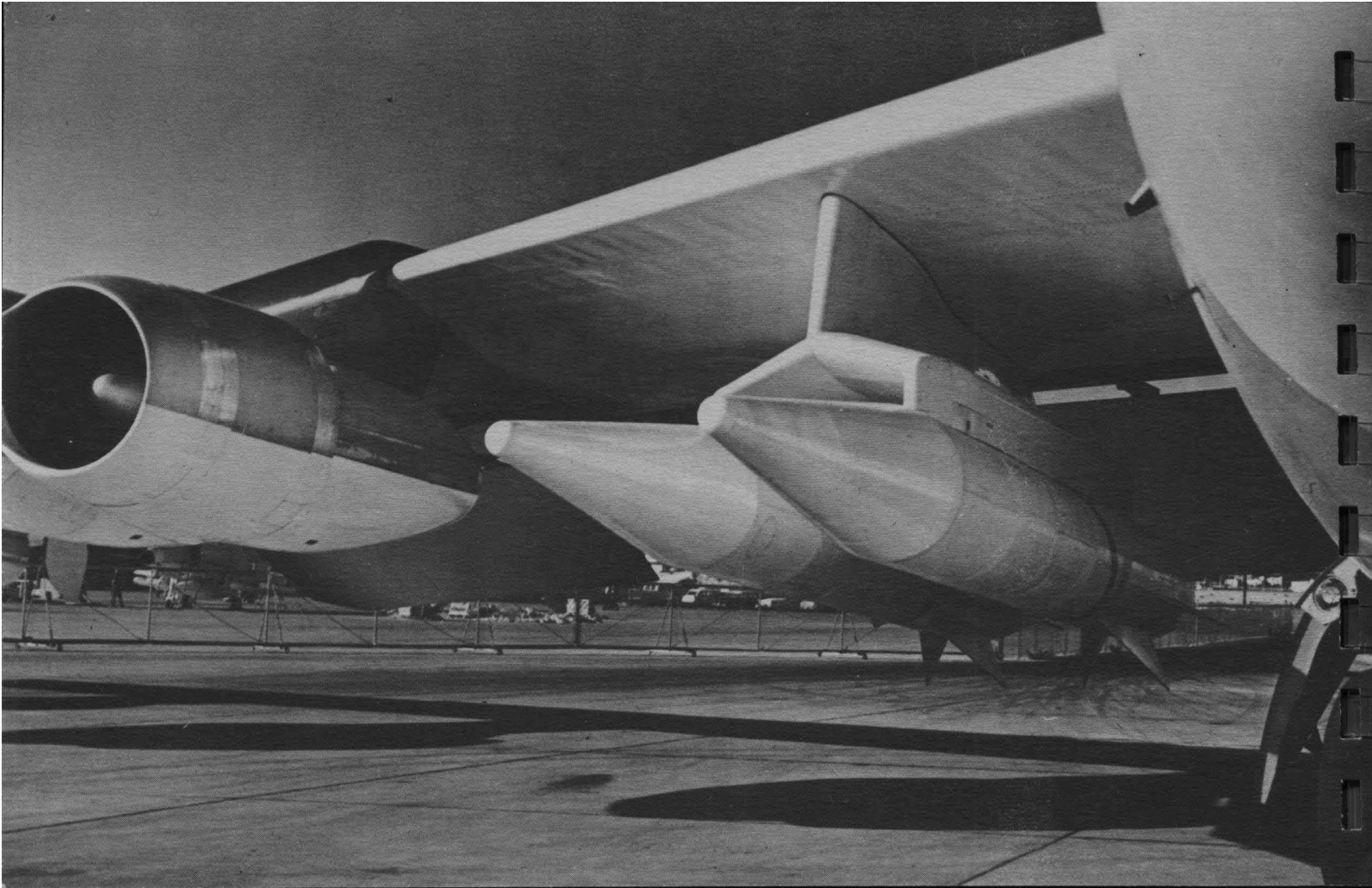
GAM-87A PYLON / LAUNCHER / THERMO-CONDITIONING SYSTEM

APRIL 1962

maintainability design review

DOUGLAS AIRCRAFT COMPANY, INC., TULSA DIVISION



FOREWORD

The Tulsa Division of the Douglas Aircraft Company extends to you a most cordial welcome.

The purpose of this booklet is to acquaint you with the GAM-87A Pylon and associated equipment. It is intended to serve only as a guide during this informal maintainability design review.

Our staff will be on hand at all times to offer you the utmost cooperation during your stay.

J. R. Allen

Vice-President - General Manager
Tulsa Division

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AGENDA*

WEDNESDAY APRIL 4, 1962

0800 - Instructions to Air Force Personnel (Lt. Col. J.R. Fowler's Office) — Col. C. H. Bolender-System Program Director

0815 - Opening statements and introduction of Douglas Aircraft Company Personnel (Conference Room A) — J. R. Allen-Vice-President-General Manager-Tulsa Division

0835 - Opening statements and introduction of Air Force Personnel

0850 - Formation of Committees: Pylon
Launcher
Thermo-Conditioning Unit

4

0905 - Proceed to Review Area

0915 - Coffee (in review area)

0925 - Review of hardware and/or drawings

1200 - Lunch

1300 - Review of hardware

1500 - Coffee

1510 - Review of hardware

1630 - End of Wednesday session

* THIS AGENDA IS TENTATIVE AND WILL BE REVISED AT CUSTOMER REQUEST.

0815 - Preparation of RFA's and/or further review of hardware

0930 - Coffee

0940 - Continuation of RFA preparation and/or review of hardware

1200 - Lunch

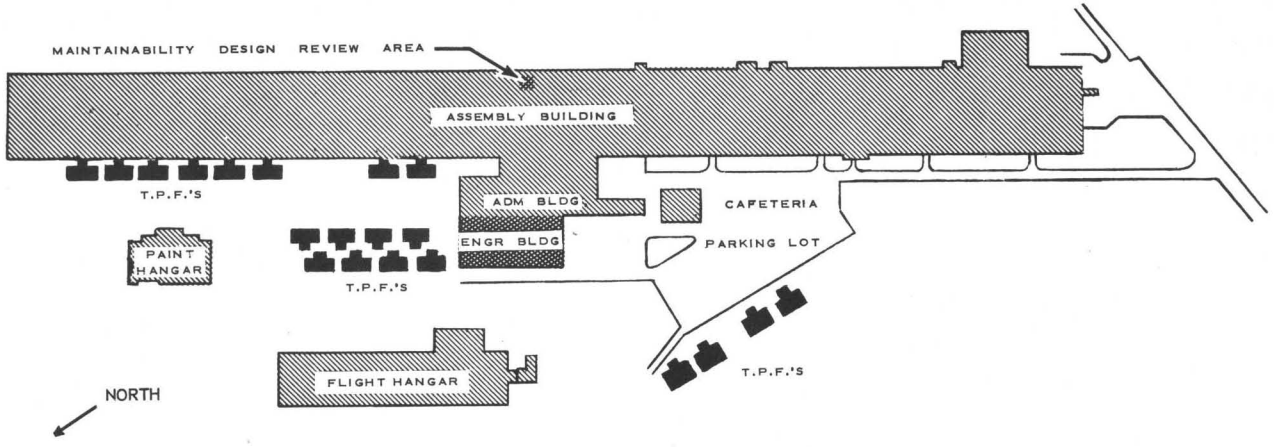
1300 - Review of RFA's

1500 - Coffee

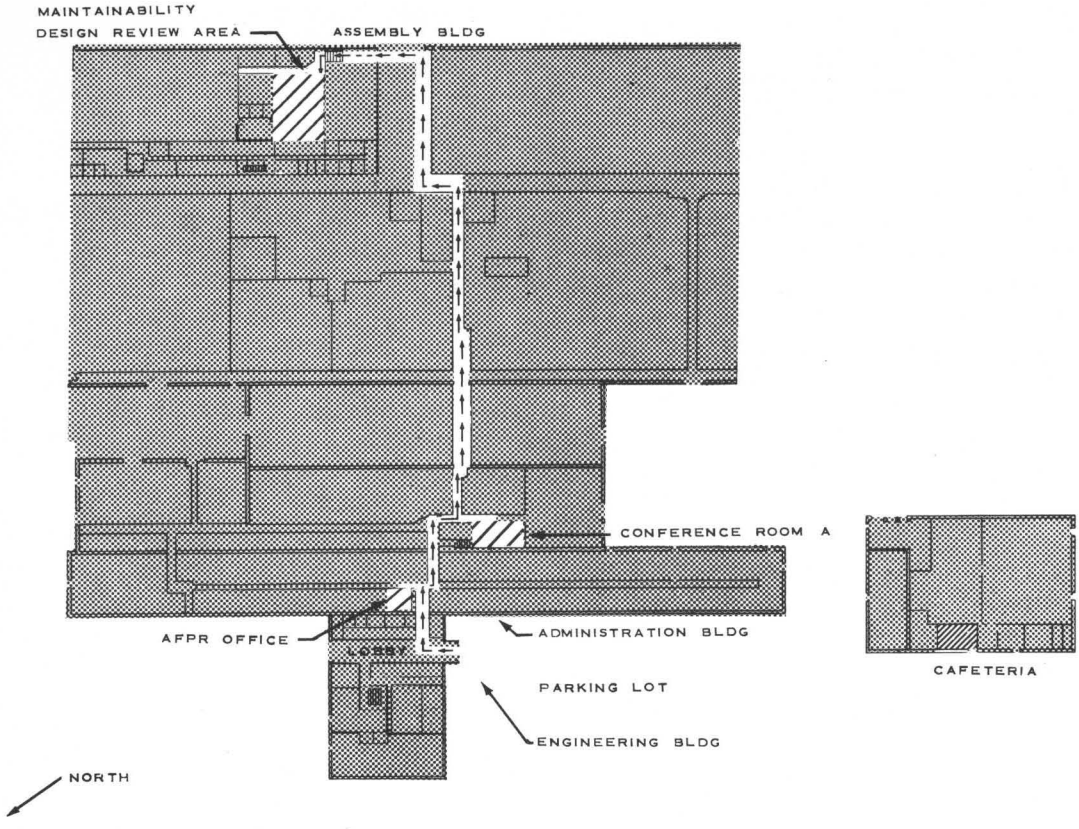
1510 - Continuation of RFA review

1620 - Closing statements

1630 - Review completed


MAINTAINABILITY DESIGN REVIEW AREA
ASSEMBLY BUILDING
T.P.F.'S
ADM BLDG
CAFETERIA
ENGR BLDG
PARKING LOT
PAINT HANGAR
T.P.F.'S
T.P.F.'S
FLIGHT HANGAR
NORTH

PLOT PLAN


MAINTAINABILITY
DESIGN REVIEW AREA
ASSEMBLY BLDG
CONFERENCE ROOM A
AFPR OFFICE
ADMINISTRATION BLDG
PARKING LOT
ENGINEERING BLDG
CAFETERIA
NORTH

AREA MAP

PYLON/LAUNCHER/ THERMO-CONDITIONING SYSTEMS

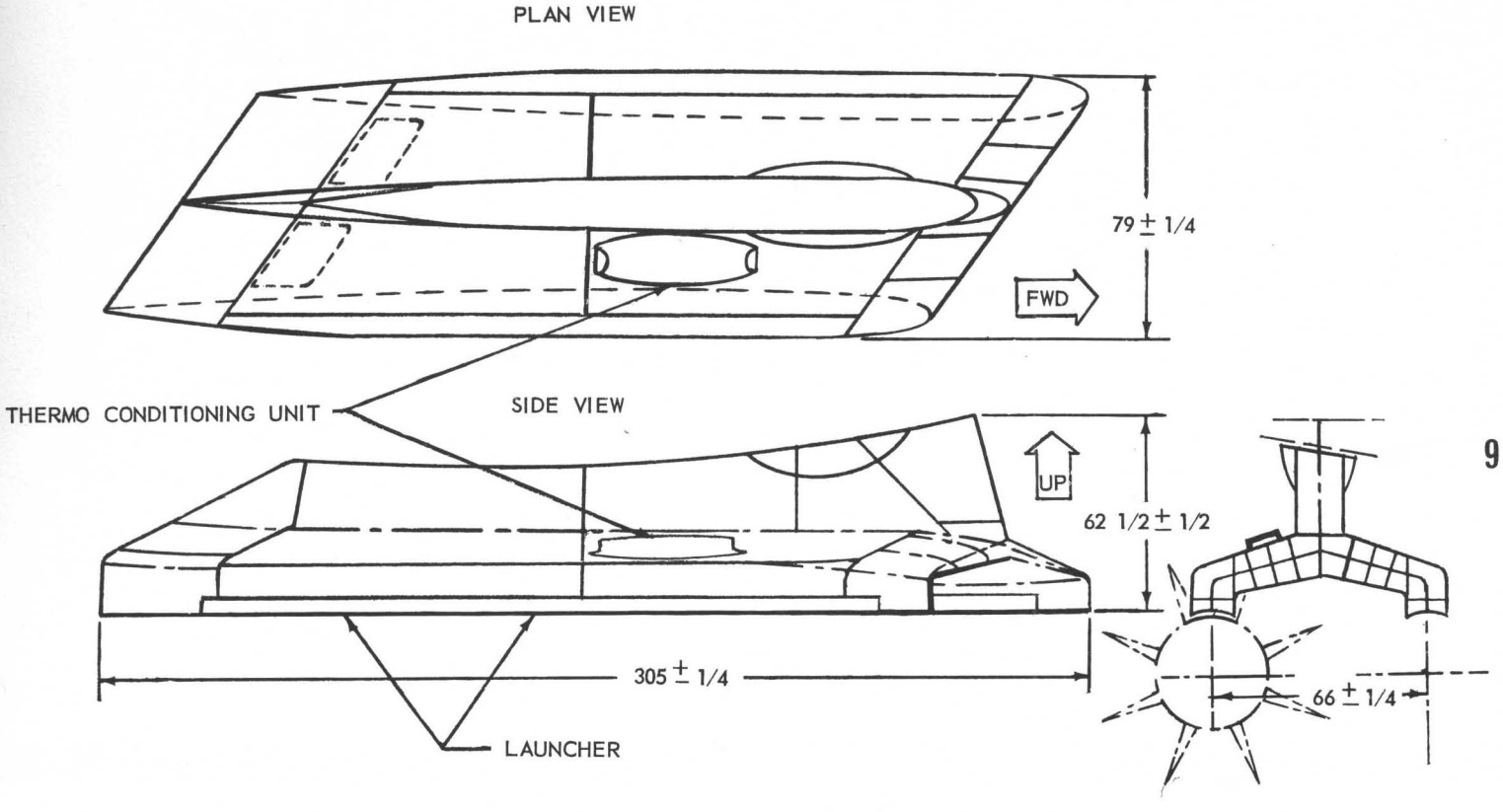
The pylon consists of a constant-thickness center section with the leading edge and trailing edge sections defined by NACA 4-digit series airfoils. Thickness ratios vary from 9.08 percent at the wing-pylon intersection to 5.04 percent at the missile. The leading edge of the outrigger legs is swept 36 degrees.

The pylon is designed so that the wing-pylon joint, tension, compression, shear and side moment loads are reacted at the forward spar. Side shear and vertical loads are reacted at the rear spar. The spars, together with the skin and major ribs, make the pylon a torque box structure for distribution of the loads to the wing.

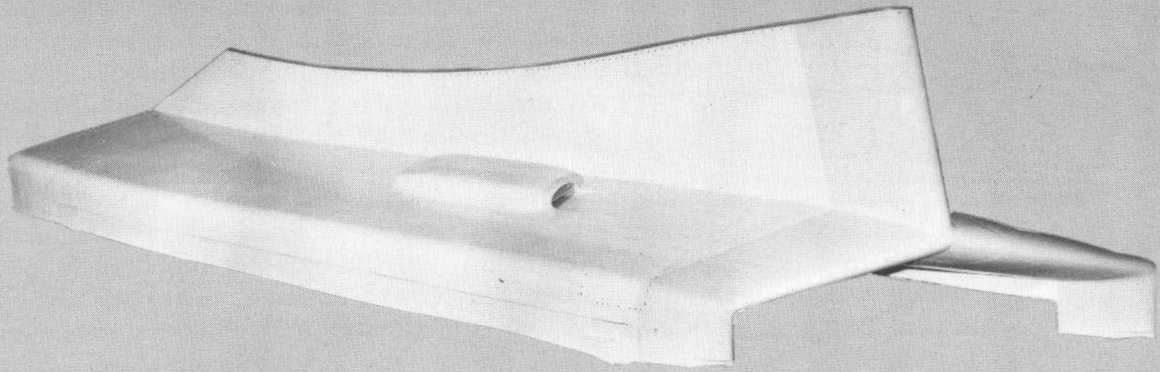
The pylon is a dual-missile-carry configuration designed for attachment to B-52F, G and H aircraft at existing wing attach points.

The launcher is a long, narrow box structure which fits into a recess on the underside of the pylon and contains a hook and sear release mechanism with an explosive actuator.

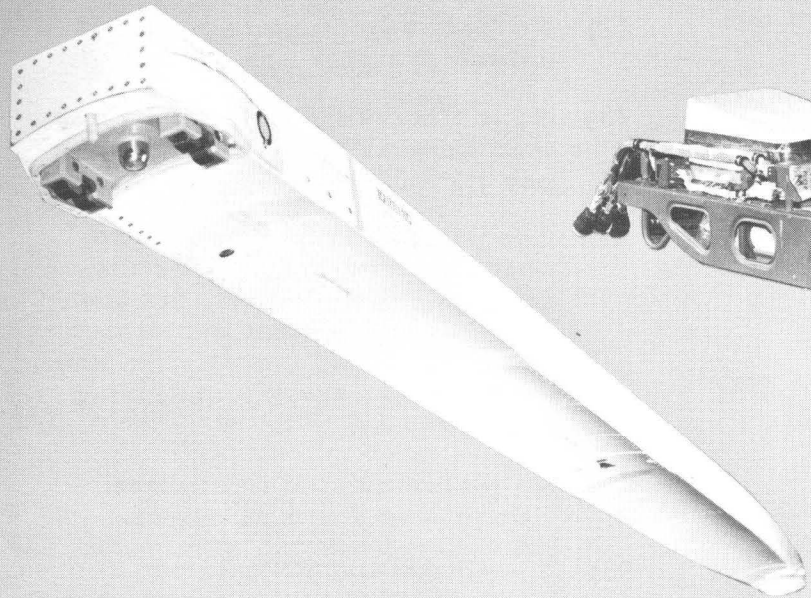
The thermo-conditioning system, consisting of a cooling circuit and a refrigeration circuit, maintains the missile guidance components in a predetermined environmental condition necessary to meet operational requirements.

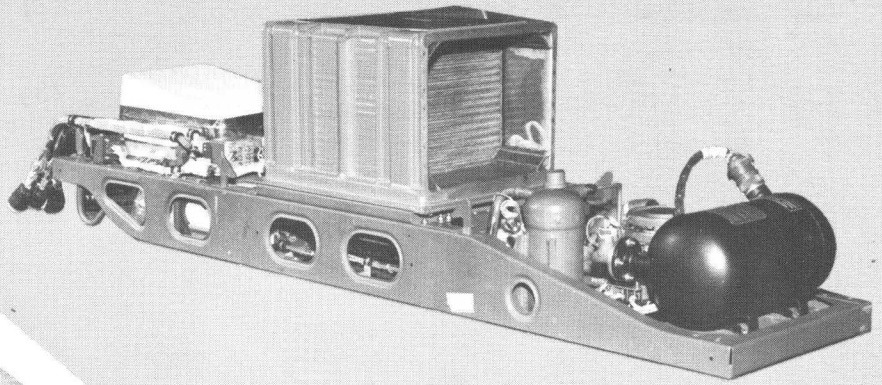

PLAN VIEW
79 ± 1/4
FWD
THERMO CONDITIONING UNIT
SIDE VIEW
UP
62 1/2 ± 1/2
305 ± 1/4
66 ± 1/4
LAUNCHER

R. H. PYLON



GAM87A R&D PYLON





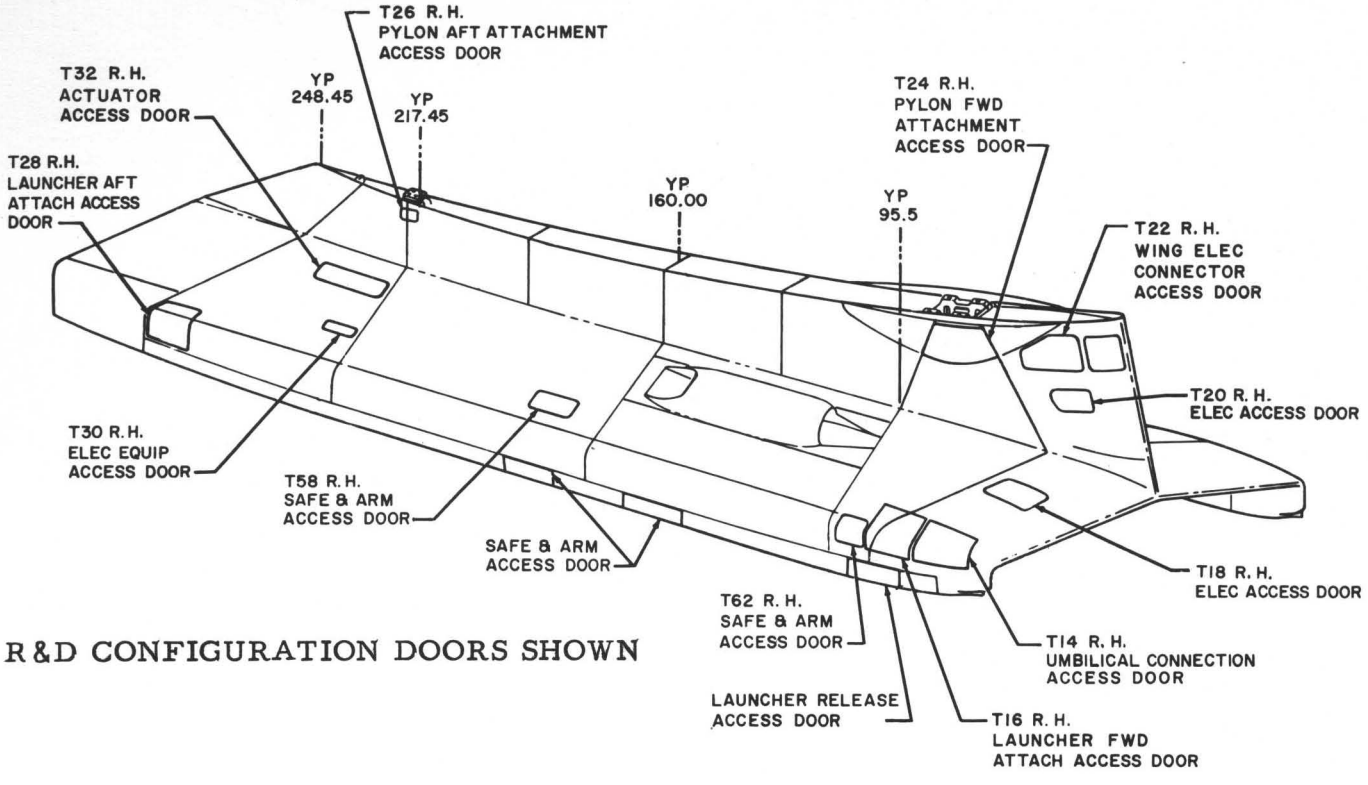
LAUNCHER

THERMO-CONDITIONING UNIT

PYLON SYSTEMS	MAINTAINABILITY COMMENTS
(1) Aft Pylon Support Trunions	(1) Lubricate per DPS 3.17 during major periodic maintenance.
(2) Mechanical Systems	(2) No field adjustments required unless systems are disturbed.
(3) Lanyard Systems	(3) No maintenance required other than normal cable maintenance per DPS 3.08.
(4) Air Deflector Mechanism (Linear Actuator)	(4) Checking and adjustment procedures are provided for the deflector mechanism, but the electro-mechanical actuator assembly shall not require any maintenance for the operating life of the unit.
(5) Mechanical Hardware	(5) No maintenance is required unless items are damaged.
(6) Electrical Components	(6) Inspection and installation access is provided through doors shown on pages 15, 16 and 17. Wiring is in conduit where necessary to eliminate clamps in inacessible locations.
(7) Electrical Umbilical	(7) Special tools are provided for maintenance.

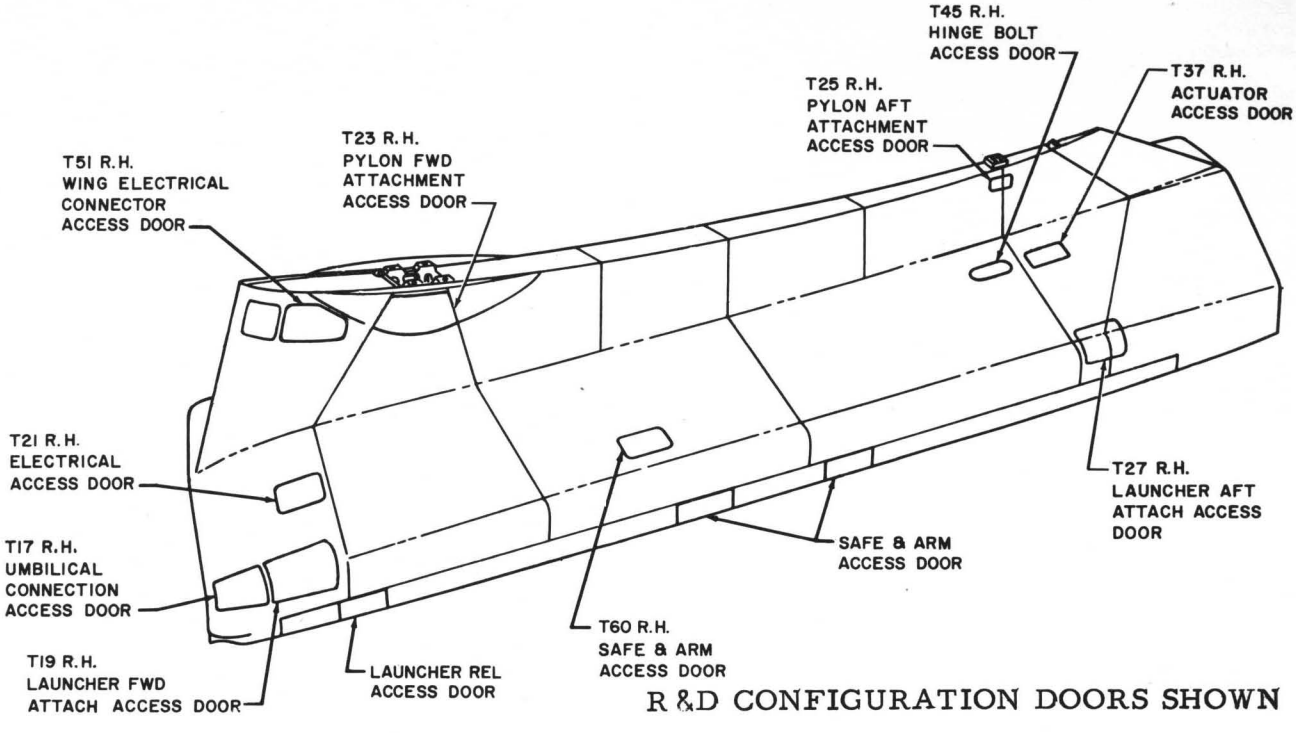
LAUNCHER SYSTEMS	MAINTAINABILITY COMMENTS
(1) Mechanical Systems a. Push rods b. Lock actuator c. Release mechanism	(1) Launcher mechanisms are adjusted on initial installation and require no field adjustments unless the systems are disturbed for repair. Procedures are provided for adjustment.
(2) Rotary Actuator	(2) The electro-mechanical actuator shall not require any periodic maintenance for the operating life of the unit.
(3) Electrical Systems	(3) Launcher electrical systems are accessible through doors shown on pages 15, 16 and 17.
(4) Explosive Actuator Assembly	(4) The actuator requires maintenance only after firing of explosive squibs. Barrels and pistons are then cleaned with trichlorethylene, pistons are lubricated with MIL-I-8660 and are re-installed with new 0-rings and back-up rings.

THERMO-CONDITIONING SYSTEM	MAINTAINABILITY COMMENTS
(1) Electrical Systems	(1) Provisions have been made for replaceable electrical components together with periodic checkout procedures.
(2) Temperature Control Valve	(2) No field level maintenance is required.
(3) Compressor motor and coolant pump motors	(3) The compressor motor is a hermetically sealed unit and the two ac coolant pump motors require no maintenance.
(4) Quick-disconnect umbilicals	(4) The umbilicals are self-sealing units and require no service unless damaged in operation.
(5) Coolant and refrigeration systems	(5) Field carts and procedures are provided for charging and adding of fluid to both systems. Both systems are sealed and require no field maintenance.

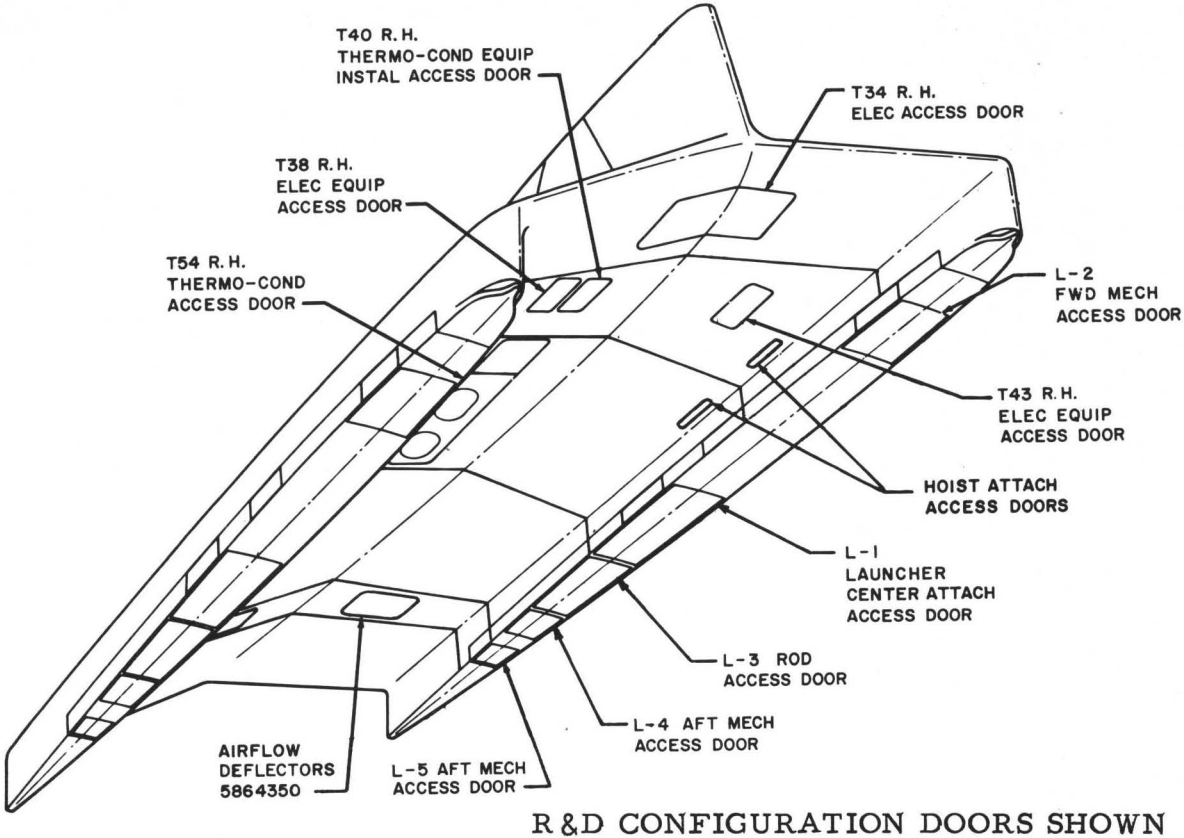


R&D CONFIGURATION DOORS SHOWN

P-8 ACCESS DOORS, OUTBOARD

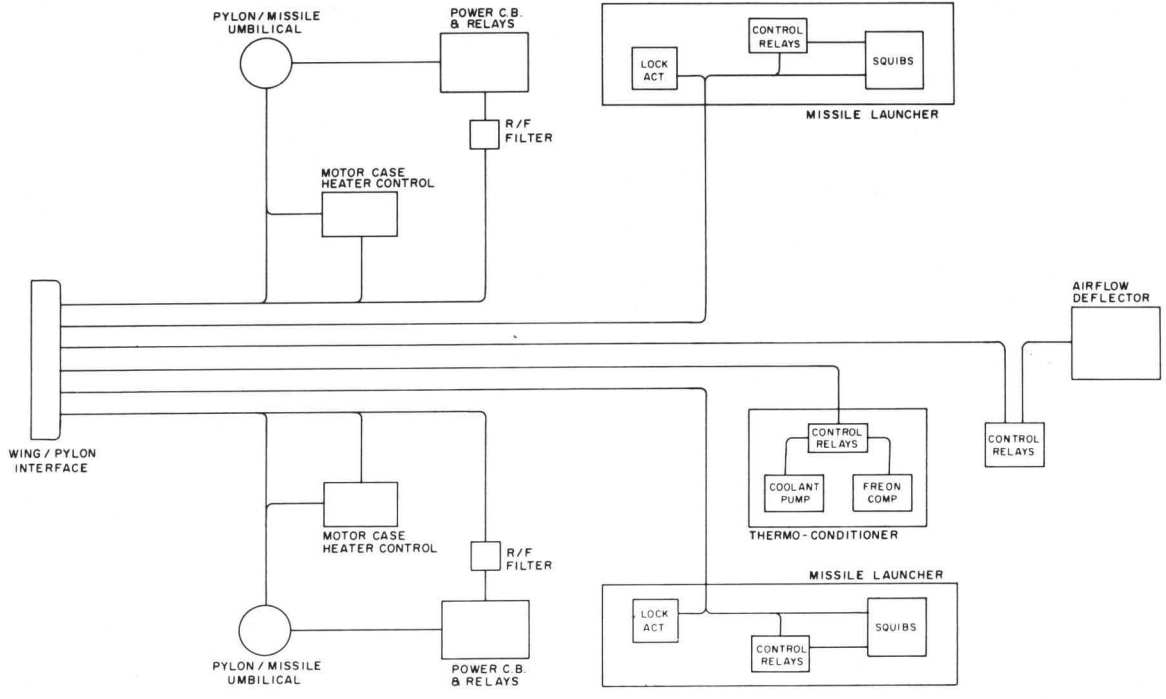


P-8 ACCESS DOORS, INBOARD

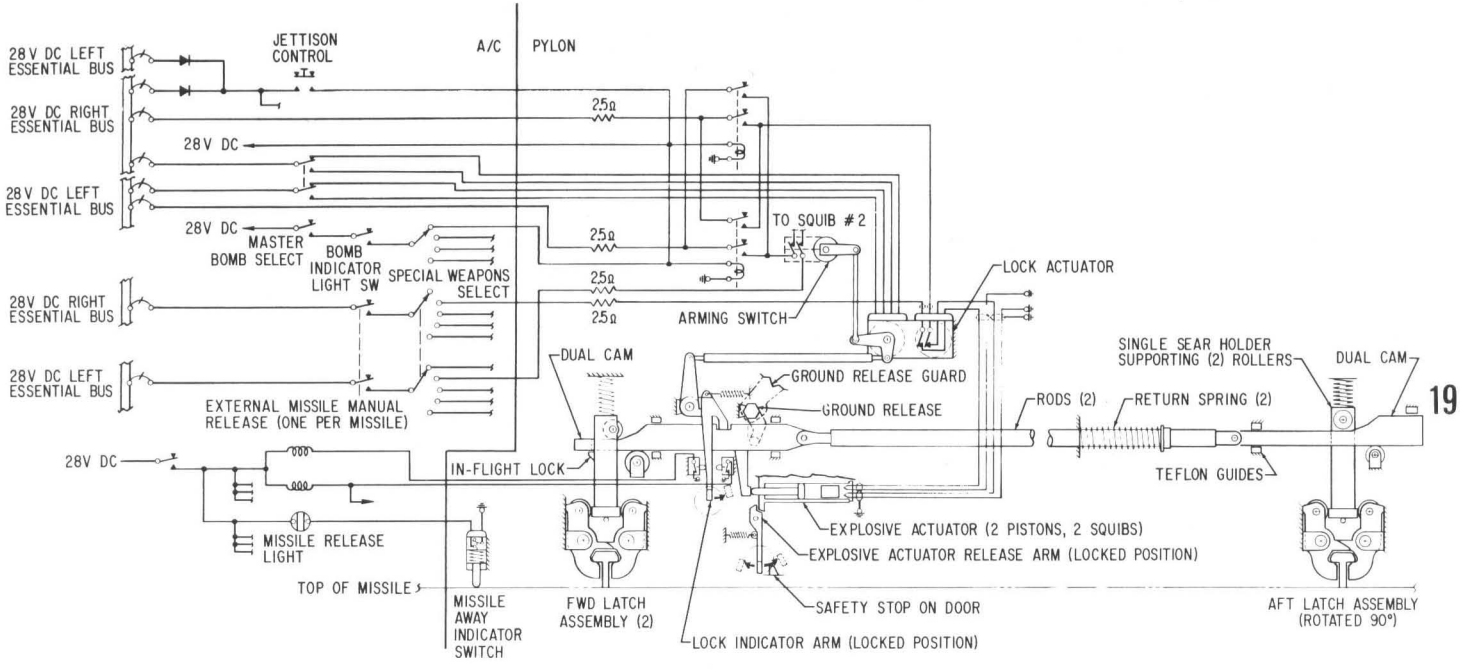


R&D CONFIGURATION DOORS SHOWN

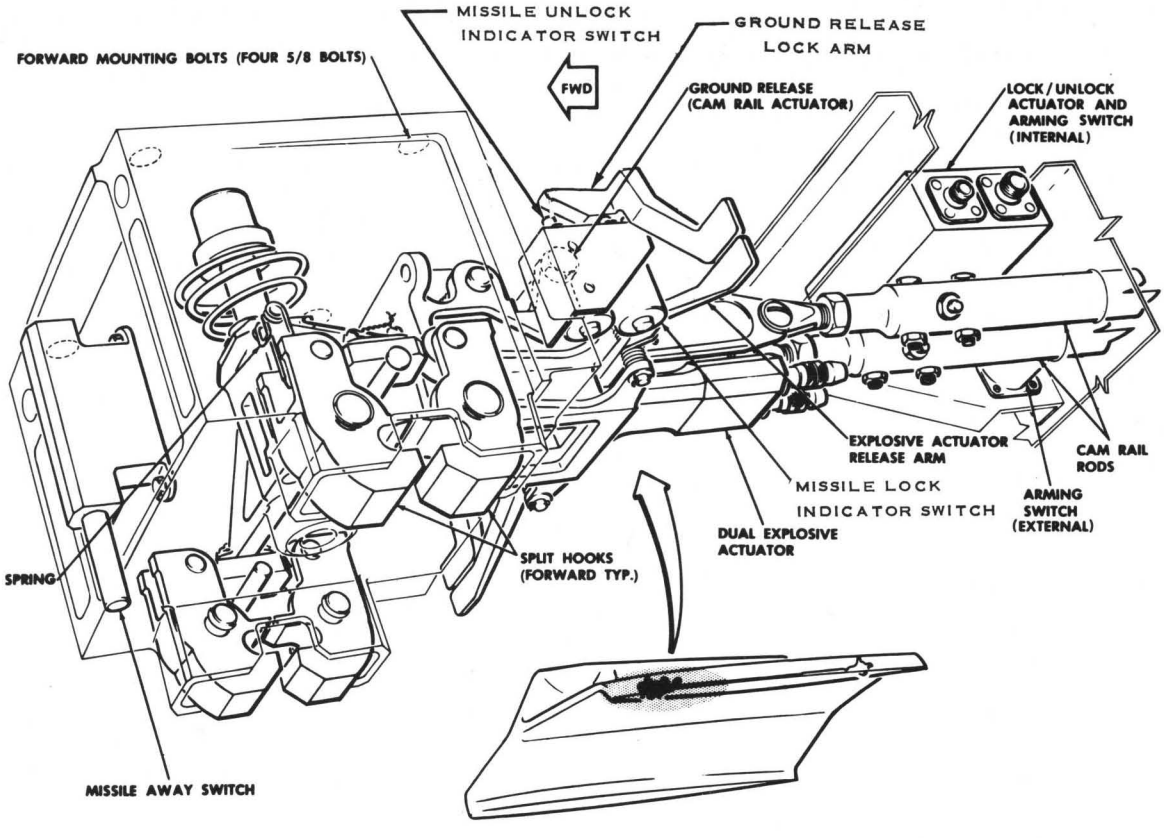
P-8 ACCESS DOORS, UNDERSIDE



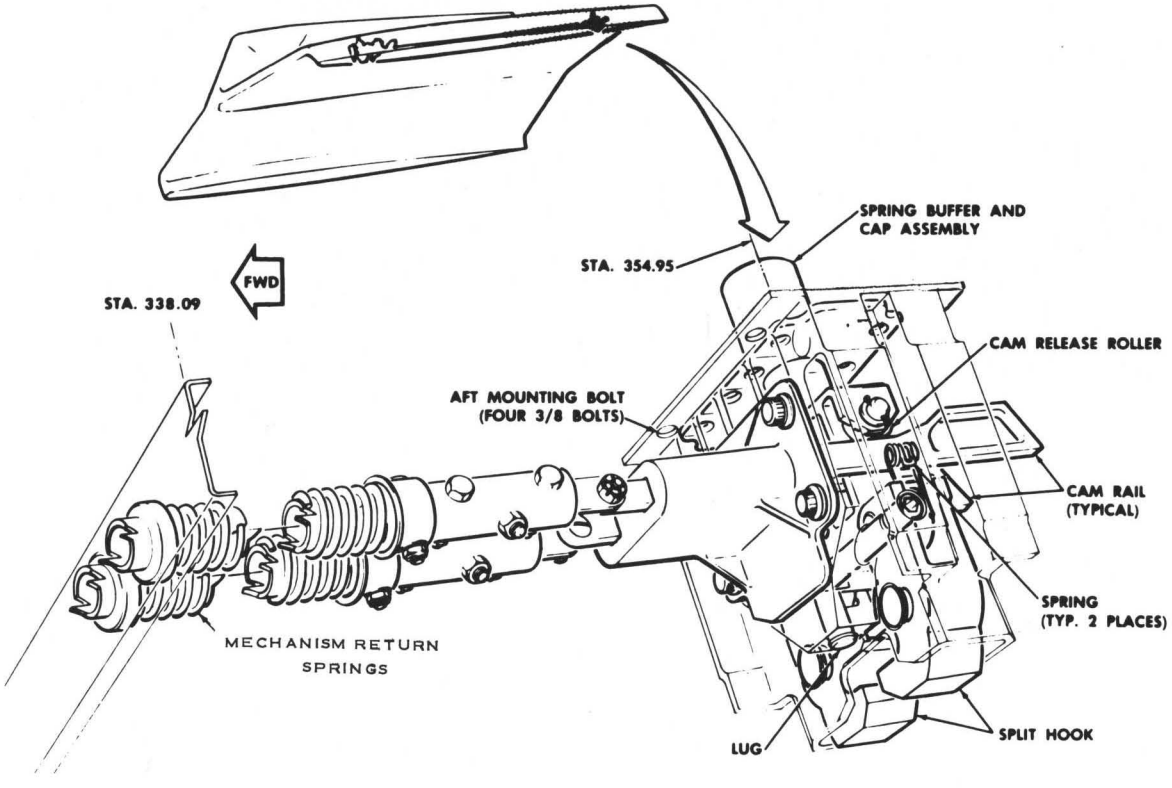
ELECTRICAL DIAGRAM PYLON - LAUNCHER



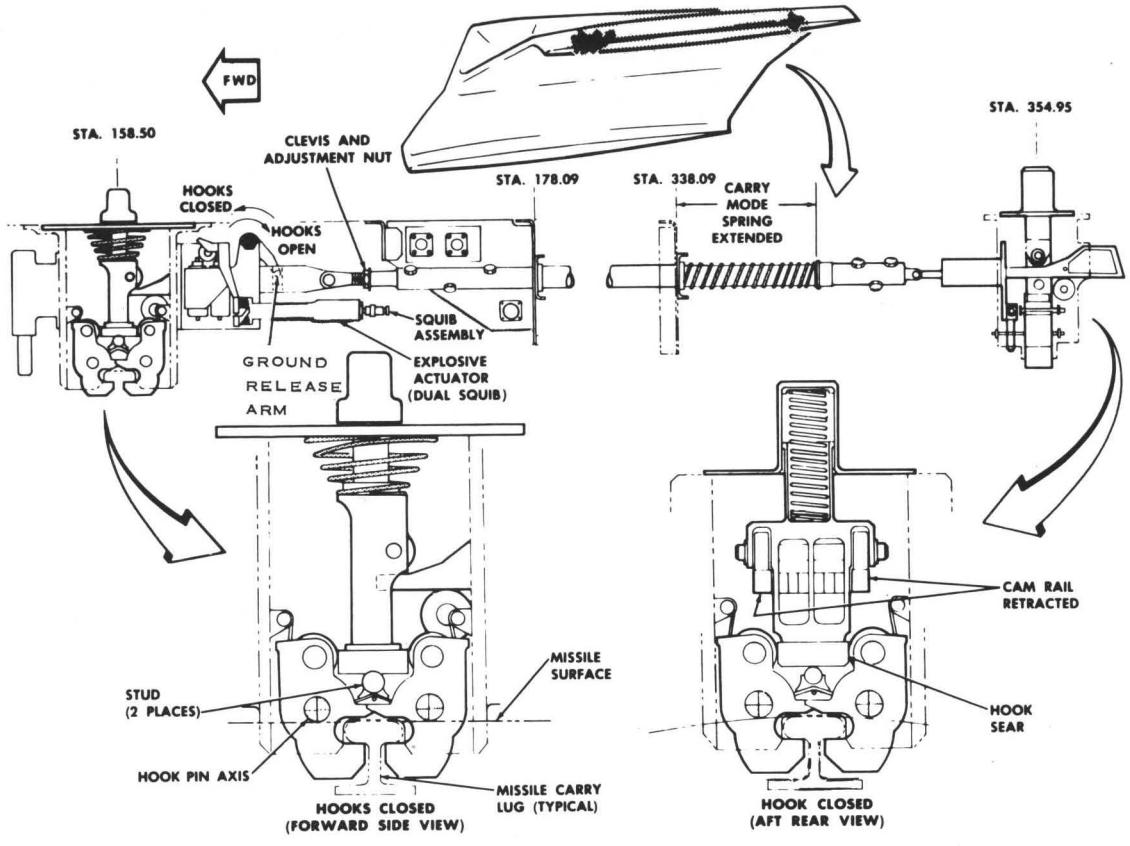
LAUNCHER RELEASE MECHANISM SCHEMATIC



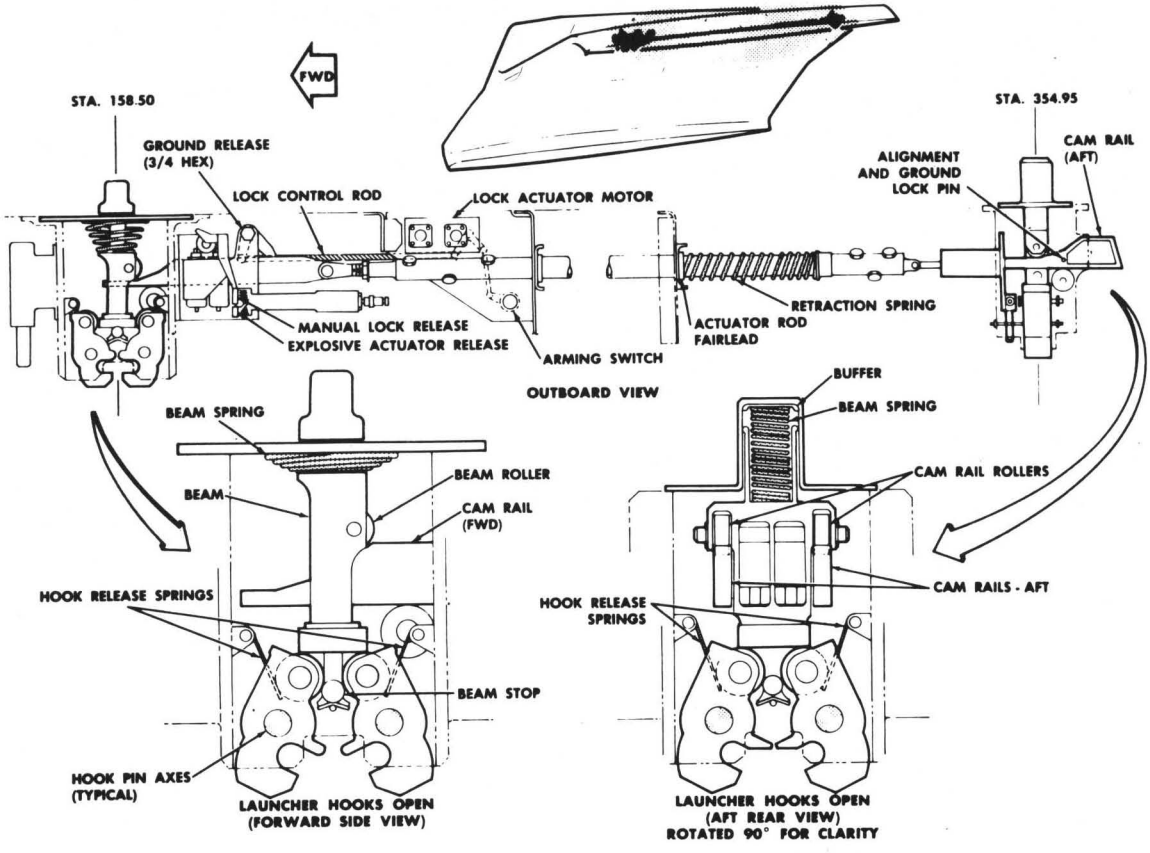
LAUNCHER RELEASE MECHANISM-FORWARD



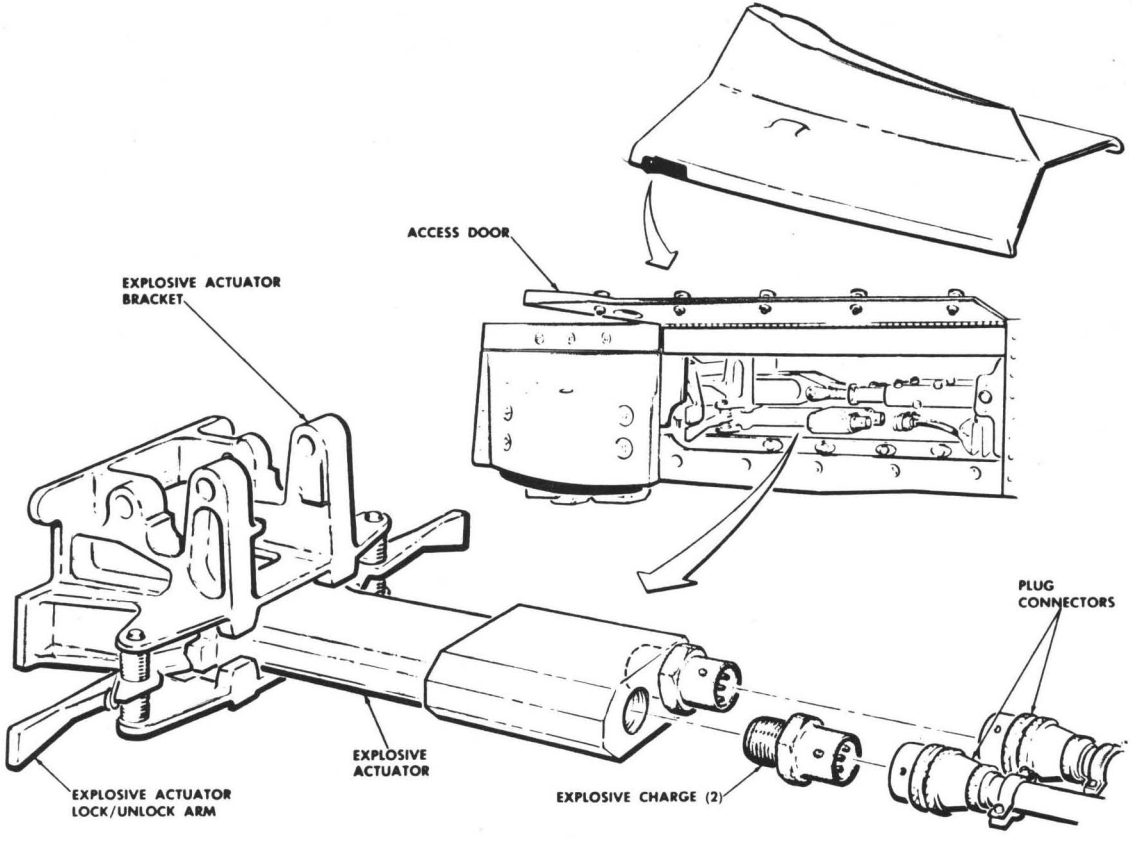
LAUNCHER RELEASE MECHANISM-AFT



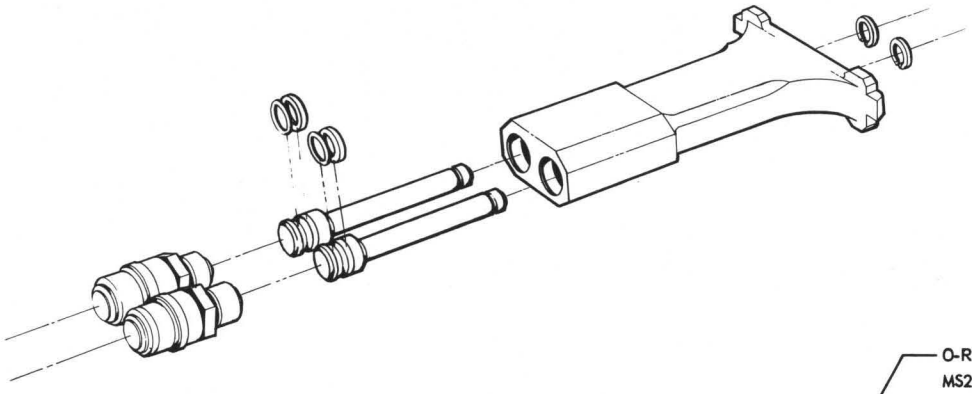
LAUNCHER RELEASE MECHANISM-CARRY MODE

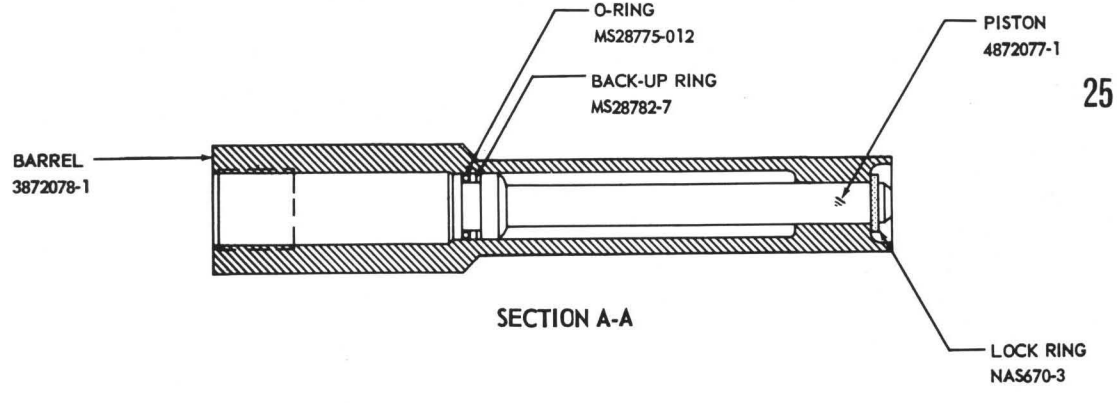


LAUNCHER RELEASE MECHANISM-LAUNCH MODE

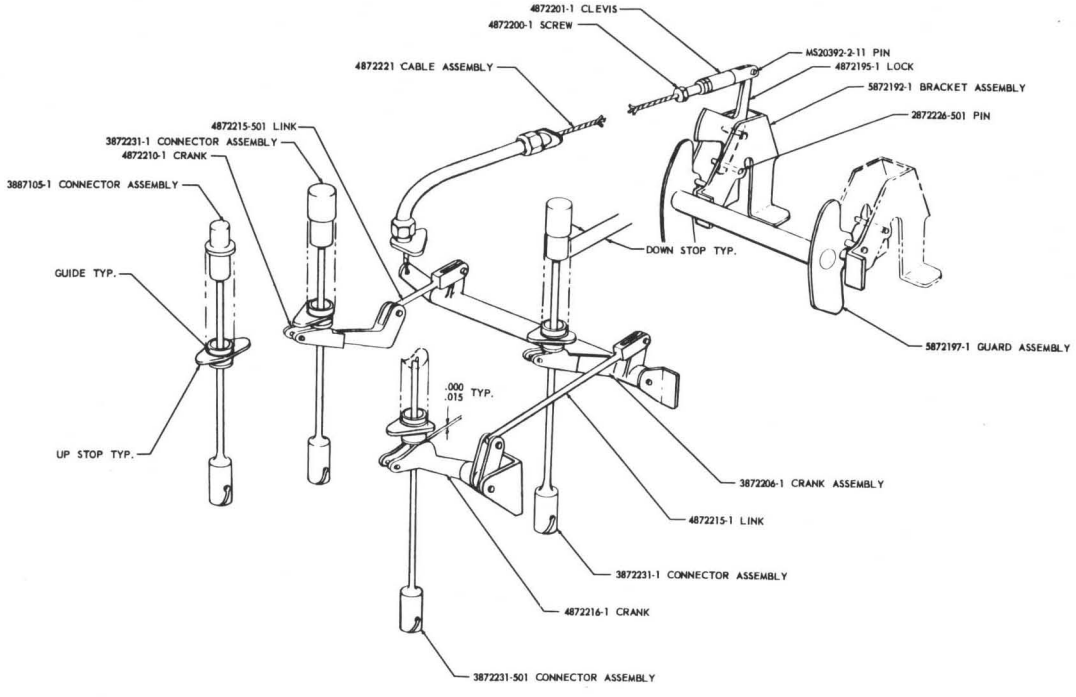


EXPLOSIVE ACTUATOR, LAUNCHER

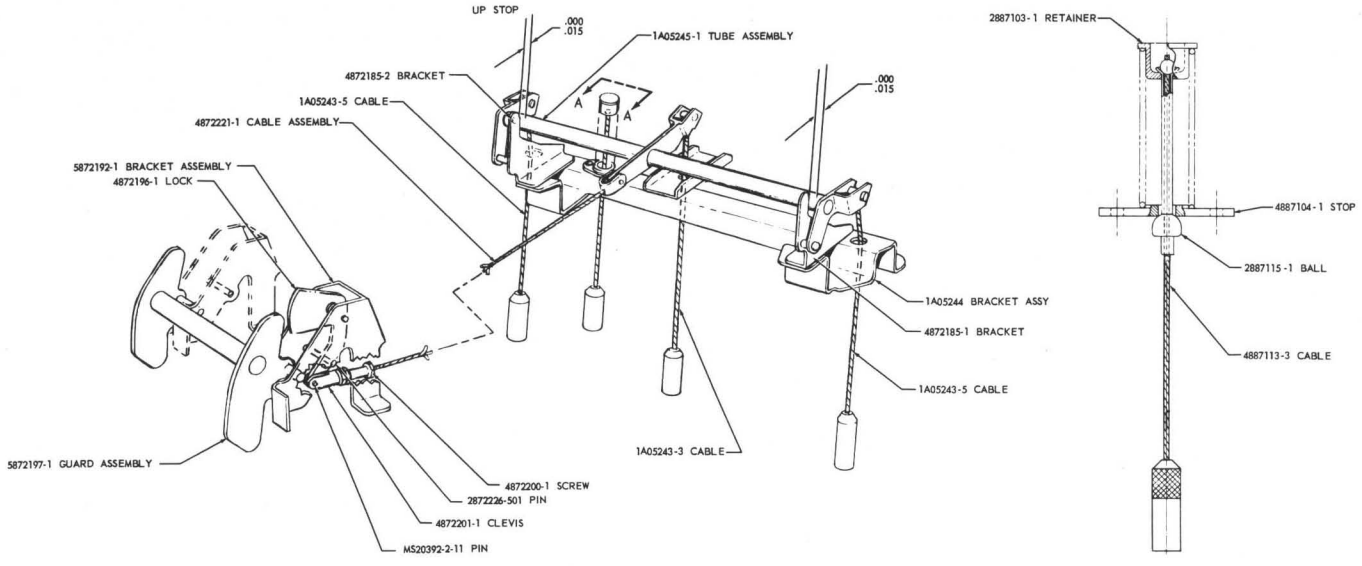




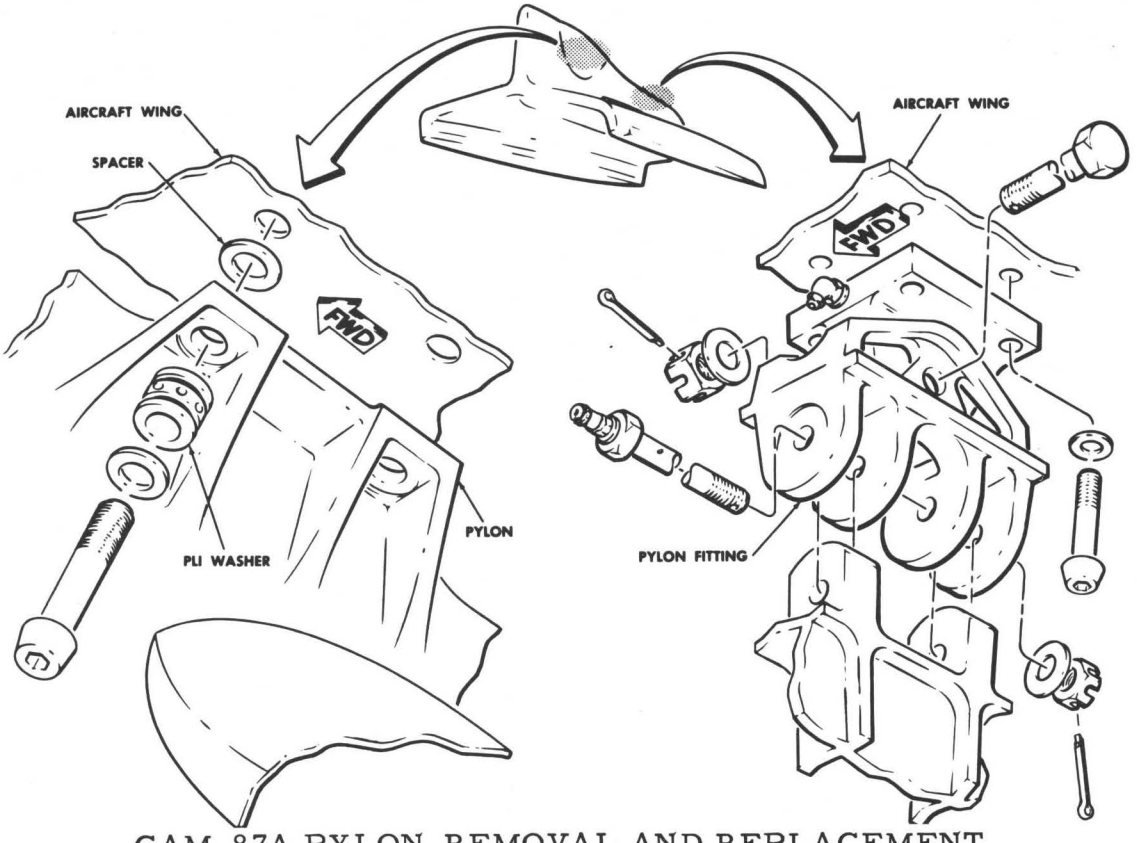
EXPLOSIVE ACTUATOR ASSEMBLY



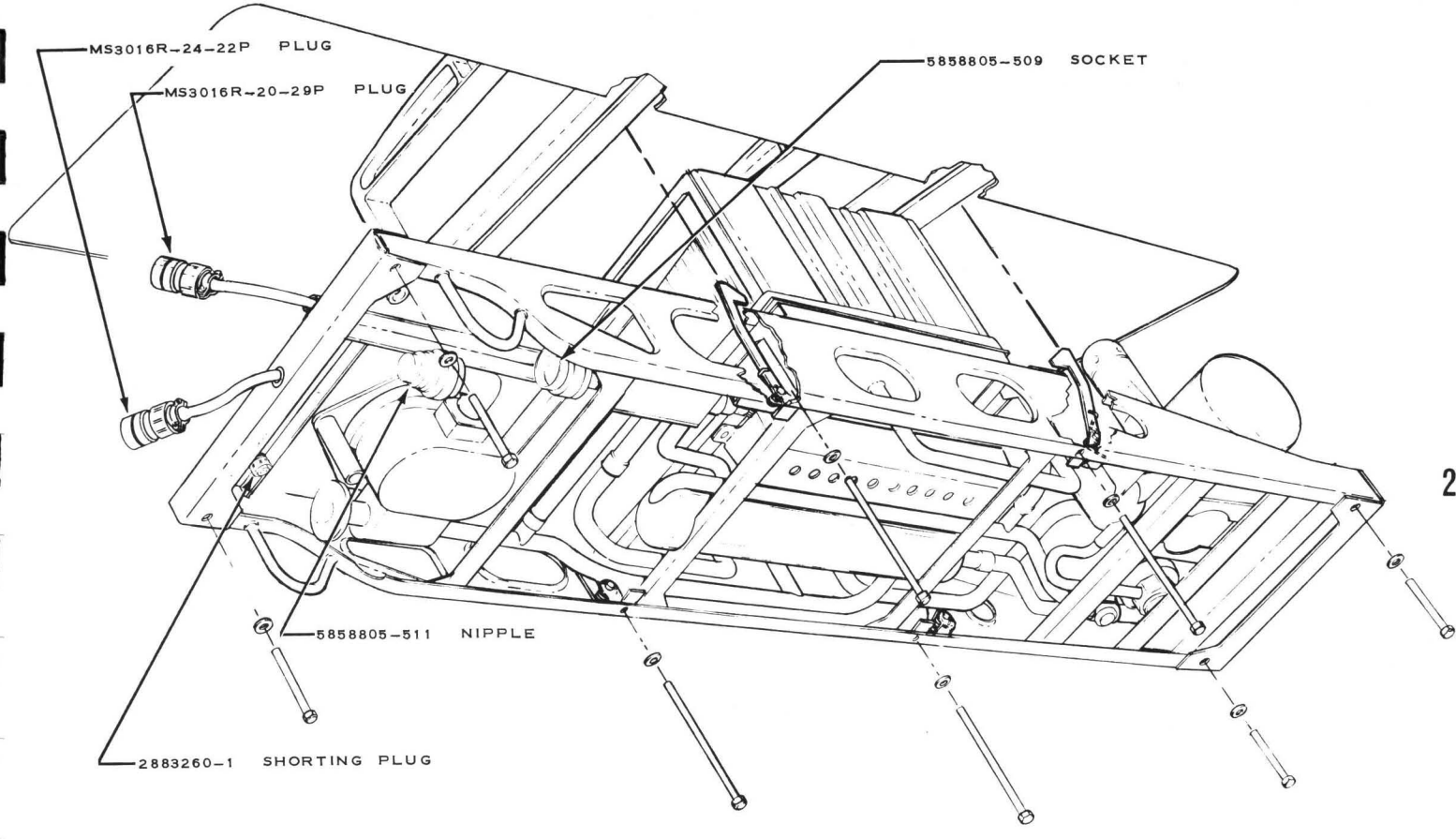
LANYARD DISCONNECT INDICATOR SYSTEM, FWD



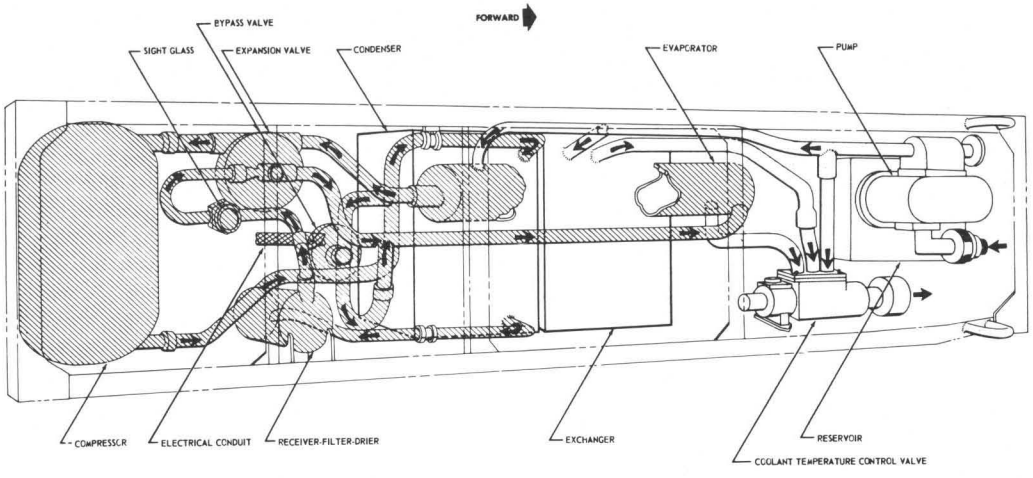
LANYARD DISCONNECT INDICATOR SYSTEM, AFT



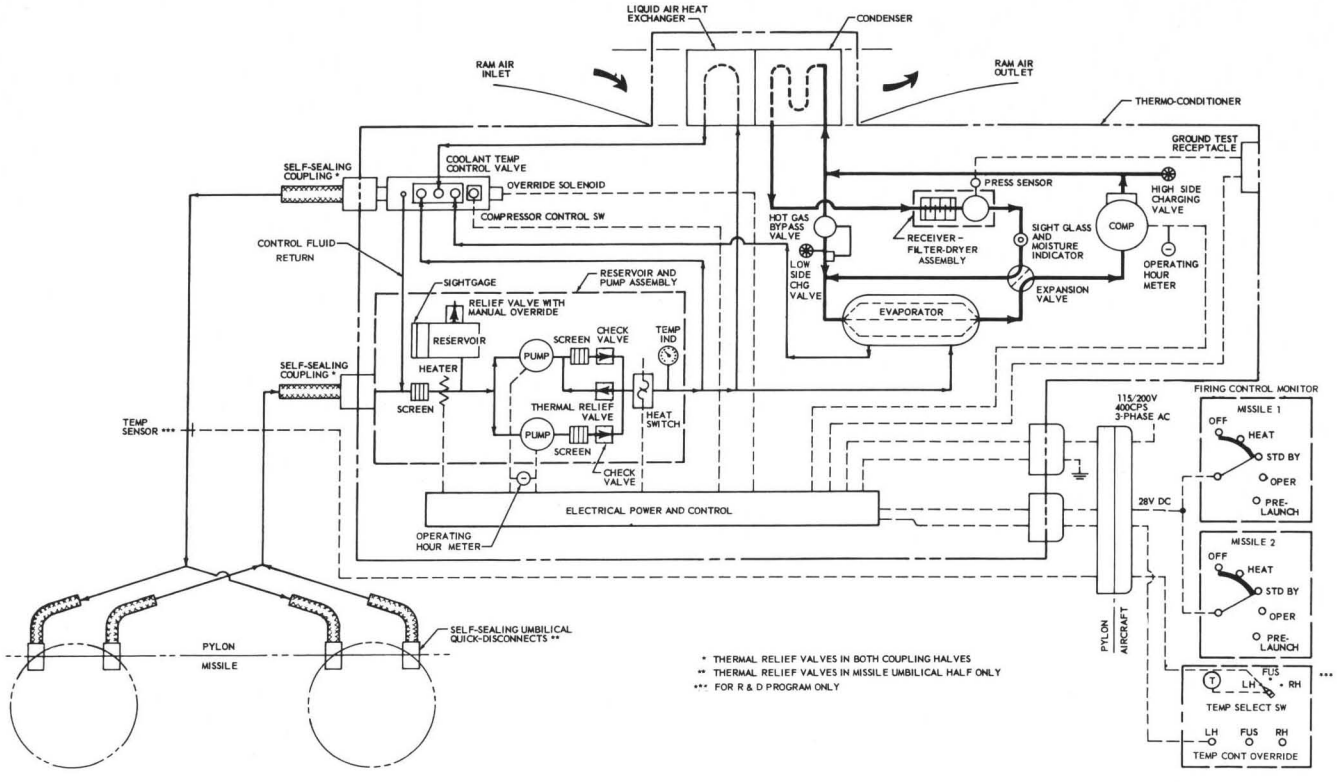
GAM-87A PYLON-REMOVAL AND REPLACEMENT



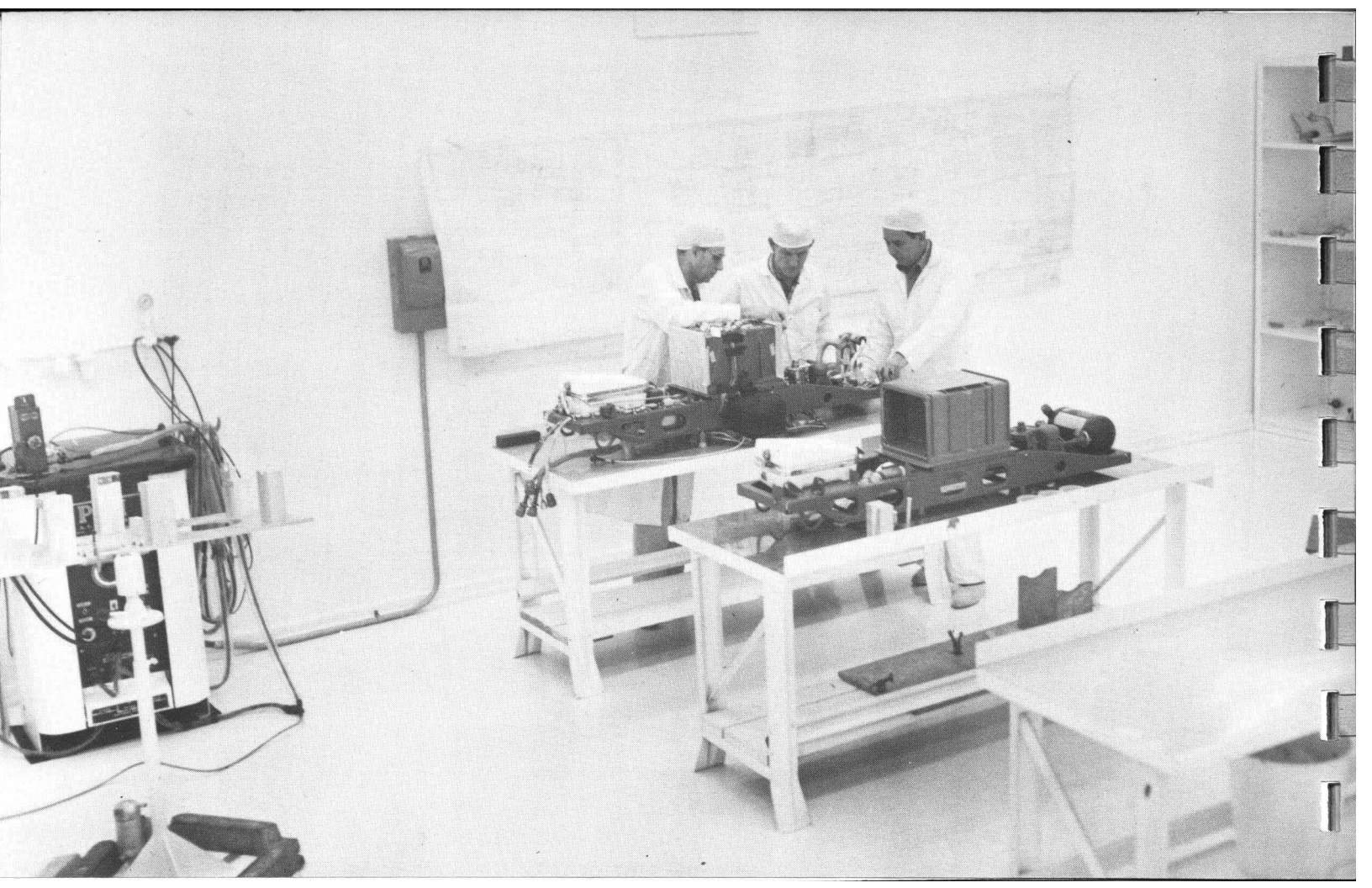
THERMO-CONDITIONING UNIT



THERMO-CONDITIONING SYSTEM



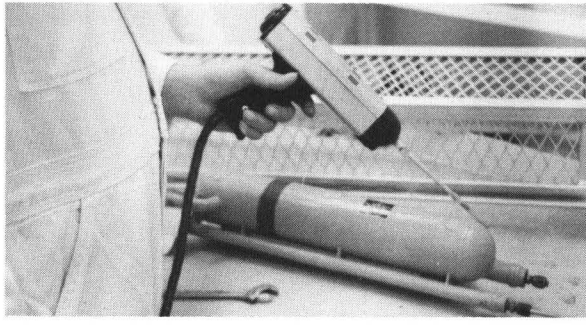
PYLON THERMO-CONDITIONING SYSTEM SCHEMATIC



TULSA DIVISION CLEAN ROOM FACILITY

In order to insure a maintenance-free Thermo-Conditioning System, the Tulsa Division of the Douglas Aircraft Company installed a clean room for the assembly of the unit. The facility provides an atmosphere free of foreign particles during the unit's fabrication. The photograph on the facing page shows Douglas technicians working on a nearly completed unit and the sub-assembly jig (far left). Upon completion, the units are tested and when they leave the clean room, they are sealed, requiring no field maintenance. Should extensive repair ever become necessary due to damage, the units should be returned to operating status under similar conditions.

1



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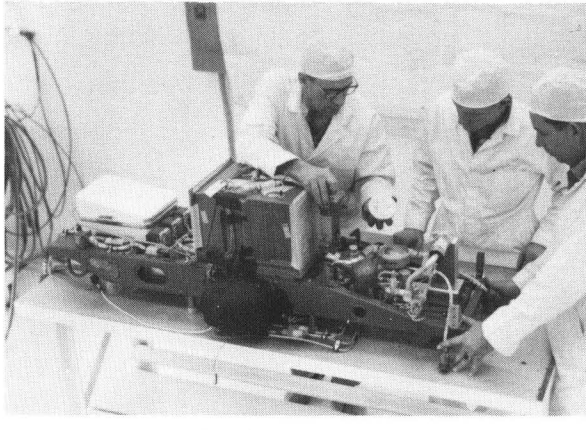
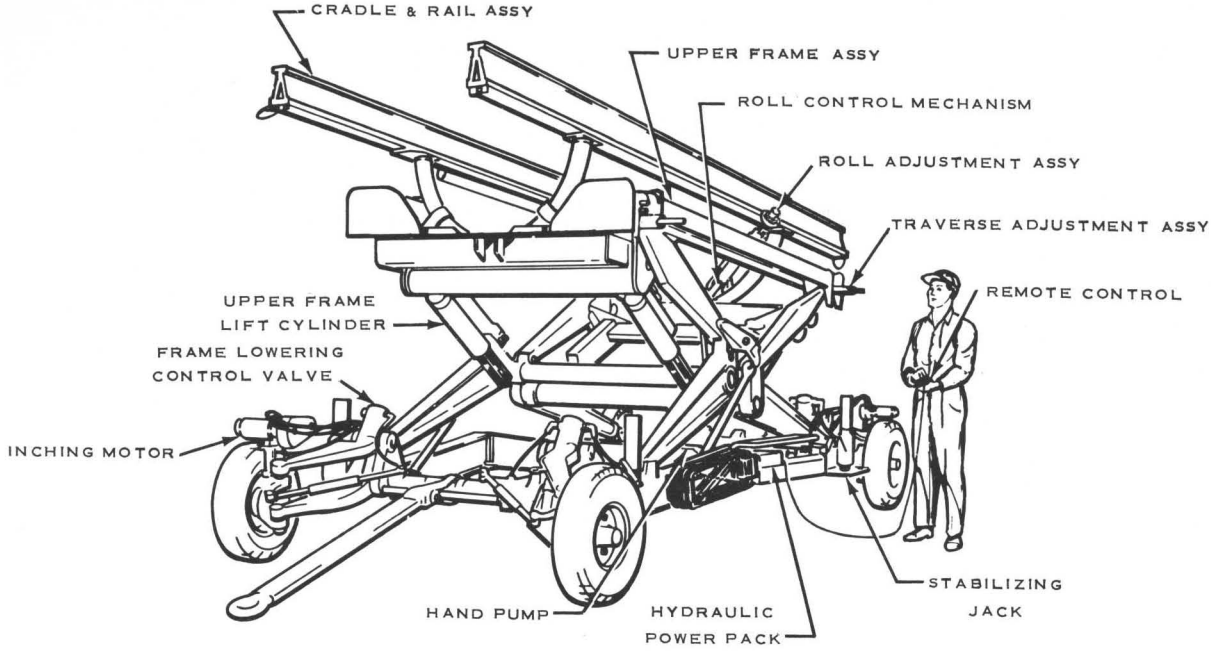


1 *In a test room adjacent to the clean room, an evaporator unit is tested for gas leaks with a halogen leak detector.*

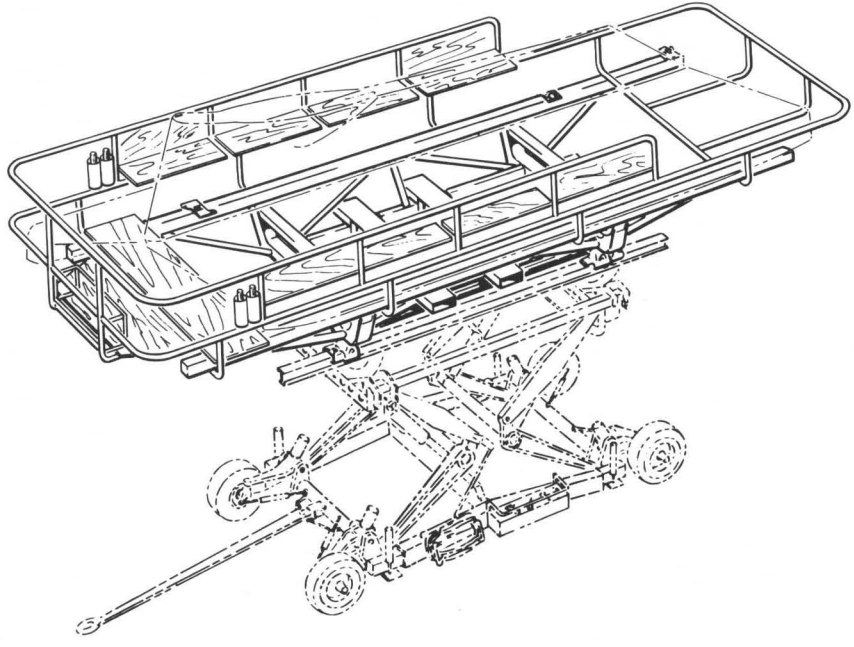
2 *Douglas technicians install a sensing device in the expansion valve.*

AEROSPACE GROUND EQUIPMENT

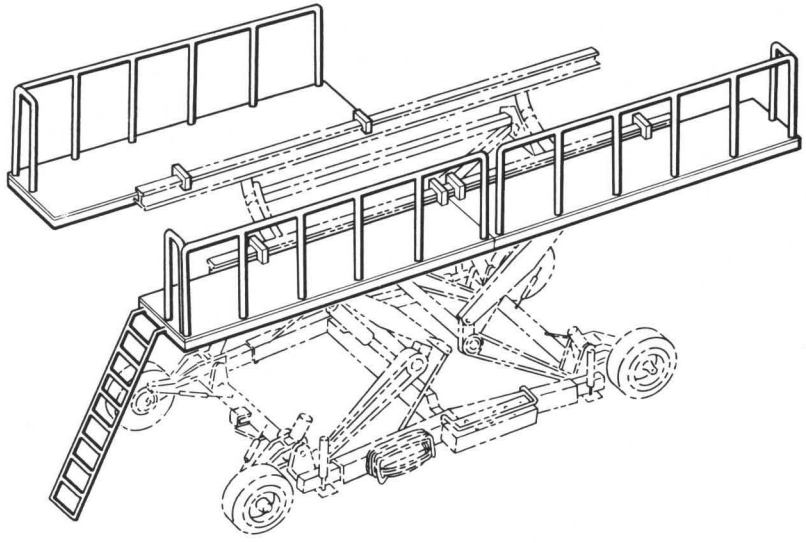
The following pages illustrate the items of ground support equipment provided for the tactical maintenance of the GAM-87A Pylon/Launcher/Thermo-Conditioning Unit. The equipment shown reflects the philosophy of minimum line maintenance required on the tactical configuration.



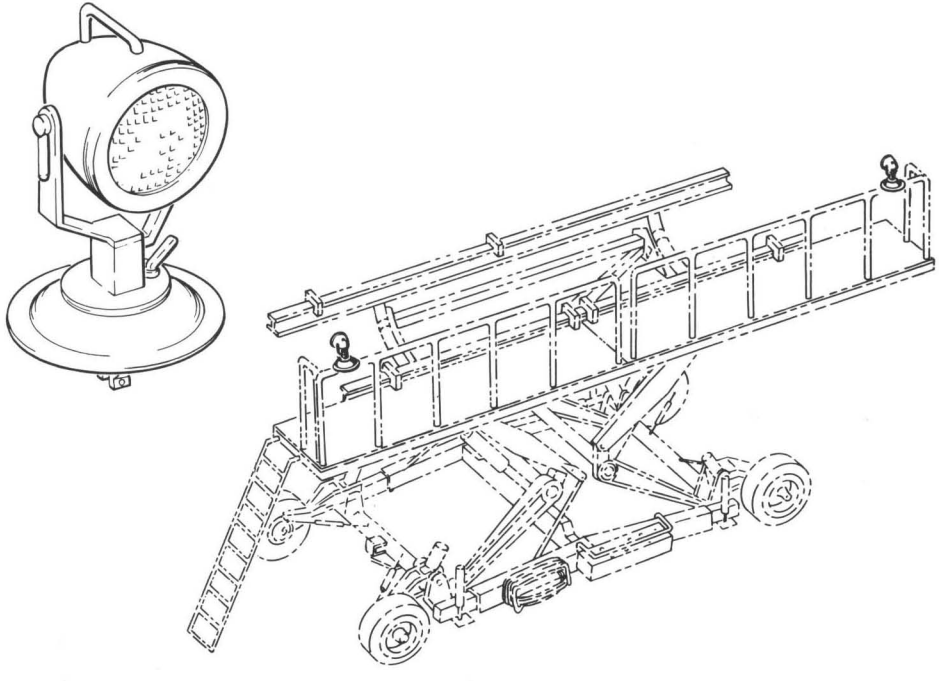
POSITIONING TRAILER, RAIL TYPE (ITEM 1)



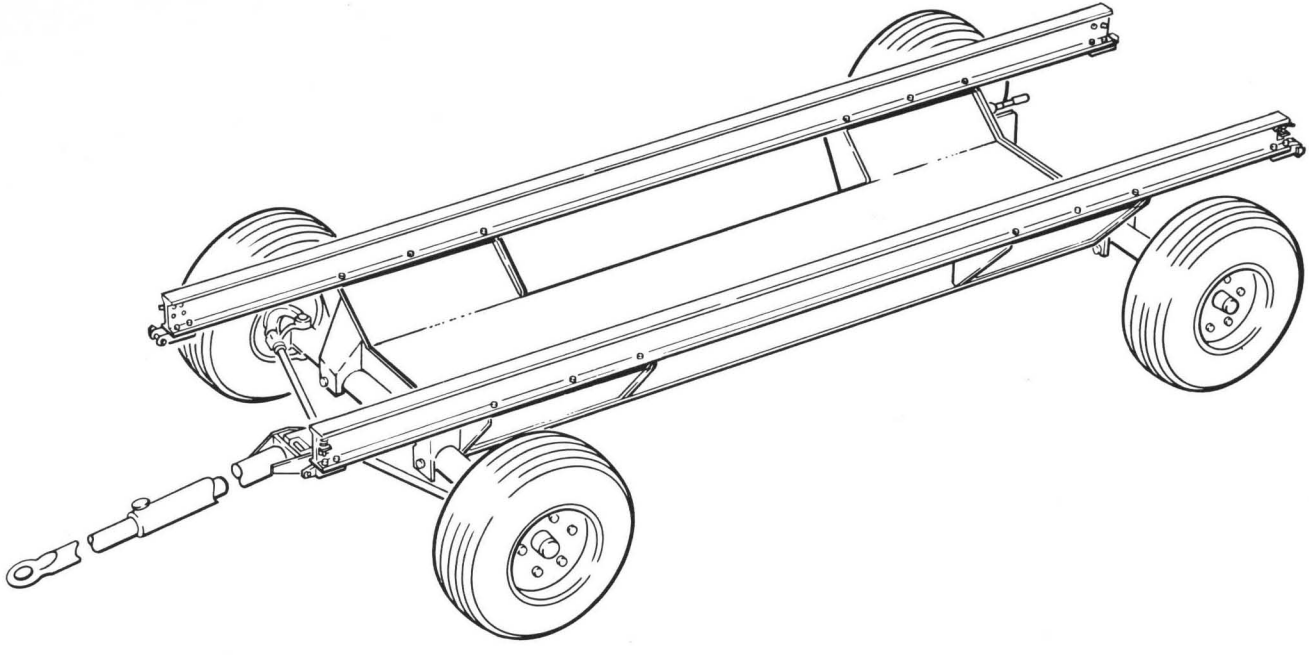
SUPPORT, PYLON (ITEM NO. 30)



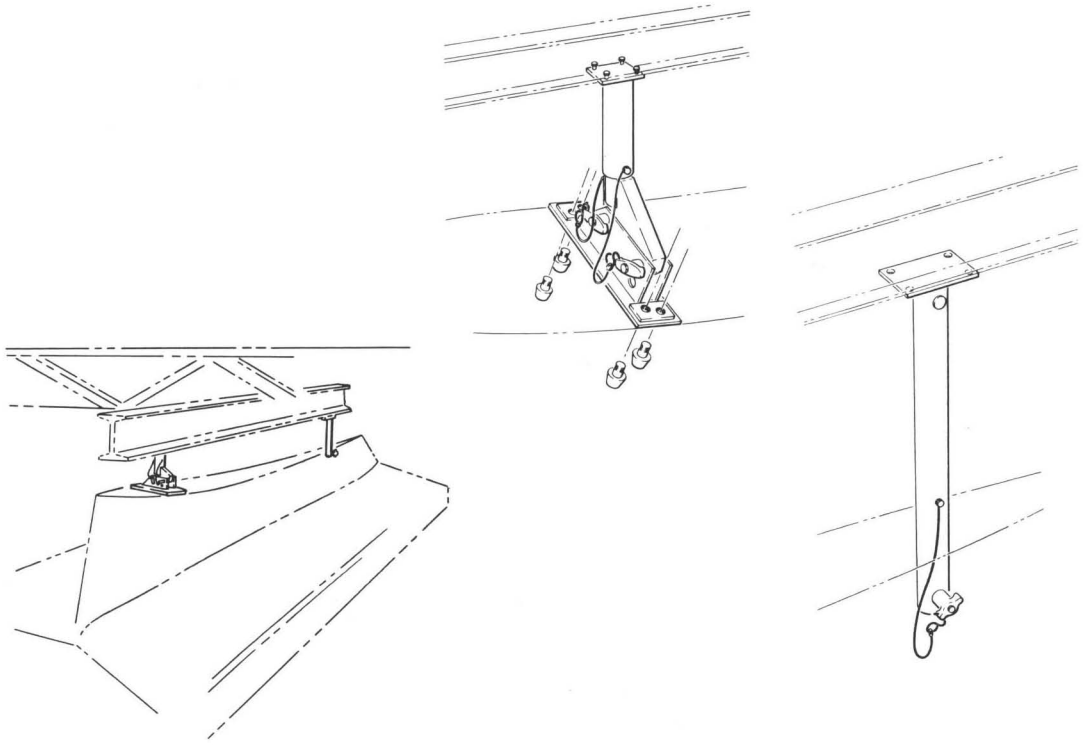
PLATFORM, AIRCRAFT LOADING (ITEM NO. 31)



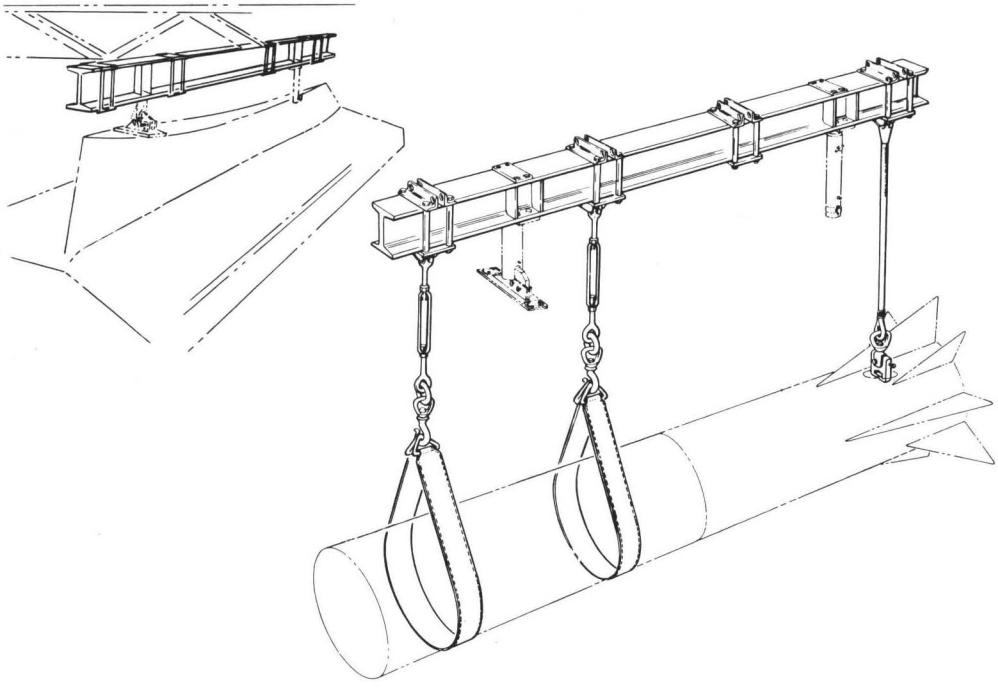
FLOODLIGHT SET, ELECTRIC (ITEM NO. 33)



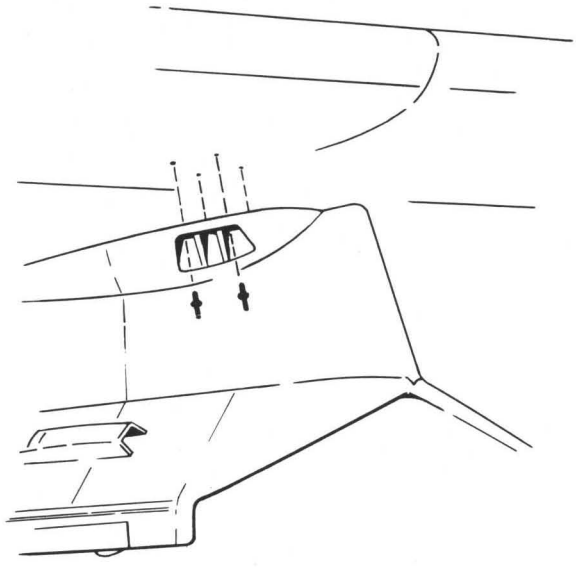
TRAILER, RAIL TYPE-MAINTENANCE (ITEM NO. 118)

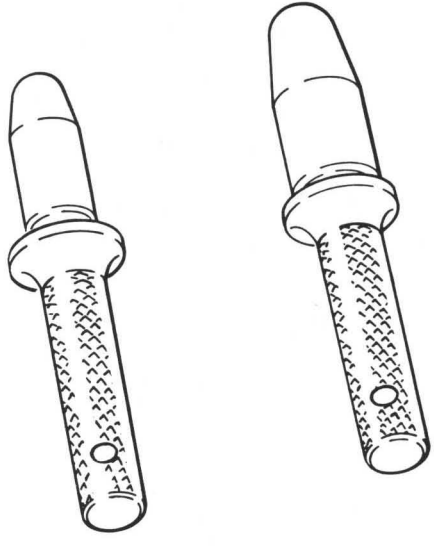


ADAPTER KIT, PYLON MAINTENANCE (ITEM NO. 122)

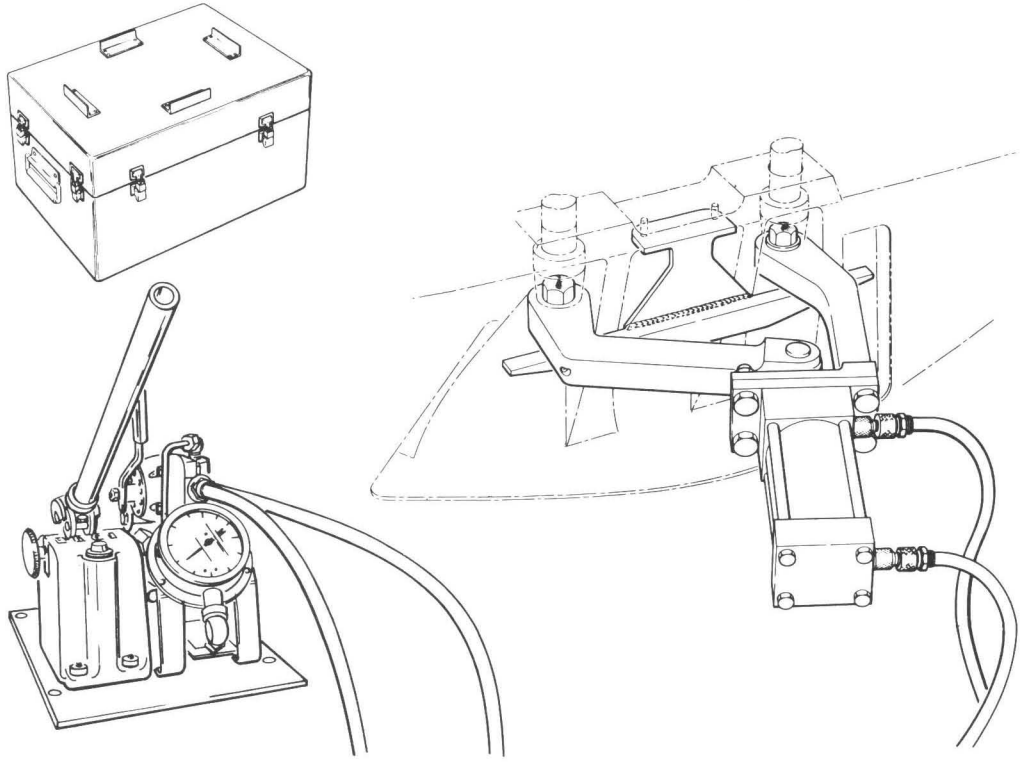


SUSPENSION EQUIPMENT, MISSILE-PYLON (ITEM NO. 163)

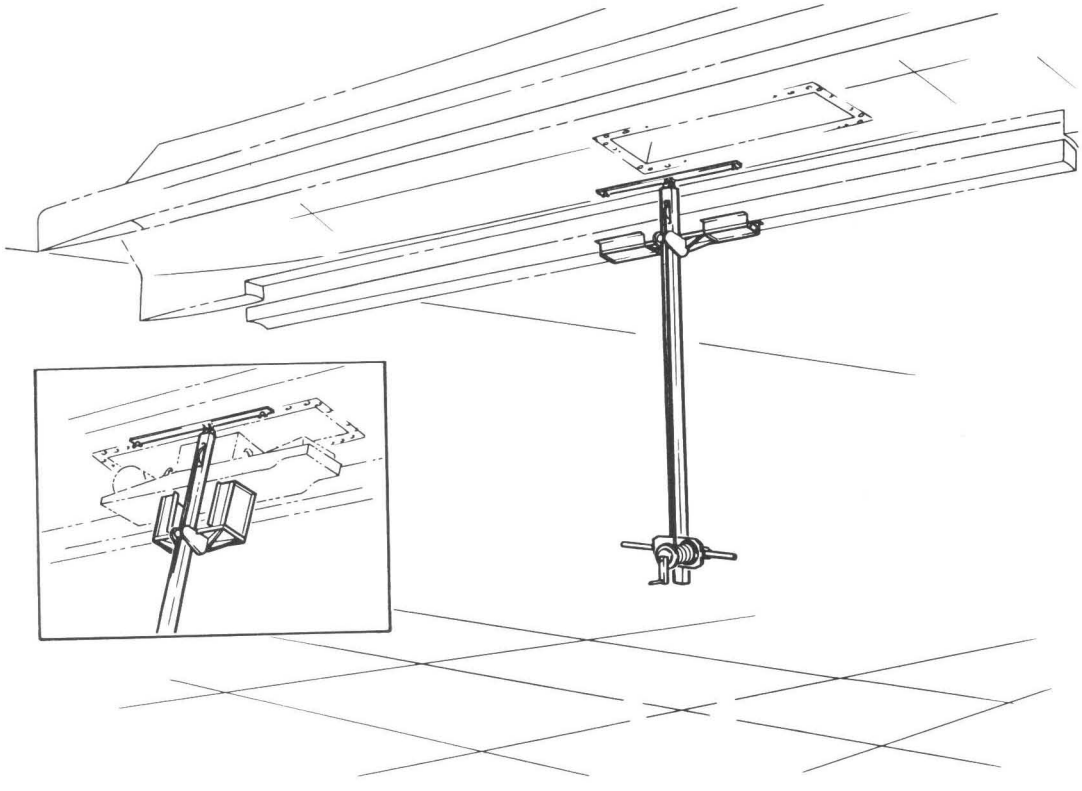




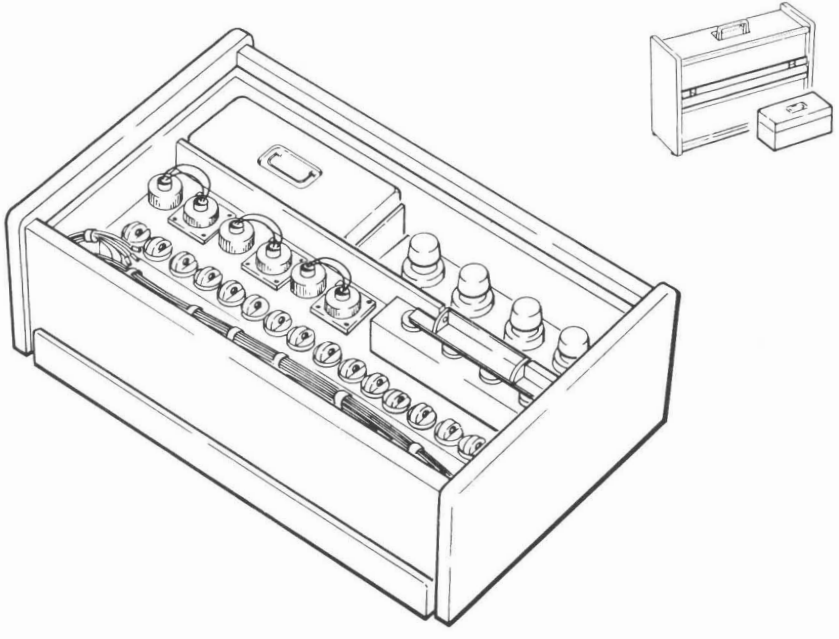
PIN KIT, GUIDE, PYLON MOUNTING (ITEM NO. 119)



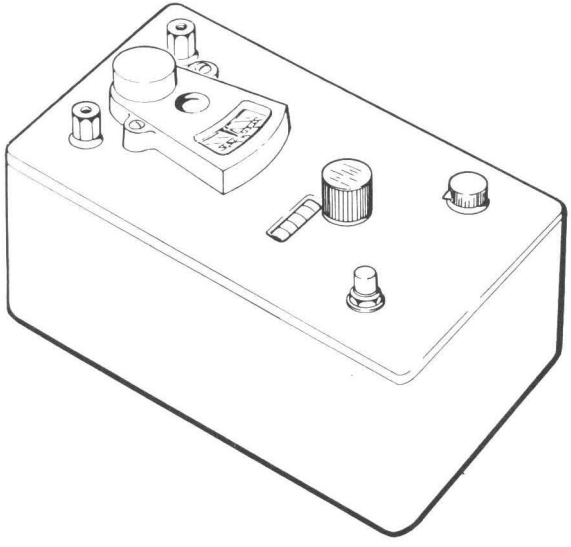
WRENCH, HYDRAULIC TORQUE-PYLON BOLTS (ITEM NO. 124)



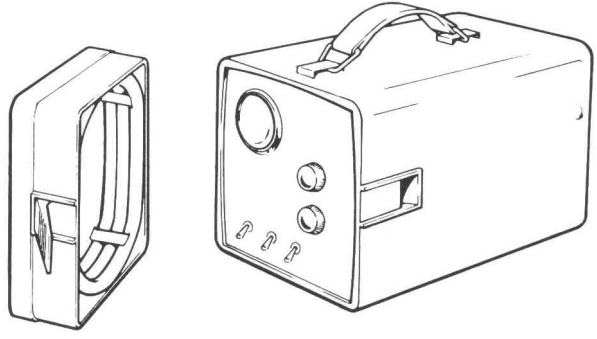
HOISTING UNIT THERMO-CONDITIONER AND LAUNCHER,
PYLON MOUNTING (ITEM NO. 120)



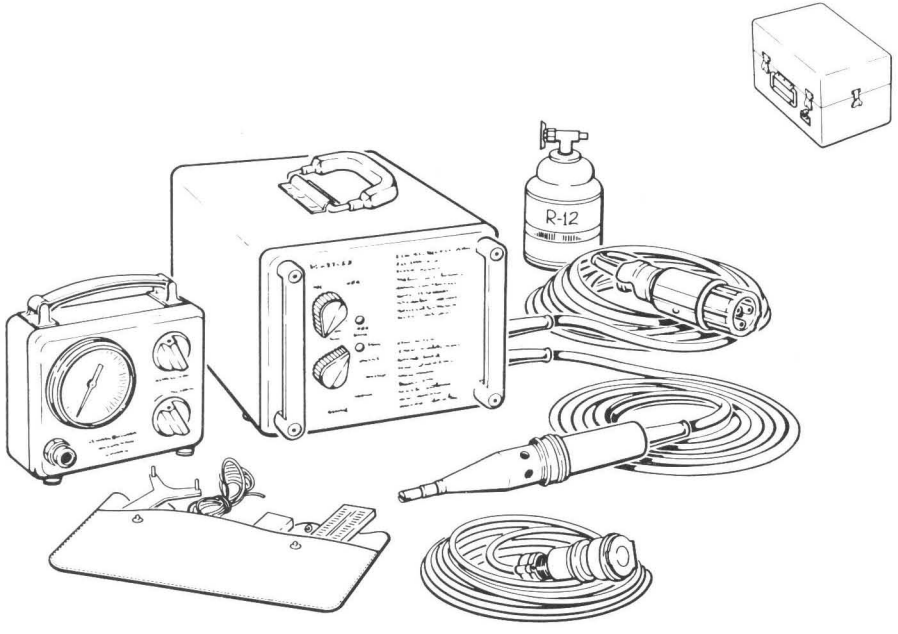
CASE, STORAGE, PYROTECHNIC DEVICES (ITEM NO. 100)



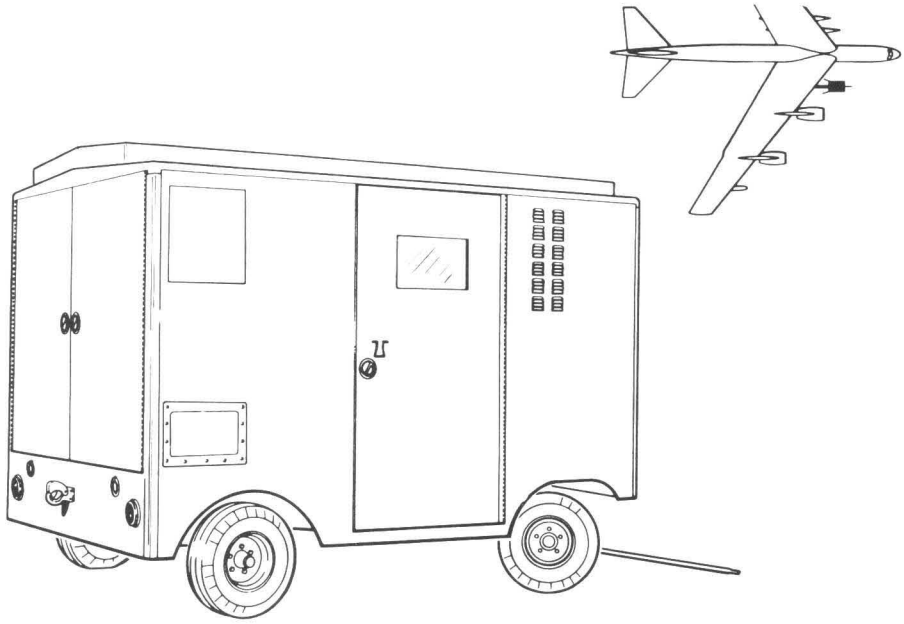
TEST SET, ELECTRIC SQUIB
(ITEM NO. 128)



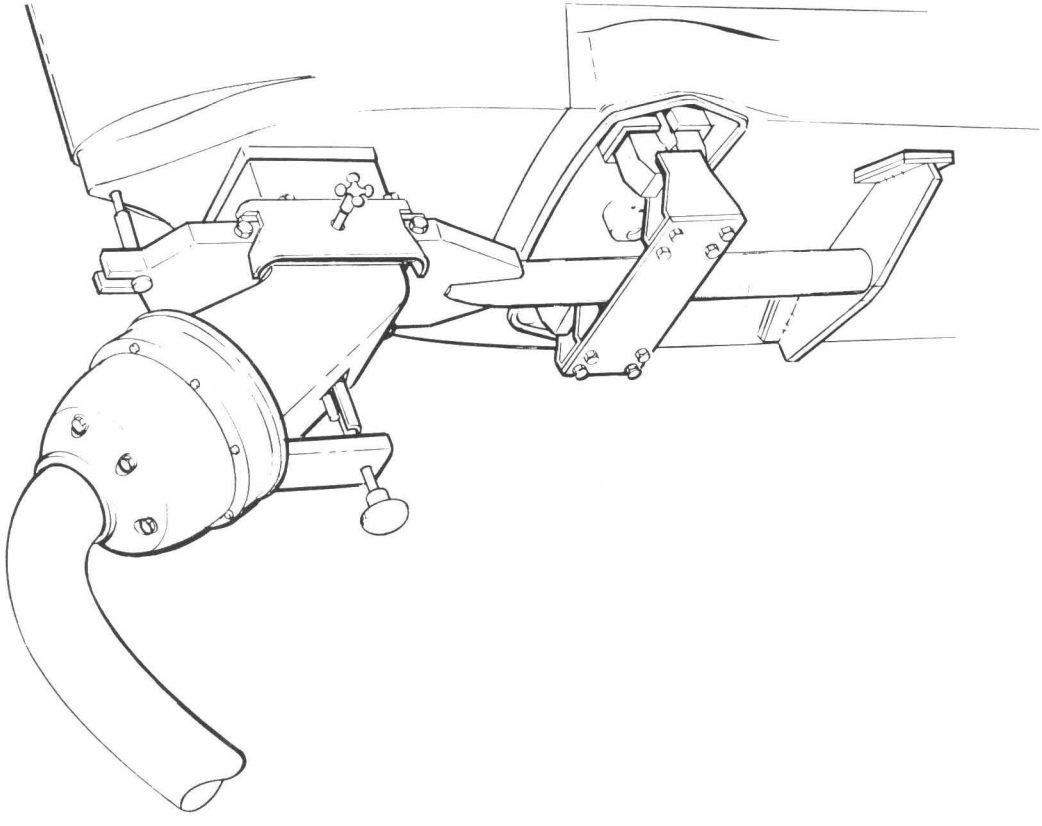
TEST SET, STRAY VOLTAGE
(ITEM NO. 55)



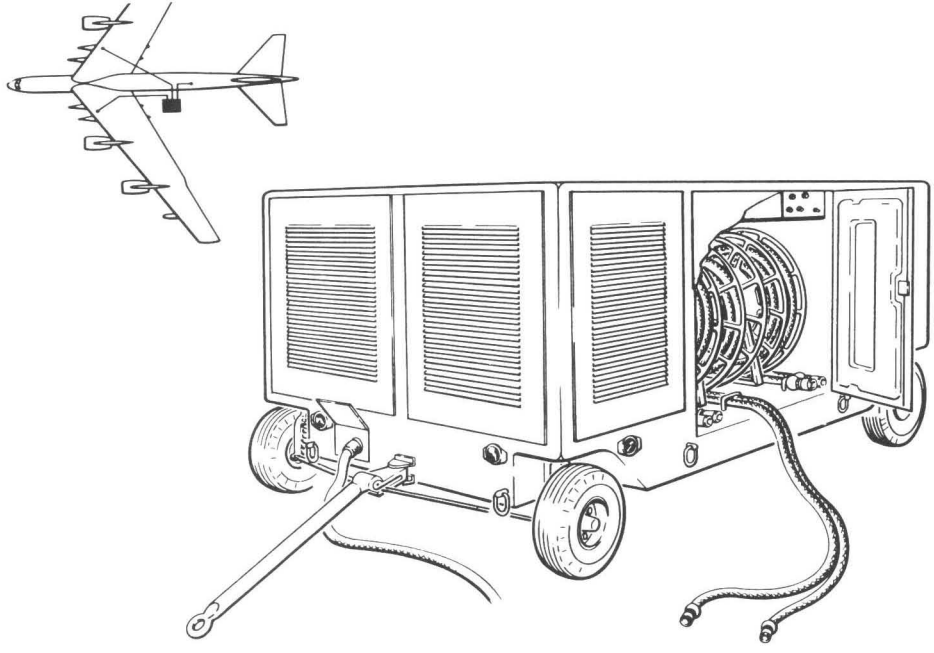
LEAK DETECTOR, HALOGENATED HYDROCARBON GAS,
EXPLOSION PROOF (ITEM NO. 80)



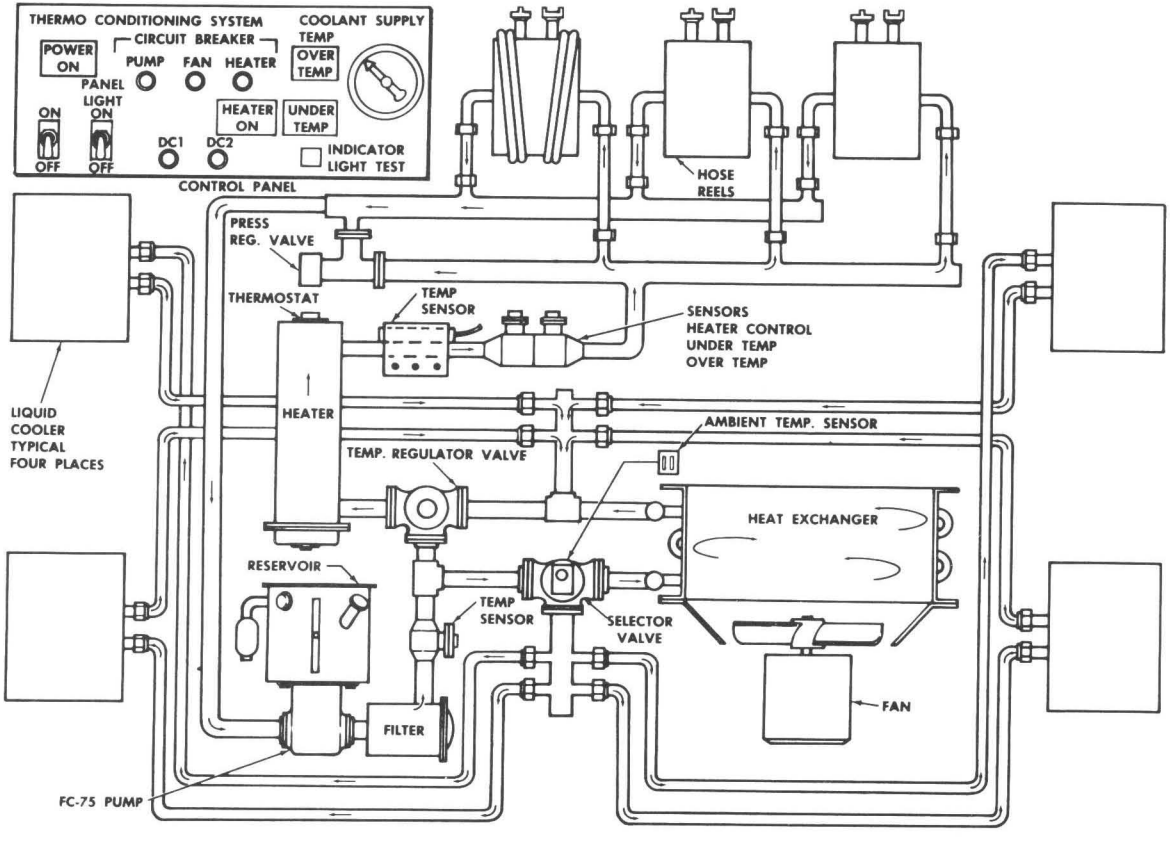
SIMULATOR, MISSILE LAUNCH CONTROL SUBSYSTEM-
SM-234(XA-1)/ASW-17 (ITEM NO. 73)
(1A02012 Electrical Cable Assembly used
in conjunction with Simulator)



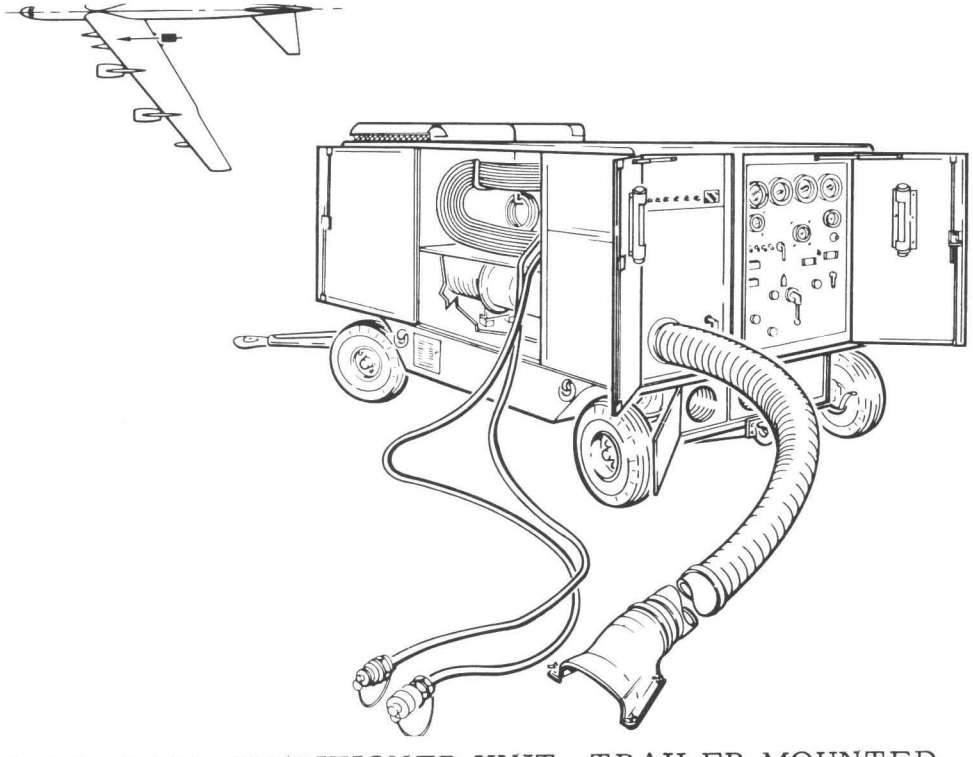
ELECTRICAL UMBILICAL ADAPTER ASSY



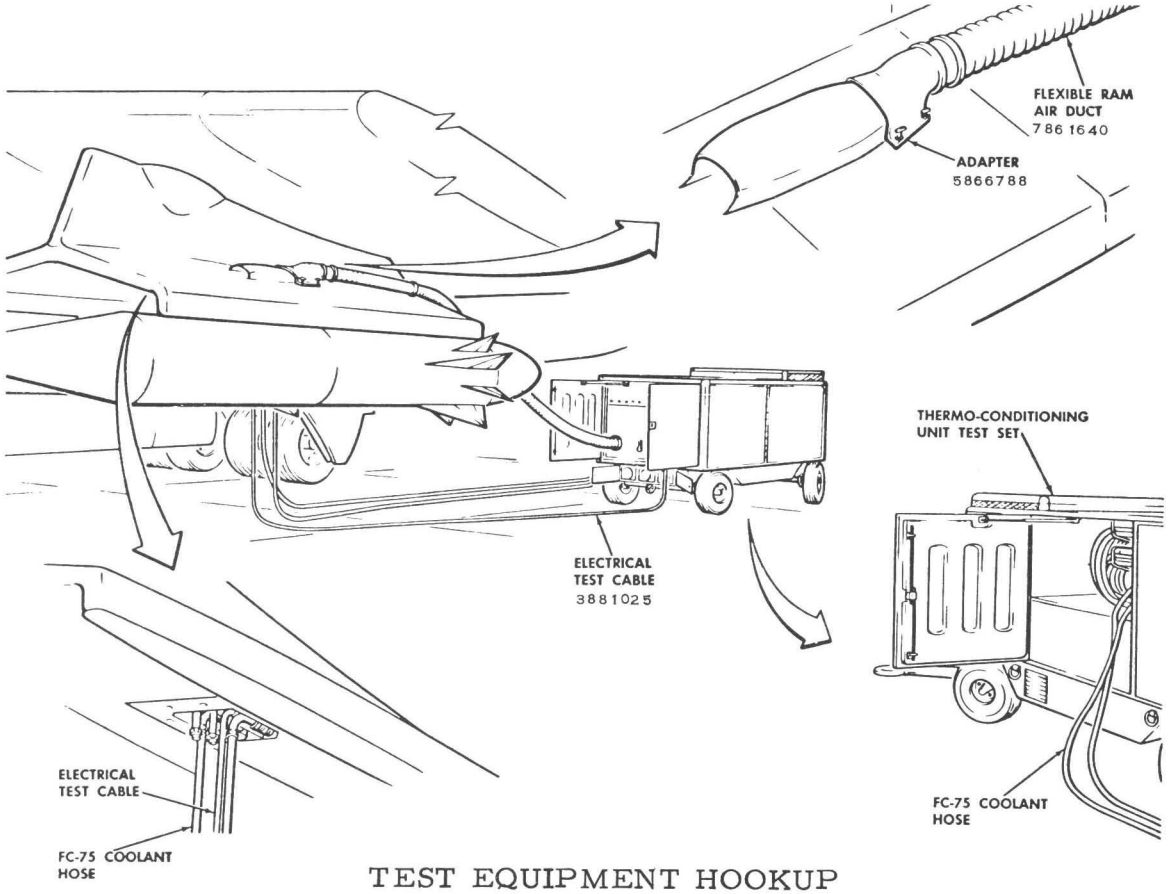
THERMO-CONDITIONER SYSTEM, TRAILER MOUNTED-
A/M32T-2(XA-1) (ITEM NO. 97)



THERMO-CONDITIONING SYSTEM TRAILER FLUID SCHEMATIC

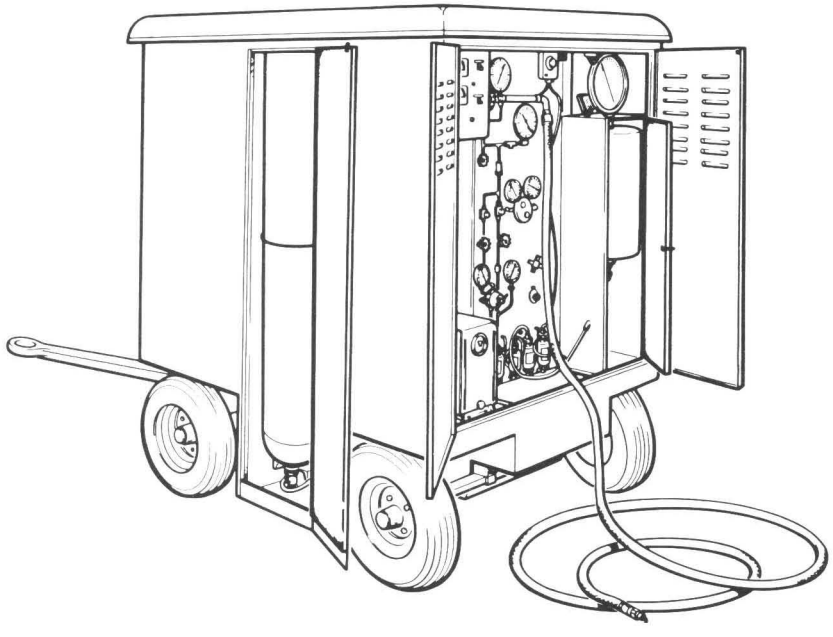


TEST SET, THERMO-CONDITIONER UNIT, TRAILER MOUNTED-
TTU-125(XA-1)/E C (ITEM NO. 57)

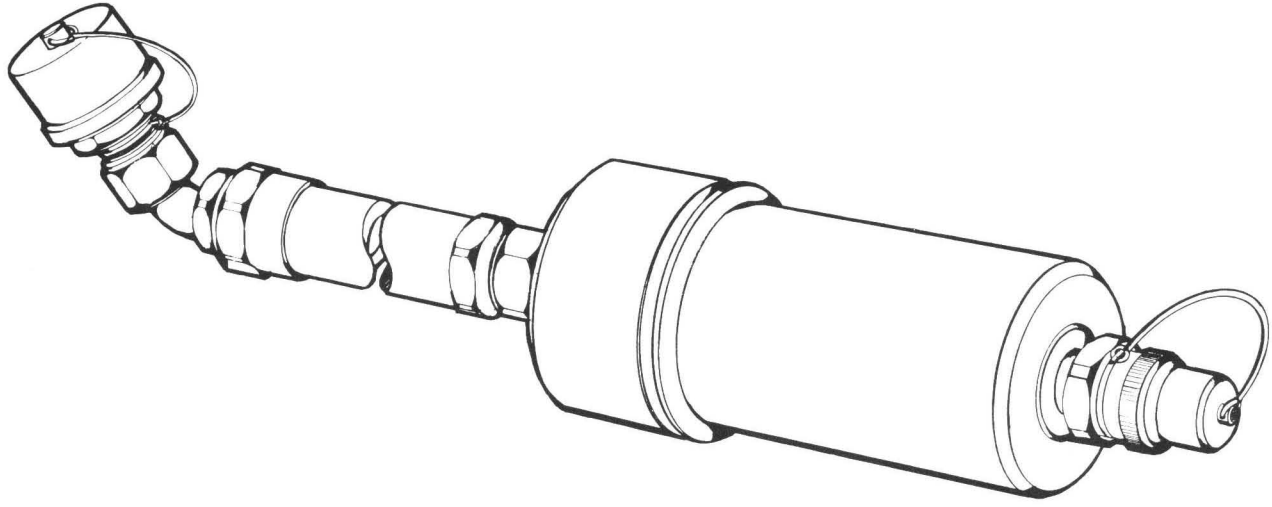


TEST EQUIPMENT HOOKUP

THERMO-CONDITIONING UNIT TEST SET, TRAILER MOUNTED



CHARGING STATION, REFRIGERANT, TRUCK MOUNTED
(ITEM NO. 79)



PYLON SUPPORT EQUIPMENT FILTER

(Used in conjunction with Item No. 57.)

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