section (para. 3-182).	

END OF MASTER MISSILE SETUP CHECKLIST



TABLE 2-2

MASTER MISSILE RECYCLE CHECKLIST

T.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2-1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2-2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2-3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2-4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2-5 Weapons Mechanic Mechanic No. 5
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OPERATION 1

NOTE

Procedures preceded by an asterisk (\*) are additional checks to be performed when a nose or missile has been changed. When recycle is performed in LSMA, checks peculiar to the launch pad will not be accomplished. *Check*

Supervise all Operations  
Insure that safety and arming plug is inserted in UOB.

Position SRP  
Eff 1) Engage PTO (para 3-59)

Shut Down NTCU (para 3-83)

Assist Mech 2 in positioning SRP.

Connect Power Pack static ground to earth ground.

Eff 2) Start PE-200 and engage PTO (para 3-82).

Eff 1) Connect Hydraulic hoses to Translauncher (para 3-140)

Inspect Power Pack (para 3-138)

Adjust Power Pack electrical output (para 3-146)

Lower Missile to checkout position (para 3-159)

TABLE 2-2 (CONTD)

MASTER MISSILE RECYCLE CHECKLIST

T.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2-1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2-2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2-3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2-4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2-5 Weapons Mechanic Mechanic No. 5
<p>Assist Mech #4 to position work stand.</p> <p>Assist Mech #4 position Nose Work stand</p>					
<p>Observe and assist Mech 5 Disconnect Warhead and Squib firing cables</p> <p>Disconnect Warhead (para 3-186)</p>					
<p>Assist Mech #4 to position work stand.</p> <p>Assist Mech 5 Disconnect Squib firing cables (para 3-187)</p>					

NOTE:  
 Notify Maint Control and Msl Combat Crew Commander that Missile is out of commission

OPERATION 2

Obtain film Box from LCC

Remove RFT Cable (para 3-50)

Remove RF Hood (para 3-51)

Assist Mech 1 in removing RF Hood door covers

Remove breather door covers

TABLE 2-2 (CONTD)

MASTER MISSILE RECYCLE CHECKLIST

T.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2-1 1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2-2 2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2-3 3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2-4 4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2-5 5 Weapons Mechanic Mechanic No. 5
OPERATION 2 (CONTD)	Remove radome (para 3-10)	Assist Mech 1 in removing radome	Remove engine start power cable and Msl aft bus power cable from missile		
Remove antenna shipping brace if necessary (para. 3-16)			Remove NICU duct assy (para 3-49)	Disconnect Hyd hoses from T/L and connect to HCU or Msl as applicable (para 3-148)	Assist Mech 3 in removing NICU duct assy
Open radar base casting (para 3-11)		Assist Mech 1 in opening base casting			
Eff A) secure thermometer (para 3-17)		Install Film (para 3-18)			
With member of launch crew pre- sent Perform Msl switch and control settings and TAT setting (para 3-19 Eff C) (Para 3-20 Eff D) (para 3-21)		*Connect Flight controls tester (para 3-66)	Observe Mech 5 connect warhead interlock cable		Connect Warhead interlock cable (para 3-183)

Install warhead  
access panel

TABLE 2-2 (CONTD)

MASTER MISSILE RECYCLE CHECKLIST

I.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	I.O. 21-TM76A-1-2-1 Guidance Systems Mechanic Mechanic No. 1	I.O. 21-TM76A-1-2-2 Controls Systems Mechanic Mechanic No.2	I.O. 21-TM76A-1-2-3 Missile Mechanic Mechanic No. 3	I.O. 21-TM76A-1-2-4 Missile Mechanic Mechanic No. 4	I.O. 21-TM76A-1-2-5 Weapons Mechanic Mechanic No. 5
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OPERATION 2  
(CONTD)

Connect SRP to Msl (para 3-65) Assist Mech 1 connect SRP to Msl (para 3-107) Assist Mech 1 remove stabilizer actuator panel (para 3-107) Assist Mech 4

Apply power to SRP (para 3-23) \*perform FCT if required (para 3-67 thru 3-79) \*Assist Mech 2 in performing FCT that fuel SOV and throttle motor are closed \*Observe stabilizer actuator package during cycling operation (para 3-184)

\*Apply external power to missile (para 3-24) \*Observe spoiler actuator package during cycling operation (para 3-149)

\*Assist Mech 2 with FCT

Close radar base casting (para 3-22) Assist Mech 1 in closing base casting

\*Shut down and disconnect FCT (para 3-190)

TABLE 2-2 (CONTD)

MASTER MISSILE RECYCLE CHECKLIST

T.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2- 1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2- 2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2- 3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2- 4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2- 5 Weapons Mechanic Mechanic No. 5
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OPERATION 2  
(CONTD)

\*Install radome  
(para 3-14)  
Assist Mech 1 in  
installing radome

Install RF Hood  
(para 3-52)  
Assist Mech 1 in  
installing RF Hood

OPERATION 3

Insure that all  
Mechanics are  
ready for exter-  
nal Power

Notify Mech 1,  
Mech 2 is ready  
for external  
Power

Notify Mech 1,  
Mech 3 is ready  
for external  
Power

Notify Mech 1,  
Mech 4 is ready  
for external  
Power

Notify Mech 1,  
Mech 5 is ready  
for external  
Power

Apply external  
Power to missile  
(para 3-24)

Apply ground  
cooling (para  
3-109)

Check to insure  
that fuel SOV  
and throttle motor  
are closed

Apply power to SRP  
main console (para  
3-25)

Apply hydraulic  
pressure to Msl  
(para 3-110)

Check Power Supply  
voltage (para 3-26)

Cycle Spoilers  
(para 3-111)

Observe Spoiler  
actuator package  
during cycling op-  
eration (para 3-149)

TABLE 2-2 (CONTD)

MASTER MISSILE RECYCLE CHECKLIST

T.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2- 1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2- 2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2- 3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2- 4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2- 5 Weapons Mechanic Mechanic No. 5
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OPERATION 3  
(CONTD)

Check SRP console  
vent system (para  
3-27)

Cycle stabilizer  
(para 3-112)

Observe stabilizer  
actuator  
package during  
cycling operation  
(para 3-184)

Cycle Missile  
Hyd reservpor  
(para 3-113)

Observe Missile  
Hyd reservoir  
during cycling  
(para 3-150)

Perform final hyd  
cycling (para  
3-114)

Set up altitude  
simulator (para  
3-28)

Monitor SRP con-  
sole and assist  
Mech 1 with center-  
ing adj

Perform Trans-  
ponder Xtal cur-  
rent check (para  
3-29)

WARNING

Insure all person-  
nel observe RF  
Hazard area

TABLE 2-2 (CONTD)

MASTER MISSILE RECYCLE CHECKLIST

T.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2- 1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2- 2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2- 3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2- 4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2- 5 Weapons Mechanic Mechanic No. 5
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OPERATION 3  
(CONTD)

NOTE

Do not remove radome until ground cooling has been operating for 15 minutes

Remove RF Hood (para 3-51)

Eff A) Remove radome (para 3-10)

Eff A) Open base casting and record thermometer indication (para 3-30)

Eff A) Perform brightness and centering adj (para 3-31)

(Eff B) Perform centering adj (para 3-32)

Shut down ground cooling (para 3-117)

Assist Mech 1 throughout the following steps in this operation

TABLE 2-2 (CONTD)

## MASTER MISSILE RECYCLE CHECKLIST

T.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2- 1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2- 2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2- 3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2- 4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2- 5 Weapons Mechanic Mechanic No. 5
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OPERATION 3  
(CONTD)

Perform antenna  
azimuth alignment  
(para 3-33)

Perform ATRAN  
visual checks  
(para 3-34)

Perform Roll Gain  
check (para 3-36)

Perform Pitch  
Gain check (para  
3-38)

Perform Vertical  
alignment of  
ATRAN antenna  
(para 3-39)

Install radome  
(para 3-14)

Install RF Hood  
(para 3-52)

## OPERATION 4

Perform final pre  
launch check (para  
3-41)

Apply ground cooling  
(para 3-109)



TABLE 2-2 (CONTD)

MASTER MISSILE RECYCLE CHECKLIST

T.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2- 1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2- 2 Controls System Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2- 3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2- 4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2- 5 Weapons Mechanic Mechanic No. 5
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OPERATION 4  
(CONTD)

Perform Missile  
pre-flight test  
(para 3-42)

Fill Missile Hyd  
reservoir after  
completion of SRP  
SEQ (para 3-115)

Shut down SRP main  
console (para 3-43)

Disconnect hyd hoses  
from missile or HCU  
as applicable (para  
3-116)

Shut down missile  
power (para 3-44)

Shut down power to  
SRP (para 3-45)

After missile power  
has been shut down,  
shut down ground  
cooling (para 3-117)

Disconnect ground Shut down Power  
cooling hose (para 3-151)  
3-118)

Disengage power  
takeoff (para  
3-61)

TABLE 2-2 (CONTD)

## MASTER MISSILE RECYCLE CHECKLIST

T.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2-1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2-2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2-3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2-4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2-5 Weapons Mechanic Mechanic No. 5
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## OPERATION 5

## NOTE

Perform applicable portions of Maint visual check before apply power for warhead continuity check

Disconnect SRP from Missile (para 3-46)

Stow SRP cable boom with cables and secure boom (para 3-47)

Assist Mech 1 in disconnecting SRP from missile

Connect P9016 to J9016 & P9022A to J9022A on UOB

Assist Mech 1 in disconnecting SRP from missile

Retract Power Pack Cable boom (para 3-119)

Assist Mech 5 in disconnecting Warhead interlock cable

Install stabilizer access panel

Install crown panel (para 3-152)

Drain Msl Sumps (para 3-120)

Install breather door covers

Install and connect Assist Mech 1 RF Hood (para 3-52) with RF Hood

Assist Mech 5 with interlock check

Perform interlock continuity test (para 3-191)

Connect Warhead and secure access panel (para 3-192)

Connect squib firing cables (para 3-190)

Connect RFT cable (para 3-53)  
Connect engine start power cable and missile aft bus cable to Msl

Assist Mech 5 in connecting squib firing cables

TABLE 2-2 (CONTD)

MASTER MISSILE RECYCLE CHECKLIST

T.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2- 1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2- 2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2- 3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2- 4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2- 5 Weapons Mechanic Mechanic No. 5
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OPERATION 5  
(CONTD)

Assist Mech 3 in connecting NTCU duct assy  
Connect NTCU duct assy to missile (para 3-54)

OPERATION 6

Check RFT Centering  
Request Launch Officer to remove power from missile Start NTCU (para 3-45)

OPERATION 7

Remove nose work stand from area (para 3-15)  
Adjust Power Pack electrical output (para 3-146)  
Energize power pack hydraulics (para 3-139)

Assist Mech 1 with work stand removal  
Elevate Missile to launch attitude (para 3-163)  
Shut down Power Pack hyd (para 3-143)

Request Missile Combat Crew Commander to perform RFT Check

TABLE 2-2 (CONTD)

MASTER MISSILE RECYCLE CHECKLIST

T.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2- 1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2- 2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2- 3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2- 4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2- 5 Weapons Mechanic Mechanic No. 5
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OPERATION 7  
(CONTD)

Eff 1) Disconnect hyd hoses from translauncher (para 3-144)

Shut down Power Pack (para 3-151)

Disconnect Power Pack static ground from earth ground

Eff 1) Disengage PTO (para 3-61)

Remove SRP from launch pad (para 3-63)

Assist Mech 2 remove SRP from launch pad

Insure that safety and arming plug has been removed from UOB

Perform Maint visual checks (para 3-7)

me 29 completed

Be 117  
Tuckey

Favelli  
MECH 3

Rodriguez  
MECH 2

Table 2-3  
Bumgardner  
MECH 4

Kolloway  
MECH 4

Teckla  
MECH 5

Operation 1 Note: A qualified supervisor must be present during missile movement.

Assist Mech 2 Assist in preparing for movement of replacement MSL to Launch Pad

Position Power Park vehicle

Prepare for movement of replacement MSL to Launch Pad (Par 3-132)

Assist Mech 3 Assist in preparing for movement of replacement MSL to Launch Pad

Assist Mech 3 Assist Mech 3 in moving re-placement MSL to Launch Pad

Adjust Power Pack electrical output (Par 3-146)

Connect Hyd hoses to W/L (Par 3-240)

Emergency Power Pack Hyd (Par 3-139)

Lower Msl to Checkout Position

Ensure that safety and arming ring is inserted in UCR and that Launch Officer turns on and initiates movement. Notify WUC and Mission Control that MSL is off ORA status

Engage Power Park Power Park off (Par 3-132)

Adjust and engage PK-200 Power Park off (Par 3-132)

Connect to busbar

Shut Down NICU (Par 3-85)

Shut Down HCU (Par 3-154)

Revised Table 2-3 TO 21TM76A-1-2, 29 March 1963

Table 2

NOIC	MECH 1	MECH 2	MECH 3	MECH 4	MECH 5
Operation 2	Assist Mech 3 Position Squib				Disconnect Warhead (Par 3-137)
Supervise and assist Mech 5 in disconnecting Warhead					Disconnect Squib firing cables (Par 3-189)

WARNING: Make sure Operation 2 is complete before starting Operation 3

Operation 3

Supervise removal of all equipment

Disconnect light off Det cable and Bendix fitting	Disconnect from J-Box Start and Hold Power cables and secure to T/L	Asst M-5 remove Hyd Hoses	Remove Shear Bolt and install Holdback Bolt (Par 3-62)	Remove MS1 Hydraulic Hoses (Par 3-189)
Disconnect Start fuel hose from Missile (Par 3-101)	Disconnect Inter Comm cable from Trausaunch <del>at</del> J-Box	Remove RF hood reel motor (Par 3-124)	Remove RF hood in Removing T/L Tie-Downs	Remove MS1G Common Ground
Disconnect engine run up and test cable Bendix fitting	Disconnect UOB cable from UOB and secure to T/L	Install Forward MS1 Tie-Downs (Par 3-125)	Disconnect T/L Tie-Downs	Disconnect Launcher cable from J9915 on UOB
Disconnect WTCU duct assembly (Par 3-149)	Remove M-3 Assist Mechan 1 in removing Duct Assembly	Remove W/L Tie-Downs (Par 3-126)	Remove W/L Tie-Downs	Assist Mechan 4 in removing T/L Tie-Downs
Disconnect RF Cable (Par 3-50)	Assist Mech 1			
Remove RF Hood (Par 3-51)	Assist Mech 1			

Set RF Hood aside

Table 2-3

NOIC MECH 1 MECH 2 MECH 3 MECH 4 MECH 5

Operation 3 (Continued)

Supervise removal of UOB Junction Box and Start Fuel Box Start Fuel Box <sup>Assist Mech 3</sup> Remove UOB J-Box and Start Fuel Box <sup>IF MOVING T/L</sup> Assist Mech 3 Assist Mech 3 Assist Mech 3 Assist Mech 3 Assist Mech 3

Supervise and assist in installing T/L Begies Assist Mech 3 Assist Mech 3 Install T/L Begies (Par 3-127) Operate T/L Hyd controls during Begies installation Assist Mech 3

<sup>Assist Mech 3</sup> connect 5th wheel to T/L ~~Position 5th wheel & connect 5th wheel to T/L (Par 3-121)~~ Operate Hyd for connecting 5th wheel (Par 3-155)

Remove left T/L Jack Pads and support fittings (Par 3-84) Retract T/L levelling jacks (Par 3-156) Shut down Power Pack Hyd (Par 3-143) Remove right T/L jack pads & support fittings (Par 3-190)

Supervise and assist in inspecting Msl Prier to removal

Disconnect Hyd Hoses from T/L (Par 3-144) Disconnect T/L Static and from Gond Post

Table 2-3

NCOIC MECH 1

MECH 2

MECH 3

MECH 4

MECH 5

Operation 4

Supervise removal of Assist Mech 4 missile and assist in removing Msl in aligning replacement Msl on Launch Pad

Assist Mech 4 secure Msl in ISMA

Assist Mech 3 in aligning replacement Msl on Launch Pad

Move replacement Msl onto pad and align T/L (Par 3-128)

Secure Msl in ISMA (Par 3-158)

Assist Mech 4 in removing Msl secure Msl in ISMA

Operation 5

Remove Cooling Duct Plugs

Position T/L Jack Pads and support fittings

Energize Power Pack Hyd (Par 3-139)

Make Static Gnd Connections (Par 3-129)

Connect LCEG Common Ground

Connect RFT Cable (Par 3-53)

Assist Mech 1 with RFT Cable

Observe Levering of T/L Jacks for alignment with pads (Par 3-131)

Observe Levering of T/L Jacks for alignment with Pads

Connect NTCU Duct Assembly

Assist Mech 1 Connect NTCU Duct Assembly

Disconnect 5th wheel and re-position (Par 3-132)

Assist Mech 3 in removal of 5th wheel

Start NTCU (Par 3-85)

Supervise and assist in removing T/L Begies

Assist Mech 3

Remove T/L Begies (Par 3-133)

Operate T/L Hyd Controls during Begies removal (Par 3-159)

Assist Mech 3



Table 2-3

NGOIC MECH 1 MECH 2 MECH 3 MECH 4 MECH 5

Operation 5 (Continued)

MECH 1	MECH 2	MECH 3	MECH 4	MECH 5
Check T/L Levelling using Inclinator (Par 3-4)	Assist Mech 4	Assist Mech 4	Lower and level T/L (Par 3-147)	Assist Mech 4
Position Mech 3	Assist Mech 3	Position Nose Work Stand if requested	Shut down Power Pack Hyd (Par 3-143)	Assist Mech 3
Assist Mech 3	Assist Mech 1	Assist Mech 1	Purge HCU (Par 3-160)	Assist Mech X
Connect Start Fuel Hose Assy (Par 3-55)	Connect Umbilical, Launch Control and Remote Arming Cables to UO	Install RF Head Reel Motor (Par 3-134)	Assist Mech 3	Assist Mech 3
Connect Engine Ramp and test cable (Par 3-56)	Connect Inter Conn Cable to T/L	If no Engine Run is required remove forward Msl Tie-downs (Par 3-153)	Assist Mech 5	Assist Mech 3
Connect Light Off Det Cable (Par 3-56)	Connect Engine Start Power Cable to J322 on T/L J-Box	Assist Mech 5 installing T/L	Fill Msl Hyd Reservoir (Par 3-162)	Assist Mech 3
Perform light off Detector cable check (Par 3-6)	Connect Msl Aft Bus Power cable to J-321 on T/L J-Box	Assist Mech 5		Assist Mech 3

Table 2-3

NGOIC MECH 1 MECH 2 MECH 3 MECH 4 MECH 5

Operation 6

Obtain Film from IO

Turn NTCU OFF

Turn NTCU OFF

If no Engine Run required Install Shear Bolt (Par 3-60)

Remove Hyd Hose from HCU and connect T/L (Par 3-140)

Assist Mech 4

\*Remove Radome (Par 3-10)

Assist Mech 1

\*Open Radar Base Casting (Par 3-11)

Assist Mech 1

\*Remove old Film (Par 3-12)

Assist Mech 1

Assist Mech 5

Remove W/H Panel

\*Install new Film (Par 3-18)

Observe Mech 1 to insure Film is installed properly

Assist Mech 5

Connect Grounding Tester

WITH LAUNCH MEMBER  
Perform Msl switch and control settings are in accordance with pre-launch data card

\*Perform Target Timer Settings (Par 3-21)  
Observe that timer Settings are correct



1000

1000

1000

1000

Remove from launch pad

Remove from launch pad

Remove from launch pad

Remove from launch pad

Remove from launch pad

Remove from launch pad

Remove from launch pad  
(Par 3-144)

Remove from launch pad

Remove from launch pad

Remove from launch pad

Remove from launch pad

Remove from launch pad

Remove from launch pad  
(Par 3-144)

Remove from launch pad  
(Par 3-144)

Remove from launch pad  
(Par 3-144)

Remove from launch pad  
(Par 3-144)

Disconnect EYR6  
Hoses from T/L  
(Par 3-144)

Remove  
Safety and  
Arming Pins  
From UDS

Disconnect power  
pack station ground  
from power pack

Remove  
Safety and  
Arming Pins  
From UDS

Remove from launch pad

Remove Power Pack  
Vehicle from Launch  
Pad (Par 3-63)

Assist Mech & in  
removing power pack  
Vehicle from Launch  
Pad

Assure that Safety and  
Arming Pins has been  
removed from UDS and re-  
turned to MCCG and  
advise Maint Control  
Missile is on ORA Status

TABLE 2-3 (cont)

MASTER MISSILE REPLACEMENT CHECKLIST

T.O. 21-TM76A-1-2- Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2- 1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2- 2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2- 3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2- 4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2- 5 Weapons Mechanic Mechanic No. 5
--	--	--	--	--	--

(Eff. II) Shut  
down PE-200  
(para. 3-86).

(Eff. I) Disconnect  
Power Pack static  
ground from ground  
rod.

Perform mainte-  
nance visual  
checks (para.  
3-7).

Observe Mech.  
No. 5 con-  
necting igniter  
cable.

Insure that  
Safety and Arm-  
ing plug has  
been removed.

Assist Mech.  
No. 2 in re-  
moving Power  
Pack vehicle  
from Launch Pad.

(Eff. I) Remove  
Power Pack  
vehicle from  
Launch Pad  
(para. 3-63).

Assist Mech. No.  
5 in performing  
stray voltage  
check.

Perform stray  
voltage check of  
UOB (para. 3-193)

Connect igniter  
cable to UOB  
(para. 3-194).

T.O. 21-TM76A-1-2

Section II

END OF MASTER MISSILE REPLACEMENT CHECKLIST

TABLE 2-4

EMERGENCY PROCEDURES

LOWERING MISSILE FROM ELEVATED POSITION.

1. Reservoir Valve OPEN.
2. Pressure Valve CLOSED.
3. Bypass Valve CLOSED.
4. Place forward elevating control to UP.
5. Actuate hand pump until elevating mechanism uplocks are clear.
6. Pull uplock release handle out, and hold.
7. Place forward elevating control to DOWN.
8. Actuate hand pump until elevating mechanism begins to descend.
9. Use forward elevating control to slow the lowering of the Missile.

ELECTRICAL FIRES.

1. Place emergency power switch OFF.
2. Lower the Missile if elevated.
3. On Warhead-Laden Missiles, electrically disconnect the Warhead from the Missile.
4. Direct fire extinguishing agent on the fire.

UOB INDICATOR LAMP ON.

1. Remove power from launch complex.
2. Disconnect battery power at Engine Pack.
3. Insert Safety and Arming plug into UOB.
4. Disconnect Rocket Motor ignitor cable from UOB.

DETACHED ROCKET MOTOR.

1. Insert safety and Arming plug into UOB.
2. Disconnect ignitor cable.

RUPTURED FUEL CELL.

1. Remove all power from launch Complex.
2. Direct fire-fighting equipment so as to protect adjacent AGE and Missiles.

WARHEAD NO-GO CONDITION.

1. Remove all power from the effected Missile.
2. Notify maintenance control to dispatch armament officer and NUCLEAR specialist from armament area.
3. Insure Safety and Arming plug is inserted in UOB.
4. Lower Missile if elevated.
5. Electrically disconnect the warhead from the Missile.
6. Proceed as directed by armament officer or nuclear specialist.

SECTION III  
OPERATING INSTRUCTIONS3-1. GENERAL.

3-2. The Missile Maintenance Crew NCOIC is responsible for all maintenance being performed at the Launch Site during his tour of duty. Each day the NOIC will conduct a Launch Site daily visual check (para. 3-7) to assure all equipment is operational. This section contains detailed operating instructions necessary for the NCOIC and Mechanics No. 1 through 5 of the Missile Maintenance Crew to perform the duties required in the Checklists in Section II. The instructions in Section II, identified by paragraph headings refer to procedures in this section.

3-3. NCOIC DETAILED INSTRUCTIONS.3-4. CHECKING TRANSLAUNCHER LEVELING.

## NOTE

Level Translauncher so that Chassis is as close to the ground as possible.

## CAUTION

If Translauncher level must be changed, loosen turnbuckles before applying Hydraulic pressure.

- a. Place clinometer on forward edge of main torque tube.
- b. When needed, using forward left or forward right Translauncher leveling controls on Translauncher hydraulic Control Panel, extend or raise either forward leveling jack, as required, until clinometer indicates zero degrees, plus or minus 10 minutes.
- c. Place clinometer on the "L" long runner of the Missile just inside the left breather door. Check level to 1.5° plus or minus 10 minutes. If needed, use aft translauncher leveling controls, extend or reduce aft leveling jacks as required.
- d. If adjustment of level has been made, turn lower support fittings on each jack mud pad until recesses in bottom edge coincide with protrusions or bolt head obstructions insuring a good seat around periphery of mud pad. Turn upper support fittings until good bearing contact is made with outer cylinder. Rotate BYPASS VALVE CONTROL TO OPEN.

3-5. INSURING THAT MISSILE IS IN REPLACEMENT CONFIGURATION.

- a. Insure that 5th Wheel is connected to Translauncher of Replacement Missile(s).
- b. Check fuel, oil, and battery levels of 5th Wheel vehicle and service if necessary.
- c. Insure 5th Wheel vehicle bogies are checked.
- d. 5th Wheel antenna is tied down.

- e. Inspect Radome for nicks, scratches, and dents.
- f. Inspect Missile and associated equipment for no interior or exterior damage, corrosion, or foreign object damage.
- g. Insure refrigeration duct plugs are installed.
- h. Inspect Fire Extinguishers for serviceability.
- i. Insure that forward Missile tiedowns are installed and that Missile is properly installed on Translauncher.
- j. Insure that "H" frame retaining latches <sup>ARE</sup> secure to "H" frame.
- k. Insure that protective cap is secured over right wing folding mechanism wing bushing.
- l. Check Missile Engine oil level and service if necessary.
- m. Check Missile fuel and service if necessary.
- n. Check interior of plenum chamber for security of attachment of hydraulic, fuel, and electrical connections, and leakage.
- o. Insure inverter duct is open.
- p. Insure that hydraulic hose lanyard post is properly installed and hyd pressure, hyd return, and common ground lanyards are attached to post.
- q. Insure Rocket Motor blocks are properly installed and secure against the Translauncher upper elevating torque member, and Rocket Motor support trunnion.
- r. Insure that Translauncher to Rocket Motor and Translauncher to Missile ground cables are installed.
- s. Insure that Translauncher tiedown collars are installed with the bolts loose to allow free movement of collar assemblies.
- t. Check Translauncher bogies for proper inflation and insure that hand brake is RELEASED.
- u. Check Translauncher Hydraulic Control Panel for proper operation of Hand Pump.
- v. Check Translauncher hydraulic reservoir for proper service.
- w. Check Translauncher to ground rod ground cable installed.
- x. Insure that forward Missile tiedown is installed.
- y. Insure that protective cap is secured over left Wing Folding Mechanism wing bushing.
- z. Insure that crown Panel and Stabilizer Actuator Access panel are properly installed.
- aa. Insure that engine runup and umbilical cable lanyard post are properly installed and lanyards connected.



- ab. Insure that umbilical cable is properly connected to Missile and quick disconnect pin engaged to pull-out lanyard.
- ac. Insure that Missile start and aft bus power cables are connected to Missile and quick release wires attached to pull-out lanyards.
- ad. Insure that power cables lanyard posts is properly installed and lanyards connected to post.
- ae. Insure that engine runup receptacle is capped or covered with protective paper and tape.
- af. Inspect NTCU duct assembly receptacle for cleanliness and general condition.
- ag. Insure Holdback bolt is installed prior to moving missile.

### 3-6. PERFORMING LIGHT-OFF CABLE CHECK.

- a. Place range selector switch of Simpson multimeter model 260 to 50V and function selector switch to + DC. Insure that meter is operating.
- b. Disconnect ENGINE LIGHT-OFF cable to be checked. Cable connections are located on AFT Junction Panel of LCEG and are as follows:

Missile No. 1	J5014
Missile No. 2	J5015
Missile No. 3	J5016
Missile No. 4	J5017

- c. Request Launch Officer to insure that MISSILE ENGINE START SELECTOR switch on Selector Control Panel is to a OFF position nearest number of Missile whose jack is to be checked.
- d. Connect negative lead of multimeter to pin B of jack to be checked and positive lead to pin A.

#### NOTE

Request Launch Officer to perform steps e through h.

- e. Insure that 28-volt d-c power is supplied to LCEG.
- f. Place 28-volt d-c TESTER POWER switch to Power Monitoring and Distribution Panel to the up position.
- g. 28V DC TESTER POWER indicator lamp must go on.
- h. Rotate MISSILE ENGINE START SELECTOR switch on Selector Control Panel to number of Missile on which jack is to be checked.
- i. Multimeter must indicate approximately 28 volts dc.

NOTE

Request Launch Officer to perform steps j through l.

- j. Rotate MISSILE ENGINE START SELECTOR switch on Selector Control Panel to nearest OFF position.
  - k. Place 28V DC TESTER POWER switch on Power Monitoring and Distribution Panel OFF.
  - l. 28V DC TESTER POWER indicator must go off.
  - m. Disconnect negative and positive leads of multimeter from jack under test.
  - n. Place range selector switch of multimeter to R x 10,000 and insure that meter is operating.
  - o. Connect leads of multimeter between pins A and B of plug of ENGINE LIGHT-OFF cable under test.
  - p. Multimeter must indicate discontinuity.
  - q. Disconnect multimeter and stow.
  - r. Connect ENGINE LIGHT-OFF cable.
- 3-7. MAINTENANCE VISUAL CHECK.

NOTE

Insure that all AGE Work Cards have been completed prior to conducting a visual check. Also, check all fire extinguishers during visual checks. These visual checks are applicable for all Launch Pads.

TRANSLAUNCHER/MISSILE

- 1. Right side uplock engaged.
- 2. Right Side shackles connected and tight.
- 3. Rocket Motor installed and ground connected (check for rust on ground clamp and bottle.
- 4. Igniter cable connected, lanyard pull connected.
- 5. Translauncher Junction Box connections.
- 6. SFB connections.
- 7. UOB cables connected.
- 8. Safety and Arming plugs inserted or removed as applicable.
- 9. Translauncher hyd controls set for emergency lowering and translauncher level checks.

10. Translauncher static ground connected.
11. Left side uplock engaged.
12. Left side shackles connected and tight.
13. NTCU duct and lanyard connected.
14. RFT cable and lanyards connected.
15. RF hood, release cable, and winch assembly connected.
16. Warhead access panel secure.
17. Area clear of foreign objects and checked for general pad safety.

## NOTE

After all launch pads have been checked, perform the following visual checks.

## (RIGHT SIDE)

## NOTE

Use inspection access ladder to reach Missile.

1. "H" frame bolts installed.
2. Missile tiedown removed.
3. Retaining latch for free movement.
4. Lanyard post installed, lanyards connected.
5. Common ground cable installed, lanyard pull connected.
6. Hydraulic pressure and return lines connected, squibs and lanyards connected.
7. Engine oil level 9-11 quarts elevated (12 qts in checkout).
8. Engine oil filler cap secure.
9. Plenum chamber checked for connections, leaks, fumes and foreign objects.
10. Light-off detector cable connected, lanyard pull connected.
11. Shear bolt installed.
12. Engine tail pipe clear, engine static ground connected to tail pipe.

## (LEFT SIDE)

13. Start fuel connection properly installed on Missile. Insure microswitch release arm is not in indentations.

14. Engine run-up and test cable, lanyard and parts connected.
15. Umbilical cable, lanyard and parts connected.
16. 28VDC cables and lanyards connected.
17. Hydraulic Reservoir full.
18. Throttle motor ZERO.
19. Main fuel shutoff valve closed.
20. Plenum chamber clear of leaks, fumes and foreign objects and water.
21. Missile tiedown removed.
22. "H" frame bolts installed.
23. Retaining latch checked for free movement.
24. Replace engine access ladder to stored position.

NOTE

Upon completion of visual checks, sign daily inspection and exceptional releases maintained in the Launch Control Center.

3-8. MECHANIC NO. 1 DETAILED INSTRUCTIONS.

## 3-9. POSITIONING NOSE WORK STAND.

- a. Position Work Stand for attachment to forward end of Translauncher.
- b. Attach Work Stand to Translauncher with pins provided.

## 3-10. REMOVING RADOME.

## CAUTION

When removing Radome, select adequate personnel to assist; using extreme care, place Radome on flat surface ringside down.

- a. Break lockwire on clamp ring handle on aft portion of Radome and remove allen-head screw beneath clamp ring handle.
- b. With Radome held in position, lift clamp ring handle to release clamp ring; then, remove it and place in suitable location.
- c. Release Radome from mounting ring, tapping gently with soft mallet if necessary.
- d. Carefully slide Radome forward on supports until spring lock engages.
- e. While supporting Radome, release spring lock on lower right support.
- f. Remove Radome assembly and place on top of clamp ring.

## 3-11. OPENING RADAR BASE CASTING.

- a. Loosen radar base casting upper hinge bolt.
- b. Loosen radar base casting lower hinge bolt.
- c. Remove the two bolts securing right side of radar base casting to Nose Section.
- d. Swing radar base casting open and secure with brace provided.

## 3-12. REMOVING ATRAN FILM FROM VIDEO CONVERTER.

- a. Remove video converter from radar base casting.

## NOTE

The video converter is released by raising two retaining levers.

- b. Remove cover from video converter by unfastening quarter-turn fastener on top of map magazine cover.
- c. Pull up on knurled knob to release switch assembly.
- d. Pull film gate back and insure that film gate remains open.

CAUTION

When removing film spools, do not place fingers around or against lens focus ring for leverage; the lens and diaphragm setting will change and damage to the video converter may result.

- e. Remove the two spools.

CAUTION

Handle film carefully to prevent damaging or smudging surface.

- f. With glossy side of film toward operator and lockpin holder in spools at top, wind roll of film on left spool by rotating spool clockwise.

- g. Place film in film box.

- h. Return film to Launch Control Center.

NOTE

Omit steps i and j if film is being re-installed at this time.

- i. Install cover on video converter.

- j. Install video converter on radar base casting and secure with two retaining levers.

3-13. CLOSING RADAR BASE CASTING.

- a. Release brace securing base casting in open position.

- b. Close base casting and install two bolts in right side.

- c. Tighten both bolts to 500 inch-pounds (42 foot-pounds) of torque.

- d. Tighten upper hinge bolt on left side of 1300 inch-pounds (108 foot-pounds) of torque.

- e. Tighten lower hinge bolt to 300 inch-pounds (25 foot-pounds) of torque.

3-14. INSTALLING RADOME.

CAUTION

When handling Radome use extreme care, so that Radome will not be bruised or cracked.

- a. Position Radome on support tubes with static hose connection on the right.

- b. Release spring lock on lower right support fitting to install Radome on support tubes.

- c. Push Radome fully aft.

- d. Install clamp ring on Radome with clamp ring handle on left side.

- e. Engage clamp and lock by pushing down on clamp ring handle.

- 3-15. REMOVING NOSE WORK STAND.
- a. Remove pop pins securing Work Stand to Translauncher.
  - b. Move Work Stand out of immediate area to an out-of-way location.
- 3-16. REMOVING ANTENNA SHIPPING BRACE.
- a. Remove the four bolts securing antenna shipping brace.
  - b. Remove antenna shipping brace.
  - c. Insure that radar antenna is free to move about roll, pitch, and spin axis.
- 3-17. SECURING THERMOMETER TO SAFETY AND ARMING BOX (Effectivity A).
- a. Obtain thermometer from Test Accessory Box in SRP.
  - b. Tape thermometer to Safety and Arming Box.
- 3-18. INSTALLING ATRAN FILM IN VIDEO CONVERTER.
- a. Remove video converter from radar base casting (if applicable).

## NOTE

The video converter is released by raising two retaining levers.

- b. Obtain film from Launch Control Center.
- c. Install film in sequence shown in figure 3-1, with a member of Launch Crew monitoring.

## NOTE

After incorporation of TCTO 21-TM76A-548, the sprocket in figure 3-10, item 7, has four index marks. The nearest index mark is aligned at 3 o'clock position.

- d. After film is installed, replace video converter into radar base casting.
  - e. Secure video converter to radar base casting with two retaining levers.
- 3-19. PERFORMING MISSILE SWITCH AND CONTROL SETTINGS, (Effectivity C).

## NOTE

The following settings must be made with Radome off and radar base casting open.

- a. Place AGP selector switch (4, figure 3-2) on Control Program Unit in position applicable to Prelaunch Data Card.

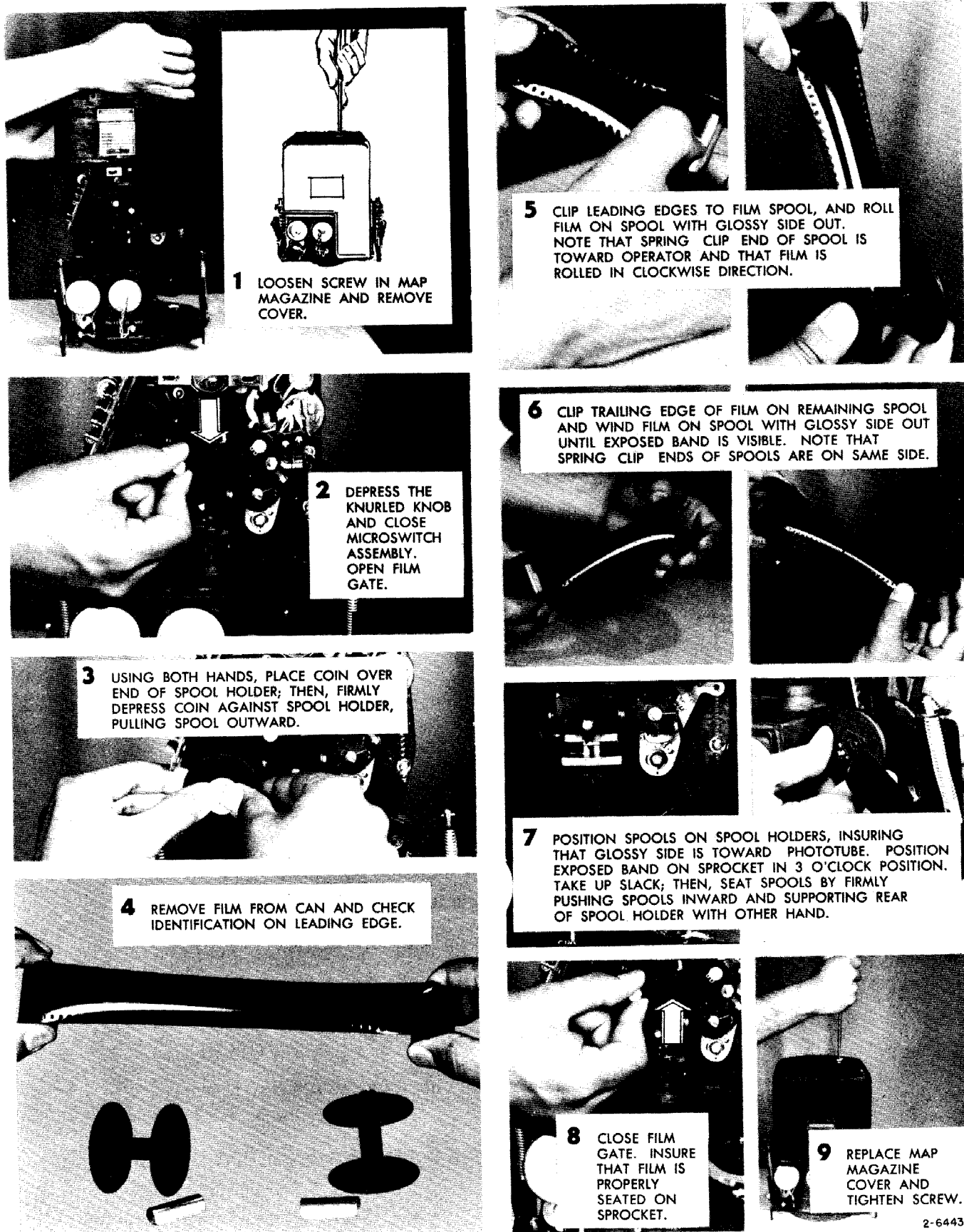


Figure 3-1. Atran Film Installation



## CAUTION

The AGP TIMER control must always be turned clockwise when making adjustment.

- b. Loosen locking screw before adjusting.
- c. Adjust AGP TIMER control (5) in accordance with Prelaunch Data Card.
- d. Obtain value of Lateral Offset from Prelaunch Data Card.
- e. Observe card on front of Control Program Unit identified as LATERAL OFFSET.
- f. Match value obtained from Prelaunch Data Card with value in N. MILES column.
- g. Obtain value from column labeled SETTING to value corresponding to step f.
- h. Unlock LATERAL OFFSET control (1) rotate until dial indicates value obtained in step g and lock.
- i. Obtain detonate setting from Prelaunch Data Card.
- j. Remove cover from Amplifier Integrator Unit.
- k. Match detonate setting with N. MILES column on chart in Control Program Cover.

## NOTE

If during step l and n, precise indications are not listed on DETONATE chart, interpolation will be necessary.

## CAUTION

All numerical values used in this example are hypothetical and are not to be used as desired indications.

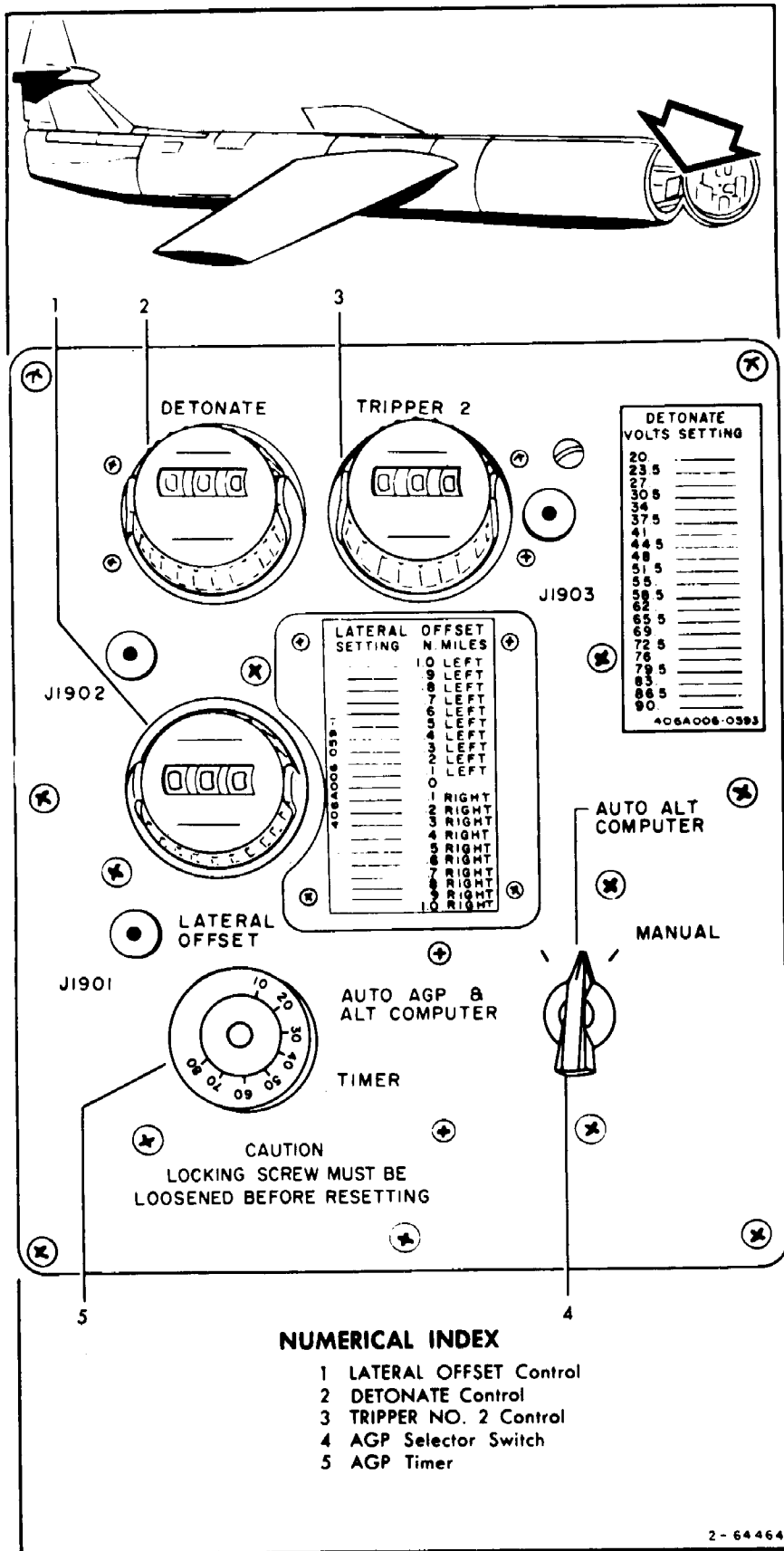


Figure 3-2. Control Program Unit (Effectivity C)

Example of how to interpolate:

R = Low VOLTS value on DETONATE chart.

S = High VOLTS value on DETONATE chart.

T = Value obtained from integrator cover.

U = Low SETTING value on DETONATE chart.

V = High SETTING value on DETONATE chart.

$X = (T-R)$

$Y = (S-R)$

$Z = (V-U)$

Absolute value =  $\frac{X}{Y}(Z) + U$

$$\frac{2}{3.5} (14) + 124 = 132$$

When

T = 57.0

S = 58.3

V = 138.0

R = 55.0

R = 55.0

U = 124.0

X = 2.0

Y = 3.5

Z = 14.0

1. Record voltage from VOLTS column directly opposite detonate setting.
- m. Match voltage obtained in step m with VOLTS column on DETONATE CHART ON Control Program Unit.
- n. Record setting in SETTING column directly opposite voltage obtained in step n.
- o. Unlock DETONATE control and rotate until it indicates setting obtained in step o.
- p. Adjust NORTH-SOUTH switch on Flight Control Unit in accordance with geographical location of Launch area.

#### NOTE

If Launch Area is north of equator, place switch at NORTH. If Launch Area is south of equator, place switch at SOUTH.

- q. Adjust LATITUDE ADJUSTMENT DIAL on Flight Control Unit in accordance with geographical location of Launch Area.

#### NOTE

This setting will be the latitude at which the Launch Area is located. This information is obtained from the Prelaunch Data Card.

3-20. PERFORMING MISSILE AND SWITCH CONTROL SETTINGS (Effectivity D).

- a. Insure that the Signal Comparator switch S1101 is ON.
- b. Adjust AGP TIMER control (figure 3-3) in accordance with Prelaunch Data Card.
- c. Obtain value of Lateral Offset from Prelaunch Data Card.
- d. Push LATERAL OFFSET control and rotate until indicator shows value obtained in step c.
- e. Obtain detonate setting from Prelaunch Data Card.
- f. Push DETONATE control and rotate until indicator shows value obtained in step e.
- g. Adjust NORTH-SOUTH switch on Flight Control Unit in accordance with geographic location of Launch Area.

NOTE

If Launch Area is north of equator, place switch to NORTH. If Launch Area is south of equator, place switch to SOUTH.

- h. Adjust LATITUDE ADJUSTMENT DIAL on Flight Control Unit in accordance with settings obtained from the Prelaunch Data Card.

3-21. PERFORMING TARGET AREA TIMER SETTINGS.

NOTE

Prior to launch of Missile, each of two Target Area Timers is set to same value. This value is theoretical flight time calculated with allowances for wind, speed of Missile, and timer error. Settings are made to timers in Launch Area. Nose Section (base casting) must be open so that the interlock control unit will be accessible. Settings are made by turning the dial-knobs on the face of the unit. The Target Area Timers operate when energized, and close the arming-circuit micro-switch after the elapse of the preset time interval. An instruction plate on the interlock control unit indicates proper method of timer adjustment. Obtain Target Area Settings from Missile Flight Plan. Method of timer setting is as follows:

- a. Turn two knurled dial-knobs on face of interlock control unit face to previously calculated settings. Follow instructions given on plates.

3-22. CLOSING RADAR BASE CASTING.

- a. Release brace securing base casting in open position.
- b. Close base casting and install two bolts in right side.

3-23. APPLYING POWER TO SRP.

- a. 28 VDC POWER MONITORING indicator lamp (3, figure 3-4) on Power Monitoring and Distribution box must be on.

- b. 120V 60 POWER MONITORING indicator lamp (24) must be on.

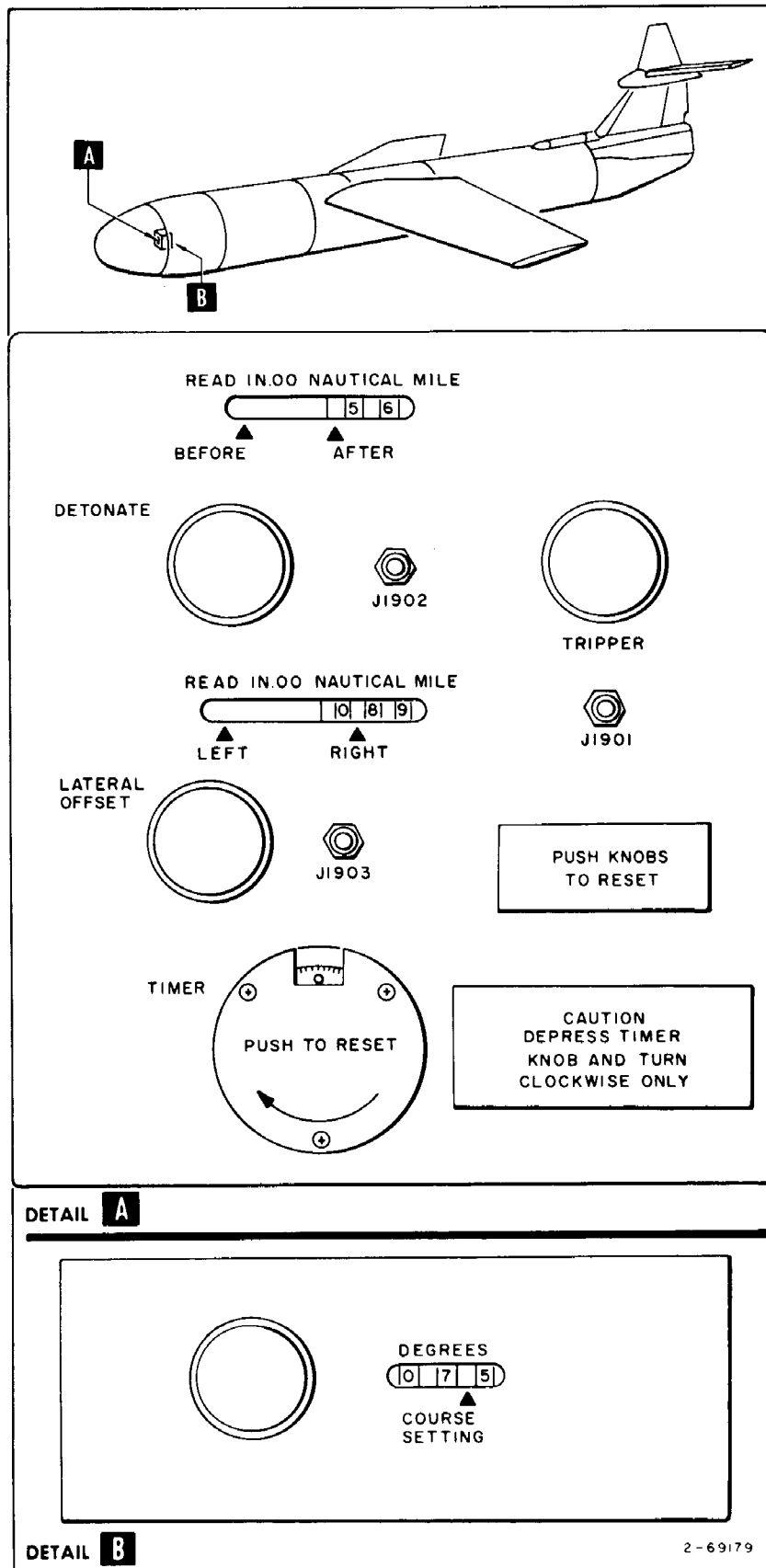


Figure 3-3. Control Program Unit (Effectivity D)

- c. 115V 400 POWER MONITORING indicator lamp (5) must be on.
- d. Place 28 VDC TESTER POWER switch (19) in on (up) position.
- e. 28 VDC TESTER POWER lamp (22) must go on.
- f. Place 120V 60 TESTER POWER switch (20) on (up) position.
- g. 120V 60 TESTER POWER indicator lamp (21) must go on.
- h. Place 115V 400 TESTER POWER switch (18) in on (up) position.
- i. 115V 400 TESTER POWER lamp (23) must go on.
- j. Depress circuit breaker CB801 (10, figure 3-5) on Power Control Panel of SRP Main Console.
- k. 28 VDC indicator lamp (1) STANDBY indicator lamp (15, figure 3-6) on Test Control Panel must go on.
- l. Depress circuit breaker CB802 (9, figure 3-5) on Power Control Panel.
- m. 120 VAC 60 CPS lamp (2) must go on.
- n. Depress circuit breaker CB803(8).
- o. 115 VAC 400 CPS lamp (3) must go on.

3-24. APPLYING EXTERNAL POWER TO MISSILE.

CAUTION

Whenever external power to Missile is shut down, SRP Main Console must be shut down first. If loss of power occurs at any time after external power has been applied to Missile, or if ATRAN CUTOOUT switch is placed ON, wait 5 minutes before reapplying power. Otherwise, damage to the APN-22 magnetron may result.

- a. Place EXT POWER switch (2, figure 3-7) on SRP Main Console Missile Monitor and Power Panel on (up).

WARNING

Insure all personnel observe RF hazard area as shown in figure 1-6.

- b. PWR ON (1, figure 3-7) and GUIDANCE SECT TEMP GO (3) indicator lamps must go on.

3-25. APPLYING POWER TO SRP MAIN CONSOLE.

- a. Insure that 28 VDC TESTER POWER switch (19, figure 3-4) on Power Monitoring and Distribution Box is ON.

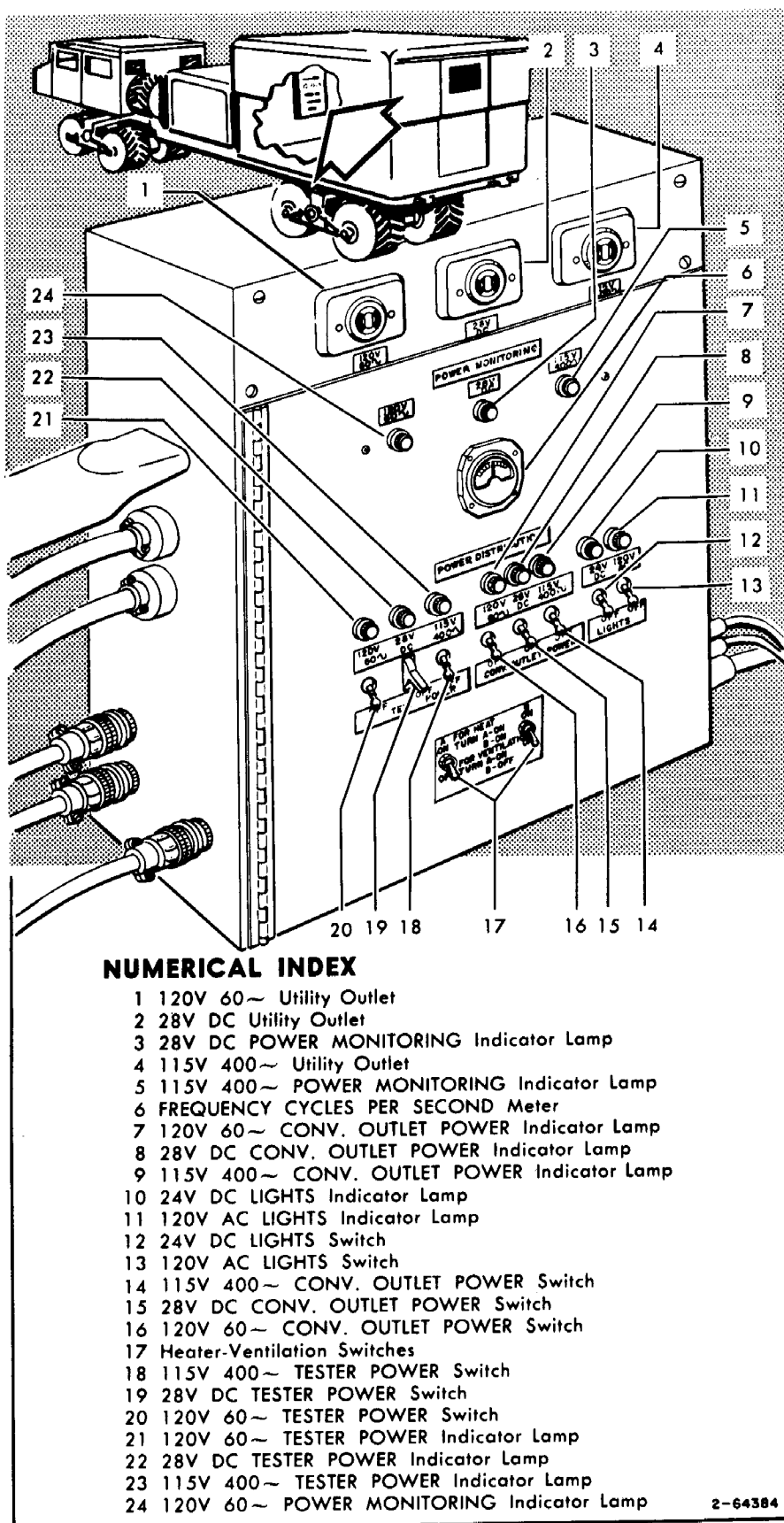


Figure 3-4. Power Monitoring and Distribution Box.

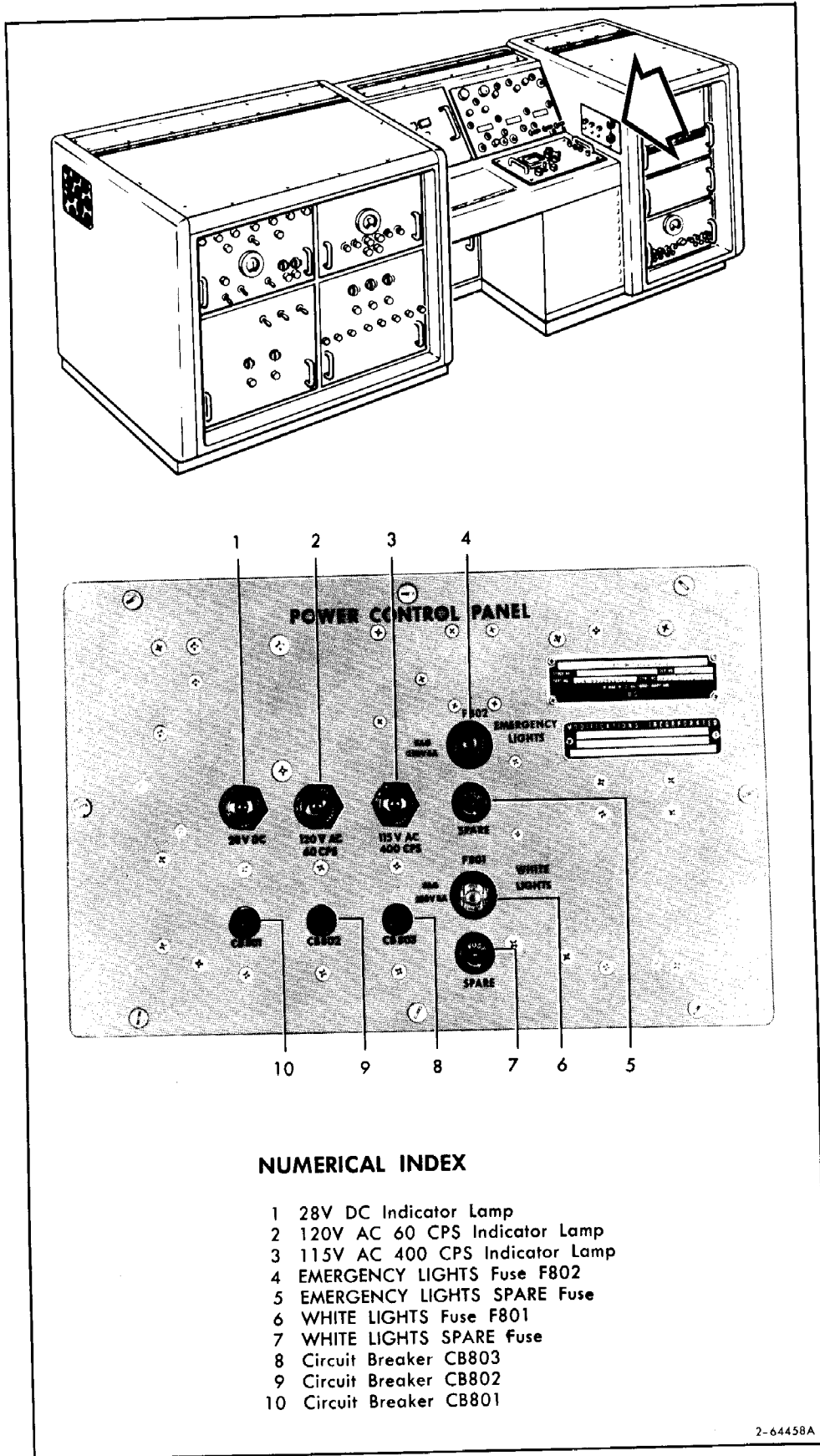


Figure 3-5. Power Control Unit



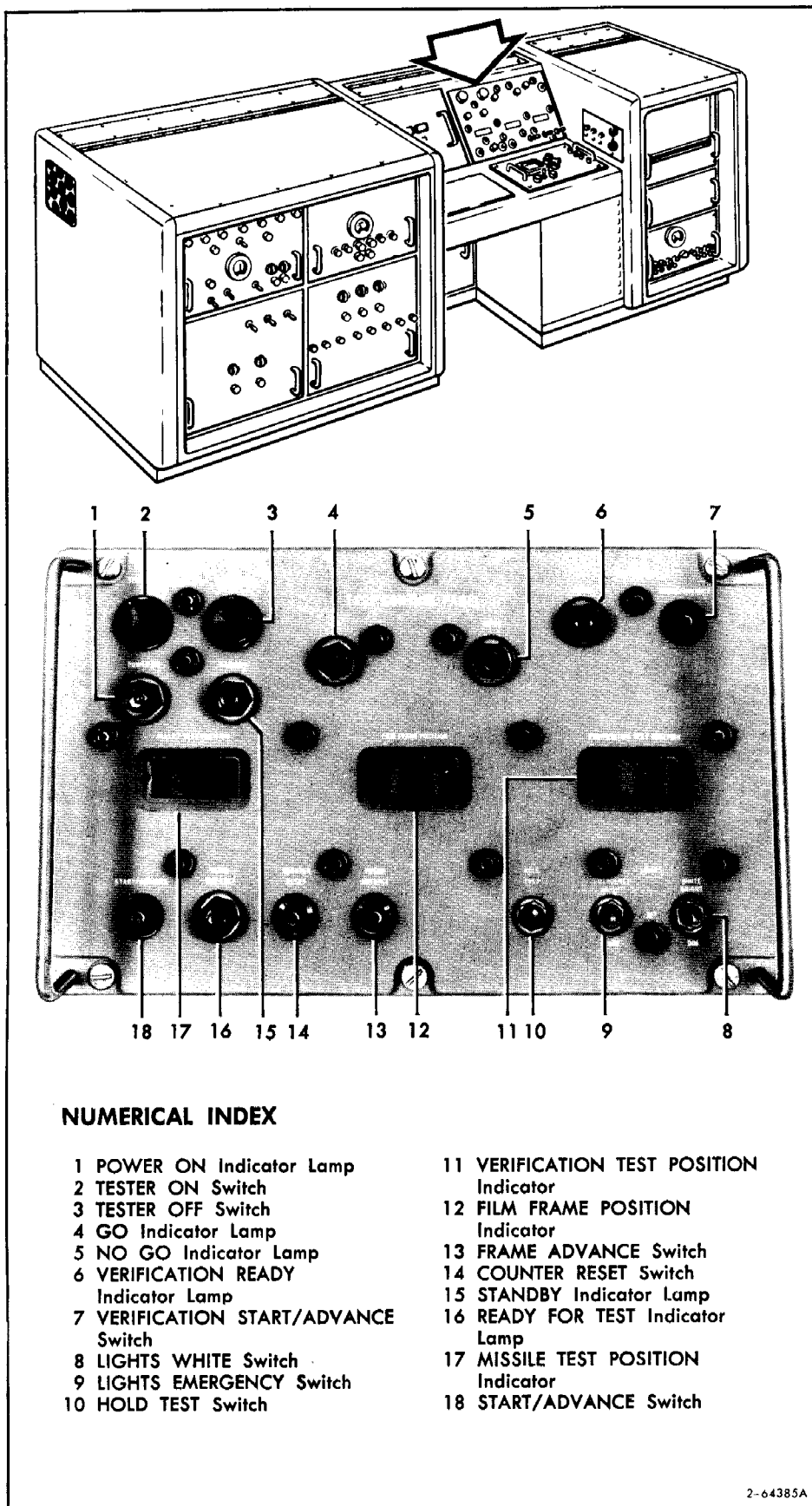


Figure 3-6. Test Control Panel

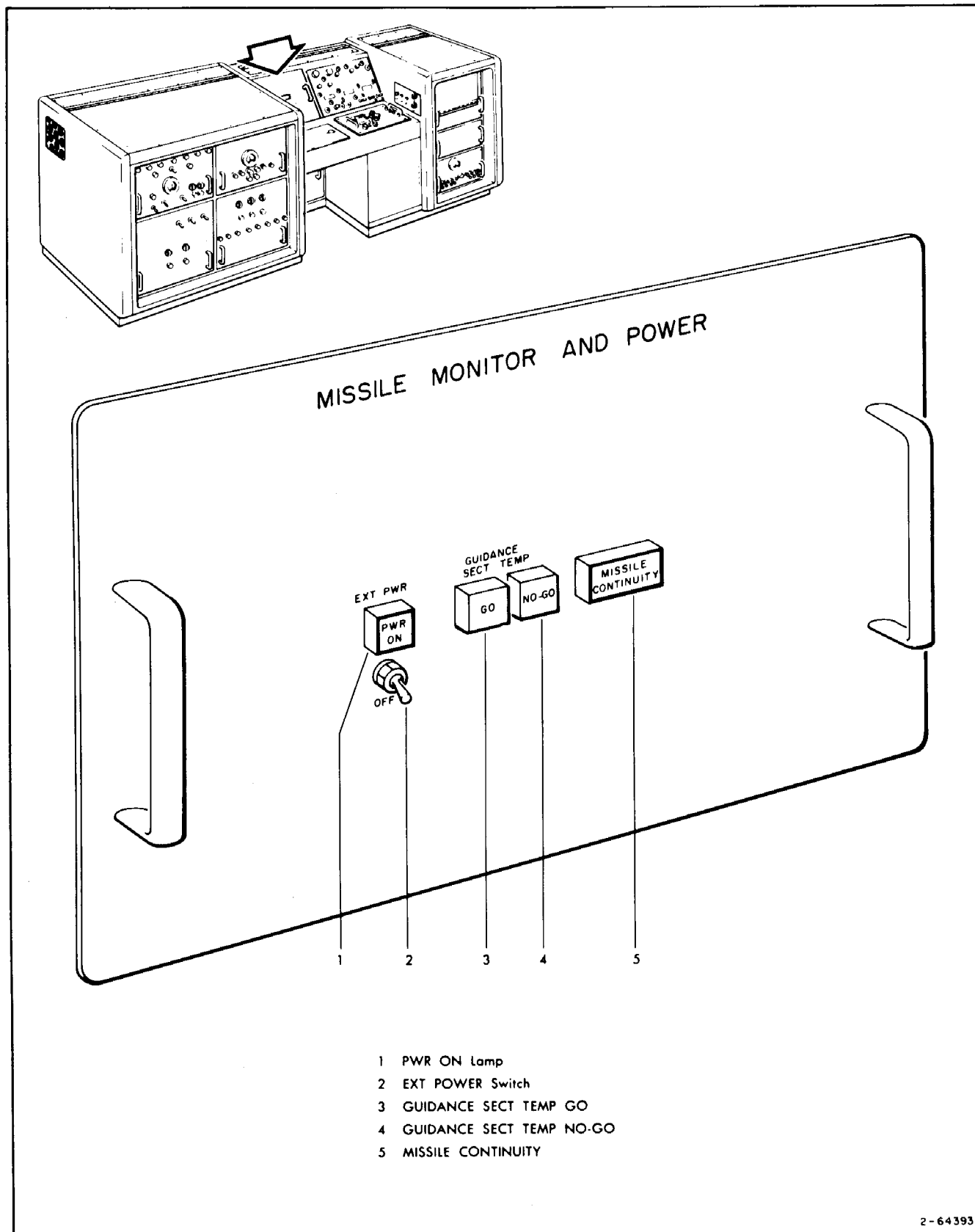


Figure 3-7. Missile Monitor and Power Panel

## NOTE

Power Monitoring and Distribution panel is mounted on forward bulkhead of tester housing.

- b. Place 28 VDC LIGHTS switch (12) in on (up) position.
- c. Insure that 120V 60 TESTER POWER switch (20) is ON.
- d. Insure that 115V 400 TESTER POWER switch (18) is ON.
- e. Place heater ventilator switches (17) in desired position in accordance with instructions printed on panel.
- f. Place HOLD TEST switch (10, figure 3-6) on Test Control Panel and in the Verification unit on off (down) position.
- g. Place LIGHTS switches (8 and 9) in most suitable position.
- h. Rotate INTENSITY control (2, figure 3-8) on Monitor Oscilloscope fully counter-clockwise.
- i. Place METER SELECTOR switch (6, figure 3-9) on SRP Console Power Supply OFF.
- j. Place CENTERING SELECTOR switch (17, figure 3-10) on Test Programmer OFF.
- k. Release locks and slide Altitude Simulator (figure 3-11) outward until its control panel is accessible.
- l. Place PUMP CONTROL switch (11) to AUTOMATIC.
- m. Slide Altitude Simulator back into console.
- n. Place ATRAN CUTOUT switch (3, figure 3-12) on Test Control Unit OFF.
- o. Place SAFETY AND ARMING switch (1) to WITH.
- p. Open the three TESTER and CONTROL CABLE CONNECTIONS access doors on left side of tester housing.

## NOTE

In the event of inclement weather, remove the rain covers from the stowage rack and install over the TEST and CONTROL CABLE CONNECTIONS access doors.

- q. Place POWER switch on SRP cable tester in off (down) position.
- r. Depress TESTER ON switch (2, figure 3-6) on Test Control Panel of SRP Main Console.
- s. STANDBY indicator lamp (15) must go off, and POWER ON indicator lamp (1) must go on.

- t. Place SWEEP SELECTOR switch (8, figure 3-8) on Monitor Oscilloscope to 40 MI.
- u. Place SIGNAL SELECTOR switch (6) to RAD. VID,.

WARNING

Observe Monitor Oscilloscope throughout this operation. Pulsed waveform must not be displayed.

- v. Using HP410B, measure voltage between test jack J1706 in sweep and phase generator of Test Programmer and common ground.
- w. Voltage measured must be between 109.25 and 120.75 VAC.
- x. Insure that all fuse indicator lamps are off.
- y. The Main Console must be allowed a warmup period of 15 minutes when ambient temperature is 40 F, (4.4 C) or above. Below 40 F, insure all louvers are closed and the 115-V 60-cycle circuit breaker on the Power Monitoring and Distribution Box is OFF. Five minutes after power is applied, place 115-V 60-cycle circuit breaker ON and open louvers.

3-26. CHECKING SRP MAIN CONSOLE POWER SUPPLY VOLTAGE.

- a. Place METER SELECTOR SWITCH (6, figure 3-9) on Power Supply panel at -300; POWER SUPPLY meter (1) must indicate in green range.
- b. Place METER SELECTOR SWITCH at -150; POWER SUPPLY meter must indicate in green range.
- c. Place METER SELECTOR SWITCH at +120; POWER SUPPLY meter must indicate in green range.
- d. Place METER SELECTOR SWITCH at +150; POWER SUPPLY meter must indicate in a green range.
- e. Place METER SELECTOR SWITCH at +130; POWER SUPPLY meter must indicate in green range.
- f. Place METER SELECTOR SWITCH at OFF.

3-27. CHECKING SRP MAIN CONSOLE VENTILATION SYSTEM.

- a. Place hand over filter pad on left side of SRP Main Console; insure that air is being taken in.
- b. Repeat step a for right side of console.
- c. Pull Transponder chassis forward; check small blower on lower right to see if it is operating; then push chassis back into place.
- d. Place the 3 louver controls on console OPEN.

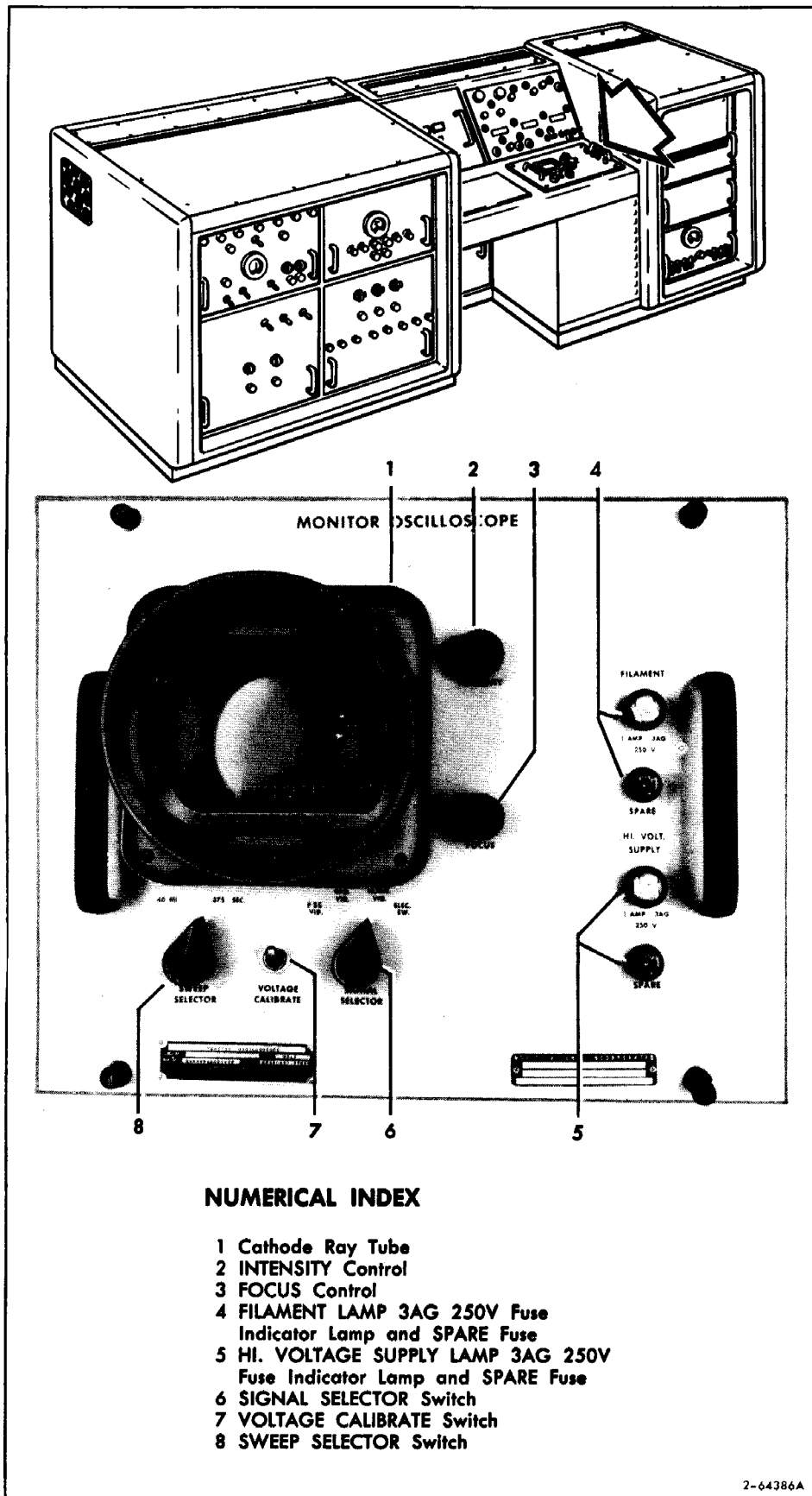


Figure 3-8. Monitor Oscilloscope

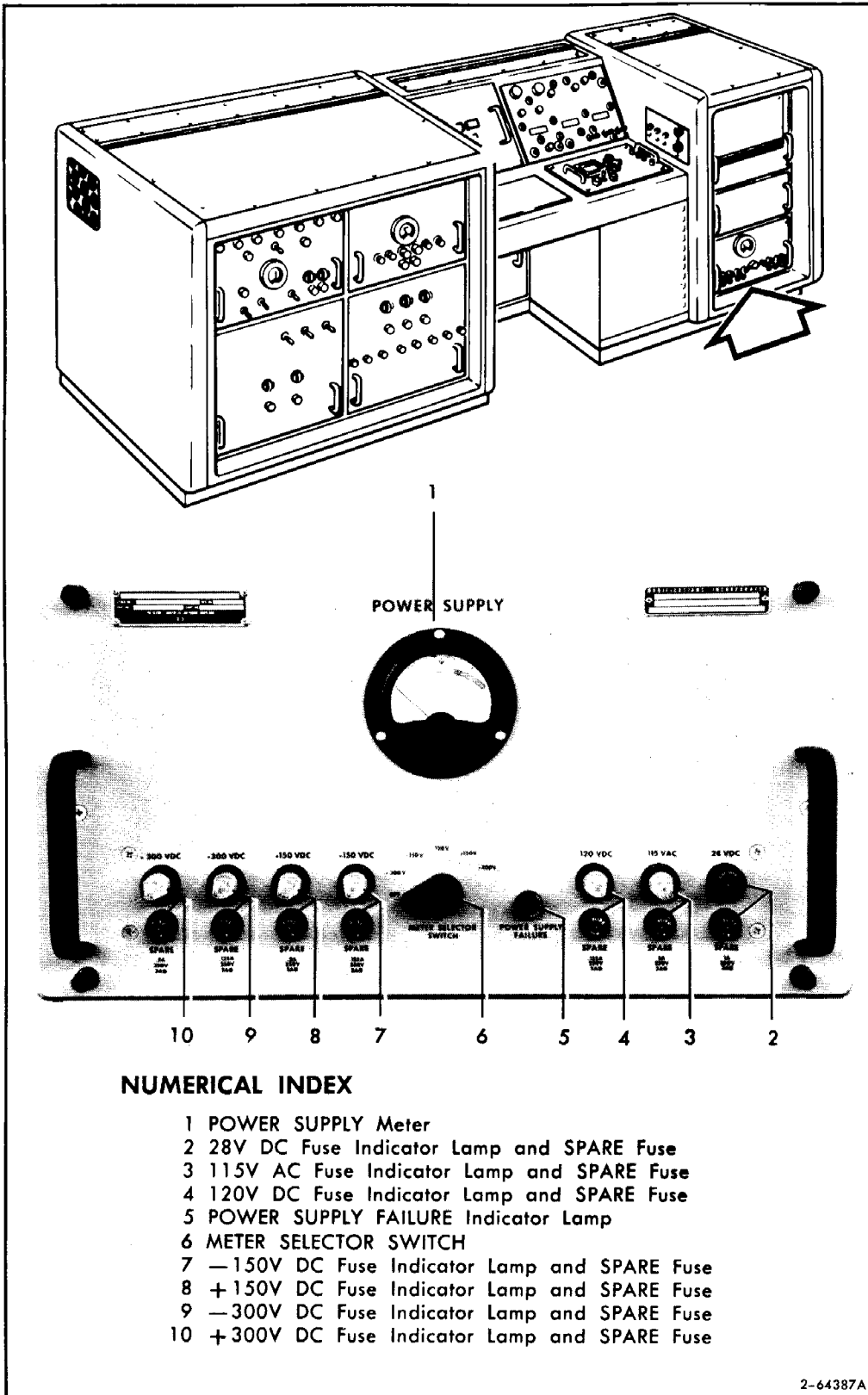


Figure 3-9. SRP Main Console Power Supply

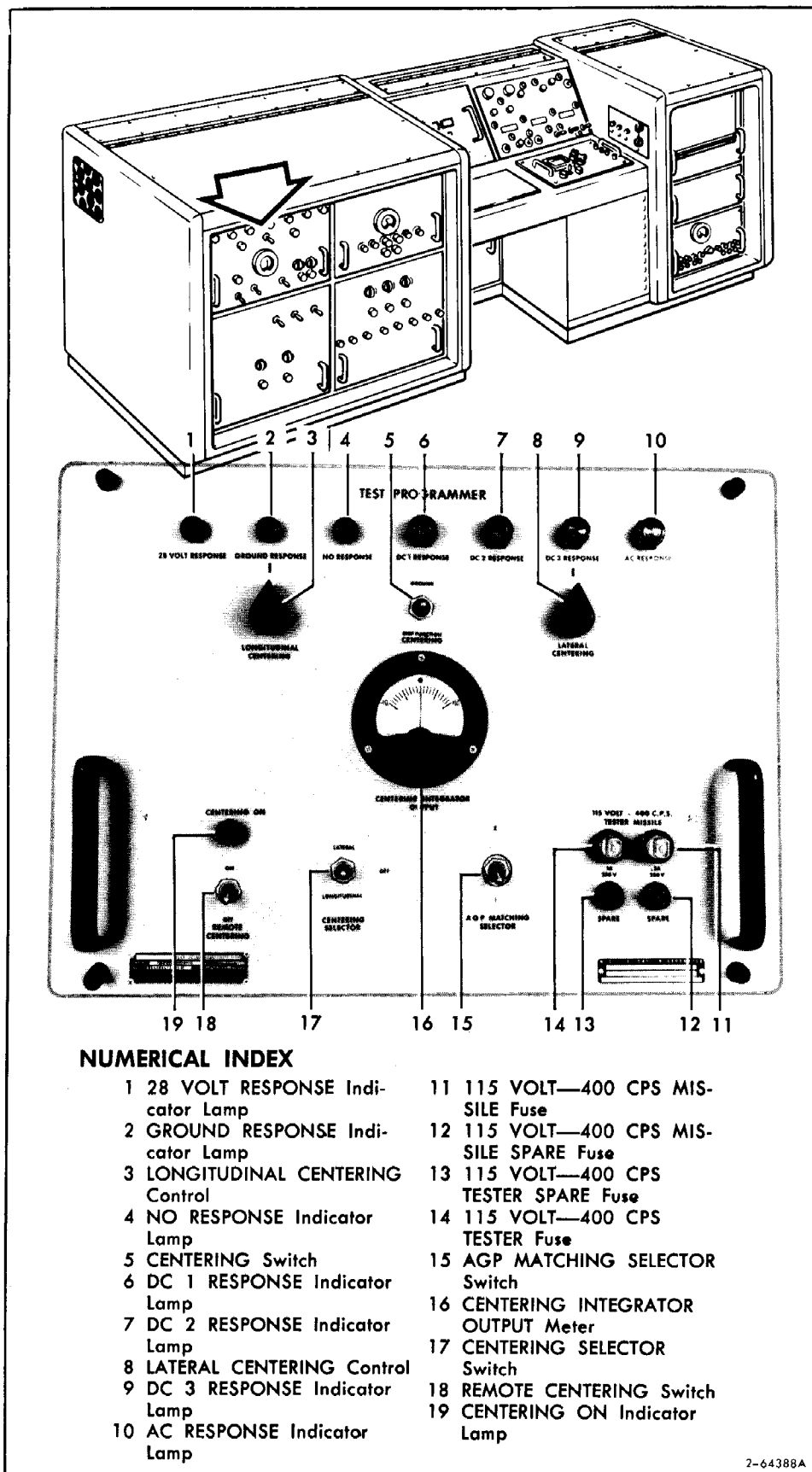


Figure 3-10. Test Programmer

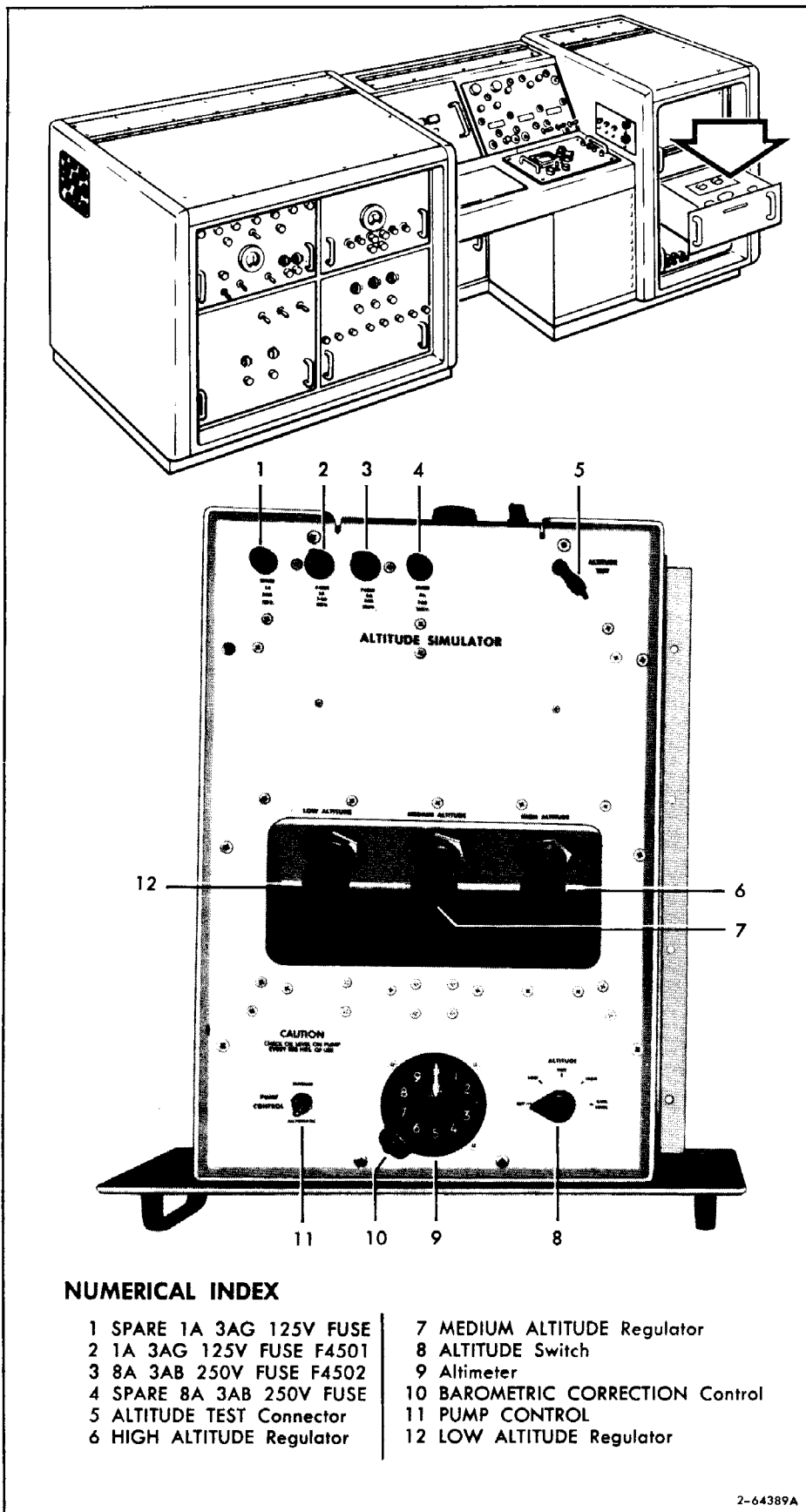


Figure 3-11. Altitude Simulator



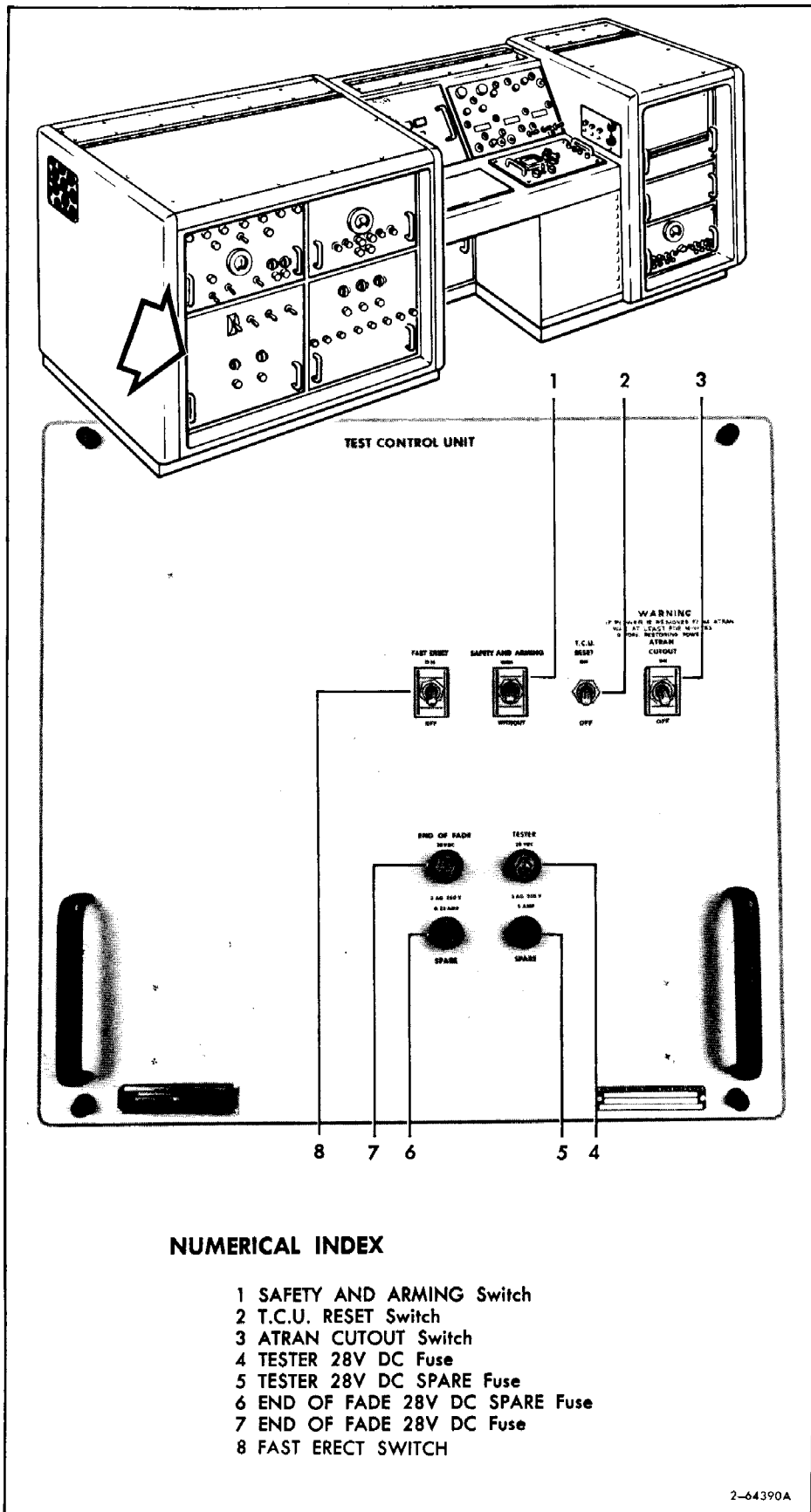


Figure 3-12. Test Control Unit

NOTE

Louver controls are on each end on the top side and to the left of Missile Monitor and Power panel.

3-28. SETTING UP ALTITUDE SIMULATOR.

- a. Pull Altitude Simulator chassis out to make controls accessible (figure 3-11).
- b. Place PUMP CONTROL switch (11) at MANUAL.
- c. Place ALTITUDE switch (8) at GND LEVEL.
- d. Using barometric correction control adjust barometric correction control (10) until barometric correction dial indicates 29.92.
- e. Adjust altimeter to nearest 1000 foot mark.
- f. Tap altimeter lightly with finger tips to insure meter is not sticking.
- g. Place ALTITUDE switch (8) to HIGH ALTITUDE.
- h. When altimeter indicates approximately 15,000 feet, place ALTITUDE switch OFF.
- i. Prepare to start stopwatch.
- j. After transient has settled note altimeter indication, and start stopwatch.
- k. Wait 3 minutes; then, stop stopwatch and note altimeter indication.
- l. Difference in altitude must be less than 300 feet.
- m. Place ALTITUDE switch at low.
- n. Adjust LOW ALTITUDE regulator (12) until altimeter indicates 8,000 feet; gently tap meter while making adjustment.
- o. Place ALTITUDE switch at HIGH.
- p. Adjust HIGH ALTITUDE regulator (6) until altimeter indicates 15,000 feet; gently tap meter while making adjustment.
- q. Place ALTITUDE switch at MED.
- r. Adjust MEDIUM ALTITUDE regulator (7) until altimeter indicates 9,000 feet; gently tap meter while making adjustment.
- s. Place ALTITUDE switch at GND LEVEL.
- t. Allow altimeter to indicate less than 7,000 feet; then, place ALTITUDE switch at LOW.
- u. Altimeter must indicate between 7,900 and 8,100 feet.

## NOTE

If necessary, adjust LOW ALTITUDE regulator to obtain indication specified in step u.

- v. Place altitude switch at High.
- w. Altimeter must indicate between 14,900 and 15,000 feet.

## NOTE

If necessary, adjust HIGH ALTITUDE regulator to obtain indication specified in step w.

- x. Place ALTITUDE switch at MED, and gently tap meter.
- y. Altimeter must indicate between 8,900 and 9,100 feet.

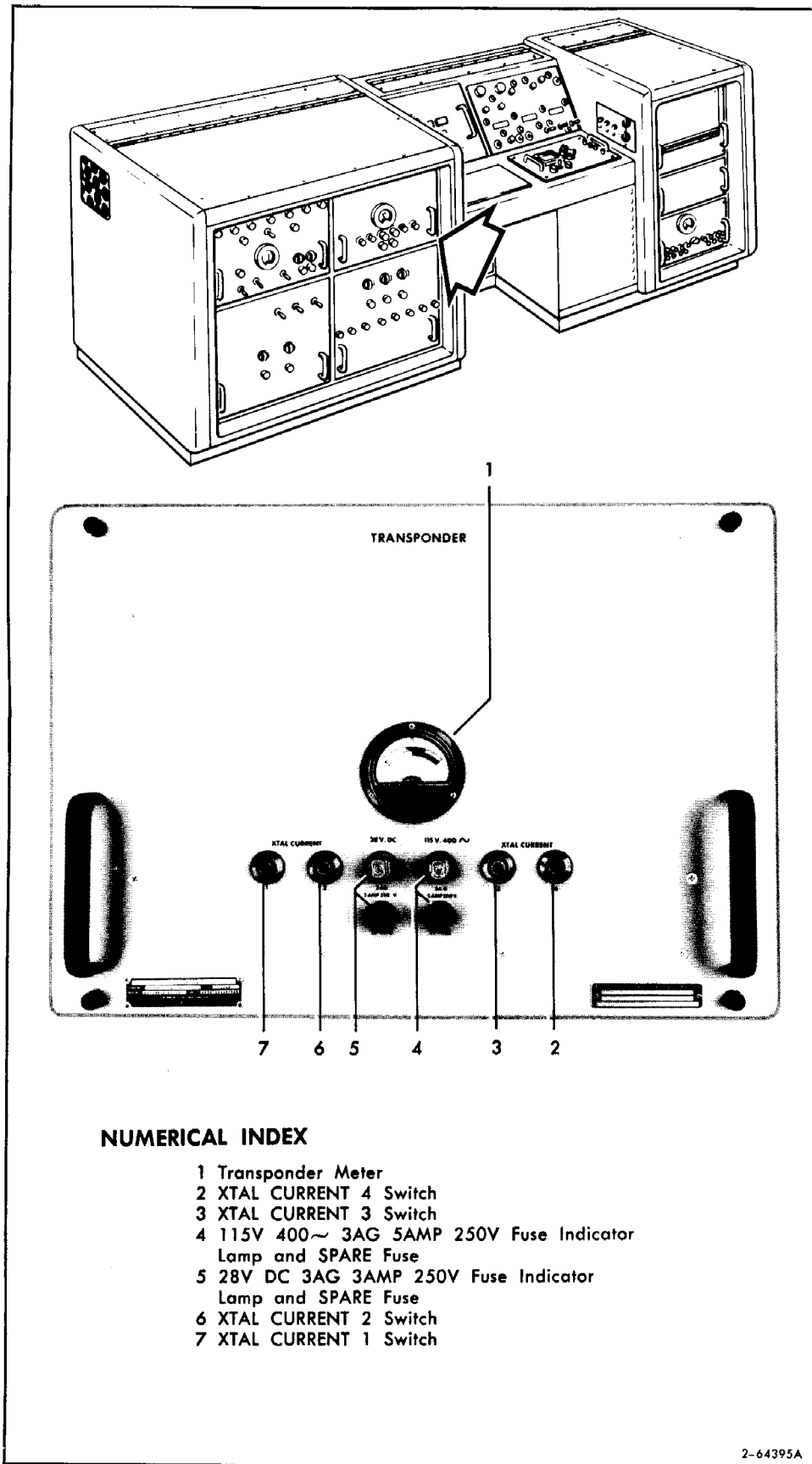
## NOTE

If necessary adjust MEDIUM ALTITUDE regulator to obtain indication specified in step y.

- z. Repeat steps s thru y until adjustments are no longer necessary; then place ALTITUDE switch at GND LEVEL and gently tap meter.
- aa. Altimeter must indicate reading obtained in step e.
- ab. Rotate ALTITUDE switch fully clockwise to OFF.
- ac. Place PUMP CONTROL switch at AUTOMATIC.
- ad. Slide Altitude Simulator back into console.

## 3-29. CHECKING TRANSPONDER CRYSTAL CURRENT.

- a. Depress and hold XTAL CURRENT switch (7, figure 3-13) on SRP Transponder Unit; transponder meter (1) must indicate in upper green XTAL CURRENT OK scale.
- b. Release XTAL CURRENT switch (6).
- c. Depress and hold XTAL CURRENT switch (6); transponder meter must indicate in upper green XTAL CURRENT OK scale.
- d. Release XTAL CURRENT switch (6).
- e. Depress and hold XTAL CURRENT 3 button (3); transponder meter must indicate in upper green XTAL CURRENT OK scale.
- f. Release XTAL CURRENT switch (3).
- g. Depress and hold XTAL CURRENT switch (2); transponder meter must indicate in upper green XTAL CURRENT OK scale.
- h. Release XTAL CURRENT switch (2).



2-64395A

Figure 3-13. Transponder

## 3-30. OPENING RADAR BASE CASTING (Effectivity A).

- a. Remove two bolts securing right side of radar base casting to Nose Section.
- b. Swing radar base casting open and secure with brace provided.
- c. Record temperature indicated on thermometer attached to Safety and Arming Box, and give the information to NCOIC.

## NOTE

Thermometer must indicate at least 75° F (23.89° C). If temperature is less than 75° F, inform NCOIC and reapply ground cooling.

## NOTE

Insure Missile has had sufficient warmup before proceeding.

## 3-31. PERFORMING BRIGHTNESS AND CENTERING ADJUSTMENT (Effectivity A).

## NOTE

This procedure must be performed when the Missile is first brought to the Launch Area, and it is to be repeated if flight film is replaced. Steps a through s must be completed within 10 minutes after temperature of Nose Section has been obtained.

- a. Depress FRAME ADVANCE switch (13, figure 3-6) until FILM FRAME POSITION indicator (12) indicates the first tracking frame (frame 18).
- b. Insure that REMOTE CENTERING switch on Test Programmer (18, figure 3-10) is OFF.
- c. Place ANTENNA SCAN CUTOUT - ATRAN MOTORS CUTOUT- ATRAN MOTORS ON switch (5, figure 3-14) on Auxilliary Test Control Panel to ANTENNA SCAN CUTOUT.
- d. Rotate antenna counterclockwise until spin index indicator indicates 270 degrees.
- e. Place HP410B vacuum tube voltmeter near Integrator Amplifier Unit.
- f. Rotate SELECTOR switch on meter to PLUS DC.
- g. Rotate RANGE switch on meter to 30 V range.
- h. Rotate ZERO ADJ on meter until meter indicates 15 volts.
- i. Connect COMMON test lead to braided ground strap on base casting.
- j. Connect DC test lead to J1301 on Integrator Unit.
- k. Place CENTERING INT. GRD. (6) on Auxiliary Test Control Panel to GND momentarily.
- l. Rotate LONG COARSE CENT control (R1410) on Control Light Gen. until meter indicates 15 volts.

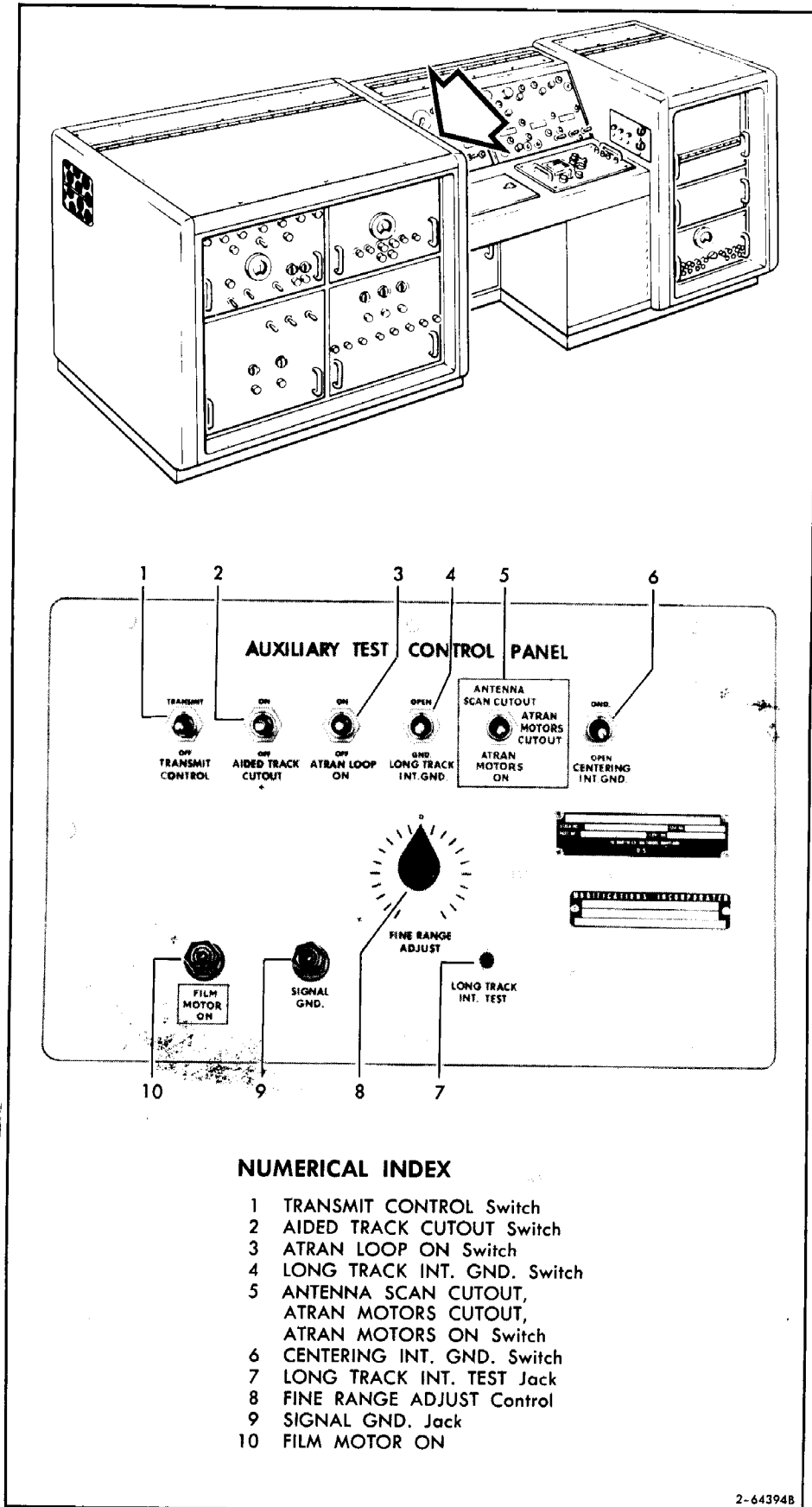


Figure 3-14. Auxiliary Test Control Panel

- m. Disconnect DC test lead from J1301, and connect it to J1304.
- n. Rotate LAT COARSE CENT (R1434) on Control Light Gen. until meter indicates 15 volts.
- o. Place CENTERING INT GRD switch to GND.
- p. Place Selector switch on HP410B to AC.
- q. Place Range switch to 100V.
- r. Disconnect DC test lead from J1304, and adjust meter to indicate zero volts.

## NOTE

When necessary, change range setting for best meter indication.

- s. Connect AC test lead to J1104 on Signal Comparator.
- t. Rotate LONG COARSE CENT control (R1410) counterclockwise until meter indicates a maximum.
- u. Obtain recorded Nose Section temperature from Launch Control Officer, and determine intensity voltage setting from table 3-2.

TABLE 3-2

## INTENSITY CONTROL SETTINGS

Temperature (degrees F°)	Temperature (degrees C°)	AC Voltage setting
75 to 85	23.89 to 29.44	40
86 to 95	30.0 to 35.0	38
96 to 105	35.56 to 40.56	37
106 to 115	41.11 to 46.11	35
116 to 120	46.67 to 48.89	34

- v. Rotate INTENSITY control (R2623) on Control Power Supply until meter indicates voltage obtained in step u.
- w. Rotate LONG COARSE CENT control clockwise until meter indicates minimum.

## NOTE

If minimum is not obtained, rotate LAT COARSE CENT until minimum is obtained.

- x. Partially close base casting, leaving enough room to make final adjustments.
- y. Place CENTERING INT. GND. switch (6) to OPEN.
- z. Repeat steps f through o.

- aa. Disconnect HP410B meter.
- ab. Replace covers on Signal Comparator, Control Light Gen, and Control Power Supply units.
- ac. Close radar base casting.
- ad. Place ANTENNA SCAN CUTOUT - ATRAN MOTORS CUTOUT - ATRAN MOTORS ON switch (5) to ATRAN MOTORS ON.
- ae. Place CENTERING SELECTOR switch (17, figure 3-10) to LATERAL, then to LONGITUDINAL. CENTERING INTEGRATOR OUTPUT meter (16) needle must indicate zero in both positions.

## NOTE

If needle deflection to right or left is greater than +3 and -3 volts dc, place CENTERING switch (5) to GROUND for 5 seconds; then, repeat step ae.

- af. If zero is not obtained, place ANTENNA SCAN CUTOUT - ATRAN MOTORS CUTOUT ATRAN MOTORS ON switch (5, figure 3-14) to ANTENNA SCAN CUTOUT, CENTERING INT. GND. switch (6) to GND., and position antenna to 270 degrees; then, repeat steps x through ae.
- ag. Depress COUNTER RESET switch (14, figure 3-6) on Test Control Panel until FILM FRAME POSITION indicator (12) indicates zero.
- ah. Remove Video Converter, and have film reset.
- ai. Place ANTENNA SCAN CUTOUT - ATRAN MOTORS CUTOUT - ATRAN MOTORS ON switch (5, figure 3-14) to ATRAN MOTORS ON.
- aj. Place CENTERING INT GRD switch (6) to OPEN.
- ak. Place CENTERING SELECTOR switch (17) to LATERAL; CENTERING INTEGRATOR OUTPUT meter (16) must indicate between +3 and -3VDC.

## NOTE

If meter deflection to right or left is greater than +3 and -3VDC, place CENTERING switch (5) to GROUND for 5 seconds. Then release, and repeat step aj.

- al. Place CENTERING SELECTOR switch to LONGITUDINAL, and observe that CENTERING INTEGRATOR OUTPUT meter indicates between +3 and -3VDC.

## NOTE

If meter deflection to the right or left is greater than +3 and 3VDC, place CENTERING switch to GROUND for 5 seconds; then repeat step ak.

- am. Place CENTERING switch to STEP FUNCTION for approximately 5 seconds, and release.



## NOTE

CENTERING INTEGRATOR OUTPUT meter must deflect to the left and return to zero after switch is released. If deflection is correct, centering is locked on. If centering is not locked on, reset film counter and film and repeat this paragraph.

## 3-32. PERFORMING CENTERING CHECK AND ADJUSTMENT (Effectivity B).

## NOTE

This procedure must be performed when the Missile is first brought to the Launch Area, and it is to be repeated if flight film is replaced.

- a. Depress FRAME ADVANCE switch (13, figure 3-6) until FILM FRAME POSITION indicator (12) indicates the first tracking frame (frame 18).
- b. Insure that REMOTE CENTERING switch on Test Programmer (18, figure 3-10) is OFF.
- c. Place ANTENNA SCAN CUTOUT - ATRAN MOTORS CUTOUT - ATRAN MOTORS ON switch (5, figure 3-14) on Auxiliary Test Control Panel to ANTENNA SCAN CUTOUT.
- d. Rotate antenna counterclockwise until spin index indicator indicates 270 degrees.
- e. Place HP410B vacuum tube voltmeter near Integrator Amplifier Unit.
- f. Rotate SELECTOR switch on meter to PLUS DC.
- g. Rotate RANGE switch on meter to 30 V range.
- h. Rotate ZERO ADJ on meter until meter indicates 15 volts.
- i. Connect COMMON test lead to braided ground strap on base casting.
- j. Connect DC test lead to J1301 on Integrator Unit.
- k. Place CENTERING INT. GRD. (6) on Auxiliary Test Control Panel to GND momentarily.
- l. Rotate LONG COARSE CENT control (R1410) on Control Light Gen. until meter indicates 15 volts.
- m. Disconnect DC test lead from J1301, and connect it to J1304.
- n. Rotate LAT COARSE CENT (R1434) on Control Light Gen. until meter indicates 15 volts.
- o. Partially close base casting, leaving enough room to make final adjustments.
- p. Repeat steps l, m, and n.
- q. Disconnect HP410B meter.

- r. Replace covers on Signal Comparator, Control Light Gen, and Control Power Supply units.
- s. Close radar base casting.
- t. Place ANTENNA SCAN CUTOFF - ATRAN MOTORS CUTOFF - ATRAN MOTORS ON switch (5) to ATRAN MOTORS ON.
- u. Place CENTERING SELECTOR switch (17, figure 3-10) to LATERAL, then to LONGITUDINAL. CENTERING INTEGRATOR OUTPUT meter (16) needle must indicate zero in both positions.

## NOTE

If needle deflection to right or left is greater than +3 and -3 volts dc, place CENTERING switch (5) to GROUND for 5 seconds; then, repeat step u.

- v. If zero is not obtained, place ANTENNA SCAN CUTOFF - ATRAN MOTORS CUTOFF - ATRAN MOTORS ON switch (5, figure 3-14) to ANTENNA SCAN CUTOFF, CENTERING INT. GND. switch (6) to GND., and position antenna to 270 degrees; then, repeat steps o through u.
- w. Depress COUNTER RESET switch (14, figure 3-6) on Test Control Panel until FILM FRAME POSITION indicator (12) indicates zero.
- x. Remove Video Converter, and have film reset.
- y. Place ANTENNA SCAN CUTOFF - ATRAN MOTORS CIRCUIT - ATRAN MOTORS ON switch (5, figure 3-14) to ATRAN MOTORS ON.
- z. Place CENTERING INT GRD switch (6) to OPEN.
- aa. Place CENTERING SELECTOR switch (17) to LATERAL; CENTERING INTEGRATOR OUTPUT meter (16) must indicate between +3 and -3VDC.

## NOTE

If meter deflection to right or left is greater than +3 and -3VDC, place CENTERING switch (5) to GROUND for 5 seconds. Then release, and repeat step z.

- ab. Place CENTERING SELECTOR switch to LONGITUDINAL, and observe that CENTERING INTEGRATOR OUTPUT meter indicates between +3 and -3VDC.

## NOTE

If meter deflection to the right or left is greater than +3 and -3VDC, place CENTERING switch to GROUND for 5 seconds; then repeat step aa.

- ac. Place CENTERING switch to STEP FUNCTION for approximately 5 seconds, and release.

## NOTE

CENTERING INTEGRATOR OUTPUT meter must deflect to the left and return to zero after switch is released. If deflection is correct, centering is locked on. If centering is not locked on, reset film counter and film and repeat this paragraph.

## 3-33. PERFORMING AZIMUTH ALIGNMENT OF ATRAN ANTENNA.

## NOTE

This paragraph must be performed only when Missile is first brought to Launch Area and during each subsequent recycle.

a. Place ANTENNA SCAN CUTOUT - ATRAN MOTORS CUTOUT - ATRAN MOTORS ON switch (5, figure 3-14) on Auxiliary Test Control Panel to ANTENNA SCAN CUTOUT.

## NOTE

During step b, if antenna is rotated past the zero point, continue to rotate it counterclockwise until zero is obtained again. Never rotate antenna clockwise.

b. Manually rotate antenna counterclockwise until antenna is at zero degrees, and insure that it does not move until step i is performed.

c. Insure that ROTO STEPPER OFF ZERO indicator lamp, behind control panel of Test Control Unit, is OFF.

## NOTE

If ROTO STEPPER OFF ZERO indicator lamp is on, place ATRAN CUTOUT switch ON; wait 5 minutes; then place ATRAN CUTOFF switch OFF. If ROTO STEPPER OFF ZERO indicator lamp remains on report condition to NCOIC.

d. Remove CRT INSPECTION PORT cap to observe CRT.

e. Place and hold CENTERING switch (5, figure 3-10) on Test Programmer at GROUND.

f. Alternately place LATERAL SWEEP CUTOUT switch S1402, on Atran indicator control unit, in each position; observe presentation on Video Converter CRT. Sweep must not move.

## NOTE

If sweep movement occurs while performing step f, unlock and adjust ATRAN COURSE REFERENCE dial on Atran adjustment panel in small increments until requirements of step f are met. ATRAN COURSE REFERENCE dial must be within plus or minus 3 degrees of zero.

g. If adjustment of ATRAN COURSE REFERENCE dial was necessary, lock dial and repeat step f.

- h. Release CENTERING switch.
- i. Insure that LATERAL SWEEP CUTOFF switch is in TRACK.
- j. Replace CRT Inspection Port cap on Video Converter.
- k. Replace cover on Video Converter.
- l. Install pressure seal over TEST PANEL ACCESS DOOR opening with existing hardware.

NOTE

Pressure seal must fit tightly around cables, waveguide, and opening to insure that Nose Section is airtight.

3-34. PERFORMING ATRAN VISUAL CHECKS.

- a. Check around Hydraulic Motor for fluid leaks.
- b. Check radome for cracks or bruised areas.

NOTE

A bruised area will appear as a blister when looking into radome.

- c. Insure that there are no broken or burned parts.
- d. Insure that the APN/22 Receiver-Transmitter is secured.
- e. Check altimeter on APN/22 Receiver-Transmitter it must indicate approximately 260 feet.
- f. Insure that all cables and boxes are secured.
- g. Insure that CRT presentation is normal.
- h. Insure that the magnetron blower is operating.
- i. Insure that all dials and timers have not been moved.
- j. Check Video Converter for loose or worn gears and switches.
- k. Check for film being inserted properly and film gate closed.
- l. Verify timer setting of Interlock Control Unit with NCOIC.

## 3-35. PERFORMING ROLL GAIN CHECK (Effectivity D).

- a. Adjust ROLL GAIN control (R3111) fully counterclockwise. If antenna starts to oscillate in roll axis, rotate the ROLL GAIN control clockwise until oscillations stop.
- b. Shock antenna housing by manually rotating antenna in roll axis approximately 20 degrees and releasing. Observe antenna roll axis response.

## NOTE

Antenna should settle down within a maximum of four overshoots. If the antenna starts to oscillate, slowly rotate the ROLL GAIN control clockwise until the oscillations stop.

- c. Repeat step b twice to insure that antenna housing does not oscillate more than four times. If antenna does oscillate more than four times when shocked, rotate ROLL GAIN control clockwise until a maximum of four overshoots are obtained.

## 3-36. PERFORMING PITCH GAIN CHECK (Effectivity D).

- a. Adjust PITCH GAIN control (R3101) fully counterclockwise. If antenna starts to oscillate, rotate the PITCH GAIN control clockwise until the oscillations stop.
- b. Shock antenna housing by manually pulling pitch yoke forward approximately 20 degrees and releasing. Observe antenna pitch axis response.

## NOTE

Antenna should settle down within a maximum of four overshoots. If the antenna starts to oscillate, slowly rotate the PITCH GAIN control clockwise until the oscillations stop.

- c. Repeat step b twice to insure that antenna housing does not oscillate more than four times. If antenna does oscillate more than four times when shocked, rotate PITCH GAIN control clockwise until a maximum of four overshoots are obtained.

3-37. PERFORMING VERTICAL ALIGNMENT OF ATRAN ANTENNA.

- a. Insure that SRP Main Console has been in step zero a minimum of 15 minutes.

CAUTION

When adjusting a synchros, remove Clinometer from milled surface. Also, stay clear of antenna. It could tilt.

- b. Connect P9047 of antenna sensors cable to ANTENNA SENSORS receptacle J9047 on Output Junction Panel.
- c. Connect ROLL and GROUND leads of cable to HP410B.
- d. Hold FAST ERECT switch, on Test Control Unit, ON to verify null of less than 1 volt on meter.
- e. Place Clinometer on roll milled surface of antenna azimuth housing cover.
- f. Clinometer must indicate between plus or minus 12 minutes of being level.

CAUTION

If necessary, loosen the 3 screws around the roll synchro B3009 on antenna, and carefully adjust to obtain indication specified in step e. Exercise caution to insure adjustment does not break the synchro leads.

- g. Disconnect ROLL lead of cable and connect PITCH lead to HP410B.
- h. Hold FAST ERECT switch ON to verify null of less than 1 volt on meter.

CAUTION

If necessary, loosen the 3 screws around the pitch synchro B3010 on antenna, and carefully adjust to obtain indication specified in step g. Exercise caution to insure adjustment does not break the synchro leads.

- i. Place Clinometer on pitch milled surface of antenna azimuth housing cover.
- j. Clinometer must indicate between plus or minus 12 minutes of being level.
- k. Disconnect and stow cable and HP410B.
- l. If adjustment of pitch and roll synchro was necessary, lock synchros; insure that antenna alignment remains within tolerance, and apply glytol to synchro clamp screws.
- m. Insure FILM FRAME position indication (12, figure 3-6) on Test Control Panel indicates zero.

- n. Remove Clinometer and stow.

### 3-38. REINSTALLING RADOME.

#### CAUTION

When handling radome, use extreme care; do not bruise or crack radome.

- a. Insure SCAN CUTOFF switch in Auxiliary Test Control Panel is ON.
- b. Position radome on support tubes with static hose connection on the right.
- c. Release spring lock on lower right support fitting to install radome on support tubes.
- d. Push radome fully aft.
- e. Install clamp ring on radome with clamp ring handle on left side.
- f. Engage clamp and lock by pushing down on clamp ring handle.
- g. Install allen-head lock screw in clamp ring handle.
- h. Lockwire screw and clamp ring handle.
- i. Place SCAN CUTOFF switch on Auxiliary Test Control Panel OFF.

### 3-39. PERFORMING FINAL PRELAUNCH CHECK.

- a. Place ANTENNA SCAN CUTOFF - ATRAN MOTORS CUTOFF - ATRAN MOTORS ON switch (5, figure 3-14) on Auxiliary Test Control Panel to ATRAN MOTORS ON.
- b. Insure that READY FOR TEST indicator lamp (16, figure 3-9) on SRP Main Console Test Control Panel is ON.

#### NOTE

When READY FOR TEST indicator lamp is on, MISSILE CONTINUITY indicator lamp on the Missile Monitor and Power Panel must be on.

- c. Place CENTERING SELECTOR switch (17, figure 3-10) to LATERAL: CENTERING INTEGRATOR OUTPUT meter (16) must indicate between +3 and -3V DC. If meter deflection to right or left is greater than +3 and -3V DC, hold CENTERING switch to GROUND for 5 seconds; then release, and check meter for correct indication.
- d. Place CENTERING SELECTOR switch to LONGITUDINAL, and observe for meter indication between +3 and -3V DC.

#### NOTE

If meter deflection to right or left is greater than +3 and -3V DC, hold CENTERING switch to GROUND for 5 seconds; then release, and check meter for correct indication.

e. Place and hold CENTERING switch to STEP FUNCTION for approximately 5 seconds. CENTERING INTEGRATOR OUTPUT meter must deflect to left and return to zero after switch is released.

## NOTE

If this occurs, centering is locked on. If centering is not locked on, reset the film and repeat brightness, and centering adjustment; then, repeat this paragraph.

f. Observe indication of transponder meter (1, figure 3-13) on Transponder.

g. Place TRANSMIT CONTROL switch (1, figure 3-14) on Auxiliary Test Control Panel to TRANSMIT: insure indication of Transponder meter is at least 1/16 inch greater than that obtained in step f.

## NOTE

If the requirements of step g are not obtained refer to applicable trouble shooting directives.

h. Transponder meter on SRP Main Console Transponder Unit must indicate in lower green RADAR PWR OK scale.

i. Place SIGNAL SELECTOR switch (6, figure 3-8) on Monitor Oscilloscope to TRANS VID.

j. Place SWEEP SELECTOR switch (8) to .375.

k. Observe that image on Cathode Ray Tube (1) corresponds to figure 3-15 (A).

## NOTE

It may be necessary to use the scope hood and vary the INTENSITY and FOCUS controls to obtain a clear image.

l. Place SWEEP SELECTOR switch to 40 MI.

m. Observe that image on Cathode Ray Tube corresponds to figure 3-15 (B).

n. Place SIGNAL GENERATOR switch to FSS VID.

o. Observe that image on Cathode Ray Tube is a shifting pulse.

p. Place SIGNAL SELECTOR switch to RAD VID.

q. Observe that image on Cathode Ray Tube is one stationary pulse.

r. Rotate vacuum tube voltmeter range selector switch to 100 V scale.

s. Adjust ZERO ADJUST control on HP410B until meter indicates 50 volts.

t. Slide Test Programmer Unit out far enough to gain access to jack J1705.

u. Insert COMMON lead to J1705 on Test Programmer Unit.



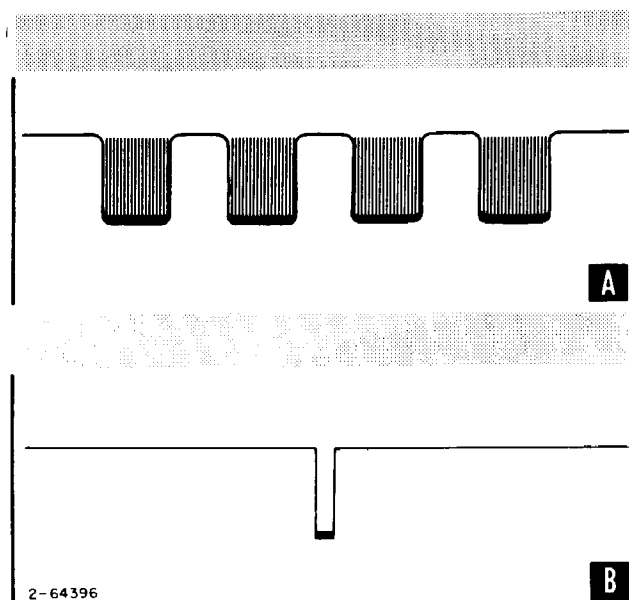


Figure 3-15. Transponder Video Image

- v. Insert DC lead of meter to SWEEP OUTPUT jack J1704 on Test Programmer Unit.
- w. Meter must indicate between +79 and +81 volts.

NOTE

If voltage is within limits, adjust meter ZERO ADJUST control until meter indicates +80 V.

- x. Prepare to start stopwatch.
- y. Simultaneously place SWEEP GEN switch S1702 on Test Programmer Unit to CAL, and start stopwatch.

NOTE

Voltage must sweep from +80 to +20 volts in 11.8 to 12.2 seconds. Adjust VOLTS PER SEC control, R5, if necessary, then repeat step y.

- z. Disconnect voltmeter test leads, and adjust ZERO ADJUST control until meter indicates zero.
  - aa. Place AIDED TRACK CUTOFF switch (2, figure 3-14) on Auxiliary Test Control Panel ON.
  - ab. Place ATRAN LOOP ON switch (3) ON.
  - ac. Rotate HP410B selector switch to 30 V scale.

- ad. Rotate ZERO ADJUST control on HP410B until meter indicates 15 volts.
- ae. Place COMMON test lead of meter in SIGNAL GND jack (10).
- af. Place DC test lead of vacuum tube voltmeter HP410B in LONG TR INT TEST jack (8).
- ag. While holding LONG TRACK INT GND switch (4) to OPEN, adjust FINE RANGE ADJUST control (9) to insure that voltmeter indicator follows movement of FINE RANGE ADJUST control; then, adjust FINE RANGE ADJUST control to obtain a zero indication on the meter.
- ah. Release LONG TRACK INT GND switch.
- ai. Place ATRAN LOOP ON switch OFF.
- aj. Place AIDED TRACK CUTOUT switch OFF.
- ak. Disconnect voltmeter test leads, and adjust ZERO ADJUST control until meter indicates zero.
- al. Place TRANSMIT CONTROL switch OFF.
- am. Insure that FILM FRAME POSITION indicator (12, figure 3-6) on Test Control Panel indicates zero.
- an. Insure that READY FOR TEST indicator lamp (16) is on.
- ao. Insure that MISSILE CONTINUITY indicator lamp on Missile Monitor and Power Panel is on.
- ap. Slide Test Programmer Unit out of main console until DC Comparator No. 1 and No. 2 and AC and DC No. 3 Comparator chassis are available.
- aq. Adjust DC 1 CAL Control on DC Comparator No. 1 and No. 2 chassis until DC 1 RESPONSE indicator lamp (6, figure 3-10) on Test Programmer flickers.

## NOTE

If a flicker cannot be obtained, adjust to a condition where indicator lamp goes on.

- ar. Adjust DC 2 CAL control until DC 2 RESPONSE indicator lamp (7) flickers.

## NOTE

If a flicker cannot be obtained, adjust to a condition where indicator lamp goes on.

- as. Adjust DC CAL control on AC and DC No. 3 comparator chassis until DC 3 RESPONSE indicator lamp (9) flickers.

## NOTE

If a flicker cannot be obtained, adjust to a condition where indicator lamp goes on.

- at. Adjust AC CAL control until AC RESPONSE indicator lamp (10) flickers.

## NOTE

If a flicker cannot be obtained, adjust to a condition where indicator lamp goes on.

- au. Slide Test Programmer Unit back into main console and secure.
- av. Slide Test Control Unit out of main console far enough to observe ATRAN ON indicator lamp.
- aw. Observe that GUIDANCE SECTION TEMP GO indicator lamp on MISSILE MONITOR AND POWER panel is on.

## CAUTION

If GUIDANCE SECTION TEMP NO GO indicator lamp comes on at any time, place EXT POWER switch on MISSILE MONITORING AND POWER panel OFF; and refer to applicable servicing instructions.

## 3-40. PERFORMING MISSILE PREFLIGHT TEST.

## NOTE

This paragraph must be thoroughly read and understood before proceeding.

- a. Prepare to start stopwatch when MISSILE TEST POSITION indicator (17, figure 3-10) indicates 3.

## NOTE

Tester will advance to step 3 approximately 18 seconds after START/ADVANCE switch (18) is depressed.

- b. Obtain time required for Missile to reach lock-on box from launch data card.

## CAUTION

If SRP automatic test sequence is stopped for more than 5 minutes during SRP check of Missile, place ANTENNA SCAN CUTOFF - ATRAN MOTORS CUTOFF - ATRAN MOTORS ON switch (5, figure 3-14) on Auxiliary Test Control panel to ATRAN MOTORS CUTOFF. Observe that FILM MOTOR ON indicator lamp goes off. When ready to continue with automatic test sequence, place switch to ATRAN MOTORS ON and observe that FILM MOTOR ON indicator lamp goes on.

- c. Momentarily depress START/ADVANCE switch on Test Control Panel.

## NOTE

The SRP Main Console will perform the automatic test sequence. This sequence consists of 50 steps with an automatic hold at step 48. At the end of the sequence the tester will automatically reset.

d. When tester advances to step 3, start stopwatch and observe TCU ON, ATRAN ON, and GUIDANCE ON indicator lamps behind Test Control Unit panel.

NOTE

During this step, the Stabilizer must start to move. The Stabilizer must move linearly until it reaches a trim position; otherwise refer to applicable servicing instructions.

e. (Effectivity A) Observe that TCU ON indicator lamp goes on between 7 and 11 seconds; ATRAN ON indicator lamp must go on at time recorded in step b plus or minus 2 seconds; GUIDANCE ON indicator lamp must go on 8 to 12 seconds after ATRAN ON.

f. (Effectivity B) Observe TCU ON indicator lamp goes on between 7 and 11 seconds; ATRAN ON indicator lamp must go on at time recorded in step b (plus or minus 2-seconds; GUIDANCE ON and ATRAN ON indicator lamps must go on simultaneously.

g. When MISSILE TEST POSITION indicator (17, figure 3-6) indicates 48, the automatic sequence must stop.

h. FILM FRAME POSITION indicator (12) must indicate 17.

i. Insure that APN-22 RELIABLE indicator lamp behind Test Control Unit panel is on.

j. Insure that altimeter (9, figure 3-11) on Altitude Simulator indicates approximately the same value recorded when Altitude Simulator check was performed.

k. Wait at least 20 seconds before proceeding.

l. After 20 seconds, depress START/ADVANCE switch on Test Control Panel.

NOTE

SRP Main Console automatic test sequence will continue.

m. At completion of test sequence, place CENTERING SELECTOR switch (17, figure 3-10) on Test Programmer to LONGITUDINAL.

n. Insure that REMOTE CENTERING switch (18) is OFF.

o. Place and hold CENTERING switch (5) to STEP FUNCTION.

p. CENTERING INTEGRATOR OUTPUT meter (16) must deflect to left.

q. Release CENTERING switch; meter must return to zero.

r. Place CENTERING SELECTOR switch OFF.

s. Slide Test Control Unit back into main console and secure.

t. Insure that FILM FRAME POSITION indicator (12, figure 3-6) indicates (18) the first tracking frame.

u. Place TRANSMIT CONTROL switch (1, figure 3-14) to TRANSMIT.

- v. Insure that SIGNAL SELECTOR switch (6, figure 3-8) on Monitor Oscilloscope is in FSS VID.
- w. Insure that SWEEP SELECTOR switch (8) is in 40 MI.
- x. Adjust INTENSITY (2) and FOCUS (3) controls as necessary.
- y. Observe that images on Cathode Ray Tube (1) are shifting pulses.
- z. Place SIGNAL SELECTOR switch to RAD VID.
- aa. Observe that images on Cathode Ray Tube are stationary pulses.
- ab. Place TRANSMIT CONTROL switch (1, figure 3-14) to OFF.
- ac. Disconnect voltmeter and stow.
- ad. Insure that MISSILE CONTINUITY indicator lamp (5, figure 3-7) on Missile Monitor and Power panel is on.
- ae. Both spoilers must be in a trim (retracted) position.

## NOTE

Maximum extension of spoiler blade must not exceed 1 inch.  
Measure with ruler if necessary.

## 3-41. SHUTTING DOWN SRP MAIN CONSOLE POWER.

- a. Depress TESTER OFF button (3; figure 3-6) on Test Control Panel.
- b. POWER ON indicator lamp (1) must go off, and STANDBY indicator lamp (15) must go on.
- c. Place circuit breakers on POWER MONITORING AND DISTRIBUTION BOX OFF.

## 3-42. SHUTTING DOWN MISSILE POWER.

- a. Place EXT POWER switch on Missile Monitor and Power Panel OFF.
- b. EXT POWER ON indicator lamp must go OFF.

## 3-43. SHUTTING DOWN POWER TO SRP.

- a. Pull circuit breakers CB803 (8, figure 3-5) on Power Control Panel to OFF position.
- b. 115V AC 400CPS indicator lamp (3) must go off.
- c. Pull circuit breaker CB802 (9) to off position.
- d. 120V AC 60CPS indicator lamp (2) must go off.
- e. Pull circuit breaker CB801 (10) to off position.
- f. 28V DC indicator lamp (1) and STANDBY indicator lamp (15, figure 3-6) on Test Control Panel must go off.

- g. Place 115 V 400 TESTER POWER switch (18, figure 3-4) on Power Monitoring and Distribution Box to off position.
- h. 115V 400 TESTER POWER indicator lamp (23) must go off.
- i. Place 120V 60 TESTER POWER switch (20) to off position.
- j. 120V 60 TESTER POWER indicator lamp (21) must go off.
- k. Place 28V DC TESTER POWER switch (19) to off position.
- l. 28V DC TESTER POWER indicator lamp must go off.
- m. 115V 400 POWER MONITORING indicator lamp (5) must be on.
- n. 120V 60 POWER MONITORING indicator lamp (24) must be on.
- o. 28V DC POWER MONITORING indicator lamp (3) must be on.

3-44. DISCONNECTING SRP FROM MISSILE.

- a. Remove pressure seal from TEST PANEL ACCESS Door on missile Nose Section.
- b. Disconnect nose test cable from receptacle J5507 on Missile.

NOTE

Receptacle J5507 is accessible through TEST PANEL ACCESS DOOR.

- c. Disconnect prelaunch test cable from receptacle J8403 on Missile.
- d. Connect P8403 to rear of RFT receptacle.

NOTE

Receptacle J8403 is accessible through TEST PANEL ACCESS DOOR.

- e. Disconnect gyro slaving cable from receptacle J9013 on Umbilical Outlet Box.
- f. Disconnect altitude hose from static port adapter.
- g. Remove static port adapters and stow in Test Accessory Box.
- h. Disconnect Delay Line Test Set from Receiver Transmitter in Nose Section.
- i. Disconnect and disassemble waveguide.
- j. Stow waveguide in Test Accessory Box.
- k. Remove and stow pressure seal in SRP.
- l. Close and secure TEST PANEL ACCESS DOOR.
- m. Remove horn assembly from Receiver Transmitter on bottom of Nose Section.

- n. Stow horn assembly in Delay Line Test Set.
  - o. Insure that warhead interlock cable has been disconnected from Missile.
  - p. Disconnect launch control cable from Umbilical Outlet Box.
  - q. Insure that EXT. POWER switch on Missile Monitor and Power panel is OFF.
  - r. Disconnect Missile Aft Bus Power cable from MISSILE AFT BUS RECEPTACLE J8614 on Missile.
  - s. Remove ground between Sta. 180 and SRP.
  - t. Disconnect waveguide.
- 3-45. STOWING SRP CABLE SUPPORT BOOM WITH CABLES AND WAVEGUIDE.
- a. Disconnect waveguide at connection nearest point of flex when rotating support boom forward; then cover waveguide ends.
  - b. Remove SRP cable support boom lock pin.
  - c. Stow boom forward against side of SRP and replace lock pin.
- 3-46. DISCONNECTING START FUEL HOSE ASSEMBLY FROM MISSILE.
- a. Actuate manual release on start fuel hose assembly; start fuel hose assembly must release from Missile.
- 3-47. DISCONNECTING NTCU DUCT FROM MISSILE.
- a. Pull cooling air duct from Missile by rubber collar.
- 3-48. DISCONNECTING RFT CABLE.
- a. Disconnect squib firing cable from RFT cable squib.
  - b. Disconnect RFT cable from RFT connector on Nose Section.
  - c. Reconnect squib firing cable to RFT cable in out-of-way location.
- 3-49. REMOVING RF HOOD. (See figure 3-16.)
- a. Open zipper on right side of hood assembly.
  - b. Remove release cord from hood lanyard collector ring.
  - c. Remove hood assembly from Missile.
- 3-50. INSTALLING RF HOOD. (See figure 3-16.)
- a. Remove release cord cover and check that pins in locking cones are secure; then replace cord cover.

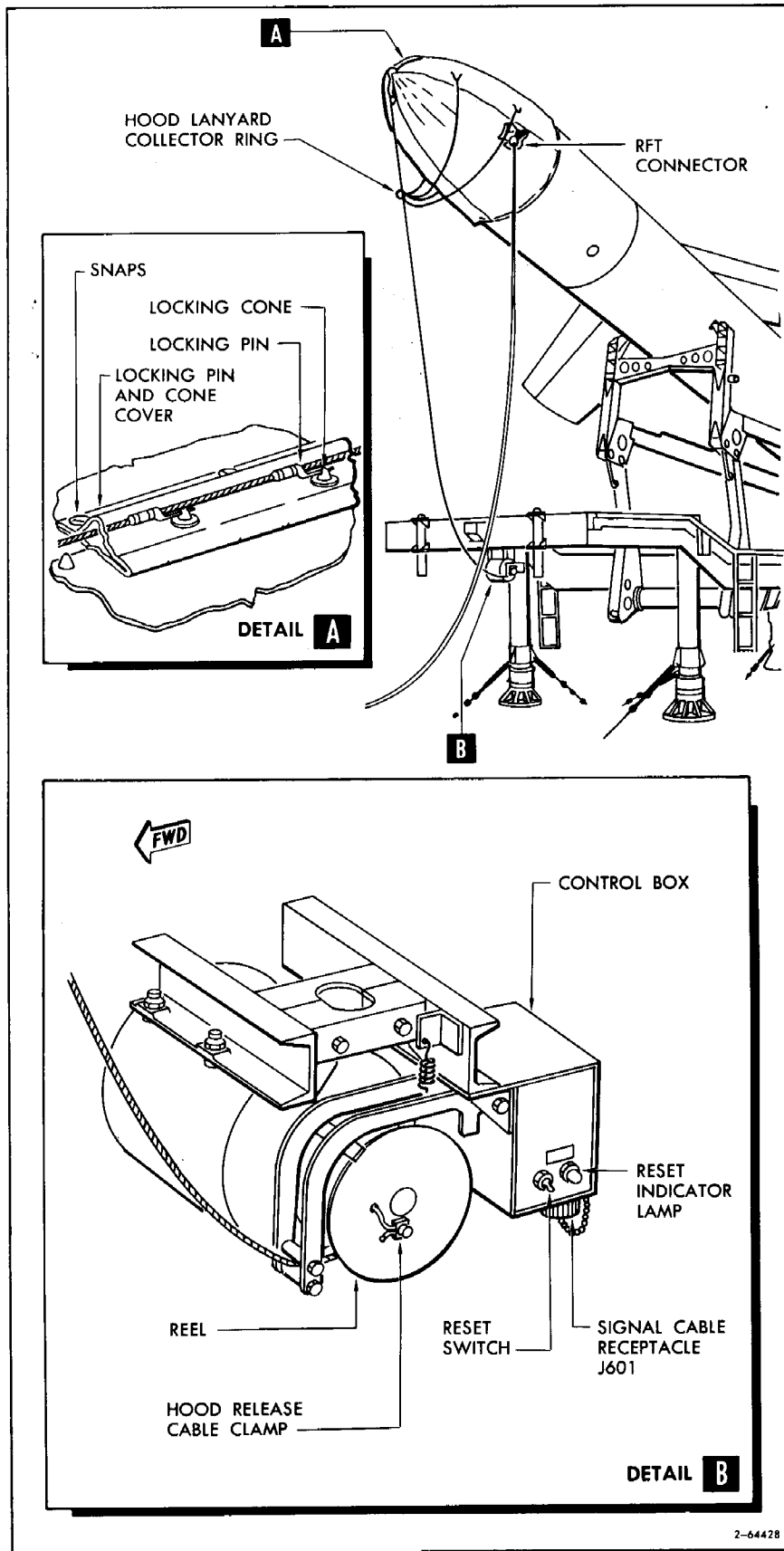


Figure 3-16. Installing RF Hood and Reel Motor



b. If pins are removed, start at front end of hood assembly and place side of hood having holes, over locking cones. Insert locking pins through holes in locking cones; then replace cover.

## NOTE

Pin on end of release cord must be inserted in last locking cone at top of hood assembly.

- c. Insure that refrigeration system intake and exhaust plugs have been removed.
- d. Insure that zippers on right and left sides of hood are closed.
- e. Position hood assembly on Missile Nose with release cord cover along top surface; then close bottom zipper.
- f. Insure that all hood lanyards are attached to collector ring.
- g. Attach release cord to hood lanyard collector ring.
- h. Position free end of release cord between spaces on reel lever; then thread cord through hole in side of reel, and secure with cable clamp provided.

3-51. CONNECTING RFT CABLE TO MISSILE. 

- a. Insure that there are no bent pins on RFT plug.
- b. Insure that center attaching bolt is tight in RFT connector.
- c. Remove squib firing cable, loosen, squib, and start attaching bolt into receptacle J9434 in left side of Nose Section.
- d. Insure that pins will engage right sockets in receptacle.
- e. Rotate attachment knob until firmly tight, tighten squib, and connect squib firing cable to squib.
- f. Connect two existing restraining lanyards to RFT cable with existing hardware.

## 3-52. CONNECTING NTCU DUCT ASSEMBLY TO MISSILE.

- a. Insure that the innermost sleeve of the coupler is fully extended in the direction of the missile mating end. When fully extended, this sleeve will cover and protect the microswitch in the fitting wall.
- b. Position coupler against the ground cooling inlet nipple on the left side of the Warhead Section so that the innermost sleeve is firmly butted against the nipple.
- c. Push coupler into the inlet nipple as far as possible.
- d. Pull firmly on base of duct connection to insure that disconnect assembly is connected and locked in place.
- e. Connect cooling duct disconnect cable to junction box receptacle J7102 and to receptacle J8003 on cooling duct disconnect fitting.

- f. Connect restraining lanyard to cooling duct coupler assembly.

3-53. CONNECTING START FUEL ASSEMBLY TO MISSILE.

NOTE

Hose fitting on side of start-fuel hose assembly must face forward part of Missile.

- a. Connect start-fuel hose assembly to START-FUEL DISCONN on bottom of Missile Aft Section.

NOTE

The start-fuel disconnect fitting must be lubricated with light grease before connecting it to Missile. Also, insure that start-fuel hose and disconnect cable assembly are routed aft of Trans-launcher cross member.

- b. Actuate manual release and insure that assembly releases with pulling on hose.

NOTE

If assembly does not release, replace start-fuel hose assembly and repeat steps a and b.

- c. Reconnect start-fuel hose assembly.

3-54. CONNECTING ENGINE RUNUP, TEST, AND LIGHT-OFF DETECTOR CABLES.

NOTE

When connecting cables with spring-loaded breakaway disconnect, insure that arming nut is turned fully counterclockwise. Connect plug and jack, and tighten coupling nut. (Cannon plug pliers may be required.) Slide arming assembly around coupling nut to an accessible position. Grasp cable by wire mesh and pull firmly from Missile to insure that plug is properly connected. Turn arming nut fully clockwise and connect lanyard to latch key.

- a. Connect engine runup and test cable to receptacle J8694 on Missile and use lanyard, part number 435A610-033-105, to connect to latch key.

- b. Connect light-off cable to receptacle J8771 on Missile and use lanyard, part number 435A610-033-101, to connect to latch key.

3-55. PERFORMING RFT CENTERING ADJUSTMENT.

WARNING

Prior to application of external power caution all personnel to stand clear of antenna and observe RF Hazard Area.

- a. Notify Launch Officer to apply external power.

- b. Open cover on light generator scanner control unit.
- c. Wait until RFT READY TO TEST light comes on.
- d. Close base casting.
- e. With RFT check, centering lock-on and note amount and direction of error for LONG and LAT centering.
- f. Open base casting.
- g. Adjust LONG and LAT course centering controls in the opposite direction and amount indicated in step e.
- h. Close base casting and recheck centering with RFT.
- i. Open base casting and secure cover on light generator scanner control.

3-56. MECHANIC NO. 2 DETAILED INSTRUCTIONS.

## 3-57. ENGAGING POWER TAKEOFF.

## WARNING

Insure that air tank valve is closed.

- a. Set hand brake and place gear shift lever in neutral position.
- b. Warmup MM-1 engine at idle RPM.

## NOTE

Operate MM-1 engine at idle RPM until proper operating temperature and low pressure Warning buzzer is off. Also air pressure gage must indicate a minimum of 90 PSI.

- c. Open hydraulic cooling radiator access door on front of MM-1 Truck and open hydraulic bypass valve.
- d. Place TRUCK POWER switch (12, figure 3-17) ON.
- e. Observe RESERVOIR LEVEL gage (6, figure 3-18) on Hydraulic Control Panel. It must indicate at least three-quarters full.
- f. Shut down MM-1 engine and engage PTO switch.
- g. Start MM-1 engine and place gear shift lever in third gear.
- h. Release MM-1 hand brake and slowly increase engine RPM with foot throttle\*to approximately 1200 RPM.

## NOTE

If PTO low pressure warning indicator lamp goes on during operation, shut down MM-1 engine and check electric lube pump for proper operation and transfer case oil level.

- i. Insure that power takeoff is engaged and rotating.
- j. Place MM-1 engine at idle RPM and reset hand brake.

## CAUTION

MM-1 operator must remain in truck cab until notified by the power pack operator that power has stabilized.

- k. Power pack operation must insure that LOW PRESSURE SELECTOR control is in booster Pump position.
- l. Rotate throttle control fully out (17, figure 3-19).
- m. Insure SELECTOR PRESSURE gage indicates between 55 and 80 psi.

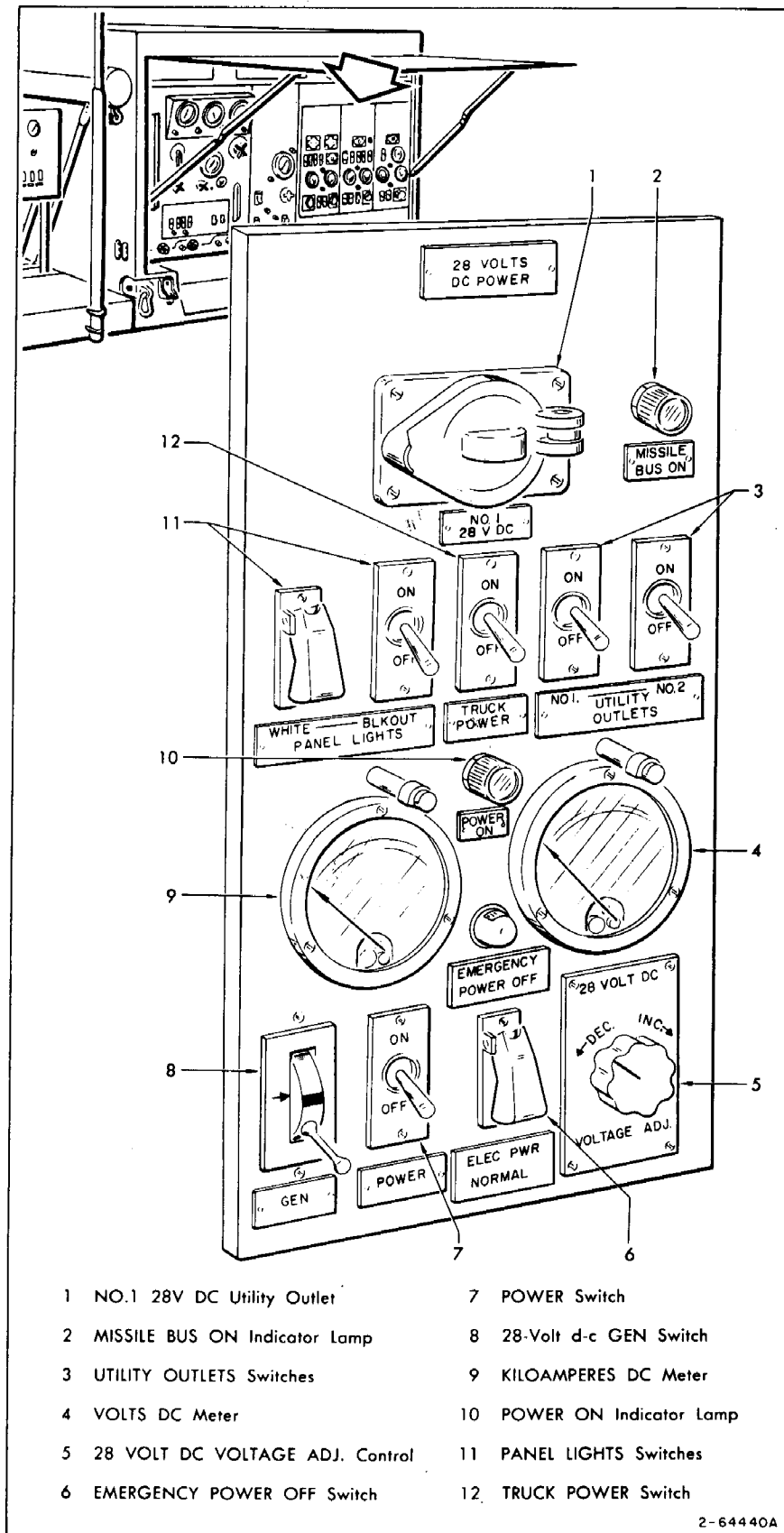
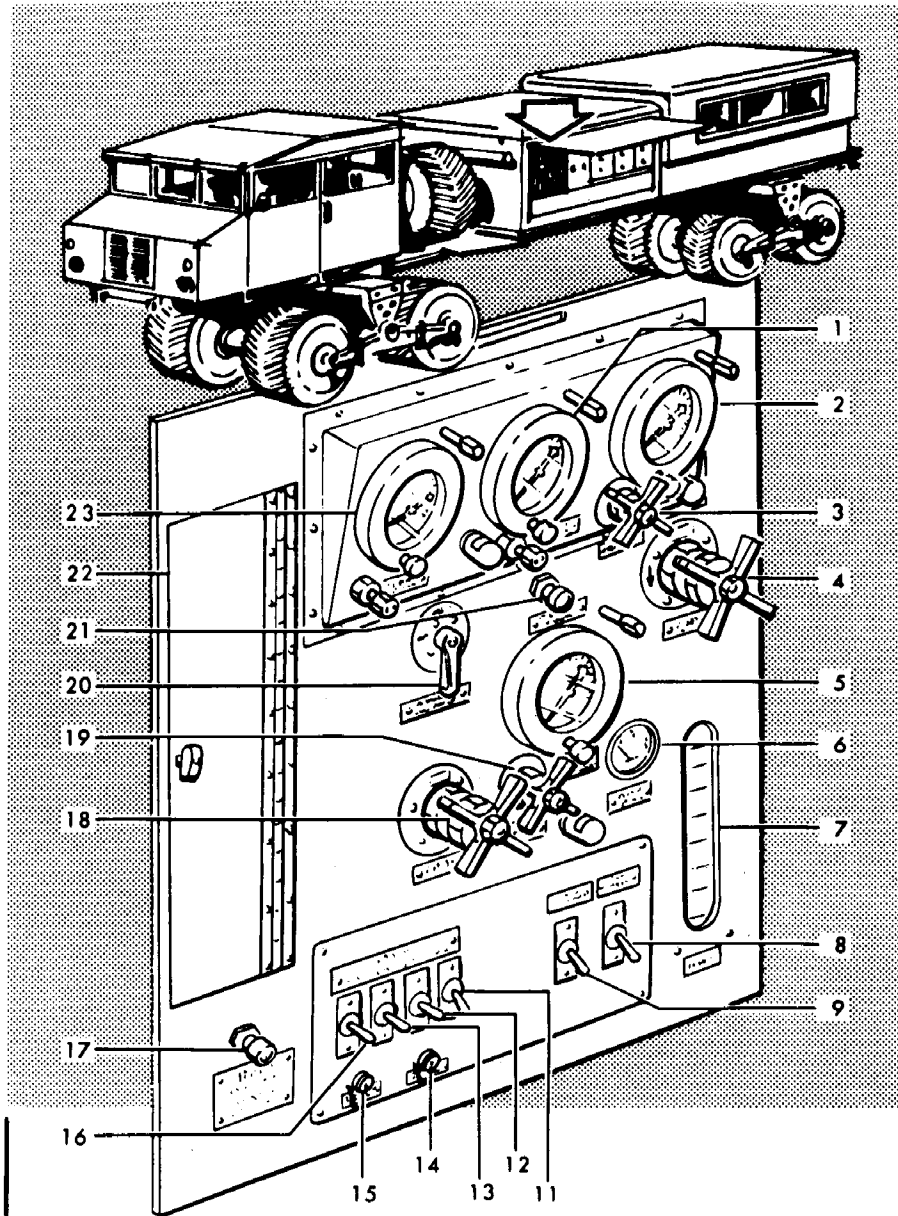


Figure 3-17. 28 Volts DC Power Panel

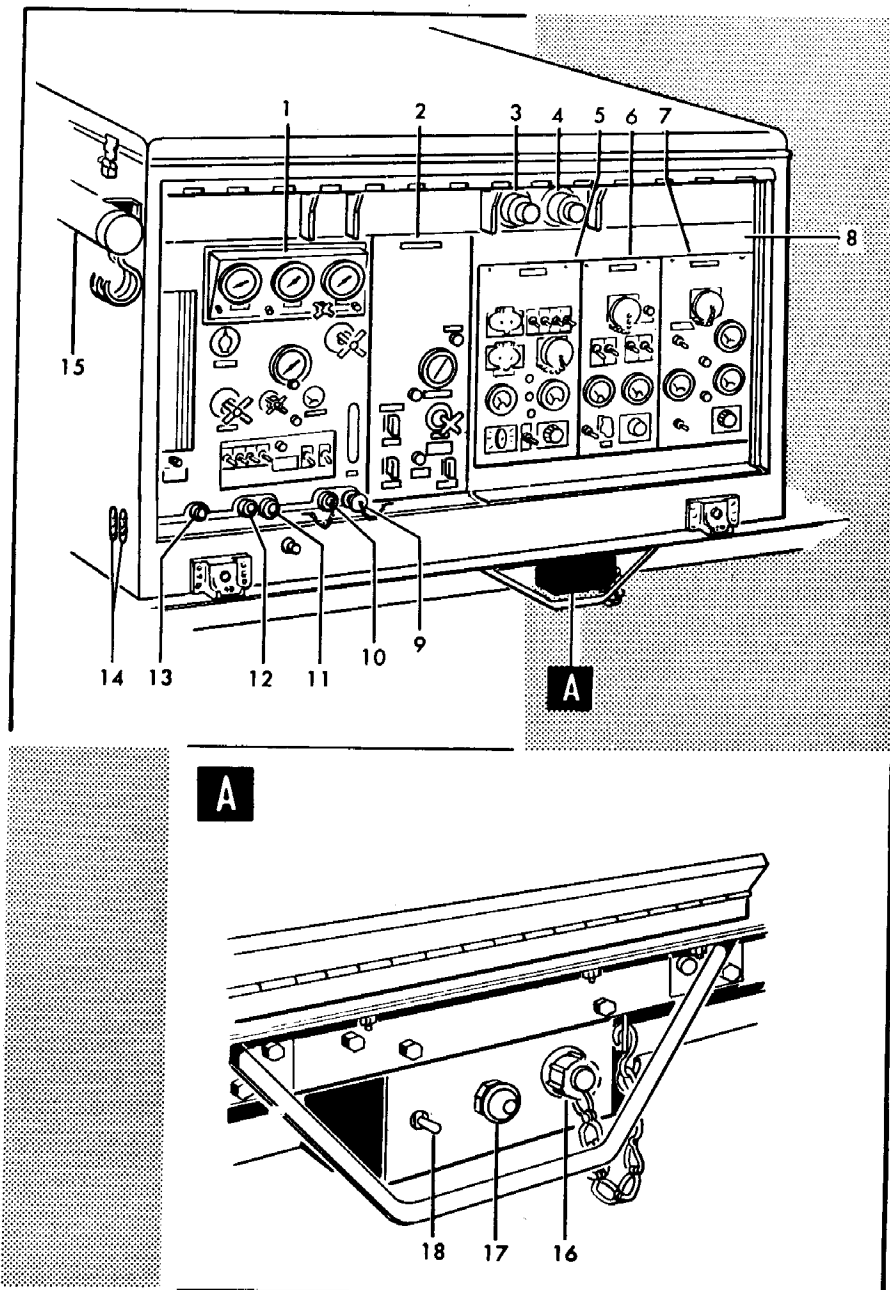


**NUMERICAL INDEX**

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|----|-----------------------------|----|---|
| 1  | SYSTEM PRESSURE Gage        | 11 | CYCLE Switch                              |
| 2  | HYD OIL TEMPERATURE Gage    | 12 | SELECTOR Switch                           |
| 3  | HIGH PRESSURE Control       | 13 | ROLL Switch                               |
| 4  | RETURN BYPASS Control       | 14 | J35 START FUEL HOSE DISC Receptacle       |
| 5  | SYSTEM FLOW Gage            | 15 | J31 HYD CYCLING Receptacle                |
| 6  | RESERVOIR LEVEL Gage        | 16 | PITCH Switch                              |
| 7  | RETURN FLOW                 | 17 | Master Gearcase Oil Supply Indicator Lamp |
| 8  | MAIN SYSTEM Switch          | 18 | SYSTEM OUTLET Control                     |
| 9  | COMPENSATOR SHUT-OFF Switch | 19 | MANUAL BYPASS Control                     |
| 10 | DELETED                     | 20 | LOW PRESSURE SELECTOR Control             |
|    |                             | 21 | OPERATING PRESSURE Indicator Lamp         |
|    |                             | 22 | Filter Element Access Panel               |
|    |                             | 23 | SELECTOR PRESSURE Gage                    |

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Figure 3-18. Hydraulic Control Panel



**NUMERICAL INDEX**

- |   |                         |    |   |
|---|-------------------------|----|---|
| 1 | HYDRAULIC CONTROL Panel | 10 | Hydraulic Pressure Hose                         |
| 2 | PNEUMATIC PANEL         | 11 | Hydraulic Return Hose                           |
| 3 | Ground Cooling Inlet    | 12 | Power Pack Hydraulic Purging Pressure Connector |
| 4 | Bleed Air Outlet        | 13 | Power Pack Hydraulic Purging Return Connector   |
| 5 | 60 CYCLE POWER Panel    | 14 | External Power Receptacles                      |
| 6 | 28 VOLT DC POWER Panel  | 15 | Cable Support Boom                              |
| 7 | 400 CYCLE POWER Panel   | 16 | AIR Connector                                   |
| 8 | Power Panel Access Door | 17 | THROTTLE Control                                |
| 9 | Start Fuel Connector    | 18 | IGNITION Control                                |

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Figure 3-19. Power Pack Control Panel

n. Master gear case oil supply indicator lamp (17, figure 3-18) on Power Pack hydraulic control panel must go off after engine RPM exceeds 1500 RPM.

## NOTE

If master gear case oil supply indicator lamp goes on during Power Pack operation immediately decrease MM-1 engine to idle RPM, disengage PTO, and check oil supply in master gear case.

o. After all power has stabilized and output power is applied to monitor distribution panel notify MM-1 operator that he can leave truck cab.

## 3-58. INSTALLING SHEAR BOLT. X

- a. Rotate holdback bolt fitting knurled knob CCW until loose.
- b. Remove holdback bolt.
- c. Insert shear bolt into fitting.
- d. Attach nut to shear bolt. During tightening a visual observation of the nut will be maintained to determine when the nut just bottoms against the translauncher holdback fitting.
- e. When nut just bottoms against fitting further tightening will cease.
- f. Rotate holdback bolt knurled knob CW until snug.

## 3-59. DISENGAGING POWER TAKEOFF.

- a. Place transmission lever to neutral.
- b. Shut down MM-1 truck.
- c. Turn ignition switch on.
- d. Disengage power takeoff.
- e. Turn ignition switch off.
- f. Open hydraulic cooling radiator access door on front of MM-1.
- g. Close hydraulic bypass valve.
- h. Close radiator access door.

## 3-60. INSTALLING HOLDBACK BOLT. X

- a. Rotate holdback bolt fitting knurled knob CCW until loose.
- b. Remove shear bolt if applicable.
- c. Insert holdback bolt into fitting.
- d. Attach nut to holdback bolt. During tightening a visual observation of the nut will be maintained to determine when the nut just bottoms against the translauncher holdback fitting.
- e. When nut just bottoms against fitting further tightening will cease.
- f. Rotate holdback bolt knurled knob CW until snug.



3-61. REMOVING POWER PACK VEHICLE FROM AREA.

- a. Insure power takeoff has been disengaged.
- b. Close and secure equipment access door.
- c. Close and secure control panel access door.
- d. Insure that hydraulic bypass valve is closed.
- e. Disconnect static ground.

X 3-62. INSTALLING ANTENNA SHIPPING BRACE.

a. Install antenna shipping brace by securing the three bolts into the base casting and the one bolt into the bottom of antenna pitch ring.

- b. Insert the cam protectors into the cam control.

3-63. CONNECTING SRP TO MISSILE. (See figure 3-20.)

- a. Connect ground cable from SRV to earth ground.
- b. Insure that the following ground connections have been made.

- (1) Power Pack to MM-1 truck bed.
- (2) MM-1 Truck Bed to earth ground.
- (3) Accessory Stand to Translauncher.
- (4) Engine tail pipe to Translauncher.
- (5) Translauncher to earth ground.
- (6) Rocket Motor to Translauncher.
- (7) Station 180 to SRP.

NOTE

Route prelaunch test cables, nose test cables, rigid waveguide, and hoses over cable support boom.

- c. Reach inside TEST PANEL ACCESS DOOR, and disconnect waveguide; route through access door opening.

CAUTION

Bend waveguide as little as possible.

- d. Position pressure seal over waveguide.

NOTE

Pressure seal must not be connected at this time.

- e. Connect flexible waveguide from waveguide connector (1, figure 3-21) on Verification Unit panel.
- f. Connect waveguide fitting to free end of flexible waveguide.
- g. Remove J-hooks from Test Accessory Box, and place on cable support boom.

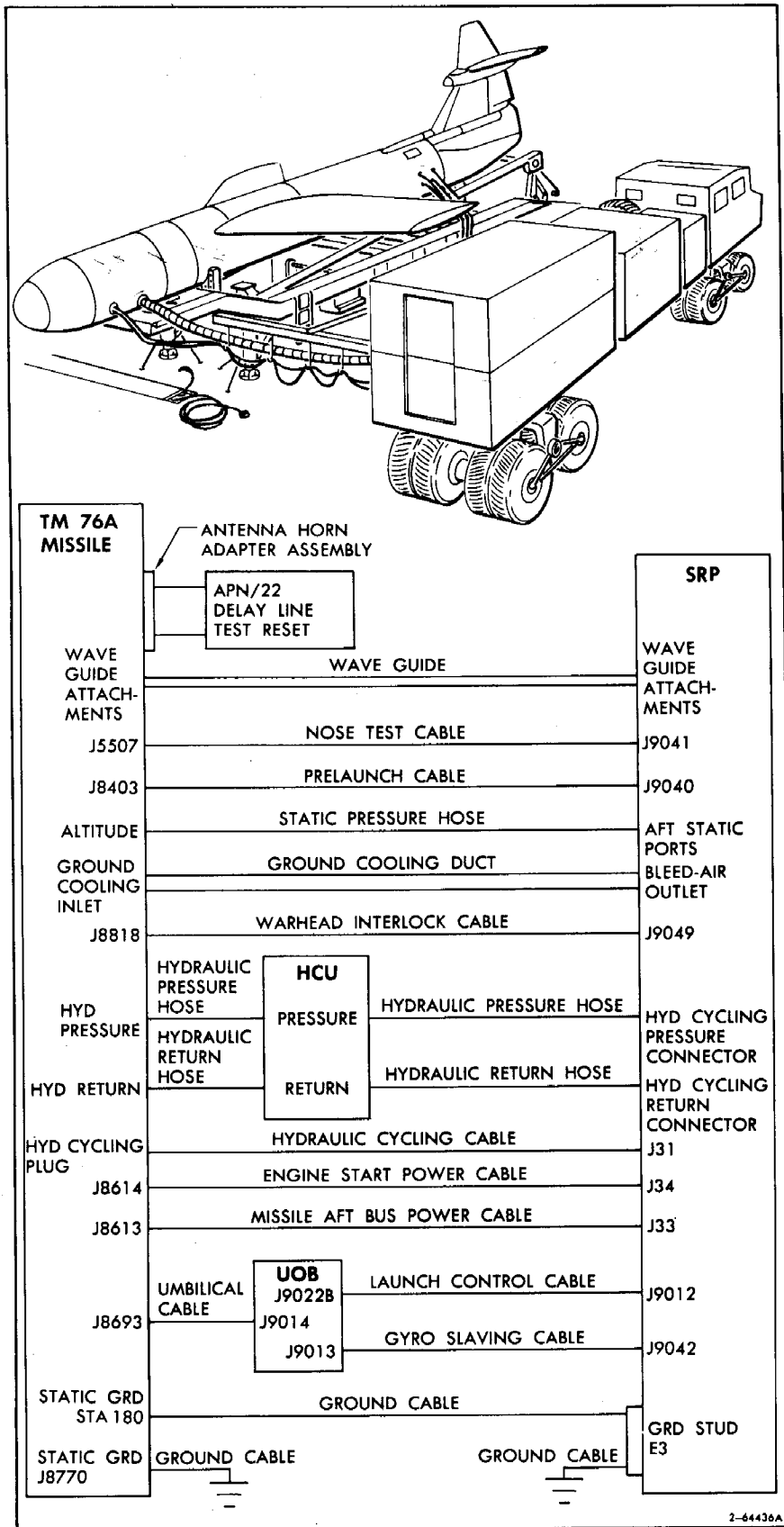


Figure 3-20. SRP Vehicle Cable Interconnections

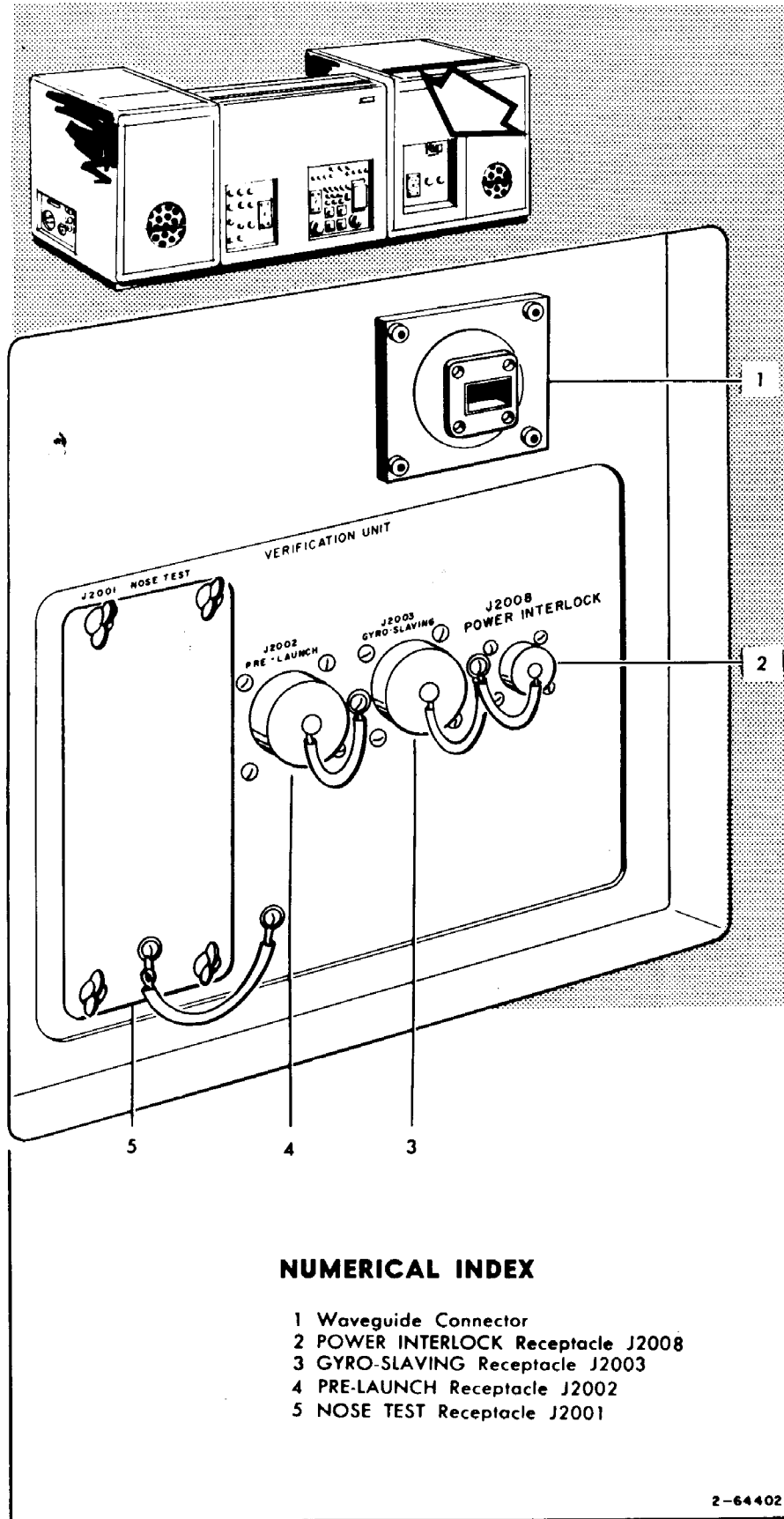


Figure 3-21. Verification Unit

h. Connect the two rigid sections of waveguide and one 90 degree fitting between flexible section protruding through pressure seal and flexible section connected to verification unit; attach waveguide to cable support boom with hardware provided.

i. Run Prelaunch Test Cable through hole in pressure seal and connect plug P8403 of cable to receptacle J8403 on Missile.

## NOTE

Receptacle J8403 is accessible through TEST PANEL ACCESS DOOR.

j. Run Nose Test Cable through hole in pressure seal and connect plug P5507 to receptacle J5507 on Missile.

## NOTE

Receptacle J5507 is accessible through TEST PANEL ACCESS DOOR.

k. Connect gyro slaving cable to receptacle J9013 on Umbilical Outlet Box (figure 3-22).

l. Connect plug P9022 of the cable to receptacle J9022B on Umbilical Outlet Box.

m. Disconnect P9022A from J9022A on UOB.

n. Disconnect P9016 from J9016 on UOB.

o. Connect plug P9014 of umbilical cable to receptacle J9014.

p. Connect complete plug P8693 assembly of umbilical cable to UMBILICAL PLUG receptacle J8693 on aft left side of Missile.

## NOTE

When connecting cables with spring-loaded break-away type disconnect, insure that arming nut is turned fully counterclockwise. Connect plug and jack, and tighten coupling nut. (Cannon plug pliers may be required.) Slide arming assembly around coupling nut to an accessible position. Grasp cable by wire mesh and pull firmly away from Missile to insure that plug is properly connected. Turn arming nut fully clockwise and connect lanyard, part number 435A610-033-113, to latch key.

q. Insure that EXT POWER switch on Missile Monitor and Power panel is OFF.

r. Connect Missile Aft Bus Power cable from receptacle J321 and J322 to MISSILE AFT BUS RECEPTACLE J8614 on aft left side of center section.

s. Remove horn assembly from Delay Line Test Set.

t. Install horn assembly to Receiver Transmitter with two quarter-turn fasteners provided.

## NOTE

Holes for installation are on bottom of Missile Nose Section. Insure that receptacle J102 on horn assembly is forward of receptacle J101.

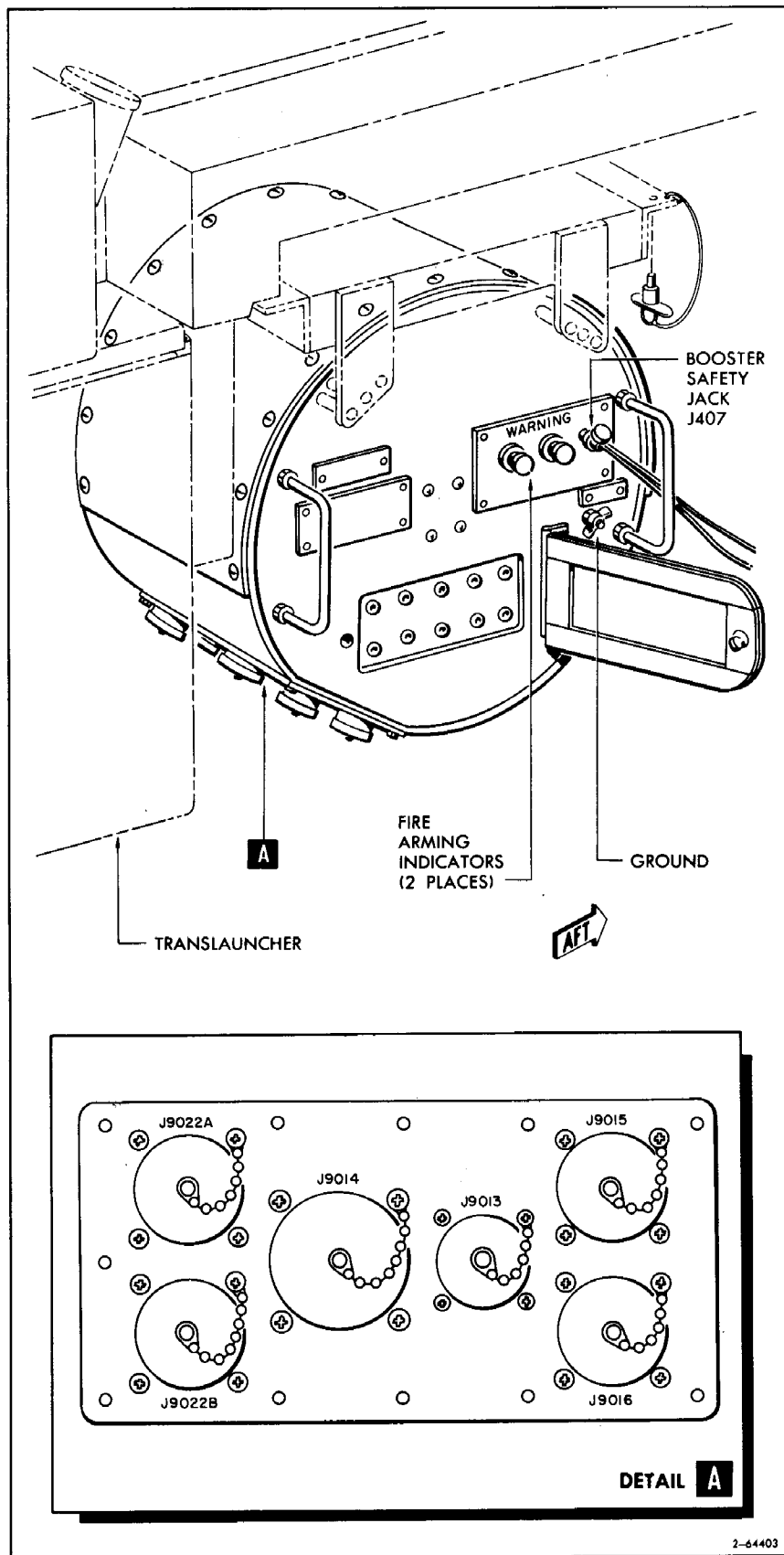


Figure 3-22. Umbilical Outlet Box

- u. Connect the cables from Delay Line Test Set to receptacle J101 and J102 on horn assembly.
- v. Remove static port cover assembly from Test Accessory Box.
- w. Remove protective paper and tape from static ports.

## NOTE

Static port covers must be installed evenly and firmly to insure a flush connection.

- x. Install static port cover that has hose adapter over static port on left side of Center Section.
- y. Install other static port cover over right static port.
- z. Connect altitude hose to ALTITUDE connector (10, figure 3-23) on Output Junction Panel.

## NOTE

Route altitude hose over small hooks below J-hooks on power pack boom.

- aa. Connect other end of the hose to left static port attachment.
- ab. Insure cap on Static Air Line Compartment Pressure Regulator has been removed.

## NOTE

Access to cap can be gained through Warhead Access Panel.

- ac. Connect Ground Cooling Hose to outlet above elect panel on power pack.

## NOTE

Lead Ground Cooling hose over support loop attached to inside of power pack control panel access door.

- ad. Connect ground cooling hose to missile ground cooling inlet.
- 3-64. CONNECTING FLIGHT CONTROLS TESTER TO MISSILE.

## NOTE

Insure that Missile power is removed and hydraulic system is connected and operative.

- a. Remove cover and connector dust caps from Flight Control Tester.
- b. Insure that all tester switches are in OFF or DOWN position.
- c. Place TEST SELECTOR switch (14, figure 3-24) OFF.
- d. Place VTVM range selector (1) fully 300.

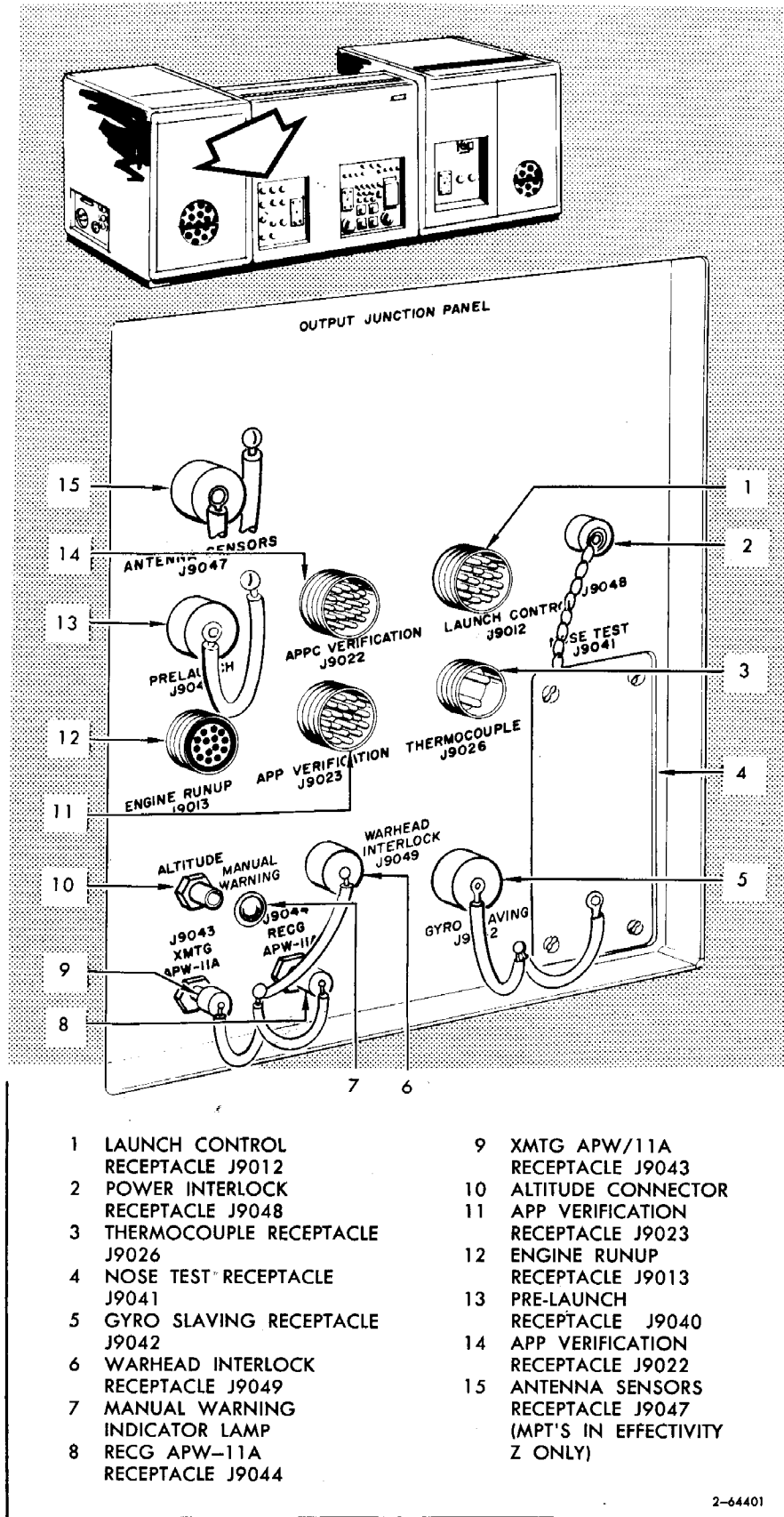


Figure 3-23. Output Junction Panel

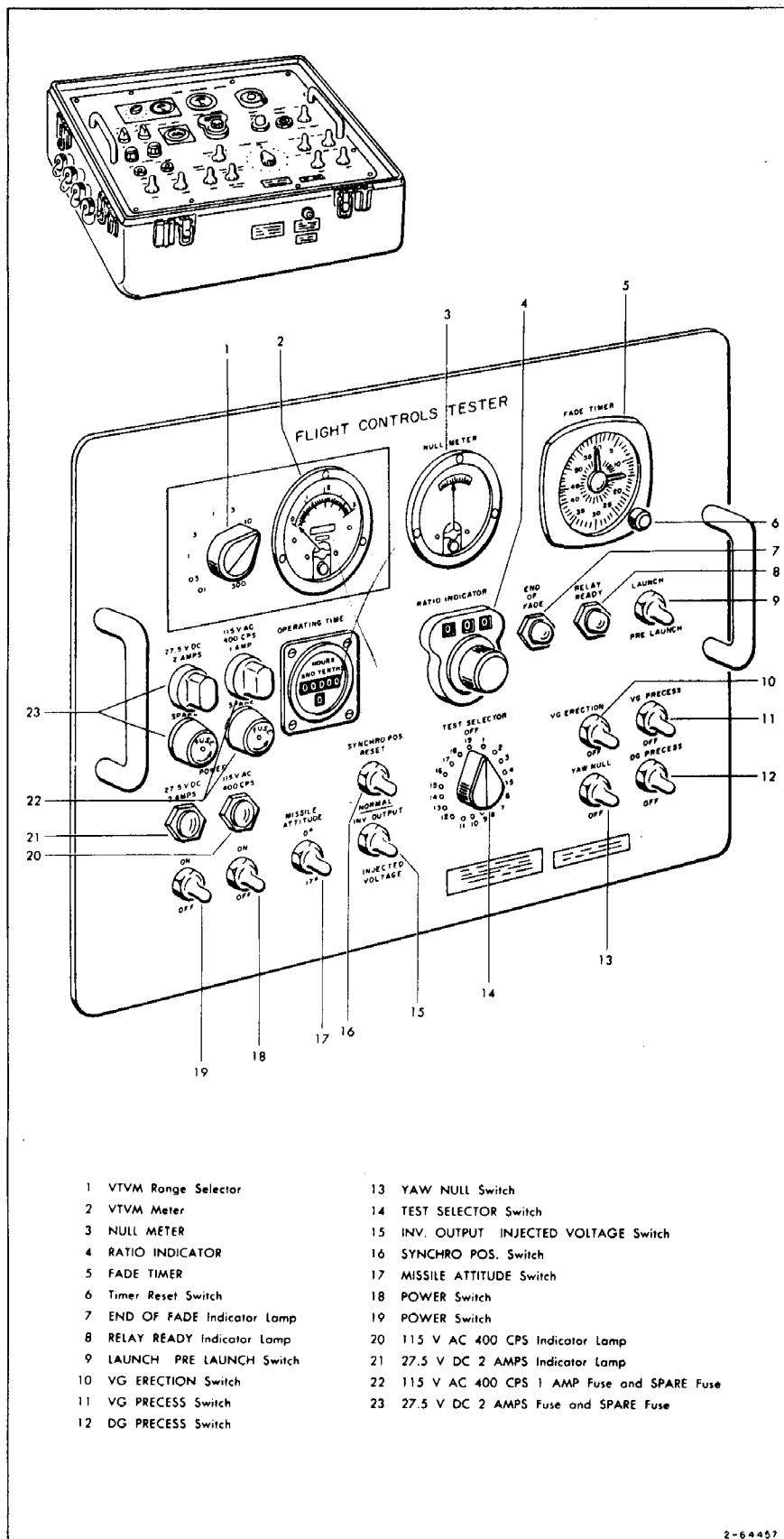


Figure 3-24. Flight Controls Tester



- e. Disconnect ATRAN power connector P5602A from J5602A on Atran Power Filter Unit in Nose Compartment.
- f. Remove dust cap from J2012 on Flight Controls Box.
- g. Connect P2012 of cable 258R9910046-9 to J2012 on Missile.
- h. Connect P6101 of cable 258R9910046-9 to J6101 on Flight Controls Tester.
- i. Disconnect P8403 from J8403 in Missile.
- j. Connect P8403 of cable 258R9910046-19 to J8403 on Missile.
- k. Connect P6102 of cable 258R9910046-19 to J6102 on Flight Controls Tester.
- l. Disconnect P8604 from TBF 9404 in Missile at Station 21.
- m. Disconnect P8615 from TBF9415 in Missile at Station 21.
- n. Connect P9415 of cable 258R9910046-29 to TBF9415 on Missile.
- o. Connect P6103 of cable 258R9910046-29 to J6103 on Flight Controls Tester.
- p. Disconnect Launch Control cable from J9022 on Umbilical Outlet Box.
- q. Disconnect GYRO SLAVING cable or remove dust cap from J9013 on Umbilical Outlet Box.
- r. Connect P9013 of cable 258R9910046-39 to J9013 on Umbilical Outlet Box.
- s. Connect P6104 of cable 258R9910046-39 to J6104 on Flight Controls Tester.
- t. Apply power to Missile from Missile Monitor and Power Panel on SRP Main Console.
- u. Place both Flight Controls Tester POWER switches (18, 19) on.
- v. Observe that both POWER lamps (20, 21) go on.
- w. Place MISSILE ATTITUDE switch to 1.5 position.
- x. Insure that all other switches are OFF (down position).

3-65. PERFORMING TEST NUMBER 1, VOLTAGE MONITOR AND HYDRAULIC CYCLING.

NOTE

If a total of 5 minutes has elapsed and test number 1 has not been completed, turn TEST SELECTOR switch to position 2. If WAIT TO TEST indicator lamp is off, turn switch back to position 1 and continue with test number 1. If indicator lamp is on, shut down Flight Controls Tester and troubleshoot FCT.

- a. Place TEST SELECTOR switch (14) to 1.

- b. Hold INV OUTPUT-INJECTED VOLTAGE switch (15) in INV OUTPUT.
- c. Observe that indication on VTVM (2) is between 112 and 124 volts.
- d. Release INV OUTPUT-INJECTED VOLTAGE switch and verify that it is in INJECTED VOLTAGE position.
- e. Place VTVM range selector to 3.
- f. Observe that indication on VTVM is between 1.67 and 1.85 vac.
- g. Request Mech. No. 3 to apply hydraulic press. to missile.

3-66. PERFORMING TEST NUMBER 2, PITCH TRIM ADJUSTMENT.

- a. Place TEST SELECTOR switch (14) to 2.
- b. WAIT TO TEST lamp may come on and remain on for approximately 2 and 1/4 minutes. If lamp comes on, wait until lamp goes off before proceeding.

NOTE

Insure that lock on the RATIO INDICATOR is disengaged before making any control adjustment. Lock control after making each control setting.

- c. Adjust RATIO INDICATOR control (4) for null on NULL METER.
- d. Verify that RATIO INDICATOR (4) indication is between 340 and 406.

NOTE

If RATIO INDICATOR indication is not between 340 and 406, localize and correct malfunction.

- e. Adjust RATIO INDICATOR (4) to 373.
- f. Unlock locking nut on PITCH TRIM control (R2405) on Controls Adjustment Unit in Missile.
- g. Adjust PITCH TRIM control (R2405) on Controls Adjustment Unit for center indication on NULL METER (3).
- h. Lock PITCH TRIM control (R2405) and insure that center indication is still obtained on NULL METER (3).

3-67. PERFORMING TEST NUMBER 3, ROLL TRIM ADJUSTMENT.

- a. Place TEST SELECTOR switch (14) to 3.
- b. Adjust RATIO INDICATOR control (4) for center indication on NULL METER (3).
- c. Verify that RATIO INDICATOR dial indication is between 480 and 520.

NOTE

If RATIO INDICATOR dial indication is not between 480 and 520; localize and correct malfunction.

- d. Adjust RATIO INDICATOR control (4) to 500.
- e. Unlock locking nut on ROLL TRIM control (R2409) on Controls Adjustment Unit in Missile.
- f. Adjust ROLL TRIM control (R2409) on Controls Adjustment Unit for center indication on NULL METER (3).
- g. Lock ROLL TRIM control (R2409) and insure that center indication is still obtained on NULL METER (3).

3-68. PERFORMING TEST NUMBER 4, ROLL PRECESSION AND ERECTION.

- a. Place TEST SELECTOR switch (14) to 4.
- b. Depress TIMER RESET switch (6) to set FADE TIMER to zero.
- c. Insure that RATIO INDICATOR control (4) is at 500.
- d. Verify that NULL METER (3) indicates within green band.
- e. Hold VERT GYRO PRECESS switch (11) in PRECESS and verify that FADE TIMER (5) is timing and NULL METER needle is moving toward outside of green band. When NULL METER needle moves outside green band, release VERT GYRO PRECESS switch and observe that FADE TIMER (5) stops timing.
- f. Hold VERT GYRO ERECT switch (1) in ERECT and verify that FADE TIMER (5) is timing and NULL METER needle proceeds smoothly through green band. When NULL METER needle assumes stable position within green band, release VERT GYRO ERECT switch and observe that FADE TIMER (5) stops timing.
- g. Verify that indication on FADE TIMER (5) is not greater than 2 minutes.
- h. Depress timer reset switch (6) to set FADE TIMER to zero.

3-69. PERFORMING TEST NUMBER 5, PITCH PRECESSION AND ERECTION.

- a. Place TEST SELECTOR switch (14) to 5.
- b. Adjust RATIO INDICATOR control (4) to 373.
- c. Verify that NULL METER indicates within green band, and note meter needle position.
- d. Hold VERT GYRO switch (16) in PRECESS and verify that FADE TIMER (5) is timing and NULL METER needle is moving toward outside of green band. When NULL METER needle moves outside green band, note needle position, release VERT GYRO switch, and observe that FADE TIMER (5) has stopped timing.
- e. Upon releasing VERT GYRO switch, NULL METER needle should return to approximately same position noted in step c.

f. Hold VERT GYRO switch (10) in ERECT and verify that NULL METER is outside of green band as noted in step d, FADE TIMER (5) is timing, and NULL METER needle proceeds smoothly through green band. When NULL METER needle assumes stable position within green band, release VERT GYRO switch and observe that FADE TIMER (5) stops timing.

g. Upon releasing VERT GYRO switch, NULL METER needle should return to position noted in step e.

h. Verify that indication on FADE TIMER (5) is not greater than 2 minutes.

i. Depress timer reset switch (6) to set FADE TIMER to zero.

### 3-70. PERFORMING TEST NUMBER 6, YAW SLAVING.

a. Place TEST SELECTOR switch (14) to 6.

b. Adjust RATIO INDICATOR (4) to 500.

c. Verify that NULL METER (3) indicates within green band.

#### NOTE

Perform step d after NULL METER needle has assumed stable position within green band.

d. Place and hold YAW NULL switch (13) in YAW NULL and verify that indication on VTVM (2) is less than .110 vac.

e. Place VTVM SELECTOR (1) to 3.

f. Recheck that indication on VTVM is less than .110 and note reading.

#### NOTE

Perform steps g and h only if indication in step f is greater than .110 vac.

g. Hold SYNCHRO POS switch (16) in RESET for approximately 15 seconds: then release switch.

h. Repeat step f.

i. Place VTVM SELECTOR (1) to 3.

j. Release YAW NULL switch.

### 3-71. PERFORMING TEST NUMBER 7, DIRECTIONAL GYRO PRECESSION.

a. Place TEST SELECTOR switch (14) to 7.

b. Adjust RATIO INDICATOR (4) to produce center indication on NULL METER (3).

c. Hold DIR GYRO switch (12) in PRECESS and verify that FADE TIMER (5) is timing and NULL METER needle indicates outside green band. When NULL METER needle moves outside green band, release DIR GYRO switch (12), and observe that FADE TIMER (5) stops timing.

CAUTION

If indication of FADE TIMER reaches 60 seconds, place DIR GYRO switch OFF.

- d. Verify that indication on FADE TIMER (5) is less than 60 seconds.
- e. Depress timer reset switch (6) to set FADE TIMER to zero.
- f. Depress timer reset switch (6) to set FADE TIMER to zero.

3-72. PERFORMING TEST NUMBER 8, PITCH LAUNCH VS. LAUNCH BIAS GAIN.

- a. Place TEST SELECTOR switch (14) to 8.
- b. RELAY READY lamp should go on after approximately 125 seconds.
- c. Verify that VTVM (2) indicates between 1.67 and 1.85 vac.
- d. Adjust RATIO INDICATOR (4) to 530.
- e. Verify that NULL METER (3) indicates within green band.

NOTE

If indication is not in the center of the green band, perform steps f thru h.

- f. Unlock locking nut on launch bias pot (R2202) on Demand Control Unit.
- g. Adjust launch bias pot (R2202) for center indication on NULL METER.
- h. Lock launch bias pot (R2202) and insure center indication on NULL METER.

3-73. PERFORMING TEST NUMBER 9, LAUNCH BIAS FADE TIMER.

- a. Place LAUNCH-PRELAUNCH switch (9) to LAUNCH.
- b. Place RATIO INDICATOR to 500.
- c. Place TEST SELECTOR switch (14) to 9; RELAY READY lamp should go off.
- d. Verify that movement of NULL METER needle (3) is smooth and without transients as it moves from left to right between pointer stop pins of the NULL METER.
- e. Verify that when FADE TIMER stops it indicates between 134 and 154 seconds.
- f. Depress timer reset switch (6) to set FADER TIMER to zero.

3-74. PERFORMING TEST NUMBER 10, LATERAL CORRECTION GAIN.

- a. Place TEST SELECTOR switch (14 to 10).
- b. Adjust RATIO INDICATOR (4) to 628.

- c. Verify that NULL METER (3) indicates within green band.

3-75. PERFORMING TEST NUMBER 11, ALTITUDE CRUISE GAIN.

- a. Place TEST SELECTOR switch (14) to 11.
- b. Adjust RATIO INDICATOR (4) to 246.
- c. Verify that NULL METER (4) indicates within green band.

3-76. PERFORMING TEST NUMBER 12, ALTITUDE LAUNCH GAIN.

- a. Place LAUNCH-PRELAUNCH switch (9) to PRELAUNCH.
- b. Place TEST SELECTOR switch (14) to 12.
- c. Verify that NULL METER (3) indicates within green band.

3-77. PERFORMING TEST NUMBER 13, FLIGHT CONTROLS SYSTEM RESET.

- a. Place TEST SELECTOR switch (14) to 13.
- b. RELAY READY lamp (8) should go on after approximately 125 seconds.

3-78. SHUTTING DOWN AND DISCONNECTING FLIGHT CONTROLS TESTER.

- a. Place TEST SELECTOR switch (14) OFF.
- b. Place POWER switches (18) and (19) OFF. The RELAY READY light should remain ON.
- c. Shut down hydraulics at Power Pack.
- d. Shut down power to Missile.
- e. Disconnect cables from Flight Controls Tester. Replace cover and connector dust caps on tester.
- f. Disconnect Flight Controls Tester cable from Missile and Umbilical Outlet Box, and replace dust caps on J2012 and J9013.
- g. Reconnect P8604 to TBF9404 at Missile Station 21.
- h. Reconnect P8615 to TBF9415 at Missile Station 21.
- i. Reconnect P5602A to J5602A on Atran Filter Unit in Nose Compartment.

3-79. CHECKING THROTTLE AND FUEL SHUTOFF VALVE.

- a. Insure that throttle indicator is at zero.
- b. Insure that fuel shutoff valve is closed (to the extreme inboard position).

3-80. STARTING PE-200 AND ENGAGING POWER TAKEOFF (EFFECTIVITY II).

- a. Insure that choke and detent are pushed in and that clutch is disengaged.
- b. Place power switch on.
- c. Push throttle in two to three notches and position handle to horizontal.
- d. Place ignition switch on.
- e. Depress STARTER button.

NOTE

If engine is difficult to start, use choke as necessary.

- f. Adjust engine speed to 1000 RPM with THROTTLE control.
- g. Position clutch lever at left of Engine Start Panel to engage (left).
- h. Adjust engine to 2800 RPM with THROTTLE control after warmup of 1 minute.

3-81. SHUTTING DOWN NTCU. (See figure 3-25.)

- a. Place POWER-ON POWER-OFF switch on NTCU control panel to POWER-OFF.
- b. All indicator lamps must go off.
- c. Notify Launch crew to place alarm switch for respective NTCU OFF.

3-82. REMOVING LEFT TRANSLAUNCHER JACK PADS AND SUPPORT FITTINGS.

- a. Remove jack pads and fittings without changing adjustments of support fitting.
- b. Position jack pads and support fittings to left of Translauncher in safe location for re-installation for use on replacement Missile.

3-83. STARTING NTCU.

- a. Check to see if ambient air inlet filter appears dirty or clogged with foreign material.
- b. If filter is dirty or clogged, replace with clean filter, and return dirty filter to maintenance area for cleaning.
- c. Repeat steps a and b for aftercooler inlet filter.
- d. NTCU must have been shutdown for at least 15 minutes.
- e. Observe that oil level in sight gage is between the ADD and FULL mark.
- f. Check for evidence of oil leaks.
- g. Insure that the NTCU has been serviced in accordance with applicable service instructions.

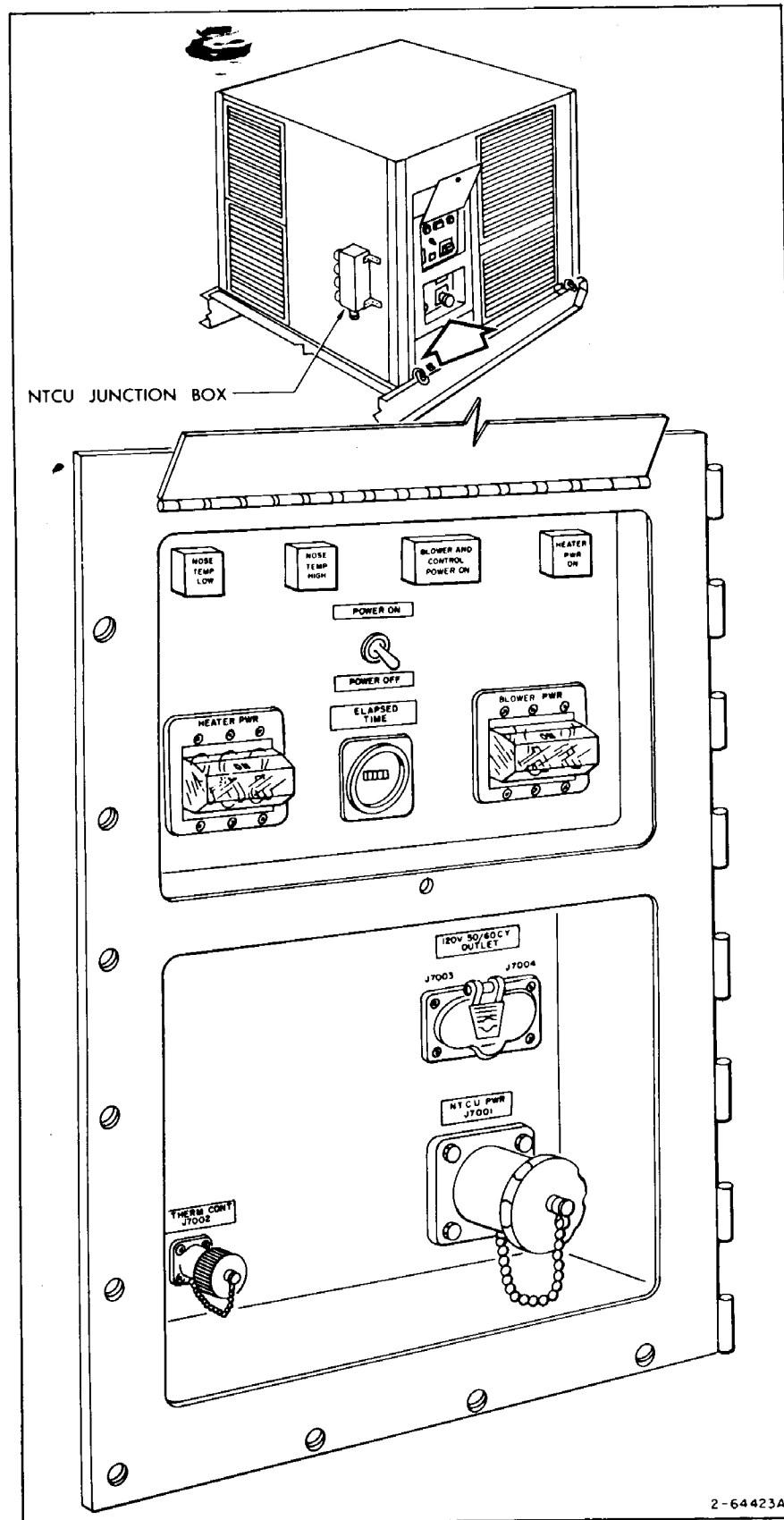


Figure 3-25. Nose Temperature Control Unit



h. Insure that MAIN POWER and HEATER PWR circuit breakers on NTCU control panel (figure 3-25) are ON.

i. Place and hold POWER ON-POWER OFF switch to POWER ON until blower motor is at normal RPM.

j. BLOWER AND CONTROL POWER ON and HEATER PWR ON indicator lamps must go on.

NOTE

NOSE TEMP HIGH or NOSE TEMP LOW indicator lamp will come on only when respective condition exists.

3-84. SHUTTING DOWN PE-200 ENGINE.

a. Decrease engine to approximately 1000 RPM with THROTTLE control and allow to idle for 3-minutes.

b. Disengage clutch.

c. Place POWER ON and IGNITION switches OFF.

- 3-85. MECHANIC NO. 3 DETAILED INSTRUCTIONS.
- 3-86. REMOVING SPOILER OPERATING MECHANISM FROM STOWED POSITION.
- a. Open Translauncher equipment box and remove spoiler mechanism.
  - b. Place spoiler mechanism to aft of wing cavity.
- 3-87. REMOVING CROWN PANEL.
- a. Remove four bolts securing crown panel and remove crown panel.
  - b. Stow bolts and washers in wing cavity for future use.
- 3-88. REMOVING SPOILER ACTUATOR PACKAGE FROM STOWED POSITION.
- a. Remove stowage bracket straps and bolt to remove spoiler actuator from stowed position in wing cavity.
  - b. Disconnect plug P8606 on spoiler actuator electrical cable from receptacle J8606 in wing cavity.

## CAUTION

Do not disconnect flexible hydraulic hose connections.

- c. Disconnect P8607 from Lourdes Valve.
  - d. Disconnect P8611 from Moog Valve.
- 3-89. INSTALLING SPOILER ACTUATOR PACKAGE INTO SPOILER OPERATING MECHANISM.
- a. Remove nut, washer, and bolt (10, 9, 3, figure 3-26) from cam plate of spoiler operating mechanism; retain bolt for reuse.
  - b. Remove nut, washers, spacers, and bolt (14, 12, 13, 15, 17, 11) from aft portion of spoiler operating mechanism; retain bolts for reuse.
  - c. Place one spacer (15, 17) on each side of aft bearing support of spoiler operating mechanism.
  - d. Insert spoiler actuator package electrical harness into opening of spoiler operating mechanism.
  - e. Position spoiler actuator package into spoiler operating mechanism.
  - f. Align bearing on aft end of spoiler actuator package with hole in spoiler operating mechanism.
  - g. Secure with attaching hardware.
  - h. Align cam plate with actuator (4).
  - i. Secure cam plate to actuator with attaching hardware.

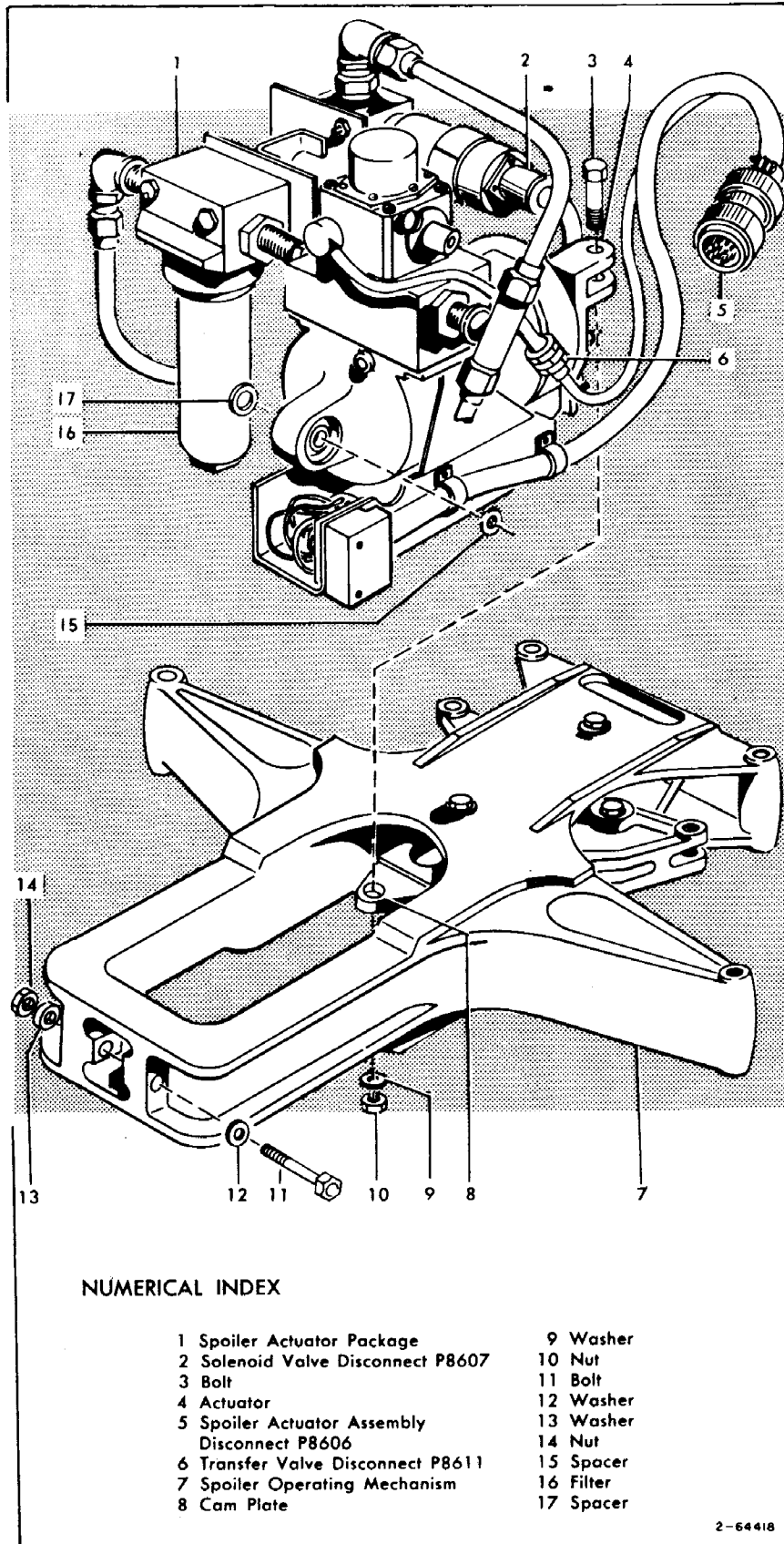


Figure 3-26. Assembly of Spoiler Mechanism

## 3-90. REMOVING WING TIEDOWN BRACKETS.

- a. Remove wing bolts from forward wing posts.
- b. Remove lock pins and shear pins from aft shear pin lugs on each wing.
- c. Remove wing tiedown brackets.
- d. Remove wing bolts from aft wing post.
- e. Stow wing bolts and shear pins in wing cavity for future use.

## 3-91. INSTALLING LEFT WING.

- a. Release wing stowage bracket straps (figure 3-27) which secure left wing.
- b. Remove trailing edge wing chock.
- c. Rotate knurled stop screw (8, figure 3-28) on left wing panel pivot support to release mounting block assembly.

## CAUTION

Maintain adequate clearance between wing panel and surrounding structure when installing Wings.

- d. Pull left wing panel directly aft until cam lock (11) engages mounting block assembly (12), securing it in place.
- e. Remove lock pin which secures left wing panel pivot support in stowed position.

## NOTE

One Mechanic is required on the ground with wing pole. One Mechanic is required on top of Missile in wing cavity. One Mechanic is required on Translauncher at wing root.

- f. Swing wing panel pivot support (9) forward to fully extended position, keeping wing parallel to Missile with trailing-edge up.
- g. Secure wing panel in extended position by engaging dog-link assembly (4).
- h. Rotate left wing downward about pivot shaft until wing tip can be grasped by operator on ground.
- i. Raise left wing tip outward and upward, causing pivot shaft to rotate about pivot stop push pin.
- j. Continue to raise wing until wing tip is at eye level; then, install wing pole in keyhole slot provided in wing tip.
- k. Pull down on cam lock release laynard to release mounting block assembly.
- l. Carefully push Wing inboard, positioning wing guide into guide channel.

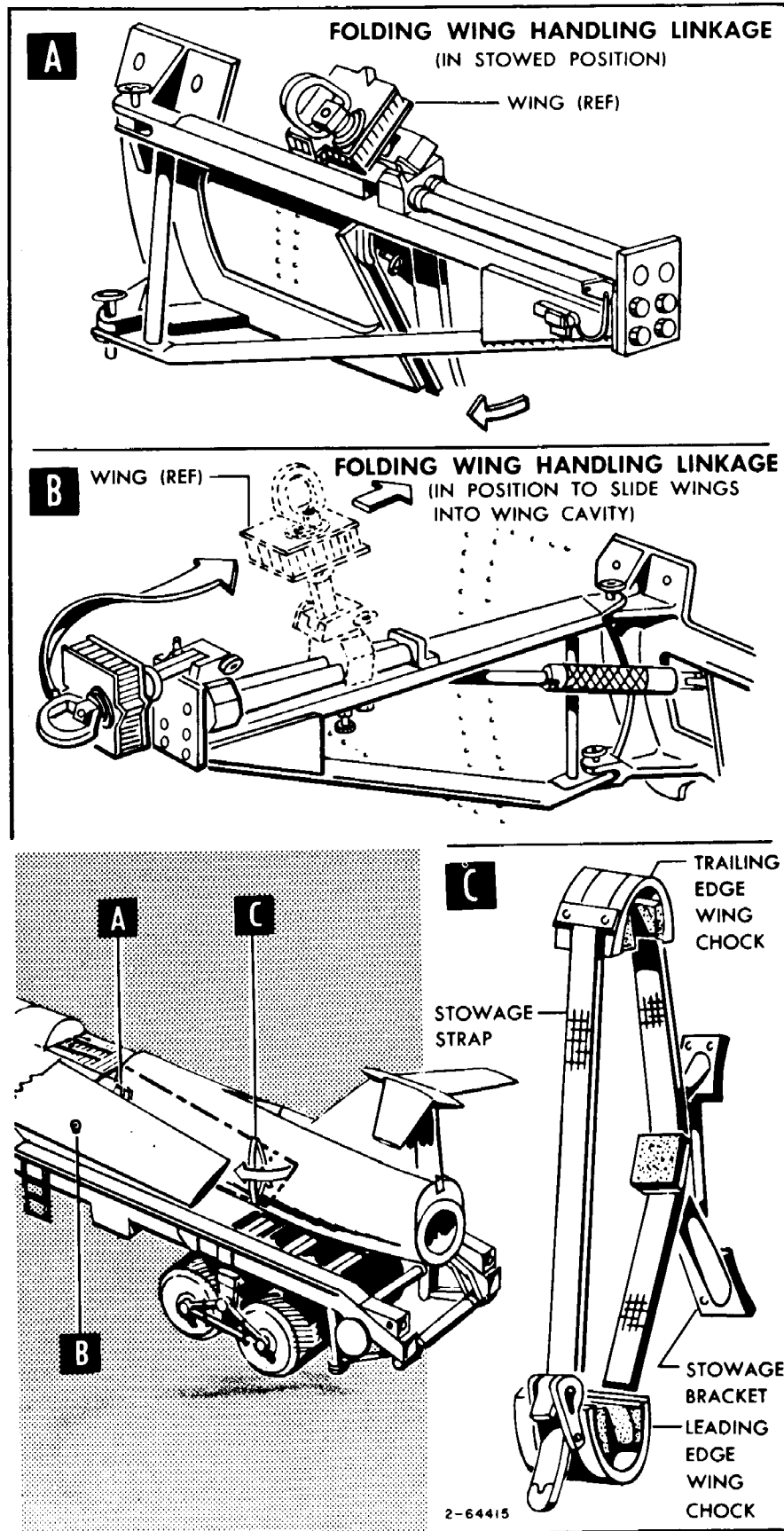


Figure 3-27. Installing Folding Wing

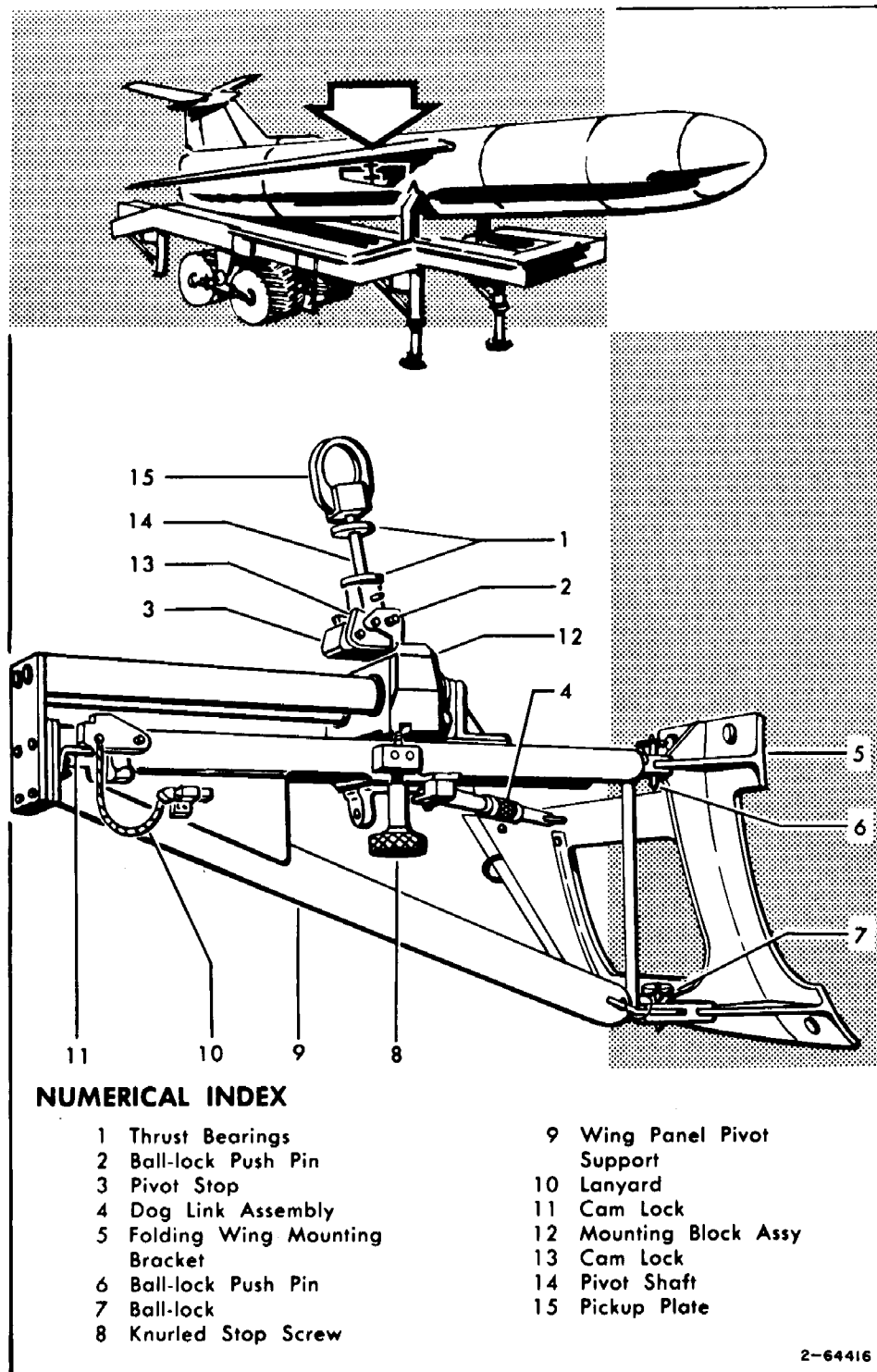


Figure 3-28. Folding Wing Mechanism

CAUTION

Insure that electrical cabling and hydraulic plumbing are clear during installation of Wing.

m. Install wing bolts through the wing casting into wing attachment post; tighten bolts. (See figure 3-29.)

n. Position and secure spoiler operating mechanism to left wing casting, using attaching hardware provided.

3-92. INSTALLING RIGHT WING.

a. Release wing stowage bracket straps (figure 3-27) which secure right wing.

b. Rotate knurled stop screw (8, figure 3-28) on right wing panel pivot support to release mounting block assembly (12).

c. Remove trailing edge wing check.

CAUTION

Maintain adequate clearance between wing panel and surrounding structure when installing Wings.

d. Pull right wing panel directly aft until cam lock (11) engages mounting block assembly and secures it in place.

e. Remove lock pin which secures right wing panel pivot support in stowed position.

f. Swing right panel pivot support forward to fully extended position, keeping wing parallel to Missile with trailing edge up.

g. Secure right wing panel in extended position by engaging dog link assembly (4).

h. Rotate right wing tip downward about pivot shaft until wing tip can be grasped by operator on ground.

i. Rotate right wing tip downward about pivot shaft until wing tip is parallel to ground.

j. Raise right wing tip outward and upward, causing pivot shaft to rotate about ball lock push pin (2).

k. Continue to raise Wing until Wing is at approximately flight attitude.

NOTE

One mechanic is required on Missile to assist in positioning the Wings during installation and also to insure that fuel vent lines and electrical harness are not damaged.

l. Pull down on cam lock release lanyard to release mounting block assembly.

m. Carefully push Wing inboard, positioning wing guide into guide channel (figure 3-29).

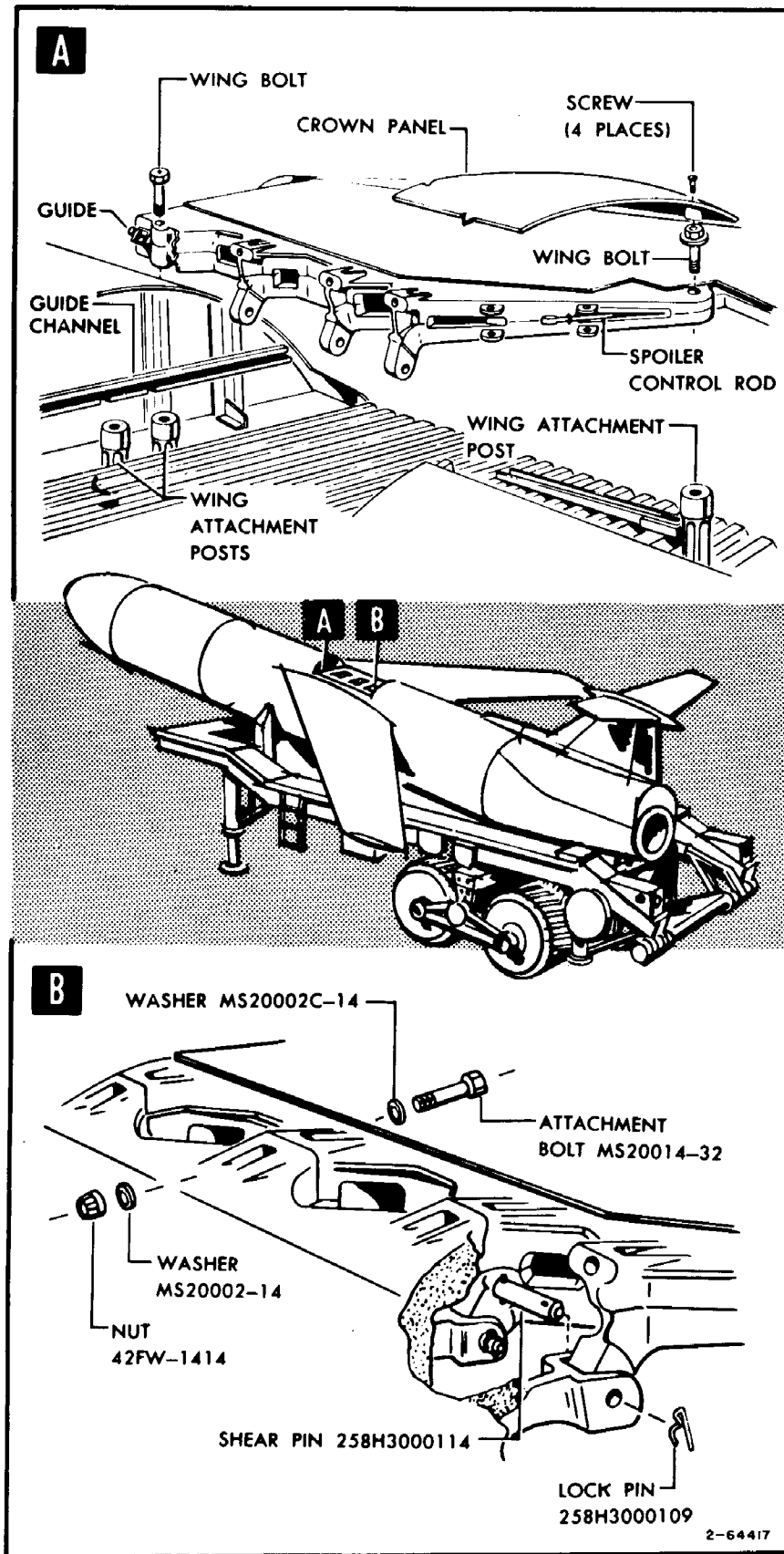


Figure 3-29. Splicing Folding Wings



- n. Mechanic on Missile must manipulate spoiler operating mechanism to align with mounting holes in right wing casting.
- o. Install and secure spoiler operating mechanism to right wing casting with attaching hardware.
- p. Install forward and aft wing splice bolts and secure with attaching hardware; washer on bolts with attaching hardware; washer on bolts with chamfer against bolt head and washer under nut. (See figure 3-29.)
- q. Insert the four shear pins with washers through shear pin lugs.

NOTE

Install shear pins from forward side of shear pin lugs. Pressure may be exerted on Wing Pole to align shear pin holes.

- r. Insert one lock pin through hole in tip of each shear pin.
- s. Install wing bolts through wing castings of right wing into wing attachment posts and secure bolts.
- t. Install remaining wing splice bolts and secure with attaching hardware; washer on bolt with chamfer against bolt head and washer under nut. (See figure 3-29.)

3-93. CONNECTING SPOILER CONTROL RODS AND SPOILER ACTUATOR PACKAGE ELECTRICAL CABLES. (See figure 3-26.)

- a. Secure rod ends of control rods to bellcranks on spoiler operating mechanism with attaching hardware.

NOTE

Washers must be installed under bolt heads. Also rod ends can be aligned with holes in bellcranks by manually raising and lowering spoiler blades.

- b. Connect plug P8606 (5) on spoiler to wing disconnect receptacle J8606.
- c. Connect plug P8607 to lourdes valve.
- d. Connect plug P8611 to moog valve.
- e. Replace crown panel (figure 3-29) and secure panel with four screws.

3-94. REMOVING LANYARD POSTS AND FITTINGS. (See figure 3-30.)

- a. Remove bolts on mounting plates of all lanyard posts and remove posts.
- b. Unscrew three (3) fittings (eye bolts) from "goose neck" of Translauncher and leave attached to attaching cables.

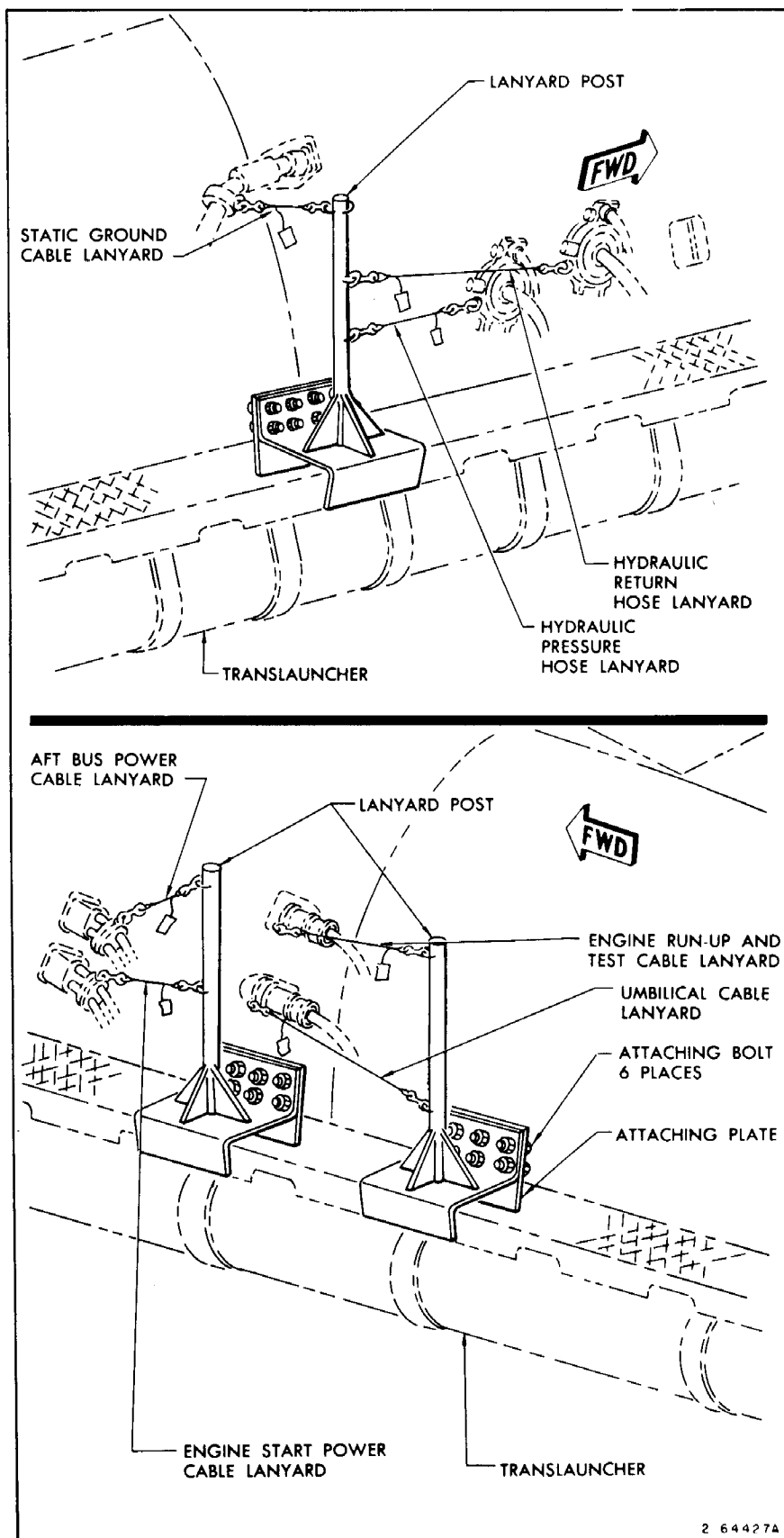


Figure 3-30. Installation of Lanyard Posts

3-95. REMOVING START AND HOLD POWER CABLES.

- a. Disconnect Engine start power cable from Engine start receptacle J8613 on Missile, remove from Translauncher and retain for installation on replacement missile.
- b. Disconnect Missile aft bus power cable from Missile aft bus receptacle J8614 on Missile, remove from Translauncher and retain for installation on Replacement Missile.

3-96. REMOVING UMBILICAL CABLE.

- a. Disconnect Umbilical Cable from receptacle J8693 on Missile, remove from Translauncher and retain for installation on Replacement Missile.
- b. Unscrew spring loaded break-away disconnect from receptacle J8693 and retain for installation on Replacement Missile.

3-97. REMOVING COLLAR ASSEMBLIES.

- a. Remove securing bolts from collar assemblies on Translauncher leveling jacks.
- b. Remove collar assemblies from jacks; retain for installation on replacement Missile Translauncher.

3-98. INSTALLING LANYARD POSTS AND FITTINGS. (See figure 3-30.)

- a. Remove bolts from mounting place of lanyard post 435A610-020-100
- b. Install lanyard post on right translauncher raising beam walkway approximately 101.5 inches from rear end of raising beam.

NOTE

When installing lanyard posts insure that posts lean away from Translauncher when secure.

- c. Replace bolts through post base and mounting plate, and tighten.
- d. Remove bolts from mounting plate of lanyard post 435A610-020-300.
- e. Install lanyard post on left translauncher raising beam walkway, approximately 92 inches from rear end of raising beam.
- f. Replace bolts through post base and mounting plate, and tighten.
- g. Remove bolts from mounting plate of lanyard post 435A610-021-300.
- h. Install lanyard post on left translauncher raising beams and walkway, approximately 108 inches from rear end of raising beam.
- i. Replace bolts through post base and mounting place, and tighten.
- j. Install three (3) fittings (eye bolts) in threaded holes provided on "goose neck" of Translauncher.

## 3-99. INSTALLING START AND HOLD POWER CABLES.

- a. Route engine start power cable behind lanyard post and connect to engine start receptacle J8613 on Missile. Use lanyard part number 435A610-033-115 to connect to latch key.
- b. Route Missile aft buss power cable behind lanyard post and connect to Missile aft buss receptacle J8614 on Missile. Use lanyard part number 435A10-033-107 to connect to latch key.

## 3-100. INSTALLING UMBILICAL CABLE.

- a. Screw spring loaded break-away disconnect on receptacle J8693.

## NOTE

When connecting cables with spring loaded break-away disconnects, insure that arming nut is turned fully counter-clockwise. Connect plug in jack, and tighten coupling nut. Slide arming assembly around coupling nut to an accessible position, grasp cable by wire mesh and pull firmly from Missile to insure that plug is properly connected. Turn arming nut fully clockwise and connect lanyard to latch key.

- b. Route Umbilical Cable behind lanyard post and connect to receptacle J8693 on Missile.

## 3-101. INSTALLING COLLAR ASSEMBLIES.

- a. Secure collar assemblies on Translauncher jack legs with attaching bolts. (See figure 3-31.)

## 3-102. INSTALLING FOLDING WING MECHANISM.

- a. Position right folding wing mechanism (figure 3-28) on right side of Missile.
- b. Position left folding wing mechanism on left side of Missile.
- c. Lubricate mounting bracket attaching hardware with thread lubricant (Specification JAN-A-669).

## NOTE

When performing steps c and d, install the longest of the eight attaching bolts into the second hole in the upper forward corner of the bracket, and tighten all bolts equally before final torquing.

- d. Position left folding wing mounting bracket, on left side of Missile Center Section, at holes provided; secure bracket in place with the eight attaching bolts and washers provided.
- e. Tighten two lower right hand attaching bolts to 100 inch-pounds torque.
- f. Tighten balance of attaching bolts to 200 inch-pounds torque.

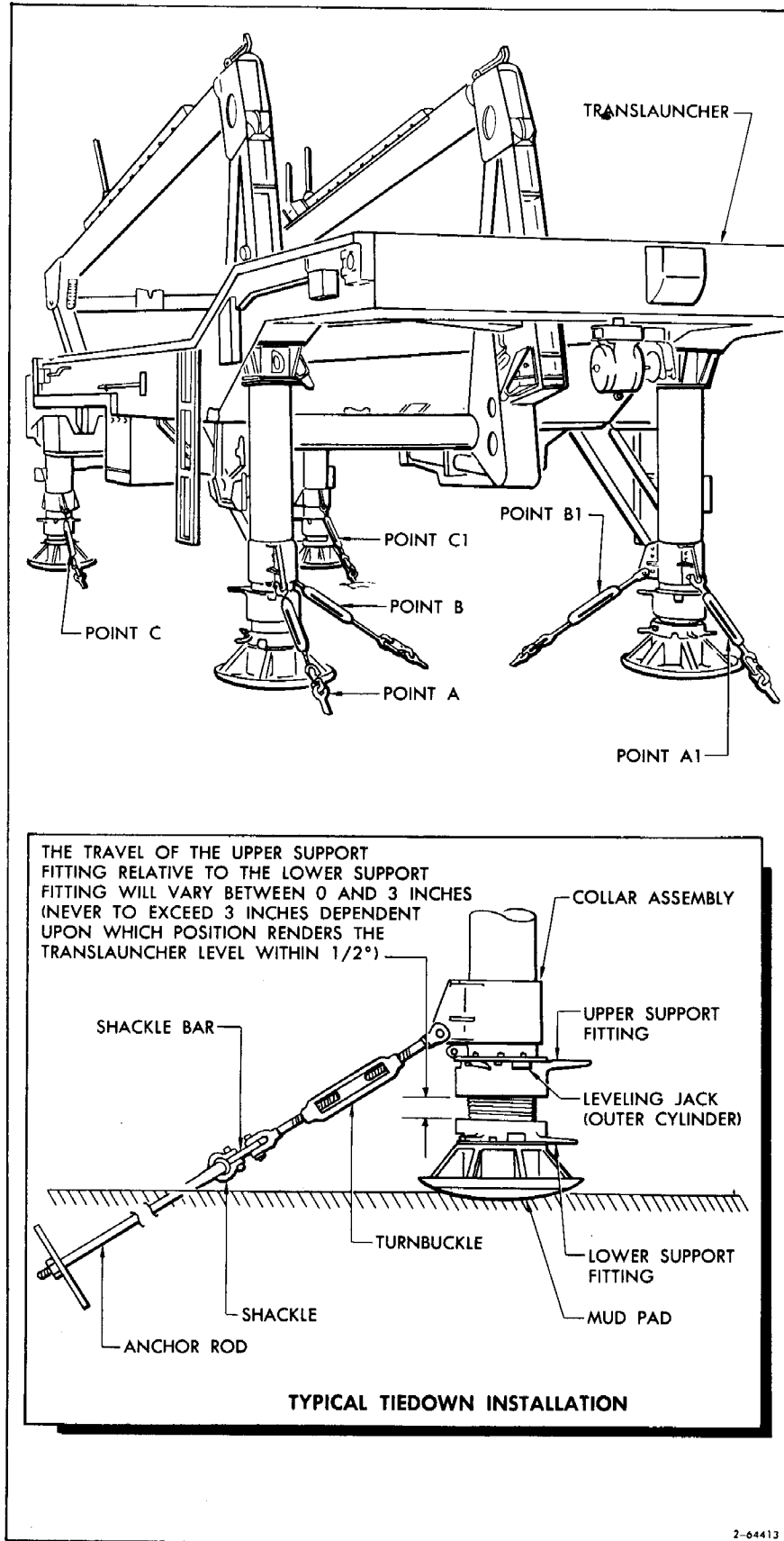


Figure 3-31. Securing Translauncher

- g. Position right folding wing mounting bracket, on right side of Missile Center Section, at holes provided; secure bracket in place with the eight attaching bolts and washers provided.
- h. Tighten two lower left hand attaching bolts to 100 inch-pounds torque.
- i. Tighten balance of attaching bolts to 200 inch-pounds torque.
- j. Place left wing panel pivot support on left mounting bracket with mounting block assembly at top.

## NOTE

The legs of the pivot support engage the two attaching hinges at the forward end of the mounting bracket.

- k. Secure legs of pivot support to hinges of mounting bracket by installing ball-lock push pin attached to each leg of pivot support.

## NOTE

The button in the handle of each push pin must be fully depressed before the pin can be installed. Install the push pins from the top.

- l. Swing pivot support to folded position; install ball-lock push pin; then adjust rubber bumper stop until it is flush with Missile fuselage.
- m. Insert pivot shaft (with lower thrust bearing installed) through hole provided in wing.
- n. Install upper thrust bearing on pivot shaft.
- o. Install threaded pickup plate on pivot shaft, and tighten.
- p. Swing pivot support to extended position and align mounting block assembly to allow ball-lock push pin to be inserted through pivot shaft.
- q. Attach free end of pivot support dog-link assembly to horizontal attachment lug at top rear of mounting bracket; use the bolt, washer and nut provided.
- r. Lock knurled sleeve of dog-link assembly over dog link knuckle by rotating sleeve.
- s. Install right wing panel pivot support by repeating steps d through l as applicable to right side.

## NOTE

Both the left and right folding wing pivot supports should now be locked in position 90 degrees to the Missile.

- 3-103. REMOVING SPOILER ACTUATOR PACKAGE AND MECHANISM. (See figure 3-26.)
- a. Remove crown panel.
  - b. Disconnect plug P8606 on spoiler actuator electrical cable from receptacle J8606 in wing cavity.

CAUTION

Do not disconnect flexible hydraulic hoses connections.

- c. Disconnect P8607 from lourdes valve.
- d. Disconnect P8611 from moog valve.
- e. Remove bolt, nut, washers and spacer bearing securing spoiler actuator to rear of operating mechanism.
- f. Remove bolt, nut and washer securing spoiler actuator rod to cam plate.
- g. Remove spoiler actuator package from operating mechanism; place actuator on Center Section behind wing cavity.
- h. Remove nut and bolt securing left spoiler control rod to operate mechanism.
- i. Remove the two nuts, bolts and washers which secure the operating mechanism to the left wing.

NOTE

Left Wing should be performed prior to performing next step.

- k. Remove nut, bolt and washer securing right spoiler control rod to operate mechanism.
- l. Remove the two nuts, bolts and washers which secure the operating mechanism to the right wing.
- m. Remove operating mechanism from right wing.
- n. Re-install bolts, washers and nuts in operating mechanism that were removed in steps f, h, i, k, and l.
- o. Stow operating mechanism in Translauncher storage box.
- p. Stow the spoiler actuator package on bracket provided in the aft section of wing cavity; install bolt, washer and nut removed in step e in rear of actuator package and secure to bracket in wing cavity.
- q. Secure actuator package to mounting bracket with tiedown strap provided.

3-104. PLACING WINGS IN FOLDED POSITION.

CAUTION

The wing panels must be handled with extreme care in winds exceeding 20 knots. Do not attempt to handle wing panels in winds exceeding 30 knots.

- a. On folding wing handling linkage, insure that pivot stop of wing panel pivot support (9, figure 3-28) is secured to base of pivot shaft.

- b. Insure that pickup plate (15) is installed on pivot shaft of folding wing handling linkage.
- c. Insure that pivot stop cam lock (11) of folding wing handling linkage is engaged on mounting block assembly.
- d. Insert wing pole assembly into keyhole in left wing tip.
- e. Remove forward and aft wing post bolts from left wing attachment posts.
- f. Remove center wing splice bolts and washers from wing panel castings.
- g. Loosen forward and aft wing splice bolts.
- h. Remove lock pins from the four shear pins securing wing panels at wing panel splice.

## NOTE

It may be necessary to shake the wing panel slightly to perform steps i and j.

- i. Withdraw the four shear pins from shear pin attachment lugs in wing panel castings.
- j. Remove forward and aft wing splice bolts and washers from wing castings.

## CAUTION

While performing steps k thru aa insure that the shear pin attachment lugs do not make contact with the fuel cell pressurization lines in the wing cavity.

- k. Move wing castings outward until cam lock of folding wing handling linkage secures left wing mounting block in a locked position against pivot support end plate. Lower wing tip until it can be grasped manually, and remove the wing pole.
- l. Continue to lower wing tip until pivot shaft bottoms in pivot stop of folding wing handling linkage.

## CAUTION

Insure that adequate clearance is maintained between wing panel and surrounding structure while performing the following steps.

- m. Rotate knurled sleeve fully counterclockwise to unlock dog link assembly of folding wing handling linkage; then slide sleeve aft to clear dog link knuckle.
- n. Carefully fold pivot support of folding wing handling linkage rearward while keeping wing panel parallel to Missile with trailing edge up.
- o. Rotate wing about pivot shaft of folding wing handling linkage by raising tip rearward and upward until it can be grasped manually by an operator stationed on Translauncher.
- p. Lock pivot support of folding wing handling linkage in stowed position against mounting bracket with push pin.



- q. Release cam lock securing mounting block against end plate of folding wing handling linkage by pulling down on release lanyard.
- r. Slide wing panel forward carefully until groove in underside of mounting block is aligned with knurled stop screw of folding wing handling linkage; then, rotate screw to lock mounting block in forward position.
- s. Place leading edge of wing panel in leading edge wing chock of folding wing stowage bracket. (See figure 3-27)
- t. Raise trailing edge wing chock of folding wing stowage bracket into position over trailing edge of wing panel.
- u. Insure that wing chock straps of folding wing stowage bracket are not twisted.
- v. Insert strap of trailing edge wing chock through buckle of leading edge wing chock, and draw strap tight.
- w. Position spoiler operating mechanism in attachment lugs of right wing and secure it with the two bolt assemblies.
- x. Repeat steps a through d as applicable for right panel.
- y. Remove the two wing post bolts securing right wing panel to wing attachment posts.
- z. Place wing post bolts, wing splice bolts, lock pins, and shear pins and washers removed in steps e through h and in step an in a cloth bag or other suitable container.
- aa. Repeat steps k through v as applicable to stow right wing panel.
- ab. Pass strap from right wing leading edge chock under Center Section.
- ac. Insert strap through buckle provided on strap of left wing leading edge chock; and draw it tight.

3-105. REMOVING STABILIZER ACCESS PANEL.

- a. Remove screws securing access panel in vertical stabilizer.
- b. Remove access panel and stow in Translauncher stowage box.

3-106. CONNECTING GROUND COOLING.

NOTE

Lead bleed-air hose over support loop attached to inside of power pack control panel access door.

- a. Connect flexible bleed-air hose to bleed-air outlet (4, figure 3-19) above electrical panel on Power Pack.
- b. Connect bleed-air hose to ground cooling inlet on left side of Warhead Section.
- c. Remove wooden plugs from right side of Nose Section.

## 3-107. APPLYING GROUND COOLING.

- a. Insure that wooden plugs in right side of Nose Section have been removed.

## CAUTION

Bleed-air is applied only when external power is applied to Missile and radome is in place on Nose. If Missile power is shut down or if radome is removed, place GROUND COOLING FAN switch off.

- b. Insure that ground cooling hose is straight and free of twist.
- c. Place GND COOLING BLOWER switch (5, figure 3-32) ON.
- d. After brief operation, GND COOLING AIR gage (2) must indicate approximately 35 psi.

## NOTE

The pressure will vary due to action of thermal controlled demand valve in cooling system.

- e. FREQUENCY meter (2, figure 3-33) must indicate between 390 and 410 CPS.

## 3-108. APPLYING HYDRAULICS.

## NOTE

Hydraulics are applied to Missile at least 1 minute after external power is applied.

- a. Connect hydraulic cycling cable from J31 on Power Pack to J8688 on Missile.
- b. Place PITCH switch (16, figure 3-18) OPEN.
- c. Place ROLL switch (13) OPEN.
- d. Place SELECTOR switch (12) OFF (center position).

## NOTE

When operating SYSTEM OUTLET, MANUAL BYPASS, HIGH PRESSURE, and RETURN BYPASS controls, insure that the control is tight in extreme OPEN or CLOSED direction unless otherwise specified.

- e. Insure that RETURN BYPASS control (4) is OPEN (ccw), and SYSTEM OUTLET control (18) is closed (cw).
- f. Rotate MANUAL BYPASS (10) fully CLOSED (cw).
- g. Rotate SYSTEM OUTLET control (18) fully open (ccw).
- h. Observe RETURN FLOW (7) indicator for air-free flow for approximately 1 minute.

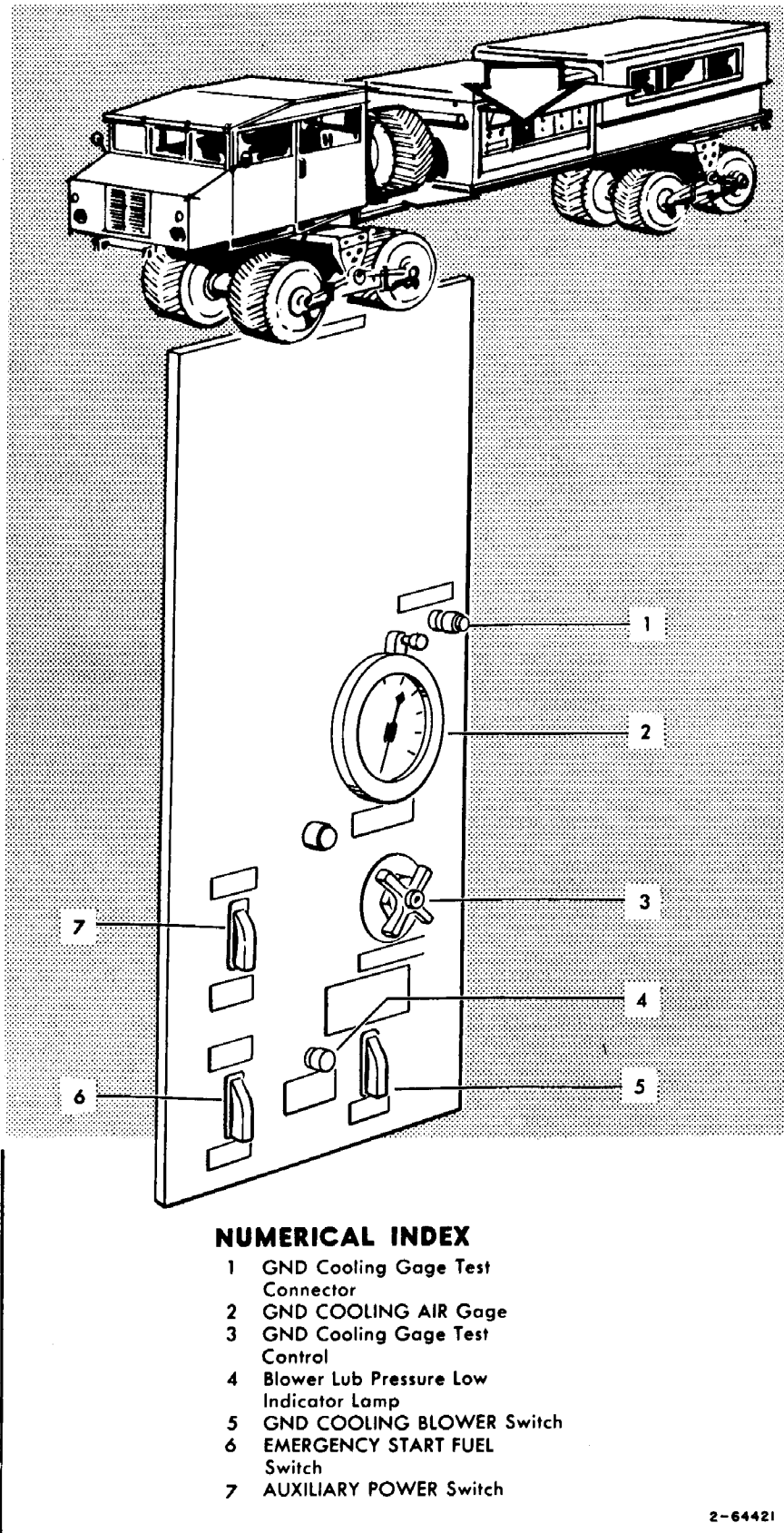


Figure 3-32. Pneumatic Control Panel

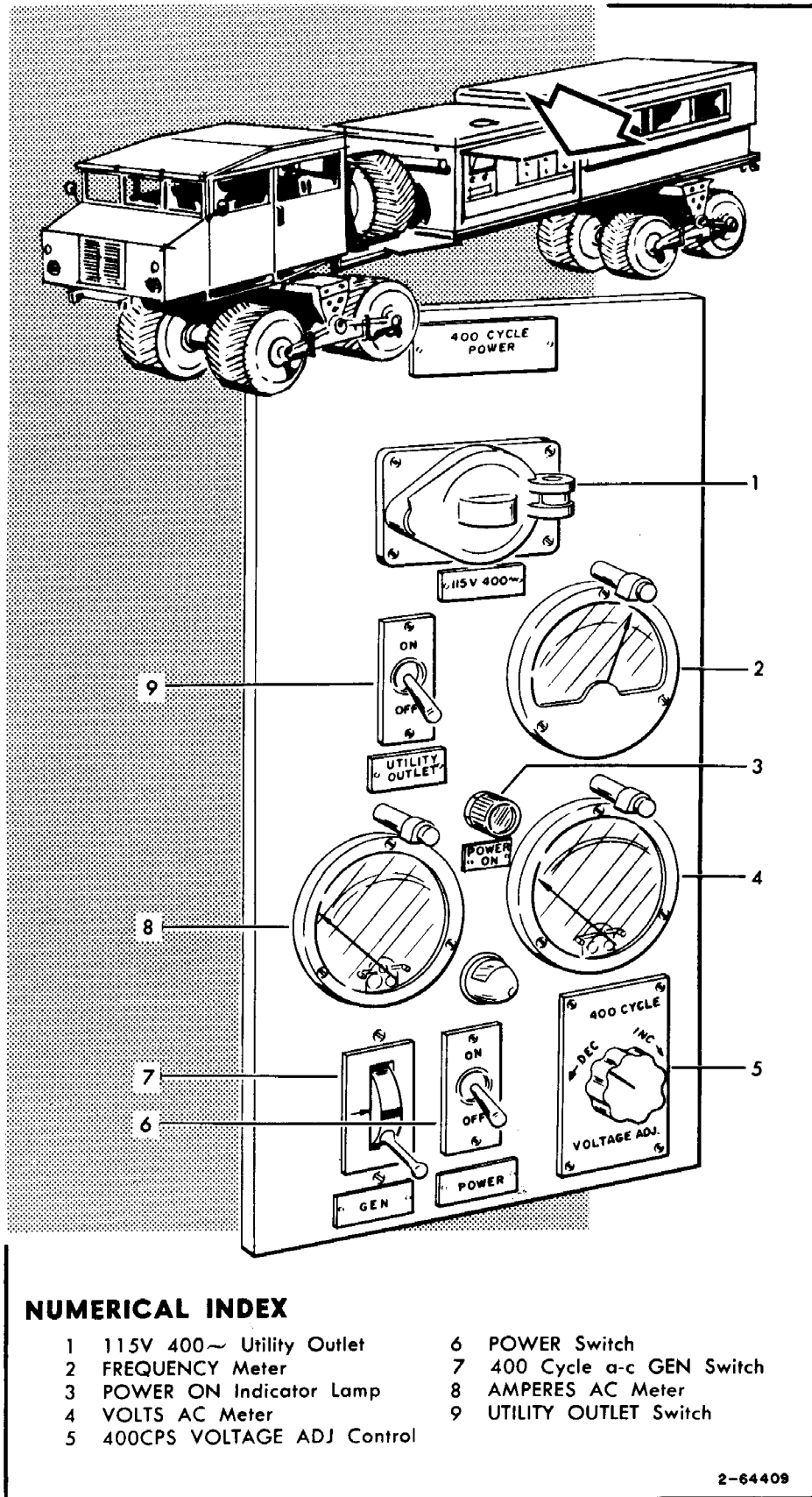


Figure 3-33. 400 Cycle Power Panel

- i. Place PITCH switch CLOSED.
- j. Place ROLL switch CLOSED.
- k. Observe that Spoilers and Stabilizer are not oscillating.

CAUTION

If Missile control surfaces begin to oscillate, request external power off; rotate SYSTEM OUTLET control fully CLOSED (cw). Wait at least 5 minutes; then resume test. If oscillations still exist, reduce system pressure with MANUAL BYPASS to 500 psi and bleed air from high point in Stabilizer Package.

1. Inspect Missile PRESSURE and RETURN hydraulic disconnects for leakage.

3-109. CYCLING SPOILERS.

NOTE

Insure that hydraulic cycling cable is connected from J31 on Power Pack to J8688 on Missile, that hold power is on, and READY FOR TEST indicator lamp on SRP Test Control Panel is on.

- a. Insure PITCH switch (16, figure 3-18) on Hydraulic Control Panel is CLOSED.
- b. Place ROLL switch (13) OPEN.
- c. Place SELECTOR switch (12) in ROLL. Note that one set of Spoilers is extended.
- d. Spoilers must be left in this position long enough to check for leakage, failure or distortion.
- e. Using CYCLE switch (11), cycle Spoilers to other extreme position. Previously extended Spoilers must retract, and other set must extend.
- f. Spoilers must be left in this position long enough to check for leakage, failure or distortion.

- g. Using CYCLE switch, cycle Spoilers at least 10 times or until air-free flow of hydraulic fluid is observed in RETURN FLOW indicator (7).
- h. Place SELECTOR switch in off (center) position.
- i. Place ROLL switch CLOSED.

### 3-110. CYCLING STABILIZER.

- a. Place PITCH switch (16, figure 3-18) OPEN.
- b. Place SELECTOR switch (12) on Hydraulic Control Panel in PITCH. Note that Stabilizer moves to one extreme position.
- c. Stabilizer must be left in this position long enough to check for leakage, failure, or distortion.
- d. Using CYCLE switch (11), cycle Stabilizer to other extreme position.
- e. Stabilizer must be left in this position long enough to check for leakage, failure, or distortion.
- f. Using CYCLE switch, cycle Stabilizer 10 times or until air-free flow of hydraulic fluid is observed in RETURN FLOW indicator (7).
- g. Place SELECTOR switch (12) in off (center) position.
- h. Place PITCH switch (16) to CLOSED.

#### NOTE

If there is oscillation of the Spoilers or Stabilizers at this point; reduce the hydraulic system pressure by opening the MANUAL BYPASS control a part of a turn to 500 psi. Then loosen the hydraulic fittings at the highest point in the Spoiler or Stabilizer Package to bleed any trapped air from the system. Tighten hydraulic fittings, then repeat paragraphs 3-111 and 3-112.

### 3-111. CYCLING HYDRAULIC RESERVOIR.

- a. Insure the RETURN BYPASS control (4, figure 3-18) on Hydraulic Control Panel is OPEN (ccw). Note that sight rod on hydraulic reservoir, visible through ENGINE ACCESS DOOR, retracts fully.
- b. Place ROLL switch (13) and PITCH switch (16) to OPEN. Sight rod must extend.
- c. Using ROLL switch and PITCH switch, cycle hydraulic reservoir five times to extreme position of sight rod each time, or until air-free flow of hydraulic fluid is observed in RETURN FLOW indicator (7); placing switches to CLOSED will retract sight rod, placing switches to OPEN will extend sight rod.
- d. Place ROLL switch and PITCH switch to CLOSED. Note that sight rod is fully retracted.

3-112. PERFORMING FINAL HYDRAULIC CYCLING.

- a. Place SELECTOR switch (12, figure 3-18) on Hydraulic Control Panel to ROLL.
- b. Using CYCLE switch (11), cycle Spoilers three times.
- c. Place SELECTOR switch (12) to PITCH.
- d. Using CYCLE switch (11), cycle Stabilizer three times.
- e. Place SELECTOR switch (12) to off (center) position.
- f. Using ROLL switch (13) and PITCH switch (16), cycle hydraulic reservoir until air-free flow is observed in RETURN FLOW indicator (7).
- g. Place LOW PRESSURE SELECTOR (20) to RETURN.
- h. Place ROLL (13) and PITCH (16) switches to CLOSED.
- i. Rotate RETURN BYPASS control (14) clockwise until 10 psi is indicated on SELECTOR PRESSURE gage (23).
- j. Place SELECTOR switch (12) to pitch.
- k. Using CYCLE switch (11), cycle stabilizer to both extreme positions. Note that operation is smooth, with no evidence of chattering or binding.
- l. Place SELECTOR switch (12) to ROLL.
- m. Using CYCLE switch (11), cycle Spoilers to both extreme positions. Note that operation is smooth, with no evidence of chattering or binding.
- n. Place SELECTOR switch (12) to off (center) position.
- o. Disconnect hydraulic cycling cable from receptacle in Missile.
- p. Notify NCOIC that Mechanic No. 3 does not need hold power.

3-113. FILLING MISSILE HYDRAULIC RESERVOIR AFTER COMPLETION OF SRP SEQUENCE.

- a. Insure that MANUAL BYPASS control (19, figure 3-18) is fully CLOSED (cw).
- b. Insure that SYSTEM OUTLET control (18) is OPEN (ccw).
- c. Rotate RETURN BYPASS control (4) fully OPEN (ccw).

NOTE

Sight rod should be fully retracted.

- d. Rotate RETURN BYPASS control (4) fully CLOSED (cw).

## NOTE

Servo valve leakage flow will be directed into the Missile reservoir, causing it to fill very slowly. While the reservoir is filling, the SELECTOR PRESSURE gage (23) must indicate  $13 (\pm .37) H$  psi, where H is the height of the Missile reservoir above the gage in feet. When reservoir is full all flow will be diverted through the Power Pack return flow relief valve causing rapid rise in the return system and SELECTOR PRESSURE gage will indicate approximately 20 psi. The rapid rise in SELECTOR PRESSURE is a remote indication of a full Missile reservoir.

- e. Immediately rotate SYSTEM OUTLET control (18) fully CLOSED (cw).
- f. Rotate RETURN BYPASS control (4) OPEN (ccw).
- g. Rotate MANUAL BYPASS control (19) fully OPEN (ccw).
- h. Place MAIN SYSTEM switch (8) OFF.
- i. Momentarily close ACCUMULATOR DUMP switch on HCU; ACCUMULATOR PRESSURE gage must indicate between 23 and 27 PSI.

## 3-114. DISCONNECTING HYDRAULIC HOSES FROM MISSILE.

- a. Insure that SYSTEM OUTLET control (18, figure 3-18) is fully CLOSED (cw).
- b. Insure that RETURN BYPASS and MANUAL BYPASS controls are fully OPEN (ccw).
- c. Disconnect power pack hydraulic hoses from Missile and power pack.
- d. Replace all dust caps and covers; stow hydraulic hoses.
- e. Connect Missile internal hydraulic hoses.

## 3-115. SHUTTING DOWN GROUND COOLING.

## NOTE

Insure that Missile power is off.

- a. Place GND COOLING BLOWER switch (5, figure 32) on Pneumatic Panel OFF.
- b. GND COOLING AIR gage (2) must decrease to zero.
- c. Install wooden plugs on right side of Nose Section.

## 3-116. DISCONNECTING GROUND COOLING HOSE.

- a. Disconnect ground cooling bleed-air hose from left side of Warhead Section.
- b. Disconnect other end of bleed-air hose from bleed-air outlet (4, figure 3-19) on Power Pack.



- c. Stow bleed-air hose in stowage compartment of Power Pack.

3-117. RETRACTING POWER PACK BOOM.

- a. Remove speed wrench from inside of equipment access stowage compartment.
- b. Insert speed wrench in boom socket in lower left corner of power pack.
- c. Rotate wrench counterclockwise until boom is fully retracted.
- d. Remove wrench and stow in equipment stowage compartment.
- e. Lock boom with locking device in lower left corner of power pack.

3-118. DRAINING MISSILE SUMPS.

- a. Place suitable container beneath sump tank drain valve (figure 3-34).
- b. Depress drain valve until all sediment and condensation have been drained; then release drain valve.
- c. Remove Engine Access Door.
- d. Place container beneath low pressure fuel filter (figure 3-35).
- e. Rotate filter drain valve control OPEN.
- f. Allow all sediment and condensation to drain, then rotate valve CLOSED.
- g. Replace Engine Access Door.

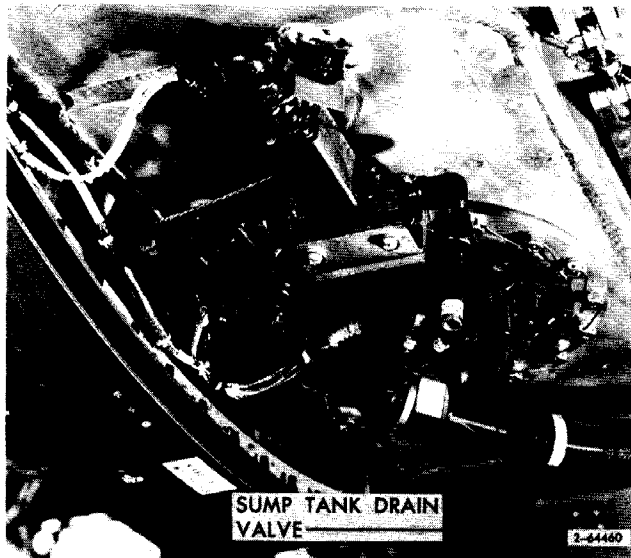


Figure 3-34. Sump Tank Area

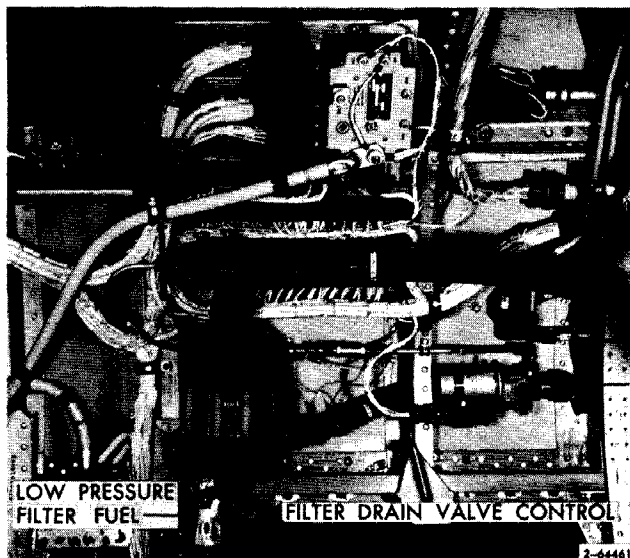


Figure 3-35. Left Side of Plenum Chamber

## 3-119. POSITIONING AND CONNECTING FIFTH WHEEL VEHICLE.

- a. Position prime mover in front of Translauncher.
- b. Back prime mover into position until it is approx. 1 ft. from Translauncher. Insure hose tenna is tied down.
- c. Connect electrical cables and brake hoses from Translauncher to prime mover.
- d. Open SERVICE and EMERGENCY air valves on truck hose tenna.
- e. In cab of prime mover, set trailer brake. Insure bogie handbrake is released.
- f. Engage fifth wheel.
- g. Set tire pressure regulator to desired pressure.
- h. Open tire lever-type shutoff valve located above each tire.

## 3-120. PREPARING FOR MOVEMENT OF REPLACEMENT MISSILE TO LAUNCH PAD.

- a. Connect 5th wheel to Translauncher. (Refer to para 3-121.)
- b. Raise Translauncher leveling jacks. (Refer to para 3-131.)
- c. Remove forward and rear jack mud pads and place to side of pad for use of Translauncher being removed from operational pad.
- d. Disconnect Missile ground cable, p/n 435A450-072-100, from grounding stake.

## 3-121. MOVING REPLACEMENT MISSILE TO LAUNCH PAD.

## NOTE

The Missile must be in 1-1/2° nose up attitude (checkout position) secured with forward Missile tiedowns, and holdback bolt installed.

- a. Insure boggie hand brake is released.
- b. Insure that a left and right wing walkers are in place.

## CAUTION

Translauncher will not be transported more than two (2) miles per hour.

- c. Transport Replacement Missile to and align behind Missile to be replaced.

## 3-122. DISCONNECTING RF HOOD REEL MOTOR. (See figure 3-16.)

- a. Disconnect nose hood removal signal cable from receptacle J601 on reel control box.
- b. Remove release cord clip from hood lanyard collector ring.
- c. Wind release cord on reel.

- d. Remove nuts and bolts and clamps securing winch assembly bracket to Translauncher.
- e. Remove reel motor and place parallel to HCU on pad surface.

3-123. INSTALLING FORWARD MISSILE TIEDOWNS.

- a. Remove tiedowns from Translauncher equipment stowage compartment.
- b. Bolt forward Missile tiedowns to Missile at station 70.
- c. Connect opposite end of tiedown to hole in launch socket support column with ball-lock push pin.
- d. Tighten turnbuckle assembly.

3-124. REMOVING TRANSLAUNCHER TIEDOWNS.

- a. Loosen turnbuckle and remove bolts attaching turnbuckle to collar assembly and anchor rod. (See figure 3-31.)
- b. Remove turnbuckles and place out-of-way.

3-125. INSTALLING TRANSLAUNCHER BOGIES.

- a. Release brake. (See figure 3-36.)
- b. Position bogie along side of Translauncher with axis parallel to Translauncher.
- c. Align V-shaped slot on bogie mounting plate with bogie kingpin on Translauncher.
- d. When Translauncher is raised enough push bogie under Translauncher until kingpin is completely seated in slot bogie mounting plate with kingpin nut and washer under mounting plate.
- e. Raise Translauncher until bogie clears the ground.
- f. Rotate bogie about kingpin until V-shaped slot on bogie mounting plate faces aft, and alignment lugs are aligned with mating sockets on Translauncher.
- g. Raise all four bogie T-handle clamps into their respective yokes, and tighten clamps securely.
- h. Connect service and emergency brake lines between chassis and bogie at quick-disconnect fittings located just above left forward bogie wheel.
- i. Open bogie walking beam control valve, located on left forward bogie subframe.
- k. Close drain cocks on main and tighten tube air reservoir.
- l. Check that all air line fittings are secure.
- m. Engage parking brake lever on left side of bogie.

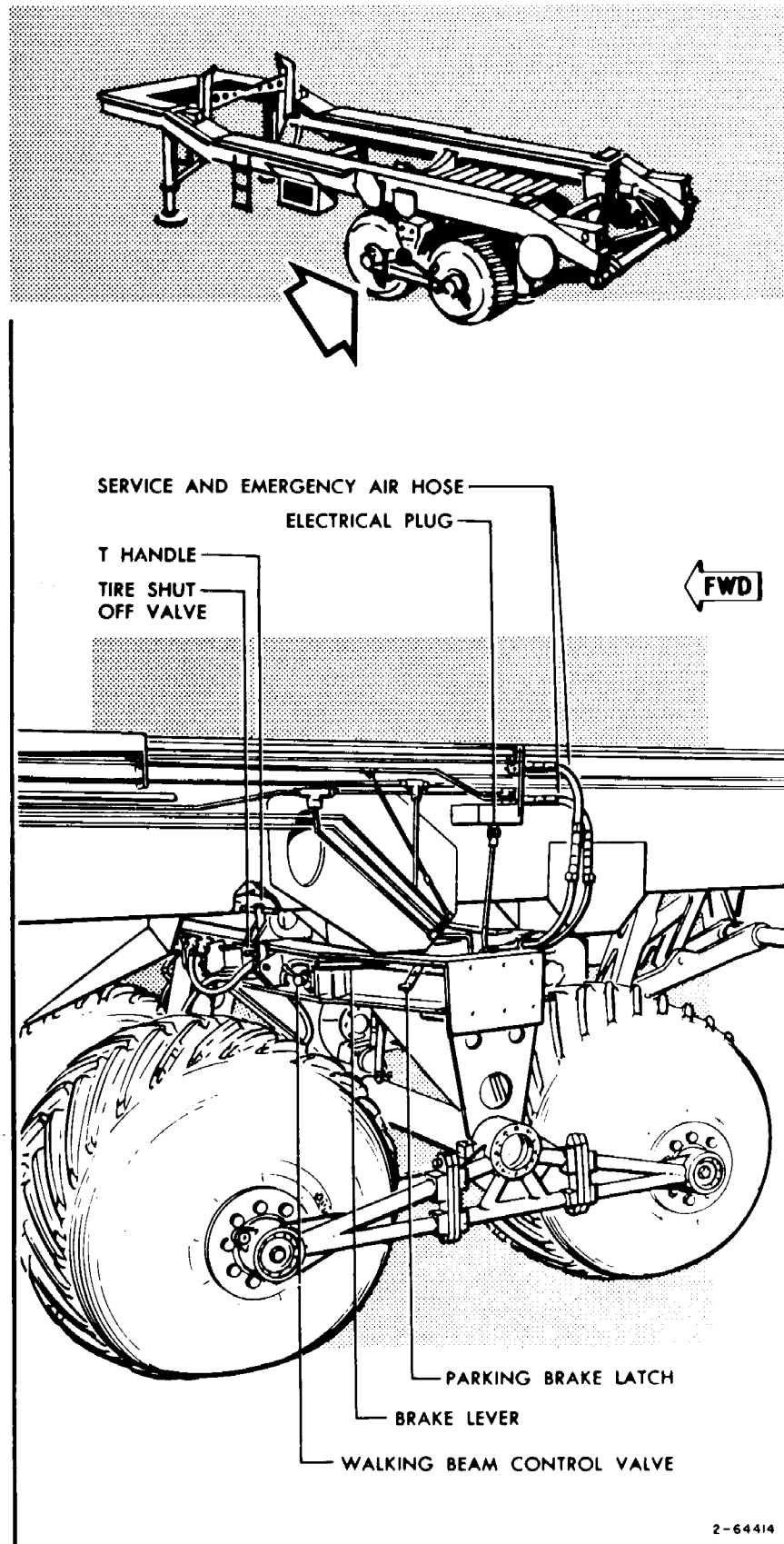


Figure 3-36. Translauncher Bogie Removal

3-126. MOVING REPLACEMENT MISSILE ONTO LAUNCH PAD AND ALIGNING TRANSLAUNCHER. (See figure 3-37.)

## NOTE

Insure that the Translauncher is positioned parallel to the line-of-flight within the allowed tolerance of plus or minus 1/4 inch. Have NCOIC re-establish forward and rear alignment markers, and the line-of-flight line, if necessary.

- a. Line of flight will be established by stretching string between markers A&B.
- b. Position Translauncher on and parallel to line-of-flight.
- c. Man stationed at forward positioning white circle of line-of-flight will direct final positioning of Translauncher.
- d. Stop MM-1 Truck when left front leveling jack is over forward positioning marker and rear leveling jack is over rear positioning marker.
- e. Lock bogie hand brake.

3-127. MAKING STATIC GROUND CONNECTIONS.

- a. Check to insure the following ground cables are connected:
  - (1) Power Pack to MM-1 truck bed.
  - (2) Power Pack to ground rod.
  - (3) NTCU to NTCU skid.
  - (4) HCU to NTCU skid.
  - (5) NTCU Skid to ground rod.
  - (6) Engine tail pipe to Translauncher.
  - (7) Translauncher to ground rod.
  - (8) Rocket Motor to Translauncher.
  - (9) ACB to ACB skid.
  - (10) Rectifier to ACB skid.
  - (11) ABC Skid to ground rod.
  - (12) PDCU to PDCU skid.
  - (13) PDCU Skid to ground rod.
  - (14) Accessory Stand to Translauncher.

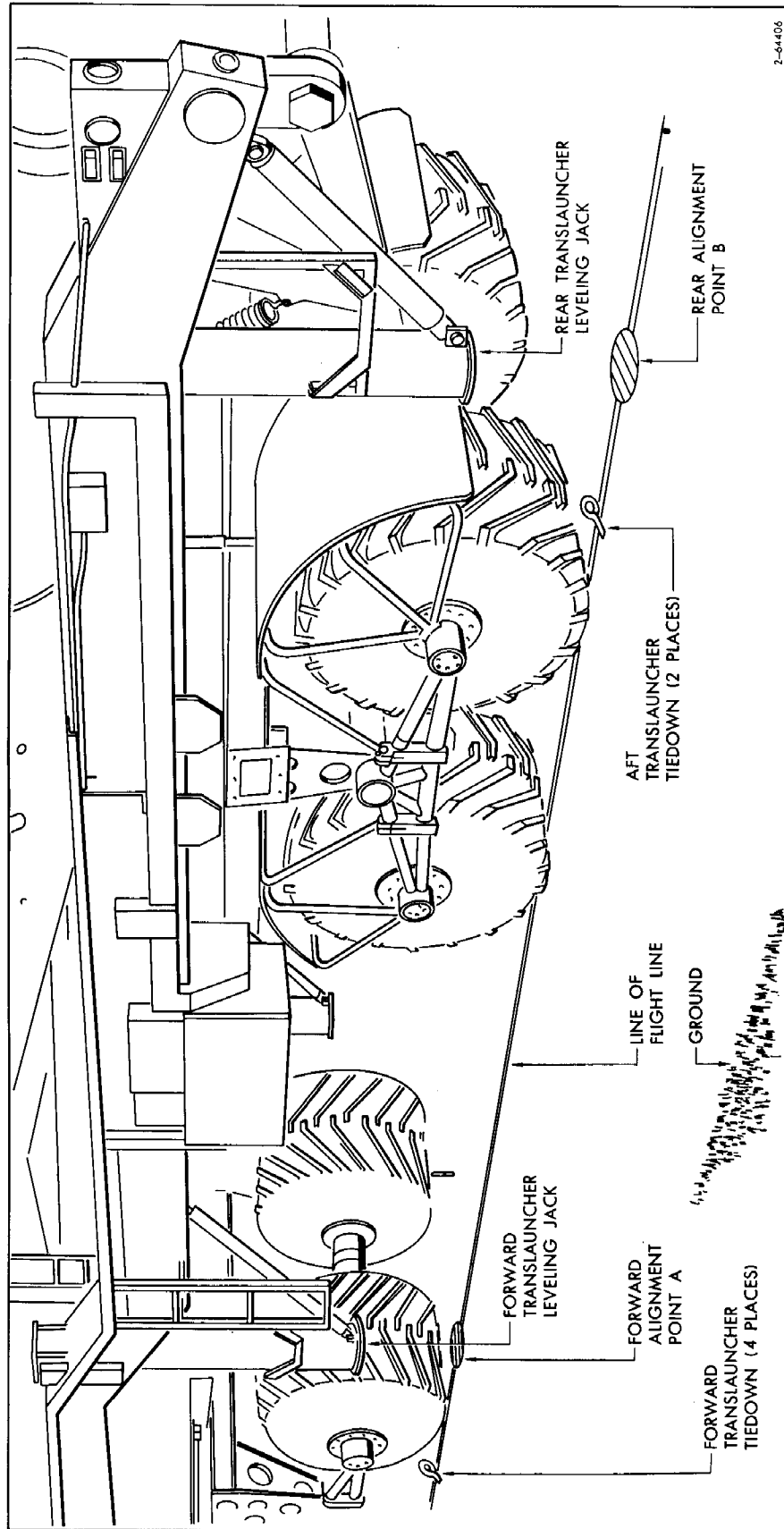


Figure 3-37. Positioning Translauncher

3-128. CONNECTING HYDRAULIC HOSES TO TRANSLAUNCHER.

- a. Insure that all lever controls on Translauncher Hydraulic Control Panel (figure 3-38) are in center position.
- b. Insure that BYPASS VALVE control (13) is OPEN and that PRESSURE control (5), and RESERVOIR control (9), are in CLOSE (cw).
- c. Remove dust caps from PRESSURE (6) and RETURN (8) disconnect fittings.
- d. Connect hydraulic hoses to fittings on Translauncher Hydraulic Control Panel.
- e. Insure that RETURN BYPASS control (4, figure 3-18) and MANUAL BYPASS control (19) on Power Pack Hydraulic Panel are OPEN (ccw).
- f. Place MAIN SYSTEM switch (8) ON.
- g. Rotate MANUAL BYPASS control (19) fully CLOSED (cw).
- h. Rotate SYSTEM OUTLET control (18) fully OPEN.

3-129. LOWERING AND RAISING TRANSLAUNCHER LEVELING JACKS.

- a. Remove dust covers from front and rear pads and jacks.
- b. Place front and rear jack mud pads in position to receive jacks.
- c. Rotate PRESSURE control on Translauncher Hydraulic Control Panel (5, figure 3-38) to OPEN (ccw).
- d. Rotate BYPASS VALVE control to CLOSED (13), (cw).
- e. Place FWD LEFT and FWD RIGHT TRANSLAUNCHER LEVELING controls (2, 3) UP or DOWN as required.
- f. Place REAR AFT LEVELING CONTROL (4) UP or DOWN as required.

NOTE

When jacks are being lowered, insure that the pistons pass thru positioned support fittings, if necessary, on jack mud pads.

- g. Place TRANSLAUNCHER LEVELING CONTROL (s) to center position.
- h. If Translauncher leveling jacks have been raised, place covers on jacks and mud pads and stow pads on Translauncher.

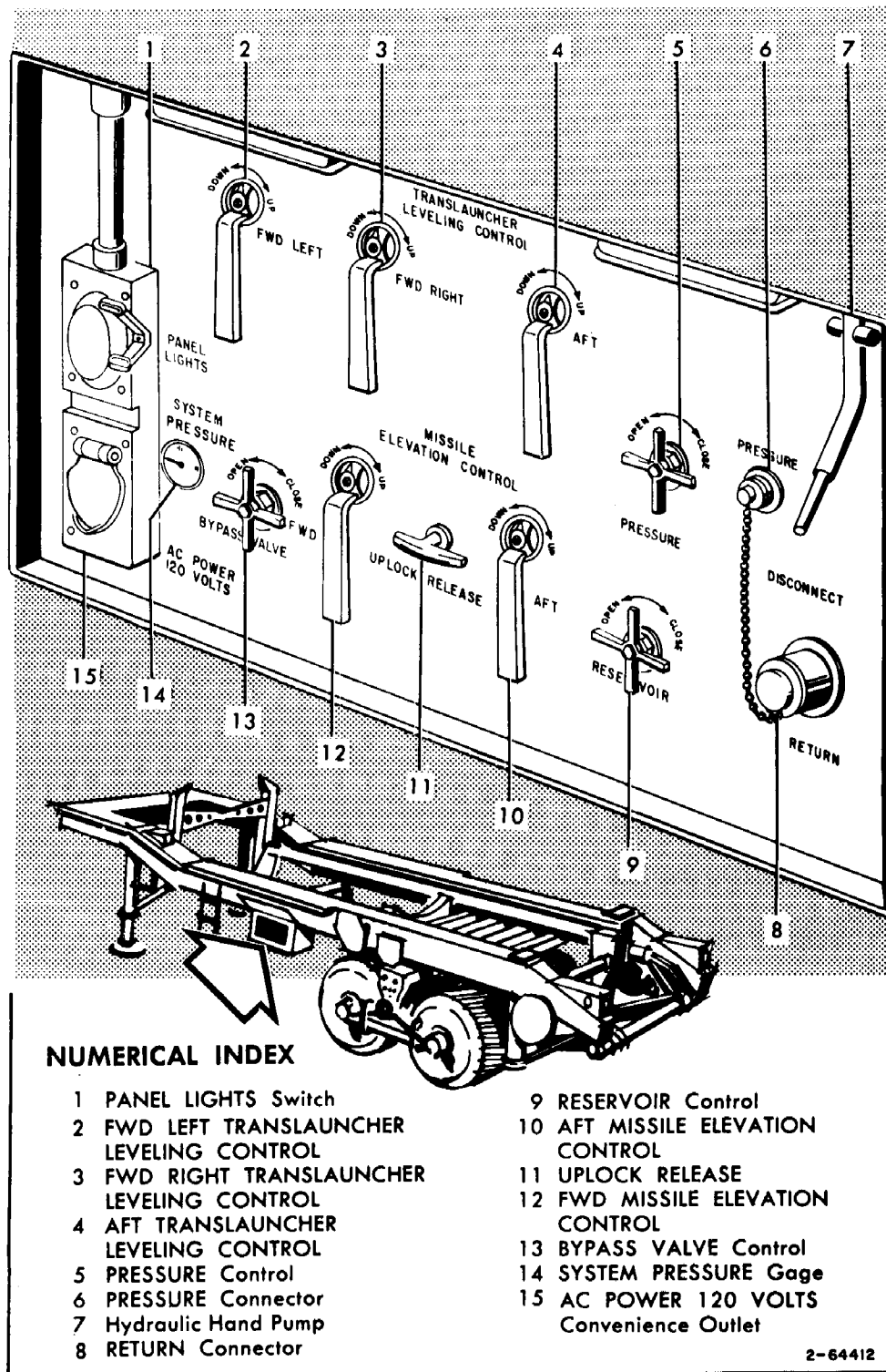


Figure 3-38. Translauncher Hydraulic Panel



3-130. DISCONNECTING AND REPOSITIONING FIFTH WHEEL VEHICLE.

- a. Close tire lever-type shutoff valve located above each tire.
- b. Close SERVICE and EMERGENCY air valves on truck hose antenna.
- c. Disconnect electrical cables and brake hoses from Translauncher to prime mover.
- d. Engage Translauncher bogie hand brake.
- e. Release Translauncher kingpin locking latch mechanism on 5th wheel pack.
- f. At the direction of Spotter, move prime mover forward until it clears Translauncher. Truck will remain in front of Translauncher to be used as a work stand.

3-131. REMOVING TRANSLAUNCHER BOGIES.

- a. Disconnect service and emergency air hoses at quick-disconnect fittings located on left side of Translauncher directly above forward bogie, and secure hoses to clips on bogie subframe. (See figure 3-36.)
- b. Disconnect electrical plug from chassis receptacle.
- c. Install the three dust covers provided.
- d. Close walking beam control valve on left forward subframe of bogie.
- e. Release parking brake lever located on left side of bogie.
- f. Close the four lever-type tire shutoff valves located directly above each tire on bogie subframe. Valves are closed when levers are vertical.
- g. Release four T-handle clamp screws holding bogie to chassis.
- h. Rotate bogie approximately 90 degrees clockwise.
- i. Push bogie clear of king pin thrust bearing.
- j. Push bogie out from under Translauncher by hand.
- k. Remove bogie to safe distance from Translauncher.
- l. Place bogie hand brake on.

3-132. INSTALLING RF HOOD REEL MOTOR. (See figure 3-16.)

- a. Position reel assembly on Translauncher king pin; then secure reel assembly with clamp, and bolt and nuts.
- b. Connect RF Hood removal cable to receptacle J601 on reel control assembly box and HOOD CONTROL receptacle J502 on HCU.

## 3-133. REMOVING FORWARD MISSILE TIEDOWNS.

- a. Loosen turnbuckle assembly.
- b. Remove ball push-pin from hole in launch socket support column.
- c. Unbolt forward Missile tiedown from Missile at station 70.
- d. Stow tiedown in Translauncher stowage box.

## 3-134. INSTALLING TRANSLAUNCHER TIEDOWNS. (See figure 3-31.)

- a. Connect turnbuckle assembly to collar assembly on Translauncher jack leg.
- b. Connect opposite end of turnbuckle assembly to anchor rod on launch pad.

## NOTE

Tighten tiedowns to approximately 200 inch-pounds of torque in consecutive order, starting with points A and A1.

3-135. MECHANIC NO. 4 DETAILED INSTRUCTIONS.

## 3-136. INSPECTING POWER PACK.

- a. Connect ground cable between MM-1 and Translauncher or ground rod.
- b. Remove ladder from below vehicle pack bed and position it to gain access to Power Pack Control Panel (figure 3-19).
- c. Open and engage support latches on Control Panel Access Door on each side of Power Pack.
- d. Check MM-1 truck fuel tank. It must be at least three-fourths full.

## NOTE

If necessary, service MM-1 fuel tank using fuel conforming to Specification MIL-G-5572.

- e. Check Power Pack hydraulic fluid level.
- f. Open ventilator access doors if weather conditions permit.
- g. Open Power Pack Access door on Power Pack.
- h. Inspect Power Pack hydraulic components for leakage.
- i. Insure that all circuit breakers on Power Monitoring and Distribution Box in SRP are OFF.
- j. Insure that all Power Pack Control Panel switches, circuit breakers and controls are in designated positions (table 3-3).

TABLE 3-3  
POWER PACK CONTROL PANEL CHECKLIST

Panel	Switch Control	Position
60 Cycle Power panel:	UTILITY OUTLET switch .....	OFF
	AM-VM switch .....	A-B
	POWER switch .....	OFF
	60 CYCLE VOLTAGE ADJ control .....	decrease (ccw)
	GEN switch .....	OFF
28 Volts DC Power panel:	PANEL LIGHT switch .....	as required
	UTILITY OUTLET switch .....	OFF
	POWER switch .....	OFF
	EMERGENCY POWER OFF switch .....	OFF
	TRUCK POWER switch .....	OFF
	28 VOLTS DC VOLTAGE ADJ control .....	decrease (ccw)
	GEN switch .....	OFF
400 Cycle Power panel:	UTILITY OUTLET switch .....	OFF
	POWER switch .....	OFF
	400 CYCLE VOLTAGE ADJ control .....	decrease (ccw)
	GEN switch .....	OFF

## 3-137. ENERGIZING POWER PACK HYDRAULICS.

- a. RESERVOIR LEVEL gage (6, figure 3-18) must indicate at least three-fourths full.
- b. Connect hydraulic pressure hose between hydraulic PRESSURE connector (10, figure 3-19) and hydraulic cycling pressure connector (12).
- c. Connect hydraulic return hose between hydraulic return connector (11) and hydraulic cycling return connector (13).
- d. Place MAIN SYSTEM switch (8, figure 3-18) ON.
- e. Insure that TRUCK POWER switch (12, figure 3-17) on 28 Volts DC panel is ON.
- f. If HYD OIL TEMPERATURE gage (2, figure 3-18) indicates below 20° F place COMPENSATOR SHUTOFF switch (9) ON until temperature gage indicates within 20° F to 180° F; then place COMPENSATOR SHUTOFF switch OFF.
- g. Rotate MANUAL BYPASS control (19) fully CLOSED (cw).
- h. Rotate SYSTEM OUTLET control (18) fully OPEN (ccw).
- i. SELECTOR PRESSURE gage (23) must indicate between 55 and 80 psi with LOW PRESSURE SELECTOR control (20) in BOOSTER PUMP.
- j. Place LOW PRESSURE SELECTOR control in FILTER. If SELECTOR PRESSURE gage indicates more than 20 psi difference from booster pump pressure, replace filter in accordance with T.O. 33Y41-2-11.
- k. Place LOW PRESSURE SELECTOR to BOOSTER PUMP.

## NOTE

OPERATING PRESSURE indicator lamp goes on when pressure reaches 1500 psi, lamp goes out when pressure falls below 1350 psi.

- l. SYSTEM PRESSURE gage (1) must indicate between 1500 and 1550 psi.
- m. Insure that RETURN BYPASS control (4) is OPEN (ccw).
- m. SYSTEM FLOW GAGE (5) must indicate between 9 and 10 gpm flow.
- o. Alternately rotate SYSTEM OUTLET control and RETURN BYPASS control CLOSED (cw); then fully OPEN (ccw) until no air bubbles are observed in RETURN FLOW meter.

## NOTE

Insure that SYSTEM OUTLET control is OPEN (ccw) after completion of step o.

- p. Rotate RETURN BYPASS control fully CLOSED (cw).
- q. Place LOW PRESSURE SELECTOR control in RETURN. SELECTOR PRESSURE gage must indicate between 23 and 27 psi.

- r. Rotate MANUAL BYPASS control fully OPEN (ccw).
- s. Rotate RETURN BYPASS control fully OPEN (ccw) until SELECTOR PRESSURE gage indication decreases toward zero.
- t. Rotate RETURN BYPASS control fully CLOSED (cw).
- u. Rotate SYSTEM OUTLET control fully CLOSED (cw).

3-138. CONNECTING HYDRAULIC HOSES TO TRANSLAUNCHER.

- a. Insure that all lever controls on Translauncher Hydraulic Control Panel are in center position.
- b. Insure that BYPASS VALVE, control (13, figure 3-38) is open and that PRESSURE control (5), and RESERVOIR control (9), are in CLOSE (cw).
- c. Remove dust caps from PRESSURE (6), and RETURN (8) disconnect fittings.
- d. Connect hydraulic hoses to fittings on Translauncher Hydraulic Control Panel.
- e. Insure that RETURN BYPASS control (4, figure 3-18) and MANUAL BYPASS control (19) on Power Pack Hydraulic Panel are OPEN (ccw).
- f. Place MAIN SYSTEM switch (8) ON.
- g. ROTATE MANUAL BYPASS control (19) fully CLOSED (cw).
- h. Rotate SYSTEM OUTLET control (18) fully OPEN.
- i. Rotate PRESSURE control (5, figure 3-38) fully OPEN (ccw).
- j. Rotate BYPASS VALVE Control (13) fully CLOSED (cw).

3-139. RAISING MISSILE TO CHECKOUT POSITION.

- a. Place forward (2&3) & AFT TRANSLAUNCHER LEVELING CONTROL (4, fig. 3-38) to UP position until translauncher is at correct height for Rocker Motor installation.
- b. Loosen the four wing screws from aft trunnion fitting.
- c. Release both cross-beam fittings which secure raising beams.
- d. Remove the two ball-lock pins from aft trunnion fitting.
- e. Insure that raising mechanism is clear of personnel and obstructions.
- f. Place and hold AFT MISSILE ELEVATION CONTROL (10) to UP until aft linkage locks engage.
- g. Place AFT MISSILE ELEVATION CONTROL (10) to DOWN for approximately 5 seconds; then return it to neutral.
- h. Remove tiedown assembly from aft trunnion fitting by removing center pin; stow assembly in translauncher tool box.

## 3-140. LOWERING MISSILE TO TRANSPORT POSITION.

- a. Remove aft trunnion assembly from translauncher tool box.
- b. Install aft trunnion assembly to missile trunnion fitting with center bolt.
- c. Place FWD MISSILE ELEVATION CONTROLS (12, figure 3-38) on Translauncher Hydraulic Control panel UP.
- d. Pull and hold UPLOCK RELEASE handle (11) to release up-locks.
- e. Move FWD MISSILE ELEVATION CONTROL to DOWN.
- f. When Missile has started down, slowly release UP-LOCK RELEASE handle.
- g. When Missile is lowered, return FWD MISSILE ELEVATION CONTROL to center position.
- h. Place AFT MISSILE ELEVATION CONTROL (10) on Hydraulic Panel UP until aft linkage locks can be disengaged.
- i. Disengage aft linkage locks.
- j. Place AFT MISSILE ELEVATION CONTROL down until aft trunnion fitting ball-lock pin holes are aligned; then, return lever to center position.
- k. Insert ball-lock pins through aft trunnion fitting and missile trunnion fitting.
- l. Tighten 4 wing screws to aft trunnion fittings.
- m. Tighten both cross beam fittings securing raising beam.

## 3-141. SHUTTING DOWN POWER PACK HYDRAULICS.

- a. Rotate SYSTEM OUTLET control (18, figure 3-18) to CLOSED (cw).
- b. Rotate Manual MANUAL BYPASS control (19) to OPEN (ccw).
- c. Rotate PRESSURE, control (5, figure 3-38) on Translauncher Hydraulic Panel to CLOSED (cw) and BYPASS VALVE control (13) to OPEN (ccw).
- d. Place MAIN SYSTEM switch (8, figure 3-18) OFF.

## 3-142. DISCONNECTING HYDRAULIC HOSES FROM TRANSLAUNCHER.

- a. Insure that SYSTEM OUTLET control (18, figure 3-18) is CLOSED (cw) and that MANUAL BYPASS control (19) is OPEN (ccw).
- b. Insure Press. Valve (5, Fig. 3-38) is CLOSED & Bypass Valve (13) is open.
- c. Disconnect hydraulic hoses from Translauncher Hydraulic Panel and power pack.
- d. Replace all dust caps and covers; stow hydraulic hoses.

3-143. REMOVING FOLDING WING MECHANISM.

- a. Remove pick-up plates (15, figure 3-28) and thrust bearings (1) from each Wing.
- b. Remove ball lock push pins (2) which secure pivot shaft to pivot stop on each folding wing mechanism.

CAUTION

INSURE THAT CAM LOCK (11) is engaged in mounting block assembly (12).

- c. Remove ball lock push pins (6 & 7) and remove wing panel support.
- d. Remove bolts securing folding wing mounting brackets (5) to Missile, and remove each mechanism.
- e. Secure pick-up plate hole covers in each Wing.
- f. Remove aft folding wing tiedown bracket from right and left side of Missile.
- g. Place folding wing mechanism in safe location.

3-144. ADJUSTING POWER PACK ELECTRICAL OUTPUT.

- a. Insure that EMERGENCY POWER OFF switch (6 Fig. 3-17) on 28VDC Power panel is in ELEC PWR NORMAL.

NOTE

To shut down power of Power Pack in an emergency, place EMERGENCY POWER OFF switch to EMERG PWR OFF.

- b. Place 28 VOLTS GEN switch (8) ON.
- c. Rotate 28 VOLT DC VOLTAGE ADJ control (5) toward INC until VOLTS DC meter ADJ indicates between 28 and 28.5 VOLTS DC.
- d. Place POWER switch (7) ON.
- e. POWER ON indicator lamp (10) must go on.

CAUTION

If Generator switch trips off during power pack operation immediately place POWER switch OFF; then check for possible overload condition.

- f. Place 60 CYCLE GEN switch (7, figure 3-39) ON.
- g. Rotate 60 CYCLE VOLTAGE ADJ control (5) toward INC until VOLTS AC meter (4) indicates 208 volts.



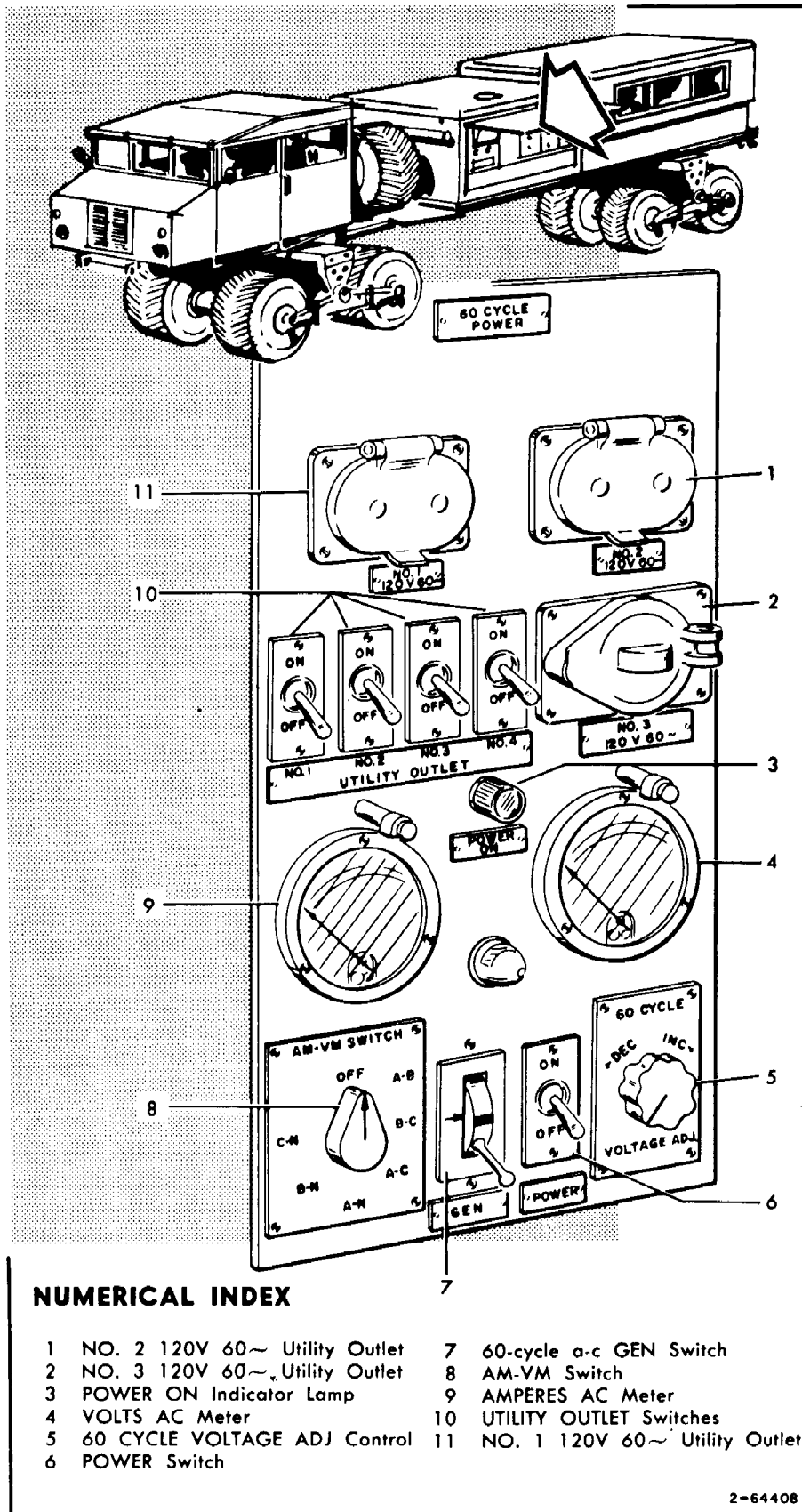


Figure 3-39. 60 Cycle Power Panel

CAUTION

If Generator Switch Trips off during power pack operation, immediately place POWER switch OFF; then check for possible overload condition.

- h. Place 60 CYCLE POWER switch (6) ON.
- i. POWER ON indicator lamp (3) must go on.
- j. Place 400 CYCLE GEN switch (7, figure 3-33) ON.
- k. Adjust 400 CYCLE VOLTAGE ADJ control (5) toward INCREASE until VOLTS AC meter (4) indicates 115 VOLTS.
- l. Place POWER switch (6) on 400 Cycle Power Panel ON.
- m. POWER ON indicator lamp (3) must go on.

CAUTION

If Generator Switch Trips off during power pack operation, immediately place POWER switch OFF; then check for possible overload condition.

- n. FREQUENCY meter (2) must indicate between 406 and 410 cycles per second.
- 3-145. LEVELING TRANSLAUNCHER.

CAUTION

(If applicable) Loosen turnbuckles before leveling Translauncher.

NOTE

Level Translauncher so that chassis is as close to the ground as possible.

- a. Place clinometer on forward main torque shaft.
- b. Using forward left (2, figure 3-38) or forward right (3) Translauncher leveling controls (s) on Translauncher Hydraulic Control Panel, extend or raise either forward leveling jack, as required, until clinometer indicates zero degrees, plus or minus 10 minutes.
- c. Place clinometer on the "L" long runner of the missile just inside the left breather door. Using aft translauncher leveling control (4), extend or raise aft leveling jack as required, until Inclinator indicates 1.5 degrees plus or minus 10 minutes.
- d. Turn lower support fitting on each jack mud pad until recesses in bottom edge coincide with protrusion or bolt head obstructions, insuring a good seat around periphery of mud pad.

e. Turn upper support fittings until a good bearing contact is made with the outer cylinder.

## NOTE

The distance between the mating shoulders of the upper and lower support fittings must not exceed 3 inches.

f. Rotate BYPASS VALVE control (13) to OPEN (ccw).

g. Rotate PRESSURE control (5) to CLOSE (cw).

3-146. DISCONNECTING HYDRAULIC HOSES FROM TRANSLAUNCHER AND CONNECTING TO MISSILE OR HCU.

a. Insure Power Pack Hydraulic system outlet valve is closed.

b. Insure Power Pack Hydraulic system manual BYPASS VALVE is open.

c. Disconnect hydraulic lines from Translauncher PRESSURE (6, figure 3-38) and RETURN (8) DISCONNECT fittings.

d. Connect hydraulic hoses to Missile or HCU as applicable.

e. Install dust caps to hydraulic fittings on Translauncher Hydraulic Control Panel.

3-147. OBSERVING SPOILER ACTUATOR PACKAGE DURING CYCLING OPERATIONS.

a. Observe spoiler actuator package for leaks and proper operation.

b. Observe hydraulic lines and fittings during operations.

3-148. OBSERVING HYDRAULIC RESERVOIR DURING CYCLING OPERATIONS.

a. Observe hydraulic reservoir for leaks and proper operation.

b. Observe hydraulic lines and fittings during operation.

3-149. SHUTTING DOWN POWER PACK.

a. Insure that SYSTEM OUTLET control (18, figure 3-18) on Power Pack Hydraulic Control panel is CLOSED (cw).

b. Insure that MANUAL BYPASS control (19) is OPEN (ccw).

c. Insure that MAIN SYSTEM switch (8) is OFF.

d. Place POWER switch (6, figure 3-33) and GEN switch (7) on 400 Cycle Power panel OFF.

e. Rotate 400 CYCLE VOLTAGE ADJ control (5) to DEC.

f. Place POWER switch (6, figure 3-39) and GEN switch (7) on 60 Cycle Power panel OFF.

- g. Rotate 60 CYCLE VOLTAGE ADJ control (5) to DEC.
- h. Place POWER switch (7, figure 3-17) and GEN switch (8) on 28 Volts DC Power panel OFF.
- i. Rotate 28 VOLT DC VOLTAGE ADJ control (5) DEC.
- j. Place AUXILIARY POWER switch (7, figure 3-32) on Pneumatic Panel OFF.

3-150. INSTALLING CROWN PANEL.

- a. Position and install crown panel in wing well.
- b. Install four bolts (insuring long bolts are in aft holes) and secure.

3-151. LOWERING MISSILE TO CHECKOUT POSITION.

- a. Rotate PRESSURE control (5, figure 3-38) on Translauncher Hydraulic Control Panel OPEN (ccw).
- b. Rotate BYPASS VALVE control (13) to CLOSE (cw).
- c. SYSTEM PRESSURE gage (14) must indicate between 1500 and 1550 PSI.
- d. Place FWD MISSILE ELEVATION CONTROLS (12) UP.
- e. Pull and hold UPLOCK RELEASE handle (11) to release up-lock.
- f. Move FWD MISSILE ELEVATION CONTROL (12) to DOWN.
- g. When Missile has started down, slowly release UPLOCK RELEASE handle (11).
- h. When Missile is lowered, return FWD MISSILE ELEVATION CONTROL (12) to center position.

CAUTION

Insure that forward frame upright retaining latches are securely engaged.

3-152. SHUTTING DOWN HCU.

- a. Place circuit breaker on PDCU for HCU OFF.

3-153. OPERATING TRANSLAUNCHER HYDRAULIC CONTROLS DURING BOGIE INSTALLATION.

- a. Place FWD and AFT TRANSLAUNCHER LEVELING CONTROLS (2, 3, 4, figure 3-38) in UP position until bogies can be pushed under Translauncher bogie king-pin.
- b. Place FWD and AFT TRANSLAUNCHER LEVELING CONTROLS (2, 3,4) in DOWN position until Translauncher bogie king-pin thrust bearing can be mated with king-pin.

c. After bogie is engaged with king-pin; place FWD and AFT TRANSLAUNCHER LEVELING CONTROLS (2, 3, 4) in UP position until bogie clears ground.

d. After bogie is rotated 90°; place FWD and AFT TRANSLAUNCHER LEVELING CONTROLS (2, 3, 4) in DOWN position until bogie rests on ground.

#### 3-154. RETRACTING TRANSLAUNCHER LEVELING JACKS.

a. Insure hydraulic pressure is applied to Translauncher Hydraulic Control Panel.

b. Place Translauncher leveling controls (2, 3, figure 3-38) and Translauncher leveling control (4) in the down position until cylinders are fully retracted.

c. Return Translauncher leveling controls to neutral position.

#### 3-155. MOVING MISSILE TO LSMA.

##### NOTE

The missile must be in 1-1/2° nose up attitude (checkout position) secured with forward Missile tiedowns, and holdback bolt installed.

a. Insure bogie handbrake is released.

b. Insure that left and right wing walkers are in place.

##### CAUTION

Translauncher will not be transported more than two (2) miles per hour.

c. Transport Alert Missile to maintenance hard-stand.

#### 3-156. SECURING MISSILE IN LSMA.

a. Make static ground connection from Translauncher to ground rod.

b. Position Translauncher jack mud pads to receive leveling jacks.

c. Lower leveling jacks.

d. Disconnect fifth wheel from Translauncher.

e. At the direction of (spotter) move MM-1 Truck to parking area.

f. Shut down MM-1 Truck.

#### 3-157. OPERATING TRANSLAUNCHER HYDRAULIC CONTROLS DURING BOGIE REMOVAL.

a. Place FWD and AFT TRANSLAUNCHER LEVELING CONTROL (2, 3, 4, figure 3-38) in UP position until all bogie tires are off ground; then return controls to center position.

b. After bogie has been rotated 90 degrees; place FWD and AFT TRANSLAUNCHER LEVELING CONTROL (2, 3, 4) in DOWN position until bogie rests on ground and king pin thrust bearing is clear of mounting bracket.

c. After bogie has been pushed clear of king pin thrust pin; place AFT and FORWARD TRANSLAUNCHER LEVELING CONTROLS (2, 3, 4) UP until bogie will clear Translauncher then return controls to center.

d. After bogie is clear of Translauncher place AFT and FORWARD TRANSLAUNCHER CONTROLS in UP or DOWN position so as to level Translauncher as close to ground as possible.

NOTE

When power pack HYD OIL TEMP GAGE indicates below 90°F, place compensator shutoff switch ON until temp reaches 90°F then place switch OFF.

3-158. PURGING HCU.

a. Check to insure that HCU (figure 3-40) ground cable is connected to HCU GROUND stud, and to HCU-NTCU skid.

b. Insure that HCU has been drained of preservative hydraulic fluid.

c. Connect HCU power cable to receptacle J501 INPUT POWER on HCU control panel.

d. Remove dust caps from PRESSURE and RETURN connectors at front of Hydraulic Cycling Unit.

e. Connect hydraulic hoses from Power Pack to respective connectors at Hydraulic Cycling Unit.

f. Remove dust covers from PRESSURE and RETURN connectors on panel at rear of Hydraulic Cycling Unit.

g. Connect Missile hydraulic pressure and return hoses to respective connectors at Hydraulic Cycling Unit.

h. Remove U loop from stowage in engine pack drawer.

i. Connect U loop to free end of hoses.

j. Remove panel on right side of HCU and insure that circuit breaker is ON.

k. Remove panel on back of HCU and insure that circuit breaker is ON.

l. Insure that correct circuit breaker on Power Distribution Control Box is ON.

m. Rotate MANUAL BYPASS control (19, figure 3-18) fully CLOSED (cw).

n. Insure that RETURN BYPASS control (4) is OPEN (ccw).

o. Rotate SYSTEM OUTLET control (18) fully OPEN (ccw).

p. Depress and hold ACCUMULATOR DUMP switch three times, holding it for 10 seconds each time.

q. Place and hold LOCAL START switch on HCU ON for three 5-second intervals, waiting 45 seconds between each ON period.

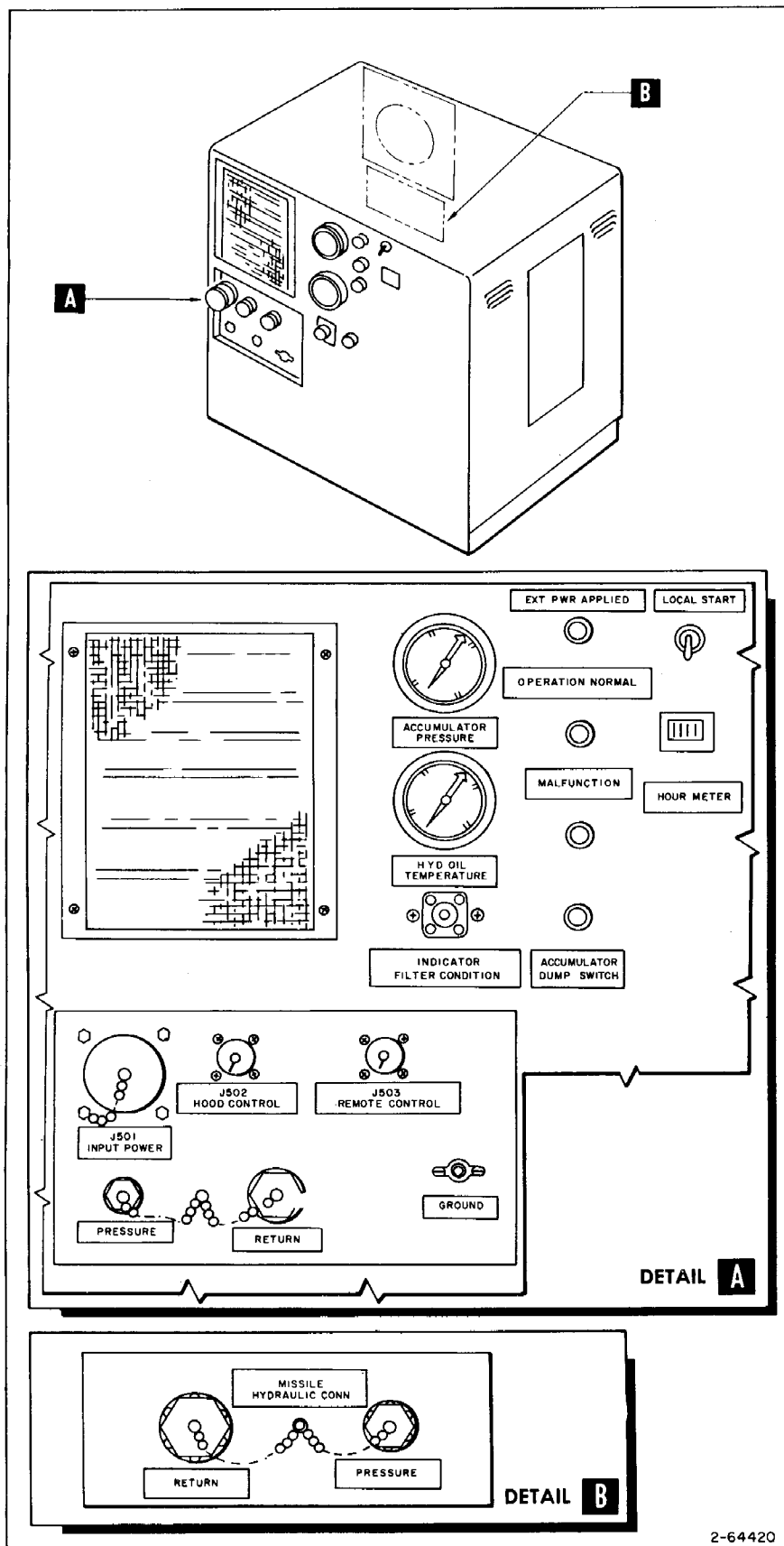


Figure 3-40 Hydraulic Cycling Unit

- r. Repeat step p.
- s. HOLD LOCAL START SW, in ON position for 1 min. or until NO air bubbles are seen in PP return flow indicator (7, fig. 3-18)
- t. Open drain valve at rear left bottom corner slightly to release air trapped in system.
- u. Install panels removed in steps i and j.
- v. Repeat steps p and q three times, or until an air-free flow of hydraulic fluid is observed in RETURN FLOW indicator.

NOTE

INDICATOR FILTER CONDITION sensing element may extend (popout) from HCU due to a hydraulic pressure surge. If sensing element is extended depress and wait one minute. If sensing element pops out within the one minute, replace filter.

- w. Rotate SYSTEM OUTLET control fully CLOSED (cw).
  - x. Rotate MANUAL BYPASS control fully OPEN (ccw).
  - y. Disconnect U loop and install dust caps and plugs.
  - z. Stow U loop in drawer of Engine Pack.
- 3-159. CONNECTING HYDRAULIC HOSES FROM HCU TO MISSILE.
- a. Remove special wrench, part number 258N9114-005 GI, from LCEG.
  - b. Obtain clean-squib housing assemblies for hydraulic pressure and return lines, if necessary.
  - c. Turn threaded portion of hydraulic pressure hose quick-disconnect, using special wrench, into squib assembly until threads have protruded approximately 1/2 inch past rubber seal of squib disconnect. Repeat this step for remaining hose.
  - d. Insure that power pack is connected to the HCU and that the SYSTEM OUTLET, MANUAL BYPASS and RETURN BYPASS valves are fully OPEN (ccw).
  - e. Insure that NTCU disconnect cable (s), part No. 435A620-013-100, has been disconnected from its respective receptacle at disconnect.
  - f. Connect hose to hydraulic return connector on Missile.
  - g. Turn hose quick-disconnect until rubber pad exerts slight pressure on Missile.
  - h. Repeat steps g thru h for hydraulic pressure hose.
  - i. Connect lanyards to hydraulic pressure, and return hose quick-disconnects.



## NOTE

When looking at lanyard post, the hydraulic pressure lanyard must be connected to the bottom ring and the hydraulic return lanyard connected to the center ring.

- j. Connect hydraulic hose quick-disconnect cables to NTCU Junction Box receptacles J7104 and J7105, and to Missile connections J8001 and J8002.
- k. Connect Hydraulic Cycling Unit remote control cable to Nose Temperature Control Unit receptacle J7106, and to Hydraulic Control Unit receptacle J503.

## 3-160. FILLING HYDRAULIC RESERVOIR.

- a. Insure that MANUAL BYPASS control (19, figure 3-18) is fully CLOSED (cw).
- b. Insure that SYSTEM OUTLET control (18) is OPEN (ccw).
- c. Rotate RETURN BYPASS control (4) fully OPEN (ccw).

## NOTE

Slight rod should be fully retracted.

- d. Rotate RETURN BYPASS control (4) fully CLOSED (cw).

## NOTE

Servo valve leakage flow will be directed into the Missile reservoir, causing it to fill very slowly. While the reservoir is filling, the SELECTOR PRESSURE gage (23) must indicate  $13 (\pm .37) H$  psi, where H is the height of the Missile reservoir above the gage in feet. When reservoir is full all flow will be diverted through the Power Pack return flow relief valve causing rapid rise in the return system and SELECTOR PRESSURE gage will indicate approximately 20 psi. The rapid rise in SELECTOR PRESSURE is a remote indication of a full Missile reservoir.

- e. Immediately rotate SYSTEM OUTLET control (18) fully CLOSED (cw).
- f. Disconnect Power Pack hydraulic hoses from Hydraulic Cycling Unit.
- g. Replace all dust caps and covers.
- h. Rotate RETURN BYPASS control (4) OPEN (ccw).

- i. Rotate MANUAL BYPASS control (19) fully OPEN (ccw).
- j. Insure that SYSTEM OUTLET control (18) is fully CLOSED (cw).
- k. Place MAIN SYSTEM switch (8) OFF.
- l. Momentarily close ACCUMULATOR DUMP switch on HCU. ACCUMULATOR PRESSURE gage must indicate between 23 and 27 psi.

3-161. ELEVATING MISSILE

NOTE

Insure that Missile umbilical cable, start-fuel hose and all other Missile cables and hoses are free of obstructions while raising Missile to launch attitude.

- a. Insure that the MANUAL BYPASS control (19, figure 3-18) on Power Pack Hydraulic Control Panel is CLOSED (cw) and SYSTEM OUTLET control (18) is OPEN (ccw).
- b. Insure that RESERVOIR VALVE is closed (9, Fig. 3-38).
- c. Rotate PRESSURE control (5, figure 3-38) on Translauncher hydraulic control panel to OPEN (ccw).
- d. Rotate BY-PASS VALVE closed (13, figure 3-38).
- e. SYSTEM PRESSURE gage (14) must indicate between 1500 and 1550 psi.
- f. Insure that aft missile support beams are fully raised and that aft linkage locks are engaged.
- g. Place FWD MISSILE ELEVATION CONTROL (12) to UP until up-locks engage.
- h. Place FWD MISSILE ELEVATION CONTROL (12) to DOWN until up-locks are firmly locked.

3-162. MECHANIC NO. 5 DETAILED INSTRUCTIONS.

## 3-163. POSITIONING NOSE AND BOOSTER VEHICLE FOR ROCKET MOTOR INSTALLATION OR REMOVAL.

## NOTE

During Rocket Motor installation or removal procedures, the Nose and Booster Vehicle must be positioned in proper relation to the Translauncher. With the Missile-laden Translauncher already in position, move the Nose and Booster Vehicle perpendicular to it, so that the left edge of the Nose and Booster Pack is approximately 45 to 55 inches from the translauncher aft raising mechanism cross member and the centerline of the Missile is aligned with the positioned turntable on the Nose and Booster Vehicle; i. e. the center point of the dolly-track cutouts is aligned with the centerline of the Missile. Both vehicles are now placed so that the booster dolly tracks may be installed.

- a. Set brakes and lock differential on Nose and Booster Vehicle.
- b. Remove stabilizing jack winch cranks from tool box on left side of vehicle.
- c. Install winch cranks on the two stabilizing jack winch crank shafts located on each side of aft end of Nose and Booster Vehicle.
- d. Pull up on latching mechanism release knobs, located near base of each winch, to unlatch stabilizing jacks.
- e. Rotate cranks to lower stabilizing jacks.
- f. Install jack braces, using quick release pins provided.
- g. Remove stabilizing jacks cranks from tool box on left side of vehicle and install cranks on splined shafts on each stabilizing jack.
- h. Remove mud pads from stowed position on each side of Nose and Booster Vehicle.
- i. Position mud pads on ground under each jack.
- j. Operate stabilizing jack cranks to lower jacks into mud pads.

## 3-164. REMOVING ROCKET MOTOR TIEDOWNS AND POSITION TURNTABLE.

- a. Take off the vinyl-coated nylon cover of the Rocket Motor; remove nylon cover loops; insure the turntable wheel blocks are secured to turntable tracks.
- b. Attach Rocket Motor sling approximately 6 inches aft of Rocket Motor support.
- c. Take turntable actuator crank from stowage in left tool box; attach crank to turntable via pin on crank.
- d. Loosen Rocket Motor dolly tiedowns, remove pin securing turntable jack to actuator support.

- e. Pin actuator to turntable gusset and remove dolly tiedowns; remove track support beam and the two 12-foot tracks from Nose and Booster Vehicle.
- f. Rotate actuator crank slowly until centerline of Rocket Motor is perpendicular to longitudinal axis of Nose and Booster Vehicle.
- g. Attach winch crank on dolly winch crank shaft; winch crank is stowed in left tool box on Nose and Booster Vehicle.
- h. Hook booster dolly winch cable to ring fastener on dolly and turn winch crank to take up slack.

CAUTION

If winch cable is too tight, damage to booster dolly may result; insure that cable connection to booster dolly is secure, and cable hook pulley, and cable are properly aligned and free of kinks, dirt, and foreign particles.

3-165. INSTALLING BOOSTER DOLLY TRACKS. (See figure 3-41.)

- a. Install track support beam into translauncher fitting on lowering beam cross member.
- b. Position the two 12-foot track support beam on Translauncher to Nose and Booster Vehicle; insure that small angles secured to each track at translauncher end are facing inward toward centerline.
- c. Secure spacer from left side of Nose and Booster Vehicle and place between tracks; adjust position of tracks as required to insert pins on track spacer in holes of track.
- d. Pin hinge ends of tracks to hinge fittings on turntable; tracks must be parallel and aligned with centerline of booster turntable. Do not force pins.

3-166. INSTALLING ROCKET MOTOR ON MISSILE. (See figure 3-41.)

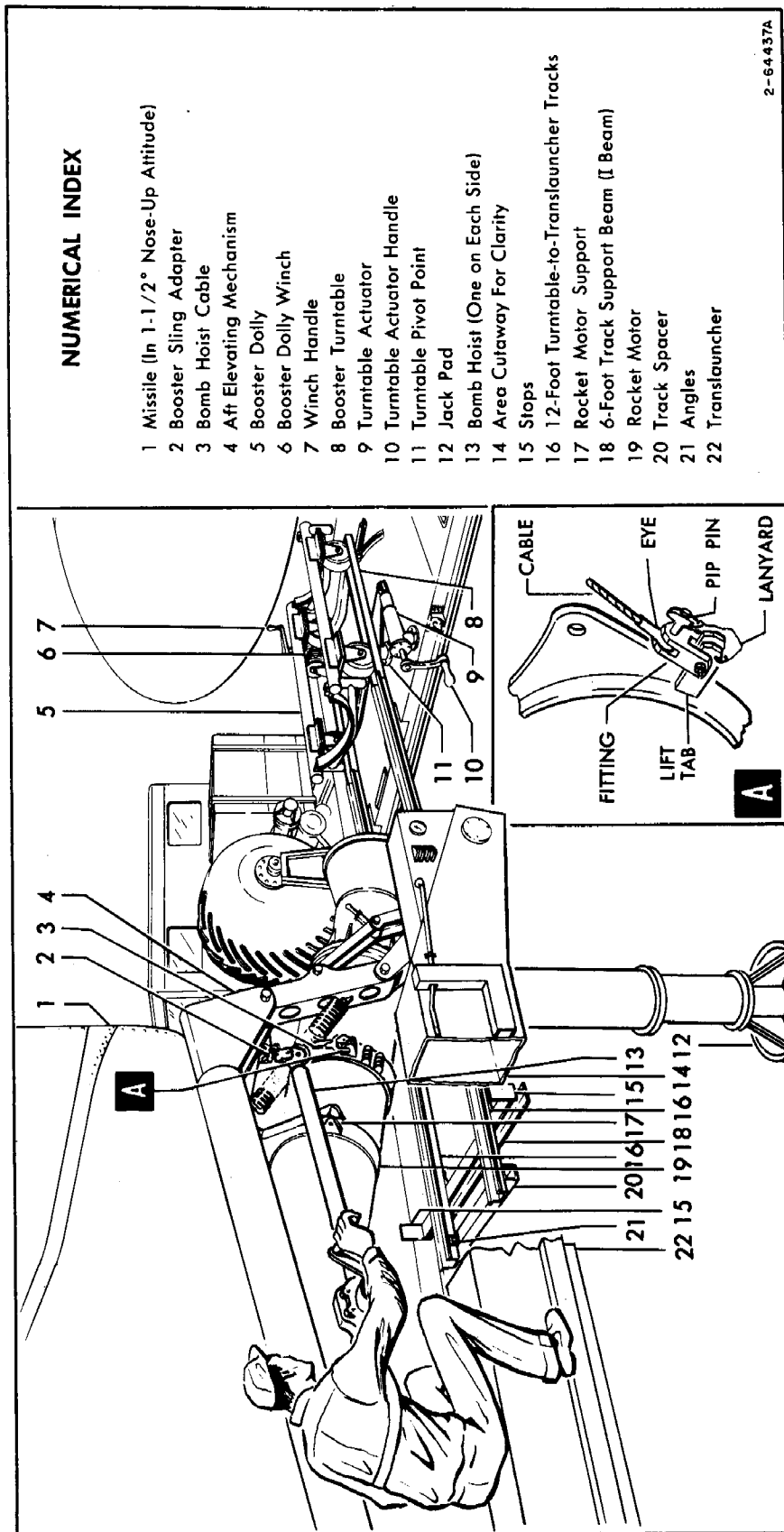
NOTE

Installation of the Rocket Motor is effected with the Missile on the Translauncher in THE CHECKOUT POSITION, also aft leveling jacks extended approximately 19-inches. Proceed as follows to assemble the Rocket Motor to the Missile.

CAUTION

Insure Safety and Arming plug is inserted in FIRE ARMING jack of UOB before installation of Rocket Motor.

- a. Attach bomb hoists (one on each side of Missile) on cross member of translauncher aft raising mechanism.
- b. Remove the two booster dolly wheel blocks from turntable tracks.
- c. Insure that Rocket Motor is firmly secured to booster dolly by tiedown straps.



**NUMERICAL INDEX**

- 1 Missile (In 1-1/2° Nose-Up Attitude)
- 2 Booster Sling Adapter
- 3 Bomb Hoist Cable
- 4 Aft Elevating Mechanism
- 5 Booster Dolly
- 6 Booster Dolly Winch
- 7 Winch Handle
- 8 Booster Turntable
- 9 Turntable Actuator
- 10 Turntable Actuator Handle
- 11 Turntable Pivot Point
- 12 Jack Pad
- 13 Bomb Hoist (One on Each Side)
- 14 Area Cutaway For Clarity
- 15 Stops
- 16 12-Foot Turntable-to-Translauncher Tracks
- 17 Rocket Motor Support
- 18 6-Foot Track Support Beam (I Beam)
- 19 Rocket Motor
- 20 Track Spacer
- 21 Angles
- 22 Translauncher

2-64437A

Figure 3-41. Arrangement for Installing Rocket Motor

- d. Attach Rocket Motor support, slots facing forward, to attachment lugs on Rocket Motor.

## NOTE

Never disconnect igniter cable at Deutsch connection except during Ordnance Area maintenance.

- e. Obtain trunnion pin from tool box and place it in missile trunnion fitting.
- f. Gently push booster dolly into the 12-foot tracks; winch operator must control movement of booster dolly by keeping winch cable taut as dolly moves down tracks.

## CAUTION

As Rocket Motor moves forward insure that forward support fitting and Rocket Motor do not strike anything. If Rocket Motor support will not clear the translauncher superstructure, raise translauncher via AFT & FWD TRANSLAUNCHER LEVELING CONTROL. Translauncher is lowered in same manner after Rocket Motor installation.

- g. Stop dolly when Rocket Motor sling adapter lugs are directly beneath hoist pulleys.

## CAUTION

Insert pip pin into fitting and cable eye from outboard side and facing away from sling adapter.

- h. Attach each bomb hoist eye in fitting on side of sling adapter; secure each eye with pop pins.
- i. Take up slack in bomb hoist cables.
- j. Loosen Rocket Motor tiedown straps by backing off T-bolts; remove pins securing tiedown to dolly; remove aft tiedown; then remove forward tiedown.
- k. Operate bomb hoist crank to slowly raise Rocket Motor clear of dolly; keep Rocket Motor balanced to facilitate removal of dolly.
- l. Operate booster dolly winch to draw dolly back onto turntable.
- m. Maintain Rocket Motor in position so that RATO support and ejection cylinder or forward support fitting accept fittings on Missile.
- n. Using bomb hoist, carefully raise Rocket Motor to a point where rear Rocket Motor supports will engage rear Rocket Motor support fittings.
- o. Rotate screwjack on cross member of translauncher aft raising mechanism until face plate of screwjack presses against aft side of Rocket Motor support when Rocket Motor is raised.

## CAUTION

Insure that center line of screwjack is at least one-half inch above bottom of Rocket Motor support.

- p. Insure that forward support fitting fork fits snugly against thrust fitting.

## NOTE

- If forward support fitting is an ejector cylinder type, the interval measurement between rear of slot of rocket motor support and support pins on missile must be between  $3/8$  and  $7/16$  inch. If forward support fitting is single piece type, the interval measurement between rear of slot of rocket motor support and support pins on missile must be between zero contact (visible clearance) and  $7/16$  inch.
- If dimensions are not within specified tolerances, lower rocket motor to convenient level, remove safety wires (if applicable). Adjust by rotating forward support fitting either CW or CCW as required. Each  $\frac{1}{2}$  rotation will change adjustment  $1/32$  inch. Install safety wire if applicable.

## WARNING

Insure that both FWD LOCKING MECHANISMS are free to move up and down.

- q. With Rocket Motor supported by forward support fitting fork and Rocket Motor support and held in place by screwjack, release bomb hoist cables from booster sling adapter.
- r. Remove and stow sling adapter and bomb hoists.
- s. Install the two wheel blocks on turntable tracks. Detach winch cable from dolly. Secure end of cable to pack-bed fitting.
- t. Remove tracks and support beam.
- u. Rotate turntable to transport position.
- v. Stow tracks and support beam.
- w. Connect four tiedowns to Rocket Motor dolly eyebolts and pack-bed fittings. Do not tighten tiedowns.
- x. Remove pin securing turntable actuator to turntable gusset; pin actuator to actuator support.
- y. Tighten booster dolly tiedowns.
- z. Remove and stow winch crank and turntable actuator crank in tool box on left of Nose and Booster Vehicle.
- aa. Operate stabilizing jack crank to retract stabilizing jack.

- ab. Remove jack brace pins and stow braces on pack bumper.
- ac. Raise stabilizing jacks to stowed position using winch crank.
- ad. Stow crank in left tool box on Nose and Booster Vehicle.
- ae. Stow jack pads near each winch on pack bed; stow Rocket Motor cover over dolly and move Nose and Booster Vehicle to location forward of translauncher for Nose installation.

3-167. POSITIONING NOSE AND BOOSTER VEHICLE FOR NOSE/WARHEAD INSTALLATION OR REMOVAL.

- a. Back Nose and Booster Vehicle to approximately 3 feet from front of Translauncher.
- b. Lower Translauncher approximately level with Nose and Booster Vehicle.

NOTE

Bottom of Translauncher and top of pack bed of the Nose and Booster Vehicle must be even.

- c. Remove bumper tubes from tool box on left side of vehicle; install tubes in retainers on front of Translauncher.
- d. Carefully back vehicle toward Translauncher until pack bumper is within approximately 2 inches of bumper tube; keep Nose and Booster Vehicle parallel to Translauncher with vehicle and translauncher center-lines not displaced more than 4 inches.
- e. Set brakes and lock differential on Nose and Booster Vehicle.
- f. Remove stabilizing jack winch cranks from tool box on left side of vehicle.
- g. Install winch cranks on stabilizing jack winch crank shafts, one located on each side of aft end of vehicle pack.
- h. Pull up on latching mechanism release knobs, located near base of each winch, to unlatch stabilizing jacks.
- i. Rotate cranks to lower stabilizing jacks.



- j. Install jack braces, using quick-release pins provided.
- k. Remove stabilizing jack cranks from tool box on left side of vehicle and install cranks on splined shaft of each stabilizing jack.
- l. Remove mud pads from stowed position on each side of vehicle pack.
- m. Position mud pads on ground under each jack.
- n. Operate stabilizing jack cranks to lower jacks into mud pads.
- o. Operate stabilizing jack cranks as necessary to level deck of vehicle pack.

## 3-168. DISCONNECTING NOSE PACKAGE/CENTER SECTION CONNECTIONS.

- a. Remove Center Section Access panel.
- b. Disconnect air conditioner duct.
- c. Disconnect static air pressure hose.
- d. Disconnect Nose Package/Center Section cables.

P 8701A from TBF 8701  
P 8910 from TBF 8910  
P 8697A from TBF 8697  
P 8698A from TBF 8698

## 3-169. POSITIONING NOSE HANDLING MECHANISM. (See figure 3-42.)

- a. Loosen, but do not remove nose section tiedowns.
- b. Tighten bolt-type handles on nose-handling mechanism ELEVATING JACK DRIVE Hand crank and PITCH CONTROL Handle.

## NOTE

Insure that ball socket clamps and wing nuts are tight.

- c. Remove nose section tiedowns.
- d. Rotate ELEVATING JACKS to raise Nose-Warhead Section.
- e. Remove forward and aft chocks.
- f. Rotate AZIMUTH DRIVE crank on left console in required direction to align Nose-Warhead Section with the Missile.

## NOTE

Do not exceed a difference of more than 4 inches between left and right elevation jack when raising Nose-Warhead Section.

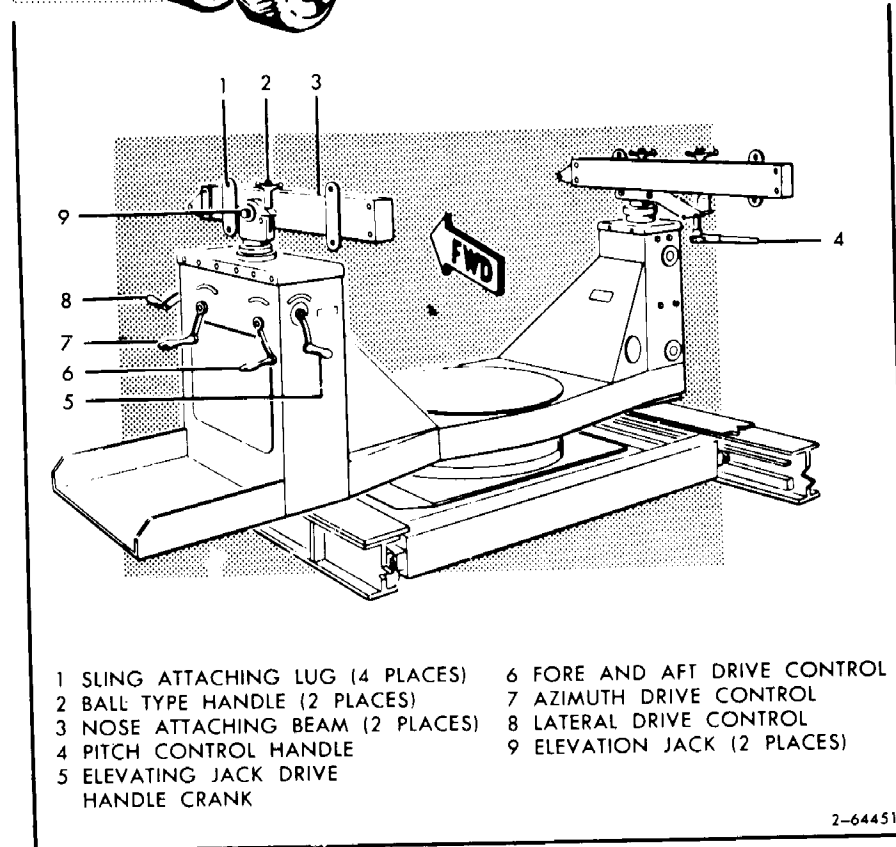
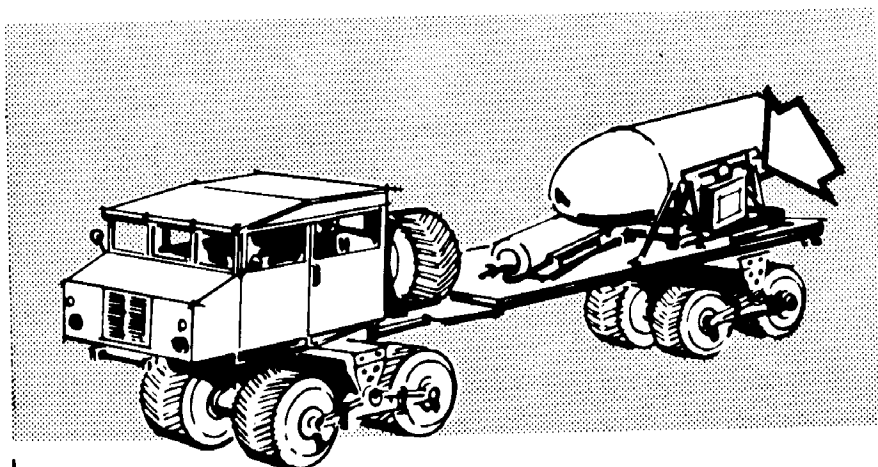


Figure 3-42. Nose Handling Mechanism

g. Rotate ELEVATING JACK DRIVE hand crank FORE AND AFT DRIVE control, AZIMUTH DRIVE control, LATERAL DRIVE control, and PITCH control handles, until Nose-Warhead Section is correctly aligned.

3-170. REMOVING NOSE/WARHEAD SECTION.

- a. Install attachment beams on Nose Section.
- b. Adjust AZIMUTH DRIVE control FORE and AFT DRIVE control, LATERAL DRIVE control, ELEVATING JACK DRIVE hand crank, and PITCH CONTROL, to align support balls on attachment beams with fittings on top of elevation jacks. (See figure 3-43.)
- c. Secure upper fittings over support balls.

CAUTION

Insure that PITCH CONTROL is secure and in proper alignment.

- d. Remove the four splice bolts which secure Center Section to Warhead Section.
- e. Slowly rotate FORE and AFT DRIVE control to remove Warhead Section from Center Section.
- f. When Warhead Section is clear of Center Section, rotate AZIMUTH DRIVE control until Nose Section is approximately 20 degree to left of pack center line.
- g. Install forward and aft chocks.
- h. Rotate FORE and AFT DRIVE control to move Nose Section toward front of pack until frame of nose mechanism is approximately 1-1/2 inches from forward chock.

NOTE

Do not exceed a difference of more than 4 inches between left and right elevation jacks when lowering Nose Section.

- i. Rotate ELEVATING JACK DRIVE hand crank FORE and AFT DRIVE control AZIMUTH DRIVE control, LATERAL DRIVE control, and PITCH CONTROL handle until Nose Section rests on chocks.
- j. Install Nose Section tiedown.
- k. Operate stabilizing jack crank to retract stabilizing jacks.
- l. Remove jack crank, and stow in tool box on left side of vehicle.
- m. Remove jack brace pins, and stow braces on jack bumper.
- n. Raise stabilizing jacks to stowed position using winch crank.
- o. Move truck clear of translauncher.
- p. Remove bumper tubes from translauncher: stow then in tool box on left side of Nose and Booster Vehicle.

- q. Remove and stow winch crank on left side of vehicle.
- r. Stow jack pads on vehicle near winch.

3-171. INSTALLING NOSE/WARHEAD SECTION. (See figure 3-43.)

- a. Remove cap from bleed-air line through access door in bottom of Center Section.
- b. Guide cables through access door.
- c. Carefully adjust ELEVATING JACK DRIVE hand crank FORE AND AFT DRIVE control, AZIMUTH DRIVE control, LATERAL DRIVE control, and PITCH CONTROL, to align Nose and Warhead Section to Center Section.
- d. With guide pins on Center Section aligned with guide holes in Nose and Warhead Section, secure Nose and Warhead Section to Center Section at splice fittings with four tension bolts.
- e. Loosen ball-type handles on elevating jacks and pitch control mechanism, and swing upper fittings back.
- f. Rotate ELEVATING JACK DRIVE hand crank to lower elevating jacks clear of attaching beams.
- g. Unbolt attachment beams from Nose/Warhead Section.
- h. Rotate FWD AND AFT DRIVE control to move carriage FWD on Pack.
- i. Operate stabilizing jack crank to retract stabilizing jack.
- j. Stow tiedown straps, chocks, and attachment beams on Nose and Booster Vehicle.
- k. Remove jack crank and stow in stowage box on left side of vehicle.
- l. Remove jack brace pins and stow braces on jack bumper.
- m. Operate winch cranks to raise jacks to stowed position.
- n. Stow and secure mud pads near each winch on jack bed.

3-172. CONNECTING NOSE/CENTER SECTION CONNECTIONS.

- a. Connect Nose Package/Center Section cables.
  - P 8701A to TBF 8701
  - P 8910 to TBF 8910
  - P 8697A to TBF 8697
  - P 8698A to TBF 8698
- b. Connect static air pressure hose.
- c. Connect air conditioner duct.
- d. Install Center Section Assess panel.

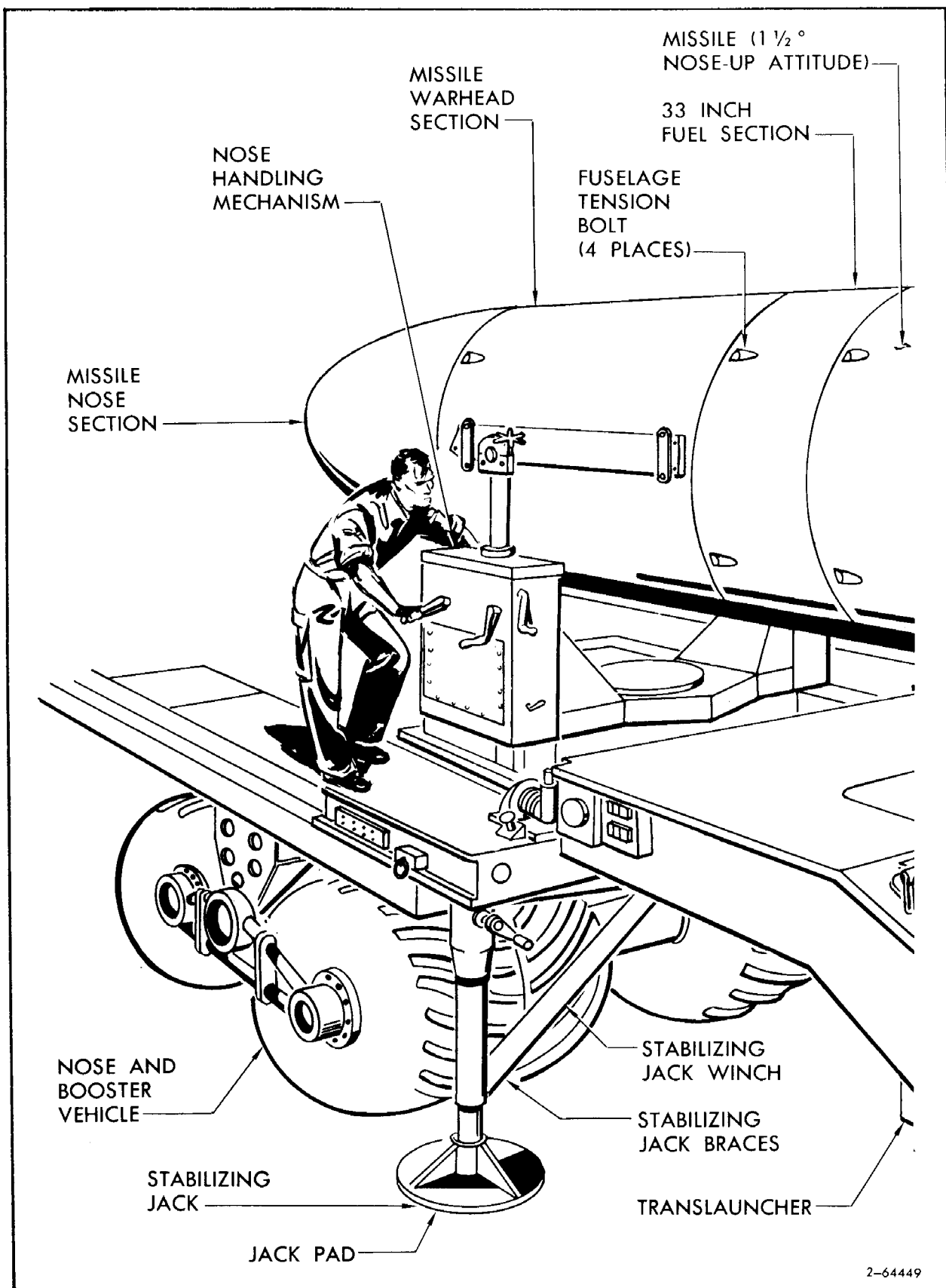


Figure 3-43. Installing Nose and Warhead

3-173. REMOVING ROCKET MOTOR FROM MISSILE.

NOTE

Never disconnect igniter cable at Deutsch connection except during Ordnance Area maintenance.

- a. Attach turntable actuator crank to turntable actuator jack using pin on crank. Crank is stowed in tool box on left of Nose and Booster Vehicle.
- b. Loosen booster dolly tiedown.
- c. Take out pin securing turntable actuator jack to actuator support; pin actuator to turntable gusset.
- d. Remove booster dolly tiedowns.
- e. Turn actuator crank to align centerline of booster dolly with centerline of trans-launcher.
- f. Attach winch crank on booster dolly winch crank shaft, and attach booster dolly winch cable to ring fastener on dolly; turn winch crank to take up slack in cable.
- g. Attach bomb-hoists (one on either side of Missile) to cross member of translauncher aft raising mechanism.
- h. Attach booster adapter sling approximately 6 inches aft of RATO support.

NOTE

If booster dolly will not clear Rocket Motor, raise Translauncher using FWD and AFT TRANSLAUNCHER ELEVATION CONTROL(s). Lower translauncher in the same manner after Rocket Motor has been removed.

- i. Move booster dolly into tracks to point where booster dolly is just below hoists.

CAUTION

Insert pip pin into fitting and cable eye from outboard side and facing away from sling adapter.

- j. Attach each bomb hoist eye in fitting on side of sling adapter; secure each eye with pip pin. Take up slack in bomb hoist cables. (See figure 3-41.)
- k. Turn screwjack handle on crossmember of Translauncher to release Rocket Motor support from thrust fitting on Missile; maintain balance of Rocket Motor to facilitate removal.
- l. Position Rocket Motor on booster dolly; center RATO sling between lines on booster dolly nameplate.
- m. Strap Rocket Motor to booster dolly with tow tiedowns. Tighten bolts to 100 pound-inches of torque.

- n. Remove and stow bomb hoists.
- o. Using winch crank, return booster dolly to turntable; install the two wheel blocks on turntable tracks.
- p. Detach winch from booster dolly; secure end of cable to pack bed fitting.
- q. Remove tracks and support beam.
- r. Rotate turntable to transport position.
- s. Stow tracks and support beam.
- t. Connect four tiedowns from booster dolly to pack bed. Remove and stow turntable actuator crank in tool box.
- u. Unpin turntable actuator from turntable. Pin driven end to actuator support on pack bed.

#### 3-174. INSTALLING ROCKET MOTOR TIEDOWNS.

- a. Pin turntable actuator to turntable gusset and install dolly tiedowns loosely.
- b. Tighten booster dolly tiedown; position Rocket Motor cover over Rocket Motor and dolly so that support frame pins fit in holes in pack bed; lace cover to pack bed fittings.
- c. Using stabilizing jack crank, retract stabilizing jacks. Remove crank and stow in tool box. Remove jack brace pads near each winch on pack bumper.
- d. Raise jacks to stowed position using winch crank. Stow jack pads near each winch on pack bed.
- e. Remove bomb hoists from Translauncher fittings, stow hoists on Nose and Booster Vehicles.
- f. Remove trunnion pin from missile trunnion fitting and stow in tool box of T/L.
- g. Install pin securing turntable jack to actuator support and tighten tiedowns.
- h. Insure that all equipment is secured for transportation.

#### 3-175. DISCONNECTING NOSE SECTION FROM WARHEAD SECTION.

##### NOTE

Insure that the following steps are performed prior to moving the Nose Section away from the Warhead Section.

- a. Disconnect static air pressure hose.
- b. Disconnect and guide air conditioner intake duct.

c. Disconnect Nose Section/Warhead Section cables:

P8603 from J9403  
P8602 from J9402  
P8601 from J9401  
P8918a from J9418a  
P8616 from J9416  
P8621 from J9421  
P8817 from J9417  
P8615 from J9415  
P8604 from J9404

3-176. POSITIONING MODIFIED NOSE AND BOOSTER VEHICLE FOR NOSE SECTION INSTALLATION OR REMOVAL.

a. Carefully back Nose and Booster Vehicle toward front of Translauncher. Keep vehicle parallel to translauncher. Position empty nose cradle under Nose Section coincident with cradle position marking on the underside of Nose Section.

b. Set brakes and lock differential on Nose and Booster Vehicle.

c. Remove stabilizing jack cranks from tool box on left side of Nose and Booster Vehicle.

d. Pull up on latch handle located on left and right sides at rear of Vehicle to release stabilizing jacks from stowed position.

e. Install jack braces with quick release pins.

f. Install jack cranks on splined shaft on each stabilizing jack.

g. Remove mud pads from stowed position on each side of Vehicle.

h. Position mud pads on ground under each jack.

i. Operate stabilizing jack cranks to lower jack onto mud pads.

j. Operate stabilizing jack cranks as necessary to stabilize deck of vehicle pack.

3-177. POSITIONING MODIFIED NOSE HANDLING MECHANISM.

a. Release tiedown support turnbuckles.

b. Remove bolts on each end of nose retaining beam; remove beam and place out-of-way on Nose and Booster Vehicle; then place bolts (finger tight) in duplicate holes on empty cradle.

c. Do not remove nose retaining straps.

d. Rotate ELEVATION JACK DRIVE, FORE AND AFT DRIVE, AZIMUTH DRIVE, LATERAL DRIVE, and PITCH CONTROL cranks until empty nose cradle is securely positioned under Nose Section.

3-178. REMOVING NOSE SECTION.

a. Remove the four AN8-13 bolts securing Nose Section to Warhead Section.



- b. Slowly rotate FORE AND AFT DRIVE control to remove Nose Section from Warhead Section.
- c. Bolt nose retaining beam in place on replaced nose cradle.
- d. Carefully rotate nose cradles 180° until replacement Nose Section is positioned for installation; using ELEVATION JACK DRIVE FORE AND AFT DRIVE, AZIMUTH DRIVE, LATERAL DRIVE, and PITCH CONTROL cranks.
- e. Remove nose retaining straps from replacement Nose Section and install on replaced Nose Section.
- f. Cap all electrical receptacles and lines on replaced Nose Section.

### 3-179. REPLACING NOSE SECTION.

- a. Remove all caps from electrical receptacles and lines on replacement Nose Section.
- b. Slowly rotate FORE AND AFT DRIVE control to install Nose Section on Warhead Section.
- c. Secure Nose Section to Warhead Section with four tension bolts AN8-13 torqued to 480-690 inch-pounds.
- d. Rotate ELEVATION JACK DRIVE, FORE AND AFT DRIVE, AZIMUTH DRIVE, LATERAL DRIVE, and PITCH CONTROL cranks until Nose Handling Mechanism is in the transport position.
- e. Insure that nose retaining straps are tight.
- f. Secure tiedown support turnbuckles.
- g. Operate stabilizer jack cranks and raise stabilizing jacks to stowed position.
- h. Remove and stow jack cranks in vehicle tool box.
- i. Remove jack brace pins and stow braces on jack bumper.
- j. Operate winch cranks to raise jacks to stowed position.
- k. Stow mud pads on vehicle.
- l. Remove Nose and Booster Vehicle to out-of-way area.

### 3-180. CONNECTING NOSE SECTION TO WARHEAD SECTION.

- a. Connect the following Nose Section/Warhead Section cables:

P8601 to J9401  
P8602 to J9402  
P8603 to J9403  
P8604 to J9404  
P8615 to J9415  
P8616 to J9416  
P8817 to J9417  
P8918a to J9418a  
P8621 to J9421

- b. Align and connect air conditioner intake duct.
- c. Connect static air pressure hose.

3-181. CONNECTING WARHEAD INTERLOCK CABLE.

- a. Connect W/H interlock cable plug P9049 to W/H interlock receptacle J9049 on output junction panel of SRP.
- b. Connect W/H interlock cable plug P8818a to receptacle J8818a on Missile-to-W/H cable bracket.
- c. Insure that shorting plug has been removed from receptacle J9417 at station 21 and that plug P8817 of Missile-to-W/H cable is connected to receptacle J9417.

3-182. OBSERVING STABILIZER ACTUATOR PACKAGE DURING CYCLING OPERATION.

- a. Observe stabilizer actuator package for leaks and proper operation.
- b. Observe hydraulic lines and fittings for leaks during operation.

3-183. DISCONNECTING WARHEAD INTERLOCK CABLE.

NOTE

After Missile power has been removed, perform the following steps.

- a. Disconnect warhead interlock cable plug P8818a from receptacle J8818a on missile-to-warhead cable bracket.
- b. Disconnect warhead interlock cable plug P9049 from warhead interlock receptacle J9049 on output junction panel of the SRP.
- c. Stow W/H interlock cable in SRP.

3-184. DISCONNECTING WARHEAD.

- a. Remove W/H access panel.
- b. Disconnect from Missile-to-W/H cable bracket W/H stub cables:

P3A from J8825A  
P3A from J8826A  
P1A from J8818A.

NOTE

The P3A connectors may have previously been connected interchangeably to J8825A and J8826A.

- c. Remove Missile-to-W/H cable bracket (if applicable).

## NOTE

If W/H is to remain disconnected for any appreciable length of time or if Warhead Section is to be moved, the warhead cable storage bracket must replace the missile-to-W/H cable bracket and the W/H stub cables must be connected to the W/H cable storage bracket.

- d. Install W/H cable storage bracket. (if applicable).

## NOTE

Install W/H cable storage bracket on warhead, using two camlock fasteners, so that the bracket is at a right angle to the former position of the missile-to-W/H cable bracket.

- e. Connect to W/H cable storage bracket W/H stub-cable.
- f. Inspect safety wire on warhead pigtails for security and lead sealing. If wire is broken or lead seal is missing notify the NCOIC to contact Armament Maintenance.

## 3-185. DISCONNECTING SQUIB FIRING CABLES.

## NOTE

The procedures in this paragraph are to be performed only when required for safety.

- a. Disconnect the following cable connections.

RFT Squib Firing Cable	FROM	RFT Squib
P8001	FROM	J8001 on Hyd Quick disconnect (Press)
P8002	FROM	J8002 on Hyd Quick disconnect (Return)
P8003	FROM	J8003 on NTCU Disconnect fitting ON W/H BRACKET

## WARNING

Insure that shorting plug and/or caps are secure in place after removal of squib firing cables.

- b. Place dust caps on disconnected firing cables.

## 3-186. DISCONNECTING HCU HYDRAULIC HOSES FROM MISSILE.

- a. Insure that squib firing cable has been disconnected from pressure and return disconnects.
- b. Disconnect restraining lanyard from hydraulic hoses and common ground cable.
- c. Disconnect hydraulic hose and ground cable from Missile by pulling on hose disconnects and ground disconnect. Install short Hyd cycling U hose.

## 3-187. REMOVING RIGHT TRANSLAUNCHER JACK PADS AND SUPPORT FITTINGS.

- a. Remove jack pads and fittings without changing the adjustments of the support fittings.
- b. Position the jack pads and support fittings to the right of the Translauncher in a safe location for reinstallation on the replacement missile.

## 3-188. CONNECTING SQUIB FIRING CABLES.

- a. Insure that the following squib firing cables are connected at the NTCU.
  - 258R9900025-249 (NTCU duct)
  - 435A620-010-700 (Hydraulic pressure hose)
  - 435A620-010-500 (Hydraulic return hose),  
(W/H ENABLING CABLE)
- b. Insure that LCEG end of Squib firing cable (435A987-007-100 RFT cable) is connected to proper connector of LCEG.
- c. Remove dust caps from squib end of firing cables.
- d. Obtain Multimeter; check P8001 pins A and B for AC or DC voltage, use lowest AC and DC range; meter indications must be zero.

## WARNING

If voltage indication is obtained, notify the NCOIC. Do not connect squib cables. After malfunction has been corrected, repeat step d, meter indication must be zero.

- e. Connect firing cable P8001 to J8001.
- f. Repeat steps d and e for remaining cables listed in step a connecting P8002 to J8002 and P8003 to J8003, hydraulic return and NTCU disconnect. *ADD WIRE*
- g. Using Multimeter, check between pins A and B, between C and B on squib end of receptacle of RFT squib firing cable. Use lowest AC and DC voltage range; meter indication must be zero.
- h. Remove shorting plug from RFT cable squib and connect squib firing cable to squib.
- i. Disconnect and stow Multimeter.

## 3-189. PERFORMING INTERLOCK CONTINUITY TEST.

- a. Obtain electrical continuity tester (258H9912960) and continuity test cable (258H9910117-299).

## NOTE

Electrical continuity tester is stowed in the SRP; Continuity test cable is stowed in the lid of the electrical continuity tester.

b. Connect continuity test cable P8818A (test cable) to J8818A (missile-to-W/H cable bracket P6001 (test cable) to J6001 (continuity tester).

## NOTE

When tester lid is opened tester should come on.

- c. Rotate test selector switch to CAL.
  - (1) Depress, hold CAL switch.
  - (2) Rotate until needle indicates full scale.
  - (3) Release CAL switch.
- d. Press-to-test No-Go indicators, replace bulbs if required.
- e. Notify NCOIC to have Missile Power turned on.
- f. Rotate test selector switch from 1 through 12 sequentially.
  - (1) Note dial and light indications.
  - (2) Rotate Test selector switch to BAT-OFF.

## NOTE

Dial indicators on the tester face panel must be less than 2 ohms for each of the 12 positions. The no-go indicator light functions are independent of the dial readings. Absence of a no-go indicator light indicates a go-condition. An ARM 1 no-go indicator light indicates malfunction of the target area timer in the interlock control. An ARM 2 no-go indicator light indicates inadvertant activation of a squib that is serving a W/H arming function. A DETONATE no-go indicator light indicates prior activation of a detenate squib.

- g. Notify NCOIC to have Missile Power turned OFF.
- h. Disconnect continuity test cable P8818A (test cable) from J8818A (missile-to Warhead Cable Bracket) P6001 (test cable) from J6001 (continuity tester).
- i. Stow continuity test cable in tester cable.
- j. Stow Electrical continuity tester in SRV.

## 3-190. CONNECTING WARHEAD.

- a. Disconnect warhead stub cables P3A (two) and P1A from warhead cable storage bracket.
- b. Secure warhead cable storage bracket in the alternate position.
- c. Install the missile-to-warhead cable bracket using the two cable Camlock fasteners. The Missile-to-cable bracket should be at right angle to the former position of the warhead cable storage bracket.

- d. Connect warhead stub cables to missile-to-warhead cable bracket.

P3A to J8825A  
P3A to J8826A  
P1A to J8818A

NOTE

The P3A connectors may be connected interchangeably to J8825A and J8826A.

- e. Inspect all cable connections at station 21 for proper connection and tightness.
- f. Inspect fuse package for proper connection and tightness.
- g. Inspect safety wire on warhead pigtails for security and lead sealing. If broken or lead seal is missing, notify NCOIC to contact Armament Maintenance.

3-191. PERFORMING STRAY VOLTAGE CHECK OF UOB.

- a. Obtain Multimeter; rotate range selector to 2.5 V and function selector to + DC and insure that meter is operative.

WARNING

Insure that P9015 of igniter cable is disconnected from J9015 on UOB.

- b. Connect negative lead of Multimeter to pin A of J9015 on Umbilical Outlet Box (figure 3-12) and positive lead to pin B.
- c. Remove Safety and ARMING plug from Safety and ARMING jack on UOB.
- d. Indication on multimeter must be zero.
- e. Connect negative lead of multimeter to pin C of J9015 and positive lead to pin D.
- f. Indication on multimeter must be zero.
- g. Insert Safety and ARMING plug into Safety and ARMING jack on UOB.
- h. Indication on multimeter must be zero.
- i. Connect negative lead of multimeter to pin A of J9015 and positive lead to pin B.
- j. Indication on multimeter must be zero.
- k. Place range selector switch of Multimeter to 50V.
- l. Connect negative lead of Multimeter to pin L of J9015 and positive lead to pin H.
- m. Indication on multimeter must be zero.
- n. Disconnect and stow Multimeter.

3-192. CONNECTING IGNITER CABLE TO UOB.

WARNING

Insure that indicator lamp on UOB is not on. Also, insure that 30-foot igniter cable is connected to 2.5 foot igniter cable on Rocket Motor and that lanyard is connected to igniter cable.

- a. Connect P9015 of 30-foot igniter cable to J9015 on UOB.

## SECTION IV

## SUPPLEMENTAL INSTRUCTIONS

4-1. GENERAL.

4-2. This section contains detailed supplemental instructions for the NCOIC and the Missile Maintenance Crew. These procedures are not normally a part of the checklist in section II. The following procedures are used as a reference in preparing to perform the tasks referenced in Section II and III of this Technical Instruction.

4-3. MISCELLANEOUS PROCEDURES.

## 4-4. LAUNCH SITE REQUIREMENTS.

4-5. Before the launch flights occupy their assigned launch sites, the launch sites will have been surveyed. Each two adjacent sites will have two or more theodolite alignment points and survey reference lines will be marked with a launch site location number and theodolite alignment point number.

4-6. The Launch Area will have an assigned launch reference point and a basic launch heading. The survey team provides this information to the Wing Missile Operations Center, where it is used to identify the launch area for the Data Processing Unit. The launch area location numbers are used on the forms prepared for the data pack.

4-7. The prelaunch data card gives the distance from the assigned launch reference point to the lock-on box.

4-8. The surveying of the theodolite alignment point D and the reference line-of-flight line is accomplished within the third order of transverse surveying. The theodolite alignment point D and the reference point F will serve as points D and F for two adjacent launch pads (figure 4-1). The figure shows a typical pad #1 and pad #2 or pad #3 and pad #4-surveying system of points. The theodolite alignment point D must be within 30 to 100 feet from each pad and within the 135 degree area of both Missiles. This point must be a ground marker allowing the theodolite to be positioned directly above it.

4-9. The target reference point F (figure 4-1) is a marker elevated so that it can be seen from the theodolite alignment point D. It is located between 60 feet and one-half mile from the theodolite alignment point.

4-10. The bearing between the target reference point F and the theodolite alignment point D must be determined and marked on the bottom of the pre-launch data card for future reference. (See figure 4-2.)

4-11. DETERMINING FORWARD AND REAR ALIGNMENT POINTS. The forward and rear alignment points must be positioned at the launch site before positioning translauncher. The procedures for determining these points are contained in paragraph 4-12 through 4-14 and are performed under the supervision of the Launch Control Officer.

4-12. POSITIONING THEODOLITE.

- a. Obtain bearing of desired missile heading from pre-launch data card.
- b. Remove tripod assembly from test accessory shelf.



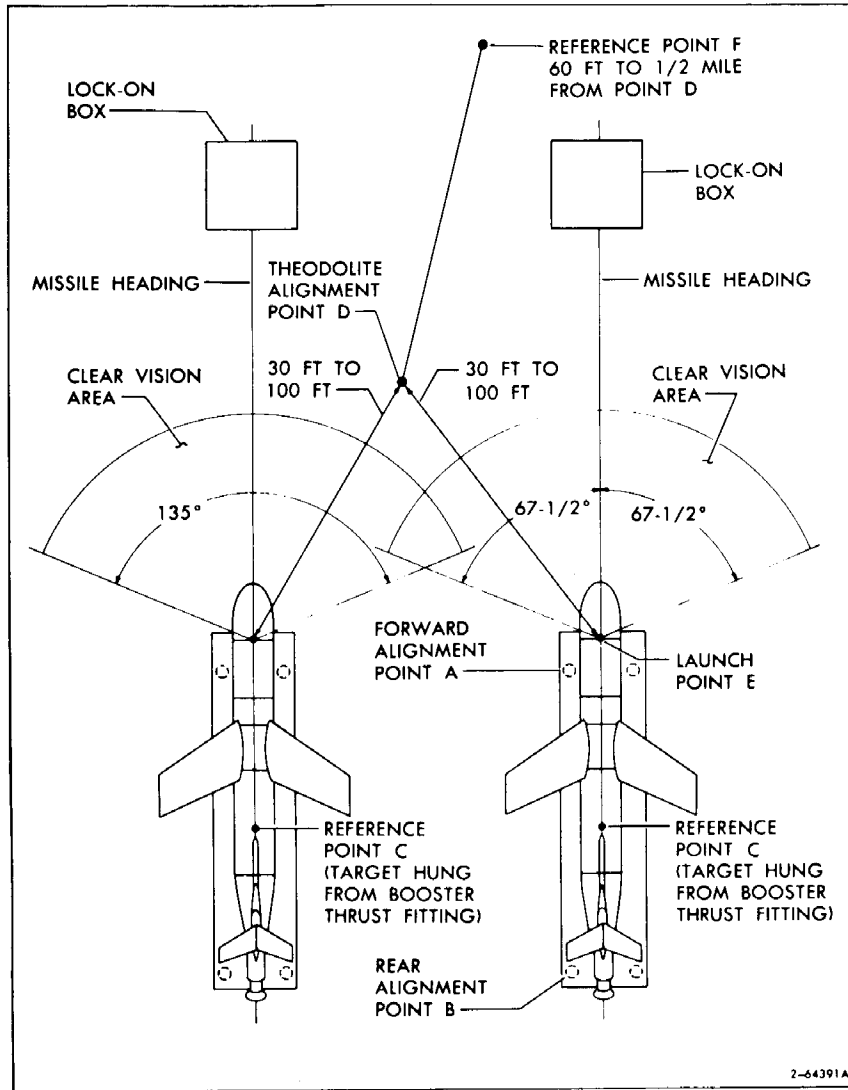


Figure 4-1. Azimuth Alignment

- c. Loosen wing nuts to extend tripod legs as required; then retighten.
- d. Erect and position tripod over theodolite alignment point D.
- e. Remove plumb line and bob from leather kit.
- f. Insert plumb line into inner bolt of central fixing screw, and lock it by firmly pushing upward and rotating.
- g. Adjust length of plumb line as necessary so that bob hangs approximately 2 inches above marked point.
- h. Position tripod so that bob is directly over center of marker.

PRELAUNCH DATA CARD	
MAP SYN. NR.	<u>F-101-4</u>
SACEUR NR.	<u>1111</u>
B. E. NR.	<u>2222-4444</u>
DATE	<u>4 JULY 1956</u>
LAUNCH SITE:	<u>#8 Zebra Able Nector;</u>
	<u>22° 22' 22.2" N,</u>
	<u>22° 22' 22.2" W</u>
LOCK ON HDG.	<u>220° 00' 00"</u>
LATITUDE ADJUST.	<u>51° E</u>
PROGRAMMER UNIT CONTROL:	
DETONATE	<u>.1B OR .1A</u>
LATERAL OFFSET	<u>.1L OR .1R</u>
AGP FT TO LOCK ON	<u>1111.1</u>
TIMER (basic AGP)	<u>58 SEC</u>
HEIGHT OF BURST	<u>1000'</u>
PAD NR.	_____
COURSE ADJ.	_____
LAUNCH HDG.	_____
TIMER (corrected AGP)	_____
CONT ARM INTERLOCK	<u>24 Sec</u>
465A410-004-1	
2-64380	

Figure 4-2. Sample Prelaunch Data Card

NOTE

When positioning tripod, exert pressure on tripod legs using foot levers provided.

- i. Insure that tripod is firmly set; then remove plumb line and bob.

NOTE

After every use of plumb line and bob, replace them in leather kit mounted on tripod. If at any time the tripod is moved from its original position, paragraphs 4-10 through 4-13 must be repeated.

CAUTION

The theodolite is a delicate piece of precision equipment and must always be handled with extreme care. When lifting theodolite, always grasp it by the right side of telescope yoke as judged when looking into the microscope eyepiece; never grasp it by the left side.

- j. Obtain theodolite (figure 4-3); loosen two locking levers by pulling outward on both ends of leather strap, and remove theodolite casing.

- k. Loosen the three black screws which secure theodolite to casting. This will release the three slides.

- l. Slide back the three slides released in step k.

- m. Loosen vertical clamp screw (15)

- n. Position telescope to horizontal position with illuminating diaphragm mirror control (2) on top.

- o. Loosen horizontal clamp screw.

NOTE

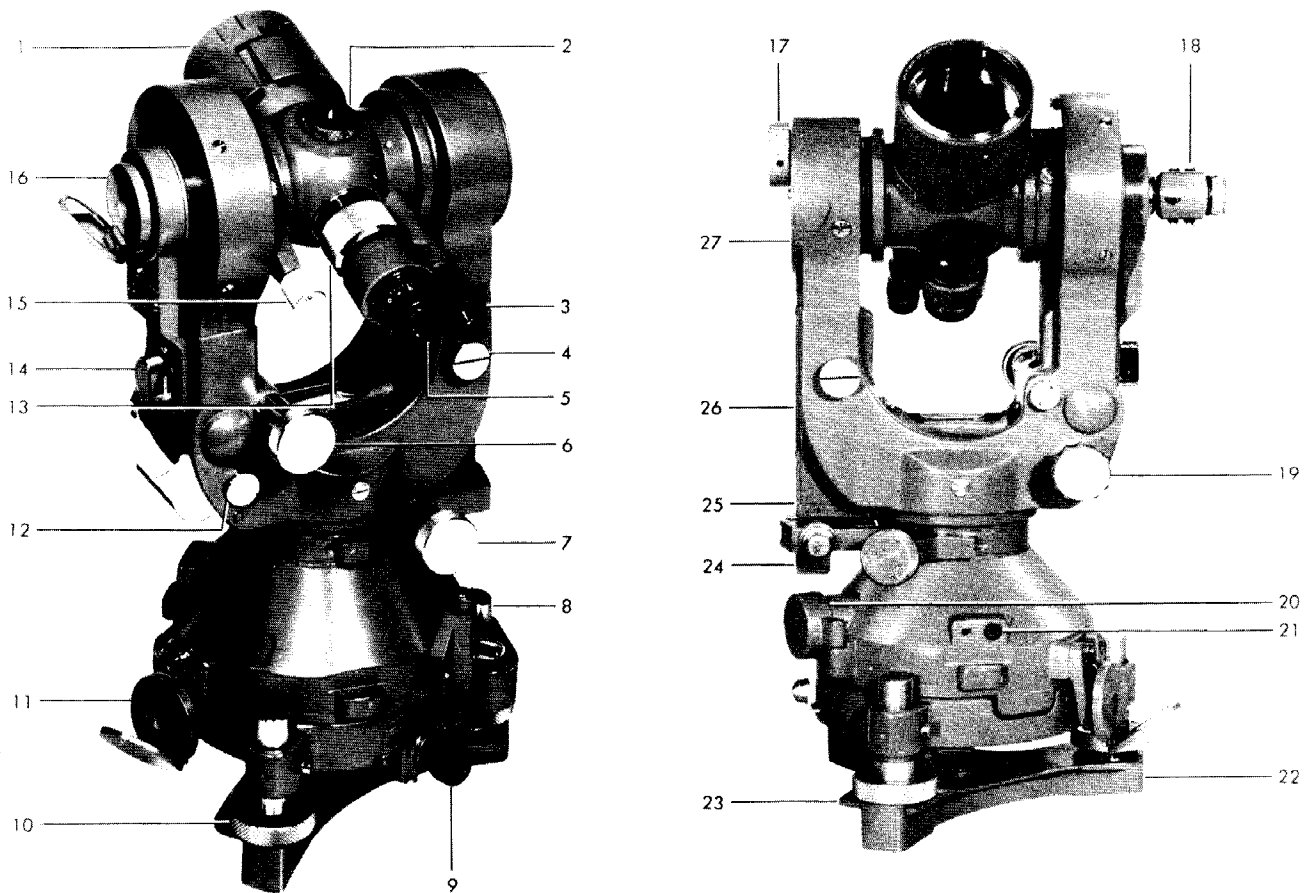
Whenever rotation of locking spring is necessary, the set screw which secures the locking spring must be loosened and then retightened after rotation has been accomplished.

- p. Install theodolite to target baseplate on tripod, and secure it by rotating locking lever. (24).

4-13. LEVELING AND CENTERING THEODOLITE.

NOTE

For night operation, perform steps a through j before proceeding; otherwise, proceed directly to step k.



- 1 OBJECTIVE LENS SUNSHADE
- 2 ILLUMINATING DIAPHRAGM MIRROR
- 3 MICROSCOPE EYEPIECE
- 4 INVERTER CONTROL
- 5 TELESCOPE EYEPIECE
- 6 ALTITUDE TANGENT SCREW
- 7 AZIMUTH TANGENT SCREW
- 8 CIRCULAR LEVEL
- 9 OPTICAL PLUMMET
- 10 LEVELING SCREW (THREE PLACES)
- 11 ILLUMINATING HORIZONTAL CIRCLE MIRROR
- 12 COLLIMATING ADJUSTMENT CONTROL
- 13 TELESCOPE FOCUSING RING
- 14 VIEWER FOR COLLIMATION LEVEL

- 15 VERTICAL CLAMP SCREW
- 16 VERTICAL CIRCLE MOUNTING RING
- 17 COINCIDENCE SETTING CONTROL
- 18 ILLUMINATING VERTICAL CIRCLE MIRROR
- 19 REFLECTOR FOR COLLIMATION LEVEL
- 20 HORIZONTAL SCALE ADJUST CONTROL
- 21 THEODOLITE BATTERY RECEPTACLE
- 22 THEODOLITE BASEPLATES
- 23 BASEPLATE LOCKING SPRING (THREE PLACES)
- 24 BOLT LOCK LEVER
- 25 HORIZONTAL CLAMP SCREW
- 26 HORIZONTAL LEVEL
- 27 THEODOLITE TELESCOPE YOKE

2-64382

Figure 4-3. Theodolite

- a. Remove battery box from Test Accessory Box.
- b. Remove extension lamp and cord from battery box.
- c. Connect plug of extension lamps to center receptacle on battery box.

## NOTE

To locate center receptacle, rotate battery box until operator is looking at the end of the box that is opposite the end with the battery case handle. A lever is visible when box is viewed from bottom. Pushing this lever to the right will cause receptacles to appear.

- d. Place battery box on tripod bracket provided.
- e. Hang lamps on hook provided on tripod, and use it as required.
- f. Connect extension cord to outermost receptacle in battery box.
- g. Connect other end of extension cord into theodolite receptacle.

## NOTE

Spare bulbs for lamps are located in battery box.

- h. Obtain two lamp fixtures from bottom of theodolite casing.
- i. Remove illuminating horizontal circle mirror (11, figure 4-3), and insert lamp fixture by firmly pushing it in until a click is heard.
- j. Remove illuminating vertical circle mirror (2), and insert lamp fixture by firmly pushing it in until a click is heard.
- k. Level theodolite using circular level (8) and leveling screws (10).
- l. Adjust optical plummet eyepiece (9) until a small cross or circle is sharply defined.
- m. Loosen central fixing screw, and position theodolite about tripod head until cross-mark on optical plummet lines up with center of marked image; then tighten fixing screw.
- n. If necessary, adjust the three leveling screws to insure precise centering of bubble in circular level.
- o. Insure that optical plummet lines up with center of marked image. Repeat steps m through o if necessary.

## NOTE

Whenever rotation or elevation of telescope is required, loosen horizontal clamp screw and vertical clamp screw; rotate theodolite; then, retighten clamp screws. While performing steps p through y, always rotate theodolite in a clockwise direction.

- p. Loosen horizontal clamp screw (25), and rotate theodolite until horizontal level (26) lies parallel to a line joining two of the leveling screws.
- q. Adjust the two leveling screws in step p to center bubble in horizontal level.
- r. Rotate theodolite 90 degrees.
- s. Re-level theodolite, using third leveling screw.
- t. Rotate theodolite 180 degrees.
- u. Adjust the three leveling screws as required to center bubble in horizontal level.

## NOTE

If bubble is shifted more than 2 graduations on horizontal level, perform steps v through z before proceeding to step aa.

- v. Rotate fine level adjustment screw until bubble moves one-half of total displacement toward center of level.

## NOTE

Fine level adjustment screw is located beneath collimation level viewer (14)

- w. Rotate theodolite 180 degrees.
- x. Bubble must appear in center (+2 graduation) of horizontal level.

## NOTE

Repeat steps v through x until error is within tolerance and constant.

- y. Rotate theodolite 90 degrees, and repeat steps v through x.
- z. Recheck centering of optical plummet.

## NOTE

Optical plummet is centered if small cross or circle coincides with center of observed image, if optical plummet is not centered, repeat steps n through z before proceeding.

- aa. Rotate inverter control (4) until line on control is in horizontal position.
- ab. Adjust illuminating horizontal circle mirror (11) for best illumination on horizontal reading scale as viewed through microscope eyepiece.
- ac. Horizontal scales can now be read by observing them through microscope eyepiece.

## NOTE

For night operation, adjust illuminating diaphragm mirror control (2) for desired illumination of cross hairs.

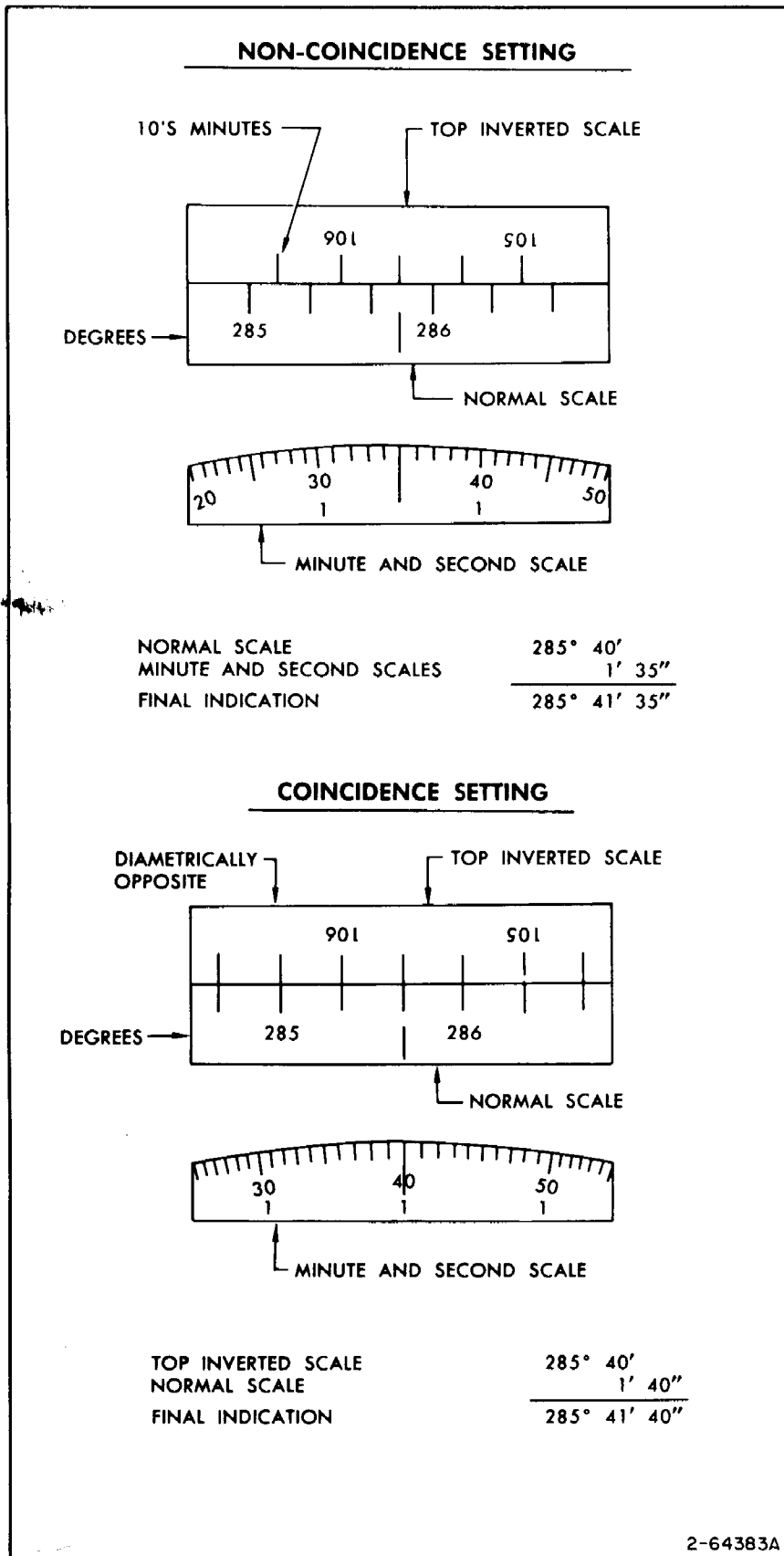


Figure 4-4. Reading Horizontal Scales

ad. Adjust milled black collar on telescope eyepiece (5) until three separate scale graduations are clear and sharp.

ae. Adjust milled black collar on microscope eyepiece, remove three separate scale graduations are clear and sharp.

#### NOTE

If ambient light causes troublesome reflections, remove objective lens sunshade (1) by rotating and drawing it forward. Replace sunshade before storing theodolite.

4-14. INTERPRETATION OF HORIZONTAL SCALES. Two separate images are clearly visible when viewed through the microscope eyepiece (3, figure 4-3). The two scales of the upper image are diametrically opposite for reading the degrees and tens of minutes. The lower image or scale indicates minutes and seconds. (see figure 4-4.) To obtain an indication from the horizontal scales, a coincidence setting must be made. This setting is obtained when the graduations on the upper half-image appear in exact prolongation of those of the lower half-image. The vertical fixed line in the center of the upper image is used as an aid in obtaining coincidence. The angle indicated by the theodolite is that number on the lower-image which is at, or to the left of, the center vertical fixed line and in exact prolongation of a graduation mark on the upper-half image. From the graduation mark above the angle on the upper-half image, the number of graduations counted to the division that is diametrically opposite the angle (angle minus 180 degrees) is multiplied by 10 to give the number of minutes to be added to the angle. Next, the number of minutes and seconds, indicated by the lower image and using the vertical fixed line as a reference is added to the angle. The sum of the degrees and minutes from the upper image and the minutes and seconds from the lower image as obtained above, is called the theodolite heading. To set a known bearing into the theodolite, the coincidence setting control (1, figure 4-3) is adjusted to indicate the number of minutes; then, the horizontal scale control (4) is adjusted to obtain coincidence at the desired number of degrees and tens of minutes. The final adjustment of the coincidence setting should always be in the clockwise direction.

#### 4-15. ESTABLISHING REFERENCE LINE-OF-FLIGHT LINE.

a. With theodolite firmly set over theodolite alignment point D, align theodolite on reference point F.

#### NOTE

Whenever adjustment of horizontal scale is necessary, first adjust coincidence setting control (17, figure 4-3), and then adjust horizontal scale adjustment control (20).

b. Obtain bearing of reference line D-F recorded on launch data card, and set it on horizontal scale.

#### NOTE

Replace cover over horizontal adjustment control after every required adjustment had been completed.

c. Determine a point (forward alignment point A) on pad approximately where left front Translauncher jack is to rest.



## NOTE

Forward alignment point A will be approximately 38 inches aft of front tiedown point in line with aft tiedown point.

- d. Position mechanic No. 1 with pencil at this point and place pencil point on forward alignment point A.
- e. Rotate theodolite so that the crosshairs align with the pencil point on forward alignment point A.
- f. Observing through microscope eyepiece (3), record indication obtained from horizontal scale; label this reading; bearing D-A.
- g. Remove tripod from point D, and reposition tripod over forward alignment stake A.
- h. Repeat steps e through i and k through z of paragraph 4-13 before proceeding.
- i. Position man with pencil over theodolite alignment point D.
- j. Position pencil exactly over point D.
- k. Align theodolite crosshairs to pencil over point D.
- ll Set bearing of line D-A, obtained in step f, on horizontal scales.
- m. Rotate theodolite until desired indication of reference line-of-flight line bearing (in degrees and tens of minutes) is observed through horizontal reading scales.
- n. Set in minutes and seconds of reference line-of-flight line using coincidence setting control (17).
- o. Bring upper scale into coincidence by adjusting azimuth tangent screw (7).
- p. Position man with pencil approximately 30 feet aft of forward alignment point A, and align pencil with crosshairs of theodolite, this point is rear alignment point B.

## NOTE

Alignment points A and B must form a line that passes through both forward and aft Translauncher tiedown points; if not, recheck data from Prelaunch Data Card, interpretation of horizontal scales, and leveling and centering of theodolite.

- q. Extend string from forward alignment point A to rear alignment point B and secure string to concrete pad with tape.
- r. Using white weather-proof paint and string as guide, paint one-inch line from forward alignment point A to rear alignment point B.
- s. Approximately 38 inches aft of forward and rear Translauncher tiedown points, paint a three-inch diameter spot.

## 4-16. AZIMUTH DETERMINATION.

## NOTE

Refer to paragraph 4-13 for interpretation of the horizontal scale.

- a. Obtain mounting assembly, and attach it to the two holes provided on underside of Missile Nose.
- b. Rotate top of target so that crosshairs are facing theodolite.
- c. Level target, using the three leveling screws as required.
- d. Rotate theodolite so that crosshairs of telescope align with reference point F.

## NOTE

Fine adjustment are made with azimuth target control (7, figure 4-3) and altitude tangent control (6).

- e. Observing through telescope eyepiece (5), adjust nickel focus rings as required.

## NOTE

Whenever adjustment of the horizontal scale is necessary adjust coincidence setting control first; then adjust horizontal adjustment scale.

- f. Adjust theodolite to indicate bearing of reference line D-F obtained from launch data card.
- g. Rotate theodolite toward target under Missile Nose, and align crosshairs of telescope with target crosshairs.

## NOTE

Refocus telescope as required by use of focus ring (13).

- h. Observing through microscope eyepiece, read indication on horizontal scale.
- i. Rotate coincidence setting control (17) so that the two graduations closest together (one on upper inverted scale and one on lower scale) appear as one.
- j. Record bearing of this line as bearing D-E.
- k. Interchange theodolite and target.

## NOTE

Theodolite will be on mounting assembly under nose of missile and target will be on tripod.

- l. Level target as required, using the three leveling screws.

- m. Loosen ventral fixing screw; reposition target so that when looking through optical plummet the marked image is centered with optical plummet mark.
- n. Level target as required using the three leveling screws.
- o. Level theodolite, using three leveling screws as required to center bubble in horizontal level.

## NOTE

Do not exert any pressure on mounting assembly, as any movement will contribute to an erroneous indication and disturb leveling and centering of theodolite.

- p. Obtain azimuth alignment target assembly from Test Accessory Box.
- q. Install target assembly on Missile just forward of booster thrust bolt.
- r. Rotate theodolite toward theodolite alignment point D; then align theodolite with target crosshairs.
- s. Set value of bearing D-E (which has been determined in step j) on horizontal scale.
- t. Slowly rotate theodolite towards aft end of Missile; align theodolite crosshairs with azimuth alignment target crosshairs.
- u. Rotate coincidence setting control so that the two graduations closest together (one on the upper inverted scale and one on lower scale) appear as one.
- v. Record indication on horizontal scales, and label this bearing; Actual Missile Heading.
- w. Rotate theodolite toward theodolite alignment point D, and align theodolite crosshairs with target crosshairs.
- y. Observing through microscope eyepiece, record indication on horizontal scale; label this bearing E-D.
- z. Interchange theodolite and target.

## NOTE

Theodolite will be mounted on tripod and target on mounting assembly.

- aa. Level and center theodolite as required.
- ab. Level and center target as required.
- ac. Rotate telescope toward point E. Align theodolite crosshairs with target crosshairs.
- ad. Set value of bearing E-D horizontal scales.
- ae. Rotate and align theodolite with reference point F.

- af. Rotate coincidence setting control so that the two graduations closest together (one on upper inverted scale and one on lower scale) appear as one.
- ag. Observing through microscope eyepiece, record indication on horizontal scales; and label this reading D-F.
- ah. Return theodolite and equipment to SRP test accessory box stowage.

#### 4-17. DETERMINATION OF ACTUAL MISSILE HEADING.

- a. Compute difference between bearing D-F as obtained from Launch Data Card and bearing D-F as obtained in step ag of paragraph 4-16.
- b. If difference computed in step a is greater than 6 minutes, repeat paragraphs 4-11 through 4-16; if difference in step a is less than 6 minutes, proceed to step c.
- c. Compute difference between Actual Missile Heading recorded in step v, paragraph 4-15 and Missile Lock-on-heading as obtained from Launch data card.

#### NOTE

If the Actual Missile Heading is greater than plus or minus 1.5 degrees of the Missile Lock-on-Heading, the Missile must be repositioned, and paragraph 4-11 through 4-16 must be repeated.

- d. Record value obtained in step c alongside COURSE ADJ on launch data card.

#### 4-18. ENERGIZING POWER PACK HYDRAULICS.

- a. RESERVOIR LEVEL gage must indicate at least three-fourths full.
- b. Insure that TRUCK POWER switch on 28 Volts DC panel is ON.
- c. Insure connection of hydraulic hoses.
- d. Insure that RETURN BYPASS control and MANUAL BYPASS control on power pack hydraulic control panel are OPEN (ccw).
- e. Place MAIN SYSTEM switch ON.
- f. Rotate MANUAL BYPASS control fully CLOSED (cw).
- g. Rotate SYSTEM OUTLET control fully OPEN.

#### 4-19. SHUTTING DOWN POWER PACK HYDRAULICS.

- a. Insure that RETURN BYPASS control on Power Pack Hydraulic Control Panel is fully OPEN (ccw).
- b. Rotate SYSTEM OUTLET control to CLOSED (cw).
- c. Rotate MANUAL BYPASS control to OPEN (ccw).
- d. Place MAIN SYSTEM switch OFF.

4-20. ATRAN COURSE REFERENCE SETTING (Effectivity C).

- a. Loosen the four screws which secure TEST PANEL ACCESS DOOR.
- b. Remove the two protective caps from the LOCK ADJUSTMENT and COURSE ADJUSTMENT controls.
- c. Rotate LOCK ADJUSTMENT control counterclockwise to unlock the ATRAN COURSE REFERENCE dial. (See figure 4-5.)

NOTE

The value of this setting must begin at present setting of dial, not at zero.

- d. Obtain COURSE ADJ value from Launch Data Card.

NOTE

If the value that has been obtained is less than 15 minutes, no adjustment is required.

- e. If adjustment is necessary, determine which way COURSE REFERENCE control must be turned.

NOTE

Before adjusting the COURSE REFERENCE control, always double-check in what direction in which the adjustment is to be made. This is done by determining which of the two headings is larger. If the Missile heading is larger than the Map heading, the COURSE REFERENCE control must be rotated clockwise. If the Missile heading is smaller than the Map heading, the COURSE REFERENCE control must be rotated counterclockwise.

- f. ADJUST COURSE REFERENCE control.
- g. Rotate LOCK ADJUSTMENT control clockwise to secure dial setting.
- h. Replace protective caps on LOCK ADJUSTMENT and COURSE ADJUSTMENT controls.
- i. Close and secure TEST PANEL ACCESS DOOR.

4-21. ATRAN COURSE REFERENCE SETTING (Effectivity D).

- a. Loosen the four screws which secure TEST PANEL ACCESS DOOR.
- b. Observe value of setting on Program Unit Control COURSE SETTING indicator. Any value change to be made must start from the observed setting and not from zero.
- c. Obtain COURSE ADJ value from Launch Data Card.

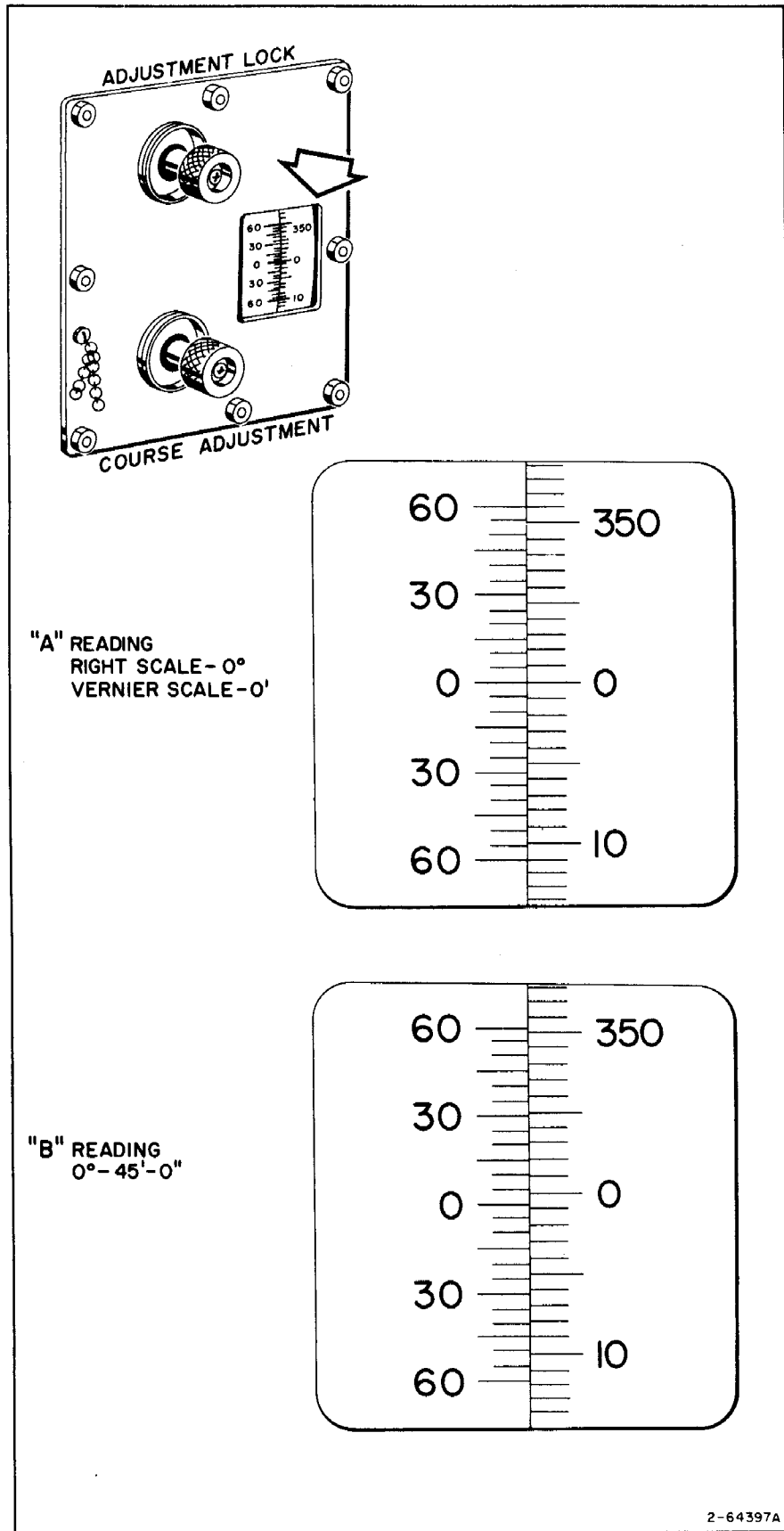


Figure 4-5. ATRAN Course Reference Adjustment (Effectivity C)

NOTE

If the value that has been obtained is less than 15 minutes (0.25 degrees), no adjustment is required. (Digit to right of pointer mark is read in tenths of a degree.)

- d. If adjustment is necessary, determine which way COURSE SETTING Control (figure 4-6) must be turned. (Push knob to turn.) Clockwise rotation decreases reading; counterclockwise rotation increases reading.

NOTE

Before adjusting the COURSE SETTING control, re-check the direction the adjustment is to be made. This is done by determining which of the two headings is larger. If the Missile heading is larger than the Map heading, the COURSE SETTING Control must be rotated clockwise. If the Missile heading is smaller than the Map heading, the COURSE SETTING control must be rotated counterclockwise.

- e. Adjust COURSE SETTING control. Insure that control disengages when released.
- f. Close the secure TEST PANEL ACCESS DOOR.

4-22. MISSILE ENGINE OPERATING LIMITATIONS.

WARNING

Operating personnel must be thoroughly familiar with the procedures contained in paragraphs 4-23 and 4-24.

- a. When performing an engine runup, do not exceed the respective time limits in table 4-1.

TABLE 4-1  
LAUNCH AREA ENGINE RUN LIMITATIONS

% RPM	Initial Installation Engine Run Seconds	75 Day Engine Run Seconds
0 to 60	60	-----
20 to 60	--	IDLE
60 to 103	15	-----
103 to 60	60	-----

4-23. STARTING LIMITATIONS.

- a. If no engine start has been attempted or if Engine has not been run within previous hour:
  - 1) Attempt engine start until automatic shutdown occurs.

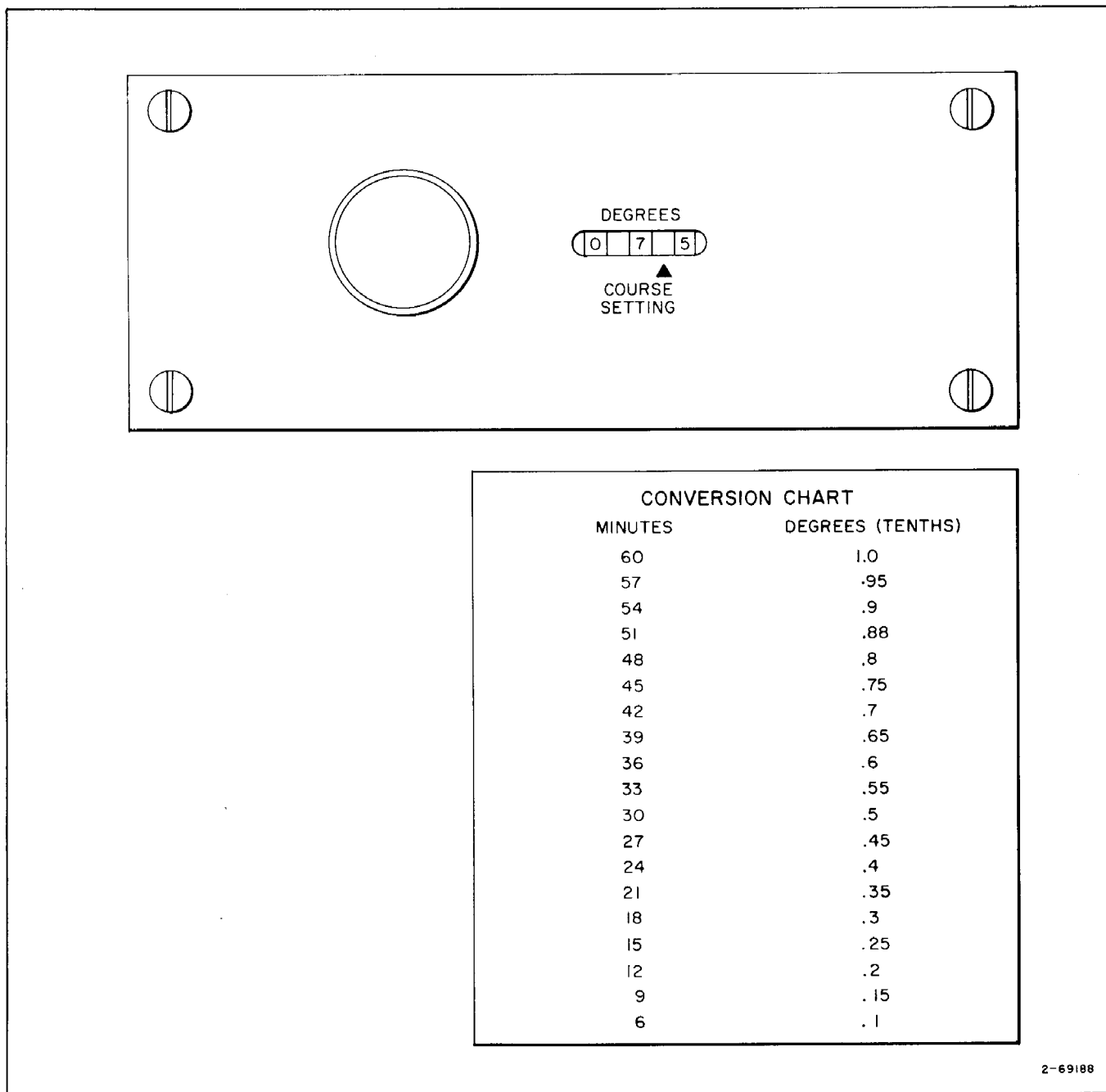


Figure 4-6. Atran Course Reference Adjustment (Effectivity D).



## Paragrphs 4-24 to 4-26

- 2) If Engine fails to start, make no further attempts to start for a least 10 minutes.
  - 3) Attempt second start until automatic shutdown occurs.
  - 4) If Engine again fails to start, make no further attempts to start for at least 30 minutes.
- b. If Engine has been operated within previous hour:
- 1) Do not attempt to start Engine for at least 20 minutes after shutdown.
  - 2) Attempt engine start until automatic shutdown occurs.
  - 3) If Engine fails to start, make no further attempts to start for at least 30 minutes.
- c. If an emergency requires additional motorization after automatic shutdown, momentarily depress RESET button, and then depress MOTORIZED button.

## NOTE

Starter-Generator must be replaced if limitations in step a and b are exceeded. If Starter-Generator is operated for more than 1 minute continuous operation, it must be replaced.

## 4-24. ENGINE LIMITATIONS DURING GROUND OPERATIONS.

- a. Replace engine after exceeding 1 minute continuous operation at maximum rpm.
- b. After operating engine for a total of 3 minutes at 85 percent rpm or above, turbine blades must be checked for clearance.

## CAUTION

Each run above 85 percent rpm (not to exceed 1 minute) must be followed by a minimum of 3 minutes at idle before returning to 85 percent rpm or above. Prior to engine shutdown, operate engine at 60% RPM for 60 seconds minimum.

- c. Replace engine if it has exceeded 600 seconds accumulative time at maximum rpm within a 5 hour period.
- d. Engine should not exceed 4 consecutive runs of 5 hours each within the limitations in steps a and c above. If limitations are exceeded, replace Engine.
- e. Replace Engine after 20 hours of operation.
- f. Replace Engine if momentary overspeed exceeds 108.5 percent.
- g. Perform post-shutdown inspection of Engine for any overspeed condition.

## 4-25. TESTING SRP CABLES.

## 4-26. APPLYING POWER TO SRP CABLE TESTER.

- a. Connect plug P9048 attached to nose test cable to receptacle J9048 (2, figure 3-23) on Output Junction Panel.

- b. Connect plug P2008 attached to other end of nose test cable to receptacle J2008 (2, figure 3-21) on Verification Panel.
- c. Remove all connector dust covers on Cable Tester.

## CAUTION

Insure that chains attached to cover do not touch shells of connectors; otherwise, a faulty indication may result.

- d. Apply power to SRP (para. 3-25).
- e. Check power supply voltage (para. 3-26).
- f. Check SRP console vent system (para. 3-27).
- g. Place POWER switch (4, figure 4-7) on Cable Tester ON.
- h. POWER ON indicator lamp (5) must go on.

## WARNING

Be extremely careful while testing cables; 700 volts are on pins during test.

## 4-27. TESTING LAUNCH CONTROL CABLE.

## NOTE

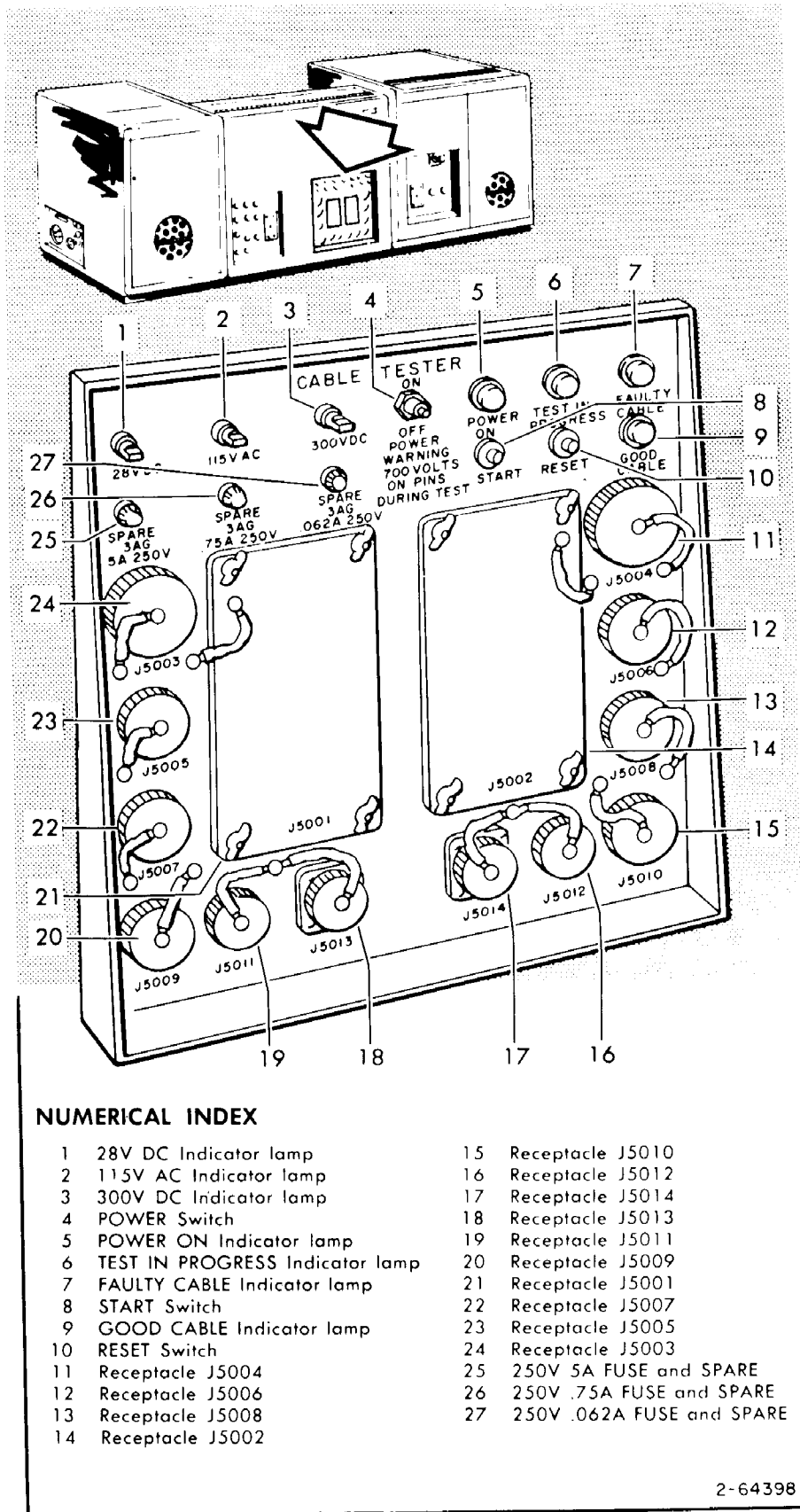
A 5-minute SRP Main Console warmup is sufficient for cable test.

- a. Connect plug P9012 of launch control cable to receptacle J5009 (20, figure 4-7) on Cable Tester Panel.
- b. Connect plug P9022 of launch control cable to receptacle J5010 (15).
- c. Momentarily depress RESET switch (10).
- d. Momentarily depress START switch (8); TEST IN PROGRESS indicator lamp (6) must go on.

## NOTE

If cable being tested is good, GOOD CABLE indicator lamp (9) must go on. If cable being tested is defective, FAULTY CABLE indicator lamp (7) must go on. If FAULTY CABLE indicator lamp goes on, tag and place cable aside for maintenance.

- e. When TEST IN PROGRESS indicator lamp goes off, disconnect plug P9012 from receptacle J5009.



**NUMERICAL INDEX**

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| 7  | FAULTY CABLE Indicator lamp     | 21 | Receptacle J5001          |
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| 13 | Receptacle J5008                | 27 | 250V .062A FUSE and SPARE |
| 14 | Receptacle J5002                |    |                           |

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Figure 4-7. Cable Tester (SRP)

- f. Disconnect plug P9022 from receptacle J5010.

#### 4-28. TESTING NOSE TEST CABLE.

- a. Connect plug P9041 of nose test cable to receptacle J5001 (21, figure 4-7) on Cable Tester panel.
- b. Connect plug P5507 of nose test cable to receptacle J5002 (14).
- c. Momentarily depress RESET switch (10).
- d. Momentarily depress START switch (18); TEST IN PROGRESS indicator lamp (6) must go on.

#### NOTE

If cable being tested is good, GOOD CABLE indicator lamp (9) must go on. If cable being tested is defective, FAULTY CABLE indicator lamp (7) must go on. If FAULTY CABLE indicator lamp goes on, tag and place cable aside for maintenance.

- e. When TEST IN PROGRESS indicator lamp goes off, disconnect plug P9041 from receptacle J5001.
- f. Disconnect plug P5507 from receptacle J5002.

#### 4-29. TESTING WARHEAD INTERLOCK CABLE.

- a. Connect plug P9049 of warhead interlock cable to receptacle J8818B of adapter cable on Cable Tester panel.
- b. Connect plug P8818A of warhead interlock cable to receptacle J5013 (18, figure 4-7).
- c. Connect plug P5014 of adapter cable to receptacle J5014.
- d. Momentarily depress the RESET switch (10).
- e. Momentarily depress the START switch (8); TEST IN PROGRESS indicator lamp (6) must go on.

#### NOTE

If cable being tested is good, GOOD CABLE indicator lamp (9) must go on. If cable being tested is defective, FAULTY CABLE indicator lamp (7) must go on. If FAULTY CABLE indicator lamp goes on, tag and place cable aside for maintenance.

- f. When TEST IN PROGRESS indicator lamp goes off, disconnect plug P9409 from receptacle J5013.
- g. Disconnect plug P8819 from receptacle J5014.

4-30. TESTING PRELAUNCH TEST CABLE.

- a. Connect plug P9040 of prelaunch test cable to receptacle J5008 (13, figure 4-7) on Cable Tester panel.
- b. Connect plug P8403 of prelaunch test cable to receptacle J5007 (22).
- c. Momentarily depress RESET switch (10).
- d. Momentarily depress START switch (8); TEST IN PROGRESS indicator lamp (6) must go on.

NOTE

If cable being tested is good, GOOD CABLE indicator lamp (9) must go on. If cable being tested is defective, FAULTY CABLE indicator lamp (7) must go on. If FAULTY CABLE indicator lamp goes on, tag and place cable aside for maintenance.

- e. When TEST IN PROGRESS indicator lamp goes off, disconnect plug P9040 from receptacle J5008.
- f. Disconnect plug P8403 from receptacle J5007.

4-31. TESTING GYRO SLAVING CABLE.

- a. Connect plug P9013 of gyro slaving cable to receptacle J5012 (16, figure 4-7) on Cable Tester panel.
- b. Connect plug P9042 of gyro slaving cable to receptacle J5011 (19).
- c. Momentarily depress RESET switch (10).
- d. Momentarily depress START switch (8); TEST IN PROGRESS indicator lamp (6) must go on.

NOTE

If cable being tested is good, the GOOD CABLE indicator lamp (9) must go on. If cable being tested is defective, the FAULTY CABLE indicator lamp (7) must go on. If FAULTY CABLE indicator lamp goes on, tag and place cable aside for maintenance.

- e. When TEST IN PROGRESS indicator lamp goes off, disconnect plug P9013 from receptacle J5012.
- f. Disconnect plug P9042 from receptacle J5011.

4-32. TESTING UMBILICAL CABLE.

- a. Connect plug P9014 of umbilical cable to receptacle J5004 (11, figure 4-7) on Cable Tester panel.
- b. Connect plug P8693 of umbilical cable to receptacle J5003 (24).

- c. Momentarily depress RESET switch (10).
- d. Momentarily depress START switch (8); TEST IN PROGRESS indicator lamp (6) must go on.

## NOTE

If cable being tested is good, GOOD CABLE indicator lamp (9) must go on. If cable being tested is defective, FAULTY CABLE indicator lamp (7) must go on. If FAULTY CABLE indicator lamp goes on, tag and place aside for maintenance.

- e. When TEST IN PROGRESS indicator lamp goes off, disconnect plug P9014 from receptacle J5004.
- f. Disconnect plug P8693 from receptacle J5003.

## 4-33. TESTING WARHEAD TEST CABLE.

- a. Connect plug P6001 of warhead cable to receptacle J5013 (18, figure 4-7) on Cable Tester panel.
- b. Connect plug P8818A of warhead cable to receptacle J8818B of adapter cable.
- c. Connect plug P5014 of adapter cable to receptacle J5014 (17).
- d. Momentarily depress RESET switch (10).
- e. Momentarily depress START switch (8); TEST IN PROGRESS indicator lamp (6) must go on.

## NOTE

If cable being tested is good, GOOD CABLE indicator lamp (9) must go on. If cable being tested is defective, FAULTY CABLE indicator lamp (7) must go on. If FAULTY CABLE indicator lamp goes on, tag and place cable aside for maintenance.

- f. When TEST IN PROGRESS indicator lamp goes off, disconnect plug P6001 from receptacle J5013.
- g. Disconnect plug P8818 from receptacle J5014.
- h. Place POWER switch on Cable Tester OFF; Power ON indicator must go off.
- i. Disconnect plug P9048 attached to nose test cable from J9048 on Output Junction Panel.
- j. Disconnect plug P2008 attached to nose test cable from J2008 on Verification Panel.

4-34. PERFORMING SRP VERIFICATION.

4-35. CONNECTING SRP VERIFICATION CABLING.

- a. Connect plug P9040 of prelaunch test cable to PRELAUNCH receptacle J9040 (13, figure 3-23) on Output Junction Panel.
- b. Connect plug P8403 of cable to PRELAUNCH receptacle J2002 (4, figure 3-21) on Verification Unit.
- c. Connect plug P9042 of gyro slaving cable to GYRO SLAVING receptacle J9042 (5, figure 3-23) on Output Junction Panel.
- d. Connect plug P9013 of cable to GYRO SLAVING receptacle J2003 (3, figure 3-21) on Verification Unit.
- e. Connect plug P9041 of nose test cable to receptacle J9041 (4, figure 3-23) on Output Junction Panel.
- f. Connect plug P5507 of nose test cable to receptacle J2001 (5, figure 3-21) on Verification Unit.
- g. Connect plug P2008 of nose test cable to receptacle J2008 (2) on Verification Unit.

4-36. PERFORMING SRP MAIN CONSOLE VERIFICATION.

- a. Insure that TESTER ON button (2, figure 3-6) on Test Control panel is depressed.
- b. Insure that POWER ON indicator lamp (1) is on, and STANDBY indicator lamp (15) is off.
- c. Insure that MISSILE TEST POSITION (17), FILM FRAME POSITION (12), and VERIFICATION TEST POSITION (11) indicators indicate zero.

NOTE

If the indicators do not indicate zero, depress COUNTER RESET button (14) on Test Control Panel and TCU RESET button on Test Control Unit.

- d. Check all press-to-test indicator lamps for proper operation.
- e. VERIFICATION READY indicator lamp (6) must be on before proceeding.
- f. Place HOLD TEST switch (10) on (up).
- g. Momentarily depress START/ADVANCE button (18). MISSILE TEST POSITION (17) and VERIFICATION TEST POSITION indicators must advance to 1.
- h. Depress TCU RESET button. MISSILE TEST POSITION and VERIFICATION TEST POSITION indicators must reset to zero.
- i. Place HOLD TEST switch off (down).
- j. Obtain HP 410B VTVM and prepare for use.

- k. Pull Test Programmer chassis out.
- l. Place VTVM on 100 volt scale.
- m. Connect DC lead to SWEEP/OUT jack J1704 on Test Programmer chassis.
- n. Connect COMMON lead to jack J1705 on Test Programmer chassis.
- o. VTVM must indicate between 29 and 31 volts.

## NOTE

If indication in step o is between 29 and 31 volts, adjust VTVM zero adjust control for exactly 80 volts.

- p. Place SWEEP GENERATOR switch S1702 on Test Programmer chassis to CAL.

## NOTE

VTVM must sweep down from 80 volts to beyond 20 volts in 10 to 14 seconds. Adjust VOLTS PER SEC control (R5), if necessary; then repeat step p.

- q. Disconnect VTVM and stow.
- r. Slide Test Programmer chassis back into console.
- s. Pull SRP Test Programmer unit out of main console until DC Comparator No. 1 and No. 2 and AC and DC No. 3 Comparator chassis are accessible.
- t. Adjust DC 1 CAL control on DC Comparator No. 1 and No. 2 chassis until DC 1 RESPONSE indicator lamp (6, figure 3-10) on Test Programmer flickers.

## NOTE

If a flicker cannot be obtained, adjust to a condition where indicator lamp goes on.

- u. Adjust DC 2 CAL control until DC 2 RESPONSE indicator lamp (7) flickers.

## NOTE

If a flicker cannot be obtained, adjust to a condition where indicator lamp goes on.

- v. Adjust DC CAL control on AC and DC No. 3 Comparator chassis until DC 3 RESPONSE indicator lamp (9) flickers.

## NOTE

If a flicker cannot be obtained, adjust to a condition where indicator lamp goes on.

- w. Adjust AC CAL control until AC RESPONSE indicator lamp (10) flickers.



NOTE

If a flicker cannot be obtained, adjust to a condition where indicator lamp goes on.

- x. Slide SRP Test Programmer unit back into main console and secure.
- y. VERIFICATION READY indicator lamp (6, figure 3-6) on Test Control panel must be on.
- z. Momentarily depress VERIFICATION START/ADVANCE button.
- aa. VERIFICATION READY indicator lamp must go out.

NOTE

SRP Main Console will perform the automatic self-verification sequence. This sequence consists of 50 steps. If, during the sequence, the NO GO indicator lamp (5) goes on and the sequence stops, repeat the procedures in paragraph 4-36.

- ab. At completion of self-verification, the console will reset and VERIFICATION READY indicator lamp will go on.

4-37. CHECKING NO GO DURING SRP MAIN CONSOLE SELF-VERIFICATION.

- a. Record test position where NO GO occurred.

NOTE

Position is indicated by VERIFICATION TEST POSITION indicator on MPT Test Control panel.

- b. List all indicator lamps on SRP Test Control Unit that are on.
- c. List all indicator lamps on verification unit and test programmer that are on.
- d. Attach recorded information to SRP and set aside for maintenance.
- e. Shut down SRP Main Console power (para. 3-43).
- f. Shut down power to SRP (para. 3-45).

4-38. MOVING TRANSLAUNCHER.

NOTE

The Missile must be in the (transport) position and properly secured prior to transporting.

- a. Insure that bogie handbrake is released.
- b. Refer to table 4-2 for transport limitations.

## WARNING

When transporting Missile, the fuel cells must either be de-fueled and purged (paragraphs 4-39 through 4-43) or fully fueled (paragraphs 4-44 through 4-47).

TABLE 4-2

## TRANSLAUNCHER TRANSPORT LIMITATIONS

Missile Configuration	Improved Roads	Unimproved Roads	Trails and/or Open Terrain
Complete Missile/fully fueled	up to 5 mph	Greatly reduced speeds for distances of 100 to 200 yards.	
Complete Missile/less fuel	up to 25	up to 15	up to 5
Missile/fully fueled less Nose and Warhead Section	up to 20	up to 10	up to 5
Missile/less fuel and less Nose and Warhead Sections	up to 30	up to 20	up to 5

## 4-39. DEFUELING MISSILE.

4-40. Defueling operations are performed with the Fuel Service and Fuel Tank Pack mounted on an MM-1 truck in an open area away from all operations. Personnel performing defueling operations must comply with all applicable safety precautions and have adequate fire fighting equipment on hand.

## CAUTION

Immediately after the Missile has been defueled, it must be purged of fumes as described in paragraph 4-43. If the cells are to remain dry for more than 10 days, they must first be preserved.

## 4-41. PREPARATIONS FOR DEFUELING.

## WARNING

All power to Missile and all power in immediate vicinity of Missile must be off.

- a. Raise Missile to checkout (1-1/2°) position.

- b. Position Fuel Service Vehicle convenient to Missile for defueling procedures.
- c. Open access door on left side of Fuel Service Pack.

## NOTE

During cold weather operations, fuel service pack heater must be used prior to defueling Missile to thaw ice accumulation in filter water separator and to heat fuel servicing hose.

- d. Remove ground cable and ground rod from accessory box on Fuel Service Vehicle.
- e. Drive ground rod at least 4-1/2 feet into ground.

## NOTE

If built-in grounding facilities are available, they may be used.

- f. Connect terminal lug of ground cable to ground lug on Fuel Service Pack, and secure with wing nut.
- g. Connect clamp end of ground cable to ground rod.
- h. Unreel ground cables from fuel service pack control panel.
- i. Clamp one cable to convenient ground on Translauncher, clamp the other cable to convenient ground on Missile.

## NOTE

Insure that good ground connection is obtained.

- j. Remove ground cable and ground rod from translauncher tool box.
- k. Drive ground rod at least 4-1/2 feet into ground.

## NOTE

If built-in grounding facilities are available, they may be used.

- l. Connect one end of ground cable to convenient ground on Translauncher.

## NOTE

Insure that good ground connection is obtained.

- m. Connect other end of ground cable to ground rod.
- n. Loosen quarter-turn fasteners securing ENGINE ACCESS DOOR in place; then remove door.
- o. Insure that missile FUEL SHUT-OFF VALVE is CLOSED.

## NOTE

Valve is closed when control lever points toward center of Missile.

- p. Disconnect flexible main fuel line at flexible hose coupling between Engine and low pressure fuel filter, located just above ENGINE ACCESS DOOR.
- q. Connect adapter 100135B to main fuel line.

## NOTE

Adapter is stored in fuel service pack accessory box.

- r. Remove suction hose 435A450-115-100 from beneath service hose reel on fuel service pack. Other sections are stowed above service hose reel.

## NOTE

Depress spring-loaded collar on connector to remove dust cap.

- s. Connect one end of suction hose to adapter.

## NOTE

Insure that spring-loaded collar secures connection.

- t. Remove dust cap from suction hose connector on fuel service pack control panel.

## NOTE

Depress spring-loaded collar on connector to remove dust cap.

- u. Connect other end of suction hose to fuel service pack suction hose connector.

## NOTE

Insure that spring-loaded collar secures connection.

- v. Place missile FUEL SHUT-OFF VALVE control lever OPEN.

## NOTE

Valve is open when lever points toward left side of Missile.

- w. Remove filler caps from No. 1, No. 2, No. 4, and No. 5 fuel cells on Missile.
- x. Insure that fuel service pack fire extinguisher indicator is in SET and that CO<sub>2</sub> cylinder is full.

## 4-42. DEFUELING PROCEDURE.

## CAUTION

Insure that vent on top of fuel tank pack is free of ice and dirt before defueling operations.

- a. Unreel servicing hose and connect grounding clamp to fuel tank pack structure.
- b. Insert fuel filter nozzle into fuel tank pack inlet.

## NOTE

When defueling procedure is performed to remove preservative from fuel system, direct nozzle into suitable container.

- c. Insure that manual shutoff valve behind fuel service pack control panel is open.

## NOTE

Valve is open when pointer on valve shaft is aligned with valve outlets.

- d. Request truck driver to engage power takeoff.
- e. Squeeze handle on fuel filler nozzle until all missile fuel cells are empty.
- f. Disconnect suction hose from adapter and immediately raise hose high enough to prevent fuel from draining out of hose.
- g. Squeeze handle on fuel filler nozzle to allow fuel to be pumped into fuel tank pack.
- h. When all lines have been cleared of fuel, disengage power takeoff on truck.
- i. Place and hold REEL MOTOR switch (10) in RUN, and guide service hose onto reel.
- j. Place REEL MOTOR switch OFF.
- k. Disconnect ground cables from Missile and Translauncher.
- l. Pull cables slightly to release, and allow cables to rewind on spring-loaded reel.
- m. Disconnect ground cable from Fuel Service Pack and ground rod.
- n. Stow ground rod and cable in accessory box.
- o. Disconnect suction hose from fuel service pack.
- p. Stow section hose in tray beneath service hose reel.
- q. Shut down heater, if operating.
- r. Close access door on fuel service pack.
- s. Replace filler cap on fuel tank pack.
- t. Move Fuel Service Vehicle to safe location.
- u. Place missile FUEL SHUT-OFF VALVE to CLOSE and connect fuel line to engine inlet.

- v. Replace filler caps on No. 1, No. 2, No. 4, and No. 5 fuel cells.
  - w. Install ENGINE ACCESS DOOR.
- 4-43. PURGING FUEL CELLS.

## NOTE

The missile fuel cells must be rendered inert by purging the cells with CO<sub>2</sub> immediately after defueling.

- a. Connect ground cable between Missile and Translauncher.
- b. Remove ground rod from translauncher tool box.
- c. Drive ground rod at least 4-1/2 feet into ground.

## NOTE

If built-in grounding facilities are available, they may be used.

- d. Connect ground cable between Translauncher and ground rod.
- e. Connect ground cable between Missile and ground rod.
- f. Disconnect fuel inlet line at the left side of sump tank.
- g. Open sump tank vent line manual bypass valve.
- h. Purge sump tank by momentarily discharging CO<sub>2</sub> bottle into sump tank inlet.
- i. Close bypass valve.
- j. Using oxygen analyzer, observe oxygen content within sump tank.

## NOTE

Oxygen content must not be more than 10% after purging. If oxygen content is more than 10%, the sump tank must be re-purged.

- k. Reconnect fuel inlet line to sump tank.
- l. Disconnect outlet line to sump tank from the forward auxiliary tank.
- m. Remove filler cap from No. 2 fuel cell.
- n. Purge auxiliary fuel tank by momentarily discharging CO<sub>2</sub> bottle into auxiliary tank outlet.
- o. Using oxygen analyzer, observe oxygen content within tank.

NOTE

Oxygen content must not be more than 10% after purging. If oxygen content is more than 10%, the tank must be repurged.

- p. Disconnect fuel line from between forward and aft auxiliary tanks.
- q. Repeat steps n and o to purge aft auxiliary tank.
- r. Reconnect fuel line to auxiliary tanks.
- s. Remove filler caps from No. 1, No. 2, No. 4, and No. 5 fuel cells.
- t. Discharge a proportionate amount of a 20 pound CO<sub>2</sub> bottle into each filler opening.

NOTE

Purge No. 3 fuel cell through the interconnect between No. 3 and 4 fuel cells.

- u. Using an oxygen analyzer, observe oxygen content in each fuel cell; then, replace caps.

NOTE

Oxygen content must not be more than 10% after purging. If oxygen content is more than 10%, the fuel cells must be repurged.

- v. Lower Missile to transport position

4-44. FUELING MISSILE.

4-45. Fueling operations shall be performed with the Fuel Service Vehicle. Personnel performing fueling operations must be familiar with the overall operation of the Fuel Service Vehicle contained in the applicable technical manual. Adequate fire fighting equipment must be on hand.

4-46. PREPARATIONS FOR FUELING.

WARNING

All power to Missile must be off. Standard fueling safety precautions must be observed.

- a. Position Fuel Service Vehicle in a convenient location for fueling Missile.
- b. Insure that Fuel Tank Pack has been serviced with JP-4 fuel, specification MIL-J-5624.

- c. Open access door on left side of Fuel Service Pack.

## NOTE

During cold weather operations, fuel service pack heater must be used prior to fueling Missile to thaw ice accumulation in filter-water separator and to heat fuel-servicing hose.

- d. Remove ground cable and ground rod from accessory box on Fuel Service Vehicle.
- e. Drive ground rod at least 4-1/2 feet into ground.
- f. Connect terminal lug of ground cable to ground lug on fuel service pack control panel, and secure lug with wing nut.
- g. Connect clamp end of ground cable to ground rod.
- h. Unreel ground cables from fuel service pack control panel.
- i. Clamp one cable to convenient ground on Translauncher.

## NOTE

Insure that a good ground connection is obtained.

- j. Clamp other cable to convenient ground on Missile.

## NOTE

Insure that a good ground connection is obtained.

- k. Remove ground cable and ground rod from translauncher tool box.
- l. Drive ground rod at least 4-1/2 feet into ground.

## NOTE

- m. Connect one end of ground cable to convenient ground on Translauncher.

## NOTE

Insure that a good ground connection is obtained.

- n. Connect other end of ground cable to ground rod.
- o. Connect ground cable from booster support on Missile to convenient ground on Translauncher.
- p. Remove suction hose beneath servicing hose reel in Fuel Service Pack.
- q. Remove dust cap from suction hose connector (6) on fuel service pack control panel.

## NOTE

Depress spring-loaded collar on connector to remove dust cap.



- r. Remove dust cap from suction hose connector on Fuel Tank Pack.

NOTE

Depress spring-loaded collar on connector to remove dust cap.

- s. Connect one end of suction hose to fuel service pack suction hose connector.

NOTE

Insure that spring-loaded collar secures connection.

- t. Connect other end of suction hose to fuel tank pack suction hose connector.

NOTE

Insure that spring-loaded collar secures connection.

- u. Insure that sump tank vent line bypass valve is closed.
- v. Insure that missile FUEL SHUT-OFF VALVE is closed.

NOTE

Valve is closed when control lever points toward the right side of the Missile.

- w. Insure that fuel shutoff valve behind fuel service pack control panel is open.
- x. Insure that vent on top of fuel pack is unobstructed, and that fuel service pack fire extinguisher indicator is in SET.
- y. Request MM-1 Truck operator to engage power take-off and start vehicle engine.

4-47. FUELING PROCEDURE.

- a. Insure that Missile is in the 1-1/2 degree checkout attitude.
- b. Unreel service hose and insert ground plug into GROUND HERE jack adjacent to filler opening of No. 2 fuel cell.
- c. Slowly raise filler cap from No. 1 fuel cell to allow pressure to bleed off; then check fuel level.

NOTE

If fuel level has stabilized and fuel cell is not full, slowly remove the filler cap from No. 5 fuel cell and bleed off pressure. If fuel overflows from fuel cell allow fuel to stabilize until fuel level is below edge of filler cap opening.

- d. Insert nozzle into No. 1 fuel cell.
- e. Fill No. 1 fuel cell to capacity.

## NOTE

Cells are full when fluid level stabilizes even with the bottom edge of filler cap opening.

- f. When No. 1 fuel cell is full, transfer fuel filler nozzle to filler opening of No. 2 fuel cell.
- g. Replace filler cap of No. 1 fuel cell.
- h. Fill No. 2 fuel cell to capacity.
- i. When No. 2 fuel cell is full, remove fuel filler nozzle from filler opening. Do not replace cap on No. 2 fuel cell at this time.
- j. Insert ground plug into GROUND HERE jack adjacent to filler opening of No. 4 fuel cell; then insert filler nozzle into No. 4 cell.
- k. Fill No. 4 fuel cell to capacity; then allow fuel level to stabilize.
- l. Repeat step m until fuel level remains even with bottom edge of filler opening.

## NOTE

As No. 4 and No. 5 fuel cells are filled, fuel will flow through interconnection and will fill No. 3 fuel cell.

- m. Transfer ground plug into ground jack adjacent to No. 5 fuel cell; transfer fuel filler nozzle to filler opening of No. 5 fuel cell.
- n. Fill No. 5 fuel cell to capacity.
- o. Remove filler cap on fuel tank pack.
- p. Transfer fuel filler nozzle into filler cap opening.
- q. Replace No. 2, No. 4, and No. 5 filler caps.
- r. Disconnect suction hose from Fuel Tank Pack, and immediately raise hose high enough to prevent fuel from draining out of hose.
- s. Squeeze handle on fuel filler nozzle to allow fuel to be pumped into fuel tank pack.
- t. Place POWER switch ON.
- u. Place and hold REEL MOTOR switch in RUN, and guide service hose onto reel.
- v. Place REEL MOTOR and POWER switches OFF.
- w. Request MM-1 Truck operator to shut down engine and to disengage power takeoff.
- x. Disconnect ground cables from Missile and Translauncher.
- y. Pull cables slightly to release, and allow cables to rewind.

- z. Disconnect ground cable from Fuel Service Pack and ground rod.
- aa. Stow ground rod and cable in accessory box.
- ab. Disconnect suction hose from Fuel Service Pack.
- ac. Stow suction hose in tray located beneath service hose reel.
- ad. Shut down heater if it is operating.
- ae. Close access door on Fuel Service Pack.
- af. Replace filler cap on Fuel Tank Pack.
- ag. Move Fuel Service Vehicle from the area.

4-48. LAUNCH COMPLEX OPERATIONAL CHECKLIST.

4-49. The Launch Complex Operational Checklist is contained in table 4-3. The check is needed to prepare the Missiles on a Launch Complex for: 1) initial Engine runup to 103% RPM and 2) return Missiles to alert status after Engine runup. The checks must be coordinated with the Launch Crew who will perform the Verification Readiness Checklist (contained in T. O. 21-TM76A-1-1) when requested by the NCOIC of the Missile Maintenance Crew. By performing the Launch Complex Operational Checklist and the Verification Readiness Checklist, the AGE and Missiles will be verified. This check proves that the Missile Engines, AGE, and airborne equipment are functional (capable of starting and advancing the Missile Engines to 103% RPM).

4-50. FILM CHANGE CHECKLIST.

4-51. The Film Change Checklist is contained in table 4-4. This checklist is to be used for changing the Atran film in an alert Missile on a Launch Pad. By utilizing this checklist, the down-time for the Missile for film change be minimized. The time will be minimized by being able to change the film on the Launch Pad instead of replacing the Missile.

TABLE 4-3

LAUNCH COMPLEX OPERATIONAL CHECKLIST

T.O.21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O.21-TM76A-1-2-1 Guidance Systems Mechanic Mechanic No. 1	T.O.21-TM76A-1-2-2 Controls Systems Mechanic Mechanic No. 2	T.O.21-TM76A-1-2-3 Missile Mechanic Mechanic No. 3	T.O.21-TM76A-1-2-4 Missile Mechanic Mechanic No. 4	T.O.21-TM76A-1-2-5 Weapons Mechanic Mechanic No. 5
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Operation 1.

Request TEMS  
Crew to perform  
LCEG minimum  
performance checks  
(if applicable).

Insure that Safety  
and Arming plug is  
inserted in each  
UOB.

(Eff. I) Position  
Power Pack vehicle.

(Eff. I) Assist  
Mech. No. 2 in  
positioning Power  
Pack vehicle.

TABLE 4-3 (cont)

## LAUNCH COMPLEX OPERATIONAL CHECKLIST

T.O. 21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O. 21-TM76A-1-2- 1 Guidance Systems Mechanic Mechanic No. 1	T.O. 21-TM76A-1-2- 2 Controls Systems Mechanic Mechanic No. 2	T.O. 21-TM76A-1-2- 3 Missile Mechanic Mechanic No. 3	T.O. 21-TM76A-1-2- 4 Missile Mechanic Mechanic No. 4	T.O. 21-TM76A-1-2- 5 Weapons Mechanic Mechanic No. 5
<p>(Eff. I) Engage Power Pack power takeoff (para. 3-59).</p> <p>(Eff. II) Start PE-200 and engage power takeoff (para. 3-82).</p> <p>(Eff. I) Connect Power Pack static ground to ground rod.</p> <p>Inspect Power Pack (para. 3-138).</p> <p>Adjust Power Pack electrical output (para. 3-146)</p> <p>Energize Power Pack hydraulics (para. 3-139)</p>					
<p>Operation 2.</p> <p>(Eff. I) Connect hyd. hoses to Translauncher (para. 3-140).</p> <p>Lower Missile to checkout position (para. 3-153).</p> <p>Observe Mech. 5 connecting w/H.</p> <p>Disconnect w/H (para. 3-187).</p>					

TABLE 4-3 (cont)  
LAUNCH COMPLEX OPERATIONAL CHECKLIST

T.O.21-TM76A-1-2- Guidance Systems Technician NCOIC	T.O.21-TM76A-1-2- 1 Guidance Systems Mechanic Mechanic No. 1	T.O.21-TM76A-1-2- 2 Controls Systems Mechanic Mechanic No. 2	T.O.21-TM76A-1-2- 3 Missile Mechanic Mechanic No. 3	T.O.21-TM76A-1-2- 4 Missile Mechanic Mechanic No. 4	T.O.21-TM76A-1-2- 5 Weapons Mechanic Mechanic No. 5
<p><b>CAUTION</b></p> <p>Insure inlet engine duct is free of foreign objects</p> <p>Assist Mech. No. 2 in performing Launch Area cable check.</p> <p><b>CAUTION</b></p> <p>Install Hold Back bolt (para. 3-62)</p> <p>Perform Launch Area cable check (para. 4-52).</p> <p>Check engine inlet duct for foreign objects.</p> <p>Disconnect squib firing cables (para. 3-187).</p>					
<p>Operation 3.</p> <p><b>WARNING</b></p> <p>Insure that W/H has been disconnected.</p> <p>Request MCCC to perform Verification Readiness Checklist.</p> <p>Operation 4.</p> <p>Request MCCC to remove power from Missile.</p> <p>Elevate Missile to Launch attitude (para. 3-163).</p> <p>Lower Missile to checkout position <del>after</del> engine run (para. 3-153)</p>					

TABLE 4-3 (cont)

LAUNCH COMPLEX OPERATIONAL CHECKLIST

T.O.21-TM76A-1-2- Guidance Systems Technician NCOIC	T.O.21-TM76A-1-2- 1 Guidance Systems Mechanic Mechanic No. 1	T.O.21-TM76A-1-2- 2 Controls Systems Mechanic Mechanic No. 2	T.O.21-TM76A-1-2- 3 Missile Mechanic Mechanic No. 3	T.O.21-TM76A-1-2- 4 Missile Mechanic Mechanic No. 4	T.O.21-TM76A-1-2- 5 Weapons Mechanic Mechanic No. 5
---	---	---	---	---	---

NOTE

Insure that power is not applied to missile until refueling is completed.

Perform post-engine shutdown inspection (para. 4-57)

Prepare Missile for refueling if required (para. 4-46).  
Assist Mech. 3 prepare Missile for refueling (para. 4-46).

Refuel Missile if required (para. 4-47).  
Assist Mech. 3 refuel missile (para. 4-47).

Request MCCC apply power to Missile prior to interlock continuity test.  
Assist Mech. No. 5 in performing interlock continuity test.

Request MCCC to remove power from Missile

Observe Mech. No. 5 connecting w/H.

Perform interlock continuity test (para. 3-191).

Install Shear Bolt (para. 3-60).

Connect w/H (para. 3-192).  
Perform Squib Stray voltage check (para. 3-190.)

TABLE 4-3 (cont)

LAUNCH COMPLEX OPERATIONAL CHECKLIST

T.O.21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O.21-TM76A-1-2- 1 Guidance Systems Mechanic Mechanic No. 1	T.O.21-TM76A-1-2- 2 Controls Systems Mechanic Mechanic No. 2	T.O.21-TM76A-1-2- 3 Missile Mechanic Mechanic No. 3	T.O.21-TM76A-1-2- 4 Missile Mechanic Mechanic No. 4	T.O.21-TM76A-1-2- 5 Weapons Mechanic Mechanic No. 5
--	---	---	---	---	---

Operation 5.

Elevate Missile to launch attitude (para. 3-163).

Shut down Power Pack hydraulics (para. 3-143).

Shut down Power Pack (para. 3-151).

(Eff. I) Disengage power takeoff (para. 3-61).

(Eff. I) Disconnect hyd. hoses from Translauncher (para. 3-144).

(Eff. II) Shutdown PE-200 (para. 3-86).

(Eff. I) Disconnect Power Pack static ground from ground rod.

Perform maintenance visual check (para. 3-7).

(Eff. I) Remove Power Pack Vehicle from Launch Pad (para. 3-63).

(Eff. I) Assist Mech. No. 2 in removing Power Pack Vehicle from Launch Pad.

END OF LAUNCH COMPLEX OPERATIONAL CHECKLIST



TABLE 4-4  
FILM CHANGE CHECKLIST (For alert Missiles)

T.O.21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O.21-TM76A-1-2- 1 Guidance Systems Mechanic Mechanic No. 1	T.O.21-TM76A-1-2- 2 Controls Systems Mechanic Mechanic No. 2	T.O.21-TM76A-1-2- 3 Missile Mechanic Mechanic No. 3	T.O.21-TM76A-1-2- 4 Missile Mechanic Mechanic No. 4	T.O.21-TM76A-1-2- 5 Weapons Mechanic Mechanic No. 5
--	---	---	---	---	---

Operation 1.

Insure that  
Safety and  
Arming plug is  
inserted in UOB.

- (Eff. D) Position  
Power Pack Vehicle.
- (Eff. D) Assist  
Mech. No. 2  
in positioning  
Power Pack  
Vehicle.
- (Eff. D) Engage  
Power Pack power  
takeoff (para.  
3-59).
- (Eff. D) Connect  
Power Pack  
static ground to  
ground rod.

TABLE 4-4 (cont)

FILM CHANGE CHECKLIST (For alert Missiles)

T.O.21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O.21-TM76A-1-2- 1 Guidance Systems Mechanic Mechanic No. 1	T.O.21-TM76A-1-2- 2 Controls Systems Mechanic Mechanic No. 2	T.O.21-TM76A-1-2- 3 Missile Mechanic Mechanic No. 3	T.O.21-TM76A-1-2- 4 Missile Mechanic Mechanic No. 4	T.O.21-TM76A-1-2- 5 Weapons Mechanic Mechanic No. 5
--	---	---	---	---	---

Inspect Power Pack (para. 3-138).

(Eff. II) Start PE-200 and engage power takeoff (para. 3-82).

Adjust Power Pack electrical output (para. 3-146).

Energize Power Pack hydraulics (para. 5-139).

(Eff. I) Connect hyd. hoses to Translauncher (para. 3-140).

Lower Missile to checkout position (para. 3-153).

Shut down NTCU (para. 3-83).

Disconnect W/H (para. 3-186).

Observe Mech. 5 disconnecting W/H  
*POSITION WORK ASSIST. MEMBERS TO POSITION AND STAND*

WARNING

Insure that all Mechanics are ready for Missile power.

TABLE 4-4 (cont)  
FILM CHANGE CHECKLIST (For alert Missiles)

T.O.21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O.21-TM76A-1-2- 1 Guidance Systems Mechanic Mechanic No. 1	T.O.21-TM76A-1-2- 2 Controls Systems Mechanic Mechanic No. 2	T.O.21-TM76A-1-2- 3 Missile Mechanic Mechanic No. 3	T.O.21-TM76A-1-2- 4 Missile Mechanic Mechanic No. 4	T.O.21-TM76A-1-2- 5 Weapons Mechanic Mechanic No. 5
--	---	---	---	---	---

Request LO to  
apply Missile  
power.

Operation 2.

*6054 P  
REMOVE RFT  
CABLE*

~~Disconnect RFT  
Squib Cable  
(Para 3-187).~~

*Disconnect  
RFT SQUIB  
(PARA 3-187)  
Remove RFT  
SQUIB*

Obtain film  
from MOCC.

Remove RF  
Hood (para.  
3-51).

Assist Mech. No.  
1 in removing  
RF Hood.

Remove Radome  
(para. 3-10).

Assist Mech. No. 1  
in removing Radome.

Open Radar base  
casting (para.  
3-11).

Assist Mech. No.  
1 in opening Radar  
base casting.

Remove old film  
(para. 3-12).

Insure that film  
is installed  
properly.

Install new film  
(para. 3-18).

*WATER / NUMBER  
CREW NUMBER*

Insure that Mis-  
sile switch and  
control settings  
are in accor-  
dance with pre-  
launch data  
card.

Perform Missile  
switch and con-  
trol settings  
(para. 3-19, Eff.  
C) or (para. 3-20,  
Eff. D).

*CONNECT CABLE  
785-16*

TABLE 4-4 (cont)

FILM CHANGE CHECKLIST (For alert Missiles)

T.O.21-TM76A-1-2- Guidance Systems Technician NCOIC	T.O.21-TM76A-1-2- 1 Guidance Systems Mechanic Mechanic No. 1	T.O.21-TM76A-1-2- 2 Controls Systems Mechanic Mechanic No. 2	T.O.21-TM76A-1-2- 3 Missile Mechanic Mechanic No. 3	T.O.21-TM76A-1-2- 4 Missile Mechanic Mechanic No. 4	T.O.21-TM76A-1-2- 5 Weapons Mechanic Mechanic No. 5
---	---	---	---	---	---

Insure that timer settings are correct.

Perform target timer settings (para. 3-21).

(Eff. A) Perform brightness and centering adjustments (para. 3-31).

Assist Mech. No. 1 with centering adjustments.

Check RFT centering.

Perform RFT centering (para. 3-57).

Request MCCC to remove power from Missile.

Observe Mech. 5 connecting W/H

Close Radar base casting (para. 3-13).

Assist Mech. No. 1 in closing Radar base casting.

After MCCC re-moves power from Missile, connect W/H (para. 3-193).

*Remove power from Missile*

*Close Radar base casting*

TABLE 4-4 (cont)  
FILM CHANGE CHECKLIST (For alert Missiles)

T.O.21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O.21-TM76A-1-2- 1 Guidance Systems Mechanic Mechanic No. 1	T.O.21-TM76A-1-2- 2 Controls Systems Mechanic Mechanic No. 2	T.O.21-TM76A-1-2- 3 Missile Mechanic Mechanic No. 3	T.O.21-TM76A-1-2- 4 Missile Mechanic Mechanic No. 4	T.O.21-TM76A-1-2- 5 Weapons Mechanic Mechanic No. 5
<p>Install and connect RF Hood (para. 3-52). <i>INSTALL RFT CABLE</i> <i>REMOVE HOOD STAND</i></p> <p>Assist Mech. No. 1 installing RF Hood. <i>ASSIST MECHANIC</i> Connect RFT Squib Cable (<del>para. 3-191</del>).</p> <p><i>INSTALL AND CONNECT RFT SQUIB</i></p>					
<p>Operation 3.</p> <p>Request MCCC to perform RFT check (operation 2, table 2-1 of T.O. 21-TM76A-1-1).</p> <p>Operation 4.</p> <p>Start NTCU (para. 3-85).</p> <p>Elevate Missile to launch attitude (para. 3-163).</p> <p>Shut down Power Pack hydraulics (para. 3-143).</p> <p>On completion of RFI check, shut-down Power Pack (para. 3-151).</p> <p>(Eff. I) Disengage power takeoff (para. 3-61).</p> <p>(Eff. I) Disconnect hyd. hoses from Translauncher (para. 3-144).</p>					

TABLE 4-4 (cont)

FILM CHANGE CHECKLIST (For alert Missiles)

T.O.21-TM76A-1-2 Guidance Systems Technician NCOIC	T.O.21-TM76A-1-2- 1 Guidance Systems Mechanic Mechanic No. 1	T.O.21-TM76A-1-2- 2 Controls Systems Mechanic Mechanic No. 2	T.O.21-TM76A-1-2- 3 Missile Mechanic Mechanic No. 3	T.O.21-TM76A-1-2- 4 Missile Mechanic Mechanic No. 4	T.O.21-TM76A-1-2- 5 Weapons Mechanic Mechanic No. 5
--	---	---	---	---	---

(Eff. II) Shut down  
PE-200 (para.  
3-86).

(Eff. I) Remove  
Power Pack  
vehicle from  
launch Pad  
(para. 3-63).

(Eff. I) Assist  
Mech. No. 2 in  
removing Power  
Pack Vehicle.

(Eff. I) Disconnect  
Power Pack static  
ground from  
ground rod.

Insure that  
safety and arm-  
ing plug is re-  
moved from UOB.

END OF FILM CHANGE CHECKLIST

4-52. LAUNCH AREA CABLE CHECKOUT.

4-53. CONNECTING AND APPLYING POWER TO SIGNAL CABLE TESTER.

NOTE

When using the Signal Cable Tester (figure 4-8) on a particular launch pad, check out only those cables applicable to that launch pad. Refer to table 4-5 for list of cables, connections, and test points. Cables 258R9900025-129, -239 and 435A610-030-100 need not be tested when another Missile is in the alert status.

- a. Procure Signal Cable Tester from SRV.
- b. Insure that no power is applied to Missile and LCEG.
- c. Remove power cable from lid of tester.
- d. Connect power cable from 120V 60 cycle outlet, on NTCU to power input receptacle J6318 on main section of Signal Cable Tester.
- e. Place POWER switch ON. POWER ON indicator lamp must go on.
- f. Insure that GND. REV. switches on Main and Secondary units are in NORMAL.

4-54. PERFORMING LEAKAGE TEST.

- a. Disconnect both ends of cable to be tested; then connect cable to applicable receptacle on Main Unit of Signal Cable Tester in accordance with table 4-5. Do not connect cable to Secondary Unit of Signal Cable Tester.
- b. Place TEST SELECTOR switch to LEAKAGE.
- c. Rotate the test point selector switches to each of the test points applicable as listed in table 4-5.

NOTE

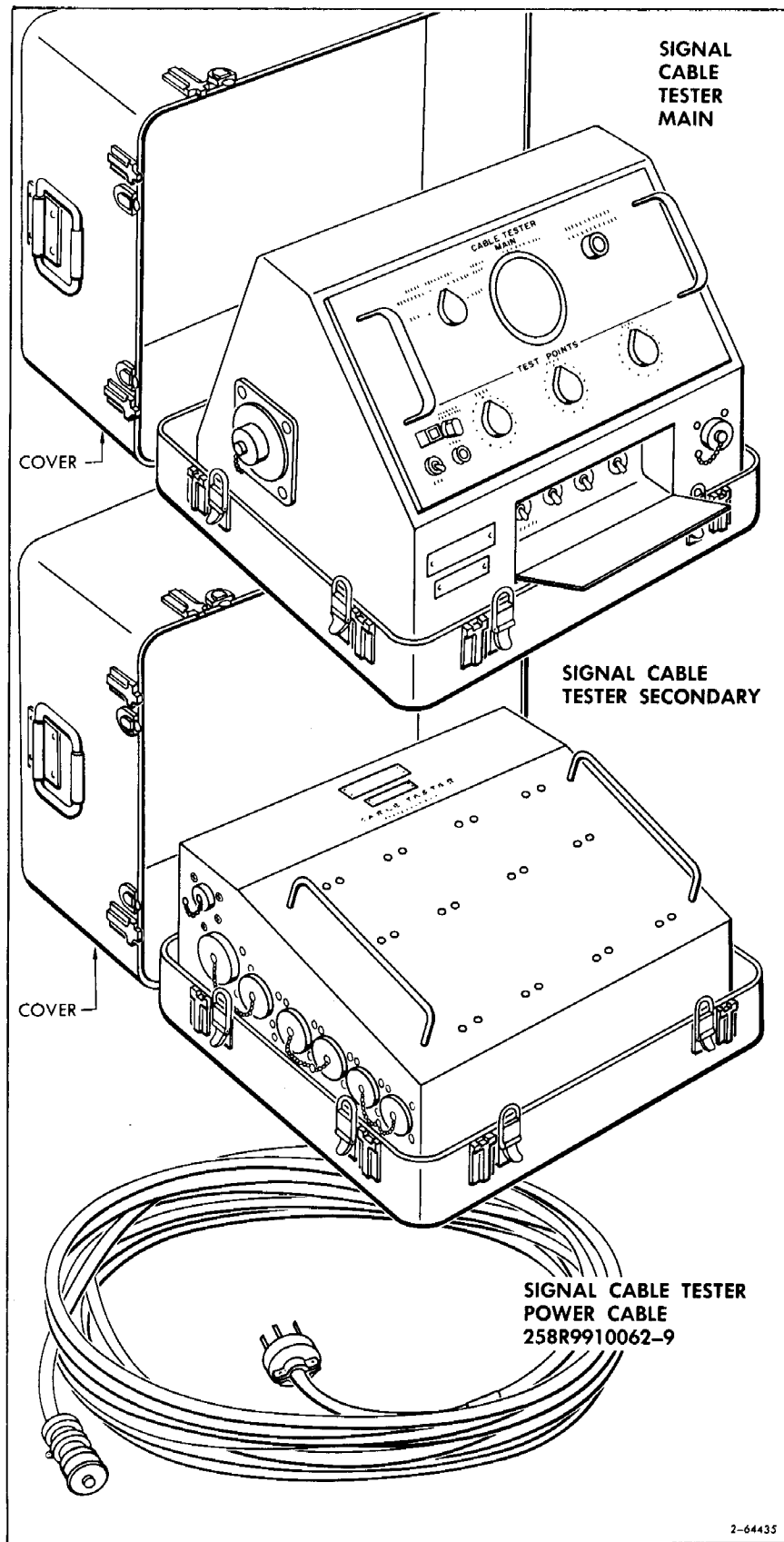
If meter indicates in the left hand red band; replace the cable under test. If meter indicates in right hand red band, replace Signal Cable Tester.

4-55. PERFORMING CONTINUITY TEST.

- a. Place TEST SELECTOR switch to CONT. CALIB. position.
- b. Adjust the CONTINUITY CALIBRATE control for a center indication on the center scale of the meter.
- c. Connect cable to Secondary Unit of Signal Cable Tester as listed in table 4-5.

NOTE

Insure that secondary unit ground cable is connected to a good ground.



2-64435

Figure 4-8. Signal Cable Tester



TABLE 4-5  
SIGNAL CABLE TESTER CONNECTIONS

Cable Number	Main		Secondary		Test Points	Key Way		Cable Name
	Plug No.	Jack No.	Plug No.	Jack No.		Main	Sec	
258R9900025-9	P9022	J6315	P5021	J6402	1 THRU 25		X	LAUNCH CONTROL
-19	P9022	J6315	P5029	J6402	1 THRU 25		N	
-29	P9022	J6315	P5019	J6402	1 THRU 25		N	
-39	P9022	J6315	P5018	J6402	1 THRU 25		X	
-49	P8694	J6317	P5026	J6408	1 THRU 36			ENGINE RUN UP AND TEST
-59	P8694	J6317	P5025	J6407	1 THRU 36			
-69	P8694	J6317	P5024	J6407	1 THRU 36			
-79	P8694	J6317	P5023	J6408	1 THRU 36			
-89	P8771	J6304	P5014	J6405	1 AND 2			ENGINE LIGHT OFF
-99	P8771	J6304	P5015	J6412	1 AND 2			
-109	P8771	J6304	P5016	J6412	1 AND 2			
-119	P8771	J6304	P5017	J6405	1 AND 2			
-129	P5022	J6306	P303	J6413	1 THRU 46			SELECTOR CONTROL
-179	P4011	J6302	P5026	J6408	1 THRU 36	X		VERIFICATION NO. 1
-189	P4012	J6316	P5021	J6402	1 THRU 25		X	VERIFICATION NO. 1
-199	P7101	J6301	P4005	J6402	1 THRU 25		X	NTCU CONTROL
-209	P7101	J6301	P4006	J6402	1 THRU 25		N	
-219	P7101	J6301	P4007	J6402	1 THRU 25		N	
-229	P7101	J6301	P4008	J6402	1 THRU 25		X	

TABLE 4-5 (cont)  
SIGNAL CABLE TESTER CONNECTIONS

Cable Number	Main		Secondary		Test Points	Key Way		Cable Name
	Plug No.	Jack No.	Plug No.	Jack No.		Main	Sec	
-239	P312	J6310	P9101	J6411	1 THRU 7			RECTIFIER ON-OFF
-249	P7102	J6309	P8003	J6417	1 THRU 8	X		NTCU HOSE DISCONNECT
-319	P9014	J6305	P8693	J6414	1 THRU 46			UMBILICAL
-329	P9015B	J6304	P9015	J6409	1 AND 2			BOOSTER ADAPTER
258R9910046-9	P6101	J6302	P2012	J6403	1 TRHU 36	W	W	FCT FLIGHT CONTROL UNIT
-19	P6102	J6302	P8403	J6403	1 THRU 36	Y	Y	FCT PRELAUNCH DISCONNECT
-29	P6103	J6302	P9415	J6403	1 THRU 36	Z	Z	FCT GUID. FUNC.
-39	P9013	J6311	P6104	J6415	1 THRU 12			FCT GYRO SLAVING
435A610-030-100	P5028	J6303	P100	J6410	1 THRU 10			MISSILE START CONTROL
610-031-100	P7106	J6309	P503	J6417	1 THRU 9	Y		HCU CONTROL
610-032-100	P601	J6314	P502	J6416	1 THRU 10			HCU TO HOOD REMOVAL
611-014-100	P313	J6313	P305 P306	J6418	1 THRU 8			START FUEL

TABLE 4-5 (cont)  
SIGNAL CABLE TESTER CONNECTIONS

Cable Number	Main		Secondary		Test Points	Key Way		Cable Name
	Plug No.	Jack No.	Plug No.	Jack No.		Main	Sec	
611-014-300	P313	J6313	P304 P307	J6418	1 THRU 8			START FUEL
611-017-100	P314	J6312	P316	J6406	1 THRU 4			FUEL-START POWER
620-013-100	P7104 P7105	J6309	P8001 P8002	J6417	1 THRU 8	N		HCU HOSE DISCON- NECT
987-007-100	P9434	J6307	P1600	J6401	1 THRU 53			RCT CABLE (See Note 2.)
	P1503 P7002	<u>J6308</u> <u>J6309</u>				N		<u>RFT SQUIB</u> <u>RFT NTCU BRANCH</u> (See Note 2.)

Note 1. Place GND, REV. switches on Main and Secondary units to REMOTE ARMING when checking REMOTE ARMING cables. Place GND, REV. switches to NORMAL at completion of REMOTE ARMING cable check.

Note 2. RFT CABLE, RFT SQUIB, and RFT NTCU BRANCH cables must all be connected at the same time in order to perform test.

- d. Place TEST SELECTOR switch to CONT.
- e. Rotate TEST POINT SELECTOR switch to applicable test points as listed in table 4-5.
- f. The meter must indicate within the green band for each of the applicable test points.

NOTE

If meter indicates in either right or left red bands of meter; replace cable under test. Test points not called out in table 4-5 and off positions will cause meter indication in left-hand red band.

- g. When all cables have been tested; place TEST SELECTOR switch to OFF.
- h. Disconnect power cable from 120V 60 cycles outlet on NTCU and power input receptacle J6318 on main section of Signal Cable Tester.
- i. Place power cable in lid of main unit.
- j. Replace covers on main and secondary units, and return to stowage in SRP.

4-56. CONNECTING LAUNCH AREA CABLES. (See figure 4-9.)

NOTE

When connecting cables with spring-loaded breakaway disconnect, insure that arming nut is turned fully counterclockwise. Connect plug and jack, and tighten coupling nut. (Cannon plug pliers may be required.) Slide arming assembly around coupling nut to an accessible position. Grasp cable by wire mesh and pull firmly from Missile to insure that plug is properly connected. Turn arming nut fully clockwise and connect lanyard to latch key.

- a. Connect engine runup and test cable to receptacle J8694 on Missile and use lanyard, part number 435A610-033-105, to connect to latch key.
- b. Connect launch control cable to receptacle J9022 on Umbilical Outlet Box.
- c. Connect ICS cable to Junction Box.
- d. Connect static ground cable to COMMON GROUND receptacle J8770 on Missile and use lanyard part number 435A610-033-109 to connect to latch key.
- e. Connect engine start power cable to receptacle J322 on Translauncher Junction Box, and to ENGINE START RECEPTACLE J8613 on Missile. Use lanyard, part number 435A610-033-115, to connect to latch key.
- f. Connect Missile aft bus power cable to receptacle J321 on Translauncher Junction Box and to Missile AFT BUS RECEPTACLE J8614 on Missile. Use lanyard, part number 435A610-033-107, to connect to latch key.
- g. Connect light-off cable to receptacle J8771 on Missile and use lanyard, part number 435A610-033-101, to connect to latch key.

h. Connect booster pump cable to Junction Box and to Start Fuel Box on aft right side of Translauncher.

i. Insure that start fuel hose is connected to Start Fuel Box and to START FUEL DISCONNECT on Missile.

## NOTE

The start-fuel disconnect fitting must be lubricated with light grease before connecting it to Missile.

j. Without pulling on start-fuel hose, actuate manual release. Start-fuel hose must release.

## NOTE

If start-fuel hose does not release, replace start-fuel hose assembly and repeat steps i and j.

k. Reconnect start-fuel hose.

l. Connect start-fuel disconnect cable to Start Fuel Box and disconnect solenoid on start-fuel disconnect cable.

## 4-57. POST-ENGINE SHUTDOWN INSPECTION.

## NOTE

The following inspection procedure must be accomplished each time the Engine is shutdown. In addition, the following steps cover special inspections that were previously required for over speed or over temperature operation.

a. Insure that engine oil level is at 12-quart mark on dip stick.

b. Examine all fuel, oil, and hydraulic lines on Engine and in plenum chamber for evidence of leakage or damage.

## NOTE

It is normal for vapor leakage from vent suction relief valve.

c. Examine engine accessories for damage and security of attachment.

d. Examine compressor rotating guide vane for damage (see table 4-5).

e. Enter tailpipe, after allowing sufficient time for cooling, and examine turbine blades, and exhaust cone with a bright light.

(1) If there is any damage to turbine blades, remove Engine and make a closer inspection of turbine blades as described in applicable manual.

(2) Check for rubbing or scraping of any surface of turbine wheel while pushing it forward and slowly rotating it. Replace Engine if such a condition exists.

(3) After Engine has accumulated 3 minutes at 85% RPM or above, check that clearance between turbine blades and shroud is not less than 0.045 inch.

(4) Check for signs of rubbing or scraping of blade tips against shroud ring. Replace Engine if such a condition exists.

(5) Examine turbine shroud ring, turbine blades, and nozzle diaphragm for evidence of molten metal deposits. Replace Engine if there is any trace of metal deposits.

## NOTE

Refer to Table 4-6.

TABLE 4-6

## COMPRESSOR ROTATING GUIDE VANE INSPECTION LIMITS

DEFECT	NUMBER	LIMIT	DISPOSITION
Nick or dent in outer two thirds of leading edge.	Any	1/4 inch deep Over 1/4 inch deep.	Continue in service Recycle Missile
Nick or dent in inner one third of leading edge	Any	3/16 inch deep Over 3/16 inch deep.	Continue in Service Recycle Missile
Bent vanes without cracks	Any		Continue in Service
Cracks in vanes	None Permitted		Recycle Missile

## 4-58. SQUIB INSTALLATION AND STRAY VOLTAGE CHECK

- a. Prior to installing squibs visually inspect each squib for corrosion, dents, and bent pins. Insure squib threads are not damaged and are free from dirt. Insure that the rubber "O" ring on the M76 MOD I squibs and the asbestos filled copper gasket on the 200X-6-134 squibs or equivalent are installed and not damaged.
- b. Insure that cable 435A620-013-100 is disconnected from J8001 on hydraulic squib actuated disconnect.
- c. Insure that cable 435A620-013-100 is disconnected from J8002 on hydraulic squib actuated disconnect.
- d. Insure that cable 258R9900025-249 is disconnected from J8003 on NTCU duct squib actuated disconnect.
- e. Obtain Multimeter and set on RX1 range and insure that meter is operating.
- f. Connect leads of Multimeter to pin A of J8001 and pin A of squib end of squib control cable.
- g. Connect leads from J8001 pin B to pin B of squib control cable.
- h. In both cases meter must indicate continuity.
- i. Repeat steps f and g for J8002 and J8003.
- j. Thread two M76 MOD I squibs into squib adapter on hydraulic pressure hose squib actuated disconnect. Remove shorting devices and connect squib firing cables to both squibs.
- k. Using Multimeter; check J8001 Pins A and B for AC or DC voltage. Use lowest AC and DC range; meter indications must be zero.

## WARNING

If voltage indication is obtained, notify the NCOIC.  
DO NOT connect cable. After malfunction has been corrected, repeat step k, meter indication must be zero.

- l. Remove shorting device and connect firing cable P8001 to J8001.
- m. Repeat steps k and l for remaining cables connecting P8002 to J8002 and P8003 to J8003, hydraulic return and NTCU disconnect.
- n. Using Multimeter, check between pins A and B, between C and B on squib end of receptacle of RFT squib firing cables. Use lowest AC and DC voltage range; meter indication must be zero.
- o. Remove shorting device from RFT cable squib and connect squib firing cable to squib.
- p. Disconnect and stow Multimeter.